Safety light curtain for long distance detection

F3SL

20-m long-distance detection. Safety light curtain (Type 4) is ideal for detection of intrusion of human bodies in large machines and conveyor lines.

Features

- Complies with IEC standards, EN standards, and North American standards. EC-based certification from TÜV for EU machine directives. Can be used as a safety guard for satisfaction of OSHA requirements for on-site labor safety in North America.
- Special controller not needed. Detection of human body intrusion is possible using just the sensor unit.
- Includes "Start/restart interlock function" to prevent automatic reset of output.
- Includes floating blanking function (disables 1 or 2 non specific beams) and Fixed Blanking (disables specific beams)
- Built-in EDM (External Device Monitor). Feedback check is possible without a controller

Ordering Information

Sensors

Infrared ray

Sensor type	Shape	Sensing distance	Operating mode	Detection width (mm)	Model
Through-beam		0.3 to 20m	Light ON	351	F3SL-A0351P30
				523	F3SL-A0523P30
				700	F3SL-A0700P30
				871	F3SL-A0871P30
				1,046	F3SL-A1046P30
				1,219	F3SL-A1219P30
				1,394	F3SL-A1394P30
				1,570	F3SL-A1570P30
				1,746	F3SL-A1746P30
				1,920	F3SL-A1920P30
				2,095	F3SL-A2095P30

Accessories (Order Separately)

Special cable (please order one each for the emitter and the receiver)

Cable length	Specifications	Model	
		For emitter	For receiver
10 m	Connector	F39-JL10A-L	F39-JL10A-D
15 m		F39-JL15A-L	F39-JL15A-D
30 m		F39-JL30A-L	F39-JL30A-D

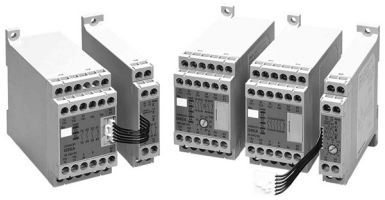
Refection mirror (15% sensing distance attenuation)

Mirror material	Width (mm)	Thickness (mm)	Length (mm)	Model
Glass mirror	125	31	460	F39-MDG460
			607	F39-MDG0607
			750	F39-MDG0750
			907	F39-MDG0907
			1,057	F39-MDG1057
			1,357	F39-MDG1357
			1,500	F39-MDG1500
			1,657	F39-MDG1657
			1,807	F39-MDG1807

Note: Other sizes are available upon request.

Safety Relay Unit

For controlling the outputs we recommend to use safety relay units G9SA or G9SB

Appearance	Output	Model
	Expandable relay unit series with up to 8 safety relay outputs. Time delay for stop category 1 can be realized. (Please refer to page G-109)	G9SA series
	Small size safety relay unit with 17.5 mm and 22.5 mm size. Up to 3 safety relay outputs are available. (Please refer to page G-123)	G9SB series
	Fletible and expandable safety unit with solid state outputs	G9SX series

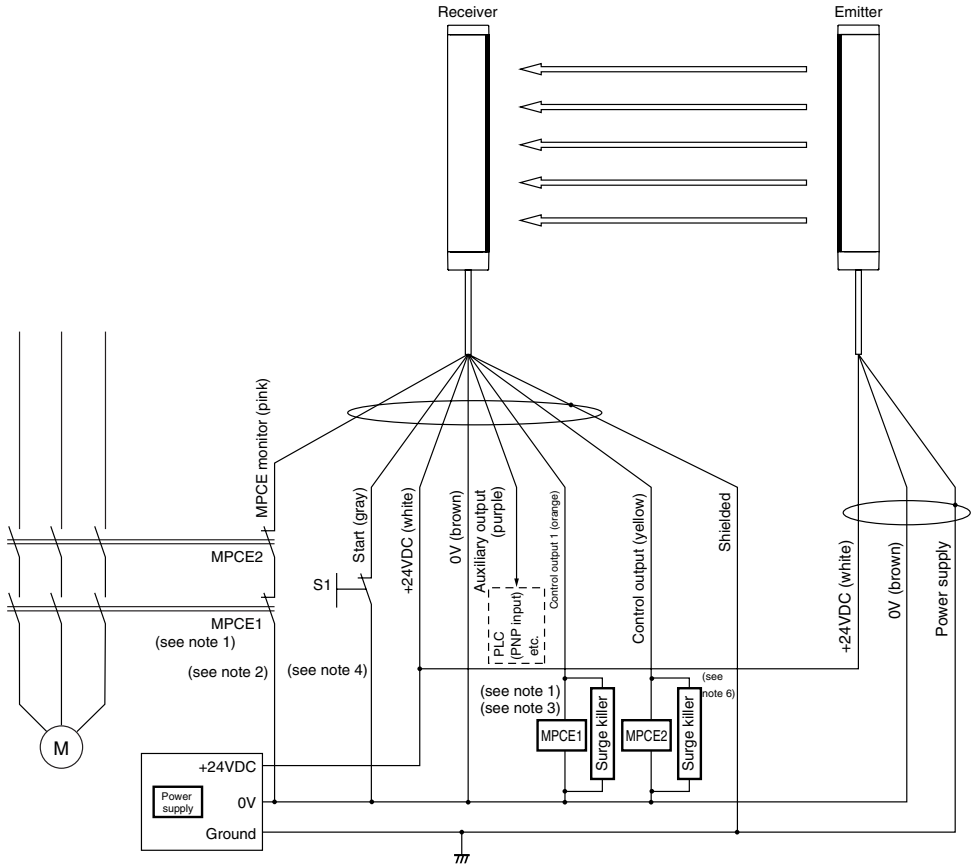
Rating/performance

Item	Model	F3SL-A0351 P30	F3SL-A0523 P30	F3SL-A0700 P30	F3SL-A0871 P30	F3SL-A1046 P30	F3SL-A1219 P30	F3SL-A1394 P30	F3SL-A1570 P30	F3SL-A1746 P30	F3SL-A1920 P30	F3SL-A2095P 30
Sensing distance		0.3 to 20 m										
Optical axis pitch		22 mm										
Number of optical axes		16	24	32	40	48	56	64	72	80	88	96
Protective height		351 mm	523 mm	700 mm	871 mm	1,046mm	1,219mm	1,394mm	1,570mm	1,746mm	1,920mm	2,095mm
Min. sensing object		Opaque object, 30-mm dia. or greater (52-mm or 74-mm dia. when using floating blanking)										
Effective Aperture angle		Emitter/receiver: ±2.5° or less each (based on IEC61496-2 at detection distance of 3 m or greater)										
Light source (wave length)		Infrared LED (850 nm)										
Power supply voltage		24 V DC ±20% including 5% ripple (p-p)										
Startup time after turning on power		3 s max.										
Current consumption		Emitter: 285 mA or less, receiver: 1.4 A or less (including load output current)										
Control output		PNP transistor outputs x 2, load current 500 mA or less (residual voltage 2 V or less) (excluding voltage drop due to cable extension), Light ON										
Auxiliary output		Same signal as control output: PNP transistor outputs x 1 output (non-safety output), load current 100 mA or less (residual voltage 1 V or less) (excluding voltage drop due to cable extension)										
Protective circuits		Output load short circuit protection, reverse power connection protection										
Safety functions		Start/restart interlock function (select enable/disable with DIP switch) • Blanking functions ① Channel select (fixed blanking) ② Floating blanking ③ No blanking (initial setting) Select ①, ②, or ③ with DIP switch. The optical axes for ① fixed blanking are set by a teach button.										
Diagnosis functions		• Self diagnosis functions when the power is turned on • External relay (MPCE) monitor function (connect external relay monitor input wire to contact b of external relay, 50 mA 24 V DC)										
Response time ON–OFF		20 ms max.				25 ms max.			30 ms max.			35 ms max.
Ambient temperature		Operating/Storage: 0°C to 55°C (with no icing or condensation)										
Ambient humidity		Operating./Storage: 35% to 95% RH (no condensation)										
Vibration resistance		Malfunction / durability: 10 to 50 Hz, amplitude 0.7 mm, 20 sweeps each in X, Y, and Z directions										
Shock resistance		Wrong operation / durability: 100 m/s2, 1,000 times each in X, Y, and Z directions										
Protective Degree		IEC Standard IP65										
Connection method		M12 Connector										
Weight (Packed state)		11kg max.										
Materi-al	Case	Aluminum										
Accessories		Test rod, mounting brackets (upper/lower), operation manual, special hex wrench for program button access, test load resistors (1 kΩ, 2 resistors), surge protector (2)										
Applicable standards		IEC (EN) 61496-1 TYPE4 ESPE *1 IEC61496-2 TYPE4 AOPD *2										

*1) ESPE (Electro-Sensitive Protective Equipment)
*2) AOPD (Active Opto-electronic Protective Devices)

Connection

Wire the F3SL only after all power has been turned off.

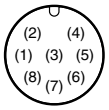


M: Mechanical drive unit including 3-phase motor
S1: Start switch for interlock reset (NC contact)
MPCE1, MPCE2: Contactor or safety relay with compulsory guide mechanism (G7SA is recommended)

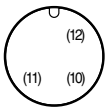
Note: 1 . Please use a safety relay with forcibly guided contacts (such as the G7SA) for MPCE1 and MPCE2, which are relays that perform ultimate control of the machine.
2 . If you do not intend to use the MPCE monitor function, short the MPCE monitor line (pink) to power supply 0 V.
3 . If a load is not connected to control output 1 and control output 2, an error will result and normal operation will not take place. For testing purposes during installation or at other times, connect the 10 kΩ resistors included with the operation manual to the MPCE1 and MPCE2 positions.
4 . If you intend to use auto start mode, short the start line (gray) to power supply 0 V.
5 . Take care when wiring not to make any mistakes regarding the cable colors. In particular, the wire colors of the power supply line (+ 24 V DC: white, 0 V: brown) are different from the regular sensor wires.
6 . Connect the provided surge protector in parallel with MPCE1 and MPCE2.

Wiring method

Receiver unit connector

Front view diagram	Pin No.	Signal name Receiver	Wire color of special cable
	1	Control output 1 (OSSD1)	Orange
	2	0V	Brown
	3	Shielded	---
	4	+DC24V	White
	5	Auxiliary output (AUXIL-	Purple
	6	MPCE monitor	Pink
	7	Start	Gray
	8	Control output 2 (OSSD2)	Yellow

Emitter unit connector

Front view diagram	Pin No.	Signal name Emitter	Wire color of special cable
	10	Shielded	---
	11	+DC24V	White
	12	0V	Brown

Special cable (purchased separately)

For emitter (3-pin)		For receiver (8-pin)		Cable length
F39-JL10A-L	Black connector	F39-JL10A-D	Red connector	10 m
F39-JL15A-L		F39-JL15A-D		15 m
F39-JL30A-L		F39-JL30A-D		30 m

Note: Please order one each for the emitter and the receiver.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. E15E-EN-01 In the interest of product improvement, specifications are subject to change without notice.