



## S18 DC-Operated Barrel-Mount Sensors

Epoxy-encapsulated barrel sensors operate on dc voltage and provide reliable sensing without adjustments.

- Available in multiple operating modes
- Meets IP69K standards
- Wide operating range from -40° C to +70° C
- High performance sensing
- Cordsets and brackets see page 200

### Opposed S18, 10-30 V DC

Infrared LED

Sensing Mode	Range	Connection	Models NPN	Models PNP
 OPPOSED	20 m	2 m		S186E Emitter
		4-pin Euro QD		S186EQ Emitter
		2 m	S18SN6R	S18SP6R
		4-pin Euro QD	S18SN6RQ	S18SP6RQ

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

Infrared LED Visible Red LED

Sensing Mode	Range	Connection	Models NPN	Models PNP
 RETRO	2 m*	2 m	S18SN6L	S18SP6L
		4-pin Euro QD	S18SN6LQ	S18SP6LQ
 POLAR RETRO	2 m*	2 m	S18SN6LP	S18SP6LP
		4-pin Euro QD	S18SN6LPQ	S18SP6LPQ

### Diffuse S18, 10-30 V DC

Infrared LED

Sensing Mode	Range	Connection	Models NPN	Models PNP
 DIFFUSE	100 mm	2 m	S18SN6D	S18SP6D
		4-pin Euro QD	S18SN6DQ	S18SP6DQ
	300 mm	2 m	S18SN6DL	S18SP6DL
		4-pin Euro QD	S18SN6DLQ	S18SP6DLQ

### Fixed-Field S18, 10-30 V DC

Infrared LED

Sensing Mode	Range	Connection	Models NPN	Models PNP
 FIXED-FIELD	0 - 25 mm Cutoff	2 m	S18SN6FF25	S18SP6FF25
		4-pin Euro QD	S18SN6FF25Q	S18SP6FF25Q
	0 - 50 mm Cutoff	2 m	S18SN6FF50	S18SP6FF50
		4-pin Euro QD	S18SN6FF50Q	S18SP6FF50Q
	0 - 100 mm Cutoff	2 m	S18SN6FF100	S18SP6FF100
		4-pin Euro QD	S18SN6FF100Q	S18SP6FF100Q

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 **W/30** to the 2 m model number (example, **S18SP6R W/12**).

\* Retroreflective range is specified using one model BRT-3 retroreflector, unless otherwise noted.

Actual sensing range may differ, depending on the efficiency and reflective area of the retroreflector used. See Accessories section for more information.



## S18 AC AC-Operated Barrel-Mount Sensors

Epoxy-encapsulated barrel sensors operated on ac voltage and provide reliable sensing without adjustments.

- Available in multiple operating modes
- Meets IP69K standards
- Wide operating range from -40° C to +70° C
- High performance sensing
- Cordsets and brackets see page 200

### Opposed S18, 20-250 V AC

Infrared LED

Sensing Mode	Range	Connection	Models LO	Models DO
 OPPOSED	20 m	2 m		S183E Emitter
		4-pin Micro QD		S183EQ1 Emitter
		2 m	S18AW3R	S18RW3R
		4-pin Micro QD	S18AW3RQ1	S18RW3RQ1

### Retro & Polar Retro S18, 20-250 V AC

Infrared LED

Visible Red LED

Sensing Mode	Range	Connection	Models LO	Models DO
 RETRO	2 m <sup>†</sup>	2 m	S18AW3L	S18RW3L
		4-pin Micro QD	S18AW3LQ1	S18RW3LQ1
 POLAR RETRO	2 m <sup>†</sup>	2 m	S18AW3LP	S18RW3LP
		4-pin Micro QD	S18AW3LPQ1	S18RW3LPQ1

### Diffuse S18, 20-250 V AC

Infrared LED

Sensing Mode	Range	Connection	Models LO	Models DO
 DIFFUSE	100 mm	2 m	S18AW3D	S18RW3D
		4-pin Micro QD	S18AW3DQ1	S18RW3DQ1
	300 mm	2 m	S18AW3DL	S18RW3DL
		4-pin Micro QD	S18AW3DLQ1	S18RW3DLQ1

### Fixed-Field S18, 20-250 V AC

Infrared LED

Sensing Mode	Range	Connection	Models LO	Models DO
 FIXED-FIELD	0 - 25 mm Cutoff	2 m	S18AW3FF25	S18RW3FF25
		4-pin Micro QD	S18AW3FF25Q1	S18RW3FF25Q1
	0 - 50 mm Cutoff	2 m	S18AW3FF50	S18RW3FF50
		4-pin Micro QD	S18AW3FF50Q1	S18RW3FF50Q1
	0 - 100 mm Cutoff	2 m	S18AW3FF100	S18RW3FF100
		4-pin Micro QD	S18AW3FF100Q1	S18RW3FF100Q1

For more specifications see page 202.

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

For 9 m cable, add suffix **W/30** to the 2 m model number (example, **S183E W/30**).




<sup>†</sup> Retroreflective range is specified using one model BRT-3 retroreflector, unless otherwise noted.

Actual sensing range may differ, depending on the efficiency and reflective area of the retroreflector used. See Accessories section for more information.


## S18-2 and S18 DC Specifications

Supply Voltage and Current	<b>S18:</b> 10 to 30 V dc (10% max. ripple); Supply current (exclusive of load current): <b>S18-2:</b> 10 to 30 V dc $\leq 55^{\circ}\text{C}$ ; 10 to 24 V dc $> 55^{\circ}\text{C}$ (10% max. ripple); Supply current (exclusive of load current): <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		
Supply Protection Circuitry	Protected against reverse polarity and transient voltages		
Output Configuration	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		
Output Rating	<b>S18:</b> 150 mA max. (each) in standard hookup. When wired for alarm output, the total load may not exceed 150 mA <b>S18-2:</b> Less than or equal to 100 mA total current through both outputs at less than or at $55^{\circ}\text{C}$ Less than or equal to 50 mA total current for ambient temperatures greater than $55^{\circ}\text{C}$ <b>OFF-state leakage current:</b> <b>S18-2:</b> less than 50 $\mu\text{A}$ at 30 V dc <b>S18:</b> less than 1 $\mu\text{A}$ at 30 V dc <b>ON-state saturation voltage:</b> <b>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		
Output Protection Circuitry	Protected against false pulse on power-up and continuous overload or short circuit of outputs		
Output Response Time	<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 <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		
Delay at Power-up	100 milliseconds; outputs are non-conducting during this time		
Repeatability	<b>S18-2: Opposed:</b> 170 microseconds <b>Polarized Retroreflective and Diffuse:</b> 100 microseconds <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.		
Adjustments	<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		
Indicators	<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 <b>S18: Two LEDs: Green:</b> Power is ON <b>Green Flashing:</b> Output overloaded <b>Yellow:</b> Light Operate (LO) output is energized		
Construction	<b>S18-2 models:</b> ABS housing <b>S18 models:</b> thermoplastic polyester housing Lenses are polycarbonate or acrylic; S18 models come with two jam nuts		
Environmental Rating	<b>S18-2:</b> IEC 60529 IP67 <b>S18:</b> Leakproof design rated NEMA 6P, IP67. QD models rated IP69K per DIN 40050-9.		
Connections	2 m or 9 m attached cable, or 4-pin Euro-style quick-disconnect fitting. QD cordsets are ordered separately. See page 200.		
Operating Conditions	<b>Temperature:</b> $-40^{\circ}$ to $+70^{\circ}\text{C}$ <b>Relative humidity:</b> <b>S18:</b> 90% at $50^{\circ}\text{C}$ (non-condensing) <b>S18-2:</b> 95% @ $50^{\circ}\text{C}$ (non-condensing)		
Vibration and Mechanical Shock	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)		
Certifications	<b>S18-2, S18 models:</b>  <b>S18 models:</b>   ECOLAB® chemical compatibility pending on some models; contact Banner Engineering for details		

## S18 AC Specifications

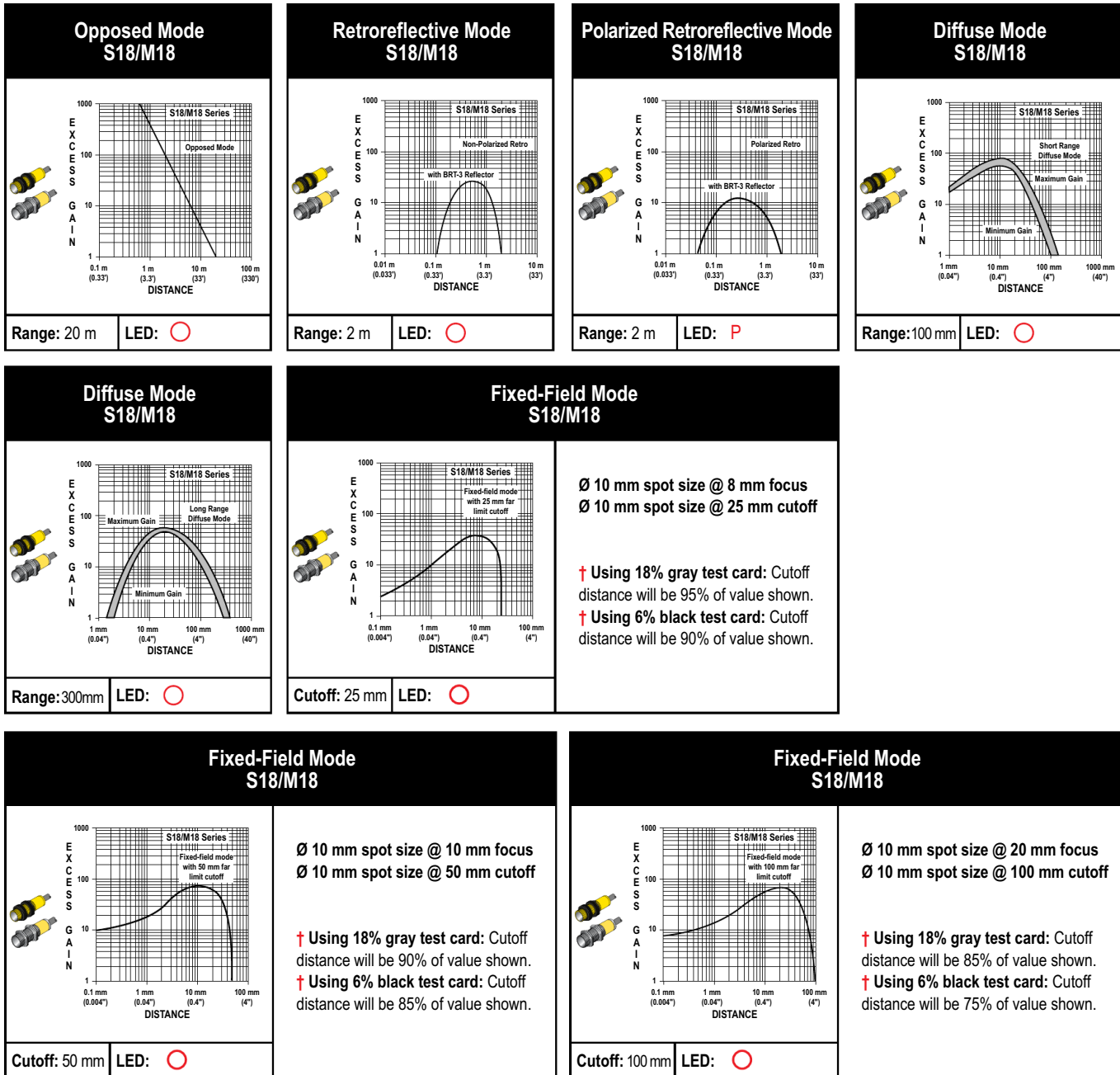
Supply Voltage and Current	20 to 250 V ac (50/60 Hz). <b>Average current:</b> 20 mA. <b>Peak current:</b> 200 mA at 20 V ac, 500 mA at 120 V ac, 750 mA at 250 V ac
Supply Protection Circuitry	Protected against transient voltages
Output Configuration	Solid-state ac switch; three-wire hookup; Light Operate (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
Output Rating	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
Output Protection Circuitry	Protected against false pulse on power-up
Output Response Time	<b>Opposed:</b> 16 milliseconds ON, 8 milliseconds OFF <b>Polarized Retroreflective, Non-polarized Retroreflective, Fixed-Field and Diffuse:</b> 16 milliseconds ON/OFF
Delay at Power-up	100 milliseconds
Repeatability	<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.
Indicators	<b>Two LEDs: Green:</b> Power ON <b>Yellow:</b> Light sensed <b>Yellow Flashing:</b> Marginal excess gain
Construction	Housings are thermoplastic polyester. Lenses are polycarbonate or acrylic; two jam nuts included.
Environmental Rating	Leakproof design rated NEMA 6P, IP67. QD models rated IP69K per DIN 40050-9.
Connections	2 m or 9 m attached cable, or 4-pin Micro-style quick-disconnect fitting. QD cordsets are ordered separately. See page 200.
Operating Conditions	<b>Temperature:</b> -40° to +70° C <b>Relative humidity:</b> 90% at 50° C (non-condensing)
Vibration and Mechanical Shock	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)
Certifications	   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: 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: 

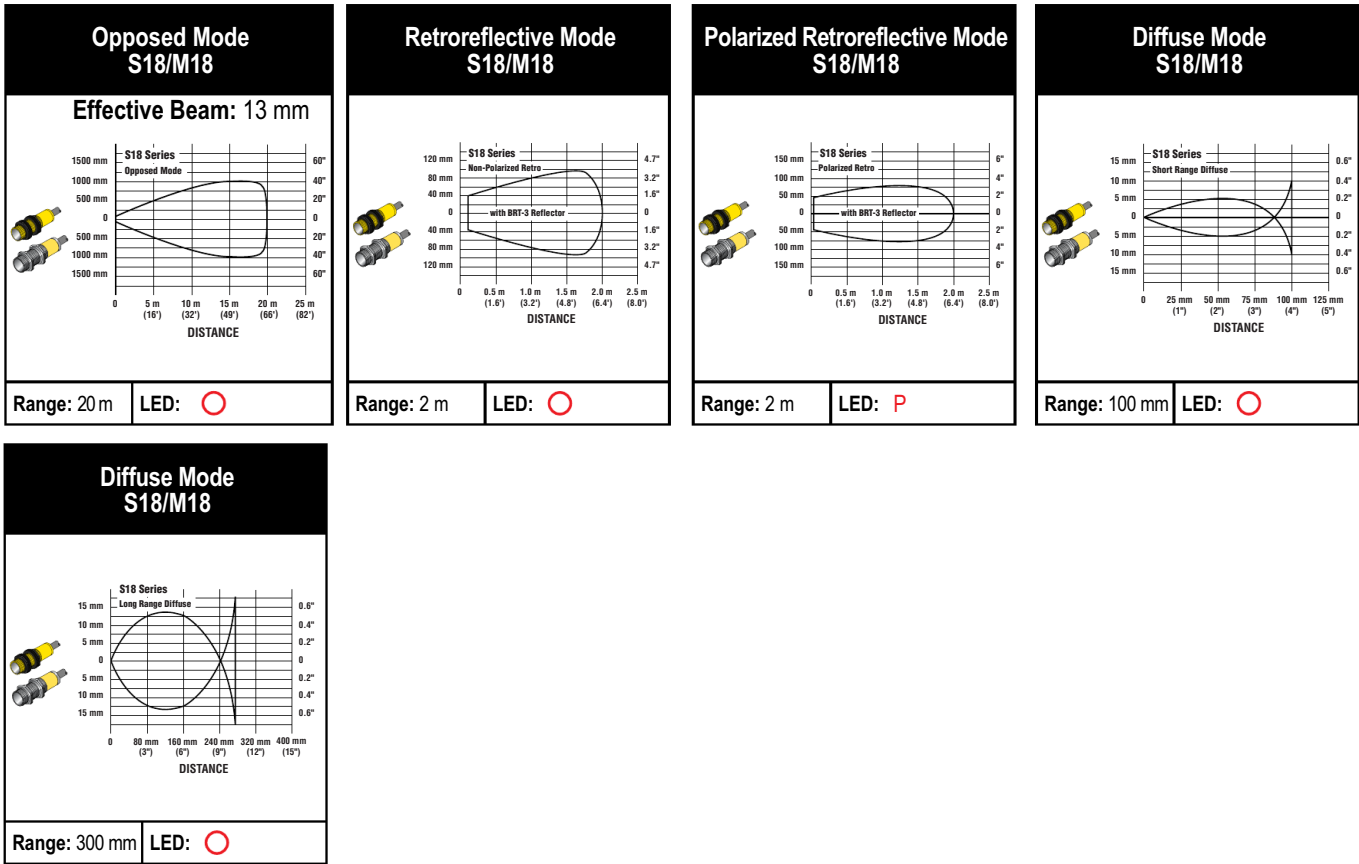
## Excess Gain Curves (Diffuse and Fixed-Field mode performance based on 90% reflectance white test card<sup>†</sup>)

○ = 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





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

 Additional cordset information available.  
See page 902.

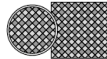

Micro QD (for Q1 models)			
See page 919			
Length	Threaded 4-Pin		
	Straight		Right-Angle
1.83 m		MQAC-406	 MQAC-406RA
4.57 m		MQAC-415	 MQAC-415RA
9.14 m		MQAC-430	 MQAC-430RA


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	Apertures
See page 932	See page 958
	



63.5 mm

ø 18.0 mm


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



58.8 mm

ø 18.0 mm


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



85.1 mm

ø 18.0 mm

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



59.1 mm

ø 18.0 mm




**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>	<b>S18:</b> 10 to 30 V dc (10% max. ripple); Supply current (exclusive of load current): <b>S18-2:</b> 10 to 30 V dc $\leq 55^{\circ}\text{C}$ ; 10 to 24 V dc $> 55^{\circ}\text{C}$ (10% max. ripple); Supply current (exclusive of load current): <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
<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>	<b>S18:</b> 150 mA max. (each) in standard hookup. When wired for alarm output, the total load may not exceed 150 mA <b>S18-2:</b> Less than or equal to 100 mA total current through both outputs at less than or at $55^{\circ}\text{C}$ Less than or equal to 50 mA total current for ambient temperatures greater than $55^{\circ}\text{C}$ <b>OFF-state leakage current:</b> <b>S18-2:</b> less than 50 $\mu\text{A}$ at 30 V dc <b>S18:</b> less than 1 $\mu\text{A}$ at 30 V dc <b>ON-state saturation voltage:</b> <b>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
<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>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 <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
<b>Delay at Power-up</b>	100 milliseconds; outputs are non-conducting during this time
<b>Repeatability</b>	<b>S18-2: Opposed:</b> 170 microseconds <b>Polarized Retroreflective and Diffuse:</b> 100 microseconds <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.
<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>	<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 <b>S18: Two LEDs: Green:</b> Power is ON <b>Green Flashing:</b> Output overloaded <b>Yellow:</b> Light Operate (LO) output is energized
<b>Construction</b>	<b>S18-2 models:</b> ABS housing <b>S18 models:</b> thermoplastic polyester housing Lenses are polycarbonate or acrylic; S18 models come with two jam nuts
<b>Environmental Rating</b>	<b>S18-2:</b> IEC 60529 IP67 <b>S18:</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> $-40^{\circ}$ to $+70^{\circ}\text{C}$ <b>Relative humidity:</b> <b>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>	<b>S18-2, S18 models:</b>  <b>S18 models:</b>   <b>ECOLAB®</b> chemical compatibility pending on some models; contact Banner Engineering for details

## S18 AC Specifications

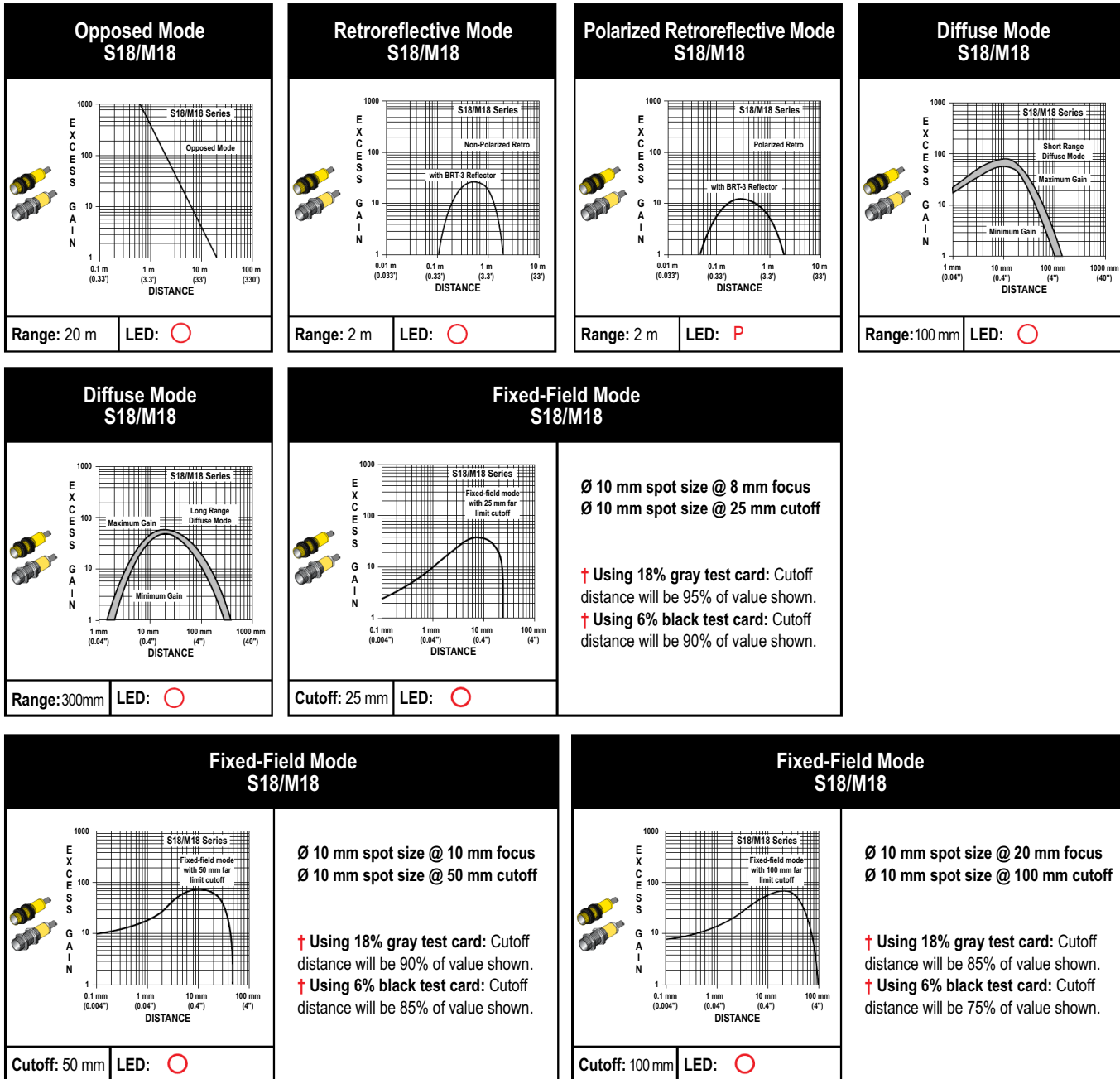
Supply Voltage and Current	20 to 250 V ac (50/60 Hz). <b>Average current:</b> 20 mA. <b>Peak current:</b> 200 mA at 20 V ac, 500 mA at 120 V ac, 750 mA at 250 V ac
Supply Protection Circuitry	Protected against transient voltages
Output Configuration	Solid-state ac switch; three-wire hookup; Light Operate (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
Output Rating	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
Output Protection Circuitry	Protected against false pulse on power-up
Output Response Time	<b>Opposed:</b> 16 milliseconds ON, 8 milliseconds OFF <b>Polarized Retroreflective, Non-polarized Retroreflective, Fixed-Field and Diffuse:</b> 16 milliseconds ON/OFF
Delay at Power-up	100 milliseconds
Repeatability	<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.
Indicators	<b>Two LEDs: Green:</b> Power ON <b>Yellow:</b> Light sensed <b>Yellow Flashing:</b> Marginal excess gain
Construction	Housings are thermoplastic polyester. Lenses are polycarbonate or acrylic; two jam nuts included.
Environmental Rating	Leakproof design rated NEMA 6P, IP67. QD models rated IP69K per DIN 40050-9.
Connections	2 m or 9 m attached cable, or 4-pin Micro-style quick-disconnect fitting. QD cordsets are ordered separately. See page 200.
Operating Conditions	<b>Temperature:</b> -40° to +70° C <b>Relative humidity:</b> 90% at 50° C (non-condensing)
Vibration and Mechanical Shock	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)
Certifications	   <b>ECOLAB®</b> 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: 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      = Visible Red LED Polarized

