Miniature Sensors - S100

DATALOGIC

The universal miniature photoelectric sensor

- Two threaded front mounting holes
- Two slotted rear mounting holes
- Anti-tampering sensor (no adjustment)
- Standard optic functions
- M8 connector and cable models
- PNP or NPN models with Light/Dark selection by wire
- Plastic housing, IP67 mechanical protection

APPLICATIONS

-Processing and packaging machines
-Conveyors
-Automatic warehousing
-Intralogistic lines

S100		
Through beam		12 m
Retroreflective		8 m
Polarized Retroreflective (long range)		6 m
Polarized Retroreflective (short range)		3 m
Diffused proximity (short range)		300 mm
Diffused proximity (long range)		500 mm
Fixed focus		70 mm
Background suppression		30...100 mm
Power supply	Vdc	10...30 Vdc
Output	PNP	▪
	NPN	▪
Connection	cable	2 m cable, 4 wires
	connector	M8 conn., 4-pole
Approximate dimensions (mm)		32x20x12
Housing material		Plastic
Mechanical protection		IP65

PRELIMINARY
SENSORS

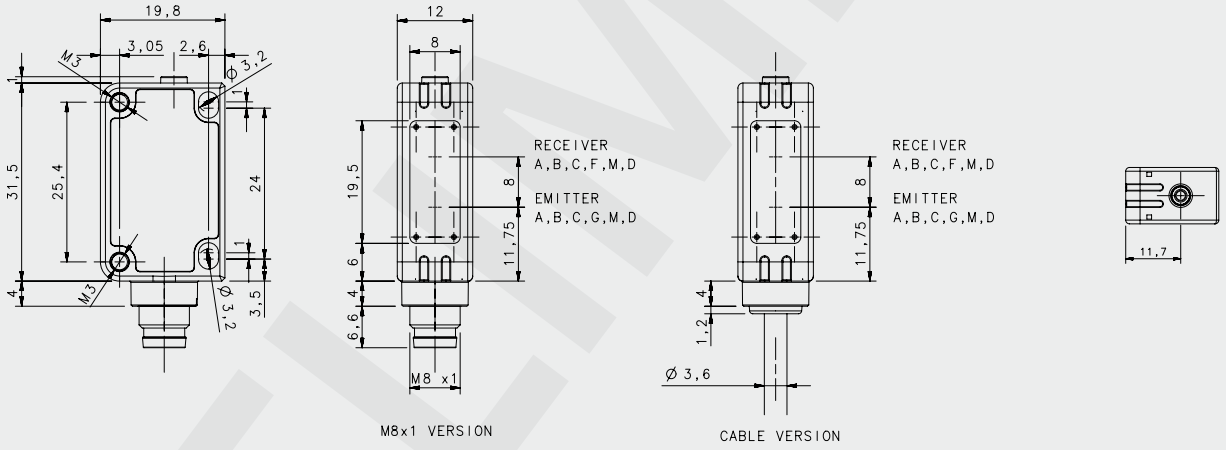
Miniature Sensors - S100

DATALOGIC

TECHNICAL DATA

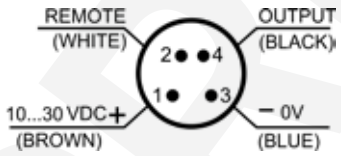
	Through beam	Retroreflective (infrared)	Polarized retroreflective (long range)	Polarized retroreflective (long range)	Diffuse (long range)	Diffuse (short range)	Fixed focus	Background suppression
Operating distance	12 m	8 m (on R5 reflector)	6 m (on R5 reflector)	3 m (on R5 reflector)	500 mm (White 90%)	300 mm (White 90%)	70 mm	30...100 mm
Emission type	Infrared LED (860 nm)		Red LED (632 nm)					
Power supply	10...30 VDC							
Ripple	10% max.							
Current consumption	20 mA max.							
Switching Output	PNP or NPN (with pull-down / pull-up = 33 KΩ and short-circuit protection							
Output current	100 mA							
Output saturation voltage	2 V max.							
Connection	2 m cable (4 wires) or M8 connector (4 pole): depends on the model (S100-...-2/5)							
Response time	2 ms	1 ms						
Switching frequency	250 Hz	500 Hz						
Indicators	POWER-ON LED (GREEN) mod.G00	OUTPUT LED (YELLOW) (mod. A00/Bx0/Cx0/D00/F00/M00)						
Remote Setting	LIGHT/DARK input							EXTERNAL TEACH-IN (object or backgound detection)
Operating temperature	-20 °C ... +55 °C							
Storage temperature	-20 °C ... +70 °C							
Ambient light rejection	according to EN 60947-5-2 (incandescent lamp 23000 lux); fluorescent and stroboscopic lamp , flash beacon							
Vibration	0.5 mm amplitude, 10 ... 55 Hz frequency, for every axis (EN60068-2-6)							
Shock resistance	11 ms (30 G) 6 shock for every axis (EN60068-2-27)							
Housing material	ABS (housing)/ PMMA (indicators cover)							
Lens material	PC lens/ PMMA window							
Mechanical protection	IP67							
Connections	2 m cable (4 wires)/ M8 4-pole connector							
Weight	50 g. max. cable versions / 10 g. connector versions							

DIMENSIONS

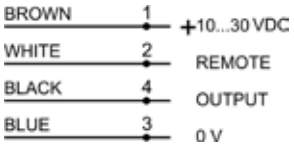


CONNECTION

M8 CONNECTOR



CABLE



PIN	WIRE	CONNECTOR	CABLE
1	Brown	10...30 Vdc	
2	White	REMOTE* (L/D, Teach-in)	
3	Blue	0 V	
4	Black	OUTPUT** (PNP or NPN)	

*REMOTE: Light/Dark selection (S100-...-A-B-C-D-F), Exernal Teach-in (S100-...-M)

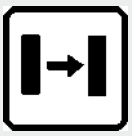
**OUTPUT: PNP or depends on the model

PREVIEW

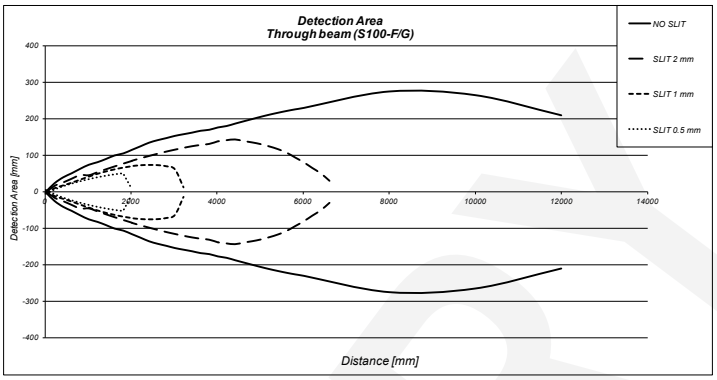
Miniature Sensors - S100

DATALOGIC

THROUGH BEAM



The emitter (S100-...-G00) and the receiver are provided in the same package and with a unique order number



	max. operating distance
NO SLIT	12 m
2 mm SLIT	6,7 m
1 mm SLIT	3,2 m
0,5 mm SLIT	2 m

SLIT EFFICIENCY

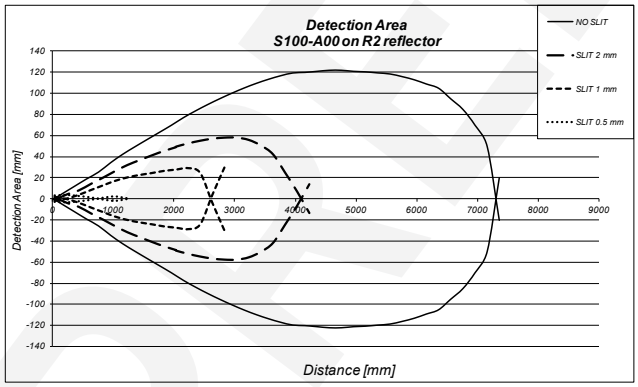
The use of the rectangular SLIT (0,5/1/2 mm x 19 mm), available as accessory, allows to reduce the power and the openess of the light beam, in order to avoid optical interference between adiacent sensors and to narrow the light beam facilitating the detection of smaller objects.

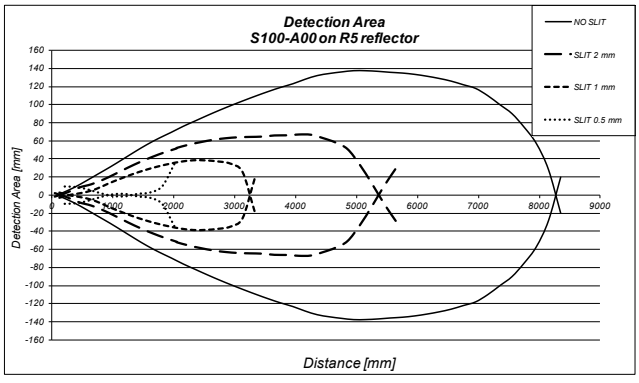
RETROREFLECTIVE (infrared)

The model is not equipped with a polarization filter and thanks to the Infrared light emission is able to pass through a trasparent protective screen without detect it.
The reflector is not included with the product.

	max. operating distance distance	
	with R5 reflector	with R2 reflector
NO SLIT	8,3 m	7,3 m
2 mm SLIT	5,6 m	4,2 m
1 mm SLIT	3,3 m	2,8 m
0,5 mm SLIT	2 m	1,2 m

REFLECTOR	TYPE	(S100-...-A0)
R1	circular (Φ23 mm)	0,03..3,5 m
R2	circular (Φ48 mm)	0,01..7 m
R3	rectangular(18x54 mm)	0,01..4 m
R4	rectangular(47x47 mm)	0,01..6 m
R5	circular (Φ75 mm)	0,01..8 m
R6	rectangular(36x55 mm)	0,01..7 m
RT3970	self-adhesive tape (60x40 mm)	0,05..2 m





PRELIMINARY

Miniature Sensors - S100

DATALOGIC

POLARIZED RETROREFLECTIVE

The model is equipped with a polarization filter to avoid false switching due to reflective objects. The absence of the trimmer is compensated by the availability of two different models:
-a short range model, suggested for the conveyor belts and applications with small detection area, especially in the detection of *critical materials* (shiny packages, reflective surfaces, metallic parts, glossy plastic objects, ceramic tiles)
-a long range model, usable in generic applications and for long distance object detections
The SLIT accessory is available with three different aperture dimensions to further reduce the emission power and to narrow the light beam.
The reflector is not included with the product.

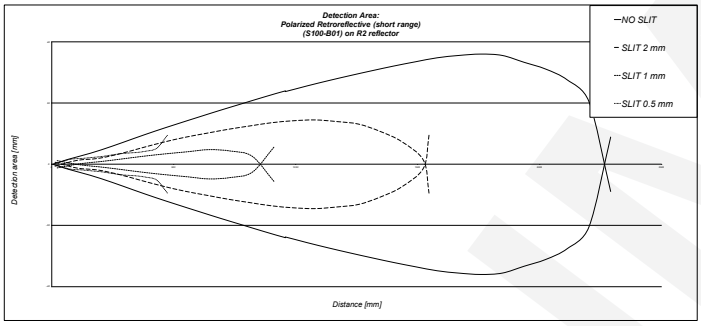
REFLECTOR	TYPE	SHORT RANGE (S100-...-B0)	LONG RANGE (S100-...-B1)
R1	circular (Φ23 mm)	0,1..0,8 m	0,02..2 m
R2	circular (Φ48 mm)	0,03..2 m	0,01..4,5 m
R3	rectangular(18x54 mm)	0,03..1,5 m	0,01..3 m
R4	rectangular(47x47 mm)	0,03..2,5 m	0,01..4,5 m
R5	circular (Φ75 mm)	0,01..3 m	0,01..5,5 m
R6	rectangular(36x55 mm)	0,03..1,8 m	0,01..4 m
RT3970	self-adhesive tape (60x40 mm)	0,1..0,8 m	0,05..1,8 m

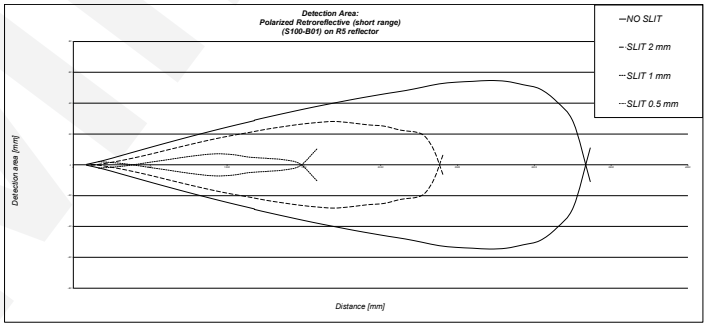
SLIT EFFICIENCY

The use of the rectangular SLIT (0,5/1/2 mm x 19 mm), available as accessory, allows to reduce the power and the openess of the light beam, in order to avoid optical interference between adjacent sensors and to narrow the light beam facilitating the detection of smaller objects.

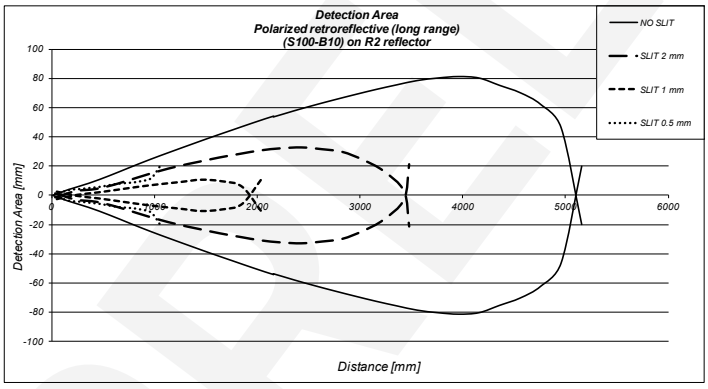
	max. operating distance			
	SHORT RANGE (S100-...-B0)		LONG RANGE (S100-...-B1)	
	with R5 reflector	with R2 reflector	with R5 reflector	with R2 reflector
NO SLIT	0,02 ... 3,5 m	0,02 ... 2,3 m	0,1...6,15 m	0,01...5,15 m
2 mm SLIT	0,05 ... 1,7 m	0,05 ... 1 m	0,2...4,4 m	0,03...3,5 m
1 mm SLIT	0,1 ... 0,55 m	0,1 ... 0,3 m	0,3...3 m	0,05...2,1 m
0,5 mm SLIT	not usable	not usable	0,5...1,5 m	0,07...1 m

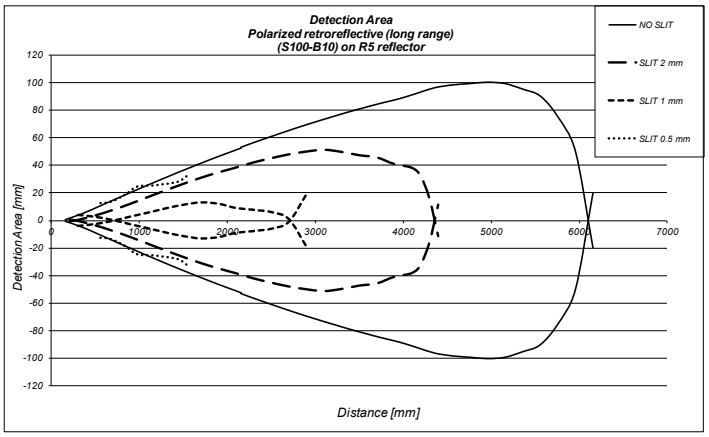
POLARIZED RETROREFLECTIVE (SHORT RANGE: S100-B00)





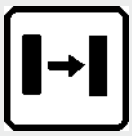
POLARIZED RETROREFLECTIVE (LONG RANGE: S100-B10)





PRELIMINARY

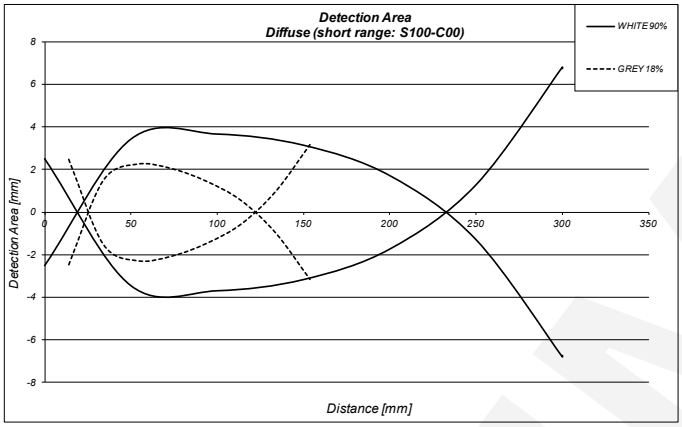
DIFFUSE PROXIMITY

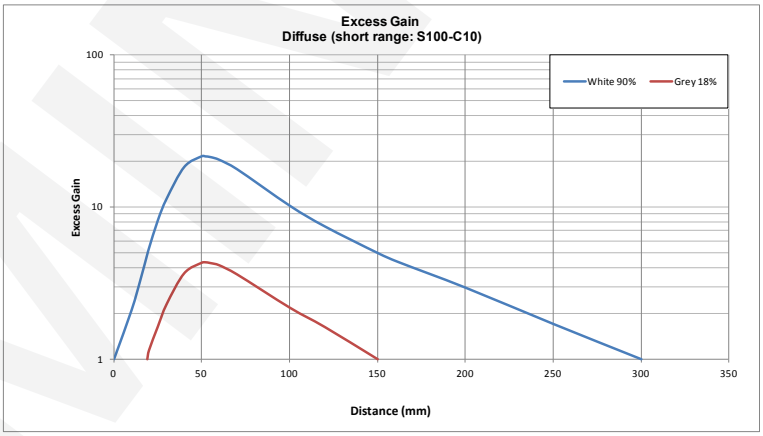


The Diffuse proximity model is available in two versions: a short range version, able to detect opaque objects up to 300 mm and a long range version with 500 mm operating distance. The high ambient light immunity of these models allows to use the sensor even in presence of fluorescent and strooboscopic lamps.

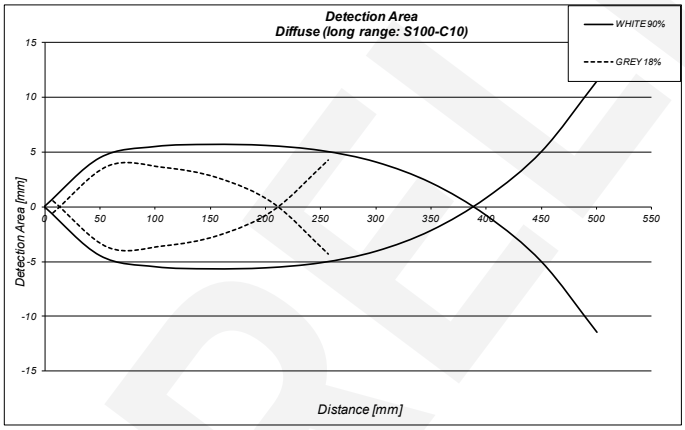
	SHORT RANGE (S100-...-C0)	LONG RANGE (S100-...-C1)
Recommended operating distance (on White 90% target)	10...240 mm	2...400 mm
Maximum operating distance (White 90% target)	1...300 mm	0...500 mm
Maximum operating distance (Grey 18% target)	20...150 mm	10...280 mm
Maximum operating distance (Black 6% target)	30...80 mm	20...160 mm
Difference White-Grey	50%	50%
Difference White-Black	75%	75%
Hysteresis	20%	20%

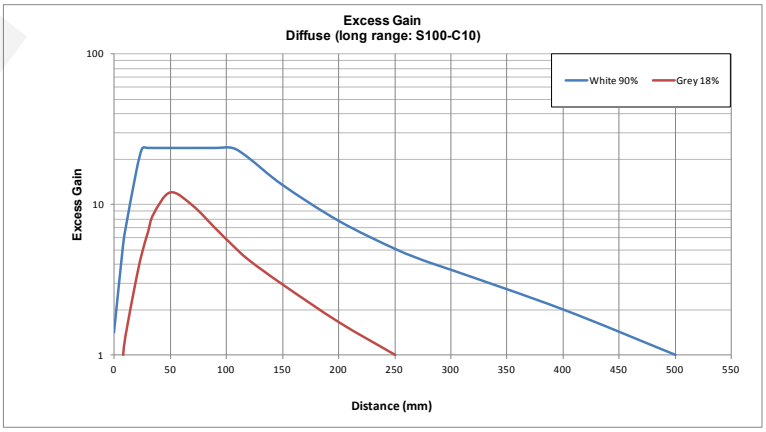
DIFFUSE (SHORT RANGE: S100-C00)





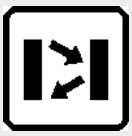
DIFFUSE (LONG RANGE: S100-C10)





PRELIMINARY

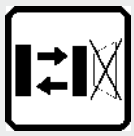
FIXED FOCUS



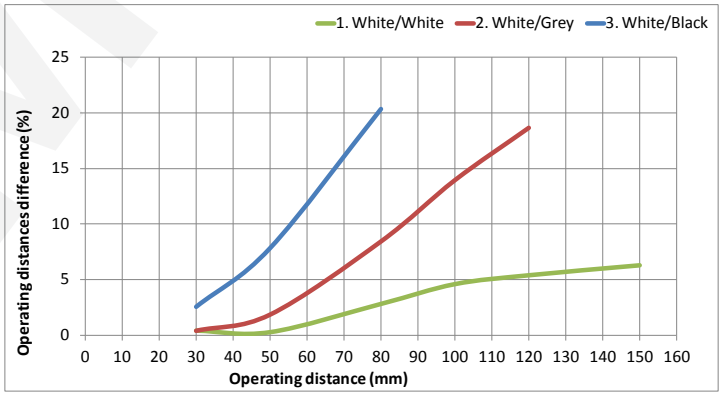
The Fixed focus model can detect opaque objects with very high efficiency and independence from the colors in a restricted area, with 70 mm focal point, without detecting anything outside of this limit. The installation is simple thanks to the visible red light spot.

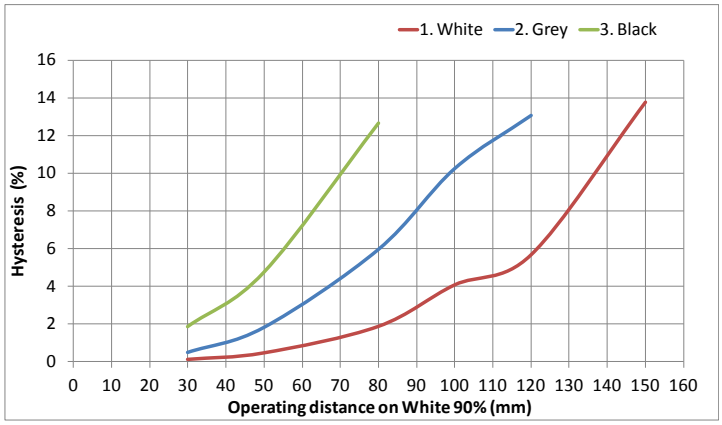
Focus point	70 mm
Maximum operating distance (White 90%)	70 mm
Maximum operating distance (Black 6%)	55 mm
Difference White/Black (%)	25%

BACKGROUND SUPPRESSION



Operating distances (background suppression)	30...100 mm
Maximum operating distance (White 90%)	0...150 mm
Maximum operating distance (Grey 18%)	4...110 mm
Maximum operating distance (Black 6%)	5...80 mm
Difference White 90%/White 90%	< 5%
Difference White 90%/Grey 18%	< 15%
Difference White 90%/Black 6%	<25 %





EXTERNAL TEACH-IN

By the remote input (white wire/pin 2) it is possible to set the sensor in order to suppress a specific background and/or to detect specific objects following the easy procedure:

OBJECT AT FIXED DISTANCE

Point the sensor towards the object and connect the white wire to +Vdc for 1 s.
The sensor is able to detect only the object at this fixed distance ignoring anything outside this distance

BACKGROUND SUPPRESSION

Point the sensor towards the background to suppress it and connect the white wire to +Vdc for 3 s.
The sensor is able to detect every object passing through the area between the active face and the background ignoring its reflections

LIGHT/DARK SELECTION

The factory default for this model is in LIGHT mode (N.O. output). Connecting the white wire (pin 2) to +Vdc for 7 s the operating mode is inverted in DARK (N.C. output)

PRELIMINARY

MODEL SELECTION AND ORDER INFORMATION

OPTIC FUNCTION	EMISSION	OPERATING DISTANCE	CONNECTION	OUTPUT	MODEL	ORDER No.
Through beam	IR	12 m	2 m cable	NPN	S100-PR-2-FG00-NK	950811100
				PNP	S100-PR-2-FG00-PK	950811110
			M8 connector	NPN	S100-PR-5-FG00-NK	950811240
				PNP	S100-PR-5-FG00-PK	950811250
Retroreflective	IR	8 m	2 m cable	NPN	S100-PR-2-A00-NK	950811000
				PNP	S100-PR-2-A00-PK	950811010
			M8 connector	NPN	S100-PR-5-A00-NK	950811140
				PNP	S100-PR-5-A00-PK	950811150
Polarized Retroreflective (short)	RED	3 m	2 m cable	NPN	S100-PR-2-B00-NK	950811020
				PNP	S100-PR-2-B00-PK	950811030
			M8 connector	NPN	S100-PR-5-B00-NK	950811160
				PNP	S100-PR-5-B00-PK	950811170
Polarized Retroreflective (long)	RED	6 m	2 m cable	NPN	S100-PR-2-B10-NK	950811280
				PNP	S100-PR-2-B10-PK	950811290
			M8 connector	NPN	S100-PR-5-B10-NK	950811300
				PNP	S100-PR-5-B10-PK	950811310
Diffuse proximity (short)	RED	300 mm	2 m cable	NPN	S100-PR-2-C00-NK	950811040
				PNP	S100-PR-2-C00-PK	950811050
			M8 connector	NPN	S100-PR-5-C00-NK	950811180
				PNP	S100-PR-5-C00-PK	950811190
Diffuse proximity (long)	RED	500 mm	2 m cable	NPN	S100-PR-2-C10-NK	950811060
				PNP	S100-PR-2-C10-PK	950811070
			M8 connector	NPN	S100-PR-5-C10-NK	950811200
				PNP	S100-PR-5-C10-PK	950811210
Fixed focus	RED	70 mm	2 m cable	NPN	S100-PR-2-D00-NK	950811080
				PNP	S100-PR-2-D00-PK	950811090
			M8 connector	NPN	S100-PR-5-D00-NK	950811220
				PNP	S100-PR-5-D00-PK	950811230
Background suppression	RED	30...100 mm	2 m cable	NPN	S100-PR-2-M00-NH	950811120
				PNP	S100-PR-2-M00-PH	950811130
			M8 connector	NPN	S100-PR-5-M00-NH	950811260
				PNP	S100-PR-5-M00-PH	950811270

CODING

S100 – P R – 5 – A 0 0 – P K

S100	P	plastic	R	radial optic	2	cable	A	retroreflective	0	short distance	0	0: no regulations	P	PNP	K	light/dark selection
					5	connector	B	polarized retroreflective	1	long distance			N	NPN	H	remote teach-in
							C	diffuse								
							D	fixed focus								
							FG	though beam								
							M	backgound suppression								

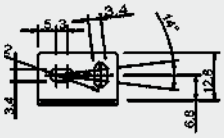
CABLES

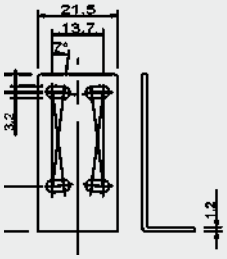
TYPE	No. Of POLES	SHEAT	LENGTH	DESCRIPTION	ORDER No.
M8 Connector (Axial)	4-pole	Grey, P.V.C.	3 m	CS-B1-02-G-03	95A251420
			5 m	CS-B1-02-G-05	95A251430
			7 m	CS-B1-02-G-07	95A251440
			10 m	CS-B1-02-G-10	95A251480
		P.U.R.	2 m	CS-B1-02-R-02	95A251500
			5 m	CS-B1-02-R-05	95A251520
M8 Connector (Radial 90°)	4-pole	Grey, P.V.C.	3 m	CS-B2-02-G-03	95A251450
			5 m	CS-B2-02-G-05	95A251460
			7 m	CS-B2-02-G-07	95A251470
		P.U.R.	5 m	CS-B2-02-R-05	95ACC2110

PRELIMINARY

ACCESSORIES

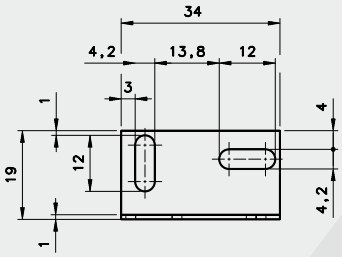
ST-5039

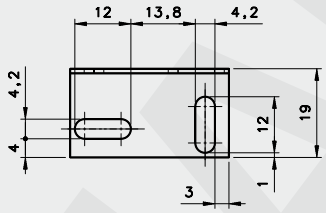




SLIT	
S100-SLIT-05	0,5x19 mm SLIT
S100-SLIT-1	1x19 mm SLIT
S100-SLIT-2	2x19 mm SLIT

ST-505





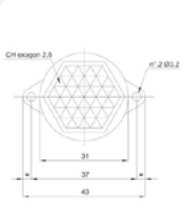
M18 ADAPTER "NOSE"

The patented ST-S3Z-M18 accessory allows to adapt the miniature sensor S100 to a M18 tubular mounting. It can be principally use with through beam and retroreflective models fixing the sensor in the proper holes as indicated on the accessory housing. It slightly affects the optic system narrowing the detection beam without changing the operating distance.

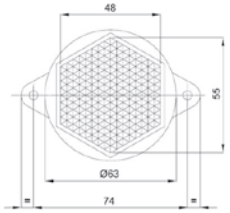
TYPE	MODEL	DESCRIPTION	Order No.
Mounting bracket	ST-505	lateral mounting	95ACC2800
	ST-5039	L-shaped bracket	95ACC2270
Slit	S100-SLIT-05	0,5x19 mm SLIT	95ACC3450
	S100-SLIT-1	1x19 mm SLIT	95ACC3460
	S100-SLIT-2	2x19 mm SLIT	95ACC3470
M18 adapter	ST-S3Z-M18	M18 THREADED ADAPTER NOSE	95ACC7850

REFLECTORS

MODEL	DESCRIPTION	ORDER No.
R1	Ø 23 mm with Ø 31 mm support	S940700023
R2	Ø 48 mm with Ø 63 mm support	S940700048
R3	18 x 54 mm with 22 x 82 mm support	S940700972
R4	47x 47 mm with 51.5 x 61 mm support	95A151340
R4K	51X61 mm IP69K protection	95A151220
R5	Ø 75 mm with Ø 82 mm support	S940700075
R6	36 x 55 mm with 40.5 x 60 mm support	95A151350
RT3870	200 x 300 mm self-adhesive reflective tape	S940000600
RT3970	200 x 300 mm self-adhesive reflective tape for polarized light	S940000604
RT3970	60 x 40 mm self-adhesive reflective tape for polarized light	S940000900

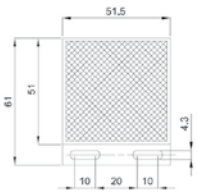


R1



R2

R3



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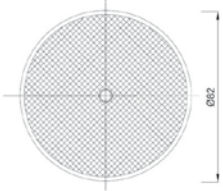

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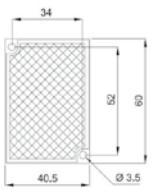

R6

Rev. 00, 04/2014

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PRELIMINARY