



Glass Fiber
Optic sensor

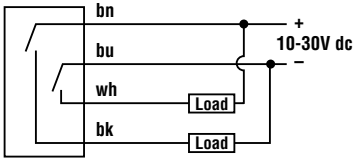


Convergent-mode
sensor

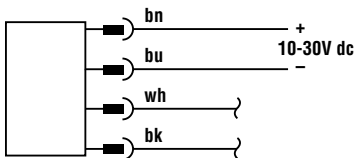
Emitters with Attached Cable



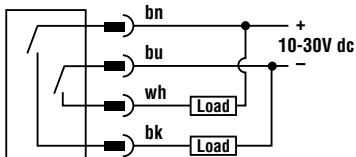
All Other Models
with Attached Cable



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



All Other Models with Quick Disconnect
(4-Pin Euro-Style)



NOTES: Output Type for all models is
Bipolar NPN/PNP. Load
150 mA max., each output.

Sensing Mode		Range	LED	Model*		
	Opposed Emitter	3 m (10')	Infrared 880 nm	SM31E		
	Opposed Receiver			SM31R		
	Opposed Emitter - Long Range			SM31EL		
	Opposed Receiver - Long Range	SM31RL				
	Opposed Emitter Clear Plastic Detection	0 to 300 mm (0 to 12") Actual range varies, depending on the light transmission properties of the plastic material being sensed.		SM31EPD		
	Opposed Receiver Clear Plastic Detection			SM31RPD		
	Non-Polarized Retroreflective	5 m (15')	Visible Red 650 nm	SM312LV		
	Polarized Retroreflective	50 mm to 2 m (2" to 7')		SM312LVAG		
	Extended-Range Polarized Retroreflective	10 mm to 3 m (0.4' to 10')		SM312LP		
	Diffuse	380 mm (15")	Infrared 880 nm	SM312D		
		300 mm (12")		SM312DBZ		
	Divergent Diffuse	130 mm (5")		SM312W		
	Convergent	16 mm (0.65") Focus		Visible Red 650 nm	SM312C	
		43 mm (1.7") Focus			SM312C2	
		16 mm (0.65") Focus			SM312CV	
		43 mm (1.7") Focus	SM312CV2			
		16 mm (0.65") Focus	Visible Blue 475 nm	SM312CVB		
		49 mm (1.9") Focus		SM312CV2B		
		16 mm (0.65") Focus	Visible Green 525 nm	SM312CVG		
		49 mm (1.9") Focus		SM312CV2G		
			Glass Fiber Optic	Range varies, depending on sensing mode and fiber optics used.	Infrared 880 nm	SM312F
					Visible Red 650 nm	SM312FV
Visible Blue 475 nm	SM312FVB					
Visible Green 525 nm	SM312FVG					
Visible Red 650 nm	SM312FP					
Visible Blue 475 nm	SM312FPB					
Visible Green 525 nm	SM312FPG					
Visible Red 650 nm	SM312FPH					
	Plastic Fiber Optic					
	Special High-Power Option Plastic Fiber Optic					

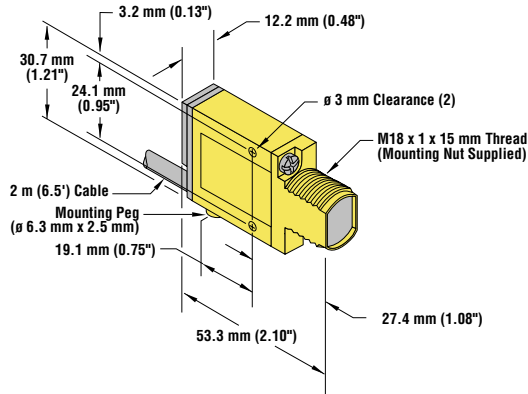
*Standard 2 m (6.5') cable models are listed.

- 9 m (30') cable: add suffix "W/30" (e.g., SM31EW/30).
- 4-pin Euro QD models: add suffix "QD" (e.g., SM31EQD).
- 150 mm (6") QD Pigtail: add suffix "QDP" (e.g., SM31EQDP).

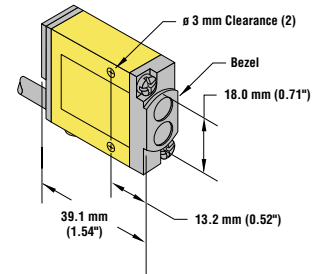
For 0.3 ms response: add suffix "MHS" (e.g., SM31EMHS).

Dimensions

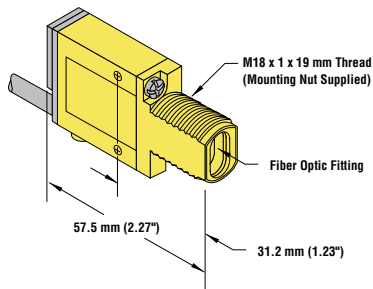
Models with suffix E, EL, EPD, R, RL, RPD, LV, LVAG, LP, D, C, C2, CV, CV2, CVG, CV2G, CVB, and CV2B



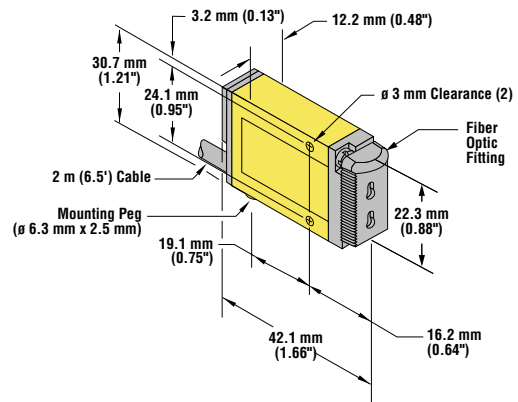
Models with suffix DBZ and W



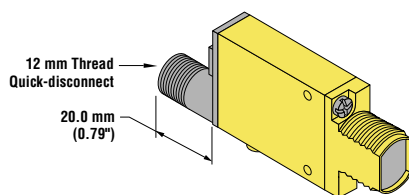
Models with suffix F, FV, FVB, and FVG



Models with suffix FP, FPB, FPG, and FPH

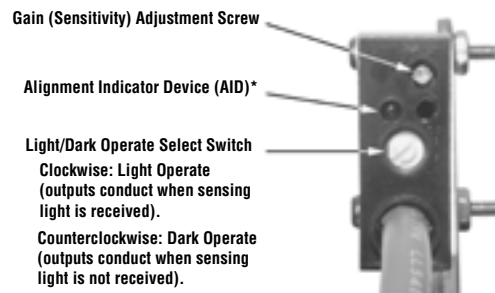


QD Models



Sensor Features

(shown with gasketed acrylic cover removed)



*U.S. Patent no. 4356393

NOTE: Please observe proper ESD precautions (grounding) when adjusting gain pot or LO/DO switch.

Specifications

Supply Voltage and Current 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

Bipolar: One current sourcing (PNP) and one current sinking (NPN) open collector transistor

Output Rating

150 mA maximum each output at 25° C, derated to 100 mA at 70° C (derate \approx 1 mA per ° C)

OFF-state leakage current: less than 1 microamp

Output saturation voltage (PNP output): < 1 volt at 10 mA, < 2 volts at 150 mA

Output saturation voltage (NPN output): < 200 millivolts at 10 mA, < 1 volt at 150 mA

Output Protection Circuitry

Protected against false pulse on power-up and continuous overload or short-circuit of outputs

Output Response Time

Sensors will respond to either a "light" or "dark" signal of 1 millisecond or longer duration, 500 Hz maximum. Modification for 0.3 millisecond response is available (MHS-suffix models; these models also feature reduced sensitivity range and reduced repeatability.)

NOTE: Outputs are non-conducting during 100 millisecond delay on power-up.

Repeatability

Opposed: 0.14 milliseconds

Non-Polarized and Polarized Retro, Diffuse, Convergent, Glass Fiber Optic, and Plastic Fiber Optic: 0.3 milliseconds

Response time and repeatability specifications are independent of signal strength.

Adjustments

Light/Dark Operate Select switch

15-turn slotted brass screw Gain (sensitivity) adjustment potentiometer (clutched at both ends of travel)

Located on the rear panel, protected by a gasketed, clear acrylic cover.

Indicators

Patented alignment Indicator Device system (AID™, US patent #4356393) lights a rear-panel-mounted LED indicator when the sensor sees light. Its pulse rate is proportional to the light signal strength (the stronger the signal, the faster the pulse rate).

Construction

Reinforced thermoplastic polyester housing, totally encapsulated, o-ring sealing, acrylic lenses, stainless steel screws

Environmental Rating

Meets NEMA standards 1, 2, 3, 3S, 4, 4X, 6, 12, and 13; IEC IP67.

Connections

PVC-jacketed 4-conductor 2 m (6.5') or 9 m (30') cables, or 4-pin Euro-style QD fitting; QD cables available separately.

Operating Conditions

Temperature: -20° to +70°C (-4° to +158°F)

Maximum relative humidity: 90% at 50°C (non-condensing)

Application Note

The NPN (current sinking) output of dc MINI-BEAM sensors is directly compatible as an input to Banner logic modules, including all non-amplified MAXI-AMP and MICRO-AMP modules. MINI-BEAMs are TTL compatible.

Certifications   