

Thank you very much for purchasing Panasonic products. Read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.



WARNING

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

## 1 SPECIFICATIONS

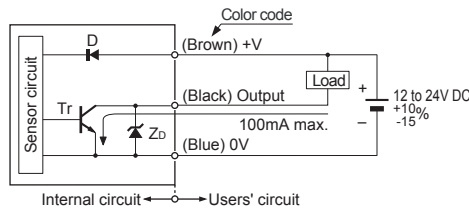
Item	Type		Shielded type			Non-shielded type		
	Model No.	Normal open / Normal closed	GX-N12M / GX-N12MB	GX-N18M / GX-N18MB	GX-N30M / GX-N30MB	GX-N12ML / GX-N12MLB	GX-N18ML / GX-N18MLB	GX-N30ML / GX-N30MLB
Max. operation distance (Note 4)			3mm ± 10%	7mm ± 10%	10mm ± 10%	8mm ± 10%	15mm ± 10%	22mm ± 10%
Stable sensing range (Note 4)			0 to 2.4mm	0 to 5.6mm	0 to 8mm	0 to 6.4mm	0 to 12mm	0 to 17.6mm
Standard sensing object			Iron sheet 12 × 12 × 1mm	Iron sheet 18 × 18 × 1mm	Iron sheet 30 × 30 × 1mm	Iron sheet 30 × 30 × 1mm	Iron sheet 50 × 50 × 1mm	Iron sheet 70 × 70 × 1mm
Supply voltage	12 to 24V DC <sup>+10%</sup> / <sub>-15%</sub> Ripple: P-P10% or less							
Current consumption (Note 5)	10mA or less							
Output	NPN open-collector transistor <ul style="list-style-type: none"> <li>• Maximum sink current: 100mA</li> <li>• Applied voltage: 30V DC or less (between output and 0V)</li> <li>• Residual voltage: 1.5V or less (at 100mA sink current)</li> <li>• 0.4V or less (at 16mA sink current)</li> </ul>							
Short-circuit protection	Incorporated							
Max. response frequency			450Hz	300Hz	300Hz	350Hz	100Hz	100Hz
Operation indicator	Orange LED (lights up when the output is ON)							
Protection	IP67 (IEC), IP67g (JEM)							
Ambient temperature	-25 to +70°C, Storage: -30 to +80°C							
Ambient humidity	45 to 85% RH, Storage: 35 to 95% RH							
Material	Enclosure: Brass (Nickel plated), Sensing part: Nylon, Indicator part: Nylon							
Cable	0.3mm <sup>2</sup> 3-core oil, heat and cold resistant cable, 2m long							
Weight (Note 8) (Note 9)			65g approx.	110g approx.	240g approx.	65g approx.	110g approx.	240g approx.
Accessories	Nut: 2 pcs., Toothed lock washer: 1 pc.							

Notes: 1) 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.  
 2) The weight of the threaded type includes the weight of two nuts and one toothed lock washer.

## 2 CAUTIONS

- This product has been developed / produced for industrial use only.
- Make sure that the power supply is off while wiring.
- Take care that wrong wiring will damage the sensor.
- 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 product, 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.
- Do not use during the initial transient time (50ms) after the power supply is switched on.
- Extension up to total 100m is possible with a 0.3mm<sup>2</sup>, or more, cable.
- Make sure that stress by forcible bend or pulling is not applied to the sensor cable joint.
- Take care that the sensor does not come in contact with 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.

## 3 I/O CIRCUIT DIAGRAM



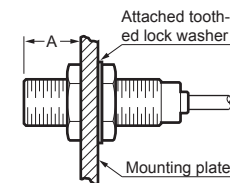
Note: If a capacitive load is directly connected to the output, malfunction may occur.

Symbols... D : Reverse supply polarity protection diode  
 Zd : Surge absorption zener diode  
 Tr : NPN output transistor

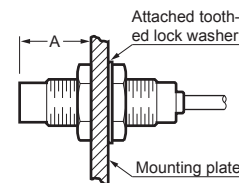
## 4 MOUNTING

- The tightening torque should be under the value given below.
- Mount such that the nuts do not protrude from the threaded portion.

<Shielded type>

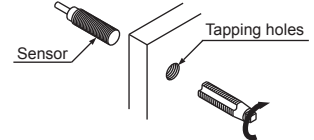


<Non-shielded type>



Model No.	Dimension A (mm)	Tightening torque
GX-N12M(B)	3.5 to 13.5	10N·m
	13.5 or more	20N·m
GX-N18M(B)	4 to 18	45N·m
	18 or more	80N·m
GX-N30M(B)	5 to 21	80N·m
	21 or more	180N·m
GX-N12ML(B)	15 or more	20N·m
GX-N18ML(B)	25 or more	80N·m
GX-N30ML(B)	30 or more	180N·m

- **Caution with GX-N12M(B) and GX-N12ML(B)**  
 The root truncation of the threads is shallow owing to strengthening of the sensors against tightening. When tapping holes on equipment to fix the sensors, the prepared holes must be  $\phi 11.2\text{mm}$  or more with **GX-N12M(B) and GX-N12ML(B)**.



- **Distance from surrounding metal**

As metal around the sensor may affect the sensing performance, pay attention to the following points.

### Influence of surrounding metal

- The surrounding metal will affect the sensing performance. Keep the minimum distance specified in the table below.

Model No.	B (mm)
GX-N12M(B)	8
GX-N18M(B)	20
GX-N30M(B)	40
GX-N12ML(B)	22
GX-N18ML(B)	45
GX-N30ML(B)	75

### Embedding of the sensor in metal

- Sensing range may decrease if the sensor is completely embedded in metal. Especially for the non-threaded type and the non-shielded type, keep the minimum distance specified in the table below.

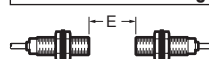
Model No.	C (mm)	D (mm)
GX-N12ML(B)	$\phi 50$	15
GX-N18ML(B)	$\phi 75$	25
GX-N30ML(B)	$\phi 105$	30

Note: With the non-shielded type, the sensing range may vary depending on the position of the nuts.

- **Mutual interference**

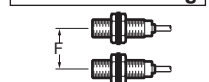
When two or more sensors are installed in parallel or face to face, keep the minimum separation distance specified below to avoid mutual interference.

### Face to face mounting



Model No.	E (mm)	F (mm)
GX-N12M(B)	25	15
GX-N18M(B)	50	35
GX-N30M(B)	90	55
GX-N12ML(B)	120	70
GX-N18ML(B)	180	125
GX-N30ML(B)	290	190

### Parallel mounting



- **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.

### Correction coefficient

Model No.	Iron	Stainless steel (SUS304)	Brass	Aluminum
GX-N12M(B)	1	0.77 approx.	0.52 approx.	0.51 approx.
GX-N18M(B)	1	0.73 approx.	0.50 approx.	0.48 approx.
GX-N30M(B)	1	0.70 approx.	0.45 approx.	0.44 approx.
GX-N12ML(B)	1	0.66 approx.	0.44 approx.	0.43 approx.
GX-N18ML(B)	1	0.68 approx.	0.46 approx.	0.44 approx.
GX-N30ML(B)	1	0.65 approx.	0.44 approx.	0.43 approx.

Note: The sensing range also changes if the sensing object is plated.

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