

# Photoelectric Sensors

Optex FA is now the second largest supplier of photoelectric sensors in Japan.

Optex provides an extensive selection of sensors to solve most applications.

All sensors are available in Cabled or M8 QD versions and are offered with a choice of NPN or PNP outputs.

C series	15
E series	18
J series	24
J2 series	29
J3 series	32
V series	36
V2 series	39
V3 / V4 series	43
SR-Q series	46
S series	50
Z / BGS-Z series	54
K series	63
FGS-D / BGS-D series	68
BGS-2S series	72
Y series	75
DM-18T series	79
Accessory	85

# Photoelectric Sensor C series

M12 QD type



Cable type

### Thru-beam type

(Sensing distance : 15m)  
· CTD-1500N / P / CN / CP

### Retro-reflective type

(Sensing distance : 0.05 - 3m)  
· CRD-300N / P / CN / CP

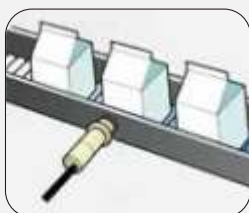
### Retro-reflective type with built-in polarizing filter

(Sensing distance : 0.05 - 1m)  
· CTDF-100N / P / CN / CP

## Applications



Positioning of wooden plate



Counting food packages

- Epoxy filled housing ensures resistance to vibration.
- M12 QD types are available.
- Rigid Nickel Plated Brass housing.

## Features

Nickel plated brass body, resistant to vibration and damage from chemicals.

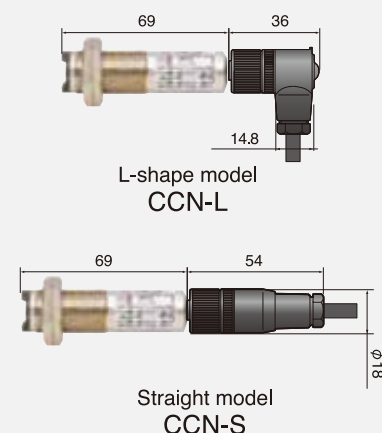
Superior in performance to sensors with plastic bodies in terms of durability and resistance to chemicals, oils and mechanical vibration.

CRDF retro-reflection type with built-in polarizing filter.

The beam can be turned 90 degrees by using the optional side view attachments.



Optional Straight and 90 degree connectors



C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

Y

DM-18T

Accessory

**Diffuse reflective type**

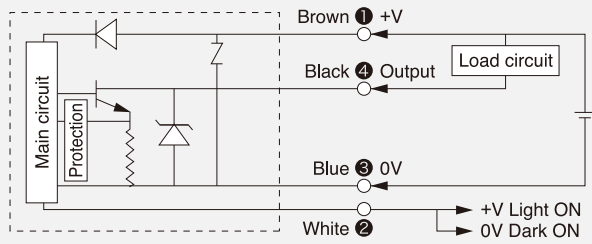
(Sensing distance : 11m)  
· CDD-11N / P / CN / CP

**Diffuse reflective type  
long distance type**

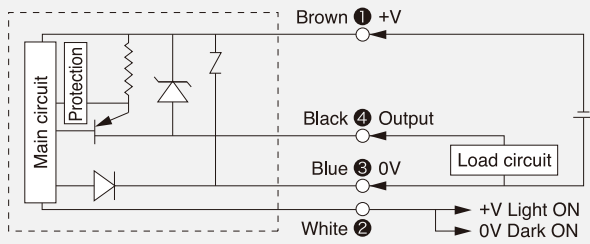
(Sensing distance : 40cm)  
· CDD-40N / P / CN / CP

**Circuit diagram**

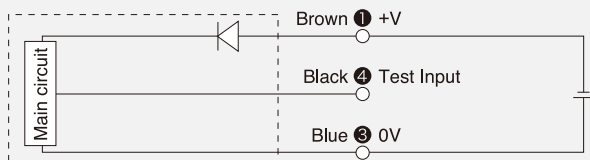
**NPN output**



**PNP output**

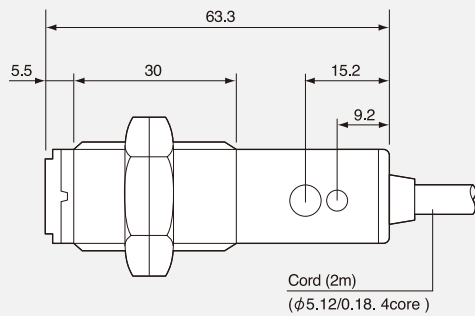


**Emitter**

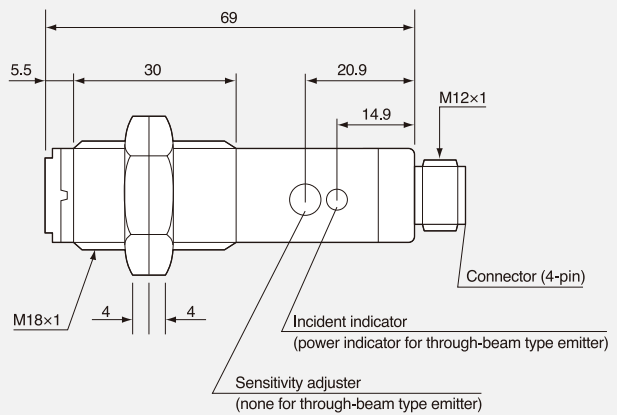


**Dimensions**

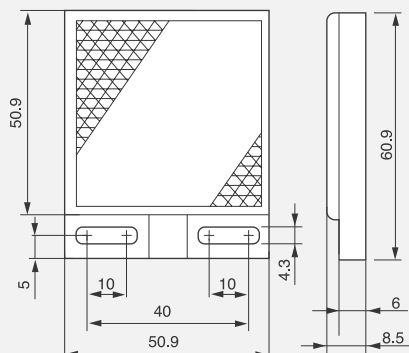
**Cable type**



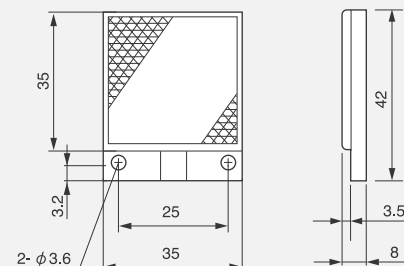
**M12 QD type**



**Standard reflector V-61**



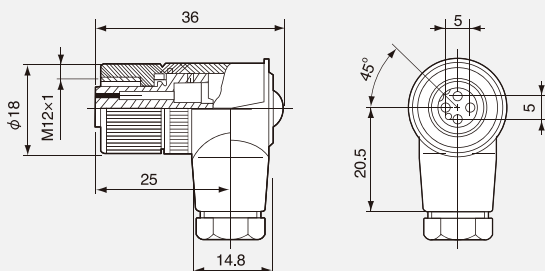
**Small reflector V-42**



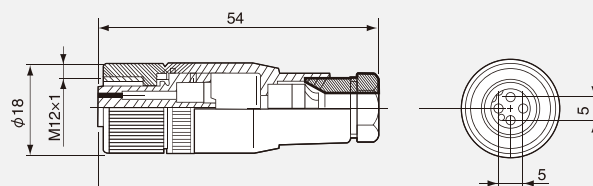
(Unit : mm)

C
E
J
J2
J3
V
V2
V3
V4
SR-Q
S
Z
BGS-Z
K
FGS-D
BGS-D
BGS-2S
Y
DM-18T
Accessory

90 degree QD connector CCN-L



Standard QD connector CCN-S



(Unit : mm)

## Specifications

Model	Thru-beam	Retro-reflective	Retro-reflective w Polarizing filler	Diffuse reflective 11cm	Diffuse reflective 40cm
<b>Cable type</b>	<b>NPN</b> CTD-1500N	CRD-300N	CRDF-100N	CDD-11N	CDD-40N
	<b>PNP</b> CTD-1500P	CRD-300P	CRDF-100P	CDD-11P	CDD-40P
<b>Connector type</b>	<b>NPN</b> CTD-1500CN	CRD-300CN	CRDF-100CN	CDD-11CN	CDD-40CN
	<b>PNP</b> CTD-1500CP	CRD-300CP	CRDF-100CP	CDD-11CP	CDD-40CP
<b>Sensing distance</b>	15m	3m	1m	11cm	40cm
<b>Response time</b>	1.5msec Max				
<b>Operating mode</b>	Light ON / Dark ON selectable				
<b>Hysteresis</b>	NIL			10% Max	
<b>Light source</b>	Infrared		Red	Infrared	
<b>Control output</b>	NPN or PNP Open collector, 100mA Max / 30V DC				
<b>Supply voltage</b>	DC 10 to 30V including 10% of ripple				
<b>Conformity</b>	JIS / C4525, CE, UL				
<b>Power consumption</b>	40mA Max	30mA Max			
<b>Operating temp / humidity</b>	-25 up to 55 °C / 35 up to 95% RH				
<b>Sensitivity adjustment</b>	Single turn potentiometer				
<b>Protection category</b>	IEC 144 IP66				
<b>Shock resistance</b>	50G (500m/S <sup>2</sup> ), X-Y-Z axis 3 times				
<b>Material</b>	Case : BSBM+Ni, Lens : PC				
<b>Reflector</b>	-	V-61	-	-	-

## Options

Standard reflector V-61



Small reflector V-42



CCN-L  
90 degree QD connector



CCN-S  
Standard QD connector



# Photoelectric Sensor E series



## Super side-sense type

### ET-S series Thru-beam type

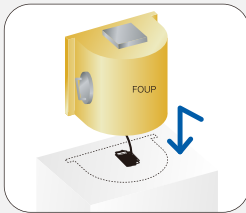
(Sensing distance : 500mm)  
· ET-S500NL,3,4 / ND,3,4  
· ET-S500PL,3,4 / PD,3,4

### ED-S series Diffuse Reflective type

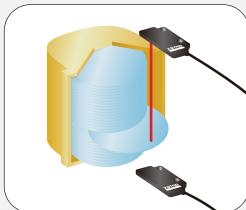
(Sensing distance : 30mm)  
· ED-S30NL,3,4 / ND,3,4  
· ED-S30PL,3,4 / PD,3,4

Next page →

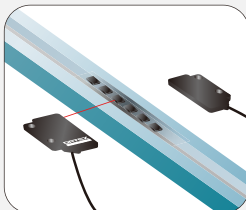
## Applications



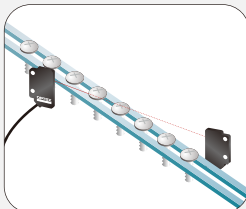
Detecting presence of FOUF



Detection of wafer extending from cassette



Detecting parts presence from parts feeder



Detecting screws at output of feeder

- **Super Side-sense Type projects the beam from the 5mm(0.19 inch) of wide edge of the sensor.**
- **M8 pig-tail connector types are available for all models.**
- **Tough mechanics. 100G Shock Resistance and IP67 Water tightness.**
- **Easily visible indicator LED can be seen even from the back.**

## Features

2 type select

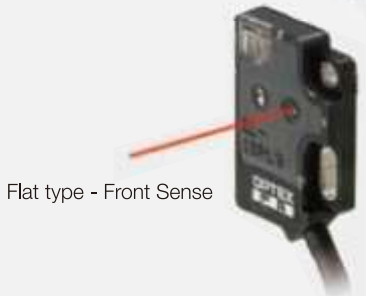
M8 pig-Tail connector for easy maintenance.



Super Side-Sense type



M8 Pig-Tail



Flat type - Front Sense

IP67 rating  
RoHS compliant



## Operating LED visible in the back

It's convenient. Verifying the operation of the sensor is easy.

Front view



Back view



## Universal mounting holes.

Flexible mounting for easy installation.



## 3.5mm thin dimensions (Flat type)

Leading edge of sensing functions are designed in this thin size. Ideal for space saving.  
(Side sense type : 5mm)



C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

Y

DM-18T

Accessory

**EL-S series**  
**Convergent type**  
(Sensing distance : 15mm)  
· EL-S15NL,3,4 / ND,3,4  
· EL-S15PL,3,4 / PD,3,4

**Flat type**  
**ET series**  
**Thru-beam type**  
(Sensing distance : 500mm)  
· ET-500NL,3,4 / ND,3,4  
· ET-500PL,3,4 / PD,3,4

**ED series**  
**Diffuse Reflective type**  
(Sensing distance : 100mm)  
· ED-100NL,3,4 / ND,3,4  
· ED-100PL,3,4 / PD,3,4

**EL series**  
**Convergent type**  
(Sensing distance : 5 - 30mm)  
· EL-30NL,3,4 / ND,3,4  
· EL-30PL,3,4 / PD,3,4

## Super Side-Sense type



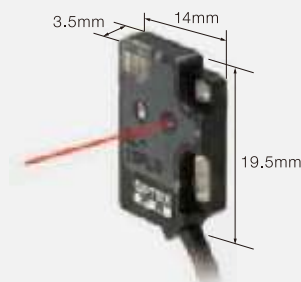
Unique Side-Sensing Type available in Duffuse, Convergent and Thru-Beam. M8 Pigtail models in both 3 and 4 pin types.

**EL-S series**  
**Convergent Type**  
15mm (0.6 inch) sensing distance.  
Light-On/Dark-On models available.  
+/-0.1 mm (0.004 inch) repeat accuracy.  
2mm (0.07 inch) project spot diameter at 15mm distance.  
0.5 msec. response speed.

**ED-S series**  
**Diffuse Reflective Type**  
30mm sensing distance.  
Light-On/Dark-On models available.  
+/-0.05mm (0.002 inch) repeat accuracy.  
30mm sensing distance with 10% Hysteresis.

**ET-S series**  
**Thru-Beam Type**  
500mm (19.7 inch) sensing distance.  
Light-On/Dark-On models available.  
+/-0.1mm (0.004 inch) repeat accuracy.  
0.25 msec. response speed.

## Flat type - Front Sense



Thin and flat design for space saving. Three different models of Convergent models.

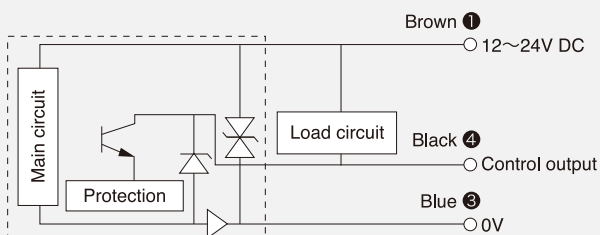
**EL - series**  
**Convergent Type**  
3 different sensing distance are available.  
30mm (1.18 inch), 15mm (0.6 inch), and 8mm (0.31 inch) for close installation.  
Compact housing is ideal for space saving.

**ED - series**  
**Diffuse Reflective Type**  
Standard diffuse reflective type with 100mm (3.94 inch) sensing distance.

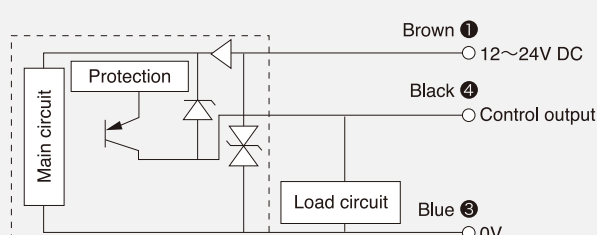
**ET - series**  
**Thru-Beam Type**  
0.5msec response speed and sharp optical system designed in 12 x 20 x 3.5 mm dimensions.

## Circuit diagram

### NPN output



### PNP output

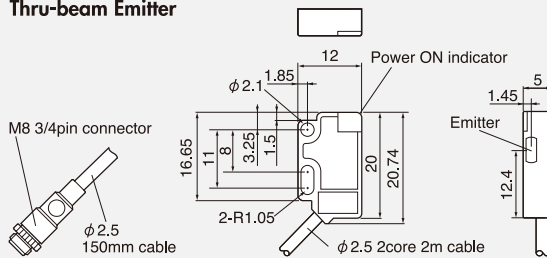


- (Sensing distance : 2 - 15mm) (Sensing distance : 3 - 8mm)  
 · EL-15NL,3,4 / ND,3,4 · EL-08NL,3,4 / ND,3,4  
 · EL-15PL,3,4 / PD,3,4 · EL-08PL,3,4 / PD,3,4

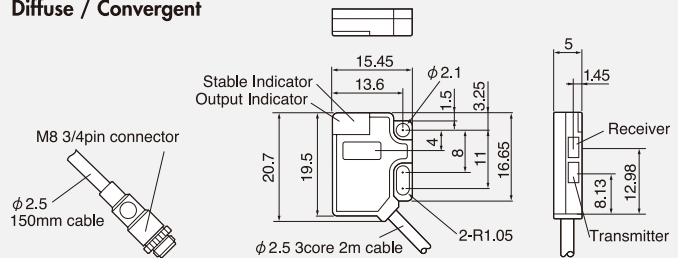
## Dimensions

### Super side - Sensing type

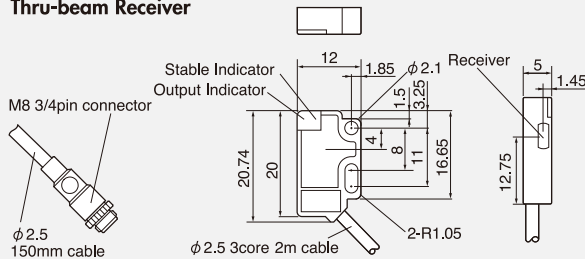
#### Thru-beam Emitter



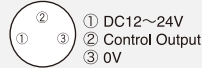
#### Diffuse / Convergent



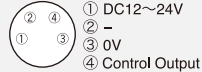
#### Thru-beam Receiver



#### <3 Pin configuration>

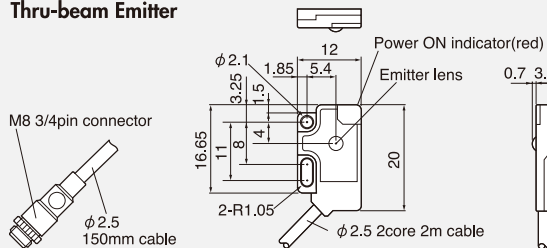


#### <4 Pin configuration>

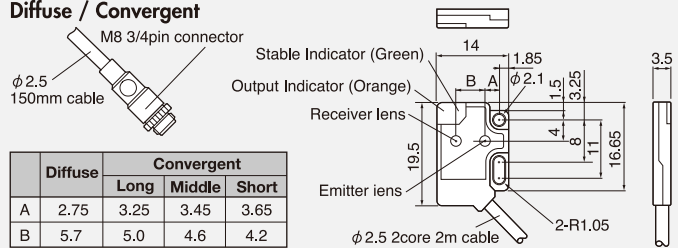


### Flat type - Front Sensing

#### Thru-beam Emitter

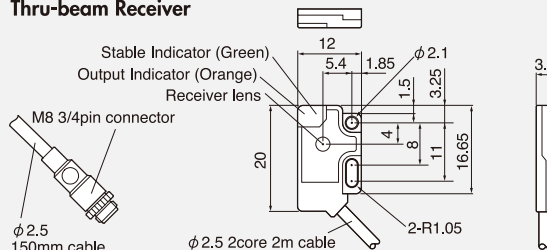


#### Diffuse / Convergent

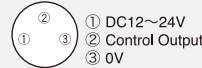


	Diffuse	Convergent		
		Long	Middle	Short
A	2.75	3.25	3.45	3.65
B	5.7	5.0	4.6	4.2

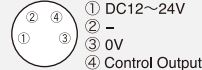
#### Thru-beam Receiver



#### <3 Pin configuration>



#### <4 Pin configuration>



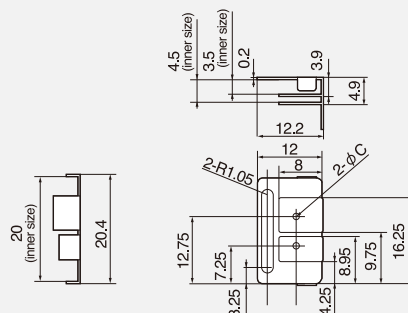
## Options

### Slit mask

- BL-W2F-1 (= φ 1mm)  
 BL-W2F-1.5 (= φ 1.5mm)

	BL-W2F-1	BL-W2F-1.5
C	1	1.5
D	1	1.5

Material: SUS304 t=0.2



(Unit : mm)

C

J

J

V

V

V

V

SR

BG

FG

BG

BGS

Y

DM

Acce



## Specifications

### Super Side - Sensing type

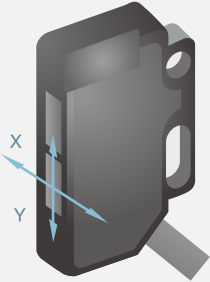
Model			Diffuse 30mm	Convergent 15mm		Thru-beam 500mm
NPN type	Light ON	2m cable	ED-S30NL	EL-S15NL		ET-S500NL
		M8 pigtail - 3pin	ED-S30NL3	EL-S15NL3		ET-S500NL3
		M8 pigtail - 4pin	ED-S30NL4	EL-S15NL4		ET-S500NL4
	Dark ON	2m cable	ED-S30ND	EL-S15ND		ET-S500ND
		M8 pigtail - 3pin	ED-S30ND3	EL-S15ND3		ET-S500ND3
		M8 pigtail - 4pin	ED-S30ND4	EL-S15ND4		ET-S500ND4
PNP type	Light ON	2m cable	ED-S30PL	EL-S15PL		ET-S500PL
		M8 pigtail - 3pin	ED-S30PL3	EL-S15PL3		ET-S500PL3
		M8 pigtail - 4pin	ED-S30PL4	EL-S15PL4		ET-S500PL4
	Dark ON	2m cable	ED-S30PD	EL-S15PD		ET-S500PD
		M8 pigtail - 3pin	ED-S30PD3	EL-S15PD3		ET-S500PD3
		M8 pigtail - 4pin	ED-S30PD4	EL-S15PD4		ET-S500PD4
Supply voltage			DC 12 to 24V ±10% Inc. 10% ripple			
Power consumption			20mA Max			30mA Max
Sensing distance			30mm			500mm
Spot size			φ3mm @ 30mm		2 - 15mm	φ60mm @ 500mm
Objects			Not restricted			opaque object
Repeat accuracy			±0.05mm Max		+/-0.1mm Max	
Response time			0.25msec(ET), 0.5msec(ED,EL)			
Light source			Red LED			
Hysteresis			10%			—
Control output			NPN or PNP Open collector, 1.8V -50mA			
Environmental illuminance			Sunlight			
			Incandescent lamp			
			10,000 lx Max			
			3,000 lx Max			
Operating temp / humidity			-25 up to 55 °C / 35 up to 85%			
Storage conditions			-40 up to 70 °C / 35 up to 95%			
Noise resistance			EN60947-5-2:1998 (Immunity) EN60947-5-2:1998 (radiation)			
Vibration resistance			10 to 55Hz, 1.5mm, X-Y-Z each for 2 hours			
Shock resistance			1000m/S <sup>2</sup> , X-Y-Z each for 3 times			
Protection category			IP67			
Warm-up time			100ms			
LED Indicator			Green (stable), Orange (output), Red (Power of emitter : ET type)			
Connector and cable			2m cable, φ2.5mm 3 cores (2 cores for emitter) / M8 Pigtail 150 mm			
Circuit protection			Over Current, Reverse Polarity, Short Circuit			
Material			PC			
Conformity			CE			

### Flat type - Front Sensing

Model			Diffuse 100mm	Convergent 8/15/30mm			Thru-beam 500mm
NPN type	Light ON	2m cable	ED-100NL	EL-30NL	EL-15NL	EL-08NL	ET-500NL
		M8 pigtail - 3pin	ED-100NL3	EL-30NL3	EL-15NL3	EL-08NL3	ET-500NL3
		M8 pigtail - 4pin	ED-100NL4	EL-30NL4	EL-15NL4	EL-08NL4	ET-500NL4
	Dark ON	2m cable	ED-100ND	EL-30ND	EL-15ND	EL-08ND	ET-500ND
		M8 pigtail - 3pin	ED-100ND3	EL-30ND3	EL-15ND3	EL-08ND3	ET-500ND3
		M8 pigtail - 4pin	ED-100ND4	EL-30ND4	EL-15ND4	EL-08ND4	ET-500ND4
PNP type	Light ON	2m cable	ED-100PL	EL-30PL	EL-15PL	EL-08PL	ET-500PL
		M8 pigtail - 3pin	ED-100PL3	EL-30PL3	EL-15PL3	EL-08PL3	ET-500PL3
		M8 pigtail - 4pin	ED-100PL4	EL-30PL4	EL-15PL4	EL-08PL4	ET-500PL4
	Dark ON	2m cable	ED-100PD	EL-30PD	EL-15PD	EL-08PD	ET-500PD
		M8 pigtail - 3pin	ED-100PD3	EL-30PD3	EL-15PD3	EL-08PD3	ET-500PD3
		M8 pigtail - 4pin	ED-100PD4	EL-30PD4	EL-15PD4	EL-08PD4	ET-500PD4
Supply voltage			DC 12 to 24V ±10% Inc. 10% ripple				
Power consumption			20mA Max			30mA Max	
Sensing distance			100mm		5 - 30mm	3 - 8mm	500mm
Spot size			φ60mm @ 100mm		φ20mm @ 30mm	φ10mm @ 15mm	φ140mm @ 500mm
Objects			Not restricted			opaque object	
Response time			0.5msec Max				
Hysteresis			White Paper : 10% (EL-08 and EL-15),15%(EL-30 and EL-100)				
Control output			NPN or PNP Open collector, 50mA Max / 24V DC				
Environmental illuminance			Sun light:10,000 lux Max,Incandescent lamp:3,000 lux Max			—	
Operating temp / humidity			-25 up to 55 °C / 35 up to 85%				
Storage temp / humidity			-40 up to 70 °C / 35 up to 95%				
Noise resistance			EN60947-5-2:1998 (Immunity) EN60947-5-2:1998 (radiation)				
Vibration resistance			10 to 55Hz, 1.5mm, X-Y-Z each for 2 hours				
Shock resistance			1000m/S <sup>2</sup> , X-Y-Z each for 3 times				
Protection category			IP67				
Warm-up time			15msec				
LED Indicator			Green (stable), Orange (output), Red (Power of emitter : ET type)				
Operating mode			Light ON / Dark ON selectable				
Connector and cable			2m cable, φ2.5mm 3 conductors (2 conductors for emitter) / M8 Pigtail 150 mm				
Circuit protection			Over Current, Reverse Polarity, Short Circuit				
Material			PC				
Conformity			CE				



Reference (typical)



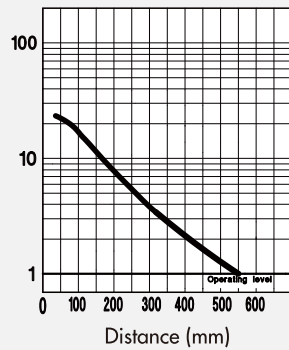
Repeat Accuracy

ET-S500		EL-S30		ET-S15	
X	Y	X	Y	X	Y
0.1	0.1	0.05	0.05	0.05	0.05

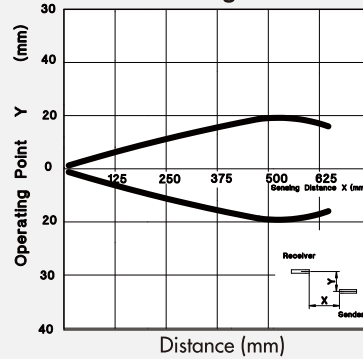
(Unit : mm)

ET-S500

Excess Gain

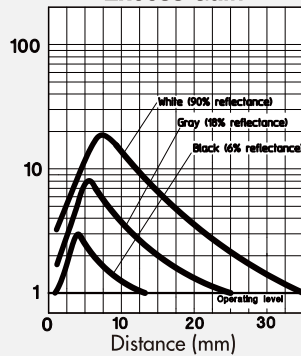


Sensing area

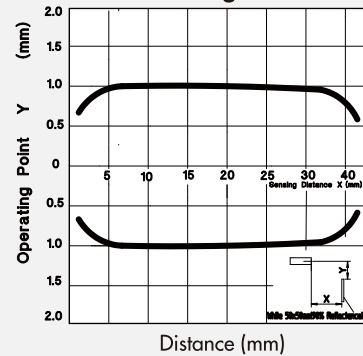


EL-S30

Excess Gain

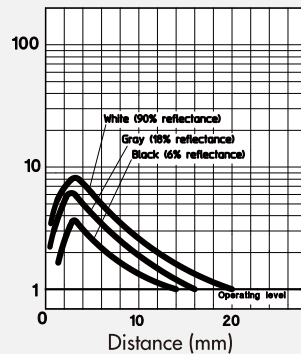


Sensing area

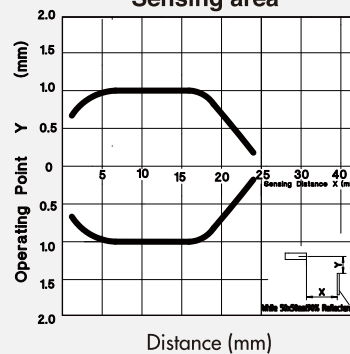


EL-S15

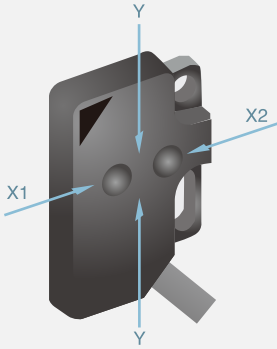
Excess Gain



Sensing area



Reference (typical)



Repeat Accuracy

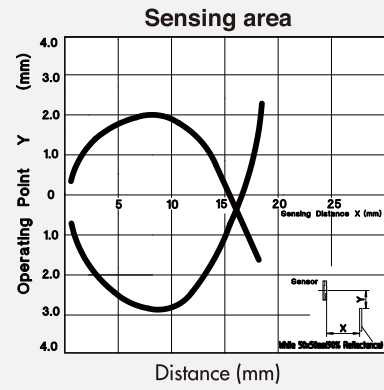
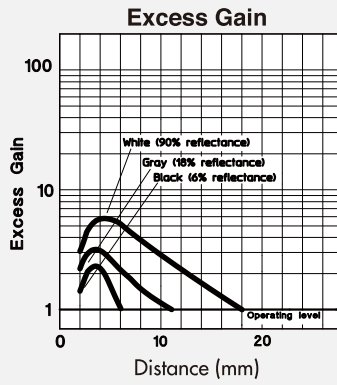
EL-30		
X1	X2	Y
0.8	0.8	0.8

EL-15		
X1	X2	Y
0.3	0.3	0.3

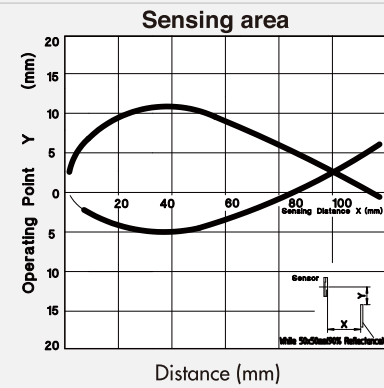
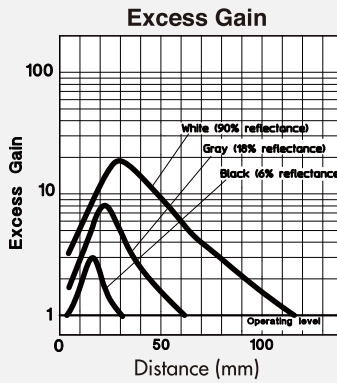
EL-08		
X1	X2	Y
0.1	0.1	0.1

(Unit : mm)

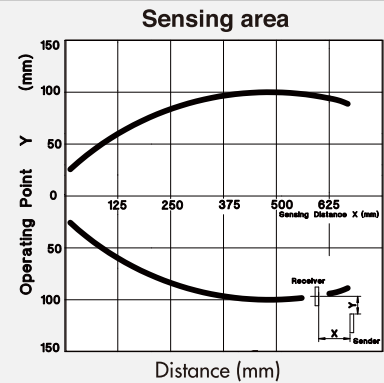
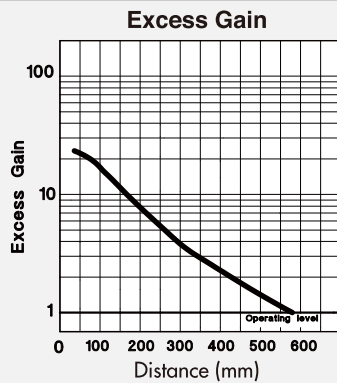
EL-15



ED-100



ET-500





M8 QD type

Cable type  
Head-on model

Cable type  
Side-on model

**Thru-beam type**

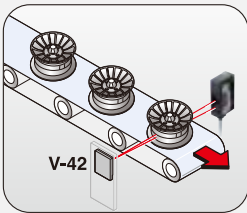
(Sensing distance : 10m)  
· JT-H(S)1000NR / PR / CNR / CPR

**Retro-reflective type with polarizing filter**

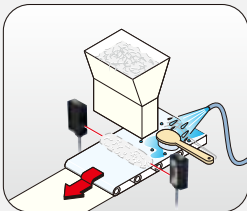
(Sensing distance : 3m)  
· JR-H(S)300N / P / CN / CP

Next page

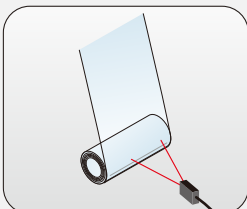
**Applications**



**Counting wheels  
(JR-S300)**



**Monitoring cookie paste  
(JT-S1000)**



**Roll of transparent film  
(JD-HW08)**

- **Epoxy filled sensor housing provides IP67G rating for complete protection against water.**
- **100G of shock resistance.**
- **M8 QD types are available for over all types.**

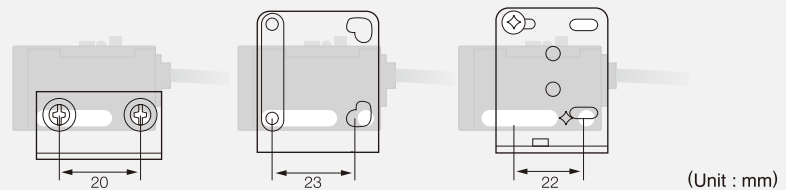
**Features**

Epoxy filled housing provides complete protection against water.



Slotted mounting holes for added flexibility.  
( Applicable for both M3 and M4 )

The slotted mounting hole (25.4 mm pitch) allows the sensor to be used with various types of mounting brackets.



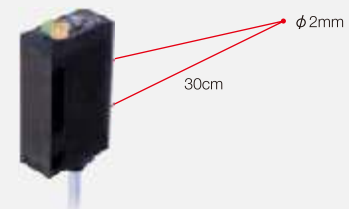
**M8 QD for easy maintenance**

The M8 QD connector types are small enough to be installed in areas where mounting space is limited.



**Visible red spot**

Visible red LED spot for easy alignment of the sensor. The projected spot is approx. 2 mm dia. at 30 cm distance from the sensor.



C

J

J

V

V

V

SR

BG

FG

BG

BGS

Y

DM

Acce

**Diffuse reflective type**

(Sensing distance : 80cm)  
· JD-H(S)80N / P / CN / CP

**Limited range (convergent) type**

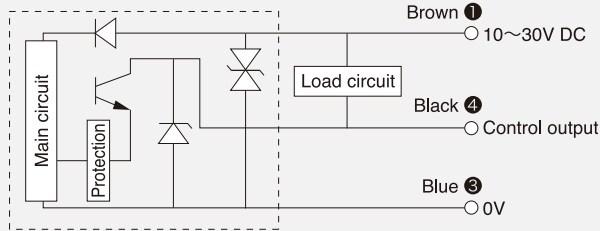
(Sensing distance : 2 - 5cm)  
· JD-H(S)L03N / P / CN / CP

**Wide angle (divergent) type**

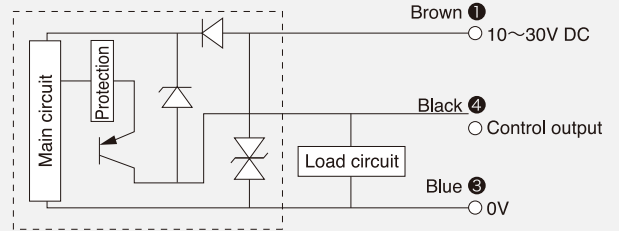
(Sensing distance : 8cm)  
· JD-H(S)W08N / P / CN / CP

**Circuit diagram**

**NPN output**

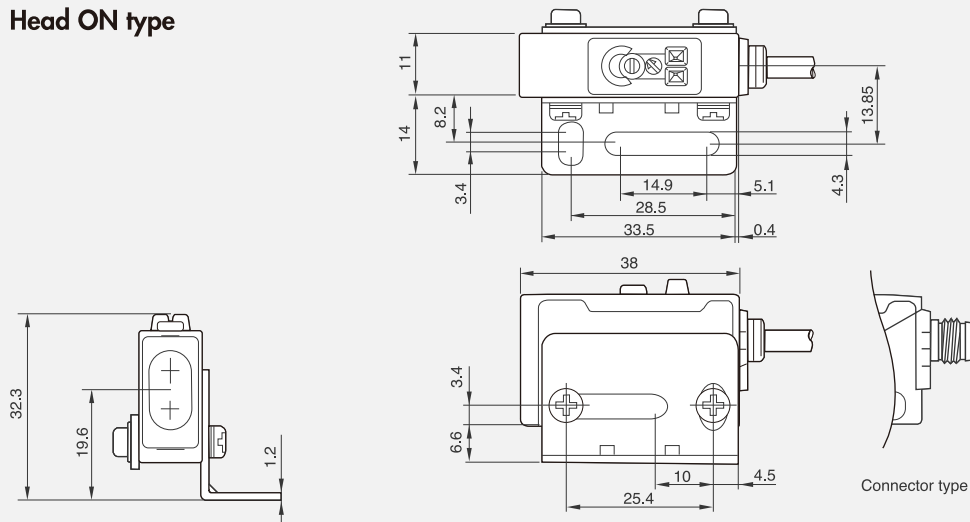


**PNP output**

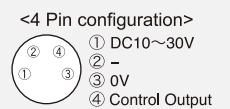
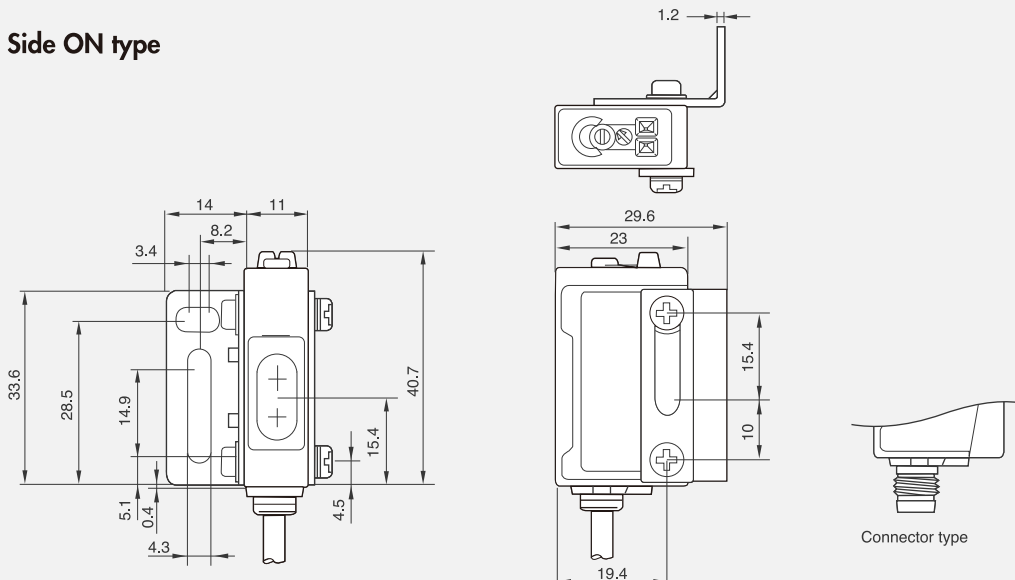


**Dimensions**

**Head ON type**



**Side ON type**



(Unit : mm)

C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z

BGS-Z

K

FGS-D

BGS-D

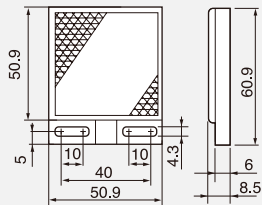
BGS-2S

Y

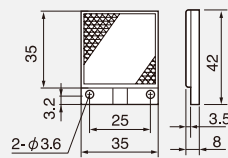
DM-18T

Accessory

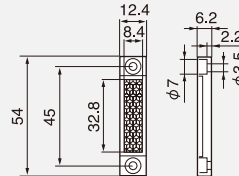
**Standard reflector V-61**



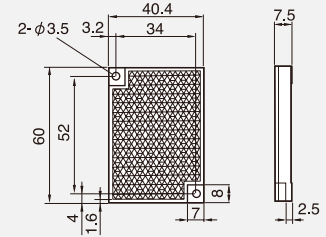
**Small reflector V-42**



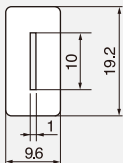
**Tiny reflector P-45**



**Anti-cloud reflector V-60K**



**SJ-01 Slit mask for JT types**



## Specifications

Model	Thru-beam	Retro-Reflection	Diffuse Reflection	Limited range (convergent)	Wide angle (divergent)	
<b>Cable type</b>	<b>NPN</b>	JT-H(S)1000NR	JR-H(S)300N	JD-H(S)β 80N	JD-H(S)L03N	JD-H(S)W08N
	<b>PNP</b>	JT-H(S)1000PR	JR-H(S)300P	JD-H(S)β 80P	JD-H(S)L03P	JD-H(S)W08P
<b>Connector type</b>	<b>NPN</b>	JT-H(S)1000CNR	JR-H(S)300CN	JD-H(S)β 80CN	JD-H(S)L03CN	JD-H(S)W08CN
	<b>PNP</b>	JT-H(S)1000CPR	JR-H(S)300CP	JD-H(S)β 80CP	JD-H(S)L03CP	JD-H(S)W08CP
<b>Sensing distance</b>	10m	3m	80cm	2-5cm	8cm	
<b>Response time</b>	0.5msec Max					
<b>Operating mode</b>	Light on / Dark on selectable					
<b>Hysteresis</b>	NIL			20% Max		
<b>Light source</b>	Red				Infrared	
<b>Control output</b>	NPN or PNP Open collector, 100mA Max / 30V DC					
<b>Supply voltage</b>	DC 10 to 30V including 10% of ripple					
<b>Conformity</b>	JIS / C4525, CE, UL					
<b>Power consumption</b>	Emitter : 20mA, Receiver 15mA	20mA Max				
<b>Sensitivity adjustment</b>	2-turn Potentiometer					
<b>Indicator</b>	2 indicator, Output (Orange), Stable (Green)					
<b>Protection category</b>	IEC 144 IP67, JEM IP67g					
<b>Shock resistance</b>	100G (1,000m/S <sup>2</sup> ), X-Y-Z axis 3 times					
<b>Environmental illuminance</b>	Sunlight : 10,000 lux Max, Incandescent lamp : 3,000 lux Max.					
<b>Material</b>	PBT (Case), PC (Lens)					

C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

Y

DM-18T

Accessory

## Options

**Standard reflector V-61**



**Small reflector V-42**



**Tiny reflector P-45**



**Anti-cloud reflector V-60K**



**JCN-S : M8 Straight type**



JCN-S : 2 meter  
JCN-5S : 5 meter  
JCN-10S : 10 meter

**JCN-L : M8 L-shape type**



JCN-L : 2 meter  
JCN-5L : 5 meter  
JCN-10L : 10 meter

**Protective mounting brackets (For Head-on types)**

**LJ-H01 : Protector**



**LJ-H02 : Protector**



**Protective mounting brackets (For Side-on types)**

**LJ-S01 : Protector**



**LJ-S02 : Protector**



**SJ-01 Slit mask for JT types**



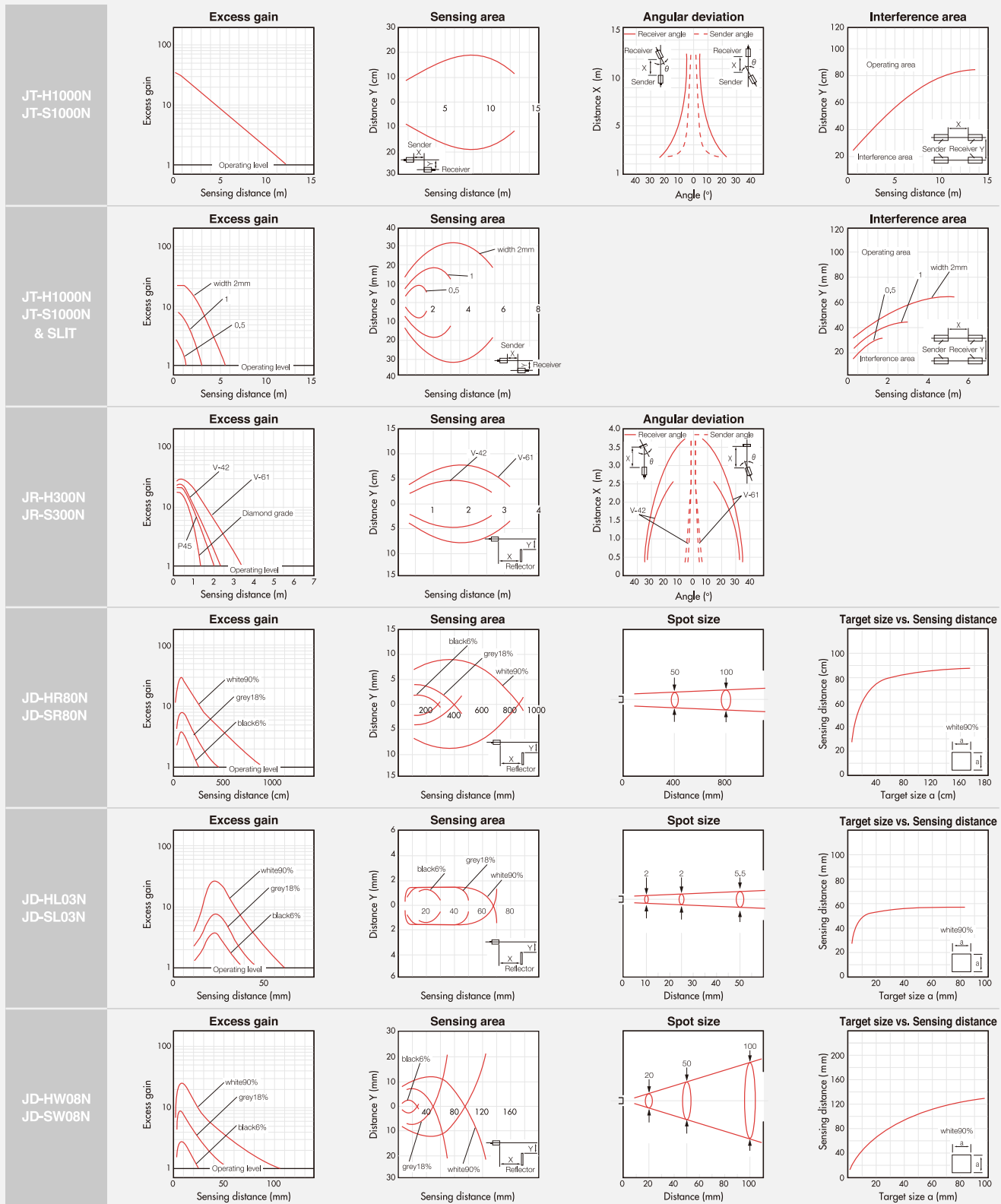
Slit size	Installation	Minimum	Maximum distance
1x10mm	Both of emitter / receiver	0.6mm	1m

**Sensor stand  
PLN-1**

**Fixture of Reflector  
PLN-1M**



**Reference (typical)**



C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z

BGS-Z

K

FGS-D

BGS-D

BGS-2S

Y

DM-18T

Accessory





head-on type

side-on type

# Photoelectric Sensor J2 series

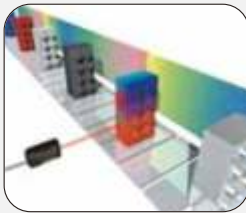
## Narrow view type

(Sensing distance : 10cm)  
• J2D-H(S)10N / P / CN / CP

## Diffuse reflective type (IR LED)

(Sensing distance : 100cm)  
• J2D-H(S)100N / P / CN / CP

### Applications



**BGS function for colorful object detection (BGS type)**

- **Epoxy filled sensor housing provides IP67 rating for complete protection against water and 100G of shock resistance.**
- **Narrow view optics project a 1.5 mm spot (Diffuse Reflective type J2D-10).**
- **1 meter sensing distance - Diffuse Reflective type (J2D-100).**

## Features

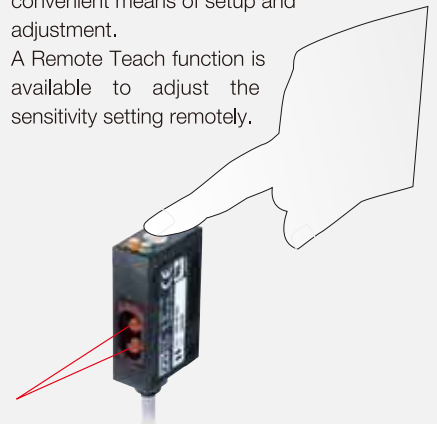
### Completely waterproof

Fully epoxy injected inside the body. (IP67)  
Protection category 100G means tough and rigid mechanics.



### Single Button Teaching

Built-in microcomputer offers a convenient means of setup and adjustment.  
A Remote Teach function is available to adjust the sensitivity setting remotely.



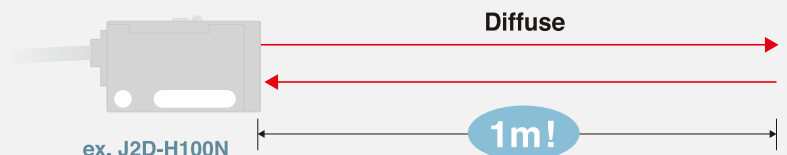
### Narrow View Diffuse.

The Narrow view diffuse model projects a 1.5 mm diameter spot at 100 mm distance. The sharp angle of view is ideal for detecting a target through a small opening.



### 1 meter Diffuse.

1 meter sensing distance in diffuse reflection mode.



C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

Y

DM-18T

Accessory

**Diffuse reflective type (Red LED)**

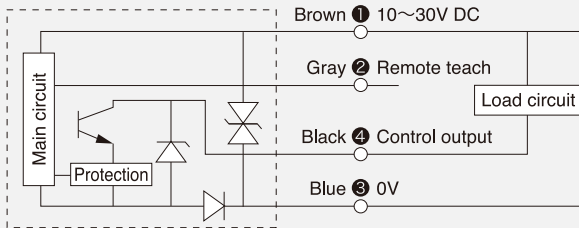
(Sensing distance : 70cm)  
· J2D-H(S)70N / P / CN / CP

**BGS type**

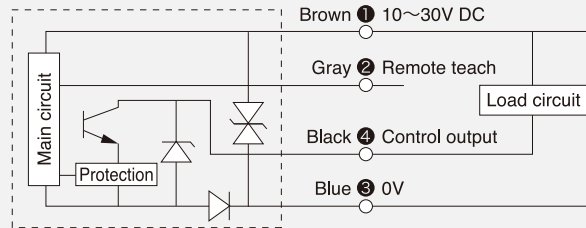
(Sensing distance : 50 - 150mm)  
· BGS-H(S)15N / P / CN / CP

**Circuit diagram**

**NPN output**



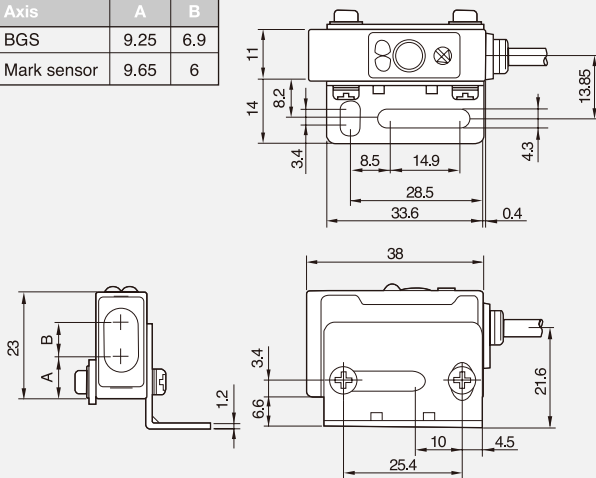
**PNP output**



**Dimensions**

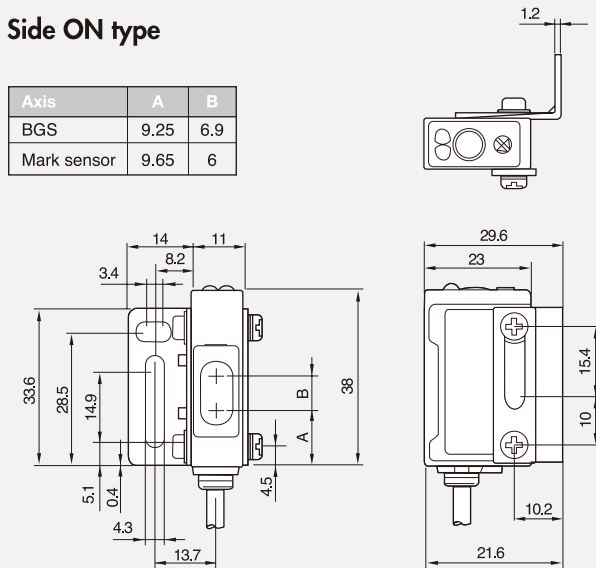
**Head ON type**

Axis	A	B
BGS	9.25	6.9
Mark sensor	9.65	6



**Side ON type**

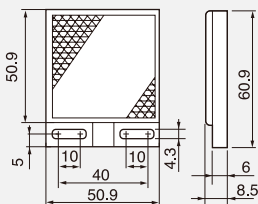
Axis	A	B
BGS	9.25	6.9
Mark sensor	9.65	6



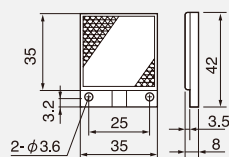
<4 Pin configuration>



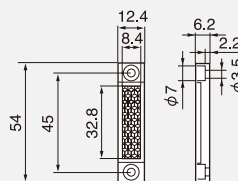
**Standard reflector V-61**



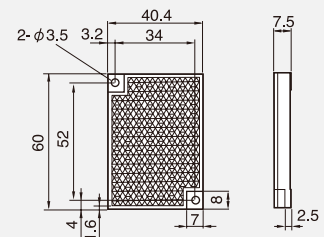
**Small reflector V-42**



**Tiny reflector P-45**



**Anti-cloud reflector V-60K**



(Unit : mm)

## Specifications

Model		Diffuse Reflective (Red)			BGS	
Cable type	NPN	J2D-H(S)10N	J2D-H(S)100N	J2D-H(S)70N	BGS-H(S)15N	
	PNP	J2D-H(S)10P	J2D-H(S)100P	J2D-H(S)70P	BGS-H(S)15P	
	Connector type	NPN	J2D-H(S)10CN	J2D-H(S)100CN	J2D-H(S)70CN	BGS-H(S)15CN
		PNP	J2D-H(S)10CP	J2D-H(S)100CP	J2D-H(S)70CP	BGS-H(S)15CP
(Remark)		*H = Head-on, S = Side-on				
Sensing distance		100mm	1000mm	700mm	50-150mm	
Power consumption		10mA Max			45mA Max	
Response time		0.5m sec			2.5 msec Max	
Hysteresis		15%			8% @ 100mm	
Spot size		φ 1.5mm@100mm	φ 85mm@1000mm	φ 50mm@600mm	φ 10mm@150mm	
Light source		Red	Infrared	Red		
Supply voltage		DC 10 to 30V including 10% of ripple				
Control output		NPN or PNP Open collector, 100mA Max / 30V DC				
Sensitivity adjustment		Teach-in (Available Remote Teach-in)				
Shock resistance		100G (1,000m/S <sup>2</sup> ), X-Y-Z axis 3 times				
Remarks		Connector is M8, 3 and 4 pin connectors are available				
Operating mode		Light on / Dark on selectable				
Operating temp		-25 up to 55 °C				
Operating humidity		35 up to 95% RH				
Storage temp / humidity		-40 up to 70 °C, 35 - 95% RH				
Environmental illuminance		Sunlight : 10,000 lux Max, Incandescent lamp : 3,000 lux Max.				
Insulation resistance		Min. 20 M Ohm / DC500V				
Conformity		JIS, CE, CRU				
(JIS C4525)		1 sec, 300V				
Feilen test		Level 3				
VDE protection		Class 3				
Vibration resistance		10 to 55 hz amplitude 1.5mm, X-Y-Z for 2 hours				
Protection category		IP67				
Material		Case : PBT, Lens : PMMA				

## Options

Standard reflector V-61



Small reflector V-42



Tiny reflector P-45



Anti-cloud reflector V-60K



JCN-S : M8 Straight type



JCN-S : 2 meter  
JCN-5S : 5 meter  
JCN-10S : 10 meter

JCN-L : M8 L-shape type



JCN-L : 2 meter  
JCN-5L : 5 meter  
JCN-10L : 10 meter

Sensor stand

PLN-1

Fixture of Reflector

PLN-1M



Protective mounting brackets (For Head-on types)

LJ-H01



LJ-H02



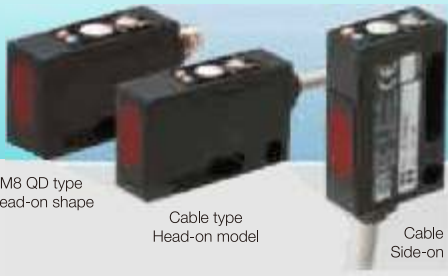
Protective mounting brackets (For Side-on types)

LJ-S01



LJ-S02





# Photoelectric Sensor J3 series

M8 QD type  
Head-on shape

Cable type  
Head-on model

Cable type  
Side-on model

### Mark sensor type

(Sensing distance : 10±2m)  
· J3M-GH(S)01N / P / CN / CP

### Retro-reflective Narrow view type

(Sensing distance : 0.05 - 1m)  
· J3R-H(S)100N / P / CN / CP

→  
Next page

- **J3M Mark sensor with Pushbutton Teach.**
- **Narrow view optics project a 3.0 mm spot (Retro-reflective type J3R-100).**
- **1.5 mm projected spot for BGS types.**
- **Epoxy filled sensor housing provides protection against vibration.**

## Features (J3 Common)

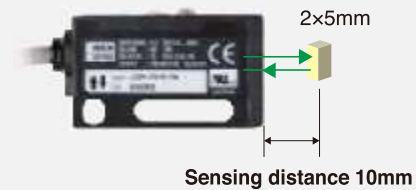
### IP67

In addition to vibration resistance, the epoxy filled housing results in an IP67 rating.



### Fast Response 200 micro sec, 10±2mm sensing distance (Mark sensor J3M type)

A latest Green LED with physical composition of GlanN2. It's best for mark sensing.



### Completely waterproof

An IP67 rating is guaranteed by filling the sensor body with epoxy. The 100G shock resistance rating protects the sensor against mechanical vibration.



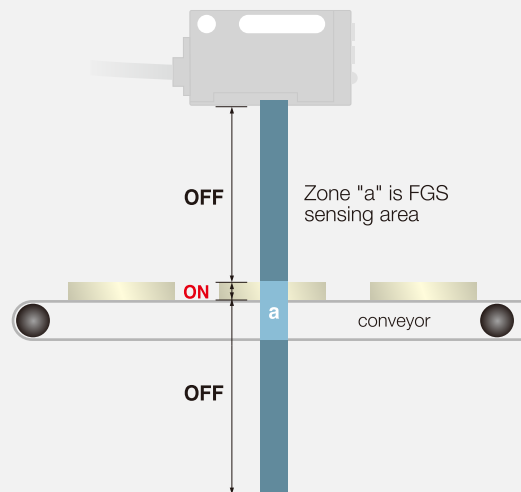
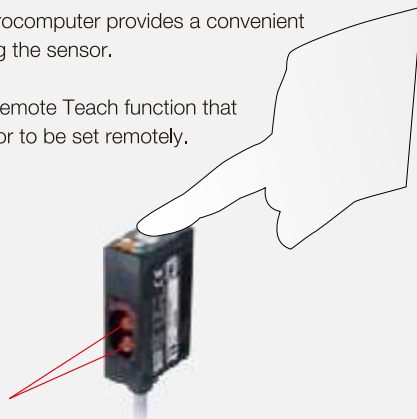
### BGS-S/H15 : Built-in FGS function

The BGS-S15 and BGS-H15 sensors are able to operate as FGS (foreground suppression) sensors. The FGS function senses the surface of the conveyor and uses this as a reflector, the sensor will detect thin and/or flat objects positioned on the conveyor. A standard diffuse reflective sensor could be used in this application but adjusting the sensitivity is sometimes difficult, the FGS function is easily adjusted and will operate in a manner similar to a retro-reflective sensor without the reflector.

### One-push Teaching.

The built-in microcomputer provides a convenient means of setting the sensor.

There is also a remote Teach function that allows the sensor to be set remotely.



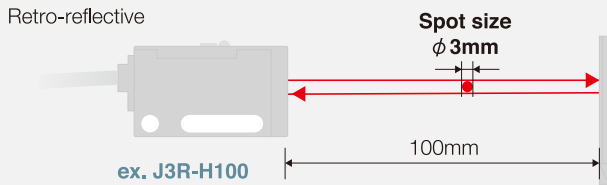
- C
- J
- J
- V
- V
- V
- V
- SR
- BG
- FG
- BG
- BGS
- Y
- DM

**BGS type**

(H) = Head-on  
(S) = Side on

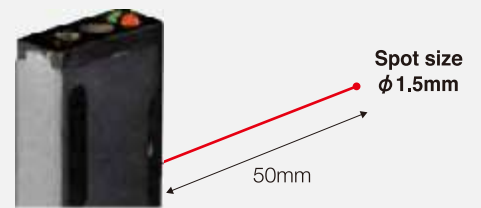
(Sensing distance : 15 - 50mm)  
· BGS-3JH(S)05N / P / CN / CP

Ideal for detection of small objects



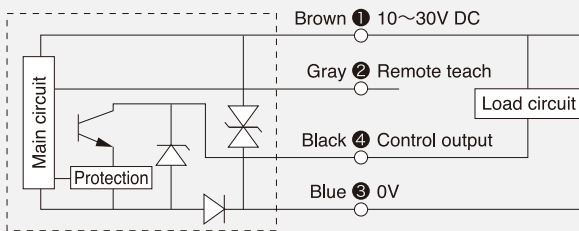
φ 1.5mm of small spot size (BGS-3JH05)

Small spot in a BGS sensing system.

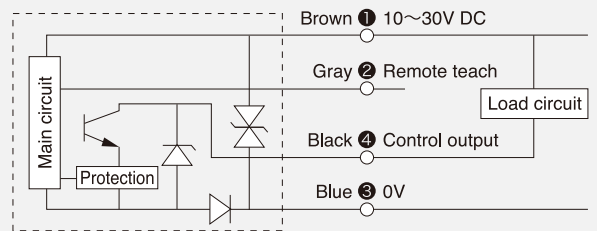


**Circuit diagram**

**NPN output**



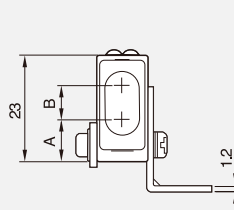
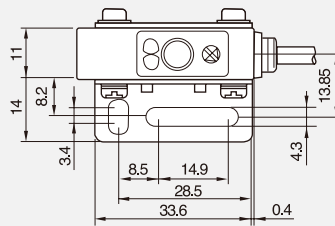
**PNP output**



**Dimensions**

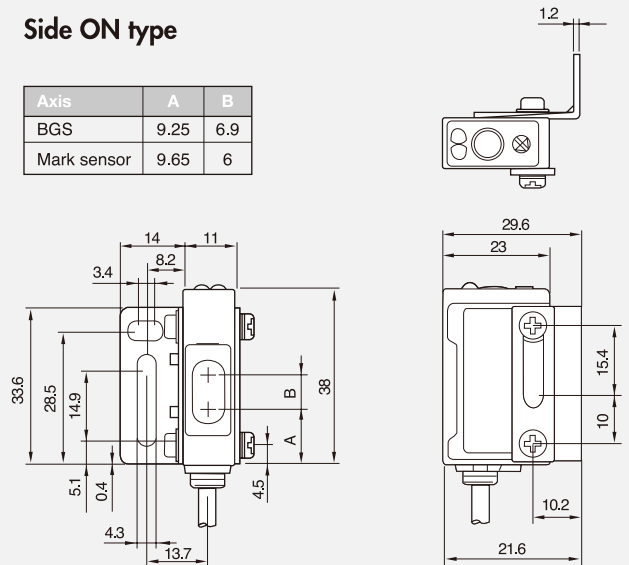
**Head ON type**

Axis	A	B
BGS	9.25	6.9
Mark sensor	9.65	6



**Side ON type**

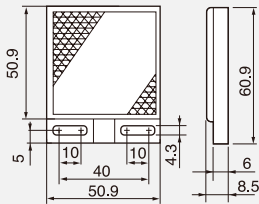
Axis	A	B
BGS	9.25	6.9
Mark sensor	9.65	6



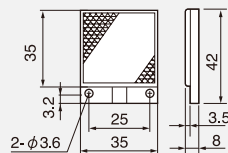
<4 Pin configuration>



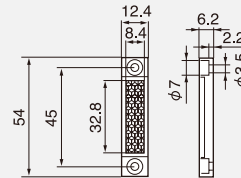
Standard reflector V-61



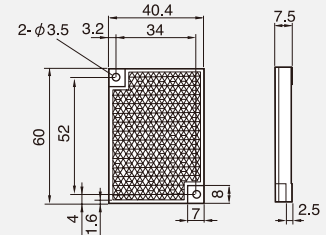
Small reflector V-42



Tiny reflector P-45



Anti-cloud reflector V-60K



(Unit : mm)

## Specifications

Model		Mark Sensor	Retro-reflective Narrow View	BGS
Cable type	NPN	J3M-GH(S)01N	J3R-GH(S)100N	BGS-3JH(S)05N
	PNP	J3M-GH(S)01P	J3R-GH(S)100P	BGS-3JH(S)05P
Connector type	NPN	J3M-GH(S)01CN	J3R-GH(S)100CN	BGS-3JH(S)05CN
	PNP	J3M-GH(S)01CP	J3R-GH(S)100CP	BGS-3JH(S)05CP
(Remark)		*H = Head-on, S = Side-on		
Sensing distance		10 +/- 2m	0.05 - 1m	15 - 50mm/18%
Power consumption		40mA Max		
Response time		0.2m sec		0.7 msec
Hysteresis		N/A		5%
Min detectable object		Appr 2 x 5mm @ 10mm	1mm @ 100mm	0.5mm round@150mm
Light source		Green	Red LED with special focusing lens	Red
Off delay		40 msec fixed		
Supply voltage		DC 10 to 30V including 10% of ripple		
Control output		NPN or PNP Open collector, 100mA Max / 30V DC		
Sensitivity adjustment		Teach-in		
Remote teach-in		Available		
Shock resistance		100G (1,000m/S <sup>2</sup> ), X-Y-Z axis 3 times		
Remarks		Light on / Dark on selectable		
Operating temp		-25 up to 55 °C		
Operating humidity		35 up to 95% RH		
Storage conditions		-40 up to 70 °C, 35 - 95% RH		
Environmental illuminance		Sunlight : 10,000lux Max, Incandescent lamp : 3,000 lux Max.		
Insulation resistance		Min. 20 M Ohm / DC500V		
Conformity (JIS C4525)		JIS, CE, C.R.U		
Feilen test		1μsec, 300V		
VDE protection		Level 3		
Vibration resistance		Class 3		
Protection category		10 to 55 hz amplitude 1.5mm, X-Y-Z for 2 hours		
Material		IP67		
		Case : PBT, Lens : PMMA		

C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

Y

DM-18T

Accessory

**Options**

**Standard reflector V-61**



**Small reflector V-42**



**Tiny reflector P-45**



**Anti-cloud reflector V-60K**



**JCN-S : M8 Straight type**



JCN-S : 2 meter  
JCN-5S : 5 meter  
JCN-10S : 10 meter

**JCN-L : M8 L-shape type**



JCN-L : 2 meter  
JCN-5L : 5 meter  
JCN-10L : 10 meter

**Protective mounting brackets (For Head-on types)**

**LJ-H01 : Protector**



**LJ-H02 : Protector**



**Protective mounting brackets (For Side-on types)**

**LJ-S01 : Protector**



**LJ-S02 : Protector**



**Sensor stand  
PLN-1**



**Fixture of Reflector  
PLN-1M**

C

E

J

J2

**J3**

V

V2

V3

V4

SR-Q

S

Z

BGS-Z

K

FGS-D

BGS-D

BGS-2S

Y

DM-18T

Accessory



M12 QD type

Cable type

# Photoelectric Sensor V series

## Thru-beam type

(Sensing distance : 40m)  
**Relay output type** · VT-4000 / T  
(Sensing distance : 30m)  
**Transistor output type** · VT-3000N / P / CN / CP

## Retro-reflective type

(Sensing distance : 10m)  
**Relay output type** · VR-1000 / T  
(Sensing distance : 8m)  
**Transistor output type** · VR-800N / P / CN / CP

→  
Next page

## Applications



Rubber / plastic industry



Transportation industry



Material handling

- **Universal voltage photoelectric sensor 12~240 VDC / 24~240 VAC.**
- **M12 QD types are available.**
- **Relay contact (AC/DC models) and Transistor output (DC models).**
- **Rugged duty sensor housing.**
- **BGS-V2000, long sensing distance (2m) with BGS operation.**

## Features

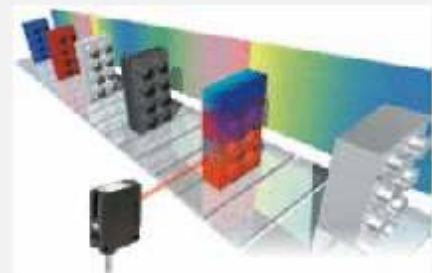
### High power light source

The strong LED light source assures stable sensing even in misty or dirty conditions.



### Long sensing BGS-V2000 (2m) BGS type

BGS-V2000 , 2m sensing BGS sensor.



### Timer Function

Adjustable ON delay, OFF delay and ON+OFF delay time by individual delay trimmer. From 0.1 to 10 sec.

ON delay volume      OFF delay volume



### Applicable for use world-wide

24 to 240V AC  
12 to 240V DC.



C

E

J

J2

J3

V

V2

V3  
V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

Y

DM-18T

Accessory



**Diffuse reflective type**

(Sensing distance : 1.3m)  
**Relay output type** · VD-130 / T  
(Sensing distance : 1m)  
**Transistor output type** · VD-100N / P / CN / CP

**Diffuse reflective type**

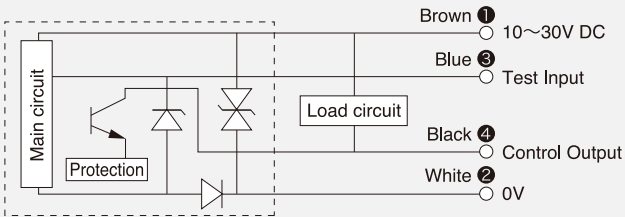
(Sensing distance : 3m)  
**Relay output type** · VD-300 / T  
(Sensing distance : 2.5m)  
**Transistor output type** · VD-250N / P / CN / CP

**BGS type**

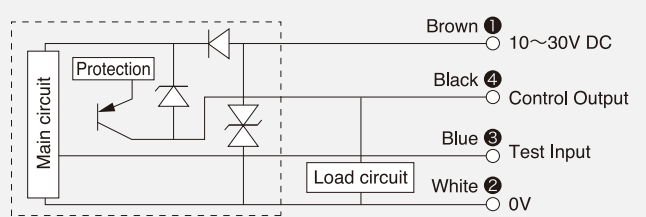
(Sensing distance : 2m)  
**Relay output type** · BGS-V2000 / T  
**Transistor output type** · BGS-V2000N / P / CN / CP

**Circuit diagram**

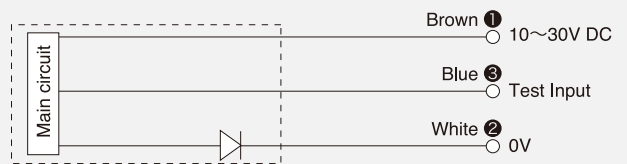
**NPN output**



**PNP output**

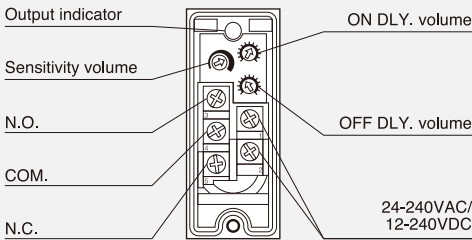


**Emitter**

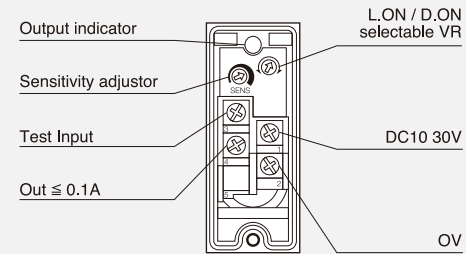


**Connections**

**Relay type**

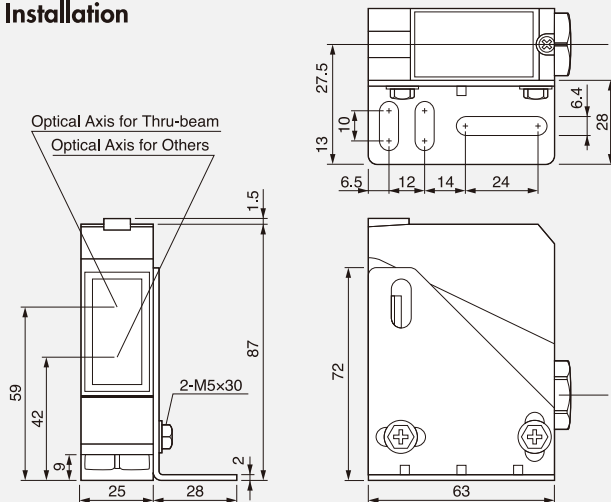


**NPN / PNP type**

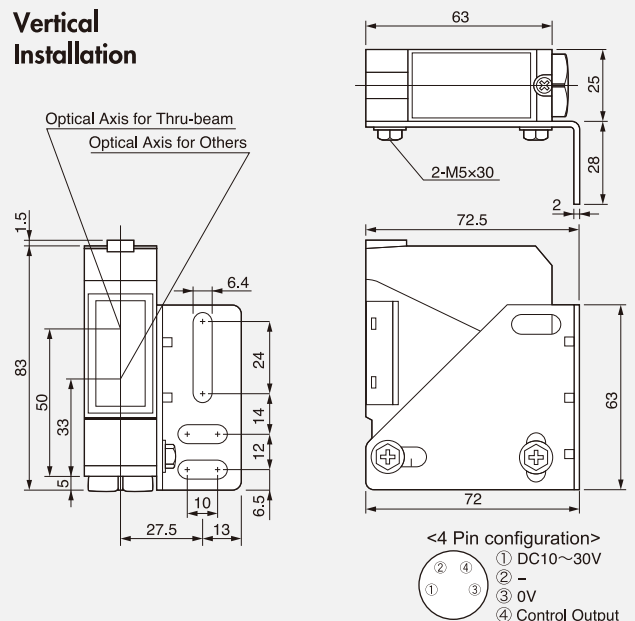


**Dimensions**

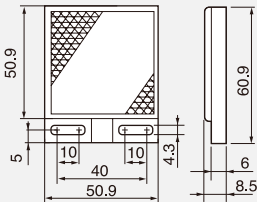
**Horizontal Installation**



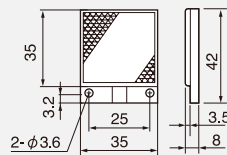
**Vertical Installation**



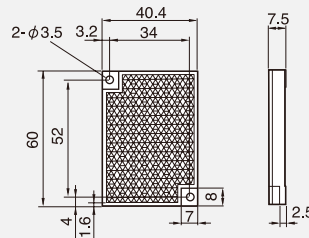
Standard reflector V-61



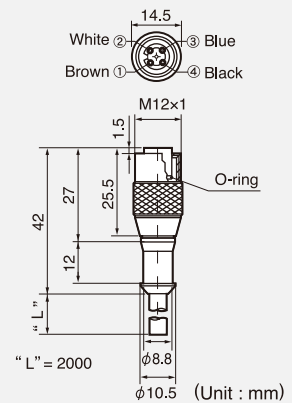
Small reflector V-42



Anti-cloud reflector V-60K



M12 connector cable  
6009 382



## Specifications

Model	Thru-beam	Retro-Reflection	Diffused-Reflection Red LED	Diffused-Reflection IR LED	BGS type
<b>Relay output type</b>	VT-4000	VR-1000	VD-130	VD-300	BGS-V2000
<b>Timer</b>	VT-4000T	VR-1000T	VD-130T	VD-300T	BGS-V2000T
<b>Transistor output type</b>	VT-3000N / 3000P	VR-800N / 800P	VD-100N / 100P	VD-250N / 250P	BGS-V2000N / 2000CN
<b>Connector</b>	VT-3000CN / 3000CP	VR-800CN / 800CP	VD-100CN / 100CP	VD-250CN / 250CP	BGS-V2000P / 2000CP
<b>Sensing distance</b>	<b>Relay type</b> 40 meter	10 meter	1.3 meter	3 meter	2 meter
	<b>Transistor type</b> 30 meter	8 meter	1 meter	2.5 meter	2 meter
<b>Response time</b>	<b>Relay type</b> 20msec				
	<b>Transistor type</b> 1.5msec			5msec	
<b>Operating mode</b>	Relay type = Light On fixed, NPN / PNP type = Light On / Dark On switchover				
<b>Hysteresis</b>	NIL			20% Max	15% Max
<b>Light source</b>	Red			Infrared	
<b>Control output</b>	NO / NC AV240V / DC30V,3A				Relay 1C, AC250V, DC30V, 3A
<b>Supply voltage</b>	NPN or PNP Open collector, 100mA Max / 30V DC				
	AC24-240V, DC12-240V +/-10% ripple				
	DC10-30V incl. 10% ripple				
<b>Conformity</b>	JIS / C4525, CE, UL				
<b>Power consumption</b>	8.5VA	5VA		5mA	
<b>Cable connection</b>	Terminal chamber, applicable cable φ6 to φ10				
<b>Test input</b>	Available in Transistor output types				
<b>Operating temp</b>	-25~+55°C				
<b>Operating humidity</b>	35~85% RH				
<b>Sensitivity adjustment</b>	Single turn trimmer				TEACH-IN
<b>Protection</b>	IEC 144, IP67				
<b>Shock resistance</b>	50G, XYZ 3-ways				
<b>Materials</b>	Glassfiber reinforced ABS (Case), PMMA (Lens)				ABS (Case), PC (Lens), PMMA (Cover)

## Options

Standard reflector V-61



Small reflector V-42



Anti-cloud reflector V-60K



Connector cable  
6009 382



C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

Y

DM-18T

Accessory



# Photoelectric Sensor V2 series

## Thru-beam type

(Sensing distance : 20m)  
**Relay output type** · V2T-2000  
**Transistor output type** · V2T-2000DN / DP  
**M12 QD Transistor type** · V2T-2000CDN / CDP

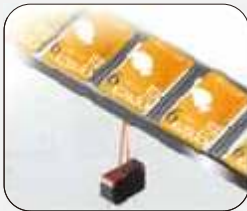
## Retro-reflective type with polarizing filter

(Sensing distance : 8m)  
**Relay output type** · V2R-800  
**Transistor output type** · V2R-800DN / DP  
**M12 QD Transistor type** · V2R-800CDN / CDP

### Applications



**Gate control  
(V2T-2000)**



**Magazines on roller conveyor  
(BGS-V50)**



**Parking control  
(V2T-2000)**



**Tire counting  
(V2R-800)**

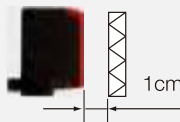
- **BGS series with a rugged duty housing.**
- **Up to 80 cm sensing distance (BGS-V80).**
- **The large lenses assure stable sensing.**
- **IP67, QD types are available.**

## Features

A large projecting and receiving lens results in a strong projected beam. Ideal for use in tough conditions.

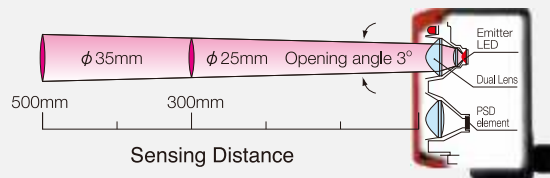


Only 1cm of dead area



Large projecting and receiving lens assures stable sensing even in misty or dusty conditions.

The sensor uses a condenser lens to project a beam that is only 3 degrees in diameter. This makes it possible to detect small objects at a long distance.



Connector can be rotated for added flexibility when mounting.  
(DC Power type)

The connector rotates 90 degrees for added flexibility when mounting.  
IP67 is maintained even with the connector.

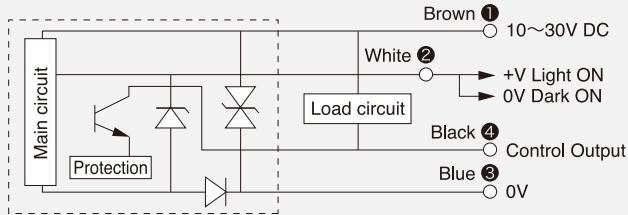


**BGS type**

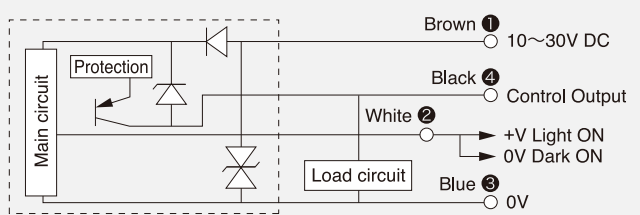
(Sensing distance : 80cm) (Sensing distance : 50cm) (Sensing distance : 30cm)  
 ·BGS-V80 / N / P / CN / CP ·BGS-V50 / N / P / CN / CP ·BGS-V30 / N / P / CN / CP

**Circuit diagram**

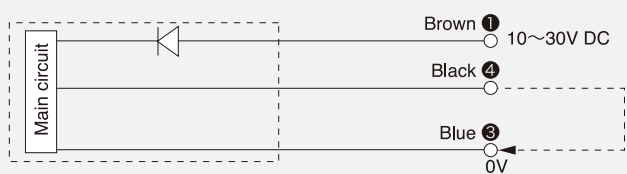
**NPN output**



**PNP output**

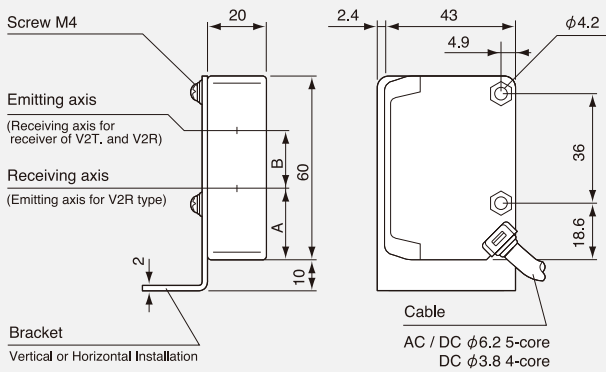


**Emitter**



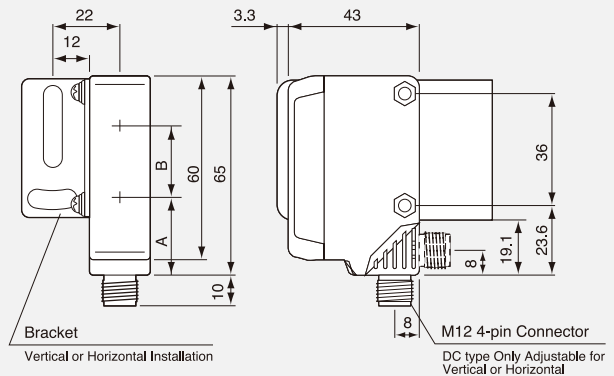
**Dimensions**

**Cable type**



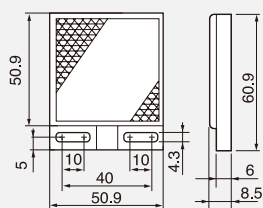
	V2T-2000	V2T-800	BGS-V50	BGS-V30
A	44	19	18	18.7
B	-	17.4	26	25.3

**Connector type**

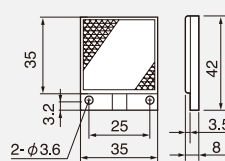


	V2T-2000	V2T-800	BGS-V50	BGS-V30
A	44	19	18	18.7
B	-	17.4	26	25.3

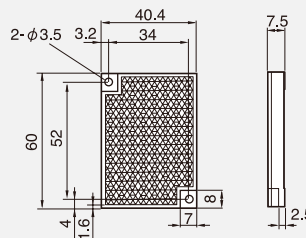
**Standard reflector V-61**



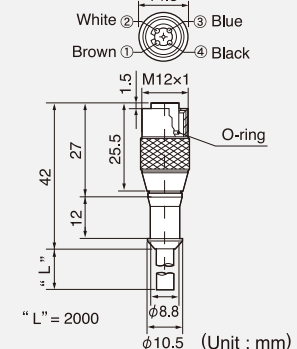
**Small reflector V-42**



**Anti-cloud reflector V-60K**



**M12 connector cable 6009 382**



## Specifications

Model	Relay Output Type					Transistor Output Type					
	Thru-beam	Retro-reflective	BGS			Thru-beam	Retro-reflective	BGS			
<b>Cable type</b>	NPN V2T-2000	V2R-800	BGS-V80	BGS-V50	BGS-V30	V2T-2000DN	V2R-800DN	BGS-V80N	BGS-V50N	BGS-V30N	
	PNP	Relay contact					V2T-2000DP	V2R-800DP	BGS-V80P	BGS-V50P	BGS-V30P
<b>Connector type</b>	NPN	—	—	—	—	V2T-2000CDN	V2R-800CDN	BGS-V80CN	BGS-V50CN	BGS-V30CN	
	PNP	—	—	—	—	V2T-2000CDP	V2R-800CDP	BGS-V80CP	BGS-V50CP	BGS-V30CP	
<b>Sensing distance</b>	20 m	8 m	80 cm	50 cm	30 cm	20 m	8 m	80 cm	50 cm	30 cm	
<b>Supply voltage</b>	24-240V AC, or 12-240V DC +/- 10%					10-30V DC including 10% of ripple					
<b>Indicator</b>	Single LED										
<b>Power consumption</b>	2VA Max						35mA Max		25mA Max		
<b>Sensitivity adjustment</b>	2-turn potentiometer										
<b>Response time</b>	1.5msec Max					1msec	0.7msec	2msec			
<b>Control output</b>	Relay output 1C, 250V AC, 0.3A / 30V DC 2A					NPN or PNP open collector (total 100mA 30V DC)					
<b>Hysteresis</b>	NIL		5% Max			NIL		5% Max			
<b>Operating mode</b>	—					Light ON / Dark ON selectable					
<b>Light source</b>	Red LED										
<b>Noise resistance</b>	IEC 1000-4-2, Level 4, IEC 1000-4-3, Level 3, C4525 1000V JIS										
<b>Operating temp / humidity</b>	-25 to +55°C / 35 to 85%/RH										
<b>Environmental illuminance</b>	Sun Light:10,000 lux max. Incandescent lamp:3,000 lux max.										
<b>Shock resistance</b>	50G (500m/s <sup>2</sup> ) X,Y,Z, axis 3 times										
<b>Protection category</b>	IP67										
<b>Housing material</b>	Housing: ABS Glassfiber reinforced. Front lens: PC (PMMA for retro-reflection)										

## Options

Standard reflector V-61



Small reflector V-42

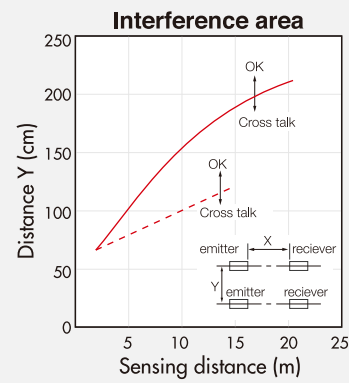
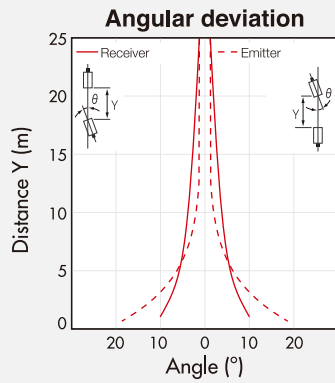
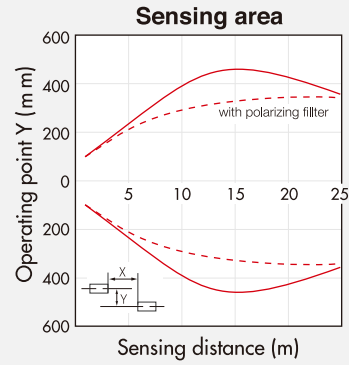
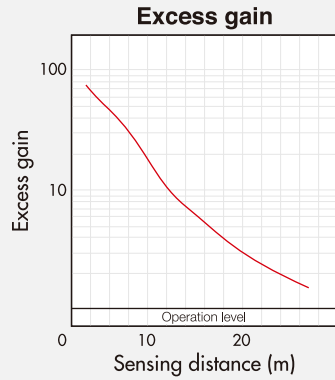


Anti-cloud reflector V-60K

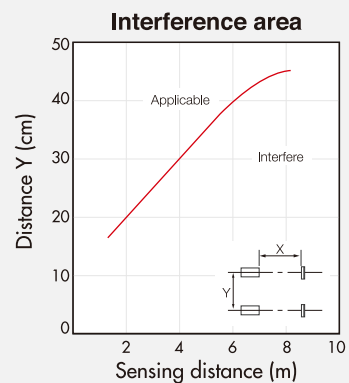
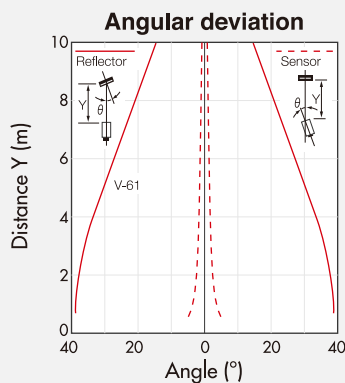
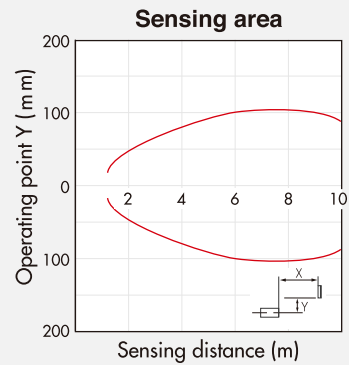
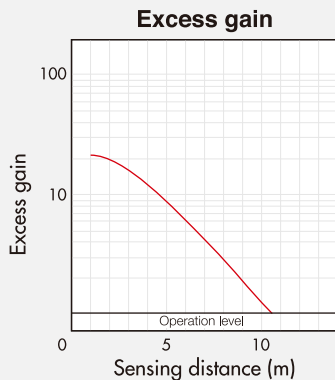

 Connector cable  
6009 382


**Reference (typical)**

V2T-2000  
V2T-2000DN



V2R-800  
V2R-800DN



C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

Y

DM-18T

Accessory



V4 series  
M12 QD type

V3 series  
Cable type

### V3 series Thru-beam type

(Sensing distance : 40m)  
**Relay output type** · V3T-4000  
**Transistor output type** · V3T-4000N / P  
**M12 QD Transistor type** · V3T-4000CN / CP

### Retro-reflective type

(Sensing distance : 0.01 - 10m)  
**Relay output type** · V3R-1000  
**Transistor output type** · V3R-1000N / P  
**M12 QD Transistor type** · V3R-1000CN / CP

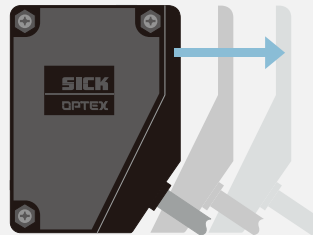
## Applications



**Access control**

## Features

Leave the base and cable in place, change the amplifier only (V3 and V4 series).



Replace unit UR-34 (Retro-type)

## Easy replacement

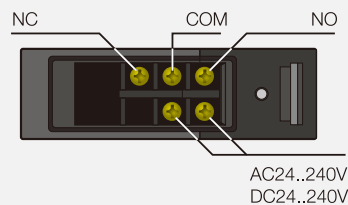
New style of QD!  
 Simply replace the main body leaving the base and cable in place.



**Strong light source!**  
 Ideal for dusty/dirty conditions.



Terminal layout for easy connection (V4 series).



## Long Scanning Range

Thru-beam:  
40m



Retro-reflective:  
10m



Diffuse reflective:  
1.3m



**Diffuse reflective type**

(Sensing distance : 1.3m)  
**Relay output type** · V3D-130  
**Transistor output type** · V3D-130N / P  
**M12 QD Transistor type** · V3D-130CN / CP

**V4 series Thru-beam type**

(Sensing distance : 40m)  
**Relay output type** · V4T-4000  
**Transistor output type** · V4T-4000N / P

**Retro-reflective type**

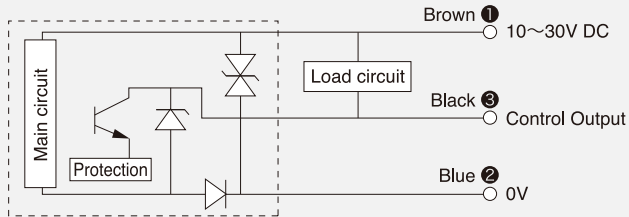
(Sensing distance : 0.01 - 10m)  
**Relay output type** · V4R-1000  
**Transistor output type** · V4R-1000N / P

**Diffuse reflective type**

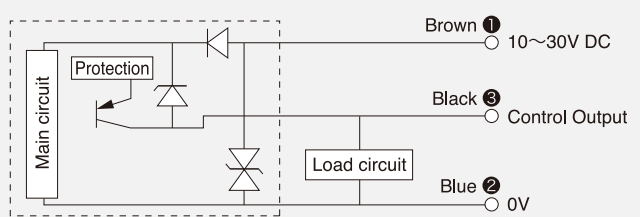
(Sensing distance : 1.3m)  
**Relay output type** · V4D-130  
**Transistor output type** · V4D-130N / P

**Circuit diagram (Transistor Output type)**

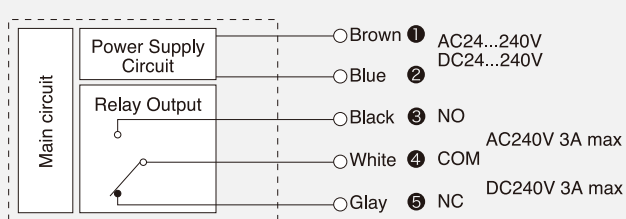
**NPN output**



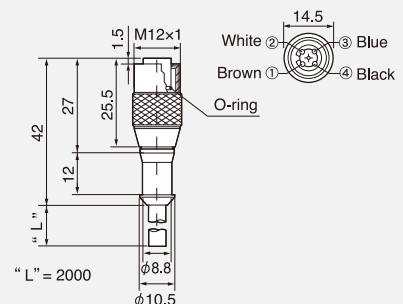
**PNP output**



**AC/DC type**



**Emitter**

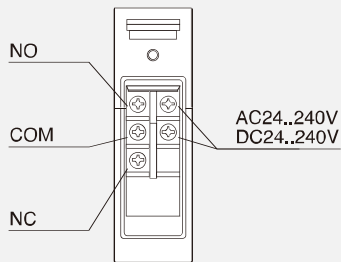


C
E
J
J2
J3
V
V2
V3
V4
SR-Q
S
Z
BGS-Z
K
FGS-D
BGS-D
BGS-2S
Y
DM-18T
Accessory

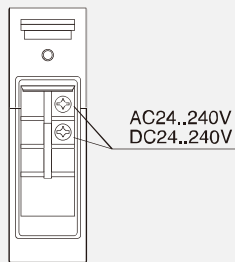


## Connections

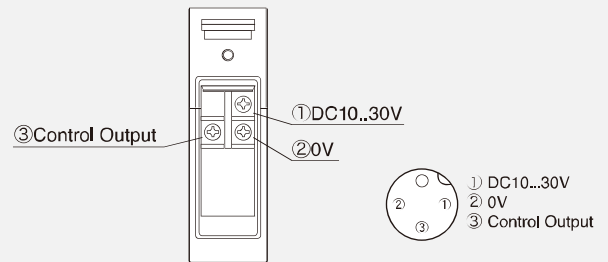
### Relay type



### Emitter



### Transistor Output type



## Specifications

Model	Relay output type			Transistor output type		
	Thru-beam	Retro-reflective	Diffuse reflective	Thru-beam	Retro-reflective	Diffuse reflective
<b>V3 series (cable/QD type)</b>	V3T-4000	V3R-1000	V3D-130	V3T-4000N, P, CN, CP	V3R-1000N, P, CN, CP	V3D-130N, P, CN, CP
<b>V4 series : (terminal type)</b>	V4T-4000	V4R-1000	V4D-130	V4T-4000N, P	V4R-1000N, P	V4D-130N, P
<b>Maintenance unit (common to V3/V4)</b>	US-34 (emitter) UE-34 (receiver)	UR-34	UD-34	US-34D (emitter) UE-34N or 34P (receiver)	UR-34N or 34P	UD-34N or 34P
<b>Sensing distance</b>	40m	0.01 - 10m	1.3m	40m	0.01 - 10m	1.3m
<b>Response time</b>	20msec			0.5 msec		
<b>Operating mode</b>	Light ON			Light ON / Dark ON switchover		
<b>Hysteresis</b>	NIL		20% Max	NIL		20% Max
<b>Light source</b>	Red					
<b>Indicator</b>	Single LED (Orange) as output indicator			Single LED (Orange) as output indicator		
<b>Control output</b>	Relay NO/NC 240V AC / 30 VDC, 3A			NPN or PNP		
<b>Supply voltage</b>	AC/DC 24-240V, +/- 10% ripple			10 - 30V DC including +/- 10% ripple		
<b>Conformity</b>	JIS/C4525, CE, UL					
<b>Power consumption</b>	9.5VA	5VA		40mA without load		
<b>Connection : V3 series</b>	2 meter cable			2 meter cable, or M12 QD		
<b>V4 series</b>	Terminal chamber, applicable cable $\phi 6$ to $\phi 10$			Terminal chamber, applicable cable $\phi 6$ to $\phi 10$		
<b>Operating temp</b>	-25 to 55 °C					
<b>Operating humidity</b>	35 to 85 % RH					
<b>Storage temp</b>	-40 to 70 C / 35 - 95% RH					
<b>Sensitivity adjustment</b>	Single turn pot.					
<b>Protection category</b>	IEC 144, IP66					
<b>Shock resistance</b>	50G , XYZ 3-ways					
<b>Materials</b>	Glassfiber reinforced ABS (Case), PMMA (Lens)					

## Options

Standard reflector V-61

Small reflector V-42

Anti-cloud reflector V-60K

Connector cable  
6009 382



# Photoelectric Sensor SR-Q series

M8 QD type



Cable type

### Cable Type

(Sensing distance : 500mm)  
· SR-Q50NW NPN type  
· SR-Q50PW PNP type

### M8 Connector Type

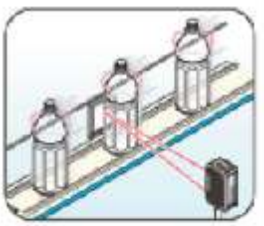
(Sensing distance : 500mm)  
· SR-Q50CNW NPN type  
· SR-Q50CPW PNP type

- **Ideal for sensing transparent objects.**
- **100G of shock resistance rating.**
- **V-45 small reflector, good for space saving.**
- **M8 QD types are available.**

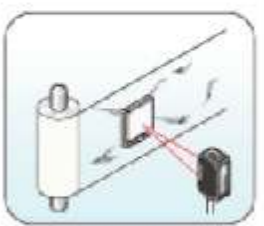
Photoelectric Sensor

C
E
J
J2
J3
V
V2
V3
V4
SR-Q
S
Z
BGS-Z
K
FGS-D
BGS-D
BGS-2S
Y
DM-18T
Accessory

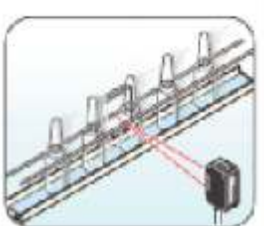
## Applications



Beverage industry



Packaging industry

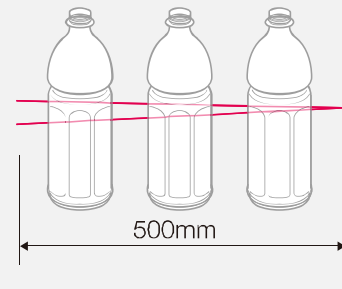


Pharmaceutical industry

## Features

### Stable detection of transparent objects.

PET bottles with any design / configuration are easily detected. The material of the bottle does not matter.  
CRT and TFT can be detected also.



### High durability to ambient noise

All sensors are designed to be resistant to electrical noise from relay contacts, inverters, electromagnetic fields, static, etc. The In-house testing (Failen Test) exceeds the IEC standard.



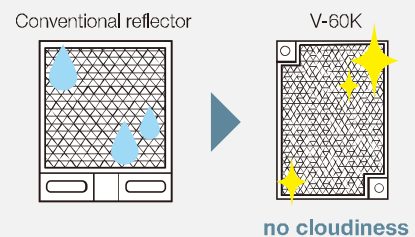
### Rigid mechanics

100G standard, tough enough to resist mechanical shock and vibration.



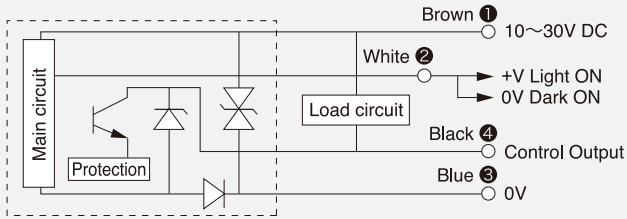
### V-60K (Anti-cloud reflector)

For high humidity conditions.

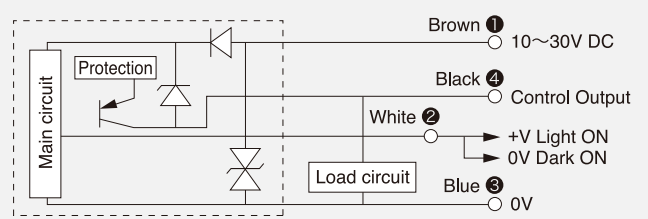


## Circuit diagram

### NPN output



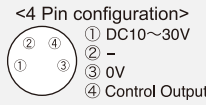
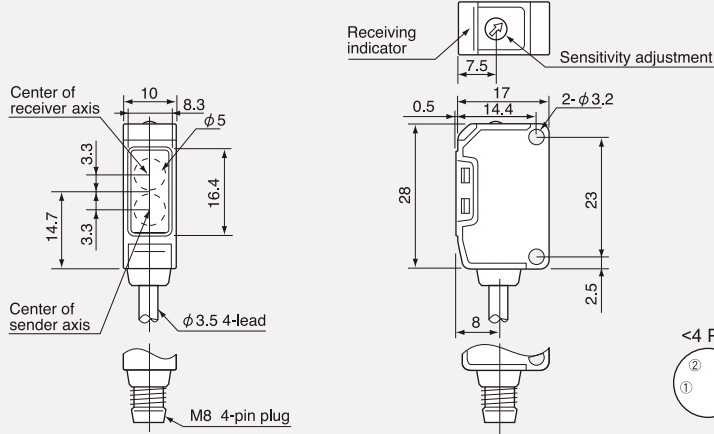
### PNP output



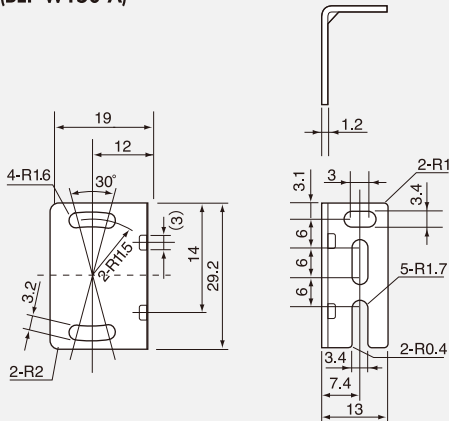
### Emitter



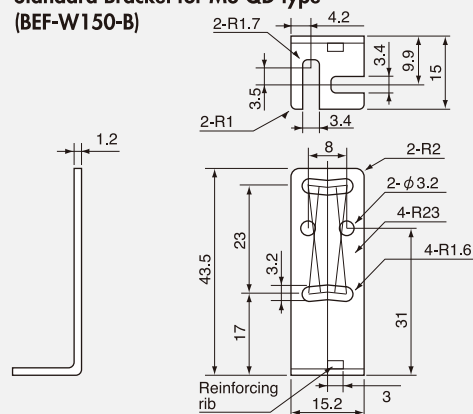
## Dimensions



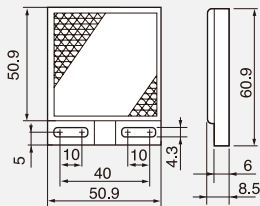
### Standard Bracket for cable type (BEF-W150-A)



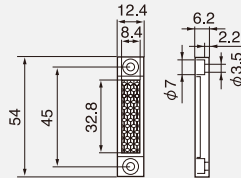
### Standard Bracket for M8 QD type (BEF-W150-B)



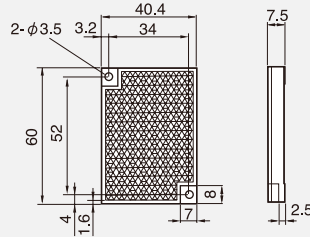
**Standard reflector V-61**



**Tiny reflector P-45**



**Anti-cloud reflector V-60K**



(Unit : mm)

## Specifications

Model	Cable type	Connector type
<b>NPN output</b>	SR-Q50NW	SR-Q50CNW
<b>PNP output</b>	SR-Q50PW	SR-Q50CPW
<b>Sensing distance</b>	500mm (With V-61)	
<b>Light source</b>	Red LED (660nm)	
<b>Response time</b>	0.5ms	
<b>Sensitivity adjustment</b>	Sensitivity volume adjustment (270 degrees)	
<b>Control output</b>	NPN/PNP open collector, max. 100mA/30VDC	
<b>Connection</b>	4-lead cable, 2m	M8 4-pin
<b>Insulation resistance</b>	20MΩ Max. (500VDC)	
<b>Supply voltage</b>	10 to 30VDC including 10% of ripple	
<b>Power consumption</b>	30mA max.	
<b>Noise resistance</b>	<b>JIS Standard</b>	C4525 500V
	<b>IEC Standard</b>	IEC801-2,3,4 Level 3
	<b>Temp/humidity</b>	-25 to 55°C/35 to 85%RH
<b>Operating</b>	<b>Environmental illuminance</b>	Sunlight 10,000 lux max. /Incandescent light 3,000 lux max.
	<b>Vibration resistance</b>	10 to 55Hz, Amplitude 1.5mm, X/Y/Z axis 2 hours
	<b>Shock resistance</b>	Approx. 100G (1000m/S <sup>2</sup> ). X/Y/Z axis 3 times on each
	<b>Protection category</b>	IP67
	<b>Material</b>	PSF+PBT
<b>Weight</b>	Approx. 5g (Without cable)	

## Options

**Standard reflector V-61**



**JCN-S : M8 Straight type**



JCN-S : 2 meter  
JCN-5S : 5 meter  
JCN-10S : 10 meter

**Tiny reflector P-45**



**JCN-L : M8 L-shape type**



JCN-L : 2 meter  
JCN-5L : 5 meter  
JCN-10L : 10 meter

**Anti-cloud reflector V-60K**



**Protective mounting brackets LS-S01**



**Sensor stand PLN-1**



**Fixture of Reflector PLN-1M**

**LS-S02**



C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

Y

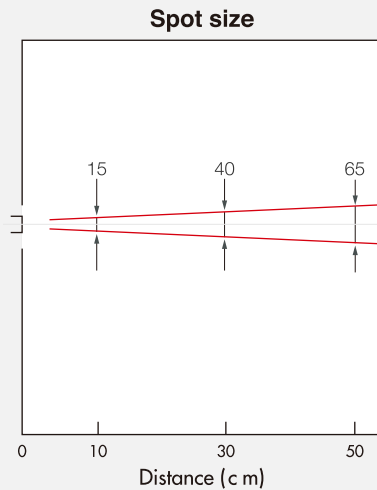
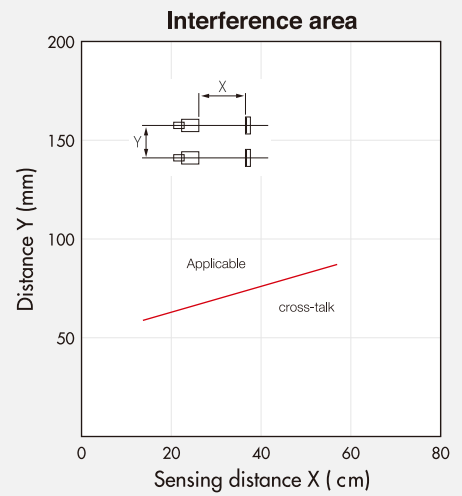
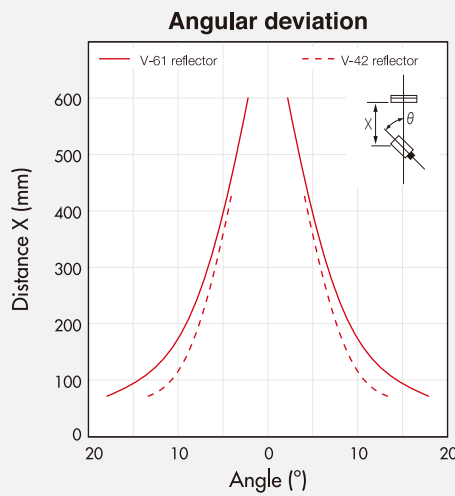
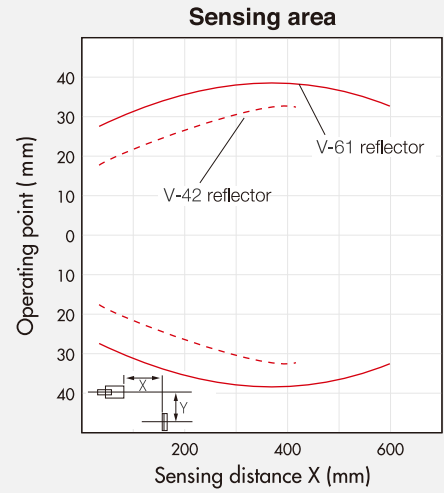
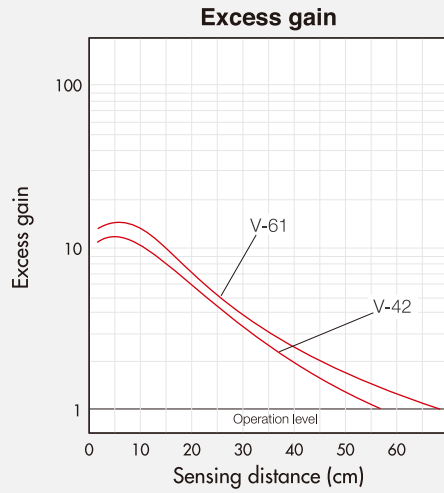
DM-18T

Accessory

Reference (typical)



SR-Q50NW



# Photoelectric Sensor S series



M8 QD type

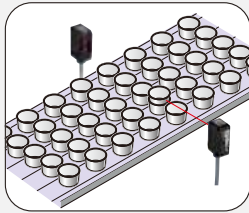
Cable type

**Thru-beam type**  
(Sensing distance : 4m)  
· ST-400N / P / CN / CP

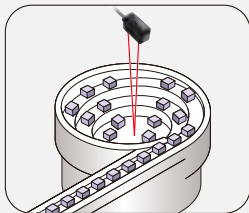
**Retro-reflective type with polarizing filter**  
(Sensing distance : 1.5m)  
· SR-150N / P / CN / CP

→  
Next page

## Applications



Double feeding of ice cream cup  
(ST-400)



Parts feeder  
(BGS-S08)

- **BGS functionality built into a small package!**
- **Built-in polarizing filter (Retro-reflective) type.**
- **100G shock resistance rating.**
- **M8 QD for all types.**

## Features

Extremely small BGS type sensors (BGS-S08 and S03) are only 17x10x20 mm. Ideal for use in OEM equipment such as Printed Circuit Board processing machines.

High rigidity for 100G shock resistance / IP67

Rigid design for high resistance to mechanical shock such as contact or collision.



0.5ms high speed response

High speed response even with transparent targets.



BGS-S03, with 1.5φ spot at 30mm distance



Photoelectric Sensor

C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

Y

DM-18T

Accessory

**Diffuse reflective type**

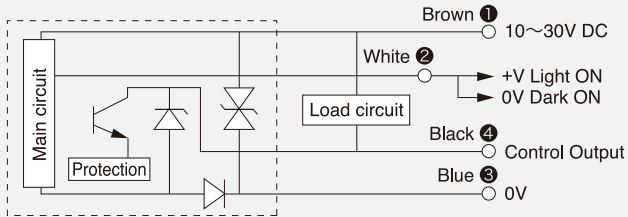
(Sensing distance : 200mm)  
· SR-20N / P / CN / CP

**BGS type**

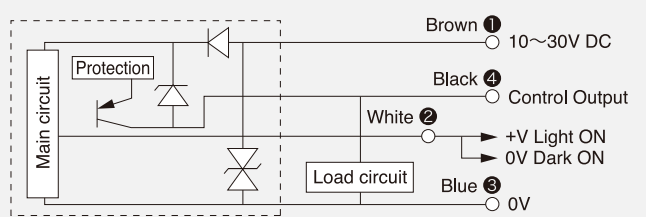
(Sensing distance : 10 to 80mm) (Sensing distance : 10 to 30mm)  
· BGS-S08N / P / CN / CP · BGS-S03N / P / CN / CP

**Circuit diagram**

**NPN output**



**PNP output**



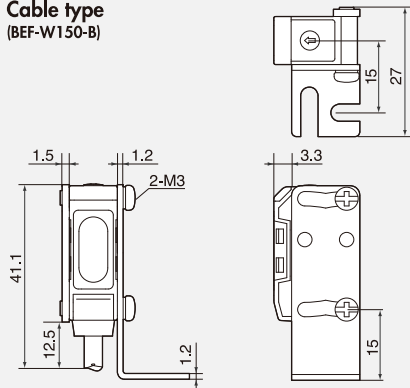
**Emitter**



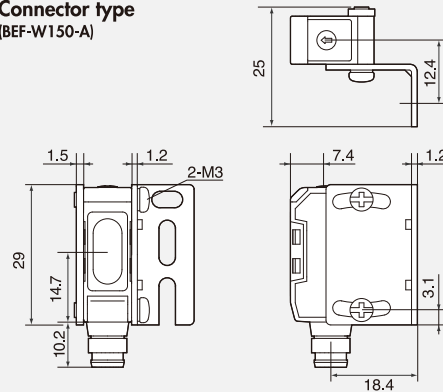
**Dimensions**

**S series**

**Cable type**  
(BEF-W150-B)

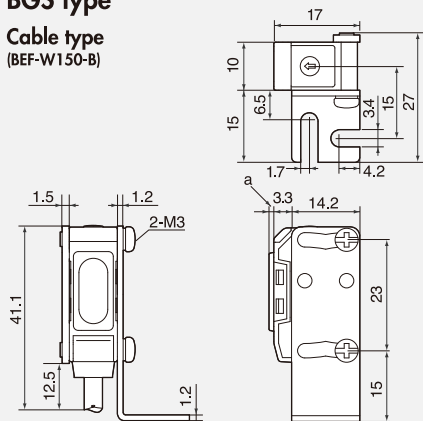


**Connector type**  
(BEF-W150-A)

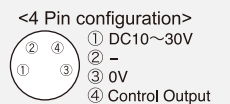
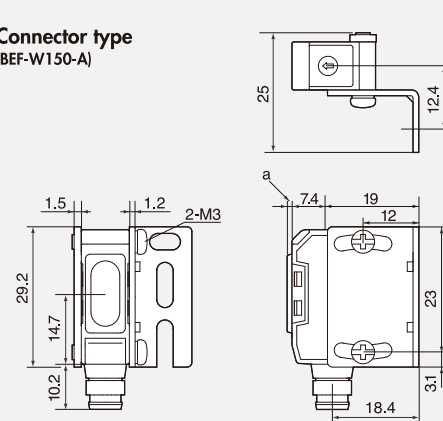


**BGS type**

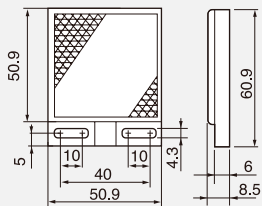
**Cable type**  
(BEF-W150-B)



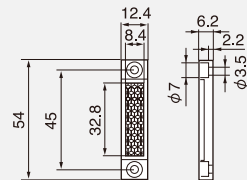
**Connector type**  
(BEF-W150-A)



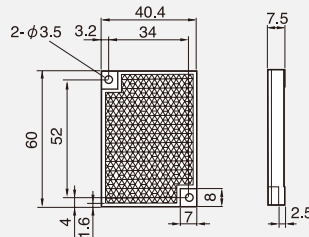
Standard reflector V-61



Tiny reflector P-45



Anti-cloud reflector V-60K



(Unit : mm)

## Specifications

Model	Thru-beam	Retro-reflective with polarizing Filter	Diffuse reflective	BGS	
<b>Cable type</b>	<b>NPN</b> ST-400N	SR-150N	SD-20N	BGS-S08N	BGS-S03N
	<b>PNP</b> ST-400P	SR-150P	SD-20P	BGS-S08P	BGS-S03P
<b>Connector type</b>	<b>NPN</b> ST-400CN	SR-150CN	SD-20CN	BGS-S08CN	BGS-S03CN
	<b>PNP</b> ST-400CP	SR-150CP	SD-20CP	BGS-S08CP	BGS-S03CP
<b>Sensing distance</b>	4 m	1.5 m	200 mm	10 to 80 mm	10 to 30 mm
<b>Supply voltage</b>	10 to 30V DC including 10% of ripple				
<b>Power consumption</b>	30mA	20mA Max			
<b>Hysteresis</b>	—		20% MAX	10% MAX	
<b>Minimum detectable object</b>	φ 6 opaque object	□45mm opaque object	—		
<b>Response time</b>	0.5msec Max				
<b>Control output</b>	NPN or PNP Open collector, 100mA Max / 30V DC				
<b>Operating mode</b>	Light ON / Dark ON selectable				
<b>Sensitivity adjustment</b>	1-turn potentiometer			5-turn potentiometer	
<b>LED Indicator</b>	Red				
<b>Operating temp / humidity</b>	-25 to +55°C / 35 to 85%RH				
<b>Protection category</b>	IP67				
<b>Environmental illuminance</b>	Sun Light:10,000 lux max. Incandescent lamp:3,000 lux max.				
<b>Shock resistance</b>	100G (1,000m/S <sup>2</sup> ) X,Y,Z, axis 3 times				
<b>Vibration resistance</b>	10 to 55 Hz amplitude 1.5mm, X-Y-Z for 2 hours				
<b>Connection</b>	"Cable type: Cable length 2m φ 3.5mm (Longer cable type of 5m is available as option) Connector type: M8 x 4-pin connector"				

## Options

Standard reflector V-61



Tiny reflector P-45



Anti-cloud reflector V-60K



JCN-S : M8 Straight type



JCN-S : 2 meter  
JCN-5S : 5 meter  
JCN-10S : 10 meter

JCN-L : M8 L-shape type



JCN-L : 2 meter  
JCN-5L : 5 meter  
JCN-10L : 10 meter

Protective mounting brackets.

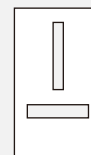
L-shape type  
LS-S01



Straight type  
LS-S02



BL-150-10  
Slit mask for ST-400



C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z

BGS-Z

K

FGS-D

BGS-D

BGS-2S

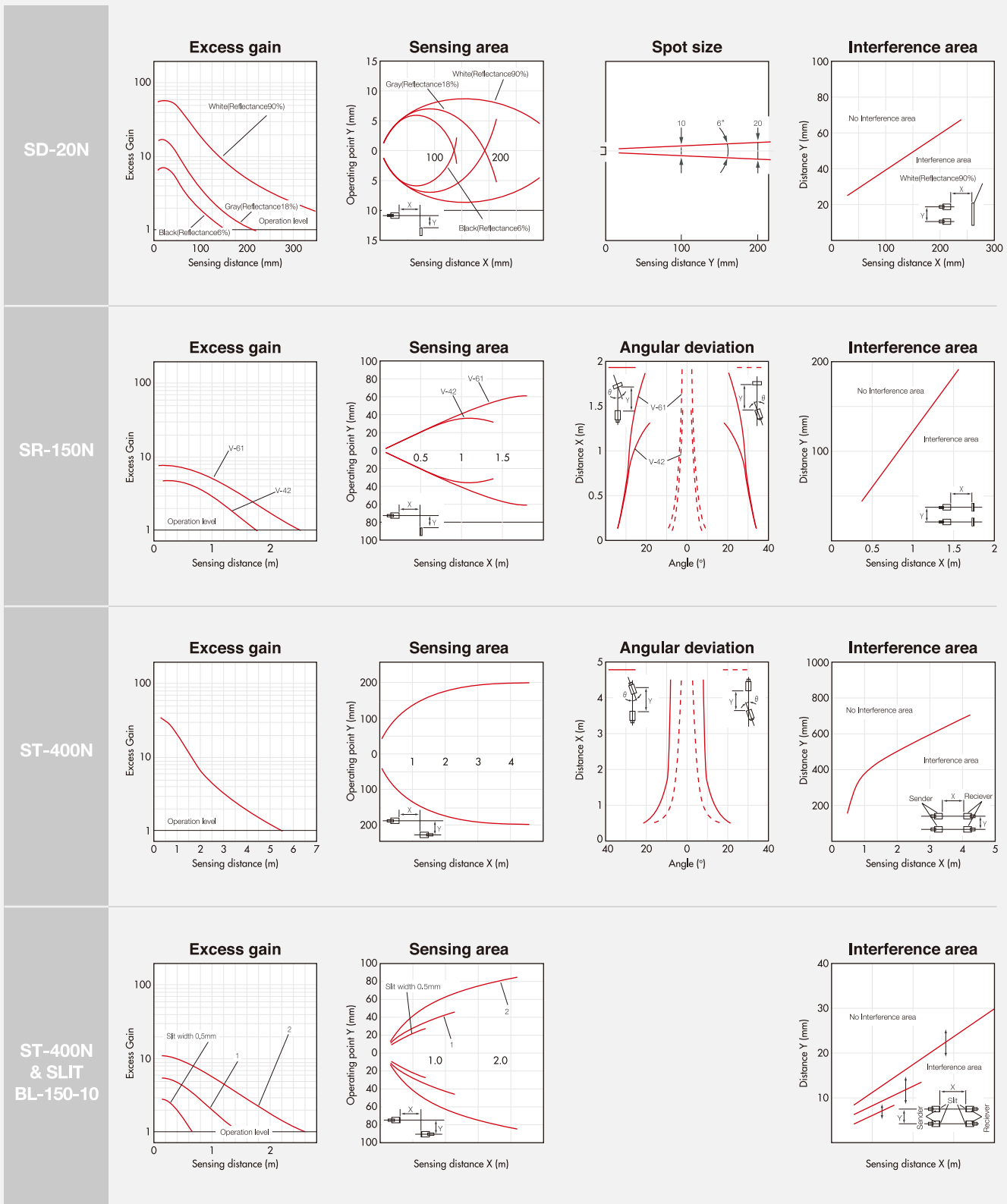
Y

DM-18T

Accessory



**Reference (typical)**



- C
- E
- J
- J2
- J3
- V
- V2
- V3
- V4
- SR-Q
- S
- Z
- BGS-Z
- K
- FGS-D
- BGS-D
- BGS-2S
- Y
- DM-18T
- Accessory



M8 QD type

Cable type

# Photoelectric Sensor Z / BGS-Z series

### Thru-beam type

(Sensing distance : 12m)  
· ZT-1200N / P / CN / CP

### Polarized Retro-reflective

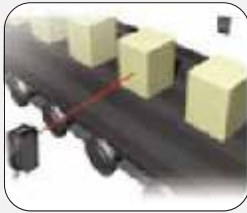
(Sensing distance : 3.5m)  
· ZR-350N / P / CN / CP

### Diffuse-reflective

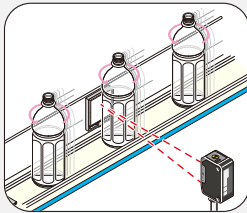
(Sensing distance : 70cm)  
· ZD-70N / P / CN / CP

→  
Next page

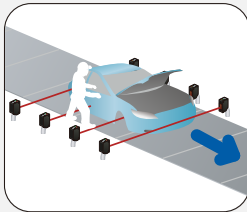
## Applications



For material handling  
(ZR-350)



Beverage industry  
(ZR-QX200)



Car on the production line  
(ZT-1200)



PCB  
(BGS-Z10N)

- **High Performance, Low Cost! All models offer cost and space savings.**
- **ZR-Q series. Ideal for detection of transparent objects! Plastic bottles, film, etc.**
- **ZR-X/QX series, Coaxial beam. Sensing through narrow opening is possible!**
- **BGS-Z series. High performance in small package!! Tough sensor! 100G shock resistance and IP67 ratings.**

## Features

### Thru-Beam type



ZT-1200N / ZT-1200P  
ZT-1200CN / ZT-1200CP

### Convergent type



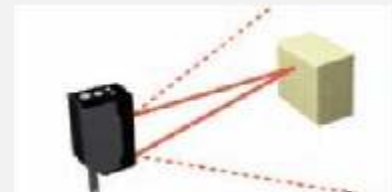
ZD-L09N / ZD-L09P  
ZD-L09CN / ZD-L09CP

### Retro Reflective type



ZR-350N / ZR-350P  
ZR-350CN / ZR-350CP

### Diffuse type (incl, divergent type)



Sensor stand  
Diffuse PLN-1  
ZD-70N / ZD-70P  
ZD-70CN / ZD-70CP  
Fixed Reflector  
Divergent PLN-1M  
ZD-W20N / ZD-W20P  
ZD-W20CN / ZD-W20CP

### BGS type



BGS-Z30N / BGS-Z30P  
BGS-Z30CN / BGS-Z30CP  
BGS-Z10N / BGS-Z10P  
BGS-Z10CN / BGS-Z10CP

### Coaxial LED type



General use  
ZR-X250N / ZR-X250P  
ZR-X250CN / ZR-X250CP  
Transparent objects  
ZR-QX200N / ZR-QX200P  
ZR-QX200CN / ZR-QX200CP

C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

Y

DM-18T

Accessory

**Convergent**

 (Sensing distance : 1-9cm)  
 · ZD-L09N / P / CN / CP

**Divergent**

 (Sensing distance : 0-200mm)  
 · ZD-W20N / P / CN / CP

**Glass detection**

 (Sensing distance : 2m)  
 · ZR-Q200N / P / CN / CP

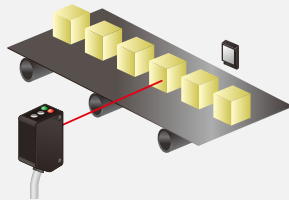
## General Purpose

- **100G shock resistance, IP67 ratings. Tough sensor !**
- **ZR-Q series, ideal for detection of PET bottles, transparent objects, etc.**
- **Standard models for cost saving.**

## Features

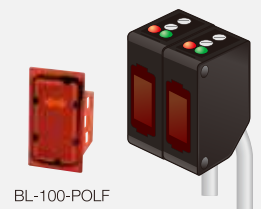
### 500μsec response

Good for fast moving objects.



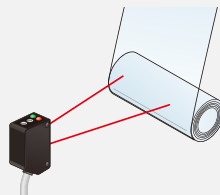
### Cross-talk prevention

With built-in cross-talk prevention, it is possible to mount two sensors side-by-side without mutual interference. (Use part number BL-100-POLF for thru-beam type sensors.)



### ZD-W20 wide angle applications

The Divergent type ZD-W20 provides a wide angle beam that can be used to detect transparent film by collecting the reflected light from the material surface.



### IP67 rating

 Hose it down!  
 Water-tightness is tested to IP67.


### Rugged 100G shock rating

Rigid design for high resistance to mechanical shock



### Threaded mounting holes

Prevents sensor from being damaged when it's mounted.



## Specifications

Model	Thru-beam	Polarized Retro-reflective	Diffuse-reflective	Convergent	Divergent	Glass detection	
Cable type	NPN	ZT-1200N	ZR-350N	ZD-70N	ZD-L09N	ZD-W20N	ZR-Q200N
	PNP	ZT-1200P	ZR-350P	ZD-70P	ZD-L09P	ZD-W20P	ZR-Q200P
M8 Connector type	NPN	ZT-1200CN	ZR-350CN	ZD-70CN	ZD-L09CN	ZD-W20CN	ZR-Q200CN
	PNP	ZT-1200CP	ZR-350CP	ZD-70CP	ZD-L09CP	ZD-W20CP	ZR-Q200CP
Sensing distance	12 m	3.5m (V-61 reflector)	70cm	1-9 cm	1-200 mm	2 m (V-61 reflector)	
Response time	0.5 msec						
Spot size	1.5m @ 12 meter	350mm @ 3.5 meter	100mm @ 700mm	12mm @ 90mm	30mm @ 50mm	300mm @ 2 meter	
Operating mode	Light On/Dark On selectable						
Hysteresis	NIL		20% Max	10% Max	20% Max	NIL	
Light source	Red LED						
Sensitivity adjustment	1-turn trimmer (240 degree)						
Control output	NPN or PNP Open collector, 100mA Max / 30V DC						
Supply voltage	DC 10 - 30V incl. 10% ripple						
Power consumption	20mA Max						
LED Indicator	Dual Indicator (Output : orange, Stable : green)						
Protection category	IP67						
Shock resistance	100G (1,000m/S <sup>2</sup> )						
Environmental illuminance	Sunlight : 10,000 lux Max., Incandescent lamp : 3,000 lux max.						
Operating temp/humidity	-25 to 55°C / 35 to 85%RH						
Materials	ABS with glass fiber (Case), PMMA (Lens)						

**Retro Reflective (General Use)**

(Sensing distance : 0.01-2m)  
· ZR-Q200N / P / CN / CP

**Retro Reflective (Coaxial Beam)**

(Sensing distance : 0-2m)  
· ZR-QX200N / P / CN4 / CP4

**Polarized Retro-reflective**

(Sensing distance : 0-2.5m)  
· ZR-X250N / P / CN4 / CP4

→  
Next page

## Retro-Reflective with Coaxial LED

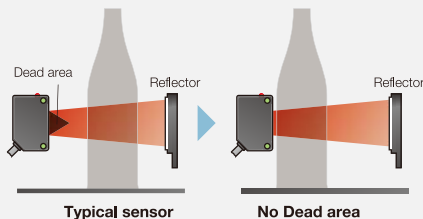
The best for transparent Plastic / Glass detection

- **Coaxial LED source gives extremely tight alignment to the target.**
- **Alignment of sensor is easy thanks to bright projected LED spot.**
- **250 μsec fast response (ZR-X, coaxial beam type)**
- **World's standard model ZR-Q (general type) and ZR-QX (coaxial beam type) for Plastic and Glass applications.**

### Features

#### Zero dead area!

The sensor has no dead area in the sensing field. This makes it ideal for use on conveyors where the position of the target changes.



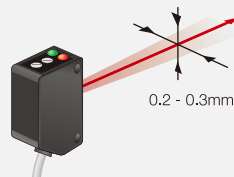
#### Good selection of sensors for various types of bottles.

Glass and plastic bottles come in various shapes / sizes and with many different contours which require testing in the field to determine the best sensor for the application. The Z series is offered with both Coaxial and Conventional LED light sources to provide a solution for the detection of any bottle type.



#### Repeat Accuracy

Very tight Repeat Accuracy, 0.2 - 0.3mm for BGS type. Even Thru-beam and Retro types have 0.3mm Repeat Accuracy(\*).  
\* = Tested at the middle point of sensing range.



#### Coaxial LED

Coaxial LED light source provides extremely tight alignment to the target, Alignment of sensor is very easy thanks to bright projected LED spot.



### Specifications

Model		Retro Reflective for Transparent				Polarized Retro-reflective (Coaxial Beam)	
		General Use		Coaxial Beam		2m Cable	M8QD 4pin
		2m Cable	M8QD 4pin	2m Cable	M8QD 4pin		
Type	NPN / PNP	ZR-Q200N / ZR-Q200P	ZR-Q200CN / ZR-Q200CP	ZR-QX200N / ZR-QX200P	ZR-QX200CN4 / ZR-QX200CP4	ZR-X250N / ZR-X250P	ZR-X250CN4 / ZR-X250CP4
Sensing distance		0.01 - 2 meter (V-61 reflector)		0 - 2 meter (P250F reflector)		0 - 2.5 meter (V-61 reflector)	
Response time		0.5 msec				250μs	
Spot size		φ300mm / at 2m		φ60mm / at 2m		φ60mm / at 2m	
Operating mode		Light On / Dark On selectable					
LED Indicator		Output : orange, Stable : green		Output : orange		Output : orange, Stable : green	
Light source		Red LED					
Sensitivity adjustment		1-turn pot.					
Control output		NPN or PNP open collector, 100mA max / DC30V					
Supply voltage		DC 10 - 30V, including 10% ripple					
Power consumption		20mA max					
Protection category		IP 67					
Shock resistance		100G (1,000m/S <sup>2</sup> )					
Environmental illuminance		Sunlight : 10,000 lux max., Incandescent lamp : 3,000 lux max					
Operating temp/humidity		-25 to 55°C / 35 to 85% RH					
Materials		ABS(Case), PMMA(Lens)					

"M8-QD in 3 pins for European machines " are available with extension code of -CN(P)3, for instance, "ZR-QX200CN3".

- C
- E
- J
- J2
- J3
- V
- V2
- V3
- V4
- SR-Q
- S
- Z BGS-Z
- K
- FGS-D
- BGS-D
- BGS-2S
- Y
- DM-18T
- Accessory

**Long distance**

 (Sensing distance : 10-300mm)  
 • BGS-Z30N / P / CN / CP

**Short distance**

 (Sensing distance : 5-100mm)  
 • BGS-Z10N / P / CN / CP

## BGS - LED Type

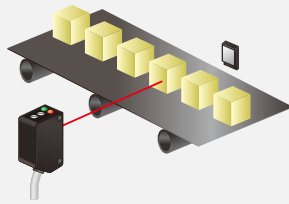
### General purpose applications

- **BGS (Background Suppression Type) Sensors are not influenced by the background, available with conventional LED light source.**

### Features

#### 500μsec response

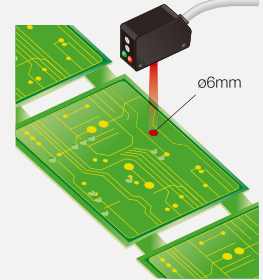
Good for fast moving objects.



#### Large projected spot size

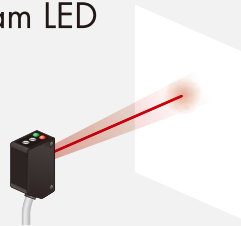
The LED version of the BGS sensors projects a large 6 mm spot that will not be affected by small holes in a PC board.

For PC boards that may have larger holes, the BGS-Z30 has an 18 mm projected spot size.



#### High power narrow beam LED

LED beam spot can be seen easily even in bright environment that helps installation.



#### 4 Turn adjustment pot.

A four turn adjustment pot, is built-in for precise adjustment of the sensing distance.

The potentiometer has a slip clutch that protects it from damage when it is turned past the end.



## Specifications

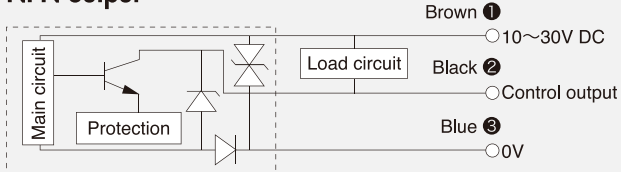
Model	long distance		short distance	
	2m Cable	M8QD 4pin	2m Cable	M8QD 4pin
Type	NPN	BGS-Z30N	BGS-Z30CN	BGS-Z10N
	PNP	BGS-Z30P	BGS-Z30CP	BGS-Z10CN
BGS-2S		BGS-Z10CP		BGS-Z10CP
Adjustable distance	50 - 300 mm (*1)		20 -100 mm (*1)	
Sensing distance	10 - 300 mm (*1)		5 -100 mm (*1)	
Response time	500μs			
Spot size	φ30mm / 300mm		φ10mm / 100mm	
Hysteresis (white to white)	5%		3%	
Operating mode	Light On / Dark On selectable			
LED Indicator	Output : orange, Stable : green			
Light source	Red LED			
Sensitivity adjustment	4-turn, endless pot.			
Control output	NPN or PNP open collector, 100mA max / DC30V			
Supply voltage	DC 10 - 30V, including 10% ripple			
Power consumption	30mA max			
Protection category	IP 67			
Shock resistance	100G (1,000m/S <sup>2</sup> )			
Environmental illuminance	Sunlight : 10,000 lux max., Incandescent lamp : 3,000 lux max			
Operating temp / humidity	-25 to 55oC / 35 to 85% RH			
Materials	ABS(Case), PMMA(Lens)			

\*M8-QD in 3 pins for European machines" are available with extension code of -CN(P)3, for instance, "ZR-QX200CN3".

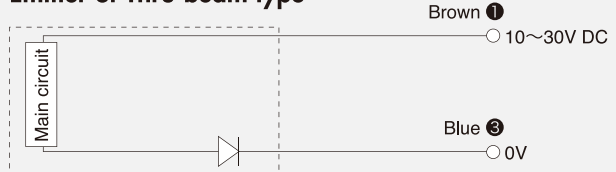
\*1 white paper 100 X 100mm

## Circuit diagram

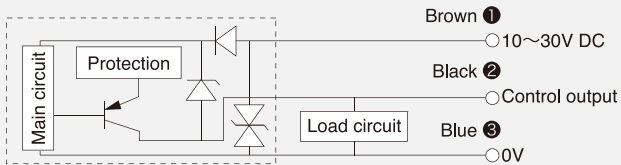
### NPN output



### Emitter of Thru-beam type

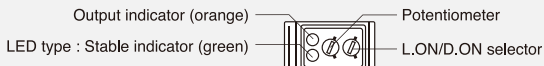


### PNP output

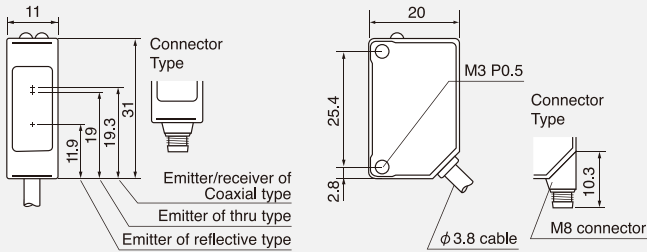


## Dimensions

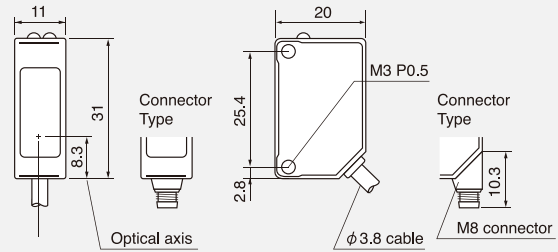
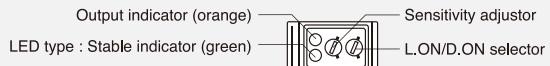
### General Use Type except BGS



Remark : ZR-QX type (coaxial beam for transparent detection) has single LED (orange for output indicator).



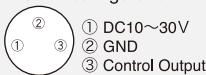
### BGS Type



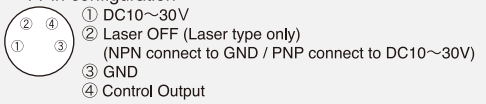
#### <Cable>

- Brown : DC10~30V
  - Blue : GND
  - Black : Control Output
  - Gray : Laser OFF (Laser type only)
- (NPN connect to GND / PNP connect to DC10~30V)

#### <3 Pin configuration>

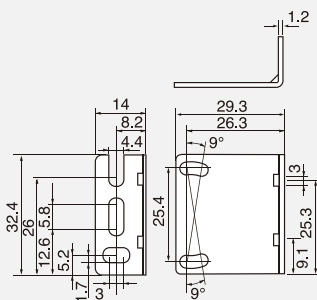


#### <4 Pin configuration>



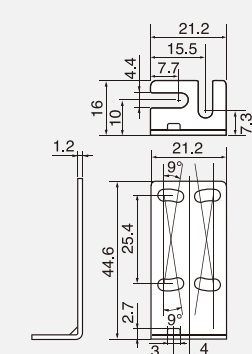
### Standard bracket BEF-W-100-A

Accessory for M8 QD type sensors

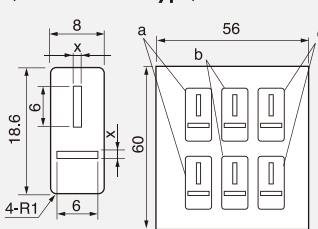


### Standard bracket BEF-W-100-B

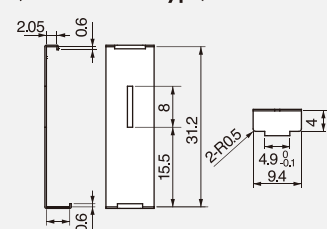
Accessory for cabled type sensors



### Slit mask BL-160-SK (for Thru-beam type)



### Metal (SUS) Slit mask BL-100-M1 (for Thru-Beam Type)

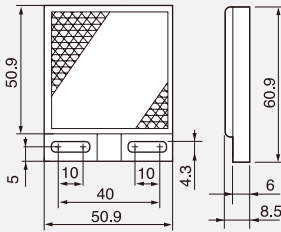


Type	Size	Attached to	Object size (Min)	Scanning range
Slit a	0.5mm	Receiver, Emitter	0.4mm	0.8mm
Slit b	1mm	Receiver, Emitter	0.6mm	2.5mm
Slit c	2mm	Receiver, Emitter	1.5mm	5mm

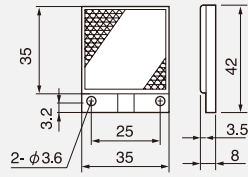
(Unit : mm)

**Reflectors for LED Type**

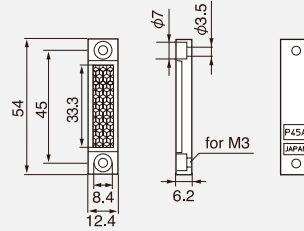
**Standard reflector V-61**  
(Standard, LED type)



**Small reflector V-42**  
(Optional, LED type)

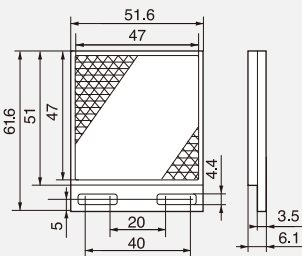


**Tiny reflector P-45A**  
(Optional, LED type)

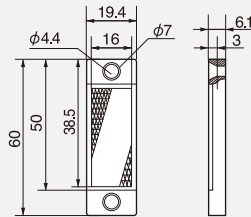


**Reflectors for Coaxial LED Type**

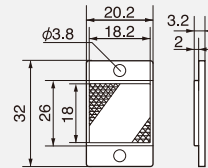
**P250F**  
(Standard, ZR-QX200)



**PL20F**  
(Optional)



**PL10F**  
(Optional)



**Detection distance by reflectors**

	P250F	PL20F	PL10F
ZR-QX	4.0	2.8	1.0

(Unit : meter)

**Options**

**Standard reflector V-61**  
(Except ZR-QX200)



**P250F (ZR-QX200, standard)**



**JCN-S : M8 Straight type**



JCN-S : 2 meter  
JCN-5S : 5 meter  
JCN-10S : 10 meter

**Small reflector V-42**



**PL20F (Optional)**

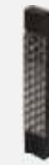


**JCN-L : L-shape M8 type**



JCN-L : 2 meter  
JCN-5L : 5 meter  
JCN-10L : 10 meter

**Tiny reflector P-45**



**PL10F (Optional)**



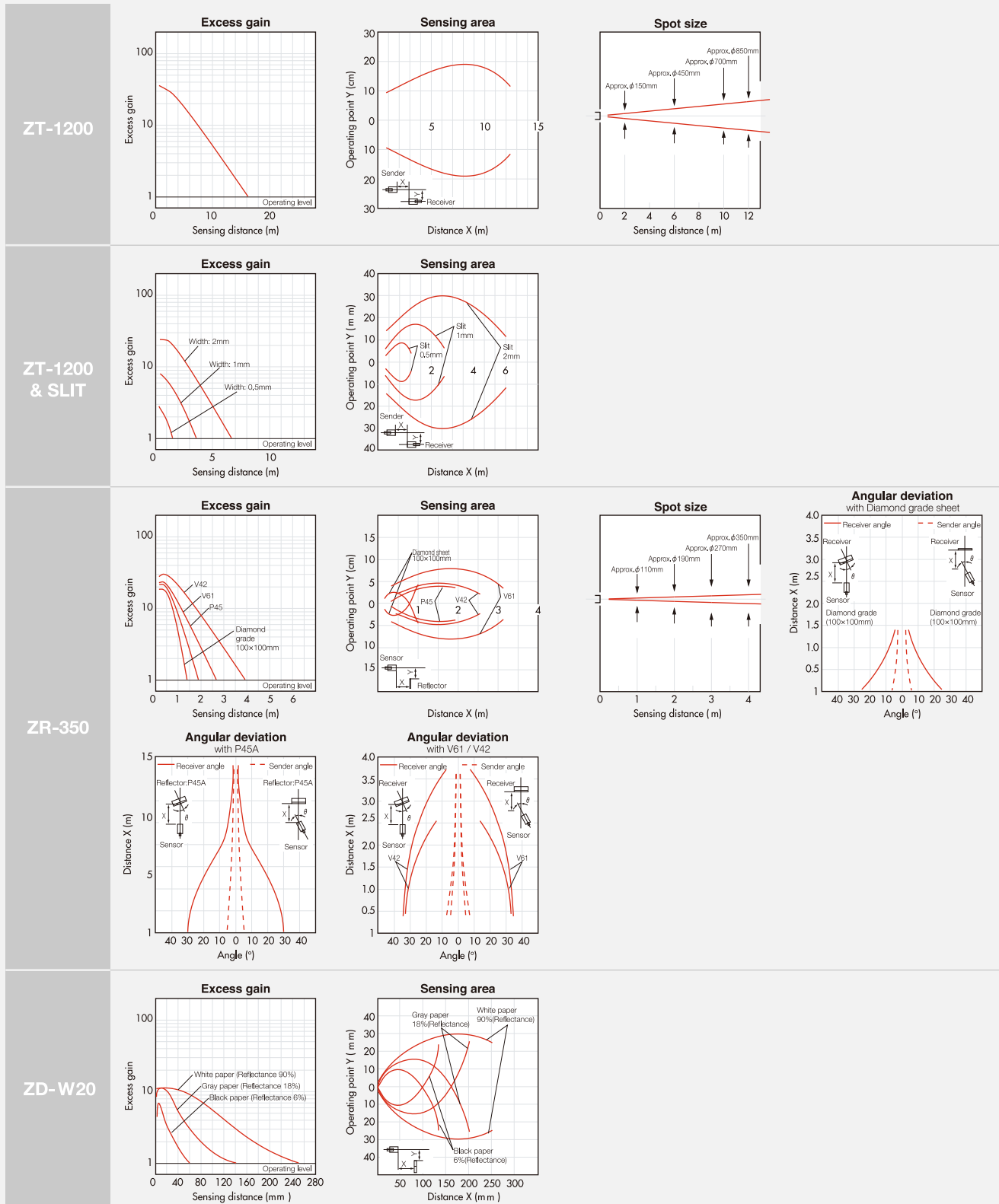
**Protective mounting brackets**  
LK-S01 LK-S02



**BL-100-POLF: Cross-talk prevention filter for ZT-1200**



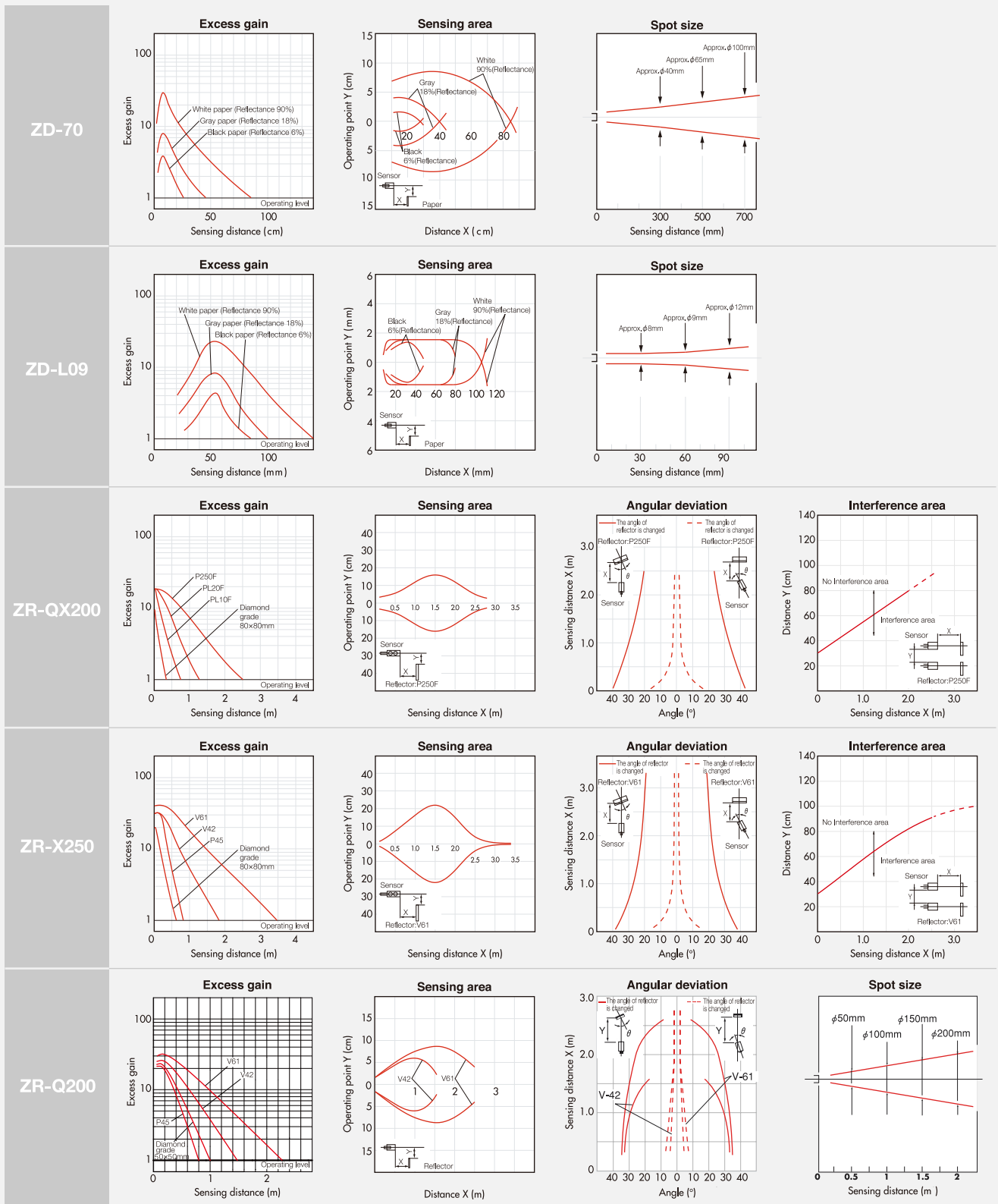
**Reference (typical)**



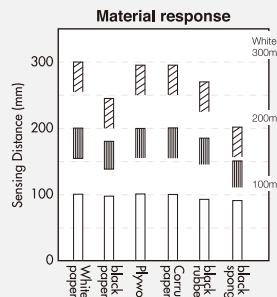
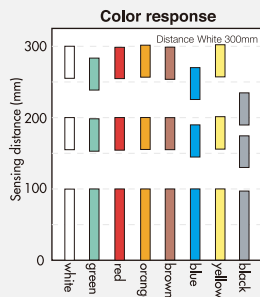
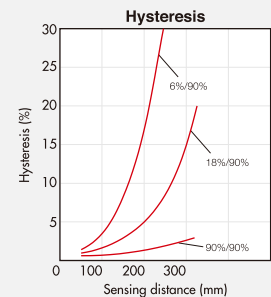
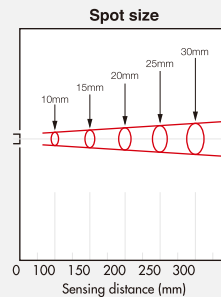
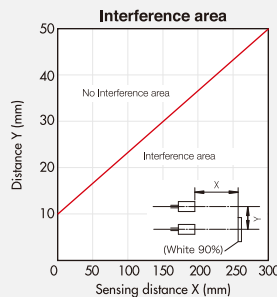
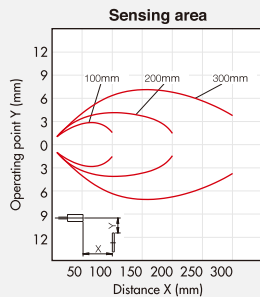
C
E
J
J2
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V
V2
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V4
SR-Q
S
Z BGS-Z
K
FGS-D
BGS-D
BGS-2S
Y
DM-18T
Accessory



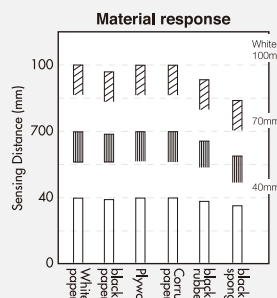
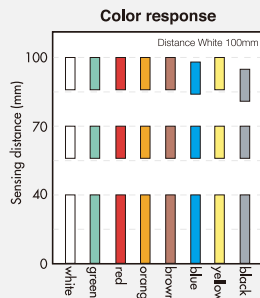
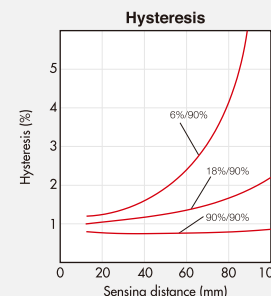
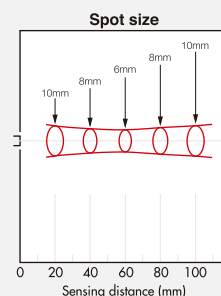
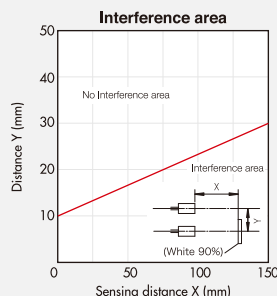
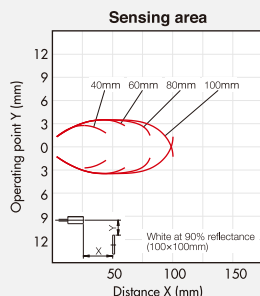
Reference (typical)



Reference (typical)



BGS-Z30



BGS-Z10

C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z

BGS-Z

K

FGS-D

BGS-D

BGS-2S

Y

DM-18T

Accessory



# Photoelectric Sensor K series

### Thru-beam type

(Sensing distance : 7m)  
• KT-700N / P / CN / CP

### Retro-reflective type with polarizing filter

(Sensing distance : 2.5m)  
• KR-250N / P / CN / CP

### Diffuse reflective type

(Sensing distance : 40cm)  
• KD-40N / P / CN / CP

## Applications



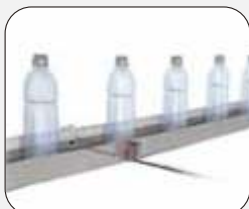
**PET bottles moving on a conveyor**



**Pallet of PET bottles**



**Counting PET bottles**



**Sensing PET bottles through a narrow opening**

- **Ideal for the detection of Glass/PET products. (KR-Q50 / KR-Q150 / KR-Q300)**
- **Test input to verify operation. (KT-700 Thru-beam type)**
- **IP67 rating, rugged design.**

## Features

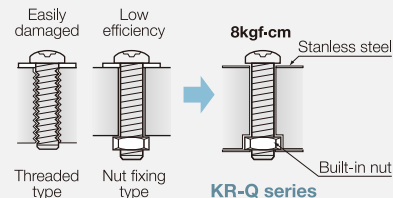
### Stainless steel housing.

The stainless steel housing helps to protect the sensor against mechanical damage if it is struck by passing objects.



### Built-in mounting nuts.

The built-in mounting nuts make installation easy and efficient, the problem of damaged threads due to over-tightening has been eliminated.



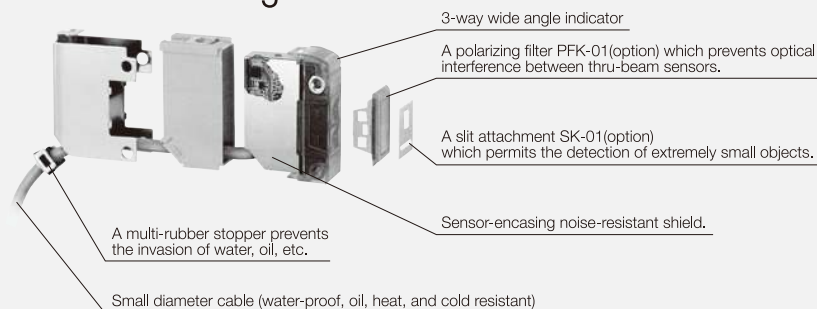
### Surpasses the VDE standard for electrical noise immunity.

The noise resistant internal circuitry is designed in accordance with the strict VDE standard.

Further, in-house Feilen Noise testing assures high reliability and compliance with international standards.



## Case and housing



**Convergent type**

(Sensing distance : 1 - 9cm)  
· KD-L09N / P / CN / CP

**Transparent object detection type**

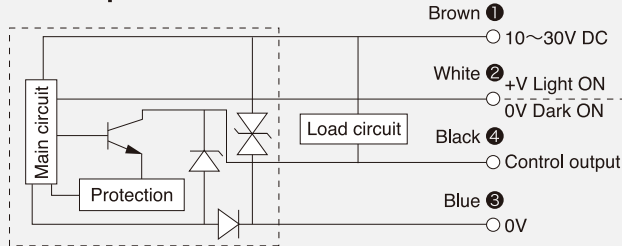
(Sensing distance : 3m)  
· KR-Q300NW / PW / CNW / CPW

(Sensing distance : 1.5m)  
· KR-Q150NW / PW / CNW / CPW

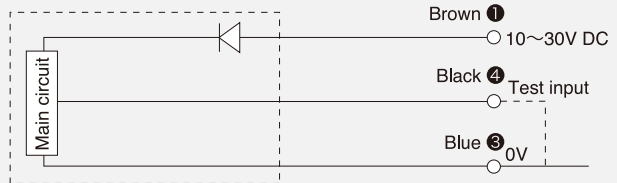
(Sensing distance : 50cm)  
· KR-Q50NW / PW / CNW / CPW

**Circuit diagram**

**NPN output**

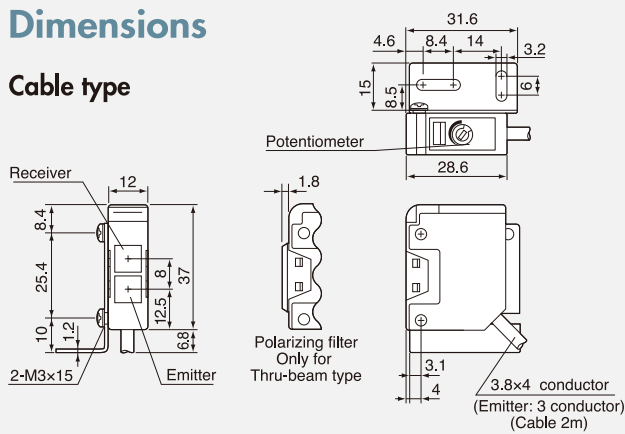


**Emitter of Thru-beam type**

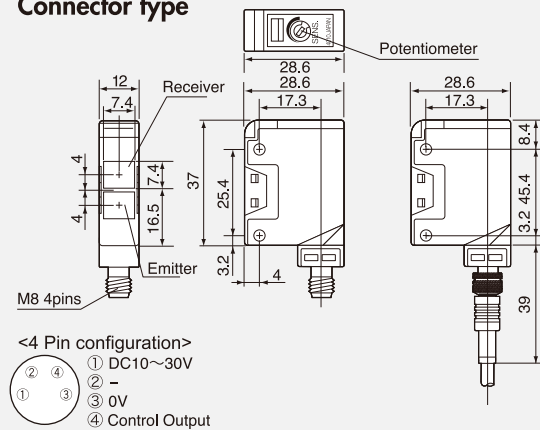


**Dimensions**

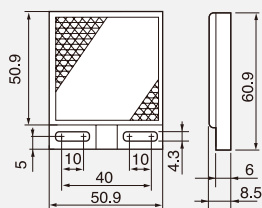
**Cable type**



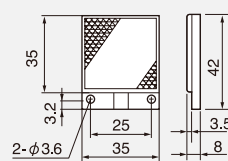
**Connector type**



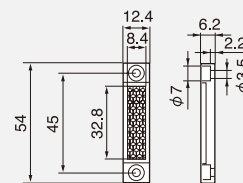
**Standard reflector V-61**



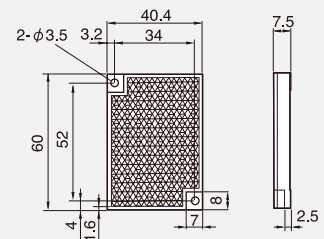
**Small reflector V-42**



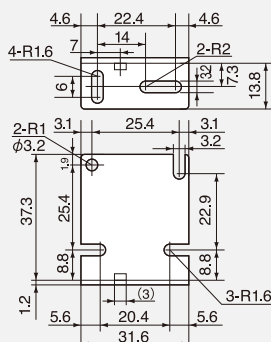
**Tiny reflector P-45**



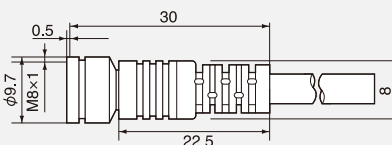
**Anti-cloud reflector V-60K**



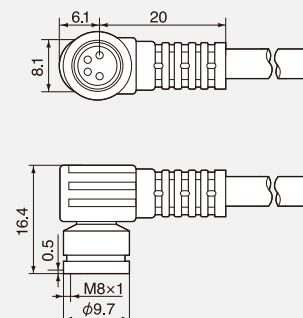
**BEF-W170**



**JCN-S : M8 Straight type**



**JCN-L : M8 L-shape type**



(Unit : mm)

C
E
J
J2
J3
V
V2
V3
V4
SR-Q
S
Z
BGS-Z
K
FGS-D
BGS-D
BGS-2S
Y
DM-18T
Accessory

## Specifications

Model		Thru-beam	Retro-reflective with polarizing Filter	Diffuse reflective	Convergent	Glass sensing			
Cable type	NPN	KT-700N	KR-250N	KD-40N	KD-L09N	KR-Q50NW	KR-Q150NW	KR-Q300NW	
	PNP	KT-700P	KR-250P	KD-40P	KD-L09P	KR-Q50PW	KR-Q150PW	KR-Q300PW	
Connector type	NPN	KT-700CN	KR-250CN	KD-40CN	KD-L09CN	KR-Q50CNW	KR-Q150CNW	KR-Q300CNW	
	PNP	KT-700CP	KR-250CP	KD-40CP	KD-L09CP	KR-Q50CPW	KR-Q150CPW	KR-Q300CPW	
Sensing distance		7 m	2.5 m	40 cm	1 - 9 cm	50 cm	1.5 m	3 m	
Light source		Red							
Min detectable object		φ7mm	—	φ40mm	—	φ2.5mm (steel wire)			
Response time		1msec Max	0.7msec Max						
Hysteresis		NIL		20% Max	10% Max	NIL			
Sensitivity adjustment		Not equipped		Single turn potentiometer					
LED Indicator		Single Indicator							
Control output		NPN or PNP Open collector, 100mA Max / 30V DC							
Test input		Equipped	Not equipped						
Operating mode		Light ON / Dark ON selectable							
Insulation resistance		Min. 20 M Ohm / DC500V							
Supply voltage		10 to 30 V DC including 10% of ripple							
Power consumption		35mA Max	30mA Max						
Conformity		JIS, UL, CE, VDE							
Operating temp / humidity		-25 to +55°C / 35 to 85%RH							
Environmental illuminance		Sun Light:20,000 lux max. Incandescent lamp:4,000 lux max.							
Vibration resistance		10 50 55 Hz amplitude 1.5mm, X-Y-Z for 2 hours							
Protection category		IEC 144 IP67, VDE Level 3							
Material		ABS (Case), PC (Lens), SUS304 (Cover)							
Weight (Net)		25g (20g for emitter of thru-beam type)					25g		

## Options

**Standard reflector V-61**

**Small reflector V-42**

**Tiny reflector P-45**

**Anti-cloud reflector V-60K**

**JCN-S : M8 Straight type**

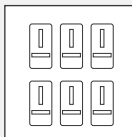

JCN-S : 2 meter  
JCN-5S : 5 meter  
JCN-10S : 10 meter

**JCN-L : L-shape M8 type**


JCN-L : 2 meter  
JCN-5L : 5 meter  
JCN-10L : 10 meter

**Protective mounting brackets  
LK-S01 LK-S02**

**Sensor stand  
PLN-1**

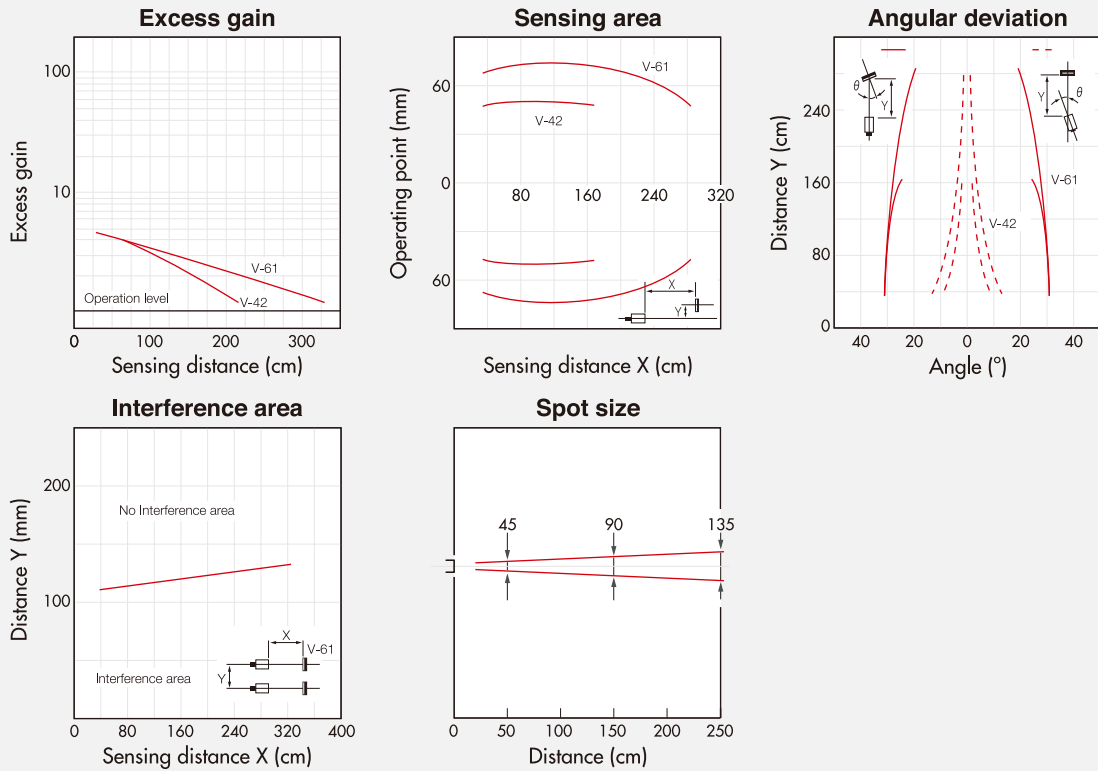
**Fixture of Reflector  
PLN-1M**
**SK-01 : Slit**

**PKF-01 : Filter**


	Slit SK-01 (Emitter + receiver)	Pol.filter PKF-01	Slit + filter
Sensing distance	1000mm	1000mm	500mm
Min.dia	φ1mm	φ7mm	φ1mm

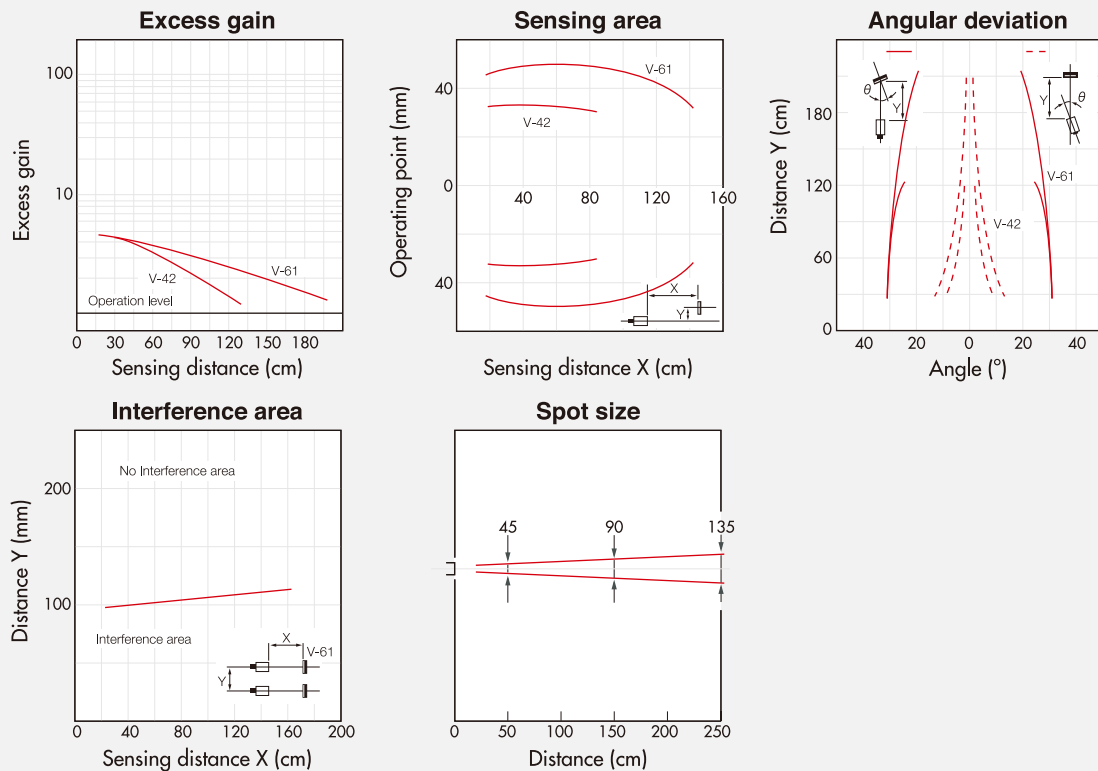
\*Just peel the sticker off the backing and apply to the surface of the sensor.

**Reference (typical)**

KR-Q300NW



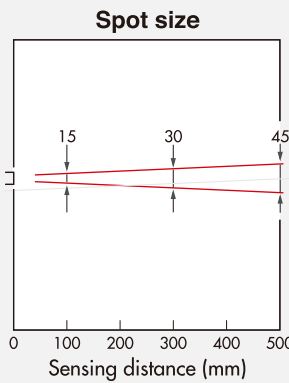
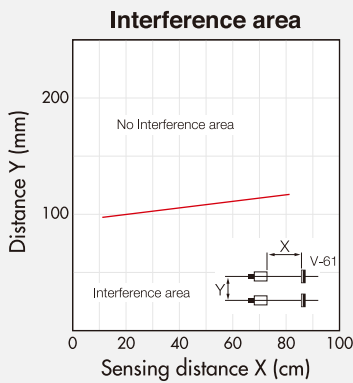
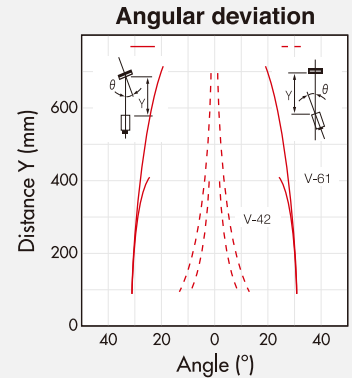
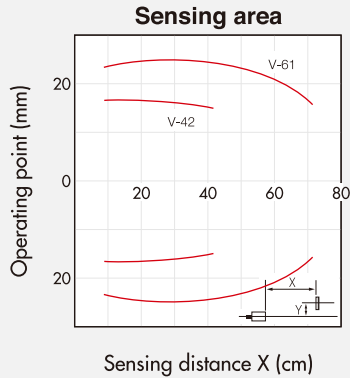
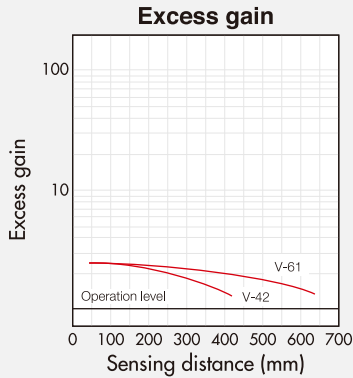
KR-Q150NW



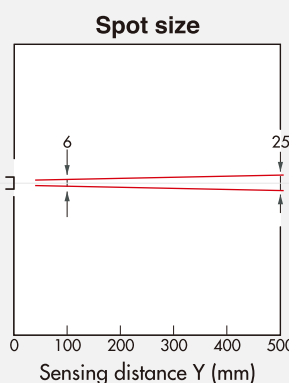
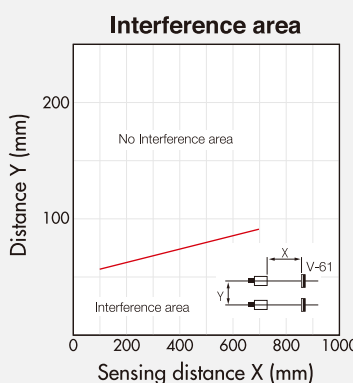
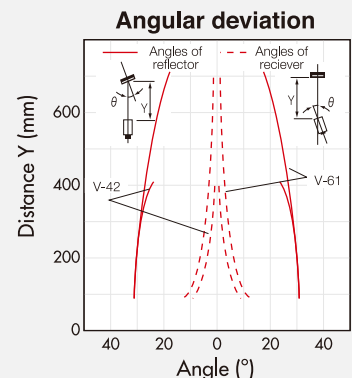
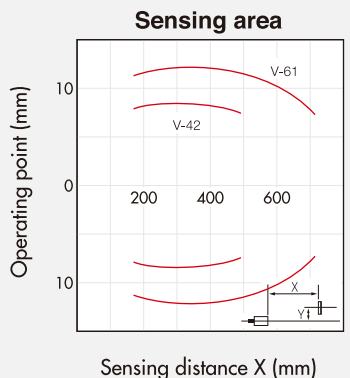
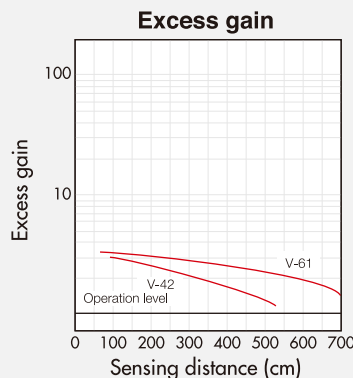
- C
- E
- J
- J2
- J3
- V
- V2
- V3
- V4
- SR-Q
- S
- Z
- BGS-Z
- K**
- FGS-D
- BGS-D
- BGS-2S
- Y
- DM-18T
- Accessory

Reference (typical)

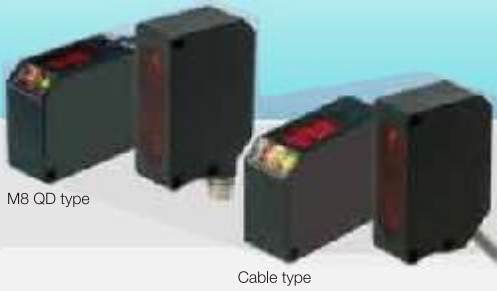
KR-Q50NW



KR-Q50N



# Photoelectric Sensor FGS-D/BGS-D series



### FGS-D series

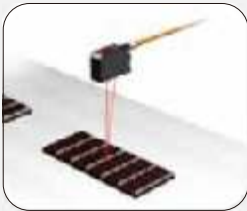
(Sensing distance : 80 ± 20mm)  
 • FGS-D10N / P / CN / CP  
 (Sensing distance : 100 - 250mm)  
 • FGS-D25N / P / CN / CP

### BGS-D series

(Sensing distance : 50 - 100mm)  
 • BGS-D10N / P / CN / CP  
 (Sensing distance : 100 - 300mm)  
 • BGS-D30N / P / CN / CP

- **High grade PSD (Position Sensing Device) is implemented in FGS (Foreground Suppression) system.**
- **Ideal for sensing thin objects lying on conveyor, etc.**
- **Numerical display for easier settings.**

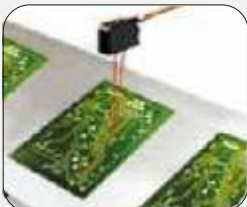
## Applications



Thin object on flat background



Vibrating conveyor



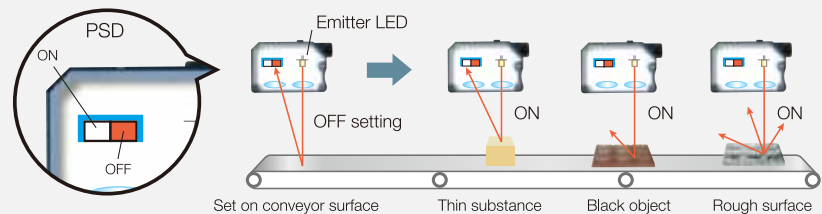
PC board lying on conveyor



Tin can

## Features of "FGS" sensor

FGS (Foreground Suppression) sensors are able to reliably detect rough and black surfaces due to the PSD sensing element.



A digital display is the ideal way to verify the sensitivity setting.

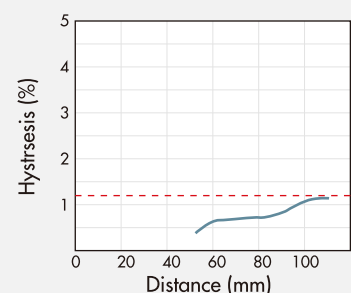


Mechanical toughness tested to 100G shock resistance.



## 3% Hysteresis

It is possible to sense a target that is 3 mm thick at 100 mm distance.



C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

Y

DM-18T

Accessory





## Specifications

Model		FGS-D series		BGS-D series	
		100mm distance	250mm distance	100mm distance	300mm distance
Cable type	NPN	FGS-D10N	FGS-D25N	BGS-D10N	BGS-D30N
	PNP	FGS-D10P	FGS-D25P	BGS-D10P	BGS-D30P
Connector type	NPN	FGS-D10CN	FGS-D25CN	BGS-D10CN	BGS-D30CN
	PNP	FGS-D10CP	FGS-D25CP	BGS-D10CP	BGS-D30CP
Spot size		φ 4mm at 100mm	φ 11mm at 300mm	φ 4mm at 100mm	φ 11mm at 300mm
Sensing distance		80 ± 20 mm	100 - 250 mm	50 - 100 mm	100 - 300 mm
Light source		Red LED			
Response time		2.5msec Max			
Sensitivity adjustment		Digital setting			
Hysteresis		3%	10%	3%	10%
Digital display		(1) Threshold (2) Distance			
LED Indicator		Output active (Orange), Stable status (Green)			
Control output		NPN or PNP Open collector 100mA / DC30V / 1.8V residual Max			
Operating mode		Light / Dark selection by cable			
Supply voltage		10 to 30V DC including 10% of ripple			
Power consumption		60mA / 10V, 25mA / 30V			
Circuit protection		Reverse Polarity, Short Circuit			
Timer		0 - 10 sec			
Noise resistance		Radiation : EN60947-5-2, Immunity : EN60947-5-2			
Conformity		JIS, UL, CE, VDE (Class3)			
Operating	Temp / humidity	Operation (-25 to 55C, 35-85% RH), Storage (-40 to 70 C, 35-95% RH)			
	Environmental illuminance	Sunlight 10,000 lux max., High Frequency Lamp 3,000 Lux max.			
	Vibration resistance	10 50 55 Hz amplitude 1.5 mm, XYZ for two hours (IEC68)			
	Shock resistance	100 G			
	Protection category	IP67			

## Options

### JCN-S : M8 Straight type



JCN-S : 2 meter  
JCN-5S : 5 meter  
JCN-10S : 10 meter

### JCN-L : M8 L-shape type



JCN-L : 2 meter  
JCN-5L : 5 meter  
JCN-10L : 10 meter

C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

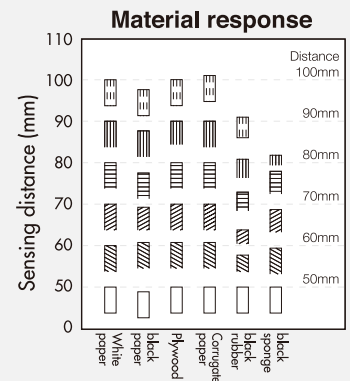
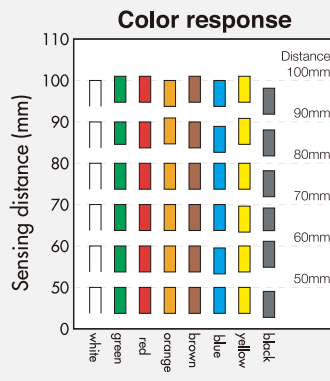
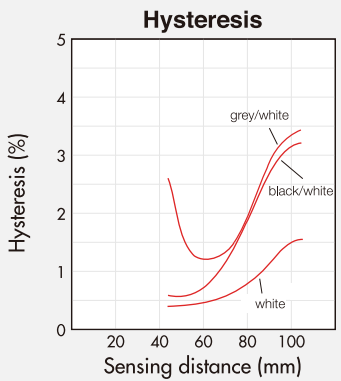
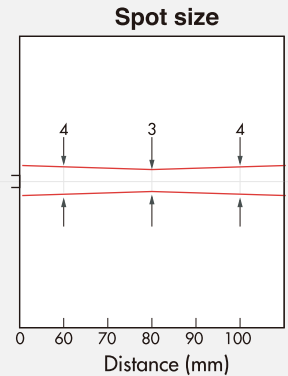
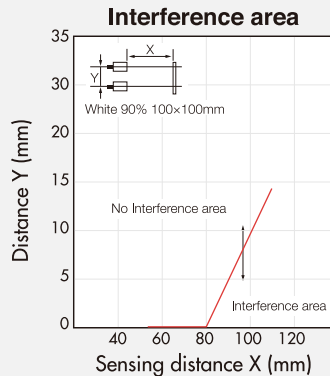
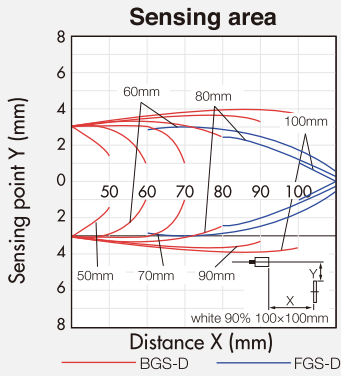
Y

DM-18T

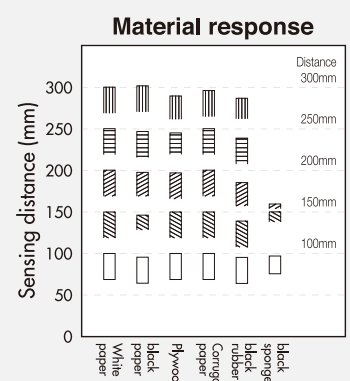
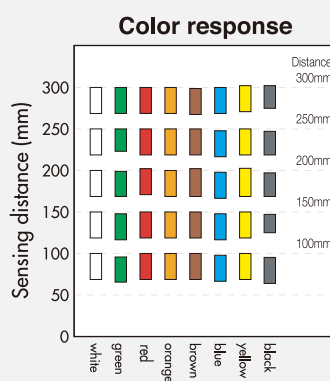
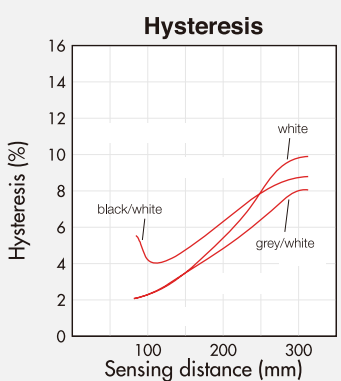
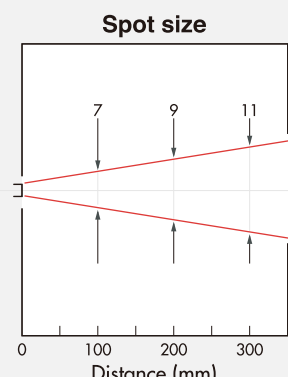
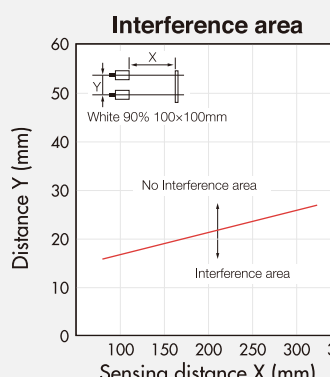
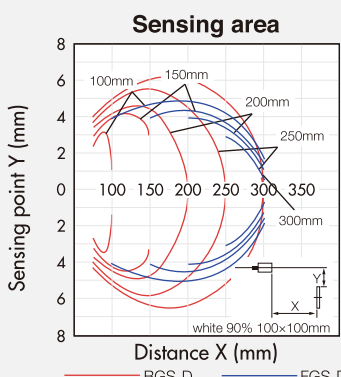
Accessory

**Reference (typical)**

**BGS-D10N  
FGS-D10N**



**BGS-D30N  
FGS-D25N**



Photoelectric Sensor

- C
- E
- J
- J2
- J3
- V
- V2
- V3
- V4
- SR-Q
- S
- Z
- BGS-Z
- K
- FGS-D**
- BGS-D**
- BGS-2S
- Y
- DM-18T
- Accessory



BGS type

Standard S2 type

# Photoelectric Sensor BGS-2S series

(Sensing distance : white 1-250mm / gray 2-250mm / black 5-200mm)  
 · BGS-2S25N / P / CN / CP  
 (Sensing distance : white 25-150mm / gray 25-150mm / black 25-80mm)  
 · BGS-2S15N / P / CN / CP

→  
Next page

Photoelectric Sensor

## Applications



**BGS-2S25N/P**  
for black PC Boards



**BGS-2S15N/P**  
anti-inverter noise



**BGS-2S10N/P**  
for limited mounting space



**BGS-2S30NT/PT**  
for longer distance.  
Timer type (0-100msec)

### BGS-2S25 Series

- Specially designed for black PC Boards.
- M8 QD types are available.

### BGS-2S15 Series

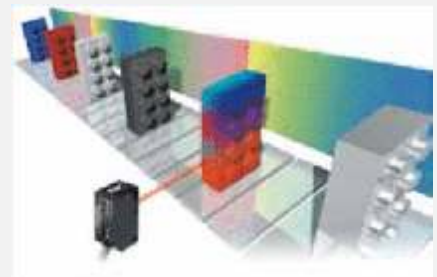
- Noise filter with anti-inverter design. Tolerant to environmental noise.
- Good for any PC Board except black colored.
- Standard BGS in Asia/Japan.

### BGS-2S10 series

- For limited area. Good repeatability.

## Features

BGS type sensors are designed to detect any target regardless of the color and/or background.

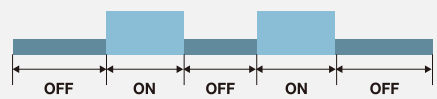


### OFF delay timer (BGS-2S30T)

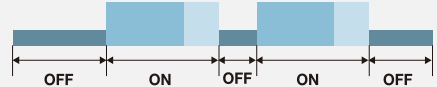
The BGS-2S30NT(PT) has a built-in Off-delay timer, 0 ~ 100 msec.



Standard output



Off-delay output



### IP67.

The one-shot molded housing results in an IP67 rating.



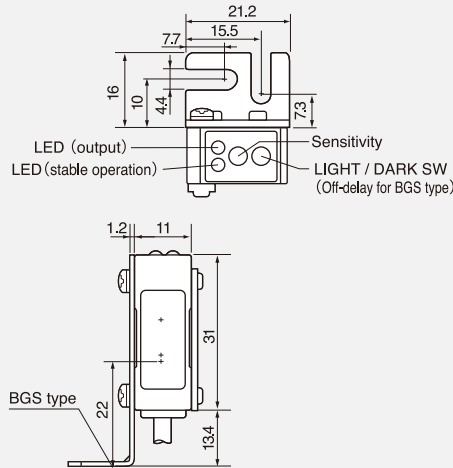
- C
- E
- J
- J2
- J3
- V
- V2
- V3
- V4
- SR-Q
- S
- Z
- BGS-Z
- K
- FGS-D
- BGS-D
- BGS-2S**
- Y
- DM-18T
- Accessory

(Sensing distance : white 5-300mm / gray 10-300mm / black 15-200mm)  
 · BGS-2S30N / P / CN / CP  
 (Sensing distance : white 40-100mm / gray 40-100mm / black 20-70mm)  
 · BGS-2S10N / P / CN / CP

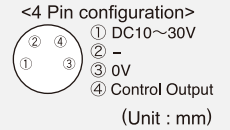
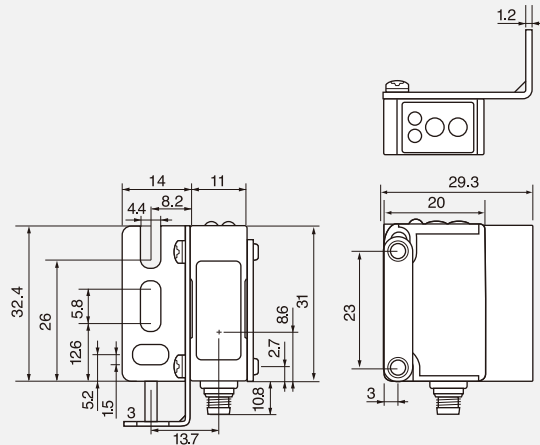
(Timer type of BGS-2S30)  
 · BGS-2S30NT / PT

## Dimensions (BGS-2S15, BGS-2S10, BGS-2S25, BGS-2S30)

### Cable Type (With Bracket BEF-W140B)



### Connector Type (With Bracket BEF-W140A)



## Specifications

Cable type	BGS-2S25N / BGS-2S25P	BGS-2S15N / BGS-2S15P	BGS-2S30N / BGS-2S30P	BGS-2S10N / BGS-2S10P	BGS-2S30NT / BGS-S30PT
Connector type	BGS-2S25CN / BGS-2S25CP	BGS-2S15CN / BGS-2S15CP	BGS-2S30CN / BGS-2S30CP	BGS-2S10CN / BGS-2S10CP	
Sensing distance	white	1 - 250mm	5 - 300mm	40 - 100mm	5 - 300mm
	gray	2 - 250mm	10 - 300mm	40 - 100mm	10 - 300mm
	black	5 - 200mm	15 - 200mm	20 - 70mm	15 - 200mm
Response time	0.5m sec Max				
Repeatability	parallel	2.0mm	2.5mm	1.5mm	2.5mm
	vertical	0.5mm	0.3mm	0.3mm	0.6mm
Operating mode	Light On, Dark On selectable				
Hysteresis	10% Max				
LED Indicator	Two - way, Green (Stable), Yellow (output)				
Light source	Red LED				
Supply voltage	DC10 - 30V incl. 10% ripple				
Conformity	JIS / C4525, CE, UL				
Power consumption	30mA Max				
Sensitivity adjustment	6 - turn trimmer				
Protection category	IEC, IP67				
Shock resistance	50G, XYZ directions				
Materials	PBT with glass (Case), PC(Lens)				
Timer	N / A		Available as option	N / A	

## Options

### JCN-S : M8 Straight type



### JCN-L : M8 L-shape type



### Protective mounting brackets LS2-S01

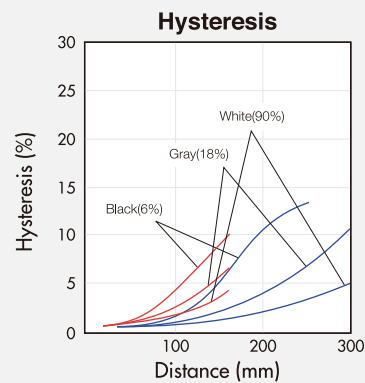
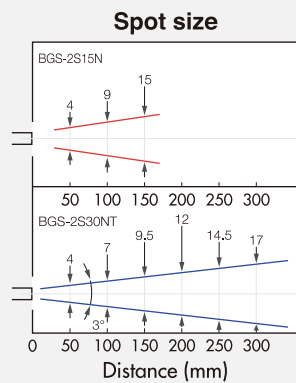
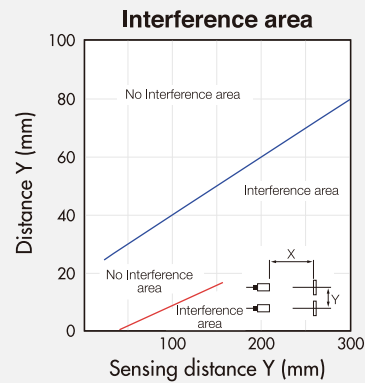
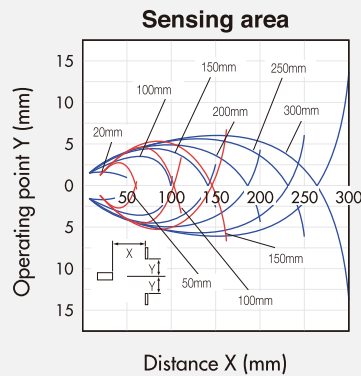


### Sensor stand PLN-1

### Fixture of Reflector PLN-1M

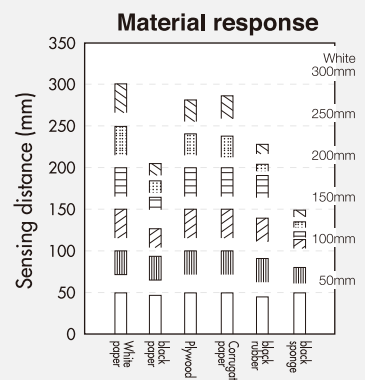
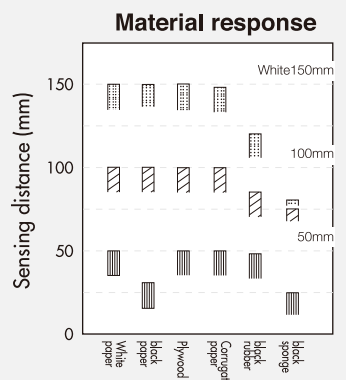
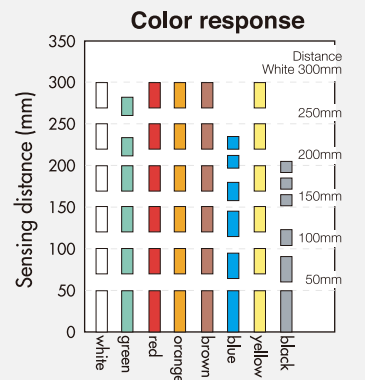
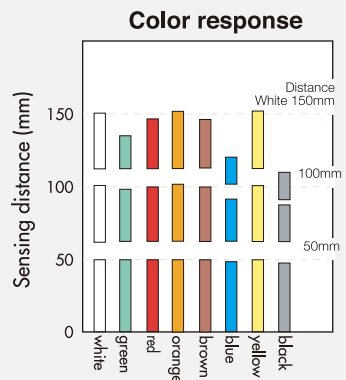


**Reference (typical)**



BGS-2S15N  
BGS-2S30NT

— BGS-2S15N  
— BGS-2S30NT



- C
- E
- J
- J2
- J3
- V
- V2
- V3
- V4
- SR-Q
- S
- Z
- BGS-Z
- K
- FGS-D
- BGS-D
- BGS-2S**
- Y
- DM-18T
- Accessory



# Easy Mount Photosensor Y series

M8 QD type

Cable type

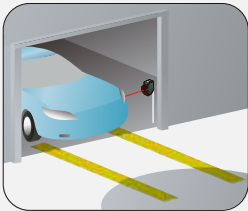
## Thru-beam type

(Sensing distance : 30m)  
• YT-1180N / P / CN / CP / N-M12 / P-M12

## Diffuse-reflective

(Sensing distance : 400mm)  
• YD-15N / P / CN / CP / N-M12 / P-M12

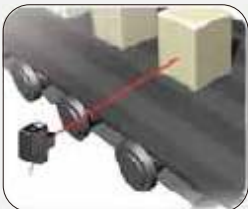
## Applications



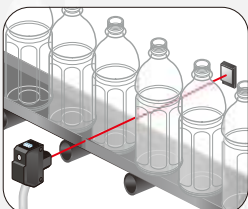
**Verifying car position**



**For Detecting PWB**



**For Conveyor**



**For Beverage industry**

- **Complete selection of sensing types including BGS and Transparent Object Detection.**
- **M18 Threaded Front Mounting.**
- **Stable Sensing Even For Plastic/Glass.**

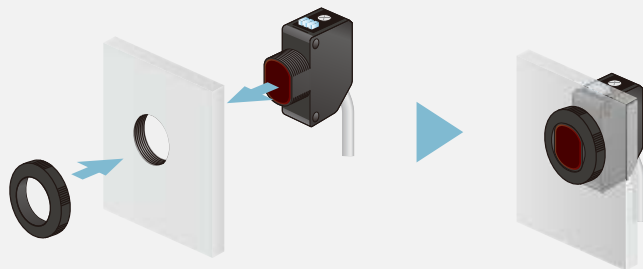
## Features

### Wide Selection

The Y series is offered with seven different models. Thru-beam, Diffuse, Retro-reflective, Transparent object detection, Convergent Beam (two types) and BGS (Background suppression). There is a model for use in almost any application.

### M18 Threaded Front Mounting

The sensor can be easily mounted by inserting into an 18 mm opening. There are also conventional mounting holes in the sensor body for added flexibility.



### Pig-tail Connector

M12 pig-tail type are available for easy maintenance.



### Rugged Waterproof Construction

The sensor has an IP67 rating. It is ideal for use in applications where it may be exposed to water spray.



**Polarized Retro-reflective**

(Sensing distance : 3.5m)  
· YR-140N / P / CN / CP / N-M12 / P-M12

**Retro - Glass**

(Sensing distance : 1m)  
· YR-Q39N / P / CN / CP / N-M12 / P-M12

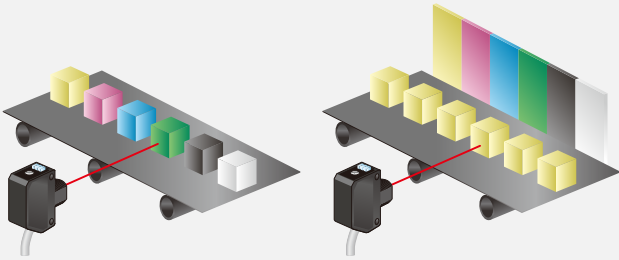
**BGS**

(Sensing distance : 200mm)  
· BGS-Y8N / P / CN / CP / N-M12 / P-M12

→  
Next page

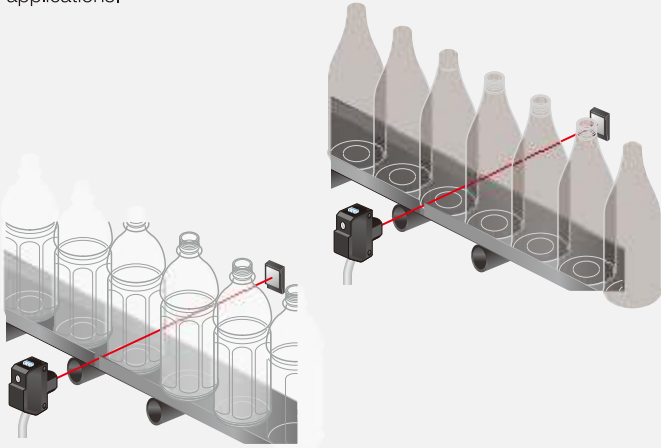
**BGS Sensing**

BGS (Background Suppression) sensors are not influenced by the color or texture of the target, the sensor is also able to ignore changes in the background.



**Stable Sensing Even For Plastic/Glass**

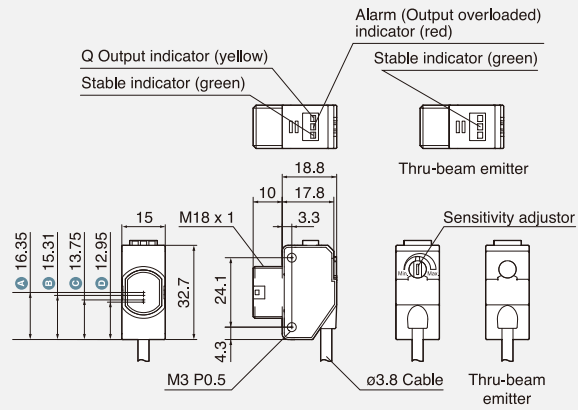
The YR-Q series was designed for the detection of transparent targets. These are ideally suited for clear plastic and glass bottle applications.



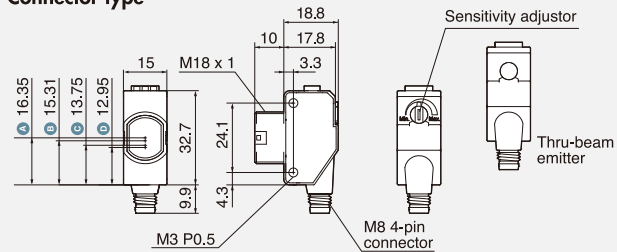
**Dimensions**

**General Use Types except BGS**

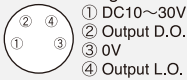
**Cable type**



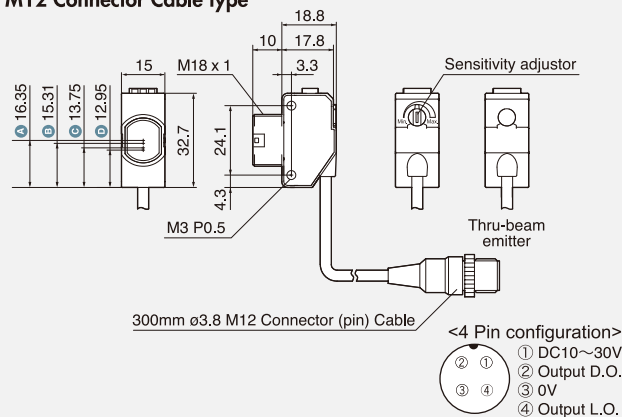
**Connector type**



**<4 Pin configuration>**



**M12 Connector Cable type**



- A** Thru-beam type
- B** Convergent Beam short range type
- C** Convergent Beam standard range type
- D** Retro-reflective / Diffuse reflective type

(Unit : mm)

C
E
J
J2
J3
V
V2
V3
V4
SR-Q
S
Z
BGS-Z
K
FGS-D
BGS-D
BGS-2S
<b>Y</b>
DM-18T
Accessory



**Convergent Beam close focus**

 (Sensing distance : 16mm)  
 · YD-L1N / P / CN / CP / N-M12 / P-M12

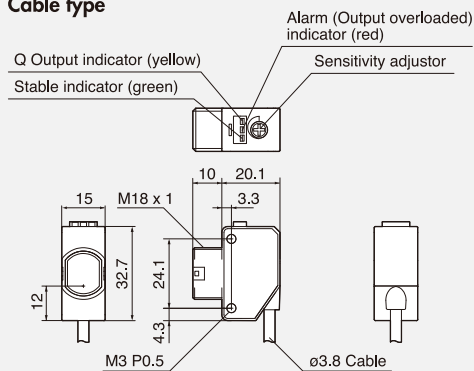
**Convergent Beam regular focus**

 (Sensing distance : 43mm)  
 · YD-L2N / P / CN / CP / N-M12 / P-M12

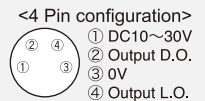
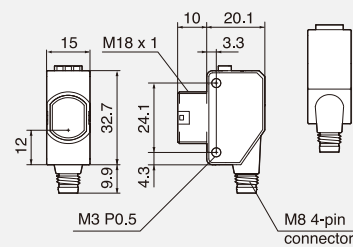
## Dimensions

### BGS Types

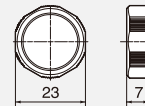
#### Cable type



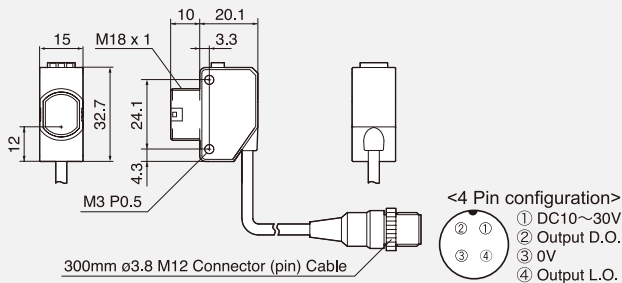
#### Connector type



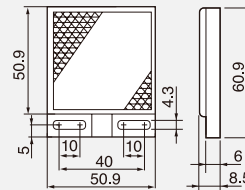
#### M18 x 1 Nut



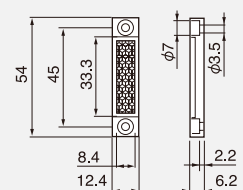
#### M12 Connector Cable type



#### V-61 for YR-140



#### P45A for YR-Q39



(Unit : mm)

## Specifications

Model (NPN / PNP different model)	Thru-Beam	Diffuse reflective	Polarized Retro-reflective	Retro - Glass	Convergent Beam		BGS
					close focus	regular focus	
2 meter (approx. 78 inch) cable	YT-1180N / P	YD-15N / P	YR-140N / P	YR-Q39N / P	YD-L1N / P	YD-L2N / P	BGS-Y8N / P
M8 QD	YT-1180CN / CP	YD-15CN / 15CP	YR-140CN / CP	YR-Q39CN / CP	YD-L1CN / CP	YD-L2CN / CP	BGS-Y8CN / CP
M12 pig-tail	YT-1180N-M12 / P-M12	YD-15N-M12 / P-M12	YR-140N-M12 / P-M12	YR-Q39N-M12 / P-M12	YD-L1N-M12 / P-M12	YD-L2N-M12 / P-M12	BGS-Y8N-M12 / P-M12
<b>Sensing distance</b>	30m (1180 inch)	0.4m (15.7 inch)	3.5m (140 inch) V-61 reflector	1m (39.3 inch) P45A reflector	16mm (0.6 inch)	43mm (1.7 inch)	200mm (7.9 inch) Setting range : 30-200mm
<b>Light source</b>	Red LED (visible)						
<b>Hysteresis</b>	N/A	20% max.	N/A	N/A	10% max.	10% max.	5%
<b>Response time</b>	0.5msec						
<b>LED Indicator</b>	3 Indicators (green indicator only :Emitter of YT-480) Yellow: output Green: stable Red: alarm - overload						
<b>Operating mode</b>	Light ON and Dark ON outputs provided						
<b>Sensitivity adjustment</b>	1turn potentiometer						4 turn potentiometer
<b>Control output</b>	NPN or PNP open collector, 100mA max. / 30VDC						
<b>Shock resistance</b>	100G , xyz three directions						
<b>Environmental illuminance</b>	Sunlight : 10,000 lux, Incandescent lamp : 3,000 lux max						
<b>Operating temp / humidity</b>	-25°C to 55°C / 35 to 85% RH						
<b>Storage temp / humidity</b>	-40°C to 70°C / 35 to 90 % RH						
<b>Supply voltage</b>	10 - 30VDC incl. 10% ripple						
<b>Power consumption</b>	emitter : 15mA max.30mA max. receiver : 20mA max.						
<b>Conformity</b>	CE , JIS/C4525						
<b>Circuit protection</b>	Reverse polarity, transient voltages, Output overcurrent						
<b>Material</b>	ABS with 20% glass (case), PMMA (lens)						
<b>Protection category</b>	IEC 144, IP67						

## Options

**V-61 for YR-140**



**P45A for YR-Q39**



**JCN-S : M8 Straight type**



JCN-S : 2 meter  
JCN-5S : 5 meter  
JCN-10S : 10 meter

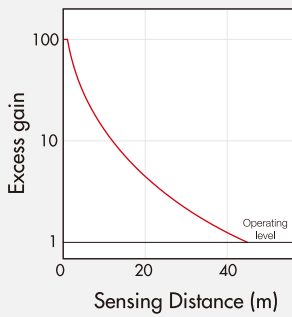
**JCN-L : M8 L-shape type**



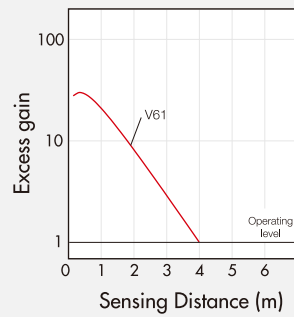
JCN-L : 2 meter  
JCN-5L : 5 meter  
JCN-10L : 10 meter

## Reference (typical)

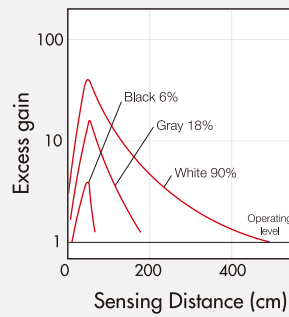
**Thru-beam**



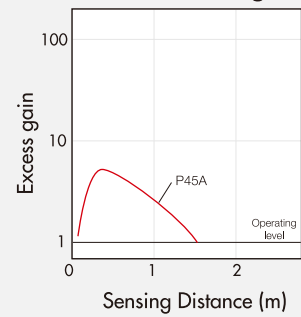
**Retro reflective**



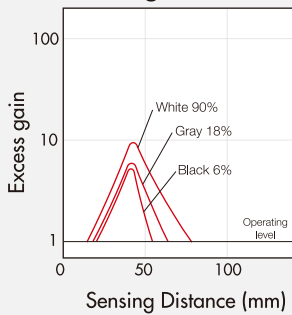
**Diffuse reflective**



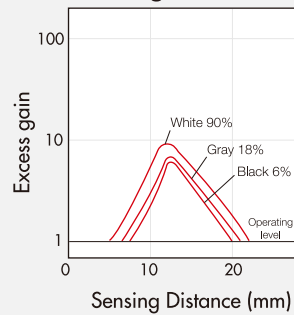
**Glass sensing**



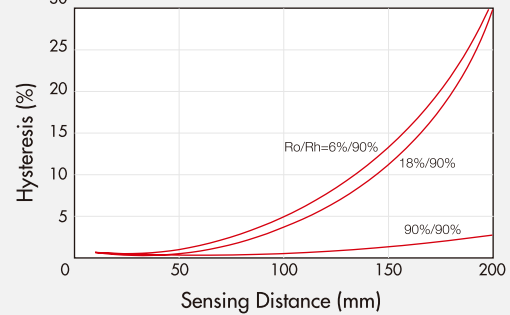
**Convergent (YD-L2)**



**Convergent (YD-L1)**



**BGS**



C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z

BGS-Z

K

FGS-D

BGS-D

BGS-2S

**Y**

DM-18T

Accessory



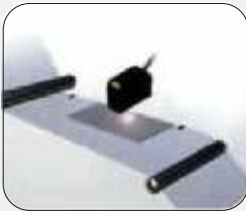
# RGB Sensor for color sensing

## DM-18T series

### DM-18T series

Mark / RGB color Type  
(Sensing distance : 18±2mm)  
· DM-18TN / TP / TCN / TCP

### Applications



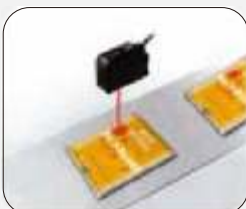
Registration mark on transparent film



Synchronizing sensor for vision sensor CVS



Color mark on laminate tube



Mark on multicolored print

- **DM-18T series, RGB sensor with automatic LED selection control.**
- **Numerical display for easy setting**

Two modes of operation are available, Mark Detection Mode and RGB Color Detection Mode.

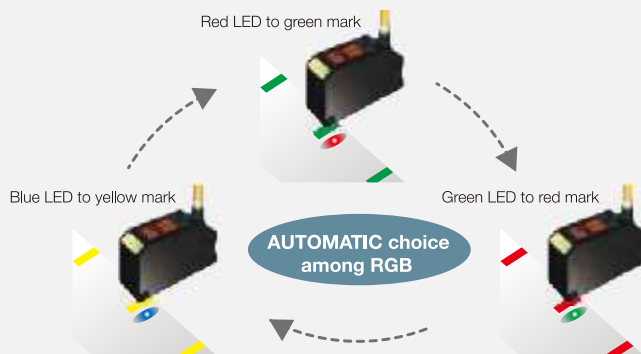
The sensor can store up to 8 complete sets of parameters to reduce the setup time when changing products.

### Features

#### Automatic Choice of RGB light source - Mark Detection mode

The DM-18T has a Red, Green and Blue LED light source built-in, the microcomputer will select the proper one to use according to the specific target color. When initially setting the sensor there is no need to perform this step.

The sensor monitors the contrast between the background and target, it is capable of sensing the difference between colors that used to be difficult to setup.



### Color Mode

To select a specific color, a three color (RGB) LED element is used. The sensor computes the color ratio between the three colors. The accuracy of the color detection is assured even with products moving on a conveyor.

One sensor is able to operate in two modes, Mark Detection (Mark Mode) or Color Sensing (Color Mode)



C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z

BGS-Z

K

FGS-D

BGS-D

BGS-2S

Y

DM-18T

Accessory

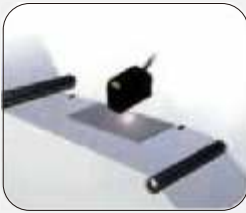


# RGB Sensor for color sensing DM-18T series

## DM-18T series

Mark / RGB color Type  
(Sensing distance : 18±2mm)  
· DM-18TN / TP / TCN / TCP

### Applications



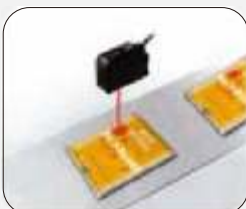
Registration mark on transparent film



Synchronizing sensor for vision sensor CVS



Color mark on laminate tube



Mark on multicolored print

- **DM-18T series, RGB sensor with automatic LED selection control.**
- **Numerical display for easy setting**

Two modes of operation are available, Mark Detection Mode and RGB Color Detection Mode.

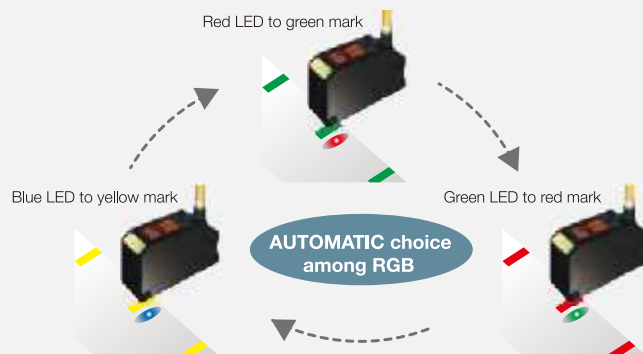
The sensor can store up to 8 complete sets of parameters to reduce the setup time when changing products.

## Features

### Automatic Choice of RGB light source - Mark Detection mode

The DM-18T has a Red, Green and Blue LED light source built-in, the microcomputer will select the proper one to use according to the specific target color. When initially setting the sensor there is no need to perform this step.

The sensor monitors the contrast between the background and target, it is capable of sensing the difference between colors that used to be difficult to setup.



## Color Mode

To select a specific color, a three color (RGB) LED element is used. The sensor computes the color ratio between the three colors. The accuracy of the color detection is assured even with products moving on a conveyor.

One sensor is able to operate in two modes, Mark Detection (Mark Mode) or Color Sensing (Color Mode)



C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z

BGS-Z

K

FGS-D

BGS-D

BGS-2S

Y

DM-18T

Accessory

## Color response (Color Mode)

Mode : Color mode

:Excellent  
  :Good enough  
  :Good  
  :Impossible

		measured color																																			
		33N (purple)				43N (blue)				47N (light blue)				54N (green)				4N (yellow)				8N (orange)				23N (red)				77N (brown)				88N (black)			
		100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25
teach color	33N (purple)	100	88	63	34	0	0	0	2	0	0	0	0	0	0	0	3	30	32	38	31	59	57	57	42	67	69	67	47	55	54	38	21	60	58	42	23
		75	90	74	44	1	0	2	12	0	0	0	0	0	0	1	12	32	33	40	41	60	58	58	54	58	66	69	56	56	57	47	32	61	60	54	32
		50	66	77	68	26	21	27	36	0	0	0	22	1	8	21	36	43	45	51	61	45	54	70	71	34	42	76	76	69	68	68	54	75	72	71	54
		25	37	46	70	40	51	55	66	0	0	10	50	22	38	52	66	51	60	65	75	15	25	54	85	4	12	47	88	59	74	84	84	55	67	86	84
	43N (blue)	100	0	0	0	90	61	18	43	47	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		75	0	0	0	88	68	24	52	54	55	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		50	0	0	0	67	74	77	0	4	48	68	16	31	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	33	0	0	22	26	51	0
		25	1	10	34	63	40	49	76	0	1	42	85	37	53	69	80	15	26	44	67	0	0	18	54	0	0	10	52	23	37	61	76	18	32	57	77
	47N (light blue)	100	0	0	0	47	51	56	28	88	60	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		75	0	0	0	51	55	57	40	85	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		50	0	0	0	0	0	34	70	66	79	0	39	56	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	6	30	0	
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	54N (green)	100	0	0	0	0	0	14	36	42	41	34	83	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	12	0	0	
		75	0	0	0	0	0	27	32	46	54	48	85	78	0	0	0	0	0	0	0	0	0	0	0	0	0	1	13	0	0	0	1	24	0	0	
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	4N (yellow)	100	30	32	43	51	1	0	10	17	0	0	4	0	0	5	17	87	69	47	64	72	72	60	53	60	62	62	74	74	52	35	68	70	57	35	
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8N (orange)	100	58	61	43	14	0	0	0	0	0	0	0	0	0	0	62	51	32	12	86	58	23	87	88	66	25	59	40	15	1	60	47	22	1			
	75	57	60	53	25	0	0	0	0	0	0	0	0	0	0	72	62	43	22	89	69	34	78	86	78	36	71	53	26	11	72	56	32	14			
	50	57	60	69	54	10	4	12	21	0	0	5	0	0	6	22	72	74	74	51	60	70	63	47	57	88	68	96	80	56	42	91	85	61	41		
	25	45	55	70	85	26	34	49	57	0	0	2	42	22	27	45	58	57	71	80	87	23	34	63	12	21	55	93	63	80	93	75	65	76	95	76	
23N (red)	100	64	56	31	3	0	0	0	0	0	0	0	0	0	0	54	41	22	1	87	76	47	12	90	56	15	46	30	4	0	54	35	10	0			
	75	69	63	41	12	0	0	0	0	0	0	0	0	0	0	59	49	32	10	88	86	56	22	90	64	24	54	39	16	1	58	47	20	0			
	50	67	71	76	45	2	0	3	13	0	0	0	0	0	0	14	61	63	65	42	68	78	89	55	56	67	69	86	72	47	31	91	82	52	33		
	25	49	58	75	87	26	33	45	53	0	0	0	41	18	25	40	53	61	68	74	83	27	37	66	93	14	25	59	69	86	89	74	64	75	91	72	
77N (brown)	100	0	0	0	1	1	11	19	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	58	0		
	75	0	0	0	15	16	31	0	0	0	0	27	1	9	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	0	0	90	94	74	0
	50	40	50	69	84	25	35	54	60	0	0	5	48	32	32	48	63	51	64	80	90	19	28	58	92	7	16	49	89	60	75	82	70	66	95	83	
	25	25	34	57	85	23	35	62	78	0	0	20	63	42	50	64	80	38	48	66	88	3	12	42	76	0	0	34	74	44	60	84	52	50	80	97	
88N (black)	100	0	0	0	10	13	24	35	0	0	0	1	9	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	91	0	0	92	71	0		
	75	0	0	0	11	8	21	32	0	0	0	0	5	15	0	0	0	0	0	0	0	0	0	0	0	0	0	89	92	0	0	80	69	0			
	50	0	0	0	25	32	48	0	0	0	0	24	30	44	0	0	0	0	0	0	0	0	0	0	0	0	0	70	85	0	0	87	77	0			
	25	26	35	57	86	25	35	63	78	0	0	20	64	45	52	64	78	37	46	68	88	3	13	43	77	0	1	34	75	41	58	84	97	56	53	78	

n < 80	"SP" value = Response time	Hysteresis
80 ≤ n < 85	H1 : 0.8ms	8
85 ≤ n < 90	H2 : 1.6ms	6
90 ≤ n	L : 4ms	4

Accessory

## Color response (Mark Mode)

Mode : Mark mode

○ :Excellent    × :Impossible

		33N (purple)				43N (blue)				47N (light blue)				54N (green)				4N (yellow)				8N (orange)				23N (red)				77N (brown)				88N (black)			
		100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25
33N (purple)	100	○																																			
	75	○	○																																		
	50	○	○	○																																	
	25	○	○	○	○																																
43N (blue)	100	○	○	○	○																																
	75	○	○	○	○	○																															
	50	○	○	○	○	○	○																														
	25	○	○	○	○	○	○	○																													
47N (light blue)	100	○	○	○	○	○	○																														
	75	○	○	○	○	○	○	○																													
	50	○	○	○	○	○	○	○	○																												
	25	○	○	○	○	○	○	○	○	○																											
54N (green)	100	○	○	○	○	○	○	○	○																												
	75	○	○	○	○	○	○	○	○	○																											
	50	○	○	○	○	○	○	○	○	○	○																										
	25	○	○	○	○	○	○	○	○	○	○	○																									
4N (yellow)	100	○	○	○	○	○	○	○	○	○	○																										
	75	○	○	○	○	○	○	○	○	○	○	○																									
	50	○	○	○	○	○	○	○	○	○	○	○	○																								
	25	○	○	○	○	○	○	○	○	○	○	○	○	○																							
8N (orange)	100	○	○	○	○	○	○	○	○	○	○	○	○																								
	75	○	○	○	○	○	○	○	○	○	○	○	○	○																							
	50	○	○	○	○	○	○	○	○	○	○	○	○	○	○																						
	25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○																					
23N (red)	100	○	○	○	○	○	○	○	○	○	○	○	○	○	○																						
	75	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○																					
	50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○																				
	25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○																			
77N (brown)	100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○																			
	75	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○																		
	50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○																	
	25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○																
88N (black)	100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
	75	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

- C
- E
- J
- J2
- J3
- V
- V2
- V3
- V4
- SR-Q
- S
- Z
- BGS-Z
- K
- FGS-D
- BGS-D
- BGS-2S
- Y
- DM-18T**

Accessory

## Specifications

Model	Mark / RGB Color type
<b>Cable type</b>	DM-18TN (or 18TP)
<b>M8 connector type</b>	DM-18TCN (or 18TCP)
<b>Sensing distance</b>	18 +/- 2mm
<b>Spot size</b>	1 X 6 mm/18mm
<b>Range adjustment</b>	Teach-in
<b>Supply voltage</b>	DC10-30V including 10% ripple (P-P)
<b>Current consumption</b>	35mA (12V), 25mA (24V)
<b>Response time</b>	Mark mode : H1/250s, H2/500s, L/1200s Color mode : H1/800s, H2/1600s, L/4000s
<b>Timer</b>	Off delay/On delay/One shot delay (10msec increment : 0-990msec, 1sec increment for 1-10 sec)
<b>Light source</b>	RGB LED
<b>LED Indicator</b>	Output indicator (orange), Stable detection (green)
<b>Digital indicator</b>	7 segment, 3 digit Red and Green LED
<b>Control output</b>	NPN or PNP open collector DC30V 100mA max
<b>Operation mode</b>	Light/Dark On selectable
<b>Operating temp / humidity</b>	-25 to 55 °C / 35-95% RH
<b>Insulation resistance</b>	20M Ohm or more (at 500V DC)
<b>Protection category</b>	IP67
<b>Noise resistance</b>	IEC, CE
<b>Shock resistance</b>	50G (500m/S <sup>2</sup> ) , XYZ 3 directions
<b>Environmental illuminance</b>	Sunlight : 10,000 lux, Incandescent lamp : 3,000 lux max
<b>Material</b>	Anti-bacterial ABS (housing), PMMA (lens)

## Options

**JCN-S : M8 Straight type**



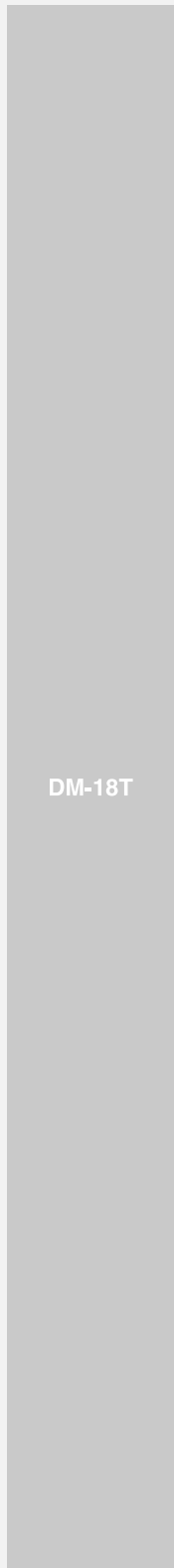
JCN-S : 2 meter  
JCN-5S : 5 meter  
JCN-10S : 10 meter

**JCN-L : L-shape M8 type**

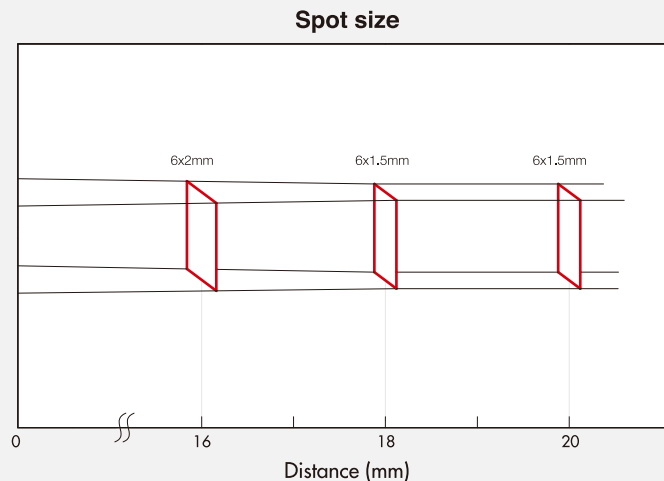
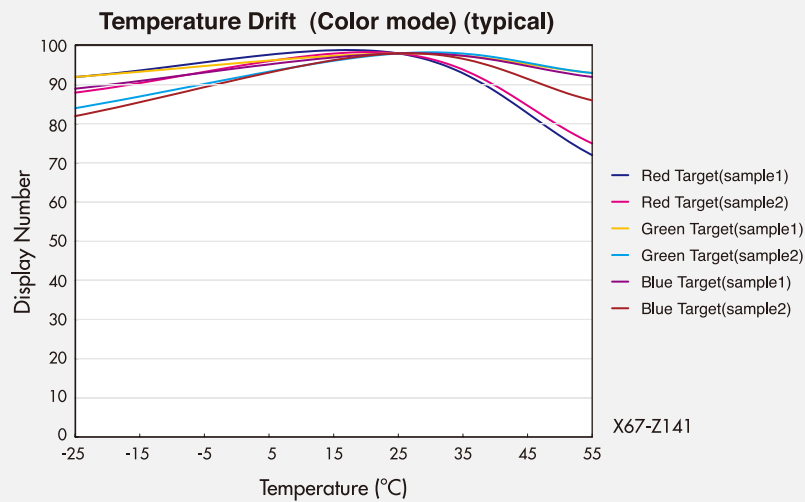
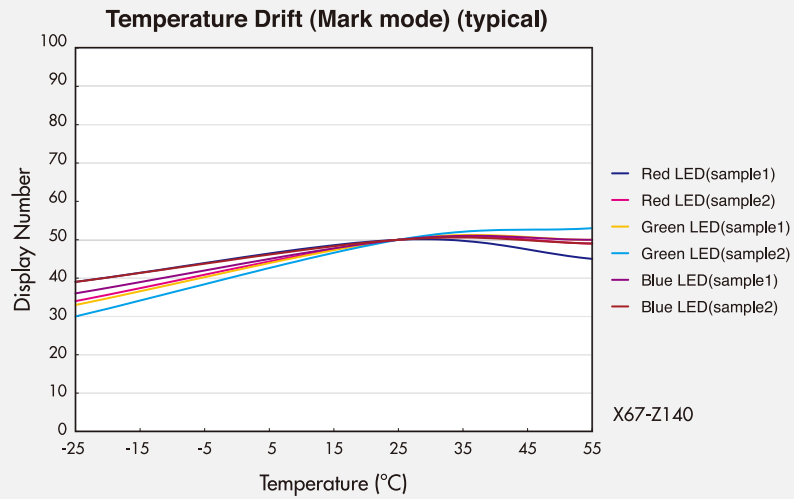


JCN-L : 2 meter  
JCN-5L : 5 meter  
JCN-10L : 10 meter

**Reference (typical)**



DM-18T



C
E
J
J2
J3
V
V2
V3
V4
SR-Q
S
Z
BGS-Z
K
FGS-D
BGS-D
BGS-2S
Y
<b>DM-18T</b>
Accessory



# Accessory

**PLN series**

- PLN-1
- PLN-1M

**Handy Testor of Photosensors**

- BP-01FA

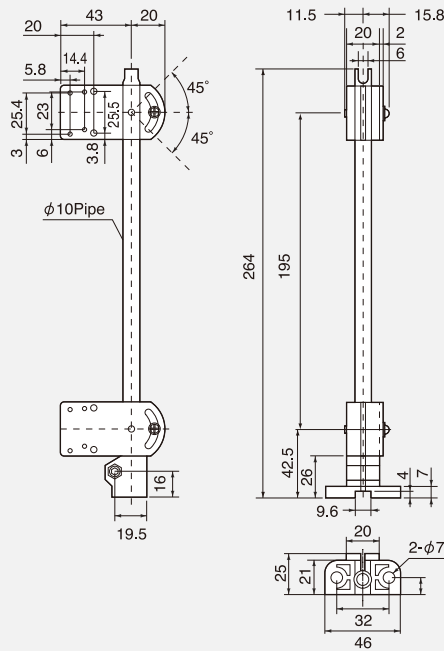


## Sensor Stand PLN-1 / PLN-1M

### Dimensions

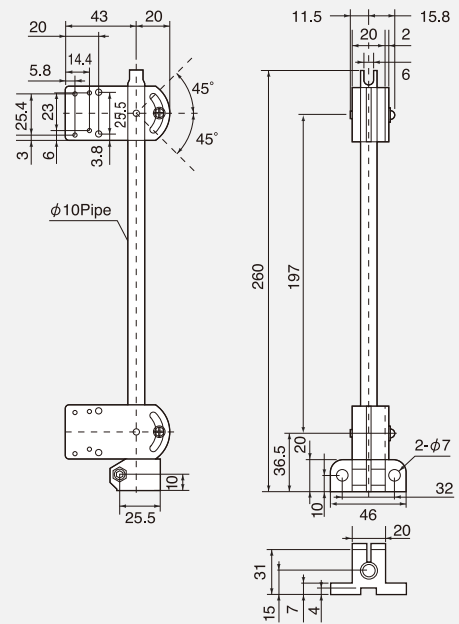
**PLN-1**

(Floor Installation)



**PLN-1**

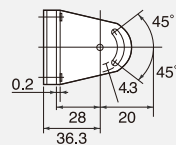
(Wall Installation)



Sensor stand PLN-1 is applicable to: **Z series, J series, S series, K series, J2 series, J3 series, Z-L series, SR-Q series, BGS-Z series, BGS-2S series**

**PLN-1M**

(Fixture of Reflector)



Fixture PLN-1M is applicable to: **V-61, V-42 and P250F**

C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z  
BGS-Z

K

FGS-D  
BGS-D

BGS-2S

Y

DM-18T

Accessory



**Handy Testor of Photosensors**  
**BP-01FA**

- *DC 18V Battery-driven Power Supply*
- *Universal NPN/PNP output*
- *Low battery alarm*
- *Handheld size*

C
E
J
J2
J3
V
V2
V3 V4
SR-Q
S
Z BGS-Z
K
FGS-D BGS-D
BGS-2S
Y
DM-18T
Accessory

Technical data are available at:  
<http://www.controlfr.com>

Si usted requiere mayor información sobre estos u otros productos, contactenos y expónganos sus necesidades y con gusto lo atenderemos



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