Type 4 Safety light curtain

FF-SYB234 Series

Compact, Universal, Smart and Full-featured

FEATURES

- 1- or 2-beam floating blanking
- Manual or automatic restart
- External Device Monitoring (EDM)
- 2 or 4 inputs for muting signals
- Input for serial connection of an auxiliary safety device
- Unique patented configuration cards for quick set up and easy replacement
- Self-contained with optical synchronisation
- 2 static (solid state) safety outputs with short-circuit and cross-fault detection
- Muting lamp/diagnosis output or static (solid state) non safety output for signalling
- Selection of the infrared emission power allows cross-talk reduction
- Enhanced diagnostic information includes the following indication: signal strength, cross-talk, muting, blanking, restart and failure diagnostic
- Test input with selectable test input type
- Two, three and four beam versions for access and beam detection
- Scanning range up to 80 m / 262.4 ft
- M12 connectors
- Mounting brackets included allowing multiple mounting positions
- Safety relay modules for more switching capability (to be ordered separately).

TYPICAL APPLICATIONS

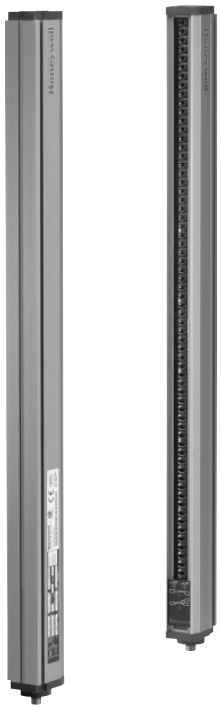
- Access detection to robot areas
- Stacking machines, transporting and conveyor technology
- Handling equipment and assembly lines
- Palletizing industry

C US (pending)

CE

INRS

Approved as Type 4 per IEC/EN 61496-1/2



The Honeywell FF-SYB light curtain is in compliance with IEC/EN 61496 - parts 1 and 2 standard and meets the requirements for a Type 4 Active Optoelectronic Protective Device, the highest level for safety products.

The product received an EC type test certificate from the French INRS notified body, required for safety equipment as per the 98/37/EC Machinery Directive. It meets the applicable parts of North American standards and regulations (OSHA 1910.212, OSHA 1910.217, ANSI standards including ANSI RIA 15.06 for Control Reliability and CSA Z434). Its UL and CSA mark makes it a product usable in most parts of the world.

As soon as an object is detected inside the protection field, the FF-SYB de-energizes its two static (solid state) safety outputs to signal the dangerous motion to stop. The FF-SYB is a self-contained light curtain that does not require a separate control unit for operation.

Functions such as floating blanking, muting, external device monitoring, manual restart and serial connection make it a comprehensive product and eliminate the need for additional control modules.

These built-in features, combined with the small size of the housing, help users reducing overall cost by saving space and installation time.

A unique patented configuration card system allows the user to set up the correct operating mode when swapping units, by simplifying and reducing the number of operations.

The long scanning distance ensures that most perimeter guarding applications are covered. The optional FF-SYZPF floor mounting posts with individual mirrors can be used to protect several sides of a machine with only one system.

⚠ WARNING

MISUSE OF DOCUMENTATION

- The information presented in this product sheet (or catalogue) is for reference only. DO NOT USE this document as system installation information.
- Complete installation, operation and maintenance information is to be referenced for each product.

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

❑ External Device Monitoring (EDM)

The FF-SYB is fitted with an EDM input which allows users to check the correct state of the final switching devices (relays or contactors with positively guided contacts). After each intrusion into the protection field, the FF-SYB will check that the EDM input loop is closed before switching the outputs back to ON. If the FF-SYB operates in automatic restart mode, it will restart immediately if the EDM loop is closed. If the FF-SYB operates in manual restart mode, it will restart when the restart push-button is pressed and if the EDM loop is closed. If the EDM loop remains open (meaning that the external device has a malfunction) the FF-SYB will keep its outputs open and will not restart.

❑ Manual restart

The FF-SYB can be used in automatic or manual restart mode. In automatic mode, the outputs will switch back to ON after an interruption of the protection field, as soon as the field becomes clear again. In manual restart mode, the FF-SYB will not switch back its outputs to ON until a manual restart push-button is pressed and released. The push-button must be a normally open type button. The manual restart will not switch the OSSDs back to ON in case of light curtain lock out (internal failure, optical interference, etc.) or when the protection field is still interrupted.

❑ Auxiliary output

An additional non safety output is available to either mimic the safety output status (solid state Normally Closed signalling output) or signal muting sequences and provide diagnostic information (mode selection depending).

❑ Muting function

The FF-SYB is fitted with a built-in muting function. Muting is the ability to temporarily inhibit the outputs of a light curtain under certain conditions. Sensors are connected to the light curtain through the main connector. An optional junction box is available to perform the electrical connections close to the location of the muting sensors.

Muting sensors are used to discriminate authorised materials from people. The muting sensors must be able to detect the passing material (pallets, vehicles, etc.) according to the material's length and speed.

Figure 1 shows an FF-SYB placed on a conveyor, with the corresponding muting sensors.

The muting activation sensors temporarily inhibit the FF-SYB light curtain as soon as they detect the object. The outputs of these sensors are connected to the muting inputs of the FF-SYB receiver. Muting sensors must be actuated within a time period of 3 s for a correct muting sequence to start.

Whenever one of the two muting sensors is made free again, the muting sequence stops. In case of an incorrect muting sequence, a temporary manual muting procedure may be performed to clear the FF-SYB light curtain detection field and revert back to normal operation.

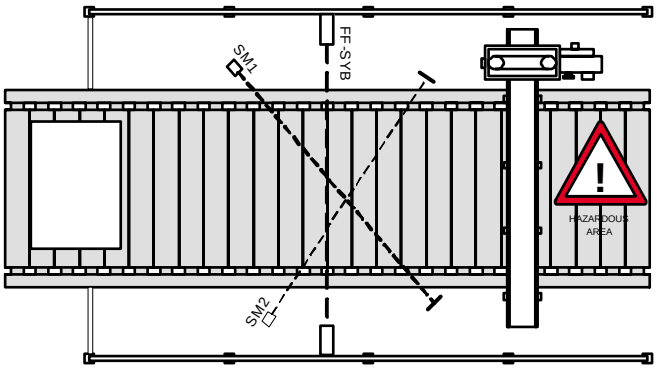
Suitable optoelectronic, mechanical, proximity sensors, etc. can be used as muting sensors.

Inputs for muting sensors accept sensors with relay or static (solid state) outputs, NPN or PNP. 2-wire sensors are also accepted.

A muting lamp output is available on the FF-SYB receiver to drive an external muting indicator that should be installed in a suitable location on the machine.

The following are some configuration examples when using the muting function:

Figure 1 *- Bi-directional application with two optoelectronic sensors*



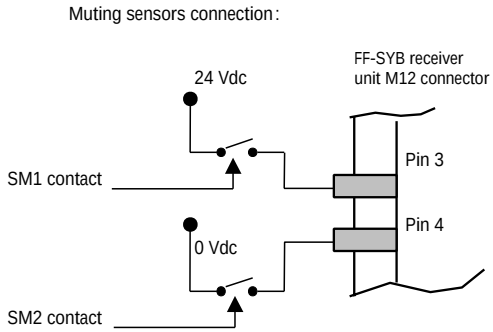
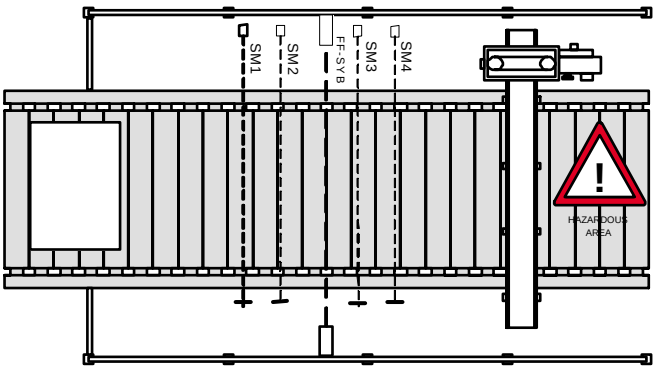


Figure 2 *- Bi-directional application with four photoelectric sensors*

2 sensors can be wired in parallel on each of the 2 muting inputs of the light curtain, creating a 4 sensor bi-directional muting.



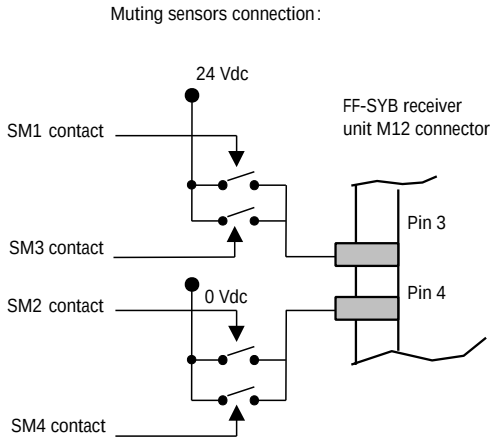
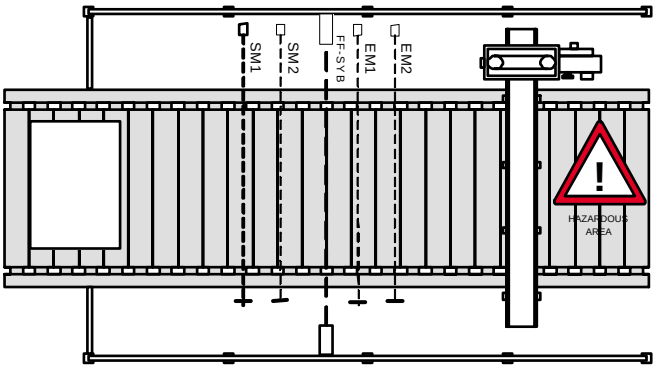
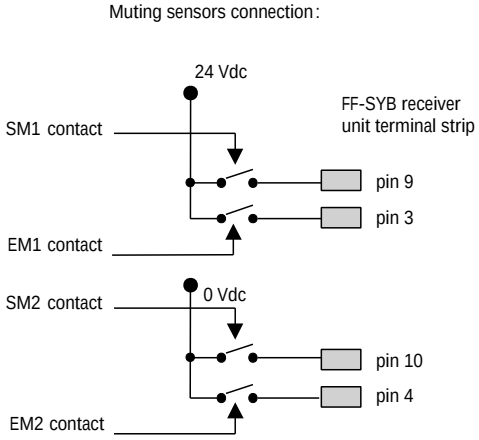


Figure 3 *- Uni-directional application with four optoelectronic sensors*



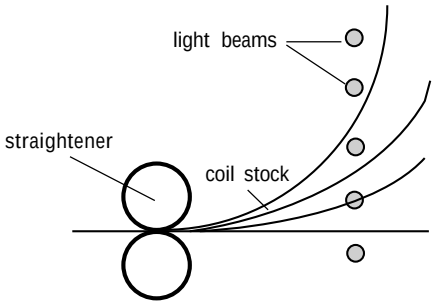


Note: this mode of operation requires direct connections to the receiver internal terminal strip. A M20 cable gland is delivered with the package. Male M23 cordsets are available on option (see "Accessories" section).

❑ Floating blanking function

The 4-beam FF-SYB04 (only) is fitted with a selectable floating blanking function which allows users to inhibit 1 or 2 beams anywhere within the protection field, except the bottom beam which is used for synchronisation. If 2 beam floating blanking is selected, the interruption of 1 or 2 beams will not lead to the opening of the outputs. The 2 beams can be adjacent or not. It is useful in those applications where material or air ejected parts randomly travel through or within the sensing field. You can also disable light beams in an area where a fixture penetrates the light field, and you can permit stationary objects to protrude into the light curtain's sensing field.

Figure 4

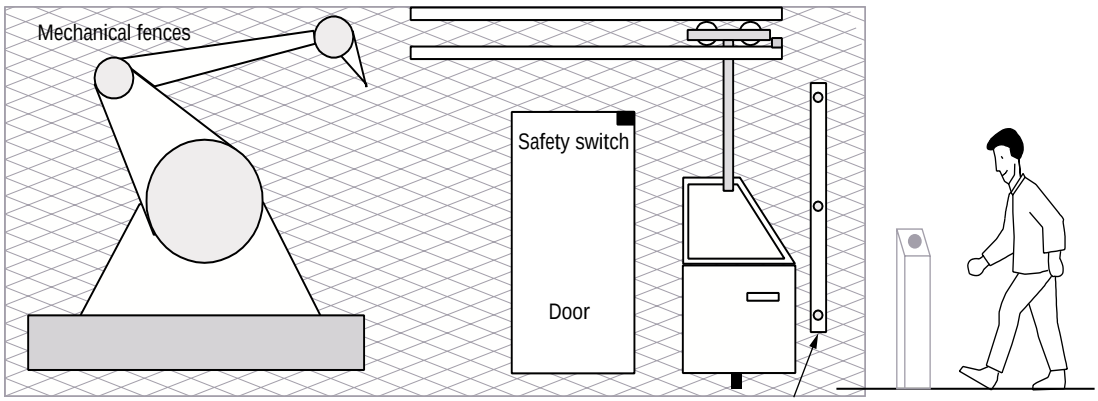


❑ Serial connection

The FF-SYB safety light curtain allows the connection of another safety device with dual outputs through 2 inputs on the receiver unit. The auxiliary safety device can be an electromechanical safety switch or any other safety device with either relay outputs or solid state outputs (for safety reasons, reversed polarity on these two inputs is mandatory, therefore connection of a second FF-SYB light curtain is not possible through these two inputs). Connection is done through the main connector. An optional junction box is available to perform the electrical connections close to the light curtain.

Figure 5

Serial connection of an FF-SYB safety light curtain with a safety gate switch.

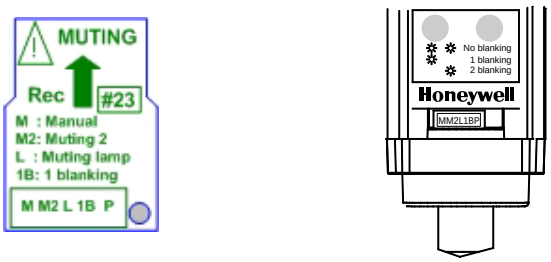


Note: This mode may be combined with the bi-directional muting mode. This combination of modes requires direct connection to the receiver internal terminal strip. A M20 cable gland is delivered with the package. Male M23 cordsets are available on option (see "Accessories" section).

❑ Configuration cards

The FF-SYB emitter and receiver are setup in the required configuration through the use of configuration cards, similar to the SIM cards used on mobile phones (see figure below). This simple and elegant method eliminates the use of jumpers or dip switches. No computer is required: settings are done on site, using one of the small configuration cards. If the user needs to use a different configuration from the factory settings, he just needs to select the configuration card which corresponds to the desired settings and install it behind the bottom cap of the emitter or receiver. The selected settings are written on the configuration card and are visible through the transparent front window.

Figure 6

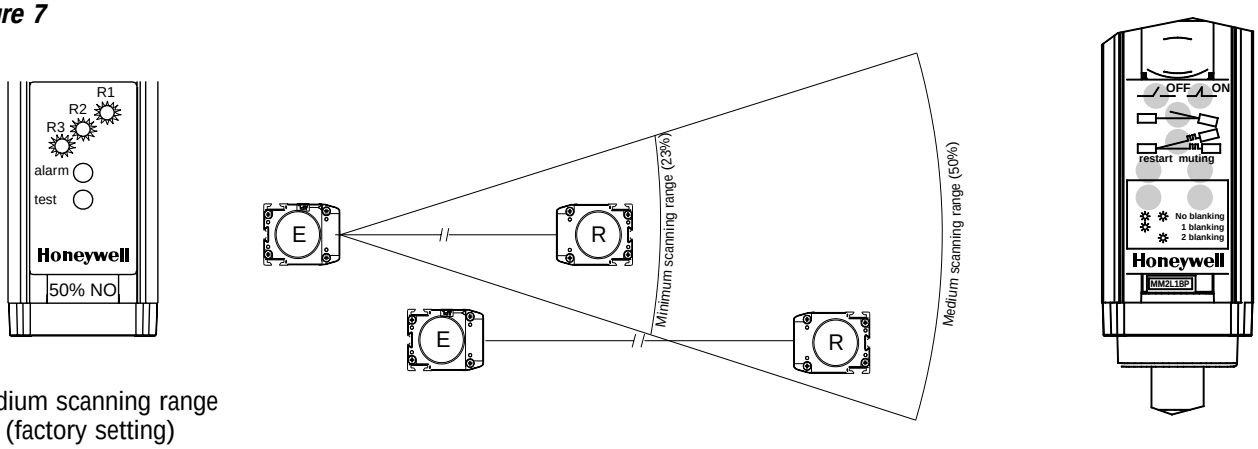


If the FF-SYB needs to be exchanged, the configuration card can be installed in another FF-SYB allowing transfer of settings in a few minutes.

❑ Cross-talk reduction system

The FF-SYB light curtain is based upon an infrared transmission between an emitter unit and a receiver unit. It is a requirement of the IEC/EN 61496-2 standard that if a receiver R2 receives two signals transmitted by two different emitters E1 and E2, the receiver R2 must turn to the alarm state. This happens if the receiver R2 is within the beam aperture angle and within the nominal scanning range of the second emitter E1. The cross-talk detection indicator flickers on the receiver R2 to warn the installer.

Figure 7

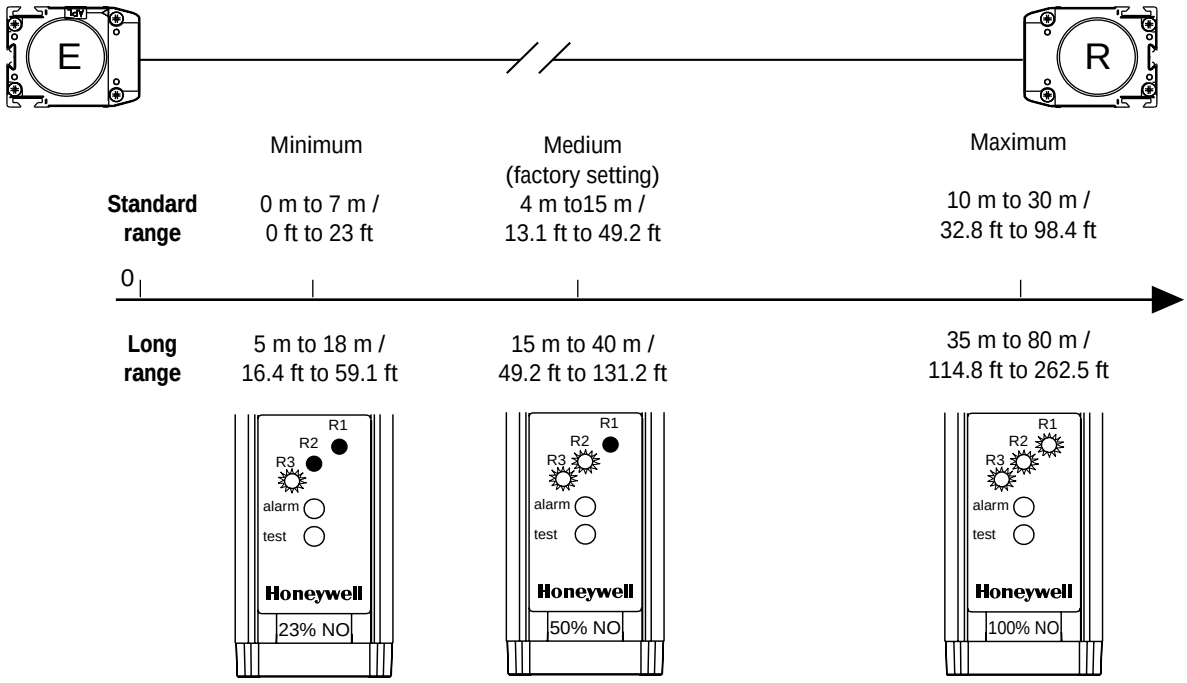


Medium scanning range (factory setting)

A configuration card is used on the emitter unit for the selection of the adequate emission power. This configuration card can be used to eliminate this cross-talk phenomenon by decreasing the scanning range. The end cap can be easily removed to select a different scanning range. Products are delivered with a medium scanning range (middle position) to minimize cross-talk upon installation.

❑ Selectable scanning ranges

Figure 8

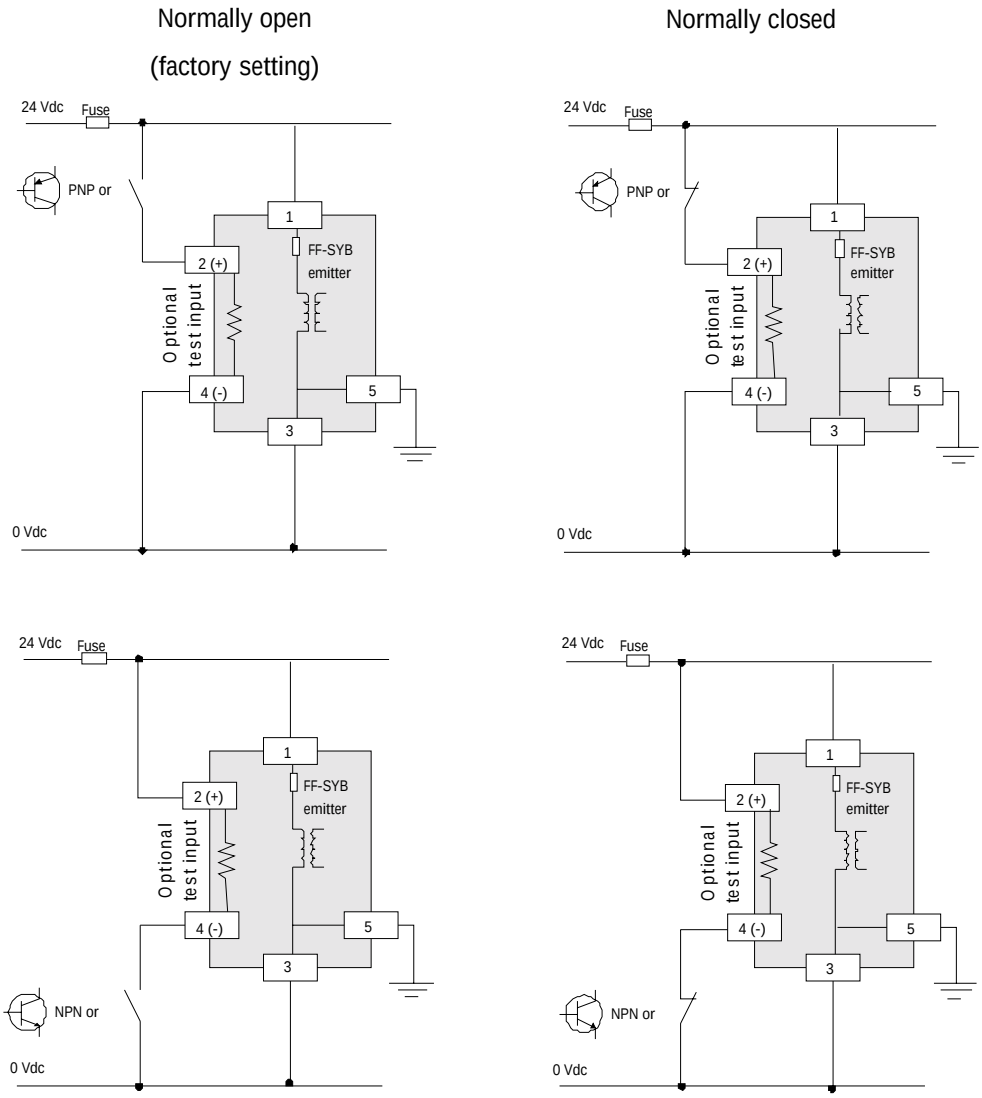


❑ Test input type

Figure 9

Voltage free contact

(PNP static (solid state) output and NPN static (solid state) output also connectable)



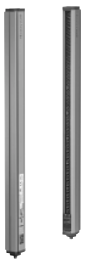
Type 4 safety light curtain

- **Type 4 according to the IEC/EN 61496 - parts 1 and 2 standards**
- **Built-in muting, floating blanking, inputs for serial connection of an auxiliary device, manual restart and EDM**
- **Control of the infrared emission source for cross-talk reduction**
- **Enhanced diagnostic information**

(pending)

INRS

Approved as Type 4 per IEC/EN 61496-1/2



Dimensions in millimeters / inches, meters / feet, weights in kg / lbs

Features	Type	*FF-SYB02500*	*FF-SYB03400*	*FF-SYB04300*
	Number of beams	2	3	4
	Beam spacing	500 mm / 19.7 in	400 mm / 15.76 in	300 mm / 11.82 in
	Nominal scanning range	*Standard range*: 0 to 30 m/0 to 98.4 ft • *Long range*: 5 to 80 m/16.4 to 262.5 ft		
	Angle of divergence	±2°, ±25 %		
	Emitting light source (immunity)	Infrared, pulsed, 880 nm (*Sunlight:* 20 000 Lux • *Lamplight:* 15 000 Lux)		
	Supply voltage and power consumption	24 Vdc (±15 %); 5 W max. for the emitter, 5 W max. for the receiver		
Safety outputs (OSSDs)	**Output type**	2 safety static (solid state) outputs (PNP with NO characteristics) with permanent short-circuit and cross-fault detections		
	Switching capability	350 mA max. at 24 Vdc		
	Response time	22 ms (beam interruption), 28 ms (Auxilary Safety Device engaged)		
	Maximum cable length	100 m / 328 ft (100 nF capacitance)		
	Restart time after power up (after beam actuation)	> 1 s (80 ms without EDM, 150 ms with EDM)		
	Loads impedance	70 Ω min. / 5 kΩ max.		
	Voltage drop	< 2 Vdc		
	Loads turn-on voltage	5 V min. on resistive loads / 7 V min. on inductive loads		
	Protections	Short-circuits and cross-faults, overloads, reversed polarity, micro-cut-off (10 ms, 100% voltage drop, 10 Hz)		
NC signalling or muting lamp/diagnosis output				
	Output type	1 PNP non safety output, NC (signalling contact) or NO (muting/diagnostic indication)		
	Switching capability	100 mA max. at 24 Vdc		
	Protections	Overloads, reversed polarity, micro-cut-off (10 ms, 100% voltage drop, 10 Hz)		
Test input (emitter) (1)	**Input type**	Floating input with selectable NO/NC test logic		
	External contact type	Relay contact, or static (solid state) PNP or static (solid state) NPN (must be activated for at least 20 ms)		
	Test loop current (resistance)	13 mA typical (750 Ω max.)		
	Protections	3000 Vdc galvanic insulation, reversed polarity, micro-cut-off (14 ms)		
Restart / EDM input (1)	**External contact type**	Relay contact (must be activated for at least 150 ms, and less than 3 s)		
	Max. voltage	29 Vdc		
Muting or serial connection inputs (1)				
	External contact type	Relay contact, or static (solid state) PNP or static (solid state) NPN (automatic recognition)		
	Timing conditions	3 s between (pins 3 and 4)		
	Maximum cable length	100 m / 328 ft (no limitation in capacitance)		
Environmental/physical characteristics				
	Temperature range	*Operating:* 0 °C to 55 °C/32 °F to 131 °F (95% relative humidity) • *Storage:* -20 °C to 75 °C/-4 °F to 167 °F		
	Sealing	NEMA 4, 13 and IP 65		
	Vibrations	IEC/EN 61496-1: 10 to 55 Hz frequency range, 1 octave/min. sweep rate, 0,35 mm ±0,05 amplitude, 20 sweeps per axis, for 3 axes		
	Shocks	IEC/EN 61496-1: 15 G - 11 ms - 3 per axis, for 3 axes		
	Bumps	IEC/EN 61496-1: 10 G - 16 ms - 1000 per axis, for 3 axes		
	Product dimension and weight	Width: 42 mm (1.65 in); depth: 55 mm (2.16 in); height (2)		
	Connection	*Emitter:* M12/5 pole male receptacle • *Receiver:* M12/8 pole male receptacle or terminal strip with M20 cable gland (see Figure 10 to determine possible modes of operation for each receiver termination type)		
	Material	*Housing:* aluminium alloy and (conductive) polycarbonate (end caps) • *Front plate:* polymethylmethacrylate (PMMA)		

Ordering information

Each listing consists of an emitter, a receiver, 2 pairs of right-angle brackets, an end cover equipped with a cable gland and a set of configurations card.

FF-SYB❑❑❑❑❑M2 - ❑

- blank: standard range
- L: long range

Model	Number of beams	Beam spacing mm/in
02500	2	500 / 19.70
03400	3	400 / 15.76
04300	4	300 / 11.82

Notes:

(1) Voltage switching (high/low): ≥ 11 Vdc min. (I > 6 mA) / ≤ 5 Vdc (I > 2 mA);
Input current (high/low): 20 mA / 10 mA at 24 Vdc.
In compliance with the IEC 61131-2 requirements for type 2 sensors.

(2) Refer to emitter and receiver dimensions / weights.

NOTICE

NON COMPLIANCE TO ANSI/RIA 15.06-1999 WITH FF-SYB02500

- Only the three beam (FF-SYB03400 Series) and the four beam versions (FF-SYB04300 Series) are in compliance with the beam heights, specified in the US Standard ANSI/RIA R15.06-1999 (Industrial Robots and Robot Systems - Safety Requirements). The two beam version (FF-SYB02500 Series) does NOT comply with ANSI/RIA R15.06 and may require additional protection.
- Refer to applicable standards. In the absence of an applicable standard, ANSI B11.19 and ANSI R15.06 may be used as reference for the USA, as well as EN 999 (or the relevant European Type C machine standard) for Europe.
- Verify compliance with ANSI/RIA R15.06 and possibly implement additional protection when floating blanking is used on the 4-beam FF-SYB234 system.

Figure 10 *- Possible modes of operation and corresponding receiver termination type and connexion box*

Card (1)	Restart mode	Blanking (2)	Auxiliary Safety Device	Muting (3)	Auxiliary output (4)	Receiver termination (5)	Connection box (6)
#01	Manual				NC signal	M12 plug	
#02	Manual	1-beam			NC signal	M12 plug	
#03	Manual	2-beam			NC signal	M12 plug	
#04	Automatic				NC signal	M12 plug	
#05	Automatic	1-beam			NC signal	M12 plug	
#06	Automatic	2-beam			NC signal	M12 plug	
#07	Automatic		yes		NC signal	M12 plug	FF-SXZBOXS
#08	Automatic	1-beam	yes		NC signal	M12 plug	FF-SXZBOXS
#09	Automatic	2-beam	yes		NC signal	M12 plug	FF-SXZBOXS
#10	Manual		yes		NC signal	M12 plug	FF-SXZBOXS
#11	Automatic			2 inputs	NC signal	M12 plug	FF-SXZBOXM2
#12	Automatic			2 inputs	Muting lamp	M12 plug	FF-SXZBOXM2
#13	Automatic			4 inputs	NC signal	Terminal strip	FF-SXZBOXM4
#14	Automatic			4 inputs	Muting lamp	Terminal strip	FF-SXZBOXM4
#15	Automatic		yes	2 inputs	NC signal	Terminal strip	FF-SXZBOXM2S
#16	Automatic		yes	2 inputs	Muting lamp	Terminal strip	FF-SXZBOXM2S
#17	Manual			2 inputs	NC signal	M12 plug	FF-SXZBOXM2
#18	Manual			2 inputs	Muting lamp	M12 plug	FF-SXZBOXM2
#19	Manual			4 inputs	NC signal	Terminal strip	FF-SXZBOXM4
#20	Manual			4 inputs	Muting lamp	Terminal strip	FF-SXZBOXM4
#21	Manual		yes	2 inputs	NC signal	Terminal strip	FF-SXZBOXM2S
#22	Manual		yes	2 inputs	Muting lamp	Terminal strip	FF-SXZBOXM2S
#23	Manual	1-beam		2 inputs	Muting lamp	M12 plug	FF-SXZBOXM2
#24	Manual	2-beam		2 inputs	Muting lamp	M12 plug	FF-SXZBOXM2
#25	Manual	1-beam		4 inputs	Muting lamp	Terminal strip	FF-SXZBOXM4
#26	Manual	2-beam		4 inputs	Muting lamp	Terminal strip	FF-SXZBOXM4
#27	Manual	1-beam	yes	2 inputs	Muting lamp	Terminal strip	FF-SXZBOXM2S
#28	Manual	2-beam	yes	2 inputs	Muting lamp	Terminal strip	FF-SXZBOXM2S

(1) Factory setting: card #01

(2) Floating blanking is available with the 4-beam FF-SYB04 model only.

(3) Muting: either 2 inputs available for the connection of 2 or 4 muting sensors to perform a bi-directional muting function (see page 2 and 3), or 4 inputs available for the connection of 4 sensors to perform a uni-directional muting function (see page 3).

(4) Auxiliary output: either a normally closed signalling output of a muting and diagnosis lamp output (see page 2).

(5) Receiver termination: some modes require direct connections to the internal receiver terminal strip. A M20 cable gland is delivered with the package. Male M23 cordsets are available on option (see "Accessories" section).

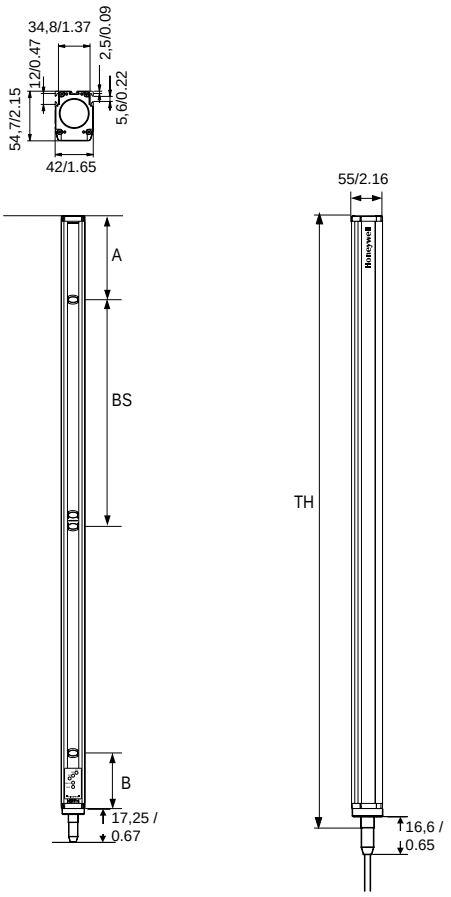
(6) Connection boxes are available for the interconnection of all sensors and actuators (see "Accessories" section).

Table 2

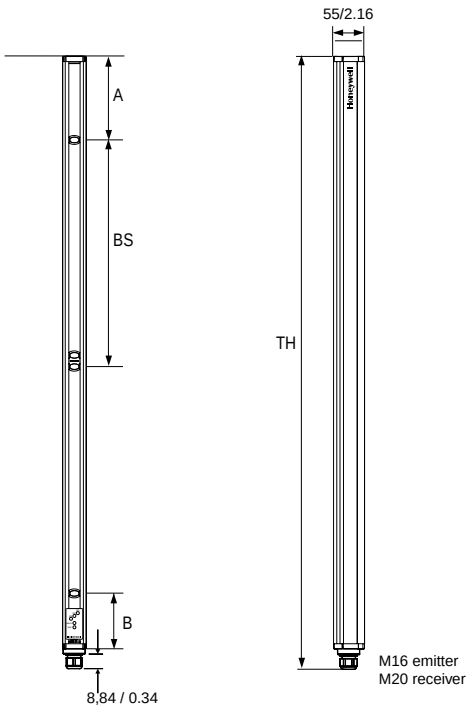
Reference	Number of beams	Beam spacing BS	Total height TH (cable gland version)	A	B	Weight per device
		mm / in	mm / in	mm / in	mm / in	kg / lbs
FF-SYB02500M2(-L)	2	500 / 19.70	744 / 29.3 (758 / 29.8)	117 / 4.61	122 / 4.81	1,42 / 3.12
FF-SYB03400M2(-L)	3	400 / 15.76	1064 / 41.9 (1078 / 42.4)	147 / 5.79	112 / 4.41	1,98 / 4.35
FF-SYB04300M2(-L)	4	300 / 11.82	1064 / 41.9 (1078 / 42.4)	67 / 2.63	92 / 3.62	1,98 / 4.35

Figure 11 *- Dimensions in mm / in*

3 beam version with M12 connector (emitter or receiver)



3 beam version with terminal strip (receiver only)



❑ LED status indicators

Figure 12 - *Emitter*

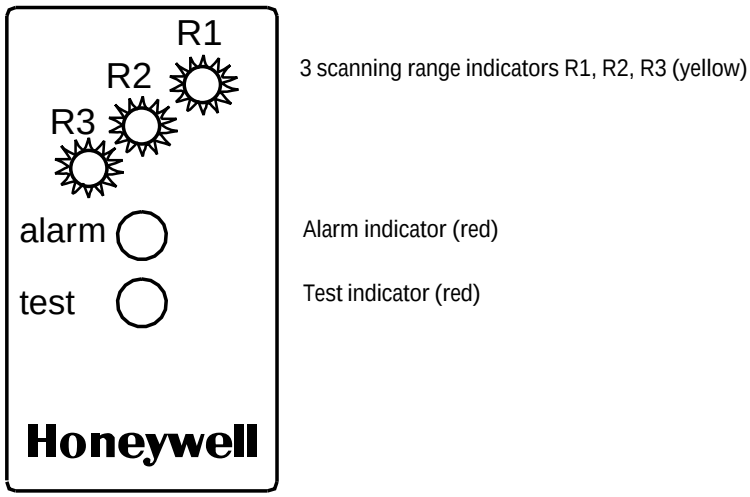
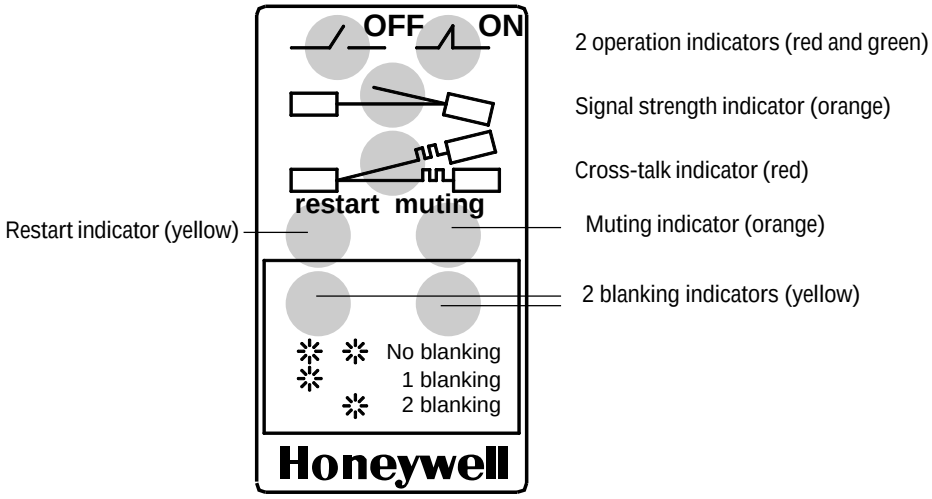


Figure 13 - *Receiver*



❑ Wiring

Figure 14 - *Recommended wiring diagram for a 2-sensor muting application with automatic restart and Temporary Manual Muting (TMM) (see Figure 1)*

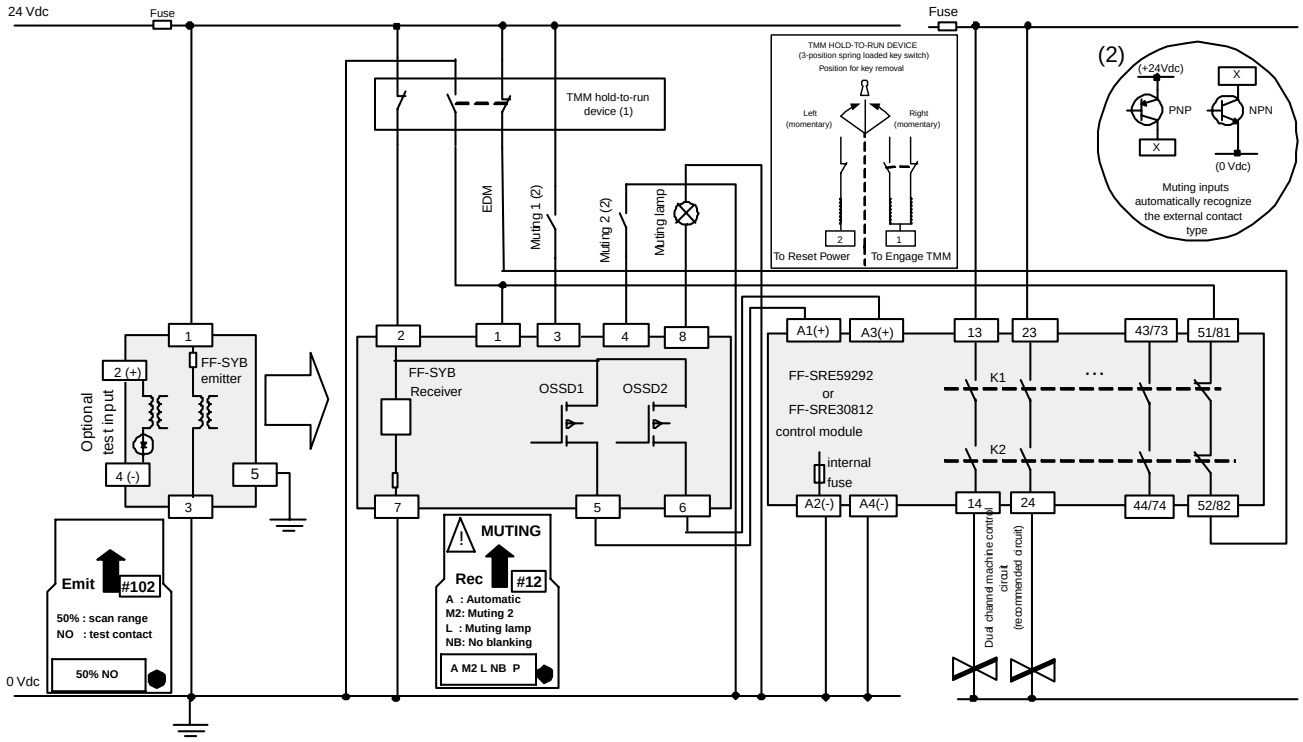
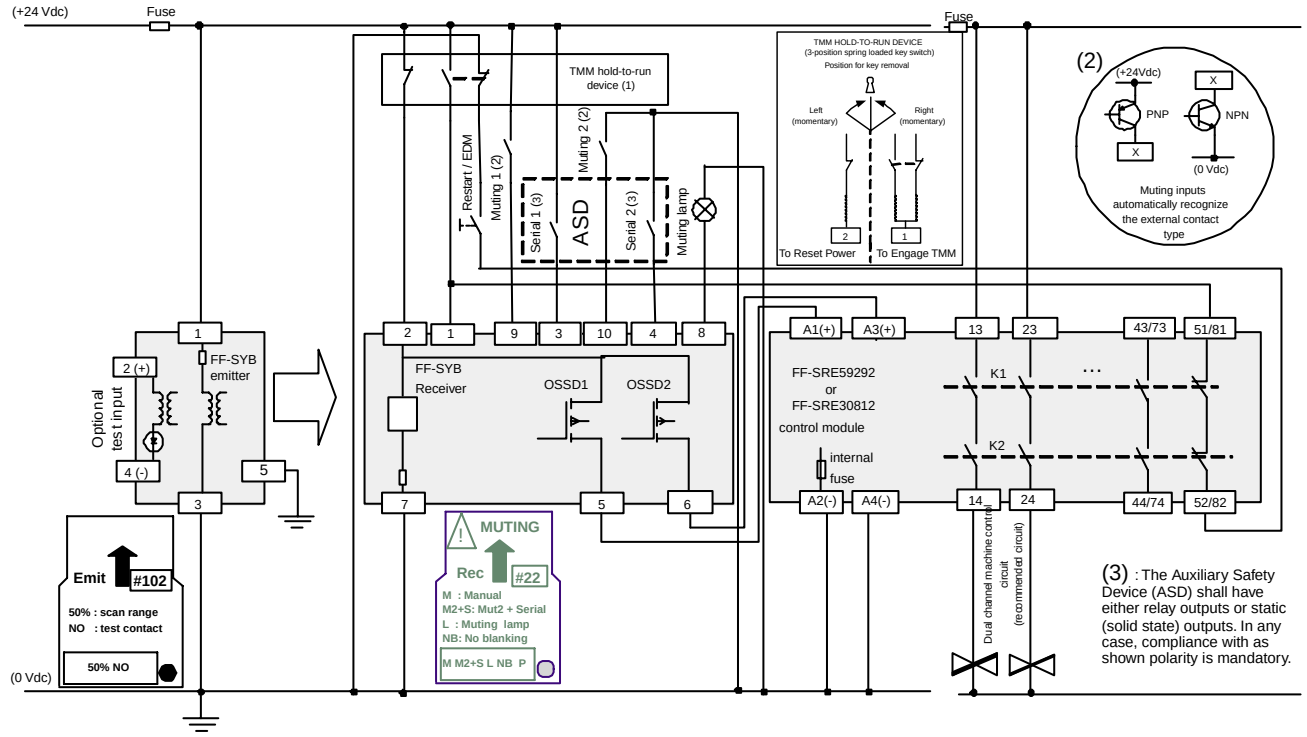


Figure 15 - *Recommended wiring diagram for a 2-sensor muting application with an auxiliary safety device, manual restart and Temporary Manual Muting (TMM)*



⚠ WARNING

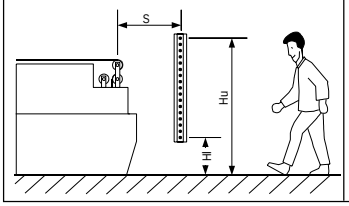
INCREASED SAFETY DISTANCE DUE TO FLOATING BLANKING

Modify the safety distance between the light curtain and the hazardous area according to the instructions in this chapter.

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

❑ European EN 999 standard

All distances/heights in mm (100 mm = 3.9 in)

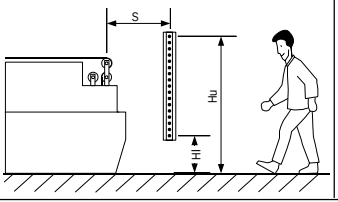
FF-SYB234 Multibeam System	**FF-SYB02500**	**FF-SYB03400**	**FF-SYB04300**
Number of beams	2	3	4
Beam spacing	500	400	300
Recommended beam heights above the reference plane per EN 999	Hi = 400 (lowest beam) Hu = 900 (uppermost beam)	Hi = 300 (lowest beam) 700 (intermediate beam) Hu = 1100 (uppermost beam)	Hi = 300 (lowest beam) 600 (intermediate beam) 900 (intermediate beam) Hu = 1200 (uppermost beam)
Normal approach 	**S ≥ 1600 (t1 + t2) + 850**		

t1: light curtain response time (s)
t2: machine stopping time (s)

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.

❑ USA's OSHA/ANSI/RIA standards

All distances/heights in inches (1 in = 25,4 mm)

FF-SYB234 Multibeam System	**FF-SYB03400**	**FF-SYB04300**
Number of beams	3	4
Beam spacing	15.76	11.82
Beam heights above the reference plane	11.82 27.58 43.34	11.82 23.64 35.46 47.28
Normal approach 	**Ds ≥ 63 (Ts + Tc + Tr) + Dpf** **If Hi < 12 and 36 ≤ Hu ≤ 48 then Dpf = 48 (Reach Over)** **If Hi ≤ 12 and Hu > 48 then Dpf = 36 (Reach Thru)** If Hi > 12, supplemental safeguarding may be required to detect crawling underneath.	

Ts: worst case stopping time of the machine (s)
Tc: worst case response time of the machine
Tr: response time of the safety devices (s)
Dpf: Depth penetration factor (in.)

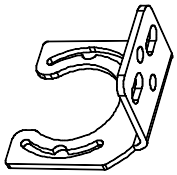
NOTICE

NON COMPLIANCE TO ANSI/RIA 15.06-1999 WITH FF-SYB02500

- Only the three beam (FF-SYB03400 Series) and the four beam versions (FF-SYB04300 Series) are in compliance with the beam heights, specified in the US Standard ANSI/RIA R15.06-1999 (Industrial Robots and Robot Systems - Safety Requirements). The two beam version (FF-SYB02500 Series) does NOT comply with ANSI/RIA R15.06 and may require additional protection.
- Refer to applicable standards. In the absence of an applicable standard, ANSI B11.19 and ANSI R15.06 may be used as reference for the USA, as well as EN 999 (or the relevant European Type C machine standard) for Europe.
- Verify compliance with ANSI/RIA R15.06 and possibly implement additional protection when floating blanking is used on the 4-beam FF-SYB234 system.

For more information, refer to the ANSI/RIA 15.06 American standard.

❑ Accessories

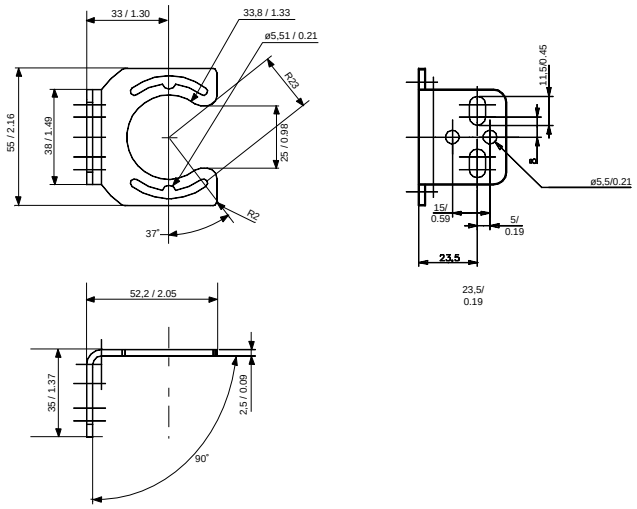


FF-SYZ634178

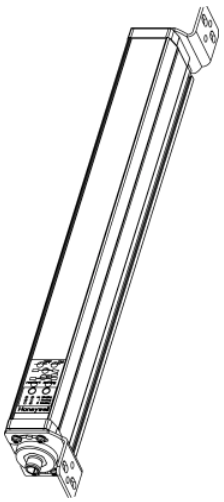
Kit of 2 right angle mounting brackets with screws, bolts, nuts and washers to mount one emitter or one receiver unit.
Possible mounting positions:

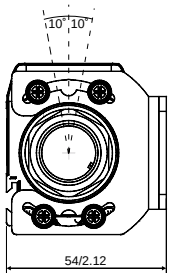
1. At the top and the bottom of the FF-SYB (allowing adjustments in azimuth directions of ±10°).
2. At one of the two lateral dovetail slots (allowing adjustments in vertical directions along the slot)
3. At the rear dovetail slot (allowing adjustments in vertical directions along the slot)

Order 2 kits for a complete set of emitter and receiver
(**already included in the FF-SYB package**).

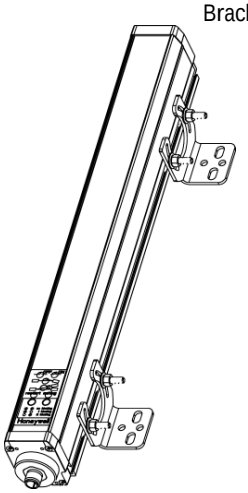


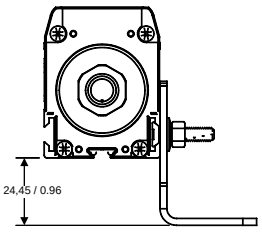
Bracket mounting at the top and the bottom

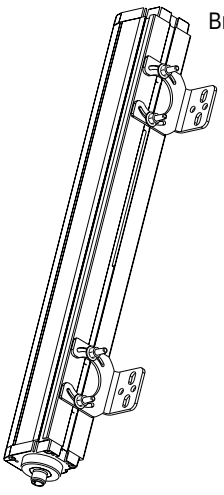




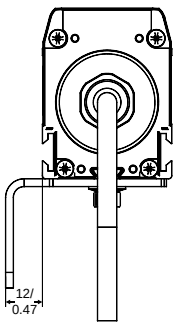
Bracket mounting at the lateral dovetail slots



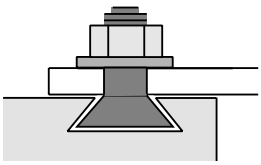


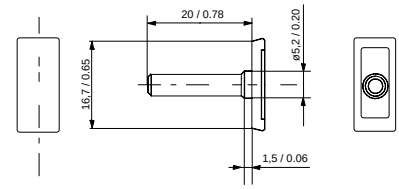


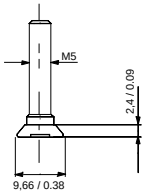
Bracket mounting at the rear dovetail slots

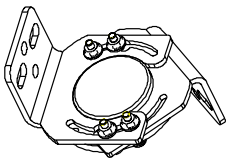


M5 dovetail shape bolt









FF-SYZ634179

Kit of 2 adjustable mounting brackets with rotating plate, screws, bolts, nuts, and washers to mount one emitter or one receiver unit.

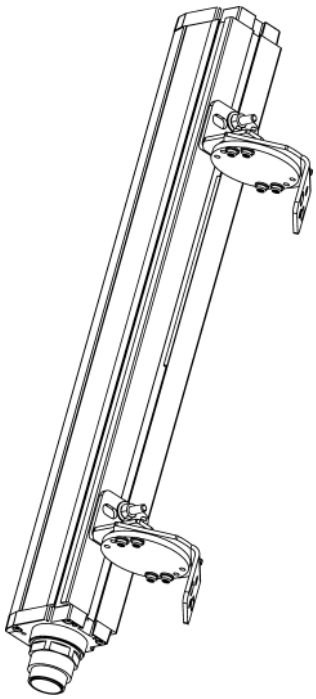
Possible mounting position is:

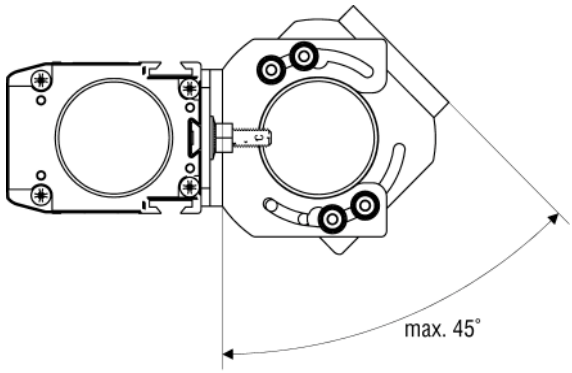
- at the rear dovetail slot
  (allowing adjustments in vertical directions along the slot an in azimuth directions of max. ± 45°)

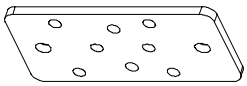
Order 2 kits for a complete set of emitter and receiver.

Refer to the section FF-SYZ634178 for the detailed dimensions of the brackets.

(to be ordered separately as an option, to be mounted together with the FF-SYZ634178 brackets delivered with the FF-SYB package)







(x 2)

FF-SYZAD

Anti-vibration kit

Kit of 2 straight brackets and 4 anti-vibration dampers (mounting hardware included) - to substitute for the FF-SYZ634178 brackets delivered with the FF-SYB package.

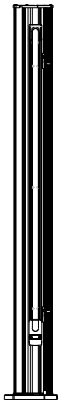
(x 4)

NOTICE

PROTECTION AGAINST HIGH VIBRATION

In case of high vibration, order:

- 2 sets of FF-SYZAD kit for light curtain systems with protection height below 1000 mm/ 39.4 in.
- 3 sets of FF-SYZAD kit for light curtain systems with protection height greater or equal to 1000 mm/39.4 in, but less than 1850 mm/72.8in.
- 4 sets of FF-SYZAD kit for light curtain systems with protection height greater than 1850 mm/72.8 in.

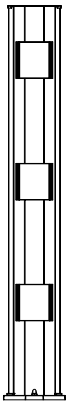


FF-SYZPF

Fixed post for FF-SYB light curtain

Floorstanding post for the installation of the following FF-SYB light curtains:
Light curtain models: FF-SYB032❑❑, FF-SYB048❑❑, FF-SYB080❑❑, FF-SYB096❑❑
Multibeam models: FF-SYB02500, FF-SYB03400, FF-SYB04300
To be ordered separately as an option.

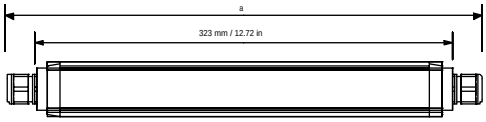
Front covers are available for additional protection of the FF-SYB234 beam access detection systems:
FF-SYZ630184-2: Front cover for 2 beams
FF-SYZ630184-3: Front cover for 3 beams
FF-SYZ630184-4: Front cover for 4 beams
To be ordered separately as an option.



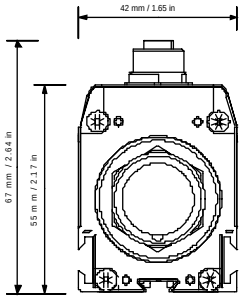
Part Listings (*)	Description
FF-SYZPF02 **FF-SYZPF12**	Floorstanding post with 2 individual mirrors for use with the FF-SYB02500 multibeam system (*)
FF-SYZPF03 **FF-SYZPF13**	Floorstanding post with 3 individual mirrors for use with the FF-SYB03400 multibeam system (*)
FF-SYZPF04 **FF-SYZPF14**	Floorstanding post with 4 individual mirrors for use with the FF-SYB04300 multibeam system (*)

(*) FF-SYZPF0❑: 10 % loss per mirror
FF-SYZPF1❑: 25 % loss per mirror
(to be ordered separately as an option)

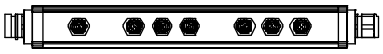
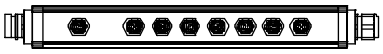
M12 connection boxes



a = 367 mm [14.45 in] for cable gland versions or
364 mm [14.33 in] for M23 versions



Sealing: IP65
Approvals: cCSAus (pending)
Material: gold anodized aluminium alloy (housing), (conductive) polycarbonate (end caps), stainless steel (front plate)
Mounting: two right-angle brackets with mounting hardware (FF-SYZ634178 included with the connection box)

FF-SXZBOXM2  Female M12 / 5 pole plug (x8) and removable spring-cage terminal block on each ends (M20 PGs)	Connection box for bi-directional muting applications (see Figure 1 and Figure 2). Allows the connection of aFF-SYB safety light curtain (emitter and receiver), two or four muting sensors, a muting/diagnostic lamp, a restart push-button and the TMM hold-to-run device via M12 connectors.
FF-SXZBOXS  Female M12 / 5 pole plug (x5) and removable spring-cage terminal block on each ends (M20 PGs)	Connection box for connection of an Auxiliary Safety Device (ASD). Allows the connection of a FF-SYB safety light curtain (emitter and receiver), the ASD, a diagnostic lamp and a restart push-button via M12 connectors.
FF-SXZBOXM2S  Female M12 / 5 pole plug (x7), female M23 / 19 poles (x1) and a removable spring-cage terminal block (M20 PG)	Connection box for bi-directional muting applications (see Figure 1 and Figure 2) with an auxiliary safety device (ASD). Allows the connection of a FF-SYB safety light curtain (emitter and receiver),), two muting sensors, a muting lamp, the ASD, a restart push-button and the TMM hold-to-run device via M12 connectors and a M23 connector.
FF-SXZBOXM4  Female M12 / 5 pole plug (x8), female M23 / 19 poles (x1) and a removable spring-cage terminal block (M20 PG)	Connection box for uni-directional muting applications (see Figure 3). Allows the connection of a FF-SYB safety light curtain (emitter and receiver), four muting sensors, a muting lamp, a restart push-button and the TMM hold-to-run device via M12 connectors and a M23 connector.

Cordsets

M12/5 pole

1: brown
2: white
3: blue
4: black
5: green/yellow

Female keyway M12, straight, 5-pin for the emitter

FF-SXZCAM125U02 2 m / 6.56 ft length
FF-SXZCAM125U05 5 m / 16.40 ft length
FF-SXZCAM125U10 10 m / 32.8 ft length
Equivalent to the 805000A09M... Micro-change® Series from Brad Harrison (see vendor catalog for color code)

Male keyway M12, 5-pin, straight - for connection boxes

FF-SXZCAM125UM02 2 m / 6.56 ft length
FF-SXZCAM125UM05 5 m / 16.40 ft length
FF-SXZCAM125UM10 10 m / 32.8 ft length
Equivalent to the 805006A09M... Micro-change® Series from Brad Harrison (see vendor catalog for color code)

M12/8 pole

1: white
2: brown
3: green
4: yellow
5: grey
6: pink
7: blue
8: red

Female keyway M12, straight, 8-pin for the receiver

FF-SXZCAM128U02 2 m / 6.56 ft length
FF-SXZCAM128U05 5 m / 16.40 ft length
FF-SXZCAM128U10 10 m / 32.8 ft length
Equivalent to the 808000P02M... Micro-change® Series from Brad Harrison (see vendor catalog for color code)

Male keyway M12, 8-pin, straight - for connection boxes

FF-SXZCAM128UM02 2 m / 6.56 ft length
FF-SXZCAM128UM05 5 m / 16.40 ft length
FF-SXZCAM128UM10 10 m / 32.8 ft length
Equivalent to the 808006P02M... Micro-change® Series from Brad Harrison (see vendor catalog for color code)

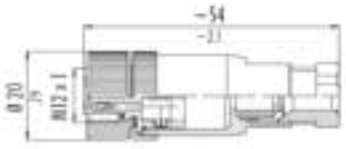
M23/19 pole

1: purple
2: red
3: grey
4: red/blue
5: green
6: grey/pink
7: white/green
8: white/green
9: white/yellow
10: white/grey
11: black
12: green/yellow
13 to 19: unused

Male keyway M23, 19-pin, straight - for connection boxes

FF-SXZCAM2319UM02 2 m / 6.56 ft length
FF-SXZCAM2319UM05 5 m / 16.40 ft length
FF-SXZCAM2319UM10 10 m / 32.8 ft length

Cable connector



FF-SXZCOM128 **Receiver plug,** Binder single keyway M12 female screw type straight connector. 8 set screws M2,5. Gold plated contacts.

FF-SXZCOM125 **Emitter plug,** Binder single keyway M12 female screw type straight connector. 5 set screws M2,5. Gold plated contacts.

FF-SXZCOM128M **For connection boxes,** Single keyway M12, 8-pin, male, screw type, straight

FF-SXZCOM125M **For connection boxes,** Single keyway M12, 5-pin, male, screw type, straight

Safety control modules

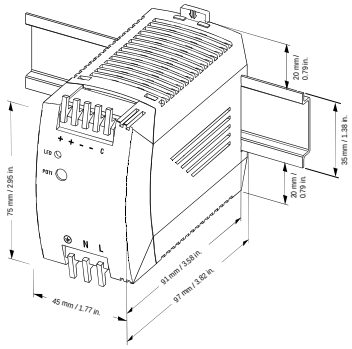
FF-SRE59292
Slim line expansion module
- 24 Vdc
- Safety interface up to Category 4 per EN 954-1
- 4 NO/1 NC safety relay outputs
- 22,5 mm / 0.88 in width

(to be ordered separately as an option).

FF-SRE30812
Expansion module
- 24 Vdc, 115 Vac or 230 Vac
- Safety interface up to Category 4 per EN 954-1
- 7 NO/1 NC internally redundant safety relay outputs
- 90 mm / 3.54 in width

(to be ordered separately as an option).

ac to dc power supply



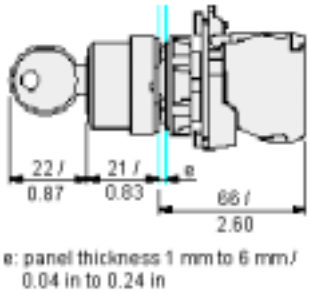
FF-SXZPWR050
ac to dc power supply
(to be ordered separately as an option)
- Approvals: UL508 listed, UL1950, cUL/CSA-C22.2 No.950-M90, EN/IEC 60950, EN 50178 (Class 2 Rated for low power installations)
- Input voltage: 85-264 Vac (43-67 Hz)
- Output voltage: 24-28 Vdc adjustable
- Rated continuous load (at 60 °C/140 °F max.): 2,1 A @ 24 Vdc / 1,8A @ 28 Vdc
- Power: 50 W
- Dimensions 75 mm x 45 mm x 97 mm / 2.95 in x 1.77 in x 3.82 in
- DIN rail mounting
- Weight: 240 g / 0.52 lbs

Muting lamp

(not contractual)

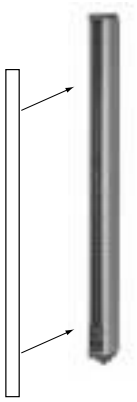
FF-SXZMLED
Beacon supplied with fixing plate for vertical surface and a LEDs bulb (Telemecanique XVB Series type). To be used as the muting/diagnostic lamp.

3 position spring loaded key switch



(not contractual)

FF-SXZTMM
ø 22 mm 3-position spring loaded key switch with a Normally Closed contact on the left position and two complementary (Normally Closed and Normally Open) contacts on the right position (Telemecanique ZB5 Series type, fixing collar with screw clamp contact blocks, key # 455).
To be used as the TMM hold-to-run device.



FF-SYZFT❑❑❑

Kit including two self-adhesive protections to be glued on the front windows of the FF-SYB light curtain.

Order 1 kit per light curtain.

CAUTION

Make sure the transparent protection tape is placed on the emitter and the filtered protection is placed on the receiver. Protections cannot be removed once in place.

Failure to comply with these instructions may result in product damage.

Features:	
Storage and operating temperatures	-20 °C to 55 °C / -4 °F to 131 °F, high resistance to the ejection of melting particules
Material	Organic glass
Prohibited liquids	Sulfuric acid, hydrofluoric acid, ammonia solution
Scanning range attenuation	36%
Optical immunity improvement factor	2,5
Ordering guide:	
FF-SYZFT064	FF-SYB❑❑064
FF-SYZFT096	FF-SYB❑❑096

Configuration cards

FF-SYZ101085R

Set of 28 configuration cards for FF-SYB receiver

FF-SYZ101092E

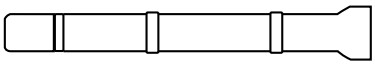
Set of 6 configuration cards for FF-SYB emitter

Installation manuals

FF-PK107120-EN	One FF-SYB English installation manual
FF-PK107120-DE	One FF-SYB German installation manual
FF-PK107120-FR	One FF-SYB French installation manual
FF-PK107120-IT	One FF-SYB Italian installation manual
FF-PK107120-SP	One FF-SYB Spanish installation manual

NOTICE

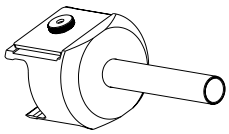
By default, products will be shipped with the installation manual in the language of the country of delivery when available or in English. If any other language is required, it must be ordered separately.



FF-SPZLASER

The laser pen FF-SPZLASER is a self-contained and compact laser device designed to ease infrared beam alignments. Its class II conforms to the EN 60825 European standard and the US 21 CFR 1040 American standard.

To be ordered separately as an option.



FF-SYZ604795

Mechanical adapter for the FF-SPZLASER laser pen to be used with the FF-SYB Series light curtain.

To be ordered separately as an option.

Warranty and remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. **The foregoing is Buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.**

While we provide application assistance, personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change at any time without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

Sales and Service

Honeywell serves its customers through a worldwide network of sales offices and distributors. For application assistance,current specifications, pricing or name of the nearest Authorised Distributor, contact a nearby sales office or:

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