SENSORS

Q25
Right-Angle Base-Mount Rectangular Sensors

- Features EZ-BEAM® technology, with specially designed optics and electronics for reliable sensing without adjustments
- Available in opposed, retroreflective or fixed-field modes in rectangular 25 mm plastic housing with 18 mm threaded mounting base
- Completely epoxy-encapsulated for superior durability, even in harsh sensing environments
- Uses an innovative dual-indicator system to take the guesswork out of monitoring sensor performance
- Available in models for ac or dc power
- Includes advanced diagnostics to warn of marginal sensing conditions or output overload (dc models)

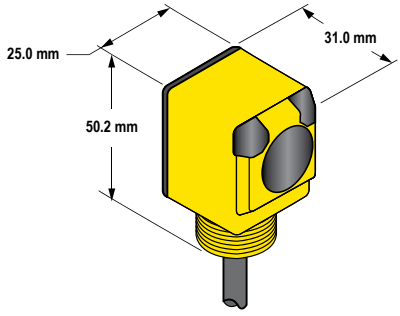
ACCESSORIES page 147

OPPOSED

P POLAR RETRO

FIXED-FIELD

Opposed and Retroreflective Models
Suffix E, R and LP



Fixed-field Models
Suffix FF

ONLINE
AUTOCAD, STEP, IGES & PDF

Q25, 10-30V dc

Infrared LED

Sensing Mode/LED	Range	Connection	Models NPN	Models PNP	Excess Gain	Beam Pattern
OPPOSED	20 m	2 m	Q256E Emitter		EGC-1 (p. 148)	BP-1 (p. 148)
		4-pin Euro QD	Q256EQ Emitter			
		2 m	Q25SN6R	Q25SP6R		
		4-pin Euro QD	Q25SN6RQ	Q25SP6RQ		

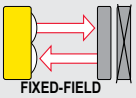
More on next page

Connection options: A model with a QD requires a mating cordset (see page 147).

For 9 m cable, add suffix **W/30** to the 2 m model number (example, **Q25SN6R W/30**).

Q25, 10-30V dc (cont'd)

Infrared LED Visible Red LED

Sensing Mode/LED	Range	Connection	Models NPN	Models PNP	Excess Gain	Beam Pattern
 POLAR RETRO	2 m†	2 m	Q25SN6LP	Q25SP6LP	EGC-2 (p. 148)	BP-2 (p. 148)
		4-pin Euro QD	Q25SN6LPQ	Q25SP6LPQ		
 FIXED-FIELD	0 - 25 mm Cutoff	2 m	Q25SN6FF25	Q25SP6FF25	EGC-3 (p. 148)	—
		4-pin Euro QD	Q25SN6FF25Q	Q25SP6FF25Q		
	0 - 50 mm Cutoff	2 m	Q25SN6FF50	Q25SP6FF50	EGC-4 (p. 148)	—
		4-pin Euro QD	Q25SN6FF50Q	Q25SP6FF50Q		
	0 - 100 mm Cutoff	2 m	Q25SN6FF100	Q25SP6FF100	EGC-5 (p. 148)	—
		4-pin Euro QD	Q25SN6FF100Q	Q25SP6FF100Q		

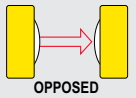
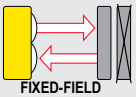
Connection options: A model with a QD requires a mating cordset (see page 147).

For 9 m cable, add suffix **W/30** to the 2 m model number (example, **Q25SN6LP W/30**).

† Retroreflective range is specified using one model BRT-3 retroreflector. Actual sensing range may differ, depending on the efficiency and reflective area of the retroreflector used. See Accessories section for more information.

Q25, 20-250V ac

Infrared LED Visible Red LED

Sensing Mode/LED	Range	Connection	Models LO	Models DO	Excess Gain	Beam Pattern
 OPPOSED	20 m	2 m	Q253E Emitter		EGC-1 (p. 148)	BP-1 (p. 148)
		4-pin Micro QD	Q253EQ1 Emitter			
		2 m	Q25AW3R	Q25RW3R		
		4-pin Micro QD	Q25AW3RQ1	Q25RW3RQ1		
 POLAR RETRO	2 m†	2 m	Q25AW3LP	Q25RW3LP	EGC-2 (p. 148)	BP-2 (p. 148)
		4-pin Micro QD	Q25AW3LPQ1	Q25RW3LPQ1		
 FIXED-FIELD	0 - 25 mm Cutoff	2 m	Q25AW3FF25	Q25RW3FF25	EGC-3 (p. 148)	—
		4-pin Micro QD	Q25AW3FF25Q1	Q25RW3FF25Q1		
	0 - 50 mm Cutoff	2 m	Q25AW3FF50	Q25RW3FF50	EGC-4 (p. 148)	—
		4-pin Micro QD	Q25AW3FF50Q1	Q25RW3FF50Q1		
	0 - 100 mm Cutoff	2 m	Q25AW3FF100	Q25RW3FF100	EGC-5 (p. 148)	—
		4-pin Micro QD	Q25AW3FF100Q1	Q25RW3FF100Q1		

Connection options: A model with a QD requires a mating cordset (see page 147).

For 9 m cable, add suffix **W/30** to the 2 m model number (example, **Q25AW3LP W/30**).

† Retroreflective range is specified using one model BRT-3 retroreflector. Actual sensing range may differ, depending on the efficiency and reflective area of the retroreflector used. See Accessories section for more information.

Q25 DC Specifications

Supply Voltage and Current	10 to 30V dc (10% max. ripple); Supply current (exclusive of load current): **Opposed Emitters:** 25 mA **Opposed Receivers:** 20 mA **Polarized Retroreflective:** 30 mA **Fixed-field:** 35 mA
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Output Configuration	Solid-state complementary dc switch; NPN (current sinking) or PNP (current sourcing), depending on model. The Dark Operate (DO) output may be wired as a normally open marginal signal alarm output, depending upon hookup to the power supply.

More on next page

Q25 DC Specifications (cont'd)

Output Rating	150 mA max. (each) in standard hookup. When wired for alarm output, the total load may not exceed 150 mA **OFF-state leakage current:** less than 1 µA at 30V dc **ON-state saturation voltage:** less than 1V at 10 mA dc; less than 1.5V at 150 mA dc
Output Protection Circuitry	Protected against false pulse on power-up and continuous overload or short circuit of outputs
Output Response Time	**Opposed:** 3 milliseconds ON, 1.5 milliseconds OFF **Polarized Retroreflective and Fixed-field:** 3 milliseconds ON/OFF
Delay at Power-up	100 milliseconds; outputs do not conduct during this time
Repeatability	**Opposed:** 375 microseconds **Polarized Retroreflective and Fixed-field:** 750 microseconds Repeatability and response are independent of signal strength.
Indicators	**Two LEDs:** **Green:** Power ON **Yellow:** Light Operate (LO) output energized
Construction	Housings are thermoplastic polyester. Lenses are polycarbonate or acrylic; one jam nut included.
Environmental Rating	Leakproof design rated NEMA 6P, IP67. QD models rated IP69K per DIN 40050-9.
Connections	2 m or 9 m attached cable, or 4-pin Euro-style quick-disconnect fitting. QD cordsets are ordered separately. See page 147.
Operating Conditions	**Temperature:** -40° to +70° C **Relative humidity:** 90% at 50° C (non-condensing)
Vibration and Mechanical Shock	All models meet Mil. Std. 202F requirements. Method 201A (Vibration; frequency 10 to 60 Hz, max., double amplitude 0.06-inch acceleration 10G). Method 213B conditions H&I (Shock: 75G with unit operating; 100G for non-operation)
Certifications	CE CSA® UL LISTED
Hookup Diagrams	**Emitters:** DC02 (p. 744) **NPN Models:** DC05 (p. 745) **PNP Models:** DC06 (p. 745)

Q25 AC Specifications

Supply Voltage and Current	20 to 250V ac (50/60 Hz) **Average current:** 20 mA **Peak current:** 200 mA at 20V ac, 500 mA at 120V ac, 750 mA at 250V ac
Supply Protection Circuitry	Protected against transient voltages
Output Configuration	Solid-state ac switch; three-wire hookup; Choose Light Operate (LO) or Dark Operate (DO), depending on model. **Light Operate:** Output conducts when the sensor sees its own (or the emitter's) modulated light **Dark Operate:** Output conducts when sensor sees dark
Output Rating	300 mA max. (continuous) **Fixed-field:** derate 5 mA/° C above +50° C **Inrush capability:** 1 amp for 20 milliseconds, non-repetitive **OFF-state leakage current:** less than 100 mA **ON-state voltage drop:** 3V at 300 mA ac; 2V at 15 mA ac
Output Protection Circuitry	Protected against false pulse on power-up
Output Response Time	**Opposed:** 16 milliseconds ON, 8 milliseconds OFF **Polarized Retroreflective and Fixed-field:** 16 milliseconds ON/OFF
Delay at Power-up	100 milliseconds
Repeatability	**Opposed:** 2 milliseconds; **Polarized Retroreflective and Fixed-field:** 4 milliseconds Repeatability and response are independent of signal strength.
Indicators	**Two LEDs:** Green and Yellow **Green:** Power ON **Yellow:** Light sensed
Construction	Housings are thermoplastic polyester. Lenses are polycarbonate or acrylic; one jam nut included.
Environmental Rating	Leakproof design rated NEMA 6P, IP67. QD models rated IP69K per DIN 40050-9.
Connections	2 m or 9 m attached cable, or 4-pin Micro-style quick-disconnect fitting. QD cordsets are ordered separately. See page 147.

More on next page

Q25 AC Specifications (cont'd)

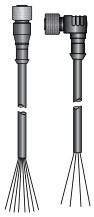
Operating Conditions	**Temperature:** -40° to +70° C **Relative humidity:** 90% at 50° C (non-condensing)
Vibration and Mechanical Shock	All models meet Mil. Std. 202F requirements. Method 201A (Vibration; frequency 10 to 60 Hz, max, double amplitude 0.06-inch acceleration 10G). Method 213B conditions H&I (Shock: 75G with unit operating; 100G for non-operation)
Certifications	CE, CSA, UL LISTED
Hookup Diagrams	**Cabled Emitters:** AC03 (p. 750) **Other Cabled Models:** AC05 (p. 751) **QD Emitters:** AC07 (p. 751) **Other QD Models:** AC06 (p. 751)

Cordsets

Euro QD

See page 682

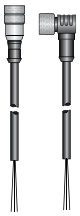
Length	Threaded 4-Pin Straight	Threaded 4-Pin Right-Angle
1.83 m	MQDC-406	MQDC-406RA
4.57 m	MQDC-415	MQDC-415RA
9.14 m	MQDC-430	MQDC-430RA



Micro QD

See page 698

Length	Threaded 4-Pin Straight	Threaded 4-Pin Right-Angle
1.83 m	MQAC-406	MQAC-406RA
4.57 m	MQAC-415	MQAC-415RA
9.14 m	MQAC-430	MQAC-430RA



Additional cordset information available. See page 679.

Brackets

Q25

		
pg. 637	pg. 638	pg. 638
SMB18A	SMB18FA..	SMB18SF

Additional brackets and information available. See page 620.

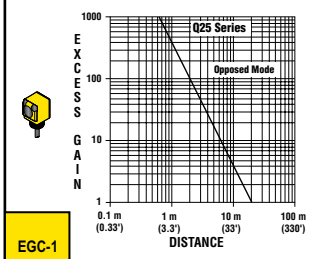
REFLECTORS
PAGE 710

Excess Gain Curves

(Fixed-field mode performance based on 90% reflectance white test card†)

○ = Infrared LED P = Visible Red LED Polarized

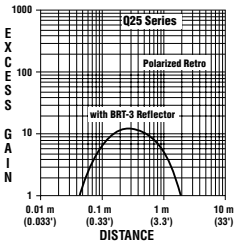
Opposed Mode Q25



EGC-1

Range: 20 m **LED:** ○

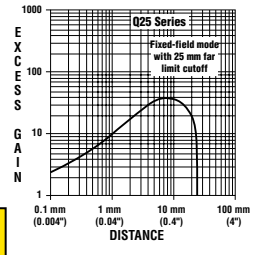
Polarized Retroreflective Mode Q25



EGC-2

Range: 2 m **LED:** P

Fixed-Field Mode Q25



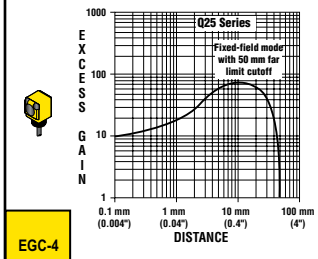
EGC-3

Cutoff: 25 mm **LED:** ○

Ø 10 mm spot size @ 8 mm focus
Ø 10 mm spot size @ 25 mm cutoff

† Using 18% gray test card: Cutoff distance will be 95% of value shown.
† Using 6% black test card: Cutoff distance will be 90% of value shown.

Fixed-Field Mode Q25



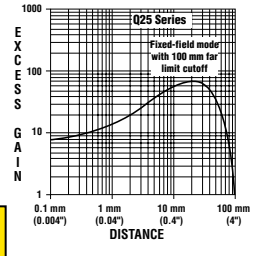
EGC-4

Cutoff: 50 mm **LED:** ○

Ø 10 mm spot size @ 10 mm focus
Ø 10 mm spot size @ 50 mm cutoff

† Using 18% gray test card: Cutoff distance will be 90% of value shown.
† Using 6% black test card: Cutoff distance will be 85% of value shown.

Fixed-Field Mode Q25



EGC-5

Cutoff: 100 mm **LED:** ○

Ø 10 mm spot size @ 20 mm focus
Ø 10 mm spot size @ 100 mm cutoff

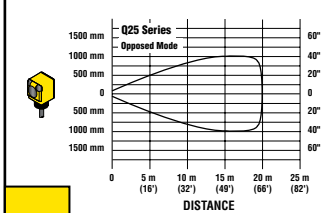
† Using 18% gray test card: Cutoff distance will be 85% of value shown.
† Using 6% black test card: Cutoff distance will be 75% of value shown.

Beam Patterns

○ = Infrared LED P = Visible Red LED Polarized

Opposed Mode Q25

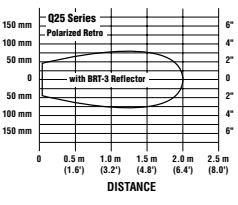
Effective Beam: 23 mm



BP-1

Range: 20 m **LED:** ○

Polarized Retroreflective Mode Q25

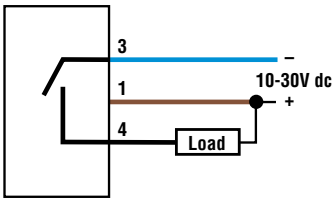


BP-2

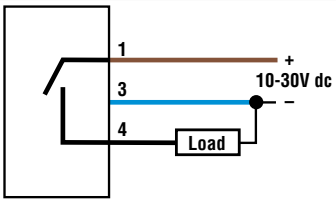
Range: 2 m **LED:** P

DC Hookups

DC01 Current Sinking (NPN)



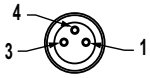
Current Sourcing (PNP)



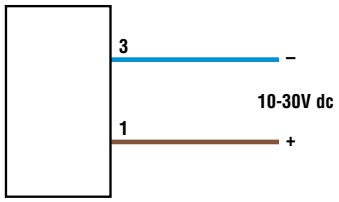
Key

1 = Brown
3 = Blue
4 = Black

3-Pin Pico



DC02 Emitter

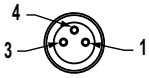


Key

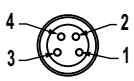
1 = Brown
2 = White†
3 = Blue
4 = Black†

† Not Used

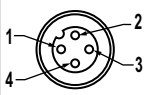
3-Pin Pico



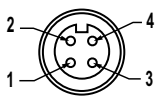
4-Pin Pico



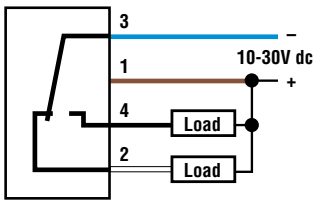
4-Pin Euro



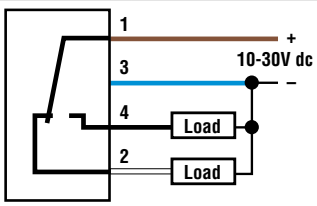
4-Pin Mini



DC03 Complementary Current Sinking (NPN)



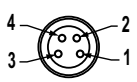
Complementary Current Sourcing (PNP)



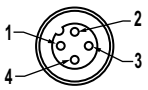
Key

1 = Brown
2 = White
3 = Blue
4 = Black

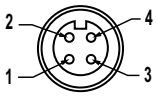
4-Pin Pico



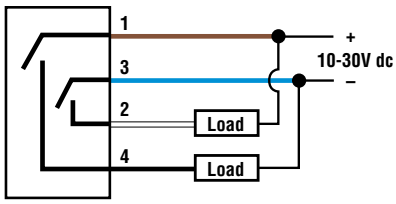
4-Pin Euro



4-Pin Mini



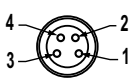
DC04 Bipolar (NPN + PNP)



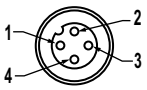
Key

1 = Brown
2 = White
3 = Blue
4 = Black

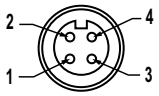
4-Pin Pico



4-Pin Euro



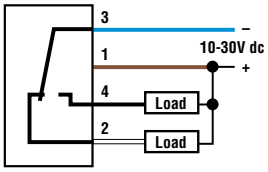
4-Pin Mini



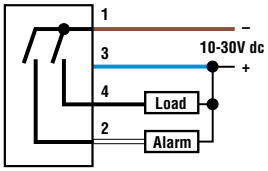
More on next page

DC Hookups

DC05 Complementary Current Sinking (NPN) Standard Hookup

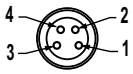
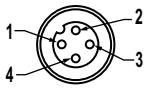


Current Sinking (NPN) Plus Current Sinking Alarm

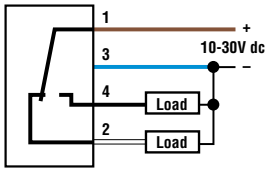


Key

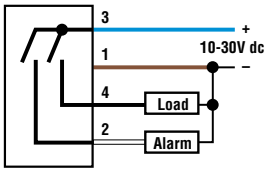
1 = Brown
2 = White
3 = Blue
4 = Black

4-Pin Pico	4-Pin Euro
	

DC06 Complementary Current Sourcing (PNP) Standard Hookup

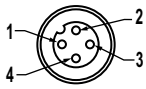


Current Sourcing (PNP) Plus Current Sourcing Alarm

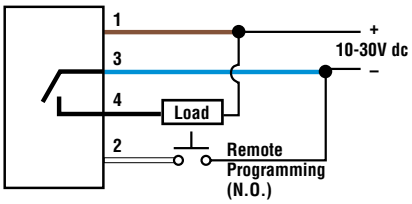


Key

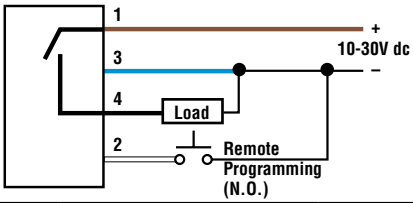
1 = Brown
2 = White
3 = Blue
4 = Black

4-Pin Pico	4-Pin Euro
	

DC07 Current Sinking (NPN)

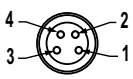
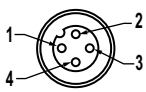


Current Sourcing (PNP)

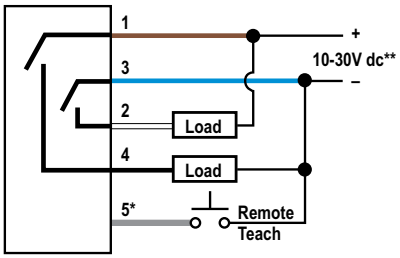


Key

1 = Brown
2 = White
3 = Blue
4 = Black

4-Pin Pico	4-Pin Euro
	

DC08 Bipolar (NPN + PNP)

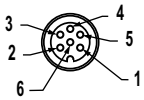
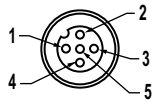


*NOTE: For some QS30 models, gray wire is used for LO/DO Select. See data sheet.
** Bussable Power models are 12-30V dc

Key

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Gray
6 = Pink †

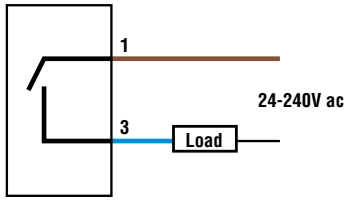
† Not Used

6-Pin Pico	5-Pin Euro
	

More on next page

AC Hookups

AC01 2-wire AC

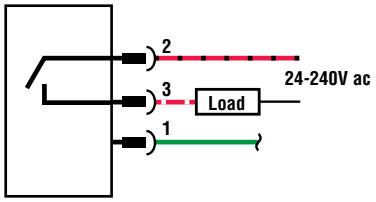


NOTE: Wire a load in series before powering up sensor.

Key

1 = Brown
3 = Blue

AC02 2-wire AC with Quick-Disconnect Cable



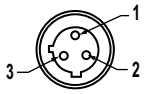
NOTE: Wire a load in series before powering up sensor.

Key

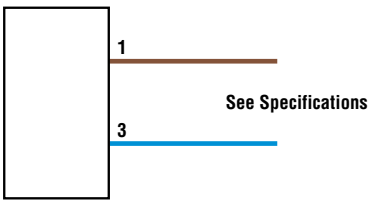
1 = Green†
2 = Red/Black
3 = Red/White

† Not Used

3-Pin Micro



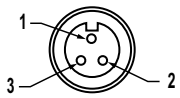
AC03 Emitters



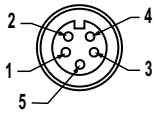
Key

1 = Brown
3 = Blue

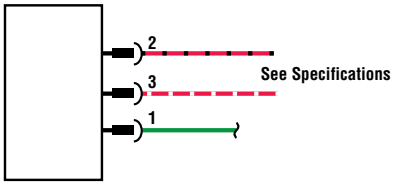
3-Pin Mini



5-Pin Mini



AC04 Emitters with Quick-Disconnect Cable

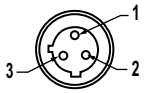


Key

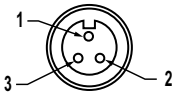
1 = Green†
2 = Red/Black
3 = Red/White

† Not Used

3-Pin Micro



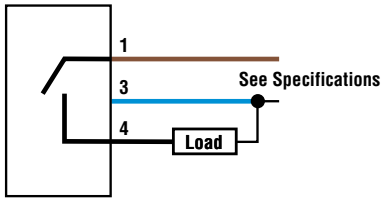
3-Pin Mini



More on next page

AC Hookups

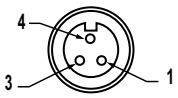
AC05 3-wire AC



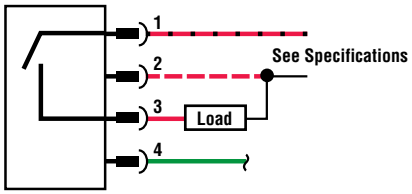
Key

1 = Brown
3 = Blue
4 = Black

3-Pin Mini



AC06 3-wire AC with Quick-Disconnect Cable

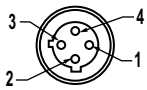


Key

1 = Red/Black
2 = Red/White
3 = Red
4 = Green†

† Not Used

4-Pin Micro



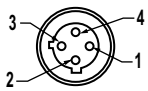
AC07 Emitters with Quick-Disconnect Cable

Key

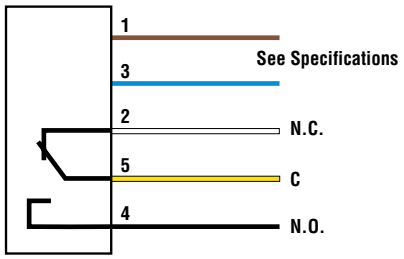
1 = Red/Black
2 = Red/White
3 = Red†
4 = Green†

† Not Used

4-Pin Micro



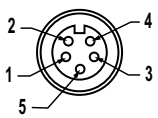
AC08 SPDT Electromechanical Relay Output



Key

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Yellow

5-Pin Mini



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