



# M18 Photoelectric Sensors - S51 Series

## Cost-effective & Versatile Photoelectric Sensor

The S51 series offers a cost-effective solution in M18 photoelectric sensors, with a wide range of functions and operating distances. S51 sensors are available with either axial or radial 90° optics. In both cases, the optic head and lenses do not project beyond the external 18mm diameter of the sensor housing. The diffuse-proximity model has a 10cm fixed operating range with a wide emission spectrum. Also available is a version with a 1 - 40cm adjustable operating range.

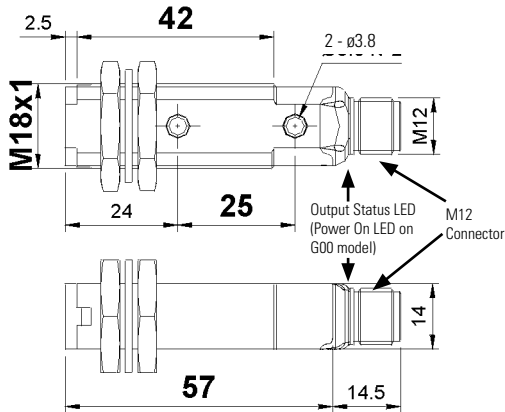
Standard retro-reflective models have an operating range up to 4m. The polarized retro-reflective models, used for reliable

detection of reflective objects, are fitted with a sensitivity adjustment and have a 3.5m operating range. The through-beam models, used for longer operating distances, reach 18 meters.

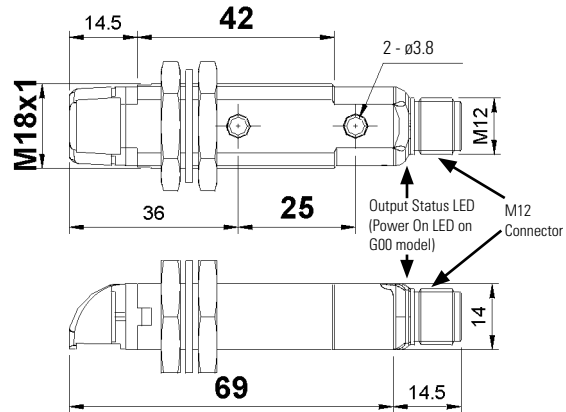
With cable or M12 connector versions and PNP or NPN output, the S51 sensors provide a 3-wire connection configuration in compliance with the EN60947-5-2 standard. The normally open output is activated in light mode in proximity models and in dark mode in retro-reflective models. The output mode can be inverted using the dark/light selection input wire provided, making these extremely versatile sensors.

**Dimensions (mm)**

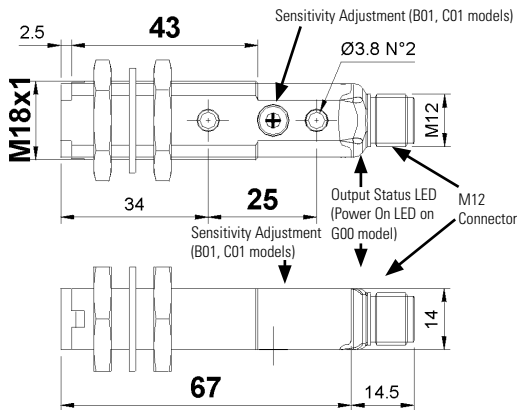
**Retro-reflective, Short Diffused, Through-beam Emitter  
Axial Optic Models**



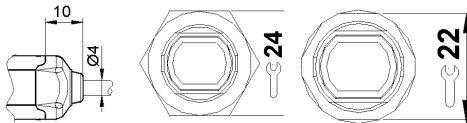
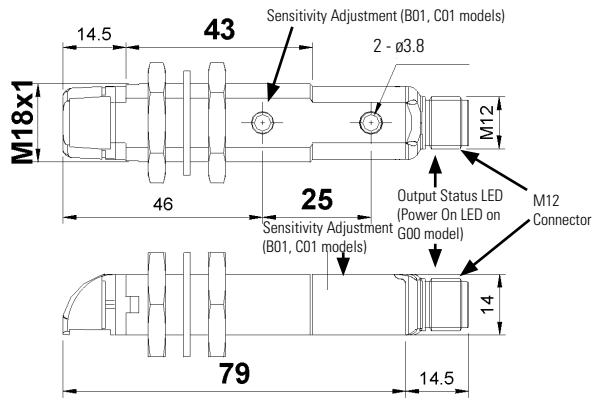
**Radial Optic Models**



**Polarized Retro-reflective, Long Diffused, Through-beam Receiver  
Axial Optic Models**

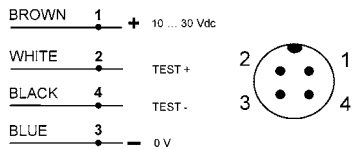


**Radial Optic Models**

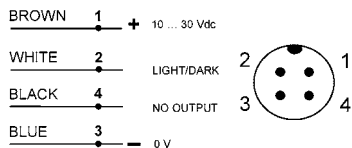


**Connections**

**Through-beam**



**Retro-reflective, Polarized Retro-reflective,  
Long Diffused, Short Diffused, Through-beam**



**Indicators & Settings**



For more information  
visit [www.idec-ds.com](http://www.idec-ds.com)

## Specifications

<b>Long Diffuse Proximity Operating Distance</b>	1 - 40cm (radial version 30 cm)
<b>Short Diffuse Proximity Operating Distance</b>	0 - 10cm (radial version 8 cm)
<b>Retro-reflective Operating Distance</b>	0.1 - 4m on R2 (radial version 3 m) on R5
<b>Polarized Retro-reflective Operating Distance</b>	0.1 - 3m on R2 (radial version 2.5 m) on R5
<b>Through-beam Operating Distance</b>	0 - 18m (radial version 15 m)
<b>Power Supply</b>	10 - 30V DC <sup>1</sup>
<b>Ripple</b>	≤ 2 Vpp
<b>Current Draw</b>	≤ 35 mA
<b>Light Emission <sup>2</sup></b>	Infrared LED 880 nm Red LED 650 nm (B01 models)
<b>Setting</b>	Sensitivity adjustment (B01, C01 models) <sup>3</sup>
<b>Indicators</b>	Yellow OUTPUT LED (excl. G00 models) Green POWER LED (G00 models)
<b>Output Type</b>	NPN or PNP versions
<b>Output Current</b>	≤ 100mA
<b>Saturation Voltage</b>	≤ 2V
<b>Response Time</b>	1ms 4ms (F00 mod.)
<b>Switching Frequency</b>	≤ 500Hz ≤ 120Hz (F00 mod.)
<b>Operating Mode</b>	dark/light selectable <sup>4</sup>
<b>Auxiliary Functions</b>	Test + and Test - (G00 mod.) <sup>5</sup>
<b>Connection</b>	2m ø4 mm cable <sup>6</sup> M12 4-pole connector <sup>7</sup>
<b>Electrical Protection</b>	Class 2
<b>Mechanical Protection</b>	IP67
<b>Protection Devices</b>	A, B <sup>8</sup>
<b>Housing Material</b>	PBT
<b>Lens Material</b>	PMMA
<b>Weight</b>	25g max. (S51-PA/PR-5), 75g max. (S51-PA/PR-2)
<b>Operating Temperature</b>	-25 to +55°C
<b>Storage Temperature</b>	-25 to +70°C
<b>Reference Standard</b>	EN60947-5-2, UL 508



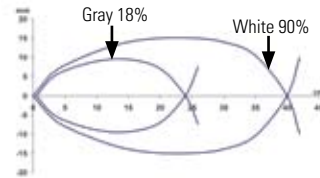
- Limit values.
- Average life of 100,000 hrs with  $T_a = +25^\circ\text{C}$ .
- 270° single-turn sensitivity adjustment.
- With L/D input not connected the proximity models function in the light mode and the retro-reflective and through-beam models in the dark mode; the light mode can be selected by connecting the L/D input to +V DC, the dark mode connecting it to 0V DC.
- Emitter off with Test+ connected to +V DC and Test- to 0V DC.
- PVC, 4 x 0.14mm<sup>2</sup>
- M12 connector compatible with quick connection systems.
- A - reverse polarity protection  
B - overload and short-circuit protection

## Connector Cables

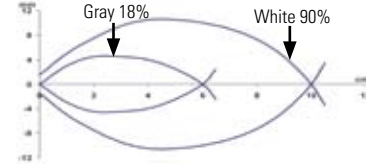
Appearance	Number of Core Wires	Type & Length	Use with	Part No.
	4	Straight, 5m	S51, S60, S62	CS-A1-02-G-05
	4	Right angle, 5m		CS-A2-02-G-05

## Detection Diagrams

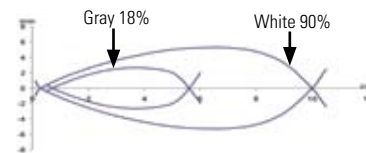
### Long Diffused



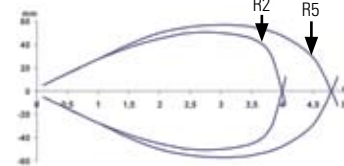
### Short Diffused



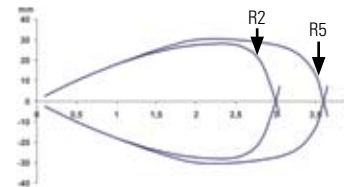
### Short Diffuse Proximity



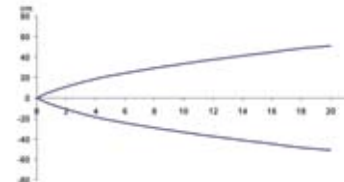
### Retro-reflective



### Polarized Retro-reflective



### Through-beam



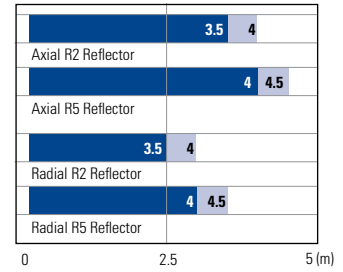
II3D

**Part Numbers**

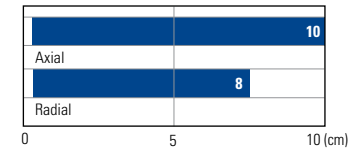
Axial	Optic Function	Connection	Output	Part Number
	Retro-reflective	2m cable	PNP	S51-PA-2-A00-PK
			NPN	S51-PA-2-A00-NK
		M12 connector	PNP	S51-PA-5-A00-PK
			NPN	S51-PA-5-A00-NK
	Polarized Retro-reflective	2m cable	PNP	S51-PA-2-B01-PK
			NPN	S51-PA-2-B01-NK
		M12 connector	PNP	S51-PA-5-B01-PK
			NPN	S51-PA-5-B01-NK
	Long Diffuse Proximity	2m cable	PNP	S51-PA-2-C01-PK
		M12 connector	PNP	S51-PA-5-C01-PK
	Short Diffuse Proximity	2m cable	PNP	S51-PA-2-C10-PK
		M12 connector	PNP	S51-PA-5-C10-PK
	Receiver	2m cable	PNP	S51-PA-2-F00-PK
			NPN	S51-PA-2-F00-NK
		M12 connector	PNP	S51-PA-5-F00-PK
			NPN	S51-PA-5-F00-NK
	Emitter	2m cable	–	S51-PA-2-G00-XG
		M12 connector	–	S51-PA-5-G00-XG
Radial	Optic Function	Connection	Output	Part Number
	Retro-reflective	2m cable	PNP	S51-PR-2-A00-PK
			NPN	S51-PR-2-A00-NK
		M12 connector	PNP	S51-PR-5-A00-PK
			NPN	S51-PR-5-A00-NK
	Polarized Retro-reflective	2m cable	PNP	S51-PR-2-B01-PK
			NPN	S51-PR-2-B01-NK
		M12 connector	PNP	S51-PR-5-B01-PK
			NPN	S51-PR-5-B01-NK
	Long Diffuse Proximity	2m cable	PNP	S51-PR-2-C01-PK
			NPN	S51-PR-2-C01-NK
		M12 connector	PNP	S51-PR-5-C01-PK
			NPN	S51-PR-5-C01-NK
Short Diffuse Proximity	2m cable	PNP	S51-PR-2-C10-PK	
		NPN	S51-PR-2-C10-NK	
	M12 connector	PNP	S51-PR-5-C10-PK	
		NPN	S51-PR-5-C10-NK	
	Receiver	2m cable	PNP	S51-PR-2-F00-PK
			NPN	S51-PR-2-F00-NK
		M12 connector	PNP	S51-PR-5-F00-PK
			NPN	S51-PR-5-F00-NK
	Emitter	2m cable	–	S51-PR-2-G00-XG
		M12 connector	–	S51-PR-5-G00-XG

**Operating Distance**

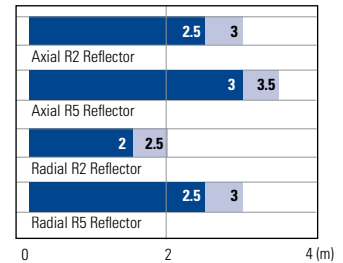
**Retro-reflective**



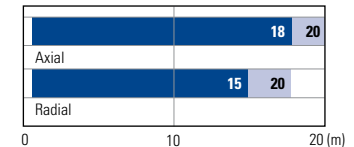
**Short Diffused**



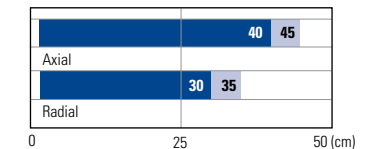
**Polarized Retro-reflective**



**Through-beam**



**Long Diffuse**



■ Recommended operating distance  
 ■ Maximum operating distance

Additional models with metal housing are available. Contact IDEC for more information.