



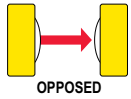
# S18-2 Plastic Barrel-Mount Sensors

A self-contained powerful sensor with bright visible red emitter beam for easy alignment and set-up.

- Available in multiple operating modes
- Wide operating range from -40° C to +70° C
- High performance sensing
- Beam inhibit or gain adjustment on select models
- Cordsets and brackets see page 200


## Opposed S18-2, 10-30 V DC

→ Visible Red LED

Sensing Mode	Range*	Adjustment	Connection	Models NPN	Models PNP
	25 m	—	2 m	<b>S18-2NAEL-2M Emitter</b>	
		—	4-pin Euro QD	<b>S18-2NAEL-Q8 Emitter</b>	
		Beam Inhibit	2 m	<b>S18-2NAEJ-2M Emitter</b>	
		Beam Inhibit	4-pin Euro QD	<b>S18-2NAEJ-Q8 Emitter</b>	
		Intensity adjust	2 m	<b>S18-2NAES-2M Emitter</b>	
		Intensity adjust	4-pin Euro QD	<b>S18-2NAES-Q8 Emitter</b>	
		—	2 m	<b>S18-2VNRL-2M</b>	<b>S18-2VPRL-2M</b>
		—	4-pin Euro QD	<b>S18-2VNRL-Q8</b>	<b>S18-2VPRL-Q8</b>
		Sensitivity adjust	2 m	<b>S18-2VNRS-2M</b>	<b>S18-2VPRS-2M</b>
		Sensitivity adjust	4-pin Euro QD	<b>S18-2VNRS-Q8</b>	<b>S18-2VPRS-Q8</b>

## Polar Retro S18-2, 10-30 V DC

→ Visible Red LED

Sensing Mode	Range*	Adjustment	Connection	Models NPN	Models PNP
	6 m	—	2 m	<b>S18-2VNLP-2M</b>	<b>S18-2VPLP-2M</b>
		—	4-pin Euro QD	<b>S18-2VNLP-Q8</b>	<b>S18-2VPLP-Q8</b>
		Sensitivity adjust	2 m	<b>S18-2VNLPC-2M</b>	<b>S18-2VPLPC-2M</b>
		Sensitivity adjust	4-pin Euro QD	<b>S18-2VNLPC-Q8</b>	<b>S18-2VPLPC-Q8</b>

For more specifications see page 201.

**Connection options:** A model with a QD requires a mating cordset (see page 200).


For 9 m cable, add suffix **9M** to the 2 m model number (example, **S18-2NAEL-9M**).

For a 4-pin Euro M12 pigtail QD, add suffix **Q5** to the model number (example, **S18-2VNRL-Q5**).

For a 4-pin Pico M8 pigtail QD, add suffix **Q3** to the model number (example, **S18-2VNRL-Q3**).


\* Range specified with BRT-84 reflector

## Retro S18-2, 10-30 V DC

 Visible Red LED

Sensing Mode	Range*	Input	Connection	Models NPN	Models PNP
	7.5 m	Sensitivity adjust	2 m	S18-2VNLV-2M	S18-2VPLV-2M
		Sensitivity adjust	4-pin Euro QD	S18-2VNLV-Q	S18-2VPLV-Q8

## Diffuse S18-2, 10-30 V DC

 Visible Red LED

Sensing Mode	Range*	Connection	Models NPN	Models PNP	
	750 mm		2 m	S18-2VNDL-2M	S18-2VPDL-2M
			4-pin Euro QD	S18-2VNDL-Q8	S18-2VPDL-Q8







For more specifications see page 201.

**Connection options:** A model with a QD requires a mating cordset (see page 200).  
 For 9 m cable, add suffix **9M** to the 2 m model number (example, **S18-2NAEL-9M**).  
 For a 4-pin Euro M12 pigtail QD, add suffix **Q5** to the model number (example, **S18-2VNRL-Q5**)  
 For a 4-pin Pico M8 pigtail QD, add suffix **Q3** to the model number (example, **S18-2VNRL-Q3**)  
 \* Range specified with BRT-84 reflector

**Cordsets**







**Euro QD (for Q models)**


See page 906

Length	Threaded 4-Pin	
	Straight	Right-Angle
1.83 m	 MQDC-406	 MQDC-406RA
4.57 m	 MQDC-415	 MQDC-415RA
9.14 m	 MQDC-430	 MQDC-430RA

**Micro QD (for Q1 models)**


See page 919


Length	Threaded 4-Pin	
	Straight	Right-Angle
1.83 m	 MQAC-406	 MQAC-406RA
4.57 m	 MQAC-415	 MQAC-415RA
9.14 m	 MQAC-430	 MQAC-430RA

 Additional cordset information available. See page 902.

**Brackets**

**M18 & S18**

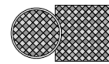
See page 864	See page 864	See page 866	See page 868
SMB18FA..	SMB18A	SMB3018SC	SMBAMS18P
			

 Additional brackets and information available. See page 852.

**Other Accessories**

**Reflectors**

See page 932



**Apertures**

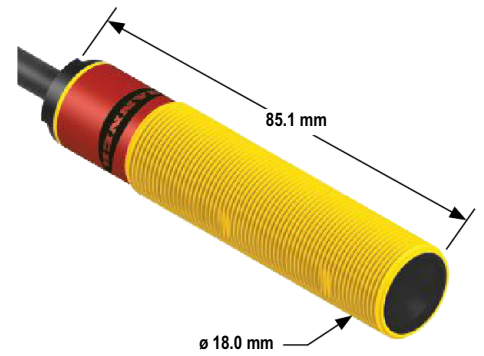
See page 958



**S18-2 dc Polarized Retroreflective and Fixed-Field Models**  
Suffix LP and FF



**S18 dc Opposed, Non-polarized Retroreflective and Diffuse Models**  
Suffix E, R, L and D





**S18 ac Opposed, Retroreflective, Polarized Retroreflective, Diffuse and Fixed-Field Models**  
Suffix E, R, L, LP, D and FF






**M18 Opposed, Non-polarized Retroreflective and Diffuse Models**  
Suffix E, R, L, D and DL


## S18-2 and S18 DC Specifications

<b>Supply Voltage and Current</b>	<p><b>S18:</b> 10 to 30 V dc (10% max. ripple); Supply current (exclusive of load current):</p> <p><b>S18-2:</b> 10 to 30 V dc <math>\leq 55^{\circ}\text{C}</math>; 10 to 24 V dc <math>&gt; 55^{\circ}\text{C}</math> (10% max. ripple); Supply current (exclusive of load current):</p> <p><b>S18-2: Opposed Emitters:</b> 17 mA      <b>S18: Opposed Emitters:</b> 25 mA  <b>Opposed Receivers:</b> 8 mA      <b>Opposed Receivers:</b> 20 mA  <b>Polarized Retroreflective:</b> 16 mA      <b>Polarized Retroreflective:</b> 30 mA  <b>Diffuse:</b> 16 mA      <b>Non-polarized Retroreflective:</b> 25 mA  <b>Fixed-Field:</b> 35 mA  <b>Diffuse:</b> 25 mA</p>
<b>Supply Protection Circuitry</b>	Protected against reverse polarity and transient voltages
<b>Output Configuration</b>	Solid-state complementary dc switch; NPN (current sinking) or PNP (current sourcing), depending on model <b>S18:</b> The Dark Operate (DO) output may be wired as a normally open marginal signal alarm output, depending upon hookup to the power supply
<b>Output Rating</b>	<p><b>S18:</b> 150 mA max. (each) in standard hookup. When wired for alarm output, the total load may not exceed 150 mA</p> <p><b>S18-2:</b> Less than or equal to 100 mA total current through both outputs at less than or at <math>55^{\circ}\text{C}</math>  Less than or equal to 50 mA total current for ambient temperatures greater than <math>55^{\circ}\text{C}</math></p> <p><b>OFF-state leakage current: S18-2:</b> less than 50 <math>\mu\text{A}</math> at 30 V dc  <b>S18:</b> less than 1 <math>\mu\text{A}</math> at 30 V dc</p> <p><b>ON-state saturation voltage: S18-2:</b> less than 1.5 V at 10 mA dc; less than 2.75 V at 100 mA dc  <b>S18:</b> less than 1 V at 10 mA dc; less than 1.5 V at 150 mA dc</p>
<b>Output Protection Circuitry</b>	Protected against false pulse on power-up and continuous overload or short circuit of outputs
<b>Output Response Time</b>	<p><b>S18-2: Opposed:</b> 1.5 milliseconds ON, 1.0 milliseconds OFF  <b>Retro, Polarized Retroreflective and Diffuse:</b> 1.5 milliseconds ON, 0.75 milliseconds OFF</p> <p><b>S18: Opposed:</b> 3 milliseconds ON, 1.5 milliseconds OFF  <b>Polarized Retroreflective, Non-polarized Retroreflective, Fixed-Field and Diffuse:</b> 3 milliseconds ON/OFF</p>
<b>Delay at Power-up</b>	100 milliseconds; outputs are non-conducting during this time
<b>Repeatability</b>	<p><b>S18-2: Opposed:</b> 170 microseconds  <b>Polarized Retroreflective and Diffuse:</b> 100 microseconds</p> <p><b>S18: Opposed:</b> 375 microseconds  <b>Polarized Retroreflective, Non-polarized Retroreflective, Fixed-Field and Diffuse:</b> 750 microseconds. Repeatability and response are independent of signal strength.</p>
<b>Adjustments</b>	<b>Diffuse (DL), Emitter (ES), Receiver (RS), Polarized Retroreflective (LPC), Retroreflective (LV) models:</b> Single turn sensitivity (gain) adjustment potentiometer <b>Emitter Beam Inhibit (EJ) models:</b> Tie black wire to 10 to 30 V dc for beam inhibit
<b>Indicators</b>	<p><b>S18-2: Three LED's: Green:</b> Power is ON      <b>Green Flashing:</b> Marginal sensing signal      <b>Yellow:</b> Pin 4 (black wire) output conducting</p> <p><b>S18: Two LED's: Green:</b> Power is ON      <b>Green Flashing:</b> Output overloaded      <b>Yellow:</b> Light Operate (LO) output is energized</p>
<b>Construction</b>	<p><b>S18-2 models:</b> ABS housing</p> <p><b>S18 models:</b> thermoplastic polyester housing</p> <p>Lenses are polycarbonate or acrylic; S18 models come with two jam nuts</p>
<b>Environmental Rating</b>	<p><b>S18-2:</b> IEC 60529 IP67</p> <p><b>S18:</b> Leakproof design rated NEMA 6P, IP67. QD models rated IP69K per DIN 40050-9.</p>
<b>Connections</b>	2 m or 9 m attached cable, or 4-pin Euro-style quick-disconnect fitting. QD cordsets are ordered separately. See page 200.
<b>Operating Conditions</b>	<b>Temperature:</b> $-40^{\circ}$ to $+70^{\circ}\text{C}$ <b>Relative humidity: S18:</b> 90% at $50^{\circ}\text{C}$ (non-condensing) <b>S18-2:</b> 95% @ $50^{\circ}\text{C}$ (non-condensing)
<b>Vibration and Mechanical Shock</b>	All models meet Mil. Std. 202F requirements. Method 201A (Vibration; frequency 10 to 60 Hz, max., double amplitude 0.06-inch acceleration 10G). Method 213B conditions H&I (Shock: 75G with unit operating; 100G for non-operation)
<b>Certifications</b>	<p><b>S18-2, S18 models:</b>  <b>S18 models:</b>        <b>ECOLAB®</b> chemical compatibility pending on some models; contact Banner Engineering for details</p>

## S18 AC Specifications

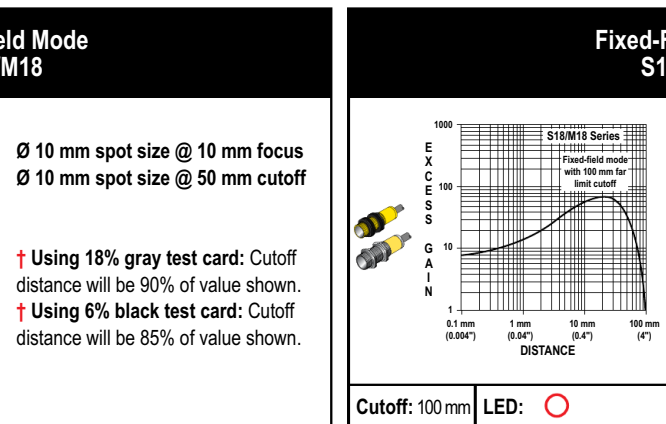
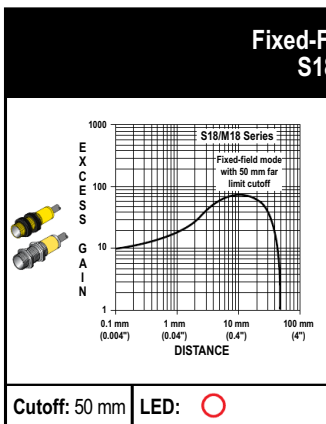
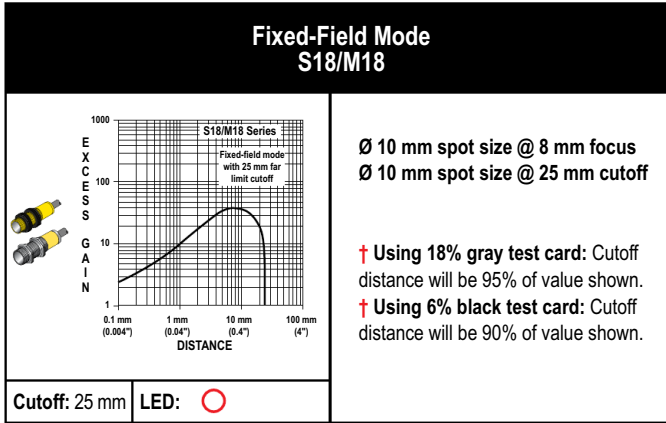
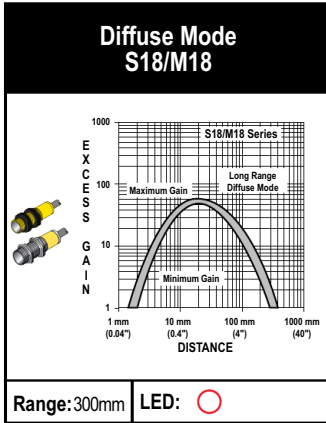
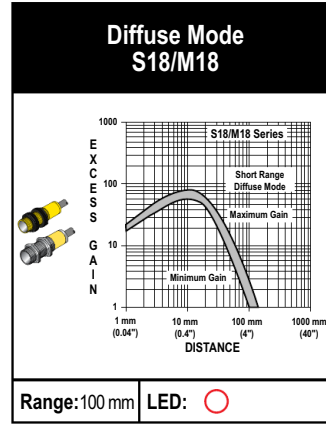
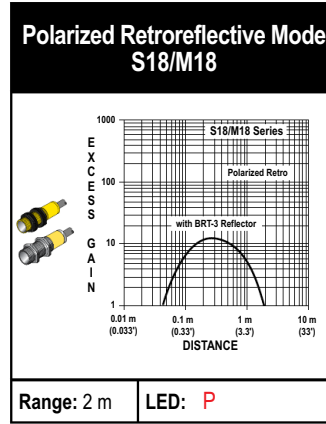
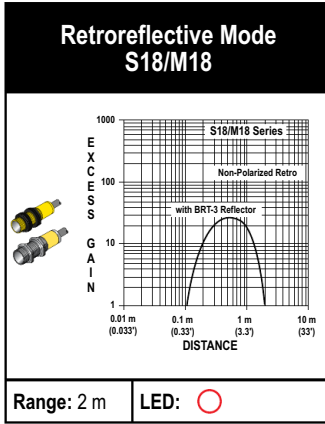
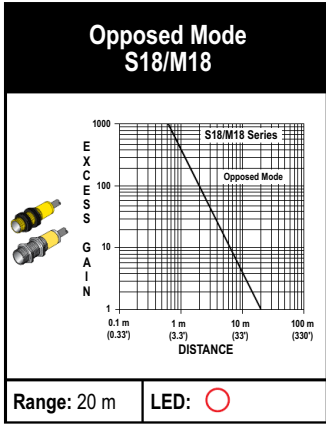
<b>Supply Voltage and Current</b>	20 to 250 V ac (50/60 Hz). <b>Average current:</b> 20 mA. <b>Peak current:</b> 200 mA at 20 V ac, 500 mA at 120 V ac, 750 mA at 250 V ac
<b>Supply Protection Circuitry</b>	Protected against transient voltages
<b>Output Configuration</b>	Solid-state ac switch; three-wire hookup; Light Operate (LO) or Dark Operate (DO), depending on model <b>Light Operate:</b> Output conducts when the sensor sees its own (or the emitter's) modulated light <b>Dark Operate:</b> Output conducts when sensor sees dark
<b>Output Rating</b>	300 mA max. (continuous) <b>Fixed-Field:</b> derate 5 mA/° C above +50° C <b>Inrush capability:</b> 1 amp for 20 milliseconds, non-repetitive <b>OFF-state leakage current:</b> less than 100 µA <b>ON-state voltage drop:</b> 3 V at 300 mA ac; 2 V at 15 mA ac
<b>Output Protection Circuitry</b>	Protected against false pulse on power-up
<b>Output Response Time</b>	<b>Opposed:</b> 16 milliseconds ON, 8 milliseconds OFF <b>Polarized Retroreflective, Non-polarized Retroreflective, Fixed-Field and Diffuse:</b> 16 milliseconds ON/OFF
<b>Delay at Power-up</b>	100 milliseconds
<b>Repeatability</b>	<b>Opposed:</b> 2 milliseconds <b>Polarized Retroreflective, Non-polarized Retroreflective, Fixed-Field and Diffuse:</b> 4 milliseconds Repeatability and response are independent of signal strength.
<b>Indicators</b>	<b>Two LEDs: Green:</b> Power ON <b>Yellow:</b> Light sensed <b>Yellow Flashing:</b> Marginal excess gain
<b>Construction</b>	Housings are thermoplastic polyester. Lenses are polycarbonate or acrylic; two jam nuts included.
<b>Environmental Rating</b>	Leakproof design rated NEMA 6P, IP67. QD models rated IP69K per DIN 40050-9.
<b>Connections</b>	2 m or 9 m attached cable, or 4-pin Micro-style quick-disconnect fitting. QD cordsets are ordered separately. See page 200.
<b>Operating Conditions</b>	<b>Temperature:</b> -40° to +70° C <b>Relative humidity:</b> 90% at 50° C (non-condensing)
<b>Vibration and Mechanical Shock</b>	All models meet Mil. Std. 202F requirements. Method 201A (Vibration; frequency 10 to 60 Hz, max, double amplitude 0.06-inch acceleration 10G). Method 213B conditions H&I (Shock: 75G with unit operating; 100G for non-operation)
<b>Certifications</b>	   ECOLAB® chemical compatibility pending on some models; contact Banner Engineering for details

## M18 DC Specifications

<b>Supply Voltage and Current</b>	10 to 30 V dc (10% max. ripple); Supply current (exclusive of load current): <b>Opposed Emitters:</b> 25 mA <b>Polarized Retroreflective:</b> 30 mA <b>Fixed-Field:</b> 35 mA <b>Opposed Receivers:</b> 20 mA <b>Non-polarized Retroreflective:</b> 25 mA <b>Diffuse:</b> 25 mA
<b>Supply Protection Circuitry</b>	Protected against reverse polarity and transient voltages
<b>Output Configuration</b>	Solid-state complementary dc switch; NPN (current sinking) or PNP (current sourcing), depending on model The Dark Operate (DO) output may be wired as a normally open marginal signal alarm output, depending upon hookup to the power supply
<b>Output Rating</b>	150 mA max. (each) in standard hookup. When wired for alarm output, the total load may not exceed 150 mA <b>OFF-state leakage current:</b> less than 1 $\mu$ A at 30 V dc <b>ON-state saturation voltage:</b> less than 1 V at 10 mA dc; less than 1.5 V at 150 mA dc
<b>Output Protection Circuitry</b>	Protected against false pulse on power-up and continuous overload or short circuit of outputs
<b>Output Response Time</b>	<b>Opposed:</b> 3 milliseconds ON, 1.5 milliseconds OFF <b>Polarized Retroreflective, Non-polarized Retroreflective, Fixed-Field and Diffuse:</b> 3 milliseconds ON/OFF
<b>Delay at Power-up</b>	100 milliseconds; outputs are non-conducting during this time
<b>Repeatability</b>	<b>Opposed:</b> 375 microseconds <b>Polarized Retroreflective, Non-polarized Retroreflective, Fixed-Field and Diffuse:</b> 750 microseconds. Repeatability and response are independent of signal strength.
<b>Indicators</b>	<b>Two LEDs:</b> <b>Green:</b> Power is ON <b>Green Flashing:</b> Output overloaded <b>Yellow:</b> Light Operate (LO) output is energized <b>Yellow Flashing:</b> Marginal excess gain
<b>Construction</b>	Stainless steel housing Lenses are polycarbonate or acrylic; come with two jam nuts
<b>Environmental Rating</b>	Leakproof design rated NEMA 6P, IP67. QD models rated IP69K per DIN 40050-9.
<b>Connections</b>	2 m or 9 m attached cable, or 4-pin Euro-style quick-disconnect fitting. QD cordsets are ordered separately. See page 200.
<b>Operating Conditions</b>	<b>Temperature:</b> -40° to +70° C <b>Relative humidity:</b> 90% at 50° C (non-condensing)
<b>Vibration and Mechanical Shock</b>	All models meet Mil. Std. 202F requirements. Method 201A (Vibration; frequency 10 to 60 Hz, max., double amplitude 0.06-inch acceleration 10G). Method 213B conditions H&I (Shock: 75G with unit operating; 100G for non-operation)
<b>Certifications</b>	M18 models: 

**Excess Gain Curves** (Diffuse and Fixed-Field mode performance based on 90% reflectance white test card<sup>†</sup>)

○ = Infrared LED    P = Visible Red LED Polarized



**Beam Patterns** (Diffuse mode performance based on 90% reflectance white test card)

○ = Infrared LED    P = Visible Red LED Polarized

