



# The stainless protector guards against shocks.

- Features a stainless protector
- Robust structure built-in nut type
- Immune to external noise

## Related products

Transparent object detection

**KR-Q**  
 ● P.412

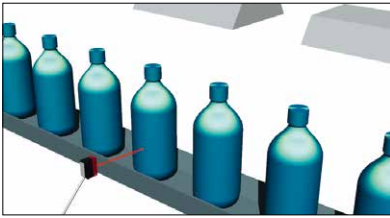

BGS type

**BGS-Z**  
 ● P.326

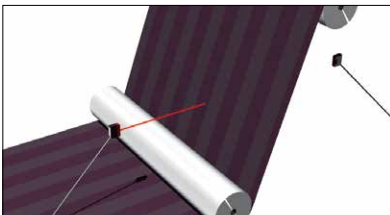

Stainless steel housing

**Z-M**  
 ● P.158

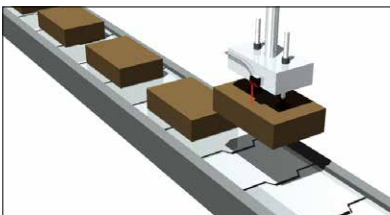

## Counting of items that pass under an inverter fluorescent lamp



## Detection of breaks in textile cloth



## Detection of robot operation abnormalities



## Selection table

Type	Shape	Sensing distance	Model (Models in parentheses are connector types)	
			NPN type	PNP type
Through-beam		7 m	<b>KT-700N</b> (KT-700CN)	<b>KT-700P</b> (KT-700CP)
Retro-reflective		0.01 to 2.5 m	<b>KR-250N</b> (KR-250CN)	<b>KR-250P</b> (KR-250CP)
Diffuse-reflective		400 mm	<b>KD-40N</b> (KD-40CN)	<b>KD-40P</b> (KD-40CP)
Limited diffuse reflective		10 to 90 mm	<b>KD-L09N</b>	<b>KD-L09P</b>
Transparent object detection		10 to 500 mm	<b>KR-Q50NW</b> (KR-Q50CNW) ● P.412	<b>KR-Q50PW</b> (KR-Q50CPW) ● P.412
		0.01 to 1.5 m	<b>KR-Q150NW</b> (KR-Q150CNW) ● P.412	<b>KR-Q150PW</b> (KR-Q150CPW) ● P.412
		0.01 to 2.5 m	<b>KR-Q300NW</b> (KR-Q300CNW) ● P.412	<b>KR-Q300PW</b> (KR-Q300CPW) ● P.412
		10 to 500 mm	<b>KR-Q50N</b> (KR-Q50CN) ● P.412	<b>KR-Q50P</b> (KR-Q50CP) ● P.412

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

**Features**

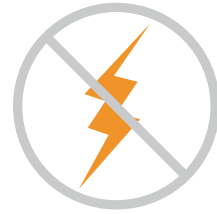
**Stainless protector which protects side of the sensor from impact**

The stainless steel protector protects sensors from being damaged or cracked by the sharp edges of workpieces or tools found in worksites.



**Equipped with a noise shield to immune to external noise**

This product has cleared each of the strict noise level standards stipulated in IEC/EN standards required for CE certification. This means that support for the CE marking conformity of exported machinery is provided in terms of safety and quality.



Rubber stopper to protect the inside from intrusion of water, oil, etc.

Wide angle indicators for easy viewing from front, side and rear

All models employ high brightness LEDs. Industry's first spot light. Contours are perfectly visible even at 400 mm.

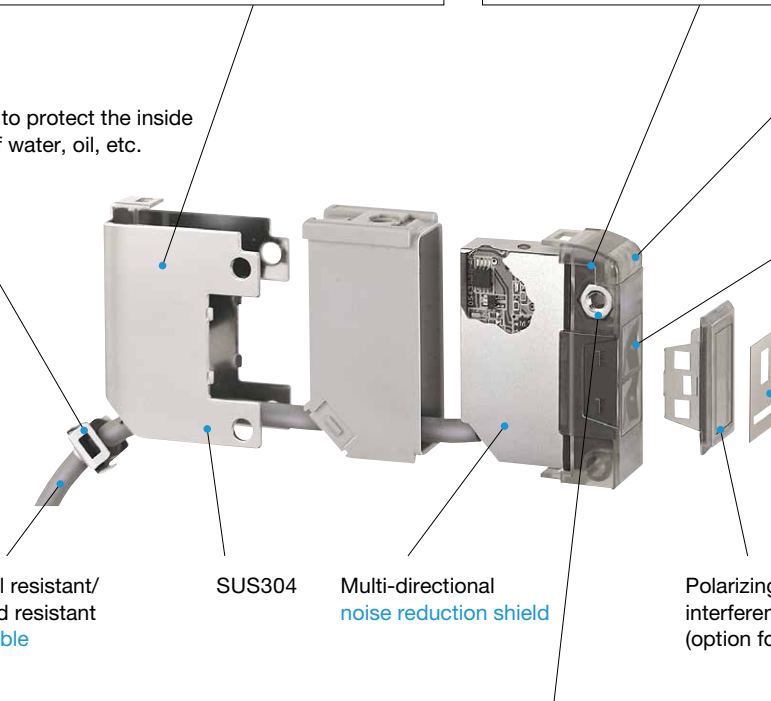
Slit mask (SK-01) for small object detection (option for KT-700□)

Water resistant/oil resistant/heat resistant/cold resistant small diameter cable

SUS304

Multi-directional noise reduction shield

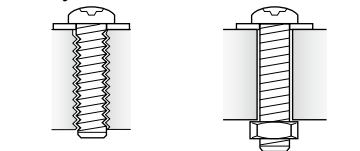
Polarizing filter (PFK-01) prevents optical interference other sensors mounted closely. (option for KT-700□)



**Mounted type with built-in nut that does not become crushed even when turned excessively.**

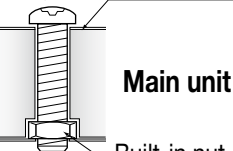
The type with built-in nut combines the best of screw cutting types and nut tightening types in that screw threads do not become crushed when tightened excessively, enabling work to be performed efficiently.

Easily crushed Poor work efficiency



Screw cutting type Nut installing type

8 kgf-cm Stainless steel



Main unit Built-in nut K series

Photoelectric Sensors

Specialized Photoelectric Sensors

Laser Displacement Sensors

Sensors with Built-in Amplifier

Z3

Z-M

Z2

E

J

**K**

S

S2

C-R

C2

PLN

## Specifications

Type		Through-beam type	Retro-reflective type	Diffuse-reflective type	Limited diffuse reflective type	
Model	NPN	Cable type	<b>KT-700N</b>	<b>KR-250N</b>	<b>KD-40N</b>	<b>KD-L09N</b>
		Connector type	<b>KT-700CN</b>	<b>KR-250CN</b>	<b>KD-40CN</b>	—
	PNP	Cable type	<b>KT-700P</b>	<b>KR-250P</b>	<b>KD-40P</b>	<b>KD-L09P</b>
		Connector type	<b>KT-700CP</b>	<b>KR-250CP</b>	<b>KD-40CP</b>	—
Sensing distance		7 m	0.01 to 2.5 m <sup>1</sup>	400 mm <sup>2</sup>	10 to 90 mm <sup>3</sup>	
Light source		Red LED				
Smallest detectable object		ø7 mm	ø40 mm	—	—	
Response time		1 ms or less	0.7 ms or less			
Hysteresis		—	—	20% or less	10% or less	
Distance adjustment		None		1-turn potentiometer		
Indicators		Light receiving indicator (red LED)				
Control output		NPN/PNP type Open collector Max. 100 mA/30 VDC				
Test input		Equipped	None			
Output mode		Light ON / Dark ON Switched by wiring				
Connection type		Cable type: Cable length: 2 m ø3.8 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		30 mA or less		
Applicable regulations		EMC directive (2004/108/EC)				
Applicable standards		EN 60947-5-2				
Company standards		Noise resistance: Feilen Level 4 cleared				
Environmental resistance	Ambient temperature/humidity	-25 to +55°C (no freezing) / 35 to 85% RH (no condensation)				
	Ambient illuminance	Sunlight: 20,000 lx Incandescent lamp: 4,000 lx				
	Vibration resistance	Endurance: 10 to 55 Hz; double amplitude 1.5 mm; 2 hours in each of the X, Y, and Z directions				
	Shock resistance	Approx. 100 G (1000 m/s <sup>2</sup> ); 3 times in each of the X, Y, and Z directions				
	Degree of protection	IEC standard, IP67				
Material		Metal cover: SUS304 Housing: ABS Lens: Polycarbonate (part of the retro-reflective type is PMMA)				
Weight without cable		Through-beam type emitter: Approx. 20g Other: Approx. 25 g				
Included accessories		Mounting bracket: BEF-W170	Mounting bracket: BEF-W170 Reflector: V-61	Mounting bracket: BEF-W170		

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

\*1. With V-61 reflector, \*2. With 200 mm × 200 mm white paper, \*3. With 100 mm × 100 mm white paper

## Options/Accessories

### Reflector

#### Standard (included)

##### V-61

Standard reflector  
H × W: 60.9 × 50.9 mm  
(included with retro-reflective type)



#### Small type

##### V-42

Small reflector  
Sensing distance 1.5 m  
H × W: 42 × 35 mm



#### Vertical type

##### P45A

Sensing distance: 850 mm  
54 × 12.4 mm



### Reflective sheet

#### Diamond grade sheet

Sensing distance: 50 to 1000 mm  
100 × 100 mm (adhesive type)



### Protective mounting bracket

#### LK series

##### LK-S01



##### LK-S02



- Ultra-durable 2 mm thick type
- Rust-resistant stainless steel
- Sensor is firmly secured using M3 Hex socket head cap screws
- The bracket is also firmly secured using M6 screw

### Connector cables

#### Straight

##### JCN-5

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



### Slit mask

#### SK-01

For KT-700□  
(Slit width 1 mm)

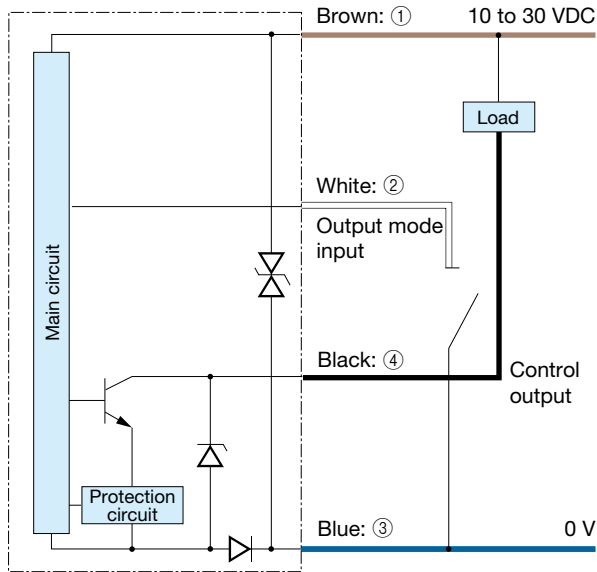
### Anti-interference filter

#### PFK-01

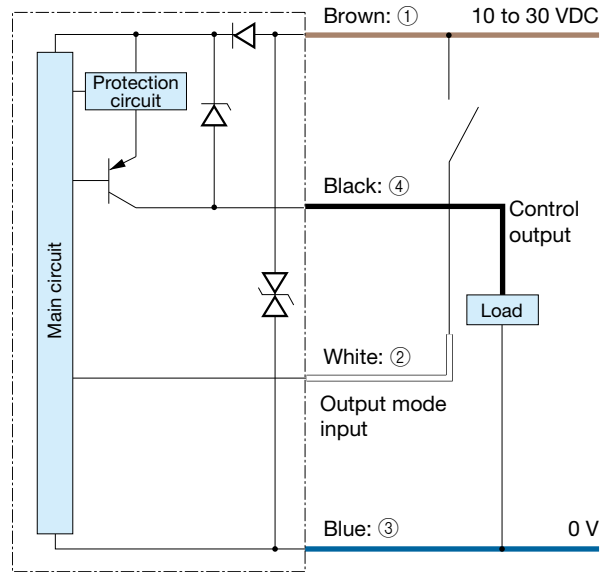
Max. sensing distance: 3 m  
For KT-700□

## I/O circuit diagram

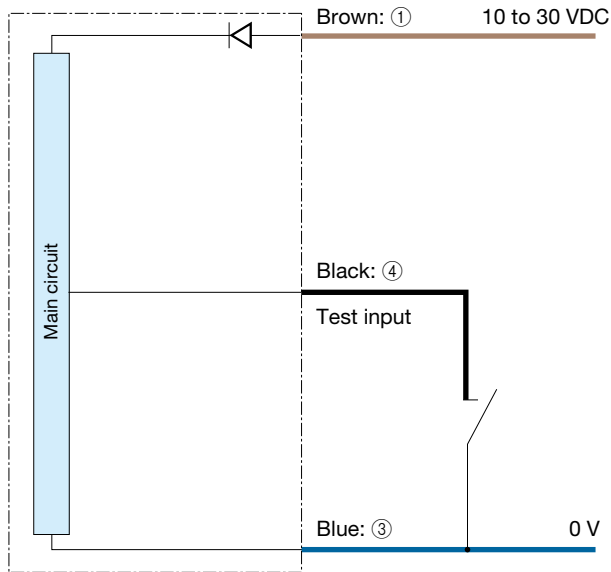
### NPN output type



### PNP output type

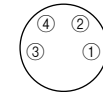


### Through-beam type emitter



### Connector type

(Pin configuration) Sensor side Connector cable side



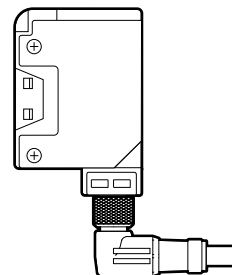
- ① 10 to 30 VDC
- ② Not connected/  
+V: Light ON (NPN)  
0 V: Dark ON
- ③ 0 V
- ④ Control output

### Connecting

- Turns to Light ON mode when the white wire is connected to +V and to Dark ON mode when connected to 0 V.
- When Test input is not used, connect the lead wire to 10 to 30 VDC or disconnect it while taking care to prevent its contact with other terminals. (equipped to through-beam type)
- 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 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 set as in the diagram below when using the L-shaped connector cable. Be aware that rotation is not possible.

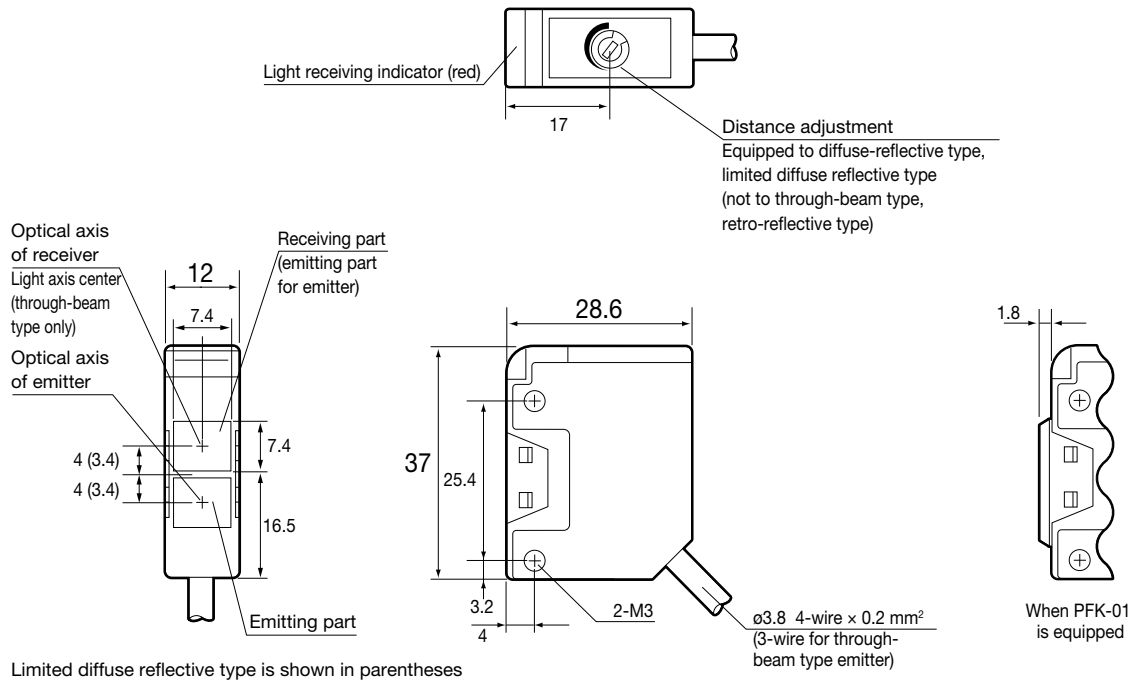


**Dimensions**

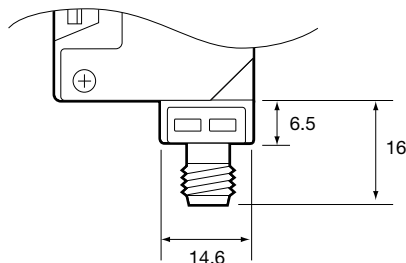
**Sensor**

(Unit: mm)

■ Cable type

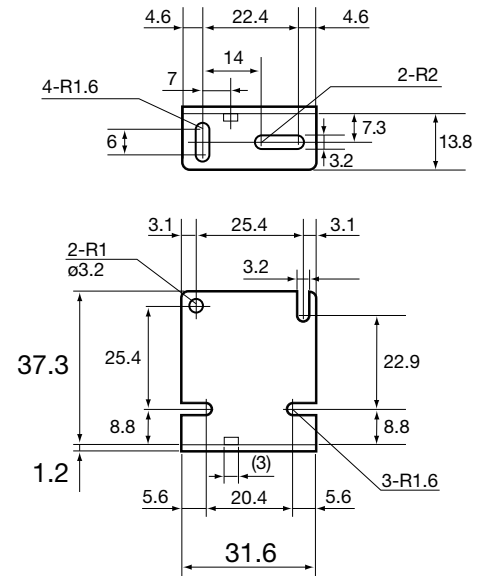


■ Connector type



**Mounting bracket (included)**

■ BEF-W170



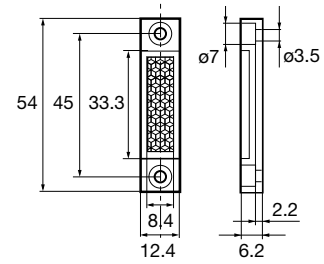
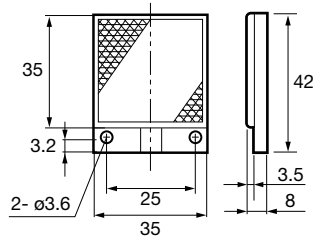
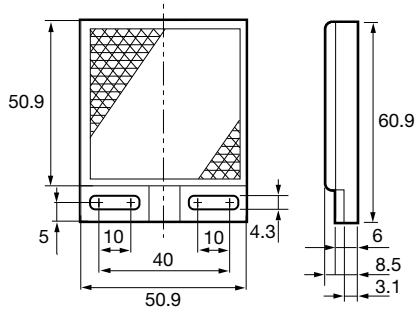
Reflector

(Unit:mm)

■ V-61: Standard type reflector (included)

■ V-42: Small reflector (optional)

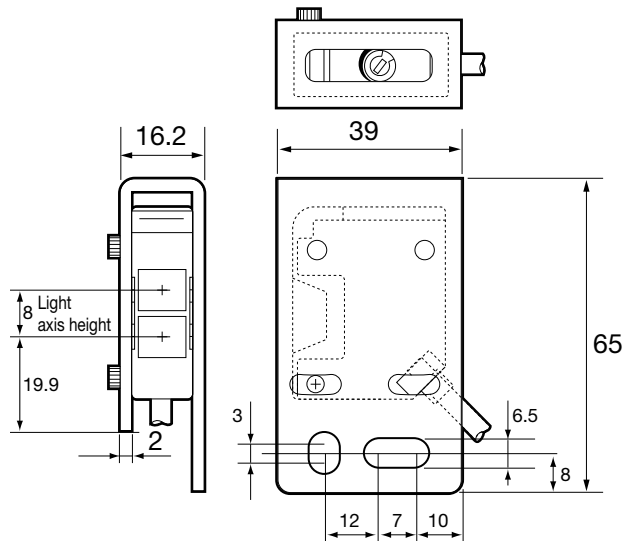
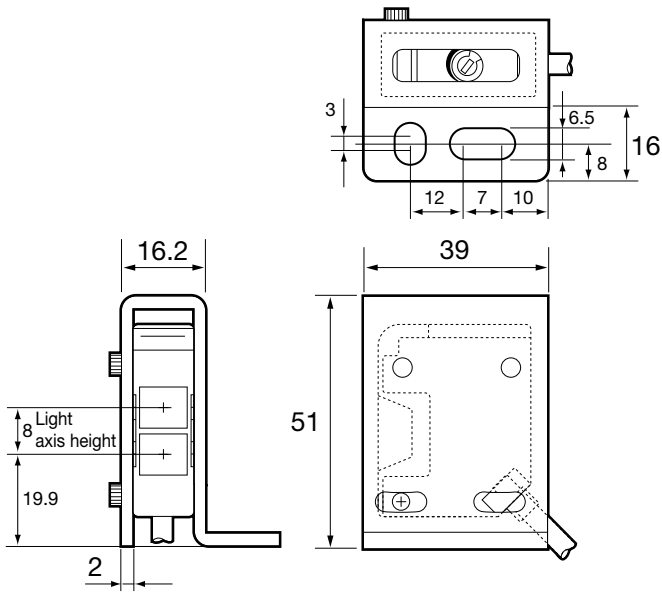
■ P45A: Vertical type reflector (optional)



Protective mounting bracket

■ LK-S01

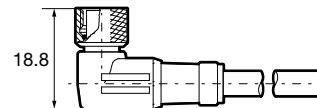
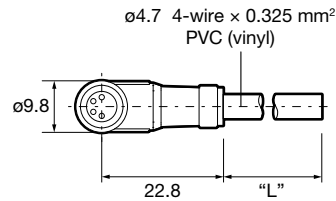
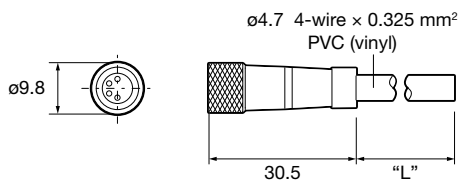
■ LK-S02



Connector cable (optional)

■ JCN-S, JCN-5S, JCN-10S

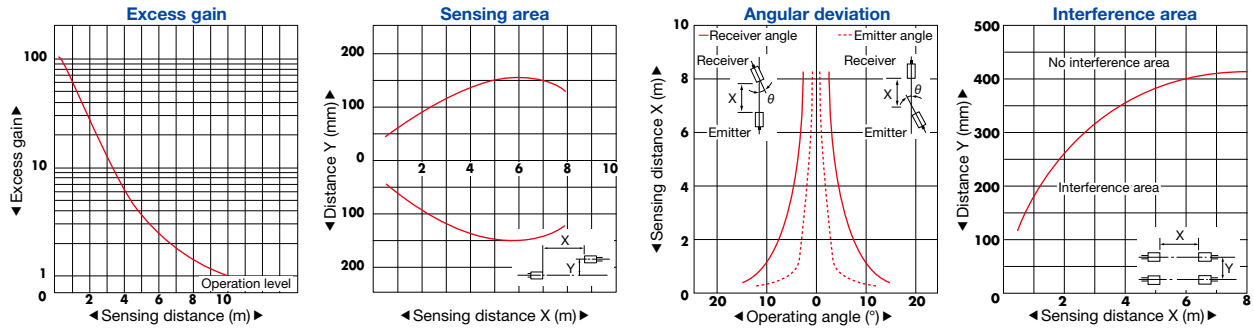
■ JCN-L, JCN-5L, JCN-10L



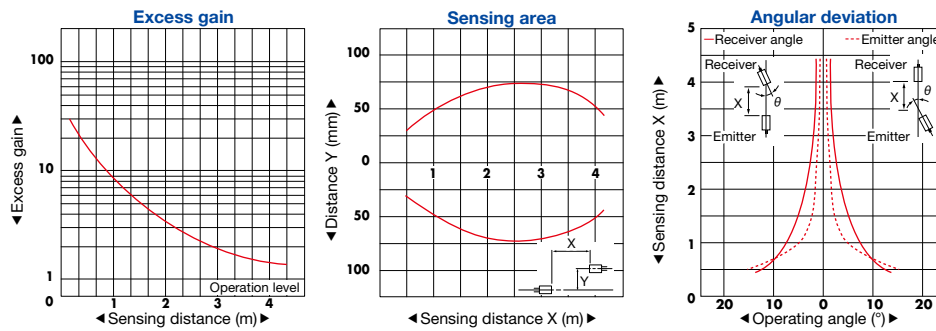
Typical characteristic data

\*Contact us for any other characteristic data that may be required.

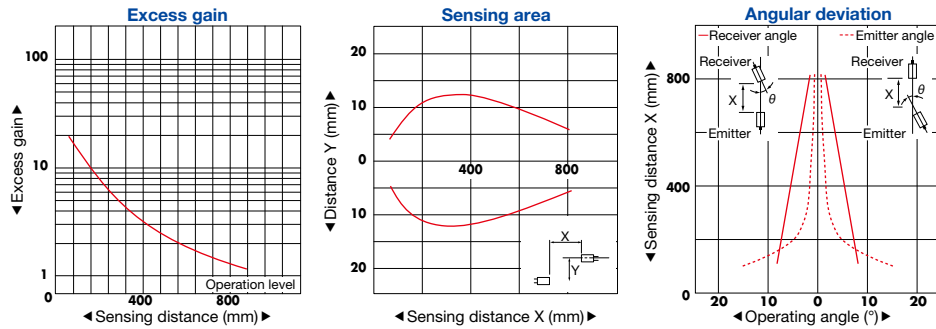
KT-700□



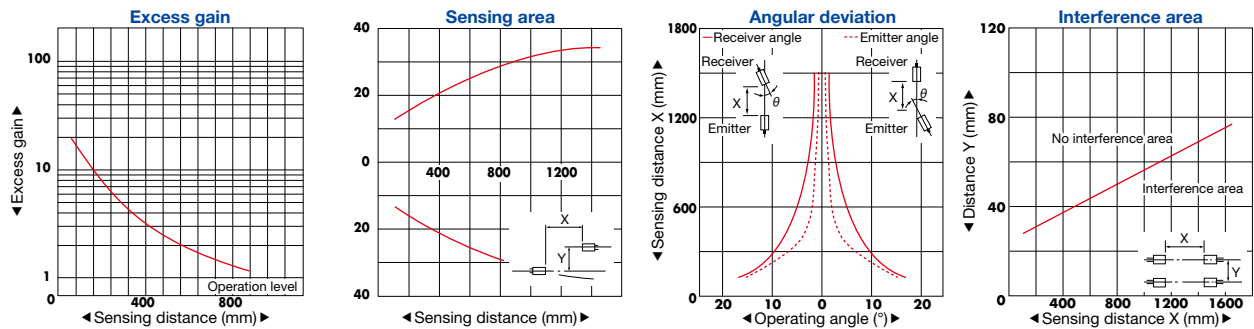
When anti-interference filter is attached KT-700□



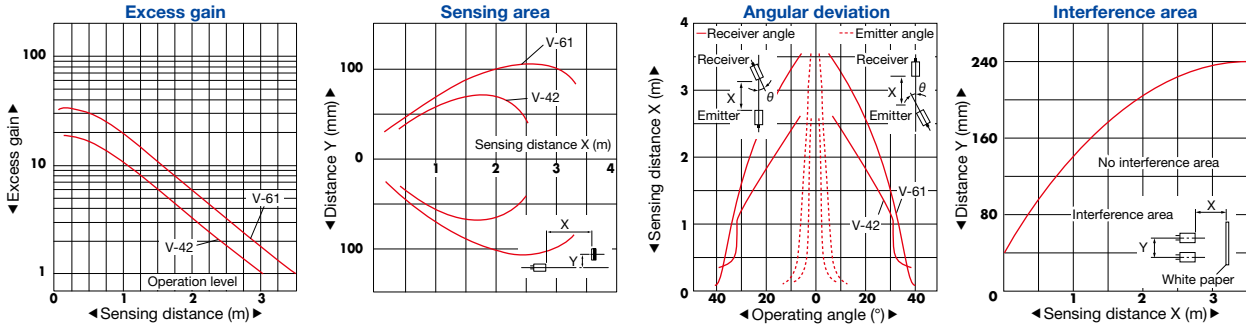
When anti-interference filter and 1 mm slit mask are attached KT-700□



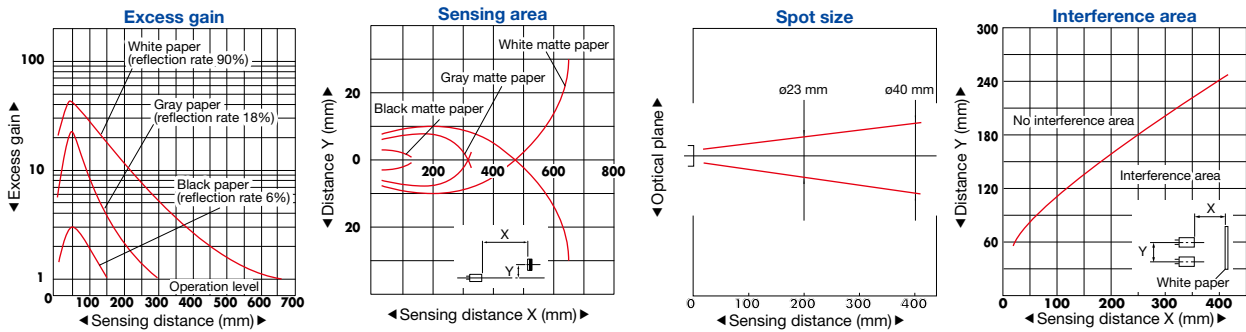
When 1 mm slit mask is attached KT-700□



**KR-250**



**KD-40**



**KD-L09**

