KEYENCE

Safety Light Curtain
GL-S Series

Maximum safety standard

Type4 | SIL3 | PLe

Ultra Fine

Ultra Thin

Two types to select from

Slim type GL-SS

Flat type GL-SF

Actual size

Approximately

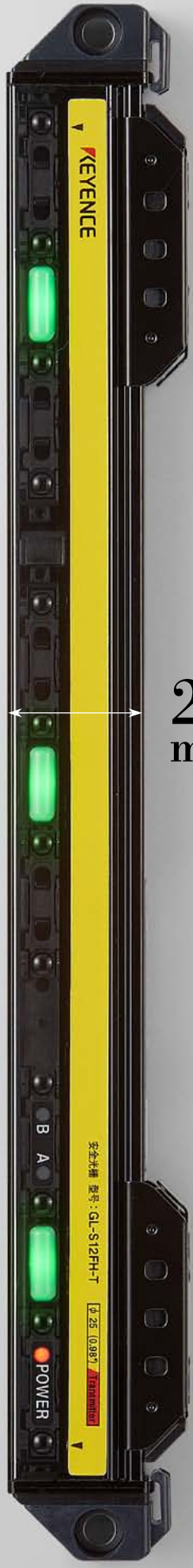
1/2

the size of conventional light curtains*

SLIM

15 mm

FLAT



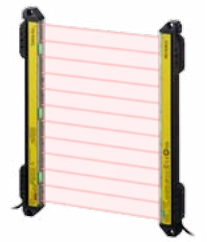
23 mm

* Compared to the volume of conventional KEYENCE models

With two innovative designs, the GL-S Series provides unique solutions for applications with space and wiring constraints!

In the past, compact applications made it difficult to integrate light curtains due to the size of the light curtains. This is why KEYENCE developed the GL-S Series of compact safety light curtains. Featuring two unique designs and simplified wiring options, the GL-S Series offers ideal solutions for countless safety needs.

SLIM



Slim type GL-SS
(Detection capability: ø25 mm)

Choose which design will easily adapt to your machine.

FLAT

Flat type GL-SF
(Detection capability: ø25 mm)

Seamless Integration Into Equipment

Compact design featuring two different mounting configurations

Quick and Easy Installation

Built-in mounting brackets and simplified wiring

Easily Identify Operation Status

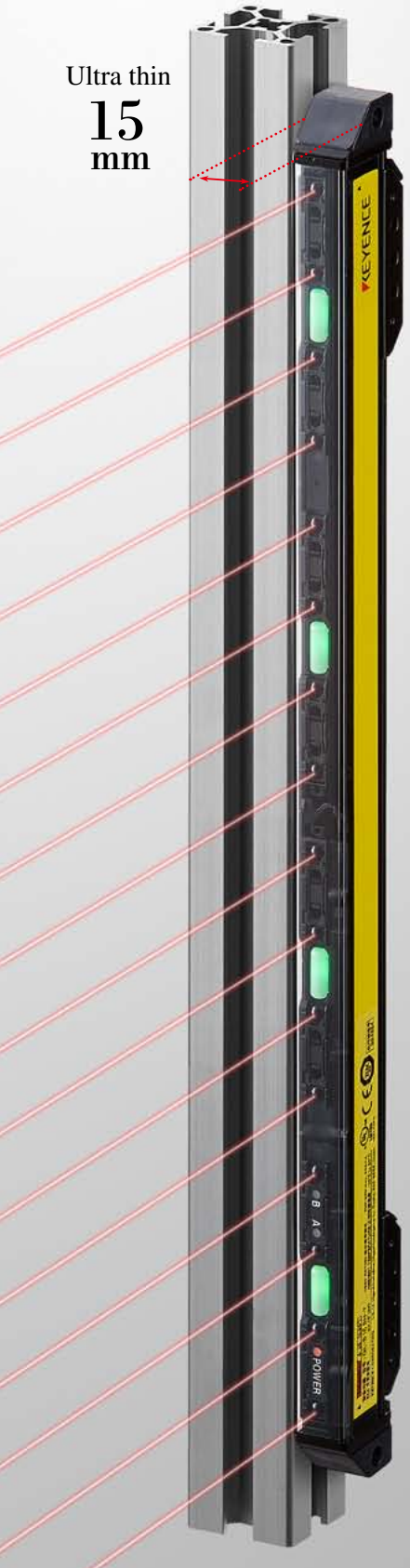
Highly visible indicators display in three colours

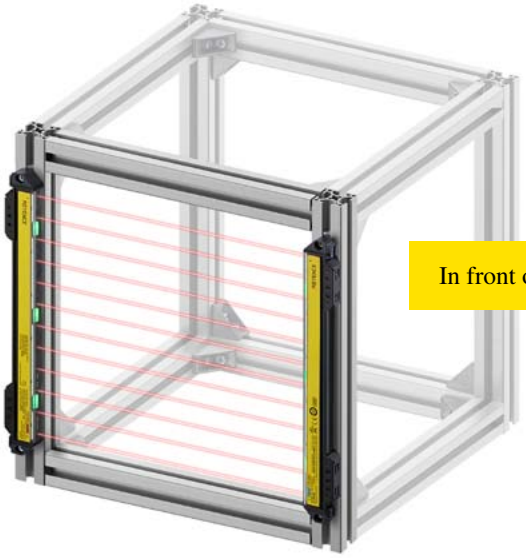
Seamless Integration Into Equipment

SLIM

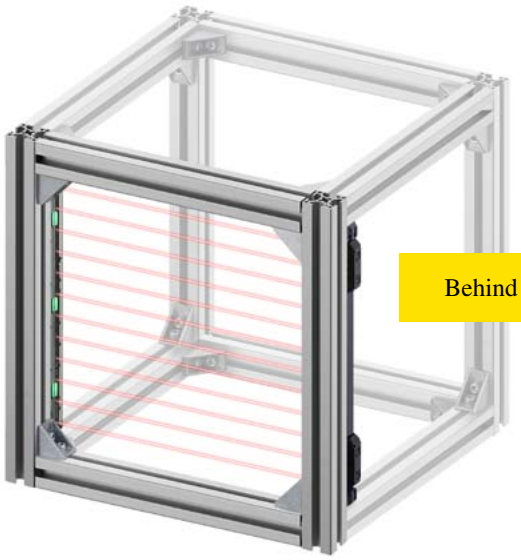
The slim type GL-SS models are designed to be installed in front of or behind a machine opening.

Ultra thin
15
mm



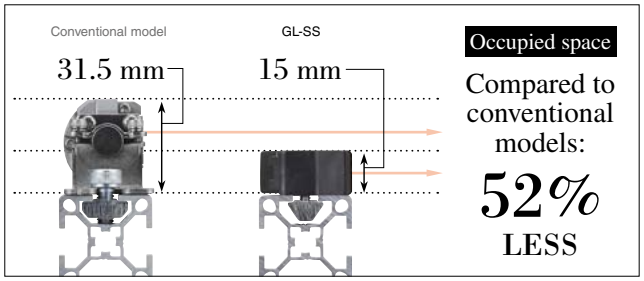


In front of a machine opening



Behind a machine opening

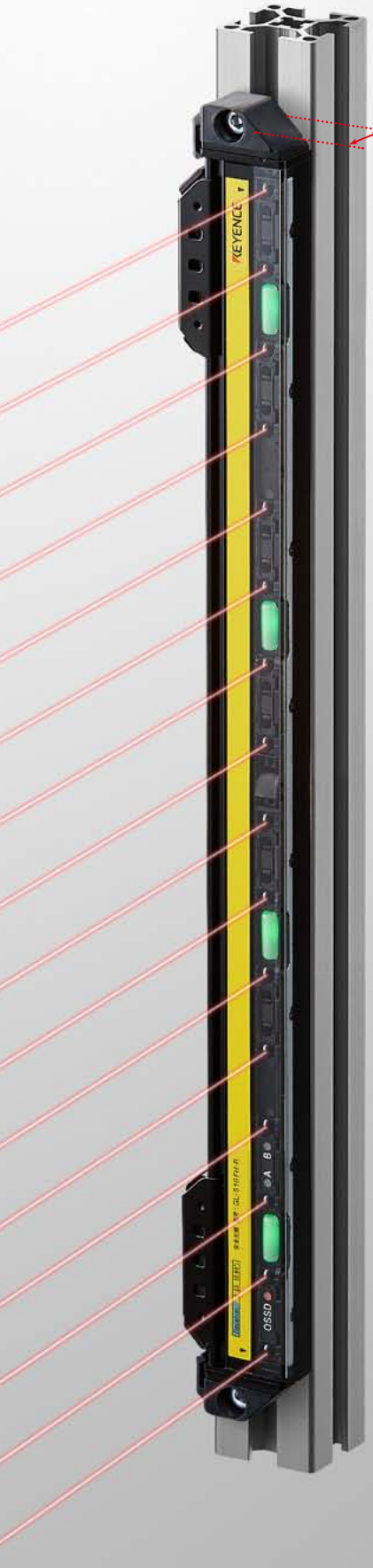
The slim type models occupy minimum space; while maintaining full functionality.

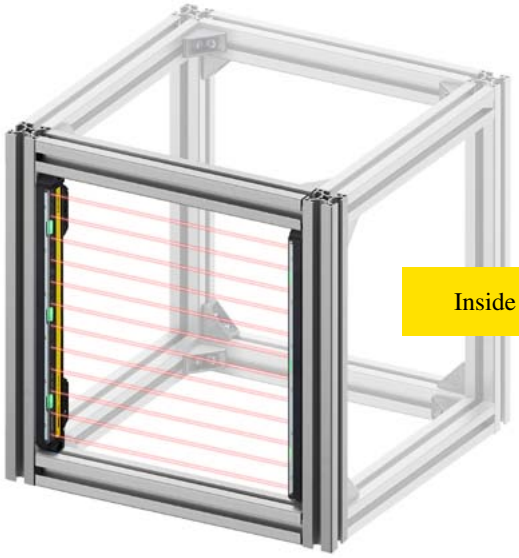


If the light curtain is mounted on a frame using the above method, the depth is a mere 15 mm compared to the 31.5 mm of the conventional model.

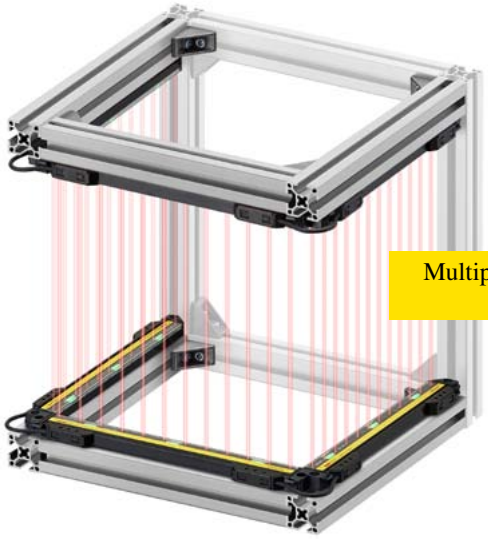
FLAT

The flat type GL-SF models are designed to be installed inside a machine opening.



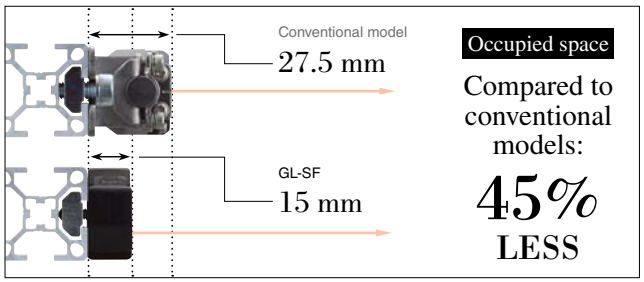


Inside a machine opening



Multiple side protection with no dead zone

The flat type models allow unobtrusive mounting without obstructing the machine opening.



When this type is installed inside a machine opening, the full width of the opening can still be used!

Quick and Easy Installation

Pre-installed mounting brackets greatly reduce the time required for light curtain mounting

Direct Mounting Brackets are supplied pre-attached to all GL-S models

When the Direct Mounting Brackets are used, the light curtain can be mounted to an aluminium frame quickly and easily. This eliminates the time spent assembling mounting brackets, and greatly reduces that overall time required to mount light curtains.

Protect multiple sides of a hazard with no dead zones

Standard beam spacing is maintained between adjacent units

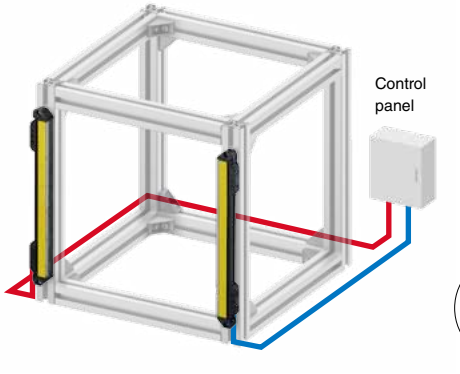
Since the beam axes start at a position 8.3 mm from the edge of the light curtain, L-shape and U-shape installations can be used without generating an unprotected area or dead zone. Because the beam axis spacing of 20 mm is maintained, the need for additional protective measures is eliminated.

Selectable wiring systems

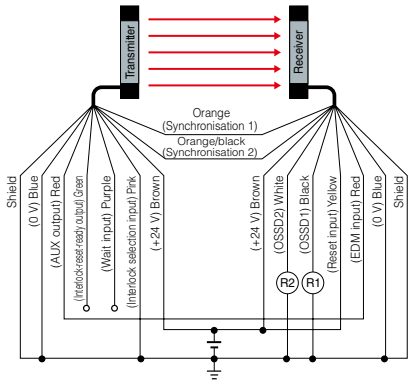
One-line, wire synchronisation, and optical synchronisation systems

The GL-S Series supports three wiring systems, which can be selected to best fit your equipment layout. Compared to conventional light curtains, the number of wires has been greatly reduced, to minimise installation time and potential wiring mistakes, making the GL-S one of easiest light curtains to interface with.

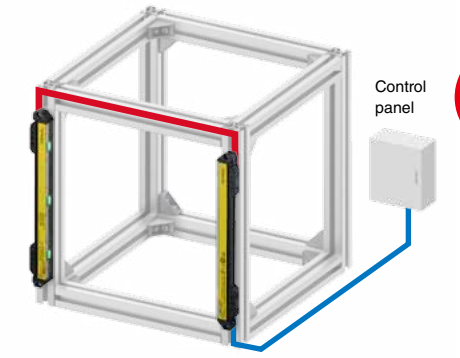
Conventional wiring



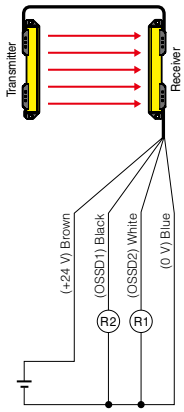
18 wires



One-line system



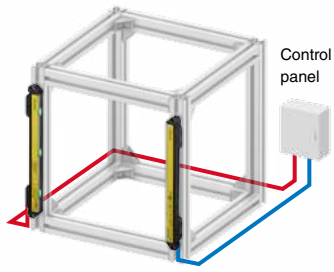
4 wires*



A connector cable is used between the transmitter and receiver. Wiring is reduced to only 4 connections.

* When an M12 connector cable is used. There will be six wires when a standard cable is used.

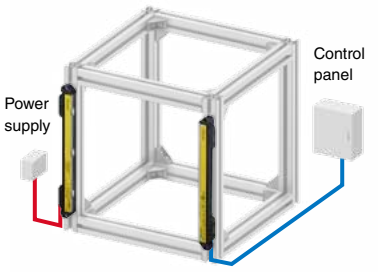
Wire synchronisation system



This multi-function system provides the EDM, interlock, and muting functions for added capabilities.

12 wires

Optical synchronisation system



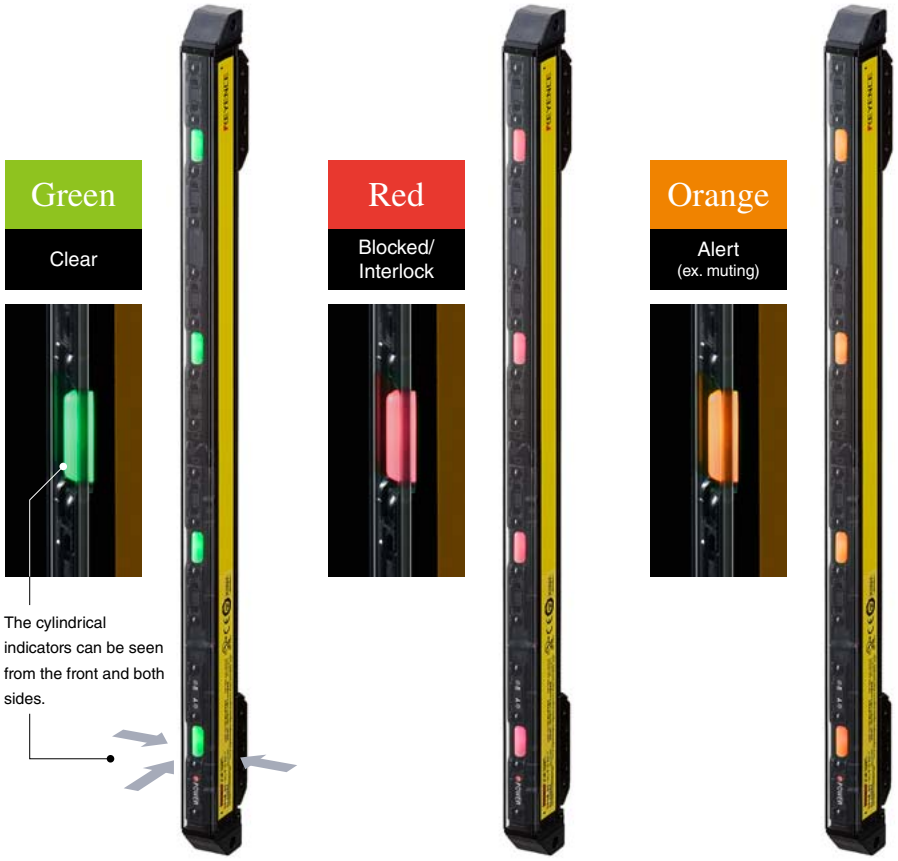
This simplified wiring system reduces the time required to route cables throughout the machine by allowing the transmitter and receiver to be powered with separate power supplies.

6 wires

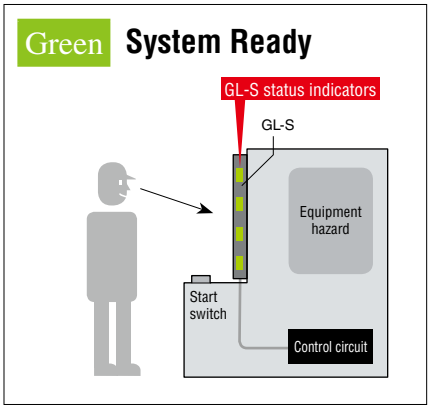
Easily Identify Operation Status

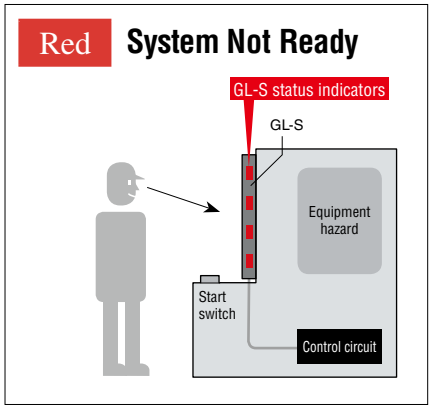
Highly visible, three colour status indicators

The status indicators can be illuminated in three colours — green, red, and orange — by activating an external input, making it possible to use them as work instruction lights.* Additionally, the indicators are visible at a wide viewing angle, allowing for easy recognition of the curtain's status.



Using the GL-S Series as a work instruction light reduces the amount of equipment required and improves work efficiency.





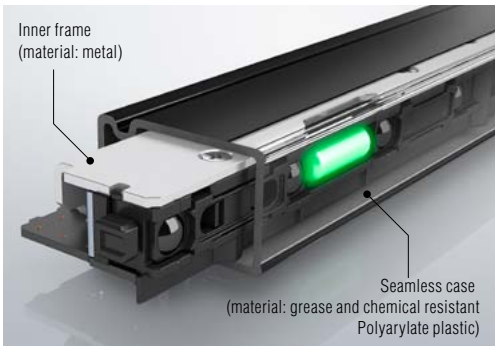
* The three colours are only available when using the one-line or wire synchronisation systems. In "fixed mode", the indicators turn ON according to the state of the GL-S (e.g. turning ON in green when the beam axes are clear and turning ON in red when a beam axis is blocked). In "external control mode", the indicators are controlled by external inputs.

Built-in Durability and Functionality

Environmentally resistant, durable housing

The GL-S Series utilises a seamless construction.
By eliminating surface joints where materials can enter into the unit, the GL-S Series light curtains are able to maintain an IP67 enclosure rating while the metal inner frame adds structural stability.

Cross-section (seamless construction)



Built-in series connection and interference prevention

Up to three GL-S Series light curtains can be connected together in-line without the concern of interference between each curtain. When not using series connection, interference prevention is available for up to two units with no additional wiring*.
This makes it possible to mount light curtains based on equipment needs and not on light curtain restrictions.

* By switching the channels, the GL-S Series supports nearby systems without interference.

Multi-sided protection using series connection

Built-in safety functions

The GL-S Series provides added safety functionality without the need for additional components.

- **Interlock function**
- **External device monitoring (EDM function)**
- **Muting function***

* When the muting function is selected, the interlock and EDM functions cannot be used. For details on the safety functions, see the "GL-S Series User's Manual."

Selecting a GL-S Series Light Curtain

Use the following steps to select the optimal GL-S Series components for your application.

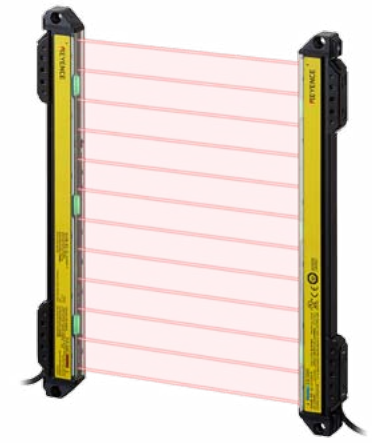
STEP 1 Select the light curtain type ▶ STEP 2 Select the light curtain length ▶ STEP 3 Select the cables ▶ STEP 4 Select the optional accessories*

* Optional accessories are not required for normal operation.

STEP 1 Select the light curtain type.

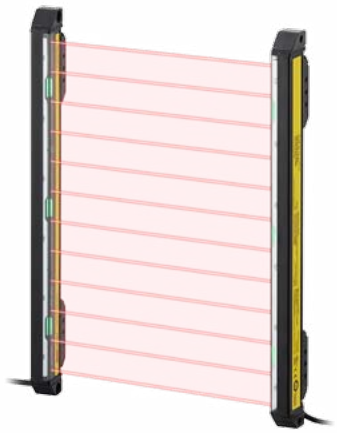
Slim type

(Detection capability: ø25 mm)



Flat type

(Detection capability: ø25 mm)



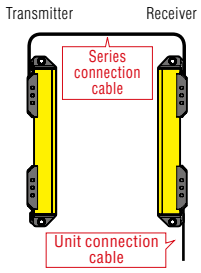
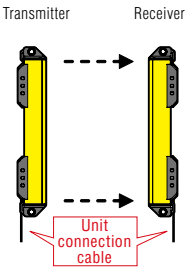
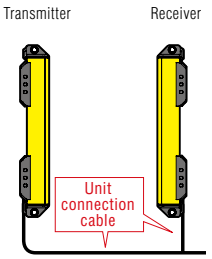
STEP 2 Select the light curtain length.

Select the length based on the equipment to be guarded.

Select the model according to the type selected in STEP 1.

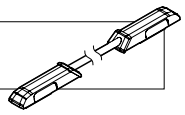
Total length (mm)	No. of beam axes	Detection height (mm)	Protection height (mm)	Detection capability (Beam axis spacing)	Operating distance	Slim type Model	Flat type Model
179.5	8	140	186	ø25 mm (20 mm spacing)	0.1 to 2 m	GL-S08SH	GL-S08FH
259.5	12	220	266			GL-S12SH	GL-S12FH
339.5	16	300	346			GL-S16SH	GL-S16FH
419.5	20	380	426			GL-S20SH	GL-S20FH
499.5	24	460	506			GL-S24SH	GL-S24FH
579.5	28	540	586			GL-S28SH	GL-S28FH
659.5	32	620	666			GL-S32SH	GL-S32FH
739.5	36	700	746			GL-S36SH	GL-S36FH
819.5	40	780	826			GL-S40SH	GL-S40FH

STEP 3 Select cables according to the required functions

Wiring system		a One-line system	b Optical synchronisation system	c Wire synchronisation system
Diagram				
List of functions	Light interference prevention	○	○	○
	Series connection	Up to 3 units and 120 beam axes	Up to 3 units and 120 beam axes	Up to 3 units and 120 beam axes
	Muting	–	–	○*1
	Interlock	–	–	○
	EDM	–	–	○
	Centre indicator	○	–*3	○
	External control of centre indicator	○	–	○*2

*1 When the muting function is in use, the interlock and EDM functions cannot be used.
*2 When the centre indicator is used in "external control mode", the muting, interlock, and EDM functions cannot be used.
*3 When using the optical synchronisation system, the centre indicator only operates on the receiver.

For series connection, two series connection cables are required.

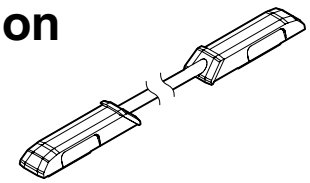


a One-line system

1. Select the length of the series connection cable for use between the transmitter and receiver

Series connection cable

(This cable is also used for series connections.)



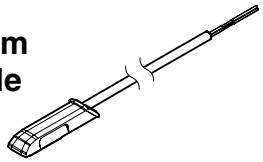
Quantity: 1

Length	Model
0.07 m	GL-SS007
0.15 m	GL-SS015
0.5 m	GL-SS05
1 m	GL-SS1
2 m	GL-SS2
3 m	GL-SS3
5 m	GL-SS5

2. Select the unit connection cable

Standard cable

One-line system dedicated cable



Quantity: 1

Output type	Length	Model
PNP	2 m	GL-SP2P1
	5 m	GL-SP5P1
	10 m	GL-SP10P1
NPN	2 m	GL-SP2N1
	5 m	GL-SP5N1
	10 m	GL-SP10N1

M12 connector cable

(For details on the length that cables can be extended to, see page 18.)

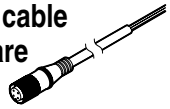
Unit connection cable

Centre indicator cannot be controlled externally when using the M12 connector cable.

Quantity: 1

Output type	Length	Model
PNP	0.3 m	GL-SPC03P
NPN		GL-SPC03N

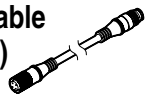
Extension cable (M12 to bare leads)



Quantity: 1

Length	Model
2 m	OP-75721
5 m	OP-87272
10 m	OP-85502

Extension cable (M12 to M12)



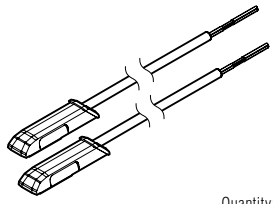
Quantity: 1

Length	Model
2 m	OP-85503
5 m	OP-85504

b Optical synchronisation system

Select the unit connection cable

Standard cable



Quantity: 1
(set includes transmitter and receiver)

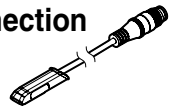
Output type	Length	Model
PNP	2 m	GL-SP2P
	5 m	GL-SP5P
	10 m	GL-SP10P
NPN	2 m	GL-SP2N
	5 m	GL-SP5N
	10 m	GL-SP10N

M12 connector cable

(For details on the distance that cables can be extended to, see page 18.)

Unit connection cable

Two cables required

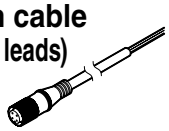


Quantity: 1

Output type	Length	Model
PNP	0.3 m	GL-SPC03P
NPN		GL-SPC03N

Extension cable (M12 to bare leads)

Two cables required

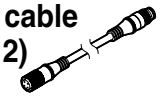


Quantity: 1

Length	Model
2 m	OP-75721
5 m	OP-87272
10 m	OP-85502

Extension cable (M12 to M12)

Two cables required



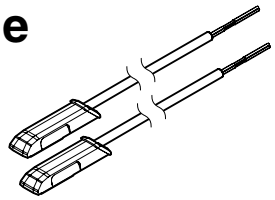
Quantity: 1

Length	Model
2 m	OP-85503
5 m	OP-85504

c Wire synchronisation system

Select the unit connection cable

Standard cable

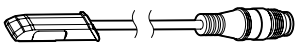


Quantity: 1
(set includes transmitter and receiver)

Output type	Length	Model
PNP	2 m	GL-SP2P
	5 m	GL-SP5P
	10 m	GL-SP10P
NPN	2 m	GL-SP2N
	5 m	GL-SP5N
	10 m	GL-SP10N

When connected to the GL-T11R*

M14 connector cable



Quantity: 1
(set includes transmitter and receiver)

Output type	Length	Model
PNP	3 m	GL-SPT3P
	5 m	GL-SPT5P
	10 m	GL-SPT10P

To extend the cable, the following is a required additional part

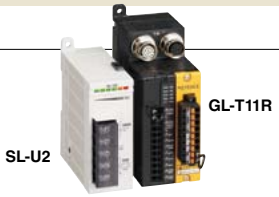
(For details on the distance that cables can be extended to, see page 18.)

Extension cable

Quantity: 1
(set includes transmitter and receiver)

Output type	Length	Model
PNP	10 m	GL-RCT10PM

Dedicated Safety Relay for the GL Series



GL-T11R Safety Relay

Type	Safety input: Light curtain	Safety output (relay)	Other I/O
Standalone type	1 channel (2 OSSD inputs)	1 channel (2 relay outputs)	EDM input

SL-U2 Dedicated Light Curtain Power Supply

Type	Input power supply voltage	Output voltage	Output capacity	Power consumption
Switching type power supply	100 to 240 VAC ±10% (50/60 Hz)	24 VDC ±10% Class 2	1.8 A	135 VA

* When using the GL-T11R, the wire synchronisation system is applied.

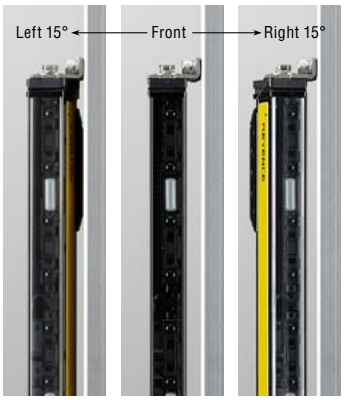
STEP 4

Select the optional accessories*

* Optional accessories are not required for normal operation.

When angle adjustment is required (±15°)

Adjustable angle mounting bracket



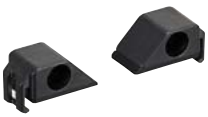
Quantity: 2 pairs

Model
GL-SB04

When no angle adjustment is required

Direct mounting bracket

Included with all GL-S models

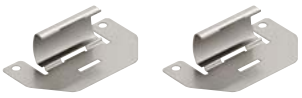


Quantity: 1 pair

Model
GL-SB01

When using a GL-S Series unit with 32 beam axes or more in an environment subject to vibration

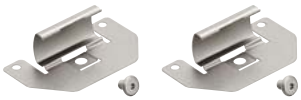
Intermediate support brackets for mounting to a flat surface



Quantity: 2

Model
GL-SB02

Intermediate support brackets for mounting to an extruded aluminium frame*



Quantity: 2

Model
GL-SB03

* There are limits to the extruded aluminium to which the brackets can be mounted. For details, see page 23.

Adjustable angle intermediate support brackets

Quantity: 2

Model
GL-SB05

Impact protection for the GL-S Series

GL-S protection cover

For use with the slim type

Quantity: 1

Corresponding light curtain model	Model
GL-S08SH	GL-SA08S
GL-S12SH	GL-SA12S
GL-S16SH	GL-SA16S
GL-S20SH	GL-SA20S
GL-S24SH	GL-SA24S
GL-S28SH	GL-SA28S
GL-S32SH	GL-SA32S
GL-S36SH	GL-SA36S
GL-S40SH	GL-SA40S

For use with the flat type

Quantity: 1

Corresponding light curtain model	Model
GL-S08FH	GL-SA08F
GL-S12FH	GL-SA12F
GL-S16FH	GL-SA16F
GL-S20FH	GL-SA20F
GL-S24FH	GL-SA24F
GL-S28FH	GL-SA28F
GL-S32FH	GL-SA32F
GL-S36FH	GL-SA36F
GL-S40FH	GL-SA40F

Common specifications

Model			GL-SxH
Beam axis spacing			20 mm
Detection capability			ø25 mm
Operating distance			0.1 to 2 m
Effective aperture angle			Max. ±3.75° (when the operating distance is 2 m)
Light source			Infrared LED (870 nm)
Response time			Optical synchronisation (Channel 0), One-line, Wire synchronisation: 6.6 to 8.7 ms Optical synchronisation (Channel A or B): 6.9 to 12.3 ms
OSSD operation			Turns on when no interruptions are present in the detection zone
Synchronisation between the transmitter and receiver			Optical synchronisation or wire synchronisation (determined by the wiring)
Light interference prevention function			Prevents mutual interference in up to two GL-S systems. Optical synchronisation: prevented by Channel A and B with setting switch Wire synchronisation: prevented automatically
Control output (OSSD output)	Output type		2 transistor outputs (PNP or NPN output is determined by the cable type.)
	Max. load current		300 mA
	Residual voltage (when ON)		Max. 2.5 V (with a cable length of 5 m)
	OFF state voltage		Max. 2.0 V (with a cable length of 5 m)
	Leakage current		Max. 200 µA
	Max. load capacitance		2.2 µF
	Load wiring resistance		Max. 2.5 Ω
Inputs 1 and 2			Short-circuit current: approx. 1 mA
Power supply	Power supply voltage		24 VDC ±20%, ripple (P-P) 10% or less, Class 2
	Current consumption		Transmitter: 31 to 50 mA Receiver: 52 to 76 mA
Protection circuit			Reverse current protection, short-circuit protection and surge protection for each output
Environmental resistance	Enclosure rating		IP65/IP67 (IEC60529)
	Overvoltage category		II
	Ambient temperature		-10 to +50°C (no freezing)
	Storage ambient temperature		-25 to +60°C (no freezing)
	Relative humidity		15 to 85% RH (no condensation)
	Storage relative humidity		15 to 95% RH
	Ambient light		Incandescent lamp: 3000 lux or less Sunlight: 20000 lux or less
	Vibration		10 to 55 Hz, 0.7 mm compound amplitude, 20 sweeps each in X, Y and Z directions
	Shock		100 m/s^2 (Approx. 10 G), 16 ms pulse in X, Y and Z directions 1000 times each axis
Material	Main unit case		Polyarylate
Approved standards	EMC	EMS	IEC61496-1, EN61496-1, UL61496-1
		EMI	EN55011 Class A, FCC Part 15B Class A, ICES-003 Class A
	Safety		IEC61496-1, EN61496-1, UL61496-1 (Type 4 ESPE)
			IEC61496-2, EN61496-2, UL61496-2 (Type 4 AOPD)
			IEC61508, EN61508 (SIL3), IEC62061, EN62061 (SIL CL3)
			EN ISO 13849-1:2008 (Category 4, PLe)
			UL508, UL1998
			GB4584

Response time

Model		OSSD Response time (ms)					
		Wire synchronisation, one-line, or optical synchronisation system (channel 0)			Optical synchronisation system (channel A or B)		
Slim type	Flat type	ON → OFF	OFF → ON*1	All blocked → ON*2	ON → OFF	OFF → ON*1	All blocked → ON*2
GL-S08SH	GL-S08FH	6.6	48.7	63.1	6.9	49.1	64.2
GL-S12SH	GL-S12FH	6.6	48.7	63.1	7.4	49.9	66.3
GL-S16SH	GL-S16FH	6.6	48.7	63.1	8.1	50.9	69.1
GL-S20SH	GL-S20FH	6.6	48.7	63.1	8.8	52.0	71.9
GL-S24SH	GL-S24FH	7.0	49.3	64.9	9.5	53.0	74.7
GL-S28SH	GL-S28FH	7.4	50.0	66.6	10.2	54.0	77.5
GL-S32SH	GL-S32FH	7.9	50.6	68.3	10.9	55.1	80.2
GL-S36SH	GL-S36FH	8.3	51.3	70.0	11.6	56.1	83.0
GL-S40SH	GL-S40FH	8.7	51.9	71.8	12.3	57.2	85.8

*1 If the interruption is present in the detection zone for less than 80 ms, the response time (OFF to ON) will be 80 ms or more to ensure that the OSSD maintains the OFF state for more than 80 ms.

*2 "All blocked" means the situation where the GL-S operates in optical synchronisation system and the transmitter and receiver is not synchronised (top and bottom beam axes are both blocked). In this situation, the response time is longer because the GL-S synchronises the transmitter and receiver first and then determines the clear or blocked.

* If the response time (ON to OFF) exceeds 20 ms, this unit cannot be used as a certified product based on the Chinese standard GB 4584 "压力机用光电保护装置技术条件".

* When the GL-S units are connected in series, the response time is calculated according to the following steps;

1. Sum up the response time of all unit.
2. Subtract the following time from the result of previous step.

▮ ON → OFF

One sub unit connected: 2 ms
Two sub units connected: 4.2 ms
(When using Optical synchronisation system and Channel A or B)
One sub unit connected: 2.7 ms
Two sub units connected: 5.7 ms

▮ OFF → ON

One sub unit connected: 42 ms
Two sub units connected: 84 ms

Current consumption

Model		Current consumption (mA)			
		When the centre indicator is ON		When the centre indicator is OFF	
Slim type	Flat type	Transmitter	Receiver	Transmitter	Receiver
GL-S08SH	GL-S08FH	31	52	26	47
GL-S12SH	GL-S12FH	34	56	27	48
GL-S16SH	GL-S16FH	36	59	27	49
GL-S20SH	GL-S20FH	39	62	28	50
GL-S24SH	GL-S24FH	41	64	28	51
GL-S28SH	GL-S28FH	44	67	29	52
GL-S32SH	GL-S32FH	45	70	29	53
GL-S36SH	GL-S36FH	48	73	30	54
GL-S40SH	GL-S40FH	50	76	30	55

* The control output (OSSD) current is not included.
* When inputs are turned ON, the current consumption increases by 1 mA per input.

Weight

GL-S (slim type)

Unit: g

Model	Weight	
	Transmitter	Receiver
GL-S08SH	90	90
GL-S12SH	110	115
GL-S16SH	135	140
GL-S20SH	160	165
GL-S24SH	185	190
GL-S28SH	215	220
GL-S32SH	245	250
GL-S36SH	275	280
GL-S40SH	305	310

GL-S (flat type)

Unit: g

Model	Weight	
	Transmitter	Receiver
GL-S08FH	95	95
GL-S12FH	125	130
GL-S16FH	155	160
GL-S20FH	185	190
GL-S24FH	220	225
GL-S28FH	255	260
GL-S32FH	290	295
GL-S36FH	325	330
GL-S40FH	360	365

Mounting bracket

Unit: g

Model	Weight
GL-SB01	10
GL-SB02	15
GL-SB03	15
GL-SB04	40
GL-SB05	45

Protection cover

Unit: g

Model		Weight
GL-SA08S	GL-SA08F	60
GL-SA12S	GL-SA12F	90
GL-SA16S	GL-SA16F	110
GL-SA20S	GL-SA20F	140
GL-SA24S	GL-SA24F	160
GL-SA28S	GL-SA28F	190
GL-SA32S	GL-SA32F	210
GL-SA36S	GL-SA36F	230
GL-SA40S	GL-SA40F	260

Unit connection cable

Unit: g

Model	Weight
GL-SP2N	120
GL-SP5N	260
GL-SP10N	500
GL-SP2P	120
GL-SP5P	260
GL-SP10P	500
GL-SP2N1	60
GL-SP5N1	130
GL-SP10N1	250
GL-SP2P1	60
GL-SP5P1	130
GL-SP10P1	250
GL-SPC03N	30
GL-SPC03P	30

Extension cable

Unit: g

Model	Weight
OP-75721	60
OP-85502	130
OP-85503	230
OP-85504	70
OP-87272	130

Series connection cable

Unit: g

Model	Weight
GL-SS007	20
GL-SS015	20
GL-SS05	30
GL-SS1	50
GL-SS2	70
GL-SS3	100
GL-SS5	150

Dedicated Safety Relay

Unit: g

Model	Weight
GL-T11R	310

Cable for connecting to the GL-T11R

Unit: g

Model	Weight
GL-SPT3P	190
GL-SPT5P	290
GL-SPT10P	540

Extension cable for connecting to the GL-T11R

Unit: g

Model	Weight
GL-RCT10PM	1000

Dedicated light curtain power supply

Unit: g

Model	Weight
SL-U2	240

Wiring

Cable specifications

(1) Cable length

1. Optical synchronisation system, wire synchronisation system

The sum of the length for the unit connection cable, extension cable, and series connection cable must be 20 m or less. This limitation applies separately to the entire transmitter cable setup and the entire receiver cable setup.

2. One-line system

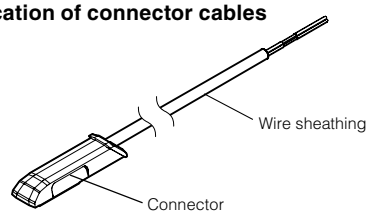
The sum of the length for all of the unit connection cables, extension cables, and series cables must be 30 m or less.

DANGER

- **Cables must be within the lengths specified. Failure to follow this specification may cause improper operation of safety functions, and may create a dangerous situation.**
- **The series connection cable cannot be cut or extended. If the cable is cut or extended, safety functions may not operate properly. Do not allow this to happen as it is extremely dangerous.**

(2) Minimum cable bending radius: 5 mm

(3) Identification of connector cables



Connector colour

PNP output cables or series connection cables: Black connectors

NPN output type cables: Grey connectors

Wire sheathing colour (standard cable)

For use with the transmitter: Grey

For use with the receiver: Black

* Other than the standard cable, all cables are black.

Point

PNP output type cables and NPN output type cables cannot be used at the same time (mixed wiring is not possible). One type of cable must be chosen based on the application.

Cable colours and pin positions

Point

- **When the synchronisation wires are not connected, the GL-S Series operates as an optical synchronisation system.**
- **For the optical synchronisation system and one-line system, input functions on the transmitter side cannot be used.**

Pin assignments

Standard cable (optical synchronisation system and wire synchronisation system)

Transmitter	
Wire colour	**Name**
Brown	+24 V
Blue	0 V
Red/white	Input 1*1
Green/white	Input 2*1
Orange	Synchronisation 1 (RS-485+)
Orange/black	Synchronisation 2 (RS-485-)

Receiver	
Wire colour	**Name**
Brown	+24 V
Blue	0 V
Black	OSSD1
White	OSSD2
Orange	Synchronisation 1 (RS-485+)
Orange/black	Synchronisation 2 (RS-485-)

*1 For wire synchronisation systems, the roles of input 1 and input 2 vary depending on the position of the setting switch.

Cable dedicated for use with one-line systems

Receiver	
Wire colour	**Name**
Brown	+24 V
Blue	0 V
Black	OSSD1
White	OSSD2
Green/white	Green lighting input
Red/white	Red lighting input

M12 connector cable (optical synchronisation system and one-line system)

Transmitter		
Pin number	**Wire colour**	**Name**
1	**Brown**	+24 V
2	**White**	Not used
3	**Blue**	0 V
4	**Black**	Not used

Receiver		
Pin number	**Wire Colour**	**Name**
1	**Brown**	+24 V
2	**White**	OSSD2
3	**Blue**	0 V
4	**Black**	OSSD1

Reference

M12 connector male pin assignments

M12 connector female pin assignments

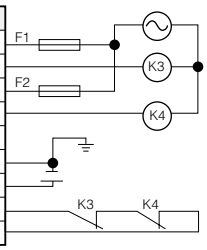
Reference

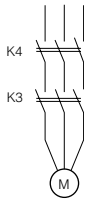
When using the optical synchronisation system, the receiver's centre indicator operates in fixed mode.

GL-T11R wiring diagram

Relay output terminals

Name	No.
FSD1	1
	2
FSD2	3
	4
Not used	5
0 V *1	6
24 V (input) *1	7
EDM input (24 V) *2	8
EDM input *2	9





Meanings of symbols

F1, F2: Fuse

K3, K4: External device (magnetic contactor, etc.)

M3: 3-phase motor

*1 Numbers 6 and 7 do not need to be wired when an SL-U2 is connected.

*2 If it is not necessary to perform error detection for K3 and K4 when the EDM input is not used, use the shorting bar between numbers 8 and 9.

GL-T11R specifications

Model			GL-T11R
Applicable model			GL-R Series, GL-S Series
Relay output	FSD1, FSD2		250 VAC, 6 A; 30 VDC, 6 A (resistive load) 240 VAC, 2 A (cosø = 0.3; inductive load) 240 VDC, 1 A (cosø = 0.3; inductive load)
Response time	ON → OFF		GL + 10 ms
	OFF → ON		GL + 32 ms
Service life	Electrical life		100000 cycles or more with a 250 VAC, 6 A resistive load (open/close frequency: 20 times/minute)
			100000 cycles or more with a 30 VDC, 6 A resistive load (open/close frequency: 20 times/minute)
			500000 cycles or more with a 250 VAC, 1 A resistive load (open/close frequency: 30 times/minute)
			500000 cycles or more with a 30 VDC, 1 A resistive load (open/close frequency: 30 times/minute)
			AC15: 100000 cycles or more with a 240 VAC, 2A inductive load (open/close frequency: 20 times/minute, cosø = 0.3)
			DC13: 100000 cycles or more with a 24 VDC, 1A inductive load (open/close frequency: 20 times/minute, L/R = 48 ms)
Non-safety output	AUX output*1 Error output*1		Transistor output (PNP/NPN input devices can be connected)*2 50 mA or less, residual voltage: 2.5 V or less (when the length of the cable between the GL-R and the GL-T11R is 5 m)
	Muting lamp output*1		Incandescent lamp (24 VDC, 1 to 5.5 W) or LED lamp (load current: 10 to 230 mA) can be connected
External input EDM input, wait input*1, reset input*1, muting inputs 1 and 2*1, override input*1			GL-R Series: ON voltage: (power supply voltage - 5 V) to power supply voltage, OFF voltage: open or 0 to 3 V, short-circuit current: approx. 2.5 mA (approx. 10 mA with EDM input only) GL-S Series: short-circuit current (EDM input): approx. 1 mA
Power supply	Power supply voltage		24 VDC ±10%, ripple (P-P) 10% or less, Class 2
	Current consumption		100 mA or less (24 VDC, when only the GL-T11R is used)
Environmental resistance	Enclosure rating		IP20 (IEC60529), must be installed within a control panel rated at IP54 or higher
	Pollution degree		2
	Overvoltage category		III
	Ambient temperature		-10 to +55°C (no freezing)
	Storage ambient temperature		-25 to +60°C (no freezing)
	Relative humidity		15 to 85% RH (no condensation)
	Storage relative humidity		15 to 95% RH
	Altitude		2000 m or less
	Vibration		10 to 55 Hz, 0.7 mm compound amplitude, 20 sweeps each in X, Y and Z directions
	Shock		100 m/s² (Approx. 10 G), 16 ms pulse in X, Y and Z directions 1000 times each axis
Material	Main unit case		Polycarbonate
Weight			Approx. 310 g
Approved standards	EMC	EMS	EN61496-1, UL61496-1, IEC61496-1
		EMI	EN55011 Class A, FCC Part 15 B Class A, ICES-003 Class A
	Safety		EN61496-1, UL61496-1, IEC61496-1 (Type 4 ESPE)
			EN ISO 13849-1:2008 (Category 4, PLe)
			UL508, EN50178

* For the operations and detailed specifications of each function, see the "GL-R User's Manual" or the "GL-S User's Manual."

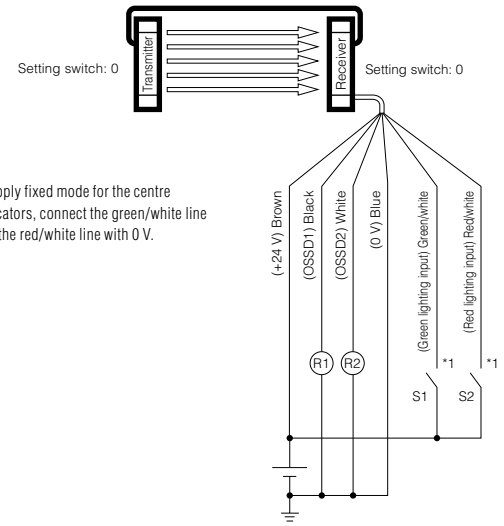
*1 When connected to the GL-S Series, this function cannot be used. *2 The output operation is the same as using the PNP output type cable.

SL-U2 specifications

Model		SL-U2
Type		Switching type
Input power supply voltage		100 to 240 VAC ±10% (50/60 Hz)
Overvoltage category		II
Output voltage		24 VDC ±10%, Class 2
Ripple/noise		240 mVp-p or less
Output capacity		1.8 A
Environmental resistance	Ambient temperature	-10°C to +55°C (no freezing)
	Relative humidity	35 to 85% RH (no condensation)
	Pollution degree	2
	Withstand voltage	1500 VAC for 1 minute (between all external terminals and case)
	Vibration	10 to 55 Hz, 0.7 mm compound amplitude, 20 sweeps each in X, Y and Z directions
	Shock	100 m/s² (Approx. 10 G), 16 ms pulse in X, Y and Z directions 1000 times each axis
	Insulation resistance	50 MΩ or more (with 500 VDC megohmmeter between all external terminals and case)
Power consumption		135 VA
Momentary interruption		10 ms or less
Weight		Approx. 240 g
Approved standards	EMC	EN61000-6-2, EN55011 Class A, FCC Part 15 Class A, ICES-003 Class A
	Safety	EN60950-1, EN50178, UL60950-1, UL508

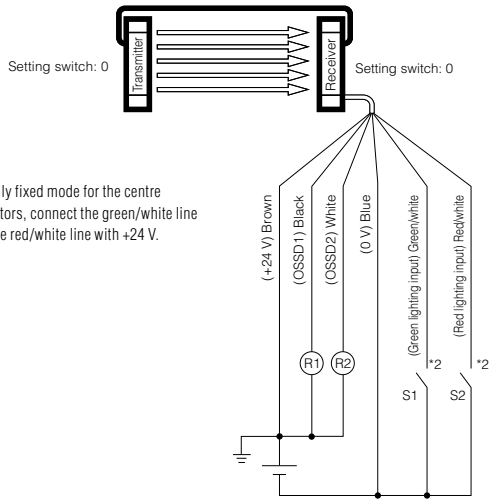
When using the one-line system

(1) PNP output cable



*1 To apply fixed mode for the centre indicators, connect the green/white line and the red/white line with 0 V.

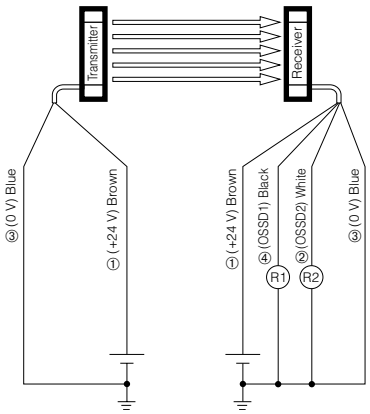
(2) NPN output cable



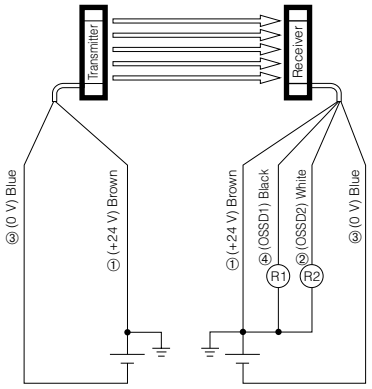
*2 To apply fixed mode for the centre indicators, connect the green/white line and the red/white line with +24 V.

When using the optical synchronisation system

(1) PNP output cable



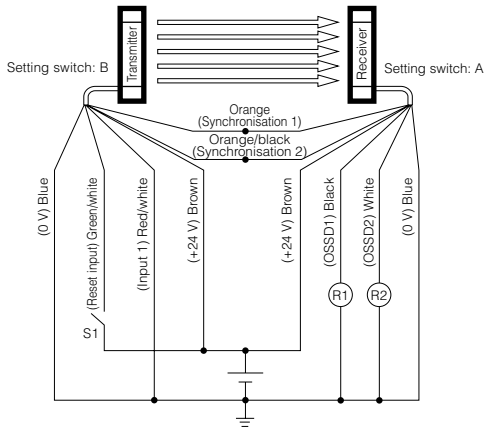
(2) NPN output cable



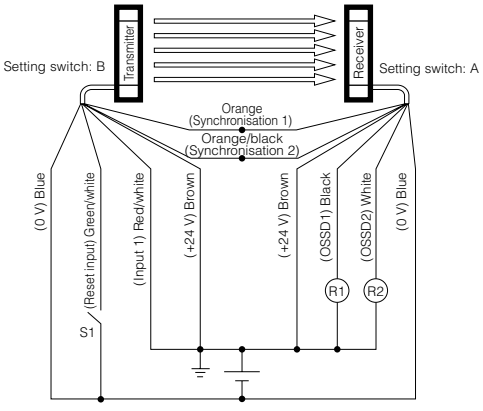
When using the wire synchronisation system

▮ When the interlock function is used

(1) PNP output cable

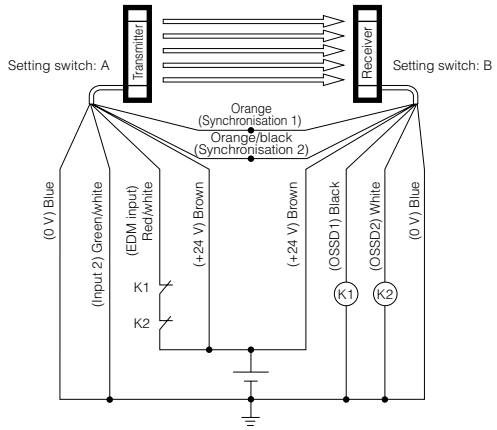


(2) NPN output cable

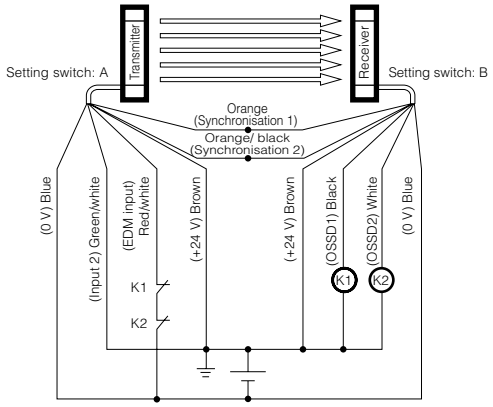


▮ When the EDM function is used

(1) PNP output cable

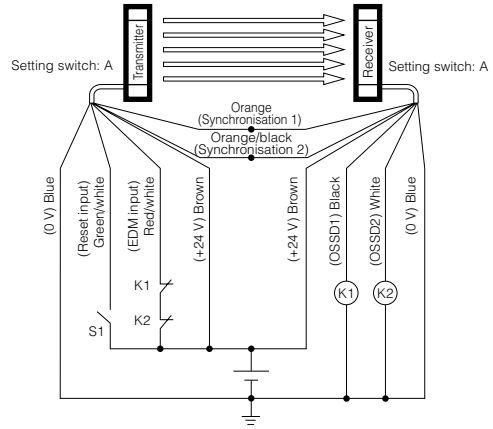


(2) NPN output cable

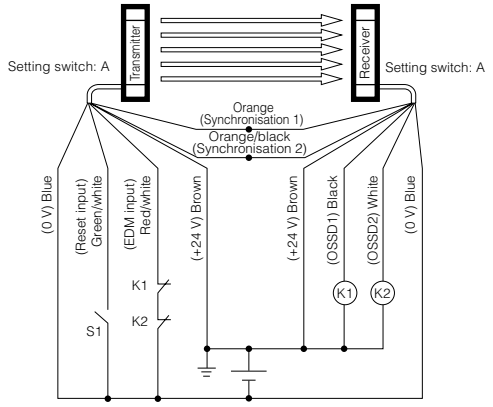


▮ When the interlock and EDM functions are used at the same time

(1) PNP output cable

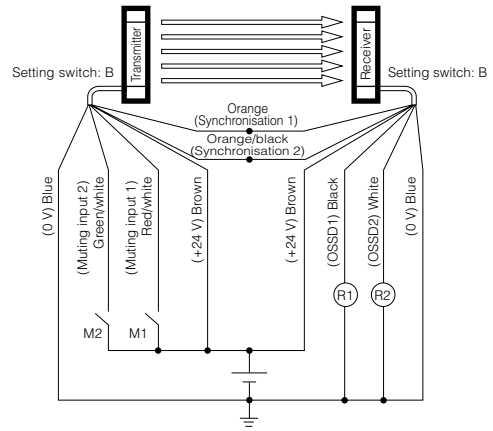


(2) NPN output cable

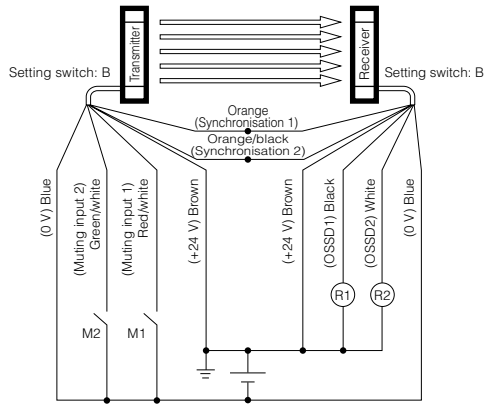


▮ When the muting function is used

(1) PNP output cable



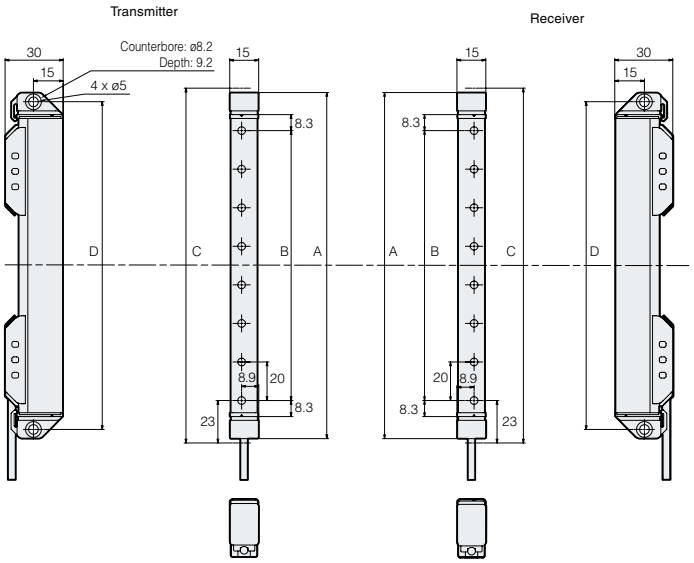
(2) NPN output cable



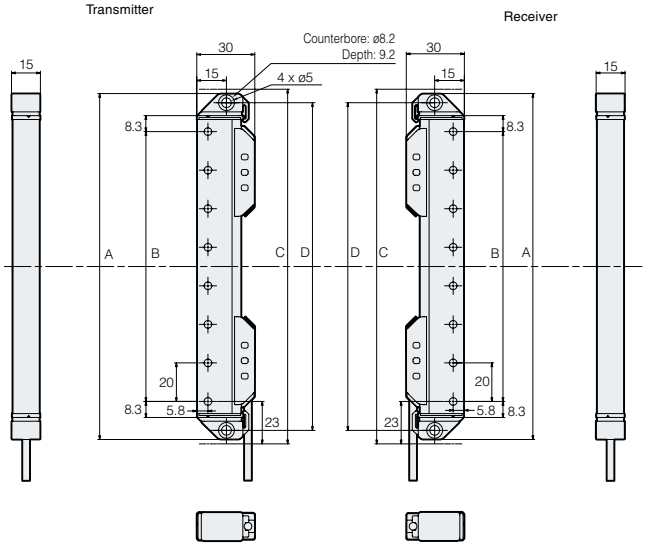
Symbol Meaning			
	R1, R2: External device (safety PLC, safety relay unit, etc.)	**S1:** Switch 1	**M1:** Muting device 1
	K1, K2: External device (force guided relay, etc.)	**S2:** Switch 2	**M2:** Muting device 2

▮ GL-S main unit

Slim type



Flat type



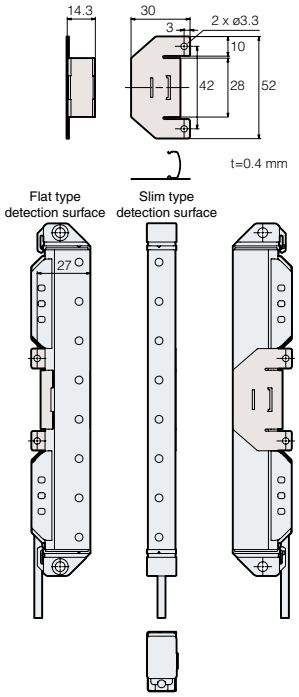
Model		No. of beam axes	A: Total length	B: Detection height	C: Protection height	D: Mounting hole spacing
Slim type	Flat type					
GL-S08SH	GL-S08FH	8	179.5	140	186	170
GL-S12SH	GL-S12FH	12	259.5	220	266	250
GL-S16SH	GL-S16FH	16	339.5	300	346	330
GL-S20SH	GL-S20FH	20	419.5	380	426	410
GL-S24SH	GL-S24FH	24	499.5	460	506	490
GL-S28SH	GL-S28FH	28	579.5	540	586	570
GL-S32SH	GL-S32FH	32	659.5	620	666	650
GL-S36SH	GL-S36FH	36	739.5	700	746	730
GL-S40SH	GL-S40FH	40	819.5	780	826	810

Note	When using a GL-S Series unit with 32 or more beam axes in an environment subject to vibration, attach optional intermediate support brackets near the centre of the GL-S Series unit.

Unit: mm

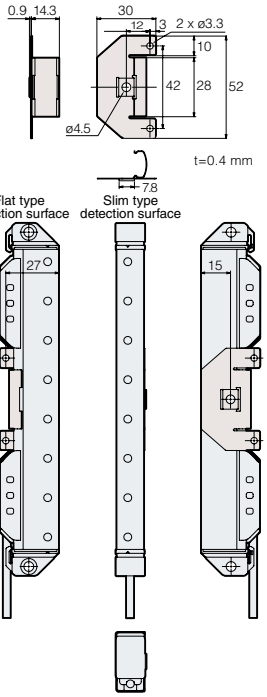
GL-SB02

Intermediate support bracket

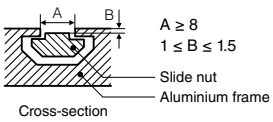


GL-SB03

Intermediate support bracket (for aluminium frame mounting)

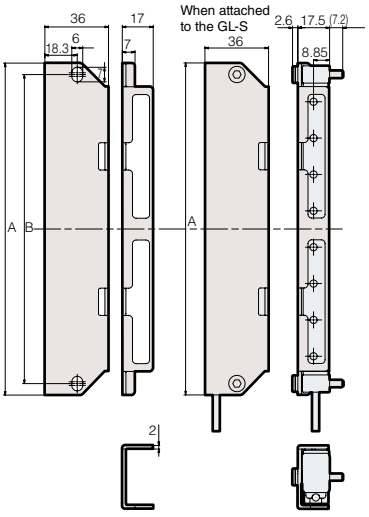


Compatible aluminium frames



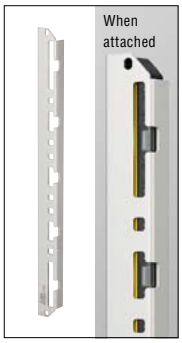
Protection cover

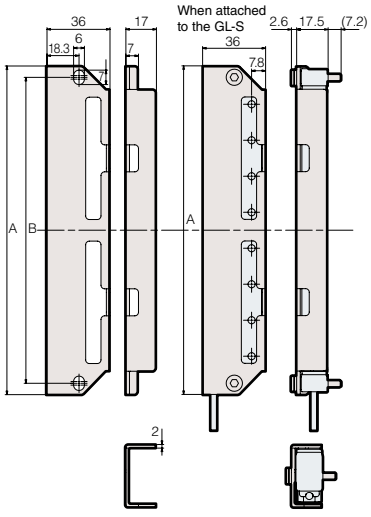
(slim type)



Protection cover

(flat type)



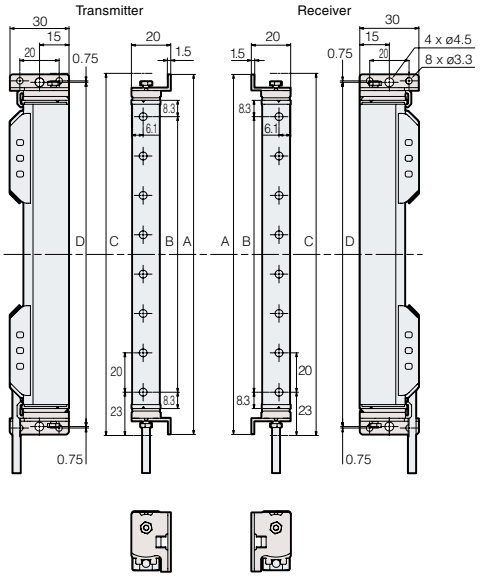


Model		No. of beam axes	A: Total length	B: Mounting hole spacing
Slim type	Flat type			
GL-S08SH	GL-S08FH	8	182.6	170
GL-S12SH	GL-S12FH	12	262.6	250
GL-S16SH	GL-S16FH	16	342.6	330
GL-S20SH	GL-S20FH	20	422.6	410
GL-S24SH	GL-S24FH	24	502.6	490
GL-S28SH	GL-S28FH	28	582.6	570
GL-S32SH	GL-S32FH	32	662.6	650
GL-S36SH	GL-S36FH	36	742.6	730
GL-S40SH	GL-S40FH	40	822.6	810

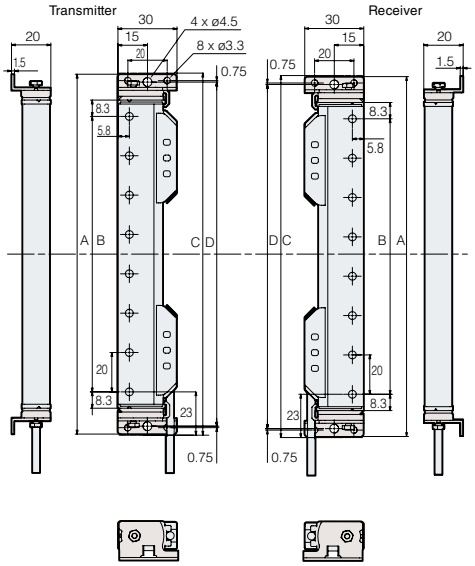
GL-SB04

Adjustable angle mounting bracket
(when attached to the light curtain)

Slim type



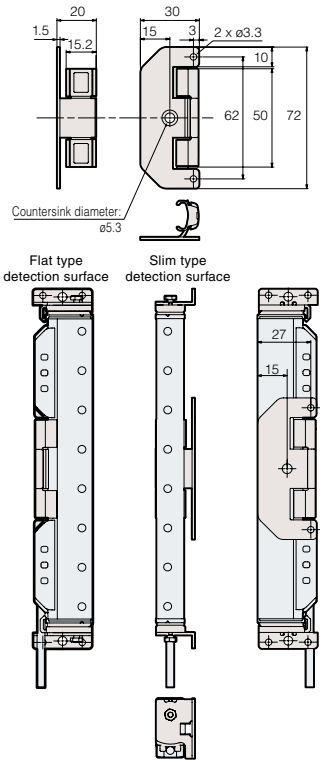
Flat type



Model		No. of beam axes	A: Total length	B: Detection height	C: Protection height	D: Mounting hole spacing
Slim type	Flat type					
GL-S08SH	GL-S08FH	8	183	140	186	175
GL-S12SH	GL-S12FH	12	263	220	266	255
GL-S16SH	GL-S16FH	16	343	300	346	335
GL-S20SH	GL-S20FH	20	423	380	426	415
GL-S24SH	GL-S24FH	24	503	460	506	495
GL-S28SH	GL-S28FH	28	583	540	586	575
GL-S32SH	GL-S32FH	32	663	620	666	655
GL-S36SH	GL-S36FH	36	743	700	746	735
GL-S40SH	GL-S40FH	40	823	780	826	815

GL-SB05

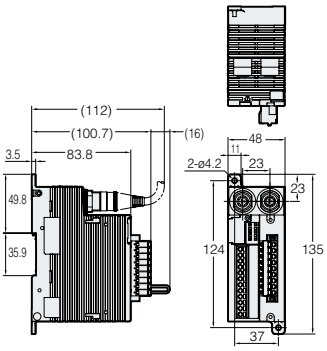
Adjustable angle intermediate
support brackets



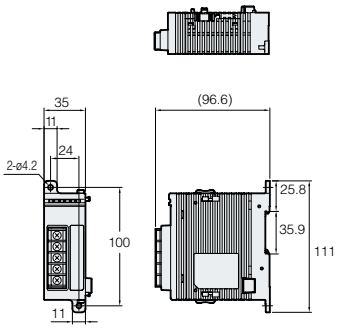
Unit: mm

▮ GL-T11R dedicated safety relay and SL-U2 dedicated light curtain power supply (class 2 output)

GL-T11R



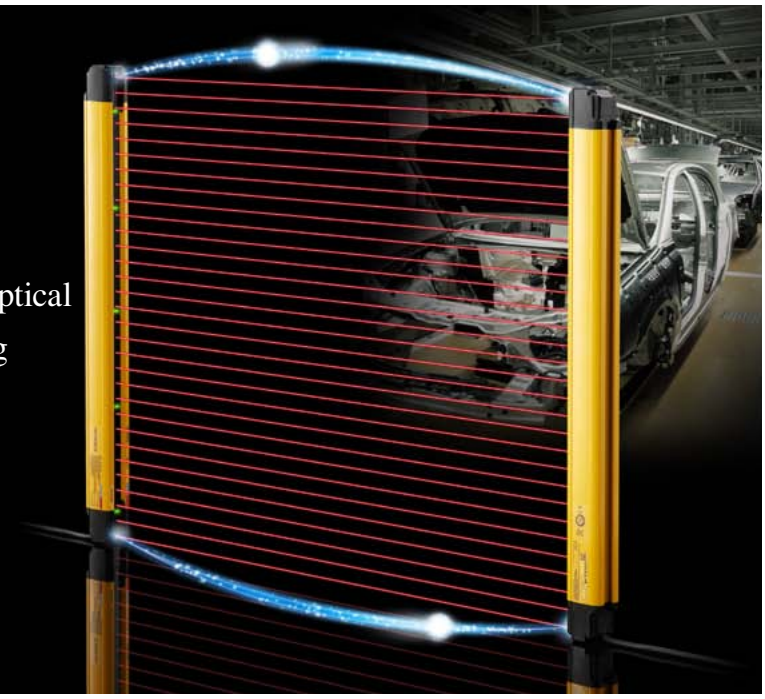
SL-U2



Type 4 Safety Light Curtain

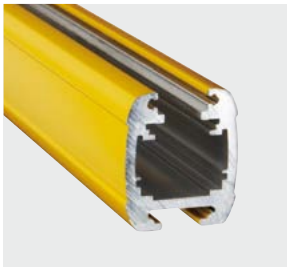
GL-R Series

Simplified installation with easy optical axis alignment and reduced wiring



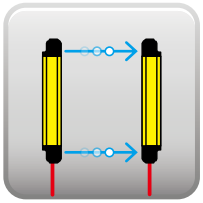
Easy optical-axis alignment

The light curtain incorporates a 3 mm metal housing, which greatly reduces the distortion that occurs when light curtains are mounted to equipment. This rigid design, paired with high powered LEDs, decreases the time required to align the GL-R Series when compared to conventional light curtains.



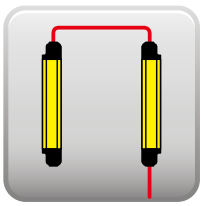
Reduced wiring systems

The GL-R Series supports two types of reduced wiring systems to decrease the work that goes into installation. Select the system to use according to the equipment layout.



Optical synchronisation system

This system uses optical communication in place of wired communication, thus allowing the transmitter and receiver to be connected to separate power sources and simplify wire management on large equipment.



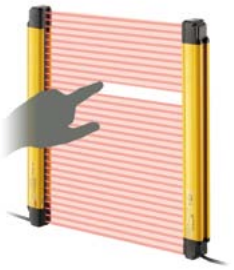
One-line system

This system replaces the transmitter cable altogether, which reduces the wiring time to 1/3 of that required for conventional light curtains. The one-line system is ideal for small equipment.

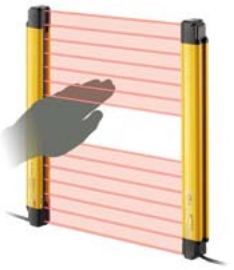
Lineup

Select from three different detection capabilities according to the distance to the equipment hazard.

GL-RF Series
[Detection capability: ø14 mm]



GL-RH Series
[Detection capability: ø25 mm]



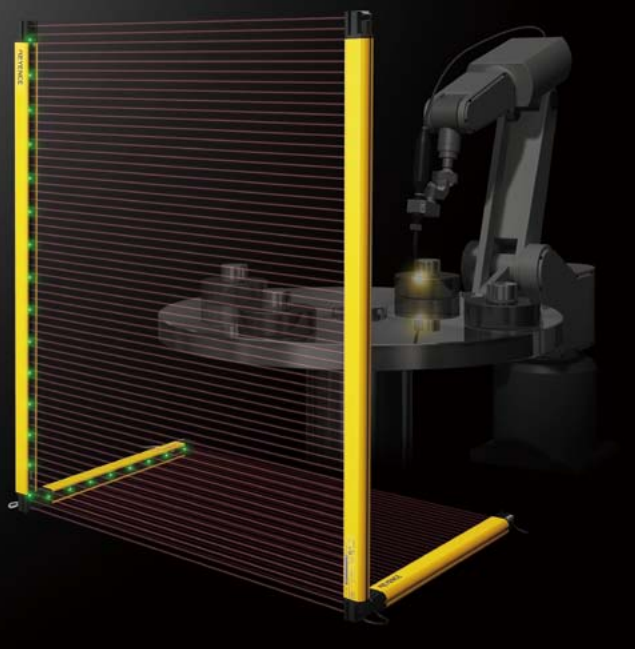
GL-RL Series
[Detection capability: ø45 mm]

Type 4 Safety Light Curtain

SL-V Series

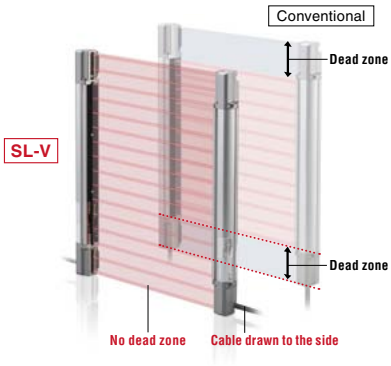
Industry first

Edge-to-edge detection zone



No dead zone

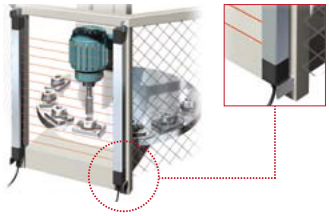
With the first beam axis placed right along the edge and cables drawn to the side, detection can be performed along the entire area. The light curtain can fit snugly into the setup because there is no need to install the light curtain outside of the sensing area in order to cover the dead zone.



Conventional

Outside mounting

Externally mounted light curtains are an obstruction.



SL-V

Space saving

The SL-V Series fits easily into equipment, eliminating dead zones.

Lineup

Select a type according to the installation environment and the distance from the equipment hazard.

Standard type

SL-VF Series
[Detection capability: ø14 mm]

SL-VH Series
[Detection capability: ø25 mm]

Heavy duty type

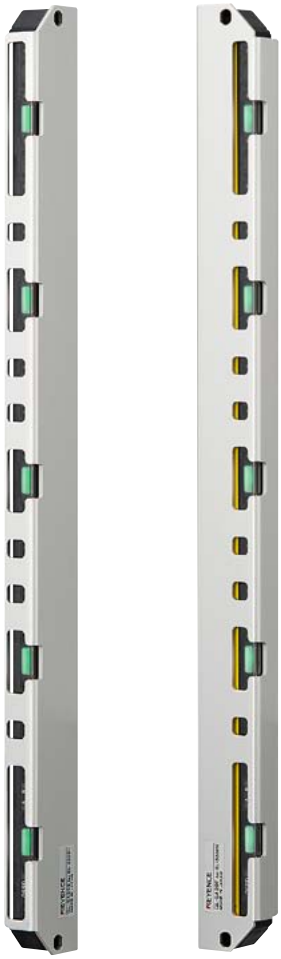
SL-VFM Series
[Detection capability: ø14 mm]

SL-VHM Series
[Detection capability: ø25 mm]

GL-S Series Safety Light Curtains

GL-S

GL-S with metal protection covers



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