

396

Digital laser type

**DR-Q** series



# Easy to set up, finely adjustable laser

| Sensing distance: Max. 4 m

| Digital adjustment function

| Built-in ASC (Automatic Sensitivity Correction) function

Related products

Low cost type

**Z3R-Q**  
● P.404



## Selection table

Type	Shape	Sensing distance	Model (Models in parentheses are connector types)	
			NPN type	PNP type
Laser type		0 to 1.5 m	<b>DR-Q150TN</b> (DR-Q150TCN)	<b>DR-Q150TP</b> (DR-Q150TCP)
		1 to 4 m	<b>DR-Q400TN</b> (DR-Q400TCN)	<b>DR-Q400TP</b> (DR-Q400TCP)

● For the connector type, please purchase an optional JCN series connector cable.

## Options/Accessories

### Reflector

Standard (included)



**P250F**

Sensing distance (refer to the table to the right)  
61 × 51 mm

Small (optional)



**PL20F**

Sensing distance (refer to the table to the right)  
60 × 20 mm

Ultra-small (optional)



**PL10F**

Sensing distance (refer to the table to the right)  
32 × 20 mm

Sensing distance when each reflector is used

	P250F	PL20F	PL10F
DR-Q400	1 to 4 m	1 to 2.8 m	0.5 to 1 m
DR-Q150	0 to 1.5 m	0 to 1 m	0 to 0.5 m

### Connector cables

Straight



**JCN-S**

Cable length: 2 m

**JCN-5S**

Cable length: 5 m

**JCN-10S**

Cable length: 10 m

L-shaped



**JCN-L**

Cable length: 2 m

**JCN-5L**

Cable length: 5 m

**JCN-10L**

Cable length: 10 m

### Detection of plastic bottles



### Detection of glass bottles



### Detection of plastic bottles in large machines



Photoelectric Sensors

Specialized Photoelectric Sensors

Laser Displacement Sensors

Transparent Object Sensors

DR-Q

Z3R-Q, ZR-QX

KR-Q, SR-Q

**Sensing distance: Max. 4 m**

Achieves long range transparent object detection

A sensing distance of 4 m, the longest class in transparent object sensors, has been realized. Additionally, by employing a red laser (Class 2) for the light source as well as a coaxial reflection structure, high-accuracy position detection is possible.

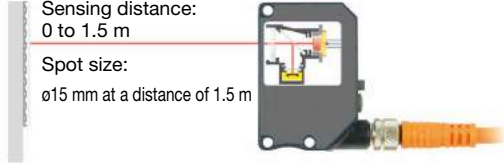
**DR-Q400T**

Sensing distance: 1 to 4 m  
Spot size:  
ø20 mm at a distance of 3.5 m



**DR-Q150T**

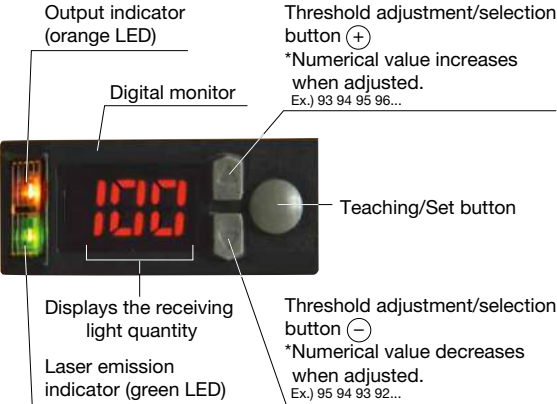
Sensing distance: 0 to 1.5 m  
Spot size:  
ø15 mm at a distance of 1.5 m



**Digital adjustment function**

Adjustment while watching values possible

Simple settings and fine adjustments are possible. Thanks to the teaching method, setting is possible by simply pressing a button. There are also buttons for fine adjustments, making it possible to configure sensitivity settings to the desired level while viewing the digital display.



**High utility**

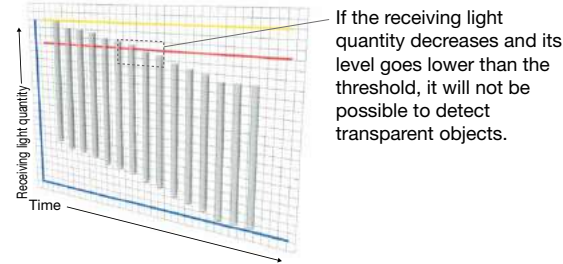
Convenient functions tailored to fit the application

- External teaching is possible
- Built-in ON / OFF / One-shot delay functions
- Enables detection of transparent containers filled with transparent liquid causing a lens effect

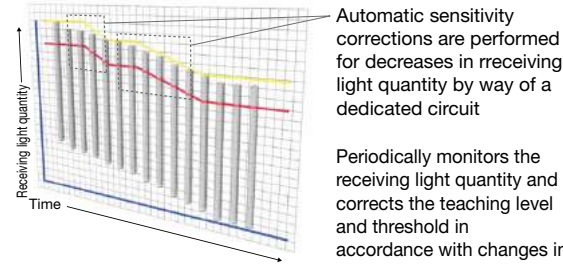
**Built-in ASC (Automatic Sensitivity Correction) function**  
**Contamination resistant**

The ASC function automatically corrects threshold values to reduce the amount of light generated when dust, water, vapor, etc., on site adheres to the reflector or lens, thereby maintaining optimum sensitivity over long periods of time. (The diagram below shows a decrease in the amount of light received due to dust and steam in the atmosphere)

<Conventional models>



<DR-Q>



— Teaching level by way of reflector — Receiving light quantity  
— Threshold (borderline of ON/OFF)



Photoelectric  
SensorsSpecialized  
Photoelectric  
SensorsLaser  
Displacement  
SensorsTransparent  
Object Sensors

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## Specifications

Type		Sensor head for amplifier separate type		
Model	NPN	Cable type	<b>DR-Q150TN</b>	<b>DR-Q400TN</b>
		Connector type	<b>DR-Q150TCN</b>	<b>DR-Q400TCN</b>
	PNP	Cable type	<b>DR-Q150TP</b>	<b>DR-Q400TP</b>
		Connector type	<b>DR-Q150TCP</b>	<b>DR-Q400TCP</b>
Sensing distance		0 to 1.5 m <sup>*1</sup>	1 to 4 m <sup>*1</sup>	
Light source		Red semiconductor laser Class 2 (IEC/JIS) <sup>2</sup> Wavelength: 650 nm Pulse width: 4 μs Maximum output: 2 mW		
Spot size		Approx. ø15 mm at a distance of 1.5 m	Approx. ø20 mm at a distance of 3.5 m	
Response time		Can be switched to 0.35 ms, 0.7 ms, 2 ms, or 5 ms		
Distance adjustment		Teaching method		
Threshold adjustment		Manual adjustment is possible after teaching		
Indicators		Output indicator (orange LED), laser emission indicator (green LED)		
Digital display		7-segment, 3-digit display		
Control output		NPN/PNP open collector Max. 100 mA / 30 VDC		
External input		Laser OFF input or teaching input (selectable by setting)		
Timer function		ON delay / OFF delay / One-shot 0 to 999 ms (setting is possible in 1 ms increments), 1 to 10 s (setting is possible in 1 s increments)		
Output mode		Light ON / Dark ON selectable by setting		
Connection type		Cable type: Cable length: 2 m (ø4 mm) / Connector type: M8, 4-pin		
Insulation resistance		20 MΩ or more (with 500 VDC)		
Rating	Supply voltage	10 to 30 VDC, including 10% ripple (p-p)		
	Current consumption	35 mA or less		
Applicable regulations		EMC directive (2004/108/EC) / FDA regulations (21 CFR 1040.10)		
Applicable standards		EN 60947-5-2		
Company standards		Noise resistance: Feilen Level 3 cleared		
Environmental resistance	Ambient temperature/humidity	-10 to +40°C / 35 to 85% RH (no freezing or condensation)		
	Ambient illuminance	Sunlight: 10,000 lx or less Incandescent light: 3,000 lx or less		
	Vibration resistance	10 to 55 Hz; double amplitude 1.5 mm; 2 hours in each of the X, Y, and Z directions		
	Shock resistance	Approx. 50 G (500 m/s <sup>2</sup> ), 3 times in each of the X, Y, and Z directions		
Degree of protection		IP67		
Material		Housing: ABS Lens front cover: PMMA		
Weight without cable		Approx. 20 g (excluding cable)		
Included accessories		Mounting bracket: BEF-WK-190 Reflector: P250F		

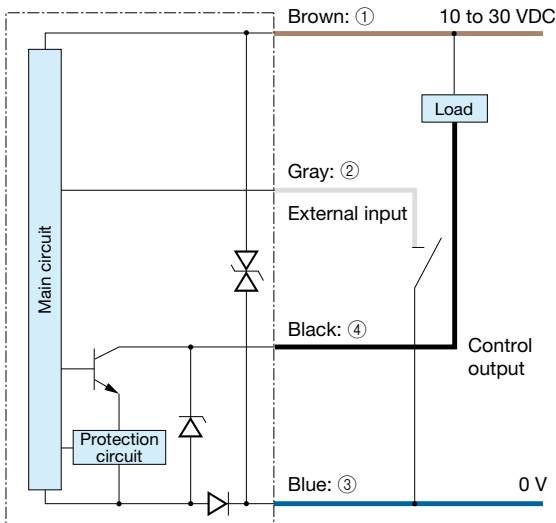
\*1. With the P250F reflector

\*2. Classified as Class II in the US FDA standards.

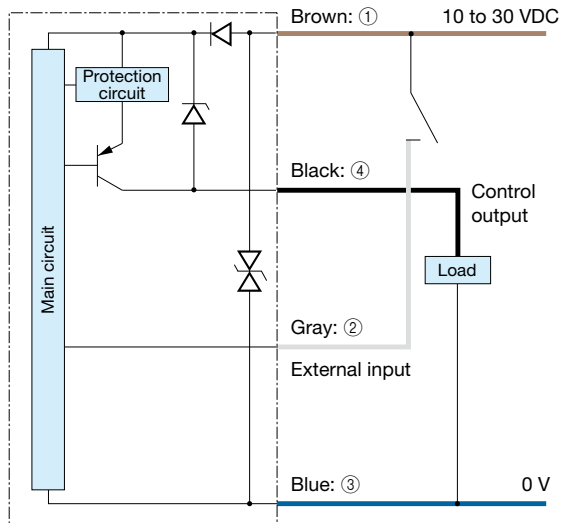
● Specifications are subject to change without prior notice for product improvement purposes.

## I/O circuit diagram

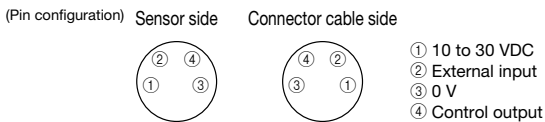
### NPN output type



### PNP output type



### Connector type

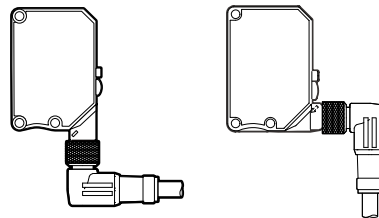


### Connecting

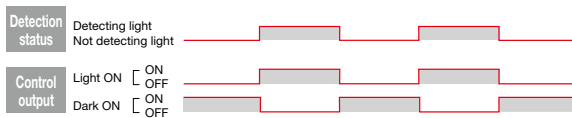
- When not used for external input, cut the lead wire and wrap it individually with insulating tape, and do not connect it to any other terminal.
- ① to ④ are connector pin No.

### Notes

- When using a switching regulator for the power supply, be sure to ground the frame ground terminal.
- Because wiring sensor wires with high-voltage wires or power supply wires can result in malfunctions due to noise, which can cause damage, make sure to wire separately.
- Avoid using the transient state while the power is on (approx. 100 ms).
- The connector direction is fixed as in the drawing below when you use L-shaped connector cable. Be aware that rotation is not possible.



## Operation mode



\*The operation mode is the same for NPN output and PNP output.

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Specialized Photoelectric Sensors

Digital laser type DR-Q series

Dimensions

Sensor  
 ■ Cable type

(Unit: mm)

Photoelectric Sensors

Specialized Photoelectric Sensors

Laser Displacement Sensors

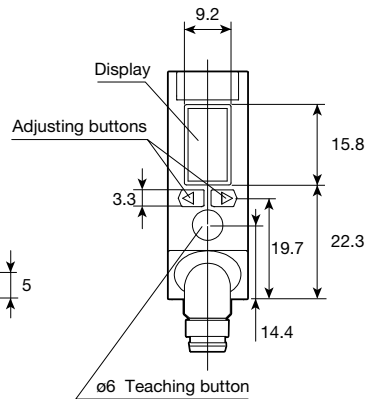
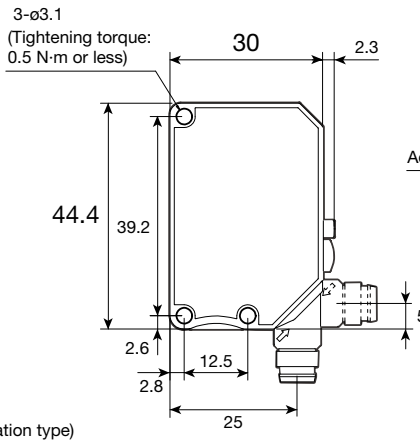
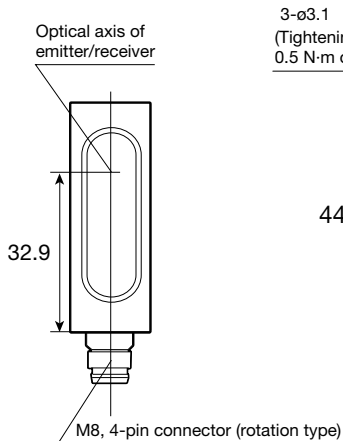
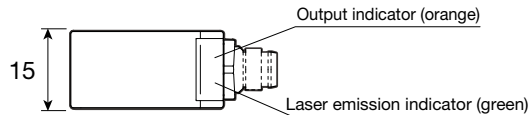
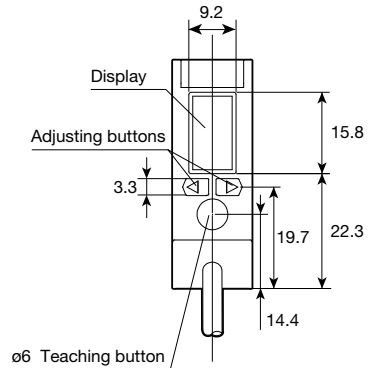
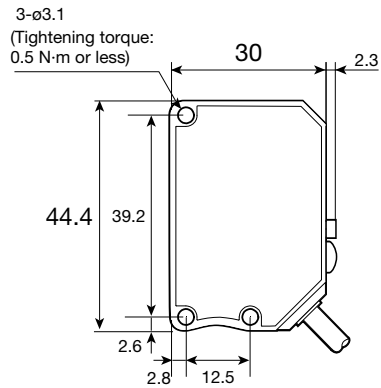
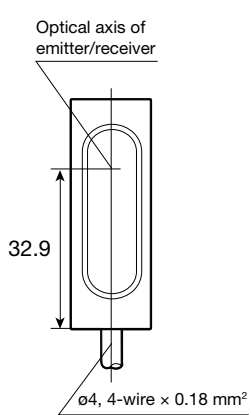
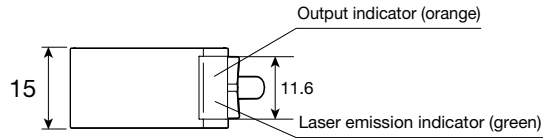
Transparent Object Sensors

DR-Q

Z3R-Q, ZR-QX

KR-Q, SR-Q

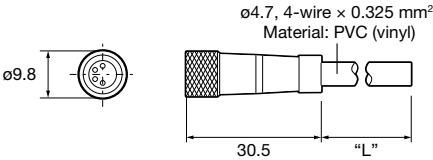
■ Connector type



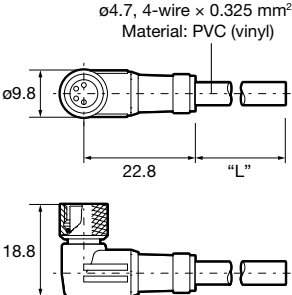
(Unit: mm)

Connector cable (optional)

■ JCN-S, JCN-5S, JCN-10S

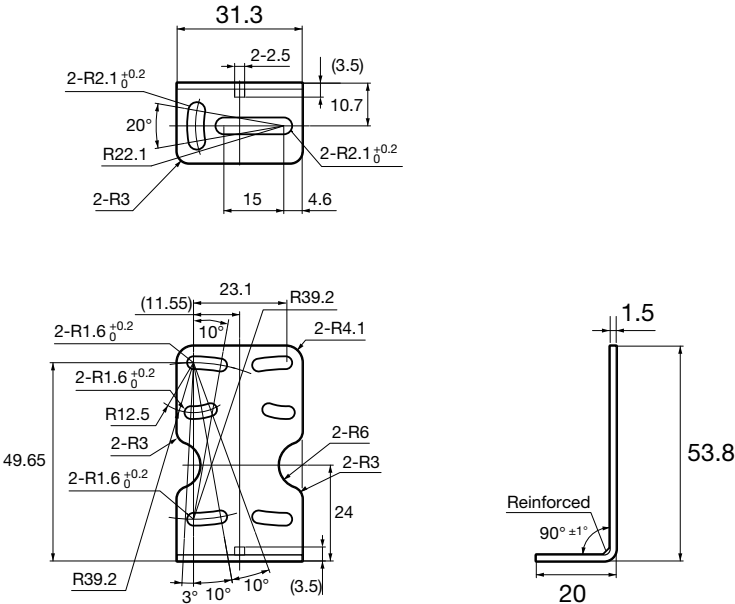


■ JCN-L, JCN-5L, JCN-10L



Mounting bracket

■ BEF-WK-190 (included)



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Digital laser type DR-Q series

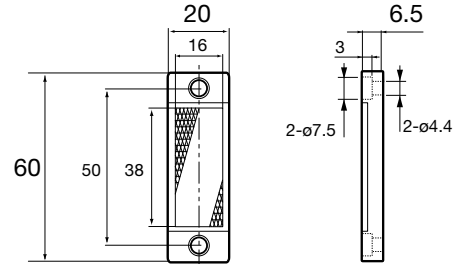
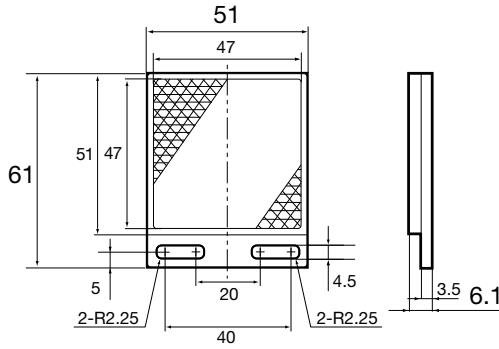
Dimensions

Reflector

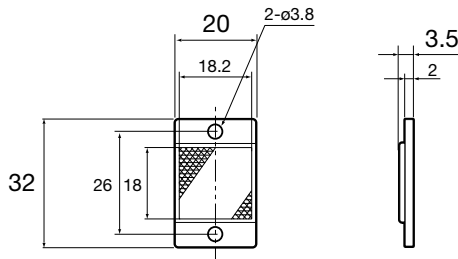
■ P250F (included)

■ PL20F (optional)

(Unit: mm)



■ PL10F (optional)



Sensing distance when each reflector is used

	P250F	PL20F	PL10F
DR-Q400	1 to 4 m	1 to 2.8 m	0.5 to 1 m
DR-Q150	0 to 1.5 m	0 to 1 m	0 to 0.5 m

Photoelectric Sensors

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Laser Displacement Sensors

Transparent Object Sensors

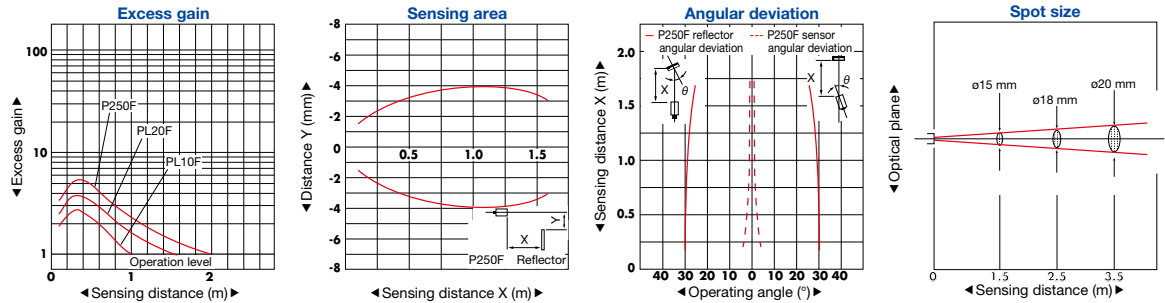
DR-Q

Z3R-Q, ZR-QX

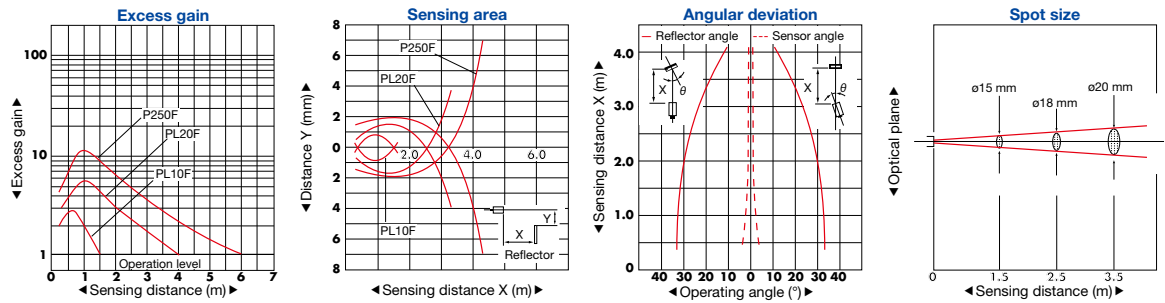
KR-Q, SR-Q

Typical characteristic data

DR-Q150T□



DR-Q400T□



Notes for sensor usage

This product emits a Class 2 (II) visible laser beam that is compliant with JIS C6802/IEC/FDA laser safety standards. Warning and explanation labels are affixed to the sides of the sensor.

**Warning** Do not look directly at the laser or intentionally shine the laser beam in another person's eyes. Doing so may cause damage to the eyes or health.

