

Solenoid driver - MACX MCR-EX-SL-SD-21-60-LP-SP - 2924100

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Ex i solenoid driver. For the intrinsically safe control of Ex i solenoid valves, alarm modules or LEDs installed in the Ex area. Current limitation at 58 mA. For gases up to Group IIB, loop-powered, electrical isolation, SIL 3. Push-in connection.

Your advantages

- ✓ Mechanically compatible with the DIN rail connector
- ✓ Various output characteristic curves compatible with standard solenoid valves
- ✓ Loop-powered: the required power is supplied via the control signal on the input side.
- ✓ Installation in zone 2, protection type "n" (EN 60079-15) permitted
- ✓ Up to SIL 3 according to IEC 61508
- ✓ 2-way electrical isolation
- ✓ Input: 19.2 V DC ... 30 V DC
- ✓ Output [Ex ia] IIB



Key Commercial Data

Packing unit	1 pc
GTIN	 4 046356 338523
GTIN	4046356338523
Weight per Piece (excluding packing)	146.000 g
Custom tariff number	85437090
Country of origin	Germany

Technical data

Note

Utilization restriction	EMC: class A product, see manufacturer's declaration in the download area
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Technical data

Dimensions

Width	12.5 mm
Height	116 mm
Depth	113.7 mm
	114.5 mm (Snapped onto DIN rail NS 35/7,5 in accordance with EN 60715)

Ambient conditions

Ambient temperature (operation)	-40 °C ... 60 °C (any mounting position, pay attention to the derating curve in the data sheet)
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Maximum altitude	≤ 2000 m
Permissible humidity (operation)	10 % ... 95 % (non-condensing)
Degree of protection	IP20 (not assessed by UL)
Noise immunity	EN 61000-6-2

Output data

Minimum output voltage	12.9 V DC (At 58 mA)
Output characteristic curve: Output resistor	133.4 Ω (Internal resistance R _i)
Response time	20 ms

Compatible valves

Note	This is an extract of possible combinations of valves and solenoid drivers.
Compatible valve	ASCO Coil 302 (12 V)
	ASCO Coil 302 (24 V)
	Bürkert Coil AC 10 standard
	Bürkert Coil AC 10 high resistance
	FESTO Coil MFH-...IA-SA-EX GBXE022AIAD03
	FESTO Coil (J)MFH-...BIA-SA-EX GBXE022AIAD03
	Norgren Herion Coil 2050
	Norgren Herion Coil 2051
	Norgren Herion Coil 2052
	Norgren Herion Coil 2053
	Parker Coil VZ95 482160.01 EEx ia IIB T6

Power supply

Power dissipation	< 1.325 W
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Connection data

Connection method	Push-in connection
Stripping length	8 mm
Conductor cross section solid	0.2 mm² ... 1.5 mm²

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Connection data

Conductor cross section flexible	0.2 mm² ... 1.5 mm²
Conductor cross section AWG	24 ... 16

General

No. of channels	1
Maximum temperature coefficient	0.01 %/K
Status display	Yellow LED (switching state / status, lights up when output circuit is active)
Degree of pollution	2
Overvoltage category	II
Electromagnetic compatibility	Conformance with EMC directive
Interference emission	EN 61000-6-4
Housing material	PA 6.6-FR
Color	gray
Designation	Output/input
Electrical isolation	375 V (Peak value in accordance with IEC/EN 60079-11)
Rated insulation voltage	300 V _{rms}
Test voltage	2.5 kV AC (50 Hz, 1 min.)
Insulation	Safe isolation in accordance with IEC/EN 61010-1

Safety characteristic data

Integrity requirement	IEC 61508 - Low demand
Equipment type	Type A
Safety Integrity Level (SIL)	3
Safe Failure Fraction (SFF)	100 %
λ_{SU}	2.84×10^{-7} (284 FIT)
λ_{SD}	0
λ_{DU}	0
λ_{DD}	0
Probability of a hazardous failure on demand (PFD _{AVG})	0 (1 year)
	0 (5 years)
	0 (10 years)
Diagnostic coverage (DC)	DC _S =0 %, DC _D =0 %

Safety data

Input power P _i	negligible
Max. internal inductance L _i	negligible
Max. internal capacitance C _i	negligible
Max. output voltage U _o	25.1 V

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Technical data

Safety data

Max. output current I_o	188 mA
Max. output power P_o	1.18 W
Group	IIB/IIIC
Max. external inductivity L_o	4 mH
Max. external capacitance C_o	0.83 μ F
Additional text	simple circuit
Group	IIB/IIIC
Max. external inductivity L_o	2 mH
Max. external capacitance C_o	300 nF
Additional text	mixed circuit
Group	IIB/IIIC
Max. external inductivity L_o	1 mH
Max. external capacitance C_o	370 nF
Additional text	mixed circuit
Group	IIB/IIIC
Max. external inductivity L_o	0.5 mH
Max. external capacitance C_o	460 nF
Additional text	mixed circuit
Group	IIB/IIIC
Max. external inductivity L_o	0.1 mH
Max. external capacitance C_o	790 nF
Additional text	mixed circuit
Safety-related maximum voltage U_m	253 V (125 V DC)

Standards and Regulations

Electromagnetic compatibility	Conformance with EMC directive
Noise emission	EN 61000-6-4
Designation	GB Standard
Standards/regulations	GB 3626.20
	GB 3836.1
	GB 3836.4
	GB 3836.8
	GB 12476.1
	GB 12476.4
Group	IIB/IIIC
	IIB/IIIC
	IIB/IIIC

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Technical data

Standards and Regulations

	IIB/IIIC
	IIB/IIIC

Conformance/approvals

Designation	CE
Certificate	CE-compliant
Additional text	and EN 61326
Designation	ATEX
Identification	# II (1) G [Ex ia Ga] IIB/IIA
	# II (1) D [Ex ia Da] IIIC
	# II 3 (1)G Ex nA [ia IIB Ga] IIC T4 Gc X
Certificate	IBExU 07 ATEX 1133X
Designation	IECEX
Identification	[Ex ia Ga] IIB/IIA
	[Ex ia Da] IIIC
	Ex nA [ia IIB Ga] IIC T4 Gc
Certificate	IECEX IBE 08.0002X
Designation	CCC / China-Ex
Identification	[Ex ia Ga] IIC
	[Ex iaD]
	Ex nA [ia Ga] IIC T4 Gc
Certificate	NEPSI GYJ20.1316X
Designation	UL, USA/Canada
Identification	UL 61010 Listed
	Class I, Div. 2, Groups A, B, C, D T4
	Class I, Div. 2, Groups IIC, IIB, IIA T4
	Associated apparatus for use in Class I, Division 1, Groups C,D
	Associated apparatus for use in Class II, Div.1 Groups E,F,D
	Associated apparatus for use in Class III, Division 1
	Associated apparatus for use in Class I, Zone 0,1,2, Groups IIB, IIA
Certificate	#, C.D.-No 83104549
Designation	UL, USA/Canada
Identification	Class I Div 2; IS for Class I, II, III Div 1
Certificate	#, C.D.-No 83104549
Designation	Shipbuilding approval
Certificate	DNV GL TAA000020C
Designation	Safety Integrity Level (SIL, IEC 61508)
Identification	3

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Technical data

Conformance/approvals

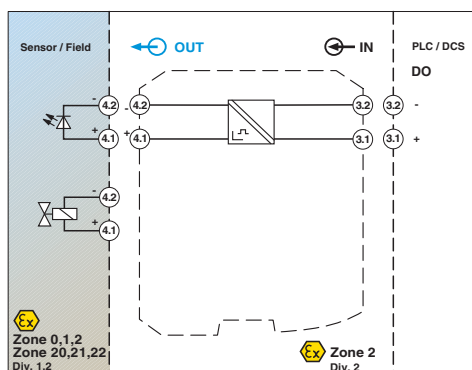
Designation	INMETRO
Identification	[Ex ia Ga] IIB/IIA
	[Ex ia Da] IIIC
	Ex nA [ia IIB Ga] IIC T4 Gc
Certificate	DNV 18.0115 X
Designation	EAC Ex
Identification	# [Ex ia Ga] IIC
	# [Ex ia Da] IIIC
Certificate	RU C-DE.AB72.B.00093/19
Temperature	B
Humidity	B
Vibration	A
EMC	A
Enclosure	Required protection according to the Rules shall be provided upon installation on board

Environmental Product Compliance

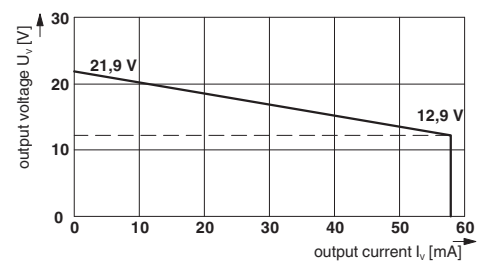
REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50 years
	For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration"

Drawings

Block diagram

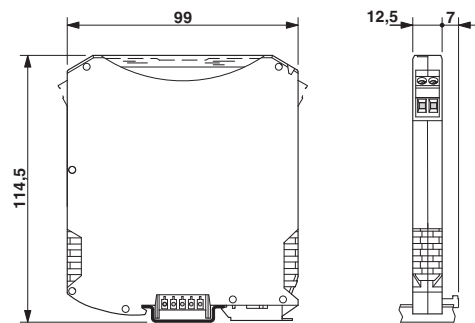


Diagram



Solenoid driver - MACX MCR-EX-SL-SD-21-60-LP-SP - 2924100

Dimensional drawing



Classifications

eCl@ss

eCl@ss 10.0.1	27210120
eCl@ss 11.0	27210120
eCl@ss 4.0	27210100
eCl@ss 4.1	27210100
eCl@ss 5.0	27210100
eCl@ss 5.1	27210100
eCl@ss 6.0	27210100
eCl@ss 7.0	27210120
eCl@ss 9.0	27210120

ETIM

ETIM 4.0	EC002653
ETIM 6.0	EC002653
ETIM 7.0	EC002653

UNSPSC

UNSPSC 6.01	30211506
UNSPSC 7.0901	39121008
UNSPSC 11	39121008
UNSPSC 12.01	39121008
UNSPSC 13.2	39121008
UNSPSC 18.0	39121008
UNSPSC 19.0	39121008
UNSPSC 20.0	39121008
UNSPSC 21.0	39121008

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Approvals

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UL Listed / cUL Listed / Functional Safety / DNV GL / CCC / cULus Listed

Ex Approvals

IECEx / UL Listed / cUL Listed / EAC Ex / ATEX / INMETRO / cULus Listed

Approval details

UL Listed		http://database.ul.com/cgi-bin/XYVV/template/LISEXT/1FRAME/index.htm	FILE E 330267
cUL Listed		http://database.ul.com/cgi-bin/XYVV/template/LISEXT/1FRAME/index.htm	FILE E 330267
Functional Safety			16/04-017 R025 V1R1
DNV GL		https://approvalfinder.dnvgl.com/	TAA000020C
CCC			2020322 316001457
cULus Listed			

Accessories

Accessories

Device marking

Solenoid driver - MACX MCR-EX-SL-SD-21-60-LP-SP - 2924100

Accessories

Plastic label - UC-EMLP (11X9) - 0819291



Plastic label, Sheet, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

Plastic label - UC-EMLP (11X9) YE - 0822602



Plastic label, Sheet, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

Plastic label - UC-EMLP (11X9) SR - 0828094



Plastic label, Sheet, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

Plastic label - US-EMLP (11X9) - 0828789



Plastic label, Card, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

Plastic label - US-EMLP (11X9) YE - 0828871



Plastic label, Card, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

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Accessories

Plastic label - US-EMLP (11X9) SR - 0828872



Plastic label, Card, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

Device marker - LS-EMLP (11X9) WH - 0831678



Device marker, Sheet, white, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255

Device marker - LS-EMLP (11X9) SR - 0831705



Device marker, Sheet, silver, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255

Device marker - LS-EMLP (11X9) YE - 0831732



Device marker, Sheet, yellow, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255

Insulating sleeve

Insulating sleeve - MPS-IH WH - 0201663



Insulating sleeve, color: white

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Accessories

Insulating sleeve - MPS-IH RD - 0201676

Insulating sleeve, color: red



Insulating sleeve - MPS-IH BU - 0201689

Insulating sleeve, color: blue



Insulating sleeve - MPS-IH YE - 0201692

Insulating sleeve, color: yellow



Insulating sleeve - MPS-IH GN - 0201702

Insulating sleeve, color: green



Insulating sleeve - MPS-IH GY - 0201728

Insulating sleeve, color: gray



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Accessories

Insulating sleeve - MPS-IH BK - 0201731

Insulating sleeve, color: black



Labeled device marker

Plastic label - UC-EMLP (11X9) CUS - 0824547



Plastic label, can be ordered: by sheet, white, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

Plastic label - UC-EMLP (11X9) YE CUS - 0824548



Plastic label, can be ordered: by sheet, yellow, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

Plastic label - UC-EMLP (11X9) SR CUS - 0828098



Plastic label, can be ordered: by sheet, silver, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

Module carrier

Module carrier - TC-D37SUB-AIO16-EX-PS-UNI - 2902932



Universal termination carrier for connecting 16 MACX Analog Ex i signal conditioners to digital or analog I/O cards, via D-SUB connector, 37-pos. (1:1 connection), with HART multiplexer connection

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Accessories

Module carrier - TC-D37SUB-ADIO16-EX-P-UNI - 2924854



Universal termination carrier for connecting 16 MACX Analog Ex i signal conditioners to digital or analog I/O cards, via D-SUB connector, 37-pos. (1:1 connection)

Power module

Power and error message module - MACX MCR-PTB - 2865625



Power and fault signaling module with screw connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GY DIN rail connector

Power and error message module - MACX MCR-PTB-SP - 2924184



Power and fault signaling module with Push-in connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GY DIN rail connector

Test plug terminal block

Test plugs - MPS-MT - 0201744



Test plugs, with solder connection up to 1 mm² conductor cross section, color: gray
