S18-2 Plastic 18 mm Barrel Sensors



Datasheet

Next Generation Self-contained DC-operated Sensors



- Economical photoelectric sensors for cost sensitive and high volume installations
- Powerful and bright visible red emitter beam for easy alignment and set-up
- Highly visible output and dual-function power and stability indicators
- Wide operating temperature range: -40 °C to +70 °C (-40 °F to +158 °F)
- Robust 250° adjustment potentiometer on select models
- Stable detection in the presence of fluorescent lights for non through-beam applications



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

Emitter/Receiver Models 1			
Model Range		Output	
S18-2NAEL-2M		25 m (82 ft)	
S18-2NAEJ-2M	Emitter	25 m (82 ft) with beam inhibit	None
S18-2NAES-2M		25 m (82 ft) with adjustment	
S18-2VNRL-2M		05 (00 ft)	Complementary NPN
S18-2VPRL-2M		25 m (82 ft)	Complementary PNP
S18-2VNRS-2M	Receiver		Complementary NPN
S18-2VPRS-2M		25 m (82 ft) with adjustment	Complementary PNP

Polarized Retroreflective Models 1			
Model Range C		Output	
S18-2VNLP-2M		Complementary NPN	
S18-2VPLP-2M	6 m (19.7 ft) with BRT-84 reflector	Complementary PNP	
S18-2VNLPC-2M		Complementary NPN	
S18-2VPLPC-2M	6 m (19.7 ft) with BRT-84 reflector, with adjustment	Complementary PNP	

Retroreflective Models 1			
Model Range Output			
S18-2VNLV-2M	7.5 m (24.6 ft) with BRT-84 reflector, with adjustment	Complementary NPN	
S18-2VPLV-2M		Complementary PNP	

¹ Integral 2 m (6.5 ft) unterminated cable models are listed.

[•] To order the 150 mm (6 in) PVC cable model with a 4-pin M8/Pico-style quick disconnect, add the suffix "Q3" to the model number. For example, S18-VNDL-Q3.



[•] To order the 9 m (30 ft) PVC cable model, add the suffix "9M" to the model number. For example, S18-2VNDL-9M.

[•] To order the 4-pin M12/Euro-style integral quick disconnect model, add the suffix "Q8" to the model number. For example, S18-2VNDL-Q8.

[•] To order the 150 mm (6 in) PVC cable model with a 4-pin M12/Euro-style quick disconnect, add the suffix "Q5" to the model number. For

example, S18-2VNDL0Q5.

Diffuse Models 1			
Model Range		Output	
S18-2VNDL-2M	750 mm (00 5 in) with a divergent	Complementary NPN	
S18-2VPDL-2M	750 mm (29.5 in) with adjustment	Complementary PNP	
S18-2VNDS-2M	300 mm (11.8 in) with adjustment	Complementary NPN	
S18-2VPDS-2M	Sub min (11.8 m) with adjustment	Complementary PNP	

Fixed Field Models			
Model	Range	Output	
S18-2VNFF30-2M	20	Complementary NPN	
S18-2VPFF30-2M	– 30 mm	Complementary PNP	
S18-2VNFF50-2M	50	Complementary NPN	
S18-2VPFF50-2M	– 50 mm	Complementary PNP	
S18-2VNFF75-2M		Complementary NPN	
S18-2VPFF75-2M	– 75 mm	Complementary PNP	
S18-2VNFF100-2M		Complementary NPN	
S18-2VPFF100-2M	– 100 mm	Complementary PNP	
S18-2VNFF150-2M	450	Complementary NPN	
S18-2VPFF150-2M	– 150 mm	Complementary PNP	
S18-2VNFF200-2M	000	Complementary NPN	
S18-2VPFF200-2M	200 mm	Complementary PNP	

Installing the S18-2 Sensor



Figure 1. S18-2 Features and Installation

To install the S18-2 Sensor:

- Align the sensor as required for the application. For the most sensitive object detection, align the sensor so that the objects move across the sensor's axis.
- 2. Secure the sensor to a bracket.
- 3. Wire sensor as shown in the wiring diagrams.
- 4. Adjust the gain adjuster (sensitivity pot) if necessary.

Wiring Diagrams

Emitter

10-30V dc

Emitter with Active High Beam Inhibit

10-30V dc

+ 10-30V dc





Complementary PNP



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Note: Open lead wires must be connected to a terminal block.

Specifications

Supply Voltage

10 V dc to 30 V dc for ambient temperature \leq 55 °C 10 V dc to 24 V dc for ambient temperature > 55 °C

Supply Current (Exclusive of Load Current)

Diffuse: 16 mA Opposed Mode Emitters: 17 mA Opposed Mode Receivers: 8 mA Retroreflective and Polarized Retroreflective: 16 mA Fixed Field: 22 mA

Output Protection Circuitry

Protected against false pulse on power-up and continuous short circuit of outputs. Short circuit protection at elevated temperature may require a power cycle to reset.

Supply Protection Circuitry

Protected against reverse polarity and transient voltages

Output Rating

≤ 50 mA total current for ambient temperatures > 55 °C ≤ 100 mA total current through both outputs ≤ 55 °C OFF-State Leakage Current: < 50 μ A at 30 V dc ON-State Saturation Voltage: < 1.5 V at 10 mA; < 3.0 V at 100 mA

Output Configuration

Complementary PNP or NPN by model number

Emitter LED

Visible Red

Indicators

Three LEDs (1 green, 2 amber) Green solid: indicates power applied and sensor ready Green flashing: indicates marginal sensing signal Amber solid: indicates Pin 4 (black wire) output conducting

Vibration and Mechanical Shock

All models meet Mil. Std. 202F requirements. Method 201A (Vibration; frequency 10 to 60 Hz, max., double amplitude 0.06 in acceleration 10G). Method 213B conditions H&I (Shock: 75G with unit operating; 100G for non-operation)

Operating Conditions

-40 °C to +70 °C (-40 °F to +158 °F) 95% at +50 °C maximum relative humidity (non-condensing)

Environmental Rating

IEC IP67

Certifications

Class 2 power ; UL Environmental Rating: Type 1

Output Response Time

Response is independent of signal strength Opposed models: 1.5 milliseconds ON, 1 millisecond OFF Retro, Polarized Retro, and Diffuse models: 1.5 milliseconds ON, 0.75 milliseconds OFF Fixed Field models: 2 milliseconds ON, 2 milliseconds OFF Delay on Power-up: 100 milliseconds; outputs do not conduct during this time

Repeatability

Repeatability is independent of signal strength Opposed models: 170 microseconds Retro, Polarized Retro, and Diffuse models: 100 microseconds Fixed Field models: 200 microseconds

Adjustments

Diffuse (DL, DS), Emitter (ES), Receiver (RS), Polarized Retroreflective (LPC), Retroreflective (LV) models: Single turn sensitivity (gain) adjustment potentiometer Emitter Beam Inhibit (EJ) models: Tie black wire to 10 to 30 V dc for beam inhibit

Construction

Housing, connector, gain pot driver: ABS Front window: PMMA Indicator windows: Clear ABS Mounting nuts: 30% glass filled PBT

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















Dimensions



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

Accessories

Cordsets

All measurements are listed in millimeters, unless noted otherwise.

4-Pin Threaded M12/Euro-Style Cordsets				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC-406	1.83 m (6 ft)		44 Typ	
MQDC-415	4.57 m (15 ft)			
MQDC-430	9.14 m (30 ft)	Straight		
MQDC-450	15.2 m (50 ft)		M12 x 1 → ø 14.5 →	1-2-2
MQDC-406RA	1.83 m (6 ft)		32 Typ.	4-0-3
MQDC-415RA	4.57 m (15 ft)		[1.26"]	1 = Brown 2 = White 3 = Blue 4 = Black
MQDC-430RA	9.14 m (30 ft)			
MQDC-450RA	15.2 m (50 ft)	Right-Angle	30 Typ. [1.18"] μ μ μ φ 14.5 [0.57"] → →	



Apertures

Model	Units	Aperture Description	Product
AP18SCN	3	Kit includes round apertures of 0.5 mm (0.02 in), 1.0 mm (0.04 in), and 2.5 mm (0.10 in) diameter.	○ ○ • • • • • • • • • • • • • • • • • • •
AP18SRN	3	Kit includes rectangular apertures of 0.5 mm (0.02 in), 1.0 mm (0.04 in), and 2.5 mm (0.10 in) wide. Each kit also includes a thread-on housing, Teflon [®] FEP [®] lens, and o-ring.	000000
APG18S	1	Kit with glass lens to protect plastic sensor lens from chemical environments and weld splatter damage.	000

Brackets

SMB18SF

- 18 mm swivel bracket with M18 × 1 internal thread
- Black thermoplastic polyester
- Stainless steel swivel locking hardware included

Hole center spacing: A = 36.0Hole size: $A = \emptyset 5.3$, $B = \emptyset 18.0$

SMB18A

- Right-angle mounting bracket with a curved slot for versatile orientation
- 12-ga. stainless steel
- 18 mm sensor mounting hole
- Clearance for M4 (#8) hardware

Hole center spacing: A to B = 24.2 Hole size: A = \emptyset 4.6, B = 17.0 × 4.6, C = \emptyset 18.5





• 30% glass-filled PBT

SMB18FA..

SMBS18-2-1

- Swivel bracket with tilt and pan movement for precision adjustment
- Easy sensor mounting to extruded rail T-slots
- Metric and inch size bolts available
- 18 mm sensor mounting hole



M18 - 1 x 6G

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Hole size: B=ø 18.1

Model	Bolt Thread (A)
SMB18FA	3/8 - 16 × 2 in
SMB18FAM10	M10 - 1.5 × 50
SMB18FAM12	n/a; no bolt included. Mounts directly to 12 mm (½ in) rods

For additional brackets, check the current Banner catalog or visit *www.bannerengineering.com*. All measurements are listed in millimeters, unless noted otherwise.

Reflectors

BRT-2X2

- Square, acrylic target
- Reflectivity factor: 1.0
- Max. temperature: +50 °C (+122 °F)
- Optional brackets are available
- Approximate size: 51 mm × 51 mm

BRT-40X19A

- Rectangular, acrylic target
- Reflectivity Factor: 1.3
- Temperature: -20 °C to +60 °C (-4 °F to +140 °F)
- Approximate size: 19 mm × 60 mm overall; 19 mm × 40 mm reflector



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BRT-84X84A

- Square, acrylic target
- Reflectivity Factor: 2.0
- Temperature: -20 °C to +60 °C (-4 °F to +140 °F)
- Approximate size: 84 mm × 84 mm

BRT-60X40C

- Rectangular, acrylic target
- Reflectivity Factor: 1.4
- Temperature: -20 °C to +60 °C (-4 °F to +140 °F)
- Optional brackets are available
 Approximate size: 40 mm × 60
 - mm





BRT-84

- Round, acrylic target
- Reflectivity Factor: 1.4
- Temperature: -20 °C to +60 °C (-4 °F to +140 °F)
- Optional brackets are available
- Size: 84 mm diameter
- Mounting Hole: 4.5 mm diameter



Retroreflective Tape

Model	Reflectivit y Factor	Maximum Temperature	Size
BRT-	0.7	+60 °C	50 mm (2 in) wide,
THG-2-100		(+140 °F)	2.5 m (100 in) long

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