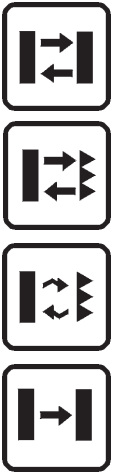


## M18 PHOTOELECTRIC SENSOR BASIC LINE



- *Basic models available with axial or radial optics*
- *Versions with NPN or PNP output, cable or M12 connector*
- *Standard 3 wire connection configuration*
- *Selectable dark or light output*

## M18 standard

## S51 SERIES

The **S51** series offers a very cost-effective solution for object detection in all industrial automation applications. The standard M18x1 tubular plastic housing is available with either axial or radial optics; in both cases the optic head and lenses do not protrude beyond the external 18 mm diameter of the sensor housing.

There are two models of the diffuse proximity function: one with 1 - 10 cm fixed operating distance and the other with 1 - 30 cm adjustable operating distance.

Standard retroreflective models have an operating distance up to 3 m whilst the polarised retroreflective models used for reliable detection of reflective objects are fitted with sensitivity adjustment and have a 2 m maximum operating distance. The emitter and receiver models, used for longer operating distances, reach 12 meters.

The sensors of the **S51** series, with cable or M12 connector, provide a 3 wire connection configuration in compliance with the EN60947-5-2 standard, having the normally open output present on pin 4, regardless of optic function. The output mode can be inverted using the dark/light selection input wire provided.

## M18 STANDARD

### AXIAL OPTIC VERSIONS

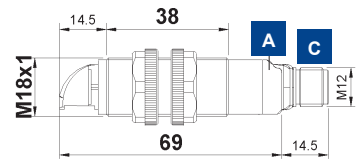
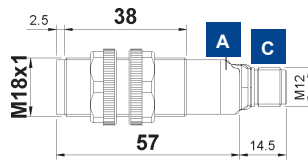


### RADIAL OPTIC VERSIONS

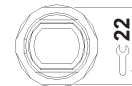
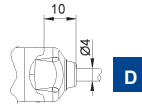
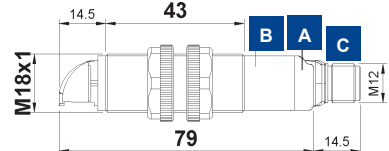
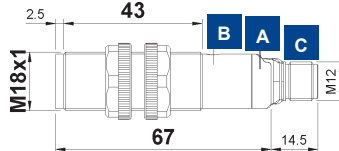


## DIMENSIONS

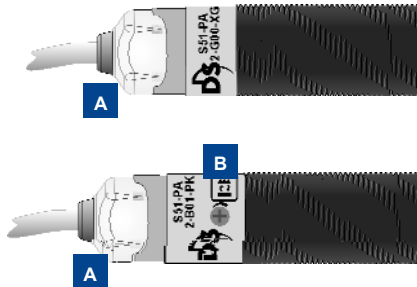
### A00/C10/G00 MODELS



### B01/C01/F00 MODELS



## INDICATORS AND SETTINGS

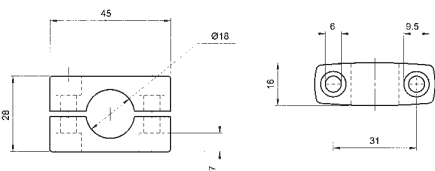


- A** OUTPUT status LED; POWER ON LED on G00 model
- B** Adjustment trimmer (B01, C01 models)
- C** M12 connector
- D** Cable connection

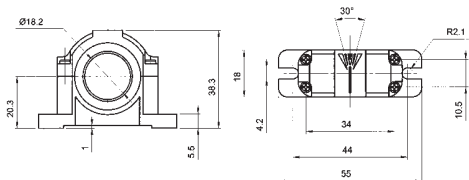
Trimmer for sensitivity adjustment. Rotate in a clockwise direction to increase the operating distance

## ACCESSORIES

**SP-40**  
fixed support for M18 tubular sensors



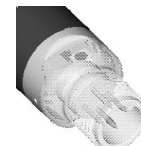
**SWING-18**  
adjustable support for M18 tubular sensors



## CONNECTIONS



S51-PA/PR-2



S51-PA/PR-5

### G00 MODEL

- BROWN 1 + 10 ... 30 Vdc
- WHITE 2 TEST +
- BLACK 4 TEST -
- BLUE 3 0 V



### A00/B01/C01/C10/F00 MODELS

- BROWN 1 + 10 ... 30 Vdc
- WHITE 2 LIGHT/DARK
- BLACK 4 NO OUTPUT
- BLUE 3 0 V

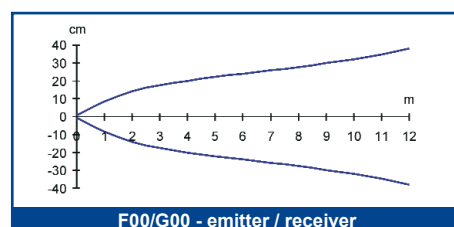
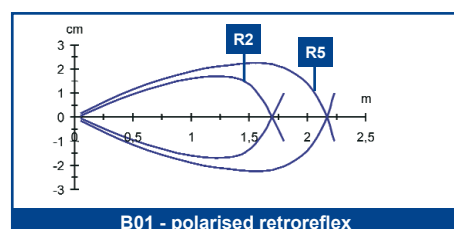
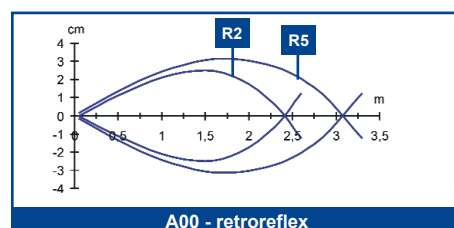
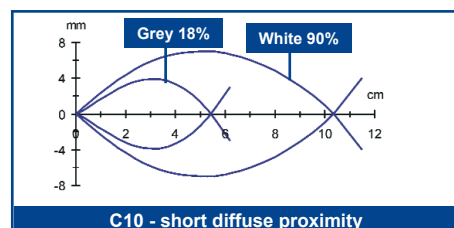
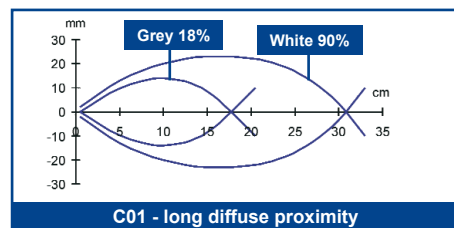




## TECHNICAL DATA

## DETECTION DIAGRAMS

<b>Long diffuse proximity operating distance:</b>	1 ... 30 cm (25 cm radial vers.)
<b>Short diffuse proximity operating distance:</b>	0 ... 10 cm (8 cm radial vers.)
<b>Retroreflex operating distance:</b>	0.1 ... 3 m (2 m radial vers.)
<b>Polarised retroreflex operating distance:</b>	0.1 ... 2 m (1.5 m radial vers.)
<b>Through beam operating distance:</b>	0 ... 12 m (10 m radial vers.)
<b>Power supply:</b>	10 ... 30 Vcc <sup>1</sup>
<b>Ripple:</b>	≤ 2 Vpp
<b>Consumption:</b>	≤ 35 mA
<b>Light emission<sup>2</sup>:</b>	infrared LED 880 nm red LED 650 nm (B01 mod.)
<b>Setting:</b>	sensitivity trimmer (B01, C01 mod.) <sup>3</sup>
<b>Indicators:</b>	yellow OUTPUT LED (excl. G00 mod.) green POWER LED (G00 mod.)
<b>Output type:</b>	NPN vers. or PNP vers.
<b>Output current:</b>	≤ 100 mA
<b>Saturation voltage:</b>	≤ 2 V
<b>Response time:</b>	1 ms 2 ms (F00 mod.)
<b>Switching frequency:</b>	500 Hz 250 Hz (F00 mod.)
<b>Operating mode:</b>	dark/light selectable <sup>4</sup>
<b>Auxiliary functions:</b>	Test + and Test - <sup>5</sup>
<b>Connection:</b>	2 m Ø 4 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>	ABS
<b>Lens material:</b>	PMMA
<b>Weight:</b>	25 g max. (connector vers.) 75 g max. (cable vers.)
<b>Operating temperature:</b>	-25 ... +55°C
<b>Storage temperature:</b>	-25 ... +70°C
<b>Reference standard:</b>	EN 60947-5-2, UL 508



**Note:** the diagrams indicate the detection area typical of the axial optic versions; the maximum operating distance of the radial optic versions decreases as indicated in the tables given below



## TECHNICAL NOTES

- Limit values
- Average life of 100.000 h with  $T_A = +25^\circ\text{C}$
- 270° single-turn trimmer
- With L/D input not connected the proximity models function in the light mode and the retroreflex and through beam models in the dark mode; the light mode can be selected connecting the L/D input to +Vdc, the dark mode connecting it to 0Vdc
- Emitter off with Test+ connected to +Vdc and Test- to 0 Vdc
- PVC, 4 x 0.14 mm<sup>2</sup>
- M12 connector compatible with quick connection systems
- A - reverse polarity protection  
B - overload and short-circuit protection

<b>A00</b>	2	2.2
axial on R2		
<b>A00</b>	2.8	3
axial on R5		
<b>A00</b>	1.5	1.7
radial on R2		
<b>A00</b>	2	2.2
radial on R5		

<b>B01</b>	1.5	1.7
axial on R2		
<b>B01</b>	2	2.2
axial on R5		
<b>B01</b>	1.2	1.4
radial on R2		
<b>B01</b>	1.5	1.7
radial on R5		

<b>C01</b>	30
axial	
<b>C01</b>	25
radial	

<b>C10</b>	10
axial	
<b>C10</b>	8
radial	

<b>F/G</b>	12	13
axial		
<b>F/G</b>	10	11
radial		

■ Recommended operating distance  
■ Maximum operating distance

## MODEL LIST

### VERSIONS WITH AXIAL OPTICS

MODEL	OPTIC FUNCTION	CONNECTION	OUTPUT	ORDER N°
S51-PA-2-A00-PK	retroreflex	2 m cable	PNP	952701000
S51-PA-2-A00-NK	retroreflex	2 m cable	NPN	952701070
S51-PA-5-A00-PK	retroreflex	M12 connector	PNP	952701260
S51-PA-5-A00-NK	retroreflex	M12 connector	NPN	952701330
S51-PA-2-B01-PK	polarised retroreflex	2 m cable	PNP	952701010
S51-PA-2-B01-NK	polarised retroreflex	2 m cable	NPN	952701080
S51-PA-5-B01-PK	polarised retroreflex	M12 connector	PNP	952701270
S51-PA-5-B01-NK	polarised retroreflex	M12 connector	NPN	952701340
S51-PA-2-C01-PK	long diffuse proximity	2 m cable	PNP	952701020
S51-PA-2-C01-NK	long diffuse proximity	2 m cable	NPN	952701090
S51-PA-5-C01-PK	long diffuse proximity	M12 connector	PNP	952701280
S51-PA-5-C01-NK	long diffuse proximity	M12 connector	NPN	952701350
S51-PA-2-C10-PK	short diffuse proximity	2 m cable	PNP	952701030
S51-PA-2-C10-NK	short diffuse proximity	2 m cable	NPN	952701100
S51-PA-5-C10-PK	short diffuse proximity	M12 connector	PNP	952701290
S51-PA-5-C10-NK	short diffuse proximity	M12 connector	NPN	952701360
S51-PA-2-F00-PK	receiver	2 m cable	PNP	952701050
S51-PA-2-F00-NK	receiver	2 m cable	NPN	952701120
S51-PA-5-F00-PK	receiver	M12 connector	PNP	952701310
S51-PA-5-F00-NK	receiver	M12 connector	NPN	952701380
S51-PA-2-G00-XG	emitter	2 m cable	-	952701060
S51-PA-5-G00-XG	emitter	M12 connector	-	952701320

### VERSIONS WITH RADIAL OPTICS

MODEL	OPTIC FUNCTION	CONNECTION	OUTPUT	ORDER N°
S51-PR-2-A00-PK	retroreflex	2 m cable	PNP	952701130
S51-PR-2-A00-NK	retroreflex	2 m cable	NPN	952701200
S51-PR-5-A00-PK	retroreflex	M12 connector	PNP	952701390
S51-PR-5-A00-NK	retroreflex	M12 connector	NPN	952701460
S51-PR-2-B01-PK	polarised retroreflex	2 m cable	PNP	952701140
S51-PR-2-B01-NK	polarised retroreflex	2 m cable	NPN	952701210
S51-PR-5-B01-PK	polarised retroreflex	M12 connector	PNP	952701400
S51-PR-5-B01-NK	polarised retroreflex	M12 connector	NPN	952701470
S51-PR-2-C01-PK	long diffuse proximity	2 m cable	PNP	952701150
S51-PR-2-C01-NK	long diffuse proximity	2 m cable	NPN	952701220
S51-PR-5-C01-PK	long diffuse proximity	M12 connector	PNP	952701410
S51-PR-5-C01-NK	long diffuse proximity	M12 connector	NPN	952701480
S51-PR-2-C10-PK	short diffuse proximity	2 m cable	PNP	952701160
S51-PR-2-C10-NK	short diffuse proximity	2 m cable	NPN	952701230
S51-PR-5-C10-PK	short diffuse proximity	M12 connector	PNP	952701420
S51-PR-5-C10-NK	short diffuse proximity	M12 connector	NPN	952701490
S51-PR-2-F00-PK	receiver	2 m cable	PNP	952701180
S51-PR-2-F00-NK	receiver	2 m cable	NPN	952701250
S51-PR-5-F00-PK	receiver	M12 connector	PNP	952701440
S51-PR-5-F00-NK	receiver	M12 connector	NPN	952701510
S51-PR-2-G00-XG	emitter	2 m cable	-	952701190
S51-PR-5-G00-XG	emitter	M12 connector	-	952701450

## ACCESSORIES

MODEL	DESCRIPTION	ORDER N°
SP-40	fixed support for tubular M18 sensors	95ACC1370
SWING-18	adjustable support for plastic tubular M18 sensors	895000006

Please refer also to **Sensor accessories**



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