

Features



- Photoelectric sensors in a compact, rugged, sealed, over-molded plastic housing
- Standard 3 mm threaded mounting holes on 25.4 mm (1") spacing
- Advanced ASIC design for excellent noise immunity and cross-talk avoidance
- Threaded metal M8 connector on Pico-style quick-disconnect models
- 10 to 30V dc operation with complementary solid-state outputs (1 normally open, 1 normally closed); PNP (sourcing) or NPN (sinking), depending on model
- Complete offering of mounting brackets and apertures available
- Crosstalk prevention filters available for visible red opposed mode pairs

Models

	Sensing Mode	Model*	Range	Output**		Sensing Mode	Model*	Range	Output**	
Opposed	624 nm Visible Red	Q20E	10 m (33')	N/A		Diffuse-mode performance based on use of 90% reflectance white test card.				
	Effective Beam: 10 mm (0.4")	Q20PR		PNP		624 nm Visible Red	Q20PDL	800 mm (32")	PNP	
		Q20NR		NPN					850 nm Infrared	Q20NDL
	850 nm Infrared	Q20EL	N/A	15 m (49')			624 nm Visible Red	Q20PDXL		
	Effective Beam: 10 mm (0.4")	Q20PRL	PNP						850 nm Infrared	Q20NDXL
		Q20NRL	NPN				624 nm Visible Red	Q20PD		
Polarized Retro	660 nm Visible Red	Q20PLP	4 m' (13')	PNP		624 nm Visible Red			Q20ND	NPN
		Q20NLP		NPN						
Retro	660 nm Visible Red	Q20PLV	6 m' (20')	PNP						
		Q20NLV		NPN						

* Only standard 2 m (6.5') cable models are listed. For 9 m (30') cable, add suffix "W/30" to the model number (e.g., Q20E W/30).

QD models:

- For 4-pin Pico-style (threaded) integral QD, add suffix "Q7" (e.g., Q20EQ7).
- For 4-pin Pico-style (threaded) 150 mm (6") pigtail QD, add suffix "Q" (e.g., Q20EQ).
- For 4-pin Euro-style 150 mm (6") pigtail QD, add suffix "Q5" (e.g., Q20EQ5).
- For 150 mm (6") PUR pigtail cable with 4-pin threaded Euro-style QD connector, add "QPMA" to the model number (e.g., Q20EQPMA)

[†] Range is specified using a model BRT-84 reflector.

**Available with Health or Alarm Mode output; contact factory for details.

WARNING . . . Not To Be Used for Personnel Protection

Never use these products as sensing devices for personnel protection. Doing so could lead to serious injury or death.

These sensors do NOT include the self-checking redundant circuitry necessary to allow their 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.

WORLD-BEAM® Q20 Series Sensors

Overview

Banner's Q20 family of sensors offers a full complement of sensing modes, with the excellent performance expected of much larger sensors. Their compact plastic housings feature overmolded construction for superior robustness and sealing. Their popular rectangular design is easy to mount into tight spaces; integral threaded mounting holes eliminate the need for separate mounting nuts.

The single-turn Gain potentiometer on most models and bright Signal LED (positioned on top of the housing for 360° visibility) provide easy alignment and configuration for reliable sensing (see Figure 1).

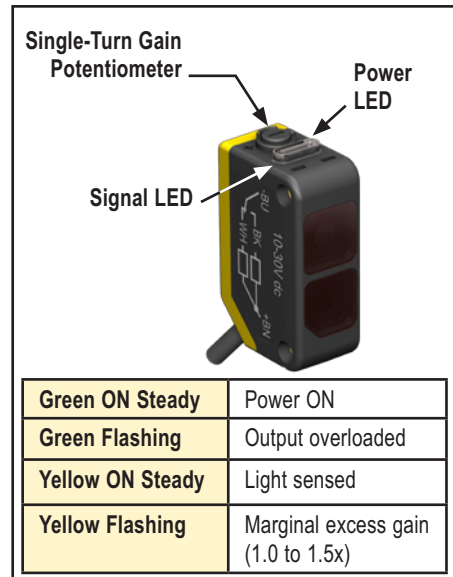


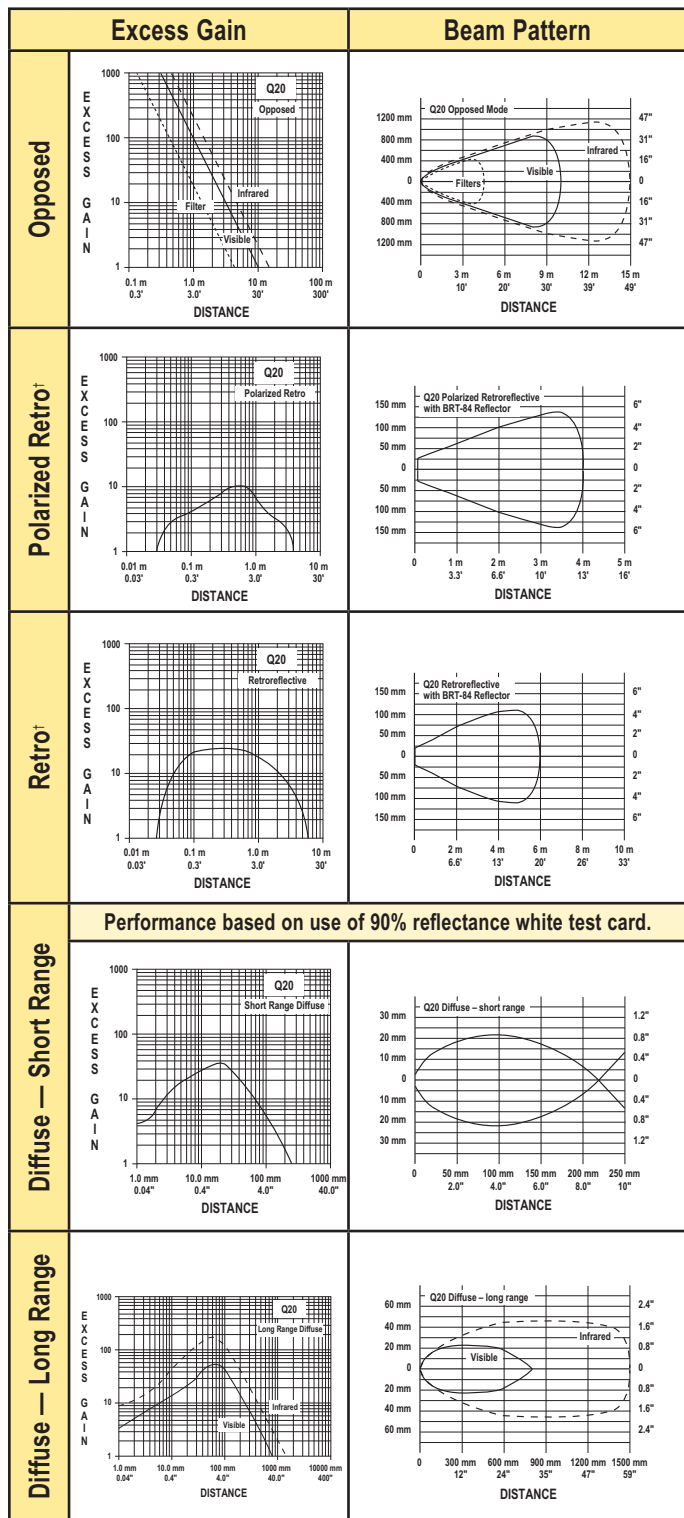
Figure 1. Features

Specifications

Supply Voltage	10 to 30V dc (10% maximum ripple) at less than 18 mA, exclusive of load
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Output Configuration	100 mA with short circuit protection OFF-state leakage current: NPN: < 200 µA sinking PNP: < 20 µA sourcing ON-state saturation voltage: NPN: < 1.6V @ 100 mA PNP: < 3.0V @ 100 mA
Output Response Time	Opposed Mode: 1 millisecond ON/600 microseconds OFF All others: 800 microseconds ON/OFF NOTE: 100 millisecond delay on power-up; outputs do not conduct during this time
Repeatability	Opposed Mode: 140 microseconds All others: 155 microseconds
Adjustments	Diffuse, Retroreflective, and Polarized Retroreflective models (only): Single-turn Sensitivity (Gain) adjustment potentiometer
Indicators	Two LED Indicators: Power (green) and Signal (yellow) Green ON Steady: Power ON Yellow ON steady: Light sensed Green flashing: Output overloaded Yellow flashing: Marginal excess gain (1 to 1.5X)
Construction	Housing: ABS Lenses: PMMA Gain Adjuster: PBT
Connections	2 m (6.5') or 9 m (30') 4-wire PVC cable, 150 mm (6") pigtail with 4-pin threaded Pico-style (Q) or Euro-style (Q5) connector, or 4-pin integral threaded Pico-style connector (Q7), depending on model
Operating Conditions	Temperature: -20° to +60° C (-4° to +140° F) Relative Humidity: 95% @ 50° C (non-condensing)
Environmental Rating	IEC IP67 (NEMA 6) and 1200 PSI washdown NEMA ICS 5, Annex F-2002
Vibration and Mechanical Shock	All models meet Mil. Std. 202F requirements method 201A (vibration: 10 to 60 Hz max., double amplitude 0.06", maximum acceleration 10G). Also meets IEC 947-5-2; 30G 11 ms duration, half sine wave
Application Notes	Opposed mode sensor spacing can be reduced by alternating emitters and receivers or by applying cross talk filters (visible red models only).
Certifications	

WORLD-BEAM® Q20 Series Sensors

Performance Curves



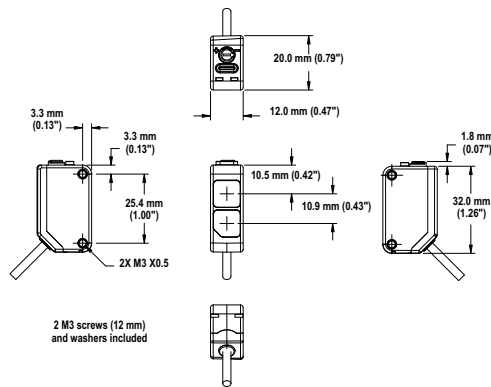
†Performance based on use of a model BRT-84 retroreflector.

See the Accessories section of your current Banner Sensors catalog or www.bannerengineering.com for complete information.

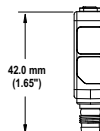
NOTE: Polarized sensors require corner cube type retroreflective targets only.

Dimensions

Cabled and Pigtail QD Models

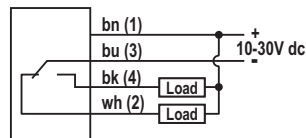


Integral QD Models

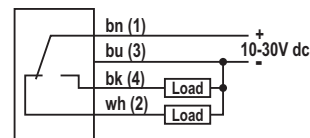


Hookups

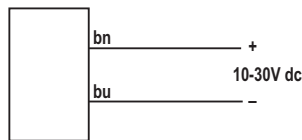
NPN (Sinking) Outputs



PNP (Sourcing) Outputs

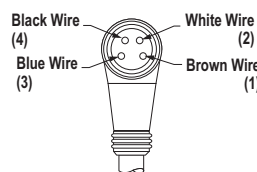


Emitters

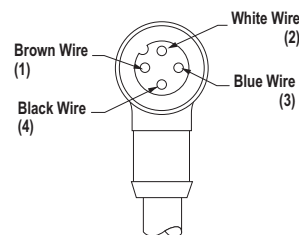


Cabled hookups only are shown. QD hookups are functionally identical.

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



4-Pin Euro-Style Pinout (Cable Connector Shown)



WORLD-BEAM® Q20 Series Sensors

Quick-Disconnect (QD) Cordsets

Style	Model	Length	Dimensions	Style	Model	Length	Dimensions
4-pin Euro-style Straight	MQDC-406 MQDC-415 MQDC-430	2 m (6.5') 5 m (15') 9 m (30')		4-pin Pico-style Right-angle	PKW4Z-2	2 m (6.5')	
4-pin Euro-style Right-angle	MQDC-406RA MQDC-415RA MQDC-430RA	2 m (6.5') 5 m (15') 9 m (30')		4-pin Threaded Pico-style Straight	PKG4M-2 PKG4M-9	2 m (6.5') 9 m (30')	
4-pin Pico-style Straight	PKG4-2	2 m (6.5')		4-pin Threaded Pico-style Right-angle	PKW4M-2 PKW4M-9	2 m (6.5') 9 m (30')	

Mounting Brackets

SMBQ20L	<ul style="list-style-type: none"> • Sensor vertical base mount • +/- 5° tip, +/- 7° swivel • Stainless steel 		SMBQ20LV	<ul style="list-style-type: none"> • Sensor vertical back mount • +/- 10° tip • Stainless steel 	
SMBQ20H	<ul style="list-style-type: none"> • Sensor horizontal flange mount • +/- 10° swivel • Stainless steel 		SMBQ20U	<ul style="list-style-type: none"> • Sensor vertical base mount with protection • +/- 22.5° swivel • Stainless steel 	

Refer to your current Banner Sensors catalog for more mounting bracket options. Bracket dimensions can be found at www.bannerengineering.com.

Cross Talk Prevention Filters (visible red models only)

Model*	Description	Reduced Sensor Range E/R (two apertures used)
PFQ20-H	Stainless steel (natural color)	4.5 m (14.67')
PFQ20-V	Stainless steel (colorized black)	

7.5 mm (0.3") dia.

* The "H" and "V" in the model numbers refer to the polarization of the filter material. Since they are visually identical, the "H" models have been left the natural stainless steel and the "V" models have been colored black.

Apertures

Model	Description	Reduced Sensor Range E/R (two apertures used)	Reduced Sensor Range EL/RL (two apertures used)
APQ20-0.5	Circular Hole 	0.5 mm (0.02") dia.	0.10 m (0.33')
APQ20-1		1 mm (0.04") dia.	0.35 m (1.14')
APQ20-2		2 mm (0.08") dia.	1.5 m (4.9')
APQ20-0.5V	Vertical Slot 	0.5 mm (0.02")	1.27 m (4.1')
APQ20-1V		1 mm (0.04")	2.6 m (8.5')
APQ20-2V		2 mm (0.08")	4.8 m (15.7')
APK-Q20	Kit	Includes two of each type.	

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