QM42 Series Sensor

Datasheet



- Compact, rugged, low cost self-contained sensors in metal die cast housings
- Epoxy-encapsulated circuitry; leakproof IP67 (NEMA 6) construction for harsh environments
- Outstanding electrical noise immunity
- Dual LED system indicates sensor performance
- Choice of integral cable or quick disconnect connector

WARNING: Not To Be Used for Personnel **Protection**

Never use this device as a sensing device for personnel **protection.** Doing so could lead to serious injury or death. This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.

Models

QM42 Opposed Mode **Emitter** (E) and Receiver (R)		
Models	Cable	Output Type
QM426E Emitter	2 m (6.5 ft)	-
QM426EQ Emitter	4-pin Euro QD	
QM42VN6R Receiver	2 m (6.5 ft)	NPN
QM42VN6RQ Receiver	4-pin Euro QD	
QM42VP6R Receiver	2 m (6.5 ft)	PNP
QM42VP6RQ Receiver	4-pin Euro QD	

QM42 **Plastic** Fiber **Optic** Mode		
Models	Cable	Output Type
QM42VN6FP	2 m (6.5 ft)	NPN
QM42VN6FPQ	4-pin Euro QD	
QM42VP6FP	2 m (6.5 ft)	PNP
QM42VP6FPQ	4-pin Euro QD	

QM42 **Diffuse** Mode		
Models	Cable	Output Type
QM42VN6D	2 m (6.5 ft)	NPN
QM42VN6DQ	4-pin Euro QD	
QM42VP6D	2 m (6.5 ft)	PNP
QM42VP6DQ	4-pin Euro QD	

QM42 Polarized **Retroreflective** Mode		
Models	Cable	Output Type
QM42VN6LP	2 m (6.5 ft)	NPN
QM42VN6LPQ	4-pin Euro QD	
QM42VP6LP	2 m (6.5 ft)	PNP
QM42VP6LPQ	4-pin Euro QD	

To order the 9 m (30 ft) cable models, add the suffix "W/30" to the model number of any cabled sensor (for example, QM42VN6D W/30). Models with a QD connector require a mating cable.

Specifications

Sensing Beam
Infrared, 880 nm for opposed and diffuse
Visible red, 660 nm for fiber optic and retroreflective modes

Supply Voltage and Current
10 to 30 V dc (10% maximum ripple) at less than:
Diffuse and retroreflective models: 20 milliamps
Opposed mode: 30 milliamps (emitter), 10 milliamps (receiver)
Fiber optic models: 30 milliamps

Supply **Protection** Circuitry
Protected against reverse polarity and transient voltages

Output **Configuration**
SPDT (complementary) solid-state dc switch; Choose NPN (current sinking) or PNP (current sourcing) models.
Light operate: N.O. output conducts when the sensor sees its own (or the emitter's) modulated light
Dark operate: N.C. output conducts when the sensor sees dark

Output **Rating**
100 mA maximum (each output)
Off-state leakage current: < 5 microamps at 30 V dc
On-state saturation voltage: < 1 V at 10 mA dc; < 1.5 V at 100 mA dc

Repeatability
Diffuse and retroreflective modes: 250 microseconds
Opposed Mode: 120 microseconds
Fiber optic mode: 60 microseconds

Adjustments
All models except emitters: 15-turn slotted brass GAIN (sensitivity) adjustment potentiometer (clutched at both ends of travel)

Indicators
Two LEDs: green and amber
Green solid = power to sensor is on (Opposed emitters: Green power "on")
Green flashing = output is overloaded
Amber solid = light is sensed; normally open output on
Amber flashing = marginal excess gain (1–1.5x) in light condition

Construction
Housings are die-cast zinc alloy with black epoxy powder paint finish; lenses are acrylic

Connections
2 m (6.5 ft) or 9 m (30 ft) attached cable, or 4-pin Euro-style quick-disconnect fitting; Cables for QD models are purchased separately

Output **Protection** Circuitry

Protected against false pulse on power-up and continuous overload or short-circuit of outputs
Overload trip point ≥ 150 mA, typical, at 20 °C

Output Response Time

Diffuse and retroreflective modes: 1 millisecond on and off
Opposed mode: 1 millisecond on, 0.5 millisecond off
Fiber optic mode: 0.25 millisecond on and off

Environmental **Rating**

IP67; NEMA 6

Operating Conditions

Temperature: –20 °C to +70 °C (–4 °F to +158 °F)
Relative Humidity: 90% at +50 °C maximum relative humidity (non-condensing)

Certifications

Required Overcurrent **Protection**

WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

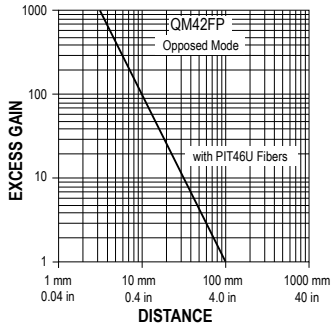
Overcurrent protection is required to be provided by end product application per the supplied table.
Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.
Supply wiring leads < 24 AWG shall not be spliced.
For additional product support, go to *www.bannerengineering.com*.

Supply Wiring (AWG)	Required Overcurrent **Protection** (Amps)
20	5.0
22	3.0
24	2.0
26	1.0
28	0.8
30	0.5

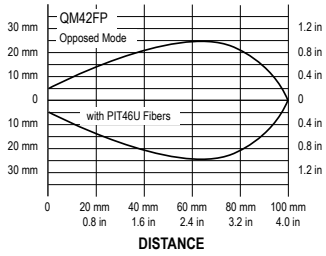
Performance Curves

Plastic Fiber **Optic** Mode - Range: 40 mm (1.5 in)

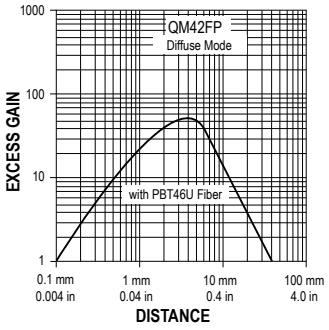
Excess Gain



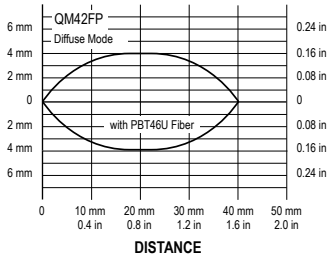
Beam **Pattern**



Excess Gain

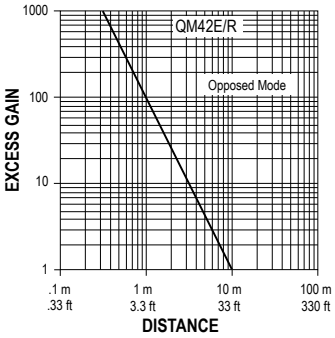


Beam **Pattern**[1]

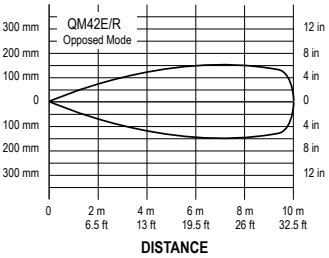


Opposed Mode - Range: 10 m (33 **ft)**

Excess Gain

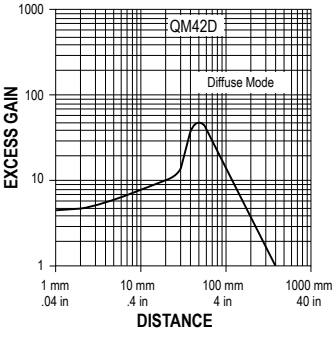


Beam **Pattern (Effective** beam: 8 mm)

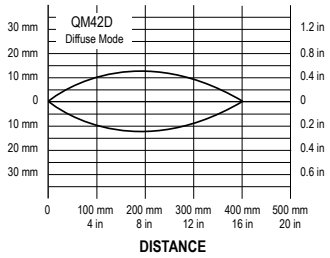


Diffuse Mode - Range: 400 mm (16 in)

Excess Gain



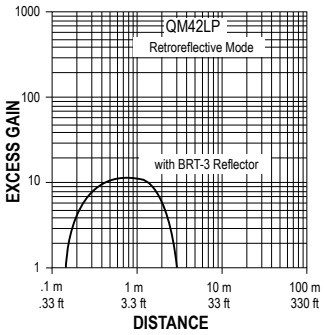
Beam **Pattern**[2]



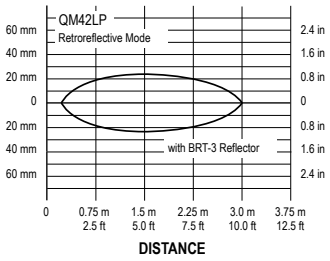
1 Diffuse mode performance is based on a 90% reflectance white test card.
2 Performance is based on a 90% reflectance white test card.

Polarized **Retroreflective** Mode - Range: 3 m (10 **ft)**

Excess Gain

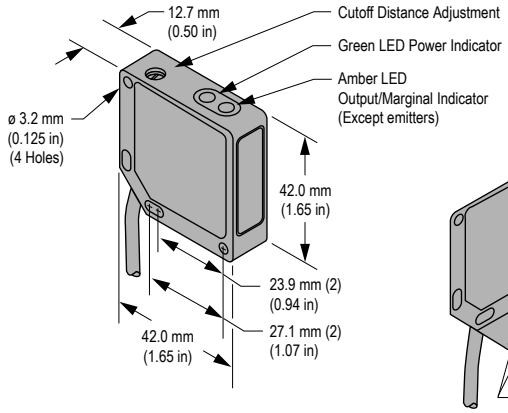


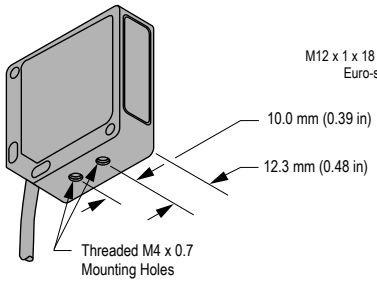
Beam **Pattern**



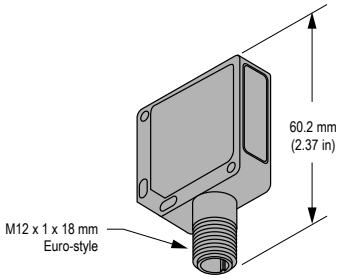
Dimensions

Cabled **Diffuse,** Opposed, and **Retroreflective** Models

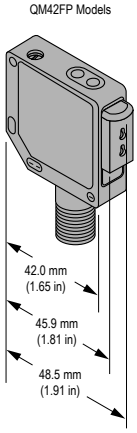




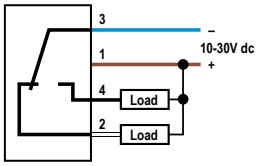
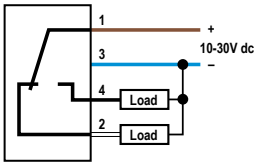
Quick Disconnect Models

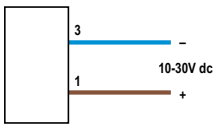
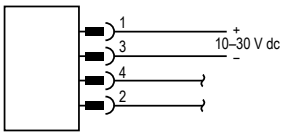


Quick Disconnect FP Models



Wiring Diagrams

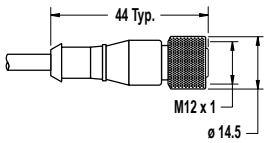
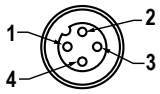
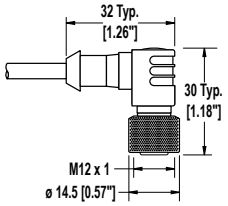
Sensors with NPN Outputs	Sensors with PNP Outputs	Key
		1 - brown 2 - white 3 - blue 4 - black

DC **Emitters**		
Cabled Models	Quick Disconnect Models	Key
		1 - brown 2 - white 3 - blue 4 - black

Cabled models are shown. Quick disconnect (QD) wiring diagrams are functionally identical.

Accessories

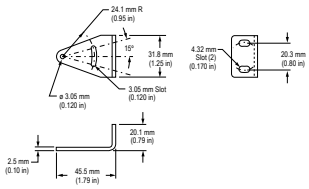
4-Pin Euro-Style Cordsets

4-Pin Threaded M12/Euro-Style Cordsets				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC-406	1.83 m (6 ft)	Straight		 1 = Brown 2 = White 3 = Blue 4 = Black
MQDC-415	4.57 m (15 ft)			
MQDC-430	9.14 m (30 ft)			
MQDC-450	15.2 m (50 ft)			
MQDC-406RA	1.83 m (6 ft)	Right-Angle		
MQDC-415RA	4.57 m (15 ft)			
MQDC-430RA	9.14 m (30 ft)			
MQDC-450RA	15.2 m (50 ft)			

Brackets

SMB19

- Right-angle mounting bracket with a curved slot for versatile orientation



All measurements are listed in millimeters [inches], unless noted otherwise.

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