



## Compact size and high performance for the most challenging detection applications

- Compact dimensions (14x42x25 mm)
- Background suppression for transparent and shiny objects
- High speed contrast sensor up to 25kHz of switching frequency
- U.V. Luminescence sensor
- Very high resolution LASER models
- INOX AISI 316L model



SENSORS

### APPLICATIONS

- Processing and Packaging machinery
- Beverage/Food/ Cosmetics/ Pharmaceutical industries
- Electronics assembling



(\*) Stainless steel models.  
ATEX II 3DG

S8		
Through beam		0...25 m
Polarized retroreflective		0,1...5 m
Retroreflective for transparent (coaxial)		0...10 m (class 2 LASER)
Diffuse proximity		0...0,8 m (T51), 0...2 m (T53, T50)
Background suppression		0...500 mm
		50...300 mm
Background suppression (CLEAR DETECTION)		20...200 mm (class 2 LASER)
		100...300 mm (LED)
Contrast sensor		50...150 mm (class 2 LASER)
Luminescence		9 ± 2 mm (10 kHz; 25 kHz)
		10...30 mm
Power supply	Vdc	10...30 V
	Vac	
	Vac/dc	
Output	PNP	▪
	NPN	▪
	NPN/PNP	
	relay	
	other	
Connection	cable	▪
	connector	▪
	M12 pig-tail (150 mm)	▪
Approximate dimensions (mm)		14x42x25
Housing material		ABS, Stainless Steel AISI 316L
Mechanical protection		IP69K (Stainless Steel vers.), IP67

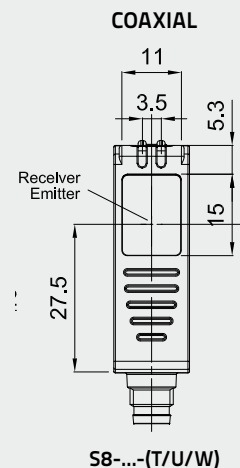
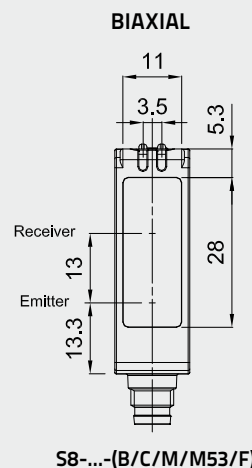
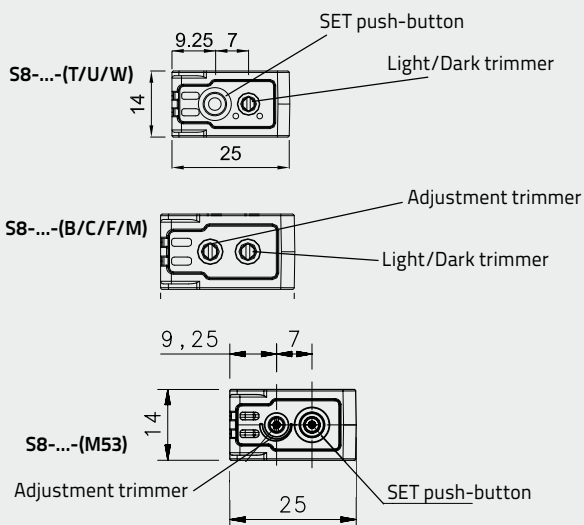
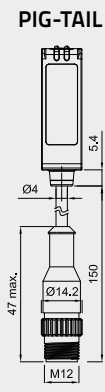
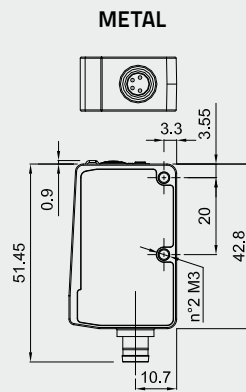
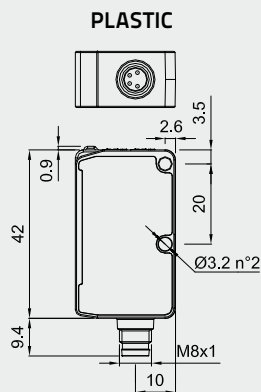
## GENERAL DATA

Power supply	12 ... 30 Vdc
Ripple	2 Vpp max.
Consumption (output current excluded)	30 mA; 35 mA (S8-M01); 20 mA (F: receiver), 15 mA (G: emitter) max
Outputs / Alarm output	PNP or NPN; 30 VDC max (short-circuit protection)
Output current	100 mA (overload protection)
Output saturation voltage	≤2 V
Operating temperature	-10 ... 55 °C
Storage temperature	-20 ... 70 °C
Dielectric strength	1500 VAC 1 min between electronic parts and housing
Insulating resistance	>20 MΩ 500 VDC between electronic parts and housing
Ambient light rejection	according to EN 60947-5-2
Vibrations	0.5 mm amplitude, 10 ... 55 Hz frequency, for every axis (EN60068-2-6)
Shock resistance	11 ms (30 G) 6 shocks per every axis (EN60068-2-27)
Housing material	ABS, Stainless Steel AISI346L
Lens material	window in PMMA; lens in PC
Mechanical protection	IP67, IP69K (Stainless Steel vers.)
Connections	M8 4-pole connector / cable with M12 4-pole connector with 150 mm length and Ø4 mm M12 pig-tail (150 mm)
Weight	12 g. max. connector version / 50 g. M12 pig-tail (150 mm) version / 70g. Max. Stainless Steel vers.



**Ex** IIBDG  
The S8 metal versions are ATEX certified

## DIMENSIONS



## CLEAR DETECTION

### M53 model

The Clear Detection sensors are developed for the detection of shiny and transparent objects through the background suppression technique.

This patented technology allows to suppress very reflective backgrounds and, at the same time, to detect objects with similar reflective characteristics.

The LED emission version is recommended with moving backgrounds, whereas the Laser version is suitable for the highest precision detection degrees, even of small objects, with a fixed and reflective background.

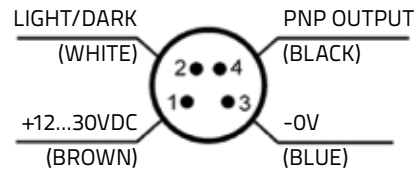
In comparison with the previous systems based on polarized retro-reflex photoelectric sensors, this technology offers some additional benefits:

- No prismatic reflector: there is no need to have the clear object passing between sensor and reflector so reducing installation time and cost.
- Less mechanical constraints: the detection can be made from either the side or from the top without modifying any part of the machine.
- Higher depth of field: the clear object can move or float between its background and the sensor without adjusting the threshold settings.

## TECHNICAL DATA

	LASER	LED
Response time	1 ms	2 ms
Switching frequency	500 Hz	250 Hz
Emission type	RED LASER ( $\lambda = 645...665\text{nm}$ ) Class 2 EN 60825-1 Class II CDRH 21 CFR PART 1040.10	RED LED (660nm)
Operating distance (typical values)	50...150 mm	100...300 mm
Difference (90% White/4% Black)	<5%	20%
Setting	8-turn distance adjustment trimmer, teach-in push button	
LIGHT/DARK selection	Remote: White wire	
Indicators	OUTPUT/ALARM LED (YELLOW) and POWER ON LED (GREEN)	

## CONNECTION



Thanks to the Teach-in push button and the background distance adjustment trimmer, it is possible to set the proper operating distance. 4 adjustable hysteresis levels allow to obtain optimal results.

The tables below show the best hysteresis levels for LED and LASER versions in different background and objects properties.

### LED HYSTERESIS LEVELS

OUT LED BLINKING	HYSTERESIS	BACKGROUND AND OBJECT FEATURES
Slow	Low	Stable background and optimum clear and shiny objects reading
Middle slow	Middle low	Little variable background and good clear and shiny objects reading
Middle fast	Middle high	Moving background and good clear and shiny objects reading
Fast	High	Moving and color variable background and reading of almost all clear and shiny objects

### LASER HYSTERESIS LEVELS

OUT LED BLINKING	HYSTERESIS	BACKGROUND AND OBJECT FEATURES
Slow	Low	Stable background and optimum shiny objects reading
Middle slow	Middle low	Little variable background and good shiny objects reading
Middle fast	Middle high	Moving background and good shiny objects reading
Fast	High	Moving and color variable background and reading of almost all shiny objects

## MODEL SELECTION AND ORDER INFORMATION

HOUSING	LIGHT EMISSION	CONNECTION	OUTPUT	DESCRIPTION	Order No.
METAL Stainless Steel (INOX AISI346L)	LASER	M8 connector	PNP	S8-MH-5-M53-PP	950801451
	LED			S8-MR-5-M53-PP	950801600
PLASTIC ABS	LASER			S8-PH-5-M53-PP	950801381
	LED			S8-PR-5-M53-PP	950801590

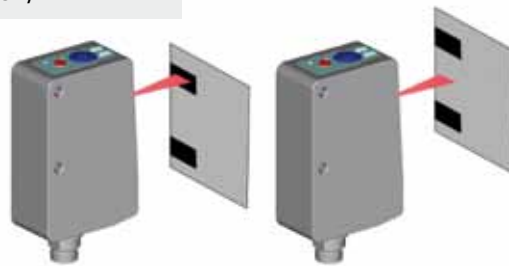
## CONTRAST

### W model

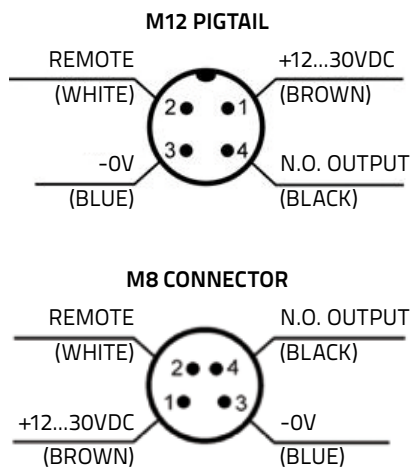
- Discriminates fine contrast differences with red, green or blue emission
- High speed detection up to 20µs (25 kHz) and 10 µs jitter
- Coaxial optical system design provides stable detection of moving objects to eliminate false detections
- Static (S8-W03/13) or dynamic (S8-W13) settings
- TL-LD series replacement thanks to the specific mounting bracket (ST-S8-TL-LD46, see accessory section)

## TECHNICAL DATA

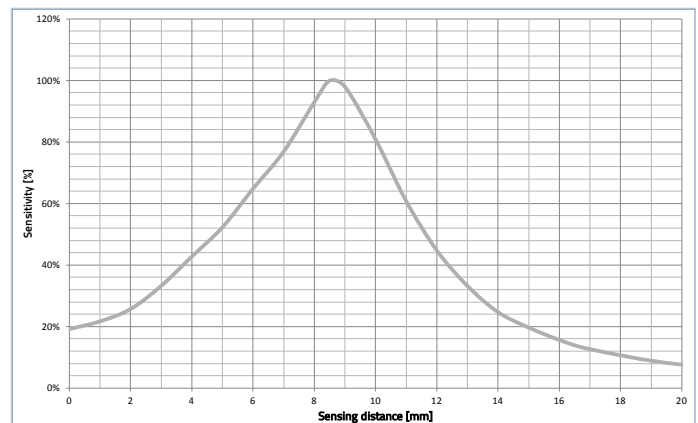
	LED	
Response time	50 µs	20 µs
Switching frequency	10 kHz	25 kHz
Jitter	25 µs	10 µs
Emission type	RGB LEDs: BLUE (465 nm)/ GREEN (520 nm)/RED (630nm) with automatic selection	
Operating distance (typical values)	9 mm	
Depth of field	± 2mm	
Spot dimension	3x1 mm <sup>2</sup>	
Setting	SET push button, Mono-turn trimmer (Delay OFF 20ms selection)	
LIGHT/DARK selection	Automatic	
Indicators	OUTPUT LED (YELLOW) and POWER ON LED (GREEN)	



## CONNECTION



## DETECTION DIAGRAM



Contrast sensor

## MODEL SELECTION AND ORDER INFORMATION

HOUSING	SWITCHING FREQUENCY	CONNECTION	OUTPUT	DESCRIPTION	Order No.
METAL Stainless Steel	10 kHz	M8 connector	PNP	S8-MR-5-W00-PH	950801360
			NPN	S8-MR-5-W00-NH	950801370
			PNP	S8-MR-5-W03-PP	950801340
			NPN	S8-MR-5-W03-NN	950801350
PLASTIC ABS		M12 pig-tail (150 mm)	PNP	S8-PR-3-W03-PP	950801140
			NPN	S8-PR-3-W03-NN	950801150
			PNP	S8-PR-5-W03-PP	950801060
			NPN	S8-PR-5-W03-NN	950801070
METAL Stainless Steel	25 kHz	M8 connector	PNP	S8-MR-5-W13-PP	950801670
			NPN	S8-MR-5-W13-NN	950801680
			PNP	S8-PR-5-W13-PP	950801650
			NPN	S8-PR-5-W13-NN	950801660
PLASTIC ABS		M12 pig-tail (150 mm)	PNP	S8-PR-3-W13-PP	950801690
			NPN	S8-PR-3-W13-NN	950801700

## LUMINESCENCE

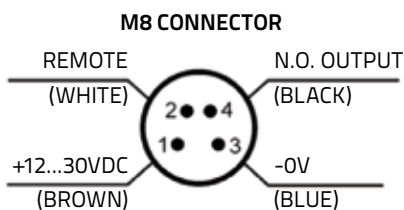
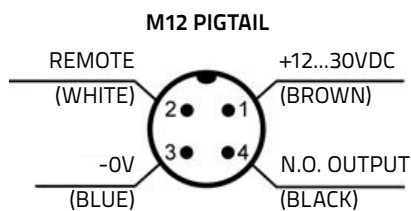
### U model

- U.V. emission (circular spot)
- More than 20 mm of operating distance
- fluorescent or phosphorescent invisible mark detection
- setting push-button or remote input for the teaching of the mark and background
- TL-LD series replacement thanks to the specific mounting bracket (ST-S8-TL-LD46, see accessory section)

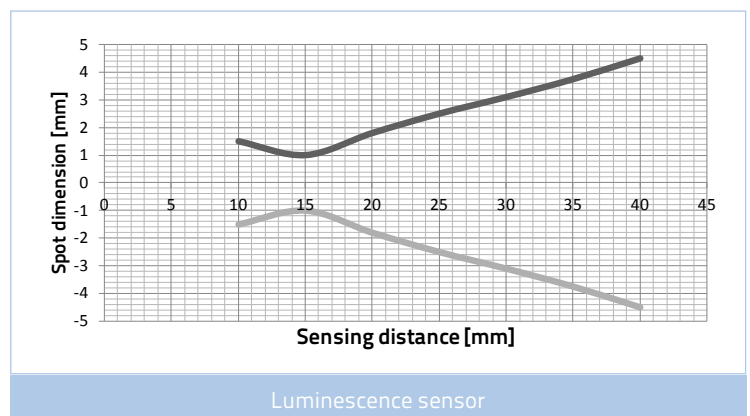
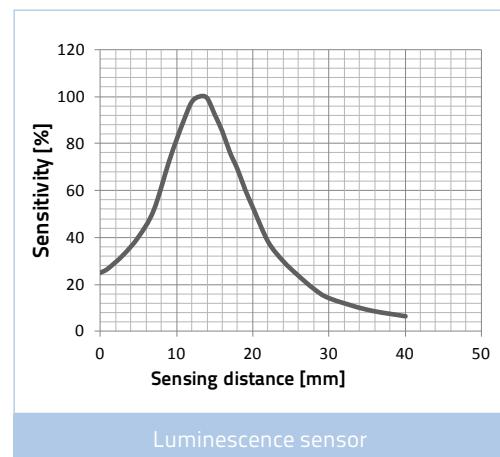
## TECHNICAL DATA

	LED
Response time	250 $\mu$ s / 1 ms
Switching frequency	2 kHz / 500 Hz (according to sensitivity)
Emission type	U.V. LED (375 nm)
Operating distance	10...30 mm
Spot dimension	2 mm @15 mm (circular)
Setting	SET push button, remote input
LIGHT/DARK selection	Mono-turn trimmer (Light / Dark selection)
Indicators	OUTPUT LED (YELLOW) and POWER ON LED (GREEN)

## CONNECTION



## DETECTION DIAGRAM



## MODEL SELECTION AND ORDER INFORMATION

HOUSING	SETTINGS	CONNECTION	OUTPUT	DESCRIPTION	Order No.
METAL Stainless Steel	Teach-in push-button; L/D trimmer selector; Remote input	M8 connector	PNP	S8-MR-5-U03-PP	950801630
			NPN	S8-MR-5-U03-NN	950801640
			PNP	S8-PR-5-U03-PP	950801610
			NPN	S8-PR-5-U03-NN	950801620
PLASTIC ABS		M12 pig-tail (150 mm)	PNP	S8-PR-3-U03-PP	950801710
			NPN	S8-PR-3-U03-NN	950801720

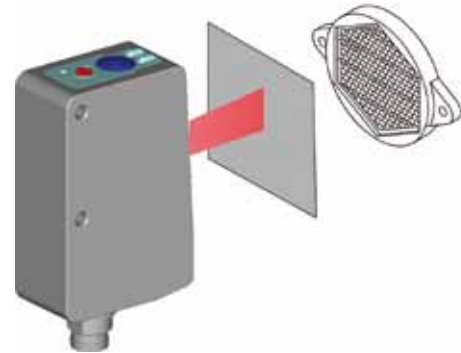
## RETROREFLECTIVE FOR TRANSPARENTS

### T models

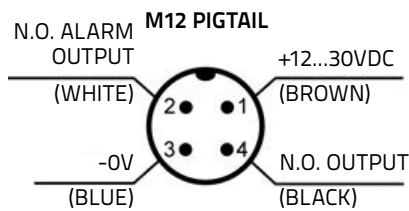
- Detects extremely transparent materials like fine plastic films, glass or PET bottles
- Coaxial optical system design provides stable detection of moving objects to eliminate false detections
- Auto-adaptive function to improve the reliability the detection even when the sensor face or reflector is contaminated (i. e. dust)

## TECHNICAL DATA

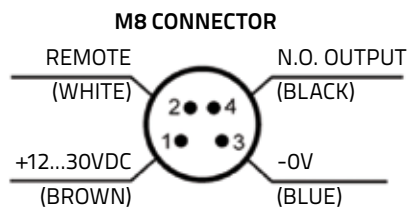
	LED
Response time	250 µs
Switching frequency	2 kHz
Emission type	RED LED (660nm)
Operating distance (typical values)	2m on R2 reflector (S8...T50/T53); 0,8m on R2 reflector (S8...T51)
Setting	SET push button (S8-T53)
LIGHT/DARK selection	Automatic (S8...T50), Mono-turn trimmer (S8...T51/T53)
Indicators	OUTPUT LED (YELLOW) and POWER ON LED (GREEN)



## CONNECTION

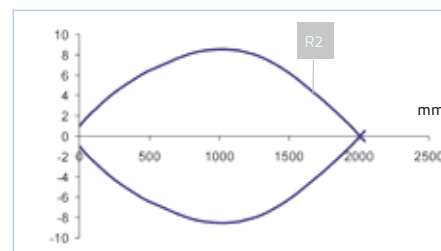


S8...T51 M12 pig-tail (150 mm) vers.



S8...T51/T53

## DETECTION DIAGRAM



Coaxial polarized retroreflective for transparents (S8...T50/T53)

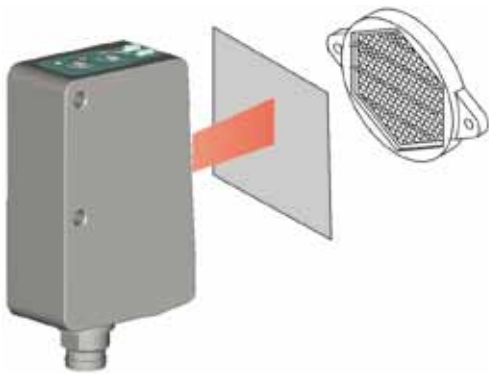
## MODEL SELECTION AND ORDER INFORMATION

HOUSING	LIGHT EMISSION	CONNECTION	OUTPUT	DESCRIPTION	Order No.	
METAL Stainless Steel (INOX AISI346L)	LED	M8 connector	NPN	S8-MR-5-T50-NH	950801330	
			PNP	S8-MR-5-T50-PH	950801320	
			NPN	S8-MR-5-T53-NN	950801310	
			PNP	S8-MR-5-T53-PP	950801300	
PLASTIC ABS		M12 pig-tail (150 mm)	NPN	S8-PR-3-T51-NN	950801130	
			PNP	S8-PR-3-T51-PP	950801120	
			M8 connector	NPN	S8-PR-5-T51-NN	950801050
				PNP	S8-PR-5-T51-PP	950801040
		NPN	S8-PR-5-T53-NN	950801290		
		PNP	S8-PR-5-T53-PP	950801280		

## POLARIZED RETROREFLECTIVE

### B models

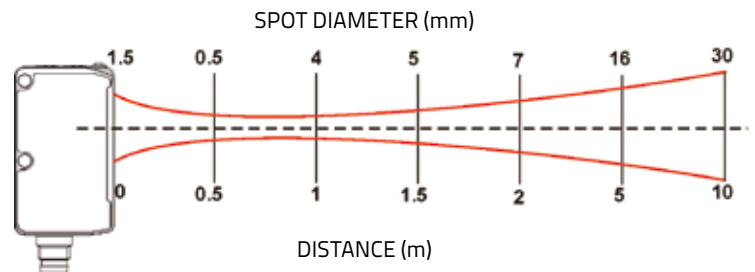
- Laser version for high resolution detection
- Alarm output for wrong functionality



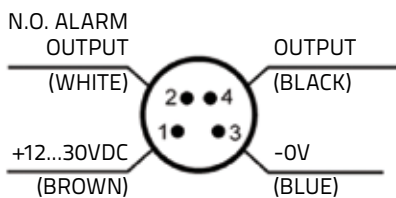
## TECHNICAL DATA

	LASER	LED
Response time	50 $\mu$ s	500 $\mu$ s
Switching frequency	10 kHz	1 kHz
Emission type	RED LASER ( $\lambda$ = 645...665nm) Class 2 EN 60825-1, Class II CDRH 21 CFR PART 1040.10	RED LED (660nm)
Pulsed emission	pot. max $\leq$ 1,5mW pulse duration = 3 $\mu$ s frequency = 40KHz	--
Focus point	500 mm	--
Spot dimension	< 0.5 mm (a 500 mm)	refer to the detection diagram
Operating distance (typical values)	0...10 m on R2 reflector	5 m on R2 reflector
Minimum object detectable	0.5 mm at 500 mm (minimum spot)	--
Setting	Mono-turn sensitivity adjustment trimmer	
LIGHT/DARK selection	Mono-turn trimmer	
Indicators	OUTPUT LED(YELLOW) and POWER ON LED (GREEN)	

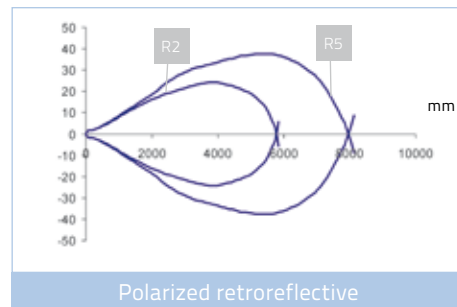
## DETECTION DIAGRAM (LASER)



## CONNECTION



## DETECTION DIAGRAM (LED)



## MODEL SELECTION AND ORDER INFORMATION

HOUSING	LIGHT EMISSION	CONNECTION	OUTPUT	DESCRIPTION	Order No.
METAL Stainless Steel (INOX AISI346L)	LASER	M8 connector	NPN	S8-MH-5-B51-NN	950801490
			PNP	S8-MH-5-B51-PP	950801480
	LED		NPN	S8-MR-5-B01-NN	950801420
			PNP	S8-MR-5-B01-PP	950801410
PLASTIC ABS	LASER	M12 pig-tail (150 mm)	NPN	S8-PH-3-B51-NN	950801090
		M8 connector	PNP	S8-PH-3-B51-PP	950801080
			NPN	S8-PH-5-B51-NN	950801010
		PNP	S8-PH-5-B51-PP	950801000	
	LED	M12 pig-tail (150 mm)	NPN	S8-PR-3-B01-NN	950801190
			PNP	S8-PR-3-B01-PP	950801180
		M8 connector	NPN	S8-PR-5-B01-NN	950801170
			PNP	S8-PR-5-B01-PP	950801160

## BACKGROUND SUPPRESSION

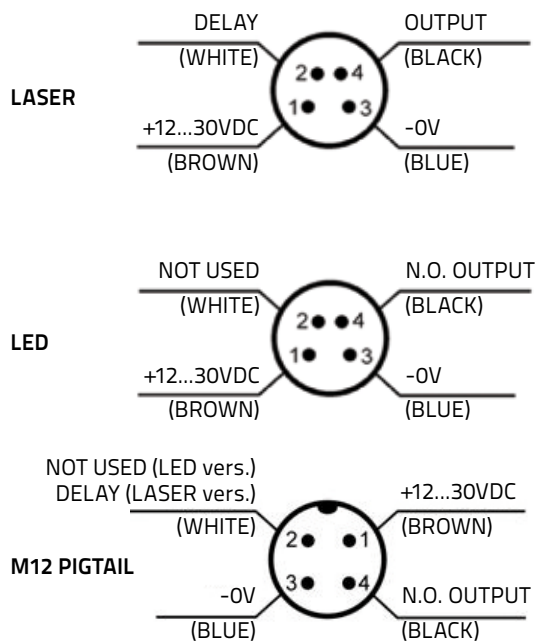
### M model

Laser version for high resolution detection

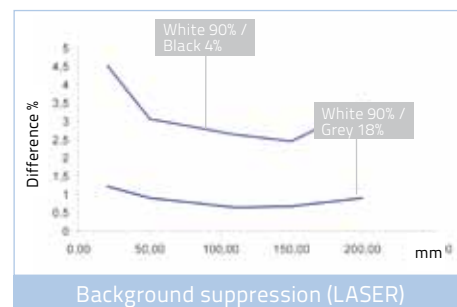
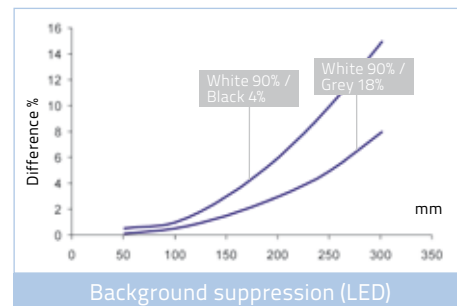
## TECHNICAL DATA

	LASER	LED
Response time	100 $\mu$ s	1 ms
Switching frequency	5 kHz	500 Hz
Emission type	RED LASER ( $\lambda$ = 645...665nm) Class 2 EN 60825-1, Class II CDRH 21 CFR PART 1040.10	RED LED (660nm)
Pulsed emission	pot. max $\leq$ 5mW pulse duration = 3 $\mu$ s frequency = 20KHz	--
Focus point	110 mm	--
Spot dimension	< 0.2 mm (a 500 mm)	--
Operating distance (typical values)	20...200 mm	50...300 mm
Minimum object detectable	0.2 mm at 200 mm	--
Difference (90% White/4% Black)	<5%	20%
Setting	8-turn distance adjustment trimmer	
LIGHT/DARK selection	Mono-turn trimmer	
Indicators	OUTPUT/ALARM LED (YELLOW) and POWER ON LED (GREEN)	

## CONNECTION



## DETECTION DIAGRAM



## MODEL SELECTION AND ORDER INFORMATION

HOUSING	LIGHT EMISSION	CONNECTION	OUTPUT	DESCRIPTION	Order No.
METAL Stainless Steel (INOX AISI346L)	LASER	M8 connector	NPN	S8-MH-5-M01-NN	950801470
			PNP	S8-MH-5-M01-PP	950801460
	LED		NPN	S8-MR-5-M01-NN	950801400
			PNP	S8-MR-5-M01-PP	950801390
PLASTIC ABS	LASER	M12 pig-tail (150 mm)	NPN	S8-PH-3-M01-NN	950801110
			PNP	S8-PH-3-M01-PP	950801100
		M8 connector	NPN	S8-PH-5-M01-NN	950801030
			PNP	S8-PH-5-M01-PP	950801020
	LED	M12 pig-tail (150 mm)	NPN	S8-PR-3-M01-NN	950801230
			PNP	S8-PR-3-M01-PP	950801220
		M8 connector	NPN	S8-PR-5-M01-NN	950801210
			PNP	S8-PR-5-M01-PP	950801200



## THROUGH BEAM

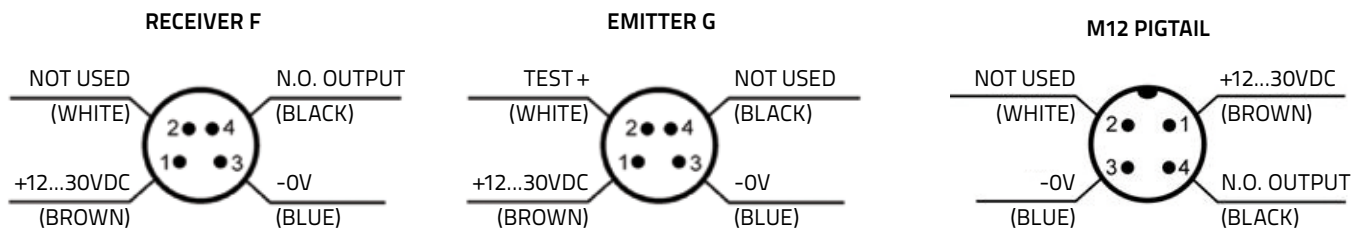
### F/G model

Emitter and receiver units ensure the highest Excess Gain

## TECHNICAL DATA

	LED
Response time	500 $\mu$ s
Switching frequency	1 kHz
Emission type	RED LED (660nm) (S8...G emitter)
Operating distance (typical values)	25 m (30 m max.)
Setting	Mono-turn sensitivity adjustment trimmer (S8...F receiver)
LIGHT/DARK selection	Mono-turn trimmer (S8...F receiver)
Indicators	OUTPUT (YELLOW, F: receiver) and POWER ON LED (GREEN)

## CONNECTION



## MODEL SELECTION AND ORDER INFORMATION

HOUSING	LIGHT EMISSION	CONNECTION	OUTPUT	DESCRIPTION	Order No.
METAL Stainless Steel (INOX AISI346L)	LED	M8 connector	NPN	S8-MR-5-F01-NN	950801570
			PNP	S8-MR-5-F01-PP	950801560
			emitter	S8-MR-5-G00-XG	950801580
PLASTIC ABS		M12 pig-tail (150 mm)	NPN	S8-PR-3-F01-NN	950801530
			PNP	S8-PR-3-F01-PP	950801520
			emitter	S8-PR-3-G00-XG	950801550
		M8 connector	NPN	S8-PR-5-F01-NN	950801510
			PNP	S8-PR-5-F01-PP	950801500
			emitter	S8-PR-5-G00-XG	950801540

## DIFFUSE PROXIMITY

### C model

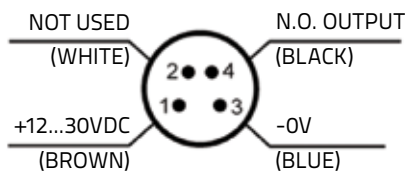
- Direct object detection with a single unit

## TECHNICAL DATA

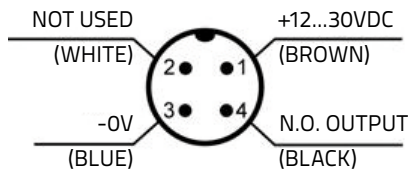
	LED
Response time	500 $\mu$ s
Switching frequency	1 kHz
Emission type	RED LED (660nm)
Operating distance (typical values)	50 cm on 90% white target (EG2)
Setting	Mono-turn sensitivity adjustment trimmer
LIGHT/DARK selection	Mono-turn trimmer
Indicators	OUTPUT/ALARM LED (YELLOW) and POWER ON LED (GREEN)

## CONNECTION

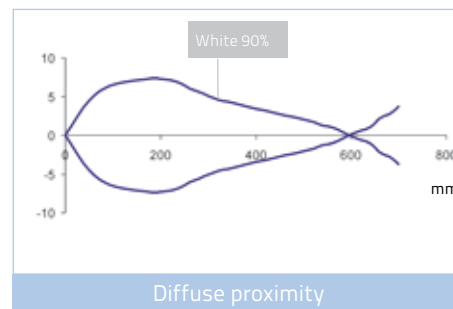
### M8 CONNECTOR



### M12 PIGTAIL



## DETECTION DIAGRAM

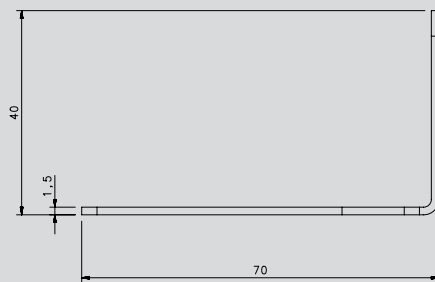
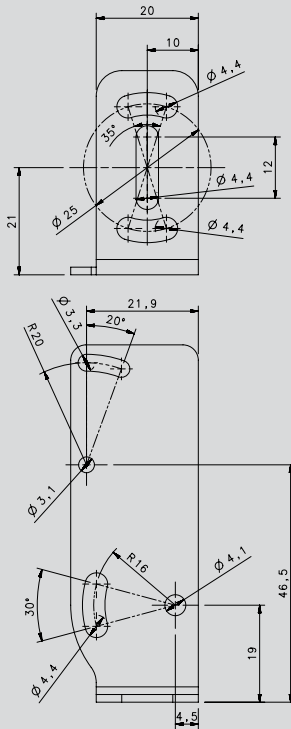
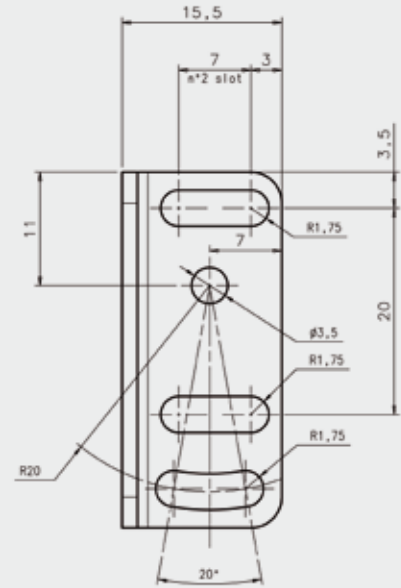
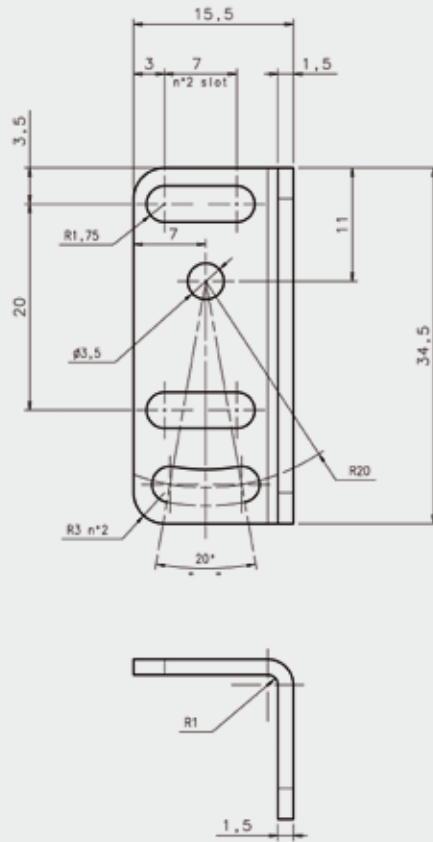
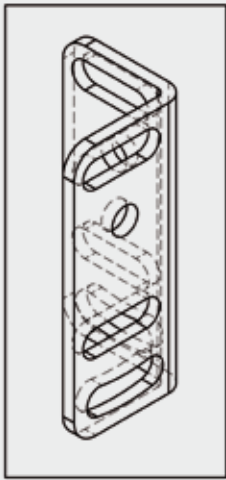


## MODEL SELECTION AND ORDER INFORMATION

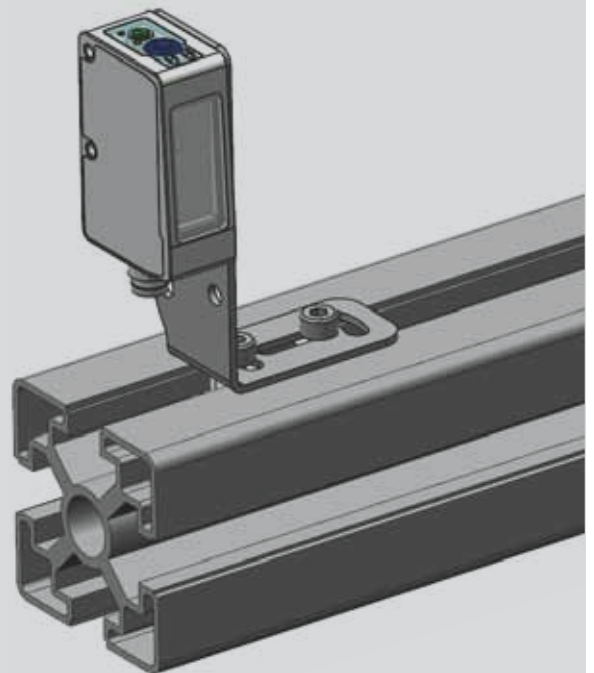
HOUSING	LIGHT EMISSION	CONNECTION	OUTPUT	DESCRIPTION	Order No.
METAL Stainless Steel (INOX AISI346L)	LED	M8 connector	NPN	S8-MR-5-C01-NN	950801440
			PNP	S8-MR-5-C01-PP	950801430
M12 pig-tail (150 mm)		NPN	S8-PR-3-C01-NN	950801270	
		PNP	S8-PR-3-C01-PP	950801250	
PLASTIC ABS		M8 connector	NPN	S8-PR-5-C01-NN	950801260
			PNP	S8-PR-5-C01-PP	950801240

## ACCESSORIES

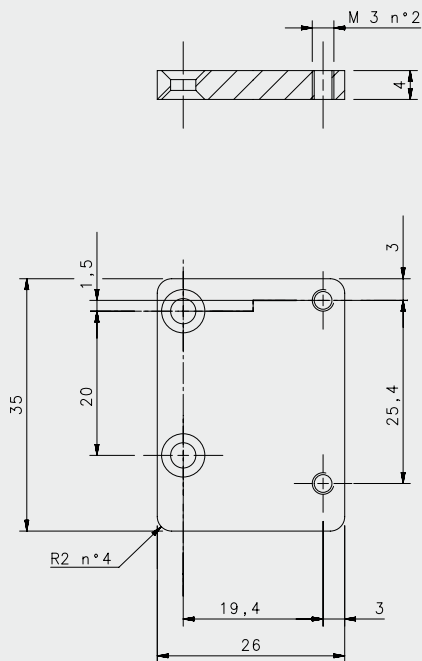
ST-5072



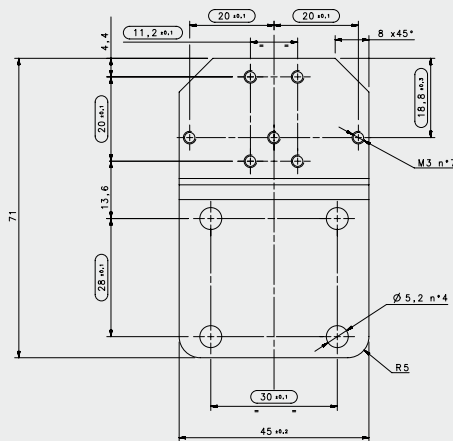
ST-S8-FRM



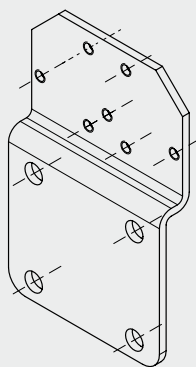
## ACCESSORIES



ST-S8-S3Z



ST-S8-TL-LD46



## ACCESSORIES SELECTION AND ORDER INFORMATION

MODEL	FUNCTION	ORDER No.
ST-S8-FRM	fixing bracket for standard frame	95ACC7860
ST-5072	fixing bracket	95ACC1470
R4K	IP69K plastic reflector 51 x 61 mm	95A151220
ST-S8-TL-LD46	TL-LD46 adapting bracket	95ACC3430
ST-S8-S3Z	S8-miniature sensors adapting bracket	95ACC3440

## CABLES

CONNECTOR	DESCRIPTION	LENGTH	MODEL	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
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
M12 Connector (Axial)	4-pole, Grey, P.V.C. (M12 pig-tail version)	3 m	CS-A1-02-G-03	95A251380
		5 m	CS-A1-02-G-05	95A251270
		7 m	CS-A1-02-G-07	95A251280
		10 m	CS-A1-02-G-10	95A251390

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