# Cylindrical Compact Inductive Proximity Sensor Amplifier Built-in

# GX SERIES


Related Information
■ General terms and conditions..... F-3
■ Selection guide ..... P.781~
■ Glossary of terms..... P.1576~
■ General precautions ..... P.1579~



CE

Recognition
(Excluding GX-4S□ and 5 m cable length type)

Contact Ramco for the best replacement options that include 2-wire and 3-wire types

email us - nsales@ramcoi.com

Bending-resistant cable type available

Metal embedding possible

## Robust enclosure and bending-resistant cable types are also available

## VARIETIES

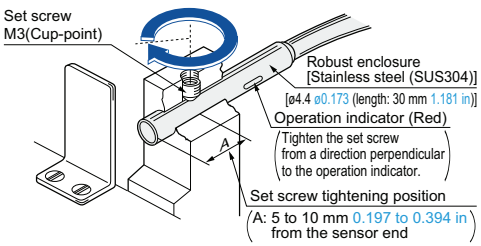
### Miniature GX-3S□

**GX-3S□** is an amplifier built-in inductive proximity sensor having a diameter of just ø3.8 mm ø0.150 in.


### Robust housing GX-4S□

The **GX-4S□** uses a robust stainless steel enclosure. The tightening torque can be 0.58 N·m or less. (2 times compared with conventional models)

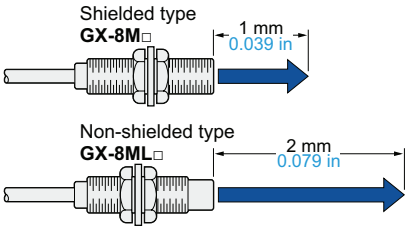
Tightening torque: **0.58 N·m or less**




## BASIC PERFORMANCE

### Long sensing range GX-8ML□

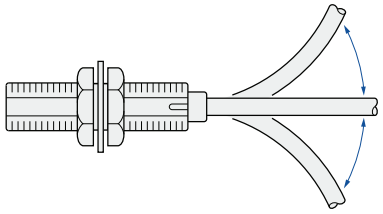
The non-shielded type (**GX-8ML□**) has twice the sensing range of the shielded type (**GX-8M□**), although having the same size. Hence, it allows margin against sensing distance variations.




## ENVIRONMENTAL RESISTANCE

### Ten times greater bending durability (Compared with conventional models) GX-□-R

The bending durability of the cable to repeated bending has been increased tenfold by using special alloy cores for the cable.



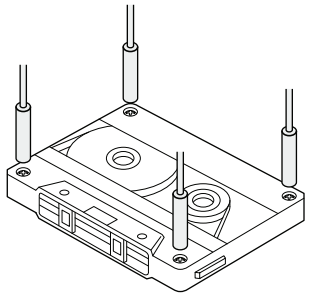

FIBER SENSORS
LASER SENSORS
PHOTOELECTRIC SENSORS
MICRO PHOTOELECTRIC SENSORS
AREA SENSORS
SAFETY LIGHT CURTAINS / SAFETY COMPONENTS
PRESSURE / FLOW SENSORS
INDUCTIVE PROXIMITY SENSORS
PARTICULAR USE SENSORS
SENSOR OPTIONS
SIMPLE WIRE-SAVING UNITS
WIRE-SAVING SYSTEMS
MEASUREMENT SENSORS
STATIC CONTROL DEVICES
LASER MARKERS
PLC
HUMAN MACHINE INTERFACES
ENERGY MANAGEMENT SOLUTIONS
FA COMPONENTS
MACHINE VISION SYSTEMS
UV CURING SYSTEMS

Selection Guide
Amplifier Built-in
Amplifier-separated
Other Products

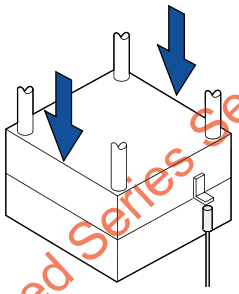
GX-F/H
GXL
GL
GX-M
GX-U/GX-FU/GX-N
GX

## APPLICATIONS

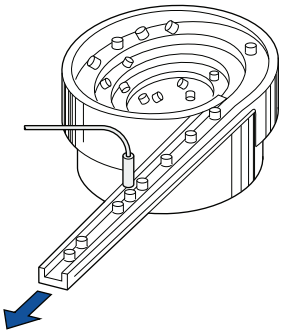
**Sensing screws on cassette**



**Sensing the punch of a die**



**Counting parts**





## ORDER GUIDE

| Type | | Appearance (mm in) | Sensing range (Note) | Model No. | Supply voltage | Output | Output operation |
|---|---|---|---|---|---|---|---|
| Shielded type | Non-threaded type | ø3.8 ø0.150, 30 1.181 | Maximum operation distance 0.8 mm 0.031 in; (0 to 0.6 mm 0 to 0.024 in) Stable sensing range | GX-3S | 12 to 24 V DC ±10 % | NPN open-collector transistor | Normally open |
| | | | | GX-3SB | | | Normally closed |
| | | Robust enclosure type ø4.4 ø0.173, 30 1.181 | 0.8 mm 0.031 in; (0 to 0.6 mm 0 to 0.024 in) | GX-4S | | | Normally open |
| | | | | GX-4SB | | | Normally closed |
| | | ø5.4 ø0.213, 30 1.181 | 1 mm 0.039 in; (0 to 0.8 mm 0 to 0.031 in) | GX-5S | 10 to 30 V DC | | Normally open |
| | | | | GX-5SB | | | Normally closed |
| | Threaded type | M5, 30 1.181 | 0.8 mm 0.031 in; (0 to 0.6 mm 0 to 0.024 in) | GX-5M | 12 to 24 V DC ±10 % | | Normally open |
| | | | | GX-5MB | | | Normally closed |
| | | M8, 30 1.181 | 1 mm 0.039 in; (0 to 0.8 mm 0 to 0.031 in) | GX-8M | 10 to 30 V DC | | Normally open |
| | | | | GX-8MB | | | Normally closed |
| Non-shielded type | | M8, 30 1.181 | 2 mm 0.079 in; (0 to 1.6 mm 0 to 0.063 in) | GX-8ML | | | Normally open |
| | | | | GX-8MLB | | | 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.

# ORDER GUIDE

## Bending-resistant cable type

Bending-resistant cable type is also available for shielded type.
When ordering this type, suffix "**-R**" to the model No.
(e.g.) Bending-resistant cable type of **GX-3S** is "**GX-3S-R**".

## 5 m 16.404 ft cable length type

5 m 16.404 ft cable length type (standard: 3 m 9.843 ft) is also available. (excluding **GX-4SB**)
When ordering this type, suffix "**-C5**" to the model No.
(e.g.) 5 m 16.404 ft cable length type of **GX-3S** is "**GX-3S-C5**".

Refer to table below for 5 m 16.404 ft cable length type of bending-resistant cable type sensor.



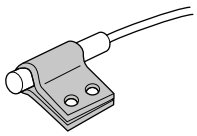
• **Table of model Nos.**

| Type | | Standard | Bending-resistant cable of 5 m 16.404 ft cable length type |
|---|---|---|---|
| Shielded type | Non-threaded type | **GX-3S** | **GX-3S-R-C5** |
| | | **GX-3SB** | **GX-3SB-R-C5** |
| | | **GX-4S** | **GX-4S-R-C5** |
| | | **GX-4SB** | ——— |
| | | **GX-5S** | **GX-5S-R-C5** |
| | | **GX-5SB** | ——— |
| | Threaded type | **GX-5M** | **GX-5M-R-C5** |
| | | **GX-5MB** | ——— |
| | | **GX-8M** | **GX-8M-R-C5** |
| | | **GX-8MB** | **GX-8MB-R-C5** |

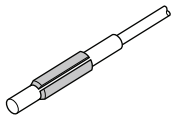
## Accessories

• **MS-SS3** (Sensor mounting bracket for **GX-3S** type)
• **MS-SS3-2** (C bracket for **GX-3S** type)
• **MS-SS5** (Sensor mounting bracket for **GX-5S** type)

• **MS-SS3**
• **MS-SS5**



• **MS-SS3-2**



By using the C bracket, the applicable tightening force can be doubled.

## SPECIFICATIONS

### Non-threaded type

| Item \ Model No. | GX-3S | GX-3SB | GX-3S-R | GX-3SB-R | GX-4S | GX-4SB | GX-4S-R | GX-4SB-R | GX-5S | GX-5SB | GX-5S-R | GX-5SB-R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type | Shielded type | | | | | | | | | | | |
| | | | Bending-resistant cable | | | | Bending-resistant cable | | | | Bending-resistant cable | |
| CE marking directive compliance | EMC Directive, RoHS Directive | | | | | | | | | | | |
| Max. operation distance (Note 2) | 0.8 mm 0.031 in ±15 % | | | | | | | | 1 mm 0.039 in ±15 % | | | |
| Stable sensing range (Note 2) | 0 to 0.6 mm 0 to 0.024 in | | | | | | | | 0 to 0.8 mm 0 to 0.031 in | | | |
| Standard sensing object | Iron sheet 5 × 5 × t 1 mm 0.197 × 0.197 × t 0.039 in | | | | | | | | Iron sheet 6 × 6 × t 1 mm 0.236 × 0.236 × t 0.039 in | | | |
| Hysteresis | 15 % or less of operation distance (with standard sensing object) | | | | | | | | | | | |
| Repeatability | 20 µm 0.787 mil or less | | | | | | | | 8 µm 0.315 mil or less | | | |
| Supply voltage | 12 to 24 V DC ±10 % Ripple P-P 10 % or less | | | | | | | | 10 to 30 V DC Ripple P-P 10 % or less | | | |
| Current consumption | 15 mA or less | | | | | | | | | | | |
| Output | NPN open-collector transistor<br>• Maximum sink current: 50 mA<br>• Applied voltage: 30 V DC or less (between output and 0 V)<br>• Residual voltage: 0.4 V or less (at 50 mA sink current) | | | | | | | | NPN open-collector transistor<br>• Maximum sink current: 200 mA (Note 3)<br>• Applied voltage: 30 V DC or less (between output and 0 V)<br>• Residual voltage: 1.5 V or less (at 200 mA sink current)<br>0.4 V or less (at 50 mA sink current) | | | |
| Utilization category | DC-12 or DC-13 | | | | | | | | | | | |
| Output operation | Normally open | Normally closed | Normally open | Normally closed | Normally open | Normally closed | Normally open | Normally closed | Normally open | Normally closed | Normally open | Normally closed |
| Short-circuit protection | — | | | | | | | | Incorporated | | | |
| Max. response frequency | 1 kHz | | | | | | | | 1.5 kHz | | | |
| Operation indicator | Red LED (lights up when the output is ON) | | | | | | | | | | | |
| Environmental resistance: Pollution degree | 3 (Industrial environment) | | | | | | | | | | | |
| Environmental resistance: Protection | IP67 (IEC) | | | | | | | | | | | |
| Environmental resistance: Ambient temperature | –25 to +70 °C –13 to +158 °F, Storage: –25 to +80 °C –13 to +176 °F | | | | | | | | | | | |
| Environmental resistance: Ambient humidity | 35 to 95 % RH, Storage: 35 to 95 % RH | | | | | | | | 35 to 85 % RH, Storage: 35 to 95 % RH | | | |
| Environmental resistance: Voltage withstandability | 500 V AC for one min. between all supply terminals connected together and enclosure | | | | | | | | | | | |
| Environmental resistance: Insulation resistance | 5 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure | | | | | | | | 50 MΩ, or more, with 500 V DC megger between all supply terminals connected together and enclosure | | | |
| Environmental resistance: 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 | | | | | | | | | | | |
| Environmental resistance: Shock resistance | 200 m/s² acceleration (20 G approx.) in X, Y and Z directions ten times each | | | | | | | | 300 m/s² acceleration (30 G approx.) in X, Y and Z directions ten times each | | | |
| Sensing range variation: Temperature characteristics | Over ambient temperature range –25 to +70 °C –13 to +158 °F: Within ±20 % of sensing range at +20 °C +68 °F | | | | | | | | Over ambient temperature range –25 to +70 °C –13 to +158 °F: Within ±15 % of sensing range at +20 °C +68 °F | | | |
| Sensing range variation: Voltage characteristics | Within ±2 % for ±10 % fluctuation of the supply voltage | | | | | | | | Within ±2.5 % for ±15 % fluctuation of the supply voltage | | | |
| Material | Enclosure: Stainless steel (SUS304), Resin part: TPX | | | | | | | | Enclosure: Brass (Nickel plated)<br>Resin part: ABS | | | |
| Cable | 0.08 mm² 3-core oil, heat and cold resistant cabtyre cable, 3 m 9.843 ft long | | 0.1 mm² 3-core bending, oil and heat resistant cabtyre cable, 3 m 9.843 ft long | | 0.08 mm² 3-core oil, heat and cold resistant cabtyre cable, 3 m 9.843 ft long | | 0.1 mm² 3-core bending, oil and heat resistant cabtyre cable, 3 m 9.843 ft long | | 0.14 mm² 3-core oil, heat and cold resistant cabtyre cable, 3 m 9.843 ft long | | 0.15 mm² 3-core bending, oil and heat resistant cabtyre cable, 3 m 9.843 ft long | |
| Cable extension | Extension up to total 100 m 328.084 ft is possible with 0.3 mm², or more, cable. | | | | | | | | | | | |
| Weight | Net weight: 30 g approx. | | | | | | | | Net weight: 55 g approx. | | | |
| Accessories | **MS-SS3** (Sensor mounting bracket): 1 pc.<br>**MS-SS3-2** (C bracket): 1 pc. | | | | — | | | | **MS-SS5** (Sensor mounting bracket): 1 pc. | | | |

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) The maximum sink current varies depending on the ambient temperature. Refer to "**I/O CIRCUIT AND WIRING DIAGRAMS** (p.846)" for details.

# SPECIFICATIONS

## Threaded type

| Item \ Type | Shielded type | | | | | | | | Non-shielded type | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Bending-resistant cable | | | | Bending-resistant cable | | | |
| Model No. | GX-5M | GX-5MB | GX-5M-R | GX-5MB-R | GX-8M | GX-8MB | GX-8M-R | GX-8MB-R | GX-8ML | GX-8MLB |
| CE marking directive compliance | EMC Directive, RoHS Directive | | | | | | | | | |
| Max. operation distance (Note 2) | 0.8 mm 0.031 in ±15 % | | | | 1 mm 0.039 in ±15 % | | | | 2 mm 0.079 in ±15 % | |
| Stable sensing range (Note 2) | 0 to 0.6 mm 0 to 0.024 in | | | | 0 to 0.8 mm 0 to 0.031 in | | | | 0 to 1.6 mm 0 to 0.063 in | |
| Standard sensing object | Iron sheet 5 × 5 × t 1 mm 0.197 × 0.197 × t 0.039 in | | | | Iron sheet 8 × 8 × t 1 mm 0.315 × 0.315 × t 0.039 in | | | | Iron sheet 12 × 12 × t 1 mm 0.472 × 0.472 × t 0.039 in | |
| Hysteresis | 15 % or less of operation distance (with standard sensing object) | | | | 10 % or less of operation distance (with standard sensing object) | | | | | |
| Repeatability | 20 µm 0.787 mil or less | | | | 8 µm 0.315 mil or less | | | | 40 µm 1.575 mil or less | |
| Supply voltage | 12 to 24 V DC ±10 % Ripple P-P 10 % or less | | | | 10 to 30 V DC Ripple P-P 10 % or less | | | | | |
| Current consumption | 15 mA or less | | | | | | | | | |
| Output | NPN open-collector transistor<br>• Maximum sink current: 50 mA<br>• Applied voltage: 30 V DC or less (between output and 0V)<br>• Residual voltage: 0.4 V or less (at 50 mA sink current) | | | | NPN open-collector transistor<br>• Maximum sink current: 200 mA (Note 3)<br>• Applied voltage: 30 V DC or less (between output and 0 V)<br>• Residual voltage: 1.5 V or less (at 200 mA sink current)<br>0.4 V or less (at 50 mA sink current) | | | | | |
| Utilization category | DC-12 or DC-13 | | | | | | | | | |
| Output operation | Normally open | Normally closed | Normally open | Normally closed | Normally open | Normally closed | Normally open | Normally closed | Normally open | Normally closed |
| Short-circuit protection | — | | | | Incorporated | | | | | |
| Max. response frequency | 1 kHz | | | | | | | | 500 Hz | |
| Operation indicator | Red LED (lights up when the output is ON) | | | | | | | | | |
| Environmental resistance: Pollution degree | 3 (Industrial environment) | | | | | | | | | |
| Environmental resistance: Protection | IP67 (IEC) | | | | | | | | | |
| Environmental resistance: Ambient temperature | – 25 to +70 °C –13 to +158 °F, Storage: – 25 to +80 °C – 13 to +176 °F | | | | | | | | | |
| Environmental resistance: Ambient humidity | 35 to 95 % RH, Storage: 35 to 95 % RH | | | | 35 to 85 % RH, Storage: 35 to 95 % RH | | | | | |
| Environmental resistance: Voltage withstandability | 500 V AC for one min. between all supply terminals connected together and enclosure | | | | | | | | | |
| Environmental resistance: Insulation resistance | 5 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure | | | | 50 MΩ, or more, with 500 V DC megger between all supply terminals connected together and enclosure | | | | | |
| Environmental resistance: 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 | | | | | | | | | |
| Environmental resistance: Shock resistance | 200 m/s² acceleration (20 G approx.) in X, Y and Z directions ten times each | | | | 300 m/s² acceleration (30 G approx.) in X, Y and Z directions ten times each | | | | 300 m/s² acceleration (30 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 ±20 % of sensing range at +20 °C +68 °F | | | | Over ambient temperature range –25 to +70 °C –13 to +158 °F: Within $^{+15}_{-10}$ % of sensing range at +20 °C +68 °F | | | | | |
| Sensing range variation: Voltage characteristics | Within ±2 % for ±10 % fluctuation of the supply voltage | | | | Within ±2.5 % for ±15 % fluctuation of the supply voltage | | | | | |
| Material | Enclosure: Brass (Nickel plated)<br>Resin part: TPX | | | | Enclosure: Brass (Nickel plated)<br>Resin part: ABS | | | | | |
| Cable | 0.08 mm² 3-core oil, heat and cold resistant cabtyre cable, 3 m 9.843 ft long | | 0.1 mm² 3-core bending, oil and heat resistant cabtyre cable, 3 m 9.843 ft long | | 0.14 mm² 3-core oil, heat and cold resistant cabtyre cable, 3 m 9.843 ft long | | 0.15 mm² 3-core bending, oil and heat resistant cabtyre cable, 3 m 9.843 ft long | | 0.14 mm² 3-core, oil, heat and cold resistant cabtyre cable, 3 m 9.843 ft long | |
| Cable extension | Extension up to total 100 m 328.084 ft is possible with 0.3 mm², or more, cable. | | | | | | | | Extension up to total 100 m 328.084 ft is possible with 0.14 mm², or more, cable. | |
| Weight (Note 4) | Net weight: 30 g approx. | | | | Net weight: 60 g approx. | | | | | |
| Accessories | Nut: 2 pcs.<br>Toothed lock washer: 1 pc. | | Nut: 2 pcs.<br>Toothed lock washer: 2 pcs. | | Nut: 2 pcs.<br>Toothed lock washer: 1 pc. | | Nut: 2 pcs.<br>Toothed lock washer: 2 pcs. | | Nut: 2 pcs.<br>Toothed lock washer: 1 pc. | |

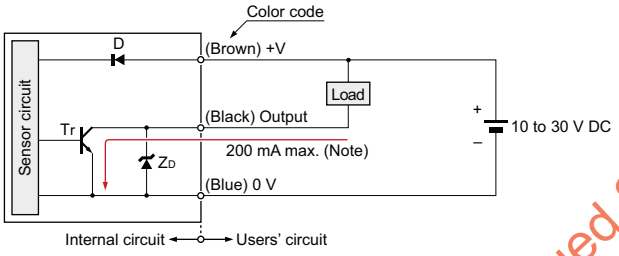


Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C +73.4 °F.
2) The maximum operation distance stands for the maximum distance for which the sensor can detect the standard sensing object.
The stable sensing range stands 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) The maximum sink current varies depending on the ambient temperature. Refer to "**I/O CIRCUIT AND WIRING DIAGRAMS** (p.846)" for details.
4) The given weight of the threaded type includes the weight of nuts and toothed lock washers.

# I/O CIRCUIT AND WIRING DIAGRAMS

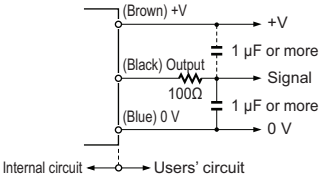
## GX-5S□ GX-8M□ GX-8ML□

### I/O circuit diagram



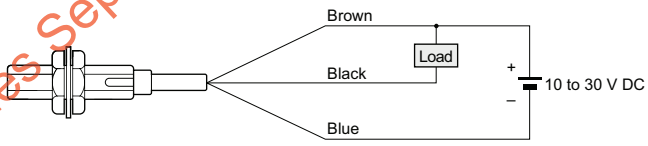

Symbols … D : Reverse supply polarity protection diode
ZD: Surge absorption zener diode
Tr : NPN output transistor

- If a capacitor of 1 µF or more is connected between 0 V and output or between +V and output, connect a 100 Ω resistor in series as shown below.

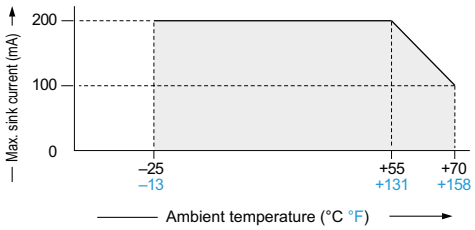



Without the resistor, the short-circuit protection is activated by the charge or discharge current of the capacitor, so that it results in delaying the response whenever the sensor switches. The connected resistor solves this problem.

### Wiring diagram



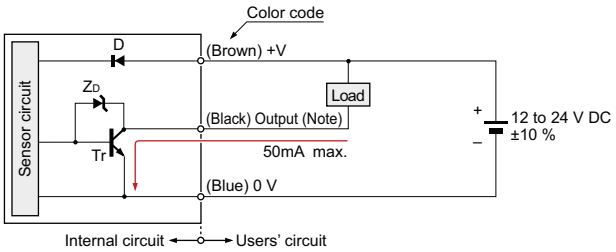

Note: The maximum sink current varies depending on the ambient temperature.






## GX-3S□ GX-4S□ GX-5M□

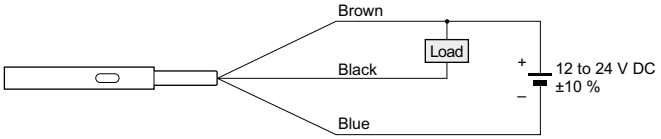
### I/O circuit diagram




Note: **GX-3S□**, **GX-4S□** and **GX-5M□** do not incorporate a short-circuit protection circuit at the output. Do not connect them directly to a power supply or a capacitive load.

Symbols … D : Reverse supply polarity protection diode
ZD: Surge absorption zener diode
Tr : NPN output transistor

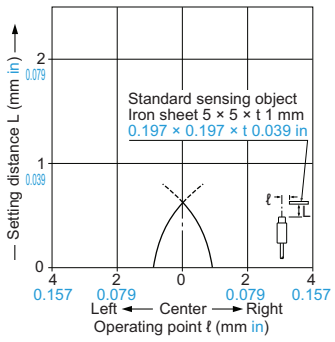
### Wiring diagram



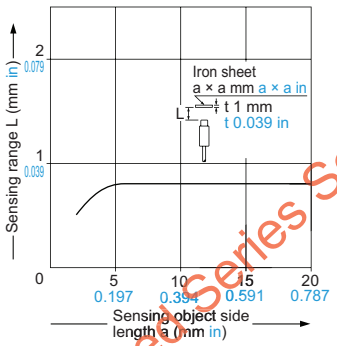
## SENSING CHARACTERISTICS (TYPICAL)

### GX-3S□ GX-4S□ GX-5M□

**Sensing field**




**Correlation between sensing object size and sensing range**

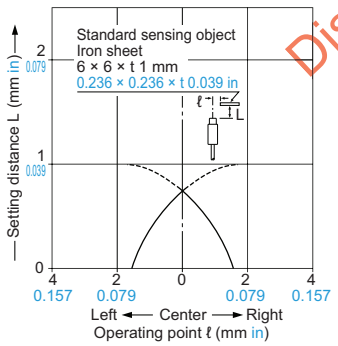



As the sensing object size becomes smaller than the standard size (iron sheet 5 × 5 × t 1 mm 0.197 × 0.197 × t 0.039 in), the sensing range shortens as shown in the left figure.

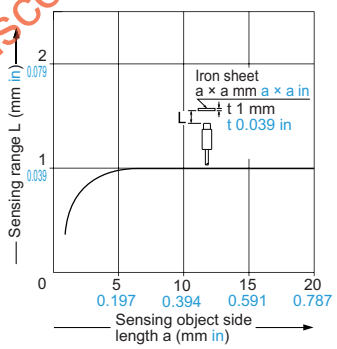


### GX-5S□

**Sensing field**



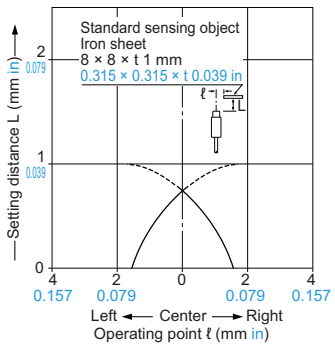

**Correlation between sensing object size and sensing range**



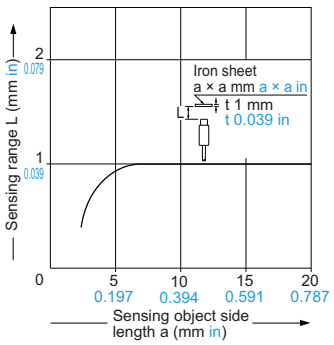

As the sensing object size becomes smaller than the standard size (iron sheet 6 × 6 × t 1 mm 0.236 × 0.236 × t 0.039 in), the sensing range shortens as shown in the left figure.

### GX-8M□

**Sensing field**



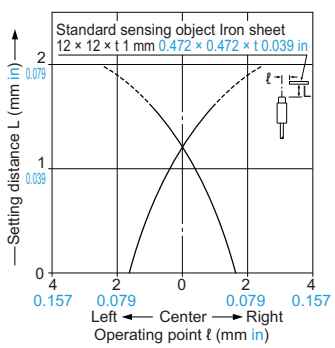

**Correlation between sensing object size and sensing range**



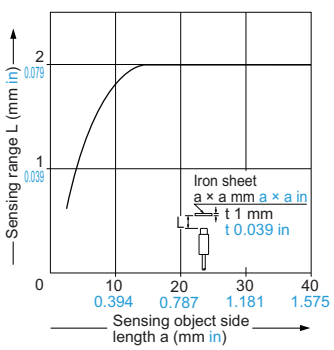

As the sensing object size becomes smaller than the standard size (iron sheet 8 × 8 × t 1 mm 0.315 × 0.315 × t 0.039 in), the sensing range shortens as shown in the left figure.

### GX-8ML□

**Sensing field**




**Correlation between sensing object size and sensing range**




As the sensing object size becomes smaller than the standard size (iron sheet 12 × 12 × t 1 mm 0.472 × 0.472 × t 0.039 in), the sensing range shortens as shown in the left figure.

## 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.

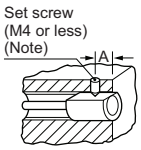
### Mounting

- The tightening torque should be as given below.

#### Mounting with set screw

**<Shielded of threaded type>**

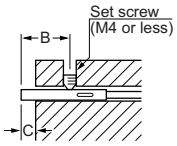
- Tighten the set screw on the flat surface of the sensor without applying excessive force. Make sure to use a set screw with a cup-point end.




Note: To fasten **GX-5M□**, use a M3 or less set screw.

| Model No. | Set screw tightening position A (mm in) | Tightening torque |
|---|---|---|
| **GX-5M□** | 5 to 10 0.197 to 0.394 | 0.29 N·m |
| **GX-8M□** | 8 to 22 0.315 to 0.866 | 0.29 N·m |

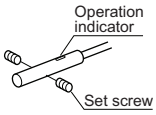
**<Non-threaded type and non-shielded of threaded type>**

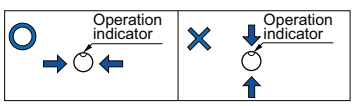



| Model No. | B (mm in) | C (mm in) | Tightening torque |
|---|---|---|---|
| **GX-3S□** | 5 to 10 0.197 to 0.394 | 3 0.118 | 0.29 N·m |
| When using the C bracket | | | 0.58 N·m |
| **GX-4S□** | 5 to 10 0.197 to 0.394 | 3 0.118 | 0.58 N·m |
| **GX-5S□** | 8 to 20 0.315 to 0.787 | 5 0.197 | 0.29 N·m |
| **GX-8ML□** | 13 to 22 0.517 to 0.866 | 10 0.394 | 0.29 N·m |

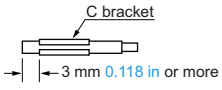
Note: The protrusion should be kept C (mm in) or more to avoid reduction of sensing range.

- To fasten **GX-3S□** and **GX-4S□**, use a M3 or less set screw and tighten it from a direction perpendicular to the operation indicator.




- When using the C bracket, place it on the sensor at a distance of 3 mm 0.118 in or more from the sensor end.

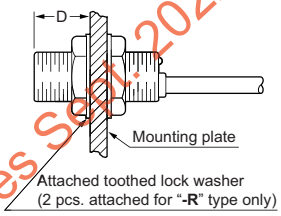



- To fasten the non-shielded threaded type, tighten the set screw on the flat surface of the sensor.

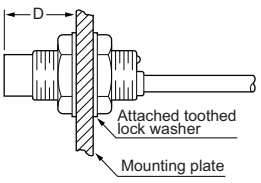
#### Mounting with nut

- Note that the maximum tightening torque differs according to the location of the nuts.

**<Shielded of threaded type>**



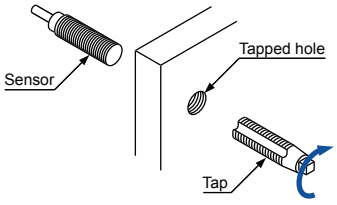

**<Non-shielded of threaded type>**




| Model No. | D (mm in) | Tightening torque |
|---|---|---|
| **GX-5M□** | 2 to 3 0.079 to 0.118 | 0.49 N·m |
| | 3 0.118 or more | 1.47 N·m |
| **GX-8M□** | 3 to 11 0.118 to 0.433 | 1.47 N·m |
| | 11 0.433 or more | 3.43 N·m |
| **GX-8ML□** | 9 to 11 0.345 to 0.433 | 0.98 N·m |
| | 11 0.433 or more | 3.43 N·m |

Note: Mount such that the nuts do not protrude from the threaded portion.

- The root truncation of the threads with **GX-8M□** and **GX-8ML□** is shallow owing to strengthening of the sensors against tightening.
When tapped hole on equipment to fix the sensors, the prepared hole must be ø7.2 mm ø0.283 in or more.



# PRECAUTIONS FOR PROPER USE

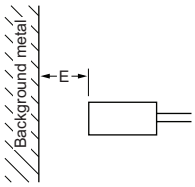
Refer to p.1579~ for general precautions.

## Distance from surrounding metal

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

### Influence of surrounding metal

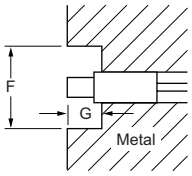
- The surrounding metal will affect the sensing performance. Keep the minimum distance specified in the table below.




| Model No. | E (mm in) |
|---|---|
| **GX-3S□** | 3 0.118 |
| **GX-4S□** | 3 0.118 |
| **GX-5S□** | 4 0.157 |
| **GX-5M□** | 3 0.118 |
| **GX-8M□** | 4 0.157 |
| **GX-8ML□** | 8 0.315 |

### 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.

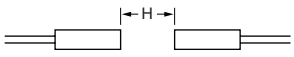



| Model No. | F (mm in) | G (mm in) |
|---|---|---|
| **GX-3S□** | ø12 ø0.472 | 3 0.118 |
| **GX-4S□** | ø12 ø0.472 | 3 0.118 |
| **GX-5S□** | ø15.4 ø0.606 | 5 0.197 |
| **GX-8ML□** | ø30 ø1.181 | 10 0.394 |

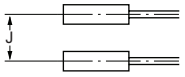
## Mutual interference

- 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




### Parallel mounting




| Model No. | H (mm in) | J (mm in) |
|---|---|---|
| **GX-3S□** | 16 0.630 | 16 0.630 |
| **GX-4S□** | 16 0.630 | 16 0.630 |
| **GX-5S□** | 20 0.787 | 15 0.591 |
| **GX-5M□** | 10 0.394 | 10 0.394 |
| **GX-8M□** | 20 0.787 | 15 0.591 |
| **GX-8ML□** | 50 1.969 | 30 1.181 |

## 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**

| Model No. / Metal | **GX-3S□ GX-4S□** | **GX-5M□** | **GX-5S□ GX-8M□ GX-8ML□** |
|---|---|---|---|
| Iron | 1 | 1 | 1 |
| Stainless steel (SUS304) | 0.65 approx. | 0.83 approx. | 0.7 approx. |
| Brass | 0.36 approx. | 0.61 approx. | 0.4 approx. |
| Aluminum | 0.30 approx. | 0.58 approx. | 0.35 approx. |

## Others

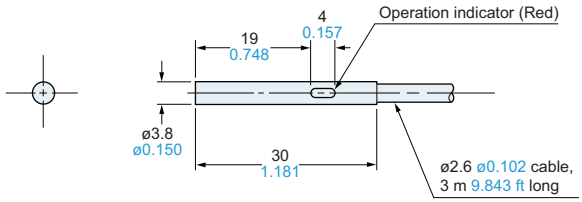
- Do not use during the initial transient time (10 ms) after the power supply is switched on.
- Make sure that stress by forcible bend or pulling is not applied directly to the sensor cable joint.
- **GX-3S□**, **GX-4S□** and **GX-5M□** do not incorporate a short-circuit protection circuit at the output. Do not connect them directly to a power supply or a capacitive load.

## DIMENSIONS (Unit: mm in)

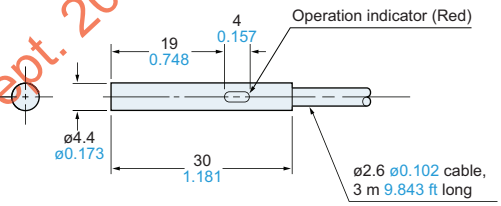
The CAD data can be downloaded from our website.



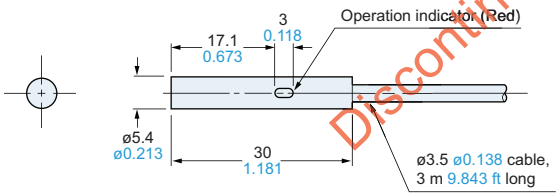
### GX-3S□ Sensor



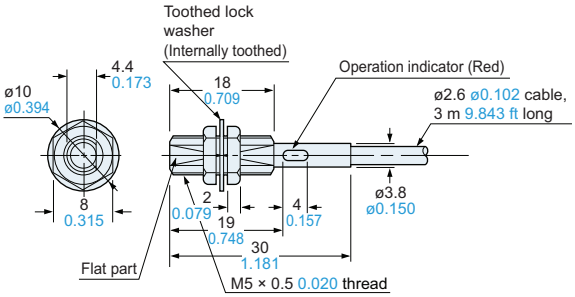

### GX-4S□ Sensor



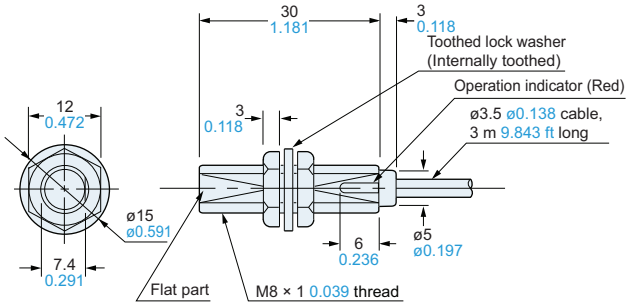

### GX-5S□ Sensor



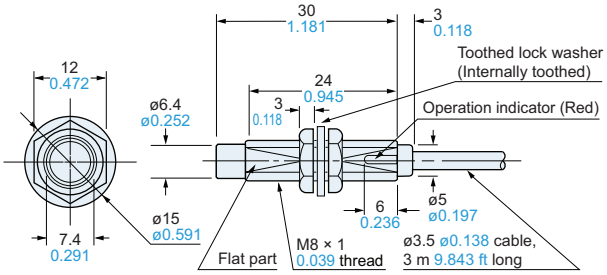

### GX-5M□ Sensor



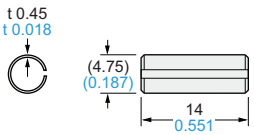

### GX-8M□ Sensor




### GX-8ML□ Sensor

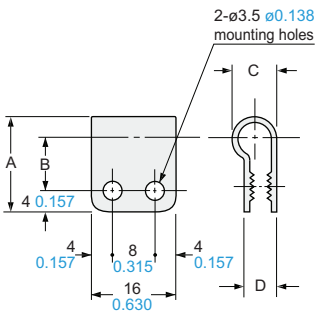



### MS-SS3-2 C bracket for GX-3S□ (Accessory for GX-3S□)




Note: By using the C bracket, the applicable tightening force can be doubled.

### MS-SS3 Sensor mounting bracket for GX-3S□ (Accessory for GX-3S□)
### MS-SS5 Sensor mounting bracket for GX-5S□ (Accessory for GX-5S□)




| Model No. / Symbols | MS-SS3 | MS-SS5 |
|---|---|---|
| A | 16 0.630 | 18 0.709 |
| B | 9 0.354 | 10 0.394 |
| C | 6.3 0.248 | 8.3 0.327 |
| D | 4.9 0.193 | 6.1 0.240 |
| Applicable model No. | GX-3S□ | GX-5S□ |

Material: Nylon 66