

**GL SERIES**

## Related Information

■ General terms and conditions..... F-3

■ Selection guide ..... P.781~

■ Glossary of terms..... P.1576~

■ General precautions ..... P.1579~


[panasonic.net/id/pidsx/global](http://panasonic.net/id/pidsx/global)

\* The **GL-8** type has been discontinued at the end of September, 2017.



Oil resistant

Different freq.  
type available

## Wide variety, high performance in surprisingly small body at low cost

### VARIETIES

#### Close mounting

Two sensors can be mounted close together because different frequency type are available.

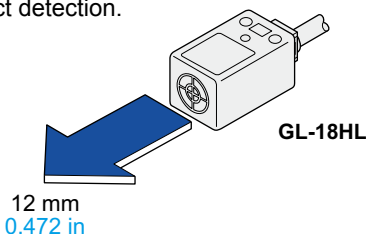
(The **GL-18HL** type can be mounted with a space of 20 mm **0.787 in** between the two sensors.)

### BASIC PERFORMANCE

#### Long sensing range

**GL-18HL** type offers a long sensing range of 12 mm **0.472 in**.

Small variations in the positions of the sensing objects do not affect detection.



### ENVIRONMENTAL RESISTANCE

#### Protection structure IP67G

**GL-18H/18HL** type are resistant to oil and have a protection structure IP67G.

### FUNCTIONS

#### Operation indicator

The **GL** series incorporates an operation indicator (red) for operation check.

### OTHERS

#### Low price

The **GL** series satisfies the need for a low price inductive proximity sensor. It is recommended to large volume users for cost reduction.

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GX-F/H

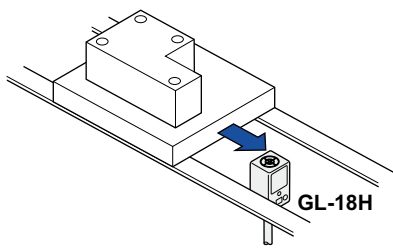
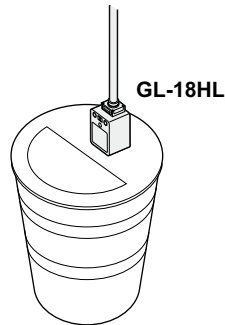
GXL

GL

GX-M

GX-U/GX-FU/  
GX-N

GX

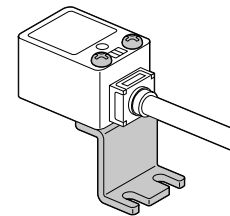
**APPLICATIONS****Positioning metal pallet****Detecting aluminum lid****ORDER GUIDE****GL-18H/18HL type**

Type	Appearance (mm in)	Sensing range (Note)	Model No.	Out- put	Output operation	
Standard <div>Different frequency</div>	 18 0.709 18 0.709 28 1.102	Maximum operation distance 5 mm 0.197 in	GL-18H	NPN open-collector transistor	Normally open	
		(0 to 4 mm 0 to 0.157 in)	GL-18HI			
		Stable sensing range	GL-18HB		Normally closed	
Long sensing range <div>Different frequency</div>		12 mm 0.472 in	GL-18HL		NPN open-collector transistor	Normally open
		(0 to 10 mm 0 to 0.394 in)	GL-18HLI			
			GL-18HLB			Normally closed

Note: The maximum operation distance stands for the maximum distance for which the sensor can detect the standard sensing object. The stable sensing range stands for the sensing range for which the sensor can stably detect the standard sensing object even if there is an ambient temperature drift and/or supply voltage fluctuation.

**Accessory**

- **MS-GL18HL**  
(Sensor mounting bracket for GL-18HL type)



Two M3 (length 25 mm 0.984 in) pan head screws are attached.

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separatedOther  
Products**GX-F/H****GXL****GL****GX-M**GX-U/GX-FU/  
GX-N**GX**

## SPECIFICATIONS

### GL-18H/18HL type

		Type	Standard			Long sensing range		
				Different frequency			Different frequency	
Item	Model No.	GL-18H	GL-18HI	GL-18HB	GL-18HL	GL-18HLI	GL-18HLB	
CE marking directive compliance		EMC Directive, RoHS Directive						
Max. operation distance (Note 2)		5 mm 0.197 in ±10 %			12 mm 0.472 in ±10 %			
Stable sensing range (Note 2)		0 to 4 mm 0 to 0.157 in			0 to 10 mm 0 to 0.394 in			
Standard sensing object		Iron sheet 25 × 25 × t 1 mm 0.984 × 0.984 × t 0.039 in			Iron sheet 40 × 40 × t 1 mm 1.575 × 1.575 × t 0.039 in			
Hysteresis		15 % or less of operation distance (with standard sensing object)						
Supply voltage		10 to 30 V DC    Ripple P-P 10 % or less						
Current consumption		10 mA or less						
Output		NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 1.5 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current)						
		Utilization category		DC-12 or DC-13				
		Output operation		Normally open	Normally closed	Normally open		Normally closed
Max. response frequency		1kHz			500Hz			
Operation indicator		Red LED (lights up when the output is ON)						
Environmental resistance	Pollution degree		3 (Industrial environment)					
	Protection		IP67 (IEC), IP67G (Note 3)					
	Ambient temperature		−25 to +70 °C −13 to +158 °F, Storage: −25 to +70 °C −13 to +158 °F					
	Ambient humidity		45 to 85 % RH, Storage: 45 to 85 % RH					
	Voltage withstandability		1,000 V AC for one min. between all supply terminals connected together and enclosure					
	Insulation resistance		50 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure					
	Vibration resistance		10 to 55 Hz frequency, 1.5 mm 0.059 in double amplitude in X, Y and Z directions for two hours each					
Shock resistance		1,000 m/s <sup>2</sup> acceleration (100 G approx.) in X, Y and Z directions three times each						
Sensing range variation	Temperature characteristics		Over ambient temperature range −25 to +70 °C −13 to +158 °F: within ±10 % of sensing range at +20 °C +68 °F					
	Voltage characteristics		Within ±2 % for ±10 % fluctuation of the supply voltage					
Material		Enclosure: Polyarylate						
Cable		0.3 mm <sup>2</sup> 3-core oil resistant cabtyre cable, 1 m 3.281 ft long						
Cable extension		Extension up to total 100 m 328.084 ft is possible with 0.3 mm <sup>2</sup> , or more, cable.						
Weight		Net weight : 45 g approx.						
Accessory					MS-GL18HL (Sensor mounting bracket): 1 set			

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C **+73.4 °F**.

2) The maximum operation distance stands for the maximum distance for which the sensor can detect the standard sensing object.

The stable sensing range stands for the sensing range for which the sensor can stably detect the standard sensing object even if there is an ambient temperature drift and/or supply voltage fluctuation.

3) If using the sensor in an environment where cutting oil droplets splatter, the sensor may be deteriorated due to added substances in the oil. Please check the resistivity of the sensor against the cutting oil you are using beforehand.

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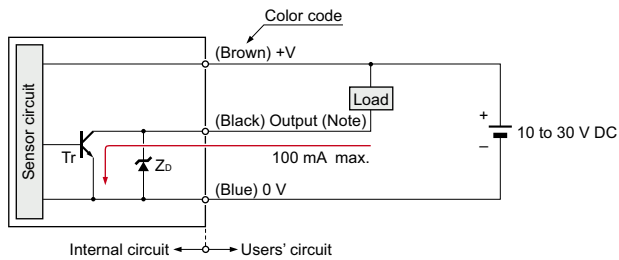
GXL

GL

GX-M

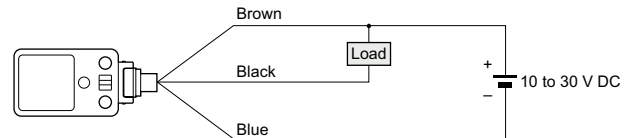
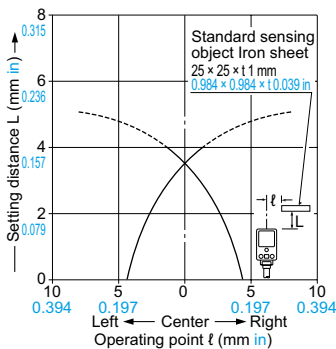
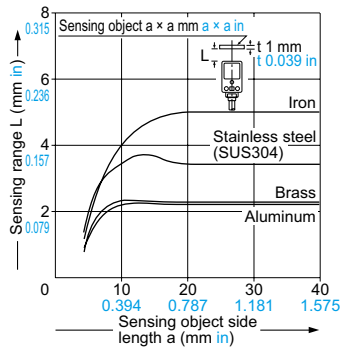
GX-U/GX-FU/GX-N

GX

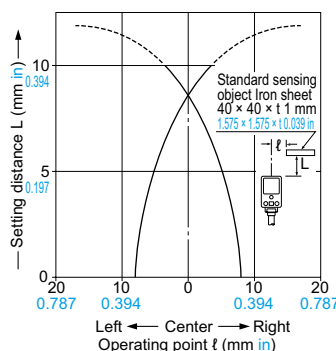
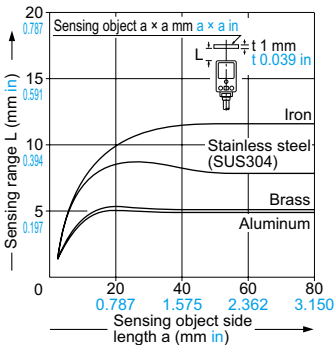
**I/O CIRCUIT AND WIRING DIAGRAMS****GL-18H/18HL type****I/O circuit diagram**

Note: Please carry out the wiring carefully since protection circuit against reverse power supply connection is not incorporated. Further, the output does not incorporate a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load.

Symbols ... Zd: Surge absorption zener diode  
Tr: NPN output transistor

**Wiring diagram****SENSING CHARACTERISTICS (TYPICAL)****GL-18H type****Sensing field****Correlation between sensing object size and sensing range**

As the sensing object size becomes smaller than the standard size (iron sheet  $25 \times 25 \times 1$  mm  $0.984 \times 0.984 \times 0.039$  in), the sensing range shortens as shown in the left figure.

**GL-18HL type****Sensing field****Correlation between sensing object size and sensing range**

As the sensing object size becomes smaller than the standard size (iron sheet  $40 \times 40 \times 1$  mm  $1.575 \times 1.575 \times 0.039$  in), the sensing range shortens as shown in the left figure.

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separatedOther  
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GX-N**GX**

## PRECAUTIONS FOR PROPER USE

Refer to p.1579~ for general precautions.

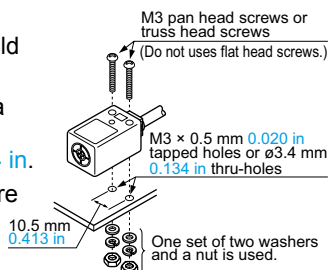


- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

### Mounting

#### GL-18H/18HL type

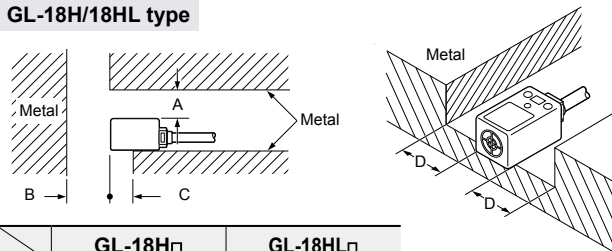
- The tightening torque should be 0.5 N·m or less.
- To mount the sensor with a nut, the thru-hole diameter should be  $\varnothing 3.4$  mm  $\varnothing 0.134$  in.
- Screws, nuts or washers are not supplied. Please arrange them separately.



### Influence of surrounding metal

- When there is a metal near the sensor, keep the minimum separation distance specified below.

#### GL-18H/18HL type



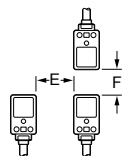
	GL-18H□	GL-18HL□
A	5 mm $0.197$ in	25 mm $0.984$ in
B	20 mm $0.787$ in	60 mm $2.362$ in
C	0 mm $0$ in	20 mm $0.787$ in (Note)
D	5 mm $0.197$ in	30 mm $1.181$ in

Note: When mounting the GL-18HL□ to an insulator or using the attached sensor mounting bracket, "C" becomes 0 mm  $0$  in.

### Mutual interference prevention

- When two or more sensors are installed in parallel or face to face, keep the minimum separation distance specified below to avoid mutual interference.

#### GL-18H/18HL type



		E	F
GL-18H type	Between "I" type and non "I" type.	0 mm (Note 2) $0$ in	20 mm $0.787$ in
	Between two "I" types or two non "I" types.	40 mm $1.575$ in	70 mm $2.756$ in
GL-18HL type	Between "I" type and non "I" type.	20 mm $0.787$ in	40 mm $1.575$ in
	Between two "I" types or two non "I" types.	130 mm $5.118$ in	200 mm $7.874$ in

Notes: 1) "I" in the model No. specifies the different frequency type.

2) Close mounting is possible for up to two sensors. When mounting three sensors or more at an equal spacing, align the model with "I" and the model without "I" alternately. The minimum value of dimension "E" should be as given below.

GL-18H type: 11 mm  $0.433$  in

### Sensing range

- The sensing range is specified for the standard sensing object. With a non-ferrous metal, the sensing range is obtained by multiplying with the correction coefficient specified below. Further, the sensing range also changes if the sensing object is smaller than the standard sensing object or if the sensing object is plated.

### Correction coefficient

	GL-18H type	GL-18HL type
Iron	1	1
Stainless steel (SUS304)	0.68 approx.	0.65 approx.
Brass	0.45 approx.	0.42 approx.
Aluminum	0.43 approx.	0.41 approx.

### Wiring

- Please carry out the wiring carefully since protection circuit against reverse power supply connection is not incorporated.
- The output does not incorporate a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load.
- Make sure that the power supply is off while wiring.
- Verify that the supply voltage variation is within the rating.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this sensor, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.

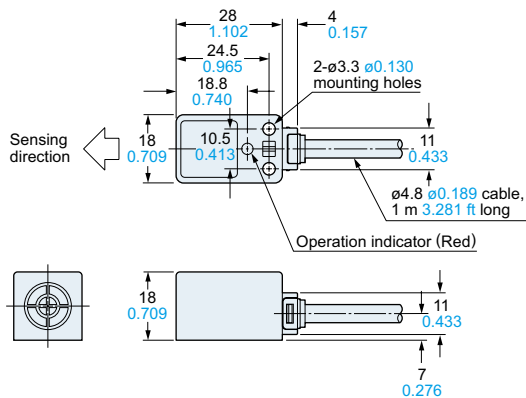
### Others

- Do not use during the initial transient time (50ms) after the power supply is switched on.
- Take care that the sensor does not come in direct contact with oil, grease, or organic solvents, such as, thinner, etc.
- Make sure that the sensing end is not covered with metal dust, scrap or spatter. It will result in malfunction.

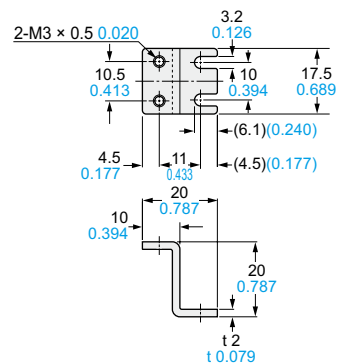
**DIMENSIONS (Unit: mm in)**

The CAD data can be downloaded from our website.

**GL-18H□ GL-18HL□** Sensor



**MS-GL18HL** Sensor mounting bracket for GL-18HL type (Accessory)



Material: Aluminum  
Two M3 (length 25 mm 0.984 in) pan head screws are attached.

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