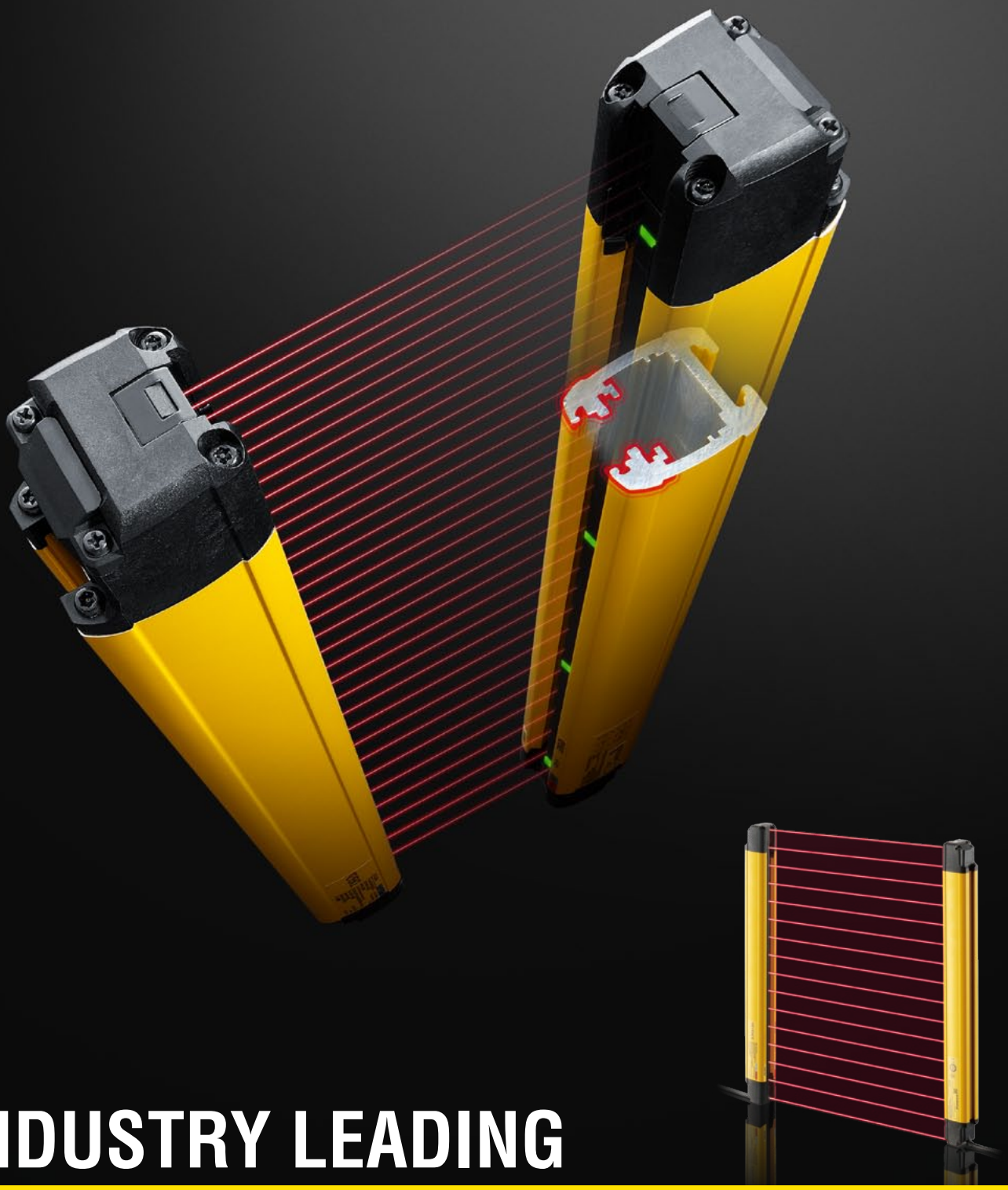
KEYENCE

Safety Light Curtain
GL-RHG Series

Maximum safety standard

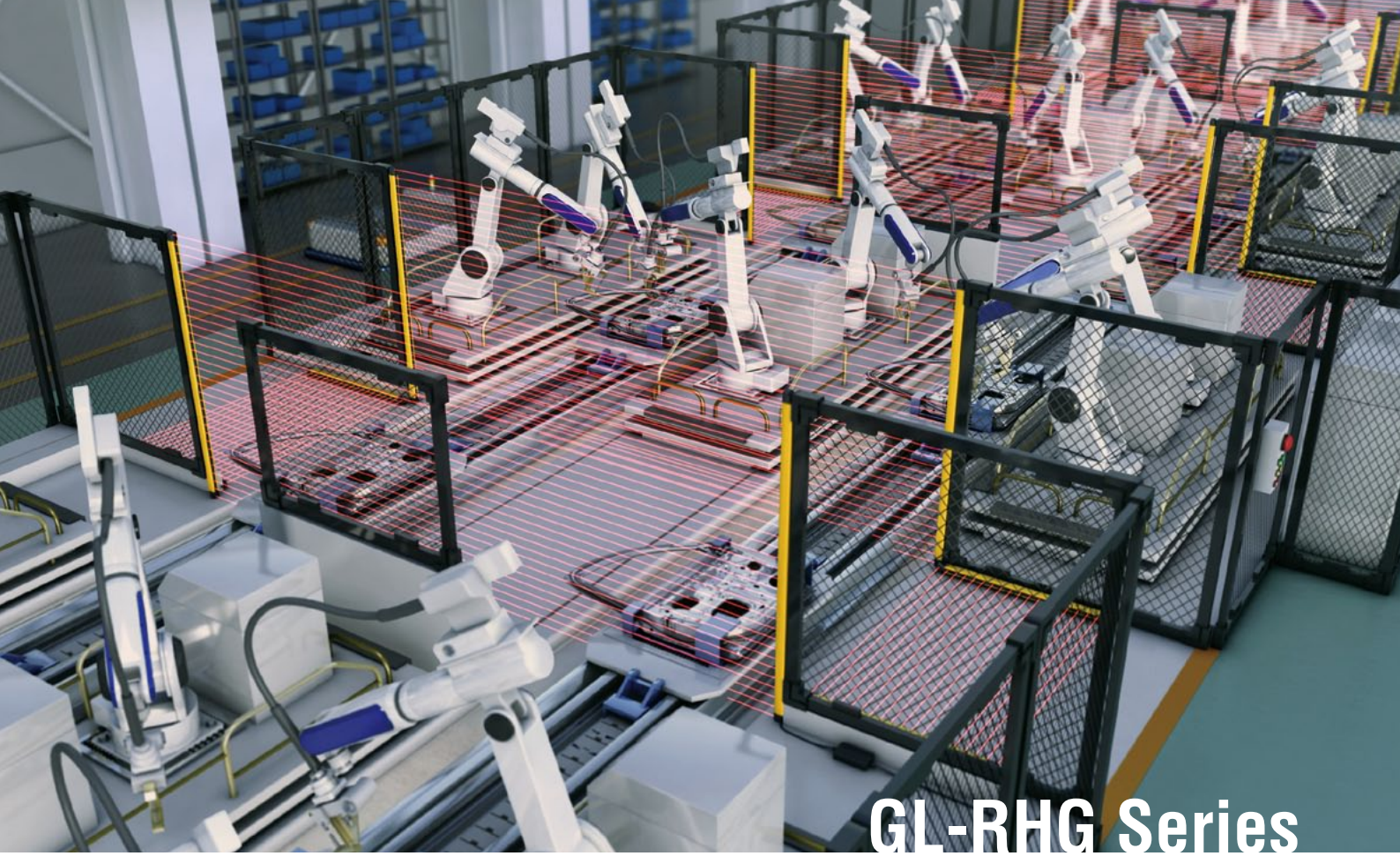
Type 4 | SIL3 | PLe

GB



INDUSTRY LEADING
SAFETY LIGHT CURTAINS

GL-RHG Series



GL-RHG Series

SAFETY LIGHT CURTAINS DESIGNED TO MEET THE NEEDS OF ANY APPLICATION



ROBUST

The GL-RHG's design features a heavy-duty, waterproof housing with a recessed lens which allows it to stand up to almost any industrial environment.

HIGH POWER

With a maximum operating distance that is nearly twice that of previous models, the GL-RHG Series has the power to not only span long ranges, but also to maintain consistent, stable operation, even when buildup is present.

BUILT-IN FUNCTIONALITY

KEYENCE safety light curtains provide complete safety solutions by equipping each unit with the functionality to satisfy both basic, and advanced safety applications.



STANDARD TYPE

GL-RHG

(Detection capability: ø**25** mm)

GLOBAL SAFETY STANDARDS

COMPLIES WITH WORLDWIDE SAFETY STANDARDS AND REGULATIONS

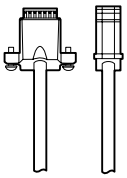
GL-RHG Series light curtains comply with the World's highest safety standards.

Type 4 | PLe | SIL3

执行标准号 GB4584

GL-RHG Series LIGHT CURTAINS SUPPORT BOTH PNP AND NPN OUTPUT FORMATS

PNP or NPN output selection is as simple as selecting the appropriate cables. This allows the units to easily conform to the output needs of existing safety systems.



EXCEPTIONAL ENCLOSURE RATINGS: IP65 & IP67

The GL-RHG Series enclosure rating encompasses both IP65 & IP67 on the basis of IEC and JIS standards. This enables these light curtains to be used in a multitude of environments.

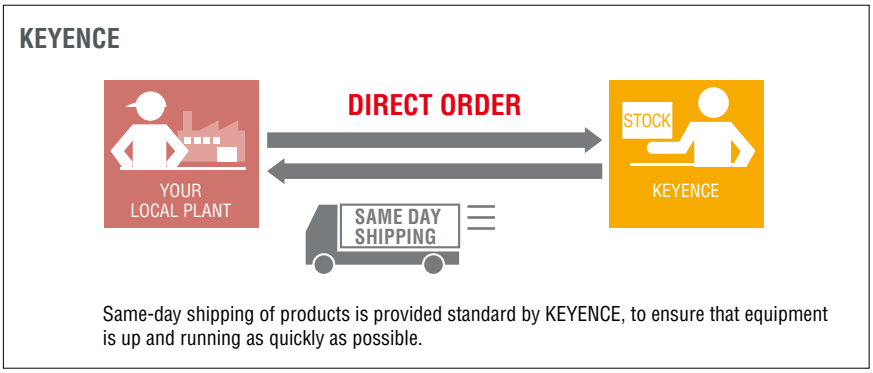
IP65 Dustproof and water-jet resistant

IP67 Dustproof and watertight

SAME DAY PROCESSING

PEACE OF MIND EVEN WHEN UNEXPECTED PROBLEMS OCCUR

KEYENCE provides same-day shipping for items ranging from sensor mounting brackets to safety light curtains and safety laser scanners. This allows customers to quickly react to unexpected design changes or emergencies that require products to prevent downtime.

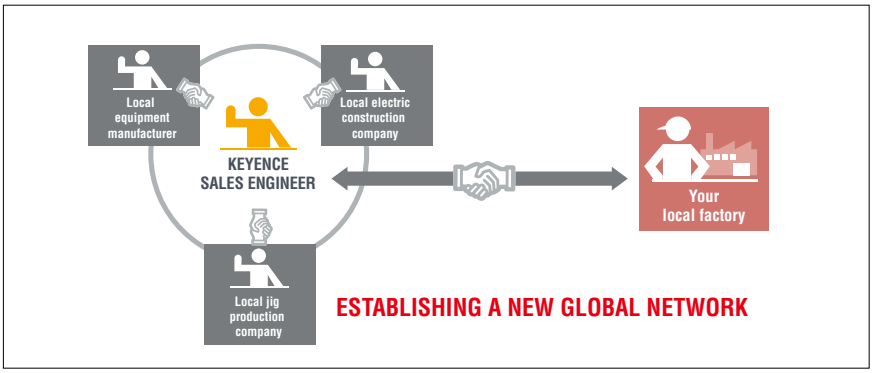


Same-day shipping of products is provided standard by KEYENCE, to ensure that equipment is up and running as quickly as possible.

ON-SITE CUSTOMER SUPPORT

PRODUCT SELECTION, PROCESS IMPROVEMENT, AND FOLLOW-UP

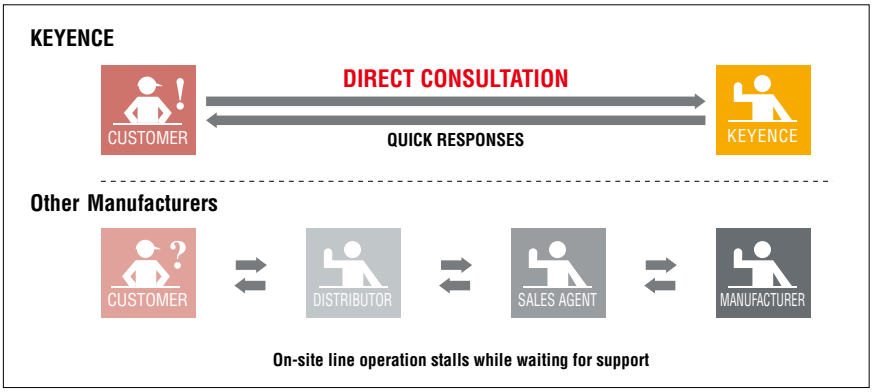
KEYENCE prides itself on working closely with machine builders and end-users to not only provide assistance with product selection, but also to provide recommendations for process improvements and to assist in follow up support.



DIRECT SALES

DIRECT SUPPORT PROVIDED BY KEYENCE REPRESENTATIVES

KEYENCE is a direct sales organisation. Our technically trained sales engineers have extensive product knowledge and training along with application and industry experience. Customers can depend on KEYENCE representatives to act as valuable resources in countless aspects of their business.

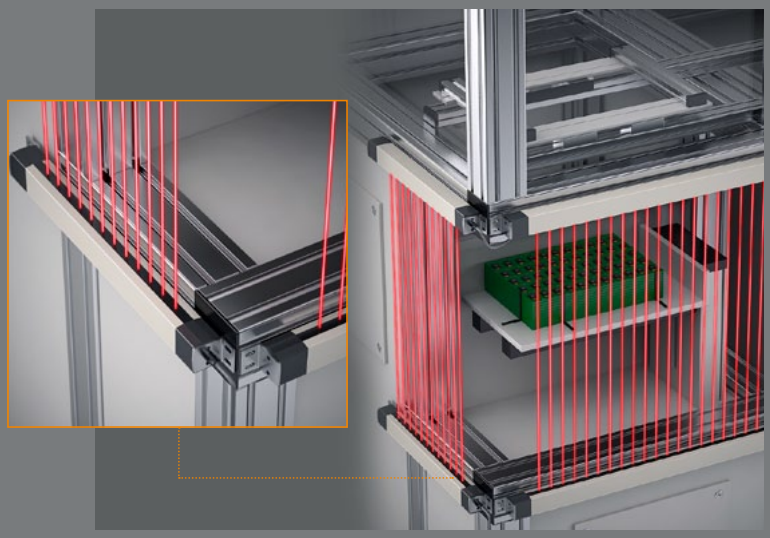


PROVIDING THE OPTIMUM SOLUTION FOR COMMON SAFETY ISSUES

DESIGN

Additional design work is required to ensure an area is fully protected

- Light curtains without edge to edge detection typically require additional guarding to cover unprotected areas
- Cables that exit directly from the bottom of a curtain and bulky mounting brackets prevent flush installation



GL-RHG Series

- All GL-RHG Series light curtains provide full-length protection and eliminate the need for additional guarding!
- Specialty mounting brackets, unique cable positioning, and a compact design make flush integration into machine openings possible!

FULL LENGTH PROTECTION | SEAMLESS INTEGRATION

INSTALLATION

Complicated and time-consuming installation

- Difficulty aligning curtains properly
- Complicated and excessive wiring
- Routing cables through a machine is a hassle





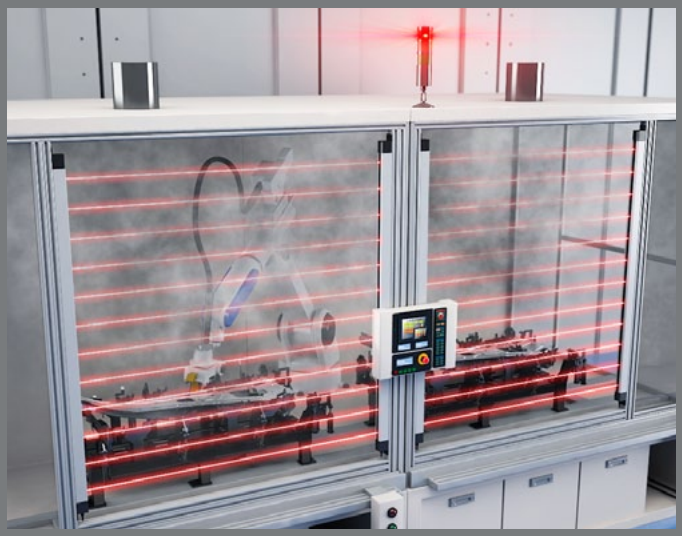
GL-RHG Series

- The innovative wiring options offered by the GL-RHG Series not only minimise the total number of wires, but also allows customers to choose the wiring configuration that best fits their machine!
- Beam axis alignment has never been easier!

MINIMAL WIRING | WIDE APERTURE ANGLE | HIGH POWER | SIMPLE MOUNTING BRACKET

OPERATION

Environmental factors cause unnecessary equipment stoppages



- Dirt buildup leads to nuisance trips
- Physical damage and other harsh environmental factors can lead to damage and equipment stoppage

GL-RHG Series

- The GL-RHG Series light curtains feature high powered light sources to blast through buildup. Additional features like high enclosure ratings and protective guarding make them suitable for even the roughest environments.

IP65/IP67 | HIGH POWER | BUILT-IN GUARDING

MAINTENANCE

Lack of support from product manufacturer



- Delayed responses cause increased downtime
- Long lead times prolong periods of equipment stoppage

GL-RHG Series

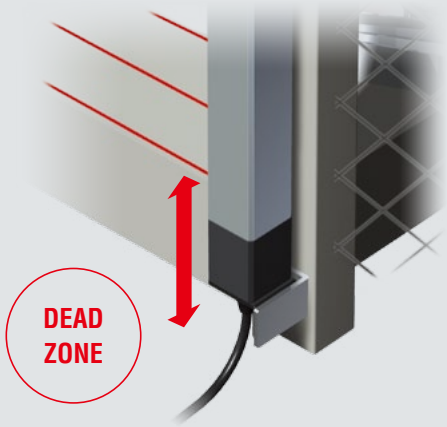
- KEYENCE'S sales engineers provide knowledgeable and in-depth support immediately!
- Same-day shipping is standard for KEYENCE products, including safety light curtains!

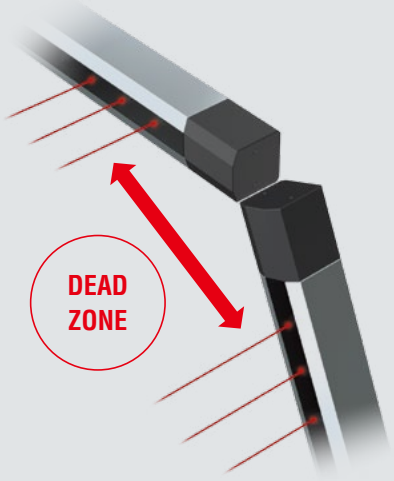
SAME-DAY SHIPPING | TECHNICAL SUPPORT

PROBLEM

Increased design time required to create additional mounting brackets or guarding

Conventional light curtains generate “Dead Zones” when they lack full length protection capabilities, feature bottom-exit cables, and/or require large top and bottom mounting brackets.





DETAILED EXAMPLES

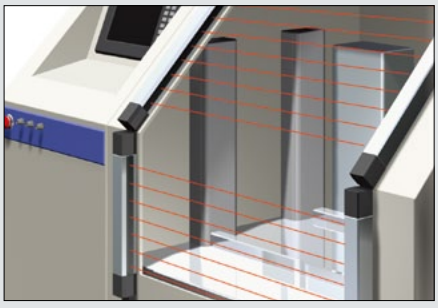
The existence of “Dead Zones” forces designers to take additional steps to ensure that an area is completely protected. This could require adding additional components or changing the orientation / mounting of the entire setup.



Additional guarding may be required to protect dead zones



Installing light curtains in an upside-down orientation may be necessary to shift the dead zone position



Dead zones created during series connection create difficult design issues

REASON

With conventional models, beam axes could not be installed near the tops and/or bottoms of the light curtains due to structural design reasons, such as circuit board arrangement or display positioning. This prevented conventional models from providing full-length protection over the entire curtain. * The KEYENCE SL-C Series was the world’s first light curtain to provide true full-length protection, and eliminate dead zones.

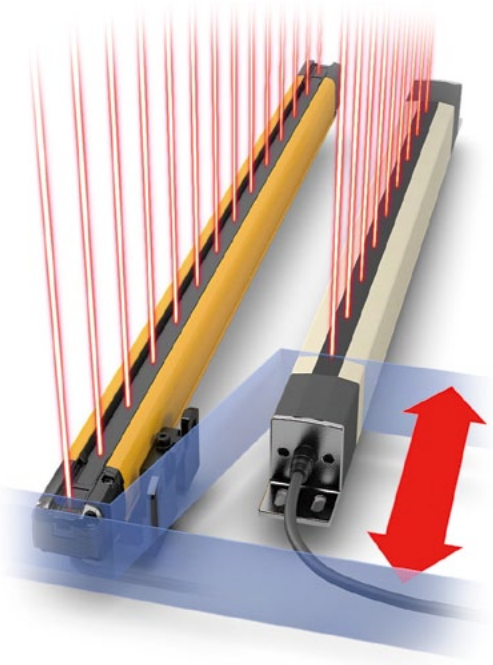
GL-RHG Series

SOLUTION

FULL LENGTH PROTECTION

Full length protection and innovative designs eliminate additional design work

GL-RHG Series light curtains can be seamlessly integrated into equipment while providing full length protection of the entire opening without the need for additional guarding.





SIDE-EXIT CABLES

GL-RHG Series



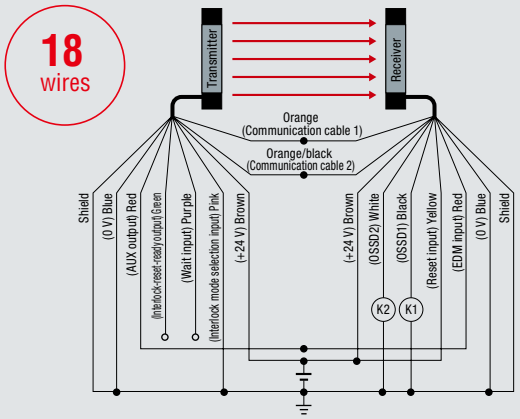
Construction that that provides full length protection of an opening

With edge to edge detection, no additional guarding is required.

PROBLEM

Complicated and time-consuming installation (wiring)

Conventional light curtains do not provide users with different wiring options and contain a large number of wires that may not be necessary for all configurations. This makes installation and wiring more difficult and time consuming.

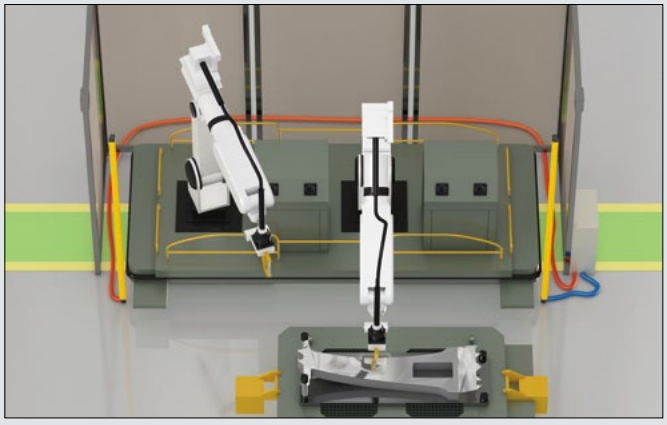


- Too many wires cause confusion.
- Routing cables through the machine is difficult.

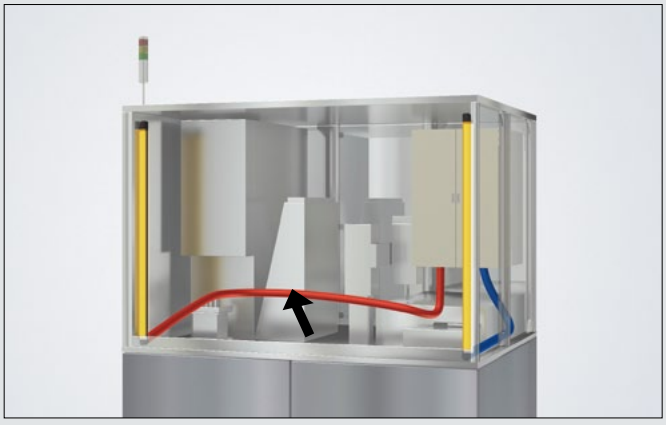
Increased time to perform wiring checks.

Problems related to wiring mistakes and noise are more likely.

DETAILED EXAMPLE



The transmitter and receiver must be connected by a synchronisation wire.



The transmitter and receiver cables must be routed through the machine and wired into the control panel.

REASON

To ensure that the receiver only detects light from its paired transmitter and does not receive any other light (ex. stray ambient light), the receiver must know the timing with which light is sent from the transmitter. This mechanism is known as the “synchronisation” of the transmitter and receiver Conventionally, this “synchronisation” has been performed by way of wiring the transmitter and receiver units together with a synchronisation wire.

GL-RHG Series

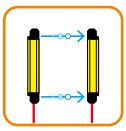
SOLUTION

MINIMAL WIRING

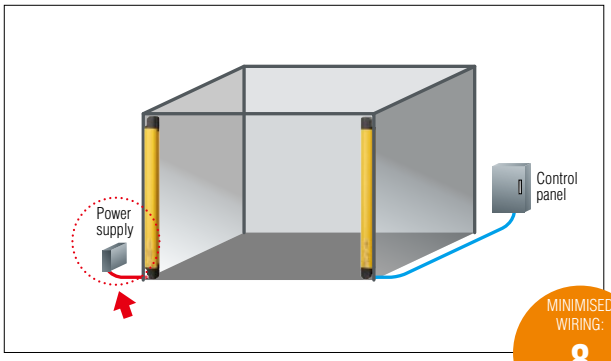
Innovative options that minimise wiring and simplify installation

It is now possible to select the optimal wiring system that best meets the requirements of your application.

OPTICAL SYNCHRONISATION SYSTEM



- There is no longer a need to connect the transmitter and receiver together.
- The transmitter can now be powered off of a separate power supply.

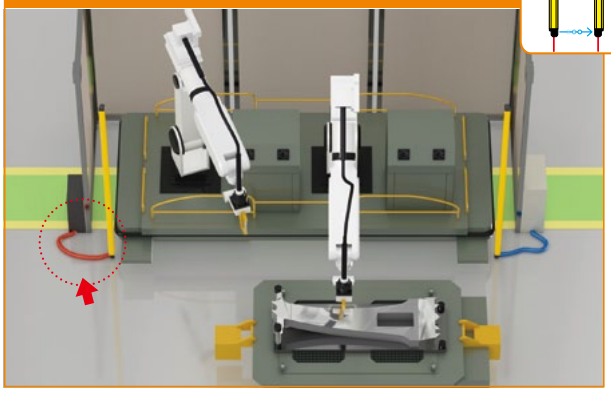


MINIMISED WIRING: 8 wires

EQUIPMENT WITH A LARGE MACHINE OPENING

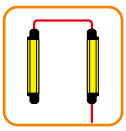
Optical synchronisation

GL-RHG Series

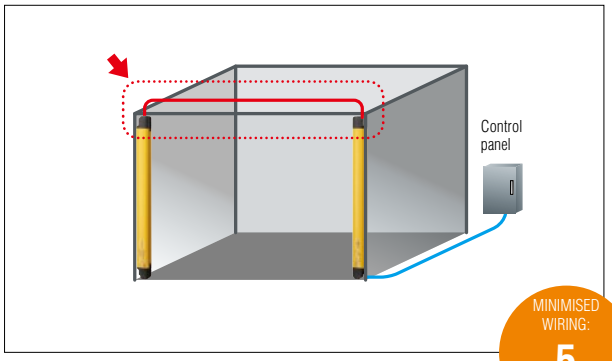


1. Cables no longer need to be routed across the machine opening.
2. The potential for cable damage is greatly reduced.
3. Troubleshooting and replacement are both quicker and easier.

ONE-LINE SYSTEM



- The number of wires can be reduced to a simple 5 wires, drastically reducing installation time.
- Only the receiver needs to be wired to the control panel.

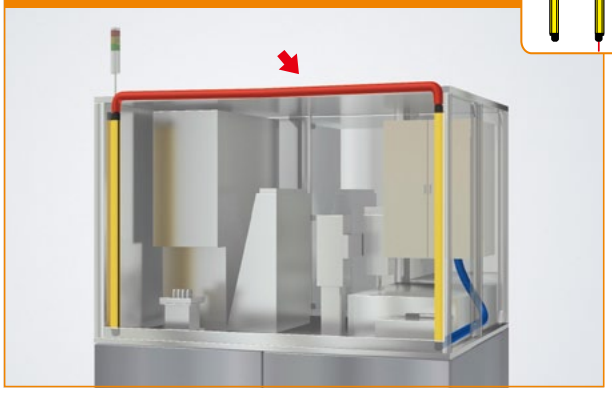


MINIMISED WIRING: 5 wires

EQUIPMENT WITH A NARROW MACHINE OPENING

One-line

GL-RHG Series

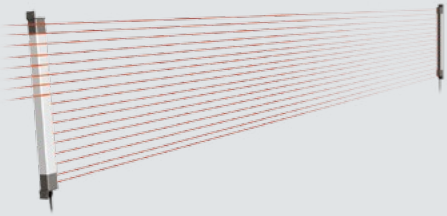


1. Simplified wiring decreases the potential for mistakes.
2. Only a single cable needs to be wired into the control box.

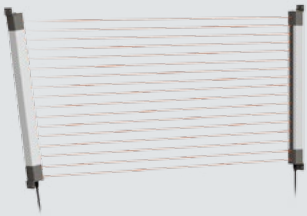
PROBLEM

Complicated and time-consuming installation (beam alignment)

Beam axis alignment is vital to stable detection; however it is typically difficult to achieve over long distances or with tall units when using conventional models.



Alignment can be difficult over long distances

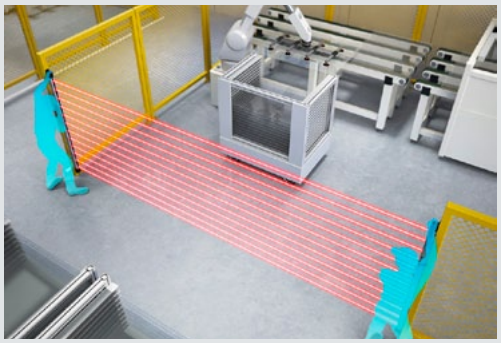


Beam axis alignment is more difficult for taller light curtains.

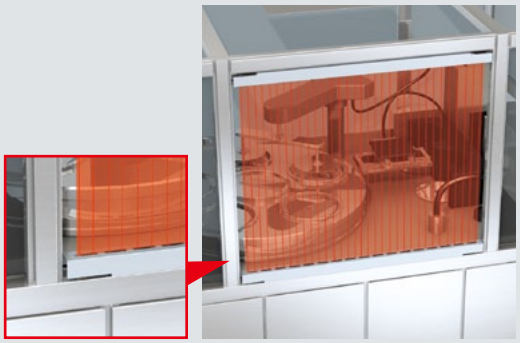


The light curtain cannot be easily adjusted.

DETAILED EXAMPLE

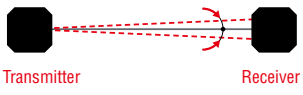


At times, it required two people to adjust the beam axis together.

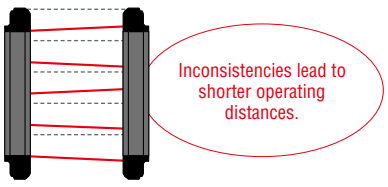


Protective covers and rigid mounting brackets made beam axis alignment even more difficult.

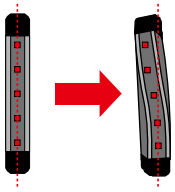
REASON



The aperture angle for the transmitted light must be ±2.5° when the devices are separated by 3 m or more.



Individual differences between internal transmitter modules led to inconsistencies in the amount of light received by each beam axis.



Weak light curtain frames allow twisting and bending to occur when installing light curtains.

GL-RHG Series

SOLUTION

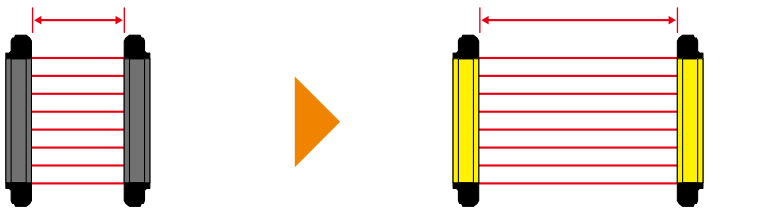
HIGH POWER | METAL CASE

Beam axis alignment is quick and easy

High powered light sources, a rigid frame, and advanced internal construction make alignment easier than ever before.



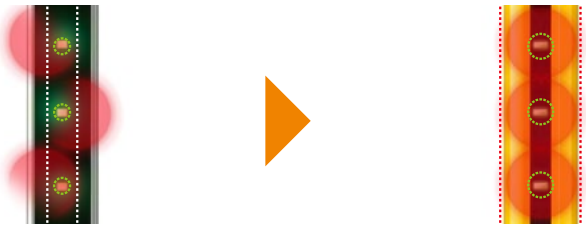
The utilisation of large lenses and powerful LED's not only increases the operating range to 15 m, but also improves alignment



Operating distance: 9 m

Operating distance: 15 m

Achievement of an ideal optical construction



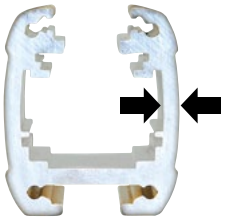
Inconsistencies existed between the transmitter and receiver modules for each beam axis.

Light quantity distribution is poor and inconsistent

Inconsistencies between the transmitter and receiver modules are eliminated.

Uniform light quantity distribution

Robust housing prevents misalignment due to twisting or bending



Thinnest point: **3** mm

5× More robust than conventional light curtains

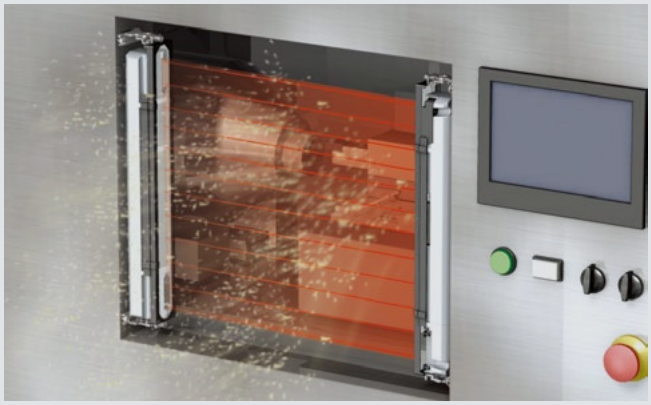
PROBLEM

Environmental factors cause unnecessary equipment stoppages

Constant preventative maintenance and caution was necessary to minimise equipment stoppage due to environmental hazards or equipment damage.



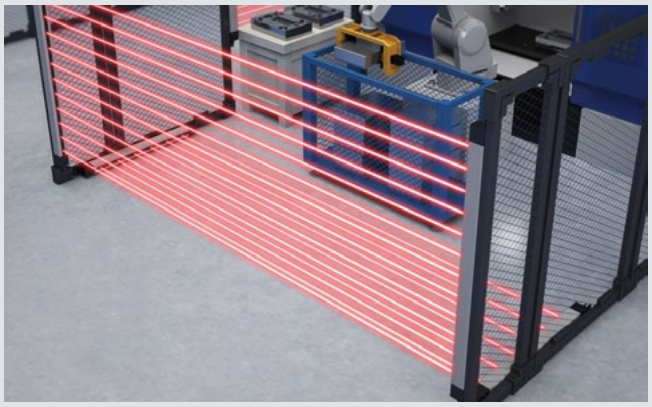
Impact from workpieces and tools can potentially damage the light curtains or cause misalignment. In either case, the result is costly equipment downtime.



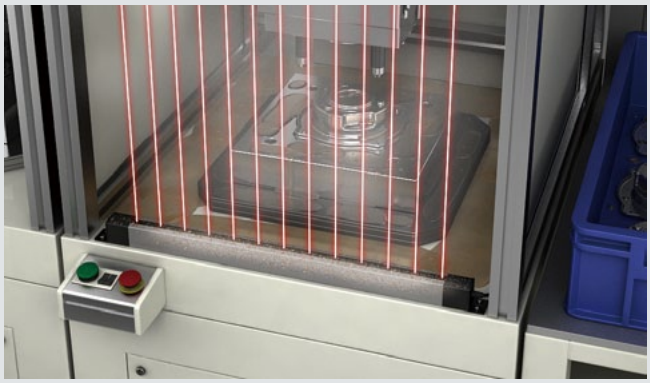
Substances such as oil mist and dust adhere to the lens surface and cause the light curtain to shut down the machine due to buildup.

DETAILED EXAMPLE

Light curtain breakdowns and damage were typically caused by the environment they were used in. Therefore, countermeasures, such as additional guarding or repetitive cleaning, were required.



Damage occurs when objects collide with the light curtains during extraction from the hazardous zone.



The bottom part of the vertical installation may be damaged by or may malfunction due to the dirt or liquids in the air.



REASON

The lens surfaces of conventional light curtains were not sufficiently protected.
Also, conventional light curtains feature enclosure ratings that are insufficient for certain environments.
Therefore, it was possible for breakdowns or malfunctions to occur because of physical impact, dirt in the environment, or water intrusion.

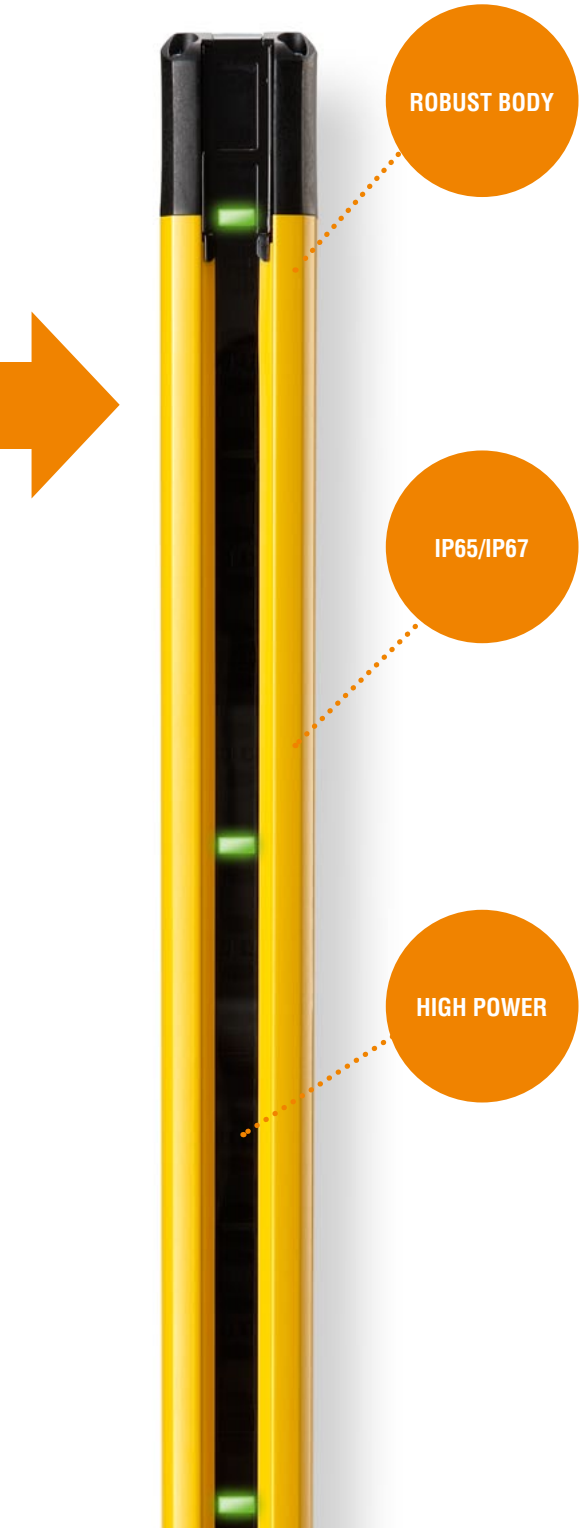
GL-RHG Series

SOLUTION

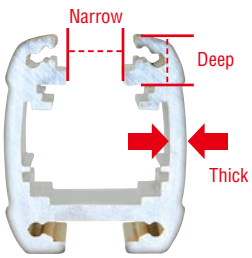
IP65/IP67 | HIGH POWER | BUILT-IN GUARDING

Stable detection in any environment

The GL-RHG Series light curtains are ideal for any type of environment due to their high power, superior enclosure ratings, and robust frame.



Rigid body construction and a recessed lens prevent damage due to impact



Thick and robust body with a minimum wall thickness of 3 mm + Recessed Lens

Best-In-Class Shock Resistance

IP65 and IP67 enclosure ratings

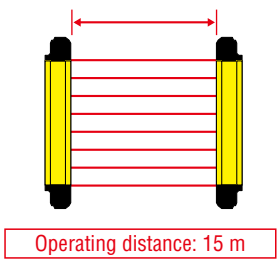


Compliance with IEC standards

IP65 Dustproof and water-jet resistant + IP67 Dustproof and watertight

Superior Environment Resistance

Best-in-class signal strength ensures consistently stable operation



Approximately twice the operating distance of conventional models + Uniform optical construction

Stable Operation in Harsh Environments

ROBUST & SLIM

GL-RHG

Series

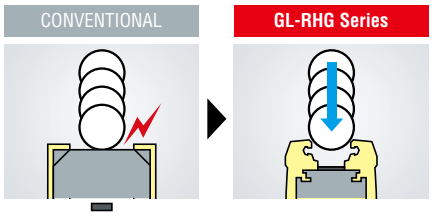
ROBUST, YET SLIM

- The recessed lens protects the detection surface from damage
- Robust extruded aluminium construction
- Built to withstand harsh environments



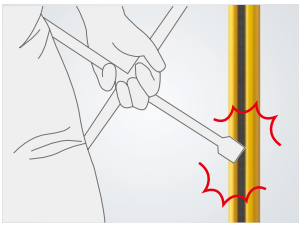
SECURELY PROTECTS THE DETECTION AREA

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

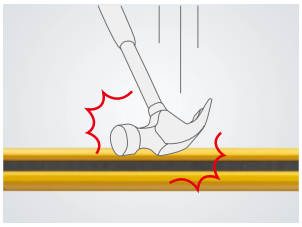


THICK AND ROBUST HOUSING THAT RESISTS IMPACT

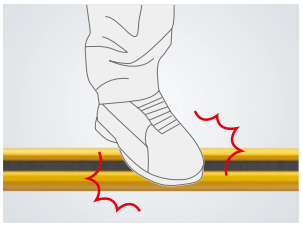
The GL-RHG Series employs a robust aluminium frame that has a minimum wall thickness of 3 mm, which protects the light curtain body from various forms of impact, such as dropping equipment or hitting it with tools.



Hitting



Dropping



Stepping, Kicking

ROBUST, YET SLIM

The overall size of the GL-RHG Series has been reduced to save space on equipment while maintaining a very high level of durability.

33% REDUCTION in size compared to the conventional model



NO NEED FOR ADDITIONAL GUARDING

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



IP65/IP67 ENCLOSURE RATING

The GL-RHG 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 Dustproof and water-jet resistant

IP67 Dustproof and watertight

* The actual appearance of the product may not match the illustrations and photographs contained in this catalogue.

QUICK FIT BRACKETS

No assembly required; direct installation on extruded aluminium framework

ADJUSTABLE ANGLE MOUNTING BRACKET





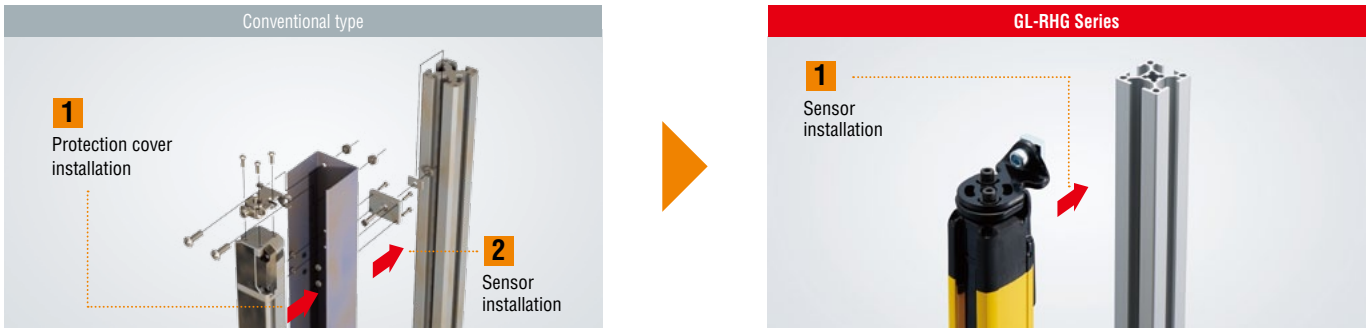
STRAIGHT/L-SHAPED MOUNTING BRACKET





GREATLY REDUCES INSTALLATION WORK

Simple one-point installation; no protective covers or mounting bracket assembly necessary



NO DEAD ZONE MOUNTING BRACKET

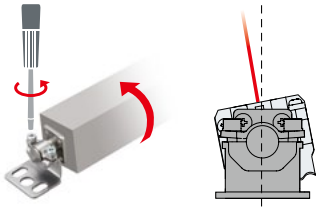


ELIMINATES BEAM AXIS OFFSET CONCERNS

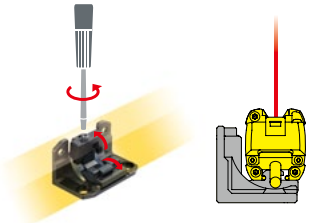
Easy to adjust no dead zone brackets reduce misalignment and decrease set-up time



Poor bracket design can cause light curtains to become misaligned.



Improved bracket design helps to eliminate beam misalignment



ROBUST & SLIM
GL-RHG
Series

BUILT-IN FUNCTIONALITY OFFERS INCREASED EASE OF USE AND VERSATILITY

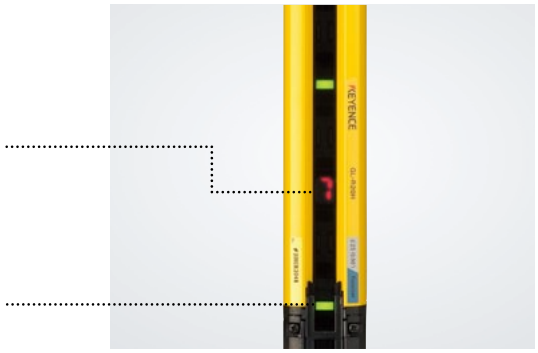
7-SEGMENT DISPLAY & CENTRE INDICATORS

7-SEGMENT DISPLAY

Errors are displayed as numeric codes, which reduces the amount of time spent identifying and correcting problems detected by the GL-RHG Series.

CENTRE INDICATORS

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



BUILT-IN FUNCTIONALITY

1 MUTUAL INTERFERENCE PREVENTION

Mutual interference between 2 units is easily prevented.

2 CENTRE INDICATOR FUNCTION CONTROL

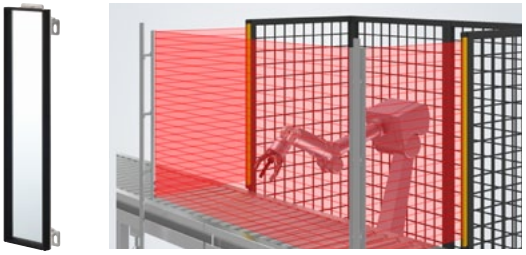
The centre indicators can be turned off to reduce current consumption.



CORNER MIRRORS SIMPLIFY SETUP

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.

*Corner mirrors cannot be used if the safety light curtain is used in Japan as a photoelectric safety device for pressing machines.



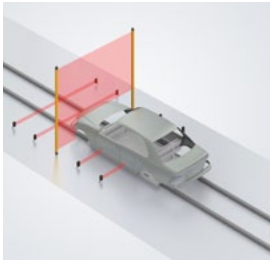
ADDITIONAL FUNCTIONALITY TO MEET THE DEMANDS OF ALL APPLICATIONS

The following functions can be used to customise the functions of the light curtain to meet the needs of any application.

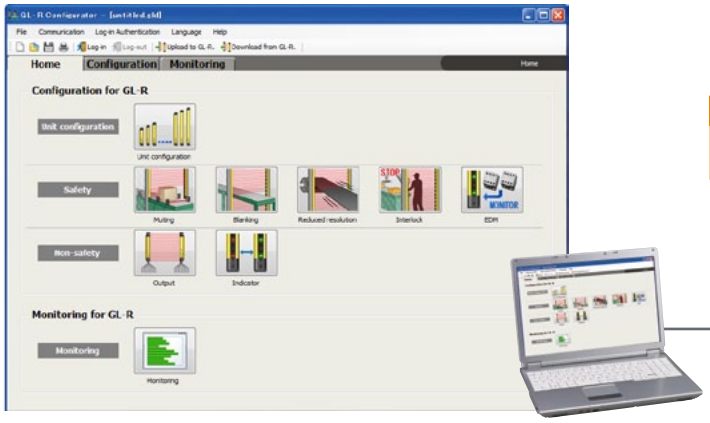
MUTING FUNCTION

Allow necessary component to pass through the light curtains, while preventing operators or incorrect parts from passing through.

Muting function



EASILY MONITOR THE LIGHT CURTAIN STATUS DURING STANDARD OPERATION



Safety device configurator
(free download)

DOWNLOAD SITE
www.keyence.co.in/safety_soft



Interface unit
GL-R1UB*
* USB cable sold separately
2 m: OP-51580, 5 m: OP-86941



EASY-TO-UNDERSTAND SOFTWARE DESIGN

The intuitive layout allows for quick and easy modifications.
Even first-time users can easily navigate and utilise the software.

SIMPLE CONNECTION USING THE DEDICATED INTERFACE UNIT AND A USB CABLE

Direct connections can be made without turning the power off.

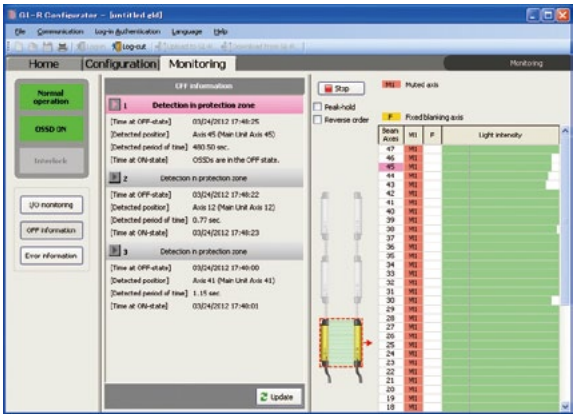
MONITORING FUNCTION

The operation of the GL-RHG Series can be monitored with a PC. The status of I/O signals including the OSSD outputs, override inputs, and error conditions can be checked along with the received light intensity on each beam. In addition, the muting function can be monitored to easily identify causes of abnormal operation during the muting setup or operation.

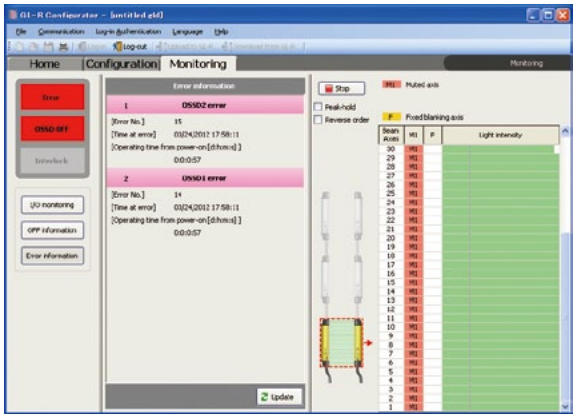


OSSD OFF INFORMATION, ERROR INFORMATION, ERROR HISTORY

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 all allows for easier troubleshooting and analysis.



OFF information



Error information

SELECTING A SAFETY COMPONENTS

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

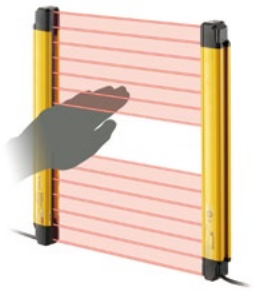
STEP 1 SELECT THE LIGHT CURTAIN LENGTH



ø25 mm

Beam axis pitch of 20 mm.

ENTRY DETECTION



In regard to other models as ø14 mm/ø25 mm detection capability, please contact your nearest office.

STEP 2 SELECT THE MOUNTING BRACKET



Adjustable angle mounting bracket
GL-RB01



Adjustable angle mounting bracket
GL-RB02



No dead zone mounting bracket
GL-RB21



Straight mounting bracket
GL-RB11



L-shaped mounting bracket
GL-RB12

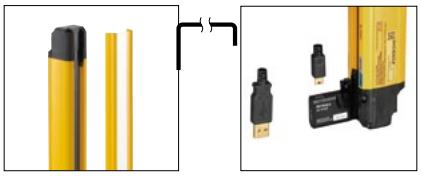
STEP 3 SELECT THE CABLES







STEP 4 SELECT THE OPTIONAL ACCESSORIES*



Front protection cover

Interface unit



Corner mirror
SL-M

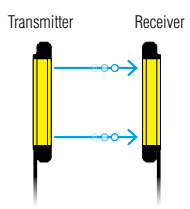
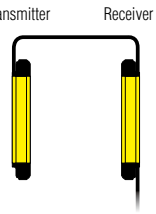
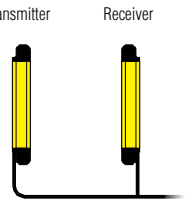


Dedicated safety relay for the GL-RHG Series
GL-T11R

*Optional accessories are not required for normal operation.

GL-RHG SERIES FUNCTIONS AND FEATURES

WIRING SYSTEM

Wiring system		Optical synchronisation system	One-line system	Wire synchronisation system
Wiring diagram				
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-RHG 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
	Receiver	5-core cable 11-core cable	5-core cable 11-core cable	7-core cable 11-core cable

Wiring system		Optical synchronisation system		One-line system		Wire synchronisation 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 function							✓	✓
	Muting lamp output							✓	✓
	Override function							✓	✓
	EDM function		✓		✓		✓		✓
	Wait input					✓	✓	✓	✓
	Reset input (for error)		✓		✓		✓		✓
	Channel configuration (Light interference prevention function)	✓	✓	✓	✓	✓	✓	✓	✓
	Centre indicator configuration	✓	✓	✓	✓	✓	✓	✓	✓
	Monitoring function	💻	💻	💻	💻	💻	💻	💻	💻

✓ Available without the configuration software 💻 Available with the configuration software

SERIES CONNECTION

Up to three GL-RHG units which have up to 240 total number of beam axes (up to 228 total number of beam axes when channel A or B is set by selecting the optical synchronization system) 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-RHG 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.

EXTERNAL DEVICE BREAKDOWN DETECTION (EDM FUNCTION)

EDM (External Device Monitoring) is a function of the GL-RHG that monitors the state of the control devices which are externally connected to the GL-RHG. The GL-RHG 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 the 11-core cable to the receiver.

STEP 1 SELECT THE LIGHT CURTAIN LENGTH



GL-RHG

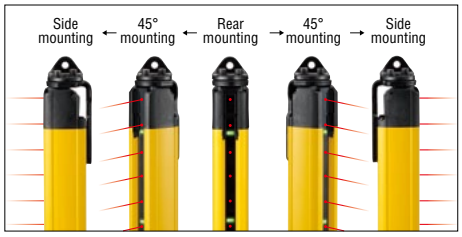
Model	No. of beam axes	Total length (mm)	Detection height (mm)	Protection height (mm)	Operating distance (m)
GL-R08HG	8	160	140	185	0.2 to 15
GL-R12HG	12	240	220	265	
GL-R16HG	16	320	300	345	
GL-R20HG	20	400	380	425	
GL-R24HG	24	480	460	505	
GL-R28HG	28	560	540	585	
GL-R32HG	32	640	620	665	
GL-R36HG	36	720	700	745	
GL-R40HG	40	800	780	825	
GL-R44HG	44	880	860	905	
GL-R48HG	48	960	940	985	
GL-R52HG	52	1040	1020	1065	
GL-R56HG	56	1120	1100	1145	
GL-R60HG	60	1200	1180	1225	
GL-R64HG	64	1280	1260	1305	
GL-R72HG	72	1440	1420	1465	
GL-R80HG	80	1600	1580	1625	
GL-R88HG	88	1760	1740	1785	
GL-R96HG	96	1920	1900	1945	

In regard to other models as 10mm/40mm beam axis pitch, please contact your nearest office.

STEP 2 SELECT THE MOUNTING BRACKET

ADJUSTABLE ANGLE MOUNTING BRACKET

GL-RB01 (incl. 2 pieces)



*The GL-RB01 is shown in the photograph.

• 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-RHG main unit is 1280 mm or longer, and if mounting it using the Adjustable angle mounting bracket, also use the antivibration bracket [GL-RB32 (2 pieces/pack)] to prevent vibration.

Model
GL-RB01

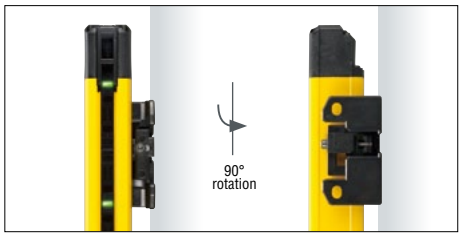


Model
GL-RB02



NO DEAD ZONE MOUNTING BRACKET

GL-RB21 (incl. 2 pieces)



• 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.

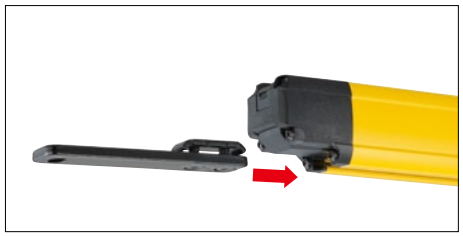
If the total length of the GL-RHG main unit is 1280 mm or longer and if mounting it using the no dead zone mounting bracket, also use the antivibration bracket [GL-RB32 (2 pieces/pack)] to prevent vibration.

Model
GL-RB21



STRAIGHT MOUNTING BRACKET

GL-RB11 (incl. 2 pieces)



• Simple attachment to standard machine framework.

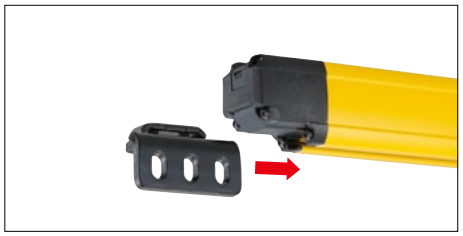
If the total length of the GL-RHG main unit is 1280 mm or longer, and if mounting it using the straight mounting bracket, also use the antivibration bracket [GL-RB31 (2 pieces/pack)] to prevent vibration.

Model
GL-RB11



L-SHAPED MOUNTING BRACKET

GL-RB12 (incl. 2 pieces)



• Simple attachment to standard machine framework.

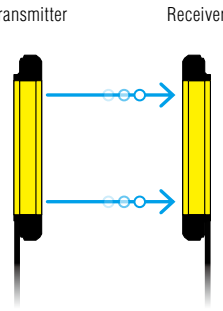
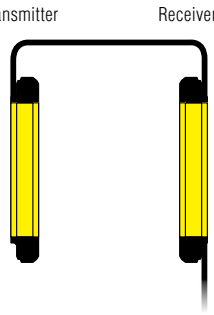
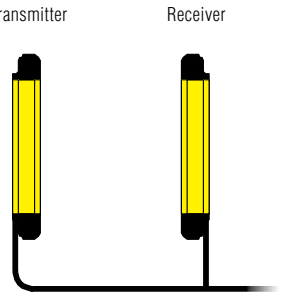
If the total length of the GL-R main unit is 1280 mm or longer, and if mounting it using the L-shaped mounting bracket, additional L-shaped mounting brackets can be used [GL-RB12 (2 pieces/pack)] to prevent vibration.

Model
GL-RB12

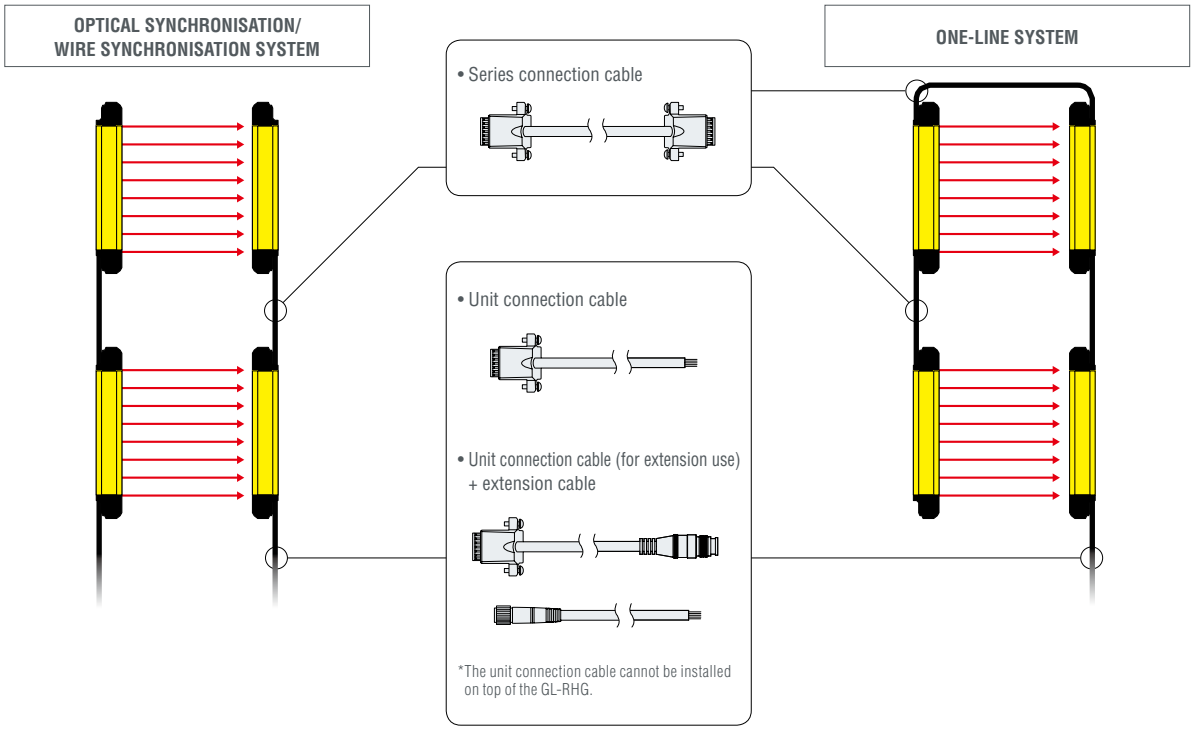


STEP 3 SELECT THE CABLES

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 SYNCHRONISATION SYSTEM	ONE-LINE SYSTEM	WIRE SYNCHRONISATION SYSTEM
Wiring diagram				
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

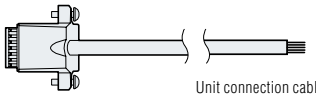
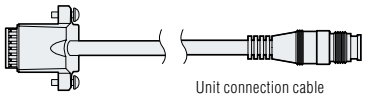
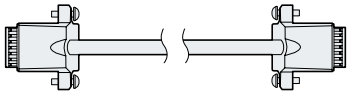
INSTALLATION SCHEMATIC



CABLES

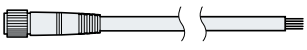
- Each model is connected to one cable.
  Therefore, at least two cables are needed as a system, one for the transmitter and another for the receiver.
- All cables can be used for both the transmitter and receiver.
- The combination of the wiring system and cable determines the functions that can be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

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 (m)	Model
 Unit connection cable	5-core	PNP	—	5	**GL-RP5P**
			—	10	**GL-RP10P**
		NPN	—	5	**GL-RP5N**
			—	10	**GL-RP10N**
	7-core	PNP	—	5	**GL-RP5PS**
			—	10	**GL-RP10PS**
		NPN	—	5	**GL-RP5NS**
			—	10	**GL-RP10NS**
	11-core	PNP	—	5	**GL-RP5PM**
			—	10	**GL-RP10PM**
		NPN	—	5	**GL-RP5NM**
			—	10	**GL-RP10NM**
 Unit connection cable (for extension use)	5-core	PNP	M12 (5-pin male)	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**
 The connector shape for both sides is the same.	Series connection cable	PNP/NPN shared	—	0.08	**GL-RS008**
				0.15	**GL-RS015**
				0.5	**GL-RS05**
				1	**GL-RS1**
				3	**GL-RS3**
				5	**GL-RS5**
				10	**GL-RS10**

FOR EXTENSION

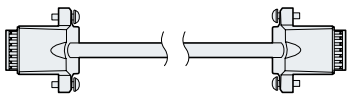
- If using a combination of the unit connection cable (for extension use) and the extension cable, make sure that they share the same amount of conductors.

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

FOR SERIES CONNECTION

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

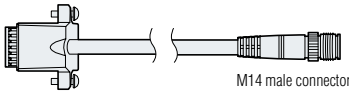
- Use a series connection cable to perform series connection.

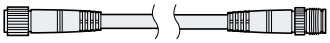
Shape	PNP/NPN	Length (m)	Model
	PNP/NPN shared	0.08	**GL-RS008**
		0.15	**GL-RS015**
		0.5	**GL-RS05**
		1	**GL-RS1**
		3	**GL-RS3**
		5	**GL-RS5**
		10	**GL-RS10**

* The connector shape for both sides is the same. There are no regulations for the direction in which connection is performed.

GL-T11R CONNECTION CABLE

• The following cable must be used for connection between the GL-RHG and GL-T11R.
The system will not operate if other GL-RHG cables are used to connect the GL-RHG and GL-T11R.

Shape	Length (m)	Model
 (Includes transmitter and receiver cables) M14 male connector	0.3	**GL-RPT03PM**
	3	**GL-RPT3PM**
	5	**GL-RPT5PM**

Shape	Length (m)	Model
 (Includes transmitter and receiver cables) M14 female connector M14 male connector	10	**GL-RCT10PM**

STEP 4 SELECT THE OPTIONAL ACCESSORIES

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

FRONT PROTECTION COVER



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.

Front protection cover	Operating distance
	GL-RHG
Single side (Transmitter or receiver only)	14.5 m
Both sides (Transmitter and receiver)	14 m

Model	Applicable GL-RHG model
GL-RA160	GL-R08HG
GL-RA240	GL-R12HG
GL-RA320	GL-R16HG
GL-RA400	GL-R20HG
GL-RA480	GL-R24HG
GL-RA560	GL-R28HG
GL-RA640	GL-R32HG
GL-RA720	GL-R36HG
GL-RA800	GL-R40HG
GL-RA880	GL-R44HG

Model	Applicable GL-RHG model
GL-RA960	GL-R48HG
GL-RA1040	GL-R52HG
GL-RA1120	GL-R56HG
GL-RA1200	GL-R60HG
GL-RA1280	GL-R64HG
GL-RA1440	GL-R72HG
GL-RA1600	GL-R80HG
GL-RA1760	GL-R88HG
GL-RA1920	GL-R96HG

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

INTERFACE UNIT

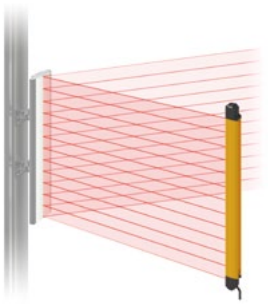


Model	Name
GL-R1UB	Interface unit
OP-51580	USB cable 2 m
OP-86941	USB cable 5 m

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

CORNER MIRROR SL-M

- 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-RHG model
SL-M12H	GL-R08HG/GL-R12HG
SL-M16H	GL-R16HG
SL-M20H	GL-R20HG
SL-M24H	GL-R24HG
SL-M28H	GL-R28HG
SL-M32H	GL-R32HG
SL-M36H	GL-R36HG
SL-M40H	GL-R40HG
SL-M44H	GL-R44HG
SL-M48H	GL-R48HG
SL-M52H	GL-R52HG
SL-M56H	GL-R56HG
SL-M60H	GL-R60HG
SL-M64H	GL-R64HG
SL-M80H*	GL-R72HG/GL-R80HG
SL-M96H*	GL-R88HG/GL-R96HG

* Newly added to the lineup

GL-T11R DEDICATED RELAY FOR THE GL-RHG Series

SL-U2 DEDICATED POWER SUPPLY FOR KEYENCE LIGHT CURTAINS (CLASS 2 OUTPUT)



Dedicated relay for the GL-RHG Series

Type	Model	Safety input	Safety output	Other I/O
		Light curtain		
Safety relay	GL-T11R	1 ch (2 inputs) (Dedicated for GL)	1 channel (2 outputs)	EDM input, Muting input, AUX output, Muting lamp output, etc.

Dedicated power supply for KEYENCE light curtains

Type	Model	Input power supply voltage	Output voltage	Output capacity	Power consumption
Switching type power supply	SL-U2	100 to 240 VAC ±10% (50/60 Hz)	24 VDC ±10% Class 2	1.8 A	135 VA

COMMON SPECIFICATIONS

Model			GL-R××HG	
Beam axis spacing/Lens diameter			20 mm / ø5	
Detection capability			ø25 mm	
Operating distance			0.2 to 15 m *1	
Effective aperture angle			Max. ±2.5° (When operating distance is 3 m or more)	
Light source			Infrared LED (870 nm)	
Response time			Optical synchronisation (Channel 0) or Wire synchronisation: 6.6 to 14.8 ms Optical synchronisation (Channel A or B): 6.9 to 22.0 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 wiring)	
Light interference prevention function			Prevents mutual interference in up to two GL-RHG systems. Optical synchronisation: prevented by Channel A and B with setting switch Wire synchronisation: 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 5 m)	
	OFF state voltage		Max. 2.0 V (with a cable length of 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		Transistor outputs (Compatible with both PNP and NPN) Load current: Max. 50 mA, Residual voltage: Max. 2.5 V (with a cable length of 5 m)	
	Error output			
	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 : 43 to 81 mA, 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		-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	
	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 the X, Y and Z directions	
	Shock		100m/s² (approx. 10G), 16 ms pulse in X, Y and Z directions, 1000 times each axis	
Material	Main unit case		Aluminium	
	Upper case/lower case		Nylon (GF 30%)	
	Front cover		Polycarbonate, SUS304	
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 0.5 m. When the front covers are installed on both of the transmitter and receiver, the Operating distance is shorten by 1.0 m.
*2 When the GL-RHG is used under surrounding air temperatures between 50 to 55°C, the Maximum load current should not exceed 350 mA.

RESPONSE TIME (OSSD)

Units: ms

Model	Response time (OSSD)					
	Wire synchronisation, One-line or Optical synchronisation system (Channel 0)			Optical synchronisation system (Channel A or B)		
	ON→OFF	OFF→ON*1	All blocked→ON*2	ON→OFF	OFF→ON*1	All blocked→ON*2
GL-R08HG	6.6	48.7	63.1	6.9	49.1	64.2
GL-R12HG	6.6	48.7	63.1	7.4	49.9	66.3
GL-R16HG	6.6	48.7	63.1	8.1	50.9	69.1
GL-R20HG	6.6	48.7	63.1	8.8	52.0	71.9
GL-R24HG	7.0	49.3	64.9	9.5	53.0	74.7
GL-R28HG	7.4	50.0	66.6	10.2	54.0	77.5
GL-R32HG	7.9	50.6	68.3	10.9	55.1	80.2
GL-R36HG	8.3	51.3	70.0	11.6	56.1	83.0
GL-R40HG	8.7	51.9	71.8	12.3	57.2	85.8
GL-R44HG	9.2	52.6	73.5	12.9	58.2	88.6
GL-R48HG	9.6	53.2	75.2	13.6	59.3	91.4
GL-R52HG	10.0	53.9	77.0	14.3	60.3	94.2
GL-R56HG	10.5	54.5	78.7	15.0	61.4	96.9
GL-R60HG	10.9	55.2	80.4	15.7	62.4	99.7
GL-R64HG	11.3	55.8	82.1	16.4	63.4	102.5
GL-R72HG	12.2	57.1	85.6	17.8	65.5	108.1
GL-R80HG	13.1	58.4	89.1	19.2	67.6	113.7
GL-R88HG	13.9	59.7	92.5	20.6	69.7	119.2
GL-R96HG	14.8	61.0	96.0	22.0	71.8	124.8

*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-RHG 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-RHG synchronises the transmitter and receiver first and then determines the clear or blocked.

Point

- When the GL-RHG 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 : 2 ms
    Two sub unit : 4.2 ms
    (When Optical synchronisation system and Channel A or B)
    One sub unit : 2.7 ms
    Two sub unit : 5.7 ms
  - ■ OFF → ON
    One sub unit : 42 ms
    Two sub unit : 84 ms
- 2.0 ms is the maximum object detection speed of the GL-RHG Series.

EXAMPLES OF WIRING

NOTICE

- Unused I/O cables should be individually insulated.
- The functions assigned to the input and output may differ according to the configuration when configuring through the configuration software. For more information, see the “GL-RHG Series user’s Manual”.
- The Grey cable (FE) is electrically connected to the main unit case.
- The main unit case and a power-supply line are connected by a capacitors 3 kV 100 pF.

SIGNAL MEANING

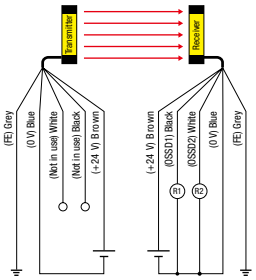
R1, R2 ..... External device (safety PLC, safety relay unit, etc.)
K1, K2 ..... External device (Force guided relay, magnet connector, etc.)
K3 ..... Solid state connector*1
S1 ..... Switch used for reset input
S2 ..... Switch used for wait input*1
M ..... 3-phase motor
PLC ..... For NON SAFETY-RELATED system control use*1

*1 These are NON SAFETY-RELATED components.

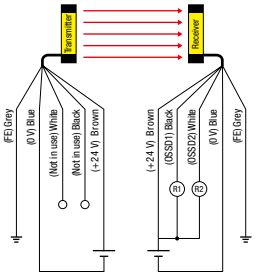
OPTICAL SYNCHRONISATION SYSTEM

Transmitter : 5-core cable, Receiver:5-core cable

(1) PNP output cable

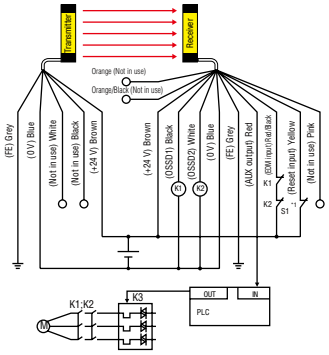


(2) NPN output cable

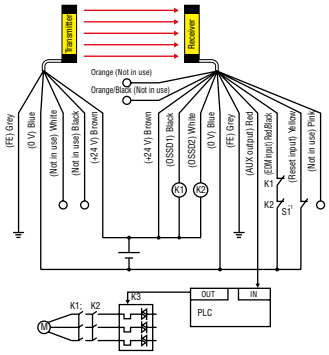


Transmitter : 5-core cable, Receiver:11-core cable Uses EDM input

(1) PNP output cable



(2) NPN output cable

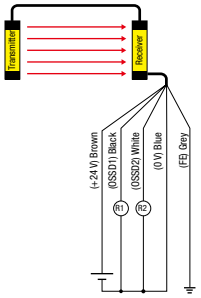


ONE-LINE SYSTEM

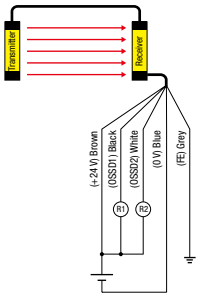
- The series connection cable must be used to connect the transmitter and receiver.
- The unit connection cable is not needed for the transmitter.
- The wiring when using an 11-core cable with the receiver is the same as the optical synchronisation system wiring.

Transmitter : Series connection cable, Receiver:5-core cable

(1) PNP output cable



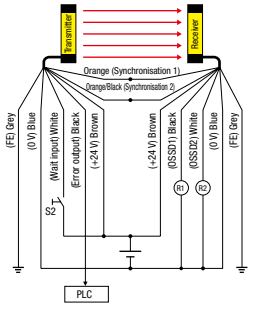
(2) NPN output cable



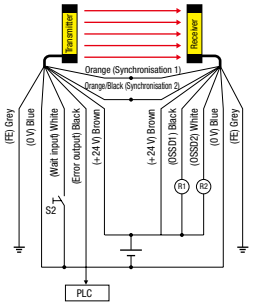
WIRE SYNCHRONISATION SYSTEM

Transmitter : 7-core cable, Receiver:7-core cable

(1) PNP output cable



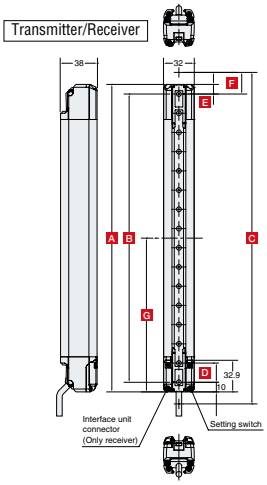
(2) NPN output cable



Unit: mm

GL-RHG Main unit





Note	When the total length of the GL-RHG main unit becomes 1280 mm or longer, attach an antivibration bracket to the centre of the length of the GL-RHG (Distance G in the figure).

Mounting bracket being used	Antivibration bracket to use
Adjustable angle mounting bracket	Antivibration bracket for adjustable angle mounting bracket
No dead zone mounting bracket	
Straight mounting bracket	Antivibration bracket for straight mounting bracket
L-shaped mounting bracket	L-shaped mounting bracket

Unit: mm

Model	No. of axes	A Length	B Detection height	C Protection height	D Beam axis pitch	E	F	G
GL-R08HG	8	160	140	185				80
GL-R12HG	12	240	220	265				120
GL-R16HG	16	320	300	345				160
GL-R20HG	20	400	380	425				200
GL-R24HG	24	480	460	505				240
GL-R28HG	28	560	540	585				280
GL-R32HG	32	640	620	665				320
GL-R36HG	36	720	700	745				360
GL-R40HG	40	800	780	825				400
GL-R44HG	44	880	860	905	20	10	22.5	440
GL-R48HG	48	960	940	985				480
GL-R52HG	52	1040	1020	1065				520
GL-R56HG	56	1120	1100	1145				560
GL-R60HG	60	1200	1180	1225				600
GL-R64HG	64	1280	1260	1305				640
GL-R72HG	72	1440	1420	1465				720
GL-R80HG	80	1600	1580	1625				800
GL-R88HG	88	1760	1740	1785				880
GL-R96HG	96	1920	1900	1945				960

KEYENCE

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SAFETY INFORMATION
Please read the instruction manual carefully in order to safely operate any KEYENCE product.

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