

Type 2 safety light curtain

FF-SLD Series

FEATURES

- Active Optoelectronic Protective Device compliant with the requirements of the IEC/EN 61496-parts 1 and 2 European Norms
- 30 mm resolution for hand detection
- Wide range of protection heights 150 mm to 1500 mm
- Self contained unit (no control unit required)
- Optical synchronisation
- 2 static safety outputs with short-circuit and cross-fault detection
- Scanning range: up to 15 m
- Automatic restart
- Enhanced indicators for alignment, output status, power status
- Electrical connections: M12 connectors
Compact: cross section 31 mm x 32 mm

APPLICATIONS

- Packaging and wrapping devices
- Automated warehouses
- Material handling machines
- Automated assembly lines series



The safety light curtains of the FF-SLD series are in compliance with type 2 Electrosensitive Protective Equipment per the IEC/EN 61496-1 and EN61496-2 standards and are very suitable for hand protection of operators exposed to risks.

Different models are available with ten standard heights ranging from 150 to 1500 mm, 30 mm resolution and an operating distance of 15 m.

The emitter and receiver units are self-contained optically synchronized units, including a test input and two safety outputs inside the housing. The connection with the machine stopping circuits is done using M12 4-pole connectors for the emitter and M12 5-pole connectors for the receiver. The safety light curtains of the FF-SLD series have also an integrated test function, automatically activated every 0.5 seconds, without stopping the machine's working cycle.

A wide range of industrial applications, requiring machine safety, can be solved using the FF-SLD safety light curtains, thanks to the extremely compact dimensions (31x32 mm), easy installation and excellent performances.

▲ WARNING

MISUSE OF DOCUMENTATION

- The information presented in this product sheet (or catalog) is for reference only. Do not use this document as system installation information.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

Type 2 safety light curtain

- Type 2 according to the IEC/EN 61496- parts 1 and 2
- Compact profile: 31 x 32 mm
- 30 mm resolution for hand detection
- Wide range of protection heights: 150 mm to 1500 mm



UL US LISTED
(pending)



SPECIFICATIONS

Power supply	24 Vdc \pm 20%
Consumption	50 mA max. / 1 W (emitter), 90 mA max. / 2,5 W (receiver without load)
Light emission	infrared LED 880 nm
Optic diameter	\varnothing 18 mm
Number of controlled beams	8 to 80 (model depending, refer to table 1)
Optical interaxis	18.4 mm
Resolution	30 mm
Protection height	150 mm to 1500 mm (model depending, refer to table 1)
Operating distance	0.2 ... 15 m
Receiver inputs	Test push-button
Indicators	Receiver: 2 yellow ALIGNMENT LEDs, red BREAK LED, green SAFE LED, Emitter: yellow WORKING UNIT CHECK LED, green POWER ON LED
Output type	2 PNP safety outputs, short-circuit protection: max.1.4 A at 55°C, min. 1.2 A at 0 °C
Output current (for all loads)	500 mA max. per output
Output voltage ON min.	23 Vdc
Output voltage OFF max.	0.2 V
Leakage current	0.65 mA
Capacitive load (pure)	100 nF max.
Resistive load (pure)	60 Ohms min.
Response time	14 ms to 24 ms (model depending, refer to table 1)
Receiver connection	M12 5-pole connector
Emitter connection	M12 4-pole connector (also compatible with M12 5 pole connector)
Safety category	Type 2 per IEC/EN61496 parts 1 and 2
Electrical protectio	class 1
Mechanical protection	IP65 (EN 60529), IP67 (connector part),
Housing material	painted aluminium (yellow RAL 1003)
End cap material	PBT
Lens material	PMMA
Cable length	50m. max. (at 100nF capacitive load and Vdc=24V)
Weight	1 Kg. max. / m of total height
Electrical connection	M12 conductors (according to EN 50044, EN 60947-5-2), poles \varnothing = 32x0.1mm, external \varnothing = 0.5mm
Operating temperature	0 ... +55 °C
Storage temperature	-25 ... +70 °C

ORDERING INFORMATION

FF-SLD 30 □□□ M 2

Resolution: \varnothing 30 mm (only)

Protection height (see table 1)

M12 connector sockets (M12 plugs with 4 pin and 5 pin not included)

Supply voltage: 24 Vdc (only)

Dimensions (in mm)

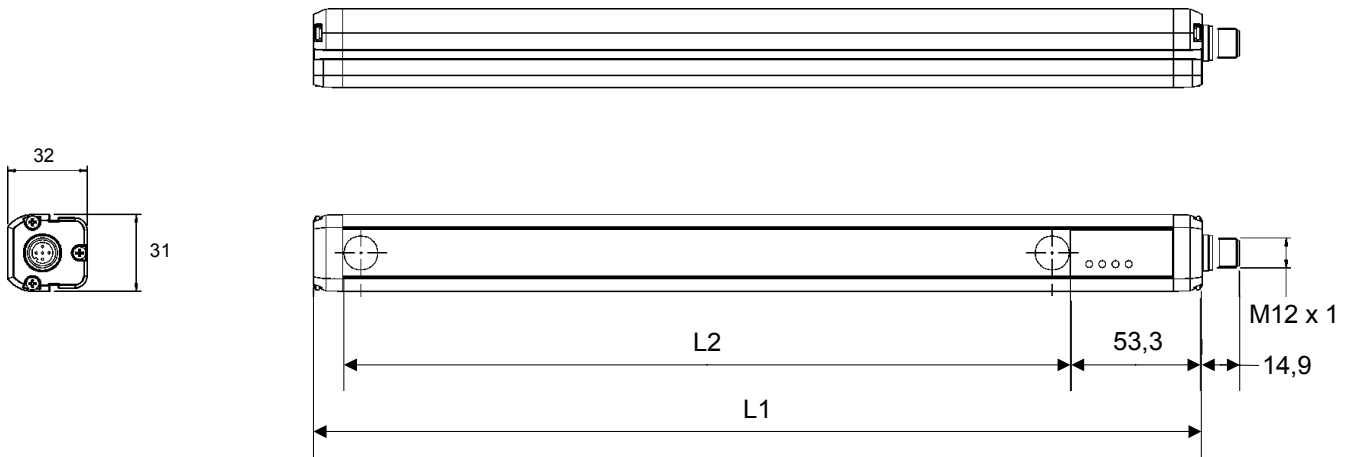


TABLE 1

FF-SLD30	015	030	045	060	075	090	105	120	135	150
Resolution (mm)	30									
Protection height (mm)	187	334	481	628	775	922	1069	1216	1363	1510
Number of beams	8	16	24	32	40	48	56	64	72	80
Response time (ms)	14	15	16	17	18	19	20	22	23	24
Total height L1 (mm)	227	374	521	668	815	962	1109	1256	1403	1550
Height L2 (mm)	147	294	441	588	735	882	1029	1176	1323	1470

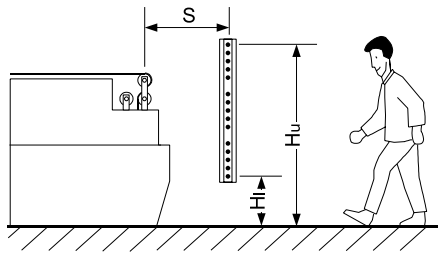
LED STATUS INDICATORS

The LED panel present on the compact receiver ensures an easy and immediate indication of the operating status of the safety light curtain. These LED indicators supply also information relative to the device's effective alignment and to diagnostics.



Safety distances (in mm)
European EN 999 standard

Normal approach



FF-SLD30

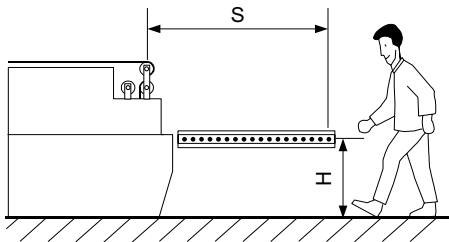
$$S = 2000 (t_1+t_2) + 128,$$

with $S = 100$

$$S = 1600 (t_1+t_2) + 128,$$

with $S = 500$

Parallel approach



$$S \geq 1600 (t_1+t_2) + (1200 - 0.4H),$$

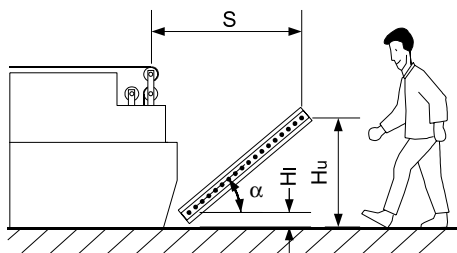
with $H \leq 875$

Or

$$S \geq 1600 (t_1+t_2) + 850,$$

with $875 \leq H \leq 1000$
 with $H \geq 15 (R-50)$, where R is the light curtain resolution

Angled approach



if $\alpha \geq 30^\circ$, then use the normal approach formula,

if $\alpha \leq 30^\circ$, then use the parallel approach formula,
 with $H_u \leq 1000$ mm and $H_I \geq 15 (R-50)$, where R is the light curtain resolution

With

S is the minimum safety distance (in mm)

t1 is the light curtain response time (in s)

t2 is the machine stopping time (in s)

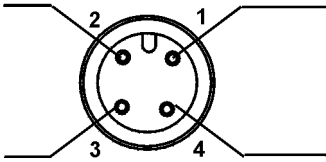
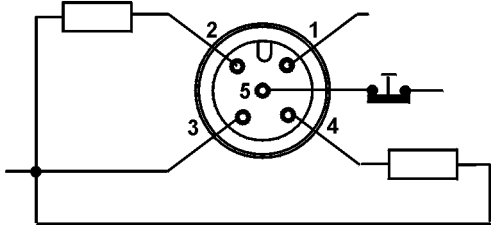
H is the height of the detection plane above the reference floor (in mm)

Hu is the height of the uppermost beam above the reference floor (in mm)

HI is the height of the lowest beam above the reference floor (in mm)

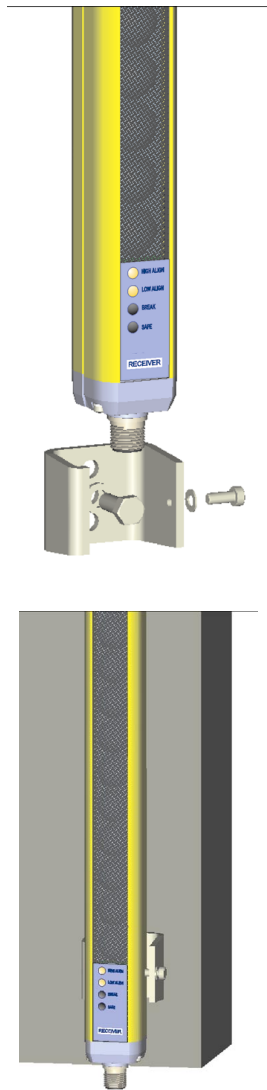
For more information, refer to the EN 999 European standard or comply with the requirements on safety distances given by the type C European standard if existing for the considered machine.

WIRING DIAGRAM

EMITTER	RECEIVER
	
<p>1 = brown = +24 Vdc 2 = not connected 3 = blue = 0 V 4 = not connected</p>	<p>1 = brown = +24 Vdc 2 = white = OSSD1 (load connection) 3 = blue = 0 V 4 = black = OSSD2 (load connection) 5 = grey = TEST (normally closed contact)</p>

ACCESSORIES

FF-SLD001001



Mounting bracket kit

One kit includes 2 brackets.

Order one bracket kit per emitter or receiver, 2 kits for an emitter/receiver system.

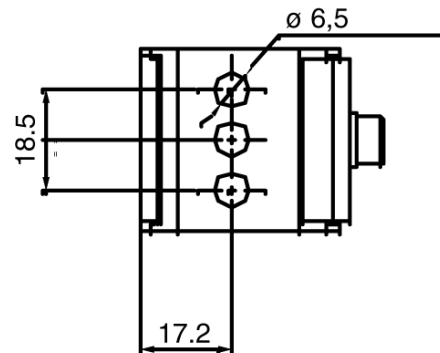
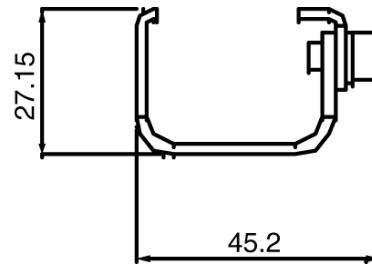
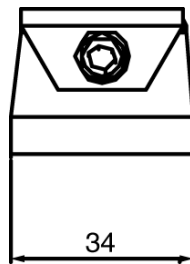
(already included in the FF-SLD30 package, to be ordered separately as spares only)

NOTICE

ADDITIONAL MOUNTING BRACKETS

For safety light curtains with protection heights greater or equal to 1000 mm / 39.4 in, 3 mounting brackets per emitter or receiver should be used.

(The additional bracket kit must be ordered separately).



Single keyway M12 plug with cable (female straight, 5 pins emitter plus 360° shielding)

One kit includes 1 plug.

Order one kit per emitter or receiver, 2 kits for an emitter/receiver system.

(not included in the FF-SLD30 package, to be ordered separately)

FF-SXZCAM125U02-S	2 m / 6.56 ft length with 360° shielding
FF-SXZCAM125U05-S	5 m / 16.40 ft length with 360° shielding
FF-SXZCAM125U10-S	10 m / 32.80 ft length with 360° shielding

Pin no.	Color code
1	brown
2	white
3	blue
4	black
5	grey

NOTICE

Although the emitter is fitted with an M12 4 pole male connector, the mating cables are fitted with 5 pole female connectors. These are compatible with each other.

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