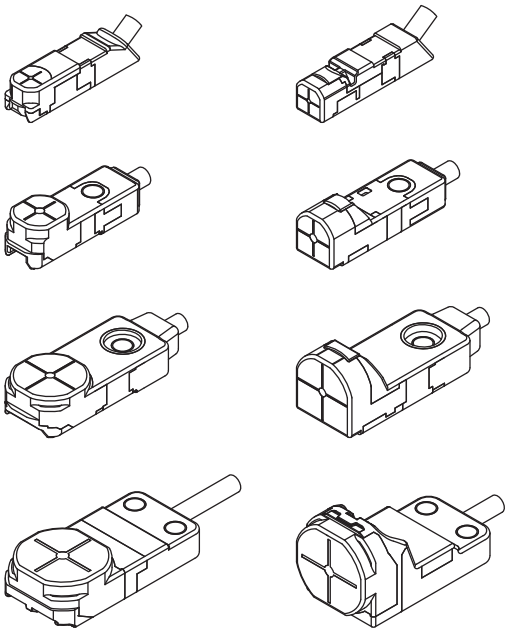
Panasonic

Amplifier Built-in Rectangular-shaped
Inductive Proximity Sensor

GX-F/H Series

USER'S MANUAL



2017.3 | panasonic.net/id/pidsx/global

WUME-GXFH-3

Contens

1. Cautions

⚠ WARNING

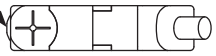
- Never use this product as a sensing device for personnel protection.
- In case of using devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

- This product has been developed / produced for industrial use only.
- Make sure to check the wiring as wrong wiring will damage or burn the product.
- Make sure to carry out wiring in the power supply off condition.
- 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 (0.5 sec.) after the power supply is switched ON.
- Extension up to total 100m is possible with a 0.3mm^2, or more of conductor cross-section area cable.
- Make sure that stress by forcible bend or pulling is not applied to the sensor cable joint.
- This product is suitable for indoor use only.
- Do not use this sensor in places having excessive vapor, dust, etc., or where it may come in contact with corrosive gas, etc.
- Take care that the sensor does not come in contact with oil, grease, organic solvents such as thinner, etc., strong acid, or alkaline.
- This product cannot be used in an environment containing inflammable or explosive gasses.
- Never disassemble or modify the product.

2. Part Description

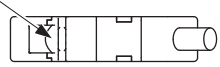
Front sensing GX-F6□

Operation indicator
(Orange)
Lights up when the
output is ON.



Top sensing GX-H6□

Operation indicator
(Orange)
Lights up when the
output is ON.

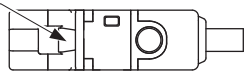


Front sensing GX-F8□

Operation indicator
(Orange)
Lights up when the
output is ON.

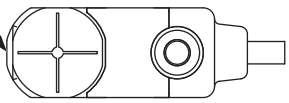
Top sensing GX-H8□

Operation indicator
(Orange)
Lights up when the
output is ON.



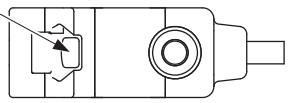
Front sensing GX-F12□

Operation indicator
(Orange)
Lights up when the
output is ON.



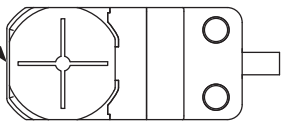
Top sensing GX-H12□

Operation indicator
(Orange)
Lights up when the
output is ON.



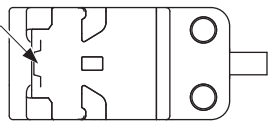
Front sensing GX-F15□ / GX-FL15□

Operation indicator
(Orange)
Lights up when the
output is ON.



Top sensing GX-H15□ / GX-HL15□

Operation indicator
(Orange)
Lights up when the
output is ON.

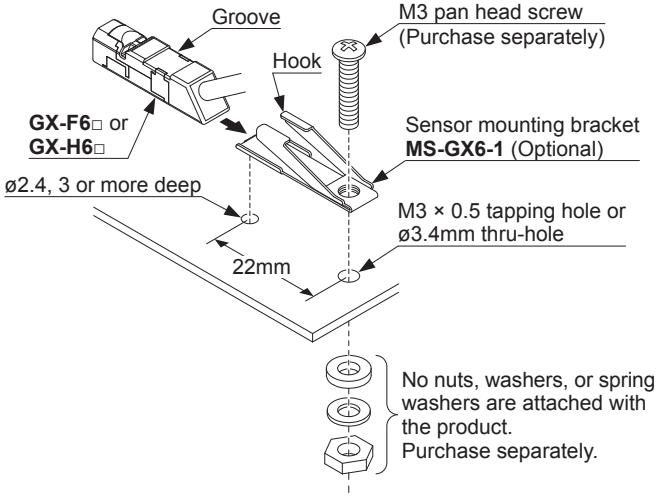


3. Mounting

3-1 Mounting GX-F6□ and GX-H6□

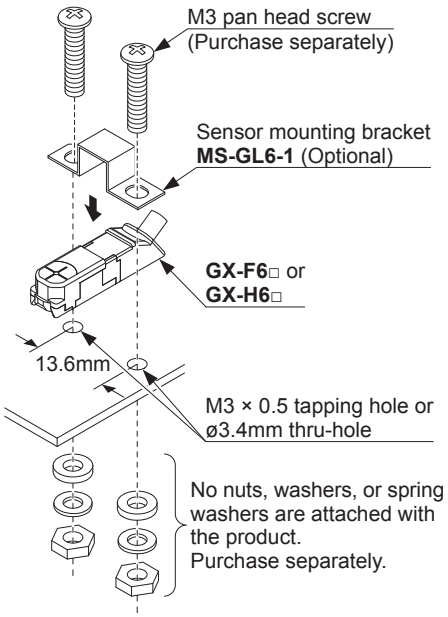
<In case of using sensor mounting bracket MS-GX6-1 (optional)>

1. Insert the **GX-F6**□ and **GX-H6**□ into the sensor mounting bracket **MS-GX6-1** as follows.
2. Push the sensor until the hook of the sensor mounting bracket **MS-GX6-1** catches the groove of the sensor.
3. Mount the sensor mounting bracket **MS-GX6-1** with a M3 pan head screw.



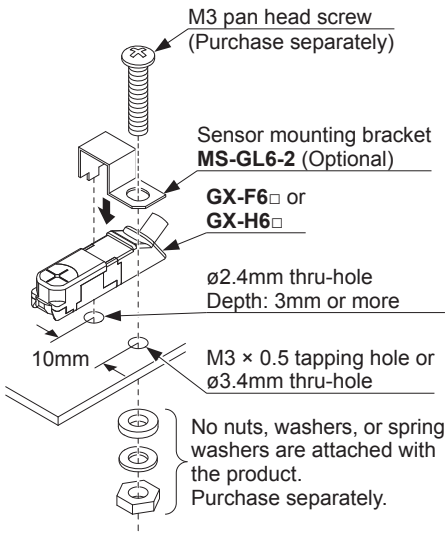
⟨In case of using sensor mounting bracket MS-GL6-1 (optional)⟩

- To mount the sensor with a nut, the mounting hole diameter should be ø3.4mm.



⟨In case of using sensor mounting bracket MS-GL6-2 (optional)⟩

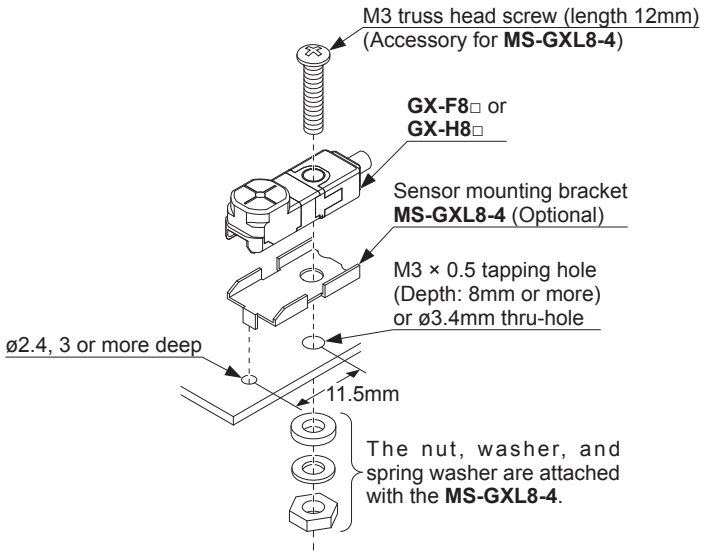
- To mount the sensor with a nut, the mounting hole diameter should be ø3.4mm.



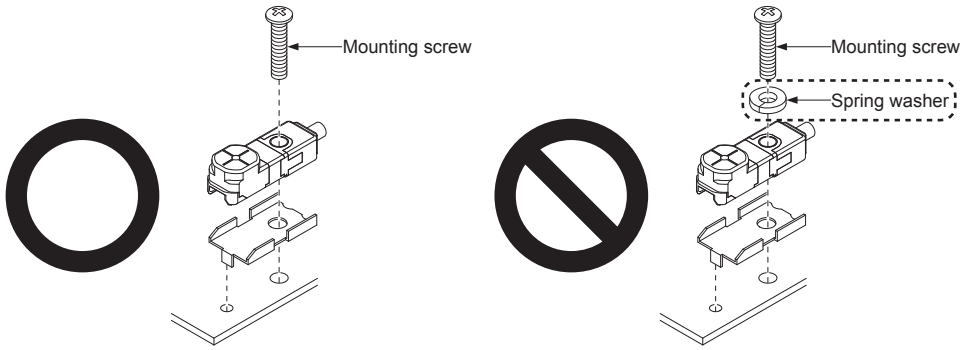
3-2 Mounting GX-F8□ and GX-H8□

<In case of using sensor mounting bracket MS-GXL8-4 (optional)>

- Make sure to use a M3 truss head screw (length: 12mm) (accessory). The tightening torque should be 0.7N·m or less.
- To mount the sensor with a nut, the mouting hole diameter should be ø3.4mm.
- Do not use a fl at head screw or a pan head screw.

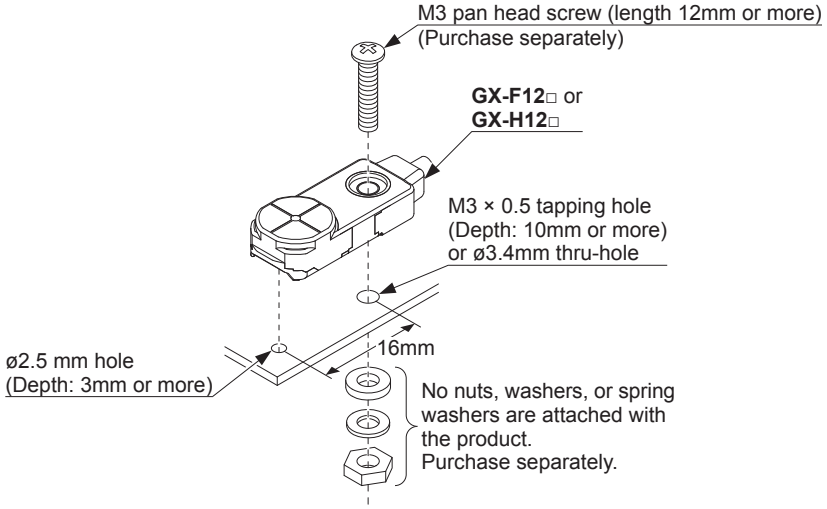


When mounting, do not use a spring washer between the mounting screw and product.

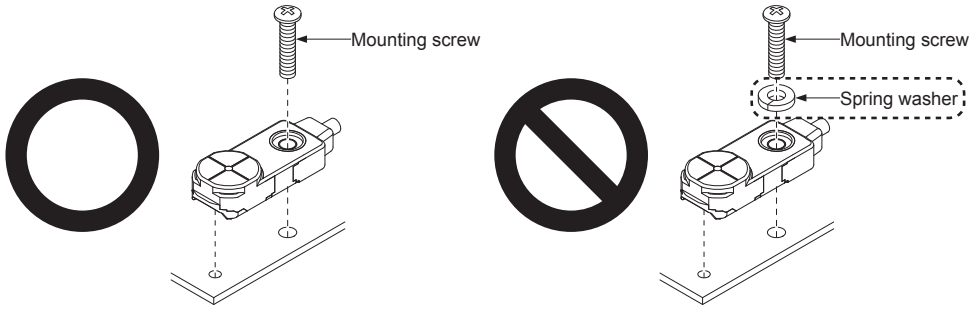


3-3 Mounting GX-F12□ and GX-H12□

- The tightening torque should be 0.7N·m or less.
- To mount the sensor with a nut, the mouting hole diameter should be ø3.4mm.
- The hole in which the boss is inserted should be ø2.5mm (depth: 3mm or more).

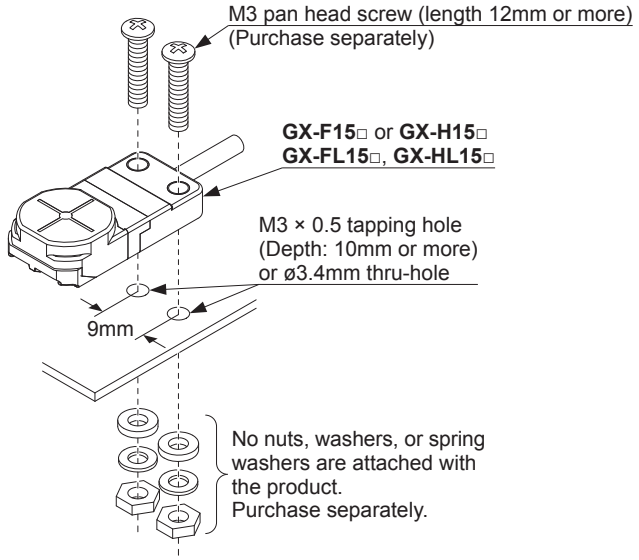


When mounting, do not use a spring washer between the mounting screw and product.

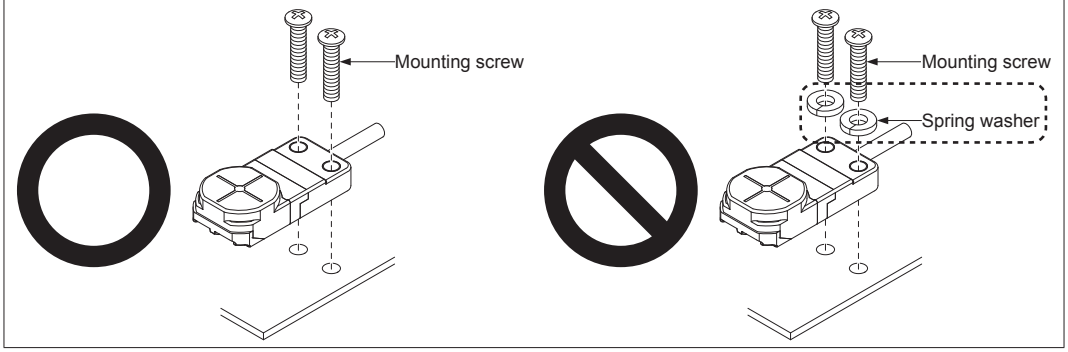


3-4 Mounting GX-F15□ and GX-H15□, GX-FL15□, GX-HL15□

- The tightening torque should be 1N·m or less.
- To mount the sensor with a nut, the mouting hole diameter should be ø3.4mm.

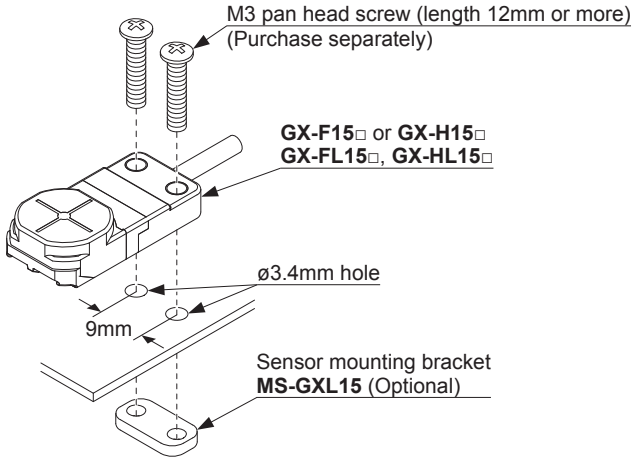


When mounting, do not use a spring washer between the mounting screw and product.

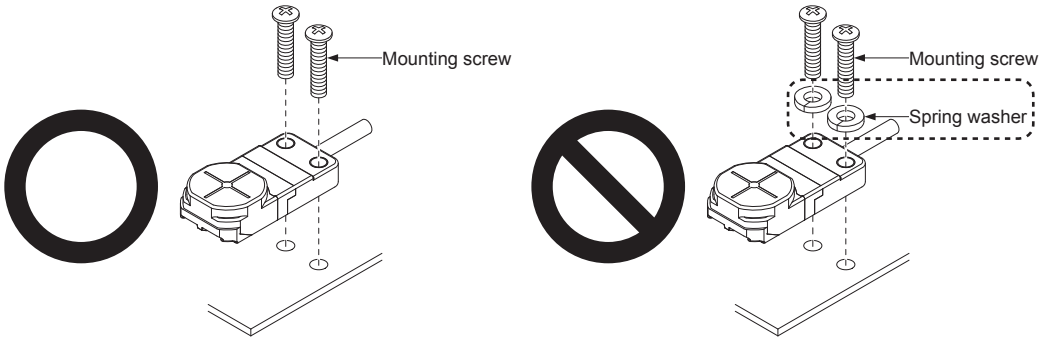


<In case of using spacer MS-GXL15 (optional)>

- The tightening torque should be 1N·m or less.
- The mouting hole diameter should be ø3.4mm.

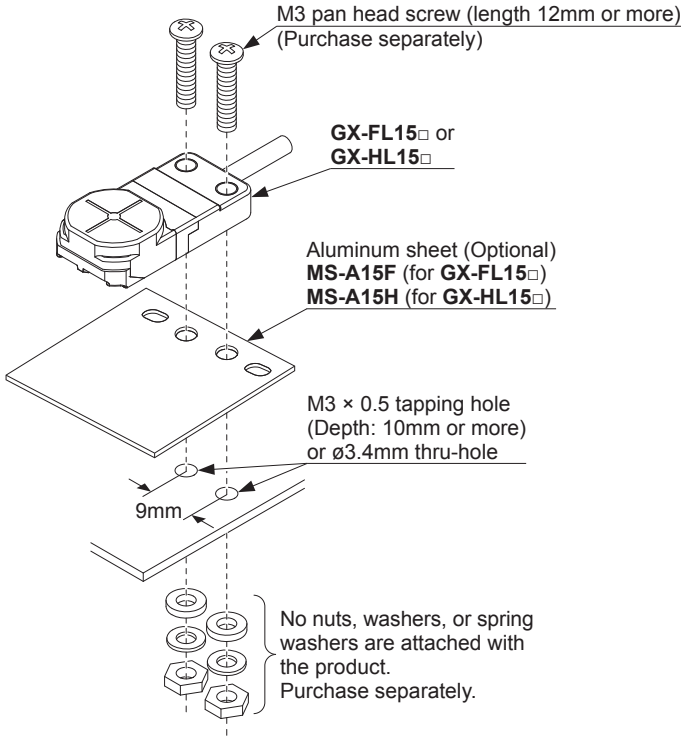


When mounting, do not use a spring washer between the mounting screw and product.

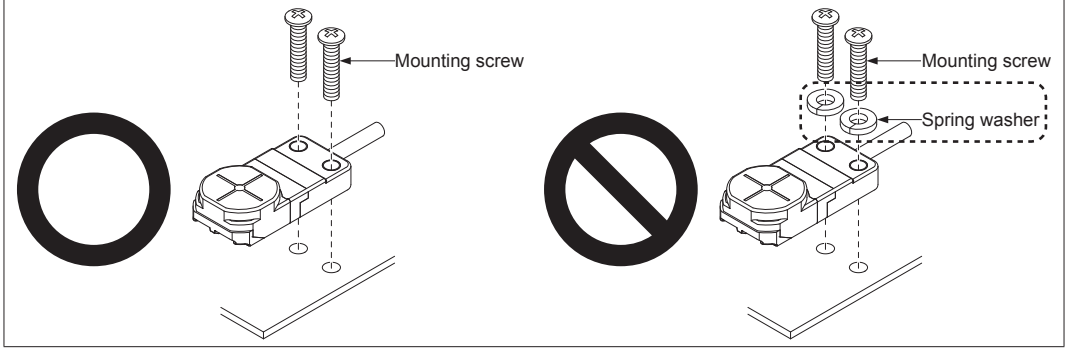


<In case of the long sensing range type GX-FL15□ or GX-HL15□>

- To mount the long sensing range **GX-FL15**□ or **GX-HL15**□ on a iron or stainless steel, the enclosed aluminum sheet **MS-A15F** (for **GX-FL15**□), **MS-A15H** (for **GX-HL15**□) (optional), or any other aluminum sheet having a minimum size of 30 × 39.5 × t0.3mm (**GX-FL15**□), 30 × 30 × t0.3mm (**GX-HL15**□), should be inserted between the sensor and the magnetic body.
  However, it is not necessary to use the aluminum sheet when mounting on an insulator.
- The tightening torque should be 1N·m or less.
- To mount the sensor with a nut, the mouting hole diameter should be ø3.4mm.



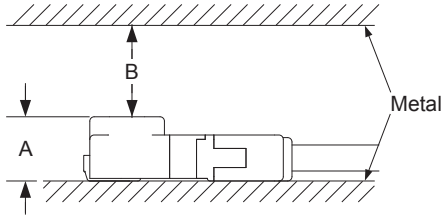
When mounting, do not use a spring washer between the mounting screw and product.

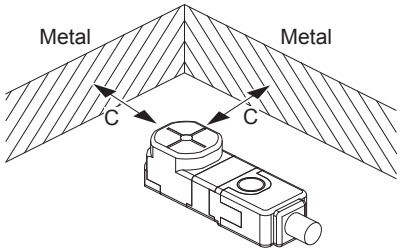


3-5 Influence of surrounding metal

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

Front sensing type



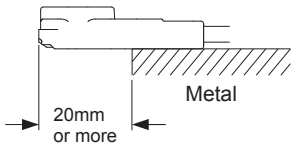


	GX-F6□	GX-F8□	GX-F12□	GX-F15□	GX-FL15□ (Note 2)
A	6mm (Note 1)	7.4mm	7.1mm	8mm	8.3mm (Note 3)
B	8mm	8mm	20mm	20mm	30mm
C	3mm	3mm	7mm	7mm	10mm

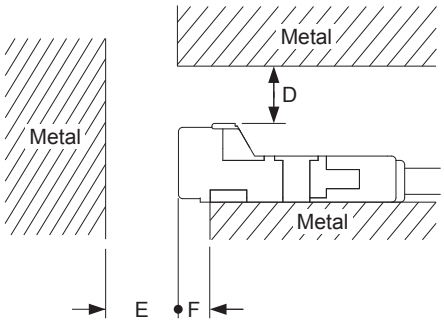
Notes: 1) The dimension is 6.4mm if the sensor mounting bracket **MS-GX6-1** (optional) is used.

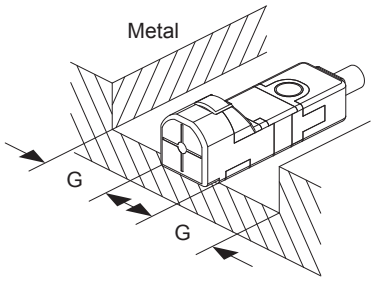
2): The **GX-FL15**□ should be mounted on an insulator.
Use the aluminum sheet **MS-A15F** (optional) when mounting the product to a iron or stainless steel. Furthermore, make sure that the product protrudes at least 20mm from the mounting base.

3): The dimension includes the thickness (0.3mm) of the aluminum sheet **MS-A15F** (optional).



Top sensing type





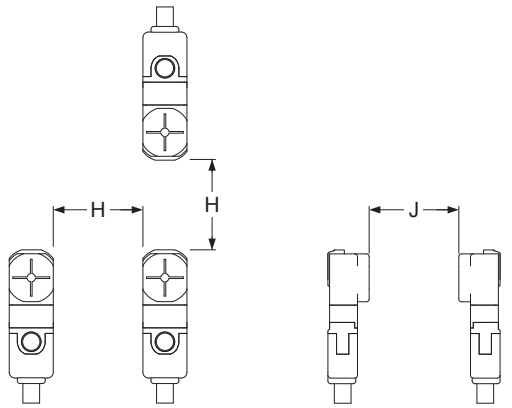
	GX-H6□	GX-H8□	GX-H12□	GX-H15□	GX-HL15□
D	3mm	4mm	7mm	6mm	12mm
E	10mm	10mm	20mm	20mm	30mm
F	2mm	3mm	3mm	0mm	10mm (Note)
G	2mm	3mm	3mm	3mm	10mm

Note: When **GX-HL15**□ is mounted on an insulator, or seated on the enclosed aluminum sheet **MS-A15H** (optional), the distance “F” can be zero.

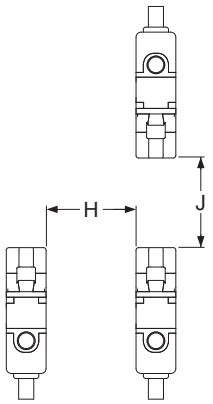
3-6 Mutual interference prevention

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

Front sensing type



Top sensing type



		H	J
GX-F6□ or **GX-H6**□	Between "**I**" type and non "**I**" type	0mm (Note 2)	15mm
	Between two "**I**" types or two non "**I**" types	13mm	25mm
GX-F8□ or **GX-H8**□	Between "**I**" type and non "**I**" type	0mm (Note 2)	15mm
	Between two "**I**" types or two non "**I**" types	20mm	35mm
GX-F12□ or **GX-H12**□	Between "**I**" type and non "**I**" type	0mm (Note 2)	25mm
	Between two "**I**" types or two non "**I**" types	25mm	50mm
GX-F15□ or **GX-H15**□	Between "**I**" type and non "**I**" type	0mm (Note 2)	25mm
	Between two "**I**" types or two non "**I**" types	45mm	70mm
GX-FL15□ or **GX-HL15**□	Between "**I**" type and non "**I**" type	0mm (Note 2)	25mm
	Between two "**I**" types or two non "**I**" types	110mm	170mm

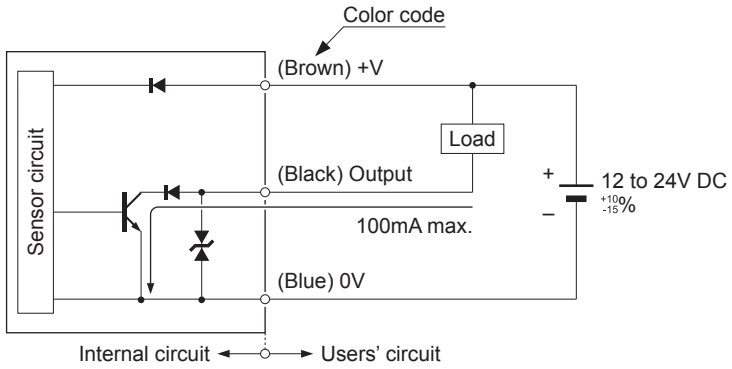
Notes: 1) "**I**" in the model No. specifies the different frequency type.

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 "H" should be as given below.

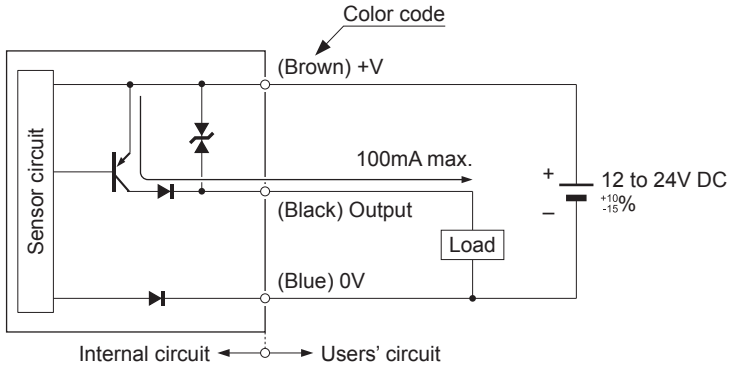
	H
GX-F6□ or **GX-H6**□	3.5mm
GX-F8□ or **GX-H8**□	6mm
GX-F12□ or **GX-H12**□	6.5mm
GX-F15□ or **GX-H15**□	15mm
GX-FL15□ or **GX-HL15**□	47.5mm

4. I/O Circuit Diagram

NPN output type / GX-F6□ / GX-H6□, GX-F8□ / GX-H8□, GX-F12□ / GX-H12□ GX-F15□ / GX-H15□, GX-FL15□ / GX-HL15□



PNP output type / GX-F6□-P / GX-H6□-P, GX-F8□-P / GX-H8□-P GX-F12□-P / GX-H12□-P, GX-F15□-P / GX-H15□-P GX-FL15□-P / GX-HL15□-P



5. Specifications

5-1 GX-F6□, GX-H6□

Type		NPN output type				PNP output type			
		Front sensing		Top sensing		Front sensing		Top sensing	
Model No.		**GX-F6A**	**GX-F6B**	**GX-H6A**	**GX-H6B**	**GX-F6A-P**	**GX-F6B-P**	**GX-H6A-P**	**GX-H6B-P**
Different frequency type		**GX-F6AI**	**GX-F6BI**	**GX-H6AI**	**GX-H6BI**	**GX-F6AI-P**	**GX-F6BI-P**	**GX-H6AI-P**	**GX-H6BI-P**
Max. operation distance (Note 1)		1.6mm ±8%							
Stable sensing range (Note 1)		0 to 1.3mm							
Standard sensing object		Iron sheet 12 × 12 × t1mm							
Hysteresis		20% or less of operation distance (with standard sensing object)							
Repeatability		Along sensing axis, perpendicular to sensing axis: 0.04mm or less							
Supply voltage		12 to 24V DC $^{+10}_{-15}$% Ripple P-P 10% or less							
Current consumption		15mA or less							
Output		NPN open-collector transistor • Maximum sink current: 100mA • Applied voltage: 30V DC or less (between output and 0V) • Residual voltage: 2V or less (at 100mA sink current)				PNP open-collector transistor • Maximum source current: 100mA • Applied voltage: 30V DC or less (between output and +V) • Residual voltage: 2V or less (at 100mA source current)			
Output operation		Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed
Max. response frequency		400Hz							
Protection		IP68 (IEC), IP68g (JEM) (Note 2) (Note 3)							
Ambient temperature		-25 to +70°C, Storage: -40 to +85°C							
Ambient humidity		35 to 85% RH, Storage: 35 to 95% RH							
Sensing range variation	Temperature characteristics	Over ambient temperature range –25 to +70°C: Within ±8% of sensing range at +23°C							
	Voltage characteristics	Within ±2% for $^{+10}_{-15}$% fluctuation of the supply voltage							
Material		Enclosure: PBT, Indicator part: Polyester							
Cable		0.15mm^2 3-core oil, heat and cold resistant cabtyre cable, 1m long							
Weight		Approx. 15g							

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 fl uctuation.
The sensing range is specifi ed for the standard sensing object. With a non-ferrous metal, the sensing range is obtained by multiplying with the correction coeffi cient specifi ed 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 coeffi cient>

Model No.	Iron	Stainless steel (SUS304)	Brass	Aluminum
GX-F6□, GX-H6□	1	Approx. 0.76	Approx. 0.50	Approx. 0.48

2) Panasonic Industrial Devices SUNX's IP68 test method
   1. Immerse at 0m below 0°C water surface and leave for 30min. Then, immerse at 0m below +70°C water surface and leave for 30min.
   2. Regard the heat shock test in 1 as one cycle and perform 20 cycles.
   3. Leave in water at a depth of 1m in water for 500 hours.
   4. After tests 1 to 3 , insulation resistance, voltage withstandability, current consumption, and sensing ranges must meet the standard values.

3) If using the sensor in an environment where cutting oil droplets splatter, the sensor may deteriorate due to added substances in the oil.

5-2 GX-F8□, GX-H8□

Type		NPN output type				PNP output type			
		Front sensing		Top sensing		Front sensing		Top sensing	
Model No.		**GX-F8A**	**GX-F8B**	**GX-H8A**	**GX-H8B**	**GX-F8A-P**	**GX-F8B-P**	**GX-H8A-P**	**GX-H8B-P**
	Different frequency type	**GX-F8AI**	**GX-F8BI**	**GX-H8AI**	**GX-H8BI**	**GX-F8AI-P**	**GX-F8BI-P**	**GX-H8AI-P**	**GX-H8BI-P**
Max. operation distance (Note 1)		2.5mm ±8%							
Stable sensing range (Note 1)		0 to 2.1mm							
Standard sensing object		Iron sheet 15 × 15 × t1mm							
Hysteresis		20% or less of operation distance (with standard sensing object)							
Repeatability		Along sensing axis, perpendicular to sensing axis: 0.04mm or less							
Supply voltage		12 to 24V DC $^{+10}_{-15}$% Ripple P-P 10% or less							
Current consumption		15mA or less							
Output		NPN open-collector transistor • Maximum sink current: 100mA • Applied voltage: 30V DC or less (between output and 0V) • Residual voltage: 2V or less (at 100mA sink current)				PNP open-collector transistor • Maximum source current: 100mA • Applied voltage: 30V DC or less (between output and +V) • Residual voltage: 2V or less (at 100mA source current)			
	Output operation	Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed
Max. response frequency		500Hz							
Protection		IP68 (IEC), IP68g (JEM) (Note 2) (Note 3)							
Ambient temperature		-25 to +70°C, Storage: -40 to +85°C							
Ambient humidity		35 to 85% RH, Storage: 35 to 95% RH							
Sensing range variation	Temperature characteristics	Over ambient temperature range –25 to +70°C: Within ±8% of sensing range at +23°C							
	Voltage characteristics	Within ±2% for $^{+10}_{-15}$% fluctuation of the supply voltage							
Material		Enclosure: PBT, Indicator part: Polyester							
Cable		0.15mm^2 3-core oil, heat and cold resistant cabtyre cable, 1m long							
Weight		Approx. 15g		Approx. 20g		Approx. 15g		Approx. 20g	

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 fl uctuation.
The sensing range is specifi ed for the standard sensing object. With a non-ferrous metal, the sensing range is obtained by multiplying with the correction coeffi cient specifi ed 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 coeffi cient>

Model No.	Iron	Stainless steel (SUS304)	Brass	Aluminum
GX-F8□, GX-H8□	1	Approx. 0.76	Approx. 0.50	Approx. 0.48

2) Panasonic Industrial Devices SUNX's IP68 test method
   1. Immerse at 0m below 0°C water surface and leave for 30min. Then, immerse at 0m below +70°C water surface and leave for 30min.
   2. Regard the heat shock test in 1 as one cycle and perform 20 cycles.
   3. Leave in water at a depth of 1m in water for 500 hours.
   4. After tests 1 to 3 , insulation resistance, voltage withstandability, current consumption, and sensing ranges must meet the standard values.

3) If using the sensor in an environment where cutting oil droplets splatter, the sensor may deteriorate due to added substances in the oil.

5-3 GX-F12□, GX-H12□

Type		NPN output type				PNP output type			
		Front sensing		Top sensing		Front sensing		Top sensing	
Model No.		**GX-F12A**	**GX-F12B**	**GX-H12A**	**GX-H12B**	**GX-F12A-P**	**GX-F12B-P**	**GX-H12A-P**	**GX-H12B-P**
	Different frequency type	**GX-F12AI**	**GX-F12BI**	**GX-H12AI**	**GX-H12BI**	**GX-F12AI-P**	**GX-F12BI-P**	**GX-H12AI-P**	**GX-H12BI-P**
Max. operation distance (Note 1)		4.0mm ±8%							
Stable sensing range (Note 1)		0 to 3.3mm							
Standard sensing object		Iron sheet 20 × 20 × t1mm							
Hysteresis		20% or less of operation distance (with standard sensing object)							
Repeatability		Along sensing axis, perpendicular to sensing axis: 0.04mm or less							
Supply voltage		12 to 24V DC $^{+10}_{-15}$% Ripple P-P 10% or less							
Current consumption		15mA or less							
Output		NPN open-collector transistor • Maximum sink current: 100mA • Applied voltage: 30V DC or less (between output and 0V) • Residual voltage: 2V or less (at 100mA sink current)				PNP open-collector transistor • Maximum source current: 100mA • Applied voltage: 30V DC or less (between output and +V) • Residual voltage: 2V or less (at 100mA source current)			
	Output operation	Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed
Max. response frequency		500Hz							
Protection		IP68 (IEC), IP68g (JEM) (Note 2) (Note 3)							
Ambient temperature		-25 to +70°C, Storage: -40 to +85°C							
Ambient humidity		35 to 85% RH, Storage: 35 to 95% RH							
Sensing range variation	Temperature characteristics	Over ambient temperature range –25 to +70°C: Within ±8% of sensing range at +23°C							
	Voltage characteristics	Within ±2% for $^{+10}_{-15}$% fluctuation of the supply voltage							
Material		Enclosure: PBT, Indicator part: Polyester							
Cable		0.15mm^2 3-core oil, heat and cold resistant cabtyre cable, 1m long							
Weight		Approx. 20g							

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 fl uctuation.
The sensing range is specifi ed for the standard sensing object. With a non-ferrous metal, the sensing range is obtained by multiplying with the correction coeffi cient specifi ed 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 coeffi cient>

Model No.	Iron	Stainless steel (SUS304)	Brass	Aluminum
GX-F12□, GX-H12□	1	Approx. 0.79	Approx. 0.56	Approx. 0.53

2) Panasonic Industrial Devices SUNX's IP68 test method
   1. Immerse at 0m below 0°C water surface and leave for 30min. Then, immerse at 0m below +70°C water surface and leave for 30min.
   2. Regard the heat shock test in 1 as one cycle and perform 20 cycles.
   3. Leave in water at a depth of 1m in water for 500 hours.
   4. After tests 1 to 3 , insulation resistance, voltage withstandability, current consumption, and sensing ranges must meet the standard values.

3) If using the sensor in an environment where cutting oil droplets splatter, the sensor may deteriorate due to added substances in the oil.

5-4 GX-F15□, GX-H15□

Type		NPN output type				PNP output type			
		Front sensing		Top sensing		Front sensing		Top sensing	
Model No.		**GX-F15A**	**GX-F15B**	**GX-H15A**	**GX-H15B**	**GX-F15A-P**	**GX-F15B-P**	**GX-H15A-P**	**GX-H15B-P**
	Different frequency type	**GX-F15AI**	**GX-F15BI**	**GX-H15AI**	**GX-H15BI**	**GX-F15AI-P**	**GX-F15BI-P**	**GX-H15AI-P**	**GX-H15BI-P**
Max. operation distance (Note 1)		5.0mm ±8%							
Stable sensing range (Note 1)		0 to 4.2mm							
Standard sensing object		Iron sheet 20 × 20 × t1mm							
Hysteresis		20% or less of operation distance (with standard sensing object)							
Repeatability		Along sensing axis, perpendicular to sensing axis: 0.04mm or less							
Supply voltage		12 to 24V DC $^{+10}_{-15}$% Ripple P-P 10% or less							
Current consumption		15mA or less							
Output		NPN open-collector transistor • Maximum sink current: 100mA • Applied voltage: 30V DC or less (between output and 0V) • Residual voltage: 2V or less (at 100mA sink current)				PNP open-collector transistor • Maximum source current: 100mA • Applied voltage: 30V DC or less (between output and +V) • Residual voltage: 2V or less (at 100mA source current)			
	Output operation	Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed
Max. response frequency		250Hz							
Protection		IP68 (IEC), IP68g (JEM) (Note 2) (Note 3)							
Ambient temperature		-25 to +70°C, Storage: -40 to +85°C							
Ambient humidity		35 to 85% RH, Storage: 35 to 95% RH							
Sensing range variation	Temperature characteristics	Over ambient temperature range –25 to +70°C: Within ±8% of sensing range at +23°C							
	Voltage characteristics	Within ±2% for $^{+10}_{-15}$% fluctuation of the supply voltage							
Material		Enclosure: PBT, Indicator part: Polyester							
Cable		0.15mm^2 3-core oil, heat and cold resistant cabtyre cable, 1m long							
Weight		Approx. 20g							

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 fl uctuation.
The sensing range is specifi ed for the standard sensing object. With a non-ferrous metal, the sensing range is obtained by multiplying with the correction coeffi cient specifi ed 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 coeffi cient>

Model No.	Iron	Stainless steel (SUS304)	Brass	Aluminum
GX-F15□, GX-H15□	1	Approx. 0.68	Approx. 0.47	Approx. 0.45

2) Panasonic Industrial Devices SUNX's IP68 test method
   1. Immerse at 0m below 0°C water surface and leave for 30min. Then, immerse at 0m below +70°C water surface and leave for 30min.
   2. Regard the heat shock test in 1 as one cycle and perform 20 cycles.
   3. Leave in water at a depth of 1m in water for 500 hours.
   4. After tests 1 to 3 , insulation resistance, voltage withstandability, current consumption, and sensing ranges must meet the standard values.

3) If using the sensor in an environment where cutting oil droplets splatter, the sensor may deteriorate due to added substances in the oil.

5-5 GX-FL15□, GX-HL15□

Type		Long sensing range type							
		NPN output type				PNP output type			
		Front sensing		Top sensing		Front sensing		Top sensing	
Model No.		**GX-FL15A**	**GX-FL15B**	**GX-HL15A**	**GX-HL15B**	**GX-FL15A-P**	**GX-FL15B-P**	**GX-HL15A-P**	**GX-HL15B-P**
	Different frequency type	**GX-FL15AI**	**GX-FL15BI**	**GX-HL15AI**	**GX-HL15BI**	**GX-FL15AI-P**	**GX-FL15BI-P**	**GX-HL15AI-P**	**GX-HL15BI-P**
Max. operation distance (Note 1)		8.0mm ±8% (Note 2)							
Stable sensing range (Note 1)		0 to 6.7mm (Note 2)							
Standard sensing object		Iron sheet 30 × 30 × t1mm							
Hysteresis		20% or less of operation distance (with standard sensing object)							
Repeatability		Along sensing axis, perpendicular to sensing axis: 0.04mm or less							
Supply voltage		12 to 24V DC $^{+10}_{-15}$% Ripple P-P 10% or less							
Current consumption		15mA or less							
Output		NPN open-collector transistor • Maximum sink current: 100mA • Applied voltage: 30V DC or less (between output and 0V) • Residual voltage: 2V or less (at 100mA sink current)				PNP open-collector transistor • Maximum source current: 100mA • Applied voltage: 30V DC or less (between output and +V) • Residual voltage: 2V or less (at 100mA source current)			
	Output operation	Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed
Max. response frequency		150Hz (Note 3)							
Protection		IP68 (IEC), IP68g (JEM) (Note 4) (Note 5)							
Ambient temperature		-25 to +70°C, Storage: -40 to +85°C							
Ambient humidity		35 to 85% RH, Storage: 35 to 95% RH							
Sensing range variation	Temperature characteristics	Over ambient temperature range –25 to +70°C: Within ±8% of sensing range at +23°C							
	Voltage characteristics	Within ±2% for $^{+10}_{-15}$% fluctuation of the supply voltage							
Material		Enclosure: PBT, Indicator part: Polyester							
Cable		0.15mm^2 3-core oil, heat and cold resistant cabtyre cable, 1m long							
Weight		Approx. 20g							

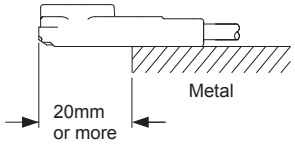
Notes: 1) The maximum operation distance stands for the maximum distance for which the sensor can detect the standard sensing object.
The stable sensing range stands for the sensing range for which the sensor can stably detect the standard sensing object even if there is an ambient temperature drift and/or supply voltage fl uctuation.
The sensing range is specifi ed for the standard sensing object. With a non-ferrous metal, the sensing range is obtained by multiplying with the correction coeffi cient specifi ed 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 coeffi cient>

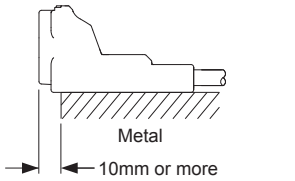
Model No.	Iron	Stainless steel (SUS304)	Brass	Aluminum
GX-FL15□	1	Approx. 0.70	Approx. 0.45	Approx. 0.43
GX-HL15□	1	Approx. 0.76	Approx. 0.50	Approx. 0.48

It is recommended that the **GX-FL15□** and the **GX-HL15□** be installed on an insulator. Note that when a sensor is installed on copper or aluminum, for example, the sensing range is obtained by multiplying with the correction coefficient specified below.

- **When installing the GX-FL15□ on steel or stainless steel**
  Ensure that the front end protrudes at least 20mm, as shown in the figure at right.
  Refer to the table below for the correction coefficient.



- **When installing the GX-HL15□ on steel or stainless steel**
  Ensure that the front end protrudes at least 10mm, as shown in the figure at right.
  Refer to the table below for the correction coefficient.



- **If the sensor cannot be installed with the front end protruding**
  Use aluminum sheet **MS-A15F** (for **GX-FL15□**) or **MS-A15H** (for **GX-HL15□**) (to be purchased separately) inserted between the sensor and the mounting plate.
  Refer to the table below for the correction coefficient.

<Correction coeffi cient>

Mounting condition	Model No.	Insulator	Iron	Stainless steel (SUS304)	Brass	Aluminum
Normal installation	**GX-FL15□**	1.0	–	–	Approx. 0.94	Approx. 0.93
	GX-HL15□	1.0	–	–	Approx. 1.05	Approx. 1.04
The end must protrude at least 20mm from the mounting base.	**GX-FL15□**	–	Approx. 1.02	Approx. 0.99	–	–
The end must protrude at least 10mm from the mounting base.	**GX-HL15□**	–	Approx. 1.04	Approx. 1.00	–	–
Use the aluminum sheet (optional).	**GX-FL15□**	–	Approx. 0.92	Approx. 0.92	–	–
	GX-HL15□	–	Approx. 1.08	Approx. 1.05	–	–

2) Each value shows the required space of the product mounted to insulators directly.In the case of mounting the product to a steel or stainless mounting plate, insert the optional aluminum sheet **MS-A15F** (for the **GX-FL15□**) or **MS-A15H** (for **GX-HL15□**) between the sensor and the mounting plate.

3) Each value shows the required space of the product mounted to insulators directly. The maximum response frequency will be 100Hz if the product is mounted to a steel or stainless mounting plate.

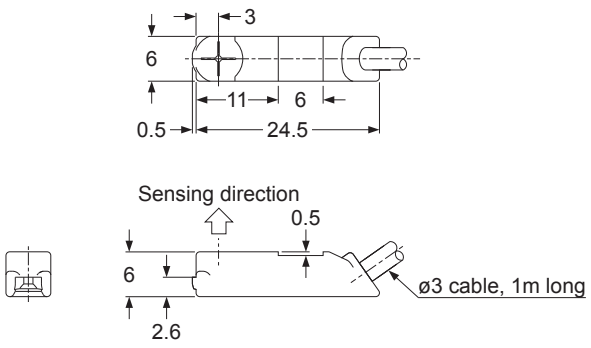
4) Panasonic Industrial Devices SUNX's IP68 test method
   1. Immerse at 0m below 0°C water surface and leave for 30min. Then, immerse at 0m below +70°C water surface and leave for 30min.
   2. Regard the heat shock test in 1 as one cycle and perform 20 cycles.
   3. Leave in water at a depth of 1m in water for 500 hours.
   4. After tests 1 to 3 , insulation resistance, voltage withstandability, current consumption, and sensing ranges must meet the standard values.

5) If using the sensor in an environment where cutting oil droplets splatter, the sensor may deteriorate due to added substances in the oil.

6. Dimensions

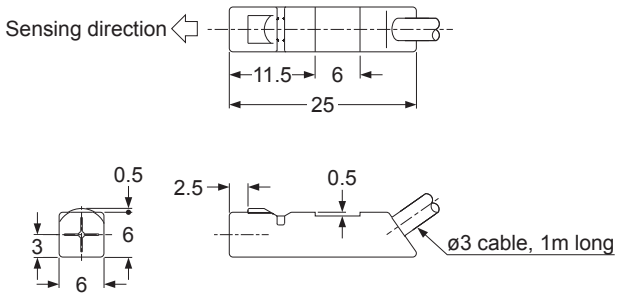
GX-F6□

(Unit: mm)



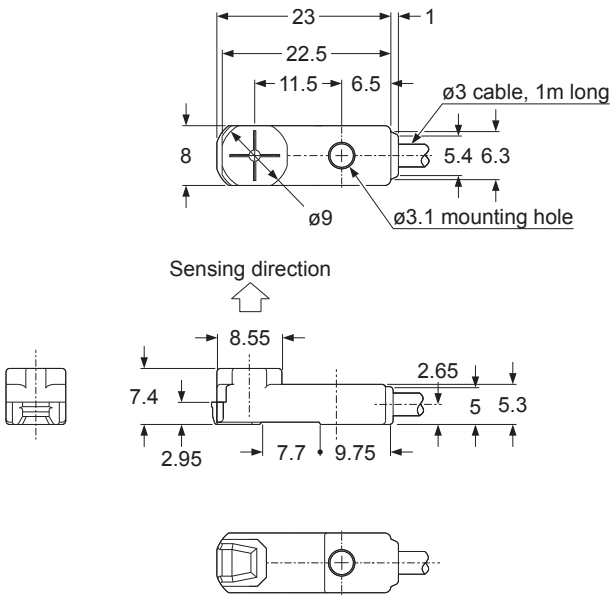
GX-H6□

(Unit: mm)



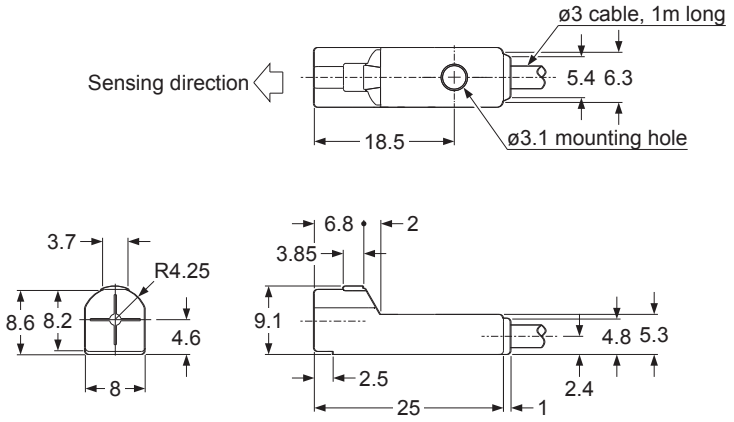
GX-F8□

(Unit: mm)



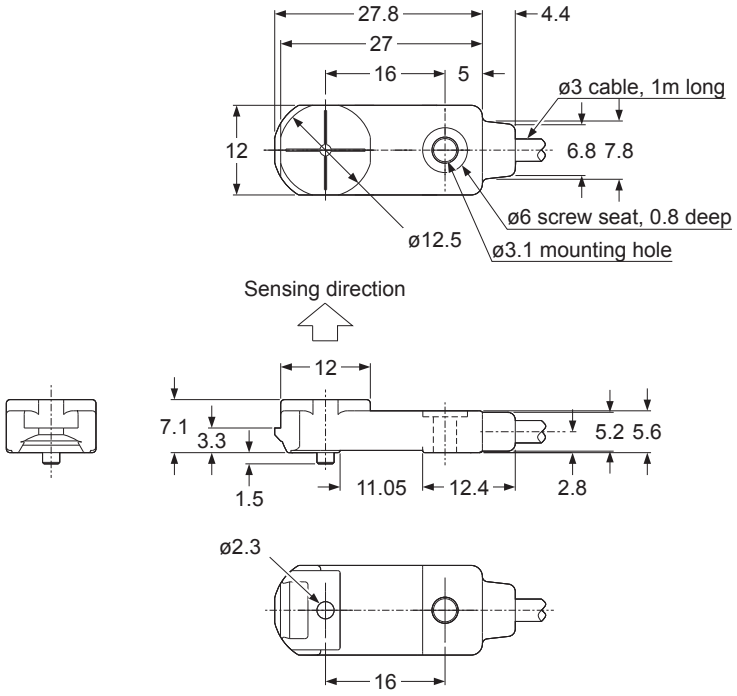
GX-H8□

(Unit: mm)



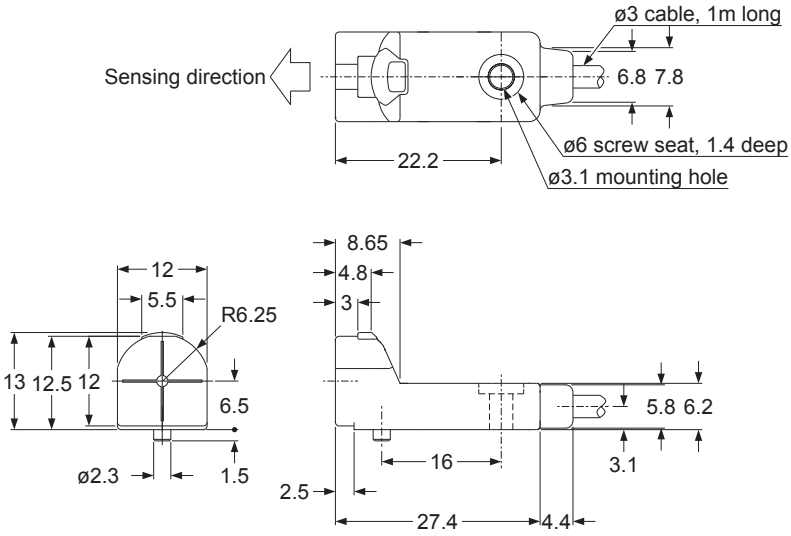
GX-F12□

(Unit: mm)



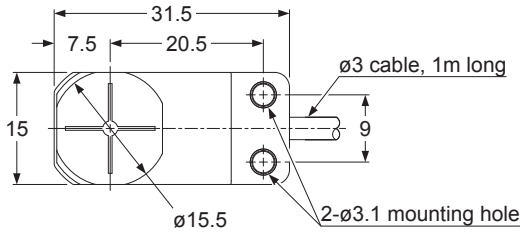
GX-H12□

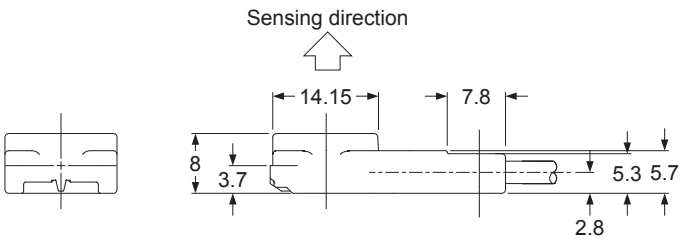
(Unit: mm)



GX-F15□, GX-FL15□

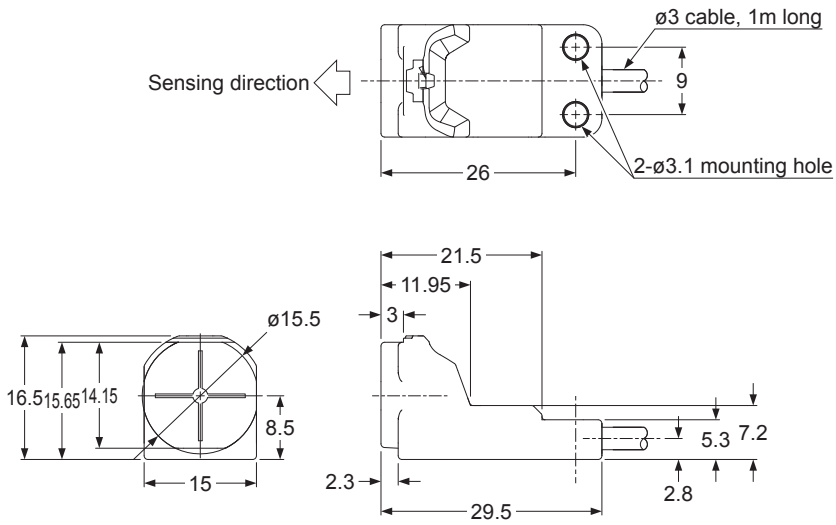
(Unit: mm)





GX-H15□, GX-HL15□

(Unit: mm)



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