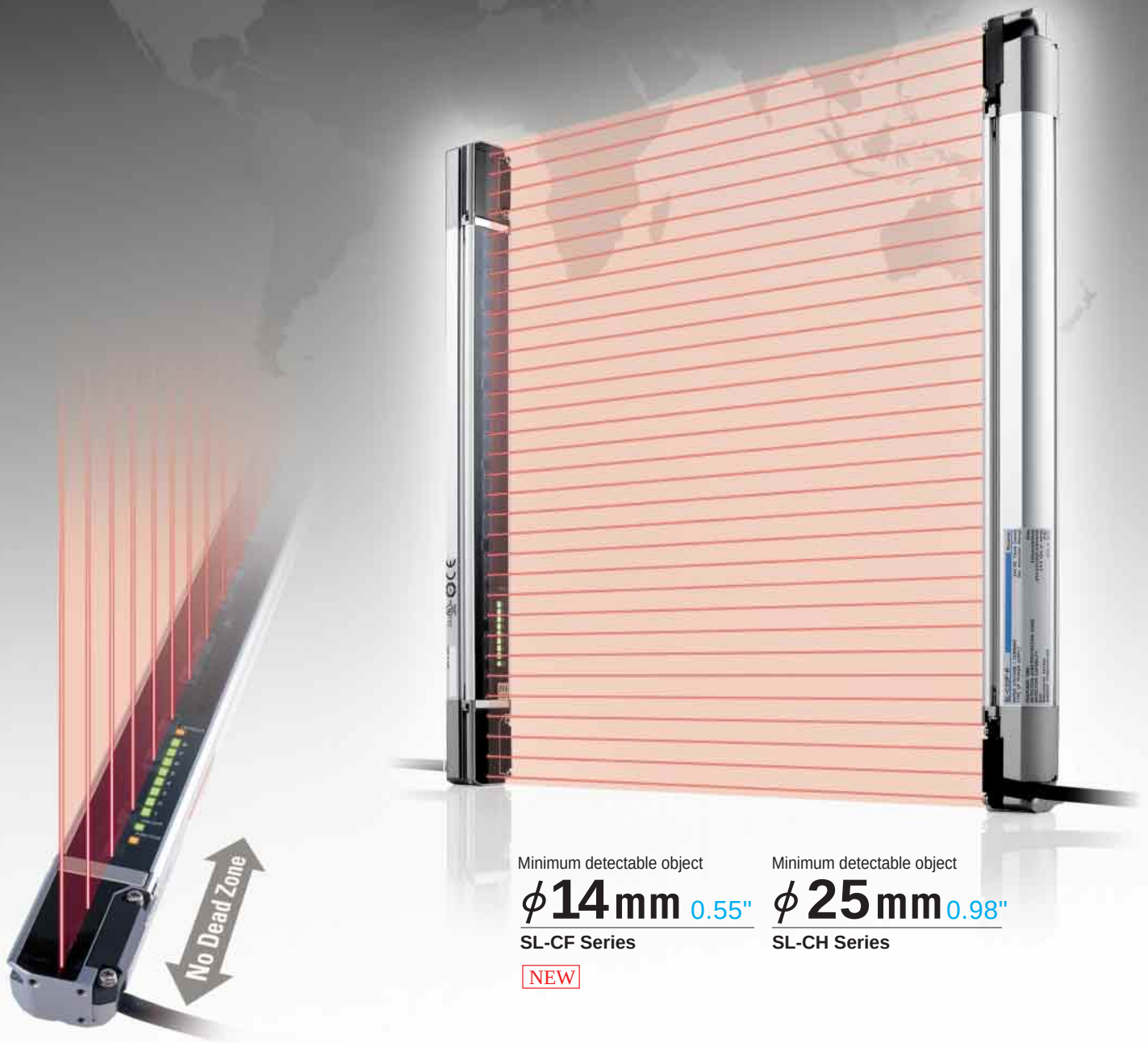
KEYENCE

NEW **Type 4 Safety Light Curtains**
SL-C Series

INDUSTRY FIRST
EDGE-TO-EDGE DETECTION ZONE



Minimum detectable object
ϕ14mm 0.55"
SL-CF Series
NEW

Minimum detectable object
ϕ25mm 0.98"
SL-CH Series

The highest safety standards level
Type4

Same-day shipment

The SL-C Series adapts to your equipment

Choose from standard or fine pitch curtains for your application.

NEW **SL-CF Series**

Minimum detectable object

ϕ**14mm** 0.55"

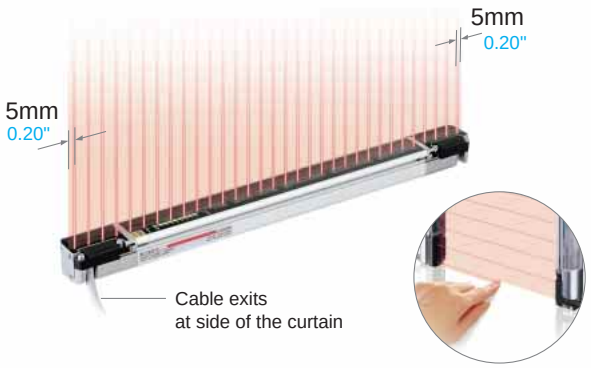
SL-CH Series

Minimum detectable object

ϕ**25mm** 0.98"

Edge-to-edge detection enables space-saving mounting

The top and bottom beam axes are positioned just 5mm(0.20")from the reference surfaces.
The cable exits at the side of the curtain to create a fully guarded area.



Space saving

SL-C Series fits perfectly into equipment, eliminating dead zones.

No dead zone

Even when several units are arranged in series, the minimum detectable object size remains the same.

What makes the SL-C so popular?

1 No dead-zone

A new standard for safety light curtains
No dead-zone — offers ultimate safety.

2 Immediate delivery

Same day shipment is possible if required.
(*For orders by 4:00pm CST on the day)

3 Cost-cutting

Helps trim overall project costs including design and wiring costs.

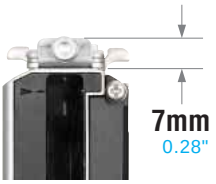
4 Ease of use

Built-in bar LEDs significantly reduce troubleshooting time.

Edge-to-edge detection creates space saving and flexible mounting

NEW Slim mounting bracket

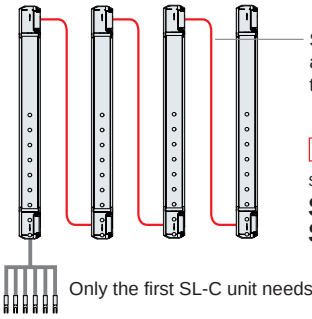
The Slim-mounting bracket (OP-51698) has no overhang on either side and only approx. 7mm (0.28") projection on the upper and lower ends. Total length doesn't exceed the protection zone, so there is no dead zone. The Slim mounting brackets rotate so adjusting the beam axis or angle is easy.



Slim mounting bracket : OP-51698

Wire-saving

When connecting in series, a maximum of 4 units can be controlled as one system. (192 beam axes max.)



Serial extension cables are available from 80mm (3.15") to 10m (32.8').

NEW

Serial extension cables

SL-S0 (Cable length 80mm 3.15")
SL-S10 (Cable length 10m 32.8')

Only the first SL-C unit needs to be wired.

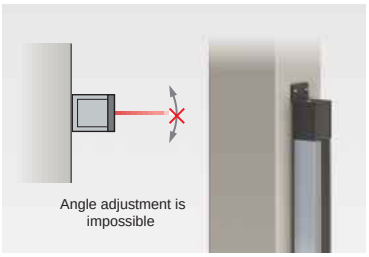
Round-body structure

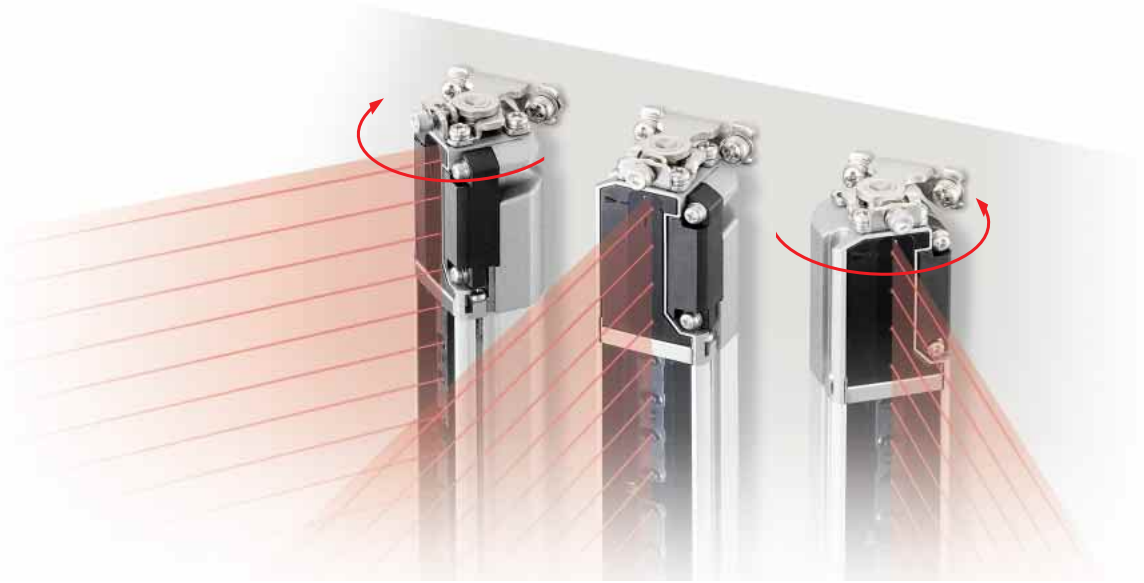
Conventional model

Square-shape sensors can't be adjusted for angle when mounted close to the equipment. It needs to be mounted at a distance from the equipment.

SL-C Series

The SL-C Series can be adjusted for angle even when mounted close to the equipment.





3 types of standard mounting brackets

KEYENCE offers 3 types of standard mounting brackets with rotating mechanisms. Using a combination of these 3 brackets allows the SL-C Series to be used with mounting holes originally intended for KEYENCE PJ-V Series light curtain and other manufacturer's light curtains.

C bracket : OP-42349

B bracket : OP-42348

A bracket : OP-42347

Simple adjustment of beam axes

With mounting brackets that rotate and the R-body (rounded body), you can freely adjust beam axes or angle after mounting. Also, readjustment of beam axes or angle is easy even when equipment is displaced.

No dead-zone mounting

When standard mounting brackets are installed inward, total length of the sensor doesn't exceed the protection zone. No longer any need to worry about the dead zone.

For edge-to-edge detection

E-to-E bracket

OP-42370

Mounted on the rear side, its rotating mechanism enables a fine alignment of beam axes or to set beam axes at an angle when used with the SL-M series corner mirrors.

L-shaped mounting bracket

OP-42371

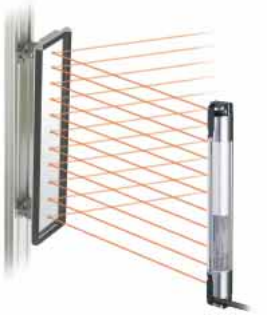
Easily create an L-shaped protection zone.

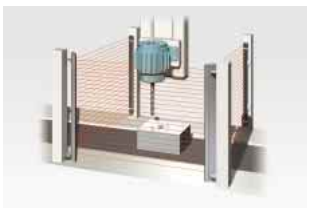
Options according to the site

Compact corner mirrors

(SL-M Series)

Multiple sides of a machine can be guarded with a single light curtain.





One SL-C Series unit and 2 SL-M corner mirrors protects 3 sides of a processing machine.

One SL-C and one SL-M can be used as a robot safety barrier.

Protective front cover

The cover protects the transmitter and the receiver. Available for all SL-C Series.

Protection bar (Dedicated for SL-CH Series)

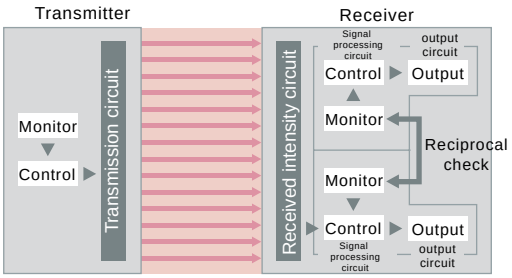
To protect the sensors from shock when taking workpieces in and out from equipment. The lightweight body allows easy mounting. The protection bars are available only for SL-CH Series.

Various functions to meet worldwide demands

The SL-C Series offers you high reliability and peace of mind

Each circuit and output is internally monitored for added protection.

The entire circuit is checked every 15ms to enable stable detection of errors and immediately stop the machine.



When an error occurs, the number of flashing red LED lamps indicates the nature of the error.

Each red LED lamp indicates the nature of the error

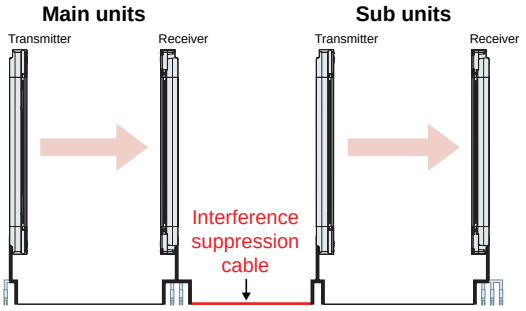
8. SL-R11 output errors
7. SL-C output errors*
6. Wiring errors
5. Mutual interference / Ambient light*
4. Transmission and received intensity error*
3. SL-R11 errors
2. Receiver error*
1. Transmitter error*

During normal operation, the LED lamps can be used as a reference for beam axes alignment.

*The other side will light the error number lamp and all lamps alternately.

Mutual interference prevention

When several light curtains are positioned together, interference may occur. Simply connect the interference suppression cable to use up to 4 units side by side. (192 beam axes max.)



Rugged

The enclosure is IP-65 rated. It is unaffected by harsh environments.

Compliance with international safety standards and regulations.

International safety standards and regulations

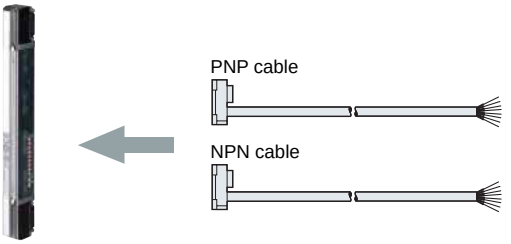
The SL-C Series of Type 4 safety light curtains complies with the following safety light curtain standards and meets the most stringent safety requirements as embodied in safety Category 4.

International standards	EN standards	UL standards	JIS standards
IEC61496-1and IEC61496-2	EN61496-1and prEN61496-2	UL61496-1and UL61496-2	JIS B9704-1and JIS B9704-2

CE TÜV c UL us LISTED ANSI OSHA JIS IEC

Both PNP/NPN outputs available

The SL-C Series offers both PNP/NPN outputs satisfying universal requirements.



Peripheral devices satisfy Category 4 safety Requirements

Dedicated power supply SL-U2

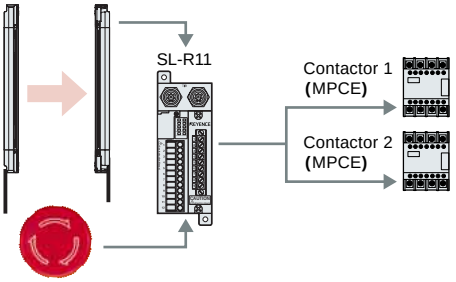
Safety relay unit SL-R11

Simple wiring

- Connecting the light curtains is easily done via a quick connector cable.
- With a separate terminal block, replacing the relay board doesn't require rewiring

Input for emergency stop button available

The E-STOP input cuts down on external components as well as labor required for system wiring, helping to trim the overall project cost.



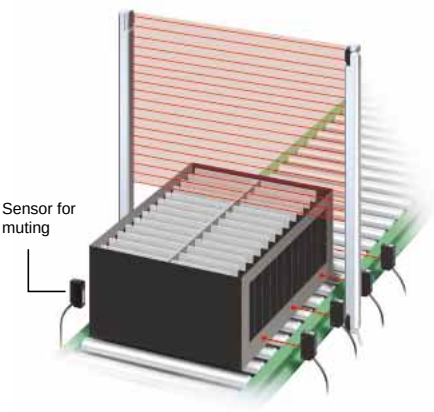
Application Unit SL-R12EX

(Dedicated for SL-CF/SL-CH Series)

SL-R11needed to use the SL-R12EX

Muting controller function

The muting controller function detects the entrance of a target and disables all or part of the beam axes so that the system will not stop operations. The beam axes to be disabled can be selected from up to 3 banks depending on the target size.



Status indicator
SL-R12D
It indicates the status of the light curtain, dedicated relay and application unit. When using the muting function, it can be used as a muting lamp.

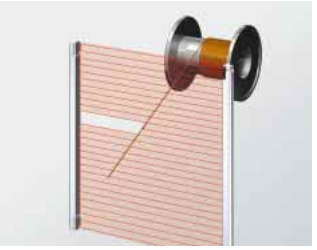
Blanking function

2 blanking types for a wide range of applications.

Fixed blanking function

Effective when obstacles are stationed in the detection area. With this function, you can operate the light curtain normally even if obstacles exist in the detection area.

Floating blanking function



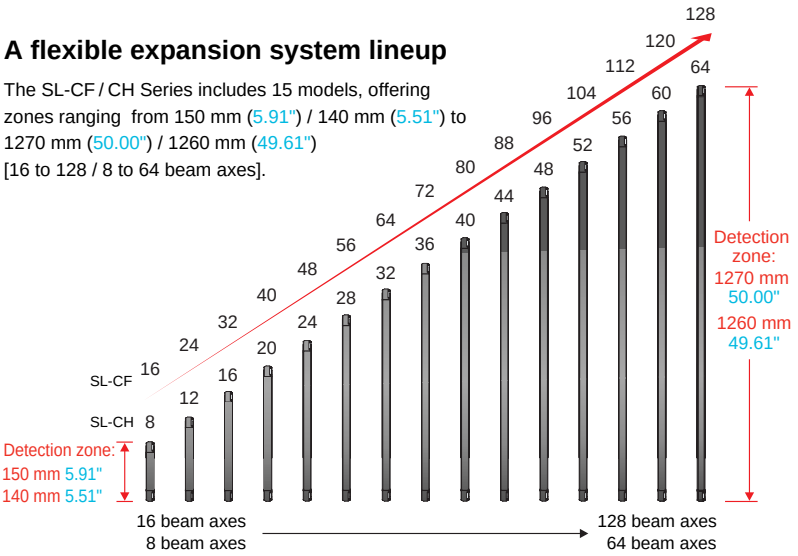
Effective for obstacles that move in the detection area. The curtain turns off only when more beam axes* than the preprogrammed number are blocked.

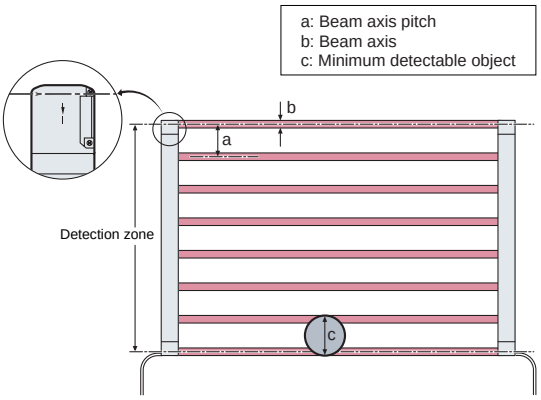
* Up to 3 beam axes.

SL-CF/CH variations

A flexible expansion system lineup

The SL-CF / CH Series includes 15 models, offering zones ranging from 150 mm (5.91") / 140 mm (5.51") to 1270 mm (50.00") / 1260 mm (49.61") [16 to 128 / 8 to 64 beam axes].





*Detection zone: Center distance between the top beam axis and the bottom beam axis.

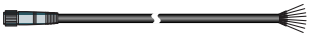
SL-CF Series (Minimum detectable object ϕ14mm 0.55", Beam axis pitch 10mm 0.39")

Model	Detecting distance	No. of beam axes	Total length (mm/inch)	Detection zone (mm/inch)
SL-C16F	0.1～7m 0.3' to 23.0'	16	160 6.30"	150 5.91"
SL-C24F		24	240 9.45"	230 9.06"
SL-C32F		32	320 12.60"	310 12.20"
SL-C40F		40	400 15.75"	390 15.35"
SL-C48F		48	480 18.90"	470 18.50"
SL-C56F		56	560 22.05"	550 21.65"
SL-C64F		64	640 25.20"	630 24.80"
SL-C72F		72	720 28.35"	710 27.95"
SL-C80F		80	800 31.50"	790 31.10"
SL-C88F		88	880 34.65"	870 34.25"
SL-C96F		96	960 37.80"	950 37.40"
SL-C104F		104	1040 40.94"	1030 40.55"
SL-C112F		112	1120 44.09"	1110 43.70"
SL-C120F		120	1200 47.24"	1190 46.85"
SL-C128F		128	1280 50.39"	1270 50.00"

SL-CH Series (Minimum detectable object ϕ25mm 0.98", Beam axis pitch 20mm 0.79")

Model	Detecting distance	No. of beam axes	Total length (mm/inch)	Detection zone (mm/inch)
SL-C08H	0.3～9m 0.98' to 29.5'	8	150 5.91"	140 5.51"
SL-C12H		12	230 9.06"	220 8.66"
SL-C16H		16	310 12.20"	300 11.81"
SL-C20H		20	390 15.35"	380 14.96"
SL-C24H		24	470 18.50"	460 18.11"
SL-C28H		28	550 21.65"	540 21.26"
SL-C32H		32	630 24.80"	620 24.41"
SL-C36H		36	710 27.95"	700 27.56"
SL-C40H		40	790 31.10"	780 30.71"
SL-C44H		44	870 34.25"	860 33.86"
SL-C48H		48	950 37.40"	940 37.01"
SL-C52H		52	1030 40.55"	1020 40.16"
SL-C56H		56	1110 43.70"	1100 43.31"
SL-C60H		60	1190 46.85"	1180 46.46"
SL-C64H		64	1270 50.00"	1260 49.61"

Cables

Model	Configuration	Specifications	included
SL-P7P		Main unit plug → Loose wires (7 m 22.97') PNP output	2 : For T and R
SL-P7N		Main unit plug → Loose wires (7 m 22.97') NPN output	2 : For T and R
SL-PC5P *1		Main unit plug → M12 connector (5 m 16.40') PNP output	2 : For T and R
SL-PC5N		Main unit plug → M12 connector (5 m 16.40') NPN output	2 : For T and R
SL-PC10P *1		Main unit plug → M12 connector (10 m 32.81') PNP output	2 : For T and R
SL-CC10PT *1		M12 connector → M12 connector (10 m 32.81') PNP output Transmitter	1 : For T only
SL-CC10PR *1		M12 connector → M12 connector (10 m 32.81') PNP output Receiver	1 : For R only
SL-CC10NT		M12 connector → M12 connector (10 m 32.81') NPN output Transmitter	1 : For T only
SL-CC10NR		M12 connector → M12 connector (10 m 32.81') NPN output Receiver	1 : For R only
SL-C5P		M12 connector → Loose wires (5 m 16.40') PNP output	2 : For T and R
SL-C5N		M12 connector → Loose wires (5 m 16.40') NPN output	2 : For T and R
SL-S0		Serial expansion cable (80 mm 0.26')	2 : For T and R
SL-S1		Serial expansion cable (0.15 m 0.49')	2 : For T and R
SL-S2		Serial expansion cable (0.5 m 1.6')	2 : For T and R
SL-S3		Serial expansion cable (3 m 9.84')	2 : For T and R
SL-S4		Serial expansion cable (1 m 3.28')	2 : For T and R
SL-S10		Serial expansion cable (10 m 32.81')	2 : For T and R

*1 Use PNP type to connect with the SL-R11.
* When using a connector cable as an extension, PNP and NPN type cables cannot be used in combination.
* Total length of cable can be 30m 98.4' max. excluding the length of serial extension cable.
* When connecting expansion units in series with SL-S10, 2 units are max. Total length of cable including the length of serial extension cables can be 43m 141.1' max.

Mounting brackets

Model	Name	Explanation
OP-51698	Slim mounting bracket	For space-saving mounting with rotating mechanism. One set contains 2 brackets.
OP-42347	Standard mounting bracket A	Standard mounting brackets with rotating mechanisms. Select a model based on the position of the mounting holes. One set contains 2 brackets.
OP-42348	Standard mounting bracket B	
OP-42349	Standard mounting bracket C	
OP-42370	Edge-to-Edge bracket	Holds the sensor in place from the side. One set contains 2 brackets
OP-42371	L-shaped mounting bracket	Useful in L-shaped installations. One set contains 2 brackets.

* 2sets(4 brackets) are needed for mounting SL-C (Transmitter and Receiver).

Peripheral devices

Model	Type
SL-R11	Intelligent Safety Relay Unit
SL-U2	SL-C/R Dedicated Power Supply
SL-R12EX	Muting / Blanking unit
SL-R12D	Status indicator
OP-42380	SL-R12D connecting cable 1.5m 4.9'
OP-42381	SL-R12D connecting cable 3m 9.8'
OP-42382	SL-R12D connecting cable 5m 16.4'
OP-42383	SL-R12D connecting cable 10m 32.8'

Other options

Model	Name	Explanation
OP-42365	SL-R11 light interference prevention connector	Makes a light interference prevention connection between 2 SL-R11 units.
OP-42372	Replacement relay board	Replacement SL-R11 relay board.
OP-42373	Intermediate support bracket	Included with models of total length at least 710mm 27.95". One set contains 2 brackets.

Compact corner mirrors

Model	Length of reflective surface (mm/inch)	Compatible SL-C Series	Detecting distance when using SL-C Series				Environmental specifications		Material	Weight (including mounting brackets)	Accessories
			With 1 mirror	With 2 mirrors	With 3 mirrors	With 4 mirrors	Ambient temperature	Relative humidity			
SL-M12H	278 10.94"	SL-C Series that has shorter total length than that of the reflective surface	SL-CH: 8.1m 26.6' SL-CF: 6.3m 20.7'	SL-CH: 7.2m 23.6' SL-CF: 5.6m 18.4'	SL-CH: 6.5m 21.3' SL-CF: 5.1m 16.7'	SL-CH: 5.9m 19.4' SL-CF: 4.6m 15.1'	-10 to +55 °C 14 to 131 °F (No freezing)	35 to 95% (No condensation)	Mirror: Back surface mirror Case: Aluminum Mounting bracket: Stainless steel	Approx. 1.4kg	Mounting brackets (2 pcs.)
SL-M16H	358 14.09"									Approx. 1.6kg	
SL-M20H	438 17.24"									Approx. 1.8kg	
SL-M24H	518 20.39"									Approx. 2.0kg	
SL-M28H	598 23.54"									Approx. 2.2kg	
SL-M32H	678 26.69"									Approx. 2.4kg	
SL-M36H	758 29.84"									Approx. 2.6kg	
SL-M40H	838 32.99"									Approx. 2.8kg	
SL-M44H	918 36.14"									Approx. 3.0kg	
SL-M48H	998 39.29"									Approx. 3.2kg	
SL-M52H	1078 42.44"									Approx. 3.7kg	Mounting brackets (3 pcs.)
SL-M56H	1158 45.59"									Approx. 3.9kg	
SL-M60H	1238 48.74"									Approx. 4.1kg	
SL-M64H	1318 51.89"									Approx. 4.3kg	

Protective covers for SL-CH

Compatible model	Protective front cover	Protection bar	Dark filter
SL-C08H	**OP-51454**	**OP-42350**	OP-51469
SL-C12H	**OP-51455**	**OP-42351**	—
SL-C16H	**OP-51456**	**OP-42352**	OP-51470
SL-C20H	**OP-51457**	**OP-42353**	—
SL-C24H	**OP-51458**	**OP-42354**	OP-51471
SL-C28H	**OP-51459**	**OP-42355**	—
SL-C32H	**OP-51460**	**OP-42356**	OP-51472
SL-C36H	**OP-51461**	**OP-42357**	—
SL-C40H	**OP-51462**	**OP-42358**	—
SL-C44H	**OP-51463**	**OP-42359**	—
SL-C48H	**OP-51464**	**OP-42360**	OP-51473
SL-C52H	**OP-51465**	**OP-42361**	—
SL-C56H	**OP-51466**	**OP-42362**	—
SL-C60H	**OP-51467**	**OP-42363**	—
SL-C64H	**OP-51468**	**OP-42364**	OP-51474

*Refer to P12 for detecting distance when using the protective front cover or dark filter. Dark filters need to be mounted on the protective front cover.
*All protective covers are 1 piece each set. 2 sets are needed when fitted to both transmitter and receiver.

Protective cover for SL-CF

Compatible model	Protective front cover
SL-C16F	**OP-66800**
SL-C24F	**OP-66801**
SL-C32F	**OP-66802**
SL-C40F	**OP-66803**
SL-C48F	**OP-66804**
SL-C56F	**OP-66805**
SL-C64F	**OP-66806**
SL-C72F	**OP-66807**
SL-C80F	**OP-66808**
SL-C88F	**OP-66809**
SL-C96F	**OP-66810**
SL-C104F	**OP-66811**
SL-C112F	**OP-66812**
SL-C120F	**OP-66813**
SL-C128F	**OP-66814**

*All protective covers are 1 piece each set. 2 sets are needed when fitted to both transmitter and receiver.

SL-CF Series (Minimum detectable object ϕ14mm 0.55", Beam axis pitch 10mm 0.39")

Model		SL-C16F	SL-C24F	SL-C32F	SL-C40F	SL-C48F	SL-C56F	SL-C64F	SL-C72F
No. of beam axes		16	24	32	40	48	56	64	72
Minimum detectable object		ϕ14mm (0.55") (when blanking function is not used)							
Beam axis pitch/Lens diameter		10mm 0.39"/ϕ4mm 0.16"							
Detection zone		150mm 5.91"	230mm 9.06"	310mm 12.20"	390mm 15.35"	470mm 18.50"	550mm 21.65"	630mm 24.80"	710mm 27.95"
Current consumption	Transmitter	61mA	67mA	73mA	79mA	85mA	91mA	97mA	103mA
	Receiver	66mA	69mA	73mA	76mA	80mA	83mA	87mA	90mA
Weight	Transmitter	Approx. 180g	Approx. 230g	Approx. 285g	Approx. 335g	Approx. 395g	Approx. 440g	Approx. 490g	Approx. 540g
	Receiver	Approx. 195g	Approx. 255g	Approx. 310g	Approx. 370g	Approx. 425g	Approx. 480g	Approx. 540g	Approx. 595g

Model		SL-C80F	SL-C88F	SL-C96F	SL-C104F	SL-C112F	SL-C120F	SL-C128F
No. of beam axes		80	88	96	104	112	120	128
Minimum detectable object		ϕ14mm (0.55") (when blanking function is not used)						
Beam axis pitch/Lens diameter		10mm 0.39"/ϕ4mm 0.16"						
Detection zone		790mm 31.10"	870mm 34.25"	950mm 37.40"	1030mm 40.55"	1110mm 43.70"	1190mm 46.85"	1270mm 50.00"
Current consumption	Transmitter	109mA	115mA	121mA	127mA	133mA	139mA	145mA
	Receiver	94mA	97mA	100mA	104mA	107mA	111mA	114mA
Weight	Transmitter	Approx. 590g	Approx. 645g	Approx. 695g	Approx. 745g	Approx. 800g	Approx. 850g	Approx. 900g
	Receiver	Approx. 655g	Approx. 710g	Approx. 765g	Approx. 825g	Approx. 880g	Approx. 940g	Approx. 995g

SL-CH Series (Minimum detectable object ϕ25mm 0.98", Beam axis pitch 20mm 0.79")

Model		SL-C08H	SL-C12H	SL-C16H	SL-C20H	SL-C24H	SL-C28H	SL-C32H	SL-C36H
No. of beam axes		8	12	16	20	24	28	32	36
Minimum detectable object		ϕ25mm (0.98") (when blanking function is not used)							
Beam axis pitch/Lens diameter		20mm 0.79"/ϕ5mm 0.20"							
Detection zone		140mm 5.51"	220mm 8.66"	300mm 11.81"	380mm 14.96"	460mm 18.11"	540mm 21.26"	620mm 24.41"	700mm 27.56"
Current consumption	Transmitter	55mA	58mA	61mA	62mA	68mA	71mA	74mA	77mA
	Receiver	67mA	69mA	71mA	73mA	76mA	78mA	81mA	83mA
Weight	Transmitter	Approx. 165g	Approx. 210g	Approx. 255g	Approx. 300g	Approx. 345g	Approx. 390g	Approx. 435g	Approx. 480g
	Receiver	Approx. 180g	Approx. 230g	Approx. 280g	Approx. 330g	Approx. 380g	Approx. 430g	Approx. 480g	Approx. 530g

Model		SL-C40H	SL-C44H	SL-C48H	SL-C52H	SL-C56H	SL-C60H	SL-C64H
No. of beam axes		40	44	48	52	56	60	64
Minimum detectable object		ϕ25mm (0.98") (when blanking function is not used)						
Beam axis pitch/Lens diameter		20mm 0.79"/ϕ5mm 0.20"						
Detection zone		780mm 30.71"	860mm 33.86"	940mm 37.01"	1020mm 40.16"	1100mm 43.31"	1180mm 46.46"	1260mm 49.61"
Current consumption	Transmitter	81mA	84mA	87mA	91mA	94mA	97mA	100mA
	Receiver	86mA	88mA	90mA	93mA	95mA	97mA	100mA
Weight	Transmitter	Approx. 525g	Approx. 570g	Approx. 615g	Approx. 660g	Approx. 705g	Approx. 750g	Approx. 860g
	Receiver	Approx. 575g	Approx. 625g	Approx. 675g	Approx. 725g	Approx. 775g	Approx. 825g	Approx. 945g

Safety Relay Unit SL-R11

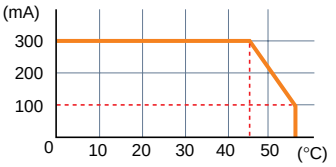
Model			SL-R11
Compatible sensor			SL-C Series
Rating	Power supply voltage		24V DC 10% ripple (P-P) 10% max.
	Current consumption		150mA max. (for SL-R11 only)
Output	FSD1, 2		230 V AC 4 A, 30 V DC 2 A (resistive load) 230 V AC 2 A, 30 V DC 1 A (cos ϕ=0.3) (inductive load)
	AUX		125 V AC 0.5 A, 30 V DC 2 A (resistive load) 125 V AC 0.25 A, 30 V DC 1 A (cos ϕ=0.3) (inductive load)
	Service life		Mechanical life: 10 million times min. Electrical life: 100,000 times min.
Response time	FSD1, 2, AUX		24ms (including sensor response time)*2
Response time during	E-STOP input		20 ms
Environmental specifications	Enclosure rating		IP-20 (IEC60529) (Install in control panels which is equal to or greater than IP-54)
	Ambient temperature		-10 to +55 °C 14 to 131 °F
	Storage ambient temperature		-10 to +60 °C 14 to 140 °F
	Relative humidity		35 to 85% RH (No condensation)
	Storage ambient humidity		35% to 95%RH
	Vibration		10 to 55 Hz double amplitude width 0.7 mm, 20 sweeps each for X, Y, Z directions
	Shock		100 m/s² (Approx. 10G) 16ms pulse, in X, Y, Z directions 1,000 times each axis
Material			Polycarbonate
Weight			Approx. 380 g
Approved standards*1	EMC	EMS	IEC61496-1, EN61496-1, UL61496-1
		EMI	EN55011 Class A, FCC Part 15 Class A
	Safety		IEC61496-1, EN61496-1, UL61496-1 (type 4 ESPE)
			IEC61496-2, prEN61496-2, UL61496-2 (type 4 AOPD)
			EN50178, UL508

*1 Evaluated in combination with the SL-C Series *2 The OFF→ON return time is 150 ms.

Common specifications of SL-C Series

Model			SL-C Series
Detecting distance	(SL-CF Series)		0.1 to 7m 0.3' to 23.0'
	(SL-CH Series)		0.3 to 9m 0.98' to 29.5'
Effective aperture angle			±2.5°max. (When detecting distance is at least 3m 9.8')
Response speed			15ms*1
Light source			Infrared LED (850nm)
Operating form			ON when all beam axis entering (when blanking function is not used)
Ratings	Supply voltage		24VDC±10 %(Ripple P-P 10% or less)
OSSD output	Output type		2 outputs each for PNP and NPN can be switched using the connection connector cable
	Maximum load current		300mA*2
	Residual voltage (ON time)		2.5V (with a cable length of 7m 23.0')
	Leakage current		100μA max. *3
	Maximum load capacity		2.2μF (when load resistance 100Ω)
	Wiring load resistance		2.5Ω max. *4
Environmental specifications	Enclosure rating		IP65 (IEC60529)
	Ambient temperature		-10 to 55°C (14 to 131°F) (No freezing)
	Storage ambient temperature		-10 to 60°C (14 to 140°F) (No freezing)
	Relative humidity		35 to 85% RH (No condensation)
	Storage ambient humidity		35 to 95%
	Ambient light		Incandescent lamp: 5,000 lux max. Sunlight 20,000 lux max.
	Vibration		10 to 55Hz, 0.7mm 0.03" double amplitude, 20 sweeps each in X, Y and Z directions
	Shock		100m/s² (Approx. 10G), 16ms pulse 1,000 iterations each in X, Y and Z directions
Material	Main unit case		Aluminum
	Upper case/Lower case		Zinc die-cast
	Front cover		Polycarbonate
Applied standards	EMC	EMS	IEC61496-1,EN61496-1,UL61496-1
		EMI	EN55011 Class A, FCC Part15 Class A
	Safety		IEC61496-1, EN61496-1, UL61496-1 (type 4 ESPE)
			IEC61496-2, UL61496-2, prEN61496-2 (type 4 AOPD)
			UL508

*1 OFF → ON return time is 125 ms.
*2 Note the derating illustrated in the graph to the right when using PNP output.
*3 Including when the power supply of SL-C Series is OFF or power supply line is disconnected.
*4 To operate 4 SL-C Series properly, make sure that wiring resistance between OSSD output and connecting device (excluding wiring resistance of optional cables) is 2.5Ω max.



Power supply unit SL-U2

Model			SL-U2
System			Switching type
Input power supply voltage			AC 100 to 240 V 10 % (50/60 Hz)
Overvoltage category			II
Output voltage			DC 24 V 10 %, Class 2
Ripple/noise			240 mVp-p or less
Output capacity			1.8 A (total of supply to various units and service power supplies)
Environmental specifications	Ambient temperature		-10 °C to +55 °C (14 to 131°F)
	Relative humidity		35 % to 85 % RH (non-condensation)
Pollution degree			2
Dielectric strength			AC 1,500 V, 1 min. (between all external terminals and case)
Vibration resistance			10 to 55 Hz, 0.7 mm 0.03" compound amplitude, 20 sweeps each in X, Y, and Z directions
Shock resistance			100 m/s(Approx.10G), 1,000 iterations each in X, Y, and Z directions
Insulation resistance			At least 50 MΩ (DC 500 V mega, between all external terminals and case)
Power consumption			135 VA
Supply voltage interruption			10 ms or less
Weight (excluding dedicated brackets)			Approx. 240 g
Applied standards	EMC	EMS	IEC61496-1, EN61496-1, UL61496-1
		EMI	IEC61000-3-2, EN61000-3-2, EN55011 Class A, FCC Part15 Class A
	Safety		EN60950, EN50178, UL60950, UL508

Application Unit SL-R12EX

Model (Name)			SL-R12EX (Intelligent extension unit)
Power supply			Supplied by SL-R11 or SL-U2
Current consumption			110mA max. (including DC24V, SL-R12D)
Input	Muting input	Maximum input voltage	26.4VDC
		Input rating	24VDC 2.3mA
		Threshold voltage (ON)	19V
		Threshold current (OFF)	0.5mA
		Common ground	A common for A1 and A2, a common for B1 and B2
	Bank selection input	Maximum input voltage	26.4VDC
		Input rating	24VDC 1.6mA
		Threshold voltage (ON)	19V
		Threshold current (OFF)	0.5mA
		Common ground	A common for A1, A2 and A3, a common for B1, B2 and B3
		Allowance for 2 inputs timing gap	200ms max.
Output for muting lamp			24VDC 15mA to 300mA
Enclosure rating			IP20(IEC60529) Mount in a control panels at least IP54
Environmental specifications	Ambient temperature		-10 to 55 °C (14 to 131°F) (No freezing)
	Relative humidity		35 to 85% RH (No condensation)
	Vibration		10 to 55Hz, 0.7mm 0.03" double amplitude, 20 sweeps each in X, Y and Z directions
	Shock		100m/s² (Approx. 10G), 16ms pulse 1,000 iterations each in X, Y and Z directions
Material			Polycarbonate
Weight			Approx. 300g

Detecting distance

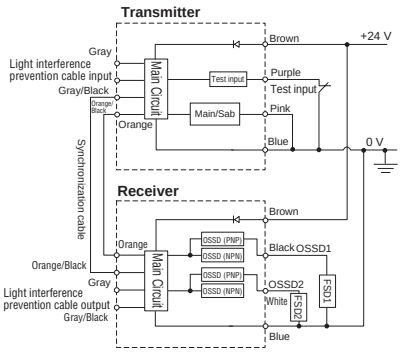
when using the Protective front cover or dark filter

No. of protective front covers	No. of dark filters	Detecting distance of SL-CH (mm/inch)
1	0	8.5 0.33"
	1	6.5 0.26"
	2	5 0.20"
2	0	8 0.31"
	1	6 0.24"
	2	4.5 0.18"
	3	3.5 0.14"
	4	2.5 0.10"

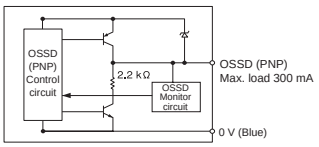
*For each transmitter and receiver, a protective front cover can be mounted on. 2 dark filters can be mounted on 1 protective front cover.

Circuits

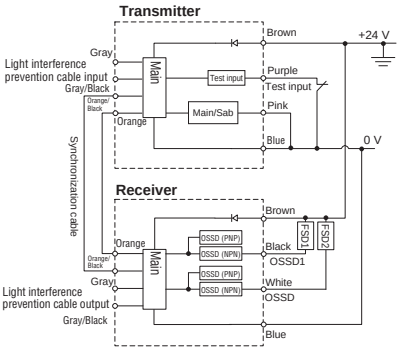
PNP



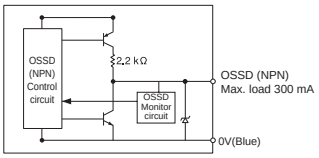
PNP output circuit



NPN

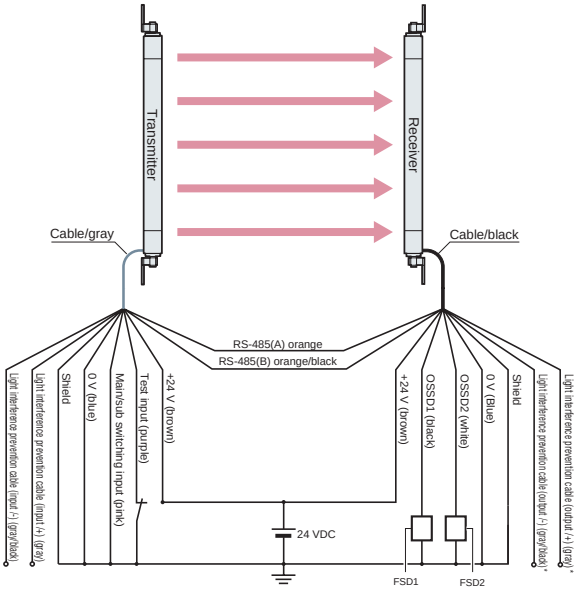


NPN output circuit

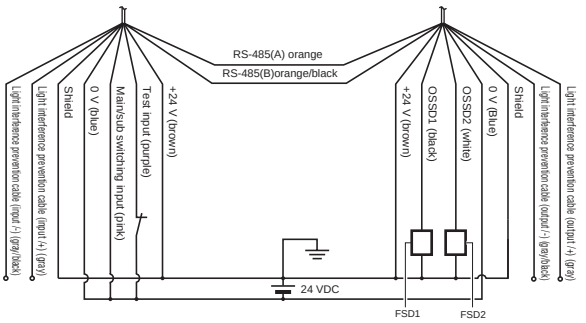


Light curtain connection diagram

For PNP output



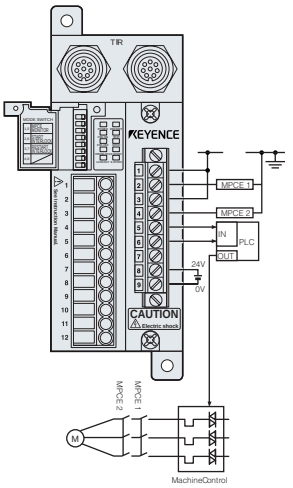
For NPN output



Wiring diagram for Category 4 compatibility (when using the SL-R11)

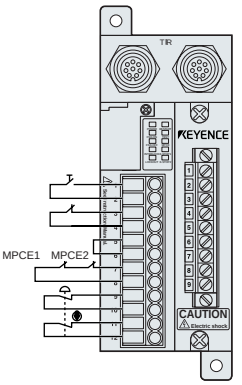
Output terminals

Terminal No.	Name
1, 2	FSD1
3, 4	FSD2
5, 6	AUX
7	Not used
8	+ 24V
9	0 V



Input terminals

Terminal No.	Name
1, 2	Start / Restart input
3, 4	TEST input
5, 6	M/S SELECT input
7, 8	MPCE MONITOR input
9, 10	E-STOP1 input
11, 12	E-STOP2 input



Use the safety light curtain properly.

Be sure to read the included instruction manual for detailed product usage information.

About Standards and Regulations

1 The SL-C/SL-R11 is a safety component as established by the European Union's Machinery Directive Annex IV Clause B. The SL-C/SL-R11 complies with the following Directives and European Standards and has been certified by TÜV Product Service GmbH.

EU Directives

- EU Machinery Directive (98/37/EC)
- EU EMC Directive (89/336/EEC)
- EU Low-voltage Directive (73/23/EEC) *only when using the SL-R11

European Standards

- EN61496-1 (Type 4 ESPE - Electro-sensitive Protective Equipment)
- EN55011
- EN50178 *only when using the SL-R11

2 The SL-C Series/SL-R11 complies with the following International Standards and has been certified by TÜV Product Service GmbH.

- IEC61496-1(Type 4 ESPE - Electro-sensitive Protective Equipment)
- IEC61496-2 (Type 4 AOPD - Active Opto-electronic Protective Device)

3 The SL-C Series/SL-R11 complies with the following UL (Underwriters Laboratories Inc.) and international standards and has been certified for Canada-U.S. Listing by UL.

- UL61496-1 (Type 4 ESPE - Electro-sensitive Protective Equipment)
- UL61496-2 (Type 4 AOPD - Active Opto-electronic Protective Device)
- IEC61496-1 (Type 4 ESPE - Electro-sensitive Protective Equipment)
- IEC61496-2 (Type 4 AOPD - Active Opto-electronic Protective Device)

4 The SL-C Series/SL-R11 has not received the model certification examination in accordance with Article 44-2 of the Japanese Industrial Safety and Health Law. As a result, the SL-C Series/SL-R11 cannot be used in Japan as a “Safety Devices for Presses and Shearing Machines” as established in Article 42 of that law.

5 The SL-C Series and SL-R11 have been designed in consideration of the following standards and regulations. For details regarding the following standards, contact the third-party certification organization, such as UL or TÜV.

Corresponding standards

- EN954-1
- IEC/EN60204-1
- EN415-4
- prEN691
- EN692
- EN693
- OSHA 29 CFR 1910.212
- OSHA 29 CFR 1910.217
- ANSI B11.1 - B.11.19
- ANSI/RIA R15.06-1999
- SEMI S2-0200
- “Guidelines for Comprehensive Safety Standards of Machinery”, June 1, 2001, number 501 issued by Ministry of Health, Labor, and Welfare in Japan.

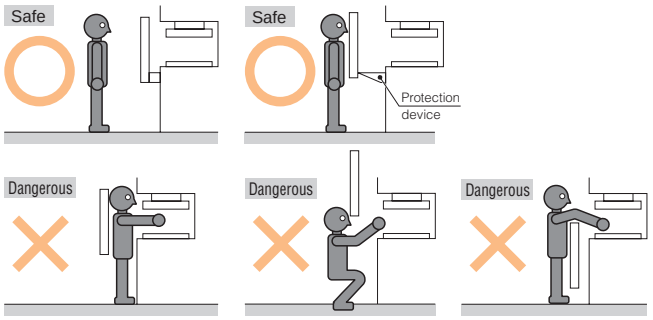
Installation and Assembly

Correct position

- The hazardous zone or hazards within the machine are accessible only through the SL-C detection zone.
- While machine is running, the machine operator's body always stays on the opposite side to the hazardous zone or hazard.

Incorrect installation

- A machine operator can access the hazardous zone or hazards without passing through the SL-C detection zone.
- The operator's body stays in between the SL-C detection zone and hazardous zone or hazard while machine is running.



WARNING

If operators are not protected from hazards by the SL-C in the entire hazardous zone, always add a safety protective equipment such as a safety guard to the portion of the hazardous zone that is not covered by the SL-C. Also, install the SL-C so that machine operators can access the hazardous zone or hazards only by passing through the SL-C's detection zone or protection zone. In other words, do not install the SL-C in a layout that allows machine operators to enter between the SL-C and the machine's hazardous zone or hazards without being detected by SL-C or access the machine's hazardous zone or hazards by bypassing the SL-C's detection zone. If these warnings are violated, it may result in a serious harm, such as an injury or death.

Be sure to separate the sensor and the hazardous zone by the safety distance (S) when installing the SL-C Series.

<Example 1: Safety distance calculation according to EN999-1999 (for normal approach into detection zone)>

Formula: S = K x T + C..... (A)

S: Safety distance (mm)
K: Approaching speed of the body or the parts of body into detection zone (mm/s)
T: Overall response time (s) (T= t1 + t2)
t1: SL-C Series maximum response time (15 ms)
t2: Maximum time required by machine to stop after receiving signal from protective equipment (SL-C)
C: Additional distance (mm) calculated from the SL-C Series detection capability.

Calculation example for a detection capability of 40 mm (1.57") or less

The safety distance is calculated using Formula (A) and the parameters established in EN999 with K = 2,000 mm/s and C = 8 (d - 14 mm (0.55")). C is a value determined from the d: SL-C Series detection capability diameter (mm) and must be equal or greater than 0.

S = 2,000 mm 78.74"/s x (t1 + t2) + 8 (d - 14 mm 0.55")..... (B)
When t1 = 15 ms, t2 = 50 ms, d = 25 mm (0.98"):
S = 2,000 mm 78.74"/s x (0.015 s + 0.05 s) + 8 (25 mm (0.98") - 14 mm (0.55"))
= 218 mm (8.58")

* The safety distance calculated using Formula (B) above must be greater than or equal to 100 mm (3.94") and less than or equal to 500 mm (19.69"). When the calculated safety distance is less than 100 mm (3.94"), use a safety distance of S = 100 mm (3.94"). Accordingly, the safety distance acquired from Formula (B) above is S = 218 mm (8.58"). (From EN999 Clause 6.1.1)

  If on the other hand the safety distance calculated using Formula (B) above exceeds 500 mm (19.69"), set K = 1,600 mm (62.99")/s and calculate the safety distance again using Formula (A).

  S = 1,600 mm (62.99")/s x (t1 + t2) + 8 (d - 14 mm (0.55"))..... (C) When t1 = 15 ms, t2 = 300 ms, d = 25 mm (0.98"):

  S = 1,600 mm (62.99")/s x (0.015 s + 0.3 s) + 8 (25 mm (0.98") - 14 mm (0.55")
  = 592 mm (23.31")

* The safety distance calculated using Formula C above must be greater than or equal to 500 mm (19.69"). When the calculated safety distance is less than 500 mm (19.69"), use a safety distance of S = 500 mm (19.69"). Accordingly, the safety distance acquired from Formula (C) above is S = 592 mm (23.31"). (From EN999 Clause 6.1.1)

* When the SL-C is being used in a non-industrial application, the minimum safety distance is calculated by adding 75 mm (2.95") to the result from Formula (B). Formula (C) cannot be used in this situation. Accordingly, when the SL-C is used in a non-industrial application, a safety distance of S = 218 mm (8.58") + 75 mm = 293 mm (11.54") is required.

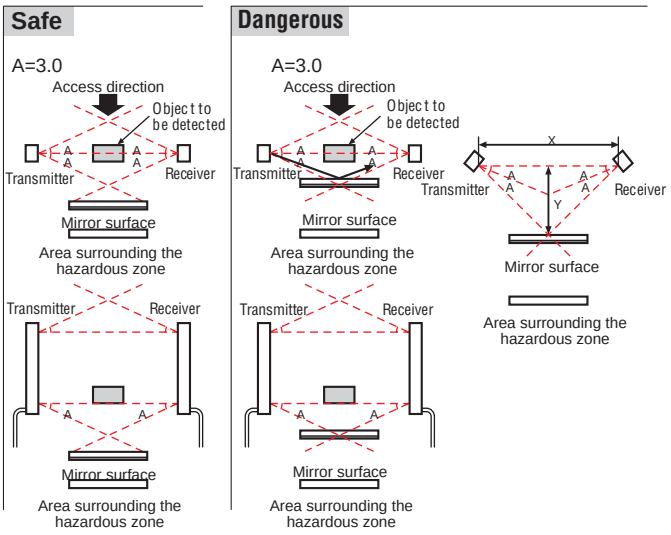
WARNING

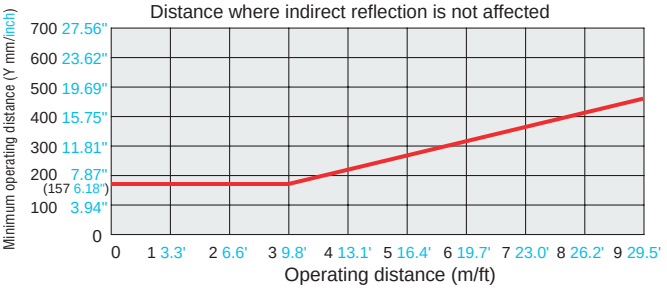
Calculate the safety distance accurately and be sure to position the SL-C so that it is separated from the machine's hazardous zone or hazard by at least the minimum safety distance. Installation of the SL-C closer to the hazardous zone or hazard than the minimum safety distance may result in significant harm to the machine operator, including death.

Installation distance from glossy surfaces

Installation Distance

If the ambient light is reflected by glossy surfaces around the SL-C, the SL-C Series may not operate correctly and it may not detect an object approaching the SL-C detection zone. To avoid such a problem, check the followings during an SL-C installation.





* Although the SL-C has the effective aperture angle of 2.5 degrees, use the value of 3.0 degrees considering beam axis deviations and other errors that may occur during an installation.
  The minimum distance (Y) from the detection zone to the reflection surface can be read from the above graph or determined using the following formula. The value Y of this formula is determined assuming the worst case scenario that beam axis misalignments occur both on the transmitter and the receiver.

Calculating the minimum distance Y

If X (operating distance (mm)) > 3000 (118.11"):
Y=X x tan3°≒0.052X (Effective aperture angle) [X=Operating distance]
If X (operating distance (mm)) ≦ 3000 (118.11"):
Y=157 (6.18")

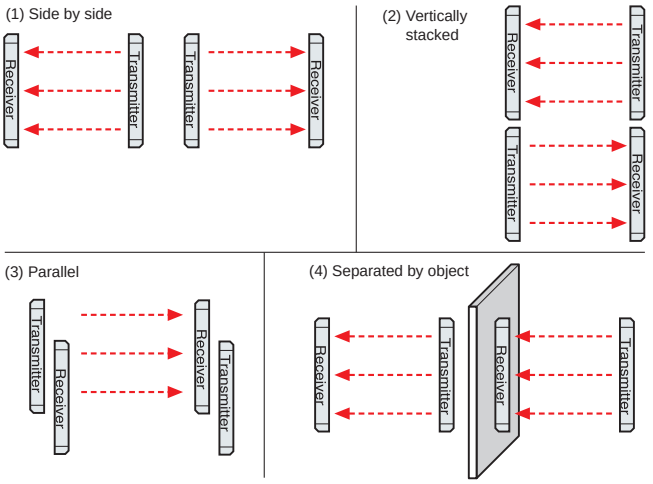
WARNING

The SL-C must be installed in a position not affected by reflections from glossy surfaces (Light Interference). If there is any glossy surface near the SL-C, cover such a surface with a black sheet or apply delustering. Make sure that no reflection light reaches the SL-C. Otherwise, the SL-C may malfunction due to light reflected by the glossy surface and serious harm, such as an injury or death of a machine operator, may result.

Light Interference Prevention Method

This section explains how to install multiple SL-C units without using the light interference prevention cables prescribed in the instruction

Sensor installation location examples

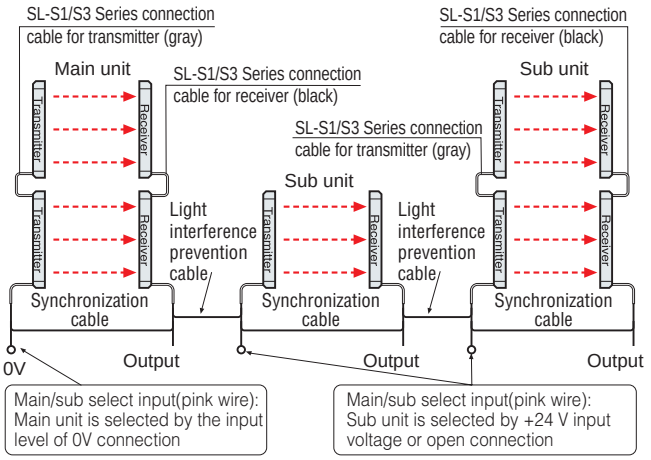


WARNING

To mount more than or equal to 2 sets of SL-C Series without using the light interference prevention cable specified in the instruction manual, install the SL-C Series as shown in the above diagrams, and then use “Checklist” provided in the instruction manual to make sure the SL-C Series operates properly. Not following this installation method could result in serious harm, such as serious injury or death of the machine operator.

Serial connections and light interference prevention connections

Both serial connections and light interference prevention connections can accommodate up to 4 units. In addition, serial connections and light interference prevention connections can be used in combination, as indicated in the diagram below.
This function is valid if the number of SL-C Series in series connection and connected via an light interference prevention cable is 12 or less, and if the total number of beam axes is 192 or less. The response time of the SL-C is not affected by this combination of series connections and light interference prevention connections.

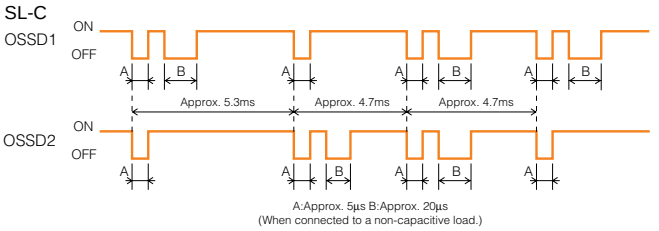


WARNING

- Use the series connection cables provided by KEYENCE only. Otherwise, the SL-C Series may not operate normally and serious harm, such as an injury or death of a machine operator may result.
- Use 2-wire shielded cable that is at least AWG #22 (nominal cross-sectional area of 0.3mm^2) for interference prevention connections. Also, use shielded that has the same electric potential as that being used for the SL-C itself) Otherwise, the SL-Cs may not operate normally and a serious harm, such as an injury or death of machine operator, may result.
- When using 2 or more sets of SL-C Series without using the above-mentioned series connection, a light interference prevention connection, or a combination of both, see “Light Interference Prevention Method” and install the SL-Cs correctly to prevent light interference.
  Responsible personnel shall perform an operational -check after the SL-C Series has been installed to ensure the absence of light interference.
  If the SL-C Series are not connected in accordance with the provisions in instruction manual, the SL-C Series will not operate normally without light interference, which could result in a serious harm, including serious injury or death.

Waveforms of control output OSSD

The SL-C performs a self-diagnosis test for the output circuit when all beam axes are clear of any obstruction and the OSSD is in the ON-state. This self-diagnosis function periodically turns OFF the OSSD output. The OSSD output is monitored by the SL-C Series and, if the OFF state signal is fed back, the SL-C determines that the output circuit operates normally.
On the other hand, if the OFF state signal is not fed back, the SL-C determines that an error has occurred in the output circuit or wirings and goes to lockout condition.
For this reason, all the other devices used to receive the SL-C Series OSSD output must be of the type that does not respond to this periodic off state.



Compatible power supply units other than the SL-U2

In order for the SL-C Series and the SL-R11 to meet the requirements of IEC61496-1, UL61496-1, and EN61496-1, use a power supply that meets all of the following conditions.

- Rated output voltage must be DC 24 V 10%.
- The power supply being used must be dedicated to the SL-C Series and SL-R11 and must not be used to supply power to other devices or equipment.
- The power supply output must meet the conditions for a Class 2 Circuit or a Limited Voltage/Current Circuit as stipulated by UL508.
- The power supply must comply with all laws, regulations, and standards relating to electric safety and electromagnetic emissions (EMC) in each country or area where the SL-C Series and SL-R11 are being used.
- The output hold time is 20 ms min.

Confirm the following if the Intelligent Extension Unit (SL-R12EX) is being used.

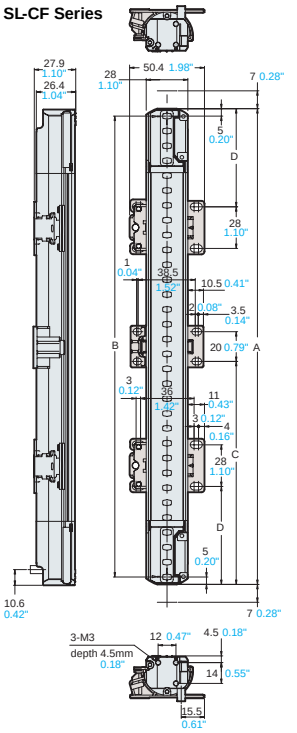
- When the Intelligent Extension Unit (SL-R12EX) is used to enable the floating blanking function, the minimum safety distance will be affected due to the fact that the function has a negative effect on the detection capability. Therefore, in such cases, calculate the minimum safety distance using the new value for detection capability with the floating blanking function enabled and apply the result for the SLC installation.
- When the Intelligent Extension Unit (SL-R12EX) is used to enable the fixed blanking function, additional safety measures must be implemented for the zone in which that function is enabled so that it is impossible to reach the hazardous zone or hazards of the machine by passing through that zone.
- Enabling the blanking blind protection function does not necessarily remove all hazardous zones allowing human approach. Depending on the target machine, installation of the blanking blind protection unit may result in the new creation of one or more hazardous zones allowing human approach. Carefully read this section before installing or using this unit. When installing the SL-C Series into/onto a machine, always follow the instructions in the SL-C Series Instruction Manual.
- The muting function deactivates the light curtain's safety functions while the light curtain detects the input signal from two or more muting devices (sensors, switches, etc.). The muting devices (sensors, switches, etc.) that are used to carry out the muting function as well as the method to install them must satisfy all conditions described in this instruction manual as well as the applicable requirements imposed by all laws, regulations, standards, and ordinances in effect in the country and region where the SL-R12EX is to be used. The muting lamp or the SL-R12D must be installed prior to carrying out the muting function on the SL-C Series. The muting lamp or the SL-R12D must be installed at the location where it can always be clearly and easily visible for the machine operators or the responsible personnel in case of normal machine operation, setting or alignment for muting or maintenance, etc.

Notice

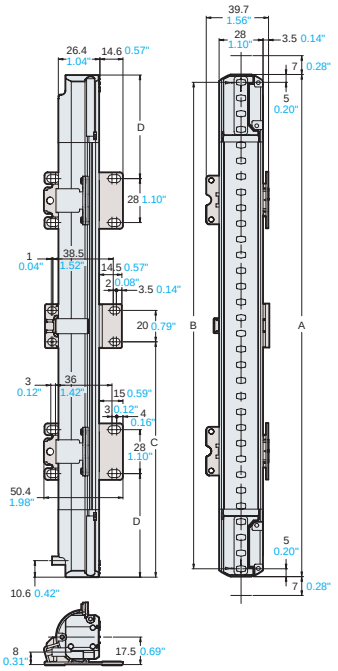
- The SL-R12EX is a dedicated control unit for the safety light curtain SL-C Series and intelligent safety relay unit SL-R11, so be sure to use it with the SL-C Series and the SL-R11 connected.
- The blanking blind protection function might be restricted according to the size of obstacles. Make sure to mount the SL-C Series and blanking blind protection unit as required. When using blanking blind protection function, be sure to contact to service office near you.

With the Edge-to-Edge mounting bracket installed

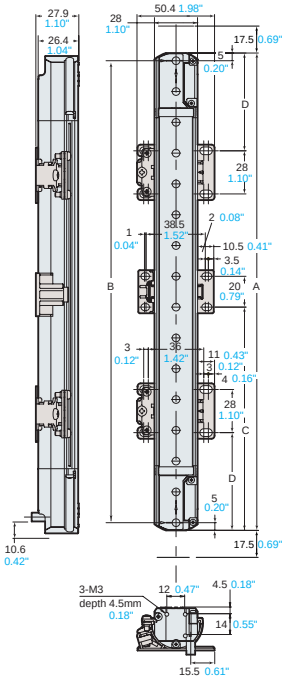
SL-CF Series



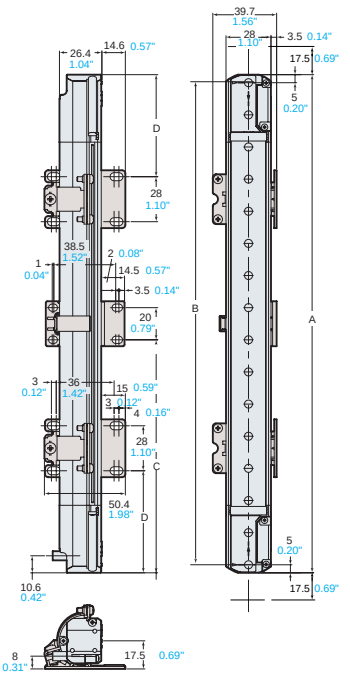
SL-CF Series



SL-CH Series



SL-CH Series



Dimensions by model

SL-CF Series

Model	No. of beam axes	Sensor length A	Detection zone B	Intermediate support bracket position C*	Intermediate support bracket position C1*	Intermediate support bracket position C2*	D
SL-C16F	16	160 6.30"	150 5.91"	—	—	—	45 1.77"
SL-C24F	24	240 9.45"	230 9.06"	—	—	—	45 to 66 1.77" to 2.64"
SL-C32F	32	320 12.60"	310 12.20"	—	—	—	45 to 93 2.64" to 3.66"
SL-C40F	40	400 15.75"	390 15.35"	—	—	—	45 to 119 3.66" to 4.69"
SL-C48F	48	480 18.90"	470 18.50"	—	—	—	45 to 146 4.69" to 5.75"
SL-C56F	56	560 22.05"	550 21.65"	—	—	—	45 to 173 5.75" to 6.81"
SL-C64F	64	640 25.20"	630 24.80"	—	—	—	45 to 199 6.81" to 7.83"
SL-C72F	72	720 28.35"	710 27.95"	350±80 13.78" ±3.15"	—	—	45 to 200 1.77" to 7.87"
SL-C80F	80	800 31.50"	790 31.10"	390±80 15.35" ±3.15"	—	—	
SL-C88F	88	880 34.65"	870 34.25"	430±80 16.93" ±3.15"	—	—	
SL-C96F	96	960 37.80"	950 37.40"	470±80 18.50" ±3.15"	—	—	
SL-C104F	104	1040 40.94"	1030 40.55"	510±80 20.08" ±3.15"	337±80 13.27" ±3.15"	683±80 26.89" ±3.15"	
SL-C112F	112	1120 44.09"	1110 43.70"	550±80 21.65" ±3.15"	363±80 14.29" ±3.15"	737±80 29.02" ±3.15"	
SL-C120F	120	1200 47.24"	1190 46.85"	590±80 23.23" ±3.15"	390±80 15.35" ±3.15"	790±80 31.10" ±3.15"	
SL-C128F	128	1280 50.39"	1270 50.00"	630±80 24.80" ±3.15"	417±80 16.42" ±3.15"	843±80 33.19" ±3.15"	

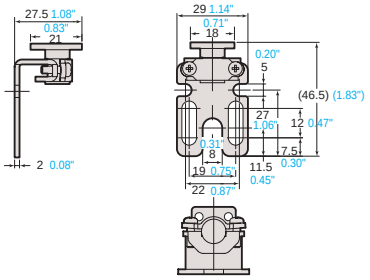
SL-CH Series

Model	No. of beam axes	Sensor length A	Detection zone B	Intermediate support bracket position C*	Intermediate support bracket position C1*	Intermediate support bracket position C2*	D
SL-C08H	8	150 5.91"	140 5.51"	—	—	—	43 1.69"
SL-C12H	12	230 9.06"	220 8.66"	—	—	—	43 to 63 1.69" to 2.48"
SL-C16H	16	310 12.20"	300 11.81"	—	—	—	43 to 89 1.69" to 3.50"
SL-C20H	20	390 15.35"	380 14.96"	—	—	—	43 to 116 1.69" to 4.57"
SL-C24H	24	470 18.50"	460 18.11"	—	—	—	43 to 143 1.69" to 5.63"
SL-C28H	28	550 21.65"	540 21.26"	—	—	—	43 to 169 1.69" to 6.65"
SL-C32H	32	630 24.80"	620 24.41"	—	—	—	43 to 196 1.69" to 7.72"
SL-C36H	36	710 27.95"	700 27.56"	345±80 13.58" ±3.15"	—	—	43 to 197 1.69" to 7.76"
SL-C40H	40	790 31.10"	780 30.71"	385±80 15.16" ±3.15"	—	—	
SL-C44H	44	870 34.25"	860 33.86"	425±80 16.73" ±3.15"	—	—	
SL-C48H	48	950 37.40"	940 37.01"	465±80 18.31" ±3.15"	—	—	
SL-C52H	52	1030 40.55"	1020 40.16"	505±80 19.88" ±3.15"	333±80 13.11" ±3.15"	677±80 26.65" ±3.15"	
SL-C56H	56	1110 43.70"	1100 43.31"	545±80 21.46" ±3.15"	360±80 14.17" ±3.15"	730±80 28.74" ±3.15"	
SL-C60H	60	1190 46.85"	1180 46.46"	585±80 23.03" ±3.15"	387±80 15.24" ±3.15"	783±80 30.83" ±3.15"	
SL-C64H	64	1270 50.00"	1260 49.61"	625±80 24.61" ±3.15"	413±80 16.26" ±3.15"	837±80 32.95" ±3.15"	

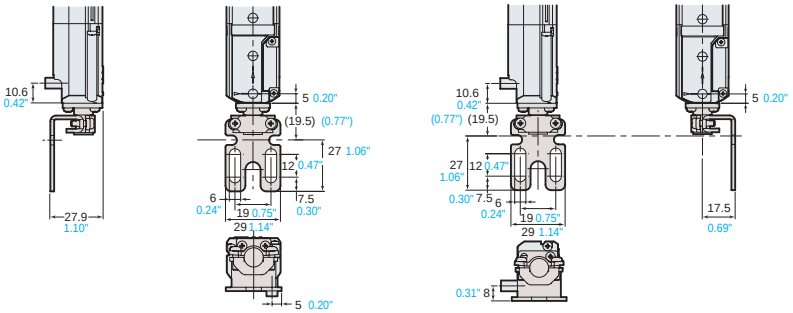
* The use of two intermediate support brackets is required for installations using Normal mounting brackets A, B, C, or the L-shaped mounting bracket and having 52 or more beam axes. For such installations, attach intermediate support brackets at dimensional positions C1 and C2. For other installations, attach one intermediate support bracket at dimensional position C.

Standard mounting bracket A, outward-facing

OP-42347

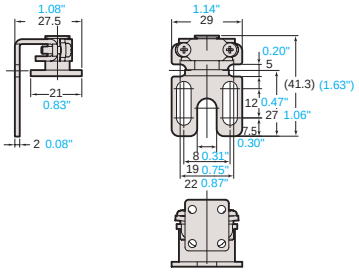


With standard mounting bracket A installed

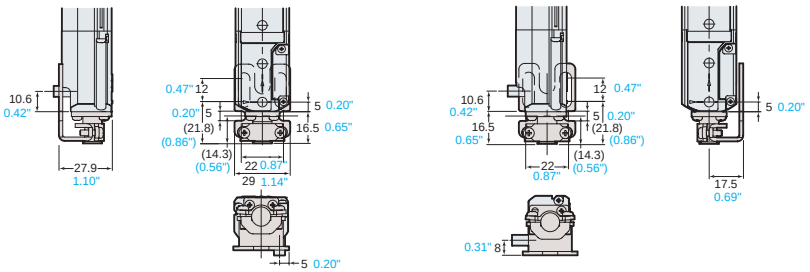


Standard mounting bracket A, inward-facing

OP-42347

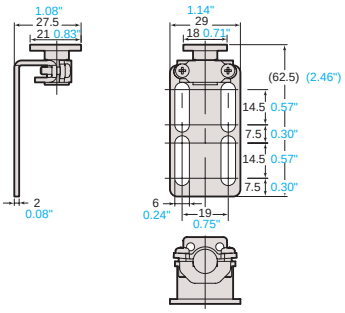


With standard mounting bracket A installed

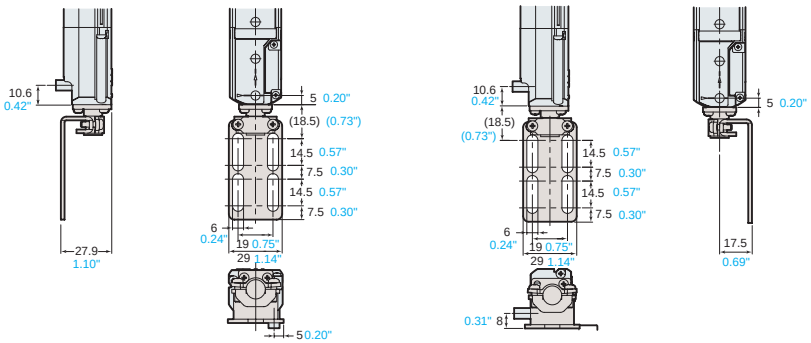


Standard mounting bracket B

OP-42348

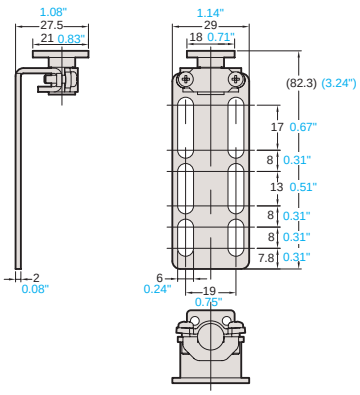


With standard mounting bracket B installed

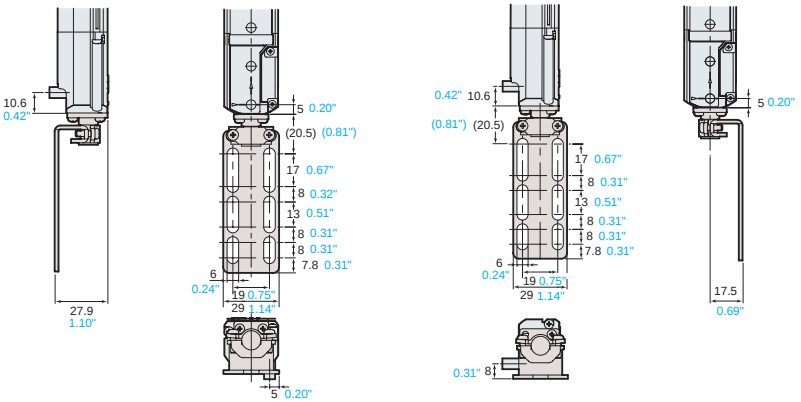


Standard mounting bracket C

OP-42349

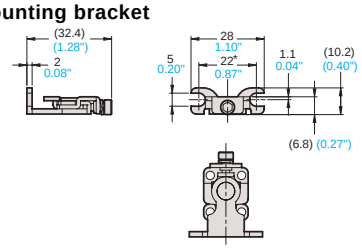


With standard mounting bracket C installed

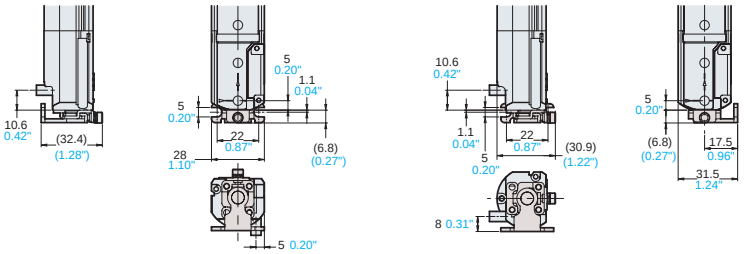


Slim mounting bracket

OP-51698



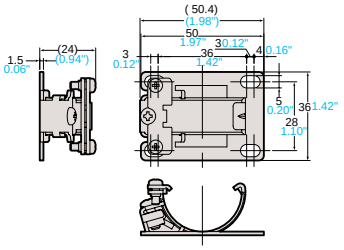
With the Slim mounting bracket installed



* When mounting Slim mounting brackets to sensors, use M4 with screw head 3.8 0.15" max.

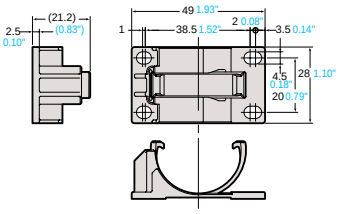
E-to-E mounting bracket

OP-42370



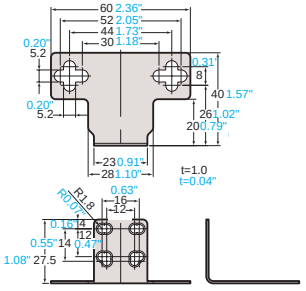
Intermediate support bracket
(included in models 36 beam axes or more)

OP-42373

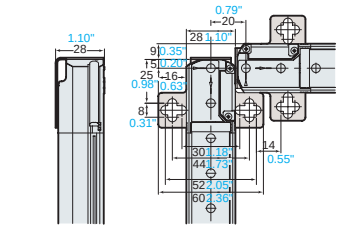


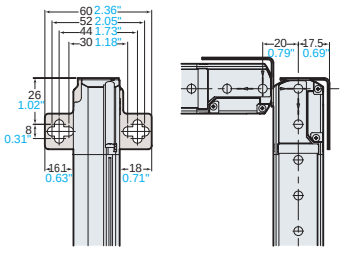
L-shaped mounting bracket

OP-42371

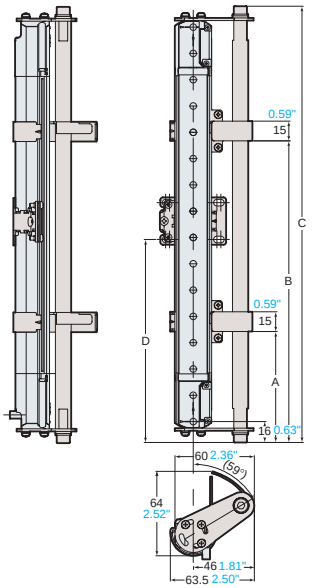


With the L-shaped mounting bracket installed

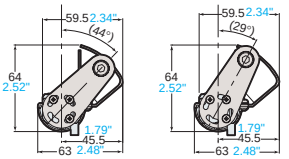




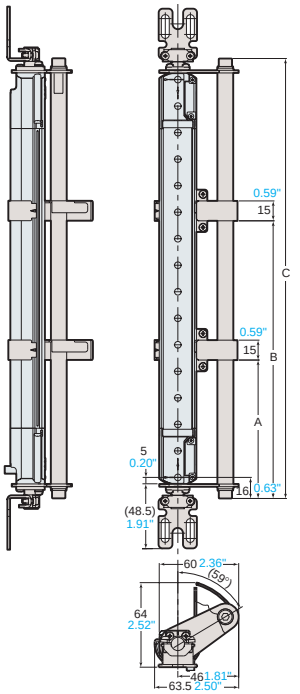
With the protection bar installed



With the protection bar installed



With standard mounting bracket installed

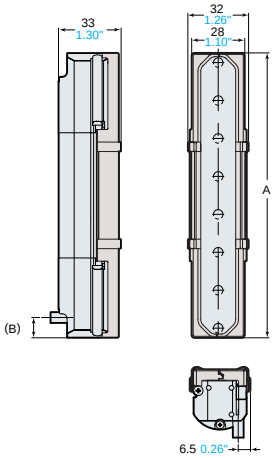


Dimensions by model

SL-CH Series

Model	No. of beam axes	Bar support bracket position A	Bar support bracket position B	Length C	Intermediate support bracket position D
SL-C08H	8	—	—	172 6.77"	—
SL-C12H	12	—	—	252 9.92"	—
SL-C16H	16	—	—	332 13.07"	—
SL-C20H	20	—	—	412 16.22"	—
SL-C24H	24	—	—	492 19.37"	—
SL-C28H	28	207±50 8.15" ±1.97"	350±50 13.78" ±1.97"	572 22.52"	—
SL-C32H	32	234±50 9.21" ±1.97"	403±50 15.87" ±1.97"	652 25.67"	—
SL-C36H	36	260±50 10.24" ±1.97"	457±50 17.99" ±1.97"	732 28.82"	352±50 13.86" ±1.97"
SL-C40H	40	287±50 11.30" ±1.97"	510±50 20.08" ±1.97"	812 31.97"	392±50 15.43" ±1.97"
SL-C44H	44	314±50 12.36" ±1.97"	563±50 22.17" ±1.97"	892 35.12"	432±50 17.01" ±1.97"
SL-C48H	48	340±50 13.39" ±1.97"	617±50 24.29" ±1.97"	972 38.27"	472±50 18.58" ±1.97"
SL-C52H	52	367±50 14.45" ±1.97"	670±50 26.38" ±1.97"	1052 41.42"	512±50 20.16" ±1.97"
SL-C56H	56	394±50 15.51" ±1.97"	723±50 28.46" ±1.97"	1132 44.57"	552±50 21.73" ±1.97"
SL-C60H	60	420±50 16.54" ±1.97"	777±50 30.59" ±1.97"	1212 47.72"	592±50 23.31" ±1.97"
SL-C64H	64	447±50 17.60" ±1.97"	830±50 32.68" ±1.97"	1292 50.87"	632±50 24.88" ±1.97"

Example front protective cover installation



Dimensions by model

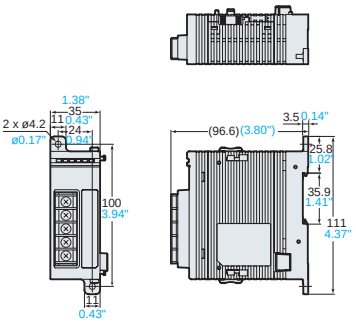
SL-CF Series

Model		A (mm/inch)	B (mm/inch)
SL-C16F	OP-66800	160.3 6.31"	10.8 0.43"
SL-C24F	OP-66801	240.3 9.46"	
SL-C32F	OP-66802	320.3 12.61"	
SL-C40F	OP-66803	400.3 15.76"	
SL-C48F	OP-66804	480.3 18.91"	
SL-C56F	OP-66805	560.3 22.06"	
SL-C64F	OP-66806	640.3 25.21"	
SL-C72F	OP-66807	720.3 28.36"	
SL-C80F	OP-66808	800.3 31.51"	
SL-C88F	OP-66809	880.3 34.66"	
SL-C96F	OP-66810	960.3 37.81"	
SL-C104F	OP-66811	1040.3 40.96"	
SL-C112F	OP-66812	1120.3 44.11"	
SL-C120F	OP-66813	1200.3 47.26"	
SL-C128F	OP-66814	1280.3 50.41"	

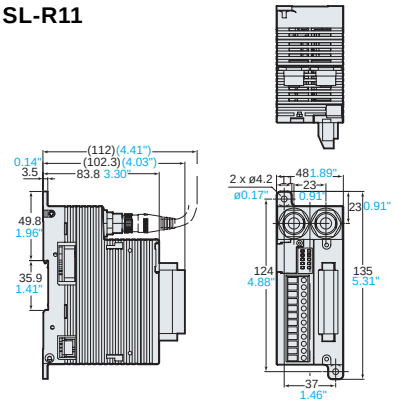
SL-CH Series

Model		A (mm/inch)	B (mm/inch)
SL-C08H	OP-51454	150.3 5.92"	10.8 0.43"
SL-C12H	OP-51455	230.3 9.07"	
SL-C16H	OP-51456	310.3 12.22"	
SL-C20H	OP-51457	390.3 15.37"	
SL-C24H	OP-51458	470.3 18.52"	
SL-C28H	OP-51459	550.3 21.67"	
SL-C32H	OP-51460	630.3 24.81"	
SL-C36H	OP-51461	710.3 27.96"	
SL-C40H	OP-51462	790.3 31.11"	
SL-C44H	OP-51463	870.3 34.26"	
SL-C48H	OP-51464	950.3 37.41"	
SL-C52H	OP-51465	1030.3 40.56"	
SL-C56H	OP-51466	1110.3 43.71"	
SL-C60H	OP-51467	1190.3 46.86"	
SL-C64H	OP-51468	1270.3 50.01"	

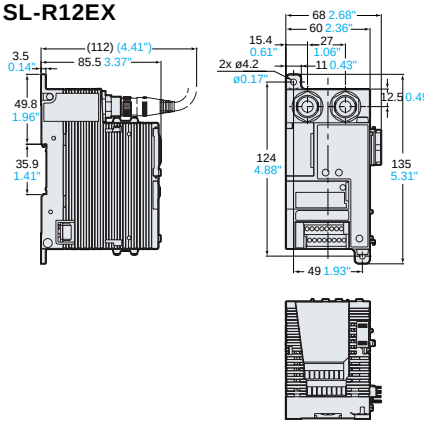
SL-U2



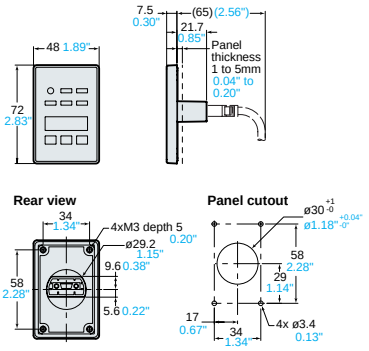
SL-R11



SL-R12EX



SL-R12D



Specifications are subject to change without notice.

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