

SENSORS AND SAFETY



PRODUCT LINEUP



SENSORS



SAFETY



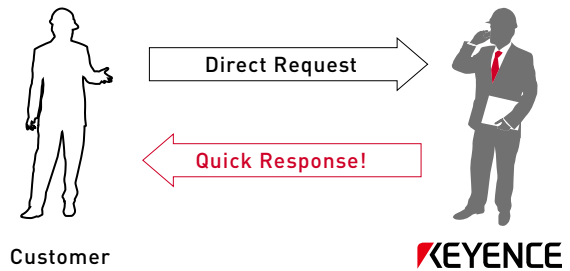
PROCESS



KEYENCE VALUE

Since 1974, KEYENCE has steadily grown and innovated to become a world leader in the development of automation and quality assurance solutions

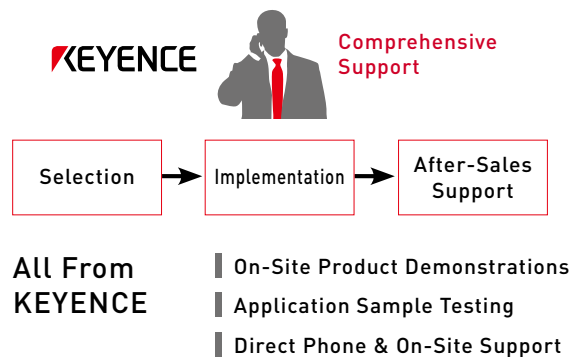
Direct Sales Network



Your Sales Engineer

- Local
- Specialized Product Expert
- KEYENCE Direct

Direct Support



Same-Day Shipping



Products ordered by 4:00 PM CST are shipped from our warehouse center in Chicago the same day!

Global Network

Over

200
Offices

in more than

45
Countries

250,000+
Clients



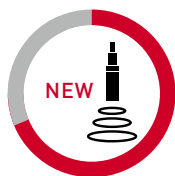
Around the World



Innovative Technology

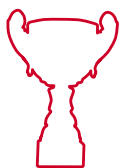
Products featuring World's
First or Industry's First
Technology

70 %



2011 to 2018

The World's Most Innovative
Companies **Top 100** – Forbes



Corporate Information

Global Headquarters: Osaka, Japan

Founded: May 1974

Capital: 289,033,000 USD

2017 Global Sales: 4,970,256,000 USD

Worldwide Employees: 6,602

Note: US dollar amounts are converted from Japanese yen for convenience only
at 106 JPY = 1 USD, the approximate exchange rate on March 20, 2018.





All-Purpose Sensors

P6

LR-Z Series

- » Unmatched Stability
- » Rugged Stainless Steel Housing
- » Simplified Operation and Setup



Long Distance Presence Sensors

P7

LR-T Series

- » Long Range Stable Detection
- » All-in-One Design and Functionality
- » Innovative OLED Display



Appearance Sensors

P8

LR-W Series

- » White LED for Full Spectrum Detection
- » Long Range, Dual Spot, and Fiber Models
- » Controller Expansion for Increased Functionality



Additional Sensors

Fiber Optic Sensors FS/FU Series



P10 to 11

Specialty Sensors LV/PX/GV/CZ Series



P12 to 13

Robust Photoeyes PR Series



P14 to 15

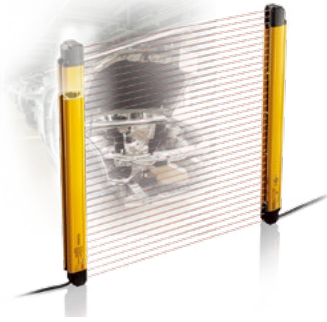
Standard Photoeyes PZ Series



P16 to 17

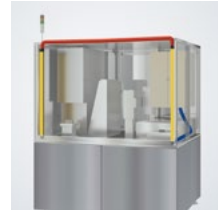
Safety Light Curtains

P18



GL-R Series

- Built-in Guarding
- Full-Length Protection
- Innovative Wiring Options

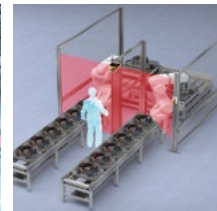
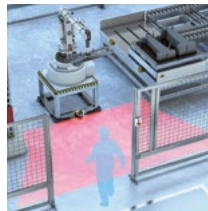


Safety Laser Scanners

P21

SZ-V Series

- Industry Leading Range
- Easy to Use Software
- Built-in Camera



Process Sensors

Clamp-On Flow Meters FD-R/Q Series

- 1/4" to 8" Pipes
- No Pipe Modification
- Detects Any Liquid



P22 to 23

Pressure Sensors GP/AP Series



P23 to 24

Guide Pulse Level Sensors FL Series

- Completely Trouble-Free
- Range up to 2m (6.6')
- Detects Any Liquid



P25 to 26

Additional Products

Proximity Sensors EV/EZ/ED/EM/ ES/ET/TA Series



P27 to 29

Power Supplies MS Series



P30

Control Units CU Series



P30

LR-Z Series

CMOS Laser Sensors



Key Features

- Stably and reliably detect any target
- Simplified 1-pt calibrations
- Robust IP68/IP69K enclosure ratings

Sensors

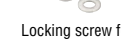
Type	Detecting distance	Spot diameter	Connection method	Output	Model
 M18 threaded mount w/ M12 connector	 25 to 490 mm 0.98° to 19.29°	Approx. ø3 mm ø0.12° 	M12 4-pin	NPN/PNP selectable	LR-ZH490CB U.C.D. Function
 M18 threaded mount w/ M12 connector	 25 to 240 mm 0.98° to 9.45°	Approx. 2.4 mm 0.09° Approx. ±1.2 mm 0.05° At detecting distance of 240 mm 9.45°	M12 4-pin	Bipolar (NPN+ PNP)	LR-ZB240CB
 M18 threaded mount w/ M12 connector	 25 to 90 mm 0.98° to 3.54°	Approx. 2 mm 0.08° Approx. ±1 mm 0.04° At detecting distance of 90 mm 3.54°	M12 4-pin		LR-ZB90CB
 Rectangular w/ cable	 35 to 500 mm 1.38° to 19.69°	Approx. ø3 mm ø0.12° 	2 m cable	NPN	LR-ZH500N U.C.D. Function
 Rectangular w/ M8 connector			M8 4-pin	PNP	LR-ZH500P U.C.D. Function
				M8 3-pin	NPN
			PNP		LR-ZH500CP U.C.D. Function
 Rectangular w/ cable	 35 to 250 mm 1.38° to 9.84°	Approx. 2.4 mm 0.09° Approx. ±1.2 mm 0.05° At detecting distance of 250 mm 9.84°	2 m cable	NPN	LR-ZB250AN
 Rectangular w/ M8 connector			M8 4-pin	PNP	LR-ZB250AP
				M8 3-pin	NPN
			PNP		LR-ZB250CP
 Rectangular w/ cable	 35 to 100 mm 1.38° to 3.94°	Approx. 2 mm 0.08° Approx. ±1 mm 0.04° At detecting distance of 100 mm 3.94°	2 m cable	NPN	LR-ZB100N
 Rectangular w/ M8 connector			M8 4-pin	PNP	LR-ZB100P
				M8 3-pin	NPN
			PNP		LR-ZB100CP

Brackets

Type	Model	Compatible models	Material/Weight
Standard mounting bracket (M3 screw × 2 supplied)	OP-87408 ^{*1}	Rectangular	SUS316L 30 g
Rear mounting bracket (M3 screw × 2 supplied)	OP-87409	Rectangular	SUS316L 30 g
Robust mounting bracket (t = 3) (M3 screw × 2 supplied)	OP-87410 ^{*2}	Rectangular	SUS316L 170 g
M18 nut & Lock washer set	OP-87413	M18 Threaded Mount	M18 nut SUS316L 10 g Lock washer SUS304 5 g

^{*1} This bracket is dedicated to the cable type. Use OP-87409 or OP-87410, when installing the connector type.

^{*2} This can be used only in combination with an L-shaped connector cable, when installing the connector type.

Type		Model	Compatible models	Material/Weight
	Adjustable bracket (M3 screw × 2 supplied)	OP-87404	Rectangular	Zinc nickel plating 95 g
	Adjustable bracket	OP-87405	M18 Threaded Mount	Zinc nickel plating 100 g
	Screw length: 45 mm 1.77°	OP-87406	—	Iron nickel plating 70 g
	Screw length: 65 mm 2.56°	OP-87407	—	Iron nickel plating 80 g

Reflectors (For U.C.D. function only)

Type	Model	Compatible models	Maximum detecting distance	Appearance
Reflector	R-6L	LR-ZH models	700 mm 27.56°	
Reflective tape	OP-87123		700 mm 27.56°	 25 × 25 mm 0.98° × 0.98°

^{*} When using the reflector or reflective tape, ensure that the spot from the sensor is stationary on the reflector.

Adjustable bracket



Adjustable bracket for rectangular type

Adjustable bracket for threaded mount type

LR-T Series

T0F Laser Sensors



Key Features

- » Position based sensing ignores color changes
- » Max 5 m (16.4') range
- » Intuitive OLED display

Sensors

Type	Detecting distance	Features	Model
 Cable (2 m 6.6')	 60 to 5000 mm 2.36" to 196.85"	Adjustable Spot Analog Output	LR-TB5000
M12 connector (Cable sold separately)			LR-TB5000C LR-TB5000CL
 Cable (2 m 6.6')	 60 to 2000 mm 2.36" to 78.74"	Smaller Size	LR-TB2000
M12 connector (Cable sold separately)			LR-TB2000C LR-TB2000CL

Brackets

Type	Model	Material/Weight
 Adjustable angle bracket (For LR-TB5000 Series) (M4 screw × 2 supplied)	OP-87773	SUS304 Approx. 150 g
 Adjustable angle bracket (For LR-TB2000 Series) (M3 screw × 2 supplied)	OP-87771	SUS304 Approx. 110 g
 Small bracket (For LR-TB2000 Series) (M3 screw × 2 supplied)	OP-87770	SUS304 Approx. 80 g

Type	Model	Material/Weight
 Adjustable bracket (For LR-TB5000 Series) (M4 screw × 2 supplied)	OP-87774	Zinc nickel plating, etc. Approx. 120 g
 Adjustable bracket (For LR-TB2000 Series) (M3 screw × 2 supplied)	OP-87772	Zinc nickel plating, etc. Approx. 110 g
 Locking screw (For adjustable bracket) (85 mm 3.35")	OP-87775	Iron nickel plating Approx. 120 g

Protection covers

Type	Model	Material/Weight
 Front protection cover (For LR-TB5000 Series)	OP-87778	SUS304, PC, etc. Approx. 6 g
 Front protection cover (For LR-TB2000 Series)	OP-87776	SUS304, SUS430, PC, etc. Approx. 50 g



LR-TB5000 + OP-87774 + OP-87775



LR-TB2000 + OP-87772 + OP-87775

LR-W Series

Full-Spectrum Sensors



Key Features

- Detect any changes in appearance
- Metal housing with IP67 enclosure rating
- Innovative white LED

Sensors: Standard Models

Type		Detecting distance	Light source	Model
Cable (2 m 6.6')	Standard Type	30 to 500 mm 1.18" to 19.69"	White LED	LR-W500
M12 connector (Cable sold separately)				LR-W500C

Sensors: Small/Dual Spot Models

Type		Detecting distance	Light source	Model
Cable (2 m 6.6')	Small/Dual Spot Type	30 to 70 mm 1.18" to 2.76"	White LED	LR-W70
M12 connector (Cable sold separately)				LR-W70C

Sensors: Fiber Extension Models

Type		Detecting distance	Light source	Model
Cable (2 m 6.6')	Fiber Type	Detecting distance and min. spot diameter are based on the attached fiber head	White LED	LR-WF10
M12 connector (Cable sold separately)				LR-WF10C

Applicable Fiber Heads

Feature / Type	Fiber unit length (Diameter) Ambient temperature	Appearance	Detecting distance	Model
M3 Hex-shaped Coaxial	1 m 3.3' Free-cut (ø1.3 ø0.05" × 2) -40 to +50°C -40 to +122°F	0.73" 18.5"	500 ms: 47 1.85" 100 ms: 32 1.26" 10 ms: 12 0.47" 1 ms: 7 0.28" 250 µs: 5 0.20"	FU-35TZ
M3 Threaded Coaxial	1 m 3.3' Free-cut (ø1.3 ø0.05" × 2) -40 to +50°C -40 to +122°F	0.67" 17"		FU-35FZ
Cylinder (Set Screw Installation) Diameter ø2 ø0.08"	1 m 3.3' Free-cut ø1.0 ø0.04" × 2 -40 to +50°C -40 to +122°F	0.39" 10" ø2 ø0.08"	500 ms: 33 1.30" 100 ms: 24 0.94" 10 ms: 9 0.35" 1 ms: 4 0.16" 250 µs: 3 0.12"	FU-49U
Beam spot diameter ø0.9 to 3.5 ø0.04" to ø0.14" Focal distance 10 to 30 0.39" to 1.18"	2 m 6.6' Free-cut (ø1.3 ø0.05" × 2) -40 to +70°C -40 to +158°F	26.4 to 31.5 1.04" to 1.24"	10 to 30 0.39" to 1.18"	FU-10
Beam spot diameter Approx. ø0.1 ø0.004" Focal distance 5 0.20"	50 cm 1.6' Cut not allowed -40 to +70°C -40 to +158°F	18 0.71" Tip: ø3 ø0.12"	5 ± 1 0.20" ± 0.04"	FU-20

Feature / Type	Fiber unit length (Diameter) Ambient temperature	Appearance	Detecting distance	Model
Focused Beam / High-power Aperture angle: Approx. 8°	2 m 6.6' Free-cut (ø2.2 ø0.09" × 2) -40 to +50°C -40 to +122°F	Thickness: 5.2 0.20" 21 0.83"	500 ms: 26 to 379 1.02" to 14.92" 100 ms: 27 to 270 1.06" to 10.63" 10 ms: 33 to 112 1.30" to 4.41" 1 ms: — 250 µs: —	FU-40
Definite-reflective Thin, Small	2 m 6.6' Free-cut (ø2.2 ø0.09" × 2) -40 to +70°C -40 to +158°F	17 0.67" 19 0.75" 7.4 0.29"	500 ms: 2 to 131 0.08" to 5.16" 100 ms: 3 to 119 0.12" to 4.69" 10 ms: 10 to 93 0.39" to 3.66" 1 ms: 12 to 79 0.47" to 3.11" 250 µs: 13 to 68 0.51" to 2.68"	FU-40S
Sleeve Side view detection	2 m 6.6' Free-cut (ø1.0 ø0.04" × 2) -40 to +70°C -40 to +158°F	ø0.08" ø2 15 0.59" 15 0.59" 7.4 0.29" Do not bend sleeve.	500 ms: 30 1.18" 100 ms: 20 0.79" 10 ms: 7 0.28" 1 ms: 3 0.12" 250 µs: 2 0.08"	FU-31
Heat Resistant Heat resistant temperature*2: 300°C 572°F	1 m 3.3' Cut not allowed -40 to +300°C -40 to +572°F	ø0.10" ø2.6 17 0.67" 10 0.39"	500 ms: 158 6.22" 100 ms: 107 4.21" 10 ms: 40 1.57" 1 ms: 24 0.94" 250 µs: 16 0.63"	FU-83C

LR-W Series

Full-Spectrum Sensors



Key Features

- » Detect any changes in appearance
- » Metal housing with IP67 enclosure rating
- » Innovative white LED

Applicable Fiber Lenses

Type	Beam spot diameter	Focal distance	Lens		Fiber units
			Model	Appearance Weight	
Small spot	Approx. $\phi 0.4$ $\phi 0.02''$	7 ± 2 $0.28' \pm 0.08''$	F-2HA	-30 to +70°C -22 to +158°F Tip: $\phi 4.3$ $\phi 0.17''$ 15.6 0.61" Approx. 1 g	FU-35FZ FU-35TZ
	Approx. $\phi 0.5$ $\phi 0.02''$	15 ± 2 $0.59' \pm 0.08''$	F-4HA	-30 to +70°C -22 to +158°F Tip: $\phi 7.4$ $\phi 0.29''$ 27 1.06" Approx. 2 g	FU-35FZ FU-35TZ
Side-view adjustable spot	Approx. $\phi 0.5$ to $\phi 3$ $\phi 0.02''$ to $\phi 0.12''$	8 to 30 $0.32'$ to $1.18''$	F-5HA	-30 to +70°C -22 to +158°F Tip: $\phi 8.7$ $\phi 0.34''$ 15.6 0.22" Approx. 2 g	FU-35FZ

Brackets and Accessories

Type	Applicable Sensors	Model	Type	Applicable Sensors	Model
	LR-W500/ W70/ WF10	OP-88021 ^{*1}		LR-W500(C)	LR-WA1 ^{*1*2}
	LR-W70/ WF10	OP-88022 ^{*1}		LR-W70(C)	LR-WA2 ^{*1*2}
	LR-W500(C)/ W70(C)/ WF10(C)	OP-88023			
		OP-88024			

*1 The 4-pin M12 connector type may not be mounted in the orientation shown in the picture (connector downward). Confirm the dimensions and surroundings carefully.

*1 When using LR-WA1 or LR-WA2, detecting range may decrease on targets with low reflectance. Perform sufficient checks in the actual installation environment.
*2 When using the LR-WA1 or LR-WA2, the enclosure rating (IP65/IP67) is not met.

MU-N Series

Multi-Sensor Controllers



Key Features

- » Compatible with LR-W, LR-T, and FD-Q Series
- » Increases sensor functionality and provide separate controller
- » Dual 7-Segment and OLED displays

Controllers

Type	Control output	External input	Analog output	Model
	4 standard outputs max. * (15 signal combinations available using binary logic)	5 inputs max. *	1 output max. *	MU-N11
			—	MU-N12

*The number of control outputs and external inputs available is based on the sensor type connected and internal settings. Contact Keyence for more information.

Cables (MU-N Power Cable)

Appearance	Applicable unit	Cable material	Cable end	Controller side	Length	Model
	Main unit	PVC (Polyvinyl chloride)	8-core loose wires	Connector	2 m 6.6'	MU-CB8
	Expansion unit		4-core loose wires			MU-CB4
			6-core loose wires			MU-CB6
			2-core loose wires			MU-CB2
	Main unit		M12 4-pin straight		0.3 m 1.0'	MU-CC4

Cables (Sensor to Controller Cable)

Appearance	Cable material	Sensor side	Controller side	Length	Model
	PVC (Polyvinyl chloride)	M12 4-pin straight	Connector	2 m 6.6'	OP-88025
				10 m 32.8'	OP-88026^{†1}
		M12 4-pin L-shape		2 m 6.6'	OP-88027
				10 m 32.8'	OP-88028^{†1}

*1 The 10 m 32.8' cable includes one spare connector for the controller side.

Connectors

Appearance	Type	Applicable model	Model
	For PVC (Polyvinyl chloride) cable	Non-connector type LR-W, LR-T, and FD-Q Series sensors OP-75721/87272/85502 OP-75722/87273/87274	OP-88029
	For PUR (Polyurethane) cable	OP-87636/87637 OP-87640/87641	OP-88030

FS / FU Series

Digital Fiber Sensors



Key Features

- Selection from 150 fiber heads
- High powered detection
- Easy to read OLED display

Fiber Heads

Active Receiver Fibers

Reflective

Type	Size / Shape	Appearance (mm inch)	Fiber unit length (Diameter) Ambient temperature	Minimum bend radius (mm inch)	Detecting distance (mm inch) ^{*1}			Model Weight
					TERA (Longest) FINE (Initial)	MEGA ULTRA SUPER	TURBO HSPD S-HSPD	
M6	Hex-shaped		2 m 6.6' Free-cut (Ø2.2 ±0.09" × 2) -40 to +60°C (-40 to +140°F)	R2 R0.08" ToughFlex	790 31.10"	710 27.95"	310 12.20"	FU-R67TZ Approx. 25 g
			1 m 3.3' Cut not allowed. -40 to +60°C (-40 to +140°F)	R10 R0.39" Stainless Steel	790 31.10"	710 27.95"	310 12.20"	FU-R67TG Approx. 32g
	Threaded		2 m 6.6' Free-cut (Ø2.2 ±0.09" × 2) -40 to +60°C (-40 to +140°F)	R2 R0.08" ToughFlex	1100 43.31"	900 35.43"	320 12.60"	FU-R67 Approx. 21g
			2 m 6.6' Free-cut (Ø2.2 ±0.09" × 2) -40 to +60°C (-40 to +140°F)	R25 R0.98"	1150 45.28"	1100 43.31"	410 16.14"	FU-R6F Approx. 21g
			1 m 3.3' Cut not allowed. -40 to +60°C (-40 to +140°F)	R10 R0.39" Stainless Steel	1100 43.31"	900 35.43"	320 12.60"	FU-R67G Approx. 29g
			1 m 3.3' Cut not allowed. -40 to +60°C (-40 to +140°F)	R10 R0.39" Stainless Steel	210 8.27"	740 29.13"	110 4.33"	

*1 When using the FS-N40 Series. Standard target: White matte paper (Reflective type only.)

Thrubeams

Type	Size / Shape	Appearance (mm inch)	Fiber unit length (Diameter) Ambient temperature	Minimum bend radius (mm inch)	Detecting distance (mm inch) ^{*1}			Optical axis diameter (mm inch)	Model Weight
					TERA (Longest) FINE (Initial)	MEGA ULTRA SUPER	TURBO HSPD S-HSPD		
M4	Hex-shaped		2 m 6.6' Free-cut (Ø2.2 ±0.09" × 2) -40 to +60°C (-40 to +140°F)	R2 R0.08" ToughFlex	3600 141.73"	3100 122.05"	880 34.65"	ø0.04"	FU-R77TZ Approx. 25 g
			1 m 3.3' Cut not allowed. -40 to +60°C (-40 to +140°F)	R10 R0.39" Stainless Steel	1800 70.87"	1800 70.87"	880 34.65"	ø0.04"	FU-R77TG Approx. 43 g
	Threaded		2 m 6.6' Free-cut (Ø2.2 ±0.09" × 2) -40 to +60°C (-40 to +140°F)	R2 R0.08" ToughFlex	3600 141.73"	3600 141.73"	1300 51.18"	ø0.13"	FU-R77 Approx. 21 g
			2 m 6.6' Free-cut (Ø2.2 ±0.09" × 2) -40 to +60°C (-40 to +140°F)	R25 R0.98"	3600 141.73"	3600 141.73"	1500 59.06"	ø0.13"	FU-R7F Approx. 21 g
			1 m 3.3' Cut not allowed. -40 to +60°C (-40 to +140°F)	R10 R0.39" Stainless Steel	1800 70.87"	1800 70.87"	1300 51.18"	ø0.13"	FU-R77G Approx. 41 g
			1 m 3.3' Cut not allowed. -40 to +60°C (-40 to +140°F)	R10 R0.39" Stainless Steel	880 34.65"	1800 70.87"	430 16.93"	ø0.13"	

* When using the FS-N40 Series. "3600 mm 141.73" (1800 mm 70.87") is assumed as maximum because the fiber cable has a length of 2 m 6.6' (1 m 3.3').

Amplifiers

Cable Type

Type	Model	Control outputs	External input
Main unit	Standard	1	0
	Main unit		
	Expansion unit		
	2-Output	2	1
	Expansion unit		

M8 Connector Type

Type	Model	Control outputs	External input
IO-Link	FS-N41C	2*	1*

* Switchable between 2 control outputs, or 1 control output + 1 external input.

Zero-Line Type

Type	Model	Control outputs
For use with Multi-Output Unit or NU Series Network	FS-N40	None*

* Counted as 1 output if expanded with Multi-Output Unit FS-MC8N/P or the NU Series communication unit.

Multi-Output Unit

Type	Model	Separate control outputs	Control outputs	External input
Compatible with all NEO Series Expansion Units	FS-MC8N FS-MC8P	8	1	1

Guarded Fibers

Reflective

Type	Size / Shape	Detecting Arrangement	Appearance (mm inch)	Fiber unit length (Diameter) Ambient temperature	Minimum bend radius (mm inch)	Detecting distance (mm inch) ^{*1}			Model Weight
						TERA (Longest) FINE (Initial)	MEGA ULTRA SUPER	TURBO HSPD S-HSPD	
M3	Threaded	Coaxial		1 m 3.3' Cut not allowed. -40 to +50°C (-40 to +122°F)	R10 R0.39" Stainless Steel	590 23.23"	540 21.26"	190 7.48"	FU-2303 Approx. 20 g
				1 m 3.3' Free-cut (Ø1.3 × 2) spiral 30 cm 11.81" -40 to +50°C (-40 to +122°F)	R10 R0.39" Stainless Steel	590 23.23"	540 21.26"	190 7.48"	FU-35FG Approx. 15 g
M6	Hex-shaped	Parallel		1 m 3.3' Cut not allowed. -40 to +50°C (-40 to +122°F)	R25 R0.98" Stainless Steel	900 35.43"	830 32.68"	520 20.47"	FU-67TG Approx. 32 g
				1 m 3.3' Cut not allowed. -40 to +50°C (-40 to +122°F)	R25 R0.98" Stainless Steel	900 35.43"	830 32.68"	520 20.47"	FU-67MTG Approx. 80 g
	Coaxial	Parallel		1 m 3.3' Cut not allowed. -40 to +50°C (-40 to +122°F)	R10 R0.39" Stainless Steel	580 22.83"	530 20.87"	170 6.69"	FU-35TG Approx. 32 g
				1 m 3.3' Cut not allowed. -40 to +50°C (-40 to +122°F)	R25 R0.98" Stainless Steel	1100 43.31"	1000 39.37"	500 19.69"	FU-67MG Approx. 70 g
				1 m 3.3' Cut not allowed. -40 to +50°C (-40 to +122°F)	R10 R0.39" Stainless Steel	1100 43.31"	1000 39.37"	500 19.69"	FU-67G Approx. 29 g
				1 m 3.3' Cut not allowed. -40 to +50°C (-40 to +122°F)	R10 R0.39" Stainless Steel	380 14.96"	610 24.02"	88 3.46"	

*1 When using the FS-N40 Series. Standard target: White matte paper (Reflective type only.)

Thrubeams

Type	Size / Shape	Appearance (mm inch)	Fiber unit length (Diameter) Ambient temperature	Minimum bend radius (mm inch)	Detecting distance (mm inch) ^{*1}			Optical axis diameter (mm inch)	Model Weight
					TERA (Longest) FINE (Initial)	MEGA ULTRA SUPER	TURBO HSPD S-HSPD		
M4	Hex-shaped		1 m 3.3' Cut not allowed. -40 to +50°C (-40 to +122°F)	R10 R0.39" Stainless Steel	1800 70.87"	1800 70.87"	1400 55.12"	ø1.13 ø0.04"	FU-77TG Approx. 43 g
			1 m 3.3' Cut not allowed. -40 to +50°C (-40 to +122°F)	R20 R0.79" Stainless Steel	1800 70.87"	1800 70.87"	1400 55.12"	ø1.13 ø0.04"	FU-77MTG Approx. 100 g
	Threaded		1 m 3.3' Cut not allowed. -40 to +50°C (-40 to +122°F)	R10 R0.39" Stainless Steel	1800 70.87"	1800 70.87"	1400 55.12"	ø1.13 ø0.04"	FU-77G Approx. 39 g
			1 m 3.3' Cut not allowed. -40 to +50°C (-40 to +122°F)	R20 R0.79" Stainless Steel	1800 70.87"	1800 70.87"	1400 55.12"	ø1.13 ø0.04"	FU-77MG Approx. 100 g

*1 When using the FS-N40 Series. "3600 mm 141.73" (1800 mm 70.87") is assumed as maximum because the fiber cable has a length of 2 m 6.6' (1 m 3.3').

Thrubeams Standard

Type	Fiber unit length (Diameter)	Appearance	Minimum bend radius	Detecting distance *1	Optical axis diameter (Standard target to be detected)	Smallest detectable object *2	Model
Size/Shape	Ambient temperature			TERA (Longest) FINE (Initial)			Weight
Hex-shaped	2 m 6.6' Free-cut (ø2.2 ø0.09") -40 to +50°C -40 to +122°F		R2 R0.08" ToughFlex	3600 141.73" 1100 43.31"	ø1.13 ø0.04"	ø0.005 ø0.0002"	FU-77TZ Approx. 25 g
	1 m 3.3' Cut not allowed. -40 to +50°C -40 to +122°F		R10 R0.39" Stainless Steel	1800 70.87" 1100 43.31"			FU-77TG Approx. 43 g
	2 m 6.6' Free-cut (ø2.2 ø0.09") -40 to +50°C -40 to +122°F		R0.5 R0.02" ToughFlex	3600 141.73" 1100 43.31"			FU-77V Approx. 25 g
	1 m 3.3' Cut not allowed. -40 to +50°C -40 to +122°F		R2 R0.08" ToughFlex	1100 43.31"			FU-77 Approx. 21 g
Threaded	2 m 6.6' Free-cut (ø2.2 ø0.09") -40 to +50°C -40 to +122°F		R0.5 R0.02" ToughFlex	3600 141.73" 1100 43.31"	ø1.13 ø0.04"	ø0.005 ø0.0002"	FU-77V Approx. 25 g
	1 m 3.3' Cut not allowed. -40 to +50°C -40 to +122°F		R2 R0.08" ToughFlex	1100 43.31"			FU-77 Approx. 21 g
	2 m 6.6' Free-cut (ø2.2 ø0.09") -40 to +50°C -40 to +122°F		R10 R0.39" Stainless Steel	1800 70.87" 1100 43.31"			FU-77G Approx. 39 g
	1 m 3.3' Cut not allowed. -40 to +50°C -40 to +122°F		R2 R0.08" ToughFlex	1100 43.31"			FU-77G Approx. 39 g

*1 When using the FS-N40 Series. "3600 141.73" is assumed as maximum because the fiber cable has a length of 2 m 6.6'.

*2 The smallest detectable object was determined at the optimal detecting distance and sensitivity setting.

Bracket Integrated

Type	Fiber unit length (Diameter)	Appearance	Minimum bend radius	Detecting distance *1	Optical axis diameter (Standard target to be detected)	Smallest detectable object *2	Model
Flat Models	Ambient temperature			TERA (Longest) FINE (Initial)			Weight
Side View	1 m 3.3' Free-cut (ø1.0 ø0.04") -40 to +50°C -40 to +122°F		R2 R0.08" ToughFlex	950 37.40" 220 8.66"	ø0.5 ø0.02"	ø0.005 ø0.0002"	FU-57TZ Approx. 5 g
	Thickness: 2.5 0.10"			740 29.13" 170 6.69"			FU-53TZ Approx. 10 g
Front View	2 m 6.6' Free-cut (ø2.2 ø0.09") -40 to +50°C -40 to +122°F		R2 R0.08" ToughFlex	3600 141.73" 1100 43.31"	ø1 ø0.04"	ø0.005 ø0.0002"	FU-54TZ Approx. 25 g
	Thickness: 4 0.16"						

Reflectives

M3 Threaded

Unit: mm inch

Fiber unit length (Diameter)	Appearance	Minimum bend radius	Detecting distance *1	Smallest detectable object *2	Model
Ambient temperature			TERA (Longest) FINE (Initial)		Weight
1 m 3.3' Free-cut (ø1.3 ø0.05" x 2) -40 to +50°C -40 to +122°F		R2 R0.08" ToughFlex	580 22.83" 120 4.72"	ø0.005 ø0.0002" gold-wire	FU-35TZ Approx. 7 g
1 m 3.3' Free-cut (ø1.3 ø0.05" x 2) -40 to +50°C -40 to +122°F			590 23.23" 130 5.12"		FU-35FZ Approx. 6 g
1 m 3.3' Cut not allowed. -40 to +50°C -40 to +122°F		R10 R0.39"			FU-2303 Approx. 15 g
1 m 3.3' Free-cut (ø1.3 ø0.05" x 2) -40 to +70°C -40 to +158°F		R25 R0.98"	100 3.94" 95 3.74"		FU-35FA Approx. 6 g

M6 Threaded

Fiber unit length (Diameter)	Appearance	Minimum bend radius	Detecting distance *1	Smallest detectable object *2	Model
Ambient temperature			TERA (Longest) FINE (Initial)		Weight
2 m 6.6' Free-cut (ø2.2 ø0.09" x 2) -40 to +50°C -40 to +122°F		R2 R0.08" ToughFlex	900 35.43" 380 14.96"	ø0.005 ø0.0002" gold-wire	FU-67TZ Approx. 32 g
1 m 3.3' Cut not allowed. -40 to +50°C -40 to +122°F			1100 43.31" 380 14.96"		FU-67TG Approx. 32 g
2 m 6.6' Free-cut (ø2.2 ø0.09" x 2) -40 to +50°C -40 to +122°F		R10 R0.39" Stainless Steel			FU-67V Approx. 25 g
2 m 6.6' Free-cut (ø2.2 ø0.09" x 2) -40 to +50°C -40 to +122°F		R0.5 R0.02" ToughFlex	1100 43.31" 380 14.96"		FU-67 Approx. 21 g
1 m 3.3' Cut not allowed. -40 to +50°C -40 to +122°F		R2 R0.08" ToughFlex	1100 43.31"	ø0.005 ø0.0002" gold-wire	FU-67G Approx. 29 g
1 m 3.3' Cut not allowed. -40 to +50°C -40 to +122°F		R10 R0.39" Stainless Steel	380 14.96"		

*1 When using the FS-N40 Series.

*2 The smallest detectable object was determined at the optimal detecting distance and sensitivity setting.

Wide Area

Type	Fiber unit length (Diameter)	Appearance	Minimum bend radius	Detecting distance *1	Optical axis diameter	Model
Detecting method	Optical axis width	Ambient temperature		TERA (Longest) FINE (Initial)		Weight
Array	40 1.57"	2 m 6.6' Free-cut (not including the 50 mm 1.97" spiral section) -20 to +50°C -4 to +122°F	R10 R0.39"	3600 141.73" 1100 43.31"	Approx. 40 x 0.25 1.57" x 0.01"	FU-A40 Approx. 70 g
	100 3.94"	2 m 6.6' Free-cut (not including the 50 mm 1.97" spiral section) -20 to +50°C -4 to +122°F	R10 R0.39"	3600 141.73" 1000 39.37"	Approx. 100 x 0.25 3.94" x 0.01"	FU-A100 Approx. 110 g
Area	11 0.43"	2 m 6.6' Free-cut (ø2.2 ø0.09") -40 to +50°C -4 to +122°F	R2 R0.08" ToughFlex	3600 141.73" 3600 141.73"	11 x 2 ¹ 0.43" x 0.08"	FU-E11 Approx. 20 g
	10 0.39"	2 m 6.6' Free-cut (ø2.2 ø0.09") -40 to +50°C -4 to +122°F	R2 R0.08" ToughFlex	3600 141.73" 2500 98.43"	10 x 3 ² 0.39" x 0.12"	FU-12 Approx. 23 g
	40 1.57"	2 m 6.6' Free-cut (ø2.2 ø0.09") -40 to +50°C -4 to +122°F	R2 R0.08" ToughFlex	3600 141.73" 3600 141.73"	40 x 3 ³ 1.57" x 0.12"	FU-E40 Approx. 30 g

*1 0.5/1.0mm 0.02"/0.04" width slits included with FU-E11.

*2 1.0mm 0.04" width slit included with FU-12.

*3 (0.5 x 20.0mm 0.02" x 0.79") and (0.5 x 30.0mm 0.02" x 1.18") slits available for use with FU-E40.

Retro-Reflectives

Type	Fiber unit length (Diameter)	Appearance	Minimum bend radius	Detecting distance *1	Model
Retro-Reflective	Ambient temperature			TERA (Longest) FINE (Initial)	Weight
M6	2 m 6.6' Free-cut (ø1.0 ø0.04" x 2) -40 to +50°C -40 to +122°F		R2 R0.08" ToughFlex	10 to 1100 0.39" to 43.31" 10 to 220 0.39" to 8.66"	FU-13 Approx. 8 g
	Thickness: 17 0.67"				
Square type	2 m 6.6' Free-cut (ø1.0 ø0.04" x 2) -20 to +55°C -4 to +131°F		R10 R0.39"	100 to 14000 3.94" to 551.18" 100 to 2300 3.94" to 90.55"	FU-15 Approx. 12 g
	Thickness: 1.06" 26.9"				

*1 When using the FS-N40 Series.

Small Spot

Type	Beam spot diameter	Focal distance	Fiber unit length (Diameter)	Appearance	Minimum bend radius	Model
Adjustable Beam			Ambient temperature			Weight
Adjustable Beam	ø0.9 to 3.5 ø0.04" to ø0.14"	10 to 30 0.39" to 1.18"	2 m 6.6' Free-cut (ø1.3 ø0.05" x 2) -40 to +70°C -40 to +158°F		R25 R0.98"	FU-10 Approx. 5 g
			Tip: ø3 ø0.12"			
Small spot	Approx. ø0.1 ø0.004"	5 0.20"	50 cm 19.69" Cut not allowed. -40 to +158°F		R25 R0.98"	FU-20 Approx. 2 g
			Tip: ø3 ø0.12"			

Specialty

Type	Fiber unit length (Diameter)	Appearance	Minimum bend radius	Detecting distance	Smallest detectable object	Model
	Ambient temperature			TERA (Longest) FINE (Initial)		Weight
Definite Reflective	2 m 6.6' Free-cut (ø2.2 ø0.09" x 2) -40 to +50°C -40 to +122°F		R2 R0.08" ToughFlex	30 to 2700 1.18" to 10.63" 30 to 530 1.18" to 20.87"	ø0.3 ø0.01" copper wire (vertical)	FU-40 Approx. 23 g
	Thickness: 5.2 0.20"					
Definite Reflective	2 m 6.6' Free-cut (ø2.2 ø0.09" x 2) -40 to +70°C -40 to +158°F		R25 R0.98"	15 to 150 0.59" to 5.91" 15 to 55 0.59" to 2.17"	—	FU-40S Approx. 25 g
Sleeve	2 m 6.6' Free-cut (ø1.0 ø0.04" x 2) -40 to +70°C -40 to +158°F		R10 R0.39"	340 13.39" 59 2.30"	ø0.005 ø0.0002" gold-wire	FU-31 Approx. 5 g
Tough Flex	1 m 3.3' Free-cut (ø1.0 ø0.04" x 2) -40 to +50°C -40 to +122°F		R2 R0.08" ToughFlex High-flex	290 11.42" 59 2.30"	ø0.005 ø0.0002" gold-wire	FU-49U Approx. 4 g
High Temperature	1 m 3.3' Cut not allowed. -40 to +300°C -40 to +572°F		R25 R0.98"	790 31.10" 350 13.78"	ø0.005 ø0.0002" gold-wire	FU-83C Approx. 23 g

LV Series

Digital Laser Sensors



Key Features

- Selection from 16 unique heads
- Adjustable beam spot type available (LV-NH32)
- Excellent for transparent target detection (LV-S62)

Brackets

LV-S61

With mounting bracket (accessory)



LV-NH62

With mounting bracket (accessory)



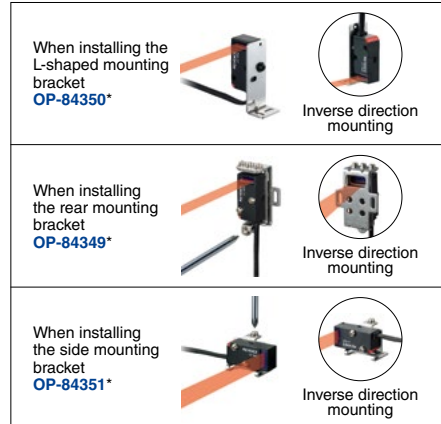
LV-S63

With mounting bracket (accessory)



LV-S62

Using the optional mounting brackets allows you to adjust the optical axis right, left, up, or down.



* Sold separately
Be sure to use the dedicated mounting brackets because optical axis adjustment is required.

Thrubeams

Appearance (mm inch)/Type	Detecting distance (mm inch)	Spot diameter (mm inch)	Model
Small beam spot	500 19.69" (Common for all power modes.)	Approx. ø1.2 ø0.05" (Detecting distance: 500 mm 19.69")	LV-S71
Position detection	500 19.69" (Common for all power modes.)	Approx. ø6 ø0.24" (Detecting distance: 500 mm 19.69")	LV-S72

Thrubeams: Area Type

Appearance (mm inch)/Type	Detecting distance (mm inch)	Area width (mm inch)	Model
Standard	2000 78.74" (Common for all power modes.)	Approx. 12 0.47"	LV-NH100
High power		Approx. 32 1.26"	LV-NH300
High power		Approx. 12 0.47"	LV-NH110

Amplifiers: Cable Type

Type	Control outputs	External input	Monitor output	Model	
				NPN	PNP
Main unit	2	1	0	LV-N11N	LV-N11P
Expansion unit				LV-N12N	LV-N12P
Monitor output	1	1	1	LV-N11MN	—

Amplifiers: M8 Connector Type

Type	Control outputs	External input	Monitor output	Model	
				NPN	PNP
Main unit	1	1	0	LV-N11CN	LV-N11CP
Expansion unit				LV-N12CN	LV-N12CP

Sensor Heads

Diffuse Reflective

Appearance (mm inch)/Type	Detecting distance (mm inch)	Spot diameter (mm inch)	Model
Small size	MEGA : 600 23.62" ULTRA : 500 19.69" SUPER : 400 15.75" TURBO : 300 11.81" FINE : 200 7.87" HSP : 150 5.91"	Approx. ø1.2 ø0.05" (Up to 500 mm 19.69" distance)	LV-S41
Small size, Side view	MEGA : 480 18.9" ULTRA : 400 15.75" SUPER : 320 12.6" TURBO : 240 9.45" FINE : 160 6.30" HSP : 120 4.72"	Approx. ø1.2 ø0.05" (Up to 400 mm 15.75" distance)	LV-S41L
Adjustable beam spot	MEGA : 1200 47.24" ULTRA : 1000 39.37" SUPER : 750 29.53" TURBO : 500 19.69" FINE : 250 9.84" HSP : 200 7.87"	Approx. ø0.8 ø0.03" max. (Up to 300 mm 11.81" distance)	LV-NH32
Coaxial structure	MEGA : 750 29.53" ULTRA : 600 23.62" SUPER : 450 17.72" TURBO : 300 11.81" FINE : 150 5.91" HSP : 100 3.94"	Approx. ø2 ø0.08" (Up to 600 mm 23.62" distance)	LV-NH35
Ultra-small beam spot	70±15 2.76±0.59" (Common for all power modes)	Approx. ø50 µm ø1.97 Mil (At 70 mm 2.76" distance)	LV-NH37
Small size, Adjustable range	Adjustment range: 50 to 200 1.97" to 7.87" (Range in which the reference distance can be adjusted)	Approx. ø2 ø0.08" (Up to 200 mm 7.87" distance)	LV-S31

Diffuse Reflective: Area Type

Appearance (mm inch)/Type	Detecting distance (mm inch)	Area width (mm inch)	Model
Long distance	MEGA : 1200 47.24" ULTRA : 1000 39.37" SUPER : 750 29.53" TURBO : 500 19.69" FINE : 250 9.84" HSP : 200 7.87"	Approx. 48×0.4 1.89" × 0.02" (At 200 mm 7.87" distance)	LV-NH42

Retro-Reflective

Appearance (mm inch)/Type	Detecting distance (mm inch)	Spot diameter (mm inch)	Model
Small beam spot	MEGA : 2.5 8.2" ULTRA : 2.6 6" SUPER : 1.5 4.9" TURBO : 1.3 3" FINE : 0.75 2.5" HSP : 0.5 1.6"	Approx. ø2.5 ø0.10" (Up to 0.5 m 1.6" distance)	LV-S61
Standard	MEGA : 8 26.2" ULTRA : 7 23" SUPER : 6 19.7" TURBO : 5 16.4" FINE : 3.5 11.5" HSP : 2 6.6"	Approx. ø1.5 ø0.06" (Up to 1 m 3.3" distance)	LV-NH62

Retro-Reflective: Area Type

Appearance (mm inch)/Type	Detecting distance (mm inch)	Spot diameter (mm inch)	Model
Wide area	MEGA : 12(6) 39.4"(19.7") ^{*1} ULTRA : 10(5) 32.8"(16.4") SUPER : 8(3.5) 26.2"(11.5") TURBO : 5(2) 16.4"(6.6") FINE : 2.5(0.7) 8.2(2.3")	Approx. ø2.5 ø0.10" (Up to 0.5 m 1.6" distance)	LV-S62
Long-distance transparent object detection	MEGA : 8 26.2" ULTRA : 7 23" SUPER : 6 19.7" TURBO : 5 16.4" FINE : 3.5 11.5" HSP : 2 6.6"	Approx. ø1.5 ø0.06" (Up to 1 m 3.3" distance)	LV-S63

PX Series

Heavy Duty Sensors



Key Features

- Water and oil resistant heads with IP68G/IP69K ratings
- Waterproof amplifier
- High powered long distance detection

Amplifiers

Type	Shape	Output type	Model
Cable type		NPN	PX-10
		PNP	PX-10P
Connector type		NPN	PX-10C
		PNP	PX-10CP

Sensor Heads

Type	Shape	Detecting distance (MEGA mode)	Model
Throughbeam		40 m 131.2'	PX-H72
		20 m 65.6'	PX-H71
		40 m 131.2'	PX-H72G
		20 m 65.6'	PX-H71G
Hex-shaped		20 m 65.6'	PX-H71TZ
		20 m 65.6'	PX-H71TZ
		20 m 65.6'	PX-H71TZ
Reflective	Standard	2 m 6.6'	PX-H61
	Armored	2 m 6.6'	PX-H61G

GV Series

CMOS Laser Sensors



Key Features

- 0.5mm (0.02") position difference detectable
- Long range 1m (39.37") model available
- Position based detection ignores surface characteristics

Amplifiers

Main/expansion unit	Appearance	Control output	Control input	Laser emission stop	Model	
Main unit		2	1	1	NPN output	GV-21
Expansion unit		2	1	1	PNP output	GV-21P
					NPN output	GV-22
					PNP output	GV-22P

Sensor Heads

Configuration	Standard detection deviation	Model ²
	0.5 mm 0.02"	GV-H45
	1 mm 0.04"	GV-H130
	3 mm 0.12"	GV-H450
	20 mm 0.79\" (Detecting distance 200 to 800 mm 7.87\" to 31.50\") 30 mm 1.81\" (Detecting distance 800 to 1,000 mm 31.50\" to 39.37\")	GV-H1000
		GV-H1000L

1. IEC class 2. Models ending in an "L" feature a Class 1 laser.

CZ Series

Luster/UV Sensors



Key Features

- Store up to 8 different appearances
- Luster detection possible
- UV detection possible

Amplifiers

Type	Main unit	Expansion unit
Model	NPN	CZ-V21A
	PNP	CZ-V21AP
Appearance		

Sensor Head: UV Detection

Type	Appearance	Detection range	Smallest spot diameter	Model
Fluorescence detection UV		25 to 55 mm 0.98\" to 2.17\" (Recommended: 35 mm 1.38\")	10 mm 0.39\" dia. at reference distance of 25 mm 0.98"	CZ-H52

Sensor Head: Luster Detection

Type	Detection range	Smallest spot diameter	Model
Luster detection	15 mm 0.59\" (Center)	Small 3 mm 0.12\" dia. Large 5 mm 0.20\" dia. at reference distance of 15 mm 0.59"	CZ-H72

PR-G Series

Robust Photoeyes



Key Features

- Rugged metal housing withstands impacts
- High power with max 30 m (98.4') range
- Bright and easy to see indicator

Thrubeam Sensors

Type	Detecting distance	Connection Method	Output	Model
 M18 threaded mount w/ M12 connector	30 m 98.4'	M12 4-pin ¹	Bipolar (NPN + PNP)	PR-G51CBD
 Rectangular w/ 2 m 6.6' cable		2 m 6.6' cable	NPN	PR-G51N
			PNP	PR-G51P
 Rectangular w/ M8 connector		M8 4-pin ¹	NPN	PR-G51CN
		M8 3-pin ¹	PNP	PR-G51CP PR-G51C3PD

Retro-Reflective Sensors

Type	Detecting distance	Connection Method	Output	Model
 M18 threaded mount w/ M12 connector	0.1 to 4.2 m 0.3' to 13.8' * When OP-84219 (R-2L) is used	M12 4-pin ⁻¹	Bipolar (NPN + PNP)	PR-G61CBD
 Rectangular w/ 2 m 6.6' cable		2 m 6.6' cable	NPN	PR-G61N
 Rectangular w/ M8 connector			M8 4-pin ⁻¹	PNP
		M8 3-pin ⁻¹	PR-G61CP	
				PR-G61C3PD

Reflective Sensors

Type	Detecting distance	Connection Method	Output	Model
M18 threaded mount w/ M12 connector	500 mm 19.69"	M12 4-pin ^{*1}	Bipolar (NPN + PNP)	PR-G41CBL
Rectangular w/ 2 m 6.6' cable		2 m 6.6' cable	NPN	PR-G41N
Rectangular w/ M8 connector		M8 4-pin ^{*1}	PNP	PR-G41CP

^{*1} Cable sold separately.

^{*2} Reflector sold separately. Reflectors and corresponding detecting distances can be found below.

Brackets

Type	Model
Standard mounting bracket for rectangular type (M3 screw x 2 supplied)	OP-87408 ^{*1,2}
Rear mounting bracket for rectangular type (M3 screw x 2 supplied)	OP-87409 ^{*2}
Robust mounting bracket for rectangular type (t = 3 mm 0.12") (M3 screw x 2 supplied)	OP-87410 ^{*2,3}
Adjustable bracket for rectangular type (M3 screw x 2 supplied)	OP-87404
Adjustable bracket for threaded mount type	OP-87405
Adjustable bracket fixing screw Screw length 45 mm 1.77"	OP-87406
	OP-87407
Extendable bracket for rectangular type	OP-87664
Extender arm for rectangular type (M3 screw x 4 and plate nut x 1 supplied)	200 mm 7.87" OP-87665 ^{*2}
	130 mm 5.12" OP-87666 ^{*2}
M18 nut	OP-3052 ^{*4}
M18 Lock washer	OP-2263 ^{*4}

^{*1} This bracket is dedicated to the cable type sensors.

Use OP-87409 or OP-87410 when using the connector type sensors.

^{*2} These brackets are only meant for use with the rectangular type sensors.

^{*3} When installing a connector type sensor in this bracket, an L-shaped connector cable must be used.

^{*4} Supplied with M18 threaded mount type.

Reflectors

Type	Detecting distance	Reflective Area	Model
Reflective mirror R-2L	0.1 to 4.2 m 0.3' to 13.8'	47 x 47 mm 1.85" x 1.85"	OP-84219
Reflective mirror R-3	0.1 to 2.9 m 0.3' to 9.5'	31 x 31 mm 1.22" x 1.22"	OP-96436
Reflective mirror R-5	0.1 to 2.5 m 0.3' to 8.2'	34 x 11.6 mm 1.34" x 0.46"	R-5
Reflective tape	0.2 to 1.1 m 0.7' to 3.6'	30 x 40 mm 1.18" x 1.57"	OP-84221
Oil/Chemical-resistant reflector	0.1 to 2.4 m 0.3' to 7.9'	51 x 51 mm 2.01" x 2.01"	OP-87623
Round reflector	0.1 to 3 m 0.3' to 9.8'	ø80 mm ø3.15" exclude ø10.5 mm ø0.41" in the middle	OP-87624

PR-M/F Series

Miniature Photoeyes



Key Features

- Resin filled SUS316L body
- Background suppression models available
- No calibration necessary

Thrubeam Sensors

Configuration	Type	Detecting distance	Connection method	Cable length	Output	Model
Thrubeam	Miniature slim type	1.2 m 47.24"	Cable	1 m 3.28'	NPN	PR-M51N1
				3 m 9.84'	NPN	PR-M51N3
			M8 4-pin *1	120 mm 4.72" *2	PNP	PR-M51P3
					NPN	PR-M51CN
					PNP	PR-M51CP
					PNP	PR-M51C3PL
	Flat type	0.6 m 23.62"	Cable	1 m 3.28'	NPN	PR-F51N1
				3 m 9.84'	NPN	PR-F51N3
			M8 4-pin *1	120 mm 4.72" *2	PNP	PR-F51P3
					NPN	PR-F51CN
			M8 3-pin Light-on *1		PNP	PR-F51CP
			M8 3-pin Dark-on *1		PNP	PR-F51C3PL
			M8 3-pin Dark-on *1		PNP	PR-F51C3PD

*1 Cable is sold separately. *2 Length between the main unit and connector.

Reflective Sensors

Configuration	Type	Detecting distance	Connection method	Cable length	Output	Model
Reflective with Background Suppression	Miniature slim type	1 to 15 mm 0.04" to 0.59"	Cable	1 m 3.28'	NPN	PR-MB15N1
				3 m 9.84'	NPN	PR-MB15N3
			M8 4-pin *1	120 mm 4.72" *2	PNP	PR-MB15P3
			M8 3-pin Light-on *1		PNP	PR-MB15CP
		1 to 30 mm 0.04" to 1.18"	Cable	1 m 3.28'	NPN	PR-MB15CN
				3 m 9.84'	NPN	PR-MB15CP
			M8 4-pin *1	120 mm 4.72" *2	PNP	PR-MB15C3PL
			M8 3-pin Light-on *1		PNP	PR-MB15C3PD
	Flat type	1 to 15 mm 0.04" to 0.59"	Cable	1 m 3.28'	NPN	PR-MB30N1
				3 m 9.84'	NPN	PR-MB30N3
			M8 4-pin *1	120 mm 4.72" *2	PNP	PR-MB30P3
			M8 3-pin Light-on *1		PNP	PR-MB30CP
		1 to 30 mm 0.04" to 1.18"	Cable	1 m 3.28'	NPN	PR-MB30CN
				3 m 9.84'	NPN	PR-MB30CP
			M8 4-pin *1	120 mm 4.72" *2	PNP	PR-MB30C3PL
			M8 3-pin Light-on *1		PNP	PR-MB30C3PD
		1 to 15 mm 0.04" to 0.59"	Cable	1 m 3.28'	NPN	PR-FB15N1
				3 m 9.84'	NPN	PR-FB15N3
			M8 4-pin *1	120 mm 4.72" *2	PNP	PR-FB15P3
			M8 3-pin Light-on *1		PNP	PR-FB15CP
		1 to 30 mm 0.04" to 1.18"	Cable	1 m 3.28'	NPN	PR-FB15CN
				3 m 9.84'	NPN	PR-FB15CP
			M8 4-pin *1	120 mm 4.72" *2	PNP	PR-FB15C3PL
			M8 3-pin Light-on *1		PNP	PR-FB15C3PD

*1 Cable is sold separately. *2 Length between the main unit and connector.

Brackets

Type	Model
Flat type standard mounting bracket (M3 screw x 2 supplied) Qty: 1	PR-B01
Flat type rear mounting bracket (M3 screw x 2 supplied) Qty: 1	PR-B02
Miniature slim type standard mounting bracket (M3 screw x 2, plate nut supplied) Qty: 1	PR-B03
Miniature slim type rear mounting bracket (M3 screw x 2, plate nut supplied) Qty: 1	PR-B04
Miniature slim type side mounting bracket (M3 screw x 2, plate nut supplied) Qty: 1	PR-B05

Type	Model
Adjustable bracket for the miniature slim type (M3 screw x 2 supplied)	OP-87404
Screw length Locking screw for adjustable bracket	Screw length: 45 mm 1.77" OP-87406
	Screw length: 65 mm 2.56" OP-87407
Adjustable mount for the flat type mounting bracket	OP-87664
Mounting bracket for the flat type (M3 screw x 4, plate nut x 1 for the compact slim/flat types supplied)	200 mm 7.87" OP-87665
	130 mm 5.12" OP-87666



Accessories

Type	Model
Plate nut (for the flat type) Qty: 2 (M3 screw x 4 supplied)	OP-87667
Plate nut (for the miniature slim type) Qty: 2 (M3 screw x 4 supplied)	OP-87668
Spacer (for the flat type) Qty: 2 x 2 (M3 screw x 4 supplied)	OP-87669
Slit, ø0.5 (for the flat type) Qty: 1 Detecting distance: 30 mm 1.18" *	OP-87670

Type	Model
Slit, 0.5 x 3 (for the flat type) Qty: 1 Detecting distance: 120 mm 4.72" *	OP-87671
Slit, ø0.5 (for the miniature slim type) Qty: 1 Detecting distance: 30 mm 1.18" *	OP-87672
Slit, 0.5 x 3 (for the miniature slim type) Qty: 1 Detecting distance: 180 mm 7.09" *	OP-87673

* Dedicated to the thrubeam type. The detecting distance is when attached to both the transmitter and receiver.

PZ-G Series

Standard Photoeyes



Key Features

- High power 4-element LED
- Extensive lineup
- Standard 1 inch mounting pitch

Brackets



Thrubeam Sensors

Type	Design	Range	Model variations			Light source (LED)	Cable ^{*1}
			NPN	PNP	Bipolar (NPN+PNP)		
Standard	Rectangular	20 m 65.6'	PZ-G51N	PZ-G51P	—	Red	Cable (2 m 6.6')
			PZ-G51CN	PZ-G51CP	—		M8 connector
			PZ-G51EN	PZ-G51EP	—		M12 pigtail quick disconnect
	Threaded	—	—	—	PZ-G51B	—	Cable (2 m 6.6')
High-power	Rectangular	40 m 131.2'	PZ-G52N	PZ-G52P	—	Infrared x 2	Cable (2 m 6.6')
			PZ-G52CN	PZ-G52CP	—		M8 connector
			PZ-G52EN	PZ-G52EP	—		M12 pigtail quick disconnect
	Threaded	—	—	—	PZ-G52B	—	Cable (2 m 6.6')
			—	—	PZ-G52CB	—	M12 connector

*1 Cable sold separately for connector pigtail quick disconnect models.

Reflective Sensors

Type	Design	Range	Model variations			Light source (LED)	Cable ^{*1}
			NPN	PNP	Bipolar (NPN+PNP)		
Diffuse reflective long-range	Rectangular	1 m 3.3'	PZ-G41N	PZ-G41P	—	Red	Cable (2 m 6.6')
			PZ-G41CN	PZ-G41CP	—		M8 connector
			PZ-G41EN	PZ-G41EP	—		M12 pigtail quick disconnect
	Threaded	—	—	—	PZ-G41B		Cable (2 m 6.6')
Diffuse reflective short-range	Rectangular	300 mm 11.81'	PZ-G42N	PZ-G42P	—		M12 connector
			PZ-G42CN	PZ-G42CP	—		Cable (2 m 6.6')
			PZ-G42EN	PZ-G42EP	—		M8 connector
	Threaded	—	—	—	PZ-G42B		M12 pigtail quick disconnect
Narrow-view reflective	Rectangular	200 mm 7.87'	PZ-G101N	PZ-G101P	—		Cable (2 m 6.6')
			PZ-G101CN	PZ-G101CP	—		M8 connector
			PZ-G101EN	PZ-G101EP	—		M12 pigtail quick disconnect
	Threaded	—	—	—	PZ-G101B		Cable (2 m 6.6')
Definite reflective	Rectangular	5 to 45mm 0.20' to 1.77'	—	—	PZ-G101CB		M12 connector
			PZ-G102N	PZ-G102P	—		Cable (2 m 6.6')
			PZ-G102CN	PZ-G102CP	—		M8 connector
	Threaded	—	PZ-G102EN	PZ-G102EP	—		M12 pigtail quick disconnect
			—	—	PZ-G102B	—	Cable (2 m 6.6')
			—	—	PZ-G102CB	—	M12 connector

*1 Cable sold separately for connector pigtail quick disconnect models.

Retro-Reflective Sensors

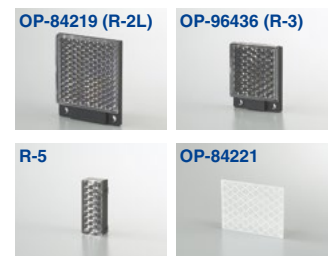
Type	Design	Range	Model variations			Light source (LED)	Cable ^{*2}
			NPN	PNP	Bipolar (NPN+PNP)		
Long-range (with P. R. O. function)	Rectangular	4.2 m 13.8'	PZ-G61N	PZ-G61P	—	Red	Cable (2 m 6.6')
			PZ-G61CN	PZ-G61CP	—		M8 connector
			PZ-G61EN	PZ-G61EP	—		M12 pigtail quick disconnect
	Threaded	—	—	—	PZ-G61B		Cable (2 m 6.6')
Transparent object detection	Rectangular	1 m 3.3'	PZ-G62N	PZ-G62P	—	Infrared	M12 connector
			PZ-G62CN	PZ-G62CP	—		Cable (2 m 6.6')
			PZ-G62EN	PZ-G62EP	—		M8 connector
	Threaded	—	—	—	PZ-G62B		M12 pigtail quick disconnect
			—	—	PZ-G62CB	—	Cable (2 m 6.6')

*1 Reflector sold separately for retro-reflective models.

*2 Cable sold separately for connector pigtail quick disconnect models.

Reflectors

Model	For use with:	Detecting distance (m ft)	
		PZ-G61 Long-range	PZ-G62 Transparent object detection
OP-84219	Retro-reflective models	0.1 to 4.2 0.3' to 13.8'	0.1 to 1 0.3' to 3.3'
R-3		0.1 to 2.9 0.3' to 9.5'	0.1 to 0.4 0.3' to 1.3'
R-5		0.1 to 2.5 0.3' to 8.2'	0.1 to 0.5 0.3' to 1.6'
OP-84221		0.2 to 0.7 0.7' to 2.3'	—



PZ-V/M Series

Position Based Photoeyes



Key Features

- Position based detection is less affected by color changes
- Internal metal threads ensure secure mounting
- Digital display models available

Thrubeam Sensors

Type	Adjustment	Model		Connector / Cable	Detecting distance
		NPN	PNP		
Thrubeam		PZ-M51	PZ-M51P	– / 2 m 6.6'	10 m 32.8'
		PZ-M52	PZ-M52P	M8 connector / 0.13 m 0.43'	
		PZ-M53	PZ-M53P	M12 connector / 0.3 m 0.98'	

Retro-Reflective Sensors

Type	Adjustment	Model		Connector / Cable	Detecting distance
		NPN	PNP		
Polarized retro-reflective (with P.R.O. function ¹)		PZ-M61	PZ-M61P	– / 2 m 6.6'	1.5 m 4.9'
		PZ-M62	PZ-M62P	M8 connector / 0.13 m 0.43'	
		PZ-M63	PZ-M63P	M12 connector / 0.3 m 0.98'	
		PZ-M65 ²	–	– / 2 m 6.6'	

1. The P.R.O. function allows mirror-surfaced targets to be detected stably due to the polarizing filters built into the sensor.

Intelligent Reflective Sensors

Type	Adjustment	Model		Connector / Cable	Detecting distance
		NPN	PNP		
Intelligent reflective		PZ-M71	PZ-M71P	– / 2 m 6.6'	900 mm 35.43"
		PZ-M72	PZ-M72P	M8 connector / 0.13 m 0.43'	
		PZ-M73	PZ-M73P	M12 connector / 0.3 m 0.98'	
		PZ-M75 ²	–	– / 2 m 6.6'	300 mm 11.81"
		PZ-M31	PZ-M31P	– / 2 m 6.6'	
		PZ-M32	PZ-M32P	M8 connector / 0.13 m 0.43'	
		PZ-M33	PZ-M33P	M12 connector / 0.3 m 0.98'	
		PZ-M35 ²	PZ-M35P ²	– / 2 m 6.6'	100 mm 3.94"
		PZ-M11	PZ-M11P	– / 2 m 6.6'	
		PZ-M12	PZ-M12P	M8 connector / 0.13 m 0.43'	
		PZ-M13	PZ-M13P	M12 connector / 0.3 m 0.98'	
		PZ-M15 ²	–	– / 2 m 6.6'	900 mm 35.43"
		PZ-V71	PZ-V71P	– / 2 m 6.6'	
		PZ-V72	PZ-V72P	M8 connector / 0.13 m 0.43'	
		PZ-V73	PZ-V73P	M12 connector / 0.3 m 0.98'	
		PZ-V75 ²	–	– / 2 m 6.6'	300 mm 11.81"
		PZ-V31	PZ-V31P	– / 2 m 6.6'	
		PZ-V32	PZ-V32P	M8 connector / 0.13 m 0.43'	
		PZ-V33	PZ-V33P	M12 connector / 0.3 m 0.98'	
		PZ-V35 ²	PZ-V35P ²	– / 2 m 6.6'	100 mm 3.94"
		PZ-V11	PZ-V11P	– / 2 m 6.6'	
		PZ-V12	PZ-V12P	M8 connector / 0.13 m 0.43'	
		PZ-V13	PZ-V13P	M12 connector / 0.3 m 0.98'	
		PZ-V15 ²	–	– / 2 m 6.6'	

2. Different frequency type

Brackets



PZ-B31 is shown.
* PZ-B32 is symmetrical.



PZ-B21A is shown.
* PZ-B22A is symmetrical.

Reflectors

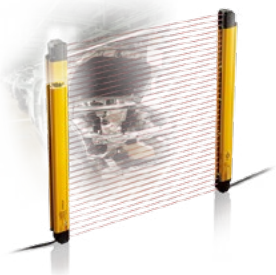
Model	Detecting distance
R-5 (*)	0.1 m to 1.5 m 0.3' to 4.9'
R-2	0.15 m to 2.6 m 0.53' to 8.5'
R-3	0.15 m to 1.9 m 0.53' to 6.2'
OP-96629	0.2 m to 0.9 m 0.7' to 3.0'

(*) R-5 reflector is included in PZ-M6x



GL-R Series

Safety Light Curtains



Light Curtains

[Detection capability: $\varnothing 14$ mm $\varnothing 0.55$ "]

GL-RF Series



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

Key Features

- » Extruded aluminum housing with recessed lens
- » Edge-to-edge detection allows for complete coverage
- » Full-length indicators clearly display operation status

[Detection capability: $\varnothing 25$ mm $\varnothing 0.98$ "]

GL-RH Series



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

[Detection capability: $\varnothing 45$ mm $\varnothing 1.77$ "]

GL-RL Series



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

Brackets (Sets of 2)

GL-RB01



GL-RB02



GL-RB21



GL-RB11

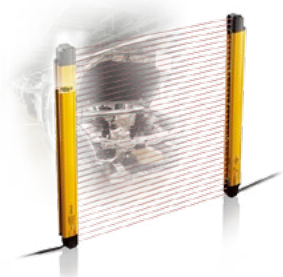


GL-RB12



GL-R Series

Safety Light Curtains



Key Features

- Extruded aluminum housing with recessed lens
- Edge-to-edge detection allows for complete coverage
- Full-length indicators clearly display operation status

Wiring system		Optical synchronization system		One-line system		Wire synchronization system	
		Transmitter	Receiver	Transmitter	Receiver	Transmitter	Receiver
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	

Cables (Sold Individually)

Shape	No. of conductors	PNP/NPN	Connector	Length (m / ft.)		Model
 Unit connection cable	5-core	PNP	—	5	16.40'	GL-RP5P
			—	10	32.81'	GL-RP10P
		NPN	—	5	16.40'	GL-RP5N
			—	10	32.81'	GL-RP10N
	7-core	PNP	—	5	16.40'	GL-RP5PS
			—	10	32.81'	GL-RP10PS
		NPN	—	5	16.40'	GL-RP5NS
			—	10	32.81'	GL-RP10NS
	11-core	PNP	—	5	16.40'	GL-RP5PM
			—	10	32.81'	GL-RP10PM
		NPN	—	5	16.40'	GL-RP5NM
			—	10	32.81'	GL-RP10NM
 Unit connection cable (for extension use)	5-core	PNP	M12 (5-pin male)	0.3	0.98'	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	0.26'	GL-RS008
				0.15	0.49'	GL-RS015
				0.5	1.64'	GL-RS05
				1	3.28'	GL-RS1
				3	9.84'	GL-RS3
				5	16.40'	GL-RS5
				10	32.81'	GL-RS10

Cables (Extension)

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

Optional Relay and Power Supply

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

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



Relay Cables (Sold as a Pair)

Shape	Length (m / ft.)	Model
 (Common to transmitter/receiver) M14 male connector	0.3 0.98'	GL-RPT03PM
	3 9.84'	GL-RPT3PM
	5 16.40'	GL-RPT5PM
	10 32.81'	GL-RPT10PM
 M14 female connector (Common to transmitter/receiver) M14 male connector	10 32.81'	GL-RCT10PM

GL-S Series

Safety Light Curtains



Key Features

- Two unique space-saving designs
- Large status indicators that can be externally controlled
- Tool free connectors and brackets for seamless integration

Light Curtains

Slim type

(Detection capability: ø25 mm ø0.98")



Flat type

(Detection capability: ø25 mm ø0.98")



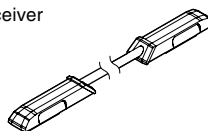
Total length (mm inch)	No. of beam axes	Detection height (mm inch)	Protection height (mm inch)	Detection capability (Beam axis spacing)	Operating distance	Slim type Model	Flat type Model
179.5 7.07"	8	140 5.51"	186 7.32"	ø25 mm ø0.98" (20 mm 0.79" spacing)	0.1 to 2 m 0.3' to 6.6'	GL-S08SH	GL-S08FH
259.5 10.22"	12	220 8.66"	266 10.47"			GL-S12SH	GL-S12FH
339.5 13.37"	16	300 11.81"	346 13.62"			GL-S16SH	GL-S16FH
419.5 16.52"	20	380 14.96"	426 16.77"			GL-S20SH	GL-S20FH
499.5 19.67"	24	460 18.11"	506 19.92"			GL-S24SH	GL-S24FH
579.5 22.81"	28	540 21.26"	586 23.07"			GL-S28SH	GL-S28FH
659.5 25.96"	32	620 24.41"	666 26.22"			GL-S32SH	GL-S32FH
739.5 29.11"	36	700 27.56"	746 29.37"			GL-S36SH	GL-S36FH
819.5 32.26"	40	780 30.71"	826 32.52"			GL-S40SH	GL-S40FH

Cables (One-Line System)

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

Series connection cable

(This cable is also used for series connections.)

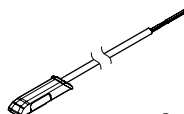


Length	Model
0.07 m 0.2'	GL-SS007
0.15 m 0.5'	GL-SS015
0.5 m 1.6'	GL-SS05
1 m 3.3'	GL-SS1
2 m 6.6'	GL-SS2
3 m 9.8'	GL-SS3
5 m 16.4'	GL-SS5

2. Select the unit connection cable

Standard cable

One-line system dedicated cable



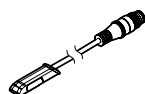
Quantity: 1

Output type	Length	Model
PNP	2 m 6.6'	GL-SP2P1
	5 m 16.4'	GL-SP5P1
	10 m 32.8'	GL-SP10P1
NPN	2 m 6.6'	GL-SP2N1
	5 m 16.4'	GL-SP5N1
	10 m 32.8'	GL-SP10N1

M12 connector cable

Unit connection cable

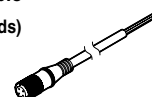
(Center indicator cannot be controlled externally when using the M12 connector cable.)



Quantity: 1

Output type	Length	Model
PNP	0.3 m	GL-SPC03P
NPN	1.0'	GL-SPC03N

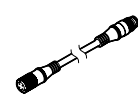
Extension cable (M12 to bare leads)



Quantity: 1

Length	Model
2 m 6.6'	OP-75721
5 m 16.4'	OP-87272
10 m 32.8'	OP-85502

Extension cable (M12 to M12)

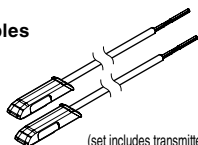


Quantity: 1

Length	Model
2 m 6.6'	OP-85503
5 m 16.4'	OP-85504

Cables (Optical Synchronization)

Standard cables



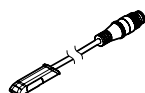
Quantity: 1
(set includes transmitter and receiver)

Output type	Length	Model
PNP	2 m 6.6'	GL-SP2P
	5 m 16.4'	GL-SP5P
	10 m 32.8'	GL-SP10P
NPN	2 m 6.6'	GL-SP2N
	5 m 16.4'	GL-SP5N
	10 m 32.8'	GL-SP10N

M12 connector cable

Unit connection cable

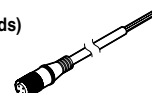
(Center indicator cannot be controlled externally when using the M12 connector cable.)



Quantity: 1

Output type	Length	Model
PNP	0.3 m	GL-SPC03P
NPN	1.0'	GL-SPC03N

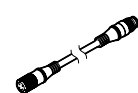
Extension cable (M12 to bare leads)



Quantity: 1

Length	Model
2 m 6.6'	OP-75721
5 m 16.4'	OP-87272
10 m 32.8'	OP-85502

Extension cable (M12 to M12)

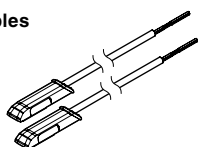


Quantity: 1

Length	Model
2 m 6.6'	OP-85503
5 m 16.4'	OP-85504

Cables (Wired Synchronization)

Standard cables



Quantity: 1
(set includes transmitter and receiver)

Output type	Length	Model
PNP	2 m 6.6'	GL-SP2P
	5 m 16.4'	GL-SP5P
	10 m 32.8'	GL-SP10P
NPN	2 m 6.6'	GL-SP2N
	5 m 16.4'	GL-SP5N
	10 m 32.8'	GL-SP10N

SZ-V Series

Safety Laser Scanners



Key Features

- Industry leading range 8.4 m [27.56']
- Simplified software for easy zone creation
- Built-in camera models enable true visualization



EtherNet/IP™

Integrated models

Function		Weight	Model
	Multi-function type	Camera Approx. 2100 g	SZ-V04X
	Standard	Approx. 2100 g	SZ-V04
	Multi-bank type	Camera Approx. 2100 g	SZ-V32X
	Standard	Approx. 2100 g	SZ-V32
	Network type	Camera Approx. 2300 g	SZ-V32NX
	Standard	Approx. 2300 g	SZ-V32N

* Integrated models include display unit, scanner head, system memory and a connection cable (SZ-VS005).

Display units

Function	Weight	Model
 Multi-function type	Approx. 420 g	SZ-VU04
 Multi-bank type	Approx. 420 g	SZ-VU32
 Network type	Approx. 600 g	SZ-VU32N

Scanner heads

Function	Weight	Model
 Camera type	Approx. 1600 g	SZ-VH1X
 Standard type	Approx. 1600 g	SZ-VH1

System memory

System memory	Weight	Model
	Approx. 60 g	SZ-VSM

Protection cover

Protection cover	Weight	Model
	Approx. 1000 g	SZ-VB21

Replacement window

Replacement window	Weight	Model
	Approx. 130 g	SZ-VHW

Mounting brackets

Installation	Weight	Name - Model
	Approx. 900 g	Adjustable angle mounting bracket (horizontal) SZ-VB01
	Approx. 1800 g	Adjustable angle mounting bracket (vertical) SZ-VB02
	Approx. 1350 g	Floor bracket SZ-VB03
	Approx. 700 g	Display unit standard bracket SZ-VB11
	Approx. 350 g	Display unit DIN rail mounting bracket (flat) SZ-VB12
	Approx. 350 g	Display unit DIN rail mounting bracket (slim) SZ-VB13

* SZ-VB13 cannot be used with SZ-VU32N.

Power cable

Appearance	Length	Weight	Model
	5 m 16.40'	Approx. 400 g	SZ-VP5
	10 m 32.81'	Approx. 800 g	SZ-VP10
	20 m 65.62'	Approx. 1500 g	SZ-VP20
	30 m 98.43'	Approx. 2200 g	SZ-VP30

* When using PROFIsafe communication, contact KEYENCE for additional power cable options.

Connection cable

Appearance	Length	Weight	Model
	0.05 m 0.16'	Approx. 80 g	SZ-VS005
	5 m 16.40'	Approx. 350 g	SZ-VS5
	10 m 32.81'	Approx. 700 g	SZ-VS10
	20 m 65.62'	Approx. 1300 g	SZ-VS20

Ethernet cable/USB cable

Appearance	Length	Weight	Model
 Main unit connection cable	0.3 m 0.98'	Approx. 110 g	SZ-VNC03
 Ethernet extension cable (RJ45)	2 m 6.56'	Approx. 160 g	OP-88086
	5 m 16.40'	Approx. 340 g	OP-88087
	10 m 32.81'	Approx. 660 g	OP-88088
 Ethernet extension cable (M12)	2 m 6.56'	Approx. 160 g	OP-88089
	5 m 16.40'	Approx. 340 g	OP-88090
	10 m 32.81'	Approx. 660 g	OP-88091
	20 m 65.62'	Approx. 1280 g	OP-88092
 USB cable	2 m 6.56'	Approx. 70 g	OP-51580
	5 m 16.40'	Approx. 200 g	OP-86941

Configuration software

Configuration software <Safety Device Configurator> can be downloaded from the KEYENCE website for free.

FD-R Series

Clamp-On Flow Meters



Key Features

- No pipe modifications necessary
- Compatible with countless liquids and pipe materials
- Integrated temperature monitoring

Flow Meters

Supported pipe size (Outer diameter)	Appearance	Rated flow velocity range	Flow rate range (Typical)	Weight	Model
1 1/2" (40A) (ø44 to ø55)		0.3 m/s to 5 m/s	36 to 400 L/min 9 to 100 gal/min 2.4 to 24 m³/h 	Approx. 2.5 kg	FD-R50
2" (50A) (ø55 to ø64)			36 to 600 L/min 9 to 150 gal/min 2.4 to 36 m³/h 		
2 1/2" (65A) (ø64 to ø83)			90 to 1000 L/min 24 to 260 gal/min 5.4 to 60 m³/h 	Approx. 3.0 kg	FD-R80
3" (80A) (ø83 to ø100)			90 to 1500 L/min 24 to 390 gal/min 5.4 to 90 m³/h 		
4" (100A) (ø100 to ø127)			220 to 2500 L/min 60 to 660 gal/min 12 to 150 m³/h 	Approx. 3.3 kg	FD-R125
5" (125A) (ø127 to ø152)			220 to 3700 L/min 60 to 990 gal/min 12 to 220 m³/h 		
6" (150A) (ø152 to ø191)			570 to 5500 L/min 150 to 1400 gal/min 36 to 330 m³/h 	Approx. 3.5 kg	FD-R200
8" (200A) (ø191 to ø220)			570 to 9500 L/min 150 to 2500 gal/min 36 to 570 m³/h 		

*The minimum flow rates (zero cut flow rates) can be changed in the settings.

Accessories

Description	Appearance	Usage	Weight	Model
Protection cover		Prevent damage to the main unit or unintended settings changes Material : SUS304, Polycarbonate	Approx. 285 g	FD-RP1
Modular cable		Send recorded data stored in FD-R to a computer	Approx. 72 g	OP-26487
RS-232C conversion adapter [9-pin]			Approx. 25 g	OP-26401

Cabling

DC Power Options: M12 4-Pin Cable, please see page 31.

AC Power Options: Please contact KEYENCE representative for more information.

FD-Q Series

Clamp-On Flow Sensors



Key Features

- No pipe modifications necessary
- Detects a large variety of liquid types
- Adapts to all sorts of pipe materials

Sensors

Appearance	Rated flow range	Supported pipe size	Model
	20 L/min 5.2 G/min	1/4" (8 A)	FD-Q10C
	30 L/min 7.9 G/min	3/8" (10 A)	
	60 L/min 15.9 G/min	1/2" (15 A)	FD-Q20C
	100 L/min 26.4 G/min	3/4" (20 A)	
	200 L/min 52.8 G/min	1" (25 A)	FD-Q32C
	300 L/min 79.3 G/min	1 1/4" (32 A)	
	400 L/min 105.7 G/min	1 1/2" (40 A)	FD-Q50C
	500 L/min 132.1 G/min	2" (50 A)	

Accessory

Appearance	Name	Material	Model
	Display Protection Cover	Polysulfone	FD-QP1

GP-M Series



Key Features

- Multiple adapter options ensure fit
- Clog resistant step flush diaphragm
- Rotatable display requiring no union joint

Sensors

Appearance	0	Rated pressure range	Fluid type	Thread diameter	Model
		-14.50 to +14.50 PSI (-100 to +100 kPa)	Gas Liquid	G3/4	GP-M001
		-14.5 to +145.0 PSI (-0.1 to +1 MPa)			GP-M010
		-14.5 to +362.6 PSI (-0.1 to +2.5 MPa)			GP-M025
		0 to +1450 PSI (0 to +10 MPa)	Liquid		GP-M100
		0 to +3626 PSI (0 to +25 MPa)			GP-M250
		0 to +5802 PSI (0 to +40 MPa)			GP-M400

Accessories

Adapters

Appearance	Type	Model
	R male 1/8	OP-87281
	R male 1/4	OP-87282
	R male 3/8	OP-87280
	G female 1/4	OP-87283
	NPT male 1/8	OP-87284
	NPT male 1/4	OP-87285
	Rc female 1/2	OP-87286

Do not use unauthorized adapters.

Display protection cover

Appearance	Material	Model
	Polysulfone	OP-87289

Throttles (Attach to the adapter before use.)

Appearance	Material	Applicable adapter	Model
	SUS303	OP-87280/OP-87281 OP-87282/OP-87284 OP-87285	OP-87311
	SUS303	OP-87283	OP-87312

It is recommended to attach a throttle to the GP-M100/M250/M400. For the other models, use it when excessive pulses or surge pressure is expected.

AP-C30 Series



Key Features

- Compact size
- Large display
- Various mounting options

Sensors

Type	Multi range			Negative pressure	Positive pressure
Model	NPN	AP-C30K			AP-C31K
	PNP	AP-C30KP			AP-C33K
Appearance					
145 PSI 29.9 inchHg 0 -29.9 inchHg					
Rated pressure range	Negative pressure mode	Positive pressure mode	Compound pressure mode	0 to -29.9 inchHg	0 to 145 PSI
	0 to -29.9 inchHg	0 to 29.5 inchHg	+29.9 to -29.9 inchHg		
Resolution	Negative pressure	Positive pressure	Compound pressure	0.1 inchHg (Normal mode)	0.2 PSI (Normal mode)
	0.1 inchHg	0.1 inchHg	0.1 inchHg	0.01 inchHg (Focus mode)	0.02 PSI (Focus mode)

Accessories

AP-B01	AP-B02	AP-B03	AP-B04	AP-A01	
Horizontal mounting bracket	Wall mounting bracket	Nameplate ceiling mounting bracket	Aslant mounting bracket	Panel mounting bracket	Mounting example

AP-C40/V40 Series



Key Features

- Small heads
- Fast response time
- Pre-programmed modes for various applications

Sensor Heads

Configuration	Rated pressure range*	Type	-29.9 inchHg	0	29.9 inchHg	145 PSI	Model
	0 to -29.9 inchHg	Negative pressure					AP-41M
	0 to -29.9 inchHg	Negative pressure					AP-41
	0 to 145.0 PSI	Positive pressure					AP-43
	29.9 to -29.9 inchHg	Compound pressure					AP-44

*The set pressure range is between -15% and +110% of the rated pressure range.

Amplifiers

Type	Appearance	Model	
		NPN	PNP
DIN	Main Unit	AP-V41AW	AP-V41AWP
	Expansion unit	AP-V42AW	AP-V42AWP
Cube		AP-C40W	AP-C40WP

* For DIN rail mounting type units, up to 8 expansion units can be used with 1 main unit. Main units include mounting brackets and expansion units include end units.

Accessories

AP-B01	AP-B02	AP-B03	AP-B04	AP-A01
Mounting example				

AP-V80 Series



Key Features

- IP67 full stainless steel structure
- Up to 7,250 PSI range
- Up to 100°C (212°F) heat resistance

Sensor Heads

Appearance	Pressure port	Pressure type	-29.9	0	29.9	145.0	1,450	2,900	7,250	Model
	NPT 1/8	Compound								AP-10SK
		Negative								AP-11SK
		Positive (Low)								AP-12SK
		Positive								AP-13SK
	NPT 1/4 (with a throttle)	Positive (High)								AP-14SK
										AP-15SK
										AP-16SK
										AP-16SK

Amplifiers

Type	Appearance	Model	
		NPN	PNP
DIN	Standard	AP-V80W	AP-V80WP
	Differential pressure	AP-V82W	AP-V82WP
Cube	Standard	AP-V85W	AP-V85WP
	Differential pressure	AP-V87W	AP-V87WP

Accessories

Appearance	Designation	Model
	Panel mounting bracket kit for AP-V85W(P)	OP-51476
	Panel spacer kit for AP-V85W(P)	OP-51605
	Head connectors (x2)	OP-42367

FL Series

Liquid Level Sensors



Key Features

- Completely trouble-free operation
- Sensing Guide-Pulse Technology
- Multiple output options

3 Different Models Designed for Varying Applications

		
Standard type FL-001	Sanitary type FL-S001	Plastic/Chemical type FL-C001
• Water/oil model • Applicable for liquids containing solid particulates • Applicable for viscous liquids	• Food/chemical industry model • Ready for CIP/SIP cleaning • Applicable for viscous liquids	• Chemical tank model • Applicable for corrosive liquids • Applicable for viscous liquids

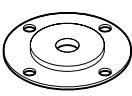
Standard Model

CONTROLLER (Required)		PROBE (Required)	
Standard type FL-001		FL-P20 (200 mm 0.66') FL-P40 (400 mm 1.31') FL-P60 (600 mm 1.97') FL-P80 (800 mm 2.62') FL-P100 (1000 mm 3.28') FL-P120 (1200 mm 3.94') FL-P140 (1400 mm 4.59') FL-P160 (1600 mm 5.25') FL-P180 (1800 mm 5.91') FL-P200 (2000 mm 6.56')	

Cables

Appearance	Standard power supply cable	Model
 Straight cable OP-87564 (2 m 6.6') OP-87565 (5 m 16.4') OP-87566 (10 m 32.8')	The following are standard PVC cables.	OP-87564 OP-87565 OP-87566
 L-shaped cable OP-87568 (2 m 6.6') OP-87569 (5 m 16.4') OP-87570 (10 m 32.8')		OP-87568 OP-87569 OP-87570

Accessories

Appearance	Type	Description	Model
	Gasket for FL-001 (Inorganic fiber + Oil-resistant rubber)	Seal material for improved mounting sealability.	OP-87548
	Condensation prevention attachment for FL-001 (SUS303)	Installing this attachment between the device and the tank prevents condensation when the medium is at a lower temperature than the ambient temperature and condensation forms on the bottom of the device. Includes two gaskets (OP-87548).	OP-87551
	Flange plate for FL-001 (SUS303) Corresponding to G3/4 JIS5K50A	-	OP-87573
	Corresponding to G3/4 JIS5K65A	Use for mounting via a flange plate. Includes one gasket (OP-87548).	OP-87574
	Nut for FL-001 G3/4 (SUS303)	Use for mounting to the top panel with a nut.	OP-87642

FL Series

Liquid Level Sensors



Key Features

- › Completely trouble-free operation
- › Sensing Guide-Pulse Technology
- › Multiple output options

Sanitary Model

CONTROLLER (Required)		PROBE (Required)	
Sanitary type FL-S001			

FL-SP20 (200 mm 0.66')
FL-SP40 (400 mm 1.31')
FL-SP60 (600 mm 1.97')
FL-SP80 (800 mm 2.62')
FL-SP100 (1000 mm 3.28')
FL-SP120 (1200 mm 3.94')
FL-SP140 (1400 mm 4.59')
FL-SP160 (1600 mm 5.25')
FL-SP180 (1800 mm 5.91')
FL-SP200 (2000 mm 6.56')

Cables

Appearance	Stainless steel power supply cable		Model
Straight cables OP-87647 (2 m 6.6') OP-87648 (5 m 16.4') OP-87649 (10 m 32.8')		The following are PVC cables with stainless steel (SUS316L) connectors. Use in situations where rust is a concern for the connectors.	OP-87647 OP-87648 OP-87649
L-shaped cables OP-87650 (2 m 6.6') OP-87651 (5 m 16.4') OP-87652 (10 m 32.8')			OP-87650 OP-87651 OP-87652

Accessories

Appearance	Type	Description	Model
	Cap for FL-S001 (included with FL-S001)	This cap offers improved waterproof performance beyond the IP67 rating of the device with no cap. The cap includes a transparent plastic window on the top for checking the display. Material: SUS304, PPSU, EPDM	OP-87558

Plastic/Chemical Model

CONTROLLER (Required)		PROBE (Required)	
Plastic/Chemical type FL-C001			

FL-CP20 (200 mm 0.66')
FL-CP40 (400 mm 1.31')
FL-CP60 (600 mm 1.97')
FL-CP80 (800 mm 2.62')
FL-CP100 (1000 mm 3.28')
FL-CP120 (1200 mm 3.94')
FL-CP140 (1400 mm 4.59')
FL-CP160 (1600 mm 5.25')
FL-CP180 (1800 mm 5.91')
FL-CP200 (2000 mm 6.56')

Cables

Appearance	Oil-resistant power supply cable		Model
Straight cables OP-87582 (2 m 6.6') OP-87583 (5 m 16.4') OP-87584 (10 m 32.8')		The following are PUR cables with high resistance to oil environments.	OP-87582 OP-87583 OP-87584
L-shaped cables OP-87586 (2 m 6.6') OP-87587 (5 m 16.4') OP-87588 (10 m 32.8')			OP-87586 OP-87587 OP-87588

Accessories

Appearance	Type	Description	Model
	Tube for FL-C001	This tube offers protection for the power supply cable in corrosive environments. Material: FKM, PPS	OP-87560
	Gasket for FL-C001	Seal material for improved mounting sealability.	OP-87561 (FFKM)
			OP-87562 (FKM)
	Cap for FL-C001	This cap offers protection for the operating surface of the device in corrosive environments. The cap prevents the display from being visible. An O ring (FKM) is included for the cap.	OP-87563
	Flange plate for FL-C001 (PVC) Corresponding to G3/4 JIS5K50A	Use for mounting via a flange plate.	OP-87577
	Corresponding to G3/4 JIS5K65A		OP-87578
	Nut for FL-C001 G3/4 (PPS)	Use for mounting to the top panel with a nut.	OP-87645

Proximity Sensors



Key Features

- Various head size options available
- Detects both ferrous and non-ferrous metals (ED series)
- Fluorocarbon-coated type for harsh environments (EV-F series)

Self-Contained Type EV Series: 2 Wire Ferrous Metal Type

Type		Detecting distance		Output type	Enclosure rating	Model	
DC 2-wire	Shielded		M8	1.5 mm 0.06"	N.O.	IP67	EV-108M
			M12	2.5 mm 0.10"			EV-112M
			M18	5 mm 0.20"			EV-118M
			M30	10 mm 0.39"			EV-130M
	Non-shielded		M8	4 mm 0.16"			EV-108U
			M12	8 mm 0.31"			EV-112U
			M18	15 mm 0.59"			EV-118U
			M30	27 mm 1.06"			EV-130U
AC 2-wire	Shielded		M12	2.5 mm 0.10"			EV-12M
			M18	5 mm 0.20"			EV-18M
			M30	10 mm 0.39"			EV-30M
DC 2-wire (Connector type)	Shielded		M8	1.5 mm 0.06"			EV-108M SO(2091)
			M12	2.5 mm 0.10"	EV-112M SO(2062)		
			M18	5 mm 0.20"	EV-118M SO(2063)		
			M30	10 mm 0.39"	EV-130M SO(2064)		
	Non-shielded		M12	8 mm 0.31"	EV-112U SO(2065)		
			M18	15 mm 0.59"	EV-118U SO(2066)		

* Can be connected to both NPN or PNP inputs.

EV-F Series: 2 Wire Ferrous Metal Type with Fluorocarbon Coating

Type		Detecting distance		Output type	Enclosure rating	Model
DC 2-wire		M12	 2.5 mm 0.10"	N.O.	IP67	EV-112F
		M18	 5 mm 0.20"			EV-118F
		M30	 10 mm 0.39"			EV-130F
Spatter-resistant		M12	 2.5 mm 0.10"			EV-112F SO(2073)
		M18	 5 mm 0.20"			EV-118F SO(2074)

* Not chemical-resistant. If you require a chemical-resistant model, use **EH-910** in a fluoropolymer-coated case.

EZ Series: 3 Wire Ferrous Metal Type

Type				Detecting distance		Output type	Enclosure rating	Model
DC 3-wire	Shielded		M8	1.5 mm 0.06"	N.O./N.C.	IP67	EZ-8M	
			M12	2.5 mm 0.10"			EZ-12M	
			M18	5 mm 0.20"			EZ-18M	
			M30	10 mm 0.39"			EZ-30M	
			Flat	5 mm 0.20"			EZ-18T	

ED Series: 3 Wire All Metal Type

Type				Detecting distance		Output type	Enclosure rating	Model
DC3-wire	Shielded		M18	5 mm 0.20"	N.O.	IP67	ED-118M	
			M30	11 mm 0.43"			ED-130M	
	Non-shielded		M18	11 mm 0.43"			ED-118U	
			M30	20 mm 0.79"			ED-130U	

Proximity Sensors



Key Features

- Various head size options available
- Detects both ferrous and non-ferrous metals (ED series)
- Fluorocarbon-coated type for harsh environments (EV-F series)

Amp-In-Cable Type

EM Series: 3 Wire Ferrous Metal Type

Type		Appearance		Detecting distance		Enclosure rating	Model	
							NPN	PNP
DC3-wire	Shielded		Cylindrical	ø3 mm ø0.12"		IP67	EM-030	EM-030P
				ø3.8 mm ø0.15"			EM-038	EM-038P
				ø5.4 mm ø0.21"			EM-054	EM-054P
				ø8 mm ø0.31"			EM-080	EM-080P
			Threaded	M5			EM-005	EM-005P
				M10			EM-010	EM-010P
				M14			EM-014	EM-014P

Separate Amplifier Type

ES Series: Ferrous Metal Type

Amplifier

Appearance	Type	Model	
		NPN	PNP
	Main unit	ES-M1	ES-M1P
	Expansion unit	ES-M2	ES-M2P

Sensor Heads

Appearance		Size	Type	Detecting distance (Stable detecting distance/ Maximum detecting distance)	Model
Shielded	Cylindrical	ø2.8 mm ø0.11"	Cylindrical	1.2 mm 0.05" (0.6 mm 0.02")	EH-302
		ø3.8 mm ø0.15"		2 mm 0.08" (0.8 mm 0.03")	EH-303A
		ø5.4 mm ø0.21"		3 mm 0.12" (1 mm 0.04")	EH-305
		ø8 mm ø0.31"	Cylindrical, with spiral tube	3 mm 0.12" (1 mm 0.04")	EH-305S
		ø10 mm ø0.39"	Cylindrical	5 mm 0.20" (2 mm 0.08")	EH-308
			Cylindrical, with spiral tube	5 mm 0.20" (2 mm 0.08")	EH-308S
	Threaded	M8	Threaded, oil-resistant	2.5 mm 0.10" (1.5 mm 0.06")	EH-108
		M10	Threaded	5 mm 0.20" (2 mm 0.08")	EH-110
			Threaded, with spiral tube	5 mm 0.20" (2 mm 0.08")	EH-110S
		M14	Threaded	8 mm 0.31" (5 mm 0.20")	EH-114
	Flat	t = 4.8 mm 0.19"	Thin	8 mm 0.31" (5 mm 0.20")	EH-614A
		t = 3.5 mm 0.16"	ULTRA Thin/Space saving	3 mm 0.12" (1 mm 0.04")	EH-605

Appearance		Size	Type	Detecting distance	Model
Non-shielded		ø2.8 mm ø0.11"	Cylindrical	7 mm 0.28" (3 mm 0.12")	EH-402
		ø14.5 mm ø0.57"	Cylindrical, Threaded	13 mm 0.51" (6 mm 0.24")	EH-416
		ø22 mm ø0.87"		18 mm 0.71" (9 mm 0.35")	EH-422
		ø30 mm ø1.18"		25 mm 0.98" (12 mm 0.47")	EH-430
		ø40 mm ø1.57"		36 mm 1.42" (18 mm 0.71")	EH-440
		ø90 mm ø3.45"	Cylindrical	70 mm 2.76" (35 mm 1.38")	EH-290

Figures in parentheses under detecting distance indicate stable detecting distance.

ES-M Series cannot be connected to **EH-422/430/440/290**.

Proximity Sensors



Key Features

- Various head options available
- Aluminum detection possible (ET Series)
- Wire and passage detection models available (TA series)

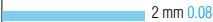
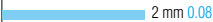
Separate Amplifier Type

ET Series: Aluminum Type

Amplifier

Appearance	Output	Model
	NPN	ET-90

Sensor Heads

Appearance		Size	Detecting distance	Model
Shielded	Cylindrical	 $\varnothing 5.4 \text{ mm } \varnothing 0.21''$ $\varnothing 8 \text{ mm } \varnothing 0.31''$	 1 mm 0.04"  2 mm 0.08"	ET-305 ET-308
	Threaded	 M10	 2 mm 0.08"	ET-110

TA Series: Metal Passage

Confirmation Type

Amplifier

Appearance	Sensitivity adjustment	Control output (One shot) ¹		Output response time		Power supply	Model
		Solid-state ² (NPN)	Relay contact	Solid-state	Relay		
	Sensitivity selector switch and fine-adjustment trimmer	100 mA (40 V max.)	SPDT 250 VAC 2 A	1 ms	10 ms	110/120/220/240 VAC ±10%, 50/60 Hz	TA-340

1. Both the solid-state and contact outputs of the amplifier are one-shot signals; the signals turn on as the object enters the sensor head.

2. NPN output can easily be converted to PNP output by connecting the optional **OP-5148** PNP Output Converter.

Sensor Heads

Appearance	Type	Smallest detectable object ¹	Detecting area	Enclosure rating	Model
	Detecting minute metallic objects	0.3 mm dia. x 0.5 mm 0.01" dia. x 0.02" steel wire	5 mm 0.20" dia.	IP67	TH-305
			10 mm 0.39" dia.		TH-310
		0.3 mm dia. x 0.75 mm 0.01" dia. x 0.03" steel wire	15 mm 0.59" dia.		TH-315
		0.3 mm dia. x 1.0 mm 0.01" dia. x 0.04" steel wire	20 mm 0.79" dia.		TH-320
	Detecting small metallic objects	2.0 mm 0.08" dia. steel ball	50 mm 1.97" dia.		TH-105
		2.5 mm 0.1" dia. steel ball	70 mm 2.76" dia.		TH-107
		3.0 mm 0.12" dia. steel ball	100 mm 3.94" dia.		TH-110
	Detecting large metallic objects	5.0 mm 0.20" dia. steel ball	100 x 150 mm 3.94" x 5.91"		TH-515
		7.0 mm 0.28" dia. steel ball	150 x 200 mm 5.91" x 7.87"		TH-520

1. Data obtained with the amplifier set at maximum sensitivity when target was travelling at 500 mm 19.69".

MS Series

Power Supplies



Key Features

- Built-in digital display shows power consumption
- 5 models available based on power needs

Power Supplies

Type		Input conditions			Model
		Rated Input voltage ^{*1}	Rated Frequency ^{*1}	Input current (100/200 VAC)	
	50 W 24 V/2.1 A	100 to 240 VAC (85 to 264 VAC, 110 to 370 VDC)	50/60 Hz (47 to 63 Hz, DC)	1.30.7 A max.	MS2-H50
	75 W 24 V/3.2 A			1.90.9 A max.	MS2-H75
	100 W 24 V/4.5 A			2.1/1.3 A max.	MS2-H100
	150 W 24 V/6.5 A			2.2/1.1 A max.	MS2-H150
	300 W 24 V/12.5 A			3.9/1.8 A max.	MS2-H300

CU Series

Control Units



Key Features

- AC powered controller that can power DC sensors
- Simplified AND logic is possible
- Relay and transistor models available

Control Units

Type	DC output	Input			Control output		Timer		Model
		No. of inputs	Input system	Minimum input time	Relay contact	Transistor ³	Timer mode	Timer period	
	12 VDC ±10%, 200 mA max.	2	Transistor (via NPN output device), contact (via limit switch/ microswitch, etc.)	0.5 ms ¹	250 VAC 2A SPDT (1c) (resistive load)	NPN: 100 mA (40 VDC) max. ⁴	ON-delay, OFF-delay, One-shot, timer OFF (selectable)	0.05 to 1 s/ 0.5 to 10 s (selectable)	CU-21TA
				5 ms ²		—	—	—	CU-21A

1. Required off time: 1.5 ms minimum.

2. Required off time: 15 ms minimum.

3. NPN output can easily be converted to PNP output by connecting the optional OP-5148 PNP output converter.

4. With overcurrent protective circuit.

Cables

M8 Connector Cables

M8 4-Pin Connector to Loose Wires

Type	Cable Material	Cable Length	Compatible Series*	Item
Straight	PUR	2 m 6.6'	LRZ/PRG/PZG	OP-87628
L-Shape		6.6'		OP-87632
Straight		10 m 32.8'		OP-87629
L-Shape		32.8'		OP-87633
Straight	PVC	2 m 6.6'	FS/LRZ/PSN/PZG/LVN/PRMF	OP-73864
L-Shape			LRZ/PZG	OP-85497
Straight			PRG	OP-87625
L-Shape				OP-87630
Straight		10 m 32.8'	FS/LRZ/PSN/PZG/LVN/PRMF	OP-73865
Straight			PRG	OP-87626
L-Shape			LRZ/PRG	OP-87619
Straight			LRZ/PRG/PRMF	OP-87621

M8 3-Pin Connector to Loose Wires

Type	Cable Material	Cable Length	Compatible Series*	Item
Straight	PVC	2 m 6.6'	LRZ/PRG/PRMF	OP-87627
L-Shape			LRZ/PRG	OP-87631
Straight	PVC-SS		LRZ/PRG/PRMF	OP-87622
L-Shape			LRZ/PRG	OP-87620

M8 4-Pin Connector to M8 4-Pin Connector

Type	Cable Material	Cable Length	Compatible Series*	Item
Straight	PUR	2 m 6.6'	PZG	OP-88069
L-Shape		6.6'		OP-88070

M8 to M12 Conversion Cables

M8 4-Pin Connector to M12 4-Pin Connector

Type	Cable Material	Cable Length	Compatible Series (*)	Item
Straight	PUR	2 m 6.6'	PZG	OP-88071
		5 m 16.4'		OP-88072
L-Shape		2 m 6.6'		OP-88073
		5 m 16.4'		OP-88074

M12 Connector Cables

M12 Connector to Loose Wires

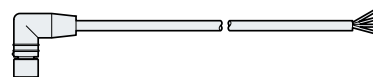
Type	Cable Material	Cable Length	Compatible Series*	Item
Straight	PUR	2 m 6.6'	LRT/LRZ/GPM/LRW/PRG/PZG/FDR	OP-87636
L-Shape			LRT/LRZ/FDQ/GPM/LRW/PRG	OP-87640
Straight		5 m 16.4'	GPM	OP-88067
L shape			GPM	OP-88068
Straight		10 m 32.8'	LRT/LRZ/GPM/LRW/PRG/PZG/FDR	OP-87637
L-Shape			LRT/LRZ/FDQ/GPM/LRW/PRG	OP-87641
Straight	PVC	2 m 6.6'	GLS/LRZ/PX/GPM/PZG/FDR	OP-75721
L-Shape			LRT/LRW/PRG	OP-87634
			LRZ/FDQ/PX/GPM/PZG	OP-75722
			LRT/LRW/PRG/FDR	OP-87638
Straight		5 m 16.4'	GLS/GPM	OP-87272
L-Shape			GPM	OP-87273
Straight		10 m 32.8'	GLS/LRZ/GPM/PZG	OP-85502
L-Shape			LRT/LRW/PRG	OP-87635
			LRZ/FDQ/GPM	OP-87274
			PRG	OP-87639
Straight	PVC-SUS	2 m 6.6'	LRZ	OP-87402
L-Shape				OP-87403
Straight	PUR-SUS316L (Outdoor)	10m 32.8'	FDR	OP-88196

M12 Connector to M12 connector

Type	Cable Material	Cable Length	Compatible Series*	Item
Straight	PUR	2 m 6.6'	PZG	OP-88075
		5 m 16.4'		OP-88076
	PVC	2 m 6.6'	PZG	OP-85503
		5 m 16.4'		OP-85504



Straight Type



L-Shape Type

*To ensure IP ratings are met, it is important to use cables specified for the particular sensor series and consult the sensor series brochure.

For additional options, contact KEYENCE.

INTELLIGENT SENSING



1D/2D CODE READERS
SR-2000 Series



STATIC ELIMINATORS
SJ Series



CONTACT SENSORS
GT2 Series



VISION SENSORS
IV Series

HIGH PRECISION MEASUREMENT



LASER MEASUREMENT
LK Series



LASER PROFILER
LJ-V Series



1D MICROMETER
LS Series



2D MICROMETER
TM Series

MACHINE VISION



VISION SYSTEMS
XG & CV-X Series



MULTI-SPECTRUM LIGHTING



LASER MARKING
MD & ML Series



INKJET PRINTING
MK-U Series

MARKING TECHNOLOGY

RESEARCH AND QUALITY



HANDHELD PROBE COORDINATE MEASUREMENT MACHINE
XM Series



IMAGE DIMENSION MEASUREMENT SYSTEMS
IM Series



DIGITAL MICROSCOPE
VHX Series



WIDE AREA 3D MEASUREMENT SYSTEM
VR Series

KEYENCE

CALL TOLL FREE

TO CONTACT YOUR LOCAL OFFICE
1-888-KEYENCE
1 - 8 8 8 - 5 3 9 - 3 6 2 3

www.keyence.com



SAFETY INFORMATION

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

CONTACT YOUR NEAREST OFFICE FOR RELEASE STATUS

KEYENCE CORPORATION OF AMERICA

500 Park Boulevard, Suite 200, Itasca, IL 60143, U.S.A. **PHONE:** +1-201-930-0100 **FAX:** +1-855-539-0123

KEYENCE CANADA INC.

E-mail: keyencecanada@keyence.com

KEYENCE MEXICO S.A. DE C.V.

E-mail: keyencemexico@keyence.com

The information in this publication is based on KEYENCE's internal research/evaluation at the time of release and is subject to change without notice. Company and product names mentioned in this catalog are either trademarks or registered trademarks of their respective companies. The specifications are expressed in metric units. The English units have been converted from the original metric units.

Copyright © 2018 KEYENCE CORPORATION. All rights reserved.

KA11-1017

TSSSensorlineup2-KA-C-US 1098-4 [611G93]