

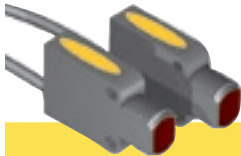


MINI-BEAM[®]2 – QS12 Series

Miniature Photoelectric Sensors

Features

- Patented design allows for a sensor only one-third the size of the original MINI-BEAM.
- 12 mm threaded barrel on most models.
- Uses advanced miniaturized microprocessor-based circuitry.
- Simple setup, using digital push-button sensitivity adjustment.
- Available for opposed, retroreflective, diffuse, and convergent sensing modes.
- 10 to 30V dc operation.
- Complementary outputs (one normally open and one normally closed), each with 150 mA switching capacity.
- IP67 and NEMA 6 environmental ratings.
- Wraparound status indicators.
- Models with either integral, unterminated cable or 150 mm (6") pigtail with 4-pin Pico-style connector.



Their small effective beam size is ideal for accuracy-dependent applications. They provide enough excess gain at short range to burn through even contaminated areas and may even sense opaque materials through a thin-walled container.



Opposed-Mode Emitter (E) and Receiver (R) Models

Model	Range	Cable*	Supply Voltage	Output Type	Excess Gain	Beam Pattern
QS126E QS12VN6R	4 m (13')	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS126EQ QS12VN6RQ		4-pin Pico-style Pigtail QD				
QS126E QS12VP6R		2 m (6.5')		PNP (sourcing)		
QS126EQ QS12VP6RQ		4-pin Pico-style Pigtail QD				

*9 m (30') cables are available by adding suffix "W/30" to the model number of any cabled sensor (e.g., QS126E W/30). A model with a pigtail QD requires a mating cable (see page 7).

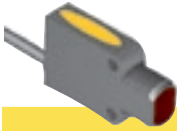


WARNING . . . Not To Be Used for Personnel Protection

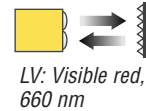
Never use this product as a sensing device for personnel protection. Doing so could lead to serious injury or death.

This product 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. Consult your current Banner Safety Products catalog for safety products which meet OSHA, ANSI and IEC standards for personnel protection.

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Excellent for sensing small items where opposed-mode sensing is not possible. Recommended for relatively clean environments where substantial excess gain is not required. Polarized models filter out unwanted reflections.

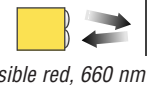


Retroreflective Models

Model	Range**	Cable*	Supply Voltage	Output Type	Excess Gain	Beam Pattern
					Performance based on BRT-50 retroreflector	
Retroreflective						
QS12VN6LV	2 m (6.5')	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6LVQ		4-pin Pico-style Pigtail QD				
QS12VP6LV		2 m (6.5')		4-pin Pico-style Pigtail QD		
QS12VP6LVQ		4-pin Pico-style Pigtail QD				
Polarized Retroreflective						
QS12VN6LP	1 m (3')	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6LPQ		4-pin Pico-style Pigtail QD				
QS12VP6LP		2 m (6.5')		4-pin Pico-style Pigtail QD		
QS12VP6LPQ		4-pin Pico-style Pigtail QD				



Convergent-mode sensors feature high excess gain and can detect objects of low reflectivity. They are a good choice for counting radiused objects with no space between them, for accurate position sensing, and for sensing clear materials that travel near the beam's focus.



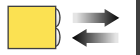
Convergent-Mode Models

Model	Focus	Cable*	Supply Voltage	Output Type	Excess Gain	Beam Pattern
					Performance based on 90% reflectance white test card	
QS12VN6CV10	10 mm (0.4")	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6CV10Q		4-pin Pico-style Pigtail QD				
QS12VP6CV10	Spot Size at Focus: 2 m (6.5')	4-pin Pico-style Pigtail QD				
QS12VP6CV10Q	Spot Size at Focus: 1 mm (0.04")			4-pin Pico-style Pigtail QD		
QS12VN6CV20	20 mm (0.8")	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6CV20Q		4-pin Pico-style Pigtail QD				
QS12VP6CV20	Spot Size at Focus: 2 m (6.5')	4-pin Pico-style Pigtail QD				
QS12VP6CV20Q	Spot Size at Focus: 1.75 mm (0.07")			4-pin Pico-style Pigtail QD		

*9 m (30') cables are available by adding suffix "W/30" to the model number of any cabled sensor (e.g., QS12VN6CV10 W/30). A model with a pigtail QD requires a mating cable (see page 7).

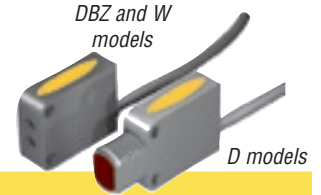
**Range specifications for retroreflective and polarized retroreflective sensors are largely dependent on target size and design.

MINI-BEAM®2 QS12 Series Miniature Photoelectric Sensors



D, DBZ: Visible red, 680 nm
W: Visible red, 660 nm

These economical single-unit sensors are excellent for sensing objects of adequate size and reflectivity at short range. Divergent (wide-angle) models are useful for sensing small items and translucent or transparent materials at close range. Models are available with or without the 12 mm threaded front.



Diffuse-Mode Models

Model	Range	Cable*	Supply Voltage	Output Type	Excess Gain	Beam Pattern
					Performance based on 90% reflectance white test card	
Diffuse						
QS12VN6D	180 mm (7")	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6DQ		4-pin Pico-style Pigtail QD				
QS12VP6D		2 m (6.5')		PNP (sourcing)		
QS12VP6DQ		4-pin Pico-style Pigtail QD				
Diffuse (Flush-Front Profile)						
QS12VN6DBZ	180 mm (7")	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6DBZQ		4-pin Pico-style Pigtail QD				
QS12VP6DBZ		2 m (6.5')		PNP (sourcing)		
QS12VP6DBZQ		4-pin Pico-style Pigtail QD				
Divergent (Wide-Angle) Diffuse						
QS12VN6W	50 mm (2")	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6WQ		4-pin Pico-style Pigtail QD				
QS12VP6W		2 m (6.5')		PNP (sourcing)		
QS12VP6WQ		4-pin Pico-style Pigtail QD				

*9 m (30') cables are available by adding suffix "W/30" to the model number of any cabled sensor (e.g., QS12VN6D W/30).
A model with a pigtail QD requires a mating cable (see page 7).

MINI-BEAM[®]2 QS12 Series Miniature Photoelectric Sensors

Overview

MINI-BEAM2 is just one-third the size of the original MINI-BEAM. With its impressive sensing performance and small size, the MINI-BEAM2 can mount inside machinery where other self-contained photoelectric sensors will not fit or function.

Sensor configuration is extremely easy, using the MINI-BEAM2's push button.

LED Indicators

MINI-BEAM2 has two bright LEDs; both are visible from the back, and each is visible from one side of the sensor. They indicate the following:

Green ON steady: Power ON

Green 5 rapid flashes: Maximum gain

Green single flash: Push button "click" registered, gain reduced by one increment

Yellow ON steady: Light sensed

Yellow/Green alternating: Minimum gain (can not reduce further)

Sensor Configuration

Sensitivity Level

Sensitivity (gain) is adjusted easily using the sensor's push button. Select from 8 possible setting increments.

- 1) Hold the push button until the Green LED flashes rapidly, 5 times, indicating that the sensor is set to maximum gain.
- 2) To reduce gain, briefly press ("click") the push button up to 7 times; gain will reduce in single increments with each click. Yellow and Green LEDs alternate after the lowest setting is reached.
- 3) To increase gain, hold the push button until gain increases to the maximum level, then "click" the push button down to the appropriate level. Gain may be readjusted in this way at any time.

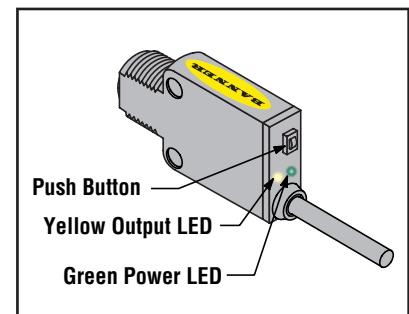



Figure 1. MINI-BEAM2 features

MINI-BEAM[®] 2 QS12 Series Miniature Photoelectric Sensors

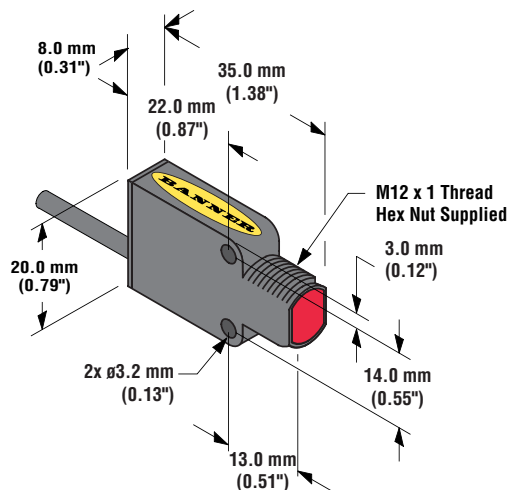
Specifications

Supply Voltage	10 to 30V dc (10% maximum ripple) at less than 25 mA, exclusive of load
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Output Configuration	Solid state complementary (SPDT): NPN or PNP (current sinking or sourcing) output models available
Output Rating	150 mA maximum each output at 25°C OFF-state leakage current: less than 10 µA @ 30V dc ON-state saturation voltage: less than 1V @ 10 mA; less than 2.0V @ 150 mA
Output Protection Circuitry	Protected against false pulse on power-up and continuous overload or short circuit of outputs
Output Response	Opposed Mode: 8 milliseconds ON, 4 milliseconds OFF All others: 1.5 milliseconds NOTE: 500 millisecond delay on power-up, outputs do not conduct during this time
Repeatability	Opposed Mode: 1 millisecond All others: 175 microseconds
Adjustments	One rubber-sealed push button Hold: Maximum gain Click: Reduce gain one increment
Indicators	2 LEDs, visible from back and sides of sensor: 1 green, 1 amber Green steady: Power ON Yellow steady: Light sensed Green flashing rapidly 5 times: Maximum gain Single Green flash: Click registered, gain reduced by one increment (total of 8) Yellow/Green alternating: Minimum gain (can not reduce further)
Construction	Black polycarbonate/ABS alloy housing; totally encapsulated circuitry
Environmental Rating	IEC IP67; NEMA 6
Connections	2 m (6.5') 4-wire PVC cable, 9 m (30') PVC cable, or 4-pin Pico-style 150 mm (6") pigtail QD
Operating Conditions	Temperature: -20° to +55° C (-4° to +131° F) Relative Humidity: 90% @ 50° C (non-condensing)
Certifications	

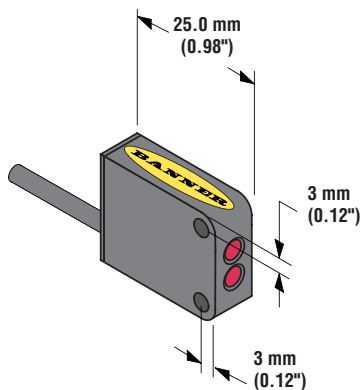
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Dimensions

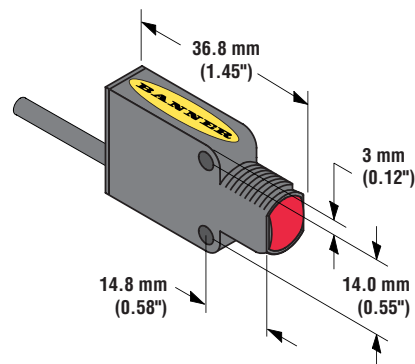
Retroreflective and Diffuse Modes (Model suffix D, LV and LP)



Diffuse and Divergent Diffuse Modes (Model suffix DBZ and W)

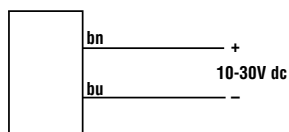


Emitter, Receiver and Convergent Mode (Model suffix E, R and CV)

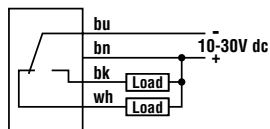


Hookups

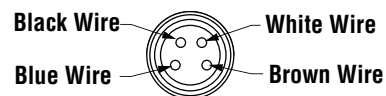
Emitters with Attached Cable



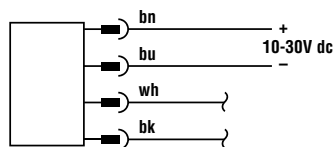
Sensors with NPN (Sinking) Outputs



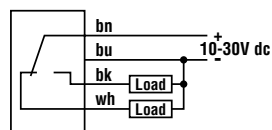
4-Pin Pico-Style Pin-Out (Cable Connector Shown)



Emitters with Quick-Disconnect (4-Pin Pico-Style)



Sensors with PNP (Sourcing) Outputs

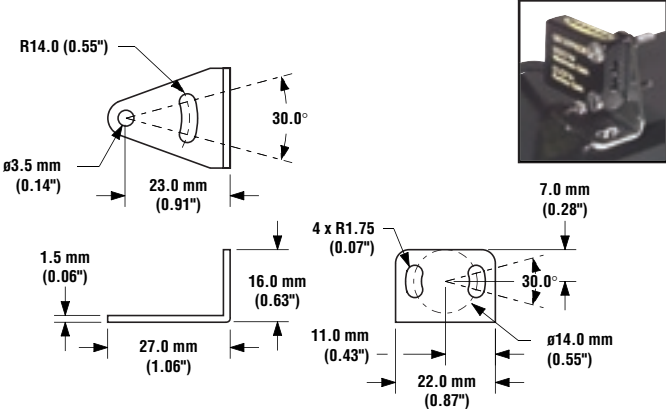
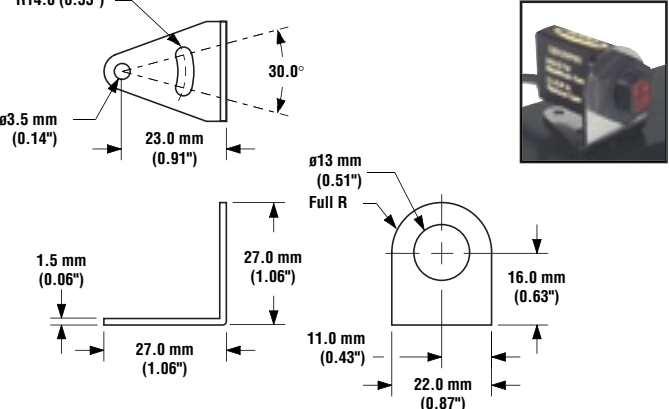




NOTE: Hookups are functionally the same for either integral cable or QD models.

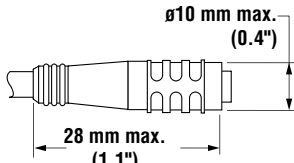
MINI-BEAM® 2 QS12 Series Miniature Photoelectric Sensors

Accessories

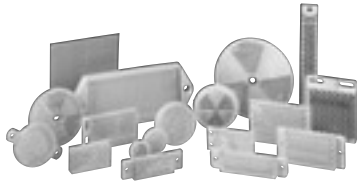
Mounting Brackets

SMBQS12S	<ul style="list-style-type: none"> • Right-angle bracket, side-mount • 300 series stainless steel, 16 ga. 	SMBQS12PD	<ul style="list-style-type: none"> • Right-angle bracket, 12 mm nose-mount • 300 series stainless steel, 16 ga.
			

Pico-Style Quick-Disconnect Cables

<p>Cable: PUR jacket, polyurethane connector body, POM snap-lock coupling Conductors: 26 or 24 AWG high-flex stranded, gold-plated contacts Temperature: -40° to +90°C (-40° to +194°F) Voltage Rating: 30V ac/36V dc</p>			
Style	Model	Length	Dimensions
4-Pin Straight	PKG4-2	2 m (6.5')	

Reflective Targets

<p>Banner offers a wide selection of high-quality retroreflective targets. See the Accessories section of your current Banner Photoelectric Sensors catalog for complete information.</p> <p>NOTE: Polarized sensors require corner cube type retroreflective targets only.</p>	
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MINI-BEAM^{®2} QS12 Series Miniature Photoelectric Sensors



WARRANTY: Banner Engineering Corp. warrants its products to be free from defects for one year. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture found to be defective at the time it is returned to the factory during the warranty period. This warranty does not cover damage or liability for the improper application of Banner products. This warranty is in lieu of any other warranty either expressed or implied.

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Banner Engineering Corp., 9714 Tenth Ave. No., Minneapolis, MN USA 55441 • Phone: 763.544.3164 • www.bannerengineering.com • Email: sensors@bannerengineering.com