KEYENCE

NEW **Safety Light Curtain**
GL-R Series

Maximum safety standard

| Type4 | SIL3 | PLe |

CE TÜV SÜD c(UL)us LISTED

Armored Protection!
Safety Light Curtain

STRONG ✕ SIMPLE ✕ SMART **3S**

GL-R Series

Armored Protection

What makes a light curtain "robust"?
KEYENCE conducted in-depth research to determine how light curtains are damaged and learned that the most common cause is damage to the lens surface when it is scratched, cracked, or otherwise broken due to impact from parts or tools. In some cases, light curtains have been installed with user-fabricated protective covers or housing to prevent this damage.
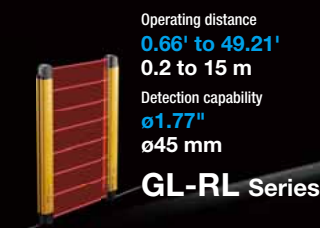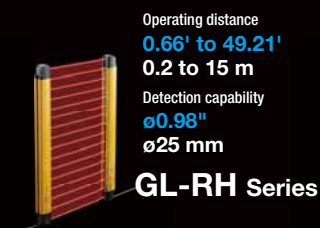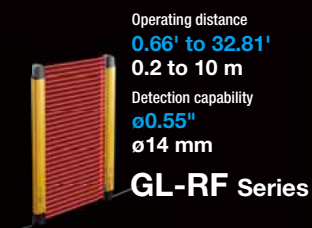As a result of this research, KEYENCE has designed a light curtain with a structure that prevents damage from parts or tools by narrowing the exposed lens area and recessing it in an impact resistant housing.*

* the narrowest lens surface aperture in the industry, according to KEYENCE research as of March, 2012

STRONG

Built-in guarding and the narrowest exposed lens surface in the industry.
With its narrow (0.35" 9mm wide) and recessed lens surface, the GL-R Series is protected against impact and resultant damage from parts, tools or operators without the need for any additional guards or covers. Additionally, the GL-R Series is protected from water and washdown environments due to its IP65/67 enclosure ratings.

Operating distance
0.66' to 32.81'
0.2 to 10 m
Detection capability
ø0.55"
ø14 mm

GL-RF Series

Operating distance
0.66' to 49.21'
0.2 to 15 m
Detection capability
ø0.98"
ø25 mm

GL-RH Series

Operating distance
0.66' to 49.21'
0.2 to 15 m
Detection capability
ø1.77"
ø45 mm

GL-RL Series

SMART

No Dead Zone
Because the first beam is emitted 0.39" 10 mm* from each end, the light curtain can be mounted flush inside of equipment, eliminating the need for additional guarding or outside mounting.
*Except GL-RL Series

7-segment display
If an error is ever detected by the light curtain, the 7-segment display provides a code that indicates the cause, which greatly reduces the time required to take corrective action.

One-line Wiring System
Reduce connections to as few as 5 wires by using this system that eliminates transmitter wiring completely.

SIMPLE

**Reduce installation time with simple wiring and easy-to-use mounting brackets.**
The introduction of the one-line wiring system and optical synchronization simplifies connections to as few as 5 wires.
Mounting brackets come pre-assembled to provide simple, one-step installation.

STRONG
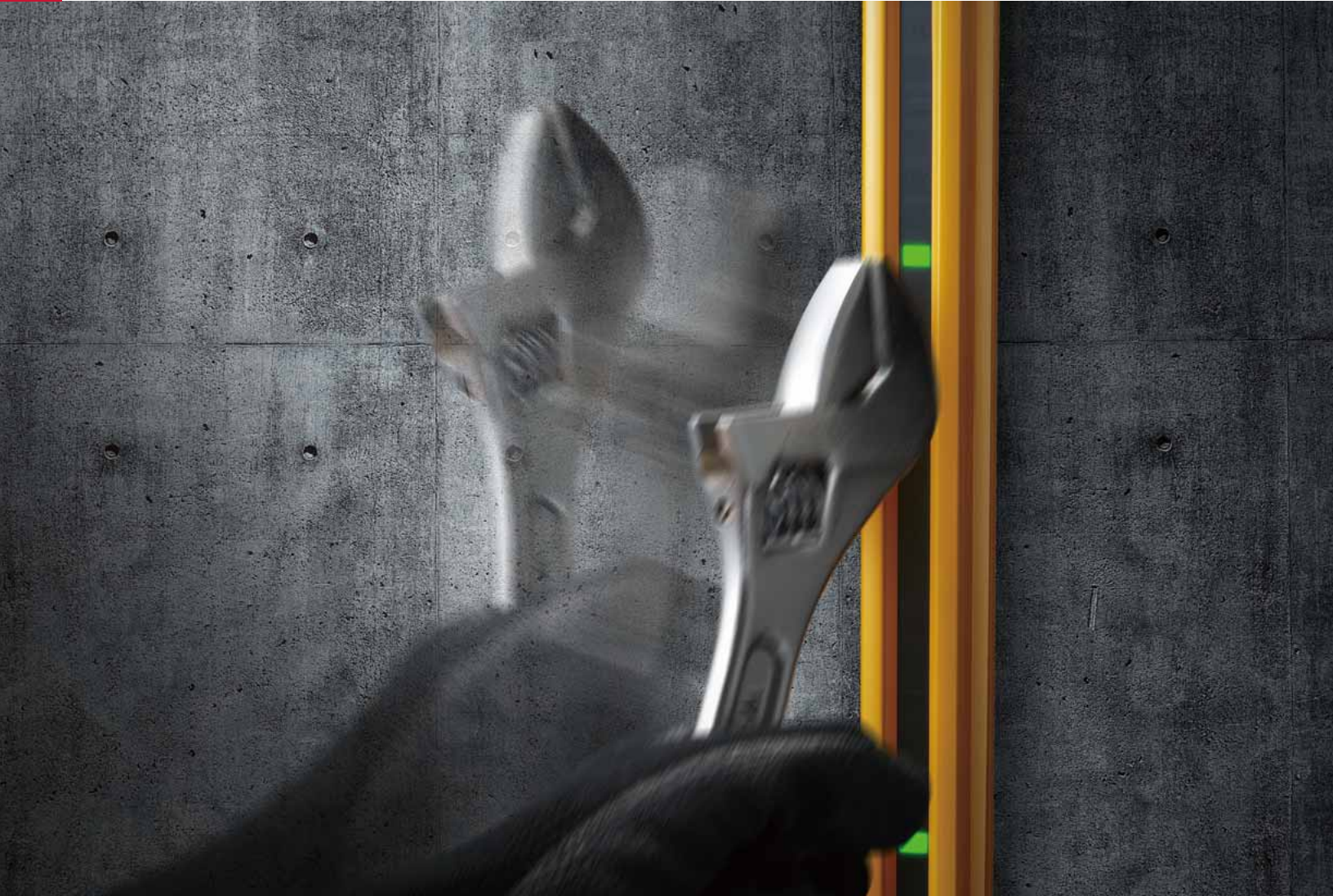
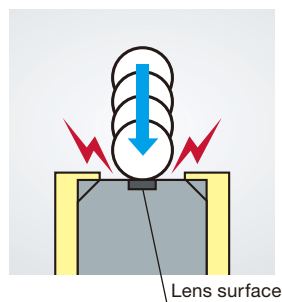## Securely protects the detection area

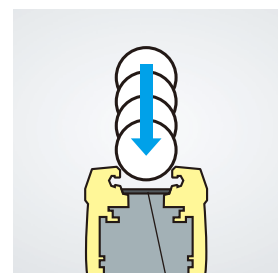Built-in guarding will completely prevent impact to the lens surface by parts or tools of ø0.67" ø17 mm or more.*

Narrow

Recessed
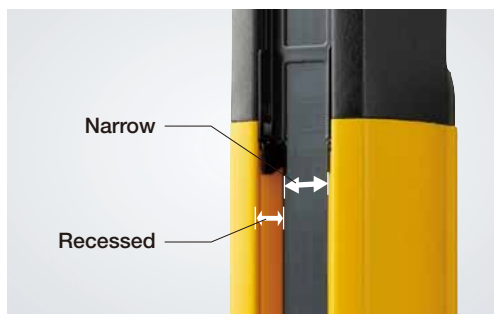
*See specifications for guaranteed values.
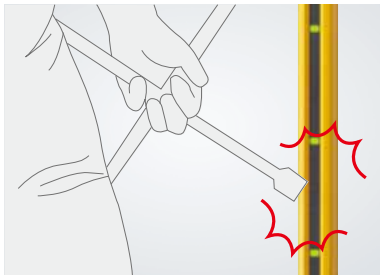
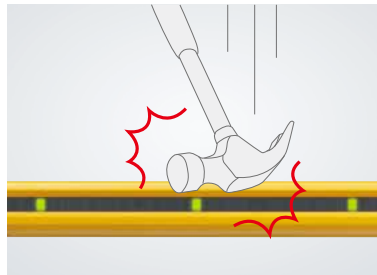Conventional Light Curtain

GL-R Series

Lens surface

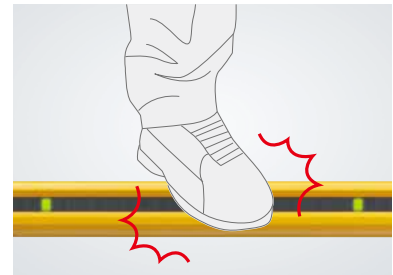Lens surface

Thick and robust housing that resists impact

The GL-R Series is designed with a 0.12" 3 mm thick housing that protects the light curtain body from various forms of impact, such as dropping equipment or hitting it with tools.*

Hitting

Dropping

Stepping, Kicking

*See specifications for guaranteed values.

No need for additional guarding

The GL-R Series can be installed and remain protected WITHOUT the use of additional U-channel type guarding, which simplifies installation and reduces cost.

Conventional Light Curtain

GL-R Series

IP65/IP67 enclosure rating

The GL-R Series housing meets IP65/IP67 enclosure ratings based on IEC and JIS standards, enabling its use in washdown environments without fear of damage to the light curtain.

| IP65 | Water-jet (washdown) resistant |
| IP67 | Watertight |

Robust, yet slim
(compared to conventional KEYENCE models)

The overall size of the GL-R Series has been reduced to save space on equipment while maintaining KEYENCE's high level of durability.

33 % reduction in size compared to the conventional model

Conventional Light Curtain

GL-R Series

1.83"
46.5 mm

1.57"
40 mm

1.50"
38 mm

1.26"
32 mm

Long range

The range of the GL-RH and GL-RL Series models have been increased over past models for use in applications requiring protection up to 49.21' 15 m.

SIMPLE
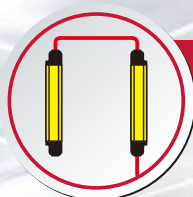
One-line system [Recommended for smaller, single operation pieces of equipment]

- Reduce the number of wires from 18 to 5
- 1/3 of the wiring installation time compared to conventional light curtains

Simplified wiring

Conventional Light Curtain	One-line system
18 wires	**5** wires
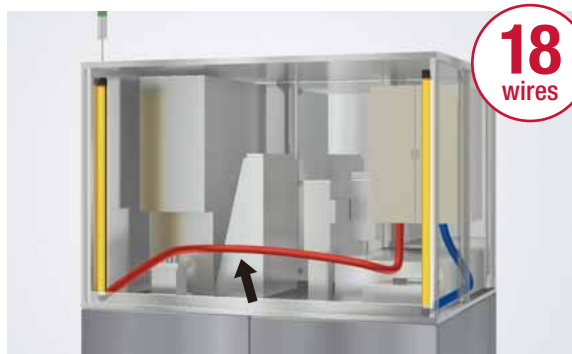
The transmitter and receiver had to be routed through the machine and wired to the control panel.

The transmitter receives power from the receiver, meaning that only the receiver has to be wired to the control panel.

Advantages of the one-line system

1 Wiring is simplified by connecting the transmitter directly to the receiver, requiring that only the receiver be wired.

2 Reduced risk of mis-wiring due to the reduction in required connections.

Conventional Light Curtain	One-line system

Wiring routed through the machine

Control panel

One-line system

Control panel

Example of wiring

Transmitter — Receiver

18 wires

Orange (Communication cable 1)
Orange/black (Communication cable 2)

Shield
(0V) Blue
(AUX output) Red
(Interlock-ready-output) Green
(Wait input) Purple
(Interlock mode selection input) Pink
(+24 V) Brown

(+24 V) Brown
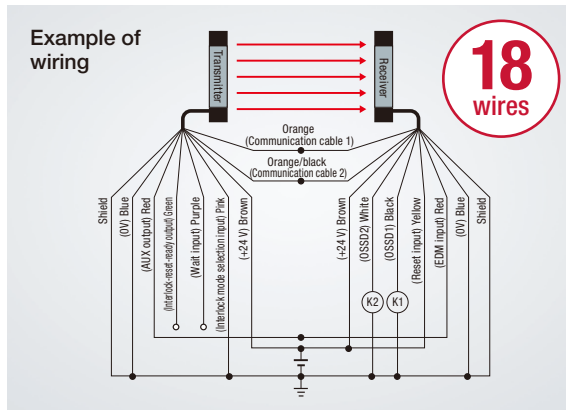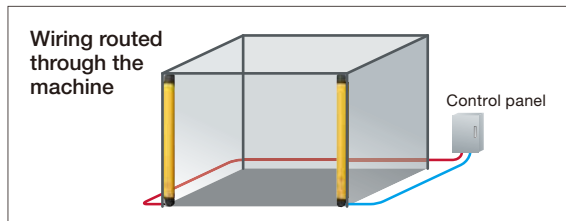(OSSD2) White
(OSSD1) Black
(Reset input) Yellow
(EDM input) Red
(0V) Blue
Shield

K2 K1

Example of wiring

Transmitter — Receiver

5 wires

Reduction in installation time up to
72%

(+24 V) Brown
(OSSD1) Black
(OSSD2) White
(0V) Blue
(FE) Gray

R2 R1

Optical synchronization [Recommended for larger pieces of equipment or work cells]

•Reduced wiring

Separate transmitter and receiver wiring simplifies installation

Conventional Light Curtain	Optical synchronization

Synchronization wiring is required.

The transmitter and receiver can be wired separately, which greatly simplifies wiring and installation time. Long lengths of cable are no longer required to be routed through the machine.

SIMPLE

Quick fit brackets

Adjustable angle mounting bracket

Straight / L-shaped mounting bracket

Vertical   Horizontal

No dead zone mounting bracket

[Easy installation]

1. No assembly required

Traditionally, mounting brackets have required assembly before installation. However, the GL-R Series brackets come pre-assembled, so installation is as simple as sliding them into the mounting track and securing them to the machine.

Conventional brackets

GL-R Series

2. Insert the bracket into the mounting track

The GL-R Series is designed to simplify mounting by inserting the brackets into the mounting track and locking them in place.

3. Mount directly to standard extruded aluminum framework

The GL-R Series mounting brackets have been designed to attach directly to standard extruded aluminum framework without the need for any additional hardware.

SMART

No Dead Zone

Because the first beam is emitted 0.39" 10 mm* from each end, the light curtain can be mounted flush inside of equipment, eliminating the need for additional guarding or outside mounting.

*Except GL-RL Series

Conventional Light Curtain

Dead Zone

GL-R

Dead Zone

0.39"
10 mm*

No Dead Zone

Side-Exit Cable

7-segment & center indicators

### 7-segment display

Errors are displayed as numeric codes, which reduces the amount of time spent identifying and correcting the problem that was detected by the GL-R Series.

Center indicator

These indicators highlight the operational status of the GL-R Series to the user. The indicators change color to identify if the light curtain is clear, interrupted, or in a lockout condition.

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SMART
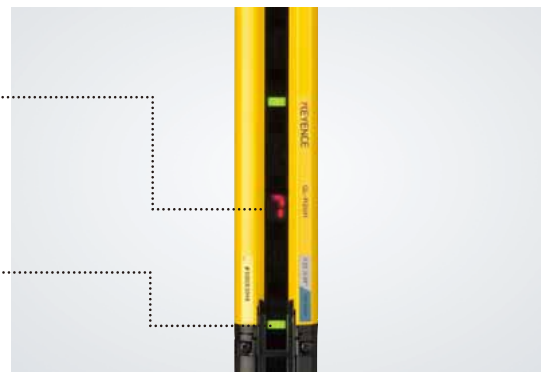
Built-in functionality
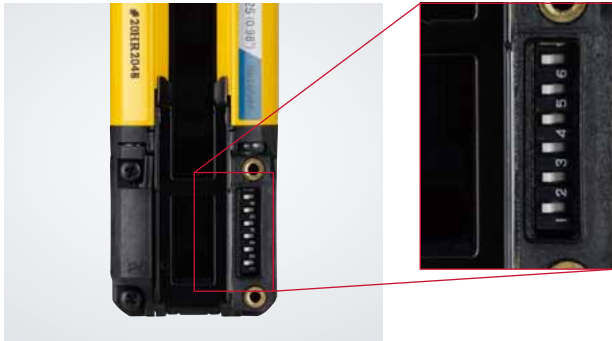
1 **Mutual interference prevention**

Mutual interference between 2 units can be prevented.

2 **Reduced resolution function***

This function expands the size of the detection capability. Up to 2 axes can be disabled.

*When the single zone mode is used

3 **Center indicator function control**

The center indicators can be turned off to reduce current consumption.

Built-in series connection ability

The coverage of the GL-R Series can be easily expanded by connecting additional units in series. All models include this feature as standard.

0.79"
20 mm*

*Except GL-RL Series.
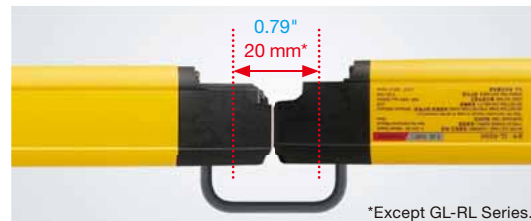
QD connector

The GL-R Series can easily be connected to a general-purpose, M12 quick disconnect port or cable.

Corner mirror

Corner mirrors are available to allow 1 set of curtains to cover up to 4 sides of a machine and reduce the amount of wiring required.

Advanced Option

PC configuration software
Safety device configurator (free download)

[Monitoring function]

The operation of the GL-R Series can be monitored with a PC. The status of I/O signals including OSSD outputs, override inputs, and error conditions can be checked as well as light intensity. In addition, monitoring the mute condition will help to easily identify causes of abnormal operation during the muting setup or operation.

[OFF information, Error information, Error history]

OSSD output OFF time, location, and duration can be easily checked by accessing the OFF information. The Error code, time of occurrence, and conditions can be checked by accessing the Error Information. All Error codes and order of occurrence are saved as Error history records, allowing the past history to be checked. This allows for easier troubleshooting and analysis.

OFF information

Error information

11
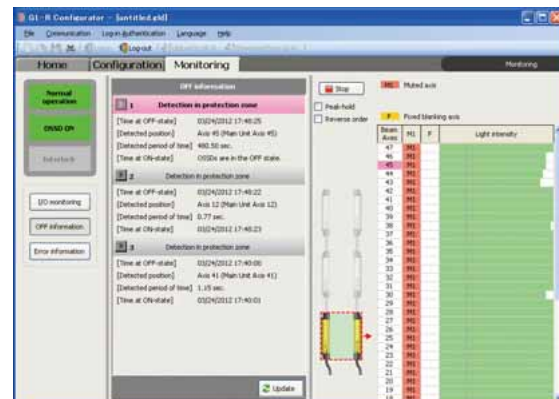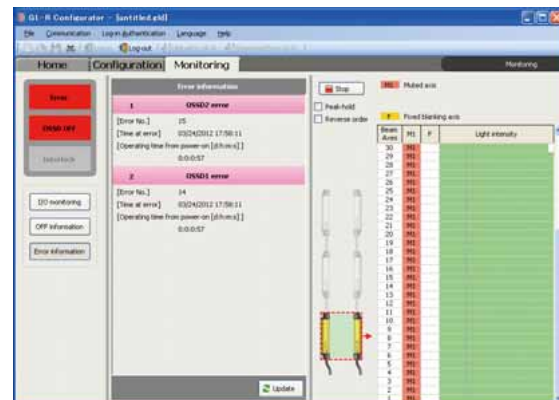
Selecting a Safety Light Curtain

Use the following steps to select the optimum GL-R Series components for your application.

step **1** → step **2** → step **3** → step **4** → step **5**

Select the light curtain type   Select the light curtain length   Select the mounting bracket   Select the cables   Select the optional accessories*

*Optional accessories are not required for normal operation.

step 1 / step 2 — Curtains

GL-RF Series
Detection capability
ø0.55" ø14 mm

GL-RH Series
Detection capability
ø0.98" ø25 mm

GL-RL Series
Detection capability
ø1.77" ø45 mm

step 3 — Brackets

Adjustable angle mounting bracket
GL-RB01

No dead zone mounting bracket
GL-RB21

Straight mounting bracket
GL-RB11

L-shaped mounting bracket
GL-RB12

step 4 — Cables

step 5 — Optional Accessories

Front protection cover   Interface unit   Corner mirror

Select the light curtain type

Select a model according to the distance to the equipment hazard.

▶ Detection capability: ø0.55" ø14 mm

Beam axis pitch of 0.39" ø10 mm.

Entry detection

To step 2 **GL-RF** P.14 ▶

▶ Detection capability: ø0.98" ø25 mm

Beam axis pitch of 0.79" ø20 mm.

Entry detection

To step 2 **GL-RH** P.14 ▶
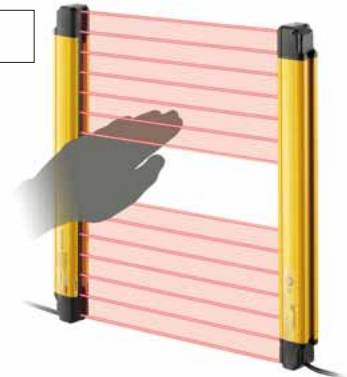
▶ Detection capability: ø1.77" ø45 mm

Beam axis pitch of 1.57" ø40 mm.

Entry/presence detection

To step 2 **GL-RL** P.14 ▶
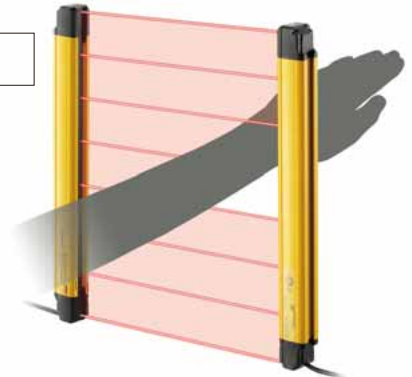
The required mounting distance from the hazard is determined by the response time and detection capability for the light curtain that has been selected. Though the ø0.98" ø25 mm model is used most frequently, if the distance to the hazard is short, select the ø0.55" ø14 mm model. If the distance to the hazard is long, you can use the ø1.77" ø45 mm model.

Select the light curtain length

If [Detection capability: ø0.55" ø14 mm] was selected in Step 1

▶ **GL-RF** Series

Model	No. of beam axes	Total length (inch mm)		Detection height (inch mm)		Protection height (inch mm)		Operating distance (ft. m)
GL-R23F	23	9.45"	240	8.66"	220	9.61"	244	
GL-R31F	31	12.60"	320	11.81"	300	12.76"	324	
GL-R39F	39	15.75"	400	14.96"	380	15.91"	404	
GL-R47F	47	18.90"	480	18.11"	460	19.06"	484	
GL-R55F	55	22.05"	560	21.26"	540	22.20"	564	
GL-R63F	63	25.20"	640	24.41"	620	25.35"	644	
GL-R71F	71	28.35"	720	27.56"	700	28.50"	724	0.67' to 32.81'
GL-R79F	79	31.50"	800	30.71"	780	31.65"	804	0.2 to 10
GL-R87F	87	34.65"	880	33.86"	860	34.80"	884	
GL-R95F	95	37.80"	960	37.01"	940	37.95"	964	
GL-R103F	103	40.94"	1040	40.16"	1020	41.10"	1044	
GL-R111F	111	44.09"	1120	43.31"	1100	44.25"	1124	
GL-R119F	119	47.24"	1200	46.46"	1180	47.40"	1204	
GL-R127F	127	50.39"	1280	49.61"	1260	50.55"	1284	

If [Detection capability: ø0.98" ø25 mm] was selected in Step 1

▶ **GL-RH** Series

Model	No. of beam axes	Total length (inch mm)		Detection height (inch mm)		Protection height (inch mm)		Operating distance (ft. m)
GL-R08H	8	6.30"	160	5.51"	140	7.28"	185	
GL-R12H	12	9.45"	240	8.66"	220	10.43"	265	
GL-R16H	16	12.60"	320	11.81"	300	13.58"	345	
GL-R20H	20	15.75"	400	14.96"	380	16.73"	425	
GL-R24H	24	18.90"	480	18.11"	460	19.88"	505	
GL-R28H	28	22.05"	560	21.26"	540	23.03"	585	
GL-R32H	32	25.20"	640	24.41"	620	26.18"	665	
GL-R36H	36	28.35"	720	27.56"	700	29.33"	745	
GL-R40H	40	31.50"	800	30.71"	780	32.48"	825	
GL-R44H	44	34.65"	880	33.86"	860	35.63"	905	
GL-R48H	48	37.80"	960	37.01"	940	38.78"	985	
GL-R52H	52	40.94"	1040	40.16"	1020	41.93"	1065	0.67' to 49.21'
GL-R56H	56	44.09"	1120	43.31"	1100	45.08"	1145	0.2 to 15
GL-R60H	60	47.24"	1200	46.46"	1180	48.23"	1225	
GL-R64H	64	50.39"	1280	49.61"	1260	51.38"	1305	
GL-R72H	72	56.69"	1440	55.91"	1420	57.68"	1465	
GL-R80H	80	62.99"	1600	62.20"	1580	63.98"	1625	
GL-R88H	88	69.29"	1760	68.50"	1740	70.28"	1785	
GL-R96H	96	75.59"	1920	74.80"	1900	76.57"	1945	

If [Detection capability: ø1.77" ø45 mm] was selected in Step 1

▶ **GL-RL** Series

Model	No. of beam axes	Total length (inch mm)		Detection height (inch mm)		Protection height (inch mm)		Operating distance (ft. m)
GL-R04L	4	6.30"	160	4.72"	120	8.07"	205	
GL-R06L	6	9.45"	240	7.87"	200	11.22"	285	
GL-R08L	8	12.60"	320	11.02"	280	14.37"	365	
GL-R10L	10	15.75"	400	14.17"	360	17.52"	445	
GL-R12L	12	18.90"	480	17.32"	440	20.67"	525	
GL-R14L	14	22.05"	560	20.47"	520	23.82"	605	
GL-R16L	16	25.20"	640	23.62"	600	26.97"	685	
GL-R18L	18	28.35"	720	26.77"	680	30.12"	765	
GL-R20L	20	31.50"	800	29.92"	760	33.27"	845	0.67' to 49.21'
GL-R22L	22	34.65"	880	33.07"	840	36.42"	925	0.2 to 15
GL-R24L	24	37.80"	960	36.22"	920	39.57"	1005	
GL-R26L	26	40.94"	1040	39.37"	1000	42.72"	1085	
GL-R28L	28	44.09"	1120	42.52"	1080	45.87"	1165	
GL-R30L	30	47.24"	1200	45.67"	1160	49.02"	1245	
GL-R32L	32	50.39"	1280	48.82"	1240	52.17"	1325	

Select the mounting bracket

▶ Adjustable angle mounting bracket **GL-RB01** (incl. 2 pieces)

| Side mounting | ← | 45° mounting | ← | Rear mounting | → | 45° mounting | → | Side mounting |
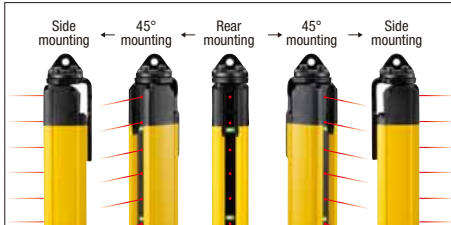
• By changing the screw positions, it is possible to adjust the angle of the light curtain by 180°.

If the total length of the GL-R main unit is 50.39" 1280 mm or longer, and if mounting it using the Adjustable angle mounting bracket, also use the antivibration bracket (GL-RB32) to prevent vibration.

To step 4   P.16 ▶

▶ No dead zone mounting bracket **GL-RB21** (incl. 2 pieces)

Useful when mounting brackets cannot be used on the top or bottom of the light curtain

90° rotation
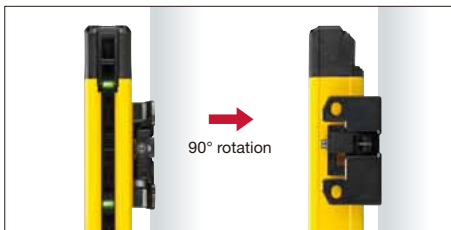
• Allows you to rotate the light curtain 90° by changing the mounting hole. It is also possible to perform fine-tuning of ±15° from this position.

If the total length of the GL-R main unit is 50.39" 1280 mm or longer and if mounting it using the no dead zone mounting bracket, also use the antivibration bracket (GL-RB32) to prevent vibration.

To step 4   P.16 ▶

▶ Straight mounting bracket **GL-RB11** (incl. 2 pieces)

• Simple attachment to standard machine framework.

If the total length of the GL-R main unit is 50.39" 1280 mm or longer, and if mounting it using the straight mounting bracket, also use the antivibration bracket (GL-RB31) to prevent vibration.

To step 4   P.16 ▶

▶ L-shaped mounting bracket **GL-RB12** (incl. 2 pieces)

• Simple attachment to standard machine framework.

If the total length of the GL-R main unit is 50.39" 1280 mm or longer, and if mounting it using the L-shaped mounting bracket, also use the L-shaped mounting bracket (GL-RB12) to prevent vibration.

To step 4   P.16 ▶

Select the cables

It is possible to select from the following 3 types of wiring systems according to the application.

Select an applicable cable according to the wiring systems listed below.

▶ Cables

- Each model is connected to one cable. Therefore, at least two cables are needed as a system, one for the transmitter and another for the receiver.
- All cables can be used for both the transmitter and receiver.
- The combination of the wiring system and cable determines the functions that can be used. Different types of cables can be used for the transmitter and receiver.
- Make sure that the length of the main unit connection cable and extension cable will be 98.43' 30 m or less regarding the transmitter and receiver, respectively, when using the optical/wire synchronization system.
- Make sure that the total length for all cables, which includes the unit connection cable, extension cable, and series connection cable, is 98.43' 30 m or less when using the one-line system.
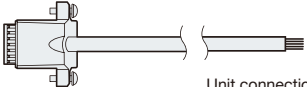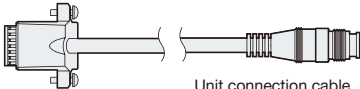
Select 1 cable for each transmitter/receiver according to the optimal wiring system.

If multiple functions are necessary, select an 11-core cable.

Wiring system		Optical synchronization system	One-line system	Wire synchronization system
Wiring diagram		Transmitter Receiver	Transmitter Receiver	Transmitter Receiver
Applicable Cables	Transmitter	5-core cable	Series connection cable	7-core cable 11-core cable
	Receiver	5-core cable 11-core cable	5-core cable 11-core cable	7-core cable 11-core cable

Select a unit connection cable or one-line system series connection cable.

If extending the cable, select a connector type.

Shape	No. of conductors	PNP/NPN	Connector	Length (ft. m)		Model
Unit connection cable	5-core	PNP	—	16.40'	5	GL-RP5P
			—	32.81'	10	GL-RP10P
		NPN	—	16.40'	5	GL-RP5N
			—	32.81'	10	GL-RP10N
	7-core	PNP	—	16.40'	5	GL-RP5PS
			—	32.81'	10	GL-RP10PS
		NPN	—	16.40'	5	GL-RP5NS
			—	32.81'	10	GL-RP10NS
	11-core	PNP	—	16.40'	5	GL-RP5PM
			—	32.81'	10	GL-RP10PM
		NPN	—	16.40'	5	GL-RP5NM
			—	32.81'	10	GL-RP10NM
Unit connection cable (for extension use)	5-core	PNP	M12 (5-pin male)	0.98'	0.3	GL-RPC03P
		NPN				GL-RPC03N
	7-core	PNP	M12 (8-pin male)			GL-RPC03PS
		NPN				GL-RPC03NS
	11-core	PNP	M14 (12-pin male)			GL-RPC03PM
		NPN				GL-RPC03NM
Series connection cable The connector shape for both sides is the same.	Series connection cable	PNP/NPN shared	—	0.26'	0.08	GL-RS008
				0.49'	0.15	GL-RS015
				1.64'	0.5	GL-RS05
				3.28'	1	GL-RS1
				9.84'	3	GL-RS3
				16.40'	5	GL-RS5
				32.81'	10	GL-RS10

For extension

• If using a combination of the unit connection cable (for extension use) and the extension cable, make sure that they share the same amount of conductors.

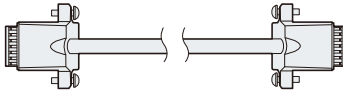| Shape	No. of conductors	PNP/NPN	Length (ft. m)	Model
	5-core M12 connector (5-pin female)		16.40' 5	**GL-RC5**
			32.81' 10	**GL-RC10**
			65.62' 20	**GL-RC20**
Extension cable	7-core M12 connector (8-pin female)	PNP/NPN shared	16.40' 5	**GL-RC5S**
			32.81' 10	**GL-RC10S**
			65.62' 20	**GL-RC20S**
	11-core M14 connector (12-pin female)		16.40' 5	**GL-RC5M**
			32.81' 10	**GL-RC10M**
			65.62' 20	**GL-RC20M**

For series connection

By connecting up to 3 GL-R units in a series, they can function as a single set of light curtains.

• Use a series connection cable to perform series connection.

Shape	PNP/NPN	Length (ft. m)	Model
		0.26' 0.08	**GL-RS008**
		0.49' 0.15	**GL-RS015**
		1.64' 0.5	**GL-RS05**
	PNP/NPN shared	3.28' 1	**GL-RS1**
*The connector shape for both sides is the same. There are no regulations for the direction in which connection is performed.		9.84' 3	**GL-RS3**
		16.40' 5	**GL-RS5**
		32.81' 10	**GL-RS10**

▶ Installation schematic

Optical synchronization/
Wire synchronization system
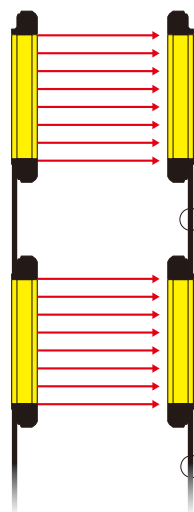
One-line system

• Series connection cable
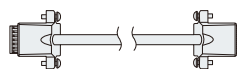
• Unit connection cable
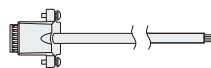
• Unit connection cable (for extension use) + extension cable
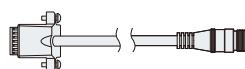
*The unit connection cable cannot be installed on top of the GL-R.
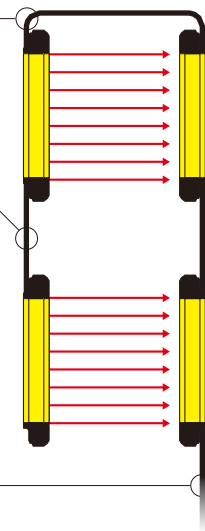
Select the optional accessories

▶ Front protection cover

Select a front protection cover to protect the detection surface as necessary.

Front protection cover	Operating distance		
	GL-RF	**GL-RH**	**GL-RL**
Single side (Transmitter or receiver only)	31.17' 9.5 m	47.57' 14.5 m	
Both sides (Transmitter and receiver)	29.53' 9 m	45.93' 14 m	

Think of the front protection cover as a replaceable item.
When heavily soiled, melted due to spatter, or damaged due to impact, replace the cover with a new one.

Two sets are required to install protection on both the transmitter and receiver. Refer to the detection distances in the chart when using the front protection cover.

| Model	Applicable **GL-R** model		
GL-RA160	—	**GL-R08H**	**GL-R04L**
GL-RA240	**GL-R23F**	**GL-R12H**	**GL-R06L**
GL-RA320	**GL-R31F**	**GL-R16H**	**GL-R08L**
GL-RA400	**GL-R39F**	**GL-R20H**	**GL-R10L**
GL-RA480	**GL-R47F**	**GL-R24H**	**GL-R12L**
GL-RA560	**GL-R55F**	**GL-R28H**	**GL-R14L**
GL-RA640	**GL-R63F**	**GL-R32H**	**GL-R16L**
GL-RA720	**GL-R71F**	**GL-R36H**	**GL-R18L**
GL-RA800	**GL-R79F**	**GL-R40H**	**GL-R20L**
GL-RA880	**GL-R87F**	**GL-R44H**	**GL-R22L**
GL-RA960	**GL-R95F**	**GL-R48H**	**GL-R24L**
GL-RA1040	**GL-R103F**	**GL-R52H**	**GL-R26L**
GL-RA1120	**GL-R111F**	**GL-R56H**	**GL-R28L**
GL-RA1200	**GL-R119F**	**GL-R60H**	**GL-R30L**
GL-RA1280	**GL-R127F**	**GL-R64H**	**GL-R32L**
GL-RA1440	—	**GL-R72H**	—
GL-RA1600	—	**GL-R80H**	—
GL-RA1760	—	**GL-R88H**	—
GL-RA1920	—	**GL-R96H**	—

▶ Interface unit

Optional accessory required to perform configuration and monitoring of the GL-R on a PC.

Model	Name
GL-R1UB	Interface unit
OP-51580	USB cable 6.56' 2 m
OP-86941	USB cable 16.40' 5 m

▶ Corner mirror SL-M Series

By using a corner mirror, it is possible to reduce costs and save time on wiring.

• This is a mirror that reflects light from the transmitter within a range of 45° to 95°. Up to 4 mirrors can be used.
  For details, see the "SL-M Series instruction manual".
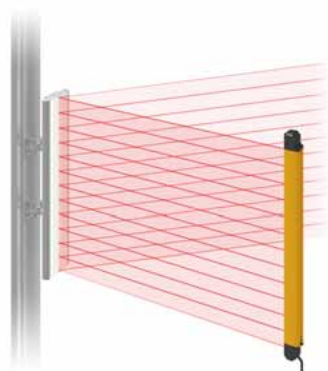
For each single corner mirror,
the detection distance will decrease
by approximately 10%.

Model	Applicable GL-R model		
SL-M12H	GL-R23F	GL-R08H/GL-R12H	GL-R04L/GL-R06L
SL-M16H	GL-R31F	GL-R16H	GL-R08L
SL-M20H	GL-R39F	GL-R20H	GL-R10L
SL-M24H	GL-R47F	GL-R24H	GL-R12L
SL-M28H	GL-R55F	GL-R28H	GL-R14L
SL-M32H	GL-R63F	GL-R32H	GL-R16L
SL-M36H	GL-R71F	GL-R36H	GL-R18L
SL-M40H	GL-R79F	GL-R40H	GL-R20L
SL-M44H	GL-R87F	GL-R44H	GL-R22L
SL-M48H	GL-R95F	GL-R48H	GL-R24L
SL-M52H	GL-R103F	GL-R52H	GL-R26L
SL-M56H	GL-R111F	GL-R56H	GL-R28L
SL-M60H	GL-R119F	GL-R60H	GL-R30L
SL-M64H	GL-R127F	GL-R64H	GL-R32L
SL-M80H[*]	—	GL-R72H/GL-R80H	—
SL-M96H[*]	—	GL-R88H/GL-R96H	—

* Newly added to the lineup

Specifications

Model		GL-RF	GL-RH	GL-RL
Beam axis spacing/Lens diameter		0.39" 10 mm / ø0.16" ø4	0.79" 20 mm / ø0.20" ø5	1.57" 40 mm / ø0.20" ø5
Detection capability		ø0.55" ø14 mm	ø0.98" ø25 mm	ø1.77" ø45 mm
Operating distance		0.66 to 32.81' 0.2 to 10 m*1	0.66 to 49.21' 0.2 to 15 m*1	
Effective aperture angle		Max. ±2.5° (When operating distance is 9.84' 3 m or more)		
Light source		Infrared LED (870 nm)		
Response time		Optical synchronization (Channel 0) or Wire synchronization: 6.6 to 18.1 ms Optical synchronization (Channel A or B): 6.9 to 27.4 ms		
OSSD operation		Turns on when no interruptions are present in the detection zone		
Synchronization between the transmitter and receiver		Optical synchronization or Wire synchronization (Determined by wiring)		
Light interference prevention function		Prevents mutual interference in up to two GL-R systems. Optical synchronization: prevented by Channel A and B with setting switch Wire synchronization: prevented automatically		
Control output (OSSD output)	Output	2 transistor outputs. (PNP or NPN is determined by the cable type)		
	Max. load current	500 mA*2		
	Residual voltage (during ON)	Max. 2.5 V (with a cable length of 16.40' 5 m)		
	OFF state voltage	Max. 2.0 V (with a cable length of 16.40' 5 m)		
	Leakage current	Max. 200 μA		
	Max. capacitive load	2.2 μF		
	Load wiring resistance	Max. 2.5 Ω		
Supplemental output (Non-safety-related output)	AUX	2 transistor outputs. (PNP or NPN is determined by the cable type)		
	Error output	Load current: Max. 50 mA, Residual voltage: Max. 2.5 V (with a cable length of 16.40' 5 m)		
	Muting lamp output	Incandescent lamp (24 VDC, 1 to 5.5 W) LED lamp (load current: 10 to 230 mA) can be connected		
External input	EDM input	[When using a PNP output cable] ON voltage: 10 to 30 V OFF voltage: Open or 0 to 3 V Short circuit current: Approx. 2.5 mA (Approx. 10 mA with EDM input only)	[When using an NPN output cable] ON voltage: 0 to 3 V OFF voltage: Open or 10 V or more Up to the power voltage Short circuit current: Approx. 2.5 mA (Approx. 10 mA with EDM input only)	
	Wait input			
	Reset input			
	Muting input 1, 2			
	Override input			
Power supply	Voltage	24 VDC ±20%, ripple (P-P) 10% or less, Class 2		
	Current consumption	Transmitter : 37 to 81mA, Receiver : 66 to 91 mA		
Protection circuit		Reverse current protection, short-circuit protection for each output, surge protection for each output		
Environmental resistance	Enclosure rating	IP65/IP67 (IEC60529)		
	Overvoltage category	II		
	Ambient temperature	14 to +131°F -10 to +55°C (No freezing)		
	Storage ambient temperature	-13 to +140°F -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: 3,000 lx or less. Sunlight: 20,000 lx or less		
	Vibration	10 to 55 Hz, 0.03" 0.7 mm compound amplitude, 20 sweeps each in the X, Y and Z directions		
	Shock	100m/S2 (approx. 10 G), 16 ms pulse in X, Y and Z directions, 1,000 times each axis		
Material	Main unit case	Aluminum		
	Upper case/lower case	Nylon (GF 30%)		
	Front cover	Polycarbonate, SUS304		
Weight		See p.22		
Approved standards	EMC	EMS	IEC61496-1, EN61496-1, UL61496-1		
		EMI	EN55011 ClassA, FCC Part15B ClassA, ICES-003 ClassA		
	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 ISO13849-1:2008 (Category 4, PLe)		
		UL508		
		UL1998		

*1 When the option front protection cover is installed on the one of transmitter or receiver, the Operating distance is shorten by 1.64' 0.5 m. When the front covers are installed on both of the transmitter and receiver, the Operating distance is shorten by 3.28' 1.0 m.
*2 When the GL-R is used under surrounding air temperatures between 122°F to 131°F 50 to 55°C, the Maximum load current should not exceed 350 mA.

Part description

Transmitter

- Beam center-line mark
- Center indicators
- 7-segment display
- Function indicators
- Setting switch

Receiver

- Beam center-line mark
- Center indicators
- 7-segment display
- Function indicators
- Setting switch

Connector for the interface unit (GL-R1UB)

(Back side)

- End cover
- Connector for the unit connection cable
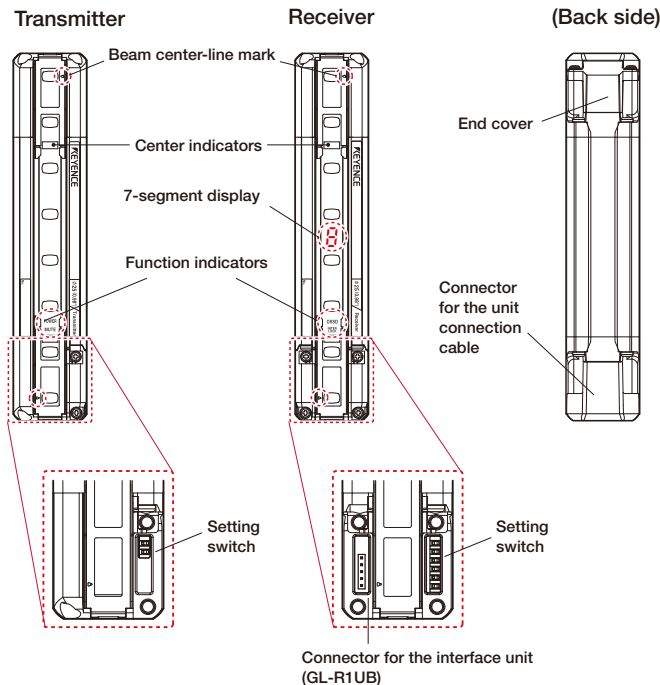
Setting switch

Transmitter

Number	Details		Settings
2	Channel	Channel 0 (Not applied) (default)	Use Channel for light interference prevention when optical synchronization system is applied. For details, refer to the "GL-R User's Manual".
		Channel A	
1		Channel B	

Receiver

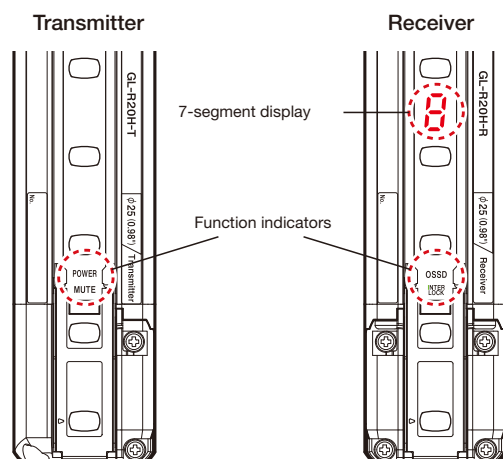| Number	Details		Settings
6	Center indicator	ON (Green) when all beam axes are clear (Default)	
		OFF when all beam axes are clear	
5	Reduced resolution function (safety function)	Reduced resolution is not applied (Default).	
4		Reduced resolution (one optical beam) is applied.	
3		Reduced resolution (two optical beams) is applied.	
2	Channel	Channel 0 (Not applied) (default)	Use Channel for light interference prevention when optical synchronization system is applied. For details, refer to the "GL-R User's Manual".
		Channel A	
1		Channel B	

20

Indicators

Transmitter

GL-R20H-T

φ25 (0.98") / Transmitter

POWER
MUTE

Receiver

GL-R20H-R

φ25 (0.98") / Receiver

OSSD

7-segment display

Function indicators

Function indicators

Transmitter		
Name	**Status**	**Details**
POWER (orange)	Light ON	Power ON (Transmitter)
	Light OFF	Power OFF (Transmitter)
MUTE (orange)	Light ON	Muted condition or Override condition
	Blinking slowly	Muting input 1 ON
	Blinking	Muting input 2 ON, or muting input 1 and 2 ON
	Light OFF	Muting input 1 and 2 OFF

Receiver		
Name	**State**	**Details**
OSSD (red/green)	Light in red	OSSD OFF
	Light in green	OSSD ON
	Blinking in green	Amount of received light is unstable. (Alert output OFF)
	Light OFF	Power OFF (Receiver)
INTERLOCK (Yellow)	Light ON	Interlock condition
	Blinking	Interlock reset ready condition (Interlock reset ready output ON)
	Light OFF	No interlock or error condition

• When optical synchronization system is applied, only the "POWER" indicator turns ON on the transmitter.

7-segment display

Upon power-up

Wire synchronization	Optical synchronization		
	Channel 0	Channel A	Channel B
11	Ξ	A	b

During normal operation

Condition	7-segment display
Applying the reduced resolution function or fixed blanking function.	F
Wait input is activated.	U
Applying the muting function or override function — Muting input 1 ON	(segment display)
Muting input 2 ON	(segment display)
Muting input 1 and 2 ON[*1]	‒ ‒
Muted Condition	(animated segment display)
Override input ON[*2]	O
Override condition.	(animated segment display)
Other than those above.	Turn OFF

[*1] When not in the muted condition because conditions for initiation of muting are not met.
[*2] When not in the override condition because conditions for initiation of override are not met.

Error condition

When an error occurs, the OSSD goes to the OFF-state and the GL-R goes to the error condition. For the 7-segment display in the error condition, refer to the "instruction manual".

Center indicators

Beam axis

Center indicator (Upper)

Center indicator (Upper)
indicates whether interruption is present in the top beam axis or not. (clear or blocked)

Center indicator (Middle)

Center indicator (Middle)
indicates whether the middle axis beams are interrupted or not.

Center indicator (Lower)

Center indicator (Lower)
indicates whether interruption is present in the bottom beam axis or not. (clear or blocked)

Center indicator	Light OFF	Light in red	Light in green	Blinking in red
Upper	Top beam axis is blocked	Although the top beam axis is unblocked, the others are blocked	No interruption is present in detection zone of the GL-R. (clear)	Error condition
Middle	Top beam axis or Bottom beam axis is blocked	Although the top and bottom beam axis are unblocked, the middle beams are blocked		
Lower	Bottom beam axis is blocked	Although the bottom beam axis is unblocked, the others are blocked		

* The center indicator on the transmitter is OFF when optical synchronization system is applied.

Response time (OSSD)

GL-RF

Units: ms

Model	Wire synchronization, One-line or Optical synchronization system (Channel 0)			Optical synchronization system (Channel A or B)		
	ON → OFF	OFF → ON*1	All blocked → ON*2	ON → OFF	OFF → ON*1	All blocked → ON*2
GL-R23F	6.9	49.2	64.4	9.3	52.7	74.0
GL-R31F	7.8	50.5	67.9	10.7	54.8	79.5
GL-R39F	8.6	51.8	71.3	12.1	56.9	85.1
GL-R47F	9.5	53.1	74.8	13.5	59.0	90.7
GL-R55F	10.4	54.3	78.3	14.9	61.1	96.3
GL-R63F	11.2	55.6	81.7	16.3	63.2	101.8
GL-R71F	12.1	56.9	85.2	17.6	65.3	107.4
GL-R79F	13.0	58.2	88.6	19.0	67.4	113.0
GL-R87F	13.8	59.5	92.1	20.4	69.4	118.5
GL-R95F	14.7	60.8	95.5	21.8	71.5	124.1
GL-R103F	15.5	62.1	99.0	23.2	73.6	129.7
GL-R111F	16.4	63.4	102.4	24.6	75.7	135.2
GL-R119F	17.3	64.7	105.9	26.0	77.8	140.8
GL-R127F	18.1	66.0	109.4	27.4	79.9	146.4

GL-RH

Units: ms

Model	Wire synchronization, One-line or Optical synchronization system (Channel 0)			Optical synchronization system (Channel A or B)		
	ON → OFF	OFF → ON*1	All blocked → ON*2	ON → OFF	OFF → ON*1	All blocked → ON*2
GL-R08H	6.6	48.7	63.1	6.9	49.1	64.2
GL-R12H	6.6	48.7	63.1	7.4	49.9	66.3
GL-R16H	6.6	48.7	63.1	8.1	50.9	69.1
GL-R20H	6.6	48.7	63.1	8.8	52.0	71.9
GL-R24H	7.0	49.3	64.9	9.5	53.0	74.7
GL-R28H	7.4	50.0	66.6	10.2	54.0	77.5
GL-R32H	7.9	50.6	68.3	10.9	55.1	80.2
GL-R36H	8.3	51.3	70.0	11.6	56.1	83.0
GL-R40H	8.7	51.9	71.8	12.3	57.2	85.8
GL-R44H	9.2	52.6	73.5	12.9	58.2	88.6
GL-R48H	9.6	53.2	75.2	13.6	59.3	91.4
GL-R52H	10.0	53.9	77.0	14.3	60.3	94.2
GL-R56H	10.5	54.5	78.7	15.0	61.4	96.9
GL-R60H	10.9	55.2	80.4	15.7	62.4	99.7
GL-R64H	11.3	55.8	82.1	16.4	63.4	102.5
GL-R72H	12.2	57.1	85.6	17.8	65.5	108.1
GL-R80H	13.1	58.4	89.1	19.2	67.6	113.7
GL-R88H	13.9	59.7	92.5	20.6	69.7	119.2
GL-R96H	14.8	61.0	96.0	22.0	71.8	124.8

GL-RL

Units: ms

Model	Wire synchronization, One-line or Optical synchronization system (Channel 0)			Optical synchronization system (Channel A or B)		
	ON → OFF	OFF → ON*1	All blocked → ON*2	ON → OFF	OFF → ON*1	All blocked → ON*2
GL-R04L	6.6	48.7	63.1	6.9	49.1	64.2
GL-R06L	6.6	48.7	63.1	6.9	49.1	64.2
GL-R08L	6.6	48.7	63.1	6.9	49.1	64.2
GL-R10L	6.6	48.7	63.1	7.0	49.3	64.9
GL-R12L	6.6	48.7	63.1	7.4	49.9	66.3
GL-R14L	6.6	48.7	63.1	7.7	50.4	67.7
GL-R16L	6.6	48.7	63.1	8.1	50.9	69.1
GL-R18L	6.6	48.7	63.1	8.4	51.4	70.5
GL-R20L	6.6	48.7	63.1	8.8	52.0	71.9
GL-R22L	6.8	49.0	64.0	9.1	52.5	73.3
GL-R24L	7.0	49.3	64.9	9.5	53.0	74.7
GL-R26L	7.2	49.6	65.7	9.8	53.5	76.1
GL-R28L	7.4	50.0	66.6	10.2	54.0	77.5
GL-R30L	7.7	50.3	67.5	10.5	54.6	78.9
GL-R32L	7.9	50.6	68.3	10.9	55.1	80.2

*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-R operates in optical synchronization system and the transmitter and receiver is not synchronized (top and bottom beam axes are both blocked). In this situation, the response time is longer because the GL-R synchronizes the transmitter and receiver first and then determines the clear or blocked.

✎Point

- When the GL-R 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 to OFF
One sub unit : 2 ms
Two sub unit : 4.2 ms
(When Optical synchronization system and Channel A or B)
One sub unit : 2.7 ms
Two sub unit : 5.7 ms

OFF to ON
One sub unit : 42 ms
Two sub unit : 84 ms

When connecting the GL-R32H (32 beam axes), GL-R24H (24 beam axes), and GLR12L (12 beam axes) in series for one-line system, the response time of each unit is 7.9 ms, 7.0 ms, and 6.6 ms respectively, and the response time (ON to OFF) is 7.9 ms + 7.0 ms + 6.6 ms - 4.2 ms = 17.3 ms.
The response time (OFF to ON) is 50.6 ms + 49.3 ms + 48.7 ms - 84 ms = 64.6 ms.

- 2.0 m/s is the maximum object detection speed of the GL-R series.

Current consumption

Units: mA

Model	Current consumption (Max.)	
	Trans-mitter	Receiver
GL-R23F	50	70
GL-R31F	54	71
GL-R39F	57	72
GL-R47F	60	74
GL-R55F	62	75
GL-R63F	64	77
GL-R71F	66	78
GL-R79F	67	80
GL-R87F	69	81
GL-R95F	71	83
GL-R103F	72	84
GL-R111F	74	85
GL-R119F	76	87
GL-R127F	78	89

Units: mA

Model	Current consumption (Max.)	
	Trans-mitter	Receiver
GL-R08H	43	66
GL-R12H	46	68
GL-R16H	50	69
GL-R20H	53	71
GL-R24H	57	72
GL-R28H	59	73
GL-R32H	61	74
GL-R36H	63	75
GL-R40H	65	76
GL-R44H	66	77
GL-R48H	68	79
GL-R52H	69	80
GL-R56H	71	81
GL-R60H	72	82
GL-R64H	73	83
GL-R72H	75	85
GL-R80H	77	87
GL-R88H	79	89
GL-R96H	81	91

Units: mA

Model	Current consumption (Max.)	
	Trans-mitter	Receiver
GL-R04L	37	66
GL-R06L	39	67
GL-R08L	41	68
GL-R10L	43	69
GL-R12L	46	70
GL-R14L	48	71
GL-R16L	50	72
GL-R18L	52	73
GL-R20L	54	75
GL-R22L	56	75
GL-R24L	57	76
GL-R26L	59	77
GL-R28L	60	78
GL-R30L	61	79
GL-R32L	62	80

Weight

Units: g

Model	Weight	
	Trans-mitter	Receiver
GL-R23F	320	330
GL-R31F	430	440
GL-R39F	550	550
GL-R47F	660	670
GL-R55F	780	780
GL-R63F	890	900
GL-R71F	1000	1010
GL-R79F	1200	1200
GL-R87F	1300	1300
GL-R95F	1400	1400
GL-R103F	1500	1500
GL-R111F	1600	1600
GL-R119F	1700	1700
GL-R127F	1800	1900

Units: g
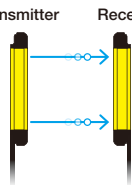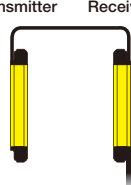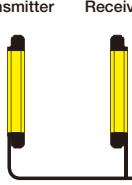
Model	Weight	
	Trans-mitter	Receiver
GL-R08H	210	210
GL-R12H	320	330
GL-R16H	430	440
GL-R20H	550	550
GL-R24H	660	660
GL-R28H	770	770
GL-R32H	880	890
GL-R36H	1000	1000
GL-R40H	1110	1110
GL-R44H	1220	1220
GL-R48H	1330	1340
GL-R52H	1440	1450
GL-R56H	1560	1560
GL-R60H	1670	1680
GL-R64H	1780	1790
GL-R72H	2010	2010
GL-R80H	2230	2240
GL-R88H	2450	2460
GL-R96H	2680	2690

Units: g

Model	Weight	
	Trans-mitter	Receiver
GL-R04L	210	210
GL-R06L	320	330
GL-R08L	430	440
GL-R10L	550	550
GL-R12L	660	660
GL-R14L	770	770
GL-R16L	880	890
GL-R18L	1000	1000
GL-R20L	1110	1110
GL-R22L	1220	1220
GL-R24L	1330	1340
GL-R26L	1440	1450
GL-R28L	1560	1560
GL-R30L	1670	1680
GL-R32L	1780	1790

Functions and features

Wiring system

Wiring system	Optical synchronization system	One-line system	Wire synchronization system
Wiring diagram	Transmitter Receiver	Transmitter Receiver	Transmitter Receiver
Advantage	• Wiring is not needed between the transmitter and receiver. • The Transmitter and the receiver can operate on different power supplies.	• Simplified wiring. • The unit connection cable is not needed for the transmitter.	• All functions of the GL-R are available.
Limitation	• The input and output functions on the transmitter are not available. • All indicators other than "Power" are not available on the transmitter.	• The input and output functions on the transmitter are not available. • There is a maximum limit for the total length of cables.	• Wiring is needed between the transmitter and the receiver.
Applicable Cables — Transmitter	5-core cable	Series connection cable	7-core cable 11-core cable
Applicable Cables — Receiver	5-core cable 11-core cable	5-core cable 11-core cable	7-core cable 11-core cable

Wiring system		Optical synchronization system		One-line system		Wire synchronization system			
Cable combination	Transmitter cable	5-core		Series connection		7-core		11-core	
	Receiver cable	5-core	11-core	5-core	11-core	7-core	11-core	7-core	11-core
Usable functions	OSSD output	✓	✓	✓	✓	✓	✓	✓	✓
	AUX (auxiliary) output		✓		✓	🖥	✓	🖥	✓
	Error output		🖥		🖥	✓	✓	✓	✓
	Muting		🖥		🖥		🖥	✓	✓
	Partial muting function		🖥		🖥		🖥	🖥	🖥
	Muting bank function								🖥
	Muted condition output		🖥		🖥		🖥	🖥	🖥
	Muting lamp output							✓(🖥)	✓(🖥)
	Override function							✓(🖥)	✓(🖥)
	Interlock function		✓(🖥)		✓(🖥)		✓(🖥)		✓(🖥)
	Interlock-reset-ready output		🖥		🖥		🖥		🖥
	EDM function		✓(🖥)		✓(🖥)		✓(🖥)		✓(🖥)
	Wait input					✓	✓	✓	✓
	Alert output		🖥		🖥	🖥	🖥	🖥	🖥
	Clear/Block output		🖥		🖥	🖥	🖥	🖥	🖥
	Reset input (for error)	✓		✓		✓		✓	
	Reduced resolution function	✓(🖥)	✓(🖥)	✓(🖥)	✓(🖥)	✓(🖥)	✓(🖥)	✓(🖥)	✓(🖥)
	Fixed blanking function	🖥	🖥	🖥	🖥	🖥	🖥	🖥	🖥
	Channel configuration (Light interference prevention function)	✓	✓	✓	✓	✓	✓	✓	✓
	Center indicator configuration	✓(🖥)	✓(🖥)	✓(🖥)	✓(🖥)	✓(🖥)	✓(🖥)	✓(🖥)	✓(🖥)
	Monitoring function	🖥	🖥	🖥	🖥	🖥	🖥	🖥	🖥

✓ Available without the configuration software   🖥 Available with the configuration software   ✓(🖥) Available without the configuration software. Functionality can be expanded when using the configuration software.

Series connection

Up to three GL-R units can be serially connected and used as a single light curtain.

OSSD

The OSSD is a safety-related control output. It connects to an external device (load), such as an FSD or MPCE. The GL-R generates self-diagnosis signals on its internal control circuit to perform diagnostics on the output circuit (OSSD). These signals periodically force the OSSD into a temporary OFF state when no interruption exists in the detection zone.

Interlock function

Interlock is a function that prevents the OSSD from automatically going to the ON state from an OFF state. You can prevent the unintended start-up and/or the unintended restart of the machine if an interlock is applied to the GL-R.

External device breakdown detection (EDM function)

EDM (External Device Monitoring) is a function of the GL-R that monitors the state of the control devices which are externally connected to the GL-R. The GL-R can detect a fault, such as welded contacts on external devices, as long as the EDM function is activated. This function is available only when connecting to the 11-core cable to the receiver.

Wiring

Cable specification

1 Cable length

1. Optical synchronization system, wire synchronization system

The sum of the length for the unit connection cable and extension cable must be 98.43' 30 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 98.43' 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 features may not operate properly. Do not allow this to happen as it is extremely dangerous.

2 Minimum cable bending radius: 0.2" 5 mm

3 Identification of connector cables
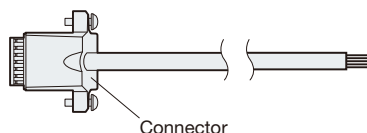
Connector

Connector color

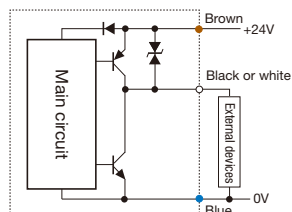PNP output type cables or series connection cables : Black connectors
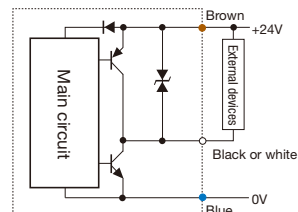NPN output type cables : Grey connectors

⬩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.
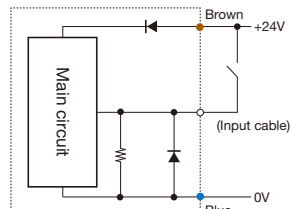
Diagrams of the I/O circuits
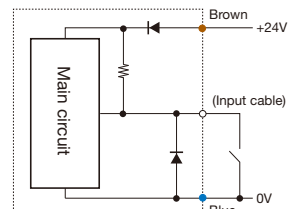
Output circuit (PNP cable)

Output circuit (NPN cable)

Input circuit (PNP cable)

Input circuit (NPN cable)

Cable colors and pin positions

> **Reference**
>
> - When the synchronization wire 1 is wired between the transmitter and receiver, and the synchronization wire 2 is wired in the same manner, the GL-R operates in wire synchronization system.
> - When the synchronization wire 1 or 2 is not connected, the GL-R operates in optical synchronization system.
> - When optical synchronization system or one-line system is applied, the input and output functions on the transmitter are not available.
> - The functions assigned to the input and output may differ according to the configuration when setting through the configuration software.
> - "Wiring systems" (page 23)

5-core cable

Pin number	Cable color	Name	
		When the transmitter is connected	When the receiver is connected
1	Brown	+24V	+24V
2	Black	(Not in use)	OSSD1
3	Blue	0V	0V
4	White	(Not in use)	OSSD2
5	Gray	FE	FE

> **Reference**
>
> M12 connector male pin assignment   M12 connector female pin assignment

7-core cable

Pin number	Cable color	Name	
		When the transmitter is connected	When the receiver is connected
1	White	Wait input	OSSD2
2	—	(Not in use)	(Not in use)
3	Black	Error output	OSSD1
4	Brown	+24V	+24V
5	Orange	Synchronization 1 (RS-485 +)	Synchronization 1 (RS-485 +)
6	Orange/black	Synchronization 2 (RS-485 -)	Synchronization 2 (RS-485 -)
7	Blue	0V	0V
8	Gray	FE	FE

> **Reference**
>
> M12 connector male pin assignment   M12 connector female pin assignment

11-core cable

Pin number	Cable color	Name	
		When the transmitter is connected	When the receiver is connected
1	White	Wait input	OSSD2
2	—	(Not in use)	(Not in use)
3	Black	Error output	OSSD1
4	Yellow	Override input	RESET input
5	Orange	Synchronization 1 (RS-485 +)	Synchronization 1 (RS-485 +)
6	Orange/black	Synchronization 2 (RS-485 -)	Synchronization 2 (RS-485 -)
7	Blue	0V	0V
8	Red	Muting lamp output	AUX output
9	Red/black	Muting input 2	EDM input
10	Brown	+24V	+24V
11	Pink	Muting input 1	Interlock selection input
12	Gray	FE	FE

> **Reference**
>
> M14 connector male pin assignment   M14 connector female pin assignment

Examples of Wiring

Signal meaning

R1, R2 ······ External device (safety PLC, safety relay unit, etc.)
K1, K2 ······ External device ((Force guided relay, magnet connector, etc.)
K3 ··········· Solid state connector*[1]
S1 ··········· Switch used for reset input
S2 ··········· Switch used for wait input*[1]
S3 ··········· Switch used for override input

S4 to 6 ····· Switch used for muting bank inputs
L1 ············· Muting lamp (Incandescent lamp or LED lamp)
P1, P2 ······ Muting device (Self-contained photoelectric sensors, etc.)
M ············· 3-phase motor
PLC ········· For NON SAFETY-RELATED system control use*[1]

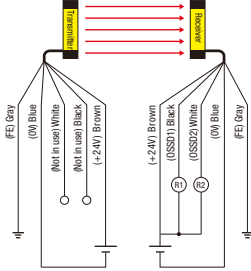*[1] These are NON SAFETY-RELATED components.

Optical synchronization system

Transmitter : 5-core cable, Receiver:5-core cable
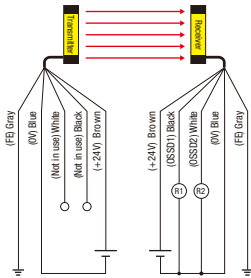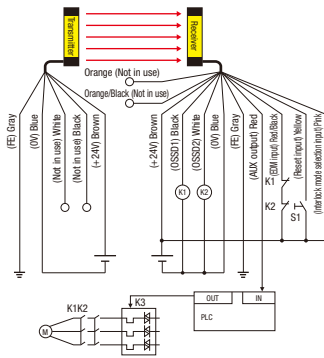
(1) PNP output cable
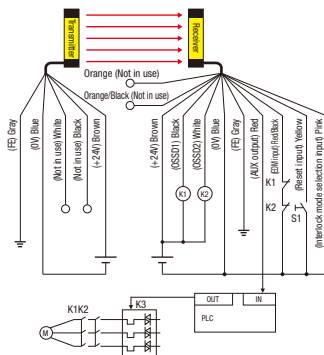

(2) NPN output cable

Transmitter : 5-core cable, Receiver:11-core cable
Uses EDM input and the interlock function

(1) PNP output cable
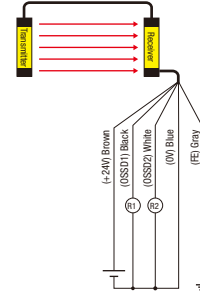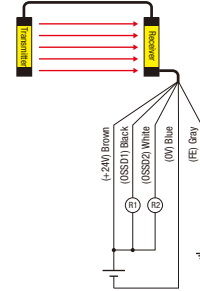

(2) NPN output cable

One-line system

- The series connection cable must be used to connect the transmitter and receiver.
- The unit connection cable is not needed for the transmitter.
- The wiring for the receiver is the same as optical synchronization system.

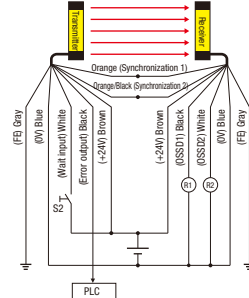### Transmitter : Series connection cable, Receiver:5-core cable
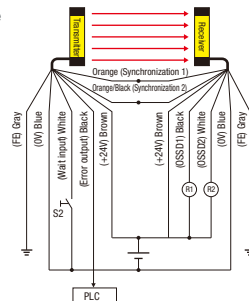
(1) PNP output cable

(2) NPN output cable

Wire synchronization system

Transmitter : 7-core cable, Receiver:7-core cable
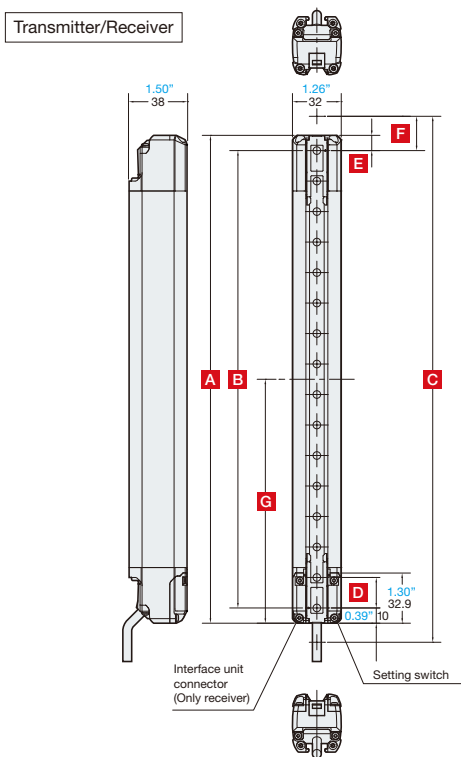
(1) PNP output cable

(2) NPN output cable
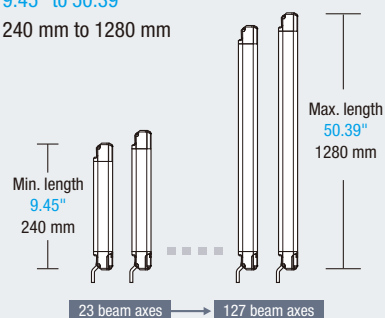
Dimensions

GL-R (GL-RF/RH/RL) Main unit

Transmitter/Receiver

1.50" / 38

1.26" / 32

F
E
A B
C
G
D 1.30" / 32.9
0.39" / 10

Interface unit connector (Only receiver)

Setting switch

GL-RF unit variation

Length
9.45" to 50.39"
240 mm to 1280 mm

Max. length
50.39"
1280 mm

Min. length
9.45"
240 mm

23 beam axes → 127 beam axes

GL-RH unit variation

Length
6.30" to 75.59"
160 mm to 1920 mm

Max. length
75.59"
1920 mm

Min. length
6.30"
160 mm

8 beam axes → 96 beam axes
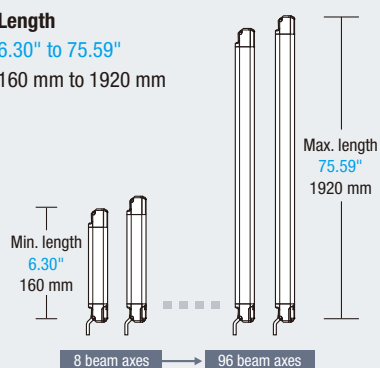
GL-RL unit variation

Length
6.30" to 50.39"
160 mm to 1280 mm

Max. length
50.39"
1280 mm

Min. length
6.30"
160 mm

4 beam axes → 32 beam axes
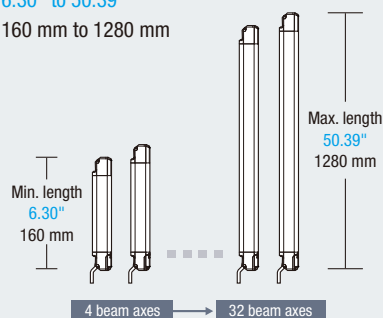
Understanding the model name

GL-R 12 H

[1] [2] [3]

[1] Series name

[2] Number of beam axes: 2 or 3 digit number.
Ex.: 08 = 8 axes, 64 = 64 axes

[3] Detection capability: F: ø0.55" ø14 mm detection type,
H: ø0.98" ø25 mm detection type,
L: ø1.77" ø45 mm detection type

The main unit includes both transmitter and receiver as one set.

Meaning of each item
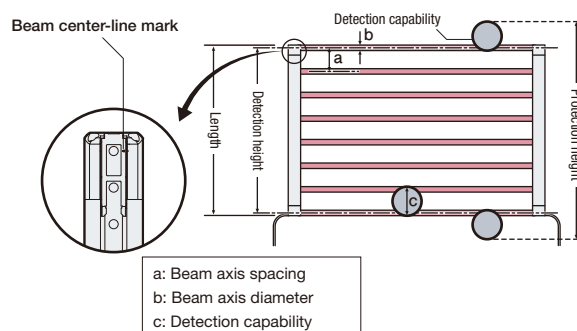
Beam center-line mark

Detection capability
b
a

Length

Detection height

Protection height

a: Beam axis spacing
b: Beam axis diameter
c: Detection capability

Unit: inch mm

Model	No. of axes	A Length		B Detection height		C Protection height		D Beam axis pitch		E		F		G	
GL-R23F	23	9.45"	240	8.66"	220	9.61"	244							4.72"	120
GL-R31F	31	12.60"	320	11.81"	300	12.76"	324							6.30"	160
GL-R39F	39	15.75"	400	14.96"	380	15.91"	404							7.87"	200
GL-R47F	47	18.90"	480	18.11"	460	19.06"	484							9.45"	240
GL-R55F	55	22.05"	560	21.26"	540	22.20"	564							11.02"	280
GL-R63F	63	25.20"	640	24.41"	620	25.35"	644							12.60"	320
GL-R71F	71	28.35"	720	27.56"	700	28.50"	724	0.39"	10	0.39"	10	0.47"	12	14.17"	360
GL-R79F	79	31.50"	800	30.71"	780	31.65"	804							15.75"	400
GL-R87F	87	34.65"	880	33.86"	860	34.80"	884							17.32"	440
GL-R95F	95	37.80"	960	37.01"	940	37.95"	964							18.90"	480
GL-R103F	103	40.94"	1040	40.16"	1020	41.10"	1044							20.47"	520
GL-R111F	111	44.09"	1120	43.31"	1100	44.25"	1124							22.05"	560
GL-R119F	119	47.24"	1200	46.46"	1180	47.40"	1204							23.62"	600
GL-R127F	127	50.39"	1280	49.61"	1260	50.55"	1284							25.20"	640

Unit: inch mm

Model	No. of axes	A Length		B Detection height		C Protection height		D Beam axis pitch		E		F		G	
GL-R08H	8	6.30"	160	5.51"	140	7.28"	185							3.15"	80
GL-R12H	12	9.45"	240	8.66"	220	10.43"	265							4.72"	120
GL-R16H	16	12.60"	320	11.81"	300	13.58"	345							6.30"	160
GL-R20H	20	15.75"	400	14.96"	380	16.73"	425							7.87"	200
GL-R24H	24	18.90"	480	18.11"	460	19.88"	505							9.45"	240
GL-R28H	28	22.05"	560	21.26"	540	23.03"	585							11.02"	280
GL-R32H	32	25.20"	640	24.41"	620	26.18"	665							12.60"	320
GL-R36H	36	28.35"	720	27.56"	700	29.33"	745							14.17"	360
GL-R40H	40	31.50"	800	30.71"	780	32.48"	825							15.75"	400
GL-R44H	44	34.65"	880	33.86"	860	35.63"	905	0.79"	20	0.39"	10	0.89"	22.5	17.32"	440
GL-R48H	48	37.80"	960	37.01"	940	38.78"	985							18.90"	480
GL-R52H	52	40.94"	1040	40.16"	1020	41.93"	1065							20.47"	520
GL-R56H	56	44.09"	1120	43.31"	1100	45.08"	1145							22.05"	560
GL-R60H	60	47.24"	1200	46.46"	1180	48.23"	1225							23.62"	600
GL-R64H	64	50.39"	1280	49.61"	1260	51.38"	1305							25.20"	640
GL-R72H	72	56.69"	1440	55.91"	1420	57.68"	1465							28,35"	720
GL-R80H	80	62.99"	1600	62.20"	1580	63.98"	1625							31.50"	800
GL-R88H	88	69.29"	1760	68.50"	1740	70.28"	1785							34.65"	880
GL-R96H	96	75.59"	1920	74.80"	1900	76.57"	1945							37.80"	960

Unit: inch mm

Model	No. of axes	A Length		B Detection height		C Protection height		D Beam axis pitch		E		F		G	
GL-R04L	4	6.30"	160	4.72"	120	8.07"	205							3.15"	80
GL-R06L	6	9.45"	240	7.87"	200	11.22"	285							4.72"	120
GL-R08L	8	12.60"	320	11.02"	280	14.37"	365							6.30"	160
GL-R10L	10	15.75"	400	14.17"	360	17.52"	445							7.87"	200
GL-R12L	12	18.90"	480	17.32"	440	20.67"	525							9.45"	240
GL-R14L	14	22.05"	560	20.47"	520	23.82"	605							11.02"	280
GL-R16L	16	25.20"	640	23.62"	600	26.97"	685							12.60"	320
GL-R18L	18	28.35"	720	26.77"	680	30.12"	765	1.57"	40	1.18"	30	1.67"	42.5	14.17"	360
GL-R20L	20	31.50"	800	29.92"	760	33.27"	845							15.75"	400
GL-R22L	22	34.65"	880	33.07"	840	36.42"	925							17.32"	440
GL-R24L	24	37.80"	960	36.22"	920	39.57"	1005							18.90"	480
GL-R26L	26	40.94"	1040	39.37"	1000	42.72"	1085							20.47"	520
GL-R28L	28	44.09"	1120	42.52"	1080	45.87"	1165							22.05"	560
GL-R30L	30	47.24"	1200	45.67"	1160	49.02"	1245							23.62"	600
GL-R32L	32	50.39"	1280	48.82"	1240	52.17"	1325							25.20"	640

Dimensions

Mounting bracket

Adjustable angle mounting bracket
GL-RB01

When mounted on GL-R

Material: SPHC

Back mounted state	Side mounted state

GL-R Length

0.47" 12
0.28" 7

0.35" 9
0.59" 15
0.67" 17
0.99" 25.1

ø0.16" ø6.2

1.89" 48
1.97" 50
1.26" 32
1.69" 43

0.58" 14.8
0.16" 4

1.84" 46.8

0.68" 17.2
0.47" 12
0.28" 7
0.51" 13
0.32" 8
0.59" 15
1.34" 34
3.74" 95.1
3.80" 96.6
0.20" 5
0.16" 4
ø0.24 ø6.2
0.32" 8.1
0.99" 25.1
0.16" 4
1.89" 48
1.26" 32

No dead zone mounting bracket
GL-RB21

When mounted on GL-R

Material: Zinc die-cast

Back mounted state	Side mounted state

GL-R Length

1.97" 50
1.61" 40.8
0.47" 12
2.22" 56.5
2.93" 74.5
2.11" 53.7
(0.65" 16.5)
0.33" 8.3
0.60" 15.3
0.25" 6.3
1.21" 30.8
1.86" 47.3

0.47" 12
2.93" 74.5
2.11" 53.7
(0.65" 16.5)
0.60" 15.3
1.97" 50
1.86" 47.3

2.22" 56.5
0.33" 8.3
0.25" 6.3
1.21" 30.8

0.59" 15
0.33" 8.3
2.22" 56.5
2.93" 74.5
0.25" 6.3
0.51" 13
1.21" 30.8
1.70" 43.3

1.61" 40.8
0.47" 12

Straight mounting bracket
GL-RB11

When mounted on GL-R

Mounted state

0.40" 10.2
0.20" 5
1.34" 34
2.15" 54.5
0.51" 13
0.32" 8
0.59" 5
0.59" 95
3.80" 96.5
0.24" 6.2
0.32" 8
0.36" 9.2
0.5" 19

Material: SPHC

GL-R Length

3.74" 95
1.44" 36.5
0.39" 10
0.24" 6.2
0.71" 18
0.20" 5
0.36" 9.2
1.69" 43
0.76" 19

L-shaped mounting bracket
GL-RB12

When mounted on GL-R

Mounted state

0.98" 25
0.59" 14.9
0.20" 5
2xR0.16" 4
0.20" 5.2
1.97" 50
1.18" 30
0.24" 6.2
13.4" 34
1.10" 28
0.43" 11
R0.08" 2
1.38" 35
R0.16" 4
3xR0.12" 3
0.40" 10.2
0.51" 13
0.20" 5
0.71" 18

Material: SPHC

GL-R Length

0.98" 25
0.20" 5
0.40" 10.2
1.97" 50
1.18" 30
0.24" 6.2
2.13" 54
(1.14" 29)
2.08" 52.9
2.48" 63
1.34" 34

1.34" 34
1.10" 28
0.20" 5

Dimensions

Unit: inch mm

Antivibration bracket

Antivibration bracket for the straight mounting bracket
GL-RB31

1.18" 30
0.47" 12
2.76" 70 1.57" 40

C0.06" 1.5
0.41" 10.5
R0.02" 0.5
0.24" 6*

Material: EPDM *0.20" 5 mm: when mounting

Mounted state

1.50" 38
1.69" 43
0.20" 5
2.76" 70
Half the length
1.26" 32
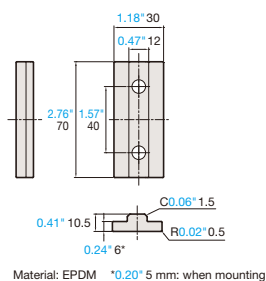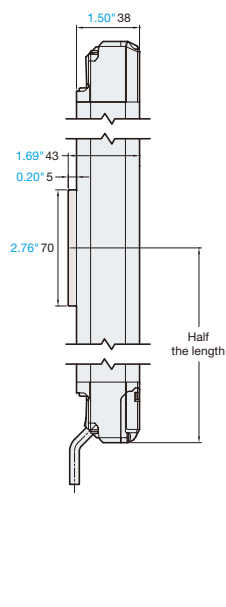
Antivibration bracket for the adjustable angle mounting bracket
GL-RB32

(1.84" 46.8)
0.03" 0.63"
30.8 16
1.11" 0.42"
28.1 10.7
1.89" 48 1.57" 40 1.54" 39 2.52" 64 3.27" 83

6×R0.24" 2
Spot facing 2×ø0.53" ø13.5 Depth 2
2×ø0.24" ø6.2

1.84" 46.8
0.16" 4
0.49" 12.5
0.72" 18.2
0.11" 2.7
1.53" 38.8

Material: SPHC, EPDM

Mounted state

1.99" 50.5
1.84" 46.8
0.49" 12.5
0.16" 4
1.84" 46.8
0.58" 14.8
3.27" 83 1.89" 48 1.57" 40
1.99" 50.5
0.49" 12.5
0.16" 4
1.84" 46.8
0.58" 14.8
0.16" 4
3.27" 83 1.89" 48 1.57" 40
Half the length

0.11" 2.7
1.53" 38.8
0.11" 2.7
1.53" 38.8
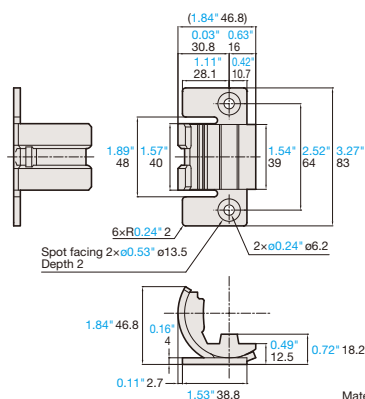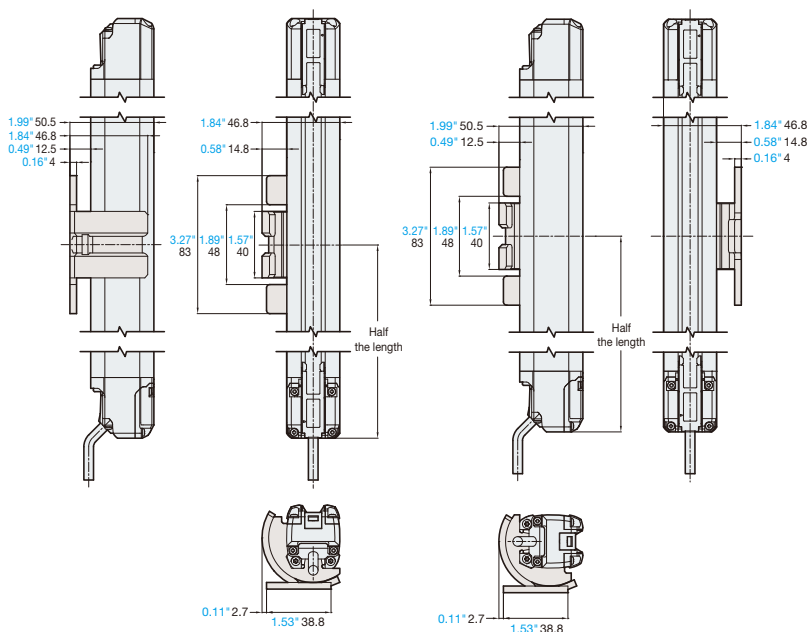
Interface unit

GL-R1UB

Mounted state

0.04" 1.1
1.95" 49.6
1.70" 43.1
0.40" 10.1
0.64" 16.3
0.98" 24.9

1.50" 38
1.25" 31.8
0.98" 24.9
1.30" 32.9
GL-R Length
1.71" 43.1
2.75" 69.8

0.06" 1.5 0.08" 2.1
0.11" 2.7
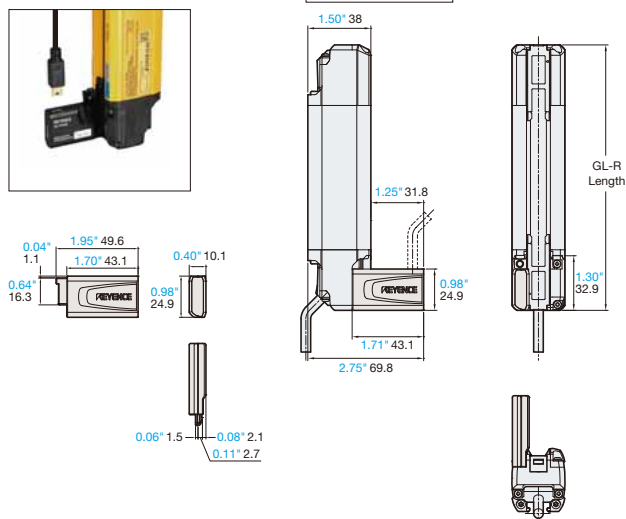
Front protection cover

GL-RA
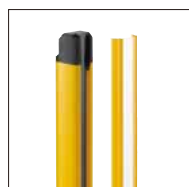
See p.18 for the details

Mounted state

1.65" 41.9
0.51" 12.9
1.33" 33.8
0.76" 19.2
Front protection cover length

CAD DATA Download: ▶ www.keyence.com/CADG

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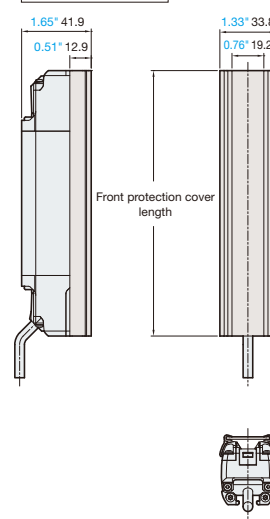
Related product

Safety Laser Scanner
SZ Series | Type3 | SIL2 | CE | TÜV | c(UL)us LISTED

Maximum protection zone
13.77' 4.2m

Ultra small size, die-cast body

- Area Protection
- Easy to install
- It can be mounted on an automated guide vehicle.

SZ-01S
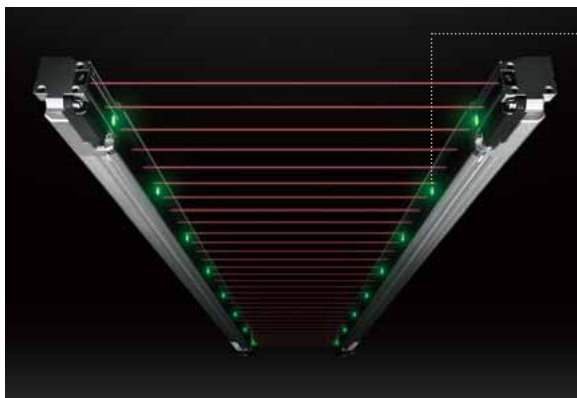Simple function type

SZ-04M
Multi-function type

SZ-16V
Multi-zone sets(banks) type

Highly-Visible Safety Light Curtain
SL-V Series | Type4 | SIL3 | CE | TÜV | c(UL)us LISTED

World's first | Highly-Visible Indicator

"Highly-Visible Indicator" will make the presence of a light curtain seen easily, which will prevent accidental light shielding. In addition, lighting and blinking of the indicator will help understand the state of the light curtain easily.

Various lineup

Super Heavy Duty

SL-VF Series
Detection capability
ø0.55" ø14 mm

SL-VH Series
Detection capability
ø0.98" ø25 mm

SL-VFM Series
Detection capability
ø0.55" ø14 mm

SL-VHM Series
Detection capability
ø0.98" ø25 mm

Safety Light Curtain
GL-R Series

STRONG ✕ SIMPLE ✕ SMART **3S**

KEYENCE