prosense® F18 Series Photoelectric Sensors

F18RS-BN-0A

F18I6-0P-0E

M18 (18mm) Plastic - DC

- 30 models - diffuse with background suppression, diffuse, polarized retroreflective and through-beam
- M12 quick-disconnect (purchase cable separately) or pigtail with PVC jacket
- Supply voltage: 10 to 30 VDC
- LED light status indicators
- IP67 protection
- Complete protection against electrical damage
- M18 mounting hex nuts included

NEED CABLES?

F18 Series Photoelectric Sensor Selection Chart

Part Number	Price		Sensing Distance	Switching Frequency	Light Emission	Logic	Output Function	Connection	Wiring	Drawing Link
Diffuse with background suppression - Teach-in button										
F18RS-BN-0A	$;;5k,!:		50-150mm [1.96-5.90 in]	500 Hz	Visible red	NPN	Complementary Light-on/Dark-on	Pigtail 6.5ft/2m	Diagram 1	PDF
F18RS-BP-0A	$;5k,?:					PNP			Diagram 2	PDF
F18RS-BN-0E	$;;5k,,:					NPN		4-pin M12 quick-disconnect	Diagram 1	PDF
F18RS-BP-0E	$-5l00:					PNP			Diagram 2	PDF
Diffuse										
F18I2-0N-0A	$-5l01:		100mm [3.93 in]	500 Hz	Infrared	NPN	Selectable Light-on/Dark-on	Pigtail 6.5ft/2m	Diagram 3	PDF
F18I2-0P-0A	$;5k,z:					PNP			Diagram 4	PDF
F18I2-0N-0E	$;;5k,]:					NPN		4-pin M12 quick-disconnect	Diagram 3	PDF
F18I2-0P-0E	$;;5k,[:					PNP			Diagram 4	PDF
Diffuse - Potentiometer										
F18I6-0N-0A	$;5k,_:		700mm [27.55 in]	500 Hz	Infrared	NPN	Selectable Light-on/Dark-on	Pigtail 6.5ft/2m	Diagram 3	PDF
F18I6-0P-0A	$;5k,#:					PNP			Diagram 4	PDF
F18I6-0N-0E	$-5l02:					NPN		4-pin M12 quick-disconnect	Diagram 3	PDF
F18I6-0P-0E	$-5l03:					PNP			Diagram 4	PDF
F18I8-BN-0A	$-5l04:			1000 Hz		NPN	Complementary Light-on/Dark-on	Pigtail 6.5ft/2m	Diagram 1	PDF
F18I8-BP-0A	$-5l05:					PNP			Diagram 2	PDF
F18I8-BN-0E	$-5l06:					NPN		4-pin M12 quick-disconnect	Diagram 1	PDF
F18I8-BP-0E	$-5l07:					PNP			Diagram 2	PDF
Polarized Retroreflective* - Potentiometer										
F18RP-0N-0A	$-5l08:		0.1-4m [0.32-13.12 ft]	500 Hz	Visible red	NPN	Selectable Light-on/Dark-on	Pigtail 6.5ft/2m	Diagram 3	PDF
F18RP-0P-0A	$-5l09:					PNP			Diagram 4	PDF
F18RP-0N-0E	$-5l0a:					NPN		4-pin M12 quick-disconnect	Diagram 3	PDF
F18RP-0P-0E	$-5l0b:					PNP			Diagram 4	PDF
F18RP-BN-0A	$-5l0c:			1000 Hz		NPN	Complementary Light-on/Dark-on	Pigtail 6.5ft/2m	Diagram 1	PDF
F18RP-BP-0A	$-5l0d:					PNP			Diagram 2	PDF
F18RP-BN-0E	$-5l0e:					NPN		4-pin M12 quick-disconnect	Diagram 1	PDF
F18RP-BP-0E	$;-5l0f:					PNP			Diagram 2	PDF
Through-beam										
F18IR-0N-0A	Receiver	$-5l0g:	25m [82.02 ft]	250 Hz	N/A	NPN	Selectable Light-on/Dark-on	Pigtail 6.5ft/2m	Diagram 3	PDF
F18IR-0P-0A	Receiver	$-5l0h:				PNP			Diagram 4	PDF
F18IR-0N-0E	Receiver	$--5l0i:				NPN		4-pin M12 quick-disconnect	Diagram 3	PDF
F18IR-0P-0E	Receiver	$--5l0j:				PNP			Diagram 4	PDF
F18IE-00-0A	Emitter	$-5l0k:		N/A	Infrared	Receiver dependent	N/A	Pigtail 6.5ft/2m	Diagram 5	PDF
F18IE-00-0E	Emitter	$--5l0l:						4-pin M12 quick-disconnect	Diagram 5	PDF

NOTES:
*Purchase reflectors separately.
**Purchase one receiver and one emitter for a complete set.

Switching Element Function

	Through-beam and Reflective Models	Diffuse Reflective Models
Light-on	N.C.	N.O.
Dark-on	N.O.	N.C.

prosense® F18 Series Photoelectric Sensors

Wiring Diagrams

Diagram 1
NPN Output

1 BROWN — L+
4 BLACK
2 WHITE
3 BLUE — L−

4:
2:

Diagram 2
PNP Output

1 BROWN — L+
4 BLACK
2 WHITE
3 BLUE — L−

4:
2:

Diagram 3
NPN Output

1 BROWN — L+
4 BLACK
2 WHITE
3 BLUE — L−

2: Teach

Open (+) Light-on
WH/2 ——|——(−) Dark-on

Diagram 4
PNP Output

1 BROWN — L+
2 WHITE
4 BLACK
3 BLUE — L−

2: Teach

(+) Light-on
WH/2 —— Open (−) Dark-on

Diagram 5

1 BROWN — L+
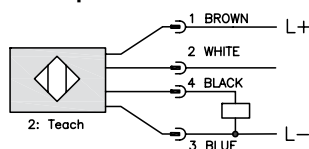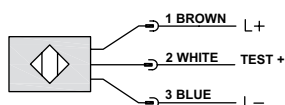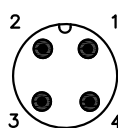2 WHITE — TEST +
3 BLUE — L−
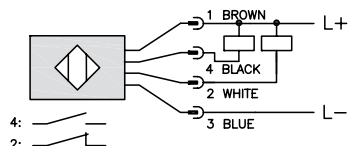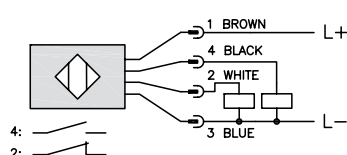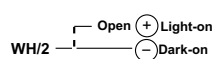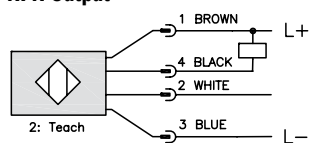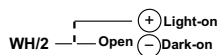
Connector

M12 Connector

2   1
3   4

2-meter Axial Cable version: check is black
M12 Connector: check is Pin 2 (white)

prosense® F18 Series Photoelectric Sensors

| Type	Diffuse With Background Suppression	Diffuse	Diffuse - Potentiometer	Polarized Retroreflective	Through-beam
Sensing Distance	50-150mm [1.96 to 5.90 in]	100mm [3.93 in]	700mm [27.55 in]	0.1-4m [0.32 to 13.12 ft]	25m [82.02 ft]
Light Spot Diameter	NA	8mm @100mm	16mm @ 700mm	6cm @ 4m	100cm @ 25m
Detection Diagram	A	B	C	D	E
Emission	Red LED (660nm)	Red LED (880nm)	Infrared LED (880nm)	Red LED (660nm)	Infrared LED (880nm)
Sensitivity	Teach	None	Potentiometer		None
Output Type	See individual parts on Selection Chart				
Operating Voltage	10-30VDC				
No-load Supply Current	35mA				
Operating (Load) Current	100mA max				
Off-state (Leakage) Current	< 0.5mA				
Voltage Drop	2V max				
Switching Frequency	500 Hz		F18I6 500 Hz F1818 1000 Hz	F18RP-0x-0x - 500 Hz F18RP-Bx-0x - 1000 Hz	Receiver 250 Hz Emitter N/A
Ripple	2 Vpp max				
Time Delay Before Availability (tv)	< 300ms				
Short-Circuit Protection	Yes				
Temperature Range	Operating: -25 to 55°C [-13 to 131°F] Storage: -25 to 70°C [-13 to 158°F]				
Protection Degree (DIN 40050)	IP67				
LED Indicators- Switching Status	Yellow output LED (all except emitters) Green stability LED (emitters POWER LED) Green/Red ready/error LED (Diffused with Background Suppression models only)				
Housing Material	Polybutylene terephthalate (PBT)				
Lens Material	Polymethyl methacrylate (PMMA)				
Shock/Vibration	Shock: 11ms (30G) 6 shock for every axis (EN60068-2-27) Vibration: 0.5 mm amplitude, 10 to 55 Hz frequency, for every axis (EN60068-2-6)				
Tightening Torque	1.5 N•m [13.27 lb-in]				
Weight	Cable Models: 75g max. (90g max. Diffuse with Background Suppression Models), Connector Models: 25g max. (40g max. Diffuse with Background Suppression Models)				
Connection	4-pin M12 quick-disconnect, or pigtail 6.5ft/2m				
Agency Approvals *	CE, cULus File E328811, CSA C22-2 File Number 60497-5-2-14				

* To obtain the most current agency approval information, see the Agency Compliance & Certifications Checklist section on the specific part number's web page.

Detection Diagrams

A - Diffuse with Background Suppression
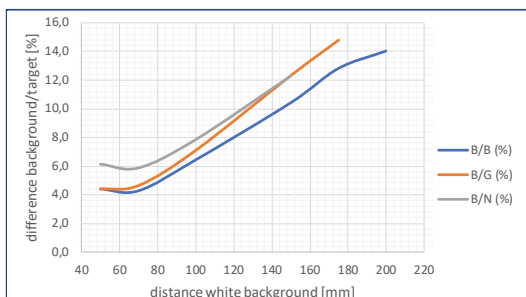
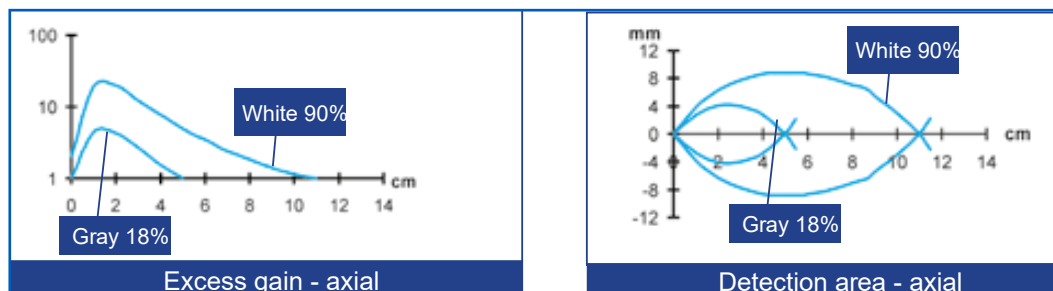Detection difference with Normal acquisition
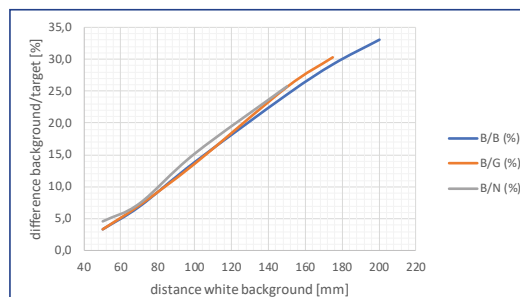
Detection difference with Fine acquisition

Warning: These products are not safety sensors and are not suitable for use in personal safety applications.

proense® F18 Series Photoelectric Sensors

Detection Diagrams
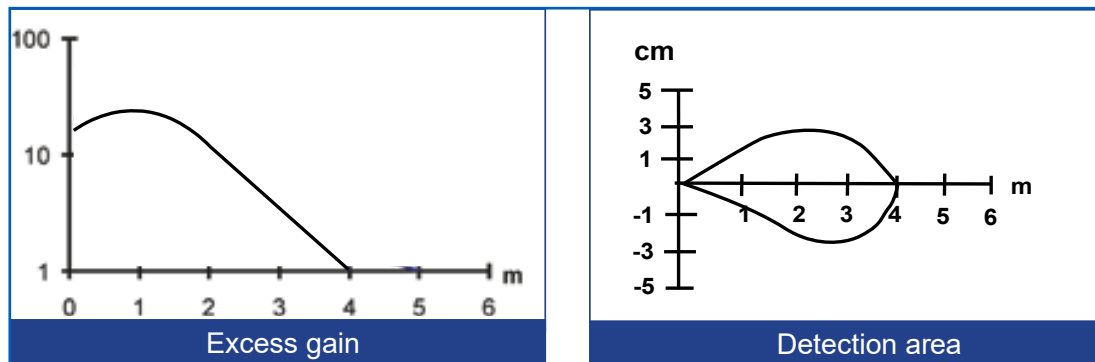
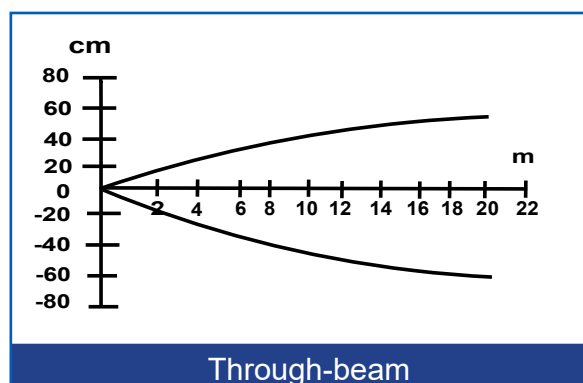### B - Diffuse

Excess gain - axial

Detection area - axial

C - Diffuse Potentiometer

Excess gain - axial

Detection area - axial

D - Retroreflective

Excess gain

Detection area

E - Through-beam

Through-beam

Accessories for 18mm Sensors

Axial Mounting Bracket

Axial mounting bracket available in zinc plated steel or 316L stainless steel. Has two mounting holes (use 4mm screws) and allows for rotation of an optical axis for right-beam-angle-adapter sensors. Hexagonal nuts not included. For use with 18mm sensors.

ST18A

Accessories for 18mm Sensors			
Part Number	*Price*	*Description*	*Weight lb [g]*
ST18A	$;97,:	Micro Detectors mounting bracket, axial, zinc plated steel. For use with 18mm sensors.	0.06 [27.2]
ST18A7W	$980:	Micro Detectors mounting bracket, axial, 316L stainless steel. For use with 18mm sensors.	0.06 [27.2]

Dimensions

mm [inches]

Right-angle Mounting Bracket

Right-angle mounting bracket for use with 18mm sensors. Has two mounting holes (use 4mm screws) and allows the rotation of an optical axis for axial sensors. Hexagonal nuts not included.

ST18C

Accessories for 18mm Sensors			
Part Number	*Price*	*Description*	*Weight lb [g]*
ST18C	$981:	Micro Detectors mounting bracket, right-angle, zinc plated steel. For use with 18mm sensors.	0.06 [27.2]
ST18C7W	$982:	Micro Detectors mounting bracket, right-angle, 316L stainless steel. For use with 18mm sensors.	0.06 [27.2]

Dimensions

mm [inches]

Sensor Accessories tSEN-483

Accessories for 18mm Sensors

Right-angle Mounting Brackets

Mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 18mm sensors. Available with or without fixed insertion stop.

Accessories for 18mm Sensors				
Part Number	Price	Description	Drawing Link	Weight lb [g]
OPT2104	$;-1nlt:	Wenglor mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 18mm sensors.	PDF	0.06 [27.2]
OPT2105	$-1nlu:	Wenglor mounting bracket, right-angle, plastic. For use with 18mm sensors.	PDF	0.06 [27.2]

OPT2104, OPT2105

Right-angle Swivel Mounting Systems

Mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 12mm rod mount. For use with 18mm sensors. Available in all 304 stainless steel or with an aluminum head and a stainless steel mounting plate.

Accessories for 18mm Sensors						
Part Number	Price	Description	Mounting Head	Mounting Plate	Drawing Link	Weight lb [g]
OPT2116	$-1nl#:	Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, aluminum, 12mm rod mount. For use with 18mm sensors.	Aluminum	304 Stainless steel	PDF	0.15 [68.0]
OPT2117	$;-1nl!:	Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 304 stainless steel, 12mm rod mount. For use with 18mm sensors.	304 Stainless steel	304 Stainless steel	PDF	0.28 [127.0]

Note: 304 Stainless steel mounting rods sold separately: OPT2109 (200mm [7.87 in] length), OPT2110 (300mm [11.81 in] length), and OPT2111 (500mm [19.69 in] length).
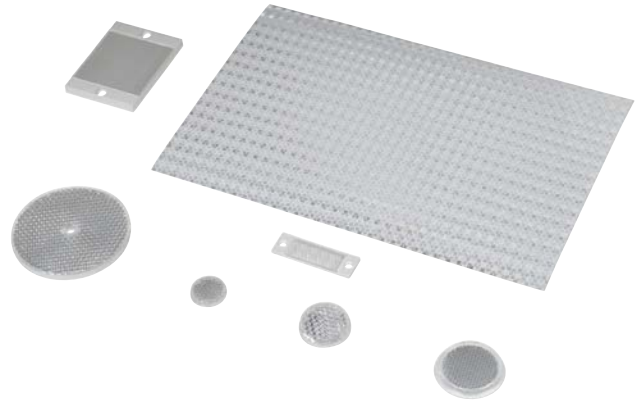
OPT2116, OPT2117

Reflectors

RL Series Reflectors for Polarized Reflective Photoelectric Sensors (All Models)

• Suitable for use with polarized light photoelectric sensors
• Shapes and sizes for most applications
• Miniature types for close mounting in multiple sensor installations
• Single hole, dual hole and self-adhesive mounting types available
• Single and 10-packs available

Installation Notes

• Keep the reflector surface clean to ensure peak detection performance. This is especially true when the maximum sensing range is being used. Clean using a damp cloth.
• When selecting a reflector, it is important to consider the ambient conditions it will be exposed to. Dusty or high humidity conditions may reduce the sensing range as much as 90%.
• Reflectors should be positioned at a 90° angle to the optical axis with a tolerance of ±15°.

Reflector Specifications							
Part number	Price	Drawing Link	Quantity	Dimensions mm [in]	Degree of Protection	Mounting	Materials
RL102	$;09[h:	PDF	10	25 [0.98]	IEC IP67	Customer-supplied adhesive or other mounting method required	Reflective face: PMMA Polymethylmethacrylate (acrylic) Base material: ABS (Acrylonitrile-butadiene-styren)
RL102-1	$?6y:		1				
RL103	$;-09[i:	PDF	10	34.5 [1.36]			
RL103-1	$?6z:		1				
RL104	$;-09[j:	PDF	10	46 [1.81]			
RL104-1	$;?6]:		1				
RL105G	$-2e_j:	PDF	10	95 x 38 [3.74 x 1.50]		Two 4.3 mm holes	
RL105G-1	$2e_k:		1				
RL106G	$;-09[l:	PDF	10	182 x 42 [7.17 x 1.65]		Two 6mm holes	
RL106G-1	$?6_:		1				
RL110	$;09[n:	PDF	10	84 [3.31]		One 5mm hole	
RL110-1	$?6#:		1				
RL116	$05yv:	PDF	10	41 x 60 [3.54 x 2.36]		Two 3mm holes	
RL116-1	$;?6!:		1				
RL100DA4	$0?77:	NA	1	200 x 300 [7.87 x 11.81]		Self-adhesive	Paper (Acrylic tape with micro prism)
RL100DC4	$0?78:	NA	1	50 x 300 [1.97 x 11.81]			
RL100DQ1	$?79:	NA	1	100 x 100 [3.94 x 3.94]			
RL111G	$;0?6,:	PDF	10	22.5 x 47 [0.89 x 1.85]		Two 3mm slots	Reflective face: PMMA Polymethylmethacrylate (acrylic) Base material: ABS (Acrylonitrile-butadiene-styren)
RL111G-1	$?6?:		1				
RL112G	$0?71:	PDF	10	19 x 73 [0.75 x 2.87]			
RL112G-1	$?70:		1				
RL113G	$0?73:	PDF	10	51.4 x 60.3 [2.02 x 2.37]		Two 4mm slots	
RL113G-1	$?72:		1				

Not recommended for applications involving moist air environments or water immersion.