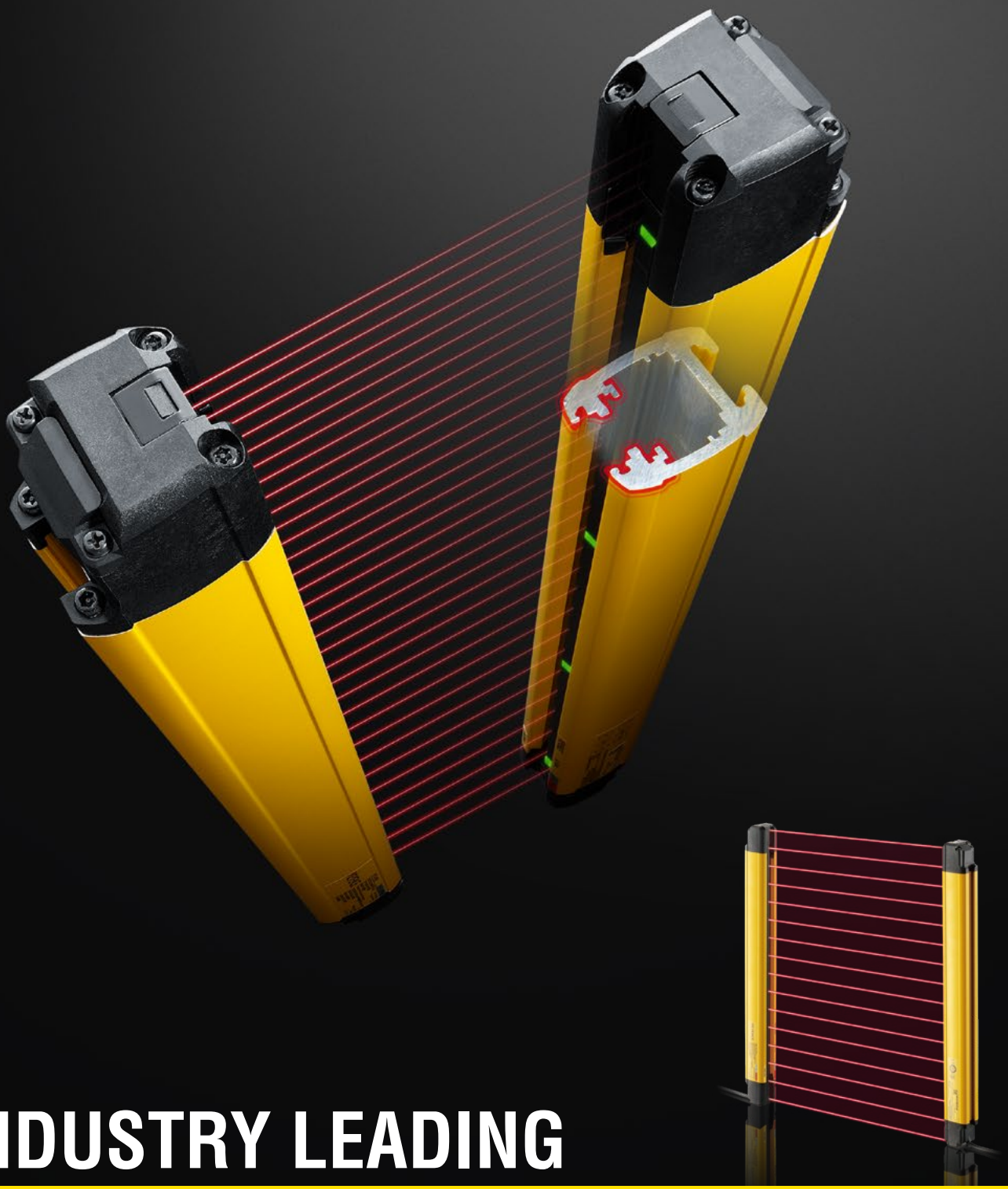
KEYENCE

**Safety Light Curtain**
GL-RHG Series

Maximum safety standard

Type 4 | SIL3 | PLe

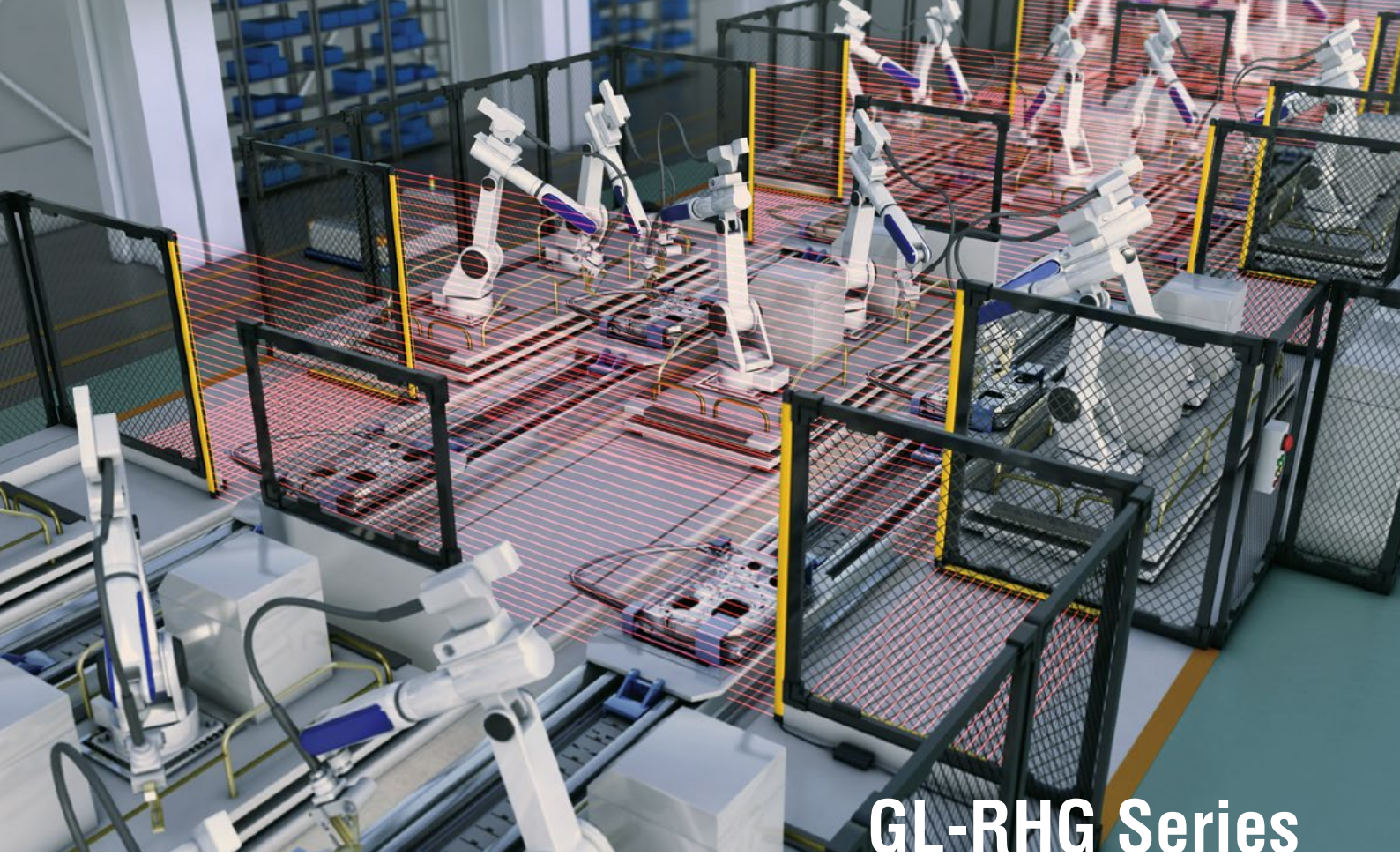
GB



# 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

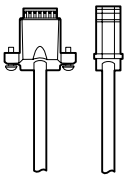
GL-RHG Series light curtains comply with the World's highest safety standards.

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.

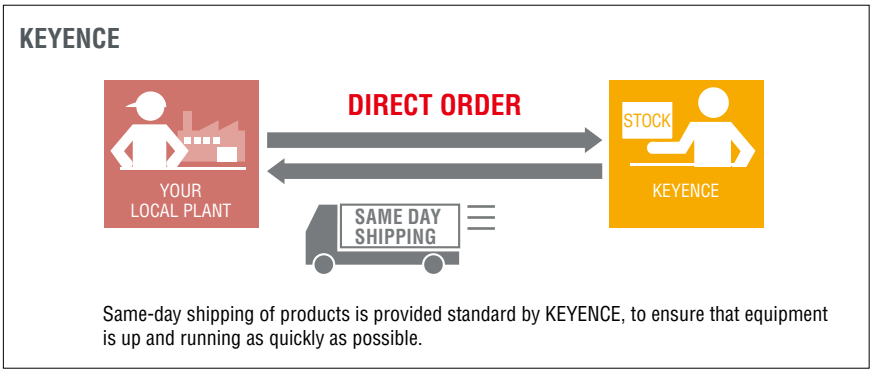
**IP65** Dustproof and water-jet resistant

**IP67** Dustproof and watertight

# SAME DAY PROCESSING

PEACE OF MIND EVEN WHEN UNEXPECTED PROBLEMS OCCUR

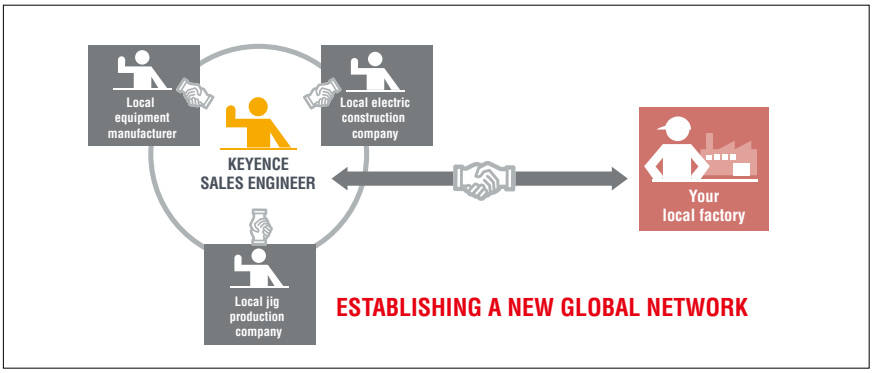
KEYENCE provides same-day shipping for items ranging from sensor mounting brackets to safety light curtains and safety laser scanners. This allows customers to quickly react to unexpected design changes or emergencies that require products to prevent downtime.




# ON-SITE CUSTOMER SUPPORT

PRODUCT SELECTION, PROCESS IMPROVEMENT, AND FOLLOW-UP

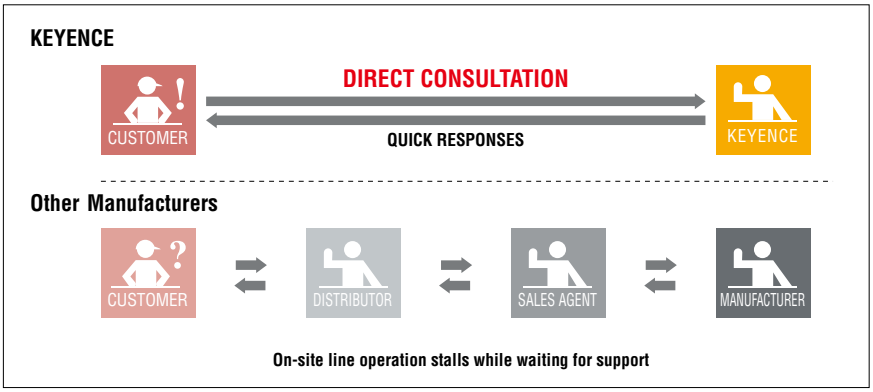
KEYENCE prides itself on working closely with machine builders and end-users to not only provide assistance with product selection, but also to provide recommendations for process improvements and to assist in follow up support.




# 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.

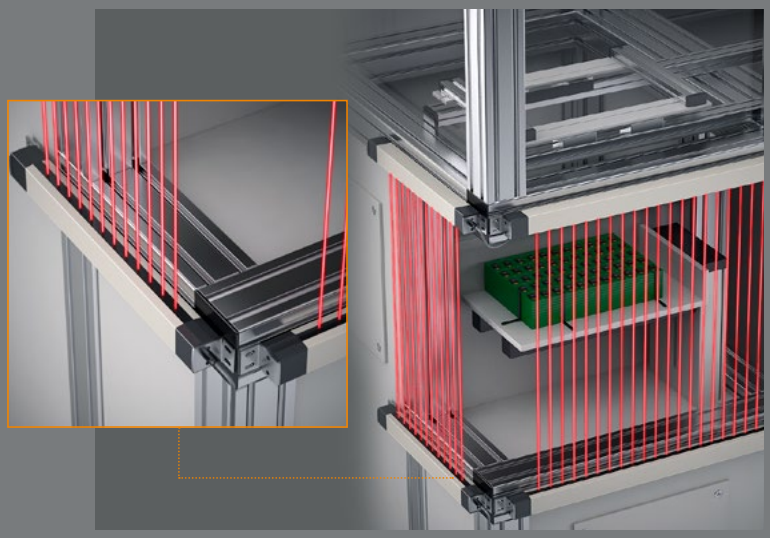


# PROVIDING THE OPTIMUM SOLUTION FOR COMMON SAFETY ISSUES

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

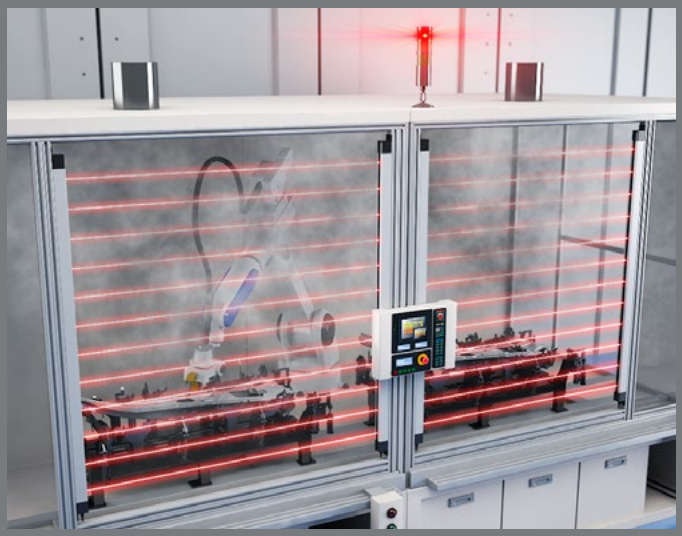
### GL-RHG Series

- 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

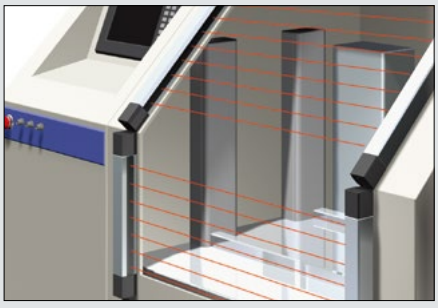
Conventional light curtains generate “Dead Zones” when they lack full length protection capabilities, feature bottom-exit cables, and/or require large top and bottom mounting brackets.


## 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.

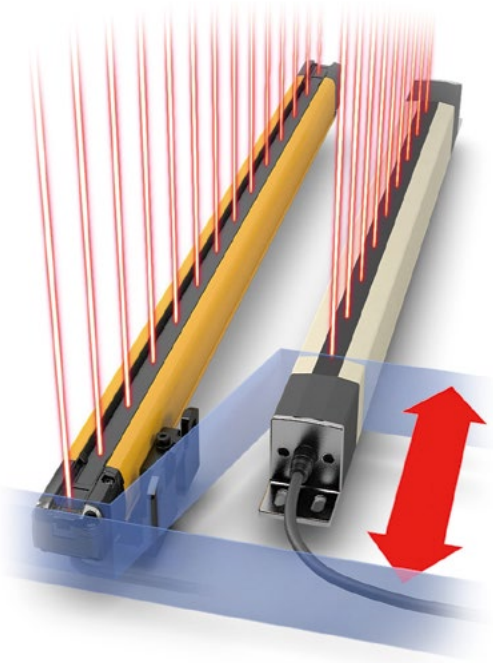
# GL-RHG Series

## SOLUTION

FULL LENGTH PROTECTION

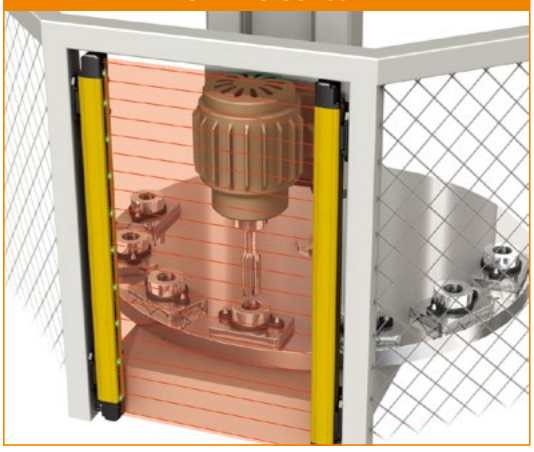
### Full length protection and innovative designs eliminate additional design work

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



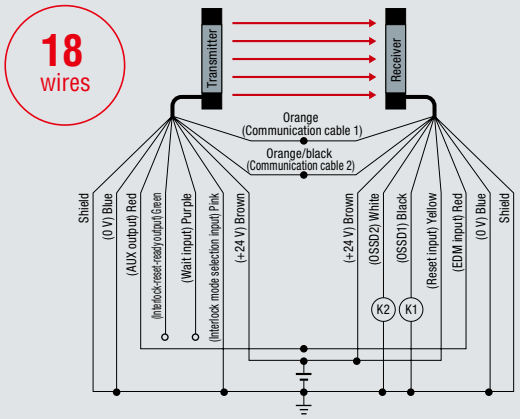
**Construction that that provides full length protection of an opening**

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.

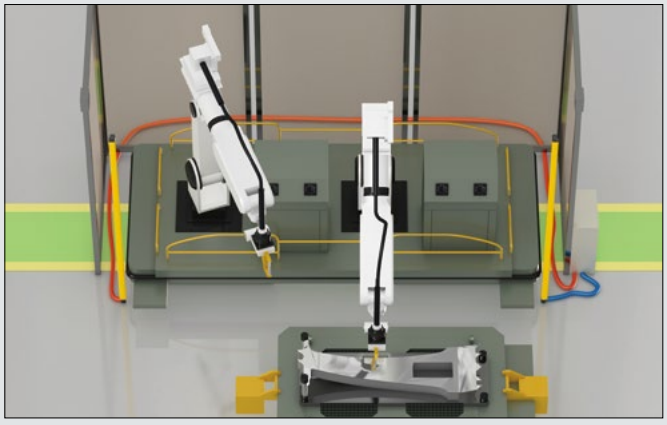



- Too many wires cause confusion.
- Routing cables through the machine is difficult.

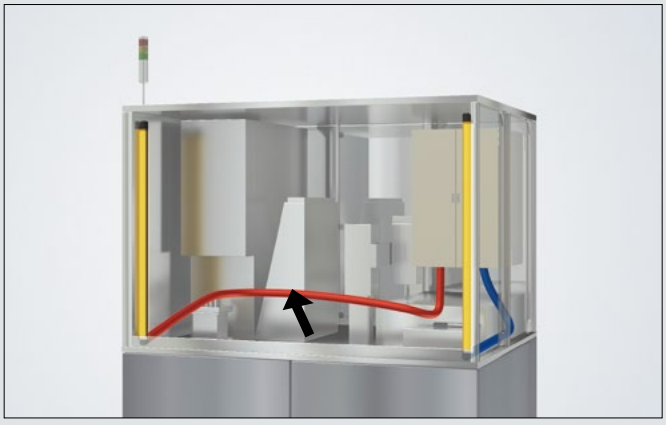
Increased time to perform wiring checks.

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

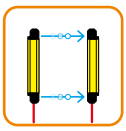
## SOLUTION

MINIMAL WIRING

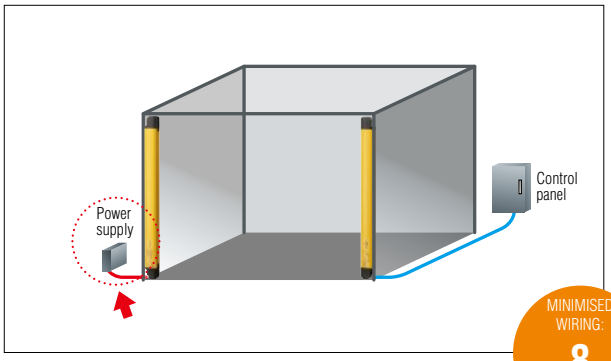
## Innovative options that minimise wiring and simplify installation

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

### OPTICAL SYNCHRONISATION SYSTEM



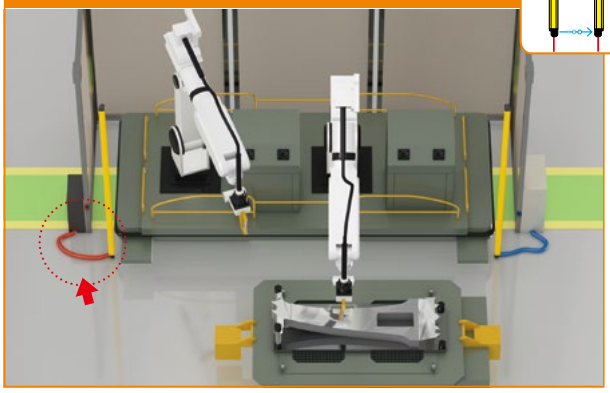
- There is no longer a need to connect the transmitter and receiver together.
- The transmitter can now be powered off of a separate power supply.




MINIMISED WIRING: 8 wires

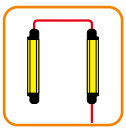
### EQUIPMENT WITH A LARGE MACHINE OPENING

Optical synchronisation

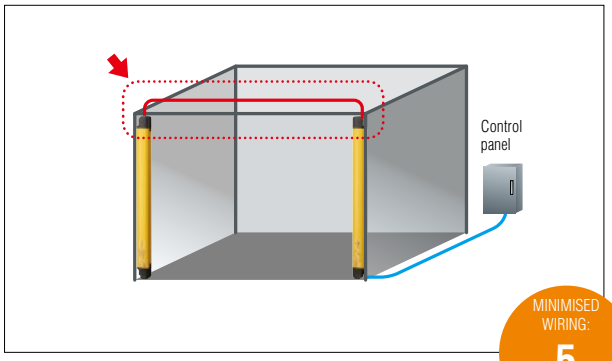



1. Cables no longer need to be routed across the machine opening.
2. The potential for cable damage is greatly reduced.
3. Troubleshooting and replacement are both quicker and easier.

### ONE-LINE SYSTEM



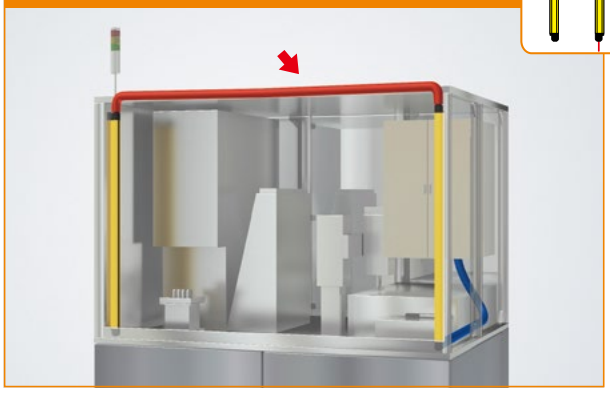
- The number of wires can be reduced to a simple 5 wires, drastically reducing installation time.
- Only the receiver needs to be wired to the control panel.




MINIMISED WIRING: 5 wires

### EQUIPMENT WITH A NARROW MACHINE OPENING

One-line

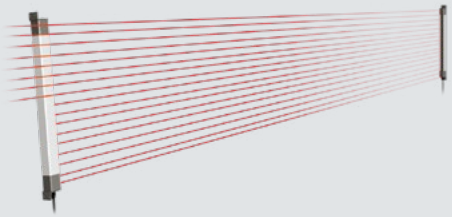



1. Simplified wiring decreases the potential for mistakes.
2. Only a single cable needs to be wired into the control box.

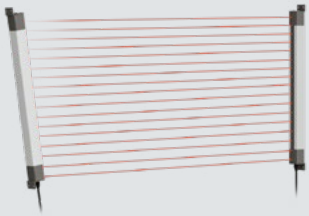
## PROBLEM

# Complicated and time-consuming installation (beam alignment)

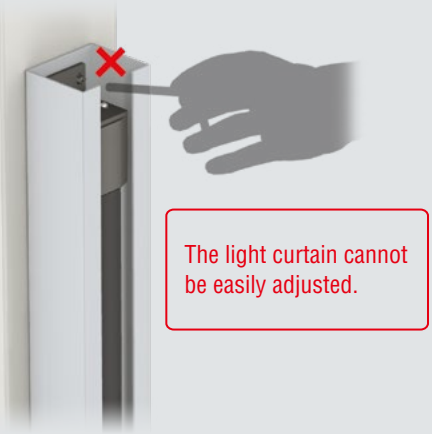
Beam axis alignment is vital to stable detection; however it is typically difficult to achieve over long distances or with tall units when using conventional models.



Alignment can be difficult over long distances

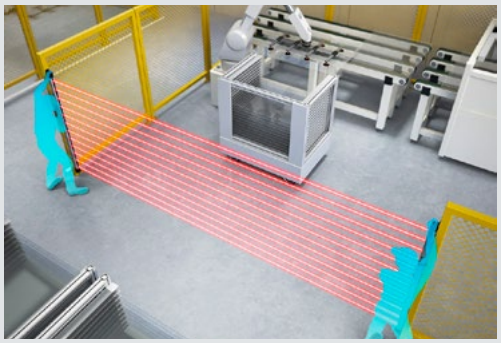


Beam axis alignment is more difficult for taller light curtains.

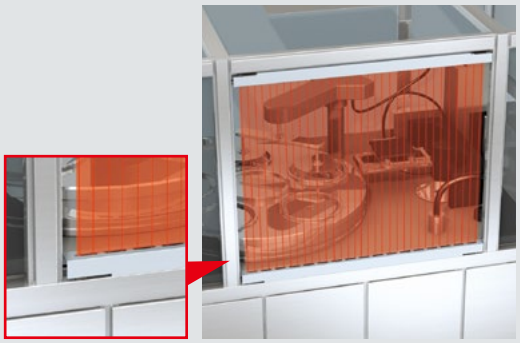


The light curtain cannot be easily adjusted.

## DETAILED EXAMPLE

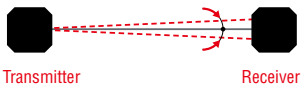


At times, it required two people to adjust the beam axis together.

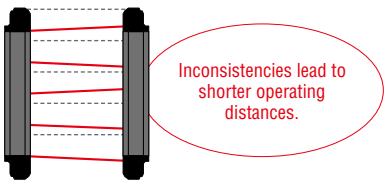


Protective covers and rigid mounting brackets made beam axis alignment even more difficult.

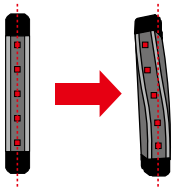
## REASON




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

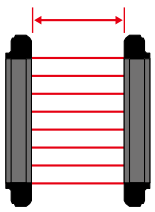
High powered light sources, a rigid frame, and advanced internal construction make alignment easier than ever before.

HIGH POWER

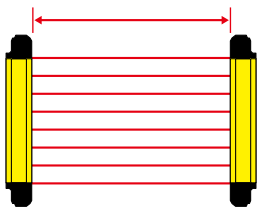
SUPERIOR OPTICAL CONSTRUCTION

RIGID HOUSING

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

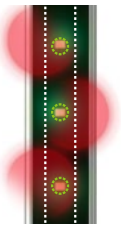


Operating distance: 9 m



Operating distance: 15 m

### Achievement of an ideal optical construction



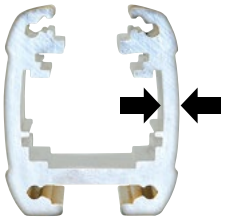
Inconsistencies existed between the transmitter and receiver modules for each beam axis.

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

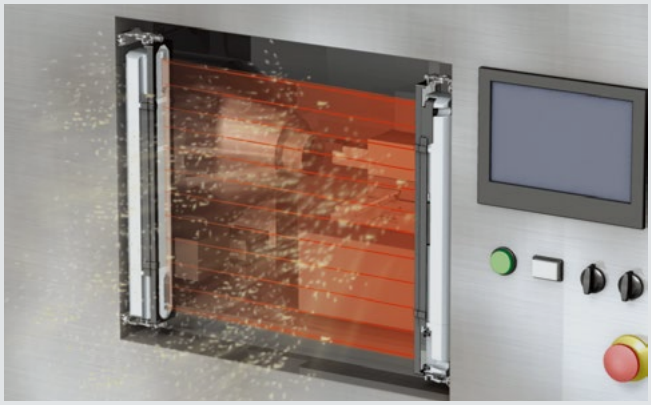
5× More robust than conventional light curtains

## 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.

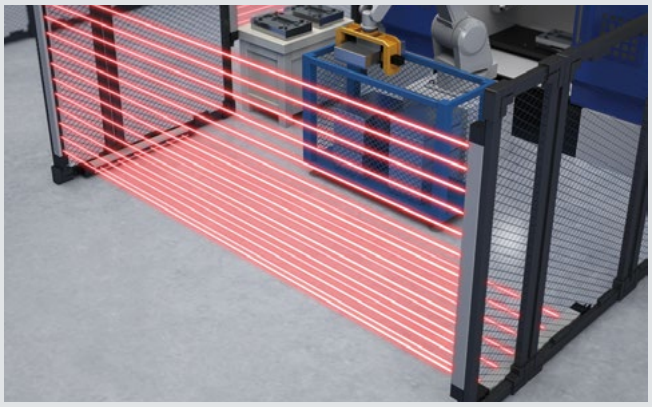
Impact from workpieces and tools can potentially damage the light curtains or cause misalignment. In either case, the result is costly equipment downtime.



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.

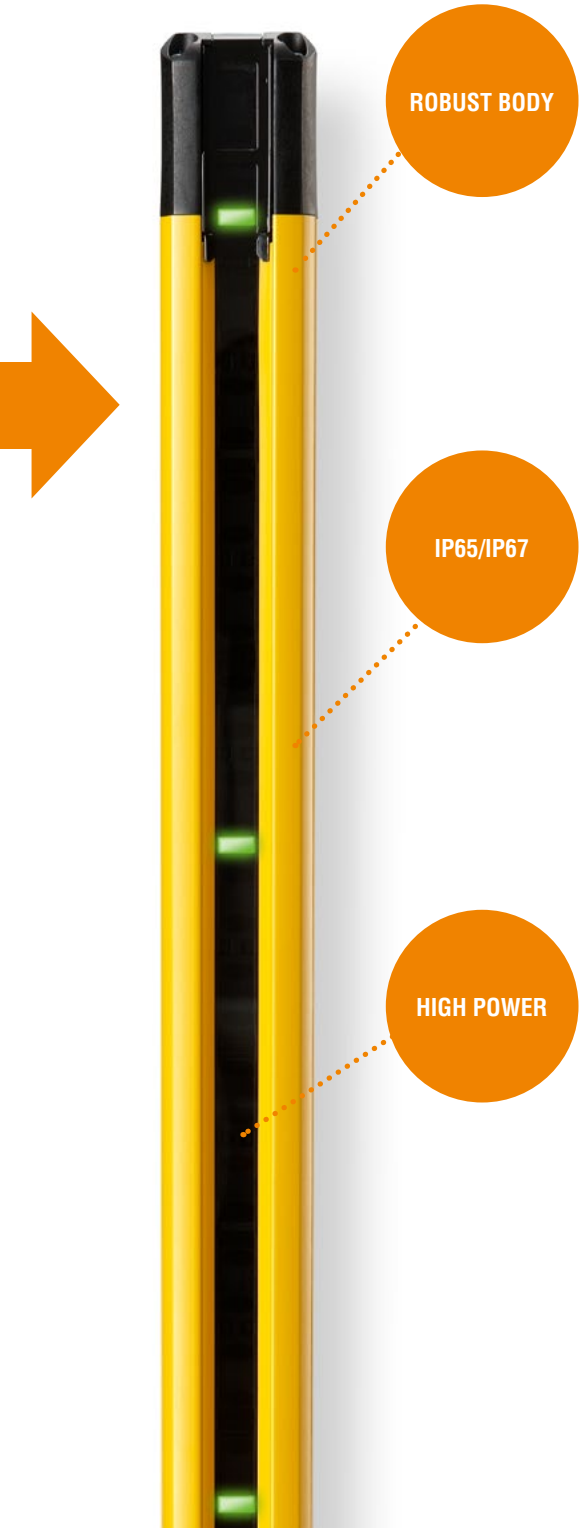
# GL-RHG Series

## SOLUTION

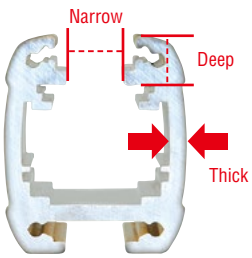
IP65/IP67 | HIGH POWER | BUILT-IN GUARDING

## 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**

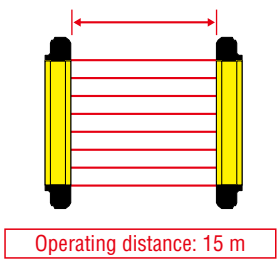
### IP65 and IP67 enclosure ratings

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

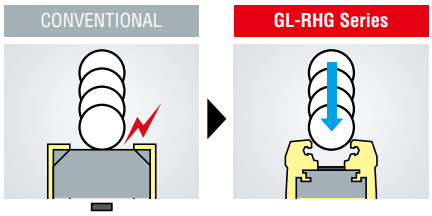
Series

# ROBUST, YET SLIM

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

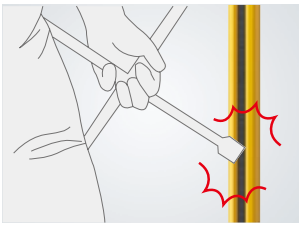

## SECURELY PROTECTS THE DETECTION AREA

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

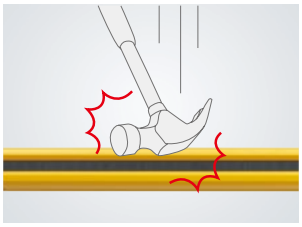



## THICK AND ROBUST HOUSING THAT RESISTS IMPACT

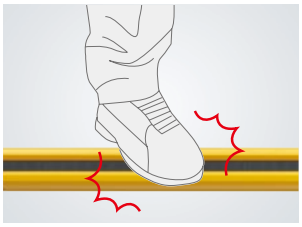
The GL-RHG Series employs a robust aluminium frame that has a minimum wall thickness of 3 mm, which protects the light curtain body from various forms of impact, such as dropping equipment or hitting it with tools.



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

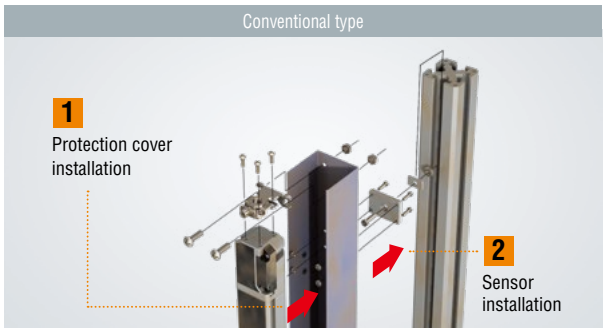
No assembly required; direct installation on extruded aluminium framework

**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

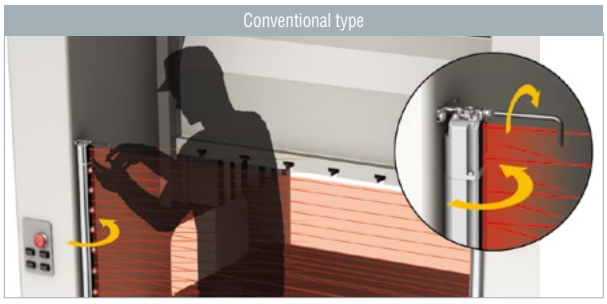




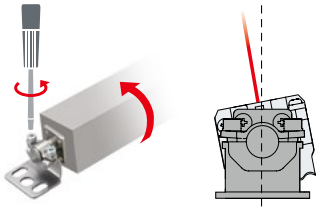
**NO DEAD ZONE MOUNTING BRACKET**

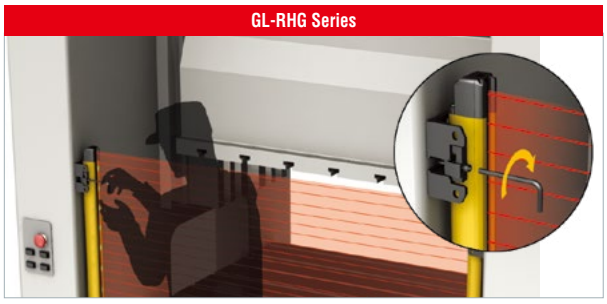
## ELIMINATES BEAM AXIS OFFSET CONCERNS

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

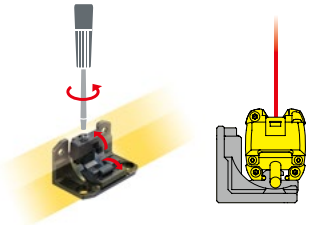



Poor bracket design can cause light curtains to become misaligned.






Improved bracket design helps to eliminate beam misalignment



ROBUST & SLIM
GL-RHG
Series

# BUILT-IN FUNCTIONALITY OFFERS INCREASED EASE OF USE AND VERSATILITY

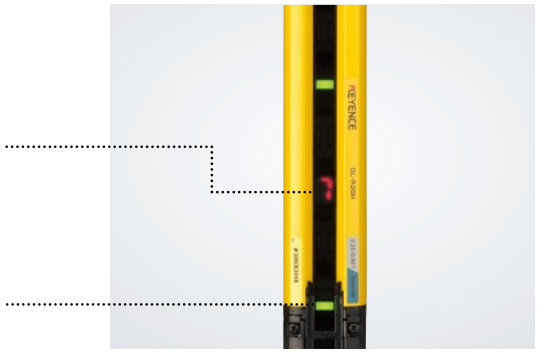
## 7-SEGMENT DISPLAY & CENTRE INDICATORS

### 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.

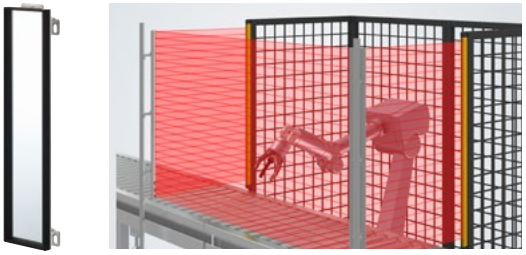
### 2 CENTRE INDICATOR FUNCTION CONTROL

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.



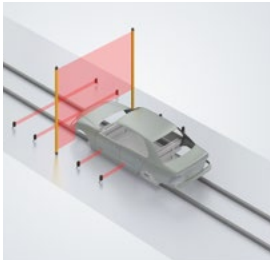
## ADDITIONAL FUNCTIONALITY TO MEET THE DEMANDS OF ALL APPLICATIONS

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

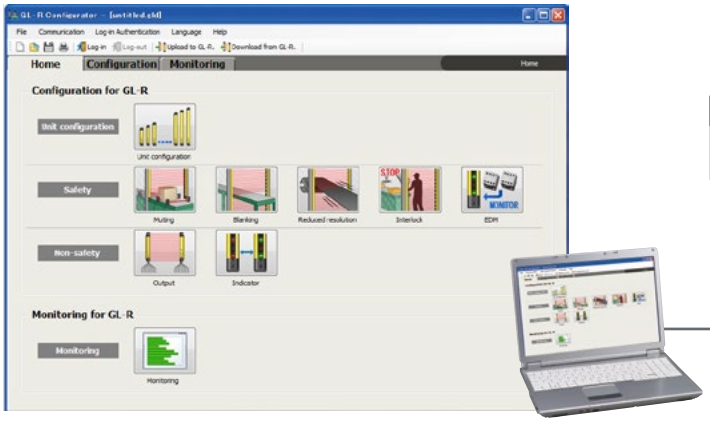
### MUTING FUNCTION

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

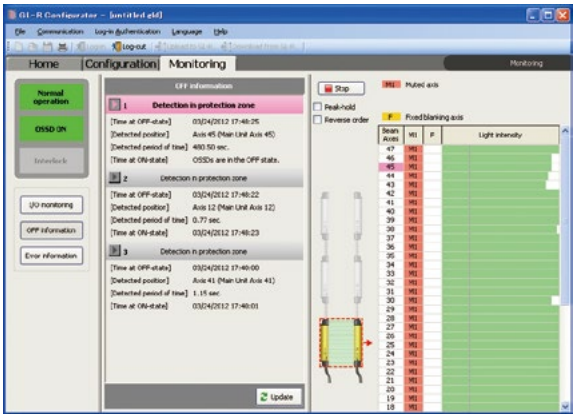
Direct connections can be made without turning the power off.

## MONITORING FUNCTION

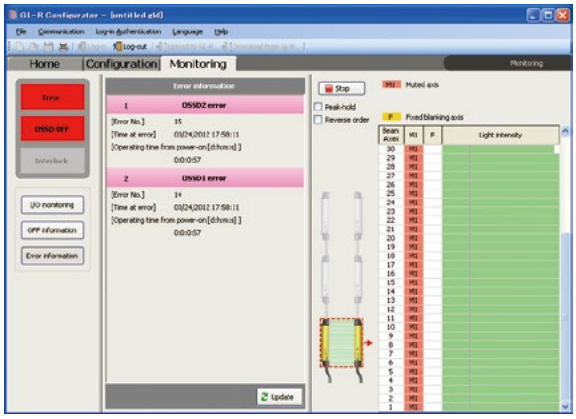
The operation of the GL-RHG Series can be monitored with a PC. The status of I/O signals including the OSSD outputs, override inputs, and error conditions can be checked along with the received light intensity on each beam. In addition, the muting function can be monitored to easily identify causes of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

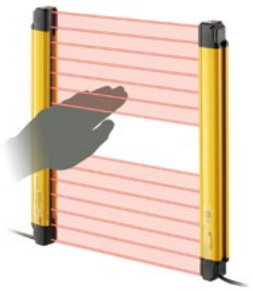
Use the following steps to select the optimum GL-RHG Series components for your application.

## 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**

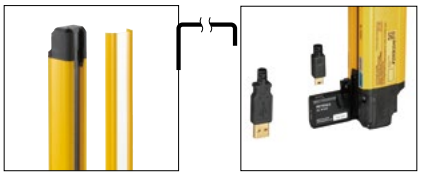
No dead zone mounting bracket
**GL-RB21**

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

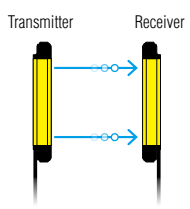
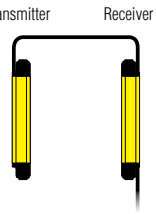
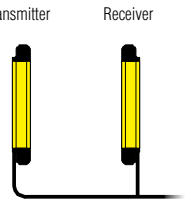
Corner mirror
**SL-M**

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.<br>• The Transmitter and the receiver can operate on different power supplies. | • Simplified wiring.<br>• 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.<br>• All indicators other than "Power" are not available on the transmitter. | • The input and output functions on the transmitter are not available.<br>• 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<br>11-core cable |
| | Receiver | 5-core cable<br>11-core cable | 5-core cable<br>11-core cable | 7-core cable<br>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**

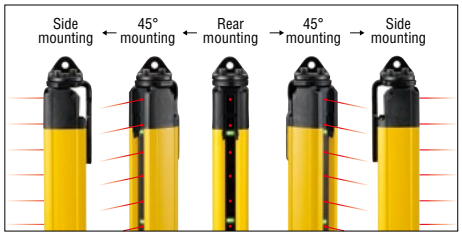
| Model | No. of beam axes | Total length (mm) | Detection height (mm) | Protection height (mm) | Operating distance (m) |
|---|---|---|---|---|---|
| **GL-R08HG** | 8 | 160 | 140 | 185 | 0.2 to 15 |
| **GL-R12HG** | 12 | 240 | 220 | 265 | |
| **GL-R16HG** | 16 | 320 | 300 | 345 | |
| **GL-R20HG** | 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°.

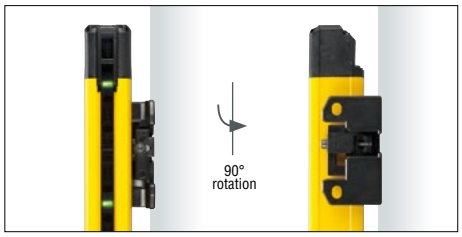
  If the total length of the GL-RHG main unit is 1280 mm or longer, and if mounting it using the Adjustable angle mounting bracket, also use the antivibration bracket [GL-RB32 (2 pieces/pack)] to prevent vibration.

| Model |
|---|
| **GL-RB01** |

| Model |
|---|
| **GL-RB02** |

## NO DEAD ZONE MOUNTING BRACKET

**GL-RB21** (incl. 2 pieces)



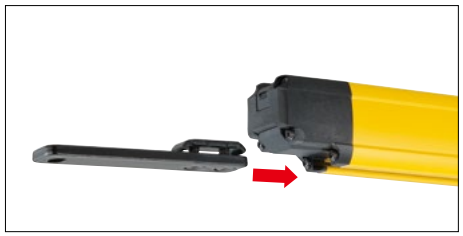

- Allows you to rotate the light curtain 90° by changing the mounting hole. It is also possible to perform fine-tuning of ±15° from this position.

  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)



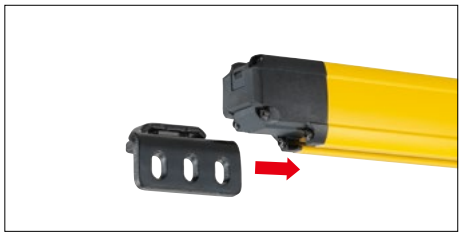
- Simple attachment to standard machine framework.

  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)



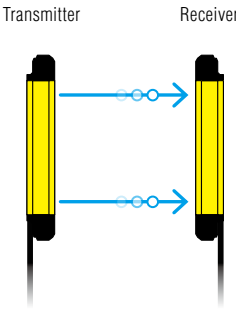
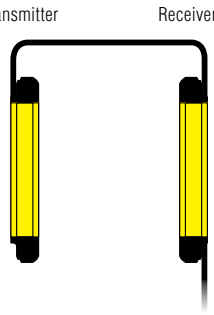
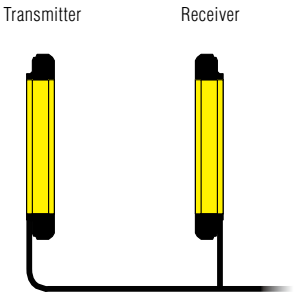
• Simple attachment to standard machine framework.

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.

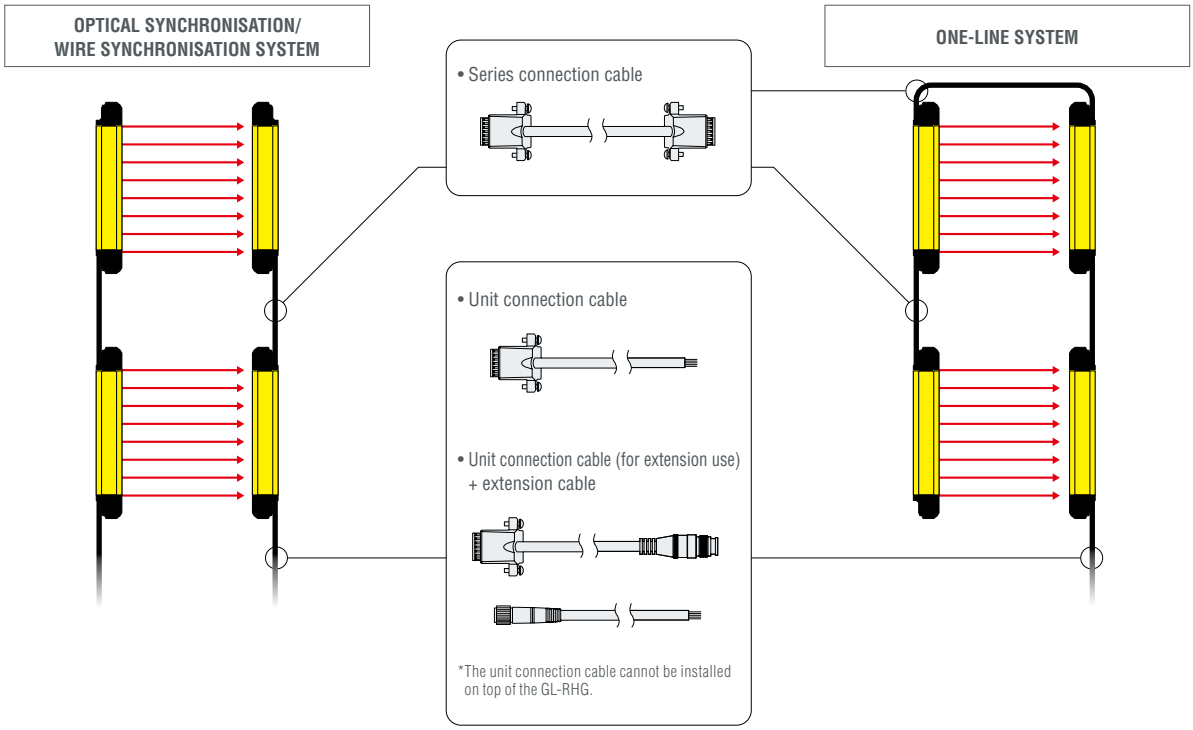
| Model |
|---|
| **GL-RB12** |

# 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<br>11-core cable |
| | Receiver | 5-core cable<br>11-core cable | 5-core cable<br>11-core cable | 7-core cable<br>11-core cable |

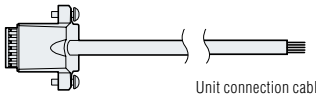
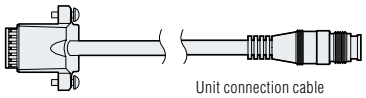
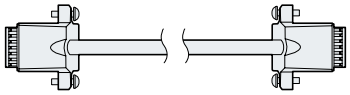
## INSTALLATION SCHEMATIC



## CABLES

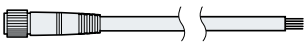
- Each model is connected to one cable.
  Therefore, at least two cables are needed as a system, one for the transmitter and another for the receiver.
- All cables can be used for both the transmitter and receiver.
- The combination of the wiring system and cable determines the functions that can be 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

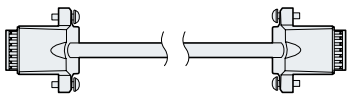
- If using a combination of the unit connection cable (for extension use) and the extension cable, make sure that they share the same amount of conductors.

| 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.

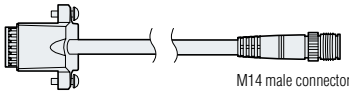
- Use a series connection cable to perform series connection.

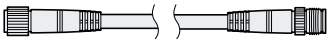
| Shape | PNP/NPN | Length (m) | Model |
|---|---|---|---|
|  | PNP/NPN shared | 0.08 | **GL-RS008** |
| | | 0.15 | **GL-RS015** |
| | | 0.5 | **GL-RS05** |
| | | 1 | **GL-RS1** |
| | | 3 | **GL-RS3** |
| | | 5 | **GL-RS5** |
| | | 10 | **GL-RS10** |

* 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)<br>M14 male connector | 0.3 | **GL-RPT03PM** |
| | 3 | **GL-RPT3PM** |
| | 5 | **GL-RPT5PM** |

| Shape | Length (m) | Model |
|---|---|---|
|  (Includes transmitter and receiver cables)<br>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.

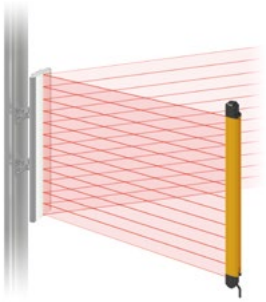
## INTERFACE UNIT

| 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".



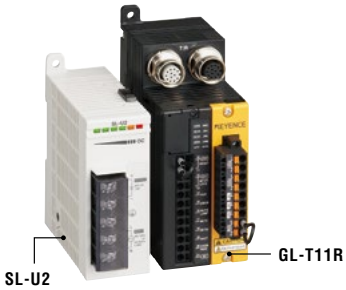
For each single corner mirror, the detection distance will decrease by approximately 10%.

| 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 |

## TEST PIECE FOR DETECTION TEST

| Model | Detail |
|---|---|
| OP-88866 | Diameter of 25 mm, Length of 200 mm |

## 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<br>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.<br>Optical synchronisation: prevented by Channel A and B with setting switch<br>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)<br>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)<br>LED lamp (load current: 10 to 230 mA) can be connected | |
| External input | EDM input | | [When using a PNP output cable]<br>ON voltage: 10 to 30 V<br>OFF voltage: Open or 0 to 3 V<br>Short circuit current: Approx. 2.5 mA (Approx. 10 mA with EDM input only) | [When using an NPN output cable]<br>ON voltage: 0 to 3 V<br>OFF voltage: Open or 10 V or more<br>Up to the power voltage<br>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/s$^2$ (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) | |
| | | | 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

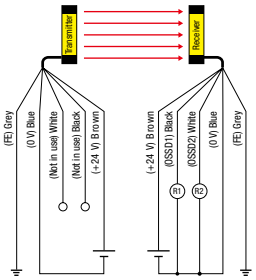
**R1, R2** ..... External device (safety PLC, safety relay unit, etc.)
**K1, K2** ..... External device (Force guided relay, magnet connector, etc.)
**K3** ..... Solid state connector*1
**S1** ..... Switch used for reset input
**S2** ..... Switch used for wait input*1
**M** ..... 3-phase motor
**PLC**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

*1 These are NON SAFETY-RELATED components.

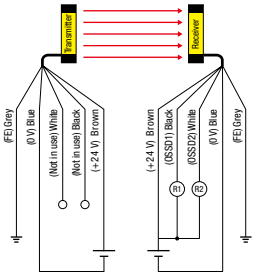
## OPTICAL SYNCHRONISATION SYSTEM

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

(1) PNP output cable

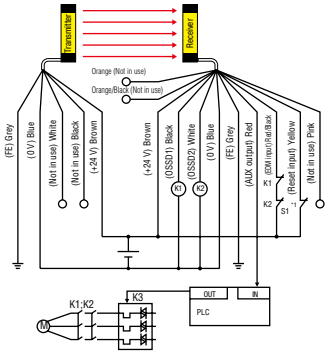



(2) NPN output cable

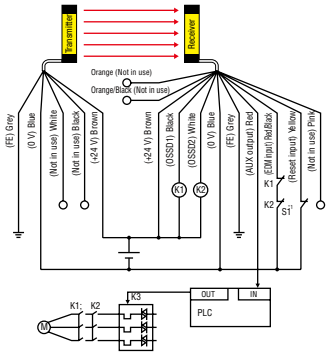



### Transmitter : 5-core cable, Receiver:11-core cable Uses EDM input

(1) PNP output cable




(2) NPN output cable

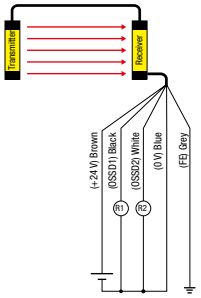



## ONE-LINE SYSTEM

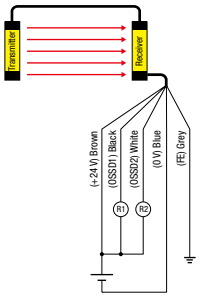
- The series connection cable must be used to connect the transmitter and receiver.
- The unit connection cable is not needed for the transmitter.
- The wiring when using an 11-core cable with the receiver is the same as the optical synchronisation system wiring.

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

(1) PNP output cable



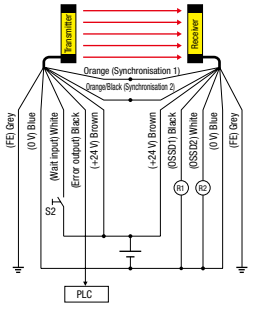

(2) NPN output cable



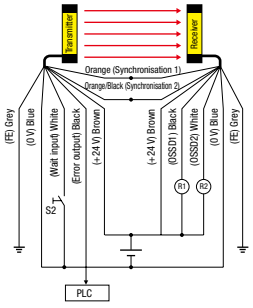

## WIRE SYNCHRONISATION SYSTEM

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

(1) PNP output cable



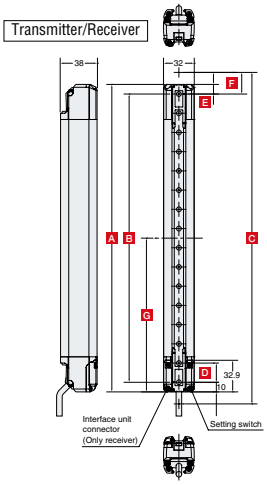

(2) NPN output cable



## DIMENSIONS

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 |

CONTACT YOUR NEAREST OFFICE FOR RELEASE STATUS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( T O L L F R E E )




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