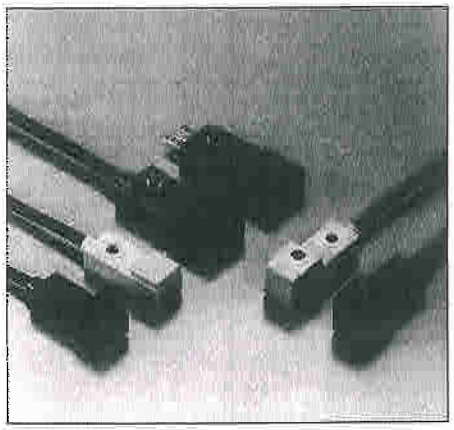
Amplifier built-in type
GXL series
Inductive proximity sensors

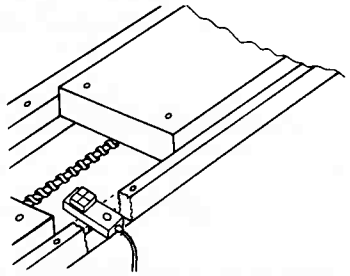
Micro size
Installable anywhere and everywhere

- **New shape**
  These are micro-sized, new-shaped sensors.
- **Low price with high accuracy**
  The **GXL** series are the lowest price inductive sensors SUNX offers with performance as high as 0.02mm repeat accuracy.
- **Close sensor-to-sensor installation**
  A line-up of varied oscillating frequency units are now available enabling installation of the sensors close to one another.
- **Operatable even under severe environmental conditions**
  Enclosures are made of one-piece molded PBT resin and utilizes oil, heat and cold resistant cables are utilized for unbeatable resistance to mechanical vibration as well as shock.

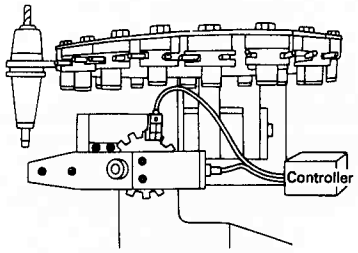


■ APPLICATIONS

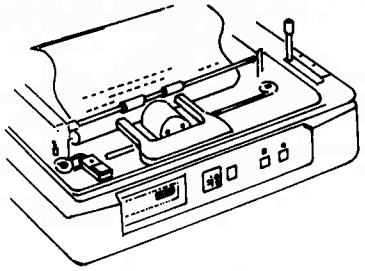
Positioning of processed products



Positioning of revolving shaft



Positioning of printer's cartridge



■ OPTIONAL COMPONENTS (available by separate order)

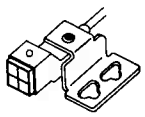
Article	Unit No.	Content
Connector	**CN-03**	Connector for terminal type
Mounting bracket	**MS-GXL8-3**	Mounting bracket for **GXL-8...**
	MS-GXL12	Mounting bracket for **GXL-12...**
	MS-GXL12-1	

■ **Connector**

• **CN-03**

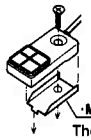
■ **Mounting bracket for GXL-8...**

• **MS-GXL8-3**



■ **Mounting bracket for GXL-12...**

• **MS-GXL12**



• **MS-GXL12-1**

The shape is identical to the **MS-GXL8**.

■SPECIFICATIONS

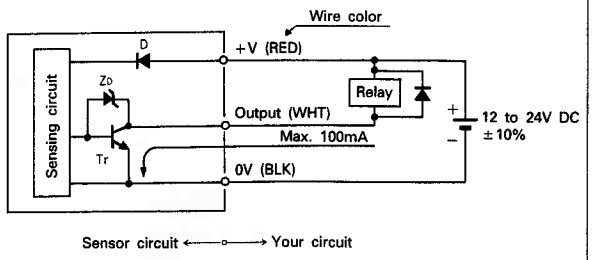
Item \ Classification	Top sensing		Front sensing					
	Cable type					Terminal type	Cable type	Terminal type
Unit No.	GXL-8H	GXL-8HB	GXL-8F	GXL-8FB	GXL-12F	GXL-12FT	GXL-12F-P	GXL-12FT-P
Varied frequency	GXL-8HI	GXL-8HIB	GXL-8FI	GXL-8FIB	GXL-12FI	GXL-12FTI	GXL-12FI-P	GXL-12FTI-P
Rated sensing distance *1	2.5mm ± 20%				$3^{+1}_{-0.6}$ mm at power voltage of 12 to 24V DC ± 10% ($3^{+2}_{-0.6}$ mm at 5V DC ± 10%)			
Setting distance *1	0 to 1.8mm				0 to 2mm			
Standard target	Iron plate 15 × 15 × t1mm				Iron plate 20 × 20 × t1mm			
Hysteresis	Less than 20% of the rated sensing distance				Less than 10% of the rated sensing distance at 12 to 24V DC ± 10% (Less than 15% of the rated sensing distance at 5V DC ± 10%)			
Repeat accuracy	Back and forth: Within 0.04mm Right and left: Within 0.04mm				Back and forth: Within 0.02mm Right and left: Within 0.03mm			
Power source	12 to 24V DC ± 10% Ripple P-P: Less than 10%				5 to 24V DC ± 10% Ripple P-P: Less than 10%			
Current consumption	Less than 15mA				Less than 10mA		Less than 15mA	
Output	NPN transistor • open collector • Sink current: Max. 100mA • Applied voltage: Less than 30V DC • Residual voltage: Less than 1V at 100mA sink current Less than 0.4V at 16mA sink current				NPN transistor • open collector • Sink current: Max. 100mA at 12 to 24V DC ± 10% (20mA at 5 to 10V DC ± 10%) • Applied voltage: Less than 30V DC • Residual voltage: Less than 0.8V at 100mA sink current Less than 0.4V at 50mA sink current		PNP transistor • open collector • Source current: Max. 100mA at 12 to 24V DC ± 10% (20mA at 5 to 10V DC ± 10%) • Residual voltage: Less than 1.5V at 100mA source current Less than 0.4V at 20mA source current	
Output operation	Approach-ON	Leave-ON	Approach-ON	Leave-ON	Approach-ON			
Max. response frequency	500Hz				1,000Hz			
Operation indicator	Red LED (illuminates when output is ON state)							
Environmental resistance: Protection	IP66							
Environmental resistance: Ambient temperature	−10 to +55°C / −30 to +80°C (storage)							
Environmental resistance: Ambient humidity	45 to 85% RH / 35 to 95%RH (storage)							
Environmental resistance: Dielectric	1,000V AC 50/60 Hz applied between live parts and enclosure for 1 min.							
Environmental resistance: Insulation	More than 10MΩ applied between live parts and enclosure at 250V DC							
Environmental resistance: Noise	Power line: 240Vp, 0.5μs pulse duration (by noise simulator)				Power line: 100Vp, 1μs pulse duration (by noise simulator)*2			
Environmental resistance: Vibration	1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y and Z directions for 2 hours each in power OFF state							
Environmental resistance: Shock	1,000m/s² (approx. 100G) impulse in each of X, Y and Z directions for 3 times each in power OFF state							
Sensing distance excursion: Temperature	Less than +15% and −10% of sensing distance at 20°C in −10 to +55°C temperature range				Less than ±20% of sensing distance at 12 to 24V DC ± 10% at 20°C in −10 to +55°C temperature range (less than ±30% at 5V DC ± 10%)			
Sensing distance excursion: Voltage	Less than ±2% at ±10% fluctuation of power source				Less than ±2% at ±10% fluctuation of power source at 12 to 24V DC ± 10% (less than ±10% at 5V DC ± 10%)			
Enclosure	Black PBT (Gray PBT for varied frequency type)							
Cable	0.08mm² × 3 cores with 1m of oil, heat and cold resistant cable				0.14mm² × 3 cores with 1m of oil, heat and cold resistant cable (terminal type excluded)			
Cable extension	Extensible up to 100m using more than 0.3mm² cable							
Weight	Approx. 12g		Approx. 11g		Approx. 18g	Approx. 4g	Approx. 18g	Approx. 4g
Accessories	**MS-GXL8** (mounting bracket) : 1 set				**MS-R1** (rubber washer): 1pc. M3 flat head screw (length: 12mm): 1pc.			

*1: Sensing and setting distances are the values to a target.
*2: As for the units of PNP output, the pulse duration is 0.5 μs.

■ INPUT/OUTPUT AND TYPICAL CONNECTION DIAGRAMS

● INPUT/OUTPUT Diagrams

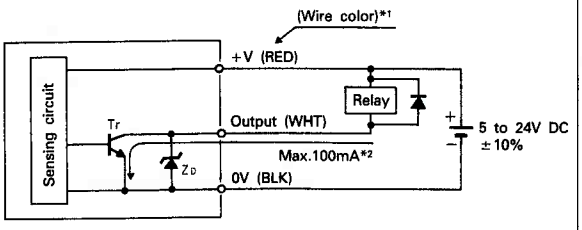
● GXL-8...



Sensor circuit ←→ Your circuit

Where, D: Reverse polarity protection diode
Zᴅ: Surge absorption zener diode
Tr: Output transistor

● GXL-12... (not applied to units suffixed by "P")



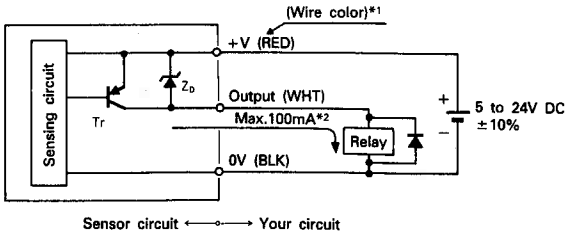
Sensor circuit ←→ Your circuit

*1: The **GXL-12FT** and the **GXL-12FTI** which are the terminal type, do not include the wire.
*2: Max. sink current is 20mA when power voltage is in 5 to 10V DC ± 10% range.

Where, Zᴅ: Surge absorption zener diode
Tr: Output transistor

● GXL-12...-P

Please be noted that units suffixed with "P" are of PNP transistor output type.



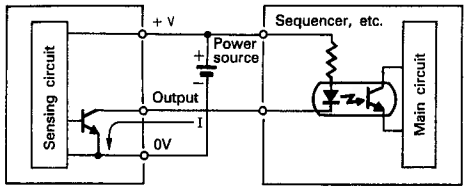
Sensor circuit ←→ Your circuit

*1: The **GXL-12FT** and the **GXL-12FTI** which are the terminal type, do not include the wire.
*2: Max. sink current is 20mA when power voltage is in 5 to 10V DC ± 10% range.

Where, Zᴅ: Surge absorption zener diode
Tr: Output transistor

● TYPICAL CONNECTION DIAGRAMS GXL-8... and GXL-12... (not applied to units suffixed by "P")

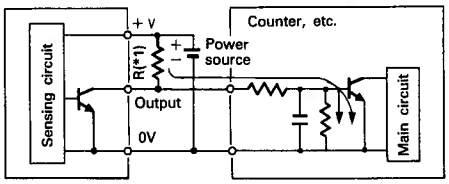
● For current-driven loads (sequencer, counter, and photo-coupler)



Sensor circuit ←→ Your circuit I : Sink current

• Surge absorption zener diode and reverse polarity protection diode are omitted in the diagram shown above.

● For voltage-driven loads (sequencer, counter, and logic circuit)

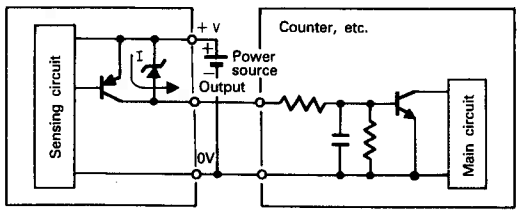


Sensor circuit ←→ Your circuit

* A pull-up resistor "R" is required for above input circuit.
• Surge absorption zener diode and reverse polarity protection diode are omitted in the diagram shown above.

● GXL-12...-P

The units with PNP output are suited to be connected to voltage-driven loads.
(A pull-up resistor is unnecessary.)

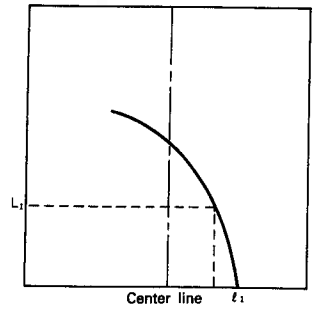


Sensor circuit ←→ Your circuit I : Source current

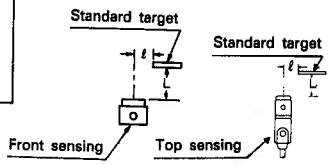
■ SENSING FIELDS

(These are typical sensing fields, and are subject to slight changes from unit to unit.)

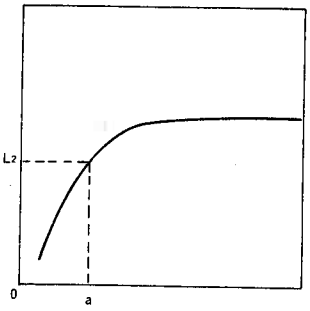
• Deviation



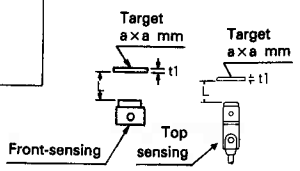
The curve is formed by connecting the points where the sensor's output turns on when the standard target approaches the sensing field from the right side of the sensor.
For example, at the setting distance L_1, the output of the sensor turns on at the point where L_1 crosses the curve ℓ_1.



• Target size – Sensing distance correlation



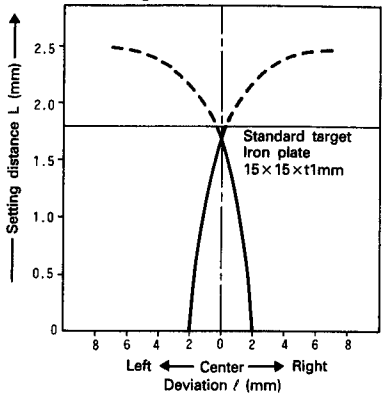
In detecting a target with a size smaller than the SUNX standard target, the sensing distance becomes shorter following the curve shown at left. For example, when target size is a x a, sensing distance is given as L_2 at which the curve crosses "a".



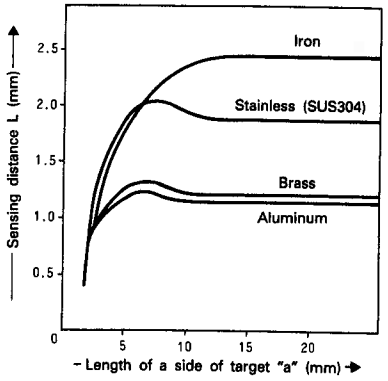
*In the sensing field curves shown below, curves for both right side and left side approaches are indicated. (For the sake of simplicity, the above description is only for the case when the standard target approaches the sensing field from the right side of the sensor.)

• GXL-8...

• Sensing field



• Target size – Sensing distance correlation



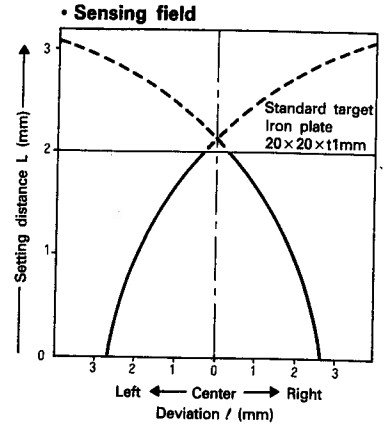
The sensing distance listed in the specifications is for the SUNX standard target. For non-ferrous object detection, the sensing distance is obtained by multiplying the correction coefficient in the table below.

Target	Correction coefficient	
	GXL-8...	GXL-12...
Iron	Approx. 1.0	Approx. 1.0
Stainless (SUS304)	Approx. 0.76	Approx. 0.7
Brass	Approx. 0.5	Approx. 0.4
Aluminum	Approx. 0.48	Approx. 0.35

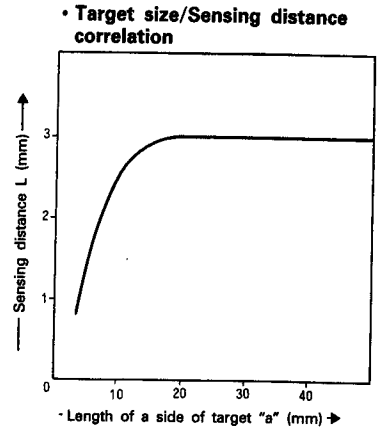
Be careful that the sensing distance varies in case the target is plated.

• GXL-12...

• Sensing field



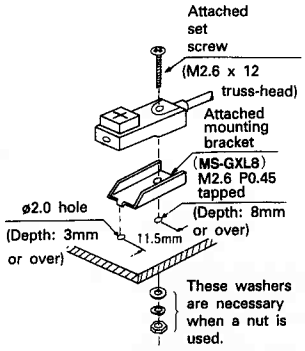
• Target size/Sensing distance correlation



■ FOR PROPER USE

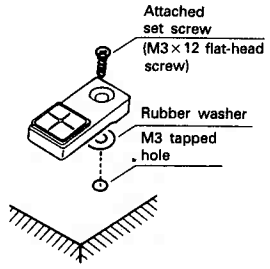
• Mounting

GXL-8...



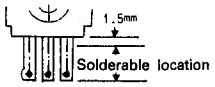
- The tightening torque shall be 3kgf·cm or less.
- When mounting the sensor with a nut, the mounting hole diameter should be 3mm and the mounting plate should have the proper thickness to tightly secure the sensor. (The thickness of the mounting plate should be 2.3mm or less when the attached set screw and nut are used.)
- When using a screw other than the one attached, use a truss-head screw. (Do not use flat-head nor pan-head screws.)

GXL-12...



- The tightening torque shall be 10kgf·cm or less.
- When mounting the sensor from the rear, use a pan-head screw available on the market. Tightening torque should be 7kgf·cm or less. (Do not use a flat-head screw.)
- When you need to secure the sensor at two points, the use of a SUNX mounting bracket **MS-GXL12-1** is recommended.

- When soldering wires to the pins of a terminal type sensor, observe the following conditions.
  Soldering temperature:
  260°C or less
  Application time:
  5 sec. or less
  Location to be soldered:
  Except 1.5mm at the head of the lead pins

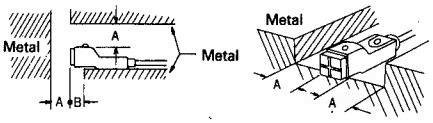


- If a switching regulator is used for the power source of the sensor, be sure to ground the frame ground (F.G.) terminal to an actual ground.
- Do not use the sensor's output signal for 10ms immediately after power is supplied to the sensor.
- Avoid mis-wiring. (Only **GXL-8...** is protected against reverse polarity. None of the models in **GXL** series are protected against output short-circuit.)
- Do not run sensor cables near high-voltage lines or power lines, nor put them together in the same raceway. This warning should be strictly observed to prevent malfunctions caused by inductive interference.
- Avoid placement where the sensor will be exposed to chemical agents like organic solvents.
- Metal dust covering the sensing face will cause a malfunction.

• Influence of surrounding metal

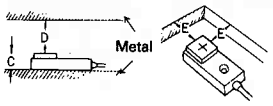
Close proximity of surrounding metal, other than the target, will affect operation. When there are metal parts near the sensor, make sure the clearance from A through E must be as per the values shown in the table below.

Top sensing type



A: 10mm or over
B: 3mm or over

Front sensing type

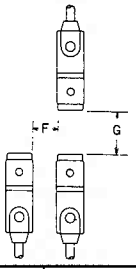


	GXL-8...	GXL-12...
C	7mm or over	7mm or over
D	10mm or over	20mm or over
E	10mm or over	10mm or over

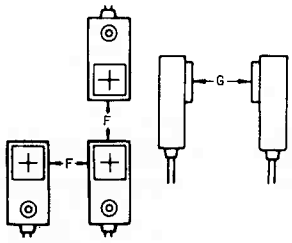
• Mutual interference

When plural sensors are installed in parallel or face to face, follow the table below for the clearance values for F and G.

Top sensing type



Front sensing type

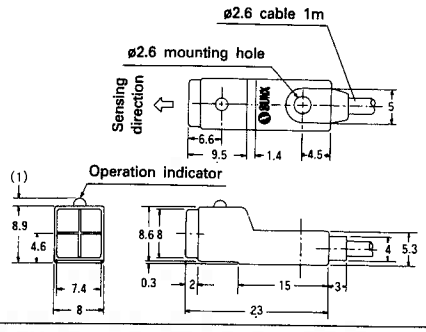


Sensor / Key	GXL-8...		GXL-12...	
	Sensors of varied frequencies *1	Sensors of identical frequency	Sensors of varied frequencies *1	Sensors of identical frequency
F	0mm (side by side) *2	12mm or over	0mm (side by side) *2	20mm or over
G	10mm or over	25mm or over	15mm or over	40mm or over

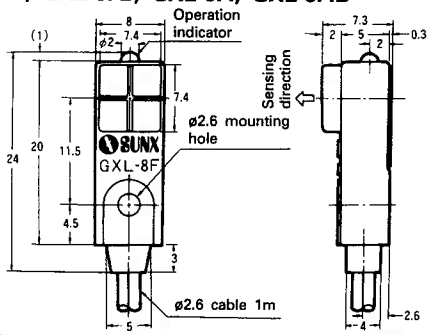
*1: Units with the suffix "I" are varied oscillating frequency type.
*2: Up to two sensors can be installed side by side without clearance. When three sensors or more are installed with the identical clearance, leave space min. 2mm for F on **GXL-8** series and min. 4mm on **GXL-12** series.

■ DIMENSIONES (mm)

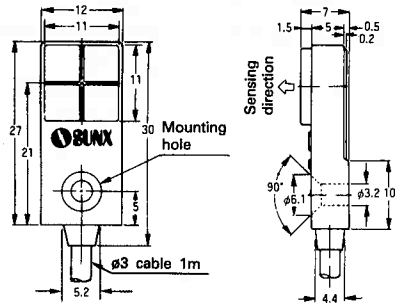
• GXL-8H, GXL-8HB, GXL-8HI, GXL-8HIB



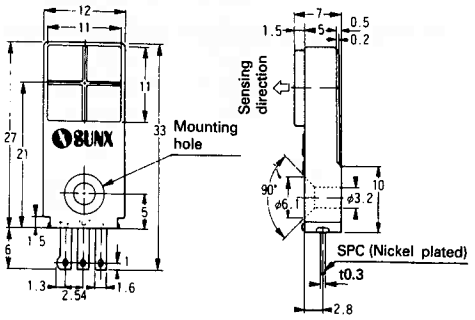
• GXL-8F, GXL-8FB, GXL-8FI, GXL-8FIB



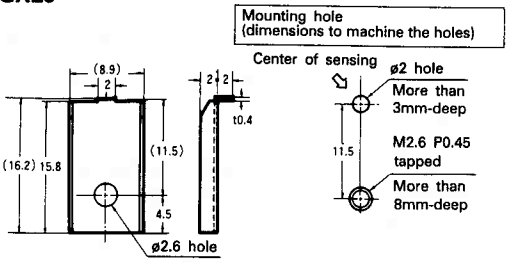
• GXL-12F, GXL-12FI, GXL-12F-P, GXL-12FI-P



• GXL-12FT, GXL-12FTI, GXL-12FT-P, GXL-12FTI-P

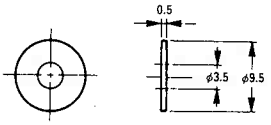


• MS-GXL8

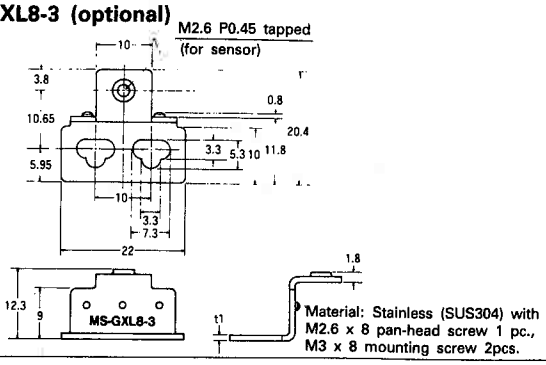


Material: SPC (nickel plated) with M2.6 x 12 truss-screw, nut, spring washer, flat washer 1pc. each

• MS-R1

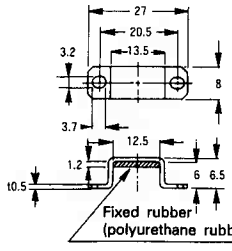


• MS-GXL8-3 (optional)



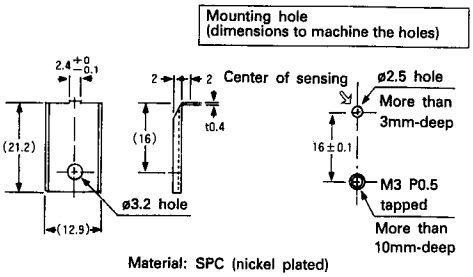
Material: Stainless (SUS304) with M2.6 x 8 pan-head screw 1 pc., M3 x 8 mounting screw 2pcs.

• MS-GXL12 (optional)



Material: SPC (nickel plated)

• MS-GXL12-1 (optional)



Material: SPC (nickel plated)

• CN-03 (optional)