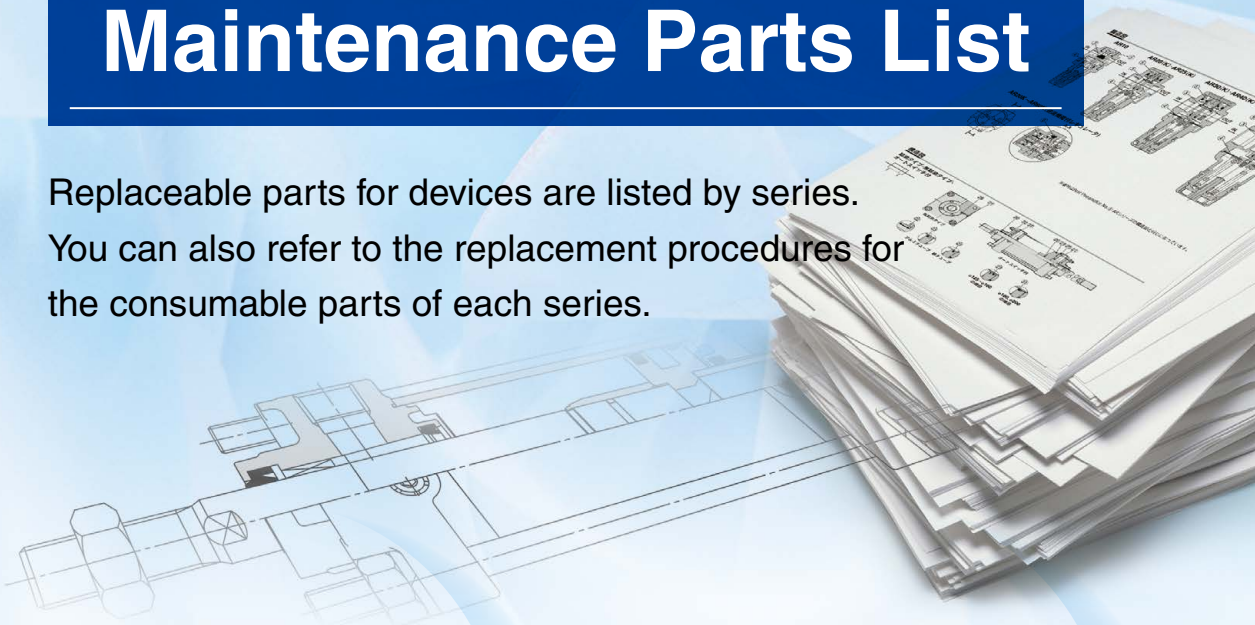
Maintenance Parts List

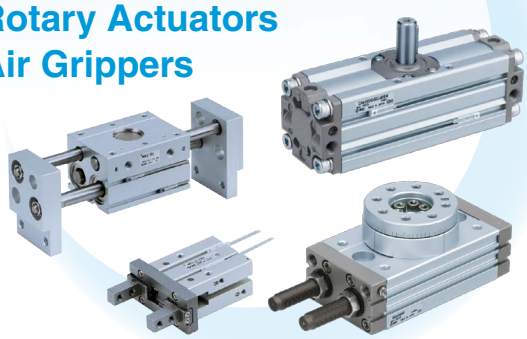
Replaceable parts for devices are listed by series.
You can also refer to the replacement procedures for the consumable parts of each series.



Actuators



Rotary Actuators
Air Grippers



Modular F.R.L.
Pressure Control Equipment



Air Preparation Equipment
Industrial Filters



SMC

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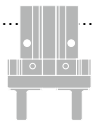
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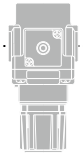
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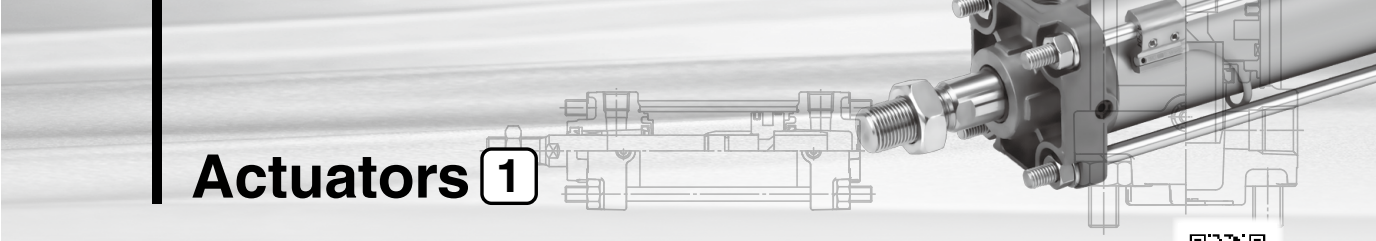
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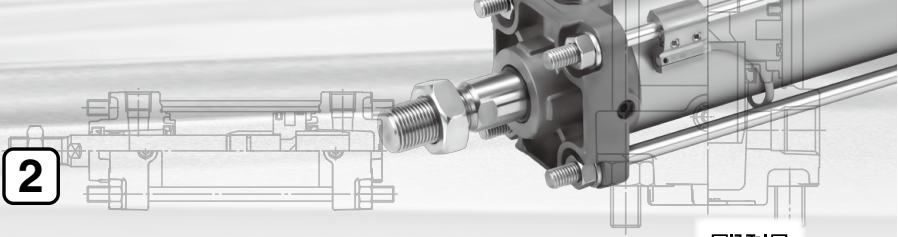
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Search for Seal Kits
You can search for seal kits on the SMC website.

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Search for Seal Kits
You can search for seal kits on the SMC website.

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MGG	Guide Cylinder	p. 160	—
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CHSG	ISO Standard Hydraulic Cylinder	p. 236	p. 509
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CH2F	JIS Standard Hydraulic Cylinder/Double Acting, Single Rod	p. 237	p. 510
CH2G	JIS Standard Hydraulic Cylinder/Double Acting, Single Rod	p. 237	p. 510
CH2H	JIS Standard Hydraulic Cylinder/Double Acting, Single Rod	p. 237	p. 510
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CHAW	Tie-rod Type Hydraulic Cylinder/Double Acting, Double Rod	p. 240	—

1 Cylinder Inspection Items

The following describes the general contents of the cylinder inspection items.
Actually, add inspection items suitable for the customer's specifications and perform the inspection work.

■ Inspection items

1) Check the cylinder mounting bolt or nut for looseness.
2) Check the cylinder mounting frame for looseness or unusual deflection.
3) Check the rod end bracket, tie-rod, or bolt for looseness or rattle.
4) Check the rod for dent or sliding scratch.
5) Check that the cylinder operates smoothly and that the minimum operating pressure does not increase.
6) Check that the piston speed or cycle time does not change.
7) Check that any shock does not occur at the operation end or that any unusual noise is not heard.
8) Check for eternal leak. In particular, carefully check the rod seal.
9) Check that the stroke is correct and that the cylinder operates the specified stroke.
10) Check that the auto switch operates correctly, that the switch joint is not loose, and that the switch position does not deviate.

■ Trouble judgment from cylinder status (Judgment from appearance)

1) Only one side of the rod surface is contaminated blackly.
→ The seal is worn out unevenly by the eccentric load or lateral load.
2) Thin sliding scratch is marked on the entire periphery of the rod in the operation direction.
→ The lubrication is faulty due to grease run-out.
3) Sliding scratch is marked on only one side of the rod surface.
→ The rod is strongly in contact with the bushing by the eccentric load or lateral load, causing scratch.
4) A part of the rod is scratched in a direction perpendicular to the cylinder operation.
→ A large lateral load is applied when the cylinder stops.
5) Air leaks from the rod seal.
→ Scratch, dent, eccentric load, or external foreign object (solid or liquid) may be the cause.

■ Probable troubles (Reference)

Refer to the cylinder troubleshooting. (p. 5)

2 Troubleshooting

The following describes the general contents of the troubleshooting.

[Cylinder]

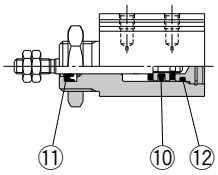
Trouble (Symptom)	Cause	Corrective action
The operation is not smooth. The output drops. The cylinder does not operate.	The grease of the sliding part runs out.	Apply the grease. The following may be the cause of the trouble. • As water content, such as drain enters, the grease flows out. • The lubrication is stopped halfway. • The cylinder is operated in an environment where the fluid splashes.
	The center between the workpiece and cylinder shaft or the center between the workpiece guide shaft and cylinder shaft deviates.	Align the center. Check that the cylinder operates smoothly with the air not supplied to the cylinder. Additionally, examine the use of the floating joint.
	The piston rod deforms.	Replace the cylinder. The following may be the cause of the trouble. • The center between the cylinder and load deviates. • A lateral load exceeding an allowable level is applied. • The kinetic energy exceeds an allowable level. • An excessive force is applied when mounting a load.
	The air leaks (seal is worn-out).	Replace the seal. The following may be the cause of the trouble. • The center between the cylinder and load deviates. • A lateral load exceeding an allowable level is applied. • The operating temperature exceeds its range. • The grease runs out. • A foreign object enters.
	The air pressure is insufficient.	Supply an appropriate pressure. The following may be the cause of the trouble. • The supply pressure decreases. • The pressure regulator setting deviates. • The piping is clogged.
	The cylinder operates at low speed.	Operate the cylinder within the specification range.
	The cylinder output is insufficient.	Increase the operating pressure or use an appropriate cylinder with a large bore size. Since there are cylinder and mechanical resistances, it is necessary to consider the load factor.
	The system configuration is not appropriate.	Use piping tube, fitting, directional control valve, and speed controller with proper sizes.
	Equipment other than the cylinder malfunctions or is faulty.	Investigate the target system step-by-step. The following may be the cause of the trouble. • The directional control valve malfunctions. • The speed controller is not adjusted properly. • The speed controller malfunctions. • The piping is clogged. • The filter is clogged, etc.
The cylinder part is damaged.	The cylinder operates at high speed.	Adjust the speed with the speed controller to operate the cylinder within the specification range.
	Overload	Operate the cylinder within its allowable kinetic energy range.
	Lateral load	Operate the cylinder within its lateral load range.
	Unusual external force is applied.	If any mechanical interference, eccentric load, or overload occurs, this may cause the cylinder to deform or break. Remove such adverse factors.

CJP2 Series ø6, ø10, ø16

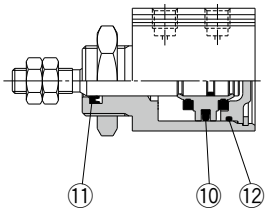
The Replacement Procedure is on p. 375

Construction

C□JP2B6



C□JP2B10, 16



∗ The numbers correspond with those in the "Construction" of the CJP2 series in the **Web Catalog**.

Seal Kit List

No.	Description		Material	Note
⑩	**Piston seal**		NBR	
⑪	**Rod seal**		NBR	
⑫	**Gasket**	**ø6, ø10, ø16**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Standard type		
6	CJP2B6D-PS	Set of nos. ⑩, ⑪, ⑫
10	CJP2B10D-PS	
16	CJP2B16D-PS	

∗ The seal kit includes a grease pack (5 g).
Order with the following part number when only the grease pack is required.
Grease pack part number: GR-L-005 (5 g)

XB6/Heat-resistant cylinder (–10 to 150°C)		
6	CJP2B6D-XB6-PS	Set of nos. ⑩, ⑪, ⑫
10	CJP2B10D-XB6-PS	
16	CJP2B16D-XB6-PS	

∗ The seal kit includes a grease pack (5 g).
Order with the following part number when only the grease pack is required.
Grease pack part number: GR-F-005 (5 g)

XB7/Cold-resistant cylinder		
6	CJP2B6D-XB7-PS	Set of nos. ⑩, ⑪, ⑫
10	CJP2B10D-XB7-PS	
16	CJP2B16D-XB7-PS	

∗ The seal kit includes a grease pack (5 g).
Order with the following part number when only the grease pack is required.
Grease pack part number: GR-T-005 (5 g)

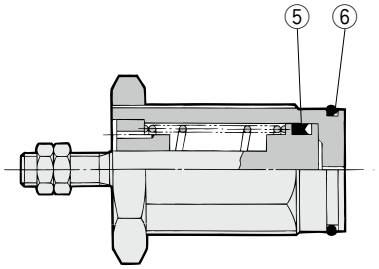
XC22/Fluororubber seal		
6	CJP2B6D-XC22-PS	Set of nos. ⑩, ⑪, ⑫
10	CJP2B10D-XC22-PS	
16	CJP2B16D-XC22-PS	

∗ The seal kit includes a grease pack (5 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-L-005 (5 g)

CJP Series ø4, ø6, ø10, ø15

Construction (Not able to disassemble)

Embedded type



∗ The numbers correspond with those in the “Construction” of the CJP series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
5	**Piston seal**	NBR	**5 is a non-replaceable part.**
⑥	**Gasket**		Special product (O-ring) embedded type only

Replacement Parts: Gasket

Bore size (mm)	Part no.	Contents
4	CJPS4-G	No. ⑥
6	CJPS6-G	
10	CJPS10-G	
15	CJPS15-G	

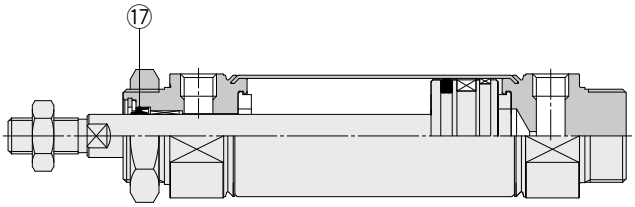
∗ For the plug mounting type
∗ Since gaskets (10 pcs./set) do not include a grease pack (10 g), it should be ordered separately.
Grease pack part no.: GR-S-005 (5 g)

CM2-Z/CM2Y-Z/CM2X-Z Series

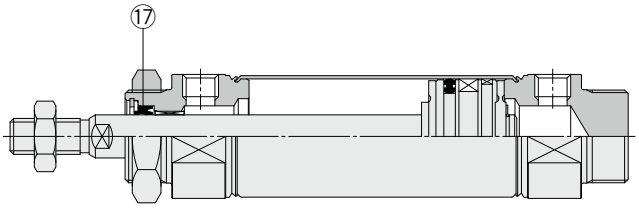
The Replacement Procedure is on p. 377

Construction

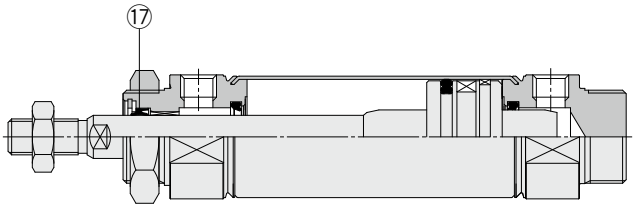
With rubber bumper



Air-hydro type

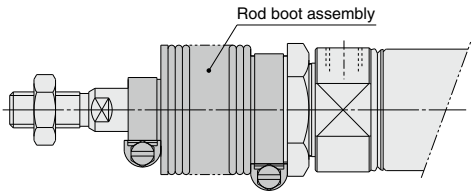


With air cushion



∗ The figures above show the construction of the CM2-Z series.
The numbers correspond with those in the "Construction" of the CM2-Z series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 243. (CM2-Z only)

Seal Kit List

No.	Description	Material	Note
⑰	**Rod seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
• Standard type (With rubber bumper/With air cushion)		
• Smooth cylinder		
20	CM20Z-PS	
25	CM25Z-PS	
32	CM32Z-PS	
40	CM40Z-PS	
Air-hydro type		
20	CM2H20-PS	
25	CM2H25-PS	
32	CM2H32-PS	
40	CM2H40-PS	
Low speed cylinder		
20	CM2X20-PS	
25	CM2X25-PS	
32	CM2X32-PS	
40	CM2X40-PS	

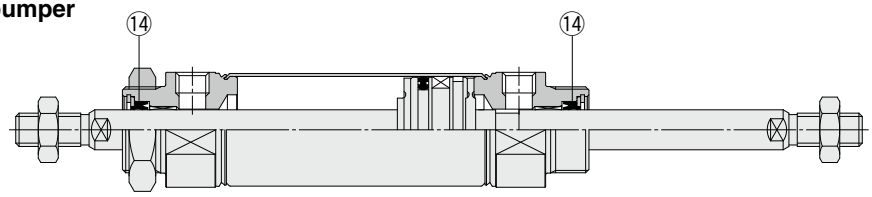
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Standard type
Grease pack part no.: GR-S-010 (10 g)
Smooth/Low speed cylinder
Grease pack part no.: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

CM2W-Z Series ø20, ø25 ø32, ø40

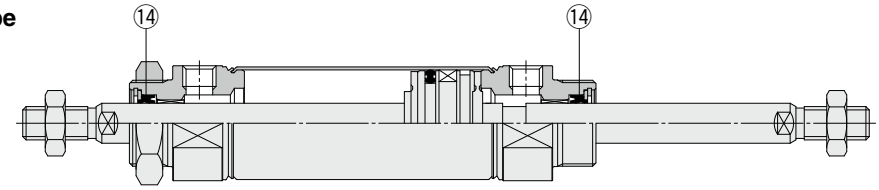
The Replacement Procedure is on p. 377

Construction

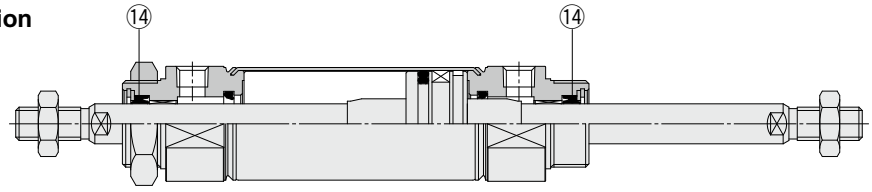
With rubber bumper



Air-hydro type

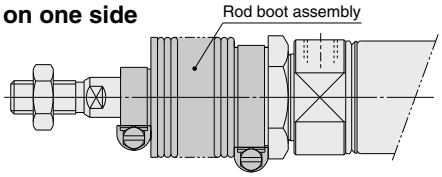


With air cushion

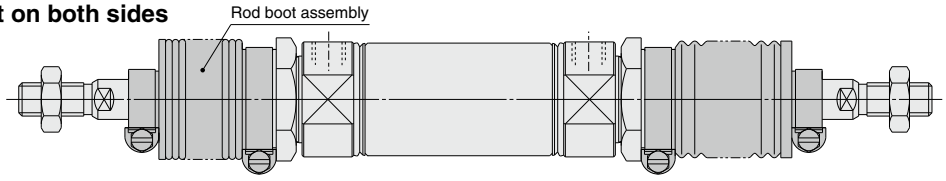


∗ The numbers correspond with those in the “Construction” of the CM2W-Z series in the **Web Catalog**.

With rod boot on one side



With rod boot on both sides



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 243.

Seal Kit List

No.	Description	Material	Note
⑭	**Rod seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
With rubber bumper/With air cushion		
20	CM20Z-PS	
25	CM25Z-PS	
32	CM32Z-PS	
40	CM40Z-PS	
Air-hydro type		
20	CM2H20-PS	
25	CM2H25-PS	
32	CM2H32-PS	
40	CM2H40-PS	

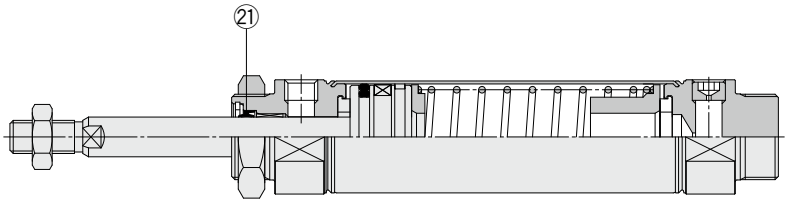
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)
∗ Order 2 pcs. per cylinder.

CM2-Z Series ø20, ø25, ø32, ø40

The Replacement Procedure is on p. 377

Construction

Spring extend



∗ The number corresponds with that in the "Construction" of the CM2-Z series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉑	**Rod seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CM20Z-PS	
25	CM25Z-PS	
32	CM32Z-PS	
40	CM40Z-PS	

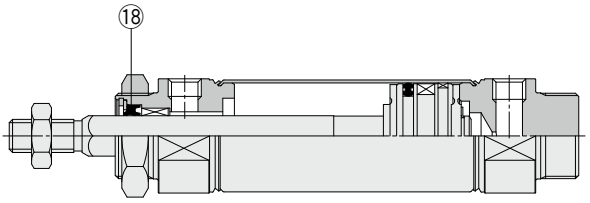
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CM2K-Z Series ø20, ø25 ø32, ø40

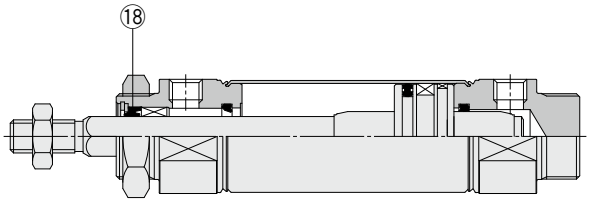
The Replacement Procedure is on p. 377

Construction

With rubber bumper

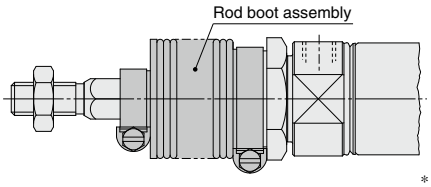


With air cushion



∗ The numbers correspond with those in the “Construction” of the CM2K-Z series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 243.

Seal Kit List

No.	Description	Material	Note
⑱	**Rod seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CM2K20-PS	
25	CM2K25-PS	
32	CM2K32-PS	
40	CM2K40-PS	

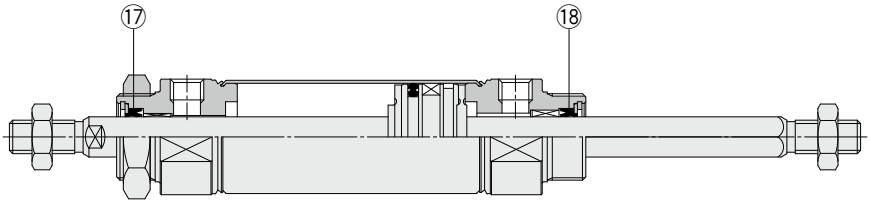
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CM2KW-Z Series ø20, ø25 ø32, ø40

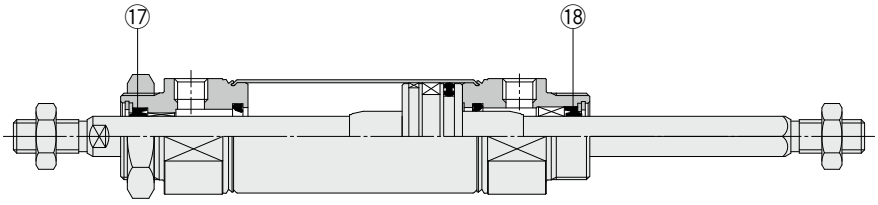
The Replacement Procedure is on p. 377

Construction

With rubber bumper



With air cushion



∗ The numbers correspond with those in the “Construction” of the CM2KW-Z series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑰	**Rod seal A**	NBR	
⑱	**Rod seal B**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.		Contents
	Rod seal A	Rod seal B	
20	CM20Z-PS	CM2K20-PS	
25	CM25Z-PS	CM2K25-PS	
32	CM32Z-PS	CM2K32-PS	
40	CM40Z-PS	CM2K40-PS	

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

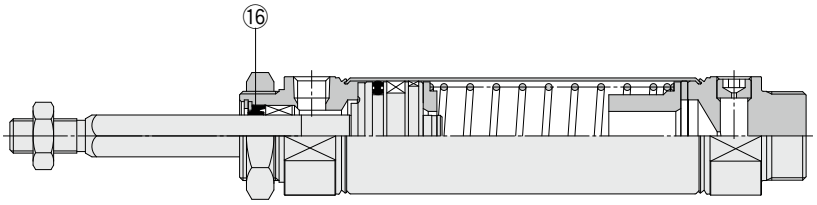
CM2K-Z Series

ø20, ø25
ø32, ø40

The Replacement Procedure is on p. 377

Construction

Spring extend



∗ The number corresponds with that in the “Construction” of the CM2K-Z series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑯	**Rod seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CM2K20-PS	
25	CM2K25-PS	
32	CM2K32-PS	
40	CM2K40-PS	

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

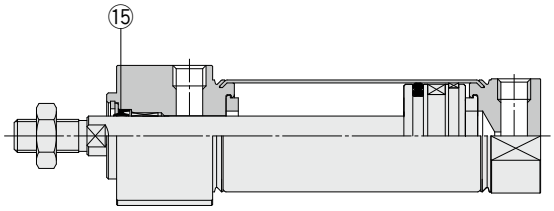
CM2R-Z Series

ø20, ø25
ø32, ø40

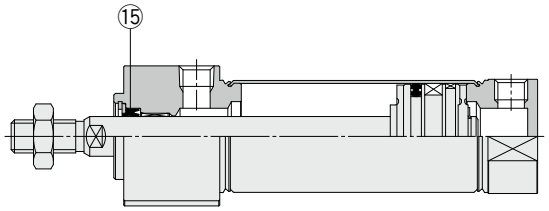
The Replacement Procedure is on p. 377

Construction

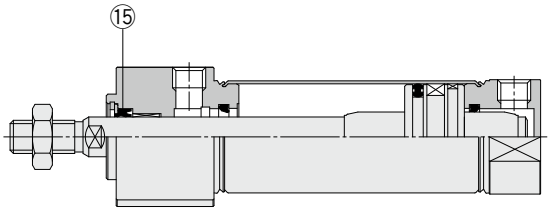
With rubber bumper



Air-hydro type



With air cushion



∗ The numbers correspond with those in the “Construction” of the CM2R-Z series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑮	**Rod seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
With rubber bumper/With air cushion		
20	CM20Z-PS	
25	CM25Z-PS	
32	CM32Z-PS	
40	CM40Z-PS	
Air-hydro type		
20	CM2H20-PS	
25	CM2H25-PS	
32	CM2H32-PS	
40	CM2H40-PS	

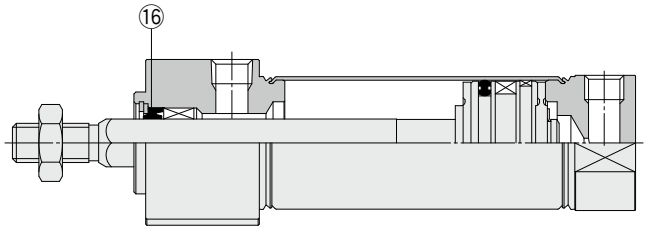
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CM2RK-Z Series

ø20, ø25
ø32, ø40

The Replacement Procedure is on p. 377

Construction



∗ The number corresponds with that in the "Construction" of the CM2RK-Z series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑯	**Rod seal**	NBR	

Replacement Parts: Seal Kit

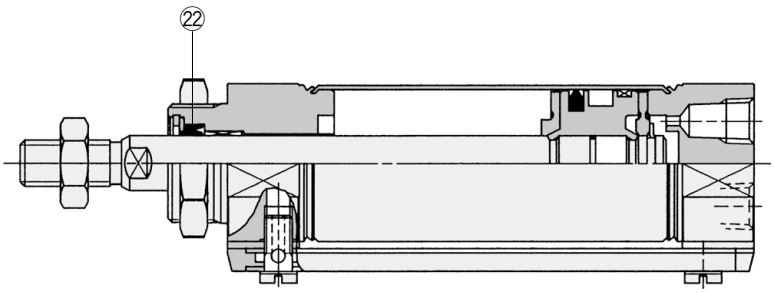
Bore size (mm)	Part no.	Contents
20	CM2K20-PS	
25	CM2K25-PS	
32	CM2K32-PS	
40	CM2K40-PS	

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CM2□P Series ø20, ø25 ø32, ø40

The Replacement Procedure is on p. 377

Construction



∗ The number corresponds with that in the "Construction" of the CM2□P series in the **Web Catalog**.
∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 243.

Seal Kit List

No.	Description	Material	Note
㉒	**Rod seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CM220-PS	
25	CM225-PS	
32	CM232-PS	
40	CM240-PS	

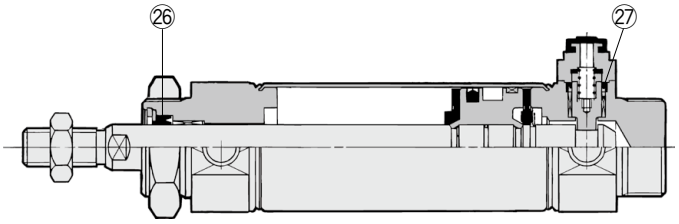
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CBM2 Series ø20, ø25, ø32, ø40

The Replacement Procedure is on p. 377

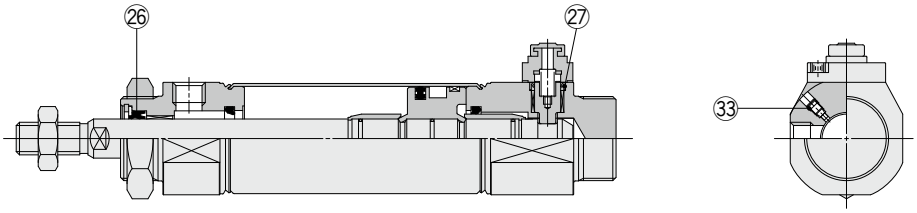
Construction

Head end lock



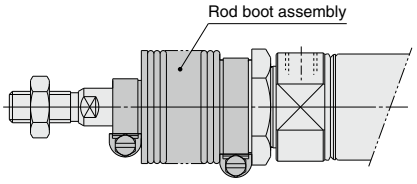
Manual release (Non-lock type): Suffix N

With air cushion



∗ The numbers correspond with those in the "Construction" of the CBM2 series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 243.

Seal Kit List

No.	Description	Material	Note
㉖	**Rod seal**	NBR	**33 is a non-replaceable part, so it is not included in the seal kit.**
㉗	**Lock piston seal**		
33	**Cushion needle seal**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
With lock at single end		
20	CBM2-20-PS	Set of nos. ㉖, ㉗
25	CBM2-25-PS	
32	CBM2-32-PS	
40	CBM2-40-PS	
With lock at both ends		
20	CBM2-20-PS-W	Set of nos. ㉖, ㉗
25	CBM2-25-PS-W	
32	CBM2-32-PS-W	
40	CBM2-40-PS-W	

∗ The seal kit includes ㉖ and ㉗. Order the seal kit based on each bore size. (Except ㉝)
∗ The seal kit includes a grease pack (10 g). Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

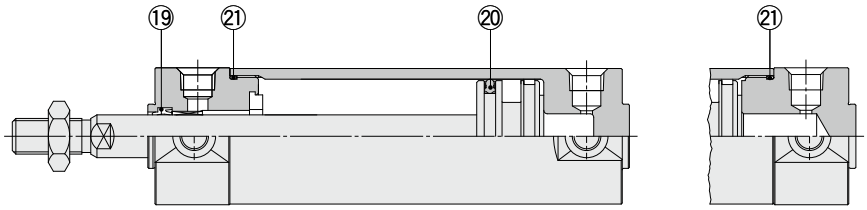
CG1-Z/CG1Y-Z Series

ø20, ø25
ø32, ø40
ø50, ø63
ø80, ø100

The Replacement Procedure is on p. 378

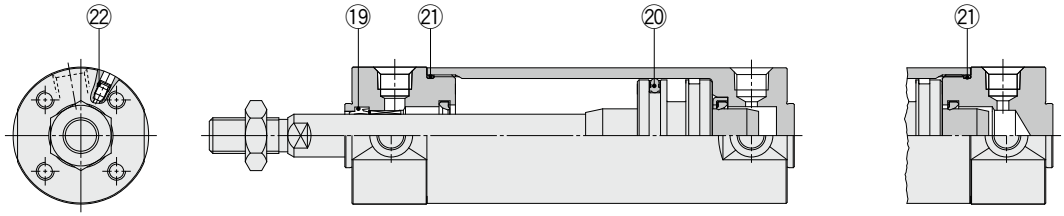
Construction

With rubber bumper



Long stroke

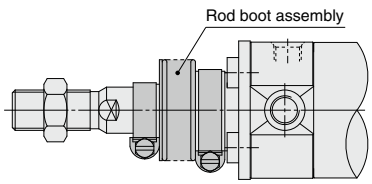
With air cushion



Long stroke

∗ The figures above show the construction of the CG1-Z series.
The numbers correspond with those in the "Construction" of the CG1-Z series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 244.

Seal Kit List

No.	Description	Material	Note
⑲	**Rod seal**	NBR	**22 is a non-replaceable part, so it is not included in the seal kit.**
⑳	**Piston seal**		
㉑	**Tube gasket**		
22	**Valve seal**		

Disassembly/Replacement

⚠Caution

1. Do not replace the bushings.

The bushings are press-fit. To replace them, they must be replaced together with the cover assembly.

2. To replace a seal, apply grease to the new seal before installing it.

If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.

3. Cylinders with ø50 or larger bore sizes cannot be disassembled.

When disassembling cylinders with bore sizes ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.)

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Standard type (With rubber bumper)		
20	CG1N20Z-PS	Set of nos. ⑲, ⑳, ㉑
25	CG1N25Z-PS	
32	CG1N32Z-PS	
40	CG1N40Z-PS	
Smooth cylinder		
20	CG1Y20Z-PS	Set of nos. ⑲, ⑳, ㉑
25	CG1Y25Z-PS	
32	CG1Y32Z-PS	
40	CG1Y40Z-PS	

∗ The seal kit includes a grease pack (10 g).
Order with one of the following part numbers when only the grease pack is required.
Standard type
Grease pack part no.: GR-S-010 (10 g)
Smooth cylinder
Grease pack part no.: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

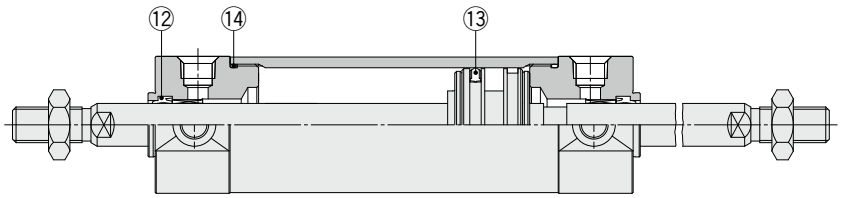
CG1W-Z Series

ø20, ø25
ø32, ø40
ø50, ø63
ø80, ø100

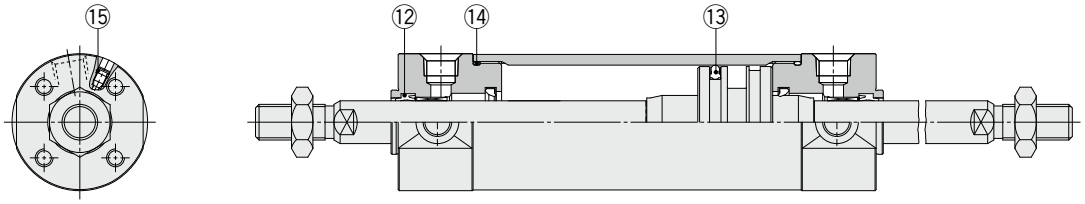
The Replacement Procedure is on p. 378

Construction

With rubber bumper

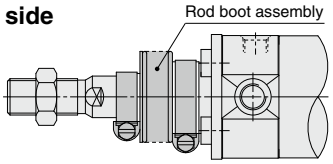


With air cushion

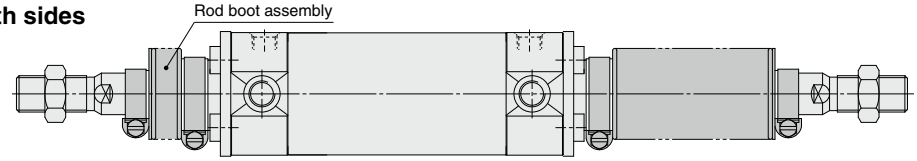


∗ The numbers correspond with those in the "Construction" of the CG1W-Z series in the **Web Catalog**.

With rod boot on one side



With rod boot on both sides



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 244.

Seal Kit List

No.	Description	Material	Note
⑫	**Rod seal**	NBR	**15 is a non-replaceable part, so it is not included in the seal kit.**
⑬	**Piston seal**		
⑭	**Tube gasket**		
15	**Valve seal**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CG1WN20Z-PS	Set of nos. ⑫, ⑬, ⑭
25	CG1WN25Z-PS	
32	CG1WN32Z-PS	
40	CG1WN40Z-PS	

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

Disassembly/Replacement

⚠Caution

1. Do not replace the bushings.

The bushings are press-fit. To replace them, they must be replaced together with the cover assembly.

2. To replace a seal, apply grease to the new seal before installing it.

If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.

3. Cylinders with ø50 or larger bore sizes cannot be disassembled.

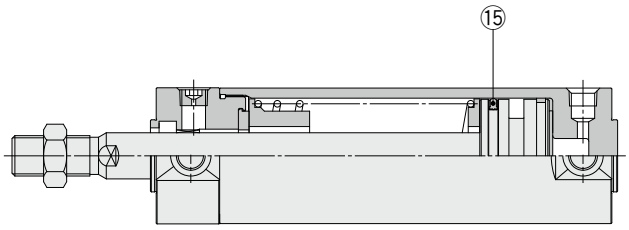
When disassembling cylinders with bore sizes ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.)

CG1-Z Series ø20, ø25, ø32, ø40

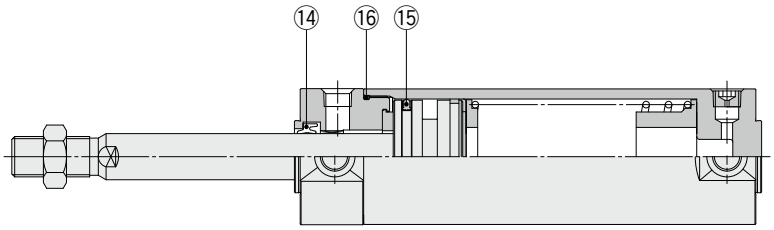
The Replacement Procedure is on p. 378

Construction

Single acting, spring return



Single acting, spring extend



∗ The numbers correspond with those in the "Construction" of the CG1-Z series in the **Web Catalog**.

Seal Kit List

● Single acting, spring return

No.	Description	Material	Note
⑮	**Piston seal**	NBR	

● Single acting, spring extend

No.	Description	Material	Note
⑭	**Rod seal**	NBR	
⑮	**Piston seal**		
⑯	**Tube gasket**		

Disassembly/Replacement

⚠ Caution

1. Do not replace the bushings.

The bushings are press-fit. To replace them, they must be replaced together with the cover assembly.

2. To replace a seal, apply grease to the new seal before installing it.

If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.

3. Cylinders with ø50 or larger bore sizes cannot be disassembled.

When disassembling cylinders with bore sizes ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position.
(Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.)

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Single acting, spring return		
20	CG1N20-S-PS	No. ⑮
25	CG1N25-S-PS	
32	CG1N32-S-PS	
40	CG1N40-S-PS	
Single acting, spring extend		
20	CG1N20Z-PS	Set of nos. ⑭, ⑮, ⑯
25	CG1N25Z-PS	
32	CG1N32Z-PS	
40	CG1N40Z-PS	

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

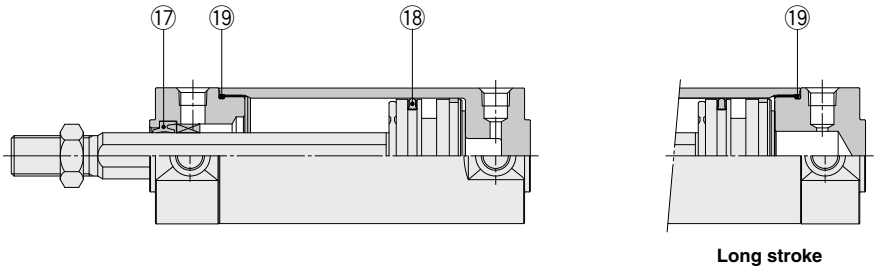
CG1K-Z Series

ø20, ø25
ø32, ø40
ø50, ø63

The Replacement Procedure is on p. 378

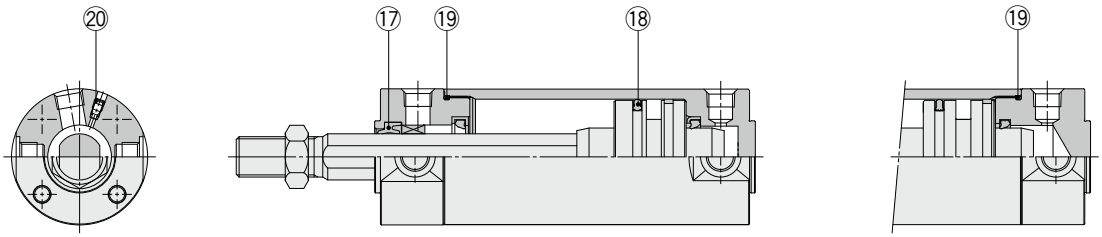
Construction

With rubber bumper



Long stroke

With air cushion



Long stroke

∗ The numbers correspond with those in the “Construction” of the CG1K-Z series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑰	**Rod seal**	NBR	**20 is a non-replaceable part, so it is not included in the seal kit.**
⑱	**Piston seal**		
⑲	**Tube gasket**		
20	**Valve seal**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CG1KN20Z-PS	Set of nos. ⑰, ⑱, ⑲
25	CG1KN25Z-PS	
32	CG1KN32Z-PS	
40	CG1KN40Z-PS	

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

Disassembly/Replacement

⚠Caution

1. Do not replace the bushings.

The bushings are press-fit. To replace them, they must be replaced together with the cover assembly.

2. To replace a seal, apply grease to the new seal before installing it.

If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.

3. Cylinders with ø50 or larger bore sizes cannot be disassembled.

When disassembling cylinders with bore sizes ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.)

4. Please consult with SMC when the rod seal is to be replaced.

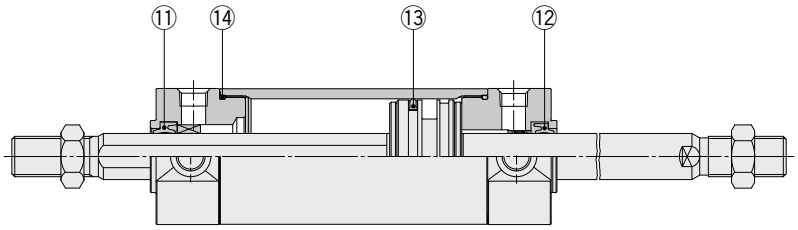
A rod seal may allow air leakage depending on the position where it is installed. Therefore, please contact SMC when a rod seal is to be replaced.

CG1KW-Z Series

ø20, ø25
ø32, ø40
ø50, ø63

The Replacement Procedure is on p. 378

Construction



∗ The numbers correspond with those in the "Construction" of the CG1KW-Z series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑪	**Rod seal A**	NBR	
⑫	**Rod seal B**		
⑬	**Piston seal**		
⑭	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CG1KWN20Z-PS	Set of nos. ⑪, ⑫, ⑬, ⑭
25	CG1KWN25Z-PS	
32	CG1KWN32Z-PS	
40	CG1KWN40Z-PS	

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

Disassembly/Replacement

⚠ Caution

1. Do not replace the bushings.

The bushings are press-fit. To replace them, they must be replaced together with the cover assembly.

2. To replace a seal, apply grease to the new seal before installing it.

If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.

3. Cylinders with ø50 or larger bore sizes cannot be disassembled.

When disassembling cylinders with bore sizes ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position.
(Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.)

4. Please consult with SMC when the rod seal is to be replaced.

A rod seal may allow air leakage depending on the position where it is installed. Therefore, please contact SMC when a rod seal is to be replaced.

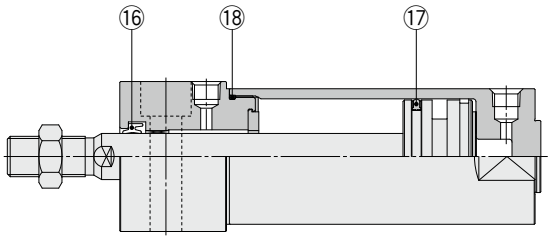
CG1R-Z Series

ø20, ø25
ø32, ø40
ø50, ø63

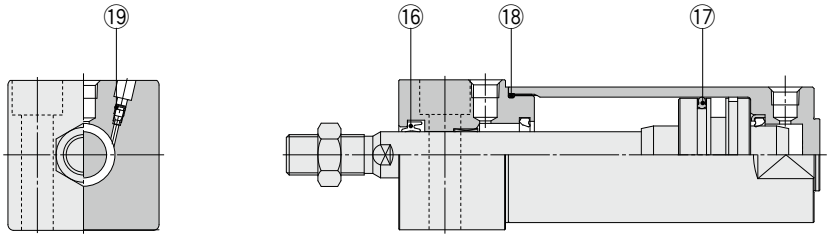
The Replacement Procedure is on p. 378

Construction

With rubber bumper



With air cushion



∗ The numbers correspond with those in the "Construction" of the CG1R-Z series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑯	**Rod seal**	NBR	**19 is a non-replaceable part, so it is not included in the seal kit.**
⑰	**Piston seal**		
⑱	**Tube gasket**		
19	**Valve seal**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CG1N20Z-PS	Set of nos. ⑯, ⑰, ⑱
25	CG1N25Z-PS	
32	CG1N32Z-PS	
40	CG1N40Z-PS	

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

Disassembly/Replacement

⚠ Caution

1. Do not replace the bushings.

The bushings are press-fit. To replace them, they must be replaced together with the cover assembly.

2. To replace a seal, apply grease to the new seal before installing it.

If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.

3. Cylinders with ø50 or larger bore sizes cannot be disassembled.

When disassembling cylinders with bore sizes ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position.
(Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.)

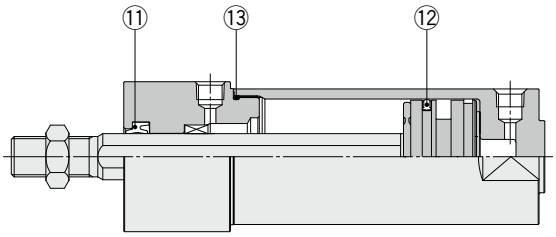
CG1KR-Z Series

ø20, ø25
ø32, ø40
ø50, ø63

The Replacement Procedure is on p. 378

Construction

Non-rotating rod, bottom mounting



∗ The numbers correspond with those in the "Construction" of the CG1KR-Z series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑪	**Rod seal**	NBR	
⑫	**Piston seal**		
⑬	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CG1KN20Z-PS	Set of nos. ⑪, ⑫, ⑬
25	CG1KN25Z-PS	
32	CG1KN32Z-PS	
40	CG1KN40Z-PS	

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

Disassembly/Replacement

⚠ Caution

1. Do not replace the bushings.

The bushings are press-fit. To replace them, they must be replaced together with the cover assembly.

2. To replace a seal, apply grease to the new seal before installing it.

If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.

3. Cylinders with ø50 or larger bore sizes cannot be disassembled.

When disassembling cylinders with bore sizes ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position.
(Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.)

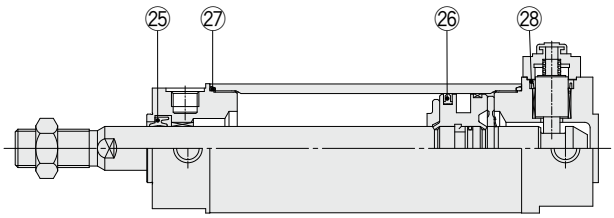
CBG1 Series

ø20, ø25, ø32, ø40
ø50, ø63, ø80, ø100

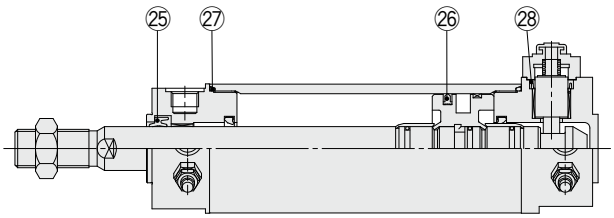
The Replacement Procedure is on p. 378

Construction

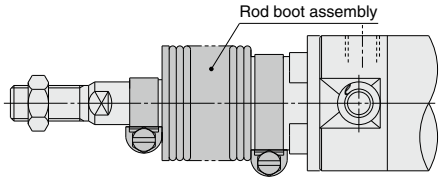
Head end lock with rubber bumper

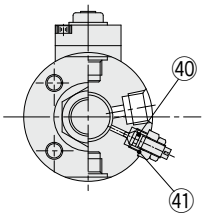


Head end lock with air cushion



With rod boot





∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 244.

∗ The numbers correspond with those in the "Construction" of the CBG1 series in the **Web Catalog**.

Seal Kit List: With Rubber Bumper

No.	Description	Material	Note
㉕	**Rod seal**	NBR	
㉖	**Piston seal**		
㉗	**Cylinder tube gasket**		
㉘	**Lock piston seal**		

Replacement Parts: Seal Kit: With Rubber Bumper

Series	Bore size (mm)	Part no.	Contents
Locking at head or rod end			
CBG1□N Rubber bumper type	**20**	CBG1N20-PS	Set of nos. ㉕, ㉖, ㉗, ㉘, and a grease pack
	25	CBG1N25-PS	
	32	CBG1N32-PS	
	40	CBG1N40-PS	
Locking at both ends			
CBG1□N Rubber bumper type	**20**	CBG1N20-PS-W	Set of nos. ㉕, ㉖, ㉗, ㉘, and a grease pack
	25	CBG1N25-PS-W	
	32	CBG1N32-PS-W	
	40	CBG1N40-PS-W	

Note) Order with a part number for each type and bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

Seal Kit List: With Air Cushion

No.	Description	Material	Note
㉕	**Rod seal**	NBR	
㉖	**Piston seal**		
㉗	**Cylinder tube gasket**		
㉘	**Lock piston seal**		
㊵	**Valve seal**		
㊶	**Valve retainer gasket**		

Replacement Parts: Seal Kit: With Air Cushion

Series	Bore size (mm)	Part no.	Contents
Locking at head or rod end			
CBG1□A Air cushion type	**20**	CBG1A20-PS	Set of nos. ㉕, ㉖, ㉗, ㉘, ㊵, ㊶, and a grease pack
	25	CBG1A25-PS	
	32	CBG1A32-PS	
	40	CBG1A40-PS	
Locking at both ends			
CBG1□A Air cushion type	**20**	CBG1A20-PS-W	Set of nos. ㉕, ㉖, ㉗, ㉘, ㊵, ㊶, and a grease pack
	25	CBG1A25-PS-W	
	32	CBG1A32-PS-W	
	40	CBG1A40-PS-W	

Note) Order with a part number for each type and bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

Disassembly/Replacement

⚠Caution

1. Do not replace the bushings.
The bushings are press-fit. To replace them, they must be replaced together with the cover assembly.

2. To replace a seal, apply grease to the new seal before installing it.
If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.

3. Cylinders with ø50 or larger bore sizes cannot be disassembled.
When disassembling cylinders with bore sizes ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position.
(Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.)
Disassembly in a locked state, may cause damage to the lock parts, it is recommended to work in the unlocked position.

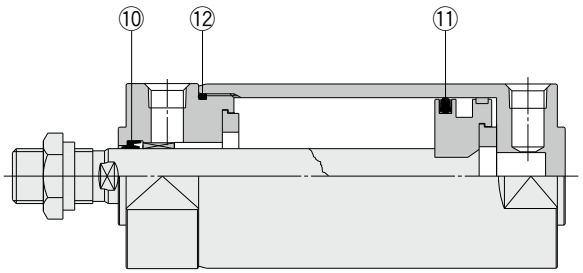
CG3 Series

ø20, ø25, ø32, ø40
ø50, ø63, ø80, ø100

The Replacement Procedure is on p. 378

Construction

With rubber bumper



∗ The numbers correspond with those in the “Construction” of the CG3 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑩	**Rod seal**	NBR	
⑪	**Piston seal**		
⑫	**Tube gasket**		

Disassembly/Replacement

⚠Caution

1. Do not replace the bushings.

The bushings are press-fit. To replace them, they must be replaced together with the cover assembly.

2. To replace a seal, apply grease to the new seal before installing it.

If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.

3. Cylinders with ø50 or larger bore sizes cannot be disassembled.

When disassembling cylinders with bore sizes ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position.
(Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.)

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CG3N20-PS	Set of nos. ⑩, ⑪, ⑫
25	CG3N25-PS	
32	CG3N32-PS	
40	CG3N40-PS	

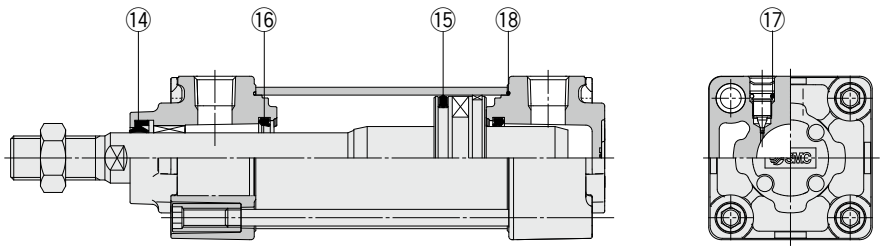
Note) Order with a part number for each type and bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

MB-Z/MBY-Z Series

ø32, ø40, ø50
ø63, ø80
ø100, ø125

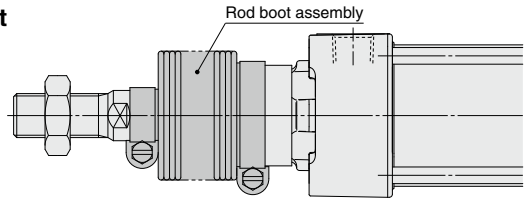
The Replacement Procedure is on p. 381

Construction



∗ The figures above show the construction of the MB-Z series.
The numbers correspond with those in the "Construction" of the MB-Z series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 245. (MB-Z only)

Seal Kit List

No.	Description	Material	Qty.	Note
⑭	**Rod seal**	NBR	1	**17 is a non-replaceable part, so it is not included in the seal kit.**
⑮	**Piston seal**	NBR	1	
⑯	**Cushion seal**	Urethane	2	
17	**Cushion valve seal**	NBR	2	
⑱	**Cylinder tube gasket**	NBR	2	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Standard type		
32	MB32Z-PS	Set of nos. ⑭, ⑮, ⑯, ⑱
40	CA2-40Z-PS	
50	CA2-50Z-PS	
63	CA2-63Z-PS	
80	CA2-80Z-PS	
100	CA2-100Z-PS	
125	MB125-PS	
Smooth cylinder		
32	MBY32Z-PS	Set of nos. ⑭, ⑮, ⑱
40	CA2Y40Z-PS	
50	CA2Y50Z-PS	
63	CA2Y63Z-PS	
80	CA2Y80Z-PS	
100	CA2Y100Z-PS	

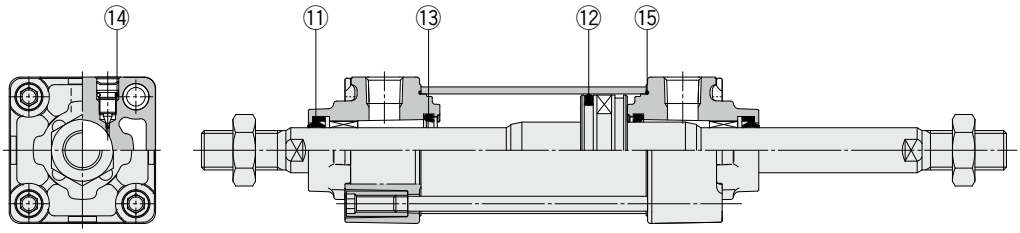
∗ The seal kit for the standard type includes ⑭, ⑮, ⑯, and ⑱. Order the seal kit based on each bore size.
∗ The center trunnion type should not be disassembled.
∗ The seal kit for the standard type includes a grease pack (ø32 to ø50: 10 g, ø63, ø80: 20 g, ø100, ø125: 30 g). The seal kit for the smooth cylinder also includes a grease pack (10 g).
Order with one of the following part numbers when only the grease pack is required.
Standard type
Grease pack part no.: GR-S-010 (10 g)
GR-S-020 (20 g)
Smooth cylinder
Grease pack part no.: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

MBW-Z Series

ø32, ø40, ø50
ø63, ø80
ø100, ø125

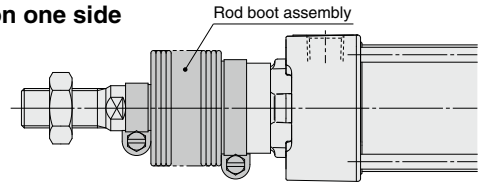
The Replacement Procedure is on p. 381

Construction

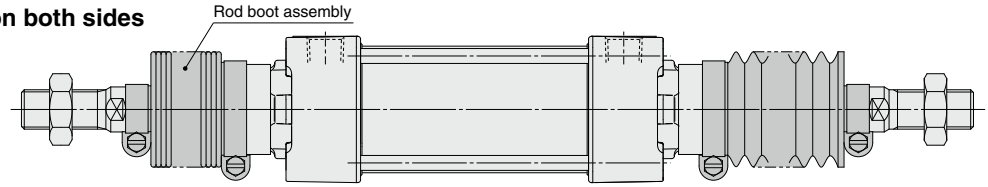


∗ The numbers correspond with those in the "Construction" of the MBW-Z series in the **Web Catalog**.

With rod boot on one side



With rod boot on both sides



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 245.

Seal Kit List

No.	Description	Material	Qty.	Note
⑪	**Rod seal**	NBR	2	**14 is a non-replaceable part, so it is not included in the seal kit.**
⑫	**Piston seal**	NBR	1	
⑬	**Cushion seal**	Urethane	2	
14	**Cushion valve seal**	NBR	2	
⑮	**Cylinder tube gasket**	NBR	2	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
32	MBW32Z-PS	Set of nos. ⑪, ⑫, ⑬, ⑮
40	CA2W40Z-PS	
50	CA2W50Z-PS	
63	CA2W63Z-PS	
80	CA2W80Z-PS	
100	CA2W100Z-PS	
125	MBW125-PS	

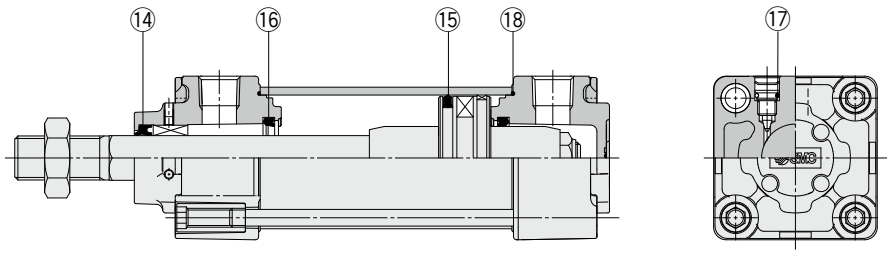
∗ The seal kit includes ⑪, ⑫, ⑬, and ⑮. Order the seal kit based on each bore size.
∗ The trunnion type should not be disassembled.
∗ The seal kit includes a grease pack (ø32 to ø50: 10 g, ø63, ø80: 20 g, ø100, ø125: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)
GR-S-020 (20 g)

MBK-Z Series

ø32, ø40, ø50
ø63, ø80, ø100

The Replacement Procedure is on p. 381

Construction



∗ The numbers correspond with those in the "Construction" of the MBK-Z series in the **Web catalog**.
∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 245.

Seal Kit List

No.	Description	Material	Qty.	Note
⑭	**Rod seal**	NBR	1	**17 is a non-replaceable part, so it is not included in the seal kit.**
⑮	**Piston seal**	NBR	1	
⑯	**Cushion seal**	Urethane	2	
17	**Cushion valve seal**	NBR	2	
⑱	**Cylinder tube gasket**	NBR	2	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
32	MBK32Z-PS	Set of nos. ⑭, ⑮, ⑯, ⑱
40	MBK40Z-PS	
50	MBK50Z-PS	
63	MBK63Z-PS	
80	MBK80Z-PS	
100	MBK100Z-PS	

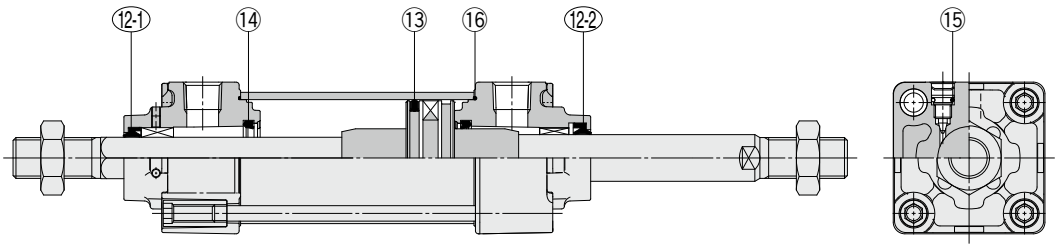
∗ The seal kit includes ⑭, ⑮, ⑯, and ⑱. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (ø32 to ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)
GR-S-020 (20 g)

MBKW-Z Series

ø32, ø40
ø50, ø63
ø80, ø100

The Replacement Procedure is on p. 381

Construction



∗ The numbers correspond with those in the "Construction" of the MBKW-Z series in the **Web Catalog**.
∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 245.

Seal Kit List

No.	Description	Material	Qty.	Note
⑫-①	**Rod seal**	NBR	1	**15 is a non-replaceable part, so it is not included in the seal kit.**
⑫-②	**Rod seal**	NBR	1	
⑬	**Piston seal**	NBR	1	
⑭	**Cushion seal**	Urethane	2	
15	**Cushion valve seal**	NBR	2	
⑯	**Cylinder tube gasket**	NBR	2	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
32	MBKW32Z-PS	Set of nos. ⑫, ⑬, ⑭, ⑯
40	MBKW40Z-PS	
50	MBKW50Z-PS	
63	MBKW63Z-PS	
80	MBKW80Z-PS	
100	MBKW100Z-PS	

∗ The seal kit includes ⑫, ⑬, ⑭, and ⑯. Order the seal kit based on each bore size.
∗ The trunnion type should not be disassembled.
∗ The seal kit includes a grease pack (ø32 to ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)
GR-S-020 (20 g)

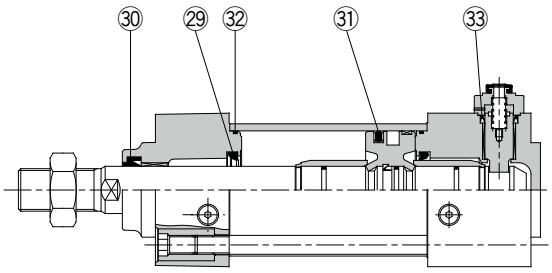
MBB Series

ø32, ø40, ø50
ø63, ø80, ø100

The Replacement Procedure is on p. 381

Construction

Locking at head end
Manual release non-locking type: N



∗ The numbers correspond with those in the "Construction" of the MBB series in the **Web Catalog**.
∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 245.

Seal Kit List

No.	Description	Material	Note
㉙	**Cushion seal**	Urethane	
㉚	**Rod seal**	NBR	
㉛	**Piston seal**	NBR	
㉜	**Cylinder tube gasket**	NBR	
㉝	**Lock piston seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Locking at head or rod end		
32	MBB32-PS	Set of nos. ㉙, ㉚, ㉛, ㉜, ㉝
40	MBB40-PS	
50	MBB50-PS	
63	MBB63-PS	
80	MBB80-PS	
100	MBB100-PS	
Locking at both ends		
32	MBB32-PS-W	Set of nos. ㉙, ㉚, ㉛, ㉜, ㉝
40	MBB40-PS-W	
50	MBB50-PS-W	
63	MBB63-PS-W	
80	MBB80-PS-W	
100	MBB100-PS-W	

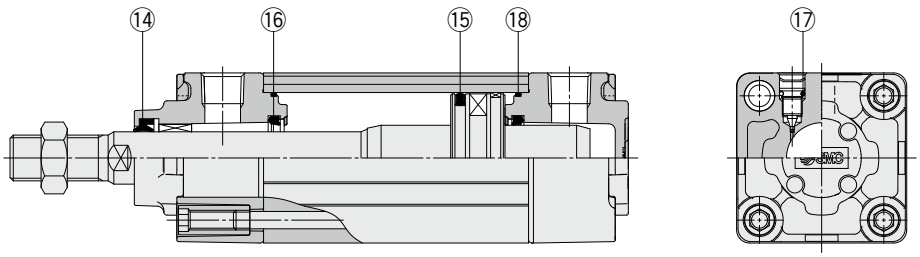
∗ Seal kits consist of items ㉙ to ㉝, and can be ordered by using the seal kit number corresponding to each bore size.
∗ The trunnion type should not be disassembled.
∗ The seal kit includes a grease pack (ø32 to ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

MB1-Z Series

ø32, ø40, ø50, ø63
ø80, ø100, ø125

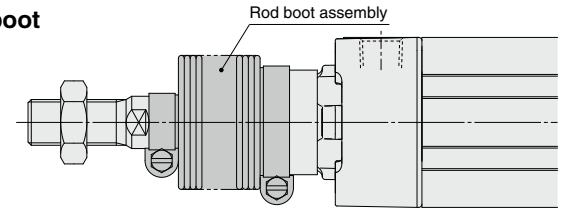
The Replacement Procedure is on p. 381

Construction



∗ The numbers correspond with those in the "Construction" of the MB1-Z series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 245.

Seal Kit List

No.	Description	Material	Qty.	Note
⑭	**Rod seal**	NBR	1	**17 is a non-replaceable part, so it is not included in the seal kit.**
⑮	**Piston seal**	NBR	1	
⑯	**Cushion seal**	Urethane	2	
17	**Cushion valve seal**	NBR	2	
⑱	**Cylinder tube gasket**	NBR	2	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
32	MB32Z-PS	Set of nos. ⑭, ⑮, ⑯, ⑱
40	MB1-40Z-PS	
50	MB1-50Z-PS	
63	MB1-63Z-PS	
80	MB1-80Z-PS	
100	MB1-100Z-PS	
125	MB125-PS	

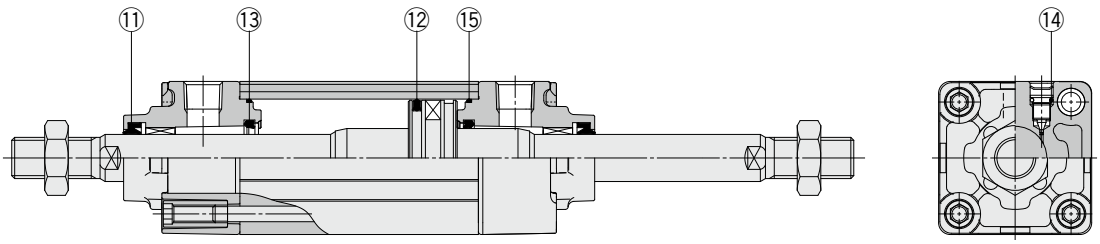
∗ The seal kit includes ⑭ to ⑯, ⑱. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (ø32 to ø50 : 10 g, ø63, ø80 : 20 g, ø100 : 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no. : GR-S-010 (10 g), **GR-S-020** (20 g)

MB1W-Z Series

ø32, ø40
ø50, ø63
ø80, ø100
ø125

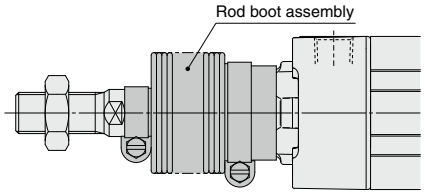
The Replacement Procedure is on p. 381

Construction

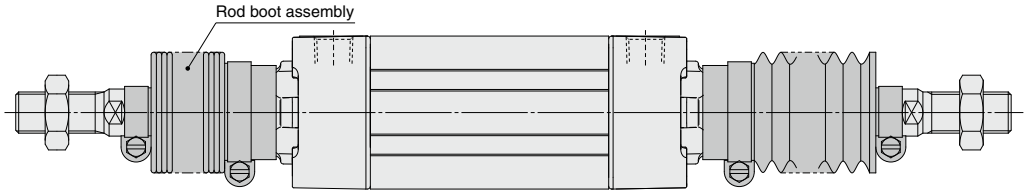


∗ The numbers correspond with those in the "Construction" of the MB1W-Z series in the **Web Catalog**.

With rod boot on one side



With rod boot on both sides



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 245.

Seal Kit List

No.	Description	Material	Qty.	Note
⑪	**Rod seal**	NBR	2	**14 is a non-replaceable part, so it is not included in the seal kit.**
⑫	**Piston seal**	NBR	1	
⑬	**Cushion seal**	Urethane	2	
14	**Cushion valve seal**	NBR	2	
⑮	**Cylinder tube gasket**	NBR	2	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
32	MBW32Z-PS	Set of nos. ⑪, ⑫, ⑬, ⑮
40	MB1W40Z-PS	
50	MB1W50Z-PS	
63	MB1W63Z-PS	
80	MB1W80Z-PS	
100	MB1W100Z-PS	
125	MBW125-PS	

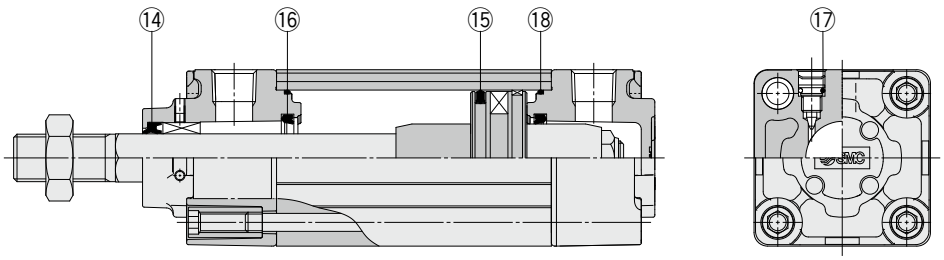
∗ The seal kit includes ⑪ to ⑬, ⑮. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (ø32 to ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

MB1K-Z Series

ø32, ø40, ø50
ø63, ø80, ø100

The Replacement Procedure is on p. 381

Construction



∗ The numbers correspond with those in the "Construction" of the MB1K-Z series in the **Web Catalog**.
∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 245.

Seal Kit List

No.	Description	Material	Qty.	Note
⑭	**Rod seal**	NBR	1	**17 is a non-replaceable part, so it is not included in the seal kit.**
⑮	**Piston seal**	NBR	1	
⑯	**Cushion seal**	Urethane	2	
17	**Cushion valve seal**	NBR	2	
⑱	**Cylinder tube gasket**	NBR	2	

Replacement Parts: Seal Kit

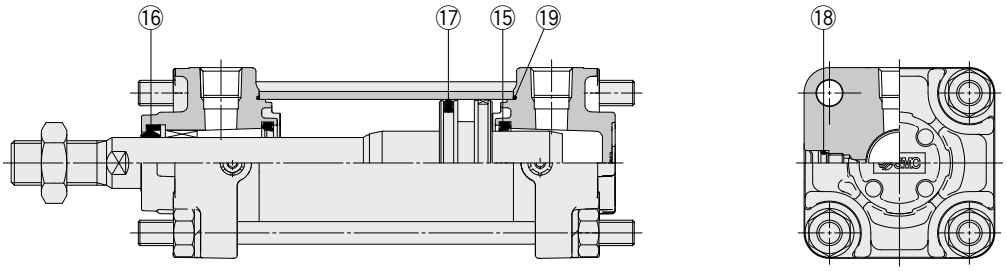
Bore size (mm)	Part no.	Contents
32	MBK32Z–PS	Set of nos. ⑭, ⑮, ⑯, ⑱
40	MB1K40Z–PS	
50	MB1K50Z–PS	
63	MB1K63Z–PS	
80	MB1K80Z–PS	
100	MB1K100Z–PS	

∗ The seal kit includes ⑭ to ⑯, ⑱. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (ø32 to ø50 : 10 g, ø63, ø80 : 20 g, ø100 : 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

CA2-Z/CA2Y-Z Series

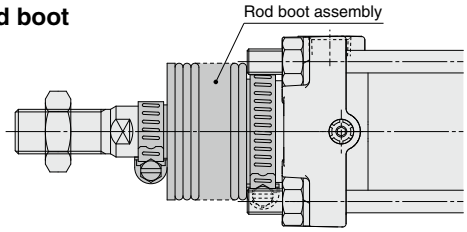
The Replacement Procedure is on p. 381

Construction



∗ The figures above show the construction of the CA2-Z series.
The numbers correspond with those in the "Construction" of the CA2-Z series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 248. (CA2-Z only)

Seal Kit List

No.	Description	Material	Note
⑮	**Cushion seal**	Urethane	**18 is a non-replaceable part, so it is not included in the seal kit.**
⑯	**Rod seal**	NBR	
⑰	**Piston seal**	NBR	
18	**Cushion valve seal**	NBR	
⑲	**Cylinder tube gasket**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Standard type		
40	CA2-40Z-PS	Set of nos. ⑮, ⑯, ⑰, ⑲
50	CA2-50Z-PS	
63	CA2-63Z-PS	
80	CA2-80Z-PS	
100	CA2-100Z-PS	
Smooth cylinder		
40	CA2Y40Z-PS	Set of nos. ⑯, ⑰, ⑲
50	CA2Y50Z-PS	
63	CA2Y63Z-PS	
80	CA2Y80Z-PS	
100	CA2Y100Z-PS	

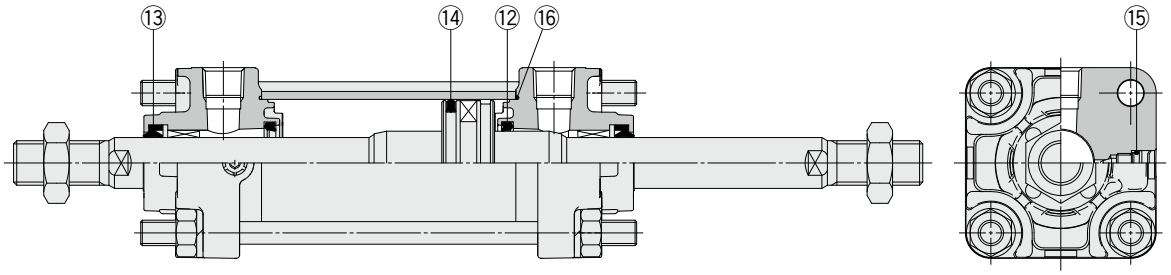
∗ The seal kit for the standard type includes ⑮, ⑯, ⑰, and ⑲. Order the seal kit based on each bore size.
∗ Do not disassemble the trunnion type.
∗ The seal kit for the standard type includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g). The seal kit for the smooth cylinder also includes a grease pack (10 g).
Order with one of the following part numbers when only the grease pack is required.
Standard type
Grease pack part no.: GR-S-010 (10 g)
GR-S-020 (20 g)
Smooth cylinder
Grease pack part no.: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

CA2W-Z Series

ø40, ø50
ø63, ø85
ø100

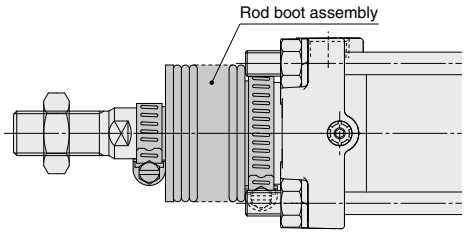
The Replacement Procedure is on p. 381

Construction

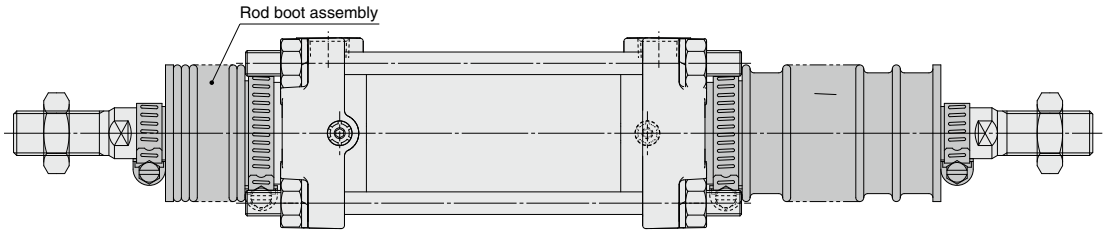


∗ The numbers correspond with those in the "Construction" of the CA2W-Z series in the **Web Catalog**.

With rod boot on one side



With rod boot on both sides



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 248.

Seal Kit List

No.	Description	Material	Note
⑫	**Cushion seal**	Urethane	**15 is a non-replaceable part, so it is not included in the seal kit.**
⑬	**Rod seal**	NBR	
⑭	**Piston seal**	NBR	
15	**Cushion valve seal**	NBR	
⑯	**Cylinder tube gasket**	NBR	

Replacement Parts: Seal Kit

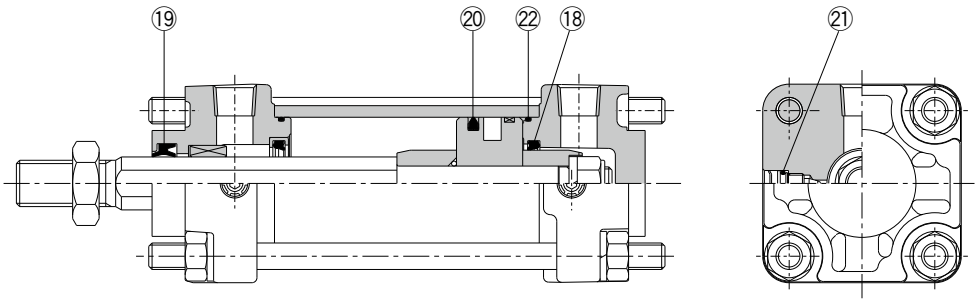
Bore size (mm)	Part no.	Contents
40	CA2W40Z-PS	Set of nos. ⑫, ⑬, ⑭, ⑯
50	CA2W50Z-PS	
63	CA2W63Z-PS	
80	CA2W80Z-PS	
100	CA2W100Z-PS	

∗ Do not disassemble the trunnion type.
∗ The seal kit includes ⑫, ⑬, ⑭ and ⑯. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

CA2K Series ø40, ø50, ø63

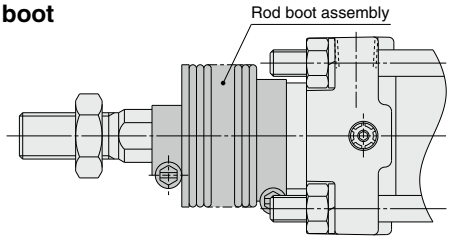
The Replacement Procedure is on p. 381

Construction



∗ The numbers correspond with those in the "Construction" of the CA2K series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 248.

Seal Kit List

No.	Description	Material	Note
⑱	**Cushion seal**	Urethane	**21 is a non-replaceable part, so it is not included in the seal kit.**
⑲	**Rod seal**	NBR	
⑳	**Piston seal**	NBR	
21	**Cushion valve seal**	NBR	
㉒	**Cylinder tube gasket**	NBR	

Disassembly/Replacement

1. Please consult with SMC when the rod seal is to be replaced.

When the rod seal is to be replaced, make sure that the seal's width across flats matches that of the non-rotating guide.
A rod seal may allow air leakage depending on the position where it is installed. Therefore, please consult with SMC when a rod seal is to be replaced.

2. Do not replace the non-rotating guide.

Since the non-rotating guide is press fitted, the entire cover assembly needs be replaced instead of a single part.

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
40	CA2K40-PS	Set of nos. ⑱, ⑲, ⑳, ㉒
50	CA2K50-PS	
63	CA2K63-PS	

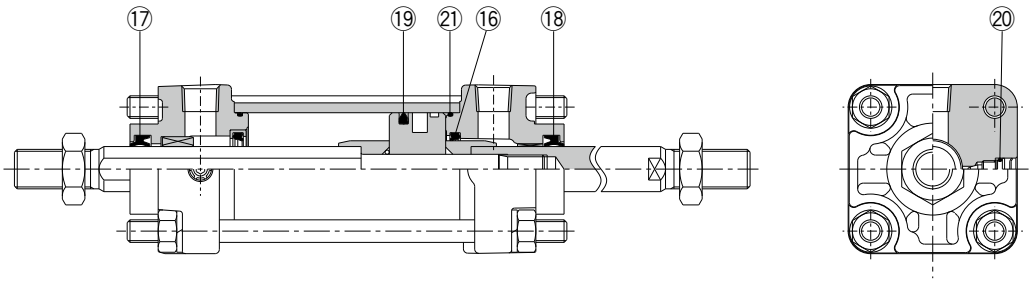
∗ The seal kit includes ⑱, ⑲, ⑳ and ㉒. Order the seal kit based on each bore size.
∗ Do not disassemble the trunnion type.
∗ The seal kit includes a grease pack (ø40, ø50: 10 g, over ø63: 20 g). Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

CA2KW Series

ø40, ø50
ø63

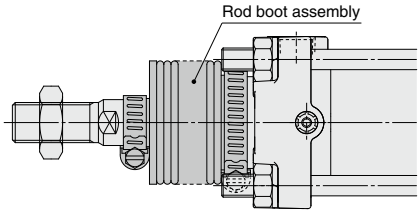
The Replacement Procedure is on p. 381

Construction

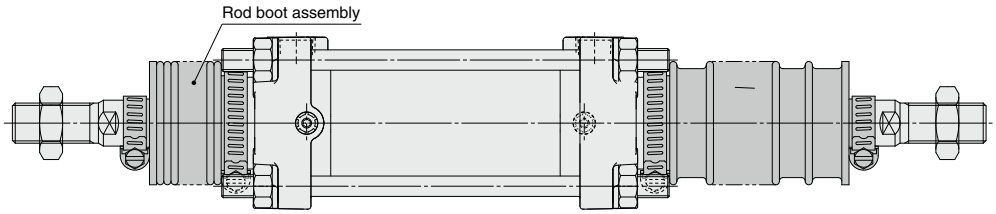


∗ The numbers correspond with those in the "Construction" of the CA2KW series in the **Web Catalog**.

With rod boot on one side



With rod boot on both sides



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 248.

Seal Kit List

No.	Description	Material	Note
⑯	**Cushion seal**	Urethane	**20 is a non-replaceable part, so it is not included in the seal kit.**
⑰	**Rod seal A**	NBR	
⑱	**Rod seal B**	NBR	
⑲	**Piston seal**	NBR	
20	**Cushion valve seal**	NBR	
㉑	**Cylinder tube gasket**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
40	CA2KW40-PS	Set of nos. ⑯, ⑰, ⑱, ⑲, ㉑
50	CA2KW50-PS	
63	CA2KW63-PS	

∗ The seal kit includes ⑯, ⑰, ⑱, ⑲, and ㉑. Order the seal kit based on each bore size.
∗ Do not disassemble the trunnion type.
∗ The seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

Disassembly/Replacement

1. Please consult with SMC when the rod seal is to be replaced.

When the rod seal is to be replaced, make sure that the seal's width across flats matches that of the non-rotating guide.
A rod seal may allow air leakage depending on the position where it is installed. Therefore, please consult with SMC when a rod seal is to be replaced.

2. Do not replace the non-rotating guide.

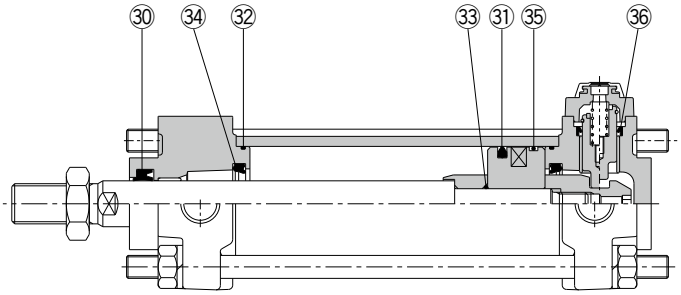
Since the non-rotating guide is press fitted, the entire cover assembly needs be replaced instead of a single part.

CBA2 Series ø40, ø50, ø63 ø80, ø100

The Replacement Procedure is on p. 381

Construction

Head side end lock



Manual release non-lock type: Suffix N

∗ The numbers correspond with those in the "Construction" of the CBA2 series in the **Web Catalog**.
∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 248.

Seal Kit List

No.	Description	Material	Note
㉚	**Rod seal**	NBR	**33 and 35 are non-replaceable parts, so they are not included in the seal kit.**
㉛	**Piston seal**	NBR	
㉜	**Cylinder tube gasket**	NBR	
33	**Piston gasket**	NBR	
㉞	**Cushion seal**	NBR	
35	**Wear ring**	Resin	
㊱	**Lock piston seal**	NBR	

Replacement Parts: Seal Kit

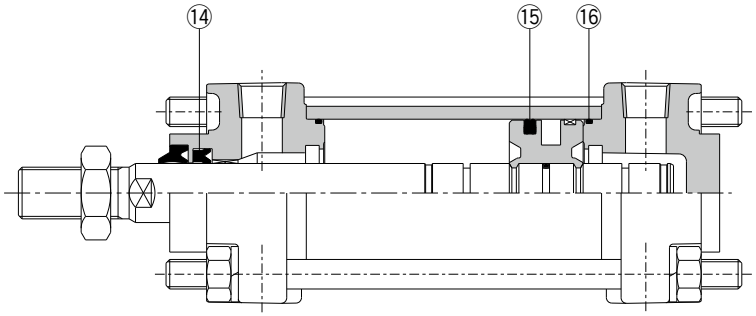
Bore size (mm)	Part no.	Contents
Single end lock		
40	MBB40-PS	Set of nos. ㉚, ㉛, ㉜, ㉞, ㊱
50	MBB50-PS	
63	MBB63-PS	
80	MBB80-PS	
100	MBB100-PS	
Double end lock		
40	MBB40-PS-W	Set of nos. ㉚, ㉛, ㉜, ㉞, ㊱
50	MBB50-PS-W	
63	MBB63-PS-W	
80	MBB80-PS-W	
100	MBB100-PS-W	

∗ The seal kit includes ㉚, ㉛, ㉜, ㉞ and ㊱. Order the seal kit based on each bore size.
∗ Do not disassemble the trunnion type.
∗ The seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

CA2□H Series

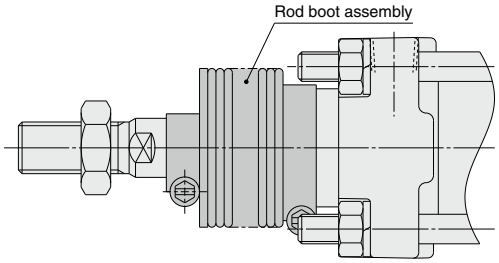
ø40, ø50, ø63
ø80, ø100

Construction



∗ The numbers correspond with those in the "Construction" of the CA2□H series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 248.

Seal Kit List

No.	Description	Material	Note
⑭	**Rod seal**	NBR	
⑮	**Piston seal**		
⑯	**Cylinder tube gasket**		

Replacement Parts: Seal Kit

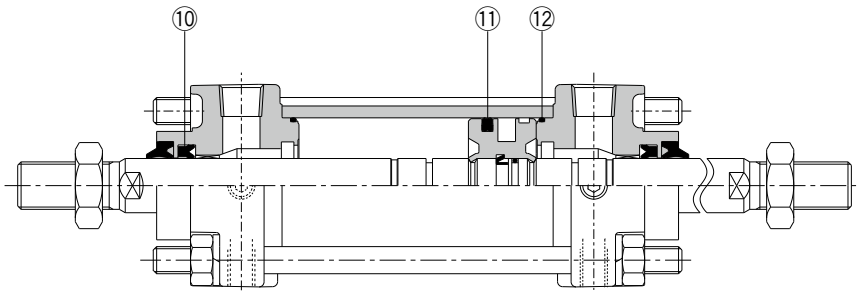
Bore size (mm)	Part no.	Contents
40	CA2H40A-PS	Set of nos. ⑭, ⑮, ⑯
50	CA2H50A-PS	
63	CA2H63A-PS	
80	CA2H80A-PS	
100	CA2H100A-PS	

∗ Do not disassemble the trunnion type.
∗ The seal kit includes ⑭, ⑮ and ⑯. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (ø40, ø50: 10 g, ø63: 20 g). Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

CA2W□H Series

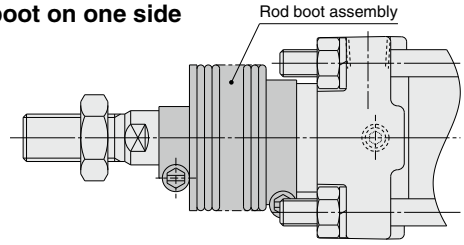
ø40, ø50, ø63
ø80, ø100

Construction

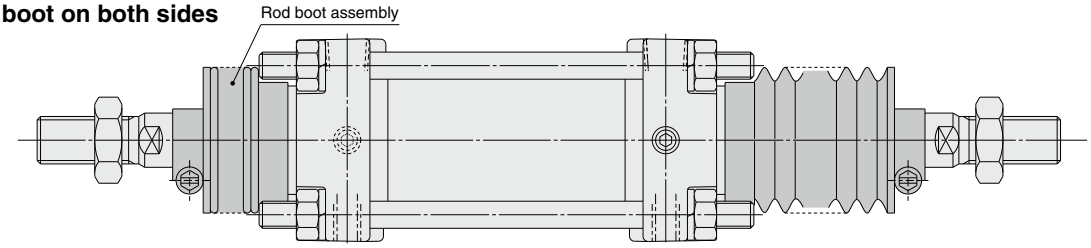


∗ The numbers correspond with those in the "Construction" of the CA2W□H series in the **Web Catalog**.

With rod boot on one side



With rod boot on both sides



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 248.

Seal Kit List

No.	Description	Material	Note
⑩	**Rod seal**	NBR	
⑪	**Piston seal**		
⑫	**Cylinder tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
40	CA2WH40A-PS	Set of nos. ⑩, ⑪, ⑫
50	CA2WH50A-PS	
63	CA2WH63A-PS	
80	CA2WH80A-PS	
100	CA2WH100A-PS	

∗ Do not disassemble the trunnion type.
∗ The seal kit includes ⑩, ⑪ and ⑫. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (ø40, ø50: 10 g, ø63 or more: 20 g). Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

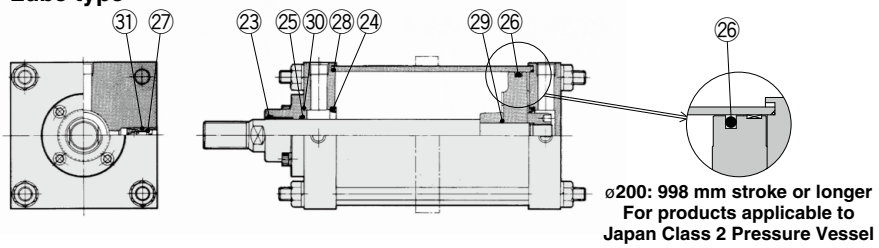
CS1 Series

Lube / Non-lube Type:
ø125, ø140, ø160, ø180
ø200, ø250, ø300
Air-hydro Type:
ø125, ø140, ø160

The Replacement Procedure is on p. 384

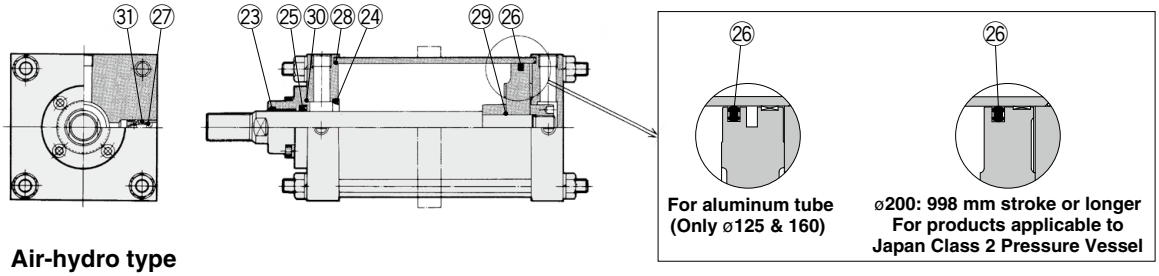
Construction

Lube type



ø200: 998 mm stroke or longer
For products applicable to Japan Class 2 Pressure Vessel

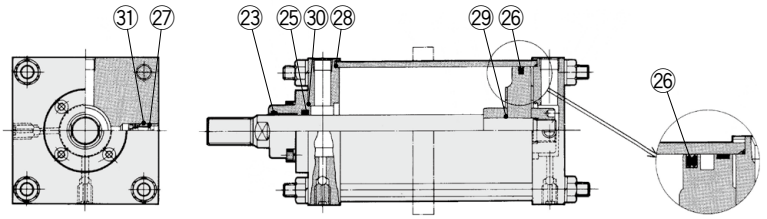
Non-lube type



For aluminum tube (Only ø125 & 160)

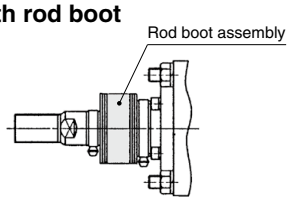
ø200: 998 mm stroke or longer
For products applicable to Japan Class 2 Pressure Vessel

Air-hydro type



For aluminum tube

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 250.

∗ The numbers correspond with those in the "Construction" of the CS1 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
Lube type, Non-lube type, Air-hydro type			
㉓	**Wiper ring**	NBR	**24, 29 and 31 are non-replaceable parts, so they are not included in the seal kit.**
24	**Cushion seal**		
㉕	**Rod seal**		
㉖	**Piston seal**		
㉗	**Valve seal**		
㉘	**Tube gasket**		
29	**Piston gasket**		
㉚	**Retaining plate gasket**		
31	**Guide gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Standard type (Lube type)		
125	CS1-125A-PS	Set of nos. ㉓, ㉕, ㉖, ㉗, ㉘, ㉚
140	CS1-140A-PS	
160	CS1-160A-PS	
180	CS1-180A-PS	
200	CS1-200A-PS	
250	CS1-250A-PS	
300	CS1-300A-PS	
Standard type (Non-lube type)		
125	CS1N125A-PS	Set of nos. ㉓, ㉕, ㉖, ㉗, ㉘, ㉚
140	CS1N140A-PS	
160	CS1N160A-PS	
180	CS1N180A-PS	
200	CS1N200A-PS	
250	CS1N250A-PS	
300	CS1N300A-PS	

∗ The seal kit includes a grease pack (ø125 to ø160: 40 g, ø180 and ø200: 50 g, ø250 and ø300: 60 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

Air-hydro type

125	CS1H125A-PS	Set of nos. ㉓, ㉕, ㉖, ㉗, ㉘, ㉚
140	CS1H140A-PS	
160	CS1H160A-PS	

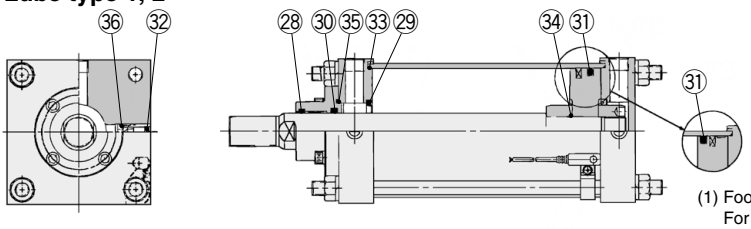
CDS1 Series

ø125, ø140, ø160
ø180, ø200

The Replacement Procedure is on p. 384

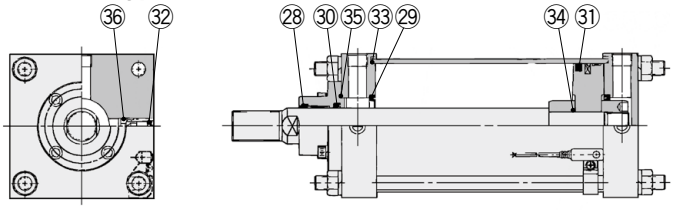
Construction

Lube type 1, 2

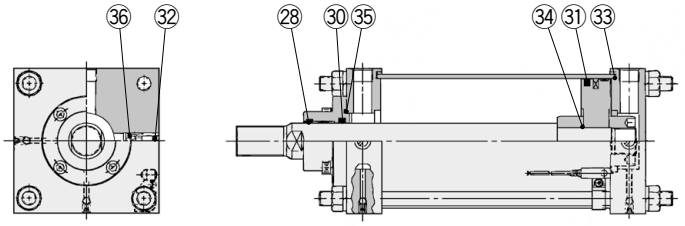


(1) Foot bracket type: Rod flange type
For ø125, ø140
1001 to 1400 st
For ø160
1201 to 1400 st
(2) For ø180, ø200
(1), (2): Non-lube type is used.

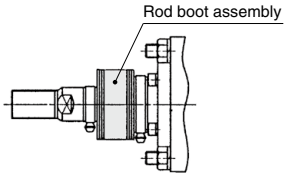
Non-lube type



Air-hydro type: ø125, ø140, ø160 only



With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 250.

∗ The numbers correspond with those in the "Construction" of the CS1 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
Lube type (1, 2), Non-lube type, Air-hydro type			
㉘	**Wiper ring**	NBR	**29, 34 and 36 are non-replaceable parts, so they are not included in the seal kit.**
29	**Cushion seal**		
㉚	**Rod seal**		
㉛	**Piston seal**		
㉜	**Valve seal**		
㉝	**Tube gasket**		
34	**Piston gasket**		
㉟	**Retaining plate gasket**		
36	**Guide gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Lube type (1)		
125	CS1-125A-PS	Set of nos. ㉘, ㉚, ㉛, ㉜, ㉝, ㉟
140	CS1-140A-PS	
160	CS1-160A-PS	
180	CDS1-180A-PS	
200	CDS1-200A-PS	
Non-lube type		
125	CS1N125A-PS	Set of nos. ㉘, ㉚, ㉛, ㉜, ㉝, ㉟
140	CS1N140A-PS	
160	CS1N160A-PS	
180	CS1N180A-PS	
200	CS1N200A-PS	
Lube type (2) Note)		
125	CDS1L125A-PS	Set of nos. ㉘, ㉚, ㉛, ㉜, ㉝, ㉟
140	CDS1L140A-PS	
160	CDS1L160A-PS	

∗ The seal kit includes a grease pack (ø125 to ø160: 40 g, ø180 and ø200: 50 g). Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

Note) Foot bracket type, Rod flange type: ø125, ø140: 1001 to 1400 stroke, ø160: 1201 to 1400 stroke.

Air-hydro type		
125	CS1H125A-PS	Set of nos. ㉘, ㉚, ㉛, ㉜, ㉝, ㉟
140	CS1H140A-PS	
160	CS1H160A-PS	

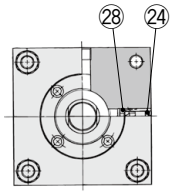
CS1W Series

Lube / Non-lube Type:
ø125, ø140, ø160, ø180
ø200, ø250, ø300
Air-hydro Type:
ø125, ø140, ø160

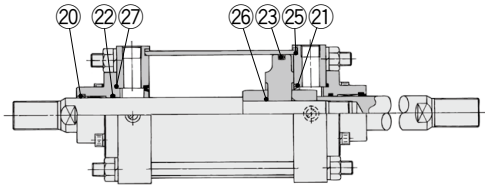
The Replacement Procedure is on p. 384

Construction

Lube type, Non-lube type, With auto switch



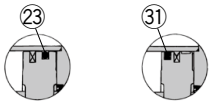
Non-lube type



With auto switch

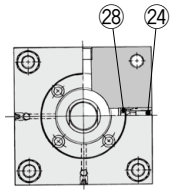


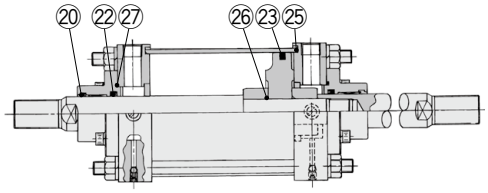
Aluminum tube Steel tube



ø125 to ø160 ø180, ø200

Air-hydro type



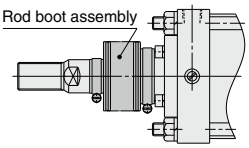




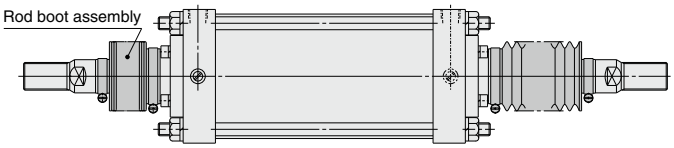
Aluminum tube Auto switch

∗ The numbers correspond with those in the "Construction" of the CS1 series in the **Web Catalog**.

With rod boot on one side



With rod boot on both sides



∗ Replaceable with the rod boot assembly. For details on replacement part numbers, refer to page 250.

Seal Kit List

No.	Description	Material	Note
Lube type / Non-lube type / Air-hydro type Lube type (with auto switch)			
⑳	**Wiper ring**	NBR	**21, 26 and 28 are non-replaceable parts, so they are not included in the seal kit.**
21	**Cushion seal**		
㉒	**Rod seal**		
㉓ ㉛	**Piston seal**		
㉔	**Valve seal**		
㉕	**Tube gasket**		
26	**Piston gasket**		
㉗	**Retaining plate gasket**		
28	**Guide gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Lube type		
125	CS1W-125A-PS	Component part numbers: ⑳, ㉒, ㉓, ㉔, ㉕, ㉗
140	CS1W-140A-PS	
160	CS1W-160A-PS	
180	CS1W-180A-PS	
200	CS1W-200A-PS	
250	CS1W-250A-PS	
300	CS1W-300A-PS	

∗ The seal kit includes a grease pack (ø125 to ø160: 40 g, ø180 and ø200: 50 g, ø250 and ø300: 60 g). Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Non-lube type / Non-lube type with auto switch		
125	CS1WN125A-PS	Set of nos. ⑳, ㉒, ㉓, ㉔, ㉕, ㉗
140	CS1WN140A-PS	
160	CS1WN160A-PS	
180	CS1WN180A-PS	
200	CS1WN200A-PS	
250 Note)	CS1WN250A-PS	
300 Note)	CS1WN300A-PS	
Lube type with auto switch		
125	CS1W-125A-PS	Set of nos. ⑳, ㉒, ㉔, ㉕, ㉗, ㉛
140	CS1W-140A-PS	
160	CS1W-160A-PS	
180	CDS1W180A-PS	
200	CDS1W200A-PS	

Note) It is not available with auto switch.

∗ The seal kit includes a grease pack (ø125 to ø160: 40 g, ø180 and ø200: 50 g, ø250 and ø300: 60 g). Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

Air-hydro type

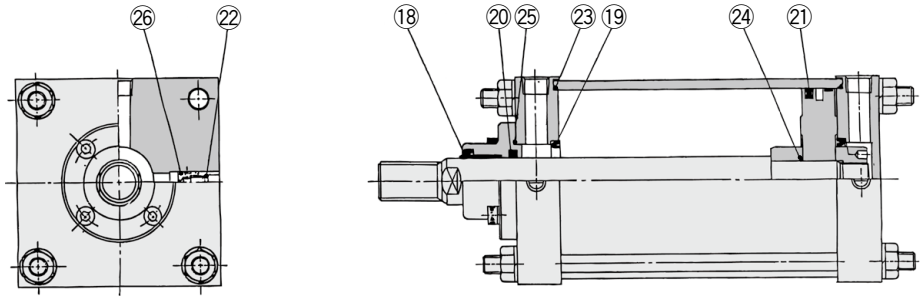
Bore size (mm)	Part no.	Contents
125	CS1WH125A-PS	Set of nos. ⑳, ㉒, ㉓, ㉔, ㉕, ㉗
140	CS1WH140A-PS	
160	CS1WH160A-PS	

CS1□Q Series ø125, ø140 ø160

The Replacement Procedure is on p. 384

Construction

Non-lube type



∗ The numbers correspond with those in the "Construction" of the CS1 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑱	**Wiper ring**	NBR	**19, 24 and 26 are non-replaceable parts, so they are not included in the seal kit.**
19	**Cushion seal** ∗		
⑳	**Rod seal**		
㉑	**Piston seal**		
㉒	**Valve seal**		
㉓	**Tube gasket**		
24	**Piston gasket**		
㉕	**Retaining plate gasket**		
26	**Guide gasket**		

∗ Used with cushion only

Replacement Parts: Seal Kit

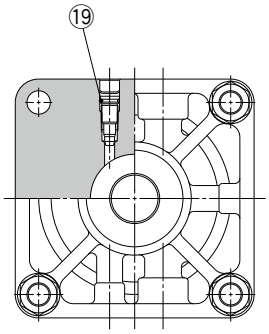
Bore size (mm)	Part no.	Contents
125	CS1Q125A-PS	Set of nos. ⑱, ⑳, ㉑, ㉒, ㉓, ㉕
140	CS1Q140A-PS	
160	CS1Q160A-PS	

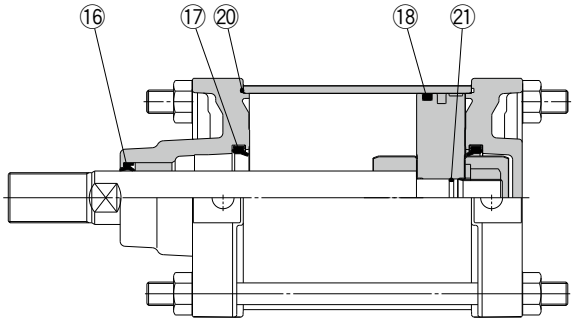
∗ Since the seal kit does not include a grease pack, please arrange with the part numbers listed below only the grease pack separately.
In that case, the amount of grease, please refer to the standard type.
Grease pack part no.: GR-L-005 (5 g), **GR-L-010** (10 g), **GR-L-150** (150 g)

CS2 Series ø125, ø140, ø160

The Replacement Procedure is on p. 384

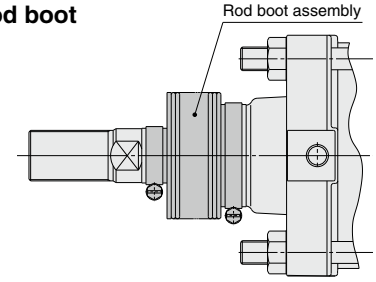
Construction





∗ The numbers correspond with those in the “Construction” of the CS2 series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 251.

Seal Kit List

No.	Description	Material	Note
⑯	**Rod seal**	NBR	**19 and 21 are non-replaceable parts, so they are not included in the seal kit.**
⑰	**Cushion seal**	Urethane	
⑱	**Piston seal**	NBR	
19	**Valve seal**	NBR	
⑳	**Tube gasket**	NBR	
21	**Piston gasket**	NBR	

Replacement Parts: Seal Kit

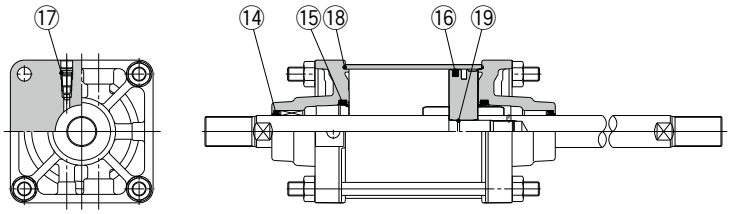
Bore size (mm)	Part no.	Contents
125	CS2-125A-PS	Set of nos. ⑯, ⑰, ⑱, ⑳
140	CS2-140A-PS	
160	CS2-160A-PS	

∗ The seal kit includes a grease pack (40 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

CS2W Series ø125, ø140, ø160

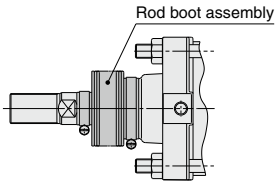
The Replacement Procedure is on p. 384

Construction

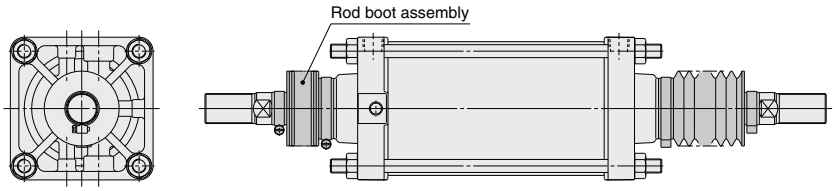


∗ The numbers correspond with those in the "Construction" of the CS2 series in the **Web Catalog**.

With rod boot on one side



With rod boot on both sides



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 251.

Seal Kit List

No.	Description	Material	Note
⑭	**Rod seal**	NBR	**17 and 19 are non-replaceable parts, so they are not included in the seal kit.**
⑮	**Cushion seal**	Urethane	
⑯	**Piston seal**	NBR	
17	**Valve seal**	NBR	
⑱	**Tube gasket**	NBR	
19	**Piston gasket**	NBR	

Replacement Parts: Seal Kit

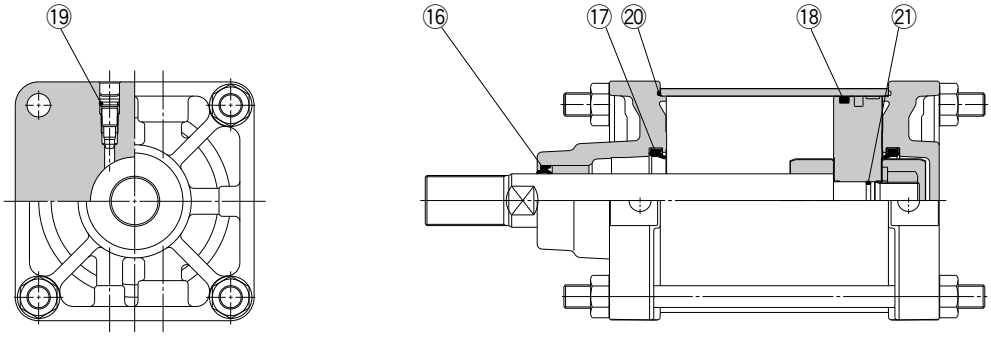
Bore size (mm)	Part no.	Contents
125	CS2W125A-PS	Set of nos. ⑭, ⑮, ⑯, ⑱
140	CS2W140A-PS	
160	CS2W160A-PS	

∗ The seal kit includes a grease pack (40 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

CS2Y Series ø125, ø140, ø160

The Replacement Procedure is on p. 384

Construction



∗ The numbers correspond with those in the "Construction" of the CS2Y series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑯	**Rod seal**	NBR	**19 and 21 are non-replaceable parts, so they are not included in the seal kit.**
⑰	**Cushion seal** ∗	Urethane	
⑱	**Piston seal**	NBR	
19	**Valve seal**	NBR	
⑳	**Tube gasket**	NBR	
21	**Piston gasket**	NBR	

∗ Used with cushion only

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
125	CS2Y125A-PS	For models without cushion Set of nos. ⑯, ⑱, ⑳
140	CS2Y140A-PS	
160	CS2Y160A-PS	
125	CS2Y125AA-PS	For models with cushion on both sides Set of nos. ⑯, ⑰ (two), ⑱, ⑳
140	CS2Y140AA-PS	
160	CS2Y160AA-PS	
125	CS2Y125AR-PS	For models with cushion on single side Set of nos. ⑯, ⑰ (one), ⑱, ⑳
140	CS2Y140AR-PS	
160	CS2Y160AR-PS	

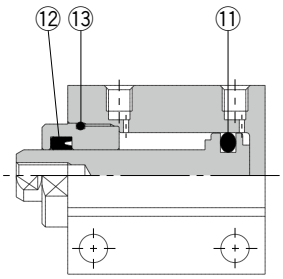
∗ The seal kit does not include a grease pack.
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-L-005 (5 g), **GR-L-010** (10 g), **GR-L-150** (150 g)

CUJ Series ø4, ø6, ø8, ø10

The Replacement Procedure is on p. 386

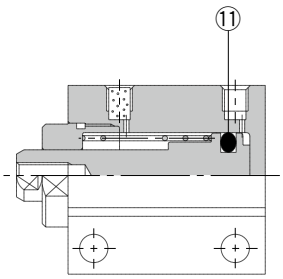
Construction

Double acting



Without magnet

Single acting, spring return



Without magnet

∗ The numbers correspond with those in the "Construction" of the CUJ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑪	**Piston seal**	NBR	
⑫	**Rod seal**		
⑬	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Double acting		
4	CUJB4-PS	Set of nos. ⑪, ⑫, ⑬, and a grease pack
6	CUJB6-PS	
8	CUJB8-PS	
10	CUJB10-PS	

∗ The seal kit ⑪ to ⑬ comes as a set. Use the kit number for each bore size.

Single acting, spring return		
4	CUJB4-S-PS	Set of no. ⑪ and a grease pack
6	CUJB6-S-PS	
8	CUJB8-S-PS	
10	CUJB10-S-PS	

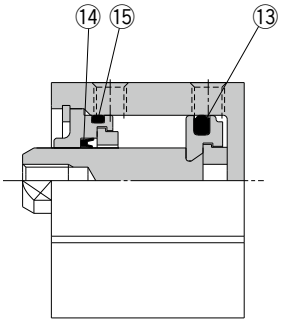
∗ Use the following part number for ordering a grease pack only.
Grease pack part no.: GR-L-005 (5 g)

CUJ Series ø12, ø16, ø20

The Replacement Procedure is on p. 386

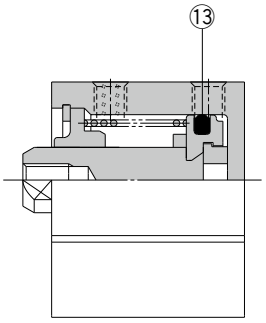
Construction

Double acting



Without magnet

Single acting, spring return



Without magnet

∗ The numbers correspond with those in the “Construction” of the CUJ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑬	**Piston seal**	NBR	
⑭	**Rod seal**		
⑮	**O-ring**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Double acting		
12	CUJB12-PS	Set of nos. ⑬, ⑭, ⑮, and a grease pack
16	CUJB16-PS	
20	CUJB20-PS	

∗ The seal kit ⑬ to ⑮ comes as a set. Use the kit number for each bore size.

Single acting, spring return		
12	CUJB12-S-PS	Set of no. ⑬ and a grease pack
16	CUJB16-S-PS	
20	CUJB20-S-PS	

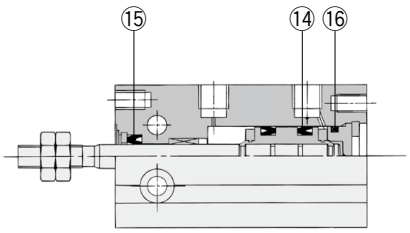
∗ Use the following part number for ordering a grease pack only.
Grease pack part no.: GR-L-005 (5 g)

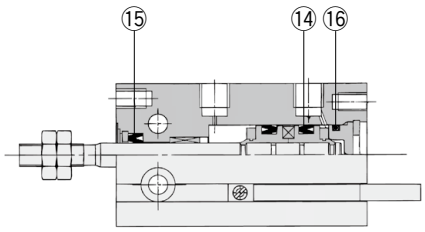
CU Series ø10, ø16, ø20, ø25, ø32

Construction

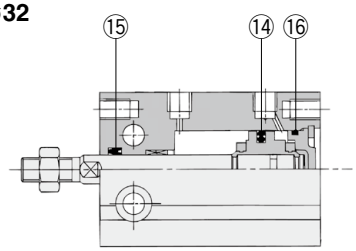
With auto switch

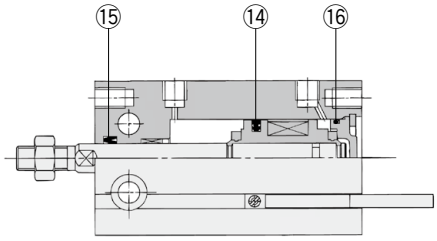
ø10





ø16 to ø32





∗ The numbers correspond with those in the "Construction" of the CU series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑭	**Piston seal**	NBR	
⑮	**Rod seal**		
⑯	**Gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	CU10D-PS	Set of nos. ⑭, ⑮, ⑯
16	CU16D-PS	
20	CU20D-PS	
25	CU25D-PS	
32	CU32D-PS	

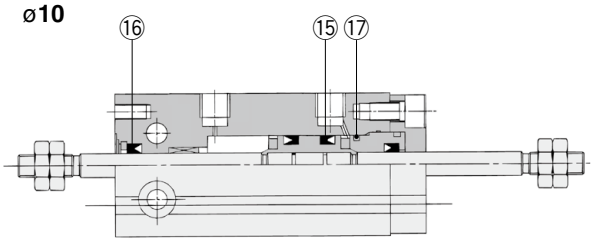
∗ ø6 cannot be repaired.
∗ The seal kit includes ⑭, ⑮, ⑯. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

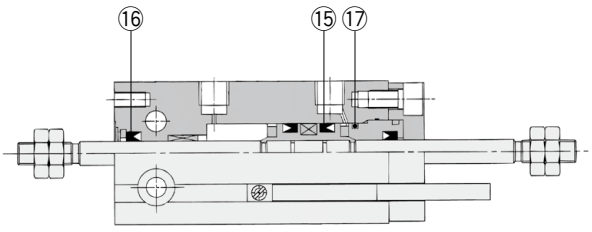
CUW Series ø10, ø16, ø20, ø25, ø32

Construction

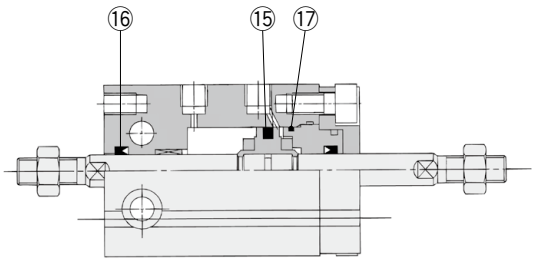
With auto switch

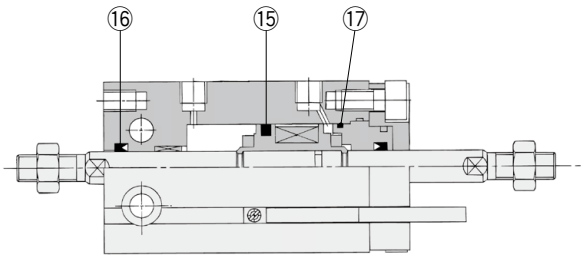
ø10





ø16 to ø32





∗ The numbers correspond with those in the “Construction” of the CUW series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑮	**Piston seal**	NBR	
⑯	**Rod seal**		
⑰	**Gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	CUW10D-PS	Set of nos. ⑮, ⑯, ⑰
16	CUW16D-PS	
20	CUW20D-PS	
25	CUW25D-PS	
32	CUW32D-PS	

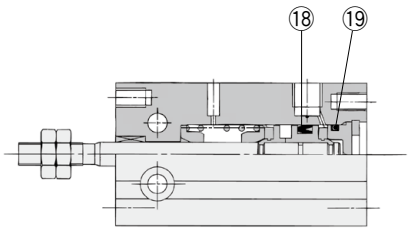
∗ ø6 cannot be repaired.
∗ The seal kit includes ⑮, ⑯, ⑰. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

CU Series ø10, ø16, ø20, ø25, ø32

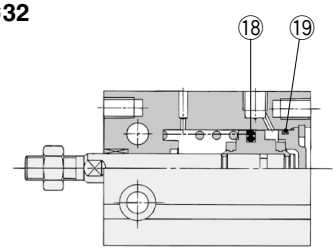
Construction

Single acting, spring return

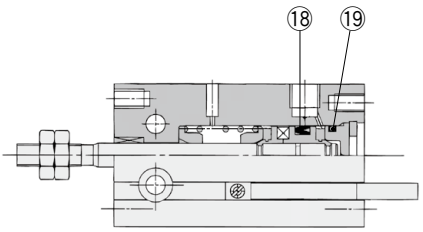
ø10

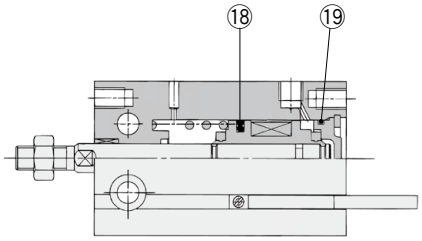


ø16 to ø32



With auto switch





∗ The numbers correspond with those in the "Construction" of the CU series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑱	**Piston seal**	NBR	
⑲	**Gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	CU10S-PS	Set of nos. ⑱, ⑲
16	CU16S-PS	
20	CU20S-PS	
25	CU25S-PS	
32	CU32S-PS	

∗ ø6 cannot be repaired.
∗ The seal kit includes ⑱, ⑲. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

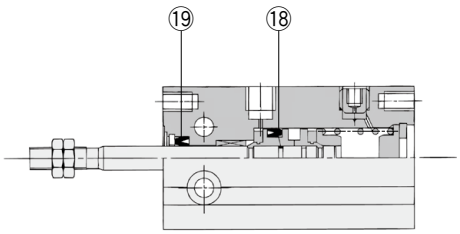
CU Series ø10, ø16, ø20, ø25, ø32

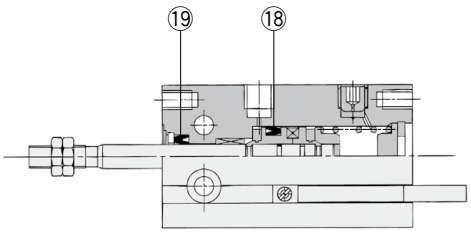
Construction

Single acting, spring extend

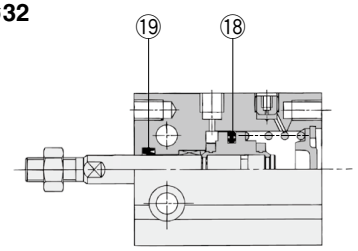
With auto switch

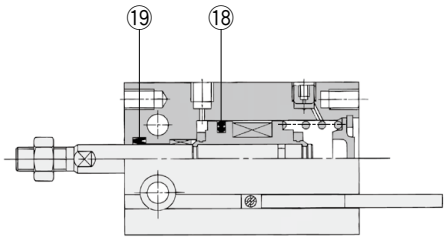
ø10





ø16 to ø32





∗ The numbers correspond with those in the “Construction” of the CU series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑱	**Piston seal**	NBR	
⑲	**Rod seal**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	CU10T-PS	Set of nos. ⑱, ⑲
16	CU16T-PS	
20	CU20T-PS	
25	CU25T-PS	
32	CU32T-PS	

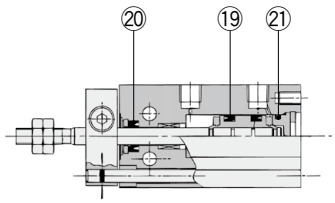
∗ ø6 cannot be repaired.
∗ The seal kit includes ⑱, ⑲. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

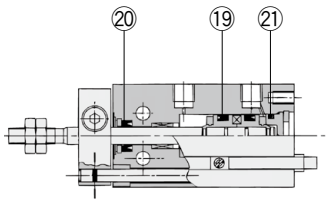
CUK Series ø10, ø16, ø20, ø25, ø32

Construction

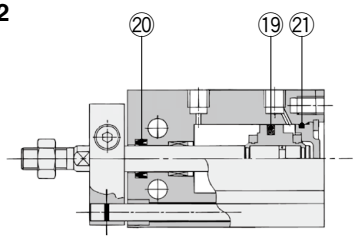
With auto switch

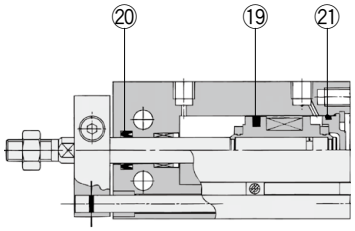
ø10





ø16 to ø32





∗ The numbers correspond with those in the "Construction" of the CUK series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑲	**Piston seal**	NBR	
⑳	**Rod seal**		
㉑	**Gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	CU10D-PS	Set of nos. ⑲, ⑳, ㉑
16	CU16D-PS	
20	CU20D-PS	
25	CU25D-PS	
32	CU32D-PS	

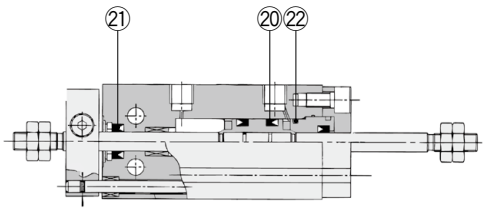
∗ ø6 cannot be repaired.
∗ The seal kit includes ⑲, ⑳, ㉑. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

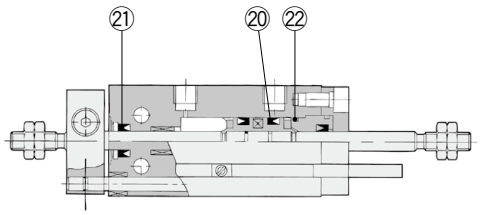
CUKW Series ø10, ø16, ø20, ø25, ø32

Construction

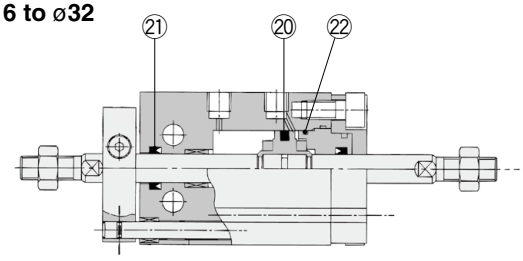
With auto switch

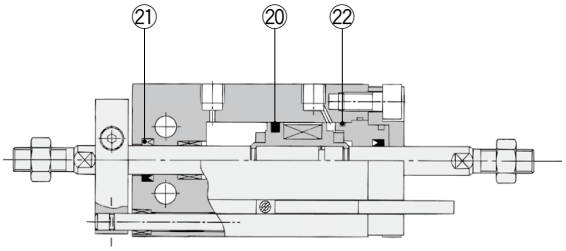
ø10





ø16 to ø32





∗ The numbers correspond with those in the “Construction” of the CUKW series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑳	**Piston seal**	NBR	
㉑	**Rod seal**		
㉒	**Gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	CUW10D-PS	Set of nos. ⑳, ㉑, ㉒
16	CUW16D-PS	
20	CUW20D-PS	
25	CUW25D-PS	
32	CUW32D-PS	

∗ ø6 cannot be repaired.
∗ The seal kit includes ⑳, ㉑, ㉒. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

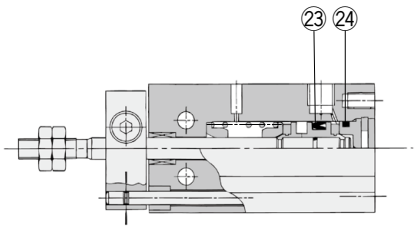
CUK Series ø10, ø16, ø20, ø25, ø32

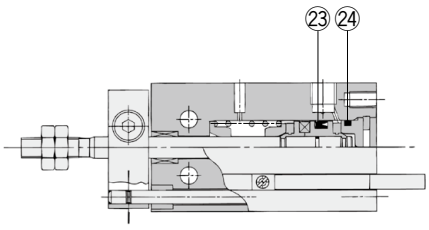
Construction

Single acting, spring return

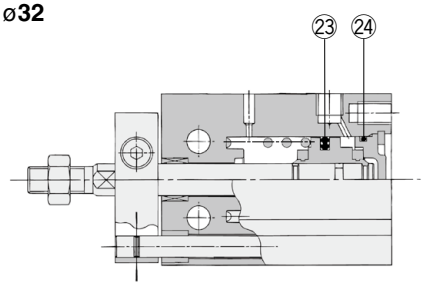
With auto switch

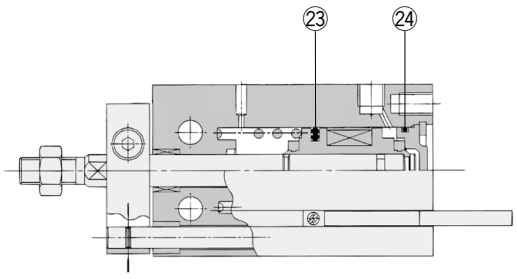
ø10





ø16 to ø32





∗ The numbers correspond with those in the “Construction” of the CUK series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉓	**Piston seal**	NBR	
㉔	**Gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	CU10S-PS	Set of nos. ㉓, ㉔
16	CU16S-PS	
20	CU20S-PS	
25	CU25S-PS	
32	CU32S-PS	

∗ ø6 cannot be repaired.
∗ The seal kit includes ㉓, ㉔. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

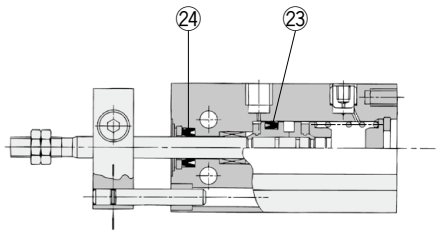
CUK Series ø10, ø16, ø20, ø25, ø32

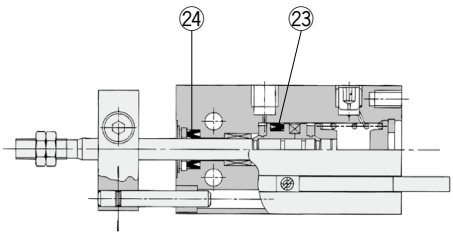
Construction

Single acting, spring extend

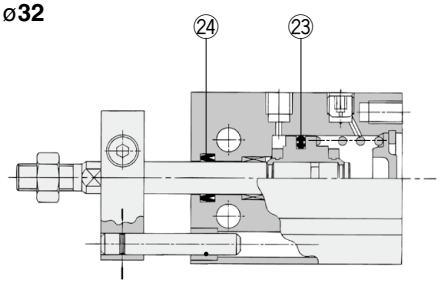
With auto switch

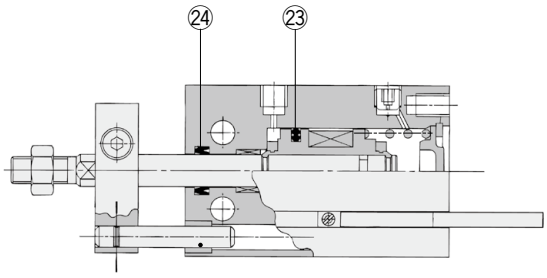
ø10





ø16 to ø32





∗ The numbers correspond with those in the “Construction” of the CUK series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉓	**Piston seal**	NBR	
㉔	**Rod seal**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	CU10T-PS	Set of nos. ㉓, ㉔
16	CU16T-PS	
20	CU20T-PS	
25	CU25T-PS	
32	CU32T-PS	

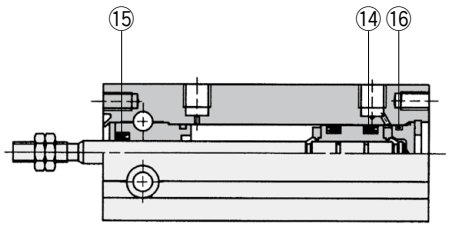
∗ ø6 cannot be repaired.
∗ The seal kit includes ㉓, ㉔. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

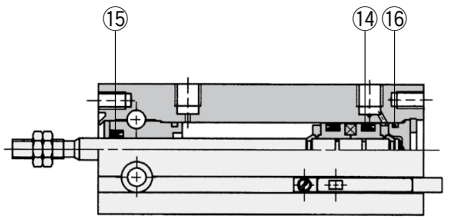
CU Series ø10, ø16, ø20, ø25, ø32

Construction

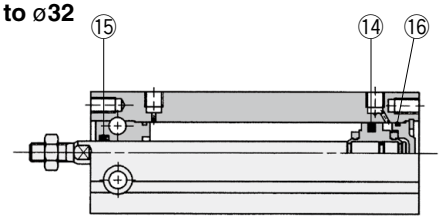
With auto switch

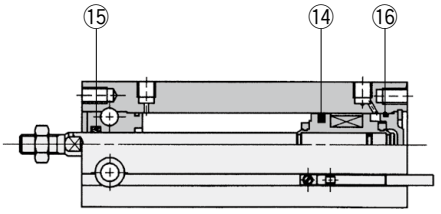
ø10





ø16 to ø32





∗ The numbers correspond with those in the "Construction" of the CU series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑭	**Piston seal**	NBR	
⑮	**Rod seal**		
⑯	**Gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	CU10D-PS	Set of nos. ⑭, ⑮, ⑯
16	CU16D-PS	
20	CU20D-PS	
25	CU25D-PS	
32	CU32D-PS	

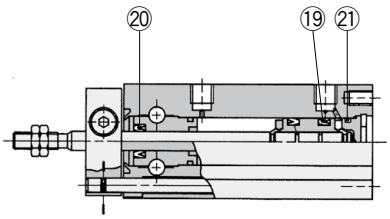
∗ ø6 cannot be repaired.
∗ The seal kit includes ⑭, ⑮, and ⑯. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

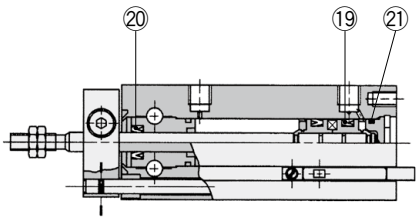
CUK Series ø10, ø16, ø20, ø25, ø32

Construction

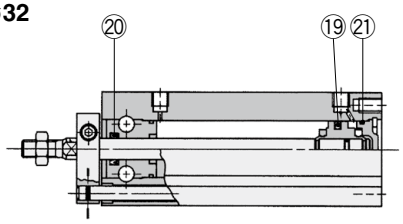
With auto switch

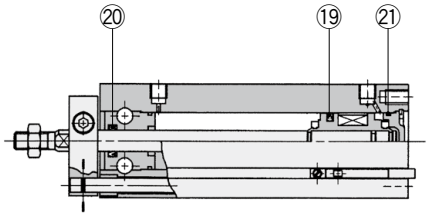
ø10





ø16 to ø32





∗ The numbers correspond with those in the “Construction” of the CUK series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑲	**Piston seal**	NBR	
⑳	**Rod seal**		
㉑	**Gasket**		

Replacement Parts: Seal Kit

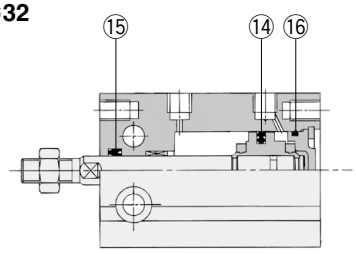
Bore size (mm)	Part no.	Contents
10	CU10D-PS	Set of nos. ⑲, ⑳, ㉑
16	CU16D-PS	
20	CU20D-PS	
25	CU25D-PS	
32	CU32D-PS	

∗ ø6 cannot be repaired.
∗ The seal kit includes ⑲, ⑳, ㉑. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

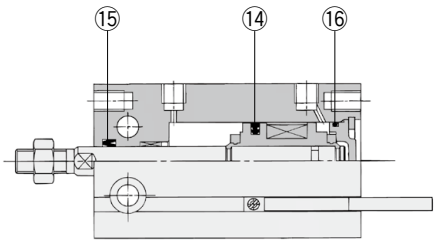
CUX Series ø16, ø20, ø25, ø32

Construction

ø16 to ø32



With auto switch



∗ The construction of the low speed cylinder CUX series is the same as the CU series.
∗ The numbers correspond with those in the "Construction" of the CU series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑭	**Piston seal**	NBR	
⑮	**Rod seal**		
⑯	**Gasket**		

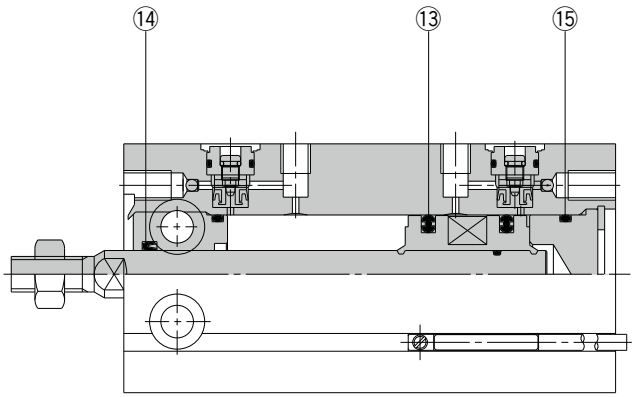
Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
16	CUX16-PS	Set of nos. ⑭, ⑮, ⑯
20	CUX20-PS	
25	CUX25-PS	
32	CUX32-PS	

∗ ø10 cannot be repaired.
∗ The seal kit includes ⑭, ⑮, and ⑯. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

CU Series ø20, ø25, ø32

Construction



∗ The numbers correspond with those in the “Construction” of the CU series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Qty.	Note
⑬	**Piston seal**	NBR	2	
⑭	**Rod seal**		1	
⑮	**Gasket**		1	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
ø20	CU20A-PS	Set of nos. ⑬, ⑭, ⑮
ø25	CU25A-PS	
ø32	CU32A-PS	

∗ The seal kit includes ⑬, ⑭, ⑮. Order the seal kit based on each bore size.

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

ZCUK Series ø10, ø16, ø20, ø25, ø32

Construction

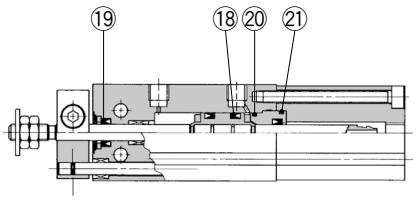
Cap piping, male thread: ZC(D)UKC

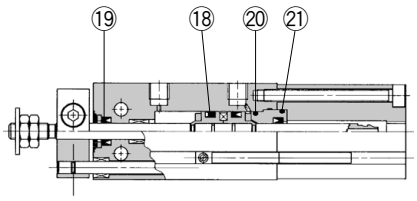
With auto switch

ø10



Pad direct mounting
For the ZC(D)UKD

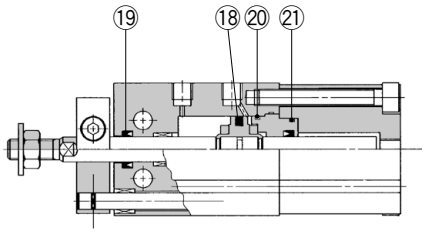


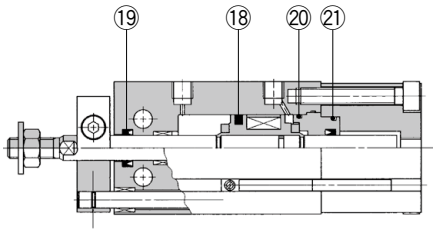


ø16 to ø32



Pad direct mounting
For the ZC(D)UKD





∗ The numbers correspond with those in the "Construction" of the ZCUK series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑱	**Piston seal**	NBR	
⑲	**Rod seal**		
⑳	**Gasket**		
㉑	**Gasket for cap**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	ZCU10-PS	Set of nos. ⑱, ⑲, ⑳, ㉑
16	ZCU16-PS	
20	ZCU20-PS	
25	ZCU25-PS	
32	ZCU32-PS	

∗ The seal kit includes ⑱, ⑲, ⑳ and ㉑. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

ZCUK Series ø10, ø16, ø20, ø25, ø32

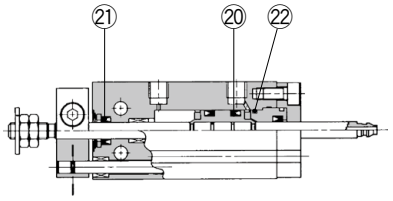
Construction

Rod piping, male thread: ZC(D)UKQ

ø10



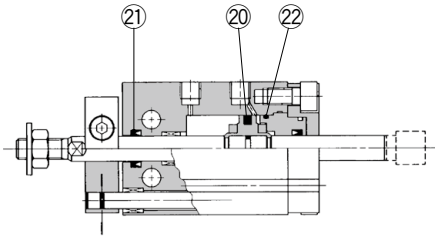
Pad direct mounting
For the ZC(D)UKR



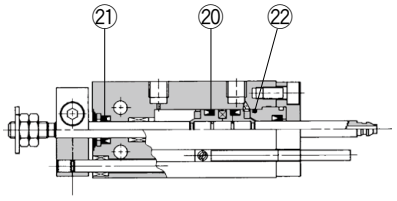
ø16 to ø32

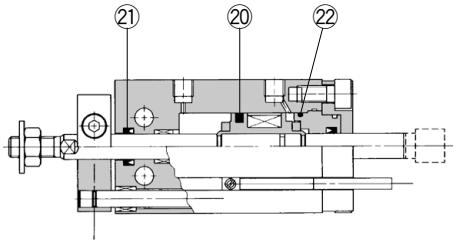


Pad direct mounting
For the ZC(D)UKR



With auto switch





∗ The numbers correspond with those in the “Construction” of the ZCUK series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑳	**Piston seal**	NBR	
㉑	**Rod seal**		
㉒	**Gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	CUW10D-PS	Set of nos. ⑳, ㉑, ㉒
16	CUW16D-PS	
20	CUW20D-PS	
25	CUW25D-PS	
32	CUW32D-PS	

∗ The seal kit includes ⑳, ㉑ and ㉒. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

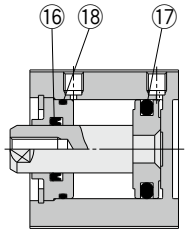
CQS/CQSY/CQSX Series

ø12
ø16
ø20
ø25

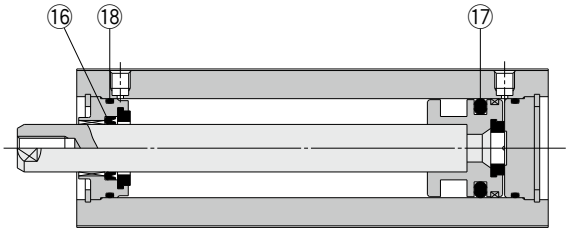
The Replacement Procedure is on p. 387

Construction

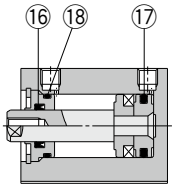
Basic type



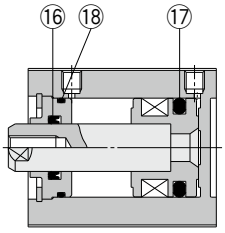
Long stroke type



With auto switch (built-in magnet)



ø12, ø16



ø20, ø25

∗ The figures above show the construction of the CQS series.
The numbers correspond with those in the "Construction" of the CQS series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑯	**Rod seal**	NBR	
⑰	**Piston seal**		
⑱	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Basic type		
12	CQSB12-PS	Set of nos. ⑯, ⑰, ⑱
16	CQSB16-PS	
20	CQSB20-PS	
25	CQSB25-PS	
Long stroke type		
12	CQSB12-L-PS	Set of nos. ⑯, ⑰, ⑱
16	CQSB16-L-PS	
20	CQSB20-L-PS	
25	CQSB25-L-PS	
Smooth cylinder		
12	CQSY12-PS	Set of nos. ⑯, ⑰, ⑱, and a grease pack (10 g)
16	CQSY16-PS	
20	CQSY20-PS	
25	CQSY25-PS	
Low speed cylinder		
12	CQSX12-PS	Set of nos. ⑯, ⑰, ⑱, and a grease pack (10 g)
16	CQSX16-PS	
20	CQSX20-PS	
25	CQSX25-PS	

∗ Order the seal kit based on each bore size. (The long stroke type includes 2 tube gaskets.)
∗ The seal kit for the standard type and long stroke type does not include a grease pack. It should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)
∗ The seal kit for smooth/low speed cylinders includes a grease pack (10 g).
Order with one of the following part numbers when only the maintenance grease for smooth/low speed cylinders is required.
Grease pack part no.: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

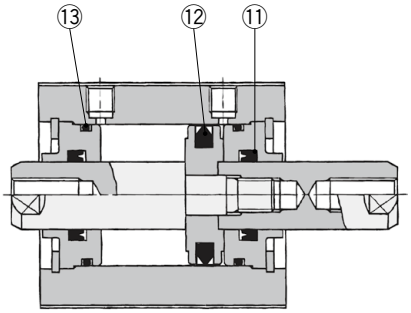
CQSW Series

ø12, ø16
ø20, ø25

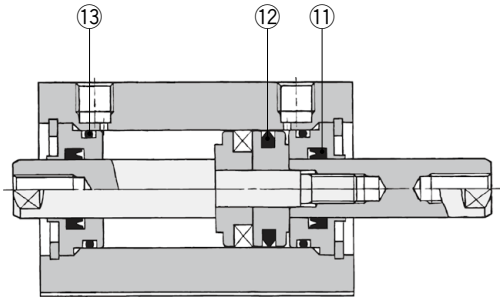
The Replacement Procedure is on p. 387

Construction

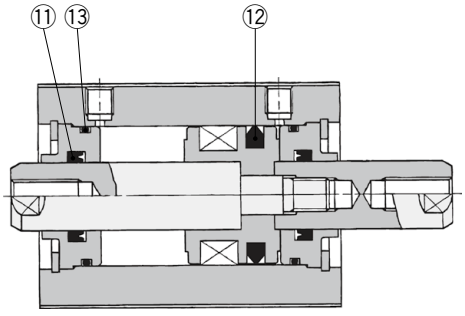
Basic type



With auto switch (built-in magnet)



ø12, ø16



ø20, ø25

∗ The numbers correspond with those in the “Construction” of the CQSW series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑪	**Rod seal**	NBR	
⑫	**Piston seal**		
⑬	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
12	CQSWB12-PS	Set of nos. ⑪, ⑫, ⑬
16	CQSWB16-PS	
20	CQSWB20-PS	
25	CQSWB25-PS	

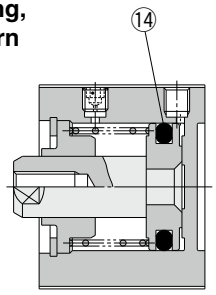
∗ The seal kit includes ⑪, ⑫, ⑬. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CQS Series ø12, ø16, ø20, ø25

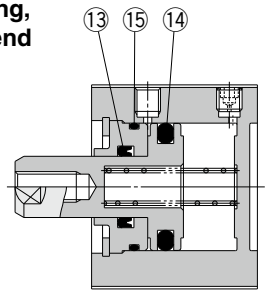
The Replacement Procedure is on p. 387

Construction

Single acting, spring return

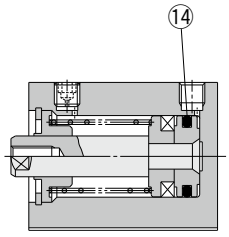


Single acting, spring extend

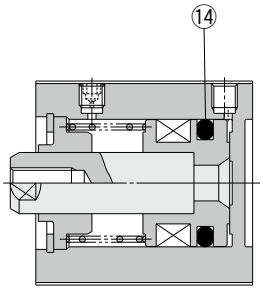


Single acting, spring return/ with auto switch (built-in magnet)

ø12, ø16

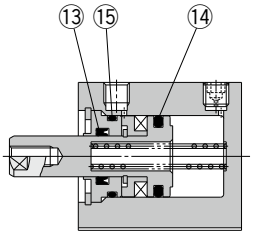


ø20, ø25

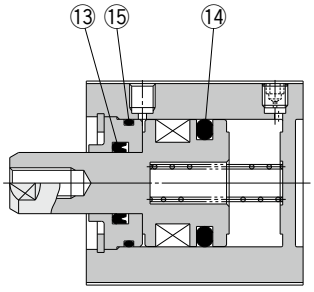


Single acting, spring extend/ with auto switch (built-in magnet)

ø12, ø16



ø20, ø25



∗ The numbers correspond with those in the "Construction" of the CQS series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑬	**Rod seal**	NBR	
⑭	**Piston seal**		
⑮	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Single acting, spring return		
12	CQSB12-S-PS	No. ⑭
16	CQSB16-S-PS	
20	CQSB20-S-PS	
25	CQSB25-S-PS	

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

Single acting, spring extend		
12	CQSB12-T-PS	Set of nos. ⑬, ⑭, ⑮
16	CQSB16-T-PS	
20	CQSB20-T-PS	
25	CQSB25-T-PS	

∗ The seal kit includes ⑬, ⑭, ⑮. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

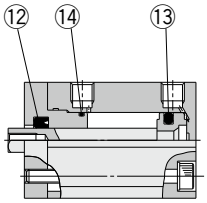
CQSK Series

ø12, ø16, ø20, ø25

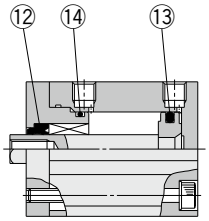
The Replacement Procedure is on p. 387

Construction

Basic type

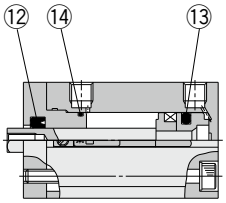


ø12

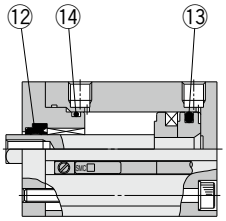


ø16, ø20, ø25

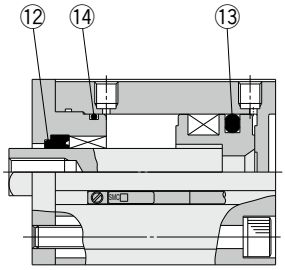
With auto switch (built-in magnet)



ø12



ø16



ø20, ø25

∗ The numbers correspond with those in the “Construction” of the CQSK series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑫	**Rod seal**	NBR	
⑬	**Piston seal**		
⑭	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
12	CQSKB12-PS	Set of nos. ⑫, ⑬, ⑭
16	CQSKB16-PS	
20	CQSKB20-PS	
25	CQSKB25-PS	

∗ The seal kit includes ⑫, ⑬, ⑭. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

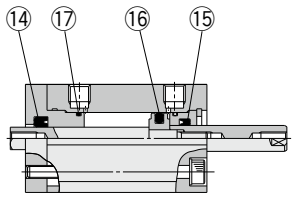
CQSKW Series

ø12, ø16
ø20, ø25

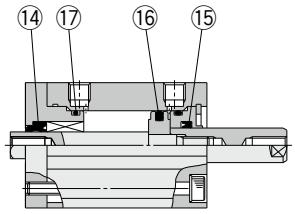
The Replacement Procedure is on p. 387

Construction

Basic type

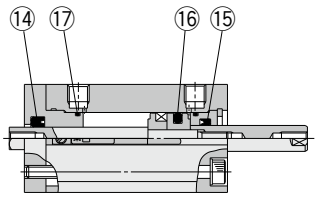


ø12

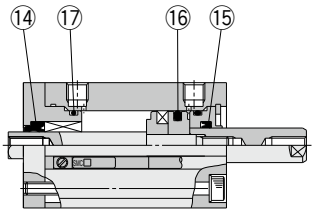


ø16, ø20, ø25

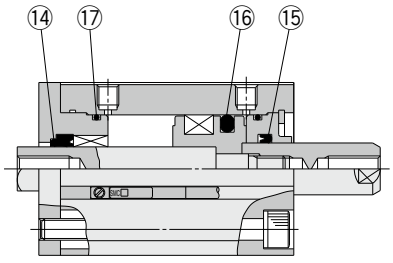
With auto switch (built-in magnet)



ø12



ø16



ø20, ø25

∗ The numbers correspond with those in the “Construction” of the CQSKW series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑭	**Rod seal for non-rotating**	NBR	
⑮	**Rod seal**		
⑯	**Piston seal**		
⑰	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
12	CQSKWB12-PS	Set of nos. ⑭, ⑮, ⑯, ⑰
16	CQSKWB16-PS	
20	CQSKWB20-PS	
25	CQSKWB25-PS	

∗ The seal kit includes ⑭, ⑮, ⑯, ⑰. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

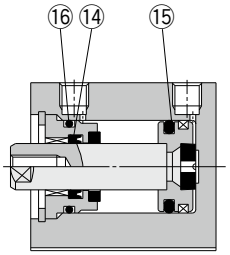
CQS□S Series

ø12, ø16
ø20, ø25

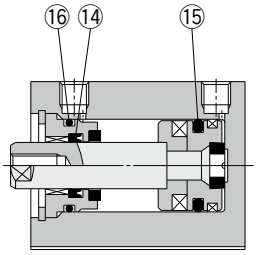
The Replacement Procedure is on p. 387

Construction

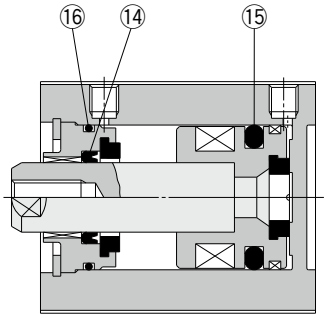
Basic type



With auto switch (built-in magnet)



ø12, ø16



ø20, ø25

∗ The numbers correspond with those in the "Construction" of the CQS□S series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑭	**Rod seal**	NBR	
⑮	**Piston seal**		
⑯	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
12	CQSB12-PS	Set of nos. ⑭, ⑮, ⑯
16	CQSB16-PS	
20	CQSB20-PS	
25	CQSB25-PS	

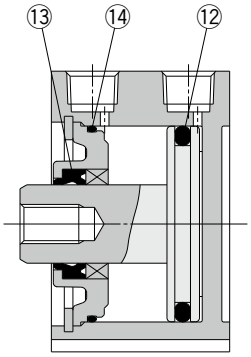
∗ The seal kit includes ⑭, ⑮, ⑯. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CQ2/CQ2Y/CQ2X Series

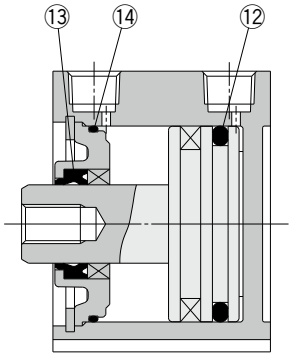
ø12, ø16, ø20
ø25, ø32, ø40
ø50, ø63
ø80, ø100

The Replacement Procedure is on p. 387

Construction



Without auto switch magnet



With auto switch magnet

∗ The figures above show the construction of the CQ2 series.
The numbers correspond with those in the "Construction" of the CQ2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑫	**Piston seal**	NBR	
⑬	**Rod seal**		
⑭	**Gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Pneumatic type		
12	CQ2B12-PS	Set of nos. ⑫, ⑬, ⑭
16	CQ2B16-PS	
20	CQ2B20-PS	
25	CQ2B25-PS	
32	CQ2B32-PS	
40	CQ2B40-PS	
50	CQ2B50-PS	
63	CQ2B63-PS	
80	CQ2B80-PS	
100	CQ2B100-PS	
Air-hydro type		
20	CQ2BH20-PS	Set of nos. ⑫, ⑬, ⑭
25	CQ2BH25-PS	
32	CQ2BH32-PS	
40	CQ2BH40-PS	
50	CQ2BH50-PS	
63	CQ2BH63-PS	
80	CQ2BH80-PS	
100	CQ2BH100-PS	

∗ The seal kit includes ⑫, ⑬, and ⑭. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Smooth cylinder		
32	CQ2Y32-PS	Set of nos. ⑫, ⑬, ⑭, and a grease pack (10 g)
40	CQ2Y40-PS	
50	CQ2Y50-PS	
63	CQ2Y63-PS	
80	CQ2Y80-PS	
100	CQ2Y100-PS	
Low speed cylinder		
32	CQ2X32-PS	Set of nos. ⑫, ⑬, ⑭, and a grease pack (10 g)
40	CQ2X40-PS	
50	CQ2X50-PS	
63	CQ2X63-PS	
80	CQ2X80-PS	
100	CQ2X100-PS	

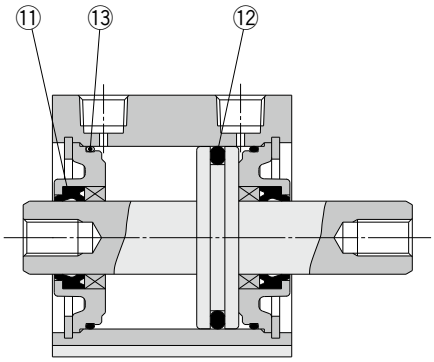
∗ The seal kit includes ⑫, ⑬, and ⑭. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-L-005 (5 g), **GR-L-010** (10 g)

CQ2W Series

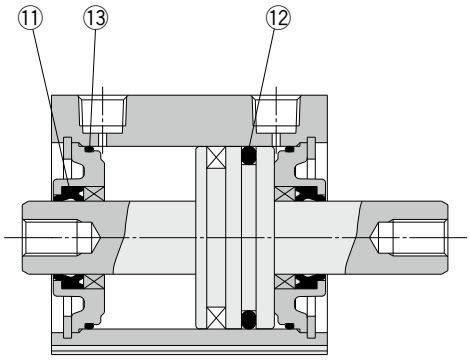
ø12, ø16, ø20
ø25, ø32, ø40
ø50, ø63, ø80
ø100

The Replacement Procedure is on p. 387

Construction



Without auto switch magnet



With auto switch magnet

∗ The numbers correspond with those in the "Construction" of the CQ2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑪	**Rod seal**	NBR	
⑫	**Piston seal**		
⑬	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Pneumatic type		
12	CQ2WB12-PS	Set of nos. ⑪, ⑫, ⑬
16	CQ2WB16-PS	
20	CQ2WB20-PS	
25	CQ2WB25-PS	
32	CQ2WB32-PS	
40	CQ2WB40-PS	
50	CQ2WB50-PS	
63	CQ2WB63-PS	
80	CQ2WB80-PS	
100	CQ2WB100-PS	
Air-hydro type		
20	CQ2WBH20-PS	Set of nos. ⑪, ⑫, ⑬
25	CQ2WBH25-PS	
32	CQ2WBH32-PS	
40	CQ2WBH40-PS	
50	CQ2WBH50-PS	
63	CQ2WBH63-PS	
80	CQ2WBH80-PS	
100	CQ2WBH100-PS	

∗ The seal kit includes ⑪, ⑫, ⑬. Order the seal kit based on each bore size.

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

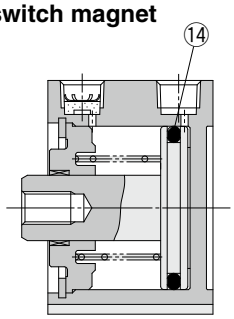
CQ2 Series

ø12, ø16, ø20, ø25
ø32, ø40, ø50

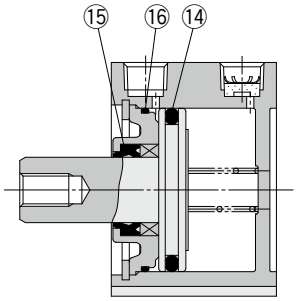
The Replacement Procedure is on p. 387

Construction

Without auto switch magnet

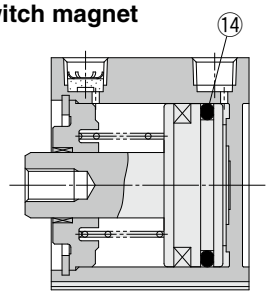


Spring return



Spring extend

With auto switch magnet



∗ The numbers correspond with those in the “Construction” of the CQ2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑭	**Piston seal**	NBR	
⑮	**Rod seal**		
⑯	**Gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Single acting, spring return		
12	CQ2B12-S-PS	No. ⑭
16	CQ2B16-S-PS	
20	CQ2B20-S-PS	
25	CQ2B25-S-PS	
32	CQ2B32-S-PS	
40	CQ2B40-S-PS	
50	CQ2B50-S-PS	
Single acting, spring extend		
12	CQ2B12-T-PS	Set of nos. ⑭, ⑮, ⑯
16	CQ2B16-T-PS	
20	CQ2B20-T-PS	
25	CQ2B25-T-PS	
32	CQ2B32-T-PS	
40	CQ2B40-T-PS	
50	CQ2B50-T-PS	

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

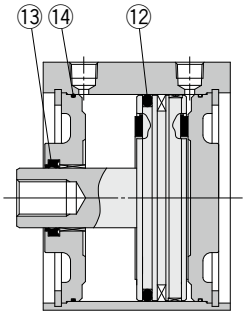
CQ2 Series

ø125, ø140, ø160
ø180, ø200

The Replacement Procedure is on p. 387

Construction

Standard



∗ The numbers correspond with those in the “Construction” of the CQ2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑫	**Piston seal**	NBR	
⑬	**Rod seal**		
⑭	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
125	CQ2B125-PS	Set of nos. ⑫, ⑬, ⑭
140	CQ2B140-PS	
160	CQ2B160-PS	
180	CQ2B180-PS	
200	CQ2B200-PS	

∗ The seal kit includes ⑫, ⑬, ⑭. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

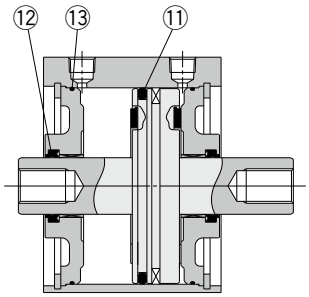
CQ2W Series

ø125, ø140, ø160
ø180, ø200

The Replacement Procedure is on p. 387

Construction

Standard



∗ The numbers correspond with those in the "Construction" of the CQ2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑪	**Piston seal**	NBR	
⑫	**Rod seal**		
⑬	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
125	CQ2WB125-PS	Set of nos. ⑪, ⑫, ⑬
140	CQ2WB140-PS	
160	CQ2WB160-PS	
180	CQ2WB180-PS	
200	CQ2WB200-PS	

∗ The seal kit includes ⑪, ⑫, ⑬. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

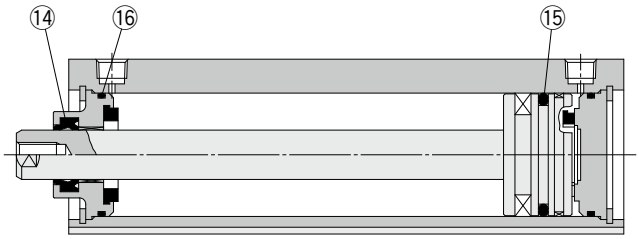
CQ2 Series

ø32, ø40, ø50
ø63, ø80, ø100

The Replacement Procedure is on p. 387

Construction

Standard



∗ The numbers correspond with those in the “Construction” of the CQ2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑭	**Rod seal**	NBR	
⑮	**Piston seal**		
⑯	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
32	CQ2A32-L-PS	Set of nos. ⑭, ⑮, ⑯
40	CQ2A40-L-PS	
50	CQ2A50-L-PS	
63	CQ2A63-L-PS	
80	CQ2A80-L-PS	
100	CQ2A100-L-PS	

∗ The seal kit includes ⑭, ⑮, ⑯. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

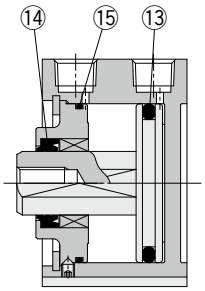
CQ2K Series

ø12, ø16, ø20, ø25
ø32, ø40, ø50, ø63

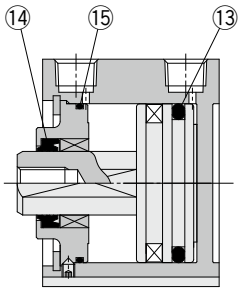
The Replacement Procedure is on p. 387

Construction

Standard



Without auto switch magnet



With auto switch magnet

∗ The numbers correspond with those in the "Construction" of the CQ2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑬	**Piston seal**	NBR	
⑭	**Rod seal**		
⑮	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
12	CQ2KB12-PS	Set of nos. ⑬, ⑭, ⑮
16	CQ2KB16-PS	
20	CQ2KB20-PS	
25	CQ2KB25-PS	
32	CQ2KB32-PS	
40	CQ2KB40-PS	
50	CQ2KB50-PS	
63	CQ2KB63-PS	

∗ The seal kit includes ⑬, ⑭, ⑮. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

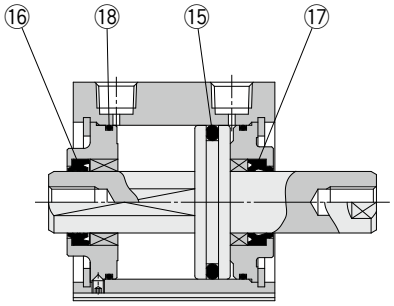
CQ2KW Series

ø12, ø16
ø20, ø25
ø32, ø40
ø50, ø63

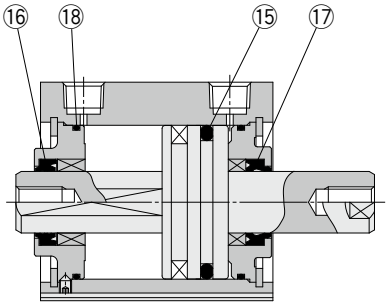
The Replacement Procedure is on p. 387

Construction

Standard



Without auto switch magnet



With auto switch magnet

∗ The numbers correspond with those in the “Construction” of the CQ2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑮	**Piston seal**	NBR	
⑯	**Rod seal for non-rotating**		
⑰	**Rod seal**		
⑱	**Gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
12	CQ2KWB12-PS	Set of nos. ⑮, ⑯, ⑰, ⑱
16	CQ2KWB16-PS	
20	CQ2KWB20-PS	
25	CQ2KWB25-PS	
32	CQ2KWB32-PS	
40	CQ2KWB40-PS	
50	CQ2KWB50-PS	
63	CQ2KWB63-PS	

∗ The seal kit includes ⑮, ⑯, ⑰, ⑱. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

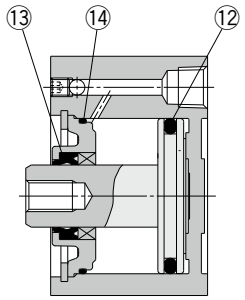
CQP2 Series

ø12, ø16, ø20, ø25
ø32, ø40, ø50, ø63
ø80, ø100

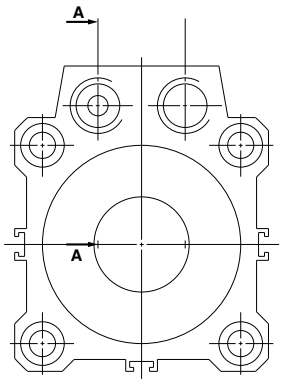
The Replacement Procedure is on p. 387

Construction

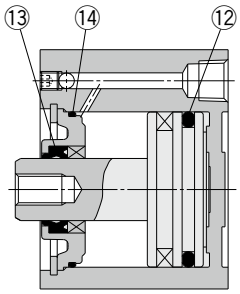
Without auto switch magnet



A-A section (port on rod end)



With auto switch magnet



A-A section (port on rod end)

∗ The numbers correspond with those in the "Construction" of the CQ2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑫	**Piston seal**	NBR	
⑬	**Rod seal**		
⑭	**Gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Pneumatic type (non-lube)		
12	CQ2B12-PS	Set of nos. ⑫, ⑬, ⑭
16	CQ2B16-PS	
20	CQ2B20-PS	
25	CQ2B25-PS	
32	CQ2B32-PS	
40	CQ2B40-PS	
50	CQ2B50-PS	
63	CQ2B63-PS	
80	CQ2B80-PS	
100	CQ2B100-PS	
Air-hydro type		
20	CQ2BH20-PS	Set of nos. ⑫, ⑬, ⑭
25	CQ2BH25-PS	
32	CQ2BH32-PS	
40	CQ2BH40-PS	
50	CQ2BH50-PS	
63	CQ2BH63-PS	
80	CQ2BH80-PS	
100	CQ2BH100-PS	

∗ The seal kit includes ⑫, ⑬, ⑭. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

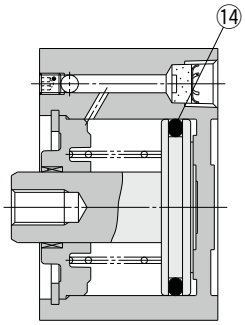
CQP2 Series

ø12, ø16, ø20, ø25
ø32, ø40, ø50

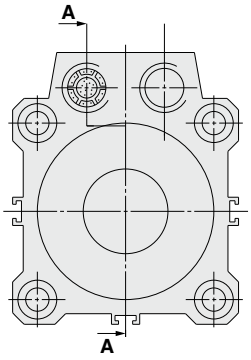
The Replacement Procedure is on p. 387

Construction

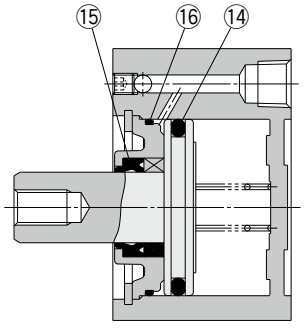
Spring return



A-A section
For the single acting type, the supply/ exhaust port is on the spring side.



Spring extend



A-A section
(Port on rod end)

∗ The numbers correspond with those in the “Construction” of the CQ2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑭	**Piston seal**	NBR	
⑮	**Rod seal**		
⑯	**Gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Single acting, spring return		
12	CQ2B12-S-PS	No. ⑭
16	CQ2B16-S-PS	
20	CQ2B20-S-PS	
25	CQ2B25-S-PS	
32	CQ2B32-S-PS	
40	CQ2B40-S-PS	
50	CQ2B50-S-PS	

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
Single acting, spring extend		
12	CQ2B12-T-PS	Set of nos. ⑭, ⑮, ⑯
16	CQ2B16-T-PS	
20	CQ2B20-T-PS	
25	CQ2B25-T-PS	
32	CQ2B32-T-PS	
40	CQ2B40-T-PS	
50	CQ2B50-T-PS	

∗ The seal kit includes ⑭, ⑮, ⑯. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

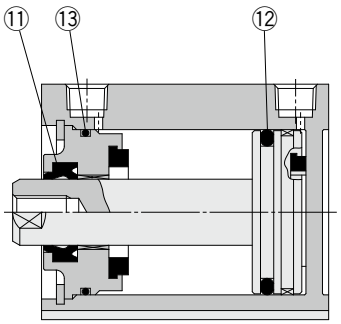
CQ2 Series

ø32, ø40, ø50
ø63, ø80, ø100

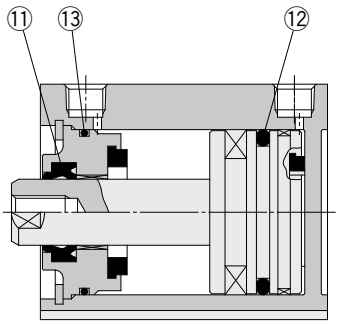
The Replacement Procedure is on p. 387

Construction

Standard



Without auto switch magnet



With auto switch magnet

∗ The numbers correspond with those in the “Construction” of the CQ2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑪	**Rod seal**	NBR	
⑫	**Piston seal**		
⑬	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
32	CQ2B32-PS	Set of nos. ⑪, ⑫, ⑬
40	CQ2B40-PS	
50	CQ2B50-PS	
63	CQ2B63-PS	
80	CQ2B80-PS	
100	CQ2B100-PS	

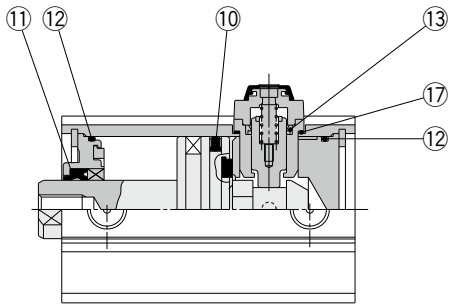
∗ The seal kit includes ⑪, ⑫, ⑬. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

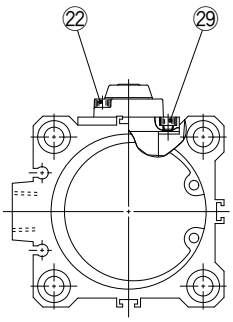
CBQ2 Series

ø20, ø25, ø32, ø40
ø50, ø63, ø80, ø100

The Replacement Procedure is on p. 387

Construction





∗ The numbers correspond with those in the “Construction” of the CQ2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑩	**Piston seal**	NBR	
⑪	**Rod seal**	NBR	
⑫	**Tube gasket**	NBR	Using 4 pcs. for ø80, ø100
⑬	**Lock piston seal**	NBR	
⑰	**Gasket**	NBR	
㉒	Hexagon socket head cap screw	Alloy steel	
㉙	Hexagon socket head cap screw	Alloy steel	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
End lock type		
20	CBQ2B20-PS	Set of nos. ⑩, ⑪, ⑫, ⑬, ⑰, ㉒, ㉙, and a grease pack
25	CBQ2B25-PS	
32	CBQ2B32-PS	
40	CBQ2B40-PS	
50	CBQ2B50-PS	
63	CBQ2B63-PS	
80	CBQ2B80-PS	
100	CBQ2B100-PS	

∗ The seal kit includes ⑩, ⑪, ⑫, ⑬, ⑰, ㉒, ㉙. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-L-005 (5 g)**, GR-L-010** (10 g)

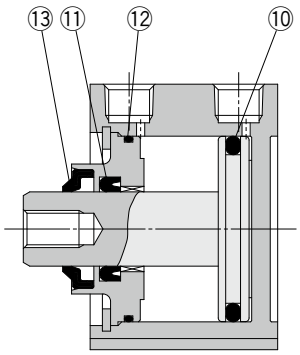
CQ2-R/V Series

ø20, ø25, ø32, ø40
ø50, ø63, ø80, ø100

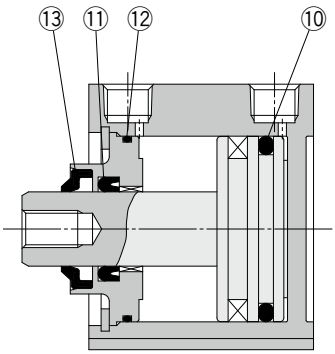
The Replacement Procedure is on p. 387

Construction

Standard



Without auto switch magnet



With auto switch magnet

∗ The numbers correspond with those in the "Construction" of the CQ2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑩	**Piston seal**	R: NBR	**13 is a non-replaceable part, so it is not included in the seal kit.**
		V: FKM	
⑪	**Rod seal**	R: NBR	
		V: FKM	
⑫	**Tube gasket**	R: NBR	
		V: FKM	
13	**Rod scraper**	R: NBR	
		V: FKM	

∗ R: NBR seal (Nitrile rubber)
V: FKM seal (Fluororubber)

Replacement Parts: Seal Kit

Bore size (mm)	Part no.		Contents
	R: NBR	V: FKM	
20	CQ2B20R-PS	CQ2B20V-PS	Set of nos. ⑩, ⑪, ⑫
25	CQ2B25R-PS	CQ2B25V-PS	
32	CQ2B32R-PS	CQ2B32V-PS	
40	CQ2B40R-PS	CQ2B40V-PS	
50	CQ2B50R-PS	CQ2B50V-PS	
63	CQ2B63R-PS	CQ2B63V-PS	
80	CQ2B80R-PS	CQ2B80V-PS	
100	CQ2B100R-PS	CQ2B100V-PS	

∗ The seal kit includes ⑩, ⑪, ⑫. Order the seal kit based on each bore size.
∗ A rod scraper cannot be replaced independently. It is press-fitted, so replace it not only with a collar, but also with a collar assembly. Please contact SMC separately for how to order it.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

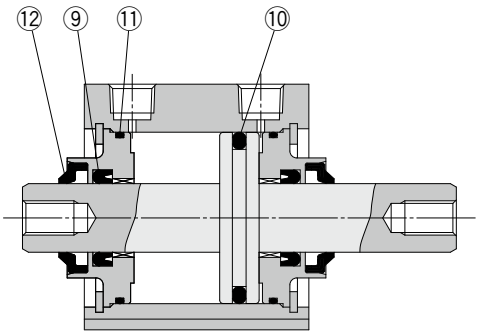
CQ2W-R/V Series

ø40, ø50, ø63
ø80, ø100

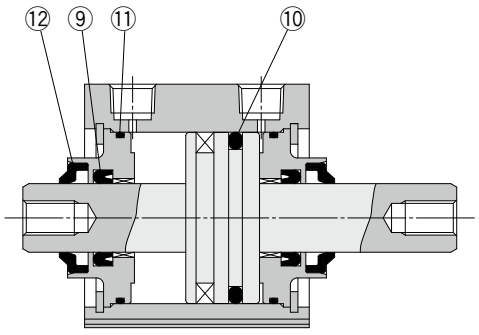
The Replacement Procedure is on p. 387

Construction

Standard



Without auto switch magnet



With auto switch magnet

∗ The numbers correspond with those in the "Construction" of the CQ2 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
⑨	**Rod seal**	R: NBR V: FKM	**12 is a non-replaceable part, so it is not included in the seal kit.**
⑩	**Piston seal**	R: NBR V: FKM	
⑪	**Tube gasket**	R: NBR V: FKM	
12	**Rod scraper**	R: NBR V: FKM	

∗ R: NBR seal (Nitrile rubber)
V: FKM seal (Fluororubber)

Replacement Parts: Seal Kit

Bore size (mm)	Part no.		Contents
	R: NBR	V: FKM	
40	CQ2WB40R-PS	CQ2WB40V-PS	Set of nos. ⑨, ⑩, ⑪
50	CQ2WB50R-PS	CQ2WB50V-PS	
63	CQ2WB63R-PS	CQ2WB63V-PS	
80	CQ2WB80R-PS	CQ2WB80V-PS	
100	CQ2WB100R-PS	CQ2WB100V-PS	

∗ The seal kit includes ⑨, ⑩, ⑪. Order the seal kit based on each bore size.
∗ A rod scraper cannot be replaced independently. It is press-fitted, so replace it not only with a collar, but also with a collar assembly. Please contact SMC separately for how to order it.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

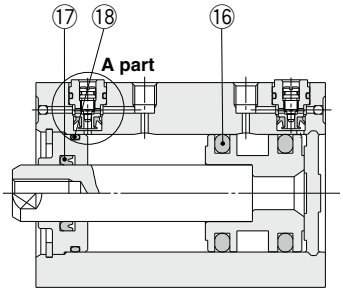
RQ Series

ø20, ø25, ø32, ø40
ø50, ø63, ø80, ø100

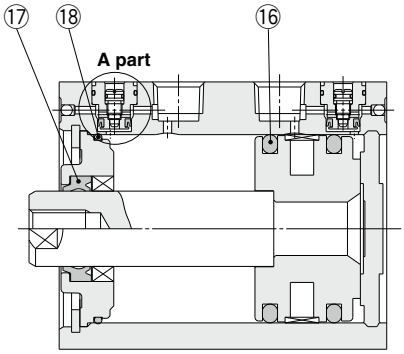
The Replacement Procedure is on p. 387

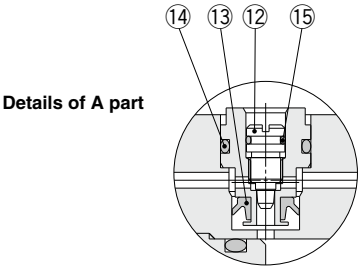
Construction

ø20 to ø40



ø50 to ø100





∗ The numbers correspond with those in the "Construction" of the RQ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
12	**Cushion needle**	Stainless steel	**12 to 15 are non-replaceable parts, so they are not included in the seal kit.**
13	**Check seal**	NBR	
14	**Check gasket**	NBR	
15	**Needle gasket**	NBR	
⑯	**Piston seal**	NBR	
⑰	**Rod seal**	NBR	
⑱	**Tube gasket**	NBR	

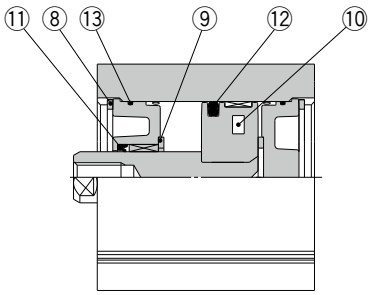
Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	RQB20-PS	Set of nos. ⑯, ⑰, ⑱, and a grease pack
25	RQB25-PS	
32	RQB32-PS	
40	RQB40-PS	
50	RQB50-PS	
63	RQB63-PS	
80	RQB80-PS	
100	RQB100-PS	

∗ The seal kit includes ⑯, ⑰, ⑱. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-L-005 (5 g)**, GR-L-010** (10 g)

CQU Series ø20, ø25, ø32, ø40

Construction



∗ The numbers correspond with those in the “Construction” of the CQU series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑧	**N-type retaining ring**	Carbon tool steel	**9 and 10 are non-replaceable parts, so they are not included in the seal kit.**
9	**Bumper**	Urethane	
10	**Magnet**	—	
⑪	**Rod seal**	NBR	
⑫	**Piston seal**	NBR	
⑬	**O-ring**	NBR	

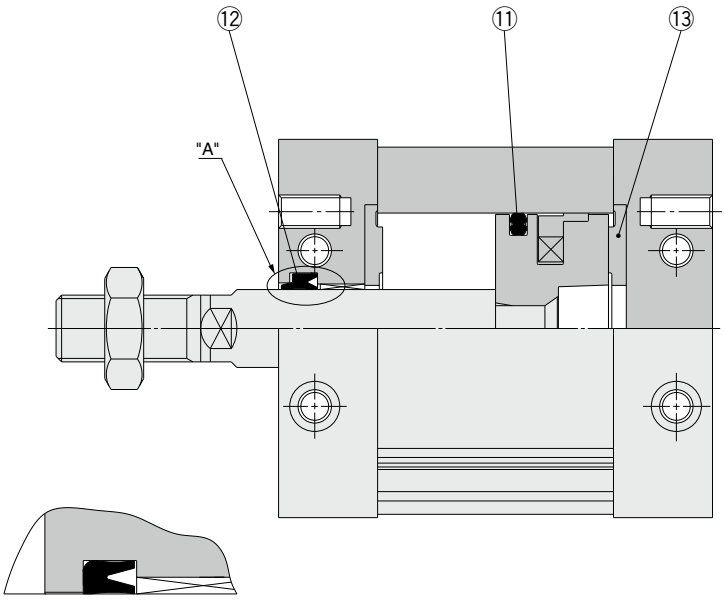
Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CQUB20-PS	Set of nos. ⑧, ⑪, ⑫, ⑬
25	CQUB25-PS	
32	CQUB32-PS	
40	CQUB40-PS	

∗ The seal kit includes ⑧, ⑪, ⑫, ⑬. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

MU Series ø25, ø32, ø40, ø50, ø63

Construction



"A" section MU□25

∗ The numbers correspond with those in the "Construction" of the MU series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑪	**Piston seal**	NBR	
⑫	**Rod seal**	NBR	
⑬	**Bumper**	Urethane	

Replacement Parts: Seal Kit

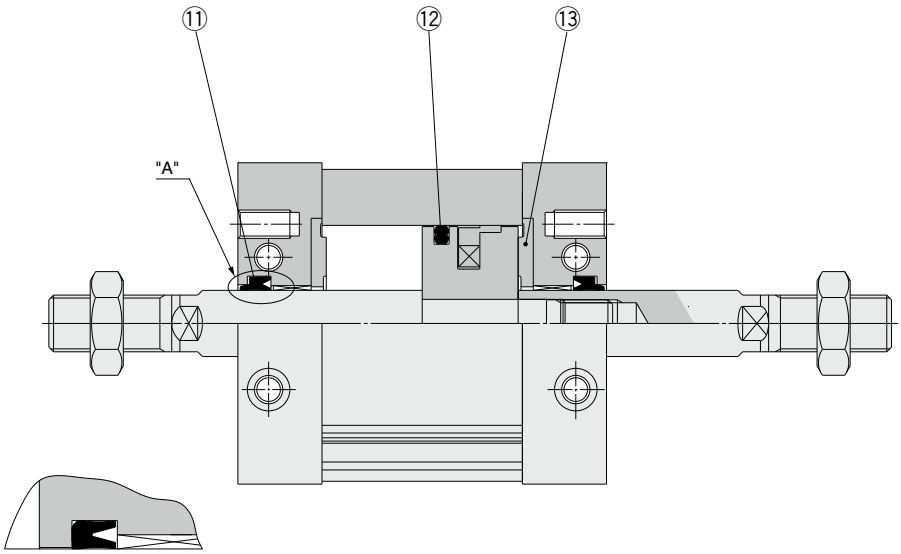
Bore size (mm)	Part no.	Contents
25	MUB25-PS	Set of nos. ⑪, ⑫, ⑬
32	MUB32-PS	
40	MUB40-PS	
50	MUB50-PS	
63	MUB63-PS	

∗ The seal kit includes ⑪ to ⑬. Order the seal kit based on each bore size.

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

MUW Series ø25, ø32, ø40, ø50, ø63

Construction



"A" section MU□25

∗ The numbers correspond with those in the "Construction" of the MU series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑪	**Rod seal**	NBR	
⑫	**Piston seal**		
⑬	**Bumper**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
25	MUW25-PS	Set of nos. ⑪, ⑫, ⑬
32	MUW32-PS	
40	MUW40-PS	
50	MUW50-PS	
63	MUW63-PS	

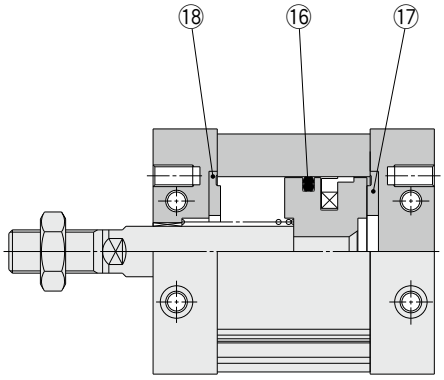
∗ The seal kit includes ⑪ to ⑬. Order the seal kit based on each bore size.

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

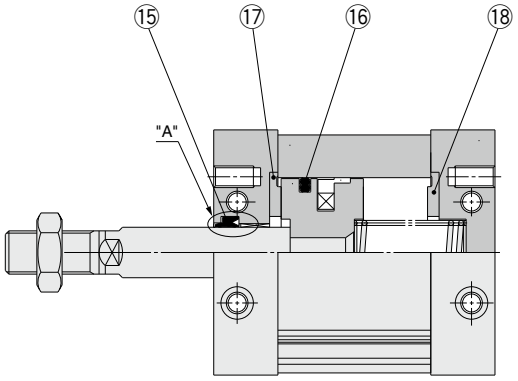
MU Series ø25, ø32, ø40, ø50, ø63

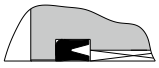
Construction

Spring return



Spring extend





"A" section MU□25

∗ The numbers correspond with those in the "Construction" of the MU series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑮	**Rod seal**	NBR	
⑯	**Piston seal**	NBR	
⑰	**Bumper**	Urethane	
⑱	**Bumper B**	Urethane	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.		Contents
	Spring return	Spring extend	
25	MU25S-PS	MU25T-PS	For spring return type: ⑯, ⑰, ⑱ as a set For spring extend type: ⑮, ⑯, ⑰, ⑱ as a set
32	MU32S-PS	MU32T-PS	
40	MU40S-PS	MU40T-PS	
50	MU50S-PS	MU50T-PS	
63	MU63S-PS	MU63T-PS	

∗ The seal kit includes ⑮, ⑯, ⑰, ⑱ (excluding ⑮ for spring return type). Order them with a part number for each bore size.

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

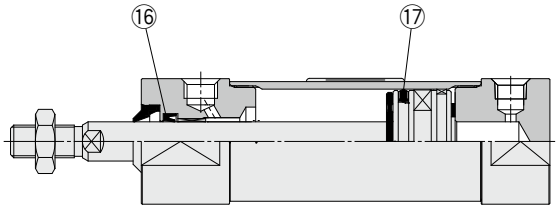
CG5-S Series

ø20, ø25, ø32
ø40, ø50, ø63
ø80, ø100

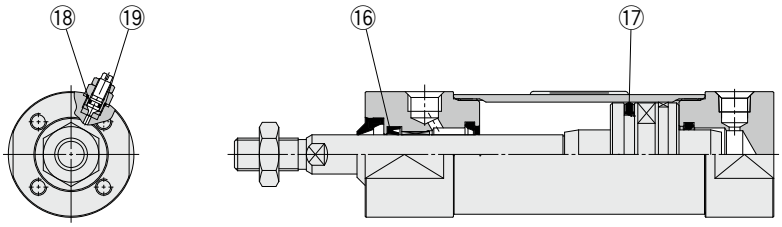
The Replacement Procedure is on p. 378

Construction

With rubber bumper



With air cushion



∗ The numbers correspond with those in the "Construction" of the CG5-S series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	
		CG5□□□SR	**CG5□□□SV**
⑯	**Rod seal**	NBR	FKM
⑰	**Piston seal**		
⑱	**Valve seal**		
⑲	**Valve retainer gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.		Contents
	CG5□N□SR	CG5□N□SV	
Rubber bumper			
20	CG5N20SR-PS	CG5N20SV-PS	Set of nos. ⑯, ⑰
25	CG5N25SR-PS	CG5N25SV-PS	
32	CG5N32SR-PS	CG5N32SV-PS	
40	CG5N40SR-PS	CG5N40SV-PS	

Bore size (mm)	Part no.		Contents
	CG5□A□SR	CG5□A□SV	
Air cushion			
20	CG5A20SR-PS	CG5A20SV-PS	Set of nos. ⑯, ⑰, ⑱, ⑲
25	CG5A25SR-PS	CG5A25SV-PS	
32	CG5A32SR-PS	CG5A32SV-PS	
40	CG5A40SR-PS	CG5A40SV-PS	

∗ Order the seal kit based on each bore size.
∗ A rod scraper cannot be replaced independently. It must be sent to the factory for servicing. Please contact SMC separately for how to order it.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-R-010 (10 g)

⚠ Caution

When disassembling cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the tube cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When retightening, tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled.)

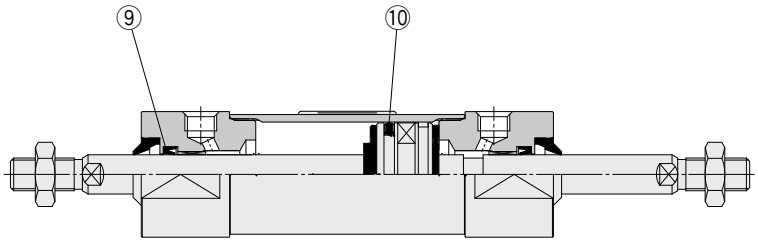
CG5W-S Series

ø20, ø25, ø32
ø40, ø50, ø63
ø80, ø100

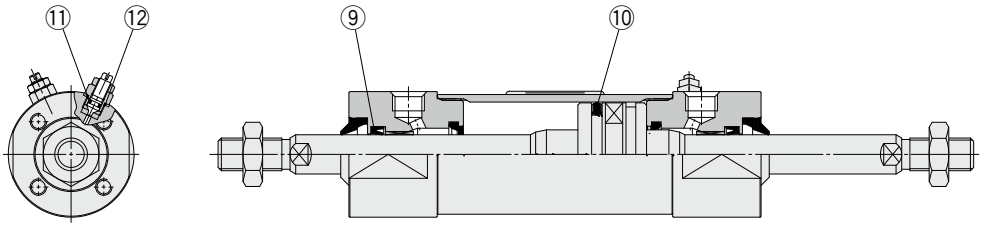
The Replacement Procedure is on p. 378

Construction

With rubber bumper



With air cushion



∗ The numbers correspond with those in the "Construction" of the CG5-S series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	
		CG5W□□□SR	CG5W□□□SV
⑨	Rod seal	NBR	FKM
⑩	Piston seal		
⑪	Valve seal		
⑫	Valve retainer gasket		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.		Contents
	CG5W□N□SR	CG5W□N□SV	
Rubber bumper			
20	CG5WN20SR-PS	CG5WN20SV-PS	⑨ 2 pcs., ⑩ 1 pc. + Grease pack (GR-R-010)
25	CG5WN25SR-PS	CG5WN25SV-PS	
32	CG5WN32SR-PS	CG5WN32SV-PS	
40	CG5WN40SR-PS	CG5WN40SV-PS	

Bore size (mm)	Part no.		Contents
	CG5W□A□SR	CG5W□A□SV	
Air cushion			
20	CG5WA20SR-PS	CG5WA20SV-PS	⑨ 2 pcs., ⑩ 1 pc., ⑪ 2 pcs., ⑫ 2 pcs. + Grease pack (GR-R-010)
25	CG5WA25SR-PS	CG5WA25SV-PS	
32	CG5WA32SR-PS	CG5WA32SV-PS	
40	CG5WA40SR-PS	CG5WA40SV-PS	

∗ As sizes ø50 and larger cannot be disassembled, the seal cannot be replaced. (For details, refer to the **Web Catalog**.)
∗ A rod scraper cannot be replaced independently. It must be sent to the factory for servicing. Please contact SMC separately for how to order it.
∗ The seal kit includes a grease pack (10 g). Order with the following part number when only the grease pack is required.
Grease pack for stainless steel cylinders part no.: GR-R-010 (10 g)

⚠ Caution

When disassembling cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the tube cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When retightening, tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled.)

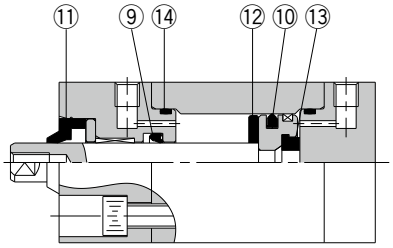
HYQ Series

ø20, ø25, ø32
ø40, ø50, ø63

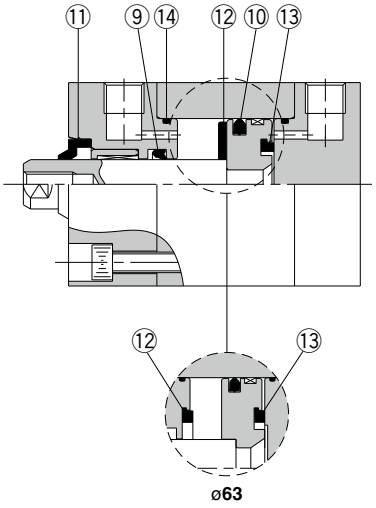
The Replacement Procedure is on p. 394

Construction

ø20, ø25



ø32 to ø63



ø63

∗ The numbers correspond with those in the "Construction" of the HYQ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑨	**Rod seal**	NBR	(FKM can be selected.)
⑩	**Piston seal**	NBR	
11	**Rod scraper**	NBR	(FKM can be selected.)
12	**Bumper A**	Resin	
13	**Bumper B**	Resin	
⑭	**Tube gasket**	NBR	(FKM can be selected.)

11, 12 and 13 are non-replaceable parts, so they are not included in the seal kit.

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	HYQB20□-PS	Set of nos. ⑨, ⑩, ⑭
25	HYQB25□-PS	

Place the seal material symbol in □.

Symbol	Material
R	NBR
H	External FKM∗

∗ External seal: Rod seal and the tube gasket are made from FKM.
∗ The seal kit includes ⑨, ⑩ and ⑭. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease for food part no.: GR-H-010 (10 g)
Standard grease part no.: GR-S-010 (10 g)

Seal Kit List

No.	Description	Material	Note
⑨	**Rod seal**	NBR	(FKM can be selected.)
⑩	**Piston seal**	NBR	
11	**Rod scraper**	NBR	(FKM can be selected.)
12	**Bumper A**	Resin	
13	**Bumper B**	Resin	(Only ø63 is common to bumper A.)
⑭	**Tube gasket**	NBR	(FKM can be selected.)

11, 12 and 13 are non-replaceable parts, so they are not included in the seal kit.

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
32	HYQB32□-PS	Set of nos. ⑨, ⑩, ⑭
40	HYQB40□-PS	
50	HYQB50□-PS	
63	HYQB63□-PS	

Place the seal material symbol in □.

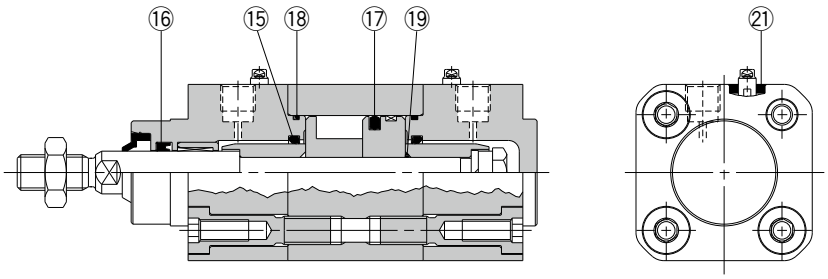
Symbol	Material
R	NBR
H	External FKM∗

∗ External seal: Rod seal and the tube gasket are made from FKM.
∗ The seal kit includes ⑨, ⑩ and ⑭. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease for food part no.: GR-H-010 (10 g)
Standard grease part no.: GR-S-010 (10 g)

HYC Series ø32, ø40, ø50, ø63

The Replacement Procedure is on p. 394

Construction



∗ The numbers correspond with those in the "Construction" of the HYC series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Qty.	Note
⑮	**Cushion seal**	Resin	2	
⑯	**Rod seal**	NBR	1	(FKM can be selected.)
⑰	**Piston seal**	NBR	1	
⑱	**Cylinder tube gasket**	NBR	2	(FKM can be selected.)
19	**Piston gasket**	NBR	1	
㉑	**Needle scraper**	NBR	2	(FKM can be selected.)

19 is a non-replaceable part, so it is not included in the seal kit.

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
32	HYCB32□-PS	Set of nos. ⑮, ⑯, ⑰, ⑱, ㉑
40	HYCB40□-PS	
50	HYCB50□-PS	
63	HYCB63□-PS	

Place the seal material symbol in □.

Symbol	Material
R	NBR
H	External FKM*

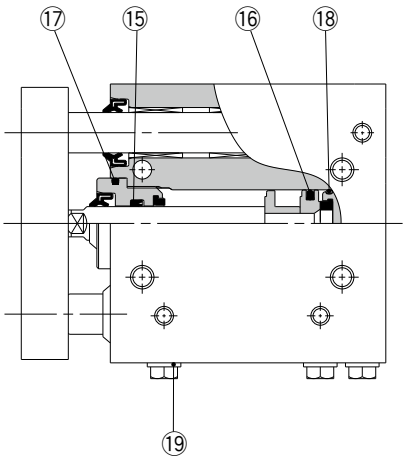
∗ External seal: Rod seal, the tube gasket and needle scraper are made from FKM.
∗ The seal kit includes ⑮, ⑯, ⑰, ⑱ and ㉑. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease for food part no.: GR-H-010 (10 g)
Standard grease part no.: GR-S-010 (10 g)

HYG Series

ø20, ø25, ø32
ø40, ø50, ø63

The Replacement Procedure is on p. 398

Construction



∗ The numbers correspond with those in the “Construction” of the HYG series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑮	**Rod seal**	NBR	(FKM can be selected.)
⑯	**Piston seal**	NBR	
⑰	**O-ring (Rod end)**	NBR	(FKM can be selected.)
18	**O-ring (Head end)**	NBR	
⑲	**Seal washer**	Stainless steel + NBR	(FKM can be selected.)

18 is a non-replaceable part, so it is not included in the seal kit.

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	HYG20□-PS	Set of nos. ⑮, ⑯, ⑰, ⑲
25	HYG25□-PS	
32	HYG32□-PS	

Place the seal material symbol in □.

Symbol	Material
R	NBR
H	External FKM∗

∗ External seal: Rod seal, O-ring (Rod side) and seal washer are made from FKM.
∗ The seal kit includes ⑮, ⑯, ⑰ and ⑲. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease for food part no.: GR-H-010 (10 g)
Standard grease part no.: GR-S-010 (10 g)

⚠ Caution

Please contact SMC to repair or replace seals of cylinder bore size 40 mm and above.

Please contact SMC when the cylinder has to be disassembled for the purpose of replacing seals, etc.

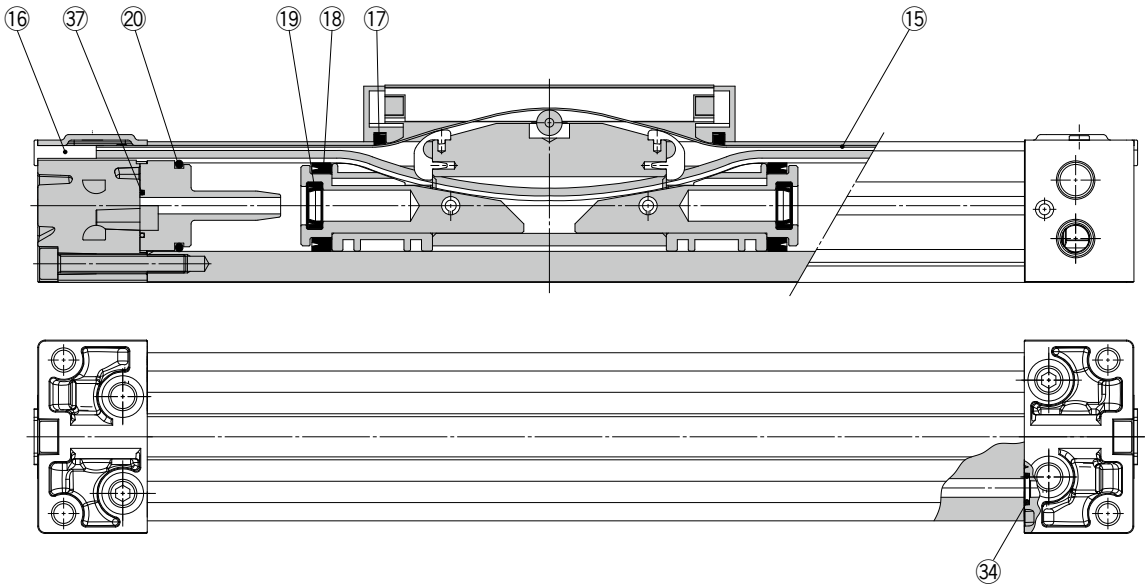
MY1B-□Z Series

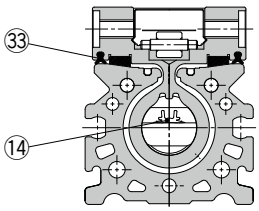
ø25
ø32
ø40

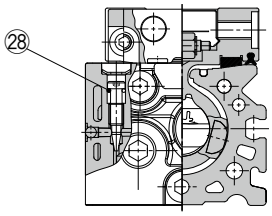
The Replacement Procedure is on p. 401

Construction

The seal belt has been changed since October 2015 (Lot no. TX). When replacing the seal belt of a cylinder that was purchased before the change, order the belt clamp shown in the table below. Lot number checking method ➡ p. 770







∗ The numbers correspond with those in the "Construction" of the MY1B-Z series in the **Web Catalog**.

Replacement Parts: Seal Kit

No.	Description	Material	Qty.	MY1B25	MY1B32	MY1B40	Note
14	**Seal belt**	Urethane	1	MY25-16C- Stroke	MY32-16C- Stroke	MY40-16C- Stroke	**14, 15, 16, 28, 33, and 37 are not included in the seal kit. Order them as required with the individual part numbers provided.**
15	**Dust seal band**	Stainless steel	1	MY1B25-16B- Stroke	MY1B32-16B- Stroke	MY1B40-16B- Stroke	
16	**Belt clamp**	Polybutylene terephthalate	2	MYC25-31-29449B	MYC25-31-29449B	MYC40-31-29451B	
28	**O-ring**	NBR	2	KA00311 (ø5.1 x ø3 x ø1.05)	KA00320 (ø7.15 x ø3.75 x ø1.7)	KA00320 (ø7.15 x ø3.75 x ø1.7)	
33	**Side scraper**	Polyamide	2	MYB25-15BA5900B	MYB32-15BA5901B	MYB40-15BA5902B	
37	**Cushion boss gasket**	NBR	2	MYB25-16GA5900	MYB32-16GA5901	MYB40-16GA5902	
⑰	**Scraper**	NBR	2	MY1B25-PS	MY1B32-PS	MY1B40-PS	
⑱	**Piston seal**	NBR	2				
⑲	**Cushion seal**	NBR	2				
⑳	**Tube gasket**	NBR	2				
㉞	**O-ring**	NBR	2				

∗ The seal kit includes ⑰, ⑱, ⑲, ⑳, and ㉞. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
When ⑭ and ⑮ are shipped independently, a grease pack is included. (10 g per 1000 strokes)
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

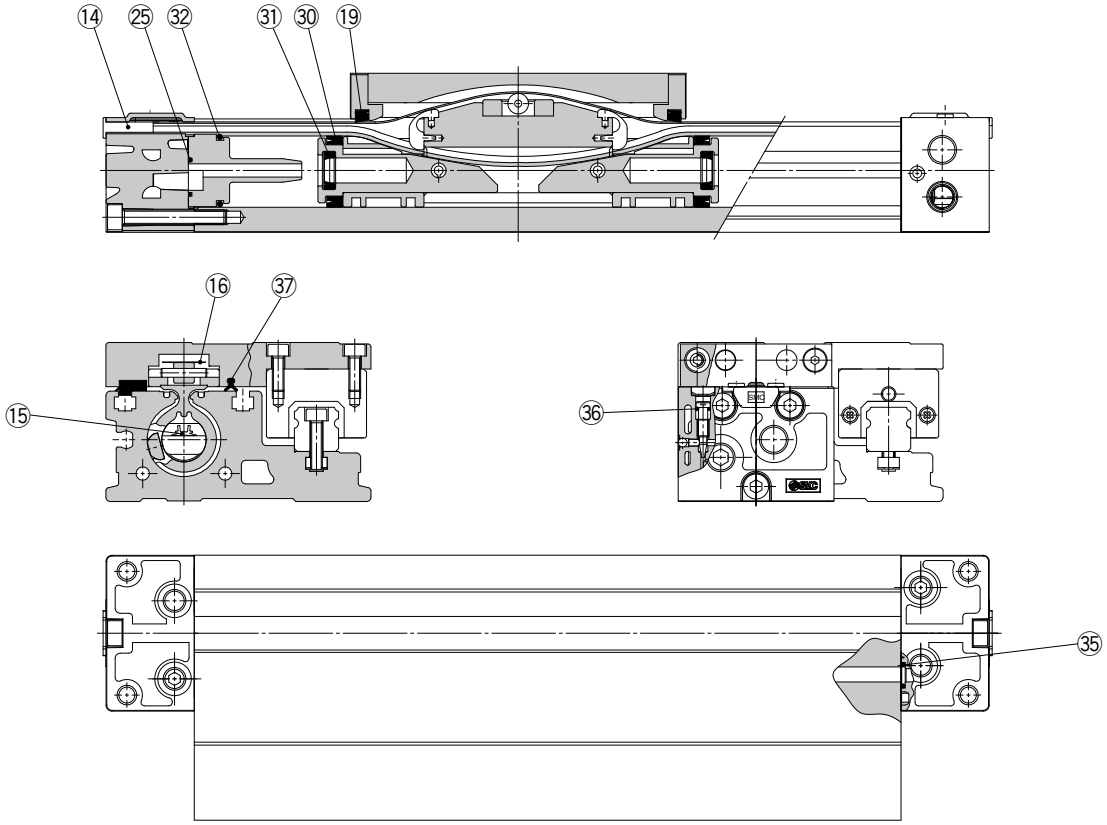
MY1H-□Z Series

ø25
ø32
ø40

The Replacement Procedure is on p. 409

Construction

The seal belt has been changed since October 2015 (Lot no. TX). When replacing the seal belt of a cylinder that was purchased before the change, order the belt clamp shown in the table below. Lot number checking method ➡ p. 770



∗ The numbers correspond with those in the "Construction" of the MY1H-Z series in the **Web Catalog**.

Replacement Parts: Seal Kit (14, 15, 16, 25, 36, and 37 are not included in the seal kit. Order them as required with the individual part numbers provided.)

No.	Description	Material	Qty.	MY1H25	MY1H32	MY1H40
14	**Belt clamp**	Special resin	2	MYC25-31-29449B	MYC25-31-29449B	MYC40-31-29451B
15	**Seal belt**	Urethane	1	MY25-16C- Stroke	MY32-16C- Stroke	MY40-16C- Stroke
16	**Dust seal band**	Stainless steel	1	MY1B25-16B- Stroke	MY1B32-16B- Stroke	MY1B40-16B- Stroke
25	**Cushion boss gasket**	NBR	2	MYB25-16GA5900	MYB32-16GA5901	MYB40-16GA5902
36	**O-ring**	NBR	2	KA00311 (ø5.1 x ø3 x ø1.05)	KA00320 (ø7.15 x ø3.75 x ø1.7)	KA00320 ø7.15 x ø3.75 x ø1.7
37	**Side scraper**	Special resin	2	MYH25-15BK2902B	MYH32-15BK2903B	MYH40-15BK2904B
⑲	**Scraper**	NBR	2	MY1H25-PS	MY1H32-PS	MY1H40-PS
㉚	**Piston seal**	NBR	2			
㉛	**Cushion seal**	NBR	2			
㉜	**Tube gasket**	NBR	2			
㉟	**O-ring**	NBR	2			

∗ The seal kit includes ⑲, ㉚, ㉛, ㉜, and ㉟. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
When ⑮ and ⑯ are shipped independently, a grease pack is included. (10 g per 1000 strokes)
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

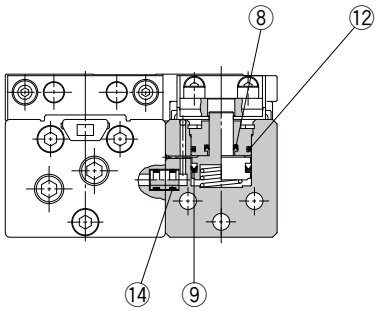
MY1H-□Z Series

ø25
ø32
ø40

The Replacement Procedure is on p. 409

Construction

With end lock: ø25 to ø40



∗ The numbers correspond with those in the "Construction" of the MY1H-Z series in the **Web Catalog**.

Replacement Parts: Seal Kit

No.	Description	Material	Qty.	MY1H25	MY1H32	MY1H40
8	**Rod seal**	NBR	1	KB00267	KB00267	KB00267
9	**Piston seal**	NBR	1	KB00217	KB00217	KB00217
12	**O-ring**	NBR	1	KA00037	KA00037	KA00037
14	**O-ring**	NBR	2	KA00048	KA00048	KA00048

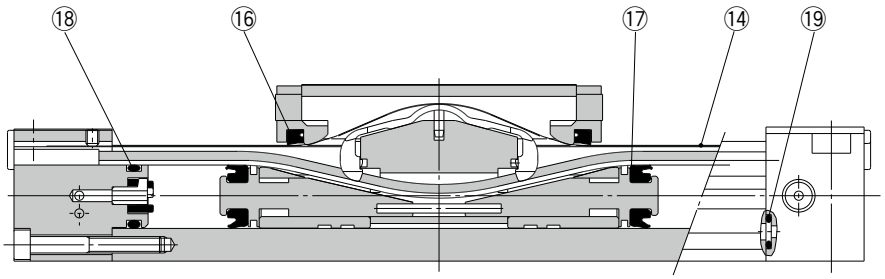
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)
∗ Replacement parts other than those shown above are the same as those for the standard type. Refer to page 121.

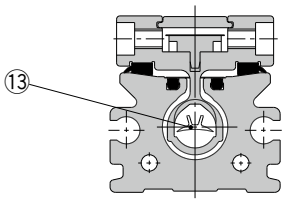
MY1B Series ø10

The Replacement Procedure is on p. 403

Construction

Centralized piping type: ø10





∗ The numbers correspond with those in the “Construction” of the MY1B series in the **Web Catalog**.

Replacement Parts: Seal Kit

No.	Description	Qty.	MY1B10	Note
13	**Seal belt**	1	MY10-16A-Stroke	**13 and 14 are not included in the seal kit. Order them as required with the individual part numbers provided.**
14	**Dust seal band**	1	MY10-16B-Stroke	
⑯	**Scraper**	2	MY1B10-PS	
⑰	**Piston seal**	2		
⑱	**Tube gasket**	2		
⑲	**O-ring**	4		

∗ The seal kit includes ⑯, ⑰, ⑱, and ⑲.
The seal kit includes a grease pack (10 g).
When ⑬ and ⑭ are shipped independently, a grease pack is included.
(10 g per 1000 strokes)
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

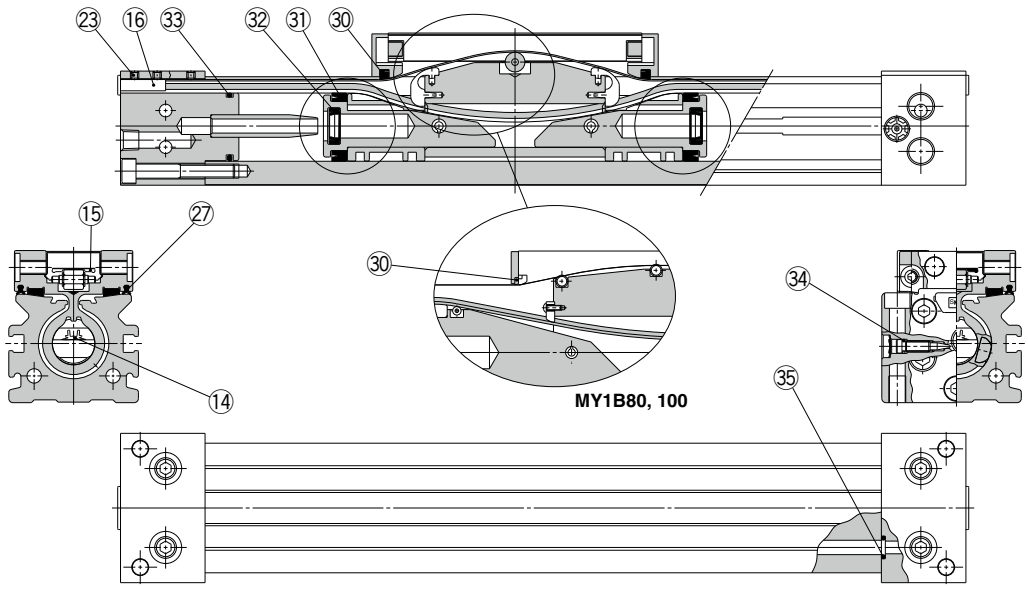
MY1B Series

ø16, ø20, ø50
ø63, ø80, ø100

The Replacement Procedure is on p. 403

Construction

ø16 to ø100



∗ The numbers correspond with those in the "Construction" of the MY1B series in the **Web Catalog**.

Replacement Parts: Seal Kit

No.	Description	Qty.	MY1B16	MY1B20	MY1B50	MY1B63
14	**Seal belt**	1	MY16-16C-Stroke	MY20-16C-Stroke	MY50-16C-Stroke	MY63-16A-Stroke
15	**Dust seal band**	1	MY16-16B-Stroke	MY20-16B-Stroke	MY50-16B-Stroke	MY63-16B-Stroke
16	**Belt clamp**	2	—	—	—	—
27	**Side scraper**	2	—	MYB20-15CA7164B	MYB50-15CA7165B	MYB63-15CA7166B
34	**O-ring**	2	KA00309 (ø4 x ø1.8 x ø1.1)	KA00309 (ø4 x ø1.8 x ø1.1)	KA00402 (ø8.3 x ø4.5 x ø1.9)	KA00777 —
㉚	**Scraper**	2	MY1B16-PS	MY1B20-PS	MY1B50-PS	MY1B63-PS
㉛	**Piston seal**	2				
㉜	**Cushion seal**	2				
㉝	**Tube gasket**	2				
㉟	**O-ring**	4				

No.	Description	Qty.	MY1B80	MY1B100	Note
14	**Seal belt**	1	MY80-16A-Stroke	MY100-16A-Stroke	**14, 15, 16, 27, and 34 are not included in the seal kit. Order them as required with the individual part numbers provided.**
15	**Dust seal band**	1	MY80-16B-Stroke	MY100-16B-Stroke	
16	**Belt clamp**	1	—	—	
27	**Side scraper**	2	MYB80-15CK2470B	MY100-15CK2471B	
34	**O-ring**	2	KA00050 —	KA00050 —	
㉚	**Scraper**	2	MY1B80-PS	MY1B100-PS	
㉛	**Piston seal**	2			
㉜	**Cushion seal**	2			
㉝	**Tube gasket**	2			
㉟	**O-ring**	4			

∗ The seal kit includes ㉚, ㉛, ㉜, ㉝, and ㉟. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
When ⑭ and ⑮ are shipped independently, a grease pack is included. (10 g per 1000 strokes)
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)
Note) Two kinds of dust seal bands are available. Since the part number varies depending on the treatment of the hexagon socket head set screw ㉓, confirm before ordering.
A: Black zinc chromated → MY□□-16B-stroke, B: Nickel plated → MY□□-16BW-stroke

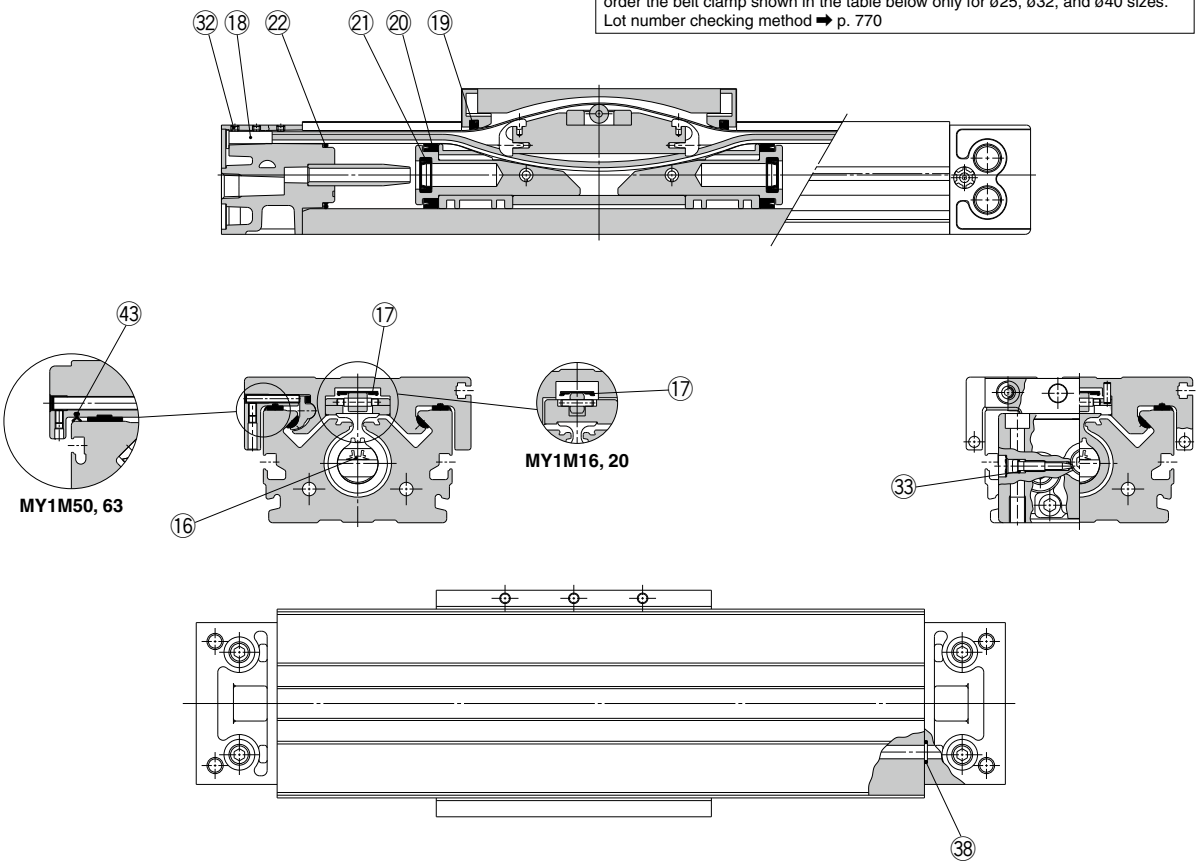
MY1M Series

ø16, ø20, ø25, ø32
ø40, ø50, ø63

The Replacement Procedure is on p. 405

Construction

The seal belt has been changed since October 2015 (Lot no. TX).
When replacing the seal belt of a cylinder that was purchased before the change, order the belt clamp shown in the table below only for ø25, ø32, and ø40 sizes.
Lot number checking method ➡ p. 770



∗ The numbers correspond with those in the "Construction" of the MY1M series in the **Web Catalog**.

Replacement Parts: Seal Kit (16, 17, 18, 33, and 43 are not included in the seal kit. Order them as required with the individual part numbers provided.)

No.	Description	Qty.	MY1M16	MY1M20	MY1M25	MY1M32	MY1M40	MY1M50	MY1M63
16	**Seal belt**	1	MY16-16C-Stroke	MY20-16C-Stroke	MY25-16C-Stroke	MY32-16C-Stroke	MY40-16C-Stroke	MY50-16C-Stroke	MY63-16A-Stroke
17	**Dust seal band**	1	MY16-16B-Stroke	MY20-16B-Stroke	MY25-16B-Stroke	MY32-16B-Stroke	MY40-16B-Stroke	MY50-16B-Stroke	MY63-16B-Stroke
18	**Belt clamp**	2	—	—	MYC25-31-29449B	MYC25-31-29449B	MYC40-31-29451B	—	—
33	**O-ring**	2	KA00309 (ø4 x ø1.8 x ø1.1)	KA00311 (ø5.1 x ø3 x ø1.05)	KA00311 (ø5.1 x ø3 x ø1.05)	KA00320 (ø7.15 x ø3.75 x ø1.7)	KA00402 (ø8.3 x ø4.5 x ø1.9)	KA00777 —	KA00777 —
43	**Side scraper**	2	—	—	—	—	—	MYM50-15CK0502B	MYM63-15CK0503B
⑲	**Scraper**	2	MY1M16-PS	MY1M20-PS	MY1M25-PS	MY1M32-PS	MY1M40-PS	MY1M50-PS	MY1M63-PS
⑳	**Piston seal**	2							
㉑	**Cushion seal**	2							
㉒	**Tube gasket**	2							
㊳	**O-ring**	4							

∗ The seal kit includes ⑲, ⑳, ㉑, ㉒, and ㊳. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
When ⑯ and ⑰ are shipped independently, a grease pack is included. (10 g per 1000 strokes)
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

Note) Two kinds of dust seal bands are available. Since the part number varies depending on the treatment of the hexagon socket head set screw ㉜, confirm before ordering.
A: Black zinc chromated → MY□□-16B-stroke, B: Nickel plated → MY□□-16BW-stroke

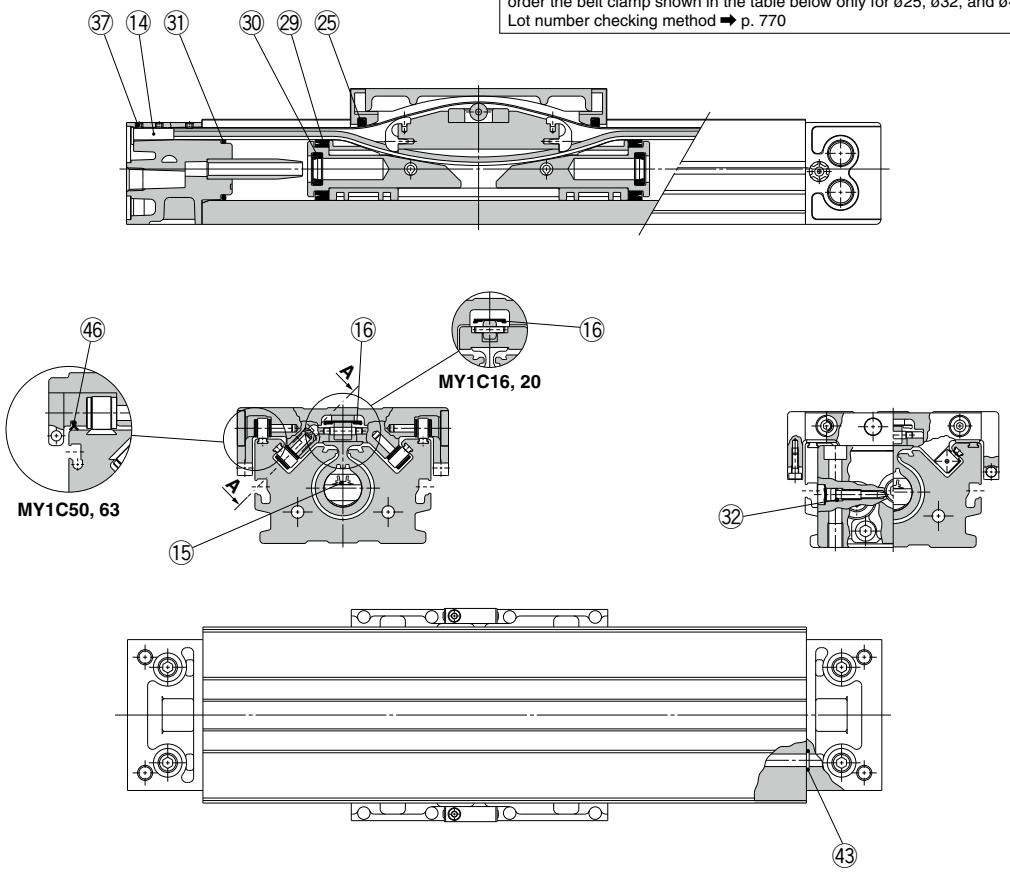
MY1C Series

ø16, ø20, ø25, ø32
ø40, ø50, ø63

The Replacement Procedure is on p. 405

Construction

The seal belt has been changed since October 2015 (Lot no. TX).
When replacing the seal belt of a cylinder that was purchased before the change, order the belt clamp shown in the table below only for ø25, ø32, and ø40 sizes.
Lot number checking method ➡ p. 770



∗ The numbers correspond with those in the "Construction" of the MY1C series in the **Web Catalog**.

Replacement Parts: Seal Kit (14, 15, 16, 32, and 46 are not included in the seal kit. Order them as required with the individual part numbers provided.)

No.	Description	Qty.	MY1C16	MY1C20	MY1C25	MY1C32	MY1C40	MY1C50	MY1C63
14	Belt clamp	2	—	—	MYC25-31-29449B	MYC25-31-29449B	MYC40-31-29451B	—	—
15	Seal belt	1	MY16-16C-Stroke	MY20-16C-Stroke	MY25-16C-Stroke	MY32-16C-Stroke	MY40-16C-Stroke	MY50-16C-Stroke	MY63-16A-Stroke
16	Dust seal band	1	MY16-16B-Stroke	MY20-16B-Stroke	MY25-16B-Stroke	MY32-16B-Stroke	MY40-16B-Stroke	MY50-16B-Stroke	MY63-16B-Stroke
32	O-ring	2	KA00309 (ø4 x ø1.8 x ø1.1)	KA00311 (ø5.1 x ø3 x ø1.05)	KA00311 (ø5.1 x ø3 x ø1.05)	KA00320 (ø7.15 x ø3.75 x ø1.7)	KA00402 (ø8.3 x ø4.5 x ø1.9)	KA00777 —	KA00777 —
46	Side scraper	2	—	—	—	—	—	MYM50-15CK0502B	MYM63-15CK0503B
㉕	Scraper	2	MY1M16-PS	MY1M20-PS	MY1M25-PS	MY1M32-PS	MY1M40-PS	MY1M50-PS	MY1M63-PS
㉙	Piston seal	2							
㉚	Cushion seal	2							
㉛	Tube gasket	2							
㊸	O-ring	4							

∗ The seal kit includes ㉕, ㉙, ㉚, ㉛, and ㊸. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
When ⑮ and ⑯ are shipped independently, a grease pack is included. (10 g per 1000 strokes)
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

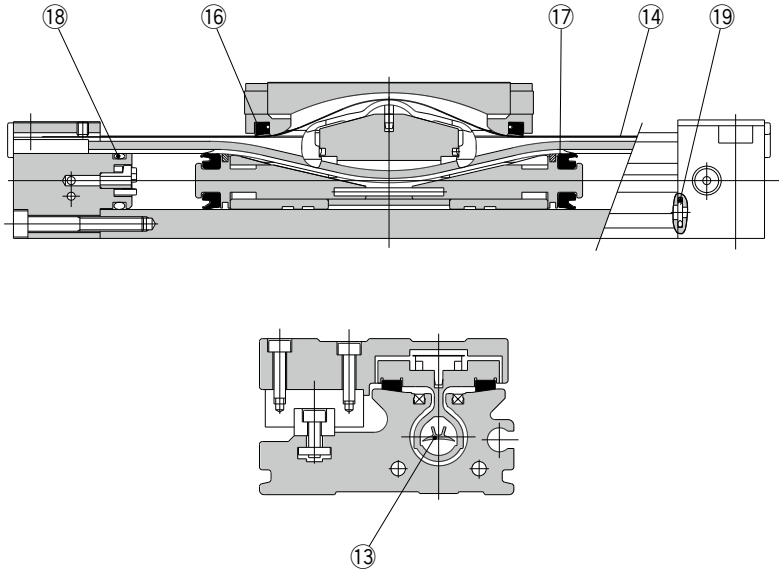
Note) Two kinds of dust seal bands are available. Since the part number varies depending on the treatment of the hexagon socket head set screw ㊲, confirm before ordering.
A: Black zinc chromated → MY□□-16B-stroke, B: Nickel plated → MY□□-16BW-stroke

MY1H Series ø10

The Replacement Procedure is on p. 411

Construction

Centralized piping type: ø10



∗ The numbers correspond with those in the "Construction" of the MY1H series in the **Web Catalog**.

Replacement Parts: Seal Kit

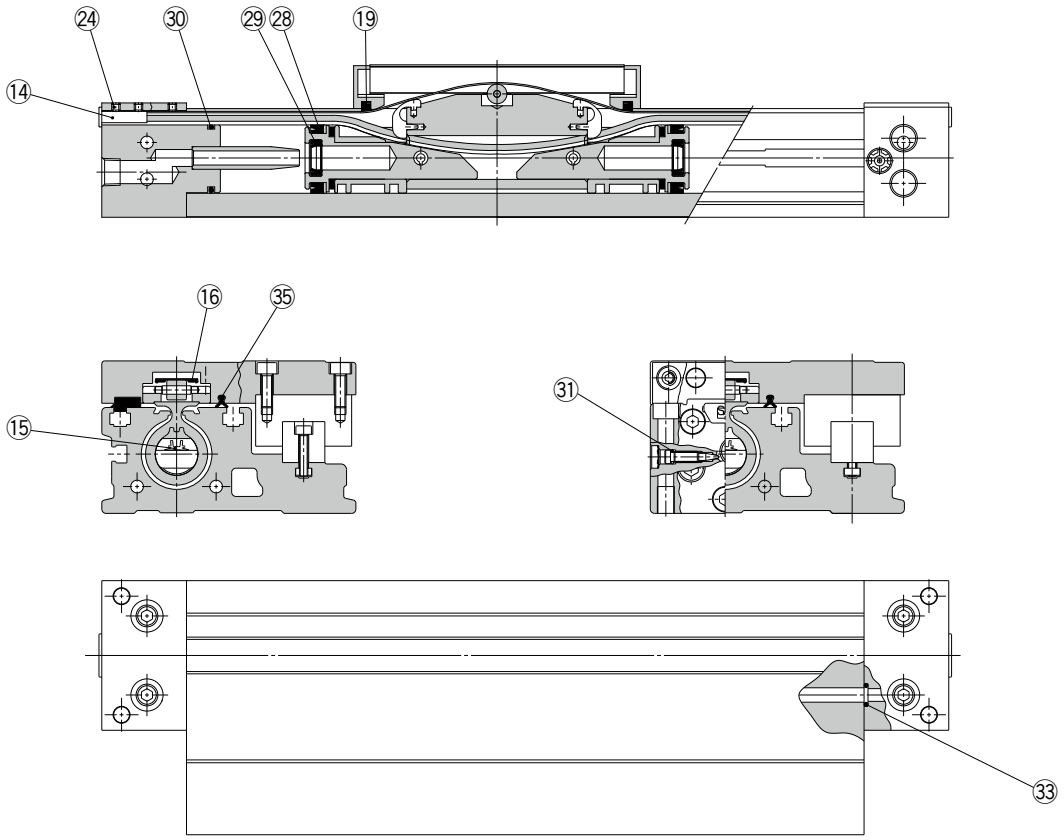
No.	Description	Qty.	MY1H10	Note
13	**Seal belt**	1	MY10-16A- Stroke	**13 and 14 are not included in the seal kit. Order them as required with the individual part numbers provided.**
14	**Dust seal band**	1	MY10-16B- Stroke	
⑯	**Scraper**	2	MY1B10–PS	
⑰	**Piston seal**	2		
⑱	**Tube gasket**	2		
⑲	**O-ring**	4		

∗ The seal kit includes ⑯, ⑰, ⑱ and ⑲.
The seal kit includes a grease pack (10 g).
When ⑬ and ⑭ are shipped independently, a grease pack is included.
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

MY1H Series ø16, ø20

The Replacement Procedure is on p. 411

Construction



∗ The numbers correspond with those in the "Construction" of the MY1H series in the **Web Catalog**.

Replacement Parts: Seal Kit (14, 15, 16, 31, and 35 are not included in the seal kit. Order them as required with the individual part numbers provided.)

No.	Description	Qty.	MY1H16	MY1H20
14	**Belt clamp**	2	—	—
15	**Seal belt**	1	MY16-16C-Stroke	MY20-16C-Stroke
16	**Dust seal band**	1	MY16-16B-Stroke	MY20-16B-Stroke
31	**O-ring**	2	KA00309 (ø4 x ø1.8 x ø1.1)	KA00309 (ø4 x ø1.8 x ø1.1)
35	**Side scraper**	1	MYH16-15BK2900B	MYH20-15BK2901B
⑲	**Scraper**	2	MY1H16-PS	MY1H20-PS
㉘	**Piston seal**	2		
㉙	**Cushion seal**	2		
㉚	**Tube gasket**	2		
㉝	**O-ring**	4		

∗ The seal kit includes ⑲, ㉘, ㉙, ㉚, and ㉝. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
When ⑮ and ⑯ are shipped independently, a grease pack is included. (10 g per 1000 strokes)
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

Note) Two kinds of dust seal bands are available. Since the part number varies depending on the treatment of the hexagon socket head set screw ㉔, confirm before ordering.
A: Black zinc chromated → MY□□-16B-stroke, B: Nickel plated → MY□□-16BW-stroke

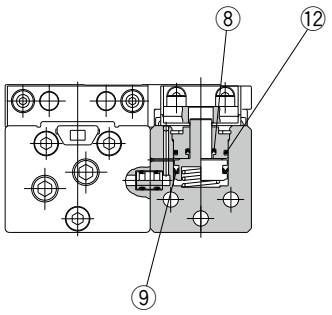
MY1H Series ø16, ø20

The Replacement Procedure is on p. 411

Construction

With end lock: ø16 to ø40

The production of this series has been discontinued.
Check the following before ordering.
- New series MY1H-□Z ➡ p. 122
- Checking whether the cylinder is a new or a previous model ➡ p. 769, 770



∗ The numbers correspond with those in the “Construction” of the MY1H series in the **Web Catalog**.

Replacement Parts: Seal Kit

No.	Description	Material	Qty.	MY1H16	MY1H20
8	**Rod seal**	NBR	1	KB00257	KB00257
9	**Piston seal**		1	KB00202	KB00202
12	**O-ring**		1	KA00057	KA00057

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)
∗ Replacement parts other than those shown above are the same as those for the standard type. Refer to page 128.

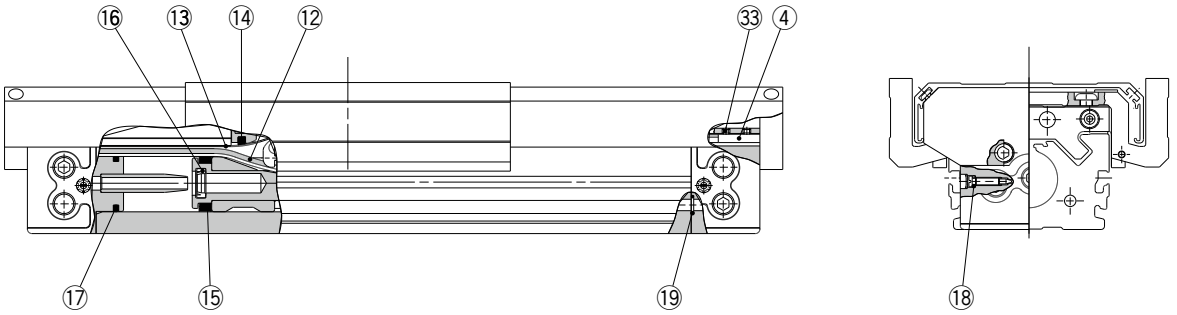
MY1□W Series

ø16, ø20, ø25
ø32, ø40, ø50
ø63

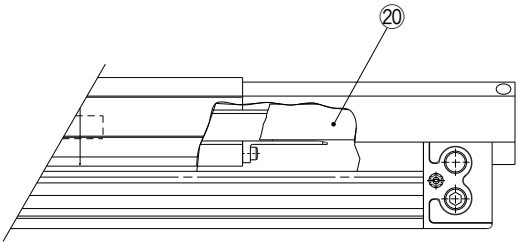
The Replacement Procedure is on p. 405

Construction

The seal belt has been changed since October 2015 (Lot no. TX).
When replacing the seal belt of a cylinder that was purchased before the change, order the belt clamp shown in the table below only for ø25, ø32, and ø40 sizes.
Lot number checking method ➡ p. 770



With side seal



∗ The numbers correspond with those in the "Construction" of the MY1□W series in the **Web Catalog**.

Replacement Parts: Seal Kit (4, 12, 13, 18, and 20 are not included in the seal kit. Order them as required with the individual part numbers provided.)

No.	Description	Qty.	ø16	ø20	ø25	ø32	ø40	ø50	ø63
4	Belt clamp	2	—	—	MYC25-31-29449B	MYC25-31-29449B	MYC40-31-29451B	—	—
12	Seal belt	1	MY16-16C-Stroke	MY20-16C-Stroke	MY25-16C-Stroke	MY32-16C-Stroke	MY40-16C-Stroke	MY50-16C-Stroke	MY63-16A-Stroke
13	Dust seal band Note)	1	MY16-16B-Stroke	MY20-16B-Stroke	MY25-16B-Stroke	MY32-16B-Stroke	MY40-16B-Stroke	MY50-16B-Stroke	MY63-16B-Stroke
18	O-ring	2	KA00309 (ø4 x ø1.8 x ø1.1)	KA00311 (ø5.1 x ø3 x ø1.05)	KA00311 (ø5.1 x ø3 x ø1.05)	KA00320 (ø7.15 x ø3.75 x ø1.7)	KA00402 (ø8.3 x ø4.5 x ø1.9)	KA00777 —	KA00777 —
20	Side seal assembly	2	MYMK-16-Stroke	MYMK-20-Stroke	MYMK-25-Stroke	MYMK-32-Stroke	MYMK-40-Stroke	—	—
⑭	Scraper	2	MY1M16-PS	MY1M20-PS	MY1M25-PS	MY1M32-PS	MY1M40-PS	MY1M50-PS	MY1M63-PS
⑮	Piston seal	2							
⑯	Cushion seal	2							
⑰	Tube gasket	2							
⑲	O-ring	4							

Note) Two kinds of dust seal bands are available. Since the part number varies depending on the treatment of the hexagon socket head set screw ㉝, confirm before ordering (Refer to the Construction of MY1M.).
A Black zinc chromated → MY□□-16B-Stroke B Nickel plated → MY□□-16BW-Stroke

∗ The seal kit includes ⑭, ⑮, ⑯, ⑰, and ⑲. Order the seal kit based on each bore size.

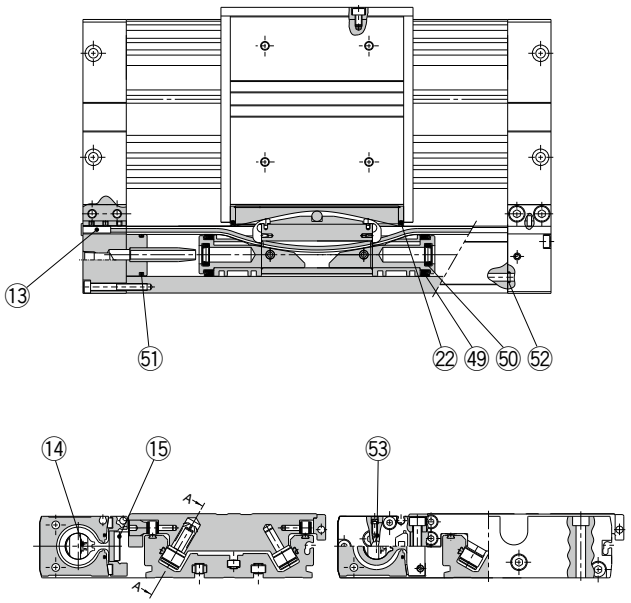
∗ The seal kit includes a grease pack (10 g).
When ⑫ and ⑬ are shipped as single units, a grease pack (10 g per 1000 strokes) is included.
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

MY2C Series ø16, ø25, ø40

The Replacement Procedure is on p. 412

Construction

The seal belt has been changed since October 2015 (Lot no. TX).
When replacing the seal belt of a cylinder that was purchased before the change, order the belt clamp shown in the table below only for ø25 and ø40 sizes.
Lot number checking method ➡ p. 770



∗ The numbers correspond with those in the "Construction" of the MY2C series in the **Web Catalog**.

Replacement Parts: Seal Kit

No.	Description	Qty.	MY2C16G	MY2C25G	MY2C40G	Note
13	**Belt clamp**	2	—	MYC25-31-29449B	MYC40-31-29451B	**13, 14, 15, and 53 are not included in the seal kit. Order them as required with the individual part numbers provided.**
14	**Seal belt**	1	MY16-16C-Stroke	MY25-16C-Stroke	MY40-16C-Stroke	
15	**Dust seal band**	1	MY2H16-16B-Stroke	MY2H25-16B-Stroke	MY2H40-16B-Stroke	
53	**O-ring**	2	KA00309 (ø4 x ø1.8 x ø1.1)	KA00309 (ø4 x ø1.8 x ø1.1)	KA00320 (ø7.15 x ø3.75 x ø1.7)	
㉒	**Scraper**	2	MY2B16-PS	MY2B25-PS	MY2B40-PS	
㊾	**Piston seal**	2				
㊿	**Cushion seal**	2				
51	**Tube gasket**	2				
52	**O-ring**	4				

∗ The seal kit includes ㉒, ㊾, ㊿, 51, and 52. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
When 14 and 15 are shipped as single units, a grease pack (10 g per 1000 strokes) is included.
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

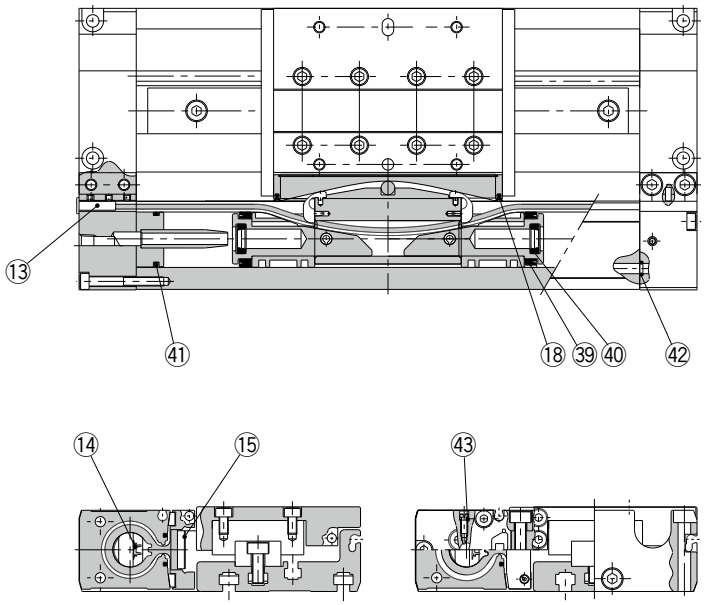
MY2H/HT Series

ø16
ø25
ø40

The Replacement Procedure is on p. 412

Construction

The seal belt has been changed since October 2015 (Lot no. TX).
When replacing the seal belt of a cylinder that was purchased before the change, order the belt clamp shown in the table below only for ø25 and ø40 sizes.
Lot number checking method ➡ p. 770



∗ The numbers correspond with those in the "Construction" of the MY2H/HT series in the **Web Catalog**.

Replacement Parts: Seal Kit

No.	Description	Qty.	MY2H16G/MY2HT16G	MY2H25G/MY2HT25G	MY2H40G/MY2HT40G	Note
13	**Belt clamp**	2	—	MYC25-31-29449B	MYC40-31-29451B	**13, 14, 15, and 43 are not included in the seal kit. Order them as required with the individual part numbers provided.**
14	**Seal belt**	1	MY16-16C-Stroke	MY25-16C-Stroke	MY40-16C-Stroke	
15	**Dust seal band**	1	MY2H16-16B-Stroke	MY2H25-16B-Stroke	MY2H40-16B-Stroke	
43	**O-ring**	2	KA00309 (ø4 x ø1.8 x ø1.1)	KA00309 (ø4 x ø1.8 x ø1.1)	KA00320 (ø7.15 x ø3.75 x ø1.7)	
⑱	**Scraper**	2	MY2B16-PS	MY2B25-PS	MY2B40-PS	
㊴	**Piston seal**	2				
㊵	**Cushion seal**	2				
㊶	**Tube gasket**	2				
㊷	**O-ring**	4				

∗ The seal kit includes ⑱, ㊴, ㊵, ㊶, and ㊷. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
When ⑭ and ⑮ are shipped as single units, a grease pack is included. (10 g per 1000 strokes)
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g) , **GR-S-020** (20 g)

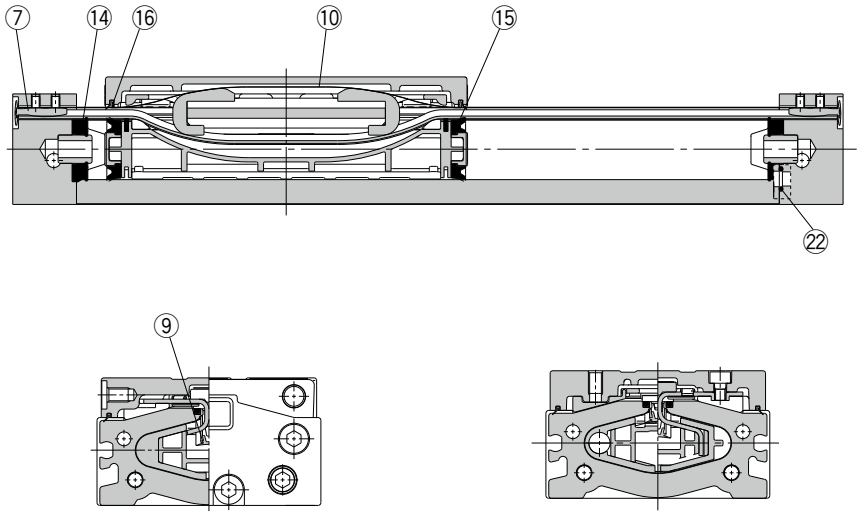
MY3A Series

ø16, ø20, ø25, ø32
ø40, ø50, ø63

The Replacement Procedure is on p. 413

Construction

The seal belt has been changed since June 2015 (Lot no. TT). When replacing the seal belt of a cylinder that was purchased before the change, order the belt clamp shown in the table below only for ø40 and ø50 sizes. Lot number checking method ➡ p. 770



∗ The numbers correspond with those in the “Construction” of the MY3 series in the **Web Catalog**.

Replacement Parts: Seal Kit (7, 9, 10, and 16 are not included in the seal kit. Order them as required with the individual part numbers provided.)

No.	Description	Material	Qty.	MY3A16	MY3A20	MY3A25	MY3A32	MY3A40	MY3A50	MY3A63
7	**Belt clamp**	Polybutylene terephthalate	1	—	—	—	—	MYA40-31-R6658B	MYA40-31-R6658B	—
9	**Seal belt**	Urethane Polyamide	1	MY3A16-16C-Stroke	MY3A20-16C-Stroke	MY3A25-16C-Stroke	MY3A32-16C-Stroke	MY3A40-16C-Stroke	MY3A50-16C-Stroke	MY3A63-16A-Stroke
10	**Dust seal band**	Stainless steel	1	MY3A16-16B-Stroke	MY3A20-16B-Stroke	MY3A25-16B-Stroke	MY3A32-16B-Stroke	MY3A40-16B-Stroke	MY3A50-16B-Stroke	MY3A63-16B-Stroke
16	**Scraper**	Polyamide	1	MYA16-15-R6656	MYA20-15-AC594	MYA25-15-R6657	MYA32-15-AC595	MYA40-15-R6658	MYA50-15-AC596	MYA63-15-R6659
14	**Gasket bumper**	NBR	2	MY3A16-PS	MY3A20-PS	MY3A25-PS	MY3A32-PS	MY3A40-PS	MY3A50-PS	MY3A63-PS
15	**Piston seal**	NBR	2							
22	**O-ring**	NBR	4							

∗ The seal kit includes ⑭, ⑮, and ㉒. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
When ⑨ and ⑩ are shipped as single units, a grease pack is included (10 g per 1000 strokes).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)
∗ For instructions on how to replace replacement parts/seals, refer to the operation manual.

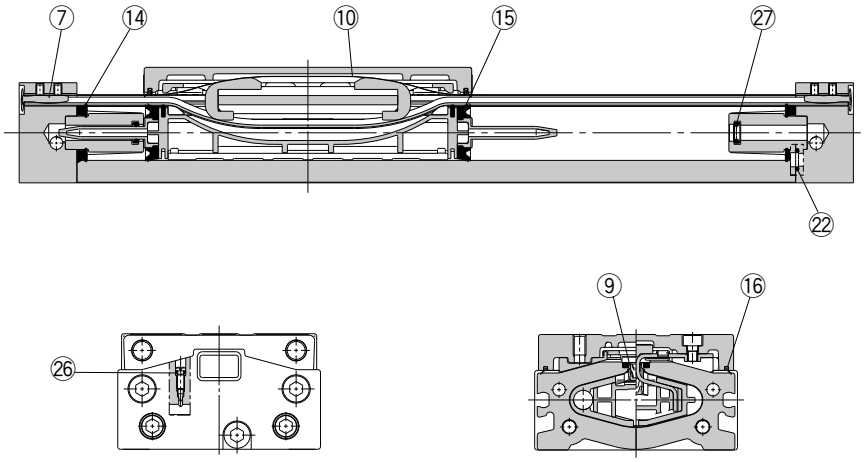
MY3B Series

ø16, ø20, ø25, ø32
ø40, ø50, ø63

The Replacement Procedure is on p. 413

Construction

The seal belt has been changed since June 2015 (Lot no. TT). When replacing the seal belt of a cylinder that was purchased before the change, order the belt clamp shown in the table below only for ø40 and ø50 sizes. Lot number checking method ➡ p. 770



∗ The numbers correspond with those in the "Construction" of the MY3 series in the **Web Catalog**.

Replacement Parts: Seal Kit (7, 9, 10, 16, and 26 are not included in the seal kit. Order them as required with the individual part numbers provided.)

No.	Description	Material	Qty.	MY3B16	MY3B20	MY3B25	MY3B32	MY3B40	MY3B50	MY3B63
7	**Belt clamp**	Polybutylene terephthalate	1	—	—	—	—	MYA40-31-R6658B	MYA40-31-R6658B	—
9	**Seal belt**	Urethane Polyamide	1	MY3B16-16C-Stroke	MY3B20-16C-Stroke	MY3B25-16C-Stroke	MY3B32-16C-Stroke	MY3B40-16C-Stroke	MY3B50-16C-Stroke	MY3B63-16A-Stroke
10	**Dust seal band**	Stainless steel	1	MY3B16-16B-Stroke	MY3B20-16B-Stroke	MY3B25-16B-Stroke	MY3B32-16B-Stroke	MY3B40-16B-Stroke	MY3B50-16B-Stroke	MY3B63-16B-Stroke
16	**Scraper**	Polyamide	1	MYA16-15-R6656	MYA20-15-AC594	MYA25-15-R6657	MYA32-15-AC595	MYA40-15-R6658	MYA50-15-AC596	MYA63-15-R6659
26	**O-ring**	NBR	2	KA00309 (ø4 x ø1.8 x ø1.1)	KA00309 (ø4 x ø1.8 x ø1.1)	KA00309 (ø4 x ø1.8 x ø1.1)	KA00309 (ø4 x ø1.8 x ø1.1)	KA00320 (ø7.15 x ø3.75 x ø1.7)	KA00320 (ø7.15 x ø3.75 x ø1.7)	KA00402 (ø8.3 x ø4.5 x ø1.9)
14	**Tube gasket**	NBR	2	MY3B16-PS	MY3B20-PS	MY3B25-PS	MY3B32-PS	MY3B40-PS	MY3B50-PS	MY3B63-PS
15	**Piston seal**	NBR	2							
22	**O-ring**	NBR	4							
27	**Cushion seal**	NBR	2							

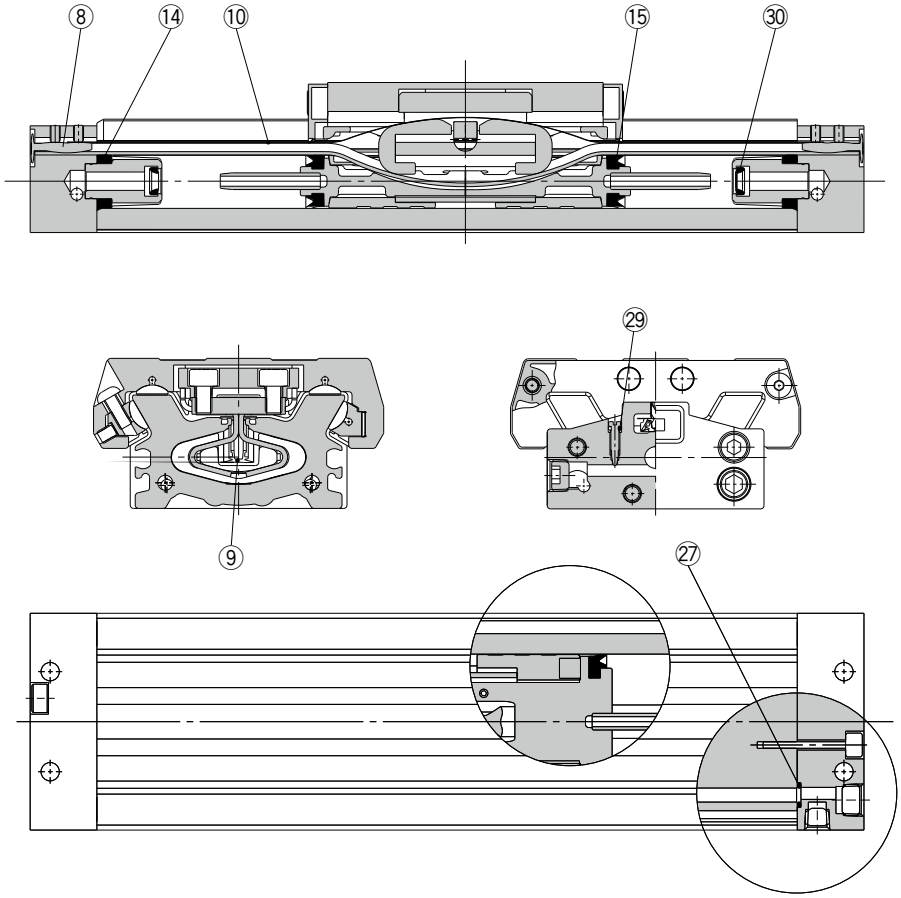
∗ The seal kit includes ⑭, ⑮, ㉒, and ㉗. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
When ⑨ and ⑩ are shipped as single units, a grease pack is included (10 g per 1000 strokes).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)
∗ For instructions on how to replace replacement parts/seals, refer to the operation manual.

MY3M Series ø16, ø25, ø40, ø63

The Replacement Procedure is on p. 413

Construction

The seal belt has been changed since June 2015 (Lot no. TT). When replacing the seal belt of a cylinder that was purchased before the change, order the belt clamp shown in the table below only for ø40 size. Lot number checking method ➡ p. 770



∗ The numbers correspond with those in the "Construction" of the MY3 series in the **Web Catalog**.

Replacement Parts: Seal Kit (8, 9, 10, and 29 are not included in the seal kit. Order them as required with the individual part numbers provided.)

No.	Description	Material	Qty.	MY3M16	MY3M25	MY3M40	MY3M63
8	**Belt clamp**	Polybutylene terephthalate	1	—	—	MYA40-31-R6658B	—
9	**Seal belt**	Urethane Polyamide	1	MY3B16-16C-Stroke	MY3B25-16C-Stroke	MY3B40-16C-Stroke	MY3B63-16A-Stroke
10	**Dust seal band**	Stainless steel	1	MY3B16-16B-Stroke	MY3B25-16B-Stroke	MY3B40-16B-Stroke	MY3B63-16B-Stroke
29	**O-ring**	NBR	2	KA00309 (ø4 x ø1.8 x ø1.1)	KA00309 (ø4 x ø1.8 x ø1.1)	KA00320 (ø7.15 x ø3.75 x ø1.7)	KA00402 (ø8.3 x ø4.5 x ø1.9)
14	**Tube gasket**	NBR	2	MY3B16-PS	MY3B25-PS	MY3B40-PS	MY3B63-PS
15	**Piston seal**	NBR	2				
27	**O-ring**	NBR	4				
30	**Cushion seal**	NBR	2				

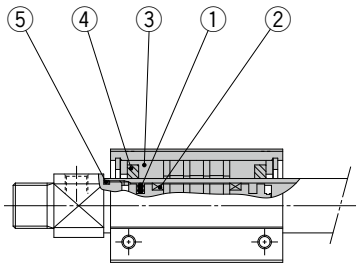
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CY3B-Z Series ø6, ø10, ø15, ø20, ø25 ø32, ø40, ø50, ø63

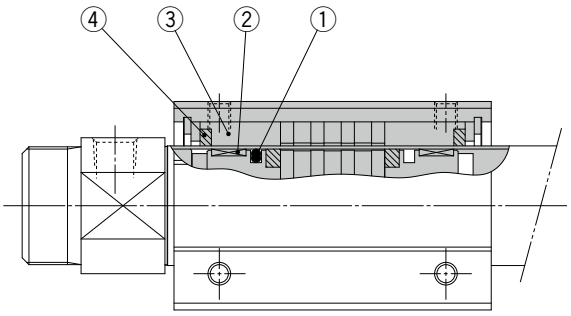
The Replacement Procedure is on p. 415-1

Replacement Parts: Seal Kit

CY3B6, 10-□Z



CY3B15 to 40-□Z



Component Parts

No.	Description
1	**Piston seal**
2	**Wear ring A**
3	**Wear ring B**
4	**Lube-retainer B**
5	**Cylinder tube gasket**

Seal Kit/Part Nos.

Bore size [mm]	Part no.	Contents
6	CY3B6-Z-PS	① (2 pcs.), ② (4 pcs.), ③ (2 pcs.), ⑤ (2 pcs.)
10	CY3B10-Z-PS	① (1 pc.), ③ (2 pcs.), ④ (2 pcs.), ⑤ (2 pcs.)
15	CY3B15-Z-PS	① (1 pc.), ② (4 pcs.), ③ (2 pcs.), ④ (2 pcs.)
20	CY3B20-Z-PS	① (1 pc.), ② (2 pcs.), ③ (2 pcs.), ④ (2 pcs.)
25	CY3B25-Z-PS	
32	CY3B32-Z-PS	
40	CY3B40-Z-PS	

∗ As sizes ø50 and ø63 cannot be disassembled, the seal kit cannot be replaced.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part number: GR-S-010
∗ For replacement of the ø10 wear ring A, please contact SMC.

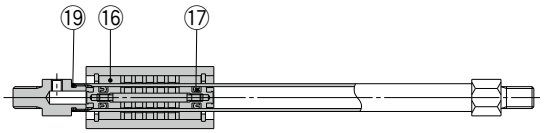
CY3B Series

ø6, ø10, ø15, ø20, ø25
ø32, ø40, ø50, ø63

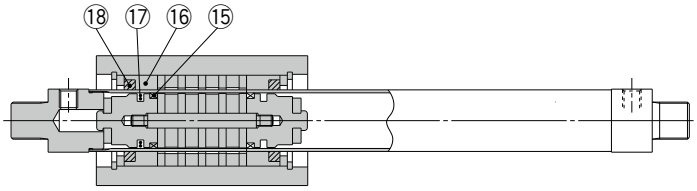
The Replacement Procedure is on p. 416

Construction

Basic type
CY3B6

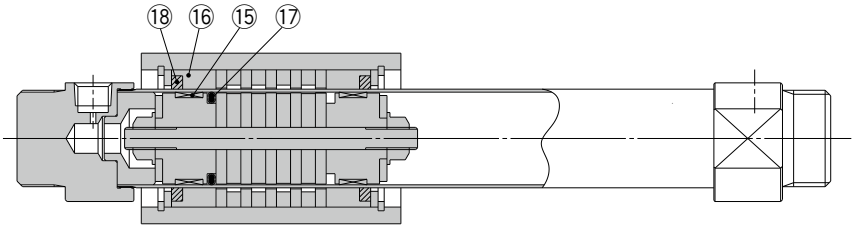


CY3B10, 15

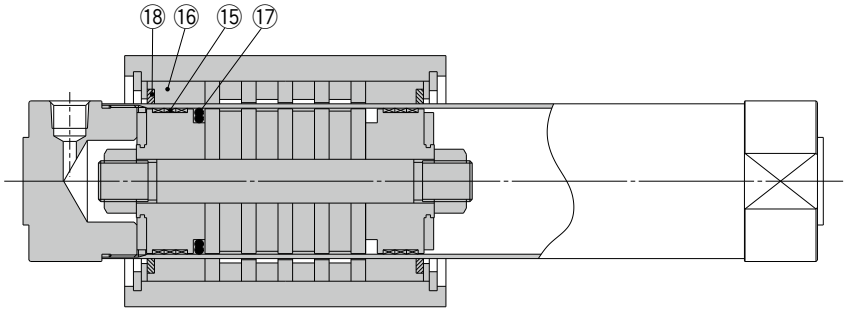


∗ The above drawing is ø15. (3 magnets are used in ø10.)

CY3B20 to 40



CY3B50, 63



∗ The numbers correspond with those in the "Construction" of the CY3B series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑮	**Wear ring A**	Special resin	
⑯	**Wear ring B**	Special resin	
⑰	**Piston seal**	NBR	
⑱	**Lube-retainer**	Special resin	
⑲	**Cylinder tube gasket**	NBR	

∗ The seal kit includes a grease pack (ø6, ø10: 5 and 10 g, ø15 to ø63: 10 g). Order with one of the following part numbers when only the grease pack is required.
Grease pack part no. for ø6, ø10: GR-F-005 (5 g) for external sliding sections
GR-S-010 (10 g) for tubing interior
Grease pack part no. for ø15 to ø63: GR-S-010 (10 g)

Replacement Parts/Seal Kit

Bore size (mm)	Part no.	Contents
6	CY3B6-PS	Set of nos. ⑯, ⑰, ⑲
10	CY3B10-PS	Set of nos. ⑯, ⑰, ⑱, ⑲
15	CY3B15-PS	Set of nos. ⑮, ⑯, ⑰, ⑱
20	CY3B20-PS	
25	CY3B25-PS	
32	CY3B32-PS	
40	CY3B40-PS	
50	CY3B50-PS	
63	CY3B63-PS	

Note 1) Seal kits are sets consisting of numbers ⑮ through ⑲. Order the seal kit based on each bore size.
Note 2) Adhesive glue is applied to the thread fixed section of the head cover and cylinder tube. Contact SMC if the head cover removal is difficult.
Note 3) For wear ring A, ø10, please consult with SMC.

CY3R Series

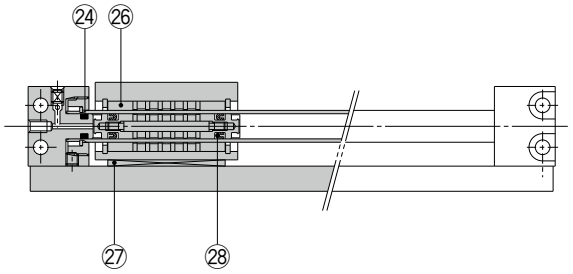
ø6, ø10, ø15, ø20
ø25, ø32, ø40, ø50
ø63

The Replacement Procedure is on p. 416-4

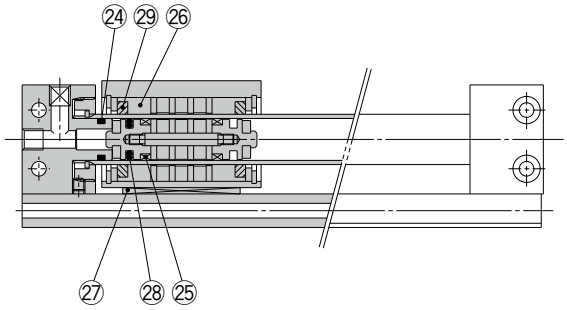
Construction

Both sides piping type

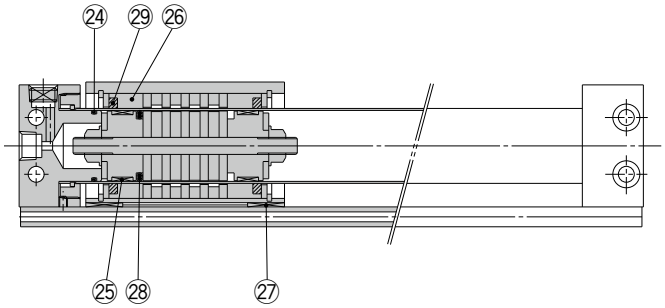
CY3R6



CY3R10



CY3R15 to 63



∗ The numbers correspond with those in the "Construction" of the CY3R series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉔	**Cylinder tube gasket**	NBR	**For the both sides piping type, ㉚ is not included in the seal kit.**
㉕	**Wear ring A**	Special resin	
㉖	**Wear ring B**	Special resin	
㉗	**Wear ring C**	Special resin	
㉘	**Piston seal**	NBR	
㉙	**Lube-retainer**	Special resin	
㉚	**Switch rail gasket**	NBR	

∗ The seal kit includes a grease pack (ø6, ø10: 5 and 10 g, ø15 to ø63: 10 g). Order with one of the following part numbers when only the grease pack is required.
Grease pack part no. for ø6, ø10: GR-F-005 (5 g) for external sliding sections
GR-S-010 (10 g) for tubing interior
Grease pack part no. for ø15 to ø63: GR-S-010 (10 g)

Replacement Parts/Seal Kit

Bore size (mm)	Part no.	Contents
6	CY3R6-PS	Set of nos. ㉔, ㉖, ㉗, ㉘
10	CY3R10-PS	Set of nos. ㉔, ㉖, ㉗, ㉘, ㉙, ㉚
15	CY3R15-PS	Set of nos. ㉔, ㉕, ㉖, ㉗, ㉘, ㉙, ㉚
20	CY3R20-PS	
25	CY3R25-PS	
32	CY3R32-PS	
40	CY3R40-PS	
50	CY3R50-PS	
63	CY3R63-PS	

Note 1) Seal kits are the same for both the both sides piping type and the centralized piping type.
Note 2) Seal kits are sets consisting of numbers ㉔ through ㉚. Order the seal kit based on each bore size.
Note 3) For wear ring A, ø10, please consult with SMC.

CY3R Series

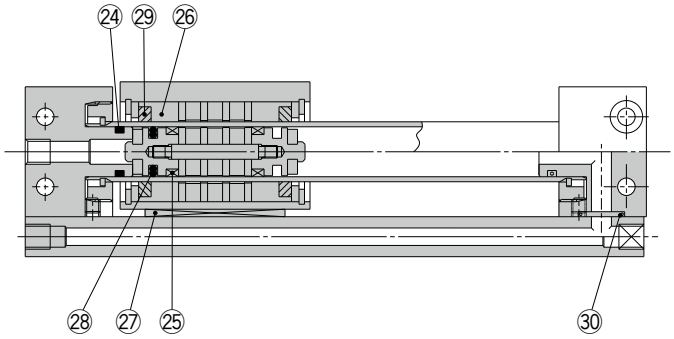
ø6, ø10, ø15, ø20
ø25, ø32, ø40, ø50
ø63

The Replacement Procedure is on p. 416-4

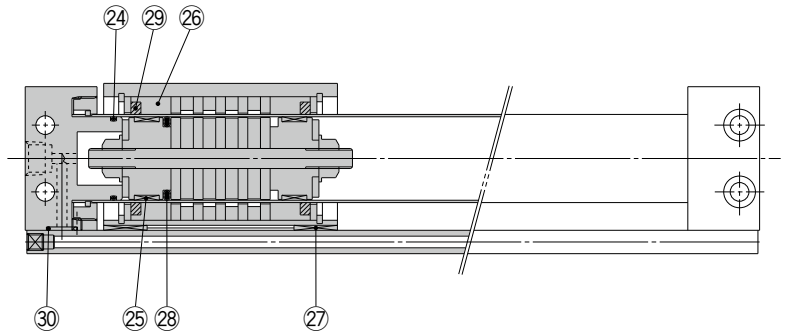
Construction

Centralized piping type

CY3RG10



CY3RG15 to 63



∗ The numbers correspond with those in the "Construction" of the CY3R series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉔	**Cylinder tube gasket**	NBR	**For the both sides piping type, ㉚ is not included in the seal kit.**
㉕	**Wear ring A**	Special resin	
㉖	**Wear ring B**	Special resin	
㉗	**Wear ring C**	Special resin	
㉘	**Piston seal**	NBR	
㉙	**Lube-retainer**	Special resin	
㉚	**Switch rail gasket**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	CY3R10-PS	Set of nos. ㉔, ㉖, ㉗, ㉘, ㉙, ㉚
15	CY3R15-PS	Set of nos. ㉔, ㉕, ㉖, ㉗, ㉘, ㉙, ㉚
20	CY3R20-PS	
25	CY3R25-PS	
32	CY3R32-PS	
40	CY3R40-PS	
50	CY3R50-PS	
63	CY3R63-PS	

Note 1) Seal kits are the same for both the both sides piping type and the centralized piping type.
Note 2) Seal kits are sets consisting of numbers ㉔ through ㉚. Order the seal kit based on each bore size.
Note 3) For wear ring A, ø10, please consult with SMC.
∗ The seal kit includes a grease pack (ø10: 5 and 10 g, ø15 to ø63: 10 g). Order with one of the following part numbers when only the grease pack is required.
Grease pack part no. for ø10: GR-F-005 (5 g) for external sliding sections
GR-S-010 (10 g) for tubing interior
Grease pack part no. for ø15 to ø63: GR-S-010 (10 g)

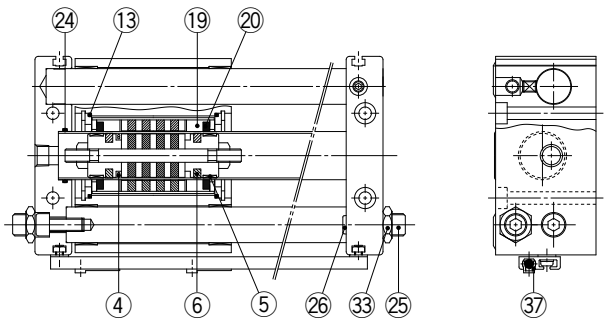
CY1S-Z Series

ø6, ø10, ø15
ø20, ø25
ø32, ø40

The Replacement Procedure is on p. 418

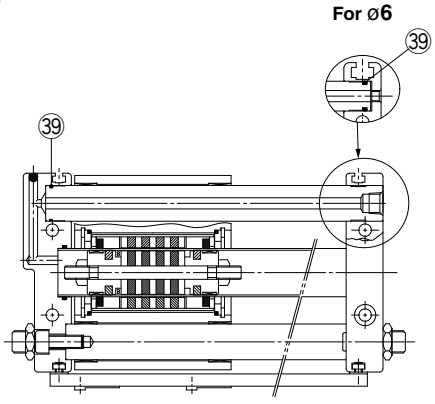
Construction

CY1S: Bilateral piping type



With bumper bolt

CY1SG: Centralized piping type



With bumper bolt

∗ The numbers correspond with those in the "Construction" of the CY1S-Z series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
④	**Piston seal**	NBR	
⑤	**Wear ring A**	Special resin	
⑥	**Lube-retainer A**	Special resin	
⑬	**Slider gasket**	NBR	
⑲	**Wear ring B**	Special resin	
⑳	**Lube-retainer B**	Special resin	

No.	Description	Material	Note
㉔	**Cylinder tube gasket**	NBR	
㉕	**Bumper bolt**	Chromium molybdenum steel	
㉖	**Bumper**	Urethane rubber	
㉝	**Hexagon nut**	Chromium molybdenum steel	
㊲	**Switch spacer**	Special resin	
㊴	**Guide shaft gasket**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Seal kit		Bumper bolt assembly		Switch spacer	
	Part no.	Contents	Part no.	Contents	Part no.	Contents
6	CY1S6-Z-PS	Set of nos. ④, ⑤, ⑬, ⑲, ㉔, ㊴	CYS06-37-AJ024-R	Set of nos. ㉕, ㉖, ㉝	BMY3-016	No. ㊲
10	CY1S10-Z-PS	Set of nos. ④, ⑬, ⑲, ⑳, ㉔, ㊴	CYS10-37-AJ025-R			
15	CY1S15-Z-PS	Set of nos. ④, ⑤, ⑥, ⑬, ⑲ ⑳, ㉔, ㊴				
20	CY1S20-Z-PS		CYS20-37-AJ027-R			
25	CY1S25-Z-PS		CYS25-37-AJ028-R			
32	CY1S32-Z-PS		CYS32-37-AJ029-R			
40	CY1S40-Z-PS					

Note 1) The seal kit includes ④, ⑤, ⑬, ⑲, ㉔, ㊴ for ø6. ④, ⑬, ⑲, ⑳, ㉔, ㊴ for ø10. ④, ⑤, ⑥, ⑬, ⑲, ⑳, ㉔, ㊴ are for ø15 to ø40. Order the seal kit based on each bore size.

Note 2) The seal kit includes a grease pack (10 g). Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010

Note 3) A switch spacer, as specified in the table above will be required if an auto switch is mounted afterward.
When ordering an additional auto switch, also order an additional switch spacer.
Refer to "Auto Switch Mounting" for details.

CY1L Series

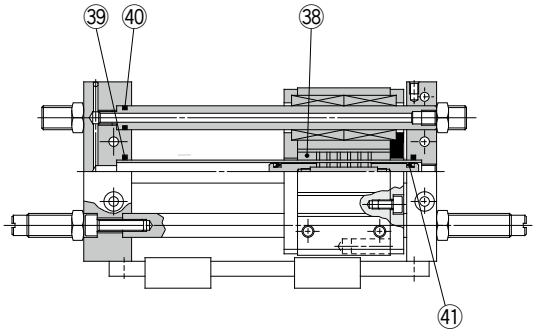
ø6, ø10, ø15, ø20
ø25, ø32, ø40

The Replacement Procedure is on p. 419

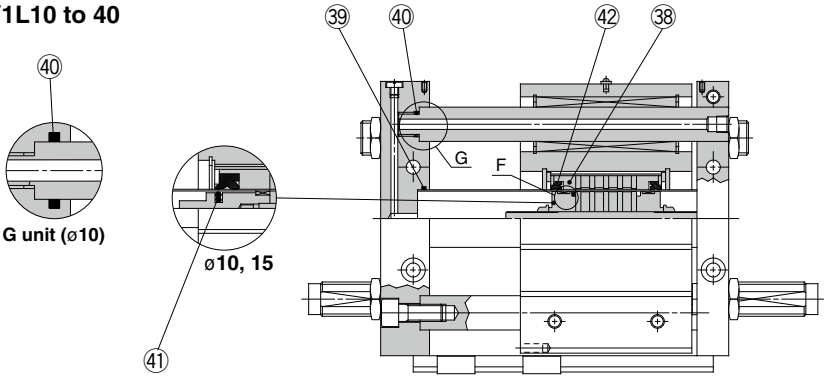
Construction

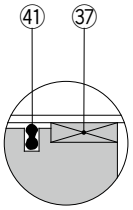
Slider type, ball bushing bearing

CY1L6



CY1L10 to 40





Enlarged view F

∗ The numbers correspond with those in the “Construction” of the CY1L series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㊲	**Wear ring A**	Special resin	
㊳	**Wear ring B**	Special resin	
㊴	**Cylinder tube gasket**	NBR	
㊵	**Guide shaft gasket**	NBR	
㊶	**Piston seal**	NBR	
㊷	**Scraper**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
6	CY1S6-PS-N	Set of nos. ㊳, ㊴, ㊵, ㊶
10	CY1L10-PS-N	Set of nos. ㊳, ㊴, ㊵, ㊶, ㊷
15	CY1L15-PS-N	Set of nos. ㊲, ㊳, ㊴, ㊵, ㊶, ㊷
20	CY1L20-PS-N	
25	CY1L25-PS-N	
32	CY1L32-PS-N	
40	CY1L40-PS-N	

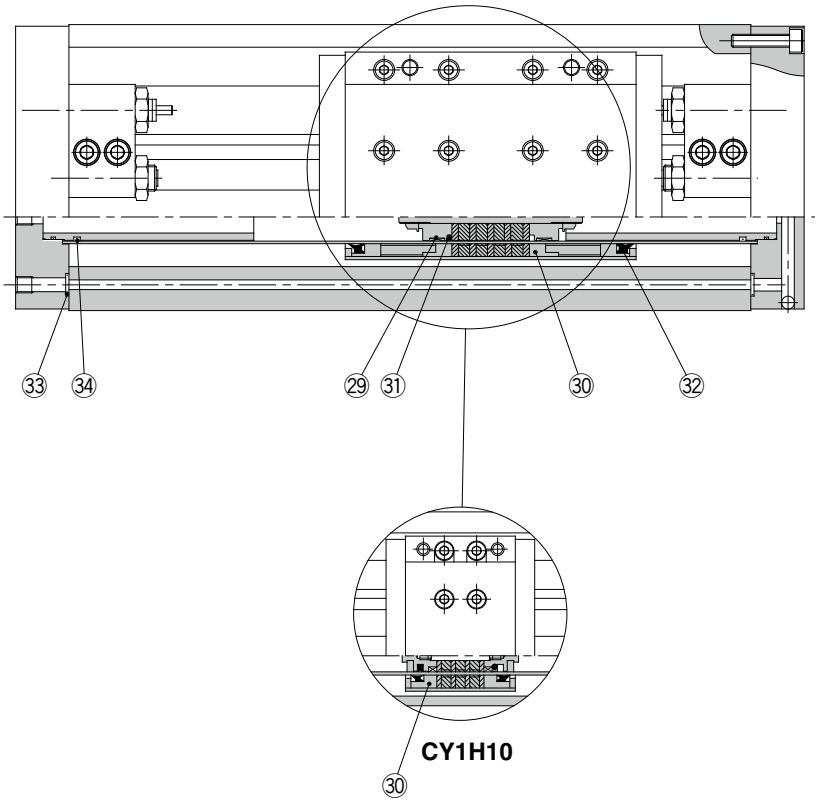
Note 1) The seal kit includes ㊳ to ㊶ for ø6. ㊳ to ㊷ are for ø10. ㊲ to ㊷ are for ø15 to ø40. Order the seal kit based on each bore size.
Note 2) ø6 are the same as for CY1S6.
Note 3) For wear ring A, ø10, please consult with SMC.
∗ The seal kit includes a grease pack (ø6, ø10: 5 and 10 g, ø15 to ø40: 10 g). Order with one of the following part numbers when only the grease pack is required.
Grease pack part no. for ø6, ø10: GR-F-005 (5 g) for external sliding parts,
GR-S-010 (10 g) for tube interior
Grease pack part no. for ø15 to ø40: GR-S-010 (10 g)

CY1H Series

Single Axis Type: ø10, ø15, ø20, ø25

Construction

Single axis type



∗ The numbers correspond with those in the "Construction" of the CY1H series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉙	**Wear ring A**	Special resin	
㉚	**Wear ring B**	Special resin	
㉛	**Piston seal**	NBR	
㉜	**Scraper**	NBR	
㉝	**O-ring**	NBR	
㉞	**O-ring**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	CY1H10-PS	Set of nos. ㉚, ㉛, ㉜, ㉝, ㉞
15	CY1H15-PS	Set of nos. ㉙, ㉚, ㉛, ㉜, ㉝, ㉞
20	CY1H20-PS	
25	CY1H25-PS	

Note 1) The seal kit includes ㉚ to ㉞ for ø10. ㉙ to ㉞ are for ø15 to ø25. Order the seal kit based on each bore size.

Note 2) For wear ring A, ø10, please consult with SMC.

∗ The seal kit includes a grease pack (ø10: 5 and 10 g, ø15 to ø25: 10 g). Order with one of the following part numbers when only the grease pack is required.

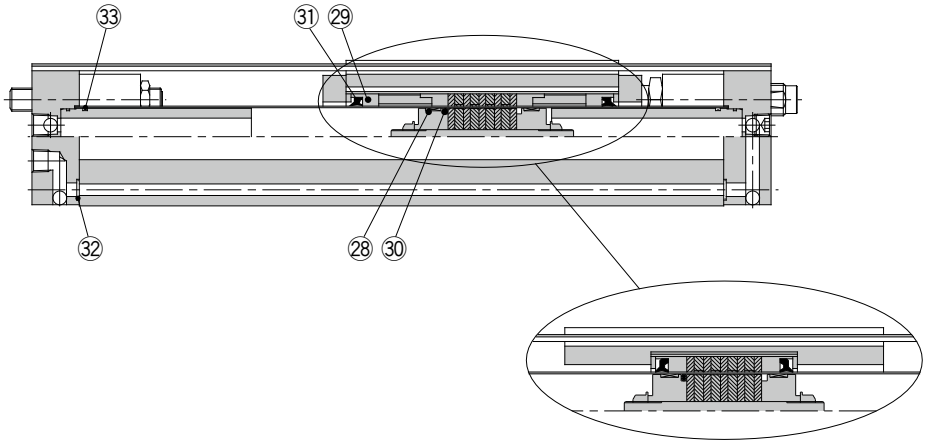
Grease pack part no. for ø10: GR-F-005 (5 g) for external sliding parts, **GR-S-010** (10 g) for tube interior

Grease pack part no. for ø15 to ø25: GR-S-010 (10 g)

CY1H Series Double Axis Type: ø25, ø32

Construction

Double axes type



CY1HT32

∗ The numbers correspond with those in the "Construction" of the CY1H series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Material
㉘	**Wear ring A**	Special resin	
㉙	**Wear ring B**	Special resin	
㉚	**Piston seal**	NBR	
㉛	**Scraper**	NBR	
㉜	**O-ring**	NBR	
㉝	**O-ring**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
25	CY1HT25-PS	Set of nos. ㉘, ㉙, ㉚, ㉛, ㉜, ㉝
32	CY1HT32-PS	

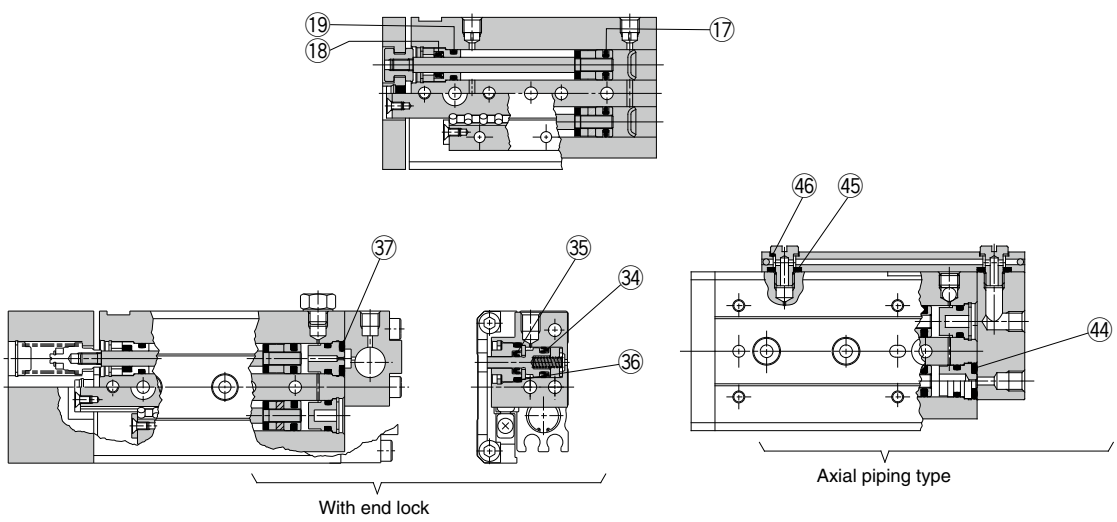
Note 1) The seal kit includes ㉘ to ㉝. Order the seal kit based on each bore size.

∗ The seal kit includes a grease pack (10 g). Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

MXS Series ø6, ø8, ø12, ø16 ø20, ø25

The Replacement Procedure is on p. 420

Construction



∗ The numbers correspond with those in the "Construction" of the MXS series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑰	**Piston seal**	NBR	
⑱	**Rod seal**		
⑲	**O-ring**		

With end lock

㊳	**Piston seal**	NBR	
㊴	**Rod seal**		
㊵	**O-ring**		
㊲	**O-ring**		

Axial piping type

㊹	**O-ring**	NBR	
㊺	**O-ring**	NBR	
㊻	**Gasket**	NBR, Stainless steel	

∗ The seal kit includes 1 set of numbered seals in the table on the right. Order the appropriate seal kit depending on the cylinder bore size.

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
6	MXS6-PS	Set of nos. ⑰, ⑱, ⑲
8	MXS8-PS	
12	MXS12-PS	
16	MXS16-PS	
20	MXS20-PS	
25	MXS25-PS	

Replacement Parts: Seal Kit for with End Lock

Bore size (mm)	Part no.	Contents
8	MXS8R-PS	Set of nos. ⑰, ⑱, ⑲, ㊳, ㊴, ㊵, ㊲
12	MXS12R-PS	
16	MXS16R-PS	
20	MXS20R-PS	
25	MXS25R-PS	

Replacement Parts: Seal Kit for Axial Piping Type

Bore size (mm)	Part no.	Contents
6	MXS6P-PS	Set of nos. ⑰, ⑱, ⑲, ㊹, ㊺, ㊻
8	MXS8P-PS	
12	MXS12P-PS	
16	MXS16P-PS	
20	MXS20P-PS	
25	MXS25P-PS	

Replacement Parts: Grease Pack

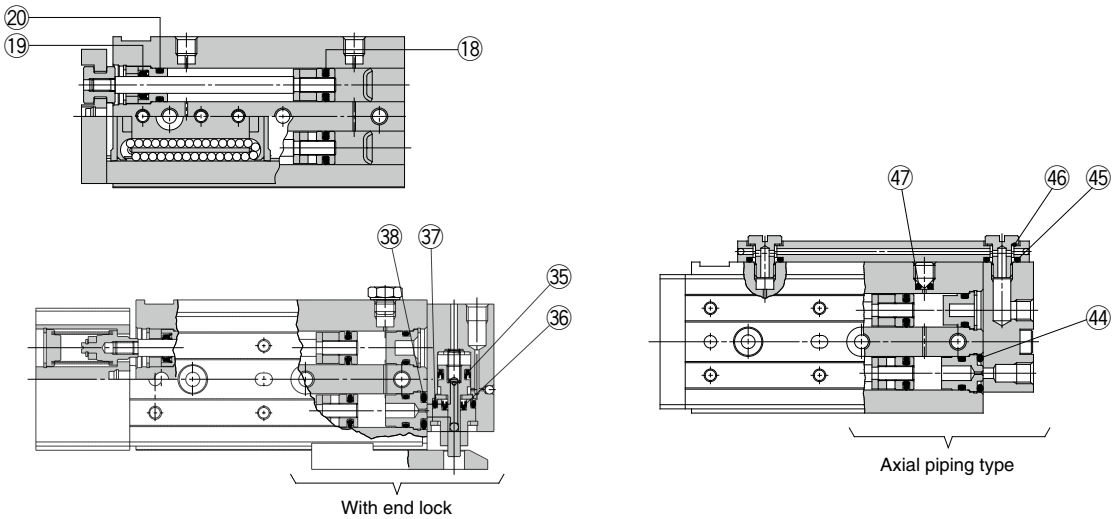
Applied unit	Grease pack part no.
Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)
Cylinder unit	GR-L-005 (5 g) GR-L-010 (10 g)

MXQ Series

ø6, ø8, ø12, ø16
ø20, ø25

The Replacement Procedure is on p. 420

Construction



∗ The numbers correspond with those in the “Construction” of the MXQ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑱	**Piston seal**	NBR	
⑲	**Rod seal**		
⑳	**O-ring**		
With end lock			
㉟	**Piston seal**	NBR	
㊱	**Rod seal**		
㊲	**O-ring**		
㊳	**O-ring**		
Axial piping type			
㊹	**O-ring**	NBR	
㊺	**O-ring**	NBR	
㊻	**Gasket**	NBR, Stainless steel	
㊼	**O-ring**	NBR	

∗ The seal kit includes these seals to provide as a set. Order the seal kit based on each bore size.

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
6	MXQ6-PS	Set of nos. ⑱, ⑲, ⑳
8	MXQ8-PS	
12	MXQ12-PS	
16	MXQ16-PS	
20	MXQ20-PS	
25	MXQ25-PS	

Replacement Parts: Seal Kit for with End Lock

Bore size (mm)	Part no.	Contents
8	MXQ8R-PS	Set of nos. ⑱, ⑲, ⑳, ㉟, ㊱, ㊲, ㊳
12	MXQ12R-PS	
16	MXQ16R-PS	
20	MXQ20R-PS	
25	MXQ25R-PS	

Replacement Parts: Seal Kit for Axial Piping Type

Bore size (mm)	Part no.	Contents
6	MXQ6P-PS	Set of nos. ⑱, ⑲, ⑳, ㊹, ㊺, ㊻, ㊼
8	MXQ8P-PS	
12	MXQ12P-PS	
16	MXQ16P-PS	Set of nos. ⑱, ⑲, ⑳, ㊹, ㊺, ㊻
20	MXQ20P-PS	
25	MXQ25P-PS	

Replacement Parts: Grease Pack

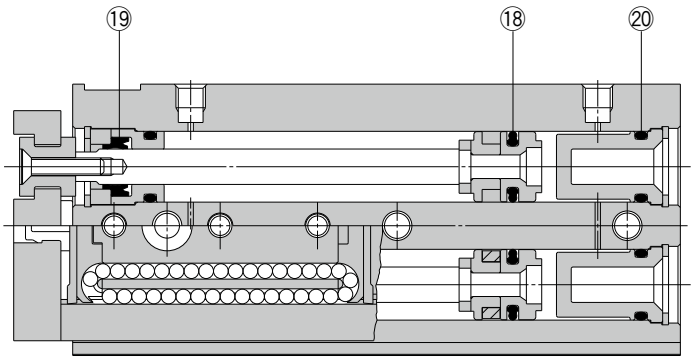
Applied section	Grease pack part no.
Guide	GR-S-010 (10 g) GR-S-020 (20 g)
Cylinder	GR-L-005 (5 g) GR-L-010 (10 g)

MXQR Series

ø6, ø8, ø12
ø16, ø20, ø25

The Replacement Procedure is on p. 420

Construction



∗ The numbers correspond with those in the “Construction” of the MXQR series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑱	**Piston seal**	NBR	
⑲	**Rod seal**		
⑳	**O-ring**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
6	MXQ6-PS	Set of nos. ⑱, ⑲, ⑳
8	MXQ8-PS	
12	MXQ12-PS	
16	MXQ16-PS	
20	MXQ20-PS	
25	MXQ25-PS	

∗ The seal kit includes these seals to provide as a set. Order the seal kit based on each bore size.

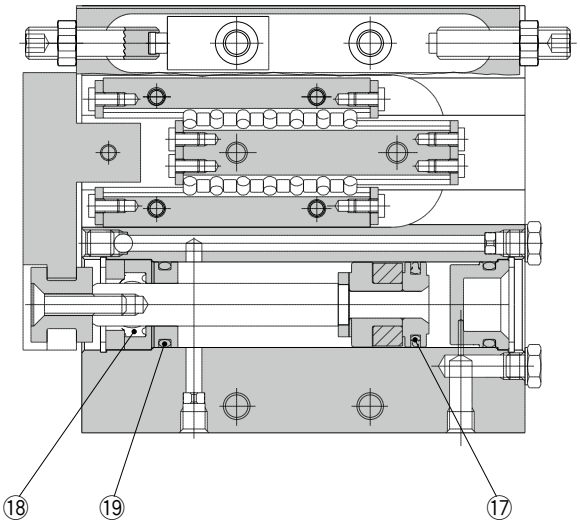
Replacement Parts: Grease Pack

Applied part	Grease pack part no.
Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)
Cylinder unit	GR-L-005 (5 g) GR-L-010 (10 g)

MXF Series ø8, ø12, ø16, ø20

The Replacement Procedure is on p. 425

Construction



∗ The numbers correspond with those in the “Construction” of the MXF series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑰	**Piston seal**	NBR	
⑱	**Rod seal**		
⑲	**O-ring**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
8	MXF8-PS	Set of nos. ⑰, ⑱, ⑲
12	MXF12-PS	
16	MXF16-PS	
20	MXF20-PS	

∗ The seal kit includes ⑰, ⑱, ⑲. Order the seal kit based on each bore size.

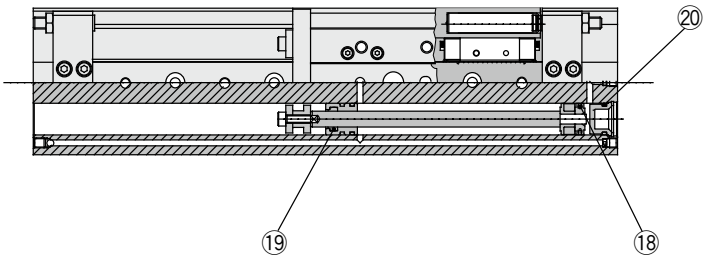
Replacement Parts: Grease Pack

Applied part	Grease pack part no.
Guide	GR-S-010 (10 g) GR-S-020 (20 g)
Cylinder	GR-L-005 (5 g) GR-L-010 (10 g)

MXW Series ø8, ø12, ø16 ø20, ø25

The Replacement Procedure is on p. 427

Construction



∗ The numbers correspond with those in the "Construction" of the MXW series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑱	**Piston seal**	NBR	
⑲	**Rod seal**		
⑳	**O-ring**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
8	MXW8-PS	Set of nos. ⑱, ⑲, ⑳
12	MXW12-PS	
16	MXW16-PS	
20	MXW20-PS	
25	MXW25-PS	

∗ The seal kit includes ⑱, ⑲, ⑳. Order the seal kit based on each bore size.

Replacement Parts: Grease Pack

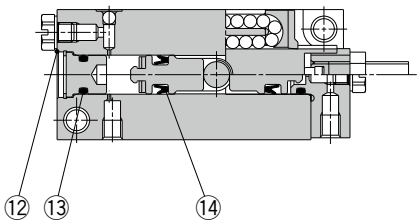
Applied part	Grease pack part no.
Guide	GR-S-010 (10 g) GR-S-020 (20 g)
Cylinder	GR-L-005 (5 g) GR-L-010 (10 g)

MXP Series ø6

The Replacement Procedure is on p. 430

Construction

MXP6



∗ The numbers correspond with those in the “Construction” of the MXP series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑫	**Gasket (for plug)**	PVC	
⑬	**O-ring**	NBR	
⑭	**Piston seal**		

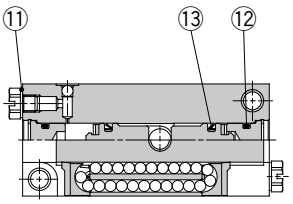
Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
6	MXP6-PS	A set of two of ⑫, ⑬ and ⑭ each

Replacement Parts: Grease Pack

Applied unit	Grease pack part no.
Guide unit	GR-S-010 (10 g)
	GR-S-020 (20 g)
Cylinder unit	GR-L-005 (5 g)
	GR-L-010 (10 g)

MXPJ6



∗ The numbers correspond with those in the “Construction” of the MXP series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑪	**Gasket (for plug)**	PVC	
⑫	**O-ring**	NBR	
⑬	**Piston seal**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
6	MXPJ6-PS	2 pieces of nos. ⑪, ⑫ and ⑬

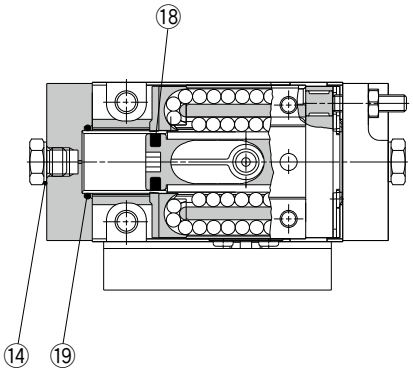
Replacement Parts: Grease Pack

Applied unit	Grease pack part no.
Guide unit	GR-S-010 (10 g)
	GR-S-020 (20 g)
Cylinder unit	GR-L-005 (5 g)
	GR-L-010 (10 g)

MXP Series ø8, ø10, ø12, ø16

The Replacement Procedure is on p. 430

Construction



∗ The numbers correspond with those in the “Construction” of the MXP series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑭	**Gasket (for plug)**	NBR, stainless steel	
⑱	**Piston seal**	NBR	
⑲	**O-ring**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
8	MXP8-PS	A set of two of ⑭, ⑱ and ⑲ each
10	MXP10-PS	
12	MXP12-PS	
16	MXP16-PS	

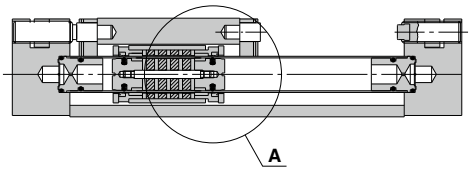
Replacement Parts: Grease Pack

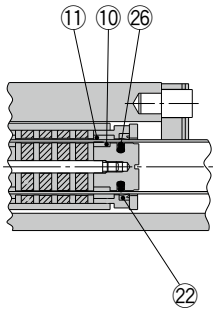
Applied unit	Grease pack part no.
Guide unit	GR-S-010 (10 g)
	GR-S-020 (20 g)
Cylinder unit	GR-L-005 (5 g)
	GR-L-010 (10 g)

MXY Series ø6, ø8, ø12

The Replacement Procedure is on p. 433

Construction





Detail drawing of part A

∗ The numbers correspond with those in the “Construction” of the MXY series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑩	**Wear ring A**	Resin	
⑪	**Wear ring B**	Resin	
㉒	**Cylinder scraper**	NBR	
㉖	**Piston seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
6	MXY6-PS	A set of two of ⑩, ⑪, ㉒ and ㉖ each
8	MXY8-PS	
12	MXY12-PS	

∗ As for MXY12, only one piston seal ㉖ is included.

Replacement Parts: Grease Pack

Grease pack part no.
GR-S-010 (10 g)
GR-S-020 (20 g)

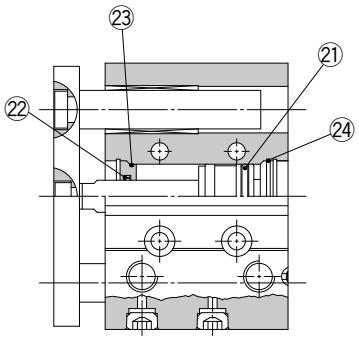
MGP-□Z Series

ø12, ø16, ø20, ø25
ø32, ø40, ø50
ø63, ø80, ø100

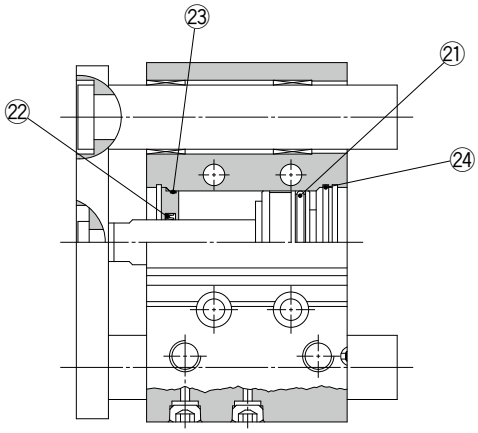
The Replacement Procedure is on p. 437

Construction: MGPM, MGPL, MGPA Series

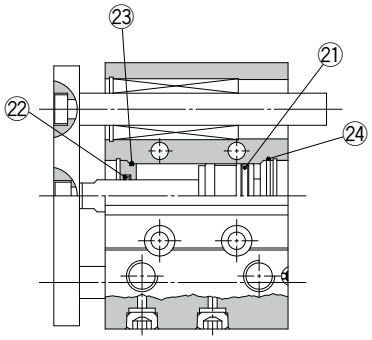
MGPM12 to 25



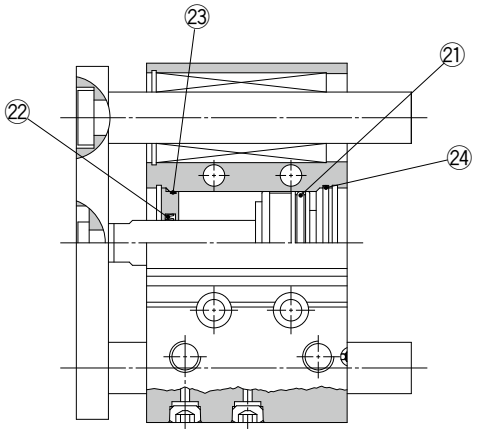
MGPM32 to 100



MGPL12 to 25
MGPA12 to 25



MGPL32 to 100
MGPA32 to 100



∗ The numbers correspond with those in the "Construction" of the MGP-Z series in the **Web Catalog**.
∗ Refer to page 241 for replacement parts/seal kit and grease pack part numbers of Made-to-Order common specifications (-XB□, -XC□).

Seal Kit List

No.	Description	Material	Note
㉑	**Piston seal**	NBR	
㉒	**Rod seal**		
㉓	**Gasket A**		
㉔	**Gasket B**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
12	MGP12-Z-PS	Set of nos. ㉑, ㉒, ㉓, ㉔
16	MGP16-Z-PS	
20	MGP20-Z-PS	
25	MGP25-Z-PS	
32	MGP32-Z-PS	

Bore size (mm)	Part no.	Contents
40	MGP40-Z-PS	Set of nos. ㉑, ㉒, ㉓, ㉔
50	MGP50-Z-PS	
63	MGP63-Z-PS	
80	MGP80-Z-PS	
100	MGP100-Z-PS	

∗ The seal kit includes ㉑ to ㉔. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

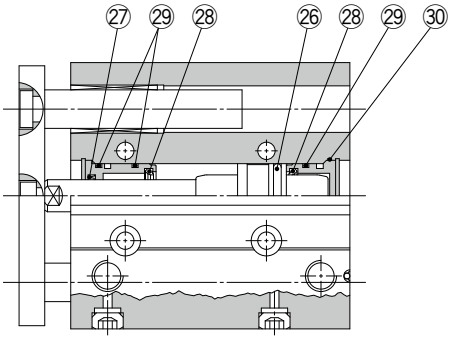
MGP-□AZ Series

ø16, ø20, ø25
ø32, ø40, ø50
ø63, ø80, ø100

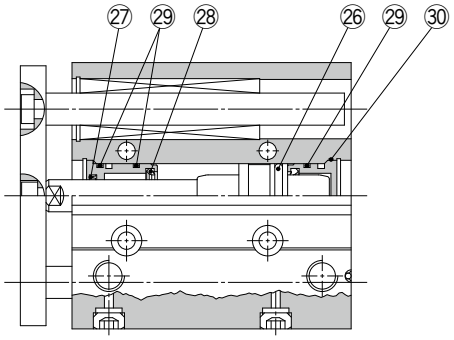
The Replacement Procedure is on p. 437

Construction: MGPM-A, MGPL-A, MGPA-A Series

MGPM



MGPL
MGPA



∗ The numbers correspond with those in the "Construction" of the MGP-AZ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉖	**Piston seal**	NBR	
㉗	**Rod seal**	NBR	
㉘	**Cushion seal**	Urethane	
㉙	**Gasket A**	NBR	
㉚	**Gasket B**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
16	MGP16-AZ-PS	Set of nos. ㉖, ㉗, ㉘, ㉙, ㉚
20	MGP20-AZ-PS	
25	MGP25-AZ-PS	
32	MGP32-AZ-PS	
40	MGP40-AZ-PS	

Bore size (mm)	Part no.	Contents
50	MGP50-AZ-PS	Set of nos. ㉖, ㉗, ㉘, ㉙, ㉚
63	MGP63-AZ-PS	
80	MGP80-AZ-PS	
100	MGP100-AZ-PS	

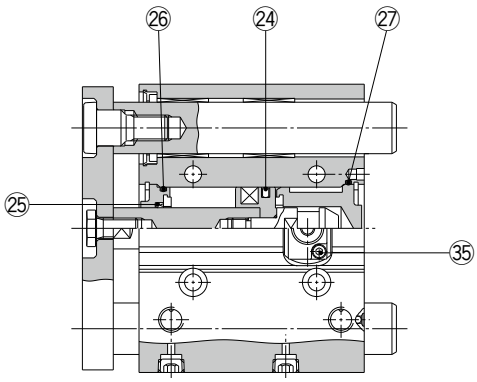
∗ The seal kit includes ㉖ to ㉚. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

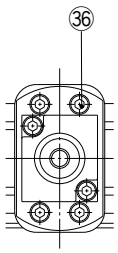
MGP Series

ø20, ø25, ø32, ø40
ø50, ø63, ø80, ø100

The Replacement Procedure is on p. 437

Construction

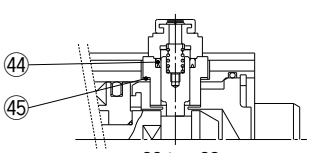




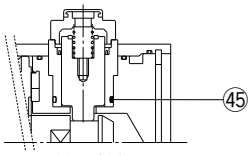
ø50, ø63

Non-locking type

(Head end lock)



ø20 to ø63



ø80, ø100

∗ The numbers correspond with those in the "Construction" of the MGP series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉔	**Piston seal**	NBR	
㉕	**Rod seal**	NBR	
㉖	**Gasket A**	NBR	
㉗	**Gasket B**	NBR	
㉟	Hexagon socket head cap screw	Carbon steel	
㊱	Hexagon socket head cap screw	Carbon steel	
㊹	**Lock piston seal**	NBR	
㊺	**Lock holder gasket**	NBR	

Replacement Parts: Seal Kit

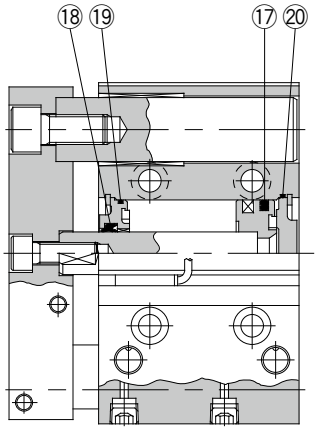
Bore size (mm)	Part no.	Contents
20	MGP20-B-PS	Set of nos. ㉔, ㉕, ㉖, ㉗, ㉟, ㊹, ㊺
25	MGP25-B-PS	
32	MGP32-B-PS	
40	MGP40-B-PS	
50	MGP50-B-PS	Set of nos. ㉔, ㉕, ㉖, ㉗, ㉟, ㊱, ㊹, ㊺
63	MGP63-B-PS	
80	MGP80-B-PS	Set of nos. ㉔, ㉕, ㉖, ㉗, ㉟, ㊹, ㊺
100	MGP100-B-PS	

∗ Each seal kit includes the parts listed above. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

MGPS Series ø50, ø80

The Replacement Procedure is on p. 437

Construction



∗ The numbers correspond with those in the "Construction" of the MGPS series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑰	**Piston seal**	NBR	
⑱	**Rod seal**		
⑲	**Gasket A**		
⑳	**Gasket B**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
50	MGP50-PS	Set of nos. ⑰, ⑱, ⑲, ⑳
80	MGP80-PS	

∗ The seal kit includes ⑰ to ⑳. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

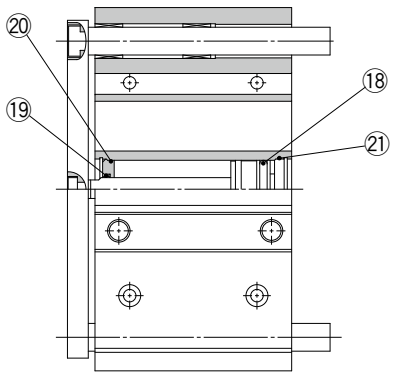
MGPW Series

ø20, ø25, ø32
ø40, ø50, ø63

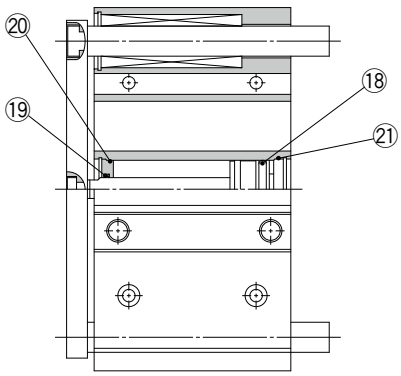
The Replacement Procedure is on p. 437

Construction: MGPWM, MGPWL, MGPWA Series

MGPWM20 to 63



MGPWL20 to 63
MGPWA20 to 63



∗ The numbers correspond with those in the "Construction" of the MGPW series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑱	**Piston seal**	NBR	
⑲	**Rod seal**		
⑳	**Gasket A**		
㉑	**Gasket B**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	MGP20-Z-PS	Set of nos. ⑱, ⑲, ⑳, ㉑
25	MGP25-Z-PS	
32	MGP32-Z-PS	

Bore size (mm)	Part no.	Contents
40	MGP40-Z-PS	Set of nos. ⑱, ⑲, ⑳, ㉑
50	MGP50-Z-PS	
63	MGP63-Z-PS	

∗ The seal kit includes ⑱ to ㉑. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

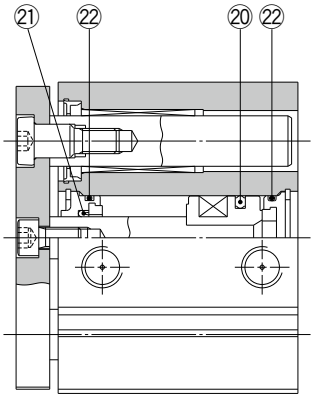
MGQ Series

ø12, ø16, ø20, ø25
ø32, ø40, ø50, ø63
ø80, ø100

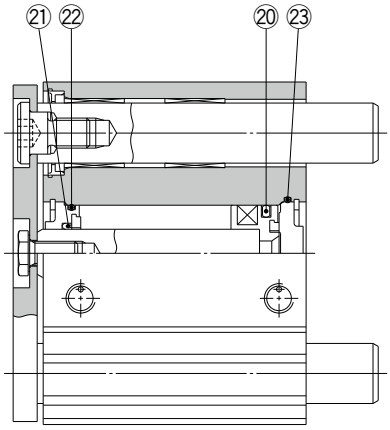
The Replacement Procedure is on p. 437

Construction

MGQM12 to 25



MGQM32 to 100



∗ The numbers correspond with those in the “Construction” of the MGQ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑳	**Piston seal**	NBR	
㉑	**Rod seal**		
㉒	**Gasket A**		
㉓	**Gasket B**		

Replacement Parts: Seal Kit

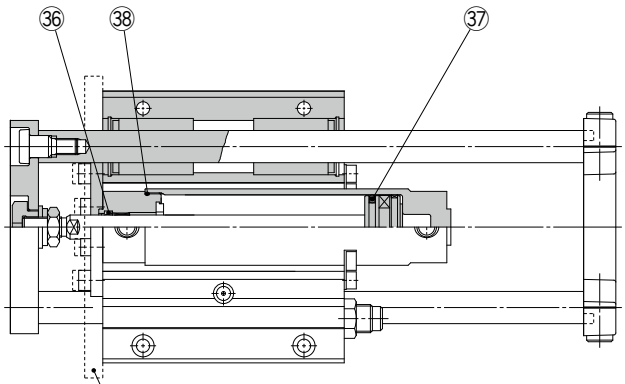
Bore size (mm)	Part no.	Description
12	MGQ12-PS	Set of nos. ⑳, ㉑, ㉒, ㉓
16	MGQ16-PS	
20	MGQ20-PS	
25	MGQ25-PS	
32	MGQ32-PS	
40	MGQ40-PS	
50	MGQ50-PS	
63	MGQ63-PS	
80	MGQ80-PS	
100	MGQ100-PS	

∗ The seal kit includes ⑳ to ㉓. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

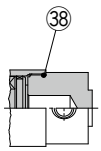
MGG Series ø20, ø25, ø32, ø40, ø50

Construction

ø20 to ø50/MGG□□



Ball bushing



Long stroke

∗ The numbers correspond with those in the "Construction" of the MGG series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㊱	**Rod seal**	NBR	
㊲	**Piston seal**		
㊳	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CG1N20Z-PS	Set of nos. ㊱, ㊲, ㊳, and a grease pack
25	CG1N25Z-PS	
32	CG1N32Z-PS	
40	CG1N40Z-PS	

∗ The seal kit includes ㊱ to ㊳. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

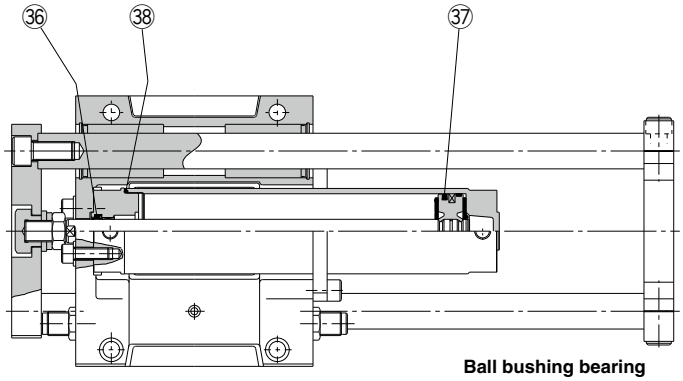
⚠Caution

When disassembling cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the tube cover or the rod cover with a vise and loosen the other side with a wrench or an adjustable angle wrench, and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position.
(Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. Please contact SMC when disassemble is required.)

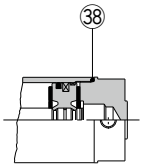
MGG Series ø63, ø80, ø100

Construction

ø63 to ø100/MGG□B

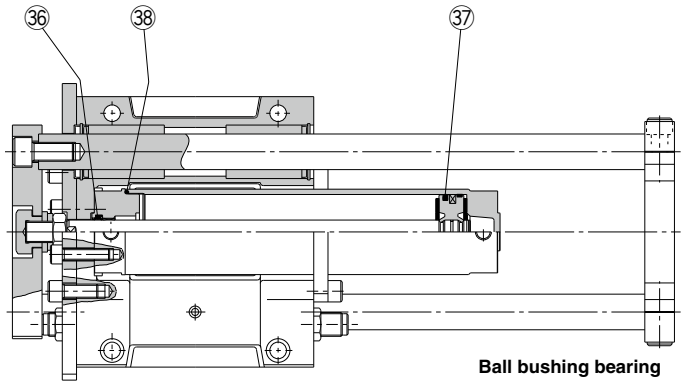


Ball bushing bearing

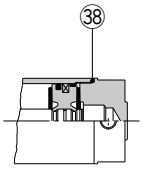


Long stroke

ø63 to ø100/MGG□F



Ball bushing bearing



Long stroke

∗ The numbers correspond with those in the “Construction” of the MGG series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
36	**Rod seal**	NBR	
37	**Piston seal**		
38	**Tube gasket**		

⚠ Caution

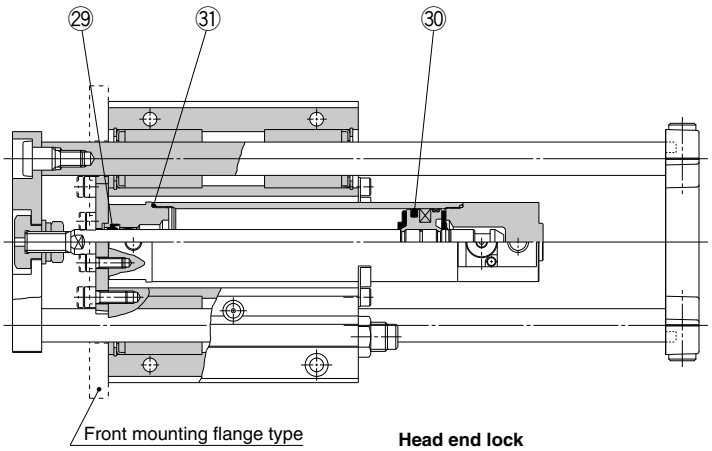
Basic cylinders with a bore size of ø50 cannot be disassembled. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. Please contact SMC when disassemble is required.)

MGG Series

ø20, ø25, ø32, ø40
ø50, ø63, ø80, ø100

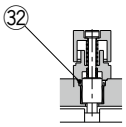
Construction

ø20 to ø100/MGG□□



Head end lock

Manual release (Lock type)



ø20 to ø63

∗ The numbers correspond with those in the "Construction" of the MGG series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉙	**Rod seal**	NBR	
㉚	**Piston seal**		
㉛	**Tube gasket**		
㉜	**Lock piston seal**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CBG1N20-PS	Set of nos. ㉙, ㉚, ㉛, ㉜
25	CBG1N25-PS	
32	CBG1N32-PS	
40	CBG1N40-PS	

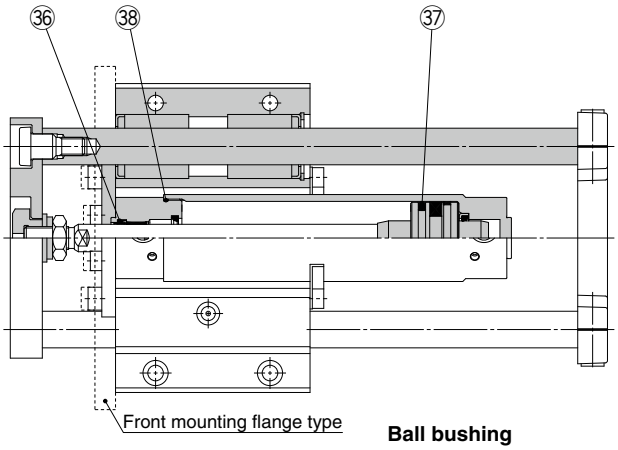
∗ The seal kit includes ㉙ to ㉜. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

⚠ Caution

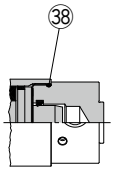
Basic cylinders with a bore size of ø50 cannot be disassembled. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. Please contact SMC when disassemble is required.)

MGC Series ø20, ø25, ø32, ø40, ø50

Construction: With Rear Plate



Ball bushing



Long stroke

∗ The numbers correspond with those in the “Construction” of the MGC series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㊱	**Rod seal**	NBR	
㊲	**Piston seal**		
㊳	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CG1N20Z-PS	Set of nos. ㊱, ㊲, ㊳, and a grease pack
25	CG1N25Z-PS	
32	CG1N32Z-PS	
40	CG1N40Z-PS	

∗ The seal kit includes ㊱ to ㊳. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (10 g). Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

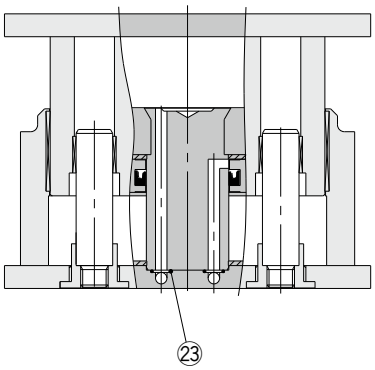
⚠ Caution

When disassembling base cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the tube cover or the rod cover with a vise and loosen the other side with a wrench or an adjustable angle wrench, and then remove the cover. When retightening,
tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. Please contact SMC when disassembly is required.)

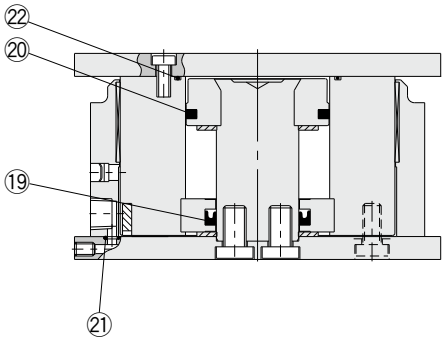
MGF Series ø40, ø63, ø100

The Replacement Procedure is on p. 441

Construction



When the cylinder is extended



When the cylinder is retracted

∗ The numbers correspond with those in the “Construction” of the MGF series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑲	**Rod seal**	NBR	
⑳	**Piston seal**		
㉑	**O-ring A**		
㉒	**O-ring B**		
㉓	**O-ring C**		

Replacement Parts: Seal Kit

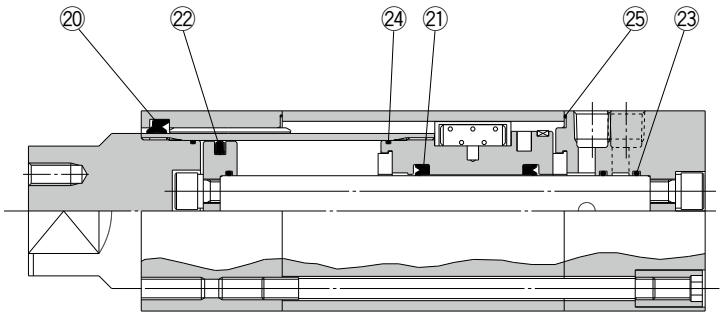
Bore size (mm)	Part no.	Contents
40	MGF40-PS	Set of nos. ⑲, ⑳, ㉑, ㉒, ㉓
63	MGF63-PS	
100	MGF100-PS	

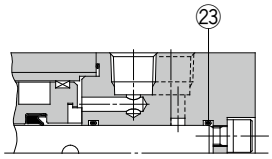
∗ The seal kit is not compatible with the clean series.
The seal kit includes ⑲ to ㉓. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-L-010 (10 g)

MGZ Series

ø20, ø25, ø32, ø40
ø50, ø63, ø80

Construction





ø20, ø25

∗ The numbers correspond with those in the "Construction" of the MGZ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑳	**Rod seal A**	NBR	**21, 22, 23 and 24 are non-replaceable parts, so they are not included in the seal kit.**
21	**Rod seal B**		
22	**Piston seal**		
23	**Piston gasket**		
24	**Tube rod gasket**		
㉕	**Cylinder tube gasket**		

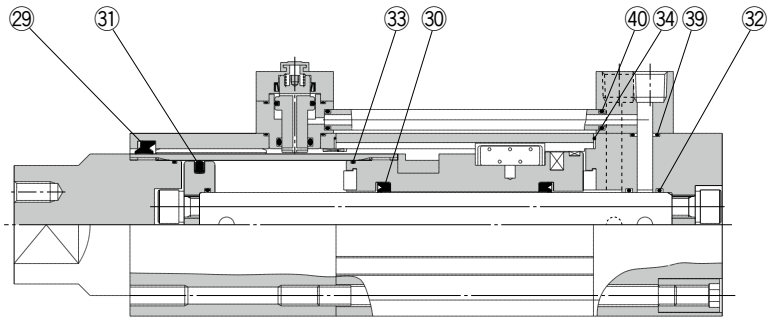
Replacement Parts: Seal Kit

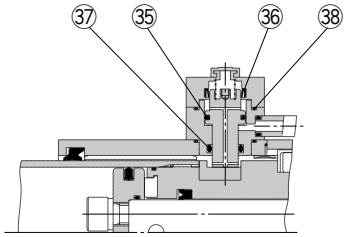
Bore size (mm)	Part no.	Contents
20	MGZ20-PS	Set of nos. ⑳, ㉕
25	MGZ25-PS	
32	MGZ32-PS	
40	MGZ40-PS	
50	MGZ50-PS	
63	MGZ63-PS	
80	MGZ80-PS	

∗ Seal kits consist of items ⑳ and ㉕, and can be ordered by using the seal kit number corresponding to each bore size.
∗ The seal kit includes a grease pack (ø20 to ø50: 10 g, ø63, ø80: 20 g). Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

MGZ Series ø40, ø50, ø63

Construction





End lock

∗ The numbers correspond with those in the “Construction” of the MGZ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉙	**Rod seal A**	NBR	**30, 31, 32 and 33 are non-replaceable parts, so they are not included in the seal kit.**
30	**Rod seal B**		
31	**Piston seal**		
32	**Piston gasket**		
33	**Tube rod gasket**		
㉞	**Cylinder tube gasket**		
㉟	**Locking piston seal A**		
㊱	**Locking piston seal B**		
㊲	**Locking piston seal C**		
㊳	**Lock holder gasket**		
㊴	**Port block gasket**		
㊵	**Pipe gasket**		

Replacement Parts: Seal Kit

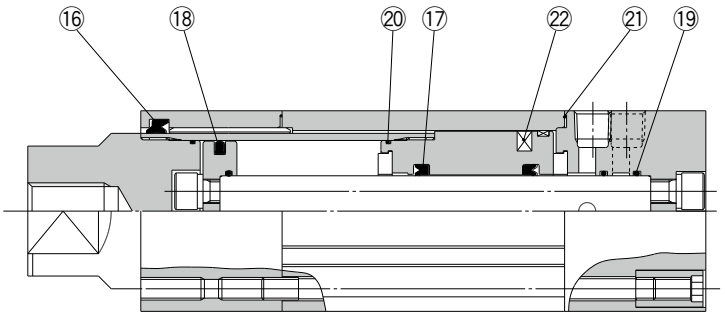
Bore size (mm)	Part no.	Contents
40	MGZ40R-PS	Set of nos. ㉙, ㉞, ㉟, ㊱, ㊲, ㊳, ㊴, ㊵
50	MGZ50R-PS	
63	MGZ63R-PS	

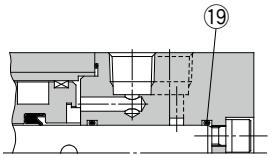
∗ Seal kits consist of items ㉙ and ㉞ to ㊵, and can be ordered by using the seal kit number corresponding to each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

MGZR Series

ø20, ø25, ø32, ø40
ø50, ø63, ø80

Construction





ø20, ø25

∗ The numbers correspond with those in the "Construction" of the MGZR series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑯	**Rod seal A**	NBR	**17, 18, 19 and 20 are non-replaceable parts, so they are not included in the seal kit.**
17	**Rod seal B**		
18	**Piston seal**		
19	**Piston gasket**		
20	**Tube rod gasket**		
㉑	**Cylinder tube gasket**		

Replacement Parts: Seal Kit

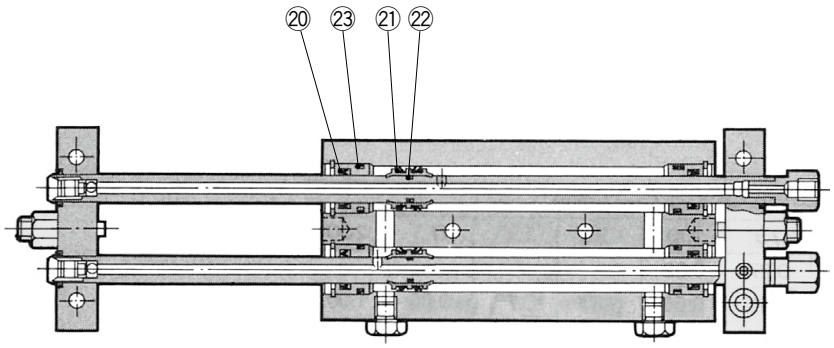
Bore size (mm)	Part no.	Contents
20	MGZ20-PS	Set of nos. ⑯, ㉑
25	MGZ25-PS	
32	MGZ32-PS	
40	MGZ40-PS	
50	MGZ50-PS	
63	MGZ63-PS	
80	MGZ80-PS	

∗ Seal kits consist of items ⑯ and ㉑, and can be ordered by using the seal kit number corresponding to each bore size.
∗ The seal kit includes a grease pack (ø20 to ø50: 10 g, ø63, ø80: 20 g). Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

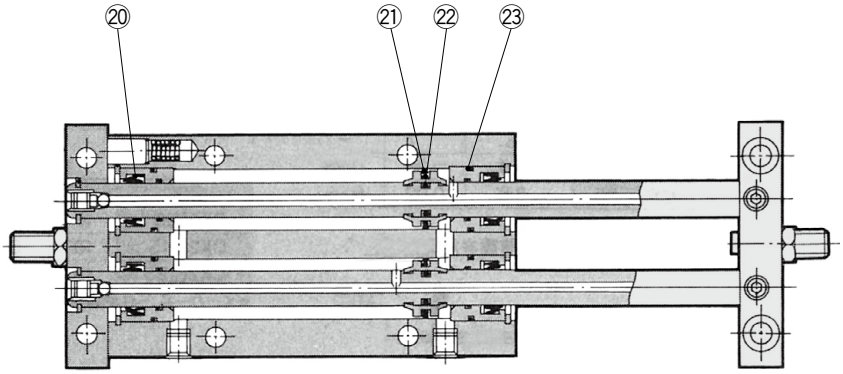
CX2 Series Slide Bearing Type: ø10, ø15, ø25

Construction

CX2N10



CX2N15, 25



∗ The numbers correspond with those in the “Construction” of the CX2 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑳	**Rod seal**	NBR	**22 is a non-replaceable part, so it is not included in the seal kit.**
㉑	**Piston seal**		
22	**Piston gasket**		
㉓	**Cylinder tube gasket**		

Replacement Parts: Seal Kit

Model	Part no.	Contents
CX2N10	CX2N10-PS	Set of nos. ⑳, ㉑, ㉓
CX2N15	CX2N15-PS	
CX2N25	CX2N25-PS	

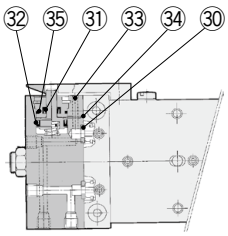
∗ The seal kit includes ⑳, ㉑, ㉓. Order the seal kit based on each bore size. (The piston gasket ㉒ is not replaceable.)

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

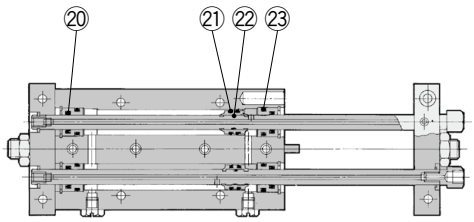
CXWM Series ø10, ø16, ø25

Construction

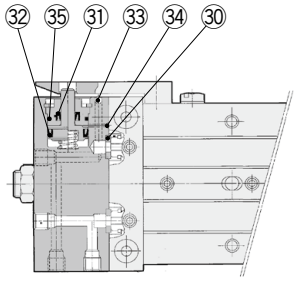
ø10



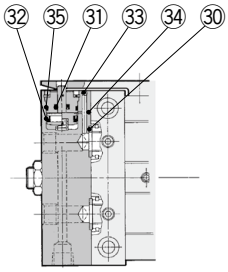
With end lock



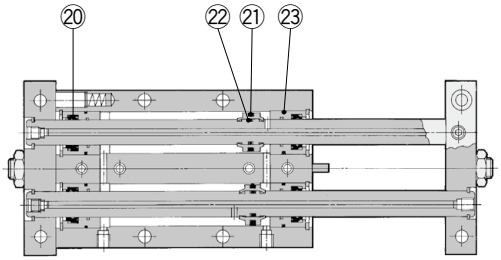
ø16, ø25



ø16/With end lock



ø25/With end lock



∗ The numbers correspond with those in the “Construction” of the CXWM series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑳	**Rod seal**	NBR	**22 is a non-replaceable part, so it is not included in the seal kit.**
㉑	**Piston seal**	NBR	
22	**Piston gasket**	NBR	
㉓	**Cylinder tube gasket**	NBR	
With end lock			
㉚	**Body gasket**	NBR	**33 and 34 are non-replaceable parts, so they are not included in the seal kit.**
㉛	**Rod seal**	NBR	
㉜	**Piston seal**	NBR	
33	**Steel ball**	High carbon chrome bearing steel	
34	**Steel ball**	High carbon chrome bearing steel	
㉟	**O-ring**	NBR	

Replacement Parts: Seal Kit

Model	Part no.	Contents
Cylinder body		
CXWM10	CXWM10-PS	Set of nos. ⑳, ㉑, ㉓
CXWM16	CXWM16-PS	
CXWM25	CXWM25-PS	

∗ The seal kit includes ⑳, ㉑, ㉓. Order the seal kit based on each bore size. (The piston gasket ㉒ is not replaceable.)
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

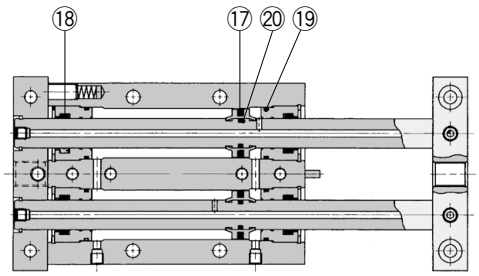
End lock		
CXWM10	CXWM10R-PS	Set of nos. ㉚, ㉛, ㉜, ㉟
CXWM16	CXWM16R-PS	
CXWM25	CXWM25R-PS	

∗ The seal kit includes ㉚, ㉛, ㉜, ㉟. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

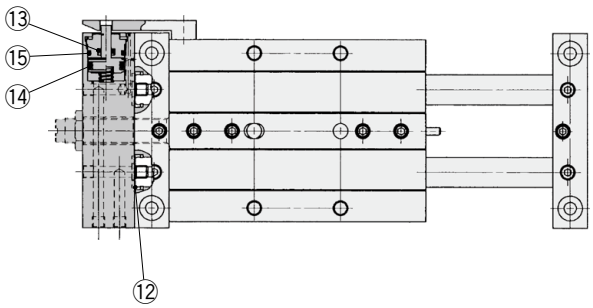
CXWM Series ø20, ø32

Construction

ø20, ø32



With end lock



∗ The numbers correspond with those in the "Construction" of the CXWM series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑰	**Piston seal**	NBR	**20 is a non-replaceable part, so it is not included in the seal kit.**
⑱	**Rod seal**		
⑲	**Cylinder tube gasket**		
20	**Piston gasket**		
With end lock			
⑫	**Body gasket**	NBR	
⑬	**Rod seal**		
⑭	**Piston seal**		
⑮	**O-ring**		

Replacement Parts: Seal Kit

Model	Part no.	Contents
Cylinder body		
CXWM20	CXWM20-PS	Set of nos. ⑰, ⑱, ⑲
CXWM32	CXWM32-PS	

∗ The seal kit includes ⑰, ⑱, ⑲. Order the seal kit based on each bore size. (The piston gasket ⑳ is not replaceable.)
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

Model	Part no.	Contents
End lock		
CXWM20	CXWM20R-PS	Set of nos. ⑫, ⑬, ⑭, ⑮
CXWM32	CXWM32R-PS	

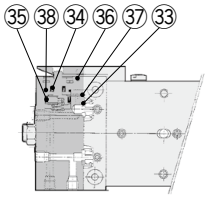
∗ The seal kit includes ⑫, ⑬, ⑭, ⑮. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CXWL Series

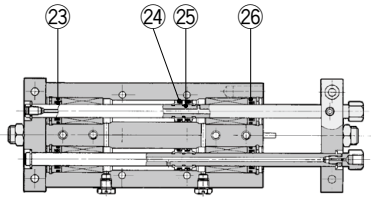
Ball Bushing Bearing Type: ø10, ø16, ø25

Construction

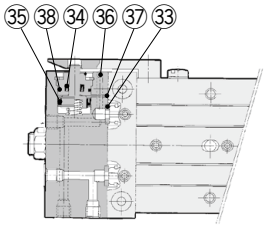
ø10



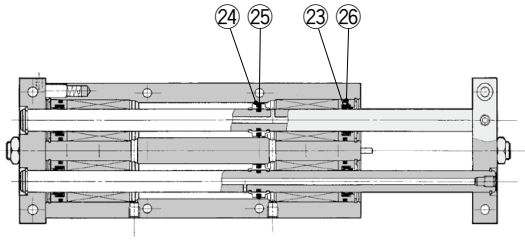
With end lock



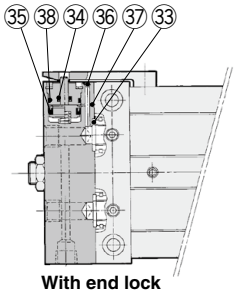
ø16



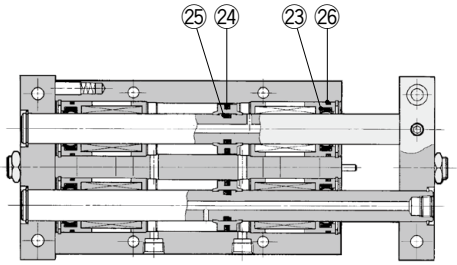
With end lock



ø25



With end lock



∗ The numbers correspond with those in the "Construction" of the CXWL series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉓	**Rod seal**	NBR	**25 is a non-replaceable part, so it is not included in the seal kit.**
㉔	**Piston seal**		
25	**Piston gasket**		
㉖	**Cylinder tube gasket**		
With end lock			
㉝	**Body gasket**	NBR	**36 and 37 are non-replaceable parts, so they are not included in the seal kit.**
㉞	**Rod seal**	NBR	
㉟	**Piston seal**	NBR	
36	**Steel ball**	High carbon chrome bearing steel	
37	**Steel ball**	High carbon chrome bearing steel	
㊳	**O-ring**	NBR	

Replacement Parts: Seal Kit

Model	Part no.	Contents
Cylinder body		
CXWL10	CXWL10-PS	Set of nos. ㉓, ㉔, ㉖
CXWL16	CXWL16-PS	
CXWL25	CXWL25-PS	

∗ The seal kit includes ㉓, ㉔ and ㉖. Order the seal kit with the part number for each model.
∗ ㉕ is not replaceable.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

End lock		
CXWL10	CXWL10R-PS	Set of nos. ㉝, ㉞, ㉟, ㊳
CXWL16	CXWL16R-PS	
CXWL25	CXWL25R-PS	

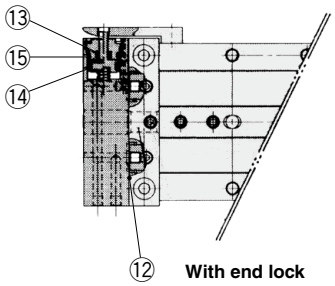
∗ The seal kit includes ㉝, ㉞, ㉟ and ㊳. Order the seal kit with the part number for each model.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CXWL Series

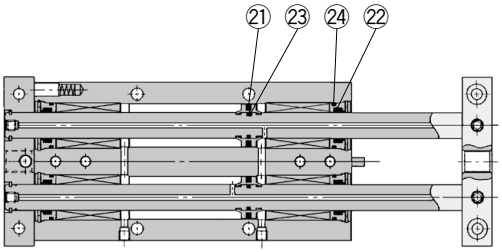
Ball Bushing Bearing Type: ø20, ø32

Construction

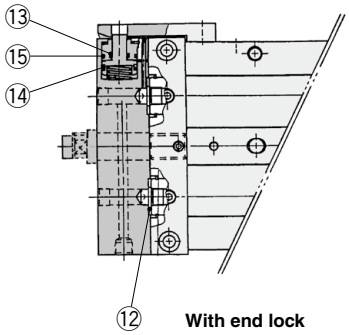
ø20



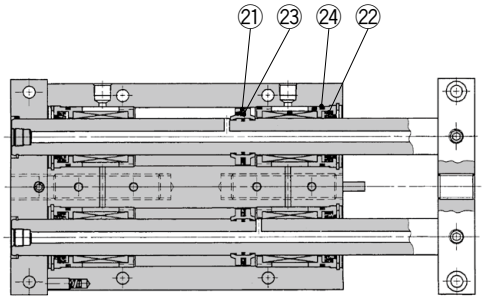
With end lock



ø32



With end lock



∗ The numbers correspond with those in the "Construction" of the CXWL series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉑	**Piston seal**	NBR	**23 is a non-replaceable part, so it is not included in the seal kit.**
㉒	**Rod seal**		
23	**Piston gasket**		
㉔	**Cylinder tube gasket**		
With end lock			
⑫	**Body gasket**	NBR	
⑬	**Rod seal**		
⑭	**Piston seal**		
⑮	**O-ring**		

Replacement Parts: Seal Kit

Model	Part no.	Contents
Cylinder body		
CXWL20	CXWL20-PS	Set of nos. ㉑, ㉒, ㉔
CXWL32	CXWL32-PS	

∗ The seal kit includes ㉑, ㉒ and ㉔. Order the seal kit with the part number for each model.
∗ ㉓ is not replaceable.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

Model	Part no.	Contents
End lock		
CXWL20	CXWL20R-PS	Set of nos. ⑫, ⑬, ⑭, ⑮
CXWL32	CXWL32R-PS	

∗ The seal kit includes ⑫, ⑬, ⑭ and ⑮. Order the seal kit with the part number for each model.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CXT Series

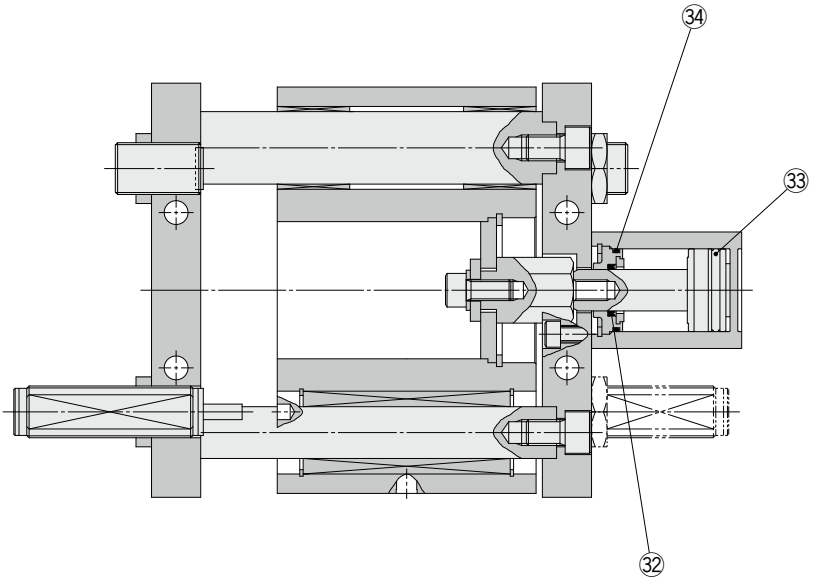
ø12, ø16, ø20, ø25, ø32, ø40

The Replacement Procedure is on p. 387

Construction

CXTM
Guide rod/Bearing

CXTL
Guide rod/Bearing



∗ The numbers correspond with those in the “Construction” of the CXT series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉜	**Rod seal**	NBR	
㉝	**Piston seal**		
㉞	**Tube gasket**		

Replacement Parts: Seal Kit

Model	Cylinder	Part no
Standard stroke		
CXT□12	CDQSB12	CQSB12-PS
CXT□16	CDQSB16	CQSB16-PS
CXT□20	CDQSB20	CQSB20-PS
CXT□25	CDQSB25	CQSB25-PS
CXT□32	CDQ2A32	CQ2B32-PS
CXT□40	CDQ2A40	CQ2B40-PS
Long stroke		
CXT□12	CDQSB12	CQSB12-L-PS
CXT□16	CDQSB16	CQSB16-L-PS
CXT□20	CDQSB20	CQSB20-L-PS
CXT□25	CDQSB25	CQSB25-L-PS
CXT□32	CDQ2A32	CQ2A32-L-PS
CXT□40	CDQ2A40	CQ2A40-L-PS

∗ The seal kit includes ㉜, ㉝ and ㉞. Order the seal kit with the kit number.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CXSJ Series

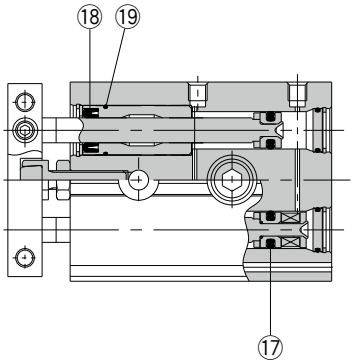
ø6, ø10, ø15, ø20
ø25, ø32

The Replacement Procedure is on p. 443

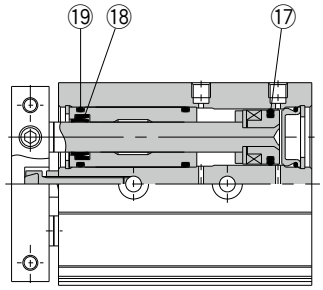
Construction

CXSJM (Slide bearing)

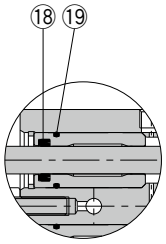
CXSJM6



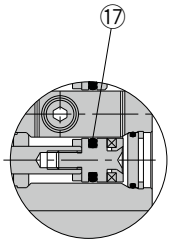
CXSJM15



CXSJM10

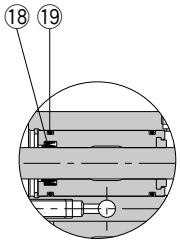


Rod cover

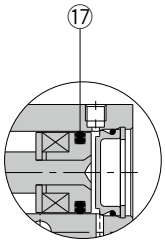


Piston rod B-side piston

CXSJM20 to 32



Rod cover



Head cover

∗ The numbers correspond with those in the “Construction” of the CXSJ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑰	**Piston seal**	NBR	
⑱	**Rod seal**		
⑲	**O-ring**		

Replacement Parts: Seal Kit

Model	Part no.	Contents
CXSJM6	CXSJM6-PS	Set of nos. ⑰, ⑱, ⑲
CXSJM10	CXSJM10-PS	
CXSJM15	CXSM15-PS	
CXSJM20	CXSM20-PS	
CXSJM25	CXSM25-PS	
CXSJM32	CXSM32-PS	

∗ The seal kit includes ⑰, ⑱, and ⑲. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CXSJ Series

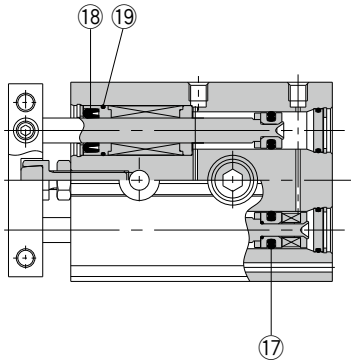
ø6, ø10, ø15, ø20
ø25, ø32

The Replacement Procedure is on p. 443

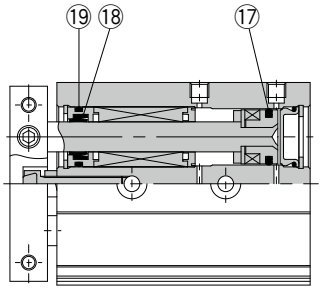
Construction

CXSJL (Ball bushing bearing)

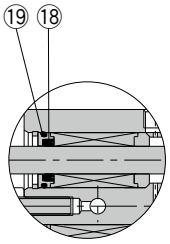
CXSJL6



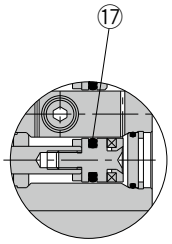
CXSJL15



CXSJL10

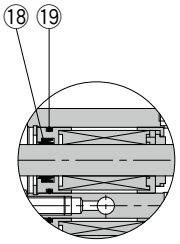


Rod cover

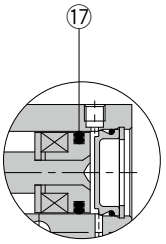


Piston rod B-side piston

CXSJL20 to 32



Rod cover



Head cover

∗ The numbers correspond with those in the “Construction” of the CXSJ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑰	**Piston seal**	NBR	
⑱	**Rod seal**		
⑲	**O-ring**		

Replacement Parts: Seal Kit

Model	Part no.	Contents
CXSJL6	CXSJL6-PS	Set of nos. ⑰, ⑱, ⑲
CXSJL10	CXSJL10-PS	
CXSJL15	CXSL15APS	
CXSJL20	CXSL20APS	
CXSJL25	CXSL25APS	
CXSJL32	CXSL32APS	

∗ The seal kit includes ⑰, ⑱, and ⑲. Order the seal kit based on each bore size.

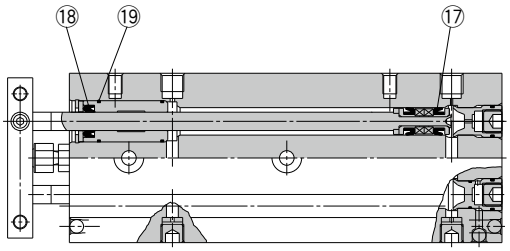
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CXS Series ø6, ø10, ø15, ø20, ø25, ø32

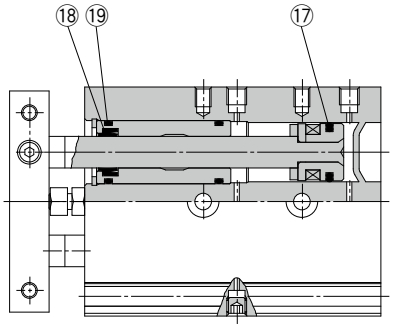
The Replacement Procedure is on p. 443

Construction

CXSM6



CXSM10 to 32



∗ The numbers correspond with those in the "Construction" of the CXS series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑰	**Piston seal**	NBR	
⑱	**Rod seal**		
⑲	**O-ring**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
6	CXSM6-PS	Set of nos. ⑰, ⑱, ⑲
10	CXSM10APS	
15	CXSM15-PS	
20	CXSM20-PS	
25	CXSM25-PS	
32	CXSM32-PS	

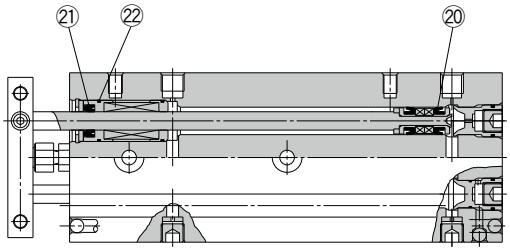
∗ The seal kit includes ⑰, ⑱ and ⑲. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CXS Series ø6, ø10, ø15, ø20, ø25, ø32

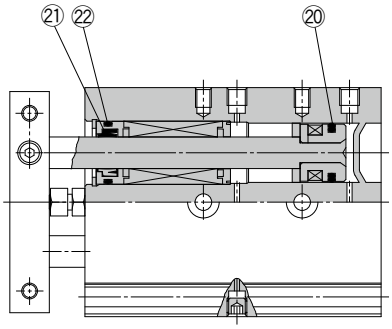
The Replacement Procedure is on p. 443

Construction

CXSL6



CXSL10 to 32



∗ The numbers correspond with those in the “Construction” of the CXS series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑳	**Piston seal**	NBR	
㉑	**Rod seal**		
㉒	**O-ring**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
6	CXSL6-PS	Set of nos. ⑳, ㉑, ㉒
10	CXSL10BPS	
15	CXSL15APS	
20	CXSL20APS	
25	CXSL25APS	
32	CXSL32APS	

∗ The seal kit includes ⑳, ㉑ and ㉒. Order the seal kit based on each bore size.

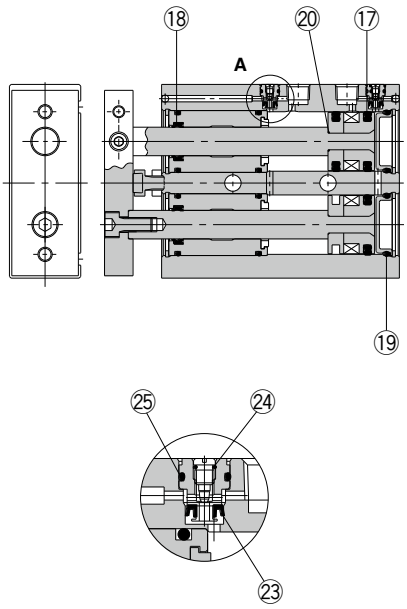
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CXS Series ø20, ø25, ø32

The Replacement Procedure is on p. 443

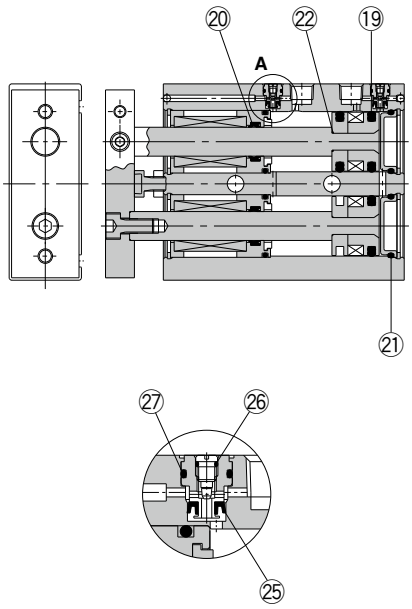
Construction

CXSM/With air cushion



Close-up of A

CXSL/With air cushion



Close-up of A

∗ The numbers correspond with those in the "Construction" of the CXS series in the **Web Catalog**.

Seal Kit List (CXSM)

No.	Description	Material	Note
⑰	**Piston seal**	NBR	**20 and 23 to 25 are non-replaceable parts, so they are not included in the seal kit.**
⑱	**Rod seal**		
⑲	**O-ring**		
20	**O-ring**		
23	**Check seal**		
24	**Needle gasket**		
25	**Check gasket**		

Seal Kit List (CXSL)

No.	Description	Material	Note
⑲	**Piston seal**	NBR	**22 and 25 to 27 are non-replaceable parts, so they are not included in the seal kit.**
⑳	**Rod seal**		
㉑	**O-ring**		
22	**O-ring**		
25	**Check seal**		
26	**Needle gasket**		
27	**Check gasket**		

Replacement Parts: Seal Kit (CXSM)

Bore size (mm)	Part no.	Contents
20	CXSM20A-PS	Set of nos. ⑰, ⑱, ⑲
25	CXSM25A-PS	
32	CXSM32A-PS	

∗ The seal kit includes ⑰, ⑱ and ⑲. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

Replacement Parts: Seal Kit (CXSL)

Bore size (mm)	Part no.	Contents
20	CXSL20A-PS	Set of nos. ⑲, ⑳, ㉑
25	CXSL25A-PS	
32	CXSL32A-PS	

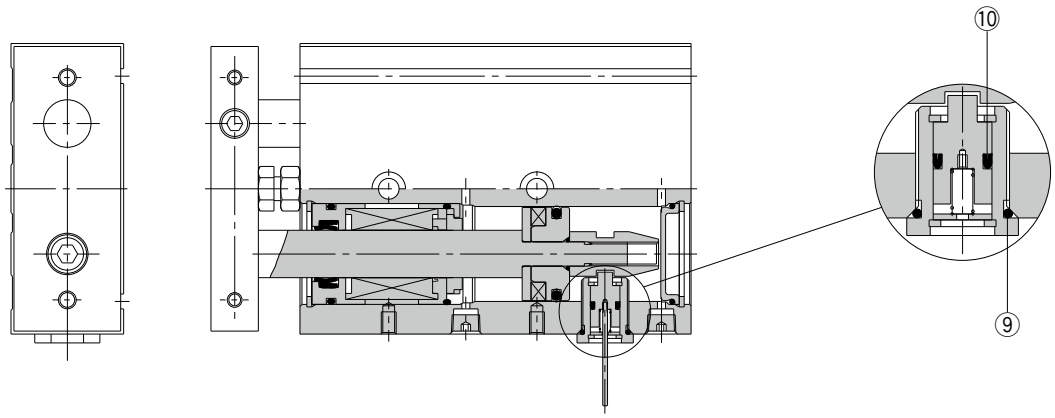
∗ The seal kit includes ⑲, ⑳ and ㉑. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CXS Series ø6, ø10, ø15, ø20, ø25, ø32

The Replacement Procedure is on p. 443

Construction

CXSM6



∗ The numbers correspond with those in the “Construction” of the CXS series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑨	**O-ring**	NBR	
⑩	**Rod seal**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
6	CXSRM6-PS	Includes the kit components of the seal kit featured on page 177 plus items ⑨ and ⑩ from the left parts list.
	CXSRL6APS	
10	CXSRM10-PS	
	CXSRL10APS	
15	CXSRM15-PS	
	CXSRL15APS	
20	CXSRM20-PS	
	CXSRL20APS	
25	CXSRM25-PS	
	CXSRL25APS	
32	CXSRM32-PS	
	CXSRL32APS	

∗ Seal kits includes the basic type seal (page 177), ⑨ and ⑩. Order the seal kit based on each bore size.

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.:GR-S-010 (10 g)

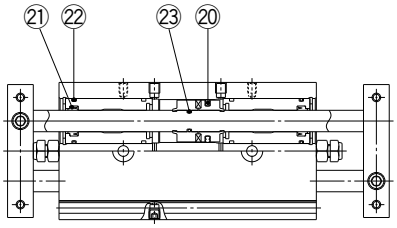
CXSW Series

ø6, ø10, ø15
ø20, ø25, ø32

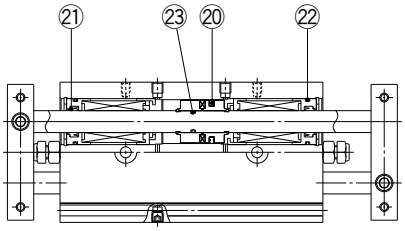
The Replacement Procedure is on p. 443

Construction

CXSWM/Slide bearing



CXSWL/Ball bushing bearing



∗ The numbers correspond with those in the “Construction” of the CXSW series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑳	**Piston seal**	NBR	**23 is a non-replaceable part, so it is not included in the seal kit.**
㉑	**Rod seal**		
㉒	**O-ring**		
23	**O-ring**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
6	CXSWM6-PS	Set of nos. ⑳, ㉑, ㉒
	CXSWL6-PS	
10	CXSWM10-PS	
	CXSWL10APS	
15	CXSWM15-PS	
	CXSWL15APS	
20	CXSWM20-PS	
	CXSWL20APS	
25	CXSWM25-PS	
	CXSWL25APS	
32	CXSWM32-PS	
	CXSWL32APS	

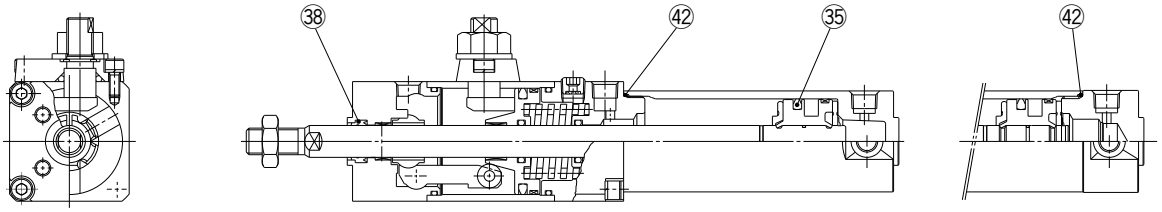
∗ The seal kit includes ⑳ to ㉒. To order them, use the order number given in the table above.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CLG1 Series ø20, ø25, ø32, ø40

The Replacement Procedure is on p. 444

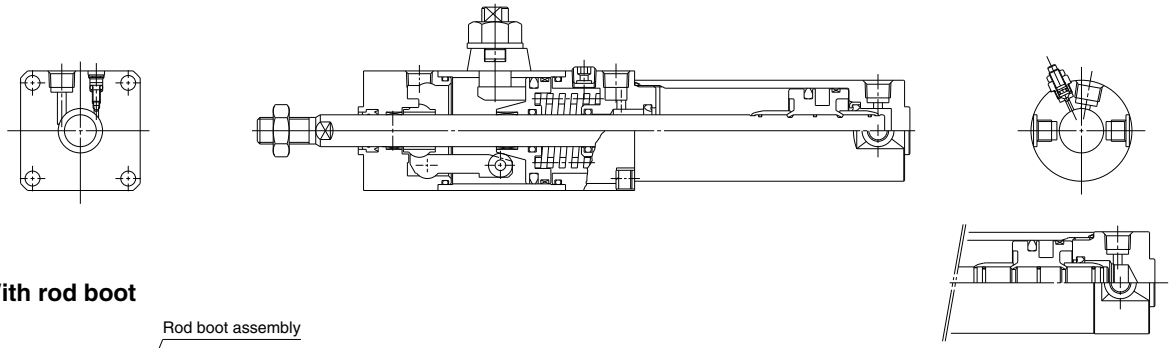
Construction

With rubber bumper: CLG1BN



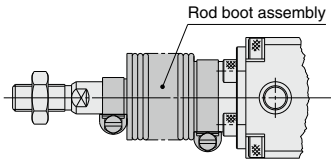
Long stroke

With air cushion: CLG1BA



Long stroke

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 253.

∗ The numbers correspond with those in the “Construction” of the CLG1 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉟	**Piston seal**	NBR	
㊳	**Rod seal B**		
㊷	**Cylinder tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CG1N20-PS	Set of nos. ㉟, ㊳, ㊷
25	CG1N25-PS	
32	CG1N32-PS	
40	CG1N40-PS	

∗ The since the lock section for the CLG1 series is normally replaced as a unit, kits are for the cylinder section only. These can be ordered using the order number for each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

Replacement Parts: Lock Unit

CLG1B N 40 TN – E

Cushion type

N	Rubber bumper
A	Air cushion

Bore size (mm)

Port thread type

Nil	Rc
TN	NPT

Lock operation

E	Spring locking (Exhaust locking)
P	Pneumatic locking (Pressure locking)
D	Spring and pneumatic locking

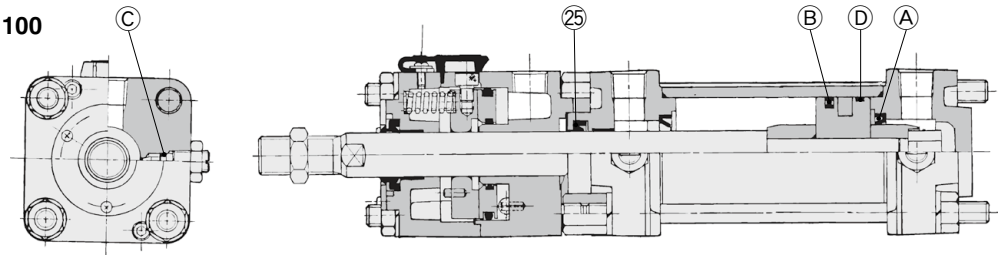
CL1 Series

ø40, ø50, ø63, ø80, ø100
ø125, ø140, ø160

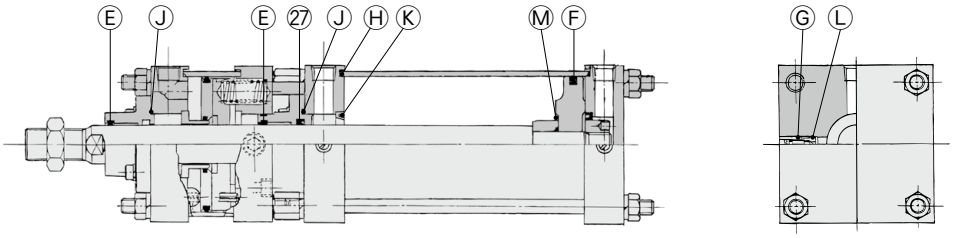
The Replacement Procedure is on p. 447

Construction

ø40 to ø100

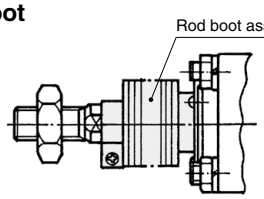


ø125 to ø160



∗ The numbers correspond with those in the "Construction" of the CL1 series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 253.

Seal Kit List

No.	Description	Material	Note
ø40 to ø100			
㉕	**Rod seal**	NBR	
Ⓐ	**Cushion seal**		
Ⓑ	**Piston seal**		
Ⓒ	**Cushion valve seal**		
Ⓓ	**Cylinder tube gasket**		
ø125 to ø160			
㉗	**Rod seal**	NBR	**K, L and M are non-replaceable parts, so they are not included in the seal kit.**
Ⓔ	**Wiper ring**		
Ⓕ	**Piston seal**		
Ⓖ	**Valve seal**		
Ⓗ	**Tube gasket**		
Ⓙ	**Retaining plate gasket**		
K	**Cushion seal**		
L	**Guide gasket**		
M	**Piston gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
40	CL40-PS	
50	CL50-PS	
63	CL63-PS	
80	CL80-PS	
100	CL100-PS	
125	CL125-PS	
140	CL140-PS	
160	CL160-PS	

∗ Since the lock section for the CL1 series is normally replaced as a unit, kits are for the cylinder section only. These can be ordered using the order number for each bore size.
∗ The seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g, ø125 to ø160: 40 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)
∗ As for the center trunnion type, it is very difficult to adjust the position of the trunnion bracket and the center of the axis.
Therefore repair at SMC is recommended.

Replacement Parts: Lock-up Unit

CL – 40 TN

Bore size (mm)

Port thread type

Nil	Rc
TN	NPT
TF	G

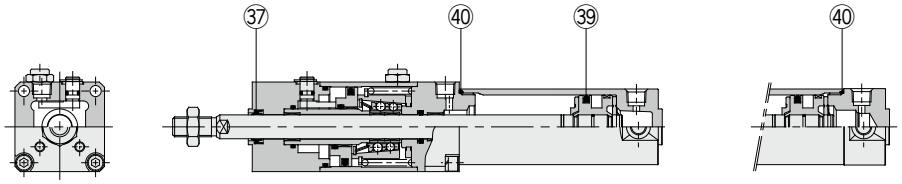
∗ Consult with SMC when replacing the lock-up unit with a bore size of ø125 to ø160.

CNG Series ø20, ø25, ø32, ø40

The Replacement Procedure is on p. 452

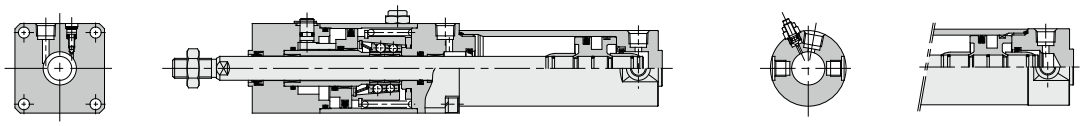
Construction

With rubber bumper: CNGBN



Long stroke

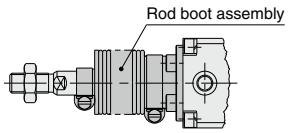
With air cushion: CNGBA



Long stroke

∗ The numbers correspond with those in the “Construction” of the CNG series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 244.

Seal Kit List

No.	Description	Material	Note
㊲	**Rod seal A**	NBR	
㊴	**Piston seal**		
㊵	**Cylinder tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CG1N20-PS	Set of nos. ㊲, ㊴, ㊵
25	CG1N25-PS	
32	CG1N32-PS	
40	CG1N40-PS	

∗ Since the lock section for the CNG series is normally replaced as a unit, kits are for the cylinder section only. These can be ordered using the order number for each bore size.
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

Replacement Parts: Lock Unit

CNG N 40 TN D – UA

Cushion type

N	Rubber bumper
A	Air cushion

Bore size (mm)

Port thread type

Nil	Rc
TN	NPT

Locking direction (Both directions)

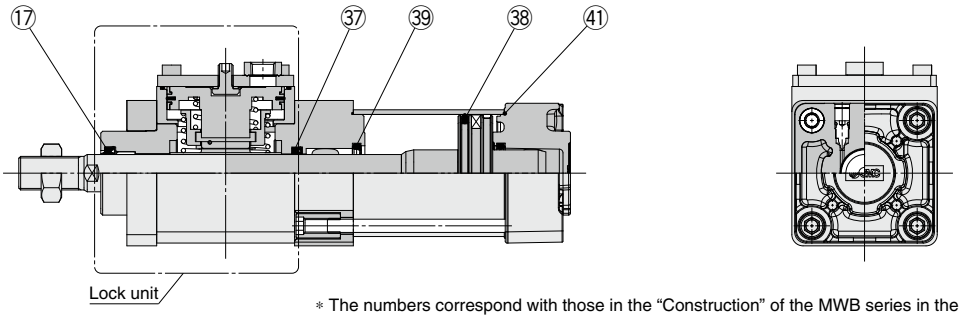
Unit assembly

MWB Series

ø32, ø40, ø50
ø63, ø80, ø100

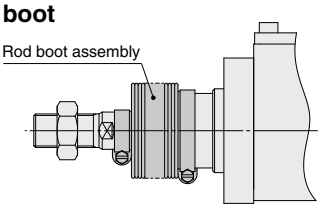
The Replacement Procedure is on p. 455

Construction



∗ The numbers correspond with those in the "Construction" of the MWB series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 245.

Component Parts

No.	Description	Material	Qty.	Note
⑰	**Rod seal A**	NBR	1	
㊲	**Rod seal B**		1	
㊳	**Piston seal B**		1	
㊴	**Cushion seal**	Urethane	2	
㊶	**Cylinder tube gasket**	NBR	2	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
32	MWB32-PS	A set of ⑰ Rod seal A, ㊲ Rod seal B, ㊳ Piston seal B, ㊴ Cushion seal, and ㊶ Cylinder tube gasket
40	MWB40-PS	
50	MWB50-PS	
63	MWB63-PS	
80	MWB80-PS	
100	MWB100-PS	

∗ Never dissemble the lock unit. It should be replaced as a unit. The seal kit shown above contains the rod seal for the cylinder and lock unit. Order the seal kit suitable for the cylinder bore size.
∗ The seal kit shown above includes a grease pack.
(ø32, ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g)
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

Lock Unit Replacement

Bore size (mm)	Port type	Replacement lock unit part no.
32	Rc	MWB32-UA
	NPT	MWB32TN-UA
	G	MWB32TF-UA
40	Rc	MWB40-UA
	NPT	MWB40TN-UA
	G	MWB40TF-UA
50	Rc	MWB50-UA
	NPT	MWB50TN-UA
	G	MWB50TF-UA
63	Rc	MWB63-UA
	NPT	MWB63TN-UA
	G	MWB63TF-UA
80	Rc	MWB80-UA
	NPT	MWB80TN-UA
	G	MWB80TF-UA
100	Rc	MWB100-UA
	NPT	MWB100TN-UA
	G	MWB100TF-UA

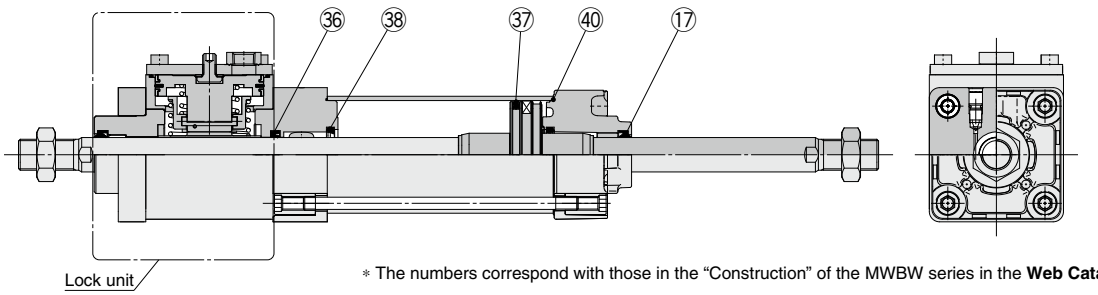
∗ For lock unit with a rod boot, add –J to the part number suffix.
Example) MWB50-UA-J

MWBW Series

ø32, ø40, ø50
ø63, ø80, ø100

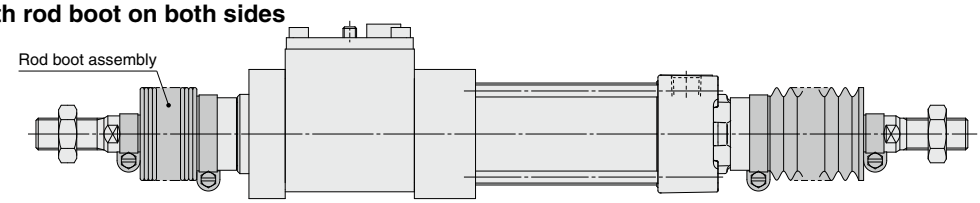
The Replacement Procedure is on p. 455

Construction



∗ The numbers correspond with those in the "Construction" of the MWBW series in the **Web Catalog**.

With rod boot on both sides



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 245.

Component Parts

No.	Description	Material	Qty.	Note
⑰	**Rod seal A**	NBR	2	
㊱	**Rod seal B**		1	
㊲	**Piston seal B**		1	
㊳	**Cushion seal**	Urethane	2	
㊵	**Cylinder tube gasket**	NBR	2	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
32	MWBW32-PS	A set of ⑰ Rod seal A, ㊱ Rod seal B, ㊲ Piston seal B, ㊳ Cushion seal, and ㊵ Cylinder tube gasket
40	MWBW40-PS	
50	MWBW50-PS	
63	MWBW63-PS	
80	MWBW80-PS	
100	MWBW100-PS	

∗ Never dissemble the lock unit. It should be replaced as a unit. The seal kit shown above contains the rod seal for the cylinder and lock unit. Order the seal kit suitable for the cylinder bore size.
∗ The seal kit shown above includes a grease pack.
(ø32, ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g)
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

Lock Unit Replacement

Bore size (mm)	Port type	Replacement lock unit part no.
32	Rc	MWB32-UA
	NPT	MWB32TN-UA
	G	MWB32TF-UA
40	Rc	MWB40-UA
	NPT	MWB40TN-UA
	G	MWB40TF-UA
50	Rc	MWB50-UA
	NPT	MWB50TN-UA
	G	MWB50TF-UA
63	Rc	MWB63-UA
	NPT	MWB63TN-UA
	G	MWB63TF-UA
80	Rc	MWB80-UA
	NPT	MWB80TN-UA
	G	MWB80TF-UA
100	Rc	MWB100-UA
	NPT	MWB100TN-UA
	G	MWB100TF-UA

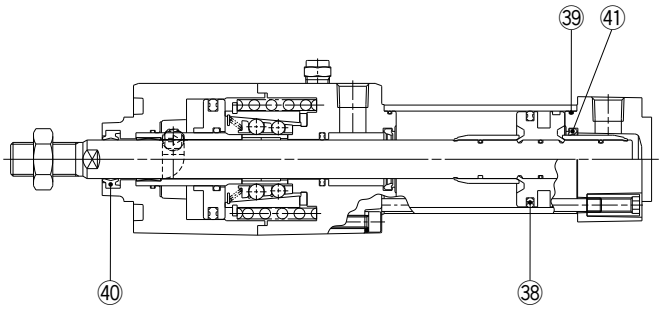
∗ For lock unit with a rod boot, add –J to the part number suffix.
Example) MWB50-UA-J

MNB Series

ø32, ø40, ø50
ø63, ø80, ø100

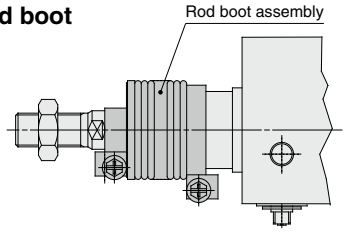
The Replacement Procedure is on p. 455

Construction



∗ The numbers correspond with those in the "Construction" of the MNB series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 245.

Seal Kit List

No.	Description	Material	Note
㊳	**Piston seal**	NBR	
㊴	**Cylinder tube gasket**		
㊵	**Rod seal A**		
㊶	**Cushion seal**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
32	MB32Z-PS	Set of nos. ㊳, ㊴, ㊵, ㊶
40	MB1-40Z-PS	
50	MB1-50Z-PS	
63	MB1-63Z-PS	
80	MB1-80Z-PS	
100	MB1-100Z-PS	

∗ Since the lock section for the MNB series is normally replaced as a unit, kits are for the cylinder section only. These can be ordered using the order number for each bore size.
∗ The seal kit includes a grease pack (ø32 to ø50: 10 g, ø63 and ø80: 20 g, ø100: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

Replacement Parts: Lock Unit

MNB 40 TN D – UA

- **40**: Bore size (mm)
- **TN**: Port thread type

Nil	Rc
TN	NPT

- **D**: Locking direction (Both directions)
- **UA**: Unit assembly

G Port

C95N 40 D – UA

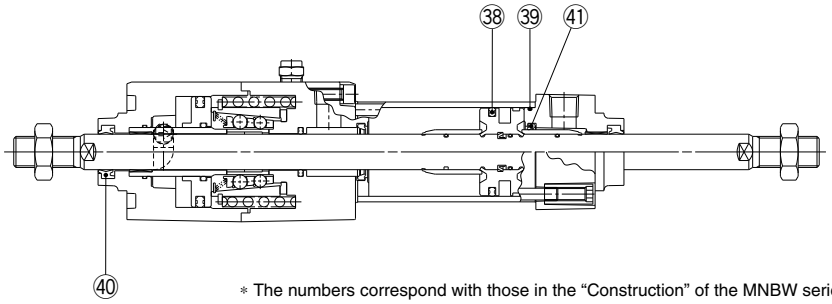
- **40**: Bore size (mm)
- **D**: Locking direction (Both directions)
- **UA**: Unit assembly

MNBW Series

ø32, ø40, ø50
ø63, ø80, ø100

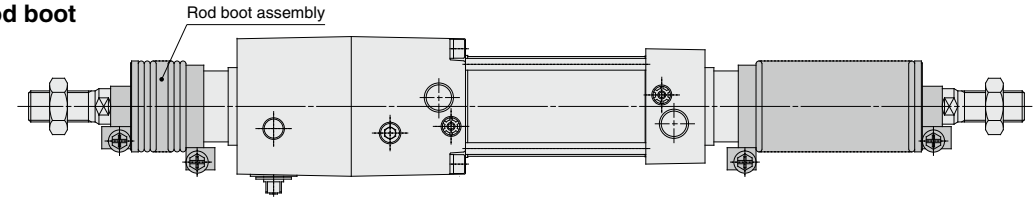
The Replacement Procedure is on p. 455

Construction



∗ The numbers correspond with those in the “Construction” of the MNBW series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 245.

Seal Kit List

No.	Description	Material	Note
㊳	**Piston seal**	NBR	
㊴	**Cylinder tube gasket**		
㊵	**Rod seal A**		
㊶	**Cushion seal**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
32	MBW32-PS	Set of nos. ㊳, ㊴, ㊵, ㊶
40	MBW40-PS	
50	MBW50-PS	
63	MBW63-PS	
80	MBW80-PS	
100	MBW100-PS	

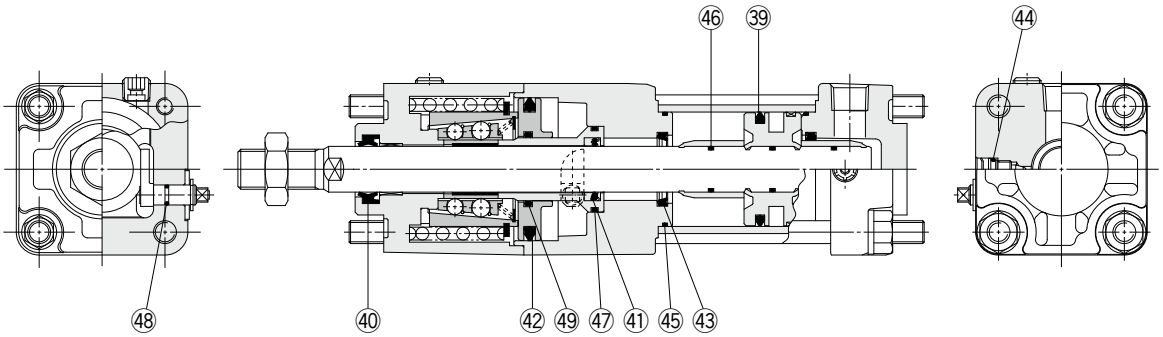
∗ As a general rule, the lock section of the MNBW series is replaced as a unit, and therefore, the replacement seal kits are for the cylinder section only. These can be ordered using the order number for each bore size.
∗ The seal kit includes a grease pack (ø32 to ø50: 10 g, ø63 and ø80: 20 g, ø100: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

CNA2 Series

ø40, ø50, ø63
ø80, ø100

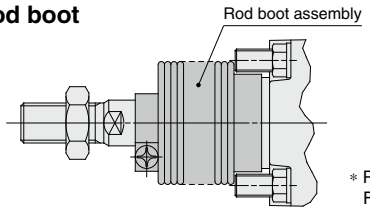
The Replacement Procedure is on p. 455

Construction



∗ The numbers correspond with those in the "Construction" of the CNA2 series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 248.

Seal Kit List

No.	Description	Material	Note
㊴	**Piston seal**	NBR	**41, 42, 44 and 46 to 49 are non-replaceable parts, so they are not included in the seal kit.**
㊵	**Rod seal A**	NBR	
41	**Rod seal B**	NBR	
42	**Release piston seal**	NBR	
㊸	**Cushion seal**	Urethane	
44	**Cushion valve seal**	NBR	
㊺	**Tube gasket**	NBR	
46	**Piston gasket**	NBR	
47	**Piston guide gasket**	NBR	
48	**Unlocking cam gasket**	NBR	
49	**O-ring**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
40	MB1-40Z-PS	Set of nos. ㊴, ㊵, ㊸, ㊺
50	MB1-50Z-PS	
63	MB1-63Z-PS	
80	MB1-80Z-PS	
100	MB1-100Z-PS	

∗ Since the lock of the CNA2 series cannot be disassembled and is normally replaced as a unit, kits are for the cylinder section only. These can be ordered using the order number for each bore size.
∗ The seal kit includes a grease pack (ø40 and ø50: 10 g, ø63 and ø80: 20 g, ø100: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)
∗ As for the center trunnion type, it is very difficult to adjust the position of the trunnion bracket and the center of the axis.
Therefore repair at SMC is recommended.

Replacement Parts: Lock Unit

CNA2 – 40 TN D – UA □

Bore size (mm)

Thread type

Nil	Rc
TN	NPT
TF	G

Unit assembly

Locking direction (Both directions)

Number

Nil	Standard
L∗	Long stroke

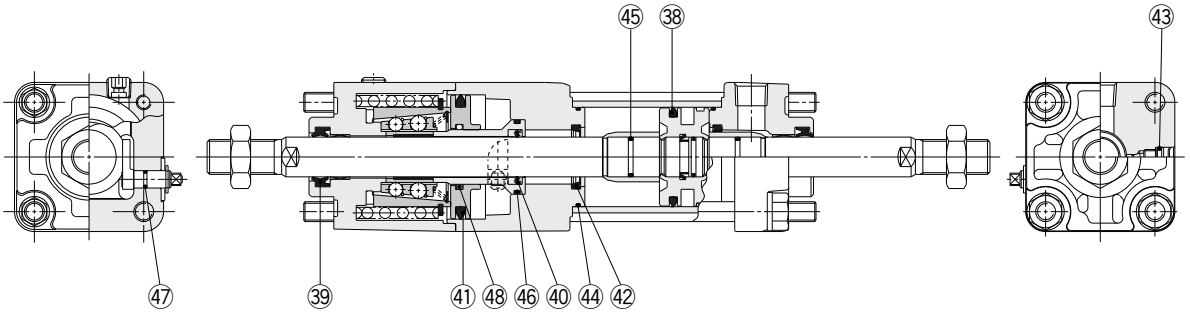
∗ The lock unit for a long-stroke cylinder is only applicable for the rod flange type with bore size ø50 to ø100 and stroke 1001 or more. (Example: CNA2-100D-UAL)

CNA2W Series

ø40, ø50
ø63, ø80
ø100

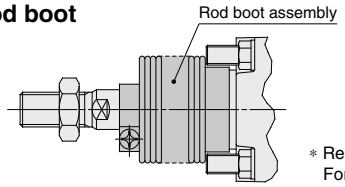
The Replacement Procedure is on p. 455

Construction



∗ The numbers correspond with those in the "Construction" of the CNA2 series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 248.

Seal Kit List

No.	Description	Material	Note
㊳	**Piston seal**	NBR	**40, 41, 43 and 45 to 48 are non-replaceable parts, so they are not included in the seal kit.**
㊴	**Rod seal A**	NBR	
40	**Rod seal B**	NBR	
41	**Release piston seal**	NBR	
㊷	**Cushion seal**	Urethane	
43	**Cushion valve seal**	NBR	
㊹	**Tube gasket**	NBR	
45	**Piston gasket**	NBR	
46	**Piston guide gasket**	NBR	
47	**Unlocking cam gasket**	NBR	
48	**O-ring**	NBR	

Replacement Parts: Seal Kit

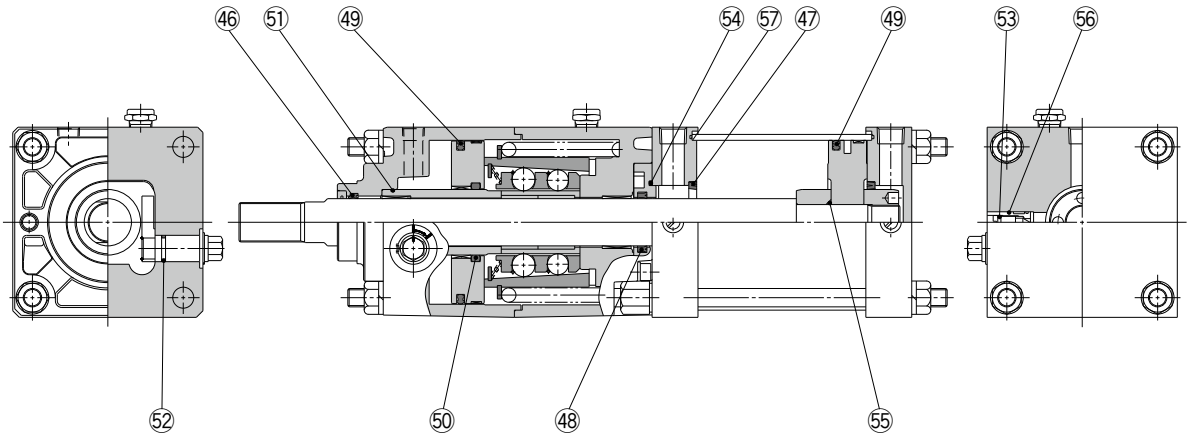
Bore size (mm)	Part no.	Contents
40	MB1W40Z-PS	Set of nos. ㊳, ㊴, ㊷, ㊹
50	MB1W50Z-PS	
63	MB1W63Z-PS	
80	MB1W80Z-PS	
100	MB1W100Z-PS	

∗ Since the lock of the CNA2 series cannot be disassembled and is normally replaced as a unit, kits are for the cylinder section only. These can be ordered using the order number for each bore size.
∗ The seal kit includes a grease pack (ø40 and ø50: 10 g, ø63 and ø80: 20 g, ø100: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)
∗ As for the center trunnion type, it is very difficult to adjust the position of the trunnion bracket and the center of the axis.
Therefore repair at SMC is recommended.

CNS Series ø125, ø140, ø160

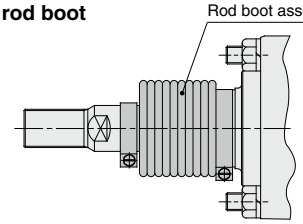
The Replacement Procedure is on p. 461

Construction



∗ The numbers correspond with those in the "Construction" of the CNS series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 250.

Seal Kit List

No.	Description	Material	Note
㊻	**Wiper ring**	NBR	**47, 50 to 52, 55 and 56 are non-replaceable parts, so they are not included in the seal kit.**
47	**Cushion seal**	NBR	
㊽	**Rod seal**	NBR	
㊾	**Piston seal**	NBR	
50	**O-ring (for release piston)**	NBR	
51	**O-ring (for piston guide)**	NBR	
52	**O-ring (for unlocking cam)**	NBR	
㊸	**Valve seal**	NBR	
㊹	**Retaining plate gasket**	NBR	
55	**Piston gasket**	NBR	
56	**Guide gasket**	NBR	
㊼	**Tube gasket**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
125	CS1N125A-PS	Set of nos. ㊻, ㊽, ㊾, ㊸, ㊹, ㊼
140	CS1N140A-PS	
160	CS1N160A-PS	

∗ Since the lock section for the CNS series is normally replaced as a unit, kits are for the cylinder section only. These can be ordered using the order number for each bore size.
∗ The seal kit includes ㊻, ㊽, ㊾, ㊸, ㊹, ㊼. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (40 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)
∗ As for the center trunnion type, it is very difficult to adjust the position of the trunnion bracket and the center of the axis.
Therefore repair at SMC is recommended.

Replacement Parts: Lock Unit

CNS 125 TN D – UA

- **125**: Bore size (mm)
- **TN**: Thread type
- **D**: Locking direction (Both directions)
- **UA**: Unit assembly

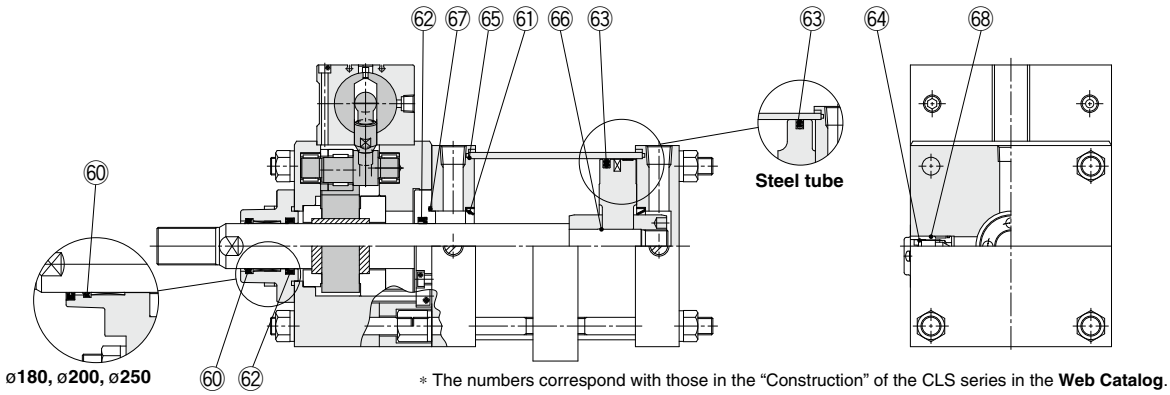
Nil	Rc
TN	NPT
TF	G

CLS Series

ø125, ø140, ø160
ø180, ø200, ø250

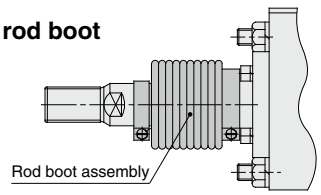
The Replacement Procedure is on p. 463

Construction



∗ The numbers correspond with those in the "Construction" of the CLS series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 250.

Seal Kit List

No.	Description	Material	Note
⑥⓪	**Wiper ring**	NBR	**61, 66 and 68 are non-replaceable parts, so they are not included in the seal kit.**
61	**Cushion seal**		
⑥②	**Rod seal**		
⑥③	**Piston seal**		
⑥④	**Valve seal**		
⑥⑤	**Tube gasket**		
66	**Piston gasket**		
⑥⑦	**Retaining plate gasket**		
68	**Guide gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
125	CS1N125A-PS	Set of nos. ⑥⓪, ⑥②, ⑥③, ⑥④, ⑥⑤, ⑥⑦
140	CS1N140A-PS	
160	CS1N160A-PS	
180	CS1N180A-PS	
200	CS1N200A-PS	
250	CS1N250A-PS	

∗ Since the lock section for the CLS series is normally replaced as a unit, replacement seal kits are for the cylinder section only.
∗∗ Seal kits are sets consisting of items ⑥⓪, ⑥②, ⑥③, ⑥④, ⑥⑤ and ⑥⑦, which can be ordered using the order number for each cylinder bore size.
∗ The seal kit includes a grease pack (ø125 to ø160: 40 g, ø180, ø200: 50 g, ø250: 60 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)
∗ As for the center trunnion type, it is very difficult to adjust the position of the trunnion bracket and the center of the axis.
Therefore repair at SMC is recommended.

Replacement Parts: Lock Unit

CLS | **125** | **TN** | **–** | **UA** | **–** | **D** | **A93**

Bore size (mm)

Port thread type

Nil	Rc
TN	NPT
TF	G

Unit assembly

Lock unit built-in magnet

Nil	Without magnet (Without auto switch)
D	Built-in magnet

Lock unit auto switch

Nil	Without auto switch

∗ Refer to the table below for applicable auto switch models.

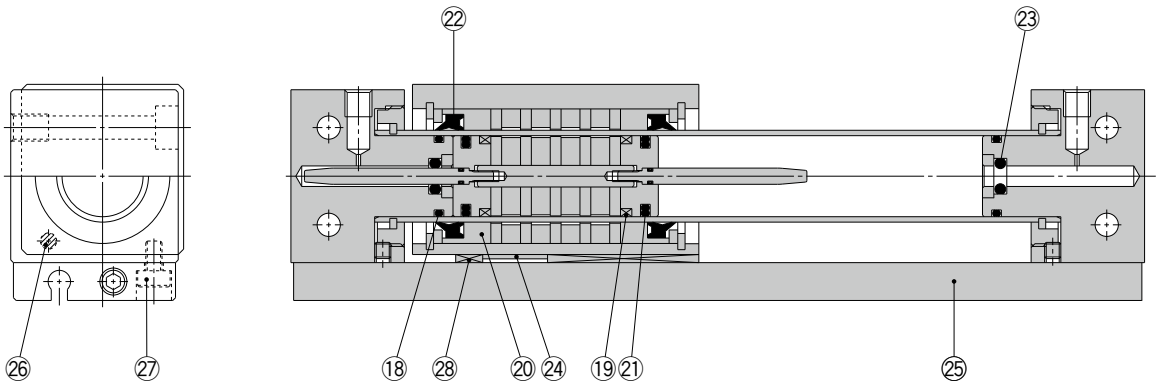
Cylinder Unit/Applicable Auto Switches

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch model	Lead wire length (m)			Applicable load	
					DC		AC		0.5 (Nil)	3 (L)	5 (Z)		
Solid state switch	——	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	——	M9N	●	●	○	——	Relay, PLC
				3-wire (PNP)				M9P	●	●	○		
				2-wire		12 V		M9B	●	●	○		
Reed switch	——	Grommet	No	2-wire	24 V	5 V, 12 V	100 V or less	A90	●	●	—	IC circuit	Relay, PLC
			Yes			12 V	100 V	A93	●	●	●	——	

REAR Series ø10, ø15

The Replacement Procedure is on p. 417

Construction



∗ The numbers correspond with those in the "Construction" of the REAR series in the **Web Catalog**.
∗ The figure is for ø15. (The magnet for ø10: 3 pcs.)

Seal Kit List

No.	Description	Material	Note
⑱	**Cylinder tube gasket**	NBR	**24 to 27 are non-replaceable parts, so they are not included in the seal kit.**
⑲	**Wear ring A**	Special resin	
⑳	**Wear ring B**	Special resin	
㉑	**Piston seal**	NBR	
㉒	**Scraper**	NBR	
㉓	**Cushion seal**	NBR	
24	**Magnetic shielding plate**	Rolled steel plate	
25	**Switch rail**	Aluminum alloy	
26	**Magnet**	—	
27	**Hexagon socket head cap screw**	Chromium steel	
㉘	**Wear ring C**	Special resin	

Replacement Parts: Seal Kit

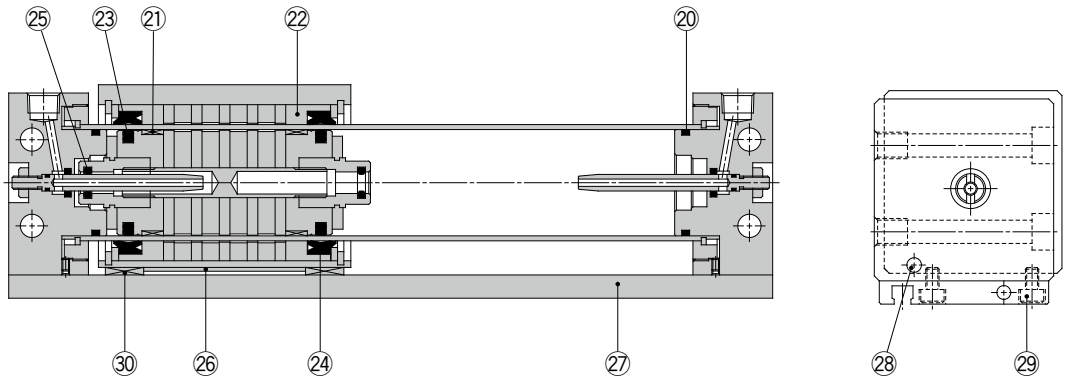
Bore size (mm)	Part no.	Contents
10	REAR10-PS	Set of nos. ⑱, ⑳, ㉑, ㉒, ㉓, ㉘ Note 1) 2)
15	REAR15-PS	Set of nos. ⑱, ⑲, ⑳, ㉑, ㉒, ㉓, ㉘ Note 1)

Note 1) It may be difficult to replace the cushion seal ㉓.
Note 2) For wear ring A, ø10, please consult with SMC.
∗ The seal kit includes a grease pack (ø10: 5 g and 10 g, ø15: 10 g). Order with one of the following part numbers when only the grease pack is required.
For ø10 grease pack part no.: GR-F-005 (5 g) **for external sliding part**
GR-S-010 (10 g) **for tube interior**
For ø15 grease pack part no.: GR-S-010 (10 g)

REAR Series ø20, ø25, ø32, ø40

The Replacement Procedure is on p. 417

Construction



∗ The numbers correspond with those in the "Construction" of the REAR series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑳	**Cylinder tube gasket**	NBR	**26 to 29 are non-replaceable parts, so they are not included in the seal kit.**
㉑	**Wear ring A**	Special resin	
㉒	**Wear ring B**	Special resin	
㉓	**Piston seal**	NBR	
㉔	**Scraper**	NBR	
㉕	**Cushion seal**	NBR	
26	**Magnetic shielding plate**	Rolled steel plate	
27	**Switch rail**	Aluminum alloy	
28	**Magnet**	—	
29	**Hexagon socket head cap screw**	Chromium steel	
㉚	**Wear ring C**	Special resin	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	REAR20-PS	Set of nos. ⑳, ㉑, ㉒, ㉓, ㉔, ㉕, ㉚ Note)
25	REAR25-PS	
32	REAR32-PS	
40	REAR40-PS	

Note) Cushion seal ㉕ may be difficult to be replaced.

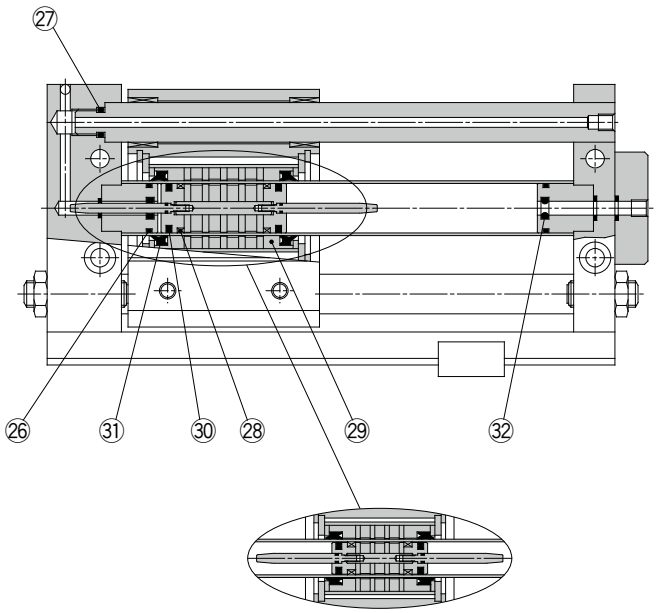
∗ The seal kit includes ⑳ to ㉕, ㉚. Order the seal kit based on each bore size.

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

REAS Series ø10, ø15

The Replacement Procedure is on p. 466

Construction



REAS10

∗ The numbers correspond with those in the "Construction" of the REAS series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉖	**Cylinder tube gasket**	NBR	
㉗	**Guide shaft gasket**	NBR	
㉘	**Wear ring A**	Special resin	
㉙	**Wear ring B**	Special resin	
㉚	**Piston seal**	NBR	
㉛	**Scraper**	NBR	
㉜	**Cushion seal**	NBR	

Replacement Parts: Seal Kit

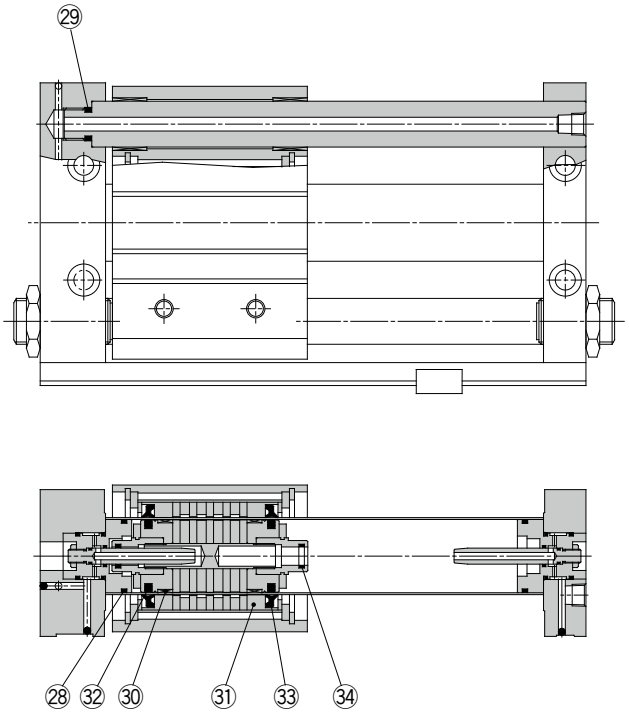
Bore size (mm)	Part no.	Contents
10	REAS10-PS	Set of nos. ㉖, ㉗, ㉙, ㉚, ㉛, ㉜ Note 1) 2)
15	REAS15-PS	Set of nos. ㉖, ㉗, ㉘, ㉙, ㉚, ㉛, ㉜ Note 1)

Note) The seal kit includes ㉖ to ㉜. Order the seal kit based on each bore size.
Note 1) It may be difficult to replace the cushion seal ㉜.
Note 2) For wear ring A, ø10, please consult with SMC.
∗ The seal kit includes a grease pack (ø10: 5 g and 10 g, ø15: 10 g). Order with one of the following part numbers when only the grease pack is required.
For ø10 grease pack part no.: GR-F-005 (5 g) **for external sliding part**
GR-S-010 (10 g) **for tube interior**
For ø15 grease pack part no.: GR-S-010 (10 g)

REAS Series ø20, ø25, ø32, ø40

The Replacement Procedure is on p. 466

Construction



∗ The numbers correspond with those in the "Construction" of the REAS series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉘	**Cylinder tube gasket**	NBR	
㉙	**Guide shaft gasket**	NBR	
㉚	**Wear ring A**	Special resin	
㉛	**Wear ring B**	Special resin	
㉜	**Piston seal**	NBR	
㉝	**Scraper**	NBR	
㉞	**Cushion seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	REAS20-PS	Set of nos.㉘, ㉙, ㉚, ㉛, ㉜, ㉝, ㉞ Note 1)
25	REAS25-PS	
32	REAS32-PS	
40	REAS40-PS	

Note) The seal kit includes ㉘ to ㉞. Order the seal kit based on each bore size.

Note 1) Cushion seal ㉞ may be difficult to be replaced.

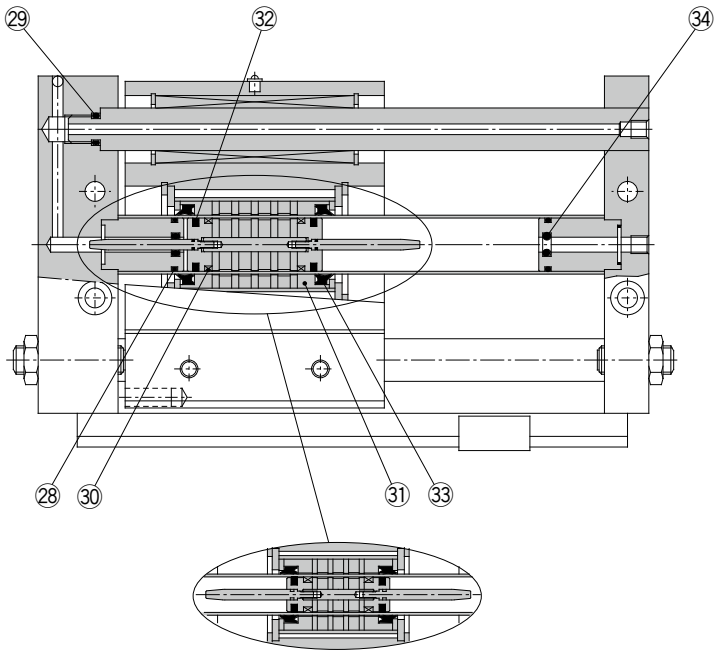
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

REAL Series

Ball Bushing Bearing Type: ø10, ø15

Construction

ø10, ø15



REAL10

∗ The numbers correspond with those in the "Construction" of the REAL series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉘	**Cylinder tube gasket**	NBR	
㉙	**Guide shaft gasket**	NBR	
㉚	**Wear ring A**	Special resin	
㉛	**Wear ring B**	Special resin	
㉜	**Piston seal**	NBR	
㉝	**Scraper**	NBR	
㉞	**Cushion seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	REAL10-PS	Set of nos. ㉘, ㉙, ㉛, ㉜, ㉝, ㉞
15	REAS15-PS	Set of nos. ㉘, ㉙, ㉚, ㉛, ㉜, ㉝, ㉞

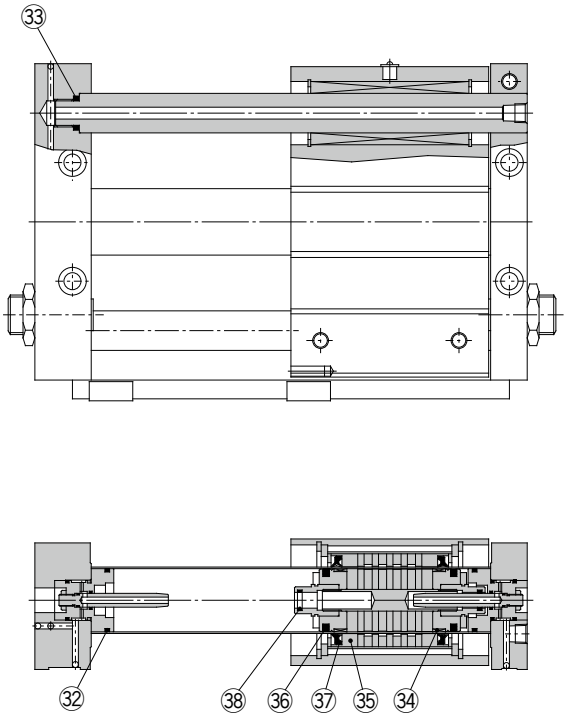
Note) The seal kit includes ㉘ to ㉞. Order the seal kit based on each bore size.
Note) It may be difficult to replace the cushion seal ㉞.
Note) For wear ring A, ø10, please consult with SMC.
∗ The seal kit includes a grease pack (ø10: 5 g and 10 g, ø15: 10 g). Order with one of the following part numbers when only the grease pack is required.
For ø10 grease pack part no.: GR-F-005 (5 g) **for external sliding part**
GR-S-010 (10 g) **for tube interior**
For ø15 grease pack part no.: GR-S-010 (10 g)

REAL Series

Ball Bushing Bearing Type: ø20, ø25, ø32, ø40

Construction

ø20 to ø40



∗ The numbers correspond with those in the "Construction" of the REAL series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉜	**Cylinder tube gasket**	NBR	
㉝	**Guide shaft gasket**	NBR	
㉞	**Wear ring A**	Special resin	
㉟	**Wear ring B**	Special resin	
㊱	**Piston seal**	NBR	
㊲	**Scraper**	NBR	
㊳	**Cushion seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	REAS20-PS	Set of nos. ㉜, ㉝, ㉞, ㉟, ㊱, ㊲, ㊳
25	REAS25-PS	
32	REAS32-PS	
40	REAS40-PS	

Note) The seal kit includes ㉜ to ㊳. Order the seal kit based on each bore size.

Note) It may be difficult to replace the cushion seal ㊳.

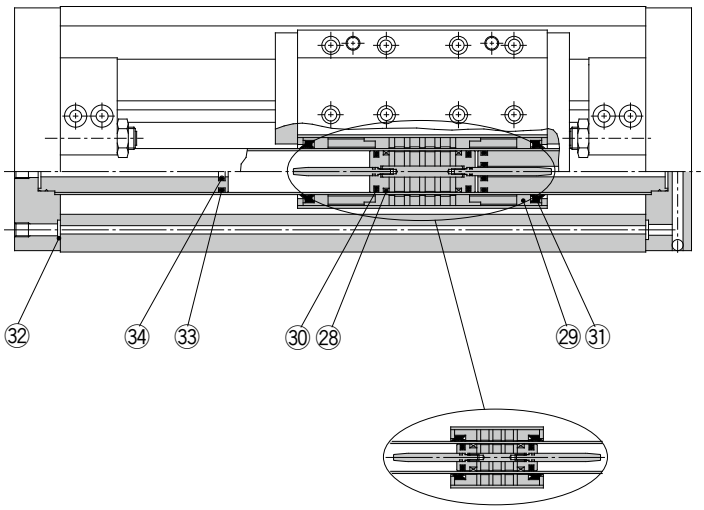
∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

REAH Series

Single Axis Type: ø10, ø15

Construction

Single axis type: ø10, ø15



REAH10

∗ The numbers correspond with those in the "Construction" of the REAH series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉘	**Wear ring A**	Special resin	
㉙	**Wear ring B**	Special resin	
㉚	**Piston seal**	NBR	
㉛	**Scraper**	NBR	
㉜	**O-ring**	NBR	
㉝	**O-ring**	NBR	
㉞	**Cushion seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
10	REAH10-PS	Set of nos. ㉙, ㉚, ㉛, ㉜, ㉝, ㉞
15	REAH15-PS	Set of nos. ㉘, ㉙, ㉚, ㉛, ㉜, ㉝, ㉞

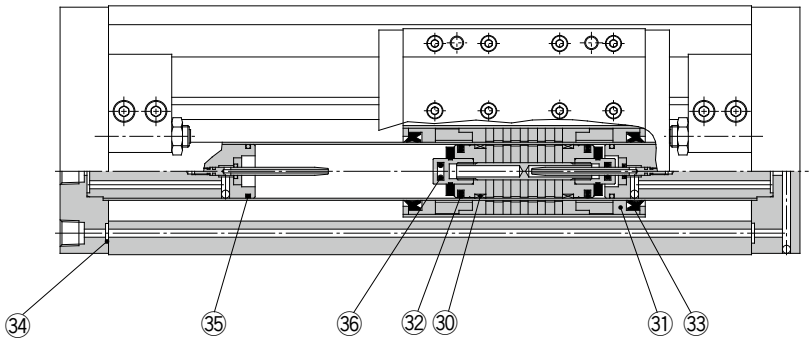
Note) The seal kit includes ㉘ to ㉞. Order the seal kit based on each bore size.
Note) It may be difficult to replace the cushion seal ㉞.
Note) For wear ring A, ø10, please consult with SMC.
∗ The seal kit includes a grease pack (ø10: 5 g and 10 g, ø15: 10 g). Order with one of the following part numbers when only the grease pack is required.
For ø10 grease pack part no.: GR-F-005 (5 g) **for external sliding part**
GR-S-010 (10 g) **for tube interior**
For ø15 grease pack part no.: GR-S-010 (10 g)

REAH Series

Single Axis Type: ø20, ø25

Construction

Single axis type: ø20, ø25



∗ The numbers correspond with those in the “Construction” of the REAH series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉚	**Wear ring A**	Special resin	
㉛	**Wear ring B**	Special resin	
㉜	**Piston seal**	NBR	
㉝	**Scraper**	NBR	
㉞	**O-ring**	NBR	
㉟	**O-ring**	NBR	
㊱	**Cushion seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	REAH20-PS	Set of nos. ㉚, ㉛, ㉜, ㉝, ㉞, ㉟, ㊱
25	REAH25-PS	

Note) The seal kit includes ㉚ to ㊱. Order the seal kit based on each bore size.

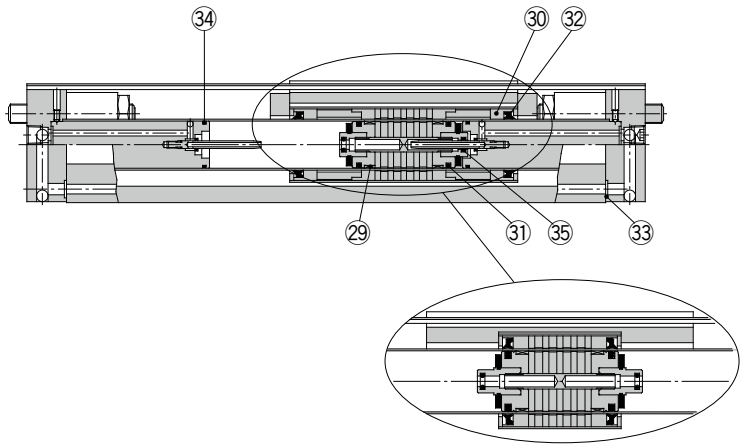
Note) It may be difficult to replace the cushion seal ㊱.

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

REAH Series Double Axis Type: ø25, ø32

Construction

Double axis type: ø25, ø32



REAHT32

∗ The numbers correspond with those in the "Construction" of the REAH series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉙	**Wear ring A**	Special resin	
㉚	**Wear ring B**	Special resin	
㉛	**Piston seal**	NBR	
㉜	**Scraper**	NBR	
㉝	**O-ring**	NBR	
㉞	**O-ring**	NBR	
㉟	**Cushion seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
25	REAHT25-PS	Set of nos. ㉙, ㉚, ㉛, ㉜, ㉝, ㉞, ㉟
32	REAHT32-PS	

Note) The seal kit includes ㉙ to ㉟. Order the seal kit based on each bore size.

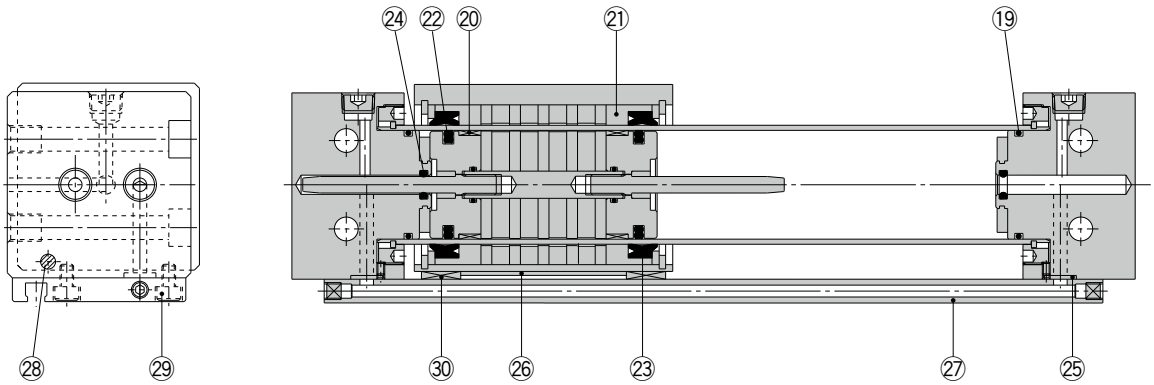
Note) It may be difficult to replace the cushion seal ㉟.

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

REBR Series ø15, ø25, ø32

The Replacement Procedure is on p. 417

Construction



∗ The numbers correspond with those in the "Construction" of the REBR series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑲	**Cylinder tube gasket**	NBR	**26 to 29 are non-replaceable parts, so they are not included in the seal kit.**
⑳	**Wear ring A**	Special resin	
㉑	**Wear ring B**	Special resin	
㉒	**Piston seal**	NBR	
㉓	**Scraper**	NBR	
㉔	**Cushion seal**	NBR	
㉕	**Switch rail gasket**	NBR	
26	**Magnetic shielding plate**	Rolled steel plate/Chromated	
27	**Switch rail**	Aluminum alloy/Clear anodized	
28	**Magnet**	—	
29	**Hexagon socket head cap screw**	Chromium steel/Nickel plated	
㉚	**Wear ring C**	Special resin	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
15	REBR15-PS	Set of nos. ⑲, ⑳, ㉑, ㉒, ㉓, ㉔, ㉕, ㉚
25	REBR25-PS	
32	REBR32-PS	

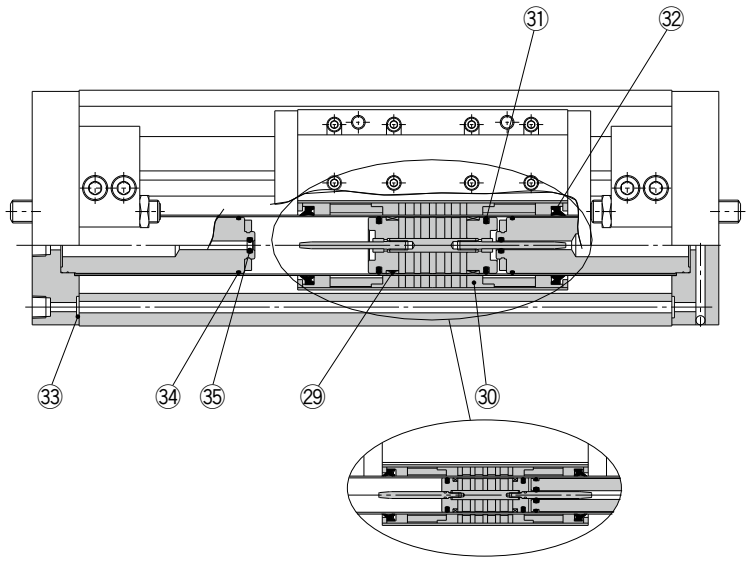
Note) Cushion seal ㉔ may be difficult to be replaced.

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

REBH Series Single Axis Type: ø15, ø25

Construction

Single axis type: ø15, ø25



REBH15

∗ The numbers correspond with those in the "Construction" of the REBH series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉙	**Wear ring A**	Special resin	
㉚	**Wear ring B**	Special resin	
㉛	**Piston seal**	NBR	
㉜	**Scraper**	NBR	
㉝	**O-ring**	NBR	
㉞	**O-ring**	NBR	
㉟	**Cushion seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
15	REBH15-PS	Set of nos. ㉙, ㉚, ㉛, ㉜, ㉝, ㉞, ㉟
25	REBH25-PS	

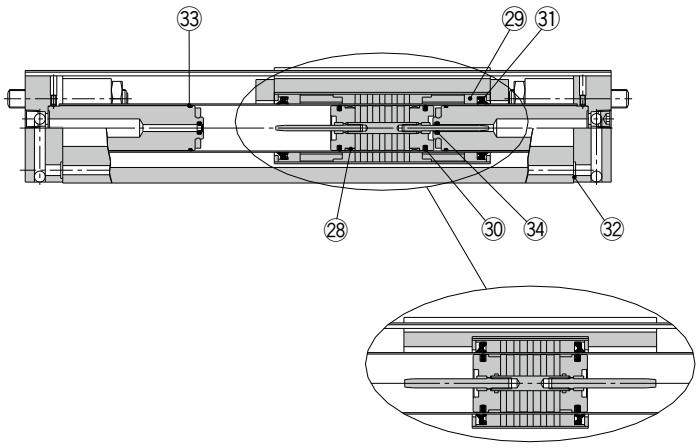
Note) Cushion seal ㉟ may be difficult to be replaced.

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

REBH Series Double Axis Type: ø25, ø32

Construction

Double axis type: ø25, ø32



REBHT32

∗ The numbers correspond with those in the “Construction” of the REBH series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉘	**Wear ring A**	Special resin	
㉙	**Wear ring B**	Special resin	
㉚	**Piston seal**	NBR	
㉛	**Scraper**	NBR	
㉜	**O-ring**	NBR	
㉝	**O-ring**	NBR	
㉞	**Cushion seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
25	REBHT25-PS	Set of nos. ㉘, ㉙, ㉚, ㉛, ㉜, ㉝, ㉞
32	REBHT32-PS	

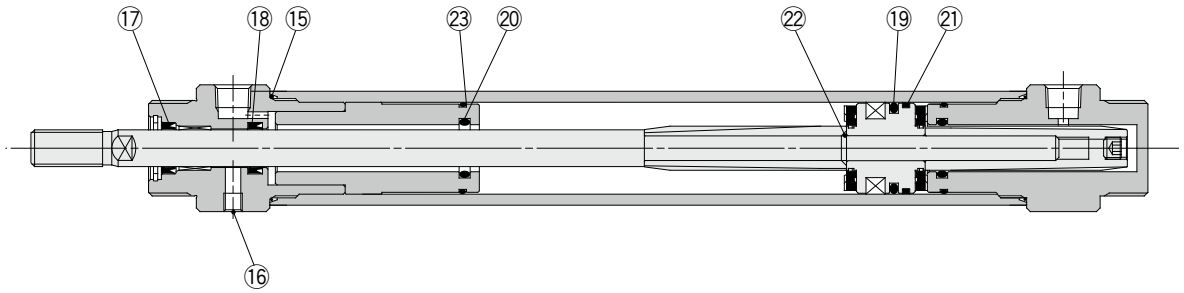
Note) Cushion seal ㉞ may be difficult to be replaced.

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

REC Series ø20, ø25, ø32, ø40

The Replacement Procedure is on p. 467

Construction



∗ The numbers correspond with those in the "Construction" of the REC series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Qty.	Note
⑮	**Cylinder tube gasket**	NBR	2	**16, 18 and 22 are non-replaceable parts, so they are not included in the seal kit.**
16	**Hexagon socket head set screw**	Carbon steel	1	
⑰	**Rod seal A**	NBR	1	
18	**Rod seal B**	NBR	1	
⑲	**Piston seal**	NBR	1	
⑳	**Cushion seal**	NBR	2	
㉑	**Wear ring**	Resin	1	
22	**Piston gasket**	NBR	1	
㉓	**Holder gasket**	NBR	2	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	REC20-PS	Set of nos. ⑮, ⑰, ⑲, ⑳, ㉑, ㉓
25	REC25-PS	
32	REC32-PS	
40	REC40-PS	

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

⚠Caution

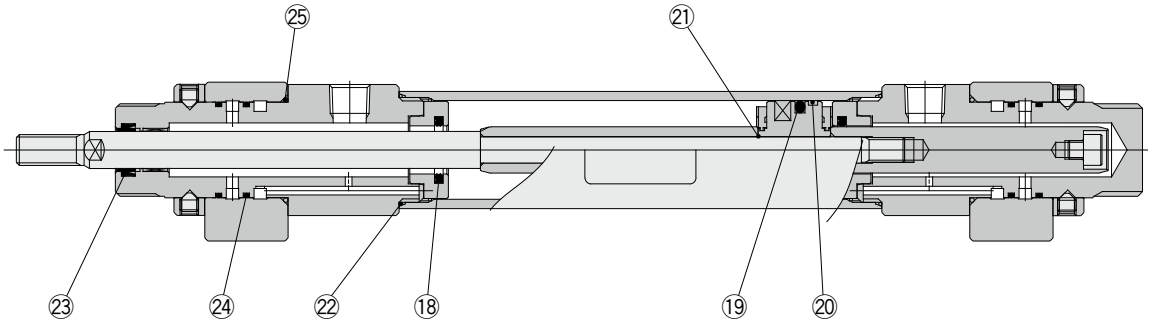
When disassembling cylinders with bore sizes of ø20 to ø40, grip the double flat part of either the tube cover or the rod cover with a vise and loosen the other side with a wrench or an adjustable angle wrench, and then remove the cover. When re-tightening, tighten approx. 2 degrees more than the original position.

RHC Series

ø20, ø25, ø32, ø40
ø50, ø63, ø80, ø100

The Replacement Procedure is on p. 469

Construction



∗ The numbers correspond with those in the "Construction" of the RHC series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Qty.	Note
⑱	**Cushion seal**	Special resin	2	**21 is a non-replaceable part, so it is not included in the seal kit.**
⑲	**Piston seal**	NBR	1	
⑳	**Wear ring**	Resin	1	
21	**Piston gasket**	NBR	—	
㉒	**Cylinder tube gasket**	NBR	2	
㉓	**Rod seal**	NBR	1	
㉔	**O-ring**	NBR	4	
㉕	**O-ring**	NBR	2	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	RHC20-PS	Set of nos. ⑱, ⑲, ⑳, ㉒, ㉓, ㉔, ㉕
25	RHC25-PS	
32	RHC32-PS	
40	RHC40-PS	

∗ The seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

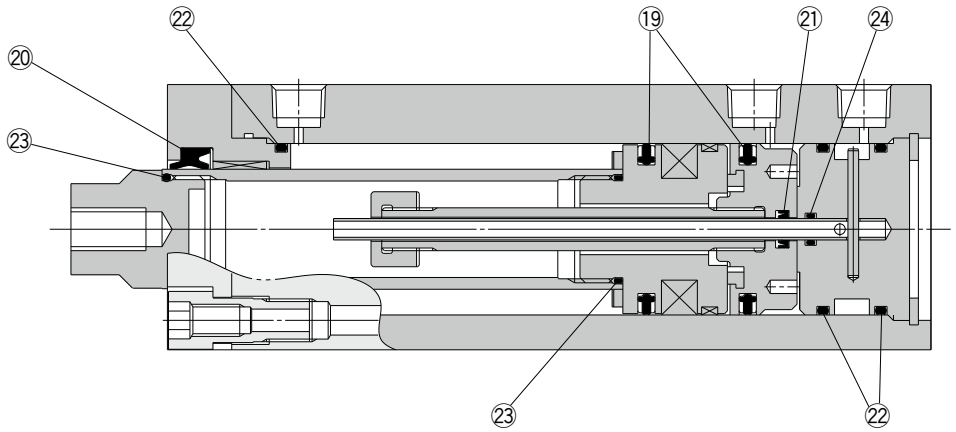
⚠Caution

When disassembling cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the rod cover or the head cover with a vise and loosen the other side with a wrench or an adjustable angle wrench, and then remove the cover. When retightening, tighten approx. 2 degrees more than the original position.

RZQ Series ø32, ø40, ø50, ø63

The Replacement Procedure is on p. 472

Construction



∗ The numbers correspond with those in the “Construction” of the RZQ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑲	**Piston seal**	NBR	**23 is a non-replaceable part, so it is not included in the seal kit.**
⑳	**Rod seal A**		
㉑	**Rod seal B**		
㉒	**Gasket A**		
23	**Gasket B**		
㉔	**Gasket C**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
32	RZQ32-PS	Set of nos. ⑲, ⑳, ㉑, ㉒, ㉔
40	RZQ40-PS	
50	RZQ50-PS	
63	RZQ63-PS	

∗ Seal kits are sets consisting of items ⑲, ⑳, ㉑, ㉒ and ㉔ and can be ordered using the seal kit number for each cylinder bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no. GR-L-010 (10 g)

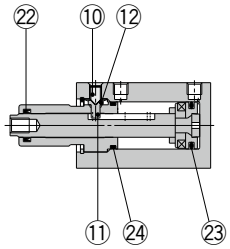
MK Series

ø12, ø16, ø20, ø25
ø32, ø40, ø50, ø63

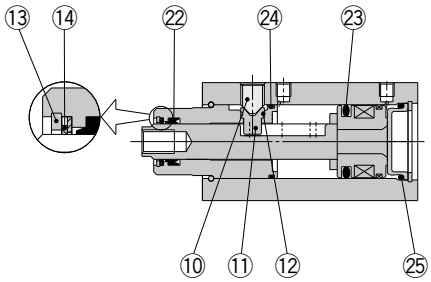
The Replacement Procedure is on p. 476

Construction

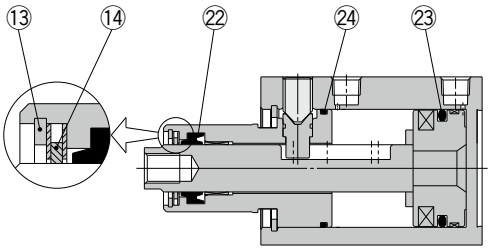
MK12, 16



MK20 to 32



MK40 to 63



∗ The numbers correspond with those in the "Construction" of the MK series in the **Web Catalog**.

Seal/Guide Pin Kit List

No.	Description	Material	Note
⑩	Hexagon socket head set screw	Chromium molybdenum steel	**13 is a non-replaceable part, so it is not included in the seal kit.**
⑪	**Guide pin**	Stainless steel	
⑫	**O-ring**	NBR	
13	Inverted internal retaining ring	Carbon tool steel	
⑭	**Coil scraper**	Phosphor bronze	
㉒	**Rod seal**	NBR	
㉓	**Piston seal**	NBR	
㉔	**Gasket**	NBR	
㉕	**O-ring**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
12	CQSB12-PS	Set of nos. ㉒, ㉓, ㉔
16	CQSB16-PS	
20	MK20Z-PS	Set of nos. ⑭, ㉒, ㉓, ㉔, ㉕
25	MK25Z-PS	
32	MK32Z-PS	
40	MK2T40-PS	Set of nos. ⑭, ㉒, ㉓, ㉔
50	MK2T50-PS	
63	MK63Z-PS	

∗ The seal kit includes numbers in the table. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

Replacement Parts: Guide Pin Kit

Bore size (mm)	Part no.	Contents
12	MK12Z-GS	Set of nos. ⑩, ⑪, ⑫
16	MK16Z-GS	
20	MK20Z-GS	
25	MK25Z-GS	
32	MK32Z-GS	
40	MK40Z-GS	
50	MK50Z-GS	
63	MK63Z-GS	

∗ The guide pin kit includes numbers in the table. Order the guide pin kit based on each bore size.
∗ For the replacement procedure of the replacement parts/seal and guide pin kits, refer to the Operation Manual.

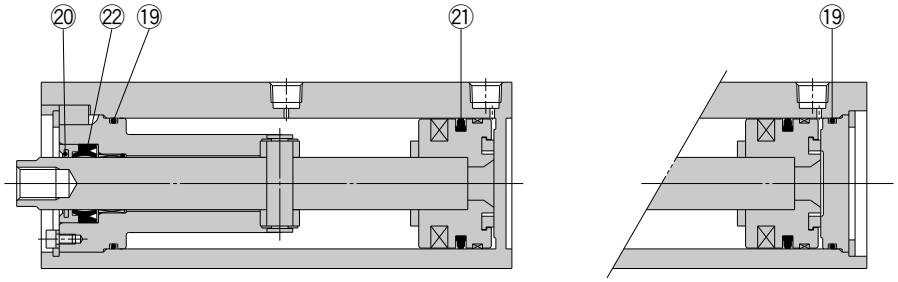
MK2T Series

ø20, ø25, ø32
ø40, ø50, ø63

The Replacement Procedure is on p. 481

Construction

MK2T□20 to 63



In case of clamp stroke 50 mm

∗ The numbers correspond with those in the "Construction" of the MK2T series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑲	**Gasket**	NBR	
⑳	**Coil scraper**	Bronze	
㉑	**Piston seal**	NBR	
㉒	**Rod seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	MK2T20-PS	Set of nos. ⑲, ⑳, ㉑, ㉒
25	MK2T25-PS	
32	MK2T32-PS	
40	MK2T40-PS	
50	MK2T50-PS	
63	MK2T63-PS	

∗ The seal kit includes ⑲, ⑳, ㉑, ㉒. Order the seal kit based on each bore size.

CKQG□/CKQP□ Series ø50

The Replacement Procedure is on p. 484

Replacement Parts

■ Seal Kit (For type without lock only)

Part no.	Contents/Quantity		
	Rod seal	Piston seal	Tube gasket
CQ2B50-PS	1	1	1

∗ Not available with a lock

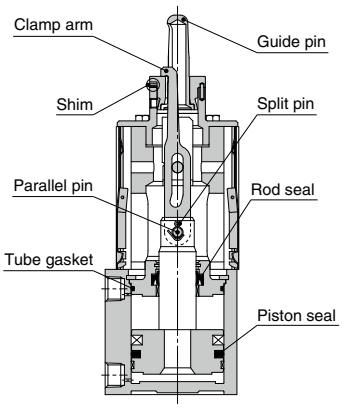
Storage of Seals (for long term storage)

1) Enclose seals by packaging and store.
2) Avoid locations exposed to direct sunlight and high temperature and humidity. In particular, isolate from equipment that can generate heat, radiation and ozone.
3) Do not stack a lot of seals, and deform or damage it by putting a heavy object on it.
4) White particles can emerge from the surface of seals during storage, but they do not affect its performance.

■ Grease Pack

Use a grease pack when adding grease during the replacement of the seals or maintenance of the cylinder.

Part no.	Grease weight
GR-S-010	10 g



CKQ□D□50
(With shims)

■ Guide Pin Part Nos.

CKQG − R 125 □

Guide pin shape

R	D
Round type	Diamond type

Shim

Nil	Without shims
S	With shims∗

∗ The guide pin comes with 1 parallel pin for positioning.

Guide pin diameter

∗ Refer to Table 1 (Symbol 2) below.

■ Clamp Arm Part Nos.

CKQG − 13 A

Applicable hole diameter of workpiece

∗ Refer to Table 1 (Symbol 1) below.

Clamp arm

∗ The clamp arm includes a split pin.

Table 1. Guide Pin

Symbol 1	Applicable hole diameter of workpiece	Symbol 2	Guide pin diameter	Shape
13	13	**125**	12.5	Round type
		127	12.7	
		128	12.8	
		129	12.9	
		130	13.0	
15	15	**145**	14.5	
		147	14.7	
		148	14.8	
		149	14.9	
		150	15.0	
16	16	**155**	15.5	
		157	15.7	
		158	15.8	
		159	15.9	
		160	16.0	

Symbol 1	Applicable hole diameter of workpiece	Symbol 2	Guide pin diameter	Shape
18	18	**175**	17.5	Round type Diamond type
		177	17.7	
		178	17.8	
		179	17.9	
		180	18.0	
20	20	**195**	19.5	
		197	19.7	
		198	19.8	
		199	19.9	
		200	20.0	
25	25	**245**	24.5	
		247	24.7	
		248	24.8	
		249	24.9	
		250	25.0	
30	30	**295**	29.5	
		297	29.7	
		298	29.8	
		299	29.9	
		300	30.0	

C(L)KQG32-X3036 ø32

Replacement Parts

■ Guide Pin Part Nos.

CKQG32X – 075 R

Guide pin diameter
∗ Refer to Table 1 below.

Guide pin shape

R	Round type 	D	Diamond type 

Table 1. Guide Pin Diameter

Symbol	075	076	077	078	079	080	095	096	097	098	099	100	105	106	107	108	109	110	115	116	117	118	119	120
Guide pin diameter [mm]	7.5	7.6	7.7	7.8	7.9	8.0	9.5	9.6	9.7	9.8	9.9	10.0	10.5	10.6	10.7	10.8	10.9	11.0	11.5	11.6	11.7	11.8	11.9	12.0
Applicable hole diameter of workpiece [mm]	For ø8						For ø10						For ø11						For ø12					
Guide pin shape	Round type						Round type/Diamond type																	

Symbol	125	126	127	128	129	130	135	136	137	138	139	140	145	146	147	148	149	150	155	156	157	158	159	160
Guide pin diameter [mm]	12.5	12.6	12.7	12.8	12.9	13.0	13.5	13.6	13.7	13.8	13.9	14.0	14.5	14.6	14.7	14.8	14.9	15.0	15.5	15.6	15.7	15.8	15.9	16.0
Applicable hole diameter of workpiece [mm]	For ø13						For ø14						For ø15						For ø16					
Guide pin shape	Round type/Diamond type																							

Symbol	175	176	177	178	179	180	195	196	197	198	199	200
Guide pin diameter [mm]	17.5	17.6	17.7	17.8	17.9	18.0	19.5	19.6	19.7	19.8	19.9	20.0
Applicable hole diameter of workpiece [mm]	For ø18						For ø20					
Guide pin shape	Round type/Diamond type											

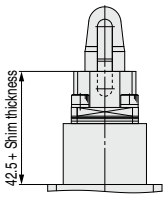
■ Clamp Arm Assembly Part Nos.

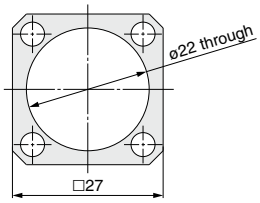
Applicable hole diameter of workpiece	Part no.
For ø8	**CKQ32-54-117ZV-R**
For ø10 and ø11	**CKQ32-54-118ZV-R**
For ø12 and ø13	**CKQ32-54-119ZV-R**
For ø14 and ø15	**CKQ32-54-120ZV-R**
For ø16	**CKQ32-54-121ZV-R**
For ø18 and ø20	**CKQ32-54-122ZV-R**

∗ The clamp arm includes a basic internal retaining ring.

Option

■ Shim





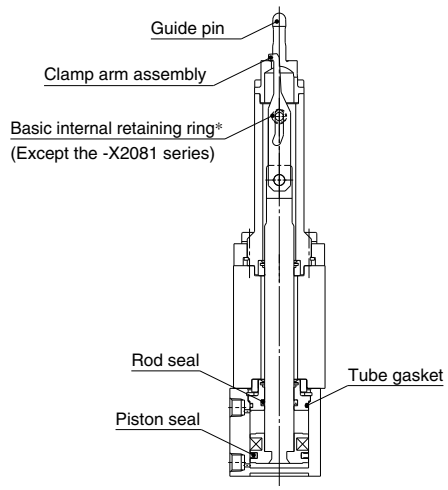
Description	Part no.	Note
Shim A	**CKQ32-36A746MN**	Plate thickness 1 [mm]
Shim B	**CKQ32-36B746MN**	Plate thickness 0.5 [mm]

- Shims can be mounted up to 3 mm.
- For auto switches (excludes the M9□V), when the total thickness of shims and a workpiece is over 2 mm, the auto switch may not be adjusted to the most sensitive position.

CKQG32 Series ø32

The Replacement Procedure is on p. 496

Replacement Parts



CKQG□32-100R□H-X2082

■ Seal Kit (For type without lock only)

Part no.	Contents
CQ2B32-PS	①Piston seal ②Rod seal ③Tube gasket

* Seal kit includes ①, ②, ③. Since the seal kit does not include a grease pack, order the "Grease Pack" below separately.
* CLKQ cannot be disassembled and therefore no seal kit is available.

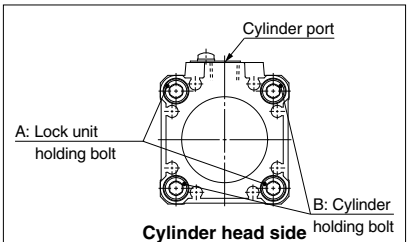
■ Grease Pack

Part no.	Contents
GR-S-010	Grease 10 g

* Please consult with SMC when replacing the actuating cylinders.

■ Shim (Option)

Refer to the **Web Catalog** for details about part numbers and dimensions.



Cylinder head side

⚠ Warning

When replacing the arm for cylinders with lock (CLKQG32 series), never loosen A: Lock unit holding bolt shown above (2 places). (Cylinders are fixed in place with B: Cylinder holding bolt (2 places).)

■ Guide Pin Part Nos.

CKQG32X − 075 R

Guide pin diameter
* Refer to Table 1 (Symbol 2) below.

Guide pin shape

R	Round type	**D**	Diamond type

■ Clamp Arm Assembly Part Nos.

CKQG32X − 08 B

Applicable hole diameter of workpiece
* Refer to Table 1 (Symbol 1) below.

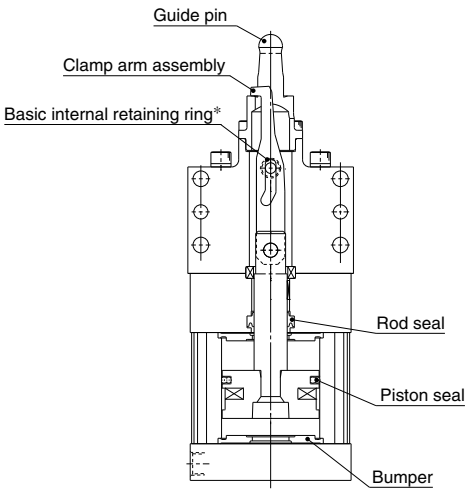
Clamp arm assembly
* The clamp arm includes a basic internal retaining ring.

Table 1. Guide Pin Diameter/Applicable Hole Diameter of Workpiece

Symbol 1	Applicable hole diameter of workpiece	Symbol 2	Guide pin diameter	Shape
08	8	**075**	7.5	Round type
		076	7.6	
		077	7.7	
		078	7.8	
		079	7.9	
		080	8.0	
09	9	**085**	8.5	
		086	8.6	
		087	8.7	
		088	8.8	
		089	8.9	
		090	9.0	
10	10	**095**	9.5	
		096	9.6	
		097	9.7	
		098	9.8	
		099	9.9	
		100	10.0	Round type
11	11	**105**	10.5	Diamond type
		106	10.6	
		107	10.7	
		108	10.8	
		109	10.9	
		110	11.0	
12	12	**115**	11.5	
		116	11.6	
		117	11.7	
		118	11.8	
		119	11.9	
		120	12.0	
13	13	**125**	12.5	
		126	12.6	
		127	12.7	
		128	12.8	
		129	12.9	
		130	13.0	Round type
14	14	**135**	13.5	Diamond type
		136	13.6	
		137	13.7	
		138	13.8	
		139	13.9	
		140	14.0	
15	15	**145**	14.5	
		146	14.6	
		147	14.7	
		148	14.8	
		149	14.9	
		150	15.0	
16	16	**155**	15.5	
		156	15.6	
		157	15.7	
		158	15.8	
		159	15.9	
		160	16.0	
18	18	**175**	17.5	
		176	17.6	
		177	17.7	Round type
		178	17.8	Diamond type
		179	17.9	
		180	18.0	
20	20	**195**	19.5	
		196	19.6	
		197	19.7	
		198	19.8	
		199	19.9	
		200	20.0	

CKU32 Series ø32

Replacement Parts



CKU32-120R□L-X2321

■ Seal Kit (For type without lock only)

Part no.	Contents
MUB32-PS	①Piston seal ②Rod seal ③Bumper

* Seal kit includes ①, ②, ③. Since the seal kit does not include a grease pack, order the "Grease Pack" below separately.
* CLKU cannot be disassembled and therefore no seal kit is available.

■ Grease Pack

Part no.	Contents
GR-S-010	Grease 10 g

* Please consult with SMC when replacing the actuating cylinders.

■ Shim (Option)

Refer to the **Web Catalog** for details about part numbers and dimensions.

■ Guide Pin Part Nos.

CKQG32X− 075 R

Guide pin diameter
* Refer to Table 1 (Symbol 2) below.

Guide pin shape

R	Round type	**D**	Diamond type

■ Clamp Arm Assembly Part Nos.

CKQG32X− 08 B

Applicable hole diameter of workpiece
* Refer to Table 1 (Symbol 1) below.

Clamp arm assembly
* The clamp arm includes a basic internal retaining ring.

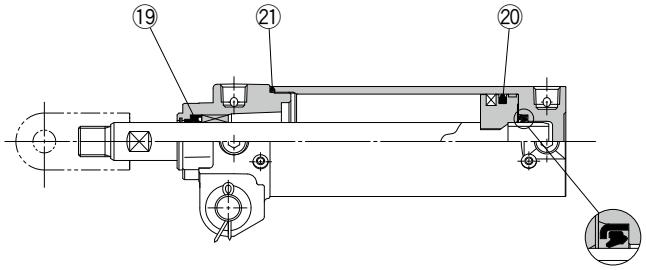
Table 1. Guide Pin Diameter/Applicable Hole Diameter of Workpiece

Symbol 1	Applicable hole diameter of workpiece	Symbol 2	Guide pin diameter	Shape
08	8	**075**	7.5	Round type
		076	7.6	
		077	7.7	
		078	7.8	
		079	7.9	
		080	8.0	
09	9	**085**	8.5	
		086	8.6	
		087	8.7	
		088	8.8	
		089	8.9	
		090	9.0	
10	10	**095**	9.5	
		096	9.6	
		097	9.7	
		098	9.8	
		099	9.9	
		100	10.0	Round type Diamond type
11	11	**105**	10.5	
		106	10.6	
		107	10.7	
		108	10.8	
		109	10.9	
		110	11.0	
12	12	**115**	11.5	
		116	11.6	
		117	11.7	
		118	11.8	
		119	11.9	
		120	12.0	
13	13	**125**	12.5	
		126	12.6	
		127	12.7	
		128	12.8	
		129	12.9	
		130	13.0	Round type
14	14	**135**	13.5	Diamond type
		136	13.6	
		137	13.7	
		138	13.8	
		139	13.9	
		140	14.0	
15	15	**145**	14.5	
		146	14.6	
		147	14.7	
		148	14.8	
		149	14.9	
		150	15.0	
16	16	**155**	15.5	
		156	15.6	
		157	15.7	
		158	15.8	
		159	15.9	
		160	16.0	
18	18	**175**	17.5	
		176	17.6	
		177	17.7	Round type
		178	17.8	Diamond type
		179	17.9	
		180	18.0	
20	20	**195**	19.5	
		196	19.6	
		197	19.7	
		198	19.8	
		199	19.9	
		200	20.0	

CKG1/CKP1 Series ø40, ø50, ø63

Construction

CKG1□40, 50, 63 Built-in standard magnet type/With magnetic field resistant auto switch



∗ The numbers correspond with those in the "Construction" of the CKG1 series in the **Web Catalog**.

Seal Kit List

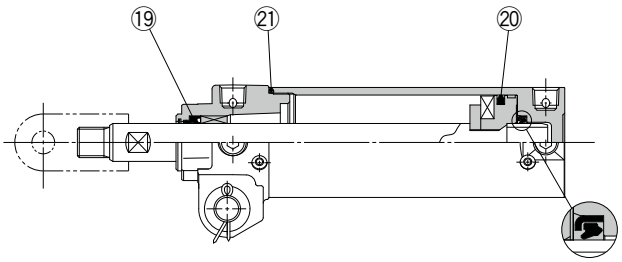
No.	Description	Material	Note
⑲	**Rod seal**	NBR	
⑳	**Piston seal**		
㉑	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
40	CK1A40-PS	Set of nos. ⑲, ⑳, ㉑

Note 1) Since the seal kit does not come with a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (compatible with all sizes)
Note 2) Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.

CKP1□40, 50, 63 Built-in strong magnet type/With magnetic field resistant auto switch



∗ The numbers correspond with those in the "Construction" of the CKP1 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑲	**Rod seal**	NBR	
⑳	**Piston seal**		
㉑	**Tube gasket**		

Replacement Parts: Seal Kit

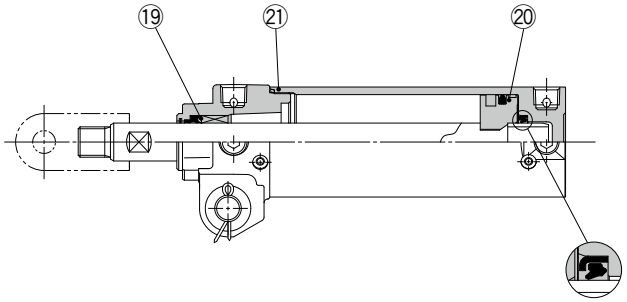
Bore size (mm)	Part no.	Contents
40	CK1A40-PS	Set of nos. ⑲, ⑳, ㉑

Note 1) Since the seal kit does not come with a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (compatible with all sizes)
Note 2) Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.

CK1/CKG1 Series ø40, ø50, ø63

Construction

CK1□40, 50, 63 Basic type/CKG1□40, 50, 63 Built-in standard magnet type



∗ The numbers correspond with those in the "Construction" of the CK□1 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑲	**Rod seal**	NBR	
⑳	**Piston seal**		
㉑	**Tube gasket**		

Replacement Parts: Seal Kit

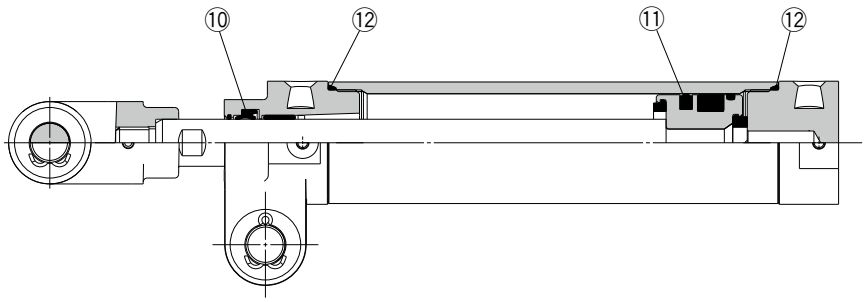
Bore size (mm)	Part no.	Contents
40	CK1A40-PS	Set of nos. ⑲, ⑳, ㉑

Note 1) Since the seal kit does not come with a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (compatible with all sizes)
Note 2) Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.

CKG/CKP-X2095

ø25, ø32, ø40

Construction



∗ The numbers correspond with those in the “Construction” of the CKG/CKP-X2095 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
⑩	**Rod seal**	NBR	Quantity: 1
⑪	**Piston seal**		
⑫	**Tube gasket**		Quantity: 2

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Note
25	CKA25-X2095-PS	Set of nos. ⑩, ⑪, ⑫
32	CKA32-X2095-PS	
40	CKA40-X2095-PS	

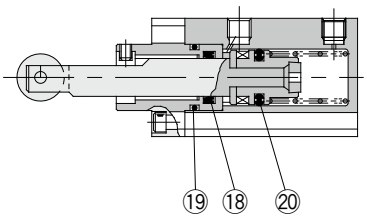
RSQ Series

ø12, ø16, ø20, ø32, ø40, ø50

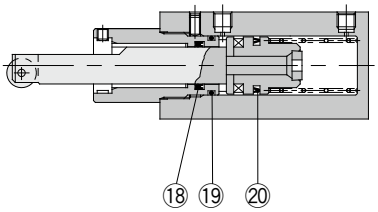
The Replacement Procedure is on p. 499

Construction

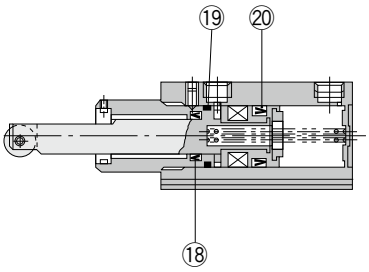
Roller rod end



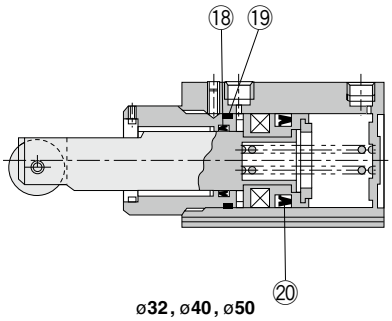
ø12



ø16



ø20



ø32, ø40, ø50

∗ The numbers correspond with those in the "Construction" of the RSQ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑱	**Rod seal**	NBR	
⑲	**Gasket**		
⑳	**Piston seal**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.			Contents
	Double acting	Double acting with spring loaded	Single acting	
12	RSQ12D-PS	RSQ12T-PS		Set of nos. ⑱, ⑲, ⑳
16	RSQ16D-PS	RSQ16B-PS	RSQ16T-PS	
20	RSQ20D-PS	RSQ20B-PS	RSQ20T-PS	
32	RSQ32D-PS	RSQ32B-PS	RSQ32T-PS	
40	RSQ40D-PS	RSQ40B-PS	RSQ40T-PS	
50	RSQ50D-PS	RSQ50B-PS	RSQ50T-PS	

∗ The seal kit includes ⑱, ⑲, ⑳. Order the seal kit based on each bore size.

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

Replacement Parts: Shock Absorber

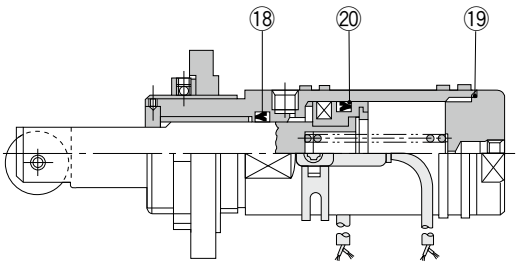
Bore size (mm)	Part no.
32	RB1007-X225
40, 50	RB1407-X552

RSG Series ø40, ø50

The Replacement Procedure is on p. 499

Construction

Roller rod end



∗ The numbers correspond with those in the “Construction” of the RSG series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑱	**Rod seal**	NBR	
⑲	**Gasket**		
⑳	**Piston seal**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.			Contents
	Double acting	Double acting with spring loaded	Single acting	
40	RSG40D-PS	RSG40B-PS	RSG40T-PS	Set of nos. ⑱, ⑲, ⑳
50	RSG50D-PS	RSG50B-PS	RSG50T-PS	

∗ The seal kit includes ⑱, ⑲, ⑳. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

Replacement Parts: Shock Absorber

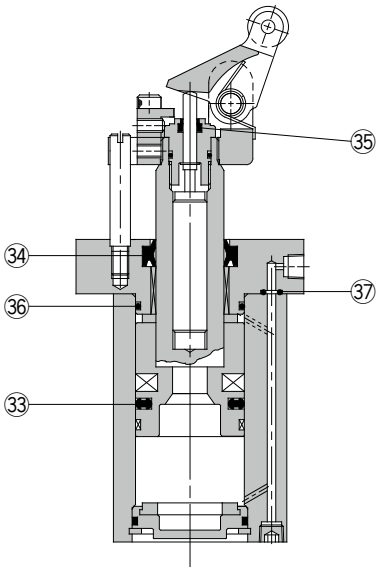
Bore size (mm)	Part no.
40, 50	RB1407-X552

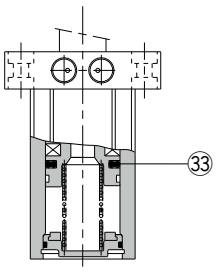
RSH Series ø20, ø32

The Replacement Procedure is on p. 501

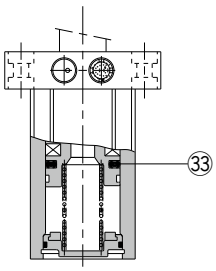
Construction

ø20, ø32
Double acting (DL, DM)





Double acting spring type (BL, BM)



Single acting (TL, TM)

∗ The numbers correspond with those in the "Construction" of the RSH/RS1H series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉝	**Piston seal**	NBR	**34 is a non-replaceable part, so it is not included in the seal kit.**
34	**Rod seal**		
㉟	**Scraper**		
㊱	**Tube gasket**		
㊲	**O-ring**		

Replacement Parts: Shock Absorber

Bore size (mm)	Part no.
20	RSH-R20
32	RSH-R32

Replacement Parts: Seal Kit

Bore size (mm)	Part no.			Contents
	Double acting	Double acting spring type	Single acting	
20	RSH20D-PS	RSH20T-PS		Set of nos. ㉝, ㉟, ㊱, ㊲
32	RSH32D-PS	RSH32T-PS		

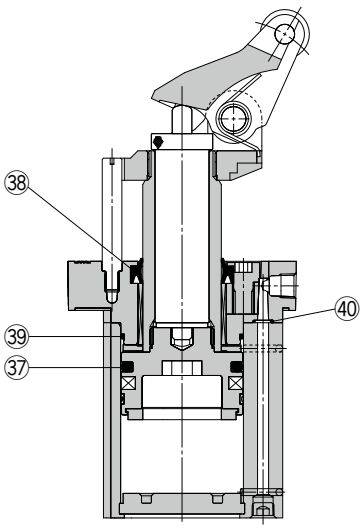
∗ The seal kit includes ㉝, ㉟, ㊱, ㊲ for ø20 to ø32. Order the seal kit based on each bore size.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

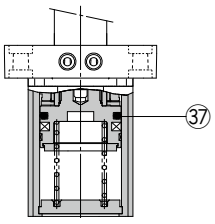
RS2H Series ø50, ø63, ø80

The Replacement Procedure is on p. 501

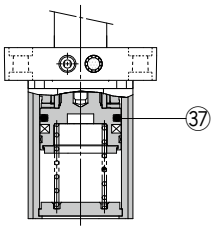
Construction

Double acting (DL, DM)





Double acting spring type (BL, BM)



Single acting (TL, TM)

∗ The numbers correspond with those in the "Construction" of the RS2H series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㊲	**Piston seal**	NBR	**38 is a non-replaceable part, so it is not included in the seal kit.**
㊳	**Rod seal**		
㊴	**Tube gasket**		
㊵	**O-ring**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.			Contents
	Double acting	Double acting spring type	Single acting	
50	RS2H50D-PS	RS2H50T-PS		Set of nos. ㊲, ㊴, ㊵
63	RS2H63D-PS	RS2H63T-PS		
80	RS2H80D-PS	RS2H80T-PS		

∗ The seal kit includes ㊲, ㊴, ㊵ for ø50 to ø80. Order the seal kit based on each bore size.

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

Replacement Parts: Shock Absorber

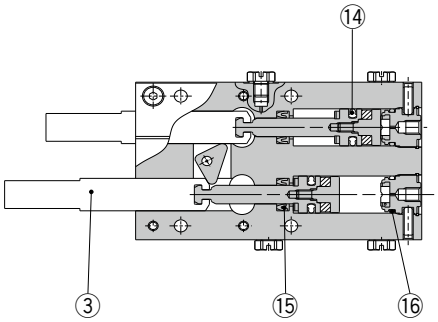
Bore size (mm)	Part no.
50	RS2H-R50
63	RS2H-R63
80	RS2H-R80

MIW Series

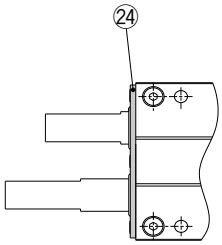
ø8, ø12, ø20, ø25, ø32

The Replacement Procedure is on p. 504

Construction



Option



Scraper

∗ The numbers correspond with those in the “Construction” of the MIW/MIS series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
3	**Finger**	Carbon steel	Heat treatment/Special treatment
⑭	**Piston seal**	NBR	**3 is not included in the seal kit. Order it as required with the individual part number provided.**
⑮	**Rod seal**	NBR	
⑯	**Gasket**	NBR	

Option: Scraper

No.	Description	Material	Note
24	**Scraper**	Stainless steel + NBR	

Replacement Parts: Seal Kit

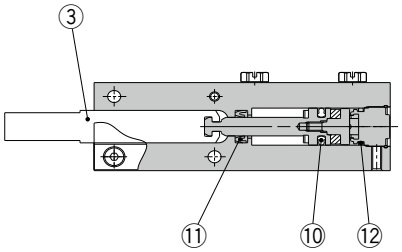
Model \ Description	Finger			Seal kit	Scraper assembly	Grease pack
	Standard	Tapped on upper and lower faces	Tapped on all faces			
MIW8-8D	MI-A0801-8	MI-A0802-8	MI-A0803-8	MIW8-PS	MIW-A0804	MH-G01 (Contents quantity 30 g)
MIW12-12D	MI-A1201-12	MI-A1202-12	MI-A1203-12	MIW12-PS	MIW-A1204	
MIW20-20D	MI-A2001-20	MI-A2002-20	MI-A2003-20	MIW20-PS	MIW-A2004	
MIW25-25D	MI-A2501-25	MI-A2502-25	MI-A2503-25	MIW25-PS	MIW-A2504	
MIW32-32D	MI-A3201-32	MI-A3202-32	MI-A3203-32	MIW32-PS	MIW-A3204	
Main parts no.	③ (1 pc.)			⑭, ⑮, ⑯	㉔	

MIS Series ø8, ø12, ø20, ø25, ø32

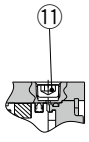
The Replacement Procedure is on p. 504

Construction

ø8

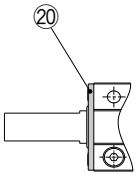


ø25, ø32



(ø32 only)

Option



Scraper

∗ The numbers correspond with those in the "Construction" of the MIW/MIS series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
3	**Finger**	Carbon steel	Heat treatment/Special treatment
⑩	**Piston seal**	NBR	**3 is not included in the seal kit. Order it as required with the individual part number provided.**
⑪	**Rod seal**	NBR	
⑫	**Gasket**	NBR	

Option: Scraper

No.	Description	Material	Note
20	**Scraper**	Stainless steel + NBR	

Replacement Parts: Seal Kit

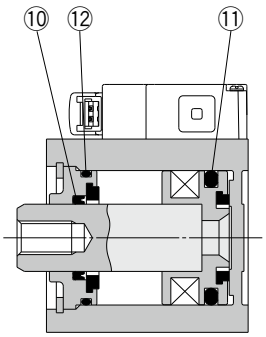
Description / Model	Finger			Seal kit	Scraper assembly	Grease pack
	Standard	Tapped on upper and lower faces	Tapped on all faces			
MIS8-10D	MI-A0801-10	MI-A0802-10	MI-A0803-10	MIS8-PS	MIS-A0804	MH-G01 (Contents quantity 30 g)
MIS8-20D	MI-A0801-20	MI-A0802-20	MI-A0803-20			
MIS12-10D	MI-A1201-10	MI-A1202-10	MI-A1203-10	MIS12-PS	MIS-A1204	
MIS12-20D	MI-A1201-20	MI-A1202-20	MI-A1203-20			
MIS12-30D	MI-A1201-30	MI-A1202-30	MI-A1203-30			
MIS20-10D	MI-A2001-10	MI-A2002-10	MI-A2003-10	MIS20-PS	MIS-A2004	
MIS20-20D	MI-A2001-20	MI-A2002-20	MI-A2003-20			
MIS20-30D	MI-A2001-30	MI-A2002-30	MI-A2003-30			
MIS25-30D	MI-A2501-30	MI-A2502-30	MI-A2503-30	MIS25-PS	MIS-A2504	
MIS25-50D	MI-A2501-50	MI-A2502-50	MI-A2503-50			
MIS32-30D	MI-A3201-30	MI-A3202-30	MI-A3203-30	MIS32-PS	MIS-A3204	
MIS32-50D	MI-A3201-50	MI-A3202-50	MI-A3203-50			
Main parts no.	③ (1 pc.)			⑩, ⑪, ⑫	⑳	

CVQ Series ø32, ø40, ø50, ø63

The Replacement Procedure is on p. 387

Construction

Basic type



∗ The numbers correspond with those in the "Construction" of the CVQ series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑩	**Rod seal**	NBR	
⑪	**Piston seal**		
⑫	**Gasket**		

Replacement Parts: Seal Kit

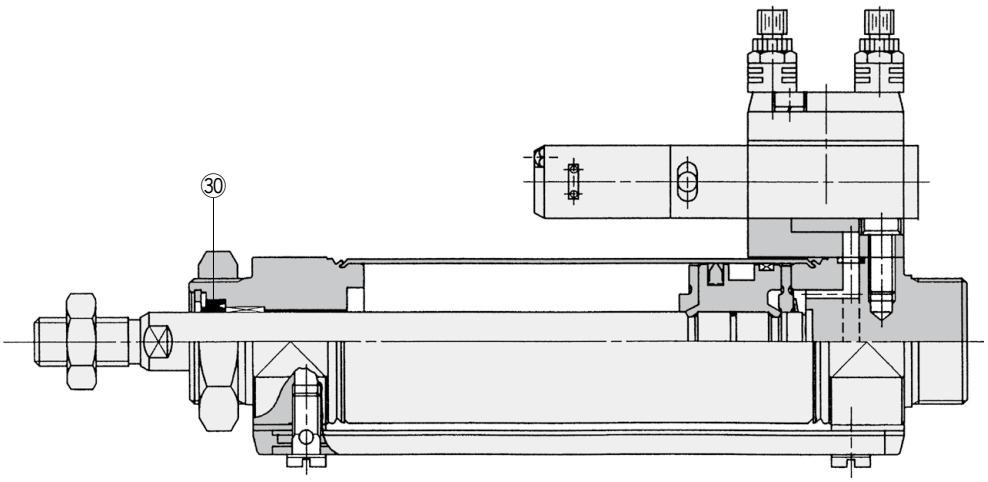
Bore size (mm)	Part no.	Contents
32	CQ2B32-PS	Set of nos. ⑩, ⑪, ⑫
40	CQ2B40-PS	
50	CQ2B50-PS	
63	CQ2B63-PS	

∗ The seal kit includes ⑩, ⑪, ⑫. Order the seal kit based on each bore size.
∗ Grease pack should be ordered separately as it is not included in the seal kit.
Grease pack part no.: GR-S-010 (10 g)

CVM5 Series ø20, ø25, ø32, ø40

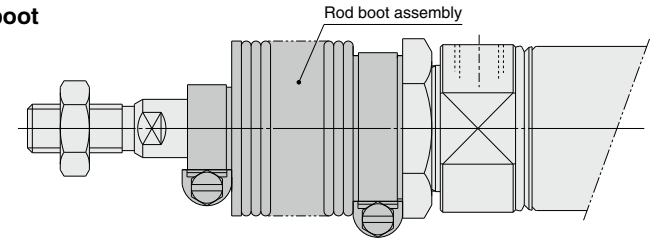
The Replacement Procedure is on p. 377

Construction



∗ The number corresponds with that in the "Construction" of the CVM5 series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 243.

Seal Kit List

No.	Description	Material	Note
30	**Rod seal**	NBR	

Replacement Parts: Seal Kit

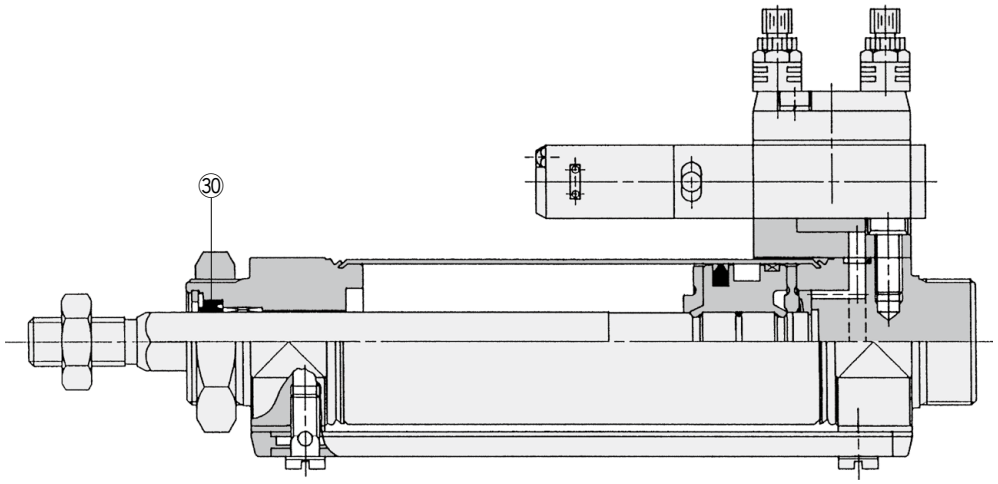
Bore size (mm)	Part no.	Contents
20	CM220-PS	
25	CM225-PS	
32	CM232-PS	
40	CM240-PS	

∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CVM5K Series ø20, ø25 ø32, ø40

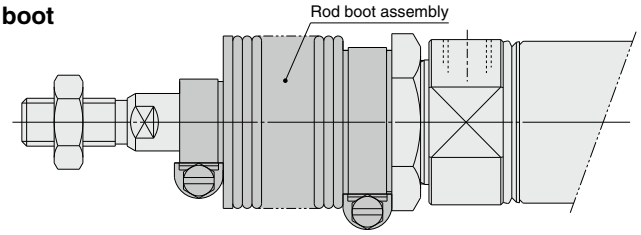
The Replacement Procedure is on p. 377

Construction



∗ The number corresponds with that in the "Construction" of the CVM5K series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 243.

Seal Kit List

No.	Description	Material	Note
30	**Rod seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CM2K20-PS	
25	CM2K25-PS	
32	CM2K32-PS	
40	CM2K40-PS	

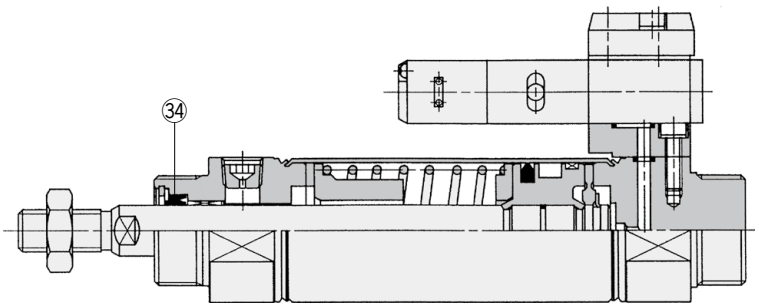
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CVM3 Series ø20, ø25, ø32, ø40

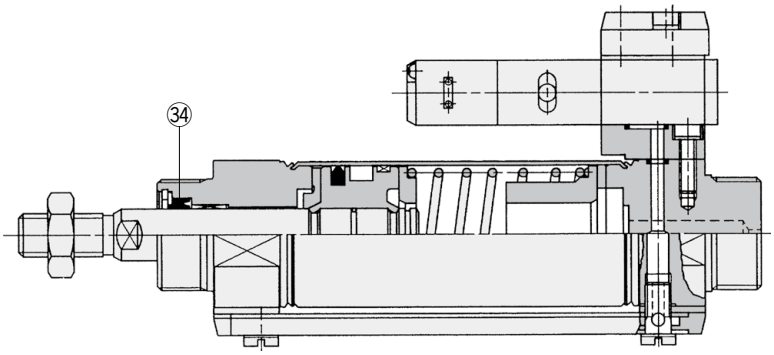
The Replacement Procedure is on p. 377

Construction

Spring return



Spring extend



∗ The numbers correspond with those in the “Construction” of the CVM3 series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉞	**Rod seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CM220-PS	
25	CM225-PS	
32	CM232-PS	
40	CM240-PS	

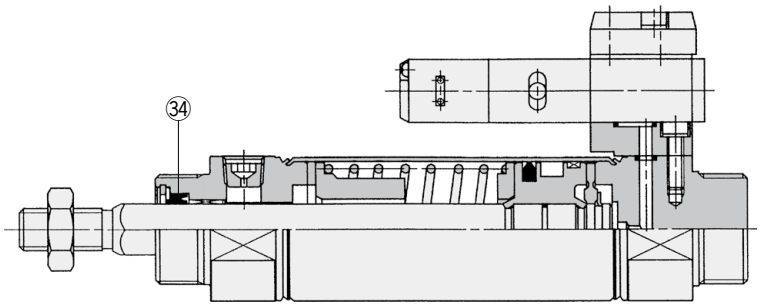
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CVM3K Series ø20, ø25 ø32, ø40

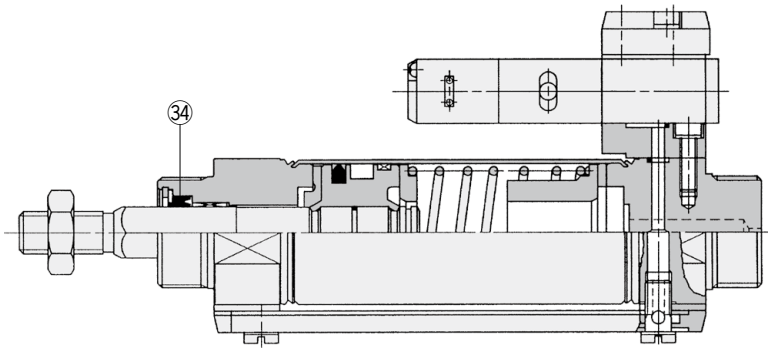
The Replacement Procedure is on p. 377

Construction

Spring return



Spring extend



∗ The numbers correspond with those in the “Construction” of the CVM3K series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉞	**Rod seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CM2K20-PS	
25	CM2K25-PS	
32	CM2K32-PS	
40	CM2K40-PS	

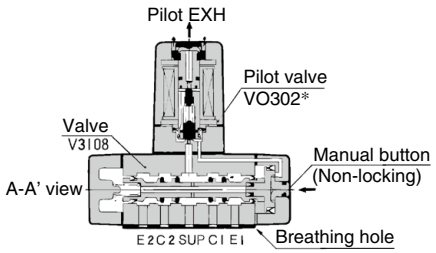
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

CV3 Series

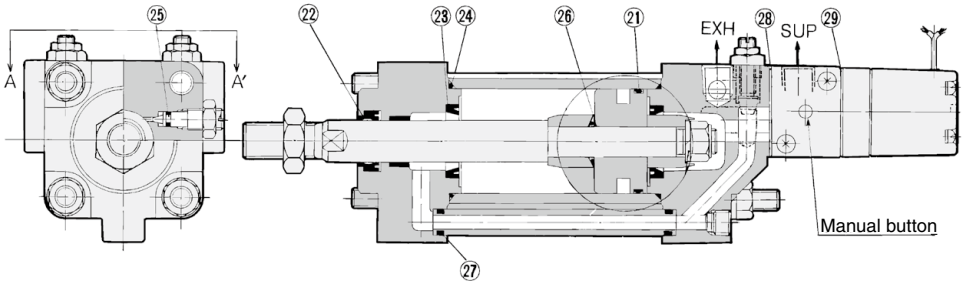
Lube Type, Non-lube Type:
ø40, ø50, ø63, ø80, ø100

Construction

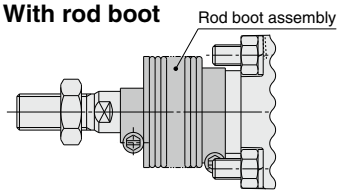
Lube type



A-A' view



With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 248.

∗ The numbers correspond with those in the "Construction" of the CV3 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
㉑	**Piston seal**	NBR	**23, 26, and 29 are non-replaceable parts, so they are not included in the seal kit.**
㉒	**Rod seal**	NBR	
23*	**Cushion seal**	NBR	
㉔	**Cylinder tube gasket**	NBR	
㉕	**Cushion valve seal**	NBR	
26*	**Piston gasket**	NBR	
㉗	**Pipe gasket**	NBR	
㉘	**Head cover gasket**	NBR	
29	**Single solenoid gasket**	NBR	
	Double solenoid gasket	NBR	

∗ Not replaceable

Replacement Parts: Seal Kit

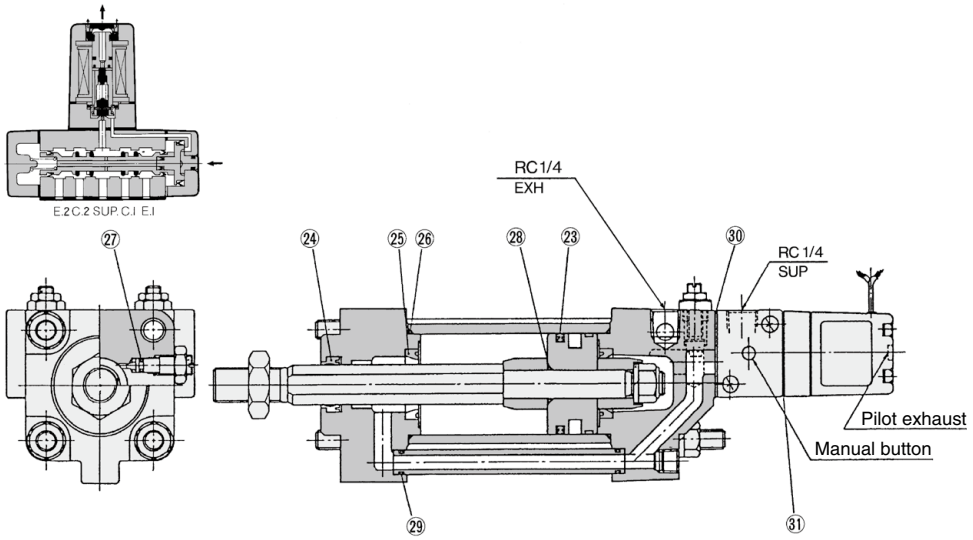
Bore size (mm)	Part no.	Contents
Non-lube type		
40	CV3N40-PS	Set of nos. ㉑, ㉒, ㉔, ㉕, ㉗, ㉘
50	CV3N50-PS	
63	CV3N63-PS	
80	CV3N80-PS	
100	CV3N100-PS	

∗ The seal kit includes ㉑, ㉒, ㉔, ㉕, ㉗, ㉘. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

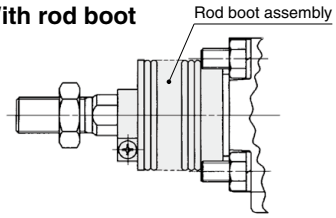
CV3K Series

Non-lube Type: ø40, ø50, ø63

Construction



With rod boot



∗ The numbers correspond with those in the "Construction" of the CV3K series in the **Web Catalog**.

∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 248.

Component Parts

No.	Description	Material	Note
㉓	**Piston seal**	NBR	**25, 28, and 31 are non-replaceable parts, so they are not included in the seal kit.**
㉔	**Rod seal**	NBR	
25∗	**Cushion seal**	NBR	
㉖	**Cylinder tube gasket**	NBR	
㉗	**Cushion valve seal**	NBR	
28∗	**Piston gasket**	NBR	
㉙	**Pipe gasket**	NBR	
㉚	**Head cover gasket**	NBR	
31	**Single solenoid gasket**	NBR	
	Double solenoid gasket	NBR	

∗ Not replaceable

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
40	CV3K40-PS	Set of nos. ㉓, ㉔, ㉖, ㉗, ㉙, ㉚
50	CV3K50-PS	
63	CV3K63-PS	

∗ The seal kit includes ㉓, ㉔, ㉖, ㉗, ㉙, ㉚. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (ø40, ø50: 10 g, ø63 or more: 20 g). Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

Disassembly/Replacement

1. Please consult with SMC when the rod seal is to be replaced.

When the rod seal is to be replaced, make sure that the seal's width across flats matches that of the non-rotating guide.
A rod seal may allow air leakage depending on the position where it is installed. Therefore, please consult with SMC when a rod seal is to be replaced.

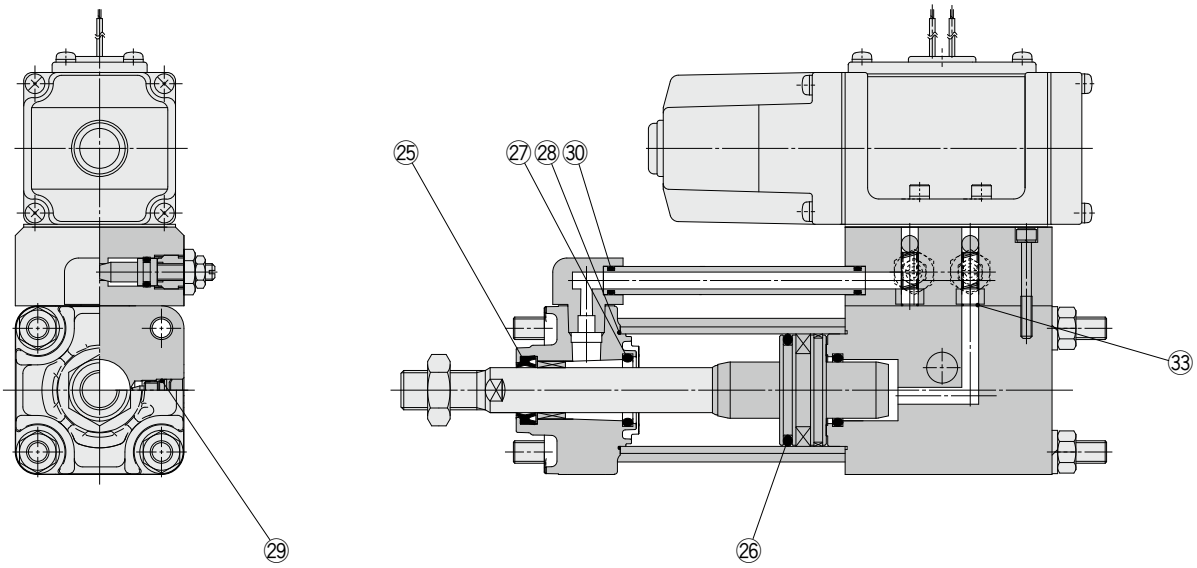
2. Do not replace the non-rotating guide.

Since the non-rotating guide is press fitted, the entire cover assembly needs be replaced instead of a single part.

CVS1 Series

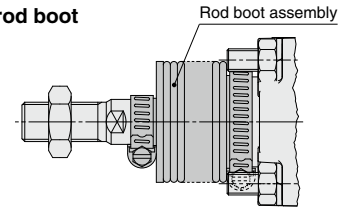
Lube Type, Non-lube Type:
ø40, ø50, ø63, ø80, ø100

Construction



∗ The numbers correspond with those in the "Construction" of the CVS1 series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 248.

Component Parts

No.	Description	Material	Note
㉕	**Rod seal**	NBR	**27 and 29 are non-replaceable parts, so they are not included in the seal kit.**
㉖	**Piston seal**		
27	**Cushion seal**	Urethane	
㉘	**Cylinder tube gasket**	NBR	
29	**Cushion valve seal**		
㉚	**Pipe gasket**		
㉝	**Valve port gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
40	CVS1N40-PS	Set of nos. ㉕, ㉖, ㉘, ㉚, ㉝
50	CVS1N50-PS	
63	CVS1N63-PS	
80	CVS1N80-PS	
100	CVS1N100-PS	

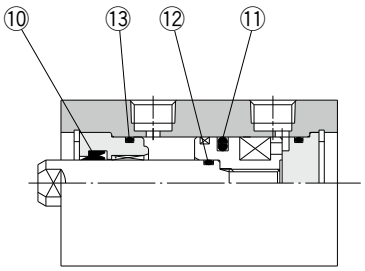
∗ The seal kit includes ㉕, ㉖, ㉘, ㉚, ㉝. Order the seal kit based on each bore size.
∗ The seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g).
Order with one of the following part numbers when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g), **GR-S-020** (20 g)

CH□QB Series

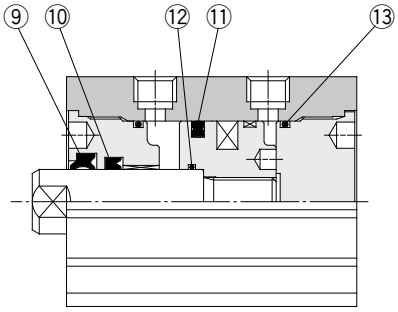
ø20, ø32, ø40
ø50, ø63, ø80, ø100

Construction

CH□QB20



CH□QB32 to CH□QB100



∗ The numbers correspond with those in the "Construction" of the CH□QB series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑨	**Scraper**	NBR	**12 is a non-replaceable part, so it is not included in the seal kit.**
⑩	**Rod seal**		
⑪	**Piston seal**		
12	**Piston gasket**		
⑬	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CHQ20-PS	Set of nos. ⑨, ⑩, ⑪, ⑬
32	CHQ32-PS	
40	CHQ40-PS	
50	CHQ50-PS	
63	CHQ63-PS	
80	CHQ80-PS	
100	CHQ100-PS	

∗ The seal kit consists of items ⑨, ⑩, ⑪ and ⑬ and can be ordered by using the seal kit number for each bore size.
∗ Special tool required for disassembly. Contact SMC for recommended tool designs and dimensions.

Cover Tightening Torque

Bore size (mm)	Tightening torque (N·m)
32	12.5 ±1.2
40	74.5 ±7.4
50	100 ±10
63	
80	411 ±41
100	

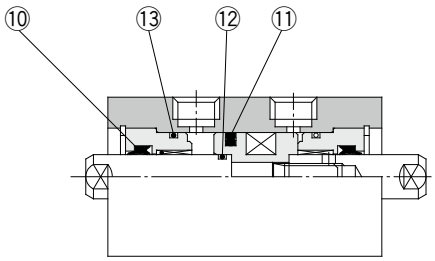
∗ Reassemble the cover with the above tightening torques.

CH□QWB Series

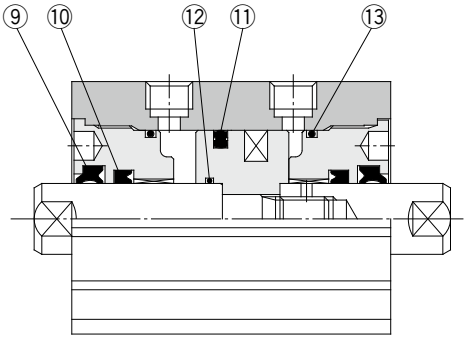
ø20, ø32, ø40
ø50, ø63, ø80, ø100

Construction

CH□QWB20



CH□QWB32 to CH□QWB100



∗ The numbers correspond with those in the "Construction" of the CH□QWB series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑨	**Scraper**	NBR	**12 is a non-replaceable part, so it is not included in the seal kit.**
⑩	**Rod seal**		
⑪	**Piston seal**		
12	**Piston gasket**		
⑬	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CHQW20-PS	Set of nos. ⑨, ⑩, ⑪, ⑬
32	CHQW32-PS	
40	CHQW40-PS	
50	CHQW50-PS	
63	CHQW63-PS	
80	CHQW80-PS	
100	CHQW100-PS	

∗ The seal kit consists of items ⑨, ⑩, ⑪ and ⑬ and can be ordered by using the seal kit number for each bore size.
∗ Special tool required for disassembly. Contact SMC for recommended tool designs and dimensions.

Cover Tightening Torque

Bore size (mm)	Tightening torque (N·m)
32	12.5 ±1.2
40	74.5 ±7.4
50	100 ±10
63	
80	411 ±41
100	

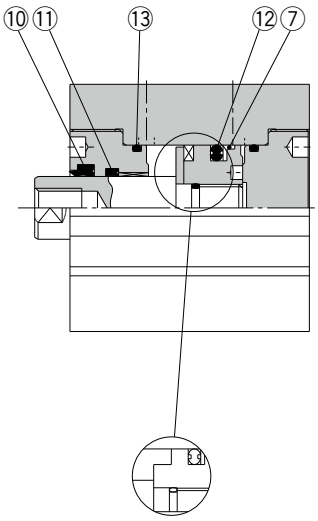
∗ Reassemble the cover with the above tightening torques.

CH□KD Series

ø20, ø25
ø32, ø40
ø50, ø63
ø80, ø100

The Replacement Procedure is on p. 506

Construction



Without auto switch

∗ The numbers correspond with those in the "Construction" of the CH□KD series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑦	**Back-up ring**	Resin	
⑩	**Scraper**	NBR	
⑪	**Rod seal**		
⑫	**Piston seal**		
⑬	**Tube gasket**		

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CHKD20-PS	Set of nos. ⑦, ⑩, ⑪, ⑫, ⑬
25	CHKD25-PS	
32	CHKD32-PS	
40	CHKD40-PS	
50	CHKD50-PS	
63	CHKD63-PS	
80	CHKD80-PS	
100	CHKD100-PS	

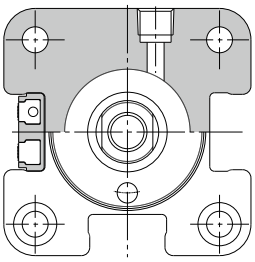
∗ The seal kit consists of items ⑦, ⑩, ⑪, ⑫ and ⑬, and can be ordered by using the seal kit number for each bore size.
∗ Special tools are necessary for disassembly. Contact SMC for recommended tool designs and dimensions. Furthermore, ø80 and ø100 are tightened with a large tightening torque, so disassembly will be difficult. Contact SMC if disassembly is required.

CH□KG Series

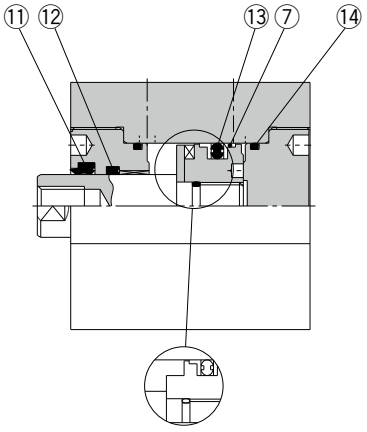
ø20, ø25
ø32, ø40
ø50, ø63
ø80, ø100

The Replacement Procedure is on p. 507

Construction



ø32 to ø100



Without auto switch

∗ The numbers correspond with those in the "Construction" of the CH□KG series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑦	**Back-up ring**	Resin	
⑪	**Scraper**	NBR	
⑫	**Rod seal**		
⑬	**Piston seal**		
⑭	**Tube gasket**		

Replacement Parts: Seal Kit

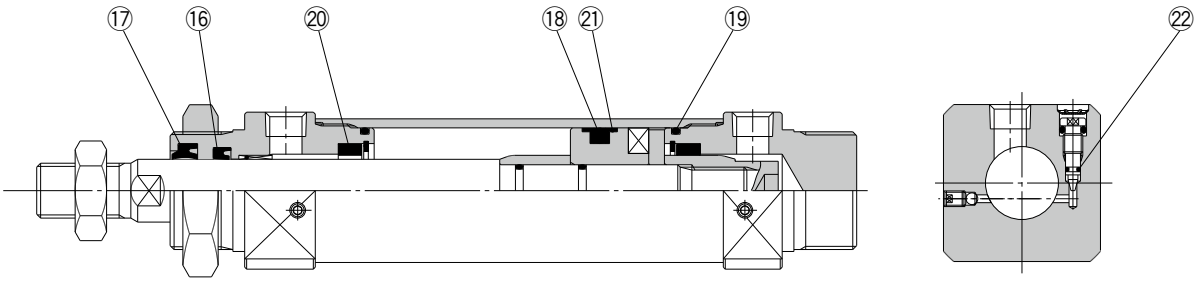
Bore size (mm)	Part no.	Contents
20	CHKG20-PS	Set of nos. ⑦, ⑪, ⑫, ⑬, ⑭
25	CHKG25-PS	
32	CHKG32-PS	
40	CHKG40-PS	
50	CHKG50-PS	
63	CHKG63-PS	
80	CHKG80-PS	
100	CHKG100-PS	

∗ The seal kit consists of items ⑦, ⑪, ⑫, ⑬ and ⑭ and can be ordered by using the seal kit number for each bore size.
∗ Special tools are necessary for disassembly. Contact SMC for recommended tool designs and dimensions. Furthermore, ø80 and ø100 are tightened with a large tightening torque, so disassembly will be difficult. Contact SMC if disassembly is required.

CHN Series ø20, ø25, ø32, ø40

The Replacement Procedure is on p. 508

Construction



∗ The numbers correspond with those in the "Construction" of the CHN series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑯	**Rod seal**	NBR	
⑰	**Scraper**	NBR	
⑱	**Piston seal**	NBR	
⑲	**Tube gasket**	NBR	
⑳	**Cushion seal**	—	
㉑	**Back-up ring**	Resin	
㉒	**Cushion valve seal A**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
20	CHN20-PS	Set of nos. ⑯, ⑰, ⑱, ⑲, ⑳, ㉑, ㉒
25	CHN25-PS	
32	CHN32-PS	
40	CHN40-PS	

∗ The seal kit consists of items ⑯ to ㉒ and can be ordered by using the seal kit number for each bore size.

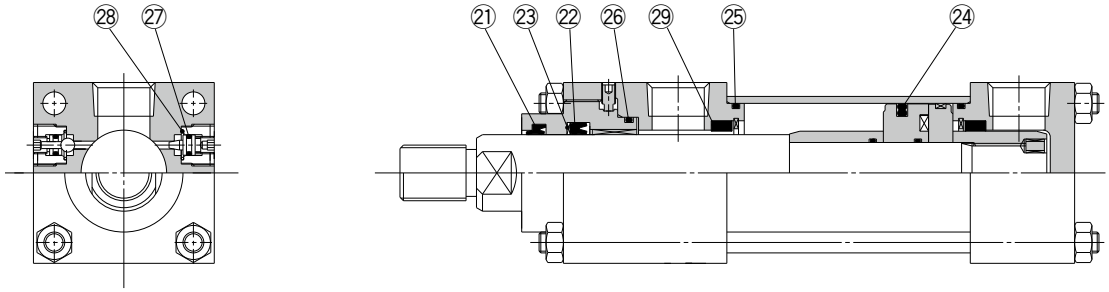
CHSD Series

ø40, ø50, ø63
ø80, ø100

The Replacement Procedure is on p. 509

Construction

CH□SDB



∗ The numbers correspond with those in the “Construction” of the CHSD series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉑	**Scraper**	NBR	**26, 27 and 28 are non-replaceable parts, so they are not included in the seal kit.**
㉒	**Rod seal**	NBR	
㉓	**Back-up ring**	Resin	
㉔	**Piston seal**	NBR	
㉕	**Cylinder tube gasket**	NBR	
26	**Holder gasket**	NBR	
27	**Valve seal**	NBR	
28	**Valve holder gasket**	NBR	
㉙	**Cushion seal**	—	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
40	CHSD40-PS	Set of nos. ㉑, ㉒, ㉓, ㉔, ㉕, ㉙
50	CHSD50-PS	
63	CHSD63-PS	
80	CHSD80-PS	
100	CHSD100-PS	

∗ The seal kit consists of items ㉑ to ㉕ and ㉙, and can be ordered by using the seal kit number for each bore size.

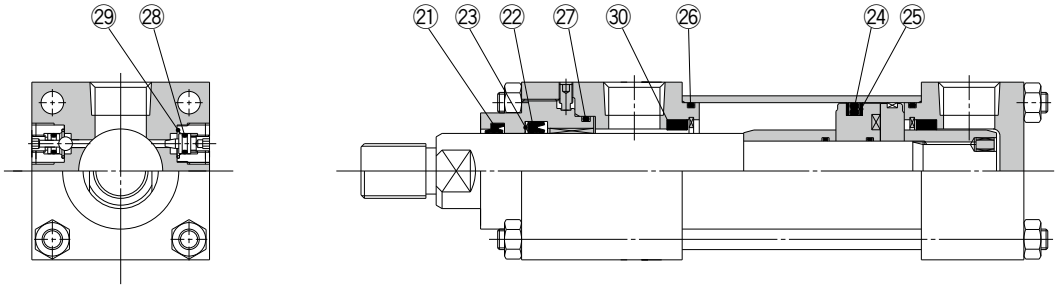
CHSG Series

ø32, ø40, ø50
ø63, ø80, ø100

The Replacement Procedure is on p. 509

Construction

CH□SGB



∗ The numbers correspond with those in the "Construction" of the CHSG series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉑	**Scraper**	NBR	**27, 28 and 29 are non-replaceable parts, so they are not included in the seal kit.**
㉒	**Rod seal**	NBR	
㉓	**Back-up ring**	Resin	
㉔	**Piston seal**	NBR	
㉕	**Back-up ring**	Resin	
㉖	**Cylinder tube gasket**	NBR	
27	**Holder gasket**	NBR	
28	**Valve seal**	NBR	
29	**Valve holder gasket**	NBR	
㉚	**Cushion seal**	—	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
32	CHSG32-PS	Set of nos. ㉑, ㉒, ㉓, ㉔, ㉕, ㉖, ㉚
40	CHSG40-PS	
50	CHSG50-PS	
63	CHSG63-PS	
80	CHSG80-PS	
100	CHSG100-PS	

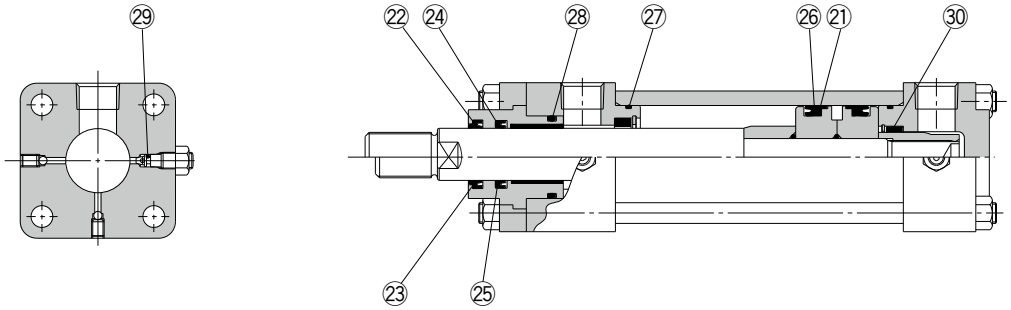
∗ The seal kit consists of items ㉑ to ㉖ and ㉚, and can be ordered by using the seal kit number for each bore size.

CH2E/CH2F/CH2G/CH2H Series

ø32, ø40
ø50, ø63
ø80, ø100

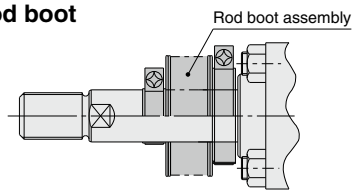
The Replacement Procedure is on p. 510

Construction



∗ The numbers correspond with those in the "Construction" of the CH2E/CH2F/CH2G/CH2H series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 254.

Seal Kit List

No.	Description	Material	Note
㉑	**Back-up ring**	Resin	
㉒	**Scraper (B-series rod)**	NBR	
㉓	**Scraper (C-series rod)**	NBR	
㉔	**Rod seal (B-series rod)**	NBR	
㉕	**Rod seal (C-series rod)**	NBR	
㉖	**Piston seal**	NBR	
㉗	**Cylinder tube gasket**	NBR	
㉘	**Holder gasket**	NBR	
㉙	**Cushion valve seal**	NBR	
㉚	**Cushion seal**	—	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.		Contents
	B-series rod	C-series rod	
32	CH2E32B-PS CH2F32B-PS CH2G32B-PS CH2H32B-PS		B-series rod: Set of nos. ㉑, ㉒, ㉔, ㉖, ㉗, ㉘, ㉙, ㉚ C-series rod: Set of nos. ㉑, ㉓, ㉕, ㉖, ㉗, ㉘, ㉙, ㉚
40	CH2E40B-PS CH2F40B-PS CH2G40B-PS CH2H40B-PS	CH2E40C-PS CH2F40C-PS CH2G40C-PS CH2H40C-PS	
50	CH2E50B-PS CH2F50B-PS CH2G50B-PS CH2H50B-PS	CH2E50C-PS CH2F50C-PS CH2G50C-PS CH2H50C-PS	
63	CH2E63B-PS CH2F63B-PS CH2G63B-PS CH2H63B-PS	CH2E63C-PS CH2F63C-PS CH2G63C-PS CH2H63C-PS	
80	CH2E80B-PS CH2F80B-PS CH2G80B-PS CH2H80B-PS	CH2E80C-PS CH2F80C-PS CH2G80C-PS CH2H80C-PS	
100	CH2E100B-PS CH2F100B-PS CH2G100B-PS CH2H100B-PS	CH2E100C-PS CH2F100C-PS CH2G100C-PS CH2H100C-PS	

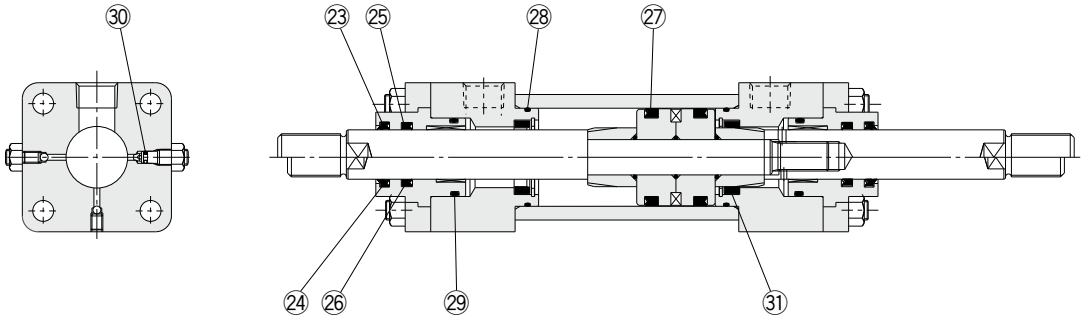
∗ The seal kit consists of items ㉑ through ㉚ and can be ordered by using the seal kit number for each bore size.

CH2EW/CH2FW Series

ø32, ø40
ø50, ø63
ø80, ø100

The Replacement Procedure is on p. 510

Construction



∗ The numbers correspond with those in the "Construction" of the CH2EW/CH2FW series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
㉓	**Scraper (B-series rod)**	NBR	
㉔	**Scraper (C-series rod)**	NBR	
㉕	**Rod seal (B-series rod)**	NBR	
㉖	**Rod seal (C-series rod)**	NBR	
㉗	**Piston seal**	NBR	
㉘	**Cylinder tube gasket**	NBR	
㉙	**Holder gasket**	NBR	
㉚	**Cushion valve seal**	NBR	
㉛	**Cushion seal**	—	

Replacement Parts: Seal Kit

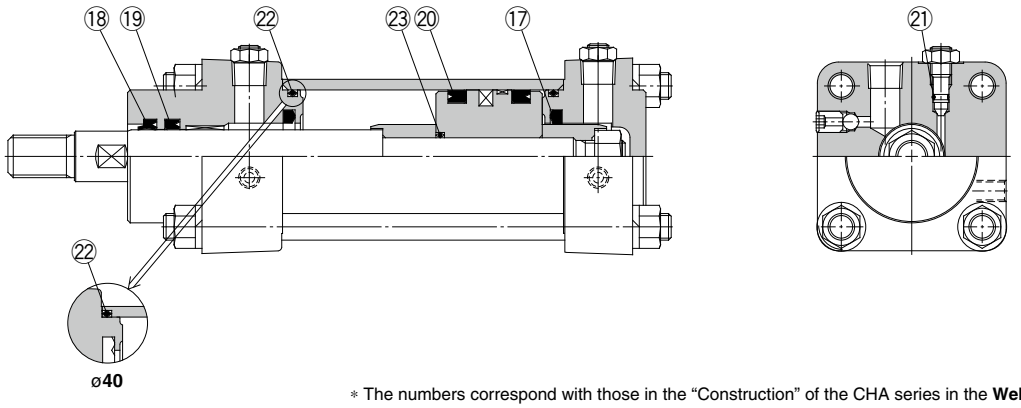
Bore size (mm)	Part no.		Contents
	B-series rod	C-series rod	
40	CH2EW40B-PS CH2FW40B-PS	CH2EW40C-PS CH2FW40C-PS	B-series rod: Set of nos. ㉓, ㉕, ㉗, ㉘, ㉙, ㉚, ㉛ C-series rod: Set of nos. ㉔, ㉖, ㉗, ㉘, ㉙, ㉚, ㉛
50	CH2EW50B-PS CH2FW50B-PS	CH2EW50C-PS CH2FW50C-PS	
63	CH2EW63B-PS CH2FW63B-PS	CH2EW63C-PS CH2FW63C-PS	
80	CH2EW80B-PS CH2FW80B-PS	CH2EW80C-PS CH2FW80C-PS	
100	CH2EW100B-PS CH2FW100B-PS	CH2EW100C-PS CH2FW100C-PS	

∗ The seal kit consists of items ㉓ through ㉛ and can be ordered using the seal kit number for each bore size.

CHA Series

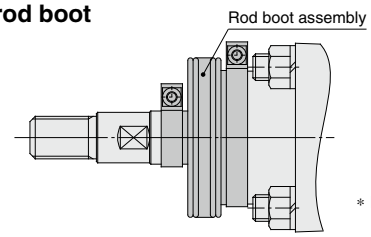
ø40, ø50, ø63, ø80
ø100, ø125, ø160

Construction



∗ The numbers correspond with those in the "Construction" of the CHA series in the **Web Catalog**.

With rod boot



∗ Replaceable with the rod boot assembly
For details on replacement part numbers, refer to page 255.

Seal Kit List

No.	Description	Material	Note
⑰	**Cushion seal**	—	**23 is a non-replaceable part, so it is not included in the seal kit.**
⑱	**Wiper ring**	NBR	
⑲	**Rod seal**	NBR	
⑳	**Piston seal**	NBR	
㉑	**Needle valve seal**	NBR	
㉒	**Cylinder tube gasket**	NBR	
23	**Piston gasket**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
40	CHA40-PS	Set of nos. ⑰, ⑱, ⑲, ⑳, ㉑, ㉒
50	CHA50-PS	
63	CHA63-PS	
80	CHA80-PS	
100	CHA100-PS	
125	CHA125-PS	
160	CHA160-PS	

∗ The seal kit consists of items ⑰ through ㉒ and can be ordered using the seal kit number for each bore size.

Tie-rod Nut Tightening Torque

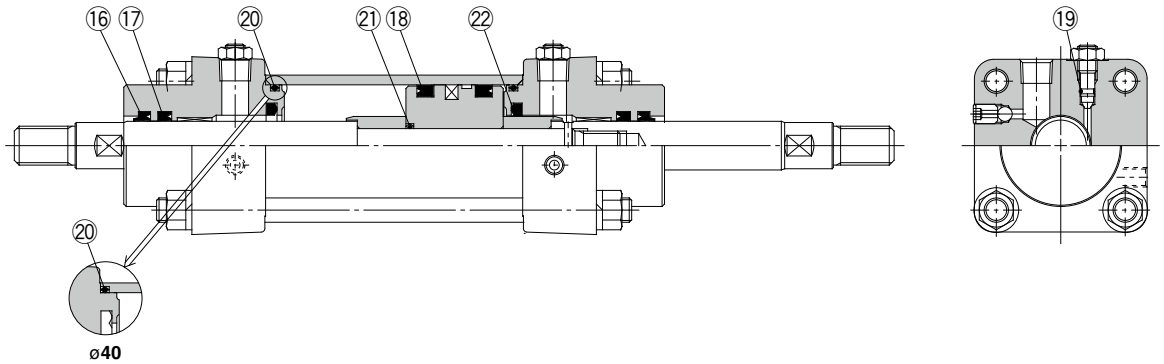
Bore size (mm)	Tightening torque (N·m)
40	10.8 ±1.1
50	24.5 ±2.4
63	24.5 ±2.4
80	38.2 ±3.8
100	38.2 ±3.8
125	68.6 ±6.8
160	107.8 ±10.7

∗ Gradually tighten the tie-rod nuts equally from opposing corners so that the tightening torques become the same as those listed above.

CHAW Series

ø40, ø50, ø63, ø80
ø100, ø125, ø160

Construction



∗ The numbers correspond with those in the "Construction" of the CHAW series in the **Web Catalog**.

Seal Kit List

No.	Description	Material	Note
⑯	**Wiper ring**	NBR	**21 is a non-replaceable part, so it is not included in the seal kit.**
⑰	**Rod seal**	NBR	
⑱	**Piston seal**	NBR	
⑲	**Needle valve seal**	NBR	
⑳	**Cylinder tube gasket**	NBR	
21	**Piston gasket**	NBR	
㉒	**Cushion seal**	—	

Replacement Parts: Seal Kit

Bore size (mm)	Part no.	Contents
40	CHAW40-PS	Set of nos. ⑯, ⑰, ⑱, ⑲, ⑳, ㉒
50	CHAW50-PS	
63	CHAW63-PS	
80	CHAW80-PS	
100	CHAW100-PS	
125	CHAW125-PS	
160	CHAW160-PS	

∗ The seal kit consists of items of ⑯ through ⑳ and ㉒ and can be ordered by using the seal kit number for each bore size.

Tie-rod Nut Tightening Torque

Bore size (mm)	Tightening torque (N·m)
40	10.8 ±1.1
50	24.5 ±2.4
63	24.5 ±2.4
80	38.2 ±3.8
100	38.2 ±3.8
125	68.6 ±6.8
160	107.8 ±10.7

∗ Gradually tighten the tie-rod nuts equally from opposing corners so that the tightening torques become the same as those listed above.

MGP-□Z Series

Replacement Parts: Seal Kit

∗ Seal kit part numbers other than those below are the same as those for the standard type.
∗ Since the seal kit does not include a grease pack, it should be ordered separately. For details, refer to page 152.

Bore size (mm)	MGP□R(NBR)/MGP□V(FKM) (Water resistant)		XB6 (Heat resistant cylinder –10 to 150°C)	XB13 (Low speed cylinder 5 to 50 mm/s)
12	—	—	MGP12-Z-XB6-PS	MGP12-Z-XB13-PS
16	—	—	MGP16-Z-XB6-PS	MGP16-Z-XB13-PS
20	MGP20R-Z-PS	MGP20V-Z-PS	MGP20-Z-XB6-PS	MGP20-Z-XB13-PS
25	MGP25R-Z-PS	MGP25V-Z-PS	MGP25-Z-XB6-PS	MGP25-Z-XB13-PS
32	MGP32R-Z-PS	MGP32V-Z-PS	MGP32-Z-XB6-PS	MGP32-Z-XB13-PS
40	MGP40R-Z-PS	MGP40V-Z-PS	MGP40-Z-XB6-PS	MGP40-Z-XB13-PS
50	MGP50R-Z-PS	MGP50V-Z-PS	MGP50-Z-XB6-PS	MGP50-Z-XB13-PS
63	MGP63R-Z-PS	MGP63V-Z-PS	MGP63-Z-XB6-PS	MGP63-Z-XB13-PS
80	MGP80R-Z-PS	MGP80V-Z-PS	MGP80-Z-XB6-PS	MGP80-Z-XB13-PS
100	MGP100R-Z-PS	MGP100V-Z-PS	MGP100-Z-XB6-PS	MGP100-Z-XB13-PS

Bore size (mm)	XC4 (With heavy duty scraper)	XC6 (Made of stainless steel)	XC8 (Adjustable stroke cylinder/Adjustable extension type)
12	—	MGP12-Z-PS	MGP12-Z-XC8-PS
16	—	MGP16-Z-PS	MGP16-Z-XC8-PS
20	MGP20-Z-PS	MGP20-Z-PS	MGP20-Z-XC8-PS
25	MGP25-Z-PS	MGP25-Z-PS	MGP25-Z-XC8-PS
32	MGP32-Z-PS	MGP32-Z-PS	MGP32-Z-XC8-PS
40	MGP40-Z-PS	MGP40-Z-PS	MGP40-Z-XC8-PS
50	MGP50-Z-XC4-PS	MGP50-Z-XC6-PS	MGP50-Z-XC8-PS
63	MGP63-Z-XC4-PS	MGP63-Z-XC6-PS	MGP63-Z-XC8-PS
80	MGP80-Z-XC4-PS	MGP80-Z-XC6-PS	MGP80-Z-XC8-PS
100	MGP100-Z-XC4-PS	MGP100-Z-XC6-PS	MGP100-Z-XC8-PS

Bore size (mm)	XC9 (Adjustable stroke cylinder/Adjustable retraction type)	XC22 (Fluororubber seal)	XC35 (With coil scraper)
12	MGP12-Z-XC9-PS	MGP12-Z-XC22-PS	—
16	MGP16-Z-XC9-PS	MGP16-Z-XC22-PS	—
20	MGP20-Z-XC9-PS	MGP20-Z-XC22-PS	MGP20-Z-PS
25	MGP25-Z-XC9-PS	MGP25-Z-XC22-PS	MGP25-Z-PS
32	MGP32-Z-XC9-PS	MGP32-Z-XC22-PS	MGP32-Z-PS
40	MGP40-Z-XC9-PS	MGP40-Z-XC22-PS	MGP40-Z-PS
50	MGP50-Z-XC9-PS	MGP50-Z-XC22-PS	MGP50-Z-XC35-PS
63	MGP63-Z-XC9-PS	MGP63-Z-XC22-PS	MGP63-Z-XC35-PS
80	MGP80-Z-XC9-PS	MGP80-Z-XC22-PS	MGP80-Z-XC35-PS
100	MGP100-Z-XC9-PS	MGP100-Z-XC22-PS	MGP100-Z-XC35-PS

Grease Pack Part Nos.

∗ Grease pack part numbers other than those below are the same as those for the standard type.

Symbol	Specifications	Grease pack part no.
25A-	Copper and zinc-free	GR-D-010 (10 g)
XB6	Heat resistant cylinder (–10 to 150°C)	GR-F-005 (5 g)
XB13	Low speed cylinder (5 to 50 mm/s)	GR-L-010 (10 g)
XC85	Grease for food processing equipment	GR-H-010 (10 g)

5 Rod Boot Assembly Replacement Part Nos.

CM2-Z, CM2W-Z, CM2K-Z, CM2P, CBM2, CLM2, CVM5(K) Series

Replacement Parts: Rod Boot Assembly Part Nos.

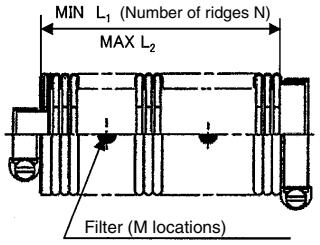
The rod boot cannot be ordered without the assembly.

1. Part Nos.

	Rod boot assembly	
	ϕ20 to 32	ϕ40
J rod boot	C2M020 – Symbol 67926-R	C2M040 – Symbol 67928-R
K rod boot	C2M020 – Symbol 67927-R	C2M040 – Symbol 67929-R

2. Dimensions 1

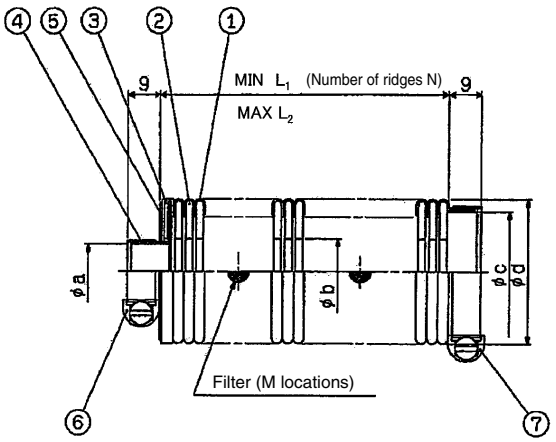
Symbol	Stroke (mm)	L1	L2	M	N	
		ϕ20 – 40	ϕ20 – 40	ϕ20 – 40	ϕ20 – 32	ϕ40
25A	1–50	12.5	62.5	1	5±0	4±0
25B	51–100	25	125	2	9±1	7±1
25C	101–150	37.5	187.5	2	13±1	10±1
25D	151–200	50	250	3	17±1	13±1
25E	201–300	75	375	4	25±2	19±2
25F	301–400	100	500	6	33±2	25±2
25G	401–500	125	625	8	41±2	31±2
25H	501–600	150	750	10	49±3	38±3
25I	601–700	175	875	12	57±3	44±3
25J	701–800	200	1000	14	65±3	50±3
25K	801–900	225	1125	16	73±3	56±3
25L	901–1000	250	1250	16	81±3	62±3



Note 1) The rod boot is the same for bore sizes ø20 to ø32.
Note 2) Strokes over 1000 are available as a special order.

3. Dimensions 2 [mm]

	ϕ20 to ϕ32	ϕ40
a	16	20
b	18	22
c	29	36
d	36	46



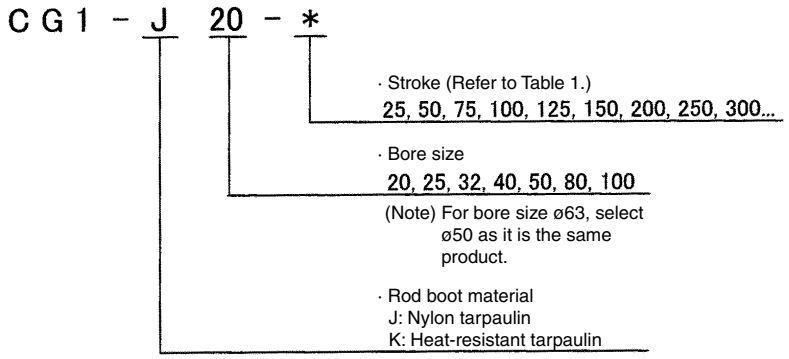
4. Component Parts

	Rod boot assembly
①	Rod boot
②	Ring
③	End plate
④	Filter cloth
⑤	Cap
⑥	Rod boot band A
⑦	Rod boot band B

CG1-Z, CG1W-Z, CBG1, CLG1, CNG Series

Replacement Parts: Rod Boot Assembly Part Nos.

1. Part Nos.



2. Component Parts

· Rod boot: 1 pc.
· Rod boot mounting band: 2 pcs. (Only 1 pc. for ø80 and ø100)

Table 1. Factory Stock Availability by Stroke

Bore size / Stroke	20		25		32		40		50		80		100	
	J	K	J	K	J	K	J	K	J	K	J	K	J	K
25	O	O	O	O	O	O	O	O	O	O	O	O	O	O
50	O	O	O	O	O	O	O	O	O	O	O	O	O	O
75	O	O	O	O	O	O	O	O	O	O	O	O	O	O
100	O	O	O	O	O	O	O	O	O	O	O	O	O	O
125	O	O	O	O	O	O	O	O	O	O	O	O	O	O
150	O	O	O	O	O	O	O	O	O	O	O	O	O	O
200	O	O	O	O	O	O	O	O	O	O	O	O	O	O
250	X	X	X	X	X	X	X	X	X	X	X	X	X	X
300	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Other strokes	X	X	X	X	X	X	X	X	X	X	X	X	X	X

○: Factory stock available
×: Factory stock unavailable/Produced upon receipt of order

5 Rod Boot Assembly Replacement Part Nos.

MB-Z, MBW-Z, MBK-Z, MBKW-Z, MBB, MB1-Z, MB1W-Z, MB1K-Z, MWB(W), MNB(W) Series

Replacement Parts: Rod Boot Assembly Part Nos.

1. Part Nos. (J: Nylon tarpaulin)

∗ For the MBK∗32∗-∗J/K(Z) rod boot, order using the rod boot assembly part number on page 247.

Bore size	Stroke			
	1 to 50	51 to 100	101 to 150	151 to 200
ϕ32	MB-32GAAA856-R-050	MB-32GAAA856-R-100	MB-32GAAA856-R-150	MB-32GAAA856-R-200
ϕ40	C2A40GAEA033-R-050	C2A40GAEA033-R-100	C2A40GAEA033-R-150	C2A40GAEA033-R-200
ϕ50	C2A50GAEA034-R-050	C2A50GAEA034-R-100	C2A50GAEA034-R-150	C2A50GAEA034-R-200
ϕ63	C2A50GAEA034-R-050	C2A50GAEA034-R-100	C2A50GAEA034-R-150	C2A50GAEA034-R-200
ϕ80	MB-80-25AC6216-R	MB-80-25BC6216-R	MB-80-25CC6216-R	MB-80-25DC6216-R
ϕ100	C2AA0GAEA037-R-050	C2AA0GAEA037-R-100	C2AA0GAEA037-R-150	C2AA0GAEA037-R-200
ϕ125	MB-A2G-EA066-R-050	MB-A2G-EA066-R-100	MB-A2G-EA066-R-150	MB-A2G-EA066-R-200

Bore size	Stroke			
	201 to 300	301 to 400	401 to 500	501 to 600
ϕ32	MB-32GAAA856-R-300	MB-32GAAA856-R-400	MB-32GAAA856-R-500	MB-32GAAA856-R-600
ϕ40	C2A40GAEA033-R-300	C2A40GAEA033-R-400	C2A40GAEA033-R-500	C2A40GAEA033-R-600
ϕ50	C2A50GAEA034-R-300	C2A50GAEA034-R-400	C2A50GAEA034-R-500	C2A50GAEA034-R-600
ϕ63	C2A50GAEA034-R-300	C2A50GAEA034-R-400	C2A50GAEA034-R-500	C2A50GAEA034-R-600
ϕ80	MB-80-25EC6216-R	MB-80-25FC6216-R	MB-80-25GC6216-R	MB-80-25HC6216-R
ϕ100	C2AA0GAEA037-R-300	C2AA0GAEA037-R-400	C2AA0GAEA037-R-500	C2AA0GAEA037-R-600
ϕ125	MB-A2G-EA066-R-300	MB-A2G-EA066-R-400	MB-A2G-EA066-R-500	MB-A2G-EA066-R-600

Bore size	Stroke			
	601 to 700	701 to 800	801 to 900	901 to 1000
ϕ32	MB-32GAAA856-R-700	MB-32GAAA856-R-800	MB-32GAAA856-R-900	MB-32GAAA856-R-1000
ϕ40	C2A40GAEA033-R-700	C2A40GAEA033-R-800	C2A40GAEA033-R-900	C2A40GAEA033-R-A00
ϕ50	C2A50GAEA034-R-700	C2A50GAEA034-R-800	C2A50GAEA034-R-900	C2A50GAEA034-R-A00
ϕ63	C2A50GAEA034-R-700	C2A50GAEA034-R-800	C2A50GAEA034-R-900	C2A50GAEA034-R-A00
ϕ80	MB-80-25IC6216-R	MB-80-25KC6216-R	MB-80-25LC6216-R	MB-80-25MC6216-R
ϕ100	C2AA0GAEA037-R-700	C2AA0GAEA037-R-800	C2AA0GAEA037-R-900	C2AA0GAEA037-R-A00
ϕ125	MB-A2G-EA066-R-700	MB-A2G-EA066-R-800	MB-A2G-EA066-R-900	MB-A2G-EA066-R-A00

∗ There is no bore size ø125 for the MBK(W)-Z, MB1K-Z, MBB, MWB, or MNB.

5 Rod Boot Assembly Replacement Part Nos.

MB-Z, MBW-Z, MBK-Z, MBKW-Z, MBB, MB1-Z, MB1W-Z, MB1K-Z, MWB(W), MNB(W) Series

Replacement Parts: Rod Boot Assembly Part Nos.

2. Part Nos. (K: Heat-resistant tarpaulin)

Bore size	Stroke			
	1 to 50	51 to 100	101 to 150	151 to 200
ϕ32	MB-32GBAA856-R-050	MB-32GBAA856-R-100	MB-32GBAA856-R-150	MB-32GBAA856-R-200
ϕ40	C2A40GBEA033-R-050	C2A40GBEA033-R-100	C2A40GBEA033-R-150	C2A40GBEA033-R-200
ϕ50	C2A50GBEA034-R-050	C2A50GBEA034-R-100	C2A50GBEA034-R-150	C2A50GBEA034-R-200
ϕ63	C2A50GBEA034-R-050	C2A50GBEA034-R-100	C2A50GBEA034-R-150	C2A50GBEA034-R-200
ϕ80	MB-80-25AC8056-R	MB-80-25BC8056-R	MB-80-25CC8056-R	MB-80-25DC8056-R
ϕ100	C2AA0GBEA037-R-050	C2AA0GBEA037-R-100	C2AA0GBEA037-R-150	C2AA0GBEA037-R-200
ϕ125	MB-A2G-AB159-R-050	MB-A2G-AB159-R-100	MB-A2G-AB159-R-150	MB-A2G-AB159-R-200

Bore size	Stroke			
	201 to 300	301 to 400	401 to 500	501 to 600
ϕ32	MB-32GBAA856-R-300	MB-32GBAA856-R-400	MB-32GBAA856-R-500	MB-32GBAA856-R-600
ϕ40	C2A40GBEA033-R-300	C2A40GBEA033-R-400	C2A40GBEA033-R-500	C2A40GBEA033-R-600
ϕ50	C2A50GBEA034-R-300	C2A50GBEA034-R-400	C2A50GBEA034-R-500	C2A50GBEA034-R-600
ϕ63	C2A50GBEA034-R-300	C2A50GBEA034-R-400	C2A50GBEA034-R-500	C2A50GBEA034-R-600
ϕ80	MB-80-25EC8056-R	MB-80-25FC8056-R	MB-80-25GC8056-R	MB-80-25HC8056-R
ϕ100	C2AA0GBEA037-R-300	C2AA0GBEA037-R-400	C2AA0GBEA037-R-500	C2AA0GBEA037-R-600
ϕ125	MB-A2G-AB159-R-300	MB-A2G-AB159-R-400	MB-A2G-AB159-R-500	MB-A2G-AB159-R-600

Bore size	Stroke			
	601 to 700	701 to 800	801 to 900	901 to 1000
ϕ32	MB-32GBAA856-R-700	MB-32GBAA856-R-800	MB-32GBAA856-R-900	MB-32GBAA856-R-1000
ϕ40	C2A40GBEA033-R-700	C2A40GBEA033-R-800	C2A40GBEA033-R-900	C2A40GBEA033-R-A00
ϕ50	C2A50GBEA034-R-700	C2A50GBEA034-R-800	C2A50GBEA034-R-900	C2A50GBEA034-R-A00
ϕ63	C2A50GBEA034-R-700	C2A50GBEA034-R-800	C2A50GBEA034-R-900	C2A50GBEA034-R-A00
ϕ80	MB-80-25IC8056-R	MB-80-25KC8056-R	MB-80-25LC8056-R	MB-80-25MC8056-R
ϕ100	C2AA0GBEA037-R-700	C2AA0GBEA037-R-800	C2AA0GBEA037-R-900	C2AA0GBEA037-R-A00
ϕ125	MB-A2G-AB159-R-700	MB-A2G-AB159-R-800	MB-A2G-AB159-R-900	MB-A2G-AB159-R-A00

∗ There is no bore size ø125 for the MBK(W)-Z, MB1K-Z, MBB, MWB, or MNB.

MB-Z, MBW-Z, MBK-Z, MBKW-Z, MBB, MB1-Z, MB1W-Z, MB1K-Z, MWB(W), MNB(W) Series

Replacement Parts: Rod Boot Assembly Part Nos.

For the MBK∗32∗-∗JZ/KZ rod boot, order using the rod boot assembly part number below.

3. MBK□32 (J: Nylon tarpaulin)

Bore size	Stroke			
	1 to 50	51 to 100	101 to 150	151 to 200
	C2M020-25A67926-R	C2M020-25B67926-R	C2M020-25C67926-R	C2M020-25D67926-R
	Stroke			
	201 to 300	301 to 400	401 to 500	501 to 600
φ32	C2M020-25E67926-R	C2M020-25F67926-R	C2M020-25G67926-R	C2M020-25H67926-R
	Stroke			
	601 to 700	701 to 800	801 to 900	901 to 1000
	C2M020-25I67926-R	C2M020-25J67926-R	C2M020-25K67926-R	C2M020-25L67926-R

4. MBK□32 (K: Heat-resistant tarpaulin)

Bore size	Stroke			
	1 to 50	51 to 100	101 to 150	151 to 200
	C2M020-25A67927-R	C2M020-25B67927-R	C2M020-25C67927-R	C2M020-25D67927-R
	Stroke			
	201 to 300	301 to 400	401 to 500	501 to 600
φ32	C2M020-25E67927-R	C2M020-25F67927-R	C2M020-25G67927-R	C2M020-25H67927-R
	Stroke			
	601 to 700	701 to 800	801 to 900	901 to 1000
	C2M020-25I67927-R	C2M020-25J67927-R	C2M020-25K67927-R	C2M020-25L67927-R

5 Rod Boot Assembly Replacement Part Nos.

CA2-Z, CA2W-Z, CA2K(W), CBA2, CA(W)□H, CV3(K), CVS1(K), CNA2(W) Series

Replacement Parts: Rod Boot Assembly Part Nos.

1. Part Nos.

Rod boot part no.	–	Stroke symbol	*1

(Example) For the CA2T63-1100JZ rod boot → Use the following part number: C2A50GAEA034-R-A10
(Note) The part number above includes rod boot bands A and B (1 set).
*1 Refer to "3." for stroke symbols.

2. Rod Boot Part Nos.

	Rod boot part no. (Excludes F: With rod flange)		Rod boot part no. (F: With rod flange)	
	J rod boot*2	K rod boot*3	J rod boot	K rod boot
φ40	C2A40GAEA033-R	C2A40GBEA033-R	C2A40GCEA033-R	C2A40GDEA033-R
φ50	C2A50GAEA034-R	C2A50GBEA034-R	C2A50GCEA034-R	C2A50GDEA034-R
φ63	C2A50GAEA034-R	C2A50GBEA034-R	C2A50GCEA034-R	C2A50GDEA034-R
φ80	C2A80GAEA036-R	C2A80GBEA036-R	C2A80GCEA036-R	C2A80GDEA036-R
φ100	C2AA0GAEA037-R	C2AA0GBEA037-R	C2AA0GCEA037-R	C2AA0GDEA037-R

*2 J rod boot: Nylon tarpaulin
*3 K rod boot: Heat-resistant tarpaulin

CA2-Z, CA2W-Z, CA2K(W), CBA2, CA(W)□H, CV3(K), CVS1(K), CNA2(W) Series

Replacement Parts: Rod Boot Assembly Part Nos.

3. Rod Boot Strokes with Factory Stock Available

For ø40

Rod boot stroke	25	50	75	100	125	150	175	200	250	300	350	400	500
Stroke symbol	025	050	075	100	125	150	175	200	250	300	350	400	500
Rod boot stroke	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
Stroke symbol	600	700	800	900	A00	A10	A20	A30	A40	A50	A60	A70	A80

For ø50 to ø100 (Excludes F: With rod flange)

Rod boot stroke	25	50	100	150	200	250	300	400	500	600	700	800	900
Stroke symbol	025	050	100	150	200	250	300	400	500	600	700	800	900
Rod boot stroke	1000	1100	1200	1300	1400	1500	1600	1700	1800				
Stroke symbol	A00	A10	A20	A30	A40	A50	A60	A70	A80				

For ø50 and ø63 (F: With rod flange)

Rod boot stroke	25	50	75	100	125	150	175	200	250	300	350	400	500
Stroke symbol	025	050	075	100	125	150	175	200	250	300	350	400	500
Rod boot stroke	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
Stroke symbol	600	700	800	900	A00	A10	A20	A30	A40	A50	A60	A70	A80

For ø80 and ø100 (F: With rod flange)

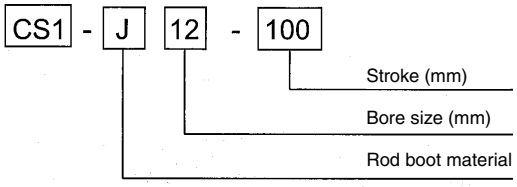
Rod boot stroke	25	50	75	100	150	200	250	300	350	400	500	600	700
Stroke symbol	025	050	075	100	150	200	250	300	350	400	500	600	700
Rod boot stroke	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800		
Stroke symbol	800	900	A00	A10	A20	A30	A40	A50	A60	A70	A80		

For intermediate stroke cylinders, go up to the next size stroke when selecting a rod boot.
Order using the same method when a rod boot is required for strokes other than those shown above.
Please confirm the delivery date with the factory.

C(D)S1, CS1W, CS1□Q, CNS, CLS, CL1(ø125 to ø160) Series

Replacement Parts: Rod Boot Assembly Part Nos.

1. Part Nos.



Rod Boot Material

Symbol	Description
J	Nylon tarpaulin
K	Heat-resistant tarpaulin

Bore Size

Symbol	Bore size
12	ϕ125, ϕ140
16	ϕ160
18	ϕ180
20	ϕ200
25	ϕ250
30	ϕ300

CS2, CS2W Series

Replacement Parts: Rod Boot Assembly Part Nos.

1. Part Nos. (J: Nylon tarpaulin)

Bore size	Stroke					
	Up to 50	51 to 75	76 to 100	101 to 150	151 to 200	201 to 250
ø125	CS2-J12-050	CS2-J12-075	CS2-J12-100	CS2-J12-150	CS2-J12-200	CS2-J12-250
ø140						
ø160	CS2-J16-050	CS2-J16-100	CS2-J16-100	CS2-J16-150	CS2-J16-200	CS2-J16-250

Bore size	Stroke					
	251 to 300	301 to 350	351 to 400	401 to 450	451 to 500	501 to 550
ø125	CS2-J12-300	CS2-J12-350	CS2-J12-400	CS2-J12-450	CS2-J12-500	CS2-J12-550
ø140						
ø160	CS2-J16-300	CS2-J16-350	CS2-J16-400	CS2-J16-450	CS2-J16-500	CS2-J16-550

Bore size	Stroke					
	551 to 600	601 to 650	651 to 700	701 to 750	751 to 800	801 to 900
ø125	CS2-J12-600	CS2-J12-650	CS2-J12-700	CS2-J12-800	CS2-J12-800	CS2-J12-900
ø140						
ø160	CS2-J16-600	CS2-J16-650	CS2-J16-700	CS2-J16-750	CS2-J16-800	CS2-J16-900

Bore size	Stroke					
	901 to 1000	1001 to 1050	1051 to 1100	1101 to 1200	1201 to 1300	1301 to 1400
ø125	CS2-J12-A00	CS2-J12-A10	CS2-J12-A10	CS2-J12-A20	CS2-J12-A30	CS2-J12-A40
ø140						
ø160	CS2-J16-A05	CS2-J16-A05	CS2-J16-A10	CS2-J16-A20	CS2-J16-A30	CS2-J16-A40

Bore size	Stroke	
	1401 to 1500	1501 to 1600
ø125	CS2-J12-A50	CS2-J12-A60
ø140		
ø160	CS2-J16-A50	CS2-J16-A60

CS2, CS2W Series

Replacement Parts: Rod Boot Assembly Part Nos.

2. Part Nos. (K: Heat-resistant tarpaulin)

Bore size	Stroke					
	Up to 50	51 to 75	76 to 100	101 to 150	151 to 200	201 to 250
ø125	CS2-K12-050	CS2-K12-75	CS2-K12-100	CS2-K12-150	CS2-K12-200	CS2-K12-250
ø140						
ø160	CS2-K16-050	CS2-K16-100	CS2-K16-100	CS2-K16-150	CS2-K16-200	CS2-K16-250

Bore size	Stroke					
	251 to 300	301 to 350	351 to 400	401 to 450	451 to 500	501 to 550
ø125	CS2-K12-300	CS2-K12-350	CS2-K12-400	CS2-K12-450	CS2-K12-500	CS2-K12-550
ø140						
ø160	CS2-K16-300	CS2-K16-350	CS2-K16-400	CS2-K16-450	CS2-K16-500	CS2-K16-550

Bore size	Stroke					
	551 to 600	601 to 650	651 to 700	701 to 800	801 to 900	901 to 1000
ø125	CS2-K12-600	CS2-K12-650	CS2-K12-700	CS2-K12-800	CS2-K12-900	CS2-K12-A00
ø140						
ø160	CS2-K16-600	CS2-K16-700	CS2-K16-700	CS2-K16-800	CS2-K16-900	CS2-K16-A00

Bore size	Stroke					
	1001 to 1100	1101 to 1200	1201 to 1300	1301 to 1400	1401 to 1500	1501 to 1600
ø125	CS2-K12-A10	CS2-K12-A20	CS2-K12-A30	CS2-K12-A40	CS2-K12-A50	CS2-K12-A60
ø140						
ø160	CS2-K16-A10	CS2-K16-A20	CS2-K16-A30	CS2-K16-A40	CS2-K16-A50	CS2-K16-A60

CL1(ø40 to ø100) Series

Replacement Parts: Rod Boot Assembly Part Nos.

1. Part Nos.

Rod boot part no.	—	Stroke symbol	*1

(Example) For the CL1T63-1100J rod boot → Use the following part number: C1L50GAAA308-R-A10
(Note) The part number above includes rod boot bands for bore sizes ø40 to ø100, a mounting flange, and 3 cross recessed round head screws.
*1 Refer to "3." for stroke symbols.

2. Rod Boot Part Nos.

	Rod boot part no.	
	J rod boot*2	K rod boot*3
ϕ40	C1L40GAAA307-R	C1L40GBAA307-R
ϕ50	C1L50GAAA308-R	C1L50GBAA308-R
ϕ63	C1L50GAAA308-R	C1L50GBAA308-R
ϕ80	C1L80GAAA310-R	C1L80GBAA310-R
ϕ100	C1LA0GAAA311-R	C1LA0GBAA311-R

*2 J rod boot: Nylon tarpaulin
*3 K rod boot: Heat-resistant tarpaulin

3. Rod Boot Stroke Symbols (3-digit symbol)

Stroke	50	100	1000	1100	1250	1800
Stroke symbol	050	100	A00	A10	A25	A80

Order using the same method when a rod boot is required for strokes other than those shown above.
Please confirm the delivery date with the factory.

CH2E, CH2F, CH2G, CH2H Series

Replacement Parts: Rod Boot Assembly Part Nos.

1. Part Nos.

Rod boot part no.	–	Stroke symbol	*1

(Example) For the CH2(E,F,G,H)*63-1000J rod boot → Use the following part number: CHE63GAR6488-R-A00
(Note) The part number above includes rod boot bands A and B (1 set).
*1 Refer to "3." for stroke symbols.

2. Rod Boot Part Nos.

Bore size	Rod boot part no. (B-series rod)		Rod boot part no. (C-series rod)	
	J rod boot*2	K rod boot*3	J rod boot	K rod boot
ϕ32	CHE32GDR6485-R-*	CHE32GER6485-R-*	–	–
ϕ40	CHE40GDR6486-R-*	CHE40GFR6486-R-*	CHE40GER6486-R-*	CHE40GGR6486-R-*
ϕ50	CHE50GAR6487-R-*	CHE50GBR6487-R-*	CHE40GDR6486-R-*	CHE40GFR6486-R-*
ϕ63	CHE63GAR6488-R-*	CHE63GBR6488-R-*	CHE50GAR6487-R-*	CHE50GBR6487-R-*
ϕ80	CHE80GAR6489-R-*	CHE80GBR6489-R-*	CHE63GAR6488-R-*	CHE63GBR6488-R-*
ϕ100	CHEA0GAR6490-R-*	CHEA0GBR6490-R-*	CHE80GAR6489-R-*	CHE80GBR6489-R-*

*2 J rod boot: Nylon tarpaulin
*3 K rod boot: Heat-resistant tarpaulin

3. Rod Boot Strokes with Factory Stock Available

Rod boot stroke	25	50	75	100	125	150	175	200	250	300	350	400	450	500
Stroke symbol	025	050	075	100	125	150	175	200	250	300	350	400	450	500
Rod boot stroke	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	
Stroke symbol	600	700	800	900	A00	A10	A20	A30	A40	A50	A60	A70	A80	

For intermediate stroke cylinders, go up to the next size stroke when selecting a rod boot.
Please confirm the delivery date with the factory.

CHA Series

Replacement Parts: Rod Boot Assembly Part Nos.

1. Part Nos.

Rod boot part no.	–	Stroke symbol *1

(Example) For the CHA*63-1000J rod boot → Use the following part number: CHA63GCK3999-A00
(Note) The part number above includes rod boot bands A and B (1 set).
*1 Refer to "3." for stroke symbols.

2. Rod Boot Part Nos.

Bore size	Rod boot part no.			
	Excludes the rod trunnion type		Rod trunnion type (U)	
	J rod boot*2	K rod boot*3	J rod boot*2	K rod boot*3
φ40	CHA40GCK3997-R-*	CHA40GDK3997-R-*		
φ50	CHA50GCK3998-R-*	CHA50GDK3998-R-*		
φ63	CHA63GCK3999-R-*	CHA63GDK3999-R-*		
φ80	CHA80GEK4000-R-*	CHA80GFK4000-R-*	CHA80GGK4000-R-*	CHA80GHK4000-R-*
φ100	CHAA0GEK4001-R-*	CHAA0GFK4001-R-*	CHAA0GGK4001-R-*	CHAA0GHK4001-R-*
φ125				
φ160	CHAA6GEK4003-R-*	CHAA6GFK4003-R-*	CHAA6GGK4003-R-*	CHAA6GHK4003-R-*

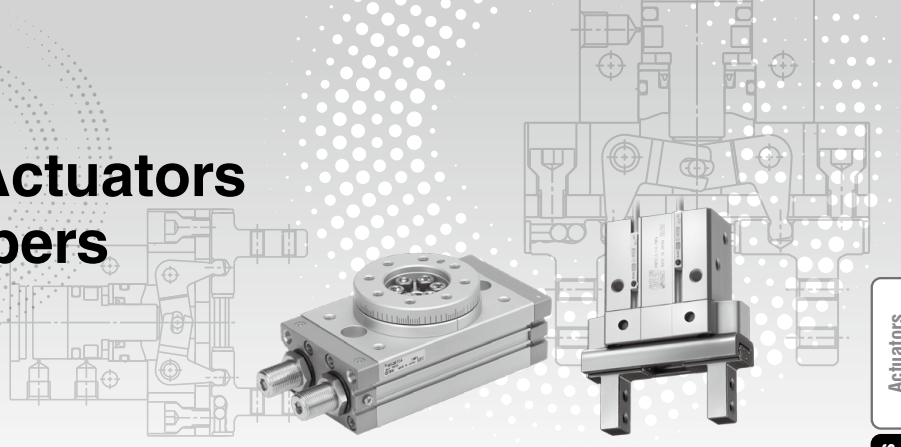
*2 J rod boot: Nylon tarpaulin
*3 K rod boot: Heat-resistant tarpaulin

3. Manufacturable Rod Boot Strokes

Rod boot stroke	25	50	75	100	125	150	175	200	250	300	350	400	450	500
Stroke symbol	025	050	075	100	125	150	175	200	250	300	350	400	450	500
Rod boot stroke	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	
Stroke symbol	600	700	800	900	A00	A10	A20	A30	A40	A50	A60	A70	A80	

For intermediate stroke cylinders, go up to the next size stroke when selecting a rod boot.
Please confirm the delivery date with the factory.

Rotary Actuators
Air Grippers



1 Maintenance ..... p. 257

2 Troubleshooting ..... p. 258

3 Construction/Replacement Parts

<Rotary Actuators>		Replacement Parts	Replacement Procedure
CRA1	Rotary Actuator/Rack & Pinion Type	**p. 260**	**p. 513**
CRQ2	Compact Rotary Actuator/Rack & Pinion Type	**p. 262**	**p. 516**
CRQ2X	Low-Speed Compact Rotary Actuator/Rack & Pinion Type	**p. 263**	**p. 516**
MSQ	Rotary Table/Rack & Pinion Type	**p. 264**	**p. 521**
MSQX	Low-Speed Rotary Table/Rack & Pinion Type	**p. 265**	—
MRQ	Rotary Cylinder	**p. 266**	—

<Air Grippers>		Replacement Parts	Replacement Procedure
JMHZ2	Compact Type Parallel Style Air Gripper	**p. 267**	**p. 525**
MHZ2	Parallel Type Air Gripper/Standard Type	**p. 268**	**p. 527**
MHZL2	Parallel Type Air Gripper/Long Stroke Type	**p. 270**	**p. 527**
MHZJ2	Parallel Type Air Gripper with Dust Cover	**p. 271**	**p. 527**
MHF2	Low Profile Air Gripper	**p. 272**	**p. 532**
MHF2-□F	Low Profile Air Gripper/With One Finger Fixed	**p. 274**	—
MHL2-Z	Wide Type Parallel Style Air Gripper	**p. 275**	**p. 534**
MHL2	Parallel Type Air Gripper/Wide Type	**p. 276**	**p. 534**
MHR3/MDHR3	Rotary Actuated Air Gripper/3-Finger Type	**p. 277**	**p. 535**
MHK2	Wedge Cam Operation Slide Guide Air Gripper/2-Finger Type	**p. 278**	**p. 536**
MHS2	Parallel Type Air Gripper/2-Finger Type	**p. 279**	**p. 537**
MHS3	Parallel Type Air Gripper/3-Finger Type	**p. 280**	**p. 537**
MHSJ3	Parallel Type Air Gripper/3-Finger Type with Dust Cover	**p. 281**	**p. 539**
MHSH3	Parallel Type Air Gripper/3-Finger Type: Through-hole Type	**p. 282**	**p. 541**
MHSH3-A	Parallel Type Air Gripper/3-Finger Type: Through-hole Type (Center pusher)	**p. 283**	**p. 543**
MHSL3	Parallel Type Air Gripper/3-Finger Type: Long Stroke	**p. 284**	**p. 545**
MHS4	Parallel Type Air Gripper/4-Finger Type	**p. 285**	**p. 537**
MHC2	Angular Type Air Gripper/Standard Type	**p. 286**	**p. 547**
MHT2	Toggle Type Air Gripper	**p. 287**	—
MHY2	180° Angular Type Air Gripper/Cam Type	**p. 288**	**p. 549**
MHW2	180° Angular Type Air Gripper/Rack & Pinion Type	**p. 289**	—

1 Maintenance

The following describes the general contents of the rotary actuator and air gripper inspection items. Actually, add inspection items suitable for the customer's specifications and perform the inspection work.

[Rotary Actuator]

■ Periodic inspection

Check followings for periodic inspection.

1) If the rotary actuator set screw become loose

2) Operating state

3) Leakage to outside

4) Is not the backlash of the rack-and-pinion abnormally large?

If any items are found by the inspection that require repairing, tighten any loose parts or disassemble the product to repair.

■ Precautions

1) Disassembling the product will void SMC's warranty. If disassembly is really necessary it is recommended to fully understand the internal construction before disassembling the products.

2) Do not damage the seals when reassembling the product.

3) If locking adhesive is applied to the bolts or screws, apply locking adhesive again during reassembly.

[Air Gripper]

■ Precautions

1) Perform maintenance and inspection according to the procedures indicated in the operation manual.
If handled improperly, human injury and/or malfunction or damage of machinery and equipment may occur.

2) If handled improperly, compressed air can be dangerous. Assembly, handling, repair, and element replacement of pneumatic systems should be performed by a knowledgeable and experienced person.

3) Remove drainage from air filters regularly.

4) Before air grippers are removed, first confirm that measures are in place to prevent workpieces from dropping, run-away equipment, etc. Then, cut off the supply pressure and electric power, and exhaust all compressed air from the system using the residual pressure release function.
When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent sudden movement.

5) Do not allow people to enter or place objects in the carrying path of the air gripper.
This may cause human injury and/or an accident.

6) Do not put hands, etc., in between the air gripper fingers or attachments.
This may cause human injury and/or an accident.

7) When removing the air gripper, first confirm that no workpieces are being held and then release the compressed air before removing the air gripper.
If a workpiece is still being held, there is a danger of it being dropped.

2 Troubleshooting

The following describes the general contents of the troubleshooting.

[Rotary Actuator]

Trouble (Symptom)	Cause	Corrective action
Actuator does not operate. Adjust speed controller and check that rotation speed of actuator is within the specified speed adjusting range.	Stable speed adjusting range is not satisfied.	Use the product within the specified speed adjusting range.
	Increase in internal leakage due to internal seal damage caused by foreign matter and/or oil.	Replace the piston seal and gasket. (In general, the product requires replacement.)
	Sealing failure of internal seal or increase in internal resistance due to the use out of the specified operating temperature range (including freezing).	Use the product within the specified operating temperature range. (In some cases of sealing failure, the piston seal and gasket require replacement.)
	a. Failure of peripheral components b. Improper adjusting of speed controllers c. Malfunction of solenoid valves d. Air supply shortage due to clogging of air filter e. Decrease in pressure due to failure of regulator	Use special products. (including measures against problems of pneumatic circuit).
Shaft/Pinion breakage	Large load energy: a. Large load mass b. Fast operating speed c. Long rotation radius	Replace the shaft or pinion. a. Use the product with the allowable energy range. b. Install cushioning device and external stopper to absorb impact energy.
	External force other than load energy is applied.	Replace the shaft or pinion. Avoid excessive external force.
	Offset load due to de-centering	Replace the shaft: Correct de-centering.
Rotation angle failure	Breakage of the connection part of the rotation axis or internal stopper	Replace the connection part or product.
Bearing breakage	Overload (Loads in radial and thrust directions are too heavy.)	Replace the bearing: Make radial and thrust loads be within the allowable range.
	Offset load due to de-centering	Replace the bearing: Correct de-centering.
	Large vibration	Replace the bearing: Absorb vibration.
External leakage	Sealing failure of O-ring due to bearing damage and/or shaft bending	Replace the bearing and/or shaft. Relieve external force.
	Seal damage due to foreign matter and/or oil	Replace the seals. Prevent foreign matter and oil entrance.
	Sealing failure due to the use out of the specified operating temperature range	Replace the piston seal and gasket. (The product requires replacement especially for the use at high temperature.) Use the product within the specified operating temperature range.

Notice on Trouble and Troubleshooting

1. Life is excluded from the causes.
2. Consult SMC for any causes other than those in the table above (except life) since the product may require disassembling check.

2 Troubleshooting

The following describes the general contents of the troubleshooting.

[Air Gripper/MHZ]

Trouble (Symptom)		Cause	Check method	Corrective action
Air leakage	**Rod seal leakage (Air external leakage)**	Wear or damage of rod seals	Check if the intrusion of liquid or the adhesion of foreign matter is occurring on the sliding part of the piston rod.	**A**
	Piston seal leakage (Air internal leakage)	Wear or damage of piston seals	Check if grease is remaining in the cylinder, or if intrusion of foreign matter is occurring.	**B**
Noncon-formance operation	**Sticking Operates slowly Does not operate Response delay**	Wear or damage of rod seals	Check if the intrusion of liquid or the adhesion of foreign matter is occurring on the sliding part of the piston rod.	**A**
		Wear or damage of piston seals	Check if grease is remaining in the cylinder, or if intrusion of foreign matter is occurring.	**B**
		Increase of operating resistance in cylinder	Check if grease is remaining in the cylinder, or if intrusion of foreign matter is occurring.	**B**
		Increase of guide operating resistance	Check the lubrication condition of the guide, or adhesion of foreign matter.	**C**
Poor accuracy	**Increase in amount of finger sway**	Wear of U groove transfer surface and steel balls of guide	Check if wear occurred on the U groove transfer surface and steel balls of the guide.	**D**
		An impression occurred on the U groove transfer surface of the guide	Check if an impression occurred on the U groove transfer surface of the guide.	**E**
Damage	**Finger breakage Guide damage Roller stopper damage**	Overload	Check if an impression occurred on the U groove transfer surface of the guide.	**E**
		Poor rolling of the steel balls due to the occurrence of an impression	Check if an impression occurred on the U groove transfer surface of the guide.	**E**
		Poor rolling of the steel balls due to intrusion of foreign matter	Check if any foreign matter is caught in the U groove transfer surface of the guide.	**F**
Appearance defect	**Occurrence of rust**	Operating environment where water splashes, etc.	Check if the operating environment tends to generate rust caused by high humidity and water splashing, etc.	**G**

Corrective action	
A	■ **The rod seals may have worn and been damaged due to insufficient lubrication on the sliding part of the piston rod.** 1. Check if there is any intrusion of liquid which will cause outflow of the grease. 2. Check if there is any intrusion of foreign matter which will accelerate the wear of the rod seals. In either case, consider use of the MHZJ series with dust cover. When the product is used in an environment where a large amount of liquid splashes, consider using a special product equipped with a fixed dust cover.
B	■ **This trouble may have been caused by the outflow of grease due to the intrusion of liquid, including condensation, drainage, coolant, etc., or intrusion of external foreign matter** 1. Check if there is any intrusion of condensation or drainage, and consider taking actions against condensation, such as installing a quick exhaust valve, use of a moisture control tube, and reducing the tubing capacity. 2. Check if there is any intrusion of foreign matter in the cylinder.
C	■ **Insufficient lubrication and adhesion of foreign matter on the U groove transfer surface of the guide can be considered as the cause.** 1. Check if there is any possibility of grease outflowing from the guide caused by the adhesion of liquid splashing in the surroundings. 2. Check if there is any possibility of the adhesion of foreign matter which will cause deterioration of the lubrication condition of the guide. In either case, consider use of the MHZJ series with dust cover. When the product is used in an environment where a large amount of liquid splashes, consider using a special product equipped with a fixed dust cover.
D	■ **The trouble may have been caused by an increase in the clearance between parts, due to wear of the U groove transfer surface and steel balls, caused by the worsening of the lubrication conditions of the guide.** Check if there is any adhesion of foreign matter on the guide, and consider the use of a product with a dust cover (MHZJ series).
E	■ **The trouble may have been caused by interaction of an excessive moment on the fingers.** 1. Check if there has been any interaction of an external force, such as contact with other equipment, etc. 2. Check if there has been any impact applied at the end of the opening/closing, caused by heavy attachment, the open/close speed being too fast, or the gripping point distance is too long, etc.
F	■ **The steel balls may have collided with the roller stopper with each operation, because normal rolling of the steel balls was obstructed due to the foreign matter caught on the U groove transfer surface of the guide.** Check if there is any adhesion of foreign matter on the guide, and consider the use of a product with a dust cover (MHZJ series).
G	■ **Rust may occur depending on the operating environment.** Consider the use of a product with a dust cover (MHZJ series) to prevent the adhesion of liquid.

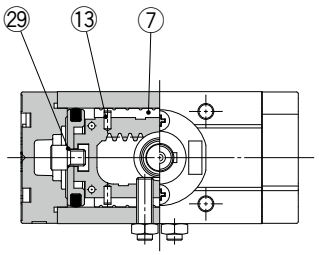
CRA1 Series Size: 30

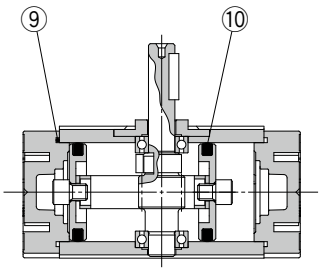
The Replacement Procedure is on p. 513

Construction

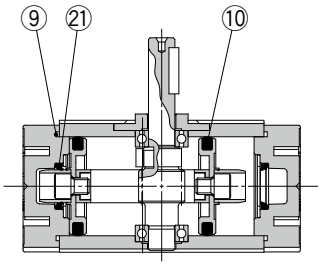
Size 30

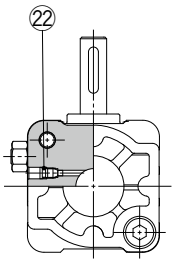
Without air cushion





With air cushion





∗ The numbers correspond with those in the "Construction" of the CRA1 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
⑦	**Slider**	Resin	**22 and 29 are non-replaceable parts, so they are not included in the seal kit.**
⑨	**Tube gasket**	NBR	
⑩	**Piston seal**	NBR	
⑬	**Spring pin**	Steel	
㉑	**Cushion seal**	Urethane	
22	**O-ring**	NBR	
29	**O-ring**	NBR	

Replacement Parts

Size		Part no.	
		Without air cushion	With air cushion
30Note 2)	**90°**	P694010-20	P694010-22
	180°	P694010-21	P694010-23
Corresponding parts		⑦, ⑨, ⑩, ⑬ are included as a set.	⑦, ⑨, ⑩, ⑬, ㉑ are included as a set.

Note 1) When ordering replacement parts, write "1" for one set of the parts per actuator.
Note 2) Replacement parts for different rotation angles are set.
A grease pack (10 g) is included.
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

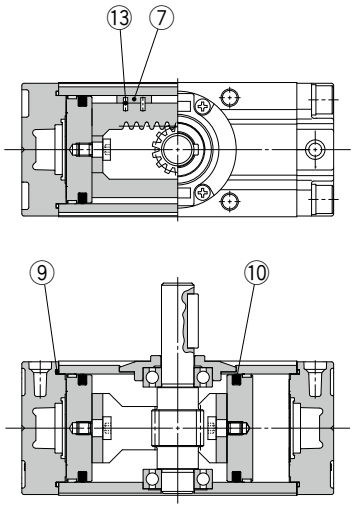
CRA1 Series Size: 50 to 100

The Replacement Procedure is on p. 514

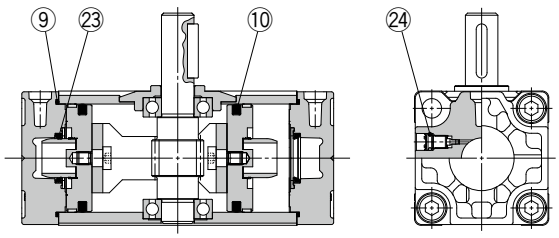
Construction

Sizes 50 to 100

Without air cushion



With air cushion



∗ The numbers correspond with those in the "Construction" of the CRA1 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
⑦	**Slider**	Resin	**24 is a non-replaceable part, so it is not included in the seal kit.**
⑨	**Tube gasket**	NBR	
⑩	**Piston seal**	NBR	
⑬	**Spring pin**	Steel	
㉓	**Cushion seal**	Urethane	
24	**O-ring**	NBR	

Replacement Parts

Size	Part no.		
	Without air cushion	With air cushion	Air-hydro
50	P694020-20	P694020-21	P694020-23
63	P694030-20	P694030-21	P694030-23
80	P694040-20	P694040-21	P694040-23
100	P694050-20	P694050-21	P694050-23
Corresponding parts	⑦, ⑨, ⑩, ⑬ are included as a set.	⑦, ⑨, ⑩, ⑬, ㉓ are included as a set.	⑦, ⑨, ⑩, ⑬ are included as a set.

Note) When ordering replacement parts, write "1" for one set of the parts per actuator.
A grease pack (10 g) is included.
Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

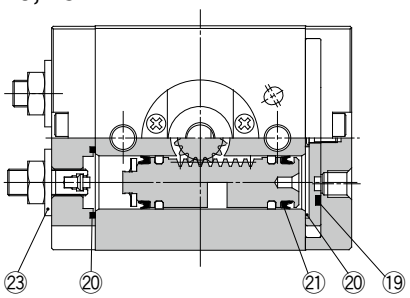
CRQ2 Series

Size: 10, 15, 20
30, 40

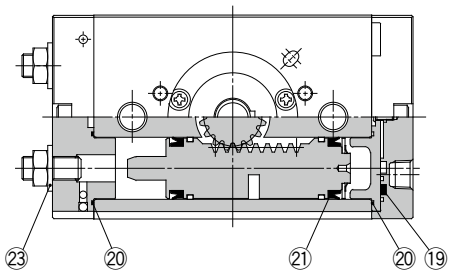
The Replacement Procedure is on p. 516

Construction

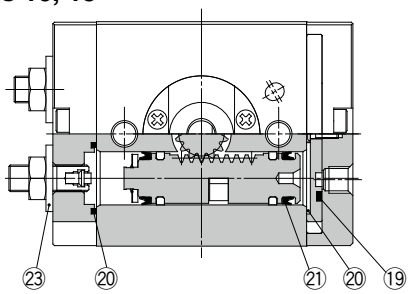
Sizes 10, 15



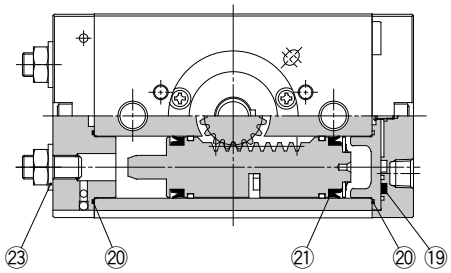
Sizes 20, 30, 40



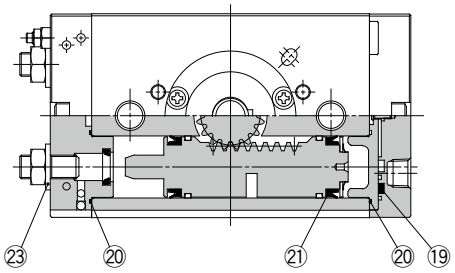
With auto switch
Sizes 10, 15



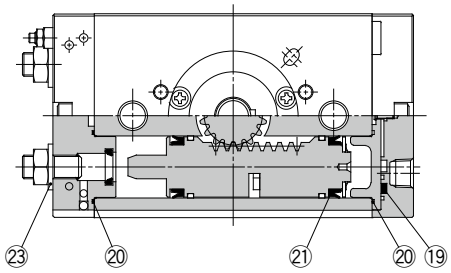
With auto switch
Sizes 20, 30, 40



With cushion
Sizes 20, 30, 40



With auto switch and cushion
Sizes 20, 30, 40



∗ The numbers correspond with those in the "Construction" of the CRQ2 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
⑲	**Seal**	NBR	
⑳	**Gasket**	NBR	
㉑	**Piston seal**	NBR	
㉓	**Seal washer**	NBR	

Replacement Parts

Description	Size				
	10	**15**	**20**	**30**	**40**
Seal kit part no.	P473010-1	P473020-1	P473030-1	P473040-1	P473050-1

A grease pack (10 g) is included. Order with the following part number when only the grease pack is required.
Grease pack part no.: GR-S-010 (10 g)

Contents

	No.	Description	Qty.	Note
Applicable parts	**19**	**Seal**	1	
	20	**Gasket for cover**	2	Size: 10, 15
		Gasket for end cover	1	
		Gasket	4	Size: 20, 30, 40
	21	**Piston seal**	4	
	23	**Seal washer**	2	

∗ A set includes all parts above.
∗ Individual part cannot be shipped.

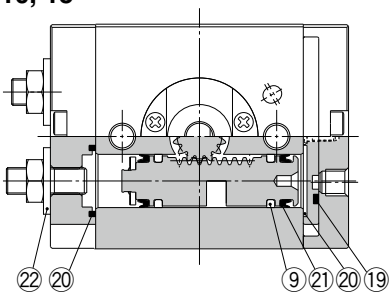
CRQ2X Series

Size: 10, 15, 20 30, 40

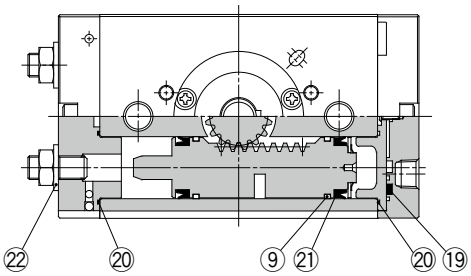
The Replacement Procedure is on p. 516

Construction

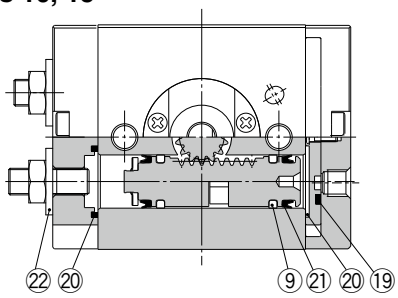
Sizes 10, 15



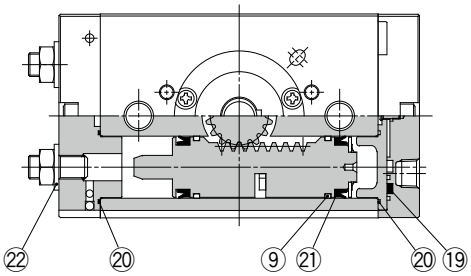
Sizes 20, 30, 40



With auto switch
Sizes 10, 15



With auto switch
Sizes 20, 30, 40



Component Parts

No.	Description	Material	Note
⑨	**Wear ring**	Resin	
⑲	**Seal**	NBR	
⑳	**Gasket**	NBR	
㉑	**Piston seal**	NBR	
㉒	**Seal washer**	NBR	

∗ The numbers correspond with those in the “Construction” of the CRQ2X series in the **Web Catalog**.

Replacement Parts

Description	Size					Contents
	10	**15**	**20**	**30**	**40**	
Seal kit part no.	P473010-23	P473020-23	P473030-23	P473040-23	P473050-23	Set of nos. ⑨, ⑲, ⑳, ㉑, ㉒

Contents

No.	Description	Qty.	Note
9	**Wear ring**	4	
19	**Seal**	1	
20	**Gasket for cover**	2	Size: 10, 15
	Gasket for end cover	1	
	Gasket	4	Size: 20, 30, 40
21	**Piston seal**	4	
22	**Seal washer**	2	

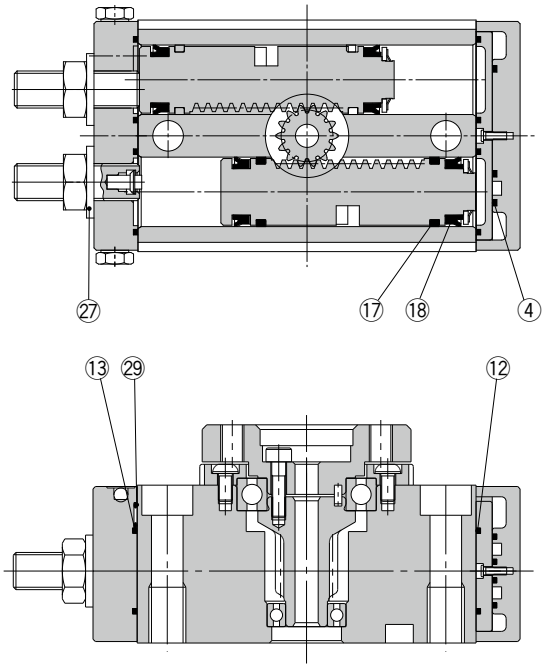
∗ A set includes all parts above.
A grease pack (10 g) is included. Order with the following part number when only the grease pack is required.
Replacement parts/Grease pack part no.: P523010-21 (10 g)

MSQ Series

Size: 10, 20, 30, 50, 70, 100, 200

The Replacement Procedure is on p. 521

Construction



Component Parts

No.	Description		Material	Note
④	**Seal**		NBR	
⑫	**Gasket**		NBR	
⑬	**Gasket**		NBR	
⑰	**Wear ring**		Resin	
⑱	**Piston seal**		NBR	
㉗	**Seal washer**		NBR	
㉙	**O-ring**	**Size: 70 to 200 only**	NBR	

∗ The numbers correspond with those in the “Construction” of the MSQ series in the **Web Catalog**.

Replacement Parts: Basic Type

Description	Size																							
	10			**20**			**30**			**50**			**70**			**100**			**200**		
Seal kit part no.	P523010-5			P523020-5			P523030-5			P523040-5			P391050-5			P391060-5			P391070-5		
Parts included in seal kit	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.
	4	**Seal**	1	**4**	**Seal**	1	**4**	**Seal**	1	**4**	**Seal**	1	**4**	**Seal**	1	**4**	**Seal**	1	**4**	**Seal**	1	**4**	**Seal**	1
	12	**Gasket**	1	**12**	**Gasket**	1	**12**	**Gasket**	1	**12**	**Gasket**	1	**12**	**Gasket**	4	**12**	**Gasket**	4	**12**	**Gasket**	4	**12**	**Gasket**	4
	13	**Gasket**	1	**13**	**Gasket**	1	**13**	**Gasket**	1	**13**	**Gasket**	1	**17**	**Wear ring**	4	**17**	**Wear ring**	4	**17**	**Wear ring**	4	**17**	**Wear ring**	4
	17	**Wear ring**	4	**17**	**Wear ring**	4	**17**	**Wear ring**	4	**17**	**Wear ring**	4	**18**	**Piston seal**	4	**18**	**Piston seal**	4	**18**	**Piston seal**	4	**18**	**Piston seal**	4
	18	**Piston seal**	4	**18**	**Piston seal**	4	**18**	**Piston seal**	4	**18**	**Piston seal**	4	**27**	**Seal washer**	2	**27**	**Seal washer**	2	**27**	**Seal washer**	2	**27**	**Seal washer**	2
	27	**Seal washer**	2	**27**	**Seal washer**	2	**27**	**Seal washer**	2	**27**	**Seal washer**	2	**29**	**O-ring**	4	**29**	**O-ring**	4	**29**	**O-ring**	4	**29**	**O-ring**	4

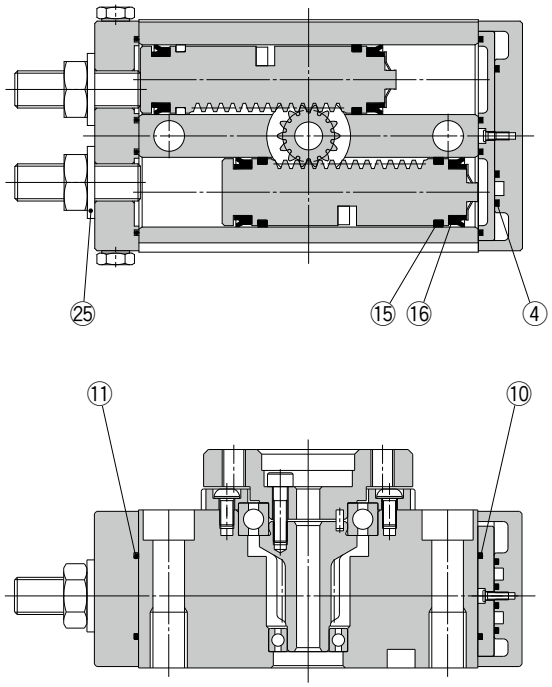
∗ A set includes all parts above.
A grease pack (10 g) is included. Order with the following part number when only the grease pack is required.
Replacement parts/Grease pack part no.: GR-S-010 (10 g)

Replacement Parts: With External Shock Absorber

Description	Size				Note
	10	**20**	**30**	**50**	
Seal kit part no.	P523010-6	P523020-6	P523030-6	P523040-6	The seal washer ㉗ is excluded from the kit contents of the basic type.

MSQX Series Size: 10, 20, 30, 50

Construction



Component Parts

No.	Description	Material	Note
④	**Seal**	NBR	
⑩	**Gasket**	NBR	
⑪	**Gasket**	NBR	
⑮	**Wear ring**	Resin	
⑯	**Piston seal**	NBR	
㉕	**Seal washer**	NBR	

∗ The numbers correspond with those in the “Construction” of the MSQX series in the **Web Catalog**.

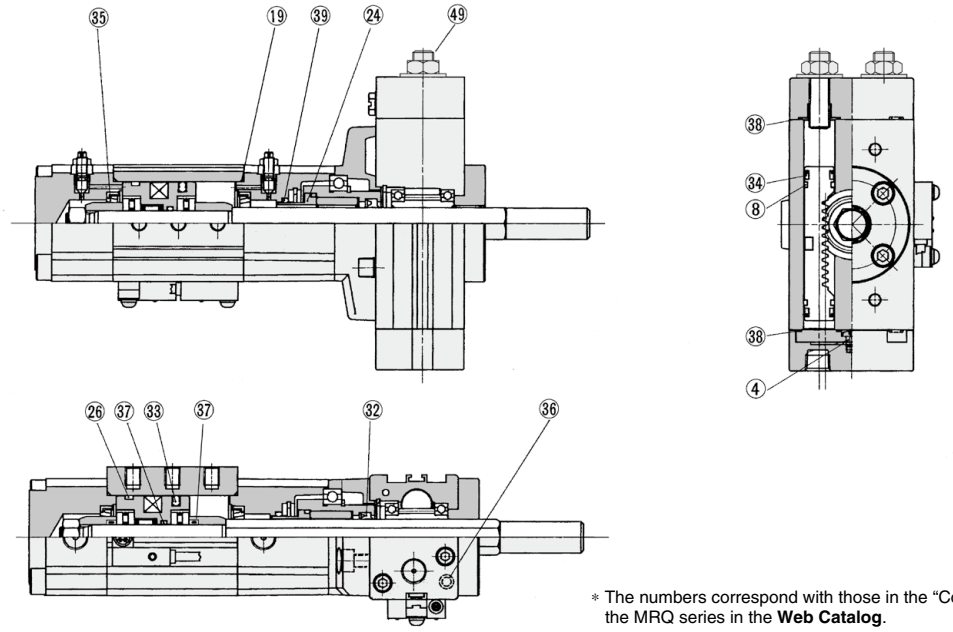
Replacement Parts

Description	Size											
	10			**20**			**30**			**50**		
Seal kit part no.	P523010-20			P523020-20			P523030-20			P523040-20		
Parts included in seal kit	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.
	4	**Seal**	1	**4**	**Seal**	1	**4**	**Seal**	1	**4**	**Seal**	1
	10	**Gasket**	1	**10**	**Gasket**	1	**10**	**Gasket**	1	**10**	**Gasket**	1
	11	**Gasket**	1	**11**	**Gasket**	1	**11**	**Gasket**	1	**11**	**Gasket**	1
	15	**Wear ring**	4	**15**	**Wear ring**	4	**15**	**Wear ring**	4	**15**	**Wear ring**	4
	16	**Piston seal**	4	**16**	**Piston seal**	4	**16**	**Piston seal**	4	**16**	**Piston seal**	4
	25	**Seal washer**	2	**25**	**Seal washer**	2	**25**	**Seal washer**	2	**25**	**Seal washer**	2

∗ A set includes all parts above.
A grease pack (10 g) is included. Order with the following part number when only the grease pack is required.
Replacement parts/Grease pack part no.: P523010-21 (10 g)

MRQ Series

Construction



∗ The numbers correspond with those in the "Construction" of the MRQ series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
④	**Seal**	NBR	
⑧	**Wear ring**	Resin	
⑲	**Tube gasket**	NBR	
24	**O-ring**	NBR	
㉖	**Wear ring**	Resin	**24, 35, 37, and 38 are non-replaceable parts, so they are not included in the seal kit.**
㉜	**Rod seal**	NBR	
㉝	**Piston seal**	NBR	
㉞	**Piston seal**	NBR	
35	**Cushion seal**	NBR	
㊱	**O-ring**	NBR	
37	**O-ring**	NBR	
38	**O-ring**	NBR	
㊴	**O-ring**	NBR	
㊾	**Seal washer**	Steel wire	

Replacement Parts

Description	Size	
	32	**40**
Spare parts assembly part no.	P31701-1	P31702-1

	No.	Description	Qty.
Parts included in the spare parts	**4**	**Seal**	1
	8	**Wear ring**	4
	19	**Tube gasket**	2
	26	**Wear ring**	1
	32	**Rod seal**	1
	33	**Piston seal**	1
	34	**Piston seal**	4
	36	**O-ring**	4
	38	**O-ring**	4
	39	**O-ring**	1
	49	**Seal washer**	2

A grease pack (10 g) is included. Order with the following part number when only the grease pack is required.
Replacement parts/Grease pack part no.: GR-S-010 (10 g)
∗ Individual part cannot be shipped.

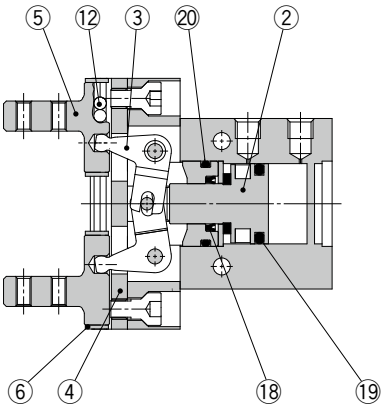
JMHZ2 Series

ø8, ø12, ø16, ø20

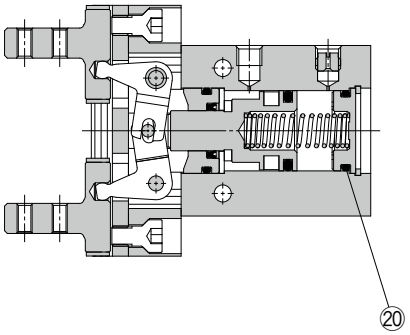
The Replacement Procedure is on p. 525

Construction

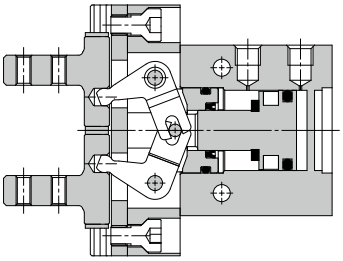
Double acting, With fingers open



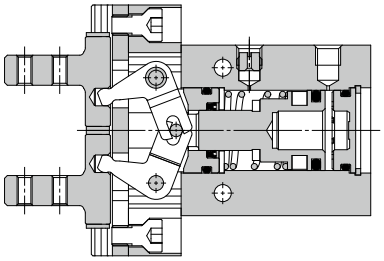
Single acting, Normally open



Double acting, With fingers closed



Single acting, Normally closed



Component Parts

No.	Description	Note
2	Piston assembly	
3	Lever	
4	Guide	
5	Finger	
6	Roller stopper	

No.	Description	Note
12	Steel ball	
18	Rod seal	
19	Piston seal	
20	Gasket	

Replacement Parts/Part Nos.

Description		JMHZ2-8	JMHZ2-12	JMHZ2-16	JMHZ2-20	Contents
Seal kit	JMHZ2-□□D	JMHZ8-PS	JMHZ12-PS	JMHZ16-PS	JMHZ20-PS	⑱⑲⑳
	JMHZ2-□□S	JMHZ8S-PS	JMHZ12S-PS	JMHZ16S-PS	JMHZ20S-PS	
	JMHZ2-□□C					
Finger assembly	JMHZ2-□□□	JMHZ-A0802	JMHZ-A1202	JMHZ-A1602	JMHZ-A1602	④⑤⑥⑫ Mounting screw
	JMHZ2-□□□1	JMHZ-A0802-1	JMHZ-A1202-1	JMHZ-A1602-1	JMHZ-A1602-1	
	JMHZ2-□□□2	JMHZ-A0802-2	JMHZ-A1202-2	JMHZ-A1602-2	JMHZ-A1602-2	
Piston assembly	JMHZ2-□□D	JMHZ-A0803	JMHZ-A1203	JMHZ-A1603	JMHZ-A2003	②
	JMHZ2-□□S	JMHZ-A0803S	JMHZ-A1203S	JMHZ-A1603S	JMHZ-A2003S	
	JMHZ2-□□C	JMHZ-A0803C				
Lever assembly		JMHZ-A0804	JMHZ-A1204	JMHZ-A1604	JMHZ-A2004	③

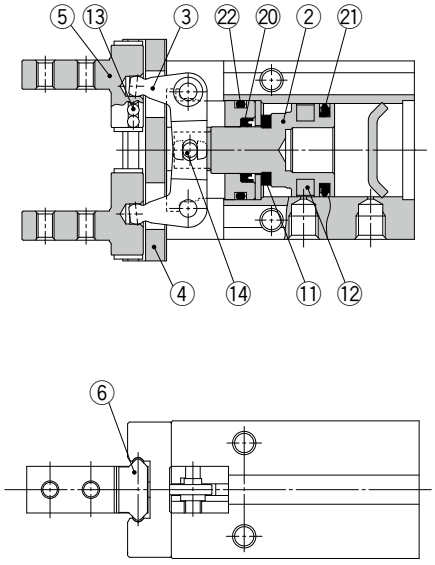
∗ Finger option
1 = Side tapped, 2 = Through-hole
∗ Since the seal kit does not include a grease pack, it should be ordered separately.
Grease pack part no.: GR-S-010 (10 g)

MHZ2 Series ø10, ø16, ø20, ø25

The Replacement Procedure is on p. 527

Construction

MHZ2-10□ to 25□



∗ The numbers correspond with those in the "Construction" of the MHZ2 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston**	ø10, ø16: Stainless steel ø20, ø25: Aluminum alloy	
③	**Lever**	Stainless steel	
④	**Guide**	Stainless steel	
⑤	**Finger**	Stainless steel	
⑥	**Roller stopper**	Stainless steel	
⑪	**Bumper**	Urethane rubber	

No.	Description	Material	Note
⑫	**Rubber magnet**	Synthetic rubber	
⑬	**Steel ball**	High carbon chrome bearing steel	
⑭	**Needle roller**	High carbon chrome bearing steel	
⑳	**Rod seal**	NBR	
㉑	**Piston seal**	NBR	
㉒	**Gasket**	NBR	

Replacement Parts/Part Nos.: Double Acting, Single Acting

Description		MHZ2-10	MHZ2-16	MHZ2-20	MHZ2-25	Main parts
Seal kit	MHZ2-□□D□ MHZ2-□□C□	MHZ10-PS	MHZ16-PS	MHZ20-PS	MHZ25-PS	⑳㉑㉒
	MHZ2-□□S□	MHZ10S-PS	MHZ16S-PS	MHZ20S-PS	MHZ25S-PS	
Finger assembly	MHZ2-□□□(N)	MHZ-AA1002(N)	MHZ-AA1602(N)	MHZ-AA2002(N)	MHZ-AA2502(N)	④⑤⑥⑬ Mounting screw
	MHZ2-□□□(N)1	MHZ-AA1002(N)-1	MHZ-AA1602(N)-1	MHZ-AA2002(N)-1	MHZ-AA2502(N)-1	
	MHZ2-□□□(N)2	MHZ-AA1002(N)-2	MHZ-AA1602(N)-2	MHZ-AA2002(N)-2	MHZ-AA2502(N)-2	
	MHZ2-□□□3	MHZ-AA1002-3	MHZ-AA1602-3	MHZ-AA2002-3	MHZ-AA2502-3	
Piston assembly	MHZ2-□□D□ MHZ2-□□S□ MHZ2-□□C□	MHZ-AA1003	MHZ-AA1603	MHZ-AA2003	MHZ-AA2503	②⑪⑫⑭
End boss assembly	MHZ2-□□D□W	MHZ-A1007	MHZ-A1607	MHZ-A2007	MHZ-A2507	Main body of adaptor Mounting screw for adaptor Seal
	MHZ2-□□□□K	MHZ-A1008	MHZ-A1608	MHZ-A2008	MHZ-A2508	
	MHZ2-□□□□M	MHZ-A1009	MHZ-A1609	MHZ-A2009	MHZ-A2509	
	MHZ2-□□□□E	MHZ-A1010	MHZ-A1610	MHZ-A2010	MHZ-A2510	
Lever assembly		MHZ-AA1004	MHZ-AA1604	MHZ-AA2004	MHZ-AA2504	③

∗ Finger option
1 = Side tapped, 2 = Through-hole, 3 = Flat type fingers
∗ End boss type
W = One-touch fitting for coaxial tubing, K = With One-touch fitting, M = With M5 port, E = Side ported
∗ The end boss assembly other than type E should be mounted on the special body.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

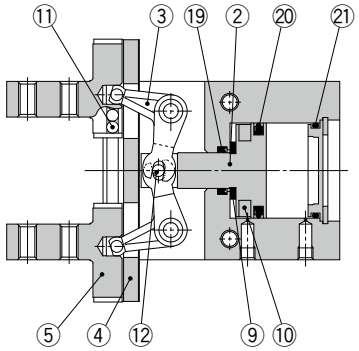
Grease pack part no.: GR-S-010 (10 g)

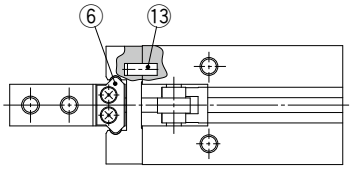
MHZ2 Series ø32, ø40

The Replacement Procedure is on p. 527

Construction

MHZ2-32□ to 40□





∗ The numbers correspond with those in the "Construction" of the MHZ2 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston**	Aluminum alloy	
③	**Lever**	Stainless steel	
④	**Guide**	Stainless steel	
⑤	**Finger**	Stainless steel	
⑥	**Roller stopper**	Stainless steel	
⑨	**Bumper**	Urethane rubber	
⑩	**Rubber magnet**	Synthetic rubber	
⑪	**Steel ball**	High carbon chrome bearing steel	

No.	Description	Material	Note
⑫	**Needle roller**	High carbon chrome bearing steel	
⑬	**Parallel pin**	Stainless steel	
⑲	**Rod seal**	NBR	
⑳	**Piston seal**	NBR	
㉑	**Gasket**	NBR	

Replacement Parts/Part Nos.: Double Acting, Single Acting

Description		MHZ2-32	MHZ2-40	Main parts
Seal kit		MHZ32-PS	MHZ40-PS	⑲⑳㉑
Finger assembly	MHZ2-□□□	MHZ-A3202	MHZ-A4002	④⑤⑥⑪⑬ Mounting screw
	MHZ2-□□□1	MHZ-A3202-1	MHZ-A4002-1	
	MHZ2-□□□2	MHZ-A3202-2	MHZ-A4002-2	
	MHZ2-□□□3	MHZ-A3202-3	MHZ-A4002-3	
Piston assembly	MHZ2-□□D□	MHZ-A3203	MHZ-A4003	②⑨⑩⑫
	MHZ2-□□S□	MHZ-A3203S	MHZ-A4003S	
	MHZ2-□□C□			
Lever assembly		MHZ-A3204	MHZ-A4004	③

∗ Finger option
1 = Side tapped, 2 = Through-hole, 3 = Flat type fingers
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part no.: GR-S-010 (10 g)

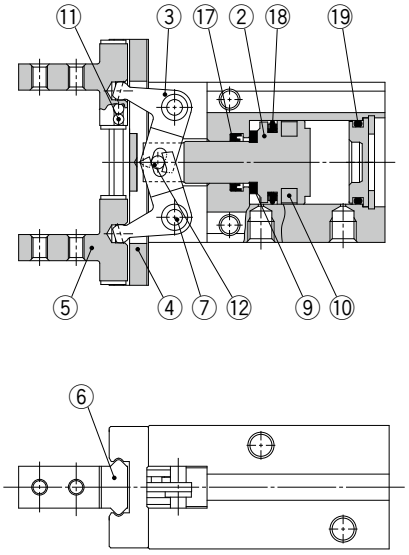
MHZL2 Series

ø10, ø16, ø20, ø25

The Replacement Procedure is on p. 527

Construction

MHZL2-10□ to 25□



∗ The numbers correspond with those in the "Construction" of the MHZL2 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston**	ø10, ø16: Stainless steel ø20, ø25: Aluminum alloy	
③	**Lever**	Stainless steel	
④	**Guide**	Stainless steel	
⑤	**Finger**	Stainless steel	
⑥	**Roller stopper**	Stainless steel	
⑦	**Lever shaft**	Stainless steel	
⑨	**Bumper**	Urethane rubber	

No.	Description	Material	Note
⑩	**Rubber magnet**	Synthetic rubber	
⑪	**Steel ball**	High carbon chrome bearing steel	
⑫	**Needle roller**	High carbon chrome bearing steel	
⑰	**Rod seal**	NBR	
⑱	**Piston seal**	NBR	
⑲	**Gasket**	NBR	

Replacement Parts/Part Nos.: Double Acting, Single Acting

Description		MHZL2-10	MHZL2-16	MHZL2-20	MHZL2-25	Main parts
Seal kit		MHZL10-PS	MHZL16-PS	MHZL20-PS	MHZL25-PS	⑰⑱⑲
Finger assembly	MHZL2-□□□	MHZL-AA1002	MHZL-AA1602	MHZL-AA2002	MHZL-AA2502	④⑤⑥⑪ Mounting screw
	MHZL2-□□□1	MHZL-AA1002-1	MHZL-AA1602-1	MHZL-AA2002-1	MHZL-AA2502-1	
	MHZL2-□□□2	MHZL-AA1002-2	MHZL-AA1602-2	MHZL-AA2002-2	MHZL-AA2502-2	
	MHZL2-□□□3	MHZL-AA1002-3	MHZL-AA1602-3	MHZL-AA2002-3	MHZL-AA2502-3	
Piston assembly	MHZL2-□□D□	MHZL-A1003	MHZL-A1603	MHZL-A2003	MHZL-A2503	②⑨⑩⑫
	MHZL2-□□S□					
	MHZL2-□□C□	MHZL-A1003C	MHZL-A1603C	MHZL-A2003C	MHZL-A2503C	
End boss assembly	MHZL2-□□D□W	MHZ-A1007	MHZ-A1607	MHZ-A2007	MHZ-A2507	Main body of adaptor Mounting screw for adaptor Seal
	MHZL2-□□□□K	MHZ-A1008	MHZ-A1608	MHZ-A2008	MHZ-A2508	
	MHZL2-□□□□M	MHZ-A1009	MHZ-A1609	MHZ-A2009	MHZ-A2509	
	MHZL2-□□□□E	MHZ-A1010	MHZ-A1610	MHZ-A2010	MHZ-A2510	
Lever assembly		MHZL-A1004	MHZL-A1604	MHZL-A2004	MHZL-A2504	③⑦

∗ Finger option
1 = Side tapped, 2 = Through-hole, 3 = Flat type fingers
∗ End boss type
W = One-touch fitting for coaxial tubing, K = With One-touch fitting, M = With M5 port, E = Side ported
∗ The end boss assembly other than type E should be mounted on the special body.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part no.: GR-S-010 (10 g)

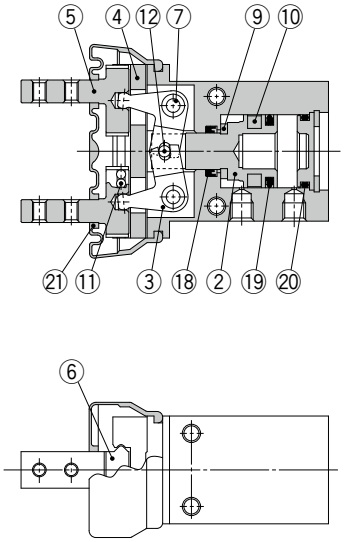
MHZJ2 Series

ø10, ø16, ø20, ø25

The Replacement Procedure is on p. 527

Construction

MHZJ2-10□ to 25□



∗ The numbers correspond with those in the "Construction" of the MHZJ2 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston**	ø10, ø16: Stainless steel ø20, ø25: Aluminum alloy	
③	**Lever**	Stainless steel	
④	**Guide**	Stainless steel	
⑤	**Finger**	Stainless steel	
⑥	**Roller stopper**	Stainless steel	
⑦	**Lever shaft**	Stainless steel	
⑨	**Bumper**	Urethane rubber	
⑩	**Rubber magnet**	Synthetic rubber	
⑪	**Steel ball**	High carbon chrome bearing steel	

No.	Description	Material	Note
⑫	**Needle roller**	High carbon chrome bearing steel	
⑱	**Rod seal**	NBR	
⑲	**Piston seal**	NBR	
⑳	**Gasket**	NBR	
㉑	**Dust cover**	Chloroprene rubber	
		Fluororubber	
		Silicone rubber	

Replacement Parts/Part Nos.: Double Acting, Single Acting

Description			MHZJ2-10	MHZJ2-16	MHZJ2-20	MHZJ2-25	Main parts
Seal kit			MHZJ10-PS	MHZJ16-PS	MHZJ20-PS	MHZJ25-PS	⑱⑲⑳
Dust cover	Material	Chloroprene rubber	MHZJ2-J10	MHZJ2-J16	MHZJ2-J20	MHZJ2-J25	㉑
		Fluororubber	MHZJ2-J10F	MHZJ2-J16F	MHZJ2-J20F	MHZJ2-J25F	
		Silicone rubber	MHZJ2-J10S	MHZJ2-J16S	MHZJ2-J20S	MHZJ2-J25S	
Finger assembly			MHZJ-AA1002	MHZJ-AA1602	MHZJ-AA2002	MHZJ-AA2502	④⑤⑥⑪ Mounting screw
Piston assembly			MHZJ-A1003	MHZJ-A1603	MHZJ-A2003	MHZJ-A2503	②⑨⑩⑫
End boss assembly	MHZJ2-□□D□W		MHZ-A1007	MHZ-A1607	MHZ-A2007	MHZ-A2507	Main body of adaptor Mounting screw for adaptor Seal
	MHZJ2-□□□□K		MHZ-A1008	MHZ-A1608	MHZ-A2008	MHZ-A2508	
	MHZJ2-□□□□M		MHZ-A1009	MHZ-A1609	MHZ-A2009	MHZ-A2509	
	MHZJ2-□□□□E		MHZ-A1010	MHZ-A1610	MHZ-A2010	MHZ-A2510	
Lever assembly			MHZJ-A1004	MHZJ-A1604	MHZJ-A2004	MHZJ-A2504	ø10, ø16: ③ ø20, ø25: ③⑦

∗ End boss type
W = One-touch fitting for coaxial tubing, K = With One-touch fitting, M = With M5 port, E = Side ported
∗ The end boss assembly other than type E should be mounted on the special body.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

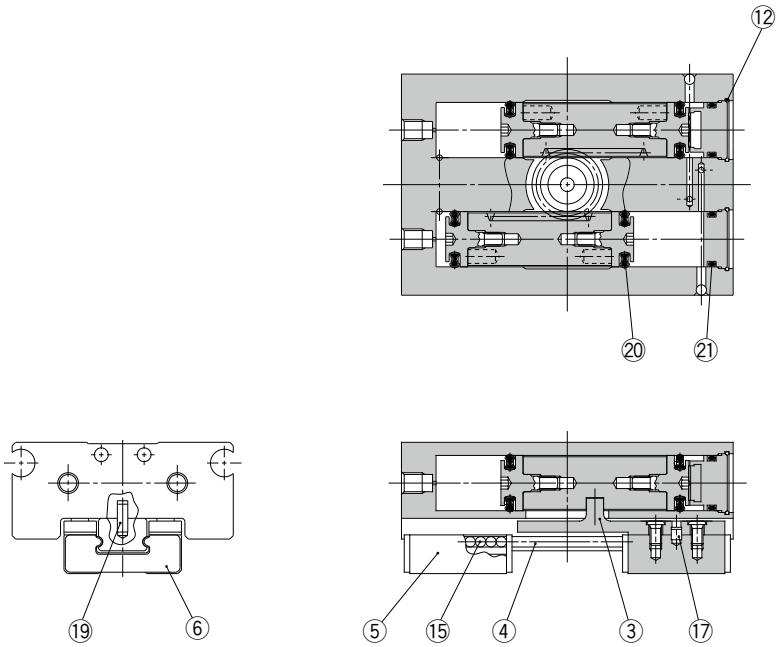
Grease pack part no.: GR-S-010 (10 g)

MHF2 Series ø8

The Replacement Procedure is on p. 532

Construction

MHF2-8D, MHF2-8D1



Component Parts

No.	Description	Material	Note
③	**Joint**	Stainless steel	
④	**Guide rail**	Stainless steel	
⑤	**Finger**	Stainless steel	
⑥	**Roller stopper**	Stainless steel	
⑫	**Clip**	Stainless steel wire	
⑮	**Steel ball**	High carbon chrome bearing steel	
⑰	**Roller**	High carbon chrome bearing steel	
⑲	**Parallel pin**	Stainless steel	
⑳	**Piston seal**	NBR	
㉑	**Gasket**	NBR	

∗ The numbers correspond with those in the “Construction” of the MHF2 series in the **Web Catalog**.

Replacement Parts/Part Nos.

Description	Model			Contents
	MHF2-8D	**MHF2-8D1**	**MHF2-8D2**	
Seal kit	MHF8-PS	MHF8-PS	MHF8-PS-2	⑫⑳㉑
Finger assembly	MHF-A0802	MHF-A0802-1	MHF-A0802-2	③④⑤⑥⑮⑰⑲ Mounting screw

∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part nos.
Guide unit: GR-S-010 (10 g)
Cylinder unit: GR-L-005 (5 g)

Bolts for Body Through-hole Mounting

Part no.	Number of pieces	
MHF-B08	MHF2-8D	2 pieces/unit
	MHF2-8D1	2 pieces/unit
	MHF2-8D2	4 pieces/unit

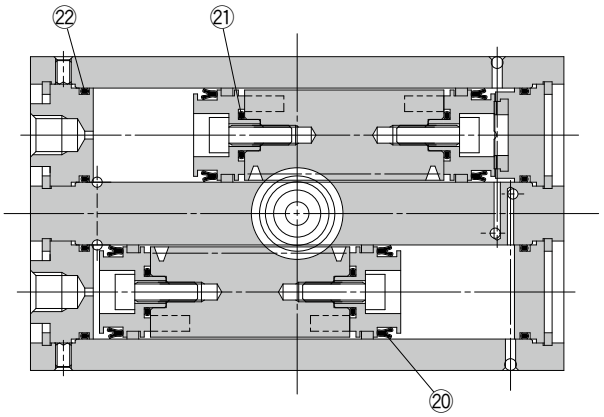
∗ The bolts for body through-hole mounting are attached to the product. But you can also place an order for just 1 piece with this part number.

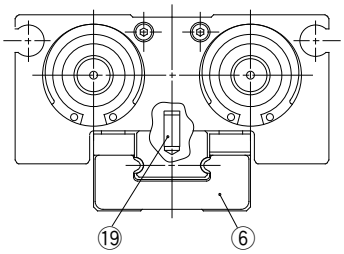
MHF2 Series ø12, ø16, ø20

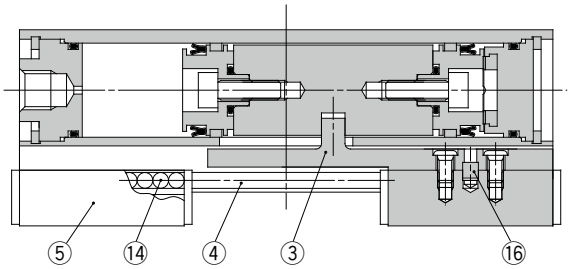
The Replacement Procedure is on p. 532

Construction

MHF2-12D□ to 20D□







∗ The numbers correspond with those in the "Construction" of the MHF2 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
③	**Joint**	Stainless steel	
④	**Guide rail**	Stainless steel	
⑤	**Finger**	Stainless steel	
⑥	**Roller stopper**	Stainless steel	
⑭	**Steel ball**	High carbon chrome bearing steel	
⑯	**ø12: Roller**	High carbon chrome bearing steel	
	ø16 to ø20: Parallel pin	Stainless steel	

No.	Description	Material	Note
⑲	**Parallel pin**	Stainless steel	
⑳	**Piston seal**	NBR	
㉑	**Gasket**	NBR	
㉒	**Gasket**	NBR	

Replacement Parts/Part Nos.

Description	Model			Contents
	MHF2-12D	**MHF2-12D1**	**MHF2-12D2**	
Seal kit	MHF12-PS	MHF12-PS	MHF12-PS	⑳㉑㉒
Finger assembly	MHF-A1202	MHF-A1202-1	MHF-A1202-2	③④⑤⑥⑭⑯⑲ Mounting screw

Description	Model			Contents
	MHF2-16D	**MHF2-16D1**	**MHF2-16D2**	
Seal kit	MHF16-PS	MHF16-PS	MHF16-PS	⑳㉑㉒
Finger assembly	MHF-A1602	MHF-A1602-1	MHF-A1602-2	③④⑤⑥⑭⑯⑲ Mounting screw

Description	Model			Contents
	MHF2-20D	**MHF2-20D1**	**MHF2-20D2**	
Seal kit	MHF20-PS	MHF20-PS	MHF20-PS	⑳㉑㉒
Finger assembly	MHF-A2002	MHF-A2002-1	MHF-A2002-2	③④⑤⑥⑭⑯⑲ Mounting screw

∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease Pack Part Nos.

MHF2-□□D, D1 (ø12, ø16, ø20)	**GR-S-010** (10 g) (Guide unit)
MHF2-□□D2 (ø12)	**GR-L-005** (5 g) (Cylinder unit)
MHF2-□□D2 (ø16, ø20)	**GR-S-010** (10 g) (Guide unit)
	GR-L-010 (10 g) (Cylinder unit)

Bolts for Body Through-hole Mounting

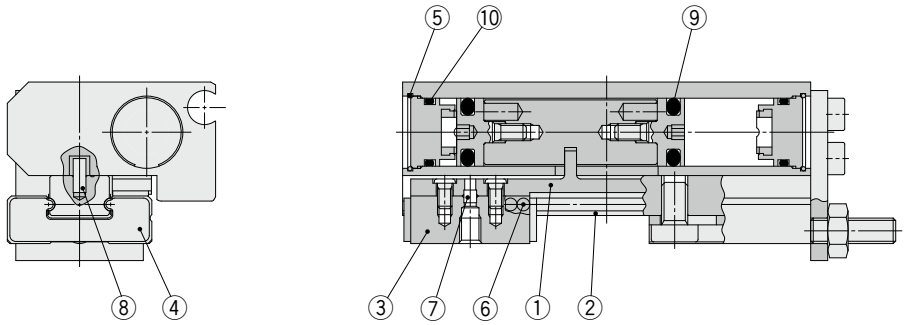
Part no.	Number of pieces	
MHF-B12	MHF2-12D	2 pieces/unit
	MHF2-12D1	2 pieces/unit
	MHF2-12D2	4 pieces/unit

∗ The bolts for body through-hole mounting are attached to the product. But you can also place an order for just 1 piece with this part number.
∗ When mounting MHF2-16D□ or MHF2-20D□ with the body through-holes, use hexagon socket head cap screws available on the market.

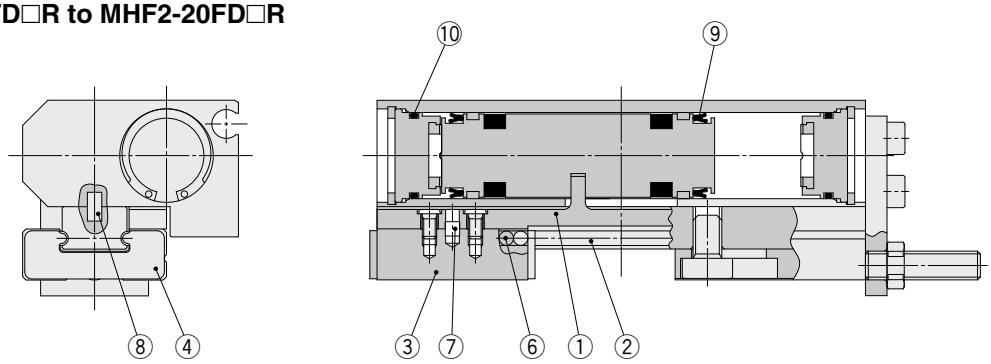
MHF2-□F Series ø8, ø12, ø16, ø20

Construction

MHF2-8FD□R



MHF2-12FD□R to MHF2-20FD□R



Component Parts

No.	Description	Note
①	**Joint**	
②	**Guide rail**	
③	**Finger**	
④	**Roller stopper**	
⑤	**Clip**	
⑥	**Steel ball**	

No.	Description	Note
⑦	**Roller (ø8, ø12)**	
	Parallel pin (ø16, ø20)	
⑧	**Parallel pin**	
⑨	**Piston seal**	
⑩	**Gasket**	

∗ The numbers correspond with those in the "Construction" of the MHF2-□F series in the **Web Catalog**.

Finger Assembly/Part Nos.

Model	Part no.	Contents
MHF2-8FDR	MHF-AA0802F	①②③④⑥⑦⑧ Guide rail mounting screw
MHF2-8FD1R	MHF-AA0802F-1	
MHF2-8FD2R	MHF-AA0802F-2	
MHF2-12FDR	MHF-AA1202F	①②③④⑥⑦⑧ Guide rail mounting screw
MHF2-12FD1R	MHF-AA1202F-1	
MHF2-12FD2R	MHF-AA1202F-2	
MHF2-16FDR	MHF-AA1602F	①②③④⑥⑦⑧ Guide rail mounting screw
MHF2-16FD1R	MHF-AA1602F-1	
MHF2-16FD2R	MHF-AA1602F-2	
MHF2-20FDR	MHF-AA2002F	①②③④⑥⑦⑧ Guide rail mounting screw
MHF2-20FD1R	MHF-AA2002F-1	
MHF2-20FD2R	MHF-AA2002F-2	

Grease Pack Part Nos.
Guide unit: GR-S-010 (10 g)

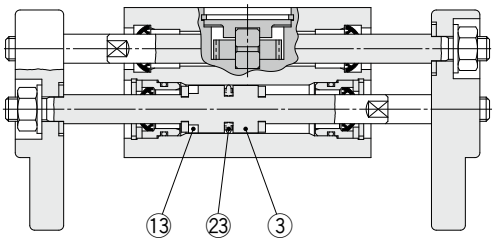
MHL2-Z Series

ø10, ø16, ø20
ø25, ø32, ø40

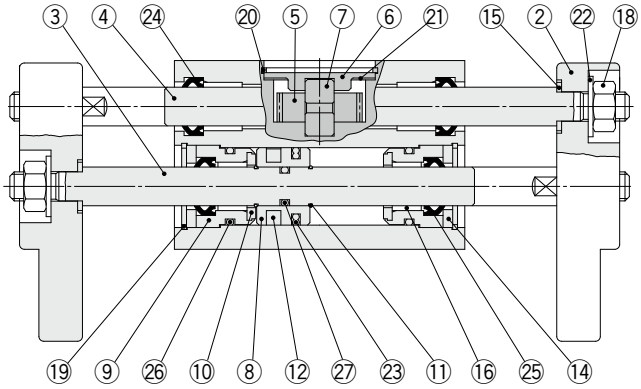
The Replacement Procedure is on p. 534

Construction

ø10



ø16 to ø40



Component Parts

∗ The numbers correspond with those in the "Construction" of the MHL2-Z series in the **Web Catalog**.

No.	Description	Material	Note
②	**Finger**	Aluminum alloy	
③	**Piston rod**	Stainless steel	
④	**Rack**	Stainless steel	
⑤	**Pinion**	Carbon steel	
⑥	**Pinion cover**	Carbon steel	
⑦	**Pinion axis**	Stainless steel	
⑧	**Piston**	Aluminum alloy	
⑨	**Rod cover**	Aluminum alloy	
⑩	**Bumper**	Urethane rubber	
⑪	**Clip**	Stainless steel spring wire	
⑫	**Rubber magnet**	Synthetic rubber	
⑬	**Magnet**	—	
⑭	**Rod seal cover B**	Cold rolled carbon steel sheet	

No.	Description	Material	Note
⑮	**Washer**	Stainless steel	
⑯	**Bearing**	Oil containing polyacetal	
⑱	**U-nut**	Carbon steel	
⑲	**Inverted internal retaining ring**	Carbon steel	
⑳	**Basic internal retaining ring**	Carbon steel	
㉑	**Wave washer**	Steel for spring	
㉒	**Conical spring washer**	Carbon steel	
㉓	**Piston seal**	NBR	
㉔	**Rod seal**	NBR	
㉕	**Rod seal**	NBR	
㉖	**Gasket**	NBR	
㉗	**Gasket**	NBR	

Replacement Parts/Part Nos.

Description		MHL2-10□Z	MHL2-16□Z	MHL2-20□Z	MHL2-25□Z	MHL2-32□Z	MHL2-40□Z	Contents
Seal kit		MHL10-PS	MHL16-PS	MHL20-PS	MHL25-PS	MHL32-PS	MHL40-PS	㉓㉔㉕㉖㉗
Piston assembly	MHL2-□□DZ	MHL-AA1001	MHL-AA1601	MHL-AA2001	MHL-AA2501	MHL-AA3201	MHL-AA4001	ø10: ③⑩⑬㉓ ø16 to ø40: ③⑧⑪⑫㉓㉗
	MHL2-□□D1Z	MHL-AA1002	MHL-AA1602	MHL-AA2002	MHL-AA2502	MHL-AA3202	MHL-AA4002	
	MHL2-□□D2Z	MHL-AA1003	MHL-AA1603	MHL-AA2003	MHL-AA2503	MHL-AA3203	MHL-AA4003	
Rack	MHL2-□□DZ	MHL-AA1004	MHL-AA1604	MHL-AA2004	MHL-AA2504	MHL-AA3204	MHL-AA4004	④
	MHL2-□□D1Z	MHL-AA1005	MHL-AA1605	MHL-AA2005	MHL-AA2505	MHL-AA3205	MHL-AA4005	
	MHL2-□□D2Z	MHL-AA1006	MHL-AA1606	MHL-AA2006	MHL-AA2506	MHL-AA3206	MHL-AA4006	
Rod cover assembly		MHL-AA1007	MHL-AA1607	MHL-AA2007	MHL-AA2507	MHL-AA3207	MHL-AA4007	ø10: ⑨⑭⑯⑲㉕㉖ ø16 to ø40: ⑨⑩⑭⑯⑲㉕㉖
Finger assembly		MHL-AA1008	MHL-AA1608	MHL-AA2008	MHL-AA2508	MHL-AA3208	MHL-AA4008	②⑮⑱㉒
Pinion assembly		MHL-AA1009	MHL-AA1609	MHL-AA2009	MHL-AA2509	MHL-AA3209	MHL-AA4009	⑤⑥⑦⑳㉑
Nut set		MHL-A1017	MHL-A1617	MHL-A2017	MHL-A2517	MHL-A3217	MHL-A4017	⑮⑱㉒
U-nut assembly		MHL-A1017A	MHL-A1617A	MHL-A2017A	MHL-A2517A	MHL-A3217A	MHL-A4017A	⑱㉒

∗ Order 1 piece finger assembly, pinion assembly, nut set and U-nut assembly respectively per unit.
∗ For piston assembly and rack, order 2 pieces per unit.
∗ For rod cover assembly, order 4 pieces per unit.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease Pack Part Nos.

MHL2-□□DZ (ø10 to ø20)	GR-S-010 (10 g)
MHL2-□□DZ (ø25, ø32)	GR-S-010 (10 g)
MHL2-□□DZ (ø40)	GR-S-020 (20 g)
MHL2-□□D1Z (ø10, ø16)	GR-S-010 (10 g)
MHL2-□□D1Z (ø20, ø25)	GR-S-010 (10 g)
MHL2-□□D1Z (ø32, ø40)	GR-S-020 (20 g)
MHL2-□□D2Z (ø10, ø16)	GR-S-010 (10 g)
MHL2-□□D2Z (ø20, ø25)	GR-S-010 (10 g)
MHL2-□□D2Z (ø32, ø40)	GR-S-010 (10 g), GR-S-020 (20 g) (1 pack each)

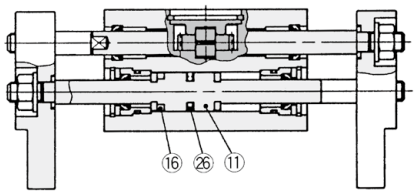
MHL2 Series

ø10, ø16, ø20
ø25, ø32, ø40

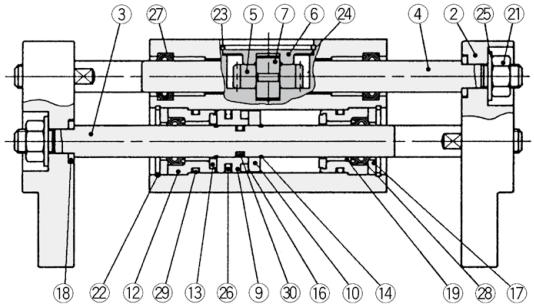
The Replacement Procedure is on p. 534

Construction

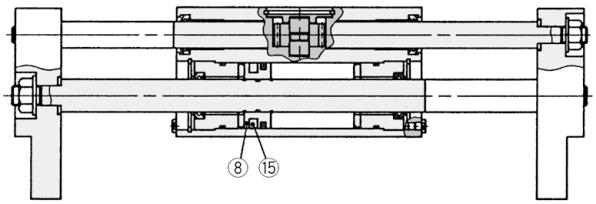
ø10



ø16 to ø25



ø32, ø40



∗ The numbers correspond with those in the "Construction" of the MHL2 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Finger**	Aluminum alloy	
③	**Piston rod**	Stainless steel	
④	**Rack**	Stainless steel	
⑤	**Pinion**	Carbon steel	
⑥	**Pinion cover**	Carbon steel	
⑦	**Pinion axis**	Stainless steel	
⑧	**Piston**	Brass	
⑨	**Piston A**	Brass	
⑩	**Piston B**	Brass	
⑪	**Piston A**	Stainless steel	
⑫	**Rod cover**	Aluminum alloy	
⑬	**Bumper**	Urethane rubber	
⑭	**Clip**	Stainless steel spring wire	
⑮	**Rubber magnet**	Synthetic rubber	
⑯	**Magnet**	—	

No.	Description	Material	Note
⑰	**Rod seal cover B**	Cold rolled carbon steel sheet	
⑱	**Washer**	Stainless steel	
⑲	**Bearing**	Oil containing polyacetal with back metal	
㉑	**U-nut**	Carbon steel	
㉒	**Inverted internal retaining ring**	Carbon steel	
㉓	**Basic internal retaining ring**	Carbon steel	
㉔	**Wave washer**	Steel for spring	
㉕	**Conical spring washer**	Carbon steel	
㉖	**Piston seal**	NBR	
㉗	**Rod seal**	NBR	
㉘	**Rod seal**	NBR	
㉙	**Gasket**	NBR	
㉚	**Gasket**	NBR	

Replacement Parts/Part Nos.

Description		MHL2-10□	MHL2-16□	MHL2-20□	MHL2-25□	MHL2-32□	MHL2-40□	Main parts
Seal kit		MHL10-PS	MHL16-PS	MHL20-PS	MHL25-PS	MHL32-PS	MHL40-PS	㉖㉗㉘㉙㉚
Piston assembly	MHL2-□□D	MHL-A1001	MHL-A1601	MHL-A2001	MHL-A2501	MHL-A3201	MHL-A4001	<ø10> ⑪⑬⑯㉖
	MHL2-□□D1	MHL-A1002	MHL-A1602	MHL-A2002	MHL-A2502	MHL-A3202	MHL-A4002	<ø16 to ø25> ③⑨⑩⑭⑯㉖㉚
	MHL2-□□D2	MHL-A1003	MHL-A1603	MHL-A2003	MHL-A2503	MHL-A3203	MHL-A4003	<ø32, ø40> ③⑧⑭⑮㉖㉚
Rack	MHL2-□□D	MHL-A1004	MHL-A1604	MHL-A2004	MHL-A2504	MHL-A3204	MHL-A4004	④
	MHL2-□□D1	MHL-A1005	MHL-A1605	MHL-A2005	MHL-A2505	MHL-A3205	MHL-A4005	
	MHL2-□□D2	MHL-A1006	MHL-A1606	MHL-A2006	MHL-A2506	MHL-A3206	MHL-A4006	
Rod cover assembly		MHL-A1007	MHL-A1607	MHL-A2007	MHL-A2507	MHL-A3207	MHL-A4007	<ø10> ⑫⑰⑲㉒㉘㉙ <ø16 to 40> ⑫⑬⑰⑲㉒㉘㉙
Finger assembly		MHL-A1008	MHL-A1608	MHL-A2008	MHL-A2508	MHL-A3208	MHL-A4008	②⑱㉑㉕
Pinion assembly		MHL-A1009	MHL-A1609	MHL-A2009	MHL-A2509	MHL-A3209	MHL-A4009	⑤⑥⑦㉓㉔
Nut set		MHL-A1017	MHL-A1617	MHL-A2017	MHL-A2517	MHL-A3217	MHL-A4017	⑱㉑㉕
U-nut assembly		MHL-A1017A	MHL-A1617A	MHL-A2017A	MHL-A2517A	MHL-A3217A	MHL-A4017A	㉑㉕

∗ Order 1 piece finger assembly, pinion assembly, nut set and U-nut assembly respectively per unit.
∗ For piston assembly and rack, order 2 pieces per unit.
∗ For rod cover assembly, order 4 pieces per unit.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease Pack Part Nos.

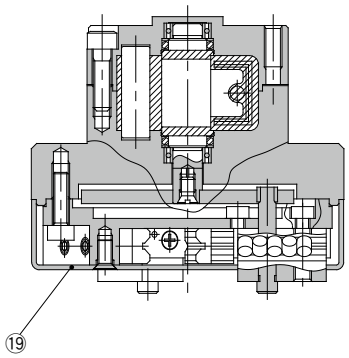
MHL2-□□D (ø10 to ø20)	**GR-S-010** (10 g)
MHL2-□□D (ø25, ø32)	**GR-S-010** (10 g)
MHL2-□□D (ø40)	**GR-S-020** (20 g)
MHL2-□□D1 (ø10, ø16)	**GR-S-010** (10 g)
MHL2-□□D1 (ø20, ø25)	**GR-S-010** (10 g)
MHL2-□□D1 (ø32, ø40)	**GR-S-020** (20 g)
MHL2-□□D2 (ø10, ø16)	**GR-S-010** (10 g)
MHL2-□□D2 (ø20, ø25)	**GR-S-010** (10 g)
MHL2-□□D2 (ø32, ø40)	**GR-S-010** (10 g), **GR-S-020** (20 g) (1 pack each)

MHR3/MDHR3 Series ø10, ø15

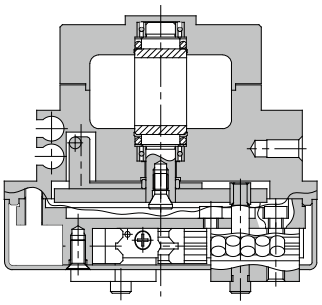
The Replacement Procedure is on p. 535

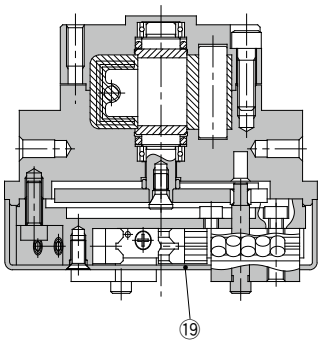
Construction

MHR3



MDHR3





∗ The numbers correspond with those in the “Construction” of the MHR3/MDHR3 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
⑲	**Cover**	Aluminum alloy	

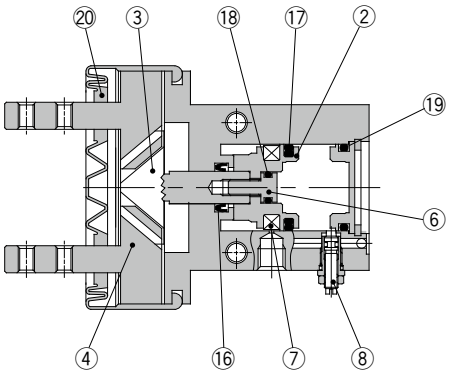
Replacement Parts

Description	**M□HR3-10□**	**M□HR3-15□**	Main parts
Cover	P3313128	P3313228	⑲

MHK2 Series ø12, ø16, ø20, ø25

The Replacement Procedure is on p. 536

Construction



∗ The numbers correspond with those in the "Construction" of the MHK2 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston**	Aluminum alloy	
③	**Cam**	Carbon steel	
④	**Finger**	Carbon steel	
		Stainless steel 304	
⑥	**Piston bolt**	Stainless steel	
⑦	**Rubber magnet**	Synthetic rubber	
⑧	**Needle assembly**		

No.	Description	Material	Note
⑯	**Rod seal**	NBR	
⑰	**Piston seal**	NBR	
⑱	**Gasket**	NBR	
⑲	**Gasket**	NBR	
⑳	**Dust cover**	Chloroprene rubber	
		Fluororubber	
		Silicone rubber	

MHK2 Replacement Parts/Part Nos.: Double Acting, Single Acting

Description			MHK2-12□	MHK2-16□	MHK2-20□	MHK2-25□	Main parts
Seal kit			MHK12-PS	MHK16-PS	MHK20-PS	MHK25-PS	⑯⑰⑱⑲
Piston assembly			MHK-A1201	MHK-A1601	MHK-A2001	MHK-A2501	②⑥⑦
Cam			P3318103	P3318203	P3318303	P3318403	③
Finger	Material	Carbon steel	P3318104	P3318204	P3318304	P3318404	④
		Stainless steel	P3318104-1	P3318204-1	P3318304-1	P3318404-1	
Needle assembly			MHK-A1206				⑧
Dust cover	Material	Chloroprene rubber	MHK2-J12	MHK2-J16	MHK2-J20	MHK2-J25	⑳
		Fluororubber	MHK2-J12F	MHK2-J16F	MHK2-J20F	MHK2-J25F	
		Silicone rubber	MHK2-J12S	MHK2-J16S	MHK2-J20S	MHK2-J25S	

∗ Order 2 fingers per unit.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part no.: MH-G01 (30 g)

MHKL2 Replacement Parts/Part Nos.: Double Acting, Single Acting

Description			MHKL2-12□	MHKL2-16□	MHKL2-20□	MHKL2-25□	Main parts
Seal kit			MHK12-PS	MHK16-PS	MHK20-PS	MHK25-PS	⑯⑰⑱⑲
Piston assembly			MHK-A1601	MHK-A1601	MHK-A2001	MHK-A2501	②⑥⑦
Cam			P3318111	P3318211	P3318311	P3318411	③
Finger	Material	Carbon steel	P3318112	P3318212	P3318312	P3318412	④
		Stainless steel	P3318112-1	P3318212-1	P3318312-1	P3318412-1	
Needle assembly			MHK-A1206				⑧
Dust cover	Material	Chloroprene rubber	MHKL2-J12	MHKL2-J16	MHKL2-J20	MHKL2-J25	⑳
		Fluororubber	MHKL2-J12F	MHKL2-J16F	MHKL2-J20F	MHKL2-J25F	
		Silicone rubber	MHKL2-J12S	MHKL2-J16S	MHKL2-J20S	MHKL2-J25S	

∗ Order 2 fingers per unit.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part no.: MH-G01 (30 g)

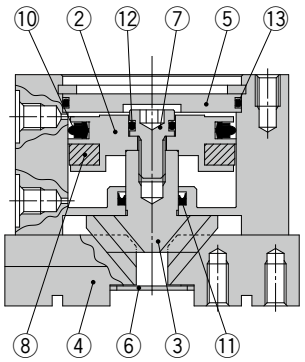
MHS2 Series

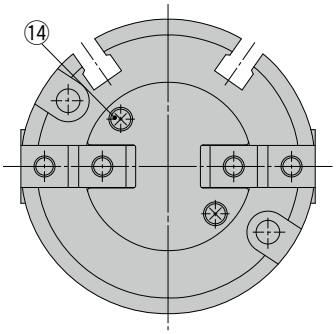
ø16, ø20, ø25, ø32
ø40, ø50, ø63

The Replacement Procedure is on p. 537

Construction

Closed condition





∗ The numbers correspond with those in the “Construction” of the MHS2 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston**	Aluminum alloy	
③	**Cam**	Carbon steel	
④	**Finger**	Carbon steel	
⑤	**Cap**	Aluminum alloy	
⑥	**End plate**	Stainless steel	
⑦	**Piston bolt**	Stainless steel	

No.	Description	Material	Note
⑧	**Magnet**	—	
⑩	**Piston seal**	NBR	
⑪	**Rod seal**	NBR	
⑫	**Gasket**	NBR	
⑬	**Gasket**	NBR	
⑭	**Cross recessed flat head screw**	Carbon steel	

Replacement Parts/Part Nos.

Description	MHS2-16D	MHS2-20D	MHS2-25D	MHS2-32D	MHS2-40D	MHS2-50D	MHS2-63D	Main parts
Seal kit	MHS16-PS	MHS20-PS	MHS25-PS	MHS32-PS	MHS40-PS	MHS50-PS	MHS63-PS	⑩⑪⑫⑬
Finger	P3316004	P3316104	P3316204	P3316304	P3316404	P3316504	P3316604	④
Cam	P3316023	P3316123	P3316223	P3316323	P3316423	P3316523	P3316623	③
Piston assembly	MHS-A1601	MHS-A2001	MHS-A2501	MHS-A3201	MHS-A4001	MHS-A5001	MHS-A6301	②⑦⑧
End plate assembly	MHS-A1613-2	MHS-A2013-2	MHS-A2513-2	MHS-A3213-2	MHS-A4013-2	MHS-A5013-2	MHS-A6313-2	⑥⑭
Cap	MHS-A1614	MHS-A2014	MHS-A2514	MHS-A3214	MHS-A4014	MHS-A5014	MHS-A6314	⑤

∗ Order 2 fingers per unit.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part no.: MH-G01 (30 g)

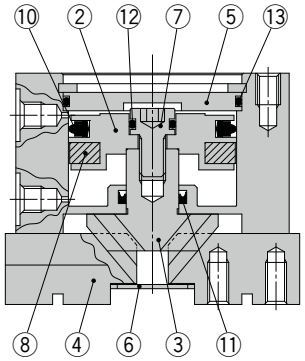
MHS3 Series

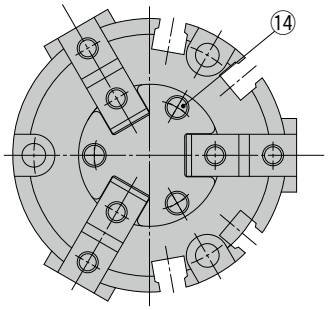
ø16, ø20, ø25, ø32, ø40
ø50, ø63, ø80, ø100, ø125

The Replacement Procedure is on p. 537

Construction

Closed condition





∗ The numbers correspond with those in the "Construction" of the MHS3 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston**	Aluminum alloy	
③	**Cam**	Carbon steel	
④	**Finger**	Carbon steel	
⑤	**Cap**	Aluminum alloy	
⑥	**End plate**	Stainless steel	
⑦	**Piston bolt**	Stainless steel	

No.	Description	Material	Note
⑧	**Magnet**	—	
⑩	**Piston seal**	NBR	
⑪	**Rod seal**	NBR	
⑫	**Gasket**	NBR	
⑬	**Gasket**	NBR	
⑭	**Cross recessed flat head screw**	Carbon steel	

Replacement Parts/Part Nos.

Description	MHS3-16D	MHS3-20D	MHS3-25D	MHS3-32D	MHS3-40D	Main parts
Seal kit	MHS16-PS	MHS20-PS	MHS25-PS	MHS32-PS	MHS40-PS	⑩⑪⑫⑬
Finger	P3316004	P3316104	P3316204	P3316304	P3316404	④
Cam	P3316003	P3316103	P3316203	P3316303	P3316403	③
Piston assembly	MHS-A1601	MHS-A2001	MHS-A2501	MHS-A3201	MHS-A4001	②⑦⑧
End plate assembly	MHS-A1613-3	MHS-A2013-3	MHS-A2513-3	MHS-A3213-3	MHS-A4013-3	⑥⑭
Cap	MHS-A16014	MHS-A2014	MHS-A2514	MHS-A3214	MHS-A4014	⑤

Description	MHS3-50D	MHS3-63D	MHS3-80D	MHS3-100D	MHS3-125D	Main parts
Seal kit	MHS50-PS	MHS63-PS	MHS80-PS	MHS100-PS	MHS125-PS	⑩⑪⑫⑬
Finger	P3316504	P3316604	P3316704	P3316804	P3316904	④
Cam	P3316503	P3316603	P3316703	P3316803	P3316903	③
Piston assembly	MHS-A5001	MHS-A6301	MHS-A8001	MHS-A10001	MHS-A12501	②⑦⑧
End plate assembly	MHS-A5013-3	MHS-A6313-3	MHS-A8013-3	MHS-A10013-3	MHS-A12513-3	⑥⑭
Cap	MHS-A5014	MHS-A6314	MHS-A8014	MHS-A10014	MHS-A12514	⑤

∗ Order 3 fingers per unit.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part no.: MH-G01 (30 g)

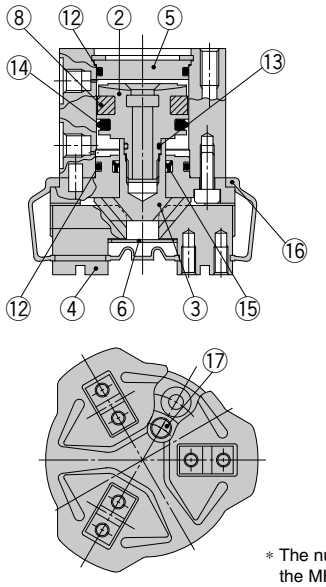
MHSJ3 Series

ø16, ø20, ø25, ø32
ø40, ø50, ø63, ø80

The Replacement Procedure is on p. 539

Construction

Closed condition



∗ The numbers correspond with those in the "Construction" of the MHSJ3 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston**	ø16 to ø25: Stainless steel	
		ø32 to ø80: Aluminum alloy	
③	**Cam**	Carbon steel	
④	**Finger**	Carbon steel	
⑤	**Cap**	Aluminum alloy	
⑥	**End plate**	Stainless steel	
⑧	**Magnet**	—	

No.	Description	Material	Note
⑫	**Gasket**	NBR	
⑬	**Gasket**	NBR	
⑭	**Piston seal**	NBR	
⑮	**Rod seal**	NBR	
⑯	**Dust cover**	Chloroprene rubber	
		Fluororubber	
		Silicone rubber	
⑰	**Cross recessed flat head screw**	Carbon steel	

Replacement Parts/Part Nos.

Description			MHSJ3-16D	MHSJ3-20D	MHSJ3-25D	MHSJ3-32D	Main parts
Seal kit			MHSJ16-PS	MHSJ20-PS	MHSJ25-PS	MHSJ32-PS	⑫⑬⑭⑮
Dust cover	Material	Chloroprene rubber	MHSJ3-J16	MHSJ3-J20	MHSJ3-J25	MHSJ3-J32	⑯
		Fluororubber	MHSJ3-J16F	MHSJ3-J20F	MHSJ3-J25F	MHSJ3-J32F	
		Silicone rubber	MHSJ3-J16S	MHSJ3-J20S	MHSJ3-J25S	MHSJ3-J32S	
Finger			P3316054	P3316154	P3316254	P3316354	④
Cam (J)			P3316093	P3316193	P3316293	P3316393	③
Piston assembly			MHS-A1603	MHS-A2003	MHS-A2503	MHS-A3203	②⑧
End plate assembly			MHSJ-A1613	MHSJ-A2013	MHSJ-A2513	MHSJ-A3213	⑥⑰
Cap			MHSJ-A1614	MHSJ-A2014	MHSJ-A2514	MHSJ-A3214	⑤

Description			MHSJ3-40D	MHSJ3-50D	MHSJ3-63D	MHSJ3-80D	Main parts
Seal kit			MHSJ40-PS	MHSJ50-PS	MHSJ63-PS	MHSJ80-PS	⑫⑬⑭⑮
Dust cover	Material	Chloroprene rubber	MHSJ3-J40	MHSJ3-J50	MHSJ3-J63	MHSJ3-J80	⑯
		Fluororubber	MHSJ3-J40F	MHSJ3-J50F	MHSJ3-J63F	MHSJ3-J80F	
		Silicone rubber	MHSJ3-J40S	MHSJ3-J50S	MHSJ3-J63S	MHSJ3-J80S	
Finger			P3316454	P3316554	P3316654	P3316754	④
Cam (J)			P3316493	P3316593	P3316693	P3316793	③
Piston assembly			MHS-A4003	MHS-A5003	MHS-A6303	MHS-A8003	②⑧
End plate assembly			MHSJ-A4013	MHSJ-A5013	MHSJ-A6313	MHSJ-A8013	⑥⑰
Cap			MHSJ-A4014	MHSJ-A5014	MHSJ-A6314	MHSJ-A8014	⑤

∗ Order 3 fingers per unit.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part no.: MH-G01 (30 g)

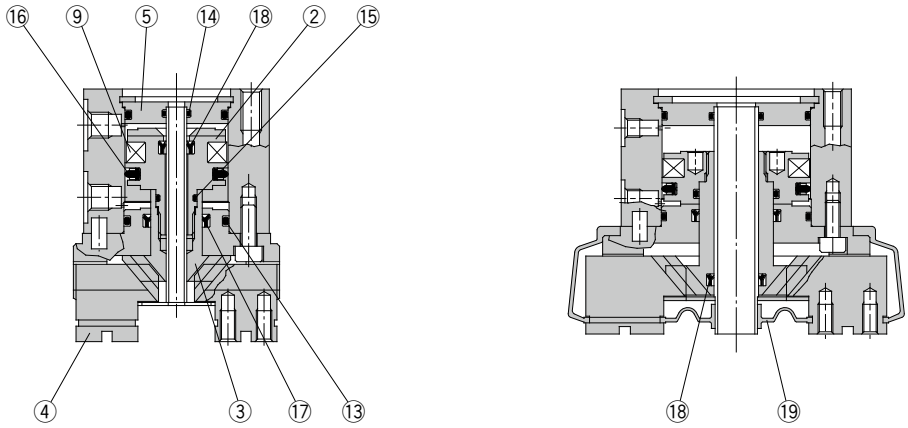
MHSH3 Series

ø16, ø20, ø25, ø32
ø40, ø50, ø63, ø80

The Replacement Procedure is on p. 541

Construction

Closed condition **ø32 to ø80** **Open condition**



∗ The numbers correspond with those in the "Construction" of the MHSH3 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston**	ø16 to ø25: Stainless steel	
		ø32 to ø80: Aluminum alloy	
③	**Cam (A)**	Carbon steel	
④	**Finger**	Carbon steel	
⑤	**Cap (A)**	Aluminum alloy	
⑨	**Magnet**	—	

No.	Description	Material	Note
⑬	**Gasket**	NBR	
⑭	**Gasket**	NBR	
⑮	**Gasket**	NBR	
⑯	**Piston seal**	NBR	
⑰	**Rod seal**	NBR	
⑱	**Rod seal**	NBR	
⑲	**Dust cover**	Chloroprene rubber	
		Fluororubber	
		Silicone rubber	

Replacement Parts/Part Nos.

Description			MHSH3-16D	MHSH3-20D	MHSH3-25D	MHSH3-32D MHSHJ3-32D	Main parts
Seal kit			MHSH16-PS	MHSH20-PS	MHSH25-PS	MHSH32-PS	⑬⑭⑮⑯⑰⑱
Dust cover	Material	Chloroprene rubber	—	—	—	MHSHJ3-J32	⑲
		Fluororubber				MHSHJ3-J32F	
		Silicone rubber				MHSHJ3-J32S	
Finger			P3316054	P3316154	P3316254	P3316354	④
Cam (A)			P3316053	P3316153	P3316253	P3316353	③
Piston assembly			MHS-A1603	MHS-A2003	MHS-A2503	MHS-A3203	②⑨
Cap			MHSH-A1614	MHSH-A2014	MHSH-A2514	MHSH-A3214	⑤

Description			MHSH3-40D MHSHJ3-40D	MHSH3-50D MHSHJ3-50D	MHSH3-63D MHSHJ3-63D	MHSH3-80D MHSHJ3-80D	Main parts
Seal kit			MHSH40-PS	MHSH50-PS	MHSH63-PS	MHSH80-PS	⑬⑭⑮⑯⑰⑱
Dust cover	Material	Chloroprene rubber	MHSHJ3-J40	MHSHJ3-J50	MHSHJ3-J63	MHSHJ3-J80	⑲
		Fluororubber	MHSHJ3-J40F	MHSHJ3-J50F	MHSHJ3-J63F	MHSHJ3-J80F	
		Silicone rubber	MHSHJ3-J40S	MHSHJ3-J50S	MHSHJ3-J63S	MHSHJ3-J80S	
Finger			P3316454	P3316554	P3316654	P3316754	④
Cam (A)			P3316453	P3316553	P3316653	P3316753	③
Piston assembly			MHS-A4003	MHS-A5003	MHS-A6303	MHS-A8003	②⑨
Cap			MHSH-A4014	MHSH-A5014	MHSH-A6314	MHSH-A8014	⑤

∗ Order 3 fingers per unit.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part no.: MH-G01 (30 g)

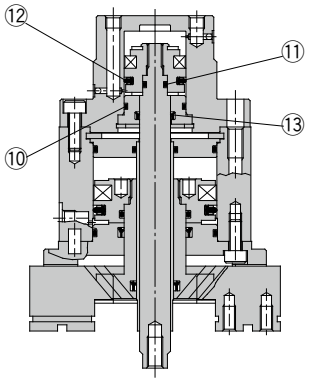
MHSH3-A Series

ø32, ø40, ø50
ø63, ø80

The Replacement Procedure is on p. 543

Construction

Center pusher/Cylinder type



Component Parts

No.	Description	Material	Note
⑩	**Gasket**	NBR	
⑪	**Gasket**	NBR	
⑫	**Piston seal**	NBR	
⑬	**Rod seal**	NBR	

∗ The numbers correspond with those in the “Construction” of the MHSH3-A series in the **Web Catalog**.

Replacement Parts/Part Nos.: Seal Kit (Center pusher/Cylinder type)

Model					Contents
MHSH3-A32A	**MHSH3-A40A**	**MHSH3-A50A**	**MHSH3-A63A**	**MHSH3-A80A**	
MHSH32A-PS	MHSH40A-PS	MHSH50A-PS	MHSH63A-PS	MHSH80A-PS	⑩⑪⑫⑬

∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part no.: MH-G01 (30 g)

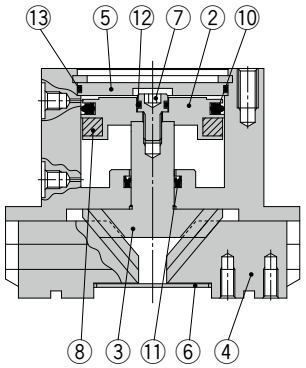
MHSL3 Series

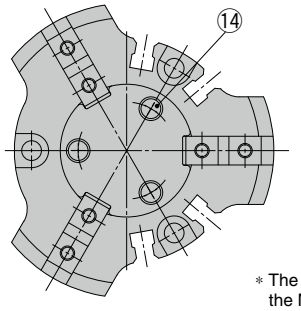
ø16, ø20, ø25, ø32, ø40
ø50, ø63, ø80, ø100, ø125

The Replacement Procedure is on p. 545

Construction

Closed condition





∗ The numbers correspond with those in the “Construction” of the MHSL3 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston**	Aluminum alloy	
③	**Cam**	Carbon steel	
④	**Finger**	Carbon steel	
⑤	**Cap**	Aluminum alloy	
⑥	**End plate**	Stainless steel	
⑦	**Piston bolt**	Stainless steel	

No.	Description	Material	Note
⑧	**Magnet**	—	
⑩	**Piston seal**	NBR	
⑪	**Rod seal**	NBR	
⑫	**Gasket**	NBR	
⑬	**Gasket**	NBR	
⑭	**Cross recessed flat head screw**	Carbon steel	

Replacement Parts/Part Nos.

Description	MHSL3-16D	MHSL3-20D	MHSL3-25D	MHSL3-32D	MHSL3-40D	Main parts
Seal kit	MHSL16-PS	MHSL20-PS	MHSL25-PS	MHSL32-PS	MHSL40-PS	⑩⑪⑫⑬
Finger	P3316034	P3316134	P3316234	P3316334	P3316434	④
Cam	P3316033	P3316133	P3316233	P3316333	P3316433	③
Piston assembly	MHS-A1601	MHS-A2001	MHS-A2501	MHS-A3201	MHS-A4001	②⑦⑧
End plate assembly	MHSL-A1613	MHSL-A2013	MHSL-A2513	MHSL-A3213	MHSL-A4013	⑥⑭
Cap	MHS-A1614	MHS-A2014	MHS-A2514	MHS-A3214	MHS-A4014	⑤

Description	MHSL3-50D	MHSL3-63D	MHSL3-80D	MHSL3-100D	MHSL3-125D	Main parts
Seal kit	MHSL50-PS	MHSL63-PS	MHSL80-PS	MHSL100-PS	MHSL125-PS	⑩⑪⑫⑬
Finger	P3316534	P3316634	P3316734	P3316834	P3316934	④
Cam	P3316533	P3316633	P3316733	P3316833	P3316933	③
Piston assembly	MHS-A5001	MHS-A6301	MHS-A8001	MHS-A10001	MHS-A12501	②⑦⑧
End plate assembly	MHSL-A5013	MHSL-A6313	MHSL-A8013	MHSL-A10013	MHSL-A12513	⑥⑭
Cap	MHS-A5014	MHS-A6314	MHS-A8014	MHS-A10014	MHS-A12514	⑤

∗ Order 3 fingers per unit.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part no.: MH-G01 (30 g)

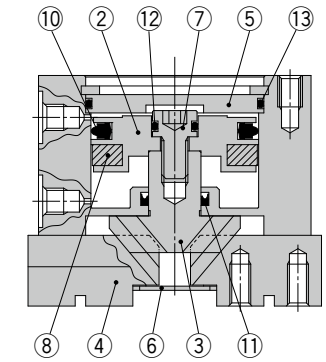
MHS4 Series

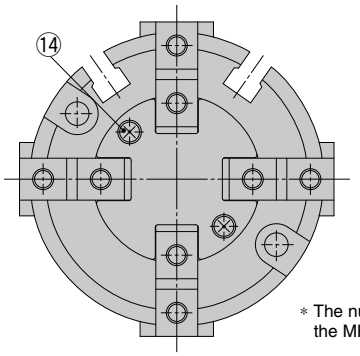
ø16, ø20, ø25, ø32
ø40, ø50, ø63

The Replacement Procedure is on p. 537

Construction

Closed condition





∗ The numbers correspond with those in the “Construction” of the MHS4 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston**	Aluminum alloy	
③	**Cam**	Carbon steel	
④	**Finger**	Carbon steel	
⑤	**Cap**	Aluminum alloy	
⑥	**End plate**	Stainless steel	
⑦	**Piston bolt**	Stainless steel	

No.	Description	Material	Note
⑧	**Magnet**	—	
⑩	**Piston seal**	NBR	
⑪	**Rod seal**	NBR	
⑫	**Gasket**	NBR	
⑬	**Gasket**	NBR	
⑭	**Cross recessed flat head screw**	Carbon steel	

Replacement Parts/Part Nos.

Description	MHS4-16D	MHS4-20D	MHS4-25D	MHS4-32D	MHS4-40D	MHS4-50D	MHS4-63D	Main parts
Seal kit	MHS16-PS	MHS20-PS	MHS25-PS	MHS32-PS	MHS40-PS	MHS50-PS	MHS63-PS	⑩⑪⑫⑬
Finger	P3316004	P3316104	P3316204	P3316304	P3316404	P3316504	P3316604	④
Cam	P3316043	P3316143	P3316243	P3316343	P3316443	P3316543	P3316643	③
Piston assembly	MHS-A1601	MHS-A2001	MHS-A2501	MHS-A3201	MHS-A4001	MHS-A5001	MHS-A6301	②⑦⑧
End plate assembly	MHS-A1613-4	MHS-A2013-4	MHS-A2513-4	MHS-A3213-4	MHS-A4013-4	MHS-A5013-4	MHS-A6313-4	⑥⑭
Cap	MHS-A1614	MHS-A2014	MHS-A2514	MHS-A3214	MHS-A4014	MHS-A5014	MHS-A6314	⑤

∗ Order 4 fingers per unit.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

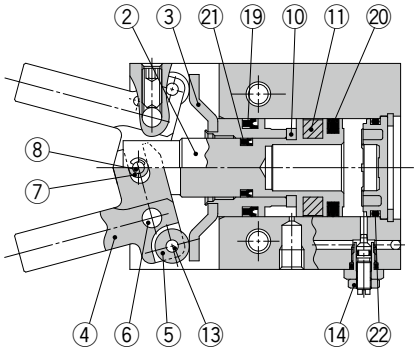
Grease pack part no.: MH-G01 (30 g)

MHC2 Series ø10, ø16, ø20, ø25

The Replacement Procedure is on p. 547

Construction

Double acting, With fingers open



∗ The numbers correspond with those in the "Construction" of the MHC2 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston A**	Aluminum alloy	
③	**Piston B assembly**		
④	**Finger**	ø10 to ø20: Stainless steel ø25: Carbon steel	
⑤	**Side roller**	Carbon steel	
⑥	**Lever shaft**	Stainless steel	
⑦	**Center roller**	Carbon steel	
⑧	**Center pin**	Carbon steel	

No.	Description	Material	Note
⑩	**Bumper**	Urethane rubber	
⑪	**Rubber magnet**	Synthetic rubber	
⑬	**Needle roller**	High carbon chrome bearing steel	
⑭	**Needle assembly**	Brass/Electroless nickel plating	
⑲	**Piston seal**	NBR	
⑳	**Piston seal**	NBR	
㉑	**Piston seal**	NBR	
㉒	**Gasket**	NBR	

Replacement Parts/Part Nos.: Double Acting, Single Acting

Description	MHC2-10□	MHC2-16□	MHC2-20□	MHC2-25□	Main parts
Seal kit	MHC10-PS	MHC16-PS	MHC20-PS	MHC25-PS	⑲⑳㉑㉒
Finger assembly	MHC-A1003	MHC-A1603	MHC-A2003	MHC-A2503	④⑤⑥⑦⑧⑬
Piston assembly set	MHC-A1002	MHC-A1602	MHC-A2002	MHC-A2502	②③⑦⑧⑩⑪⑲⑳㉑
Piston A assembly	MHC-A1001	MHC-A1601	MHC-A2001	MHC-A2501	②⑩⑪
Piston B assembly	P3311145B	P3311245B	P3311345B	P3311445C	③
Needle assembly	MH-A1006	MH-A1606			⑭

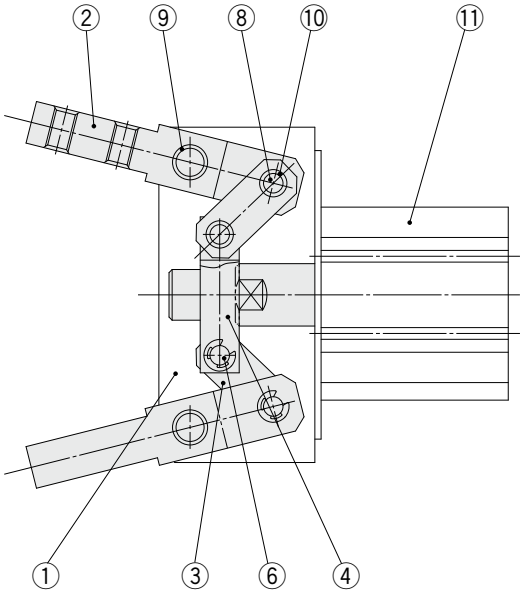
∗ Order 1 piece finger assembly per unit.

∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part no.: GR-S-010 (10 g)

MHT2 Series ø32, ø40, ø50, ø63

Construction



Component Parts

No.	Description	Material	Note
①	**Side plate**	Aluminum alloy	
②	**Finger**	Carbon steel	
③	**Lever**	Carbon steel	
④	**Joint**	Carbon steel	
⑥	**Joint pin**	Stainless steel	
⑧	**Lever pin**	Stainless steel	
⑨	**Bearing**		
⑩	**Bearing**		
⑪	**Cylinder**		

∗ The numbers correspond with those in the “Construction” of the MHT2 series in the **Web Catalog**.

Replacement Parts/Part Nos.

Description	MHT2-32DZ	MHT2-40DZ	MHT2-50DZ	MHT2-63DZ	Main parts
Finger assembly	MH-TA3201	MH-TA4001	MH-TA5001	MH-TA6301	②⑨
Lever assembly	MH-TA3202	MH-TA4002	MH-TA5002	MH-TA6302	③⑩
Link parts assembly	MH-TA3203	MH-TA4003	MH-TA5003	MH-TA6303	<ø32, ø50> ②③④⑥⑧⑨⑩ <ø40, ø63> ②③④⑧⑨⑩
Compact cylinder	CDQ2A32-15DZ	CDQ2A40-15DZ	CDQ2A50-20DZ	CDQ2A63-20DZ	⑪

∗ For finger assembly, lever assembly, order 2 pieces per unit.

Grease pack part nos.
For finger part: MH-G01 (30 g)
For cylinder part: GR-S-010 (10 g)

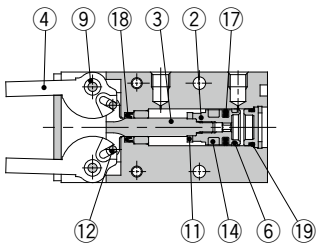
MHY2 Series ø10, ø16, ø20, ø25

The Replacement Procedure is on p. 549

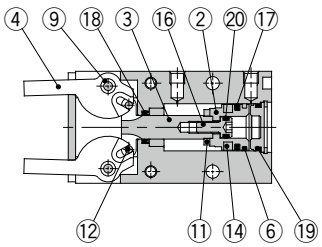
Construction

Closed condition

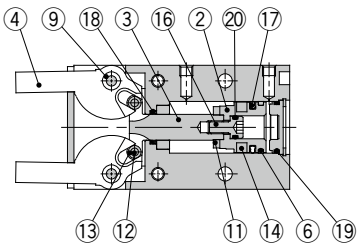
ø10



ø16



ø20, ø25



∗ The numbers correspond with those in the "Construction" of the MHY2 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston**	ø10: Stainless steel ø16 to 25: Aluminum alloy	
③	**Joint**	Stainless steel	
④	**Finger**	Stainless steel	
⑥	**Wear ring**	Resin	
⑨	**Bushing B**	Sintered alloy steel	
⑪	**Bumper**	Urethane rubber	
⑫	**Needle roller**	High carbon chrome bearing steel	

No.	Description	Material	Note
⑬	**Joint roller**	Carbon steel	
⑭	**Rubber magnet**	Synthetic rubber	
⑯	**Piston bolt**	Stainless steel	
⑰	**Piston seal**	NBR	
⑱	**Rod seal**	NBR	
⑲	**Gasket**	NBR	
⑳	**Gasket**	NBR	

Replacement Parts/Part Nos.

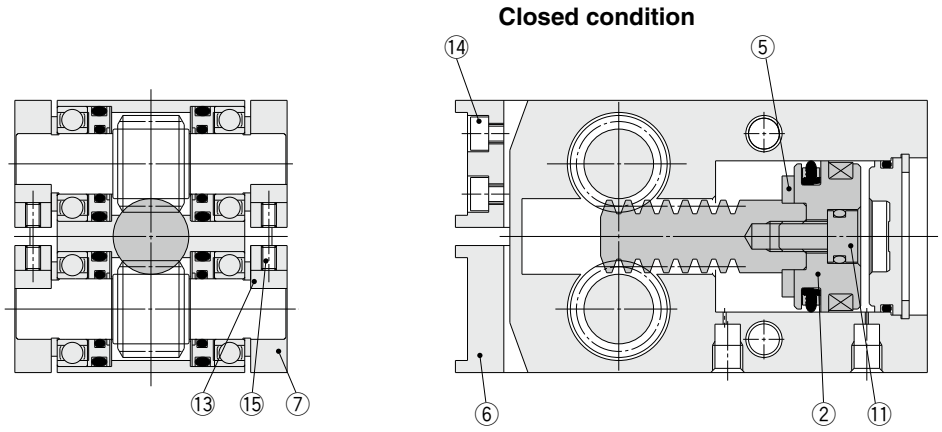
Description		MHY2-10	MHY2-16	MHY2-20	MHY2-25	Main parts
Seal kit		MHY10-PS	MHY16-PS	MHY20-PS	MHY25-PS	<ø10> ⑰⑱⑲ <ø16, ø20, ø25> ⑰⑱⑲⑳
Finger assembly	MHY2-□D	MHY-A1001	MHY-A1601	MHY-A2001	MHY-A2501	④⑨
	MHY2-□D2	MHY-A1001-2	MHY-A1601-2	MHY-A2001-2	MHY-A2501-2	
Joint assembly		MHY-A1002	MHY-A1602	MHY-A2002	MHY-A2502	<ø10, ø16> ③⑫ <ø20, ø25> ③⑫⑬
Piston assembly		MHY-A1003	MHY-A1603	MHY-A2003	MHY-A2503	<ø10> ②⑥⑪⑭ <ø16, ø20, ø25> ②⑥⑪⑭⑯

∗ Order 1 piece finger assembly per unit.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part no.: MH-G04 (30 g)

MHW2 Series ø20, ø25, ø32, ø40, ø50

Construction



∗ The numbers correspond with those in the "Construction" of the MHW2 series in the **Web Catalog**.

Component Parts

No.	Description	Material	Note
②	**Piston**	Aluminum alloy	
⑤	**Bumper**	Urethane rubber	
⑥	**Finger (A)**	Carbon steel	
⑦	**Finger (B)**	Carbon steel	
⑧	**Rubber magnet**	Synthetic rubber	

No.	Description	Material	Note
⑨	**Rack**	Carbon steel	
⑪	**Piston bolt**	Stainless steel	
⑬	**Key**	Carbon steel	
⑭	**Hexagon socket head cap screw**	Carbon steel	
⑮	**Hexagon socket head set screw**	Carbon steel	

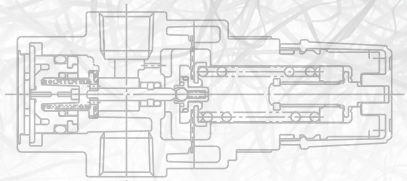
Replacement Parts/Part Nos.

Description		MHW2-20	MHW2-25	MHW2-32	MHW2-40	MHW2-50	Main parts
Seal kit		MHW20-PS	MHW25-PS	MHW32-PS	MHW40-PS	MHW50-PS	⑱⑲⑳㉑㉒
Piston assembly		MHW-A2001	MHW-A2501	MHW-A3201	MHW-A4001	MHW-A5001	②⑤⑧⑨⑪㉒
Finger assembly	MHW2-□D	MHW-A2002	MHW-A2502	MHW-A3202	MHW-A4002	MHW-A5002	⑥⑦⑬⑭⑮
	MHW2-□D1	MHW-A2002-1	MHW-A2502-1	MHW-A3202-1	MHW-A4002-1	MHW-A5002-1	
Finger A assembly	MHW2-□D	MHW-A2006	MHW-A2506	MHW-A3206	MHW-A4006	MHW-A5006	⑥⑭
Finger C assembly	MHW2-□D1	MHW-A2006-1	MHW-A2506-1	MHW-A3206-1	MHW-A4006-1	MHW-A5006-1	⑥⑭
Finger B assembly		MHW-A2007	MHW-A2507	MHW-A3207	MHW-A4007	MHW-A5007	⑦⑬⑮

∗ Order 1 piece finger assembly per unit.
∗ Since the seal kit does not include a grease pack, it should be ordered separately.

Grease pack part nos.
ø20, ø25, ø32: GR-S-010 (10 g)
ø40, ø50: GR-S-020 (20 g)

Modular F.R.L.
Pressure Control Equipment





1 Indication of Replacement of Elements, Inspection Items ..... p. 291

2 Troubleshooting ..... p. 292

3 Construction/Replacement Parts

		Replacement Parts	Replacement Procedure
AC-D	Air Combination	p. 295	p. 553
AF20-D to AF60-D	Air Filter	p. 296	p. 556
AFM20-D to AFM40-D	Mist Separator	p. 297	p. 563
AFD20-D to AFD40-D	Micro Mist Separator	p. 297	p. 563
AR20-D to AR60-D	Regulator	p. 298	p. 568
AR20K-D to AR60K-D	Regulator with Backflow Function	p. 298	p. 568
AR20M-D to AR40M-D	Common Supply Regulator	p. 299	p. 575
AR20MK-D to AR40MK-D	Common Supply Regulator with Backflow Function	p. 299	p. 575
AL20-D to AL60-D	Lubricator	p. 300	p. 581
AW20-D to AW60-D	Filter Regulator	p. 301	p. 592
AW20K-D to AW60K-D	Filter Regulator with Backflow Function	p. 301	p. 592
AWM20-D to AWM40-D	Mist Separator Regulator	p. 303	p. 592
AWD20-D to AWD40-D	Micro Mist Separator Regulator	p. 303	p. 592
AC-A	Air Combination	p. 304	p. 608
AC-B	Air Combination	p. 305	—
ACG-B	Air Combination	p. 306	—
ARG20-B to ARG40-B	Regulator with Built-in Pressure Gauge	p. 308	—
ARG20K-B to ARG40K-B	Regulator with Built-in Pressure Gauge with Backflow Function	p. 308	—
AWG20-B to AWG40-B	Filter Regulator with Built-in Pressure Gauge	p. 309	—
AWG20K-B to AWG40K-B	Filter Regulator with Built-in Pressure Gauge with Backflow Function	p. 309	—
ACG	Air Combination	p. 310	—
AF10-A to AF60-A	Air Filter	p. 312	p. 611
AFM20-A to AFM40-A	Mist Separator	p. 313	p. 622
AFD20-A to AFD40-A	Micro Mist Separator	p. 313	p. 624
AR10-A to AR40-A	Regulator	p. 314	p. 630
AR20-B to AR60-B	Regulator	p. 315	p. 635
AR20K-B to AR60K-B	Regulator with Backflow Function	p. 315	p. 637
AL10-A to AL60-A	Lubricator	p. 316	p. 642
AW10-A to AW40-A	Filter Regulator	p. 317	p. 650
AW20-B to AW60-B	Filter Regulator	p. 318	p. 666
AW20K-B to AW60K-B	Filter Regulator with Backflow Function	p. 318	p. 669
AWM20 to AWM40	Mist Separator Regulator	p. 319	p. 678
AWD20 to AWD40	Micro Mist Separator Regulator	p. 319	p. 684
ARG20(K)/30(K)/40(K)	Regulator with Built-in Pressure Gauge	p. 320	p. 690
AWG20/30/40	Filter Regulator with Built-in Pressure Gauge	p. 321	p. 696
AWG20K/30K/40K	Filter Regulator with Built-in Pressure Gauge with Backflow Function	p. 322	—
AR425 to 935	Pilot Operated Regulator	p. 323	p. 703
AMR3000 to 6000	MR Unit (Regulator with Mist Separator)	p. 324	p. 707
ARM5A	Compact Manifold Regulator/Centralized Supply Type	p. 325	p. 708
ARM5B	Compact Manifold Regulator/Individual Supply Type	p. 326	p. 708
ARM5S	Regulator/Single Unit Type	p. 327	p. 708
ARM10	Regulator/Single Unit Type	p. 328	p. 712
ARM11A	Compact Manifold Regulator/Common Supply Type	p. 329	p. 712
ARM11B	Compact Manifold Regulator/Individual Supply Type	p. 330	p. 712
ARM11A/B	Compact Manifold Regulator/Options	p. 331	p. 712

1 Indication of Replacement of Elements, Inspection Items

The following describes the general contents of the element replacement and regular check.

Indication of replacement of air filter, inspection items

■ Replacement standards

<Element replacement>

The differential pressure (pressure drop) between the primary side and secondary side reaches 0.1 MPa.
Even when any pressure differential does not occur, replace the element every two years.

■ Inspection items

1) Checking of external leak or case crack

If the case is cracked, this may lead to a serious accident, such as case rupture. So, replace the case immediately and locate the cause. If the case is contaminated significantly and the internal status cannot be checked, clean the case with neutral detergent. At this time, never use solvent or machine cleaning solution.

2) Functional inspection of drain discharge mechanism

Check that the drain mechanism functions correctly without fail and that the drain is discharged periodically for manual type.

If the drain is produced excessively, a trouble may occur in the purification equipment on the upstream side.

■ Probable troubles (Reference)

Refer to the "Troubleshooting" for air filter/auto drain. (p. 292)

Regulator inspection items

■ Inspection items

Check the set pressure level before starting up the equipment. If the set pressure level is beyond the specified range, locate the cause.
(Be sure to locate the cause before starting the readjustment.) Additionally, check the following points during periodic inspection.

1) Functional inspection and grease-up of the valve body (including the valve guide)

2) Functional inspection and grease-up of the valve spring

Check for rust, breakage, or permanent settling.

3) Checking of setting function and relief function (Check the functions by increasing or decreasing the setting.)

■ Probable troubles (Reference)

Refer to the "Troubleshooting" for regulator. (p. 293)

Lubricator inspection items

■ Inspection items

① Inspection of dripping volume: Inspect this item when starting the equipment operation.
② Check the oil status inside the case. Check for drain entry.
③ Check for air leak inside the case or air backflow on the secondary side.

■ Probable troubles (Reference)

Refer to the "Troubleshooting" for lubricator. (p. 294)

2 Troubleshooting

The following describes the general contents of the troubleshooting.

[Air Filter/Auto Drain]

Trouble (Symptom)	Cause	Corrective action
The pressure drop is large and the specified flow rate cannot be obtained.	1. The element is clogged.	1. Replace the element.
The air leaks from the portion between the bowl and body.	1. The bowl O-ring is damaged.	1. Replace the bowl O-ring. Apply the grease to the bowl O-ring, and then assemble it into the bowl.
The air leaks from the bowl.	1. The bowl is damaged.	1. Replace the bowl assembly or replace the bowl with a metallic bowl.
The air leaks from the drain cock.	1. A foreign object is caught in the valve of the drain cock.	1. Open the drain cock for several seconds to blow out the foreign object.
	2. The drain cock seat is damaged.	2. Replace the bowl assembly.
The drain is not discharged even when the drain cock is opened.	1. The discharge port of the drain cock is clogged with solid foreign object.	1. Replace the bowl assembly.
An excessive amount of drain is discharged to the pipe at the outlet.	1. The drain level exceeds the baffle.	1. Open the drain cock to discharge the drain, and then replace the element.

2 Troubleshooting

The following describes the general contents of the troubleshooting.

[Regulator]

Trouble (Symptom)	Cause	Corrective action
The pressure cannot be regulated.	1. The regulator is installed in a direction opposite to the flow direction.	1. Check the flow direction. If the installation direction is opposite to the flow direction, reinstall the regulator.
	2. The spring is broken.	2. Replace the spring.
	3. The valve spring is broken.	3. Replace the valve spring.
	4. A foreign object is caught in the valve seat or valve O-ring.	4. Remove the valve guide, and then clean the valve, valve seat, and valve O-ring. At this time, apply the grease to the valve O-ring and sliding part after cleaning.
	5. The rubber lining surface of the valve is damaged.	5. Replace the valve.
	6. A foreign object is caught in the check valve seat. (AR20K to AR60K)	6. Replace the check valve assembly.
The set pressure level does not become zero (0) even when the knob is loosened.	1. A foreign object is caught in the valve seat or valve O-ring.	1. Remove the valve guide, and then clean the valve, valve seat, and valve O-ring. At this time, apply the grease to the valve O-ring and sliding part after cleaning.
	2. The rubber seat surface of the valve is damaged.	2. Replace the valve.
	3. The valve spring is broken.	3. Replace the valve spring.
	4. The valve is locked.	4. Clean the sliding surface of the valve O-ring and apply the grease.
	5. A foreign object is caught in the check valve seat. (AR20K to AR60K)	5. Replace the check valve assembly.
The air leaks from the exhaust port in the bonnet.	1. The diaphragm is damaged.	1. Replace the diaphragm assembly.
	2. The piston seal is damaged.	2. Replace the piston assembly or clean it. At this time, apply the grease to the piston seal and sliding surface.
	3. A foreign object is caught in the exhaust valve seat.	3. Clean the exhaust valve seat or replace the diaphragm assembly.
	4. A foreign object is caught in the valve seat or valve O-ring.	4. Remove the valve guide, and then clean the valve, valve seat, and valve O-ring. At this time, apply the grease to the valve O-ring and sliding part after cleaning.
	5. The rubber sheet surface of the valve is damaged.	5. Replace the valve.
	6. The back pressure exceeding the set pressure level is applied to the secondary side.	6. Review the air circuit so that the back pressure exceeding the set pressure level is not applied.
	7. A foreign object is caught in the check valve seat. (AR20K to AR60K)	7. Replace the check valve assembly.

[Regulator]

Trouble (Symptom)	Cause	Corrective action
The air leaks from the portion between the bonnet and body.	1. The bonnet screw is loose.	1. Retighten the bonnet screw.
	2. The diaphragm is damaged.	2. Replace the diaphragm assembly.
The air does not flow backward.	1. A foreign object is caught in the sliding part of the check valve, causing malfunction. (AR20K to AR60K)	1. Replace the check valve assembly.
	2. The check valve is locked. (AR20K to AR60K)	2. Replace the check valve assembly.

[Lubricator]

Trouble (Symptom)	Cause	Corrective action
The oil does not drop even when the air flows.	1. The equipment is not connected correctly.	1. Check the “IN”, “OUT”, and arrow marks on the equipment. If any incorrect connection is found, connect the equipment again.
	2. The oil volume inside the bowl is insufficient.	2. Supply the oil.
	3. The air consumption flow rate is insufficient.	3. Select an appropriate lubricator with a minimum dripping flow rate suitable for the flow rate to be used.
	4. The damper is damaged.	4. Replace the damper (assembly).
	5. The oil adjustment valve is closed.	5. Open the oil adjustment valve.
	6. The air leaks from the bowl or lubrication plug.	6. Replace the case O-ring or lubrication plug assembly.
	7. The element is clogged.	7. Replace the damper pushing air assembly.
	8. The air leaks from the sight dome.	8. Replace the sight dome assembly.
Air bubbles are mixed in the oil drop.	1. The oil passage pipe seal is damaged.	1. Replace the damper retainer air assembly.
	2. The oil volume inside the bowl is insufficient.	2. Supply the oil.
The air or oil leaks from the sight glass.	1. The sight dome is damaged.	1. Replace the sight dome assembly.
	2. The O-ring is damaged.	2. Replace the sight dome assembly.
The air leaks from the lubrication plug.	1. The O-ring is damaged.	1. Replace the lubrication plug assembly.
The air leaks from the portion between the bowl and body.	1. The bowl O-ring is damaged.	1. Replace the bowl O-ring. Apply the grease to the bowl O-ring and assemble it into the bowl.
The air leaks from the bowl	1. The bowl is damaged.	1. Replace the bowl assembly or replace the bowl with a metallic bowl.

AC-D Series

The Replacement Procedure is on p. 553

Air Filter + Regulator + Lubricator
AC20-D to AC60-D

Options/Accessories/Part Nos.

Section	Description \ Model			Options/Accessories/part nos.					
				For AC20-D	For AC30-D	For AC40-D	For AC40-06-D	For AC50-D	For AC60-D
				For AC20A-D	For AC30A-D	For AC40A-D	For AC40A-06-D	For AC50A-D	For AC60A-D
				For AC20B-D	For AC30B-D	For AC40B-D	For AC40B-06-D	For AC50B-D	For AC60B-D
				For AC20C-D	For AC30C-D	For AC40C-D	For AC40C-06-D	—	—
				For AC20D-D	For AC30D-D	For AC40D-D	For AC40D-06-D	—	—
Option	∗1 Pressure gauge	Round type	Standard	G36-10-□01		G46-10-□01			
			0.02 to 0.2 MPa setting	G36-4-□01		G46-4-□01			
		Round type (with color zone)	Standard	G36-10-□01-L		G46-10-□01-L			
			0.02 to 0.2 MPa setting	G36-4-□01-L		G46-4-□01-L			
		Square embedded type∗2	Standard	GC3-10AS-D [136150A (Pressure gauge cover only)]					
			0.02 to 0.2 MPa setting	GC3-4AS-D [136150A (Pressure gauge cover only)]					
	Digital pressure switch		NPN output, Wiring bottom entry	ISE35-N-25-MLA-X523 [ISE35-N-25-M (Switch body only)]∗3					
			NPN output, Wiring top entry	ISE35-R-25-MLA-X523 [ISE35-R-25-M (Switch body only)]∗3					
			PNP output, Wiring bottom entry	ISE35-N-65-MLA-X523 [ISE35-N-65-M (Switch body only)]∗3					
			PNP output, Wiring top entry	ISE35-R-65-MLA-X523 [ISE35-R-65-M (Switch body only)]∗3					
	Float type auto drain∗4		N.C.	AD27-D	AD37-D	AD47-D			
			N.O.	—	AD38-D	AD48-D			
Accessory	Spacer			Y200-D	Y300-D	Y400-D	Y500-D	Y600-D	
	Spacer with bracket			Y200T-D	Y300T-D	Y400T-D	Y500T-D	Y600T-D	

∗1 □ in part numbers for a round type pressure gauge indicates a pipe thread type. No indication is necessary for R; however, indicate N for NPT. Please contact SMC regarding the connection thread NPT and pressure gauge supply for psi unit specifications.

∗2 Including an O-ring and 2 mounting screws

∗3 Lead wire with connector (2 m), adapter, lock pin, O-ring (1 pc.), mounting screws (2 pcs.) are attached. [ ]: Switch body only
Regarding how to order the digital pressure switch, refer to the **Web Catalog**.

∗4 Min. operating pressure: N.O. type–0.1 MPa; N.C. type–0.1 MPa (AD27-D) and 0.15 MPa (AD37-D/AD47-D). Please contact SMC separately for psi and °F unit display specifications.

Spacer / Spacer with Bracket

Replacement Parts/Part Nos.

Description	Material	Model				
		Y200-D Y200T-D	Y300-D Y300T-D	Y400-D Y400T-D	Y500-D Y500T-D	Y600-D Y600T-D
Seal	HNBR	Y220P-050S	Y320P-050S	Y420P-050S	Y520P-050S	Y620P-050S

AF20-D to AF60-D

The Replacement Procedure is on p. 556

Bowl Assembly/Part Nos.

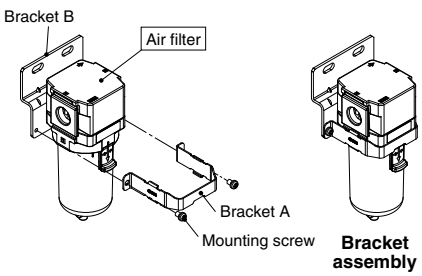
Bowl material	Drain discharge mechanism	Drain port	Other	Model					
				AF20-D	AF30-D	AF40-D	AF40-06-D	AF50-D	AF60-D
Polycarbonate	Manual	With drain cock	—	C2SF-D	—	—			
			With bowl guard	C2SF-C-D	C3SF-D	C4SF-D			
		Drain cock with barb fitting	With bowl guard	—	C3SF-W-D	C4SF-W-D			
		With drain guide (without valve function)	—	C2SF□-J-D	—	—			
			With bowl guard	C2SF□-CJ-D	C3SF□-J-D	C4SF□-J-D			
	Automatic*1 (Auto drain)	Normally closed (N.C.)	—	AD27-D	—	—			
			With bowl guard	AD27-C-D	AD37□-D	AD47□-D			
		Normally open (N.O.)	With bowl guard	—	AD38□-D	AD48□-D			
Nylon	Manual	With drain cock	—	C2SF-6-A	—	—			
			With bowl guard	C2SF-6C-A	C3SF-6-D	C4SF-6-D			
		Drain cock with barb fitting	With bowl guard	—	C3SF-6W-D	C4SF-6W-D			
		With drain guide (without valve function)	—	C2SF□-6J-A	—	—			
			With bowl guard	C2SF□-6CJ-A	C3SF□-6J-D	C4SF□-6J-D			
	Automatic*1 (Auto drain)	Normally closed (N.C.)	—	AD27-6-A	—	—			
			With bowl guard	AD27-6C-A	AD37□-6-D	AD47□-6-D			
		Normally open (N.O.)	With bowl guard	—	AD38□-6-D	AD48□-6-D			
Metal	Manual	With drain cock	—	C2SF-2-A	C3SF-2-A	C4SF-2-A			
			With level gauge	—	C3LF-8-A	C4LF-8-A			
		With drain guide (without valve function)	—	C2SF□-2J-A	C3SF□-2J-A	C4SF□-2J-A			
			With level gauge	—	C3LF□-8J-A	C4LF□-8J-A			
	Automatic*1 (Auto drain)	Normally closed (N.C.)	—	AD27-2-A	AD37□-2-A	AD47□-2-A			
			With level gauge	—	AD37□-8-A	AD47□-8-A			
		Normally open (N.O.)	—	—	AD38□-2-A	AD48□-2-A			
			With level gauge	—	AD38□-8-A	AD48□-8-A			

*1 The bowl assembly comes with a bowl seal.
□ in bowl assembly part numbers indicates a pipe thread type (applicable tubing for auto drain).
No indication is necessary for Rc thread; however, indicate N for NPT thread, and F for G thread. (For auto drain, Nil: ø10, N: ø3/8")
Please contact SMC separately for psi and °F unit display specifications.

Options/Part Nos.

Optional specifications	Model					
	AF20-D	AF30-D	AF40-D	AF40-06-D	AF50-D	AF60-D
Bracket assembly*1	AF24P-070AS	AF34P-070AS	AF44P-070AS	AF49P-070AS	AF54P-070AS	
Auto drain	Refer to "Bowl Assembly/Part Nos."					

*1 The assembly of a bracket A/B and 2 mounting screws



Replacement Parts/Part Nos.

Description	Model					
	AF20-D	AF30-D	AF40-D	AF40-06-D	AF50-D	AF60-D
Filter element	AF20P-060S	AF30P-060S	AF40P-060S		AF50P-060S	AF60P-060S
Baffle	AF24P-040S	AF34P-040S	AF44P-040S		AF54P-040S	AF64P-040S
Bowl seal	C2SFP-260S	C32FP-260S	C42FP-260S			
Bowl assembly*1, *2	Refer to "Bowl Assembly/Part Nos."					

*1 The bowl assembly comes with a bowl seal.
*2 Please contact SMC separately for psi and °F unit display specifications.

The Replacement Procedure is on p. 563

Bowl Assembly/Part Nos.

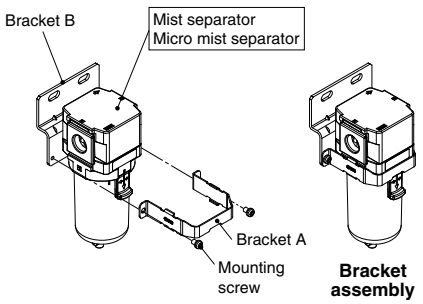
Bowl material	Drain discharge mechanism	Drain port	Other	Model			
				AFM20-D/AFD20-D	AFM30-D/AFD30-D	AFM40-D/AFD40-D	AFM40-06-D/AFD40-06-D
Polycarbonate	Manual	With drain cock	—	C2SF-D	—	—	
			With bowl guard	C2SF-C-D	C3SF-D	C4SF-D	
		Drain cock with barb fitting	With bowl guard	—	C3SF-W-D	C4SF-W-D	
		With drain guide (without valve function)	—	C2SF□-J-D	—	—	
			With bowl guard	C2SF□-CJ-D	C3SF□-J-D	C4SF□-J-D	
	Automatic*1 (Auto drain)	Normally closed (N.C.)	—	AD27-D	—	—	
			With bowl guard	AD27-C-D	AD37□-D	AD47□-D	
		Normally open (N.O.)	With bowl guard	—	AD38□-D	AD48□-D	
Nylon	Manual	With drain cock	—	C2SF-6-A	—	—	
			With bowl guard	C2SF-6C-A	C3SF-6-D	C4SF-6-D	
		Drain cock with barb fitting	With bowl guard	—	C3SF-6W-D	C4SF-6W-D	
		With drain guide (without valve function)	—	C2SF□-6J-A	—	—	
			With bowl guard	C2SF□-6CJ-A	C3SF□-6J-D	C4SF□-6J-D	
	Automatic*1 (Auto drain)	Normally closed (N.C.)	—	AD27-6-A	—	—	
			With bowl guard	AD27-6C-A	AD37□-6-D	AD47□-6-D	
		Normally open (N.O.)	With bowl guard	—	AD38□-6-D	AD48□-6-D	
Metal	Manual	With drain cock	—	C2SF-2-A	C3SF-2-A	C4SF-2-A	
			With level gauge	—	C3LF-8-A	C4LF-8-A	
		With drain guide (without valve function)	—	C2SF□-2J-A	C3SF□-2J-A	C4SF□-2J-A	
			With level gauge	—	C3LF□-8J-A	C4LF□-8J-A	
	Automatic*1 (Auto drain)	Normally closed (N.C.)	—	AD27-2-A	AD37□-2-A	AD47□-2-A	
			With level gauge	—	AD37□-8-A	AD47□-8-A	
		Normally open (N.O.)	—	—	AD38□-2-A	AD48□-2-A	
			With level gauge	—	AD38□-8-A	AD48□-8-A	

*1 The bowl assembly comes with a bowl seal. □ in bowl assembly part numbers indicates a pipe thread type (applicable tubing for auto drain). No indication is necessary for Rc thread; however, indicate N for NPT thread, and F for G thread. (For auto drain, Nil: ø10, N: ø3/8")
Please contact SMC separately for psi and °F unit display specifications.

Options/Part Nos.

Optional specifications	Model			
	AFM20-D AFD20-D	AFM30-D AFD30-D	AFM40-D AFD40-D	AFM40-06-D AFD40-06-D
Bracket assembly*1	AF24P-070AS	AF34P-070AS	AF44P-070AS	AF49P-070AS
Auto drain	Refer to "Bowl Assembly/Part Nos."			

*1 The assembly of a bracket A/B and 2 mounting screws



Replacement Parts/Part Nos.

Description		Model			
		AFM20-D AFD20-D	AFM30-D AFD30-D	AFM40-D AFD40-D	AFM40-06-D AFD40-06-D
Element assembly	AFM20 to 40-D	AFM20P-060AS	AFM30P-060AS	AFM40P-060AS	
	AFD20 to 40-D	AFD20P-060AS	AFD30P-060AS	AFD40P-060AS	
Bowl seal		C2SFP-260S	C32FP-260S	C42FP-260S	
Bowl assembly*1, *2		Refer to "Bowl Assembly/Part Nos."			

*1 The bowl assembly comes with a bowl seal.
*2 Please contact SMC separately for psi and °F unit display specifications.

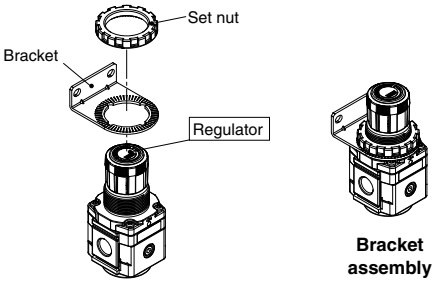
The Replacement Procedure is on p. 568

Options/Part Nos.

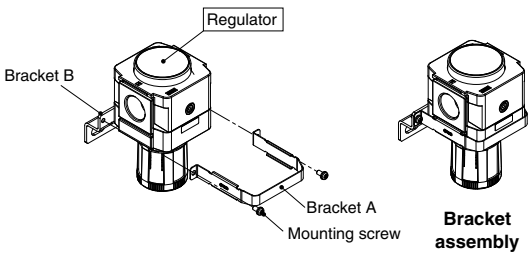
Optional specifications			Model					
			AR20(K)-D	AR30(K)-D	AR40(K)-D	AR40(K)-06-D	AR50(K)-D	AR60(K)-D
Bracket assembly*1			AR23P-270AS	AR33P-270AS	AR43P-270AS		AR54P-270AS	
Set nut			AR23P-260S	AR33P-260S	AR43P-260S		—*2	
Pressure gauge*3	Round type	Standard	G36-10-□01		G46-10-□01			
		0.02 to 0.2 MPa setting	G36-4-□01		G46-4-□01			
	Round type (with color zone)	Standard	G36-10-□01-L		G46-10-□01-L			
		0.02 to 0.2 MPa setting	G36-4-□01-L		G46-4-□01-L			
	Square embedded type*4	Standard	GC3-10AS-D [136150A (Pressure gauge cover only)]					
		0.02 to 0.2 MPa setting	GC3-4AS-D [136150A (Pressure gauge cover only)]					
Digital pressure switch		NPN output, Wiring bottom entry	ISE35-N-25-MLA-X523 [ISE35-N-25-M (Switch body only)]*5					
		NPN output, Wiring top entry	ISE35-R-25-MLA-X523 [ISE35-R-25-M (Switch body only)]*5					
		PNP output, Wiring bottom entry	ISE35-N-65-MLA-X523 [ISE35-N-65-M (Switch body only)]*5					
		PNP output, Wiring top entry	ISE35-R-65-MLA-X523 [ISE35-R-65-M (Switch body only)]*5					

*1 The assembly of a bracket and set nuts. For the AR50(K)-D and AR60(K)-D, the assembly includes a bracket A/B and 2 mounting screws.
*2 Please contact SMC regarding the set nuts for the AR50(K)-D and AR60(K)-D.
*3 □ in part numbers for a round pressure gauge indicates a pipe thread type. No indication is necessary for R; however, indicate N for NPT. Please contact SMC regarding the pressure gauge supply for both MPa and psi unit specifications.
*4 Including an O-ring and 2 mounting screws. [ ]: Pressure gauge cover only
*5 In addition to the pressure switch body, lead wire with connector (2 m), adapter, lock pin, O-ring (1 pc.), mounting screws (2 pcs.) are attached. [ ]: Switch body only (For the digital pressure switch specifications, refer to the **Web Catalog**.)

AR20(K)-D to AR40(K)-06-D



AR50(K)-D/AR60(K)-D



Replacement Parts/Part Nos.

Description		Model					
		AR20(K)-D	AR30(K)-D	AR40(K)-D	AR40(K)-06-D	AR50(K)-D	AR60(K)-D
Valve assembly		AR24P-060AS	AR34P-060AS	AR44P-060AS	AR49P-060AS	AR54P-060AS	AR64P-060AS
Diaphragm assembly	Relieving type	AR24P-150AS	AR34P-150AS	AR44P-150AS		AR54P-150AS	
	Non-relieving type	AR24P-150AS-N	AR34P-150AS-N	AR44P-150AS-N		AR54P-150AS-N	
Valve guide assembly		AR24P-050AS	AR34P-050AS	AR44P-050AS		AR54P-050AS	
Check valve assembly*1		AR24KP-020AS					

*1 The check valve assembly is applicable for a regulator with backflow function (AR20K-D to AR60K-D) only. The assembly of a check valve cover, check valve body assembly, and 2 mounting screws

AR20M-D to AR40M-D / AR20MK-D to AR40MK-D

The Replacement Procedure is on p. 575

Options/Part Nos.

Optional specifications			Model		
			AR20M(K)-D	AR30M(K)-D	AR40M(K)-D
Bracket assembly*1			AR23P-270AS	AR33P-270AS	AR43P-270AS
Set nut			AR23P-260S	AR33P-260S	AR43P-260S
Pressure gauge*2	Round type	Standard	G36-10-□01		G46-10-□01
		0.02 to 0.2 MPa setting	G36-4-□01		G46-4-□01
	Round type (with color zone)	Standard	G36-10-□01-L		G46-10-□01-L
		0.02 to 0.2 MPa setting	G36-4-□01-L		G46-4-□01-L
	Square embedded type*3	Standard	GC3-10AS-D [136150A (Pressure gauge cover only)]		
		0.02 to 0.2 MPa setting	GC3-4AS-D [136150A (Pressure gauge cover only)]		
Digital pressure switch		NPN output, Wiring bottom entry	ISE35-N-25-MLA-X523 [ISE35-N-25-M (Switch body only)]*4		
		NPN output, Wiring top entry	ISE35-R-25-MLA-X523 [ISE35-R-25-M (Switch body only)]*4		
		PNP output, Wiring bottom entry	ISE35-N-65-MLA-X523 [ISE35-N-65-M (Switch body only)]*4		
		PNP output, Wiring top entry	ISE35-R-65-MLA-X523 [ISE35-R-65-M (Switch body only)]*4		

*1 The assembly of a bracket and set nuts
*2 □ in part numbers for a round pressure gauge indicates a pipe thread type. No indication is necessary for R; however, indicate N for NPT. Please contact SMC regarding the pressure gauge supply for psi unit specifications.
*3 Including an O-ring and 2 mounting screws. [ ]: Pressure gauge cover only
*4 In addition to the pressure switch body, lead wire with connector (2 m), adapter, lock pin, O-ring (1 pc.), and mounting screws (2 pcs.) are attached. [ ]: Switch body only (Regarding how to order the digital pressure switch, refer to the **Web Catalog**.)

Replacement Parts/Part Nos.

Description		Model		
		AR20M(K)-D	AR30M(K)-D	AR40M(K)-D
Valve assembly	Without backflow function	AR24P-060AS	AR34P-060AS	AR44P-060AS
	With backflow function	AR24KP-560AS	AR34KP-560AS	AR44KP-560AS
Diaphragm assembly	Relieving type	AR24P-150AS	AR34P-150AS	AR44P-150AS
	Non-relieving type	AR24P-150AS-N	AR34P-150AS-N	AR44P-150AS-N
Valve guide assembly		AR24P-050AS	AR34P-050AS	AR44P-050AS

AL20-D to AL60-D

The Replacement Procedure is on p. 581

Bowl Assembly/Part Nos.

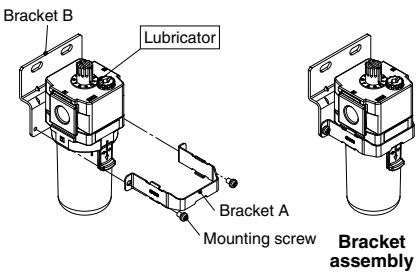
Bowl material	Lubricant exhaust port	Other	Model					
			AL20-D	**AL30-D**	**AL40-D**	**AL40-06-D**	**AL50-D**	**AL60-D**
Polycarbonate	**Without drain cock**	—	C2SL-D	—	—			
		With bowl guard	C2SL-C-D	C3SL-D	C4SL-D			
	With drain cock	—	C2SL-3-D	—	—			
		With bowl guard	C2SL-3C-D	C3SL-3-D	C4SL-3-D			
	Drain cock with barb fitting	**With bowl guard**	—	C3SL-3W-D	C4SL-3W-D			
Nylon	**Without drain cock**	—	C2SL-6-A	—	—			
		With bowl guard	C2SL-6C-A	C3SL-6-D	C4SL-6-D			
	With drain cock	—	C2SL-36-A	—	—			
		With bowl guard	C2SL-36C-A	C3SL-36-D	C4SL-36-D			
	Drain cock with barb fitting	**With bowl guard**	—	C3SL-36W-D	C4SL-36W-D			
Metal	**Without drain cock**	—	C2SL-2-A	C3SL-2-A	C4SL-2-A			
		With level gauge	—	C3LL-8-A	C4LL-8-A			
	With drain cock	—	C2SL-23-A	C3SL-23-A	C4SL-23-A			
		With level gauge	—	C3LL-38-A	C4LL-38-A			

∗1 The bowl assembly comes with a bowl seal. Please contact SMC separately for psi and °F unit display specifications.

Options/Part Nos.

Optional specifications	Model					
	AL20-D	**AL30-D**	**AL40-D**	**AL40-06-D**	**AL50-D**	**AL60-D**
Bracket assembly∗1	AF24P-070AS	AF34P-070AS	AF44P-070AS	AF49P-070AS	AF54P-070AS	

∗1 The assembly of a bracket A/B and 2 mounting screws



Replacement Parts/Part Nos.

Description	Model					
	AL20-D	**AL30-D**	**AL40-D**	**AL40-06-D**	**AL50-D**	**AL60-D**
Sight dome assembly	AL20P-080AS					
Lubrication plug assembly	AL24P-060AS	AL34P-060AS	AL44P-060AS			
Damper retainer assembly	AL20P-030AS	AL30P-030AS	AL40P-030AS		AL54P-030AS	AL60P-030AS
Damper	AL20P-040S	AL30P-040S	AL44P-040S		AL60P-040AS	
Bowl seal	C2SFP-260S	C32FP-260S	C42FP-260S			
Bowl assembly∗1, ∗2	Refer to “Bowl Assembly/Part Nos.”					

∗1 The bowl assembly comes with a bowl seal.
∗2 Please contact SMC separately for psi and °F unit display specifications.

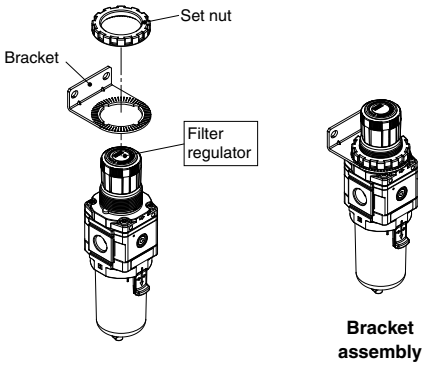
The Replacement Procedure is on p. 592

Options/Part Nos.

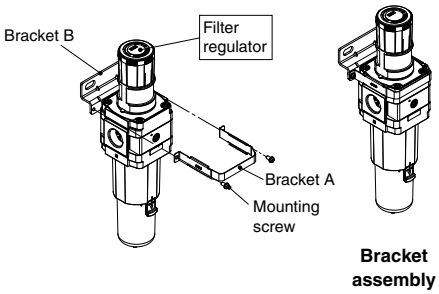
Optional specifications			Model				
			AW20(K)-D	AW30(K)-D	AW40(K)-D	AW40(K)-06-D	AW60(K)-D
Bracket assembly*1			AW23P-270AS	AR33P-270AS	AR43P-270AS		AR54P-270AS
Set nut			AR23P-260S	AR33P-260S	AR43P-260S		—*2
Pressure gauge*3	Round type	Standard	G36-10-□01		G46-10-□01		
		0.02 to 0.2 MPa setting	G36-4-□01		G46-4-□01		
	Round type (with color zone)	Standard	G36-10-□01-L		G46-10-□01-L		
		0.02 to 0.2 MPa setting	G36-4-□01-L		G46-4-□01-L		
	Square embedded type*4	Standard	GC3-10AS-D [136150A (Pressure gauge cover only)]				
		0.02 to 0.2 MPa setting	GC3-4AS-D [136150A (Pressure gauge cover only)]				
Digital pressure switch		NPN output, Wiring bottom entry	ISE35-N-25-MLA-X523 [ISE35-N-25-M (Switch body only)]*5				
		NPN output, Wiring top entry	ISE35-R-25-MLA-X523 [ISE35-R-25-M (Switch body only)]*5				
		PNP output, Wiring bottom entry	ISE35-N-65-MLA-X523 [ISE35-N-65-M (Switch body only)]*5				
		PNP output, Wiring top entry	ISE35-R-65-MLA-X523 [ISE35-R-65-M (Switch body only)]*5				

*1 The assembly of a bracket and set nuts
*2 For the AW60(K)-D, the assembly includes a bracket A/B and 2 mounting screws. Please contact SMC regarding the set nuts for the AW60(K)-D.
*3 □ in part numbers for a round type pressure gauge indicates a pipe thread type. No indication is necessary for R; however, indicate N for NPT. Please contact SMC regarding the pressure gauge supply for both MPa and psi unit specifications.
*4 Including an O-ring and 2 mounting screws. [ ]: Pressure gauge cover only
*5 In addition to the pressure switch body, lead wire with connector (2 m), adapter, lock pin, O-ring (1 pc.), mounting screws (2 pcs.) are attached.
[ ]: Switch body only (Regarding how to order the digital pressure switch, refer to the **Web Catalog**.)

AW20(K)-D to AW40(K)-06-D



AW60(K)-D



The Replacement Procedure is on p. 592

Replacement Parts/Part Nos.

Description		Model				
		AW20(K)-D	AW30(K)-D	AW40(K)-D	AW40(K)-06-D	AW60(K)-D
Valve assembly		AW24P-060AS	AW34P-060AS	AW44P-060AS	AW49P-060AS	AW64P-060AS
Filter element		AF20P-060S	AF30P-060S	AF40P-060S		AW60P-060S
Baffle		AF24P-040S	AF34P-040S	AF44P-040S		AW64P-030S
Diaphragm assembly	Relieving type	AR24P-150AS	AR34P-150AS	AR44P-150AS		AR54P-150AS
	Non-relieving type	AR24P-150AS-N	AR34P-150AS-N	AR44P-150AS-N		AR54P-150AS-N
Bowl seal		C2SFP-260S	C32FP-260S	C42FP-260S		
Bowl assembly*1, *2		Refer to "Bowl Assembly/Part Nos."				
Check valve assembly*3		AR24KP-020AS				

*1 The bowl assembly comes with a bowl seal.
*2 Please contact SMC separately for psi and °F unit display specifications.
*3 The check valve assembly is applicable for a filter regulator with backflow function (AW20K-D to AW60K-D) only. The assembly includes a check valve cover, check valve body assembly, and 2 mounting screws.

Bowl Assembly/Part Nos.

Bowl material	Drain discharge mechanism	Drain port	Other	Model				
				AW20-D	AW30-D	AW40-D	AW40-06-D	AW60-D
Polycarbonate	Manual	With drain cock	—	C2SF-D	—	—		
			With bowl guard	C2SF-C-D	C3SF-D	C4SF-D		
		Drain cock with barb fitting	With bowl guard	—	C3SF-W-D	C4SF-W-D		
		With drain guide (without valve function)	—	C2SF□-J-D	—	—		
			With bowl guard	C2SF□-CJ-D	C3SF□-J-D	C4SF□-J-D		
	Automatic*1 (Auto drain)	Normally closed (N.C.)	—	AD27-D	—	—		
			With bowl guard	AD27-C-D	AD37□-D	AD47□-D		
		Normally open (N.O.)	With bowl guard	—	AD38□-D	AD48□-D		
Nylon	Manual	With drain cock	—	C2SF-6-A	—	—		
			With bowl guard	C2SF-6C-A	C3SF-6-D	C4SF-6-D		
		Drain cock with barb fitting	With bowl guard	—	C3SF-6W-D	C4SF-6W-D		
		With drain guide (without valve function)	—	C2SF□-6J-A	—	—		
			With bowl guard	C2SF□-6CJ-A	C3SF□-6J-D	C4SF□-6J-D		
	Automatic*1 (Auto drain)	Normally closed (N.C.)	—	AD27-6-A	—	—		
			With bowl guard	AD27-6C-A	AD37□-6-D	AD47□-6-D		
		Normally open (N.O.)	With bowl guard	—	AD38□-6-D	AD48□-6-D		
Metal	Manual	With drain cock	—	C2SF-2-A	C3SF-2-A	C4SF-2-A		
			With level gauge	—	C3LF-8-A	C4LF-8-A		
		With drain guide (without valve function)	—	C2SF□-2J-A	C3SF□-2J-A	C4SF□-2J-A		
			With level gauge	—	C3LF□-8J-A	C4LF□-8J-A		
	Automatic*1 (Auto drain)	Normally closed (N.C.)	—	AD27-2-A	AD37□-2-A	AD47□-2-A		
			With level gauge	—	AD37□-8-A	AD47□-8-A		
		Normally open (N.O.)	—	—	AD38□-2-A	AD48□-2-A		
			With level gauge	—	AD38□-8-A	AD48□-8-A		

*1 The bowl assembly comes with a bowl seal.
□ in bowl assembly part numbers indicates a pipe thread type (applicable tubing for auto drain).
No indication is necessary for Rc thread; however, indicate N for NPT thread, and F for G thread. (For auto drain, Nil: ø10, N: ø3/8")
Please contact SMC separately for psi and °F unit display specifications.

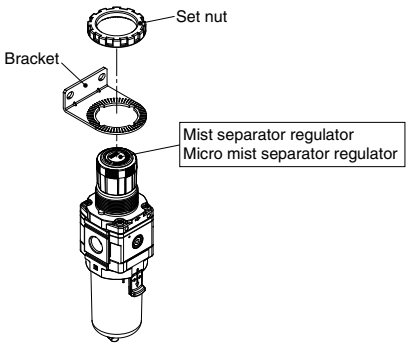
The Replacement Procedure is on p. 592

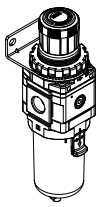
Options/Part Nos.

Optional specifications			Model		
			AWM20-D/AWD20-D	AWM30-D/AWD30-D	AWM40-D/AWD40-D
Bracket assembly*1			AW23P-270AS	AR33P-270AS	AR43P-270AS
Set nut			AR23P-260S	AR33P-260S	AR43P-260S
Pressure gauge*2	Round type	Standard	G36-10-□01		G46-10-□01
		0.05 to 0.2 MPa setting	G36-4-□01		G46-4-□01
	Round type (with color zone)	Standard	G36-10-□01-L		G46-10-□01-L
		0.05 to 0.2 MPa setting	G36-4-□01-L		G46-4-□01-L
	Square embedded type*3	Standard	GC3-10AS-D [136150A (Pressure gauge cover only)]		
		0.05 to 0.2 MPa setting	GC3-4AS-D [136150A (Pressure gauge cover only)]		
Digital pressure switch		NPN output, Wiring bottom entry	ISE35-N-25-MLA-X523 [ISE35-N-25-M (Switch body only)]*4		
		NPN output, Wiring top entry	ISE35-R-25-MLA-X523 [ISE35-R-25-M (Switch body only)]*4		
		PNP output, Wiring bottom entry	ISE35-N-65-MLA-X523 [ISE35-N-65-M (Switch body only)]*4		
		PNP output, Wiring top entry	ISE35-R-65-MLA-X523 [ISE35-R-65-M (Switch body only)]*4		

*1 The assembly of a bracket and set nuts
*2 □ in part numbers for a round type pressure gauge indicates a pipe thread type. No indication is necessary for R; however, indicate N for NPT. Please contact SMC regarding the pressure gauge supply for both MPa and psi unit specifications.
*3 Including an O-ring and 2 mounting screws. [ ]: Pressure gauge cover only
*4 In addition to the pressure switch body, lead wire with connector (2 m), adapter, lock pin, O-ring (1 pc.), mounting screws (2 pcs.) are attached.
[ ]: Switch body only (Regarding how to order the digital pressure switch, refer to the **Web Catalog**.)

AWM20 to 40-D, AWD20 to 40-D





Bracket assembly

Replacement Parts/Part Nos.

Description		Model		
		AWM20-D/AWD20-D	AWM30-D/AWD30-D	AWM40-D/AWD40-D
Valve assembly		AWM24P-090AS	AWM34P-090AS	AWM44P-090AS
Element assembly	AWM	AFM20P-060AS	AFM30P-060AS	AFM40P-060AS
	AWD	AFD20P-060AS	AFD30P-060AS	AFD40P-060AS
Diaphragm assembly	Relieving type	AR24P-150AS	AR34P-150AS	AR44P-150AS
	Non-relieving type	AR24P-150AS-N	AR34P-150AS-N	AR44P-150AS-N
Bowl seal		C2SFP-260S	C32FP-260S	C42FP-260S
Bowl assembly*1, *2		Refer to “Bowl Assembly/Part Nos.”		

*1 The bowl assembly comes with a bowl seal.
*2 Please contact SMC separately for psi and °F unit display specifications.

AC-A Series

The Replacement Procedure is on p. 608

Air Filter + Regulator + Lubricator
AC10-A to AC40-A

Options/Attachments/Part Nos.

Section	Type / Model		Options/Attachments part nos.					
			AC10-A	**AC20-A**	**AC25-A**	**AC30-A**	**AC40-A**	**AC40-06-A**
			AC10A-A	**AC20A-A**	**—**	**AC30A-A**	**AC40A-A**	**AC40A-06-A**
			AC10B-A	**AC20B-A**	**AC25B-A**	**AC30B-A**	**AC40B-A**	**AC40B-06-A**
			—	**AC20C-A**	**AC25C-A**	**AC30C-A**	**AC40C-A**	**AC40C-06-A**
			—	**AC20D-A**	**—**	**AC30D-A**	**AC40D-A**	**AC40D-06-A**
Option	Pressure gauge Note 1) Round type	**Standard**	G27-10-R1	G36-10-□01			G46-10-□01	
		0.02 to 0.2 MPa setting	G27-10-R1 Note 2)	G36-4-□01			G46-4-□01	
	Round type (with color zone)	**Standard**	—	G36-10-□01-L			G46-10-□01-L	
		0.02 to 0.2 MPa setting	—	G36-4-□01-L			G46-4-□01-L	
Attachment	**Spacer**		Y100-A	Y200-A	Y300-A		Y400-A	Y500-A
	Spacer with bracket		Y100T-A	Y200T-A	Y300T-A		Y400T-A	Y500T-A
	Check valve Note 3, 4)		—	AKM2000-□01-A (□02)-A	AKM3000-(□01)-A □02-A		AKM4000-(□02)-A □03-A	—
	Pressure switch Note 4)		—	IS10M-20-A	IS10M-30-A		IS10M-40-A	IS10M-50-A
	T-spacer Note 3, 4)		Y110-M5-A	Y210-□01-A (□02)-A	Y310-(□01)-A □02-A		Y410-(□02)-A □03-A	Y510-(□02)-A □03-A
	Pressure relief 3 port valve Note 4)		—	VHS20-□01A □02A	VHS30-□02A □03A		□02A VHS40-□03A □04A	VHS40-□06A
	Piping adapter Note 4)		E100-M5-A	□01-A E200-□02-A □03-A	□02-A E300-□03-A □04-A		□02-A E400-□03-A □04-A □06-A	E500-□06-A
	Pressure switch with piping adapter Note 4)		—	□01-A IS10E-20□02-A □03-A	□02-A IS10E-30□03-A □04-A		□02-A IS10E-40□03-A □04-A □06-A	—
	Cross spacer Note 4)		Y14-M5-A	Y24-□01-A □02-A	Y34-□01-A □02-A		Y44-□02-A □03-A	Y54-□03-A □04-A

Note 1) □ in round pressure gauge part numbers indicates a pipe thread type. No indication is necessary for R; however, indicate N for NPT. Please contact SMC regarding the pipe thread type NPT and the supply of pressure gauge with psi unit display specifications.
Note 2) Standard pressure gauge
Note 3) For F.R.L. units, port sizes without ( ) are standard specifications.
Note 4) Separate spacers are required for modular unit.

AC-B Series

Air Filter + Regulator + Lubricator
AC20-B to AC60-B

Options/Attachments/Part Nos.

Section	Type		Model	Options/Attachments part nos.							
				AC20-B	AC25-B	AC30-B	AC40-B	AC40-06-B	AC50-B	AC55-B	AC60-B
				AC20A-B	—	AC30A-B	AC40A-B	AC40A-06-B	AC50A-B	—	AC60A-B
				AC20B-B	AC25B-B	AC30B-B	AC40B-B	AC40B-06-B	AC50B-B	AC55B-B	AC60B-B
				AC20C-B	AC25C-B	AC30C-B	AC40C-B	AC40C-06-B	—	—	—
				AC20D-B	—	AC30D-B	AC40D-B	AC40D-06-B	—	—	—
Option	Pressure gauge Note 1)	Round type	Standard	G36-10-□01			G46-10-□01				
			0.02 to 0.2 MPa setting	G36-4-□01			G46-4-□01				
		Round type (with color zone)	Standard	G36-10-□01-L			G46-10-□01-L				
			0.02 to 0.2 MPa setting	G36-4-□01-L			G46-4-□01-L				
		Square embedded type Note 2)	Standard	GC3-10AS [GC3P-010AS (Pressure gauge cover only)]							
			0.02 to 0.2 MPa setting	GC3-4AS [GC3P-010AS (Pressure gauge cover only)]							
	Digital pressure switch		NPN output, Wiring bottom entry	ISE35-N-25-MLA [ISE35-N-25-M (Switch body only)] Note 3)							
			NPN output, Wiring top entry	ISE35-R-25-MLA [ISE35-R-25-M (Switch body only)] Note 3)							
			PNP output, Wiring bottom entry	ISE35-N-65-MLA [ISE35-N-65-M (Switch body only)] Note 3)							
			PNP output, Wiring top entry	ISE35-R-65-MLA [ISE35-R-65-M (Switch body only)] Note 3)							
	Float type auto drain Note 4)		N.O.	—	AD38-A		AD48-A				
			N.C.	AD27-A	AD37-A		AD47-A				
Attachment	Spacer			Y200-A	Y300-A		Y400-A	Y500-A	Y600-A		
	Spacer with bracket			Y200T-A	Y300T-A		Y400T-A	Y500T-A	Y600T-A		
	Check valve Note 5, 6)			AKM2000-□01-A (□02)-A	AKM3000-(□01)-A □02-A		AKM4000-(□02)-A □03-A	—	—	—	—
	Pressure switch Note 6)			IS10M-20-A	IS10M-30-A		IS10M-40-A	IS10M-50-A	IS10M-60-A		
	T-spacer Note 5, 6)			Y210-□01-A (□02)-A	Y310-(□01)-A □02-A		Y410-(□02)-A □03-A	Y510-(□02)-A □03-A	Y610-□03-A (□04)-A	Y610-(□03)-A □04-A	
	Pressure relief 3 port valve Note 6)			VHS20-□01A □02A	VHS30-□02A □03A		□02A VHS40-□03A □04A	VHS40-□06A	VHS50-□06A □10A	—	—
	Piping adapter Note 6)			□01-A E200-□02-A □03-A	□02-A E300-□03-A □04-A		□02-A E400-□03-A □04-A □06-A	E500-□06-A	E600-□06-A □10-A		
	Pressure switch with piping adapter Note 6)			□01-A IS10E-20□02-A □03-A	□02-A IS10E-30□03-A □04-A		□02-A IS10E-40□03-A □04-A □06-A	—	—	—	—
	Cross spacer Note 6)			Y24-□01-A □02-A	Y34-□01-A □02-A		Y44-□02-A □03-A	Y54-□03-A □04-A	—	—	—

Note 1) □ in part numbers for a round type pressure gauge indicates a pipe thread type. No indication is necessary for R; however, indicate N for NPT. Please contact SMC regarding the connection thread NPT and pressure gauge supply for psi unit specifications.
Note 2) Including an O-ring and 2 mounting screws
Note 3) Lead wire with connector (2 m), adapter, lock pin, O-ring (1 pc.), mounting screw (2 pcs.) are attached. [ ]: Switch body only.
Also, regarding how to order the digital pressure switch, refer to the **Web Catalog**.
Note 4) Min. operating pressure: N.O. type–0.1 MPa; N.C. type–0.1 MPa (AD27-A) and 0.15 MPa (AD37-A/AD47-A). Please consult with SMC separately for psi and °F unit display specifications.
Note 5) For F.R.L. units, port sizes without ( ) are standard specifications.
Note 6) Separate spacers are required for modular unit.

ACG-B Series

Air Filter + Regulator + Lubricator
ACG20-B to ACG40-B

Options/Attachments/Part Nos.

Section	Description / Model			Options/Attachment/part nos. For ACG20-B	For ACG30-B	For ACG40-B
	Pressure gauge∗1	Standard	**0 to 1.0 MPa**	GB2-10AS	GB3-10AS	GB4-10AS
		Semi-standard	**0 to 0.3 MPa**	GB2-3AS	GB3-3AS	GB4-3AS
Option	**Float type**∗2 **auto drain**		**N.C.**	AD27-A	AD37-A	AD47-A
			N.O.	—	AD38-A	AD48-A
Attachment	**Spacer**			Y200-A	Y300-A	Y400-A
	Spacer with bracket			Y200T-A	Y300T-A	Y400T-A
	Check valve∗3, ∗4			AKM2000-□01-A (□02-A)	AKM3000-(□01-A) □02-A	AKM4000-(□02-A) □03-A
	Pressure switch∗4, ∗5			IS10M-20-A	IS10M-30-A	IS10M-40-A
	Pressure relief 3-port valve∗4			VHS20-□01A □02A	VHS30-□02A □03A	□02A VHS40-□03A □04A

∗1 Contact SMC regarding pressure gauge supply for psi unit specifications.
∗2 Min. operating pressure: 0.1 MPa for N.O. type, 0.1 MPa for N.C. type (AD27-A) and 0.15 MPa for N.C. type (AD37-A and AD47-A). Contact SMC for psi and °F specifications.
∗3 For F.R.L. units, port sizes not in ( ) are for standard application.
∗4 Separate spacers are required for modular unit.
∗5 The pressure switch cannot be mounted on the inlet and outlet sides of an ARG-B with an upward facing knob (semi-standard specification: -Y).

Filter Regulator + Lubricator
ACG20A-B to ACG40A-B

Options/Attachments/Part Nos.

Section	Description / Model			Options/Attachments/part nos. For ACG20A-B	For ACG30A-B	For ACG40A-B
	Pressure gauge∗1	Standard	**0 to 1.0 MPa**	GB2-10AS	GB3-10AS	GB4-10AS
		Semi-standard	**0 to 0.3 MPa**	GB2-3AS	GB3-3AS	GB4-3AS
Option	**Float type**∗2 **auto drain**		**N.C.**	AD27-A	AD37-A	AD47-A
			N.O.	—	AD38-A	AD48-A
Attachment	**Spacer**			Y200-A	Y300-A	Y400-A
	Spacer with bracket			Y200T-A	Y300T-A	Y400T-A
	Check valve∗3, ∗4			AKM2000-□01-A (□02-A)	AKM3000-(□01-A) □02-A	AKM4000-(□02-A) □03-A
	Pressure relief 3-port valve∗4			VHS20-□01A □02A	VHS30-□02A □03A	□02A VHS40-□03A □04A

∗1 Contact SMC regarding pressure gauge supply for psi unit specifications.
∗2 Min. operating pressure: 0.1 MPa for N.O. type, 0.1 MPa for N.C. type (AD27-A) and 0.15 MPa for N.C. type (AD37-A and AD47-A). Contact SMC for psi and °F specifications.
∗3 For F.R.L. units, port sizes not in ( ) are for standard application.
∗4 Separate spacers are required for modular unit.

Air Filter + Regulator
ACG20B-B to ACG40B-B

Options/Attachments/Part Nos.

Section	Description / Model			Options/Attachments/part no. For ACG20B-B	For ACG30B-B	For ACG40B-B
	Pressure gauge∗1	Standard	**0 to 1.0 MPa**	GB2-10AS	GB3-10AS	GB4-10AS
		Semi-standard	**0 to 0.3 MPa**	GB2-3AS	GB3-3AS	GB4-3AS
Option	**Float type**∗2 **auto drain**		**N.C.**	AD27-A	AD37-A	AD47-A
			N.O.	—	AD38-A	AD48-A
Attachment	**Spacer**			Y200-A	Y300-A	Y400-A
	Spacer with bracket			Y200T-A	Y300T-A	Y400T-A
	Pressure switch∗3, ∗4			IS10M-20-A	IS10M-30-A	IS10M-40-A
	Pressure relief 3-port valve∗3			VHS20-□01A □02A	VHS30-□02A □03A	□02A VHS40-□03A □04A

∗1 Contact SMC regarding pressure gauge supply for psi unit specifications.
∗2 Min. operating pressure: 0.1 MPa for N.O. type, 0.1 MPa for N.C. type (AD27-A) and 0.15 MPa for N.C. type (AD37-A and AD47-A). Contact SMC for psi and °F specifications.
∗3 Separate spacers are required for modular unit.
∗4 The pressure switch cannot be mounted on the inlet and outlet sides of an ARG-B with an upward facing knob (semi-standard specification: -Y).

ACG-B Series

Air Filter + Mist Separator + Regulator
ACG20C-B to ACG40C-B

Options/Attachments/Part Nos.

Section	Description		Model	Options/Attachments/part nos. For ACG20C-B	For ACG30C-B	For ACG40C-B
	Pressure gauge*1	Standard	0 to 1.0 MPa	GB2-10AS	GB3-10AS	GB4-10AS
		Semi-standard	0 to 0.3 MPa	GB2-3AS	GB3-3AS	GB4-3AS
Option	Float type auto drain*2		N.C.	AD27-A	AD37-A	AD47-A
			N.O.	—	AD38-A	AD48-A
Attachment	Spacer			Y200-A	Y300-A	Y400-A
	Spacer with bracket			Y200T-A	Y300T-A	Y400T-A
	Pressure switch*3, *4			IS10M-20-A	IS10M-30-A	IS10M-40-A
	Pressure relief 3-port valve*3			VHS20-□01A □02A	VHS30-□02A □03A	□02A VHS40-□03A □04A

∗1 Contact SMC regarding pressure gauge supply for psi unit specifications.
∗2 Min. operating pressure: 0.1 MPa for N.O. type, 0.1 MPa for N.C. type (AD27-A) and 0.15 MPa for N.C. type (AD37-A and AD47-A). Contact SMC for psi and °F specifications.
∗3 Separate spacers are required for modular unit.
∗4 The pressure switch cannot be mounted on the inlet and outlet sides of an ARG-B with an upward facing knob (semi-standard specification: -Y).

Filter Regulator + Mist Separator
ACG20D-B to ACG40D-B

Options/Attachments/Part Nos.

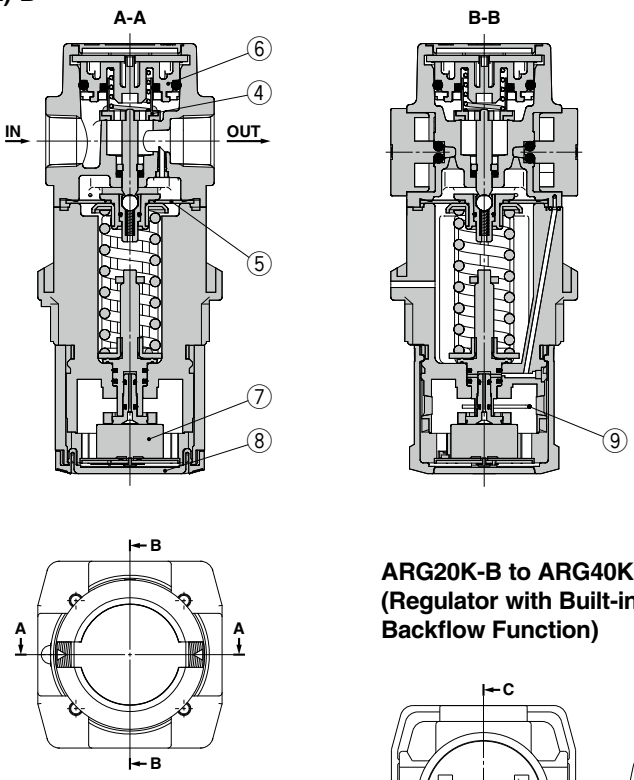
Section	Description		Model	Options/Attachments/part nos. For ACG20D-B	For ACG30D-B	For ACG40D-B
	Pressure gauge*1	Standard	0 to 1.0 MPa	GB2-10AS	GB3-10AS	GB4-10AS
		Semi-standard	0 to 0.3 MPa	GB2-3AS	GB3-3AS	GB4-3AS
Option	Float type auto drain*2		N.C.	AD27-A	AD37-A	AD47-A
			N.O.	—	AD38-A	AD48-A
Attachment	Spacer			Y200-A	Y300-A	Y400-A
	Spacer with bracket			Y200T-A	Y300T-A	Y400T-A
	Pressure relief 3-port valve*3			VHS20-□01A □02A	VHS30-□02A □03A	□02A VHS40-□03A □04A

∗1 Contact SMC regarding pressure gauge supply for psi unit specifications.
∗2 Min. operating pressure: 0.1 MPa for N.O. type, 0.1 MPa for N.C. type (AD27-A) and 0.15 MPa for N.C. type (AD37-A and AD47-A). Contact SMC for psi and °F specifications.
∗3 Separate spacers are required for modular unit.

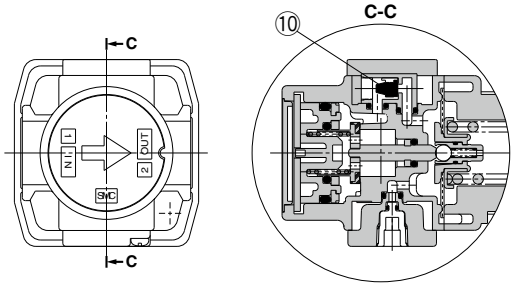
ARG20-B to ARG40-B / ARG20K-B to ARG40K-B

Construction

ARG20(K)-B to ARG40(K)-B



ARG20K-B to ARG40K-B (Regulator with Built-in Pressure Gauge with Backflow Function)



Replacement Parts/Part Nos.

No.	Description	Material	Model		
			ARG20(K)-B	ARG30(K)-B	ARG40(K)-B
4	Valve	Brass, HNBR	AR20P-410S	AR30P-410S	AR40P-410S
5	Diaphragm assembly	Weatherable NBR	AR20P-150AS	AR30P-150AS	AR40P-150AS
6	Valve guide assembly	POM/NBR	AR20P-050AS	AR30P-050AS	AR40P-050AS
7	Pressure gauge*1	—	GB2-10AS	GB3-10AS	GB4-10AS
8	Pressure gauge cover	PC	ARG20P-400S	ARG30P-400S	ARG40P-400S
9	Clip	Stainless steel	ARG20P-420S	ARG30P-420S	ARG40P-420S
10	Check valve assembly*2	—	AR23KP-020AS		

*1 Only the standard part numbers are listed in the pressure gauges. For the semi-standard part numbers, refer to the optional part numbers.
*2 The check valve assembly is applicable for a filter regulator with backflow function (ARG20K-B to ARG40K-B) only. The assembly of a check valve cover, check valve body assembly and 2 mounting screws

Options/Part Nos.

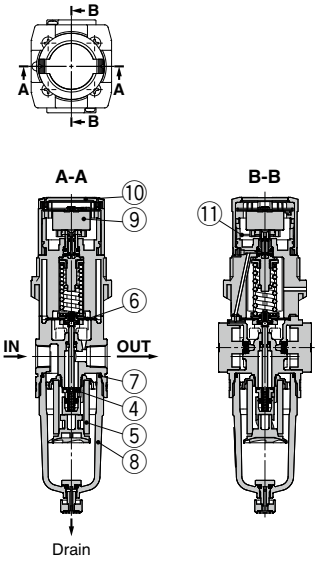
Optional specifications			Model		
			ARG20(K)-B	ARG30(K)-B	ARG40(K)-B
Bracket assembly*1			ARG23P-270AS	ARG33P-270AS	ARG43P-270AS
Set nut			ARG23P-260S	ARG33P-260S	ARG43P-260S
Pressure gauge	Standard	1.0 MPa	GB2-10AS	GB3-10AS	GB4-10AS
	Semi-standard	0.3 MPa	GB2-3AS	GB3-3AS	GB4-3AS
		1.0 MPa/150 psi	GB2-10AS-X101	GB3-10AS-X101	GB4-10AS-X101
		0.3 MPa/45 psi	GB2-3AS-X101	GB3-3AS-X101	GB4-3AS-X101

*1 The assembly of a bracket and set nuts

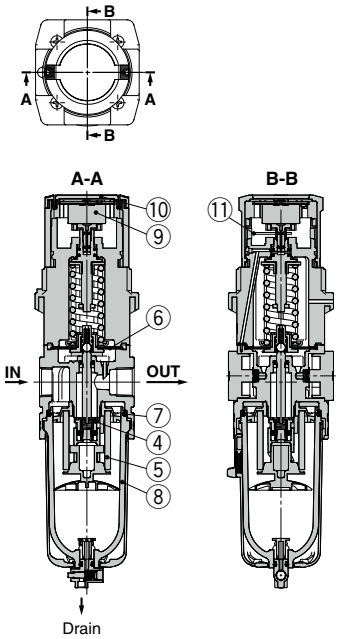
AWG20-B to AWG40-B / AWG20K-B to AWG40K-B

Construction

AWG20(K)-B

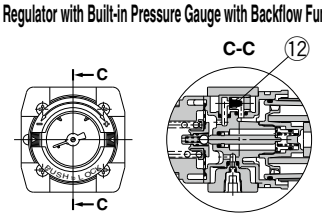


AWG30(K)-B/AWG40(K)-B



AWG20K-B to AWG40K-B

(Filter Regulator with Built-in Pressure Gauge with Backflow Function)



Replacement Parts/Part Nos.

No.	Description	Material	Model		
			AWG20(K)-B	AWG30(K)-B	AWG40(K)-B
4	Valve assembly	Brass, HNBR	AW20P-340AS	AW30P-340AS	AW40P-340AS
5	Element	Non-woven fabric	AF20P-060S	AF30P-060S	AF40P-060S
6	Diaphragm assembly	Weatherable NBR	AR20P-150AS	AR30P-150AS	AR40P-150AS
7	Bowl seal	NBR	C2SFP-260S	C32FP-260S	C42FP-260S
8	Bowl assembly∗1	PC	C2SF-A	C3SF-A∗2	C4SF-A∗2
9	Pressure gauge∗3	—	GB2-10AS	GB3-10AS	GB4-10AS
10	Pressure gauge cover	PC	ARG20P-400S	ARG30P-400S	ARG40P-400S
11	Clip	Stainless steel	ARG20P-420S	ARG30P-420S	ARG40P-420S
12	Check valve assembly∗4	—	AR23KP-020AS		

∗1 The bowl assembly comes with a bowl seal. Please consult with SMC separately for psi and °F unit display specifications.
∗2 The bowl assembly for the AWG30(K)-B and AWG40(K)-B models comes with a bowl guard (Material: Polycarbonate).
∗3 Only the standard part numbers are listed in the pressure gauges. For the semi-standard part numbers, refer to the optional part numbers.
∗4 The check valve assembly is applicable for a filter regulator with backflow function (AWG20K-B to AWG40K-B) only.
The assembly of a check valve cover, check valve body assembly and 2 mounting screws

Options/Part Nos.

Optional specifications			Model		
			AWG20(K)-B	AWG30(K)-B	AWG40(K)-B
Bracket assembly∗1			ARG23P-270AS	ARG33P-270AS	ARG43P-270AS
Set nut			ARG23P-260S	ARG33P-260S	ARG43P-260S
Pressure gauge	Standard	1.0 MPa	GB2-10AS	GB3-10AS	GB4-10AS
	Semi-standard	0.3 MPa	GB2-3AS	GB3-3AS	GB4-3AS
		1.0 MPa/150 psi	GB2-10AS-X101	GB3-10AS-X101	GB4-10AS-X101
		0.3 MPa/45 psi	GB2-3AS-X101	GB3-3AS-X101	GB4-3AS-X101

∗1 The assembly of a bracket and set nuts

Bowl Assembly/Part Nos.

Bowl material	Drain discharge mechanism	Drain port	Other	Model		
				AWG20(K)-B	AWG30(K)-B	AWG40(K)-B
Polycarbonate	Manual	With drain cock	—	C2SF-A	—	—
			With bowl guard	C2SF-C-A	C3SF-A	C4SF-A
		Drain cock with barb fitting	With bowl guard	—	C3SF-W-A	C4SF-W-A
		With drain guide (without valve function)	—	C2SF□-J-A	—	—
			With bowl guard	C2SF□-CJ-A	C3SF□-J-A	C4SF□-J-A
	Automatic∗1 (Auto drain)	Normally closed (N.C.)	—	AD27-A	—	—
			With bowl guard	AD27-C-A	AD37□-A	AD47□-A
		Normally open (N.O.)	With bowl guard	—	AD38□-A	AD48□-A
Nylon	Manual	With drain cock	—	C2SF-6-A	—	—
			With bowl guard	C2SF-6C-A	C3SF-6-A	C4SF-6-A
		Drain cock with barb fitting	With bowl guard	—	C3SF-6W-A	C4SF-6W-A
		With drain guide (without valve function)	—	C2SF□-6J-A	—	—
			With bowl guard	C2SF□-6CJ-A	C3SF□-6J-A	C4SF□-6J-A
	Automatic∗1 (Auto drain)	Normally closed (N.C.)	—	AD27-6-A	—	—
			With bowl guard	AD27-6C-A	AD37□-6-A	AD47□-6-A
		Normally open (N.O.)	With bowl guard	—	AD38□-6-A	AD48□-6-A
Metal	Manual	With drain cock	—	C2SF-2-A	C3SF-2-A	C4SF-2-A
			With level gauge	—	C3LF-8-A	C4LF-8-A
		With drain guide (without valve function)	—	C2SF□-2J-A	C3SF□-2J-A	C4SF□-2J-A
			With level gauge	—	C3LF□-8J-A	C4LF□-8J-A
	Automatic∗1 (Auto drain)	Normally closed (N.C.)	—	AD27-2-A	AD37□-2-A	AD47□-2-A
			With level gauge	—	AD37□-8-A	AD47□-8-A
		Normally open (N.O.)	—	—	AD38□-2-A	AD48□-2-A
			With level gauge	—	AD38□-8-A	AD48□-8-A

∗1 Min. operating pressure: N.O. type–0.1 MPa (AD38-A, AD48-A); N.C. type–0.1 MPa (AD27-A) and 0.15 MPa (AD37-A, AD47-A).
The bowl assembly comes with a bowl seal.
□ in bowl assembly part numbers indicates a pipe thread type (applicable tubing for auto drain).
No indication is necessary for Rc thread; however, indicate N for NPT thread, and F for G thread. (For auto drain, Nil: ø10, N: ø3/8")
Please consult with SMC separately for psi and °F unit display specifications.

ACG Series

Air Filter + Regulator + Lubricator
ACG20/30/40

Options/Attachments/Part Nos.

Description			Options/Attachments part nos.		
		Model	**ACG20**	**ACG30**	**ACG40**
Pressure gauge Note 1)	**Standard**	**0 to 1.0 MPa**	GB2-10AS	GB3-10AS	GB4-10AS
	Optional	**0 to 0.3 MPa**	GB2-3AS	GB3-3AS	GB4-3AS
Options	**Float type auto drain** Note 2)	**N.C.**	AD27	AD37	AD47
		N.O.	–	AD38	AD48
Attachments	**Spacer**		Y200	Y300	Y400
	Spacer with bracket		Y200T	Y300T	Y400T
	Check valve Note 3, 4)		AKM2000-□01, (□02)	AKM3000-(□01), □02	AKM4000-(□02), □03
	Pressure switch Note 4, 5)		IS10M-20	IS10M-30	IS10M-40
	Residual pressure relief 3 port valve Note 4)		VHS20-□01, □02	VHS30-□02, □03	VHS40-□02, □03, □04

Note 1) Contact SMC regarding pressure gauge supply for psi unit specifications.
Note 2) Min. operating pressure: 0.1 MPa for N.O. type, 0.1 MPa for N.C. type (AD27) and 0.15 MPa for N.C. type (AD37 and 47). Contact SMC for psi and °F specifications.
Note 3) For F.R.L. units, port sizes not in ( ) are for standard application.
Note 4) Separate spacers are required for modular unit.
Note 5) The pressure switch cannot be mounted on the inlet and outlet sides of an ARG with an upward facing knob (optional specification: -Y).

Filter Regulator + Lubricator
ACG20A/30A/40A

Options/Attachments/Part Nos.

Description			Options/Attachments part nos.		
		Model	**ACG20A**	**ACG30A**	**ACG40A**
Pressure gauge Note 1)	**Standard**	**0 to 1.0 MPa**	GB2-10AS	GB3-10AS	GB4-10AS
	Optional	**0 to 0.3 MPa**	GB2-3AS	GB3-3AS	GB4-3AS
Options	**Float type auto drain** Note 2)	**N.C.**	AD27	AD37	AD47
		N.O.	–	AD38	AD48
Attachments	**Spacer** Note 3, 4)		Y200	Y300	Y400
	Spacer with bracket		Y200T	Y300T	Y400T
	Check valve		AKM2000-□01, (□02)	AKM3000-(□01), □02	AKM4000-(□02), □03
	Residual pressure relief 3 port valve Note 4)		VHS20-□01, □02	VHS30-□02, □03	VHS40-□02, □03, □04

Note 1) Contact SMC regarding pressure gauge supply for psi unit specifications.
Note 2) Min. operating pressure: 0.1 MPa for N.O. type, 0.1 MPa for N.C. type (AD27) and 0.15 MPa for N.C. type (AD37 and 47). Contact SMC for psi and °F specifications.
Note 3) For F.R.L. units, port sizes not in ( ) are for standard application.
Note 4) Separate spacers are required for modular unit.

Air Filter + Regulator
ACG20B/30B/40B

Options/Attachments/Part Nos.

Description			Options/Attachments part nos.		
		Model	**ACG20B**	**ACG30B**	**ACG40B**
Pressure gauge Note 1)	**Standard**	**0 to 1.0 MPa**	GB2-10AS	GB3-10AS	GB4-10AS
	Optional	**0 to 0.3 MPa**	GB2-3AS	GB3-3AS	GB4-3AS
Options	**Float type auto drain** Note 2)	**N.C.**	AD27	AD37	AD47
		N.O.	–	AD38	AD48
Attachments	**Spacer**		Y200	Y300	Y400
	Spacer with bracket		Y200T	Y300T	Y400T
	Pressure switch Note 3, 4)		IS10M-20	IS10M-30	IS10M-40
	Residual pressure relief 3 port valve Note 3)		VHS20-□01, □02	VHS30-□02, □03	VHS40-□02, □03, □04

Note 1) Contact SMC regarding pressure gauge supply for psi unit specifications.
Note 2) Min. operating pressure: 0.1 MPa for N.O. type, 0.1 MPa for N.C. type (AD27) and 0.15 MPa for N.C. type (AD37 and 47). Contact SMC for psi and °F specifications.
Note 3) Separate spacers are required for modular unit.
Note 4) The pressure switch cannot be mounted on the inlet and outlet sides of an ARG with an upward facing knob (optional specification: -Y).

ACG Series

Air Filter + Mist Separator + Regulator
ACG20C/30C/40C

Options/Attachments/Part Nos.

Description / Model			Options/Attachments part nos.		
			ACG20C	**ACG30C**	**ACG40C**
Pressure gauge Note 1)	**Standard**	**0 to 1.0 MPa**	GB2-10AS	GB3-10AS	GB4-10AS
	Optional	**0 to 0.3 MPa**	GB2-3AS	GB3-3AS	GB4-3AS
Options: **Float type auto drain** Note 2)		**N.C.**	AD27	AD37	AD47
		N.O.	–	AD38	AD48
Attachments: **Spacer**			Y200	Y300	Y400
Spacer with bracket			Y200T	Y300T	Y400T
Pressure switch Note 3, 4)			IS10M-20	IS10M-30	IS10M-40
Residual pressure relief 3 port valve Note 3)			VHS20-□01, □02	VHS30-□02, □03	VHS40-□02, □03, □04

Note 1) Contact SMC regarding pressure gauge supply for psi unit specifications.
Note 2) Min. operating pressure: 0.1 MPa for N.O. type, 0.1 MPa for N.C. type (AD27) and 0.15 MPa for N.C. type (AD37 and 47). Contact SMC for psi and °F specifications.
Note 3) Separate spacers are required for modular unit.
Note 4) The pressure switch cannot be mounted on the inlet and outlet sides of an ARG with an upward facing knob (optional specification: -Y).

Filter Regulator + Mist Separator
ACG20D/30D/40D

Options/Attachments/Part Nos.

Description / Model			Options/Attachments part nos.		
			ACG20D	**ACG30D**	**ACG40D**
Pressure gauge Note 1)	**Standard**	**0 to 1.0 MPa**	GB2-10AS	GB3-10AS	GB4-10AS
	Optional	**0 to 0.3 MPa**	GB2-3AS	GB3-3AS	GB4-3AS
Options: **Float type auto drain** Note 2)		**N.C.**	AD27	AD37	AD47
		N.O.	–	AD38	AD48
Attachments: **Spacer**			Y200	Y300	Y400
Spacer with bracket			Y200T	Y300T	Y400T
Residual pressure relief 3 port valve Note 3)			VHS20-□01, □02	VHS30-□02, □03	VHS40-□02, □03, □04

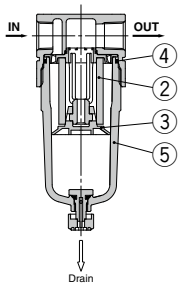
Note 1) Contact SMC regarding pressure gauge supply for psi unit specifications.
Note 2) Min. operating pressure: 0.1 MPa for N.O. type, 0.1 MPa for N.C. type (AD27) and 0.15 MPa for N.C. type (AD37 and 47). Contact SMC for psi and °F specifications.
Note 3) Separate spacers are required for modular unit.

AF10-A to AF60-A

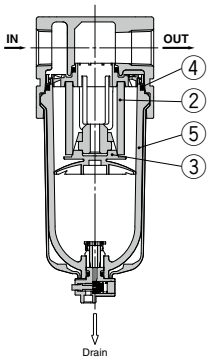
The Replacement Procedure is on p. 611

Construction

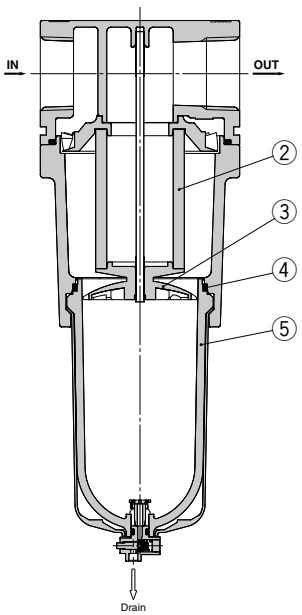
AF10-A/AF20-A



AF30-A to AF40-06-A



AF50-A/AF60-A



∗ The numbers correspond with those in the "Construction" of the AF series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description	Material	Model						
			AF10-A	AF20-A	AF30-A	AF40-A	AF40-06-A	AF50-A	AF60-A
②	**Filter element**	Non-woven fabric	AF10P-060S	AF20P-060S	AF30P-060S	AF40P-060S		AF50P-060S	AF60P-060S
③	**Baffle**	PBT	AF10P-040S Note 2)	AF22P-040S	AF32P-040S	AF42P-040S		AF50P-040S	AF60P-040S
④	**Bowl seal**	NBR	C1SFP-260S	C2SFP-260S	C32FP-260S	C42FP-260S			
⑤	**Bowl assembly** Note 1)	Polycarbonate	C1SF-A	C2SF-A	C3SF-A	C4SF-A			

Note 1) The AF20-A to AF60-A models come with a bowl seal. Please contact SMC regarding the supply of bowl assembly with psi and °F unit display specifications.
Note 2) The baffle material for the AF10-A (AF10P-040S) only is polyacetal.

Options/Part Nos.

Optional specifications	Model						
	AF10-A	AF20-A	AF30-A	AF40-A	AF40-06-A	AF50-A	AF60-A
Bracket assembly Note)	—	AF22P-050AS	AF32P-050AS	AF42P-050AS	AF42P-070AS	AF52P-050AS	

Note) The assembly of a bracket and 2 mounting screws

Bowl Assembly/Part Nos.

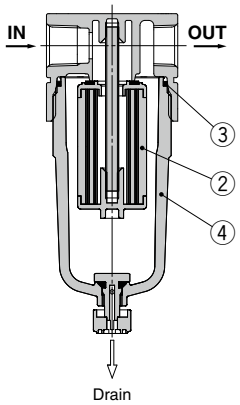
Bowl material	Drain discharge mechanism	Drain port	Other	Model						
				AF10-A	AF20-A	AF30-A	AF40-A	AF40-06-A	AF50-A	AF60-A
Polycarbonate	Manual discharge	With drain cock	—	C1SF-A	C2SF-A	—	—			
			With bowl guard	—	C2SF-C-A	C3SF-A	C4SF-A			
		Drain cock with barb fitting	With bowl guard	—	—	C3SF-W-A	C4SF-W-A			
		With drain guide (without valve function)	—	—	C2SF□-J-A	—	—			
			With bowl guard	—	C2SF□-CJ-A	C3SF□-J-A	C4SF□-J-A			
	Note) Automatic discharge (Auto drain)	Normally closed (N.C.)	—	AD17-A	AD27-A	—	—			
			With bowl guard	—	AD27-C-A	AD37□-A	AD47□-A			
		Normally open (N.O.)	With bowl guard	—	—	AD38□-A	AD48□-A			
Nylon	Manual discharge	With drain cock	—	C1SF-6-A	C2SF-6-A	—	—			
			With bowl guard	—	C2SF-6C-A	C3SF-6-A	C4SF-6-A			
		Drain cock with barb fitting	With bowl guard	—	—	C3SF-6W-A	C4SF-6W-A			
		With drain guide (without valve function)	—	—	C2SF□-6J-A	—	—			
			With bowl guard	—	C2SF□-6CJ-A	C3SF□-6J-A	C4SF□-6J-A			
	Note) Automatic discharge (Auto drain)	Normally closed (N.C.)	—	AD17-6-A	AD27-6-A	—	—			
			With bowl guard	—	AD27-6C-A	AD37□-6-A	AD47□-6-A			
		Normally open (N.O.)	With bowl guard	—	—	AD38□-6-A	AD48□-6-A			
Metal	Manual discharge	With drain cock	—	C1SF-2-A	C2SF-2-A	C3SF-2-A	C4SF-2-A			
			With level gauge	—	—	C3LF-8-A	C4LF-8-A			
		With drain guide (without valve function)	—	—	C2SF□-2J-A	C3SF□-2J-A	C4SF□-2J-A			
			With level gauge	—	—	C3LF□-8J-A	C4LF□-8J-A			
	Note) Automatic discharge (Auto drain)	Normally closed (N.C.)	—	AD17-2-A	AD27-2-A	AD37□-2-A	AD47□-2-A			
			With level gauge	—	—	AD37□-8-A	AD47□-8-A			
		Normally open (N.O.)	—	—	—	AD38□-2-A	AD48□-2-A			
			With level gauge	—	—	AD38□-8-A	AD48□-8-A			

Note) Min. operating pressure: N.O. type–0.1 MPa (AD38-A, AD48-A); N.C. type–0.1 MPa (AD17-A, AD27-A) and 0.15 MPa (AD37-A, AD47-A).
The bowl assembly for the AF20-A to AF60-A models comes with a bowl seal.
□ in bowl assembly part numbers indicates a pipe thread type (applicable tubing for auto drain).
No indication is necessary for Rc thread; however, indicate N for NPT thread, and F for G thread. (For auto drain, Nil: ø10, N: ø3/8")
Please consult with SMC separately for psi and °F unit display specifications.

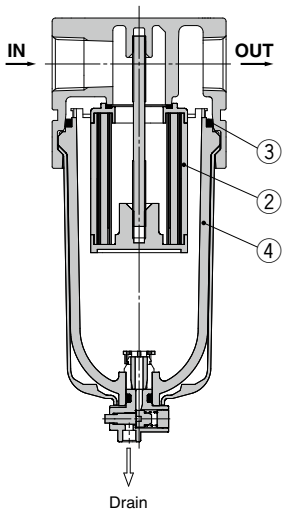
The Replacement Procedure is on p. 622

Construction

AFM20-A
AFD20-A



AFM30-A to AFM40-06-A
AFD30-A to AFD40-06-A



∗ The numbers correspond with those in the "Construction" of the AFM/AFD series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description		Material	Model			
				AFM20-A AFD20-A	AFM30-A AFD30-A	AFM40-A AFD40-A	AFM40-06-A AFD40-06-A
②	Element assembly	AFM20 to 40	—	AFM20P-060AS	AFM30P-060AS	AFM40P-060AS	
		AFD20 to 40	—	AFD20P-060AS	AFD30P-060AS	AFD40P-060AS	
③	Bowl seal		NBR	C2SFP-260S	C32FP-260S	C42FP-260S	
④	Bowl assembly Note)		Polycarbonate	C2SF-A	C3SF-A	C4SF-A	

Note) Including a bowl O-ring. Please contact SMC regarding the supply of bowl assembly with psi and °F unit display specifications.

Options/Part Nos.

Optional specifications		Model			
		AFM20-A AFD20-A	AFM30-A AFD30-A	AFM40-A AFD40-A	AFM40-06-A AFD40-06-A
Bracket assembly Note 1)		AF22P-050AS	AF32P-050AS	AF42P-050AS	AF42P-070AS
Float type auto drain Note 2, 3)	N.C.	AD27-A	AD37-A	AD47-A	
	N.O.	—	AD38-A	AD48-A	

Note 1) The assembly of a bracket and 2 mounting screws
Note 2) Min. operating pressure: N.O. type–0.1 MPa; N.C. type–0.1 MPa (AD27-A) and 0.15 MPa (AD37-A/AD47-A).
Please consult with SMC separately for psi and °F unit display specifications.
Note 3) Please consult with SMC for details on drain piping to fit NPT or G port sizes.

Bowl Assembly/Part Nos.

Bowl material	Drain discharge mechanism	Drain port	Other	Model			
				AFM20-A AFD20-A	AFM30-A AFD30-A	AFM40-A AFD40-A	AFM40-06-A AFD40-06-A
Polycarbonate	Manual discharge	With drain cock	—	C2SF-A	—	—	
			With bowl guard	C2SF-C-A	C3SF-A	C4SF-A	
		Drain cock with barb fitting	With bowl guard	—	C3SF-W-A	C4SF-W-A	
		With drain guide (without valve function)	—	C2SF□-J-A	—	—	
			With bowl guard	C2SF□-CJ-A	C3SF□-J-A	C4SF□-J-A	
	Note) Automatic discharge (Auto drain)	Normally closed (N.C.)	—	AD27-A	—	—	
			With bowl guard	AD27-C-A	AD37□-A	AD47□-A	
		Normally open (N.O.)	With bowl guard	—	AD38□-A	AD48□-A	
Nylon	Manual discharge	With drain cock	—	C2SF-6-A	—	—	
			With bowl guard	C2SF-6C-A	C3SF-6-A	C4SF-6-A	
		Drain cock with barb fitting	With bowl guard	—	C3SF-6W-A	C4SF-6W-A	
		With drain guide (without valve function)	—	C2SF□-6J-A	—	—	
			With bowl guard	C2SF□-6CJ-A	C3SF□-6J-A	C4SF□-6J-A	
	Note) Automatic discharge (Auto drain)	Normally closed (N.C.)	—	AD27-6-A	—	—	
			With bowl guard	AD27-6C-A	AD37□-6-A	AD47□-6-A	
		Normally open (N.O.)	With bowl guard	—	AD38□-6-A	AD48□-6-A	
Metal	Manual discharge	With drain cock	—	C2SF-2-A	C3SF-2-A	C4SF-2-A	
			With level gauge	—	C3LF-8-A	C4LF-8-A	
		With drain guide (without valve function)	—	C2SF□-2J-A	C3SF□-2J-A	C4SF□-2J-A	
			With level gauge	—	C3LF□-8J-A	C4LF□-8J-A	
	Note) Automatic discharge (Auto drain)	Normally closed (N.C.)	—	AD27-2-A	AD37□-2-A	AD47□-2-A	
			With level gauge	—	AD37□-8-A	AD47□-8-A	
		Normally open (N.O.)	—	—	AD38□-2-A	AD48□-2-A	
			With level gauge	—	AD38□-8-A	AD48□-8-A	

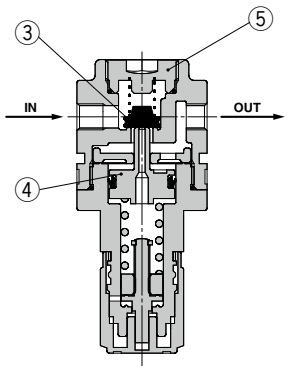
Note) Min. operating pressure: N.O. type–0.1 MPa (AD38-A, AD48-A); N.C. type–0.1 MPa (AD17-A, AD27-A) and 0.15 MPa (AD37-A, AD47-A).
The bowl assembly for the AFM20-A to AFM40-06-A, AFD20-A to AFD40-06-A models comes with a bowl seal.
□ in bowl assembly part numbers indicates a pipe thread type (applicable tubing for auto drain). No indication is necessary for Rc thread; however, indicate N for NPT thread, and F for G thread. (For auto drain, Nil: ø10, N: ø3/8")
Please consult with SMC separately for psi and °F unit display specifications.

AR10-A to AR40-A

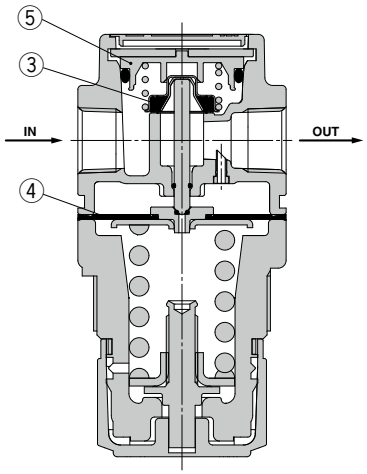
The Replacement Procedure is on p. 630

Construction

AR10-A



AR20-A to 40-06-A



∗ The numbers correspond with those in the "Construction" of the AR series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description	Material	Model					
			AR10-A	AR20-A	AR25-A	AR30-A	AR40-A	AR40-06-A
③	Valve assembly	Stainless steel/HNBR	AR10P-090S	AR22P-060AS		AR32P-060AS	AR42P-060AS	
④	Diaphragm assembly	Weatherable NBR	AR10P-150AS Note)	AR22P-150AS		AR32P-150AS	AR42P-150AS	
⑤	Valve guide assembly	Polyacetal	131329	AR22P-050AS		AR32P-050AS	AR42P-050AS	

Note) The AR10-A is a piston type. The assembly of a piston and a seal (KSYP-13)

Options/Part Nos.

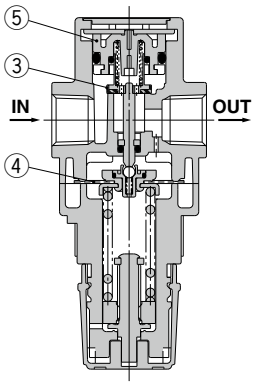
Optional specifications			Model					
			AR10-A	AR20-A	AR25-A	AR30-A	AR40-A	AR40-06-A
Bracket assembly Note 1)			AR12P-270AS	AR22P-270AS	AR27P-270AS	AR32P-270AS	AR42P-270AS	AR42P-270AS
Set nut			AR12P-260S	AR22P-260S	AR22P-260S	AR32P-260S	AR42P-260S	AR42P-260S
Pressure gauge	Round type Note 2)	Standard	G27-10-R1	G36-10-□01			G46-10-□01	
		0.02 to 0.2 MPa setting	G27-10-R1 Note 3)	G36-4-□01			G46-4-□01	
	Round type (with color zone) Note 2)	Standard	—	G36-10-□01-L			G46-10-□01-L	
		0.02 to 0.2 MPa setting	—	G36-4-□01-L			G46-4-□01-L	

Note 1) The assembly of a bracket and set nuts
Note 2) □ in round pressure gauge part numbers indicates a pipe thread type. No indication is necessary for R; however, indicate N for NPT.
Please contact SMC regarding the pipe thread type NPT and the supply of pressure gauge with psi unit display specifications.
Note 3) Standard pressure gauge

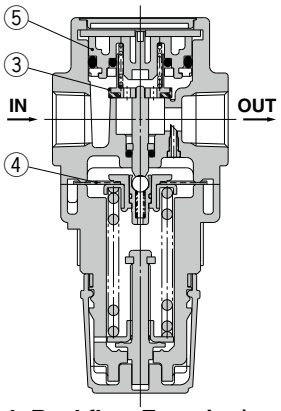
The Replacement Procedure is on p. 635

Construction

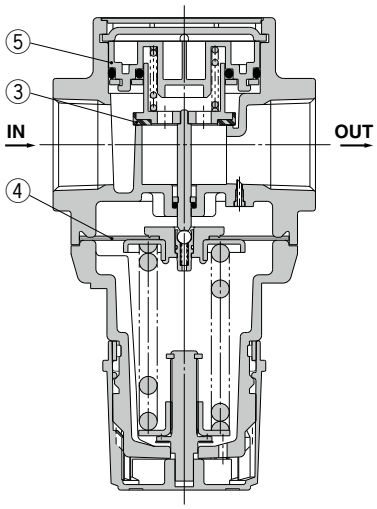
AR20(K)-B/AR25(K)-B



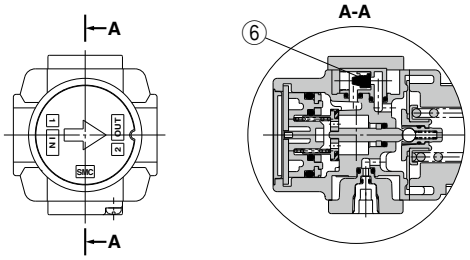
AR30(K)-B/AR40(K)-B



AR50(K)-B/AR60(K)-B



AR20K-B to AR60K-B (Regulator with Backflow Function)



∗ The numbers correspond with those in the "Construction" of the AR series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description	Material	Model						
			AR20(K)-B	AR25(K)-B	AR30(K)-B	AR40(K)-B	AR40(K)-06-B	AR50(K)-B	AR60(K)-B
③	**Valve**	Brass/HNBR	AR20P-410S	AR25P-410S	AR30P-410S	AR40P-410S		AR50P-410S	AR60P-410S
④	**Diaphragm assembly**	Weatherable NBR	AR20P-150AS	AR25P-150AS	AR30P-150AS	AR40P-150AS		AR50P-150AS	
⑤	**Valve guide assembly**	Polyacetal	AR20P-050AS	AR25P-050AS	AR30P-050AS	AR40P-050AS		AR50P-050AS	AR60P-050AS
⑥	**Check valve assembly** Note)	—	AR23KP-020AS						

Note) The check valve assembly is applicable for a regulator with backflow function (AR20K-B to AR60K-B) only. The assembly of a check valve cover, check valve body assembly and 2 mounting screws

Options/Part Nos.

Option		Model	AR20(K)-B	AR25(K)-B	AR30(K)-B	AR40(K)-B	AR40(K)-06-B	AR50(K)-B	AR60(K)-B
Bracket assembly Note 1)			AR23P-270AS	AR28P-270AS	AR33P-270AS	AR43P-270AS		AR52P-270AS	
Set nut			AR23P-260S	AR28P-260S	AR33P-260S	AR43P-260S		— Note 2)	
Pressure gauge	Round type Note 3)	**Standard**	G36-10-□01			G46-10-□01			
		0.02 to 0.2 MPa setting	G36-4-□01			G46-4-□01			
	Round type (with color zone) Note 3)	**Standard**	G36-10-□01-L			G46-10-□01-L			
		0.02 to 0.2 MPa setting	G36-4-□01-L			G46-4-□01-L			
	Square embedded type Note 4)	**Standard**	GC3-10AS [GC3P-010AS (Pressure gauge cover only)]						
		0.02 to 0.2 MPa setting	GC3-4AS [GC3P-010AS (Pressure gauge cover only)]						
Digital pressure switch Note 5)		NPN output, Wiring bottom entry	ISE35-N-25-MLA [ISE35-N-25-M (Switch body only)]						
		NPN output, Wiring top entry	ISE35-R-25-MLA [ISE35-R-25-M (Switch body only)]						
		PNP output, Wiring bottom entry	ISE35-N-65-MLA [ISE35-N-65-M (Switch body only)]						
		PNP output, Wiring top entry	ISE35-R-65-MLA [ISE35-R-65-M (Switch body only)]						

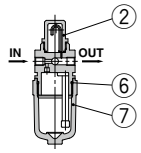
Note 1) The assembly of a bracket and set nuts. Including 2 mounting screws for the AR50(K)-B and AR60(K)-B
Note 2) Please consult with SMC regarding the set nuts for the AR50(K)-B and AR60(K)-B.
Note 3) □ in part numbers for a round pressure gauge indicates a pipe thread type. No indication is necessary for R; however, indicate N for NPT. Please contact SMC regarding the pressure gauge supply for psi unit specifications.
Note 4) Including an O-ring and 2 mounting screws. [ ]: Pressure gauge cover only
Note 5) In addition to the pressure switch body, lead wire with connector (2 m), adapter, lock pin, O-ring (1 pc.), mounting screw (2 pcs.) are attached. [ ]: Switch body only. (Regarding how to order the digital pressure switch, refer to the **Web Catalog**.)

AL10-A to AL60-A

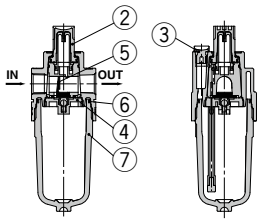
The Replacement Procedure is on p. 642

Construction

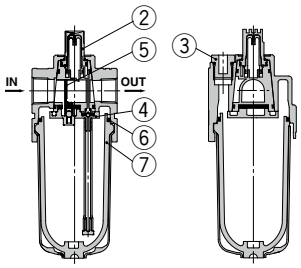
AL10-A



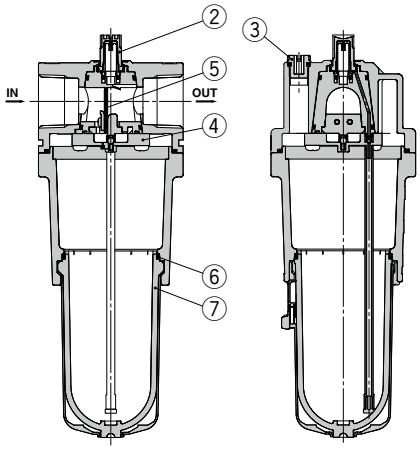
AL20-A



AL30-A/AL40-A



AL50-A/AL60-A



Replacement Parts/Part Nos.

No.	Description	Material	Model						
			AL10-A	AL20-A	AL30-A	AL40-A	AL40-06-A	AL50-A	AL60-A
②	Sight dome assembly	Polycarbonate	AL10P-080AS	AL20P-080AS					
③	Lubrication plug assembly	—	—	AL22P-060AS	AL32P-060AS	AL42P-060AS			
④	Bumper retainer assembly	—	—	AL20P-030AS	AL30P-030AS	AL40P-030AS		AL50P-030AS	AL60P-030AS
⑤	Bumper (assembly)	Synthetic resin	—	AL20P-040S	AL30P-040S	AL40P-040S		AL50P-040AS	AL60P-040AS
⑥	Bowl seal	NBR	C1SFP-260S	C2SFP-260S	C32FP-260S	C42FP-260S			
⑦	Bowl assembly Note)	Polycarbonate	C1SL-A	C2SL-A	C3SL-A	C4SL-A			

Note) · The AL20-A to AL60-A models come with a bowl seal. Please consult with SMC separately for psi and °F unit display specifications.
· The bowl assembly for the AL30-A to AL60-A models comes with a bowl guard (Material: Polycarbonate).

Options/Part Nos.

Optional specifications	Model						
	AL10-A	AL20-A	AL30-A	AL40-A	AL40-06-A	AL50-A	AL60-A
Bracket assembly Note)	—	AF22P-050AS	AF32P-050AS	AF42P-050AS	AF42P-070AS	AF52P-050AS	

Note) The assembly of a bracket and 2 mounting screws

Bowl Assembly/Part Nos.

Bowl material	Lubricant exhaust port	Other	Model						
			AL10-A	AL20-A	AL30-A	AL40-A	AL40-06-A	AL50-A	AL60-A
Polycarbonate	Without drain cock	—	C1SL-A	C2SL-A	—	—			
		With bowl guard	—	C2SL-C-A	C3SL-A	C4SL-A			
	With drain cock	—	C1SL-3-A	C2SL-3-A	—	—			
		With bowl guard	—	C2SL-3C-A	C3SL-3-A	C4SL-3-A			
	Drain cock with barb fitting	With bowl guard	—	—	C3SL-3W-A	C4SL-3W-A			
Nylon	Without drain cock	—	C1SL-6-A	C2SL-6-A	—	—			
		With bowl guard	—	C2SL-6C-A	C3SL-6-A	C4SL-6-A			
	With drain cock	—	C1SL-36-A	C2SL-36-A	—	—			
		With bowl guard	—	C2SL-36C-A	C3SL-36-A	C4SL-36-A			
	Drain cock with barb fitting	With bowl guard	—	—	C3SL-36W-A	C4SL-36W-A			
Metal	Without drain cock	—	C1SL-2-A	C2SL-2-A	C3SL-2-A	C4SL-2-A			
		With level gauge	—	—	C3LL-8-A	C4LL-8-A			
	With drain cock	—	C1SL-23-A	C2SL-23-A	C3SL-23-A	C4SL-23-A			
		With level gauge	—	—	C3LL-38-A	C4LL-38-A			

Note) · The AL20-A to AL60-A models come with a bowl seal.
· Please consult with SMC separately for psi and °F unit display specifications.

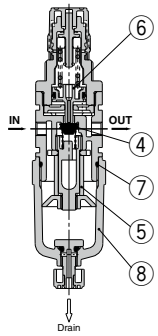
∗ The numbers correspond with those in the “Construction” of the AL series in the **Web Catalog**.

AW10-A to AW40-A

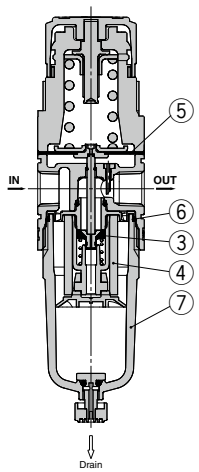
The Replacement Procedure is on p. 650

Construction

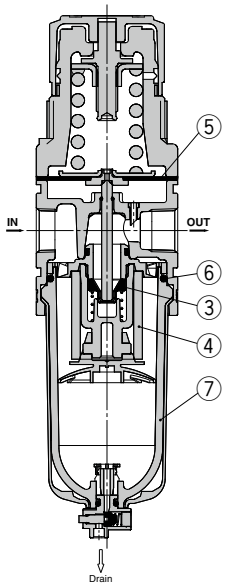
AW10-A



AW20-A



AW30-A to AW40-06-A



∗ The numbers correspond with those in the "Construction" of the AW series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description	Material	Model				
			AW10-A	AW20-A	AW30-A	AW40-A	AW40-06-A
③	Valve assembly	Stainless steel/HNBR	AR10P-090S	AW22P-060AS	AW32P-060AS	AW42P-060AS	
④	Filter element	Non-woven fabric	AF10P-060S	AF20P-060S	AF30P-060S	AF40P-060S	
⑤	Diaphragm assembly	Weatherable NBR	AR10P-150AS Note 1)	AR22P-150AS	AR32P-150AS	AR42P-150AS	
⑥	Bowl seal	NBR	C1SFP-260S	C2SFP-260S	C32FP-260S	C42FP-260S	
⑦	Bowl assembly Note 2)	Polycarbonate	C1SF-A	C2SF-A	C3SF-A	C4SF-A	

Note 1) The AW10-A is a piston type. The assembly of a piston and a seal (KSYP-13)
Note 2) The AW20-A to AW40-06-A models come with a bowl seal. Please contact SMC regarding the supply of bowl assembly with psi and °F unit display specifications.

Options/Part Nos.

Optional specifications			Model				
			AW10-A	AW20-A	AW30-A	AW40-A	AW40-06-A
Bracket assembly Note 1)			AR12P-270AS	AR22P-270AS	AR32P-270AS	AR42P-270AS	
Set nut			AR12P-260S	AR22P-260S	AR32P-260S	AR42P-260S	
Note 2) Pressure gauge	Round type	Standard	G27-10-R1	G36-10-□01		G46-10-□01	
		0.02 to 0.2 MPa setting	G27-10-R1 Note 3)	G36-4-□01		G46-4-□01	
	Round type (with color zone)	Standard	—	G36-10-□01-L		G46-10-□01-L	
		0.02 to 0.2 MPa setting	—	G36-4-□01-L		G46-4-□01-L	

Note 1) The assembly of a bracket and set nuts
Note 2) □ in round pressure gauge part numbers indicates a pipe thread type. No indication is necessary for R; however, indicate N for NPT.
Please contact SMC regarding the pipe thread type NPT and the supply of pressure gauge with psi unit display specifications.
Note 3) Standard pressure gauge

Bowl Assembly/Part Nos.

Bowl material	Drain discharge mechanism	Drain port	Other	Model				
				AW10-A	AW20-A	AW30-A	AW40-A	AW40-06-A
Polycarbonate	Manual discharge	With drain cock	—	C1SF-A	C2SF-A	—	—	
			With bowl guard	—	C2SF-C-A	C3SF-A	C4SF-A	
		Drain cock with barb fitting	With bowl guard	—	—	C3SF-W-A	C4SF-W-A	
		With drain guide (without valve function)	—	—	C2SF□-J-A	—	—	
			With bowl guard	—	C2SF□-CJ-A	C3SF□-J-A	C4SF□-J-A	
	Note) Automatic discharge (Auto drain)	Normally closed (N.C.)	—	AD17-A	AD27-A	—	—	
			With bowl guard	—	AD27-C-A	AD37□-A	AD47□-A	
		Normally open (N.O.)	With bowl guard	—	—	AD38□-A	AD48□-A	
Nylon	Manual discharge	With drain cock	—	C1SF-6-A	C2SF-6-A	—	—	
			With bowl guard	—	C2SF-6C-A	C3SF-6-A	C4SF-6-A	
		Drain cock with barb fitting	With bowl guard	—	—	C3SF-6W-A	C4SF-6W-A	
		With drain guide (without valve function)	—	—	C2SF□-6J-A	—	—	
			With bowl guard	—	C2SF□-6CJ-A	C3SF□-6J-A	C4SF□-6J-A	
	Note) Automatic discharge (Auto drain)	Normally closed (N.C.)	—	AD17-6-A	AD27-6-A	—	—	
			With bowl guard	—	AD27-6C-A	AD37□-6-A	AD47□-6-A	
		Normally open (N.O.)	With bowl guard	—	—	AD38□-6-A	AD48□-6-A	
Metal	Manual discharge	With drain cock	—	C1SF-2-A	C2SF-2-A	C3SF-2-A	C4SF-2-A	
			With level gauge	—	—	C3LF-8-A	C4LF-8-A	
		With drain guide (without valve function)	—	—	C2SF□-2J-A	C3SF□-2J-A	C4SF□-2J-A	
			With level gauge	—	—	C3LF□-8J-A	C4LF□-8J-A	
	Note) Automatic discharge (Auto drain)	Normally closed (N.C.)	—	AD17-2-A	AD27-2-A	AD37□-2-A	AD47□-2-A	
			With level gauge	—	—	AD37□-8-A	AD47□-8-A	
		Normally open (N.O.)	—	—	—	AD38□-2-A	AD48□-2-A	
			With level gauge	—	—	AD38□-8-A	AD48□-8-A	

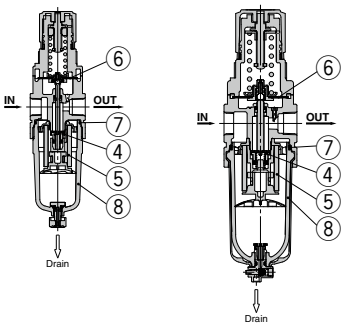
Note) Min. operating pressure: N.O. type–0.1 MPa (AD38-A, AD48-A); N.C. type–0.1 MPa (AD17-A, AD27-A) and 0.15 MPa (AD37-A, AD47-A).
The bowl assembly for the AW10-A to AW40-06-A models comes with a bowl seal.
□ in bowl assembly part numbers indicates a pipe thread type (applicable tubing for auto drain).
No indication is necessary for Rc thread; however, indicate N for NPT thread, and F for G thread. (For auto drain, Nil: ø10, N: ø3/8")
Please consult with SMC separately for psi and °F unit display specifications.

AW20-B to AW60-B / AW20K-B to AW60K-B

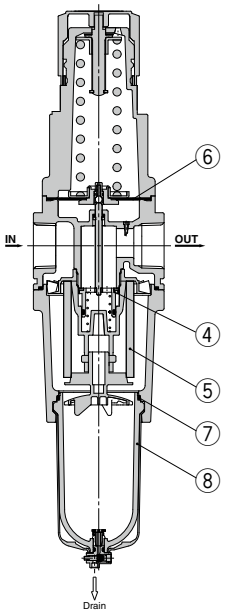
The Replacement Procedure is on p. 666

Construction

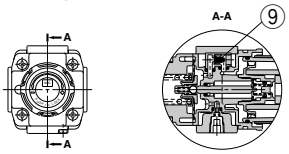
AW20(K)-B **AW30(K)-B/AW40(K)-B**



AW60(K)-B



AW20K-B to AW60K-B
(Filter Regulator with Backflow Function)



∗ The numbers correspond with those in the "Construction" of the AW series in the **Web Catalog**.

Note) Min. operating pressure: N.O. type–0.1 MPa (AD38-A, AD48-A); N.C. type–0.1 MPa (AD27-A) and 0.15 MPa (AD37-A, AD47-A).
The bowl assembly comes with a bowl seal.
□ in bowl assembly part numbers indicates a pipe thread type (applicable tubing for auto drain).
No indication is necessary for Rc thread; however, indicate N for NPT thread, and F for G thread. (For auto drain, Nil: ø10, N: ø3/8")
Please consult with SMC separately for psi and °F unit display specifications.

Replacement Parts/Part Nos.

No.	Description	Material	Model				
			AW20(K)-B	AW30(K)-B	AW40(K)-B	AW40(K)-06-B	AW60(K)-B
④	Valve assembly	Brass/HNBR	AW20P-340AS	AW30P-340AS	AW40P-340AS		AW60P-090AS
⑤	Filter element	Non-woven fabric	AF20P-060S	AF30P-060S	AF40P-060S		AW60P-060S
⑥	Diaphragm assembly	Weatherable NBR	AR20P-150AS	AR30P-150AS	AR40P-150AS		AR50P-150AS
⑦	Bowl seal	NBR	C2SFP-260S	C32FP-260S	C42FP-260S		
⑧	Bowl assembly Note 1)	Polycarbonate	C2SF-A	C3SF-A Note 2)	C4SF-A Note 2)		
⑨	Check valve assembly Note 3)	—	AR23KP-020AS				

Note 1) The bowl assembly comes with a bowl seal. Please consult with SMC separately for psi and °F unit display specifications.
Note 2) The bowl assembly for the AW30(K)-B to AW60(K)-B models comes with a bowl guard (Material: Polycarbonate).
Note 3) The check valve assembly is applicable for a filter regulator with backflow function (AW20K to 60K-B) only. The assembly of a check valve cover, check valve body assembly and 2 mounting screws

Options/Part Nos.

Optional specifications			Model				
			AW20(K)-B	AW30(K)-B	AW40(K)-B	AW40(K)-06-B	AW60(K)-B
Bracket assembly Note 1)			AW23P-270AS	AR33P-270AS	AR43P-270AS		AW62P-270AS
Set nut			AR23P-260S	AR33P-260S	AR43P-260S		— Note 2)
Pressure gauge	Round type Note 3)	**Standard**	G36-10-□01		G46-10-□01		
		0.02 to 0.2 MPa setting	G36-4-□01		G46-4-□01		
	Round type Note 3) (with color zone)	**Standard**	G36-10-□01-L		G46-10-□01-L		
		0.02 to 0.2 MPa setting	G36-4-□01-L		G46-4-□01-L		
	Square embedded type Note 4)	**Standard**	GC3-10AS [GC3P-010AS (Pressure gauge cover only)]				
		0.02 to 0.2 MPa setting	GC3-4AS [GC3P-010AS (Pressure gauge cover only)]				
Digital pressure switch Note 5)		NPN output, Wiring bottom entry	ISE35-N-25-MLA [ISE35-N-25-M (Switch body only)]				
		NPN output, Wiring top entry	ISE35-R-25-MLA [ISE35-R-25-M (Switch body only)]				
		PNP output, Wiring bottom entry	ISE35-N-65-MLA [ISE35-N-65-M (Switch body only)]				
		PNP output, Wiring top entry	ISE35-R-65-MLA [ISE35-R-65-M (Switch body only)]				

Note 1) The assembly of a bracket and set nuts. Including 2 mounting screws for the AW60(K)-B
Note 2) Please consult with SMC regarding the set nuts for the AW60(K)-B.
Note 3) □ in part numbers for a round type pressure gauge indicates a pipe thread type.
No indication is necessary for R; however, indicate N for NPT.
Please contact SMC regarding the pressure gauge supply for psi unit specifications.
Note 4) Including an O-ring and 2 mounting screws. [ ]: Pressure gauge cover only
Note 5) In addition to the pressure switch body, lead wire with connector (2 m), adapter, lock pin, O-ring (1 pc.), mounting screw (2 pcs.) are attached.
[ ]: Switch body only. (Regarding how to order the digital pressure switch, refer to the **Web Catalog**.)
A pressure switch can be mounted on the AW60(K)-B, with a special mounting adapter (Pressure switch adapter assembly: AW63P-310AS) and mounting screws (M3 x 0.5 x 14) which are delivered with the mounting adapter.

Bowl Assembly/Part Nos.

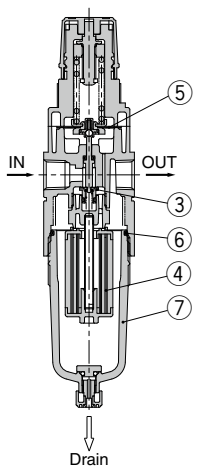
Bowl material	Drain discharge mechanism	Drain port	Other	Model				
				AW20-B	AW30-B	AW40-B	AW40-06-B	AW60-B
Polycarbonate	Manual discharge	With drain cock	—	C2SF-A	—	—		
			With bowl guard	C2SF-C-A	C3SF-A	C4SF-A		
		Drain cock with barb fitting	With bowl guard	—	C3SF-W-A	C4SF-W-A		
		With drain guide (without valve function)	—	C2SF□-J-A	—	—		
			With bowl guard	C2SF□-CJ-A	C3SF□-J-A	C4SF□-J-A		
	Note) Automatic discharge (Auto drain)	Normally closed (N.C.)	—	AD27-A	—	—		
			With bowl guard	AD27-C-A	AD37□-A	AD47□-A		
		Normally open (N.O.)	With bowl guard	—	AD38□-A	AD48□-A		
Nylon	Manual discharge	With drain cock	—	C2SF-6-A	—	—		
			With bowl guard	C2SF-6C-A	C3SF-6-A	C4SF-6-A		
		Drain cock with barb fitting	With bowl guard	—	C3SF-6W-A	C4SF-6W-A		
		With drain guide (without valve function)	—	C2SF□-6J-A	—	—		
			With bowl guard	C2SF□-6CJ-A	C3SF□-6J-A	C4SF□-6J-A		
	Note) Automatic discharge (Auto drain)	Normally closed (N.C.)	—	AD27-6-A	—	—		
			With bowl guard	AD27-6C-A	AD37□-6-A	AD47□-6-A		
		Normally open (N.O.)	With bowl guard	—	AD38□-6-A	AD48□-6-A		
Metal	Manual discharge	With drain cock	—	C2SF-2-A	C3SF-2-A	C4SF-2-A		
			With level gauge	—	C3LF-8-A	C4LF-8-A		
		With drain guide (without valve function)	—	C2SF□-2J-A	C3SF□-2J-A	C4SF□-2J-A		
			With level gauge	—	C3LF□-8J-A	C4LF□-8J-A		
	Note) Automatic discharge (Auto drain)	Normally closed (N.C.)	—	AD27-2-A	AD37□-2-A	AD47□-2-A		
			With level gauge	—	AD37□-8-A	AD47□-8-A		
		Normally open (N.O.)	—	—	AD38□-2-A	AD48□-2-A		
			With level gauge	—	AD38□-8-A	AD48□-8-A		

AWM(D)20 to AWM(D)40

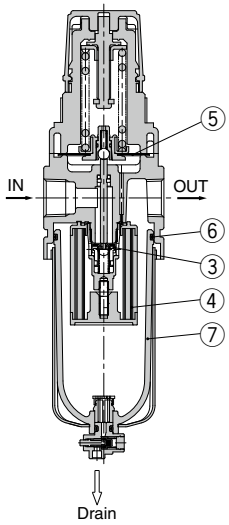
The Replacement Procedure is on p. 678, 684

Construction

AWM20
AWD20



AWM30/40
AWD30/40



∗ The numbers correspond with those in the "Construction" of the AW□ series in the **Web Catalog**.

Note 1) The assembly of a bracket and set nuts

Note 2) □ in part numbers for a round pressure gauge indicates a type of connection thread. No indication is necessary for R; however, indicate N for NPT. Please contact SMC regarding the connection thread NPT and pressure gauge supply for psi unit specifications.

Note 3) Including an O-ring and 2 mounting screws. [ ]: Pressure gauge cover only

Note 4) Lead wire with connector (2 m), adapter, lock pin, O-ring (1 pc.), mounting screw (2 pcs.) are attached. [ ]: Switch body only. Also, regarding how to order the digital pressure switch, refer to the **Web Catalog**.
A separate pressure switch adapter assembly (AW60P-310AS) is required only for AW60(K). For mounting, please use the included mounting screws (M3 x 0.5 x 14).
The mounting screw (M3 x 0.5 x 7) attached to the digital pressure switch assembly will not be required.

Note 5) Min. operating pressure: N.O. type–0.1 MPa; N.C. type–0.1 MPa (AD27) and 0.15 MPa (AD37/47). Please contact SMC for psi and °F unit specifications.

Note 6) Please consult SMC for details on drain piping to fit NPT or G port sizes.

Note) • Including O-ring.
• The bowl assembly for the AWM30/40, AWD30/40 comes with a bowl guard (steel band material). (except when the bowl material is metal)

Replacement Parts/Part Nos.

No.	Description		Material	Model AWM20 AWD20	Model AWM30 AWD30	Model AWM40 AWD40
③	**Valve assembly**		Brass, HNBR	AWM20P-090AS	AWM30P-090AS	AWM40P-090AS
④	**Element assembly**	AWM20 to AWM40	—	AFM20P-060AS	AFM30P-060AS	AFM40P-060AS
		AWD20 to AWD40	—	AFD20P-060AS	AFD30P-060AS	AFD40P-060AS
⑤	**Diaphragm assembly**		Weather resistant NBR	AR20P-150AS	AR30P-150AS	AR40P-150AS
⑥	**Bowl O-ring**		NBR	C2SFP-260S	C3SFP-260S	C4SFP-260S
⑦	**Bowl assembly** Note 1)		Polycarbonate	C2SF	C3SF Note 2)	C4SF Note 2)

Note 1) Including a bowl O-ring. Please contact SMC regarding the bowl assembly supply for psi and °F unit specifications.

Note 2) The bowl assembly for the AWM30/40, AWD30/40 comes with a bowl guard (steel band material).

Options/Part Nos.

Optional specifications			Model AWM20 AWD20	Model AWM30 AWD30	Model AWM40 AWD40
Bracket assembly Note 1)			AW20P-270AS	AR30P-270AS	AR40P-270AS
Set nut			AR20P-260S	AR30P-260S	AR40P-260S
Pressure gauge	**Round type** Note 2)	**Standard**	G36-10-□01		G46-10-□02
		0.02 to 0.2 MPa setting	G36-2-□01		G46-2-□02
	Round type (with color zone) Note 2)	**Standard**	G36-10-□01-L		G46-10-□02-L
		0.02 to 0.2 MPa setting	G36-2-□01-L		G46-2-□02-L
	Square embedded type Note 3)	**Standard**	GC3-10AS [GC3P-010AS (Pressure gauge cover only)]		
		0.02 to 0.2 MPa setting	GC3-2AS [GC3P-010AS (Pressure gauge cover only)]		
Digital pressure switch Note 4)		NPN output/Wiring bottom entry	ISE35-N-25-MLA [ISE35-N-25-M (Switch body only)]		
		NPN output/Wiring top entry	ISE35-R-25-MLA [ISE35-R-25-M (Switch body only)]		
		PNP output/Wiring bottom entry	ISE35-N-65-MLA [ISE35-N-65-M (Switch body only)]		
		PNP output/Wiring top entry	ISE35-R-65-MLA [ISE35-R-65-M (Switch body only)]		
Float type auto drain Note 5) Note 6)		**N.C.**	AD27	AD37	AD47
		N.O.	—	AD38	AD48

Semi-standard: Bowl Assembly/Part Nos.

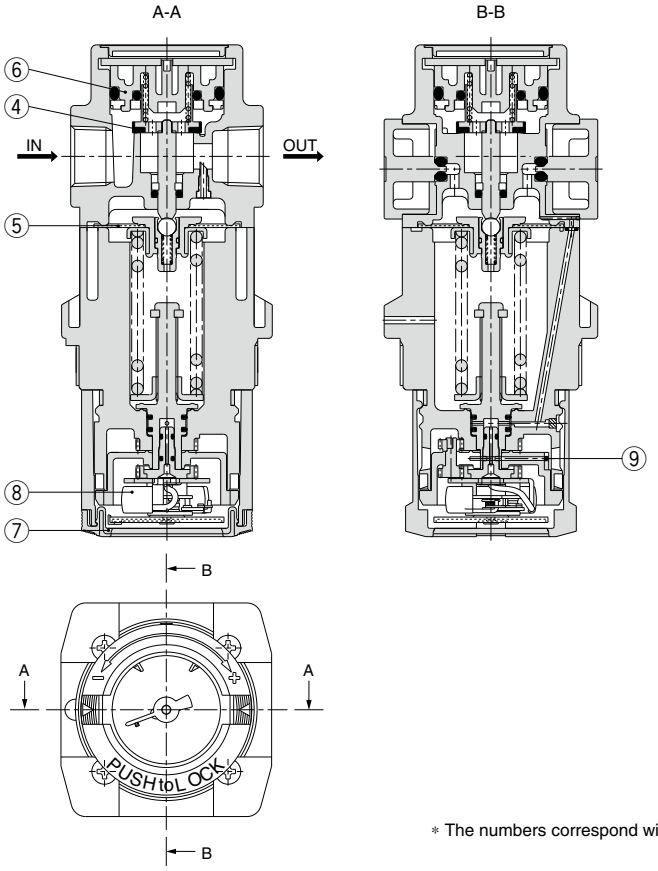
Semi-standard specifications: Bowl material	Float type auto drain (Note 5) Note 6): N.C.	Float type auto drain (Note 5) Note 6): N.O.	With drain guide (Note 6)	With barb fitting	With bowl guard	Model AWM20 AWD20	Model AWM30 AWD30	Model AWM40 AWD40
Polycarbonate	—	—	—	—	●	C2SF-C	—	—
	●	—	—	—	●	AD27-C	—	—
	—	—	●	—	—	C2SF-J	C3SF-J	C4SF-J
	—	—	—	●	—	—	C3SF-W	C4SF-W
	—	—	●	—	●	C2SF-CJ	—	—
Nylon	—	—	—	—	—	C2SF-6	C3SF-6	C4SF-6
	—	—	—	—	●	C2SF-6C	—	—
	●	—	—	—	—	AD27-6	AD37-6	AD47-6
	—	●	—	—	—	—	AD38-6	AD48-6
	●	—	—	—	●	AD27-6C	—	—
	—	—	●	—	—	C2SF-6J	C3SF-6J	C4SF-6J
	—	—	—	●	—	—	C3SF-6W	C4SF-6W
	—	—	●	—	●	C2SF-6CJ	—	—
Metal	—	—	—	—	—	C2SF-2	C3SF-2	C4SF-2
	●	—	—	—	—	AD27-2	AD37-2	AD47-2
	—	●	—	—	—	—	AD38-2	AD48-2
	—	—	●	—	—	C2SF-2J	C3SF-2J	C4SF-2J
Metal bowl with level gauge	—	—	—	—	—	—	C3LF-8	C4LF-8
	●	—	—	—	—	—	AD37-8	AD47-8
	—	●	—	—	—	—	AD38-8	AD48-8
	—	—	●	—	—	—	C3LF-8J	C4LF-8J

ARG20(K)/30(K)/40(K)

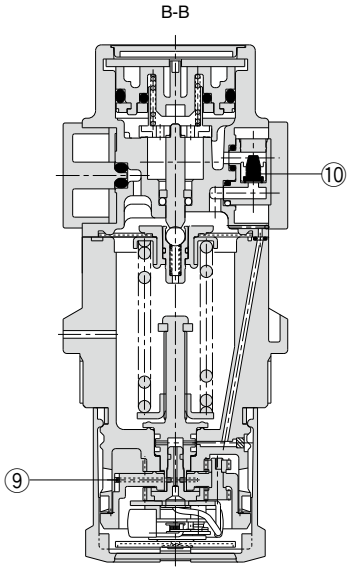
The Replacement Procedure is on p. 690

Construction

ARG20/30/40



ARG20K/30K/40K



∗ The numbers correspond with those in the “Construction” of the ARG series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description	Material	Qty.	Model			Note
				ARG20(K)	**ARG30(K)**	**ARG40(K)**	
4	**Valve**	Brass, HNBR	1	AR20P-410S	AR30P-410S	AR40P-410S	
5	**Diaphragm assembly**	Weather resistant NBR	1	AR20P-150AS	AR30P-150AS	AR40P-150AS	
6	**Valve guide assembly**	POM, NBR	1	AR20P-050AS	AR30P-050AS	AR40P-050AS	
7	**Pressure gauge cover**	PC	1	ARG20P-400S	ARG30P-400S	ARG40P-400S	
8	**Pressure gauge** Note 1)	—	1	GB2-10AS	GB3-10AS	GB4-10AS	
9	**Clip**	Stainless steel	1	ARG20P-420S	ARG30P-420S	ARG40P-420S	
10	**Check valve assembly** Note 2)	—	1	AR20KP-020AS			ARG20K, 30K, 40K

Note 1) Only the standard part numbers are listed for the pressure gauges.
Note 2) The assembly of a check valve body assembly, check valve cover and mounting 2 screws

Options/Part Nos.

Option \ Applicable model				**ARG20(K)**	**ARG30(K)**	**ARG40(K)**
Bracket assembly Note 1)				ARG20P-270AS	ARG30P-270AS	ARG40P-270AS
Set nut				ARG20P-260S	ARG30P-260S	ARG40P-260S
Pressure gauge	**Pressure gauge display range**	**Standard**	**0 to 1.0 MPa**	GB2-10AS	GB3-10AS	GB4-10AS
		Optional	**0 to 0.3 MPa**	GB2-3AS	GB3-3AS	GB4-3AS
			0 to 150 psi	GB2-P10AS	GB3-P10AS	GB4-P10AS
			0 to 45 psi	GB2-P3AS	GB3-P3AS	GB4-P3AS

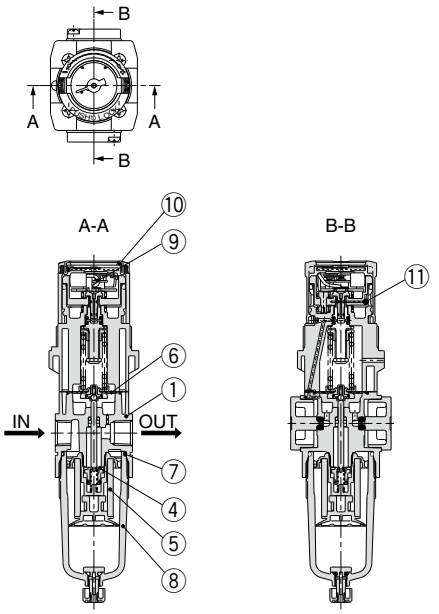
Note 1) The assembly of a bracket and set nuts

AWG20/30/40

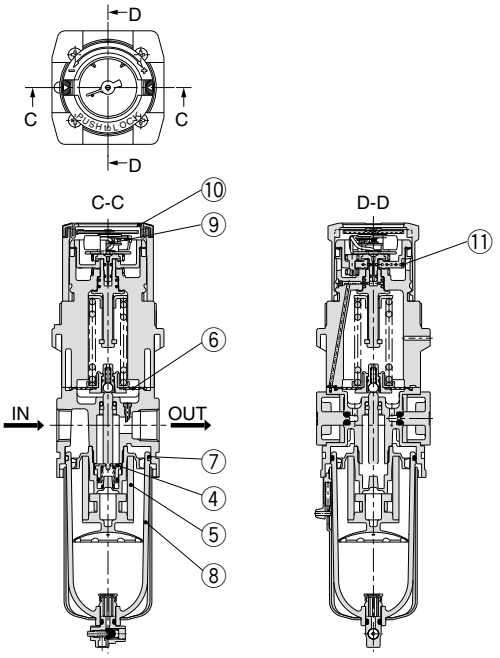
The Replacement Procedure is on p. 696

Construction

AWG20



AWG30/40



∗ The numbers correspond with those in the “Construction” of the AWG series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description	Material	Qty.	Model			Note
				AWG20	**AWG30**	**AWG40**	
4	**Valve assembly**	Brass, HNBR	1	AW20P-340AS	AW30P-340AS	AW40P-340AS	
5	**Filter element**	Non-woven fabric	1	AF20P-060S	AF30P-060S	AF40P-060S	
6	**Diaphragm assembly**	Weather resistant NBR	1	AR20P-150AS	AR30P-150AS	AR40P-150AS	
7	**Bowl O-ring**	NBR	1	C2SFP-260S	C3SFP-260S	C4SFP-260S	
8	**Bowl assembly** Note 1)	PC	1	C2SF	C3SF Note 2)	C4SF Note 2)	
9	**Pressure gauge** Note 3)	—	1	GB2-10AS	GB3-10AS	GB4-10AS	
10	**Pressure gauge cover**	PC	1	ARG20P-400S	ARG30P-400S	ARG40P-400S	
11	**Clip**	Stainless steel	1	ARG20P-420S	ARG30P-420S	ARG40P-420S	

Note 1) Including a bowl O-ring. Contact SMC regarding the bowl assembly supply for psi and °F unit specifications.
Note 2) The bowl assembly for AWG30/40 comes with a bowl guard (steel band material).
Note 3) Only the standard part numbers are listed in the pressure gauges. For the semi-standard part numbers, refer to the optional part numbers.

Options/Part Nos.

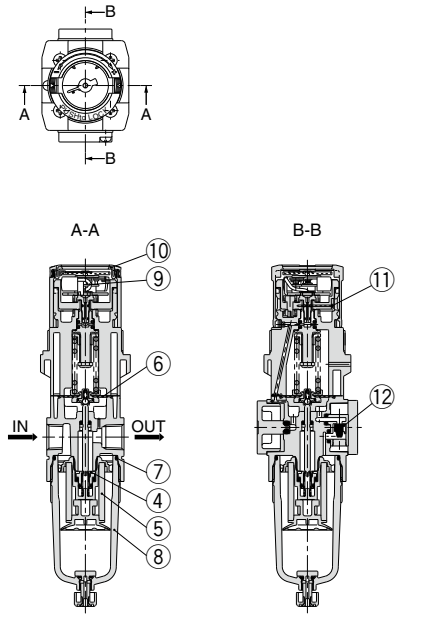
Option / Applicable model				**AWG20**	**AWG30**	**AWG40**
Bracket assembly Note 1)				ARG20P-270AS	ARG30P-270AS	ARG40P-270AS
Set nut				ARG20P-260S	ARG30P-260S	ARG40P-260S
Pressure gauge	**Pressure gauge display range**	**Standard**	**0 to 1.0 MPa**	GB2-10AS	GB3-10AS	GB4-10AS
		Optional	**0 to 0.3 MPa**	GB2-3AS	GB3-3AS	GB4-3AS
			0 to 150 psi	GB2-P10AS	GB3-P10AS	GB4-P10AS
			0 to 45 psi	GB2-P3AS	GB3-P3AS	GB4-P3AS
Float type auto drain Note 2)			**N.O.**	—	AD38	AD48
			N.C.	AD27	AD37	AD47

Note 1) The assembly of a bracket and set nuts
Note 2) Min. operating pressure: N.O. type–0.1 MPa; N.C. type–0.1 MPa (AD27) and 0.15 MPa (AD37/47). Contact SMC regarding the specifications for psi unit and °F.

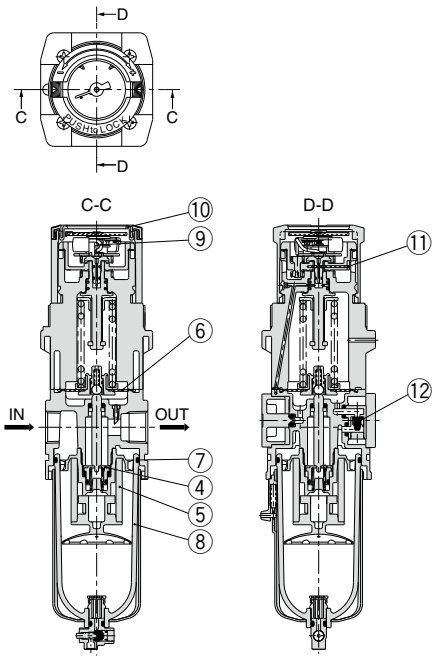
AWG20K/30K/40K

Construction

AWG20K



AWG30K/40K



∗ The numbers correspond with those in the “Construction” of the AWG series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description	Material	Qty.	Model			Note
				AWG20K	AWG30K	AWG40K	
4	**Valve assembly**	Brass, HNBR	1	AW20P-340AS	AW30P-340AS	AW40P-340AS	
5	**Filter element**	Non-woven fabric	1	AF20P-060S	AF30P-060S	AF40P-060S	
6	**Diaphragm assembly**	Weather resistant NBR	1	AR20P-150AS	AR30P-150AS	AR40P-150AS	
7	**Bowl O-ring**	NBR	1	C2SFP-260S	C3SFP-260S	C4SFP-260S	
8	**Bowl assembly** Note 1)	PC	1	C2SF	C3SF Note2)	C4SF Note2)	
9	**Pressure gauge** Note 3)	—	1	GB2-10AS	GB3-10AS	GB4-10AS	
10	**Pressure gauge cover**	PC	1	ARG20P-400S	ARG30P-400S	ARG40P-400S	
11	**Clip**	Stainless steel	1	ARG20P-420S	ARG30P-420S	ARG40P-420S	
12	**Check valve assembly**	—	1	AR20KP-020AS			

Note 1) Including a bowl O-ring. Contact SMC regarding the bowl assembly supply for psi and °F unit specifications.
Note 2) The bowl assembly (AWG30K/40K) comes with a bowl guard (steel band material).
Note 3) Only the standard part numbers are listed for the pressure gauges. For the semi-standard part numbers, refer to the optional part numbers.

Options/Part Nos.

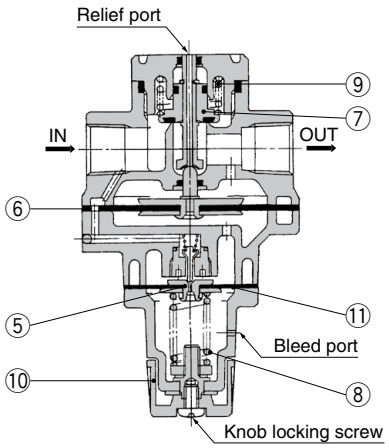
Option \ Applicable model				AWG20K	AWG30K	AWG40K
Bracket assembly Note 1)				ARG20P-270AS	ARG30P-270AS	ARG40P-270AS
Set nut				ARG20P-260S	ARG30P-260S	ARG40P-260S
Pressure gauge	**Pressure gauge display range**	**Standard**	**0 to 1.0 MPa**	GB2-10AS	GB3-10AS	GB4-10AS
		Optional	**0 to 0.3 MPa**	GB2-3AS	GB3-3AS	GB4-3AS
			0 to 150 psi	GB2-P10AS	GB3-P10AS	GB4-P10AS
			0 to 45 psi	GB2-P3AS	GB3-P3AS	GB4-P3AS
Float type auto drain Note 2)			**N.O.**	—	AD38	AD48
			N.C.	AD27	AD37	AD47

Note 1) The assembly of a bracket and set nuts
Note 2) Min. operating pressure: N.O. type–0.1 MPa; N.C. type–0.1 MPa (AD27) and 0.15 MPa (AD37/47). Contact SMC regarding the specifications for psi unit and °F.

AR425 to 935

The Replacement Procedure is on p. 703

Construction



∗ The numbers correspond with those in the "Construction" of the AR series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description	Material	Qty.	Model				Note
				AR425/435	**AR625/635**	**AR825/835**	**AR925/935**	
5, 11	**Exhaust valve assembly** Note 1)	—	1	132586A	132586A	132586A	132586A	
6	**Main valve side diaphragm assembly**	—	1	132581A	132659A	13275A	13285A	
7	**Valve assembly**	—	1	132572A	132653A	132752A	132829A	
8	**Adjusting spring**	Steel wire	1	135053(AR425) 135025(AR435)	135053(AR625) 135025(AR635)	135053(AR825) 135025(AR835)	135053(AR925) 135025(AR935)	
9	**Valve spring**	Stainless steel	1	135211	132656	132713	13289	
10	**Knob**	ABS	1	13414				

Note 1) Including a diaphragm

Options/Part Nos.

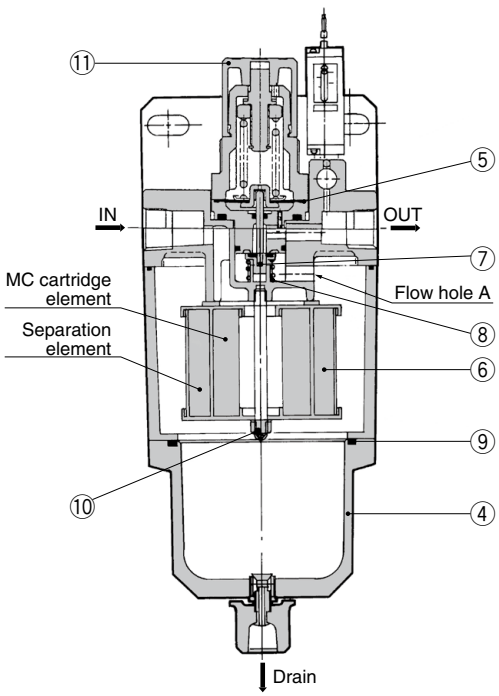
Description \ Model	Options/part nos.			
	AR4□5	**AR6□5**	**AR8□5**	**AR9□5**
Bracket	B24P	B25P	—	—
Pressure gauge with limit indicator Note 1)	G46-10-□02 (Max. 1.0 MPa), G46-2-□02 (Max. 0.2 MPa)			

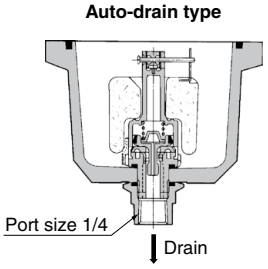
Note 1) • In the gauge part no. (e.g. G46-10-□02), □indicate kind of the connecting thread. Put nothing for Rc and "N" for NPT thread.
• Please consult with SMC for NPT pressure gauge.
Note 2) Use caution not to tighten excessively when mounting a pressure gauge, otherwise it may result in a breakdown. Use a pipe tape for sealing. Recommended torque: 12 to 14 N·m.

AMR3000 to 6000

The Replacement Procedure is on p. 707

Construction





∗ The numbers correspond with those in the "Construction" of the AMR series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description	Material	Qty.	Model				Note
				AMR3000	AMR4000	AMR5000	AMR6000	
4	Bowl assembly	Aluminum die-casted	1	13573A	13553A	13583A	13563A	
5	Diaphragm assembly	Weather resistant NBR	1	1349161A	131515A	131515A	131614A	
6	Element Note)	—	1	13579	135511	13589	13569	
7	Valve assembly	Brass, HNBR	1	135711A	13154A	135811A	135614-1A	
8	Valve spring	Stainless steel	1	135011	131514	131613	135413	
9	O-ring	NBR	1	KA00064	KA00466	KA00452	KA00455	
10	Gasket	Fiber	1	135714	635327	635327	63555	
11	Knob	POM	1	1349167	131534	131534	131634	

Note) The MC cartridge element and the separation element are integrated.

Accessory (Standard)/Part Nos.

Description \ Model		AMR3000	AMR4000	AMR5000	AMR6000
Bracket		13576	13556	13587	13568
Pressure gauge Note 5, 6)	1.0 MPa	G36-10-□01		G46-10-□02	

Accessories (Option)/Part Nos.

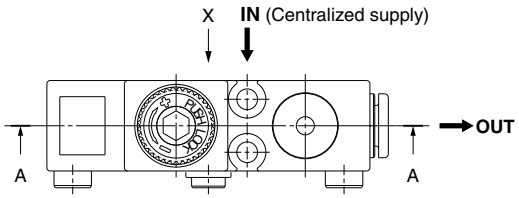
Description \ Model	AMR3000	AMR4000	AMR5000	AMR6000
Adapter assembly Note 7)	1/4: E3-02□ 3/8: E3-03□	1/4: E4-02□ 3/8: E4-03□ 1/2: E4-04□	1/2: E5-04□ 3/4: E5-06□	3/4: E6-06□ 1 : E6-10□
Float type auto drain (AMR□100) Note 8)	AD33-X203	AD33-X202	AD33-X210	AD33-X201
Compact pressure switch	IS10-01 (0.4 MPa setting)			
Elbow (R x Rc) Note 9)	135510		135613	

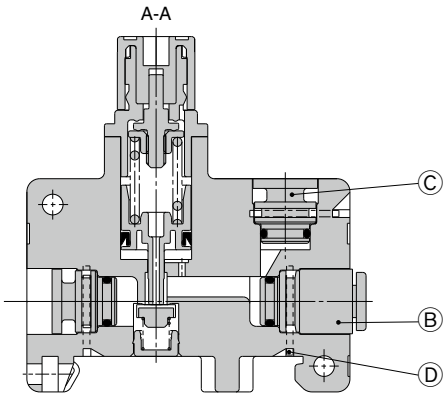
Note 5) • □ in the gauge part number (e.g. G36-10-□01) indicates thread. Specify no symbol for "Rc", and "N" for "NPT."
• Please consult with SMC if "NPT" gauge is required.
Note 6) Use caution not to tighten excessively when mounting a pressure gauge, otherwise it may result in a breakdown. Use a pipe tape for sealing. Recommended tightening torque for pressure regulator: R 1/8 = 7 to 9 N·m, R 1/4 = 12 to 14 N·m
Note 7) Piping adapter, O-ring, Hexagon socket bolt, Hexagon socket bolt assembly. These are shipped together with products. "□" in the gauge part number indicates thread type. Specify no symbol for "RC", "N" for "NPT", and "G" for "F."
Note 8) Min. operating pressure = 0.1 MPa
Note 9) If a compact pressure switch is mounted later on, an elbow (R x Rc) is necessary.

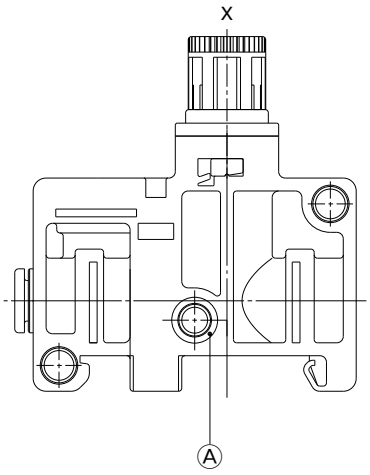
ARM5A Series

The Replacement Procedure is on p. 708

Construction







Replacement Parts

No.	Description	Material	Qty.	Part no.
A	**O-ring**	NBR	1	136019
B	**Fitting assembly**	—	1	See below
C	**Port plug**	PBT, HNBR	1	See below
D	**Clip**	Stainless steel	3	136010

∗ The numbers correspond with those in the “Construction” of the ARM5A series in the **Web Catalog**.

One-touch Fittings for Centralized Supply Block

VVQ1000−51A−□C6

One-touch fittings for centralized supply block

Fitting type

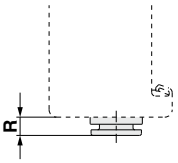
Nil	Straight
L1	Elbow

Fitting size

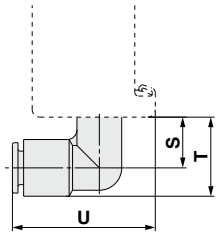
Symbol	Size
C6	ø6
C8	ø8
N7	ø1/4
N9	ø5/16



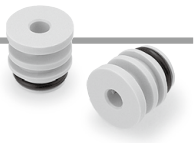
Straight type



Elbow type

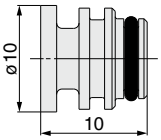


Port Plug



VVQ0000−58A

Single unit regulator/ Port plug for regulator block



Note) The O-ring is attached.
Refer to page 708 for details of the replacement.

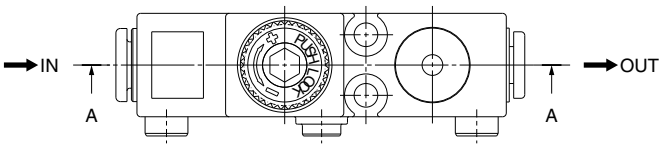
Fitting size	One-touch fittings for centralized supply block			
	Straight	Elbow	Elbow	Elbow
	R	**S**	**T**	**U**
ø4, ø5/32	—	—	—	—
ø6	3	12.5	19	35.5
ø1/4	3	12.5	19	35.5
ø8, ø5/16	5	13.5	21	38.5

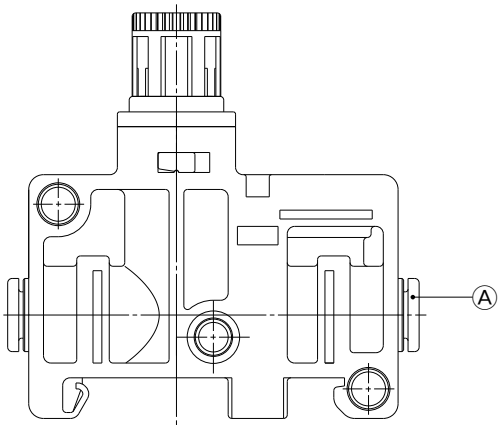
Note) The O-ring is attached.
Refer to page 709 for details of the replacement.

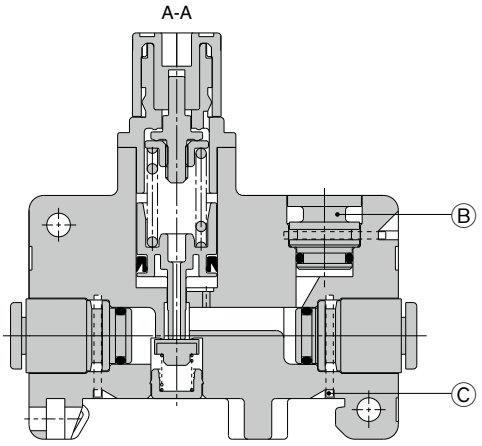
ARM5B Series

The Replacement Procedure is on p. 708

Construction







Replacement Parts

No.	Description	Material	Qty.	Part no.
A	**Fitting assembly**	—	2	See below
B	**Port plug**	PBT, HNBR	1	See below
C	**Clip**	Stainless steel	3	136010

∗ The numbers correspond with those in the “Construction” of the ARM5B series in the **Web Catalog**.

One-touch Fittings for Regulator Block

VVQ1000−50A − **□** **C4**

One-touch fittings for regulator block

Fitting type

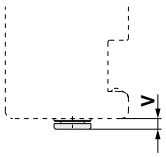
Nil	Straight
L1	Elbow

Fitting size

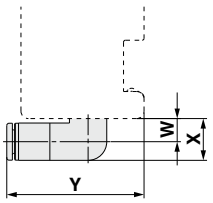
Symbol	Size
C4	ø4
C6	ø6
N3	ø5/32
N7	ø1/4



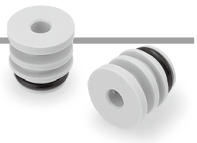
Straight type



Elbow type

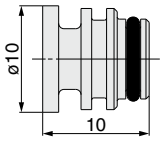


Port Plug



VVQ0000−58A

Single unit regulator/ Port plug for regulator block



Note) The O-ring is attached.
Refer to page 708 for details of the replacement.

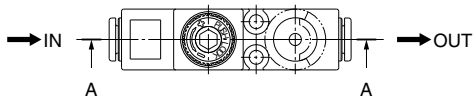
Fitting size	One-touch fittings for regulator block			
	Straight	Elbow	Elbow	Elbow
	V	**W**	**X**	**Y**
ø4, ø5/32	2.5	6	11	35.5
ø6	3	6.5	11	36
ø1/4	6.5	6	11.5	38.5
ø8, ø5/16	—	—	—	—

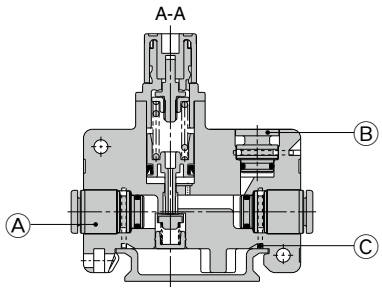
Note) The O-ring is attached.
Refer to page 709 for details of the replacement.

ARM5S Series

The Replacement Procedure is on p. 708

Construction





∗ The numbers correspond with those in the "Construction" of the ARM5S series in the **Web Catalog**.

Replacement Parts

No.	Description	Material	Qty.	Part no.
A	**Fitting assembly**	—	2	See below
B	**Port plug**	PBT, HNBR	1	See below
C	**Clip**	Stainless steel	3	136010

One-touch Fittings for Regulator

VVQ1000 − 50A − □ C4

One-touch fittings for regulator

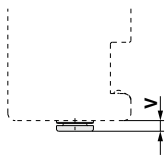
Fitting type

Nil	Straight
L1	Elbow

Fitting size

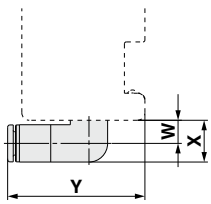
C4	ø4
C6	ø6
N3	ø5/32
N7	ø1/4

Straight type



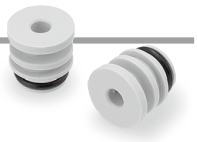


Elbow type



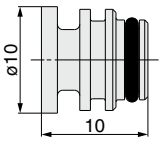


Port Plug



VVQ0000−58A

Single unit regulator/ Port plug for regulator block



Note) The O-ring is attached.
Refer to page 708 for details of the replacement.

Fitting size	One-touch fittings for regulator			
	Straight	Elbow	Elbow	Elbow
	V	**W**	**X**	**Y**
ø4, ø5/32	2.5	6	11	35.5
ø6	3	6.5	11	36
ø1/4	6.5	6	11.5	38.5
ø8, ø5/16	—	—	—	—

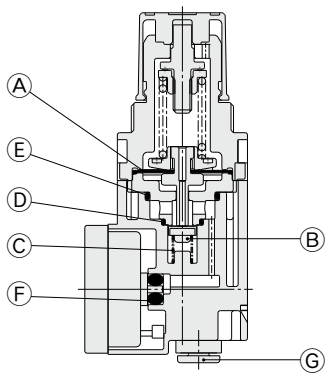
Note) The O-ring is attached.
Refer to page 709 for details of the replacement.

ARM10 Series

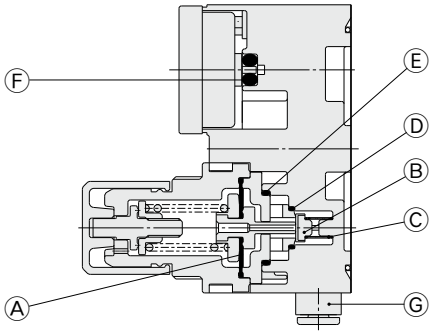
The Replacement Procedure is on p. 712

Construction

ARM10



ARM10F



Replacement Parts

No.	Description	Material	Part no.	Note
A	Diaphragm assembly	Weather resistant	136126A	Relieving type
		NBR, POM	136126-1A	Non-relieving type
B	Valve	HNBR, Aluminum alloy	136127-30#1	
C	Valve spring	Stainless steel	136131	
D	O-ring	NBR	136146	Standard model
		HNBR	136146-30	Oil-free specification
E	O-ring	NBR	136147	Standard model
		HNBR	136147-30	Oil-free specification
F	O-ring	NBR	136148	Standard model
		HNBR	136148-30	Oil-free specification
		NBR	KA01731	Standard model for digital pressure switch
		HNBR	KA01613	Oil-free spec. for digital pressure switch
G	Fitting assembly	—	The right reference	

∗ The numbers correspond with those in the “Construction” of the ARM10 series in the **Web Catalog**.

One-touch Fittings for Regulator

VVQ1000-50A – [ ] **C4** – [ ]

One-touch fittings for regulator

Fitting type

Symbol	Type
Nil	Straight
L1	Elbow

Fitting size

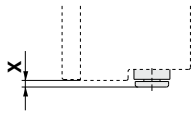
Symbol	Size
C4	ø4
C6	ø6
N3	ø5/32
N7	ø1/4

Option

Symbol	Description
Nil	None
X17	Oil-free

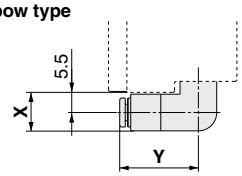
ARM10

Straight type



Fitting size	X
ø4, ø5/32	2
ø6	2
ø1/4	6

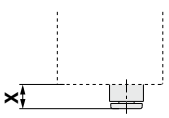
Elbow type



Fitting size	X	Y
ø4, ø5/32	10.5	21.5
ø6	10.5	22
ø1/4	10.5	24.5

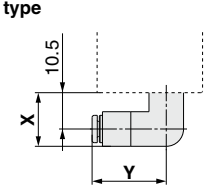
ARM10F

Straight type



Fitting size	X
ø4, ø5/32	7
ø6	7
ø1/4	11

Elbow type

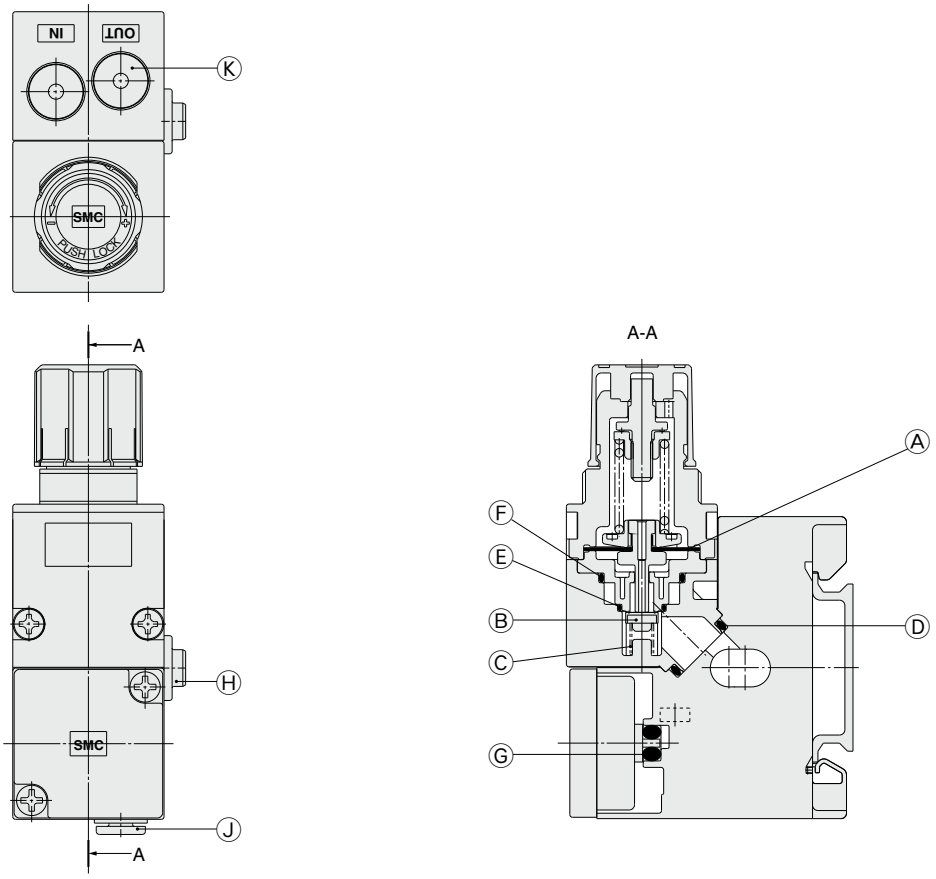


Fitting size	X	Y
ø4, ø5/32	15.5	21.5
ø6	15.5	22
ø1/4	15.5	24.5

ARM11A Series

The Replacement Procedure is on p. 712

Construction



∗ The numbers correspond with those in the “Construction” of the ARM11A series in the **Web Catalog**.

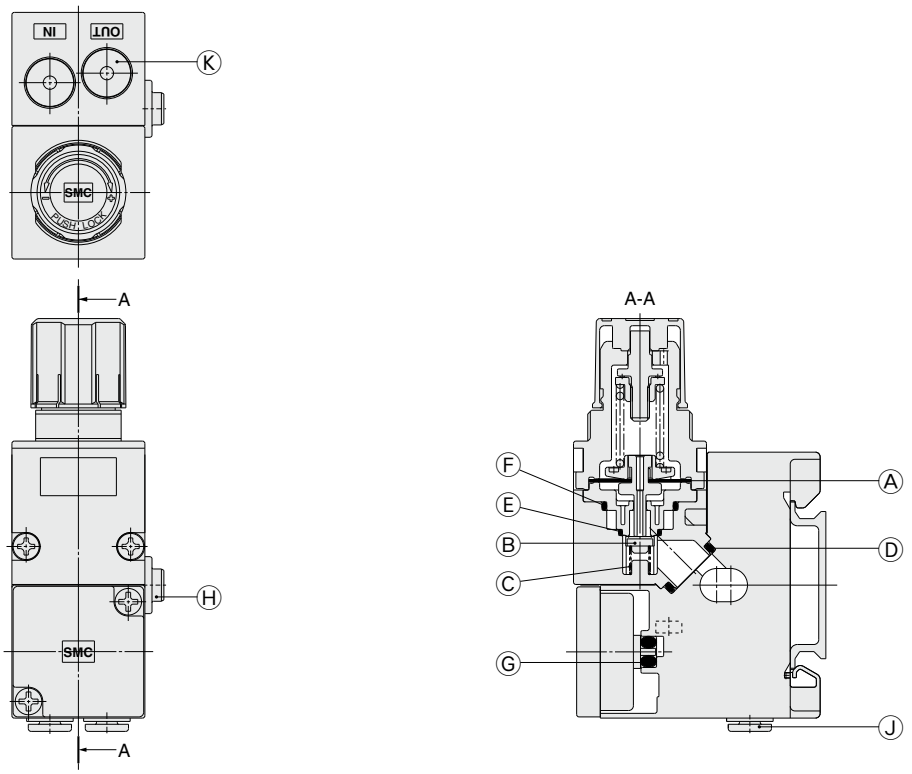
Replacement Parts

No.	Description	Material	Part no.	Note
A	**Diaphragm assembly**	Weather resistant NBR, POM	136126A	Relieving type
			136126-1A	Non-relieving type
B	**Valve**	HNBR, Aluminum alloy	136127-30#1	
C	**Valve spring**	Stainless steel	136131	
D	**Gasket**	HNBR	136137-30	
E	**O-ring**	NBR	136146	Standard model
		HNBR	136146-30	Oil-free specification
F	**O-ring**	NBR	136147	Standard model
		HNBR	136147-30	Oil-free specification
G	**O-ring**	NBR	136148	Standard model
		HNBR	136148-30	Oil-free specification
		NBR	KA01731	Standard model for digital pressure switch
		HNBR	KA01613	Oil-free spec. for digital pressure switch
H	**O-ring**	NBR	136149	Standard model
		HNBR	136149-30	Oil-free specification
J	**Fitting assembly**	—	Refer to page 331.	
K	**Port plug**	PBT/HNBR	Refer to page 331.	

ARM11B Series

The Replacement Procedure is on p. 712

Construction



∗ The numbers correspond with those in the “Construction” of the ARM11B series in the **Web Catalog**.

Replacement Parts

No.	Description	Material	Part no.	Note
A	**Diaphragm assembly**	Weather resistant NBR, POM	136126A	Relieving type
			136126-1A	Non-relieving type
B	**Valve**	HNBR, Aluminum alloy	136127-30#1	
C	**Valve spring**	Stainless steel	136131	
D	**Gasket**	HNBR	136137-30	
E	**O-ring**	NBR	136146	Standard model
		HNBR	136146-30	Oil-free specification
F	**O-ring**	NBR	136147	Standard model
		HNBR	136147-30	Oil-free specification
G	**O-ring**	NBR	136148	Standard model
		HNBR	136148-30	Oil-free specification
		NBR	KA01731	Standard model for digital pressure switch
		HNBR	KA01613	Oil-free spec. for digital pressure switch
H	**O-ring**	NBR	136149	Standard model
		HNBR	136149-30	Oil-free specification
J	**Fitting assembly**	—	Refer to page 331.	
K	**Port plug**	PBT/HNBR	Refer to page 331.	

Options

The Replacement Procedure is on p. 712

One-touch Fittings for Regulator Block

VVQ1000−50A-□C4-□

One-touch fittings for regulator block

Fitting type

Symbol	Type
Nil	Straight
L1	Elbow

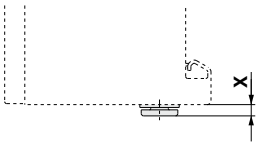
Fitting size

Symbol	Size
C4	ø4
C6	ø6
N3	ø5/32
N7	ø1/4

Semi-standard

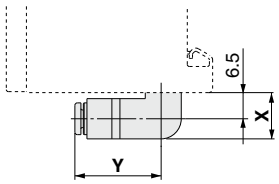
Symbol	Description
Nil	None
X17	Oil-free

Straight type



Fitting size	X
ø4, ø5/32	3
ø6	3
ø1/4	7

Elbow type



Fitting size	X	Y
ø4, ø5/32	11.5	19
ø6	11.5	19.5
ø1/4	11.5	22

One-touch Fittings for Common Supply Block

VVQ2000−51A-□C6-□

One-touch fittings for regulator

Fitting type

Symbol	Type
Nil	Straight
L1	Elbow

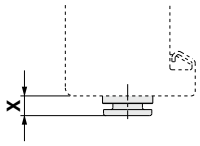
Fitting size

Symbol	Size
C6	ø6
C8	ø8
C10	ø10
N7	ø1/4
N9	ø5/16
N11	ø3/8

Semi-standard

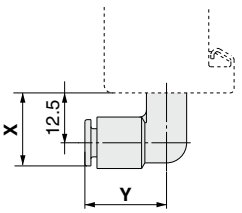
Symbol	Description
Nil	None
X17	Oil-free

Straight type



Fitting size	X
ø6	5
ø8, ø5/16	5
ø10, ø3/8	5.5
ø1/4	5

Elbow type



Fitting size	X	Y
ø6	19	20
ø8, ø5/16	20	23
ø10, ø3/8	22	26
ø1/4	19	20.5

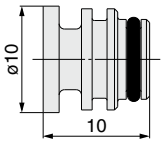
Port Plug

VVQ0000−58A-□

Single unit regulator/ Port plug for regulator block

Semi-standard

Symbol	Description
Nil	None
X17	Oil-free



Air Preparation Equipment
Industrial Filters



Air Preparation Equipment

1 Indication of Replacement of Elements, Inspection Items ····· p. 333

2 Troubleshooting ····· p. 334

3 Construction/Replacement Parts

		Replacement Parts	Replacement Procedure
AFJ	Vacuum Filter	p. 335	—
AMJ	Drain Separator for Vacuum	p. 336	p. 336
AMG	Water Separator	p. 337	p. 337
AFF-D/AM-D/AMD-D	Compressed Air Preparation Filter	p. 338	p. 719
AMK-D	Activated Carbon Filter	p. 340	p. 730
AFF□D/AM□D/AMD□D	Compressed Air Preparation Filter	p. 342	p. 741
AFF	Main Line Filter	p. 343	p. 343
AM	Mist Separator	p. 344	p. 344
AMD	Micro Mist Separator	p. 345	p. 345
AMH	Micro Mist Separator with Pre-filter	p. 346	p. 346
AME	Super Mist Separator	p. 347	p. 347
AMF	Odor Removal Filter	p. 348	p. 348

Industrial Filters

1 Indication of Replacement of Elements, Inspection Items ····· p. 350

2 How to Select Element Order Number for Replacement

	How to Select Element Order Number for Replacement	p. 351
	Elements: Sintered Metal/Fiber	p. 353
	Standard Elements: Paper/Micromesh	p. 354

3 Replacement Parts and Seal List

		Replacement Parts	Replacement Procedure
FGD	Industrial Filter: Vessel Series	p. 355	p. 743
FGE	Industrial Filter: Vessel Series	p. 357	p. 744, 746
FGG	Industrial Filter: Vessel Series	p. 359	p. 749
FGA	Industrial Filter: Vessel Series	p. 361	p. 751
FGB (Discontinued products)	Industrial Filter: Vessel Series	p. 362	p. 755
FGC	Industrial Filter: Vessel Series	p. 363	p. 759
FGF	Bag Filter	p. 364	p. 761
FGH	High Precision Filter for Liquids	p. 366	p. 763
FQ1	Quick Change Filter	p. 368	p. 765
FN1	Low Maintenance Filter	p. 370	p. 766
FN4	Low Maintenance Filter	p. 370	p. 766

1 Indication of Replacement of Elements, Inspection Items

The following describes the general contents of the element replacement and regular check.

Main line filter/mist separator/micro mist separator replacement standards and inspection items

■ Replacement standards

<Element replacement timing>

a. For AFF2C to 22C, 37B, 75B, AM□150C to 550C, 650, and 850

The pressure drop reaches 0.1 MPa or two years have elapsed after operation start, whichever comes earlier. [The pressure drop can be checked using the equipment with the element service indicator (-T) or differential pressure gauge (made to order specifications).]

b. For AFF75A to 220A, AMD8□□ to AMD10□□ (Free standing type)

The pressure drop reaches 0.1 MPa or one year has elapsed after operation start, whichever comes earlier. Check the pressure drop using the pressure gauge. (Equipment with pressure gauge: -G)

c. For AME

If red spots appear on the element surface before the standards (a) shown above are satisfied, replace the element.

d. For AMF

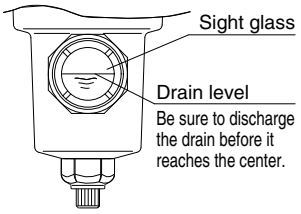
If oil odor is found at the outlet before the standards (a) or (b) shown above are satisfied, replace the element.

- When replacing the element, replace also the O-ring and gasket with new ones. For details about how to replace the O-ring and gasket, Refer to relevant pages that describe the replacement parts in detail.

■ Inspection items

① **If the element reaches the replacement timing, immediately replace the element with a new one. If the element is used continuously without replacement, the element may be damaged.**

② **Be sure to discharge the drain accumulated in the filter container.**
If the drain is not discharged, the accumulated drain flows to the outlet. When using the AFF2C to 22C, 37B, 75B, AM□150C to 550C, 650, or 850 with the drain cock, drain guide, or ball valve, discharge the drain before the drain level reaches the center of the sight glass. If the drain is not discharged, the drain flows to the outlet. Be sure to discharge the drain and check the discharge status while referring to the figure on the right.

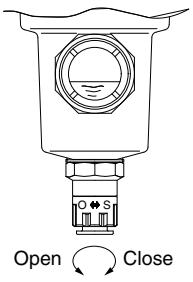


③ With auto drain

- This auto drain functions to discharge the drain when the drain level reaches the upper portion of the sight glass.
- For the AFF2C to 22C, 37B, AM□150C to 550C, and 650 with the auto drain, the drain is automatically discharged with the knob tightened to the “S” side during normal operation. Additionally, the drain can also be discharged manually.

<Manual operation procedure>

A manual knob is provided at the end of the auto drain. This knob is tightened to the “S” side during normal operation. When the knob is loosened to the “O” side, the drain can be discharged. (Note that the drain gushes from the drain port if the pressure remains inside the filter.)



■ Probable troubles (Reference)

Refer to the "Troubleshooting." (p. 334)

2 Troubleshooting

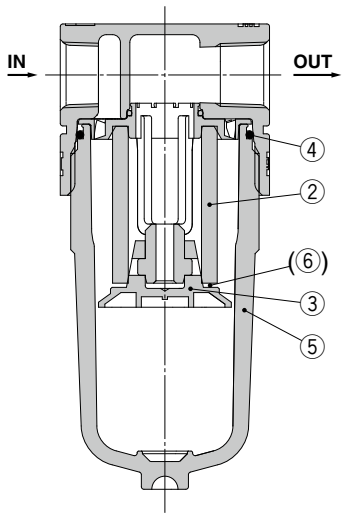
The following describes the general contents of the troubleshooting.

Trouble (Symptom)	Cause	Corrective action
The pressure drop is large.	The flow rate is excessive.	Use the equipment at a flow rate that is lower than the max. flow rate diagram stated on the catalog or review the filter size.
	The element is used continuously even after its service life has expired.	Replace the element.
Oily contents or solid foreign matter come to the secondary side.	The flow rate is excessive.	Use the equipment at a flow rate that is lower than the max. flow rate diagram stated on the catalog or review the filter size.
	The element is used continuously even after its service life has expired.	Replace the element.
	The drain discharge is faulty.	[Manual drain] Discharge the drain before it reaches the center of the sight glass. [Auto drain] Clean the inside or replace the auto drain.
	Oily content, such as grease flows out from the equipment installed on the secondary side of the filter.	Install the AM series at the end of the pipe.
	Ambient air is entangled. (When used for the air blow.)	Perform the air blow in a clean environment. The nozzle becomes negative pressure and the ambient air is entangled. This may cause oily content or solid foreign object to enter the blow air.
	The cleaning of the pipe on the secondary side is insufficient.	Clean the inside of the pipe on the secondary side.
The drain leaks outside.	The seat is faulty.	① Check the O-ring for foreign matter sticking ② Check the O-ring for kink, flaw, crack, or deterioration.
The drain leaks from the float type auto drain.	The seat is faulty (foreign matter is sticking).	Clean the inside or replace the auto drain.
	The operation is faulty.	Clean the inside or replace the auto drain.
	The supply pressure is insufficient.	Check the air supply capability. N.O. type 0.1 MPa N.C. type 0.15 MPa

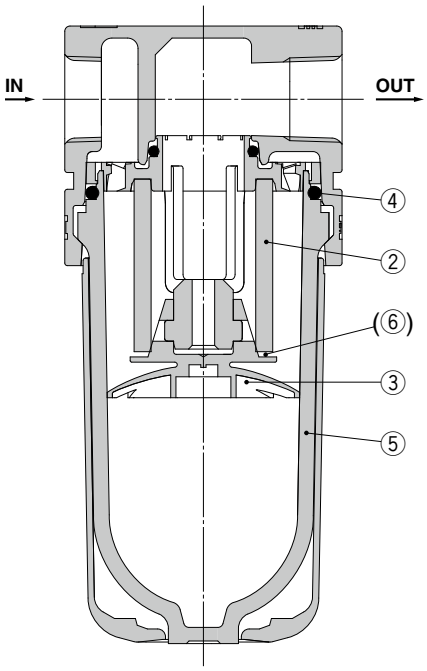
AFJ20 to AFJ40 Series

Construction

AFJ20



AFJ30, AFJ40



∗ The numbers correspond with those in the “Construction” of the AFJ series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description		Material	Model		
				AFJ20	**AFJ30**	**AFJ40**
2	**Filter element**	**5 μm**	Non-woven fabric	AF20P-060S	AF30P-060S	AF40P-060S
		40 μm	PA	AF22P-820S	AF32P-820S	AF42P-820S
		80 μm	PA	AF22P-830S	AF32P-830S	AF42P-830S
3	**Baffle**		PBT	AF22P-040S	AF32P-040S	AF42P-040S
4	**Bowl O-ring**		NBR	C2SFP-260S	C32FP-260S	C42FP-260S
5	**Bowl assembly** Note 1)		Polycarbonate	C2SJ	C3SJ	C4SJ
6	**Seal** Note 2)		NBR	AW22P-070S	AW32P-070S	AW42P-070S

Note 1) The bowl assembly includes the bowl O-ring.
The bowl assembly for the AFJ30 and AFJ40 models comes with a bowl guard (Material: Polycarbonate).
Note 2) The seal is for 40 μm and 80 μm elements.

Option/Part Nos.

Model	**AFJ20**	**AFJ30**	**AFJ40**
Bracket assembly Note)	AF22P-050AS	AF32P-050AS	AF42P-050AS

Note) The assembly of a bracket and 2 mounting screws

Bowl Assembly/Part Nos.

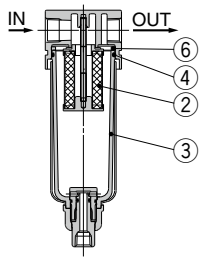
Bowl material	Model		
	AFJ20	**AFJ30**	**AFJ40**
Polycarbonate	C2SJ	C3SJ	C4SJ
Nylon	C2SJ-6	C3SJ-6	C4SJ-6

Note) The bowl assembly includes the bowl O-ring.

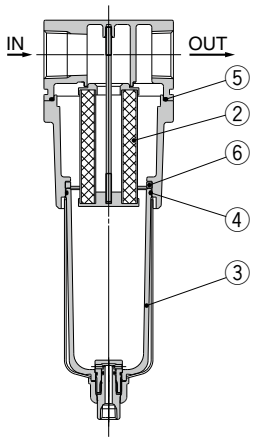
AMJ Series

Construction

AMJ3000, 4000



AMJ5000



∗ The numbers correspond with those in the “Construction” of the AMJ series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description	Material	Model			Note
			AMJ3000	**AMJ4000**	**AMJ5000**	
2	**Element assembly**	—	AMJ-EL3000	AMJ-EL4000	AMJ-EL5000	
3	**Bowl assembly** Note)	—	AMJ-CA30-□	AMJ-CA40-□	AMJ-CA40-□	
4	**O-ring**	NBR	C3SFP-260S	C4SFP-260S	C4SFP-260S	
5	**O-ring**	NBR	—	—	111710	
6	**Spacer**	NBR	AMJ-SA001	AMJ-SA002	AMJ-SA003	

Note) The spacer ⑥ is not included in the bowl assembly.

Maintenance

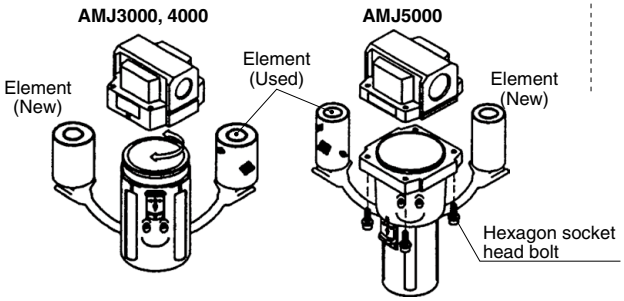
⚠Caution

1.Replace the element when one of followings occurs.

- Pressure drop reaches 0.02 MPa.
- Element operates for 2 years.

Element part number: AMJ-EL∗∗∗∗

∗ ∗∗∗∗ is AMJ size symbol. (ex: AMJ-EL3000)



2.How to replace the element assembly

First, discharge the pressure in the bowl. (Make pressure 0 MPa.)

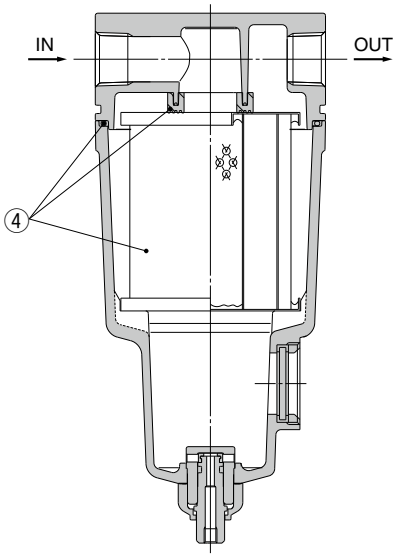
- Remove the bowl (housing).
- Replace the element.
- Assemble the bowl (housing).

∗ ( ) for AMJ5000

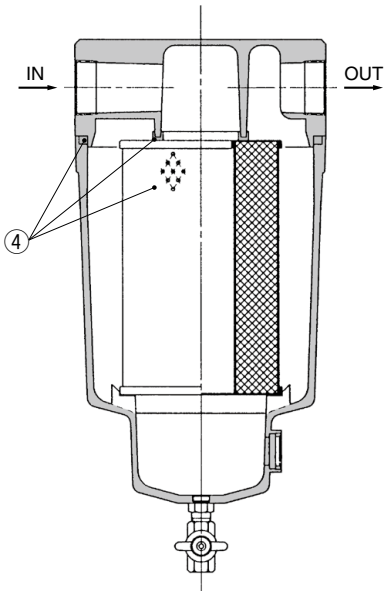
AMG Series

Construction

AMG150C to AMG550C, AMG650



AMG850



∗ The numbers correspond with those in the “Construction” of the AMG series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description∗1	Material	Applicable model∗2	Model						
				AMG150C	**AMG250C**	**AMG350C**	**AMG450C**	**AMG550C**	**AMG650**	**AMG850**
4	**Element assembly**	Resin, others	Except option F	AMG-EL150	AMG-EL250	AMG-EL350	AMG-EL450	AMG-EL550	AMG-EL650	AMG-EL850
			For option F	AMG-EL150-F	AMG-EL250-F	AMG-EL350-F	AMG-EL450-F	AMG-EL550-F	—	—

∗1) Element assembly: With gasket (1 pc.) and O-ring (1 pc.)
∗2) F option, the rubber material: In the case of fluororubber

Maintenance

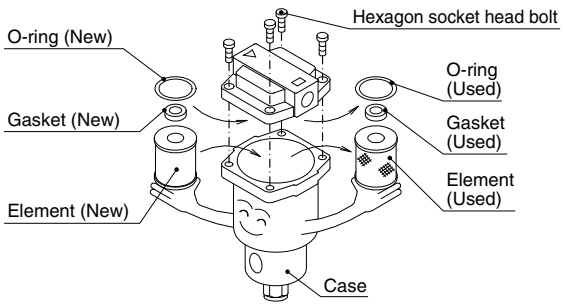
1.Element replacement

Extremely dirty air might cause clogging due to deteriorated oil or rust. Replacement is necessary regularly. (When a pressure drop reached 0.1 MPa or replace element with new one when the element has been used for 2 years.)
Element (gasket, O-ring accessory) part number: AMG-EL∗∗∗
∗ ∗∗∗ is AMG size symbol. (Ex: AMG-EL150)

2.How to replace the element assembly

First, discharge the pressure in the body. (Make pressure 0 MPa.)

- Remove the 4 hexagon socket head bolts.
- Replace the element, gasket, O-ring.
- Tighten the hexagon socket head bolts.



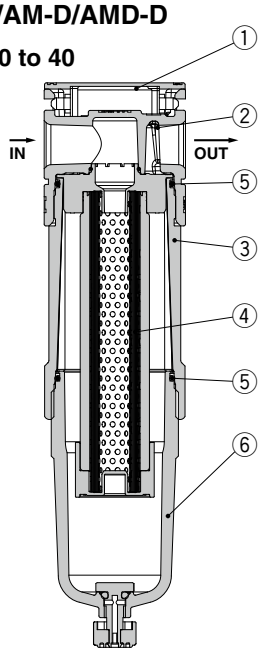
AFF-D/AM-D/AMD-D Series

The Replacement Procedure is on p. 719

Construction

AFF-D/AM-D/AMD-D

Sizes 20 to 40



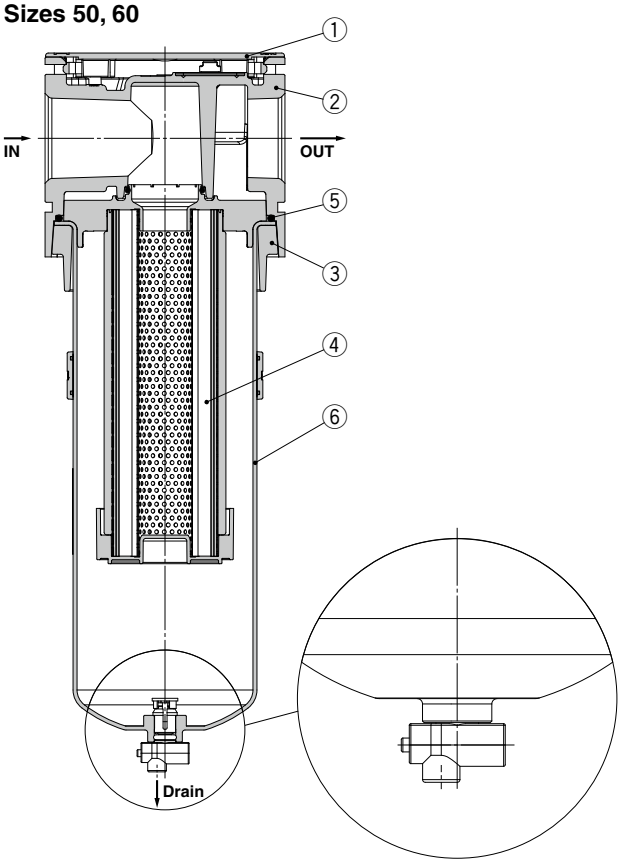
Component Parts

No.	Description	Material
1	Body cover	Resin
2	Body	Aluminum die-cast
3	Joint	Aluminum die-cast

Replacement Parts/Part Nos.

No.	Description		Size		
			20	30	40
4	Element	AFF	AFF24P-060AS	AFF34P-060AS	AFF44P-060AS
		AM	AM24P-060AS	AM34P-060AS	AM44P-060AS
		AMD	AMD24P-060AS	AMD34P-060AS	AMD44P-060AS
		AMK	AMK24P-060AS	AMK34P-060AS	AMK44P-060AS
5	Bowl seal		C2SFP-260S	C32FP-260S	C42FP-260S
6	Bowl assembly		Refer to the next page.		

Sizes 50, 60



Component Parts

No.	Description	Material
1	Body cover	Resin
2	Body	Aluminum die-cast
3	Flange	Aluminum die-cast

Replacement Parts/Part Nos.

No.	Description		Size	
			50	60
4	Element	AFF	AFF54P-060AS	AFF64P-060AS
		AM	AM54P-060AS	AM64P-060AS
		AMD	AMD54P-060AS	AMD64P-060AS
5	Bowl seal		AM54P-160S	
6	Bowl assembly		Refer to “Bowl Assembly/Part Nos.”	

AFF-D/AM-D/AMD-D Series

The Replacement Procedure is on p. 719

Construction

AFF-D/AM-D/AMD-D

Bowl Assembly/Part Nos.

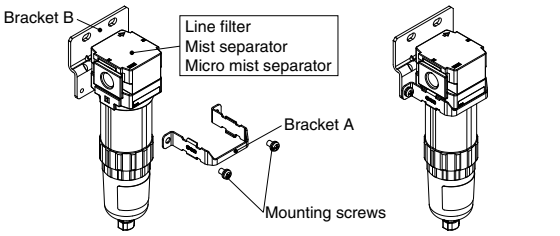
Bowl material	Drain discharge mechanism	Drain port	Other	Size				
				20	30	40	50	60
Polycarbonate, Stainless steel	Manual	With drain cock	—	C2SF-D	—	—	AM54P-120AS	AM64P-120AS
			With bowl guard	C2SF-C-D	C3SF-D	C4SF-D	—	—
		Drain cock with barb fitting	With bowl guard	—	C3SF-W-D	C4SF-W-D	AM54P-120AS-W	AM64P-120AS-W
		With drain guide (without valve function)	—	C2SF□-J-D	—	—	AM54P-□120AS-J	AM64P-□120AS-J
			With bowl guard	C2SF□-CJ-D	C3SF□-J-D	C4SF□-J-D	—	—
	Automatic (Auto drain)	Normally closed (N.C.)	—	AD27-D	—	—	AM54P-□120AS-C	AM64P-□120AS-C
			With bowl guard	AD27-C-D	AD37□-D	AD47□-D	—	—
		Normally open (N.O.)	—	—	—	—	AM54P-□120AS-D	AM64P-□120AS-D
			With bowl guard	—	AD38□-D	AD48□-D	—	—
Nylon	Manual	With drain cock	—	C2SF-6-A	—	—	—	—
			With bowl guard	C2SF-6C-A	C3SF-6-D	C4SF-6-D	—	—
		Drain cock with barb fitting	With bowl guard	—	C3SF-6W-D	C4SF-6W-D	—	—
		With drain guide (without valve function)	—	C2SF□-6J-A	—	—	—	—
			With bowl guard	C2SF□-6CJ-A	C3SF□-6J-D	C4SF□-6J-D	—	—
	Automatic (Auto drain)	Normally closed (N.C.)	—	AD27-6-A	—	—	—	—
			With bowl guard	AD27-6C-A	AD37□-6-D	AD47□-6-D	—	—
		Normally open (N.O.)	With bowl guard	—	AD38□-6-D	AD48□-6-D	—	—
Metal	Manual	With drain cock	—	C2SF-2-A	C3SF-2-A	C4SF-2-A	—	—
			With level gauge	—	C3LF-8-A	C4LF-8-A	—	—
		With drain guide (without valve function)	—	C2SF□-2J-A	C3SF□-2J-A	C4SF□-2J-A	—	—
			With level gauge	—	C3LF□-8J-A	C4LF□-8J-A	—	—
	Automatic (Auto drain)	Normally closed (N.C.)	—	AD27-2-A	AD37□-2-A	AD47□-2-A	—	—
			With level gauge	—	AD37□-8-A	AD47□-8-A	—	—
		Normally open (N.O.)	—	—	AD38□-2-A	AD48□-2-A	—	—
			With level gauge	—	AD38□-8-A	AD48□-8-A	—	—

∗ The bowl assembly for sizes 20 to 40 comes with a bowl seal. The bowl assembly for sizes 50 and 60 comes with a flange and a bowl seal.
∗ The □ in the bowl assembly part numbers is for indicating the pipe thread type (applicable tubing for the auto drain). No indication is necessary for an Rc thread; however, indicate "N" for an NPT thread, and "F" for a G thread. (For auto drain, Nil: ø10, N: ø3/8") Please contact SMC separately for psi and °F unit display specifications.

Options/Part Nos.

Description	Size			
	20	30	40	50, 60
Bracket assembly	AF24P-070AS	AF34P-070AS	AF44P-070AS	AF54P-070AS
Auto drain	Refer to "Bowl Assembly/Part Nos."			

∗ The assembly consists of an A and B bracket and 2 mounting screws.



Bracket mounting view

Maintenance

⚠Warning

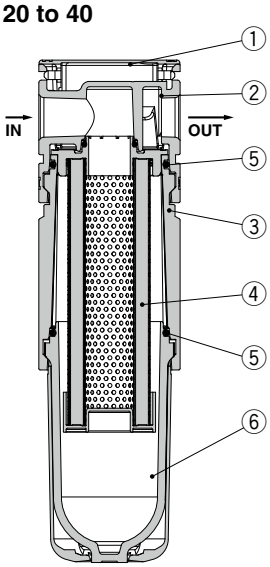
1. The recommended replacement timing for the element is within 2 years from the start of use or prior to a product pressure drop of 0.1 MPa, whichever comes first.
Failure to replace the element in a timely manner may result in element breakage.

AMK-D Series

The Replacement Procedure is on p. 730

Construction

Sizes 20 to 40



Component Parts

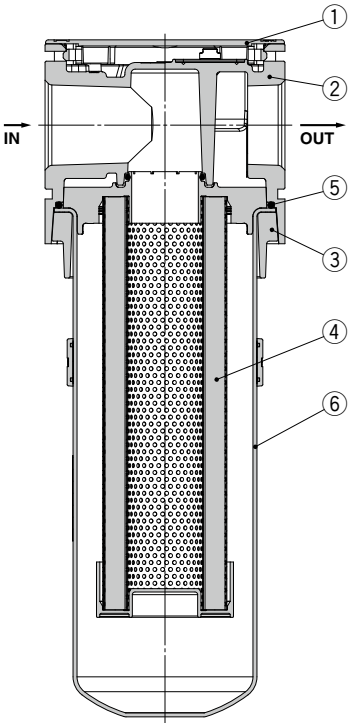
No.	Description	Material
1	**Body cover**	Resin
2	**Body**	Aluminum die-cast
3	**Joint**	Aluminum die-cast

Replacement Parts/Part Nos.

No.	Description	Model		
		AMK20	**AMK30**	**AMK40**
4	**Element**	AMK24P-060AS	AMK34P-060AS	AMK44P-060AS
5	**Bowl seal**	C2SFP-260S	C32FP-260S	C42FP-260S
6	**Bowl assembly**	Refer to the next page.		

∗ When it is time to replace the element, refer to the maintenance instructions in the specific product precautions (page 341).

Sizes 50, 60



Component Parts

No.	Description	Material
1	**Body cover**	Resin
2	**Body**	Aluminum die-cast
3	**Flange**	Aluminum die-cast

Replacement Parts/Part Nos.

No.	Description	Size	
		50	**60**
4	**Element**	AMK54P-060AS	AMK64P-060AS
5	**Bowl seal**	AM54P-160S	
6	**Bowl assembly**	Refer to “Bowl Assembly/Part Nos.”	

AMK-D Series

The Replacement Procedure is on p. 730

Construction

Bowl Assembly/Part Nos.

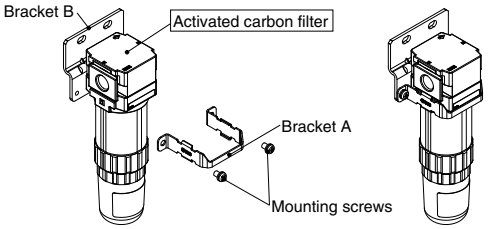
Bowl material	Other	Model				
		AMK20	**AMK30**	**AMK40**	**AMK50**	**AMK60**
Polycarbonate, Stainless steel	—	C2SF-D-X401	C3SK-D	C4SK-D	AMK54P-120AS	AMK64P-120AS
	With bowl guard	C2SK-C-D	—	—	—	—
Nylon	—	C2SF-6-A-X401	C3SK-6-D	C4SK-6-D	—	—
	With bowl guard	C2SK-6C-D	—	—	—	—
Metal	—	C2SF-2-A-X401	C3SF-2-A-X401	C4SF-2-A-X401	—	—

∗ The bowl assembly for sizes 20 to 40 comes with a bowl seal. The bowl assembly for sizes 50 and 60 comes with a flange and a bowl seal. Please contact SMC separately for psi and °F unit display specifications.

Option/Part Nos.

Description	Model			
	AMK20	**AMK30**	**AMK40**	**AMK50, 60**
Bracket assembly	AF24P-070AS	AF34P-070AS	AF44P-070AS	AF54P-070AS

∗ The assembly consists of an A and B bracket and 2 mounting screws.



Bracket mounting view

Maintenance

⚠Warning

1. AMK20 to 60-D

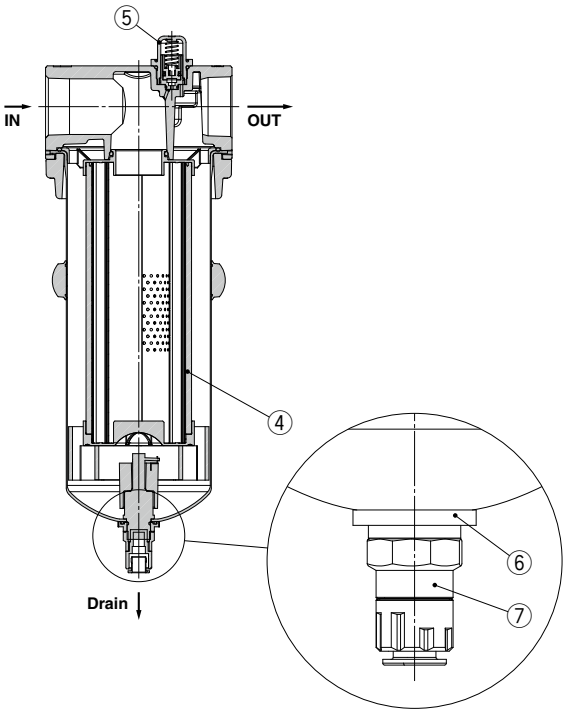
1 year from the start of use or before the service life reaches 2000 hours (The replacement timing of the element varies depending on the operating conditions. Even before the above replacement timing is reached, if an oil smell is emitted from the outlet, replace the element periodically thereafter.)

AFF□D/AM□D/AMD□D Series

The Replacement Procedure is on p. 741

Construction

AFF□D/AM□D/AMD□D



Replacement Parts/Part Nos.

No.	Description		Size		
			70D	80D	90D
4	Element	For AFF	AFF-EL70D	AFF-EL80D	AFF-EL90D
		For AM	AM-EL70D	AM-EL80D	AM-EL90D
		For AMD	AMD-EL70D	AMD-EL80D	AMD-EL90D
5	Element service indicator		AM-SA072		
6	Drain port spacer		AM-SA075		
7	Auto drain*1	For Rc, G thread	AD43PA-D		
		For NPT thread	NAD43PA-D		

*1 The -H and -J specifications cannot be replaced.

Maintenance

⚠Caution

1. Replace the element according to the replacement timing explained below. Failure to do so may result in element breakage.

<Element replacement>

Replacement is recommended after the element service indicator begins to display red but before the level of red reaches the top or within 2 years from the start of use, whichever comes first.

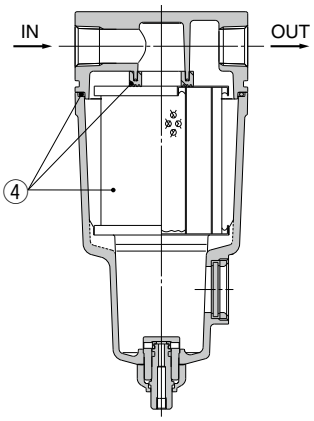
2. When replacing the element, also replace the O-ring with a new one. Refer to the operation manual for replacement procedures.

3. To replace the element, make sure that the residual pressure in the filter container is zero. Replacement with residual pressure in the container may cause injury or damage of the filter.

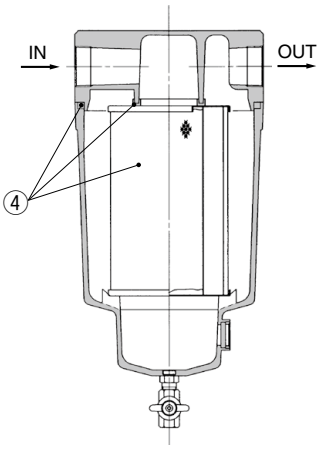
AFF Series

Construction

AFF2C to AFF22C, AFF37B



AFF75B



∗ The numbers correspond with those in the "Construction" of the AFF series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description∗1	Material	Applicable model∗2	Model						
				AFF2C	AFF4C	AFF8C	AFF11C	AFF22C	AFF37B	AFF75B
4	**Element assembly**	Cotton paper, others	Except option F	AFF-EL2B	AFF-EL4B	AFF-EL8B	AFF-EL11B	AFF-EL22B	AFF-EL37B	AFF-EL75B
			For option F	AFF-EL2B-F	AFF-EL4B-F	AFF-EL8B-F	AFF-EL11B-F	AFF-EL22B-F	—	—

∗1) Element assembly: With gasket (1 pc.) and O-ring (1 pc.)
∗2) F option, the rubber material: In the case of fluororubber

Maintenance

1.Replace the element when one of followings occurs.

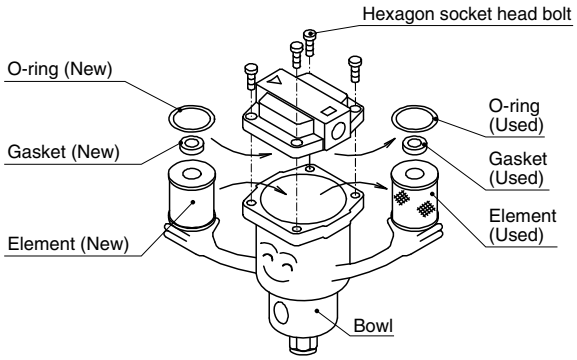
- Pressure drop reaches 0.1 MPa.
- Element operates for 2 years.
  Element assembly (gasket, O-ring accessory) part number: AFF-EL∗∗∗

∗ ∗∗∗ is AFF size symbol. (ex.: AFF-EL2B)

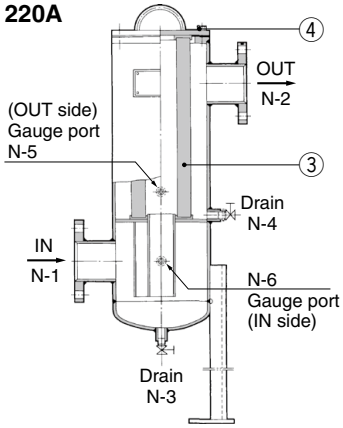
2.How to replace the element assembly

First, discharge the pressure in the body. (Make pressure 0 MPa.)

- Remove the 4 hexagon socket head bolts.
- Replace the element, gasket, O-ring.
- Tighten the hexagon socket head bolts.



AFF75A to 220A



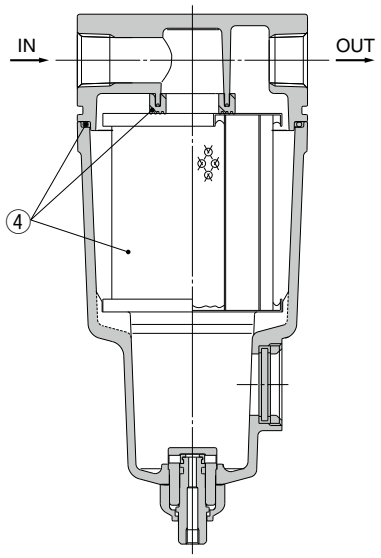
Replacement Parts/Part Nos.

No.	Description	Material	Qty.	Model			
				AFF75A	AFF125A	AFF150A	AFF220A
3	**Element**	—	1	EC700-003N		EC800-003N	EC900-003N
4	**Seal**	NBR	1	AL-33S		AL-34S	AL-35S

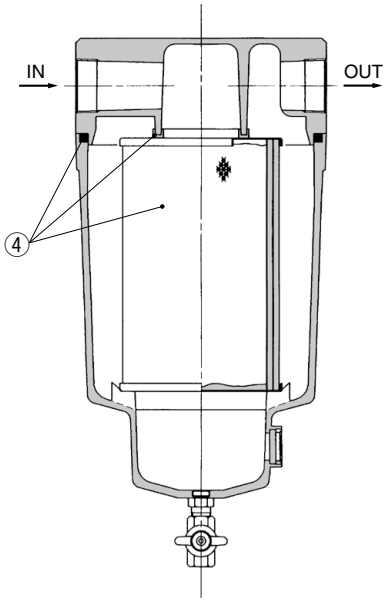
AM Series

Construction

AM150C to AM550C, AM650



AM850



∗ The numbers correspond with those in the "Construction" of the AM series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description∗1	Material	Applicable model∗2	Model						
				AM150C	**AM250C**	**AM350C**	**AM450C**	**AM550C**	**AM650**	**AM850**
4	**Element assembly**	Glass fiber, others	Except option F	AM-EL150	AM-EL250	AM-EL350	AM-EL450	AM-EL550	AM-EL650	AM-EL850
			For option F	AM-EL150-F	AM-EL250-F	AM-EL350-F	AM-EL450-F	AM-EL550-F	—	—

∗1) Element assembly: With gasket (1 pc.) and O-ring (1 pc.)
∗2) F option, the rubber material: In the case of fluororubber

Maintenance

1.Replace the element when one of followings occurs.

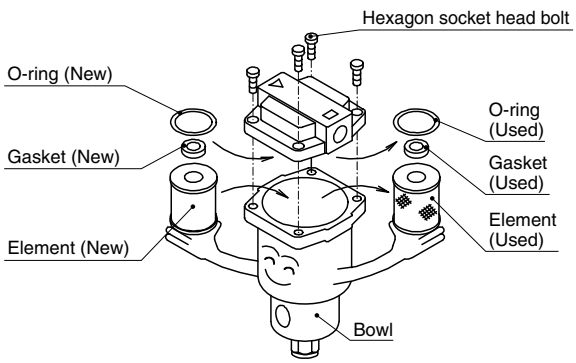
- Pressure drop reaches 0.1 MPa.
- Element operates for 2 years.
  Element assembly (gasket, O-ring accessory) part number: AM-EL∗∗∗

∗ ∗∗∗ is AM size symbol. (ex.: AM-EL150)

2.How to replace the element assembly

First, discharge the pressure in the body. (Make pressure 0 MPa.)

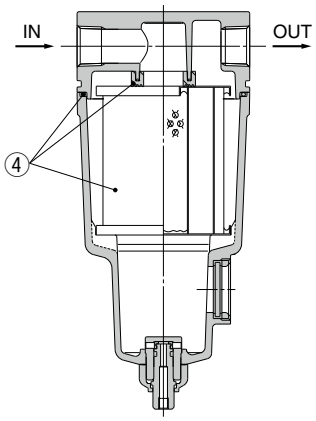
- Remove the 4 hexagon socket head bolts.
- Replace the element, gasket, O-ring.
- Tighten the hexagon socket head bolts.



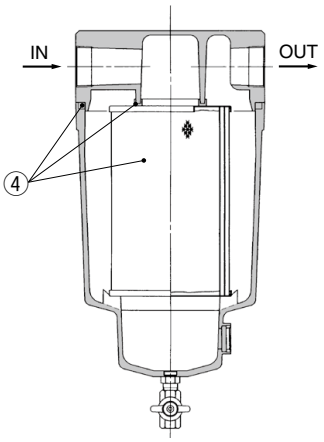
AMD Series

Construction

AMD150C to AMD550C, AMD650



AMD850



∗ The numbers correspond with those in the "Construction" of the AMD series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description∗1	Material	Applicable model∗2	Model						
				AMD150C	**AMD250C**	**AMD350C**	**AMD450C**	**AMD550C**	**AMD650**	**AMD850**
4	**Element assembly**	Glass fiber, others	Except option F	AMD-EL150	AMD-EL250	AMD-EL350	AMD-EL450	AMD-EL550	AMD-EL650	AMD-EL850
			For option F	AMD-EL150-F	AMD-EL250-F	AMD-EL350-F	AMD-EL450-F	AMD-EL550-F	—	—

∗1) Element assembly: With gasket (1 pc.) and O-ring (1 pc.)
∗2) F option, the rubber material: In the case of fluororubber

Maintenance

1.Replace the element when one of followings occurs.

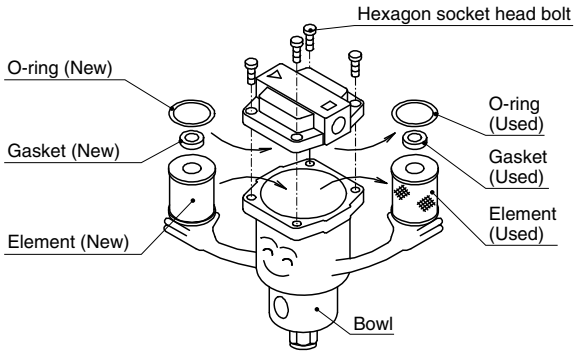
- Pressure drop reaches 0.1 MPa.
- Element operates for 2 years (1 year for free standing type). Element assembly (gasket, O-ring accessory) part number: AMD-EL∗∗∗

∗ ∗∗∗ is AMD size symbol. (ex.: AMD-EL150)

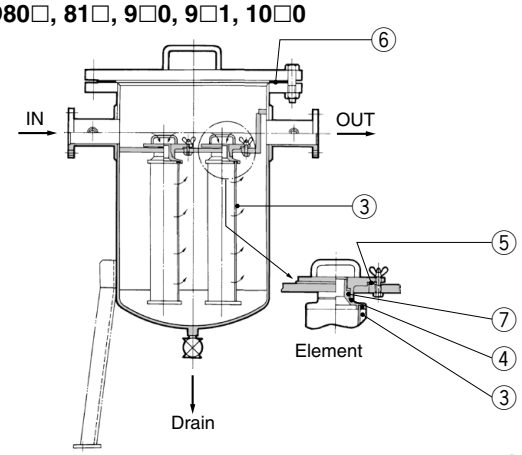
2.How to replace the element assembly

First, discharge the pressure in the body. (Make pressure 0 MPa.)

- Remove the 4 hexagon socket head bolts.
- Replace the element, gasket, O-ring.
- Tighten the hexagon socket head bolts.



AMD80□, 81□, 9□0, 9□1, 10□0



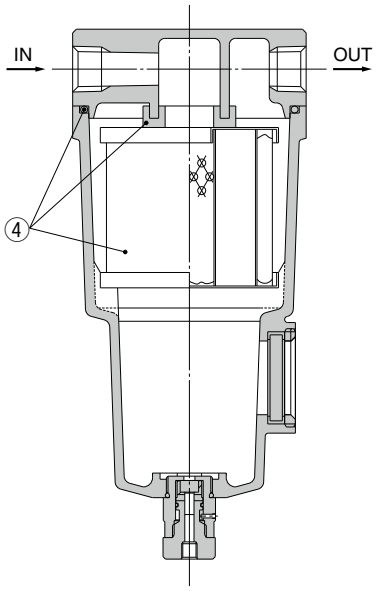
Replacement Parts

Model applicable filter	③ Element		④ Seal (Material: NBR)		⑤ Seal (Material: NBR)		⑥ Gasket (Material: V#6500)		⑦ O-ring (Material: NBR)	
	Part no.	Qty.	Part no.	Qty.	Part no.	Qty.	Part no.	Qty.	Part no. (Nominal)	Qty.
AMD800 AMD810	63174	1	63148	1	OD112XID90XT3	1	AL-61S	1	KA00061 (1A-G35)	1
AMD801 AMD811		1		1	—	—	AL-60S	1		1
AMD900 AMD910		3		3	OD112XID90XT3	3	AL-63S	1		3
AMD901 AMD9111		3		3	—	—	AL-62S	1		3
AMD1000 AMD1010		5		5	OD112XID90XT3	5	AL-31S	1		5

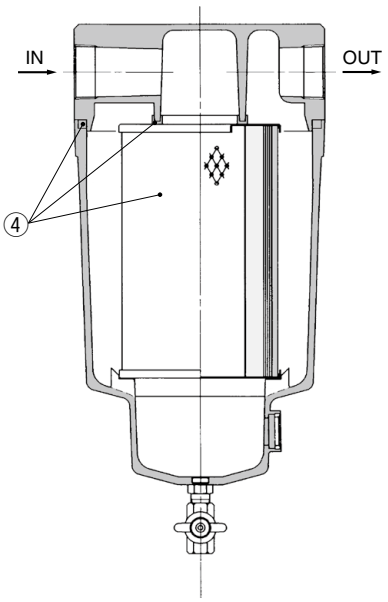
AMH Series

Construction

AMH150C to AMH550C, AMH650



AMH850



∗ The numbers correspond with those in the “Construction” of the AMH series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description∗1	Material	Applicable model∗2	Model						
				AMH150C	**AMH250C**	**AMH350C**	**AMH450C**	**AMH550C**	**AMH650**	**AMH850**
4	**Element assembly**	Glass fiber, others	Except option F	AMH-EL150	AMH-EL250	AMH-EL350	AMH-EL450	AMH-EL550	AMH-EL650	AMH-EL850
			For option F	AMH-EL150-F	AMH-EL250-F	AMH-EL350-F	AMH-EL450-F	AMH-EL550-F	—	—

∗1) Element assembly: With gasket (1 pc.) and O-ring (1 pc.)
∗2) F option, the rubber material: In the case of fluororubber

Maintenance

1.Replace the element when one of followings occurs.

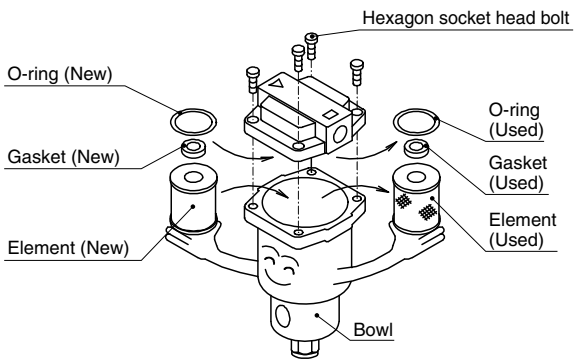
- Pressure drop reaches 0.1 MPa.
- Element operates for 2 years.
  Element assembly (gasket, O-ring accessory) part number: AMH-EL∗∗∗

∗ ∗∗∗ is AMH size symbol. (ex.: AMH-EL150)

2.How to replace the element assembly

First, discharge the pressure in the body. (Make pressure 0 MPa.)

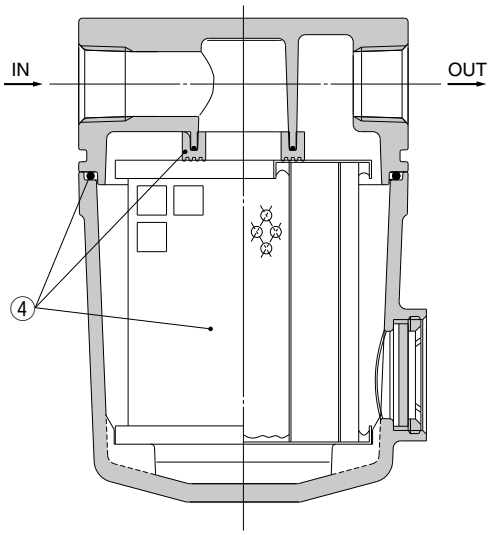
- Remove the 4 hexagon socket head bolts.
- Replace the element, gasket, O-ring.
- Tighten the hexagon socket head bolts.



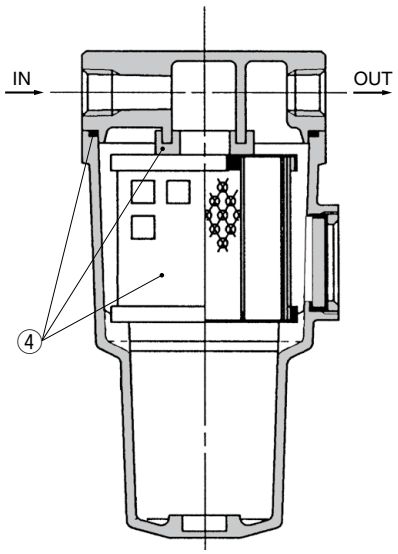
AME Series

Construction

AME150C to AME550C



AME650, AME850



∗ The numbers correspond with those in the “Construction” of the AME series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description∗1	Material	Applicable model∗2	Model						
				AME150C	**AME250C**	**AME350C**	**AME450C**	**AME550C**	**AME650**	**AME850**
4	**Element assembly**	Glass fiber, others	Except option F	AME-EL150	AME-EL250	AME-EL350	AME-EL450	AME-EL550	AME-EL650	AME-EL850
			For option F	AME-EL150-F	AME-EL250-F	AME-EL350-F	AME-EL450-F	AME-EL550-F	—	—

∗1) Element assembly: With gasket (1 pc.) and O-ring (1 pc.)
∗2) F option, the rubber material: In the case of fluororubber

Maintenance

1.Replace the element when one of followings occurs.

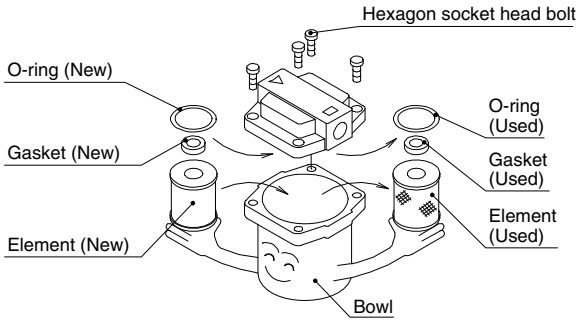
- Red spots appear on the element surface.
- Operated for 2 years, or pressure drop reaches 0.1 MPa.
  Element assembly (gasket, O-ring accessory) part number: AME-EL∗∗∗

∗ ∗∗∗ is AME size symbol. (ex.: AME-EL150)

2.How to replace the element assembly

First, discharge the pressure in the body. (Make pressure 0 MPa.)

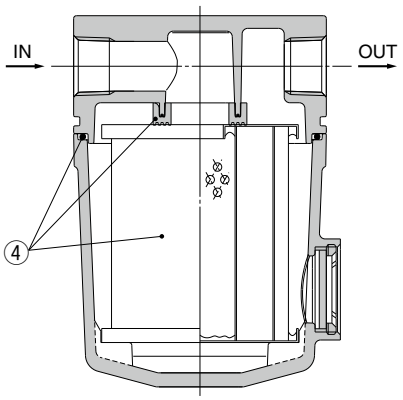
- Remove the 4 hexagon socket head bolts.
- Replace the element, gasket, O-ring.
- Tighten the hexagon socket head bolts.



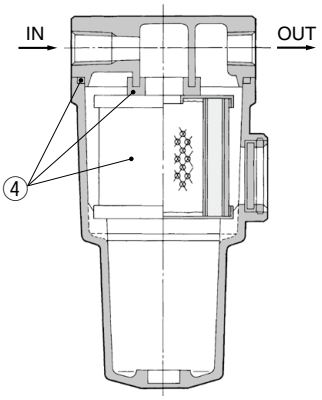
AMF Series

Construction

AMF150C to AMF550C



AMF650, AMF850



∗ The numbers correspond with those in the "Construction" of the AMF series in the **Web Catalog**.

Replacement Parts/Part Nos.

No.	Description∗1	Material	Applicable model∗2	Model						
				AMF150C	**AMF250C**	**AMF350C**	**AMF450C**	**AMF550C**	**AMF650**	**AMF850**
4	**Element assembly**	Glass fiber, others	Except option F	AMF-EL150	AMF-EL250	AMF-EL350	AMF-EL450	AMF-EL550	AMF-EL650	AMF-EL850
			For option F	AMF-EL150-F	AMF-EL250-F	AMF-EL350-F	AMF-EL450-F	AMF-EL550-F	—	—

∗1) Element assembly: With gasket (1 pc.) and O-ring (1 pc.)
∗2) F option, the rubber material: In the case of fluororubber

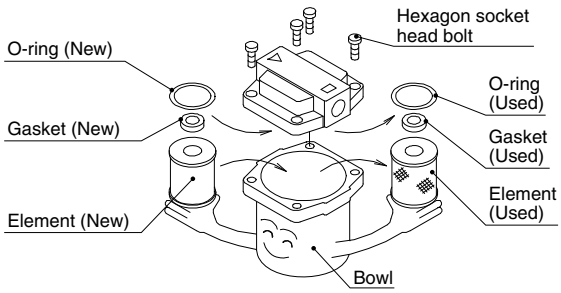
Maintenance

1.Element replacement

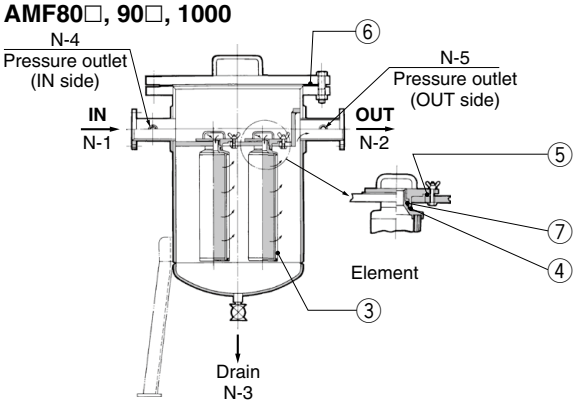
Since the element life depend on odor concentration of compressed air, it cannot be specified. Confirm deodorizing capacity remaining period, and replace the element periodically afterwards.
Replace the element when you smell oil on the outlet side.
Replace the element with a new one when the element has been used for 2 years, or when pressure drop reaches 0.1 MPa.
Element assembly (gasket, O-ring accessory) part number: AMF-EL∗∗∗
∗ ∗∗∗ is AMF size symbol. (ex.: AMF-EL150)

2.How to replace the element assembly

First, discharge the pressure in the body. (Make pressure 0 MPa.)
- Remove the 4 hexagon socket head bolts.
- Replace the element, gasket, O-ring.
- Tighten the hexagon socket head bolts.



AMF80□, 90□, 1000



Replacement Parts

Model applicable filter	③ Element		④ Seal (Material: NBR)		⑤ Seal (Material: NBR)		⑥ Gasket (Material: V#6500)		⑦ O-ring (Material: NBR)	
	Part no.	Qty.	Part no.	Qty.	Part no.	Qty.	Part no.	Qty.	Part no. (Nominal)	Qty.
AMF800	63271	1	63148	1	OD112XID90XT3	1	AL-61S	1	KA00061 1A-G35	1
AMF801		1		1	—	—	AL-60S	1		1
AMF900		3		3	OD112XID90XT3	3	AL-63S	1		3
AMF901		3		3	—	—	AL-62S	1		3
AMF1000		5		5	OD112XID90XT3	5	AL-31S	1		5

1 Indication of Replacement of Elements, Inspection Items

■ Replacement standards

<Element replacement>

The differential pressure (pressure drop) between the primary side and secondary side reaches 0.1 MPa.

■ Inspection items

Check each seal part for leak periodically.

Check the pressure/temperature periodically to make sure that the filter is within its operable range.

If the differential pressure reaches 0.1 MPa during operation, stop the operation and replace the element with a new one.

Remove the dust accumulated in the case periodically.

2 How to Select Element Order Number for Replacement

POINT

The element number for replacement is written on the nameplate.



Element number for replacement
Order the element number written in here.

∗ If the information written on the nameplate cannot be confirmed, please specify the element number as described below.

Order Example

∗ Element number for FGGSB-20-B002NA

A Check the product number of the industrial filter. Confirm the items written on the right.

❶ **Element length**
∗ The element length is the total length of combined short elements.
❷ **Element category**
❸ **Nominal filtration accuracy**
❹ **Element seal material**

How to Order

FGG S B – 20 – B 002 N A – ☐

Material

Symbol	Body	O-ring
S	Stainless steel 304	NBR
L	Stainless steel 304	FKM

Element length ❶

Symbol	Element length
B	L500 (L250 x 2)
C	L750 (L250 x 3)
D	L1000 (L250 x 4)

Port size

Symbol	Port size Rc
20	2

Element category ❷

Symbol	Element type	Material
B	Sintered metal	Bronze
S		Stainless steel
T	Fiber (Honeycomb)	Polypropylene
G		Glass fiber
H		Cotton
P	Paper	Cotton
M	Micromesh	Stainless steel 304/Epoxy
L		Stainless steel 316

Nominal filtration accuracy (μm) ❸

Symbol	Nominal filtration accuracy (μm)
X50	0.5
001	1
002	2
005	5
010	10
020	20
040	40
050	50
070	70
074	74
075	75
100	100
105	105
120	120

Note) For a comparison with the nominal filtration accuracy according to the element category, refer to pages 353 and 354.

Element seal material Note 1) ❹

Symbol	Element seal material
A Note 2)	Non-asbestos
T	Fluororesin
N	NBR
V	FKM

Note 1) Not used with fiber elements
Note 2) Not possible with bronze elements

Option

Symbol	Pressure gauge type
Nil	None (with plug)
G1	G46-10-02M (Brass at wetted parts)
G2	G46-10-02X3 (Stainless steel at wetted parts)

∗ Please use the applicable pressure gauge depending on the fluid used.

B Select the Number and Size of Elements

∗ Please select accordingly from the following two selection types of numbers and sizes.

Specifications ❺

Model		FGGSB Note 1)		FGGSC Note 1)		FGGSD Note 1)		FGGLB Note 1)		FGGLC Note 1)		FGGLD Note 1)	
Number of elements		7 Note 2)	14	7 Note 2)	21	7 Note 2)	28	7 Note 2)	14	7 Note 2)	21	7 Note 2)	28
Element size		ø65 x L500	ø65 x L250	ø65 x L750	ø65 x L250	ø65 x L1000	ø65 x L250	ø65 x L500	ø65 x L250	ø65 x L750	ø65 x L250	ø65 x L1000	ø65 x L250
Main materials	Cover	Stainless steel 304											
	Case	Stainless steel 304											
	O-ring	NBR						FKM					
	Legs	SS400 (Chromatic plating)											

Note 1) Cannot be used with gases
Note 2) In the case of a sintered metal element or paper element

SMC

There are various types of elements for replacement.
Select respective element type according to the type of industrial filter you are using.

C Element Model Determination

Specify the element type by filling out the element number with the respective codes of the items selected in sections A and B.

∗ **As for the number of orders, specify it by item ❺, "number of elements", in section B.**
The number of orders is 7 in this example.

How to Order Standard Elements

Model Determination **E B 200 – 002 N**

Element symbol

Element material

Symbol	Element material
B	Bronze
S	Stainless steel 316

A – 2

Element size

Symbol	Element size
100	ø65 x L250
200	ø65 x L500
300	ø65 x L750
400	ø65 x L1000

A – 1
B – 5

Nominal filtration accuracy (μm)

Symbol	Nominal filtration accuracy (μm)
001	1
002	2
005	5
010	10
020	20
040	40
070	70
100	100
120	120

A – 3

Element seal material/Operating temperature range

Symbol	Element seal material	Operating temperature range(°C)
A Note)	Non-asbestos	0 to150
T	Fluororesin	0 to120
N	NBR	0 to 80
V	FKM	0 to 120

Note) Not possible with bronze elements

A – 4

Sintered Metal Filter Elements

- **Outstanding mechanical strength, heat resistance and chemical resistance**
- **Formed by sintering finely powdered metal, so a high filtration accuracy can be obtained.**
- **Even if clogging progresses, the element can be reused by cleaning.**
- **Main applications**

  Ideal as a check filter for keeping fluid clean. All types of gases, fluids, general solvents and high-temperature fluids



⚠Caution

Bronze element, but may have been discolored by moisture in the atmosphere, the characteristics are not affected.

Specifications

Material		Bronze	Stainless steel 316
Operating temperature (C°) Note 2)		0 to 150	0 to 150
Nominal filtration accuracy (μm) Note 3)		1, 2, 5, 10, 20, 40, 70, 100, 120	
Max. differential pressure resistance		0.7 MPa	
Element replacement differential pressure		0.1 MPa	
Chemical resistance	Acid	Cannot be used	Can be used Note 1)
	Alkali	Cannot be used	Can be used
Element category of How to Order		B	S

Note 1) Cannot be used with hydrochloric acid, hydrofluoric acid or phosphoric acid
Note 2) Varies depending on the seal material used
Note 3) The name is for distinguishing the raw material, and is different from the actual filtration rating. (Refer to the **Web Catalog**.)

How to Order Standard Elements

E B 200 – 005 N

Element symbol

Element material

Symbol	Element material
B	Bronze
S	Stainless steel 316

Element size

Symbol	Element size
100	ø65 x L250
200	ø65 x L500
300	ø65 x L750
400	ø65 x L1000

Nominal filtration accuracy (μm)

Symbol	Nominal filtration accuracy (μm)
001	1
002	2
005	5
010	10
020	20
040	40
070	70
100	100
120	120

Element seal material/Operating temperature range

Symbol	Element seal material	Operating temperature range(°C)
A Note)	Non-asbestos	0 to 150
T	Fluororesin	0 to 120
N	NBR	0 to 80
V	FKM	0 to 120

Note) Not possible with bronze elements.

Fiber Elements

- **Four types of materials with different characteristics are available so the filters are applicable to any application.**
- **Elements are economical because particle capturing capacity is excellent, and element life is long.**
- **Elements are disposable so maintenance and replacement are easy.**
- **Main applications**

Cotton	Cleaning water, General neutral fluids, General solvents, Dry air
Polypropylene	Plating fluids, General acids, Alkali fluids, Industrial water, Cooling water
Glass fiber	Acid fluids, High-temperature fluids



Specifications

Material	Core material	Operating temperature (°C)	Nominal filtration accuracy (μm)	Differential pressure resistance (Max.)	Element replacement differential pressure
Cotton	Stainless steel 304	–20 to 100	0.5, 1, 5, 10, 20, 50, 75, 100	0.2 MPa	0.1 MPa
Polypropylene	Polypropylene	0 to 60	0.5, 1, 5, 10, 20, 50, 75, 100		
Glass fiber	Stainless steel 316	0 to 400	1, 5, 10, 20		

Note) Size for all is ø65 x L250. Different lengths are available as a special order up to 750 mm, only for cotton and polypropylene.

How to Order Standard Elements

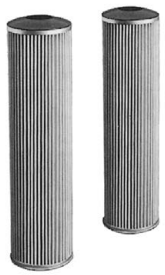
Element material		Cotton	Polypropylene	Glass fiber
Core material		Stainless steel 304	Polypropylene	Stainless steel 316
Nominal filtration accuracy (μm)	0.5	EH10G	EHM10A	—
	1	EH39R10GV	EHM39R10AY	EHK27R10S
	5	EH23R10GV	EHM23R10AY	EHK19R10S
	10	EH19R10GV	EHM19R10AY	EHK15R10S
	20	EH15R10G	EHM15R10A	EHK10R10S
	50	EH11R10G	EHM11R10A	—
	75	EH10R10G	EHM10R10A	—
	100	EH8R10G	EHM8R10A	—
Element category of How to Order		H	T	G

Note) Element seals are not used for fiber elements.

Paper Elements

- **Cartridges are pleated for a large filtration area, and elements are economical due to their long service life.**
- **Main applications**

  Ideal for filtration of hydraulic oil, lubricating oil, fuel oil, oils for the liquid gas industry, dry inert gases, and dry air



Specifications

Material	Filter paper (Cotton, Phenol resin impregnated paper)
Operating temperature (C°)	0 to 80
Nominal filtration accuracy (μm)	5, 10, 20
Max. differential pressure resistance	0.6 MPa
Adhesive used	Epoxy resin
Element replacement differential pressure	0.1 MPa
Element category of How to Order	P

How to Order Standard Elements

EP 200 – 010 N

Paper element

Element size

Symbol	Element size
100	ø65 x L250
200	ø65 x L500
300	ø65 x L750
400	ø65 x L1000

Element seal material

Symbol	Element seal material
N	NBR
V	FKM

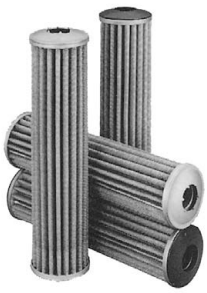
Nominal filtration accuracy (μm)

Symbol	Nominal filtration accuracy (μm)
005	5
010	10
020	20

Micromesh Elements

- **Stainless steel metal mesh has high filtration accuracy.**
- **Outstanding heat and chemical resistance. Applicable to a wide range of applications**
- **Pleated type has 3 times the filtration area of a cylinder.**
- **Filters are economical because they can be cleaned and repeatedly used.**
- **Main applications**

  Please use 40 microns or less as a high-precision filter, and 74 microns or higher as a high-grade strainer. All types of gases and fluids, high-temperature fluids



Specifications

Model		EM100	EM500
Materials		Stainless steel 304	Stainless steel 316
Jointing material		Epoxy resin	—
Operating temperature (C°) Note 2)		–5 to 100	–180 to 300
Nominal filtration accuracy (μm)		5, 10, 20, 40, 74, 105	
Max. differential pressure resistance		0.7 MPa	
Element replacement differential pressure		0.1 MPa	
Chemical resistance	**Acid**	Cannot be used	Can be used Note 1)
	Alkali	Can be used	Can be used
Element category of How to Order		M	L

Note 1) Cannot be used with hydrochloric acid, hydrofluoric acid or phosphoric acid
Note 2) The values depending on the seal material used

How to Order Standard Elements

EM 500 – 074 A

Micromesh element symbol

Element composition symbol

Symbol	Element composition symbol
100	Stainless steel 304
500	Stainless steel 316

Nominal filtration accuracy (μm)

Symbol	Nominal filtration accuracy (μm)
005	5
010	10
020	20
040	40
074	74
105	105

(Size ø65 x L250)

Element seal material/Operating temperature range

Symbol	Element seal material	Operating temperature range(°C)
A Note)	Non-asbestos	0 to 150
T Note)	Fluororesin	0 to 120
N	NBR	0 to 80
V	FKM	0 to 120

Note) Not possible with EM100 (Stainless steel 304)

Replacement Seal

Symbol	Part no.	Quantity
A	AL-7S	2
T	AL-6S	
N	AL-8S	
V	AL-9S	

FGD Series ①

The Replacement Procedure is on p. 743

Replacement Parts and Seal List

How to Order

FGD C A – 03 – B 002 N □

Element length

Symbol	Element length
A	L250
B	L500 (L250 x 2)

Port size

Symbol	Port size Rc
03	3/8
04	1/2
06	3/4

Accessory

Symbol	Accessory
Nil	None
-B	Bracket

Element category

Symbol	Element type	Material
B	Sintered metal	Bronze
S		Stainless steel
T	Fiber (Honeycomb)	Polypropylene
G		Glass fiber
H		Cotton
P	Paper	Cotton
M	Micromesh	Stainless steel 304/Epoxy
L		Stainless steel 316
J	HEPO Ⅱ	Polyester/Polypropylene

Element seal material Note)

Symbol	Element seal material
A	Non-asbestos
T	Fluororesin
N	NBR
V	FKM

Note) Refer to the table below for the element seal material types by the element category.

Material

Symbol	Cover	Case	Gasket/O-ring	Seal
C	Aluminum	SPCD	NBR	Nylon
E	Aluminum	SPCD	NBR	Nylon/Fluororesin (Antistatic specifications)
T	SCS14	Stainless steel 316	Fluororesin	Fluororesin
F	SCS14	Stainless steel 316	Fluororesin	Fluororesin (Antistatic specifications)

Note) If there is a static charge, select a product with an antistatic specification.

Element/Element Seal Material Combinations

Element material \ Element seal material		**Nil** (Without seal)	Non-asbestos	PTFE	NBR	FKM
			A	**T**	**N**	**V**
B	Bronze			○	○	○
S	Stainless steel		○	○	○	○
T	Polypropylene	○				
G	Glass fiber	○				
H	Cotton (Fiber)	○				
P	Cotton (Paper)				○	○
M	Stainless steel 304/Epoxy				○	○
L	Stainless steel 316		○	○	○	○
J	Polyester/PP			○	○	○

Nominal filtration accuracy (μm) Note)

Symbol	Nominal filtration accuracy (μm)	Symbol	Nominal filtration accuracy (μm)
X50	0.5	**050**	50
001	1	**070**	70
002	2	**074**	74
005	5	**075**	75
010	10	**100**	100
020	20	**105**	105
040	40	**120**	120

Note) For a comparison with the nominal filtration accuracy according to the element category, refer to the **Web Catalog**.

Specifications

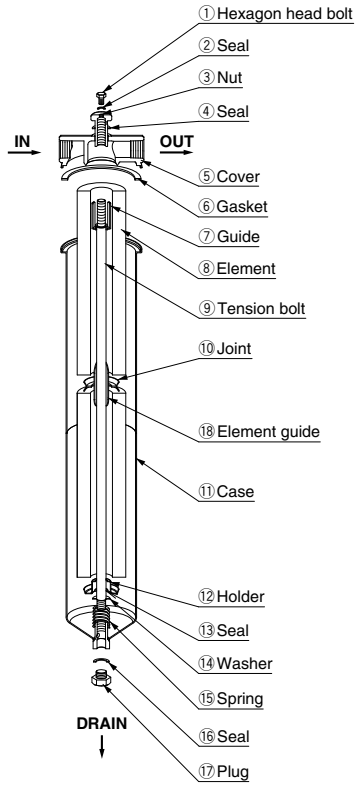
Model		FGDCA	FGDCB	FGDEA	FGDEB	FGDTA	FGDTB	FGDFA	FGDFB
Number of elements		1	2 Note)	1	2 Note)	1	2 Note)	1	2 Note)
Element size		ø65 to 70 x L250	ø65 to 70 x L500 (L250 x 2)	ø65 to 70 x L250	ø65 to 70 x L500 (L250 x 2)	ø65 to 70 x L250	ø65 to 70 x L500 (L250 x 2)	ø65 to 70 x L250	ø65 to 70 x L500 (L250 x 2)
Main materials	**Cover**	Aluminum				SCS14			
	Case	SPCE				Stainless steel 316			
	Gasket/ O-ring	NBR				Fluororesin			
	Seal	Nylon		Nylon/Fluororesin		Fluororesin			

Note) 1 element (ø65 x L500) in the case of a sintered metal element or paper element

FGD Series ②

The Replacement Procedure is on p. 743

Replacement Parts and Seal List



Parts descriptions and functions

(Figure shows the product with two FGD□B elements.)

Note) There is no compatibility between the FGDT/F and FGDC/E as the seal structure on the gasket portion is different. Use the cover and case of the same model.

Parts Descriptions and Functions

No.	Description	Material	Function
①	**Hexagon head bolt**	Stainless steel or iron	Plug to release air in the housing
②	**Seal**	Resin	
③	**Nut**	Stainless steel or iron	Tightens the cover
④	**Seal**	Resin	
⑤	**Cover**	Stainless steel or Aluminum	The lid of the filter body
⑥	**Gasket**	Resin or rubber	
⑦	**Guide**	Stainless steel	Seals the gap between the element and tension bolt
⑧	**Element**	Depends on the element type	The mounted element collects residue.
⑨	**Tension bolt**	Stainless steel or iron	Connects the case and cover
⑩	**Joint**	Stainless steel	Seals the area between elements (when two FGD□B elements are used)
⑪	**Case**	Stainless steel or iron	Filter body
⑫	**Holder**	Stainless steel	Seals the elements
⑬	**Seal**	Resin or rubber	
⑭	**Washer**	Stainless steel	
⑮	**Spring**	Stainless steel	Stabilizes the element
⑯	**Seal**	Resin	
⑰	**Plug**	Stainless steel or iron	Drainage discharging plug
⑱	**Element guide**	Stainless steel or iron	

Replacement Parts

Description	Part no.	Applicable model	Part no. (Kit contents)
Nut kit	**FGD-KT001**	FGDC	①, ②, ③, ④: 1 pc. each
	FGD-KT002	FGDE	
	FGD-KT003	FGDT	
	FGD-KT004	FGDF	
Replacement cover	**FGD-CV005-**$^{03}_{04}_{06}$	FGDT/F	⑤
	FGD-CV006-$^{03}_{04}_{06}$	FGDC/E	
Joint	**FGD-OP001**	FGD□	⑩
Seal kit	**KT-FGDC**	FGDC	②, ④, ⑥, ⑬, ⑯: 1 pc. each
	KT-FGDE	FGDE	
	KT-FGDT	FGDT	
	KT-FGDF	FGDF	
Replacement case assembly	**FGD-CA002**	FGDT/F(L250)	⑦, ⑨, ⑪, ⑫, ⑬, ⑭, ⑮, ⑯, ⑰: 1 pc. each Note) Only the FGD-CA003 and CA005 includes ⑱ element guide in the set.
	FGD-CA003	FGDT/F(L500)	
	FGD-CA004	FGDC/E(L250)	
	FGD-CA005	FGDC/E(L500)	

- **Refer to pages 351 and 352 for selection.**
- **Refer to pages 353 and 354 for the replacement element type.**

∗ The numbers correspond with those in the "Replacement Parts and Seal List" of the FGD series in the **Web Catalog**.

FGE Series ①

The Replacement Procedure is on p. 744, 746

Replacement Parts and Seal List

How to Order

FGES/FGEL type (V-band type) **FGE S A – 10 – B 002 N A – G1**

Material

Symbol	Body	Gasket/O-ring
S	Stainless steel 304	NBR
L		FKM

Option

Symbol	Pressure gauge type
G1	G46-10-02M (Brass at wetted parts)
G2	G46-10-02-SRB (Stainless steel at wetted parts)
Nil	None (with plug)

∗ Please use the applicable pressure gauge depending on the fluid used.
Control the differential pressure even when none pressure gauge is selected.

FGET type (Bolt tightening type) **FGE T A – 10 – B 002 N**

Material

Symbol	Body	Gasket/O-ring
T	Stainless steel 304	Fluororesin

Element length

Symbol	Element length
A	L250
B	L500 (L250 x 2)
C	L750 (L250 x 3)

Port size

Symbol	Port size R
10	1
20	2

Element category

Symbol	Element type	Material
B	Sintered metal	Bronze
S		Stainless steel
T	Fiber	Polypropylene
G		Glass fiber
H		Cotton
P	Paper	Cotton
M	Micromesh	Stainless steel 304/Epoxy
L		Stainless steel 316
J	HEPO Ⅱ	Polyester/Polypropylene

Element seal material Note)

Symbol	Element seal material
A	Non-asbestos
T	Fluororesin
N	NBR
V	FKM

Note) Refer to the table below for the element seal material types by the element category.

Element/Element Seal Material Combinations

Element material \ Element seal material		Nil (Without seal)	A (Non-asbestos)	T (PTFE)	N (NBR)	V (FKM)
B	Bronze			○	○	○
S	Stainless steel		○	○	○	○
T	Polypropylene	○				
G	Glass fiber	○				
H	Cotton (Fiber)	○				
P	Cotton (Paper)				○	○
M	Stainless steel 304/Epoxy				○	○
L	Stainless steel 316		○	○	○	○
J	Polyester/PP			○	○	○

Nominal filtration accuracy (μm) Note)

Symbol	Nominal filtration accuracy (μm)	Symbol	Nominal filtration accuracy (μm)
X50	0.5	050	50
001	1	070	70
002	2	074	74
005	5	075	75
010	10	100	100
020	20	105	105
040	40	120	120

Note) For a comparison with the nominal filtration accuracy according to the element category, refer to the **Web Catalog**.

Specifications

Model		FGESA Note 1)	FGESB Note 1)		FGESC Note 1)		FGELA Note 1)	FGELB Note 1)		FGELC Note 1)		FGETA	FGETB		FGETC	
Number of elements		4	4 Note 2)	8	4 Note 2)	12	4	4 Note 2)	8	4 Note 2)	12	4	4 Note 2)	8	4 Note 2)	12
Element size		ø65 to 70 x L250	ø65 to 70 x L500	ø65 to 70 x L250	ø65 to 70 x L750	ø65 to 70 x L250	ø65 to 70 x L250	ø65 to 70 x L500	ø65 to 70 x L250	ø65 to 70 x L750	ø65 to 70 x L250	ø65 x L250	ø65 x L500	ø65 x L250	ø65 x L750	ø65 x L250
Main materials	Cover	Stainless steel 304														
	Case	Stainless steel 304														
	Gasket	—	—		—		—	—		—		Fluororesin	Fluororesin		Fluororesin	
	O-ring	NBR					FKM					—				
	Legs	SS400 (Chromatic plating)														

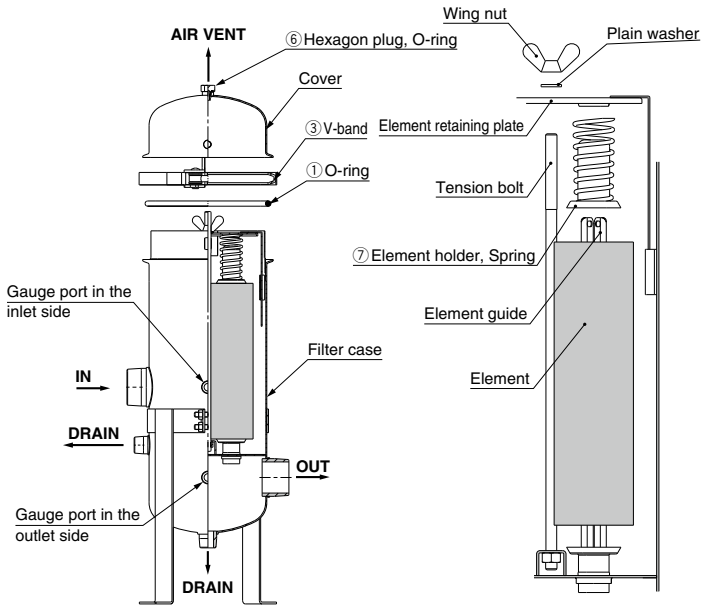
Note 1) Cannot be used with gases
Note 2) In the case of a sintered metal element or paper element

FGE Series ②

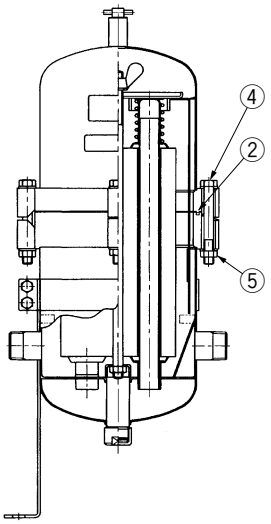
The Replacement Procedure is on p. 744, 746

Replacement Parts and Seal List

FGES/FGEL type (V-band type)



FGET type (Bolt tightening type)



Replacement Parts/Part Nos.

No.	Description	Qty.	Applicable model		
			FGES	FGEL	FGET
1	O-ring	1	FGE-KT001	FGE-KT002	—
2	Gasket	1	—	—	AL-19S
3	V-band	1	CY-24S		—
4	Hexagon head bolt	4	—	—	CB00021
5	Hexagon nut	4	—	—	DA00110
6	Hexagon plug	1	FGE-OP007	FGE-OP008	—
	O-ring	1			
7	Spring	4	FGE-OP005		—
	Element holder	4			

- **Refer to pages 351 and 352 for selection.**
- **Refer to pages 353 and 354 for the replacement element type.**

∗ The numbers correspond with those in the "Replacement Parts and Seal List" of the FGE series in the **Web Catalog**.

FGG Series ①

The Replacement Procedure is on p. 749

Replacement Parts and Seal List

How to Order

FGG S B – 20 – B 002 N A – G1

Material

Symbol	Body	O-ring
S	Stainless steel 304	NBR
L	Stainless steel 304	FKM

Element length

Symbol	Element length
B	L500 (L250 x 2)
C	L750 (L250 x 3)
D	L1000 (L250 x 4)

Port size

Symbol	Port size Rc
20	2

Element category

Symbol	Element type	Material
B	Sintered metal	Bronze
S		Stainless steel
T	Fiber (Honeycomb)	Polypropylene
G		Glass fiber
H		Cotton
P	Paper	Cotton
M	Micromesh	Stainless steel 304/Epoxy
L		Stainless steel 316

Nominal filtration accuracy (μm) Note)

Symbol	Nominal filtration accuracy (μm)	Symbol	Nominal filtration accuracy (μm)
X50	0.5	050	50
001	1	070	70
002	2	074	74
005	5	075	75
010	10	100	100
020	20	105	105
040	40	120	120

Note) For a comparison with the nominal filtration accuracy according to the element category, refer to the **Web Catalog**.

Option

Symbol	Pressure gauge type
G1	G46-10-02M (Brass at wetted parts)
G2	G46-10-02-SRB (Stainless steel at wetted parts)
Nil	None (with plug)

∗ Please use the applicable pressure gauge depending on the fluid used.
Control the differential pressure even when none pressure gauge is selected.

Element seal material Note)

Symbol	Element seal material
A	Non-asbestos
T	Fluororesin
N	NBR
V	FKM

Note) Refer to the table below for the element seal material types by the element category.

Element/Element Seal Material Combinations

Element material \ Element seal material		Nil (Without seal)	Non-asbestos A	PTFE T	NBR N	FKM V
B	Bronze			○	○	○
S	Stainless steel		○	○	○	○
T	Polypropylene	○				
G	Glass fiber	○				
H	Cotton (Fiber)	○				
P	Cotton (Paper)				○	○
M	Stainless steel 304/Epoxy				○	○
L	Stainless steel 316		○	○	○	○

Specifications

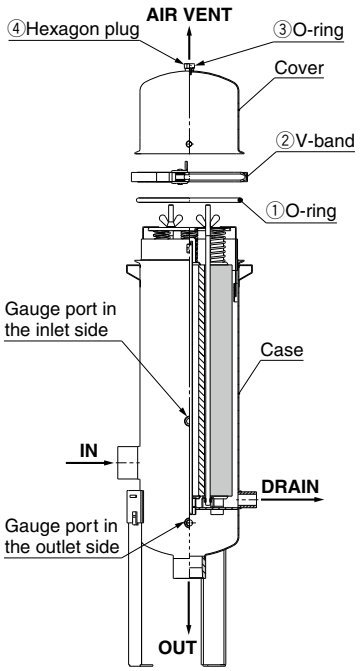
Model		FGGSB Note 1)		FGGSC Note 1)		FGGSD Note 1)		FGGLB Note 1)		FGGLC Note 1)		FGGLD Note 1)	
Number of elements		7 Note 2)	14	7 Note 2)	21	7 Note 2)	28	7 Note 2)	14	7 Note 2)	21	7 Note 2)	28
Element size		ø65 x L500	ø65 x L250	ø65 x L750	ø65 x L250	ø65 x L1000	ø65 x L250	ø65 x L500	ø65 x L250	ø65 x L750	ø65 x L250	ø65 x L1000	ø65 x L250
Main materials	Cover	Stainless steel 304											
	Case	Stainless steel 304											
	O-ring	NBR						FKM					
	Legs	SS400 (Chromatic plating)											

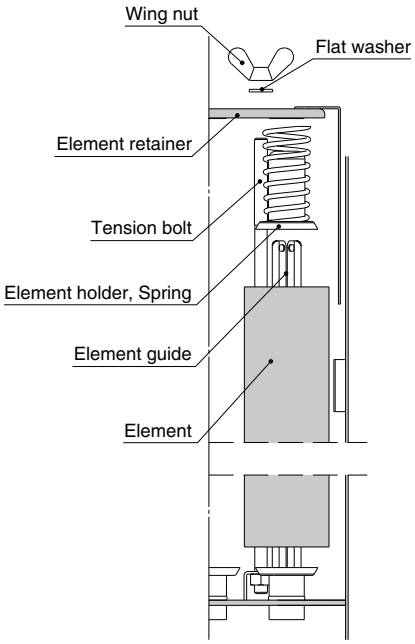
Note 1) Cannot be used with gases
Note 2) In the case of a sintered metal element or paper element

FGG Series ②

The Replacement Procedure is on p. 749

Replacement Parts and Seal List





Replacement Parts/Part Nos.

No.	Description	Qty.	Applicable model	
			FGGS	FGGL
1	O-ring	1	FGF-KT01	FGF-KT02
2	V-band	1	CY-27S	
3	O-ring	1	FGE-OP007	FGE-OP008
4	Hexagon plug	1		

- **Refer to pages 351 and 352 for selection.**
- **Refer to pages 353 and 354 for the replacement element type.**

∗ The numbers correspond with those in the "Replacement Parts and Seal List" of the FGG series in the **Web Catalog**.

FGA Series (Produced upon receipt of order)

The Replacement Procedure is on p. 751

Replacement Parts and Seal List

How to Order

FGA C 04 A – 10 – B 002 N

Case material (wetted parts)

Symbol	Case material (wetted parts)
C	SS400
S	Stainless steel 304

Number of arranged elements

Symbol	Number of arranged elements	Symbol	Number of arranged elements
04	4	29	29
07	7	34	34
09	9	37	37
18	18	53	53
22	22	83	83

Element length

Symbol	Element length
A	L250
B	L500 (L250 x 2)
C	L750 (L250 x 3)
D	L1000 (L250 x 4)

Port size

Symbol	Port size
10	25 (1B)
14	40 (1 1/2B)
20	50 (2B)
24	65 (2 1/2B)
30	80 (3B)
40	100 (4B)
60	150 (6B)

Note) The connection method is JIS 10KFF flange connection.

Element category

Symbol	Element type	Material
B	Sintered metal	Bronze
S		Stainless steel
T	Fiber	Polypropylene
G		Glass fiber
H		Cotton
P	Paper	Cotton
M	Micromesh	Stainless steel 304/Epoxy
L		Stainless steel 316

Element seal material Note)

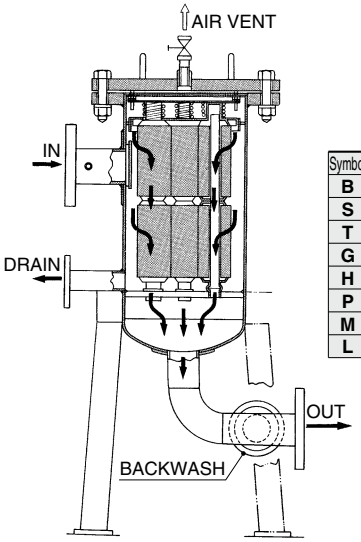
Symbol	Element seal material
A	Non-asbestos
T	Fluororesin
N	NBR
V	FKM

Note) Refer to the table below for the element seal material types by the element category.

Nominal filtration accuracy (μm) Note)

Symbol	Nominal filtration accuracy (μm)	Symbol	Nominal filtration accuracy (μm)
X50	0.5	050	50
001	1	070	70
002	2	074	74
005	5	075	75
010	10	100	100
020	20	105	105
040	40	120	120

Note) For a comparison with the nominal filtration accuracy according to the element category, refer to the **Web Catalog**.





Element mounting figure

Element/Element Seal Material Combinations

Element material \ Element seal material		Nil (Without seal)	Non-asbestos A	PTFE T	NBR N	FKM V
B	Bronze			○	○	○
S	Stainless steel		○	○	○	○
T	Polypropylene	○				
G	Glass fiber	○				
H	Cotton (Fiber)	○				
P	Cotton (Paper)				○	○
M	Stainless steel 304/Epoxy				○	○
L	Stainless steel 316		○	○	○	○

Applicable Element Specifications

Description	Material	Nominal filtration accuracy (μm)	Size
Sintered metal	Bronze	1, 2, 5, 10, 20, 40 70, 100, 120	ø65 x L250 ø65 x L500 ø65 x L750 ø65 x L1000
	Stainless steel 316		
Paper	Cotton (Phenol)	5, 10, 20	ø65 x L250 ø65 x L500 ø65 x L750 ø65 x L1000
Fiber	Cotton	0.5, 1, 5, 10, 20 50, 75, 100	ø65 x L250
	Polypropylene		
	Glass fiber	1, 5, 10, 20	
Micromesh	Stainless steel 304	5, 10, 20, 40 74, 105	ø65 x L250
	Stainless steel 316		

• Refer to pages 353 and 354 for the replacement element type.

* The numbers correspond with those in the "Replacement Parts and Seal List" of the FGA series in the **Web Catalog**.

FGB Series (Discontinued products)

The Replacement Procedure is on p. 755

Replacement Parts and Seal List

How to Order

FGB C 04 A – 10 – B 002 N

This series was discontinued in July 2014.
(Lot number: SU)
Currently only the element can be replaced.

Case material (wetted parts)

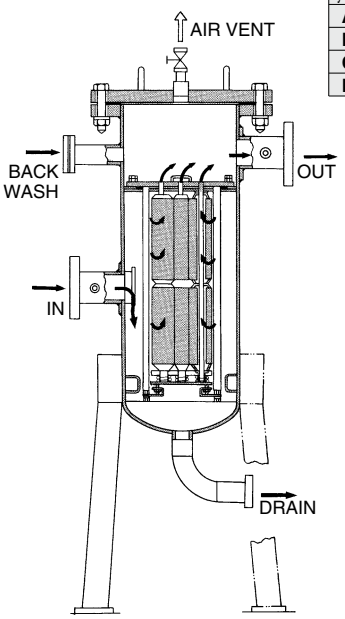
Symbol	Case material (wetted parts)
C	SS400
S	Stainless steel 304

Number of arranged elements

Symbol	Number of arranged elements	Symbol	Number of arranged elements
04	4	30	30
07	7	36	36
13	13	55	55
19	19	83	83

Element length

Symbol	Element length
A	L250
B	L500 (L250 x 2)
C	L750 (L250 x 3)
D	L1000 (L250 x 4)



Port size

Symbol	Port size
10	25 (1B)
14	40 (1 1/2B)
20	50 (2B)
24	65 (2 1/2B)
30	80 (3B)
40	100 (4B)
60	150 (6B)

Note) The connection method is JIS 10KFF flange connection.

Element category

Symbol	Element type	Material
B	Sintered metal	Bronze
S		Stainless steel
T	Fiber	Polypropylene
G		Glass fiber
H		Cotton
P	Paper	Cotton
M	Micromesh	Stainless steel 304/Epoxy
L		Stainless steel 316

Element seal material Note 1)

Symbol	Element seal material
A Note 2)	Non-asbestos
T	Fluororesin
N	NBR
V	FKM

Note 1) Not used with fiber elements
Note 2) Not possible with bronze elements

Nominal filtration accuracy (μm) Note)

Symbol	Nominal filtration accuracy (μm)	Symbol	Nominal filtration accuracy (μm)
X50	0.5	050	50
001	1	070	70
002	2	074	74
005	5	075	75
010	10	100	100
020	20	105	105
040	40	120	120

Note) For a comparison with the nominal filtration accuracy according to the element category, refer to the **Web Catalog**.

Applicable Element Specifications

Description	Material	Nominal filtration accuracy (μm)	Size
Sintered metal	Bronze	1, 2, 5, 10, 20, 40 70, 100, 120	ø65 x L250 ø65 x L500 ø65 x L750 ø65 x L1000
	Stainless steel 316		
Paper	Cotton (Phenol)	5, 10, 20	ø65 x L250 ø65 x L500 ø65 x L750 ø65 x L1000
Fiber	Cotton	0.5, 1, 5, 10, 20 50, 75, 100	ø65 x L250
	Polypropylene		
	Glass fiber	1, 5, 10, 20	
Micromesh	Stainless steel 304	5, 10, 20, 40 74, 105	ø65 x L250
	Stainless steel 316		



Element mounting figure

• Refer to pages 353 and 354 for the replacement element type.

∗ The numbers correspond with those in the "Replacement Parts and Seal List" of the FGB series in the **Web Catalog**.

FGC Series (Produced upon receipt of order)

The Replacement Procedure is on p. 759

Replacement Parts and Seal List

How to Order

FGC 1 C A – 04 – B 002 N

Max. operating pressure

Symbol	Max. operating pressure
1	1 MPa
2	2 MPa
4	4 MPa

Case material (wetted parts)

Symbol	Case material (wetted parts)
C	SGP
S	Stainless steel 304

Element length

Symbol	Element length
A	L250
B	L500 (L250 x 2)

Port size

Symbol	Port size
04	15 (1/2B)
06	20 (3/4B)
10	25 (1B)

Note) The connection method is flange connection, as indicated below.
FGC1: JIS 10KFF flange connection
FGC2: JPI300LbRF flange connection
FGC4: JPI600LbRF flange connection

Element seal material Note)

Symbol	Element seal material
A	Non-asbestos
T	Fluororesin
N	NBR
V	FKM

Note) Refer to the table below for the element seal material types by the element category.

Nominal filtration accuracy (μm) Note)

Symbol	Nominal filtration accuracy (μm)	Symbol	Nominal filtration accuracy (μm)
X50	0.5	050	50
001	1	070	70
002	2	074	74
005	5	075	75
010	10	100	100
020	20	105	105
040	40	120	120

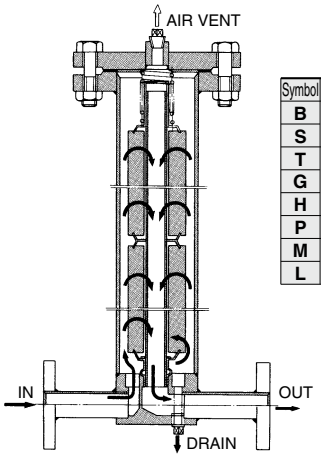
Note) For a comparison with the nominal filtration accuracy according to the element category, refer to the **Web Catalog**.

Element category

Symbol	Element type	Material
B	Sintered metal	Bronze
S		Stainless steel
T	Fiber	Polypropylene
G		Glass fiber
H		Cotton
P	Paper	Cotton
M	Micromesh	Stainless steel 316/Epoxy
L		Stainless steel 316

Element/Element Seal Material Combinations

Element material		Nil (Without seal)	Non-asbestos A	PTFE T	NBR N	FKM V
B	Bronze			○	○	○
S	Stainless steel		○	○	○	○
T	Polypropylene	○				
G	Glass fiber	○				
H	Cotton (Fiber)	○				
P	Cotton (Paper)				○	○
M	Stainless steel 304/Epoxy				○	○
L	Stainless steel 316		○	○	○	○





Element mounting figure

Applicable Element Specifications

Description	Material	Nominal filtration accuracy (μm)	Size
Sintered metal	Bronze	1, 2, 5, 10, 20, 40 70, 100, 120	ø65 x L250 ø65 x L500
	Stainless steel 316		
Paper	Cotton (Phenol)	5, 10, 20	ø65 x L250 ø65 x L500
Fiber	Cotton	0.5, 1, 5, 10, 20 50, 75, 100	ø65 x L250
	Polypropylene		
	Glass fiber	1, 5, 10, 20	
Micromesh	Stainless steel 304	5, 10, 20, 40 74, 105	
	Stainless steel 316		ø65 x L250

• **Refer to pages 353 and 354 for the replacement element type.**

* The numbers correspond with those in the "Replacement Parts and Seal List" of the FGC series in the **Web Catalog**.

FGF Series ①

The Replacement Procedure is on p. 761

Replacement Parts and Seal List

How to Order

One element included

Three, five elements included (produced upon receipt of order)

FGF	S	1	A	–	20	–	E	005	B	–	G		
FGF	S	3	A	–	40	–	E	005				–	F

Pressure gauge

Symbol	Pressure gauge
G	With pressure gauge (1 MPa: Brass for wetted parts)
Nil	Without pressure gauge (with plug)

∗ Note that the differential pressure must be controlled strictly.

Bag filter

Material

Symbol	Case material	Seal material	Applicable model FGF□1	FGF□3	FGF□5
S	Stainless steel	NBR	●	●	●
C	Carbon steel		—	●	●
L	Stainless steel	FKM	●	●	●
R	Carbon steel		—	●	●

Number of elements

Symbol	Number of elements
1	1 pc. included (FGF□1)
3	3 pcs. included (FGF□3)
5	5 pcs. included (FGF□5)

Element size

Symbol	Element size
A	ø190 x L440
B	ø190 x L770

Element material (Polyester)

Port size

Symbol	Port size	Applicable model
20	Rc2	FGF□1
40	100 (4^B) JIS10^{K}FF	FGF□3
60	150 (6^B) JIS10^{K}FF	FGF□5

Option

Symbol	Option∗	Applicable model FGF□1	FGF□3	FGF□5
Nil	None	●	●	●
F	Companion flange	—	●	●
L	Foundation bolt (3 pcs.)	●	●	●

∗ In the case of multiple options, indicate symbols in alphabetical order.

Nominal filtration accuracy Note)

Symbol	Nominal filtration accuracy (μm)
005	5
010	10
025	25
050	50
100	100

Note) The nominal filtration accuracy refers to the filtration accuracy according to SMC criteria, and serves as a guideline for the particulates that can be filtered out. It does not mean that 100% of the particulates of the diameter shown can be filtered out.

Part number of element for replacement



EJ	501S	–	005

Element symbol

Element size

Symbol	Element size	Applicable model
501S	ø190 x L440	For FGF□□A
601S	ø190 x L770	For FGF□□B

Specifications

Model		FGF□1A-20	FGF□1B-20	FGF□3A-40 Note 2)	FGF□3B-40 Note 2)	FGF□5A-60 Note 2)	FGF□5B-60 Note 2)
Element	Material	Polyester					
	Nominal filtration accuracy	5, 10, 25, 50, 100 μm					
	Element replacement differential pressure	0.1 MPa Note 1)					
	Number of elements	1 element included		3 elements included		5 elements included	
	Size	ø190 x L440	ø190 x L770	ø190 x L440	ø190 x L770	ø190 x L440	ø190 x L770
	Filtration area	1800 cm^2	3400 cm^2	5400 cm^2	10200 cm^2	9000 cm^2	17000 cm^2

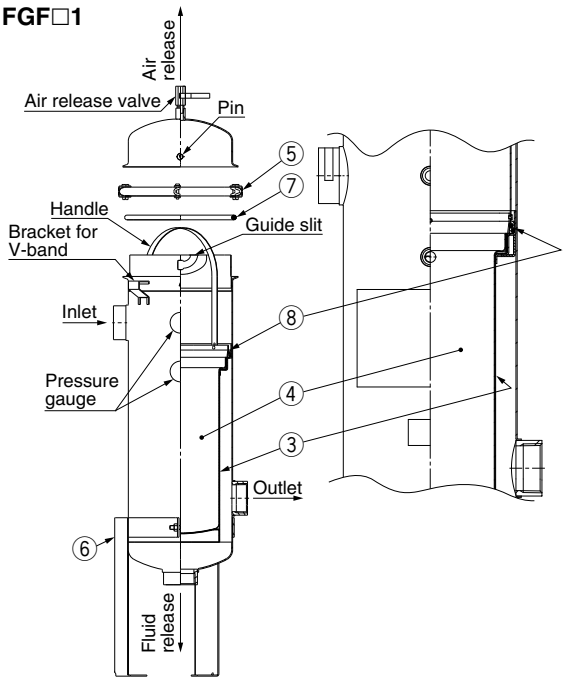
Note 1) Control the element replacement so that the differential pressure does not exceed 0.1 MPa.
Note 2) Please contact SMC for delivery time as the FGF3□ and FGF5□ are produced upon receipt of order.

FGF Series ②

The Replacement Procedure is on p. 761

Replacement Parts and Seal List

FGF□1

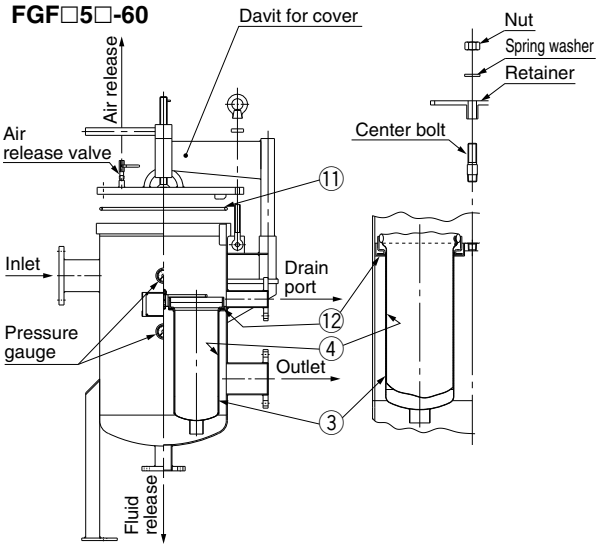


Replacement Parts

No.	Description	Part no.	Material	Qty.	Applicable model Note)
3	**Basket**	FGF-BT01	Stainless steel 304	1	FGF□1A
		FGF-BT02		1	FGF□1B
4	**Element**	EJ501S-□	Polyester	1	FGF□1A
		EJ601S-□		1	FGF□1B
5	**V-band**	FGF-BA01	Stainless steel	1	FGF□1□
6	**Legs assembly (with bolt, nut, flat washer)**	FGF-OP01 (Set)	Carbon steel	1	FGF□1□
7	**O-ring**	FGF-KT01	NBR	1	FGFS1□
		FGF-KT02	FKM	1	FGFL1□
8	**Holder assembly (with O-ring)**	FGF-KT03 (Set)	Polypropylene/ NBR	1	FGFS1□
		FGF-KT04 (Set)	Polypropylene/ FKM	1	FGFL1□

Note) Refer to "How to Order" on page 364 for the □ part of the model number.

FGF□3□-40
FGF□5□-60



Replacement Parts

No.	Description	Part no.	Material	Qty.	Applicable model Note)
3	**Basket**	BT-3S	Stainless steel 304	3	FGF□3A-40
				5	FGF□5A-60
		BT-4S	Stainless steel 304	3	FGF□3B-40
				5	FGF□5B-60
4	**Element**	Refer to "How to Order."	Polyester	3	FGF□3□-40
				5	FGF□5□-60
11	**O-ring**	AL-26S	NBR	1	FGFS3□-40
					FGFC3□-40
		AL-27S		1	FGFS5□-60
					FGFC5□-60
		AL-23S	FKM	1	FGFL3□-40
					FGFR3□-40
		AL-24S		1	FGFL5□-60
					FGFR5□-60
12	**Gasket**	AL-20S	NBR	3	FGFS3□-40
					FGFC3□-40
				5	FGFS5□-60
					FGFC5□-60
		AL-21S	FKM	3	FGFL3□-40
					FGFR3□-40
				5	FGFL5□-60
					FGFR5□-60

Note) Refer to "How to Order" on page 364 for the □ part of the model number.

Part number of element for replacement



EJ 501S – 005

- **Element symbol**
- **Element size**

Symbol	Element size	Applicable model
501S	ø190 x L440	For FGF□□A
601S	ø190 x L770	For FGF□□B

- **Nominal filtration accuracy** Note)

Symbol	Nominal filtration accuracy (μm)
005	5
010	10
025	25
050	50
100	100

Note) The nominal filtration accuracy refers to the filtration accuracy according to SMC criteria, and serves as a guideline for the particulates that can be filtered out. It does not mean that 100% of the particulates of the diameter shown can be filtered out.

∗ The numbers correspond with those in the "Replacement Parts and Seal List" of the FGF series in the **Web Catalog**.

FGH Series ①

The Replacement Procedure is on p. 763

Replacement Parts and Seal List

How to Order

FGH [100] – [03] – [J] [002] [T]

High precision filter for liquids

Body size

Symbol	Element length	Applicable element
100	L117	EJ701S
200	L246	EJ801S, ED801S
300	L496	EJ901S, ED901S

∗ The membrane element cannot be selected for FGH100.

Port size

03	Rc3/8
04	Rc1/2
06	Rc3/4
10	Rc1

Element classification Note)

Symbol	Element
J	HEPO Ⅱ
D	Membrane

Note) Refer to the **Web Catalog** for details about specifications, models, dimensions, etc. regarding the elements.

Filtration accuracy

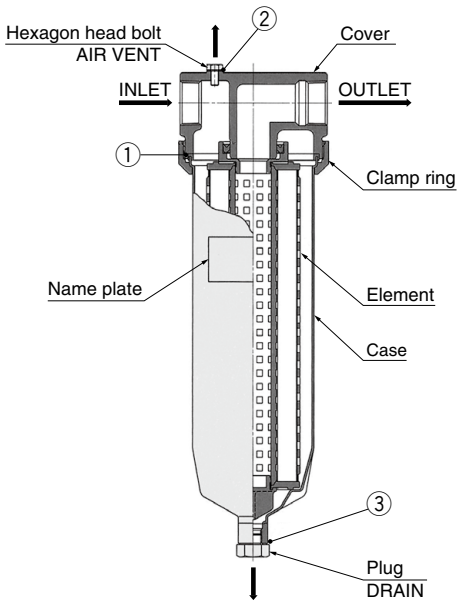
Symbol	Filtration accuracy		Applicable for:	Applicable body
002	2 μm	Filtration efficiency 99%	HEPO Ⅱ	FGH100 to 300
004	4 μm			
006	6 μm			
013	13 μm			
X20	0.2 μm	Filtration efficiency 99.9%	Membrane	FGH200 to 300
X40	0.4 μm			

Element seal

Symbol	Material
T	PTFE

Specifications

Model	FGH100	FGH200	FGH300
Number of built-in elements (element length) (mm)	1 (125)	1 (250)	1 (500)



Replacement Parts/Part Nos.

No.	Description	Model		
		FGH100	FGH200	FGH300
1	**Gasket**	AL-58S#1		
2	**Seal**	AL-43S		
3	**Seal**	AL-53S		

∗ Use each one of the above parts for each filter unit.
∗ Use a commercially available belt wrench etc. for mounting and removing clamp rings.

• **Refer to page 367 for the replacement element type.**

∗ The numbers correspond with those in the "Replacement Parts and Seal List" of the FGH series in the **Web Catalog**.

FGH Series ②

The Replacement Procedure is on p. 763

HEPO Ⅱ Element for FGH Series
EJ Series



Specifications

Model			EJ□S-002	EJ□S-004	EJ□S-006	EJ□S-013
Filtration accuracy(Filtration efficiency 99%)			2	4	6	13
Filtration area (cm^2)	Length	117 mm	1890	2310	2090	2490
		246 mm	4250	5200	4700	5600
		496 mm	8500	10400	9400	11200
Heat resistant temperature (°C)			80			
Material	Filter media		Polyester			
	Reinforcement material		Polypropylene			
	Others		Polypropylene			
Pressure resistance			0.5 MPa at 20°C, 0.125 MPa at 80°C			

Note) See "How to Order" below for items represented by □.

How to Order Elements

EJ 701 S – 002 T

Element classification

EJ	HEPO Ⅱ

Element size symbol

701	For FGH100
801	For FGH200
901	For FGH300

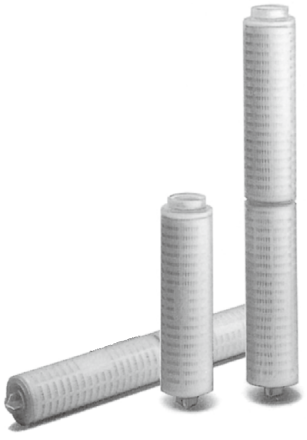
Filtration accuracy (Filtration efficiency 99%)

002	2 μm
004	4 μm
006	6 μm
013	13 μm

Element seal

T	PTFE

Membrane Element for FGH Series
ED Series



Specifications

Model			ED□S-X20	ED□S-X40
Filtration accuracy(Filtration efficiency 99.9%) Note 1)			0.2	0.4
Filtration area (cm^2)	Length	247 mm	4,000	6,200
		495 mm	8,000	12,400
Heat resistant temperature (°C)			80	
Material	Filter media		Polyether sulfone	Cellulose acetate & polyester
	Reinforcement material		Polypropylene	Polyester
	Others		Polypropylene	Polypropylene
Pressure resistance			0.5 MPa at 20°C, 0.125 MPa at 80°C	
Resistivity recovery Note 2)			60 min at 10 L/m	—
Others			100 L/4000 cm^2 Pure water cleaning	—

Note 1) Filtration accuracy: tested with ultrapure water, flow rate at ΔP = 0.01 MPa
Note 2) Resistivity recovery: time taken to recover to 18 MΩ·cm with ultrapure water
Note 3) See "How to Order" below for items represented by □.

How to Order Elements

ED 801 S – X20 T

Element classification

ED	Membrane

Element size symbol

801	For FGH200
901	For FGH300

∗ Cannot be used for FGH100

Filtration accuracy (Filtration efficiency 99.9%)

X20	0.2 μm
X40	0.4 μm

Element seal

T	PTFE

FQ1 Series ①

RoHS

The Replacement Procedure is on p. 765

Replacement Parts and Seal List

How to Order

FQ1 0 1 0 N – 04 – M005N –B

Model symbol (In-line filters)

Housing material

Symbol	Cover	Case
0	Stainless steel 304	Stainless steel 304

Element sealing method

1	Flat gasket (Double/Open/End)

Element size

Symbol	Element size
0	L125
1	L250
2	L500 (L250 x 2)

Housing O-ring material

Symbol	Material
N	NBR
V	FKM

Port size

Symbol	Port size	Applicable model		
		FQ1010	**FQ1011**	**FQ1012**
04	Rc1/2	●	●	
06	Rc3/4	●	●	●
10	Rc1		●	●

Element type
Select from tables below.

Options

Nil	N/A
-B	Bracket

Made to order specifications

	Note
Nil	
X19	Without V-band support
X61	Cover with bracket seat
X68	Chemical resistant type

∗ For other made to order specifications, refer to the **Web Catalog**.



FQ1010□ **FQ1011□** **FQ1012□**

Specifications

Model	FQ1010	FQ1011	FQ1012
Number of built-in elements (L: Element length in mm)	1 (L 125)	1 (L 250)	2 (L 250 x 2)

Element

1. Fiber element (P.P.)

Dimensions	Element symbol	Nominal filtration accuracy (μm)	Part no.
ø65 x L250	**TX50**	0.5	EHM10A
	T001	1	EHM39R10AY
	T005	5	EHM23R10AY
	T010	10	EHM19R10AY
	T020	20	EHM15R10A
	T050	50	EHM11R10A
	T075	75	EHM10R10A
	T100	100	EHM8R10A

2. Fiber element (Cotton)

Dimensions	Element symbol	Nominal filtration accuracy (μm)	Part no.
ø65 x L250	**HX50**	0.5	EH10G
	H001	1	EH39R10GV
	H005	5	EH23R10GV
	H010	10	EH19R10GV
	H020	20	EH15R10G
	H050	50	EH11R10G
	H075	75	EH10R10G
	H100	100	EH8R10G

3. Micromesh element (Stainless steel 304)

Bonding material: Epoxy resin

Dimensions	Element symbol	Nominal filtration accuracy (μm)	Part no.
ø65 x L250	**M005□**	5	EM100-005□
	M010□	10	EM100-010□
	M020□	20	EM100-020□
	M040□	40	EM100-040□
	M074□	74	EM100-074□
	M105□	105	EM100-105□
ø65 x L125	**M005□**	5	EM200-005□X4
	M010□	10	EM200-010□X4
	M020□	20	EM200-020□X4
	M040□	40	EM200-040□X4
	M074□	74	EM200-074□X4
	M105□	105	EM200-105□X4

Note) Specify the seal material in place of "□" (N for NBR or V for FKM).

4. Micromesh element (Stainless steel 316)

Dimensions	Element symbol	Nominal filtration accuracy (μm)	Part no.
ø65 x L250	**L005□**	5	EM500-005□
	L010□	10	EM500-010□
	L020□	20	EM500-020□
	L040□	40	EM500-040□
	L074□	74	EM500-074□
	L105□	105	EM500-105□
ø65 x L125	**L005□**	5	EM600-005□X4
	L010□	10	EM600-010□X4
	L020□	20	EM600-020□X4
	L040□	40	EM600-040□X4
	L074□	74	EM600-074□X4
	L105□	105	EM600-105□X4

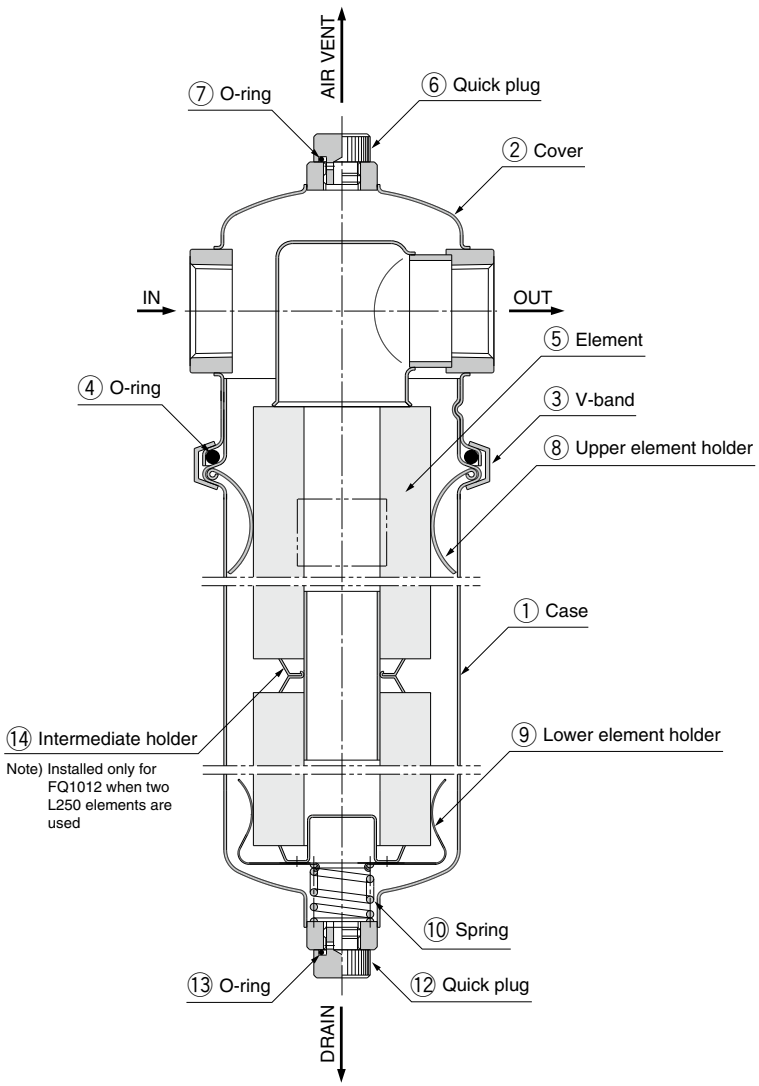
Note) Specify the seal material in place of "□" (N for NBR or V for FKM).

FQ1 Series ②

RoHS

The Replacement Procedure is on p. 765

Replacement Parts and Seal List



Replacement Parts

Description	Part number	Material	Applicable model	Part no. (Set contents)	Note
Case assembly	**FQ1-CA001N**	Stainless steel 304 Note) O-ring material N: NBR V: FKM	FQ1010N	①, ⑧, ⑨, ⑩, ⑫, ⑬: 1 pc. each Note) Only the FQ1-CA003□ includes ⑭ intermediate holder in the set.	Element size: L125
	FQ1-CA001V		FQ1010V		
	FQ1-CA002N		FQ1011N		Element size: L250
	FQ1-CA002V		FQ1011V		
	FQ1-CA003N		FQ1012N		Element size: L500 (L250 x 2)
	FQ1-CA003V		FQ1012V		
V-band for replacement	**FQ-BA001**	Stainless steel 304	FQ1 series	③	
O-ring kit	**FQ-KT005N**	NBR	FQ101□N	④, ⑦, ⑬: 1 pc. each	④: OR NBR-70-1 P85 ⑦, ⑬: OR NBR-70-1 P11
	FQ-KT005V	FKM	FQ101□V		④: OR FKM-70 P85 ⑦, ⑬: OR FKM-70 P11
Quick plug	**AG-9S**	Stainless steel 303	FQ1 series	⑥, ⑫	
Upper element holder	**L-131S**	Stainless steel 304	FQ1 series	⑧	
Lower element holder	**L-135S**	Stainless steel 304	FQ1 series	⑨, ⑩	
Intermediate holder	**FQ-OP001**	Stainless steel 304	FQ1 series	⑭	
Bracket	**BP-15S**	SPC	FQ101□□-04		For port size Rc 1/2
	BP-14S		FQ101□□-06		For port size Rc 3/4
	BP-13S		FQ101□□-10		For port size Rc 1

FN1/FN4 Series ①

The Replacement Procedure is on p. 766

Replacement Parts and Seal List

How to Order

With single element FN11 0 1 N – 10 – S 020 □

With four elements FN41 0 2 N – 20 – S 020 □

Housing material

Symbol	Housing material
1	Stainless steel 304

Element type Note)

Symbol	Element type	Applicable model
0	Cylindrical type (5 μm, 20 μm)	FN1, FN4
1	Step type (5 μm)	FN1

Note) Refer to the **Web Catalog** for detailed element type.

Element length

Symbol	Element length	Applicable model
1	L250 mm	FN1
2	L500 mm	FN1, FN4

Seal material

Symbol	Seal material
N	NBR
V	FKM

Port size

Symbol	Port size	Applicable model
10	Rc1	FN1
20	Rc2	FN4

Element material

Symbol	Element material
S	Stainless steel 304

Nominal filtration rating

Symbol	Nominal filtration rating
005	5 μm (Cylindrical type, Step type)
020	20 μm (Cylindrical type)

Pressure gauge

Symbol	Pressure gauge
Nil	None (With plug)
G Note 1)	With pressure gauge Note 2) (Wetted part: Brass)

Note 1) Contact SMC for the pressure gauge specification for stainless steel wetted parts.
Note 2) The FN4 series is equipped with two pressure gauges.

Specifications

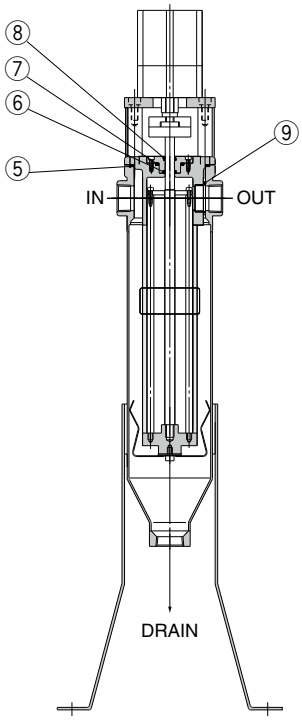
Model		FN1101	FN1111	FN1102	FN1112	FN4102
Element dimension		ø65 x 250L		ø65 x 500L		
Element	Material	Stainless steel 304				
	Construction	Cylindrical type	Step type	Cylindrical type	Step type	Cylindrical type
	Nominal filtration rating	5 μm, 20 μm	5 μm	5 μm, 20 μm	5 μm	5 μm, 20 μm
	Differential pressure proof	0.6 MPa				

FN1/FN4 Series ②

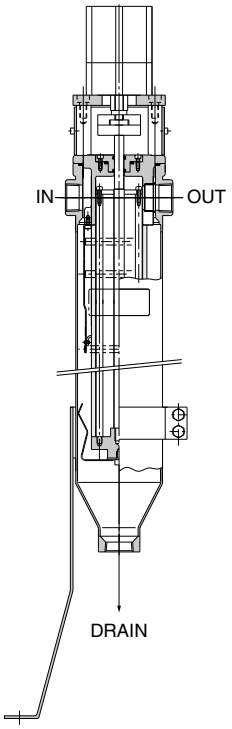
The Replacement Procedure is on p. 766

Replacement Parts and Seal List

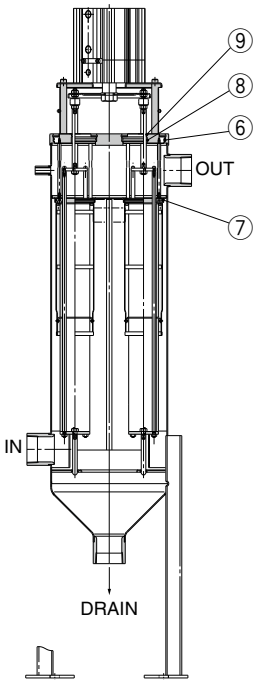
FN11□1□-10-S□□□□



FN11□2□-10-S□□□□



FN4102□-20-S□



∗ The numbers correspond with those in the "Replacement Parts and Seal List" of the FN1/FN4 series in the **Web Catalog**.

Replacement Parts

No.	Description	Qty.	Material
⑤	**O-ring**	1	NBR or FPM
⑥	**Penta seal**	1	
⑦	**O-ring**	1	
⑧	**Scraper**	1	
⑨	**O-ring**	1	

Replacement Parts: Seal Kit

Model	Part no.	Material	Note
FN11□□N	**KT-FN11N**	NBR	Items ⑤ through ⑨ from the above chart, 1 pc. each
FN11□□V	**KT-FN11V**	FPM	

Replacement Element

Model	Part no.	Qty.	Note
FN11□1□	END100-005	1	5 μm, Cylindrical type
	END100-020	1	20 μm, Cylindrical type
	END110-005	1	5 μm, Step type
FN11□2□	END200-005	1	5 μm, Cylindrical type
	END200-020	1	20 μm, Cylindrical type
	END210-005	1	5 μm, Step type

Replacement Parts

No.	Description	Qty.	Material
⑥	**O-ring**	1	NBR or FPM
⑦	**O-ring**	1	
⑧	**Penta seal**	1	
⑨	**Scraper**	1	

Replacement Parts: Seal Kit

Model	Part no.	Material	Note
FN4102N	**KT-FN41N**	NBR	Items ⑥ through ⑨ from the above chart, 1 pc. each
FN4102V	**KT-FN41V**	FPM	

Replacement Element

Model	Part no.	Qty.	Note
FN4102□	END400-005	1	5 μm, Cylindrical type
	END400-020	1	20 μm, Cylindrical type

FN1/FN4 Series ③

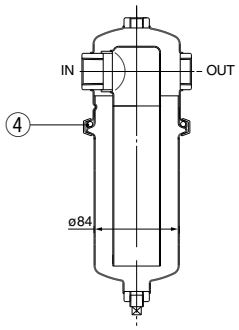
Options (Sold separately)

Reservoir Tank: FNR Series

This tank is used to store a sufficient amount of fluid for back-flushing (For the FN1 series).

∗ It is not required for the FN4, which has a built-in tank.





How to Order

FNR10 0 N – 10

Size

Symbol	Capacity	Applicable model
0	1.1 L	FN11□1
1	1.8 L	FN11□2

Seal material

Symbol	Material
N	NBR
V	FKM

Port size

Symbol	Port size
10	Rc1

Replacement Parts

No.	Description	Material	Qty.	Note
4	**O-ring**	NBR	1	OR NBR-70-1 P85∗
		FKM	1	OR FKM-70 P85∗

∗ When ordering an O-ring, order the standard product shown in the note.

Specifications

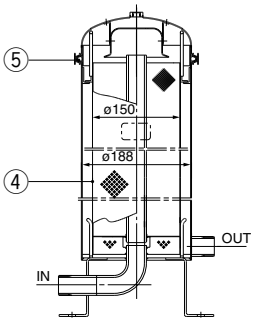
Model		FNR100N-10	FNR100V-10	FNR101N-10	FNR101V-10
Tank capacity		1.1 L		1.8 L	
Port size		Rc1			
Material	**Case & Cover**	Stainless steel 304			
	O-ring	NBR	FKM	NBR	FKM
Weight		1.5 kg		1.9 kg	
Applicable filter		FN11□1□ (Element L 250)		FN11□2□ (Element L 500)	

Dust recovery filter (Produced upon receipt of order)

This filter is for recovering dust from fluid after element back-flushing.

It enables the re-use of the element (Gold mesh).





How to Order

FND100 N – 10 – M 149 X0

Seal material

Symbol	Material
N	NBR
V	FKM

Port size

Symbol	Port size
10	R1

Element type

Symbol	Type
M	Gold mesh

Nominal filtration rating

Symbol	Nominal filtration rating
149	149 μm

Replacement Parts

No.	Description	Part no.	Material	Qty.
4	**Element**	EZH710AS-149	Stainless steel 304	1
5	**O-ring**	FGE-KT001	NBR	1
		FGE-KT002	FKM	1

Specifications

Model		FND100N-10-M149X0	FND100V-10-M149X0
Port size		R1	
Material	**Case & Cover**	Stainless steel 304	
	O-ring	NBR	FKM
	Element	Stainless steel 304	
Element nominal filtration rating		149 μm	
Weight		7.5 kg	

Note) Produced upon receipt of order

Replacement Procedure
Actuators

CJP2	Pin Cylinder	**p. 375**
CM2	Air Cylinder	**p. 377**
CVM	Valve Mounted Cylinder	**p. 377**
CG1	Air Cylinder	**p. 378**
CG3	Air Cylinder/Short Type	**p. 378**
CG5-S	Stainless Steel Cylinder	**p. 378**
MB	Air Cylinder	**p. 381**
MB1	Square Tube Type Air Cylinder	**p. 381**
CA2	Air Cylinder	**p. 381**
CS1	Air Cylinder	**p. 384**
CS2	Air Cylinder	**p. 384**
CUJ	Mini Free Mount Cylinder	**p. 386**
CQS	Compact Cylinder	**p. 387**
CQ2	Compact Cylinder	**p. 387**
RQ	Compact Cylinder with Air Cushion	**p. 387**
CXT	Platform Cylinder	**p. 387**
CVQ	Compact Cylinder/With Solenoid Valve	**p. 387**
HYQ	Hygienic Design Cylinder	**p. 394**
HYC	Hygienic Design Cylinder	**p. 394**
HYG	Hygienic Design Cylinder	**p. 398**
MY1B-□Z	Mechanically Jointed Rodless Cylinder/Basic Type	**p. 401**
MY1B	Mechanically Jointed Rodless Cylinder/Basic Type	**p. 403**
MY1M	Mechanically Jointed Rodless Cylinder/Slide Bearing Guide Type	**p. 405**
MY1C	Mechanically Jointed Rodless Cylinder/Cam Follower Guide Type	**p. 405**
MY1□W	Mechanically Jointed Rodless Cylinder/With Protective Cover	**p. 405**
MY1H-□Z	Mechanically Jointed Rodless Cylinder/Linear Guide Type	**p. 409**
MY1H	Mechanically Jointed Rodless Cylinder/Linear Guide Type	**p. 411**
MY2C	Mechanically Jointed Rodless Cylinder/Cam Follower Guide Type	**p. 412**
MY2H/HT	Mechanically Jointed Rodless Cylinder/Linear Guide Type	**p. 412**
MY3A	Mechanically Jointed Rodless Cylinder/Basic Type	**p. 413**
MY3B	Mechanically Jointed Rodless Cylinder/Basic Type	**p. 413**
MY3M	Mechanically Jointed Rodless Cylinder/Slide Bearing Guide Type	**p. 413**
CY3B-Z	Magnetically Coupled Rodless Cylinder/Basic	**p. 415-1**
CY3B	Magnetically Coupled Rodless Cylinder/Basic Type	**p. 416**
CY3R	Magnetically Coupled Rodless Cylinder/Direct Mount Type	**p. 417**
REAR	Sine Rodless Cylinder	**p. 417**
REBR	Sine Rodless Cylinder	**p. 417**
CY1S	Magnetically Coupled Rodless Cylinder/Slider Type: Slide Bearing	**p. 418**
CY1L	Magnetically Coupled Rodless Cylinder/Slider Type: Ball Bushing Bearing	**p. 419**
MXS	Air Slide Table	**p. 420**
MXQ	Air Slide Table	**p. 420**
MXQR	Air Slide Table/Reversible Type	**p. 420**
MXF	Low Profile Slide Table	**p. 425**
MXW	Air Slide Table	**p. 427**
MXP	Air Slide Table	**p. 430**
MXY	Air Slide Table/Long Stroke Type	**p. 433**
MGP	Compact Guide Cylinder	**p. 437**
MGPW	Compact Guide Cylinder/Wide Type	**p. 437**
MGQ	Compact Guide Cylinder	**p. 437**
MGF	Guide Table	**p. 441**
CXSJ/CXS/CXSW	Dual Rod Cylinder	**p. 443**
CLG1	Fine Lock Cylinder	**p. 444**
CL1	Lock-up Cylinder	**p. 447**
CNG	Cylinder with Lock	**p. 452**
MWB	Cylinder with Lock	**p. 455**
MNB	Cylinder with Lock	**p. 455**
CNA2	Cylinder with Lock	**p. 455**
CNS	Cylinder with Lock	**p. 461**
CLS	Cylinder with Lock	**p. 463**
REAS	Sine Rodless Cylinder	**p. 466**
REC	Sine Cylinder	**p. 467**
RHC	High Power Cylinder	**p. 469**
RZQ	3 Position Cylinder	**p. 472**
MK	Rotary Clamp Cylinder/Standard	**p. 476**
MK2T	Rotary Clamp Cylinder/Double Guide Type	**p. 481**
CKQG/CKQP	Pin Clamp Cylinder	**p. 484**
C(L)KQG32-X2082	Pin Clamp Cylinder/Compact Cylinder Type	**p. 496**
RSQ	Stopper Cylinder	**p. 499**
RSG	Stopper Cylinder	**p. 499**
RSH	Heavy Duty Stopper Cylinder	**p. 501**
RS2H	Heavy Duty Stopper Cylinder	**p. 501**
MIW/MIS	Escapements	**p. 504**
CH□KD	JIS Standard Compact Hydraulic Cylinder	**p. 506**
CH□KG	Compact Hydraulic Cylinder	**p. 507**
CHN	Small Bore Hydraulic Cylinder	**p. 508**
CHSD/CHSG	ISO Standard Hydraulic Cylinder	**p. 509**
CH2□	JIS Standard Hydraulic Cylinder	**p. 510**

⚠Caution

Ask SMC for replacing a seal if a tube inside diameter is 4 mm.

Tubes with a 4 mm I.D cannot be disassembled. If they need to be disassembled in order to replace the seal or for other purposes, please contact your SMC sales representative for the repair.

1. Disassembly of the Cylinder

1-1. Cleaning

Prior to disassembly, wipe off any dirt from the outside of the actuator. This will prevent the intrusion of dust and foreign objects during disassembly.

Take particular care on the surface of the piston rod.

1-2. Removal of the retaining ring

Remove the retaining ring with an appropriate pair of pliers.

1-3. Removal of the head cover

Remove the head cover from the body by pushing the piston rod to the head side.

1-4. Disassembly

Pull out the piston rod.

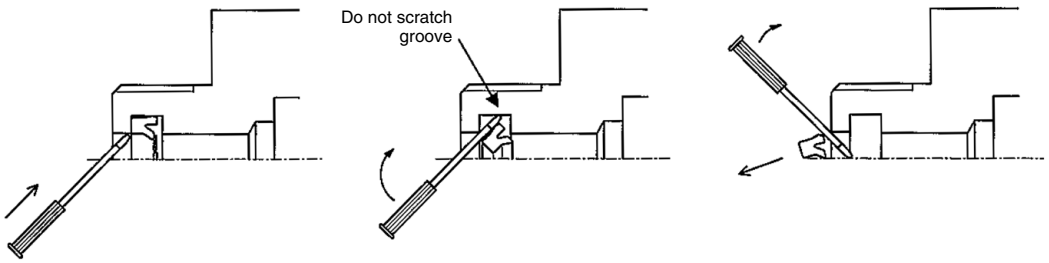
Take care not to scratch or mark the internal face of the body.

2. Removal of the Seal

2-1. Rod seal

Insert a watchmaker's screwdriver, etc. from the front of the body and prise the seal out.

Take care not to scratch or score the seal groove in the body.

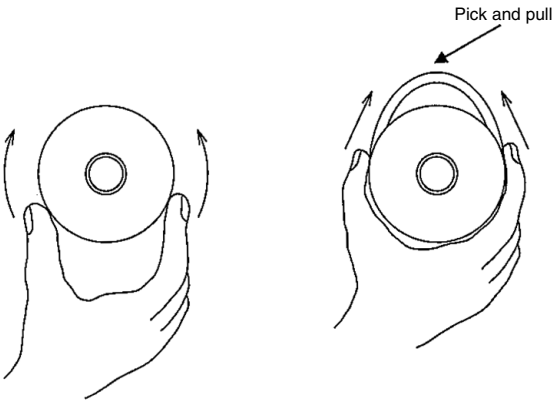


2-2. Piston seal

Push the piston seal partially to make it come off and pull it out manually.

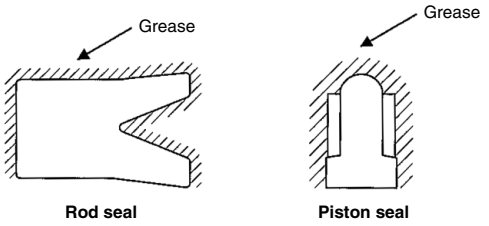
2-3. Gasket (See right)

Push the gasket partially to make it come off and pull it out manually.



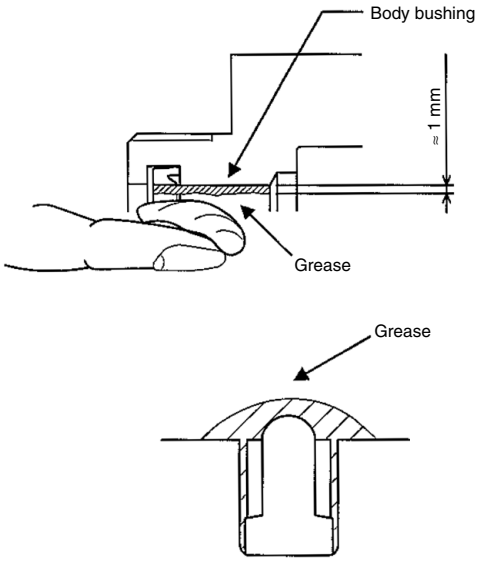
3. Application of Grease

3-1. Rod seal, piston seal
Apply the grease evenly all around the new seal.
3-2. Gasket
Spread a thin film of grease over the gasket.



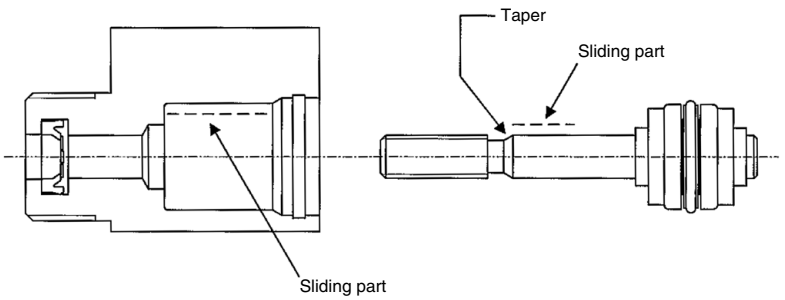
4. Mounting of the Seal

4-1. Rod seal
Mount the rod seal with attention to direction.
Then, apply the grease on the rod seal and the body bushing.
4-2. Piston seal
When mounting the seal, ensure there are no twists in the seal.
Also add the grease inside the groove.
4-3. Gasket
Pay attention not to make the gasket come off.



5. Application of Grease

5-1. Each component of the cylinder
Spread grease entirely over the parts shown.



6. Reassembly of the Cylinder

6-1. Insertion of the piston rod assembly
Insert the piston rod assembly in the body.
6-2. Insertion of the head cover assembly
Insert the head cover assembly in the body.
6-3. Mounting of the retaining ring
Mount the retaining ring with an appropriate pair of pliers.
6-4. Check the assembly condition.
Confirm that there is no air leakage from the seal and that the cylinder can operate smoothly at a minimum operating pressure.

⚠Caution

The cylinder of CM2/CVM series can not disassemble because the cover and the tube are connected by rolling caulking method.

1. Replacement of the Rod Seal

Replacement of the rod seal can be done even at the state of cylinder installed. As for replacement work, proceed as follows.

1-1. Demounting

When removing the retaining ring with a basic internal retaining ring fitting tool for hole (snap ring pliers) and pulling out the piston rod at the state of rod cover port stopped up by finger, the seal retainer and rod seal can be demounted.

1-2. Greasing

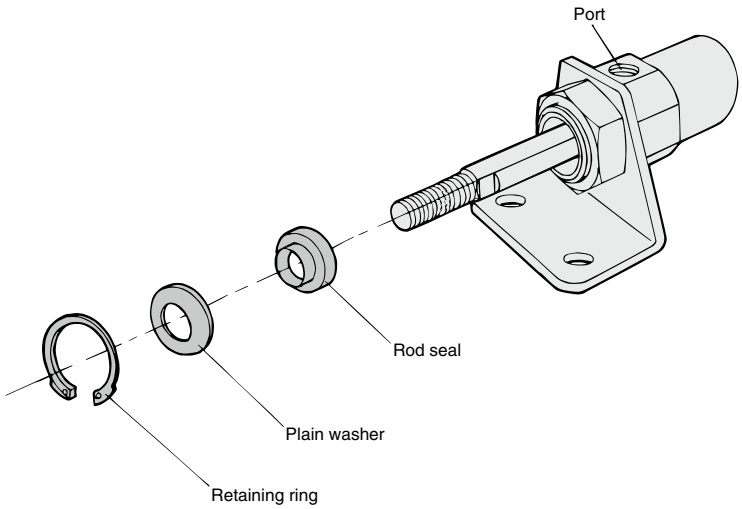
Use GR-S-010 grease for this product.

Fulling lubricate by grease on inner-and-outer peripheries of new rod seals for replacement. Moreover, fill grease into groove and slot portions.

1-3. Mounting

Mounting the rod seal with paying attention as to direction. Slowly push the rod seal with slight rotation when letting the thread part of piston rod tip and width across flat part pass through and surely install to the rod cover housing.

Then, mount in the order of the seal retainer and the retaining ring.



1. Replacement of the Seal

It is possible to replace the rod seal, piston seal, cylinder tube gasket for ø20 to ø40.

CBG1 Series

For ø20 to ø40, it is possible to replace the rod seal, piston seal, cylinder tube gasket, and lock piston seal.

⚠Warning

Only people who have sufficient knowledge and experience are allowed to replace seals.

The person who disassembles and reassembles the cylinder is responsible for the safety of the product. Repeatedly disassembling and reassembling the product may cause wearing or deformation of the screws as well as a decline in screw tightening strength. When reassembling the product, be sure to check the cover and tubing screws for wear, deformities, or any other abnormalities. Operating the product with damaged screws may result in the cover or tubing coming off during operation, which could lead to a serious accident. Caution must be taken to avoid such incidents.

⚠Caution

When replacing seals, take care not to hurt your hand or finger on the corners of parts.

2. Disassembly/Reassembly

⚠Caution

Disassemble and assemble the cylinder in a clean area. Perform on a clean cloth.

For disassembling, hold the flats of the tube cover gently in a vice and hold the flats of the rod cover with a wrench or monkey wrench to loosen and remove the rod cover. When reassembling, tighten 0 to 2 degrees more than the original position before disassembling.
Bore size of ø50 or more cannot be disassembled because they are tightened to a high torque.
Contact your SMC sales representative if you need to disassemble these products.
For single-acting type, please be noted that the cover might pop up due to the internal spring.

CG5-S Series

The cover and cylinder tube are tighten with Loctite 542 as seal in order to prevent from leakage. Remove old loctite completely and put new loctite when reassemble cylinder.

3. Removal of the Seal

3-1. Rod seal

Insert a watchmaker's screwdriver from the front of the cover to pull out the seal as shown in Fig. 1.

⚠Caution

Take care not to damage the seal groove of the cover at this time.

CG5-S Series

Whole rod cover assembly need to be changed when rod scraper of water resistant type is worn.

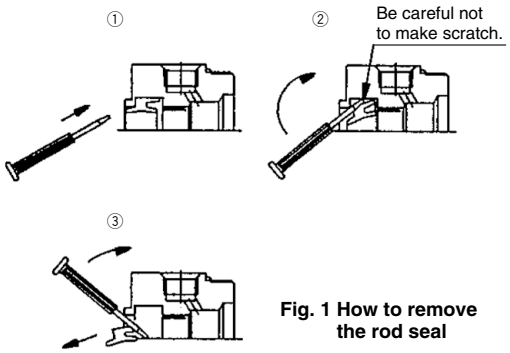


Fig. 1 How to remove the rod seal

CG5-S Series

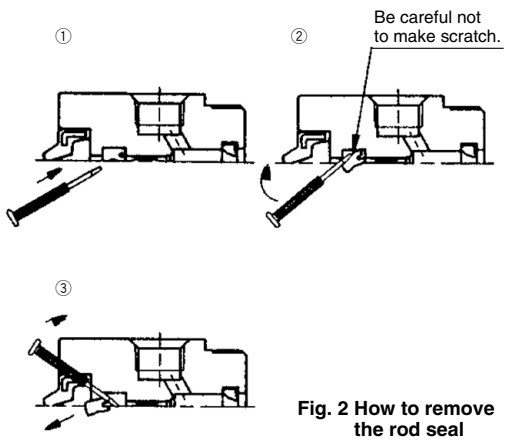


Fig. 2 How to remove the rod seal

3-2. Piston seal

Wipe off grease around the piston seal first to make removal easier.

Hold the piston seal with one hand and push it into groove so that piston seal can be lifted off and pulled out without using a watchmaker's screwdriver. (Fig. 3)

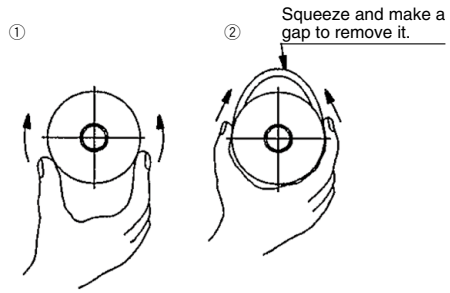


Fig. 3 How to remove the piston seal

3-3. Tube gasket
Remove the tube gasket with the watchmaker's screwdriver or the like.

3-4. Valve seal, valve retaining gasket (For the CBG1/CG5 air cushion type only)
After disassembling by referring to Fig. 4, pull out them with a watchmaker's screwdriver.

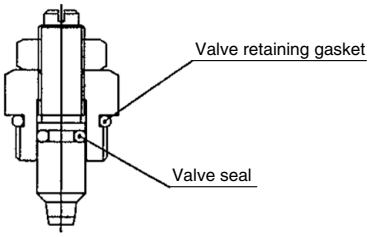


Fig. 4 Positions of the valve seal and valve retaining gasket

3-5. Lock piston seal (End lock section)

CBG1 Series

a. Insert the manual bolt through the rubber cap of the end lock unit (This is not necessary for –*L lock type).
b. Unscrew the 2 hexagon socket head cap screws and pull out the end lock unit.
c. For ø20 to ø63, remove the lock piston seal.
d. For ø80 and ø100, remove the seal retainer and lock piston seal.

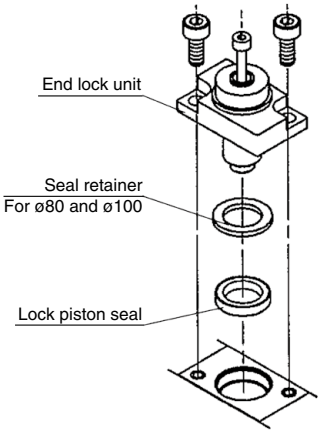


Fig. 5 How to remove the lock piston seal

4. Application of Grease

⚠Caution

For types other than the CG5:
Use JIS Class 2 lithium soap base grease.
For the CG5:
Use the specified grease.
If grease other than the specified grease is used, it may result in the malfunction of the product.
Grease pack for the CG5 part number: GR-R-010 (10 g) [Grease for food processing equipment]
Order the required number of grease packs.

4-1. Rod seal, lock piston seal
Lightly apply grease to the circumference of a new seal to make mounting easier and have better contact with the cover. Fill in the groove with grease since this is necessary for operation.

4-2. Piston seal
Lightly and evenly apply grease to the inner and outer circumferences for easier mounting on the piston.

4-3. Tube gasket
Lightly apply grease. This prevents its drop when assembling the cylinder.

4-4. Valve seal and valve retaining gasket (Air cushion type only)
Lightly apply grease. This prevents their drop when assembling the valve.

4-5. Cylinder component parts
Apply grease to each component parts of the cylinder in Fig. 6. Appendix table shows the grease amount required for a cylinder with a 100 mm stroke. For your reference, amount taken with a forefinger is about 3 (g).

$L \approx 100$ mm, or stroke x $\frac{1}{2}$

CG1 Series

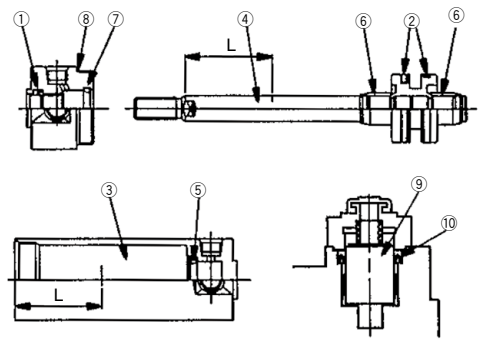
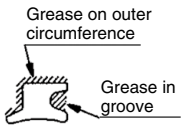
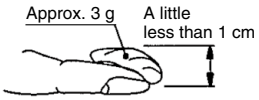


Fig. 6 Grease application points

CBG1 Series/ End lock section



①Rod seal



Grease amount

Grease application amount (g)

Stroke \ Bore size	ø20	ø25	ø32	ø40	Application points
100 stroke	2	3	3	3 to 4	①②③④⑤⑥⑦⑧⑨⑩
Additional 50 stroke	0.5	0.5	0.5	1	③④

∗ Rubber bumper type does not have ⑤, ⑥, and ⑦.
∗ ⑨ and ⑩ are the end lock parts of the CBG1 series.

CG3 Series

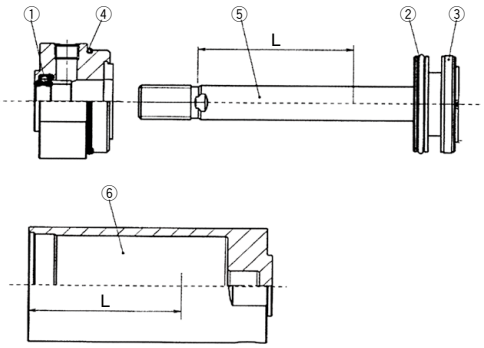


Fig. 7 Grease application points

Grease application amount (g)

Stroke \ Bore size	ø20	ø25	ø32	ø40	Position for grease
100 stroke	2	3	3	3 to 4	①②③④⑤⑥
Additional 50 stroke	0.5	0.5	0.5	1	⑤⑥

5. Mounting of the Seal

5-1. Rod seal
Be careful with the direction of seal while mounting. Apply grease to the seal and the inner circumference of the bushing as Fig. 8. For small bore sizes, use a watchmaker's screwdriver to apply grease.

5-2. Piston seal
After mounting the seal, rub grease into the seal groove and the outer circumference of the seal as Fig. 9.

5-3. Tube gasket (Excludes the CG5)
Install the tube gasket to the cover.

5-4. Valve seal, valve retaining gasket (For the CBG1/CG5 air cushion type only)
By referring to Fig. 4, install them to the specified position.

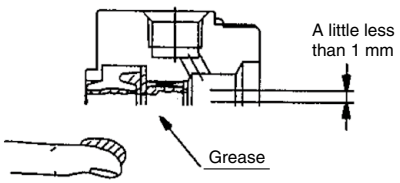


Fig. 8 Rod seal

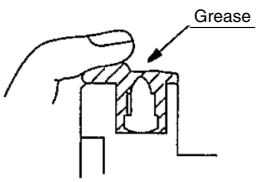


Fig. 9 Piston seal

CG5-S Series

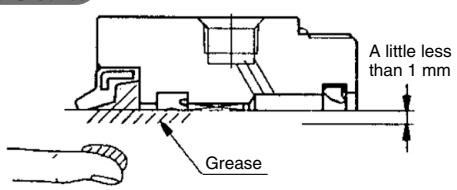


Fig. 10 Rod seal

⚠Caution

Make sure that there is nothing wrong with operation and air leakage when assembly is completed.

1. Disassembly of the Cylinder

The cylinder needs to be disassembled and assembled in a clean area.

MB/MB1 Series

For work tools, refer to the Table 1.

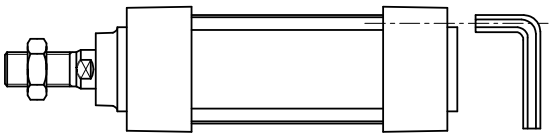


Table 1 Work tools

Bore size	Width across flats of a hexagon wrench	
	When removing the support bracket	When removing the tie-rod nut
32, 40	4	6
50, 63	5	8
80, 100	6	10
125	8	12

CA2 Series

For work tools, refer to the Table 2.

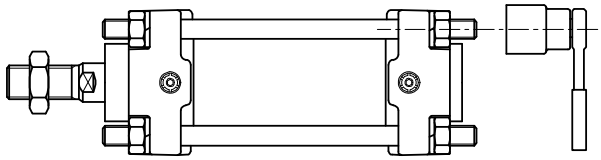


Table 2 Work tools

Bore size	Applicable socket
40, 50	13 (M8)
63	17 (M10)
80, 100	19 (M12)

2. Removal of the Seals

2-1. Rod seal, cushion seal
Insert a watchmaker's screwdriver to pull out the seals.
Take care not to damage the seal groove of the cover. (Fig. 1)

2-2. Piston seal
Remove it as in Fig. 2.

2-3. Tube gasket
Remove it in the same way as Fig. 2.

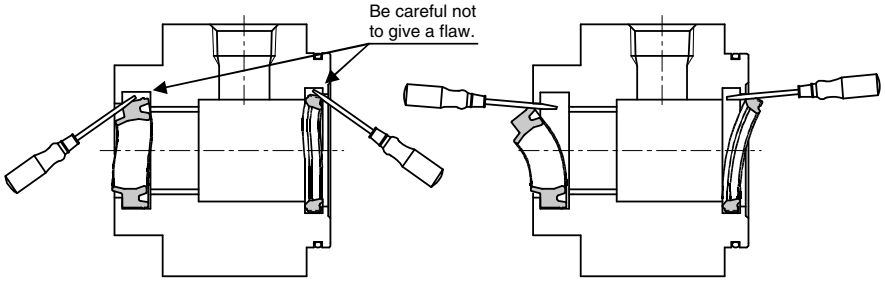


Fig. 1 Removal of the rod seal, cushion seal

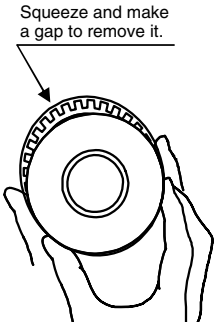


Fig. 2 Removal of the piston seal

3. Application of Grease to the Seal

3-1. Apply grease slightly to the outer circumference of each seal.
3-2. Fill in the groove of the rod seal with grease.

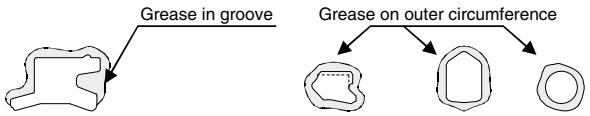


Fig. 3 Grease to the seals

4. Mounting of the Seals

4-1. Rod seal, cushion seal
Mount the seal in the correct direction by bending the seal with fingers as Fig. 4.
4-2. Piston seal
Mount the seal while stretching it as in Fig. 5.

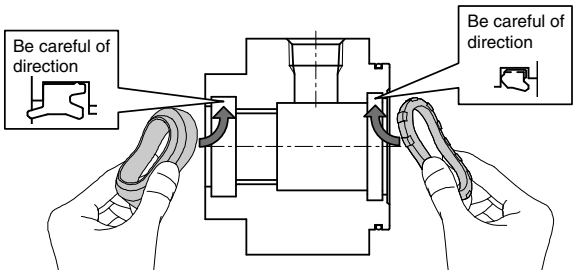


Fig. 4 Mounting of the rod seal, cushion seal

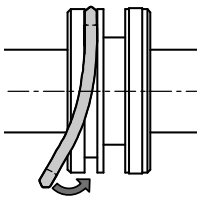


Fig. 5 Mounting of the piston seal

5. Application of Grease

5-1. Rod seal, cushion seal
Apply grease to the seal and the inner circumference of the bushing. (Fig. 6)
5-2. Piston seal
Rub grease into the seal groove and the outer circumference of the seal. (Fig. 7)
5-3. Cylinder component parts
Apply grease to each component parts of the cylinder in Fig. 9. Appendix table shows the grease amount required for a cylinder with a 100 mm stroke. For your reference, amount taken with a forefinger is about 3 g. (Fig. 8)

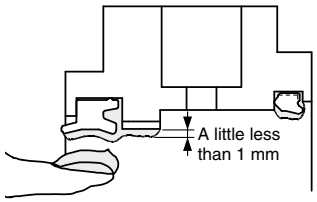


Fig. 6 Rod seal Cushion seal

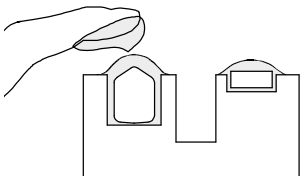


Fig. 7 Piston seal

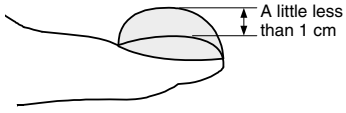


Fig. 8 Grease amount

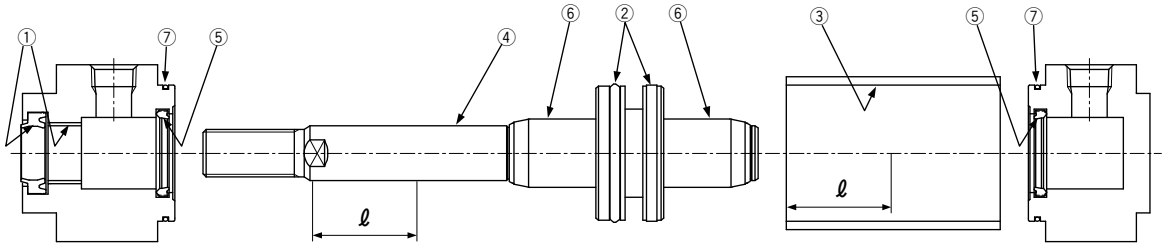


Fig. 9 Grease application points

$\ell = \frac{\text{STROKE}}{2}$ or 100 mm and more

Table 3 Grease application amount (g)

Stroke	Bore size							
	32	**40**	**50**	**63**	**80**	**100**	**125**	Application points
100 stroke	3 to 4	3 to 4	3 to 5	4 to 5	6 to 8	8 to 10	15 to 17	①②③④⑤⑥⑦
Additional 50 stroke	1	1	1	1.5	2	3	3	③④

∗ Use GR-S-010 (10 g) or GR-S-020 (20 g) grease.

6. Reassembly of the Cylinder

6-1. Make sure no particles are present. Do not scratch the seals.

6-2. To assemble the tie-rod to the cylinder, tighten the tie-rod to the shorter screw side by hand.

6-3. Set the tie-rod nuts from the cover on the opposite side. Tighten the tie-rod nut so that the tensile force is even.
Refer to the appropriate tightening torque of Table 4 and 5.
As for tightening brackets, refer to the same table.

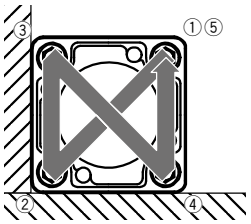


Fig. 10 Tie-rod tightening order

MB/MB1 Series

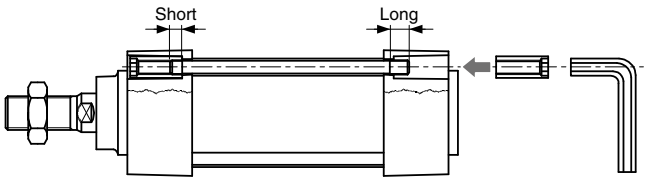


Table 4 Appropriate tightening torque

Bore size	**Appropriate tightening torque** (N·m)
32, 40	5.1
50, 63	11.0
80, 100	25.0
125	30.1

CA2 Series

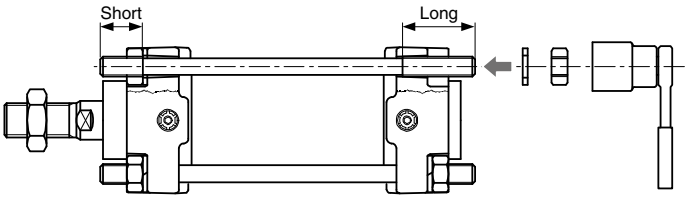


Table 5 Appropriate tightening torque

Bore size	**Appropriate tightening torque** (N·m)
40, 50	7.4
63	20
80, 100	29

1. Disassembly

1-1. Disassembly should be done in a wide space containing little dust.

1-2. After removing the cylinder, be sure to protect the end of piping port and rubber hose on the machine side with a clean cloth to prevent dust from entering.

1-3. Disassemble the unit with care to prevent damage to the sliding portion.

1-4. Check the double chamfered portion at the rod end for burrs to prevent damage to the seal and the bushing when removing the cover (push plate) from the piston rod. If burrs are found, remove them with a "file".

1-5. Loose either of nuts for tie-rod with "ratchet handle for socket wrench", "T-type slide handle for socket wrench" or "spinner handle for socket wrench", etc. and remove it from the tie-rod. Please refer to the table for "socket for socket wrench."

***CS1** Series*

Bore size (mm)	Nut	Applicable socket
125, 140	Class1, M14 x 1.5	JISB4636 Dodecagon 22
160	Class1, M16 x 1.5	JISB4636 Dodecagon 24
180	Class1, M18 x 1.5	JISB4636 Dodecagon 27
200	Class1, M20 x 1.5	JISB4636 Dodecagon 30
250	Class1, M24 x 1.5	JISB4636 Dodecagon 36
300	Class1, M30 x 1.5	JISB4636 Dodecagon 46

***CS2** Series*

Bore size (mm)	Nut	Applicable socket
125, 140	Class2, M14 x 1.5	JISB4636 Dodecagon 22
160	Class2, M16 x 1.5	JISB4636 Dodecagon 24

1-6. Remove the 4 tie-rods from the cover.

1-7. Remove the push plate (rod cover) from the piston rod with care to prevent damage to the seal and bushing.

1-8. Pull the piston rod and pull out the piston from the cylinder tube.

1-9. Remove the cylinder tube from the head cover.

1-10. Disassembly of the rod cover (For the head cover, it should also be in accordance with this procedure.)

***CS1** Series*

a. Remove the cylinder tube gasket. When excessive deformation or cut is found with the gasket, replace it.

b. Remove the cushion cover from the cover with a "flat head screwdriver."
(Tool: A screwdriver, Nominal size 8 x 150 Normal type, Normal class)

c. Remove the cushion valve seal from the cushion valve with a cloth.

d. Loosen the hexagon socket head cap screw for push plate by using "hexagon wrench" and remove the push plate. Applicable "Hexagon wrenches" are shown in the table below.

Bore size (mm)	Hexagon socket head cap screw	Nominal size of wrench
125, 140, 160	M8 x 1.25 x 25L	6
180, 200	M10 x 1.5 x 30L	8
250, 300	M12 x 1.75 x 35L	10

e. Remove the wiper ring. If it cannot be removed by hand, use a small "flat head screwdriver" and remove it with care to prevent damage to it.

f. Remove the rod seal by using a small "flat head screwdriver" with care to prevent damage to it.

g. Remove the push plate gasket.

h. Since the cushion seal is pressed fit, air will leak from the portion where the cushion seal is pressed fit due to damage or change in pressing force. Therefore, when the cushion seal should be replaced, the rod cover assembly and the head cover assembly should be replaced. (For those that are to be assembled with the Class 2 pressure vessel, the rod and head covers cannot be replaced. Please consult SMC as required.)

i. Since the bushing is pressed fit into the push plate, it is difficult to remove structurally and even if it is removed, stock for press fit lowers when it is pressed fit again. Therefore, when it is replaced, replace the push plate assembly.

***CS2** Series*

a. Remove the cylinder tube gasket. When excessive deformation or cut is found with the gasket, replace it.

b. Pick out the rod seal with a small flat head screwdriver carefully not to damage seal and rod cover.

c. Remove the cushion seal from the cover with a small flat head screwdriver carefully not to damage seal and rod cover.

d. The bushing is pressed fit to the rod cover and difficult to remove. Even if it can be removed, the allowance for press-fit is reduced, which requires the replacement as a rod cover assembly.

2. Replacement of the Seal

2-1. Removal of the seal

Please refer to "1. Disassembly" for dismantling of the wiper ring, rod seal, valve seal, tube gasket, and push plate gasket.

Since piston seal has a deep groove for sealing, use your hand (not a watchmaker's screwdriver) and push from one side of seal and pull it out when it lifts off.

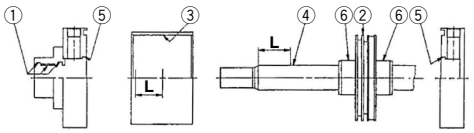
2-2. Application of grease

a. Seal: Apply thin coat of grease.

b. Cylinder component

Apply grease to the individual components as the figure below. The table shows the grease amount required for a cylinder with a 100 mm stroke.

CS1 Series

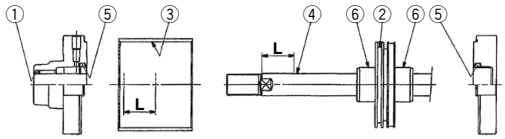


Grease application amount (g)

Bore size (mm)	125	140	160	180	200	250	300	Portion to apply
100st	15 to 17	20 to 22	24 to 26	27 to 29	30 to 32	33 to 35	36 to 38	① to ⑥
Additional 50st	3	3	3	4	4	5	5	③④

For grease, use lithium soap group grease JIS #2.

CS2 Series



$$L = \frac{\text{STROKE}}{2} \text{ or 100 mm and more}$$

Grease application amount (g)

Bore size (mm)	125	140	160	Portion to apply
100st	15 to 17	20 to 22	24 to 26	① to ⑥
Additional 50st	3	3	3	③④

For grease, use lithium soap group grease JIS #2

2-3. Mounting of the seal

CS1 Series

a. Wiper ring/Rod seal
Mount it in correct direction.

b. Seals other than wiper ring
After mounting seals, apply grease on the inside diameter surfaces of the bushing (rubbing grease into surface).

CS2 Series

a. Cushion seal/Rod seal
Mount in correct direction.

b. Seals other than rod seal and cushion seal (Mounting directionless seals)
After mounting seals, apply grease on the inside diameter surfaces of the bushing (rubbing grease into surface).

3. Assembly

3-1. Before assembling the cylinder, be sure to clean each part to remove dust.

3-2. Before assembling the cylinder, apply enough grease to the rod, bushing, tube, and seal.

3-3. For rusty part, remove the rust completely.

3-4. Assembly should be done in a clean area with care to prevent foreign objects from entering.

3-5. Mount seal with care to prevent damage to it.

3-6. Insert the piston into the tube or rod into the bushing with care to prevent damage to each seal.

3-7. Tighten the tie-rods and bolts with the appropriate torque shown in the table below.

CS1 Series

Tightening torque (N·m)

Bore size (mm)		125	140	160	180	200	250	300
Tie-rod	Steel tube	49		75.5	103	147.1	254	451.1
	Aluminum tube	39.2		62.8	92.7	132.4	–	–
Push plate bolt		11			22		38	

CS2 Series

Tightening torque (N·m)

Bore size (mm)	125	140	160
Tightening torque	39.2		62.8

1. How to Disassemble

1-1. Disassembly

a. ø4 to ø10

Lightly hold the cylinder tube in a vice. Use a wrench on the width across flats of the rod cover and turn it counterclockwise to detach the rod cover.

b. ø12 to ø20

Remove the retaining ring with an appropriate pair of pliers (tools for installing a basic internal retaining ring).

Moreover, please note that the retaining ring comes off from pliers when detaching it, it flies, and the human body and peripherals might be disadvantaged.

1-2. Removal of the existing seal

For piston seal and tube gasket (O-ring), pick their edges and pull them out of the groove.

For rod seal, use a fine watchmaker's screwdriver to remove it from the seal groove. At that time, be careful not to scratch the inside of the groove and bearing.

2. How to Assemble

2-1. Mounting of the seal

a. Tube gasket (O-ring)

Spread the surface of the tube gasket with special grease included in a seal set and mount the gasket in the specified groove. (For double acting cylinders only.)

b. Piston seal

Fill a concavity at the side of piston seal with the special grease. Then, mount the seal in the specified groove without a twist.

c. Rod seal

Spread the entire rod seal and fill U-shape groove with the special grease. Then, mount the rod seal in the specified groove. Make sure to mount it in the right direction. (For double acting cylinders only.)

2-2. Application of grease to the cylinder tube

It is recommended that grease should be applied to cylinder tube in case of seal replacement.

Wipe existing grease with a cloth. Be careful not to scratch the inside of cylinder tube and leave out any fiber of the cloth as well. Air leakage may occur otherwise.

2-3. Assembly

a. ø4 to ø10

After attaching the piston rod assembly to the rod cover assembly, set them into cylinder tube.

Tighten the rod cover with the torque specified below.

Tightening torque

ø4	ø6	ø8	ø10
0.97 N·m ± 10%	3.08 N·m ± 10%	5.02 N·m ± 10%	5.63 N·m ± 10%

b. ø12 to ø20

After connecting the piston rod assembly to rod cover assembly, set them into cylinder tube, and install the retaining ring with an appropriate pair of pliers (tool for installing a basic internal retaining ring).

Pay attention that the ring will slip off from the pliers, and cause injury or damage to peripheral equipment. Additionally, ensure the retaining ring is mounted properly into the retaining ring groove.

3. Inspection

Inspect cylinders with replaced seal for proper operation and air leakage so as to confirm there is no defect before use.

Disassembly/Reassembly

Disassemble and assemble the cylinder in a clean area. Perform on a clean cloth.

For disassembling, hold the flats of the tube cover gently in a vice and hold the flats of the rod cover with a wrench or monkey wrench to loosen and remove the rod cover. When reassembling, tighten 2 degrees more than the original position before disassembling.

⚠ Caution

1. For installation and removal, use an appropriate pair of pliers (tool for installing a basic internal retaining ring).

Even if an appropriate pair of plier (tool for installing a basic internal retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a basic internal retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

2. Only people who have sufficient knowledge and experience are allowed to replace seals.

The person who disassembles and reassembles the cylinder is responsible for the safety of the product.

3. When replacing seals, take care not to hurt your hand or finger on the corners of parts.

CBQ2 Series

When more grease is needed due to the maintenance of the cylinder, etc., please order grease pack, which is available separately.

Lock holder mounting bolt is included for ø20 to ø63. Be sure to exchange it when disassembling and re-assembling the cylinder, or it may cause of the air leakage.

1. Disassembly of the Cylinder

See the structural drawing and structural parts for disassembly.

1-1. Cleaning of the external surface

Remove dusts and foreign objects from the external surfaces to prevent them from entering the cylinder during disassembly. In particular, the surface of the piston rod and the collar should be cleaned carefully.

1-2. Removal of the retaining ring

Use an appropriate pair of pliers (tool for installing a basic internal retaining ring) for removing the retaining ring. Pay attention that the ring will slip off from the end of the pliers, and cause injury or damage to peripheral equipment.

CQ2K Series

Removal of the rod cover holding bolt and the collar holding retaining ring.

a. Bore size ø12 to ø32

Remove the hexagon socket head cap screw holding the rod cover with a hexagon wrench.

b. Bore size ø40 to ø63

Remove the retaining ring with an appropriate pair of pliers (tool for installing a basic internal retaining ring), and remove the hexagon set screw on the side of the cylinder tube with a hexagon wrench (2 mm width across flats). Be careful not to let the ring slip from the end of the pliers as it may cause injury or damage to surrounding equipment.

1-3. Disassembly

Pull out the rod cover and the collar through the bolt or nut mounted on the piston rod end, and take the collar out from the piston rod. At that time, take care not to damage the internal surface of the cylinder tube and the bushing of the collar.

CBQ2 Series

a. Removal of the end lock: Fig. 1.

Lock piston seal

Insert the manual bolt and screw it in over the rubber cap of the end lock unit to the internal lock piston. (It is not necessary for –∗L. lock type)

Remove the 2 hexagon socket head cap screws and pull off the end lock unit.

As for ø20 to ø63, remove the locking piston seal.

As for ø80 and ø100, remove the seal retainer and lock piston seal.

Then, remove the lock holder mounting bolt and remove the lock unit and the gasket.

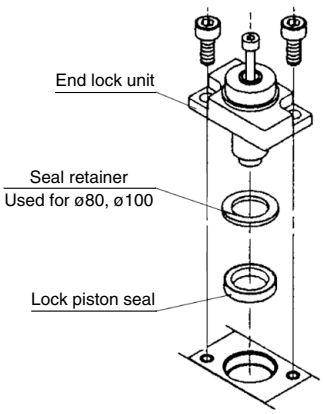


Fig. 1 How to remove the end lock

2. Removal of the Seal

2-1. Rod seal

Tool: A watchmaker's screwdriver, etc.

Insert a watchmaker's screwdriver from the front side of the cover as shown in Fig. 2.

Take care not to damage the seal groove of the cover at this time.

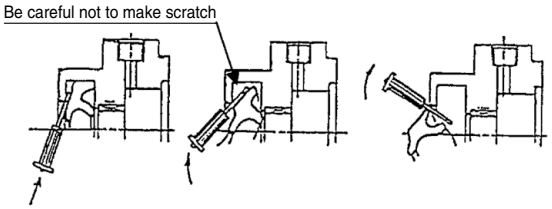


Fig. 2 Removal of the rod seal

CQ2 Series

Insert a watchmaker's screwdriver into the rod cover and collar to pull out the rod seal. Do not to damage the seal groove on the collar at this time.

2-2. Piston seal

Wipe off grease around the piston seal first to make removal easier.

Hold the piston seal with one hand and push it into groove so that piston seal can be lifted off and pulled out without using a watchmaker's screwdriver. (Fig. 3)

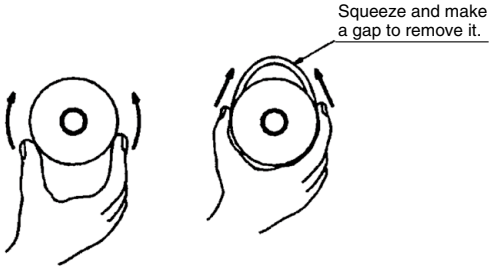


Fig. 3 Piston seal

2-3. Tube gasket

Remove the tube gasket with a watchmaker's screwdriver or the like.

3. Application of Grease

3-1. Rod seal

Apply grease around the replacement seal. Fill grease in the groove. (Fig. 4)



Fig. 4 Rod seal

3-2. Piston seal

Apply grease thinly and evenly to the external and internal peripheries of the piston seal to ensure easy fitting to the piston.



Fig. 5 Piston seal

3-3. Tube gasket

Thinly apply grease to the tube gasket. Grease will help prevention of dropping off during fitting the cylinder.

3-4. Cylinder parts

Apply grease to all points of cylinder parts as shown in Fig. 6. Grease in quantities show in Table 1 are required for each of 100 mm stroke cylinders in accordance with their diameters.

The quantity of grease taken up by the forefinger as shown in Fig. 8 is approx. 3 g.

$$L \approx 100 \text{ mm or Stroke} \times \frac{1}{2}$$

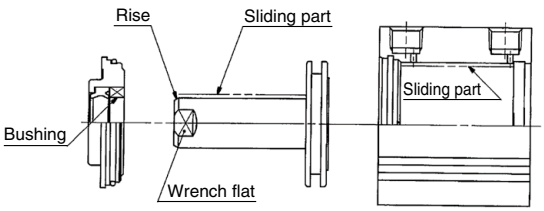


Fig. 6 Grease application points

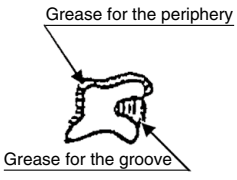


Fig. 7



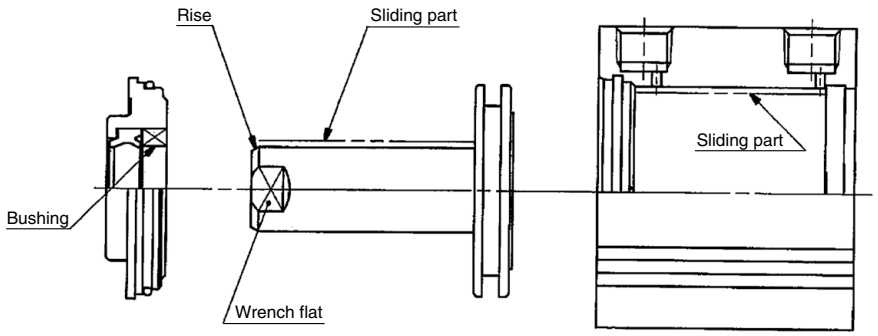
Fig. 8 Grease amount

Table 1 Grease application amount (g)

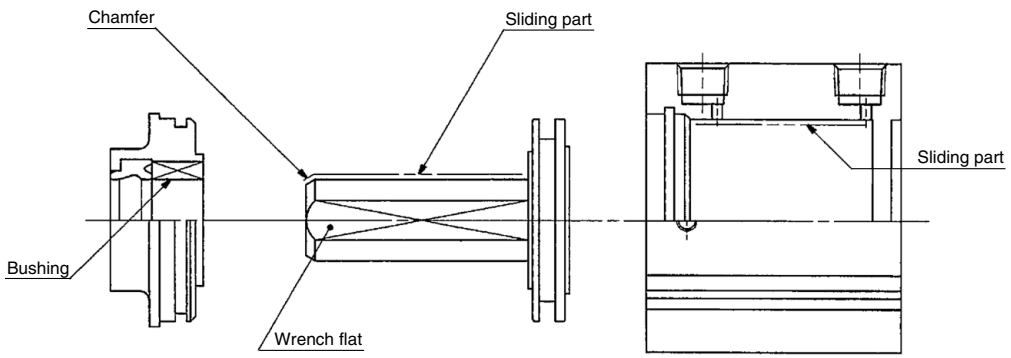
Stroke \ Bore size (mm)	20	25	32	40	50	63	80	100
100 stroke	2	3	3	3 to 4	3 to 5	4 to 5	6 to 8	8 to 10
Additional 50 stroke	0.5	0.5	0.5	1	1	1.5	1.5	2

b. Apply grease to the sliding part of each part.

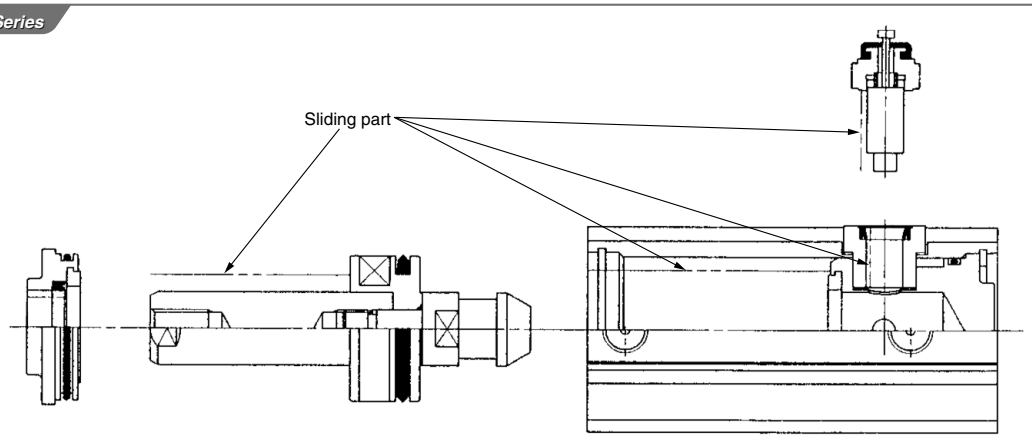
CQ2/RQ Series



CQ2K Series



CBQ2 Series



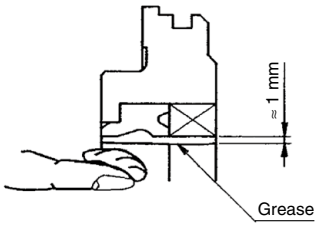
4. Mounting of the Seal

4-1. Rod seal

Mount the seal in the correct direction.

After mounting, apply grease to the seal and bushing evenly.

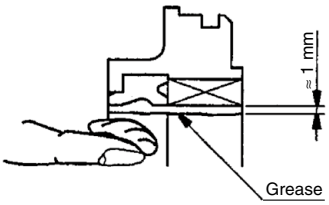
For small diameter cylinders, apply grease with a watchmaker's screwdriver.



CQ2K Series

To mount the rod seal in the correct direction, the whole internal sliding surface of the guide and rod seal should be visible when looking at the rod cover assembly from the piston side.

After mounting, apply grease to the seal and bushing evenly.



4-2. Piston seal

Mount without twisting. After mounting, apply grease to the external circumference of the seal, and the gap to the mounting groove.



4-3. Tube gasket

Mount the tube gasket on the cover.

5. Reassembly of the Cylinder

5-1. Insertion of the rod cover and collar to the piston rod
Apply grease to the piston rod end or 30° angled raise and wrench flat, and insert the collar gently with care not to damage the rod seal.

5-2. Insertion of the piston, rod cover and collar to the cylinder tube.
Apply grease to appropriate parts of the cylinder tube, and insert the piston and collar gently without any damage to them by the retaining ring groove.

5-3. Mounting of the retaining ring
Use an appropriate pair of pliers (tool for installing a basic internal retaining ring). Pay attention that the ring will slip off from the pliers, and cause injury or damage to peripheral equipment. Additionally, ensure the retaining ring is mounted properly into the retaining ring groove.

CQ2K Series

a. Mounting of the rod cover holding bolt and collar retaining ring

1) Bore size ø12 to ø32
Tighten the hexagon socket head cap screw holding the rod cover with a hexagon wrench to the recommended tightening torque. (Refer to Table for the recommended tightening torque.)

2) Bore size ø40 to ø63
Position the collar so that the hole position on the external circumference aligns with the tap of the cylinder tube, and tighten the hexagon set screw to the recommended tightening torque. (Refer to Table for the recommended tightening torque.) Use an appropriate pair of pliers (tool for installing a basic internal retaining ring). Pay attention that the ring will slip off from the pliers, and cause injury or damage to peripheral equipment. Additionally, ensure the retaining ring is mounted properly into the retaining ring groove.

Bore size (mm)		Rod cover holding hexagon socket head cap screw	Collar holding hexagon set screw	Recommended tightening torque (N·m)
12	Without auto switch	M3 x 0.5 x *L	–	0.59 to 1.06
	With auto switch	M2.5 x 0.45 x 6L	–	0.33 to 0.61
16	Without auto switch	M3 x 0.5 x *L	–	0.59 to 1.06
	With auto switch	M2.5 x 0.45 x 6L	–	0.33 to 0.61
20	Without auto switch	M5 x 0.8 x *L	–	2.84 to 5.10
	With auto switch	M3 x 0.5 x 10L	–	0.59 to 1.06
25	Without auto switch	M5 x 0.8 x *L	–	2.84 to 5.10
	With auto switch	M4 x 0.7 x 10L	–	1.37 to 2.45
32		M5 x 0.8 x *L	–	2.84 to 5.10
40		–	M3 x 0.5 x 4L Truncated cone point	0.20 to 0.39
50		–	M4 x 0.7 x 6L Truncated cone point	0.20 to 0.39
63		–	M4 x 0.7 x 6L Truncated cone point	0.20 to 0.39

* *L: The length of the hexagon socket head cap screw depends on the stroke.

CBQ2 Series

a. Mounting of the end lock

Apply grease to the lock piston surface and internal lock holder. Insert the gasket and lock holder, then fix them with a new hexagon socket head cap screw which is attached to the seal kit.

Insert the end lock unit and fix it with a new hexagon socket head cap screw which is attached to the seal kit. (Fig. 9, 10, 11)

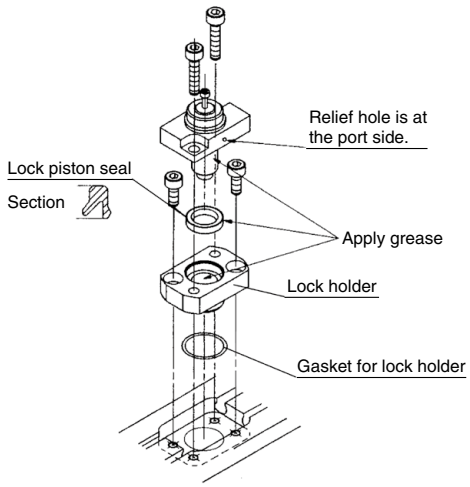


Fig. 9 Reassembling of the end lock part (ø20, ø25)

Tightening torque of bolts for the cap, lock holder

Hexagon socket head cap screw	Applicable bore size	Tightening torque
M3	ø20 to ø63	0.71 to 0.86
M5	ø80 and ø100	2.65 to 3.24

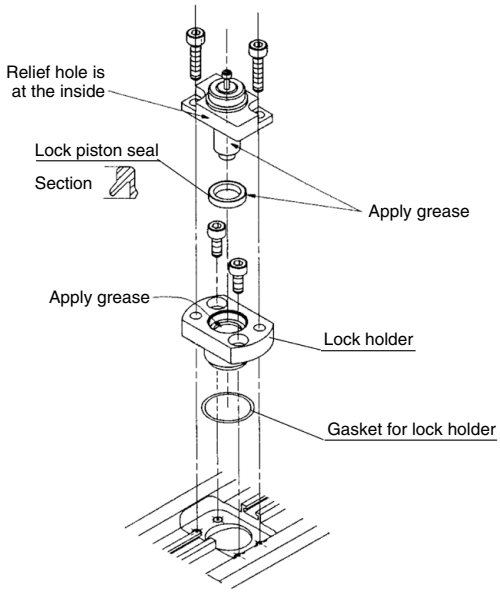


Fig. 10 Reassembling of the end lock part (ø32 to ø63)

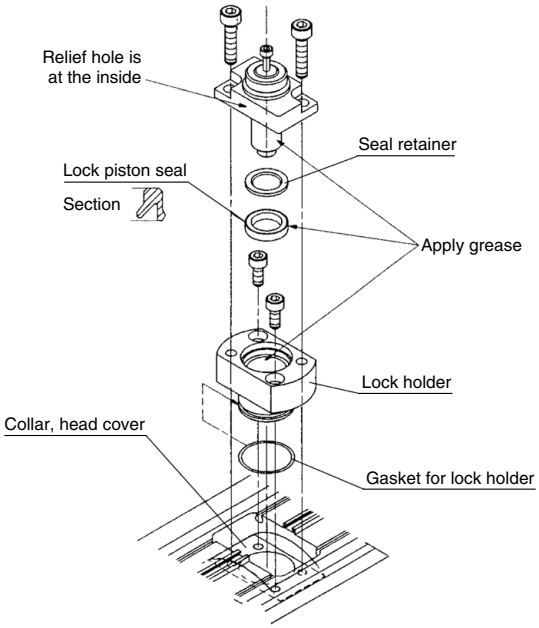


Fig. 11 Reassembling of the end lock part (ø80, ø100)

5-4. Check the assembly condition.
Confirm that there is no air leakage from the seal and that the cylinder can operate smoothly at a minimum operating pressure.

CXT Series

Replacement of the Driving Cylinder

1. Driving cylinder of this device is normal compact cylinder, so it is possible to replace it. The following is types of cylinder.

Applicable type	**Driving cylinder type**
CXT□12	CDQSB12-∗∗DC
CXT□16	CDQSB16-∗∗DC
CXT□20	CDQSB20-∗∗DC
CXT□25	CDQSB25-∗∗DC
CXT□32	CDQ2A32-∗∗DC
CXT□40	CDQ2A40-∗∗DC

Driving cylinder type ∗∗ indicates stroke.

2. Replacement procedures
Please comply with the following procedure as referring constructions on page 173.
   a. Disconnect connection between piston rod㉔ and adaptor⑩ with a wrench.
   b. Remove 4 bolts fixing plate② to the driving cylinder. Note)
   c. Replace the driving cylinder to another and fix it with 4 bolts. Please make sure that piston rod㉔ does not touch the inside of plate A② hole.
   d. Screw adapter⑩ in piston rod㉔ and tight it with a wrench.

Note) In case of a cylinder with short stroke, hexagon wrench sometimes does not apply between plate A② and slide block① due to its narrow space. In that case, replace the driving cylinder by removing plate A itself with loosening the 2 tightening bolts between plate A and guide axis④.

3. In case of replacing only seals etc. of cylinder, replace it after removing the cylinder on 2). Please refer to “Appendix. Replacement procedure of cylinder seal”

1. Disassembly of the Cylinder

1-1. Cleaning

Prior to disassembly, wipe off any dirt from the outside of the actuator. This will prevent the intrusion of dust and foreign objects during disassembly.

Take particular care on the surface of the piston rod.

1-2. Removal of the switch rail [if the switch is mounted]

Loosen the hexagon bolt and remove the switch rail and switch rail pedestal.

1-3. Removal of the rod cover

HYQ Series

Loosen the hexagon socket head cap screw and remove the rod cover.

HYC Series

Loosen the tie-rod nut and remove the rod cover.

1-4. Disassembly

Pull out the piston rod by holding a bolt or nut mounted on the piston rod end. Take care not to scratch or mark the internal face of the cylinder tube.

1-5. Removal of the head cover

HYQ Series

Loosen the hexagon socket head cap screw and remove the head cover.

HYC Series

Loosen the tie-rod nut and remove the head cover.

2. Removal of the Seal

2-1. Rod seal [Fig. 7]

Insert a watchmaker's screwdriver, etc. from behind the rod cover and prise the seal out. Take care not to scratch or score the seal groove in the rod cover.

HYQ Series

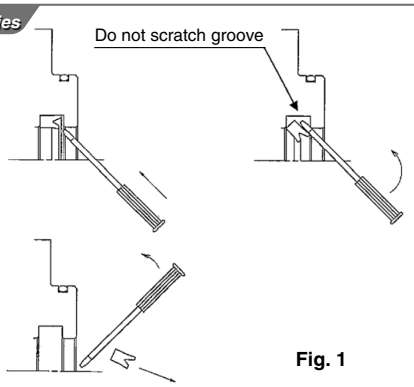


Fig. 1

HYC Series

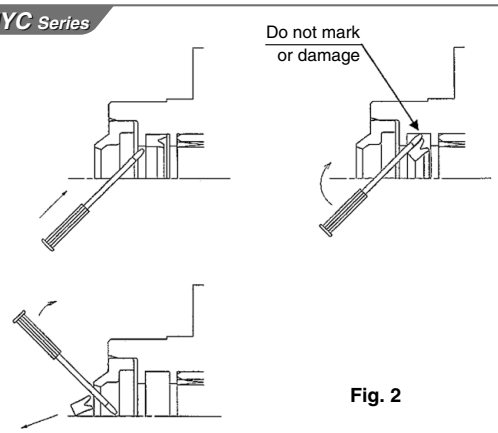


Fig. 2

2-2. Cushion seal

HYC Series

Insert a watchmaker's screwdriver, etc. from the front of the rod cover and take out. Take care not to mark or damage the seal groove of the rod cover. Likewise, insert the watchmaker's screwdriver, etc. from the front of the head cover and take out. Do not mark or damage the seal groove of the head cover. (Fig. 3)

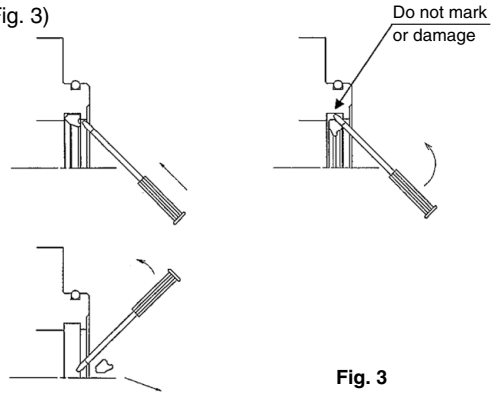


Fig. 3

2-3. Piston seal

Since the piston seal is inserted deeply, push it partially to make it come off and pull it out manually. Do not use a watchmaker's screwdriver. (Fig. 4)

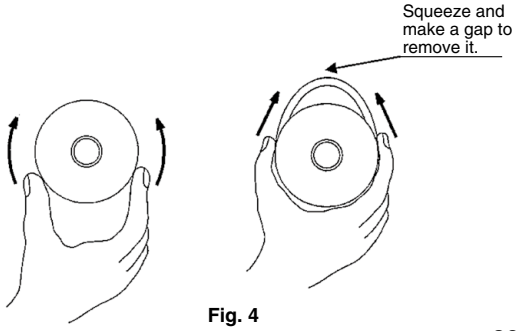


Fig. 4

2-4. Tube gasket
Push the tube gasket partially to make it come off and pull it out manually. (Fig. 4)

2-5. Needle scraper

HYC Series

Insert a tool with point end into the needle scraper and take out. Take care not to be injured. (Fig. 5)

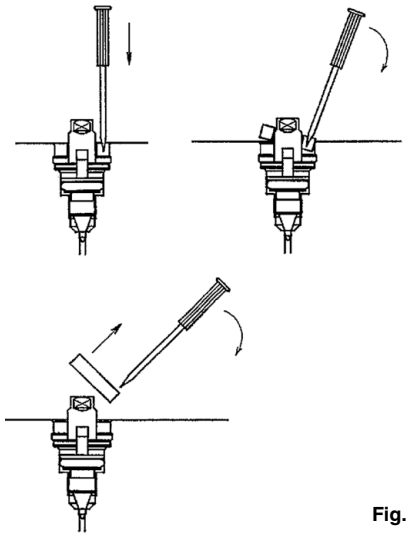


Fig. 5

3. Application of Grease

3-1. Rod seal, piston seal [Fig. 6, Fig. 7]
Apply the grease all around a new seal evenly. Also add the grease inside the groove.

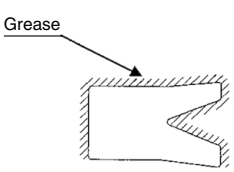


Fig. 6 Rod seal

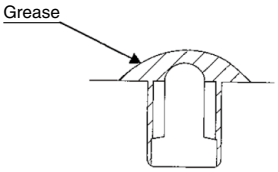


Fig. 7 Piston seal

3-2. Cushion seal [Fig. 8]

HYC Series

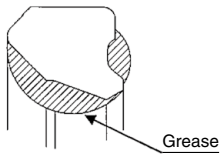


Fig. 8 Cushion seal

3-3. Tube gasket
Spread a thin film of grease over the gasket.

3-4. Rod scraper
Fill the rod scraper groove with grease. (Fig. 9)

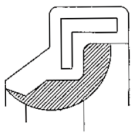


Fig. 9

3-5. Each component of the cylinder

HYQ Series

Spread grease entirely over the parts shown. (Fig. 10)

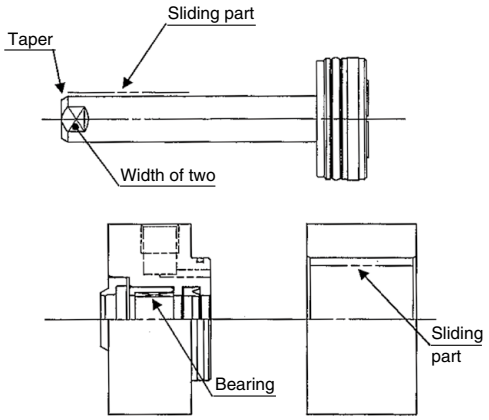


Fig. 10

HYC Series

Cover entirely with grease.

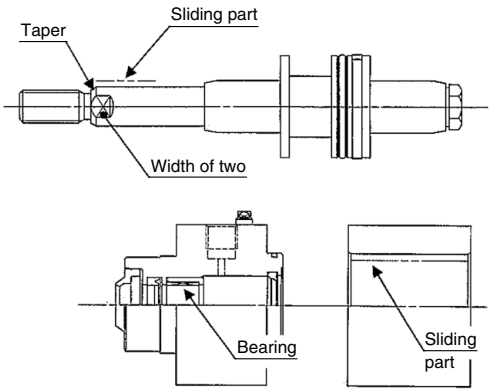


Fig. 11

4. Mounting of the Seal

4-1. Rod seal

Mount the seal with attention to direction.
Then, apply the grease on the seal and bearing evenly.

HYQ Series

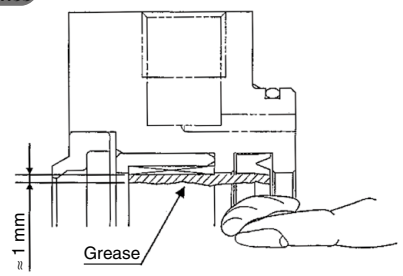


Fig. 12

HYC Series

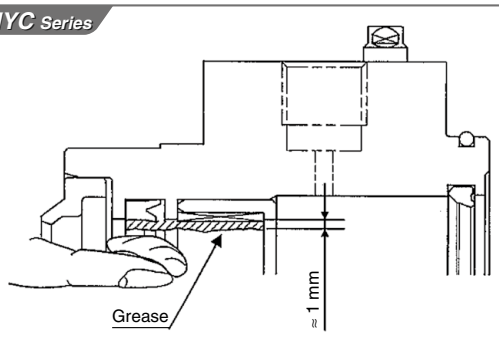


Fig. 13

4-2. Piston seal

Make sure not to twist the seal, when mounting.

4-3. Cushion seal

HYC Series

Note the direction when mounting the seal.

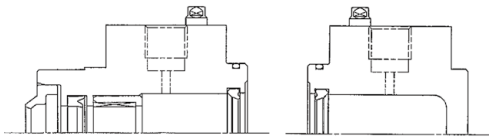


Fig. 14

4-4. Tube gasket

Pay attention not to make the gasket come off.

4-5. Needle scraper

HYC Series

Press down with hand to mount. At that time, ensure there is no protrusion from the cover end face.

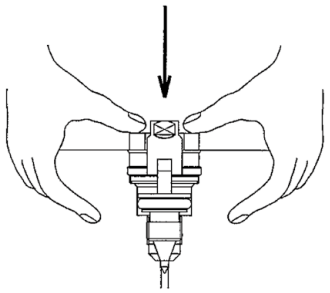


Fig. 15

5. Reassembly of the Cylinder

5-1. Tighten the head cover.

HYQ Series

Wipe off the old adhesive from the threaded part of the hexagon socket head cap screw and apply a new layer of adhesive (Loctite 242 (blue)).
Tighten the cylinder tube and head cover with a hexagon socket head cap screw.

Table 1

Applicable bore size	**Tightening torque** (N·m)
ø20	2.1 to 3.9
ø25	3.6 to 6.8
ø32	2.1 to 3.9
ø40	
ø50	3.6 to 6.8
ø63	8.8 to 16.2

HYC Series

Wipe off the adhesive from the threaded part of the tie rod bolt and apply adhesive (Loctite 242 (blue)) newly.
Tighten the cylinder tube and the head cover with a tie-rod bolt.

Table 2

Applicable bore size	**Tightening torque** (N·m)
ø32	8.8 to 16.2
ø40	
ø50	17.2 to 31.8
ø63	

5-2. Inset the rod assembly into the cylinder tube.

Apply the grease to the part receiving the cylinder tube and insert the rod assembly carefully and slowly make sure the piston seal and gasket are not damaged.

5-3. Tighten the rod cover.

HYQ Series

Wipe off the old adhesive from the threaded part of the hexagon socket head cap screw, and apply a new layer of adhesive (Loctite 243 (blue)).
Tighten the cylinder tube and rod cover with a hexagon socket head cap screw. (Tightening torque: Refer to Table 1)

HYC Series

Wipe off the adhesive from the threaded part of the tie-rod bolt and apply adhesive (Loctite 243 (blue)) newly.
Tighten the cylinder tube and rod cover with a tie-rod bolt. (Tightening torque: Refer to Table 2)

5-4. Mount the switch rail (if the switch is mounted).

Applicable bore size	**Tightening torque** (N·m)
ø20 to ø63	1.1 to 1.9

5-5. Check the assembly condition.
Confirm there is no air leakage from the seal and the cylinder can operate smoothly at a minimum operating pressure.

⚠Caution

Ask SMC for replacing a seal if a tube inside diameter has 40 mm or more.

The cylinder with internal diameter of 40 mm or more has extremely large tightening torque at the rod cover.
Therefore, if the cylinder needs to be disassembled for replacing a seal, ask SMC for the work. SMC can supply a seal kit. However, if the cylinder results in failure or damage after it is disassembled by the other party than SMC, we cannot compensate such failure.

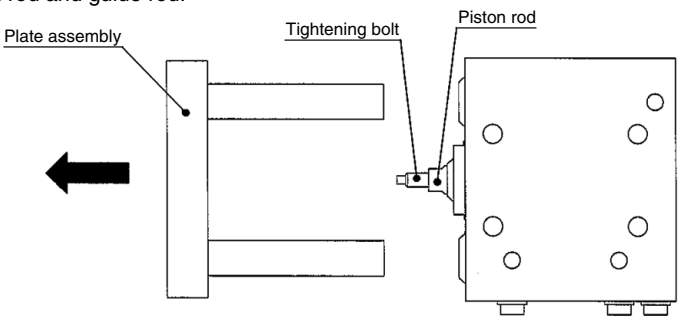
1. Disassembly of the Cylinder

1-1. Cleaning
Prior to disassembly, wipe off any dirt from the outside of the actuator. This will prevent intrusion of dust and foreign objects during disassembly.
Take particular care on the surface of the piston rod and guide rod.

1-2. Removal of the assembly
Fix the chamfer on the piston rod, which is retracted, with a wrench, and remove a fixing bolt from a plate by turning the piston rod.

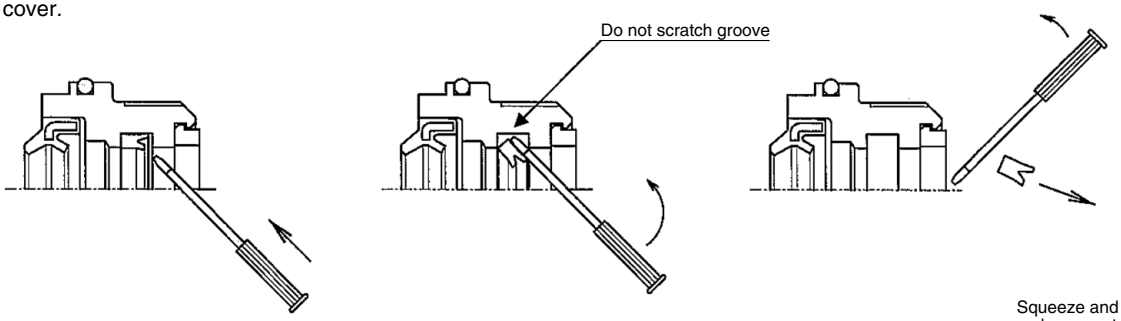
1-3. Removal of the rod cover assembly
Remove the rod cover assembly by rotating the chamfer on the rod cover.

1-4. Disassembly
Pull out the piston rod by holding a nut mounted on the Tightening bolt end. Take care not to scratch or mark the internal face of the body tube.



2. Removal of the Seal

2-1. Rod seal
Insert a precision driver etc. from behind the rod cover and prise the seal out. Take care not to scratch or score the seal groove in the rod cover.



2-2. O-ring (rod side) [Fig. 1]
Push the tube gasket partially to make it come off and pull it out manually.

2-3. Piston seal [Fig. 1]
Since the piston seal is inserted deeply, push it partially to make it come off and pull it out manually. Do not use a precision driver.

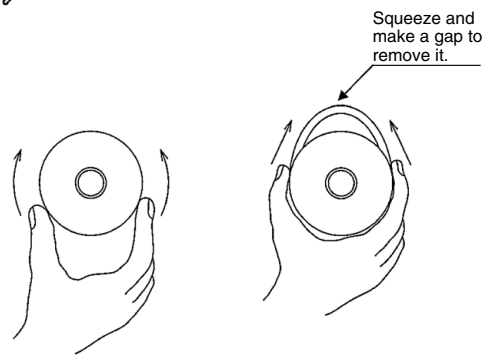
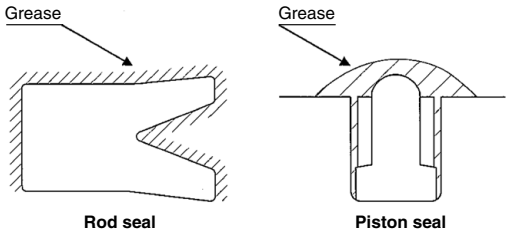


Fig. 1

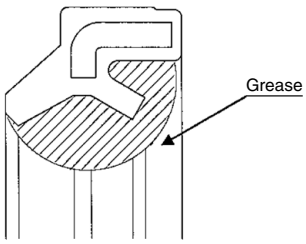
3. Application of Grease

3-1. Rod seal, piston seal
Apply the grease all around a new seal evenly. Also add the grease inside the groove.

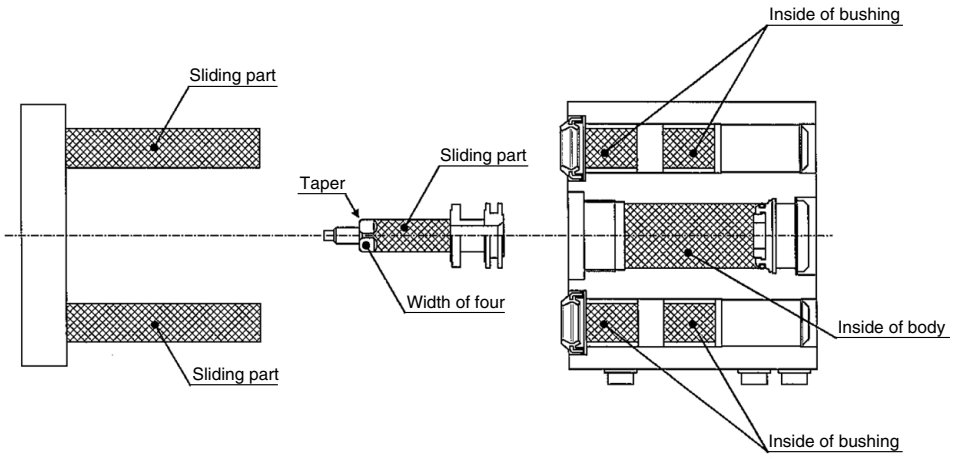
3-2. O-ring (rod side)
Spread a thin film of grease over the gasket.



3-3. Scraper
Fill the scraper (part of piston rod and guide rod) groove with grease.



3-4. Each component of the cylinder
Spread grease entirely over the parts shown.

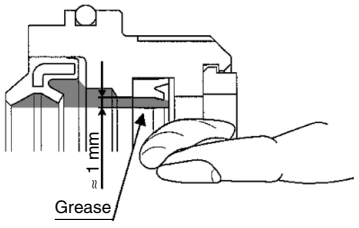


4. Mounting of the Seal

4-1. Rod seal
Mount the seal with attention to direction.
Then, apply the grease on the seal evenly.

4-2. Piston seal
When mounting the seal, ensure there are no twists in the seal.

4-3. O-ring (rod side)
Pay attention not to make the gasket come off.



5. Reassembly of the Cylinder

5-1. Insert the piston rod assembly into the body.
Insert the piston rod assembly carefully and slowly, so as not to damage the piston seal.

5-2. Tighten the rod cover.
Tighten the rod cover and the body. (Tightening torque: Refer to Table 1)
O-ring must be fit in a groove correctly, and must not be torn out.

5-3. Tighten the plate assembly
Apply adhesive on a thread hole on a plate. (Kind of adhesive: Loctite 263 [red])
Insert the guide rod of the plate assembly into the body.
Fixing the chamfer on the piston rod with a wrench, tighten the tightening bolt and the plate assembly by rotating the piston rod.
(Tightening torque: Refer to Table 2)

5-4. Check the assembly condition.
Confirm there is no air leakage from the seal and the cylinder can operate smoothly at a minimum operating pressure.

Table 1

Bore size (mm)	Tightening torque (N·m)
20	140
25	260
32	500

Table 2

Bore size (mm)	Tightening torque (N·m)
20	2.1 to 3.9
25	3.7 to 6.7
32	8.8 to 16.2

The products in this series are refreshed products.
Check the following before ordering.
• Previous series (Discontinued product) MY1B ➡ p. 124
• Checking whether the cylinder is a new or a previous model ➡ p. 769, 770

1. Disassembly

a. Remove the thin head screws on the top surface of the head cover (in 2 locations on each side, 4 in total), and then remove the head plate and belt clamp. (Refer to Fig. 1.)
b. Remove the holding bolts on the end cover (on both sides of the slider), and then remove the end cover. (Refer to Fig. 1.)
(In some cases, when removing the end cover, the spacer, stopper, or double round parallel key may fall out. Be sure not to lose these components.)
c. Remove the top cover.

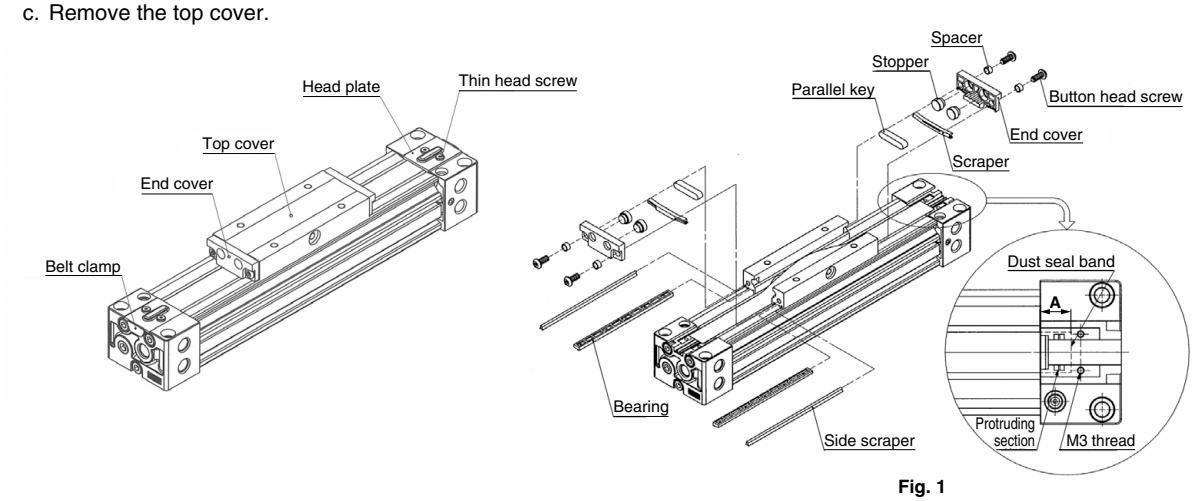


Fig. 1

2. Assembly

a. Install the dust seal band (Table 1), which has been coated with grease on both sides, so that its end surface is in the middle between the M3 thread on the top surface of the head cover and the protruding section. (Recommended position: the A dimension) (Refer to Fig. 2.)

Table 1. Dust seal band standard list

Bore size (mm)	Part number	Standard length
25	**MY1B25-16B-Stroke**	(Stroke + 184) 0/–2
32	**MY1B32-16B-Stroke**	(Stroke + 242) 0/–2
40	**MY1B40-16B-Stroke**	(Stroke + 286) 0/–2

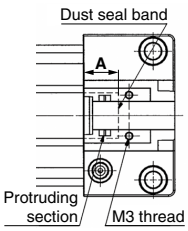


Fig. 2

Dust seal band end surface installation position

Bore size (mm)	A
25	12
32	18
40	18

b. Attach the double round parallel key, and then attach the end cover, spacer, and stopper with holding bolts. (Refer to Table 2 for the end cover tightening torque.)
(When attaching the end cover, be sure to leave about 1 mm clearance between the bottom of the end cover and the top surface of the cylinder tube.) (Refer to Fig. 3.)

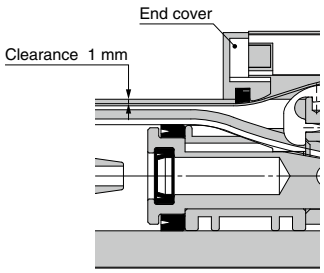


Fig. 3

Table 2. End cover holding hexagon socket button head screw size, Tightening torque

Bore size (mm)	Size	Torque value (N·m)
25	M4	0.7
32	M4	0.7
40	M4	0.7

c. Attach one side of the dust seal band, the belt clamp and the head plate with thin head screws. (Refer to Fig. 4.) (Refer to Table 2 for the thin head screw tightening torque.)

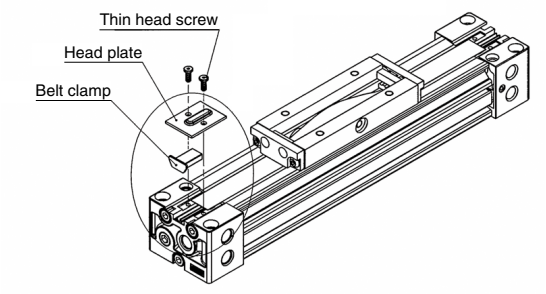
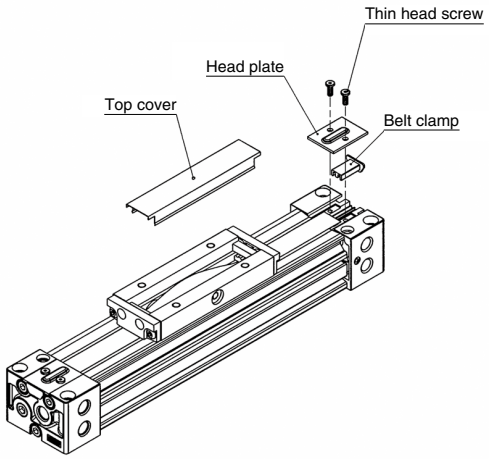


Fig. 4

Table 2. Head plate holding thin head screw size, Tightening torque

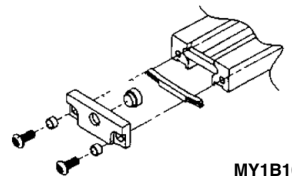
Bore size (mm)	Size	Torque value (N·m)
25	M3	0.63
32	M3	0.63
40	M3	0.63

d. After attaching one side of the dust seal band, operate the cylinder a few times (3 to 4 times), and then check the dust seal band for sagging.
e. Attach the other side of the dust seal band and the other belt clamp to the head plate with thin head screws.
f. Attach the top cover, manually operate the cylinder a few times, and then check the dust seal band for rising or sagging.

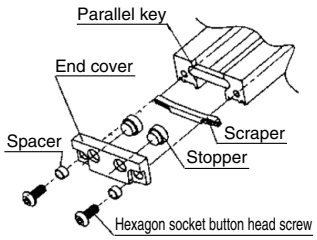


1. Disassembly

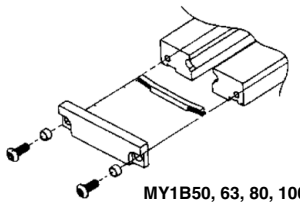
a. Loosen the 2 set screws at one side. That is, 4 set screws (within dotted line) both sides totally for 3 rotations.
b. Remove the end cover by removing the 2 hexagon socket button head screws for fixing on the end cover (at both sides of the slider).
c. Remove the opposite end cover in the same way.
d. Remove the top cover.
e. Pull out the dust seal band at this condition.



MY1B16



MY1B20



MY1B50, 63, 80, 100

Fig. 2

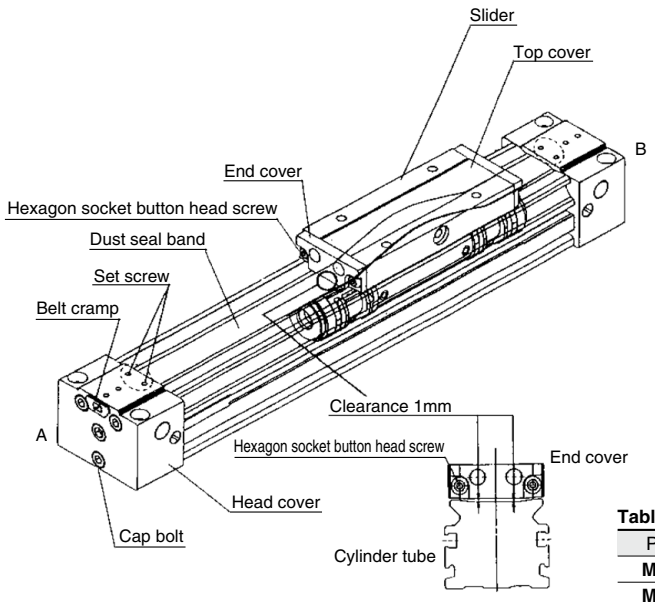


Fig. 1

Table 1. Dust seal band standard list

Part number	Standard length	Part number	Standard length
MY10-16B-st	st + 110 $^{0}_{-1}$	**MY63-16B-st**	st + 382 $^{+2}_{0}$
MY16-16B-st	st + 160 $^{0}_{-1}$	**MY80-16B-st**	st + 544 $^{+2}_{0}$
MY20-16B-st	st + 200 $^{0}_{-1}$	**MY100-16B-st**	st + 634 $^{+2}_{0}$
MY50-16B-st	st + 328 $^{+2}_{0}$		

Note) 2 type of dust seal bands are available and the part no. depends on treatment of setscrew.
•Black zinc chromated → MY ∗∗-16B-st
•Nickel plating → MY∗∗-16BW-st

2. Assembly

a. Be sure to mark both ends of the replacement dust seal band in the manner shown in Fig. 4 before applying grease to the entire band (Note 1). (Length of dust seal band is defined as regulated. But check the length again before mounting for shipping.)
b. Put the dust seal band for replacement in slider.
c. Fix the end cover assembly so that clearance between the end cover assembly and the cylinder tube is about 1 mm. In that case, a proper tightening torque of the hexagon socket button bolt is regulated by values shown in table. 2. Fix the opposite end cover as same way. (Fig. 2) In case of fixing the end cover, ensure that the spacer, stopper and parallel key are installed.
d. Insert both dust seal band into the head cover up to line (10 mm). At the same time, put the dust seal band in the groove of cylinder tube while stretching the dust seal band. Also, as the stainless plate of the dust seal band is as thin as 0.1 mm, be careful not to bend it or break in insertion.

Table 2. Tightening torque of hexagon socket button head screw

Diameter	Bolt size	Tightening torque (N·m)
10		
16, 20	M3 x 0.5	0.3
50, 63, 80, 100	M5 x 0.8	1.5

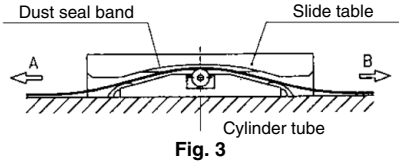


Fig. 3

∗For ø10, ø80 and ø100, the dust seal band is magnetic hold type. Set the dust seal band on the cylinder tube with equivalent clearance W_1 and W_2. (Fig. 5) Another work is same way as above 4.

e. Tighten only the 2 set screws at A side after installation. In that case, adjust so that dust seal band located near screws does not lift due to excessive tightening. Proper tightening torque is 0.1 N·m (1 kgf·cm).

f. Reciprocate the slider 3 to 4 times up to both stroke ends to remove sagging of the dust seal band.

g. Be sure to return the slider up to B side stroke end and tighten at B side in the same way after ensuring that dust seal band is inserted into the head cover for approx. 10 mm.

h. Install the top cover.

i. Reciprocate the slider a few times manually again.
If the seal band does not lift, installation will complete.

Note 1) For grease, use lithium soap grease with consistency No. 1 or No. 2.

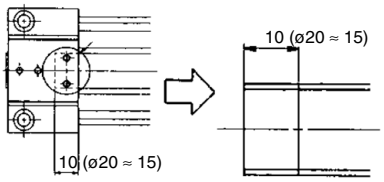


Fig. 4

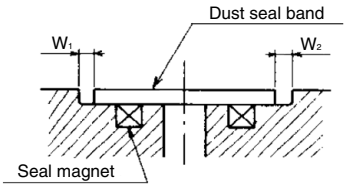


Fig. 5

Maintenance

Monthly application of grease to the slide bearing and the dust seal band may lengthen the life.
Grease pack is recommended. (Grease pack part no.: GR-S-010)

1. Refer to Replacement Procedure of MY1M/C Dust Seal Band.
2. How to install the cylinder with the cover
   Refer to Installation Procedure for MY1□W.
3. How to install the side seal of the cylinder with cover.
   Refer to Mounting Procedure for MY1□WK side seal.

1. Replacement of the Dust Seal Band

MY1M/C Series

1. Disassembly
   a. Loosen the 2 set screws at one side, that is, 4 set screws at both sides.
   b. Remove the end cover by removing the 2 (4) hexagon socket button head screws for fixing which are on the end cover.
   c. Remove the opposite end cover in the same way.
   d. Pull out the dust seal band in this condition.

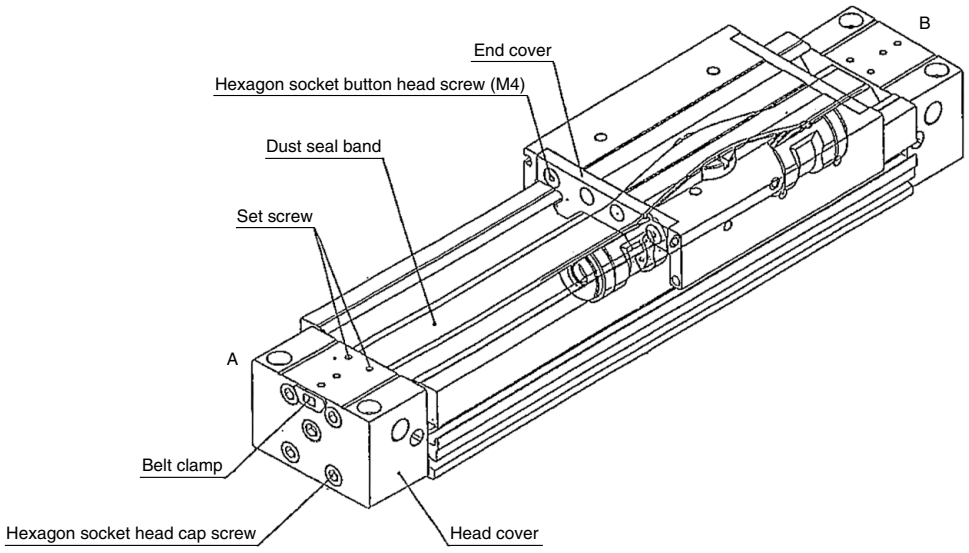


Table. 1 Dust seal band standard list

Model number	Standard length
MY16-16B-st	st + 160 $^{+2}_{0}$
MY20-16B-st	st + 200 $^{+2}_{0}$
MY25-16B-st	st + 182 $^{+2}_{0}$
MY32-16B-st	st + 228 $^{+2}_{0}$
MY40-16B-st	st + 272 $^{+2}_{0}$
MY50-16B-st	st + 328 $^{+2}_{0}$
MY63-16B-st	st + 382 $^{+2}_{0}$

Note) 2 type of dust seal bands are available and the part no. depends on treatment of set screw.
Black zinc chromated → MY□□-16B-st
Nickel plating → MY□□-16BW-st

2. Assembly

a. After first performing the additional process shown in Fig. 2, be sure to apply grease to the entire replacement dust seal band in the manner shown in Fig. 1 (Note 1).

b. The dust seal band for replacement is pierced the slide table.

c. The end cover is fixed so that the clearance between the end cover assembly bottom part and the cylinder tube upper surface is about 1 mm.
The adequate tightening torque at this time is 0.7 N·m (7 kgf·cm).
The opposite end cover is fixed in the same way.

d. The dust seal bands of both sides are inserted in the head cover to the position drawn with a pen (about 10 mm). Then, at the same time, insert the dust seal band in the groove of cylinder tube by pulling it to both sides. (Fig. 4)

e. If the dust seal band is installed properly without coming to the surface, tighten two set screws at A side.
Adequate tightening torque is 0.1 N·m (1 kgf·cm).

f. Reciprocate the slide table 3 or 4 times to both stroke ends in order to remove the sag of the dust seal band.

g. Be sure to return the slide table to B side stroke end and tighten the set screw at B side after ensuring that the dust seal band is inserted in the head cover of about 10 mm.

h. Reciprocate the slide table again manually a few times and ensure that the dust seal band does not come to the surface.

Note 1) Apply grease evenly as the drawing 1. Use consistency No. 1 or No. 2 of the lithium soap grease.

Table. 2 Tightening torque of button bolt

Diameter	Bolt size	Tightening torque (N·m)
16, 20	M3 x 0.5	0.3
25, 32, 40	M4 x 0.7	0.7
50, 63	M5 x 0.8	1.5



Grease application amount (Shaded portion) ≈ 0.3mm

Fig. 1

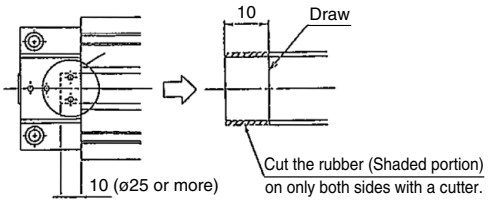


Fig. 2

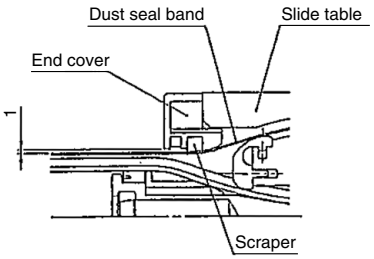


Fig. 3

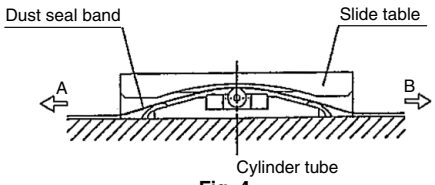
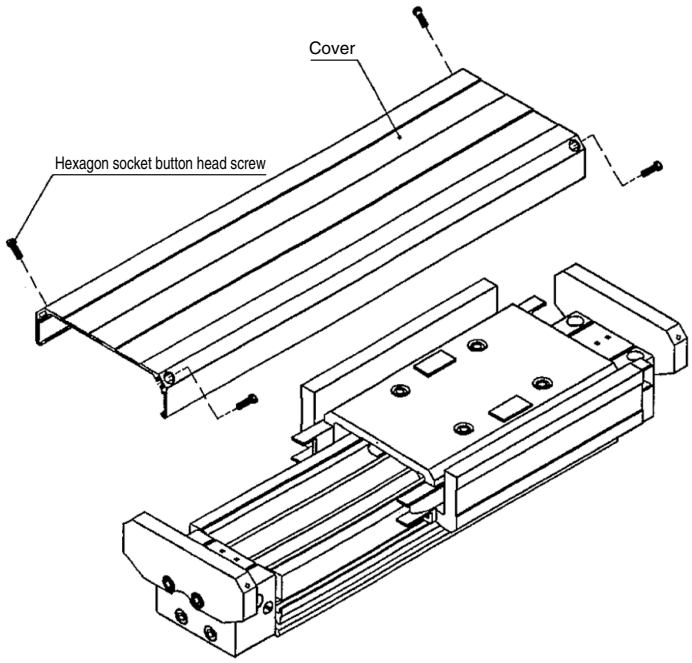


Fig. 4

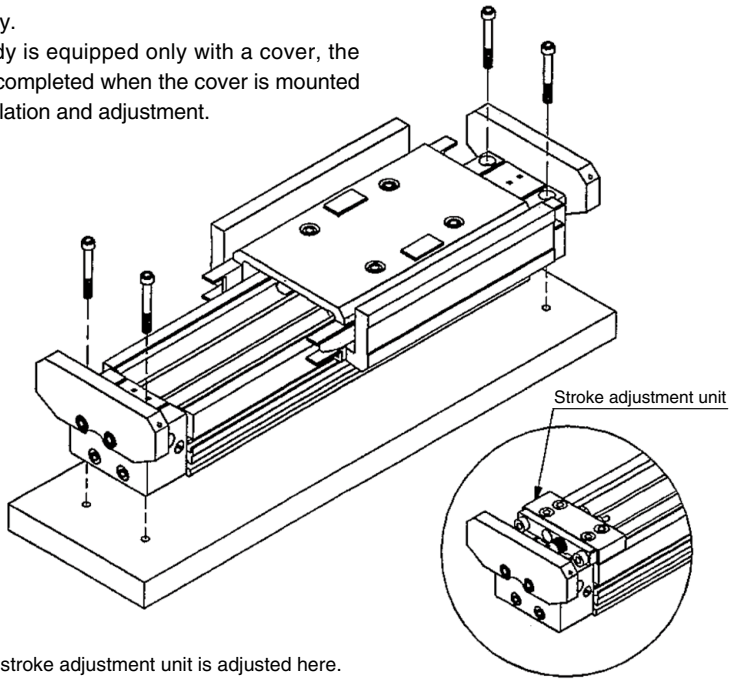
2. Installation

MY1□W Series

1. Removal of the cover
   a. Remove the hexagon socket button head screw to remove the cover.



2. Installation, adjustment
   a. Install the body.
   b. When the body is equipped only with a cover, the installation is completed when the cover is mounted after the installation and adjustment.

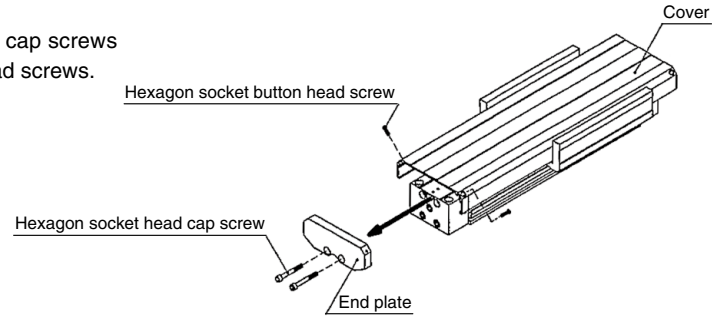


Note) The optional stroke adjustment unit is adjusted here.

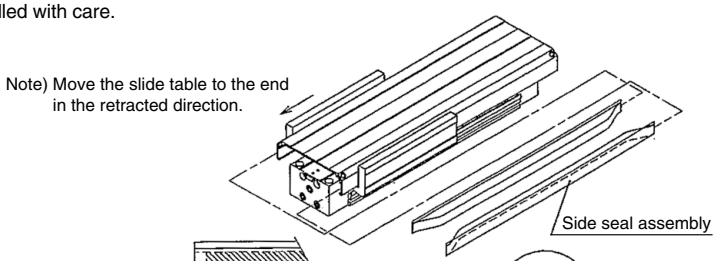
3. Installation of the Side Seal

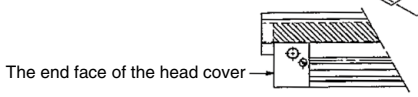
MY1□WK Series

1. End plate removal procedure
   a. Remove the 2 hexagon socket head cap screws and the 2 hexagon socket button head screws.
   b. Remove the end plate on one end.

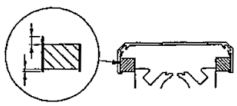


2. Installation of the side seal
   a. Insert the side seal assembly from the end surface.
   Note) The stainless part of the side seal assembly is very sharp. It should be handled with care.



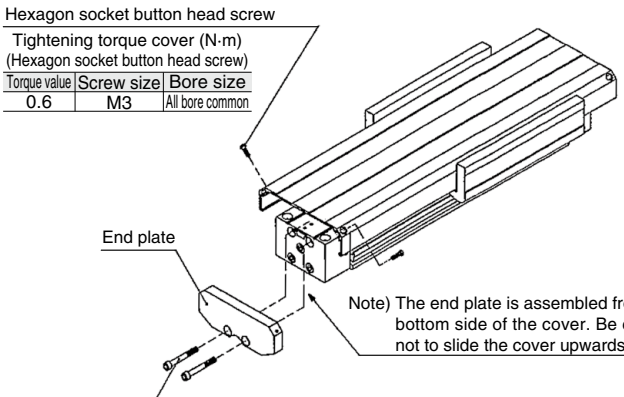


Note) Insert the side seal to the end surface of the head cover. Do not bend it before insertion.



Note) Be careful with the side seal assembly direction.

3. Assembly of the cover
   a. Mount the end plate and fix it.

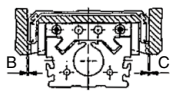


Tightening torque cover (N·m)
(Hexagon socket button head screw)

Torque value	Screw size	Bore size
0.6	M3	All bore common

Tightening torque cover (N·m)
(Hexagon socket head cap screw)

Bore size	Screw size	Torque value
ø**16**	M3	0.6
ø**20**	M4	1.4
ø**25**	M5	2.8
ø**32**	M6	4.8
ø**40**	M6	4.8



Note) The clearance of B and C part has to be checked at the full stroke. If there is contact, the clearance should be adjusted by loosening the hexagon head cap screw and retightening it.

1. Disassembly

a. Remove the thin head screws on the top surface of the head cover (in 2 locations on each side, 4 in total), and then remove the head plate and belt clamp. (Refer to Fig. 1.)

b. Remove the holding bolts on the end cover (on both sides of the slider), and then remove the end cover. (Refer to Fig. 1.) (In some cases, when removing the end cover, the spacer, stopper, bearing, or side scraper may fall out. Be sure not to lose these components.)

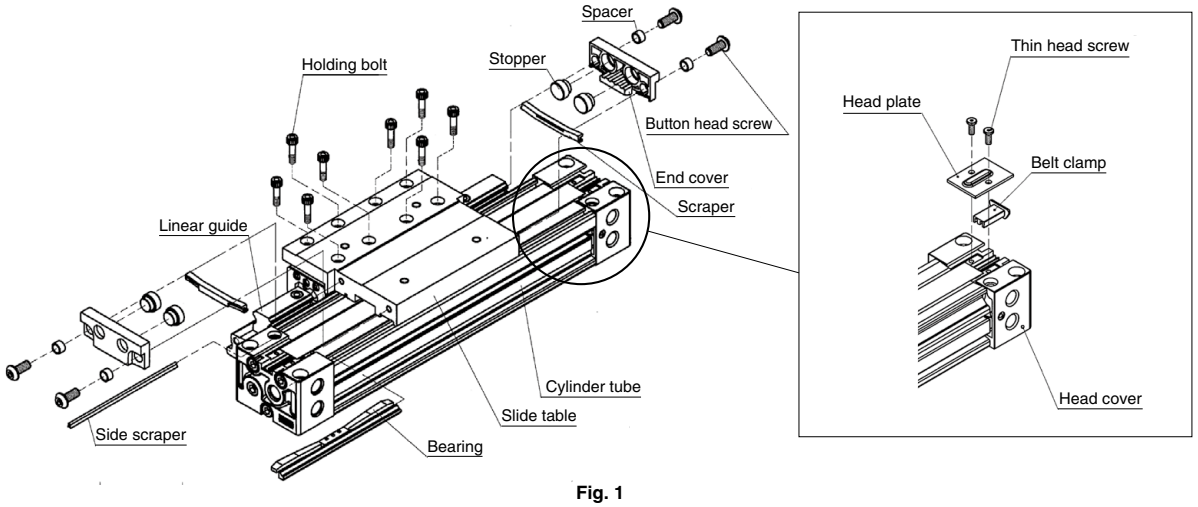


Fig. 1

2. Assembly

a. Install the dust seal band (Table 1), which has been coated with grease on both sides, so that its end surface is in the middle between the M3 thread on the top surface of the head cover and the protruding section. (Recommended position: the A dimension) (Refer to Fig. 2.)

Table 1. Dust seal band standard list

Bore size (mm)	Part number	Standard length
25	**MY1B25-16B-Stroke**	(Stroke + 184) 0/–2
32	**MY1B32-16B-Stroke**	(Stroke + 242) 0/–2
40	**MY1B40-16B-Stroke**	(Stroke + 286) 0/–2

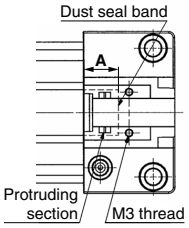


Fig. 2

Dust seal band end surface installation position

Bore size (mm)	A
25	12
32	18
40	18

b. Attach the end cover, spacer, and stopper with holding bolts. (Refer to Table 2 for the end cover tightening torque.)

* When attaching the end cover, be sure to leave about 1 mm clearance between the bottom of the end cover and the top surface of the cylinder tube. (Refer to Fig. 3.)

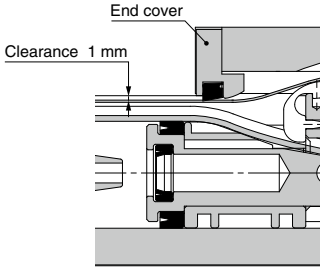


Fig. 3

Table 2. End cover holding hexagon socket button head screw size, Tightening torque

Bore size (mm)	Size	Torque value (N·m)
25	M4	0.7
32	M4	0.7
40	M4	0.7

c. Attach one side of the dust seal band, the belt clamp and the head plate with thin head screws. (Refer to Fig. 4.) (Refer to Table 2 for the thin head screw tightening torque.)

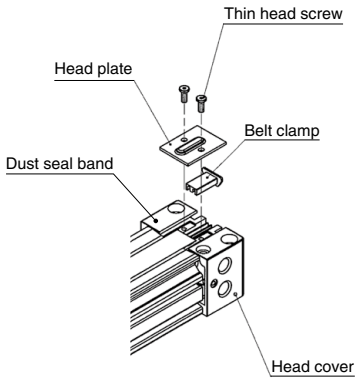


Fig. 4

Table 2. Head plate holding thin head screw size, Tightening torque

Bore size (mm)	Size	Torque value (N·m)
25	M3	0.63
32	M3	0.63
40	M3	0.63

d. After attaching one side of the dust seal band, operate the cylinder a few times (3 to 4 times), and then check the dust seal band for sagging.
e. Attach the other side of the dust seal band and the other belt clamp to the head plate with thin head screws.
f. After manually operating the cylinder a few times, if there is no rising or sagging of the dust seal band, the process is complete.

1. Disassembly

a. Loosen the 2 set screws at one side, that is, 4 set screws at both sides.
b. Remove the end cover by removing the 2 (4) bolts with a hexagon hole fixing which are on the end cover.
c. Remove the opposite end cover in the same way.
d. Pull out the dust seal band in this condition.

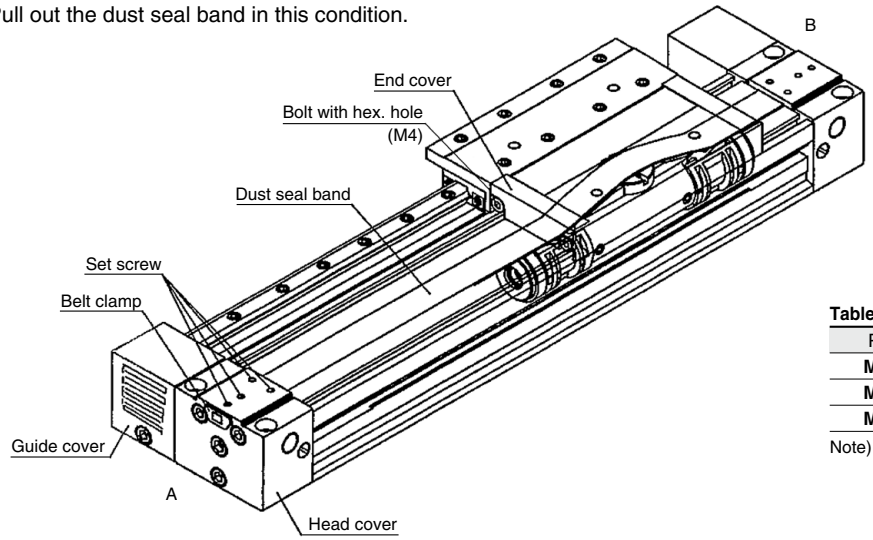


Table. 1 Dust seal band standard list

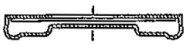
Part number	Standard length
MY10-16B-st	st + 110 $^{+2}_{0}$
MY16-16B-st	st + 160 $^{+2}_{0}$
MY20-16B-st	st + 200 $^{+2}_{0}$

Note) 2 types of dust seal bands are available and the part no. depends on treatment of set screw.(Over ø16)
Black zinc chromated → MY**-16B-st
Nickel plating → MY**-16BW-st

2. Assembly

a. After first performing the additional process shown in Fig. 2, be sure to apply grease to the entire replacement dust seal band in the manner shown in Fig. 1 (Note 1).
b. The dust seal band for replacement is pierced the slide table.
c. The end cover is fixed so that the clearance between the end cover assembly bottom part and the cylinder tube upper surface is about 1 mm. (Fig. 2)
The adequate tightening torque at this time is 0.7 N·m (7 kgf·cm).
The opposite end cover is fixed in the same way.
d. The dust seal bands of both sides inserted in the head cover to the position drawn with a pen (Fig. 3). Then, at the same time, insert the dust seal band in the groove of cylinder tube by pulling it to both sides. (Fig. 4)
e. If the dust seal band is installed properly without coming to the surface, tighten the 2 set screws at A side. Adequate tightening torque is 0.1 N·m (1 kgf·m).
f. Reciprocate the slide table 3 or 4 times to both stroke ends in order to remove the sag of the dust seal band.
Be sure to return the slide table to B side stroke end and tighten the set screw at B side after ensuring that the dust seal band is inserted in the head cover of about 10 mm.

Note 1) Apply grease evenly as the fig. 1. Use consistency No. 1 or No. 2 of the lithium soap grease.
Note 2) After inserting the dust seal band, pull it by the hands to A and B directions to make it a little tightened, and insert it to the cylinder tube ditch. (Fig. 4)
Note 3) Adequate tightening torque of the set screw is 0.1 N·m (1 kgf·cm).
Note 4) Ensure that the magic drawing of additional work to the dust seal band (Fig. 2) is hidden inside the head cover assembly.



Grease application amount
(Shaded portion) ≈ 0.3 mm
Fig. 1

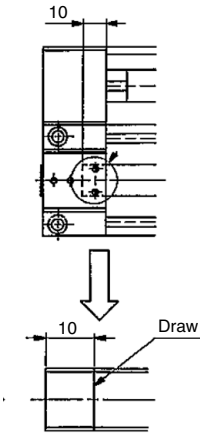


Fig. 2

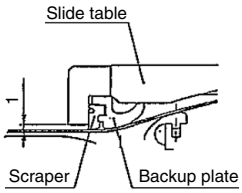


Fig. 3

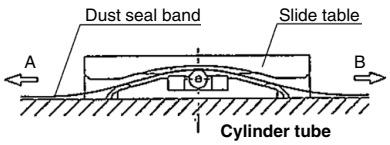
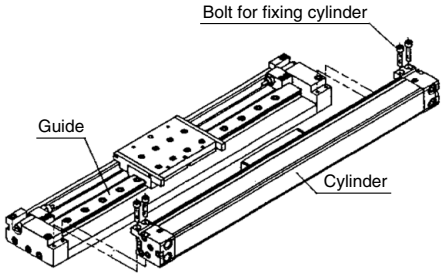
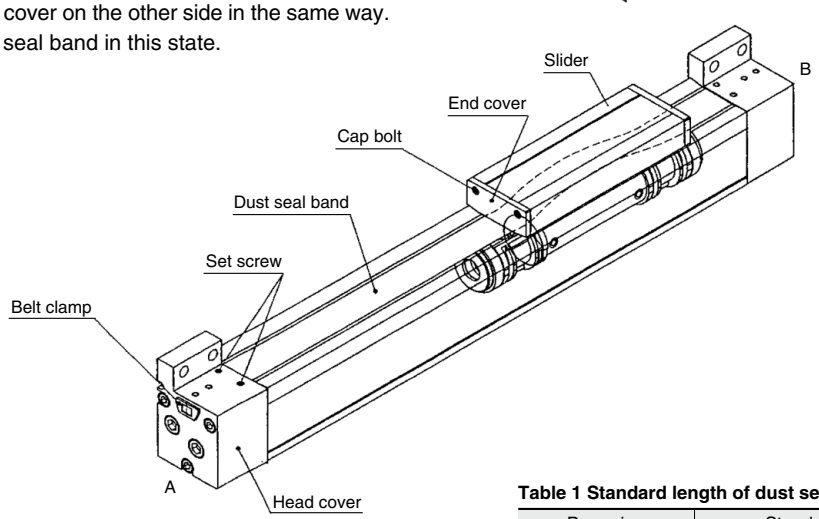


Fig. 4

1. Disassembly

a. Remove the 4 cap bolts for fixing the cylinder and remove the cylinder from the guide.
b. Loosen the 2 set screws on one side (3 screws for ø16) of the head cover, total 4 screws on both sides (6 screws for ø16). (Note 1)
c. Remove the 2 cap bolts for fixing the end cover to remove the end cover.
d. Remove the end cover on the other side in the same way.
e. Pull out the dust seal band in this state.





2. Assembly

a. Cut the dust seal band for replacement into the dimension shown in Table 1 and bend both ends at about 10° (Fig. 2) with L dimension in Table 2 from the position in Fig. 1.
b. Mount it on the cylinder facing the bent side downward. (Note 2)
c. Adjust the end cover to obtain about 1 mm clearance between the bottom face of the end cover and the top face of the cylinder tube and fix with care so that the scraper will not drop or twist. (Fig. 3)
d. Fix the end cover on the other side in the same way.
e. Adjust the dust seal band to obtain L dimensions in Table 2 (L dimension: the length of the dust seal band projected from the cylinder tube), and fix the set screws on side A. (Note 3)
f. Stretch the dust seal band toward side B and fix it with the set screws on side B.
g. Move the slider in full stroke for 2 to 3 times to check the dust seal band for fit.
h. Apply grease to the sliding part of the dust seal band (upper face of the cylinder tube) and mount the cylinder on the guide. (Note 4)

Note 1) For ø16, remove the belt clamp.
Note 2) The dust seal band is made of a thin material. Do not bend it at portions other than those designated.
Note 3) Tightening torque for set screws is 0.1 N·m (1 kgf·cm).
Note 4) For grease, use lithium soap base grease No. 1 or No. 2.

Table 1 Standard length of dust seal band

Bore size	Standard length
ø16	Stroke + 160^{+2}_{0}
ø25	Stroke + 176^{+2}_{0}
ø40	Stroke + 270^{+2}_{0}

Table 2 L dimension of dust seal band

Bore size	L dimension (mm)
ø16	20
ø25	8
ø40	10

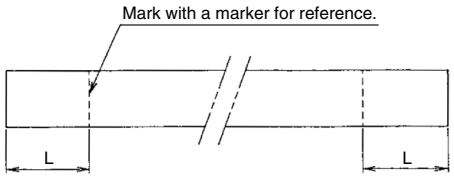


Fig. 1

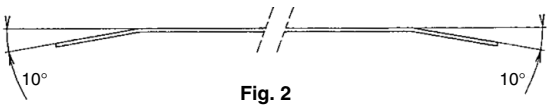


Fig. 2

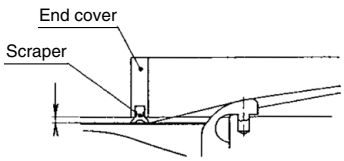


Fig. 3

1. Inspection/Maintenance

Regular grease applying (once a month) to the bearing sliding surface and the dust seal band is recommended for more improvement of life.

Refer to “Guide to Replacement of MY3□ Dust Seal Band” to replace the dust seal band.

2. Disassembly/Assembly

MY3A/B Series

Replacement Procedure of the Seal Belt

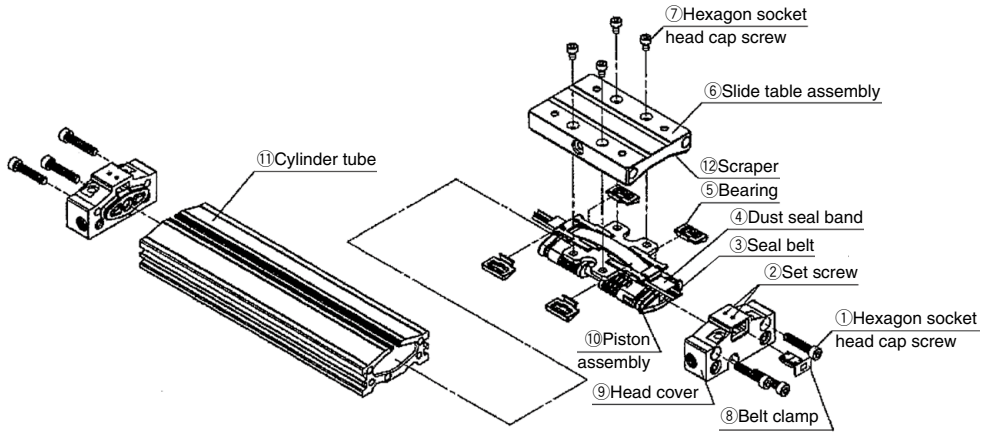


Fig. 1

1.Disassembly

a. Loosen 2 set screws ② on the top head cover ⑨.
b. Remove belt clamp ⑧.
c. Remove 4 retaining hexagon socket head cap screws ⑦ on the top of slide table assembly ⑥.
d. Remove slide table assembly ⑥. (At this time, please watch that the beanings ⑤ and the scraper ⑫ might fall. (Note 2)
e. In this condition, Pull out dust seal band ④.
f. Remove 4 bearings ⑤ in the right and left from piston assembly ⑩.
g. Remove 3 head cover retaining hexagon socket head cap screws ①.
h. Pull out head cover ⑨ from cylinder tube ⑪.
i. Pull out the other head cover ⑨ from cylinder tube ⑪ in the same method.
j. Pull out piston assembly ⑩ from cylinder tube ⑪.
k. Pull out seal belt ③ from cylinder tube ⑪.

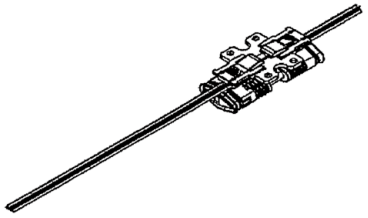


Fig. 2

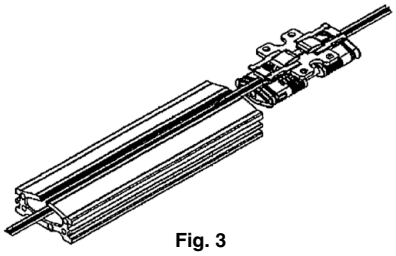


Fig. 3

2. Assembly
   a. Avoid flaws on the seal belt, as it may cause air leakage (Pay special attention to the edges indicated by arrows in Fig. 4).
   b. Check that the total length of the seal belt is of a recommended length and apply grease to the whole surface (Refer to Table 1).
   c. Put the seal belt through the piston assembly and assemble it to the cylinder tube as shown in Fig. 2 and 3.
   d. Keep the same extra length of seal belt on both left and right ends of the cylinder tube and slowly reciprocate the piston assembly once to fit the seal belt into the cylinder tube. Then, reciprocate the piston assembly a couple of times more and wipe the extra grease collected forward of the piston off. (When grease remains on the contact side of the piston and the head cover, it may cause the lurching by sticking.
   e. Insert the right and left head cover in the cylinder tube, and tighten the head cover retaining hexagon socket head cap screws.
   f. Put the dust seal band in piston assembly. (Note 1)
   g. Insert the bearing into the piston assembly. (Note 1)
   h. Assembly the slide table assembly to the piston assembly with the retaining hexagon socket head cap screws. (Note 1)
   i. Cut off the extra seal belt over the head cover ends with a cutter and assemble the belt clamp.
   j. Tighten the 2 set screws each on the top of both head covers. (Note 1)
   k. This is the end of replacement work.
   If air leakage is considerable after replacement, consult SMC.

Replacement Procedure of the Dust Seal Band

1. Disassembly
   a. Loosen the 2 set screws at one side, that is, 4 set screws both sides totally for 3 rotations.
   b. Remove the slide table by removing the 2 hexagon socket button bolts for fixing on the slide table.
   Pay attention not to let the bearing and the scraper come off when the slid table is removed.
   c. Pull out the dust seal band at this condition.
2. Assembly
   a. Cut the replacement dust seal band to the dimensions shown in Table 1.
   *The length of the dust seal band is defined as regulated, but check the length again before mounting for shipping.
   b. Pass the replacement dust seal band through the opening (at 2 places) of the belt separator, and mount on the cylinder body.
   c. Set the bearing in place.
   d. Mount the scraper into the groove on the slide table.

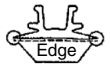


Fig. 4

Table 1. Seal belt part no.

	Bore size	Part no.	Recommended length
MY3A	ø16	MY3A16-16C-st	st + 206
	ø20	MY3A20-16C-st	st + 225
	ø25	MY3A25-16C-st	st + 246
	ø32	MY3A32-16C-st	st + 289
	ø40	MY3A40-16C-st	st + 336
	ø50	MY3A50-16C-st	st + 370
	ø63	MY3A63-16A-st	st + 416
MY3B MY3M Note 3)	ø16	MY3B16-16C-st	st + 218
	ø20	MY3B20-16C-st	st + 245
	ø25	MY3B25-16C-st	st + 274
	ø32	MY3B32-16C-st	st + 321
	ø40	MY3B40-16C-st	st + 372
	ø50	MY3B50-16C-st	st + 406
	ø63	MY3B63-16A-st	st + 452

Note 1) Refer to "Dust Seal Band Replacement Procedure" for dust seal band assembling (installation of the bearing and the slide table assembly).
Note 2) When parts fall check no adhesion of the foreign objects and assembly it.
Note 3) Only bore sizes ø16, ø25, ø40 and ø63 are available in MY3M.

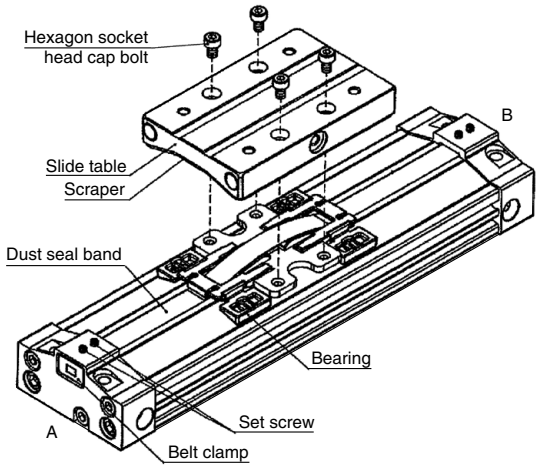


Table 1. Standard length dust seal band

Bore size	MY		MY	
	Part no.	Recommended length	Part no.	Recommended length
ø16	MY3A16-16B-st	st + 106 $^{0}_{-2}$	MY3B16-16B-st	st + 118 $^{0}_{-2}$
ø20	MY3A20-16B-st	st + 125 $^{0}_{-2}$	MY3B20-16B-st	st + 145 $^{0}_{-2}$
ø25	MY3A25-16B-st	st + 146 $^{0}_{-2}$	MY3B25-16B-st	st + 174 $^{0}_{-2}$
ø32	MY3A32-16B-st	st + 189 $^{0}_{-2}$	MY3B32-16B-st	st + 221 $^{0}_{-2}$
ø40	MY3A40-16B-st	st + 236 $^{0}_{-2}$	MY3B40-16B-st	st + 272 $^{0}_{-2}$
ø50	MY3A50-16B-st	st + 270 $^{0}_{-2}$	MY3B50-16B-st	st + 305 $^{0}_{-2}$
ø63	MY3A63-16B-st	st + 316 $^{0}_{-2}$	MY3B63-16B-st	st + 352 $^{0}_{-2}$

e. Set the slide table in place referring to the fixing bolt position, and fix it with the 4 hexagon socket head bolts.
f. Align the end surfaces and insert them to the head cover so that the protruded amount of the dust seal band from the cylinder tube will be L dimension shown in Table 2, and fix the set screw closer to the A side holding the belt clamp.
g. Pull the dust seal band to the B side until it has no protruded part, and fix the set screw close to the B side holding the belt clamp.
h. Tighten the set screw closer to the cylinder tube on the top of the head cover until all of the lifted part of the dust seal band near the cylinder tube ends at both of A and B sides are eliminated.
   In that case, adjust so that the dust seal band located near screws does not lift due to excessive tightening. Proper tightening torque is 0.1 N·m (1 kgf·cm).
i. Cycle the slide table at full stroke 2 to 3 times, and check there is no lifted part all over the dust seal band.
j. Apply grease to the whole sliding part (top of the cylinder tube) of the dust seal band.

Note 1) Handle the dust seal band with care because it is thing and easily bent.

Note 2) For grease, use lithium soap grease with consistency No. 1 or No. 2.

Table 2. Dust seal band L dimension (MY3A/B)

Bore size	L dimension (mm)
ø16	11.5
ø20	14
ø25	18
ø32	20.5
ø40	25
ø50	25
ø63	29

1. Disassembly

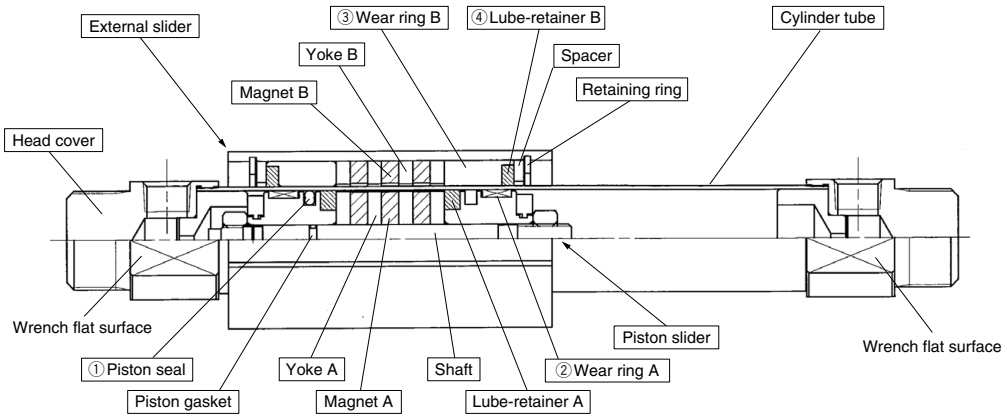


Fig. 1 Internal structure (Model: CY3B20-Z)

Steps	Precautions	Others
1. Removal of the head cover · Hold the wrench flats of one of the head covers with a vise, etc. · Remove the other head cover using a wrench or monkey wrench on its wrench flats.	· As the surface of the cylinder tube is a sliding surface, be sure to avoid scratching or denting it. · Do not grip the cylinder tube directly with a vise or pipe wrench. · Be aware that only 1 of the 2 head covers can be removed. · When reassembling the head cover, tighten it an additional 3 to 5 degrees from its position before removal.	· Adhesive is applied to the threads of the cylinder tube and head cover to prevent loosening. · When reassembling, remove the hardened adhesive, oil, etc., from the threads, reapply adhesive, and tighten the head cover. [Loctite No. 542 (Red)]
2. Removal of the slider · Take the external slider and the piston slider out from the cylinder tube separately.	· Use external force or air pressure to forcibly shift the positional relationship of the external slider and the piston slider inside the cylinder tube, which will disengage the magnetic coupling, and take them out separately. If the external slider and piston slider are removed while still magnetically coupled, the sliders will not be able to be removed from each other. (Refer to Fig. 2 on page 415-2 for the disengagement method.) **⚠Warning** · Be careful when handling as the magnets used in the sliders are extremely strong. · When using air pressure to shift the positional relationship of the external slider and the piston slider, do so with the head cover tightened. If the head cover is loose, it may come off when the piston slider collides with the head cover, resulting in the piston slider shooting out.	· When replacing the seal kit, do not disassemble down to the magnet and yoke. Mounting the magnet in the wrong direction (polarity) during reassembly may result in reduced magnet holding force.

2. Replacement

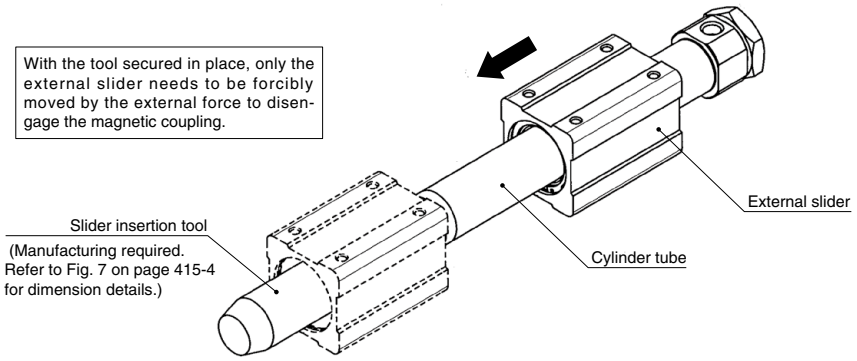


Fig. 2 External slider removal procedure (using external force)

Part name	Consumable parts to be replaced	Content
1. Piston slider ①Piston seal **(Lip faces outward)** ①Piston seal **(Lip faces outward)** ②Wear ring A ø6 ①Piston seal **(Mounting position: Existing mounting position (shaft end without a thread))** Shaft (End without thread) Shaft (End with thread) ②Wear ring A ø20 to ø63 **Fig. 3 Piston seal mounting direction**	Can be ordered as part of the seal kit (Refer to page 415-5.) [Applicable size] ø6 to ø40 (Bore sizes ø50 and ø63 not supported) ∗ If maintenance is required for bore size ø50 or ø63, request a repair at an SMC factory. ①Piston seal Bore size / Qty. **ø6** / 2 **ø10** to **ø40** / 1 (**ø50, ø63**) / (1) ②Wear ring A Bore size / Qty. **ø6** / 4 **ø10** / 2 **ø15** / 4 **ø20** to **ø40** / 2 (**ø50, ø63**) / (6)	· When installing piston seal ①, apply grease from the grease pack included in the seal kit, or from the specified grease pack, to the seal groove. · For ø6 piston seals, there is a designated mounting direction. As shown in Fig. 3, install the seal with the lip facing outward. · There is no specified mounting direction for ø10 and ø15 piston seals. Mount the seal in the groove on only 1 (optional) of the 2 pistons. · There is a specified mounting direction for ø20 to ø63 piston seals. Be sure to mount the seal at the existing mounting position (the shaft end without a thread). If it is mounted in the groove on the opposite piston, it will not seal. · After installing the piston seal, be sure to check that the seal is not twisted. · For wear ring A ②, only ø10 cannot be replaced. Contact SMC if replacement is required. · When inserting the part back into the cylinder tube after replacement, apply extra grease to the piston seal and wear ring A of the piston slider.
2. External slider ④Lube-retainer B ④Lube-retainer B ③Wear ring B **Fig. 4 External slider replacement parts**	③Wear ring B Bore size / Qty. **ø6** to **ø40** / 2 (**ø50, ø63**) / (2) ④Wear ring B Bore size / Qty. **ø6** / None **ø10** to **ø40** / 2 (**ø50, ø63**) / (2)	· Remove one of the external slider retaining rings (retaining ring) with snap ring pliers. · Remove spacer, wear ring B, and Lube-retainer, and then replace them. · Allow the Lube-retainer to soak in the grease for approx. 2 hours before installing it. ∗ Conduct replacement on each side of the external slider, one side at a time. Do not remove the magnetic components (the magnet and yoke) from the body. Doing so may result in reduced cylinder performance. · When inserting the external slider back into the cylinder tube after replacing the parts, apply extra grease from the grease pack included in the seal kit, or from the specified grease pack, to the Lube-retainer and wear ring B of the external slider.

∗ Specified grease (Grease pack)

3. How to insert the external slider and piston slider into the cylinder tube (Caution required)

Procedures

(1) Apply grease to the inner surface of the cylinder tube.
(2) Place the piston slider on top of the external slider (For bore sizes other than ø6). For bore size ø6, the sliders have no insertion direction.
(3) If the piston slider will not couple at the center of the external slider as in Fig. 6, rotate the piston slider 180° so it is positioned as in Fig. 5. If incorrectly positioned sliders are inserted into the cylinder tube as is, they will not magnetically couple as required.
In addition, the stoke will not operate normally.
(4) Insert the slider insertion tool into the cylinder tube.
(5) Confirm that the sliders are in the same state as in Fig. 5, and insert the greased external slider into the cylinder tube.
(6) Remove the slider insertion tool from the cylinder tube.
(7) Insert the greased piston slider into the cylinder tube.
(8) Manually move the external slider back and forth multiple times to spread the grease within the cylinder tube.
(9) Move the external slider to the stroke end, and lightly wipe off the excess grease adhering to the end surface of the piston slider.
(10) After wiping off the grease adhering to the threads of the cylinder tube with alcohol, etc., apply adhesive (Loctite No. 542 (red)) to the cylinder tube or head cover threads, and then tighten the head cover.
For bore sizes ø6 and ø10, confirm that there are no scratches or other damage on the cylinder tube gasket before tightening. Adhesive is not required.
(11) Fit the external slider and piston slider into place inside the cylinder tube. (Refer to Fig. 9 on page 416-3 for the fitting procedure.)
(12) Confirm that the positional relationship of the external slider and piston slider is correct. (Refer to Fig. 8 on page 415-4.)

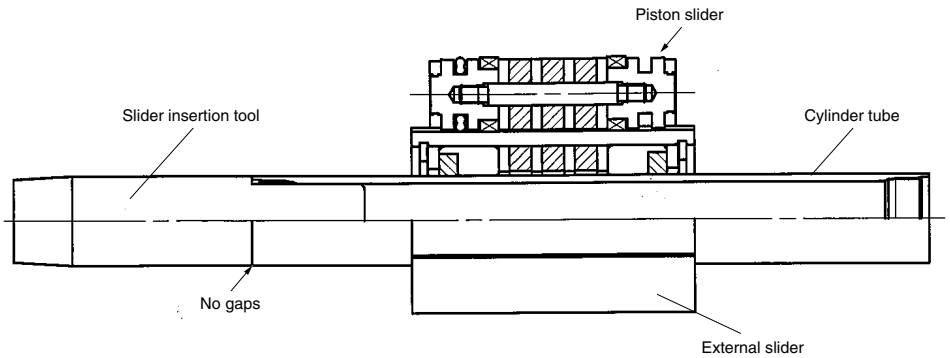


Fig. 5 Correct positioning (the centers of the sliders are aligned) (ø10)

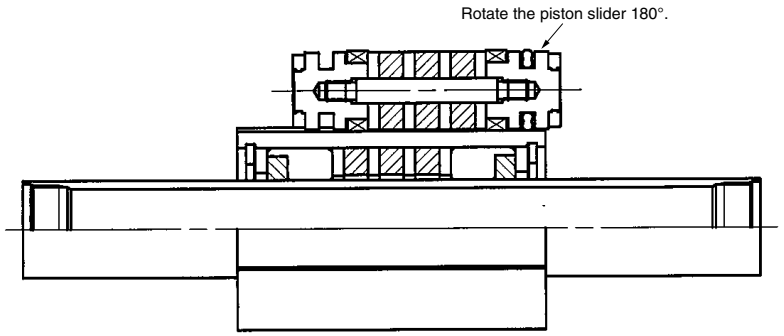
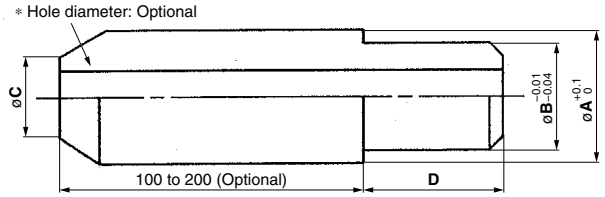


Fig. 6 Incorrect positioning (the centers of the sliders are not aligned) (ø10)

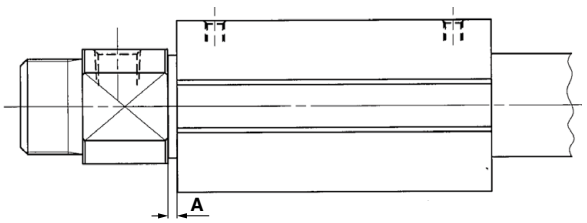
If the external slider is inserted directly into the cylinder tube without the use of the slider insertion tool, the Lube-retainer attached to the external slider may get caught on the cylinder tube entrance, resulting in damage. (Refer to Fig. 7 on page 416-3.)



∗ For the release of air when inserting tubing

	ø6	ø10	ø15	ø20	ø25	ø32	ø40	ø50	ø63
A	7.6	12	16.6	21.6	26.4	33.6	41.6	52.4	65.4
B	6	10	15	20	25	32	40	50	63
C	4	8	13	18	23	30	36	46	56
D	20	20	30	30	40	50	60	60	60

Fig. 7 Slider insertion tool dimensions

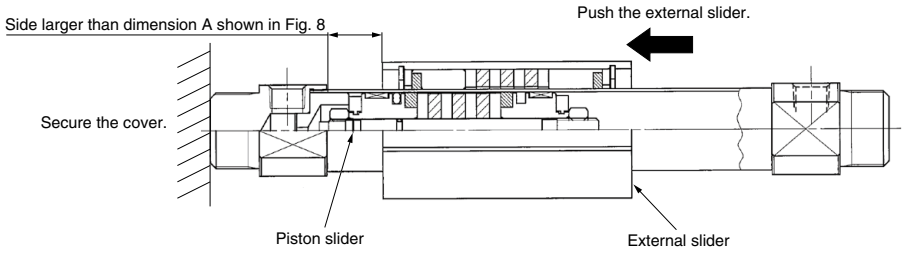


Bore size	**A** (mm)
ø6	4
ø10	1.5
ø15 to **ø32**	2
ø40	3
ø50, ø63	8

Fig. 8 External slider and head cover gap dimensions (Under normal conditions)

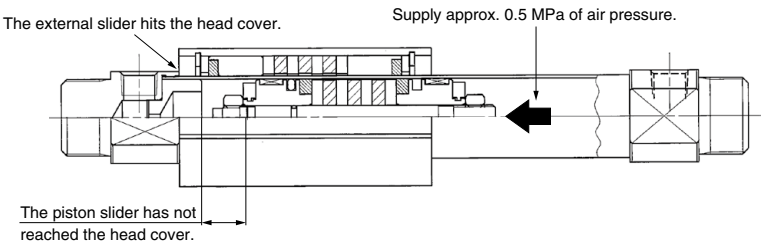
[Slider fitting procedure]

◎ How to push the external slider with external force (by hand, etc.)



∗ The piston slider hits the cover, and the external slider cannot reach the stroke end.

◎ How to push the piston slider with air pressure (approx. 0.5 MPa) (Opposite side of the above figure)



∗ The external slider hits the cover, and the piston slider cannot reach the stroke end.

Fig. 9 Slider fitting procedure

1. Disassembly

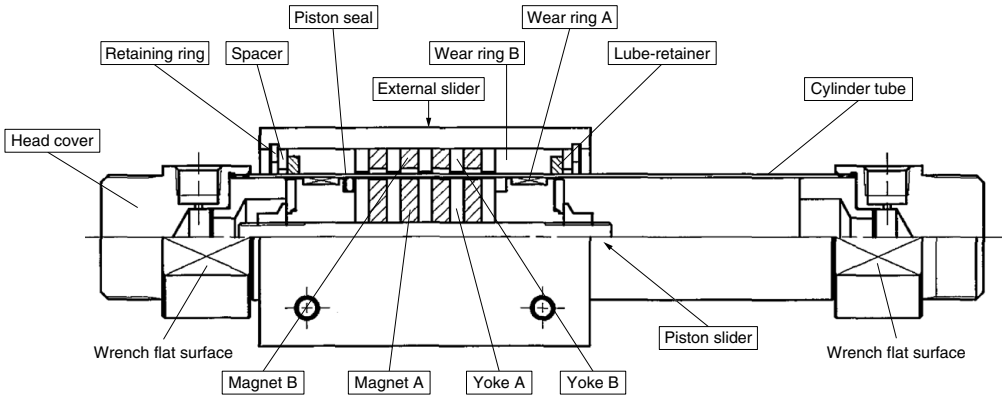


Fig. 1 Internal structure (Model: CY3B25)

Steps	Precautions	Others
1. Removal of the head cover · Hold the wrench flats of one of the head covers with a vise, etc. · Remove the other head cover using a wrench or monkey wrench on its wrench flats.	· As the surface of the cylinder tube is a sliding surface, be sure to avoid scratching or denting it. · Do not grip the cylinder tube directly with a vise or pipe wrench. · Be aware that only 1 of the 2 head covers can be removed. · When reassembling the head cover, tighten it an additional 3 to 5 degrees from its position before removal.	· Adhesive is applied to the threads of the cylinder tube and head cover to prevent loosening. · When reassembling, remove the hardened adhesive, oil, etc., from the threads, reapply adhesive, and tighten the head cover. [Loctite No. 542 (Red)]
2. Removal of the slider · Take the external slider and the piston slider out from the cylinder tube separately.	· Use external force or air pressure to forcibly shift the positional relationship of the external slider and the piston slider inside the cylinder tube, which will disengage the magnetic coupling, and take them out separately. If the external slider and piston slider are removed while still magnetically coupled, the sliders will not be able to be removed from each other. (Refer to Fig. 2 on page 416-1 for the disengagement method.) **⚠Warning** · Be careful when handling as the magnets used in the sliders are extremely strong. · When using air pressure to shift the positional relationship of the external slider and the piston slider, do so with the head cover tightened. If the head cover is loose, it may come off when the piston slider collides with the head cover, resulting in the piston slider shooting out.	· When replacing the seal kit, do not disassemble down to the magnet and yoke. Mounting the magnet in the wrong direction (polarity) during reassembly may result in reduced magnet holding force.

2. Replacement

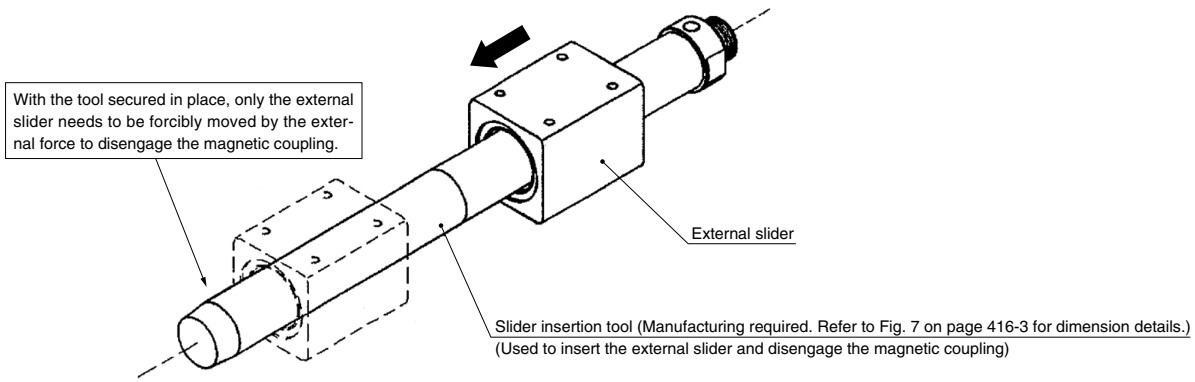
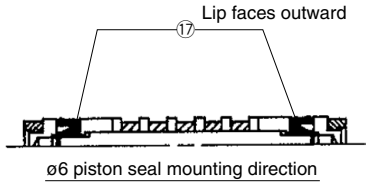
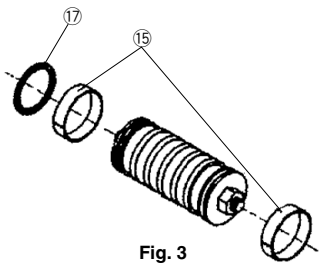
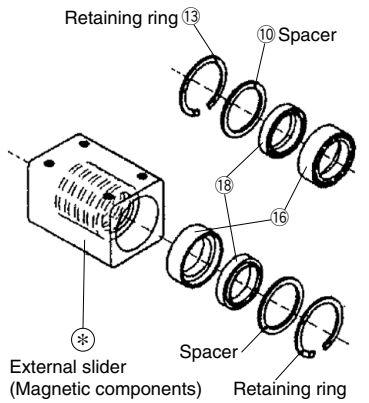


Fig. 2 External slider removal procedure (using external force)

Part name	Consumable parts to be replaced	Content
1. Piston slider  ø6 piston seal mounting direction  **Fig. 3**	Can be ordered as part of the seal kit (Refer to the **Web Catalog**.) Piston seal ⑰ Bore size / Qty. **ø6**: 2 **ø10 to ø63**: 1 Wear ring A ⑮ Bore size / Qty. **ø6**: – **ø10 to ø40**: 2 **ø50, ø63**: 6	· When installing piston seal ⑰, apply grease from the grease pack included in the seal kit, or from the specified grease pack, to the seal groove. · For ø6 piston seals, there is a designated mounting direction. As shown in Fig. 3, install the seal with the lip facing outward. · For piston seals other than ø6, install 1 in any one of the installation grooves. There is no designated mounting direction. · After installing the piston seal, be sure to check that the seal is not twisted. · For wear ring A ⑮, only ø10 cannot be replaced. Contact SMC if replacement is required. · When inserting the part back into the cylinder tube after replacement, apply extra grease to the piston seal and wear ring A of the piston slider.
2. External slider  **Fig. 4**	Lube-retainer ⑱ Bore size / Qty. **ø6**: – **ø10 to ø63**: 2 Wear ring B ⑯ Bore size / Qty. **ø6 to ø63**: 2	· Remove one of the external slider retaining rings (retaining ring ⑭) with snap ring pliers. · Remove spacer ⑩, wear ring B ⑯, and Lube-retainer ⑱, and then replace them. · Allow the Lube-retainer to soak in the grease for approx. 2 hours before installing it. ✻ Conduct replacement on each side of the external slider, one side at a time. Do not remove the magnetic components (the magnet and yoke) from the body. Doing so may result in reduced cylinder performance. · When inserting the external slider back into the cylinder tube after replacing the parts, apply extra grease from the grease pack included in the seal kit, or from the specified grease pack, to the Lube-retainer and wear ring B of the external slider.

✻ Specified grease (Grease pack)
ø6, ø10: GR-F-005 (For external slider sliding) and GR-S-010 (For inside the cylinder tube)
ø15 to ø63: GR-S-010 (Same for internal and external parts)

3. How to insert the external slider and piston slider into the cylinder tube (Caution required)

Procedures

(1) Apply grease to the inner surface of the cylinder tube.
(2) Place the piston slider on top of the external slider (for bore sizes ø6 and ø10). For bore sizes other than ø6 and ø10, the sliders have no insertion direction.
(3) If the piston slider will not couple at the center of the external slider as in Fig. 6, rotate the piston slider 180° so it is positioned as in Fig. 5. If incorrectly positioned sliders are inserted into the cylinder tube as is, they will not magnetically couple as required.
In addition, the stoke will not operate normally.
(4) Insert the slider insertion tool into the cylinder tube.
(5) Confirm that the sliders are in the same state as in Fig. 5, and insert the greased external slider into the cylinder tube.
(6) Remove the slider insertion tool from the cylinder tube.
(7) Insert the greased piston slider into the cylinder tube.
(8) Manually move the external slider back and forth multiple times to spread the grease within the cylinder tube.
(9) Move the external slider to the stroke end, and lightly wipe off the excess grease adhering to the end surface of the piston slider.
(10) After wiping off the grease adhering to the threads of the cylinder tube with alcohol, etc., apply adhesive (Loctite No. 542 (red)) to the cylinder tube or head cover threads, and then tighten the head cover.
For bore sizes ø6 and ø10, confirm that there are no scratches or other damage on the cylinder tube gasket before tightening. Adhesive is not required.
(11) Fit the external slider and piston slider into place inside the cylinder tube. (Refer to Fig. 9 on page 416-3 for the fitting procedure.)
(12) Confirm that the positional relationship of the external slider and piston slider is correct. (Refer to Fig. 8 on page 416-3.)

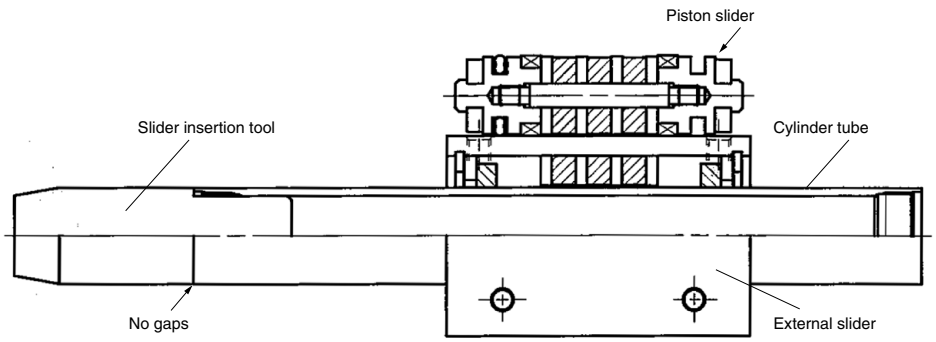


Fig. 5 Correct positioning (the centers of the sliders are aligned) (ø10)

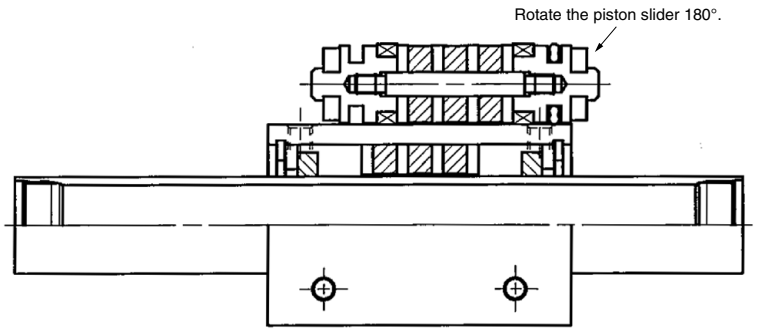
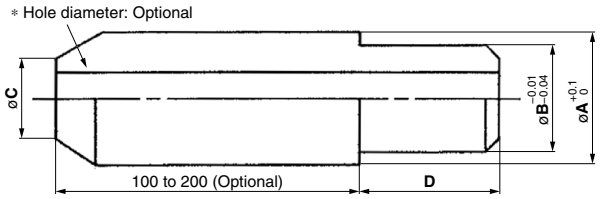


Fig. 6 Incorrect positioning (the centers of the sliders are not aligned) (ø10)

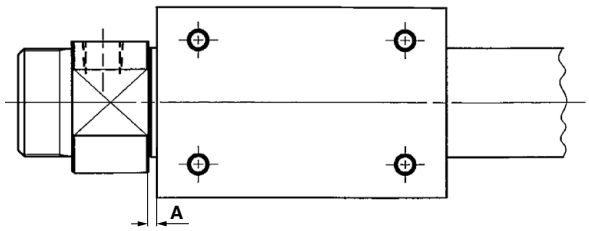
If the external slider is inserted directly into the cylinder tube without the use of the slider insertion tool, the Lube-retainer attached to the external slider may get caught on the cylinder tube entrance, resulting in damage. (Refer to Fig. 7 on page 416-3.)



∗ For the release of air when inserting tubing

	ø6	ø10	ø15	ø20	ø25	ø32	ø40	ø50	ø63
A	7.6	12	16.6	21.6	26.4	33.6	41.6	52.4	65.4
B	6	10	15	20	25	32	40	50	63
C	4	8	13	18	23	30	36	46	56
D	20	20	30	30	40	50	60	60	60

Fig. 7 Slider insertion tool dimensions

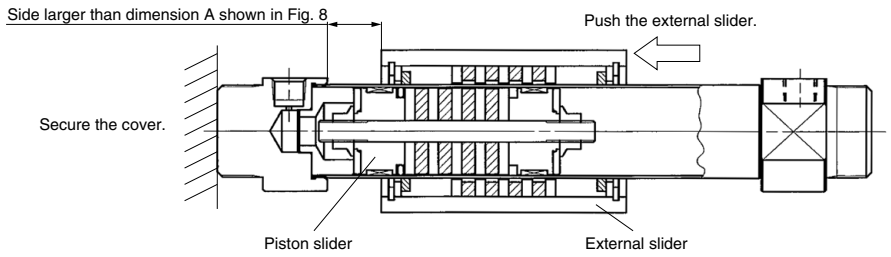


Bore size	**A**(mm)
ø6	4
ø10	1.5
ø15 to ø32	2
ø40	3
ø50, ø63	8

Fig. 8 External slider and head cover gap dimensions (Under normal conditions)

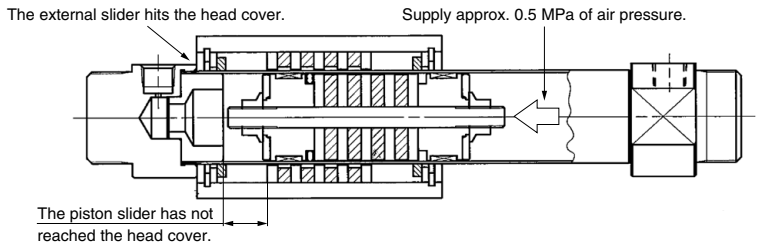
[Slider fitting procedure]

◎ How to push the external slider with external force (by hand, etc.)



∗ The piston slider hits the cover, and the external slider cannot reach the stroke end.

◎ How to push the piston slider with air pressure (approx. 0.5 MPa) (Opposite side of the above figure)



∗ The external slider hits the cover, and the piston slider cannot reach the stroke end.

Fig. 9 Slider fitting procedure

1 Disassembly

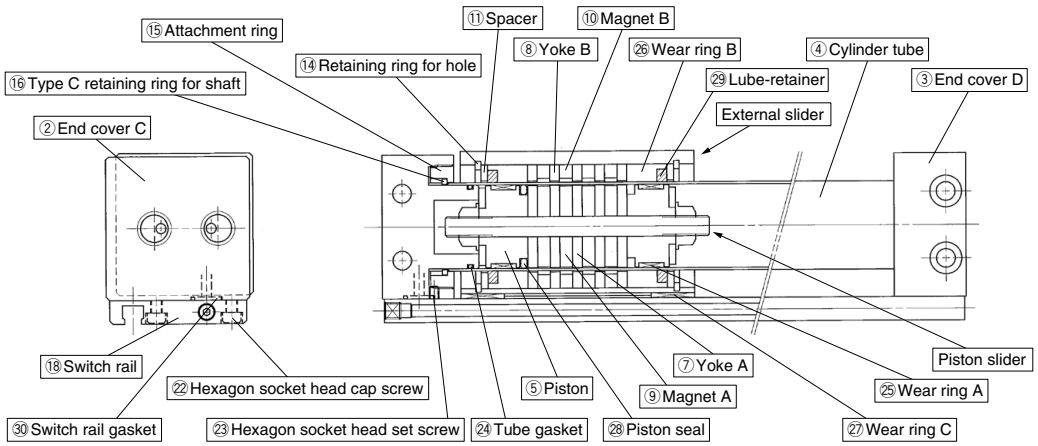
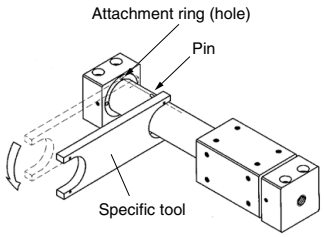


Fig. 1 Internal structure (Model: CY3RG25)

Steps	Precautions	Others
1. Removal of the ⑱ switch rail · Remove the ㉒ hexagon socket head cap screw with a hexagon wrench, and then remove the ⑱ switch rail.		· Adhesive is applied on the hexagon socket head cap screw. Be sure to reapply adhesive during reassembly. [Loctite No. 263]
2. Removal of the ② ③ end cover · Use a hexagon wrench to loosen the ㉓ hexagon socket head set screw for securing the ⑮ attachment ring on the ⑱ switch rail mounting surface of the ② ③ end covers. · Remove the ⑮ attachment ring using the specific tool (Fig. 2). It may also be possible to remove it with snap ring pliers with bent tips. · Pull out the ② ③ end covers from the ④ cylinder tube. · Remove the ⑯ type C retaining ring for the shaft from the ④ cylinder tube.	· Be sure not to forget to loosen the hexagon socket head set screw before removing the attachment ring. · The attachment ring can be removed by applying torque in the counterclockwise direction. · As the tip of the type C retaining ring for the shaft is sharp, be careful to avoid injury while working. · As the surface of the cylinder tube is a sliding surface, be sure to avoid scratching or denting it. **Specific tool** Part no. / Applicable tube I.D. (mm) **CYRZ-V**: 6, 10, 15, 20 **CYRZ-W**: 25, 32, 40 **CYRZ-X**: 50 **CYRZ-Y**: 63	 **Fig. 2**
3. Removal of the slider · Take the external slider and the piston slider out from the ④ cylinder tube separately.	· Use external force or air pressure to forcibly shift the positional relationship of the external slider and the piston slider inside the cylinder tube, which will disengage the magnetic coupling, and take them out separately. If the external slider and piston slider are removed while still magnetically coupled, the sliders will not be able to be removed from each other. (Refer to Fig. 3 on page 416-5 for the disengagement method.) **⚠Warning** · Be careful when handling as the magnets used in the sliders are extremely strong. · When using air pressure to shift the positional relationship of the external slider and the piston slider, do so with the end cover tightened. If the end cover is loose, it may come off when the piston slider collides with the end cover, resulting in the piston slider shooting out.	· When replacing the seal kit, do not disassemble down to the magnet and yoke. Mounting the magnet in the wrong direction (polarity) during reassembly may result in reduced magnet holding force.

2 Replacement

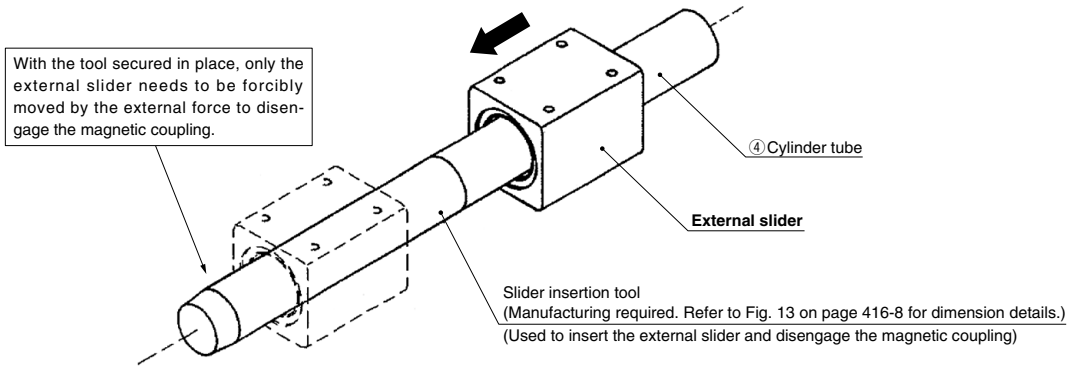
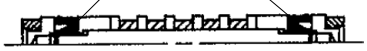
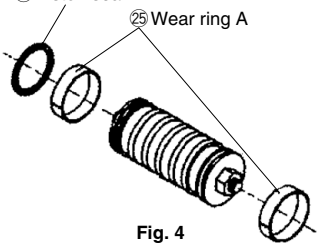
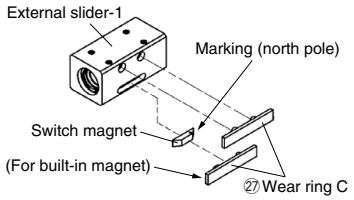
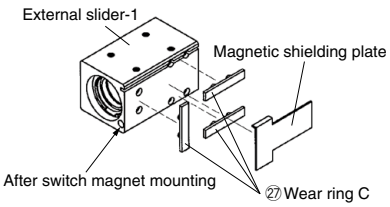
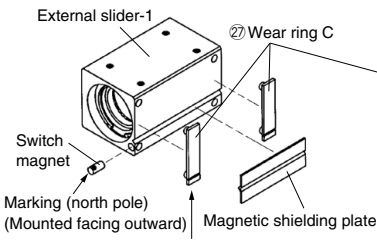
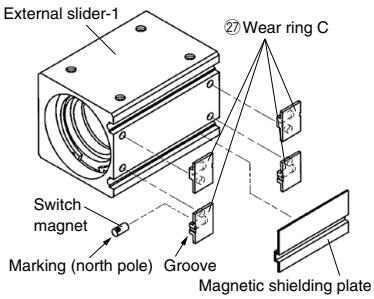
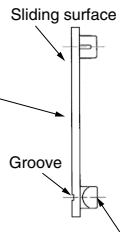
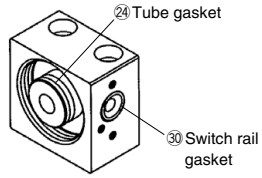


Fig. 3 External slider removal procedure (using external force)

Part name	Consumable parts to be replaced	Content
1. Piston slider (Lip faces outward) ㉘ Piston seal  ø6 piston seal mounting direction ㉘ Piston seal ㉕ Wear ring A  **Fig. 4**	Can be ordered as part of the seal kit Piston seal Bore size / Qty. **ø6**: 2 **ø10 to ø63**: 1 Wear ring A Bore size / Qty. **ø6**: – **ø10 to ø40**: 2 **ø50, ø63**: 6	· When installing piston seal, apply grease from the grease pack included in the seal kit, or from the specified grease pack, to the seal groove. · For ø6 piston seals, there is a designated mounting direction. As shown in Fig. 4, install the seal with the lip facing outward. · For piston seals other than ø6, install 1 in any one of the installation grooves. There is no designated mounting direction. · After installing the piston seal, be sure to check that the seal is not twisted. · For wear ring A, only ø10 cannot be replaced. Contact SMC if replacement is required. · When inserting the part back into the cylinder tube after replacement, apply extra grease to the piston seal and wear ring A of the piston slider.
2. External slider-1 (Internal parts replacement) ⑭ Retaining ring for hole ⑪ Spacer ㉙ Lube-retainer ㉖ Wear ring B ㉖ Wear ring B ⑪ Spacer External slider (Magnetic components) ⑭ Retaining ring for hole **Fig. 5**	Lube-retainer Bore size / Qty. **ø6**: – **ø10 to ø63**: 2 Wear ring B Bore size / Qty. **ø6 to ø63**: 2	· Remove one of the external slider retaining rings (retaining ring for hole) with snap ring pliers. · Remove spacer, wear ring B, and Lube-retainer, and then replace them. · Allow the Lube-retainer to soak in the grease for approx. 2 hours before installing it. ∗ Conduct replacement on each side of the external slider, one side at a time. Do not remove the magnetic components (the magnet and yoke) from the body. Doing so may result in reduced cylinder performance. · When inserting the external slider back into the cylinder tube after replacing the parts, apply extra grease from the grease pack included in the seal kit, or from the specified grease pack, to the Lube-retainer and wear ring B of the external slider.

∗ Specified grease (Grease pack)
ø6, ø10: GR-F-005 (For external slider sliding) and GR-S-010 (For inside the cylinder tube)
ø15 to ø63: GR-S-010 (Same for internal and external parts)

Part name	Consumable parts to be replaced	Content
3. External slider-2 (㉗ wear ring C replacement)  **Fig. 6 ø6, ø10**  **Fig. 7 ø15**  ∗ ø20: For reed switches, the long ㉗ wear ring C is mounted. **Fig. 8 ø20, ø25**  **Fig. 9 ø32 to ø63**	Wear ring C Bore size / Qty. **ø6, ø10** — 2 **ø15** — 3 **ø20, ø25** — 2 **ø32 to ø63** — 4  ∗ For bore size ø20, wear ring C for both solid state and reed switches are included in the seal kit. Use the appropriate wear ring C for the type of switch. (Seal kit: 2 pcs. for solid state switches, 1 pc. for reed switches)	**ø6, ø10** · Replace wear ring C with the new wear ring. The wear ring can be easily removed by inserting a flat head screwdriver, etc., into the mounting part. · There is a switch magnet mounted on only 1 (of the 2) wear ring C, and it is to be mounted on the groove of the external slider. · When replacing wear ring C, insert the side of the switch magnet with the marking in the direction shown in Fig. 6. Note that if the mounting direction is reversed, the switch will malfunction. · Wear ring C can be mounted by simply pushing it into the hole/groove. **ø15** · Replace wear ring C with the new wear ring. · Wear ring C can be mounted by simply pushing it into the hole. **ø20, ø25** · Replace wear ring C with the new wear ring. · Mount with the groove side of the wear ring C sliding surface facing the switch magnet side of the external slider. · For bore size ø20, the type of wear ring C to be mounted varies depending on the type of switch (reed/solid state). <For solid state switch> For the left and right wear ring C, 2 identical pieces which are shorter in length are used. <For reed switch> The wear ring C on the switch magnet side is longer in length. The other wear ring C is the same (shorter) as the one for solid state switches. · When replacing wear ring C, if the switch magnet protrudes from the external slider, insert it into the mounting hole with the side of the switch magnet with the marking facing outward as shown in Fig. 8. · Mount wear ring C after mounting the switch magnet. **ø32 to ø63** · Replace wear ring C with the new wear ring. · As shown in Fig. 9, 1 (of the 4) wear ring C has a switch magnet mounted on it (the other 3 do not). Push the magnet into the groove of wear ring C, with the groove side of the wear ring C end face and the side of the magnet with the marking facing the same direction.
4. ②③ End cover  **Fig. 10**	Tube gasket Bore size / Qty. **ø6 to ø63** — 2 Switch rail gasket (Centralized piping only) Bore size / Qty. **ø10** — 1 **ø15 to ø63** — 2	· Replace the greased tube gasket and switch rail gasket.

3 How to insert the external slider and piston slider into the cylinder tube (Caution required)

Procedures

(1) Apply grease to the inner surface of the cylinder tube.
(2) Place the piston slider on top of the external slider (for bore sizes ø6 and ø10). For bore sizes other than ø6 and ø10, the sliders have no insertion direction.
(3) If the piston slider will not couple at the center of the external slider as in Fig. 12, rotate the piston slider 180° so it is positioned as in Fig. 11. If incorrectly positioned sliders are inserted into the cylinder tube as is, they will not magnetically couple as required.
In addition, the stoke will not operate normally.
(4) Insert the slider insertion tool into the cylinder tube.
(5) Confirm that the sliders are in the same state as in Fig. 11, and insert the greased external slider into the cylinder tube.
(6) Remove the slider insertion tool from the cylinder tube.
(7) Insert the greased piston slider into the cylinder tube.
(8) Manually move the external slider back and forth multiple times to spread the grease within the cylinder tube.
(9) Move the external slider to the stroke end, and lightly wipe off the excess grease adhering to the end surface of the piston slider.
(10) Follow the disassembly procedure in the reverse order to reassemble the end cover, etc.
(11) Fit the external slider and piston slider into place inside the cylinder tube. (Refer to Fig. 15 on page 416-8 for the fitting procedure.)
(12) Confirm that the positional relationship of the external slider and piston slider is correct. (Refer to Fig. 14 on page 416-8.)
(13) Place the cylinder from step (12) on a flat surface, press the upper part of both end covers, and rotate them to remove the backlash between the end covers.
(14) Mount the switch rail.

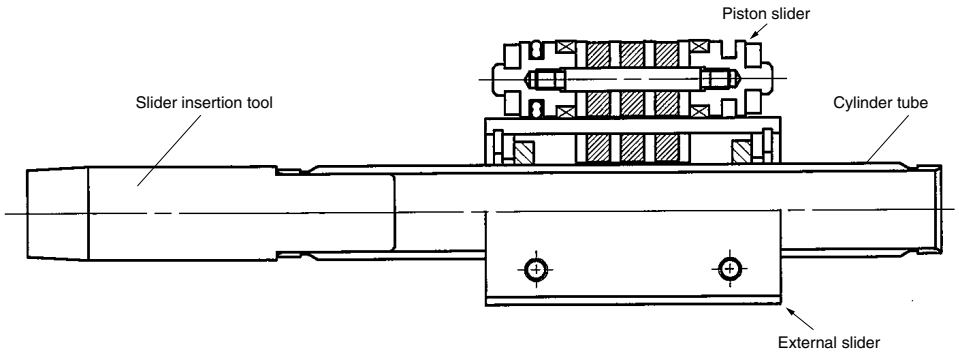


Fig. 11 Correct positioning (the centers of the sliders are aligned) (ø10)

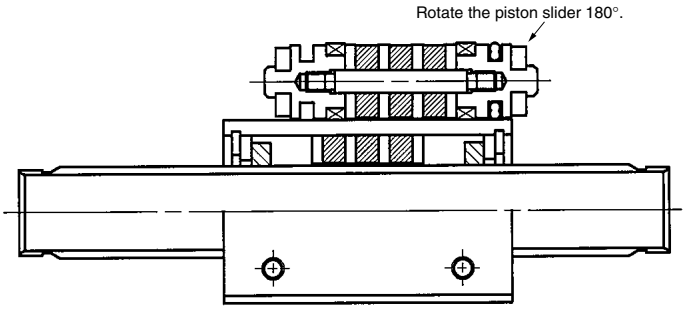
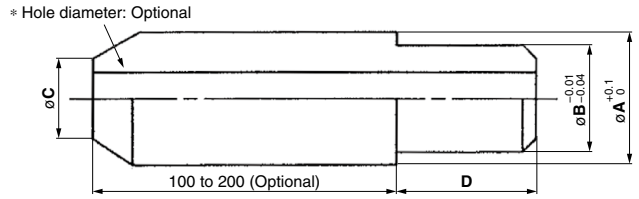


Fig. 12 Incorrect positioning (the centers of the sliders are not aligned) (ø10)

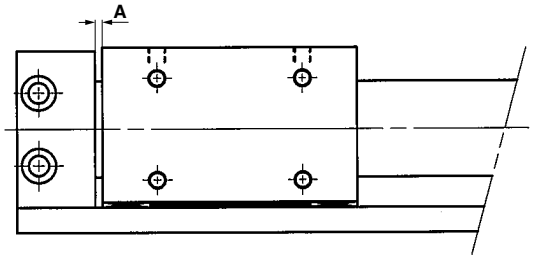
If the external slider is inserted directly into the cylinder tube without the use of the slider insertion tool, the Lube-retainer attached to the external slider may get caught on the cylinder tube entrance, resulting in damage. (Refer to Fig. 13 on page 416-8.)



∗ For the release of air when inserting tubing

	ø6	ø10	ø15	ø20	ø25	ø32	ø40	ø50	ø63
A	7.6	12	16.6	21.6	26.4	33.6	41.6	52.4	65.4
B	6	10	15	20	25	32	40	50	63
C	4	8	13	18	23	30	36	46	56
D	20	20	30	30	40	50	60	60	60

Fig. 13 Slider insertion tool dimensions



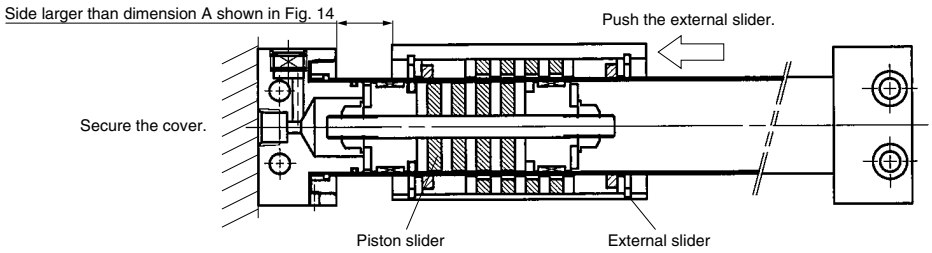
Bore size	**A** (mm)
ø6 to ø15	1.5
ø20, ø25	2
ø32 to ø63	3

∗ Both ends have the same dimensions.

Fig. 14 External slider and head cover gap dimensions (Under normal conditions)

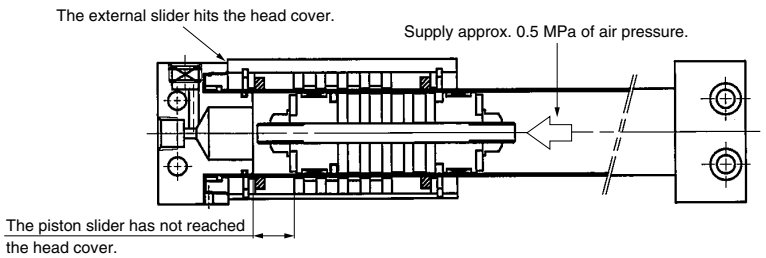
[Slider fitting procedure]

◎ How to push the external slider with external force (by hand, etc.)



∗ The piston slider hits the cover, and the external slider cannot reach the stroke end.

◎ How to push the piston slider with air pressure (approx. 0.5 MPa) (Opposite side of the above figure)

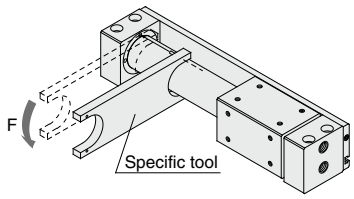


∗ The external slider hits the cover, and the piston slider cannot reach the stroke end.

Fig. 15 Slider fitting procedure

1. Disassembly and Maintenance

1-1. If the cylinder needs to be disassembled for replacement of piston packing, soft wiper, and wear ring, specific tool is required. The specific tool can be ordered by part no. shown on Table.



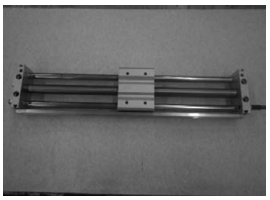
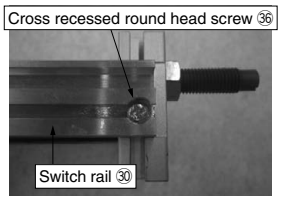
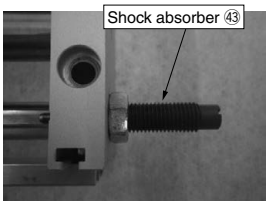
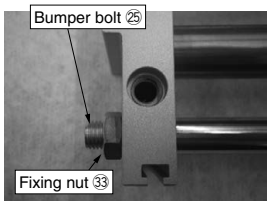
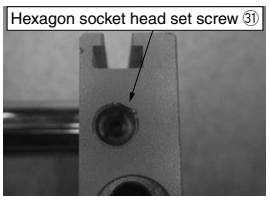
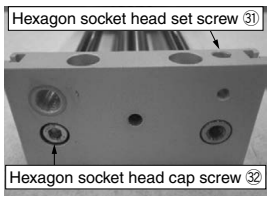
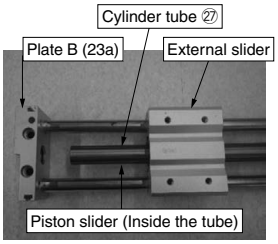
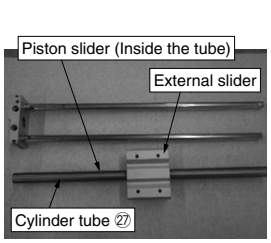
Part no. of specific tool

Part on.	**Applicable cylinder tube I.D.** (mm)
CYRZ-V	6, 10, 15, 20
CYRZ-W	25, 32, 40
CYRZ-X	50
CYRZ-Y	63

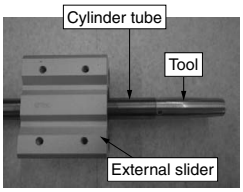
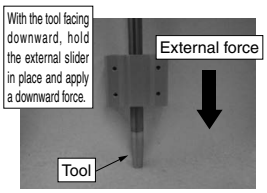
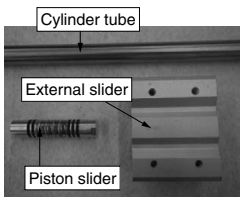
1-2. As for sine rodless cylinders, the cushion ring and seal are assembled to provide the optimum cushioning effect.
Therefore, they should be returned to the factory for maintenance.
If you disassemble them by necessity, please note the following points.

a. If the cylinder body or piston is removed from the cylinder tube, displace the positions of the external slider and the piston forcedly to eliminate holding force and take out them individually. If they are removed together with holding force left, they become unable to separate from each other by internal and external magnet force.
b. Loosen the hexagon socket head female screw on side of the end cover with a hexagon wrench, take off the attachment ring from the end cover from the specific tool and then remove the end cover from the cylinder tube. After that, remove the basic internal retaining ring mounted on the external face of the cylinder tube with a snap ring pliers. The used magnet has strong suction force and should be handled with care if the external slider and piston slider are removed from the cylinder tube.
c. Never disassembly the parts which compose the magnet (external slider and piston slider).
The disassembly of them may deprive holding force from the magnet and cause operating failure.
d. For handling of the external slider and the piston slider, watch on your arm should be put off not to get influence from strong magnetic field.
e. Handle the external slider and piston slider with care to protect the magnet from drop on the floor and collision to the metal.
f. Apply grease periodically on the external face of the cylinder tube and the sliding parts of the switch rail.
g. Since the cushion ring is precisely attached to the head cover, be careful not to take it off nor deform/dent it.

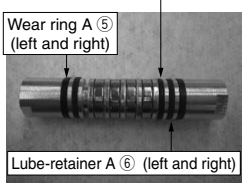
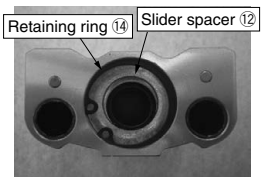
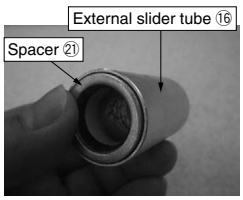
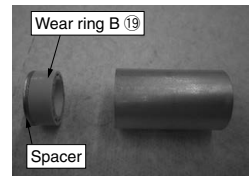
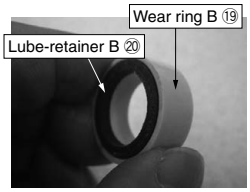
1. Disassembly

No.	Process	Steps			Note
1	Accessory removal	1) Remove the switch rail (㉚). (Picture 2) Use a Phillips head screwdriver to remove the cross-recessed round head screws (㊱) from both ends of the switch rail. 2) Remove the shock absorber (㊸), bumper bolt (㉕), and adjustment bolt (㊶). (Pictures 3 and 4) Remove fixing nuts (㉝) and (㉞) with a monkey wrench.	 Picture 1: Cylinder appearance	 Picture 2: Switch rail	Cross recessed round head screw ø6 to ø40: M3 Shock absorber and bumper bolt nut size ø6: M6 ø10/ø15: M8 ø20: M10 ø25: M14 ø32/ø40: M20 Adjustment bolt nut size ø6/ø10/ø15: M4 ø20/ø25: M6 ø32/ø40: M8
			 Picture 3: Shock absorber	 Picture 4: Bumper bolt	
2	Plate A removal (For the bilateral piping type) Plate C removal (For the centralized piping type)	1) Remove the hexagon socket head set screws (㉛) from the counterbore surfaces of plate A (㉒) and plate C (23a). (Picture 5) Use a hexagon wrench to remove them. 2) Remove the hexagon socket head cap screws (㉜) from the outside end surfaces of plate A and plate C. (Picture 6) Use a hexagon wrench to remove them. 3) Remove plate A and plate C from the guide shaft. (Picture 7)	 Picture 5: Hexagon socket head set screw	 Picture 6: Hexagon socket head cap screw	Hexagon socket head set screw ø6: M3 ø10/ø15: M4 ø20/ø25: M5 ø32: M6, ø40: M8 Hexagon socket head cap screw ø6: M4 ø10/ø15: M5 ø20/ø25: M6 ø32: M8 ø40: M10 ∗ Plate A will be difficult to remove if it is tilted to the side, so be sure to hold it straight during removal. ∗ If plate A is difficult to remove, it can be removed while tapping it lightly with a plastic hammer, etc. However, be sure to do so in a manner that does not damage it.
			 Picture 7: Plate A and plate C removal		
3	Cylinder body removal (External slider) (Piston slider) (Cylinder tube)	1) Remove the cylinder tube (㉗) from plate B (23a) with the external slider and piston slider in a magnetically coupled state. (Pictures 8 and 9)	 Picture 8: Cylinder body removal 1	 Picture 9: Cylinder body removal 2	∗ Be aware that at this time, if the external slider is pulled out from the cylinder tube as is, the piston slider will come out with it. Be sure to pull it out while holding the cylinder tube.

∗ The numbers after the part names indicate the part numbers as shown in the "Construction" section of the catalog.

No.	Process	Steps	Note
4	External slider and piston slider removal	1) When removing the external slider and piston slider from the cylinder tube, use the slider insertion tool (Picture 10) (Manufacturing required. Refer to Fig. 2 on page 418-3 for details.) and remove them separately after disengaging the magnetic coupling. 2) Mount the tool to the cylinder tube. (Picture 11) 3) With the tool facing downward, apply a downward force on the external slider to disengage the magnetic coupling. (Picture 12) Then, remove the external slider and the piston slider separately. (Picture 13)  Picture 10: Slider insertion tool  Picture 11: Slider insertion tool mounting  Picture 12: External slider removal procedure  Picture 13: Removal of internal slider and external slider complete	· If the external slider and piston slider are removed while still magnetically coupled, the sliders will not be able to be removed from each other. **⚠Warning** · Be careful when handling as the magnets used in the sliders are extremely strong. · Try to refrain from using air pressure to forcibly shift the positional relationship of the external slider and the piston slider whenever possible. This method sometimes results in damage to the parts when the metal end of the piston slider hits the metal plate surface directly. (For the type without a rubber bumper)

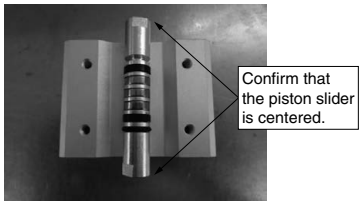
2. Replacement procedures

No.	Process	Steps	Note
5	Replacement of seal	[Piston slider seal replacement] Replace the piston seal (④), wear ring A (⑤), and Lube-retainer A (⑥), all of which are included in the seal kit. (Picture 14)  Picture 14: Piston slider (ø15) Piston seal ④ Bore size / Qty. ø6: 2 ø10 to ø63: 1 Wear ring A ⑤ Bore size / Qty. ø6: – ø10 to ø40: 2 Lube-retainer A ⑥ Bore size / Qty. ø6, ø10: – ø15 to ø40: 2 [External slider inner seal replacement] 2) Remove the external slider retaining ring (⑭) on one side. (Picture 15) 3) Remove the slider spacer (⑫) (including the slider gasket (⑬)). (Picture 15) 4) Remove the external slider tube assembly (external slider tube (⑯), spacer (㉑), wear ring B (⑲), Lube-retainer B (⑳), magnet B (⑰), and external slider side yoke (⑱)). (Picture 16) 5) Replace the seals. (Pictures 17 and 18) Slider gasket ⑬ Bore size / Qty. ø6 to ø40: 2 Wear ring B ⑲ Bore size / Qty. ø6 to ø40: 2 Lube-retainer B ⑳ Bore size / Qty. ø6: – ø10 to ø40: 2  Picture 15: External slider  Picture 16: External slider tube assembly  Picture 17: Wear ring B removal  Picture 18: Wear ring B, Lube-retainer B	· When installing piston seal, apply grease from the grease pack included in the seal kit, or from the specified grease pack, to the seal groove. · For ø6 piston seals, there is a designated mounting direction. Install the piston seals on both sides with the lips facing outward. · For piston seals other than ø6, install 1 in any one of the installation grooves. There is no designated mounting direction. · For wear ring A, only ø10 cannot be replaced. Contact SMC if replacement is required. · Allow the Lube-retainer to soak in the grease for approx. 2 hours before installing it. · Lube-retainer A is made of a material that does not stretch easily, so if it is pulled forcibly, it will not return to its original state. · When removing the external slider tube assembly, be careful not to bump it as this may result in the internal magnets, etc., popping out. · When replacing wear ring B and Lube-retainer B, perform removal on each side of the external slider tube, one side at a time. · When replacing the seals, do not disassemble down to the magnet and yoke. Mounting the magnet in the wrong direction (polarity) during reassembly may result in reduced magnetic holding force.

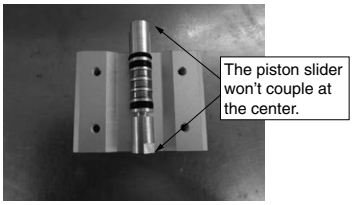
∗ Replace the seals other than those described in this manual according to usage conditions.

3. How to insert the external slider and piston slider into the cylinder tube (Caution required)

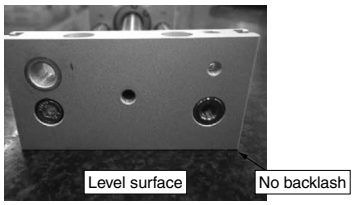
No.	Process	Steps	Note
6	Reassembling	1) After completing the seal replacement, follow the disassembly procedure in the reverse order to reassemble. Procedures ① : Apply grease to the inner surface of the cylinder tube. ② : Place the piston slider on top of the external slider (for bore sizes ø6 and ø10). For bore sizes other than ø6 and ø10, the sliders have no insertion direction, so ignore this step. ③ : If the piston slider will not couple at the center of the external slider (Picture 20), rotate the piston slider 180° so it is positioned as in Picture 19. If incorrectly positioned sliders are inserted into the cylinder tube as is, they will not magnetically couple as required. In addition, the stoke will not operate normally. ④ : Insert the slider insertion tool into the cylinder tube. ⑤ : Reconfirm that the sliders are in the same state as in Picture 19. ⑥ : Apply extra grease to wear ring B and the Lube-retainer of the external slider. ⑦ : Insert the greased external slider into the cylinder tube. ⑧ : Remove the slider insertion tool from the cylinder tube. ⑨: Apply extra grease to the piston seal, wear ring A, and the Lube-retainer of the piston slider. ⑩ : Insert the greased piston slider into the cylinder tube. ⑪ : Manually move the external slider back and forth multiple times to spread the grease within the cylinder tube. ⑫ : Move the external slider to the stroke end, and lightly wipe off the excess grease adhering to the end surface of the piston slider. ⑬ : Insert the assembly from step ⑫ into the guide shaft and plate B, and follow the disassembly procedure in the reverse order to reassemble. (Be sure to do so on a flat surface.) ⑭ : Fit the external slider and piston slider into place inside the cylinder tube. (Refer to Fig. 4-1 and Fig. 4-2 on page 418-3.) ⑮ : Confirm that the positional relationship of the external slider and piston slider is correct. (Refer to Fig. 3 on page 418-3.) ⑯ : After completing step ⑮, place the cylinder on a flat surface again and confirm that there is no backlash due to twisting between the plates. If there is backlash present, loosen the bolts, etc., and re-tighten them. (Picture 21)	· If the external slider is inserted directly into the cylinder tube without the use of the slider insertion tool, the Lube-retainer attached to the external slider may get caught on the cylinder tube entrance, resulting in damage. Be sure to use the tool. (Refer to Fig. 2 on page 418-3.) · When reassembling, remove any hardened adhesive, oil, etc., from the threads of the bolts and screws, and reapply adhesive to prevent loosening. [Loctite No. 263 (High strength)]



Picture 19: Correct positioning (the centers of the sliders are aligned) (ø10)



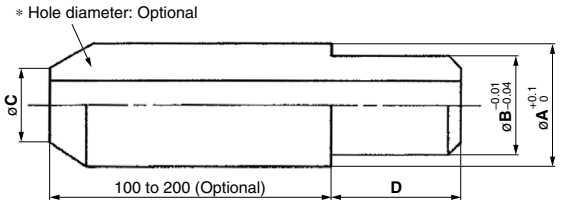
Picture 20: Incorrect positioning (the centers of the sliders are not aligned) (ø10)



Picture 21: Check for backlash.

∗ Specified grease (Grease pack): GR-S-010 (Same for all sizes)

[Slider insertion tool]



∗ For the release of air when inserting tubing

	ø6	ø10	ø15	ø20	ø25	ø32	ø40
A	7.6	12	16.6	21.6	26.4	33.6	41.6
B	6	10	15	20	25	32	40
C	4	8	13	18	23	30	36
D	20	20	30	30	40	50	60

Fig. 2 Slider insertion tool dimensions

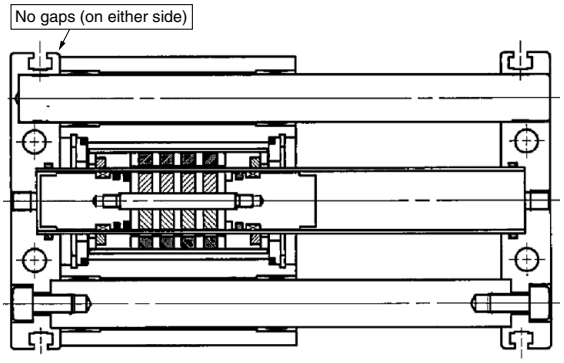
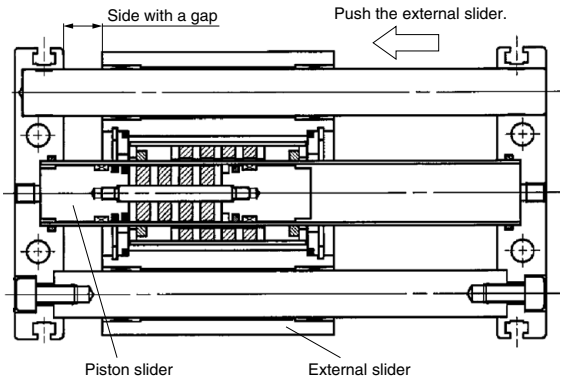


Fig. 3 External slider and plate gap dimensions (Under normal conditions)

[Slider fitting procedure]

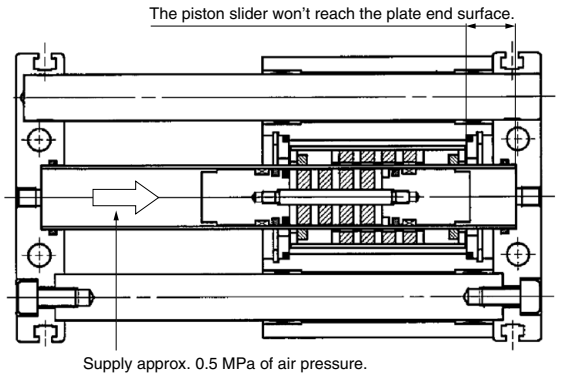
◎ How to push the external slider with external force (by hand, etc.)



∗ The piston slider hits the plate, and the external slider cannot reach the stroke end.

Fig. 4-1 Slider fitting procedure (How to push in the external slider)

◎ How to push the piston slider with air pressure (approx. 0.5 MPa) (Opposite side of the fig. 4-1)



∗ The external slider hits the cover, and the piston slider cannot reach the stroke end.

Fig. 4-2 Slider fitting procedure (How to push in the piston slider)

1. Maintenance

If the cylinder needs to be disassembled to replace the piston seal, wear ring, etc., care should be taken for the following points.

1-1. To remove the external slider or the piston slider from the cylinder tube, the holding force must be released by shifting the positions of the external slider and the piston slider forcibly. Removing them without doing so may cause the respective magnets to attract each other, making them impossible to separate.

1-2. Upon completing the above step to remove the sliders, remove the cylinder tube and plate A from guide shafts A and B by loosening the hexagon socket head cap screw on the plate A side. (While carrying out replacement work (of the packing, etc.), please refrain from disassembling other parts of the product as air leakage may result.)

1-3. The magnet assembly (piston slider and external slider) must not be disassembled. Doing so may result in decreased holding force and other problems.

1-4. The piston slider and external slider have a set direction (L type and ø6, ø10).
Refer to the diagram below for details. Connect the external slider (slide block) and the piston slider and insert into the cylinder tube as shown in Fig. 1-(a). If the positioning resembles Fig. 1-(b), rotate the piston slider to insert.

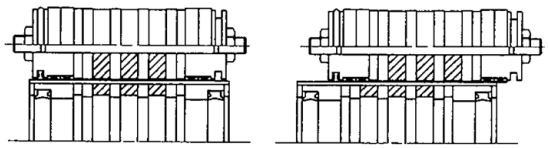


Fig. 1-(a) Correct direction Fig. 1-(b) Incorrect direction

Fig. 1 Direction of the slider

1-5. Before handling the magnet assembly, remove your wrist watch so as not to subject it to the effects of the strong magnetic field.

1-6. Thorough care should be taken to prevent the magnets from dropping on the floor or being knocked against metal objects.

2. Other Precautions

2-1. The slider contains parts made of iron, so care should be taken to prevent water droplets from entering the cylinder tube.

2-2. Grease should be periodically applied to the bearing part of the slide block.

2-3. After the product is reassembled, thoroughly flush the piping with air to remove any remaining dirt or cutting chips from inside the piping.

2-4. Care should be taken to prevent the external surfaces of the cylinder tube and the guide shaft from being scratched, dented, etc. Damage to the scraper, wear ring, and bushing may lead to a malfunction.

2-5. The changing of magnet holding force (for example, CY1L25L→CY1L25H) is carried out in our factories. Please contact our sales office for further details or to request this service.

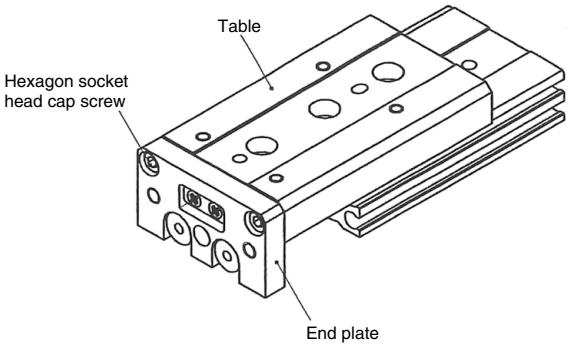
2-6. Please contact us beforehand if the cylinder (cylinder tube, guide shaft surface) is to be used in an environment where it will be exposed to (warm) water, coolant, etc.

⚠Caution

1. The cross roller part which is the guide system of the Air slide table, should not be taken apart because the pre-load has been already adjusted at the mounting stage.
2. Replenishment of grease during piston seal replacement.
   Apply special grease to the piston seal section and the sliding section.
   (Grease No.: GR-L)

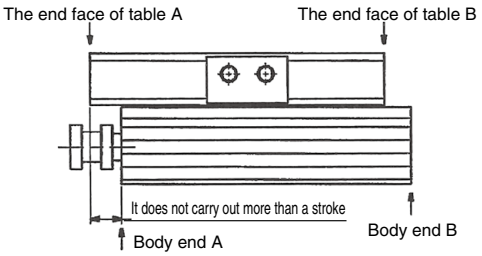
1. Replacement of the Seal

1-1. Remove the hexagon socket head cap screws which connect the end plate and the table.
1-2. Remove the end plate.



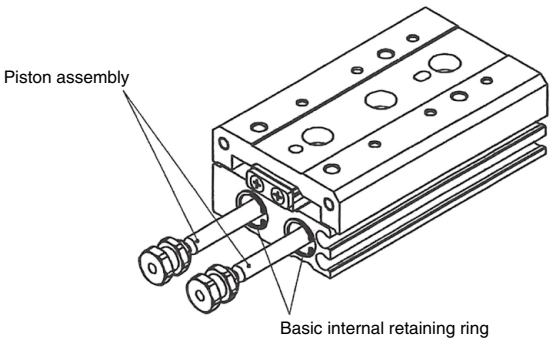
MXQ Series

Cautions after removing the end plate

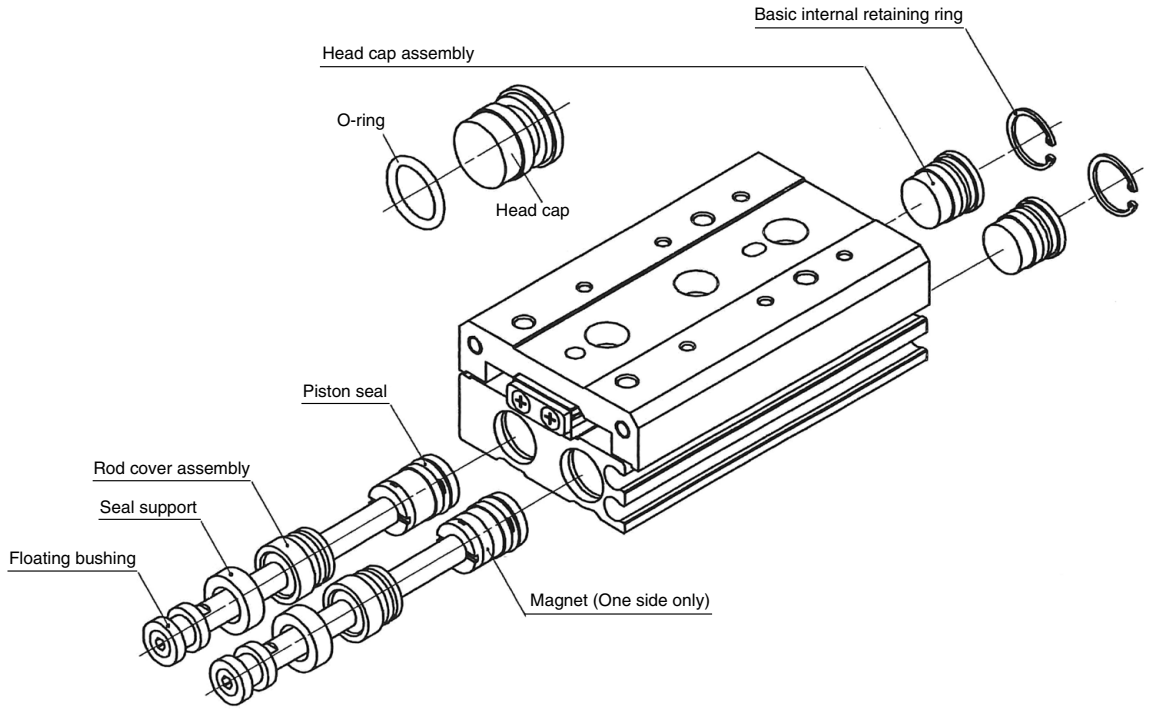


Make sure that table end A does not exceed the body end A at the full stroke after removing the end plate.
Make sure that table end B does not exceed the body end B at the full stroke after removing the end plate.
(The steel balls in the guide will fall out.)

1-3. Remove the basic internal retaining ring.
(Using a retaining ring tool)
1-4. Pull out the piston assembly.

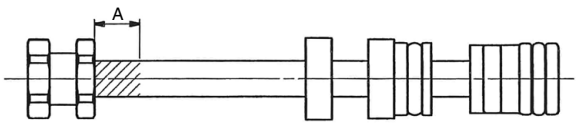


1-5. Apply grease to the piston seal and replace it.
1-6. Remove the basic internal retaining ring on the head cap side. (Using a retaining ring tool)
∗ For the MXQR
1-7. Remove the head cap, apply grease and replace the O-ring. ∗ For the MXQR



1-8. Remove the floating bushing.

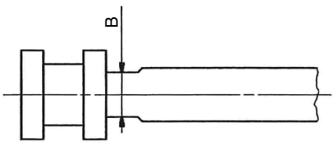
ø6 and ø8 do not have width across flats. Lock onto the shaded part with a round nose chain pliers with side cutters. (It is not possible to lock onto areas other than the shaded part.)



	MXS6	MXS8
Dimension A	3.2 mm or less	3.6 mm or less

	MXQ(R)6	MXQ(R)8
Dimension A	3.2 mm or less	3.6 mm or less

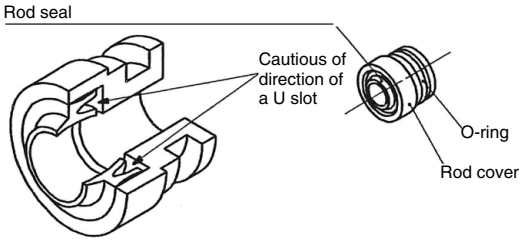
For ø12 to ø25, fix the width across flats of the rod with a wrench.



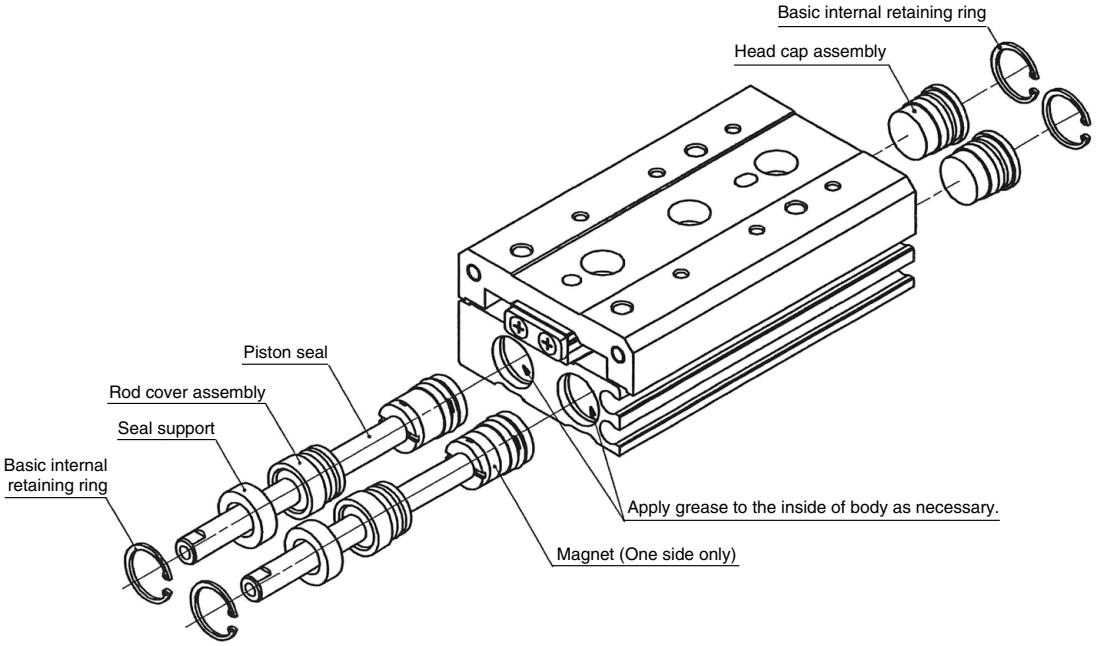
	MXS12	MXS16	MXS20	MXS25
Dimension B	5 mm	6 mm	8 mm	10 mm

	MXQ(R)12	MXQ(R)16	MXQ(R)20	MXQ(R)25
Dimension B	5 mm	6 mm	8 mm	10 mm

1-9. Remove the seal support.
1-10. Remove the rod cover assembly.
1-11. Apply grease to the O-ring and replace it.
1-12. Apply grease to the rod seal and replace it.



1-13. Mount the rod cover assembly and seal support to the piston rod assembly and insert it into the body.
1-14. Fix the seal support with the basic internal retaining ring. (Using a retaining ring tool)
1-15. Insert the head cap assembly into the body and fix it with the basic internal retaining ring. (Using a retaining ring tool)
∗ For the MXQR



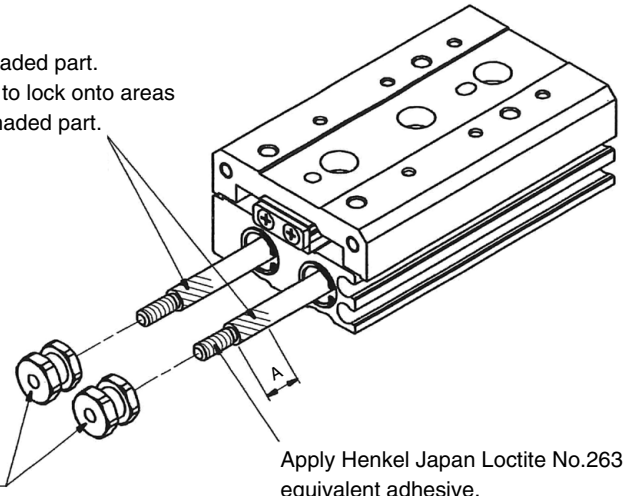
1-16. Mount the floating bushing onto the piston rod assembly.

ø6, ø8

Lock onto the shaded part.
It is not possible to lock onto areas other than the shaded part.

Model	Dimension A
MXS6	3.2 mm or less
MXS8	3.6 mm or less

Model	Dimension A
MXQ(R)6	3.2 mm or less
MXQ(R)8	3.6 mm or less



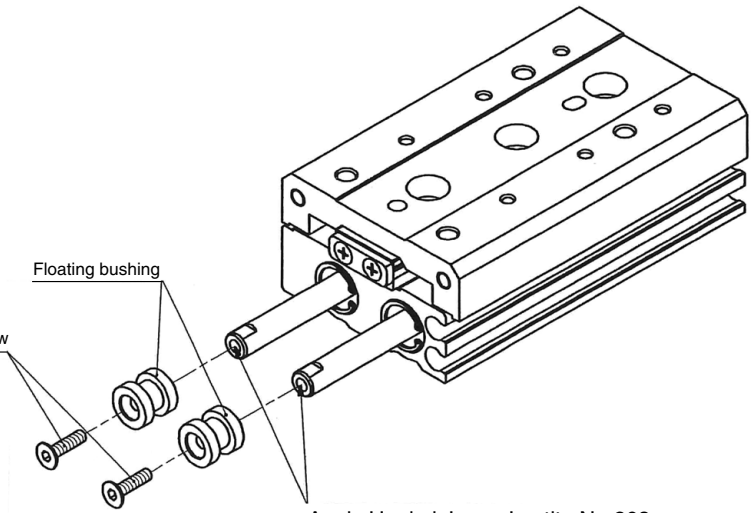
Floating bushing

Apply Henkel Japan Loctite No.263 or an equivalent adhesive.
If adhesive is squeezed out from part A after assembly, wipe it off.

Model	Tightening torque (N·m)
MXS6	0.21
MXS8	0.41

Model	Tightening torque (N·m)
MXQ(R)6	0.21
MXQ(R)8	0.41

ø12 to ø25



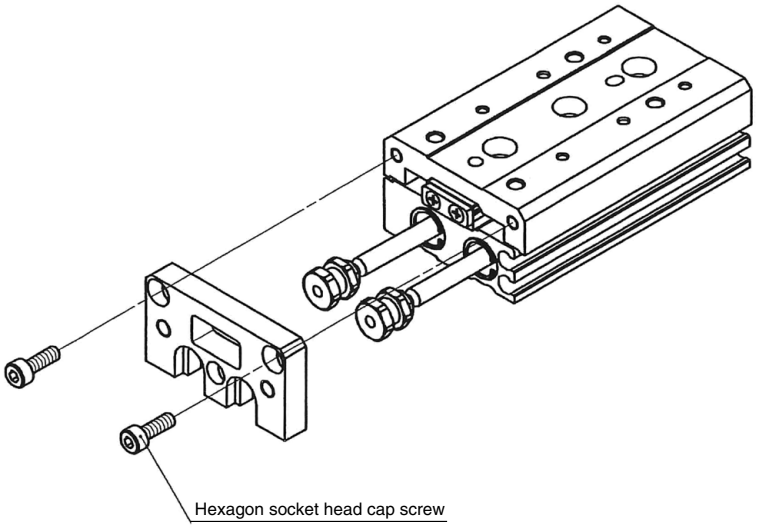
Apply Henkel Japan Loctite No.263 or an equivalent adhesive.

Model	Hexagon socket head cap screw	Tightening torque (N·m)
MXS12	M3 x 14	1.0
MXS16	M4 x 18	2.4
MXS20	M5 x 20	4.3
MXS25	M6 x 25	6.9

Model	Hexagon socket head cap screw	Tightening torque (N·m)
MXQ(R)12	M3 x 14	1.0
MXQ(R)16	M4 x 18	2.4
MXQ(R)20	M5 x 20	4.3
MXQ(R)25	M6 x 25	6.9

1-17. Mount the end plate.

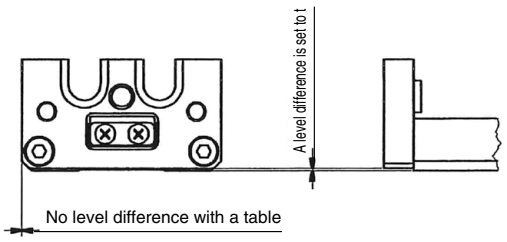
1-18. Tighten the end plate mounting bolt with the specified torque.



Apply Henkel Japan Loctite No.263 or an equivalent adhesive.

Model	Hexagon socket head cap screw	Tightening torque (N·m)
MXS6	M2.5 x 6	0.5
MXS8	M3 x 6	0.9
MXS12	M4 x 10	2.1
MXS16	M5 x 12	4.3
MXS20	M5 x 14	
MXS25	M6 x 18	6.9

Model	Hexagon socket head cap screw	Tightening torque (N·m)
MXQ(R)6	M2.5 x 6	0.5
MXQ(R)8	M3 x 6	0.9
MXQ(R)12	M4 x 8	2.1
MXQ(R)16	M5 x 10	4.3
MXQ(R)20	M5 x 16	
MXQ(R)25	M6 x 16	6.9



Model	Level difference t mm
MXS6	0.5
MXS8	
MXS12	
MXS16	0.3
MXS20	0.5
MXS25	

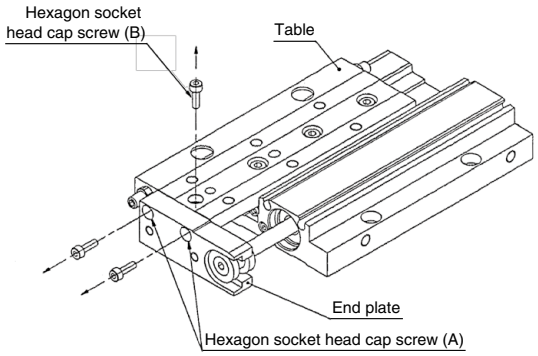
Model	Level difference t mm
MXQ(R)6	0.3
MXQ(R)8	
MXQ(R)12	
MXQ(R)16	
MXQ(R)20	0.5
MXQ(R)25	

⚠Caution

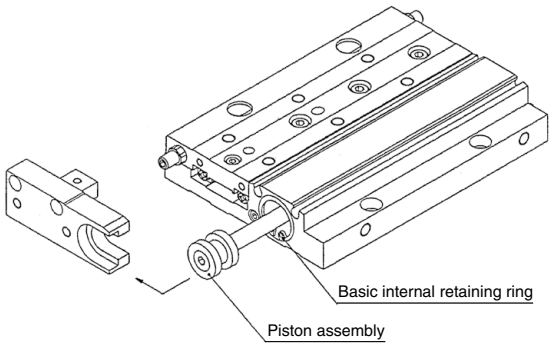
The cross roller section which is the guide system of the air slide table should not be disassembled because the pre-load has been already adjusted at mounting.

1 Replacement of the Seal

1-1. Loosen the hexagon socket head cap screws which connect the end plate to the table.



1-2. Move the end plate as indicated by the arrow to remove.



1-3. Take off the basic internal retaining ring with a retaining ring tool.

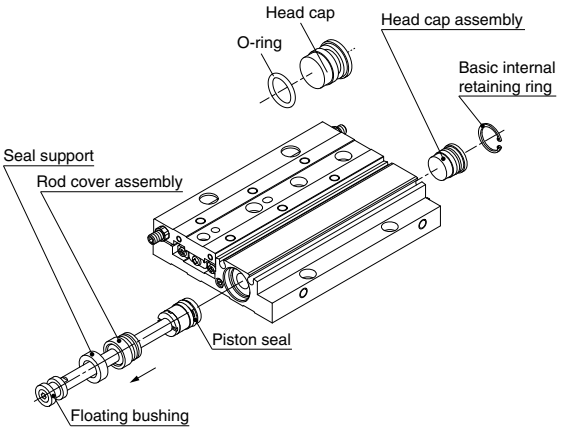
1-4. Pull out the piston assembly.

1-5. Apply grease to the piston seal and replace it.

1-6. Remove the basic internal retaining ring, and then remove the head cap assembly.

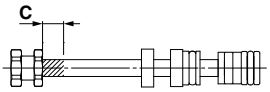
(Using a retaining ring tool)

1-7. Apply grease to the O-ring and replace it.



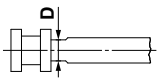
1-8. Remove the floating bushing.

ø8 do not have width across flats. Lock onto the shaded part with a round nose chain pliers with side cutters. (It is not possible to lock onto areas other than the shaded part.)



	MXF8
Dimension C	3.6 mm or less

For ø12 to ø20, fix the width across flats of the rod with a wrench.



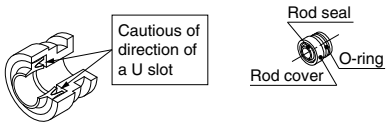
	MXF12	MXF16	MXF20
Dimension D	5 mm	6 mm	8 mm

1-9. Remove the seal support.

1-10. Remove the rod cover assembly.

1-11. Apply grease to the O-ring and replace it.

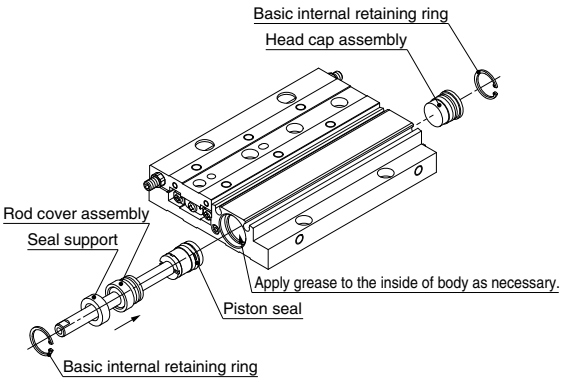
1-12. Apply grease to the rod seal and replace it.



1-13. Mount the rod cover assembly and seal support to the piston rod assembly and insert it into the body.

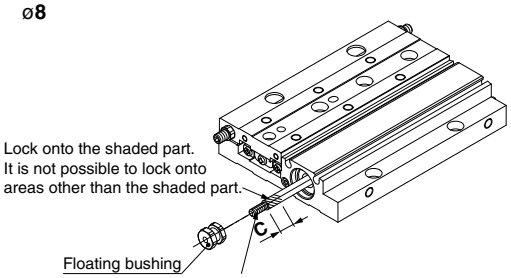
1-14. Fix the seal support with the basic internal retaining ring. (Using a retaining ring tool)

1-15. Insert the head cap assembly into the body and fix it with the basic internal retaining ring. (Using a retaining ring tool)



1-16. Mount the floating bushing onto the piston rod assembly.

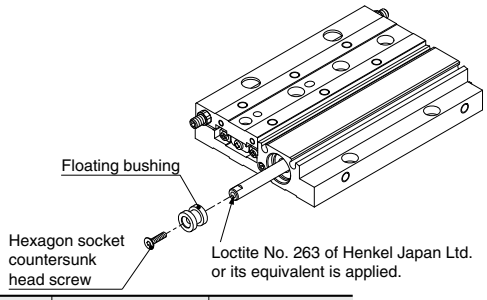
ø8



Model	Tightening torque (N·m)
MXF8	0.41

Loctite No. 263 of Henkel Japan Ltd. or its equivalent is applied.
If adhesive is squeezed out from part A after assembly, wipe it off.

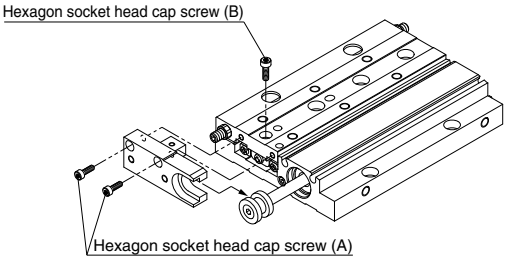
ø12 to ø20



Model	Hexagon socket countersunk head screw	Tightening torque (N·m)
MXF12	M3 x 14	1.0
MXF16	M4 x 14	2.4
MXF20	M5 x 20	4.3

1-17. Mount the end plate.

1-18. Tighten the end plate mounting bolt with the specified torque.



End plate attachment (A)

Model	Hexagon socket head cap screw	Tightening torque (N·m)
MXF8	M2 x 10	0.25
MXF12	M2.5 x 10	0.47
MXF16	M3 x 10	0.88
MXF20	M4 x 14	2.06

Loctite No. 263 of Henkel Japan Ltd. or its equivalent is applied.

End plate attachment (B)

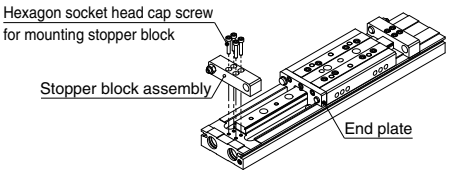
Model	Hexagon socket head cap screw	Tightening torque (N·m)
MXF8	M2 x 8	0.25
MXF12	M2.5 x 8	0.47
MXF16	M3 x 10	0.88
MXF20	M4 x 14	2.06

Loctite No. 263 of Henkel Japan Ltd. or its equivalent is applied.

1 Replacement of the Seal

1-1. Remove the stopper block assembly.

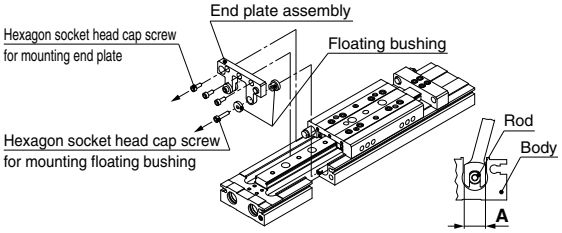
1) Remove the stopper block mounting bolts from the end plate side, and then remove the stopper block.



1-2. Remove the end plate.

<MXW12, 16, 20, 25>

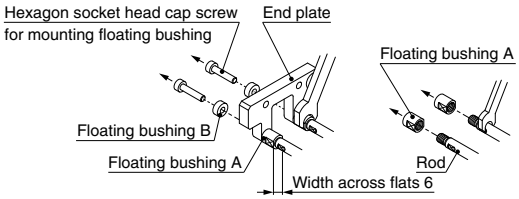
1) Remove the end plate mounting bolts.
2) Holding the width across flats of the rod with a wrench, remove the floating bushing mounting bolt.
3) Remove the end plate.



	MXW8	MXW12	MXW16	MXW20	MXW25
Dimension A	8	85	14.5	18	23.5
Width across flats	3.5	5	6	8	10

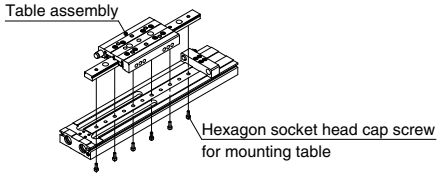
<MXW8>

1) Remove the end plate mounting bolts.
2) Holding the width across flats of floating bushing A with a wrench, remove the floating bushing mounting bolt.
3) Remove floating bushing B and the end plate.
4) Holding the width across flats of the rod with a wrench, remove floating bushing A.



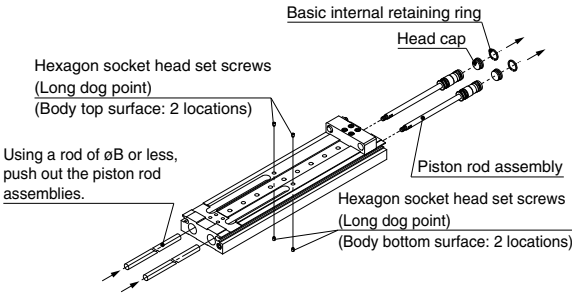
1-3. Remove the table assembly.

1) Remove the table mounting bolts, and then remove the table assembly.



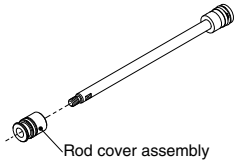
1-4. Remove the piston rod assembly.

1) Remove the set screws securing the rod cover from the top and bottom surfaces of the body.
2) Remove the basic internal retaining ring, and then, using a rod of øB or less, push out the head caps and piston rod assemblies.



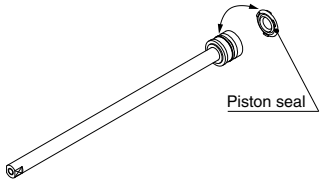
	MXW8	MXW12	MXW16	MXW20	MXW25
øB	7	11	15	19	24

1-5. Remove the rod cover assembly from the piston rod assembly.



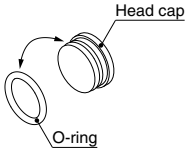
1-6-1. Replacement procedure of the piston seal

∗ Avoid torsion, etc.



1-6-2. O-ring replacement

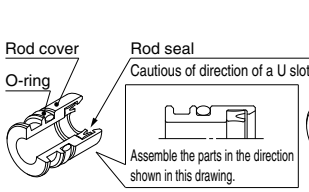
∗ Avoid torsion, etc.



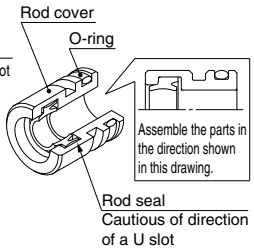
1-6-3. Rod seal and O-ring replacement

∗ Avoid torsion, etc.

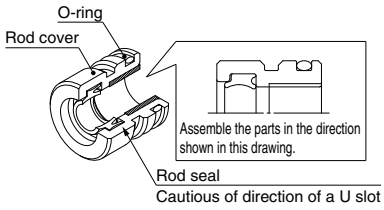
<MXW8>



<MXW12>

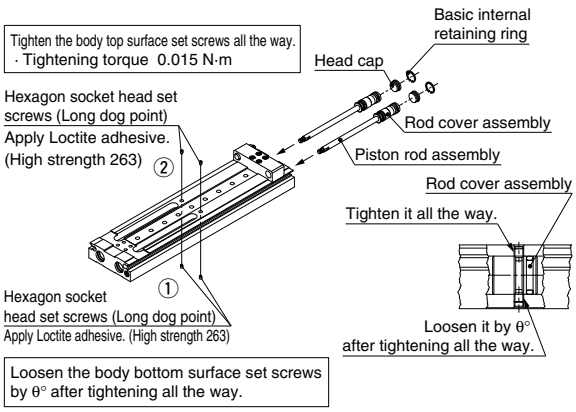


<MXW16, 20, 25>



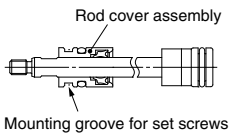
1-7. Mount the rod cover.

1) Mount the rod cover assemblies to the piston rod assemblies.
2) Mount the piston rod assemblies to the product body.
3) Secure the rod cover assemblies with the set screws. Tighten the rod cover assembly set screws in the order stated below.
   ①Body bottom surface side
   ②Body top surface side
4) Mount the head caps and basic internal retaining ring.

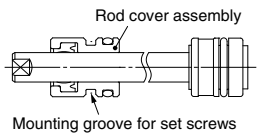


Rod cover assembly insertion direction

<MXW8>



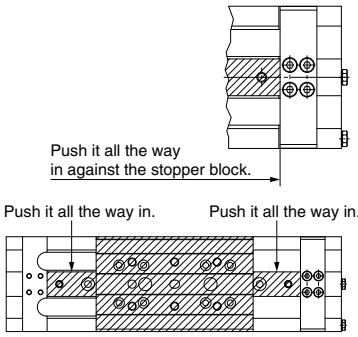
<MXW12 to 25>



	MXW8	MXW12	MXW16	MXW20	MXW25
θ°	40°	60°	60°	40°	40°

1-8. Mount the table assembly.

1) Push the table assembly all the way in against the body and stopper block to perform positioning, and then mount the table assembly using the bolts.



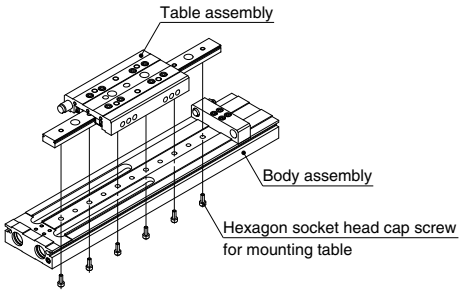


Table attachment

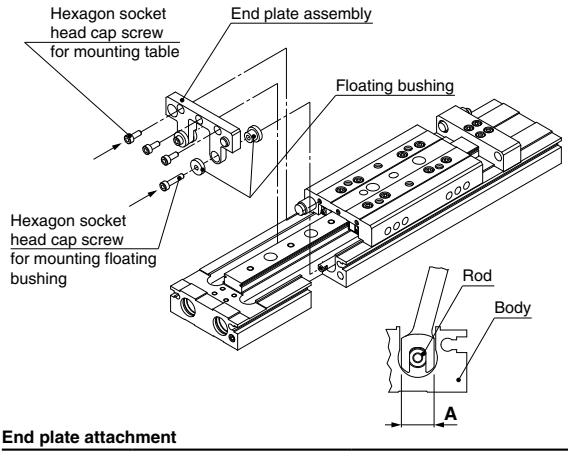
Model	Hexagon socket head cap screw	Tightening torque (N·m)
MXW8	M3 x 16	1.1
MXW12	M4 x 20	2.5
MXW16	M5 x 25	5.1
MXW20	M6 x 35	8.6
MXW25	M8 x 40	21.6

Adhesive: Loctite 243 adhesive

1-9. Mount the end plate assembly.

<MXW12, 16, 20, 25>

1) Mount the floating bushings to the end plate.
2) Holding the width across flats of the rod with a wrench, tighten the floating bushing mounting bolt.
3) Tighten the end plate mounting bolt.



End plate attachment

Model	Hexagon socket head cap screw	Tightening torque (N·m)
MXW8	M3 x 8	0.6
MXW12	M3 x 8	0.6
MXW16	M4 x 12	1.4
MXW20	M5 x 12	2.8
MXW25	M6 x 16	4.8

Adhesive: Loctite 243 adhesive

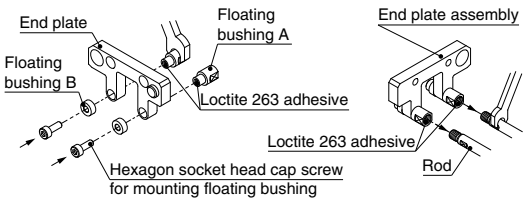
Floating bushing attachment

Model	Hexagon socket head cap screw	Tightening torque (N·m)
MXW12	M3 x 14	1.1
MXW16	M4 x 20	2.5
MXW20	M5 x 20	5.1
MXW25	M6 x 30	8.6

Adhesive: Loctite 243 adhesive

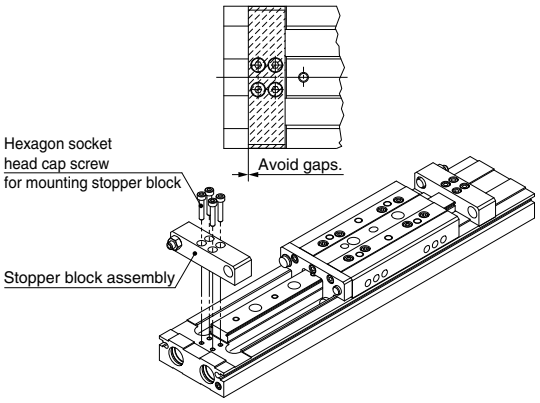
<MXW8>

1) Holding the width across flats of floating bushing A with a wrench, tighten the floating bushing mounting bolt with a tightening torque of 1.1 N·m.
2) Holding the width across flats of the rod with a wrench, mount the end plate assembly by tightening the floating bushing mounting bolt with a tightening torque of 0.6 N·m.
3) Tighten the end plate mounting bolt.



1-10. Mount the stopper block assembly.

1) Pushed all the way in against the body, perform positioning as shown below, and then mount the stopper block assembly using the bolts.



Stopper block attachment

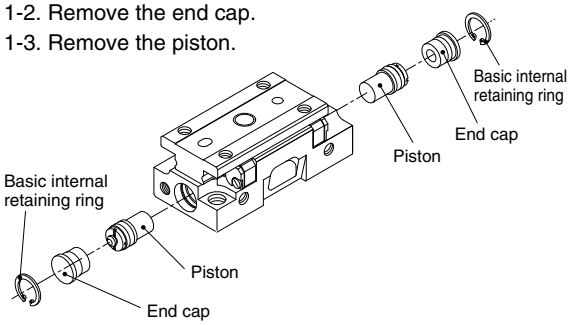
Model	Hexagon socket head cap screw	Tightening torque (N·m)
MXW8	M2.5 x 15	0.3
MXW12	M3 x 16	0.6
MXW16	M4 x 20	1.4
MXW20	M5 x 30	2.8
MXW25	M6 x 40	4.8

Adhesive: Loctite 243 adhesive

1. Replacement of the Seal

MXPJ6

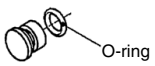
1-1. Remove the basic internal retaining ring. (Using a retaining ring tool)
1-2. Remove the end cap.
1-3. Remove the piston.



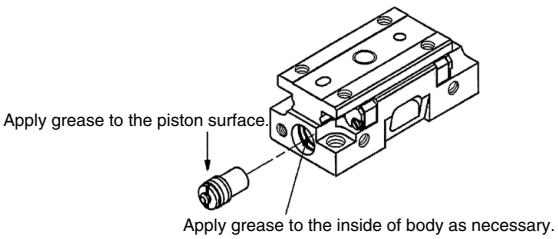
1-4. Apply grease to the piston for replacement.



1-5. Apply grease to the O-ring for replacement.



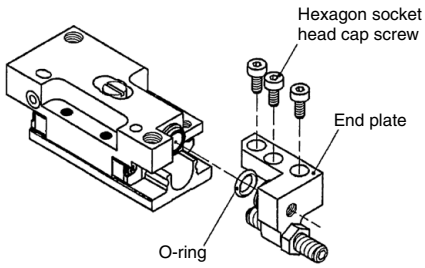
1-6. Apply grease to the piston surface.



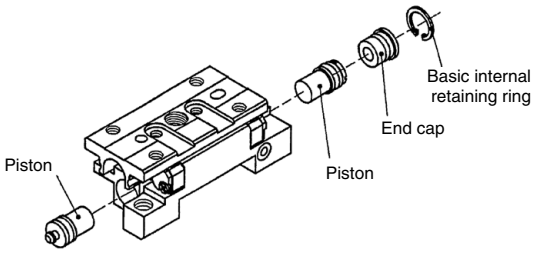
1-7. Insert the piston and assemble parts in the reverse order of removal.

MXP6

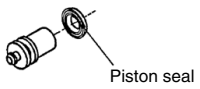
1-1. Remove the bolts for end plate mount.
1-2. Remove the end plate.
1-3. Remove the O-ring on the end plate.



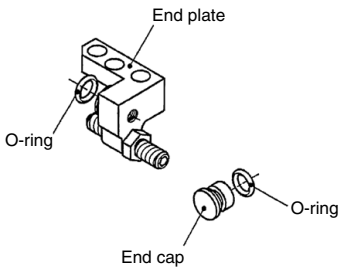
1-4. Remove the basic internal retaining ring. (Using a retaining ring tool)
1-5. Remove the end cap.
1-6. Remove the piston.



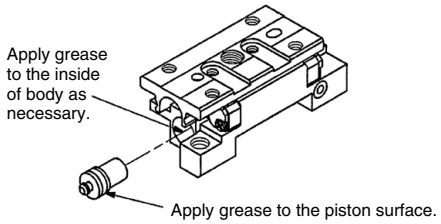
1-7. Apply grease to the piston for replacement.



1-8. Apply grease to the O-ring for replacement.



1-9. Apply grease to the piston surface.

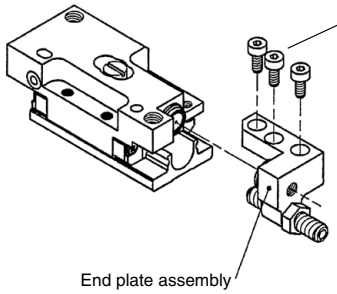


1-10. Insert the piston and assemble parts in the reverse order of removal.

Note) Tighten the end plate mounting bolt with the specified torque.

Bolt size	Tightening torque
M2 x 5	0.27 N·m

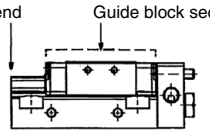
Adhesive
Loctite 243



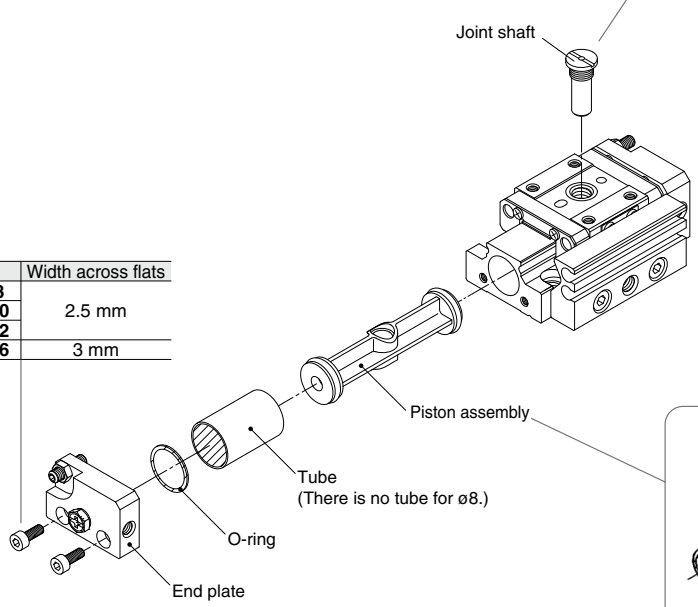
No gap is present at the mating surface between the body assemblies.

MXP8, 10, 12, 16

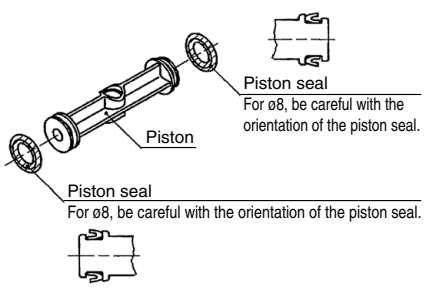
1. Remove the bolts for end plate mount.
2. Remove the end plate.
3. Remove the tube and the O-ring.
4. Apply grease to the O-ring and replace it.
5. Remove the joint shaft. Remove the piston assembly from the body.
6. Apply grease to the piston seal and replace it.



Make sure that the guide block will not exceed the body end surface after removing the joint shaft. (The steel balls in the guide will fall out.)



Type	Width across flats
MXP8	2.5 mm
MXP10	
MXP12	
MXP16	3 mm

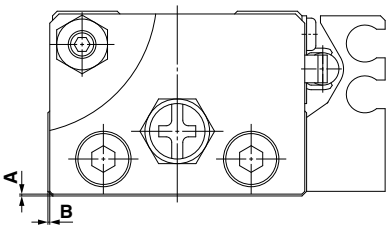


7. Insert the piston assembly to the body, and tighten the body with the joint shaft.
8. Apply grease to the shaded part of the tube inner surface if necessary. (See the drawing of previous page)
9. Mount the tube and the O-ring.
10. Mount the end plate.
11. Fasten bolts for the end plate mount with the specified torque.

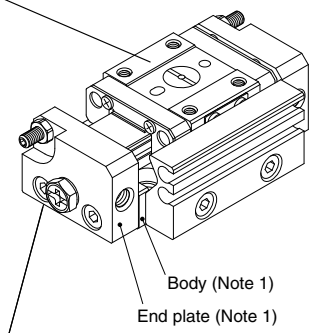
Note 1) Assemble the end plate so that A, B dimensions will be values on table below.

(mm)

Type	A	B
MXP8	0.2	0.2
MXP10		
MXP12	0.5	0.3
MXP16		



Type	Tightening torque joint shaft
MXP8	0.4 N·m
MXP10	0.7 N·m
MXP12	1.8 N·m
MXP16	3.6 N·m



Type	Bolt torque
MXP8	0.65 N·m
MXP10	1.14 N·m
MXP12	
MXP16	2.70 N·m

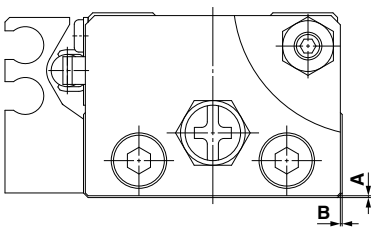
Adhesive
Loctite 243

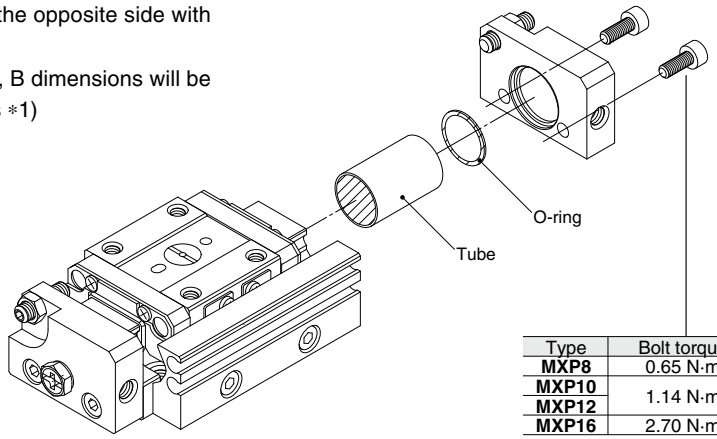
12. Remove the end plate mounting bolt on the opposite side.
13. Remove the end plate on the opposite side.
14. Remove the tube and the O-ring.
15. Apply grease to the O-ring and replace it.
16. Apply grease to the shaded part of the tube inner surface if necessary.
17. Mount the tube and the O-ring.
18. Mount the end plate on the opposite side. (∗2)
19. Tighten the end plate mounting bolt on the opposite side with the specified torque.

Note 2) Assemble the end plate so that A, B dimensions will be values on table below. (As well as ∗1)

(mm)

Type	A	B
MXP8	0.2	0.2
MXP10		
MXP12	0.5	0.3
MXP16		





Type	Bolt torque
MXP8	0.65 N·m
MXP10	1.14 N·m
MXP12	
MXP16	2.70 N·m

Adhesive
Loctite 243

1. Replacement of the Seal

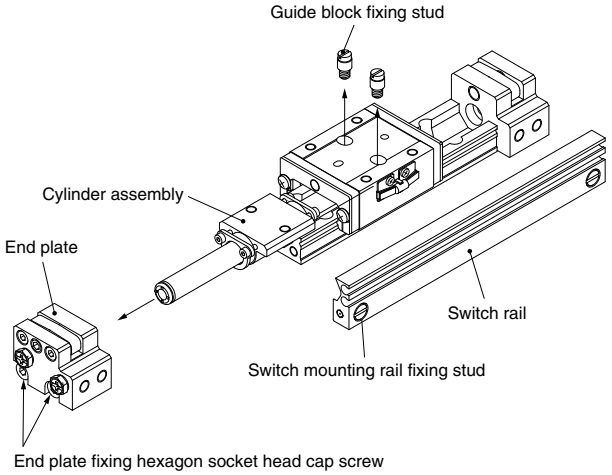
1-1. a. Remove the guide block fixing studs.

Note) Take care so that the guide block would not come off even partially to prevent a steel ball of the guide block from coming out and becoming unavailable.

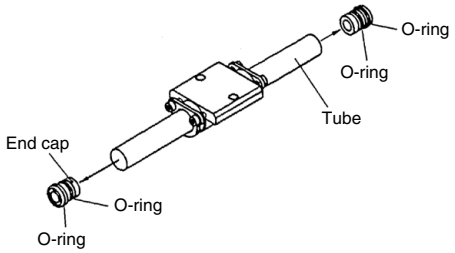
b. Loosen the switch rail fixing studs and disconnect the switch rail.

c. Loosen the end plate fixing hexagon socket head cap screws and disconnect the end plate.

d. Disconnect the cylinder assembly.



1-2. a. Take off the end cap from the tube of the cylinder assembly.



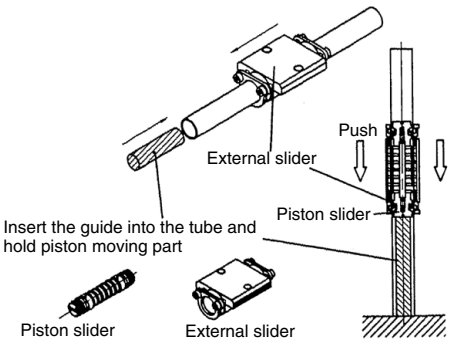
1-3. a. Insert the guide into the tube and hold the piston slider.

Note) Do not damage an internal face of the tube at this time.

b. Move the external slider forcedly to make holding force unable to act.

c. Take off the piston slider from the tube.

d. Take off the external slider from the tube.



1-4. a. Loosen hexagon socket head bolts on both end faces of the body and disconnect the spacer.

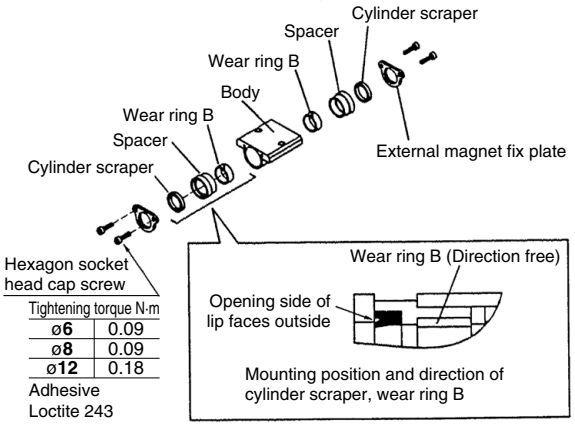
Note) Take care so that magnet B and yoke B would not come out.

b. Take off wear ring B and the cylinder scraper from the spacer and replace each with new one.

Note) Pay attention to the mounting direction of cylinder scraper.

c. Tighten hexagon socket head cap screws on right end face with referential mark on body turned front until spacer is made close to body tightly.

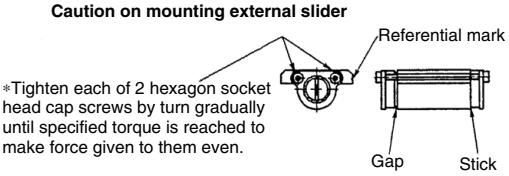
d. Tighten hexagon socket head cap screws on left end face with referential mark on body turned front until spacer is mounted on body with clearance.



Note) Tighten each of 2 hexagon socket head cap screws by turn gradually until specified torque is reached to make force given to them even.

Note) Before tightening, apply the specified adhesive (Loctite 243 or equivalent) on hexagon socket head cap screws.

Caution on mounting external slider



Tighten the bolt which comes right when referential mark is turned front. (Gap is created between left spacer and body.)

1-5. a. Holding one piston by flat head screwdriver, loose the other piston by flat head screwdriver.

b. Take off yoke A and magnet A from shaft. Magnet A should be kept with stick inserted.

Note) Mounting direction of magnet A is specified. So, keep them in the manner like above not to be unable to recognize correct mounting direction.

c. Take off wear ring A and the piston seal and replace each with new one.

Note) Mind mounting direction of piston seal in MXY6 and MXY8.

Note) Apply the specified grease on wear ring A and the piston seal.

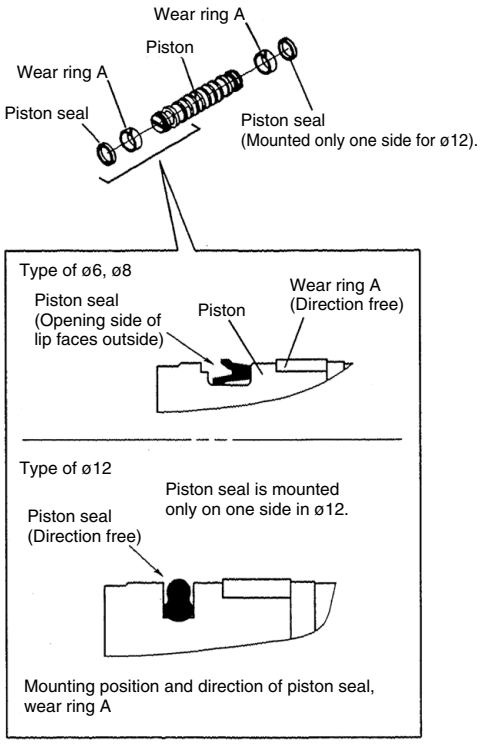
Note) Confirm that the seal is mounted without twist.

Note) The piston seal is mounted only on one side in MXY12.

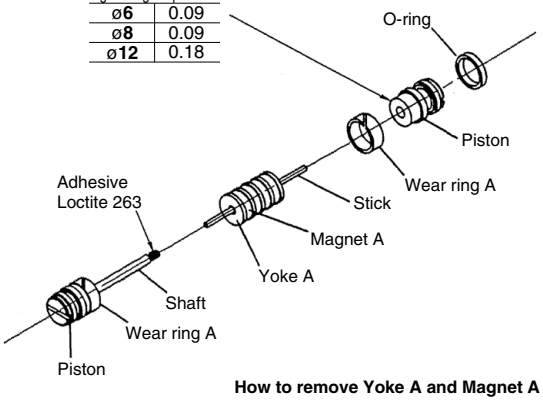
d. Insert yoke A and magnet A into shaft the reverse procedure.

e. Tighten the piston to the shaft with the specified torque on right figure.

Note) Apply the specified adhesive (Loctite 263 or equivalent) on the end of shaft.



Tightening torque N·m	
ø6	0.09
ø8	0.09
ø12	0.18

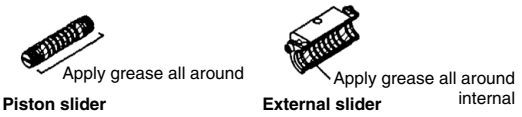


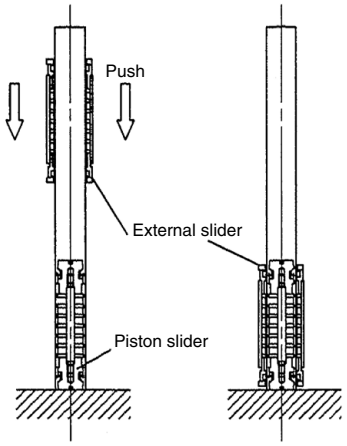
How to remove Yoke A and Magnet A

1-6. a. Apply grease all around the piston slider.
b. Apply grease all around the internal face of the external slider.
c. Insert the piston moving part and external slider into the tube.
d. Move the external moving part to a little over stroke end manually to engage it with the piston slider (i. e. to locate magnet coupling on adequate position.)
e. Apply grease evenly on the internal and external face of the tube.

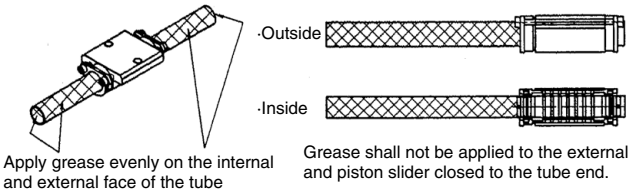
Note) Do not close external slider to the end of tube to apply the grease because all of grease is brought to there during operation.

Note) Use a specified one for grease.



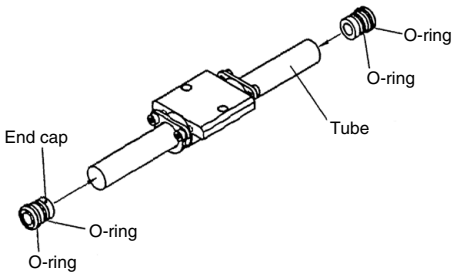


Caution on applying grease on tube



1-7. Put the end cap in the tube.

Note) Ensure the O-ring does not come off.



1-8. a. Tighten the end plate on left side to rail temporarily with referential mark on the guide block turned to front (with port bore turned to front as well).

Note) Apply the specified adhesive (Loctite 243 or equivalent) on the end plate holding hexagon socket head cap screws.

b. Pass the cylinder assembly between the rail and the guide block with referential mark on the cylinder assembly turned to front and then tighten the end plate on right side temporarily like one on left side.

c. Tighten the guide block holding stud by torque specified on right figure to hold the guide block to the external slider.

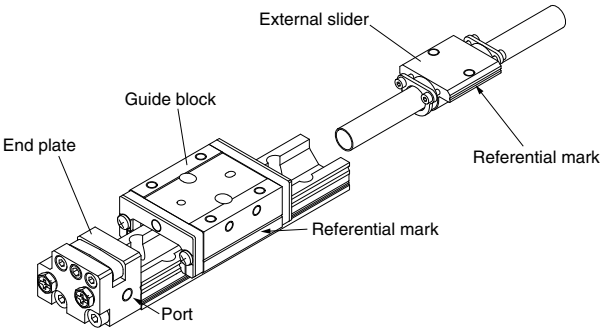
Note) Apply the specified grease on the side of the guide block fixing stud except for threaded part.

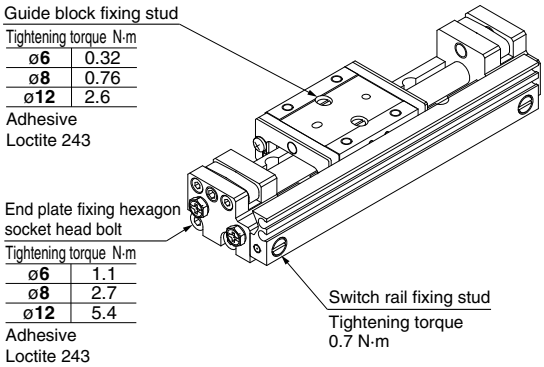
d. Tighten the end plate fixing hexagon socket head cap screw by torque specified on right figure.

e. Tighten the switch rail holding stud by torque specified on right figure to hold the switch rail to the end plate.

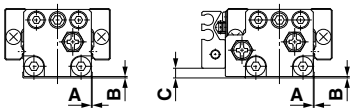
Note) Keep step among the end plate, switch rail and rail within the value shown on right figure.

Note) Ensure the switch rail does not contact magnet by moving the guide block all over its movable part.



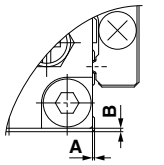


Step between end plate and rail shall comply with table.



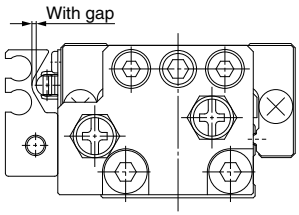
One side centralized piping

Type of without switch rail Type of with switch rail



Detail of dimension A and B

Model	A	B	C
MXY6	0.3	0.3	0.5
MXY8	0.3	0.5	3.5
MXY12	0.3	0.5	8.5



⚠ Caution

Cylinder needs to be disassembled/assembled under the clean environment. Use a clean cloth.
Before disassembly, eliminate the dirt on the outer surface so that foreign objects do not enter the cylinder or the guide.

1. Disassembly

1-1. Tools
A retaining ring plier for hole, wrench, hexagon wrench, socket wrench (or air impact wrench).

1-2. Fix the piston rod so that it is not scratched. Remove the guide rod assembly by loosening the plate mounting bolt with a hexagon wrench or socket wrench.
Or, loosen the plate set bolt with the air impact wrench to remove the guide rod assembly.
Continue the work without removing the guide rod from the plate.

1-3. Remove the 2 retaining rings (rod and head side) with retaining ring pliers, and pull out the collar, the head cover, and the piston rod assembly.
For air cushion type and end lock type, it is necessary to remove the collar and parts below.
Air cushion type (ø80, ø100)
• Set screw at the bottom of the cylinder.
End lock type
• End lock unit (See below)

Bore size (mm)	**Retaining ring size**	**Plate mount bolt tightening torque** (kgf·cm)
12	RTW-13	14
16	RTW-18	34
20	RTW-22	52
25	RTW-26	88
32	RTW-34	220
40	RTW-42	220
50	RTW-52	440
63	RTW-65	440
80	RTW-82	1,240
100	RTW-102	2,000

Removal of the End Lock (With End Lock)

1. Tools
A retaining ring plier for hole, hexagon wrench, wrench, socket wrench (or air impact wrench), or watchmaker's screwdriver.
2. Insert the manual bolt from the top of the end lock unit rubber cap, and screw the bolt into the lock piston, (Not necessary for -∗L, lock type)
3. Remove the 2 hexagon socket head cap screws to pull out the end lock unit.
4. For ø20 to ø63, remove the lock piston seal.
For ø80, ø100, remove the seal retainer and lock piston seal.
5. Remove the lock holder mounting bolt to remove the lock unit and gasket.

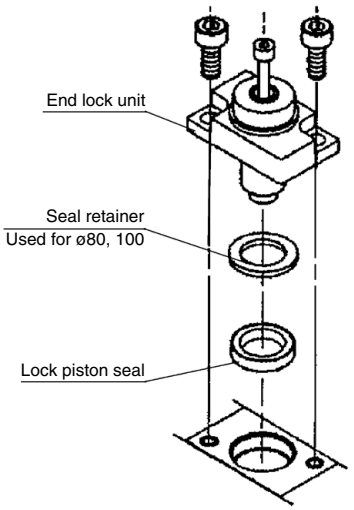


Fig. 1 How to remove the end lock

2. Removal of the Seal

2-1. Rod seal
a. Tool:
A watchmaker's screwdriver, etc.
b. Insert the driver to the collar front to pull out the seal like Fig. 2.
Do not damage the seal groove on the collar at this time.

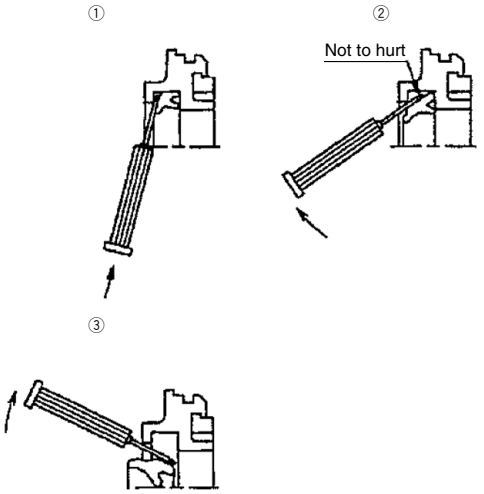


Fig. 2 How to remove the rod seal

2-2. Piston seal

Wipe off grease around the piston seal first to make removal easier.

Hold piston seal with one hand and push it into groove so that piston seal can be lifted off and pulled out without using a watchmaker's screwdriver. (Fig. 3)

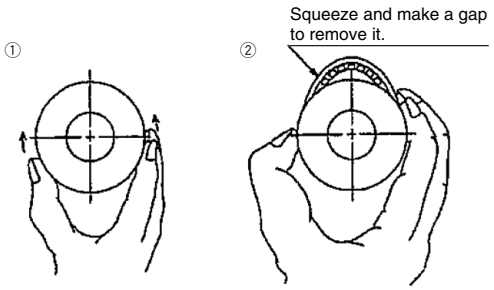


Fig. 3 How to remove piston seal

2-3. Gasket

Pull out the collar and the head cover outer rim or the gasket inside of the body (ø32 or larger) with precision driver.

2-4. Cushion seal (With air cushion only)

a. Tool: A watchmaker's screwdriver, etc.

b. As shown in Fig.4, pull out the cushion seal by inserting the precision screwdriver from the back of the seal and the head cover. Take care not to damage the seal groove at this time.

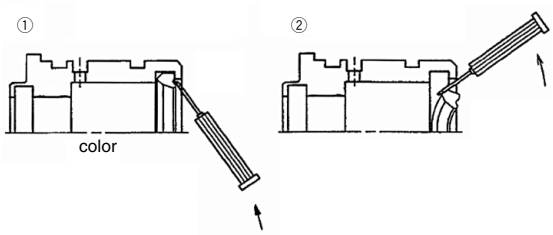


Fig. 4 Removal of the cushion seal

3. Application of Grease

Use grease pack in table or lithium soap base grease JIS2, or equivalent.

Table Grease pack no.

10 g type	GR-S-010
20 g type	GR-S-020

3-1. Rod seal

Apply grease slightly to outer circumference of new seal for replace. This helps the seal to accustom to the collar. For the grove, fill it with grease. This is necessary for operation.

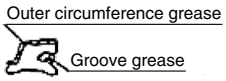


Fig. 4

3-2. Piston seal

Apply grease to outer/inner circumference of seal slightly and evenly to make mounting this to the piston easier.

3-3. Gasket

Apply grease slightly. Provide better sealing and stop falling.

3-4. Cushion seal (With air cushion only)

Apply grease to outer/inner circumference of seal slightly and evenly to make mounting this to the seal groove.

3-5. Cylinder parts

Apply grease to cylinder parts including the guide.

With End Lock

Use lithium soap radical grease JIS2 corresponding to such as "Nippon Oil Corporation multipurpose grease No. 2", "Idemitsu Daphne coronex No. 2", "Kyoseki lisonix grease No. 2".

4. Assembly

4-1. Mount seal

a. Rod seal

Mind the seal direction. Apply grease all over the seal and inner surface of the bush as Fig. 8. You may use a precision screwdriver to apply grease for small bore sizes.

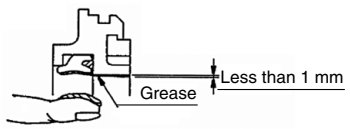


Fig. 8 Rod seal

b. Piston seal

Apply grease rubbing to seal groove and outer circumference.

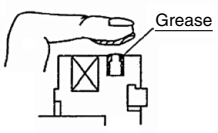


Fig. 9 Piston seal

c. Gasket (With rubber bumper)
Mount to the groove of the collar and the head cover. For ø32 or larger, mount to the inner groove of the body, not to the head cover.
This case, the gasket of the body is large type.

d. Gasket (With air cushion)
Mount to the groove of the collar and the head cover. For ø32 or larger, mount to the inner groove of the head cover and the body.
This case, the gasket of the body is large type.
Do not mount the gasket on the air passage (through hole groove) as in Fig.10.

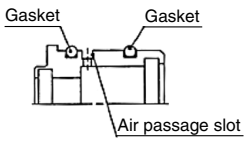


Fig. 10 Gasket mounting position

e. Cushion seal (With air cushion only)
Mount the seal in the correct direction. Apply grease thinly and evenly to the inner circumference of the seal. As the seal has a floating mechanism, it is normal to have some play.

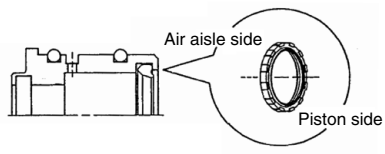


Fig. 11 Cushion seal mounting position

4-2. Assemble cylinder

a. Insert the head cover to the body to fix with a retaining ring.

b. Insert the collar to the piston rod.
Apply grease to the piston rod end or 30 degree of slope at the end of wrench flat, and insert the collar gently so that the piston seal is not hurt.

c. Insert the piston and the collar to the tube and fix it with a retaining ring.
Apply grease to the inlet of the tube and insert the piston and the collar gently so that the piston seal and the gasket are not hurt by the retaining ring groove.

d. Guide rod assembly assembling
Apply glue to the plate mounting bolt when mounting the guide rod assembly. Then, tighten the bolt with tightening torque in Table 1.

After assembling, ensure manually that work properly operate smoothly.
Check the air leakage.

With End Lock

1. Mount end lock

   Apply grease to the lock piston surface, lock holder inner surface to insert the gasket and lock holder. Then, fix them with new hexagon socket head cap screws included in accessories.

   Insert the end lock unit and fix it with new hexagon socket head cap screws included in accessories. (See drawing 12, 13, 14, 15)

   After assembling, ensure manually that end lock work properly and that the cylinder operate smoothly with lock released.

Cap and lock holder bolt tightening torque

Hexagonal bolt	**Bore size** (mm)	**Tightening torque** (N)
M3	**ø20 to ø63**	0.71 to 0.86
M5	**ø80, ø100**	2.65 to 3.24

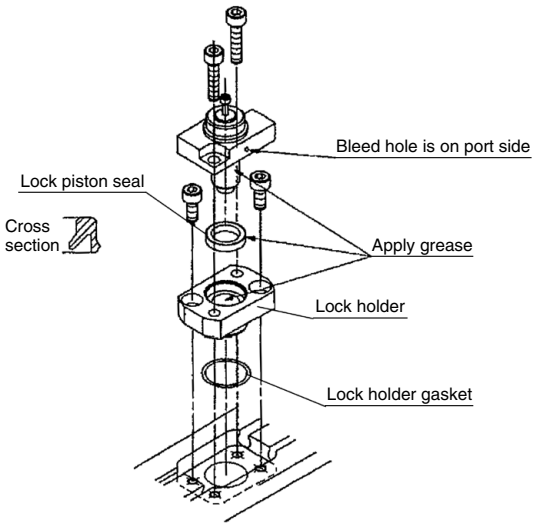


Fig. 12 End lock reassembled (ø20, ø25)

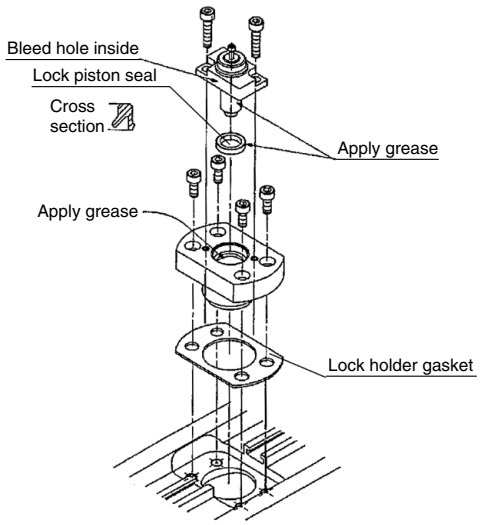


Fig. 14 End lock reassembled (ø50, ø63)

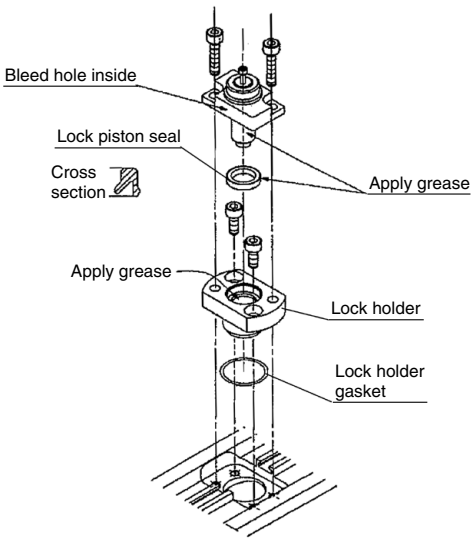


Fig. 13 End lock reassembled (ø32, ø40)

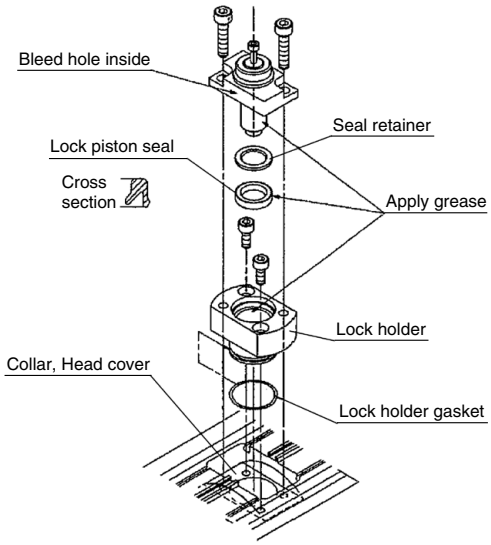


Fig. 15 End lock reassembled (ø80, ø100)

⚠Caution

Replace the hexagon socket head bolt with a new one included in the seal kit to avoid air leakage.

Tighten the hexagon socket head bolts evenly to avoid air leakage.

⚠Caution

Disassemble and assemble the cylinder in a clean area. Remove dusts and foreign objects from external surfaces to prevent them from entering the cylinder during disassembly. Perform on a clean cloth.

1. Maintenance

1-1. When malfunction of cylinder occurs due to air leakage, replace the seal and gasket by referring to procedure shown below.

1-2. Replacement procedure

a. Remove 2 hexagon head bolts C ⑭ and separate upper part and lower part assemblies.

b. Remove 6 hexagon head bolts A ⑫ of the upper part assembly and remove plate ⑥.

c. Push the piston rod assembly (piston rod ⑤ + piston ④) from the rod seal side to pull the piston rod out of tube ②.

d. Remove piston seal ⑳ from piston ④ and replace it by new one. Apply grease on the overall surface of piston seal.

e. Remove rod seal ⑲ from rod cover ③ and replace it by new one. Care should be taken for the orientation of rod seal. Mount it by referring to the internal structural drawing.

f. Remove 4 hexagon head bolts B ⑬, separate body ① and end plate ⑦.

g. Remove 2 O-rings C ㉓ on the end plate side and replace them. Apply grease on the overall surface of gasket.

h. Remove O-ring B ㉒ from tube ② and replace it. Apply grease on the overall surface of gasket.

i. After all replacement is completed, reassemble the parts. To assemble, follow the disassembling procedure a to h in reverse order.

2. Caution at Assembly and Disassembly

2-1. Adhesive is applied to each bolt to prevent loosening. Since powders (adhesive) come out when the bolt is removed, care should be taken to prevent them from entering cylinder and sliding part.

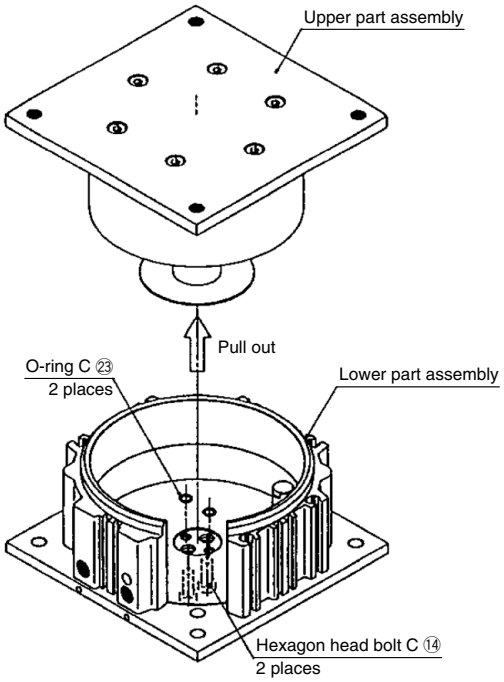
2-2. Apply the adhesive (moderate strength) to each bolt at assembling.

2-3. When the upper part assembly is inserted to the lower part assembly, the bushing in the lower part assembly is not complete round. Therefore, press the bushing with the tube of the upper part assembly so that the bushing becomes complete round. Care should be taken not to break the bushing since broken bushing will cause a malfunction.

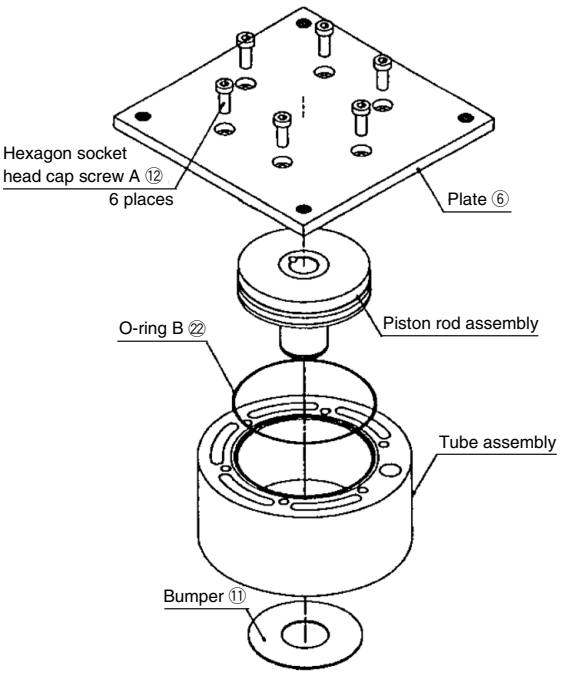
2-4. Insert the piston rod assembly to the same position as it was disassembled.
If the piston rod assembly is rotated, lifting and lowering ports would be reversed.

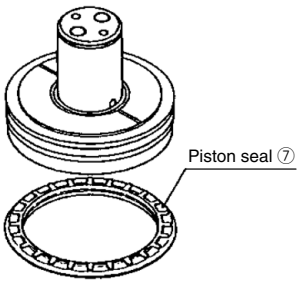
3. Disassembly

3-1. Separation of the upper part assembly from the lower part assembly

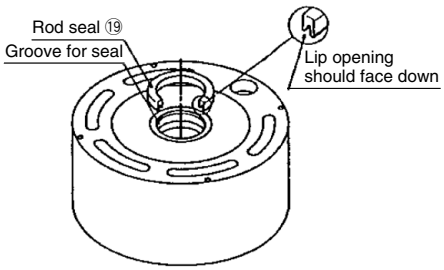


3-2. Disassembly of the upper part assembly



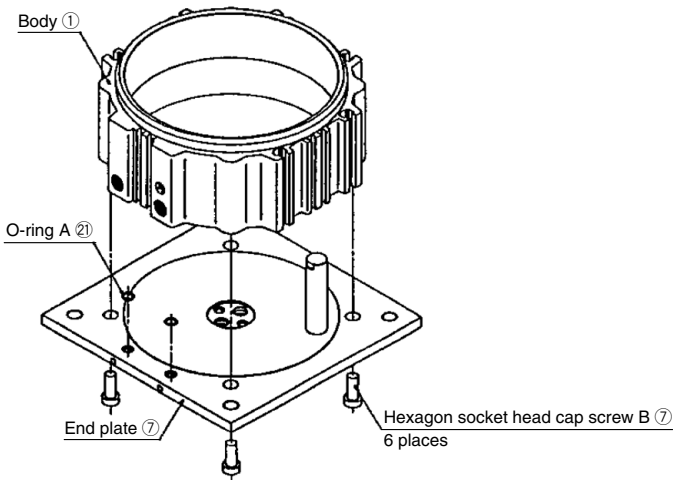


Replacement of the piston seal



Replacement of the rod seal

3-3. Disassembly of the lower part assembly



1. Disassembly

⚠Caution

Disassemble and assemble the cylinder in a clean area. Please begin working after it wipes off with a clean cloth, etc.

CXS Series

With end lock

1-1. Detach the lock unit (⑤ to ⑩) from the housing.

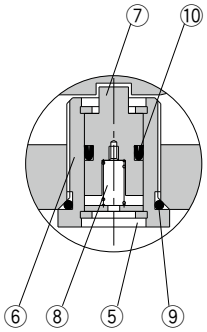


Fig. 1

[For the type with a retaining ring on the head cover side]

1-2. Loosen and remove the hexagon socket head cap screw and set screw which fix the plate, rod. Then pull the plate out of the rod.
At this occasion, screws are sometime hard to unscrew because they are applied Loctite. Pay attention not to damage the hexagon head.
As plates are sometime hard to unscrew as well, use a gear-puller not to damage the rods.

1-3. Detach the retaining rings on the side of the head cover using pliers (tool for installing a basic internal retaining ring).

1-4. Hit rods lightly with a plastic hammer, then pull them out from head cover side. At this occasion, they go through bearing part, so make sure there are no burrs or deformation. Burrs or deformations have to be removed by a file or sandpaper.

1-5. Detach the retaining rings on the side of the rod cover by using pliers (tool for installing a basic internal retaining ring), then the rod cover away in the same method of 1-4.

[For the type without a retaining ring on the head cover side]

1-2. Detach the retaining rings on the side of the rod cover using pliers (tool for installing a basic internal retaining ring).

1-3. Pull out the rod together with the plate from the housing.

1-4. Paying attention to the above items, pull the plate out from the rod, and then pull the rod cover out from the rod.
The seals are not reusable. They have to be replaced by the new one at the occasion of reassembling.
At this time, grease has to be applied to seals and kept away from the dust.

CXS Series

With end lock

1-6. Replace the O-ring and lock seal. Remove the retaining ring when you replace the lock seal.
The seals are not reusable. They have to be replaced by the new one at the occasion of reassembling.

2. Assembly

2-1. Reassemble the parts by reversing the disassembling process.
For the type without a retaining ring on the head cover side, reassemble without mounting the plate.
Confirm that the retaining ring fits securely in the mounting groove.

2-2. Mount the plate to the rod.
It is necessary for the rod to be in the extend state. Apply 0.2 MPa or more from the supply port of the head cover side. Tighten the hexagon socket head cap screw pressing the plate to the rod. Then, tighten the hexagon socket head set screw.
Make sure the product operates with the min. operating pressure (see table below) without any problem. (The product operates smoothly when it is moved by hand)

Bore size (mm)	6	10	15	20	25	32
Min. operating pressure (MPa)	0.15	0.1		0.05		

CXS Series

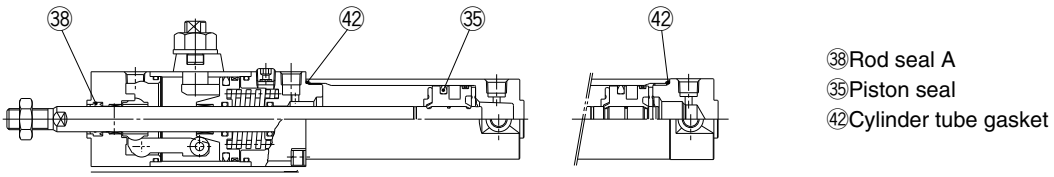
With end lock

After tightening, make sure there is no problem when it is operated in min. operation pressure (See below) and confirm the lock on the return side.

Bore size (mm)	6	10	15	20	25	32
Min. operating pressure (MPa)	0.3					

1. Disassembly of the Cylinder

1-1. Disassemble and assemble the cylinder in a clean area.
1-2. Refer to the “Replacement Procedure of the Lock Unit” (CLG-1) ① to ③ for disassembly.



Long stroke

㊳Rod seal A
㉟Piston seal
㊷Cylinder tube gasket

2. Removal of the Seal

㊳ Rod seal A: Insert a watchmaker’s screwdriver to pull out the seal.
Take care not to damage the seal groove of the cover. (Fig. 1)
㉟ Piston seal: Remove the piston seal. (Fig. 2)
㊷ Cylinder tube gasket: Insert a watchmaker’s screwdriver to pull out the seal.

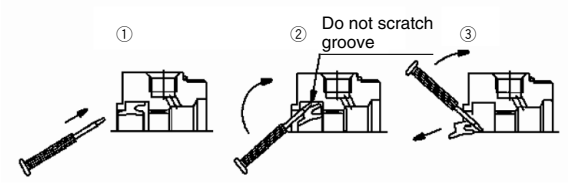


Fig. 1 Removal of the rod seal

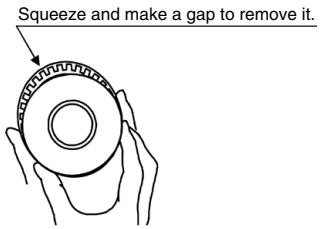


Fig. 2 Removal of the piston seal

3. Application of Grease to the Seal

3-1. Apply grease slightly to the outer circumference of each seal.
3-2. Fill in the groove of the rod seal with grease.

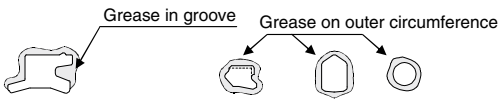


Fig. 3 Grease to the seals

4. Mounting of the Seal

㊳ Rod seal A: Mount the seal in the correct direction.
㉟ Piston seal: Mount the seal while stretching it as Fig. 5.

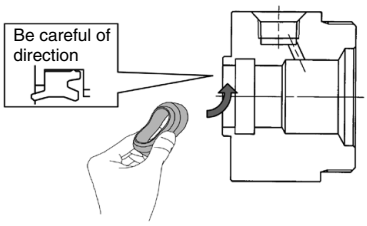


Fig. 4 Installation of the rod seal

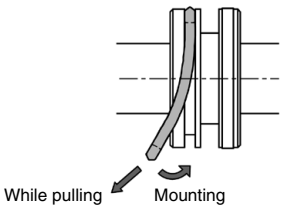


Fig. 5 Installation of the piston seal

5. Application of Grease

㊳ Rod seal B: Apply grease to the seal and the inner circumference of the bushing. (Fig. 6)
Use a precision screwdriver to apply grease to the small bore diameter while making sure not to leave scratches.

㉟ Piston seal: Rub grease into the seal groove and outer circumference of the seal. (Fig. 7)

㊷ Cylinder tube gasket: Lightly apply grease.

• Cylinder component parts: Apply grease to each component parts of the cylinder in Fig. 9.
Appendix table shows the grease amount required for a cylinder with a 100 mm stroke.
For your reference, amount taken with a forefinger is about 3 g. (Fig. 8)

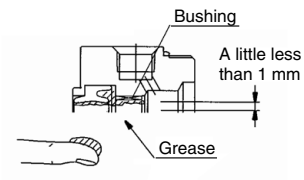


Fig. 6 Rod seal

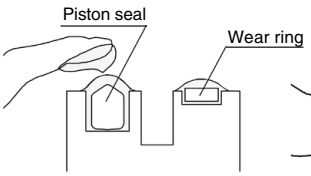


Fig. 7 Piston seal

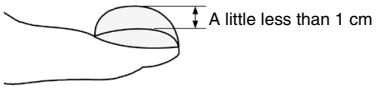


Fig. 8 Grease amount

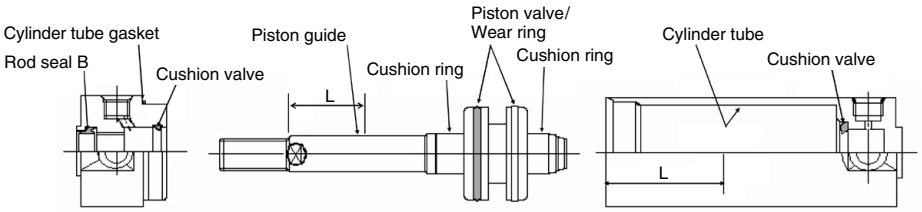


Fig. 9 Grease application points $L = \frac{\text{STROKE}}{2}$ or 100 mm and more

Table 1 Grease application amount (g)

Stroke	Bore size			
	20	25	32	40
100 stroke	2	3	3	3 to 4
Additional 50 stroke	0.5	0.5	0.5	1

6. Reassembly of the Cylinder

6-1. Make sure no particles are present. Do not scratch the seals.

6-2. Tighten the cover approx. 0-2 degrees more from the original position (where the ports of rod and head covers match).

6-3. After completing the assembly, manually check whether the movement is smooth.

7. Replacement Parts

7-1. For the CLG1 series, the lock-up unit (except the long-stroke lock-up) and the seals (rod seal B, piston seal, cylinder tube gasket) can be replaced.

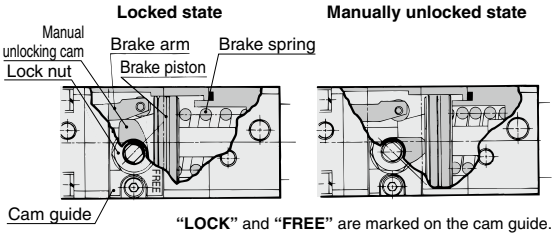
7-2. Contact SMC sales representatives if it is necessary to replace parts other than those mentioned above.

8. Replacement Procedure of the Lock Unit

⚠Caution

The lock unit for the CLG1 series can be replaced.
(However, please note that lock units cannot be replaced in the case of long stroke specifications.)

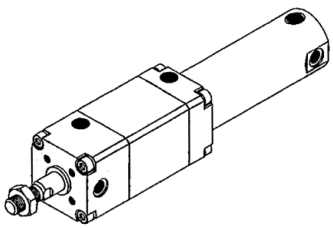
8-1. Release the manual lock.
- a. Loose the locking nut.
- b. Supply air pressure of 0.3 MPa or more to the lock release port.
- c. Turn the wrench flats section of the manual unlocking cam until it stop at the FREE position that is marked on the cam guide.
- d. While keeping the wrench flats section in place, tighten the lock nut.



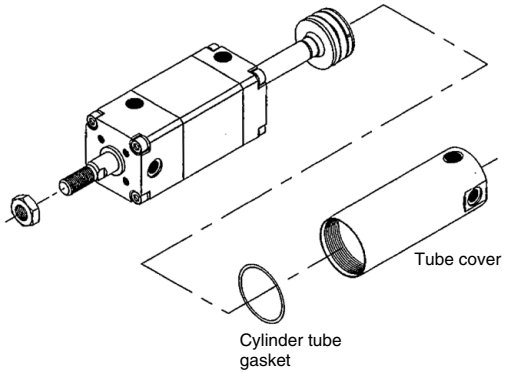
"LOCK" and **"FREE"** are marked on the cam guide.

8-2. Remove the lock unit by securing the square section of the rod cover or the wrench flats of the tube cover in an apparatus such as a vice, and then loosening the other end with a wrench or adjustable angle wrench, etc.
See the table below for the dimensions of the square section and the wrench flats.

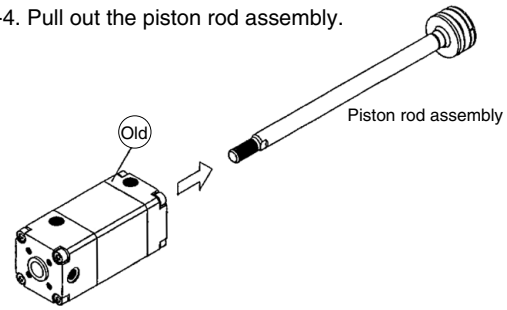
Bore size (mm)	**Rod cover square section** (mm)	**Tube cover wrench flats** (mm)
20	38	24
25	45	29
32	45	35.5
40	52	44



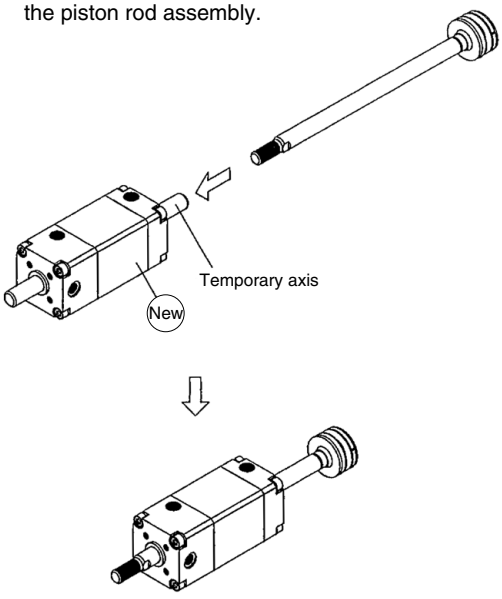
8-3. Remove the tube cover.



8-4. Pull out the piston rod assembly.



8-5. Replace the temporary axis of a new lock unit with the piston rod assembly.



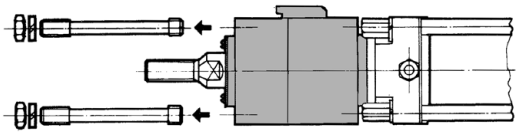
Note) When replacing the piston rod assembly with a new lock unit, care should be taken not to cut rod seal B with threads or wrench flats.
Lock the manual unlocking cam before use.

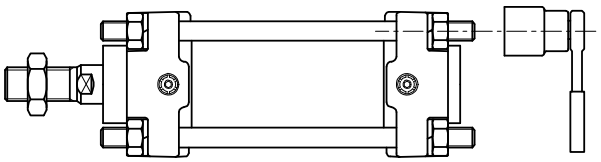
8-6. Reassemble by reversing the procedure in steps 8-1. and 8-3. When retightening the sections, turn approx. 2˚ past their position prior to disassembly.

1. Disassembly of the Cylinder

Disassemble and assemble the cylinder in a clean area.

1-1. Loosen the tie-rod nuts and pull out the 4 tie-rods.





1-2. Open the rubber cap and screw in the unlocking bolt, which is provided as an accessory part. At this time, apply air pressure of 0.2 MPa to 0.3 MPa to disengage the lock and insert the bolt. (The operation to follow can be performed properly and easily with the application of air pressure.) After verifying that the bolt has been inserted properly, pull out the unit from the rod.

Table 1 Work tools

Bore size (mm)	**Applicable socket**
40, 50	13 (M8)
63	17 (M10)
80, 100	19 (M12)

2. Removal of the Seal

2-1. Rod seal
Insert a watchmaker's screwdriver to pull out the seal.
Take care not to damage the seal groove of the cover. (Fig. 1)

2-2. Piston seal
Remove it as in Fig. 2.

2-3. Tube gasket
Remove it in the same way as Fig. 2.

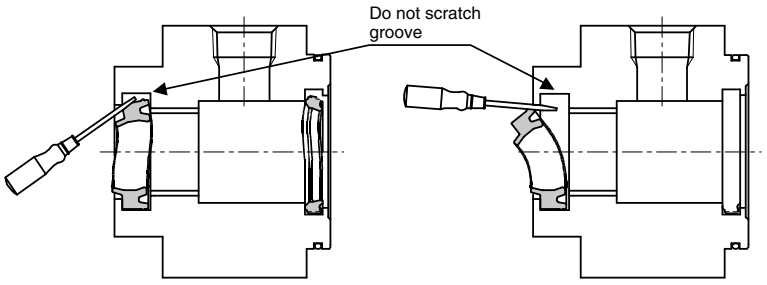


Fig. 1 Removal of the rod seal

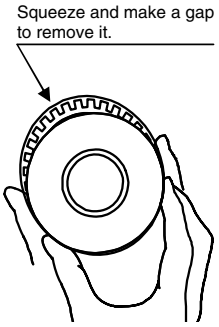


Fig. 2 Removal of the piston seal

3. Application of Grease to the Seal

3-1. Apply grease slightly to the outer circumference of each seal.

3-2. Fill in the groove of the rod seal with grease.

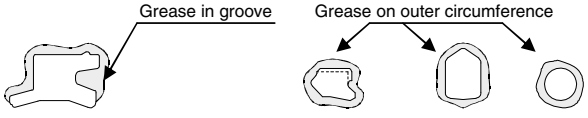


Fig. 3 Grease to the seals

4. Mounting of the Seal

4-1. Rod seal
Mount the seal in the correct direction by bending the seal with fingers as Fig. 4.
4-2. Piston seal
Mount the seal while stretching it as in Fig. 5.

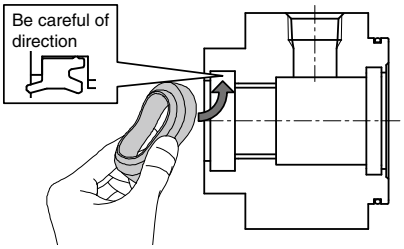


Fig. 4 Installation of the rod seal

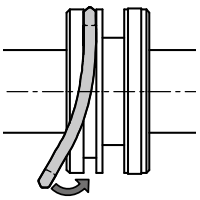


Fig. 5 Installation of the piston seal

5. Application of Grease

5-1. Rod seal
Apply grease to the seal and the inner circumference of the bushing. (Fig. 6)
5-2. Piston seal
Rub grease into the seal groove and outer circumference of the seal. (Fig. 7)
5-3. Cylinder component parts
Apply grease to each component parts of the cylinder in Fig. 9. Appendix table shows the grease amount required for a cylinder with a 100 mm stroke. For your reference, amount taken with a forefinger is about 3 g. (Fig. 8)

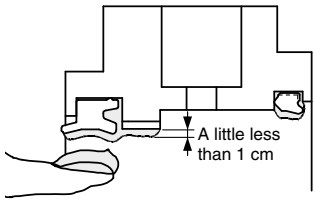


Fig. 6 Rod seal Cushion seal

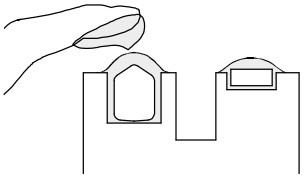


Fig. 7 Piston seal

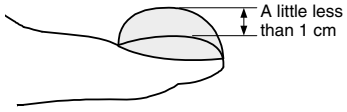


Fig. 8 Grease amount

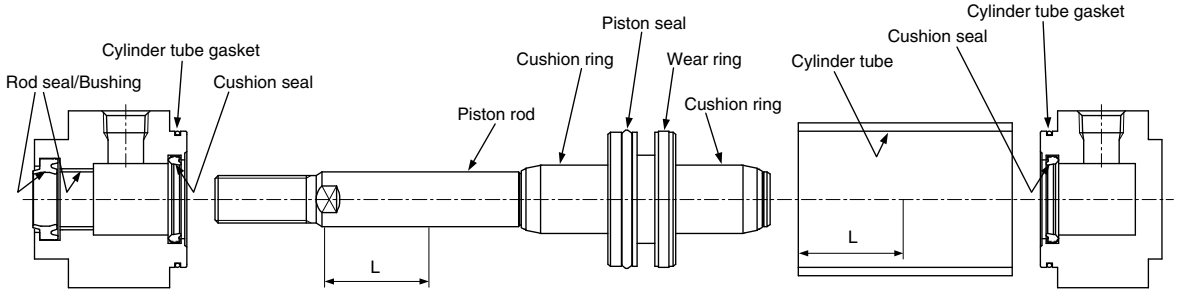


Fig. 9 Grease application points

$L = \frac{\text{STROKE}}{2}$ or 100 mm and more

Table. 2 Grease application amount (g)

Stroke	Bore size						
	32	40	50	63	80	100	125
100 stroke	3 to 4	3 to 4	3 to 5	4 to 5	6 to 8	8 to 10	15 to 17
Additional 50 stroke	1	1	1	1.5	1.5	2	3

6. Reassembly of the Cylinder

6-1. Make sure no particles are present. Do not scratch the seals.

6-2. To assemble the tie-rod to the cylinder, tighten the tie-rod to the shorter screw side by hand.

6-3. Set the tie-rod nuts from the head cover side. Tighten the tie-rod nut so that the tensile force is even.
Refer to the appropriate tightening torque of Table 3.
Brackets refer to the same table.

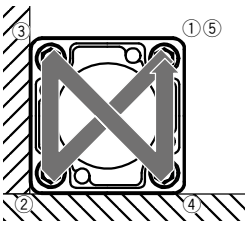


Fig. 10 Tie-rod tightening order

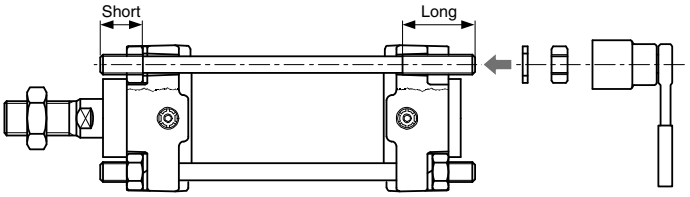
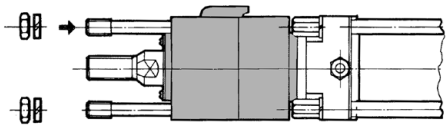


Table 3 Appropriate tightening torque

Bore size (mm)	**Appropriate tightening torque** (N·m)
40, 50	10.8
63	24.5
80, 100	38.2

6-4. Install the 4 tie-rods, with their shorter threaded portion oriented towards the rod cover, and tighten them with uniform torque. Until the installation and adjustment have been completed, never pull out the unlocking bolt (or release the air pressure).



1. Disassembly

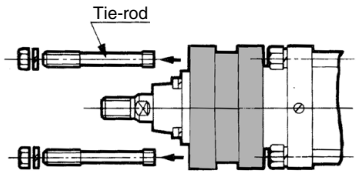
1-1. Disassembly should be done in a wide space containing little dust.

1-2. After removing the cylinder, be sure to protect the end of piping port and rubber hose on the machine side with a clean cloth to prevent dust from entering.

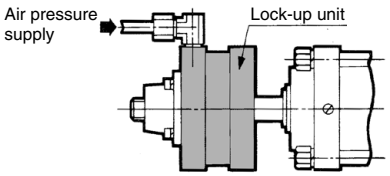
1-3. Disassemble the unit with care to prevent damage to the sliding portion.

1-4. Check the double chamfered portion at the rod end for burrs to prevent damage to the seal and the bushing when removing the lock-up unit from the piston rod. If burrs are found, remove them with a "file."

1-5. Loosen the tie-rod nuts and pull out the 4 tie-rods.



1-6. Apply air pressure of 0.2 MPa to 0.3 MPa to disengage the lock and pull out the lock-up unit from the piston rod.



1-7. Loose either of nuts for head side tie-rod with "ratchet handle for socket wrench", "T-type slide handle for socket wrench" or "spinner handle for socket wrench," etc. and remove it from the tie-rod. Please refer to the table for "socket for socket wrench."

Bore size (mm)	Nut	Applicable socket
125, 140	Class1, M14 x 1.5	JISB4636 Dodecagon22
160	Class1, M16 x 1.5	JISB4636 Dodecagon24

1-8. Remove the 4 tie-rods from cover.

1-9. Remove the push plate (rod cover) from the piston rod with care to prevent damage to the seal and bushing.

1-10. Pull the piston rod and pull out the piston from the cylinder tube.

1-11. Remove the cylinder tube from the head cover.

1-12. Disassembly of the rod cover (For the head cover, it should also be in accordance with this procedure.)

a. Remove the cylinder tube gasket. When excessive deformation or cut is found with the gasket, replace it.

b. Remove the cushion valve from the cover by using "flat head screwdriver."
(Tool: A screwdriver, Nominal size 8 x 150, Normal type, Normal class)

c. Remove the cushion valve seal from the cushion valve with a cloth.

d. Loosen the hexagon socket head cap screw for push plate with a "hexagon wrench" and remove the push plate. Applicable "Hexagon wrenches" are shown in the table below.

Bore size (mm)	Hexagon socket head cap screw	Nominal size of wrench
125, 140, 160	M8 x 1.25 x 25L	6

e. Remove the wiper ring. If it cannot be removed by hand, use a small "flat head screwdriver" and remove it with care to prevent damage to it.

f. Remove the rod seal with a small "flat head screwdriver" with care to prevent damage to it.

g. Remove the push plate gasket.

h. Since the cushion seal is pressed fit, air will leak from the portion where the cushion seal is pressed fit due to damage or change in pressing force. Therefore when the cushion seal should be replaced, the rod cover assembly and the head cover assembly should be replaced. (Rod and head covers are not replaceable for type 2 pressure containers. Please consult with SMC for more detail.)

i. Since the bushing is pressed fit into push plate, it is difficult to remove structurally and even if it is removed, stock for press fit lowers when it is pressed fit again. Therefore when it is replaced, replace the push plate assembly.

2. Replacement of the Seal

2-1. Removal of the seal

Please refer to "1. Disassembly" for dismantling of wiper ring, rod seal, valve seal, tube gasket and push plate gasket.

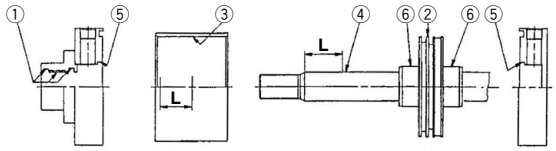
Since the piston seal has a deep groove for sealing, use your hand (not a watchmaker's screwdriver) and push from one side of seal and pull it out when it lifts off.

2-2. Application of grease

a. Seals: Apply thin coat of grease.

b. Cylinder component

Apply grease to the individual components as the figure below. The table shows the grease amount required for a cylinder with a 100 mm stroke.



Grease application amount (g)

Bore size (mm)	125	140	160	Portion to apply
100 stroke	15 to 17	20 to 22	24 to 26	① to ⑥
Additional 50 stroke	3	3	3	③④

For grease, use lithium soap group grease JIS #2

2-3. Mounting of the seal

a. Wiper ring/Rod seal

Mount in the correct direction.

b. Seals other than wiper ring

After mounting the seals, apply grease on the inside diameter surfaces of the bushing (rubbing grease into surface).

3. Assembly

3-1. Before assembling cylinder, be sure to clean each part to remove dust.

3-2. Before assembling, apply enough grease to the rod, bushing, tube and seal.

3-3. For rusty part, remove the rust completely.

3-4. Assembly should be done in a clean area with care to prevent foreign objects from entering.

3-5. Mount the seal with care to prevent damage to it.

3-6. Insert the piston into the tube or the rod into the bushing with care to prevent damage to each seal.

3-7. Tighten the tie-rod and bolt with the appropriate torque shown in the table below.

Tightening torque (N·m)

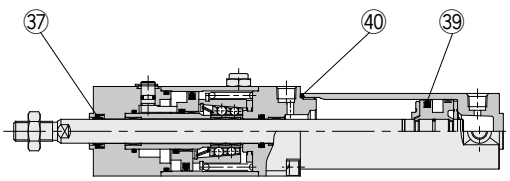
Bore size (mm)		125	140	160
Tie-rod	Steel tube	49		75.5
	Aluminum tube	39.2		62.8
Push plate bolt		11		

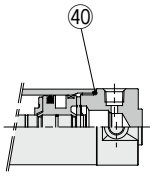
3-8. Insert the lock-up unit to the piston rod while the lock is released with the air pressure of 0.2 to 0.3 MPa, Install the 4 tie-rods, with their shorter threaded portion oriented towards the rod cover, and tighten them with uniform torque.

Maintain the application of air pressure until the installation and adjustment have been completed, and never actuate the lock in the meantime.

1. Disassembly of the Cylinder

1-1. Disassemble and assemble the cylinder in a clean area.
1-2. Refer to the “Replacement Procedure of the Lock Unit” (CNG-3) ① to ③ for disassembly.





Long stroke

㊲Rod seal A
㊴Piston seal
㊵Cylinder tube gasket

2. Removal of the Seal

㊲ Rod seal A: Insert a watchmaker’s screwdriver to pull out the seal.
Take care not to damage the seal groove of the cover. (Fig. 1)
㊳ Piston seal: Remove the piston seal. (Fig. 2)
㊵ Cylinder tube gasket: Insert a watchmaker’s screwdriver to pull out the seal.

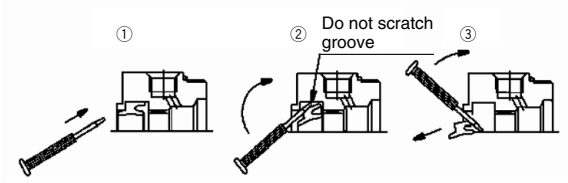


Fig. 1 Removal of the rod seal

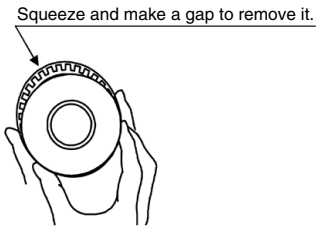


Fig. 2 Removal of the piston seal

3. Application of Grease to the Seal

3-1. Apply grease slightly to the outer circumference of each seal.
3-2. Fill in the groove of the rod seal with grease.

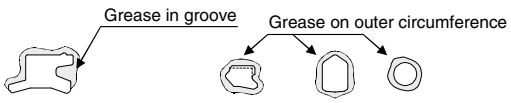


Fig. 3 Grease to the seals

4. Mounting of the Seal

㊲ Rod seal A: Mount the seal in the correct direction.
㊴ Piston seal: Mount the seal while stretching it as Fig. 5.

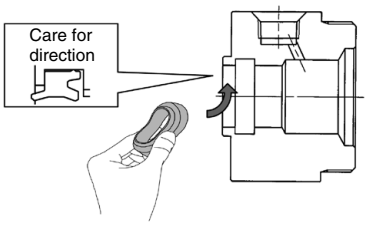


Fig. 4 Installation of the rod seal

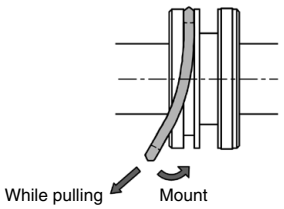


Fig. 5 Installation of the piston seal

5. Application of Grease

㊲ Rod seal A: Apply grease to the seal and the inner circumference of the bushing. (Fig. 6)
Use a precision screwdriver to apply grease to the small bore diameter while making sure not to leave scratches.

㊴ Piston seal: Rub grease into the seal groove and outer circumference of the seal. (Fig. 7)

㉚ Cylinder tube gasket: Lightly apply grease.

• Cylinder component parts: Apply grease to each component parts of the cylinder in Fig. 9.
Appendix table shows the grease amount required for a cylinder with a 100 mm stroke.
For your reference, amount taken with a forefinger is about 3 g. (Fig. 8)

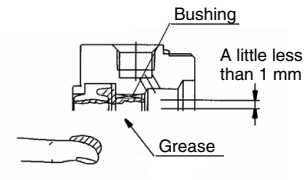


Fig. 6 Rod seal

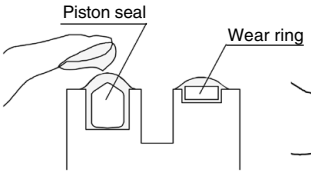


Fig. 7 Piston seal

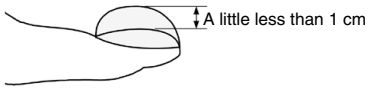


Fig. 8 Grease amount

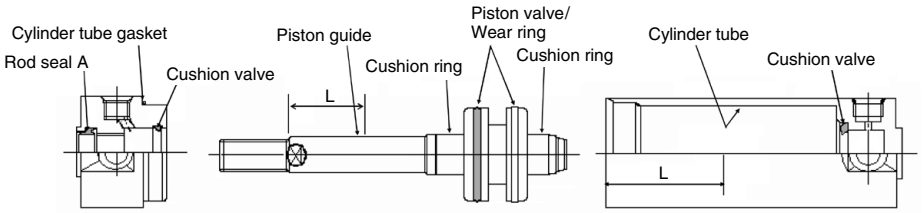


Fig. 9 Grease application points $L = \frac{\text{STROKE}}{2}$ or 100 mm and more

Grease application amount (g)

Stroke	Bore size			
	20	**25**	**32**	**40**
100 stroke	2	3	3	3 to 4
Additional 50 stroke	0.5	0.5	0.5	1

6. Reassembly of the Cylinder

6-1. Make sure no particles are present. Do not scratch the seals.

6-2. Tighten the cover approx. 0-2 degrees more from the original position (where the ports of rod and head covers match).

6-3. After completing the assembly, manually check whether the movement is smooth.

7. Replacement Parts

7-1. For the CNG series, the lock-up unit (except the long-stroke) and the seal (rod seal B, piston seal, cylinder tube gasket) can be replaced.

7-2. Contact SMC sales representatives if it is necessary to replace parts other than those mentioned above.

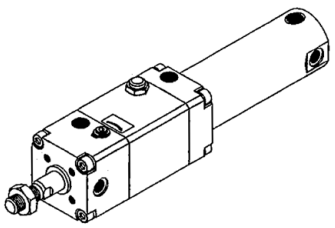
8. Replacement of the Lock Unit

⚠Caution

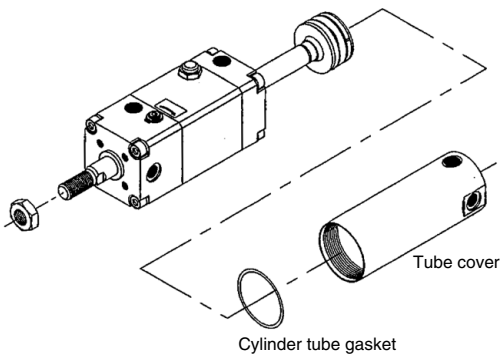
The lock unit for the CNG series can be replaced.
(However, please note that lock units cannot be replaced in the case of long stroke specifications.)

8-1. Remove the lock unit by securing the square section of the rod cover or the wrench flats of the tube cover in an apparatus such as a vice, and then loosening the other end with a wrench or adjustable angle wrench, etc.
See the table below for the dimensions of the square section and the wrench flats.

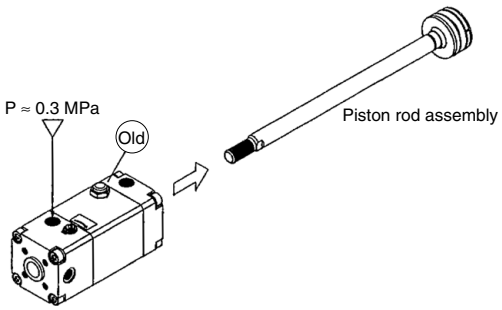
Bore size (mm)	**Rod cover square section** (mm)	**Tube cover wrench flats** (mm)
20	38	24
25	45	29
32	45	35.5
40	52	44



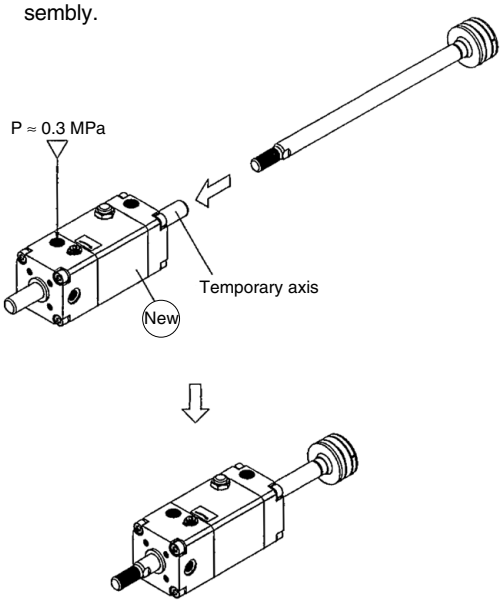
8-2. Remove the tube cover.



8-3. Apply compressed air of 0.3 MPa or more to the unlocking port, and pull out the piston rod assembly.



8-4. Similarly apply compressed air of 0.3 MPa or more to the unlocking port of the new lock unit, and replace the temporary axis with the previous piston rod assembly.



Note) When replacing the piston rod assembly with a new lock unit, care should be taken not to cut rod seal B with threads or wrench flats.
Be sure to keep applying compressed air with a pressure of at least 0.3 MPa to the lock releasing port when replacing the temporary axis of a new lock unit with the piston rod assembly.
If the compressed air applied to the lock releasing port is released (when it is in the lock condition) while the temporary rod and the piston rod assembly are removed from the lock unit, the brake shoe will be deformed and it will become impossible to insert the piston rod assembly, which will make the lock unit impossible to use.

8-5. Reassemble by reversing the procedure in steps 8-1. and 8-2. When retightening the sections, turn approx. 2˚ past their position prior to disassembly.

1. Disassembly of the Cylinder

Disassemble and assemble the cylinder in a clean area.

MNB Series

How to Replace Lock Units ②
(MWB: Page 458, MNB: Page 459) Refer to a to c.

Table 1 Work tools (MNB)

Bore size (mm)	Width across flats of a hexagon wrench	
	When removing the support bracket	When removing the tie-rod nut
32, 40	4	6
50, 63	5	8
80, 100	6	10
125	8	12

CNA2 Series

How to Replace Lock Units ② (Page 460)
Refer to a to c.

Table 2 Work tools

Bore size (mm)	Applicable socket
40, 50	13 (M8)
63	17 (M10)
80, 100	19 (M12)

2. Removal of the Seal

2-1. Rod seal, cushion seal
Insert a watchmaker's screwdriver to pull out the seal.
Take care not to damage the seal groove of the cover. (Fig. 1)
2-2. Piston seal
Remove it as in Fig. 2.
2-3. Tube gasket
Remove it in the same way as Fig. 2.

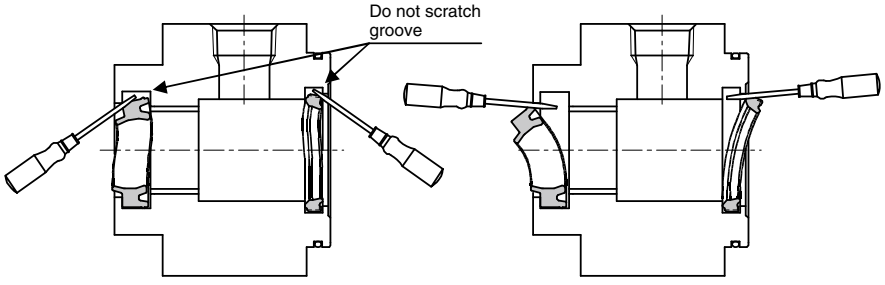


Fig. 1 Removal of the rod seal, cushion seal

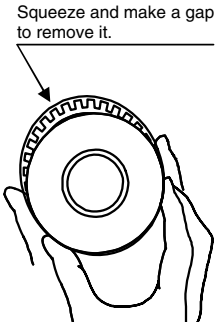


Fig. 2 Removal of the piston seal

3. Application of Grease to the Seal

3-1. Apply grease slightly to the outer circumference of each seal.
3-2. Fill in the groove of the rod seal with grease.

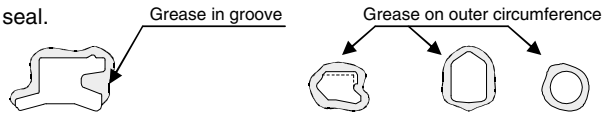


Fig. 3 Grease to the seals

4. Mounting of the Seal

4-1. Rod seal, cushion seal
Mount the seal in the correct direction by bending the seal with fingers as Fig. 4.

4-2. Piston seal
Mount the seal while stretching it as in Fig. 5.

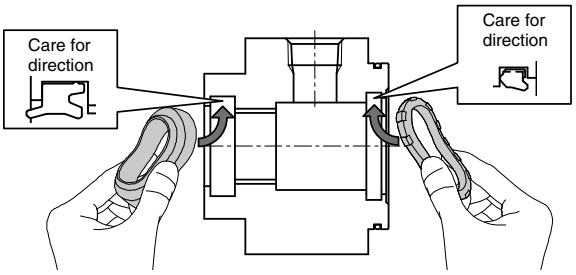


Fig. 4 Installation of the rod seal, cushion seal

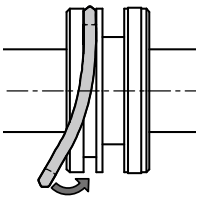


Fig. 5 Installation of the piston seal

5. Application of Grease

5-1. Rod seal, cushion seal
Apply grease to the seal and the inner circumference of the bushing. (Fig. 6)

5-2. Piston seal
Rub grease into the seal groove and outer circumference of the seal. (Fig. 7)

5-3. Cylinder component parts
Apply grease to each component parts of the cylinder in Fig. 9. Appendix table shows the grease amount required for a cylinder with a 100 mm stroke. For your reference, amount taken with a forefinger is about 3 g. (Fig. 8)

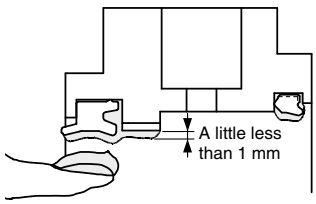


Fig. 6 Rod seal Cushion seal

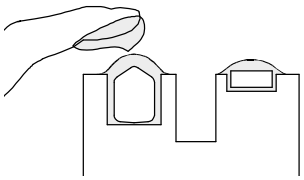


Fig. 7 Piston seal

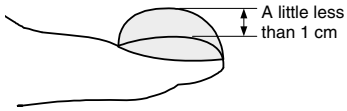


Fig. 8 Grease amount

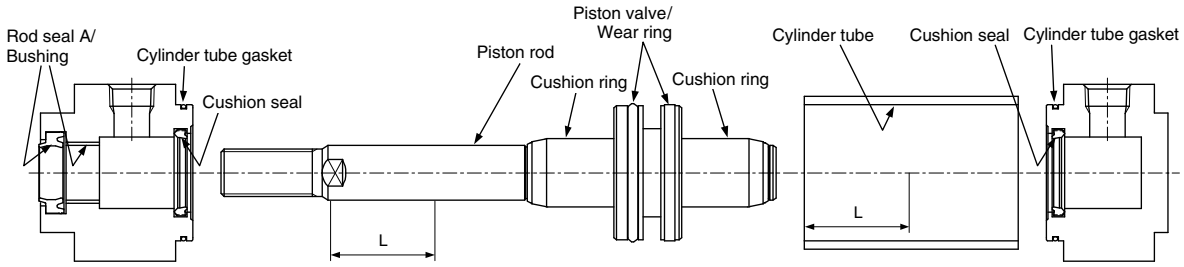


Fig. 9 Grease application points

$L = \frac{\text{Stroke}}{2}$ or 100 mm and more

Grease application amount (g)

Stroke	Bore size						
	32	40	50	63	80	100	125
100 stroke	3 to 4	3 to 4	3 to 5	4 to 5	6 to 8	8 to 10	15 to 17
Additional 50 stroke	1	1	1	1.5	1.5	2	3

6. Reassembly of the Cylinder

6-1. Make sure no particles are present. Do not scratch the seals.

6-2. For details on lock unit replacement, refer to the pages below.
- MWB (Page 458)
- MNB (Page 459)
- CNA2 (Page 460)

6-3. To assemble the tie-rod to the cylinder, tighten the tie-rod to the shorter screw side by hand from the head cover side.

6-4. Set the tie-rod nuts. Tighten the tie-rod nut so that the tensile force is even. Refer to the appropriate tightening torque of Table 4 and 5. As for mounting brackets, refer to the same table.

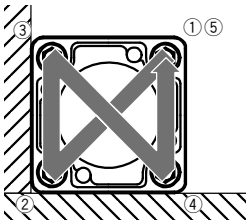


Fig. 10 Tie-rod tightening order

MWB/MNB Series

Table 4 Appropriate tightening torque

Bore size (mm)	**Appropriate tightening torque** (N·m)
32, 40	5.1
50, 63	11.0
80, 100	25.0

CNA2 Series

Table 5 Appropriate tightening torque

Bore size (mm)	**Appropriate tightening torque** (N·m)
40, 50	7.4
63	20
80, 100	29

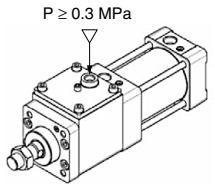
7. Replacement Procedure of the Lock Unit

MWB Series

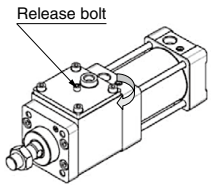
⚠Warning

Although the lock unit for the MWB series can be replaced, do not disassemble the lock unit.

1. The lock unit for the MWB series can be replaced.
2. How to replace the lock unit
   1) To release the lock state, screw-in the lock release bolt to the body cap end or pressurize the lock release port with 0.3 MPa or more.



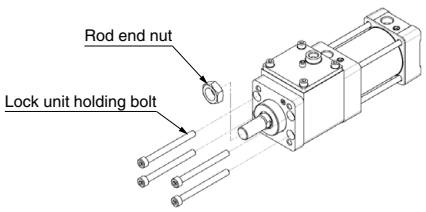
a) Lock released by air pressure



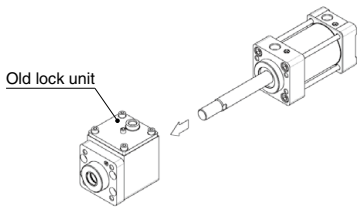
b) Manual lock release

   2) Remove the lock unit holding bolt (hexagon socket head cap screw) on the rod side of the cylinder with hexagon wrench. Refer to the table below for the hexagon wrench.
   If using the rod end nut, please remove it.

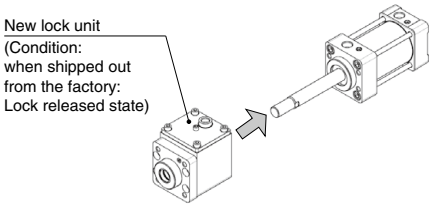
Bore size (mm)	Hexagon wrench size of the lock holding bolt
32	3
40·50	5
63	6
80	8
100	10



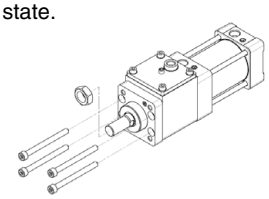
   3) Pull out the old lock unit from the cylinder.



   4) Insert a new lock unit into the cylinder. The lock unit for maintenance is supplied with lock released state at the shipment from the factory.



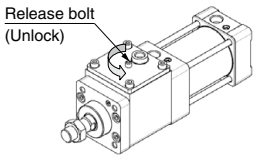
   5) Insert the lock unit holding bolt and tighten it temporarily. Check that the piston rod operates smoothly by hand while maintaining the lock release state.



   6) Confirm that the operation of 5) is performed correctly, and then tighten the lock unit holding bolt with the appropriate tightening torque as shown in the table below.

Tube I. D. (mm)	Appropriate tightening torque of the lock unit holding bolt (N·m)
32	1.35 to 1.65
40·50	4.7 to 5.7
63	11.3 to 13.7
80	22.1 to 26.9
100	37.8 to 46.2

   7) After assembly is completed, rotate the release bolt counterclockwise by hand with a hexagon wrench until resistance is felt. Once that position is reached, rotate it for an additional 1/6th of a turn to securely tighten the release bolt.
   ∗ Please do not use an electric driver or pneumatic driver.



Check that the cylinder is locked and confirm that the lock is released when air pressure of 0.3 MPa or more is applied to the lock unit release port. In addition to this, the piston rod should operate smoothly with the min. operating pressure.
Check that there is no air leakage from the release bolt.

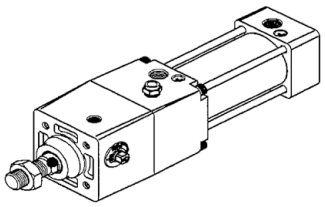
MNB Series

⚠ Warning

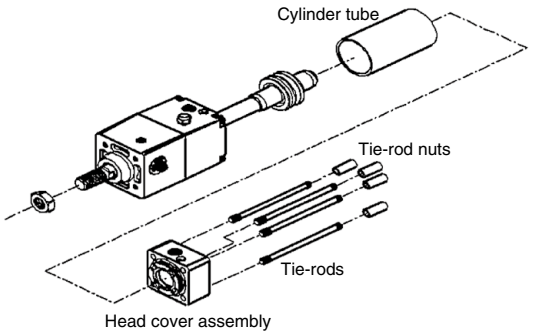
Although the lock unit for the MNB series can be replaced, do not disassemble the lock unit.

1. The lock unit for the MNB series can be replaced.
2. How to replace the lock unit
   a. Loosen the cylinder head cover tie-rod nuts (four) with a hexagon wrench. Refer to the table below for applicable.

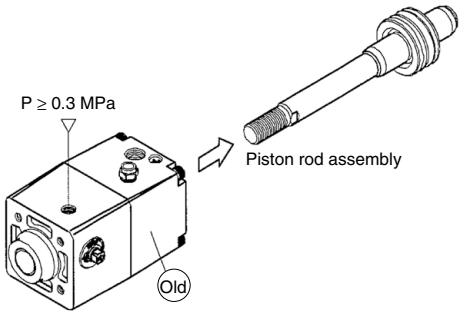
Bore size (mm)	Width across flats of a hexagon wrench
32, 40	6
50, 63	8
80, 100	10



b. Remove the tie-rods, head cover and cylinder tube.



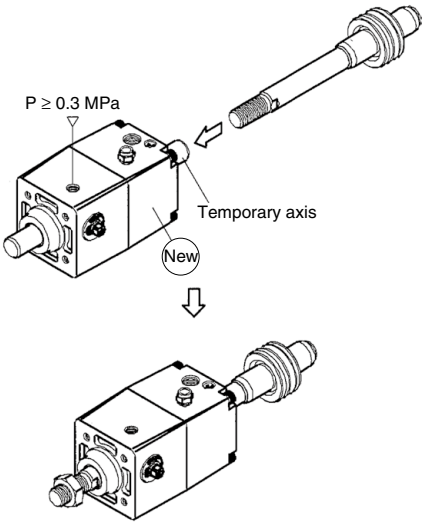
c. Apply 0.3 MPa or more of pressure to the lock release port to pull out the piston rod assembly.



d. Apply 0.3 MPa or more of pressure to new lock unit lock release port to change the piston rod assembly to the tentative rod.

Note1) Attention should be taken not to cut rod seal B with screws and the wrench flat when replacing the piston rod assembly to new lock unit.

Note2) Be sure to keep applying compressed air with a pressure of at least 0.3 MPa to the lock releasing port when replacing the temporary axis of a new lock unit with the piston rod assembly.
If the compressed air applied to the lock releasing port is released (when it is in the lock condition) while the temporary rod and the piston rod assembly are removed from the lock unit, the brake shoe will be deformed and it will become impossible to insert the piston rod assembly, which will make the lock unit impossible to use.



e. Reassemble in reverse order from b to a.

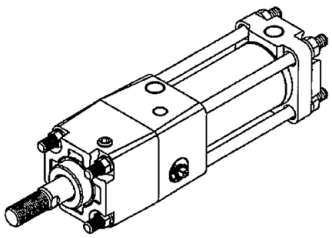
⚠ Caution

Do not apply grease nor oil to the piston rod surface.

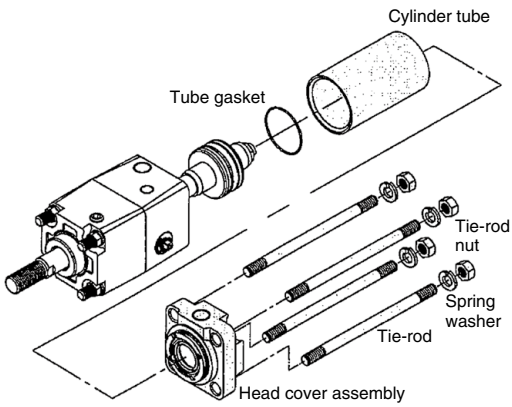
CNA2 Series

1. The lock unit for the CNA2 series can be replaced.
2. How to replace the lock unit
   a. Loosen the tie-rod nuts (4 pieces) on the cylinder head cover side with a socket wrench.
   For applicable socket, refer to the below table.

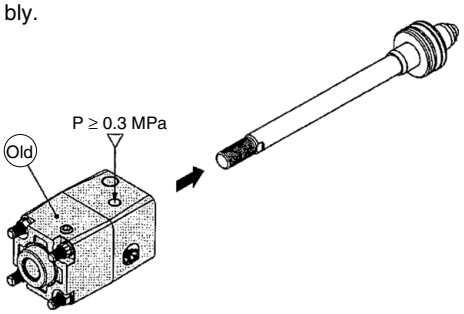
Bore size (mm)	Nut mounting bracket		
	Nut	Width across flats dimension	Socket
40, 50	JISB1181 Class 2 M8 x 1.25	13	JISB4636 + 2-point angle socket 13
63	JISB1181 Class 2 M10 x 1.25	17	JISB4636 + 2-point angle socket 17
80, 100	JISB1181 Class 2 M12 x 1.75	19	JISB4636 + 2-point angle socket 19



b. Remove the tie-rods, head cover and cylinder tube.



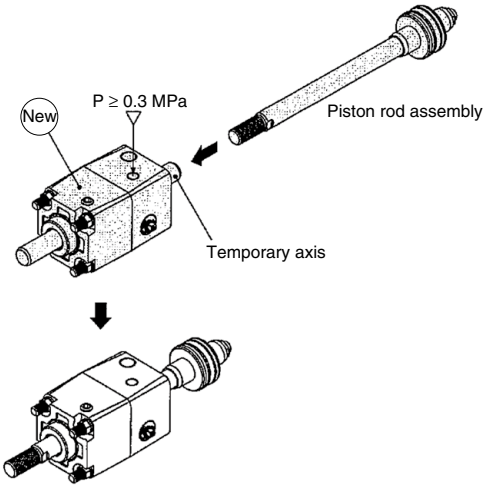
c. Apply 0.3 MPa or more of compressed air to the unlocking port, and pull out the piston rod assembly.



d. Similarly, apply 0.3 MPa or more of compressed air to the unlocking port of the new lock unit, and replace the new lock unit's temporary axis with the previous piston rod assembly.

Note1) Attention should be taken not to cut rod seal B with screws and the wrench flat when replacing the piston rod assembly to new lock unit.

Note2) Be sure to keep applying compressed air with a pressure of at least 0.3 MPa to the lock releasing port when replacing the temporary axis of a new lock unit with the piston rod assembly.
If the compressed air applied to the lock releasing port is released (when it is in the lock condition) while the temporary rod and the piston rod assembly are removed from the lock unit, the brake shoe will be deformed and it will become impossible to insert the piston rod assembly, which will make the lock unit impossible to use.



e. Reassemble in reverse order from step b to a.

⚠ Caution

Do not apply grease nor oil to the piston rod surface.

1. Disassembly

1-1. Disassembly should be done in a wide space containing little dust.

1-2. After removing the cylinder, be sure to protect the end of piping port and rubber hose on the machine side with a clean cloth to prevent dust from entering.

1-3. Disassemble the unit with care to prevent damage to the sliding portion.

1-4. Check the double chamfered portion at the rod end for burrs to prevent damage to the seal and the bushing when removing the lock unit from the piston rod. If burrs are found, remove them with a "file."

1-5. Remove the lock unit according to section 4, Replacing Procedures of Lock Unit.

1-6. Loose either of nuts for head side tie-rod with "ratchet handle for socket wrench", "T-type slide handle for socket wrench" or "spinner handle for socket wrench", etc. and remove it from the tie-rod. Refer to the table for "socket for socket wrench."

Bore size (mm)	Nut	Applicable socket
125, 140	Class1, M14 x 1.5	JISB4636 Dodecagon22
160	Class1, M16 x 1.5	JISB4636 Dodecagon24

1-7. Remove the 4 tie-rods from the cover.

1-8. Remove the rod cover from the piston rod with care to prevent damage to the seal and bushing.

1-9. Pull the piston rod and pull out the piston from the cylinder tube.

1-10. Remove the cylinder tube from the head cover.
Remove the wiper ring of the lock unit. If it cannot be removed by hand, use a small "flat head screwdriver" and remove it with care to prevent damage to it.

1-11. Disassembly of the rod cover (For the head cover, it should also be in accordance with this procedure.)

a. Remove the cylinder tube gasket. When excessive deformation or cut is found with the gasket, replace it.

b. Remove the cushion valve from the cover with a "flat head screwdriver."
(Tool: A screwdriver, Nominal size 8 x 150, Normal type, Normal class)

c. Remove the cushion valve seal from the cushion valve with a cloth.

d. Loosen the hexagon socket head cap screw for push plate B with a "hexagon wrench" and remove the push plate D. Applicable "Hexagon wrenches" are shown in the table below.

e. Remove the rod seal with a small "flat head screwdriver" with care to prevent damage to it.

f. Remove the push plate gasket.

Bore size (mm)	Hexagon socket head cap screw	Nominal size of wrench
125, 140, 160	M8 x 1.25 x 25L	6

g. Since the cushion seal is pressed fit, air will leak from the portion where the cushion seal is pressed fit due to damage or change in pressing force. Therefore when the cushion seal should be replaced, the rod cover assembly and the head cover assembly should be replaced.

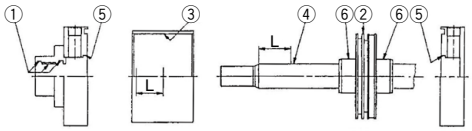
2. Replacement Procedure of the Seal

2-1. Removal of the seal
Please refer to "1. Disassembly" for dismantling of wiper ring, rod seal, valve seal, tube gasket and push plate gasket.
Since piston seal has a deep groove for sealing, use your hand (not a watchmaker's screwdriver) and push from one side of the seal and pull it out when it lifts off.

2-2. Application of grease

a. Seals: Apply thin coat of grease.

b. Cylinder component
Apply grease to the individual components as the figure below. The table shows the grease amount required for a cylinder with a 100 mm stroke.



Grease application amount (g)

Bore size (mm)	**125**	**140**	**160**	**Portion to apply**
100 stroke	15 to 17	20 to 22	24 to 26	① to ⑥
Additional 50 stroke	3	3	3	③④

For grease, use lithium soap group grease JIS #2.

2-3. Mounting of the seal

a. Wiper ring/Rod seal
Mount in the correct direction.

b. Seals other than the wiper ring
After mounting the seals, apply grease on the inside diameter surfaces of the bushing (rubbing grease into surface).

3. Assembly

3-1. Before assembling cylinder, be sure to clean each part to remove dust.
3-2. Before assembly, apply enough grease to the rod, bushing, tube and seal.
3-3. For rusty part, remove the rust completely.
3-4. Assembly should be done in a clean area with care to prevent foreign objects from entering.
3-5. Mount seal with care to prevent damage to it.
3-6. Insert the piston into the tube or the rod into the bushing with care to prevent damage to each seal.
3-7. Tighten the tie-rod and bolt with the appropriate torque shown in the table below.

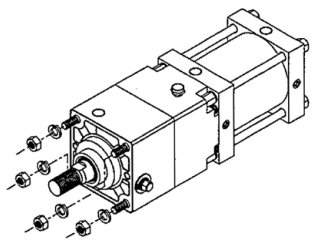
Tightening torque (N·m)

Bore size (mm)		125	140	160
Tie-rod	Steel tube	49		75.5
	Aluminum tube	39.2		62.8
Push plate bolt		11		

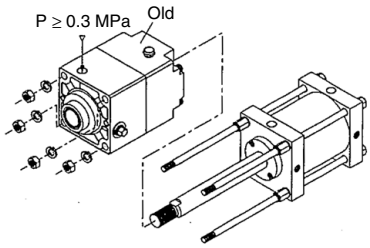
4. Replacement Procedure of the Lock Unit

4-1. The lock unit for the CNS series can be replaced.
4-2. Replacing procedures of lock unit
a. Loosen the tie-rod nuts (4 pieces) on the rod cover side of cylinder with a socket wrench.

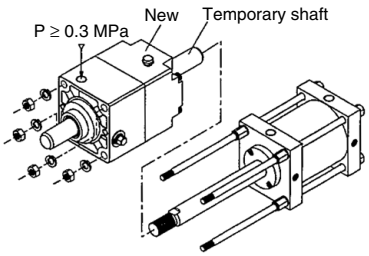
Bore size (mm)	Nut	Dimension of width across flats	Socket
125, 140	JIS B1181 M14 x 1.5	22	JIS B4636 Socket22
160	JIS B1181 M16 x 1.5	24	JIS B4636 Socket24



b. Remove the lock unit by applying compressed air over 0.3 MPa to lock release port.

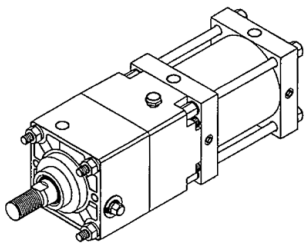


c. Also apply compressed air over 0.3 MPa to a new lock unit and replace the piston rod of cylinder with the temporary shaft.



Note) To replace the piston rod assembly with the temporary shaft of a new lock unit, make sure that the compressed air of 0.3 MPa or higher is kept applied to the lock release port.
If the compressed air is exhausted (locked state) while the temporary shaft and piston rod assembly are pulled out from the lock unit, a brake shoe will be deformed and the piston rod assembly cannot be inserted. This makes the lock unit unusable.

d. Tighten the tie-rod nuts (4 pieces) on the cylinder rod side with a socket wrench.



⚠Warning

Customer shall not disassemble the CNS series lock unit.
1. Because of the powerful spring installed, do not loosen or remove hexagon socket head cap screws fixing covers A and B (parts may be shot out).
2. Please consult with our sales person if disassembly and repair are necessary.

⚠Caution

Apply grease and oil to the surface of the piston rod only when it is necessary.

1. Disassembly

1-1. Disassembly should be done in a wide space containing little dust.

1-2. After removing the cylinder, be sure to protect the end of piping port and rubber hose on the machine side with a clean cloth to prevent dust from entering.

1-3. Disassemble the unit with care to prevent damage to the sliding portion.

1-4. Check the double chamfered portion at the rod end for burrs to prevent damage to the seal and the bushing when removing the lock unit from the piston rod. If burrs are found, remove them with a "file."
Remove the lock unit according to "Appendix. Replacement Procedures of Lock Unit."

1-5. Side of the head of nuts for tie-rod with "ratchet handle for socket wrench", "T-type slide handle for socket wrench" or "spinner handle for socket wrench," etc. and remove it from the tie-rod. Refer to the table for "socket for socket wrench."

Bore size (mm)	Nut	Applicable socket
125·140	Class1, M14 x 1.5	JISB4636 Dodecagon22
160	Class1, M16 x 1.5	JISB4636 Dodecagon24
180	Class1, M18 x 1.5	JISB4636 Dodecagon27
200	Class1, M20 x 1.5	JISB4636 Dodecagon30
250	Class1, M24 x 1.5	JISB4636 Dodecagon36

1-6. Remove the 4 tie-rods from the cover.

1-7. Remove the rod cover from the piston rod with care to prevent damage to the seal and bushing.

1-8. Pull the piston rod and pull out the piston from the cylinder tube.

1-9. Remove the cylinder tube from the head cover.
Remove the wiper ring of lock unit. If it cannot be removed by hand, use a small "flat head screwdriver" and remove it with care to prevent damage to it.

1-10. Disassembly of the rod cover (For the head cover, it should also be in accordance with this procedure.)

a. Remove the cylinder tube gasket. When excessive deformation or cut is found with the gasket, replace it.

b. Remove the cushion cover from the cover with a "flat head screwdriver."
(Tool: A screwdriver, Nominal size 8 x 150, Normal type, normal class)

c. Remove the cushion valve seal from the cushion valve with a cloth.

d. Loosen the hexagon socket head cap screw for the push plate with a "hexagon wrench" and remove the push plate. Applicable "Hexagon wrenches" are shown in the table right above.

Bore size (mm)	Hexagon socket head cap screw	Nominal size of wrench
125, 140, 160	M8 x 1.25 x 16L	6
180, 200	M10 x 1.5 x 18L	8
250	M12 x 1.75 x 22L	10

e. Remove the rod seal with a small "flat head screwdriver" with care to prevent damage to it.

f. Remove the push plate gasket.

g. Since the cushion seal is pressed fit, air will leak from the portion where the cushion seal is pressed fit due to damage or change in pressing force. Therefore when the cushion seal should be replaced, the rod cover assembly and the head cover assembly should be replaced.

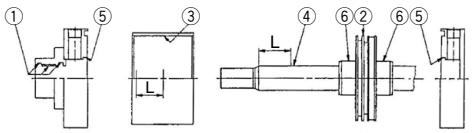
2. Replacement Procedure of Seal

2-1. Removal of the seal
Please refer to "1. Disassembly" for dismantling of wiper ring, rod seal, valve seal, tube gasket and push plate gasket.
Since piston seal has a deep groove for sealing, use your hand (not a screwdriver) and push from one side of seal and pull it out when it lifts off.

2-2. Application of grease

a. Seals: Apply thin coat of grease.

b. Cylinder component
Apply grease to the individual components as the figure below. The table shows the grease amount required for a cylinder with a 100 mm stroke.



Grease application amount (g)

Bore size (mm)	125	140	160	180	200	250	Portion to apply
100st	15 to 17	20 to 22	24 to 26	27 to 29	30 to 32	33 to 35	① to ⑥
Additional 50st	3	3	3	4	4	5	③④

For grease, use lithium soap group grease JIS #2.

2-3. Mounting of the seal

a. Wiper ring/Rod seal
Mount in the correct direction.

b. Seals other than the wiper ring
After mounting the seals, apply grease on the inside diameter surfaces of the bushing (rubbing grease into surface).

3. Assembly

3-1. Before assembling the cylinder, be sure to clean each part to remove dust.

3-2. Before assembly, apply enough grease to the rod, bushing, tube and seal.

3-3. For rusty part, remove the rust completely.

3-4. Assembly should be done in a clean area with care to prevent foreign objects from entering.

Tightening torque (N·m)

Bore size (mm)		125	140	160	180	200	250
Tie-rod	Steel tube	49		75.5	103	147.1	254
	Aluminum tube	39.2		62.8	92.7	132.4	–
Push plate bolt		11			22		38

3-5. Mount the seal with care to prevent damage to it.

3-6. Insert the piston into the tube or rod into the bushing with care to prevent damage to each seal.

3-7. Tighten the tie-rod and bolt with the appropriate torque shown in the table below.

4. Replacement Procedure of the Lock Unit

4-1. The lock unit for the CLS series can be replaced.

⚠Caution

1. Never disassemble the lock unit.
A heavy duty spring is contained in part of the unit, which presents a serious hazard if disassembly is performed incorrectly.
In addition, the lock unit is adjusted before shipment. If readjustment is not performed correctly after reassembly, a serious danger will be created, as performance will not meet specifications.

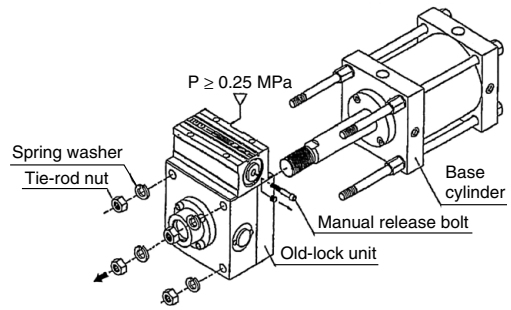
2. The cylinder body and the lock unit are heavy materials. Two or more persons are required for the replacement of the unit after cleaning up the working environment.

3. The brake tube assembly and the lock unit can be separated. Do not disassemble any other parts.

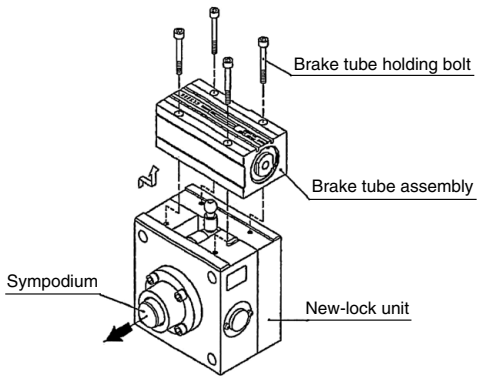
4-2. Loosen the 4 tie-rod nuts on the rod cover side of the cylinder with a socket wrench.
Refer to the table below for the size of the tie-rod nut.

Bore size (mm)	Tie-rod nut	Width across flats dimension	Socket
125, 140	JISB1181 Class 1 M14 x 1.5	22	JISB4636 + 2-point angle socket 22
160	JISB1181 Class 1 M16 x 1.5	24	JISB4636 + 2-point angle socket 24
180	JISB1181 Class 1 M18 x 1.5	27	JISB4636 + 2-point angle socket 27
200	JISB1181 Class 1 M20 x 1.5	30	JISB4636 + 2-point angle socket 30
250	JISB1181 Class 1 M24 x 1.5	36	JISB4636 + 2-point angle socket 36

4-3. Release the lock by hand or apply 0.25 MPa to the unlocking port and pull out the lock unit from the base cylinder.



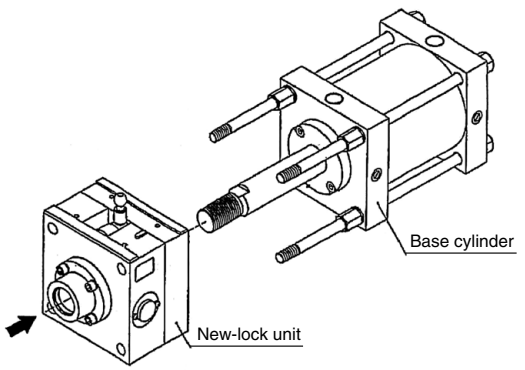
4-4. Remove the 4 holding bolts for the new lock unit brake tube assembly and remove the brake tube assembly.



4-5. Pull out the temporary shafts from the lock unit and insert the lock unit to the base cylinder.

⚠Caution

1. Take care not to damage the inner surface of the brake shoe with the width across flats during insertion of the lock unit.



4-6. After making sure that the key is mounted to the specified location, assemble the brake tube assembly and fix it with holding bolts.

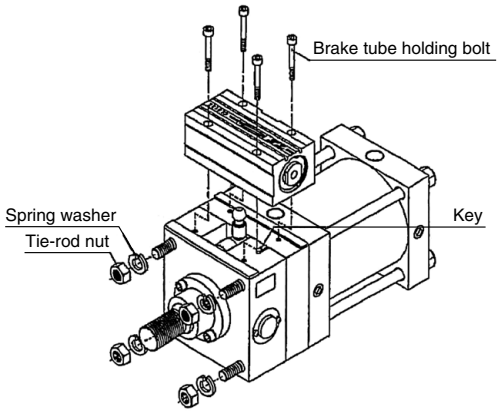
(N·m)

Bore size (mm)	Bolt size	Tightening torque (standard)
125, 140	M6	4.8
160	M8	11.9
180	M8	11.9
200	M10	24.5
250	M12	42

4-7. Lastly, tighten the tie-rod nuts.

(N·m)

Bore size (mm)	Bolt size	Tightening torque (standard)
125, 140	M14	34.3
160	M16	53.9
180	M18	73
200	M20	102
250	M24	180



⚠Caution

Apply 0.08 MPa or more of air pressure to the cylinder port before installing the equipment for checking the operation. Make sure that the manual release bolts are removed before installing the equipment.

1. Maintenance

As for sine rodless cylinders, the cushion ring and seal are assembled to provide the optimum cushioning effect.

Therefore, they should be returned to the factory for maintenance.

If you disassemble them by necessity, please note the following points.

1-1. To remove the external slider or piston slider from cylinder tube, holding force must be released by shifting positions of the external slider and slider piston forcibly. Removing those without doing so, respective magnets call each other directly and may become impossible to separate.

1-2. Upon completing above works to separate respective sliders, by loosening hexagon head cap screw (at plate A side,) remove the cylinder tube and plate A from guide rod A and B. (While replacing works (of packing, so on), other parts should not be disassembled, disassembling other parts may cause to air leakage.)

1-3. The magnet assembly (piston slider and external slider) must not be disassembled. Disassembling this may cause to decrease of holding force and other defects.

1-4. When handling the magnet assembly, watch on your arm should be put off not to get influence from strong magnetic field.

1-5. Thorough care should be taken for the magnet not to drop on the floor or knock against metal.

1-6. Make sure the external slider is in the correct direction. (REAS10 only).
Insert the external slider (slide block) and the piston slider to the cylinder tube. If the direction is incorrect (Fig. 2), turn the piston slider 180 degrees then insert. If the direction is not corrected, the specified holding force will not be realized.

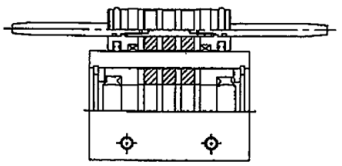


Fig. (1) Correct position

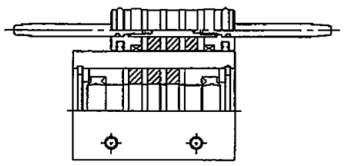


Fig. (2) Incorrect position

1. Disassembly and Reassembly of the Cylinder

Disassemble and assemble the cylinder in a clean area. Put a clean cloth on a working place.
For disassembly, hold width across flats of the head cover or rod cover with a vice, wrench, or monkey wrench, and loose and remove the covers respectively.

2. Removal of the Seal

2-1. Rod seal

The rod seal A can be replaced with the cylinder mounted. On the other hand, the rod seal B should not be replaced by customer because of its difficulty in mounting works.

Use retaining ring pliers (tool for installing a basic internal retaining ring) to remove the retaining ring, and take the piston rod out from the rod cover with closing the ports of the rod cover by fingers. Then, the seal holder and rod seal A will appear and can be removed from the piston rod.

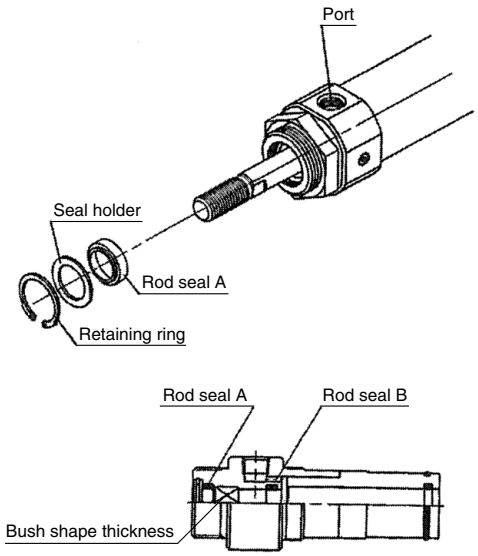


Fig. 1

2-2. Piston seal

Wipe off grease around piston seal first to make removal easier.

Hold the piston seal with one hand and push it into groove so that the piston seal can be lifted off and pulled out without using a watchmaker's screwdriver. (Fig. 2)

2-3. Tube gasket

Remove the tube gasket with a watchmaker's screwdriver or the like. (Be careful not to damage the surrounding parts of the tube gasket.)

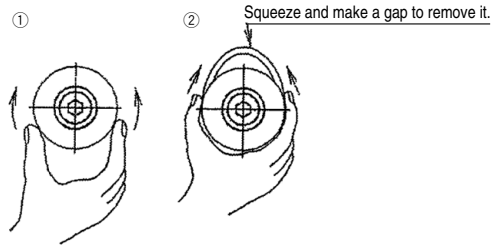


Fig. 2 Removal of the piston seal

3. Application of Grease

Use lithium soap base grease equivalent to JIS class 2. You may also order our grease package (GR-S-010 for 10 g and GR-S-020 for 20 g).

3-1. Rod seal

Apply grease thin around the internal and external faces of the new seal for replacement. This is for smooth mounting of the rod seal to the cover and firm fitting between them. Also, the grease is required for the seal groove.

3-2. Piston seal

Apply grease thin and evenly around the internal and external faces of the piston seal for smooth mounting to the piston.

3-3. Tube gasket

Apply grease thin to the tube gasket to prevent it from coming off from the cylinder when assembling.

3-4. Other parts of the cylinder

The parts of the cylinder shown in Fig. 3 also require grease to be applied. The amount shall be as specified in Table 1 for one cylinder with a 100 mm stroke. You can consider the amount scooped by index finger to be approx. 3 g. (Fig. 4)

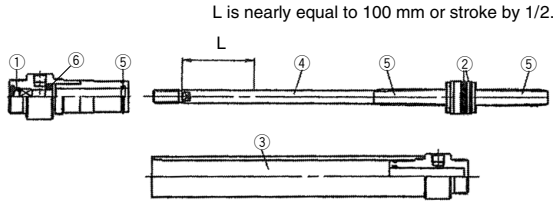


Fig. 3 Grease application points

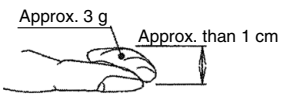


Fig. 4 Grease amount

Table 1 Grease application amount (g)

Stroke	ø20	ø25	ø32	ø40	Applying position
100 stroke	2	3	3	3 to 4	①②③④⑤⑥
Additional 50 stroke	0.5	0.5	0.5	1	③④

4. Mounting of the Seal

4-1. Rod seal

Mount the rod seal with care for direction. When passing the rod seal through the threaded part at the piston rod end and width across flat, press the rod seal slowly and gradually with rotating. And then, mount it to the housing of the rod cover firmly.

After that, mount the seal holder and retaining ring.

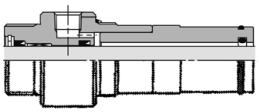


Fig. 5

4-2. Piston seal

Mount the piston seal and rub grease into the inside and the external face of the seal groove as shown in Fig. 6.

4-3. Tube gasket

Mount the tube gasket, apply grease slightly and mount to the head and rod covers.

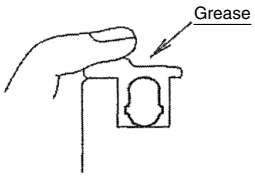


Fig. 6

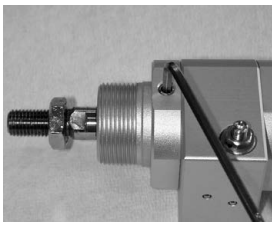
That is all for the replacement of seals. After they are assembled, check if the cylinder operates smoothly by hand and there is no air leakage as the last step.

1. Replacement of the Seal

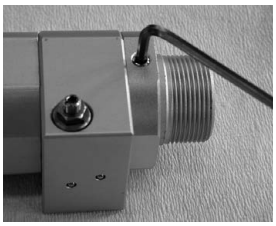
Seal for cylinder should be disassembled and reassembled on the clean bench without metal chips and dust. Attached metal chips and dust will cause air leakage. Pay great attention to the operation to prevent air leakage.

1-1. Removal of the mounting nut and bracket
The bracket such as a foot or flange is fixed with a nut. Loosen the nut to remove the bracket and mounting nut.

1-2. Removal of the relief valve body holder
Since the relief valve body holder is fixed with a set screw, use a hexagon wrench to loosen it. The relief valve body holder on the cover side is slightly deformed due to screw. When the relief valve body holder is removed from the cover, remove it as rotating.

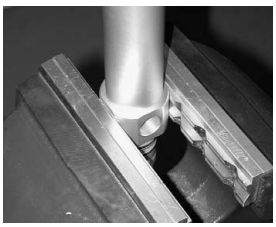


Picture 1: R/C side



Picture 2: H/C side

1-3. Removal of the rod cover
When the cylinder cover is removed after the relief valve body holders on both rod and head cover side removed, fix head cover with a vice and loosen the screwed-in rod cover with a wrench or monkey wrench.



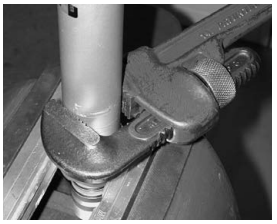
Picture 3: Fixed (H/C side)



Picture 4: R/C side

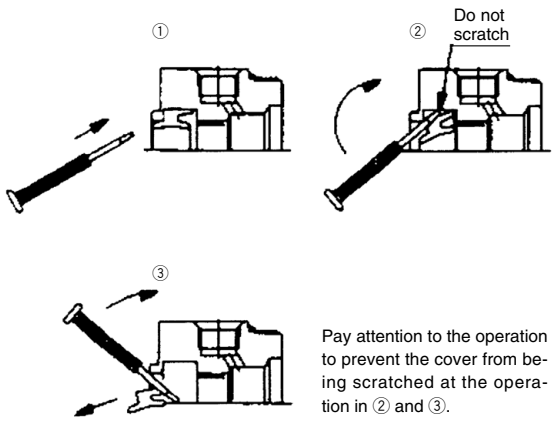
1-4. Removal of the piston rod assembly
Extract the piston rod assembly from the tube as rotating it after the rod cover is removed,

1-5. Removal of the head cover
Loosen the screwed-in tube as rotating it with a pipe wrench leaving head cover fixed with a vice. Pay great attention to the operation to prevent the inside of the tube from deformation.



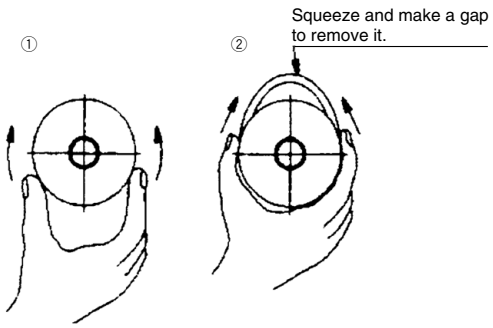
Picture 5: H/C side

1-6. Removal of the rod seal
Since rod seal is mounted on the cover part where groove is machined, remove it with a watchmaker's screwdriver.



Pay attention to the operation to prevent the cover from being scratched at the operation in ② and ③.

1-7. Removal of the piston seal
Wipe off grease around the piston seal to remove it easily, then remove it in accordance with the procedure stated below.

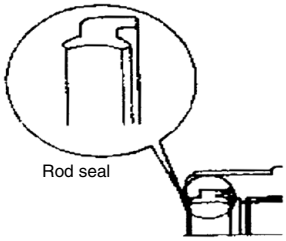


1-8. Replacement of the wear ring
When the wear ring is worn out, remove and replace it with a watchmaker's screwdriver.

1-9. Removal of the cushion seal
Since the cushion seal is mounted on the parts of rod and head cover where groove is machined, remove it carefully with a watchmaker's screwdriver with the same operation for the rod seal.

1-10. Each O-ring
Remove each part just in the case that there are flaws on surface of O-ring. Use the same operation as the piston seal for the small O-ring which mounted on the groove. Put small amount of grease.

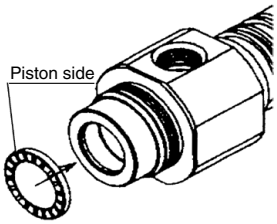
1-11. Installation of the rod seal
Install the rod seal with correct direction after applying grease on whole part. Check if there is no deformation on seal, and if so, set it correctly with finger.





Picture 6: Installation of rod seal

1-12. Installation of the cushion seal
Install the cushion seal with correct direction after applying grease on whole part. Check if there is no deformation on the seal, and if so, set it correctly with finger.



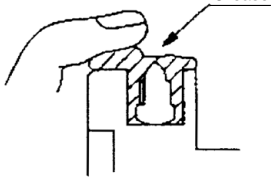


Picture 7: Installation cushion seal

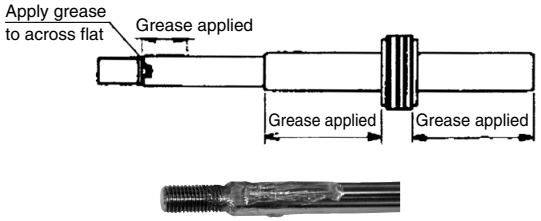
1-13. Installation of the piston seal
Install piston seal by expanding it to mounting groove after applying grease on whole part. Then, put grease to the outside of the piston like below diagram.



Picture 8: Installation of the piston seal



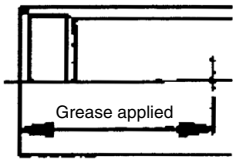
1-14. Grease for the piston rod assembly
Spread grease thinly and equally to pointed part stated below.



Picture 9: Grease applied piston rod assembly

1-15. Preliminary tightening of the tube and cover
Prepare assembly by screwing head cover in tube with hand.

1-16. Grease for the sliding portion (I.D.) of the tube
Apply grease the inside of the cylinder tube. Put approx. 1 cm (3 g) of grease on finger as standard and apply it to the range, which is equivalent length to cylinder I.D. equally.

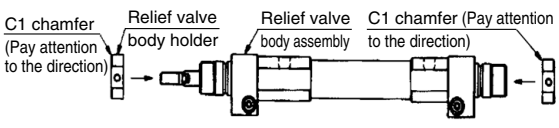


1-17. Insertion of the piston rod assembly
Insert the piston rod assembly to the assembly in step 1-16. Pay great attention to the operation to protect the piston seal from flaws by screw at the end of the tube.

1-18. Preliminary tightening of the rod cover
Screw-in rod cover to the assembly assembled up to 3-17 with hand. Pay great attention to operation to protect the rod seal from flaws by screws on the end of tube.

1-19. Final tightening of the cover
Fix head cover with vice and screw-in rod cover with a wrench or monkey wrench with the same procedure at disassembly. Tight additionally approx. 1~2° as standard considering the relation of ports between the rod cover and the head cover before disassembly.

1-20. Installation of the relief valve body
Install the valve body on the cover. Install it as rotating until it touch's to the end of the cover as facing C chamfer to outside.



1-21. Relief valve fixing

Fix the hexagon socket set screw with a hexagon wrench. Refer to the following table for tightening torque.

Table 3, Tightening torque (N·m)

Model	Tightening torque
RHC*20	1.5 ± 10%
RHC*25	1.5 ± 10%
RHC*32	2.6 ± 10%
RHC*40	2.6 ± 10%

1-22. Check before cylinder installation

Perform a trial operation with a min. operating pressure of 0.05 MPa before mounting cylinder to check if each part is not loosened or if there is no air leakage, then check same things at a max. operating pressure of 1.0 MPa. After checking no failure on parts, install the cylinder.

1. Replaceable Seal

1-1. The seals shown on the below figure can be replaced.

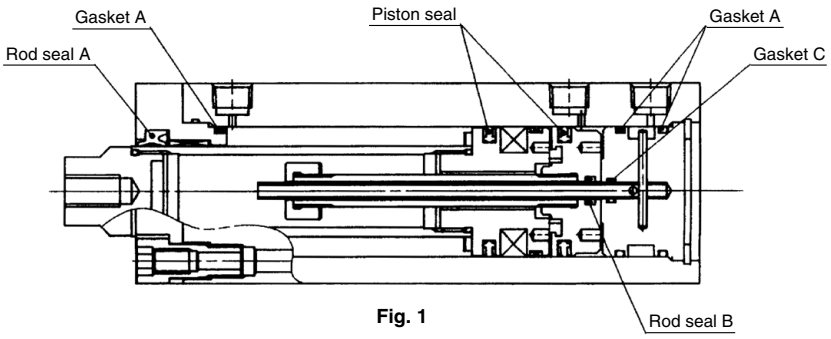


Fig. 1

2. Disassembly of the Cylinder

⚠Caution

Disassemble and assemble the cylinder in a clean area. Use a clean cloth.
Before disassembly, eliminate the dirt on the outer surface so that foreign material does not enter the cylinder or the guide.

2-1. Removing of the rod cover
Loose the fitting bolts, and remove the rod cover.

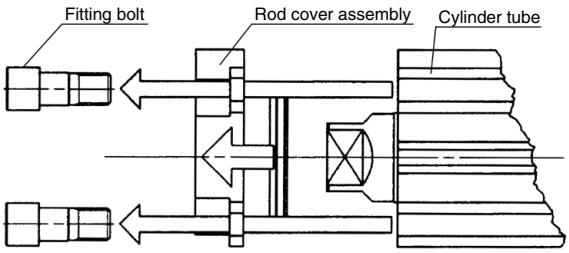


Fig. 2

2-2. Removal of the components
Following the removal of the retaining ring, press the tube rod cover out from the rod side, and take it out from the head side.

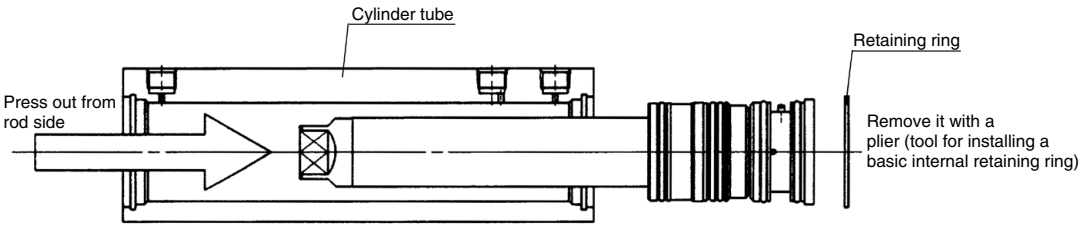


Fig. 3

⚠Caution

Perform mounting and removal of the retaining ring with a proper plier (tool for installing a basic internal retaining ring).
There is a risk of causing damage for human body and peripheral equipment when a retaining ring is removed from the end of plier even if it is a proper plier. Supply air after checking the retaining ring is mounted at the retaining ring groove securely.

2-3. Removal of the head cover assembly
Take the head cover assembly out from the piston rod assembly.
(The piston rod assembly cannot be further disassembled.)

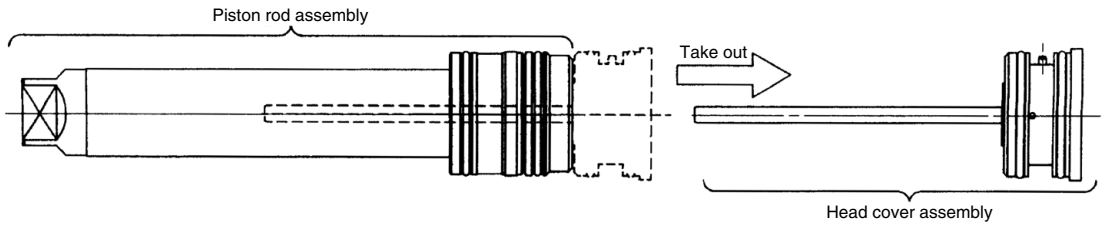


Fig. 4

2-4. Take the parallel pin out from the head cover, and remove the inner pipe.

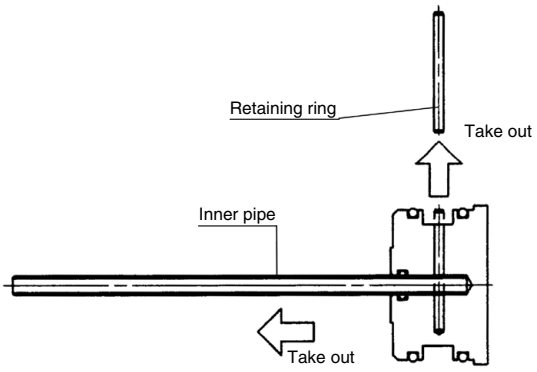


Fig. 5

3. Removal of the Seal

3-1. Removal of the rod seal
Remove the seal by inserting a watchmaker's screwdriver from the front side of the rod cover. During this work, do not give a flaw on the seal groove at the rod cover.

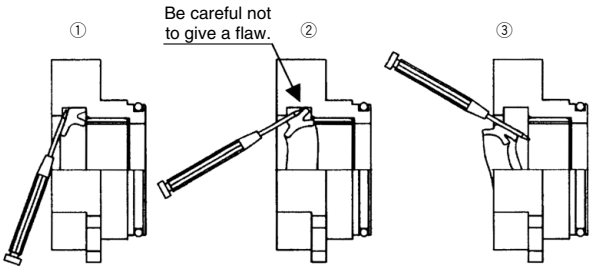


Fig. 6

3-2. Removal of the piston seal
a. Wipe out grease around the piston seal (it helps easy removal of a piston seal).
b. As the piston seal groove is deep, remove the seal using a gap made by squeezing it, not using a precision driver.

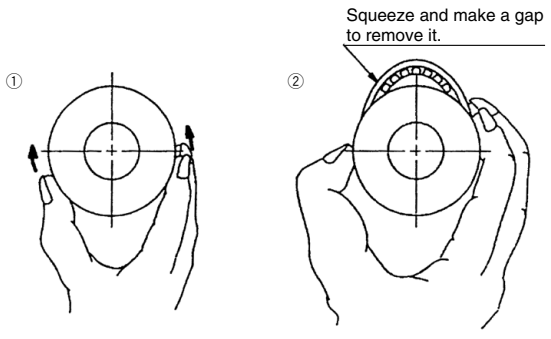


Fig. 7

3-3. Removal of the gasket

a. Gasket around the rod cover and head cover
In the same way as the removal of the piston seal, squeeze the gasket and make a gap to remove it.

b. Gasket inside the head cover
In the same way as the removal of the rod seal, insert a watchmaker's screwdriver to remove it. Be careful not to give a flaw on the seal groove at the rod cover.

4. Application of Grease

4-1. Rod seal, piston seal
Apply grease thinly and evenly to the seal for replacement. Fill grease into the groove.

4-2. Gasket
Apply grease thinly and evenly to the gasket for replacement.

4-3. Cylinder parts
Apply grease to each part.
Refer to "6. Assembling of Cylinder" for the parts to apply grease.



Fig. 8

5. Mounting of the Seal

5-1. Rod seal
Mount the seal with care of its direction. Apply grease to the seal and the internal face of the bushing evenly after mounting it as shown on Fig. 9.
Apply grease to rod seal B with a precision driver.

5-2. Piston seal
Mount the seal without twisted. After mounting it, apply the grease to the seal and the seal groove as shown on Fig. 10.

5-3. Gasket
Fit it up with care of drop off.

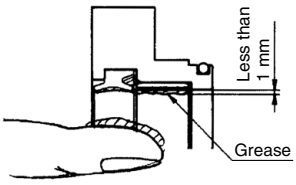


Fig. 9

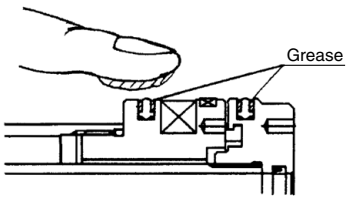


Fig. 10

6. Assembly of the Cylinder

6-1. Apply grease to insertion for the head cover at the inner pipe.

6-2. Insert the inner pipe to the head cover. (Match the hole of head cover with the one of inner pipe.) Perform Inserting slowly and carefully so as not to catch the gasket.

6-3. Get the parallel pin through the head cover and the inner pipe.

6-4. Pull the inner pipe lightly to check it will not fall off from the head cover.

6-5. Apply grease to the inner pipe.

6-6. Insert the head cover assembly (inner pipe) to the piston rod assembly. Perform Inserting slowly and carefully so as not to catch rod seal B.

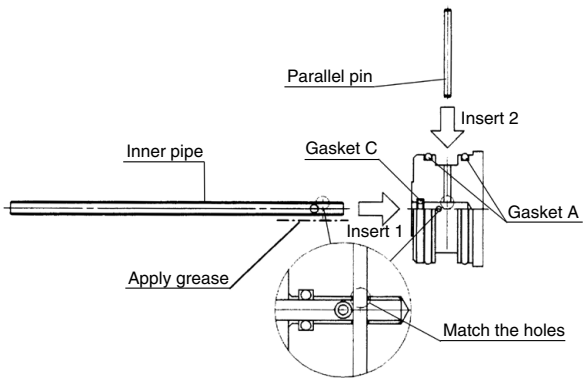


Fig. 11

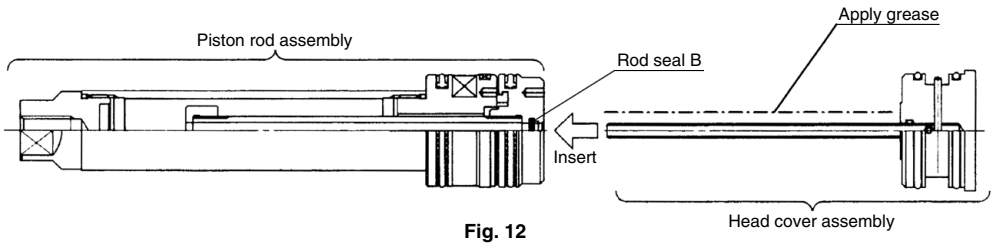


Fig. 12

6-7. Apply grease to the inside of the cylinder tube and outside of the tube rod, piston A, and piston B.
6-8. Insert the piston rod assembly and head cover assembly to the cylinder tube. Perform Inserting slowly and carefully so as not to catch the piston seal and the gasket.
6-9. Mount a retaining ring on the cylinder tube to fix the head cover.

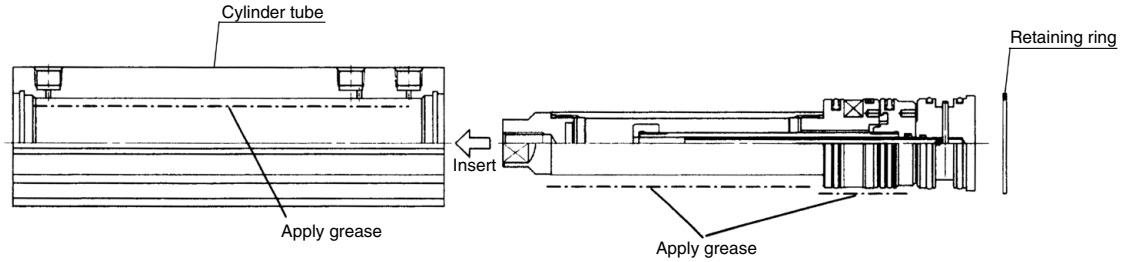


Fig. 13

6-10. Insert the rod cover assembly to the cylinder tube. Mount the rod seal A slowly and carefully so as not to be caught.
6-11. Apply locking agent to the fitting bolt.
6-12. Tighten the fitting bolts at the cylinder tube to fix the rod cover. Refer to Table 1 for the tightening torque of the fitting bolts.

Table 1

Bore size (mm)	Nominal size	Tightening torque [N·m]
32	M8 x 0.75	6.2
40	M8 x 0.75	6.2
50	M10 x 0.75	15.6
63	M12 x 1.0	21.0

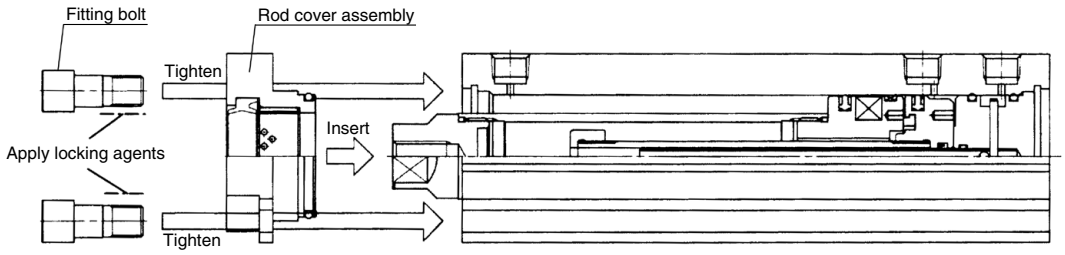


Fig. 14

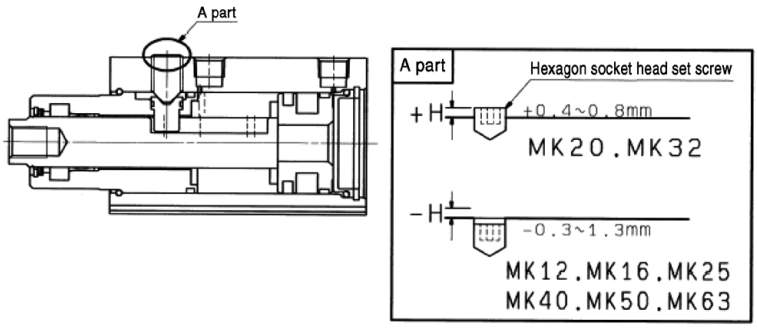
After completing the assembly, confirm that there is not air leakage from the sealing parts, and also that it operates smoothly with the low operating pressure.

1. Caution

1-1. Hexagon socket head set screw

The hexagon socket head set screw on the outside surface of the MK series cylinder tube must be securely tightened in order to retain the rotational function of the piston rod. Because of this, it should never be loosened except for during disassembly for maintenance.

After loosening for maintenance, be sure to tighten the hexagon socket head set screw back to the proper position. If operated while not positioned properly, damage to the piston rod rotation mechanism may occur. In addition, refrain from operating if the hexagon socket head set screw or the guide pin have become deformed or have been damaged in any way.



Height	MK12	MK16	MK20	MK25	MK32	MK40	MK50	MK63
H	–0.8	–1.3	+0.4	–0.5	+0.8	–0.3	–1.0	–1.0

1-2. Retaining ring installation/removal

For installation and removal, use an appropriate pair of pliers (tool for installing a basic internal retaining ring). Even if a proper plier (tool for installing a basic internal retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a basic internal retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

2. Disassembly of the Cylinder

To disassemble, refer to the construction drawing in “6. Basic Construction.”

2-1. Cleaning of the external surface

Remove dusts and foreign objects from external surfaces to prevent them from entering the cylinder during disassembly. In particular, the surface of the piston rod and the collar should be cleaned carefully.

2-2. Hexagon socket head set screw removal

Loosen the hexagon socket head set screw to remove it.

2-3. Removal of the retaining ring

· For bore sizes ø12, ø16, and ø40 to ø63, it is located on the rod side end of the tube.
· For bore sizes ø20 to ø32, it is located on the head side end of the tube.

2-4. Detaching from the cylinder tube

· ø12, ø16, ø40 to ø63
Pull out the rod cover together with the piston rod from the tube.
· ø20 to ø32
Push the rod cover together with the piston rod toward the tube side. Then, after pushing the head cover and O-ring out from the opposite side (the head side of the tube), pull the rod cover and piston rod assembly out.

2-5. Guide pin removal

Pull the guide pin out from the rod cover using pliers to remove the piston rod assembly.

⚠Caution

As there is nowhere to grip the bore size ø20 guide pin with pliers, it must be pushed out from the opposite side (from inside the rod cover). To do so, use a watchmaker’s flat head screwdriver, or another thin tool that can fit in between the tip of the guide pin and the bottom of the piston rod/guide groove, to push the guide pin out.

3. Removal of the Seal

3-1. Coil scraper

· ø20 to ø32
After removing the inverted internal retaining ring, be sure to remove the coil scraper as well as the scraper presser underneath it from the rod cover.

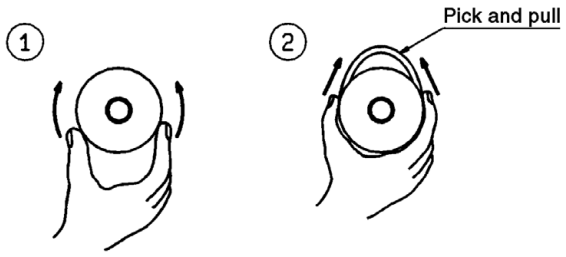
· ø40 to ø63
After removing the inverted internal retaining ring, be sure to remove the coil scraper with the 2 scraper pressers on each side of it from the rod cover.

3-2. Rod seal

Insert a watchmaker's screwdriver into the rod side of the rod cover to remove it.
Do not give a flaw on the seal groove at the rod cover.

3-3. Piston seal

Push the tube gasket partially to make it come off and pull it out manually.



Piston seal

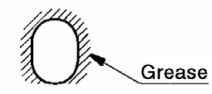
4. Application of Grease

4-1. Rod seal, piston seal

Apply grease around the replacement seal.



Rod seal



Piston seal

4-2. Tube gasket, O-ring (For guide pin)

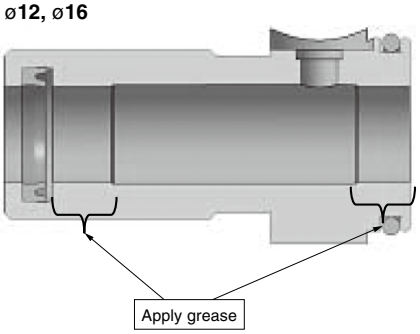
Thinly apply grease to the tube gasket.

4-3. Cylinder parts

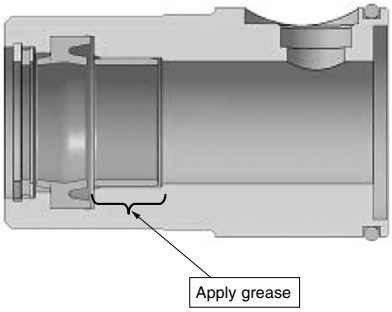
Apply grease to all sliding parts.

· Rod cover

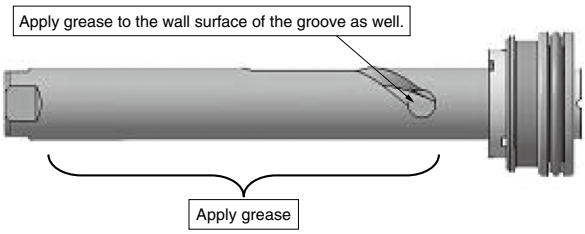
ø12, ø16



ø20 to ø63

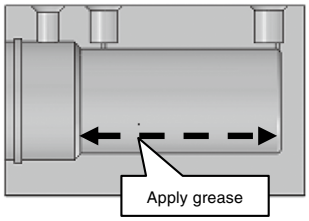


· Piston rod assembly

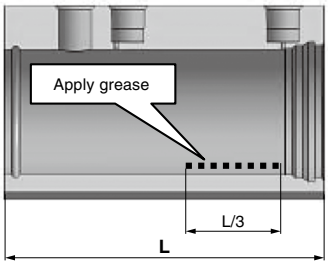


· Cylinder tube

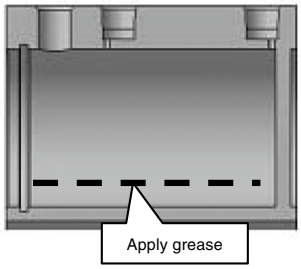
ø12, ø16



ø20 to ø32



ø40 to ø63



5. Mounting of the Seal

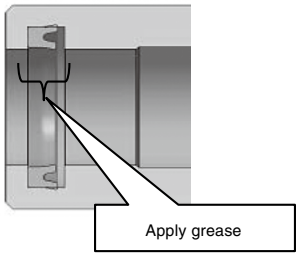
5-1. Coil scraper

Reassemble while referring to “3. Removal of the Seal” above, taking into account that there are part composition differences between cylinder sizes.

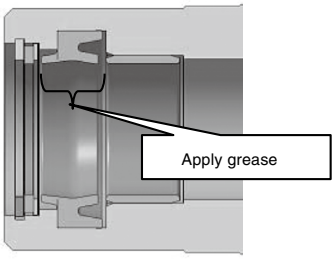
5-2. Rod seal

Mount the seal with attention to direction. (Refer to the figure below.)
Then, apply the grease on the seal evenly.

ø12, ø16



ø20 to ø63



5-3. Piston seal

Mount without twisting. After mounting, apply grease to the external circumference of the seal, and the gap to the mounting groove.



Piston seal

5-4. Tube gasket, O-ring (For guide pin)

Pay attention not to make the gasket come off.

6. Reassembly of the Cylinder

6-1. Insert the piston rod into the rod cover.

Apply grease to the piston rod end or 30° angled raise and wrench flat, and insert the collar gently with care not to damage the rod seal.

6-2. Guide pin mounting

After inserting the piston rod assembly into the rod cover, line up the guide pin hole with the guide groove, and insert the guide pin.

6-3. Insertion of piston and rod cover to cylinder tube.

· ø12, ø16, ø40 to ø63
Insert the rod cover/piston rod assembly assembled in 6-1 and 6-2 into the rod side of the tube, lining up the guide pin with the tube set screw hole, and then adjust the direction of the rod cover.

· ø20 to ø32
Insert the rod cover/piston rod assembly assembled in 6-1 and 6-2 into the head side of the tube, lining up the guide pin with the tube set screw hole, and then adjust the direction of the rod cover.

6-4. Mounting of hexagon socket head set screw

Using the tip of a hexagon socket head set screw, hold the guide pin in the tube from directly above, and then secure the rod cover to the tube.

⚠Caution

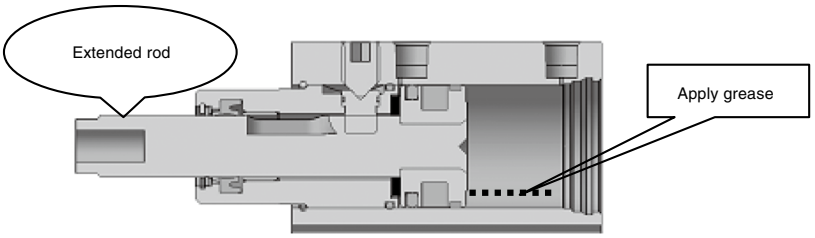
After referring to "1-1. Hexagon socket head set screw," be sure to tighten it securely.

6-5. Mounting of the retaining ring

Use an appropriate pair of pliers (tool for installing a basic internal retaining ring). Pay attention that the ring will slip off from the pliers, and cause injury or damage to peripheral equipment. Additionally, ensure the retaining ring is mounted properly into the retaining ring groove.

⚠Caution

For bore sizes ø20 to ø32, reapply grease on the inner surface of the tube, and then install the head cover and O-ring followed by the retaining ring. For grease application, refer to the drawing below.



ø20 to ø32

6-6. Check the assembly condition.

Confirm that there is no air leakage from the seal and that the cylinder can operate at a minimum operating pressure.

1. Disassembly of the Cylinder

1-1. Cleaning
Prior to disassembly, wipe off any dirt from the outside of the actuator. This will prevent the intrusion of dust and foreign materials during disassembly.
Take particular care on the surface of the piston rod.

1-2. Removal of the arm
Remove the arm with rod point.

1-3. Removal of the hexagon socket head cap screw [only ø25 or more]. (Fig. 1)
Remove the hexagon socket head cap screw (with a washer or spring washer).

1-4. Removal of the retaining ring (Fig. 2)
Remove with an appropriate pair of pliers (tool for installing a basic internal retaining ring). Moreover, please note that the retaining ring comes off from pliers when detaching it, it files, and the human body and peripherals might be disadvantaged.

1-5. Disassembly
Install the bolt etc. in the point part of the piston rod, and pull it out with the rod cover assembly and the key.
In that case, please note that neither the inside diameter of the tube nor the rod cover bearing are damaged.

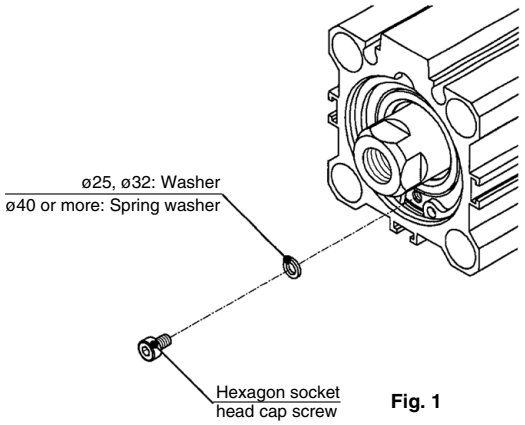


Fig. 1

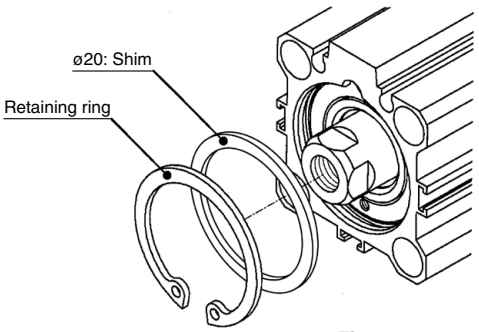


Fig. 2

2. Removal of the Seal

2-1. Removal of the coil scraper
Insert a precision driver etc. from front the rod cover assembly and prise the seal out. From front rod cover assembly and prise the coil scraper out.
Take care not to scratch or score the coil scraper groove in the rod cover assembly.

2-2. Removal of the rod seal
Insert a precision driver etc. from front the rod cover assembly and prise the seal out.
Take care not to scratch or score the seal groove in the rod cover assembly.

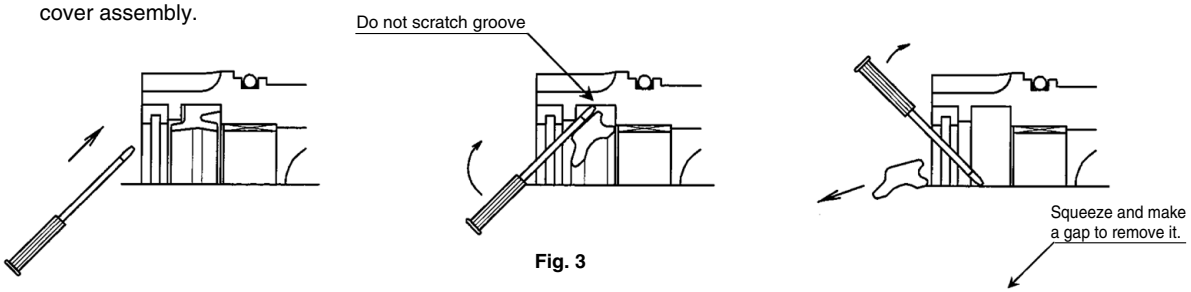


Fig. 3

2-3. Removal of the piston seal
As the piston seal groove is deep, remove the seal using a gap made by squeezing it, not using a precision driver.

2-4. Removal of the tube gasket
Squeeze the gasket and make a gap to remove it.
(Refer to the right Fig. 4).

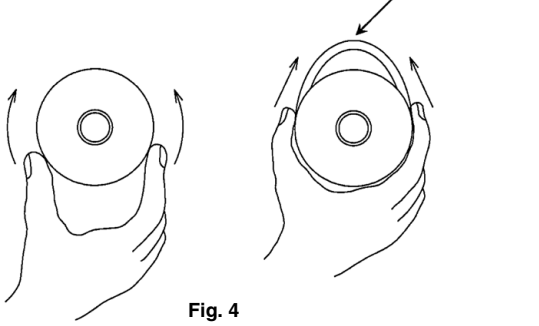


Fig. 4

3. Application of Grease

3-1. Grease spreading of rod seal and piston seal (Fig. 5)
There is thinly no irregularity and lithium system grease* is spread on all surroundings of the rod seal and piston seal for the exchange.
*SMC recommendation grease: It is possible to arrange. (Refer to the operation manual.)

3-2. Grease spreading of tube gasket
There is thinly no irregularity and lithium system grease* is spread on the whole of the tube gasket for the exchange.
*SMC recommendation grease: It is possible to arrange. (Refer to the operation manual.)

3-3. Grease spreading of each part
There is thinly no irregularity and lithium system grease* is spread on a specified part of the rod cover assembly, piston rod assembly and cylinder tube assembly.
*SMC recommendation grease: It is possible to arrange. (Refer to the operation manual.)

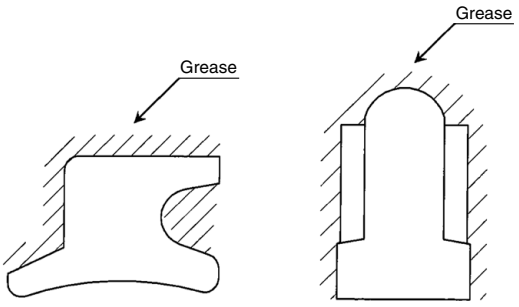


Fig. 5

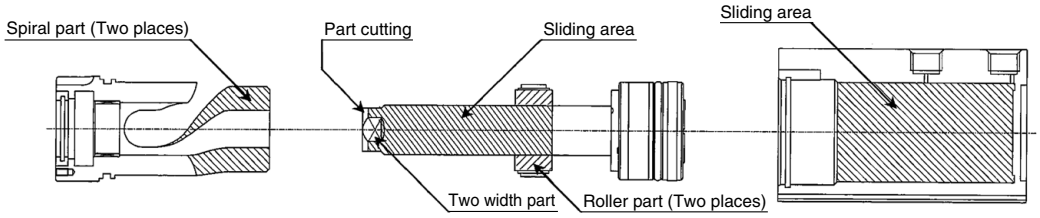


Fig. 6

4. Installation of the Seal and Coil Scraper

4-1. Installation of the rod seal and tube gasket (Fig. 7)
Install the direction of rod seal so as not to make a mistake.
Install the tube gasket so as not to drop out of rod cover assembly.
After it installs it, there is no irregularity and lithium system grease* is spread on the rod seal and bearing.
*SMC recommendation grease: It is possible to arrange. (Refer to the operation manual.)

4-2. Installation of the coil scraper
Install the coil scraper for the exchange in the coil scraper ditch surely.

4-3. Installation of the piston seal (Fig. 8)
Install it so that the piston seal should not twist.
Spread it to rub lithium system grease* into between piston seal outer part and the ditch after it installs it.
*SMC recommendation grease: It is possible to arrange. (Refer to the operation manual.)

4-4. Installation of the tube gasket
Please note the dropout, and install it.

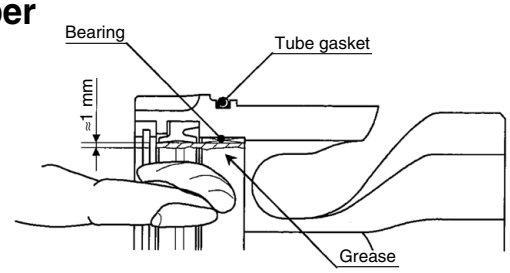


Fig. 7

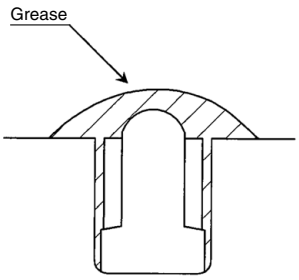


Fig. 8

5. Assembly of the Cylinder

5-1. Insertion of the rod cover assembly (Fig. 9)
Insert it politely slowly so as not to damage the rod seal in corner part piston rod assembly.

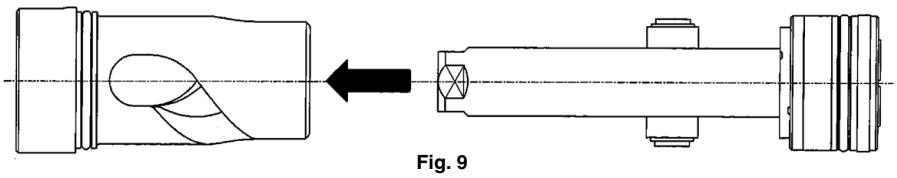


Fig. 9

5-2. Insertion of the piston rod assembly (Fig. 10)
Insert it politely slowly to damage neither the piston seal nor the tube gasket in corner part cylinder tube assembly.

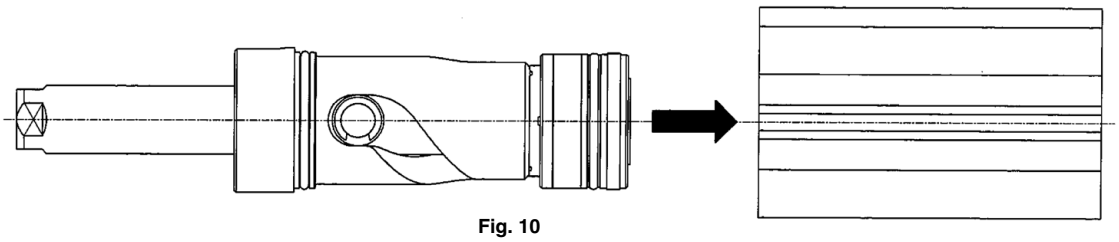


Fig. 10

5-3. Installation of the key and retaining ring (Fig. 11)
Insert the key in the key ditch, and install the retaining ring with an appropriate pair of pliers (tool for installing a basic internal retaining ring).
In that case, install the direction of the retaining ring so as not to make a mistake.
Because the retaining ring comes off from pliers when it installs it, it flies, and the human body and peripherals might be disadvantaged. Please note it.
Moreover, please confirm whether in the retaining ring ditch surely.

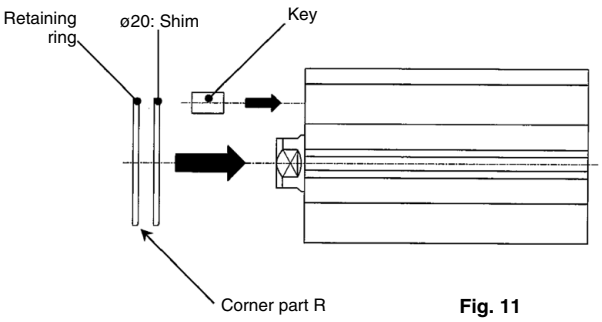


Fig. 11

5-4. Installation of the hexagon socket head cap screw [only ø25 or more] (Fig. 12)
After cleaning the adhesive from the hexagon socket head cap screw and the rod cover assembly with alcohol etc., apply the tightening adhesive to the screw holes of the rod cover assembly (SMC recommended adhesive: Loctite Corp. 242 [Blue]) in order not to loose.
Spread the adhesive (SMC recommendation adhesive: Loctite Corp. 242 [Blue]) for loose stop on screw hole part rod cover assembly.
Tighten with the hexagon socket head cap screw (∗ø25, ø32: with washer/ø40 or more: with a spring washer).
Please confirm whether the adhesive has overflowed after it concludes it.
Wipe an extra adhesive off when overflowing.

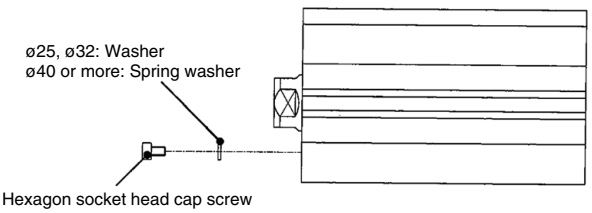


Fig. 12

Tightening torque

Bore size	**Size of screw**	**Tightening torque** (N·m)
ø25, ø32	M2.5 x 0.45	0.36 ± 10% (0.324 to 0.396)
ø40, ø50, ø63	M3 x 0.5	0.63 ± 10% (0.570 to 0.690)

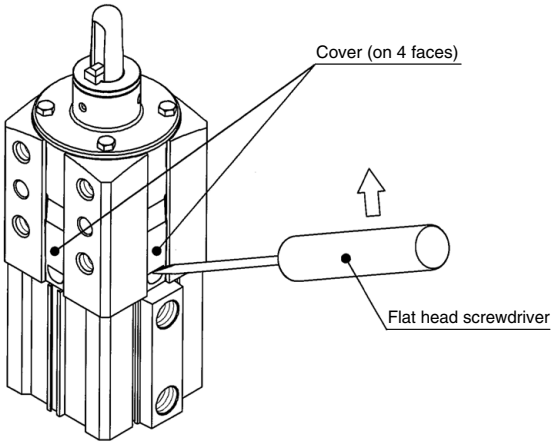
5-5. Check the assembly condition.
Confirm that there is no air leakage from the seal and that the cylinder can operate smoothly at a minimum operating pressure.

⚠Caution

1. **Confirm air is not supplied for the cylinder before disassembly and reassembly.**
2. **Never disassembly lock unit [For only CLKQG/CLKQP series]**
   The lock unit is equipped with heavy duty spring and may cause danger if disassembled.
   Also, if it is reassembled incorrectly, the locking performance is impaired and desired function become unavailable.
   For these reasons, the disassembly of lock unit at customer's site is prohibited strictly.
   (If disassembly or replacement of a part is required absolutely, contact SMC.)

1. Romoval of the Spatter

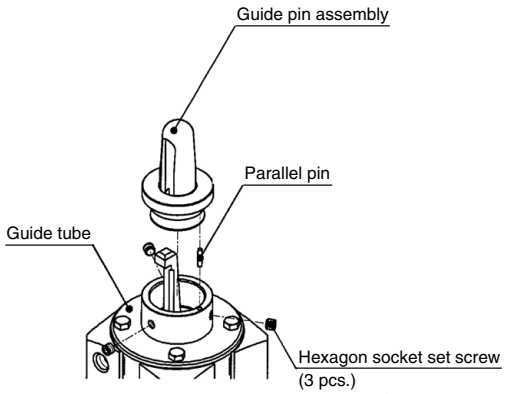
a. Insert a flat head screwdriver into the groove of cover and set up the cover straight toward direction marked with arrows by the driver. Then the cover is opened.
∗ If excessive force is given to do this, the cover may be damaged.
b. Collect the spatter inside the groove.
c. Push the cover unit it snaps.



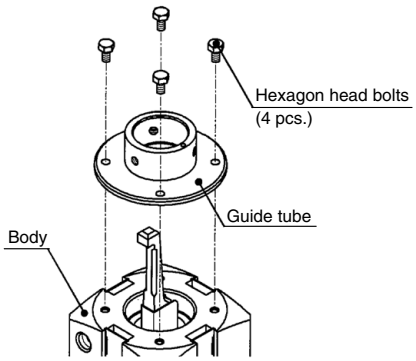
2. Replacement of the Guide Pin and Clamp Arm

The clamping position height: For the LOW type

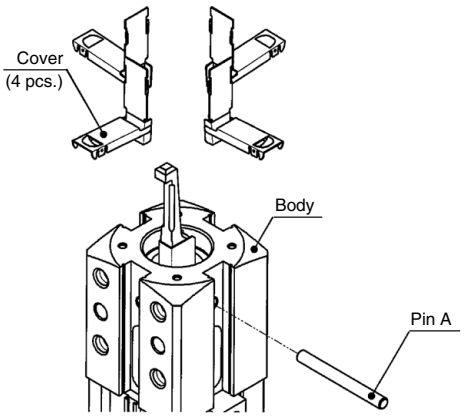
1. Disassembly of the clamping part
   a. Cleaning of the appearance
      Wipe off the dirt of appearance to prevent intrusion of dust and foreign objects during disassembly.
   b. Removal of the guide pin assembly
      Adjust the position of the clamp arm to the unclamping side, detach the hexagon socket set screw (3 pcs.), and guide pin assembly from guide tube.
      Detach the parallel pin which does a positional match of the guide tube and guide pin assembly.



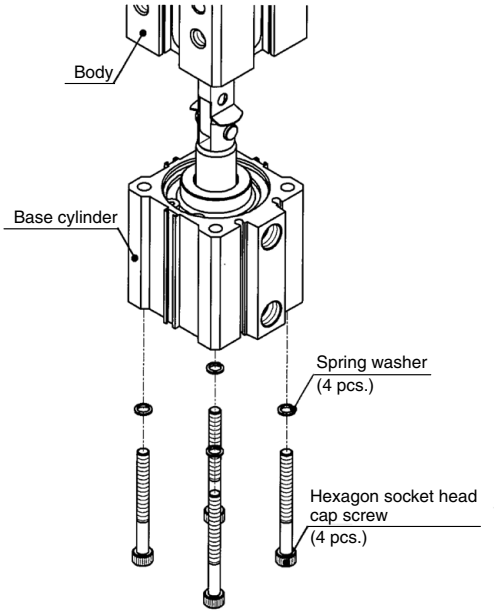
c. Removal of the clamp arm
   1) Detach the hexagon head bolt (4 pcs.), and detach the guide tube from the body.



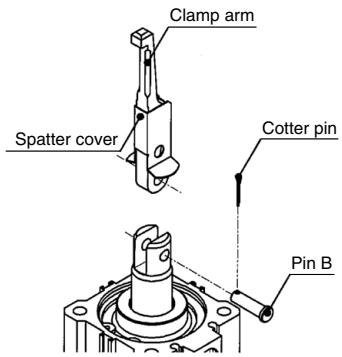
   2) Insert a flat head screwdriver or similar object into the cover groove and open. Then detach the cover (4 pcs.).
      Detach pin A from the body side hole.
      Pay attention to cut neither the hand nor the finger, etc. when you detach the cover.



3) Loosen the hexagon socket head cap screw (4 pcs.) the base cylinder, and detach the body from the base cylinder.



4) Extract the cotter pin, detach pin B, and detach the clamp arm (The spatter cover also together).

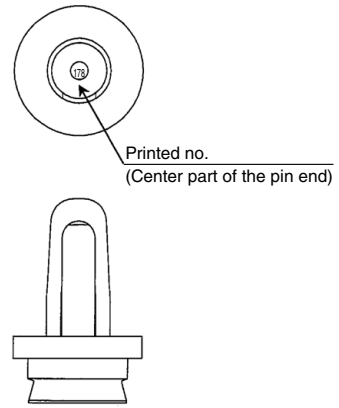


2. Reassembly of the clamping part

a. Check the part number.

Check the number printed on clamp arm and guide pin assembly with reference to the following table.

	Printed no.	
	Guide pin assembly	Clamp arm
Applicable combination	125, 127, 128, 129, 130	13
	145, 147, 148, 149, 150	15-16
	155, 157, 158, 159, 160	15-16
	175, 177, 178, 179, 180	18
	195, 197, 198, 199, 200	20
	245, 247, 248, 249, 250	25
	295, 297, 298, 299, 300	30



Guide pin assembly **Clamp arm**

b. Mounting of the clamp arm

1) There is thinly no irregularity and lithium system grease is spread on the slash part of the clamp arm for the exchange (both sides).
Moreover, there is no irregularity and lithium system grease is spread on the pin hole part and the cam ditch part of the clamping arm a lot (Grease can collect).
Install the spatter cover (The direction is noted) in the clamping arm.
In that case, install it so that the pin hole of the spatter cover and the cam groove of the clamp arm are visible.

Grease application amount (standard)

Both sides of clamping arm	≈ 0.05 g
Clamp arm pin hole part	≈ 0.10 g
Clamp arm cam ditch part	≈ 0.50 g

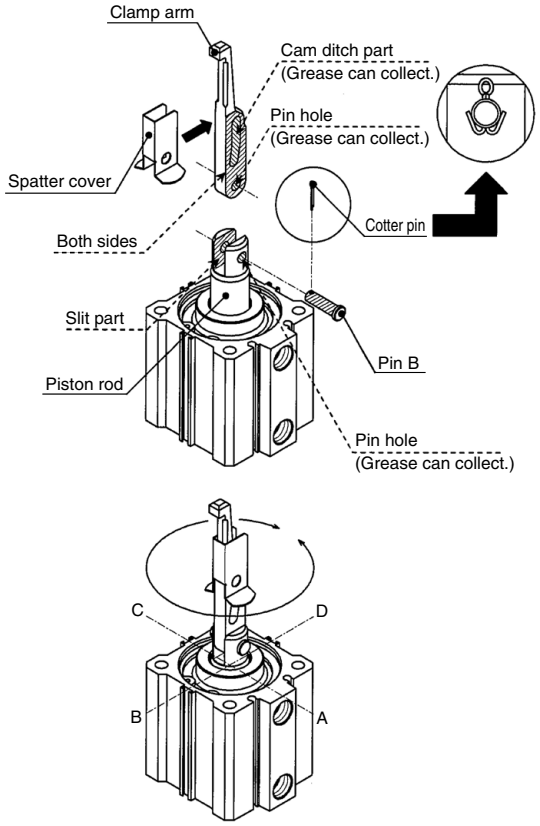
2) There is thinly no irregularity and lithium system grease is spread on the slash part in pin B and the piston rod slit part (both sides).
Moreover, there is no irregularity and lithium system grease is spread on the piston rod pin hole part a lot (Grease can collect).
Do not damage the finger etc. for the acute angle when you spread grease on the piston rod slit part.

Grease application amount (standard)

Pin B	≈ 0.05 g
Piston rod slit part	≈ 0.05 g
Piston rod pin hole part	≈ 0.10 g

3) Insert the clamp arm (with spatter cover) in the piston rod slit part and insert pin B.
Insert the cotter pin for the exchange through the hole for the cotter pin of pin B, and bend the point with the needle rose pliers.

4) Rotate the clamp arm, and rotate it so that the A-D installation position may squarely become direction of the fingernail.
(Rotate it while moving the piston rod up and down when it rotates.)

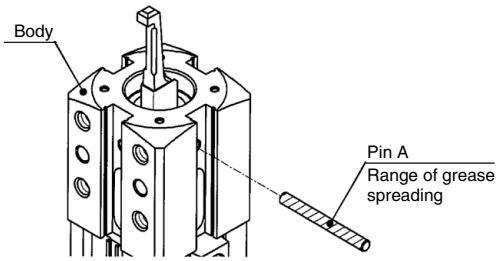


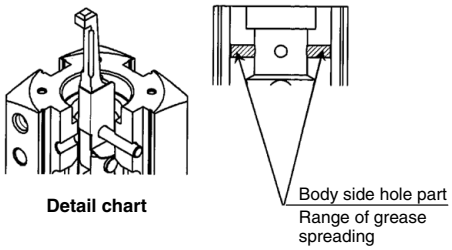
c. Mounting of the guide pin assembly

1) Put into the state to draw out the piston rod, confirm the body installation side and the clamping arm fingernail position, and insert the body.
There is thinly no irregularity and lithium system grease is spread on the slash part of pin A.
There is no irregularity and lithium system grease is spread on the body side hole part (pin A insertion part) a lot (Grease can collect).
Insert pin A from the body side hole through the spatter cover and the clamp arm (Refer to a detail chart).

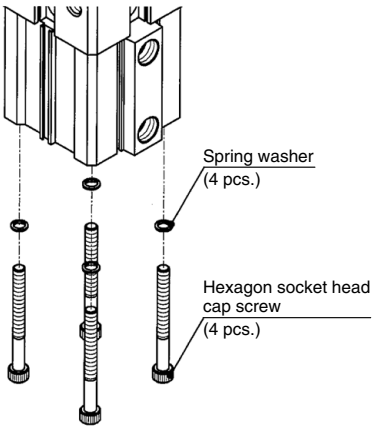
Grease application amount (standard)

Pin A	≈ 0.05 g
Body side hole part	≈ 0.20 g

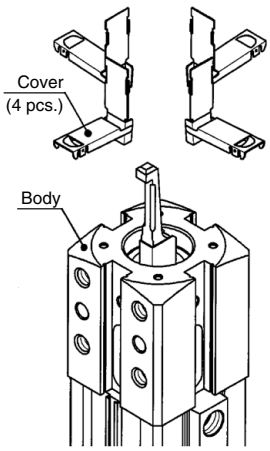




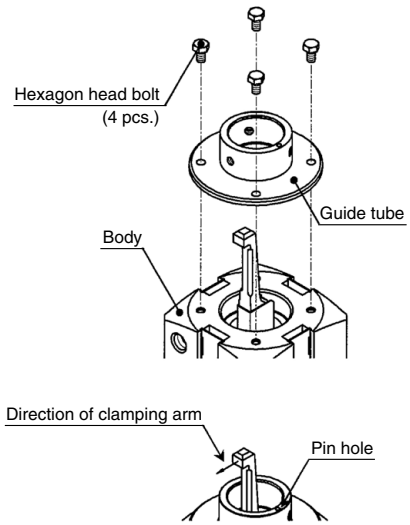
2) Fasten, in order, the spring washer (4 pcs.) and the hexagon socket head cap screw (4 pcs.) from the head side of the base cylinder.
Tightening torque: 4 to 6 (N·m)



3) Install the cover (4 pcs.) on the body. In that case, please note the direction of insertion.



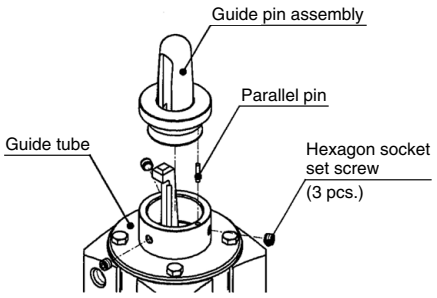
4) After cleaning the adhesive from the hexagon head bolts (4 pcs.) and the body with alcohol etc., apply the tightening adhesive to the screw holes of the body (SMC recommended adhesive: Loctite Corp. 242 [Blue]) in order not to loose. Please install the guide tube in the body with the hexagon head bolt (4 pcs.).
In that case, install it so the guide tube pin hole is on the right side of the clamp arm (detail chart).
Tightening torque: 1.5 to 1.8 (N·m)
Please confirm whether the adhesive has overflowed after concluding the hexagon head bolt (4 pcs.).
Wipe an extra adhesive off when overflowing.



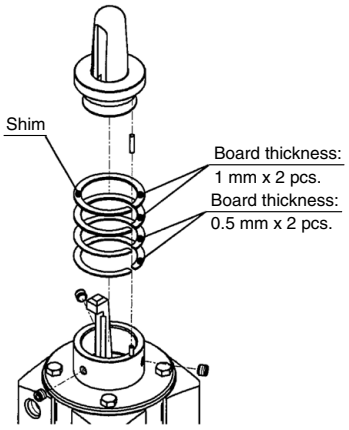
Detail chart

5) Insert the parallel pin for the exchange in the pin hole of guide pin assembly for the exchange, (when equipped with a shim, adhesive to secure the parallel pin to the guide pin assembly) suit to the position of the pin hole on the guide tube side, insert, and tighten with the hexagon socket set screw (3 pcs.: [green] with the adhesive).
Tightening torque: 4.86 to 5.94 (N·m)
However, when the adhesive color of the hexagon socket set screw (3 pcs.) is “red”, or the “green” adhesive is stripped off from repeated replacements, completely remove the remaining adhesive from the thread of the hexagon socket set screw and the screw hole of the guide tube with alcohol. Then apply tightening adhesive (SMC recommendation: Loctite Corp. 243 [Blue]) to the hexagon socket set screw (3 pcs.).
Please confirm whether the adhesive has overflowed after it concludes it.
Wipe an extra adhesive off when overflowing.

For the with shim type, insert the shim between the guide pin assembly and the guide tube.
Install the order of shim referring to the following.
Please confirm shim does not dash out from the guide tube outer after assemble.



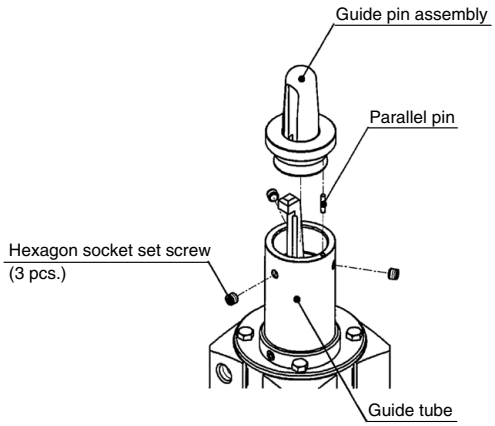
Without shim



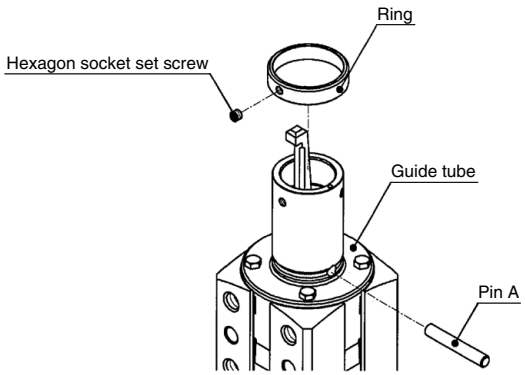
With shim

The clamping position height: For the HIGH type

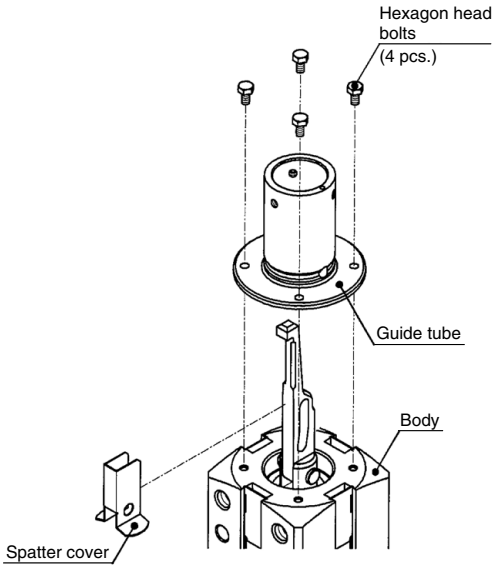
1. Disassembly of the clamping part
   a. Cleaning of the appearance
      Wipe off the dirt of appearance to prevent intrusion of dust and foreign objects during disassembly.
   b. Removal of the guide pin assembly
      Adjust the position of the clamp arm to the unclamping side, detach the hexagon socket set screw (3 pcs.), and guide pin assembly from the guide tube.
      Detach the parallel pin which does a positional match of the guide tube and guide pin assembly.



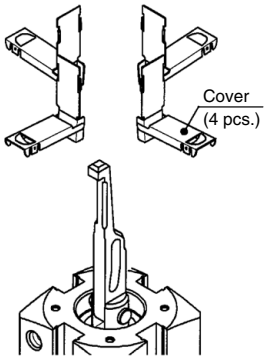
   c. Removal of the clamp arm
      1) Detach the hexagon socket set screw, and detach the ring from the guide tube.
         Detach pin A from the guide tube side hole.



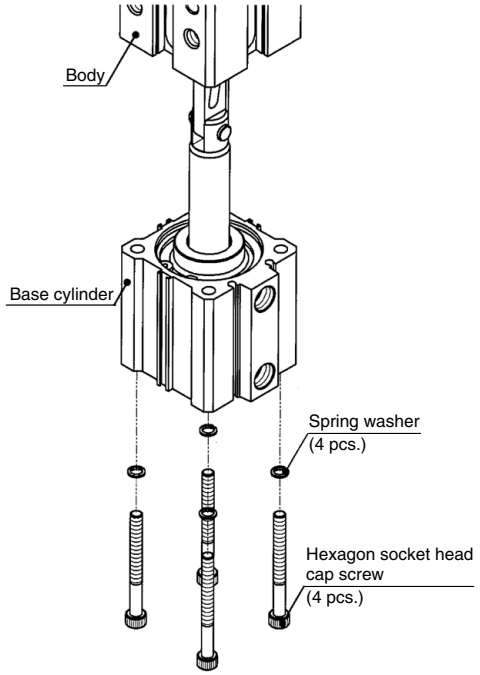
      2) Detach the hexagon head bolt (4 pcs.), and detach the guide tube and spatter cover from the body.



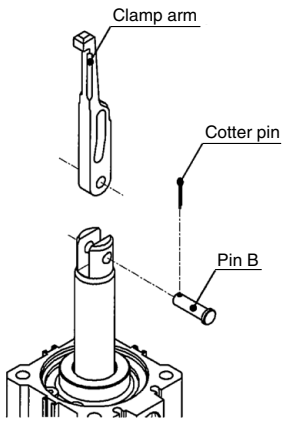
      3) Insert a flat head screwdriver or similar object into the cover groove and open. Then detach the cover (4 pcs.).
         Pay attention to cut neither the hand nor the finger, etc. when you detach the cover.



4) Loosen the hexagon socket head cap screw (4 pcs.) of the base cylinder, and detach the body from the base cylinder.



5) Extract the cotter pin, detach pin B, and detach the clamp arm.

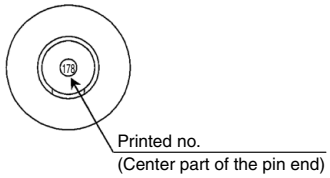


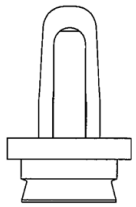
2. Reassembly of the clamping part

a. Check the part number.

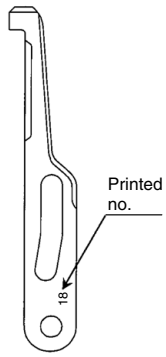
Check the number printed on clamp arm and guide pin assembly with reference to the following table.

	Printed no.	
	Guide pin assembly	Clamp arm
Applicable combination	125, 127, 128, 129, 130	13
	145, 147, 148, 149, 150	15-16
	155, 157, 158, 159, 160	15-16
	175, 177, 178, 179, 180	18
	195, 197, 198, 199, 200	20
	245, 247, 248, 249, 250	25
	295, 297, 298, 299, 300	30





Guide pin assembly



Clamp arm

b. Installation of the clamp arm

1) There is thinly no irregularity and lithium system grease is spread on the slash part of the clamp arm for the exchange (both sides).
Moreover, there is no irregularity and lithium system grease is spread on the pin hole part and the cam ditch part a lot (Grease can collect).

Grease application amount (standard)

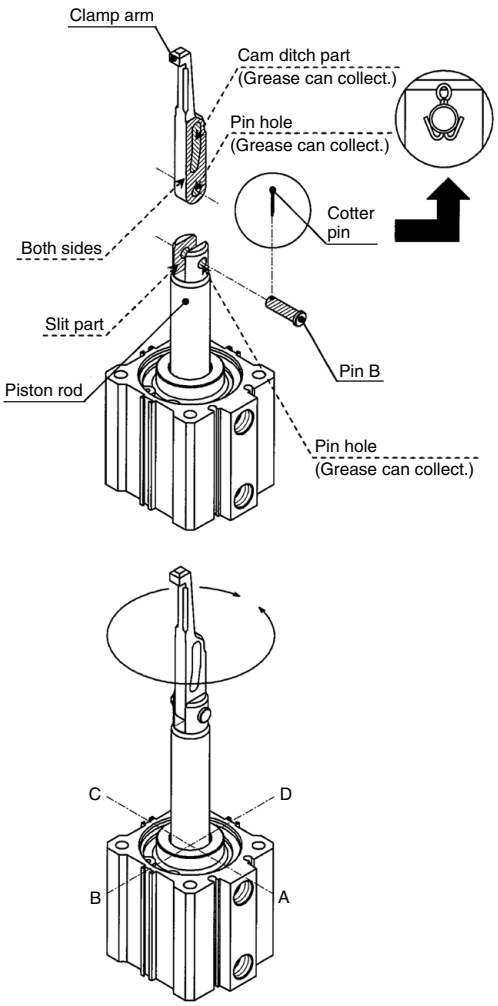
Both sides of clamp arm	≈ 0.05 g
Clamp arm pin hole part	≈ 0.10 g
Clamp arm cam ditch part	≈ 0.50 g

2) There is thinly no irregularity and lithium system grease is spread on the slash part in pin B and the piston rod slit part (both sides).
There is no irregularity and lithium system grease is spread on the piston rod pin hole part a lot (Grease can collect).
Do not damage the finger etc. in the slit part for the acute angle when you spread grease on the piston rod slit part.

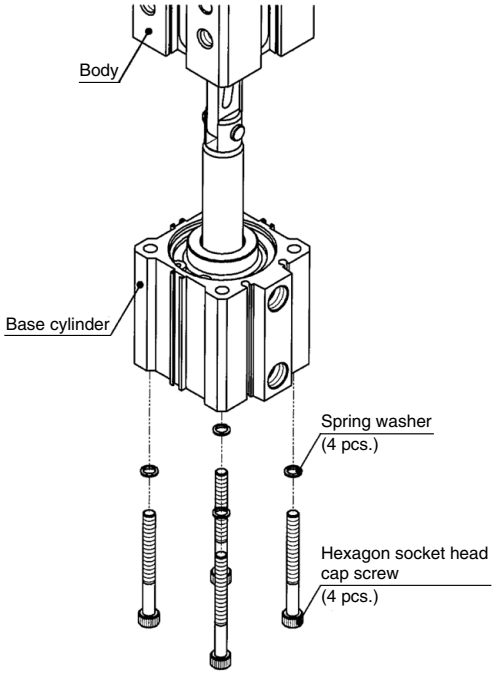
Grease application amount (standard)

Pin B	≈ 0.05 g
Piston rod slit part	≈ 0.05 g
Piston rod pin hole part	≈ 0.10 g

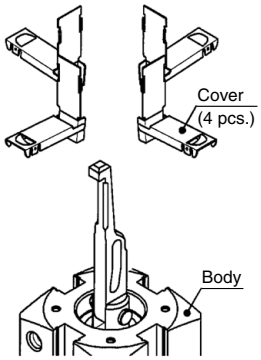
3) Insert the clamp arm in the piston rod slit part and insert pin B.
Insert the cotter pin for the exchange through the hole for the cotter pin of pin B, and bend the point with the radio pincers.
4) Rotate the clamp arm, and rotate it to become it at right angles with the A-D installation position and the direction of the fingernail.
(Rotate it while moving the piston rod and down when it rotates.)



c. Mounting of the guide pin assembly
1) Put into the state to draw out the piston rod, confirm the body installation side and the clamp arm fingernail position, and insert the body.
Fasten, in order, the spring washer (4 pcs.) and the hexagon socket head cap screw (4 pcs.) from the head side of the base cylinder.
Tightening torque: 4 to 6 (N·m)



2) Install the cover (4 pcs.) on the body. In that case, please note the direction of insertion.

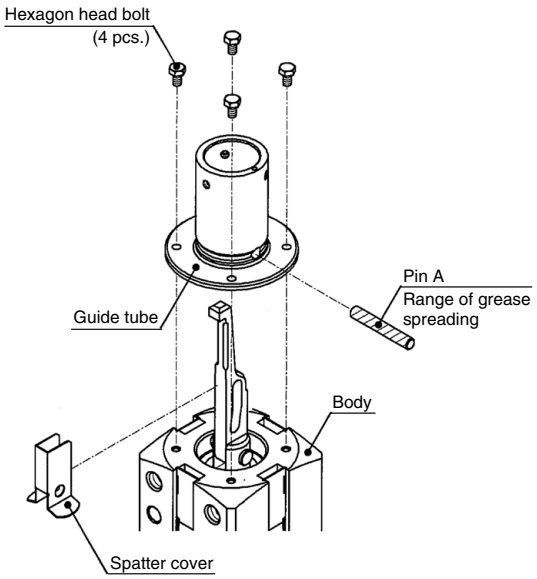


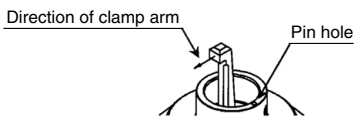
3) After cleaning the adhesive from the hexagon head bolts (4 pcs.) and the body with alcohol etc., apply the tightening adhesive to the screw holes of the body (SMC recommended adhesive: Loctite Corp. 243 [Blue]) in order not to loose.
Spread lithium system grease on the pin hole part of pin A and the guide tube.

Grease application amount (standard)

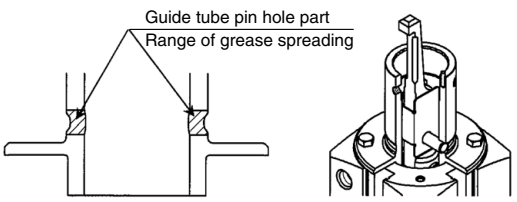
Pin A	≈ 0.05 g
Guide tube pin hole part	≈ 0.10 g

Install the spatter cover (The direction is noted) in the clamp arm.
In that case, install it so that the pin hole of the spatter cover and the cam groove of the clamp arm are visible.
Insert the guide tube in the body.
In that case, install it so the guide tube pin hole is on the right side of the clamp arm (detail chart).
Insert pin A from the guide tube side hole through the spatter cover and the clamp arm (Refer to detail chart 2).
Install it with the hexagon head bolt (4 pcs.) after inserting pin A. Tightening torque: 1.5 to 1.8 (N·m).
Please confirm whether the adhesive has overflowed after concluding the hexagon head bolt (4 pcs.).
Wipe an extra adhesive off when overflowing.



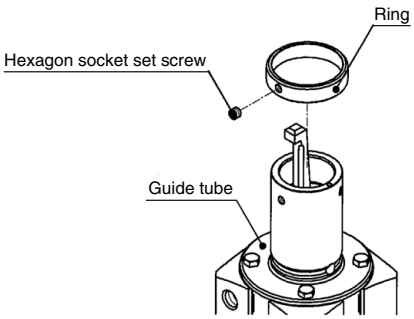


Detail chart 1



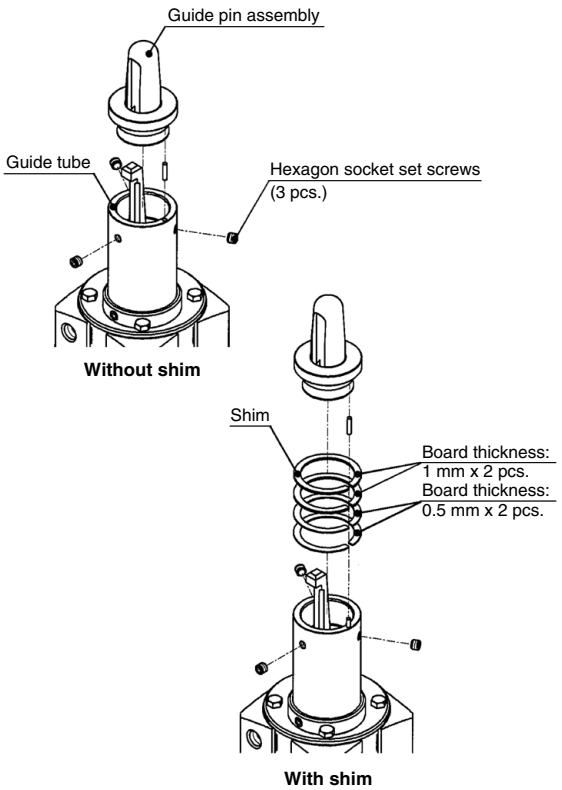
Detail chart 2

4) Insert the ring in the guide tube and install it with a hexagon socket set screw (with the adhesive [Green]).
Align the screw hole position of the ring to the same direction of the clamp arm claw and tighten. (Refer to the figure below.)
Tightening torque: 1.5 to 1.8 (N·m)
However, when the adhesive color of the hexagon socket set screw is “red”, or the “green” adhesive is stripped off from repeated replacements, completely remove the remaining adhesive from the thread of the hexagon socket set screw and the screw hole of the guide tube with alcohol. Then apply tightening adhesive (SMC recommendation: Loctite Corp. 243 [Blue]) to the hexagon socket set screw.
Please confirm whether the adhesive has overflowed after it concludes it.
Wipe an extra adhesive off when overflowing.



5) Insert the replacement parallel pin in the pin hole of the replacement guide assembly (when equipped with a shim, secure with adhesive on the parallel pin and the guide pin assembly), line up with the pin hole on the guide tube, insert, and tighten with the hexagon socket set screw (3 pcs.: with the adhesive [Green]).
Tightening torque: 4.86 to 5.94 (N·m)
However, when the adhesive color of the hexagon socket set screw (3 pcs.) is “red”, or the “green” adhesive is stripped off from repeated replacements, completely remove the remaining adhesive from the thread of the hexagon socket set screw and the screw hole of the guide tube with alcohol. Then apply tightening adhesive (SMC recommendation: Loctite Corp. 243 [Blue]) to the hexagon socket set screw (3 pcs.).
Please confirm whether the adhesive has over flowed after it concludes it.
Wipe an extra adhesive off when overflowing.

For type with shim, insert the shim between the guide pin assembly and the guide tube.
Install the order of shim referring to the following.
Please confirm shim does not dash out from the guide tube outer after assemble.



3. Replacement of Seal

(Only for the CKQG/P series because disassemble of CLKQG/P is unacceptable.)

3-1. Disassembly of the base cylinder

a. Cleaning of the appearance

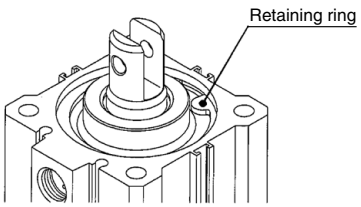
Wipe off the dirt of appearance to prevent intrusion of dust and foreign objects during disassembly.

Intensively, pay attention to surface of the piston rod and collar.

b. Removal of the retaining ring

Use adequate pliers (tool for installing a basic internal retaining ring).

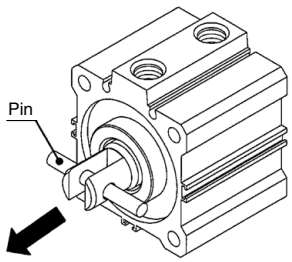
And pay attention not to cause the retaining ring to pop out and damage the human body and peripheral equipments.



c. Disassembly

Take off the piston rod with collar assembly by pulling out the pin inserted into the hole on the end of piston rod and then remove the collar assembly from the piston rod assembly.

At the time, pay attention not to give any flaw on inner face of the tube and bearing of the collar assembly.

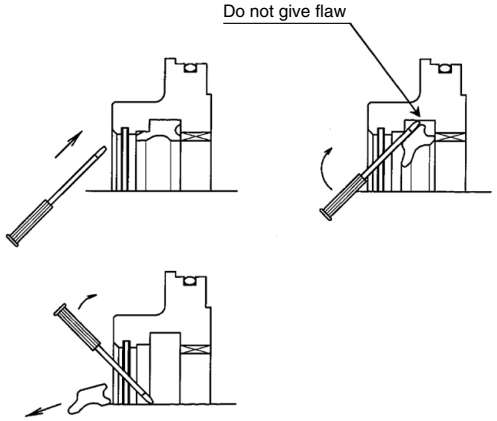


3-2. Removal of the seal

a. Removal of the rod seal

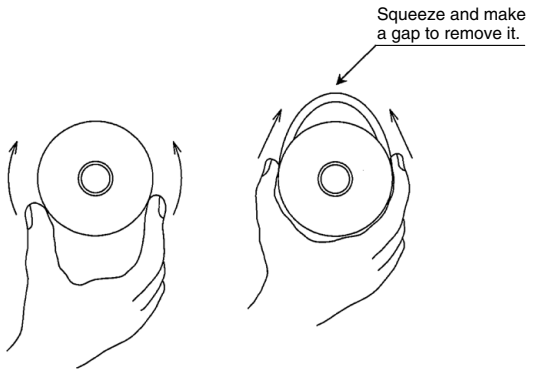
Remove it with a watchmaker's screwdriver inserted from the front of the collar assembly.

Do not give any flaw on the groove of the collar assembly seal.



b. Removal of the piston seal

As the piston seal groove is deep, remove the seal using a gap made by squeezing it, not using a precision driver.



c. Removal of the tube gasket

Push the seal gasket partially to make it come off and pull it out manually.

Squeeze the gasket and make a gap to remove it. (Refer to the above figure.)

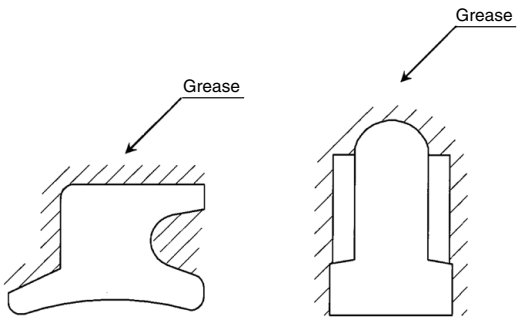
3-3. Application of grease

a. Rod seal, piston seal

There is thinly no irregularity and lithium system grease is spread on all surroundings of the rod seal and piston seal for the exchange.

Grease application amount (standard)

Rod seal	≈ 0.10 g
Piston seal	≈ 0.30 g



Rod seal **Piston seal**

b. Tube gasket

There is thinly no irregularity and lithium system grease is spread on the whole of the tube gasket for the exchange.

Grease application amount (standard)

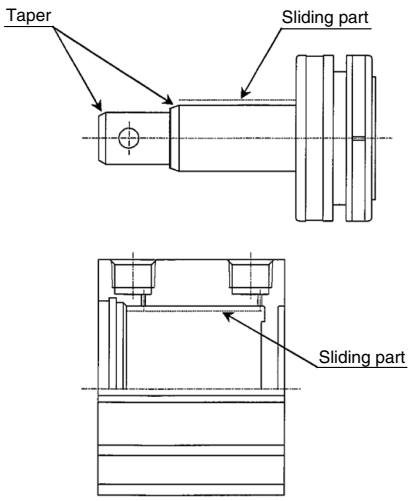
Tube gasket	≈ 0.15 g

c. Each components of the cylinder

There is thinly no irregularity and lithium system grease is spread on a specified part of piston rod assembly and cylinder tube assembly.

Grease application amount (standard)

Sliding part and taper of piston rod	L type	≈ 0.20 g
	H type	≈ 0.30 g
Sliding part of cylinder tube		≈ 0.40 g



3-4. Mounting of the seal

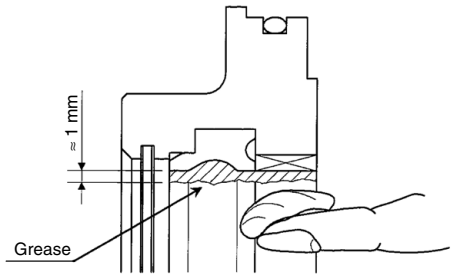
a. Mounting of the rod seal

Mount the seal with attention to direction.

After installation, apply lithium type grease evenly onto the rod seal and bearing.

Grease application amount (standard)

Rod seal and bearing	≈ 0.25 g



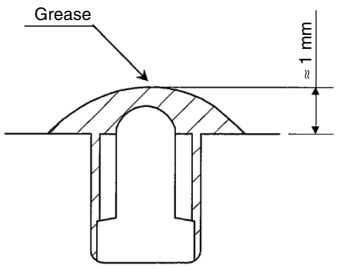
b. Mounting of the piston seal

Mount the piston seal without twist.

Spread it to rub lithium system grease into between piston seal outer part and the ditch after it installs it.

Grease application amount (standard)

Piston packing outer part and ditch	≈ 0.70 g



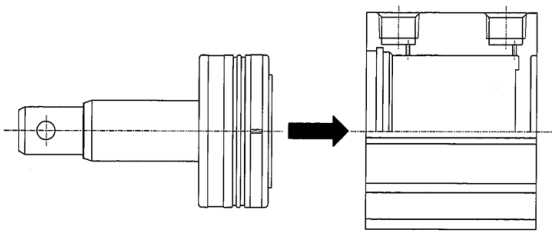
c. Mounting of the tube gasket

Pay attention not to make the gasket come off.

3-5. Reassembly of the cylinder

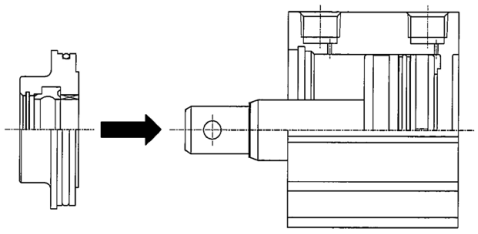
a. Insertion of the piston rod assembly

Insert it politely slowly so as not to damage rod seal in corner part cylinder tube assembly.



b. Insertion of the color assembly

Damage neither rod packing nor the tube gasket in corner part piston rod assembly and cylinder tube assembly. Insert it politely slowly.



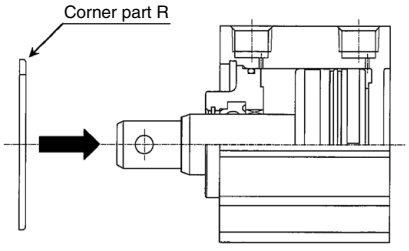
c. Mounting of the retaining ring

Use adequate pliers (tool for installing a basic internal ring).

Mount the retaining ring with attention to direction.

And pay attention not to cause the retaining ring to pop out and damage the human body and peripheral equipments.

After mounting, confirm the retaining ring is secured firmly by the mating hole.



d. Check of the reassembly condition

Confirm there is no air leakage from seal etc. and the cylinder can be moved smoothly at a min. operating pressure.

1. Replacement of the Guide Pin and Clamp Arm

The clamping position height: For the LOW type

1-1. Disassembly of the clamping part

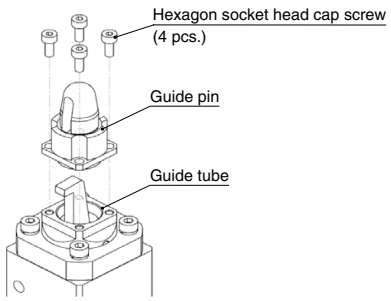
a. Cleaning of the appearance

Wipe off the dirt of appearance to prevent intrusion of dust and foreign objects during disassembly.

b. Removal of the guide pin

Adjust the position of the clamp arm to the unclamping side, detach the hexagon socket head cap screw (4 pcs.), and guide pin from guide tube. Screw-locking adhesive is applied on the threaded part of the hexagon socket head cap screws. If there is any adhesive residue leftover on the threaded part on guide tube side, be sure to remove it.

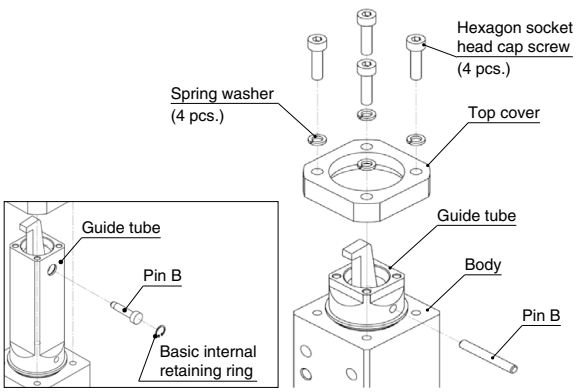
(Same for the HIGH type)



c. Removal of the clamp arm

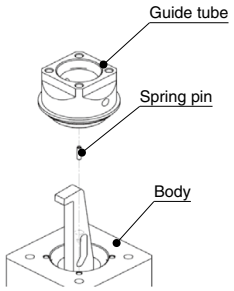
1) Remove the hexagon socket head cap screws (4 pcs.), and then remove the top cover from the body. Remove pin B from the guide tube side surface hole.

(For the HIGH type, remove the retaining ring before removing pin B.)



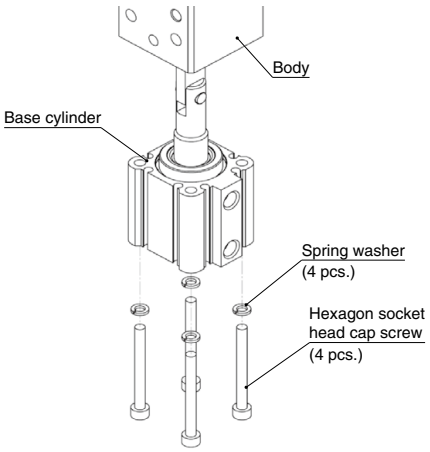
2) Remove the guide tube from the body. At this time, be careful not to lose the spring pin for body and guide tube positioning. (It does not have to be removed.)

(LOW type)



3-1) <Without lock>

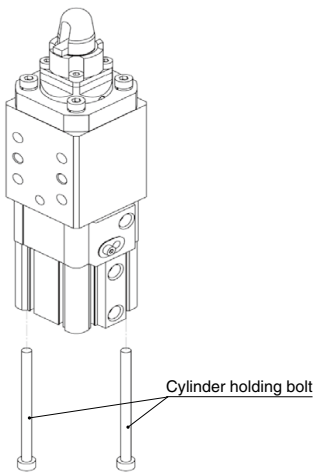
Loosen the hexagon socket head cap screw (4 pcs.) the base cylinder, and detach the body from the base cylinder.

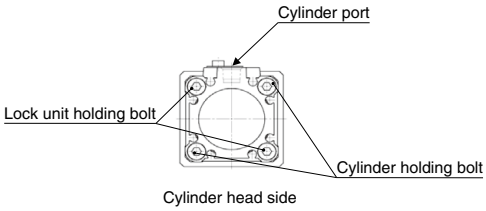


3-2) <With lock>

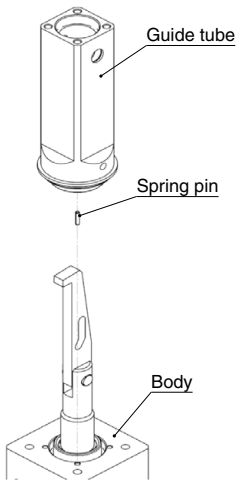
There are 2 hexagon socket head cap screws to be loosened. Be aware that their position is predetermined.

Do not under any circumstances loosen the lock unit holding bolt.



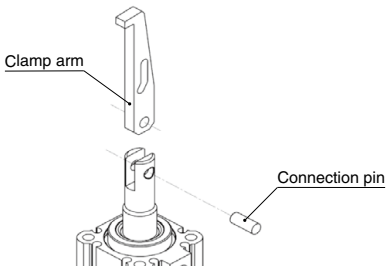


(HIGH type)



4) Remove the connection pin, and then remove the clamp arm.

(Same for the HIGH type)

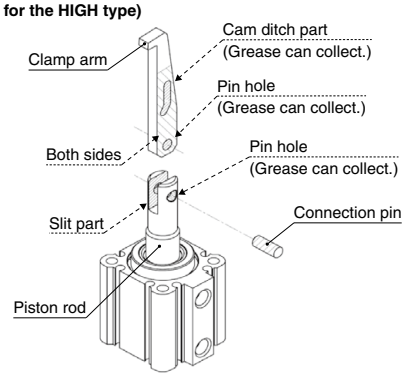


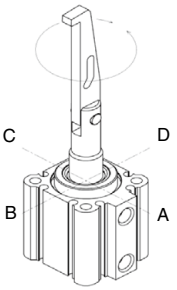
2. Reassembly of the clamping part

a. Installation of the clamp arm

1) There is thinly no irregularity and lithium system grease is spread on the slash part of the clamp arm for the exchange (both sides). Moreover, there is no irregularity and lithium system grease is spread on the pin hole part and the cam ditch part of the clamping arm a lot (Grease can collect).
2) There is thinly no irregularity and lithium system grease is spread on the slash part in connection pin and the piston rod slit part (both sides). Moreover, there is no irregularity and lithium system grease is spread on the piston rod pin hole part a lot (Grease can collect).
3) Insert the clamp arm in the piston rod slit part and insert connection pin.
4) Rotate the clamp arm, and rotate it so that the A-D installation position may squarely become direction of the fingernail. (Rotate it while moving the piston rod up and down when it rotates.)

(Same for the HIGH type)

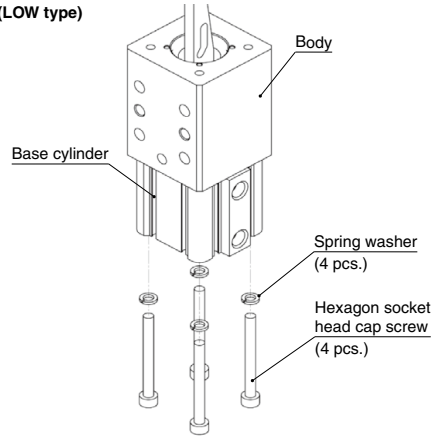




b. Mounting of the guide pin

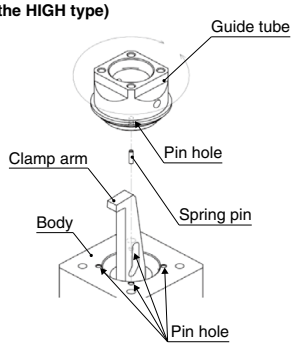
1) Put into the state to draw out the piston rod, confirm the body installation side and the clamping arm fingernail position, and insert the body.
2) Fasten, in order, the spring washer (4 pcs.) and the hexagon socket head cap screw (4 pcs.) from the head side of the base cylinder. Tightening torque: 2.7 to 3.3 (N·m)

(LOW type)



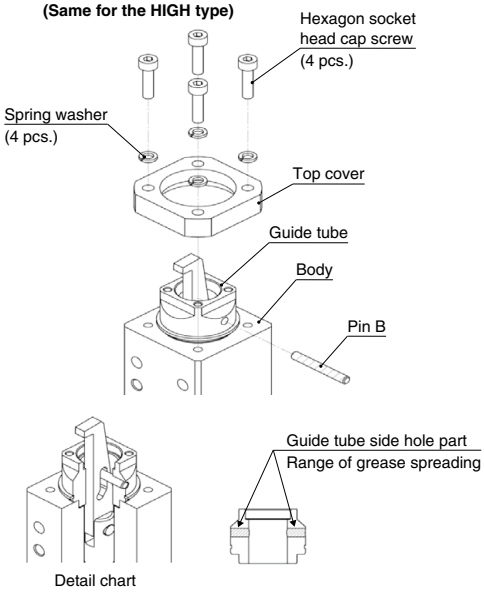
3) Insert the spring pin into the guide tube pin hole. (If it was removed earlier.)
Rotate the guide tube so that it is square with the guide tube side hole part (pin B insertion part) and the clamp arm claw direction, and then insert it, lining it up with the pin hole on the body side.

(Same for the HIGH type)

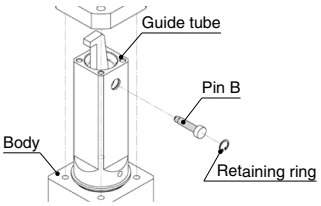


4) There is thinly no irregularity and lithium system grease is spread on the slash part of pin B.There is no irregularity and lithium system grease is spread on the guide tube side hole part (pin B insertion part) a lot (Grease can collect).Insert pin B into the guide tube. Install the replacement retaining ring using suitable pliers (tool for installing a basic internal retaining ring). In addition, confirm that the retaining ring fits securely in the retaining ring groove. (If not installed correctly, pin B will come out if pushed from the opposite side. Be sure to confirm the installation state before continuing.)
Mount the top cover to the body by mounting the spring washers (4 pcs.) and the hexagon socket head cap screws (4 pcs.) in that order.
Tightening torque: 2.7 to 3.3 (N·m)

(Same for the HIGH type)

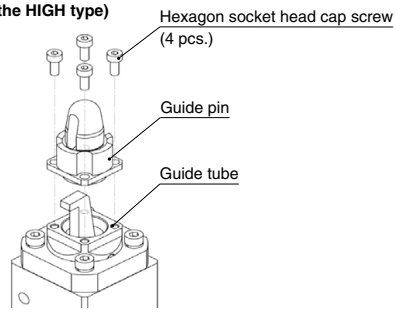


For the HIGH type, be sure to install a retaining ring to pin B to keep it from coming out.
Install the replacement retaining ring using suitable pliers (tool for installing a basic internal retaining ring). In addition, confirm that the retaining ring fits securely in the retaining ring groove. (If not installed correctly, pin B will come out if pushed from the opposite side. Be sure to confirm the installation state before continuing.)



5) Mount the replacement guide pin to the guide tube with the hexagon socket head cap screws (4 pcs.).
Tightening torque: 1.35 to 1.65 (N·m)
When the screw-locking adhesive on the hexagon socket head cap screws has worn down due to multiple guide pin replacements, we recommend reapplying adhesive. (SMC's recommended adhesive: Loctite 243 (blue))

(Same for the HIGH type)



1. Disassembly and Assembly of the Cylinder

Disassemble and assemble the cylinder in a clean area. Perform on a clean cloth.

For the RSG series, hold the flats of the tube cover gently in a vice, and hold the flats of the head cover with a wrench or monkey wrench to loosen and remove the head cover. When reassembling, tighten it 2 degrees further than the pre-disassembly position.

For the RSQ series, after securing the tube and cover with the holding screws, secure them with the hexagon socket head set screws. To disassemble, loosen the set screw that is screwed into the tube, hold the tube gently in a vice, and hold the flats of the rod cover with a wrench or monkey wrench to loosen and remove the cover. When reassembling, after tightening it 2 to 3 degrees further than the pre-disassembly position, secure the cover with the set screws.

2. Removal of the Seal

2-1. Rod seal

Tool: A watchmaker's screwdriver, etc.

Insert a precision screwdriver from the front side of the cover as shown in Figure 1.

At this time, exercise care not to damage the packing groove of the cover.

2-2. Piston seal

Wipe off grease around the piston seal first to make removal easier.

Hold the piston seal with one hand and push it into groove so that piston seal can be lifted off and pulled out without using a watchmaker's screwdriver. (Fig. 2)

2-3. Tube gasket

Remove the tube gasket with a watchmaker's screwdriver or the like.

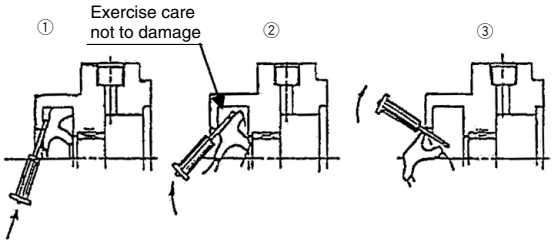


Fig. 1 Removal of the rod seal

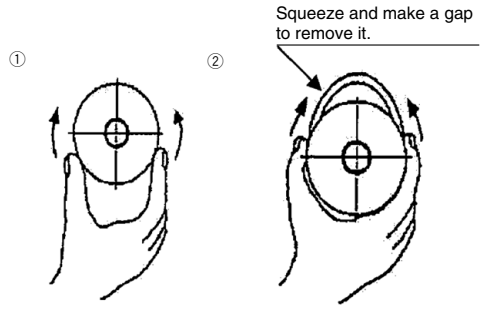


Fig. 2 Removal of the piston seal

3. Application of Grease

3-1. Rod seal

Thinly apply grease to the periphery of a new seal before replacement. Grease will help tight fitting to the cover.

Fill the seal groove with grease for smooth movement. (Fig. 3)

3-2. Piston seal

Apply grease thinly and evenly to the external and internal peripheries of the piston seal to ensure easy fitting to the piston.

3-3. Tube gasket

Thinly apply grease to the tube gasket. Grease will help prevention of dropping off during fitting the cylinder.

3-4. Cylinder parts

Apply grease to all points of cylinder parts as shown in Fig. 4.

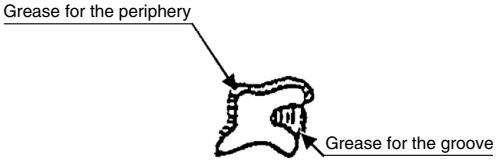


Fig. 3

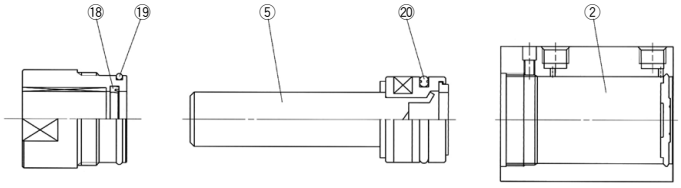


Fig. 4 Grease application points

4. Mounting of the Seal

4-1. Rod seal
Mount the rod seal in the correct direction. After this, apply grease to the seal and the entire internal periphery of the bushing as shown in Fig. 5. For small diameter cylinders, apply grease with a watchmaker' screwdriver.

4-2. Piston seal
After mounting the seal, apply grease to the inner and outer peripheries of the seal groove while rubbing it by finger as shown in Fig. 6.

4-3. Tube gasket
Mount the tube gasket on the cover.

After completion of installation, check the cylinder for smooth manual movement. Moreover, the procedure will be finished after checking a leakage from the seal.

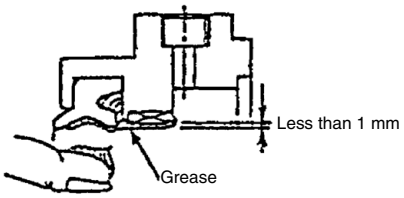


Fig. 5 Rod seal

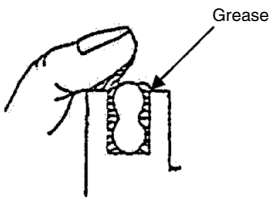


Fig. 6 Piston seal

5. Replacement of the Shock Absorber

5-1. Loosen the hexagon socket head set screw (M3) at the piston rod by approximately one turn, and push down the lever. (See Fig. 7)
Tool: A hexagon wrench, Width across flats 1.5 mm

Replacement Parts: Shock Absorber

Bore size (mm)	Part no.
32	RB1007–X225
40·50	RB1407–X552

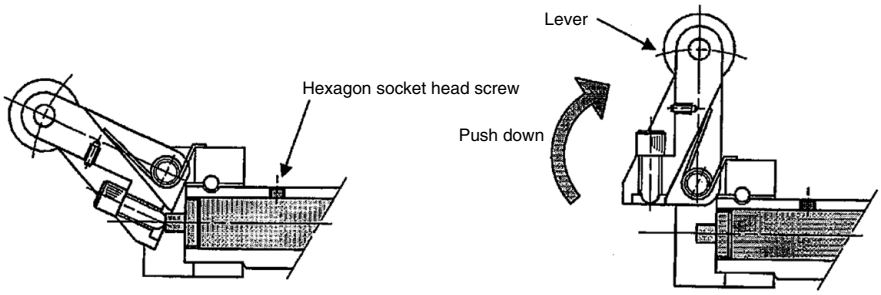


Fig. 7

5-2. While pushing down the lever, remove the shock absorber and replace it with a new shock absorber.
Tighten the hexagon socket set screw (M3 x 0.5) of the piston rod. Stop tightening around 1/4 turn after the set screw comes into contact with the shock absorber.
If it is tightened too much, it may cause damage to the hexagon socket set screw or a malfunction of the shock absorber.
Tightening torque: 0.29 N·m
Tool: A hexagon wrench, Width across flats 1.5 mm

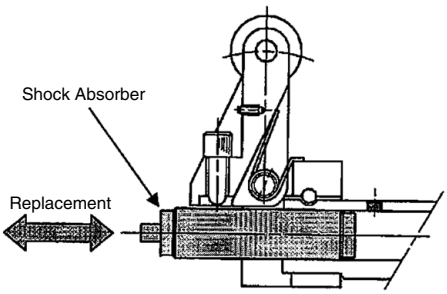


Fig. 8

1. Replacement of the Seal

The piston seal, cylinder tube gasket, O-ring of the RSH/RS2H series can be replaced. The scraper of the RSH series can be replaced.
Contact SMC sales representatives if it is necessary to replace parts other than those mentioned above.

⚠Caution

When replacing the seals, take care not to hurt your hand or finger on the corners of parts.

2. Disassembly/Reassembly

⚠Caution

Disassemble and assemble the cylinder in a clean area. Perform on a clean cloth.

When disassembling the cylinder, loosen the hexagon socket head cap screws (ø20: 2 pcs., ø32 to ø80: 4 pcs.) with a hexagon wrench. Remove the rod cover and piston rod from the cylinder tube as Fig.1
When reassembling, apply locking adhesive on the hexagon socket head cap screws and tighten them.

- Hexagon socket head cap screw tightening torque
  ø20: 3.0 N·m
  ø32: 5.2 N·m
  ø50: 12.5 N·m
  ø63: 24.5 N·m
  ø80: 42.0 N·m

RSH20 **RSH32, RS2H50/63/80**

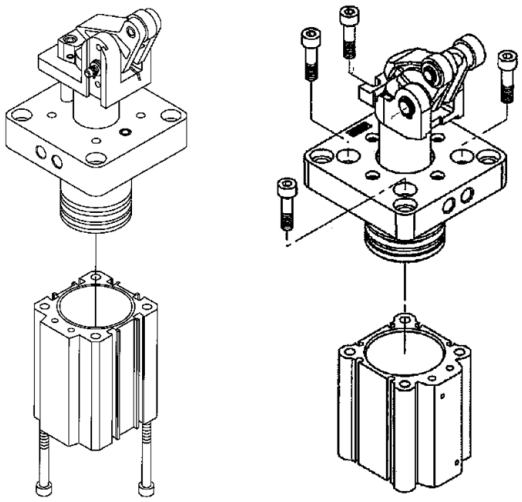


Fig. 1

3. Removal of the Seal

3-1. Piston seal
Wipe off grease around the piston seal first to make removal easier.
Hold piston seal with one hand and push it into groove so that piston seal can be lifted off and pulled out without with a watchmaker's screwdriver. (Fig. 2)

3-2. Tube gasket
Remove the tube gasket with a watchmaker's screwdriver or the like.

3-3. O-ring
Remove the tube gasket with a watchmaker's screwdriver or the like.

3-4. Scraper (RSH series only)
Remove the scraper by inserting a watchmaker's screwdriver or the like. Take care not to damage the seal groove of the cover at this time.

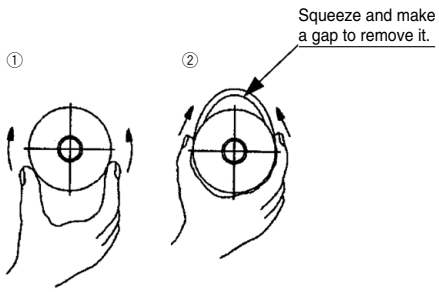


Fig. 2

4. Grease Application

⚠Caution

Use our recommended grease.
Grease pack no.: GR-S-010 (10 g)**, GR-S-020** (20 g)

4-1. Piston seal (RSH, RS2H: No.37)
Lightly and evenly apply grease to the inner and outer circumferences for easier mounting on the piston.

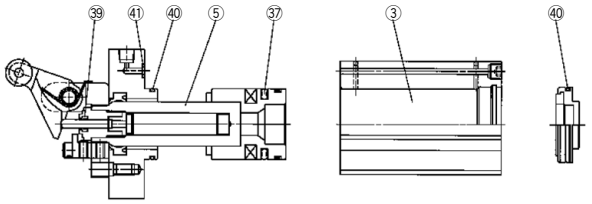
4-2. Tube gasket (RSH: No.40, RS2H: No.39)
Lightly apply grease. This prevents its drop when assembling the cylinder.

4-3. O-ring (RSH: No.41, RS2H: No.40)
Lightly apply grease. This prevents its drop when assembling the cylinder.

4-4. Scraper (RSH: No.39)
Apply a little grease to the outer circumference of the new seal for replacement. This improves mounting and adhesion of the seal to the cover.

4-5. Cylinder component parts
Apply grease to each component parts of the cylinder in Fig. 3.

RSH20/32



RS2H50/63/80

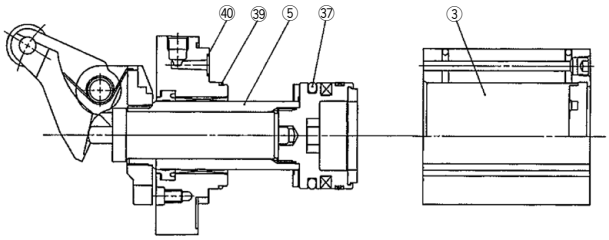


Fig. 3

5. Mounting of the Seal

5-1. Piston seal
After mounting the seal, apply grease to the inner and outer peripheries of the seal groove while rubbing it by finger as shown in Fig. 4.

5-2. Tube gasket
Mounted to the cover. (For the RSH series, tube gasket is mounted to the bottom plate, too.)

5-3. O-ring
Apply the O-ring to the cover.

5-4. Scraper
Mount the scraper in the correct direction.
Apply grease to the inner circumference of the seal using something, such as a precision screwdriver.

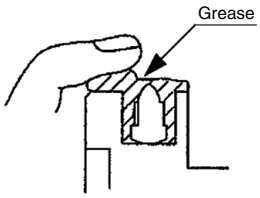


Fig. 4

⚠Caution

Confirm that there is no problem with operation and air tightness after assembly.

6. Replacement of the Shock Absorber

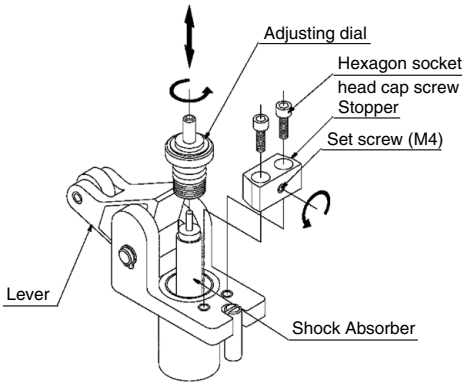


Fig. 5

~RSH Series (Fig. 5)~

6-1. Loosen the 2 hexagon socket head set screws of the stopper and the shock absorber set screw to remove the stopper from the lever holder.

6-2. Push down the lever 90 degrees and loosen the adjusting dial to remove it.

6-3. Pull out the shock absorber and replace it with a new shock absorber.

6-4. After tightening the adjusting dial, fix the stopper with hexagon socket head cap screws. Before fixing the stopper with hexagon socket head cap screws, apply adhesive to the screws.

• Hexagon socket head cap screw tightening torque: 1.5 N·m

6-5. Fix the shock absorber with a set screw.

• Set screw tightening torque: 1.5 N·m

~RS2H Series (Fig. 6)~

6-1. Loosen the set screw (M4) of the lever holder which fixes the shock absorber. Push down the lever 90 degrees to pull out the shock absorber.

6-2. Fix the shock absorber with a set screw.

• Set screw tightening torque: 1.5 N·m

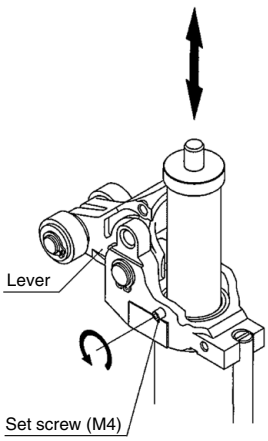


Fig. 6

⚠Caution

After replacing the shock absorber, tighten the set screw firmly and apply grease to the shock absorber rod end surface (Fig.7).

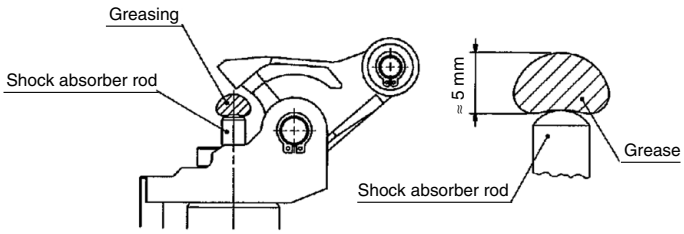


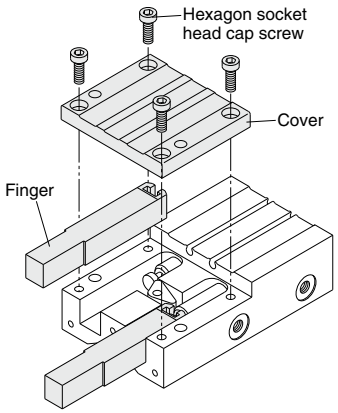
Fig. 7

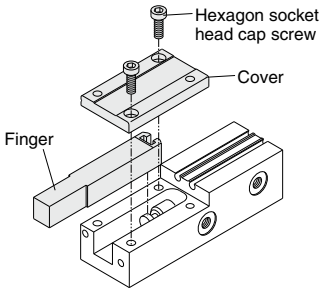
1. Replacement of the Finger

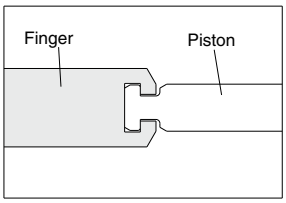
1-1. Remove the hexagon socket head cap screws.
1-2. Remove the cover.
1-3. Replace the finger.
  a. Apply the specified grease to the finger, body, cover and T groove part of the finger.
  b. Insert the piston in the T groove so that it will be hooked there.
1-4. Fix the cover and tighten the hexagon socket head cap screws.

Bore size	Hexagon socket head cap screw	Hexagon width across flats	Tightening torque (N·m)
8	M2 x 6	1.5	0.24
12	M2.5 x 6	2	0.36
20	M4 x 10	3	1.5
25	M5 x 14	4	3.0
32	M6 x 15	5	5.2

Note) For assembly, apply Henkel Japan Loctite No.243 or equivalent adhesive and tighten with the specified tightening torque. Please consult SMC if you feel replacement is difficult.





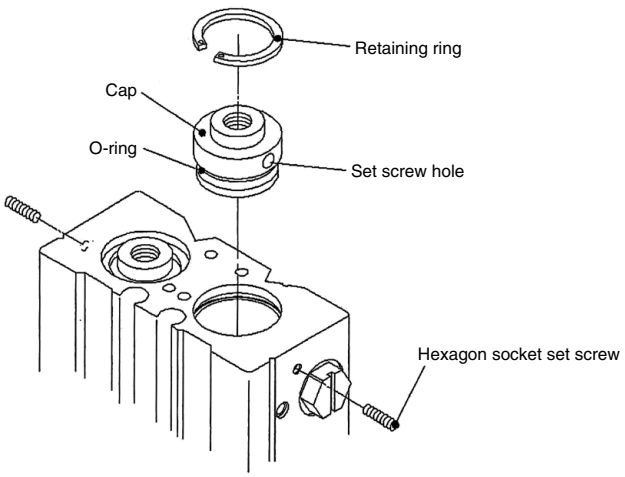


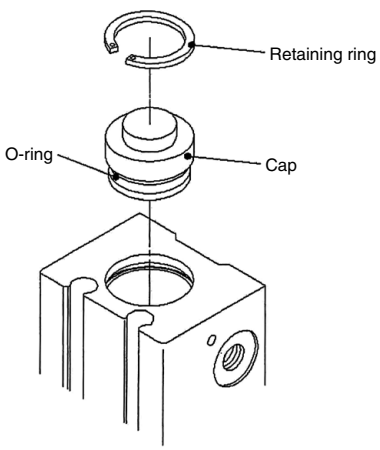
Finger and position connection

2. Replacement of the Seal

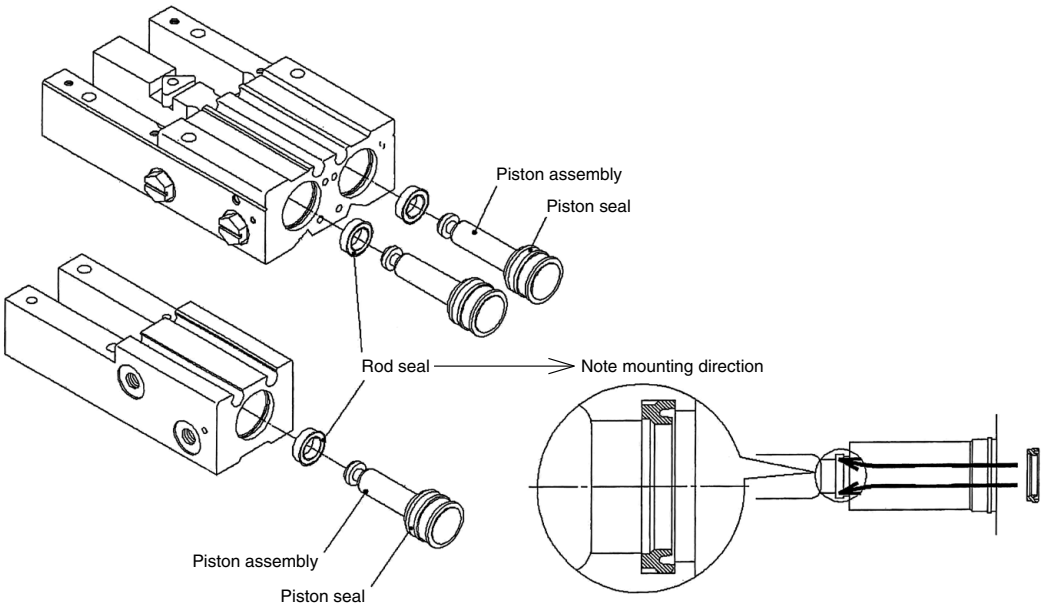
2-1. Remove the cover and the finger. (Refer to the "Replacement Procedure of Finger.")
2-2. Loosen the hexagon socket set screws. (Refer to the table of hexagon socket set screw size).
  * For MIS, hexagon socket set screw is not included except for the stroke adjusting type.
2-3. Remove the retaining ring with spring pliers to remove the cap.
  * If there are any questions for ø8, please consult SMC.

Bore size	Hexagon socket set screw	Hexagon width across flats	Tightening torque (N·m)
8	M2 x 6	0.9	0.176
12	M2 x 6	0.9	0.176
20	M3 x 8	1.5	0.63
25	M4 x 8	2	1.5
32	M4 x 8	2	1.5





2-4. Take out the piston assembly and replace the seal, to which the specified grease is applied.



2-5. Apply the specified grease lightly to the sliding interface between the outer periphery and the body of the piston, and assemble them in the reversed order.

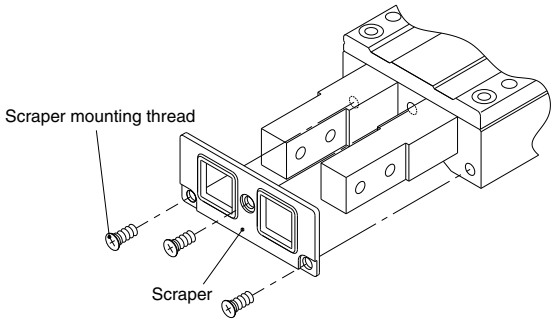
3. Scraper Option

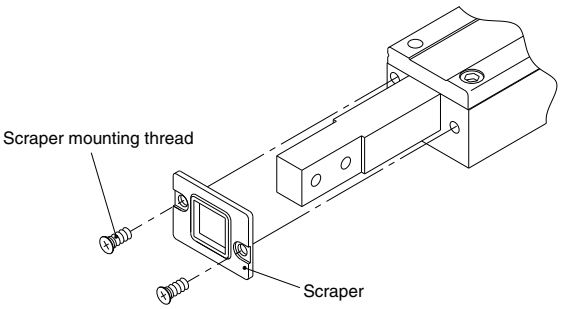
⚠Caution

1-1. **Please observe the specified torque limits when mounting a scraper.**
A tightening torque above the specified limits can cause a damage, while tightening torque below the specified limits can cause a dislocation or drop off.

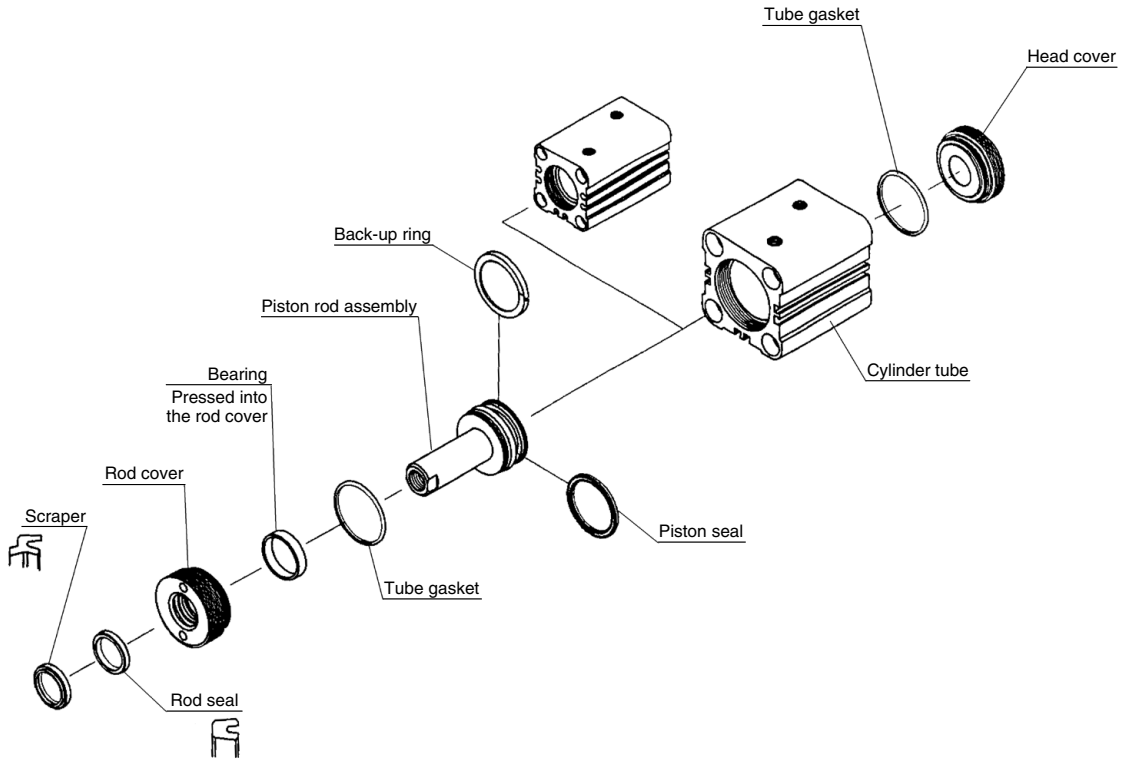
Tightening torque

Model	Bolt (N·m)
MIW8	0.176
MIS8	
MIW12	0.36
MIS12	
MIW20	0.63
MIS20	
MIW25	0.63
MIS25	
MIW32	1.5
MIS32	





1. Exploded View



⚠Caution

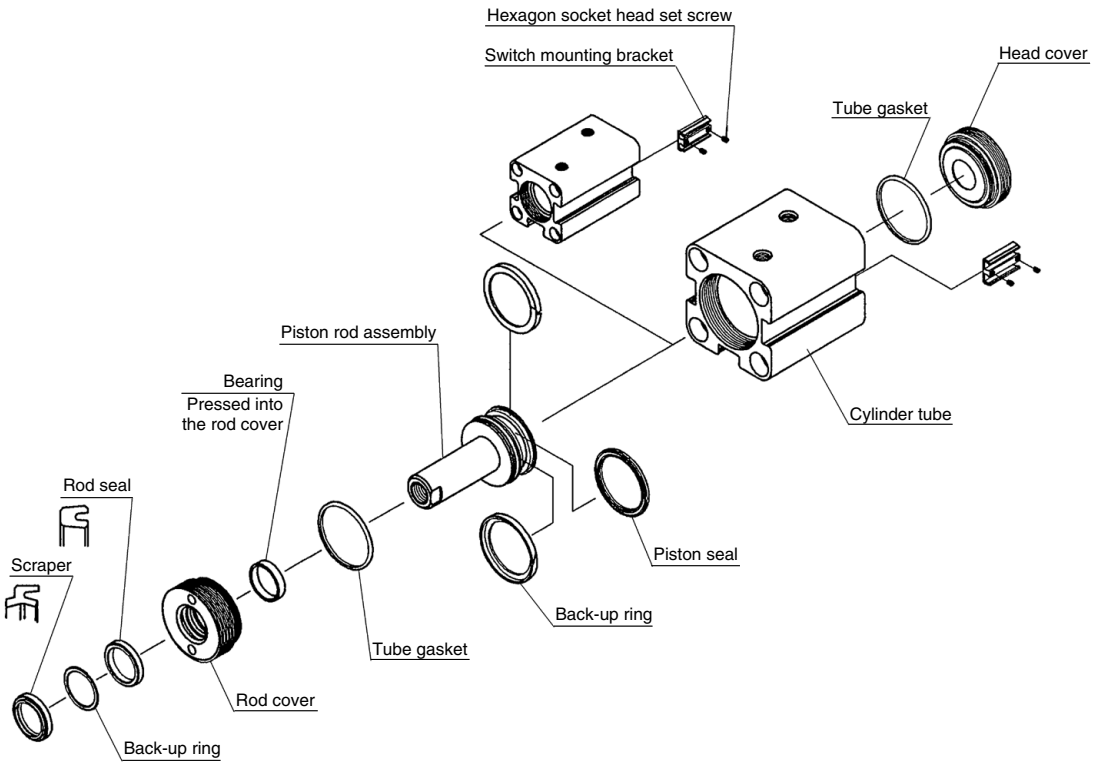
1. The piston rod assembly cannot be disassembled. The bearing cannot be removed because it is pressed into the rod cover.
2. Replace the seal with a new one to disassemble and repair the cylinder.
3. If fuel oil such as gasoline and kerosene or solvent are used to wash parts touched to seal, wipe off or dry up them completely before assembling the seal.
4. Apply hydraulic fluid (Oil used for the cylinder) or grease to the seal and the housing to be able to move smoothly before assembling.
5. Assemble the seal after confirming the sealing direction.
6. If a driver is used for mounting, round the point of the driver not to make a flaw on the seal and housing.
7. For handling the seal, take care to avoid excessive extension and deformation.

Cover tightening torque

Bore size (mm)	Tightening torque (N·m)
20	23.5 ± 2.4
25	35.3 ± 3.5
32	68.6 ± 6.8
40	117.7 ± 11.7
50	215.7 ± 21.6
63	372.6 ± 37.3
80	804.1 ± 80.4
100	1470 ± 147

∗ Remount the cover with the tightening torques listed above.

1. Exploded View



⚠Caution

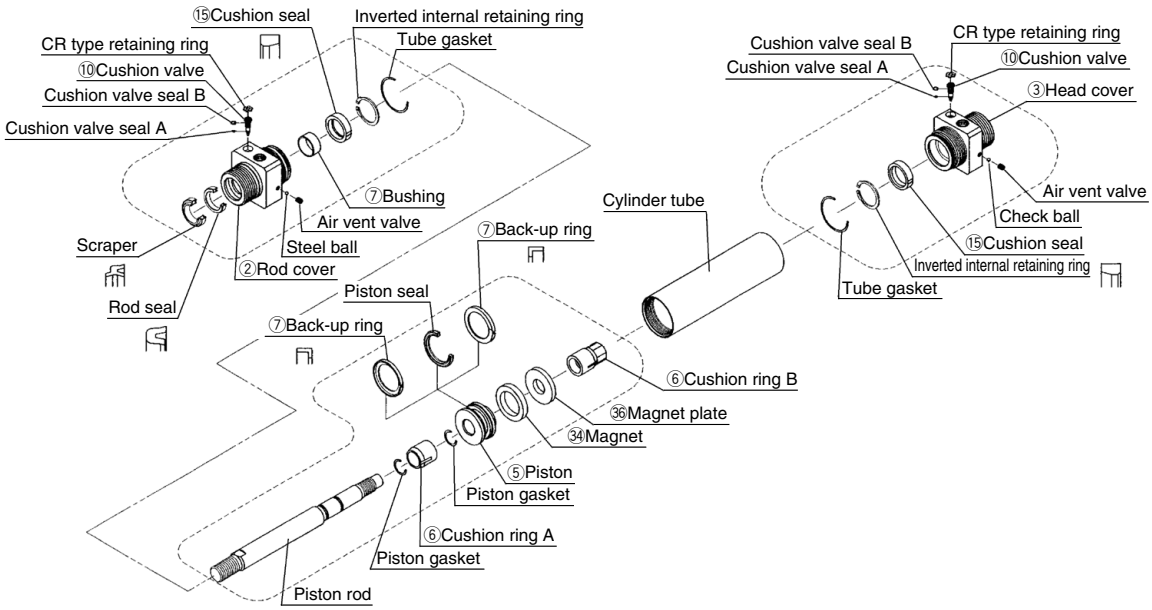
1. The piston rod assembly cannot be disassembled. The bearing cannot be removed because it is pressed into the rod cover.
2. Replace the seal with a new one to disassemble and repair the cylinder.
3. If fuel oil such as gasoline and kerosene or solvent are used to wash parts touched to seal, wipe off or dry up them completely before assembling seal.
4. Apply hydraulic fluid (Oil used for the cylinder) or grease to the seal and the housing to be able to move smoothly before assembling.
5. Assemble the seal after confirming the sealing direction.
6. If a driver is used for mounting, round the point of the driver not to make a flaw on the seal and the housing.
7. For handling the seal, take care to avoid excessive extension and deformation.

Cover tightening torque

Bore size (mm)	Tightening torque (N·m)
20	23.5 ± 2.4
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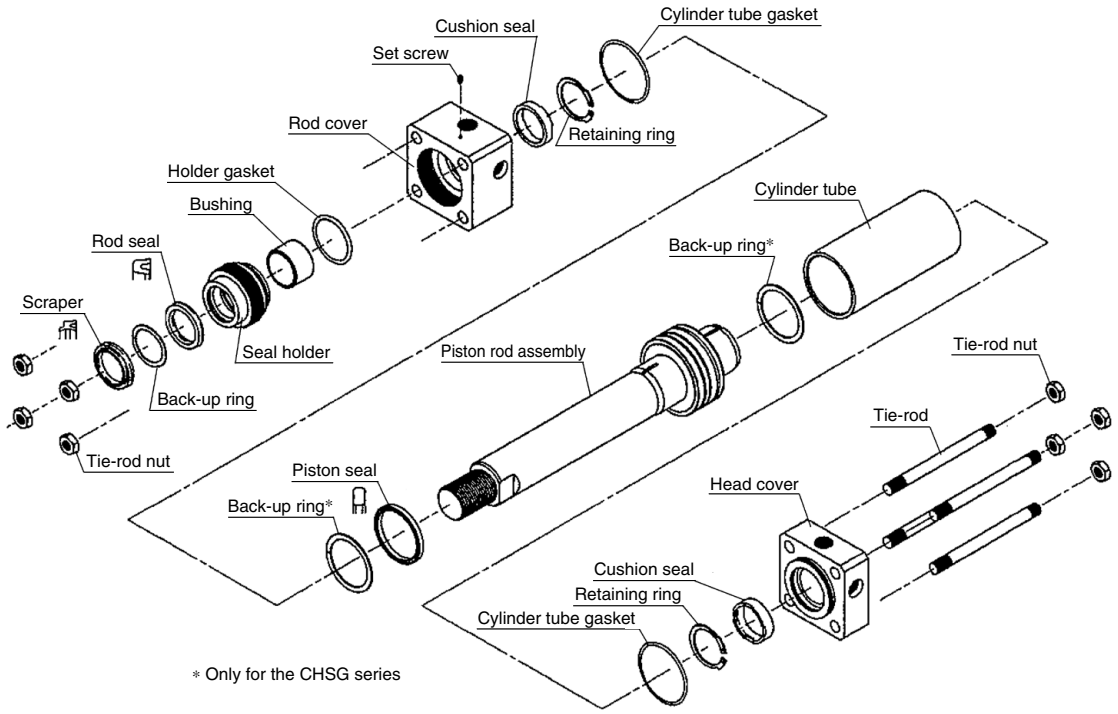
1. Exploded View



⚠Caution

1. The rod cover and head cover are screw-in type.
2. The piston rod assembly cannot be disassembled. The bushing cannot be taken out as it is pressed into the rod cover.
3. Replace the seal at the time of cylinder disassembly and repair.
4. When fuel oil such as gasoline and kerosene or solvent is used to wash the parts that contact seal, thoroughly wipe or dry them off before placing.
5. Apply hydraulic oil (to be used for the cylinder) or grease to the seal and housing for smooth sliding.
6. Assemble the seal after confirming the sealing direction.
7. Blunt the tip of a driver not to flaw the seal and housing.
8. Carefully handle the seal to avoid excessive elongation and deformation.
9. Please note that the positions of the rod and head covers might move from their original positions upon remounting.

1. Exploded View



⚠Caution

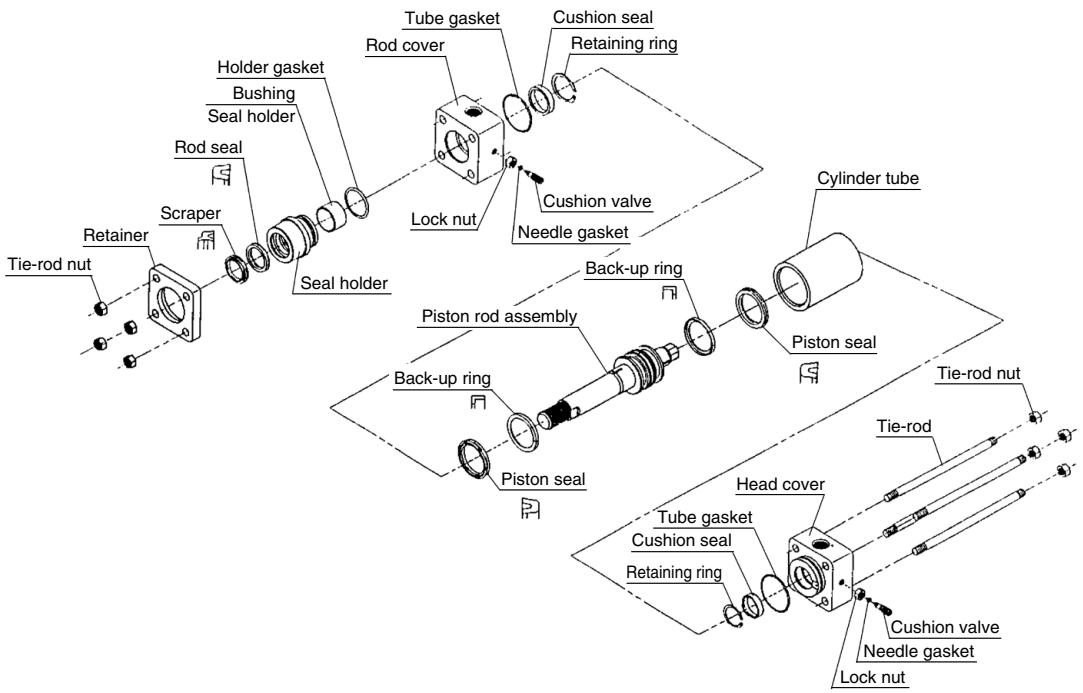
1. The piston rod assembly cannot be disassembled. The bushing cannot be taken out as it is pressed into the seal holder.
2. Replace the seal at the time of cylinder disassembly and repair.
3. When fuel oil such as gasoline and kerosene or solvent is used to wash the parts that contact seal, thoroughly wipe or dry them off before placing.
4. Apply hydraulic oil (to be used for the cylinder) or grease to the seal and housing for smooth sliding.
5. Verify the sealing direction and then set seal.
6. Blunt the tip of a driver not to flaw the seal and housing when it is used for mounting.
7. Carefully handle the seal to avoid excessive elongation and deformation.

Tie-rod nut tightening torque

Bore size (mm)	Tightening torque (N·m)	
	CHSD	CHSG
32		10.8 ± 1.08
40	10.8 ± 1.08	24.5 ± 2.45
50	24.5 ± 2.45	24.5 ± 2.45
63	24.5 ± 2.45	42.2 ± 4.22
80	53.9 ± 5.39	137.3 ± 13.73
100	107.8 ± 10.78	137.3 ± 13.73

* Tighten the tie-rod nuts diagonally and equally with torque shown in the table above.

1. Disassembling Drawing



⚠Caution

1. The piston rod assembly cannot be disassembled. The bearing cannot be taken out as it is pressed into the rod cover.
2. Replace the seal at the time of cylinder disassembly and repair.
3. When fuel oil such as gasoline and kerosine or solvent is used to wash the parts that contact seal, thoroughly wipe or dry them off before setting.
4. Apply hydraulic oil (to be used for the cylinder) or grease to the seal and housing for smooth sliding.
5. Verify the sealing direction and then set seal.
6. Blunt the tip of a driver not to flaw the seal and housing when it is used for mounting.
7. Carefully handle the seal to avoid excessive elongation and deformation.

Tie-rod nut tightening torque

Bore size (mm)	Tightening torque (N·m)		
	CH2E	CH2F	CH2G/H
32	11.8 ± 1.1	14.7 ± 1.4	24.5 ± 2.4
40	11.8 ± 1.1	19.6 ± 1.9	24.5 ± 2.4
50	14.7 ± 1.4	24.5 ± 2.4	24.5 ± 2.4
63	24.5 ± 2.4	39.2 ± 3.9	42.1 ± 4.2
80	44.1 ± 4.4	68.6 ± 6.8	107.8 ± 10.7
100	94 ± 9.4	73.5 ± 7.3	147.1 ± 14.7

∗ Tighten the tie-rod nuts diagonally and equally with torque shown in the table above.

Replacement Procedure
Rotary Actuators
Air Grippers

Rotary Actuators

CRA1	Rotary Actuator/Rack & Pinion Type	**p. 513**
CRQ2	Compact Rotary Actuator/Rack & Pinion Type	**p. 516**
CRQ2X	Low-Speed Compact Rotary Actuator/Rack & Pinion Type	**p. 516**
MSQ	Rotary Table/Rack & Pinion Type	**p. 521**

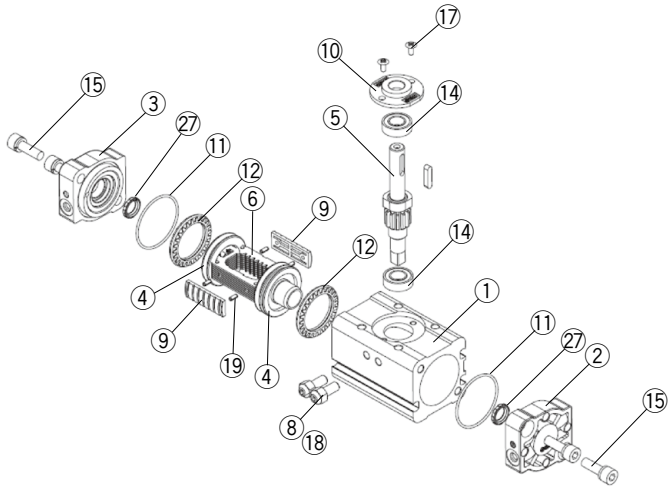
Air Grippers

JMHZ2	Parallel Style Air Gripper/Compact Type	**p. 525**
MHZ2	Parallel Type Air Gripper/Standard Type	**p. 527**
MHZL2	Parallel Type Air Gripper/Long Stroke Type	**p. 527**
MHZJ2	Parallel Type Air Gripper/With Dust Cover	**p. 527**
MHF2	Low Profile Air Gripper	**p. 532**
MHL2-Z	Parallel Style Air Gripper/Wide Type	**p. 534**
MHL2	Parallel Type Air Gripper/Wide Type	**p. 534**
MHR3/MDHR3	Rotary Actuated Air Gripper/3-Finger Type	**p. 535**
MHK2	Wedge Cam Operation Slide Guide/Air Gripper/2-Finger Type	**p. 536**
MHS2/MHS3/MHS4	Parallel Type Air Gripper/2 Finger, 3 Finger, 4 Finger	**p. 537**
MHSJ3	Parallel Type Air Gripper/3-Finger Type with Dust Cover	**p. 539**
MHSH3/MHSHJ3	Parallel Type Air Gripper/3-Finger Type Through-hole Type	**p. 541**
MHSL3	Parallel Type Air Gripper/3-Finger Type Long Stroke	**p. 545**
MHC2	Angular Type Air Gripper/Standard Type	**p. 547**
MHY2	180° Angular Type Air Gripper Cam Type	**p. 549**

Size 30

1. Disassembly

1-1. Loosen the hexagon nut ⑱ to remove the hexagon socket set screw ⑧ with the hexagon nut from the body ①.
1-2. Loosen the cross recessed round head tapping screw ⑰ to remove the bearing retainer ⑩ with the shaft ⑤ from the body. Remove the lower bearing ⑭ from the body housing at this time.
1-3. Loosen the hexagon socket head cap screw with washers ⑮ to remove the cover ② and ③ from the body. (Remove the cover from the right and left sides.)
1-4. Remove the piston ④ with the rack ⑥ from the body.
(The rack has a specified mounting direction, so this should be checked when removing it from the body.)



2. Assembly

2-1. Apply the grease provided in the seal kit to parts shown in Table 1.
2-2. Mount the tube gasket ⑪ to the left cover ③ to mount to the body ①. Tighten them with the hexagon socket head cap screw with washers ⑮.
2-3. Insert the rack ⑥ and the piston ④ into the body. Set the lower bearing ⑭ to the housing in the body. At this time, the piston assembly should be inserted carefully so as not to damage the piston seal ⑫ through which the housing for the bearing of the body will pass.
2-4. After push the rack and the piston until it touches the left cover, mount the shaft ⑤ to the body. Refer to Fig.1 for the direction of the keyway (facing to the right cover ②).
2-5. Mount the upper bearing ⑭ and the bearing retainer ⑩ to the shat and the body. Tighten them with the cross recessed round head tapping screw ⑰.
2-6. Mount the tube gasket to the right cover to mount to the body. Tighten them with the hexagon socket head cap screw with washers.
2-7. Mount the hexagon socket set screw to the body and secure with the hexagon nut.
2-8. After assembly is completed, perform an operation test and check that there is no air leakage.

Table 1 Parts where grease is to be applied

Application of grease	Grease
① Body (Inner sliding surface)	GR-S-10
④ Piston (Seal groove)	
⑨ Slider (Sliding surface)	
⑪ Tube gasket	
⑫ Piston seal	
㉗ Cushion seal (For with air cushion)	

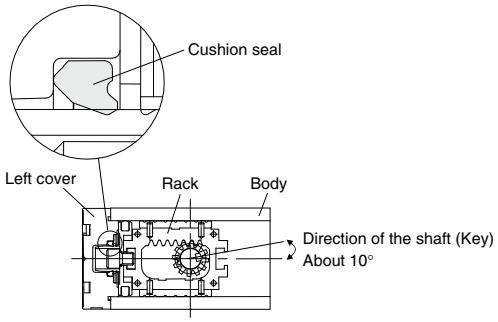
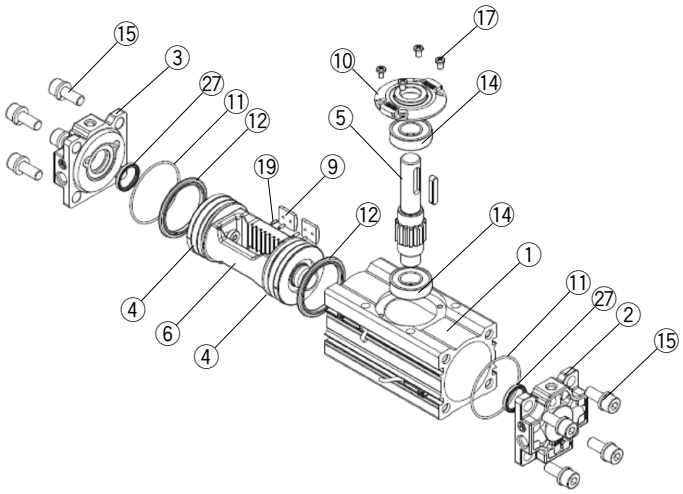


Fig.1 Direction of the assembly of the shaft seal

Size 50 to 100

1. Disassembly

1-1. Loosen the cross recessed round head tapping screw ⑰ to remove the bearing retainer ⑩ with the shaft ⑤ from the body ①. Remove the lower bearing ⑭ from the body housing at this time.
1-2. Loosen the hexagon socket head cap screw with washers ⑮ to remove the cover ② and ③ from the body. (Remove the cover from the right and left sides.)
1-3. Remove the piston ④ with the rack ⑥ from the body.
(The rack has a specified mounting direction, so this should be checked when removing it from the body.)



2. Assembly

2-1. Apply the grease provided in the seal kit to parts shown in Table 2.
2-2. Mount the tube gasket ⑪ to the left cover ③ to mount to the body ①. Tighten them with the hexagon socket head cap screw with washers ⑮.
2-3. Insert the rack ⑥ and the piston ④ into the body. Set the lower bearing ⑭ to the housing in the body. At this time, the piston assembly should be inserted carefully so as not to damage the piston seal ⑫ through which the housing for the bearing of the body will pass.
2-4. Push the rack and the piston until it touches the left cover. Mount the shaft ⑤ to the body. Refer to Fig. 2 for the direction of the keyway (facing to the right cover ②).
2-5. Mount the upper bearing ⑭ and the bearing retainer ⑩ to the shat and the body. Tighten them with the cross recessed round head tapping screw ⑰.
2-6. Mount the tube gasket to the right cover to mount to the body. Tighten them with the hexagon socket head cap screw with washers.
2-7. After assembly is completed, perform an operation test and check that there is no air leakage.

Table 2 Parts where grease is to be applied

Application of grease	Grease
① Body (Inner sliding surface)	GR-S-10
④ Piston (Seal groove)	
⑨ Slider (Sliding surface)	
⑪ Tube gasket	
⑫ Piston seal	
㉗ Cushion seal (For with air cushion)	

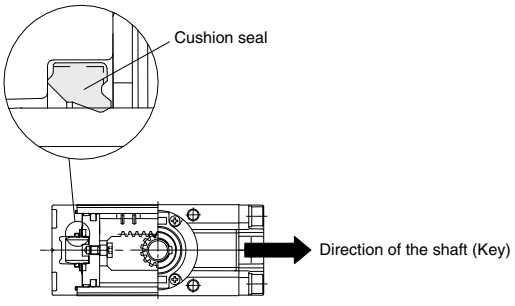
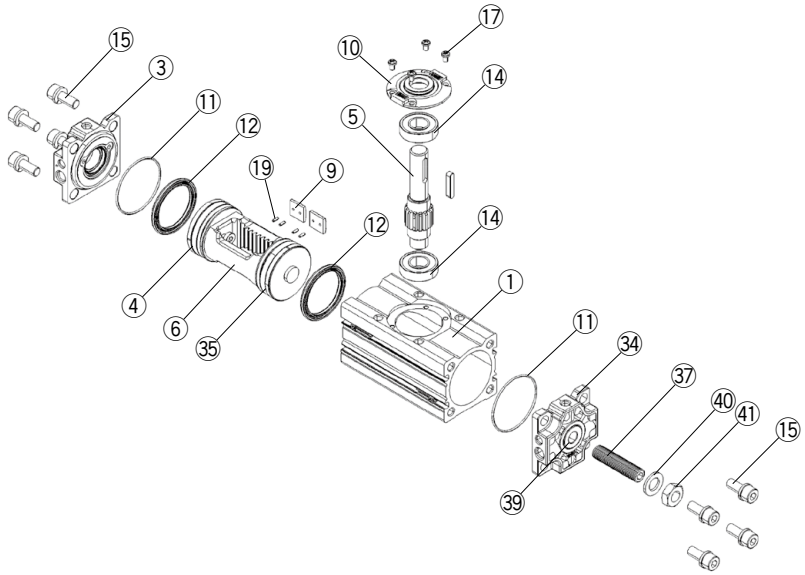


Fig. 2 Direction of the assembly of the shaft

Angle adjustable type

1. Disassembly

1-1. Loosen the cross recessed round head tapping screw ⑰ to remove the bearing retainer ⑩ with the shaft ⑤ from the body ①. Remove the lower bearing ⑭ from the body housing at this time.
1-2. Loosen the hexagon socket head cap screw with washers ⑮ to remove the cover ③ and ㉞ from the body. (Remove the cover from the right and left sides.)
1-3. Remove the piston ④ and ㉟ with the rack ⑥ from the body.
(The rack has a specified mounting direction, so this should be checked when removing it from the body.)
1-4. Loosen the hexagon nut ㊶ of right cover ㉞ to remove the seal washer ㊵ and hexagon nut with the hexagon socket set screw ㊲ from the angle adjustment collar ㊴.



2. Assembly

2-1. Apply the grease provided in the seal kit to parts shown in Table 3.
2-2. Mount the tube gasket ⑪ to the left cover ③ to mount to the body ①. Tighten them with the hexagon socket head cap screw with washers ⑮.
2-3. Insert the rack ⑥ and the piston ④ and ㉟ into the body. Set the lower bearing ⑭ to the housing in the body. At this time, the piston assembly should be inserted carefully so as not to damage the piston seal ⑫ through which the housing for the bearing of the body will pass.
2-4. Push the rack and the piston until it touches the left cover. Mount the shaft ⑤ to the body. Refer to Fig. 3 for the direction of the keyway (facing to the right cover ㉞).
2-5. Mount the upper bearing ⑭ and the bearing retainer ⑩ to the shat and the body. Tighten them with the cross recessed round head tapping screw ⑰.
2-6. Mount the seal washer ㊵ and the hexagon nut ㊶ to the hexagon socket set screw ㊲ to mount the angle adjustment collar ㊴ of the right cover.
2-7. Mount the tube gasket to the right cover to mount to the body. Tighten them with the hexagon socket head cap screw with washers.
2-8. After assembly is completed, perform an operation test and check that there is no air leakage.

Table 3 Parts where grease is to be applied

Application of grease	Grease
① Body (Inner sliding surface)	GR-S-10
④㉟ Piston (Seal groove)	
⑨ Slider (Sliding surface)	
⑪ Tube gasket	
⑫ Piston seal	
㊵ Seal washer	

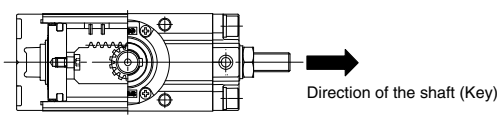


Fig. 3 Direction of the assembly of the shaft

1. Disassembly

1-1. Loosen the cross recessed no.0 screw (size 10,15) or roundhead screw (size 20, 30, 40).
1-2. Pull out the bearing retainer and the shaft from the body. Remove the bearing from the housing at this time.
1-3. Loosen the hexagon socket head bolt to remove the cover assembly and the end cover assembly.
1-4. Push the piston assembly from one side to pull out the 2 piston assemblies from the body.
1-5. Take out the bearing from the body.

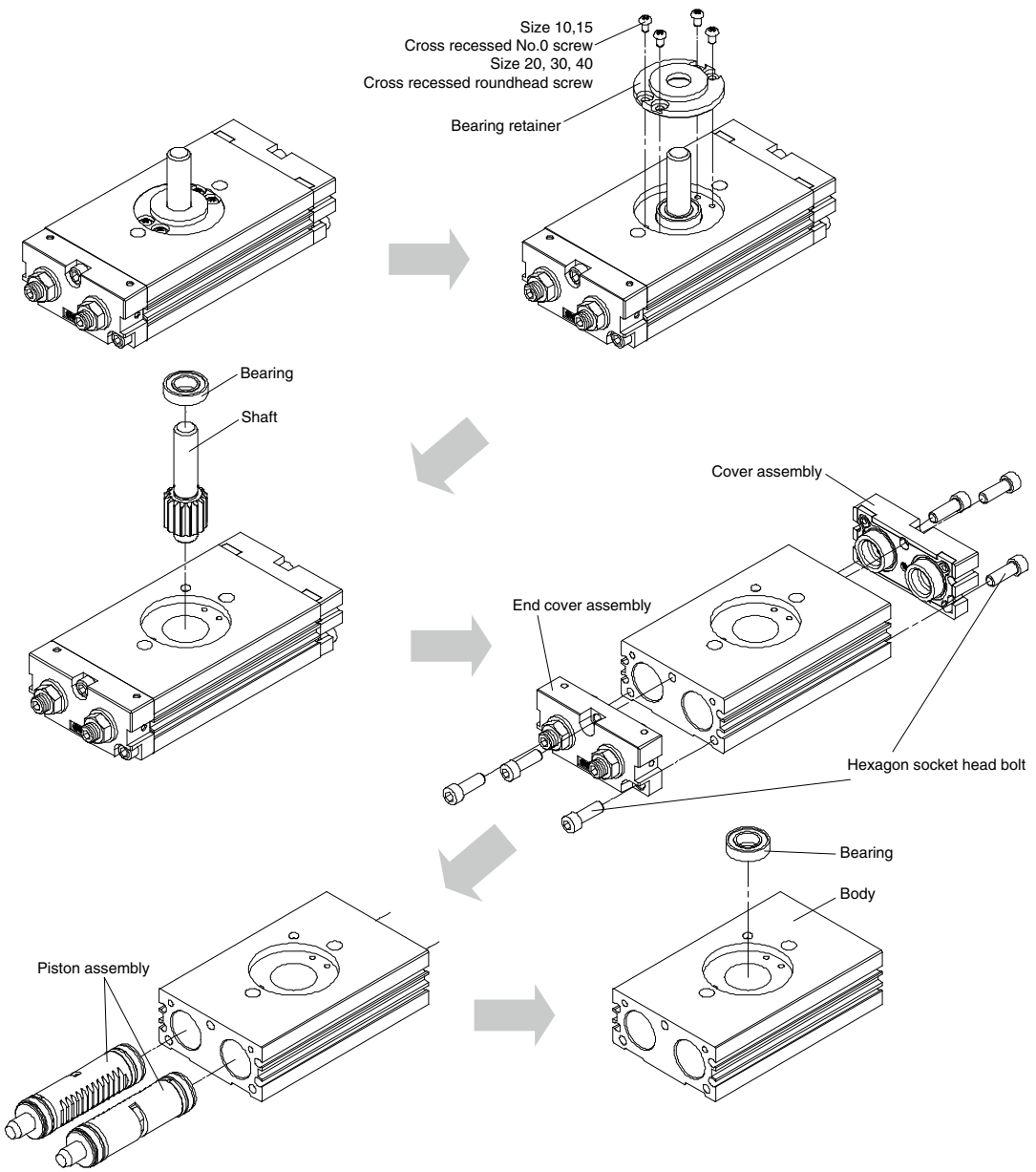


Fig.1

2. Assembly

2-1. Clean each component sufficiently before assembled to prevent a dust from attaching.
Apply the grease which is enclosed to the seal set to each part shown in Table 1. The referential amount of applied grease is to the extent which can brighten the surface of components.
After that, mount a piston seal to the piston with care not to damage the piston seal.

Table 1 Parts applied with grease

Grease applied parts	Grease	
	CRQ2	CRQ2X
Cylinder internal surface	GR-S-010 (Lithium mineral oil grease No.2)	P523010-21
Piston seal groove		
Piston seal		
Cover gasket		
End cover gasket		
Gasket		
Cushion seal		

Body assembly
Wipe off the internal face of the cylinder body with alcohol, apply grease, and set the bearing to the housing of the body.

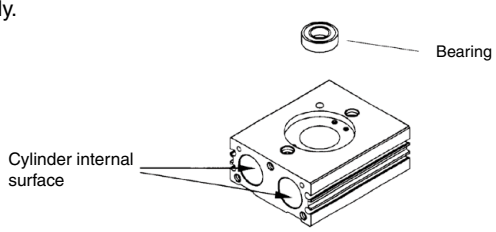


Fig.2

Piston assembly
Pay attention to the orientation of the piston seal.

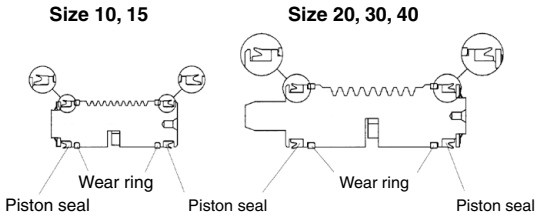
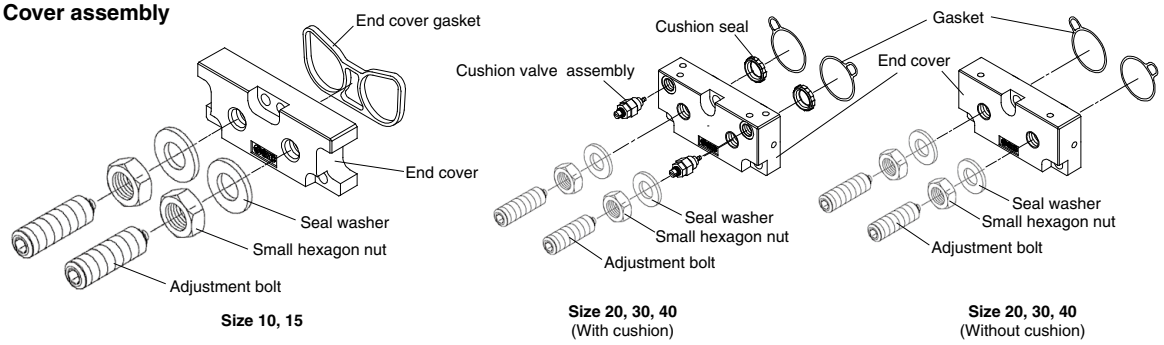


Fig.3

Cover assembly



Size 10, 15

Size 20, 30, 40
(With cushion)

Size 20, 30, 40
(Without cushion)

Fig. 4

Insert and attach the cushion seal and the seal with the direction in the drawing below.

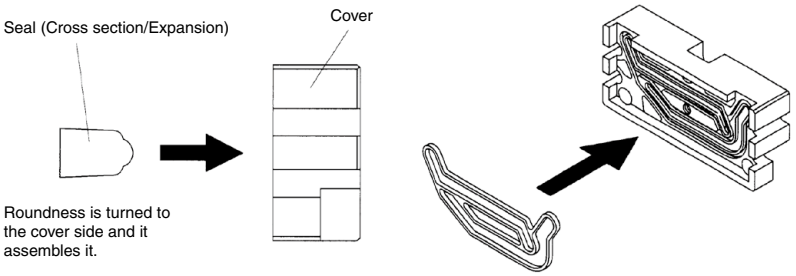
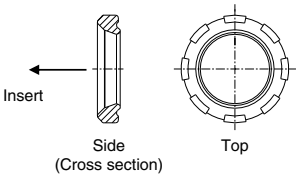


Fig.5



Cushion seal

Adjustment bolt assembly

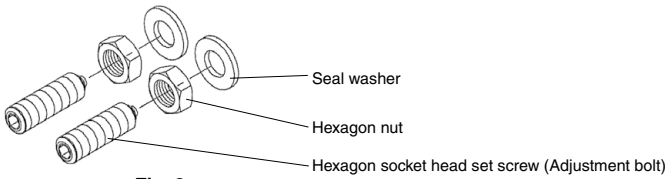
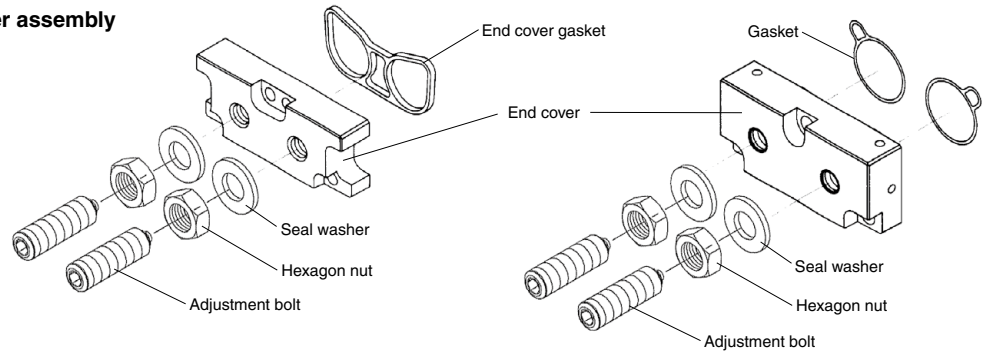


Fig. 6

End cover assembly



Size 10, 15 **Size 20, 30, 40**

Fig. 7

2-2. Insert the piston assembly to the body. At this time, the piston seal passes the opening of the cylinder and should be pressed inward not to be scratched. Also, pay attention to the mounting orientation of the piston. (See Fig. 8)

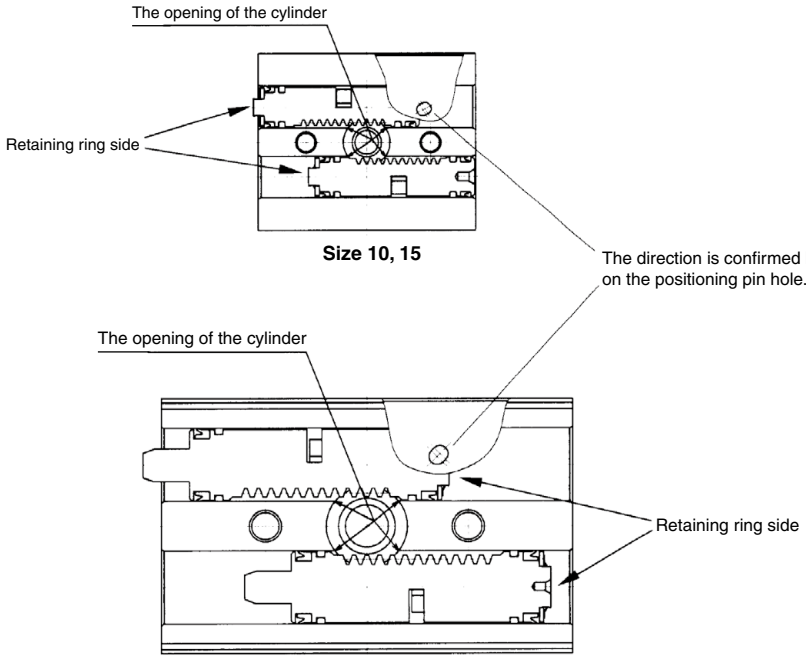
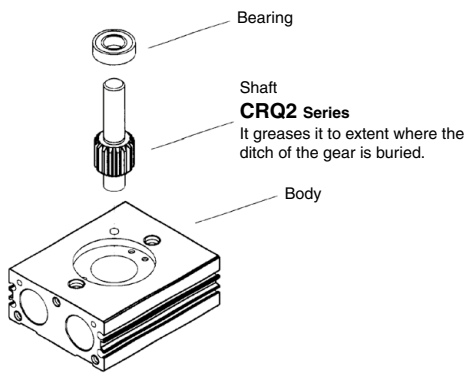
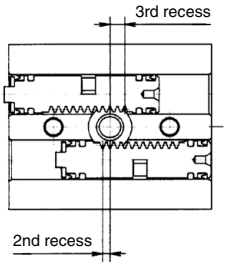


Fig. 8

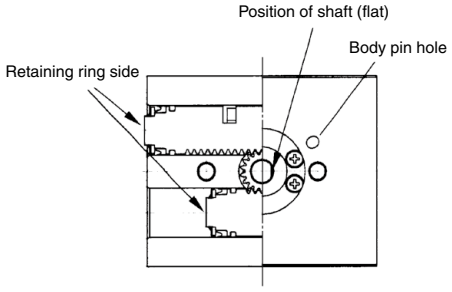
2-3. Mount the shaft and bearing to the body. The shaft should be mounted by positioning the piston assembly with reference to the flat of the shaft (size 10 and 15) and key (size 20, 30 and 40).

Fig. 9

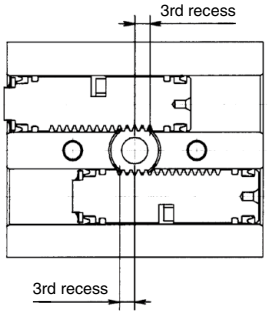




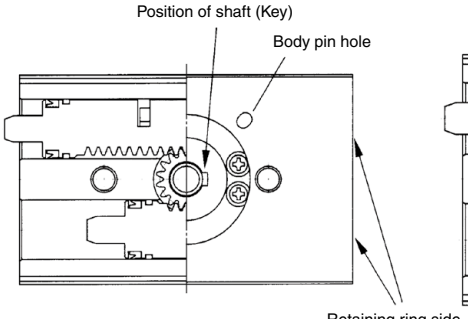
Size 10 (90°)



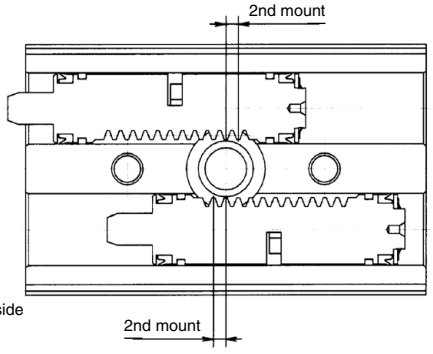
Size 10, 15



Size 10 (180°), 15



Size 20, 30, 40



Size 20, 30, 40

CRQ2 Series

Mount the cover and the end cover, and push the piston assembly and the cover until they touch the end cover as in Fig.10. Adjust the hexagon socket head set screw (adjustment bolt) so that the screw does not contact with the piston assembly.

Mount the shaft. Key groove or flat direction is the same as the cover direction, and mount the shaft so that the shaft is on the right turning upward by 5 to 10° to horizontal line. If the key groove rotation range is inadequate or displaced, correct the piston assembly to the right position and assemble.

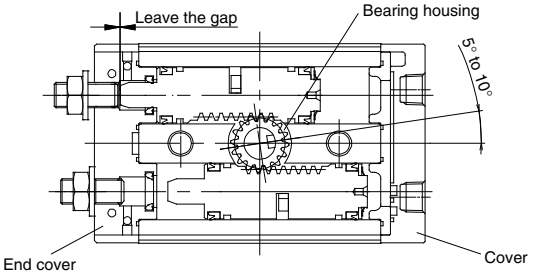


Fig. 10

2-4. Mount the bearing retainer, and then tighten the cross recessed no.0 screw or cross recessed round head screw.

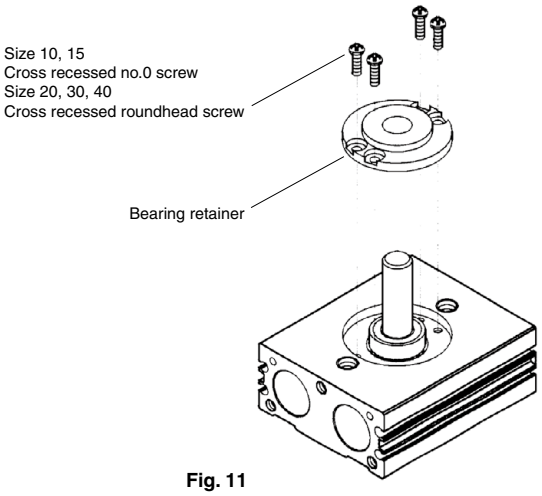
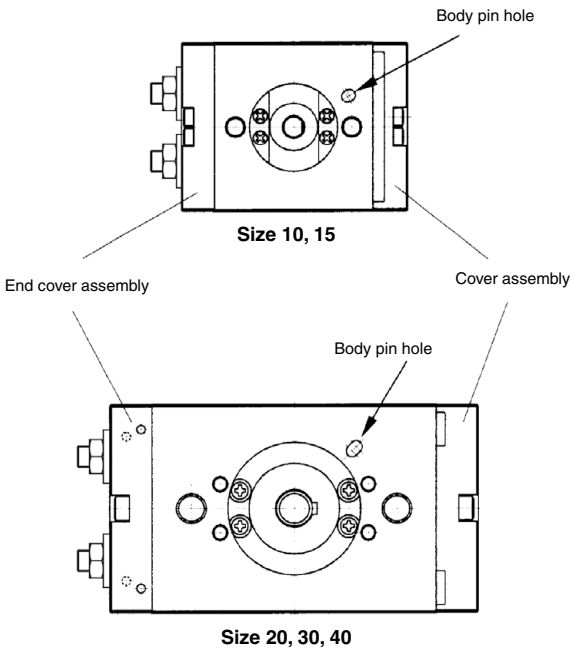


Fig. 11

2-5. Mount the cover assembly and the end cover assembly, and then tighten the hexagon socket head bolt.



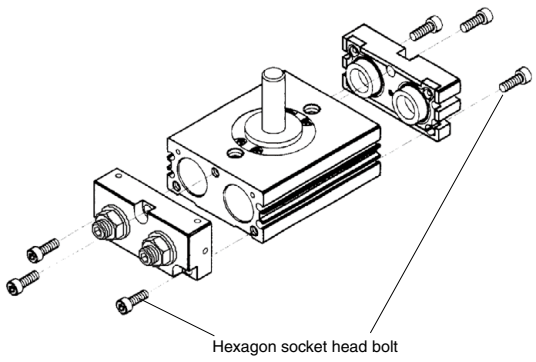
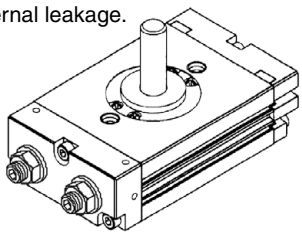


Fig. 12

2-6. Perform an operation test after assembly, and then check for external leakage.



Disassembly is not possible for the MSQA10 to 50 as adhesive is used to secure the cover and end cover (MSQ1 to 7), and the high-precision bearing is press-fit to the table (MSQA10 to 50).

1. Disassembly

1-1. Loosen the hexagon socket head cap screw and pull out the table. Loosen the hexagon thin socket head bolt (Size 10: Cross recessed round head screw; Size 70, 100, 200: Hexagon socket head cap screw) to remove the bearing retainer.
1-2. Pull out the pinion and the bearing from the body.
1-3. Loosen the hexagon socket head bolt to remove the cover assembly and the end cover assembly.
1-4. Push the piston assembly from one side to pull out the 2 piston assemblies from the body.
(Do not scratch the piston seals when pulling out the piston.)
1-5. Take out the bearing from the body. However, for sizes 70, 100, and 200, the bearing on the lower side of the body cannot be removed as the bearing is press-fitted.

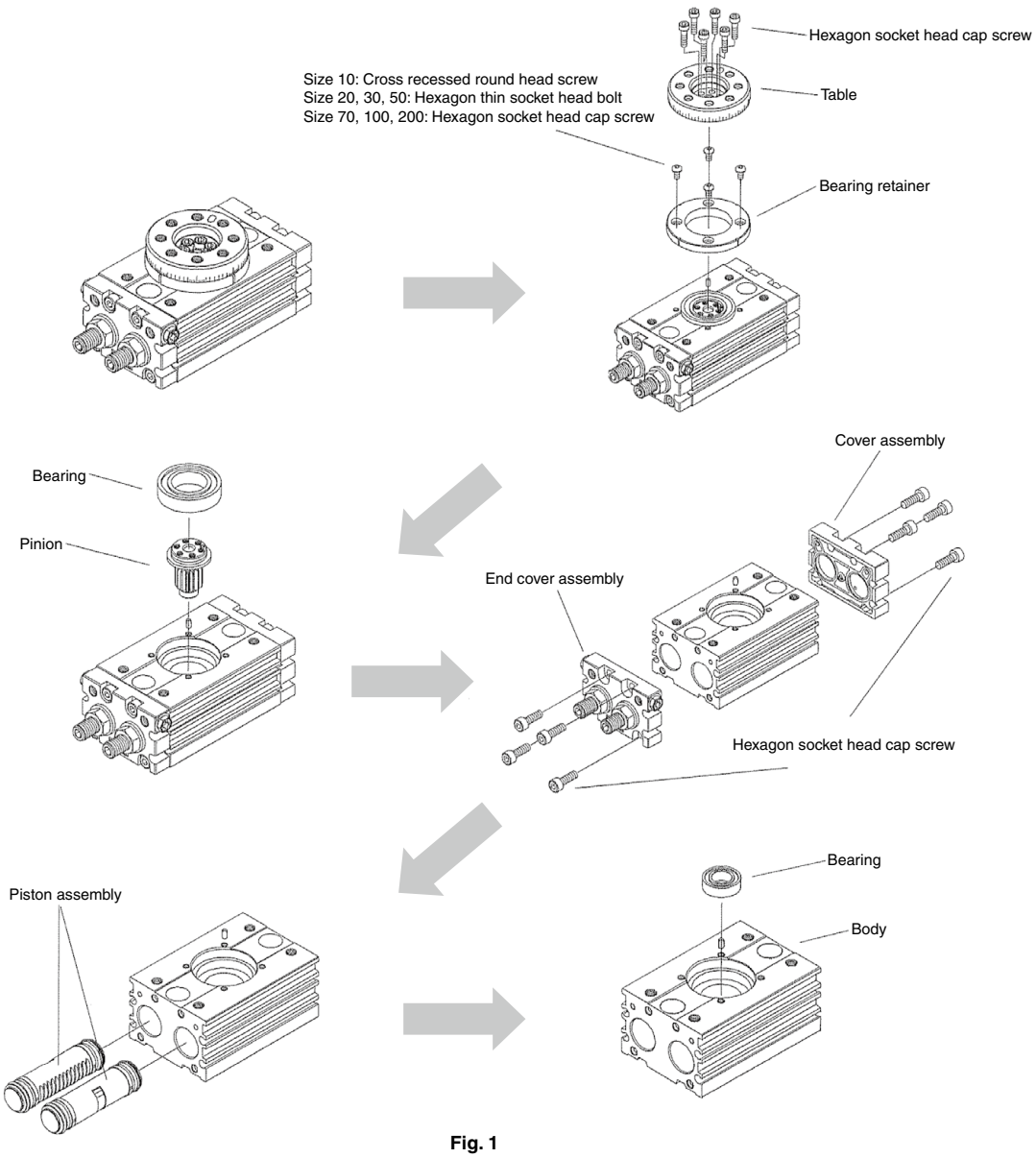


Fig. 1

2. Assembly

2-1. Clean each component sufficiently before assembly to remove any dust etc.
Apply the grease provided in the seal set to each part shown in Table 1. As a guideline, apply enough grease to make the surface shiny.

Table 1 Parts where grease is to be applied

Grease applied parts	Grease
Cylinder internal surface	GR-S-010
Piston seal groove	
Piston seal	
Cover seal	
End cover gasket	
Seal	
O-ring (Size 70, 100, 200)	

Body assembly
Apply grease after wiping the inside of the cylinder with alcohol, and then mount the bearing on the housing.

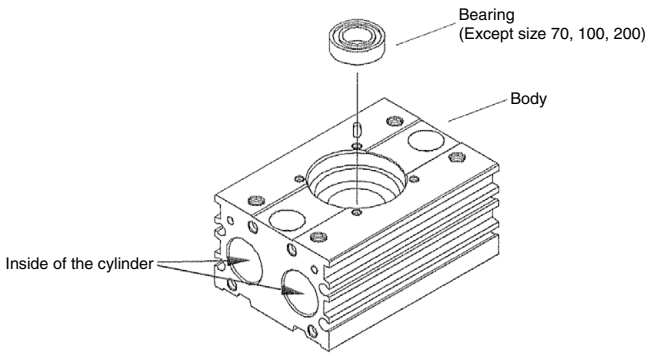


Fig. 2

Piston assembly
Pay attention to the installation direction of the piston seal as the direction is specified.
Then mount the piston seal to the piston, taking care not to damage the piston seal.

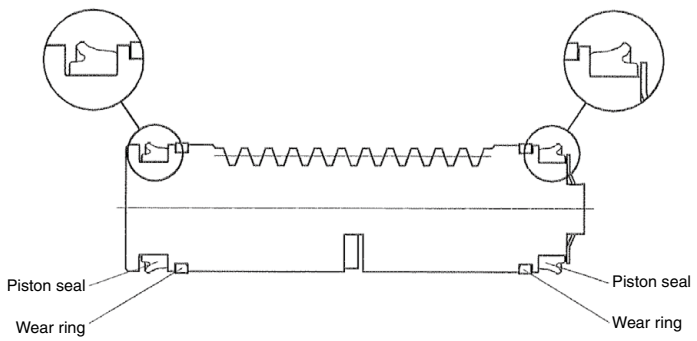


Fig. 3

Cover assembly

Size 10, 20, 30, 50

Size 70, 100, 200

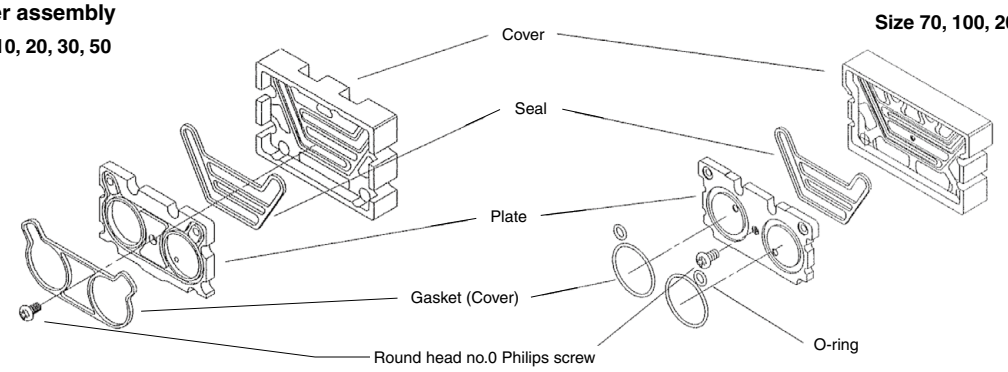
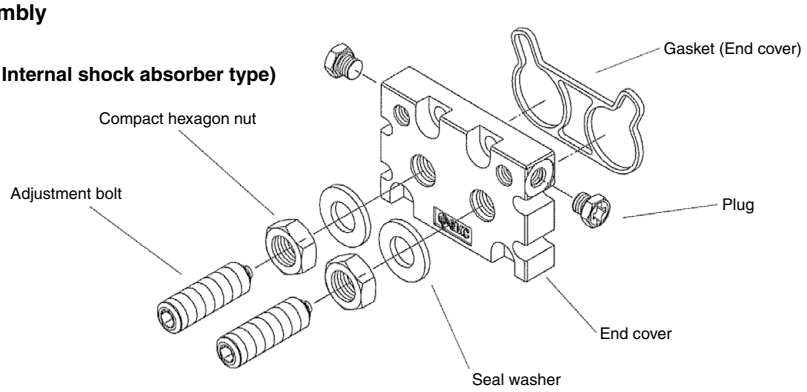


Fig. 4

End cover assembly

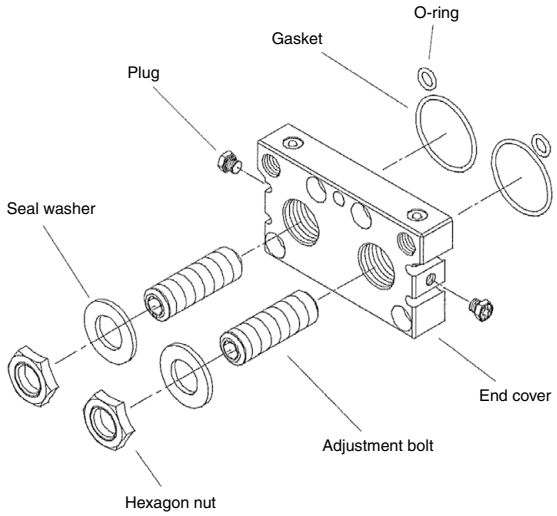
Size 10, 20, 30, 50

(Adjustment bolt, Internal shock absorber type)



Size 70, 100, 200

(Adjustment bolt, Internal shock absorber type)



Size 10, 20, 30, 50

(External shock absorber type)

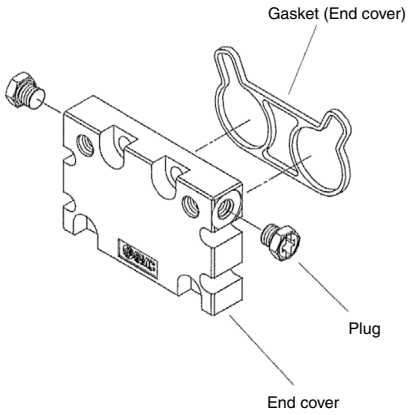
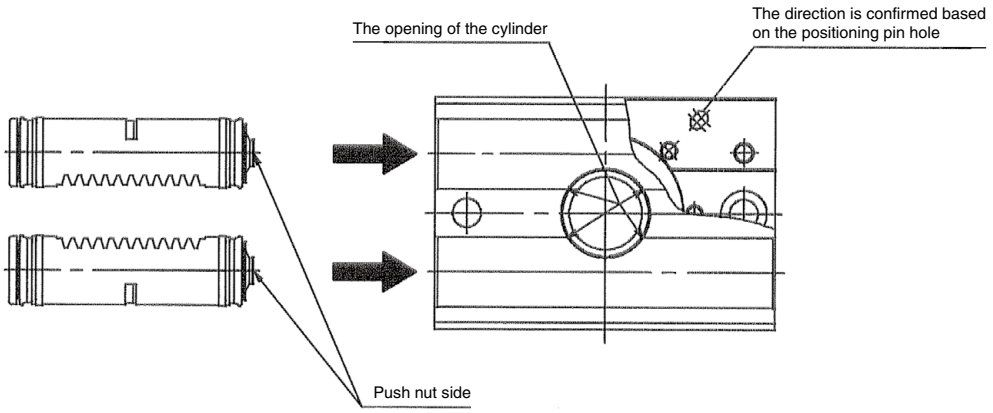


Fig. 5

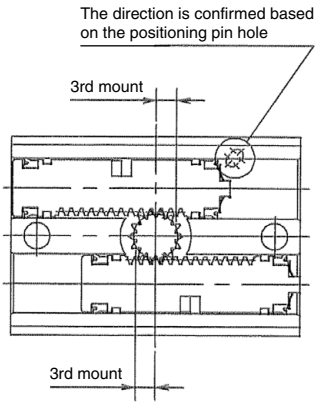
2-2. Insert the piston assembly into the body assembly. In this case, the piston seals pass through the cylinder opening, so install the seals into the opening while squeezing them to prevent the seals from being damaged.
Pay attention to the insertion direction of the piston and the body as they are specified. (Fig. 6)

Fig. 6

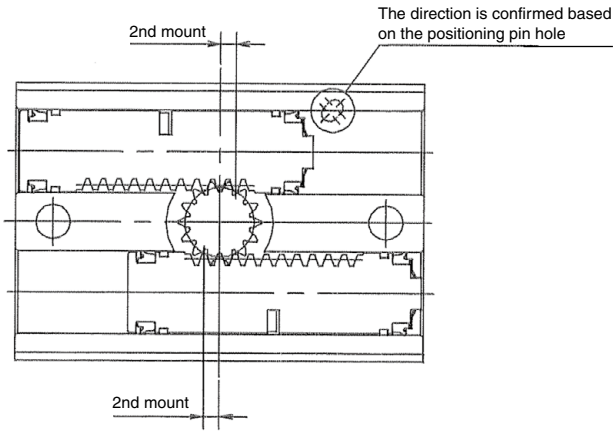


2-3. Hold the piston in place and install the pinion gear on the piston.
Fig. 7 shows the piston position and Fig. 8 shows the pinion gear assembly angle.

Fig. 7

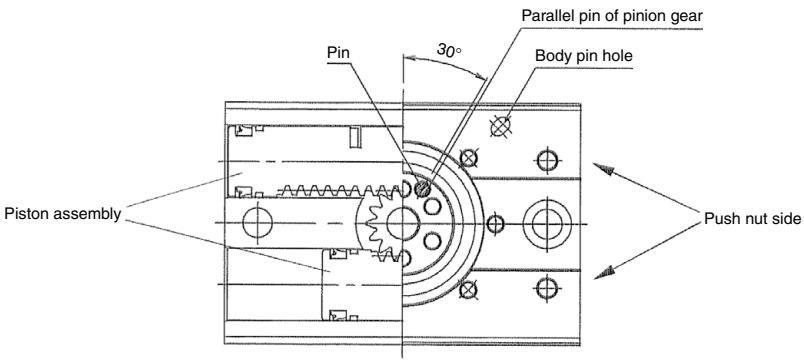


Size 10

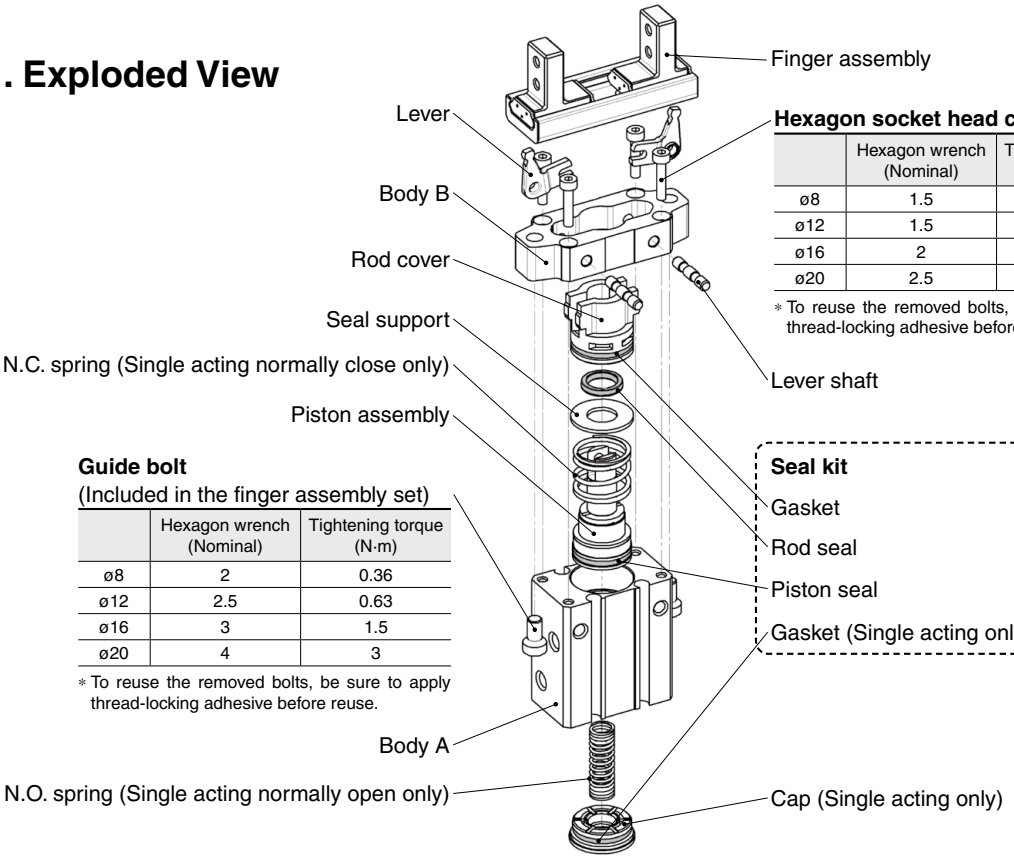


Size 20, 30, 50, 70, 100, 200

Fig. 8



1. Exploded View



Hexagon socket head cap screws

	Hexagon wrench (Nominal)	Tightening torque (N·m)
ø8	1.5	0.18
ø12	1.5	0.18
ø16	2	0.36
ø20	2.5	0.63

∗ To reuse the removed bolts, be sure to apply thread-locking adhesive before reuse.

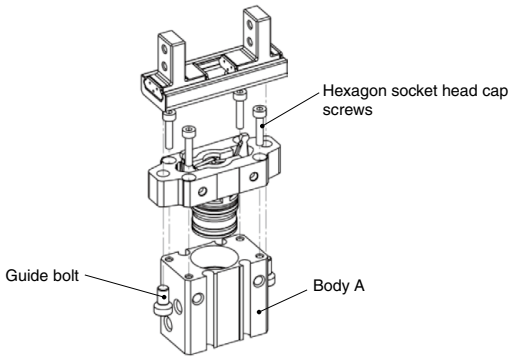
Guide bolt
(Included in the finger assembly set)

	Hexagon wrench (Nominal)	Tightening torque (N·m)
ø8	2	0.36
ø12	2.5	0.63
ø16	3	1.5
ø20	4	3

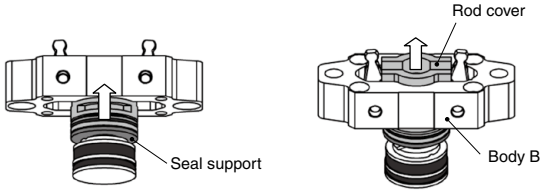
∗ To reuse the removed bolts, be sure to apply thread-locking adhesive before reuse.

2. Replacement of the Seal

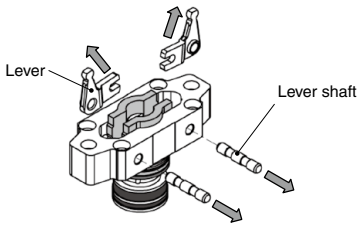
2-1. Loosen the guide bolts, and then remove the finger assembly.
2-2. Loosen the hexagon socket head cap screws, and then remove them from Body A.



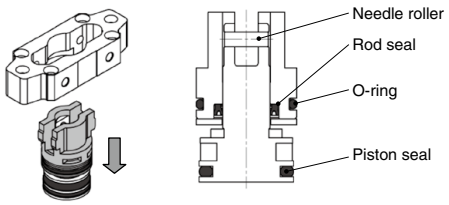
2-3. Push the seal support so that the rod cover comes out of Body B end surface.



2-4. Remove the lever shaft and lever.



2-5. Pull out the rod cover and piston assembly, and then replace the seal.



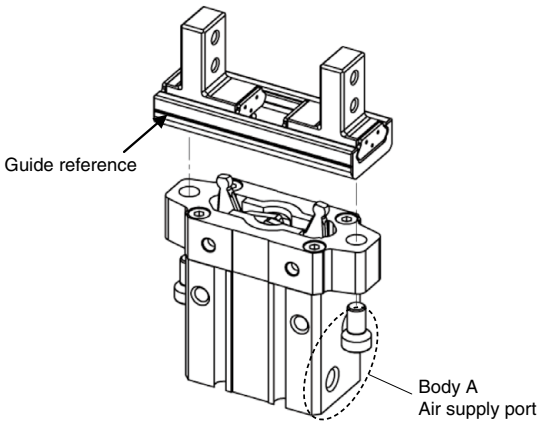
Assembly should be performed by following the removal procedure in reverse.
Refer to the disassembly drawing for the tightening torque for the bolt.
Use a specified grease.
Grease pack part no: GR-S-010 (10 g)

3. Finger Assembly Set Replacement

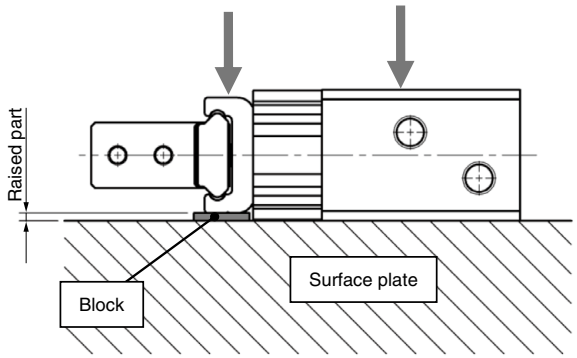
3-1. Direction of the body of the drawing on the right is recommended for mounting the finger assembly to the body.

⚠Caution

For ø8, use a hexagon wrench with a ball end. Mount the finger assembly and Body A with care so that the guide bolts do not interfere with Body A.



3-2. The guide may be displaced during tightening of the guide bolts. In order to avoid this displacement, place the guide and Body A on a flat surface and insert a spacer to fill the gap between the surface and guide (with reference line face down).



With across flat of the guide bolt and tightening torque

	Width across flats (Nominal)	Tightening torque (N·m)	Spacer size required (mm)
ø8	2	0.36	1.7
ø12	2.5	0.63	1.2
ø16	3	1.5	1.2
ø25	4	3	2.4

∗ To reuse the removed bolts, be sure to apply thread-locking adhesive before reuse.

1. Exploded View

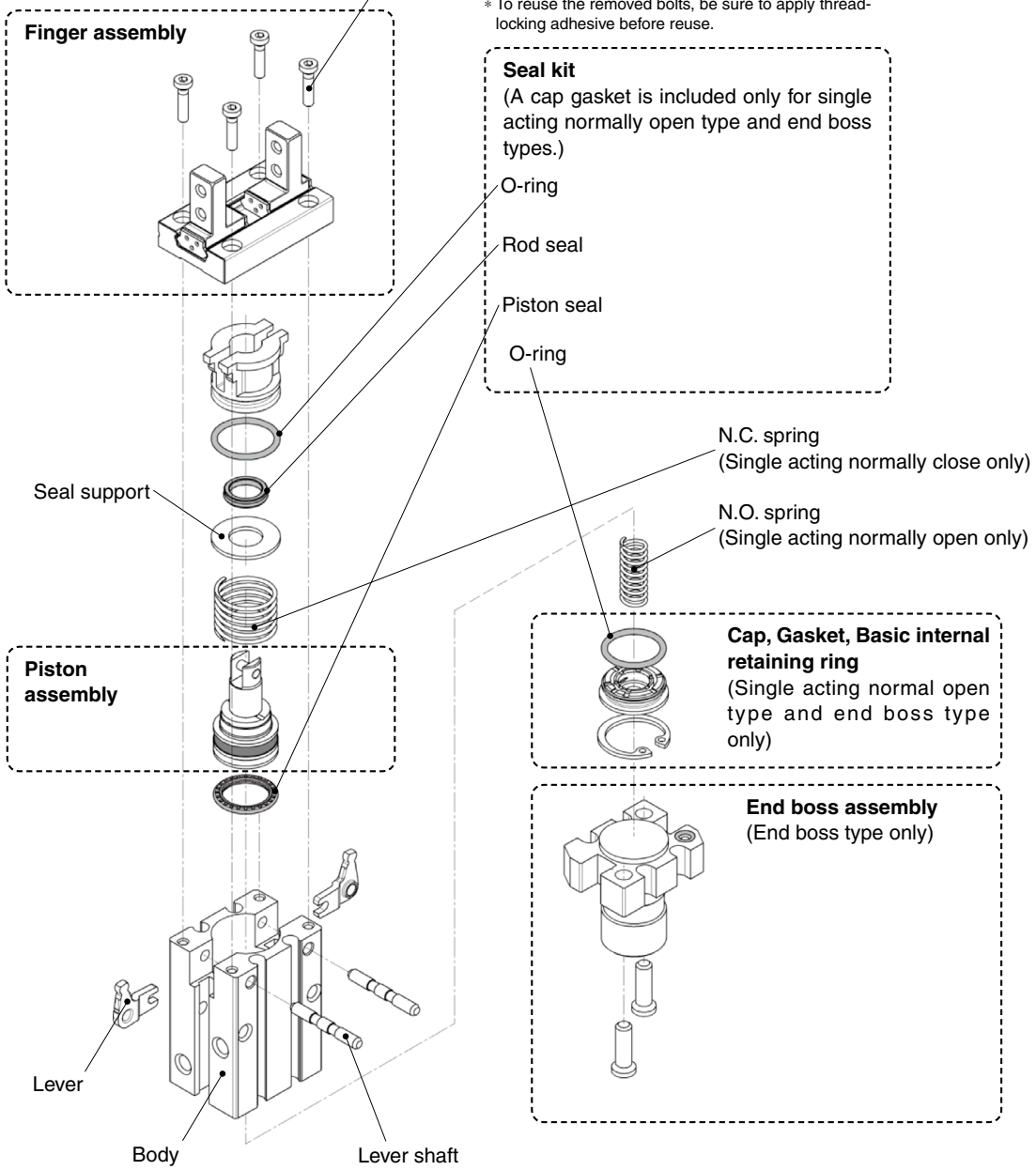
MHZ2 Series

ø10 to ø25

Guide bolt

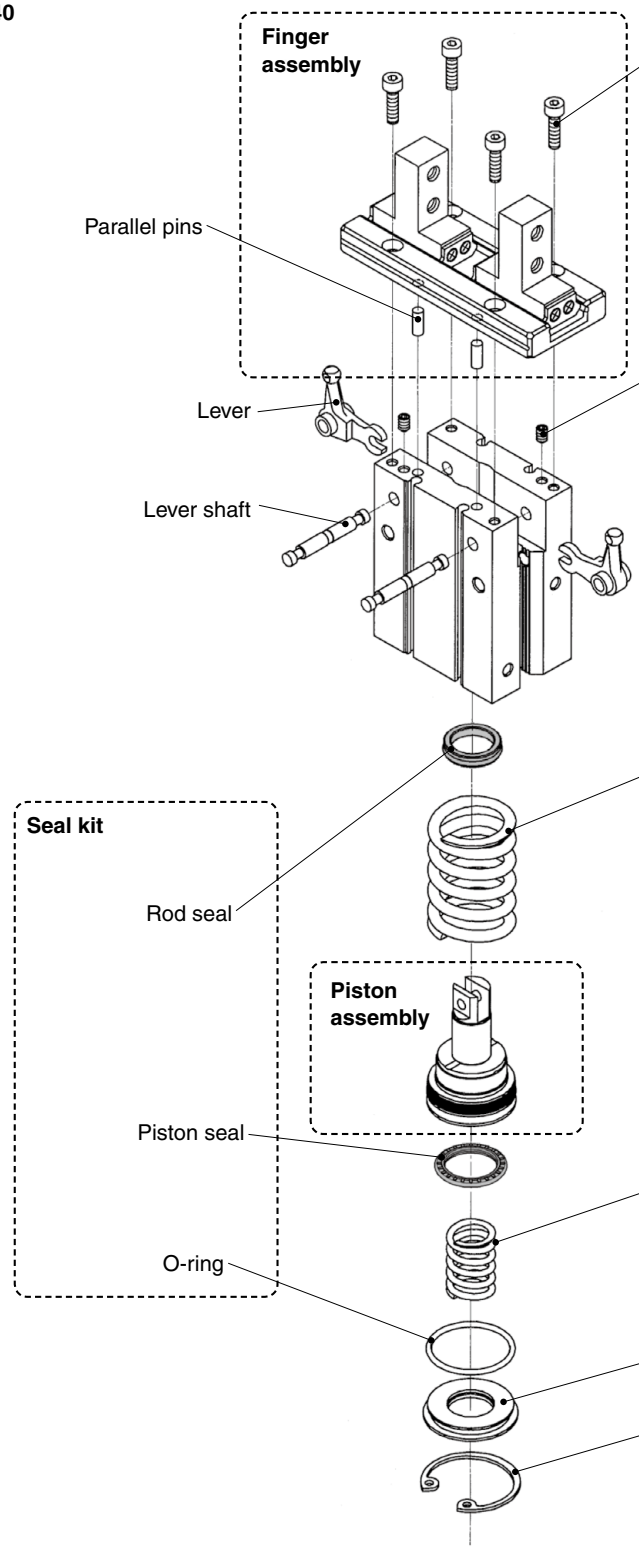
	Hexagon wrench (Nominal)	Tightening torque (N·m)
ø10	1.5	0.27
ø16	2	0.54
ø20	2.5	0.95
ø25	3	2.25

∗ To reuse the removed bolts, be sure to apply thread-locking adhesive before reuse.



MHZ2 Series

ø32, ø40



Guide bolt

	Hexagon wrench (Nominal)	Tightening torque (N·m)
ø32	3	1.37
ø40	4	2.84

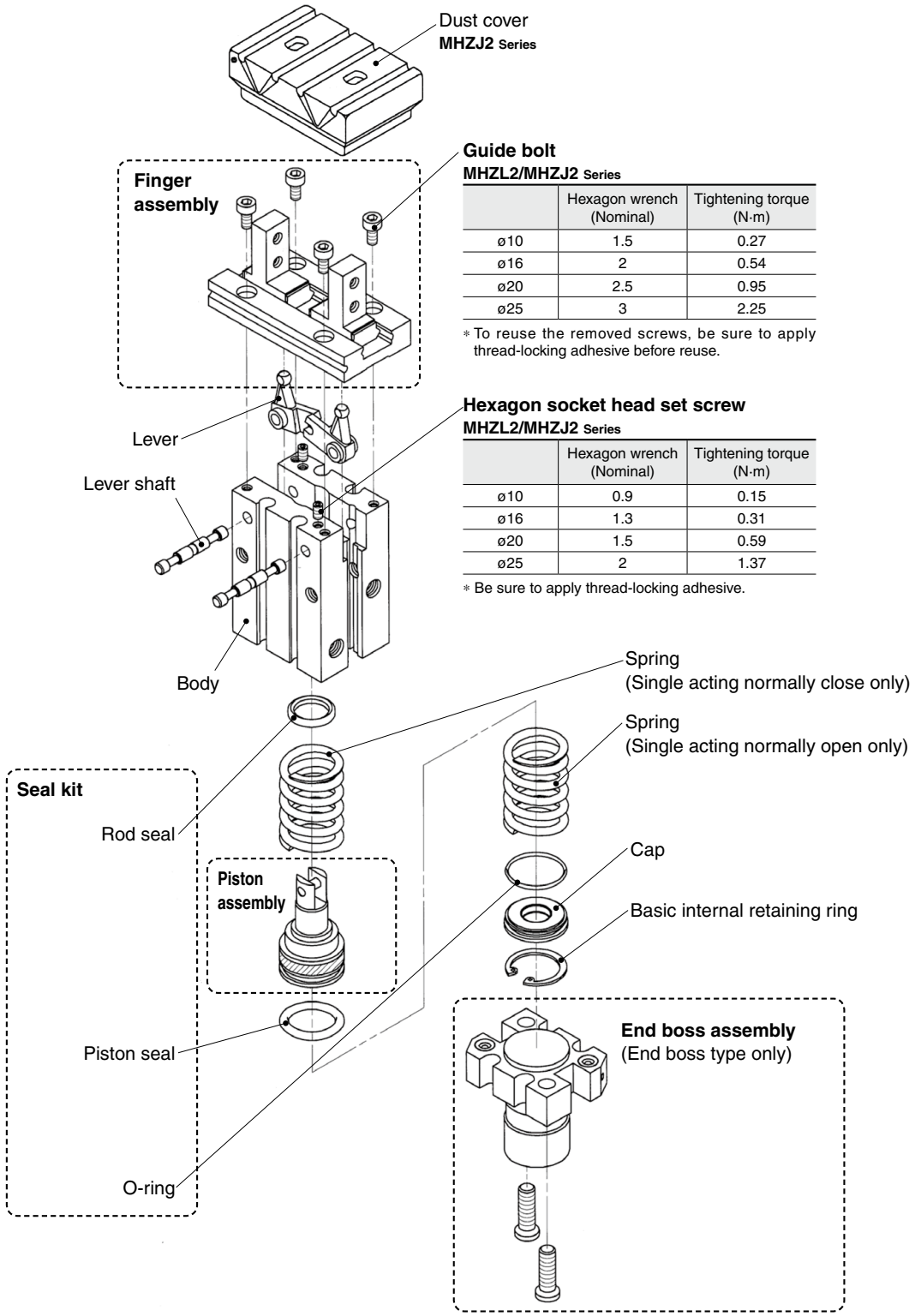
∗ To reuse the removed bolts, be sure to apply thread-locking adhesive before reuse.

Hexagon socket head set screw

	Hexagon wrench (Nominal)	Tightening torque (N·m)
ø32	2	1.37
ø40	2.5	2.84

∗ Be sure to apply thread-locking adhesive.

MHZL2/MHZJ2 Series



	Hexagon wrench (Nominal)	Tightening torque (N·m)
ø10	1.5	0.27
ø16	2	0.54
ø20	2.5	0.95
ø25	3	2.25

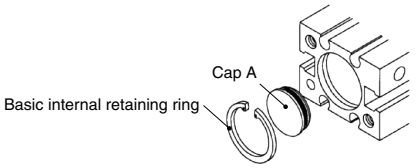
∗ To reuse the removed screws, be sure to apply thread-locking adhesive before reuse.

	Hexagon wrench (Nominal)	Tightening torque (N·m)
ø10	0.9	0.15
ø16	1.3	0.31
ø20	1.5	0.59
ø25	2	1.37

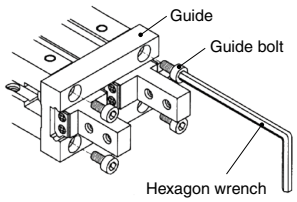
∗ Be sure to apply thread-locking adhesive.

2. Replacement of the Seal

2-1. Remove the basic internal retaining ring with the specified tool, and then remove the cap.



2-2. Loosen the guide bolts, and then remove the guide.



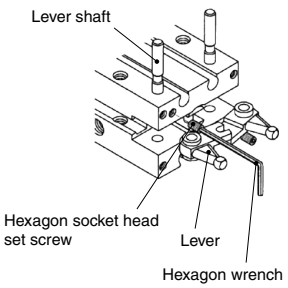
Hexagon wrench size

	Nominal
ø32	3
ø40	4

MHZL2/MHZJ2 Series
Hexagon wrench size

	Nominal
ø10	1.5
ø16	2
ø20	2.5
ø25	3

2-3. Loosen the guide bolts, and then pull out the lever shaft to move the lever.



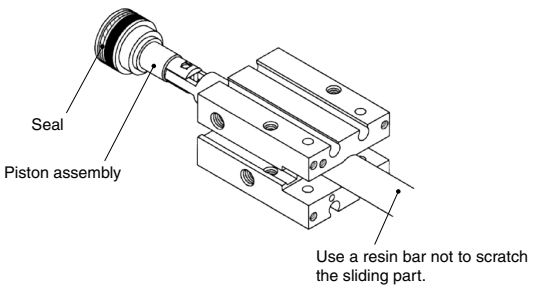
Hexagon wrench size

	Nominal
ø32	2
ø40	2.5

MHZL2/MHZJ2 Series
Hexagon wrench size

	Nominal
ø10	0.9
ø16	1.3
ø20	1.5
ø25	2

2-4. Remove the piston assembly, and then replace the seal.

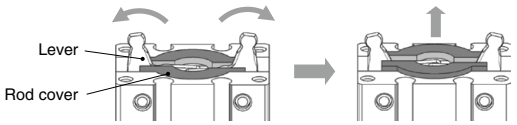


Assembly should be performed by following the removal procedure in reverse.
Refer to the disassembly drawing for the tightening torque for the guide bolt and hexagon socket head set screws.
Use a specified grease.
Grease pack part no: GR-S-010 (10 g)

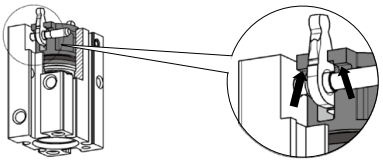
MHZ2 Series

ø10 to ø25

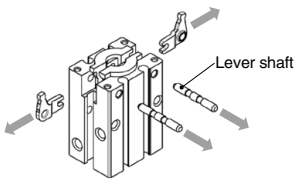
① Loosen the guide bolts, and then remove the finger assembly.
② Open the lever and have the rod cover come out of the body end surface.



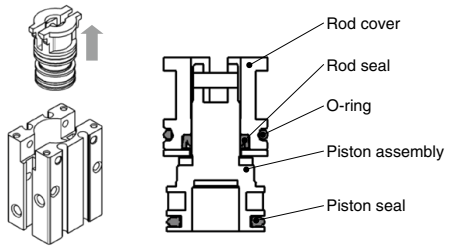
③ Push the protrusions of the rod cover to have the rod cover pop out.



④ Remove the lever shaft and lever.



⑤ Pull out the piston assembly, and then replace the seal.

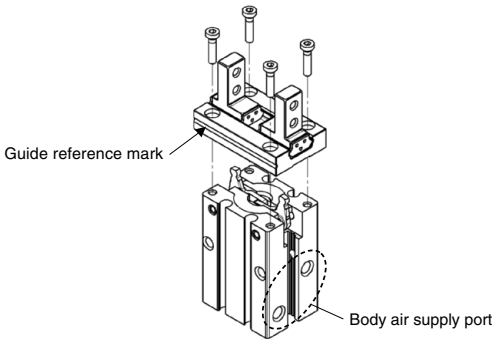


Assembly should be performed by following the removal procedure in reverse.
Refer to the disassembly drawing for the tightening torque for the guide bolt.
Use a specified grease.
Grease pack part no: GR-S-010 (10 g)
When the O-ring for single acting normal open type or end boss type cap is replaced, it is necessary to remove the basic internal retaining ring.

3. Finger Assembly Set Replacement

MHZ2/MHZL2/MHZJ2

3-1. Direction of the body of the drawing below is recommended for mounting the finger assembly to the body.



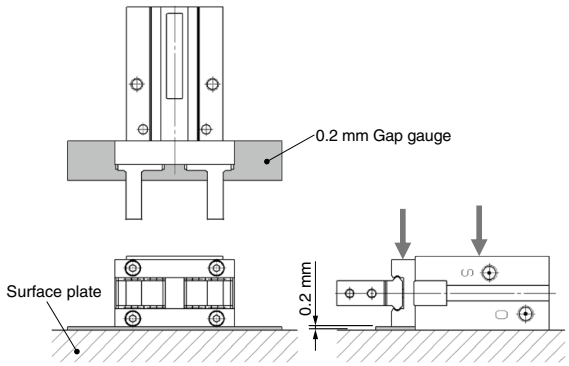
Note 1) The old model has the 2 positioning pins at the joint of the body and guide. These pins are not necessary. Please remove them.

Note 2) As the old MHZL2-16 model has a shallow screw depth, the current finger assembly cannot be mounted on the product. For mounting, please request servicing from the SMC factory.

3-2. The guide may be displaced during tightening of the guide bolts. In order to avoid the displacement, insert the 0.2 mm of gap gauge near the guide reference mark and press the guide and body to the surface plate.

With across flat of the guide bolt and tightening torque

	Width across flats (Nominal)	Tightening torque (N·m)
ø10	1.5	0.27
ø16	2	0.54
ø20	2.5	0.95
ø25	3	2.25

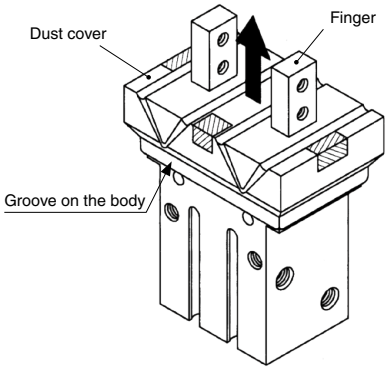


MHZJ2 Series

Replacement of the Dust Cover

<Removal of the Dust Cover>

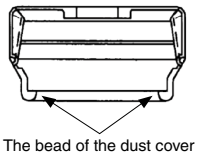
1. Hold the shaded regions indicated in the picture (▨) of the cover. Remove the dust cover from the body groove carefully.
2. When the bead of the dust cover is separated from the body groove, pull the shaded part in direction of the finger.
3. When all the bead of the dust cover is out of the body groove, pull the cover in direction shown by arrow to remove it from the air gripper.



<Mounting of the Dust Cover>

1. Put the dust cover on the finger.
2. Attach the dust cover to the groove of the finger.
3. Push the bead of the dust cover into the hole in the body groove.

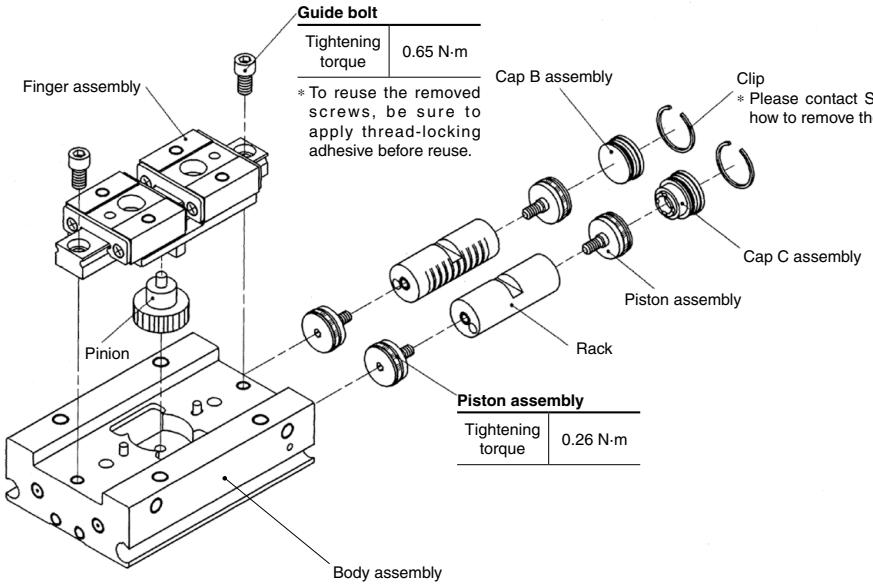
Note) Be careful not to tear the dust cover during mounting or removal of the dust cover. Also, be careful not to twist the finger.



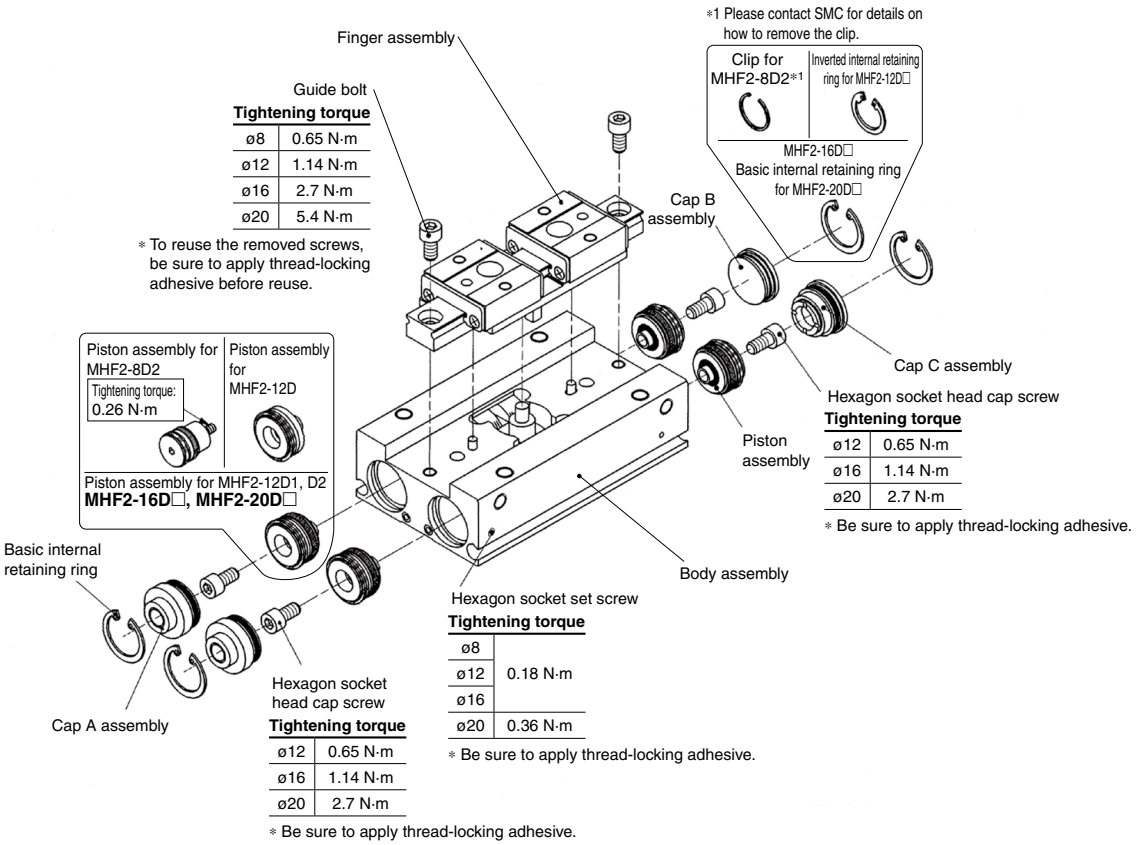
Cross section for the dust cover

1. Exploded View

Applicable model: MHF2-8D, MHF2-8D1



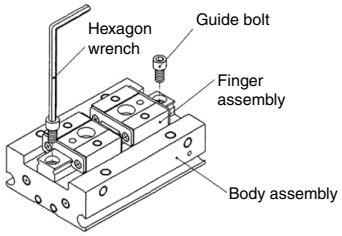
Applicable model: MHF2-8D2, MHF2-12D□ to 20D□



2. Replacement of the Seal

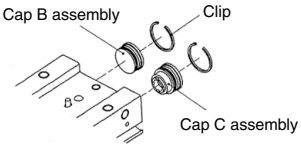
Applicable model: MHF2-8D, MHF2-8D1

2-1. Loosen the guide bolts, and then remove the finger assembly.

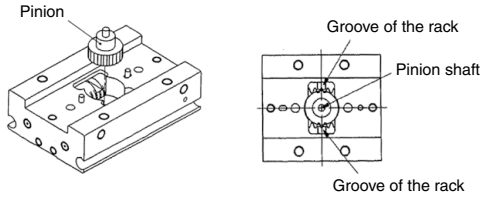


Hexagon wrench size	
	Nominal
ø8	2

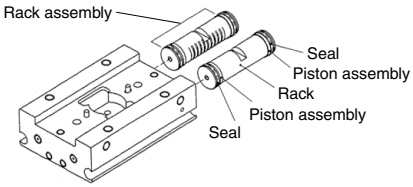
2-2. Remove the clips, cap B assemblies, and cap C assemblies.
* Please contact SMC for details on how to remove the clip.



2-3. Remove the pinion. (Make sure to align the groove of the rack and the pinion shaft when they are assembled.)



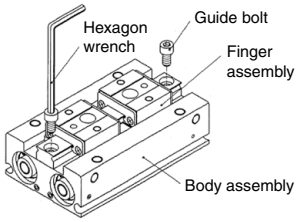
2-4. Remove the rack assembly, and then replace the seal.



Assembly should be performed by following the removal procedure in reverse.
Refer to the disassembly drawing for the tightening torque for the guide bolt.
Use a specified grease.
Grease pack part no For guide: GR-S-010 (10 g)**, For cylinder: GR-L-005** (5 g)

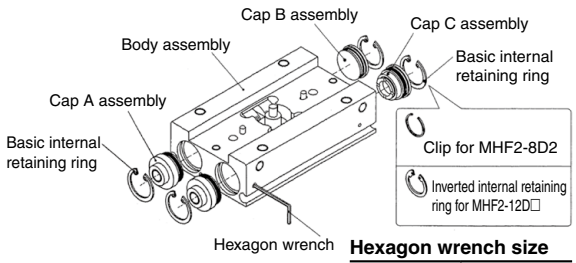
Applicable model: MHF2-8D2, MHF2-12D□ to 20D□

2-1. Loosen the guide bolts, and then remove the finger assembly.



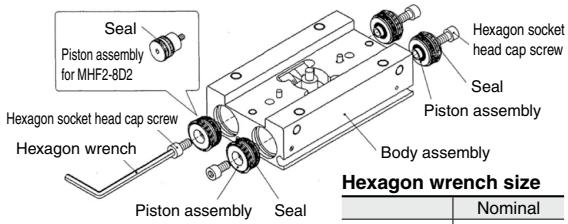
Hexagon wrench size	
	Nominal
ø8	2
ø12	2.5
ø16	3
ø20	4

2-2. Loosen the hexagon socket set screws to remove the ø8 clips, ø12 inverted internal retaining rings, ø16 and ø20 basic internal retaining ring, caps A, caps B and caps C.
* Please contact SMC for details on how to remove the clip.



Hexagon wrench size	
	Nominal
ø8	0.9
ø12	
ø16	
ø20	1.3

2-3. Loosen the hexagon socket head cap screws on the ø8 piston assemblies to remove the piston assembly, and then replace the seal. (Mounting direction of seals more than ø12 is specified.)



Hexagon wrench size	
	Nominal
ø8	1.5
ø12	2
ø16	2.5
ø20	3

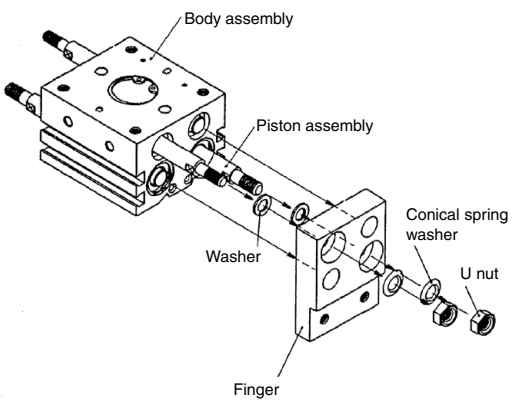


⚠Caution
Mounting direction of the seals more than ø12.

Assembly should be performed by following the removal procedure in reverse. Refer to the disassembly drawing for the tightening torque for the guide bolts, hexagon socket set screws, and hexagon socket head set screws.
Use a specified grease.
Grease pack part no For guide: GR-S-010 (10 g)**, For cylinder: GR-L-005** (5 g) or **GR-L-010** (10 g)

1. Replacement of the Piston Assembly

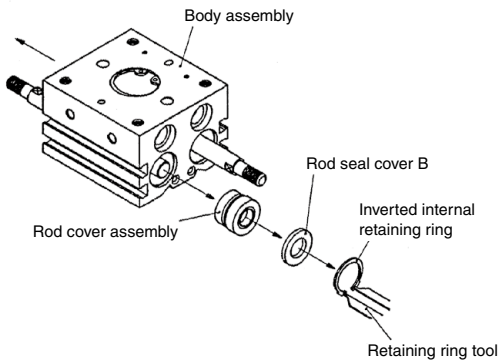
1-1. Loosen the U nut, and then remove the conical spring washer, finger, and washer.



1-2. Remove the inverted internal retaining ring with a retaining ring tool.

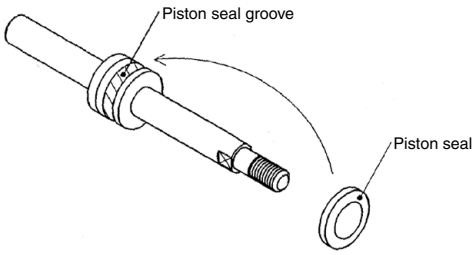
1-3. Remove rod seal cover B and the rod cover assembly.

1-4. Pull out the piston assembly.

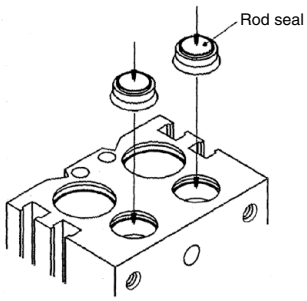


2. Replacement of the Seal Set

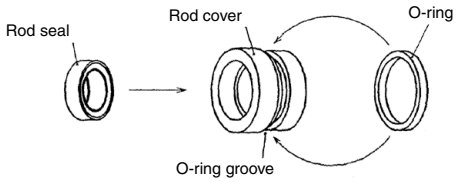
2-1. Replacement of the piston seal

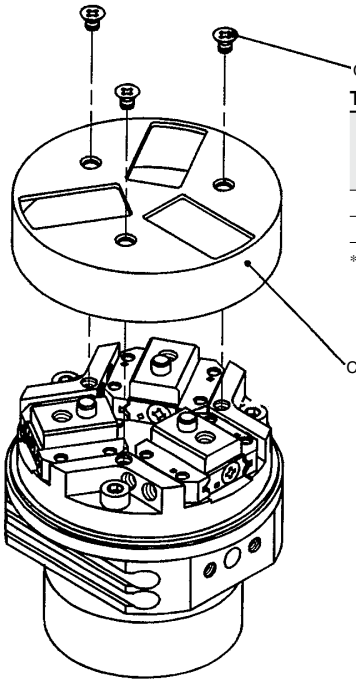


2-2. Replacement of the rod seal for the body rack



2-3. Replacement of the O-ring and the rod seal for the rod cover assembly





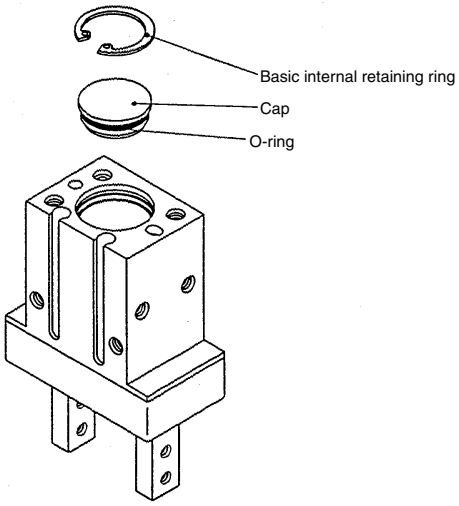
Tightening torque

	Bolt size	Tightening torque (N·m)
M(D)HR3-10□	M2 x 0.4	0.2
M(D)HR3-15□	M2.5 x 0.45	0.3

∗ Be sure to apply thread-locking adhesive.

1. Replacement of the Piston Assembly

1-1. Remove the basic internal retaining ring, the cap, and the O-ring.



1-2. Loosen the piston bolt with a hexagon wrench.

Hexagon wrench size

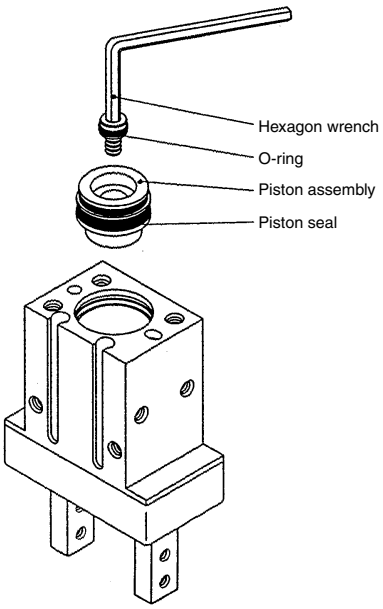
	Width across flats (mm)
ø12	2.5
ø16	2.5
ø20	2.5
ø25	4

1-3. Take out the piston assembly, and then replace the seal.

1-4. Follow this procedure backward for assembly.

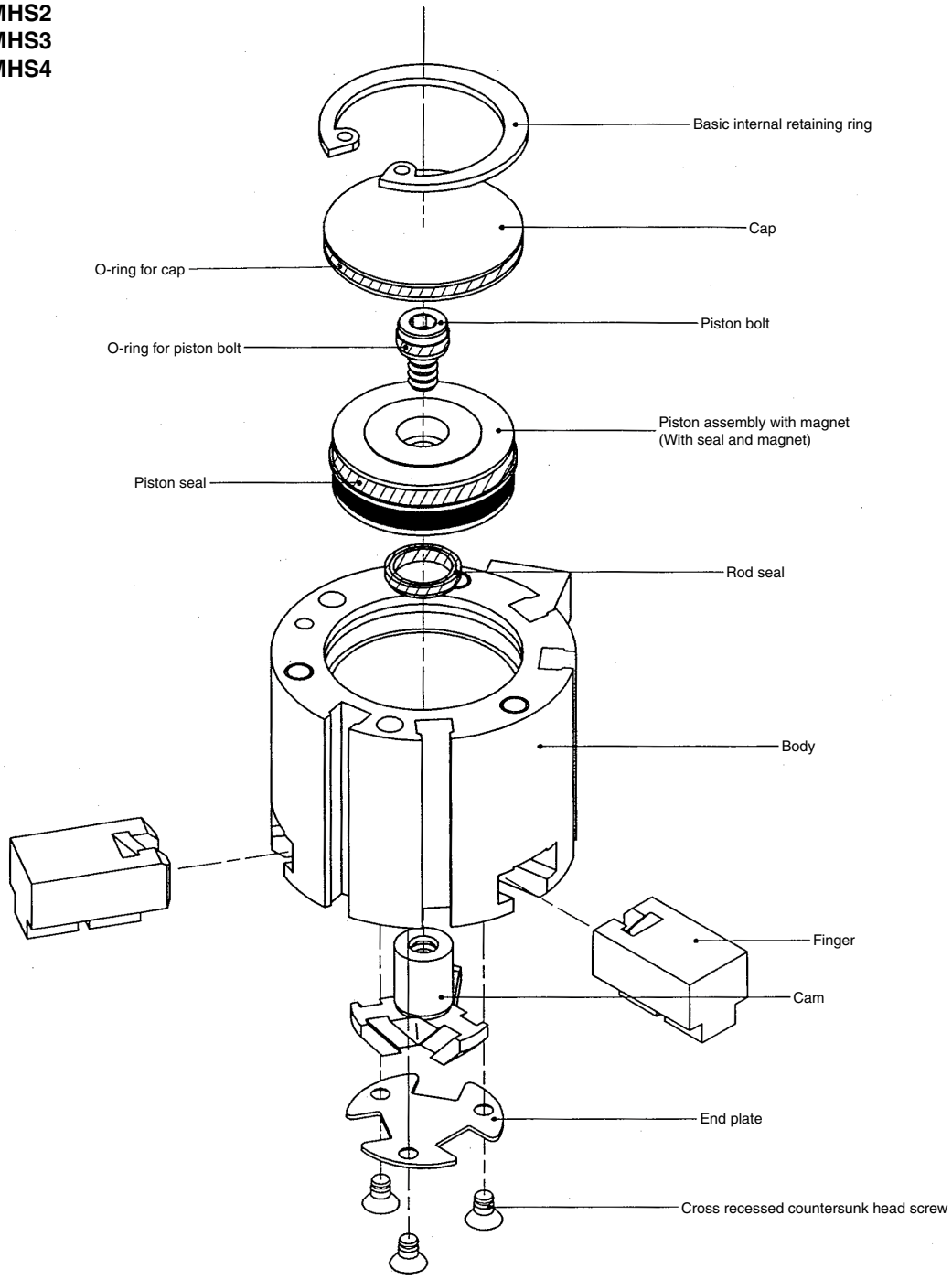
	Applicable bolt size	Width across flats	Tightening torque (N·m)
ø12	M3 x 0.5	2.5	0.9
ø16	M3 x 0.5	2.5	0.9
ø20	M3 x 0.5	2.5	0.9
ø25	M5 x 0.8	4	4.2

∗ Be sure to apply thread-locking adhesive.



1. Exploded View

MHS2
MHS3
MHS4

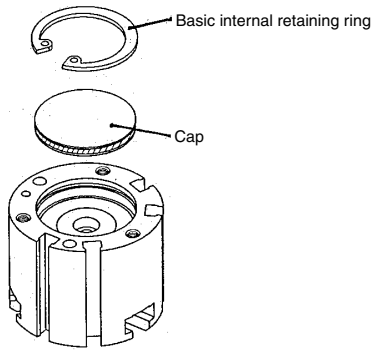


There are no major differences in construction between the MHS3 and the MHS2 and MHS4.
Disassemble while referring to the disassembly instructions for the MHS3.

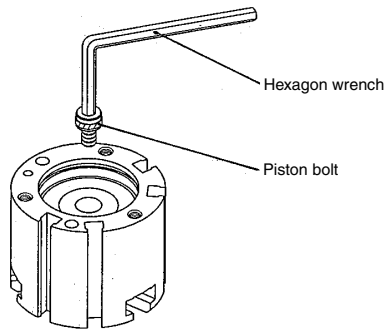
2. Replacement of the Seal

MHS3

2-1. Remove the basic internal retaining ring with the specified tool, and then remove the cap.



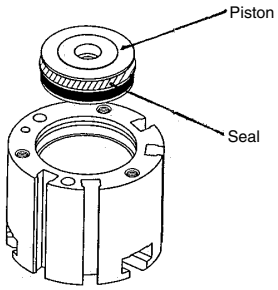
2-2. Remove the piston bolt.



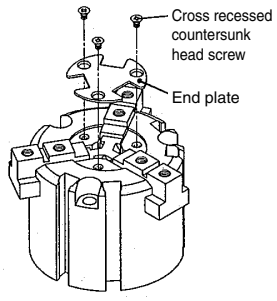
	Applicable bolt size	Hexagon width across flats	Tightening torque (N·m)
ø16	M3 x 0.5	2.5	0.6
ø20	M3 x 0.5	2.5	0.6
ø25	M4 x 0.7	3	1.4
ø32	M5 x 0.8	4	5.1
ø40	M5 x 0.8	4	5.1
ø50	M6 x 1	5	8.6
ø63	M8 x 1.25	6	21.6
ø80	M10 x 1.5	8	24
ø100	M12 x 1.75	10	42.2
ø125	M14 x 2	12	67.7

∗ Be sure to apply thread-locking adhesive.

2-3. Remove the piston, and then replace the seal.



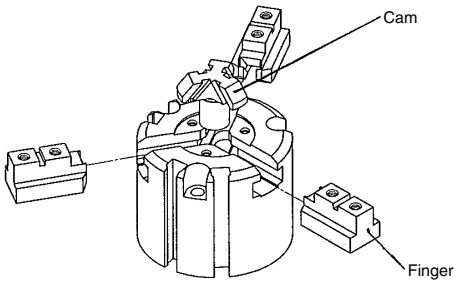
2-4. Unscrew the cross recessed countersunk head screws, and then remove the end plate.



	Bolt size	Tightening torque (N·m)
ø16	M2 x 0.4	0.2
ø20	M2 x 0.4	0.2
ø25	M2 x 0.4	0.2
ø32	M2 x 0.4	0.2
ø40	M3 x 0.5	0.6
ø50	M3 x 0.5	0.6
ø63	M3 x 0.5	0.6
ø80	M4 x 0.7	1.4
ø100	M4 x 0.7	1.4
ø125	M4 x 0.7	1.4

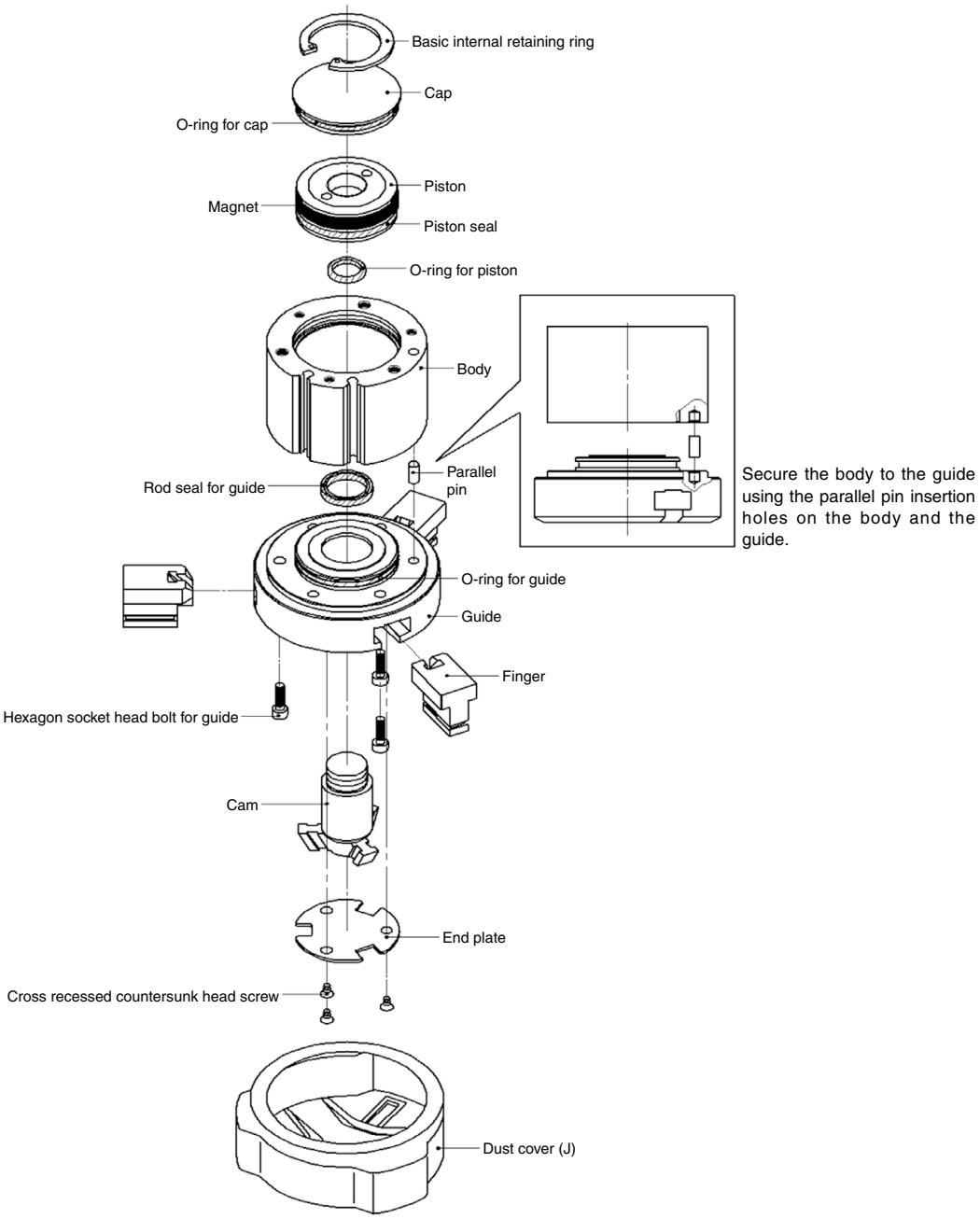
∗ Be sure to apply thread-locking adhesive.

2-5. Open fingers, and then remove the cam.



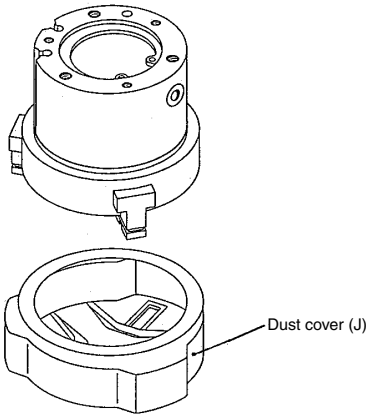
Assembly should be performed by following the removal procedure in reverse.
Use a specified grease.
Grease pack part no: MH-G01 (30 g)

1. Exploded View

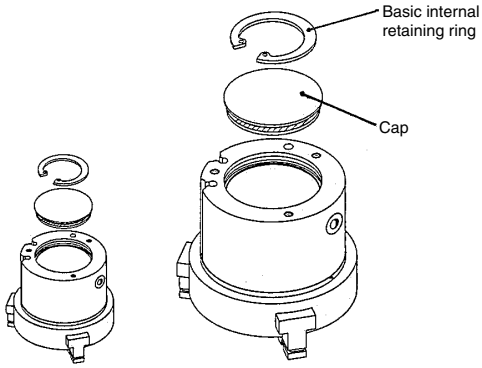


2. Replacement of the Seal

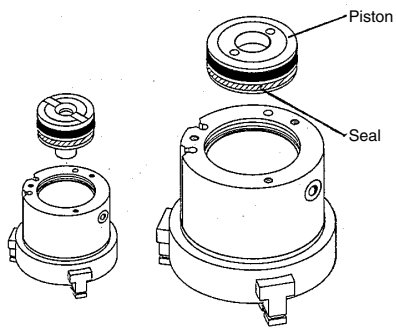
2-1. Remove dust cover (J).



2-2. Remove the basic internal retaining ring with the specified tool, and then remove the cap.

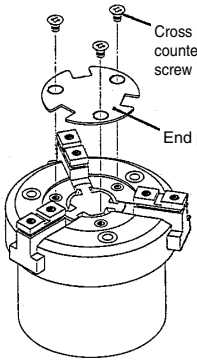


2-3. Using the specialized tool, remove the piston, and then replace the seal.



To remove the piston from the cam, one of SMC's specialized tools is required. Please contact SMC before disassembling the product.

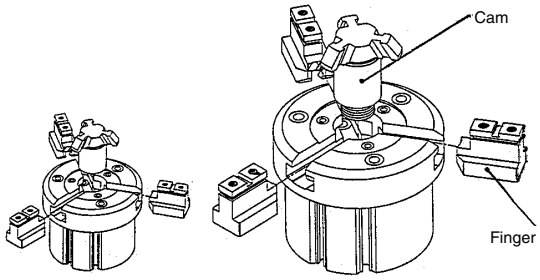
2-4. Unscrew the cross recessed countersunk head screws, and then remove the end plate.



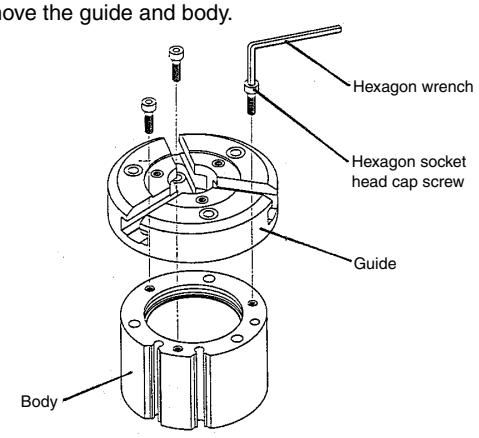
	Bolt size	Tightening torque (N·m)
ø16	M1.7 x 0.35	0.15
ø20	M2 x 0.4	0.2
ø25	M2 x 0.4	0.2
ø32	M2 x 0.4	0.2
ø40	M3 x 0.5	0.6
ø50	M3 x 0.5	0.6
ø63	M3 x 0.5	0.6
ø80	M4 x 0.7	1.4

∗ Be sure to apply thread-locking adhesive.

2-5. Open fingers, and then remove the cam.



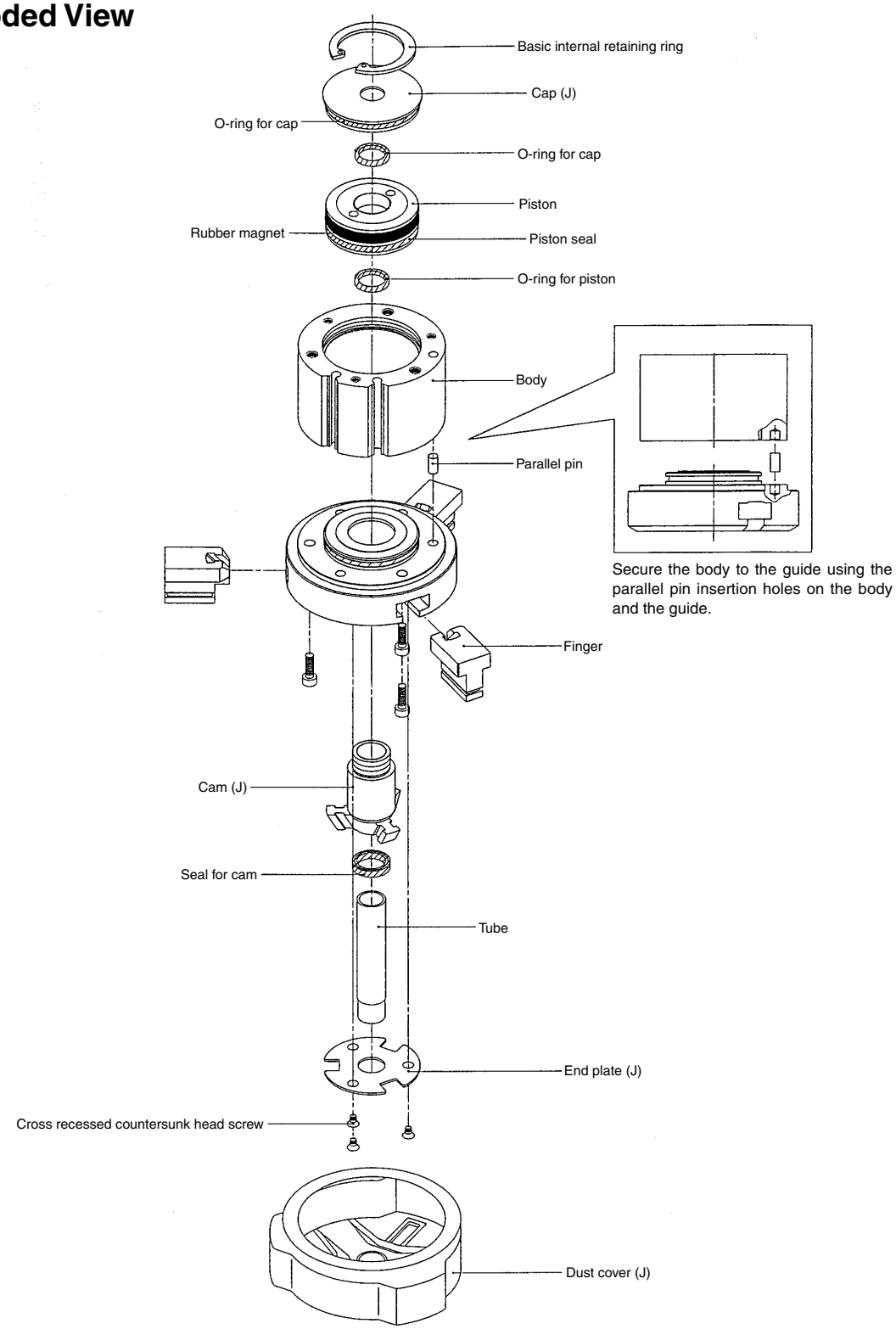
2-6. Loosen the hexagon socket head cap screw, and then remove the guide and body.



	Applicable bolt size	Hexagon width across flats	Tightening torque (N·m)
ø16	M2.5 x 0.45	2	0.3
ø20	M3 x 0.5	2.5	0.6
ø25	M3 x 0.5	2.5	0.6
ø32	M4 x 0.7	3	1.4
ø40	M4 x 0.7	3	1.4
ø50	M5 x 0.8	4	2.8
ø63	M5 x 0.8	4	2.8
ø80	M6 x 1	5	4.8

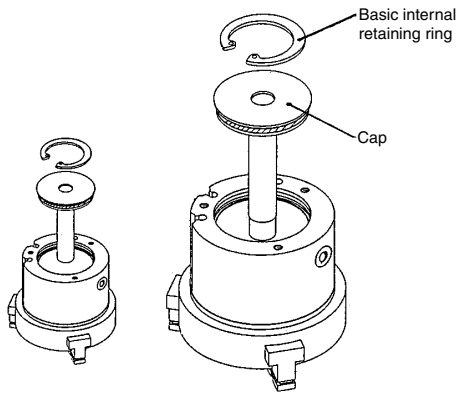
∗ Be sure to apply thread-locking adhesive.

1. Exploded View

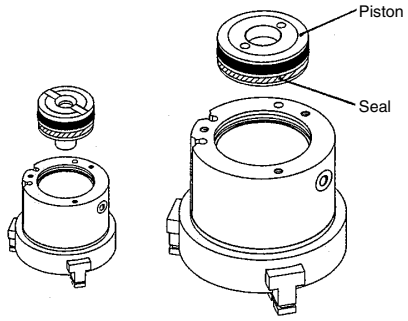


2. Replacement of the Seal

2-1. Remove the basic internal retaining ring with the specified tool, and then remove the cap. At the same time, pull the tube out.

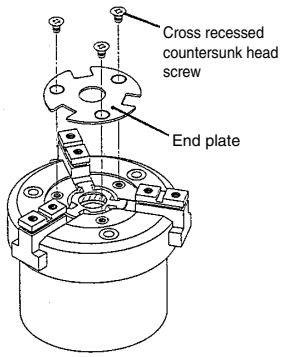


2-2. Using the specialized tool, remove the piston, and then replace the seal.



To remove the piston from the cam, one of SMC's specialized tools is required. Please contact SMC before disassembling the product.

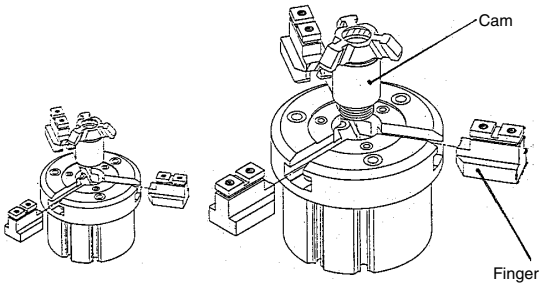
2-3. Unscrew the cross recessed countersunk head screws, and then remove the end plate.



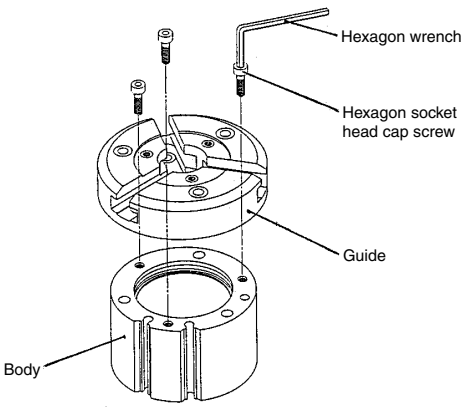
	Bolt size	Tightening torque (N·m)
ø16	M1.7 x 0.35	0.15
ø20	M2 x 0.4	0.2
ø25	M2 x 0.4	0.2
ø32	M2 x 0.4	0.2
ø40	M3 x 0.5	0.6
ø50	M3 x 0.5	0.6
ø63	M3 x 0.5	0.6
ø80	M4 x 0.7	1.4

∗ Be sure to apply thread-locking adhesive.

2-4. Open fingers, and then remove the cam.



2-5. Loosen the hexagon socket head cap screw, and then remove the guide and body.

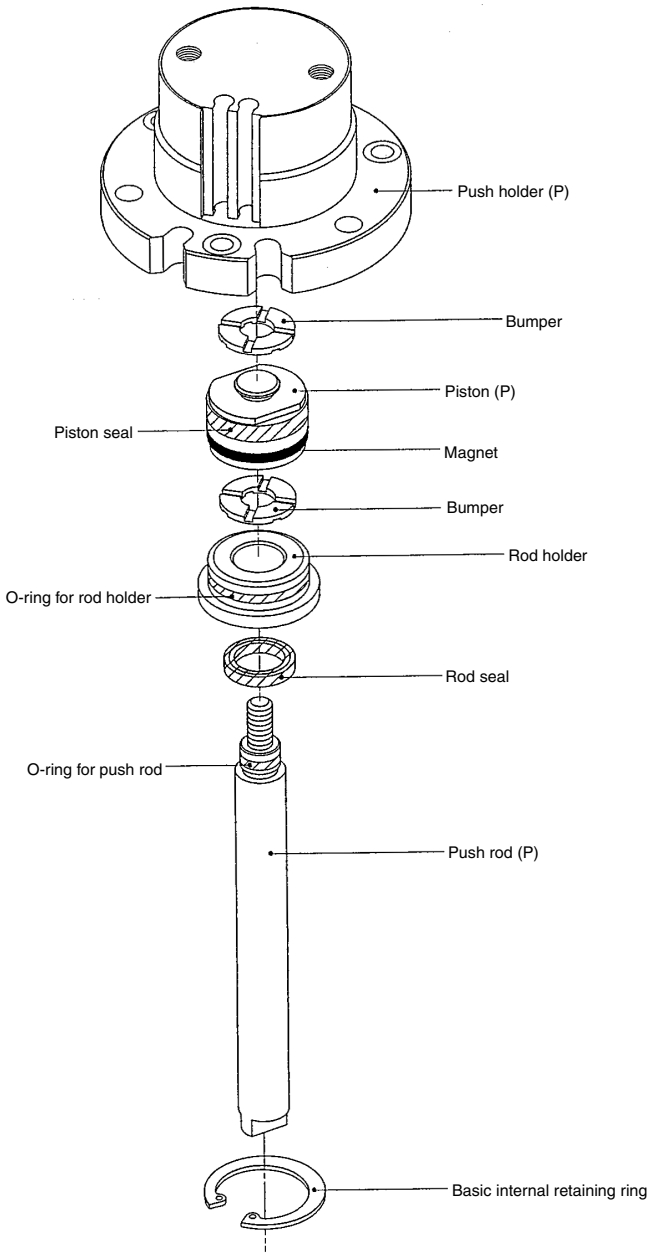


	Applicable bolt size	Hexagon width across flats	Tightening torque (N·m)
ø16	M2.5 x 0.45	2	0.3
ø20	M3 x 0.5	2.5	0.6
ø25	M3 x 0.5	2.5	0.6
ø32	M4 x 0.7	3	1.4
ø40	M4 x 0.7	3	1.4
ø50	M5 x 0.8	4	2.8
ø63	M5 x 0.8	4	2.8
ø80	M6 x 1	5	4.8

∗ Be sure to apply thread-locking adhesive.

1. Exploded View

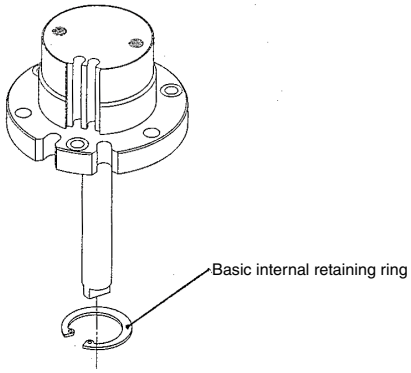
Center pusher/Cylinder type



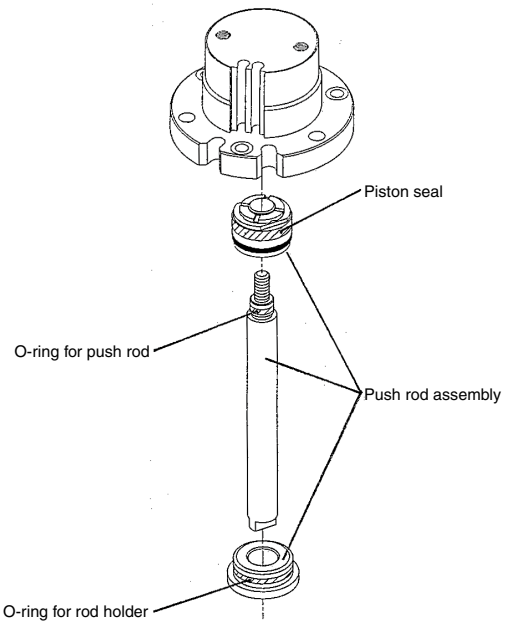
2. Replacement of the Seal

Center pusher/Cylinder type

2-1. Remove the basic internal retaining ring with the specified tool.

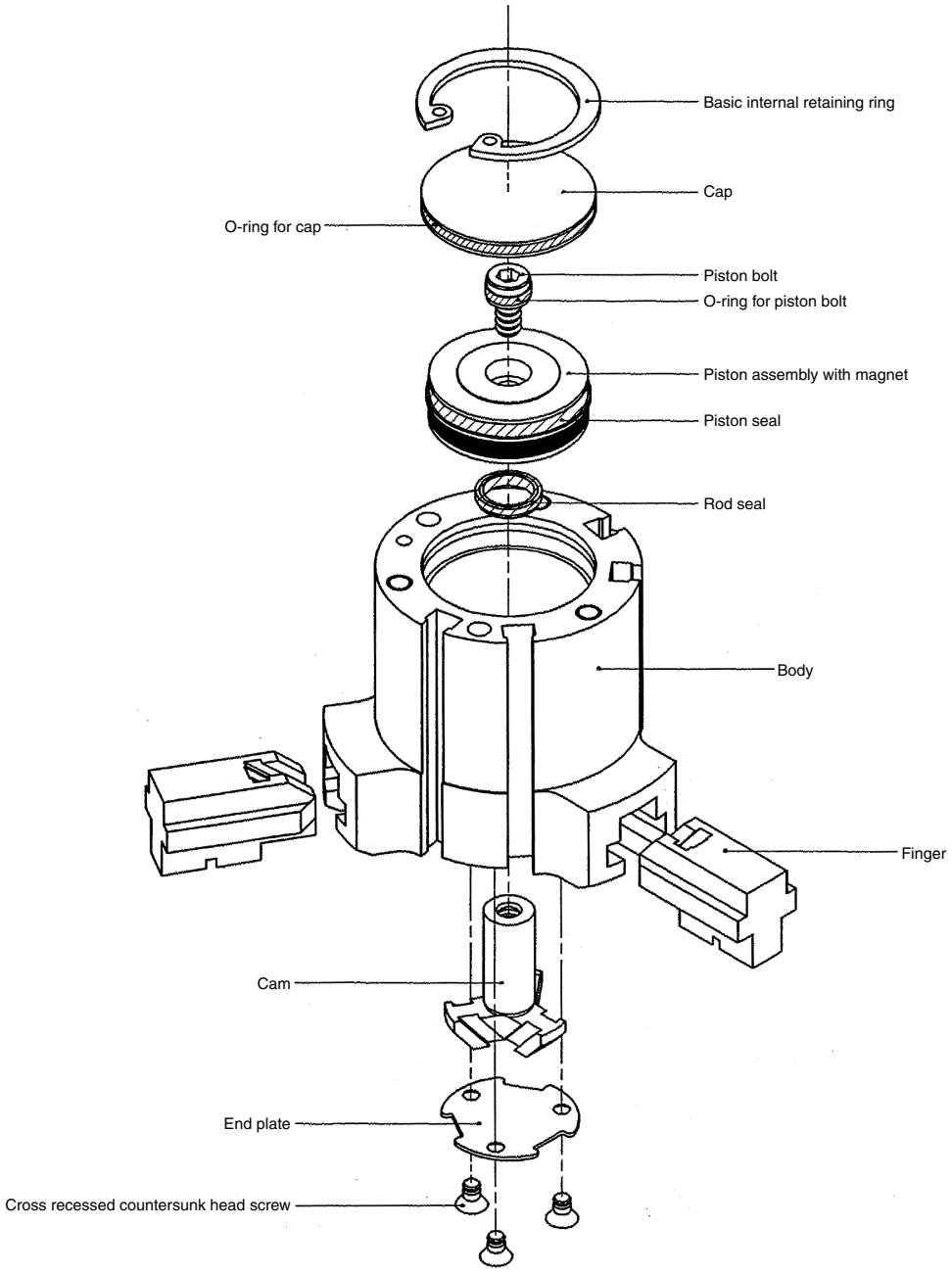


2-2. Take out the push rod assembly, and then replace the seal.



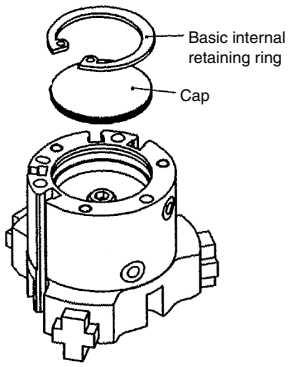
Assembly should be performed by following the removal procedure in reverse.
Refer to the disassembly drawing for the tightening torque for the guide bolt and hexagon socket head set screws.
This product uses a specialized grease. Please contact SMC for details.

1. Exploded View

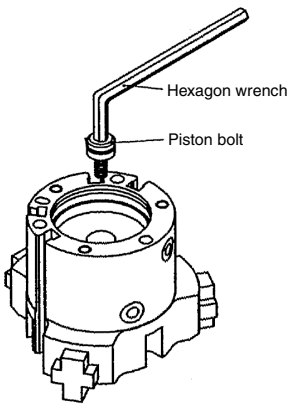


2. Replacement of the Seal

2-1. Remove the basic internal retaining ring with the specified tool, and then remove the cap.



2-2. Remove the piston bolt.

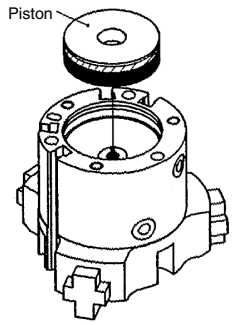


	Applicable bolts	Hexagon width across flats	Tightening torque (N·m)
ø16	M3 x 0.5	2.5	0.6
ø20	M3 x 0.5	2.5	0.6
ø25	M4 x 0.7	3	1.4
ø32	M5 x 0.8	4	5.1
ø40	M5 x 0.8	4	5.1
ø50	M6 x 1	5	8.6
ø63	M8 x 1	6	21.6
ø80	M10 x 1.5	8	24.0
ø100	M12 x 1.75	10	42.2
ø125	M14 x 12	12	67.7

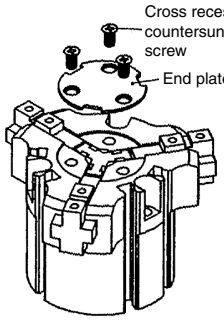
∗ Be sure to apply thread-locking adhesive.

Assembly should be performed by following the removal procedure in reverse.
Use a specified grease.
Grease pack part no: MH-G01 (30 g)

2-3. Remove the piston.



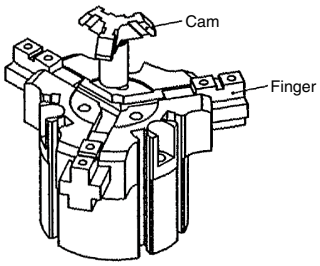
2-4. Unscrew the cross recessed countersunk head screws, and then remove the end plate.



	Bolt size	Tightening torque (N·m)
ø16	M2 x 0.4	0.2
ø20	M2 x 0.4	0.2
ø25	M2 x 0.4	0.2
ø32	M2 x 0.4	0.2
ø40	M3 x 0.5	0.6
ø50	M3 x 0.5	0.6
ø63	M3 x 0.5	0.6
ø80	M4 x 0.7	1.4
ø100	M4 x 0.7	1.4
ø125	M4 x 0.7	1.4

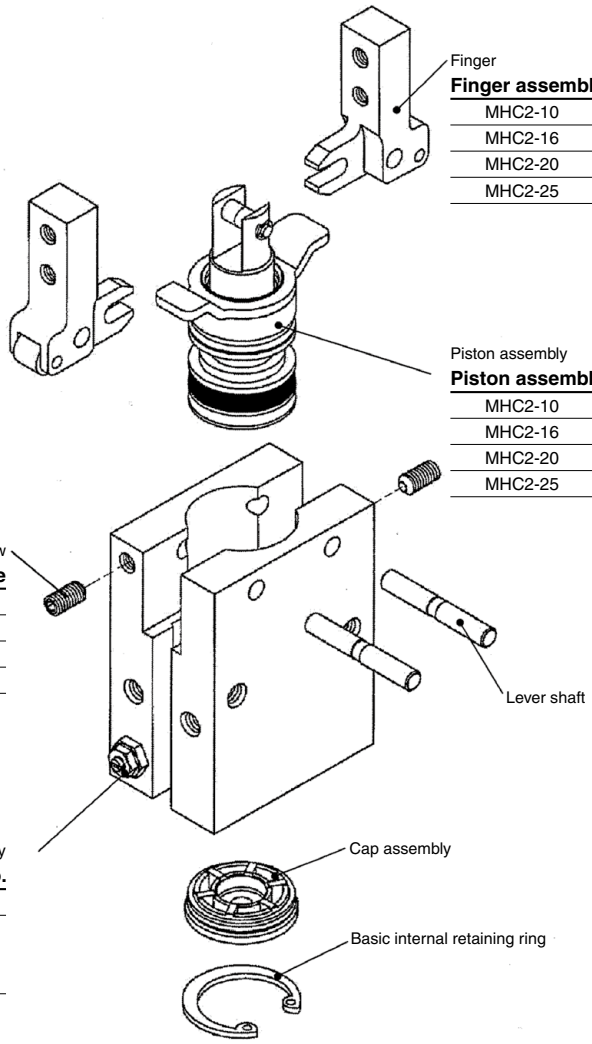
∗ Be sure to apply thread-locking adhesive.

2-5. Open fingers, and then remove the cam.



2-6. Replace each seal.

1. Exploded View



Finger

Finger assembly no.

MHC2-10	MHC-A1003
MHC2-16	MHC-A1603
MHC2-20	MHC-A2003
MHC2-25	MHC-A2503

Piston assembly

Piston assembly no.

MHC2-10	MHC-A1002
MHC2-16	MHC-A1602
MHC2-20	MHC-A2002
MHC2-25	MHC-A2502

Hexagon socket head set screw

	Tightening torque
MHC2-10	0.32 N·m
MHC2-16	0.6 N·m
MHC2-20	1.4 N·m
MHC2-25	2.9 N·m

∗ Be sure to apply thread-locking adhesive.

Needle assembly

Needle assembly no.	
MHC2-10	MH-A1006
MHC2-16	MH-A1606
MHC2-20	
MHC2-25	

∗ For the single acting normally open type, there is a spring that goes between the cap assembly and the piston assembly.

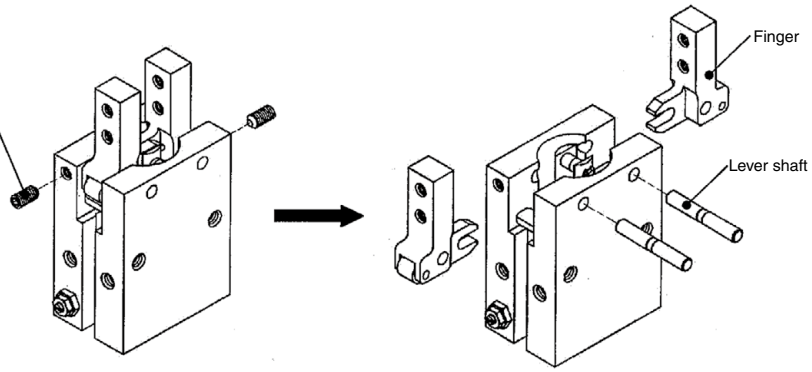
2. Replacement of the Seal

2-1. Loosen the hexagon socket set screw, pull out the lever shaft, and then remove the finger.

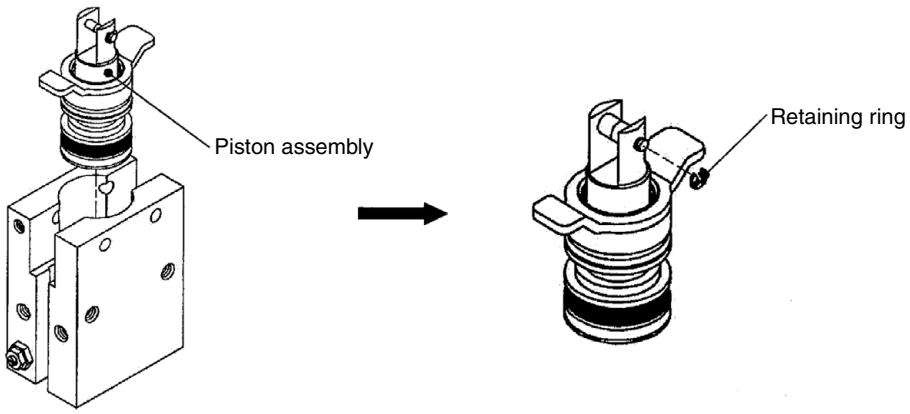
Hexagon socket set screw

Hexagon wrench size

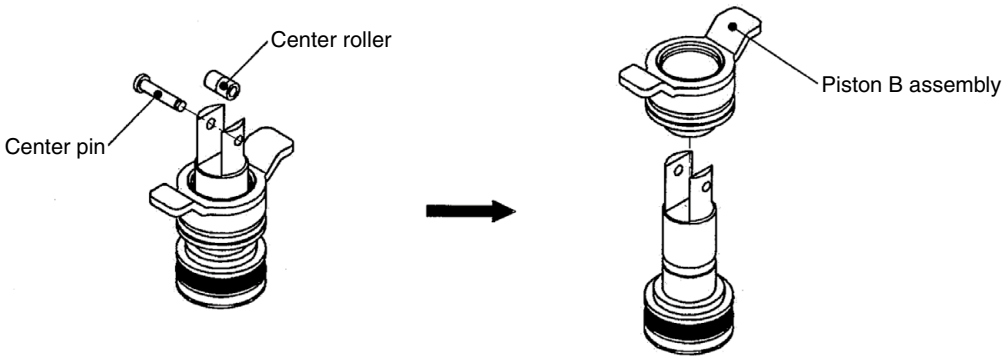
	Nominal
ø10	1.3
ø16	1.5
ø20	2
ø25	2.5



2-2. Take out the piston assembly, and then remove the E retaining ring with the specified tool.

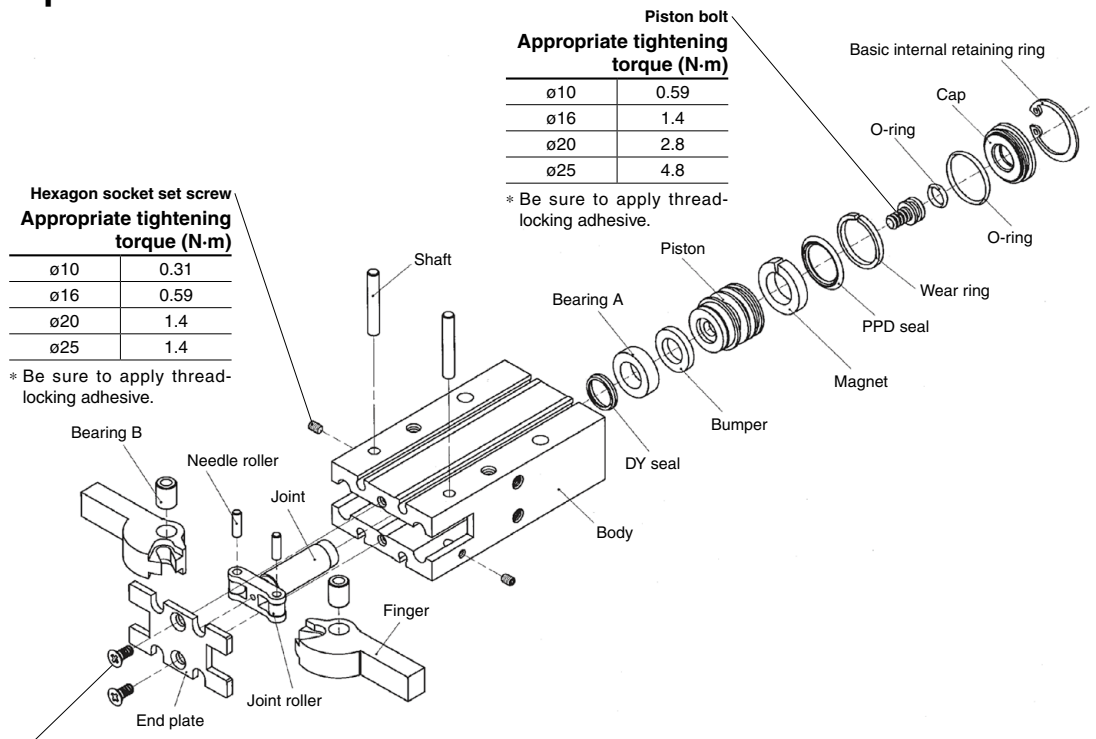


2-3. Remove the center pin, center roller, and piston B assembly, and then replace the seal.



· Assembly should be performed by following the removal procedure in reverse.
· Refer to the disassembly drawing for the tightening torque for the hexagon socket set screws.
· Use a specified grease. **Grease pack part no: GR-S-010** (10 g)

1. Exploded View



Piston bolt

Appropriate tightening torque (N·m)

ø10	0.59
ø16	1.4
ø20	2.8
ø25	4.8

∗ Be sure to apply thread-locking adhesive.

Hexagon socket set screw

Appropriate tightening torque (N·m)

ø10	0.31
ø16	0.59
ø20	1.4
ø25	1.4

∗ Be sure to apply thread-locking adhesive.

Cross-recessed and flat head machine screw

Appropriate tightening torque (N·m)

ø10	0.31
ø16	0.59
ø20	1.4
ø25	2.8

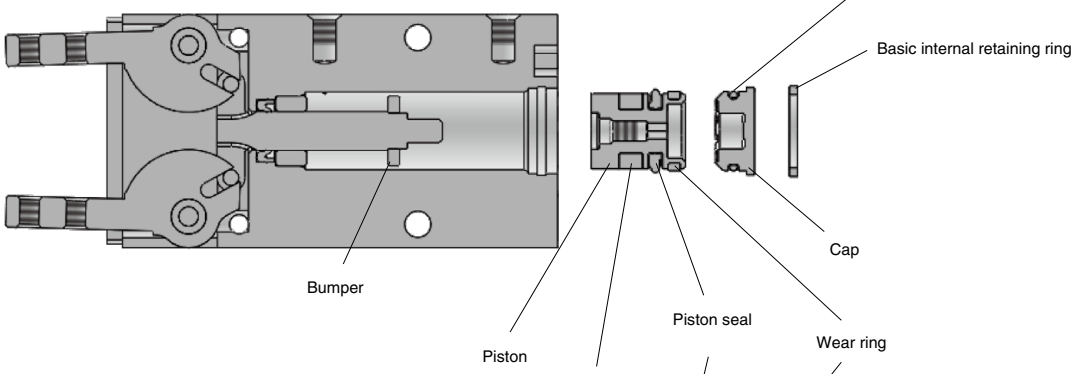
∗ Be sure to apply thread-locking adhesive.

2. Piston Seal and O-ring Replacement

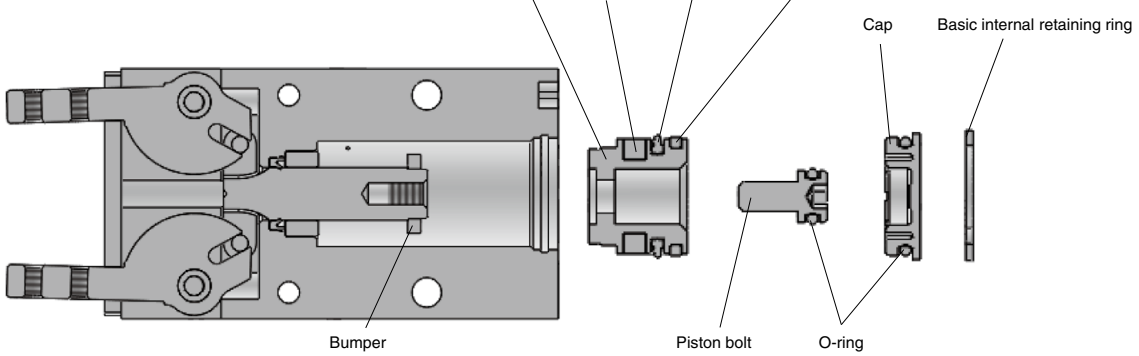
2-1. Remove the basic internal retaining ring with the specified tool, then remove the cap.
2-2. Loosen the piston bolt (piston) with a hexagon wrench.
2-3. Take out the piston assembly, and then replace the seal and the O-ring.
· Assembly should be performed by following the removal procedure in reverse. Confirm that the bumper is in the predetermined position.
· Refer to the disassembly drawing for the tightening torque for the piston bolt.
· Use a specified grease. **Grease pack part no: MH-G04** (30 g)

	Hexagon width across flats
ø10	2
ø16	3
ø20	4
ø25	5

ø10



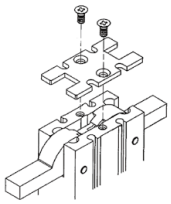
ø16 to ø25



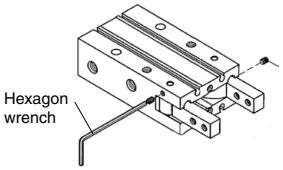
3. Replacement of the Rod Seal

3-1. Take out the piston assembly in the same manner as when replacing the piston seal.

3-2. Unscrew the cross recessed countersunk head screws, and then remove the end plate.

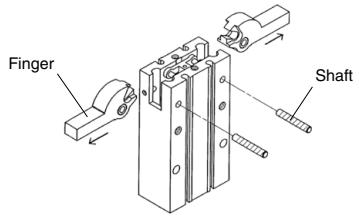


3-3. Loosen the hexagon socket head set screw with a hexagon wrench.

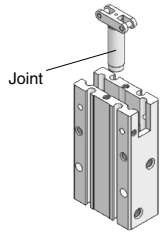


	Hexagon width across flats
ø10	2
ø16	3
ø20	4
ø25	5

3-4. Take out the shaft, and then remove the finger.

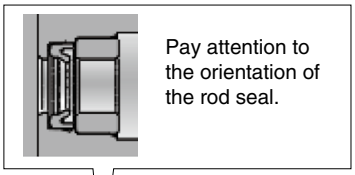


3-5. Pull the joint out.

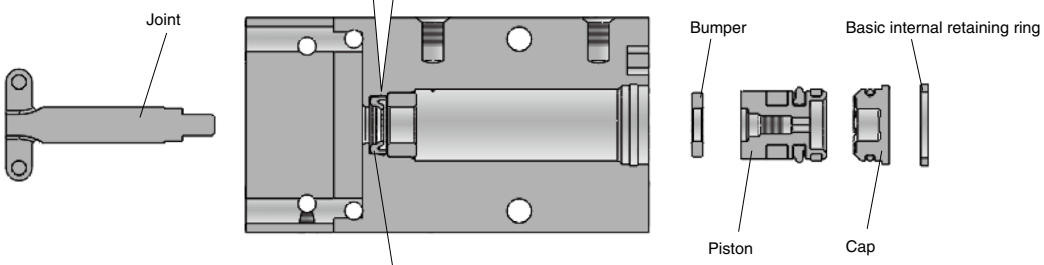


3-6. Replace the rod seal.
Pay attention to the orientation. (Refer to the cross section drawing.)

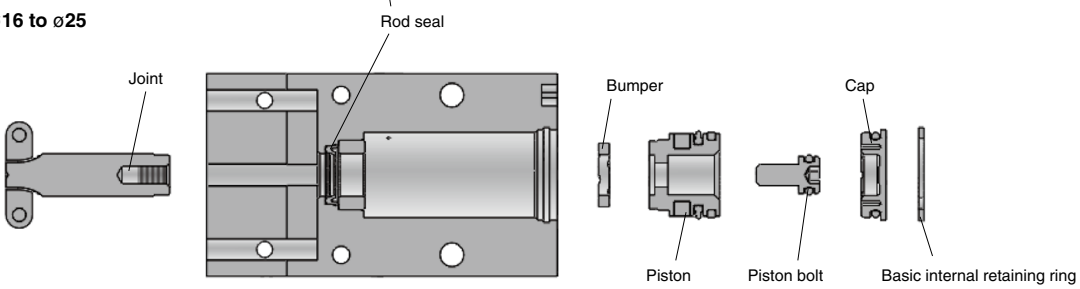
· Assembly should be performed by following the removal procedure in reverse.
After inserting the joint, mount the bumper in the predetermined position.
· Refer to the exploded view for the piston bolt (piston) and hexagon socket head set screw tightening torques.
· Use a specified grease.
Grease pack part no: MH-G04 (30 g)



ø10



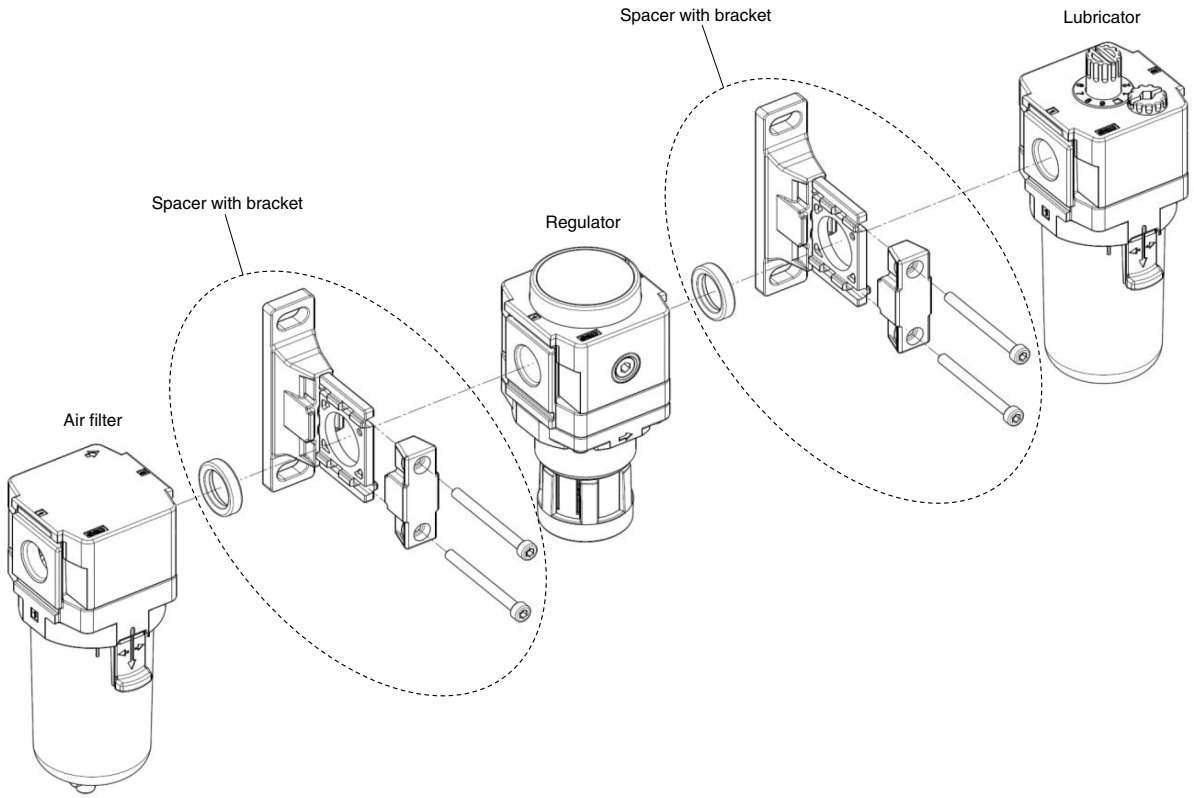
ø16 to ø25



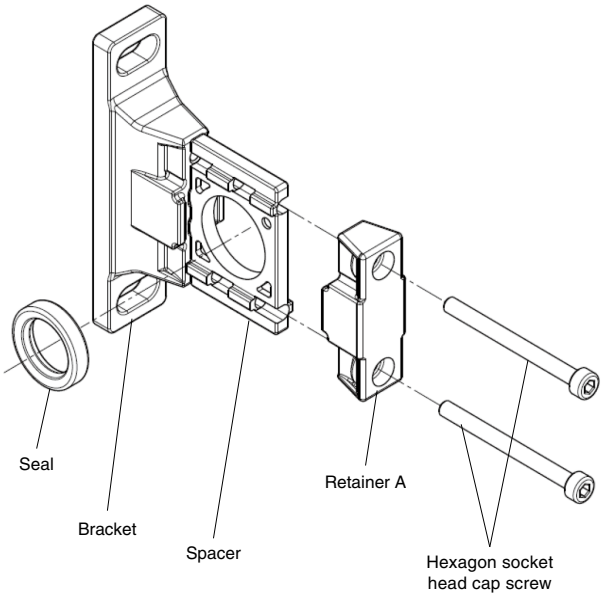
Replacement Procedure
Modular F.R.L. Pressure Control Equipment

AC-D	Air Combination	**p. 553**
AF20-D to AF60-D	Air Filter	**p. 556**
AFM20-D to AFM40-D	Mist Separator	**p. 563**
AFD20-D to AFD40-D	Micro Mist Separator	**p. 563**
AR20-D to AR60-D	Regulator	**p. 568**
AR20K-D to AR60K-D	Regulator with Backflow Function	**p. 568**
AR20M-D to AR40M-D	Common Supply Regulator	**p. 575**
AR20MK-D to AR40MK-D	Common Supply Regulator with Backflow Function	**p. 575**
AL20-D to AL60-D	Lubricator	**p. 581**
AW20-D to AW60-D	Filter Regulator	**p. 592**
AW20K-D to AW60K-D	Filter Regulator with Backflow Function	**p. 592**
AC-A	F.R.L. Units	**p. 608**
AF10-A to AF60-A	Air Filter	**p. 611**
AFM20-A to AFM40-A	Mist Separator	**p. 622**
AFD20-A to AFD40-A	Micro Mist Separator	**p. 624**
AR10-A to AR40-A	Regulator	**p. 630**
AR20-B to AR60-B	Regulator	**p. 635**
AR20K-B to AR60K-B	Regulator with Backflow Function	**p. 637**
AL10-A to AL60-A	Lubricator	**p. 642**
AW10-A to AW40-A	Filter Regulator	**p. 650**
AW20-B to AW60-B	Filter Regulator	**p. 666**
AW20K-B to AW60K-B	Filter Regulator with Backflow Function	**p. 669**
AWM20 to AWM40	Mist Separator Regulator	**p. 678**
AWD20 to AWD40	Micro Mist Separator Regulator	**p. 684**
ARG	Regulator with Built-in Pressure Gauge	**p. 690**
AWG	Filter Regulator with Built-in Pressure Gauge	**p. 696**
AR425 to 925	Pilot Operated Regulator	**p. 703**
AMR3000 to 6000	MR Unit (Regulator with Mist Separator)	**p. 707**
ARM5	Compact Manifold Regulator	**p. 708**
ARM10/11	Compact Manifold Regulator	**p. 712**

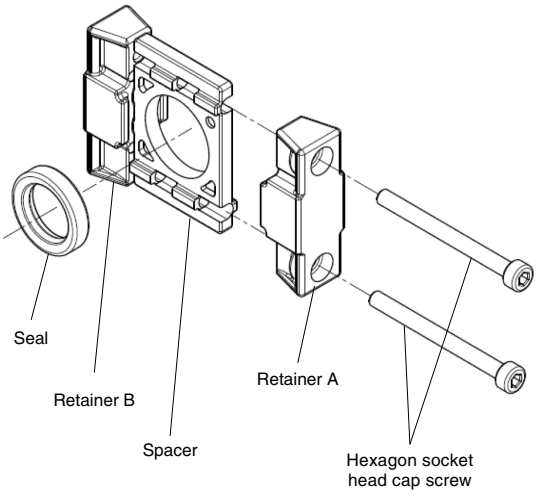
1) F.R.L. units


Spacer with bracket
Lubricator
Spacer with bracket
Regulator
Air filter

2) Spacer with bracket



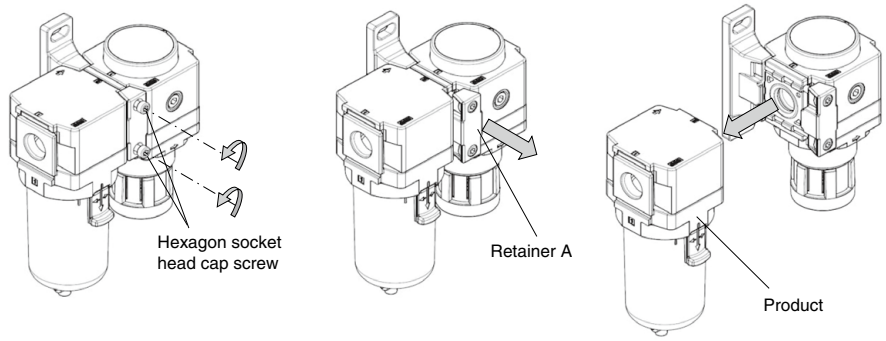
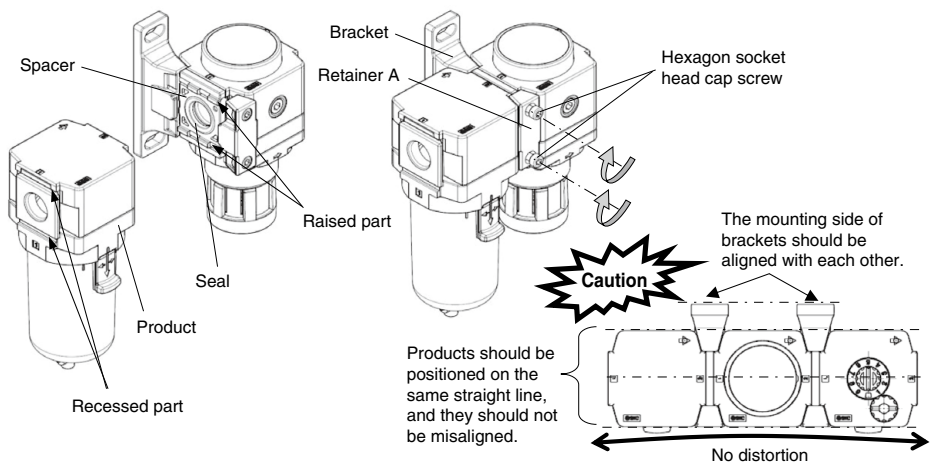
3) Spacer



⚠Warning

- Before replacement, ensure that the regulator is not pressurized.
- Also, make sure to loosen the knob of the regulator or filter regulator so that the set pressure is zero.
- After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

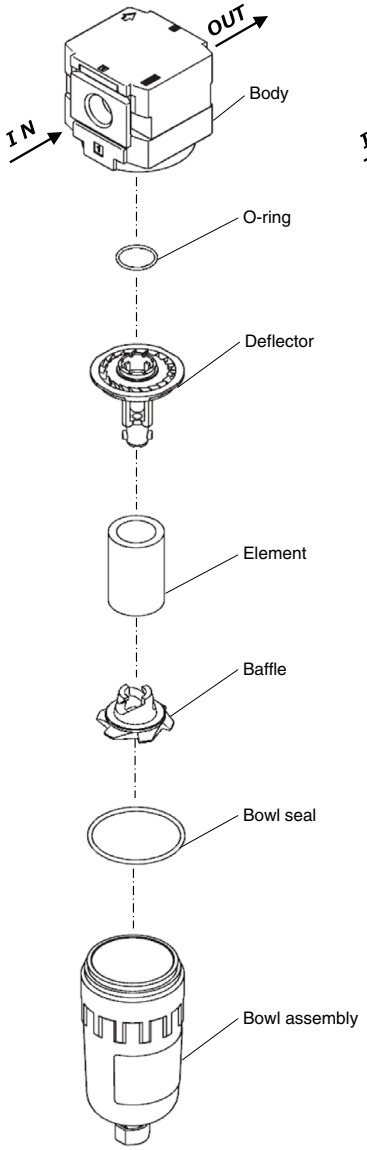
1. Air Combination

<table>
<tr><th>Applicable model</th><th>Process</th><th>Procedure</th><th>Tools</th><th>Check item</th></tr>
<tr><td rowspan="6">AC20-D
AC30-D
AC40-D
AC50-D
AC60-D</td><td>Disassembly</td><td>1) Untighten the 2 hexagon socket head cap screws with a hexagon wrench to loosen retainer A.</td><td>Hexagon wrench
Nominal:
AC20-D: 2
AC30-D, AC40-D, AC40-06-D: 3
AC50-D, AC60-D: 4</td><td>—</td></tr>
<tr><td></td><td>2) Remove the product.</td><td>—</td><td>—</td></tr>
<tr><td></td><td colspan="3"> 
</td></tr>
<tr><td></td><td>Process</td><td>Procedure</td><td>Tools</td><td>Check item</td></tr>
<tr><td>Assembly</td><td>3) Fit the raised part of the spacer to the recessed part of the product.</td><td>—</td><td>—</td></tr>
<tr><td></td><td>4) Tighten retainer A with the 2 hexagon socket head cap screws temporarily.</td><td>—</td><td>—</td></tr>
<tr><td></td><td>5) Tighten those 2 hexagon socket head cap screws with a hexagon wrench evenly. Refer to the criteria shown on the right for the tightening torque for the screws.</td><td>Hexagon wrench
Nominal:
AC20-D: 2
AC30-D, AC40-D, AC40-06-D: 3
AC50-D, AC60-D: 4</td><td>Tightening torque:
AC20-D: 0.36 ± 0.036 N·m
AC30-D, AC40-D: 1.2 ± 0.05 N·m
AC40-06-D: 1.4 ± 0.05 N·m
AC50-D, AC60-D: 3.0 ± 0.05 N·m</td></tr>
<tr><td></td><td colspan="3"> 
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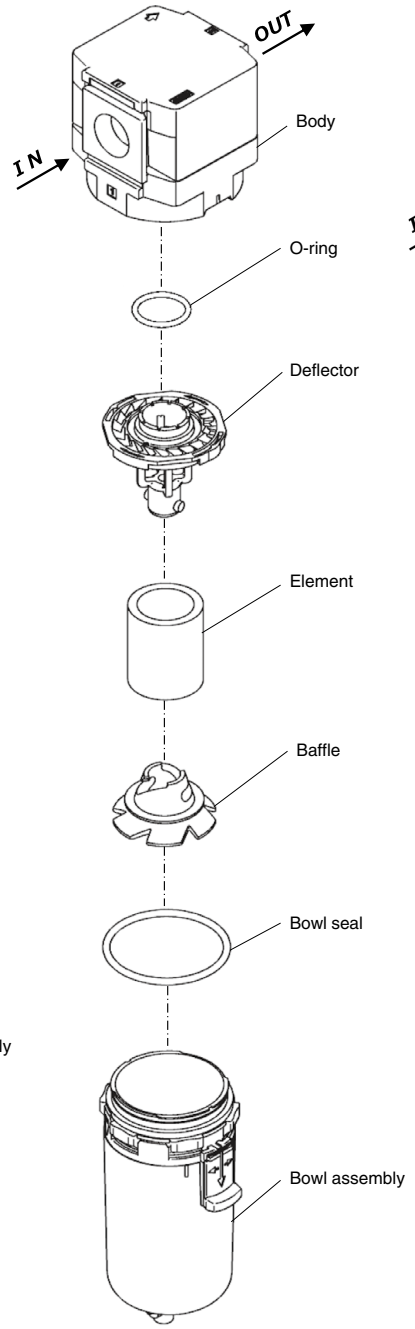
Note) For individual product, refer to the operation manual of each product.

AF20-D to 60-D Series Exploded View

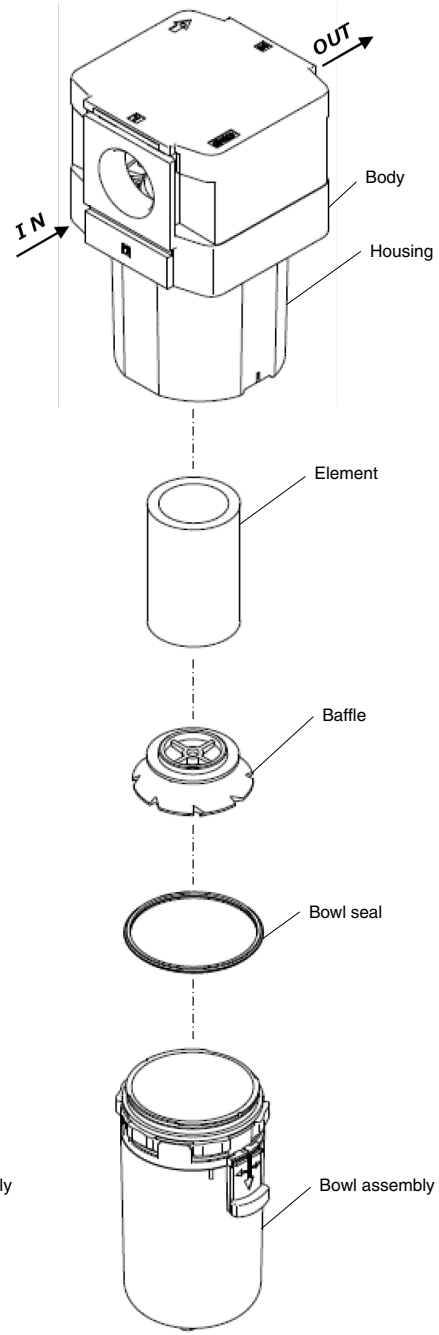
1) AF20-D



2) AF30-D/40-D

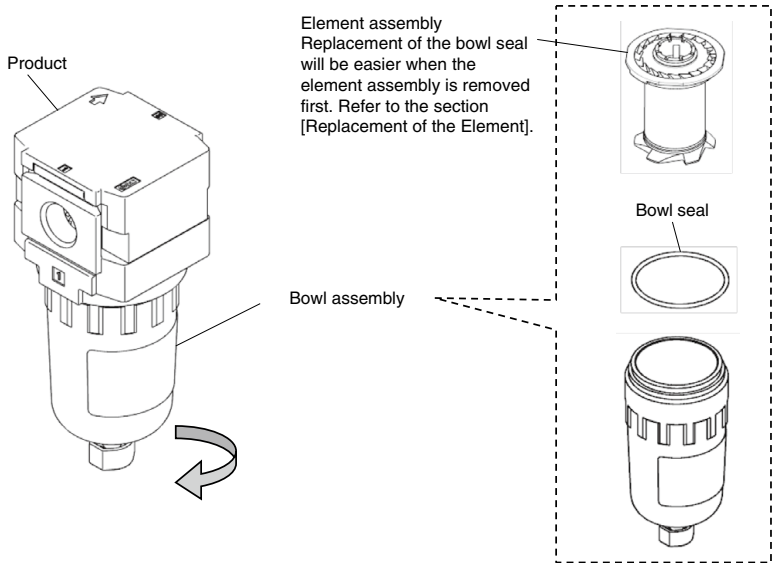


3) AF50-D/60-D

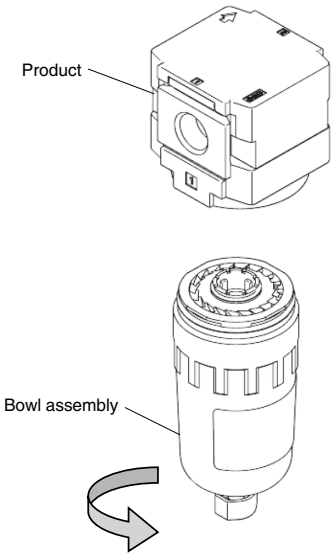


1. Replacement of Bowl Assembly

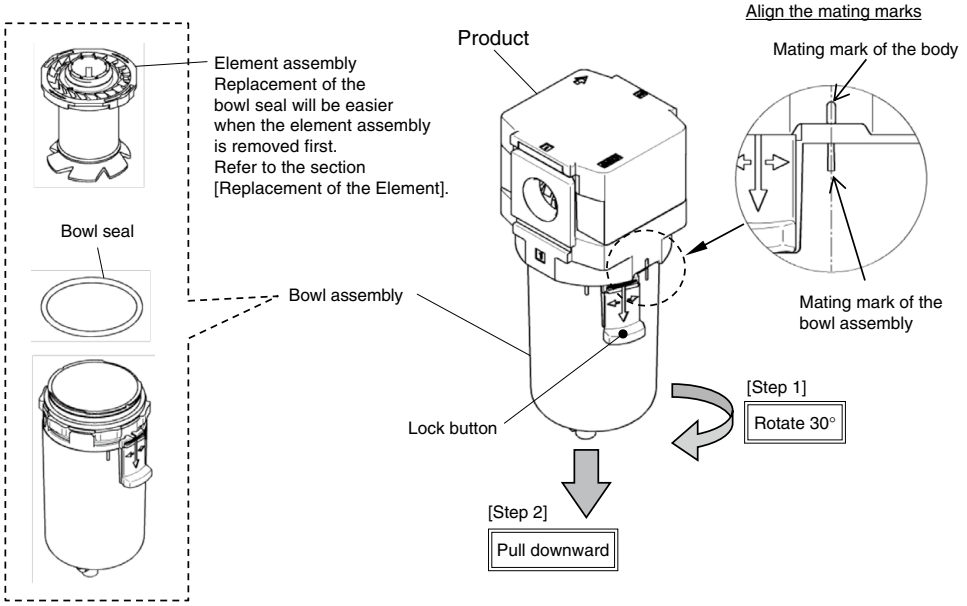
Applicable model	Process	Procedure	Tools	Check item
AF20-D	Disassembly	1) Remove the bowl assembly from the product. If the bowl assembly is tightened too much to be removed, use a hook wrench until it can be loosened by hand.	SMC's special wrench Part no.: 1129129	—



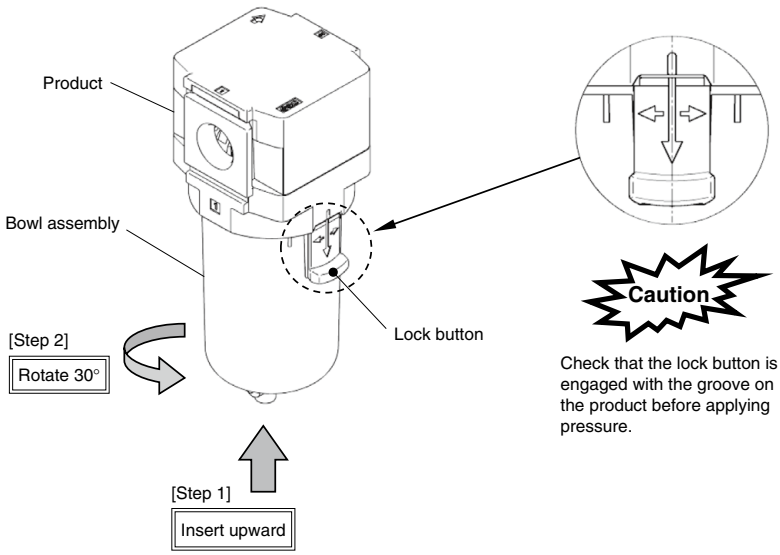
Applicable model	Process	Procedure	Tools	Check item
AF20-D	Assembly	1) Screw the bowl assembly into the product. Tighten it referring to the specified torque.	—	Referential tightening torque: 2.1 N·m



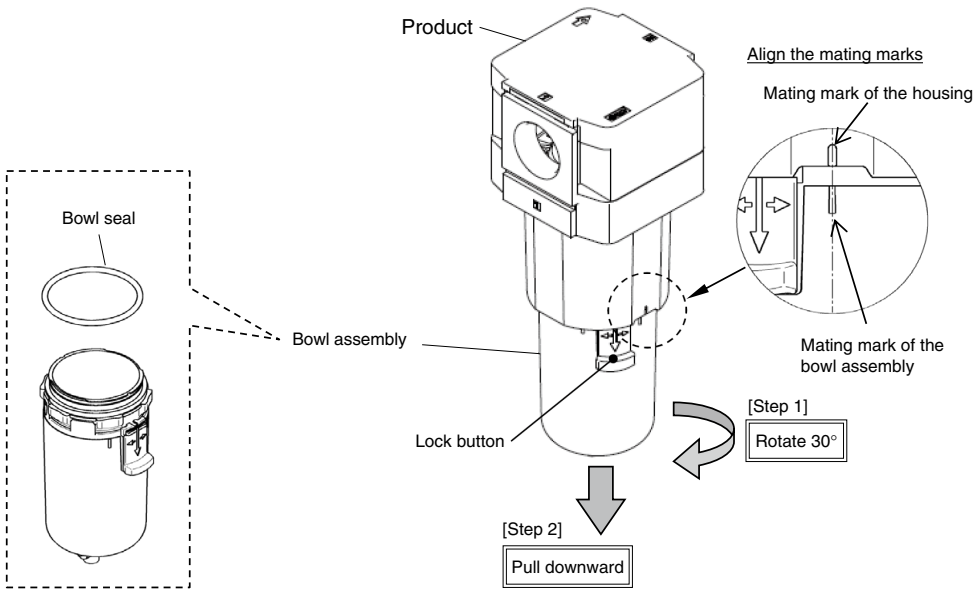
Applicable model	Process	Procedure	Tools	Check item
AF30-D AF40-D	Disassembly	1) Remove the bowl assembly from the product. While the lock button is held down, rotate the bowl assembly by approx. 30 degrees so that the mating marks of the body and bowl assembly meet each other. Then remove the bowl assembly by pulling it downward.	—	—



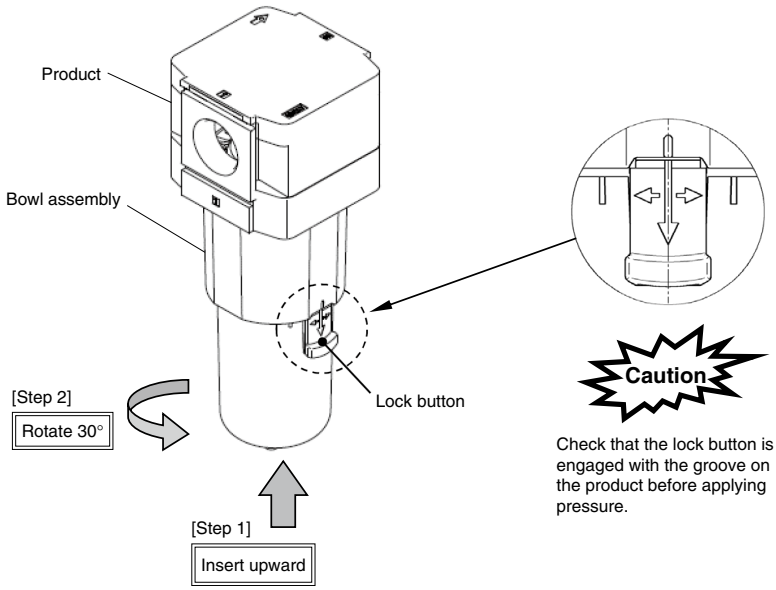
Process	Procedure	Tools	Check item
Assembly	1) Mount the bowl assembly to the product and rotate the bowl assembly until the lock button is locked in position as shown in the figure below.	—	—



Applicable model	Process	Procedure	Tools	Check item
AF50-D AF60-D	Disassembly	1) Remove the bowl assembly from the product. While the lock button is held down, rotate the bowl assembly by approx. 30 degrees so that the mating marks of the body and bowl assembly meet each other. Then remove the bowl assembly by pulling it downward.	—	—

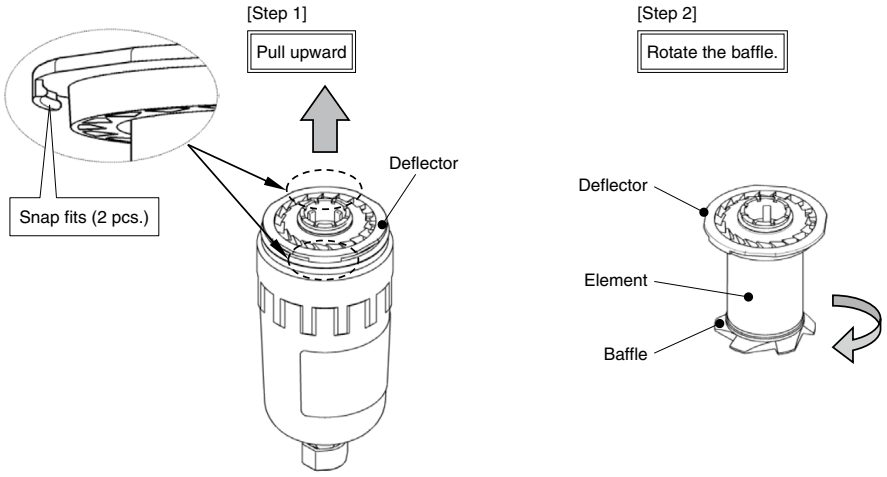


Process	Procedure	Tools	Check item
Assembly	1) Mount the bowl assembly to the product and rotate the bowl assembly until the lock button is locked in position as shown in the figure below.	—	—

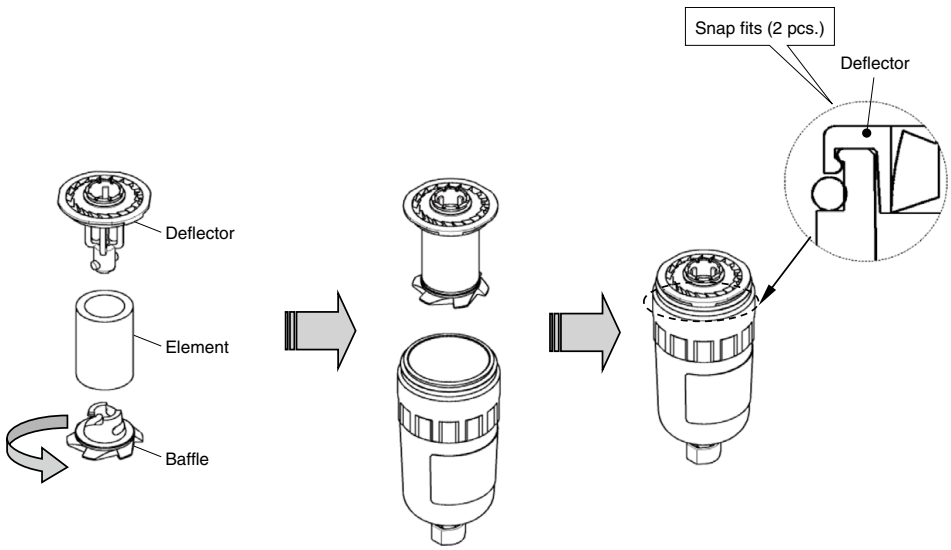


2. Replacement of the Element

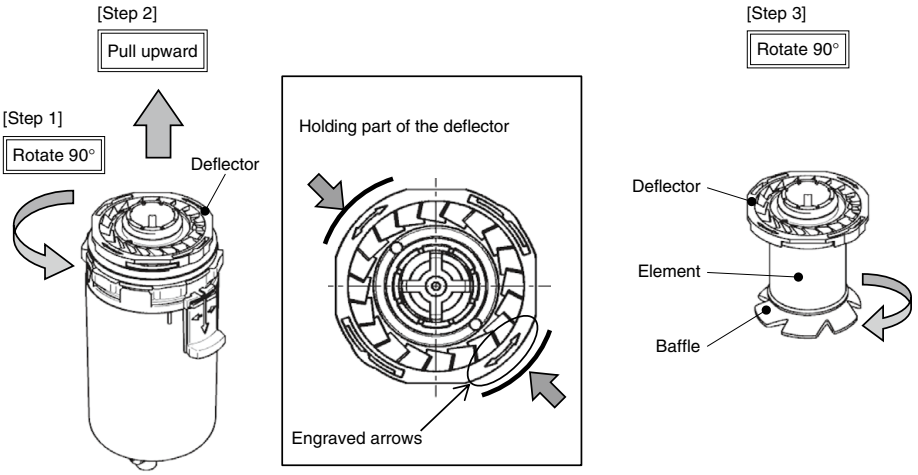
Applicable model	Process	Procedure	Tools	Check item
AF20-D	Disassembly	1) First remove the bowl assembly referring to the section [Replacement of the Bowl Assembly], then remove the snap fits (2 pcs.) of the deflector and pull upward to remove the element assembly. Rotate the baffle in the arrow direction to remove the element from the element assembly.	—	—



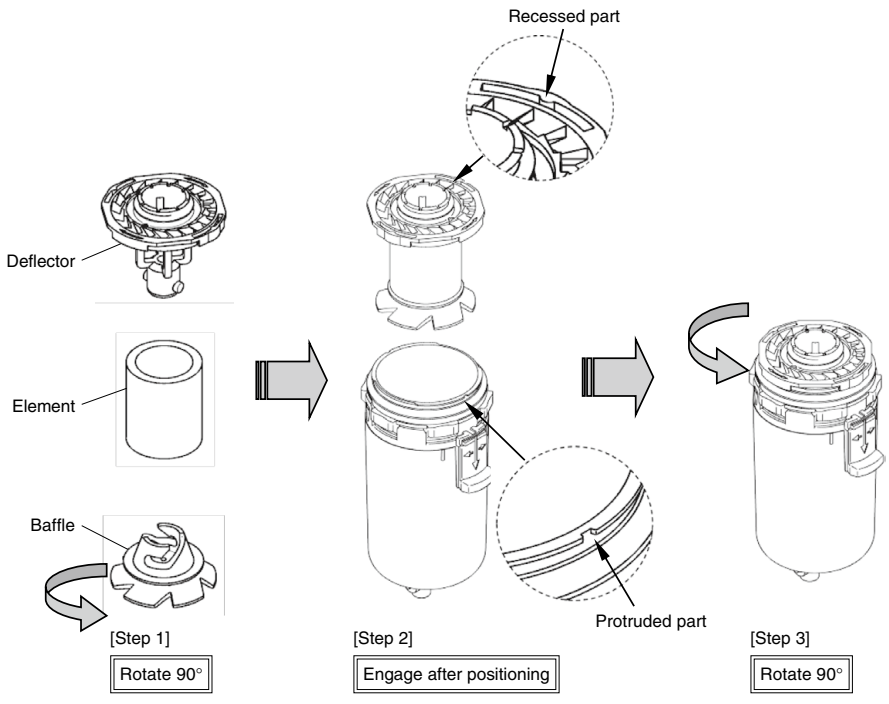
Process	Procedure	Tools	Check item
Assembly	1) Mount the element to the deflector and rotate the baffle in the arrow direction to mount the element to the baffle. Once the element and baffle are mounted, press the deflector downward until the snap fits (2 pcs.) are engaged with the bowl assembly. Mount the bowl assembly referring to section [Replacement of the Bowl Assembly] .	—	—

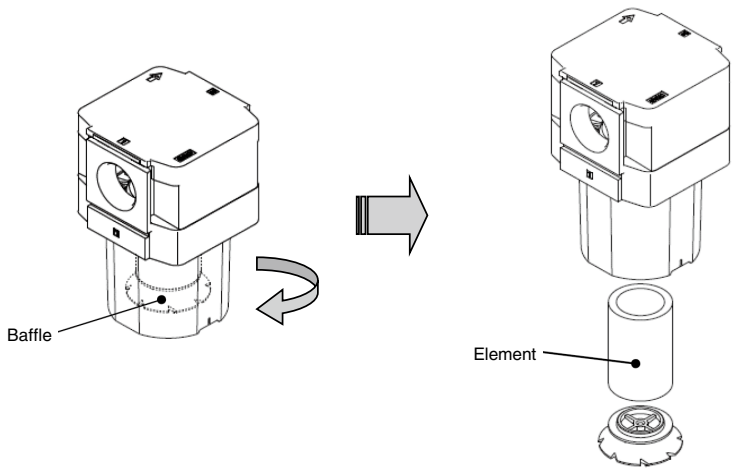
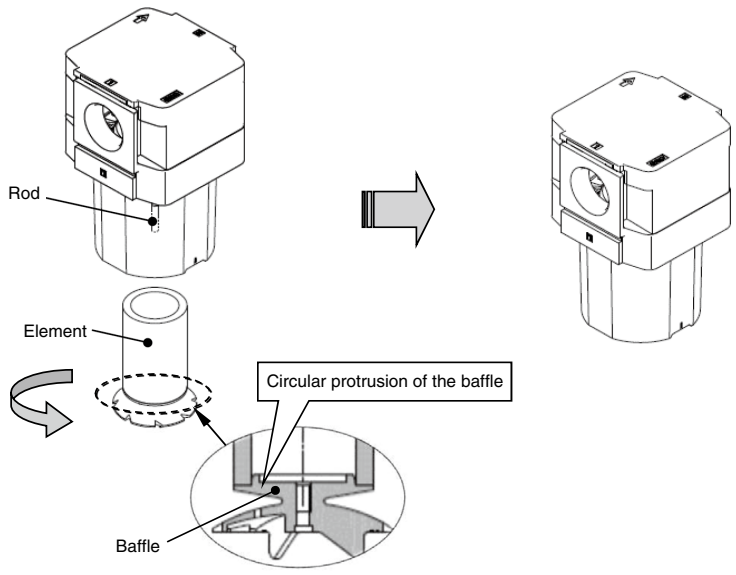


Applicable model	Process	Procedure	Tools	Check item
AF30-D AF40-D	Disassembly	1) First remove the bowl assembly referring to the section [Replacement of the Bowl Assembly], then remove the snap fits (2 pcs.) of the deflector and pull upward to remove the element assembly. Rotate the baffle in the arrow direction to remove the element from the element assembly.	—	—

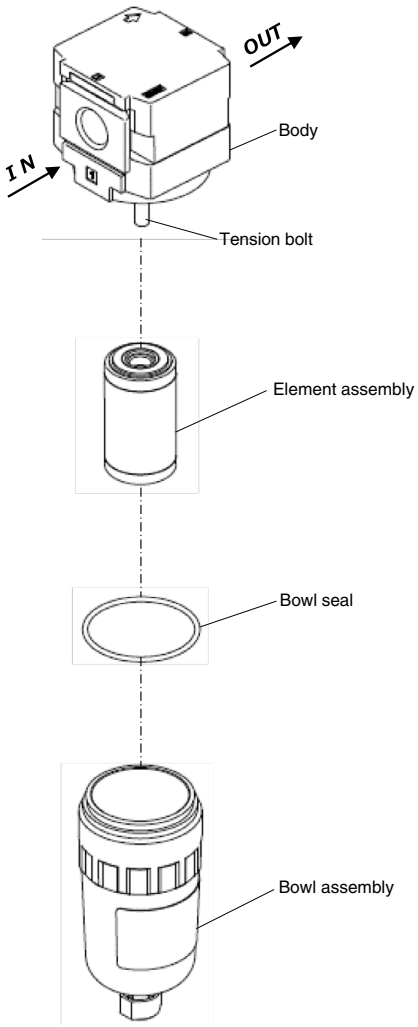


Process	Procedure	Tools	Check item
Assembly	1) Mount the element to the deflector and rotate the baffle in the arrow direction to mount the element to the baffle. Then insert the element assembly into the bowl assembly and rotate in either direction so that the protruded part of the element assembly engages with the recessed part of the bowl assembly. Mount the bowl assembly referring to the section [Replacement of the Bowl Assembly].	—	—

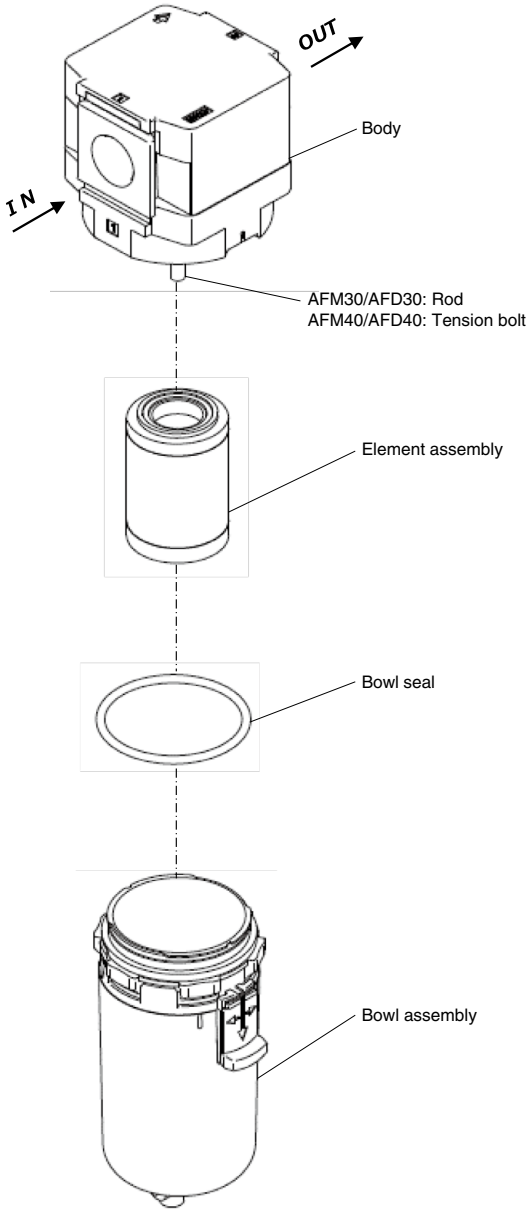


Applicable model	Process	Procedure	Tools	Check item
AF50-D AF60-D	Disassembly	1) Remove the bowl assembly referring to the section [Replacement of the Bowl Assembly] . When the bowl assembly is removed, rotate the baffle to the left to remove the element.	—	—
				
	Process	Procedure	Tools	Check item
	Assembly	1) Assemble the element and baffle. Then, assemble the baffle to the rod by rotating it to the right by hand. Rotate the baffle until the element is set without play. Then, rotate the baffle another 1/2 turn to the right. Refer to the tightening torque in the Criteria when tightening by hand. Mount the bowl assembly referring to the section [Replacement of the Bowl Assembly].	—	Referential tightening torque: 1.8 N·m
				

1) AFM20-D
AFD20-D



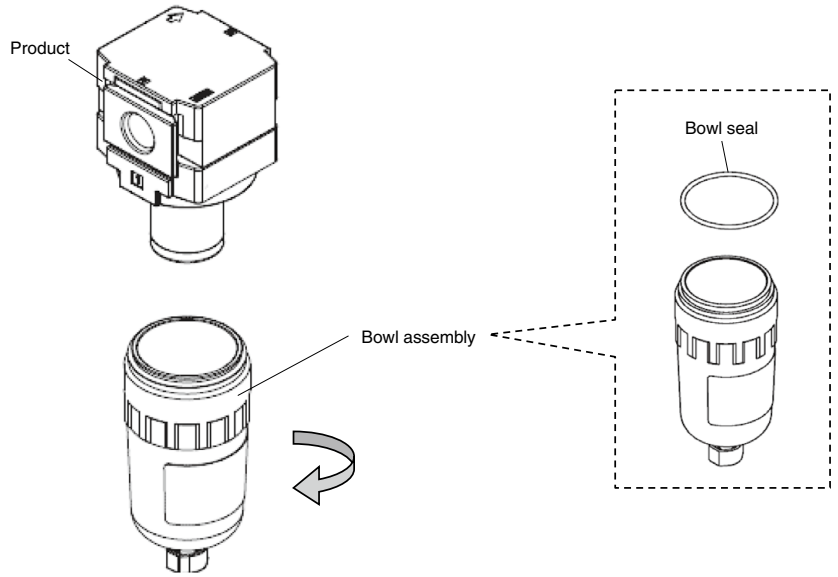
2) AFM30-D, AFM40-D
AFD30-D, AFD40-D



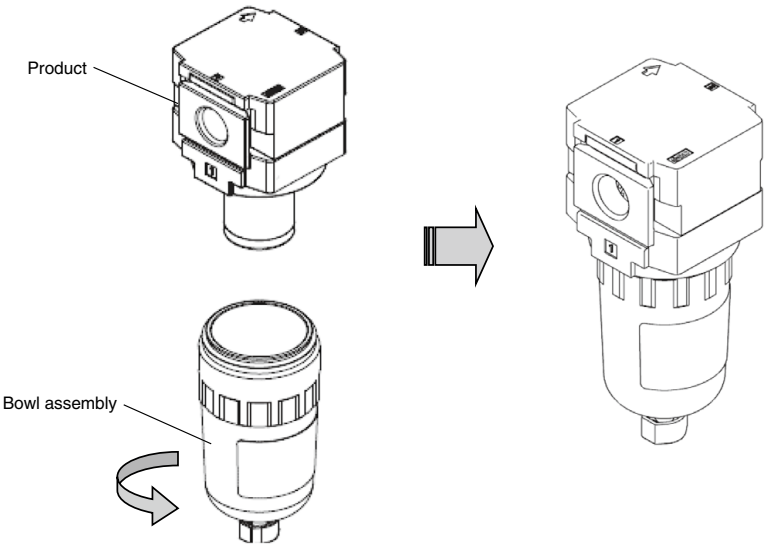
⚠Warning
Before replacement, ensure that the regulator is not pressurized.
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Replacement of the Bowl Assembly

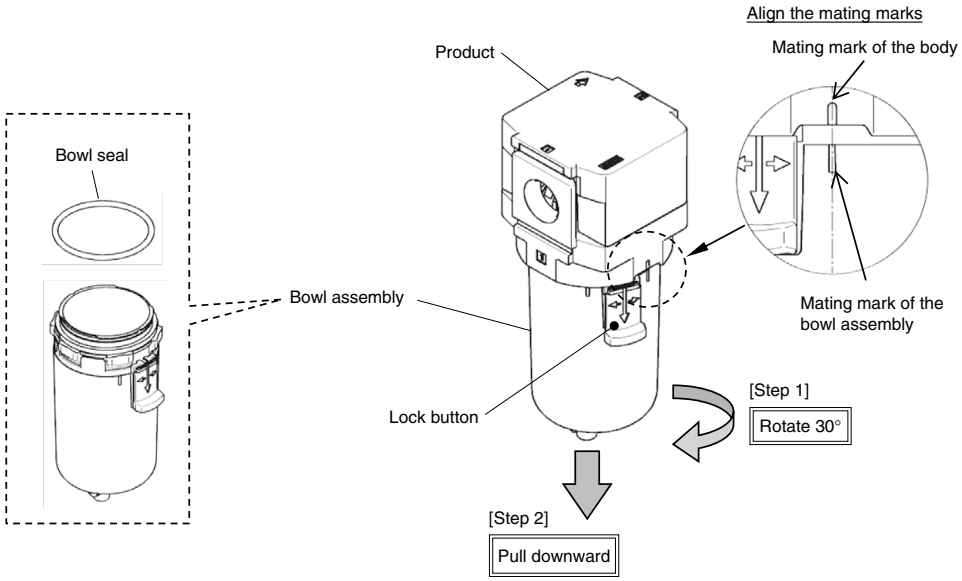
Applicable model	Process	Procedure	Tools	Check item
AFM20-D AFD20-D	Disassembly	1) Remove the bowl assembly from the product. If the bowl assembly is tightened too much to be removed, use a hook wrench until it can be loosened by hand.	SMC's special wrench Part no.: 1129129	—



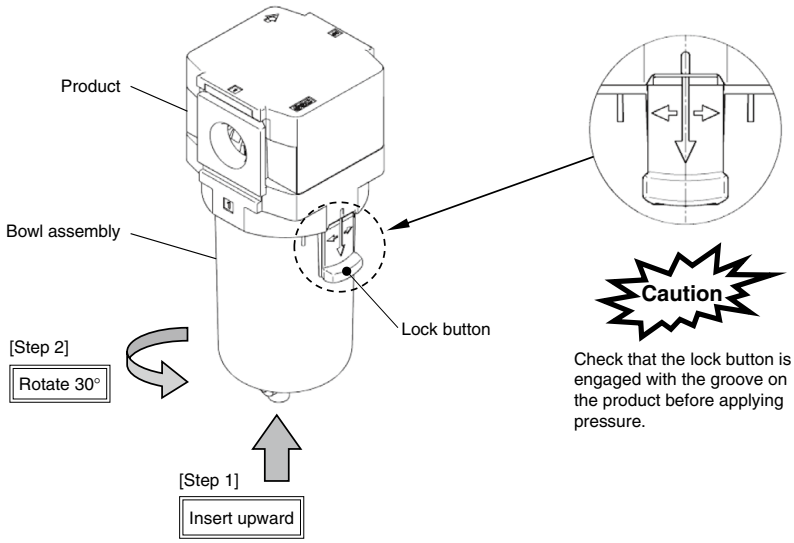
Process	Procedure	Tools	Check item
Assembly	1) Screw the bowl assembly into the product. Tighten it referring to the specified torque.	—	Referential tightening torque: 2.1 N·m



Applicable model	Process	Procedure	Tools	Check item
AFM30-D AFM40-D AFD30-D AFD40-D	Disassembly	1) Remove the bowl assembly from the product. While the lock button is held down, rotate the bowl assembly by approx. 30 degrees so that the mating marks of the body and bowl assembly meet each other. Then remove the bowl assembly by pulling it downward.	—	—

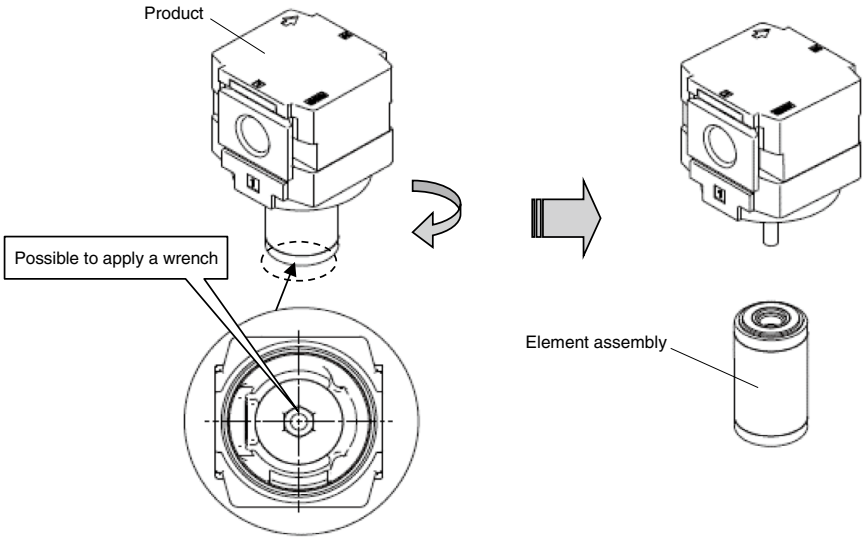


Process	Procedure	Tools	Check item
Assembly	1) Mount the bowl assembly to the product and rotate the bowl assembly until the lock button is locked in position as shown in the figure below.	—	—

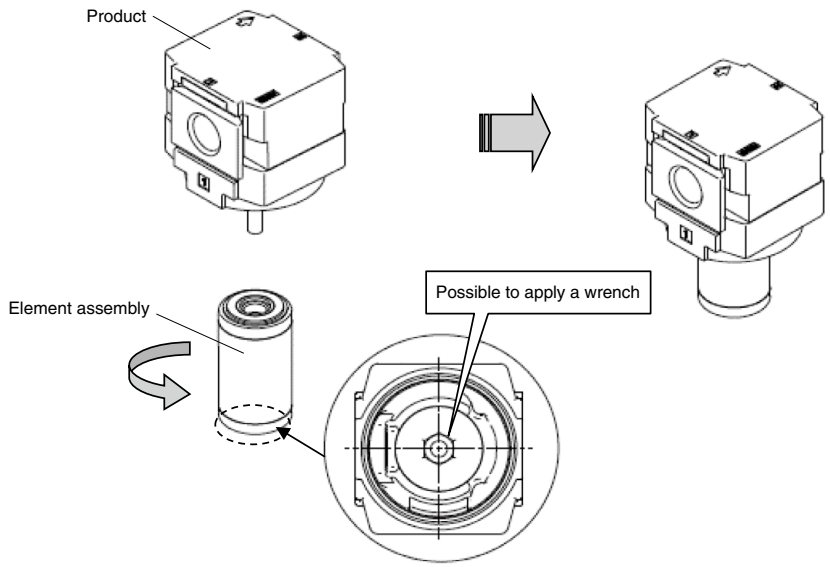


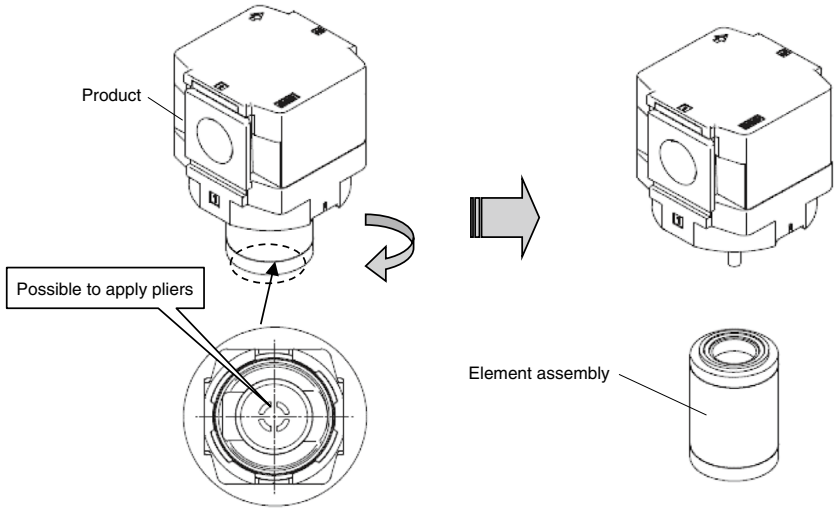
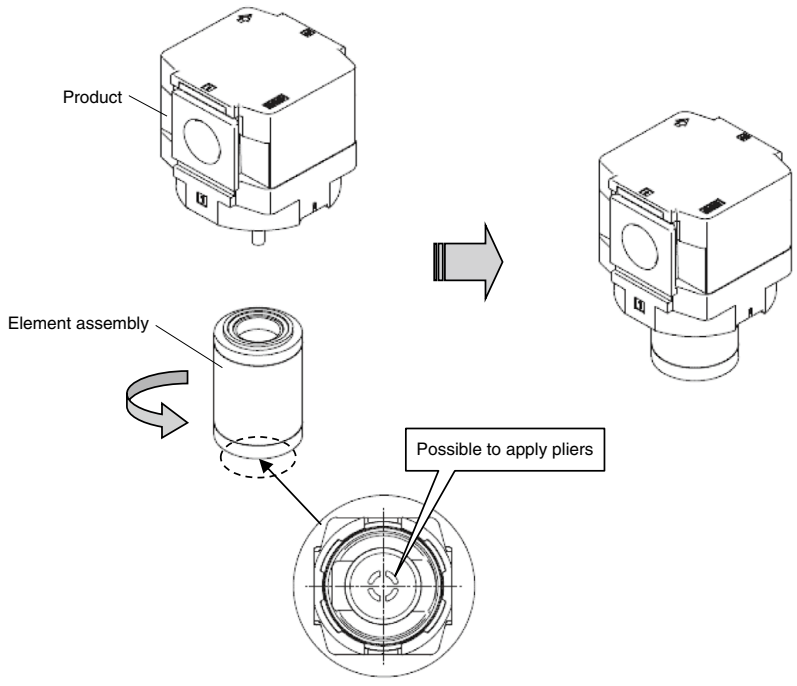
2. Replacement of the Element

Applicable model	Process	Procedure	Tools	Check item
AFM20-D AFD20-D	Disassembly	1) Remove the bowl assembly referring to the section [Replacement of the Bowl Assembly] . After that, remove the element assembly by rotating it counterclockwise using a wrench.	Wrench Nominal size: 7	—

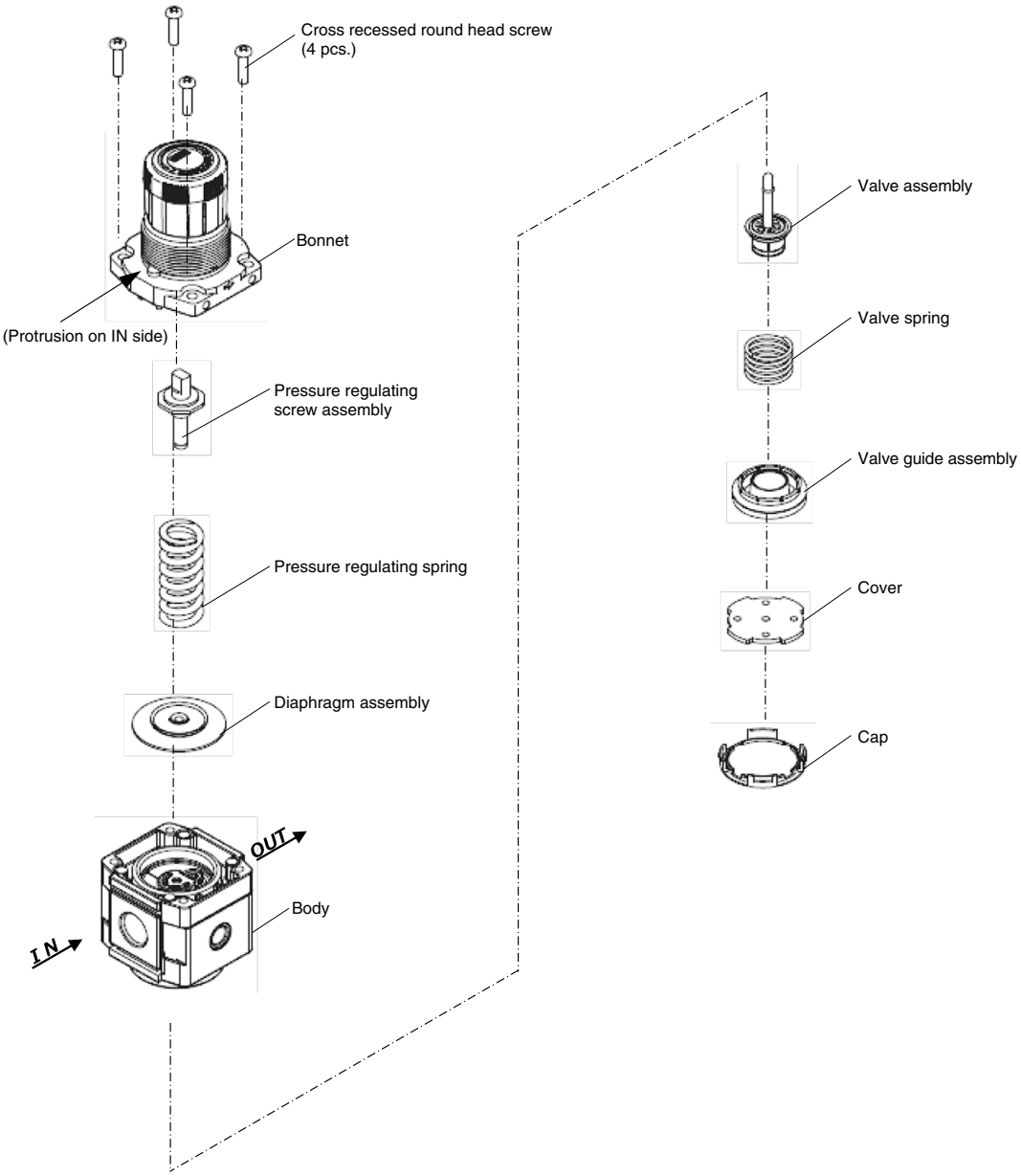


Process	Procedure	Tools	Check item
Assembly	1) Mount the element assembly by rotating it clockwise using a wrench. Tighten the element assembly referring to the torque specified on the right. Mount the the bowl assembly referring to the section [Replacement of the Bowl Assembly].	Wrench Nominal size: 7	Tightening torque: 0.49 ± 0.05 N·m

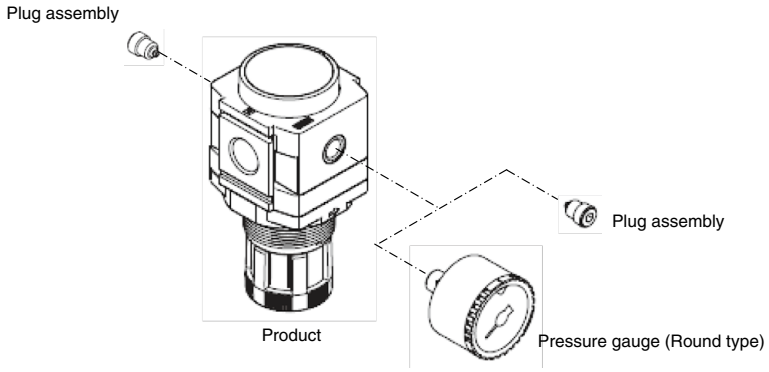


Applicable model	Process	Procedure	Tools	Check item
AFM30-D AFM40-D AFD30-D AFD40-D	Disassembly	1) Remove the bowl assembly referring to the section [Replacement of the Bowl Assembly]. After that, remove the element assembly by rotating it counterclockwise using round nose pliers.	Round nose pliers	—
				
	Process	Procedure	Tools	Check item
	Assembly	1) Mount the element assembly by rotating it clockwise using round nose pliers. Tighten the element assembly referring to the torque specified on the right. Mount the bowl assembly referring to the section [Replacement of the Bowl Assembly].	Round nose pliers	Tightening torque: **AFM30-D**: 1.47 ± 0.2 N·m **AFM40-D**: 1.96 ± 0.2 N·m
				

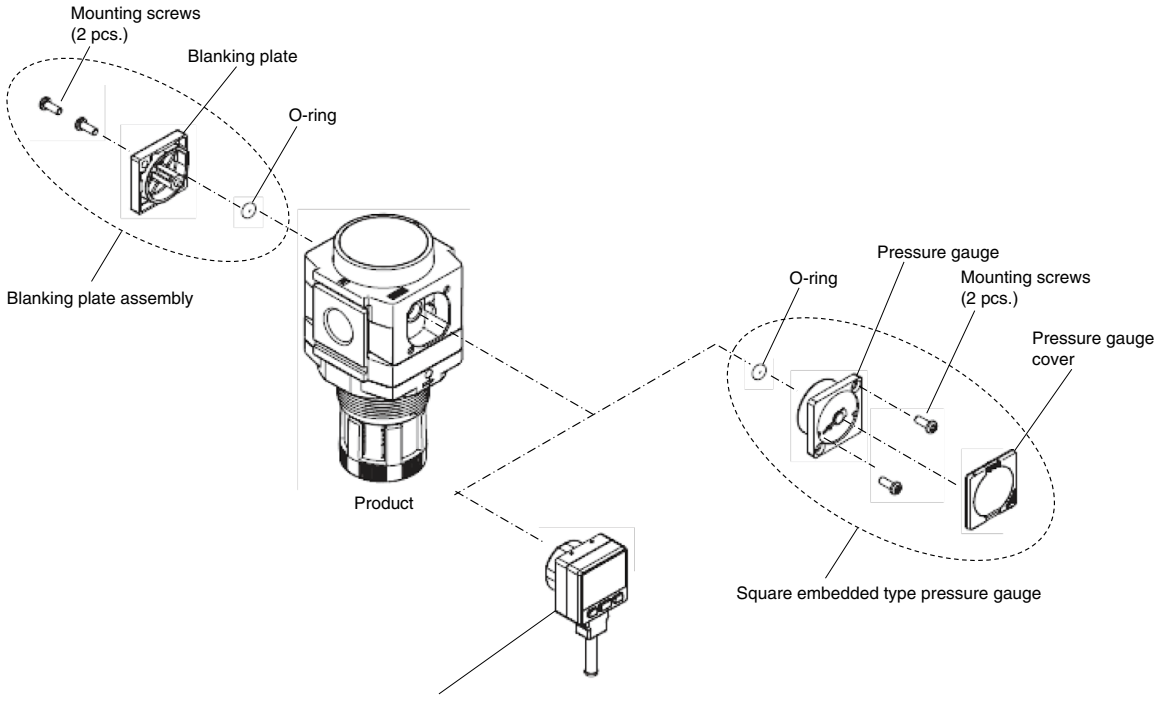
AR20-D/AR30-D/AR40-D/AR50-D/AR60-D



Pressure Gauge Port
[Applicable model: Without pressure gauge/With pressure gauge (Round type)]



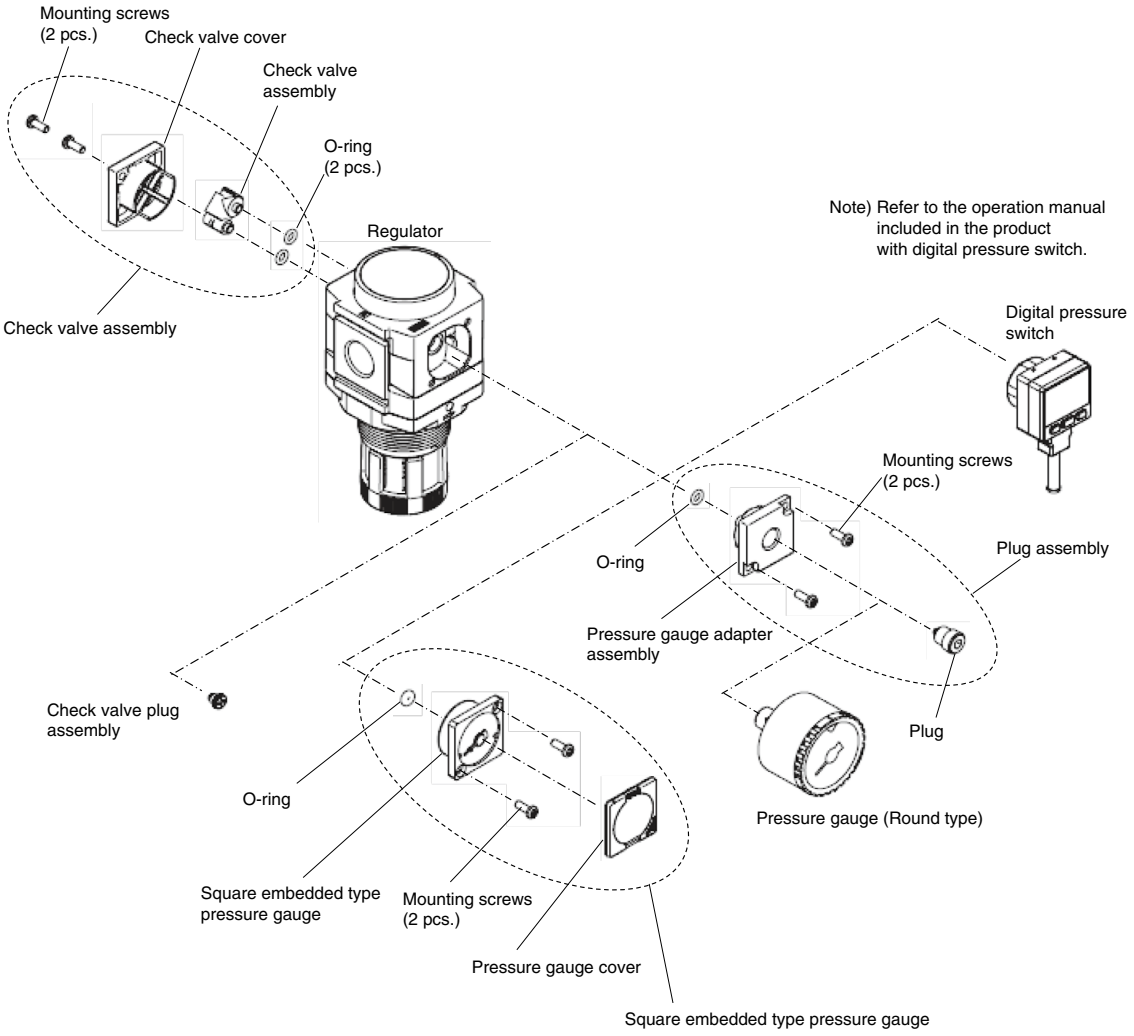
Pressure Gauge Port
[Applicable model: With square embedded type pressure gauge/With digital pressure switch]



Note) Refer to the operation manual included in the product with digital pressure switch.

· When the pressure gauge is mounted on the back of the product, swap all parts for the front and back.

Pressure Gauge Port [Applicable model: With backflow function]



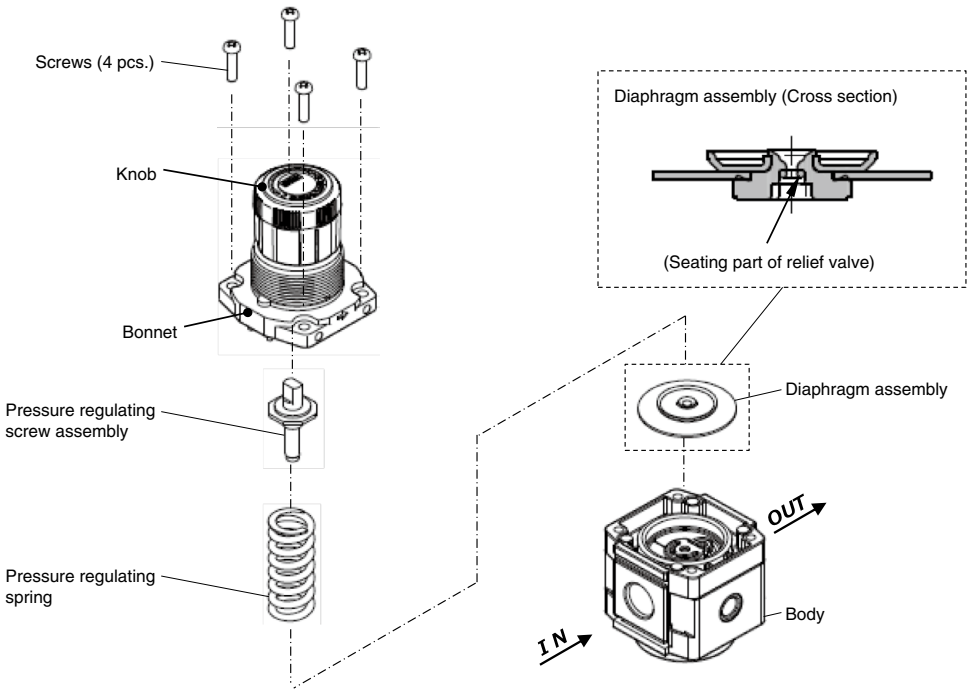
· When the pressure gauge is mounted on the back of the product, swap all parts for the front and back.

⚠Warning

Before replacement, ensure that the regulator is not pressurized.
Also, make sure to loosen the knob of the regulator so that the set pressure is zero.
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

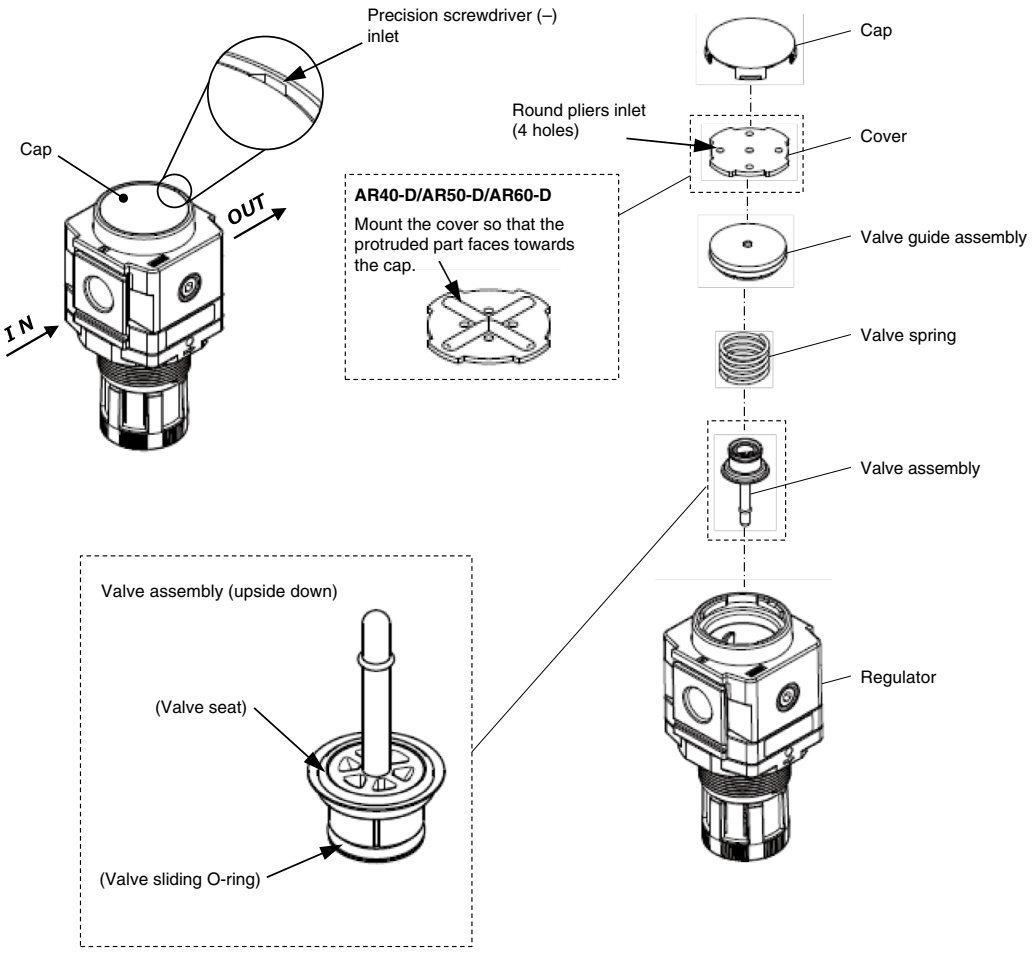
1. Diaphragm Assembly

Applicable model	Process	Procedure	Tools	Check item
AR20-D AR30-D AR40-D AR50-D AR60-D	Disassembly	1) Loosen the knob completely before disassembly.	—	—
		2) Remove the 4 screws and remove the bonnet.	AR20/AR30/AR40 Phillips screwdriver (+) AR50/AR60 Hexagon wrench Nominal size: 5	—
		3) Remove the pressure regulating screw assembly, pressure regulating spring, and diaphragm assembly in that order.	—	—
	Assembly	4) Assemble the diaphragm assembly, pressure regulating spring, and then pressure regulating screw assembly.	—	Direction of the diaphragm assembly and the pressure regulating screw assembly
		5) Assemble the bonnet to the body. While the convex side of the bonnet is facing the IN side, mount it onto the body. Then tighten the 4 mounting screws temporarily, before tightening them diagonally and evenly to fix the bonnet.	AR20/AR30/AR40 Phillips screwdriver (+) AR50/AR60 Hexagon wrench Nominal size: 5	Tightening torque: AR20-D, AR30-D: 2.35 ± 0.3 N·m AR40-D, AR50-D, AR60-D: 3.5 ± 0.3 N·m



2. Valve Guide Assembly and the Valve Assembly

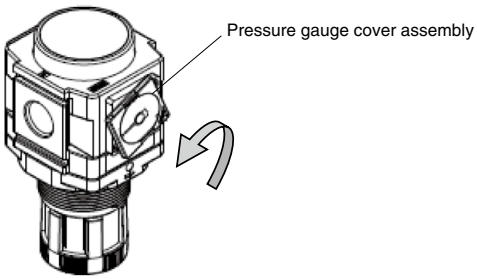
Applicable model	Process	Procedure	Tools	Check item
AR20-D AR30-D AR40-D AR50-D AR60-D	Disassembly	1) Remove the cap. Insert a precision screwdriver (-) between the body and cap to lift the cap.	Precision screwdriver (–)	—
		2) Remove the cover. Insert round pliers into the small holes of the cover and rotate 45 degree to the left or right, then lift the cover to remove.	Round pliers Nominal: 125	—
		3) Remove the valve guide assembly. Remove it while lifting the circumferential part with a precision screwdriver.	Precision screwdriver (–)	—
		4) Remove the valve spring.	—	—
		5) Remove the valve assembly.	—	—
	Assembly	6) After replacing the removed components with new components, place them into the regulator. Assemble the components in reverse order to the removal procedure.	—	See below for the mounting direction of the components.

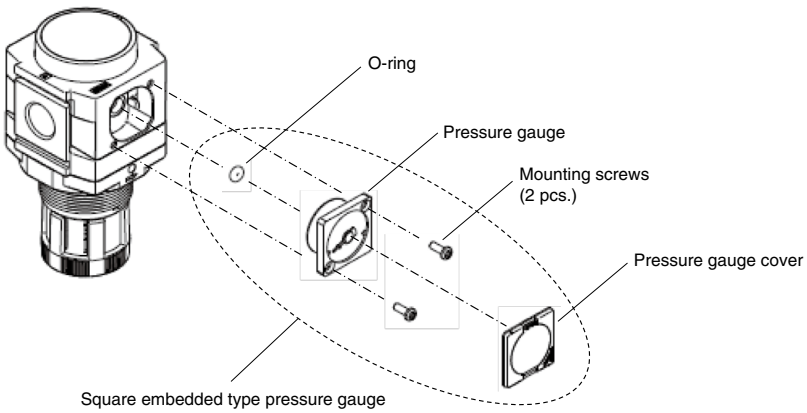


3. Square Embedded Type Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
AR20-D AR20K-D AR30-D AR30K-D AR40-D AR40K-D AR50-D AR50K-D AR60-D AR60K-D	Disassembly	1) Remove the pressure gauge cover. Rotate the pressure gauge cover 15 degrees in the arrow direction (counterclockwise) and pull it out.	—	—
		2) Remove the pressure gauge. Remove the 2 mounting screws and remove the pressure gauge.	Phillips screwdriver (+)	—
	Assembly	3) Confirm that the O-ring is mounted onto the pressure gauge. When the O-ring comes out or is left on the regulator, mount the O-ring to the pressure gauge correctly.	—	Presence of the O-ring
		4) Mount the pressure gauge. Mount the pressure gauge to the regulator with the mounting screws and tighten the screws referring to the tightening torque specified in the right column.	Phillips screwdriver (+)	Tightening torque: 0.85 ± 0.05 N·m
		5) Mount the pressure gauge cover. Set the pressure gauge cover with its arrow on the lower right corner. Mate the 2 fingers of the pressure gauge cover with the 2 finger slits of the pressure gauge, and rotate the pressure gauge cover 15 degrees to the opposite direction of the arrow (clockwise).	—	—

Note) Applicable to the product with square embedded type pressure gauge (E).

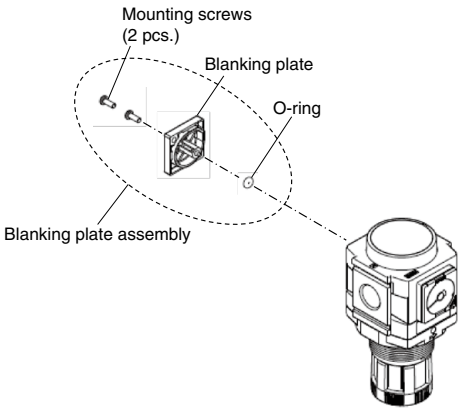




4. Blanking Plate Assembly

Applicable model	Process	Procedure	Tools	Check item
AR20-D AR30-D AR40-D AR50-D AR60-D	Disassembly	1) Remove the blanking plate. Remove the 2 mounting screws and remove the blanking plate.	Phillips screwdriver (+)	—
	Assembly	2) Confirm that the O-ring is mounted onto the blanking plate. When the O-ring comes out or is left on the regulator, mount the O-ring to the pressure gauge correctly.	—	Presence of the O-ring
		3) Mount the blanking plate. Mount the blanking plate to the product with the mounting screws and tighten the screws referring to the tightening torque specified in the right column.	Phillips screwdriver (+)	Tightening torque: 0.6 ± 0.05 N·m

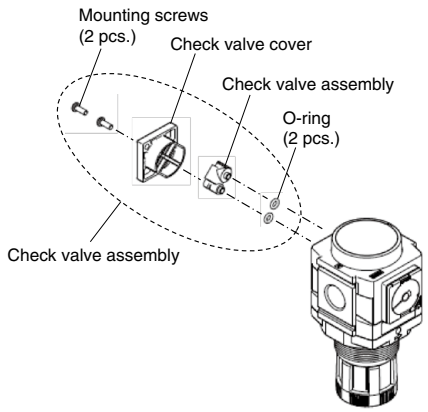
Note) Applicable to the product with square type pressure gauge (E), or digital pressure switch (E1 to E4). Not applicable to the product with backflow function.

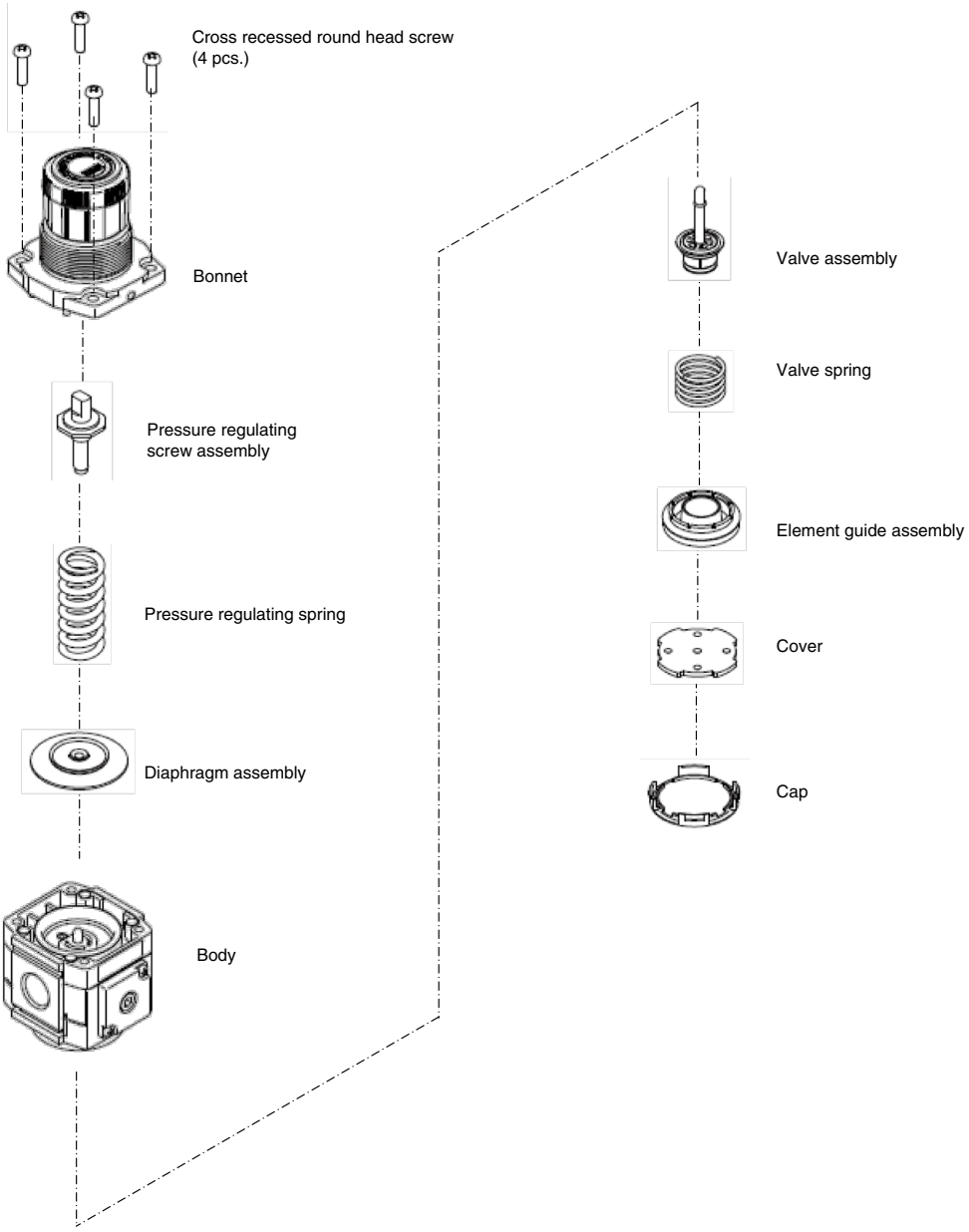


5. Check Valve Assembly

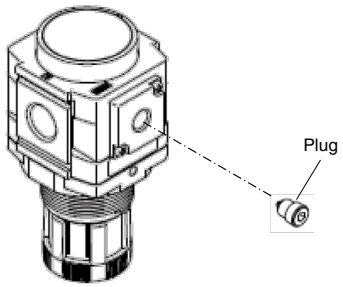
Applicable model	Process	Procedure	Tools	Check item
AR20K-D AR30K-D AR40K-D AR50K-D AR60K-D	Disassembly	1) Remove the check valve cover. Remove the 2 mounting screws and the check valve cover.	Phillips screwdriver (+)	—
		2) Remove the check valve assembly. Remove the check valve assembly by pulling it toward the operator.	—	—
	Assembly	3) Confirm that the O-ring is mounted onto the check valve assembly. When the O-ring comes out or is left on the regulator, mount the O-ring to the check valve assembly correctly.	—	Presence of the O-ring
		4) Mount the check valve cover. Mount the check valve cover to the product with the mounting screws and tighten the screws referring to the tightening torque specified in the right column.	Phillips screwdriver (+)	Tightening torque: 0.6 ± 0.05 N·m

Note) Applicable to the product with backflow function.

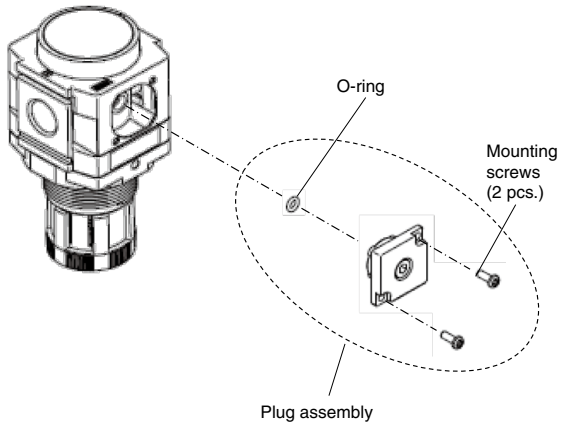



Cross recessed round head screw
(4 pcs.)
Bonnet
Pressure regulating
screw assembly
Pressure regulating spring
Diaphragm assembly
Body
Valve assembly
Valve spring
Element guide assembly
Cover
Cap

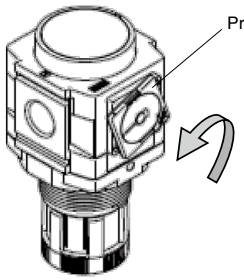
Pressure Gauge Port
[Applicable model: Without pressure gauge]

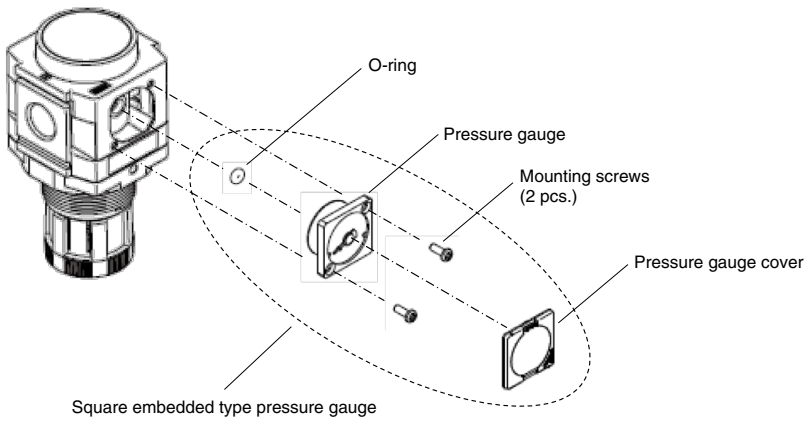


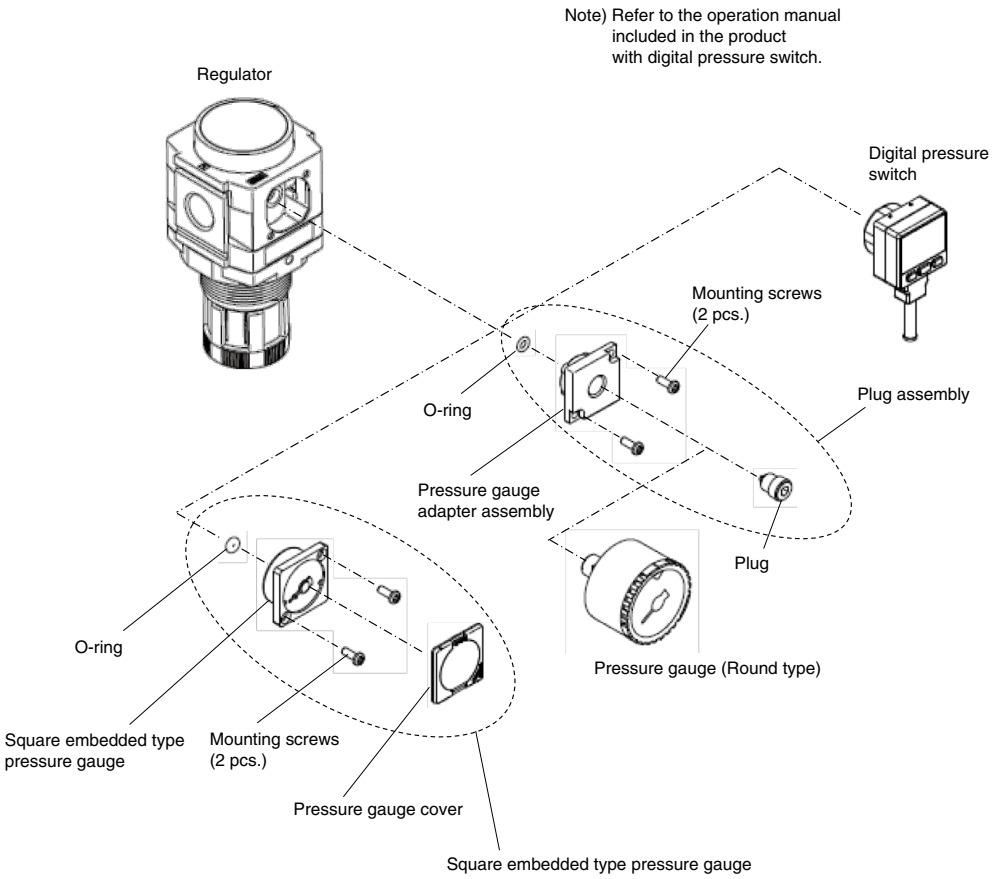
Pressure Gauge Port
[Applicable model: Without pressure gauge]



Pressure Gauge Port [Applicable model: With square embedded type pressure gauge]







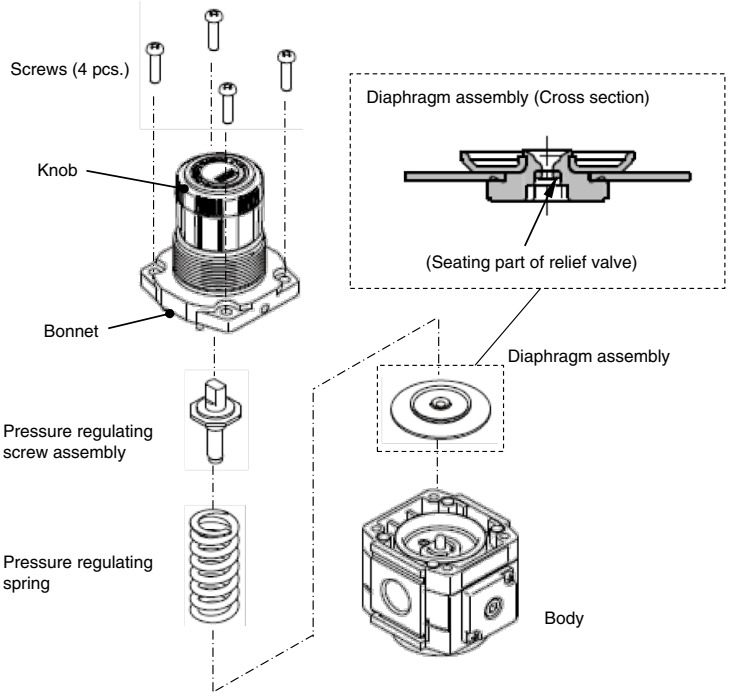
· When swapping the square embedded type pressure gauge and the digital pressure switch, tighten them with 0.85 ± 0.05 N·m. Tighten others with 0.6 ± 0.05 N·m.

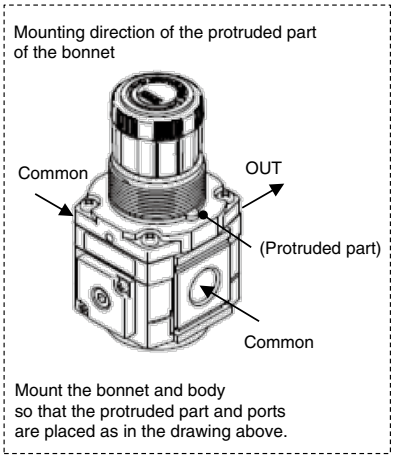
⚠Warning

Before replacement, ensure that the regulator is not pressurized.
Also, make sure to loosen the knob of the regulator so that the set pressure is zero.
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Replacement of the Diaphragm Assembly

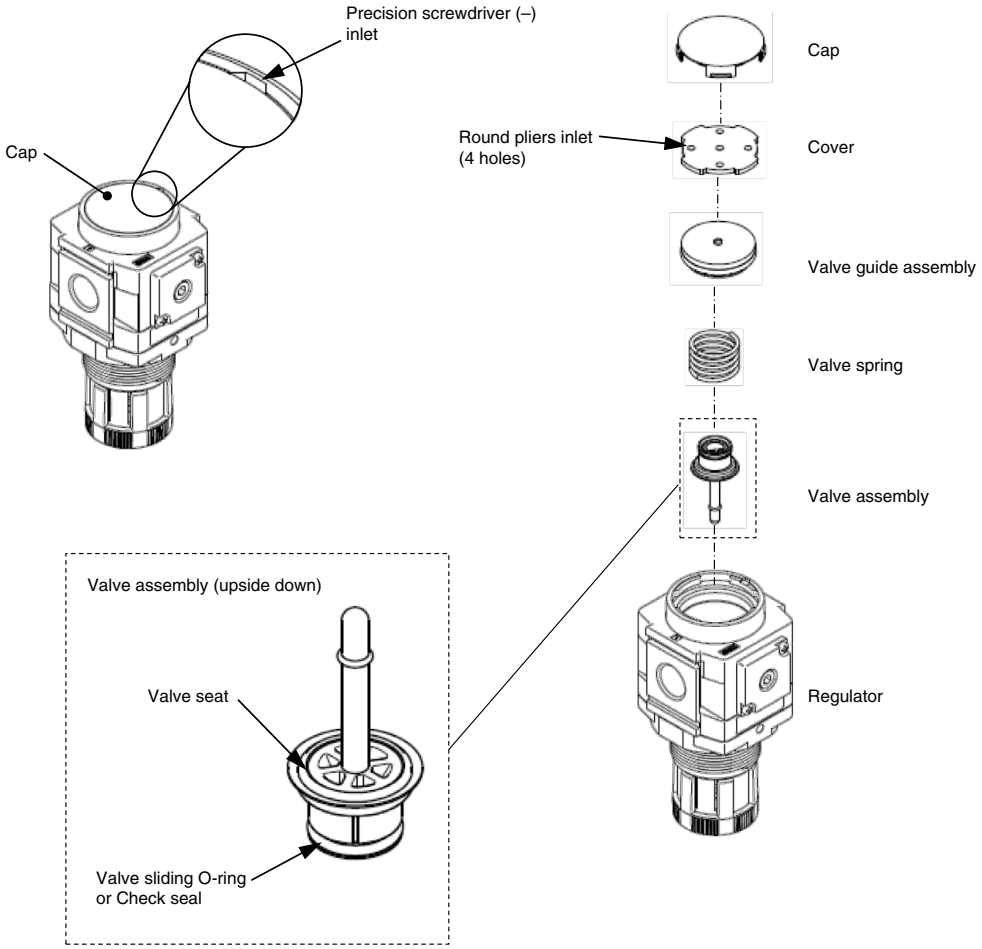
Applicable model	Process	Procedure	Tools	Check item
AR20M AR30M AR40M	Disassembly	1) Loosen the knob completely before disassembly.	—	—
		2) Remove the 4 screws and remove the bonnet.	Phillips screwdriver (+)	—
		3) Remove the pressure regulating screw assembly, pressure regulating spring, and diaphragm assembly in that order.	—	—
	Assembly	4) Assemble the diaphragm assembly, pressure regulating spring, and then pressure regulating screw assembly.	—	Direction of the diaphragm assembly and the pressure regulating screw assembly
		5) Assemble the bonnet to the body. Mount the bonnet to the body with the protruded side facing upwards an inline with ports. Tighten four mounting screws temporarily, then tightening them diagonally and evenly to fix the bonnet.	Phillips screwdriver (+)	Tightening torque: **AR20M**, **AR30M**: 2.35 ± 0.3 N·m **AR40M**: 3.5 ± 0.3 N·m





2. Replacement of the Valve Guide Assembly and the Valve Assembly

Applicable model	Process	Procedure	Tools	Check item
AR20M AR30M AR40M	Disassembly	1) Remove the cap. Insert a precision screwdriver (-) between the body and cap to lift the cap.	Precision screwdriver (–)	—
		2) Remove the cover. Insert round pliers into the small holes of the cover and rotate 45 degree to the left or right, then lift the cover to remove.	Round pliers Nominal: 125	—
		3) Remove the valve guide assembly. Remove it while lifting the circumferential part with a precision screwdriver.	Precision screwdriver (–)	—
		4) Remove the valve spring.	—	—
		5) Remove the valve assembly.	—	—
	Assembly	6) After replacing the removed components with new components, place them into the regulator. Assemble the components in reverse order to the removal procedure.	—	See below for the mounting direction of the components.



3. Replacement of the Square Embedded Type Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
AR20M AR30M AR40M	Disassembly	1) Remove the pressure gauge cover. Rotate the pressure gauge cover 15 degrees in the arrow direction (counterclockwise) and pull it out.	—	—
		2) Remove the pressure gauge. Remove the 2 mounting screws and remove the pressure gauge.	Phillips screwdriver (+)	—
	Assembly	3) Confirm that the O-ring is mounted onto the pressure gauge. When the O-ring comes out or is left on the regulator, mount the O-ring to the pressure gauge correctly.	—	Presence of the O-ring
		4) Mount the pressure gauge. Mount the pressure gauge to the regulator with the mounting screws and tighten the screws referring to the tightening torque to the specified criteria.	Phillips screwdriver (+)	Tightening torque: 0.85 ± 0.05 N·m
		5) Mount the pressure gauge cover. Set the pressure gauge cover with its arrow on the lower right corner. Mate the 2 fingers of the pressure gauge cover with the 2 finger slits of the pressure gauge, and rotate the pressure gauge cover 15 degrees to the opposite direction of the arrow (clockwise).	—	—

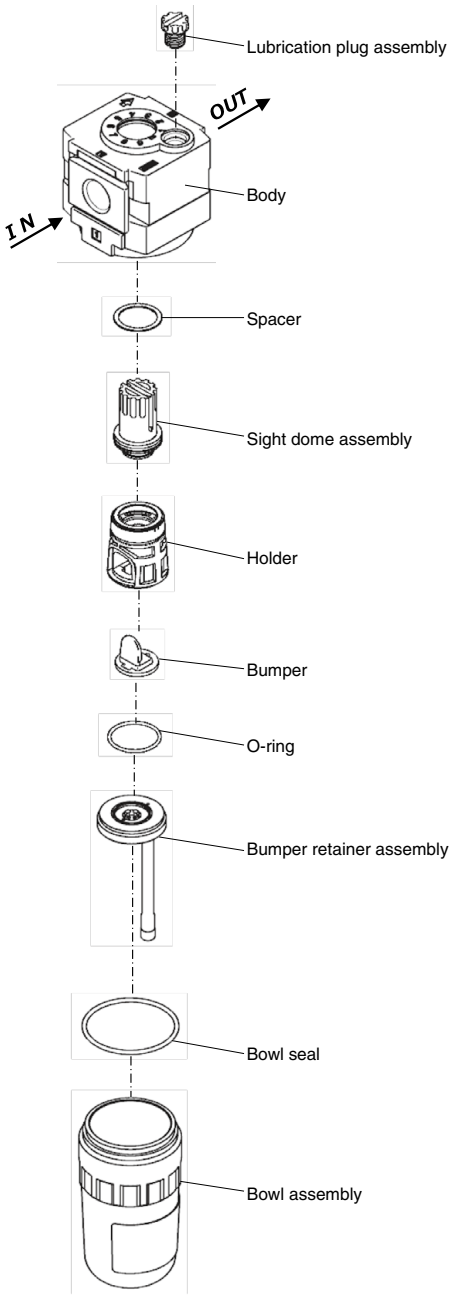
4. Replacement of the Plug

Applicable model	Process	Procedure	Tools	Check item
AR20M AR30M AR40M	Disassembly	1) Remove the plug by turning counterclockwise.	Hexagon wrench Nominal size: 4	—
	Assembly	2) Assemble the plug by turning clockwise to the specified tightening torque.	Hexagon wrench Nominal size: 4	Tightening torque: 0.6 ± 0.05 N·m

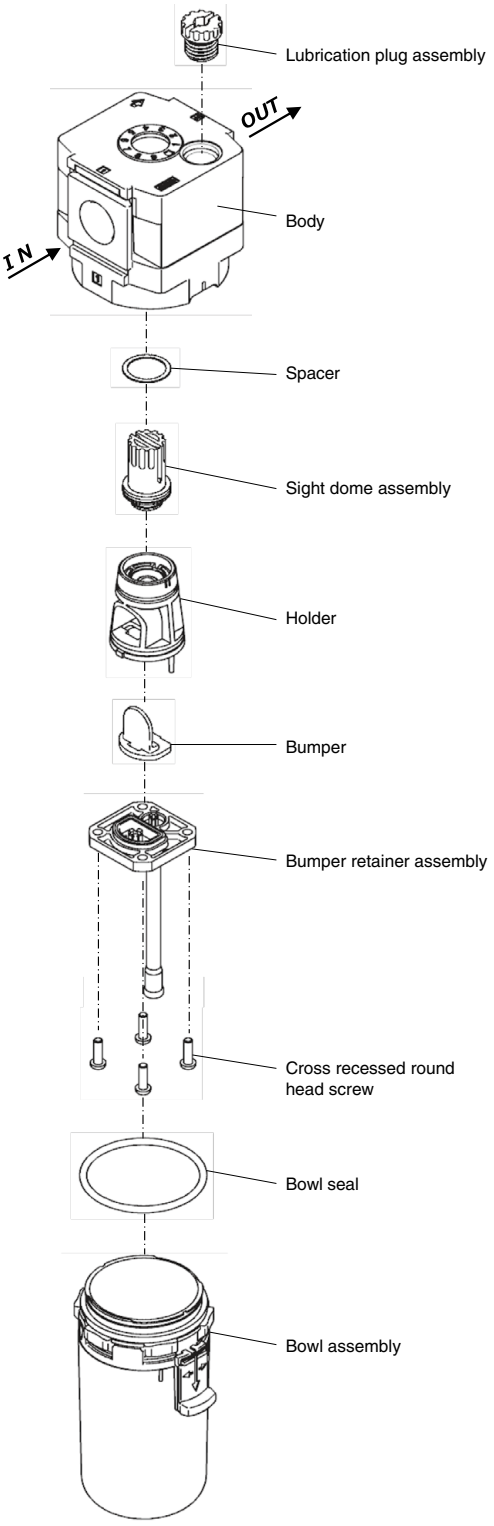
5. Replacement of the Plug Assembly

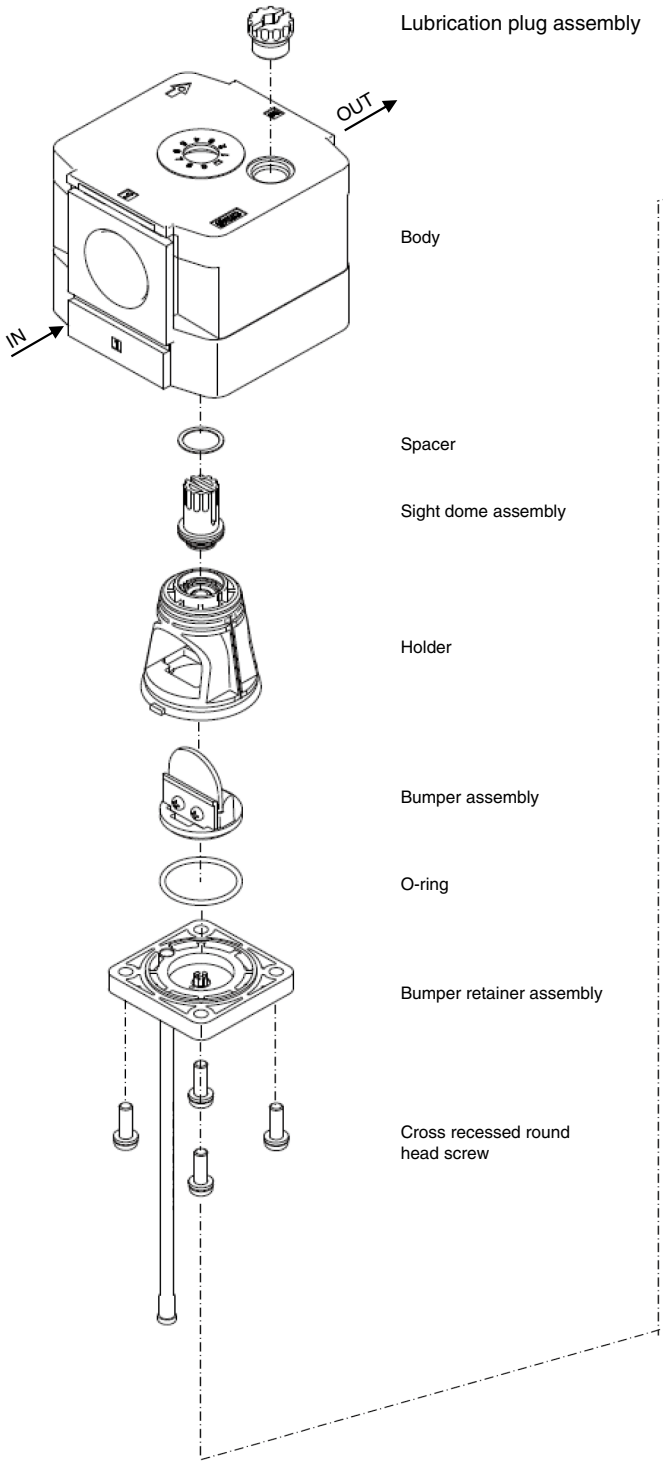
Applicable model	Process	Procedure	Tools	Check item
AR20M AR30M AR40M	Disassembly	1) Remove the plug assembly. Remove the 2 mounting screws and remove the plug assembly.	Phillips screwdriver (+)	—
	Assembly	2) Confirm that the O-ring is mounted onto the component "A." When the O-ring comes out or is left on the regulator, mount the O-ring to the plug assembly correctly.	—	Presence of the O-ring
		3) Assemble the plug assembly. Assemble the plug assembly to the product with the mounting screws and tighten the screws referring to the tightening torque specified in the right column.	Phillips screwdriver (+)	Tightening torque: 0.6 ± 0.05 N·m

1) AL20-D



2) AL30-D/AL40-D





Lubrication plug assembly

Body

Spacer

Sight dome assembly

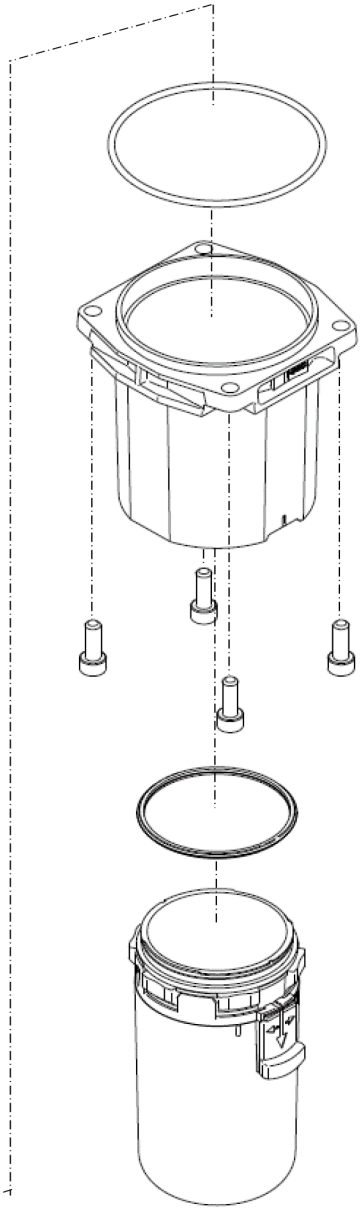
Holder

Bumper assembly

O-ring

Bumper retainer assembly

Cross recessed round head screw



O-ring

Housing

Hexagon socket head cap screw

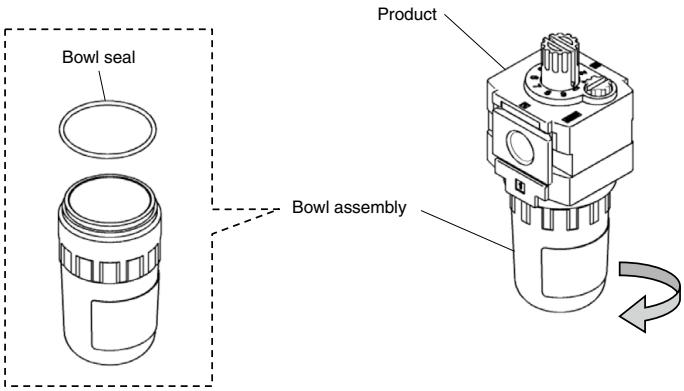
Bowl seal

Bowl assembly

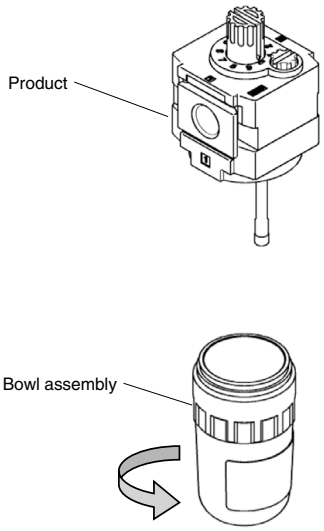
⚠Warning
Before replacement, ensure that the regulator is not pressurized.
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Bowl Assembly

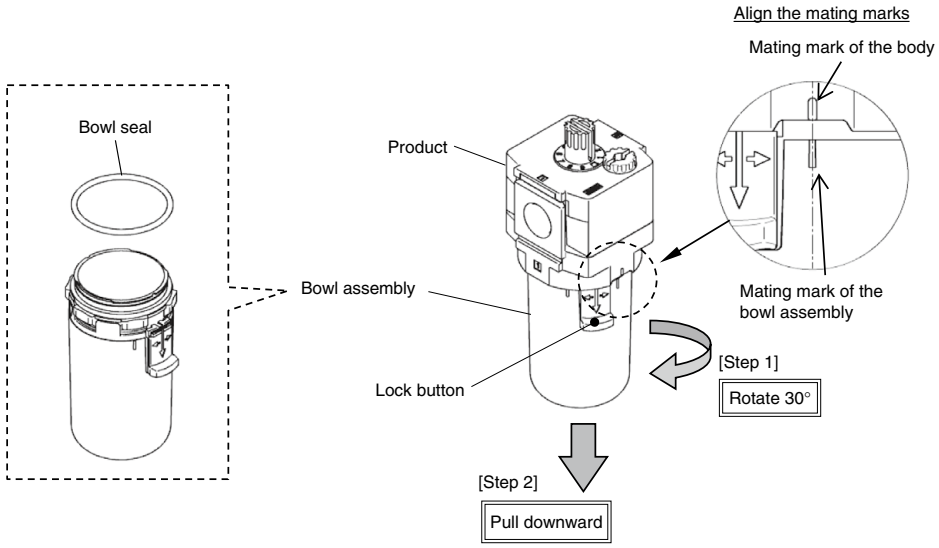
Applicable model	Process	Procedure	Tools	Check item
AL20-D	Disassembly	1) Remove the bowl assembly from the product. If the bowl assembly is tightened too much to be removed, use a hook wrench until it can be loosened by hand.	SMC's special wrench Part no.: 1129129	—



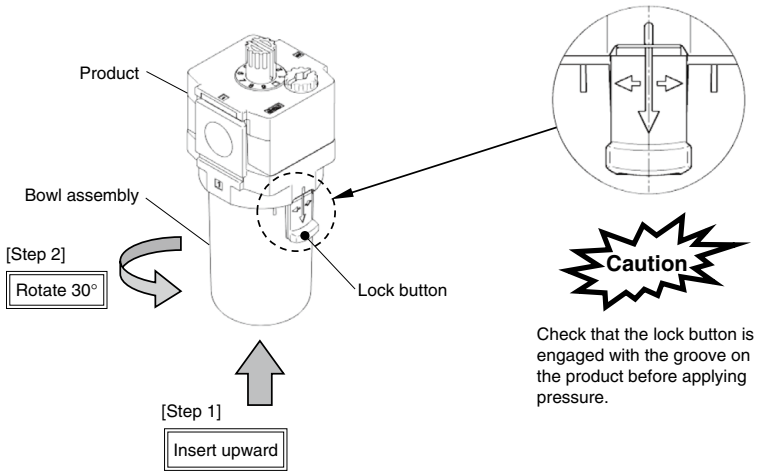
Process	Procedure	Tools	Check item
Assembly	2) Screw the bowl assembly into the product. Tighten it referring to the specified torque.	—	Referential tightening torque: 2.1 N·m



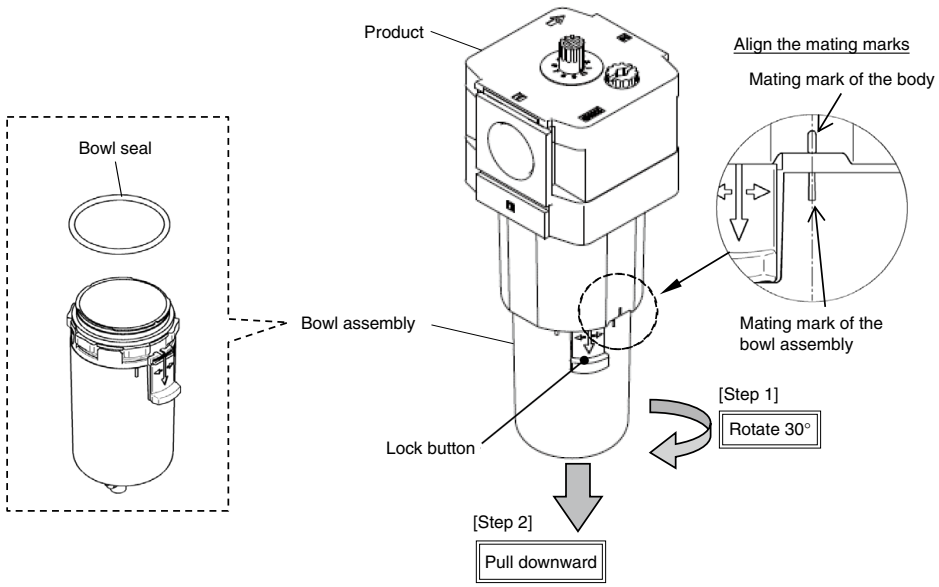
Applicable model	Process	Procedure	Tools	Check item
AL30-D AL40-D	Disassembly	1) Remove the bowl assembly from the product. While the lock button is held down, rotate the bowl assembly by approx. 30 degrees so that the mating marks of the body and bowl assembly meet each other. Then remove the bowl assembly by pulling it downward.	—	—



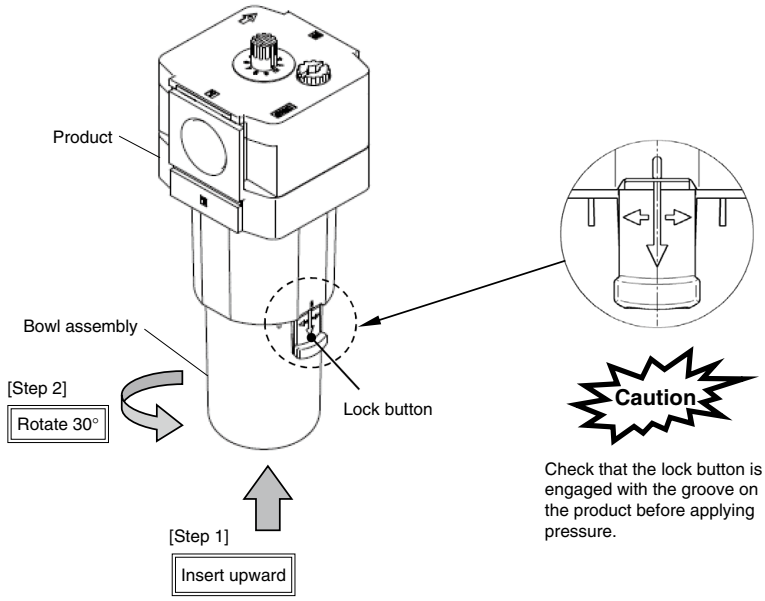
Process	Procedure	Tools	Check item
Assembly	2) Mount the bowl assembly to the product and rotate the bowl assembly until the lock button is locked in position as shown in the figure below.	—	—



Applicable model	Process	Procedure	Tools	Check item
AL50-D AL60-D	Disassembly	1) Remove the bowl assembly from the product. While the lock button is held down, rotate the bowl assembly by approx. 30 degrees so that the mating marks of the body and bowl assembly meet each other. Then remove the bowl assembly by pulling it downward.	—	—

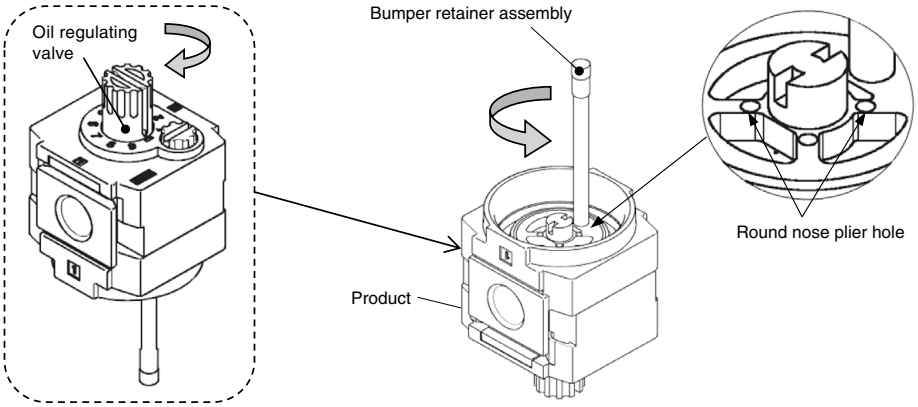


Process	Procedure	Tools	Check item
Assembly	2) Mount the bowl assembly to the product and rotate the bowl assembly until the lock button is locked in position as shown in the figure below.	—	—

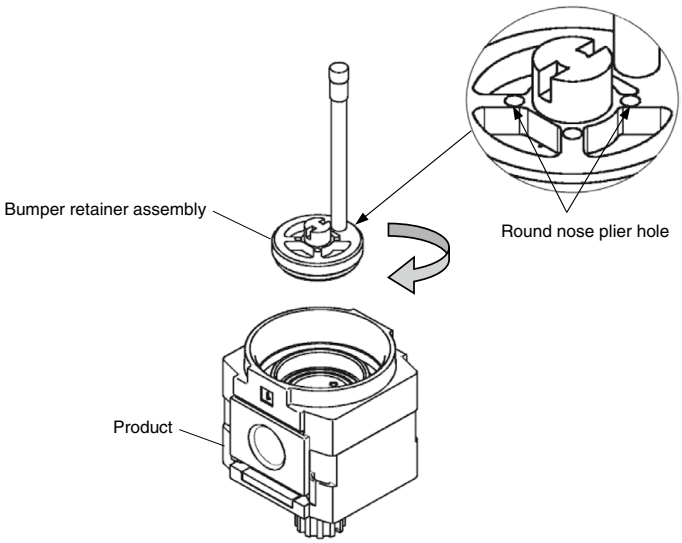


2. Bumper Retainer Assembly

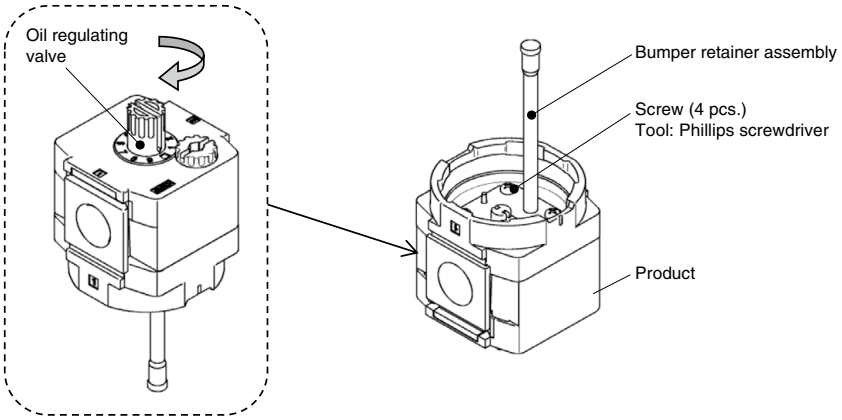
Applicable model	Process	Procedure	Tools	Check item
AL20-D	Disassembly	1) Remove the bowl assembly referring to section [Replacement of Bowl Assembly] . After removing the bowl assembly, rotate the oil regulating valve by hand to close the valve fully before disassembly. Remove the bumper retainer assembly by hooking the round nose pliers to the holes and turning them in the direction of the figure.	Round nose pliers (125 or 150)	—



Process	Procedure	Tools	Check item
Assembly	2) Screw the damper retainer assembly into the product. After assembling, mount the bowl assembly referring to section [Replacement of the Bowl Assembly] .	Round nose pliers (125 or 150)	Tightening torque (N·m) Model: AL20-D — Torque: 1.4 ± 0.1

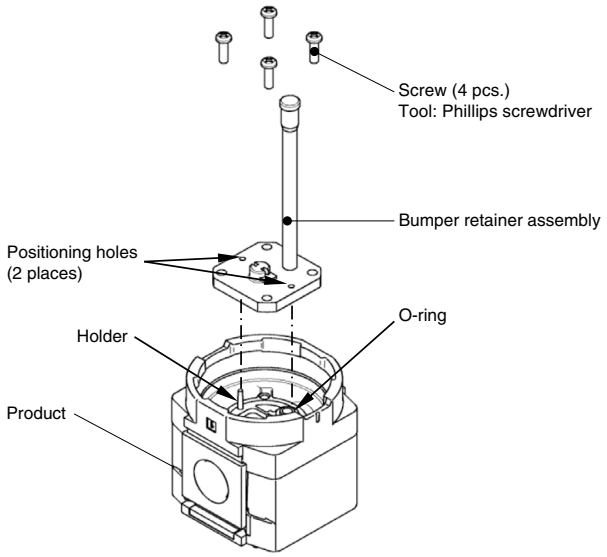


Applicable model	Process	Procedure	Tools	Check item
AL30-D AL40-D	Disassembly	1) Remove the bowl assembly referring to section [Replacement of the Bowl Assembly] . After removing the bowl assembly, rotate the oil regulating valve by hand to close the valve fully before disassembly. Remove the 4 screws, and then remove the bumper retainer assembly. There is an O-ring between the bumper retainer assembly and the holder assembly. Be careful not to miss it.	Phillips screwdriver (+)	—

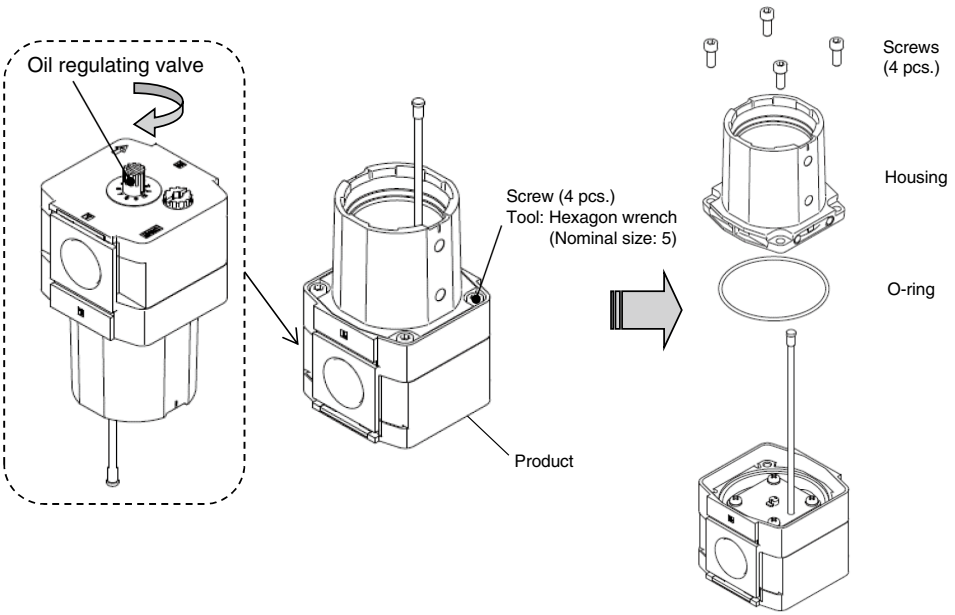


Process	Procedure	Tools	Check item
Assembly	2) Ensure that the O-ring is mounted correctly. Mate the holders and the positioning holes on the bumper retainer assembly. Tighten the bumper retainer assembly with 4 screws as in the figure below. After assembling, mount the bowl assembly referring to section [Replacement of the Bowl Assembly] .	Phillips screwdriver (+)	Tightening torque (N·m)

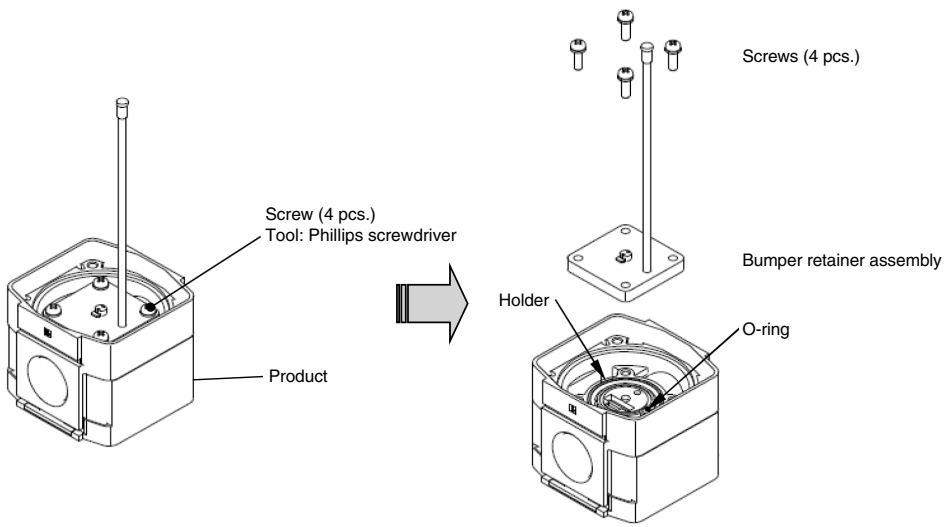
Model	Torque
AL30-D	0.4 ± 0.1
AL40-D	0.7 ± 0.2



Applicable model	Process	Procedure	Tools	Check item
AL50-D AL60-D	Disassembly	1) Remove the bowl assembly referring to section [Replacement of the Bowl Assembly] . After removing the bowl assembly, rotate the oil regulating valve by hand to close the valve fully before disassembly. Remove the 4 screws. Remove the housing and O-ring.	Hexagon wrench (Nominal size: 5)	—

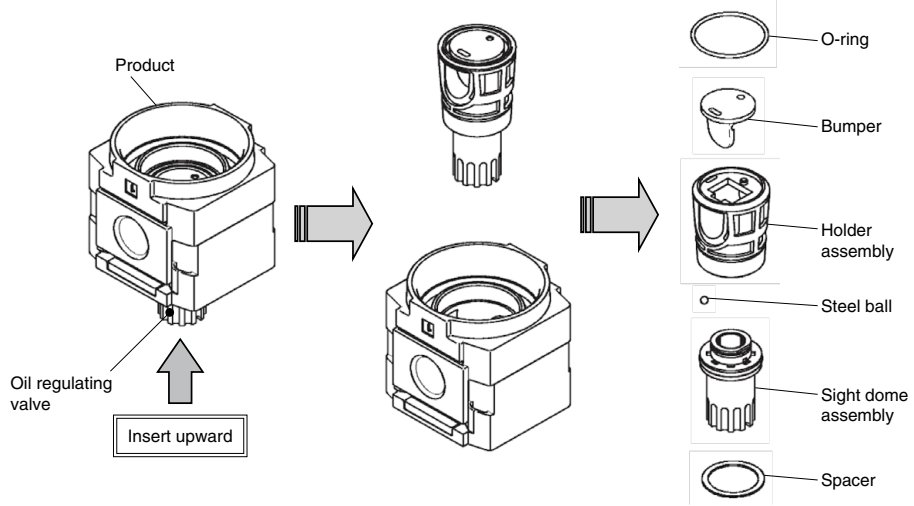


Process	Procedure	Tools	Check item
Disassembly	2) Remove the 4 screws and then remove the bumper retainer. There is an O-ring between the bumper retainer assembly and the holder assembly. Be careful not to miss it.	Phillips screwdriver (+)	—

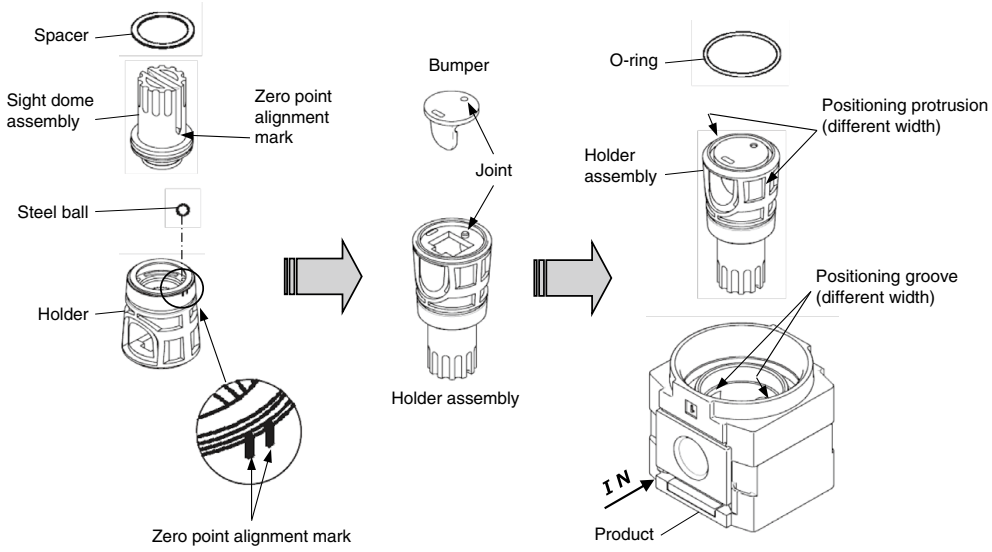


3. Bumper and the Sight Dome Assembly

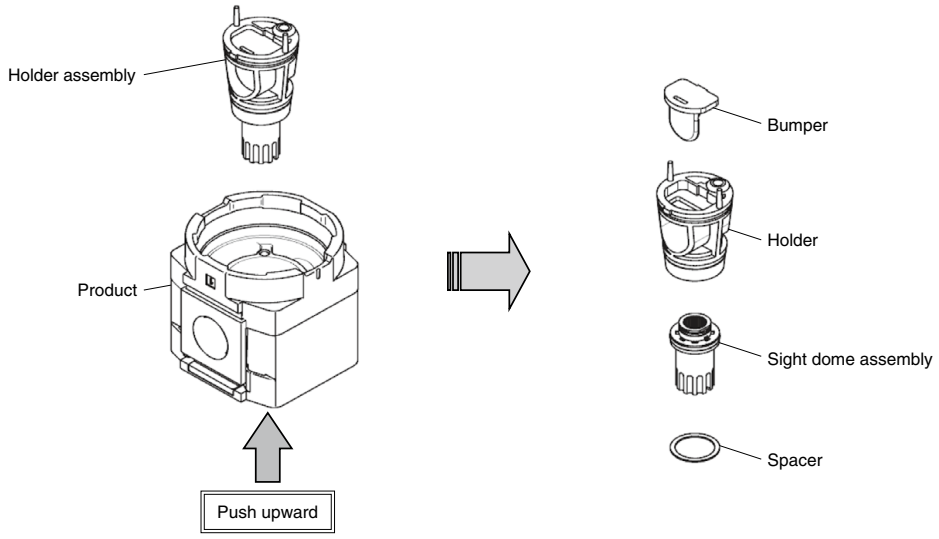
Applicable model	Process	Procedure	Tools	Check item
AL20-D	Disassembly	1) Remove the bumper retainer assembly referring to section [Replacement of the Bumper Retainer Assembly]. After removing the bumper retainer assembly, remove the holder assembly by pushing the oil regulating value (sight dome assembly) into the body. Separate the holder assembly and sight dome assembly by hand. There is a steel ball inside. Please take care not to miss it.	—	—



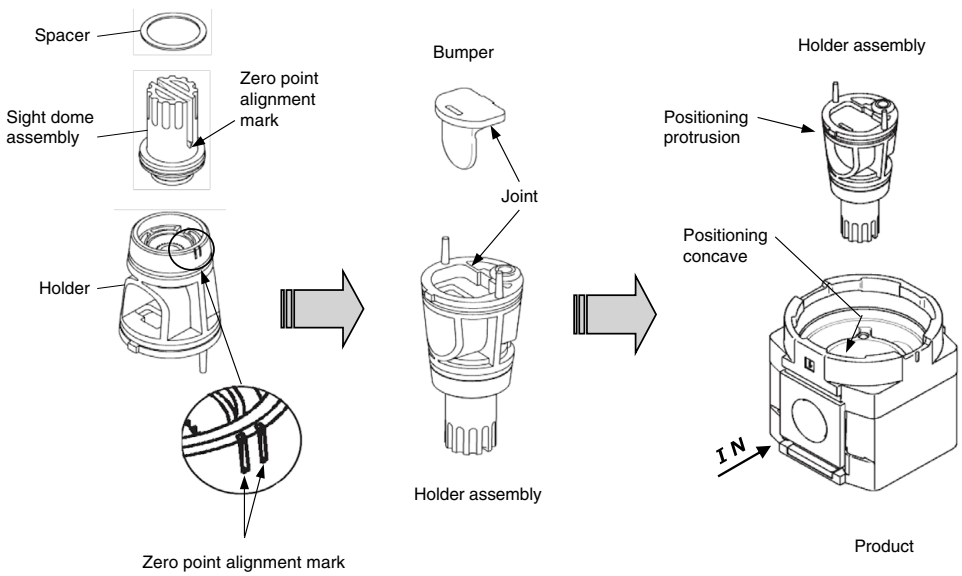
Process	Procedure	Tools	Check item
Assembly	2) Assemble the spacer, sight dome assembly, steel ball and holder. Place the steel ball in the oil inlet of the holder assembly and assemble the sight dome assembly by aligning the zero point alignment mark of the sight dome assembly with the zero point alignment mark of the holder assembly. Next, install the bumper in the holder assembly. Assemble them in a direction that matches the shape of the bumper and the protrusion of the holder assembly. Lastly, assemble the holder assembly to the body. When the holder assembly and body are assembled with correct positioning, the end surfaces of the holder and body become flat. After assembling the O-ring, assemble the bumper retainer assembly referring to section [Replacement of the Bumper Retainer Assembly].	—	—



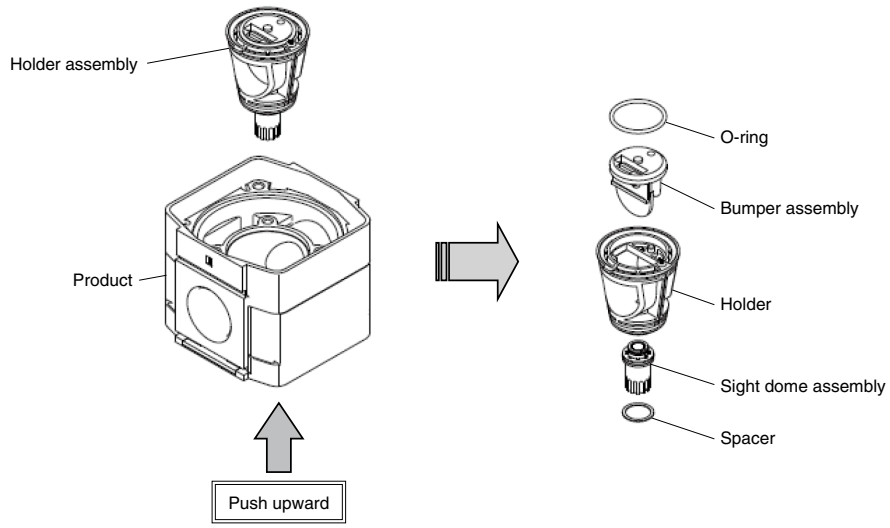
Applicable model	Process	Procedure	Tools	Check item
AL30-D AL40-D	Disassembly	1) Remove the bumper retainer assembly referring to section [Replacement of the Bumper Retainer Assembly]. Remove the sight dome assembly by pushing it in the arrow direction. Separate the holder assembly and sight dome assembly by hand. Remove the bumper using tweezers so that it is not damaged.	Tweezers	—



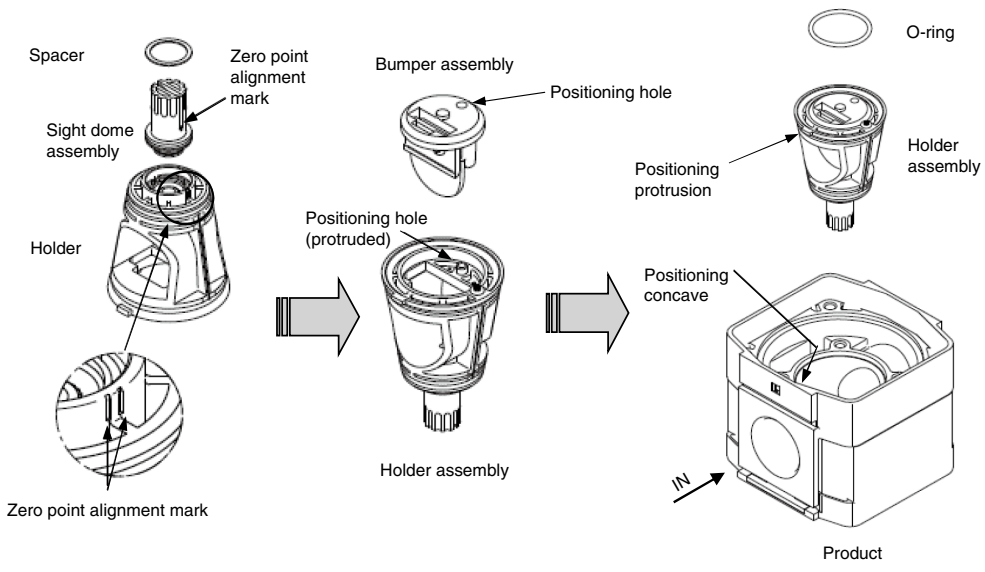
Process	Procedure	Tools	Check item
Assembly	2) Assemble the spacer, sight dome assembly and holder. Assemble the sight dome assembly by aligning the zero point alignment mark of the sight dome assembly with the zero point alignment mark of the holder assembly. Next, install the bumper in the holder assembly. Assemble them in a direction that matches the shape of the bumper and the concave of the holder assembly. Lastly, assemble the holder assembly to the body. When the holder assembly and body are assembled with correct positioning, the end surfaces of the holder and body become flat. After assembling, mount the bumper retainer assembly referring to section [Replacement of the Bumper Retainer Assembly].	—	—



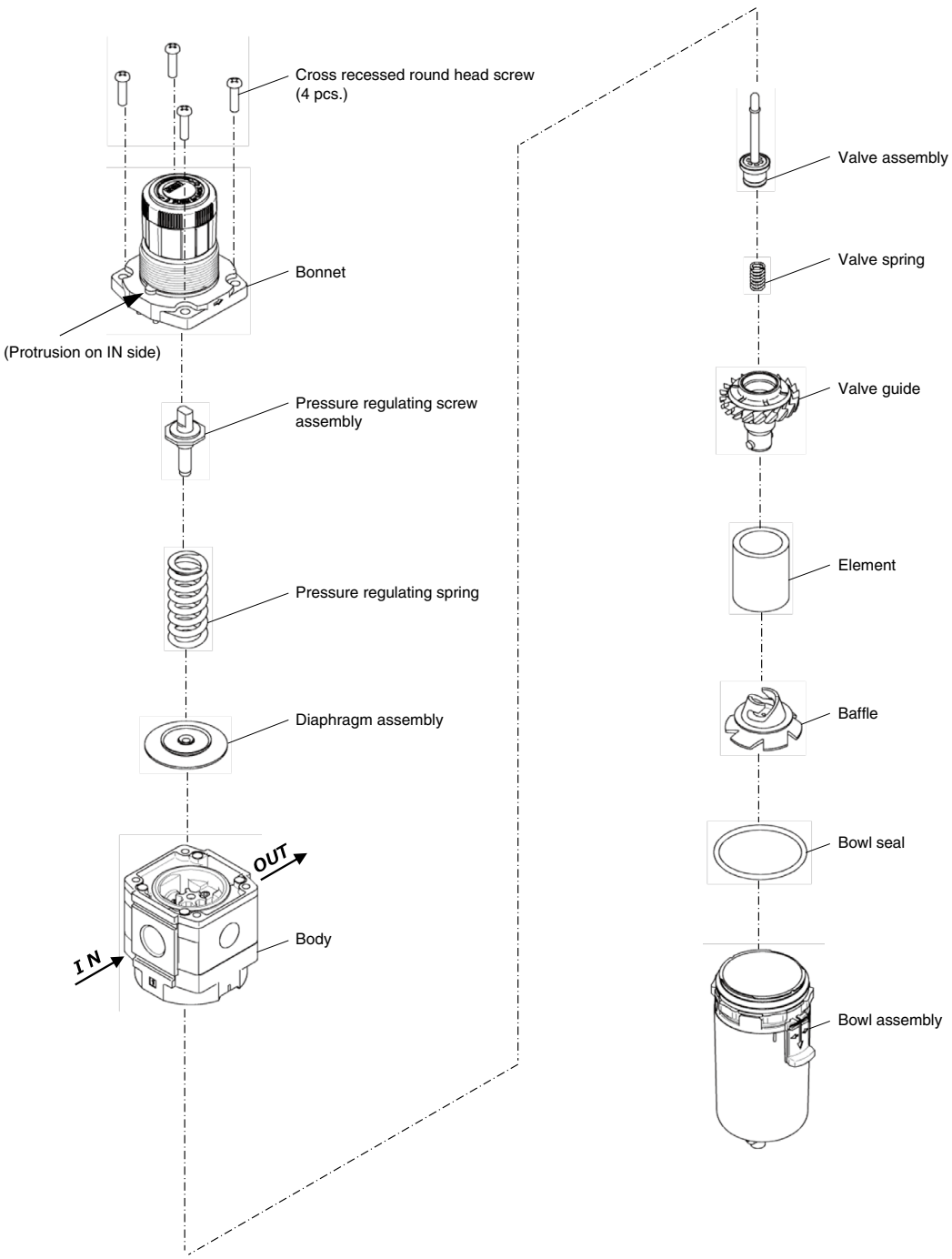
Applicable model	Process	Procedure	Tools	Check item
AL50-D AL60-D	Disassembly	1) Remove the retainer assembly referring to section [Replacement of the Bumper Retainer Assembly]. Remove the sight dome assembly by pushing it in the arrow direction. Separate the holder assembly and sight dome assembly by hand. Remove the bumper assembly using tweezers so that it is not damaged.	Tweezers	—



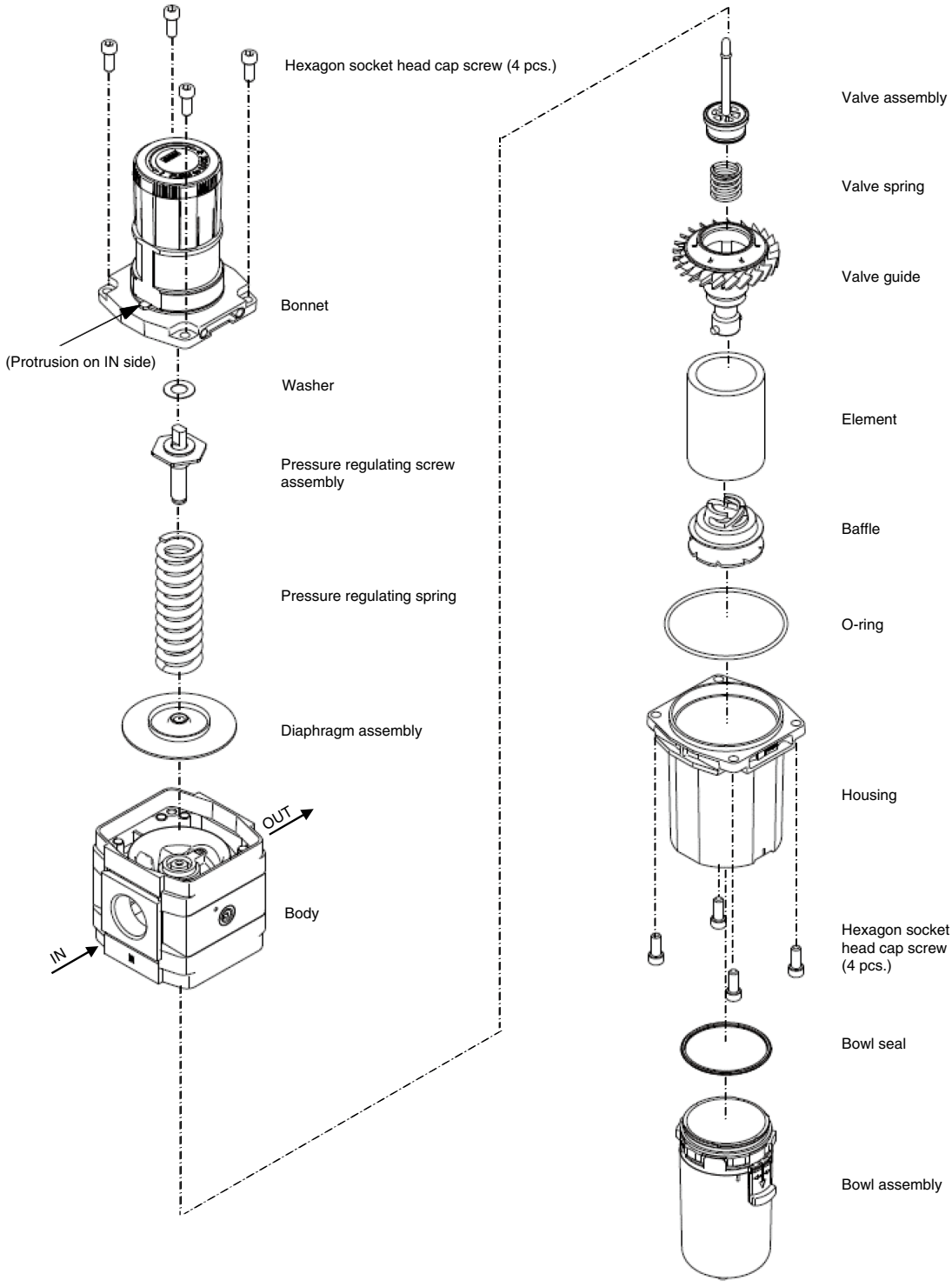
Process	Procedure	Tools	Check item
Assembly	2) Assemble the spacer, sight dome assembly and holder. Assemble the sight dome assembly by aligning the zero point alignment mark of the sight dome assembly with the zero point alignment mark of the holder assembly. Next, install the bumper assembly in the holder assembly. Assemble the bumper assembly and holder assembly when their positioning hole match. Be careful with the side of the protrusion. Lastly, assemble the holder assembly and O-ring to the body. When the holder assembly and body are assembled with correct positioning, the end surfaces of the holder and body become flat. After assembling, mount the retainer assembly referring to section [Replacement of the Bumper Retainer Assembly].	—	—



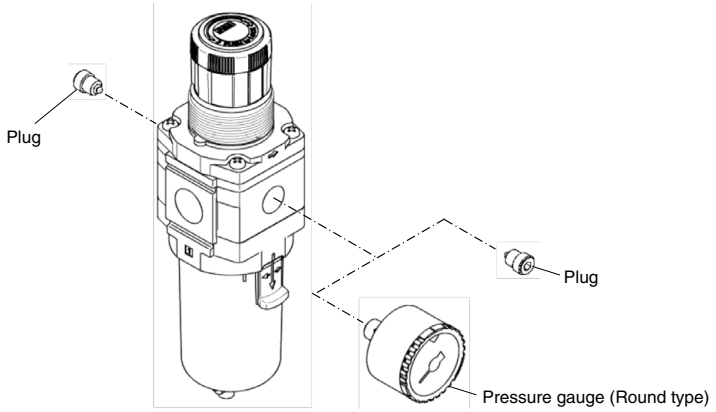
AW20-D/AW30-D/AW40-D



AW60-D

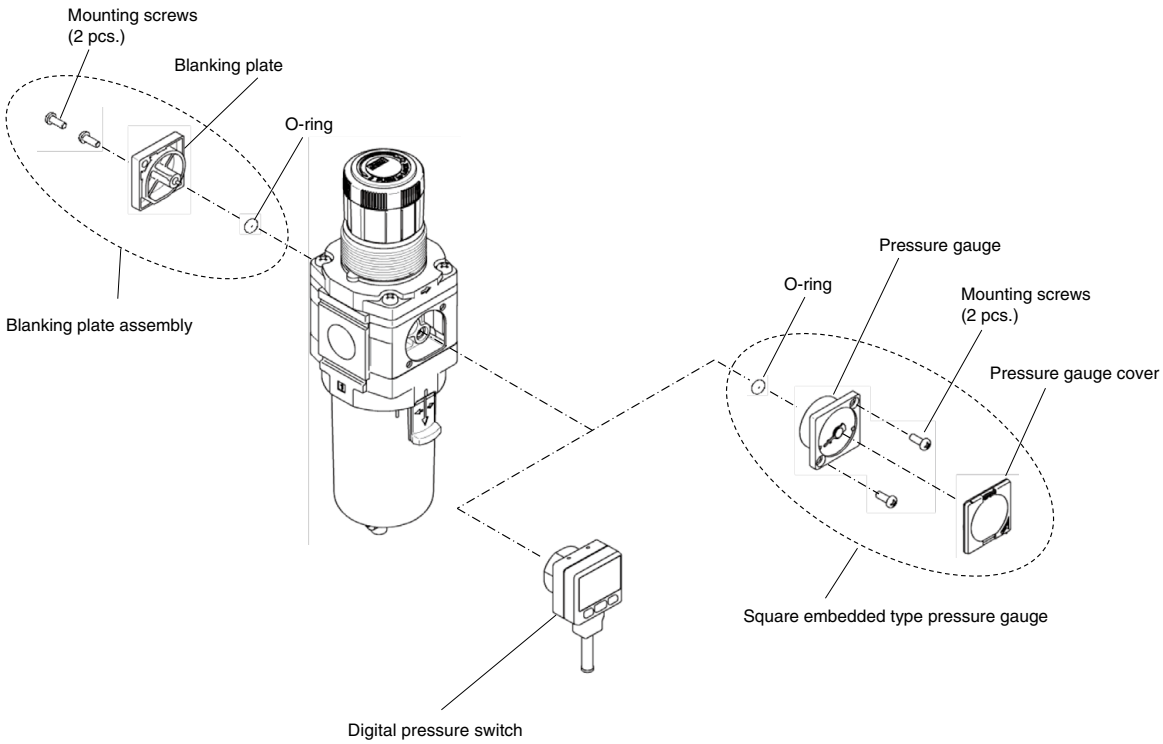

Hexagon socket head cap screw (4 pcs.)
Bonnet
(Protrusion on IN side)
Washer
Pressure regulating screw assembly
Pressure regulating spring
Diaphragm assembly
OUT
IN
Body
Valve assembly
Valve spring
Valve guide
Element
Baffle
O-ring
Housing
Hexagon socket head cap screw (4 pcs.)
Bowl seal
Bowl assembly

Pressure Gauge Port
[Applicable model: Without pressure gauge/With pressure gauge (Round type)]



Filter regulator

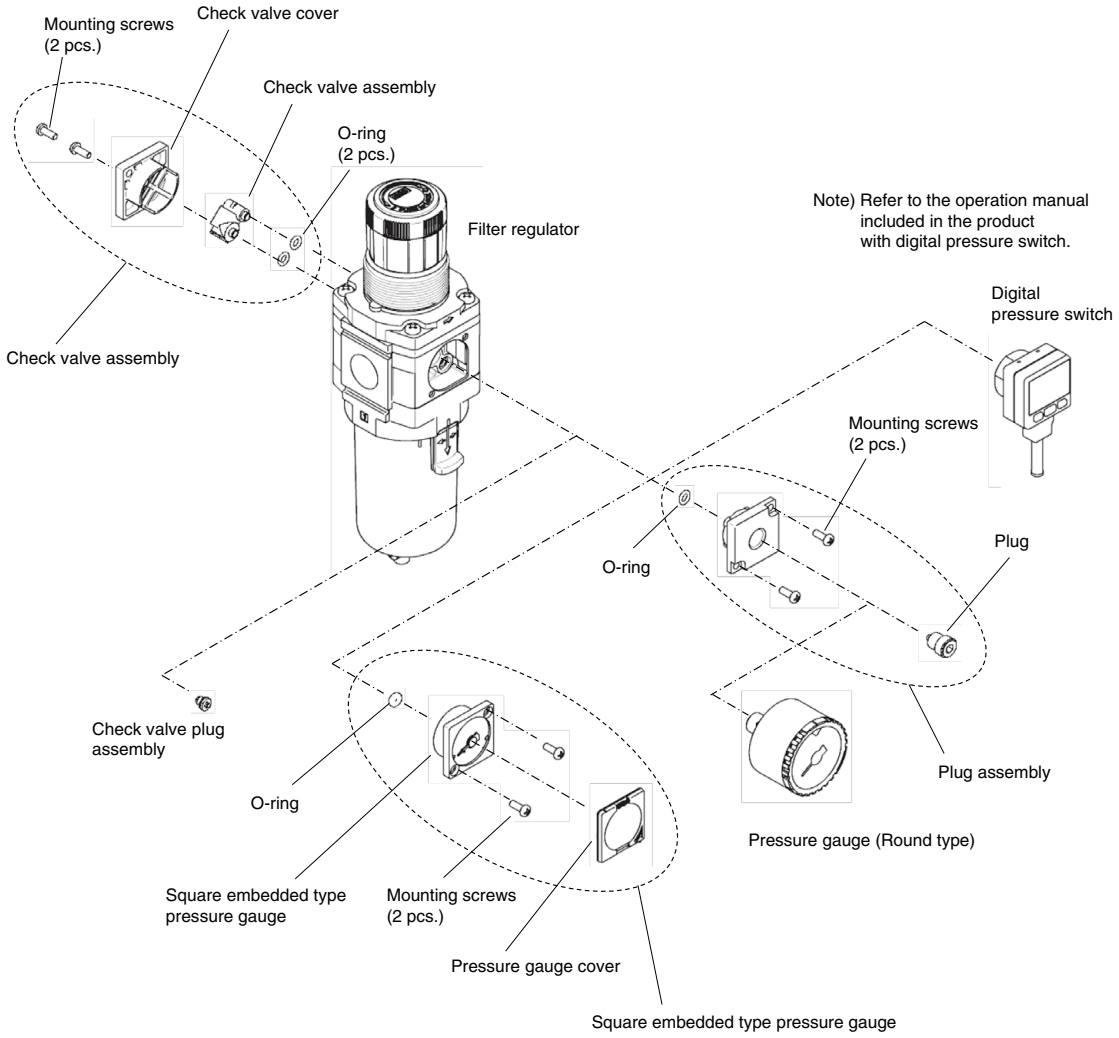
Pressure Gauge Port
[Applicable model: With square embedded type pressure gauge/With digital pressure switch]



Note) Refer to the operation manual included in the product with digital pressure switch.

· When the pressure gauge is mounted on the back of the product, swap all parts for the front and back.

Pressure Gauge Port [Applicable model: With backflow function]



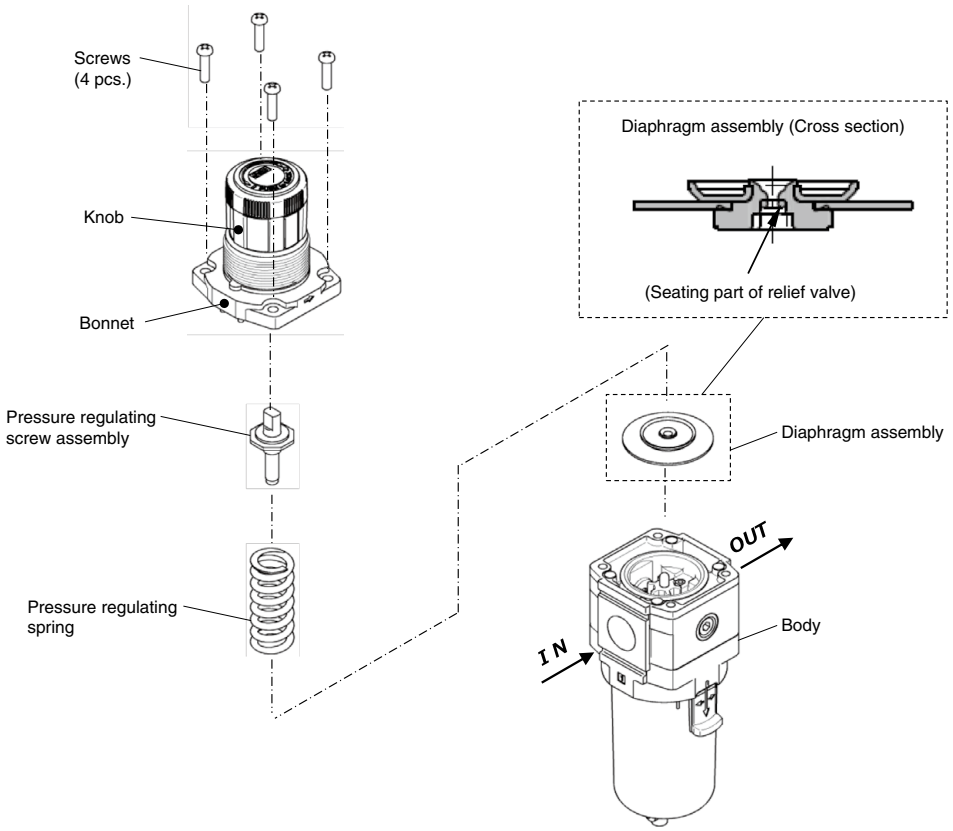
· When the pressure gauge is mounted on the back of the product, swap all parts for the front and back.
Be sure to change the check valve plug as well.

⚠Warning

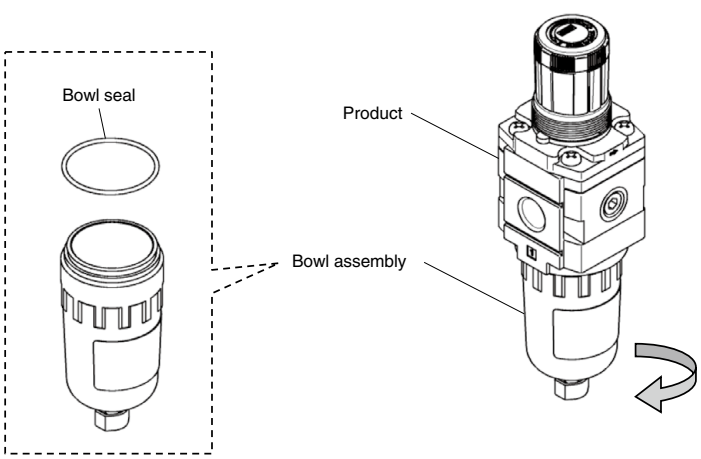
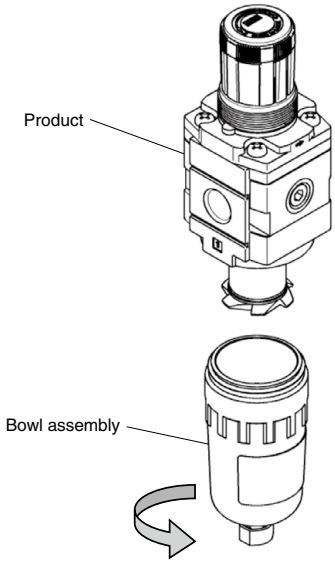
Before replacement, ensure that the regulator is not pressurized.
Also, make sure to loosen the knob of the filter regulator so that the set pressure is zero.
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Diaphragm Assembly

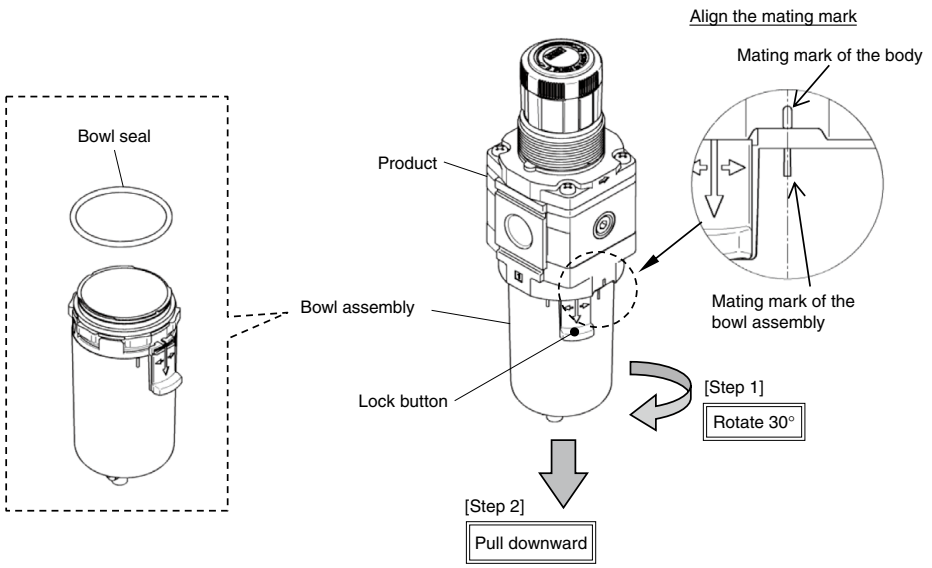
Applicable model	Process	Procedure	Tools	Check item
AW20-D AW30-D AW40-D AW60-D	Disassembly	1) Loosen the knob completely before disassembly.	—	—
		2) Remove the 4 screws and remove the bonnet.	AW20/AW30/AW40 Phillips screwdriver (+) AW60 Hexagon wrench Nominal size: 5	—
		3) Remove the pressure regulating screw assembly, pressure regulating spring, and diaphragm assembly in that order.	—	—
	Assembly	4) Assemble the diaphragm assembly, pressure regulating spring, and then pressure regulating screw assembly.	—	Direction of the diaphragm assembly and the pressure regulating screw assembly
		5) Assemble the bonnet to the body. While the convex side of the bonnet is facing the IN side, mount it onto the body. Then tighten the 4 mounting screws temporarily before tightening them diagonally and evenly to fix the bonnet.	AW20/AW30/AW40 Phillips screwdriver (+) AW60 Hexagon wrench Nominal size: 5	Tightening torque: AW20-D, AW30-D: 2.35 ± 0.3 N·m AW40-D, AW60-D: 3.5 ± 0.3 N·m



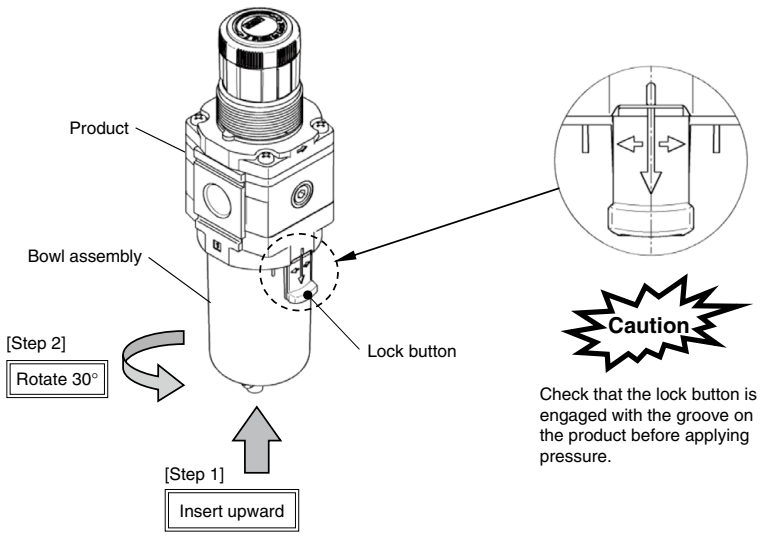
2. Bowl Assembly

Applicable model	Process	Procedure	Tools	Check item
AW20-D AW20K-D	Disassembly	1) Remove the bowl assembly from the product. If the bowl assembly is tightened too much to be removed, use a hook wrench until it can be loosened by hand.	SMC's special wrench Part no.: 1129129	—
				
	Process	Procedure	Tools	Check item
	Assembly	2) Screw the bowl assembly into the product. Tighten it referring to the specified torque.	—	Referential tightening torque: 2.1 N·m
				

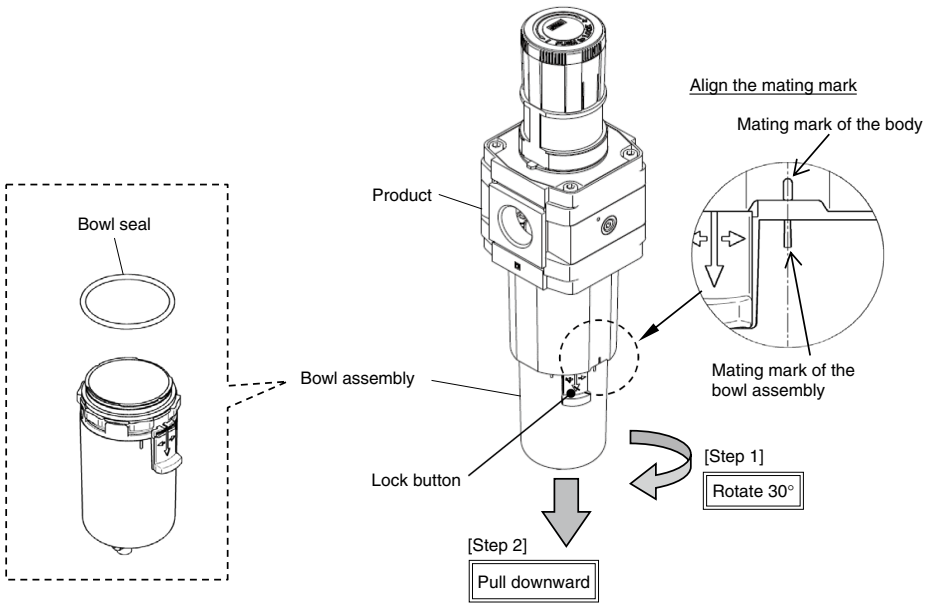
Applicable model	Process	Procedure	Tools	Check item
AW30-D AW30K-D AW40-D AW40K-D	Disassembly	1) Remove the bowl assembly from the product. While the lock button is held down, rotate the bowl assembly by approx. 30 degrees so that the mating marks of the body and bowl assembly meet each other. Then remove the bowl assembly by pulling it downward.	—	—



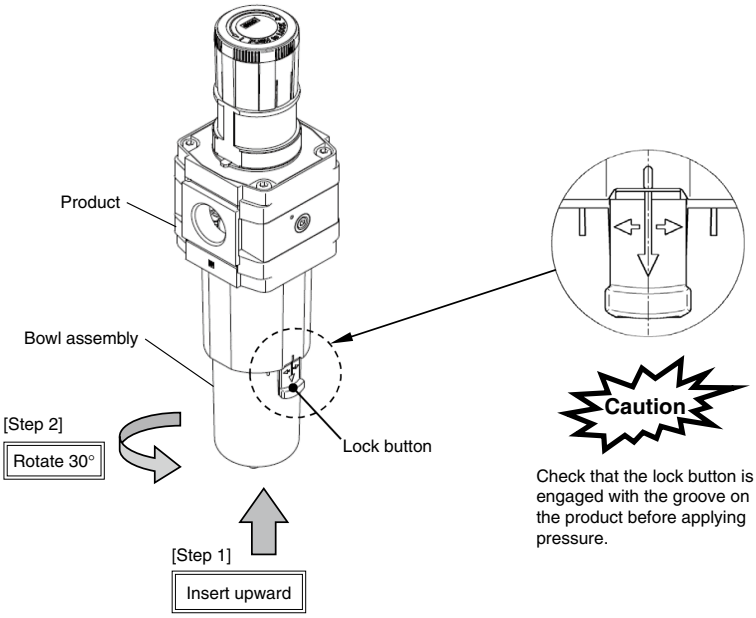
Process	Procedure	Tools	Check item
Assembly	2) Mount the bowl assembly to the product and rotate the bowl assembly until the lock button is locked in position as shown in the figure below.	—	—



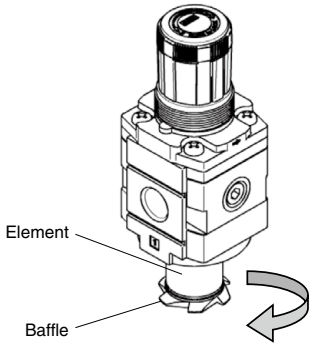
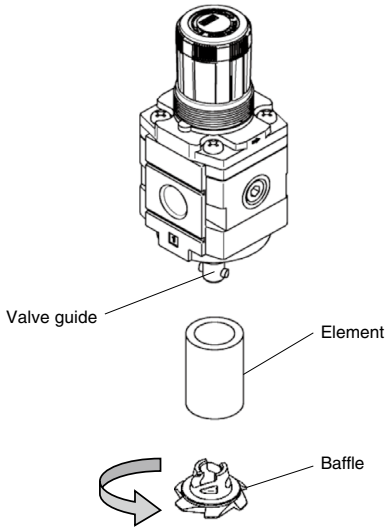
Applicable model	Process	Procedure	Tools	Check item
AW60-D AW60K-D	Disassembly	1) Remove the bowl assembly from the product. While the lock button is held down, rotate the bowl assembly by approx. 30 degrees so that the mating marks of the body and bowl assembly meet each other. Then remove the bowl assembly by pulling it downward.	—	—



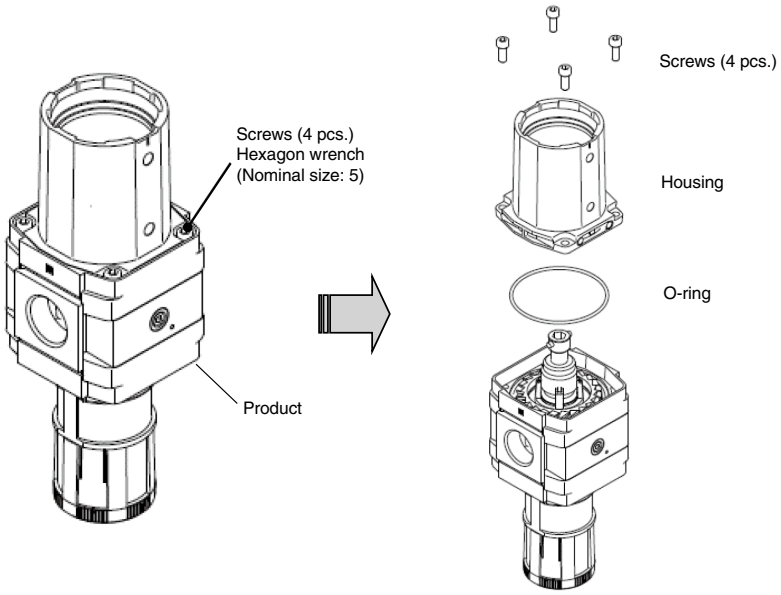
Process	Procedure	Tools	Check item
Assembly	2) Mount the bowl assembly to the product and rotate the bowl assembly until the lock button is locked in position as shown in the figure below.	—	—



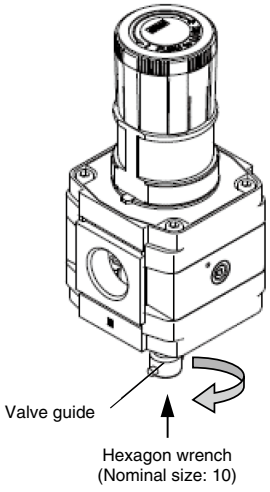
3. Element Assembly

Applicable model	Process	Procedure	Tools	Check item
AW20-D AW20K-D AW30-D AW30K-D AW40-D AW40K-D	Disassembly	1) Remove the bowl assembly referring to section [Replacement of the Bowl Assembly]. Rotate the baffle in the arrow direction to remove the element.	—	—
				
	Process	Procedure	Tools	Check item
	Assembly	2) Mount the element to the valve guide and rotate the baffle in the arrow direction to mount the element. Assemble the bowl assembly referring to section [Replacement of the Bowl Assembly].	—	—
				

Applicable model	Process	Procedure	Tools	Check item
AW60-D AW60K-D	Disassembly	1) Remove the bowl assembly and element referring to sections [Replacement of the Bowl Assembly] and [Replacement of the Element]. Remove 4 screws and remove the housing and O-ring.	Hexagon wrench Nominal size: 5	—

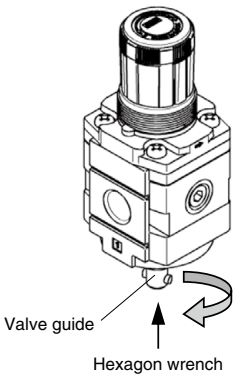


Process	Procedure	Tools	Check item
Disassembly	2) Rotate the valve guide in the arrow direction to remove, taking care not to lose the valve spring.	Hexagon wrench Nominal size: 10	—

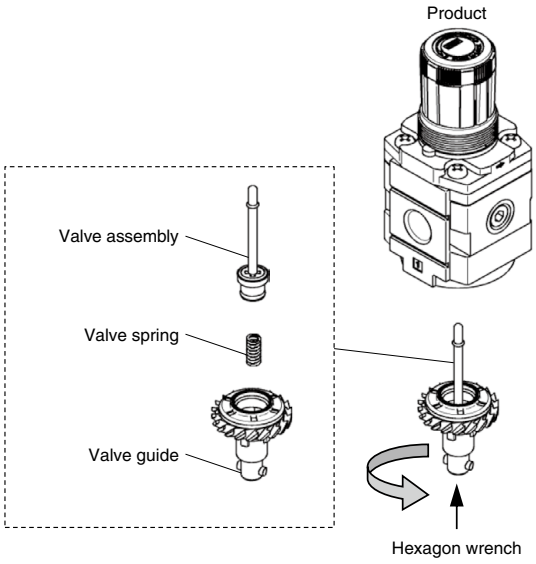


4. Valve Assembly

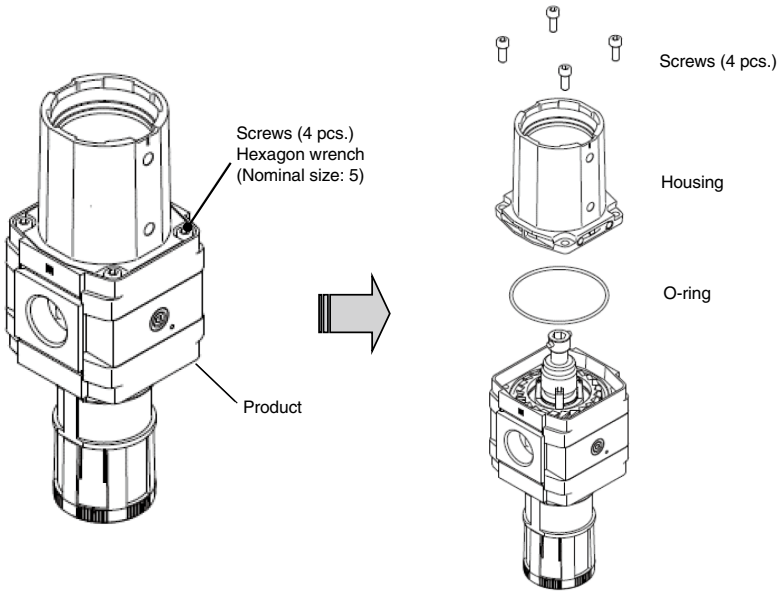
Applicable model	Process	Procedure	Tools	Check item
AW20-D AW20K-D AW30-D AW30K-D AW40-D AW40K-D	Disassembly	1) Remove the bowl assembly and element referring to sections [Replacement of the Bowl Assembly] and [Replacement of the Element]. Rotate the valve guide in the arrow direction to remove, taking care not to lose the valve spring.	Hexagon wrench **AW20-D** Nominal: 4 **AW30-D** Nominal: 6 **AW40-D** Nominal: 8	—



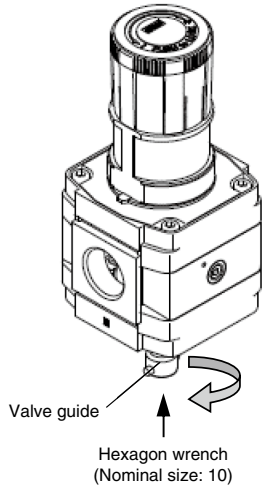
Process	Procedure	Tools	Check item
Assembly	2) Mount the valve spring and valve assembly on the valve guide as shown in the drawing. Rotate the valve guide in the arrow direction to mount the valve guide to the product. Assemble the element and the bowl assembly referring to sections [Replacement of the Element] and [Replacement of the Bowl Assembly].	Hexagon wrench **AW20-D** Nominal: 4 **AW30-D** Nominal: 6 **AW40-D** Nominal: 8	Tightening torque: **AW20-D** 0.45 N·m **AW30-D** 0.95 N·m **AW40-D** 1.15 N·m



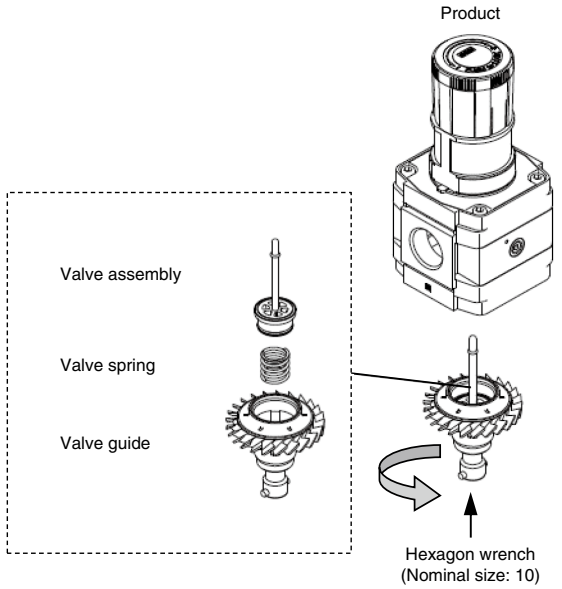
Applicable model	Process	Procedure	Tools	Check item
AW60-D AW60K-D	Disassembly	1) Remove the bowl assembly and element referring to sections [Replacement of the Bowl Assembly] and [Replacement of the Element]. Remove the 4 screws and then remove the housing and O-ring.	Hexagon wrench Nominal size: 5	—



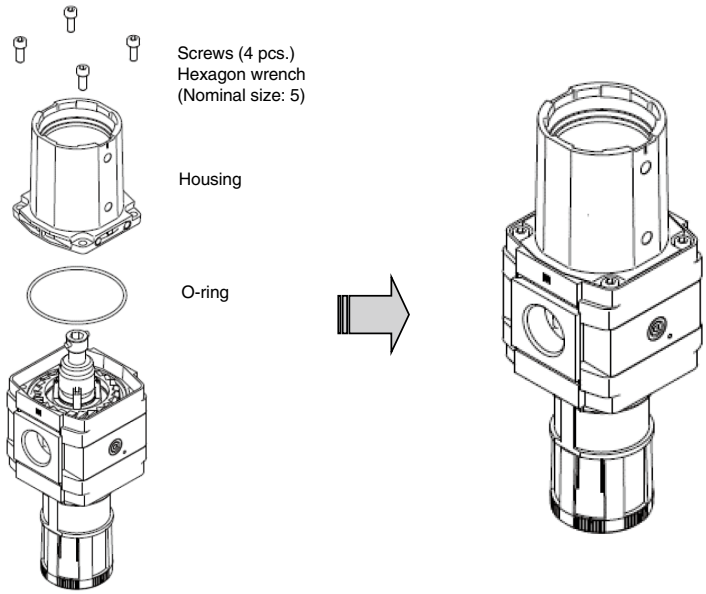
Process	Procedure	Tools	Check item
Disassembly	2) Rotate the valve guide in the arrow direction to remove, taking care not to lose the valve spring.	Hexagon wrench Nominal size: 10	—



Applicable model	Process	Procedure	Tools	Check item
AW60-D AW60K-D	Assembly	3) Mount the valve spring and valve assembly on the valve guide as shown in the drawing. Rotate the valve guide in the arrow direction to mount the valve guide to the product.	Hexagon wrench Nominal size: 10	Tightening torque: 6.5 ± 0.3 N·m



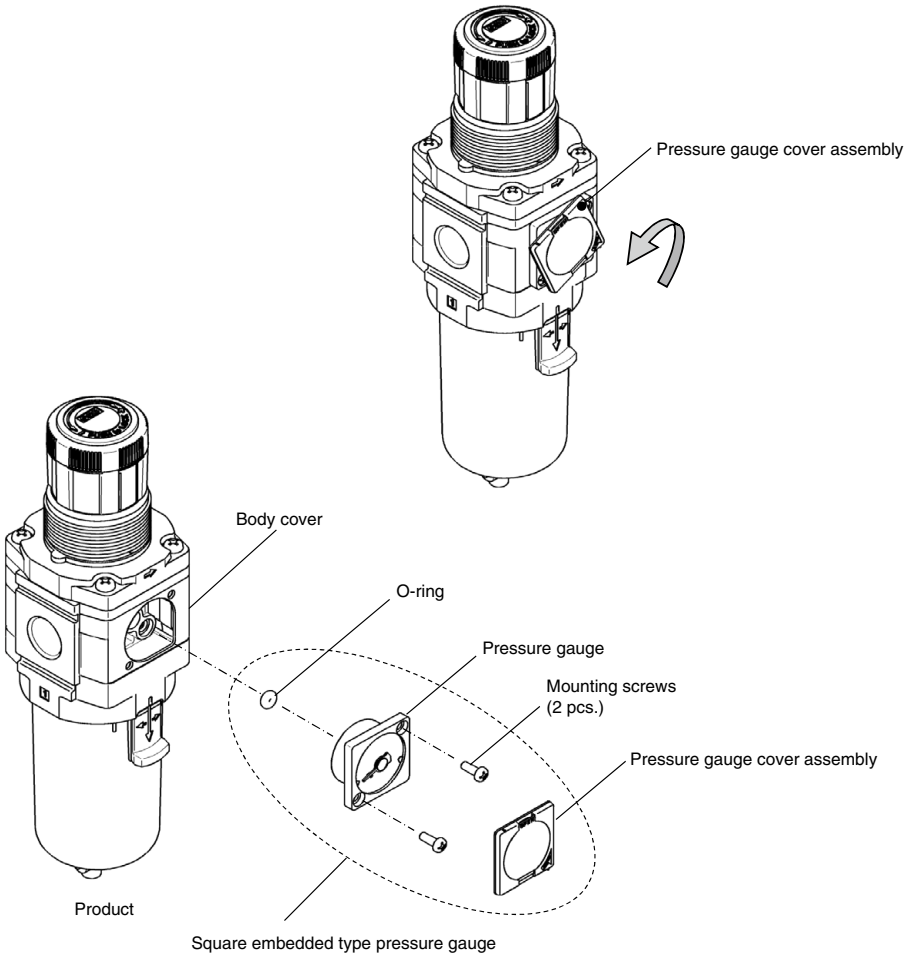
Process	Procedure	Tools	Check item
Assembly	4) Mount the O-ring and housing to the body. Assemble them with the 4 screws. Then, assemble the element and the bowl assembly referring to section [Replacement of the Element] and [Replacement of the Bowl Assembly] .	Hexagon wrench Nominal size: 5	Tightening torque: 3.5 ± 0.3 N·m



5. Square Embedded Type Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
AW20-D AW20K-D AW30-D AW30K-D AW40-D AW40K-D AW60-D AW60K-D	Disassembly	1) Remove the pressure gauge cover assembly. Rotate the pressure gauge cover assembly 15 degrees in the arrow direction (counterclockwise) and pull it out.	—	—
		2) Remove the pressure gauge. Remove the 2 mounting screws and remove the pressure gauge. The body cover comes out together. Please take care not missing it.	Phillips screwdriver (+)	—
	Assembly	3) Confirm that the O-ring is mounted onto the pressure gauge. When the O-ring comes out or is left on the filter regulator, mount the O-ring to the pressure gauge correctly.	—	Presence of the O-ring
		4) Assemble the pressure gauge. Mount the pressure gauge to the filter regulator with the mounting screws and tighten the screws referring to the tightening torque specified in the right column.	Phillips screwdriver (+)	Tightening torque: 0.85 ± 0.05 N·m
		5) Mount the pressure gauge cover assembly. Set the pressure gauge cover assembly with its arrow on the lower right corner. Mate the 2 fingers of the pressure gauge cover assembly with the 2 finger slits of the pressure gauge, and rotate the pressure gauge cover assembly 15 degrees to the opposite direction of the arrow (clockwise).	—	—

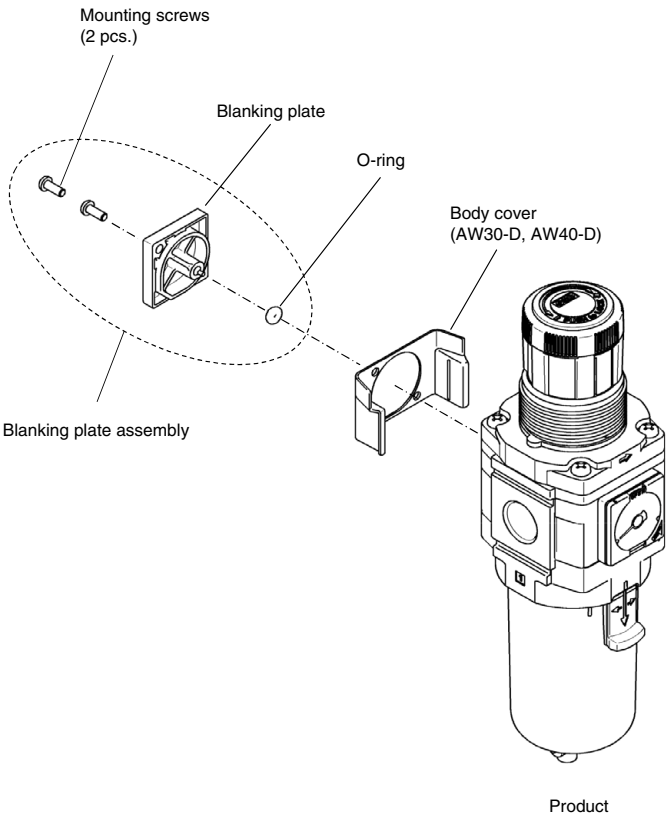
Note) Applicable to the product with square embedded type pressure gauge (E).



6. Blanking Plate Assembly

Applicable model	Process	Procedure	Tools	Check item
AW20-D AW30-D AW40-D AW60-D	Disassembly	1) Remove the blanking plate. Remove the 2 mounting screws and remove the blanking plate. The body cover (AW30-D, AW40-D) comes out together. Please take care not missing it.	Phillips screwdriver (+)	—
	Assembly	2) Confirm that the O-ring is mounted onto the blanking plate. When the O-ring comes out or is left on the filter regulator, mount the O-ring to the blanking plate correctly.	—	Presence of the O-ring
		3) Assemble the blanking plate. Mount the blanking plate to the product, over the body cover, with the mounting screws and tighten them referring to the tightening torque specified in the right column.	Phillips screwdriver (+)	Tightening torque: 0.6 ± 0.05 N·m

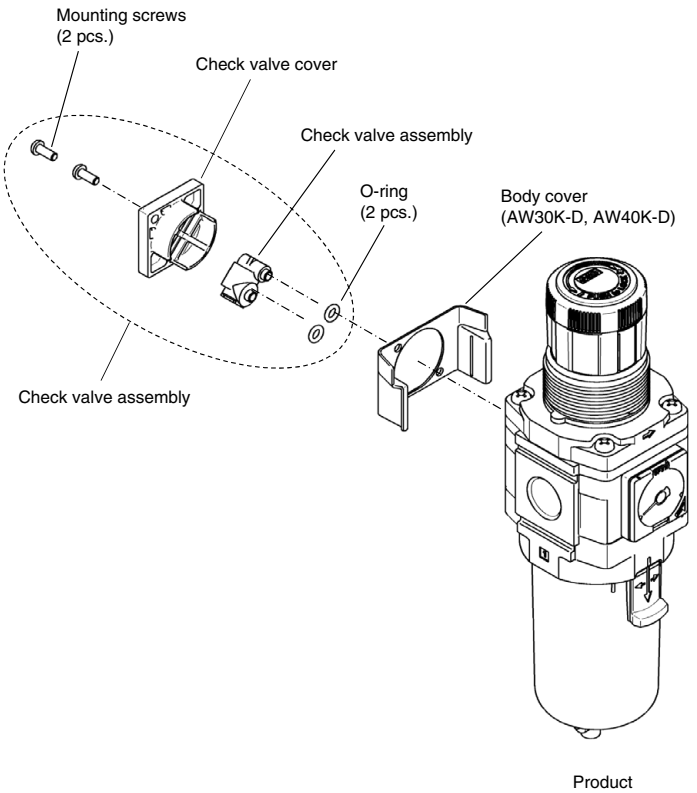
Note) Applicable to the product with square embedded type pressure gauge (E) or digital pressure switch (E1 to E4). Not applicable to the product with backflow function.



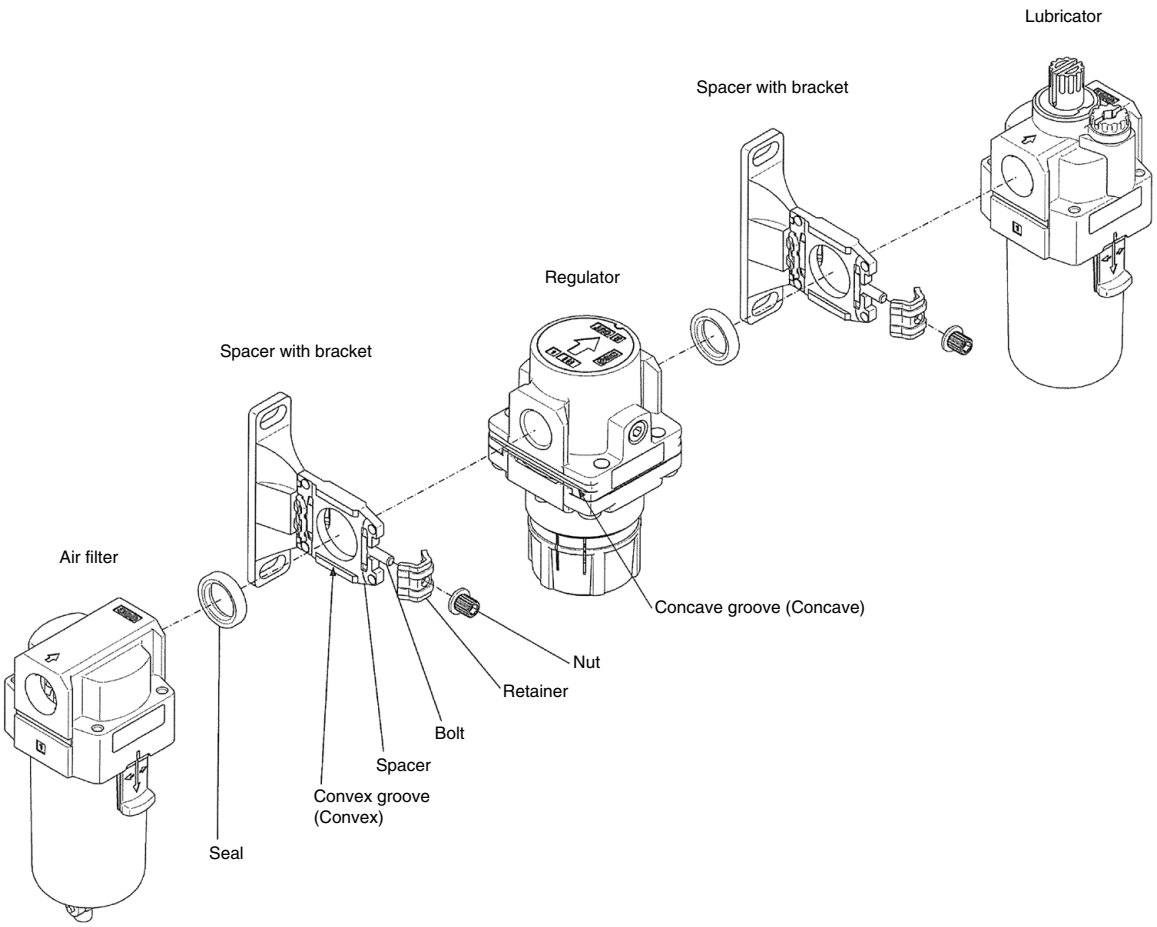
7. Check Valve Assembly

Applicable model	Process	Procedure	Tools	Check item
AW20K-D AW30K-D AW40K-D AW60K-D	Disassembly	1) Remove the check valve cover. Remove the 2 mounting screws and the check valve cover. The body cover comes out together. Please take care not missing it.	Phillips screwdriver (+)	—
		2) Remove the check valve assembly. Remove the check valve assembly by pulling it toward the operator.	—	—
	Assembly	3) Confirm that the O-ring is mounted onto the check valve assembly. When the O-ring comes out or is left on the filter regulator, mount the O-ring to the check valve assembly correctly.	—	Presence of the O-ring
		4) Assemble the check valve cover. Assemble the check valve cover to the product with the mounting screws and tighten the screws referring to the tightening torque specified in the right column.	Phillips screwdriver (+)	Tightening torque: 0.6 ± 0.05 N·m

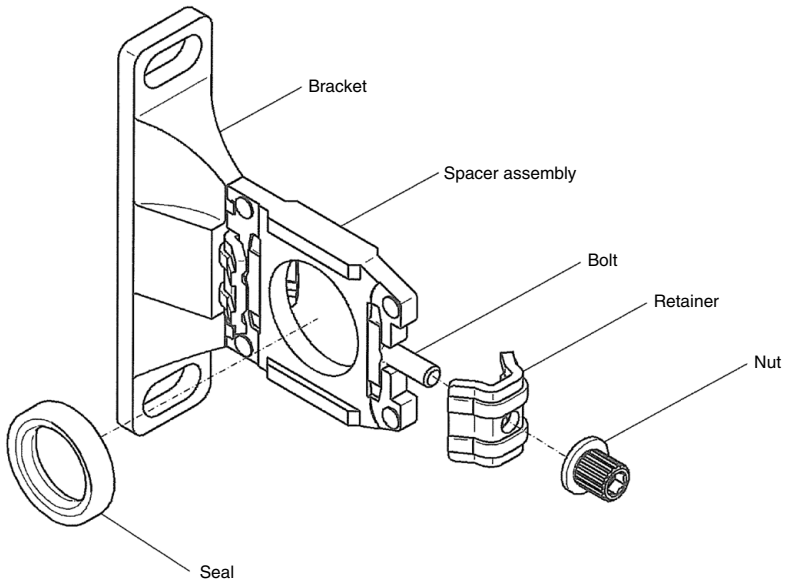
Note) Applicable to the product with backflow function.



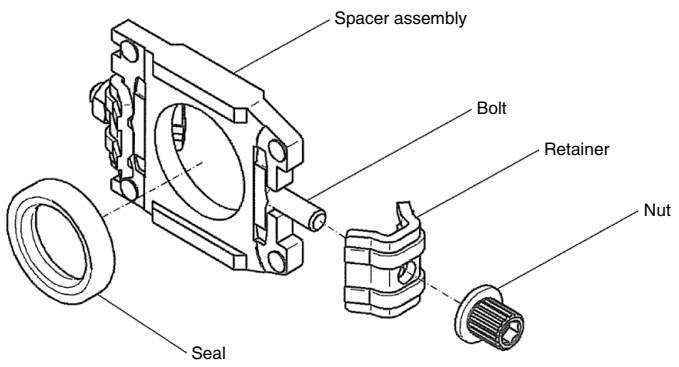
1) F.R.L. units


Lubricator
Spacer with bracket
Regulator
Spacer with bracket
Air filter
Concave groove (Concave)
Nut
Retainer
Bolt
Spacer
Convex groove
(Convex)
Seal

2) Spacer with bracket



3) Spacer



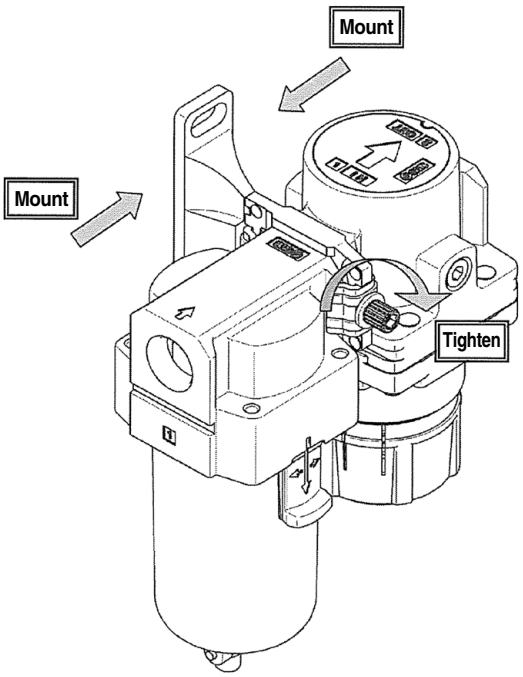
⚠Warning

- Before replacement, ensure that the regulator is not pressurized.
- Rotate the knob of the regulator and filter regulator to zero.
- Replace while referring to the “Exploded View.”
- After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

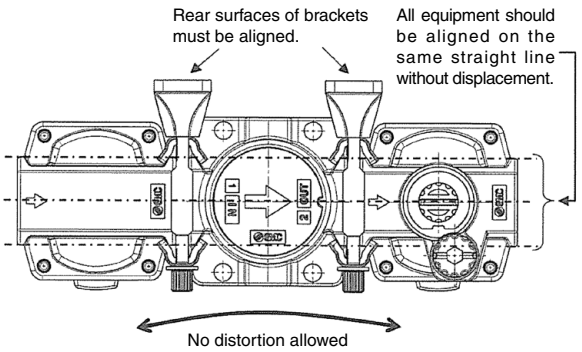
1. Air Combination

Process	Procedure	Tools	Check item
Disassembly	1) Remove the pipes connected to the product as required.	—	—
	2) Remove the nut and retainer. Insert the hexagon wrench into the hexagon hole on the nut, and turn the wrench to the left to remove the nut and retainer. At this time, hold the product by hand to prevent it from falling.	Hexagon wrench Nominal: **AC10-A, AC20-B**: 3 **AC25, 30-B**: 4 **AC40(-06)-B**: 5 **AC50, 55, 60-B**: 6	—
	3) Remove the product.	—	—
Assembly	4) Mount the spacer onto the product. Engage the convex groove on the spacer with the concave groove on the product. At this time, be careful not to confuse the IN and OUT of the product.	—	—
	5) While holding the product by hand, let the bolt on the spacer pass through the retainer, and then turn the nut to the right to tighten it temporarily.	—	—
	6) Tighten the nut. Insert the hexagon wrench into the hexagon hole on the nut, and turn the wrench to the right to tighten the nut. Refer to the “Check item” in the right column for the tightening torque.	Hexagon wrench Nominal: **AC10-A, AC20-B**: 3 **AC25, 30-B**: 4 **AC40(-06)-B**: 5 **AC50, 55, 60-B**: 6	Tightening torque: **AC10-A, AC20-B**: 0.6 ± 0.05 N·m **AC25, 30-B**: 1.5 ± 0.05 N·m **AC40(-06)-B, AC50, 55, 60-B**: 3.0 ± 0.1 N·m

[Modular connection (assembly) method]

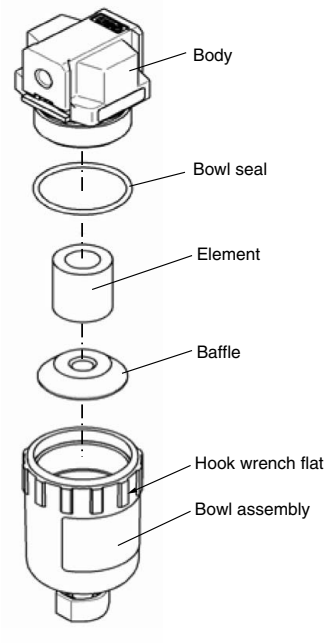


[Precautions for the Modular connection (assembly)]

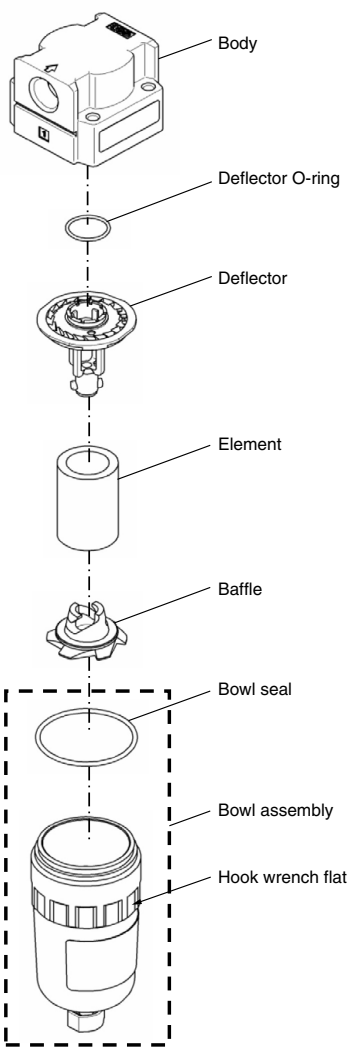


∗ For details on each product, refer to the corresponding operation manuals.

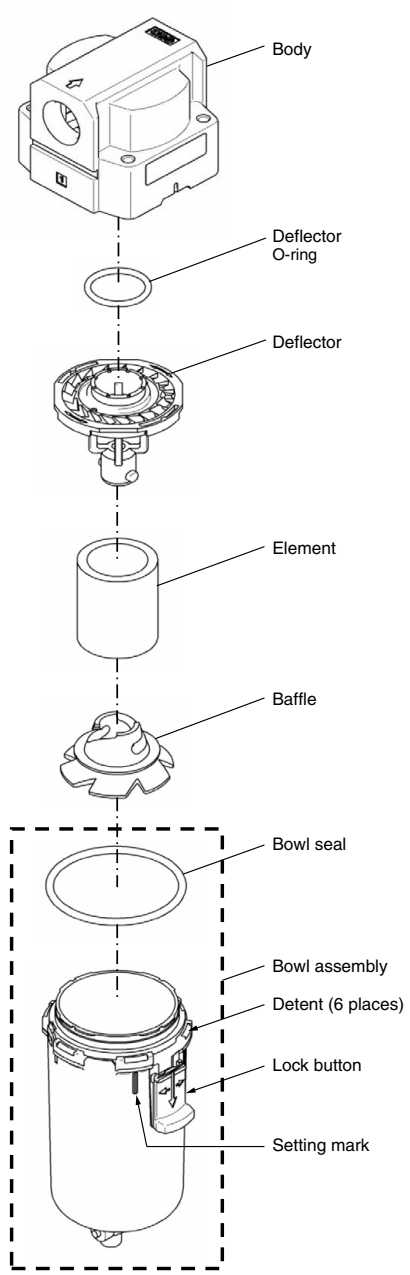
1) AF10-A

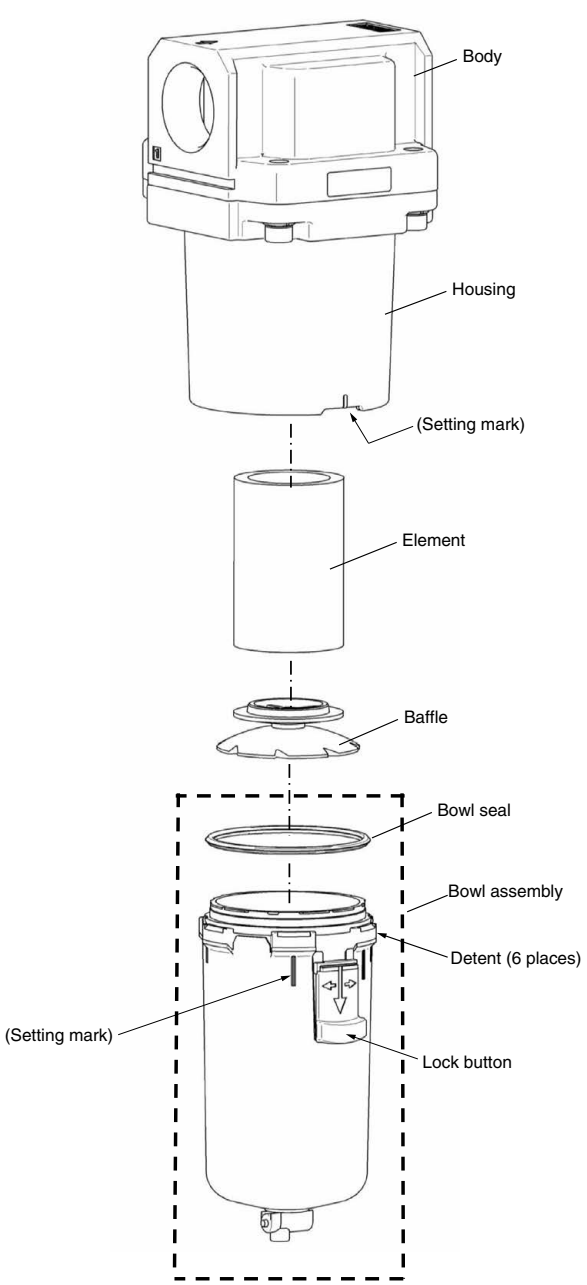


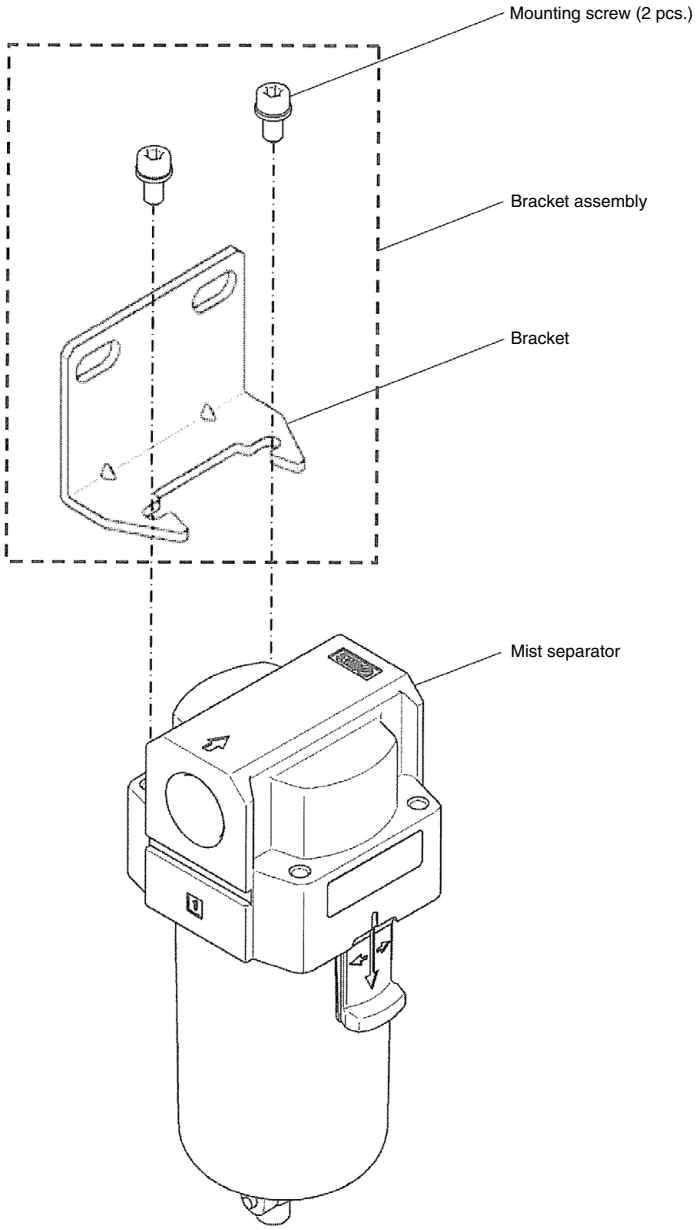
2) AF20-A



3) AF30-A/40-A



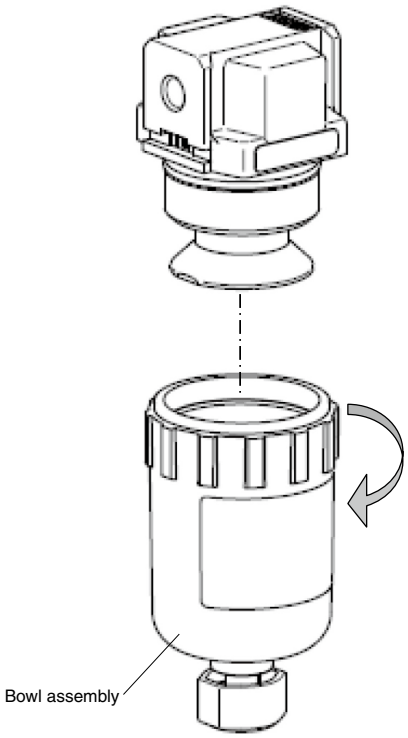
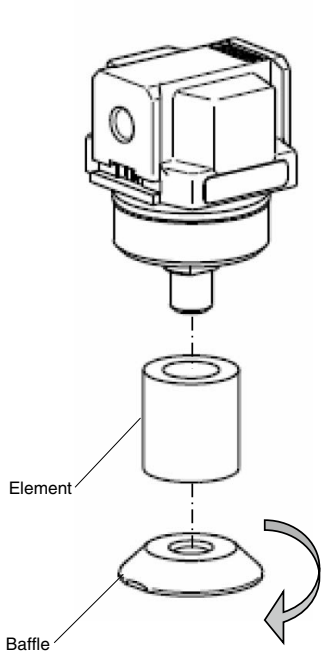

Body
Housing
(Setting mark)
Element
Baffle
Bowl seal
Bowl assembly
Detent (6 places)
(Setting mark)
Lock button


Mounting screw (2 pcs.)
Bracket assembly
Bracket
Mist separator

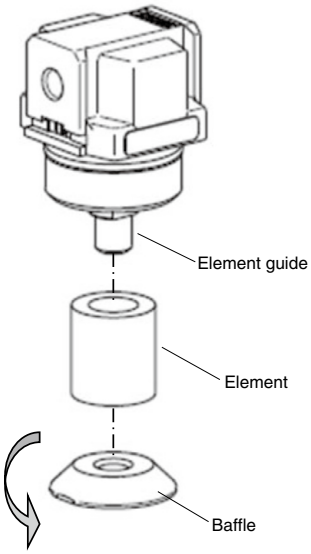
⚠Warning

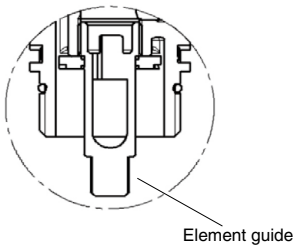
Before replacement, ensure that the regulator is not pressurized.
Replace while referring to the “Exploded View.”
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Bowl Assembly, Element

Applicable model	AF10-A	
Process	Disassembly	
Procedure	1) Turn the bowl assembly in the direction shown in the figure below to remove it from the product. If the bowl assembly has been tightened too much to be removed, use a hook wrench until it can be loosened by hand. (Hook wrench nominal: 25/28)	2) Turn the baffle by hand in the direction shown in the figure below to remove the element.
		

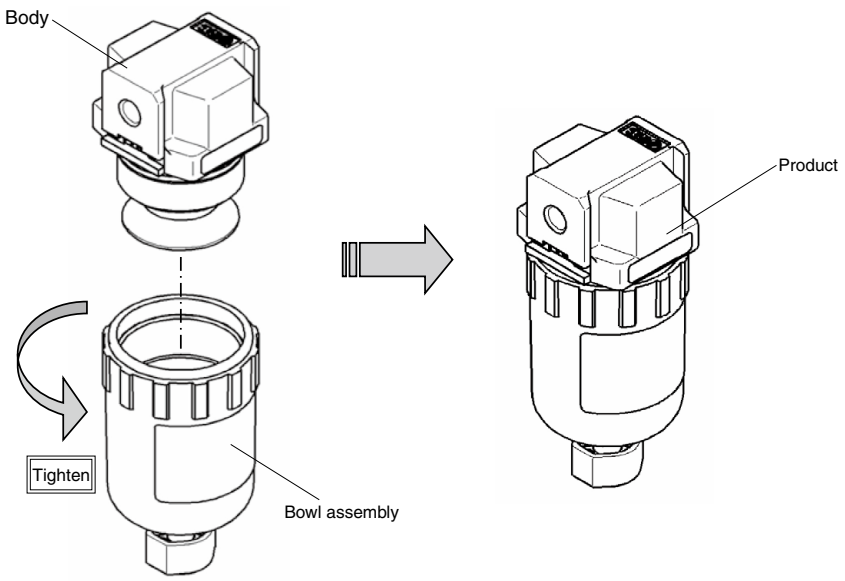
Applicable model	AF10-A	
Process	Assembly	
Procedure	1) Mount the element to the element guide. (Direction is not specified.)	2) Turn the baffle by hand in the direction shown in the figure below to tighten the element. As the mounting direction of the baffle is specified, refer to the “Exploded View.” For manual tightening, use the “Referential tightening torque” provided below.





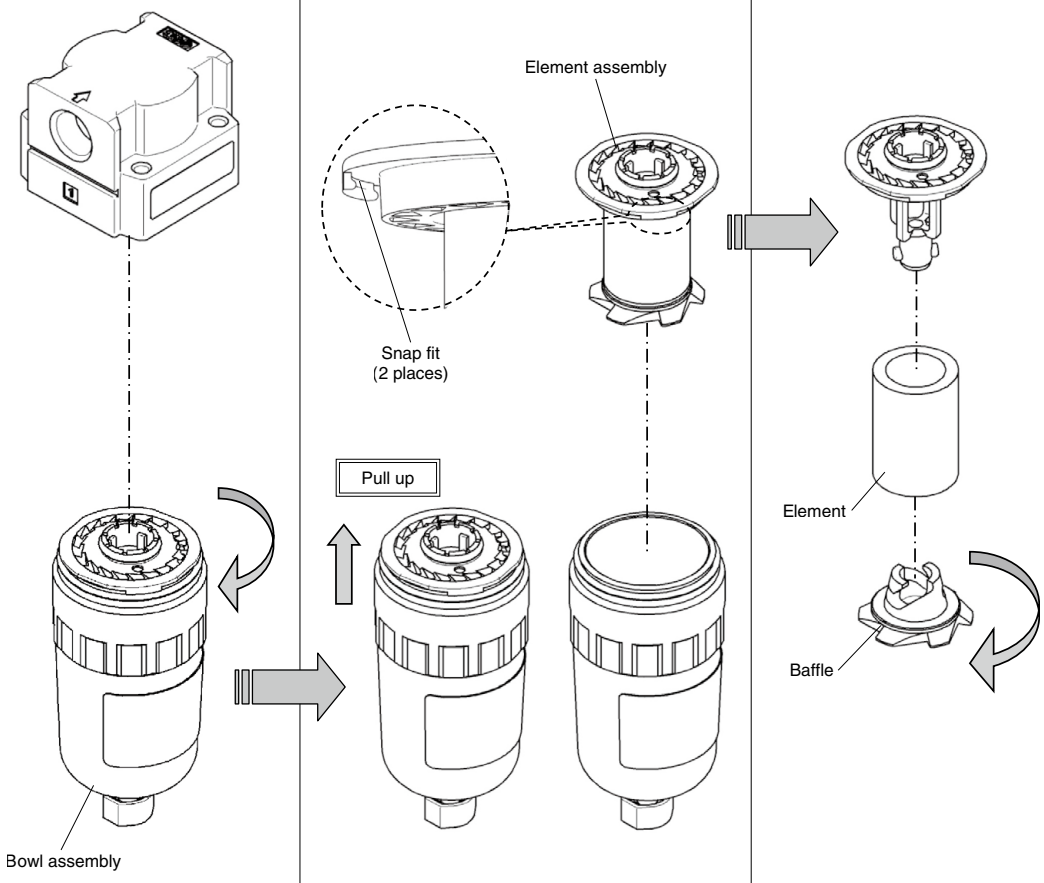
Referential tightening torque: 0.35 ± 0.05 N·m

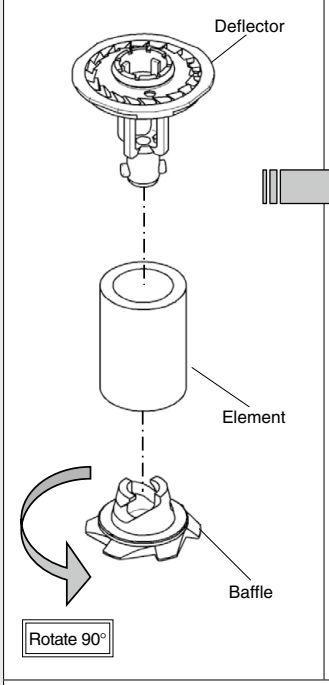
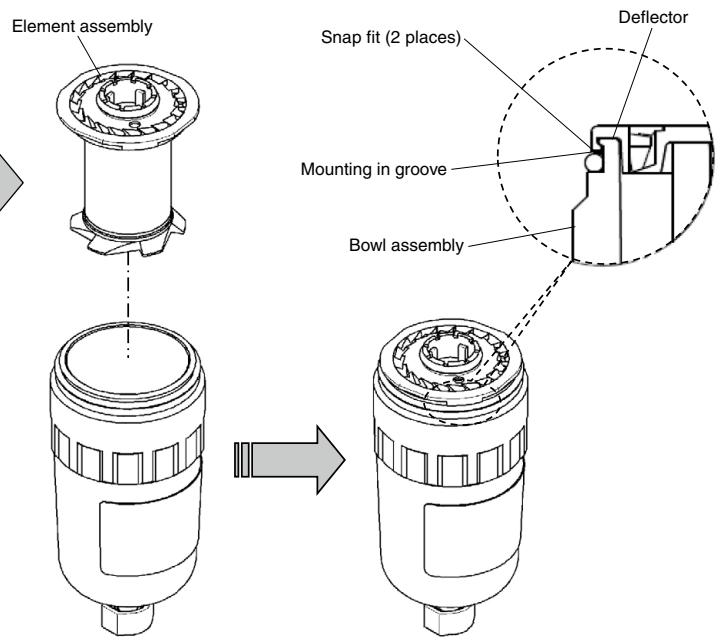
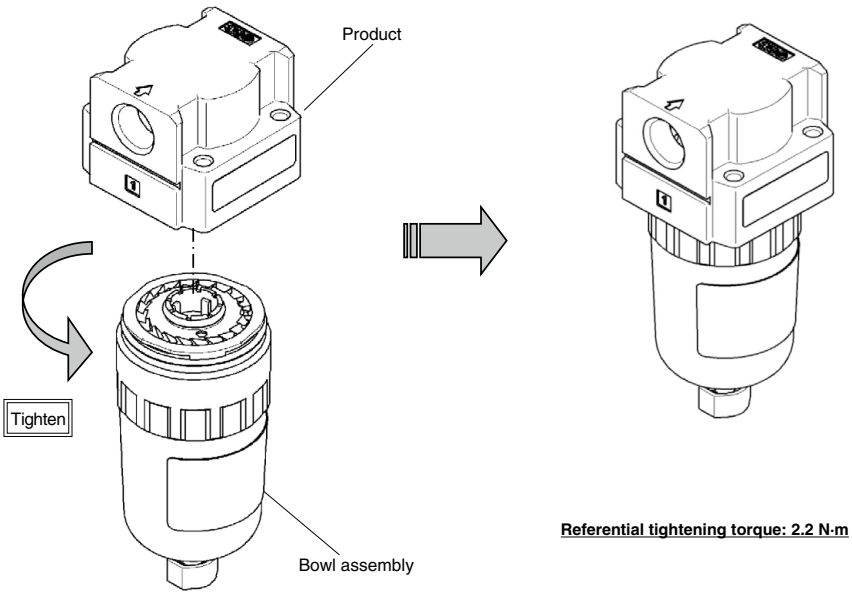
3) Mount the bowl assembly onto the body firmly by turning it in the direction shown in the figure below.
For manual tightening, use the “Referential tightening torque” provided below.



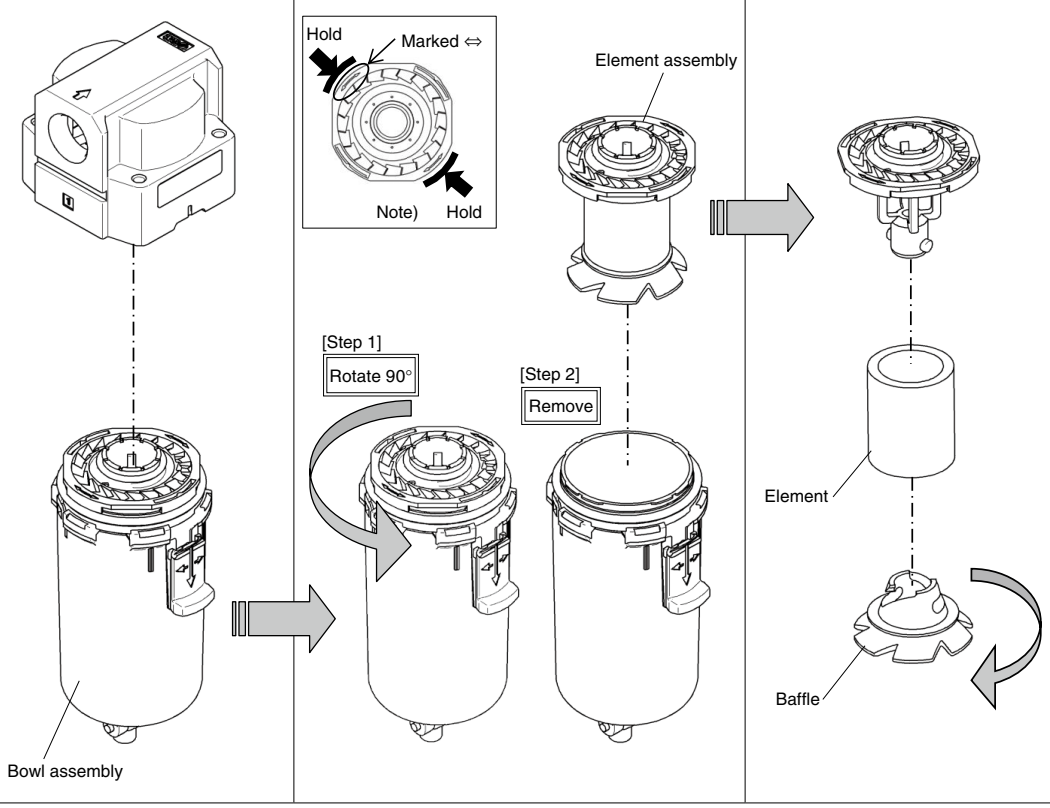
Referential tightening torque: 1.5 N·m

Applicable model	AF20-A		
Process	Disassembly		
Procedure	1) Turn the bowl assembly to the left to remove it from the product. If the bowl assembly has been tightened too much to be removed, use SMC's special wrench until it can be loosened by hand. (SMC's special wrench part no.: 1129129 (Recommended))	2) Hold the outer periphery, avoiding the two snap fits on the deflector, and pull it up to remove the element assembly.	3) Turn the baffle in the direction of the arrow to remove the element.



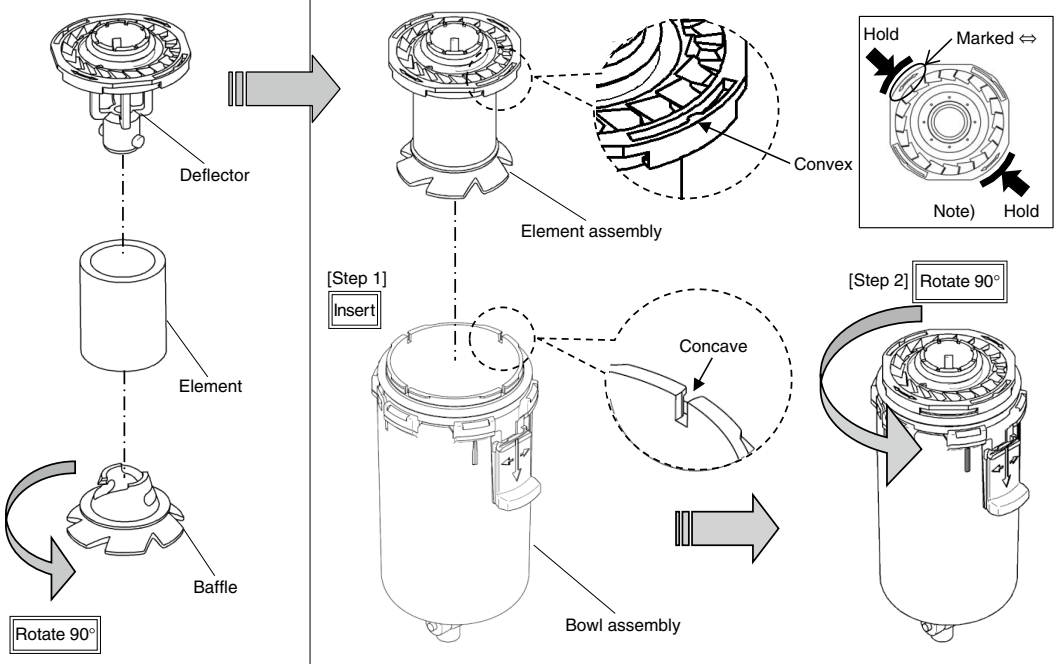
Applicable model	AF20-A	
Process	Assembly	
Procedure	1) Mount the element onto the deflector, and turn the baffle in the direction shown in the figure below to secure the element.	2) When mounting the element assembly onto the bowl assembly, engage the two snap fits on the deflector with the bowl assembly (until you hear a click).
		
	3) Mount the bowl assembly onto the product firmly by turning it to the right. For manual tightening, use the “Referential tightening torque” provided below.	
		**Referential tightening torque: 2.2 N·m**

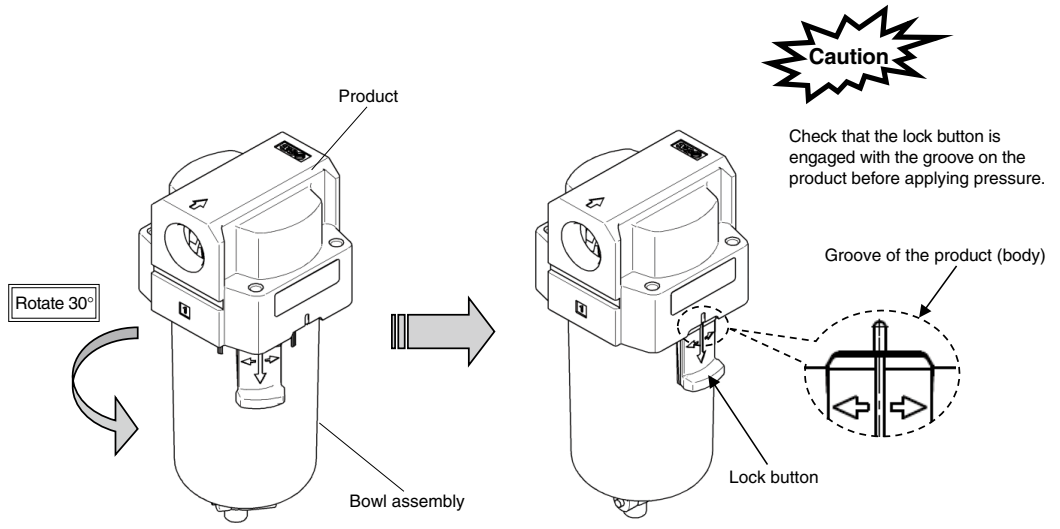
Applicable model	AF30-A/40-A		
Process	Disassembly		
Procedure	1) Remove the bowl assembly from the product.	2) Turn the element assembly 90 degrees either to the left or right to remove it.	3) Turn the baffle in the direction of the arrow to remove the element.



Note) Hold the sections marked ⇔ on the circular arc, and turn the element assembly.

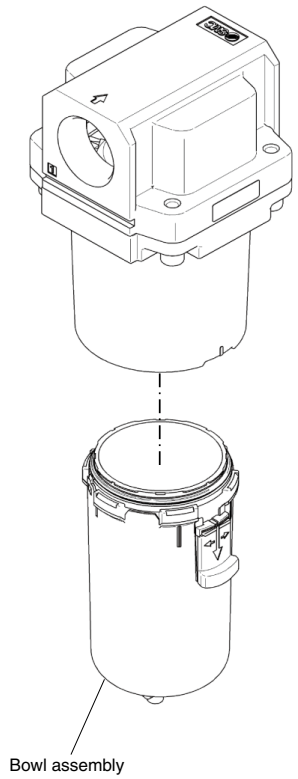
Applicable model	AF30-A/40-A
Process	Assembly
Procedure	1) Mount the element onto the deflector, and turn the baffle in the direction shown in the figure below to secure the element.
	2) After mounting the element assembly onto the bowl assembly, turn the element assembly 90 degrees either to the left or right until the convex on the element assembly is engaged with the concave on the bowl assembly.
	3) Mount the bowl assembly onto the product, and turn it until the lock button is aligned with the groove on the product as shown in the figure below.

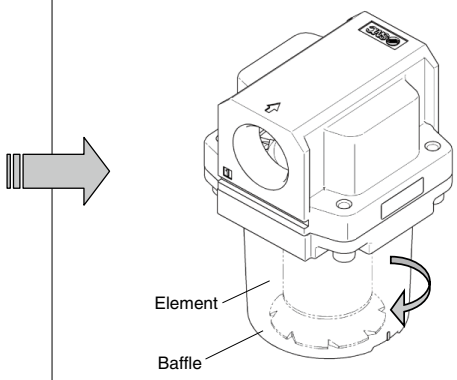




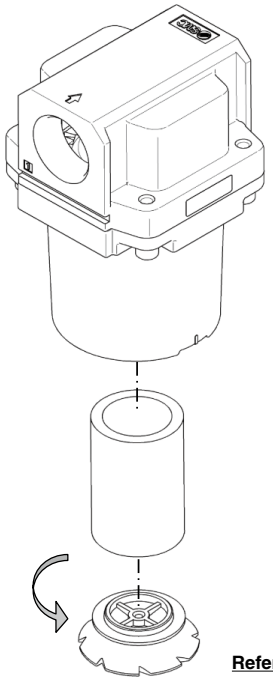
Note) Hold the sections marked ⇔ on the circular arc, and turn the element assembly.

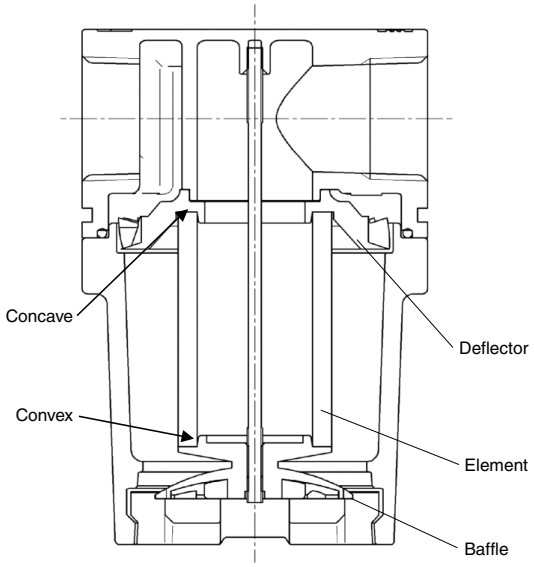
Applicable model	AF50-A/60-A	
Process	Disassembly	
Procedure	1) Remove the bowl assembly from the product.	2) Turn the baffle in the direction of the arrow to remove the element.





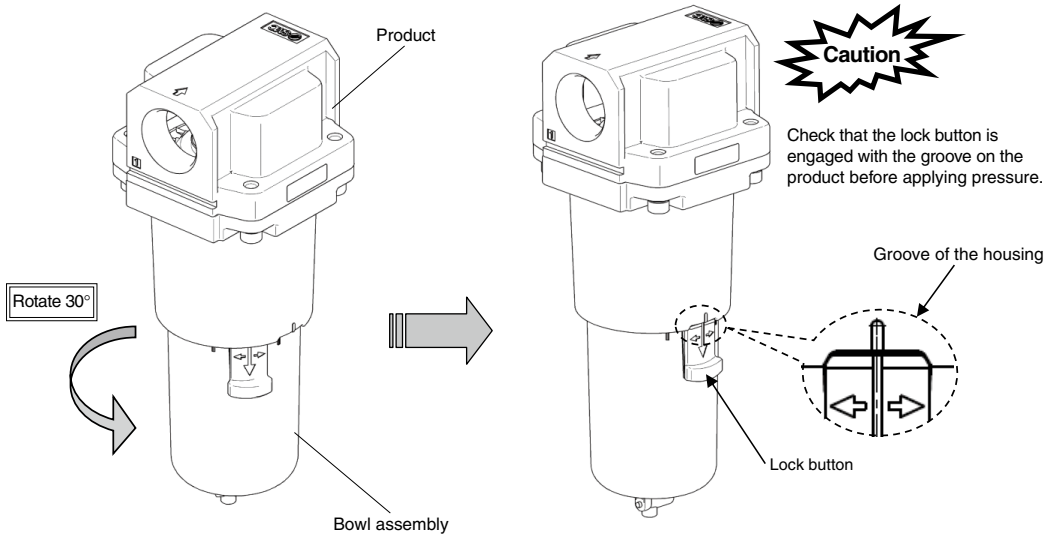
Applicable model	AF50-A/60-A
Process	Assembly
Procedure	1) Mount the element by engaging it with the concave on the deflector. Insert the baffle into the element, paying attention to the mounting direction (so that the convex on the baffle is engaged with the element). Turn the baffle to the right until it is slightly jointed with the element. Then, tighten it further by making an additional half turn to the right. For manual tightening, use the “Referential tightening torque” provided below.





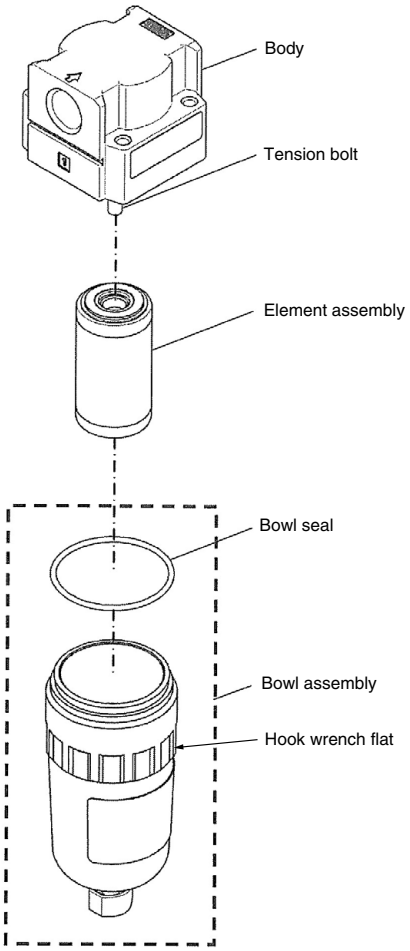
Referential tightening torque: 1.8 N·m

2) Mount the bowl assembly onto the product, and turn the bowl assembly until the lock button is aligned with the groove on the housing as shown in the figure below.

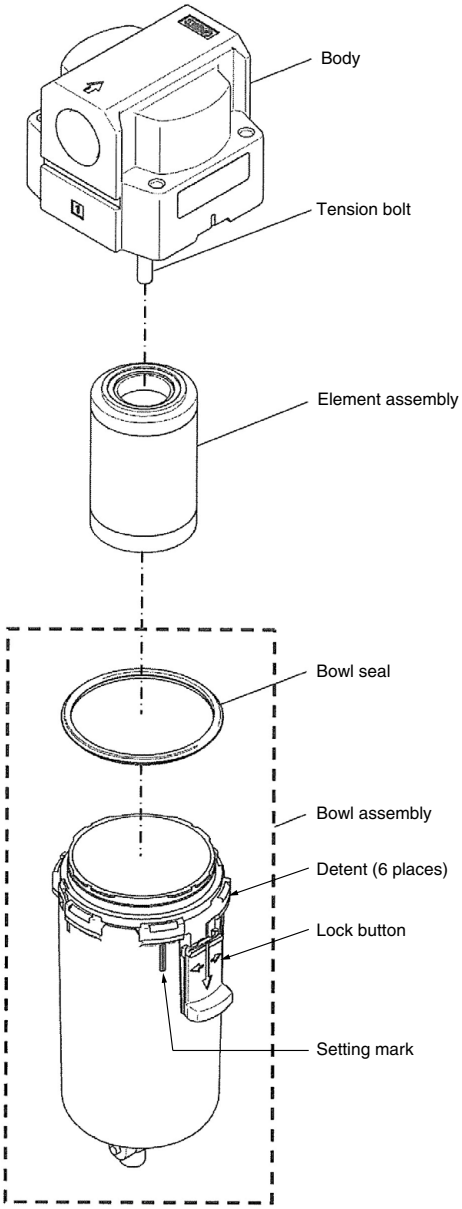


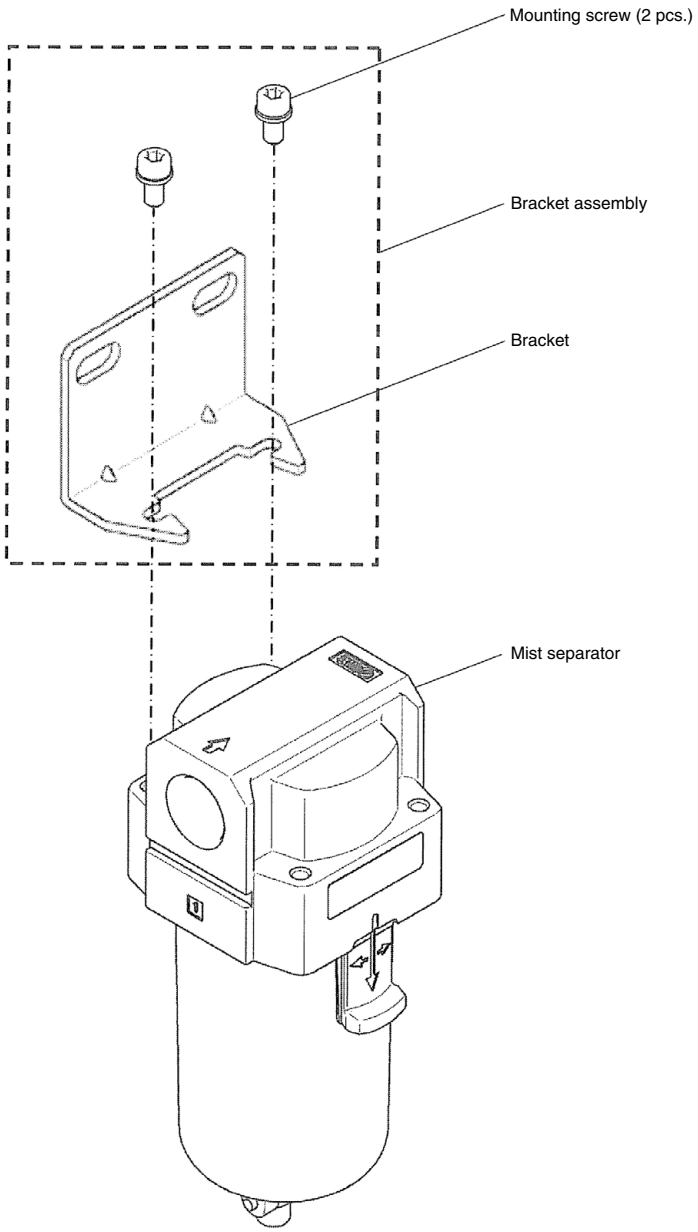
AFM20-A to 40-A Exploded View 1

1) AFM20-A



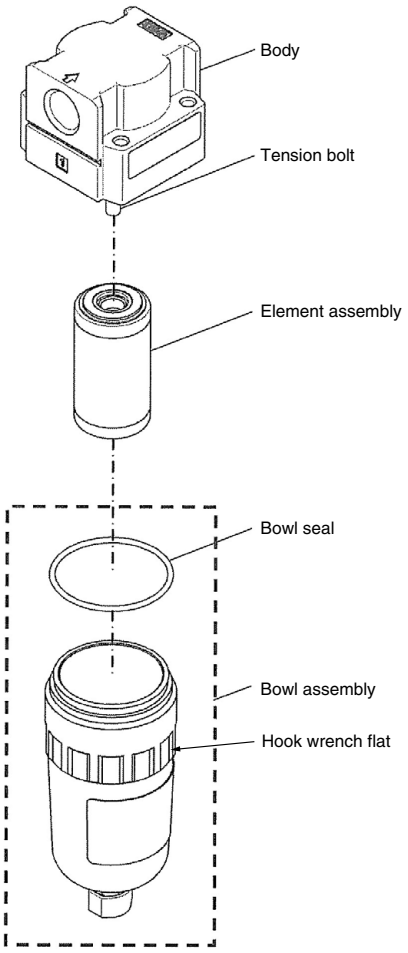
2) AFM30-A/40-A



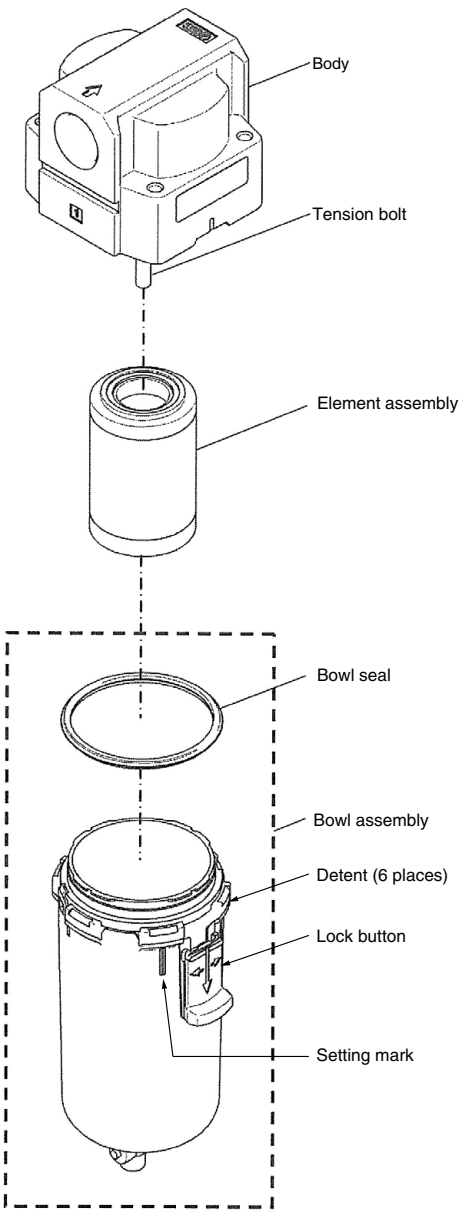

Mounting screw (2 pcs.)
Bracket assembly
Bracket
Mist separator

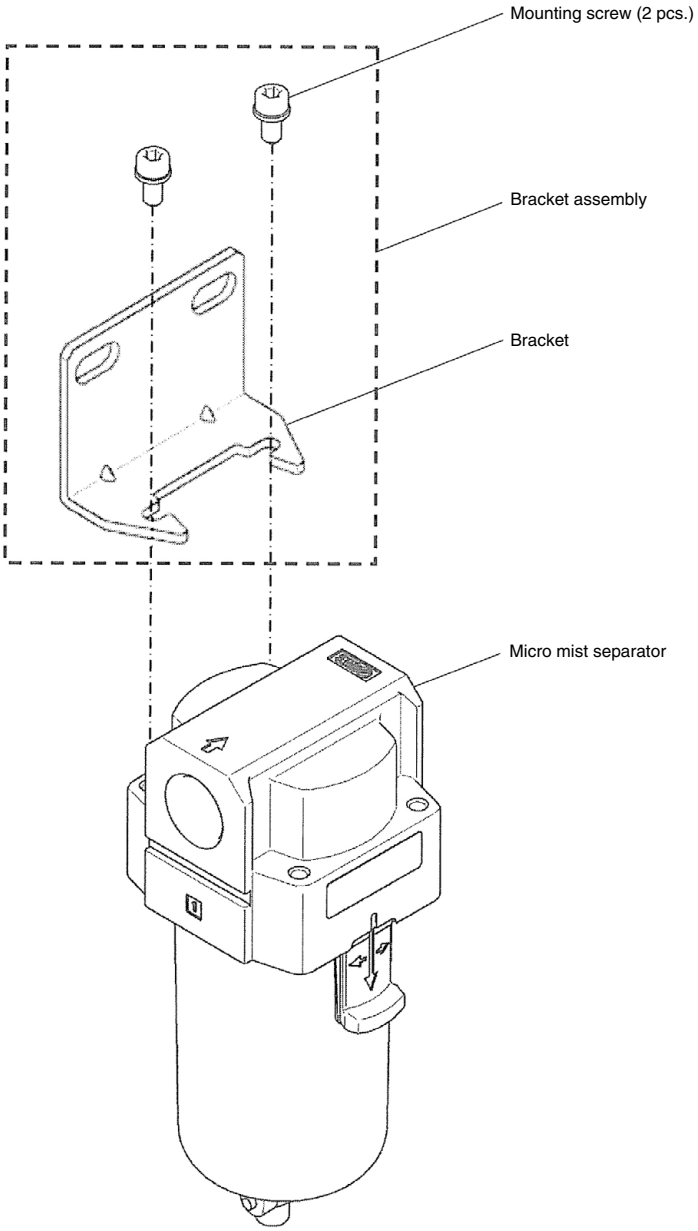
AFD20-A to 40-A Exploded View 1

1) AFD20-A



2) AFD30-A/40-A

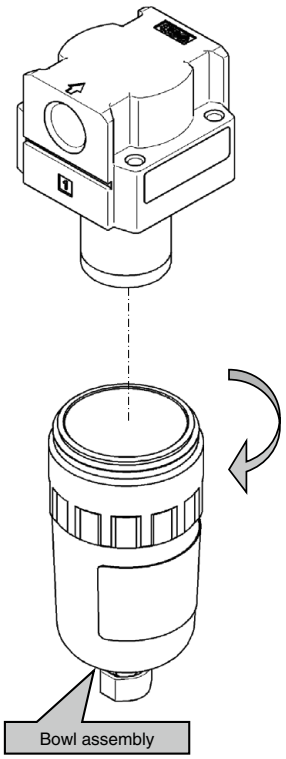
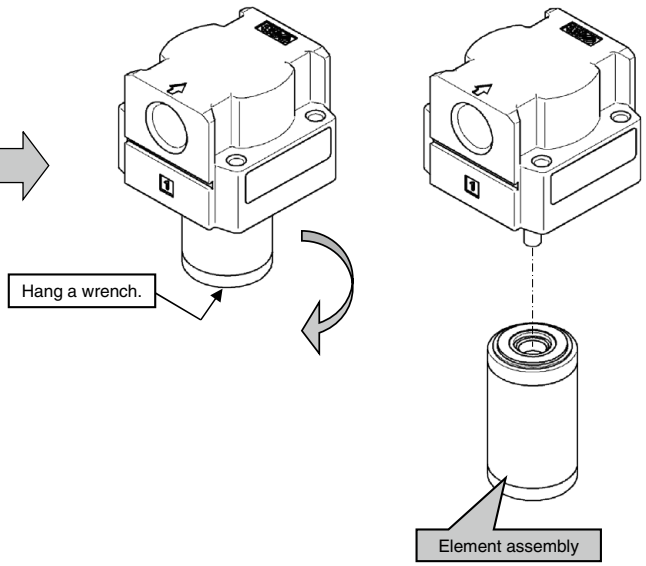



Mounting screw (2 pcs.)
Bracket assembly
Bracket
Micro mist separator

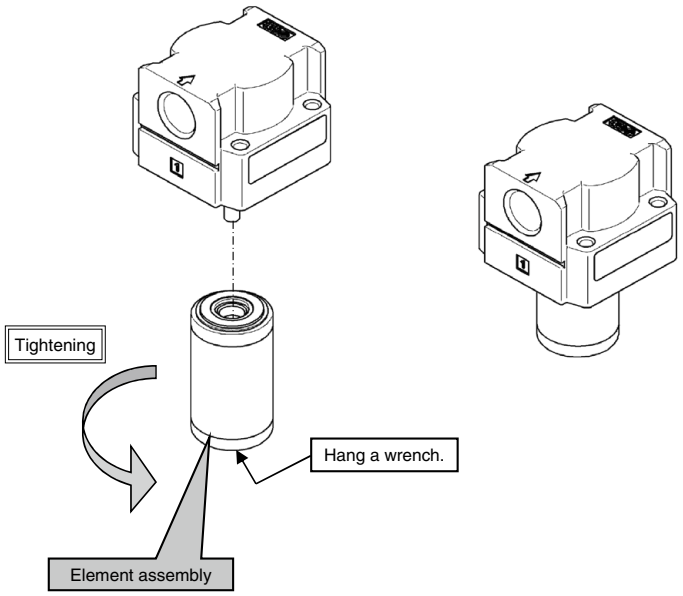
⚠Warning

Before replacement, ensure that the regulator is not pressurized.
Replace while referring to the “Exploded View.”
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Bowl Assembly, Element Assembly

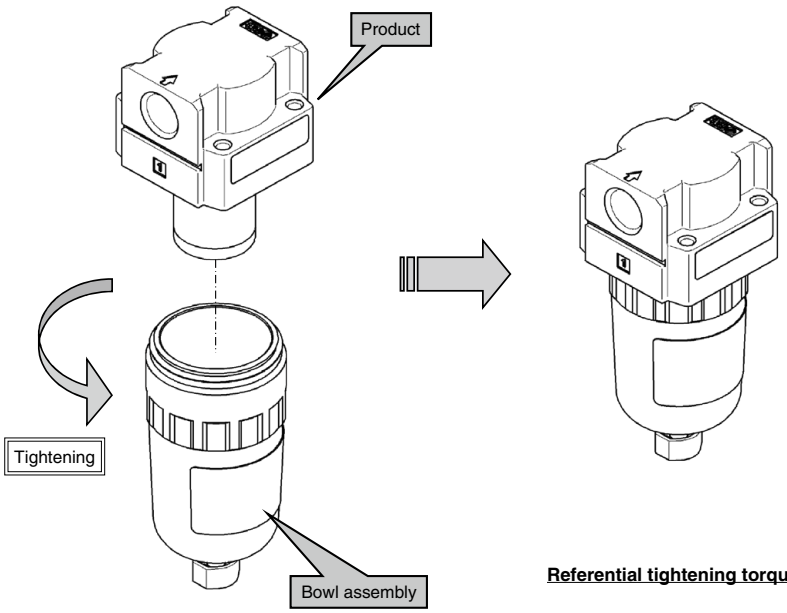
Applicable model	AFD20-A	
Process	Disassembly	
Procedure	1) The bowl assembly is released counterclockwise, detaches it from the product. If the bowl assembly is tightened too much to be removed, use hook wrench until it can be loosened by hand. (Hook wrench, Nominal: 34/38)	2) Hold the element with a wrench to rotate it counterclockwise and remove the element. (Wrench, Nominal: 7)
		

Applicable model	AFD20-A
Process	Assembly
Procedure	1) Hold the element with a wrench to rotate it counterclockwise and remove the element. See check item for referential tightening torque. (Wrench Nominal: 7)



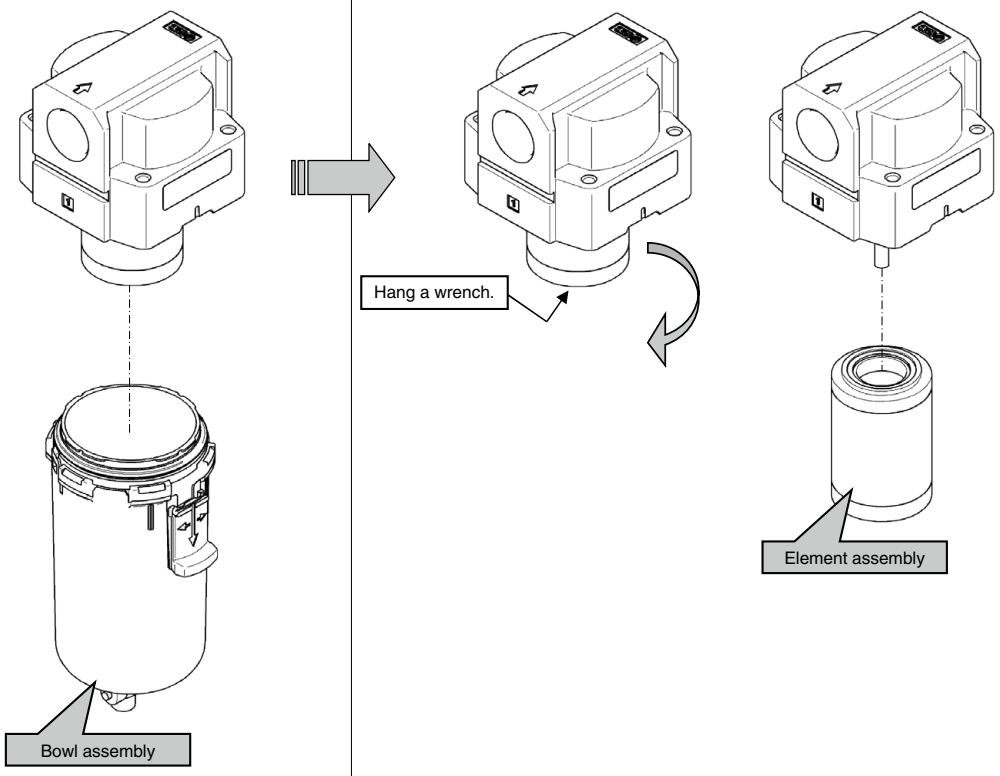
Tightening torque: 0.49 ± 0.05 N·m

2) The bowl assembly is rotated clockwise and and secured to the product. Tighten by hand is the followed tightening to torque level shown.

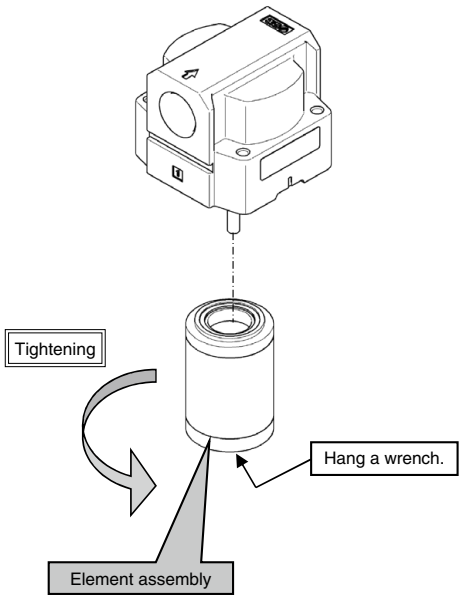


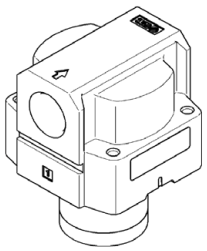
Referential tightening torque: 2.2 N·m

Applicable model	AFD30,40-A	
Process	Disassembly	
Procedure	1) The bowl assembly is detached from the product.	2) Hold the element with a round pliers to rotate it counterclockwise and remove the element.



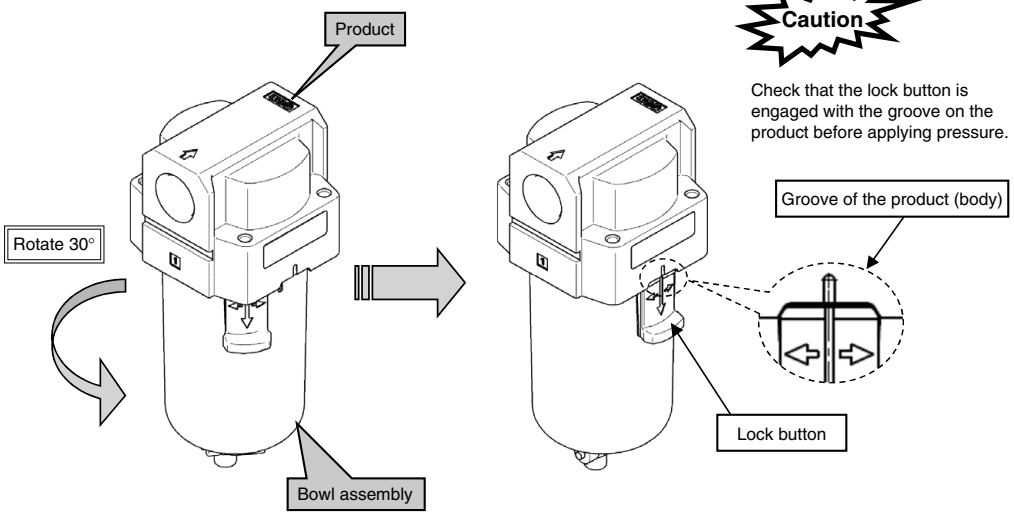
Applicable model	AFD30,40-A
Process	Assembly
Procedure	1) Hold the element with a round pliers to rotate it counterclockwise and remove the element. See check item for referential tightening torque.





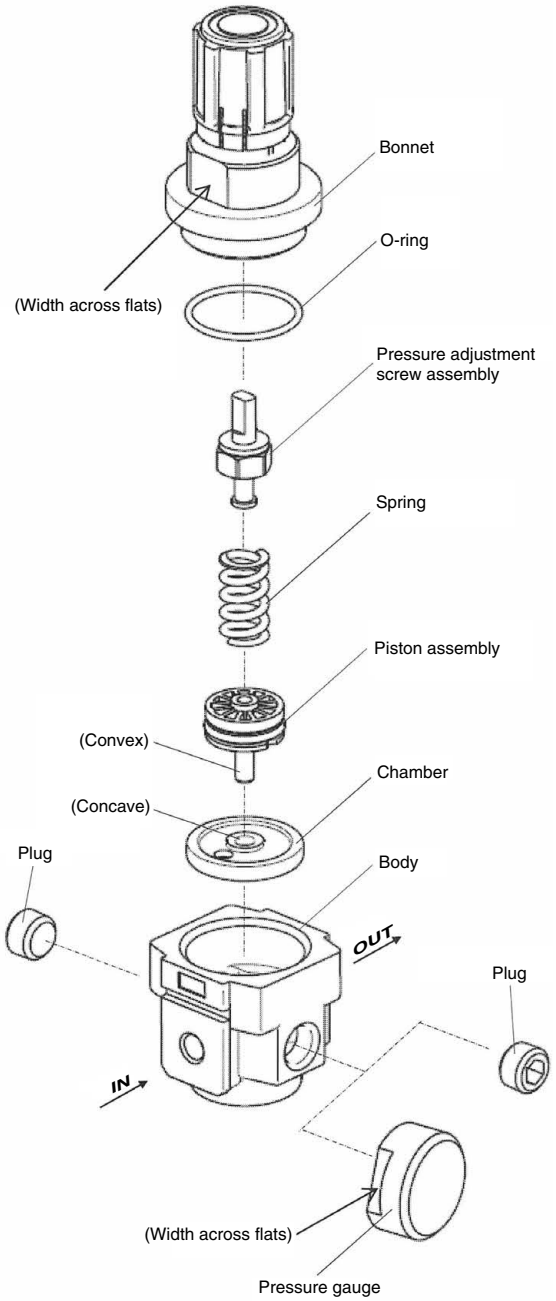
Tightening torque:
AFD30-A: 1.47 ± 0.2 N·m
AFD40-A: 1.96 ± 0.2 N·m

2) The bowl assembly is rotated until the bowl assembly is attached to the product, and the lock button clicks into body when locked in position.

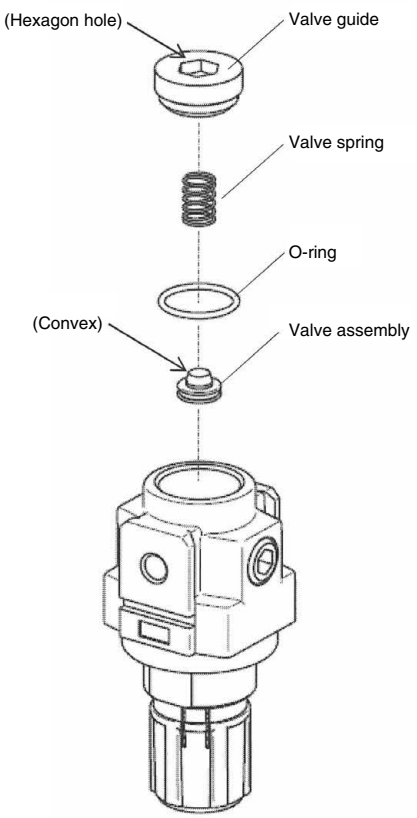


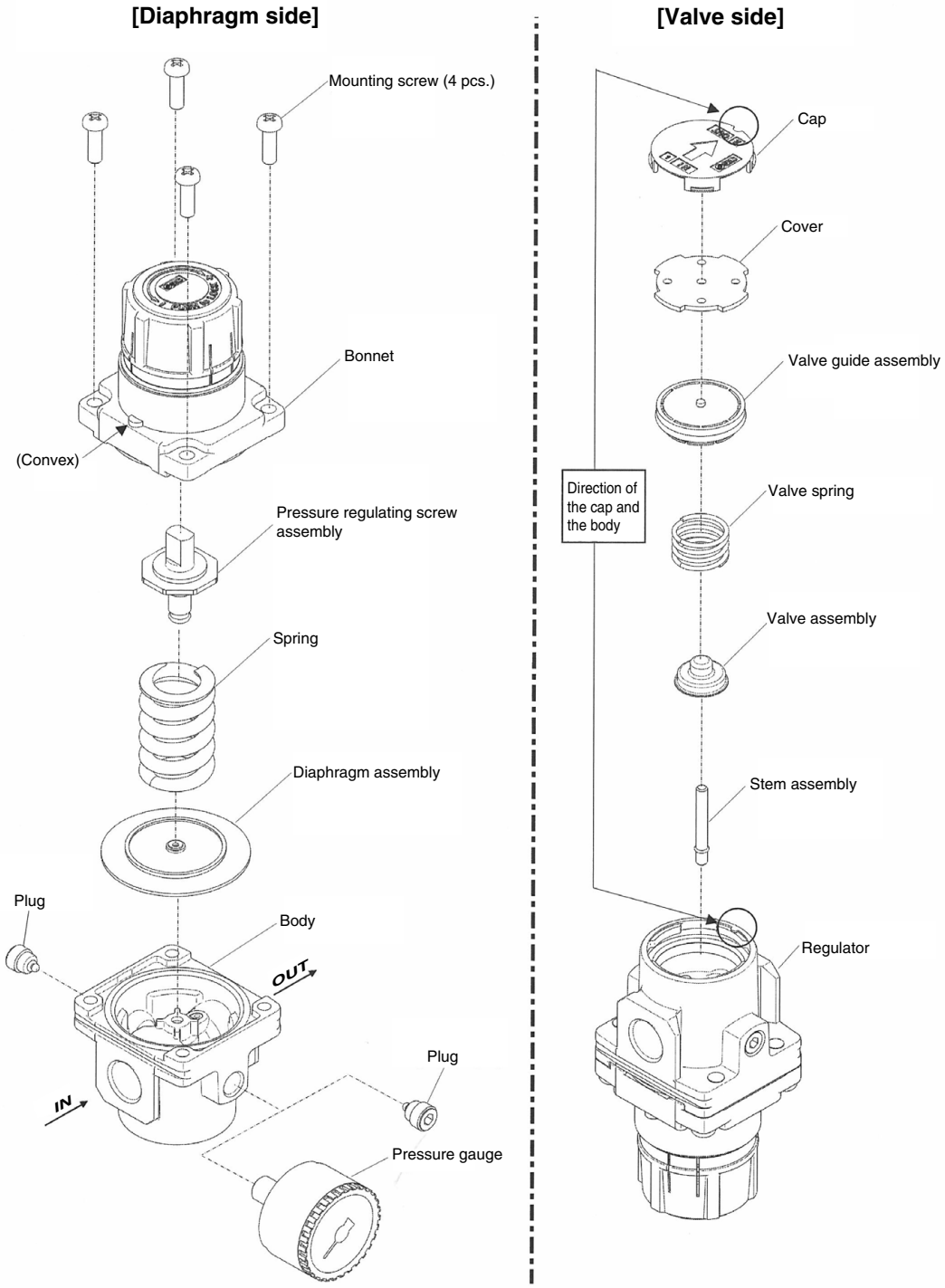
AR10-A Exploded View 1

[Piston side]

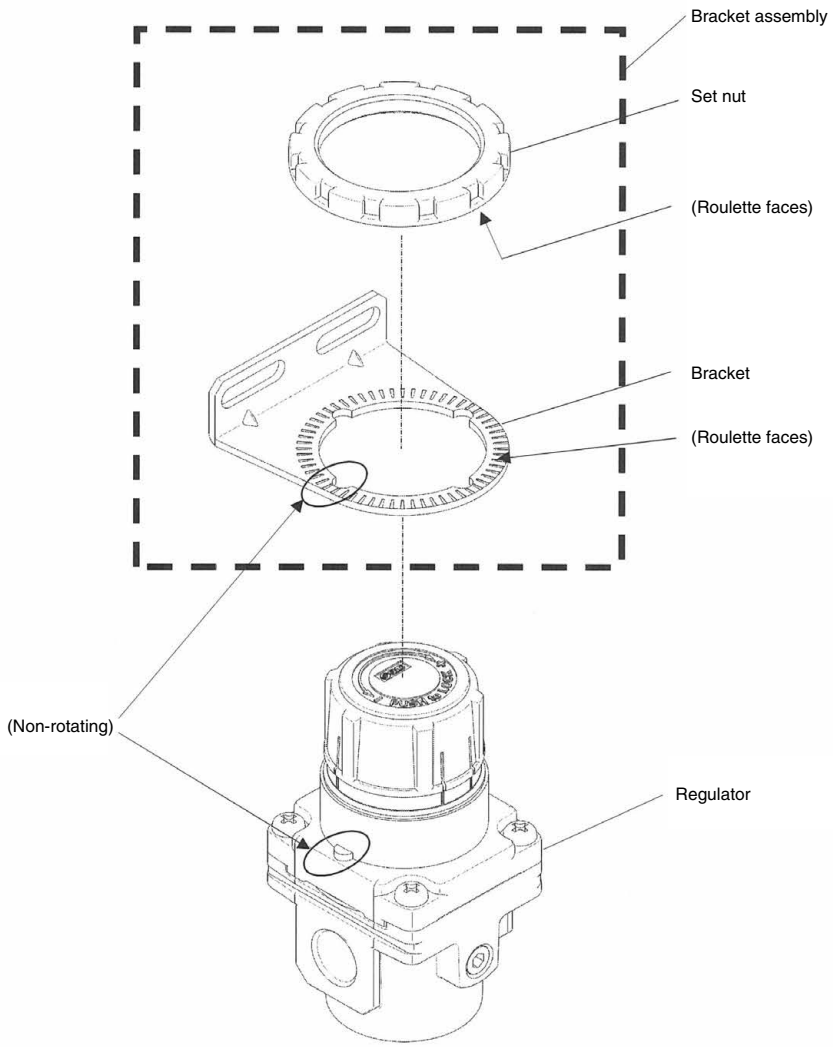


[Valve side]




[Diaphragm side]
[Valve side]
Mounting screw (4 pcs.)
Bonnet
(Convex)
Pressure regulating screw assembly
Spring
Diaphragm assembly
Plug
Body
OUT
IN
Plug
Pressure gauge
Cap
Cover
Valve guide assembly
Direction of the cap and the body
Valve spring
Valve assembly
Stem assembly
Regulator

Bracket Assembly, Panel Mount Exploded View 3



⚠Warning
Before replacement, ensure that the regulator is not pressurized.
Rotate the pressure adjusting knob to zero.
Replace while referring to the “Exploded View.”
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

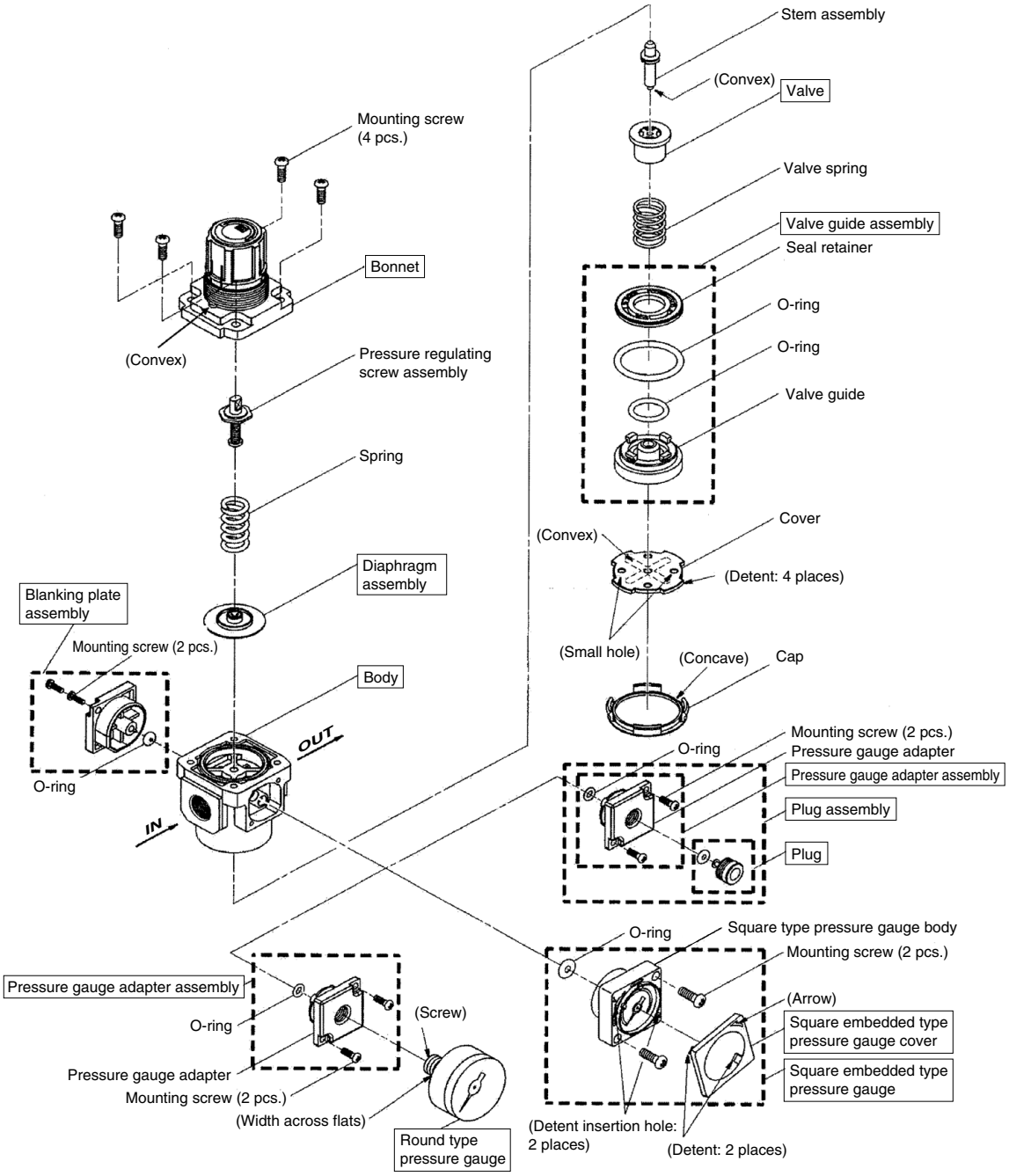
1. Diaphragm Assembly (Piston Assembly)

Applicable model	Process	Procedure	Tools	Check item
AR10-A	Disassembly	1) Remove the bonnet assembly. Hold the bonnet with a wrench on the width across flat, and rotate counterclockwise to remove the bonnet assembly.	Wrench Nominal: 16	
		2) Remove the piston assembly from the bonnet. Pull out the piston assembly with the knob facing downwards. Otherwise, the pressure regulating screw assembly or spring may fall out.	—	
	Assembly	3) Mount the piston assembly to the bonnet assembly. Insert the piston assembly into the bonnet so that the piston assembly convex faces the body. If the pressure regulating screw or spring is not mounted on the bonnet, mount it before mounting the piston assembly.	—	
		4) Ensure the chamber is mounted on the body. If the chamber is removed during disassembly, mount the chamber ensuring that it's facing the right direction. The convex of the chamber should face the bonnet side.	—	Presence of the chamber Mounting direction
		5) Mount the bonnet assembly to the body. Hold the bonnet assembly with a wrench on the wrench flat, and rotate the body clockwise to secure it. Refer to the “Check item” for the tightening torque.	Wrench Nominal: 16	Tightening torque: 1.8 ± 0.3 N·m
AR20-A AR25-A AR30-A AR40-A	Disassembly	1) Removing bonnet Remove all 4 screws, and then remove the bonnet. Carefully store the bonnet parts. <Bonnet parts> · Pressure regulating screw assembly · Spring · Diaphragm assembly	Phillips head screwdriver	
	Assembly	2) Mount the disassembled parts onto the body. Perform mounting while referring to the “Exploded View” (page 631).	—	Direction of the diaphragm assembly and the pressure regulating screw assembly
		3) Mounting bonnet Mount the convex IN side of the bonnet to the body, and tighten the 4 mounting screws half way with a Phillips head screwdriver. Then, tighten the screws completely in a diagonal pattern with the indicated tightening torque.	Phillips head screwdriver	Tightening torque: **AR20-A**, **AR25-A**: 0.62 ± 0.3 N·m **AR30-A**: 3.5 ± 0.3 N·m **AR40-A**: 2.6 ± 0.3 N·m

2. Valve Guide (Assembly), Valve Assembly

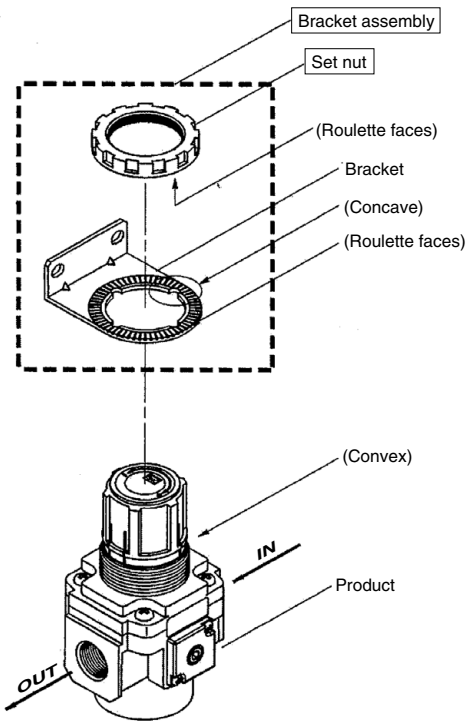
Applicable model	Process	Procedure	Tools	Check item
AR10-A	Disassembly	1) Remove the valve guide. Insert the hexagon wrench key into the valve guide hexagon socket, and rotate counterclockwise to remove it.	Hexagon wrench key Nominal: 6	—
		2) Remove the valve spring.	—	—
		3) Remove the valve.	—	—
	Assembly	4) Mount the valve. Set the valve so that the convex surface faces the valve guide.	—	The concave surface is the valve guide side (top).
		5) Mount the valve spring. Insert the valve so that the inner circumference of the valve spring fits in the convex surface of the valve.	—	—
		6) Ensure the O-ring is mounted. Ensure the valve guide seal O-ring is mounted. Mount the O-ring if the ring is missing.	—	Presence of the O-ring
		7) Mount the valve guide. Insert the hexagon wrench key into the valve guide hexagon socket, and rotate the wrench clockwise to tighten the guide. Refer to the “Check item” for the tightening torque.	Hexagon wrench key Nominal: 6	Tightening torque: 0.75 ± 0.15 N·m
AR20-A AR25-A AR30-A AR40-A	Disassembly	1) Remove the cap. Insert a watchmaker's screwdriver into the gap between the body and the cap and dig up the cap.	Watchmaker's screwdriver (−)	—
		2) Remove the cover. Insert the circular pliers into the 2 small holes of the cover, rotate 45 degrees to one side or the other, and then lift.	Circular pliers Nominal: 125	—
		3) Remove the valve guide assembly. Lift the outer periphery with a watchmaker’s screwdriver or similar for removal.	Watchmaker's screwdriver (−)	—
		4) Remove the valve spring.	—	—
		5) Remove the valve assembly.	—	—
	Assembly	6) Mount the disassembled parts onto the body. Perform mounting while referring to the “Exploded View.”	—	· Direction of the valve · Direction of the cap

AR20-B to 60-B Exploded View 1

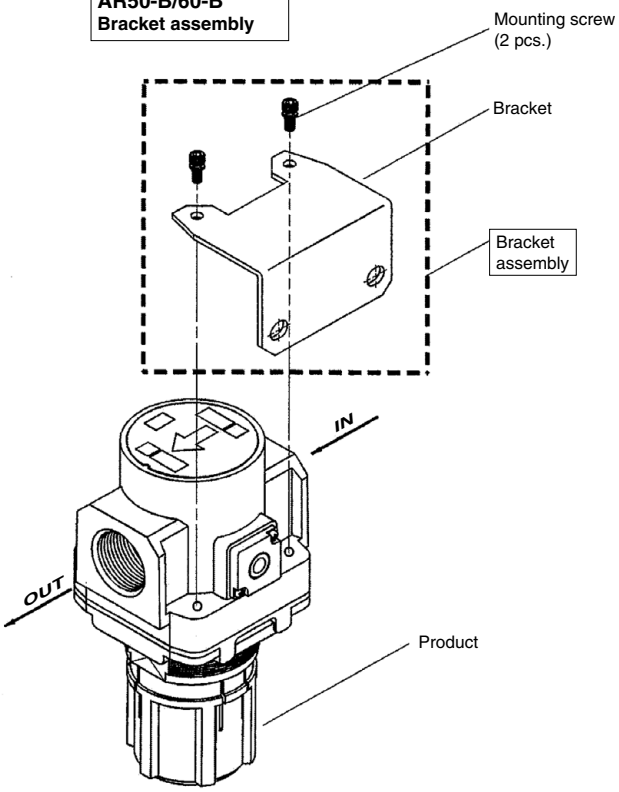


Note) It is possible to mount the square embedded type pressure gauge, pressure gauge adapter assembly, or plug assembly instead of the blanking plate assembly.

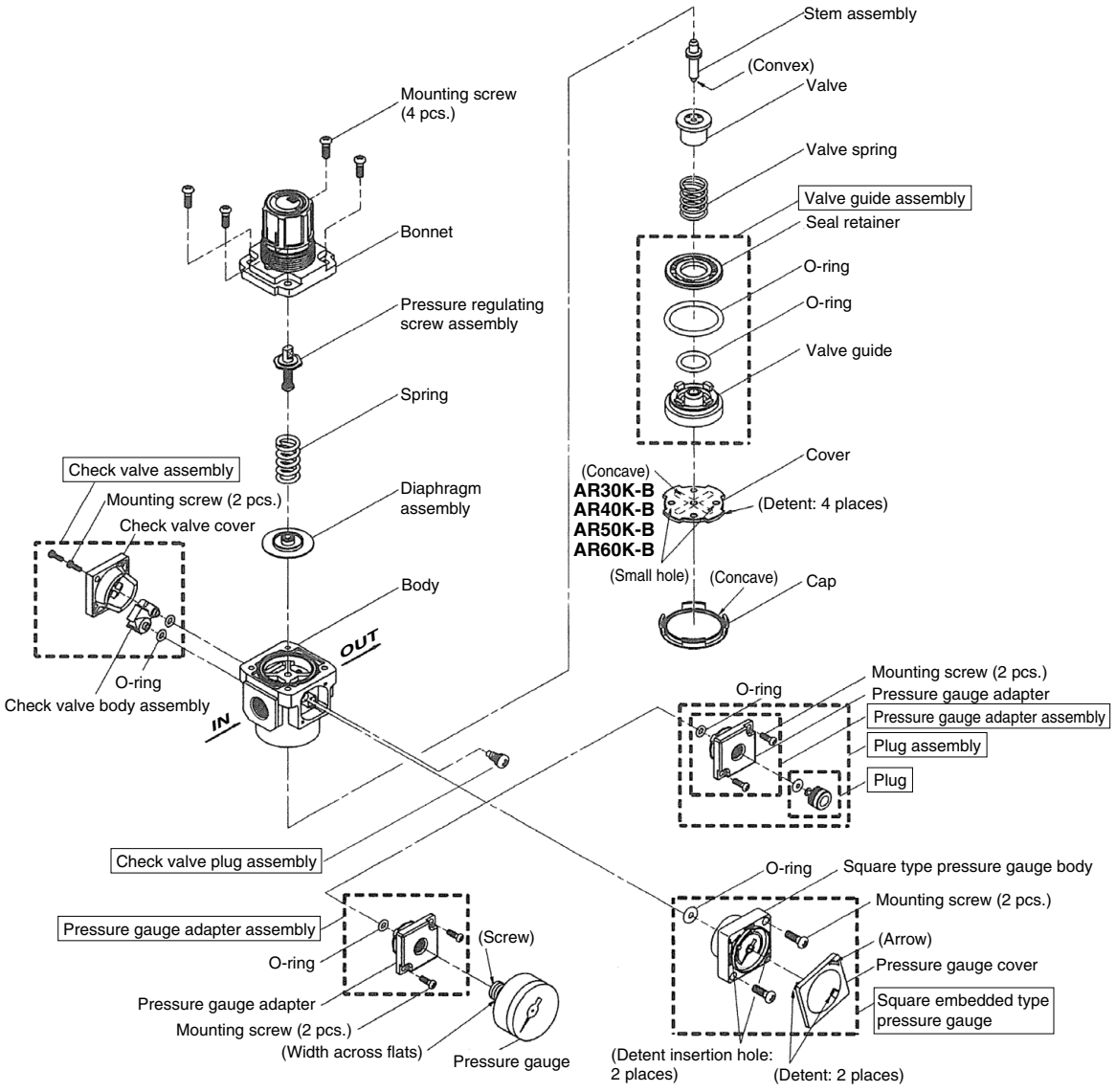
AR20-B/25-B/30-B/40-B
Bracket assembly



AR50-B/60-B
Bracket assembly

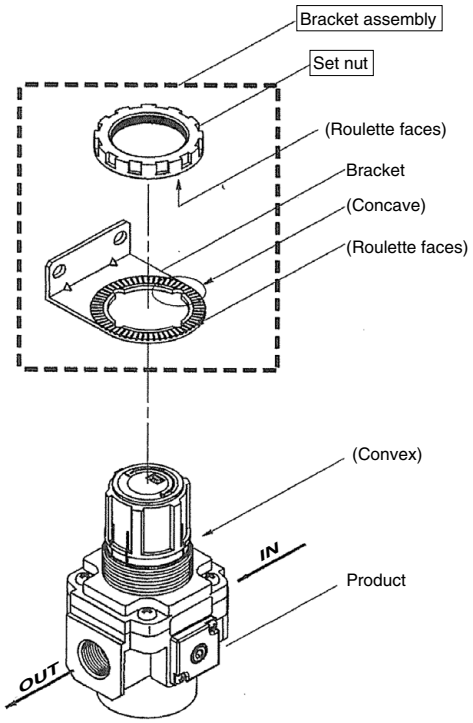


AR20K-B to 60K-B Exploded View 1

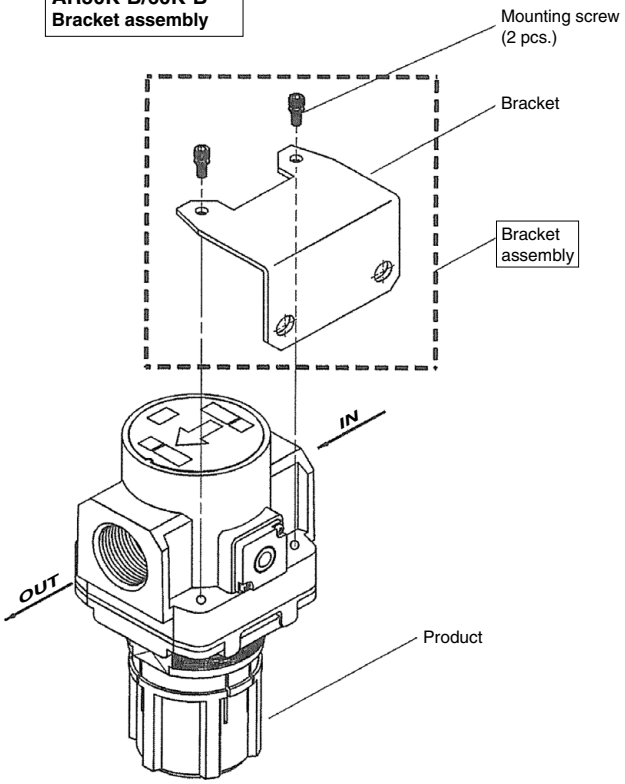


Note) The flow direction can be changed by removing the check valve assembly and replacing it with the square embedded type pressure gauge, pressure gauge adapter assembly, and plug assembly.

AR20K-B/25K-B/30K-B/40K-B
Bracket assembly



AR50K-B/60K-B
Bracket assembly



⚠Warning
Before replacement, ensure that the regulator is not pressurized.
Rotate the pressure adjusting knob to zero.
Replace while referring to the “Exploded View.”
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Diaphragm Assembly

Applicable model	Process	Procedure	Tools	Check item
AR20(K)-B AR25(K)-B AR30(K)-B AR40(K)-B AR50(K)-B AR60(K)-B	Disassembly	1) Remove the bonnet. Rotate the set screw counterclockwise with a Phillips head screwdriver to remove the bonnet from the body.	Phillips head screwdriver	—
		2) Remove parts in order of the pressure regulating screw assembly, spring, and the diaphragm assembly. Please note that the diaphragm assembly will be attached to the bonnet if disassembled with the knob facing down.	—	—
	Assembly	3) Mount parts to the body in order of the diaphragm assembly, spring, and pressure regulating screw.	—	Direction of the diaphragm assembly and the pressure regulating screw assembly
		4) Mount the bonnet to the body. Mount the convex IN side of the bonnet to the body, and tighten the 4 mounting screws half way with a Phillips head screwdriver. Then, tighten the screws completely in a diagonal pattern with the indicated tightening torque.	Phillips head screwdriver	Tightening torque: **AR20(K)-B** 2.35 ± 0.3 N·m **AR25(K)-B** 2.35 ± 0.3 N·m **AR30(K)-B** 2.35 ± 0.3 N·m **AR40(K)-B** 3.5 ± 0.3 N·m **AR50(K)-B** 3.5 ± 0.3 N·m **AR60(K)-B** 3.5 ± 0.3 N·m

2. Valve Guide (Assembly), Valve Assembly

Applicable model	Process	Procedure	Tools	Check item
AR20(K)-B AR25(K)-B AR30(K)-B AR40(K)-B AR50(K)-B AR60(K)-B	Disassembly	1) Remove the cap. Insert a watchmaker’s screwdriver in the gap between the body and the cap and dig up the cap.	Watchmaker’s screwdriver (−)	—
		2) Remove the cover. Insert the circular pliers into the 2 small holes of the cover, rotate 45 degrees to one side or the other and lift.	Circular pliers Nominal: 125	—
		3) Remove the valve guide assembly. Hold the valve guide with a needle nose pliers, and lift it.	Needle nose pliers	—
		4) Remove the valve spring.	—	—
		5) Remove the valve.	—	—
	Assembly	6) Mount the valve. Mate the stem convex and the valve center hole.	—	Positioning the stem and the valve (centering)
		7) Mount the valve spring. Insert the valve spring into the valve hole.	—	—
		8) Mount the valve guide assembly and the cover assembly to the body. Align the body groove and the cover clamp, push in the valve guide and cover assembly, insert the circular pliers into the 2 small holes of the cover and rotate 45 degrees to one side or the other to lock into place.	Circular pliers Nominal: 125	—
		9) Mount the cap. Mate the convex of the body cover and the concave of the cap, and push them in to settle. Ensure the end of the body and the cap are almost flat.	—	Direction of the body and the cap. Body end and the cap are almost flat.

3. Bracket Assembly, Panel Mount

Applicable model	Process	Procedure	Tools	Check item
AR20(K)-B AR25(K)-B AR30(K)-B AR40(K)-B	Assembly	1) Mount the parts to the bracket (panel). Mate the bracket (panel) concave and the bonnet convex to mount the bracket.	—	—
		2) Settle the bracket (panel) with set nut. Rotate the set nut clockwise with a hook wrench to settle the parts to the bracket (panel). For the tightening torque, refer to the "Check item" on the right. When mounting the bracket, ensure that the roulette faces of the set nut and the bracket are mated appropriately. When mounting with bracket, set nut tightened manually is adequate for general used.	Hook wrench Nominal: AR20(K)-B 34/38 AR25(K)-B 40/42 AR30(K)-B 52/55 AR40(K)-B 52/55	Tightening torque: AR20(K)-B 2.0 ± 0.2 N·m AR25(K)-B 2.5 ± 0.2 N·m AR30(K)-B 3.5 ± 0.3 N·m AR40(K)-B 4.0 ± 0.4 N·m
AR50(K)-B AR60(K)-B	Assembly (Bracket assembly)	1) Mount the bracket to the product. Fix them by tightening the 2 mounting screws using a hexagon wrench key.	Hexagon wrench key Nominal: 5	Referential tightening torque: 2.6 N·m

4. Square Embedded Type Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
AR20(K)-B AR25(K)-B AR30(K)-B AR40(K)-B AR50(K)-B AR60(K)-B	Disassembly	1) Remove the pressure gauge cover. Rotate the pressure gauge cover 15 degrees to the arrow mark (counterclockwise) to pull it out.	—	—
		2) Remove the pressure gauge Rotate the 2 mounting screws counterclockwise with a Phillips head screwdriver to remove the pressure gauge and two mounting screws.	Phillips head screwdriver	—
	Assembly	3) Ensure that the O-ring is mounted to the pressure gauge. Mount the O-ring to the pressure gauge if the ring fall off.	—	Presence of the O-ring
		4) Mount the pressure gauge. Rotate the 2 mounting screws clockwise with a Phillips head screwdriver to mounting screws temporary. Then settle them with tightening torque in check item.	Phillips head screwdriver	Tightening torque: 0.6 ± 0.05 N·m
		5) Mount the pressure gauge cover. Insert the pressure gauge mating two detent of the pressure gauge and holes for them so that the arrow of the pressure gauge cover comes upper right. Rotate the pressure gauge cover 15 degree opposite to the arrow to mount the pressure gauge.	—	—

5. Circular Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
AR20(K)-B AR25(K)-B AR30(K)-B AR40(K)-B AR50(K)-B AR60(K)-B	Disassembly	1) Remove the pressure gauge. Hold the pressure gauge with a wrench on the wrench flat. Then, rotate the gauge.	Wrench Nominal: AR20(K)-B, AR25(K)-B, AR30(K)-B, AR40(K)-B, AR50(K)-B, AR60(K)-B: 14	—
	Assembly	2) Wind the pressure gauge thread with the sealant tape leaving 1.5 to 2 threads from the end.	—	Wind sealant tape leaving 1.5 to 2 threads
		3) Mount the pressure gauge. Hold the pressure gauge with a wrench on the wrench flat, and rotate it clockwise to mount the circular pressure gauge. Refer to the "Check item" for tightening torque of pressure gauge.	Wrench Nominal: AR20(K)-B, AR25(K)-B, AR30(K)-B, AR40(K)-B, AR50(K)-B, AR60(K)-B: 14	Tightening torque: AR20(K)-B, AR25(K)-B, AR30(K)-B, AR40(K)-B, AR50(K)-B, AR60(K)-B: 7 to 9 N·m

6. Pressure Gauge Adapter, Plug

Applicable model	Process	Procedure	Tools	Check item
AR20(K)-B AR25(K)-B AR30(K)-B AR40(K)-B AR50(K)-B AR60(K)-B	Disassembly	1) Remove the plug. Insert the hexagon wrench key to hexagon socket of the plug. Rotate the plug counterclockwise to remove the plug.	Hexagon wrench key Nominal: AR20(K)-B, AR25(K)-B, AR30(K)-B, AR40(K)-B, AR50(K)-B, AR60(K)-B: 4	—
		2) Remove the pressure gauge adapter. Rotate the 2 mounting screws counterclockwise with a Phillips head screwdriver to remove the pressure gauge adapter and two mounting screws.	Phillips head screwdriver	—
	Assembly	3) Ensure that the O-ring is mounted to the pressure gauge adapter. If not, mount the O-ring.	—	—
		4) Mount the pressure gauge adapter. Rotate the 2 screws clockwise with a Phillips head screwdriver to fix pressure gauge adapter. Refer to the “Check item” for tightening torque of 2 screws.	Phillips head screwdriver (Torque driver)	Tightening torque: 0.6 ± 0.05 N·m
		5) Mount the plug assembly. Insert hexagon wrench key into hexagon socket on the plug and rotate clockwise to fix the plug. Refer to the “Check item” for tightening torque of 2 screws.	Hexagon wrench key Nominal: AR20(K)-B, AR25(K)-B, AR30(K)-B, AR40(K)-B, AR50(K)-B, AR60(K)-B: 4	Tightening torque: AR20(K)-B, AR25(K)-B, AR30(K)-B, AR40(K)-B, AR50(K)-B, AR60(K)-B: 0.6 ± to 0.05 N·m

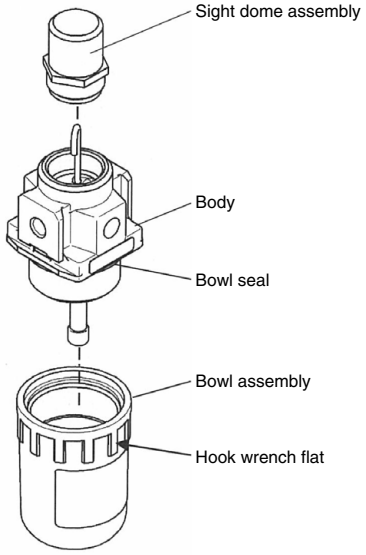
7. Blanking Plate Assembly

Applicable model	Process	Procedure	Tools	Check item
AR20-B AR25-B AR30-B AR40-B AR50-B AR60-B	Disassembly	1) Remove the blanking plate. Rotate the 2 mounting screws counterclockwise with a Phillips head screwdriver to remove the blanking plate and the 2 mounting screws.	Phillips head screwdriver	—
	Assembly	2) Ensure that the O-ring is mounted to the blanking plate. If not, mount the O-ring.	—	—
		3) Mount the blanking plate. Rotate the 2 screws clockwise with a Phillips head screwdriver to fix blanking plate. Refer to the “Check item” for tightening torque of 2 screws.	Phillips head screwdriver (Torque driver)	Tightening torque: 0.6 ± 0.05 N·m

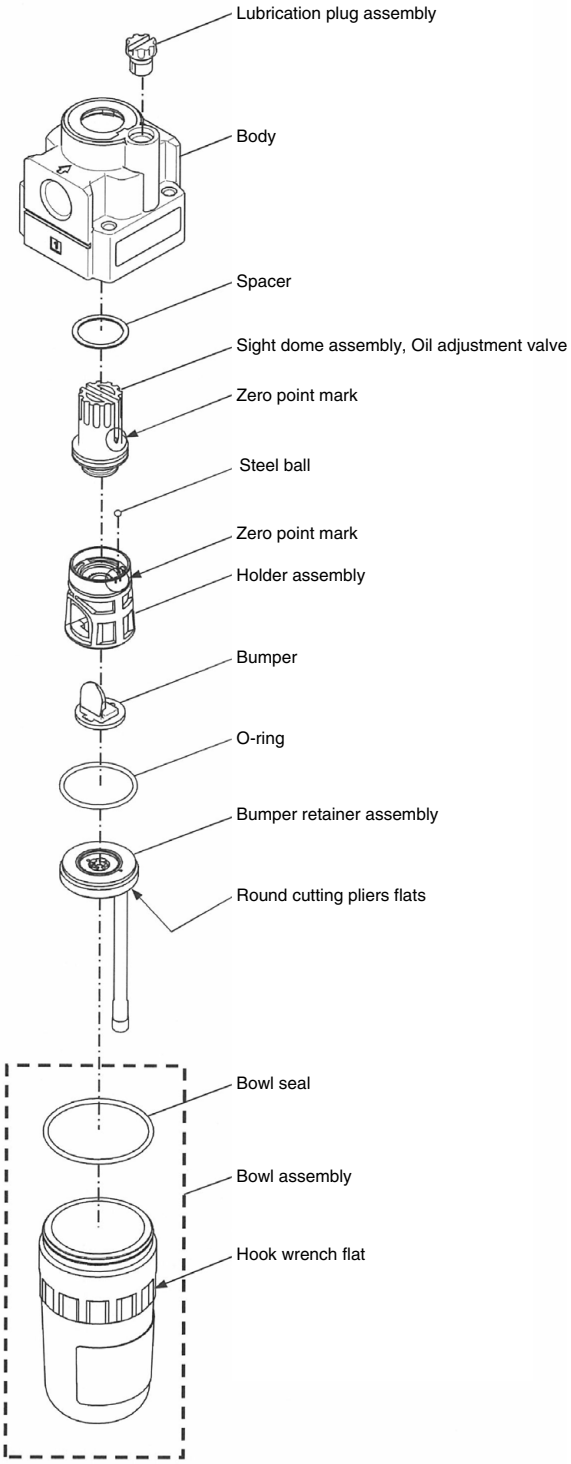
8. Check Valve Assembly

Applicable model	Process	Procedure	Tools	Check item
AR20K-B AR25K-B AR30K-B AR40K-B AR50K-B AR60K-B	Disassembly	1) Remove the check valve cover. Rotate the 2 screws counterclockwise with a Phillips head screwdriver and remove the check valve cover and the screws.	Phillips head screwdriver	—
		2) Remove the check valve assembly from the body. The check valve can be removed by pulling it out by hand. At this time, confirm that the O-ring is mounted to body side properly so that it would not come out from the body.	—	—
	Assembly	3) Confirm that the 2 O-rings are mounted to body side. If not, mount them to the body.	—	—
		4) Insert convexes on the check valve into O-ring insert holes on the body.	—	Direction of the check valve body assembly
		5) Mount the check valve cover. Rotate the 2 screws clockwise with a Phillips head screwdriver to fix the check valve cover. Refer to the “Check item” for tightening torque of 2 screws.	Phillips head screwdriver (Torque driver)	Tightening torque: 0.6 ± 0.05 N·m

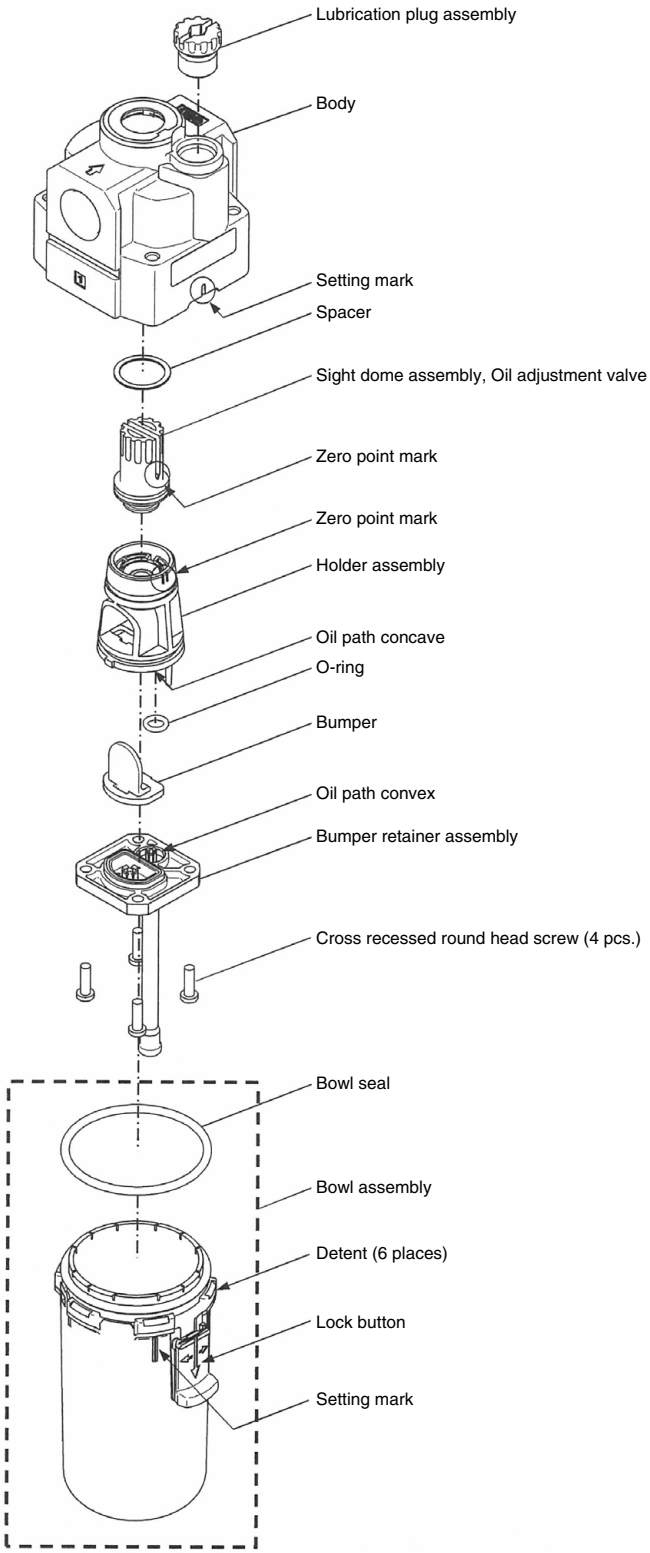
1) AL10-A



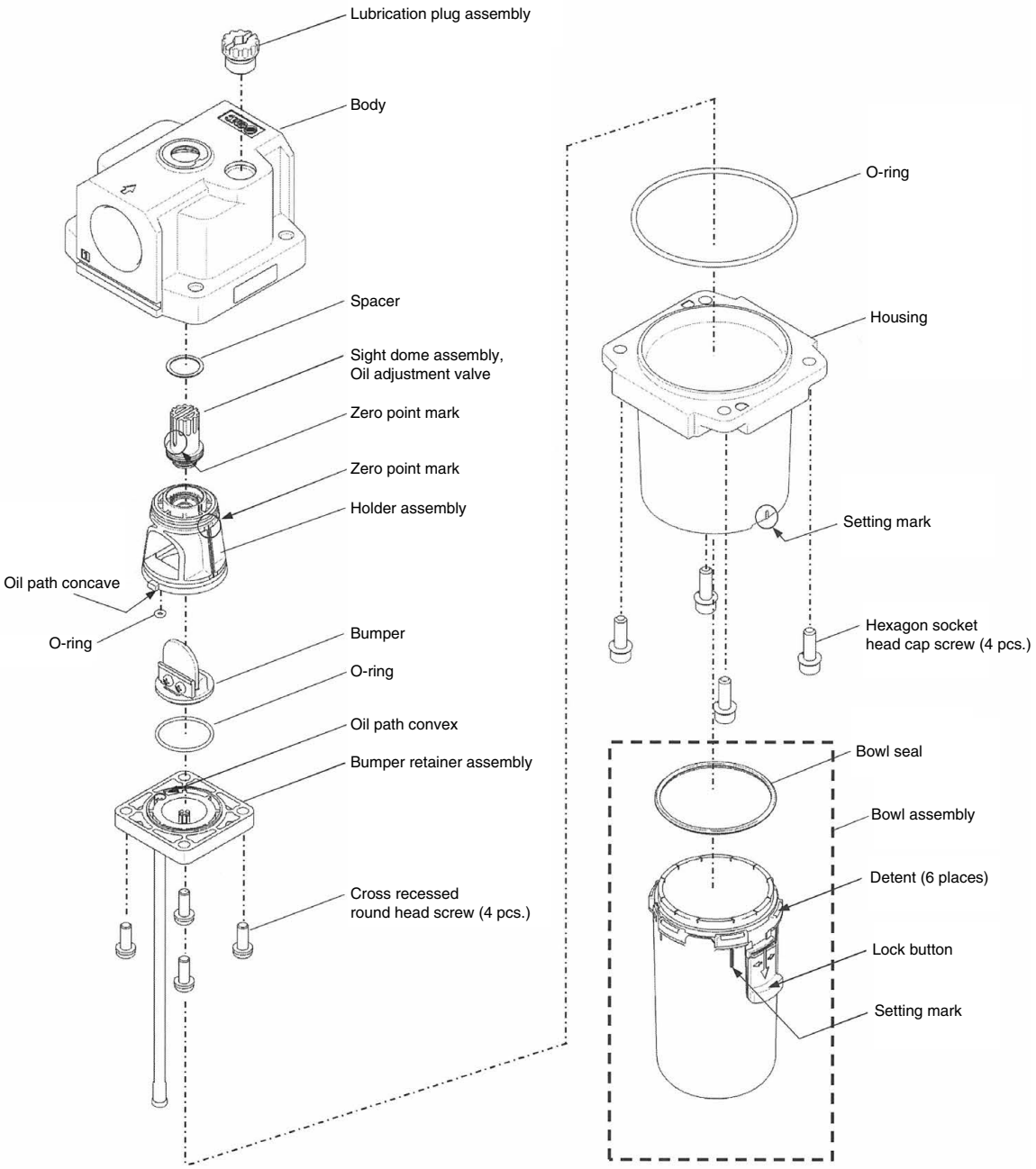
2) AL20-A

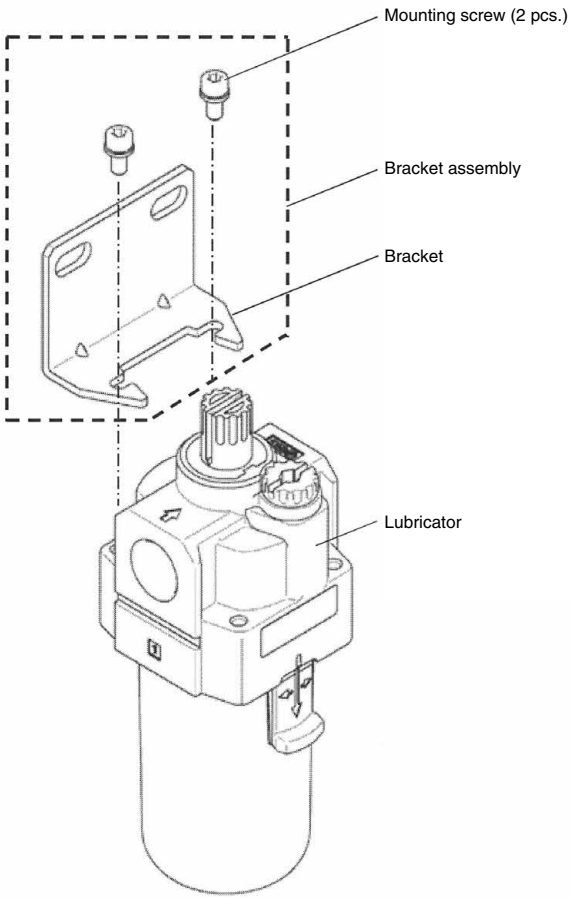


3) AL30-A/40-A


Lubrication plug assembly
Body
Setting mark
Spacer
Sight dome assembly, Oil adjustment valve
Zero point mark
Zero point mark
Holder assembly
Oil path concave
O-ring
Bumper
Oil path convex
Bumper retainer assembly
Cross recessed round head screw (4 pcs.)
Bowl seal
Bowl assembly
Detent (6 places)
Lock button
Setting mark

4) AL50-A/60-A


Lubrication plug assembly
Body
Spacer
Sight dome assembly,
Oil adjustment valve
Zero point mark
Zero point mark
Holder assembly
Oil path concave
O-ring
Bumper
O-ring
Oil path convex
Bumper retainer assembly
Cross recessed
round head screw (4 pcs.)
O-ring
Housing
Setting mark
Hexagon socket
head cap screw (4 pcs.)
Bowl seal
Bowl assembly
Detent (6 places)
Lock button
Setting mark


Mounting screw (2 pcs.)
Bracket assembly
Bracket
Lubricator

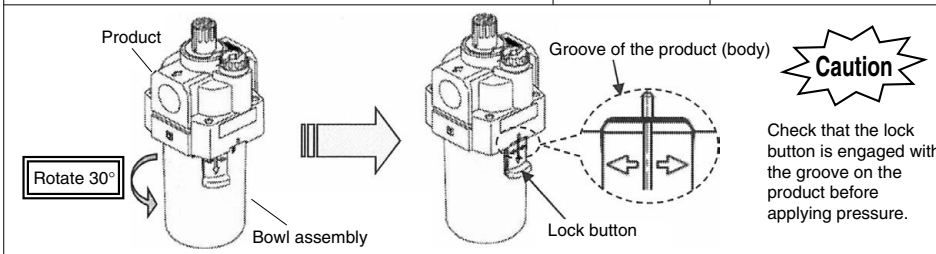
⚠Warning
Before replacement, ensure that the regulator is not pressurized.
Replace while referring to the "Exploded View."
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Bowl Assembly, Sight Dome Assembly

Applicable model	Process	Procedure	Tools	Check item
AL10-A	Disassembly	1) Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly is tightened too much to be removed, use a hook wrench until it can be loosened by hand.	(Hook wrench Nominal: 25/28)	—
		2) Remove the sight dome assembly. Rotate counterclockwise with a wrench to remove the sight dome assembly.	Wrench Nominal: 14	—
	Assembly	3) Mount the bowl assembly. Hold the bowl assembly by hand and rotate clockwise. Do not use tool for mounting because the bowl may be damaged. Refer to the "Check item" for referential tightening torque.	—	Referential tightening torque: 1.5 N·m
		4) Mount the sight dome assembly. Rotate clockwise with a wrench to mount the sight dome assembly. Tightening torque at this time is shown on the "Check item."	Wrench Nominal: 14 (Torque wrench)	Tightening torque: 0.8 ± 0.2 N·m

2. Bowl Assembly, Bumper Retainer Assembly, Bumper, Sight Dome Assembly

Applicable model	Process	Procedure	Tools	Check item
AL20-A	Disassembly	1) Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly is tightened too much to be removed, use a wrench until it can be loosened by hand.	SMC's special wrench (Recommended) Part no.: 1129129	—
		2) Close the oil adjustment valve (outer of the sight dome) fully. Rotate the oil adjustment valve clockwise by manual until feeling the end of rotation with light force.	—	—
		3) Remove the bumper retainer assembly. Hold the bumper retainer assembly with a pair of round cutting pliers and rotate counterclockwise.	Round cutting pliers Nominal: 125 or 150	—
		4) Remove the O-ring, bumper, holder assembly, steel ball, sight dome assembly and spacer. Push the sight dome assembly forward to the body by hand for disconnection. And the holder assembly and the sight dome assembly can be separated away by hand as well, but at the time the attention has to be paid not to lose the steel balls between them. The bumper can be pulled out with a pair of tweezers.	Tweezers	—
	Assembly	5) Insert the spacer to the sight dome assembly.	—	—
		6) Connect the sight dome assembly, the steel balls and the holder assembly. After inserting the steel balls into the path hole of oil on the holder assembly, put the sight dome assembly into the holder assembly by meeting zero point mark of both holder assembly and the sight dome.	—	Zero point mark on the holder assembly shall meet with zero point mark on the sight dome assembly.
		7) Insert the bumper into the holder assembly. For insertion, meet the setting concave (bumper) and convex (holder assembly).	—	Setting concave on the bumper shall meet with the setting convex on the holder assembly.
		8) Insert the assembly 5) to 7) mentioned above (sight dome + spacer + steel ball + holder assembly + damper) to the body. For insertion, meet the setting convex and concave on the body holder. Proper insertion makes the face of the holder and the body flat.	—	Setting concave on the body shall meet with the setting convex of the holder. The face of the holder and the body is made flat.
		9) Mount the bumper retainer assembly. Hold the bumper retainer assembly with a pair of round cutting pliers and rotate clockwise. tightening torque at this time is shown on the "Check item."	Round cutting pliers Nominal: 125 or 150	Tightening torque: 1.4 ± 0.1 N·m
		10) Mount the bowl assembly. Hold the bowl assembly by hand and rotate clockwise. Do not use tool for mounting because the bowl may be damaged. Refer to the "Check item" for referential tightening torque.	—	Referential tightening torque: 2.1 N·m

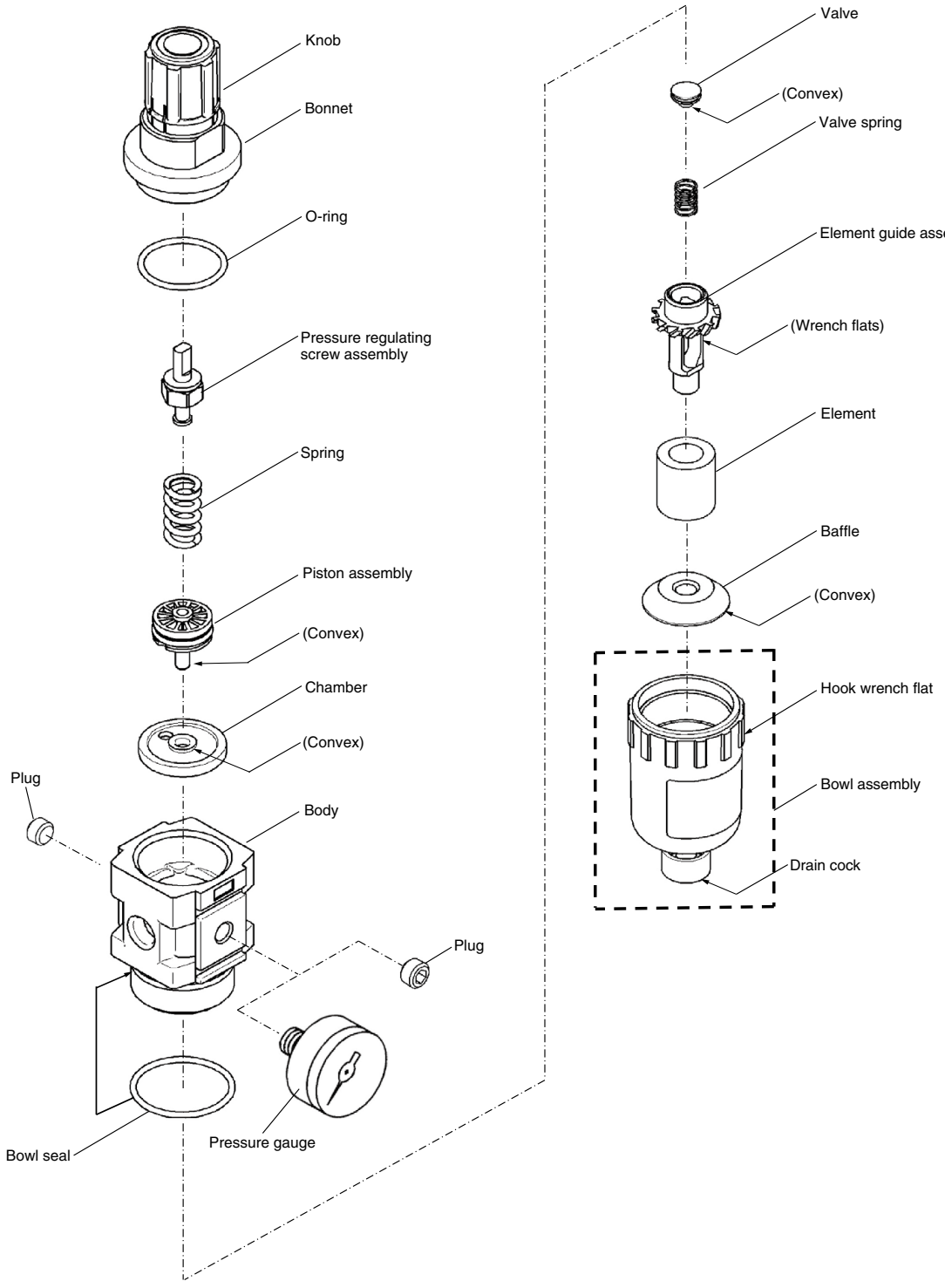
Applicable model	Process	Procedure	Tools	Check item
AL30-A AL40-A	Disassembly	1) Remove the bowl assembly. Push the lock button on the bowl assembly down and rotate clock or counterclockwise by 30°. After the rotation, the bowl assembly can be pulled out.	—	—
		2) Close the oil adjustment valve (outer of the sight dome) fully. Rotate the oil adjustment valve clockwise by manual until feeling the end of rotation with light force.	—	—
		3) Remove the bumper retainer assembly. Loosen and remove the 4 cross recessed round head screws with a Phillips head screwdriver to remove the bumper retainer assembly. At this time, the attention has to be paid not to lose the O-ring between the bumper retainer assembly and the holder assembly.	Phillips head screwdriver	—
		4) Remove the bumper, holder assembly, sight dome assembly and spacer. Push the sight dome assembly forward to the body by hand for disconnection. And the holder assembly and the sight dome assembly can be separated away by hand as well. The bumper can be pulled out with a pair of tweezers.	Tweezers	—
	Assembly	5) Insert the spacer into the sight dome assembly.	—	—
		6) Connect the sight dome assembly with the holder assembly. Put the sight dome assembly into the holder assembly by meeting zero point mark of both holder assembly and the sight dome assembly.	—	Zero point mark on the holder assembly shall meet with zero point mark on the sight dome assembly.
		7) Insert the bumper into the holder assembly. For insertion, the shape of the bumper is matched to the shape of the convex part of the holder assembly.	—	Setting the shape of the bumper shall meet with the setting convex of the holder assembly.
		8) Insert the assembly 5) to 7) mentioned above (sight dome + spacer + holder assembly + bumper) to the body. For insertion, meet the setting convex and concave on the body holder. Proper insertion makes the face of the holder and the body flat.	—	Setting concave on the body shall meet with the setting convex of the holder. The face of the holder and the body is made flat.
		9) Mount the bumper retainer assembly. Place the bumper retainer assembly so that the oil path convex (bumper holder assembly) and concave (holder) could meet, and then fix it by the 4 cross recessed round head screws with a Phillips head screwdriver. Tightening torque at this time is shown on the "Check item." And the screw which is tightened next after first tightened screw shall be what is located at cross corner of first one.	Phillips head screwdriver	Tightening torque AL30-A: 0.4 ± 0.1 N·m AL40-A: 0.7 ± 0.2 N·m
		10) Mount the bowl assembly. Insert the bowl assembly into the body by using individual setting mark and rotate clock or counterclockwise by 30° (until the lock button is released). If the release of the lock button is confirmed, mount of the bowl assembly is completed.	—	Lock button is up.
				

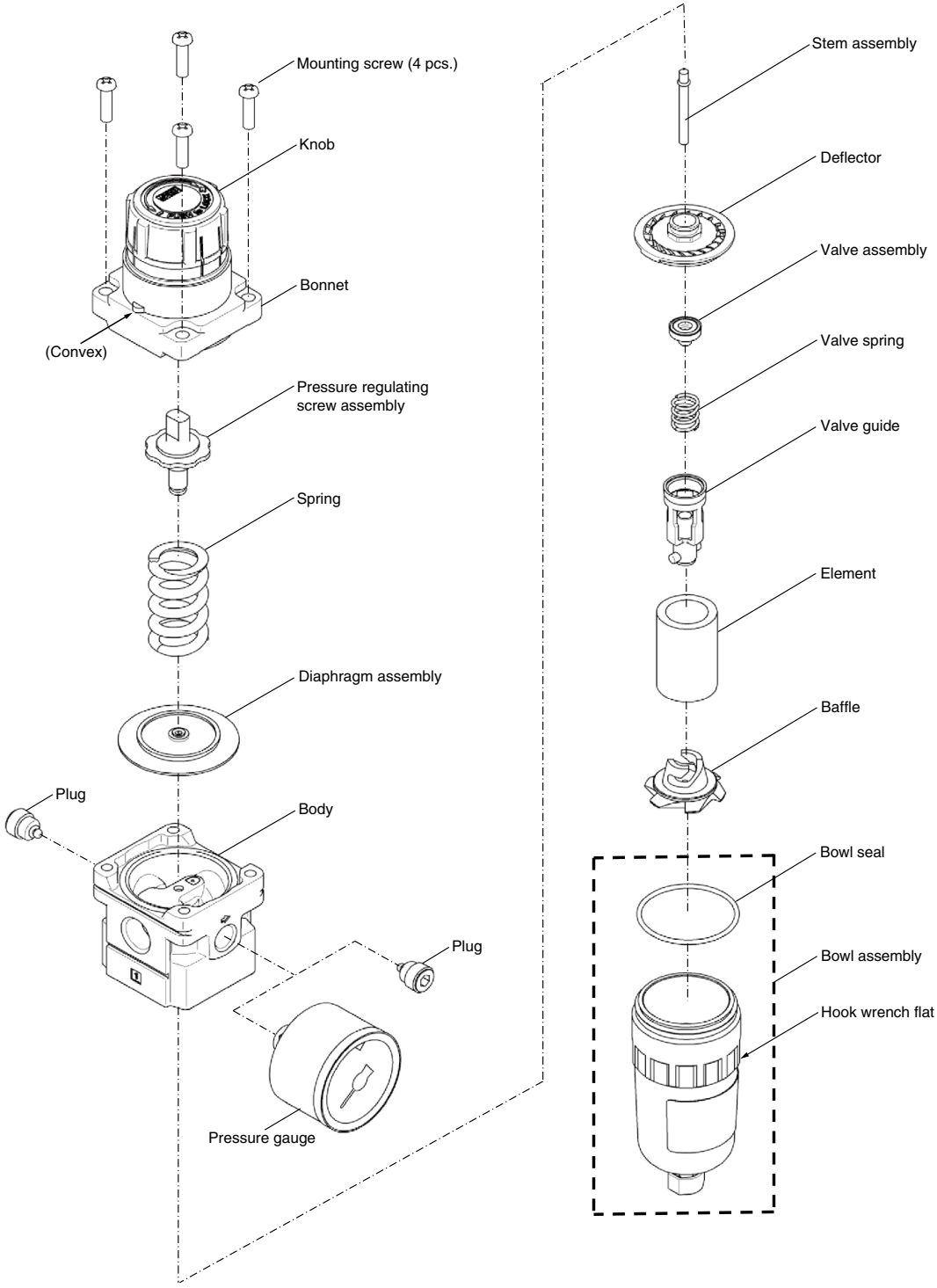
Applicable model	Process	Procedure	Tools	Check item
AL50-A AL60-A	Disassembly	1) Remove the housing including the bowl assembly. Loosen the 4 hexagon socket head cap screws with a hexagon wrench to remove the housing (including the bowl assembly) and O-ring.	Hexagon wrench Nominal: 5	—
		2) Close the oil adjustment valve (outer of the sight dome) fully. Rotate the oil adjustment valve clockwise by manual until feeling the end of rotation with light force.	—	—
		3) Remove the damper retainer assembly. Loosen and remove the 4 cross recessed round head screws with a Phillips head screwdriver to remove the bumper retainer assembly.	Phillips head screwdriver	—
		4) Remove the O-ring, bumper assembly, holder assembly, sight dome assembly and spacer. Push the sight dome assembly forward to the body by hand for disconnection. And the holder assembly and the sight dome assembly can be separated away by hand as well.	—	—
	Assembly	5) Insert the spacer into the sight dome assembly.	—	—
		6) Connect the sight dome assembly with the holder assembly. Put the sight dome assembly into the holder assembly by meeting zero point mark of both holder assembly and the sight dome assembly.	—	Zero point mark on the holder assembly shall meet with zero point mark on the sight dome assembly.
		7) Insert the bumper into the holder assembly. For insertion, the setting hole of the bumper assembly is matched to the convex part of the holder assembly.	—	Setting the setting hole of the bumper assembly shall meet with the convex of the holder assembly.
		8) Insert the assemblies 5) to 7) mentioned above (sight dome + spacer + holder assembly + bumper assembly) to the body. For insertion, meet the setting convex and concave on the body holder. Proper insertion makes the face of the holder and the body flat.	—	Setting concave on the body shall meet with the Setting convex of the holder. The face of the holder and the body is made flat.
		9) Install the O-ring to the holder assembly.	—	—
		10) Mount the bumper retainer assembly. Place the bumper retainer assembly so that the oil path convex (bumper holder assembly) and concave (holder) could meet, and then fix it by the 4 cross recessed round head screws with a Phillips head screwdriver. Tightening torque at this time is shown on the “Check item.” And the screw which is tightened next after first tightened screw shall be what is located at cross corner of first one.	Phillips head screwdriver	Tightening torque AL50-A: 1.4 ± 0.1 N·m AL60-A: 1.4 ± 0.1 N·m
		11) Install the O-ring to the body.	—	—
		12) Mount the housing including the bowl assembly. Place the housing including the bowl assembly on the body at the position with configuration match by checking the appearance of them and fix it by the 4 hexagon socket head cap screws with a hexagon wrench. Tightening torque at this time is shown on the “Check item.” And the screw which is tightened next after first tightened screw shall be what is located at cross corner of first one.	Hexagon wrench Nominal: 5	Tightening torque AL50-A: 4.5 ± 1 N·m AL60-A: 4.5 ± 1 N·m

3. Lubrication Plug Assembly

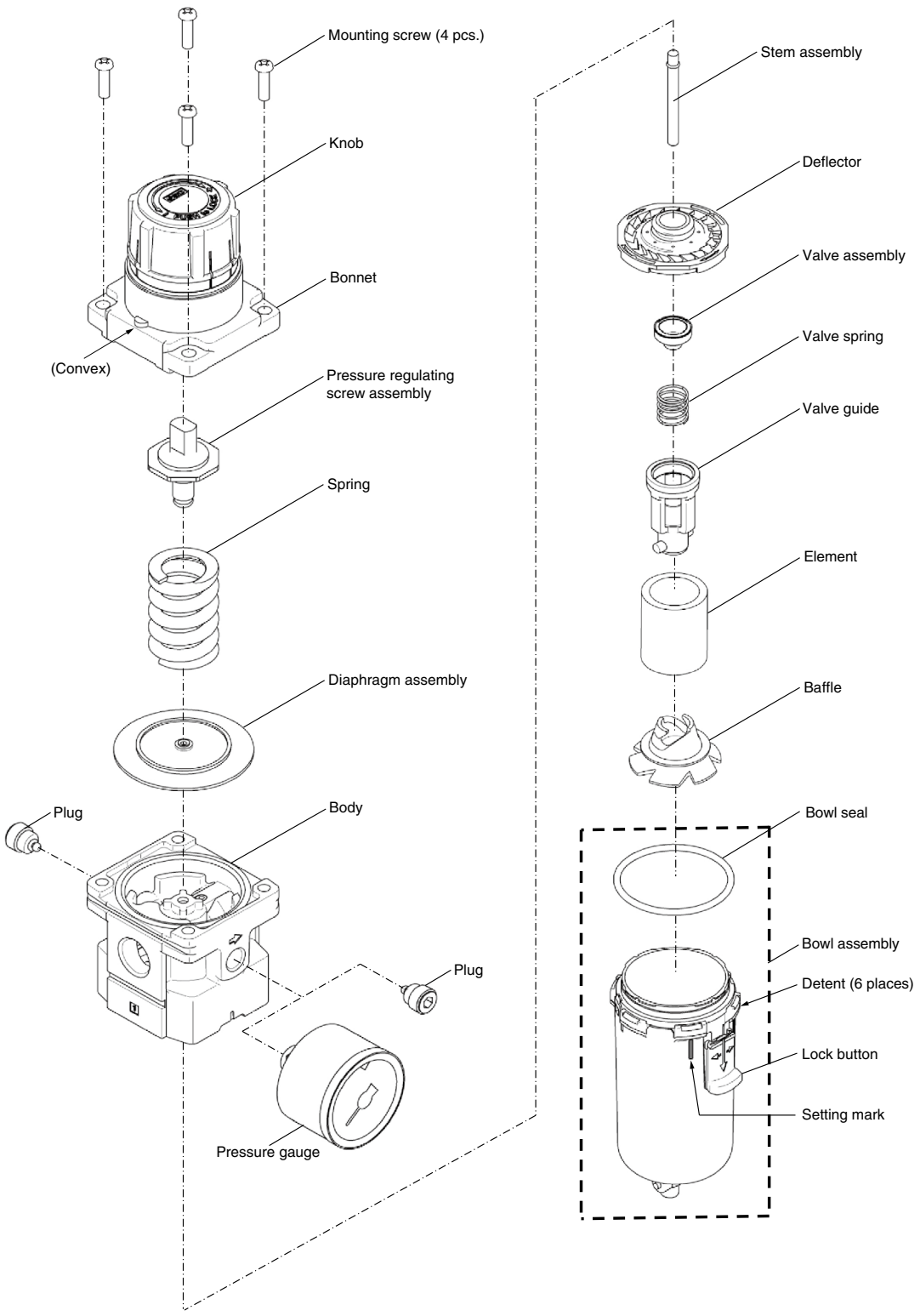
Applicable model	Process	Procedure	Tools	Check item
AL20-A AL30-A AL40-A AL50-A AL60-A	Disassembly	1) Remove the lubrication plug assembly. Insert a flat head screwdriver into the groove on the top of lubrication plug and rotate counterclockwise to remove the lubrication plug assembly from the body.	Flat head screwdriver	—
	Assembly	2) Mount the lubrication plug assembly. Insert a flat head screwdriver into the groove on the top of lubrication plug and rotate clockwise to fix the lubrication plug assembly to the body. The tightening torque at this time is shown on the “Check item.”	Flat head screwdriver	Tightening torque AL20-A: 0.3 ± 0.05 N·m AL30-A: 0.4 ± 0.05 N·m AL40-A to 60-A: 0.55 ± 0.05 N·m

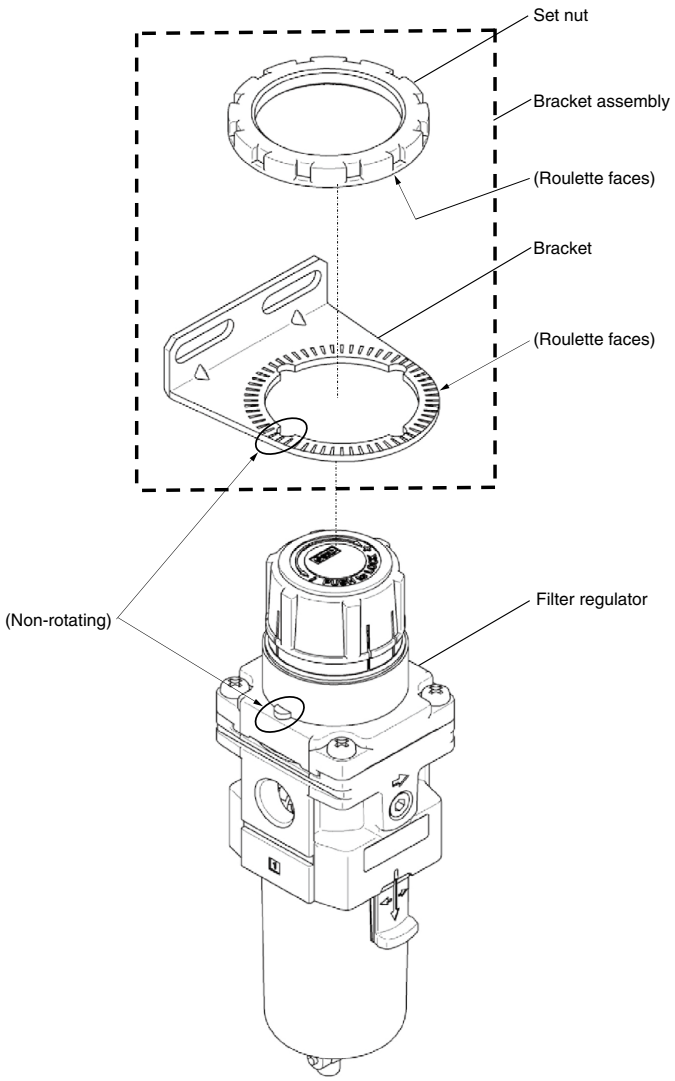
AW10-A Exploded View 1




Mounting screw (4 pcs.)
Knob
Bonnet
(Convex)
Pressure regulating screw assembly
Spring
Diaphragm assembly
Plug
Body
Plug
Pressure gauge
Stem assembly
Deflector
Valve assembly
Valve spring
Valve guide
Element
Baffle
Bowl seal
Bowl assembly
Hook wrench flat

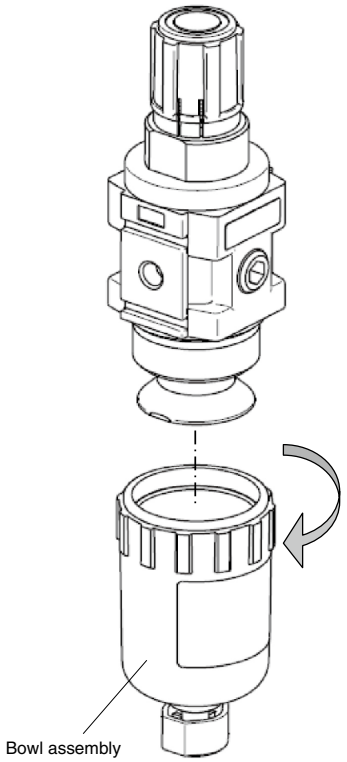
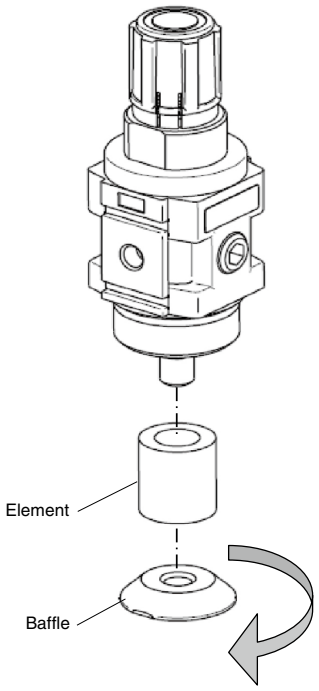
AW30-A/40-A Exploded View 3



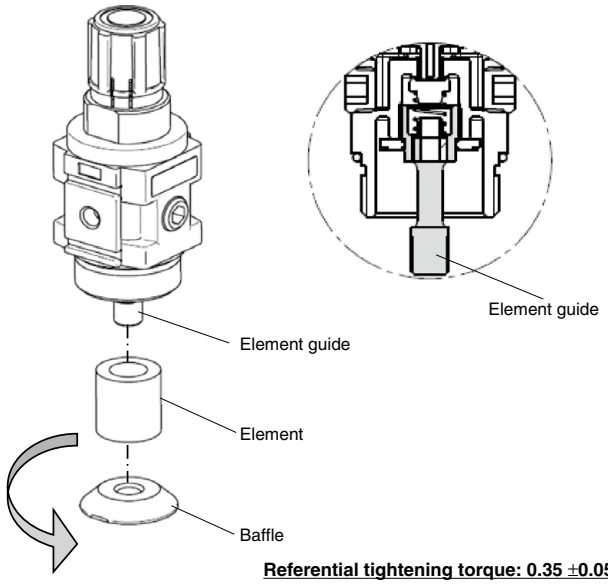

Set nut
Bracket assembly
(Roulette faces)
Bracket
(Roulette faces)
(Non-rotating)
Filter regulator

⚠Warning
Before replacement, ensure that the regulator is not pressurized.
Rotate the pressure adjusting knob to zero.
Replace while referring to the “Exploded View.”
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Bowl Assembly, Element

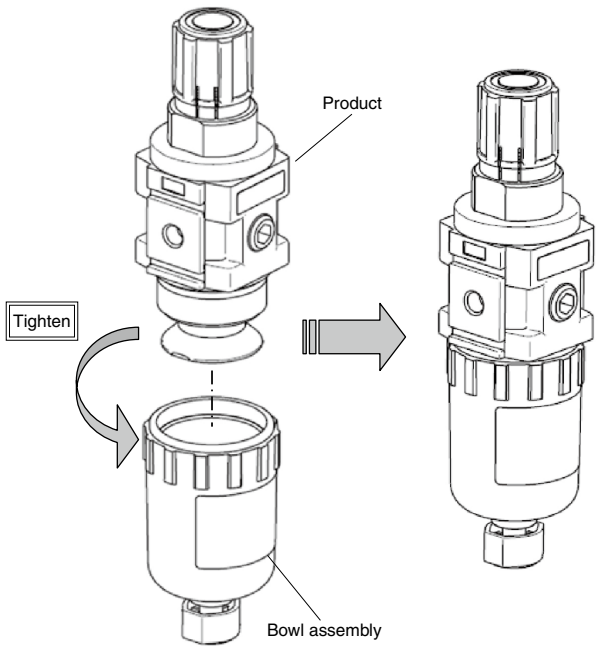
Applicable model	AW10-A	
Process	Disassembly	
Procedure	1) Turn the bowl assembly in the direction shown in the figure below to remove it from the product. If the bowl assembly has been tightened too much to be removed, use a hook wrench until it can be loosened by hand. (Hook wrench nominal: 25/28)	2) Turn the baffle by hand in the direction shown in the figure below (in the direction of the arrow) to remove the baffle and element.
		

Applicable model	AW10-A	
Process	Assembly	
Procedure	1) Mount the element to the element guide. (Direction is not specified.)	2) Turn the baffle by hand in the direction shown in the figure below to tighten the element. As the mounting direction of the baffle is specified, refer to the "Exploded View." For manual tightening, use the "Referential tightening torque" provided below.



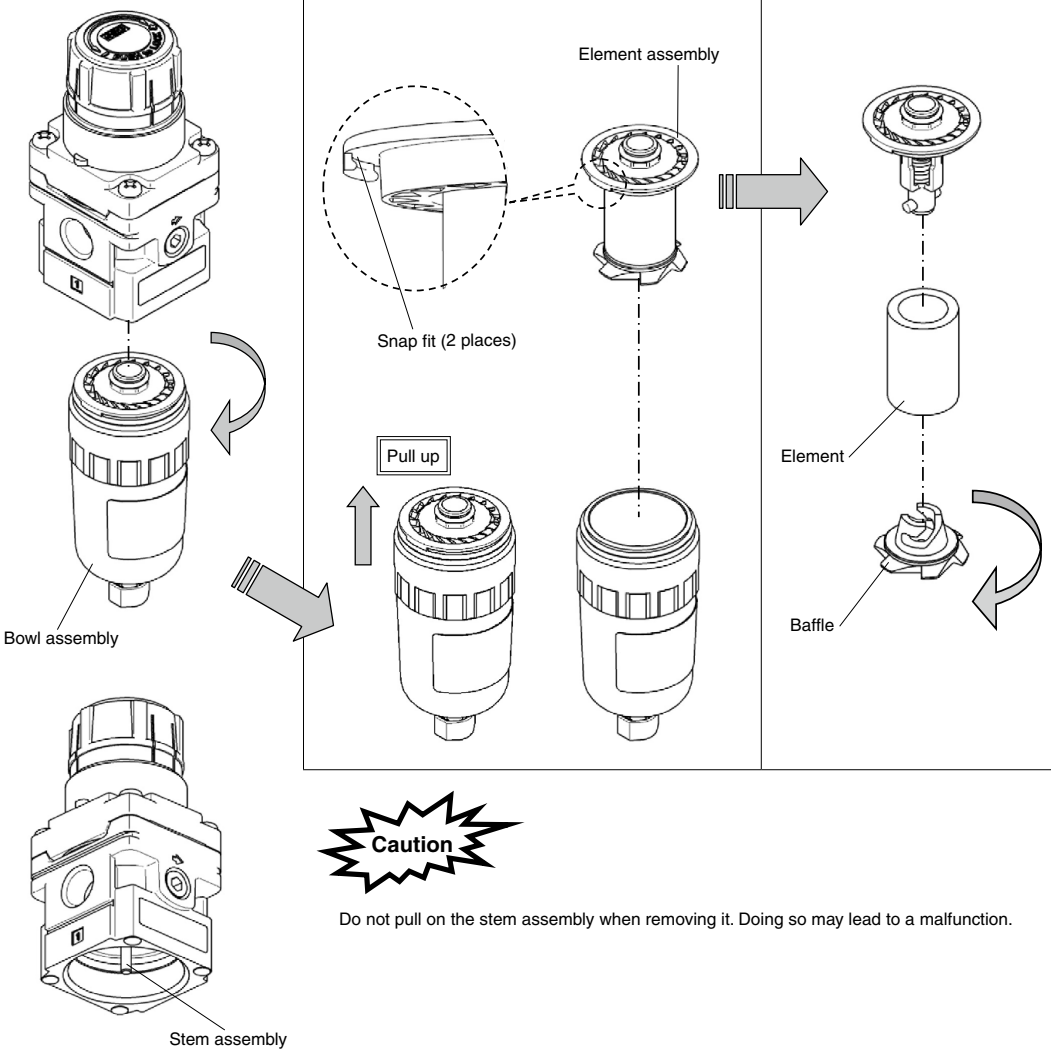
Referential tightening torque: 0.35 ±0.05 N·m

3) Mount the bowl assembly onto the product firmly by turning it in the direction shown in the figure below.
For manual tightening, use the "Referential tightening torque" provided below.



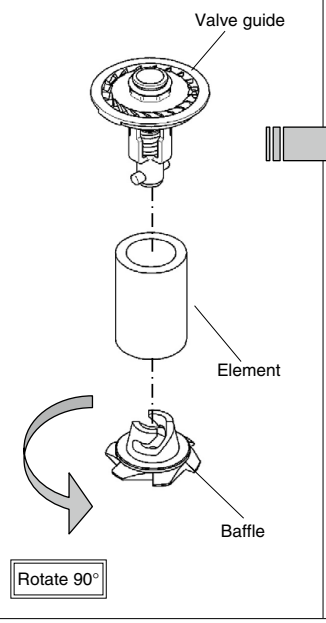
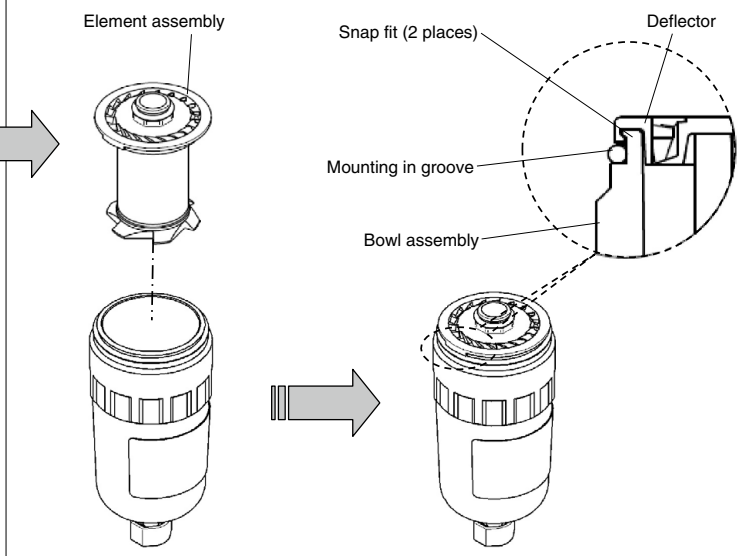
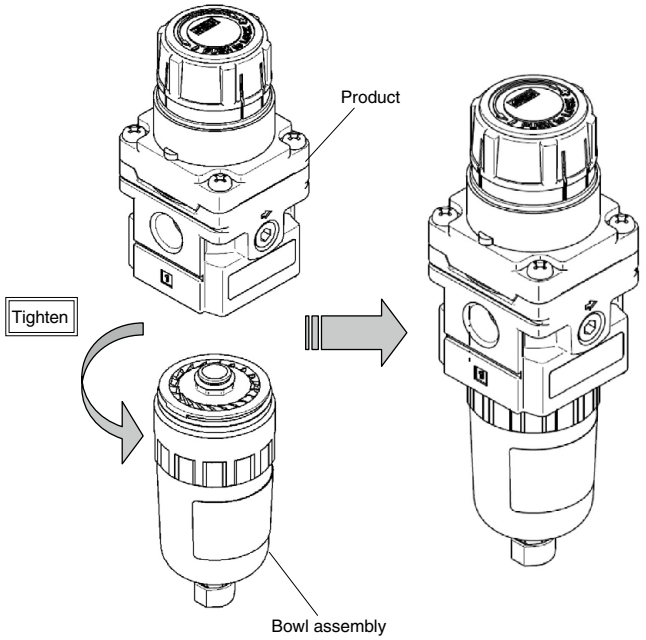
Referential tightening torque: 1.5 N·m

Applicable model	AW20-A		
Process	**Disassembly**		
Procedure	1) Turn the bowl assembly in the direction shown in the figure below to remove it from the product. If the bowl assembly has been tightened too much to be removed, use SMC's special wrench until it can be loosened by hand. (SMC's special wrench part no.: 1129129 (Recommended))	2) Hold the outer periphery, avoiding the 2 snap fits on the deflector, and pull it up to remove the element assembly.	3) Turn the baffle in the direction of the arrow to remove the element.



Caution

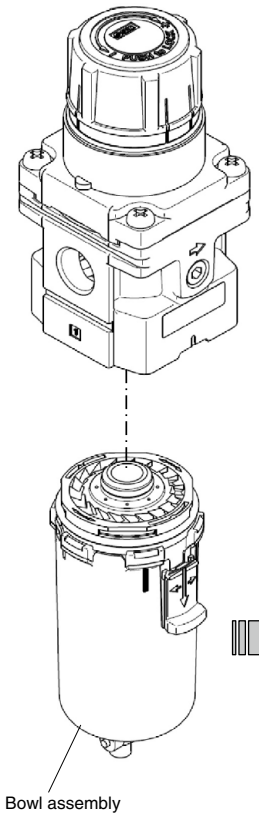
Do not pull on the stem assembly when removing it. Doing so may lead to a malfunction.

Applicable model	AW20-A
Process	Assembly
Procedure	1) Mount the element onto the valve guide, and turn the baffle in the direction shown in the figure below to secure the element. 
	2) When mounting the element assembly onto the bowl assembly, engage the 2 snap fits on the deflector with the bowl assembly (until you hear a click). 
	3) Mount the bowl assembly onto the product firmly by turning it to the right. For manual tightening, use the “Referential tightening torque” provided below.  **Referential tightening torque: 2.1 N·m**

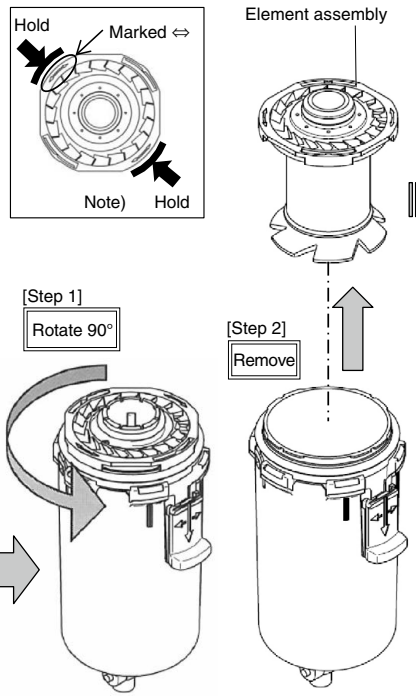
Applicable model	AW30-A/40-A
Process	Disassembly

Procedure

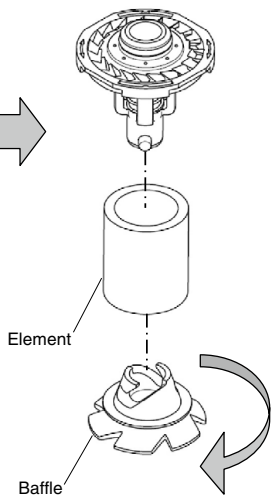
1) Remove the bowl assembly from the product.

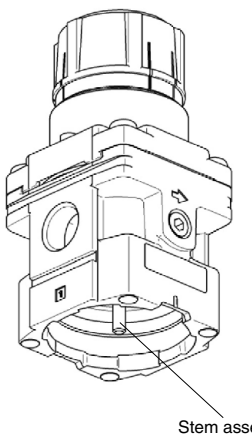


2) Turn the element assembly 90 degrees either to the left or right to remove it.



3) Turn the baffle in the direction of the arrow to remove the element.



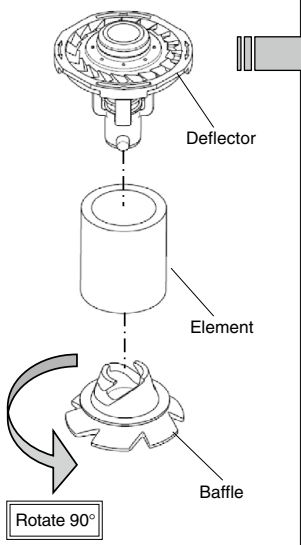


Caution

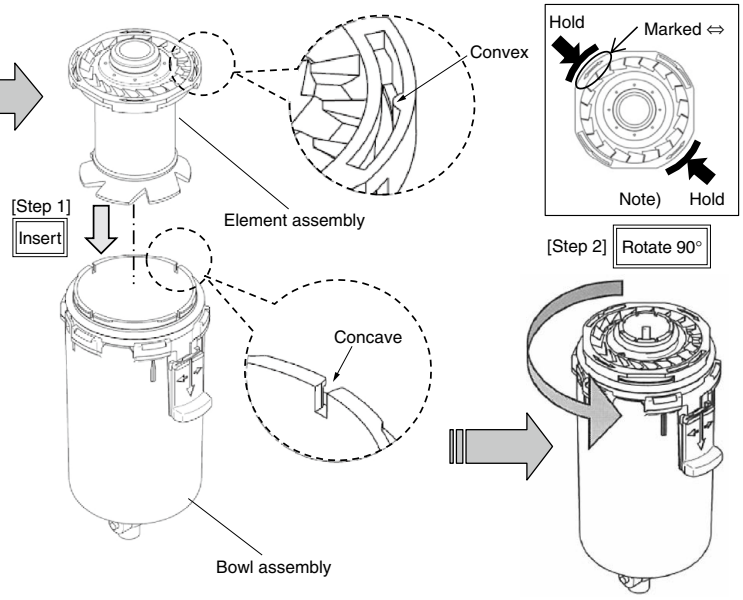
Do not pull on the stem assembly when removing it. Doing so may lead to a malfunction.

Note) Hold the sections marked ⇔ on the circular arc, and turn the element assembly.

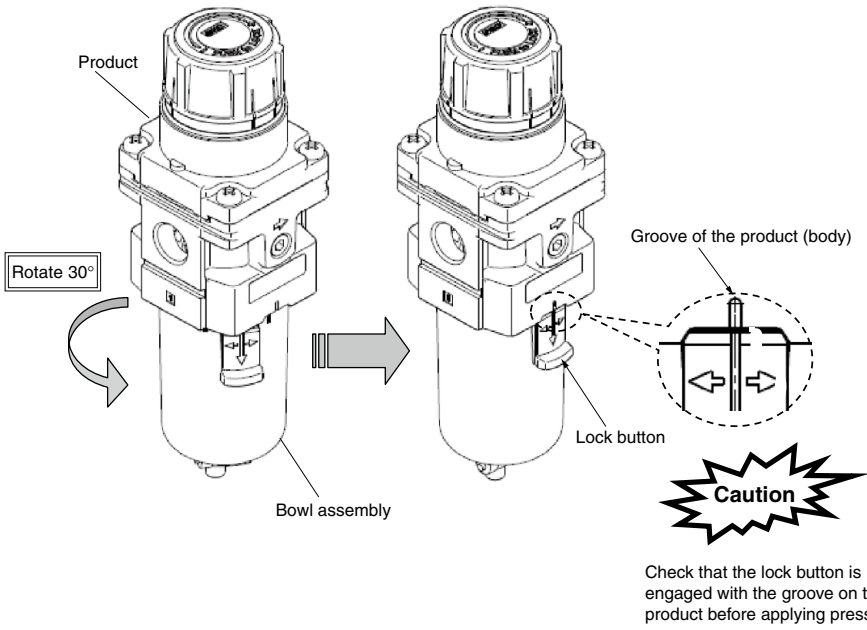
Applicable model	AW30-A/40-A
Process	Assembly
Procedure	1) Mount the element onto the deflector, and turn the baffle in the direction shown in the figure below to secure the element.



	2) After mounting the element assembly onto the bowl assembly, turn the element assembly 90 degrees either to the left or right until the convex on the element assembly is engaged with the concave on the bowl assembly.



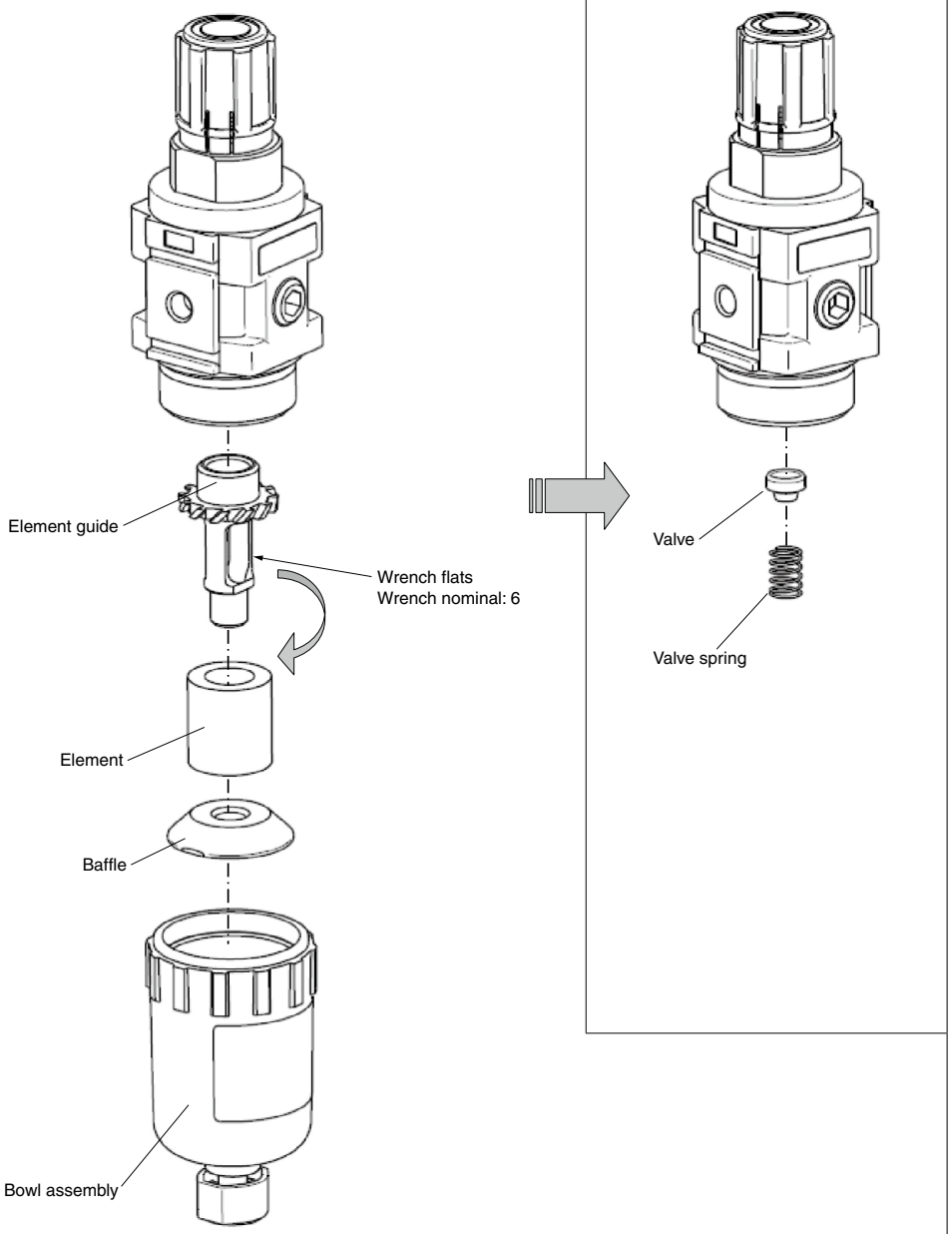
	3) Mount the bowl assembly onto the product, and turn it until the lock button is aligned with the groove on the product as shown in the figure below.



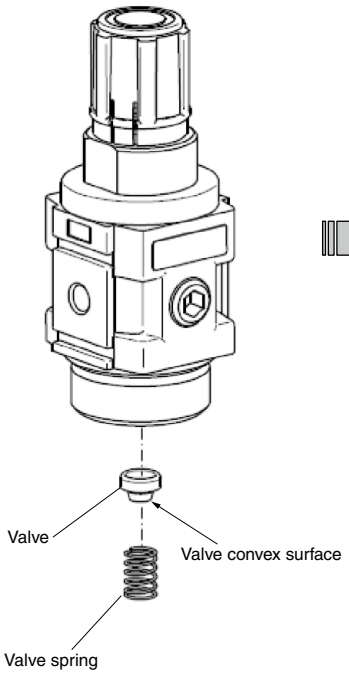
Note) Hold the sections marked ⇔ on the circular arc, and turn the element assembly.

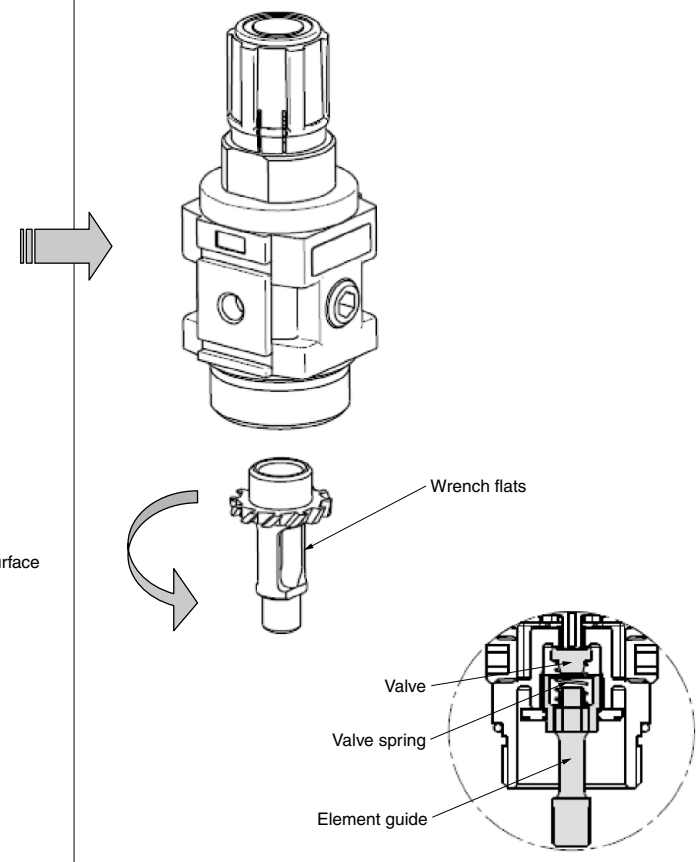
2. Valve Assembly

Applicable model	AW10-A		
Process	Disassembly		
Procedure	1) Remove the bowl assembly and element from the product.*	2) Remove the element guide. Hold the element guide with a wrench to rotate it in the direction shown in the figure below and remove the valve guide.	3) Remove the valve spring and valve.
	* For the removal procedure, refer to <Disassembly> (AW10-A: page 654) of the bowl assembly and element.		



Applicable model	AW10-A
Process	Assembly
Procedure	1) ①Set the valve so that the convex faces the element guide. ②Set the valve so that the convex enters the inner perimeter of the valve spring.
	2) Mount the element guide. Hold the element guide with a wrench to rotate it in the direction shown in the figure below and mount the element guide. Refer to the table below for the tool and tightening torque to be used.





Tool	Tightening torque
Wrench nominal: 6	0.35 ±0.05 N·m

Applicable model	AW20-A/AW30-A/AW40-A
Process	Disassembly

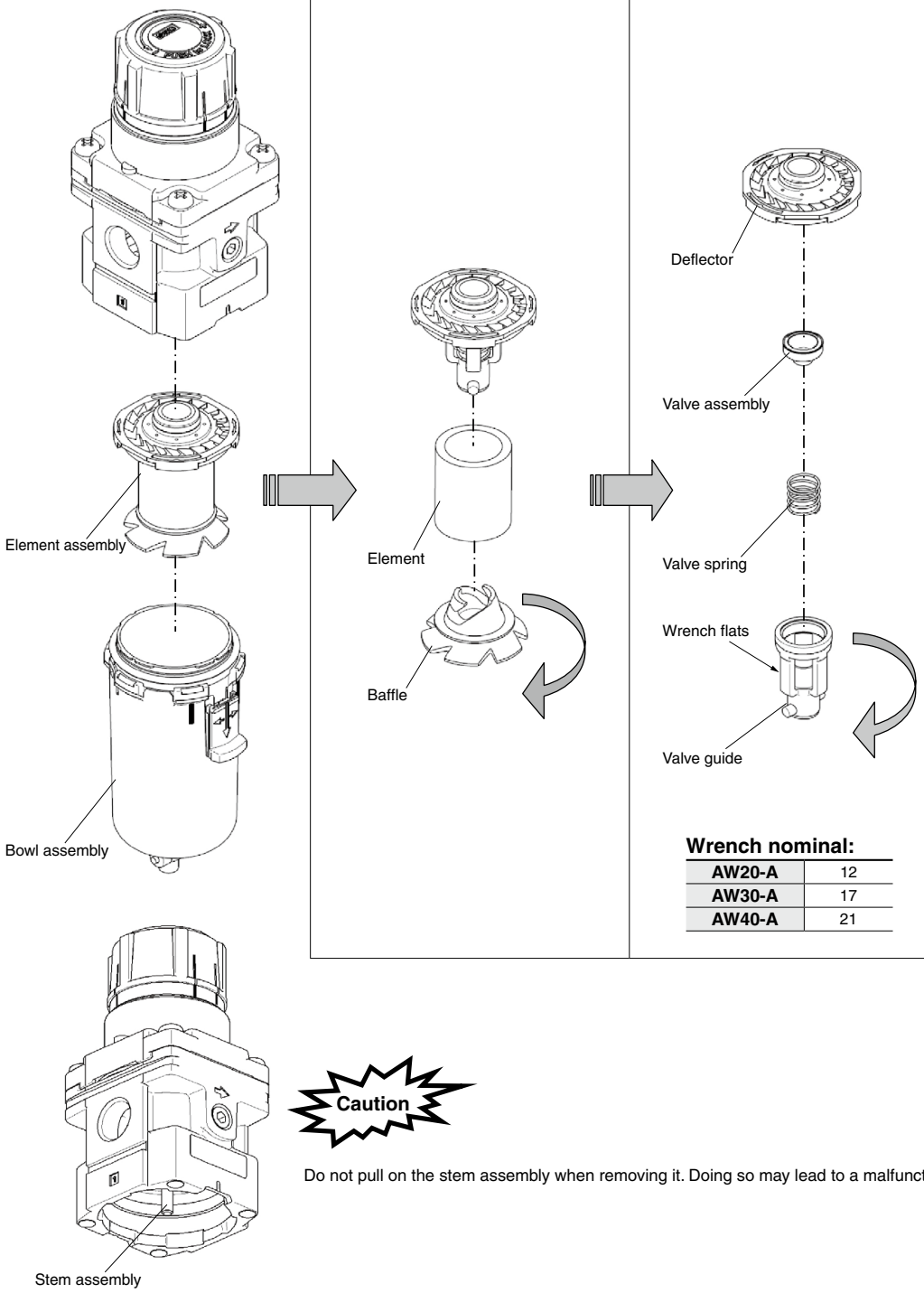
Procedure

1) Remove the bowl assembly and element assembly from the product.

2) Remove the element and baffle from the element assembly.

3) Hold the valve guide with a wrench, and turn it in the direction of the arrow to remove the deflector, valve assembly, and valve spring. (Wrench nominal: Refer to the table below.)

* For the removal procedure, refer to <Disassembly> (AW20-A: page 656, AW30-A/40-A: page 658) of the bowl assembly and element assembly.



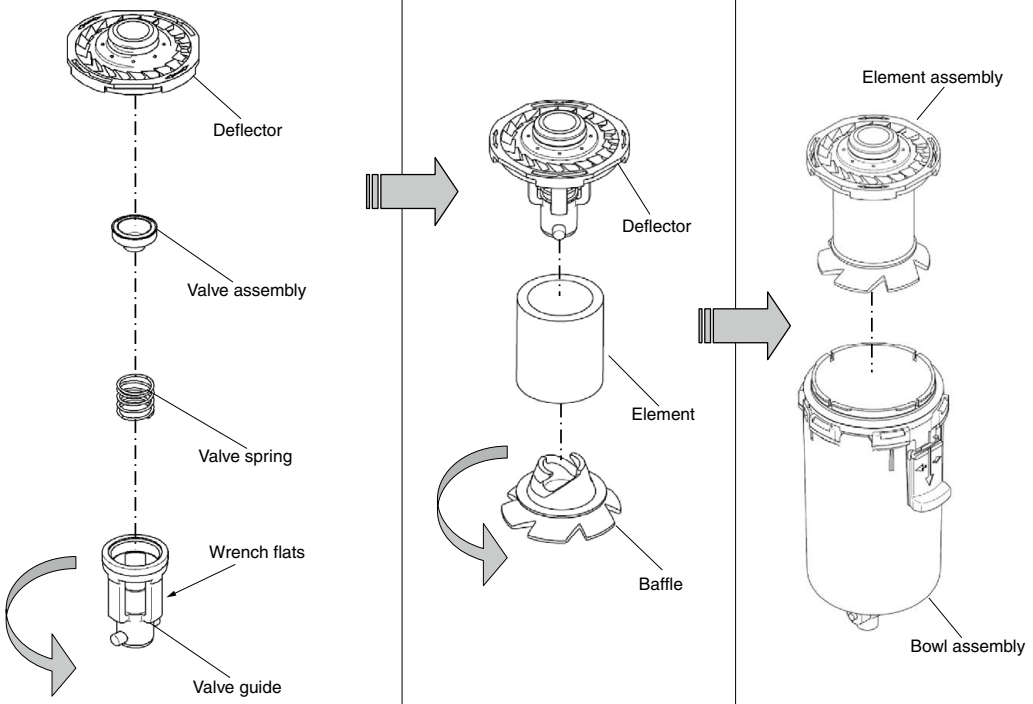
Wrench nominal:

AW20-A	12
AW30-A	17
AW40-A	21

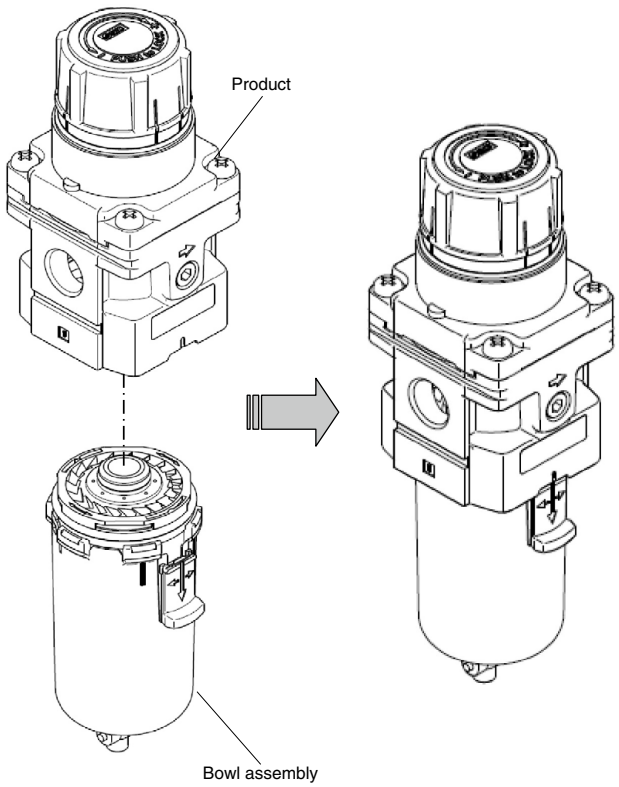
Caution

Do not pull on the stem assembly when removing it. Doing so may lead to a malfunction.

Applicable model	AW20-A/AW30-A/AW40-A		
Process	**Assembly**		
Procedure	1) Hold the valve guide with a wrench, and turn it in the direction of the arrow to tighten the deflector, valve assembly, and valve spring. Refer to the table below for the tools and tightening torques to be used.	2) Mount the element onto the deflector and secure the baffle. * For the mounting procedure, refer to <Assembly> (AW20-A: page 657, AW30-A/40-A: page 659) of the bowl assembly and element assembly.	3) Mount the element assembly onto the bowl assembly.



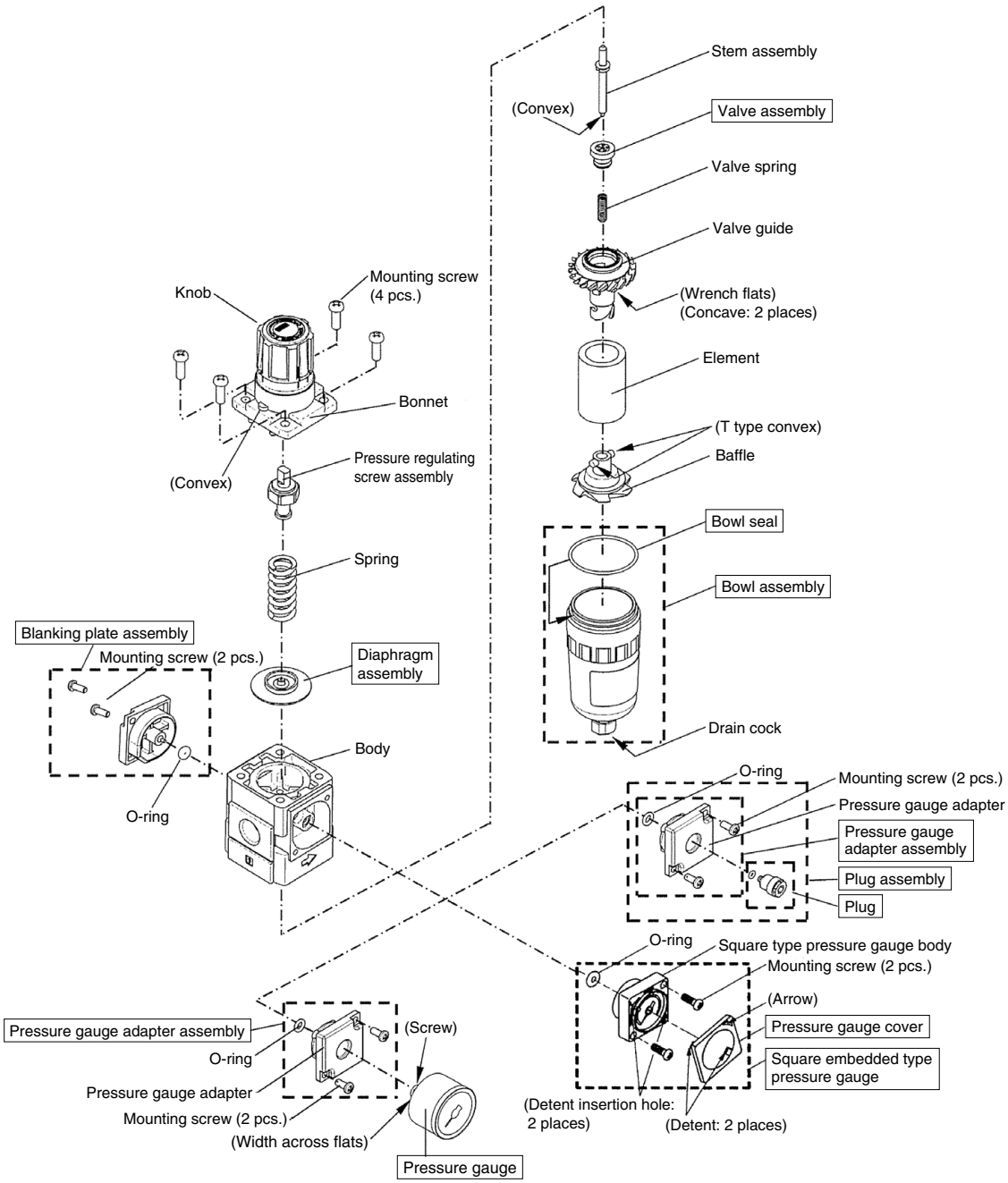
	Tool	Tightening torque
AW20-A	Wrench nominal: 12	0.45 ±0.05 N·m
AW30-A	Wrench nominal: 17	0.95 ±0.05 N·m
AW40-A	Wrench nominal: 21	1.15 ±0.05 N·m

Applicable model	AW20-A/AW30-A/AW40-A
Process	Assembly
Procedure	4) Mount the bowl assembly onto the product firmly.
	∗ For the mounting procedure, refer to <Assembly> (AW20-A: page 657, AW30-A/40-A: page 659) of the bowl assembly and element assembly.
	

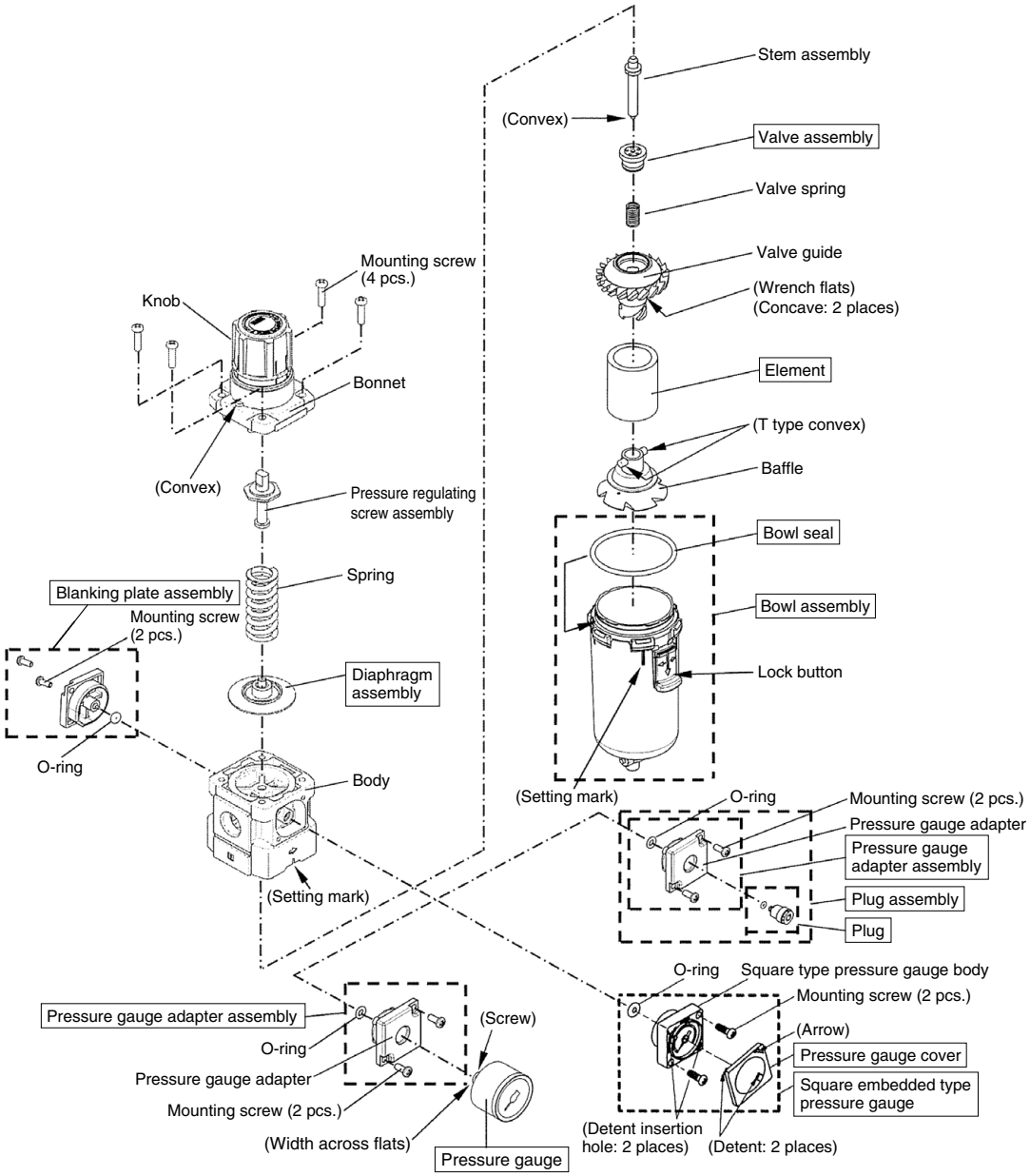
3. Diaphragm Assembly

Applicable model	Process	Procedure	Tools	Check item
AW10-A	Disassembly	1) Remove the bonnet assembly. Hold the bonnet with a wrench on the width across flat, and rotate counterclockwise to remove the bonnet assembly.	Wrench Nominal: 16	—
		2) Remove the piston assembly from the bonnet assembly. Pull out the piston assembly with the knob facing downwards. Otherwise, the pressure regulating screw assembly or spring may fall out.	—	—
	Assembly	3) Mount the piston assembly to the bonnet assembly. Insert the piston assembly into the bonnet so that the piston assembly convex faces the body. If the pressure regulating screw or pressure regulating spring is not mounted on the bonnet, mount it before mounting the piston assembly.	—	—
		4) Ensure that the chamber is mounted on the body. If the chamber is removed during disassembly, mount the chamber ensuring that it's facing the right direction. The convex of the chamber should face the bonnet.	—	Presence of the chamber Mounting direction
		5) Mount the bonnet assembly to the body. Hold the bonnet assembly with a wrench on the width across flat, and rotate the body clockwise to secure it. Refer to the “Check item” for the tightening torque.	Wrench Nominal: 16	Tightening torque: 1.8 ± 0.3 N·m
AW20-A AW30-A AW40-A	Disassembly	1) Removing bonnet Remove all 4 screws, and then remove the bonnet. Carefully store the bonnet parts. <Bonnet parts> · Pressure regulating screw assembly · Spring · Diaphragm assembly	Phillips head screwdriver	—
	Assembly	2) Mount the disassembled parts onto the body. Perform mounting while referring to the “Exploded View” (pages 662 to 664).	—	Direction of the pressure regulating screw assembly and diaphragm assembly
		3) Mounting bonnet Mount the convex IN side of the bonnet to the body, and tighten the 4 mounting screws half way with a Phillips head screwdriver. Then, tighten the screws completely in a diagonal pattern with the indicated tightening torque.	Phillips head screwdriver	Tightening torque: **AW20-A** 0.62 ± 0.3 N·m **AW30-A** 3.5 ± 0.3 N·m **AW40-A** 2.6 ± 0.3 N·m

AW20-B Exploded View 1

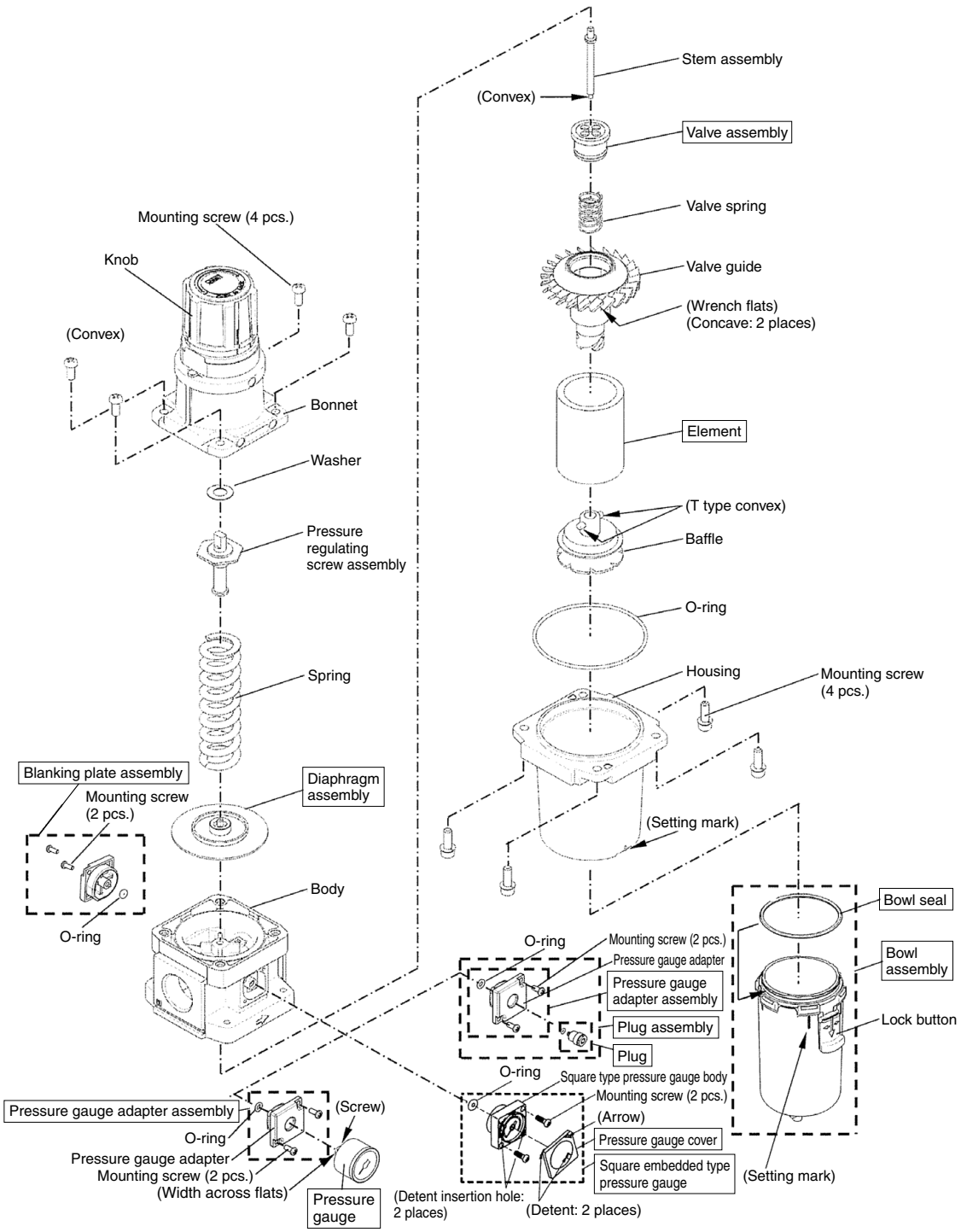


Note) It is possible to mount a square embedded type pressure gauge, a pressure gauge adapter assembly, or a plug assembly instead of a blanking plate assembly.

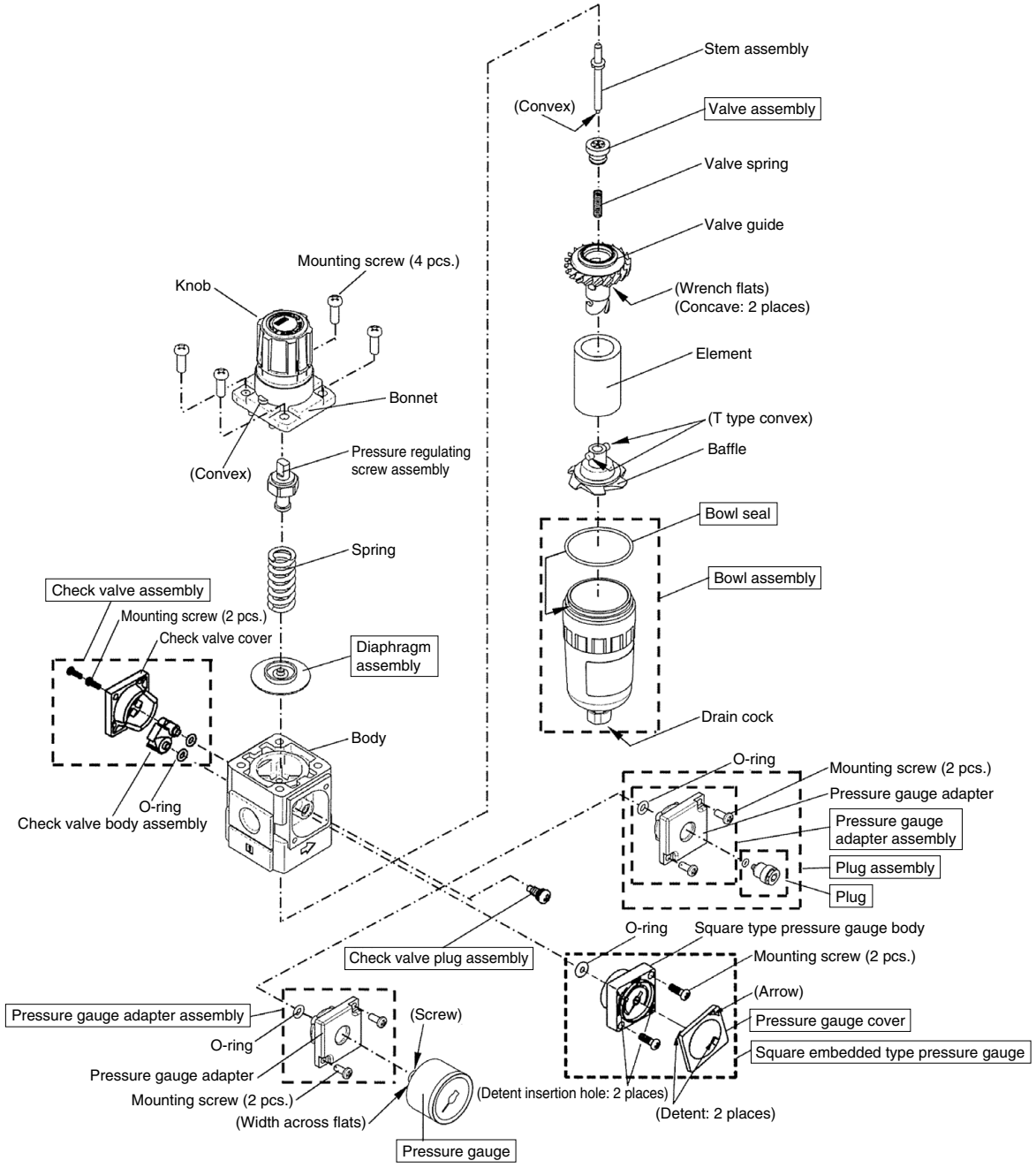


Note) It is possible to mount a square embedded type pressure gauge, a pressure gauge adapter assembly, or a plug assembly instead of a blanking plate assembly.

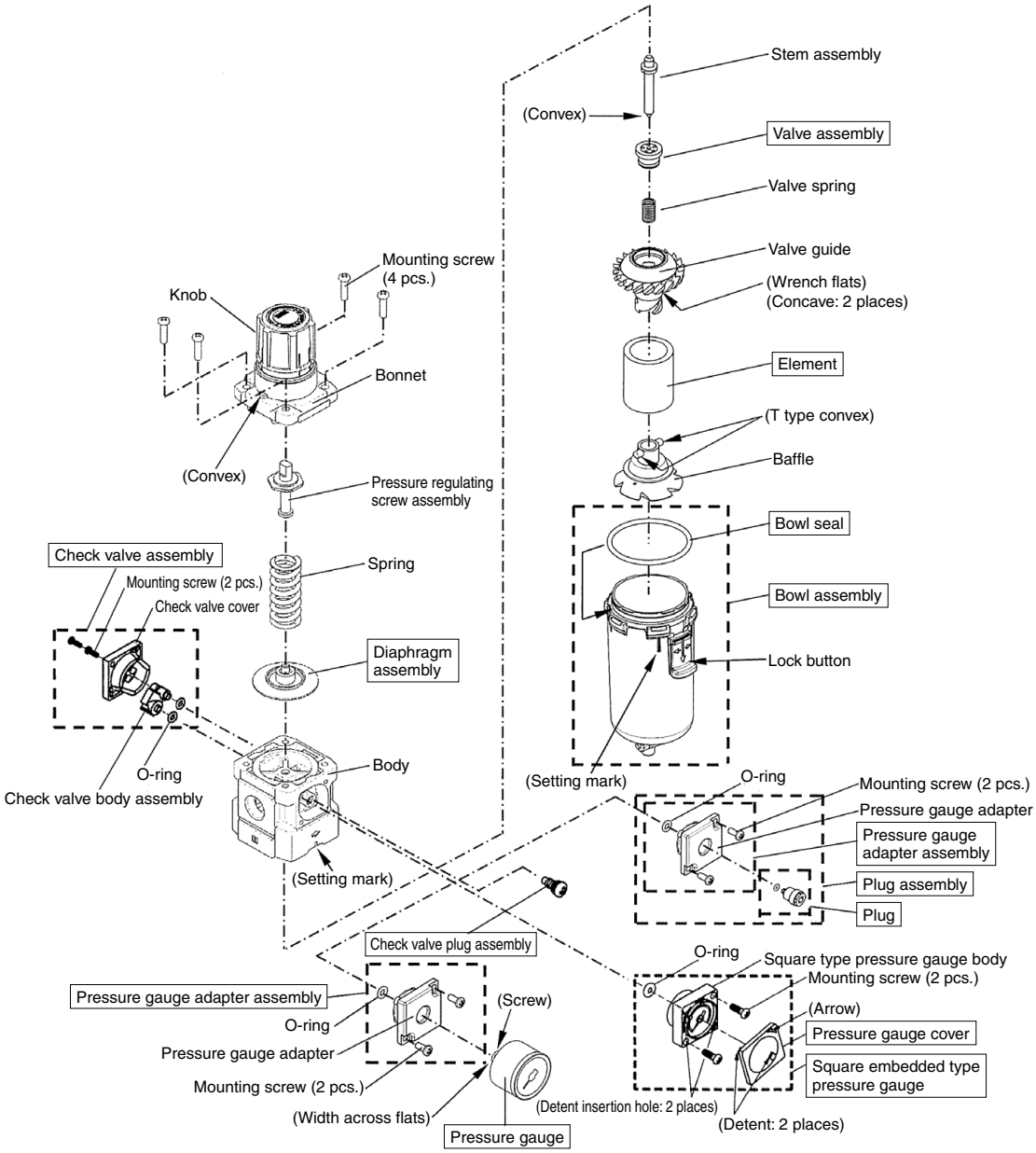
AW60-B Exploded View 3



Note) It is possible to mount a square embedded type pressure gauge, a pressure gauge adapter assembly, or a plug assembly instead of a blanking plate assembly.

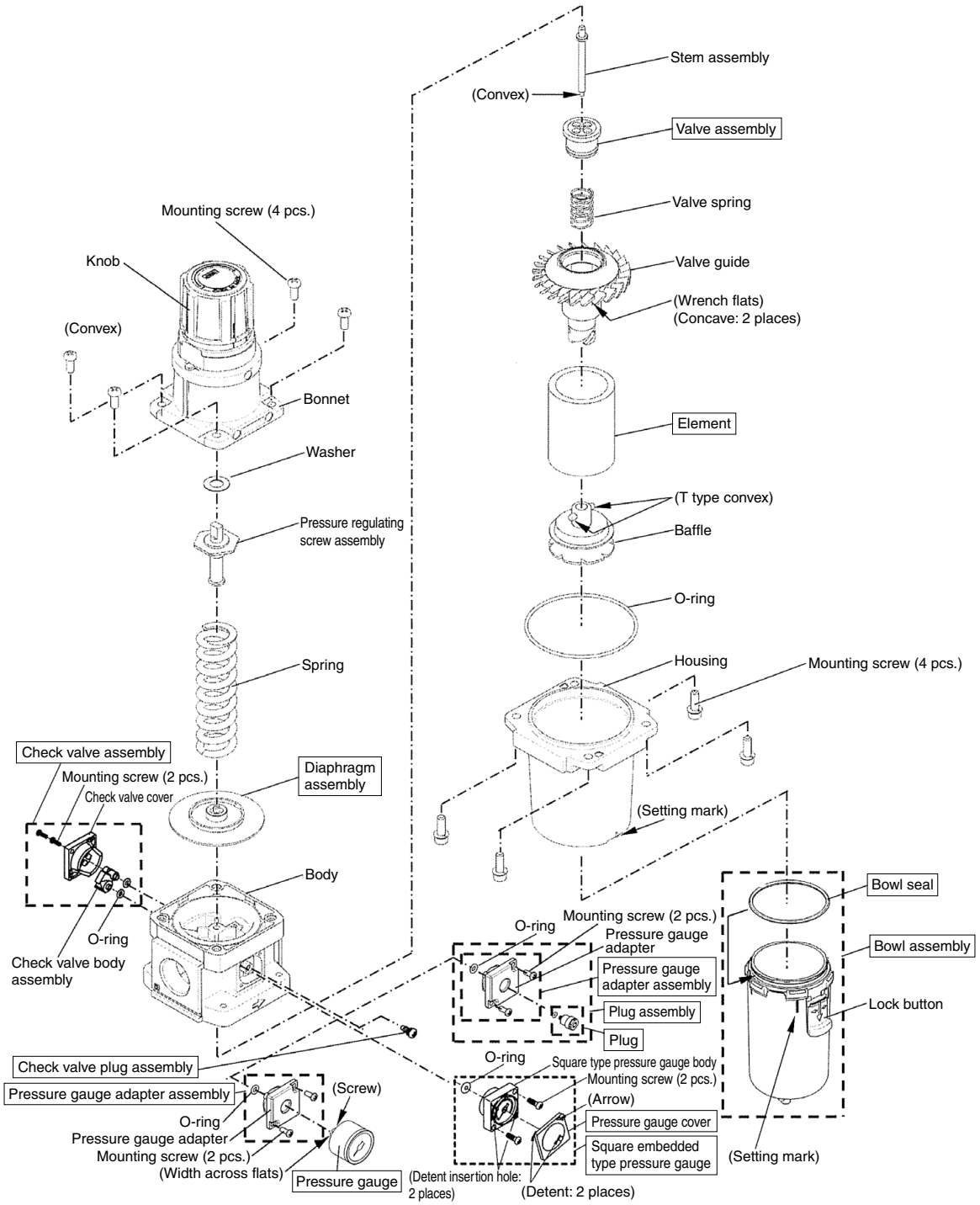


Note) The flow direction can be changed by removing the check valve assembly and replacing it with the square embedded type pressure gauge, pressure gauge adapter assembly, and plug assembly. At this time, the check valve plug assembly must also be replaced.

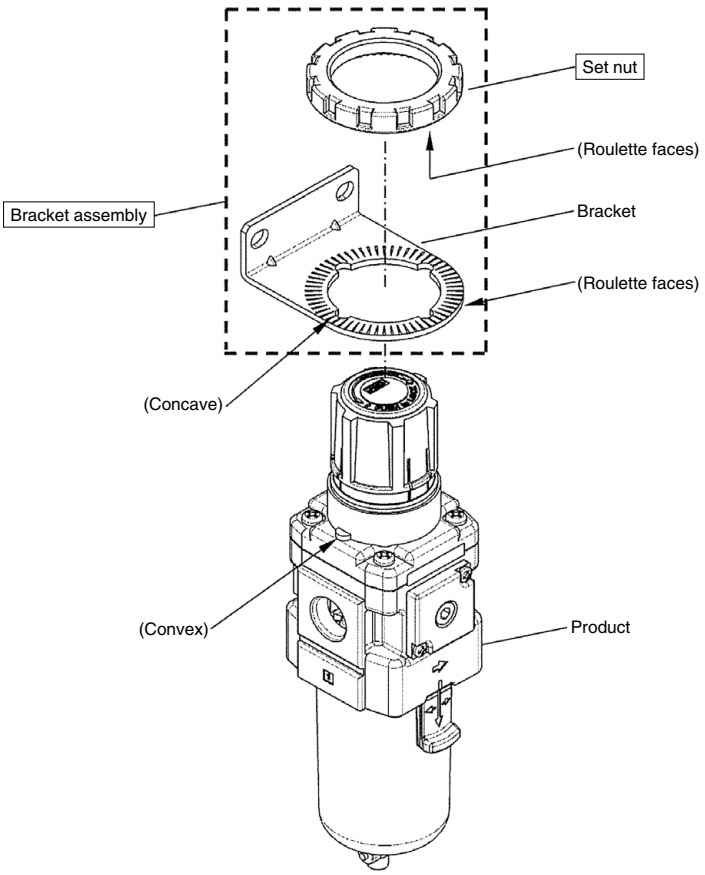


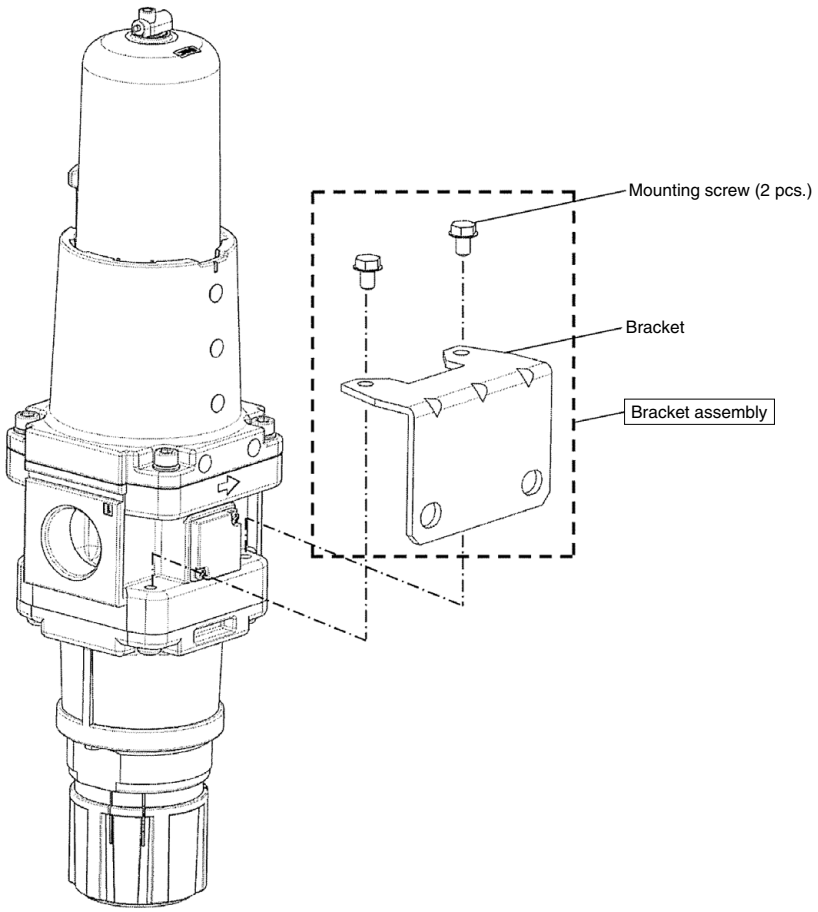
Note) The flow direction can be changed by removing the check valve assembly and replacing it with the square embedded type pressure gauge, pressure gauge adapter assembly, and plug assembly. At this time, the check valve plug assembly must also be replaced.

AW60K-B Exploded View 3



Note) The flow direction can be changed by removing the check valve assembly and replacing it with the square embedded type pressure gauge, pressure gauge adapter assembly, and plug assembly. At this time, the check valve plug assembly must also be replaced.


Set nut
(Roulette faces)
Bracket assembly
Bracket
(Roulette faces)
(Concave)
(Convex)
Product


Mounting screw (2 pcs.)
Bracket
Bracket assembly

⚠Warning

Before replacement, ensure that the regulator is not pressurized.
Rotate the pressure adjusting knob to zero.
Replace while referring to the "Exploded View."
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Bowl Assembly/Element

Applicable model	Process	Procedure	Tools	Check item
AW20(K)-B	Disassembly	1) Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly has been tightened too much to be removed, use a wrench until it can be loosened by hand.	SMC's special wrench (Recommended) Part no.: 1129129	—
		2) Remove the baffle and element. Rotate the baffle by hand and counterclockwise to remove the baffle and element.	—	—
	Assembly	3) Mount the element. Mount the element to the valve guide.	—	—
		4) Mount the baffle. Insert the baffle so that concave on the valve guide could meet T convex on the baffle. And rotate it clockwise manually until feeling the snap fit (approx. 110°) to fix to the element.	—	—
		5) Mount the bowl assembly. Hold the bowl assembly by hand and rotate clockwise. Do not use tool for mounting because the bowl may be damaged. Refer to the "Check item" for referential tightening torque.	—	Referential tightening torque: 2.1 N·m
AW30(K)-B AW40(K)-B AW60(K)-B	Disassembly	1) Remove the bowl assembly. Push the bowl assembly lock button. Lifting the bowl assembly, rotate the assembly 30 degree (right or left) to pull out the assembly.	—	—
		2) Remove the baffle and element. Rotate the baffle by hand and counterclockwise to remove the baffle and element.	—	—
	Assembly	3) Mount the element. Mount the element to the valve guide.	—	—
		4) Mount the baffle. Insert the baffle so that concave on the valve guide could meet T convex on the baffle. And rotate it clockwise manually until feeling the snap fit (approx. 110°) to fix to the element.	—	Direction of baffle. For element convex side.
		5) Mount the bowl assembly. Match the mating mark of the body and the bowl assembly to insert the assembly to the body. Rotate the assembly 30 degree (right or left) until the lock button is tossed up to mount the bowl assembly. Ensure that the lock button is up.	—	Lock button is up.

2. Diaphragm Assembly

Applicable model	Process	Procedure	Tools	Check item
AW20(K)-B AW30(K)-B AW40(K)-B AW60(K)-B	Disassembly	1) Remove the bonnet assembly. Rotate the set screw counterclockwise with a Phillips head screwdriver to remove the bonnet from the body.	Phillips head screwdriver	—
		2) Remove parts in order of the pressure regulating screw assembly, spring, and the diaphragm assembly. Please be noted that the diaphragm assembly adheres to the bonnet if disassemble parts with the knob facing downwards.	—	—
	Assembly	3) Mount parts to the body in order of the diaphragm assembly, spring, and pressure regulating screw assembly.	—	Direction of the diaphragm assembly and the pressure regulating screw assembly
		4) Mount the bonnet to the body. Mount the convex IN side of the bonnet to the body, and tighten the 4 mounting screws half way with a Phillips head screwdriver. Then, tighten the screws completely in a diagonal pattern with the indicated tightening torque.	Phillips head screwdriver	Tightening torque: **AW20(K)-B** 2.35 ± 0.3 N·m **AW30(K)-B** 2.35 ± 0.3 N·m **AW40(K)-B** 3.5 ± 0.3 N·m **AW60(K)-B** 3.5 ± 0.3 N·m

3. Valve Assembly

Applicable model	Process	Procedure	Tools	Check item
AW20(K)-B AW30(K)-B AW40(K)-B	Disassembly	1) Remove the valve guide after removing the bowl assembly and element. Hold the valve guide with a wrench on the wrench flat to rotate it counterclockwise, and remove the valve guide.	Wrench Nominal: AW20(K)-B 11 AW30(K)-B 17 AW40(K)-B 21	—
		2) Remove the valve spring.	—	—
		3) Remove the valve assembly.	—	—
	Assembly	4) Mount the valve assembly. Connect the stem convex and the valve center hole.	—	Positioning of the stem and the valve (centering)
		5) Mount the valve spring. Insert the valve spring into the valve hole.	—	—
		6) Mount the valve guide. Hold the valve guide with a wrench on the wrench flat to rotate it clockwise, and mount the valve guide. Refer to the "Check item" for the tightening torque.	Wrench Nominal: AW20(K)-B 11 AW30(K)-B 17 AW40(K)-B 21	Tightening torque: AW20(K)-B 0.8 ± 0.1 N·m AW30(K)-B 2.35 ± 0.3 N·m AW40(K)-B 3.5 ± 0.3 N·m
AW60(K)-B	Disassembly	1) Remove the bowl assembly, housing, and element. Remove a housing from a body by rotating the 4 mounting screws counterclockwise with a hexagon wrench key.	Hexagon wrench key Nominal: 5	—
		2) Remove the valve guide. Hold the valve guide with a wrench on the wrench flat to rotate it counterclockwise and remove the valve guide.	Wrench Nominal: 30	—
		3) Remove the valve spring.	—	—
		4) Remove the valve assembly.	—	—
	Assembly	5) Mount the valve assembly. Connect the stem convex and the valve center hole.	—	Positioning of the stem and the valve (centering)
		6) Mount the valve spring. Insert the valve spring into the valve hole.	—	—
		7) Mount the valve guide. Hold the valve guide with a wrench on the wrench flat to rotate it clockwise, and mount the valve guide. Refer to the "Check item" for the tightening torque.	Wrench Nominal: 30	Tightening torque: 6.5 ± 0.3 N·m
		8) Mount the housing. Mount the O-ring on the body, assemble the housing, and tighten the 4 mounting screws temporarily. Tighten the screws additionally and evenly with the tightening torque shown on the right with a hexagon wrench key.	Hexagon wrench key Nominal: 5	Tightening torque: 4.5 ± 1.0 N·m

4. Bracket Assembly, Panel Mount

Applicable model	Process	Procedure	Tools	Check item
AW20(K)-B AW30(K)-B AW40(K)-B	Assembly	1) Mount the parts to the bracket (panel). Connect the bracket (panel) concave and the bonnet convex to mount the bracket.	—	—
		2) Secure the bracket (panel) with the set nut. Rotate the set nut clockwise with a hook wrench to secure the parts to the bracket (panel). Refer to the "Check item" for the tightening torque. The set nut knurling surface should face the bracket. When mounting with a bracket, a manually tightened set nut is adequate for general use.	Hook wrench Nominal: AW20(K)-B 34/38 AW30(K)-B 52/55 AW40(K)-B 52/55	Tightening torque: AW20(K)-B 2.0 ± 0.2 N·m AW30(K)-B 3.5 ± 0.3 N·m AW40(K)-B 4.0 ± 0.4 N·m
AW60(K)-B	Assembly	1) Mount the product to the bracket. The 2 mounting screws are tightened with a wrench for holding.	Wrench Nominal: 10	Tightening torque: 2.6 N·m

5. Square Embedded Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
AW20(K)-B AW30(K)-B AW40(K)-B AW60(K)-B	Disassembly	1) Remove the pressure gauge cover. Rotate the pressure gauge cover 15 degrees counterclockwise to pull out the pressure gauge cover.	—	—
		2) Remove the pressure gauge. Rotate the 2 mounting screws counterclockwise with a Phillips head screwdriver to remove the pressure gauge and the 2 mounting screws.	Phillips head screwdriver	—
	Assembly	3) Ensure that the O-ring is mounted to the pressure gauge. Mount the O-ring to the pressure gauge if the ring fall off.	—	Presence of O-ring
		4) Mount the pressure gauge. Rotate the mounting screws clockwise with a Phillips head screwdriver to mounting screws temporarily. Then settle them with tightening torque in "Check item."	Phillips head screwdriver	Tightening torque: 0.6 ± 0.05 N·m
		5) Mount the pressure gauge cover. Insert the pressure gauge mating 2 detents of the pressure gauge and holes for them so that the arrow of the pressure gauge cover comes upper right. Rotate the pressure gauge cover 15 degrees opposite to the arrow to mount the pressure gauge.	—	—

6. Circular Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
AW20(K)-B AW30(K)-B AW40(K)-B AW60(K)-B	Disassembly	1) Remove the pressure gauge. Hold the pressure gauge with a wrench on the width across flat. Then, rotate the gauge counterclockwise to remove the gauge.	Wrench Nominal: AW20(K)-B, AW30(K)-B, AW40(K)-B, AW60(K)-B: 14	—
	Assembly	2) Wind the pressure gauge thread with the sealant tape leaving 1.5 to 2 threads from the end.	—	Wind sealant tape leaving 1.5 to 2 threads
		3) Mount the pressure gauge. Hold the pressure gauge on the width across flat with a wrench, and rotate it clockwise to mount the circular pressure gauge. Refer to the "Check item" for tightening torque of pressure gauge.	Wrench Nominal: AW20(K)-B, AW30(K)-B, AW40(K)-B, AW60(K)-B: 14	Tightening torque: AW20(K)-B, AW30(K)-B, AW40(K)-B, AW60(K)-B: 7 to 9 N·m

7. Pressure Gauge Adapter, Plug

Applicable model	Process	Procedure	Tools	Check item
AW20(K)-B AW30(K)-B AW40(K)-B AW60(K)-B	Disassembly	1) Remove the plug. Insert the hexagon wrench key to hexagon hole of hexagon plug. Rotate the plug counterclockwise to remove the plug.	Hexagon wrench key Nominal: AW20(K)-B, AW30(K)-B, AW40(K)-B, AW60(K)-B: 4	—
		2) Remove the pressure gauge adapter. Rotate the 2 mounting screws counterclockwise with a Phillips head screwdriver to remove the pressure gauge and 2 mounting screws.	Phillips head screwdriver	—
	Assembly	3) Confirm the pressure gauge adapter has the O-ring. If not, mount the O-ring.	—	—
		4) Mount the pressure gauge adapter. Rotate the 2 mounting screws clockwise with a Phillips head screwdriver to fix the pressure gauge adapter. Refer to the “Check item” for tightening torque of 2 screws.	Phillips head screwdriver (Torque driver)	Tightening torque: 0.6 ± 0.05 N·m
		5) Mount the plug assembly. Insert the hexagon wrench key into hexagon hole on the plug and rotate clockwise to fix the plug. Refer to the “Check item” for tightening torque of 2 screws.	Hexagon wrench key Nominal: AW20(K)-B, AW30(K)-B, AW40(K)-B, AW60(K)-B: 4	Tightening torque: AW20(K)-B, AW30(K)-B, AW40(K)-B, AW60(K)-B: 0.6 ± 0.05 N·m

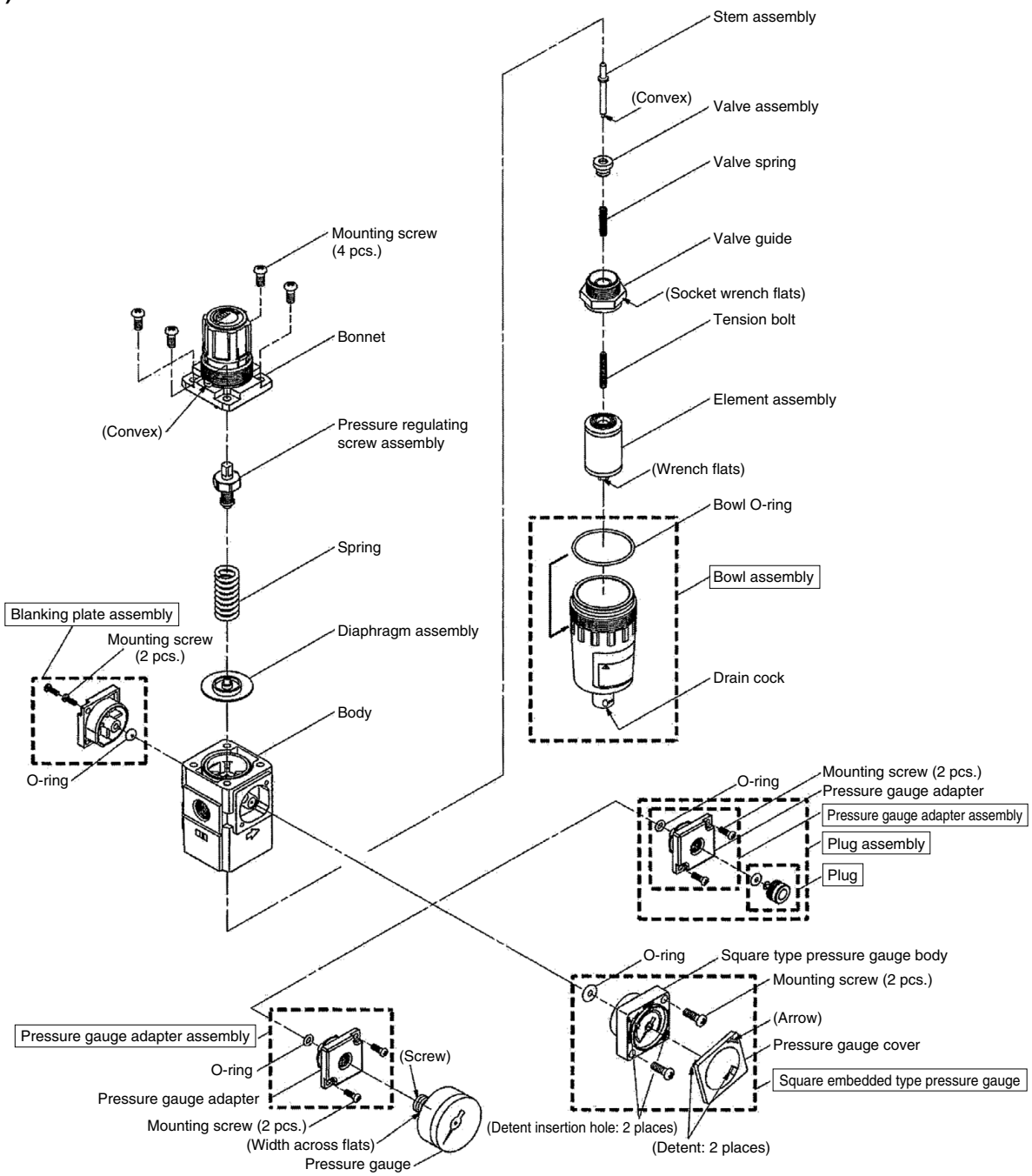
8. Blanking Plate Assembly

Applicable model	Process	Procedure	Tools	Check item
AW20(K)-B AW30(K)-B AW40(K)-B AW60(K)-B	Disassembly	1) Remove the blanking plate. Rotate the 2 mounting screws counterclockwise with a Phillips head screwdriver to remove the blanking plate and 2 mounting screws.	Phillips head screwdriver	—
	Assembly	2) Confirm the blanking plate has the O-ring. If not, mount the O-ring.	—	—
		3) Mount the blanking plate. Rotate the 2 mounting screws clockwise with a Phillips head screwdriver to fix the blanking plate. Refer to the “Check item” for tightening torque of 2 screws.	Phillips head screwdriver (Torque driver)	Tightening torque: 0.6 ± 0.05 N·m

9. Check Valve Assembly

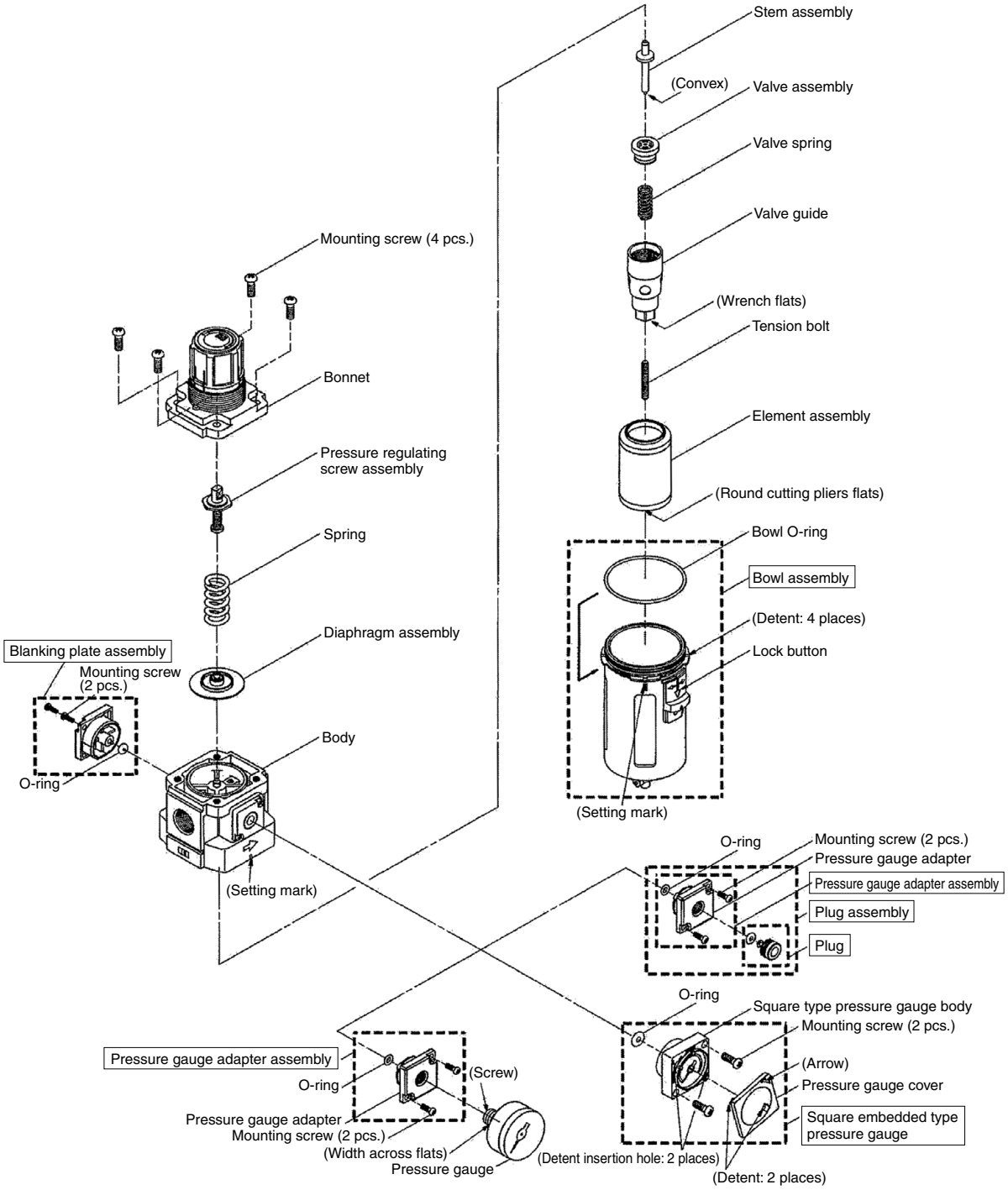
Applicable model	Process	Procedure	Tools	Check item
AW20K-B AW30K-B AW40K-B AW60K-B	Disassembly	1) Remove the check valve cover. Rotate the 2 mounting screws counterclockwise with a Phillips head screwdriver to remove the check valve cover.	Phillips head screwdriver	—
		2) Remove the check valve assembly from the body. Pull and remove the check valve assembly. Then, ensure that the 2 O-rings do not fall out of the body.	—	—
	Assembly	1) Ensure that the O-rings do not fall out of the body and mount them if they fall off.	—	—
		2) Insert convex on the check valve body into the 2 inserting holes for the O-rings respectively.	—	Direction of the check valve body assembly
		3) Mount the check valve cover. Rotate the 2 mounting screws clockwise with a Phillips head screwdriver to fix the check valve cover to the body. Refer to the “Check item” for adequate tightening torque for the screws.	Phillips head screwdriver (Torque driver)	Tightening torque: 0.6 ± 0.05 N·m

1) AWM20



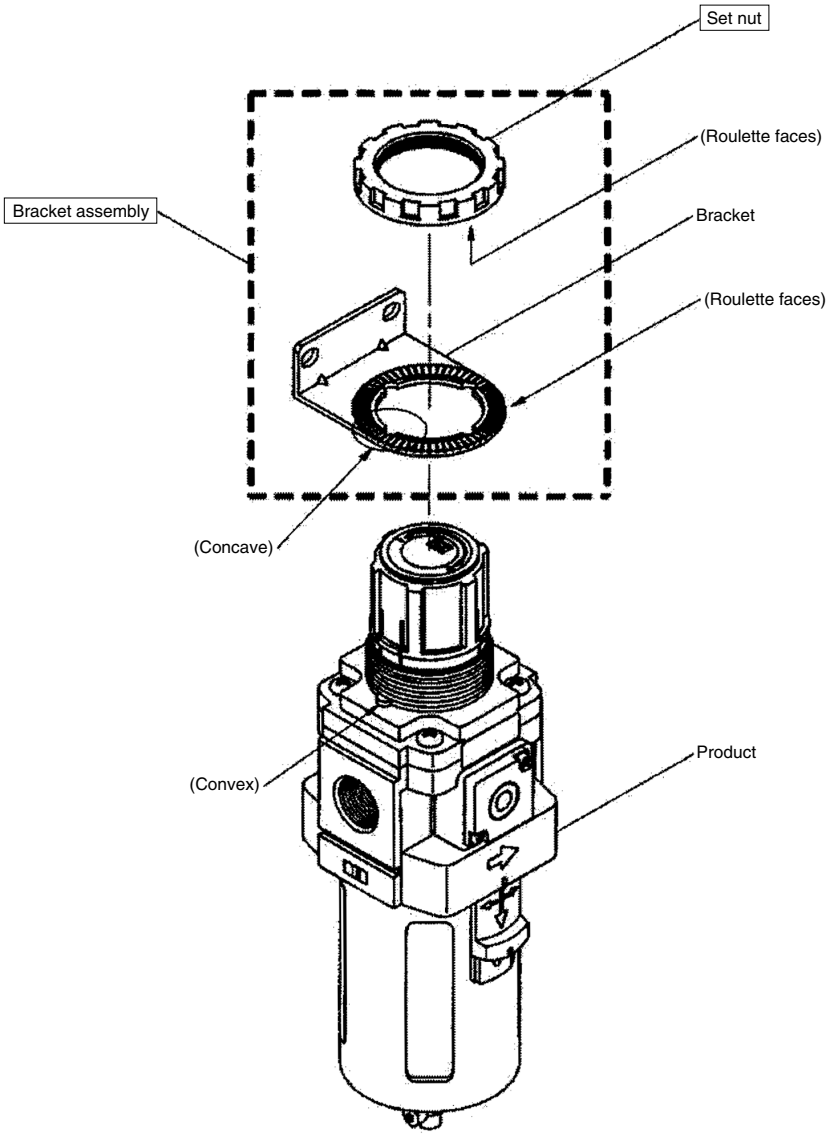
Note) It is possible to mount a square embedded type pressure gauge, a pressure gauge adapter assembly, or a plug assembly instead of a blanking plate assembly.

2) AWM30/40



Note) It is possible to mount a square embedded type pressure gauge, a pressure gauge adapter assembly, or a plug assembly instead of a blanking plate assembly.

3) AWM20/30/40 Bracket assembly, panel mount exploded view



⚠Warning
Before replacement, ensure that the regulator is not pressurized.
Rotate the pressure adjusting knob to zero.
Replace while referring to the "Exploded View."
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Bowl Assembly/Element

Applicable model	Process	Procedure	Tools	Check item
AWM20	Disassembly	1) Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly has been tightened too much to be removed, use a hook wrench until it can be loosened by hand.	(Hook wrench Nominal: 34/38)	—
		2) Remove the element. Hold the element with a wrench to rotate it counterclockwise and remove the element.	Wrench Nominal: 7	—
	Assembly	3) Mount the element. Hold the element with a wrench to rotate it clockwise, and mount the element. Refer to the "Check item" for the tightening torque.	Wrench Nominal: 7	Tightening torque: 0.49 ± 0.05 N·m
		4) Mount the bowl assembly. Hold the bowl assembly by hand and rotate clockwise. Do not use tool for mounting because the bowl may be damaged. Refer to the "Check item" for referential tightening torque.	—	Referential tightening torque: 2.1 N·m
AWM30 AWM40	Disassembly	1) Remove the bowl assembly. Push the bowl assembly lock button by hand. Lifting the bowl assembly, rotate the assembly 45 degrees (right or left) to pull out the assembly.	—	—
		2) Remove the element. Hold the element with a round cutting to rotate it counterclockwise, and remove the element.	Round cutting	—
	Assembly	3) Mount the element. Hold the element with a round cutting to rotate it clockwise, and mount the element. Refer to the "Check item" for the tightening torque.	Round cutting	Tightening torque: AWM30 1.47 ± 0.2 N·m AWM40 1.96 ± 0.2 N·m
		4) Mount the bowl assembly. Match the mating mark of the body and the bowl assembly to insert the assembly to the body. Rotate the assembly 45 degrees (right or left) until the lock button is tossed up to mount the bowl assembly. Ensure that the lock button is up.	—	Lock button is up.

2. Diaphragm Assembly

Applicable model	Process	Procedure	Tools	Check item
AWM20 AWM30 AWM40	Disassembly	1) Remove the bonnet. Rotate the set screw counterclockwise with a Phillips head screwdriver to remove the bonnet from the body.	Phillips head screwdriver	—
		2) Remove parts in order of the pressure regulating screw assembly, spring, and the diaphragm assembly. Please be noted that the diaphragm assembly adheres to the bonnet if disassemble parts with the knob facing downwards.	—	—
	Assembly	3) Mount parts to the body in order of the diaphragm assembly, spring, and pressure regulating screw.	—	Direction of the diaphragm assembly and the pressure regulating screw assembly
		4) Mount the bonnet to the body. Mount the convex IN side of the bonnet to the body, and tighten the 4 mounting screws half way with a Phillips head screwdriver. Then, tighten the screws completely in a diagonal pattern with the indicated tightening torque.	Phillips head screwdriver	Tightening torque: **AWM20** 2.35 ± 0.3 N·m **AWM30** 2.35 ± 0.3 N·m **AWM40** 3.5 ± 0.3 N·m

3. Valve Assembly

Applicable model	Process	Procedure	Tools	Check item
AWM20	Disassembly	1) Remove the valve guide after removing the bowl assembly and element. Hold the valve guide with a socket wrench on the socket wrench flat to rotate it counterclockwise, and remove the valve guide.	Socket wrench Nominal: 18	—
		2) Remove the valve spring.	—	—
		3) Remove the valve.	—	—
	Assembly	4) Mount the valve. Connect the stem convex and the valve center hole.	—	Positioning of the stem and the valve (centering)
		5) Mount the valve spring. Insert the valve spring into the valve hole.	—	—
		6) Mount the valve guide. Hold the valve guide with a socket wrench on the socket wrench flat to rotate it clockwise, and mount the valve guide. Refer to the "Check item" for the tightening torque.	Socket wrench Nominal: 18	Tightening torque: 40 ± 3.5N·m
		7) Mount the element and bowl assembly.	—	—
AWM30 AWM40	Disassembly	1) Remove the valve guide after removing the bowl assembly and element. Hold the valve guide with a wrench to rotate it counterclockwise, and remove the valve guide.	Wrench Nominal: AWM30: 8; AWM40: 12	—
		2) Remove the valve spring.	—	—
		3) Remove the valve.	—	—
	Assembly	4) Mount the valve. Connect the stem convex and the valve center hole.	—	Positioning of the stem and the valve (centering)
		5) Mount the valve spring. Insert the valve spring into the valve hole.	—	—
		6) Mount the valve guide. Hold the valve guide with a wrench on the wrench flat to rotate it clockwise, and mount the valve guide. Refer to the "Check item" for the tightening torque.	Wrench Nominal: AWM30: 8; AWM40: 12	Tightening torque: AWM30: 25 ± 2.5 N·m; AWM40: 55 ± 5 N·m
		7) Mount the element and bowl assembly.		

4. Bracket Assembly, Panel Mount

Applicable model	Process	Procedure	Tools	Check item
AWM20 AWM30 AWM40	Assembly	1) Mount the parts to the bracket (panel). Connect the bracket (panel) concave and the bonnet convex to mount the bracket.	—	—
		2) Secure the bracket (panel) with the set nut. Rotate the set nut clockwise with a hook wrench to secure the parts to the bracket (panel). Refer to the "Check item" for the tightening torque. The set nut knurling surface should face the bracket. When mounting with a bracket, a manually tightened set nut is adequate for general use.	Hook wrench Nominal: AWM20: 34/38; AWM30: 52/55; AWM40: 52/55	Tightening torque: AWM20: 2.0 ± 0.2 N·m; AWM30: 3.5 ± 0.3 N·m; AWM40: 4.0 ± 0.4 N·m

5. Square Embedded Type Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
AWM20 AWM30 AWM40	Disassembly	1) Remove the pressure gauge cover. Rotate the pressure gauge cover 15 degrees counterclockwise to pull out the pressure gauge cover.	—	—
		2) Remove the pressure gauge. Rotate the 2 mounting screws counterclockwise with a Phillips head screwdriver to remove the pressure gauge and the 2 mounting screws.	Phillips head screwdriver	—

Applicable model	Process	Procedure	Tools	Check item
AWM20 AWM30 AWM40	Assembly	3) Ensure that the O-ring is mounted to the pressure gauge. Mount the O-ring to the pressure gauge if the ring fall off.	—	Presence of the O-ring
		4) Mount the pressure gauge. Rotate the 2 mounting screws clockwise with a Phillips head screwdriver to mounting screws temporarily. Then secure them with tightening torque in “Check item.”	Phillips head screwdriver	Tightening torque: 0.3 ± 0.05 N·m
		5) Mount the pressure gauge cover. Insert the pressure gauge mating 2 detents of the pressure gauge and holes for them so that the arrow of the pressure gauge cover comes upper right. Rotate the pressure gauge cover 15 degrees opposite to the arrow to mount the pressure gauge.	—	—

6. Circular Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
AWM20 AWM30 AWM40	Disassembly	1) Remove the pressure gauge. Hold the pressure gauge with a wrench on the width across flat. Then, rotate the gauge counterclockwise to remove the gauge.	Wrench Nominal: 14	—
	Assembly	2) Wind the pressure gauge thread with the sealant tape leaving 1.5 to 2 threads from the end.	—	Wind sealant tape leaving 1.5 to 2 threads
		3) Mount the pressure gauge. Hold the pressure gauge on the width across flat with a wrench, and rotate it clockwise to mount the circular pressure gauge. Refer to the “Check item” for tightening torque of pressure gauge.	Wrench Nominal: 14	Tightening torque: AWM20: 7 to 9 N·m AWM30: 7 to 9 N·m AWM40: 12 to 14 N·m

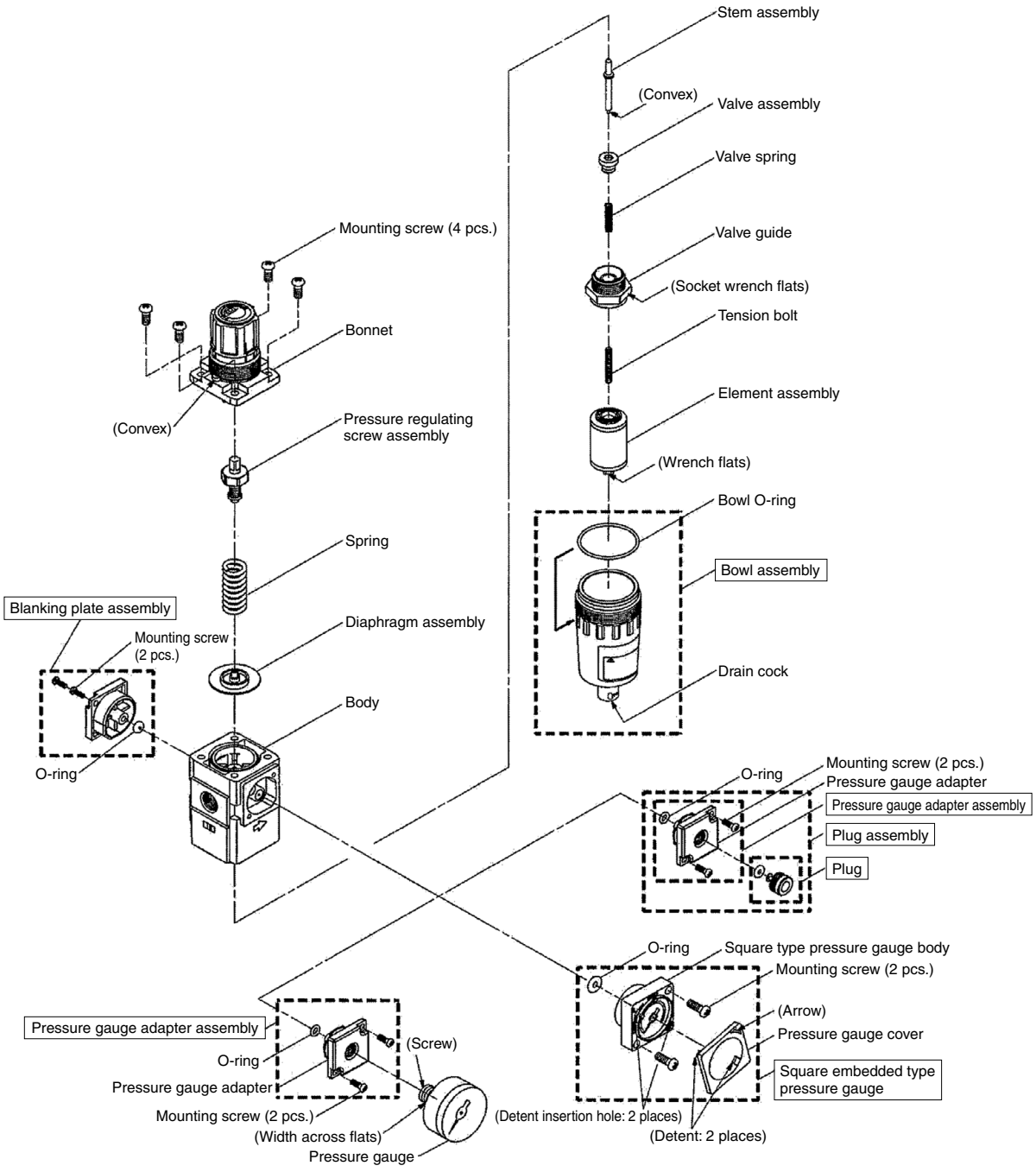
7. Pressure Gauge Adapter, Plug

Applicable model	Process	Procedure	Tools	Check item
AWM20 AWM30 AWM40	Disassembly	1) Remove the plug. Insert the hexagon wrench key to the hexagon hole of hexagon plug. Rotate the plug counterclockwise to remove the plug.	Hexagon wrench key Nominal: AWM20: 4 AWM30: 4 AWM40: 6	—
		2) Remove the pressure gauge adapter. Rotate the 2 mounting screws counterclockwise with a Phillips head screwdriver to remove the pressure gauge and 2 mounting screws.	Phillips head screwdriver	—
	Assembly	3) Confirm that the pressure gauge adapter has the O-ring. If not, mount the O-ring.	—	—
		4) Mount pressure gauge adapter. Rotate the 2 mounting screws clockwise with a Phillips head screwdriver to fix pressure gauge adapter. Refer to the “Check item” for tightening torque of 2 screws.	Phillips head screwdriver (Torque driver)	Tightening torque: 0.3 ± 0.05 N·m
		5) Mount plug assembly. Insert the hexagon wrench key into the hexagon hole on the plug and rotate clockwise to fix the plug. Refer to the “Check item” for tightening torque of 2 screws.	Hexagon wrench key Nominal: AWM20: 4 AWM30: 4 AWM40: 6	Tightening torque: AWM20: 0.6 ± 0.05 N·m AWM30: 0.6 ± 0.05 N·m AWM40: 1.0 ± 0.1 N·m

8. Blanking Plate Assembly

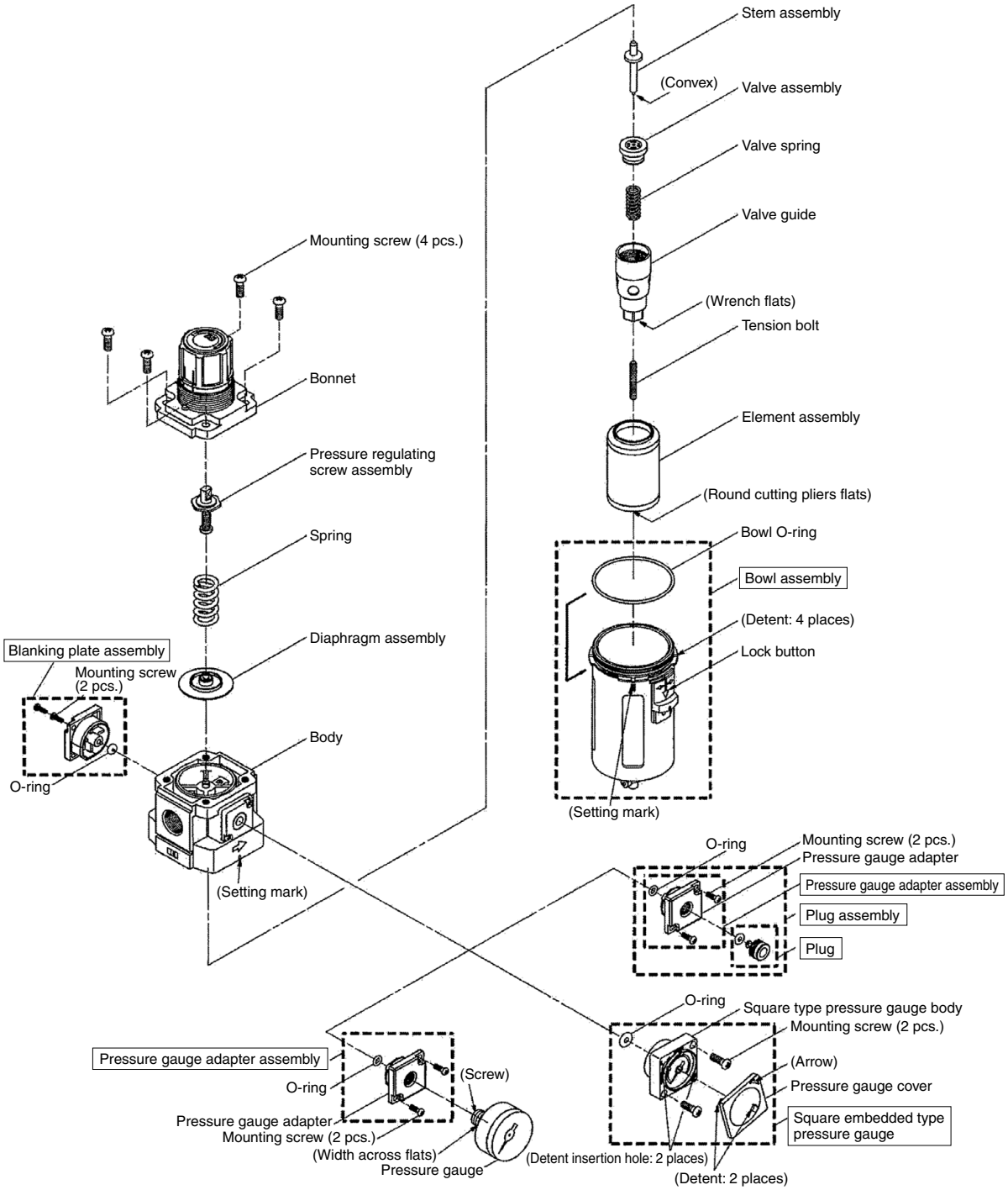
Applicable model	Process	Procedure	Tools	Check item
AWM20 AWM30 AWM40	Disassembly	1) Remove the blanking plate. Rotate the 2 mounting screws counterclockwise with a Phillips head screwdriver to remove the blanking plate and 2 mounting screws.	Phillips head screwdriver	—
	Assembly	2) Confirm that the blanking plate has the O-ring. If not, mount the O-ring.	—	—
		3) Mount the blanking plate. Rotate the 2 mounting screws clockwise with a Phillips head screwdriver to fix the blanking plate. Refer to the “Check item” for tightening torque of 2 screws.	Phillips head screwdriver (Torque driver)	Tightening torque: 0.3 ± 0.05 N·m

1) AWD20



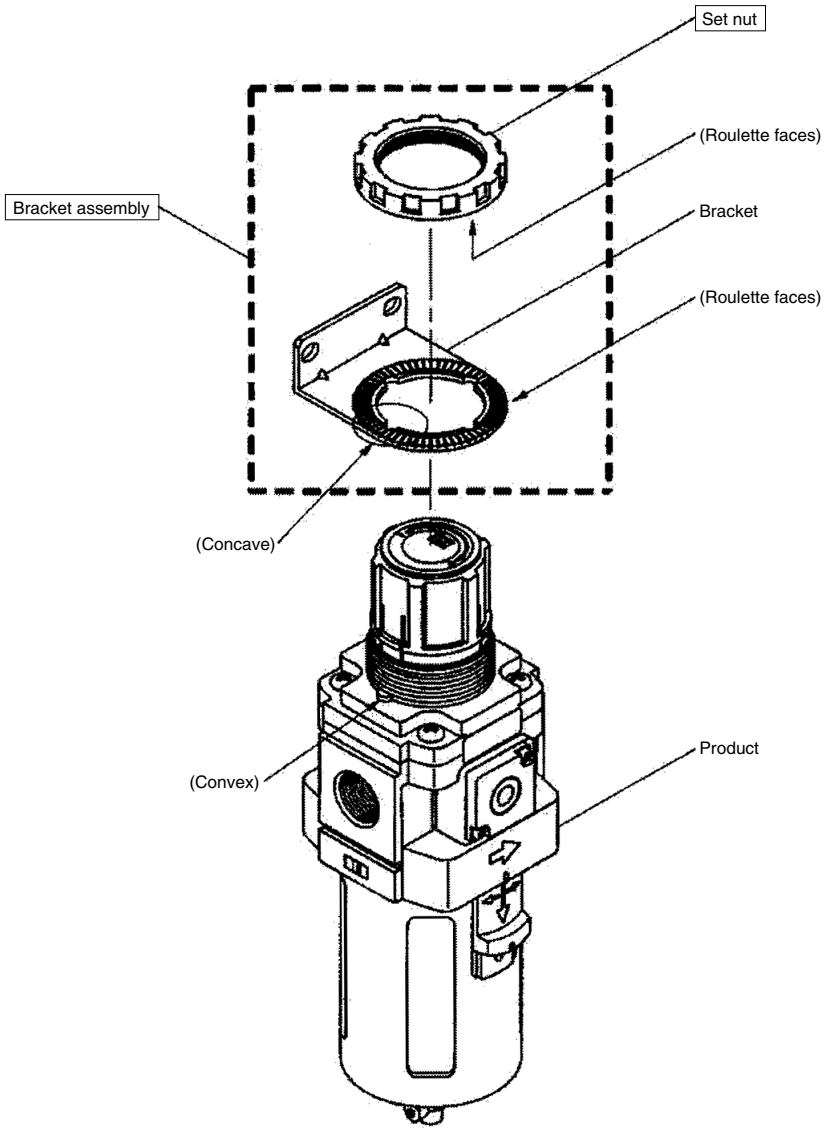
Note) It is possible to mount a square embedded type pressure gauge, a pressure gauge adapter assembly, or a plug assembly instead of a blanking plate assembly.

2) AWD30/40



Note) It is possible to mount a square embedded type pressure gauge, a pressure gauge adapter assembly, or a plug assembly instead of a blanking plate assembly.

3) AWD20/30/40 Bracket assembly, panel mount exploded view



⚠Warning
Before replacement, ensure that the regulator is not pressurized.
Rotate the pressure adjusting knob to zero.
Replace while referring to the "Exploded View."
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Bowl Assembly/Element

Applicable model	Process	Procedure	Tools	Check item
AWD20	Disassembly	1) Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly has been tightened too much to be removed, use a hook wrench until it can be loosened by hand.	(Hook wrench Nominal: 34/38)	—
		2) Remove the element. Hold the element with a wrench to rotate it counterclockwise and remove the element.	Wrench Nominal: 7	—
	Assembly	3) Mount the element. Hold the element with a wrench to rotate it clockwise, and mount the element. Refer to the "Check item" for the tightening torque.	Wrench Nominal: 7	Tightening torque: 0.49 ± 0.05 N·m
		4) Mount the bowl assembly. Hold the bowl assembly by hand and rotate clockwise. Do not use tool for mounting because the bowl may be damaged. Refer to the "Check item" for referential tightening torque.	—	Referential tightening torque: 2.1 N·m
AWD30 AWD40	Disassembly	1) Remove the bowl assembly. Push the bowl assembly lock button by hand. Lifting the bowl assembly, rotate the assembly 45 degrees (right or left) to pull out the assembly.	—	—
		2) Remove the element. Hold the element with a round cutting to rotate it counterclockwise, and remove the element.	Round cutting	—
	Assembly	3) Mount the element. Hold the element with a round cutting to rotate it clockwise, and mount the element. Refer to the "Check item" for the tightening torque.	Round cutting	Tightening torque: AWD30 1.47 ± 0.2 N·m AWD40 1.96 ± 0.2 N·m
		4) Mount the bowl assembly. Match the mating mark of the body and the bowl assembly to insert the assembly to the body. Rotate the assembly 45 degrees (right or left) until the lock button is tossed up to mount the bowl assembly. Ensure that the lock button is up.	—	Lock button is up.

2. Diaphragm Assembly

Applicable model	Process	Procedure	Tools	Check item
AWD20 AWD30 AWD40	Disassembly	1) Remove the bonnet assembly. Rotate the set screw counterclockwise with a Phillips head screwdriver to remove the bonnet from the body.	Phillips head screwdriver	—
		2) Remove parts in order of the pressure regulating screw assembly, spring, and the diaphragm assembly. Please be noted that the diaphragm assembly adheres to the bonnet if disassemble parts with the knob facing downwards.	—	—
	Assembly	3) Mount parts to the body in order of the diaphragm assembly, spring, and pressure regulating screw assembly.	—	Direction of the diaphragm assembly and the pressure regulating screw assembly
		4) Mount the bonnet to the body. Mount the convex IN side of the bonnet to the body, and tighten the 4 mounting screws half way with a Phillips head screwdriver. Then, tighten the screws completely in a diagonal pattern with the indicated tightening torque.	Phillips head screwdriver	Tightening torque: **AWD20** 2.35 ± 0.3 N·m **AWD30** 2.35 ± 0.3 N·m **AWD40** 3.5 ± 0.3 N·m

3. Valve Assembly

Applicable model	Process	Procedure	Tools	Check item
AWD20	Disassembly	1) Remove the valve guide after removing the bowl assembly and element. Hold the valve guide with a socket wrench on the socket wrench flat to rotate it counterclockwise, and remove the valve guide.	Socket wrench Nominal: 18	—
		2) Remove the valve spring.	—	—
		3) Remove the valve.	—	—
	Assembly	4) Mount the valve. Connect the stem convex and the valve center hole.	—	Positioning of the stem and the valve (centering)
		5) Mount the valve spring. Insert the valve spring into the valve hole.	—	—
		6) Mount the valve guide. Hold the valve guide with a socket wrench on the socket wrench flat to rotate it clockwise, and mount the valve guide. Refer to the "Check item" for the tightening torque.	Socket wrench Nominal: 18	Tightening torque: 40 ± 3.5 N·m
		7) Mount the element and bowl assembly.		
AWD30 AWD40	Disassembly	1) Remove the valve guide after removing the bowl assembly and element. Hold the valve guide with a wrench to rotate it counterclockwise, and remove the valve guide.	Wrench Nominal: AWD30: 8; AWD40: 12	—
		2) Remove the valve spring.	—	—
		3) Remove the valve.	—	—
	Assembly	4) Mount the valve. Connect the stem convex and the valve center hole.	—	Positioning of the stem and the valve (centering)
		5) Mount the valve spring. Insert the valve spring into the valve hole.	—	—
		6) Mount the valve guide. Hold the valve guide with a wrench on the wrench flat to rotate it clockwise, and mount the valve guide. Refer to the "Check item" for the tightening torque.	Wrench Nominal: AWD30: 8; AWD40: 12	Tightening torque: AWD30: 25 ± 2.5 N·m; AWD40: 55 ± 5 N·m
		7) Mount the element and bowl assembly.		

4. Bracket Assembly, Panel Mount

Applicable model	Process	Procedure	Tools	Check item
AWD20 AWD30 AWD40	Assembly	1) Mount the parts to the bracket (panel). Connect the bracket (panel) concave and the bonnet convex to mount the bracket.	—	—
		2) Secure the bracket (panel) with the set nut. Rotate the set nut clockwise with a hook wrench to secure the parts to the bracket (panel). Refer to the "Check item" for the tightening torque. The set nut knurling surface should face the bracket. When mounting with a bracket, a manually tightened set nut is adequate for general use.	Hook wrench Nominal: AWD20: 34/38; AWD30: 52/55; AWD40: 52/55	Tightening torque: AWD20: 2.0 ± 0.2 N·m; AWD30: 3.5 ± 0.3 N·m; AWD40: 4.0 ± 0.4 N·m

5. Square Embedded Type Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
AWD20 AWD30 AWD40	Disassembly	1) Remove the pressure gauge cover. Rotate the pressure gauge cover 15 degrees counterclockwise to pull out the pressure gauge cover.	—	—
		2) Remove the pressure gauge. Rotate the 2 mounting screws counterclockwise with a Phillips head screwdriver to remove the pressure gauge and the 2 mounting screws.	Phillips head screwdriver	—

Applicable model	Process	Procedure	Tools	Check item
AWD20 AWD30 AWD40	Assembly	3) Ensure that the O-ring is mounted to the pressure gauge. Mount the O-ring to the pressure gauge if the ring fall off.	—	Presence of O-ring
		4) Mount the pressure gauge. Rotate the 2 mounting screws clockwise with a Phillips head screwdriver to mounting screws temporarily. Then secure them with tightening torque in “Check item.”	Phillips head screwdriver	Tightening torque: 0.3 ± 0.05 N·m
		5) Mount the pressure gauge cover. Insert the pressure gauge mating 2 detents of the pressure gauge and holes for them so that the arrow of the pressure gauge cover comes upper right. Rotate the pressure gauge cover 15 degrees opposite to the arrow to mount the pressure gauge.	—	—

6. Circular Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
AWD20 AWD30 AWD40	Disassembly	1) Remove the pressure gauge. Hold the pressure gauge with a wrench on the width across flat. Then, rotate the gauge counterclockwise to remove the gauge.	Wrench Nominal: 14	—
	Assembly	2) Wind the pressure gauge thread with the sealant tape leaving 1.5 to 2 threads from the end.	—	Wind sealant tape leaving 1.5 to 2 threads
		3) Mount the pressure gauge. Hold the pressure gauge on the width across flat with a wrench, and rotate it clockwise to mount the circular pressure gauge. Refer to the “Check item” for tightening torque of pressure gauge.	Wrench Nominal: 14	Tightening torque: AWD20: 7 to 9 N·m AWD30: 7 to 9 N·m AWD40: 12 to 14 N·m

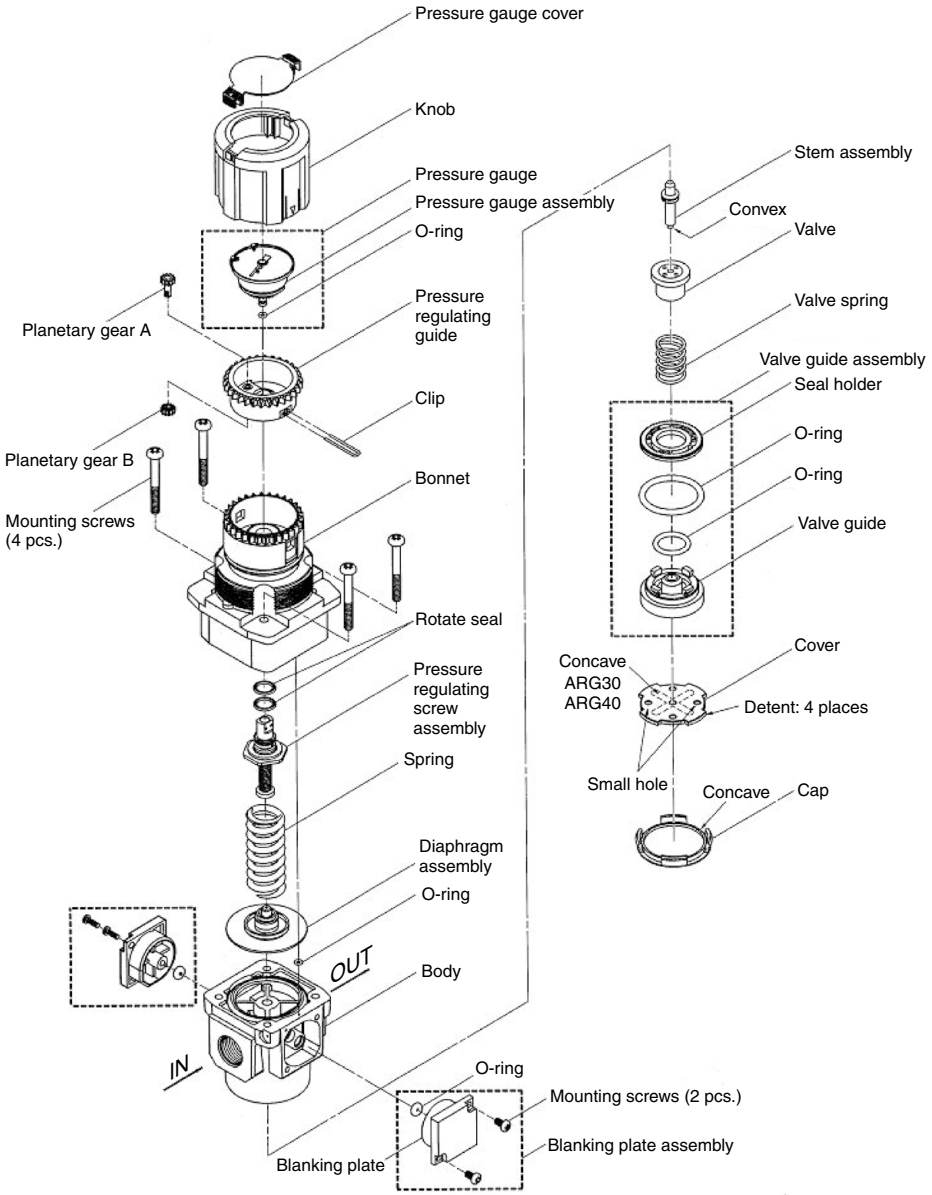
7. Pressure Gauge Adapter, Plug

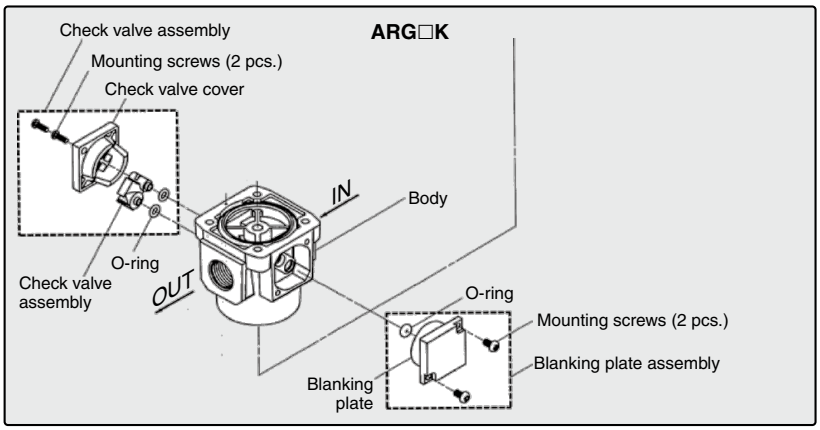
Applicable model	Process	Procedure	Tools	Check item
AWD20 AWD30 AWD40	Disassembly	1) Remove the plug. Insert the hexagon wrench key to the hexagon hole of hexagon plug. Rotate the plug counterclockwise to remove the plug.	Hexagon wrench key Nominal: AWD20: 4 AWD30: 4 AWD40: 6	—
		2) Remove the pressure gauge adapter. Rotate the 2 mounting screws counterclockwise with a Phillips head screwdriver to remove the pressure gauge and 2 mounting screws.	Phillips head screwdriver	—
	Assembly	3) Confirm that the pressure gauge adapter has the O-ring. If not, mount the O-ring.	—	—
		4) Mount the pressure gauge adapter. Rotate the 2 mounting screws clockwise with a Phillips head screwdriver to fix the pressure gauge adapter. Refer to the “Check item” for tightening torque of 2 screws.	Phillips head screwdriver (Torque driver)	Tightening torque: 0.3 ± 0.05 N·m
		5) Mount the plug assembly. Insert the hexagon wrench key into the hexagon hole on the plug and rotate clockwise to fix the plug. Refer to the “Check item” for tightening torque of 2 screws.	Hexagon wrench key Nominal: AWD20: 4 AWD30: 4 AWD40: 6	Tightening torque: AWD20: 0.6 ± 0.05 N·m AWD30: 0.6 ± 0.05 N·m AWD40: 1.0 ± 0.1 N·m

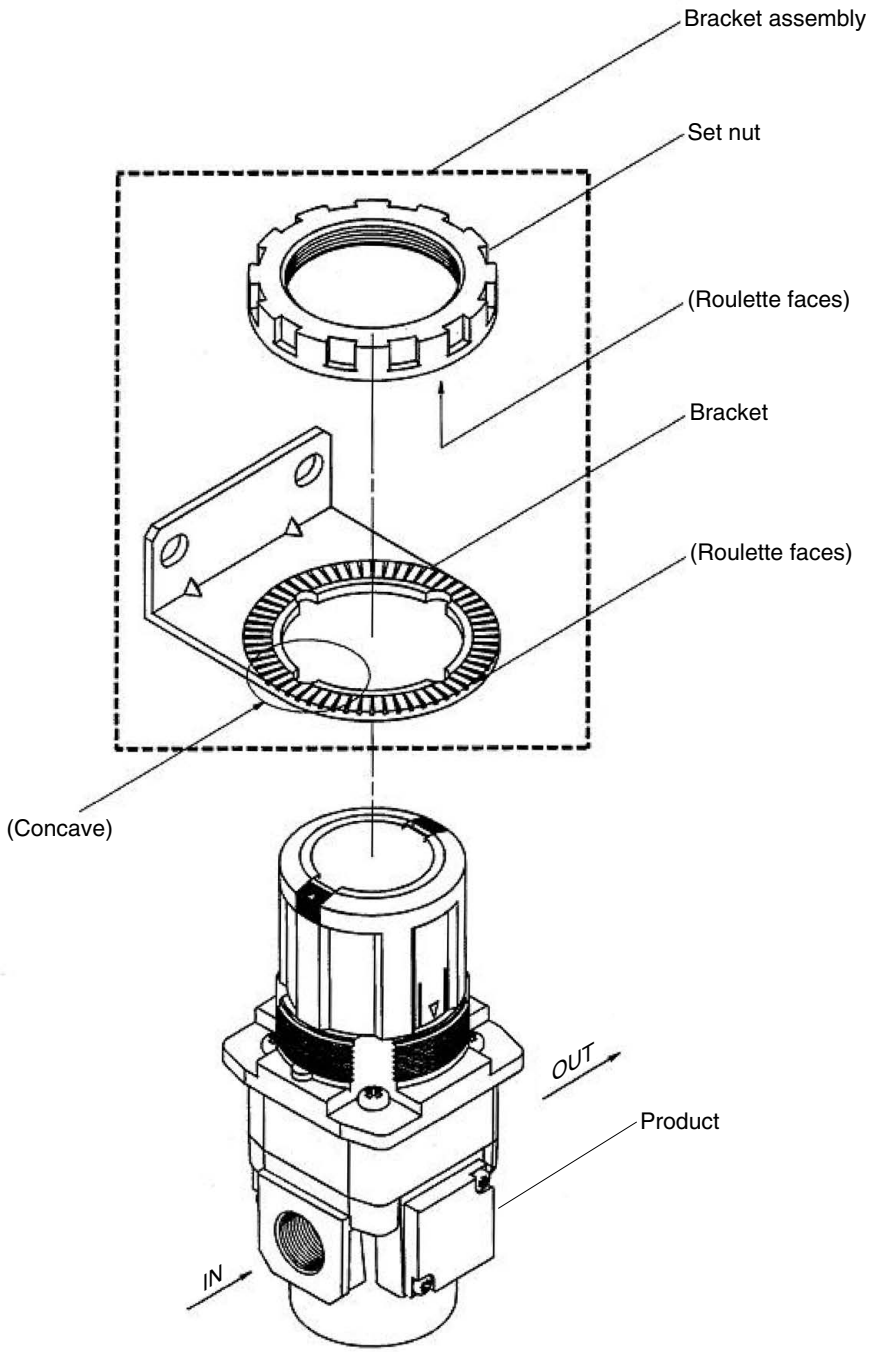
8. Blanking Plate Assembly

Applicable model	Process	Procedure	Tools	Check item
AWD20 AWD30 AWD40	Disassembly	1) Remove the blanking plate. Rotate the 2 mounting screws counterclockwise with a Phillips head screwdriver to remove the blanking plate and the 2 mounting screws.	Phillips head screwdriver	—
	Assembly	2) Confirm that the blanking plate has the O-ring. If not, mount the O-ring.	—	—
		3) Mount the blanking plate. Rotate the 2 mounting screws clockwise with a Phillips head screwdriver to fix the blanking plate. Refer to the “Check item” for tightening torque of 2 screws.	Phillips head screwdriver (Torque driver)	Tightening torque: 0.3 ± 0.05 N·m

ARG20(K), 30(K), 40(K) Exploded View 1






Bracket assembly
Set nut
(Roulette faces)
Bracket
(Roulette faces)
(Concave)
OUT
Product
IN

⚠Warning
Before replacement, ensure that the regulator is not pressurized.
Rotate the pressure adjusting knob to zero.
Replace while referring to the "Exploded View."
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Diaphragm Assembly

Applicable model	Process	Procedure	Tools	Check item
ARG20(K) ARG30(K) ARG40(K)	Disassembly	1) Remove the bonnet assembly. Rotate the mounting screw counterclockwise with a Phillips head screwdriver to remove the bonnet from the body.	Phillips head screwdriver	—
		2) Remove parts in order of the spring and the diaphragm assembly. Please be noted that the diaphragm assembly adheres to the bonnet if disassemble parts with the knob facing downwards.	—	—
	Assembly	3) Mount the diaphragm assembly first and then spring on the body.	—	Direction of the diaphragm assembly
		4) Mount the bonnet to the body. Mount the convex IN side of the bonnet to the body, and tighten the 4 mounting screws half way with a Phillips head screwdriver. Then, tighten the screws completely in a diagonal pattern with the indicated tightening torque.	Phillips head screwdriver	Tightening torque: **ARG20(K)** 2.15 ± 0.3 N·m **ARG30(K)** 2.35 ± 0.3 N·m **ARG40(K)** 3.5 ± 0.3 N·m

2. Valve Guide Assembly, Valve

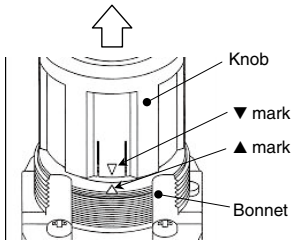
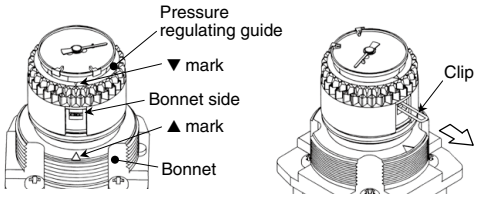
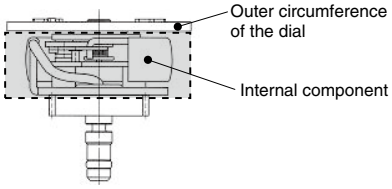
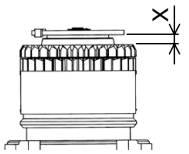
Applicable model	Process	Procedure	Tools	Check item
ARG20(K) ARG30(K) ARG40(K)	Disassembly	1) Remove the cap. Insert a watchmaker's screwdriver in the gap between the body and the cap and dig up the cap.	Watchmaker's screwdriver	—
		2) Remove the cover. Insert the circular pliers into the 2 small holes of the cover, rotate 45 degrees to one side or the other and lift.	Circular pliers Nominal: 125	—
		3) Remove the valve guide assembly. Hold the valve guide with a needle nose pliers, and lift it.	Needle nose pliers	—
		4) Remove the valve spring.	—	—
		5) Remove the valve.	—	—
	Assembly	6) Mount the valve. Connect the stem convex and the valve center hole.	—	Positioning of the stem and the valve (centering)
		7) Mount the valve spring. Insert the valve spring to the valve hole.	—	—
		8) Mount the valve guide assembly and the cover assembly to the body. Align the body groove and the cover clamp, push in the valve guide and cover assembly, insert the circular pliers into the 2 small holes of the cover and rotate 45 degrees to one side or the other to lock into place.	Circular pliers Nominal: 125	—
		9) Mount the cap. Connect the convex of the body cover and the concave of the cap, and push them in to secure. Ensure that the end of the body and the cap are almost flat.	—	Alignment mark of the body and the cap. The body end and the cap are almost flat.

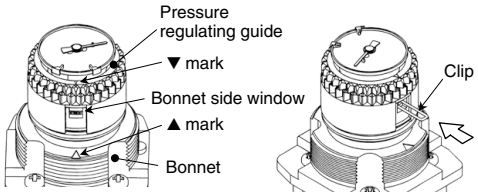
3. Bracket Assembly, Panel Mount

Applicable model	Process	Procedure	Tools	Check item
ARG20(K) ARG30(K) ARG40(K)	**Assembly**	1) Mount the parts to the bracket (panel). Connect the bracket (panel) concave and the bonnet convex to mount the bracket.	—	—
		2) Secure the bracket (panel) with the set nut. Rotate the set nut clockwise with a hook wrench to secure the parts to the bracket (panel). Refer to the “Check item” for the tightening torque. When mounting the bracket for ARG20(K)/30(K)/40(K), ensure that the roulette faces of the set nut and the bracket are mated appropriately. When mounting with a bracket, a manually tightened set nut is adequate for general use. (ARG20(K)/30(K)/40(K))	**ARG20(K)/30(K)/40(K)** **Hook wrench** **Nominal:** **ARG20(K)** 52/55 **ARG30(K)** 58/65 **ARG40(K)** 65/70	Tightening torque: **ARG20(K)** 2.5 ± 0.2 N·m **ARG30(K)** 3.5 ± 0.3 N·m **ARG40(K)** 4.0 ± 0.4 N·m

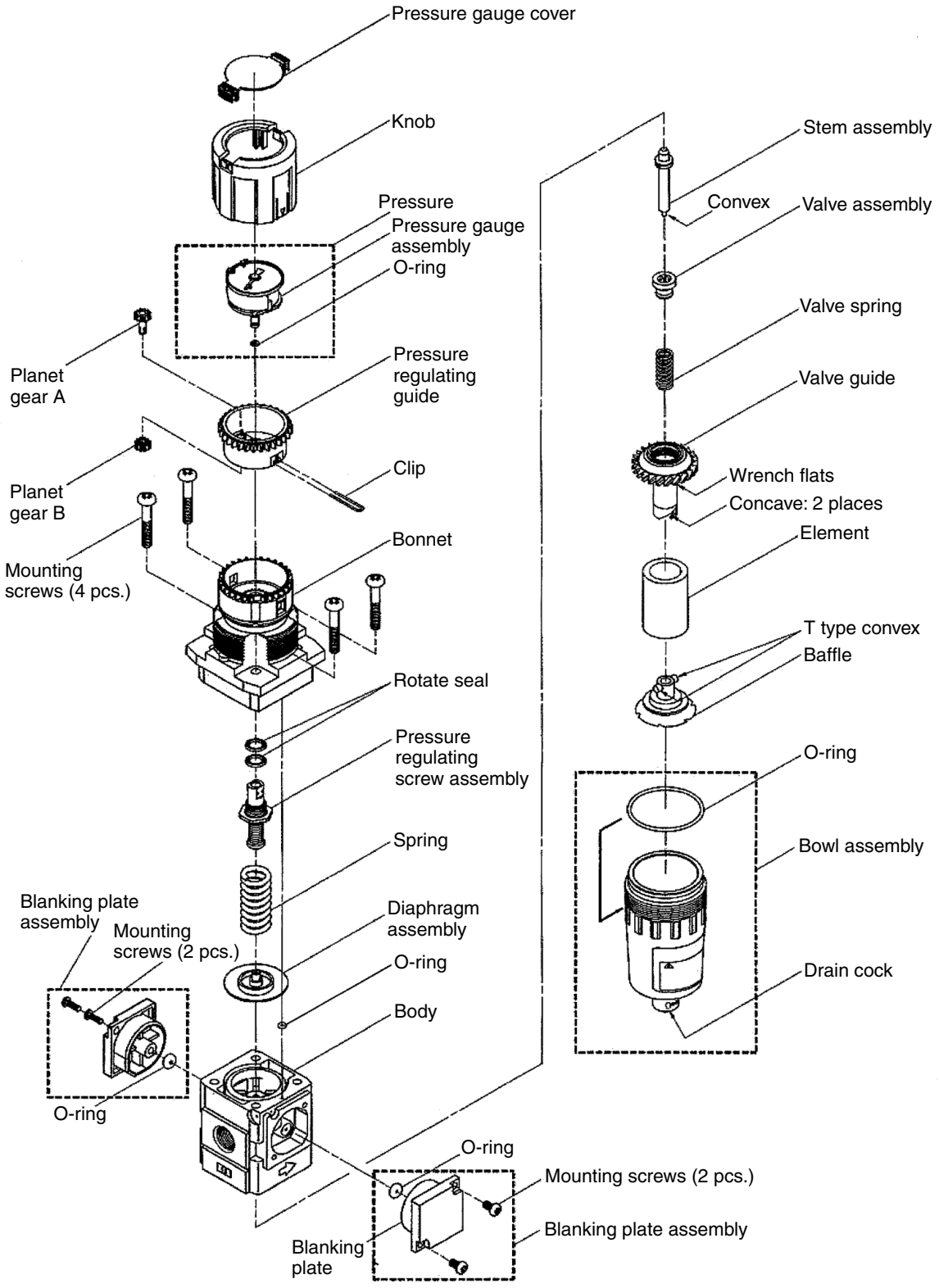
⚠Warning

Before replacement, ensure that the regulator is not pressurized.
Rotate the pressure adjusting knob to zero.
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

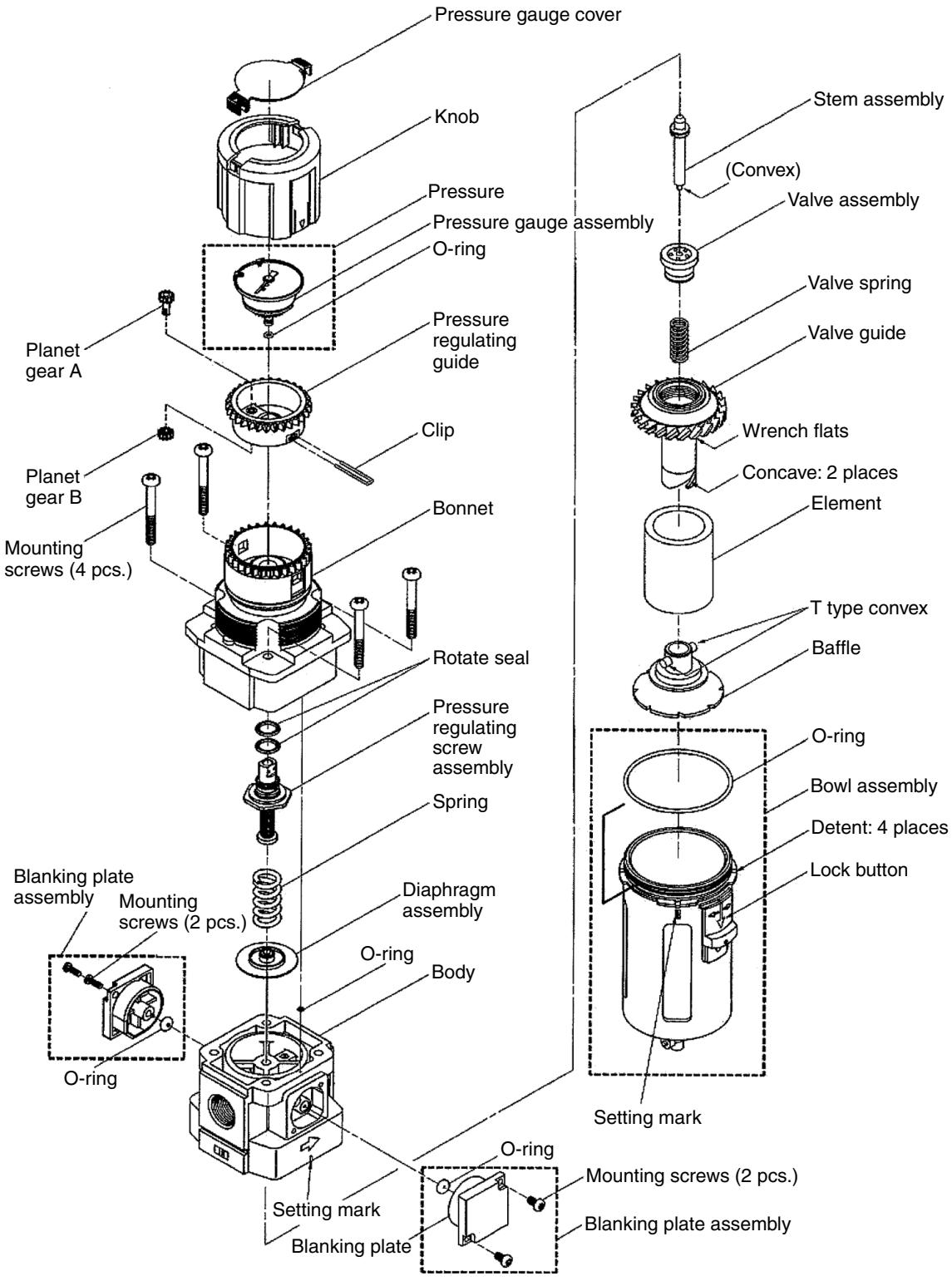
Applicable model	Process	Procedure	Tools	Check item
ARG20(K) ARG30(K) ARG40(K)	Disassembly	1) Preparation Release the pressure regulating knob lock with the pressure regulating knob completely loosened.	—	The orange line can be seen between the pressure regulating knob and the bonnet.
		2) Removal of the knob Pull out the knob to remove at the position where ▼ mark of the knob and ▲ mark of the bonnet meet. 	—	—
		3) Removal of the clip The clip becomes visible from the side window of the bonnet if ▲ mark of the bonnet and ▼ mark of the pressure regulating guide meet, pull out the clip with a pair of tweezers. * Rotate the pressure regulating guide clockwise when matching the mark. 	Tweezers	—
		4) Removal of the pressure gauge Pull out the pressure gauge holding the outer circumference of the dial. * Do not touch the internal component of the pressure gauge (surrounded by dashed line). It may damage the indication accuracy of the pressure gauge. 	—	—
	Assembly	5) Setting the pressure gauge Hold the outer circumference of the dial and set the gauge at specified angle, and push in the gauge lightly. For reference, Table 1 shows the gap dimension between the bottom surface of the dial and the top surface of the pressure regulating guide after mounting the pressure gauge. Note 1) If the gauge does not enter by some interference when setting the pressure gauge, set the gauge by slightly rotating it in rotating direction. (The planet gear of the pressure regulating guide and the sun gear integrated in the pressure gauge interfere each other.) Note 2) Set the pressure gauge completely. Note 3) The end of the pressure gauge has greased the O-ring. Attention should be taken so that dust and particle not enter to the pressure gauge.	—	 Table 1 Gap dimension X dimension (Reference valve): ARG20(K) 2.6 mm; ARG30(K) 3.3 mm; ARG40(K) 3.3 mm

Applicable model	Process	Procedure	Tools	Check item
ARG20(K) **ARG30(K)** **ARG40(K)**	**Assembly**	6) Setting the clip Insert the clip from the side window of the bonnet where ▲ mark of the pressure regulating guide and ▼ mark of the bonnet meet. Use something sharp like tweezers when inserting the clip to the end. If the clip is not inserted to the end the knob may not rotate after setting the knob. Note 1) The clip is slightly tapered to the end to avoid falling off. Slightly open the end of the clip when setting the clip. Note 2) Following causes are possible when the clip is stuck in the middle. ①The pressure regulating screw is lower than the original position. (Gap is made between the pressure regulating nut and the spring. When the pressure regulating screw is completely loosened, the pressure regulating screw may be lowered if excessive press force applied to the pressure regulating screw.) Countermeasure … Turn the pressure regulating guide approx. 5 times clockwise (pressure rise direction). ②Pressure gauge is not properly set. Countermeasure…5) See setting the pressure gauge.  	Tweezers	—
		7) Setting the knob Set the knob, and finish.	—	—

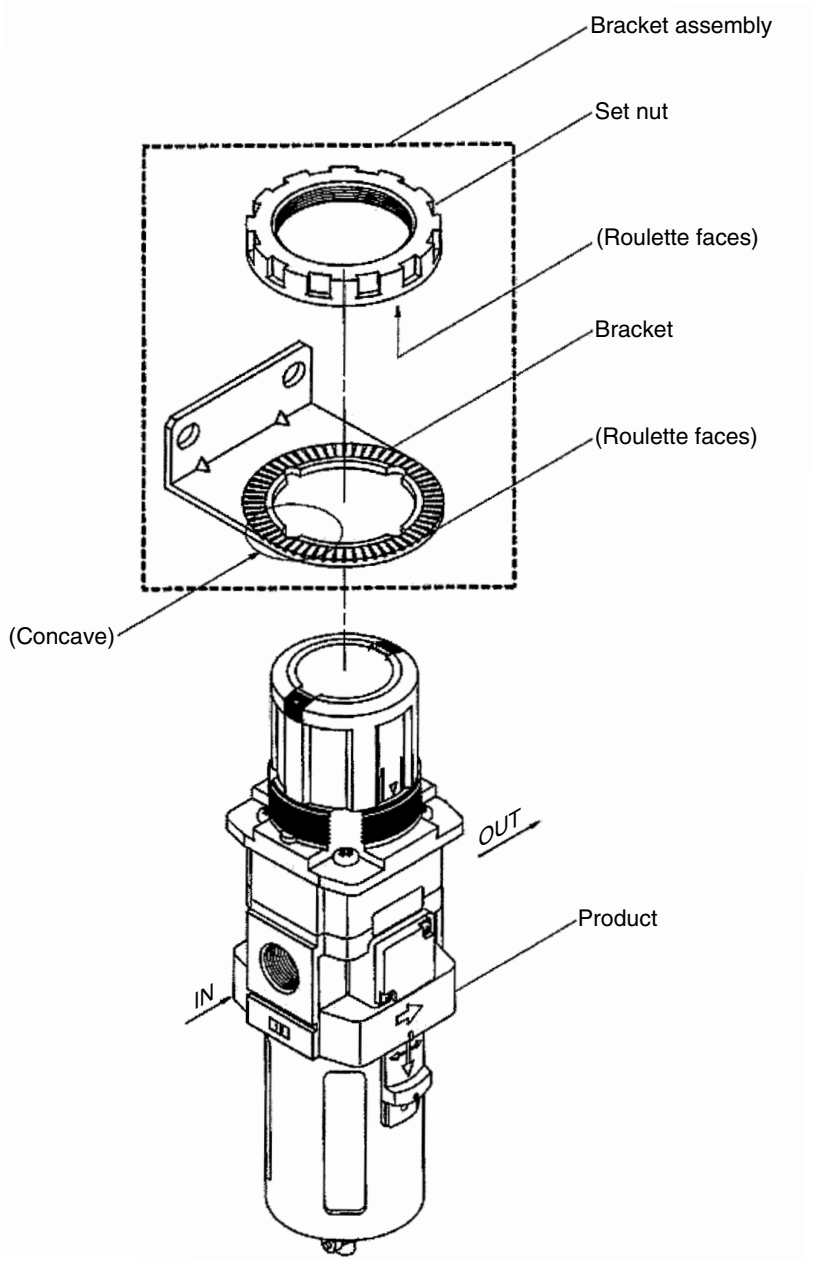
AWG20 Exploded View 1



AWG30, 40 Exploded View 2



AWG20, 30, 40 Bracket Assembly, Panel Mount Exploded View 3



⚠Warning

Before replacement, ensure that the regulator is not pressurized.
Rotate the pressure adjusting knob to zero.
Replace while referring to the "Exploded View."
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Bowl Assembly/Element

Applicable model	Process	Procedure	Tools	Check item
AWG20	Disassembly	1) Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly has been tightened too much to be removed, use a hook wrench until it can be loosened by hand.	(Hook wrench) (Nominal: 34/38)	—
		2) Remove the baffle and element. Rotate the baffle by hand and counterclockwise to remove the baffle and element.	—	—
	Assembly	3) Mount the element. Mount the element to the valve guide.	—	—
		4) Mount the baffle. Insert the baffle so that concave on the valve guide could meet T convex on the baffle. And rotate it clockwise manually until feeling the snap fit (approx. 110°) to fix to the element.	—	—
		5) Mount the bowl assembly. Hold the bowl assembly by hand and rotate clockwise. Do not use tool for mounting because the bowl may be damaged. Refer to the "Check item" for referential tightening torque.	—	Referential tightening torque: 2.1 N·m
AWG30 AWG40	Disassembly	1) Remove the bowl assembly. Push the bowl assembly lock button. Lifting the bowl assembly, rotate the assembly 45 degrees (right or left) to pull out the assembly.	—	—
		2) Remove the baffle and element. Rotate the baffle by hand and counterclockwise to remove the baffle and element.	—	—
	Assembly	3) Mount the element. Mount the element to the valve guide.	—	—
		4) Mount the baffle. Insert the baffle so that concave on the valve guide could meet T convex on the baffle. And rotate it clockwise manually until feeling the snap fit (approx. 110°) to fix to the element.	—	Direction of the baffle. For element convex side.
		5) Mount the bowl assembly. Match the mating mark of the body and the bowl assembly to insert the assembly to the body. Rotate the assembly 45 degrees (right or left) until the lock button is tossed up to mount the bowl assembly. Ensure that the lock button is up.	—	Lock button is up.

2. Diaphragm Assembly

Applicable model	Process	Procedure	Tools	Check item
AWG20 AWG30 AWG40	Disassembly	1) Remove the bonnet assembly. Rotate the set screw counterclockwise with a Phillips head screwdriver to remove the bonnet from the body.	Phillips head screwdriver	—
		2) Remove parts in order of the spring, and the diaphragm assembly. Please be noted that the diaphragm assembly adheres to the bonnet if disassemble parts with the knob facing downwards.	—	—
	Assembly	3) Mount parts to the body in order of the diaphragm assembly, spring.	—	Diaphragm
		4) Mount the bonnet to the body. Mount the convex IN side of the bonnet to the body, and tighten the 4 mounting screws half way with a Phillips head screwdriver. Then, tighten the screws completely in a diagonal pattern with the indicated tightening torque.	Phillips head screwdriver	Tightening torque: **AWG20** 2.15 ± 0.3 N·m **AWG30** 2.35 ± 0.3 N·m **AWG40** 3.5 ± 0.3 N·m

3. Valve Assembly

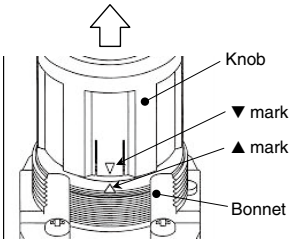
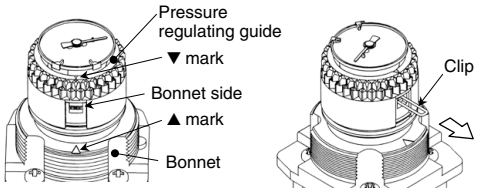
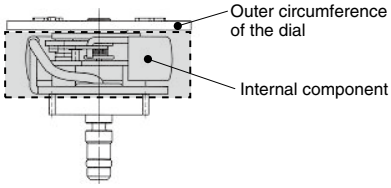
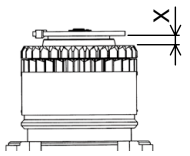
Applicable model	Process	Procedure	Tools	Check item
AWG20 AWG30 AWG40	Disassembly	1) Remove the valve guide after removing the bowl assembly and element. Hold the valve guide with a wrench on the wrench flat to rotate it counterclockwise, and remove the valve guide.	Wrench Nominal: AWG20: 7 AWG30: 17 AWG40: 21	—
		2) Remove the valve spring.	—	—
		3) Remove the valve assembly.	—	—
	Assembly	4) Mount the valve assembly. Connect the stem convex and the valve center hole.	—	Positioning of the stem and the valve (centering)
		5) Mount the valve spring. Insert the valve spring into the valve hole.	—	—
		6) Mount the valve guide. Hold the valve guide with a wrench on the wrench flat to rotate it clockwise, and mount the valve guide. Refer to the "Check item" for the tightening torque.	Wrench Nominal: AWG20: 7 AWG30: 17 AWG40: 21	Tightening torque: AWG20: 0.8 ± 0.1 N·m AWG30: 2.35 ± 0.3 N·m AWG40: 3.5 ± 0.3 N·m

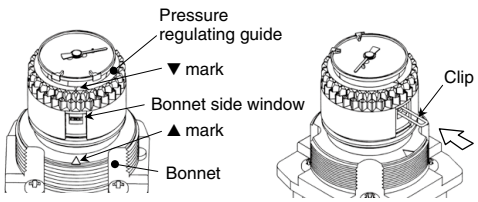
4. Bracket Assembly, Panel mount

Applicable model	Process	Procedure	Tools	Check item
AWG20 AWG30 AWG40	Assembly	1) Mount the parts to the bracket (panel) Connect the bracket (panel) concave and the bonnet convex to mount the bracket.	—	—
		2) Secure the bracket (panel) with the set nut. Rotate the set nut clockwise with a hook wrench to secure the parts to the bracket (panel). Refer to the "Check item" for the tightening torque. Set nut knurling surface should face the bracket (AWG20 to 40). When mounting with bracket, a manually tightened set nut is adequate for general use. (AWG20 to 40)	AWG20/30/40 Hook wrench Nominal: AWG20: 52/55 AWG30: 58/65 AWG40: 65/70	Tightening torque: AWG20: 2.0 ± 0.2 N·m AWG30: 3.5 ± 0.3 N·m AWG40: 4.0 ± 0.4 N·m

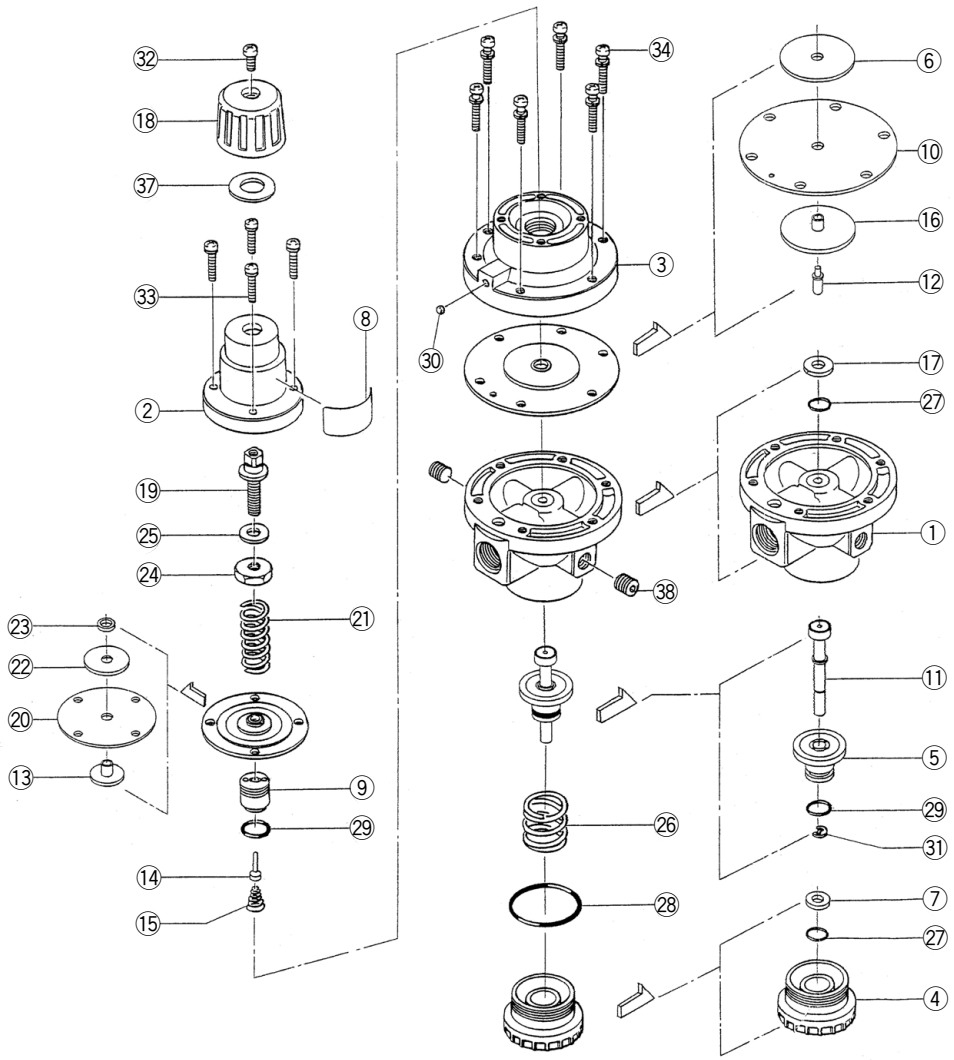
⚠Warning

Before replacement, ensure that the regulator is not pressurized.
Rotate the pressure adjusting knob to zero.
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

Applicable model	Process	Procedure	Tools	Check item
AWG20 AWG30 AWG40	Disassembly	1) Preparation Release the knob lock with the pressure regulating knob completely loosened.	—	The orange line can be seen between the knob and the bonnet.
		2) Removal of the knob Pull out the knob to remove at the position where ▼ mark of the knob and ▲ mark of the bonnet meet. 	—	—
		3) Removal of the clip The clip becomes visible from the side window of the bonnet if ▲ mark of the bonnet and ▼ mark of the pressure regulating guide meet, pull out the clip with a pair of tweezers. * Rotate the pressure regulating guide clockwise when matching the mark. 	Tweezers	—
		4) Removal of the pressure gauge Pull out the pressure gauge holding the outer circumference of the dial. * Do not touch the internal component of the pressure gauge (surrounded by dashed line). It may damage the indication accuracy of the pressure gauge. 	—	—
	Assembly	5) Setting the pressure gauge Hold the outer circumference of the dial and set the gauge at specified angle, and push in the gauge lightly. For reference, Table 1 shows the gap dimension between the bottom surface of the dial and the top surface of the pressure regulating guide after mounting the pressure gauge. Note 1) If the gauge does not enter by some interference when setting the pressure gauge, set the gauge by slightly rotating it in rotating direction. (The planet gear of the pressure regulating guide and the sun gear integrated in the pressure gauge interfere each other.) Note 2) Set the pressure gauge completely. Note 3) The end of the pressure gauge has greased the O-ring. Attention should be taken so that dust and particle not enter to the pressure gauge.	—	 Table 1 Gap dimension X dimension (Reference value): AWG20 2.6 mm; AWG30 3.3 mm; AWG40 3.3 mm

Applicable model	Process	Procedure	Tools	Check item
AWG20 **AWG30** **AWG40**	**Assembly**	6) Setting the clip Insert the clip from the side window of the bonnet where ▲ mark of the pressure regulating guide and ▼ mark of the bonnet meet. Use something sharp like tweezers when inserting the clip to the end. If the clip is not inserted to the end the knob may not rotate after setting the knob. Note 1) The clip is slightly tapered to the end to avoid falling off. Slightly open the end of the clip when setting the clip. Note 2) Following causes are possible when the clip is stuck in the middle. ①The pressure regulating screw is lower than the original position. (Gap is made between the pressure regulating nut and the spring. When the pressure regulating screw is completely loosened, the pressure regulating screw may be lowered if excessive press force applied to the pressure regulating screw.) Countermeasure … Turn the pressure regulating guide approx. 5 times clockwise (pressure rise direction). ②Pressure gauge is not properly set. Countermeasure…5) See setting the pressure gauge.  	Tweezers	—
		7) Setting the knob Set the knob, and finish.	—	—

AR425 Exploded View 1

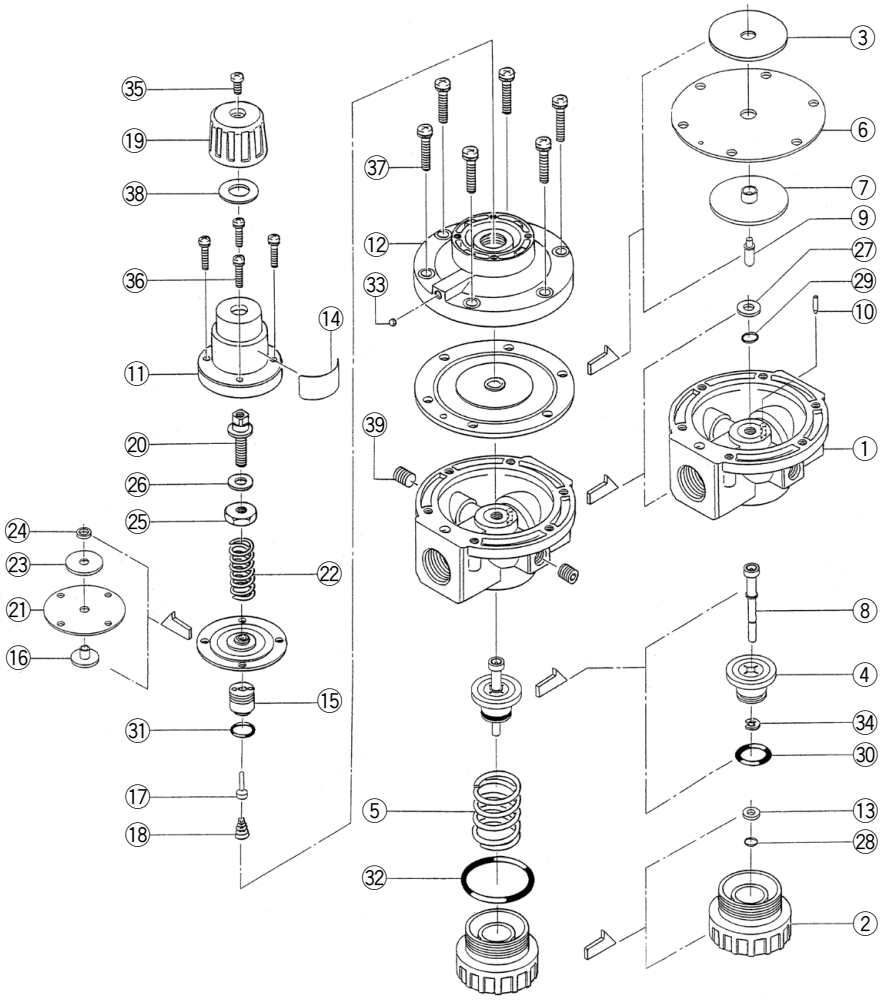


Component Parts

Item	Part Name	Qty.	Remarks
①	**Body**	1	Chromate treatment
②	**Bonnet**	1	Chromate treatment
③	**Chamber**	1	Chromate treatment
④	**Valve guide**	1	Chromate treatment
⑤	**Valve**	1	Rubber lining material: HNBR
⑥	**Diaphragm shell**	1	Zinc chromate treatment
⑦	**O-ring holder**	1	Chromate treatment
⑧	**Name plate**	1	Complete product no. indicated
⑨	**Valve seat**	1	
⑩	**Diaphragm**	1	
⑪	**Stem**	1	Rubber lining material: HNBR
⑫	**Rod**	1	
⑬	**Diaphragm holder**	1	
⑭	**Pilot valve**	1	Rubber lining material: HNBR
⑮	**Valve spring**	1	
⑯	**Diaphragm holder**	1	
⑰	**O-ring holder**	1	Chromate treatment
⑱	**Knob**	1	

Item	Part Name	Qty.	Remarks
⑲	**Adjustment screw**	1	Zinc chromate treatment
⑳	**Diaphragm**	1	
㉑	**Spring**	1	Zinc chromate treatment
㉒	**Diaphragm shell**	1	Chromate treatment
㉓	**Washer**	1	
㉔	**Spring holder**	1	Zinc chromate treatment
㉕	**Seal**	1	
㉖	**Valve spring**	1	
㉗	**O-ring**	2	JIS B2401 P5
㉘	**O-ring**	1	JIS B2401 G35
㉙	**O-ring**	2	JIS B2401 P10
㉚	**Steel ball**	1	ø4
㉛	**Retaining ring**	1	JIS B2805 4
㉜	**Cross recessed round head screw**	1	M5 x 0.8 x 8 Black zinc chromate treatment
㉝	**Cross recessed round head screw**	4	M4 x 0.7 x 16 Nickel plating
㉞	**Cross recessed round head screw**	6	M5 x 0.8 x 22 Nickel plating
㊲	**Flat washer**	1	ø10.5 x ø20 x 1.2 Zinc chromate treatment
㊳	**Hexagon socket head plug**	2	R(PT) 1/4 Nickel plating

AR625 Exploded View 2

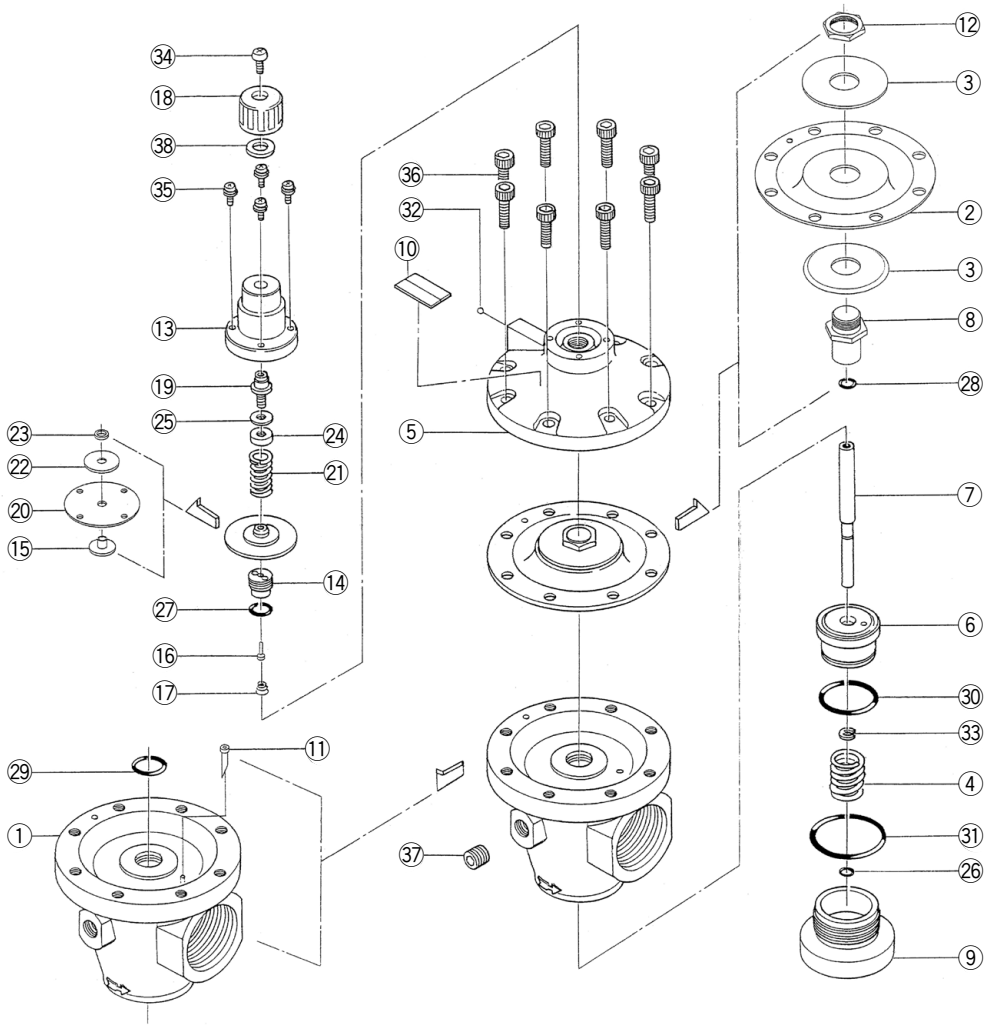


Component Parts

Item	Part Name	Qty.	Remarks
①	**Body**	1	Chromate treatment
②	**Valve guide**	1	Chromate treatment
③	**Diaphragm shell**	1	Zinc chromate treatment
④	**Valve**	1	Rubber lining material: HNBR
⑤	**Valve spring**	1	
⑥	**Diaphragm**	1	
⑦	**Diaphragm holder**	1	
⑧	**Stem**	1	Rubber lining material: HNBR
⑨	**Rod**	1	
⑩	**Static pressure tube**	1	
⑪	**Bonnet**	1	Chromate treatment
⑫	**Chamber**	1	Chromate treatment
⑬	**O-ring holder**	1	Chromate treatment
⑭	**Name plate**	1	Complete product no. indicated
⑮	**Valve seat**	1	
⑯	**Diaphragm holder**	1	
⑰	**Pilot valve**	1	Rubber lining material: HNBR
⑱	**Valve spring**	1	
⑲	**Knob**	1	
⑳	**Adjustment screw**	1	Zinc chromate treatment

Item	Part Name	Qty.	Remarks
㉑	**Diaphragm**	1	
㉒	**Spring**	1	Zinc chromate treatment
㉓	**Diaphragm shell**	1	Chromate treatment
㉔	**Washer**	1	
㉕	**Spring holder**	1	Zinc chromate treatment
㉖	**Seal**	1	
㉗	**O-ring holder**	1	Chromate treatment
㉘	**O-ring**	1	JIS B2401 P5
㉙	**O-ring**	1	JIS B2401 P6
㉚	**O-ring**	1	JIS B2401 P16
㉛	**O-ring**	1	JIS B2401 P10
㉜	**O-ring**	1	JIS B2401 G40
㉝	**Steel ball**	1	ø4
㉞	**Retaining ring**	1	JIS B2805 4
㉟	**Cross recessed round head screw**	1	M5 x 0.8 x 8 Black zinc chromate treatment
㊱	**Cross recessed round head screw**	4	M4 x 0.7 x 16 Nickel plating
㊲	**Cross recessed round head screw**	6	M6 x 1 x 22 Nickel plating
㊳	**Flat washer**	1	ø10.5 x ø20 x 1.2 Zinc chromate treatment
㊴	**Hexagon socket head plug**	2	R(PT) 1/4 Nickel plating

AR825 Exploded View 3

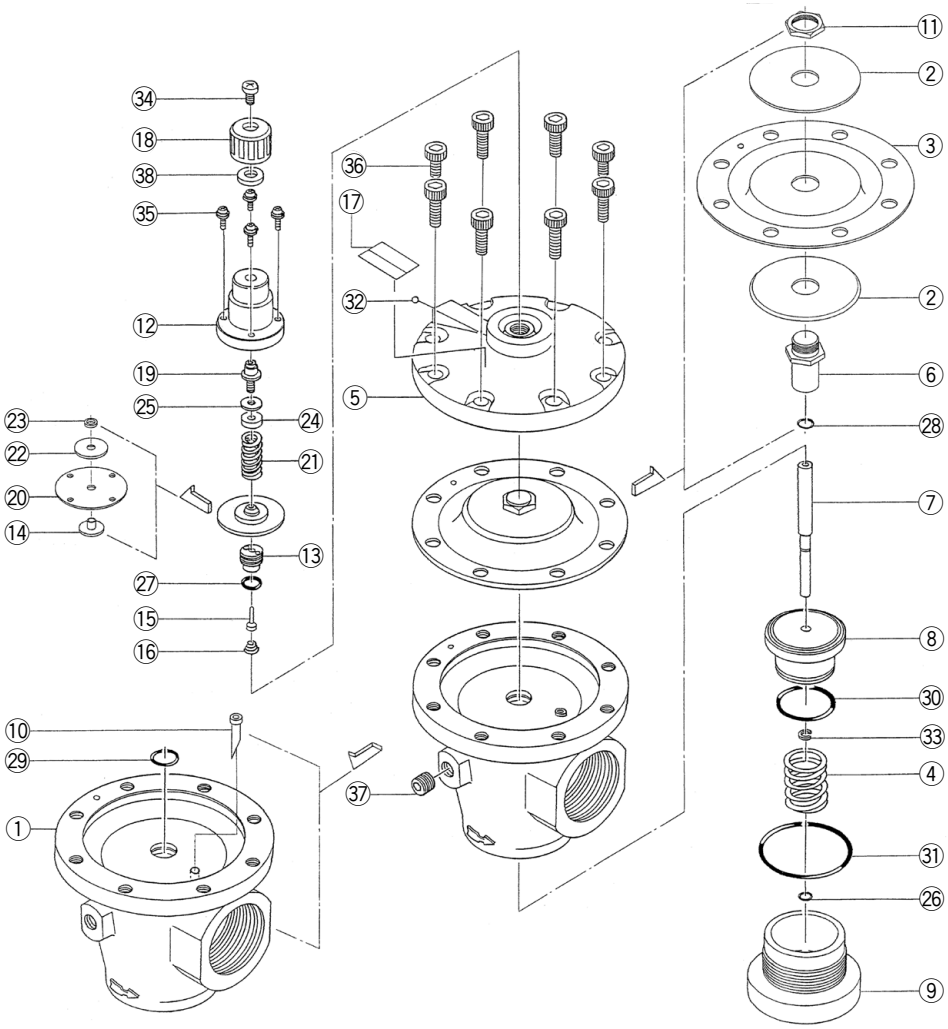


Component Parts

Item	Part Name	Qty.	Remarks
①	**Body**	1	Chromate treatment
②	**Diaphragm**	1	
③	**Diaphragm shell**	2	Zinc chromate treatment
④	**Valve spring**	1	
⑤	**Chamber**	1	Chromate treatment
⑥	**Valve**	1	Rubber lining material: HNBR
⑦	**Stem**	1	
⑧	**Diaphragm shell holder**	1	
⑨	**Valve guide**	1	Chromate treatment
⑩	**Name plate**	1	Complete product no. indicated
⑪	**Static pressure tube**	1	
⑫	**Set nut**	1	
⑬	**Bonnet**	1	Chromate treatment
⑭	**Valve seat**	1	
⑮	**Diaphragm holder**	1	
⑯	**Pilot valve**	1	Rubber lining material: HNBR
⑰	**Valve spring**	1	
⑱	**Knob**	1	
⑲	**Adjustment screw**	1	Zinc chromate treatment

Item	Part Name	Qty.	Remarks
⑳	**Diaphragm**	1	
㉑	**Spring**	1	Zinc chromate treatment
㉒	**Diaphragm shell**	1	Chromate treatment
㉓	**Washer**	1	
㉔	**Spring holder**	1	Zinc chromate treatment
㉕	**Seal**	1	
㉖	**O-ring**	1	JIS B2401 P7
㉗	**O-ring**	1	JIS B2401 P10
㉘	**O-ring**	1	
㉙	**O-ring**	1	JIS B2401 P20
㉚	**O-ring**	1	JIS B2401 P30
㉛	**O-ring**	1	JIS B2401 G50
㉜	**Steel ball**	1	ø4
㉝	**Retaining ring**	1	TE-23
㉞	**Cross recessed round head screw**	1	M5 x 0.8 x 8 Black zinc chromate treatment
㉟	**Cross recessed round head screw**	4	M4 x 0.7 x 16 Nickel plating
㊱	**Hexagon socket head cap screw**	8	M8 x 1.25 x 18 Nickel plating
㊲	**Hexagon socket head plug**	2	R(PT) 1/4 Nickel plating
㊳	**Flat washer**	1	ø10.5 x ø20 x 1.2 Zinc chromate treatment

AR925 Exploded View 4



Component Parts

Item	Part Name	Qty.	Remarks
①	**Body**	1	Chromate treatment
②	**Diaphragm shell**	2	Zinc chromate treatment
③	**Diaphragm**	1	
④	**Valve spring**	1	
⑤	**Chamber**	1	Chromate treatment
⑥	**Diaphragm shell holder**	1	
⑦	**Stem**	1	
⑧	**Valve**	1	Rubber lining material: HNBR
⑨	**Valve guide**	1	Chromate treatment
⑩	**Static pressure tube**	1	
⑪	**Set nut**	1	
⑫	**Bonnet**	1	Chromate treatment
⑬	**Valve seat**	1	
⑭	**Diaphragm holder**	1	
⑮	**Pilot valve**	1	Rubber lining material: HNBR
⑯	**Valve spring**	1	
⑰	**Name plate**	1	Complete product no. indicated
⑱	**Knob**	1	
⑲	**Adjustment screw**	1	Zinc chromate treatment

Item	Part Name	Qty.	Remarks
⑳	**Diaphragm**	1	
㉑	**Spring**	1	Zinc chromate treatment
㉒	**Diaphragm shell**	1	Chromate treatment
㉓	**Washer**	1	
㉔	**Spring holder**	1	Zinc chromate treatment
㉕	**Seal**	1	
㉖	**O-ring**	1	JIS B2401 P7
㉗	**O-ring**	1	JIS B2401 P10
㉘	**O-ring**	1	
㉙	**O-ring**	1	JIS B2401 P20
㉚	**O-ring**	1	JIS B2401 P42
㉛	**O-ring**	1	JIS B2401 G70
㉜	**Steel ball**	1	ø5
㉝	**Retaining ring**	1	TE-23
㉞	**Cross recessed round head screw**	1	M5 x 0.8 x 8 Black zinc chromate treatment
㉟	**Cross recessed round head screw**	4	M4 x 0.7 x 16 Nickel plating
㊱	**Hexagon socket head cap screw**	8	M10 x 1.5 x 20 Nickel plating
㊲	**Hexagon socket head plug**	2	R(PT) 1/4 Nickel plating
㊳	**Flat washer**	1	ø10.5 x ø20 x 1.2 Zinc chromate treatment

1. Element Replacement Method

To replace the element, carry out the procedure of 1-1 to 1-8 below while referring to the figure.

1-1. Using a hexagonal wrench, loosen the 4 hexagon socket head cap screws and remove the bowl. At this time, confirm that the O-ring groove in the bowl. If the O-ring is out of place, fit it into the O-ring groove.

1-2. Using a wrench, loosen the domed cap nut and remove it together with the gasket.

1-3. Pull the element downwards and remove it. If the element is difficult to remove, remove it by pushing it in the horizontal direction.

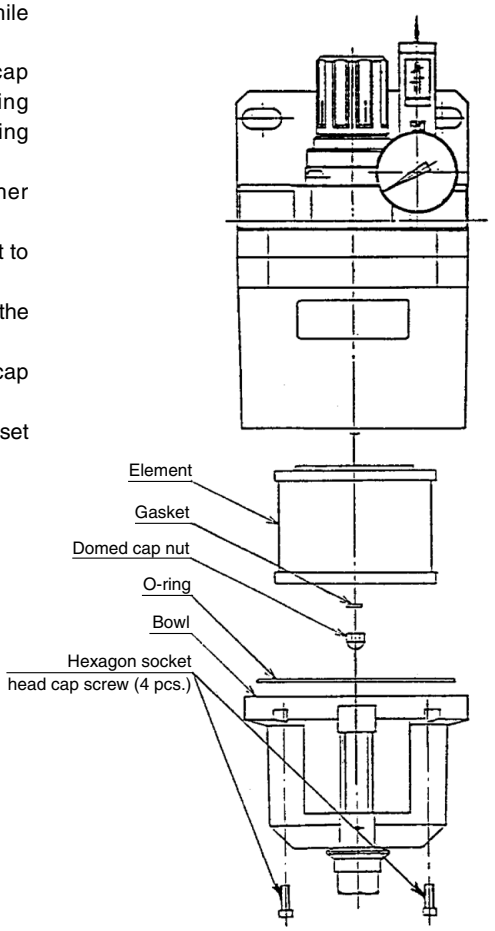
1-4. Coat the top of the element seal with a thin layer of grease, then set the seal so that it is uppermost and pass the tension bolt through it.

1-5. Pass the tension bolt through the gasket, then tighten the domed cap nut to fix the gasket in place.

1-6. Confirm that the O-ring is fitted in the O-ring groove in the bowl, and set the liquid level gauge so that it is facing the front.

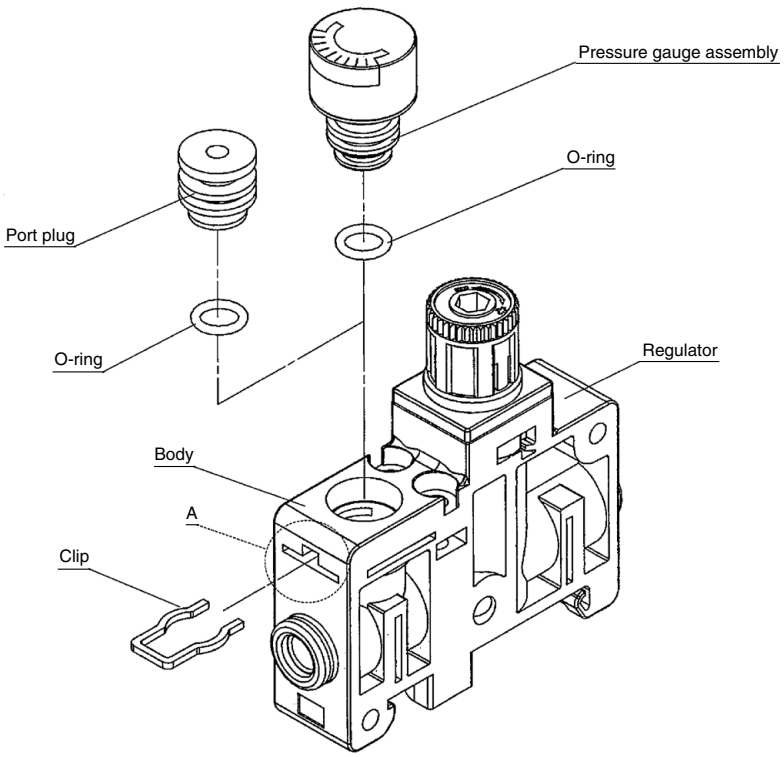
1-7. Fix the bowl by tightening the 4 hexagon socket head cap screws.

1-8. Confirm that there is no leakage between the bowl and the housing.

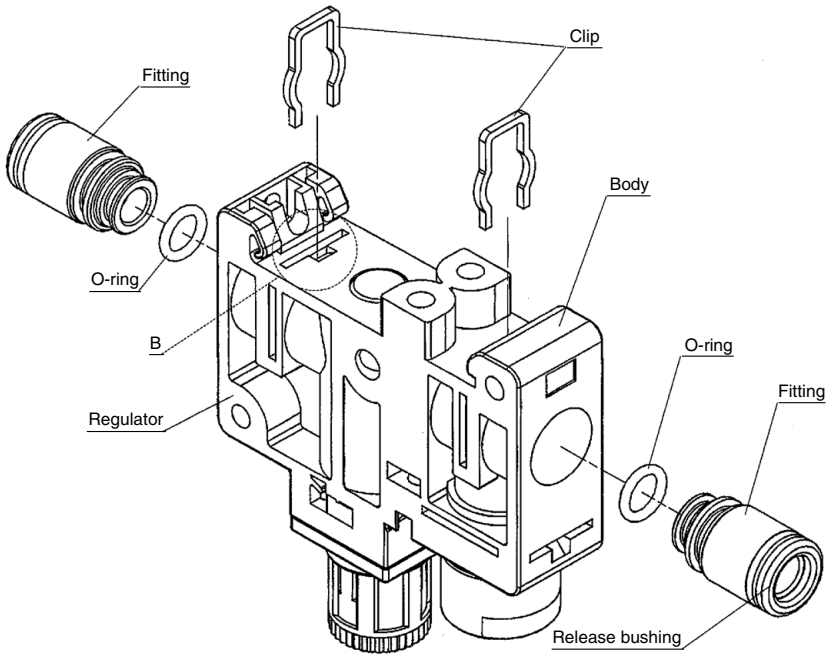


⚠Warning
Before replacement, ensure that the regulator is not pressurized.
Fully rotate the pressure adjusting knob counterclockwise and return it to zero.
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Replacement of Pressure Gauge/Port Plug

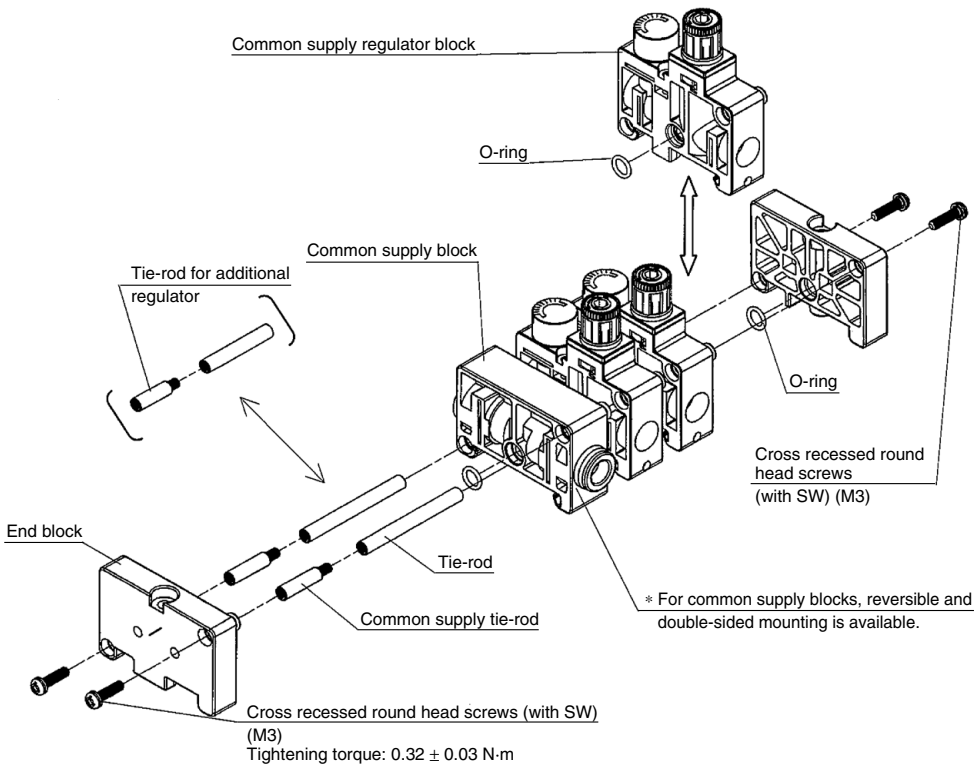
Content	Replacement of Pressure gauge/Port plug	
Parts	Pressure gauge, Port plug	
Tools	Watchmaker's flat head screwdriver	
Process	Disassembly	Assembly
Procedure	1) Insert a watchmaker's flat head screwdriver along with taper of hole A on OUT side of the body. 2) Hook the tip of the screwdriver to the inserted clip, and pull out the clip. ∗ As the clip may fly out, pull it slowly as holding it with a hand. 3) Pull out the mounted pressure gauge/port plug.	1) Insert the pressure gauge/port plug all the way in properly. 2) Put the clip back to the hole. Use the tip of the watchmaker's flat head screwdriver to insert the clip to the end properly.
Check item	—	1) Presence of the O-ring (If dust or particles are remained on the O-ring it may cause air leakage. Therefore take measures to prevent them from attaching on the O-ring.
Exploded view		

2. Replacement of One-touch Fittings

Content	Exchange of One-touch fittings (IN side and OUT side port)	
Parts	One-touch fittings	
Tools	Watchmaker's flat head screwdriver	
Process	Disassembly	Assembly
Procedure	1) Insert a watchmaker's flat head screwdriver along with taper of hole B on OUT side of the body. 2) Hook the tip of the screwdriver to the inserted clip, and pull out the clip. ∗ As the clip may fly out, pull it slowly as holding it with a hand. 3) Pull out the mounted One-touch fitting.	1) Insert the One-touch fitting all the way in properly. 2) Put the clip back to the hole. Use the tip of the watchmaker's flat head screwdriver to insert the clip to the end properly.
Check item	—	1) Presence of the O-ring (If dust or particles are remained on the O-ring it may cause air leakage. Therefore take measures to prevent them from attaching on the O-ring.)
Exploded view	 ∗ If it is hard to remove the fitting, do not remove the release bushing with a strong force. It that case, install the tube and plug, and pull the fitting out together with them.	

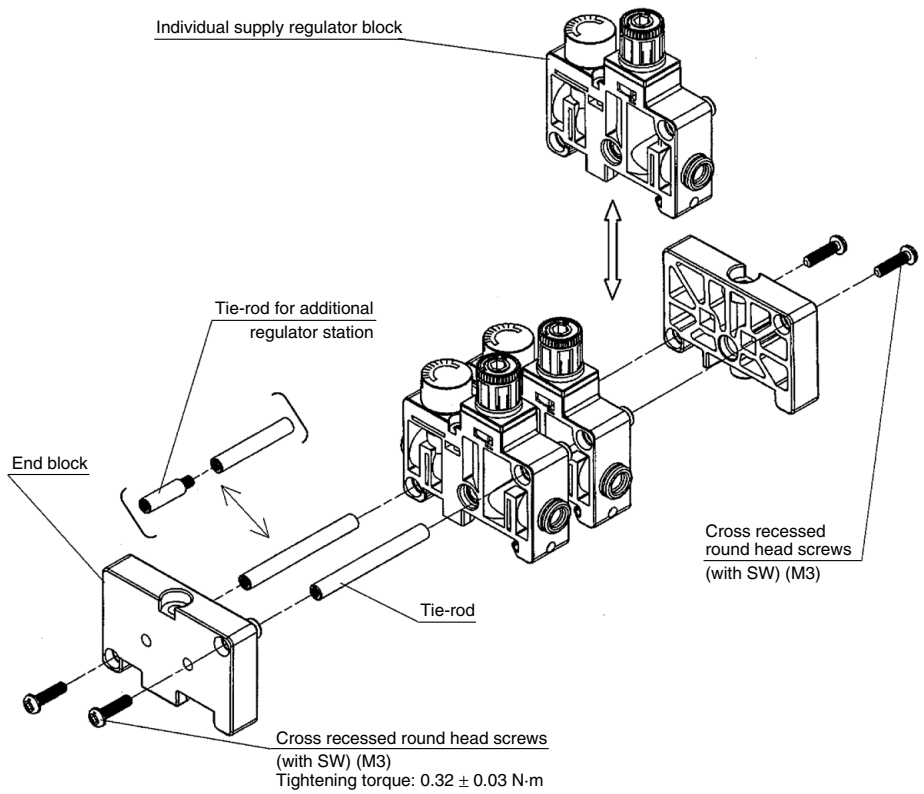
3. Replacement of Manifold Stations (Common Supply Specification)

Content	Change of Manifold stations and Common supply block	
Parts	Regulator block, Common supply block	
Tools	Phillips head screwdriver	
Process	Disassembly	Assembly
Procedure	1) Loosen and remove the cross recessed round head screw on the corner of the end block. 2) Pull out the tie-rod from the end block, common supply block and regulator.	1) Connect the several tie-rods from each other. 2) Engage the tie-rods with the upper left side of the end block, and temporarily tighten them with 2 pcs. of cross recessed round head screws. 3) Check that O-ring is mounted on the recessed connection of each block of the manifold, and insert the each block to the tie-rods. 4) Temporarily tighten the cross recessed round head screws on the right side. 5) Tighten the cross recessed round head screws on both sides of manifold within the following specified torque.
Check item	—	1) Presence of the O-ring (If dust or particles are remained on the O-ring it may cause air leakage. Therefore take measures to prevent them from attaching on the O-ring.)
Exploded view	Note) The length of tie-rod and common supply tie-rod is varied depending on the applicable stations. Tie-rods for additional stations, tie-rods for applicable stations or common supply tie-rods are necessary separately.	



4. Replacement of Manifold Stations (Individual Supply Specification)

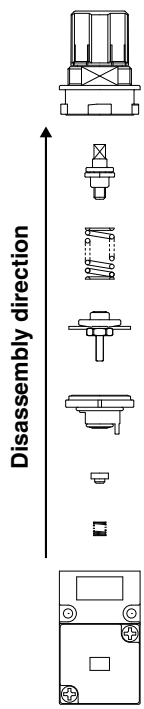
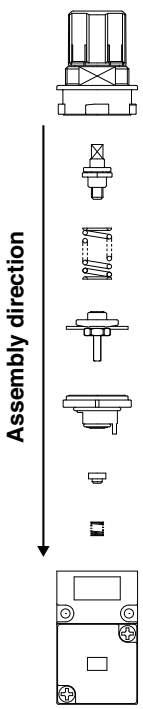
Content	Change of Manifold stations	
Parts	Regulator block	
Tools	Phillips head screwdriver	
Process	Disassembly	Assembly
Procedure	1) Loosen and remove the cross recessed round head screw on the corner of the end block. 2) Pull out the tie-rod from the end block, common supply block and regulator.	1) Connect the several tie-rods from each other. 2) Engage the tie-rods with the upper left side of the end block, and temporarily tighten them with 2 pcs. of cross recessed round head screws. 3) Insert each block to the tie-rod. 4) Temporarily tighten the cross recessed round head screws (2 pcs.) on the right side. 5) Tighten the cross recessed round head screws on both sides of manifold within the following specified torque.
Check item	—	—
Exploded view	Note) The length of tie-rod and common supply tie-rod is varied depending on the applicable stations. Tie-rods for additional stations, tie-rods for applicable stations or common supply tie-rods are necessary separately.	



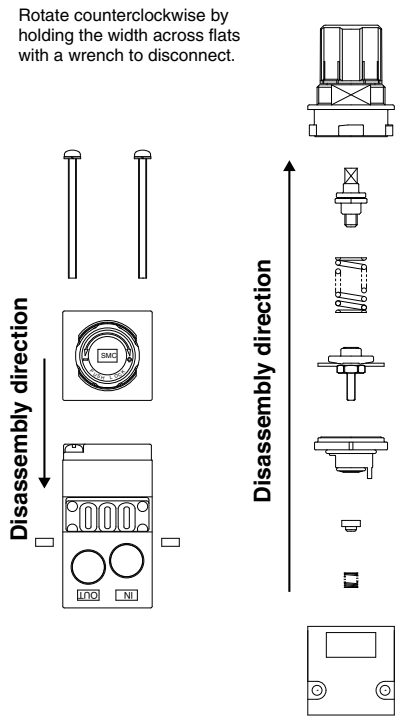
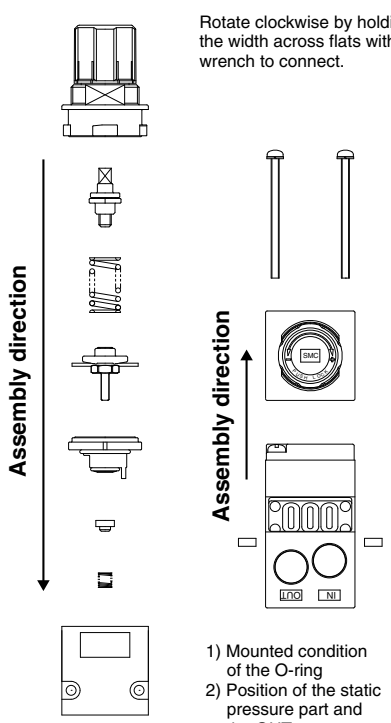
⚠Warning
Before replacement, ensure that the regulator is not pressurized.
Fully rotate the pressure adjusting knob counterclockwise and return it to zero.
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. ARM10 Regulator

(Wash and Replacement of the Diaphragm, O-rings, Valve, and Valve Spring)

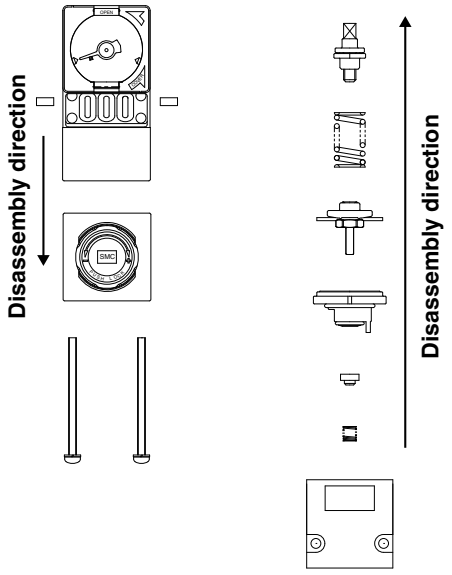
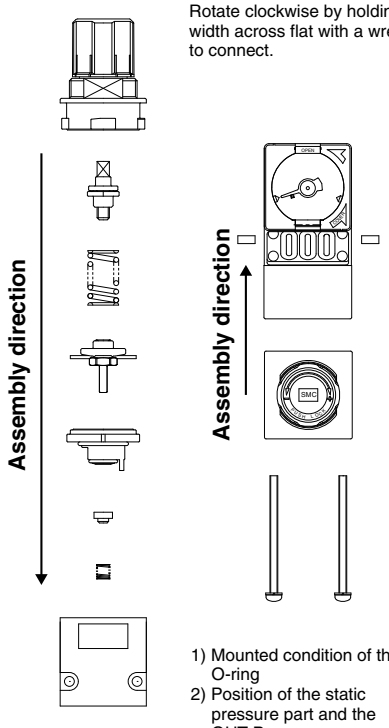
Tools	Wrench (18 mm in width), Snap ring pliers, Tweezers	
Process	**Disassembly**	**Assembly**
Procedure	1) Rotate the bonnet counterclockwise by holding its width across flats with a wrench to disconnect. (The pressure regulating screw and spring are to remain mounted on the bonnet.) 2) Remove the diaphragm assembly manually. 3) Remove the valve seat assembly by holding it with a pair of snap ring pliers. 4) Remove the valve and valve spring.	1) Mount the valve spring and the valve with a pair of tweezers. 2) Mount the valve seat assembly (with the 2 O-rings mounted) with a pair of snap ring pliers so that the static pressure part of the valve seat and the OUT passage can be in the proper position. 3) Hold the valve seat assembly by accessing it from the side opening to prevent it from coming apart. 4) Mount the diaphragm assembly. 5) Mount the bonnet which has the pressure regulating screw and spring installed to its body, and rotate it clockwise by holding the width across flats with a wrench to connect it to the body.
Check item	—	1) Presence of the O-ring 2) Position of the static pressure part of the valve and the OUT passage
Disassembly/ Assembly procedure	 Rotate counterclockwise by holding the width across flats with a wrench to disconnect.	 Rotate clockwise by holding the width across flats with a wrench to connect. 1) Mounted condition of the O-ring 2) Position of the static pressure part and the OUT passage

2. ARM11□A/ARM11□C Regulator Block (Knob Position: Top or Bottom Type)
(Wash and Replacement of the Gasket, Diaphragm, O-rings, Valve, and Valve Spring)

Tools	Phillips head screwdriver, Wrench (18 mm in width), Snap ring pliers, Tweezers	
Process	**Disassembly**	**Assembly**
Procedure	1) Loosen and remove the round head screws of regulator assembly with a Phillips head screwdriver to become the regulator assembly to be disconnected manually. 2) Rotate the bonnet counterclockwise by holding its width across flats with a wrench to disconnect. (The pressure regulating screw and spring are to remain mounted on the bonnet.) 3) Remove the diaphragm assembly manually. 4) Remove the valve seat assembly by holding it with a pair of snap ring pliers. 5) Remove the valve and valve spring.	1) Mount the valve spring and the valve with a pair of tweezers. 2) Mount the valve seat assembly (with the 2 O-rings mounted) with a pair of snap ring pliers so that the static pressure part of the valve seat and character “A” on body can be in the proper position. 3) Hold the valve seat assembly by accessing it from the side opening to prevent it from coming apart. 4) Mount the diaphragm assembly. 5) Mount the bonnet which has the pressure regulating screw and spring installed to its body, and rotate it clockwise by holding the wrench flat with a wrench to connect it to the body. 6) Mount the regulator assembly on manifold block and hold it by tightening the 2 round screws with a Phillips head screwdriver.
Check item	—	1) Presence of the O-ring 2) Position of the static pressure part of the valve seat and character “A” on body. 3) Tightening torque of the round screw: 0.32 ± 0.03 N·cm
Disassembly/ Assembly procedure		 1) Mounted condition of the O-ring 2) Position of the static pressure part and the OUT passage

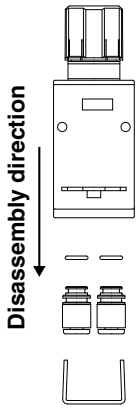
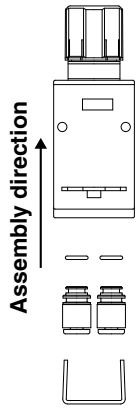
3. ARM11□B Regulator Block (Knob Position: Front Type)

(Wash and Replacement of the Gasket, Diaphragm, O-rings, Valve, and Valve Spring)

Tools	Phillips head screwdriver, Wrench (18 mm in width), Snap ring pliers, Tweezers	
Process	**Disassembly**	**Assembly**
Procedure	1) Loosen and remove the round head screws of regulator assembly with a Phillips head screwdriver to become the regulator assembly to be disconnected manually. 2) Rotate the bonnet counterclockwise by holding its width across flats with a wrench to disconnect. (The pressure regulating screw and spring are to remain mounted on the bonnet.) 3) Remove the diaphragm assembly manually. 4) Remove the valve seat assembly by holding it with a pair of snap ring pliers. 5) Remove the valve and valve spring.	1) Mount the valve spring and the valve with a pair of tweezers. 2) Mount the valve seat assembly (with the 2 O-rings mounted) with a pair of snap ring pliers so that the static pressure part of the valve seat and character “B” on body can be in the proper position. 3) Hold the valve seat assembly by accessing it from the side opening to prevent it from coming apart. 4) Mount the diaphragm assembly. 5) Mount the bonnet which has the pressure regulating screw and spring installed to its body, and rotate it clockwise by holding the wrench flat with a wrench to connect it to the body. 6) Mount the regulator assembly on manifold block and hold it by tightening the 2 round screws with a Phillips head screwdriver.
Check item	—	1) Presence of the O-ring 2) Position of the static pressure part of the valve seat and character “B” on body 3) Tightening torque of the round head screw: 0.32 ± 0.03 N·cm
Disassembly/ Assembly procedure	Rotate counterclockwise by holding the width across flat with a wrench to disconnect. 	Rotate clockwise by holding the width across flat with a wrench to connect.  1) Mounted condition of the O-ring 2) Position of the static pressure part and the OUT Passage

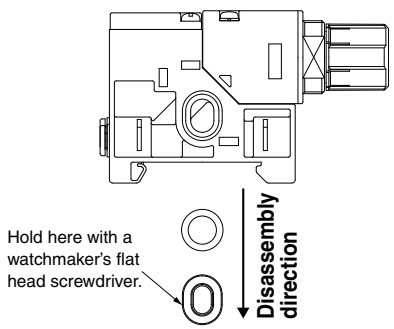
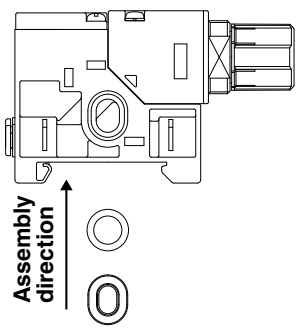
4. ARM10, 11 Regulator, Manifold Block

(Wash, Air Blowing and Replacement of the O-ring for the Fittings)

Tools	Watchmaker's flat head screwdriver	
Process	**Disassembly**	**Assembly**
Procedure	1) Remove the clip by holding it with a watchmaker's flat head screwdriver. 2) Pull the fitting assembly out manually.	1) Push the fitting assembly until it comes to a stop to mount. 2) Push the clip until it comes to a stop to mount.
Check item	—	1) Confirm the fitting assembly reaches the mounting end for it. 2) Confirm the clip reaches the mounting end for it.
Disassembly/ Assembly procedure		

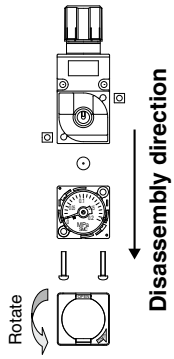
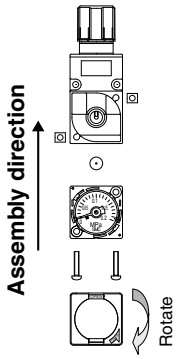
5. ARM11 Regulator Block

(Wash and Replacement of the O-ring for the Bushing)

Tools	Watchmaker's flat head screwdriver	
Process	**Disassembly**	**Assembly**
Procedure	1) Remove the bushing by holding it with a watchmaker's flat head screwdriver. 2) Remove the O-ring from the bushing.	1) Mount the O-ring to the bushing. 2) Push the bushing until it comes to a stop to mount.
Check item	—	1) Confirm the bushing reaches the mounting end for it.
Disassembly/ Assembly procedure		

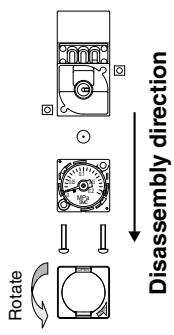
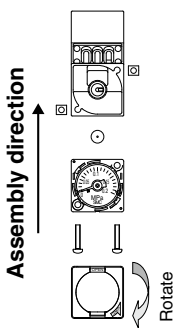
6. ARM10 Regulator

(Wash and Replacement of the O-ring for the Pressure Gauge)

Tools	Phillips head screwdriver	
Process	**Disassembly**	**Assembly**
Procedure	1) Remove the cover assembly by rotating it counterclockwise manually. 2) Loosen and remove the 2 round head screws with a Phillips head screwdriver. 3) Remove the pressure gauge assembly. 4) Remove the O-ring.	1) Mount the O-ring. 2) Mount the pressure gauge assembly. 3) Hold the pressure gauge assembly by tightening the 2 round head screws with a Phillips head screwdriver. 4) Mount the cover assembly by rotating clockwise manually. (Mind direction of cover and position of locating mark and detent.)
Check item	—	1) Presence of the O-ring 2) Tightening torque of the round head screw: 0.32 ± 0.03 N·cm
Disassembly/ Assembly procedure		

7. ARM11 Regulator Block

(Wash and Replacement of the O-ring for the Pressure Gauge)

Tools	Phillips head screwdriver	
Process	**Disassembly**	**Assembly**
Procedure	1) Loosen and remove the round head screws from the regulator assembly with a Phillips head screwdriver to become the regulator assembly to be disconnected. 2) Remove the cover assembly by rotating counterclockwise manually. 3) Remove the 2 round head screws from the pressure assembly with a Phillips head screwdriver. 4) Remove the pressure gauge assembly. 5) Remove the O-ring.	1) Mount the O-ring to the bushing. 2) Mount the pressure gauge assembly. 3) Hold the pressure gauge assembly by tightening the 2 round head screws with a Phillips head screwdriver. 4) Mount the cover assembly by rotating clockwise manually. (Pay attention to the cover direction, alignment mark and detent.) 5) Mount the regulator assembly to the manifold block and hold it by tightening the 2 round screws with a Phillips head screwdriver.
Check item	—	1) Presence of the O-ring 2) Tightening torque of the round head screw: 0.32 ± 0.03 N·cm
Disassembly/ Assembly procedure		

Replacement Procedure
Air Preparation Equipment
Industrial Filters

Air Preparation Equipment

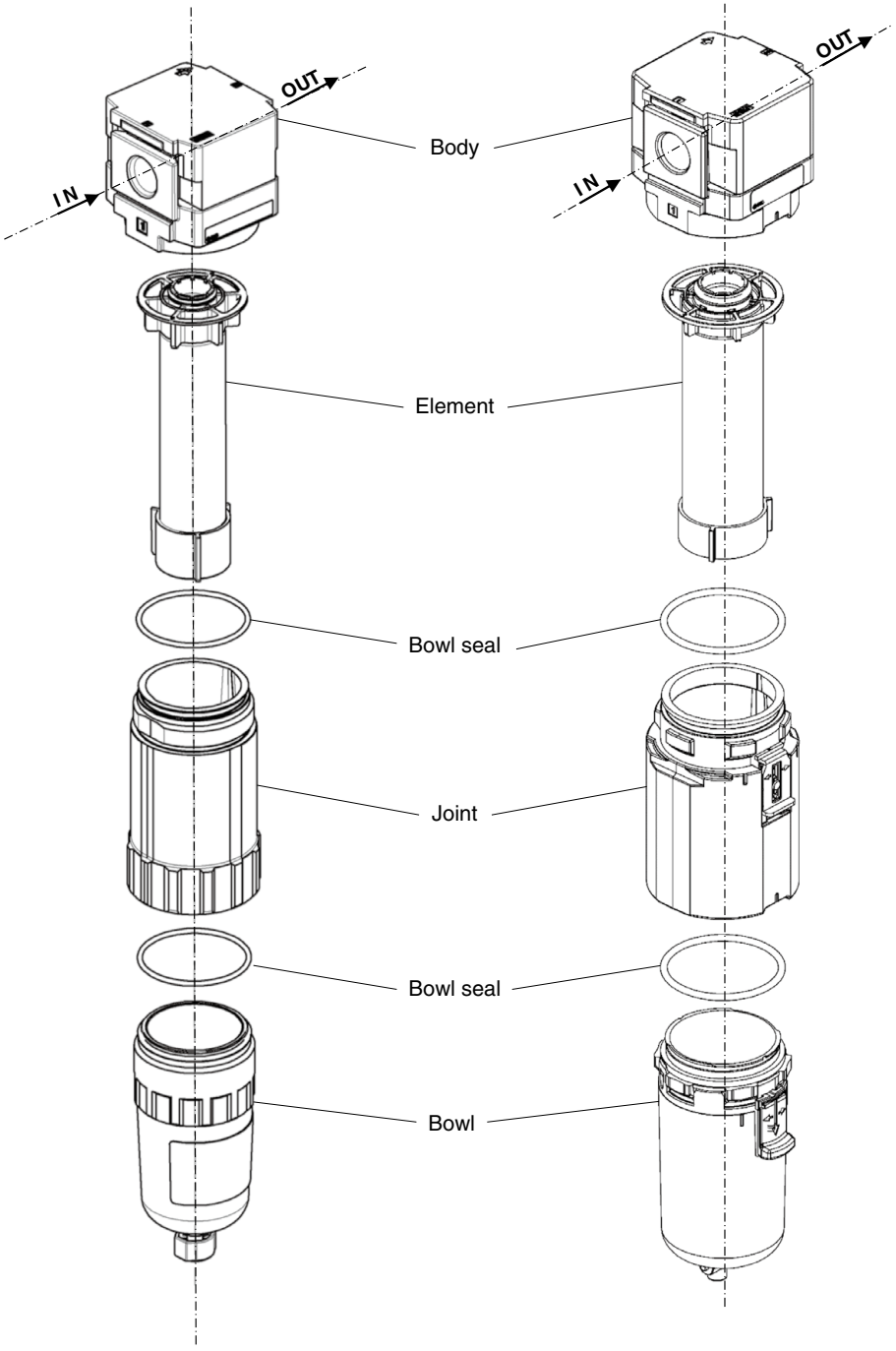
AFF-D	Line Filter	**p. 719**
AM-D	Mist Separator	**p. 719**
AMD-D	Micro Mist Separator	**p. 719**
AMK-D	Activated Carbon Filter	**p. 730**
AFF□D	Main Line Filter	**p. 741**
AM□D	Mist Separator	**p. 741**
AMD□D	Micro Mist Separator	**p. 741**

Industrial Filters

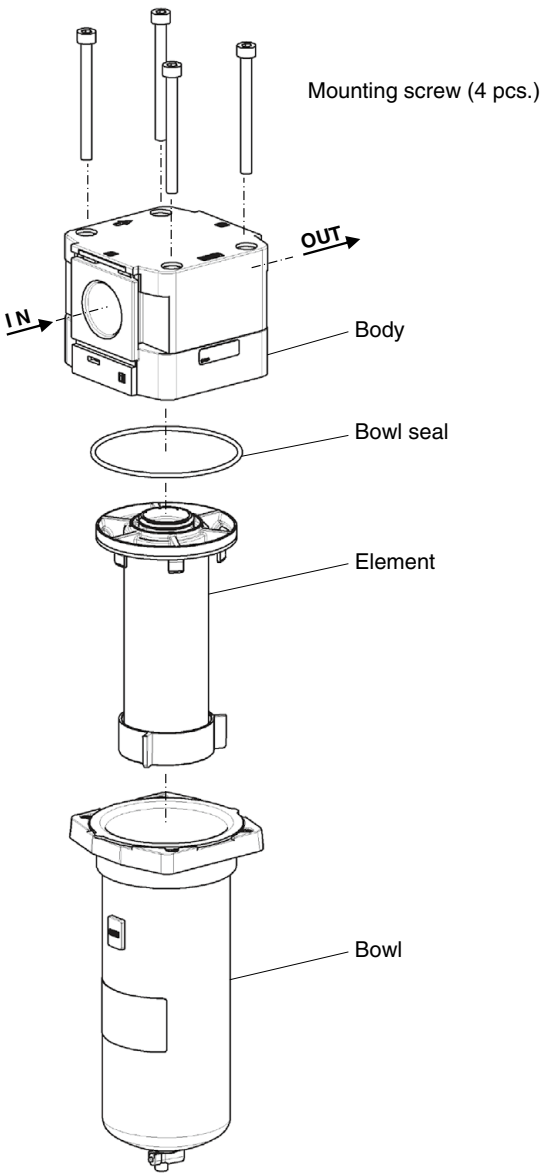
FGD	Vessel Series	**p. 743**
FGE	Vessel Series	**p. 744**
FGET	Vessel Series	**p. 746**
FGG	Vessel Series	**p. 749**
FGA	Vessel Series	**p. 751**
FGB (Discontinued products)	Vessel Series	**p. 755**
FGC	Vessel Series	**p. 759**
FGF	Bag Filter	**p. 761**
FGH	High Precision Filter for Liquids	**p. 763**
FQ1	Quick Change Filter	**p. 765**
FN1/FN4	Low Maintenance Filter	**p. 766**

1) AFF/AM/AMD20

2) AFF/AM/AMD30
AFF/AM/AMD40



3) AFF/AM/AMD50
AFF/AM/AMD60

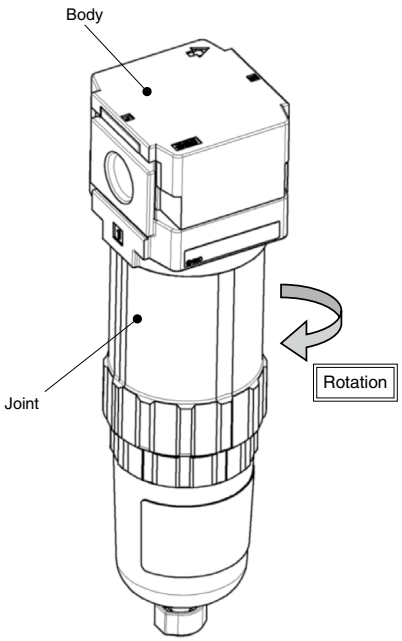


⚠Warning
Before replacement, ensure that the regulator is not pressurized.
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Element — Disassembly [AFF/AM/AMD20]

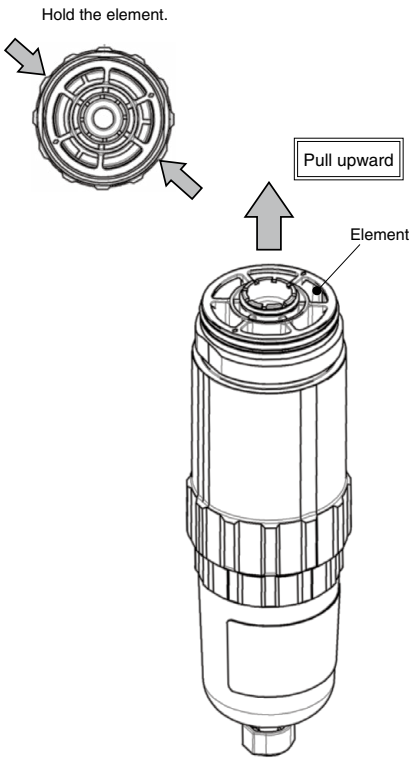
Step 1

Remove the joint from the product.



Step 2

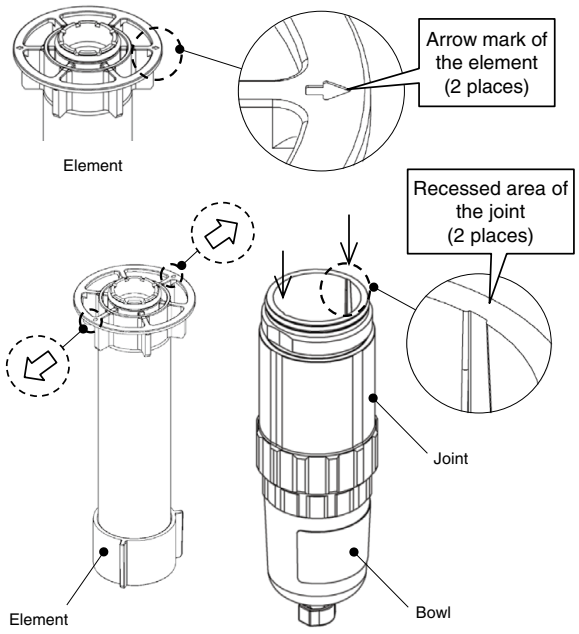
Remove the element by the holding part of the element (shown by the arrows below).



2. Element — Assembly [AFF/AM/AMD20]

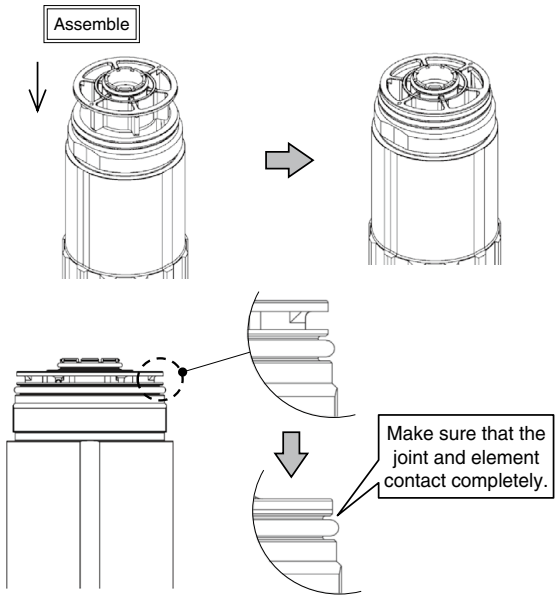
Step 1

Align 2 arrow marks and 2 recessed areas of the joint.



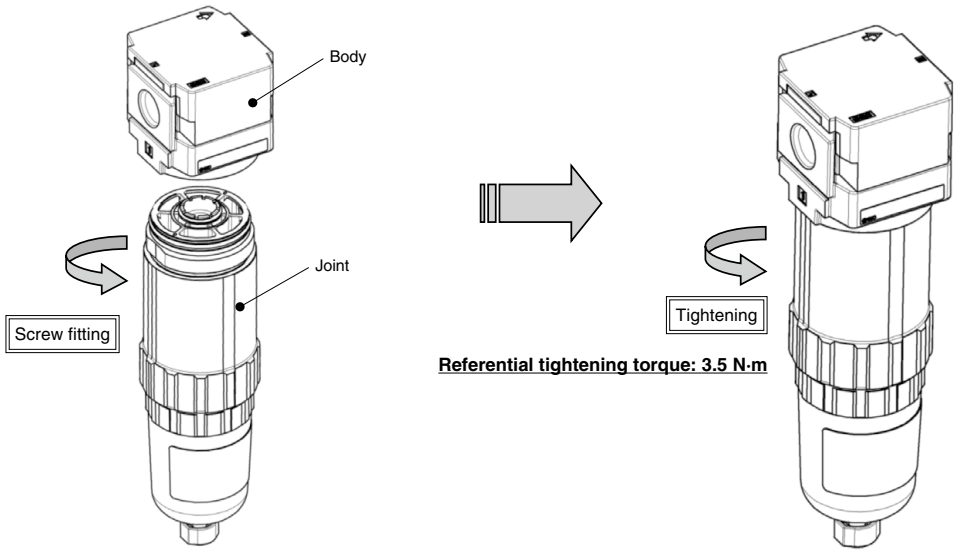
Step 2

Press the element downward until the element and joint come into contact with each other completely. If they are forced to be inserted without aligning, the element will break.



Step 3

Screw the bowl into the product.
Tighten it referring to the specified torque below.

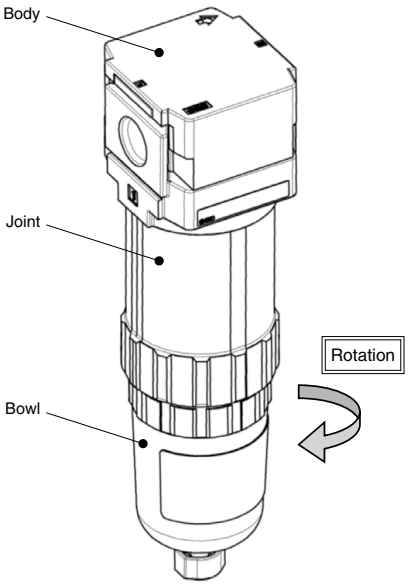


Referential tightening torque: 3.5 N·m

3. Bowl — Disassembly [AFF/AM/AMD20]

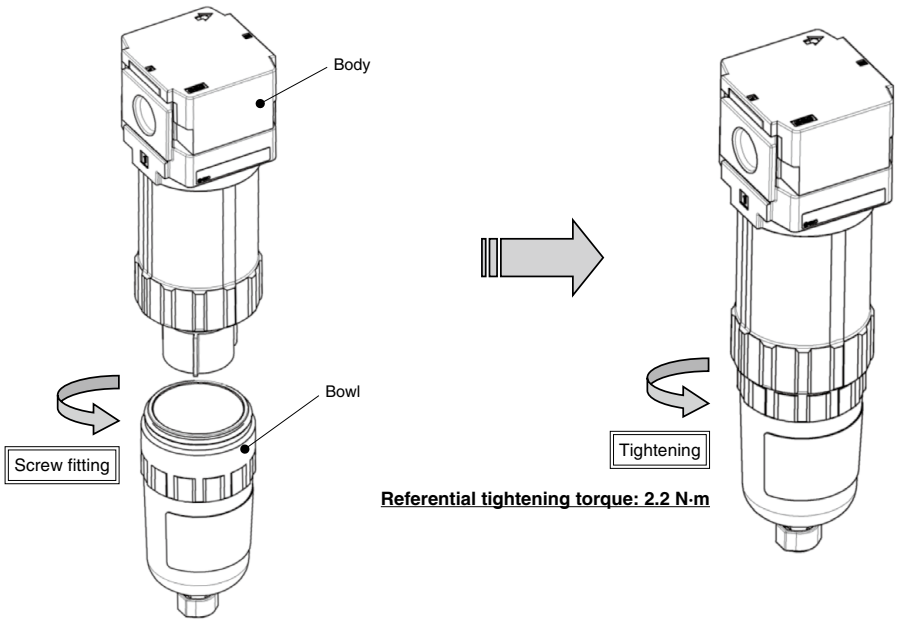
Step 1

Remove the bowl from the product.



Step 2

Screw the bowl assembly into the product.
Tighten it referring to the specified torque below.

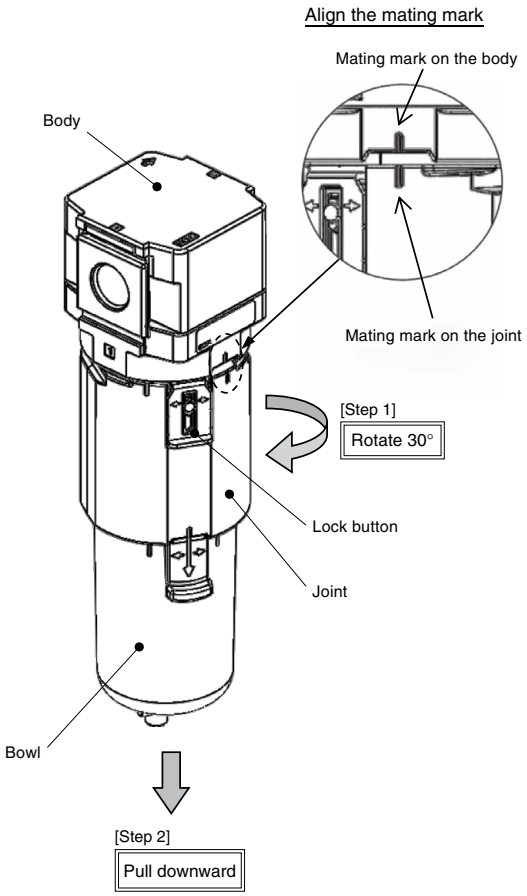


Referential tightening torque: 2.2 N·m

4. Element — Disassembly [AFF/AM/AMD30, 40]

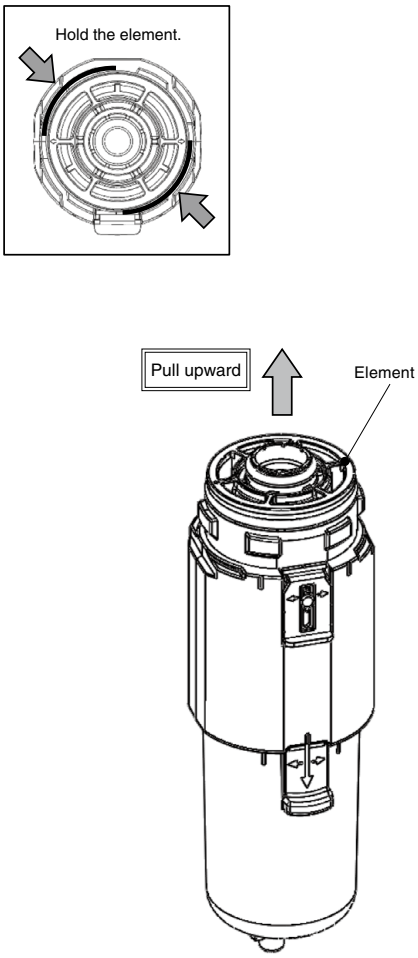
Step 1

To remove the joint from the body, rotate for approx. 30 degrees with the lock button held down. Align the mating mark of the body and joint and pull down the bowl assembly to remove it.



Step 2

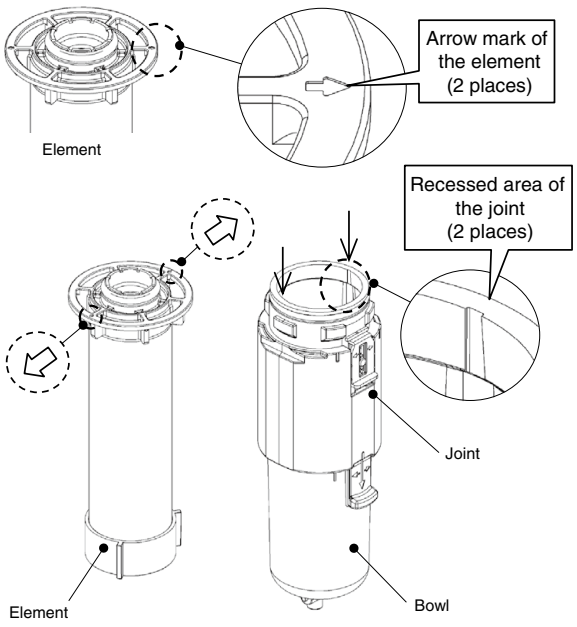
Hold the element as shown below and pull upward to remove the element.



5. Element — Assembly [AFF/AM/AMD30, 40]

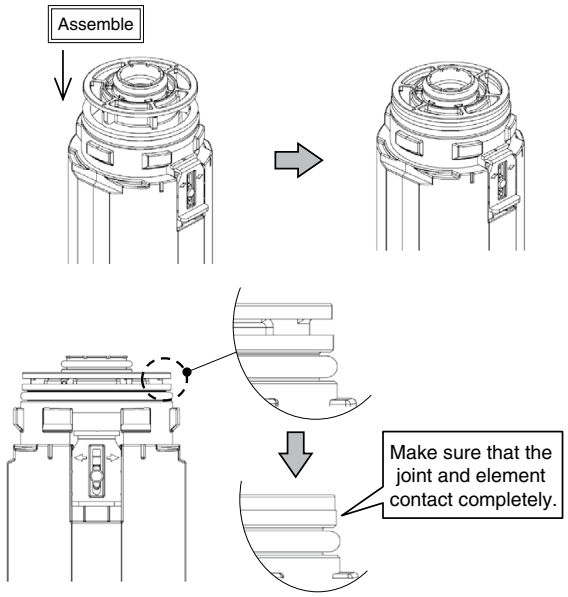
Step 1

Align 2 arrow marks and 2 recessed areas of the joint.



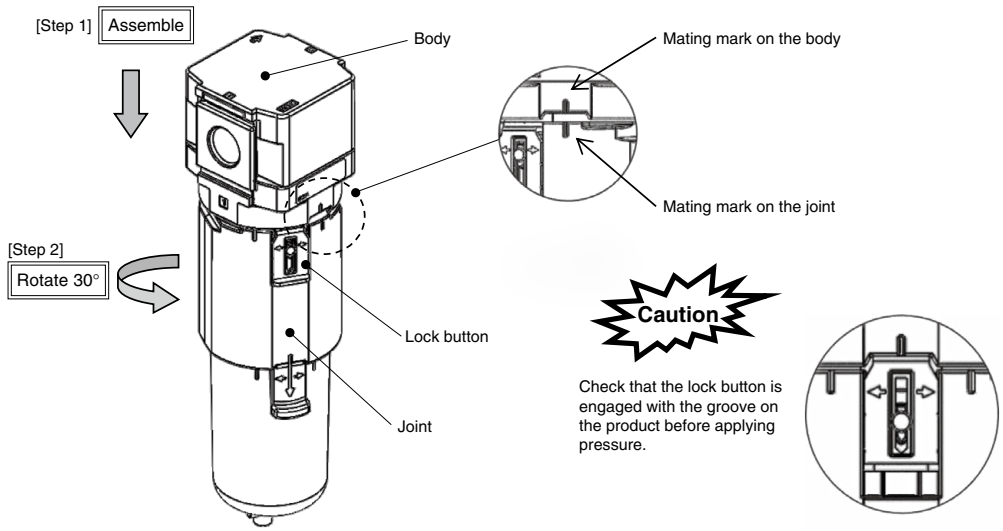
Step 2

Press the element downward until the element and joint come into contact with each other completely. If they are forced to be inserted without aligning, the element will break.



Step 3

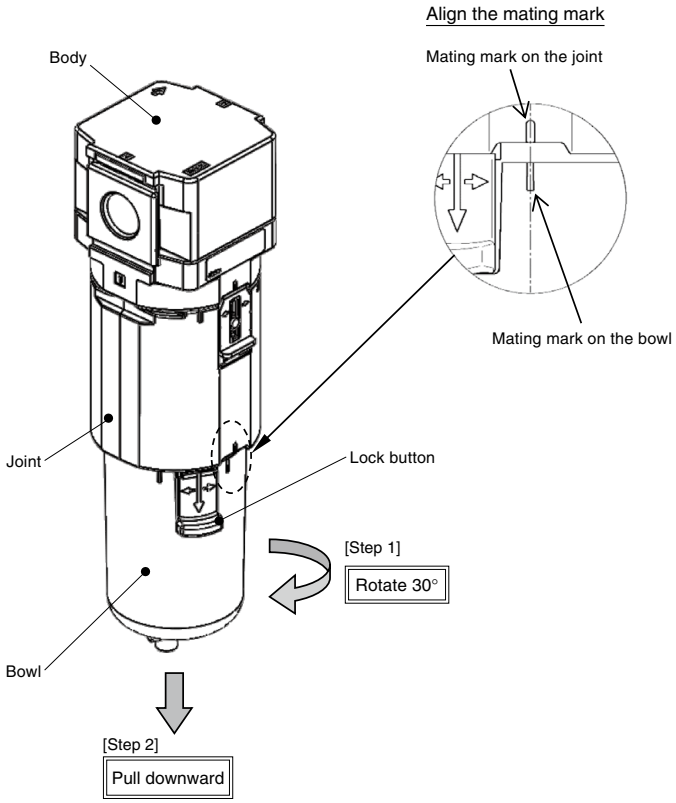
While the lock button is held down, mount the body and joint where their marks meet. Rotate the joint until the lock button meets the body groove (approx. 30 degrees).



6. Bowl — Disassembly [AFF/AM/AMD30, 40]

Step 1

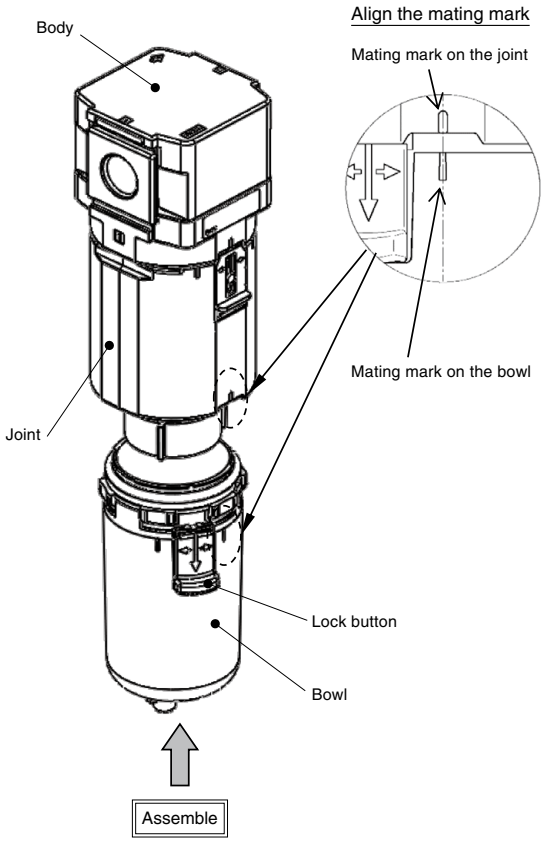
To remove the bowl from the product, rotate for approx. 30 degrees while the lock button is held down. Align the mating mark of the joint and bowl and pull the bowl down to remove it.



7. Bowl — Assembly [AFF/AM/AMD30, 40]

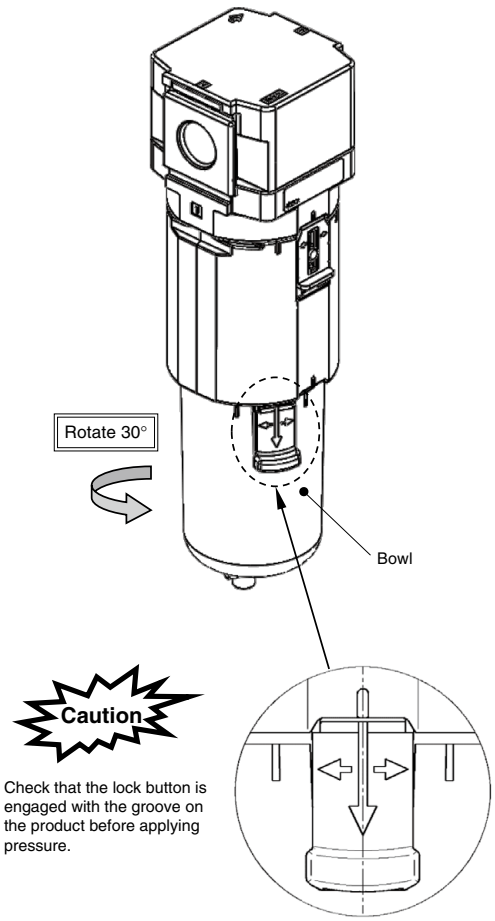
Step 1

Mount the bowl at the position where the mating mark of the joint and bowl assembly meet.



Step 2

While the lock button is held down, rotate the bowl assembly so that the lock button meets the groove of the joint (approx. 30 degrees).



8. Replacement of the Bowl [AFF/AM/AMD50, 60]

Step 1

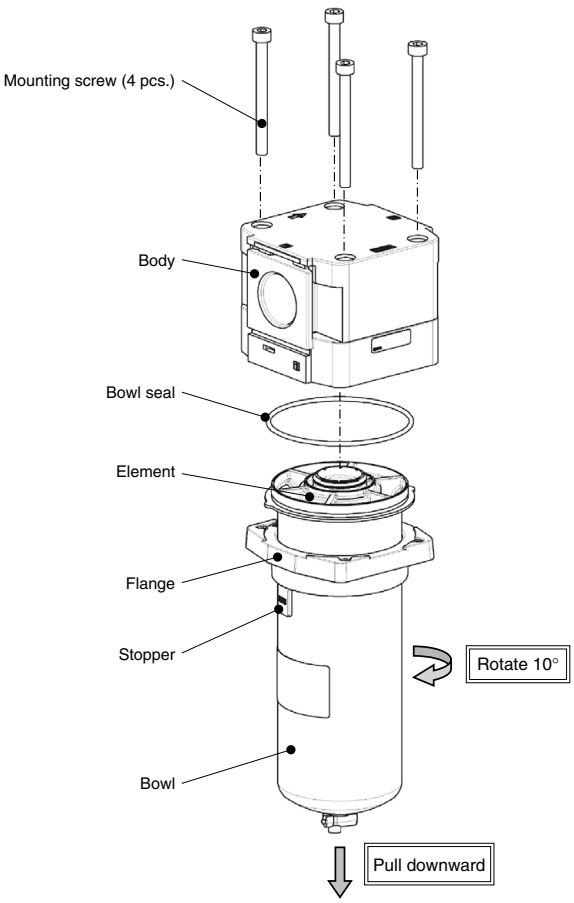
Remove the bowl from the product.
Remove four mounting screws while supporting the flange by hand, and lower the flange up to the stopper.
(Hexagon wrench key Nominal size: 5)

Step 2

Rotate bowl by around 10° in the arrow direction, then remove the bowl from the body.

Step 3

Remove the bowl seal and element.



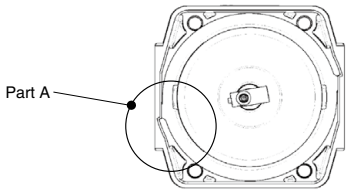
Step 4

Install the element and bowl seal in the bowl.

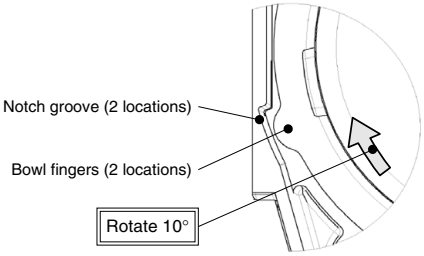
Step 5

Insert the fingers (2 locations) of the bowl into the notches (2 locations) of the body by aligning them with each other, and turn the bowl by around 10° in the arrow direction. Engage both fingers (2 locations) of the bowl with the body.

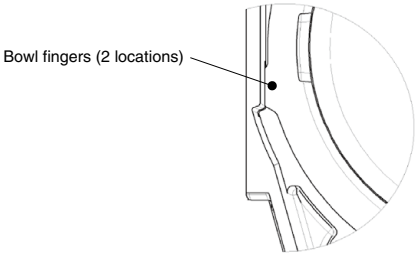
Engagement condition of the finger part of bowl



Align the notch groove with the finger of the bowl (Part A).



Engage the fingers of the bowl with the body (Part A).



Step 6

Install the flange to the body, temporarily tighten the 4 mounting screws, and then tighten them diagonally and evenly to secure the flange.
(Hexagon wrench key: Nominal size: 5)

Tightening torque:

AM50	3.5 ± 0.3 N·m
AM60	

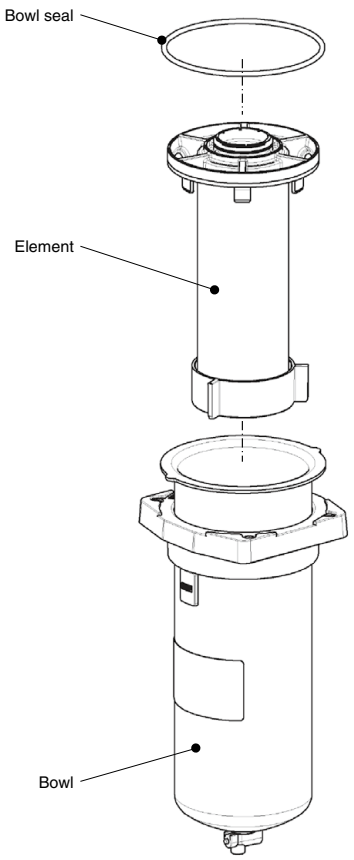
9. Replacement of the Element [AFF/AM/AMD50, 60]

Step 1

Remove the bowl by referring to the section [8. Replacement of the Bowl] (P.728).

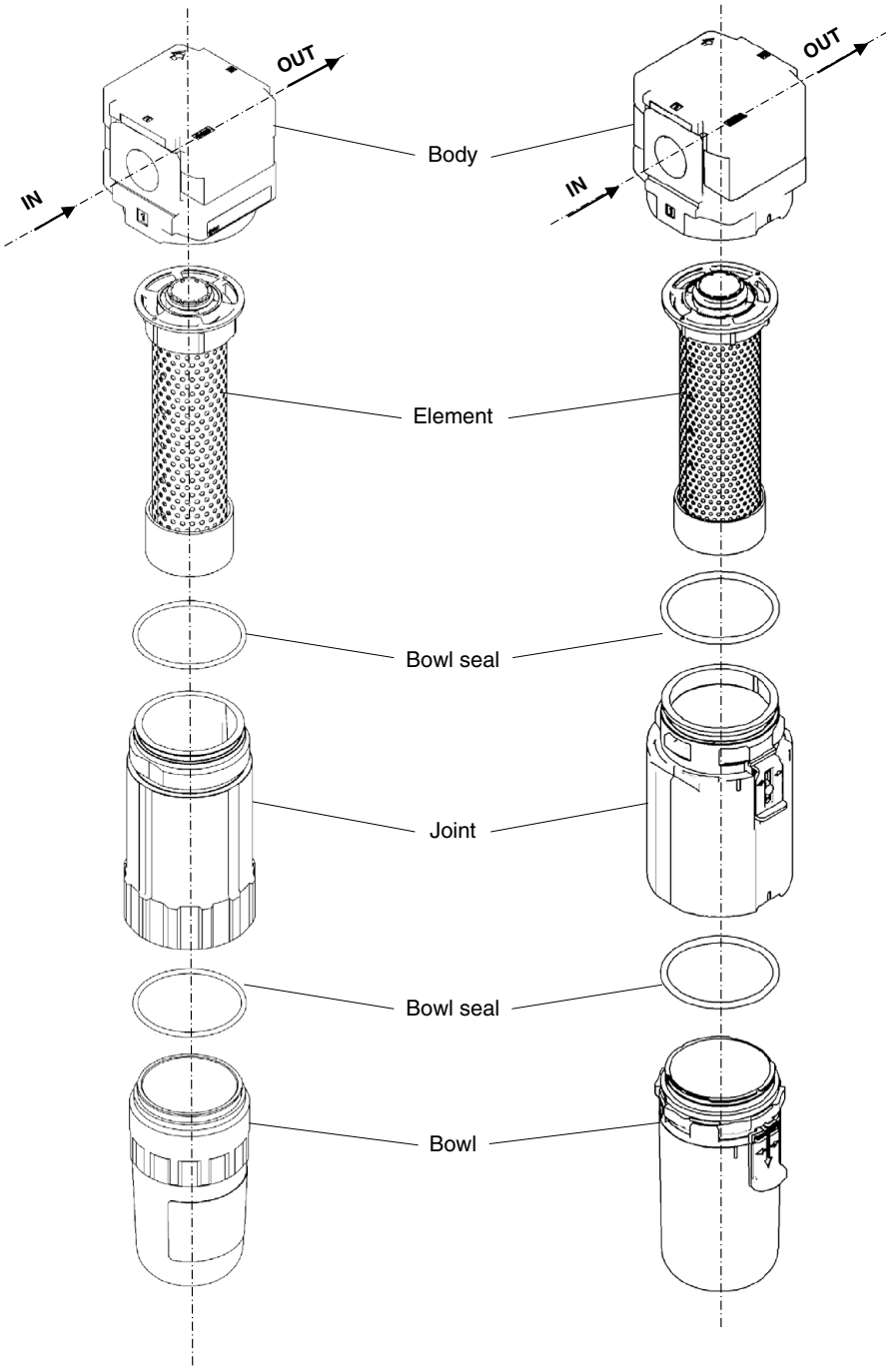
Step 2

Install the replacing element and bowl seal in the bowl. Mount the bowl by referring to the section [8. Replacement of the Bowl] (P.728).

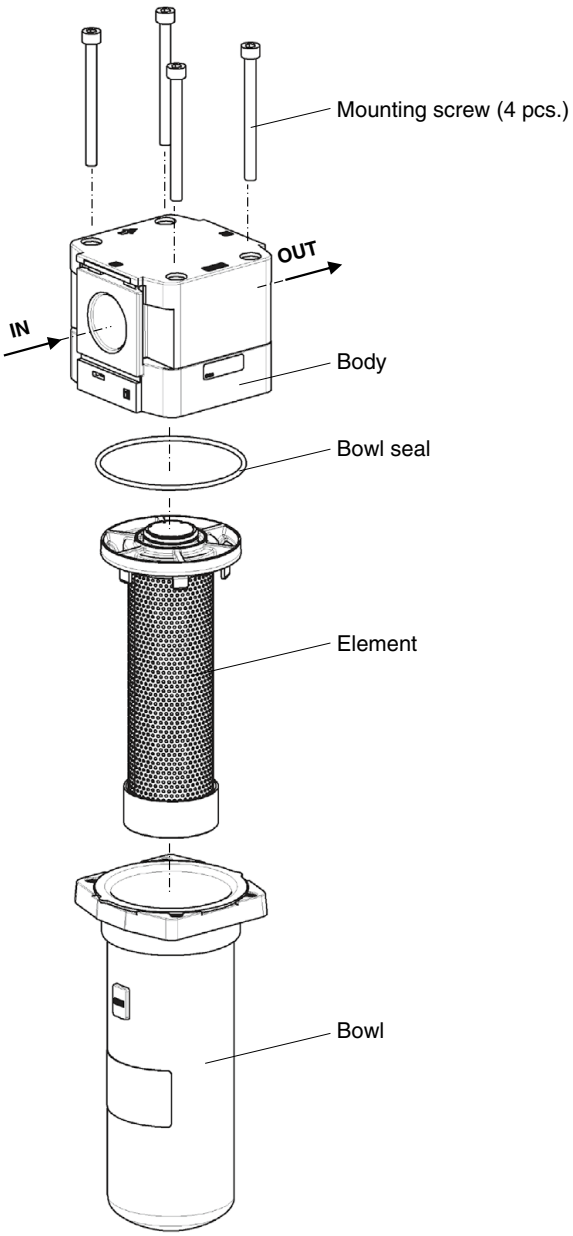


1) AMK20

2) AMK30, AMK40



3) AMK50, AMK60

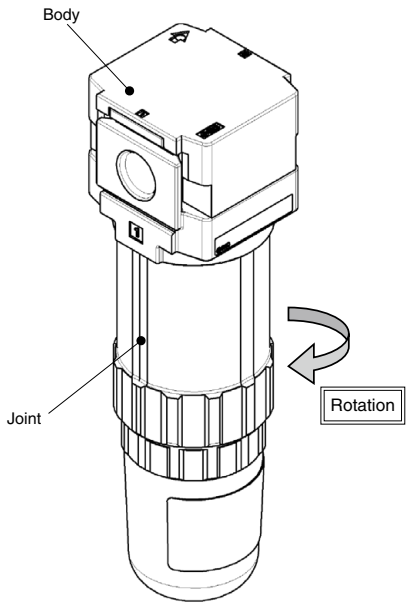


⚠Warning
Before replacement, ensure that the regulator is not pressurized.
After replacement, ensure that the specified function is satisfied and that no external leakage is found before resuming operation.

1. Element — Disassembly [AMK20]

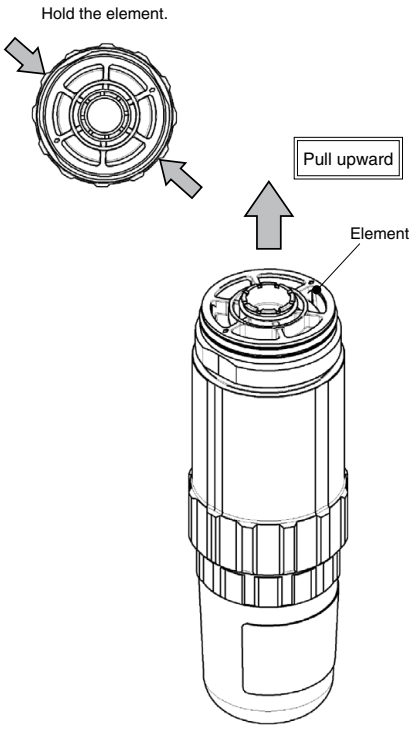
Step 1

Remove the joint from the product.



Step 2

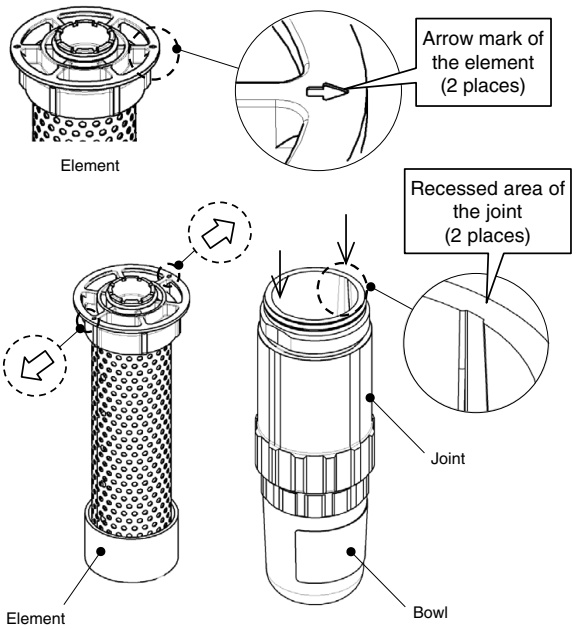
Remove the element by the holding part of the element (shown by the arrows below).



2. Element — Assembly [AMK20]

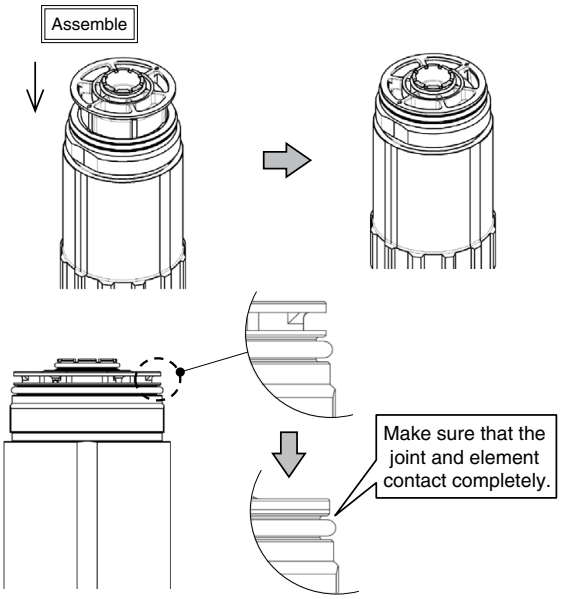
Step 1

Align 2 arrow marks and 2 recessed areas of the joint.



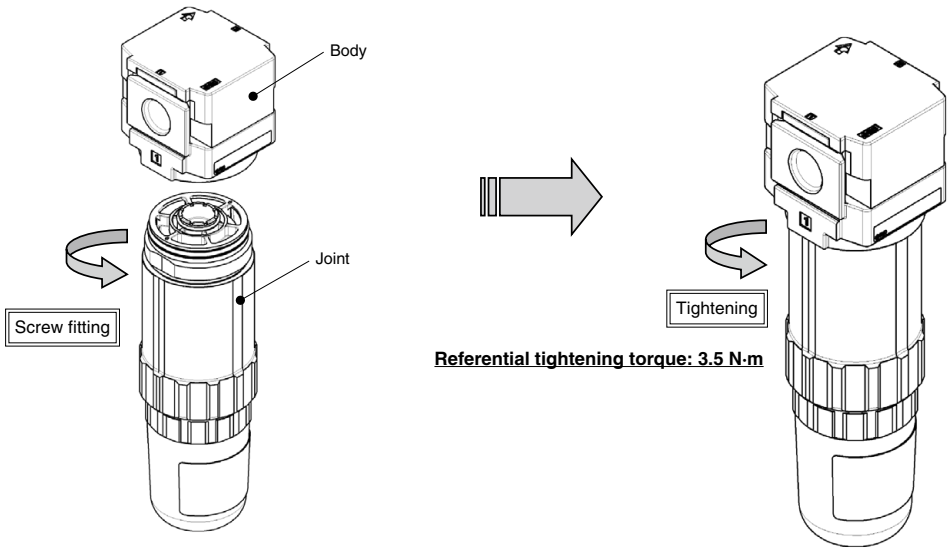
Step 2

Press the element downward until the element and joint come into contact with each other completely. If they are forced to be inserted without aligning, the element will break.



Step 3

Screw the bowl into the product.
Tighten it referring to the specified torque below.

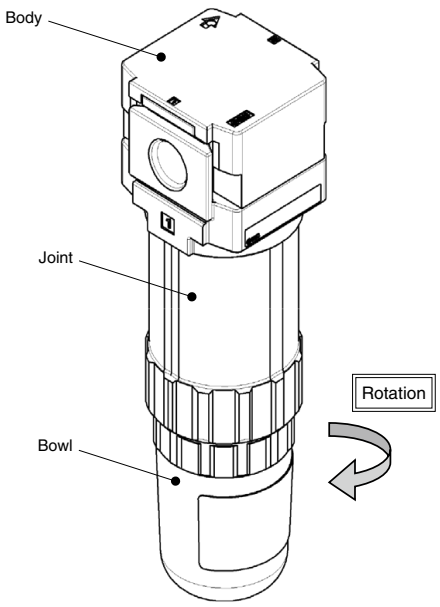


Referential tightening torque: 3.5 N·m

3. Bowl Assembly — Disassembly [AMK20]

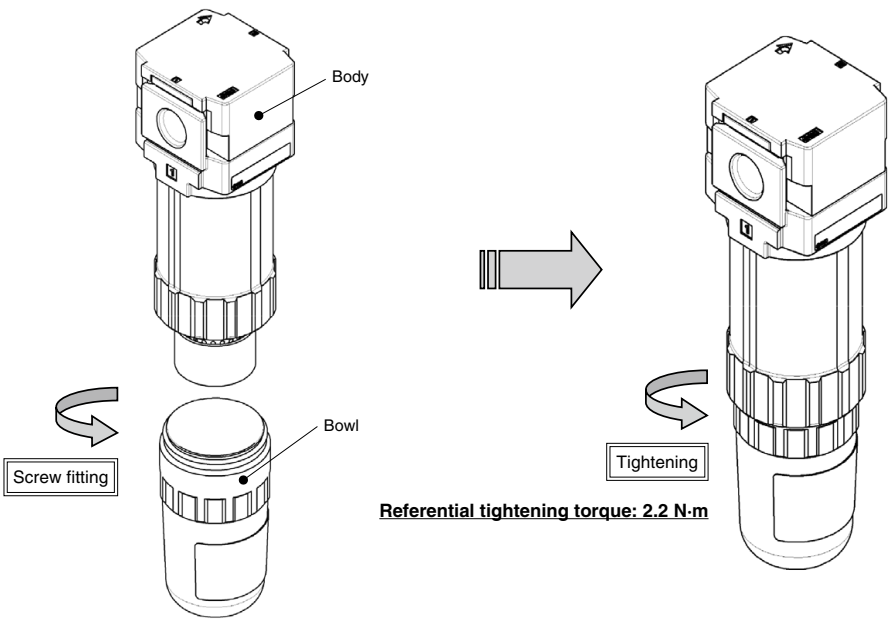
Step 1

Remove the bowl from the product.



Step 2

Screw the bowl into the product.
Tighten it referring to the specified torque below.

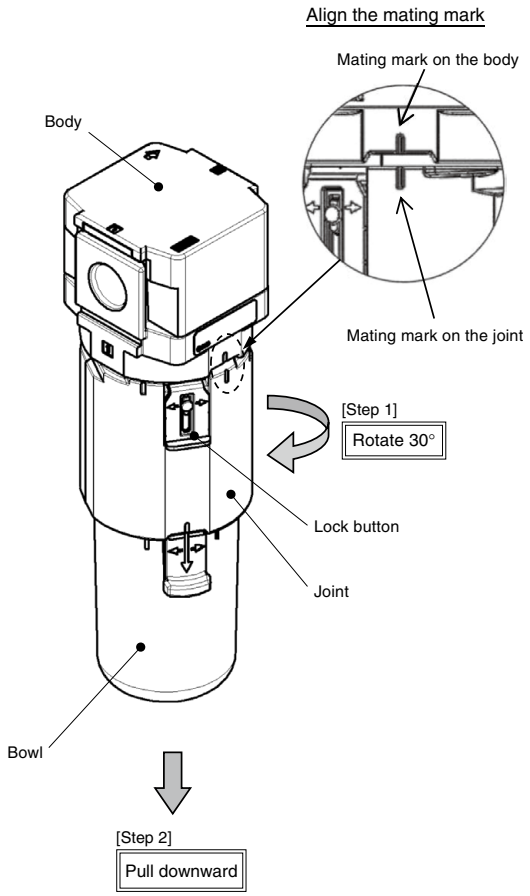


Referential tightening torque: 2.2 N·m

4. Element — Disassembly [AMK30, AMK40]

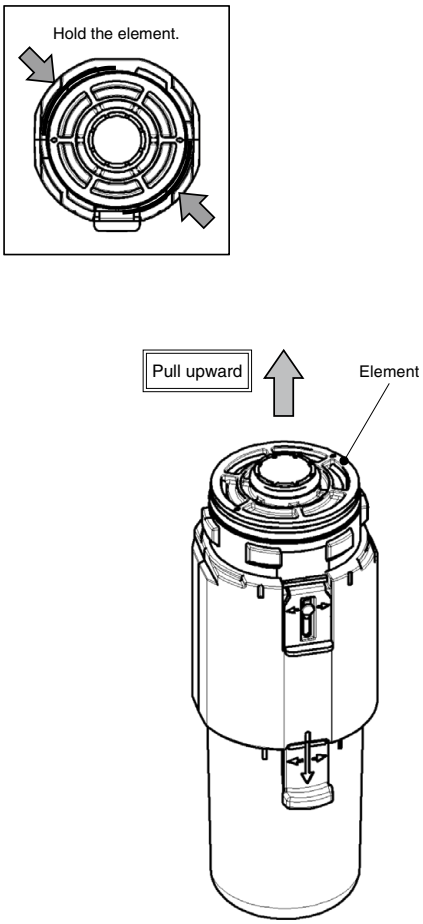
Step 1

To remove the joint from the body, rotate for approx. 30 degrees with the lock button held down. Align the mating mark of the body and joint and pull down the bowl assembly to remove it.



Step 2

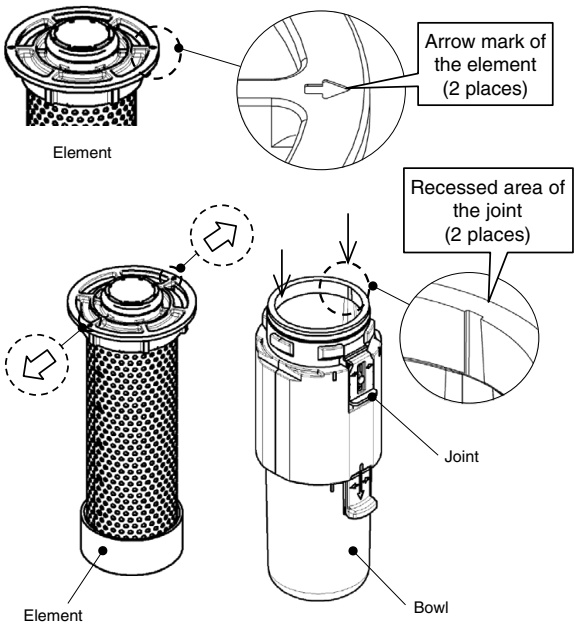
Hold the element as shown below and pull upward to remove the element.



5. Element — Assembly [AMK30, AMK40]

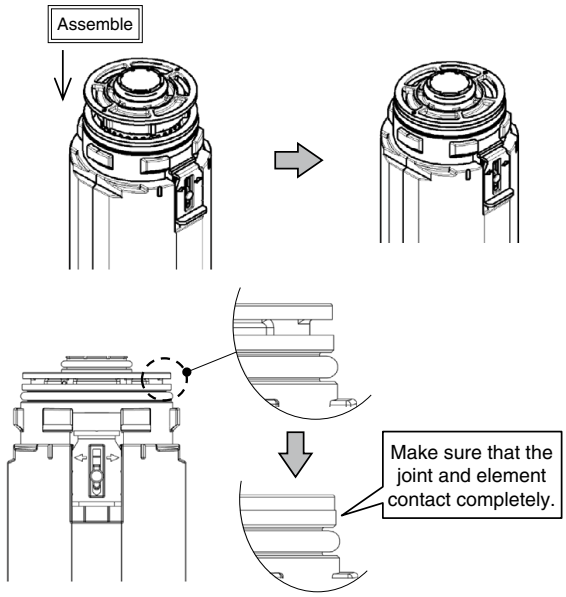
Step 1

Align 2 arrow marks and 2 recessed areas of the joint.



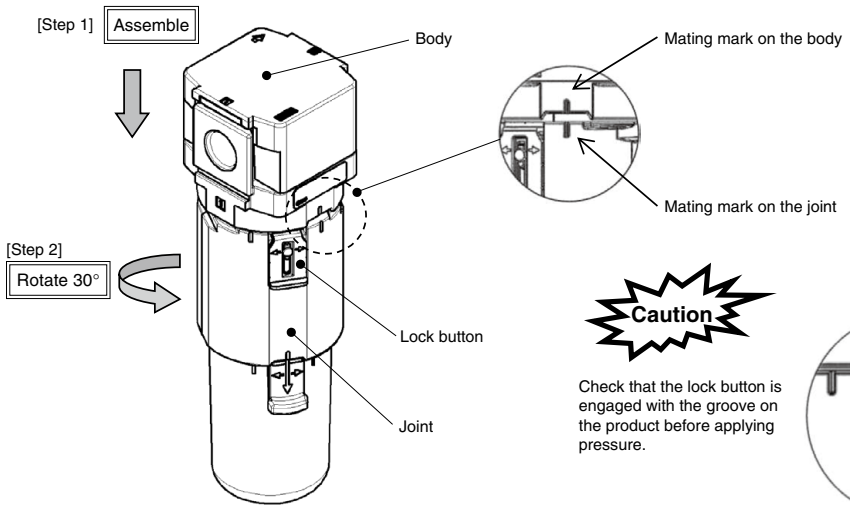
Step 2

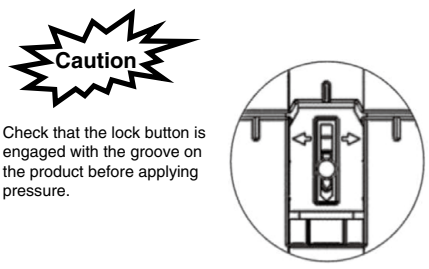
Press the element downward until the element and joint come into contact with each other completely. If they are forced to be inserted without aligning, the element will break.



Step 3

While the lock button is held down, mount the body and joint where their marks meet. Rotate the joint until the lock button meets the body groove (approx. 30 degrees).

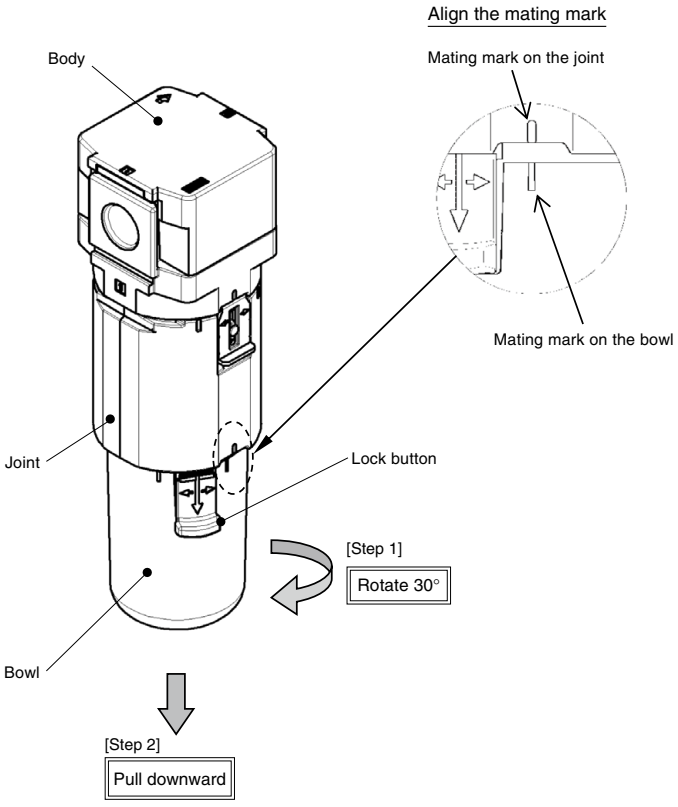




6. Bowl — Disassembly [AMK30, AMK40]

Step 1

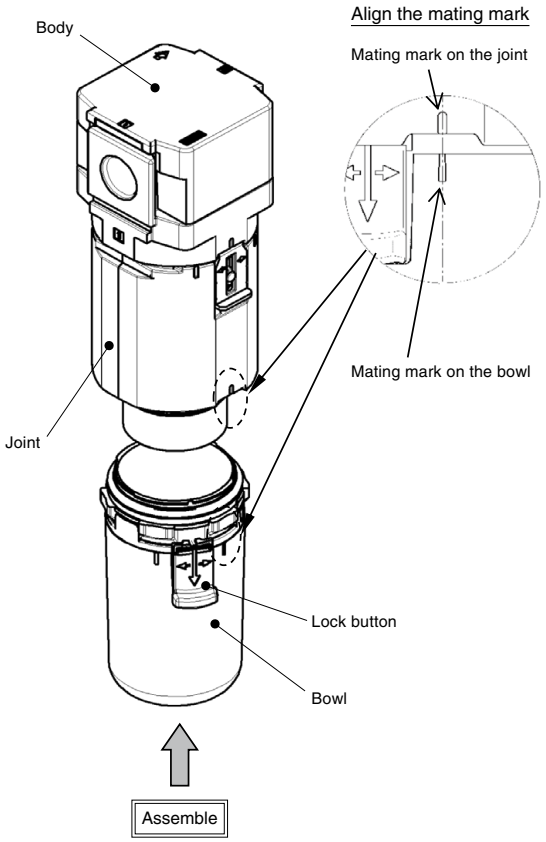
To remove the bowl from the product, rotate for approx. 30 degrees while the lock button is held down. Align the mating mark of the joint and bowl assembly and pull the bowl assembly down to remove it.



7. Bowl — Assembly [AMK30, AMK40]

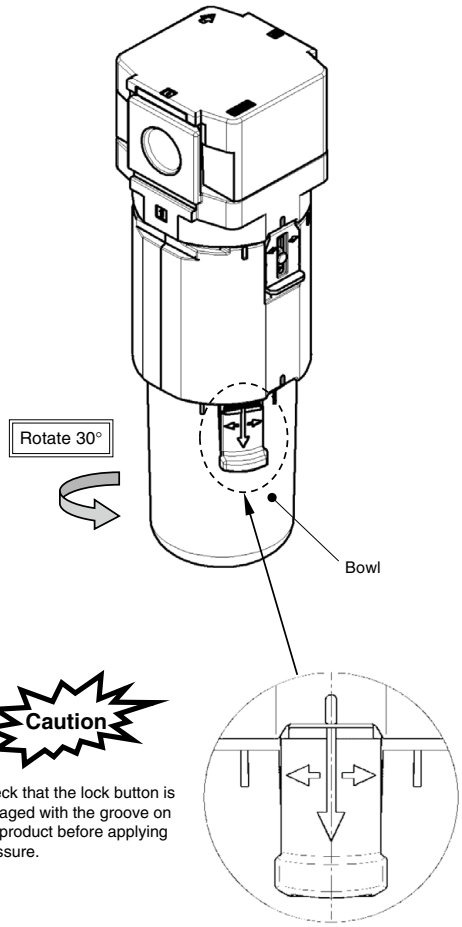
Step 1

Mount the bowl assembly at the position where the mating mark of the joint and bowl assembly meet.



Step 2

While the lock button is held down, rotate the bowl assembly so that the lock button meets the groove of the joint (approx. 30 degrees).



8. Replacement of the Bowl [AMK50, 60]

Step 1

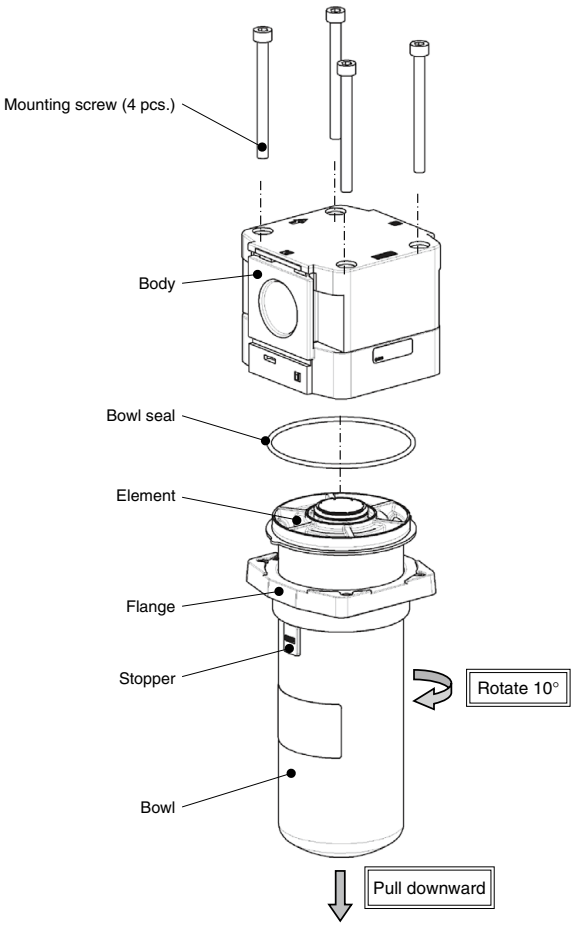
Remove the bowl from the product.
Remove the 4 mounting screws while supporting the flange by hand, and lower the flange up to the stopper.
(Hexagon wrench key Nominal size: 5)

Step 2

Rotate the bowl by around 10° in the arrow direction, then remove the bowl assembly from the body.

Step 3

Remove the bowl seal and element.



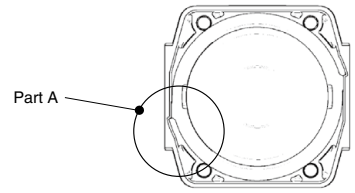
Step 4

Install the element and bowl seal in the bowl.

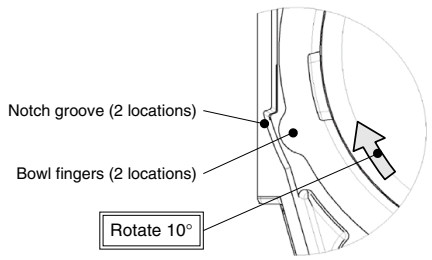
Step 5

Insert the fingers (2 locations) of the bowl into the notches (2 locations) of the body by aligning them with each other, and turn the bowl by around 10° in the arrow direction. Engage both fingers (2 locations) of the bowl with the body.

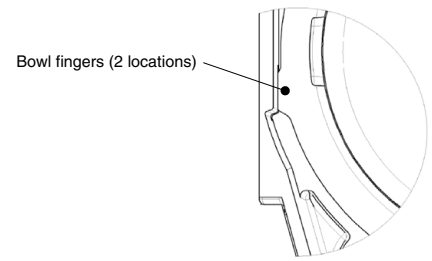
Engagement condition of the finger part of bowl



Align the notch groove with the finger of the bowl (Part A).



Engage the fingers of the bowl with the body (Part A).



Step 6

Install the flange to the body, temporarily tighten four mounting screws, and then tighten them diagonally and evenly to secure the flange.

Tightening torque:

AMK50	3.5 ± 0.3 N·m
AMK60	

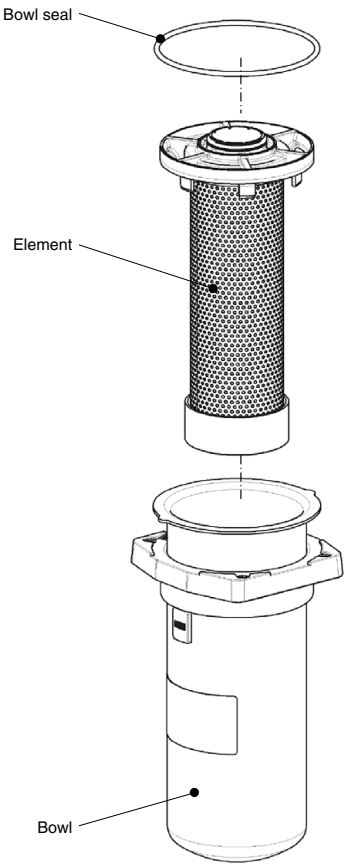
9. Replacement of the Element [AMK50, 60]

Step 1

Remove the bowl by referring to the section [8. Replacement of the Bowl] (P.739).

Step 2

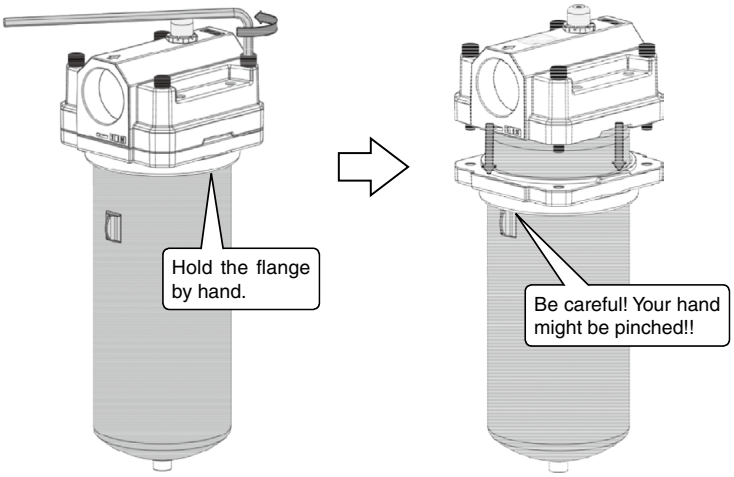
Install the replacing element and bowl seal in the bowl. Mount the bowl by referring to the section [8. Replacement of the Bowl].



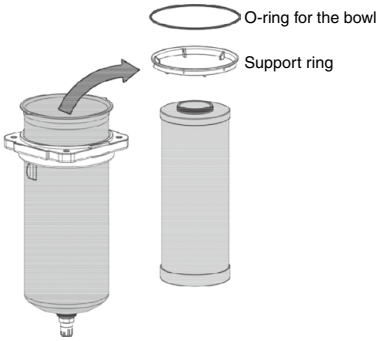
⚠Warning
Be sure to set the pressure to zero before work.

1. Element Replacement

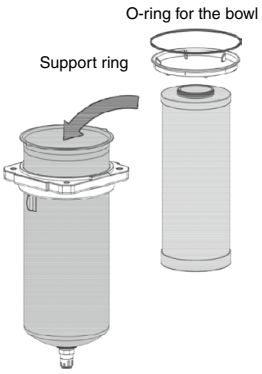
1-1. Remove the bowl from the body.
1-2. Loosen the hexagon socket head cap screws with a hexagon wrench key while holding the flange by hand.
After loosening all the bolts, lower the flange to the stopper slowly.
In this operation, fingers should not be pinched between the flange and the stopper.



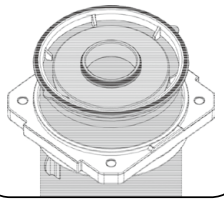
1-3. When the bowl is rotated in the direction shown by the arrow below, by approx. 10 degrees, the bowl is removed from the body.
At this time, be careful not to drop the bowl.
* The O-ring for bowl can easily fall off, so replacement should be performed while the bowl is held upright.
1-4. Remove the used element and the element O-ring.
In this operation, remove the support ring to make the replacement easier.



1-5. Insert an element (new) into the bowl and mount an O-ring (new) for the bowl.
If the support ring was removed, mount the support ring before the O-ring for bowl.
* Ensure that the element inserting direction is correct.
1-6. Mount the bowl to the body.

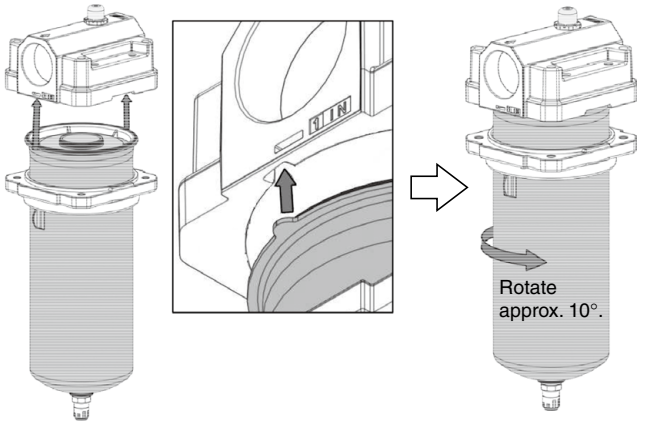


Point
Make sure that the O-ring for the element is facing upward.

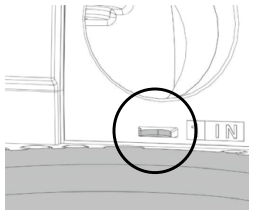


1-7. Insert the bowl locating tabs (2 parts) into the slots (2 parts) of the body, and rotate the bowl in the direction shown by the arrow below by approx. 10 degrees.

∗ Check that the tabs of the bowl are visible from the square opening at the lower part of the piping port.

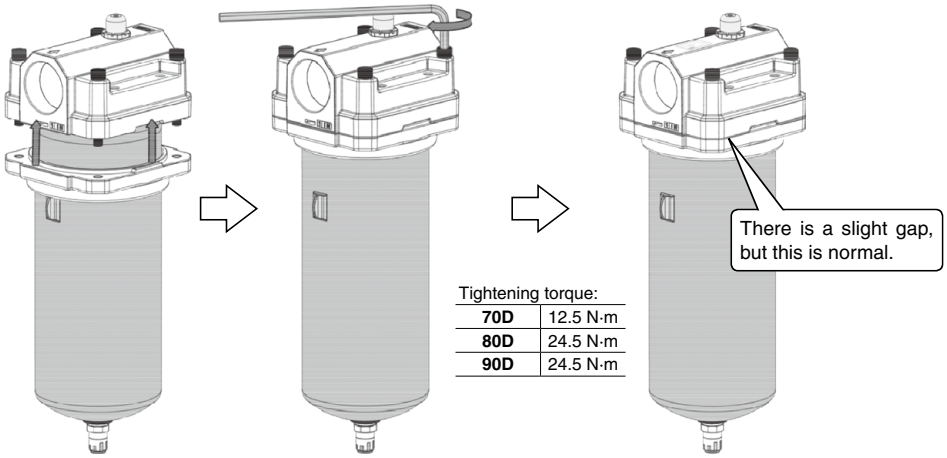


Point



Check that the tabs of the bowl are visible from the square opening (IN side and OUT side).

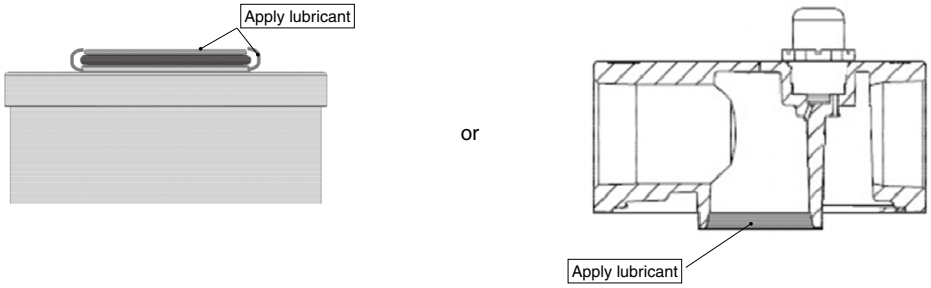
1-8. Pull up the flange and tighten the hexagon socket head cap screws with a hexagon wrench.
Tightening torque is 12.5 N·m for 70D, and 24.5 N·m for 80D and 90D.
Although there will be a slight gap between the body and flange even after tightening with the tightening torque above, this is normal.



Tightening torque:	
70D	12.5 N·m
80D	24.5 N·m
90D	24.5 N·m

[When it is difficult to insert the new element into the body.]

Please apply lubricant to the connection (body) of the O-ring for the element.
At this time, pay attention that lubricant is not stuck to the element surface and internal surface of the bowl and body (parts other than the element connection). Select the lubricant which is applicable to the user application.
O-ring material···NBR, initial lubricant···White Vaseline



1. Removal of the Element (See Fig. 1)

1-1. Stop the operation.

1-2. Check the following before maintenance.

⚠Caution

· Confirm that the pressure of the system in which the filter is installed is zero.

· When using the product at a high temperature, be sure to check that the surface temperature of the filter container is not more than 40°C before starting operation in order to prevent burns.

1-3. After closing the piping valve on the IN side of the filter, close the piping valve on the OUT side of the filter.

1-4. Discharge the residual fluid inside from the drain port.

1-5. Loosen the nut and remove the element.

1-6. Move the case downward to remove it.

1-7. Remove the element.

∗ When 2 elements (250 mm) are used, be careful not to lose the joint which seals the elements. It will be reused later.

1-8. Clean the inside of the case, gasket, seals and plug with a clean operation fluid or solution.

2. Mounting of the Element (See Fig. 1)

2-1. Assemble in the reverse order of [1] Removal of the Element.

2-2. Replace any deteriorated or swollen gasket or seals with new ones.

2-3. Put the tension bolt through the hole of the element, and insert the element into the case.

[When 2 elements (250 mm) are used.]

∗ When inserting the element, do not drop the element until the lower end reaches the element guide.

∗ Insert the joint between the elements.

2-4. Align the tension bolt with the center hole of the cover, and insert the case, in which the element has been inserted, into the cover.

2-5. Push the case from the bottom and tighten the nut from the top of the cover with tightening torque below.

(Control the torque to avoid leakage.)

∗ Tightening torque control value: FGDT/F 25 N·m, FGDC/E 15 N·m

3. Restart the Operation

3-1. After the replacement of the element, check the parts are assembled correctly before restarting operation. In case of fluid leakage, stop the operation immediately. Check the sealing condition and take corrective actions.

3-2. When supplying pressure by starting the pump, open the relief port (hexagon bolt) to discharge air. After the air is released, close the air exhaust port (hexagon bolt) and start the operation.

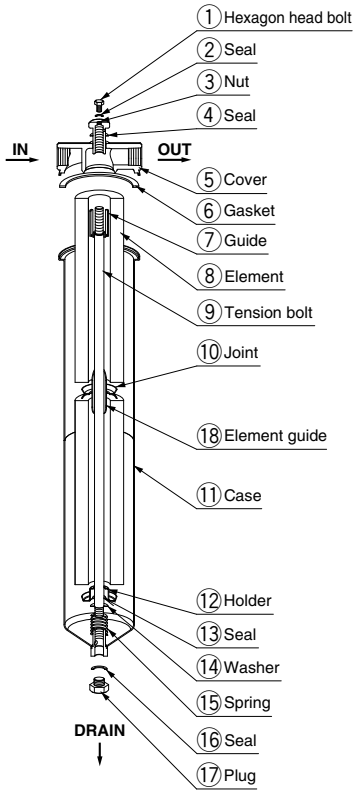


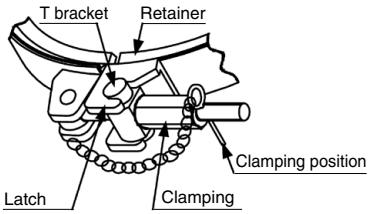
Figure 1 Parts descriptions and functions

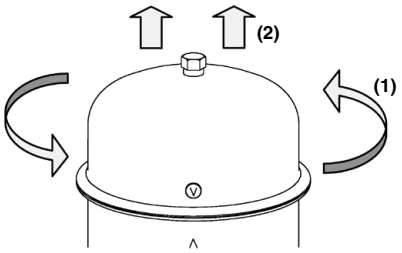
(Figure shows the product with the 2 FGD□B elements.)

1. Removal of the Cover

1-1. Stop the operation.
1-2. Close the valve in order of INLET, then, OUTLET.
1-3. Zeroes the pressure in the filter.
1-4. Open the drain valve for inlet and outlet to discharge all fluid inside.
1-5. Pull out the V-band clamping position check pin.
1-6. Loosen the V-band tightening nut and remove the latch. Then, remove the cover and O-ring for checking,
1-7. Rotate the cover counterclockwise and lift it to remove the cover. (In order of (1)(2) in drawing on the right)
1-8. If the O-ring is swollen, replace it with a new O-ring.

[O-ring for replacement] Part no.: JISB2401-1A-P185 (NBR)
Part no.: JISB2401-4D-P185 (FKM)

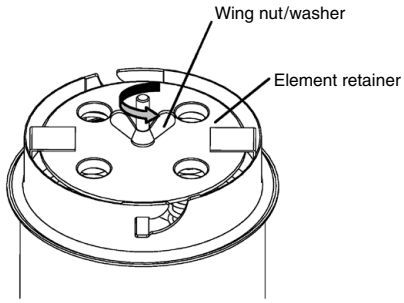




⚠Warning
Remove V-band/cover after confirming the pressure in the filter is zero.

2. Removal of the Element

2-1. Remove the wing nut and the washer.
2-2. Remove the element retainer.
2-3. Remove the element mounting bracket (a part integrating the element holder and the spring).
2-4. Take out parts in order of the element, then, joint (element guide).
∗ It is not a must to take out the element guide.
Element, and joint can be taken out together by taking out the element guide.
Note) Joint may not be necessary depending on filter and element type.



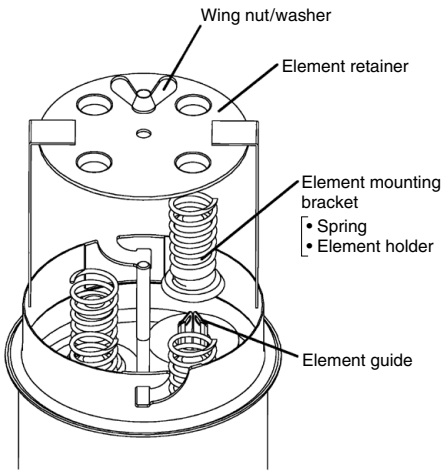
⚠Caution
Attention should be taken to avoid burning for high temperature.

3. Mounting of the Element

3-1. To recycle the micro mesh element and sintered element, eliminate any dust between the end plate and the seal completely.

⚠Caution
Replace all equipment using fluoropolymer seal. Recycle of used seal leads to cause sealing leakage.

3-2. Mount the element guide if it is removed.
3-3. Insert parts in order of the element, joint , element, then, element mounting bracket so that they are concentric.
Note) The joint may not be necessary.

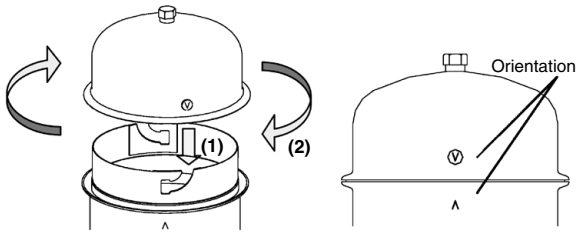


⚠Caution
When element is mounted, do not drop the parts from the top of the element guide for mounting.

3-4. When 2 to 3 elements are placed on top of the other, a set in which the element and joint are prepared can be mounted to the element support.
3-5. Assemble the element mounting bracket.
3-6. Mount the element retainer carefully.

4. Mounting of the O-ring and Cover

4-1. Set the O-ring to the case.
4-2. Rotate the cover clockwise while pushing till the end so that the orientation mark of the case and the cover match. [In order of (1) and (2) on drawing on the right]



5. Mounting and Tightening of the V-band

5-1. Mount the V-band to the collar of the cover and the case correctly. [Refer Fig. (a), (b)]

⚠Warning
The cover may be fallen off due to incorrect mounting. Mount the cover properly.

5-2. Hit the circumference of the V-band lightly with a plastic hammer for secure mounting.
5-3. Mount the T-bracket to the latch correctly. [See Fig. (c)]
5-4. Tighten the clamping nut to specified position (position from where the clamping position check pin can be inserted), and insert the clamping position check pin. [See Fig.(c)]
5-5. When the clamping nut cannot be tightened to the specified position (position where the clamping position check pin can be inserted), replace the V-band and O-ring to new ones. (See Table 1).

⚠Caution
Clean the V-band and the contact surface between the cover and the case before mounting. Dirty contact surface lead to cause leakage.

⚠Warning
Replace with a new V-band when deformation or worn out by screw is found on the band.

[V-band for replacement] Part no. : CY-24S

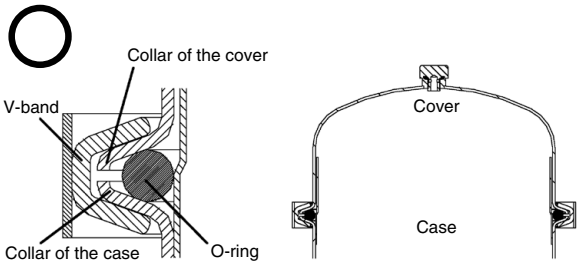


Fig. (a) Correct mounting of the V-band

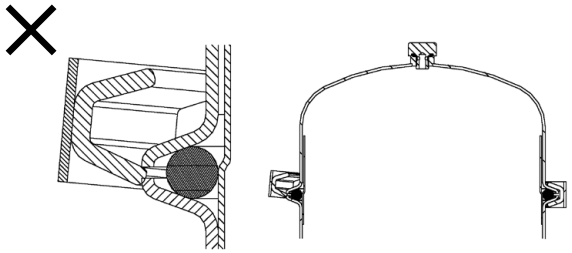


Fig. (b) Incorrect mounting of the V-band
(Not correctly with the collar of the cover)

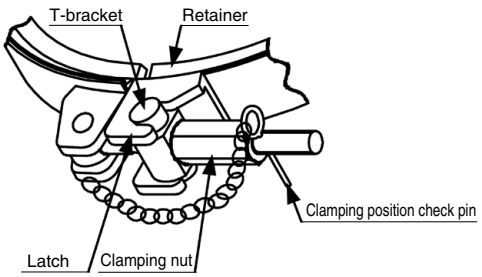
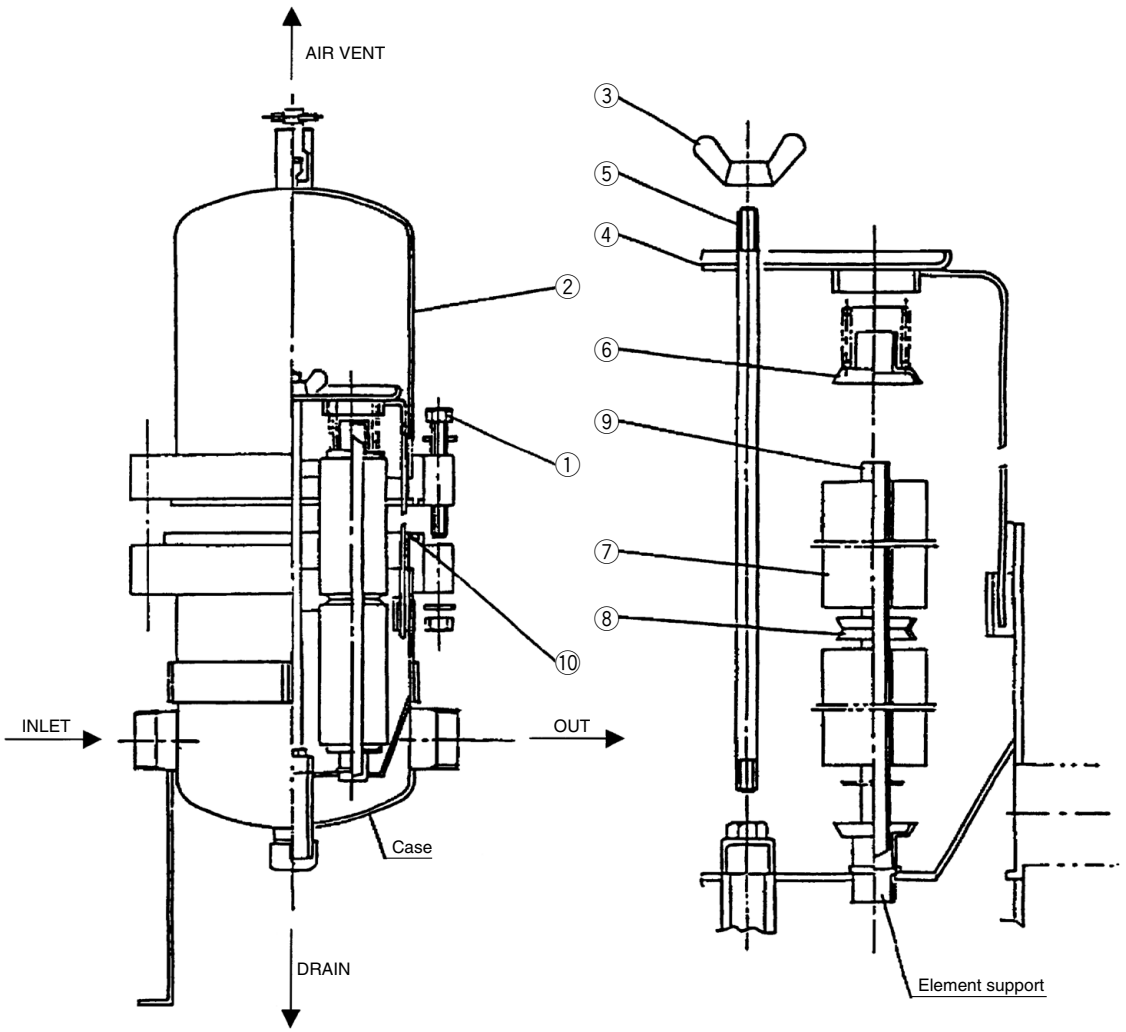


Fig. (c) V-band tightening

6. Restart and Air Discharge

6-1. When restart the operation after the replacement of the element, mount the V-band to the specified position. Confirm connecting parts and seal do not leak before starting the operation.
6-2. When restarting the operation, open the upper air relief port to **discharge air**.

1. Instruction Drawing for Disassembly & Reassembly of the Filter



①Hexagon head bolt, Nut, Washer
②Cover
③Wing nut
④Element retainer
⑤Tension bolt
⑥Element mounting bracket
⑦Element
⑧Joint
⑨Element guide
⑩Gasket

2. Removal of the Cover

2-1. Close the inlet and outlet valves.
2-2. Open the drain valve to make the pressure in the filter zero, and open the air vent valve to completely remove the inside fluid.
2-3. Loosen the hexagon head bolts and nuts fastening the filter cover to the filter case.
2-4. Remove the cover.

3. Removal of the Element

3-1. Remove the wing nut.
3-2. Remove the element retainer.
3-3. Take out parts in order of the element mounting bracket, element, joint, and element guide.
The element guide may not necessarily be taken out. It is not a must to take out the element guide.
After removal of the element mounting bracket, the elements and joints can be taken out as a unit by taking out the element guide in accordance with instructions shown in Fig. 1.

Note) The joint may not be necessary.

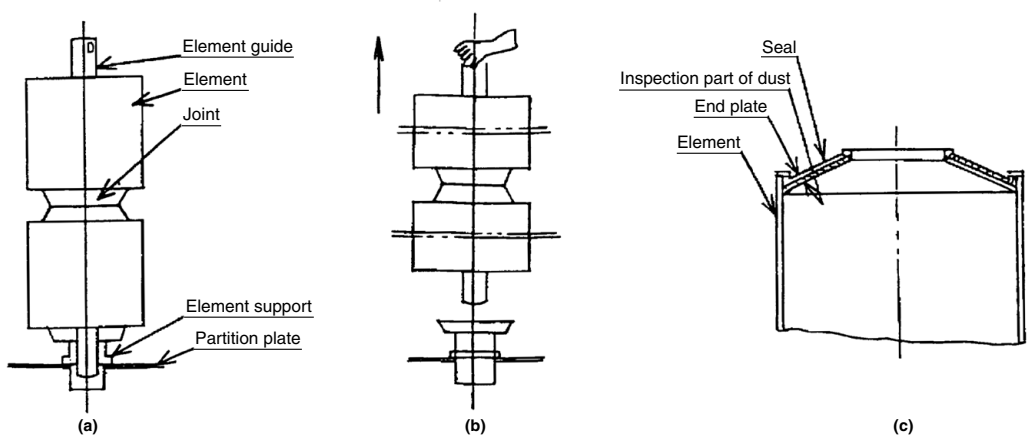


Fig. 1

4. Mounting of the Element

(Handle the elements under the clean atmosphere.)

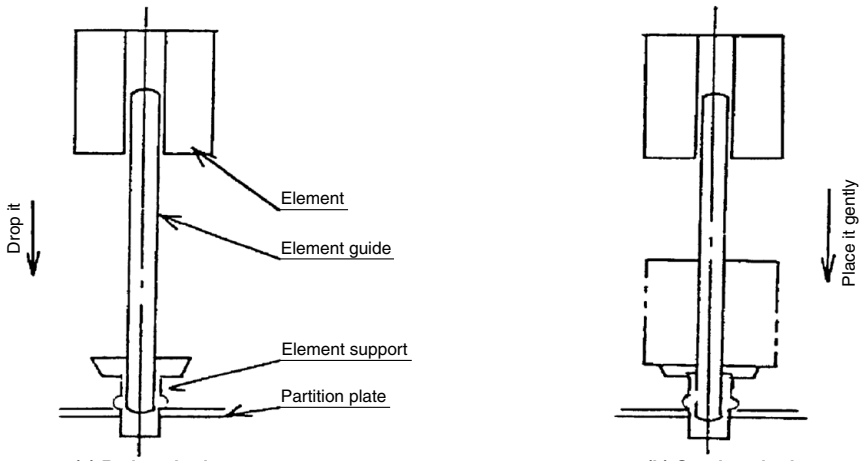
4-1. For fitting a cylindrical or pleat type micromesh element (which does not use spherical seal) or a sintered element, remove dust between the end plate and the seal completely without fail, before fitting. (Refer to Fig. 1 c)

Note) Replace any PTFE seal if used. Be sure to exchange it for new one.
As it is hard, as the seal becomes imperfect, attention must be paid to it.

4-2. Mount the element guide if taken off.

4-3. Insert an element, joint, the other element, and element mounting bracket in this order and in such a way that they are exactly concentric.

Note) Some units may not require the joint, does not need according to circumstances.
In incorporating the element to the element guide, do not drop the element from the upper end of the element guide.



x (a) Bad method ○ (b) Good method

Note) When 2 or 3 elements are put one upon another, it is possible to firstly set elements and joints to the element guide and then mount the element guide assembly on the element support. (Refer to Fig. 1, reversely to the order of removal.)

4-4. Incorporate the element mounting bracket.

4-5. Fit the element retainer gently.

5. Mounting of the Cover

5-1. After making sure that the gasket is not damage, set it at the given place.
Damaged gasket requires replacement.

5-2. Set the cover at the given place.

5-3. Fasten the hexagon head bolts, nuts and washer.

6. Restart and Air Discharge

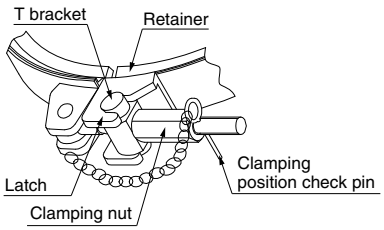
Make sure that no pressure-leak is exhibited from the seat surface. Then put the unit into regular operation in accordance with the procedure of operation described below.

6-1. Before starting the operation, make sure of the open or close position of each valve in the piping and of being perfectly sealed at the joining parts.

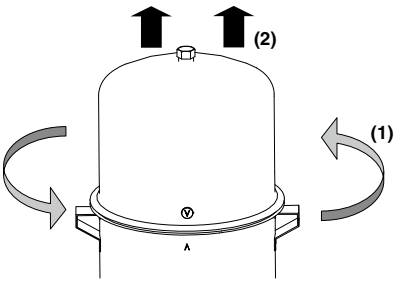
6-2. Open the air discharging valve and supply fluid. Upon air in the container is removed completely, close the air discharging valve. Then start a regular operation.

Note) Since this filter consists of many thin press-formed parts, it must be handled using clean gloves.

1. Removal of the Cover



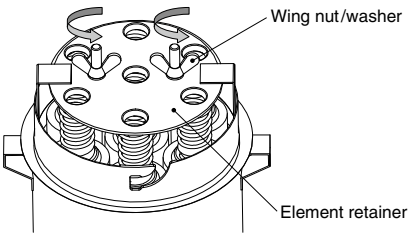
1-1. Stop the operation.
1-2. Close the valve in order of INLET, then, OUTLET.
1-3. Zeroes the pressure in the filter.
1-4. Open the drain valve for inlet and outlet to discharge all fluid inside.
1-5. Pull out the V-band clamping position check pin.
1-6. Loosen the V-band tightening nut and remove the latch. Then, remove the cover and O-ring for checking,
1-7. Rotate the cover counterclockwise and lift it to remove the cover. [In order of (1)(2) in drawing on the right]
1-8. If the O-ring is swollen, replace it with a new O-ring.



[O-ring for replacement] Part no.: AL-25S (NBR)
Part no.: AL-22S (FKM)

⚠Warning
Remove V-band/cover after confirming the pressure in the filter is zero.

2. Removal of the Element



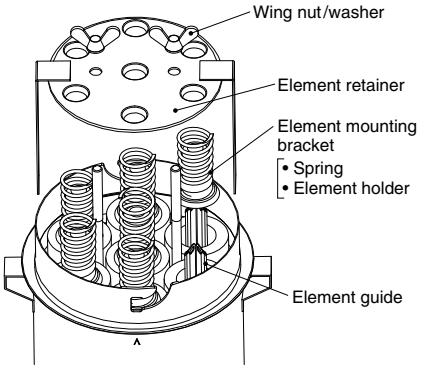
2-1. Remove the wing nut and the washer.

⚠Caution
Please remove the 2 wing nuts at the same time. The element retainer might not be able to incline from one side when it is outside and to remove well.

2-2. Remove the element retainer.
2-3. Remove the element mounting bracket (a part integrating the element holder and the spring).
2-4. Take out parts in order of the element, then, joint (element guide).
* It is not a must to take out the element guide.
Element, and joint can be taken out together by taking out the element guide.
Note) The joint may not be necessary depending on filter and element type.

⚠Caution
Attention should be taken to avoid burning for high temperature.

3. Mounting of the Element



3-1. To recycle the micro mesh element and sintered element, eliminate any dust between the end plate and the seal completely.
3-2. Mount the element guide if it is removed.
3-3. Insert parts in order of the element, joint , element, then, element mounting bracket so that they are concentric.
Note) The joint may not be necessary.

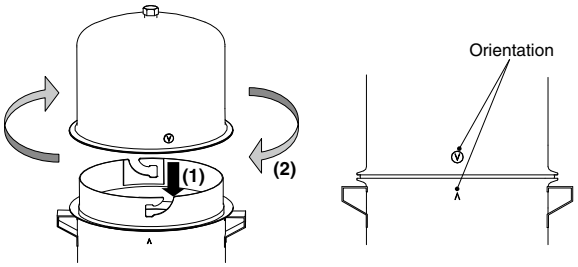
⚠Caution
When element is mounted, do not drop the parts from the upper end of the element guide for mounting.

3-4. When 2 to 3 elements are placed on top of the other, a set in which the element and joint are prepared can be mounted to the element support.
3-5. Assemble the element mounting bracket.
3-6. Mount the element retainer carefully.

4. Mounting of the O-ring and Cover

4-1. Set the O-ring to the case.

4-2. Rotate the cover clockwise while pushing till the end so that the orientation mark of the case and the cover match. [In order of (1) and (2) on drawing on the right]



5. Mounting and Tightening of the V-band

5-1. Mount the V-band to the collar of the cover and the case correctly. [Refer Fig. (a), (b)]

⚠Warning

The cover may be fallen off due to incorrect mounting. Mount the cover properly.

5-2. Hit the circumference of the V-band lightly with a plastic hammer for secure mounting.

5-3. Mount the T-bracket to the latch correctly. [See Fig. (c)]

5-4. Tighten the clamping nut to the specified position (position from where the clamping position check pin can be inserted), and insert the clamping position check pin. [See Fig. (c)]

5-5. When the clamping nut cannot be tightened to specified position (position where the clamping position check pin can be inserted), replace the V band and O-ring to new ones. (See Table 1).

⚠Warning

Replace with a new V-band when deformation or worn out by screw is found on the band

[V-band for replacement] Part no: CY-27S

⚠Caution

Clean the V-band and the contact surface between the cover and the case before mounting. Dirty contact surface lead to cause leakage.

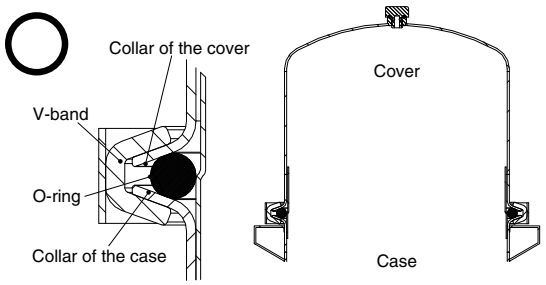


Fig. (a) Correct mounting of the V-band

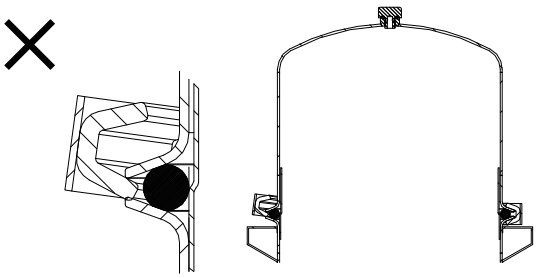


Fig. (b) Incorrect mounting of the V-band

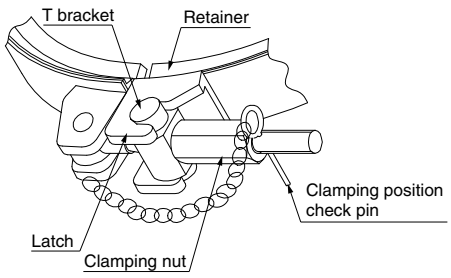


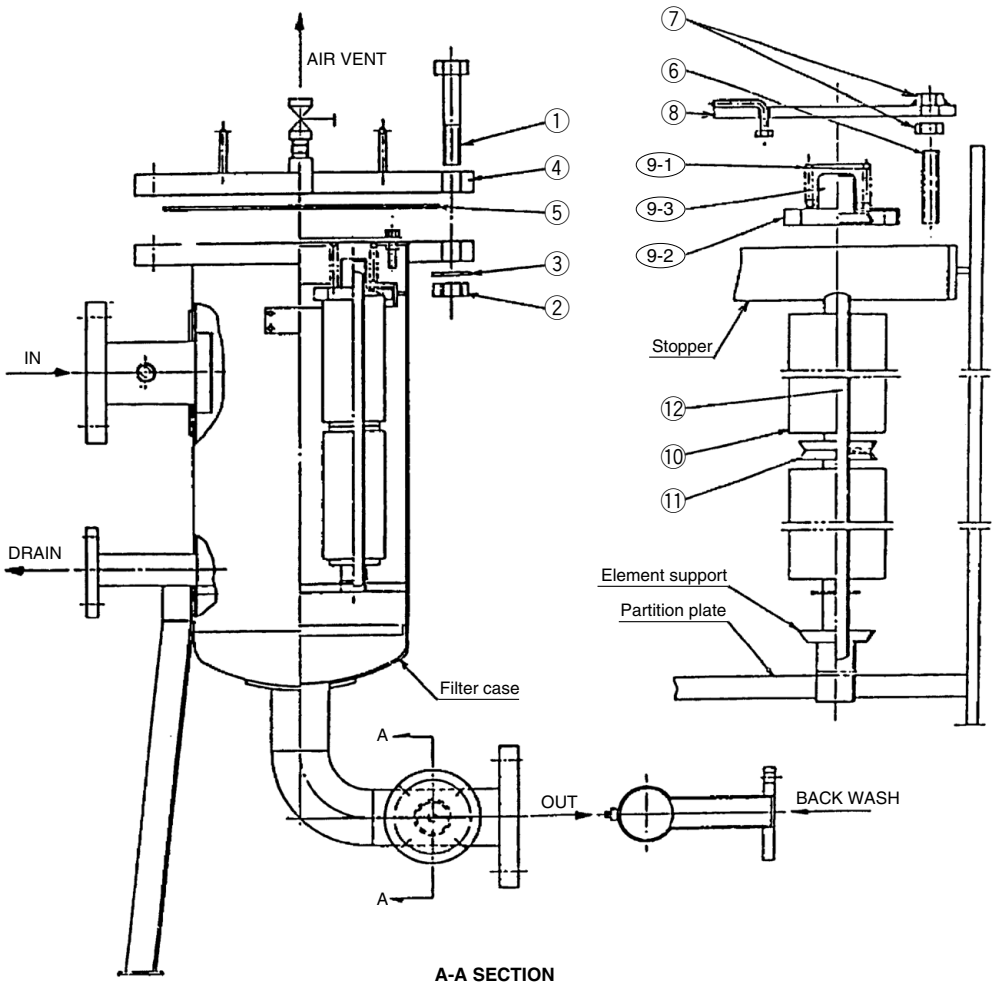
Fig. (c) V-band tightening

6. Restart and Air Discharge

6-1. When restarting the operation after the replacement of the element, follow the procedure of section 4 “Operation.”

6-2. When restarting the operation, open the upper air relief port to **discharge air**.

1. Instruction Drawing for Disassembly & Reassembly of the Filter



A-A SECTION

①Hexagon head bolt
②Hexagon nut
③Washer
④Cover
⑤Gasket
⑥Adjustment bolt
⑦Lock nut
⑧Element retainer
⑨Element mounting bracket
⑨-1Spring
⑨-2Vibration stop
⑨-3Element holder
⑩Element
⑪Joint
⑫Element guide

2. Overhaul

2-1. If the differential pressure rises due to clogging and reaches the threshold for element replacement (0.1 MPa), replace the element with the new one.

2-2. The removal and mounting of the element at the time of overhauling shall be made in the following sequence.

3. Removal of the Cover

3-1. Close the valves at inlet and outlet.

3-2. Open the air vent and drain valves and make the pressure inside the filter zero (0) in order to discharge all fluid inside.

3-3. Loosen the bolt ① and nut ② for tightening the filter cover and the filter case little by little uniformly. When the nut can be turned with hand, remove them one after another in order from the end.

3-4. Remove the cover and gasket.

4. Removal of the Element

4-1. Remove the element retainer.
Set the bolt ⑥ and nut ⑦ in the plate as it is.
Please note that it could cause deformation due to the incomplete sealing or overtightened element if it is mounted without any adjustment. For details, refer to section 7, “Adjustment Method for Mounting Other Elements.”

4-2. Take them out in the element mounting bracket, element, joint, element guide in order.
The element guide is not required to be taken out forcibly.
After the element holder is taken out, if the element guide is taken out in such a manner as shown in Fig. 1, the element and joint can be taken out together.

Note) In some cases, no joint is required.

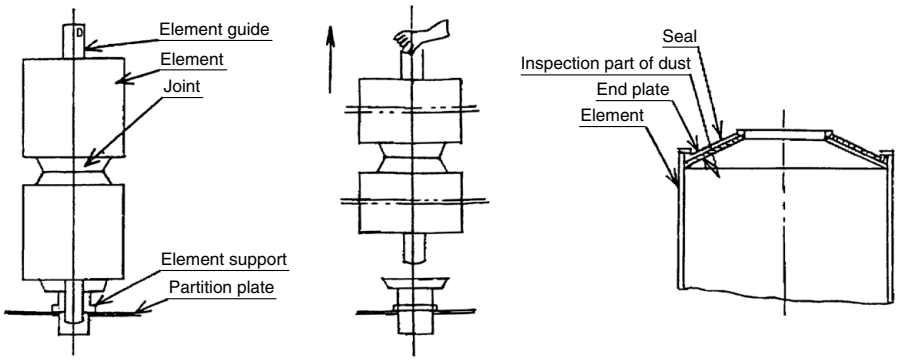


Fig. 1

5. Mounting of the Element

(Be sure to handle under the clean surrounding condition.)

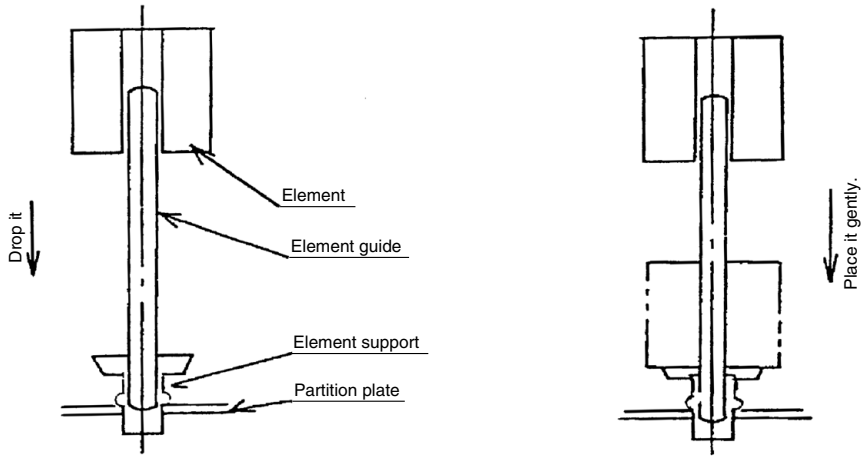
5-1. In the case of the micro mesh element (cylindrical or pleat type (spherical seal is not used)) and sintered element, be sure to remove dust completely between end plate and seal completely. (Refer to Fig. 1 (c))

Note) Replace any PTFE seal if used. Be sure to exchange it for new one.
As it is hard, as the seal becomes imperfect, attention must be paid to it.

5-2. Mount the element guide if taken off.

5-3. Insert them in the order of element, joint, element, element mounting bracket in order in such a way that they are concentric.
In some cases, no joint is required.

Note) When the element is mounted, be sure to avoid building in it by dropping from the upper end of the element guide.

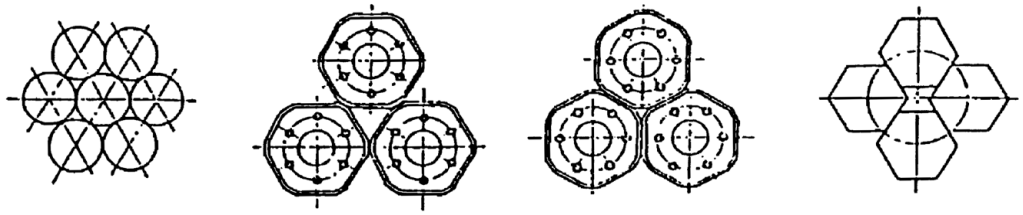


x (a) Bad method ○ (a) Good method

Fig. 2

∗ Incidentally, when the number of arrangements is many and the number of piling of elements is 3-4 stages, the one in which element and joint are set in the element guide can be set at element support. [Refer to Fig. 1 for the details: Procedure opposite to that for removal]

5-4. The element mounting bracket must be built in it by such a manner as shown in (b) and (c) of (Fig. 3).



x Bad example ○ Good example

(a) Arranging condition of element. (b) Arrangement of 7 pcs. or more (c) 4-pcs. arrangement

Fig. 3

Note) Fig. 3 (b) and (c) show the arranging condition of the element mounting bracket (spring, vibration stop, element holder) shown in Fig. 4

5-5. Fit the element retainer gently.

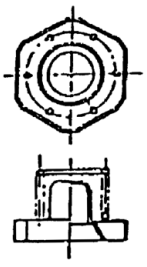
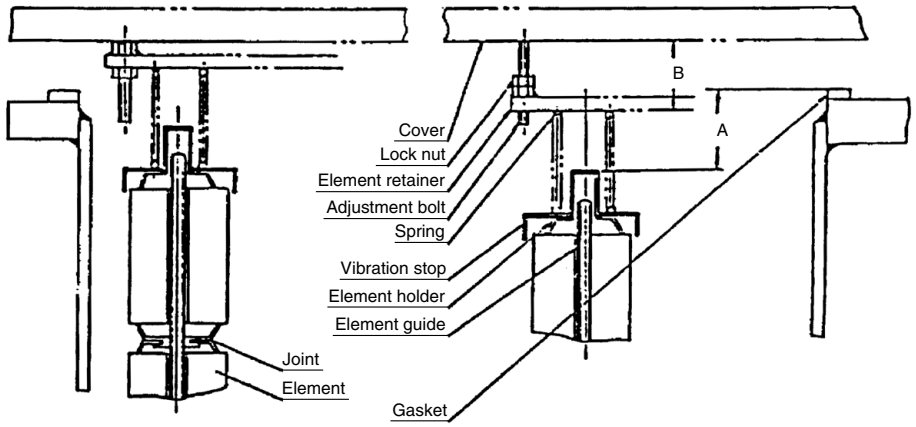


Fig. 4

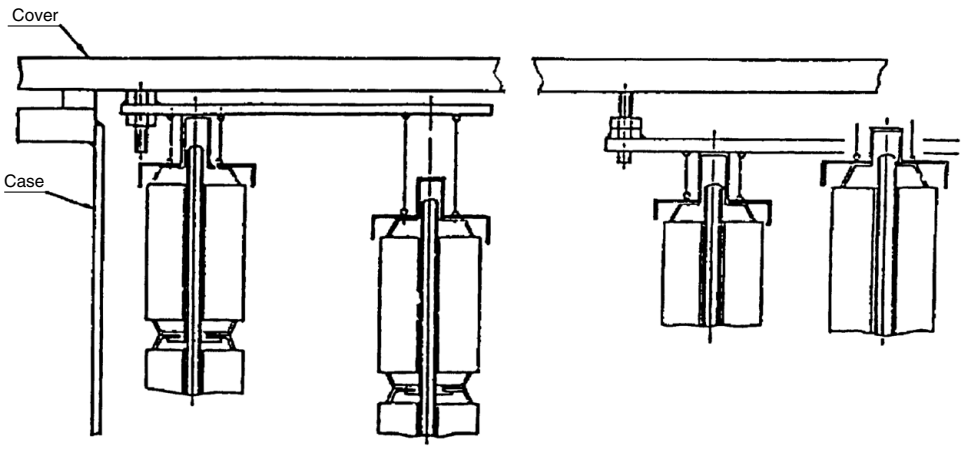
6. Mounting of the Cover

6-1. Ensure that the gasket is not damaged, and set it to the specified position. Also set the bolt ①, nut ② and washer ③ and tighten them uniformly diagonally.
When the gasket is damaged, exchange it for new one.

6-2. After confirmation that there is no leakage of pressure from the seat surface, start the normal operation.
(Method of operation, please refer to the operation manual.)



(a) Mounting condition employing joint **(b) Mounting condition not employing joint**



(c) Good condition **(d) Bad condition** **(e) Good condition** **(f) Bad condition**

Fig. 5 Tightening condition

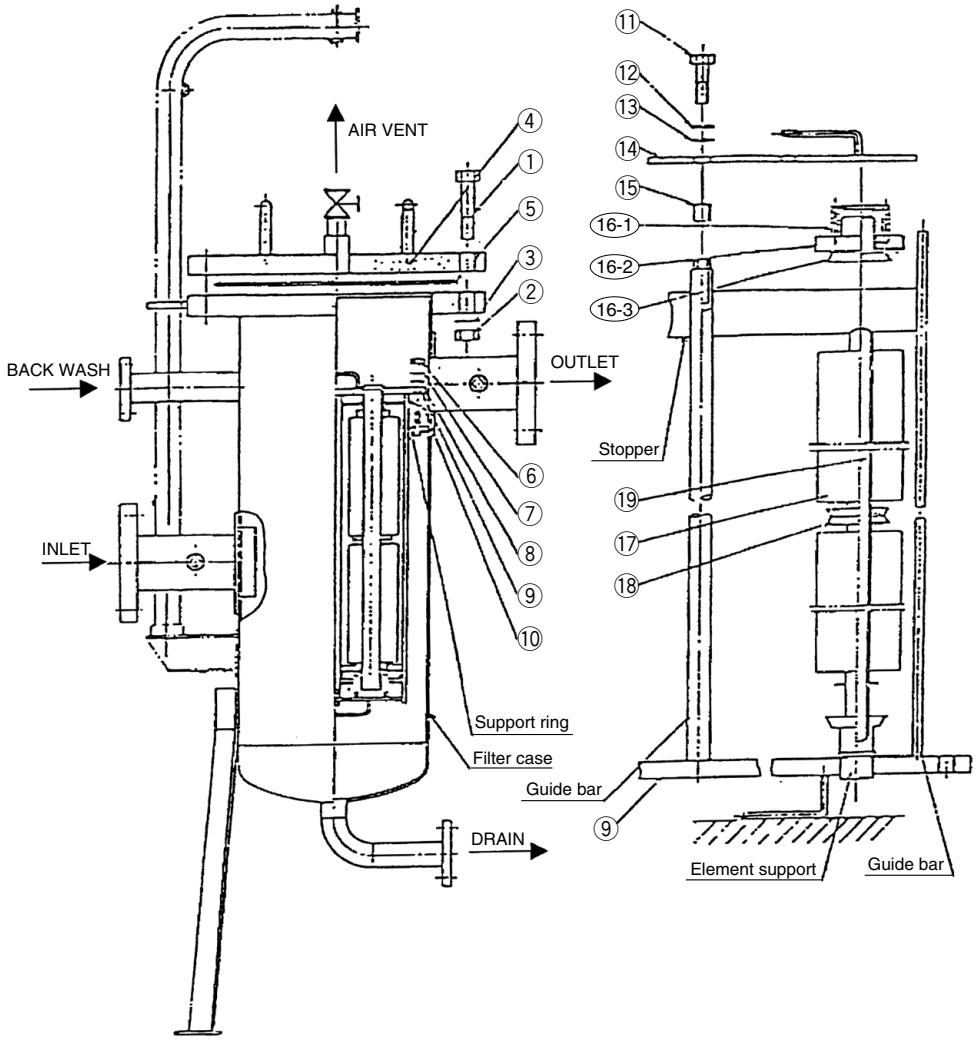
7. Adjustment Method for Mounting Other Elements

7-1. Adjust it in such a way that the element retainer and element are at a close contact condition when the filter cover is installed, employing the adjustment bolt and lock nut shown in (Fig. 5) [Refer to (c) and (e) of Fig. 5] when the element retainer is installed.

7-2. Adjustment must be made in the following manner.
Make measurement on dimensions A as shown in Fig. 5 (b) and adjust it in such a way that Dimensions A are equal to those B, resulting in being at such a condition as shown in (e) of Fig. 5.
As can be seen in Fig. 5 (a) and (b), the lock nut should be set to the bottom in the installation employing the joint. In the installation not employing the joint, set it to the top.

1. Instruction Drawing for Disassembly & Reassembly of the Filter

Element assembly exploded view



①Hexagon head bolt
②Hexagon nut
③Washer
④Cover
⑤Gasket
⑥Hexagon nut
⑦Spring washer
⑧Washer
⑨Partition-plate
⑩Gasket
⑪Hexagon head bolt
⑫Spring washer
⑬Washer
⑭Element retainer
⑮Collar
⑯Element mounting bracket
⑯-1Spring
⑯-2Vibration stop
⑯-3Element holder
⑰Element
⑱Joint
⑲Element guide

2. Overhaul

2-1. If the differential pressure rises due to clogging and reaches the threshold for element replacement (0.1 MPa), replace the element with the new one.

2-2. The removal and mounting of the element at the time of overhauling shall be made in the following sequence.

3. Removal of the Cover

3-1. Close the valves at inlet and outlet.

3-2. Open the air vent and drain valves and make the pressure inside the filter zero (0) in order to discharge all fluid inside.

3-3. Loosen the bolt ①, and nut ② for tightening the filter cover and the filter case little by little uniformly at first. When the nut can be turned with hand, remove them one after in order the end.

3-4. Remove the cover and gasket.

4. Method for Removal of the Element Assembly

4-1. Loosen the nut ⑥ little by little uniformly. Remove the nut, spring washer and washer.

4-2. Lift the element assembly from the container by means of a davit or any other lifting device out of the container. Then, lift it vertically so that the guide bar protecting the element does not touch the support ring too much.

4-3. Turn the element assembly taken out of the container upside down so that the partition plate is located downwards as illustrated in the disassembly drawing.

5. Removal of the Element

5-1. Loosen the hexagon head bolt ⑪ little by little uniformly. Remove the spring washer and washer.

5-2. Remove the element retainer.

5-3. Take out the members in the order of collar, element mounting bracket, element, joint and element guide. The element guide is not needed to be taken out forcibly. If the element guide is taken out in the procedure after taking out of the element holder (Fig. 1 (b)), both element and joint can be taken out at the same time.

Note) The joint is not needed in some cases.

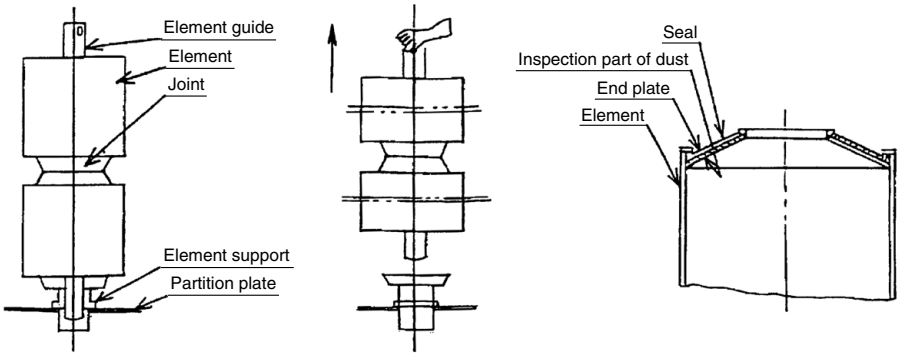


Fig. 1

6. Mounting of the Element

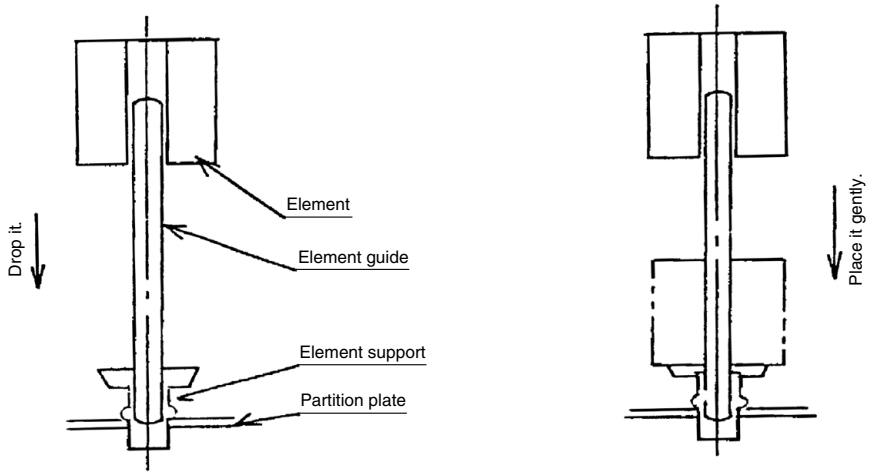
(Be sure to handle it under the clean environmental condition.)

6-1. In the case of the micromesh element (cylindrical and pleat type (employing no seal)) and sintered element, be sure to remove the dust located between end plate and seal without fail. (Refer to Fig. 1 (c) for the details)

6-2. When the element guide is removed, fit it.

6-3. Insert the members correctly in the order of element, joint, element and element fitting hardware in such a way that concentricity may be obtained.

Note) No joint is needed sometimes.
When the element is installed, do not drop it from the upper end of the element guide and assemble it. (Fig. 2)

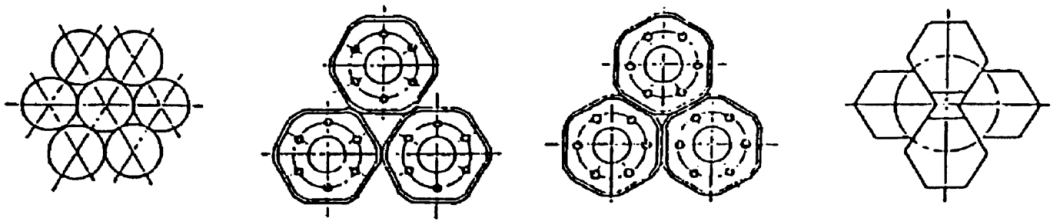


x (a) Bad method ○ (b) Good method

Fig. 2

Note) When the number of arranged ones is many and the number of stacking of elements is 3-4 stages, the element guide to which the element and joint are set can be set to the element support. (Refer to Fig. 1 for the details: Opposite procedure to that for taking out)

6-4. The fitting hardware for element shall be assembled in such a method as shown by (b) and (c) of (Fig. 3).



x : Bad example ○ : Good example

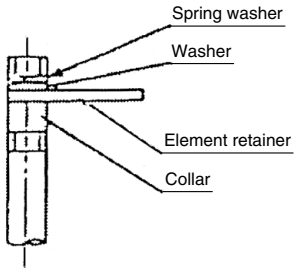
(a) Arranging condition of element (b) Arrangement of 7 pcs. or more (c) 4 pcs. arrangement

Fig. 3

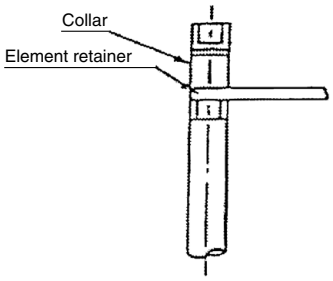
Note) Fig. 3 (b) and (c) show the arranging condition of the element mounting bracket in Fig. 4 (spring, vibration stop, element holder).

6-5. The collar should be set to the bottom of the element retainer only when the honeycomb element is used. For other elements, it should be set to the top of the retainer.

Note 1) The collar is not used for the single element assembly.
Note 2) The collar for honeycomb element cannot be used for other elements.



(a) Honeycomb element



(b) Other elements (Sintered, paper, micromesh)

Fig. 5

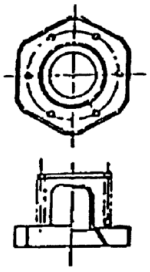
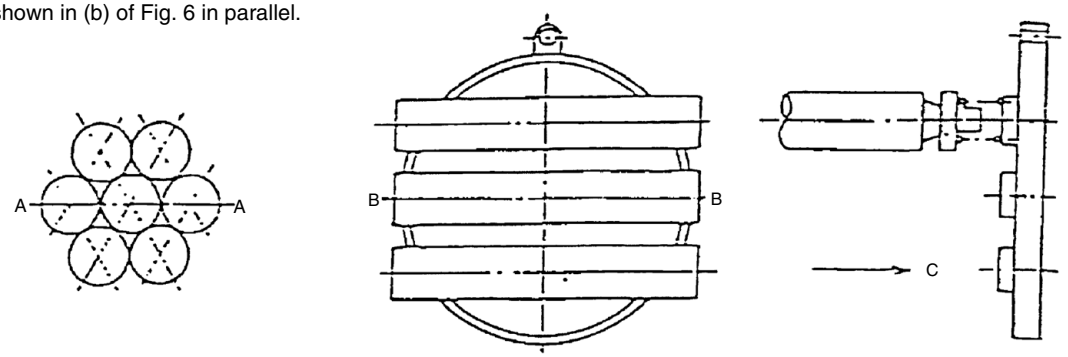


Fig. 4

6-6. The element retainer shall be assembled in such a way that the symbol A-A in (a) of Fig. 6 is overlapped with symbol B-B of element retainer shown in (b) of Fig. 6 in parallel.



View of "c"

(a) Arranging condition of the element

(b) Element retainer

Fig. 6

Note 1) When the element retainer is installed, place it correctly in such a way that the element mounting bracket is not moved.
Note 2) Fit the washer ⑬ and spring washer ⑫ and tighten the bolt ⑪ little by little uniformly. Then, tighten it to such an extent that the guide bar comes in close contact with bolt nut, spring washer, washer, element retainer.

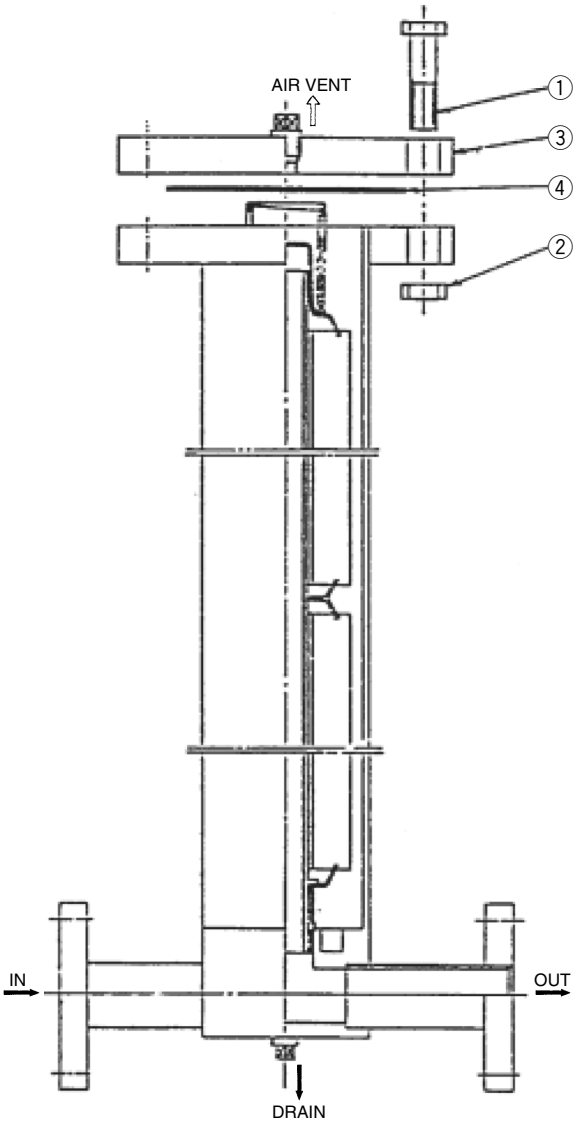
7. Mounting of the Element Assembly

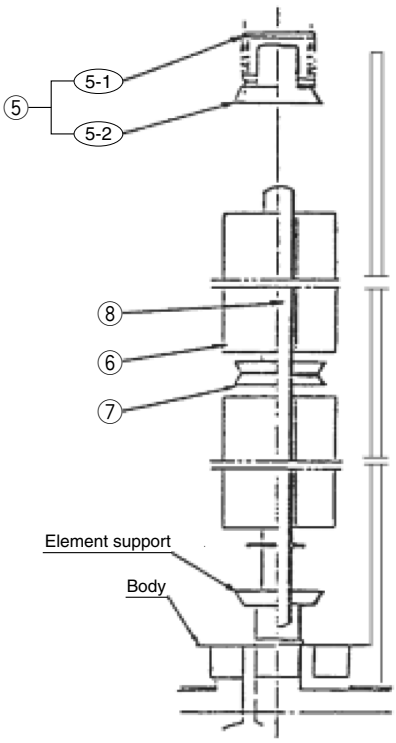
7-1. Turn the element assembly set at 4-2-4 upside down in such a way that the partition plate comes upside.
7-2. Before the element assembly is installed, be sure to install the gasket at specified position correctly.
7-3. Employing the davit and other lifting devices, assemble it in the same way that the element assembly is taken out.
7-4. Install the washer ⑧ and spring washer ⑦ and tighten them uniformly with nut ⑥.

8. Mounting of the Cover

8-1. Ensure that the gasket is not damaged, and set it to the specified position. Also set the bolt ①, nut ② and washer ③ and tighten them uniformly diagonally.
If the gasket is damaged, replace it with the new one.
8-2. After ensuring that there is no pressure leakage, start the actual operation.

1. Instruction Drawing for Disassembly & Reassembly of the Filter





①Hexagon head bolt
②Hexagon nut
③Cover
④Gasket
⑤Element mounting bracket
5-1 Spring
5-2 Element holder
⑥Element
⑦Joint
⑧Element guide

2. Overhaul

2-1. If the differential pressure rises due to clogging and reaches the threshold for element replacement (0.1 MPa), replace the element with the new one.

2-2. Take out the element at the time of overhauling and carry out the mounting operation in the following sequence.

3. Removal of the Cover

3-1. Close the valves at inlet and outlet.

3-2. Open the air vent valve and drain valve in order make the pressure inside the filter zero (0) and discharge all fluid from the inside.

3-3. Loosen the bolt ① and nut ② for tightening the filter cover and the filter case little by little uniformly at first. When the nut can be turned with hand, remove them one after another in order from the end.

3-4. Remove the cover and gasket.

4. Removal of the Element

4-1. Take out the element mounting bracket, element, joint, element guide in order.

4-2. It is not required to take out the element forcibly.

4-3. After taking out the element holder, the element and joint can be taken out together if the element guide is taken out in such a manner as mentioned in (Fig.1).

Note) In some cases, no joint is required.

5. Mounting of the Element

(Handle it under the clean surrounding condition.)

5-1. As for the elements except the honeycomb and paper elements, check if there is no dust between the end plate and seal when taking them out. If there is any dust, clean it off. (See Fig. 1 (c).)

5-2. Mount it when the element guide is removed:

5-3. Insert them in the order of element, joint, element, element mounting bracket in such a way that they are concentric.

Note) No joint is needed in some cases.

When the element is installed, avoid building in it by dropping from the upper end of the element guide when the element is installed.

6. Mounting of the Cover

6-1. Ensure that the gasket is not damaged, and set it to the specified position. Also set the bolt ① and nut ② and tighten them uniformly diagonally.
When the gasket is damaged, exchange it for new one.

6-2. After ensuring that there is no leakage of pressure from the seat surface, start the actual operation.

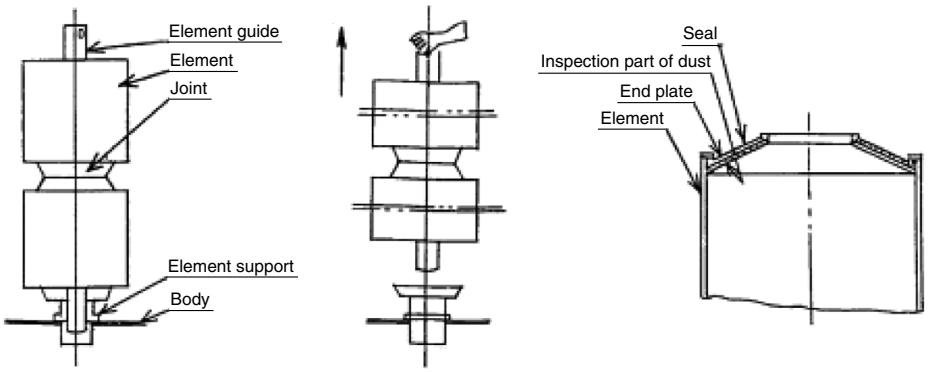


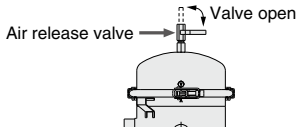
Fig.1

One element included type

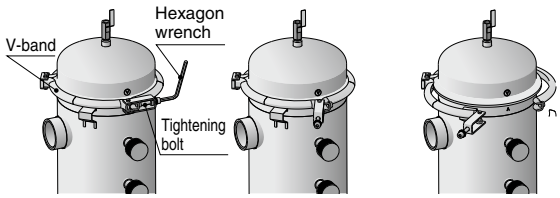
1. Removal of the Element

1-1. After stopping the operation, close the valve in the order of inlet and outlet.

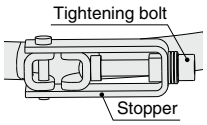
1-2. Open the air release valve to let the internal pressure of a filter be zero, and open the liquid discharging valve to let out the internal fluid completely.



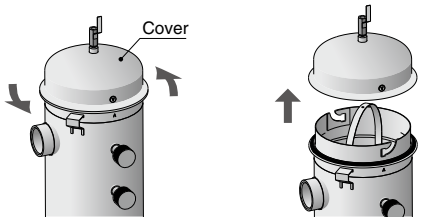
1-3. Loosen the tightening bolts of the V-band and remove the stopper.
(The tightening bolts can be loosened with a hexagon wrench [width across flats 6 mm].)



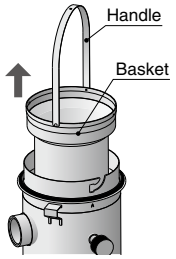
∗ Check the O-ring and the V-band, and if there is any abnormality, replace it with a new one.
(Refer to “Replacement Parts” on page 365.)



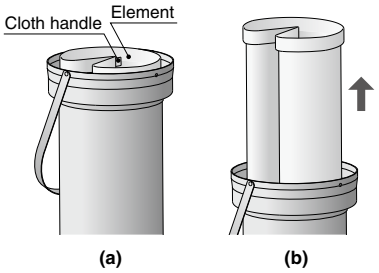
1-4. Remove the cover upward by turning it counterclockwise.



1-5. Using the handle, remove the basket vertically.
∗ Inspect the O-ring attached to the holder assembly in the case, and replace it with a new one if it is expanded or there is any abnormality.
(Refer to “Replacement Parts” on page 365.)

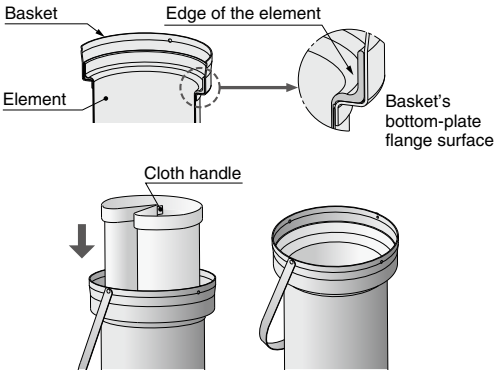


1-6. A handle made of cloth is attached to the element so that elements can be pulled out of the basket by fingers or using sticks, pulling them to the center. (Element for replacement: Refer to “Part number of element for replacement” on page 365.)



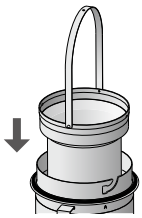
2. Mounting of the Element

2-1. Pull a new element by the cloth handle toward the center, and put it inside the basket, folding the edge of an element. Further, push the edge of an element to the basket’s bottom-plate flange surface thoroughly.



∗ Set the handle avoiding attaching it to the notch (guide slit) of the case and INLET.

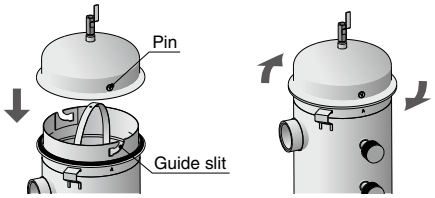
2-2. Grasp the handle and put the basket in the case.



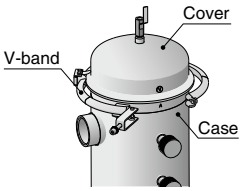
2-3. Set the O-ring to the case.

* Replace the O-ring with a new one if it is expanded or there is any abnormality. (Refer to “Replacement Parts” on page 365.)

2-4. Adjust the pins (2 locations) to the guide slit of the case inside the cover, and push them thoroughly and turning clockwise.

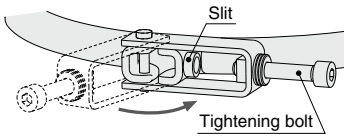


2-5. Install the V-band in the edge of the cover and case correctly.

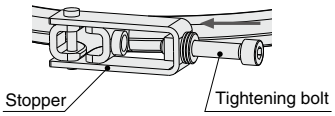


* Clean the contact surface of the V-band, cover and case prior to the attachment.

2-6. Align the tightening bolts with the slit and fasten properly.

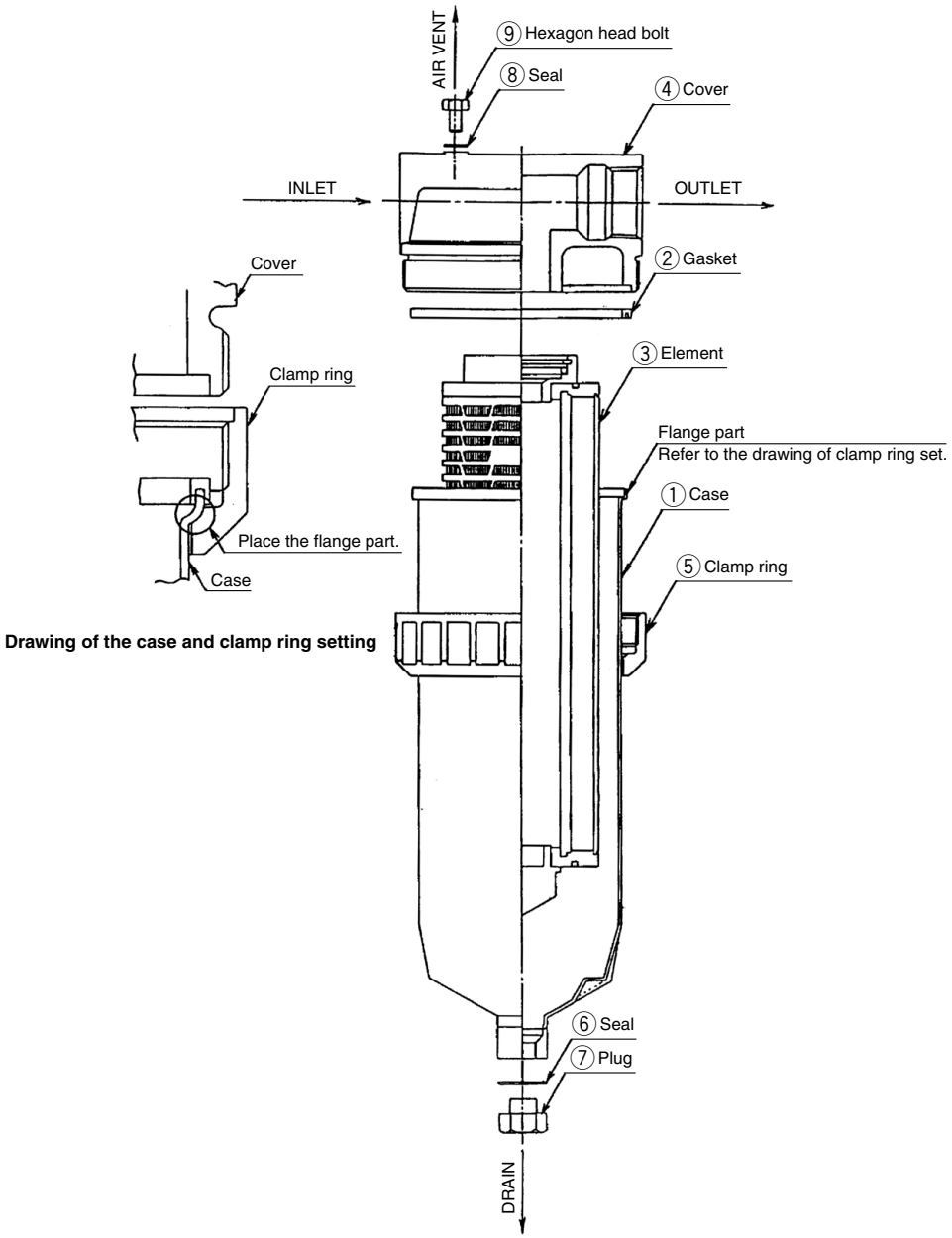


2-7. Tighten the tightening bolts until the heads are tight against the surface.



* When restarting this product after replacing the elements, be sure to release the air by opening the release valve on the top.

1. Instruction Drawing for Disassembly & Reassembly of the Filter



Drawing of the case and clamp ring setting

1. Removal of the Element

1-1. Stop the fluid sent to the filter. (If a valve is installed before or after the filter, close the valve.)

1-2. Loosen the air vent (hexagon head bolt ⑨) and completely discharge the pressure in the filter.

1-3. Remove drain (plug ⑦) and discharge the fluid from the filter.

1-4. A large force is required to loosen clamp ring ⑤. Use a commercially available belt wrench etc. to loosen clamp ring ⑤ so that the tool is not removed, so as to make it turnable by hand. Remove case ① by hand while supporting it, and remove the element together with case ①.

1-5. Pull out element ③ from cover ④. Since the PTFE seal is used, a certain amount of force may be necessary to pull out the element. If there is not enough space under case ①, lower case ① by about 100 mm, and remove the element together with case ①.

1-6. Dispose the removed element.

1-7. Clean the inside of case ①, gasket ②, seal ⑥ and plug ⑦ using a clean operation fluid or solvent.

2. Mounting of new Element

2-1. Check that the sealing surface of case ① is not scarred.

2-2. Check whether or not the gasket and seal are damaged or deformed.
Replace any abnormal one with a new one.

2-3. Since the PTFE seal is used for element ③, a certain amount of force is needed to set the element. Set the element in the following procedure.
Handle element ③ carefully to keep it clean, for example, open the element package only when the element is mounted.

a. Fit the grooved part of gasket ② into the flange part of case ①.

b. Place element ③ in case ①. Element ③ must be positioned at the center of case ①.

c. Set clamp ring ⑤ to case ①. The tapered part of clamp ring ⑤ must be facing downward.

d. Set the seal part of the element ③ to the cover ④ while the flange part of case ① is being placed on clamp ring ⑤.

e. Since the PTFE is used for the material of gasket ②, a large force is required to tighten clamp ring ⑤. After screwing clamp ring ⑤ into cover ④ by hand, use a commercially available belt wrench etc. to tighten the clamp ring so that the tool is not removed and no leakage occurs. (Reference tightening rotation angle: approx. 1/4 to 1/2 turn after tightening by hand)

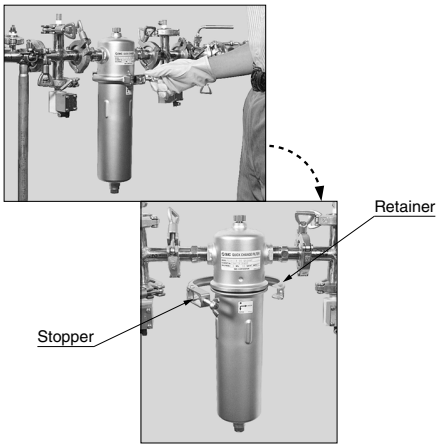
∗ This makes the element ③ be pushed up as a whole, and the element seal will be installed to the case ① sealing. The element ③ can also be pushed hard by hand to be surely installed before setting the case ①.

2-4. Set seal ⑥ on plug ⑦ of drain and tighten hexagon head bolt ⑨ of the air vent so that no leakage occurs.

2-5. Start the operation.

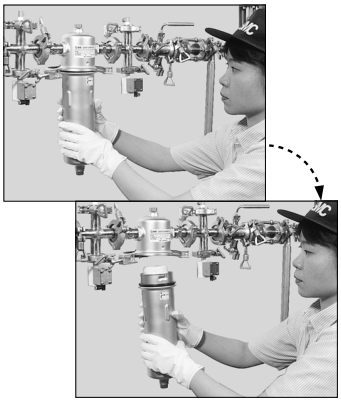
1. Removal of the Element

1-1. Stop liquid flowing into the filter. (If there are valves before and after the filter, close these valves.)
1-2. Release pressure inside the filter completely by loosening the air vent plug.
1-3. Discharge fluid inside the filter by removing the drain plug.
1-4. Remove the stopper from the retainer by loosening the wing bolt on the V-band.



1-5. To extract the element from the case, rotate the case counterclockwise about 20 degrees until it stops, then lower it by about 40 mm and remove it from the cover.

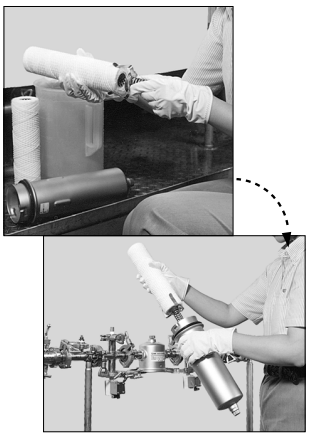
Note) When using the 2 L250 elements, do not discard the intermediate holder since it is used.



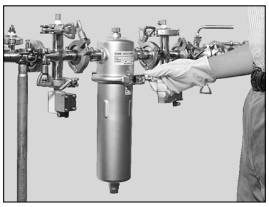
1-6. Clean the inside of the case, gaskets, seals, holders, plugs, etc., using a clean operation fluid or solvent.

2. Installing the Element

2-1. Ensure that the O-rings are not damaged or deformed. If needed, replace with new ones.
2-2. Check that the lower holder inside the case is not inclined, and then insert the element.
[When using the 2 L250 elements]
Insert the intermediate holder into the lower part of the second element (upper level), and then place one side of the intermediate holder into the case by inserting it into the upper part of the first element (lower level).



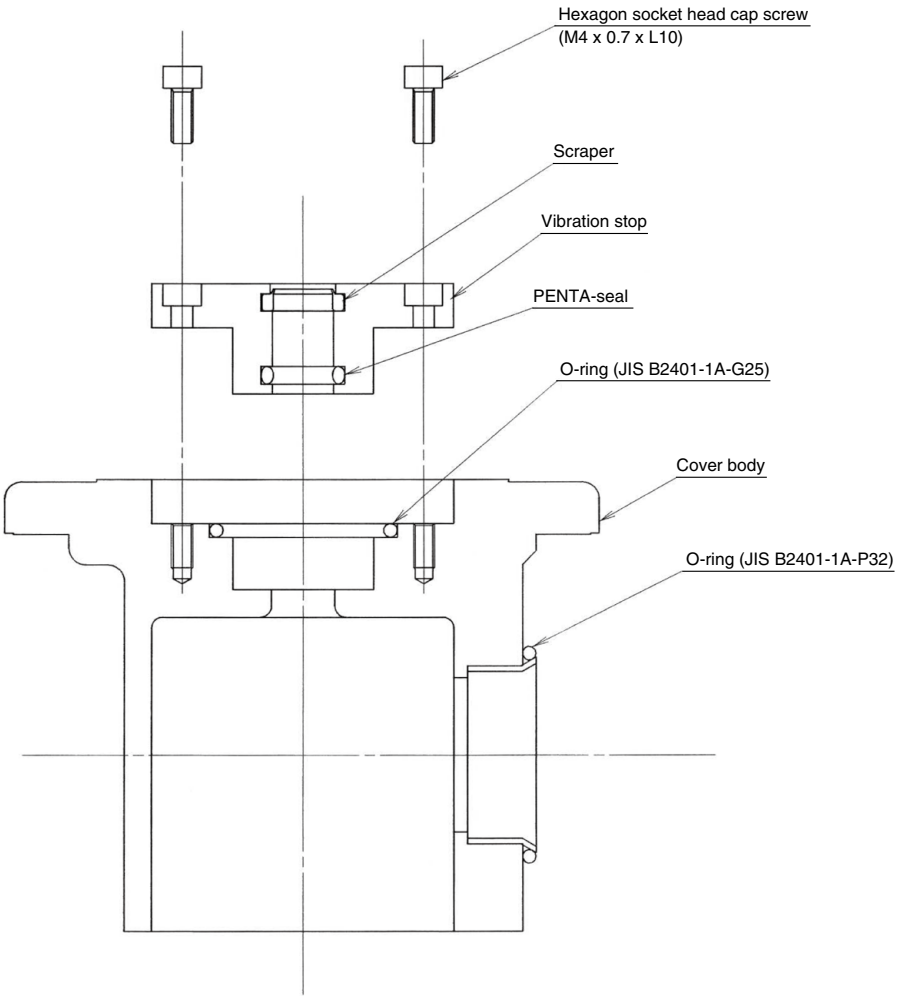
2-3. Align the indentations of the case with the projections of the cover, lift the case upward by about 10 mm and rotate it clockwise about 20 degrees.
2-4. Mount it in such a way that the entire flanged perimeter of the cover and case are held by the retainer of the V-band.



2-5. Set the stopper on the retainer while holding down the V-band outside perimeter, and then tighten the wing bolt to the prescribed position.
2-6. Tighten the drain plug.
2-7. When air release is completed, tighten the air vent plug.

1. Instruction Drawing for Disassembly & Reassembly of the Cover Assembly

FN1 Series



2. Disassembly

FN1 Series

2-1. Remove the cover [2 M4 hexagon socket head cap screws See Figure 1]
2-2. Remove the cylinder flange fixing screws (four M8 hexagon socket head cap screws), and remove the entire body of the cylinder. [Slide the entire body of the cylinder in the horizontal direction, and remove the cylinder from the joint. See Fig. 2]
2-3. Remove the 4 struts. [See Fig. 2]
2-4. Pull the cover assembly upward. [Pull out the entire body of the element. See Fig. 3]
2-5. Remove the mounting bracket inside the cover assembly. [Remove the set screw, and turn the mounting bracket. See Fig. 4]
For FN11□2□-10, two screws are mounted in the middle of the guide assembly [M3 See Fig. 4]
2-6. The element can now be pulled out of the cover.
Do not disassemble the element any further.

Note) Reassembly should be performed by reversing the disassembly procedure.

Refer to the schematic drawings for the assembly and disassembly procedures for the cover, seals etc.

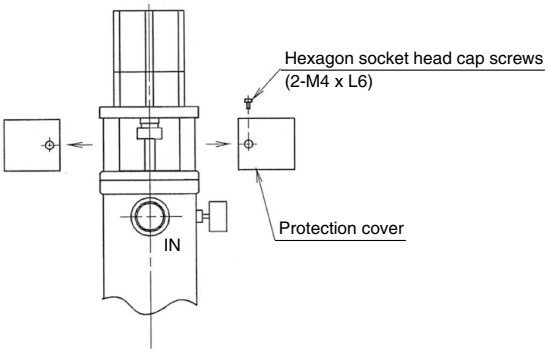


Fig. 1

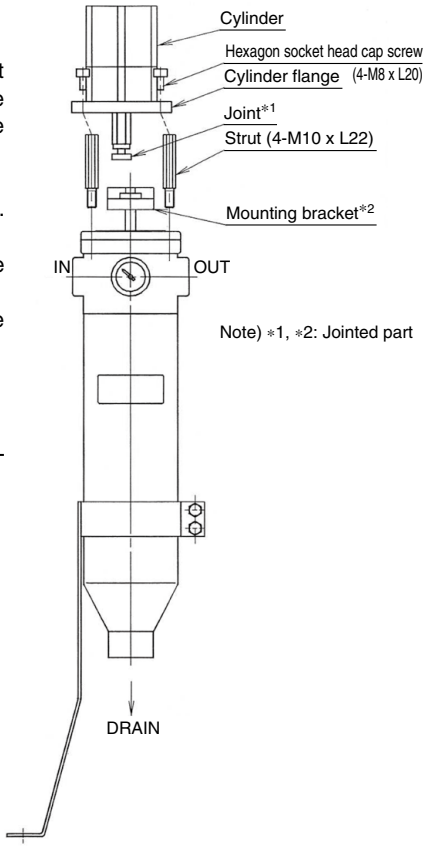


Fig. 2

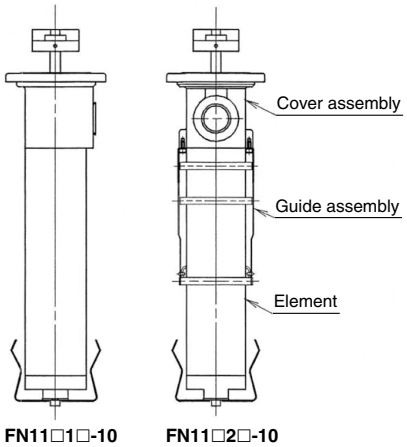


Fig. 3

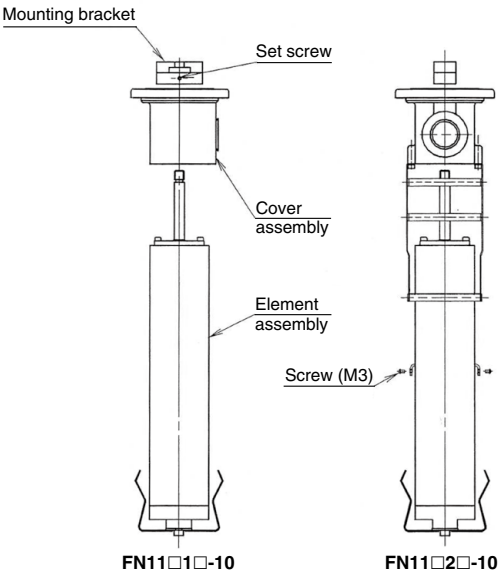


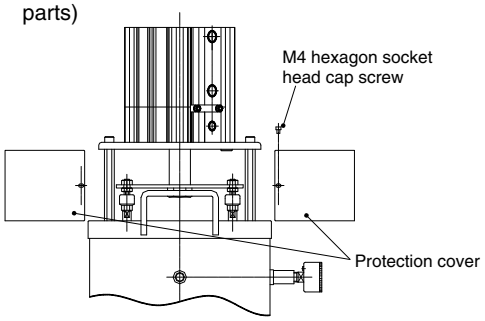
Fig. 4

FN4 Series

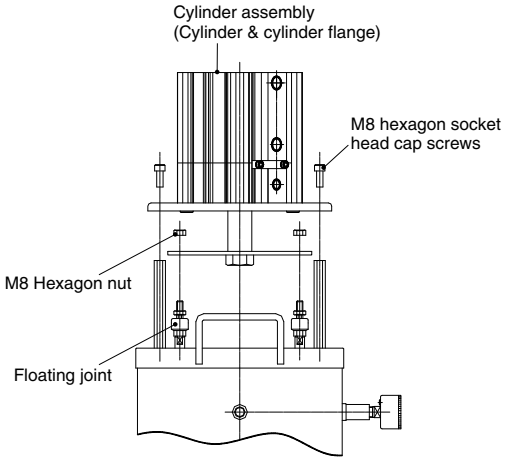
Basically, this filter does not need any maintenance, but if an element needs cleaning (differential pressure cannot be returned as dust adheres) or an element or a seal needs replacement, clean or replace the element by following the dismantling procedure below.

2-1. Stop the operation.
- a. Stop the operation of filter.
- b. Close the valves at IN and OUT.
- c. Open the DRAIN valve to make the internal pressure zero and to exhaust all the fluid inside.

2-2. Remove the protection cover.
- a. Remove the set screws of a protection cover, and slide the cover to the side.
  (M4 hexagon socket head cap screws at 2 parts)



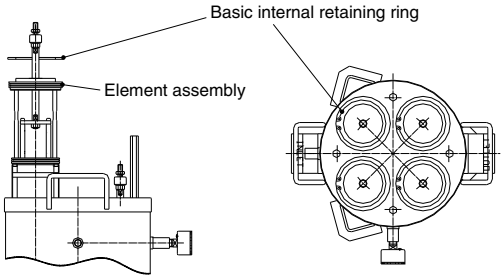
2-3. Remove the cylinder assembly.
- a. Remove the M8 hexagon nut at four parts.
- b. Remove the cylinder flange holding bolts.
  Holding bolt: M8 hexagon socket head cap screws at four parts up to the cylinder, and remove it.



2-4. Take out the element assembly.
- a. Remove the basic internal retaining ring at four parts.
- b. Withdraw the element assembly upward from the case.

∗ Remove the O-ring to the new one if it has any problems such as swelling.

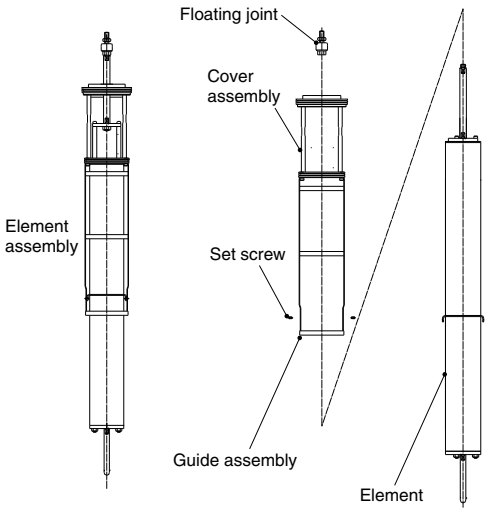
[O-ring for replacement]
KT-FN41N (JIS B2401-1A-G90 and G80) (Material: NBR)
KT-FN41V (JIS B2401-4D-G90 and G80) (Material: FPM)



2-5. Remove the element.
- a. Remove the floating joint.
- b. Remove the intermediate screws of the guide assembly.
- c. Withdraw the element from the cover assembly.

∗ Do not dismantle the element further more.

[Replacement Element]
END400-005 (5 μm Type)
END400-020 (20 μm Type)
∗ 4 elements are required per unit.



2-6. Clean the element.
- a. Clean the element taken out.
  [Cleaning method] Ultrasonic cleaning, solvent cleaning, blowing cleaning, etc

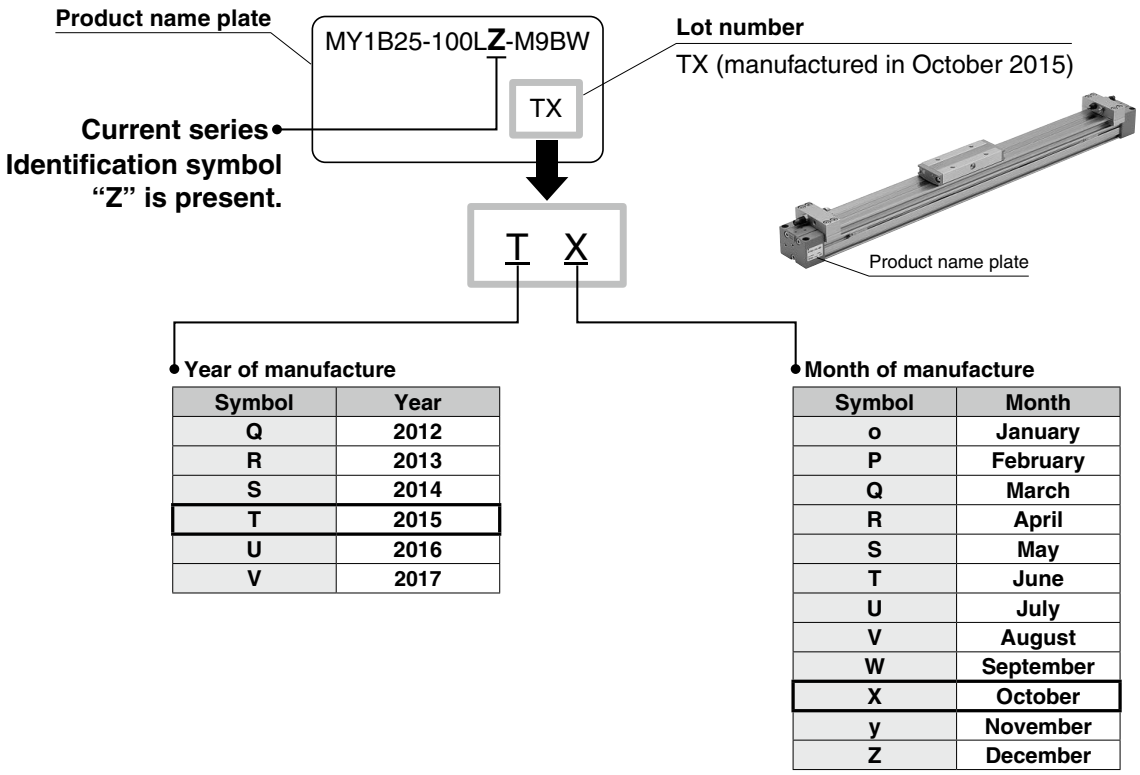
∗ Do not clean it with acid or a hard brush.

2-7. Assembly and Restart
- a. Assemble it by following the dismantling procedure backward.
- b. For restarting, follow Section 3 “Operation” in the Operation Manual.

Checking Whether your Cylinder is a Current or Previous Model

To check the seal belt shape of the product currently in use, check the product number and lot number printed on the product name plate or the label affixed to the packing box (bag).

Example) For the MY1B series mechanically jointed rodless cylinder



Symbol	Year
Q	2012
R	2013
S	2014
T	2015
U	2016
V	2017

Symbol	Month
o	January
P	February
Q	March
R	April
S	May
T	June
U	July
V	August
W	September
X	October
y	November
Z	December

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AC-B	Air Combination	p. 305	—
AC-D	Air Combination	p. 295	p. 553
ACG	Air Combination	p. 310	—
ACG-B	Air Combination	p. 306	—
AF10-A to AF60-A	Air Filter	p. 312	p. 611
AF20-D to AF60-D	Air Filter	p. 296	p. 556
AFD20-A to AFD40-A	Micro Mist Separator	p. 313	p. 624
AFD20-D to AFD40-D	Micro Mist Separator	p. 297	p. 563
AFF	Main Line Filter	p. 343	p. 343
AFF□D/AM□D/AMD□D	Compressed Air Preparation Filter	p. 342	p. 741
AFF-D/AM-D/AMD-D	Compressed Air Preparation Filter	p. 338	p. 719
AFJ	Vacuum Filter	p. 335	—
AFM20-A to AFM40-A	Mist Separator	p. 313	p. 622
AFM20-D to AFM40-D	Mist Separator	p. 297	p. 563
AL10-A to AL60-A	Lubricator	p. 316	p. 642
AL20-D to AL60-D	Lubricator	p. 300	p. 581
AM	Mist Separator	p. 344	p. 344
AMD	Micro Mist Separator	p. 345	p. 345
AME	Super Mist Separator	p. 347	p. 347
AMF	Odor Removal Filter	p. 348	p. 348
AMG	Water Separator	p. 337	p. 337
AMH	Micro Mist Separator with Pre-filter	p. 346	p. 346
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AR20-D to AR60-D	Regulator	p. 298	p. 568
AR20K-B to AR60K-B	Regulator with Backflow Function	p. 315	p. 637
AR20K-D to AR60K-D	Regulator with Backflow Function	p. 298	p. 568
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ARG20K-B to ARG40K-B	Regulator with Built-in Pressure Gauge with Backflow Function	p. 308	—
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ARM11B	Compact Manifold Regulator/Individual Supply Type	p. 330	p. 712
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AWG20-B to AWG40-B	Filter Regulator with Built-in Pressure Gauge	p. 309	—
AWG20K/30K/40K	Filter Regulator with Built-in Pressure Gauge with Backflow Function	p. 322	—
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Revision History

Edition C

* A list of current and previous cylinders, checking methods, and the model index have been added.
* Refreshed products (CM2-Z, CG1-Z, CA2-Z series, etc.) have been added to the actuator section.
* Refreshed products (AC-A, AF-A, AR-A, B series, etc.) have been added to the modular F.R.L section.
* The number of pages has been increased from 488 to 572. VZ

M-E21-1

* Rod boot assembly (for cylinders) part numbers have been added.
* Air grippers (JMHZ2, MHZ2, MHL2, MHS□, etc.) have been added.
* Rotary actuators (CRA1, NSQ, CRQ□, MRQ, etc.) have been added.
* The AC60-D modular F.R.L has been added.
  (60-D air filters, regulators, lubricators, etc., have been added.)
* The number of pages has been increased from 572 to 780. AY

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) **Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

⚠ Safety Instructions | Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.

SMC Corporation

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Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

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