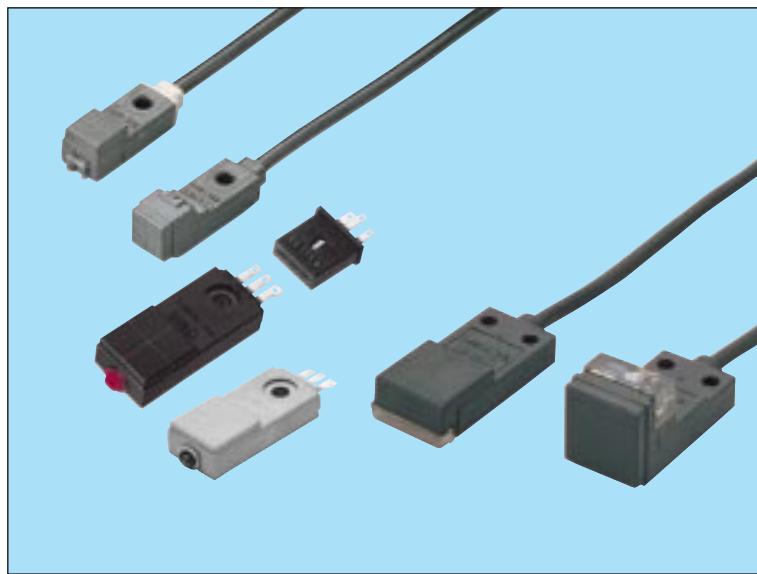


INDUCTIVE
PROXIMITY SENSORS

GXL SERIES

Micro-size Inductive Proximity Sensor

GXL
GL-6
GL-8U
GL-N12
GL-18H/18HL
Amplifier Built-in Type



High Performance
in Micro-size Design

CE Marked
Conforming to EMC Directive

Wide Model Variety

Models ranging from extremely compact type to long sensing range type are available to suit various applications.

Versatile Mounting

Since the sensor is fingertip size, it can be mounted in a tight space.

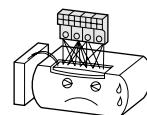


Reduced Wiring Operation

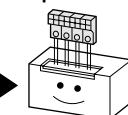
The wiring cost of the DC 2-wire type is 2/3 that of a conventional model. Besides, the possibility of miswiring is reduced.

Particularly convenient when many sensors are used.

Wiring of the
3-wire type is
cumbersome.

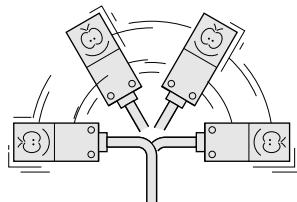


Wiring of the
2-wire type is
simple and neat.



Inflection Resistant Cable Type

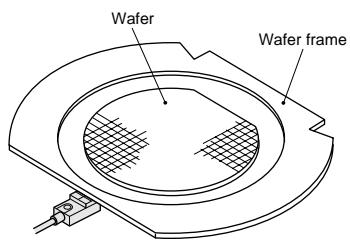
The inflection resistance of its cable is ten times that of the conventional model. The sensor can be mounted on a moving table or a robot arm.



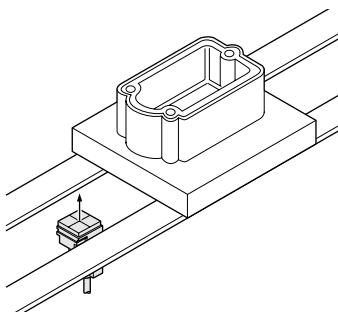
※ Except PNP output type and 5m cable
attached NPN output type

APPLICATIONS

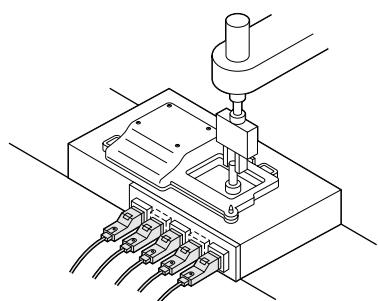
Detecting wafer frame



Detecting aluminum pallet



Code reading



ORDER GUIDE

GXL-8 type

Type	Appearance (mm)	Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation
DC 2-wire Front sensing		Maximum operation distance 2.5mm (0 to 1.8mm) Stable sensing range	GXL-8FU	Non-contact DC 2-wire type	Normally open
Top sensing			GXL-8FUI		Normally closed
Front sensing			GXL-8FUB		Normally open
Top sensing			GXL-8FUIB		Normally closed
Front sensing			GXL-8HU		Normally open
Top sensing			GXL-8HUI	NPN open-collector transistor	Normally open
Front sensing			GXL-8HUB		Normally closed
Top sensing			GXL-8HUIB		Normally open
Front sensing			GXL-8F		Normally closed
Top sensing			GXL-8FI		Normally open
Front sensing			GXL-8FB		Normally closed
Top sensing			GXL-8FIB		Normally open
Front sensing			GXL-8H		Normally closed
Top sensing			GXL-8HI		Normally open
Front sensing			GXL-8HB		Normally open
Top sensing			GXL-8HIB		Normally closed

Notes: 1) The maximum operation distance stands for the maximum distance for which the sensor can detect the standard sensing object.

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

2) 'I' in the model No. indicates a different frequency type.

GXL-N12 type

Type	Appearance (mm)	Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation
NPN output Cable type		Maximum operation distance 3mm (0 to 2mm) Stable sensing range	GXL-N12F (Note 3)	NPN open-collector transistor	Normally open
Terminal type			GXL-N12FI (Note 3)		Normally closed
NPN output Terminal type			GXL-N12FB		Normally open
Cable type			GXL-N12FIB		Normally closed
Terminal type			GXL-N12FT (Note 3)		Normally open
NPN output Cable type			GXL-N12FTI (Note 3)		Normally closed
Terminal type			GXL-N12FTB	PNP open-collector transistor	Normally open
NPN output Terminal type			GXL-N12FTIB		Normally closed
Cable type			GXL-N12F-P		Normally open
Terminal type			GXL-N12FI-P		Normally closed
NPN output Terminal type			GXL-N12FB-P		Normally open
Cable type			GXL-N12FIB-P		Normally closed
Terminal type			GXL-N12FT-P		Normally open
NPN output Cable type			GXL-N12FTI-P		Normally closed
Terminal type			GXL-N12FTB-P		Normally open
NPN output Terminal type			GXL-N12FTIB-P		Normally closed

Notes: 1) The maximum operation distance stands for the maximum distance for which the sensor can detect the standard sensing object.

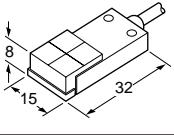
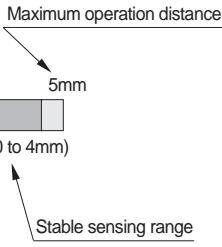
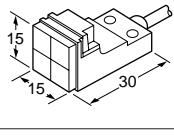
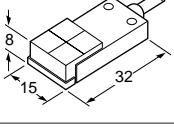
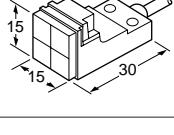
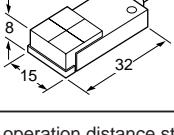
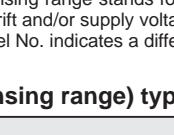
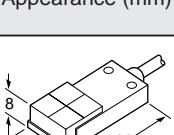
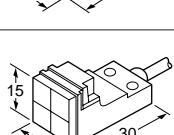
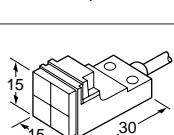
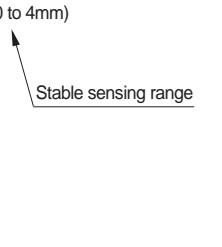
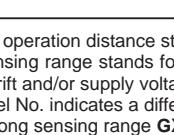
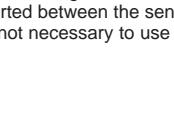
The stable sensing range stands for the sensing range for which the sensor can stably detect the standard sensing object even if there is an ambient temperature drift and/or supply voltage fluctuation.

2) 'I' in the model No. indicates a different frequency type.

3) These models, with normally open NPN output, are also available as 5V supply voltage type. Please contact our office for details.

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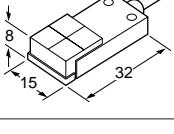
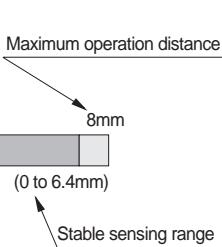
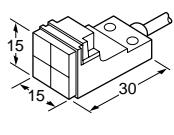
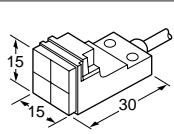
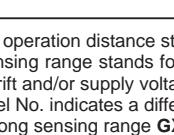
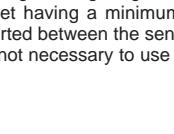
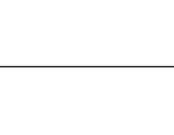
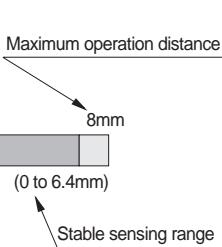
GXL-15 (Standard) type

Type	Appearance (mm)		Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation
DC 2-wire	Front sensing			GXL-15FU	Non-contact DC 2-wire type	Normally open
	Top sensing			GXL-15FUI		Normally closed
	Front sensing			GXL-15FUB		Normally open
	Top sensing			GXL-15FUIB		Normally closed
	Front sensing			GXL-15HU		Normally open
	Top sensing			GXL-15HUI		Normally closed
	Front sensing			GXL-15HUB		Normally open
	Top sensing			GXL-15HUIB		Normally closed
NPN output	Front sensing			GXL-15F	NPN open-collector transistor	Normally open
	Top sensing			GXL-15FI		Normally closed
	Front sensing			GXL-15FB		Normally open
	Top sensing			GXL-15FIB		Normally closed
	Front sensing			GXL-15H		Normally open
	Top sensing			GXL-15HI		Normally closed
	Front sensing			GXL-15HB		Normally open
	Top sensing			GXL-15HIB		Normally closed
PNP output	Front sensing			GXL-15F-P	PNP open-collector transistor	Normally open
	Top sensing			GXL-15FI-P		Normally closed
	Front sensing			GXL-15FB-P		Normally open
	Top sensing			GXL-15FIB-P		Normally closed

Notes: 1) The maximum operation distance stands for the maximum distance for which the sensor can detect the standard sensing object. The stable sensing range stands for the sensing range for which the sensor can stably detect the standard sensing object even if there is an ambient temperature drift and/or supply voltage fluctuation.

2) 'I' in the model No. indicates a different frequency type.

GXL-15 (Long sensing range) type ... For mounting on non-magnetic material (Note 3)

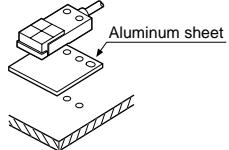
Type	Appearance (mm)		Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation
DC 2-wire	Front sensing			GXL-15FLU	Non-contact DC 2-wire type	Normally open
	Top sensing			GXL-15FLUI		Normally closed
	Front sensing			GXL-15FLUB		Normally open
	Top sensing			GXL-15FLUIB		Normally closed
	Front sensing			GXL-15HLU		Normally open
	Top sensing			GXL-15HLUI		Normally closed
	Front sensing			GXL-15HLUB		Normally open
	Top sensing			GXL-15HLUIB		Normally closed
NPN output	Front sensing			GXL-15HL	NPN open-collector transistor	Normally open
	Top sensing			GXL-15HLI		Normally closed
	Front sensing			GXL-15HLB		Normally open
	Top sensing			GXL-15HLIB		Normally closed

Notes: 1) The maximum operation distance stands for the maximum distance for which the sensor can detect the standard sensing object. The stable sensing range stands for the sensing range for which the sensor can stably detect the standard sensing object even if there is an ambient temperature drift and/or supply voltage fluctuation.

2) 'I' in the model No. indicates a different frequency type.

3) To mount the long sensing range **GXL-15** on a magnetic body, such as iron, the enclosed aluminum sheet, or any other aluminum sheet having a minimum size of 30 × 39.5 × 0.3mm (**GXL-15HLU** / **GXL-15HL**: 30 × 30 × 0.3mm), should be inserted between the sensor and the magnetic body.

However, it is not necessary to use the aluminum sheet when mounting on a non-magnetic body, such as, aluminum or an insulator.



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Inflection resistant cable type and 5m cable length type

Inflection resistant cable type and 5m cable length type are also available.

• Table of Model Nos.

Type	Standard	Inflection resistant cable type	5m cable length type	Inflection resistant cable & 5m cable length type
DC 2-wire	GXL-8FU	GXL-8FU-R	GXL-8FU-C5	GXL-8FU-R-C5
	GXL-8FUI	GXL-8FUI-R	GXL-8FUI-C5	GXL-8FUI-R-C5
	GXL-8FUB	GXL-8FUB-R	GXL-8FUB-C5	GXL-8FUB-R-C5
	GXL-8FUIB	GXL-8FUIB-R	GXL-8FUIB-C5	GXL-8FUIB-R-C5
	GXL-8HU	GXL-8HU-R	GXL-8HU-C5	GXL-8HU-R-C5
	GXL-8HUI	GXL-8HUI-R	GXL-8HUI-C5	GXL-8HUI-R-C5
	GXL-8HUB	GXL-8HUB-R	GXL-8HUB-C5	GXL-8HUB-R-C5
	GXL-8HUIB	GXL-8HUIB-R	GXL-8HUIB-C5	GXL-8HUIB-R-C5
	GXL-15FU	GXL-15FU-R	GXL-15FU-C5	GXL-15FU-R-C5
	GXL-15FUI	GXL-15FUI-R	GXL-15FUI-C5	GXL-15FUI-R-C5
	GXL-15FUB	GXL-15FUB-R	GXL-15FUB-C5	GXL-15FUB-R-C5
	GXL-15FUIB	GXL-15FUIB-R	GXL-15FUIB-C5	GXL-15FUIB-R-C5
	GXL-15HU	GXL-15HU-R	GXL-15HU-C5	GXL-15HU-R-C5
	GXL-15HUI	GXL-15HUI-R	GXL-15HUI-C5	GXL-15HUI-R-C5
	GXL-15HUB	GXL-15HUB-R	GXL-15HUB-C5	GXL-15HUB-R-C5
	GXL-15HUIB	GXL-15HUIB-R	GXL-15HUIB-C5	GXL-15HUIB-R-C5
	GXL-15FLU	GXL-15FLU-R	GXL-15FLU-C5	GXL-15FLU-R-C5
	GXL-15FLUI	GXL-15FLUI-R	GXL-15FLUI-C5	GXL-15FLUI-R-C5
	GXL-15FLUB	GXL-15FLUB-R	GXL-15FLUB-C5	GXL-15FLUB-R-C5
	GXL-15FLUIB	GXL-15FLUIB-R	GXL-15FLUIB-C5	GXL-15FLUIB-R-C5
	GXL-15HLU	GXL-15HLU-R	GXL-15HLU-C5	GXL-15HLU-R-C5
	GXL-15HLUI	GXL-15HLUI-R	GXL-15HLUI-C5	GXL-15HLUI-R-C5
	GXL-15HLUB	GXL-15HLUB-R	GXL-15HLUB-C5	GXL-15HLUB-R-C5
	GXL-15HLUIB	GXL-15HLUIB-R	GXL-15HLUIB-C5	GXL-15HLUIB-R-C5
	GXL-8F	GXL-8F-R	GXL-8F-C5	
	GXL-8FI	GXL-8FI-R	GXL-8FI-C5	
	GXL-8FB	GXL-8FB-R	GXL-8FB-C5	
	GXL-8FIB	GXL-8FIB-R	GXL-8FIB-C5	
	GXL-8H	GXL-8H-R	GXL-8H-C5	
	GXL-8HI	GXL-8HI-R	GXL-8HI-C5	
	GXL-8HB	GXL-8HB-R	GXL-8HB-C5	
	GXL-8HIB	GXL-8HIB-R	GXL-8HIB-C5	
	GXL-N12F	GXL-N12F-R	GXL-N12F-C5	
	GXL-N12FI	GXL-N12FI-R	GXL-N12FI-C5	
	GXL-N12FB	GXL-N12FB-R	GXL-N12FB-C5	
	GXL-N12FIB	GXL-N12FIB-R	GXL-N12FIB-C5	
	GXL-N12FT			
	GXL-N12FTI			
	GXL-N12FTB			
	GXL-N12FTIB			
	GXL-15F	GXL-15F-R	GXL-15F-C5	
	GXL-15FI	GXL-15FI-R	GXL-15FI-C5	
	GXL-15FB	GXL-15FB-R	GXL-15FB-C5	
	GXL-15FIB	GXL-15FIB-R	GXL-15FIB-C5	
	GXL-15H			
	GXL-15HI			
	GXL-15HB			
	GXL-15HIB			
	GXL-15HL			
	GXL-15HLI			
	GXL-15HLB			
	GXL-15HLIB			
	GXL-N12F-P		GXL-N12F-P-C5	
	GXL-N12FI-P		GXL-N12FI-P-C5	
	GXL-N12FB-P		GXL-N12FB-P-C5	
	GXL-N12FIB-P		GXL-N12FIB-P-C5	
	GXL-N12FT-P			
	GXL-N12FTI-P			
	GXL-N12FTB-P			
	GXL-N12FTIB-P			
	GXL-15F-P		GXL-15F-P-C5	
	GXL-15FI-P		GXL-15FI-P-C5	
	GXL-15FB-P		GXL-15FB-P-C5	
	GXL-15FIB-P		GXL-15FIB-P-C5	

Amplifier-separated Type
GA-10/GHGX-U
GXAmplifier Built-in Type
GL-18H/18HLGL-8U
GL-8UGL-6
GL-6

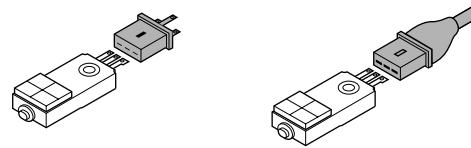
OPTIONS

Designation	Model No.	Description
Connector	CN-13	Connector for the terminal type
	CN-13-C1	Length: 1m
	CN-13-C3	Length: 3m Mating cable for the terminal type
Sensor mounting bracket	MS-GXL8-3	Mounting bracket for NPN output of GXL-8 type
	MS-GXL12-2	Mounting bracket for GXL-N12 type
	MS-GXL15	Mounting bracket for GXL-15 type
	MS-GXL15-2	Mounting bracket for GXL-15F type

Connector

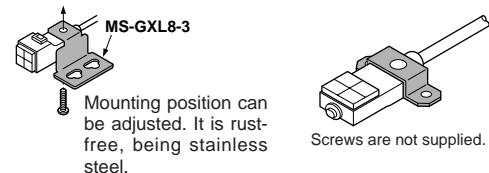
- **CN-13**

- **CN-13-C1**
- **CN-13-C3**



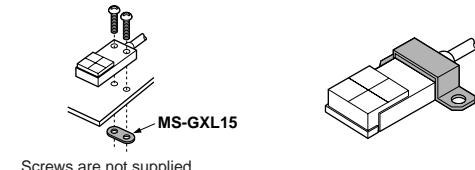
Sensor mounting bracket

- **MS-GXL8-3**
- **MS-GXL12-2**

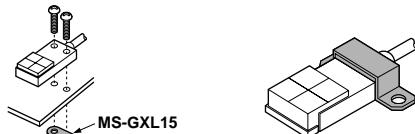


A set of one pan head screw and two screws with washers is attached.

- **MS-GXL15**



- **MS-GXL15-2**



Screws are not supplied.

SPECIFICATIONS

DC 2-wire type

Item	Standard Model No.	Type	GXL-8 type		GXL-15 type								
			Standard		Long sensing range (For mounting on non-magnetic body) (Note 1)								
			Front sensing	Top sensing	Front sensing	Top sensing	Front sensing	Top sensing					
GXL-8FU		GXL-8HU		GXL-15FU		GXL-15HU		GXL-15FLU					
Max. operation distance (Note 2)		2.5mm ± 20%		5mm ± 10%		8mm ± 10%							
Stable sensing range (Note 2)		0 to 1.8mm		0 to 4mm		0 to 6.4mm							
Standard sensing object		Iron sheet 15 × 15 × t1mm		Iron sheet 20 × 20 × t1mm		Iron sheet 30 × 30 × t1mm							
Hysteresis		20% or less of operation distance											
Repeatability		Along sensing axis, perpendicular to sensing axis: 0.04mm or less											
Supply voltage		12 to 24V DC ± 10% Ripple P-P 10% or less											
Current consumption (Note 3)		0.8mA or less											
Output		Non-contact DC 2-wire type • Load current: 3 to 70mA (Note 4) • Residual voltage: 3V or less (Note 5)		Non-contact DC 2-wire type • Load current: 3 to 100mA (Note 4) • Residual voltage: 3V or less (Note 5)									
Utilization category		DC-12 or DC-13											
Short-circuit protection		Incorporated											
Max. response frequency		1kHz											
Operation indicator		Normally closed type: Red LED (lights up when the output is ON)											
2-color indicator		Normally open type: Lights up in green under stable sensing condition Lights up in red under unstable sensing condition											
Environmental resistance	Pollution degree		3 (Industrial environment)										
	Protection		IP67 (IEC), IP67g (JEM)										
	Ambient temperature		−25 to +70°C, Storage: −30 to +80°C										
	Ambient humidity		45 to 85% RH, Storage: 35 to 95% RH										
	EMC		Emission: EN50081-2, Immunity: EN50082-2										
	Voltage withstandability		1,000V AC for one min. between all supply terminals connected together and enclosure										
	Insulation resistance		50MΩ, or more, with 250V DC megger between all supply terminals connected together and enclosure										
	Vibration resistance		10 to 55Hz frequency, 1.5mm amplitude in X, Y and Z directions for two hours each										
Shock resistance		1,000m/s ² acceleration (100G approx.) in X, Y and Z directions for three times each											
Sensing range variation	Temperature characteristics		Over ambient temperature range −25 to +70°C: within $\pm 15\%$ of sensing range at 20°C										
	Voltage characteristics		Within $\pm 2\%$ for $\pm 10\%$ fluctuation of the supply voltage										
Material		Enclosure: PBT, Indicator part: Polyalylate			Enclosure: PET (Glass fiber) Indicator part: Polyalylate		Enclosure: PET (Glass fiber) Indicator part: Polyalylate						
Cable (Note 6)		0.15mm ² 2-core oil, heat and cold resistant cable, 1m long		0.2mm ² 2-core oil, heat and cold resistant cable, 1m long									
Cable extension		Extension up to total 50m is possible with 0.3mm ² , or more, cable.											
Weight		12g approx.		20g approx.									
Accessory		MS-GXL8-4 (Sensor mounting bracket): 1 set				MS-A15F (Aluminum sheet): 1 No.		MS-A15H (Aluminum sheet): 1 No.					

Notes: 1) To mount the long sensing range **GXL-15** type on a magnetic body, such as iron, the enclosed aluminum sheet, or any other aluminum sheet having a minimum size of 30 × 39.5 × t0.3mm (**GXL-15HLU** type: 30 × 30 × t0.3mm), should be inserted between the sensor and the magnetic body. However, it is not necessary to use the aluminum sheet when mounting on a non-magnetic body, such as, aluminum or an insulator. 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) It is the leakage current when the output is in the OFF state. 4) The maximum load current varies with the ambient temperature. Refer to 'I/O CIRCUIT AND WIRING DIAGRAMS' for more details. 5) When the cable is extended, the residual voltage becomes larger according to the resistance of the cable. The residual voltage of 5m cable length type increases by 0.1V. 6) The inflection resistant cable type (model No. with suffix '-R') has a 0.15mm² (**GXL-15** type: 0.2mm²) inflection, oil, heat and cold resistant cabtyre cable, 1m long.

Amplifier Built-in Type	GL-18H/18HL	GL-N12	GL-8U	GX-U	GX-N	GX	GA-10/GH	Amplifier-separated Type

SPECIFICATIONS

NPN and PNP output type

Item	Standard model No.	Type	NPN output						PNP output								
			GXL-8 type		GXL-N12 type		GXL-15 type		GXL-N12 type		GXL-15 type						
			Front sensing	Top sensing	Cable type	Terminal type	Standard		Long sensing range (For mounting on non-magnetic body (Note 1))	Cable type	Terminal type						
			GXL-8F	GXL-8H	GXL-N12F	GXL-N12FT	GXL-15F	GXL-15H	GXL-15HL	GXL-N12F-P	GXL-N12FT-P	GXL-15F-P					
Max. operation distance (Note 2)			2.5mm ± 20%		3mm ± 10%		5mm ± 10%		8mm ± 10%	3mm ± 10%		5mm ± 10%					
Stable sensing range (Note 2)			0 to 1.8mm		0 to 2mm		0 to 4mm		0 to 6.4mm	0 to 2mm		0 to 4mm					
Standard sensing object			Iron sheet 15 × 15 × t1mm		Iron sheet 20 × 20 × t1mm				Iron sheet 30 × 30 × t1mm	Iron sheet 20 × 20 × t1mm							
Hysteresis			20% or less of operation distance														
Repeatability			Along sensing axis, perpendicular to sensing axis: 0.04mm or less				Along sensing axis, perpendicular to sensing axis: 0.06mm or less		Along sensing axis, perpendicular to sensing axis: 0.04mm or less								
Supply voltage			12 to 24V DC ± 10%				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: 1V or less (at 100mA sink current) 0.4V or less (at 16mA sink current)								PNP open-collector transistor • Maximum source current: 100mA • Applied voltage: 30V DC or less (between output and +V) • Residual voltage: 1V or less (at 100mA source current) 0.4V or less (at 16mA source current)						
Utilization category			DC-12 or DC-13														
Short-circuit protection																	
Max. response frequency			500Hz			250Hz			500Hz		250Hz						
Operation indicator			Red LED (lights up when the output is ON)														
Environmental resistance	Pollution degree		3 (Industrial environment)														
	Protection		IP67 (IEC), IP67g (JEM) except for the terminal type														
	Ambient temperature		−10 to +55°C, Storage: −30 to +80°C														
	Ambient humidity		45 to 85% RH, Storage: 35 to 95% RH														
	EMC		Emission: EN50081-2, Immunity: EN50082-2														
	Voltage withstandability		1,000V AC for one min. between all supply terminals connected together and enclosure														
	Insulation resistance		50MΩ, or more, with 250V DC megger between all supply terminals connected together and enclosure														
Sensing range variation	Vibration resistance		10 to 55Hz frequency, 1.5mm amplitude in X, Y and Z directions for two hours each														
	Shock resistance		1,000m/s ² acceleration (100G approx.) in X, Y and Z directions for three times each														
Material	Temperature characteristics		Over ambient temperature range −10 to +55°C: within $^{+15}_{-10}$ % of sensing range at 20°C														
	Voltage characteristics		Within ± 2% for ± 10% fluctuation of the supply voltage														
Cable (Note 3)			0.08mm ² 3-core oil, heat and cold resistant cabtyre cable, 1m long	0.15mm ² 3-core oil, heat and cold resistant cabtyre cable, 1m long			0.15mm ² 3-core oil, heat and cold resistant cabtyre cable, 1m long				0.15mm ² 3-core oil, heat and cold resistant cabtyre cable, 1m long						
Cable extension			Extension up to total 100m is possible with 0.3mm ² or more, cable.														
Weight			12g approx.	20g approx.	5g approx.		20g approx.			5g approx.	20g approx.						
Accessories			MS-GXL8 (Sensor mounting bracket): 1 set	MS-GXL12-1 (Sensor mounting bracket): 1 No. M3 pan head screw, plain washer, spring washer and nut: 1 set	MS-R1 (Rubber washer): 1 No.		MS-A15H (Aluminum sheet): 1 No.	MS-GXL12-1 (Sensor mounting bracket): 1 No. M3 pan head screw, plain washer, spring washer and nut: 1 set	MS-R1 (Rubber washer): 1 No.								

Notes: 1) To mount the long sensing range GXL-15 type on a magnetic body, such as iron, the enclosed aluminum sheet or any other aluminum sheet having a minimum size of 30 × 30 × t0.3mm, should be inserted between the sensor and the magnetic body. However, it is not necessary to use the aluminum sheet when mounting on a non-magnetic body, such as, aluminum or an insulator.

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.

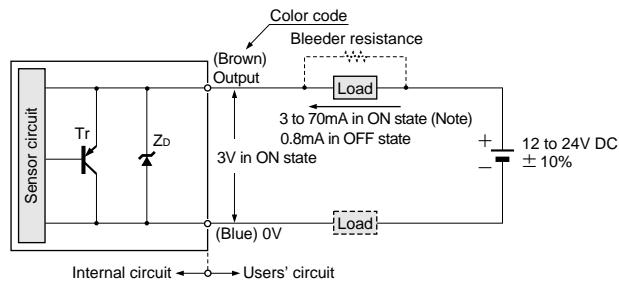
3) The inflection resistant cable type (model No. with suffix 'R') has a 0.15mm² (GXL-8 type: 0.1mm²) inflection, oil, heat and cold resistant cabtyre cable, 1m long.

I/O CIRCUIT AND WIRING DIAGRAMS

DC 2-wire type

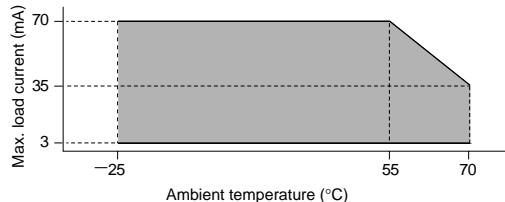
GXL-8FU/GXL-8HU type

I/O circuit diagram

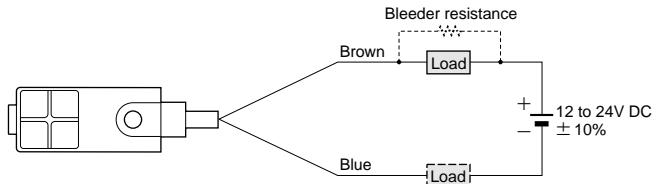


Symbols ... Z_D : Surge absorption zener diode
Tr: PNP output transistor

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

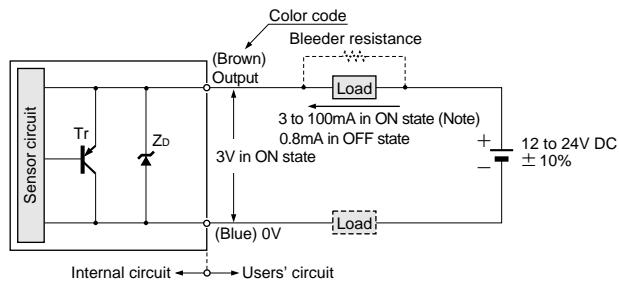


Wiring diagram



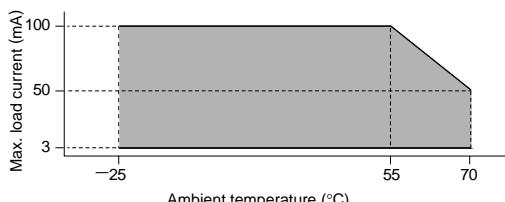
GXL-15FU/GXL-15HU/GXL-15FLU/GXL-15HLU type

I/O circuit diagram

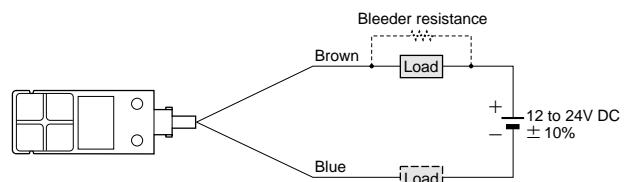


Symbols ... Z_D : Surge absorption zener diode
Tr: PNP output transistor

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



Wiring diagram



Conditions for the load

- 1) The load should not be actuated by the leakage current (0.8mA) in the OFF state.
- 2) The load should be actuated by (supply voltage - 3V) in the ON state.
- 3) The current in the ON state should be between 3 to 100mA DC.
[In case the current is less than 3mA, connect a bleeder resistance in parallel to the load so that a current of 3mA, or more, flows.]

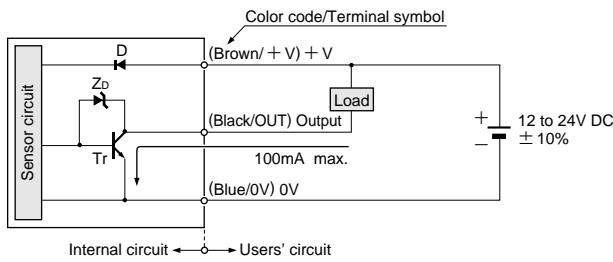
Conditions for the load

- 1) The load should not be actuated by the leakage current (0.8mA) in the OFF state.
- 2) The load should be actuated by (supply voltage - 3V) in the ON state.
- 3) The current in the ON state should be between 3 to 100mA DC.
[In case the current is less than 3mA, connect a bleeder resistance in parallel to the load so that a current of 3mA, or more, flows.]

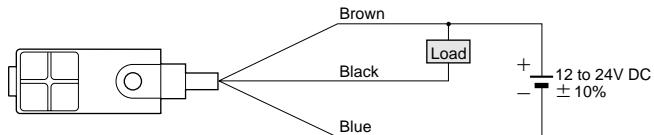
I/O CIRCUIT AND WIRING DIAGRAMS

NPN output type

I/O circuit diagram



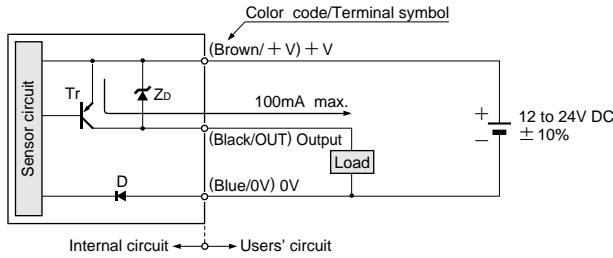
Wiring diagram



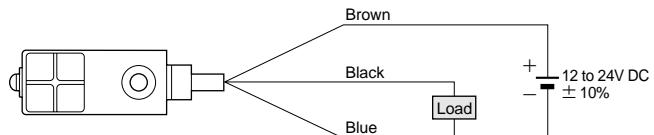
Symbols ... D: Reverse supply polarity protection diode
Z_D: Surge absorption zener diode
Tr : NPN output transistor

PNP output type

I/O circuit diagram



Wiring diagram

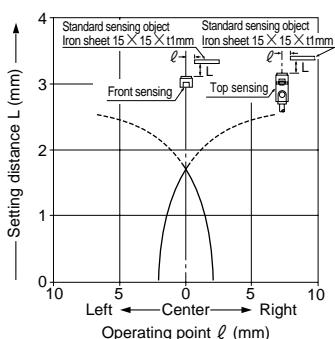


Symbols ... D: Reverse supply polarity protection diode
Z_D: Surge absorption zener diode
Tr : PNP output transistor

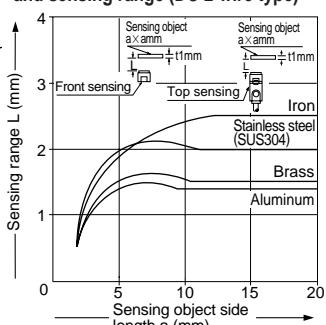
SENSING CHARACTERISTICS (TYPICAL)

GXL-8 type

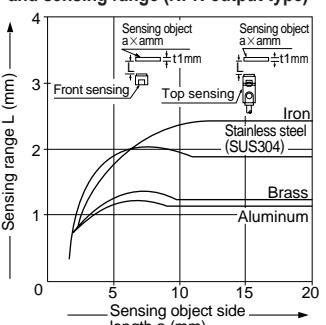
Sensing field (common)



Correlation between sensing object size and sensing range (DC 2-wire type)



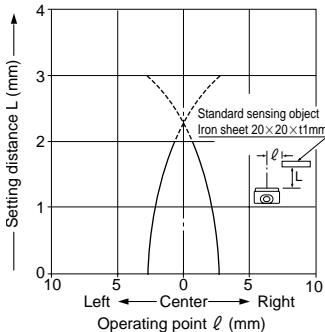
Correlation between sensing object size and sensing range (NPN output type)



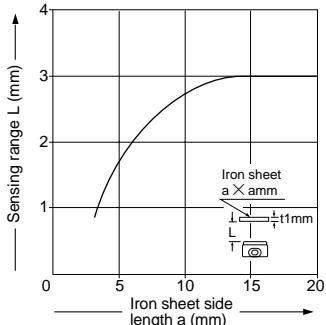
As the sensing object size becomes smaller than the standard size (iron sheet 15 × 15 × t1mm), the sensing range shortens as shown in the left figures.

GXL-N12 type

Sensing field



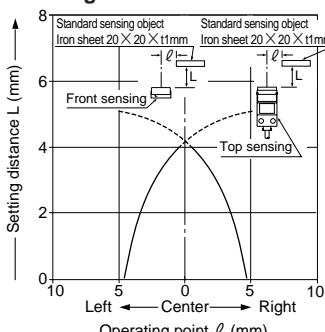
Correlation between sensing object size and sensing range



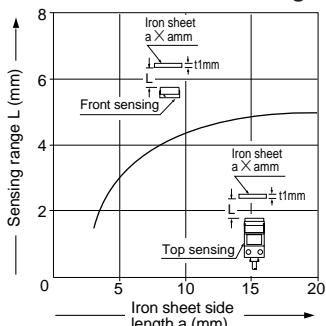
As the sensing object size becomes smaller than the standard size (iron sheet 20 × 20 × t1mm), the sensing range shortens as shown in the left figure.

GXL-15 (Standard) type

Sensing field



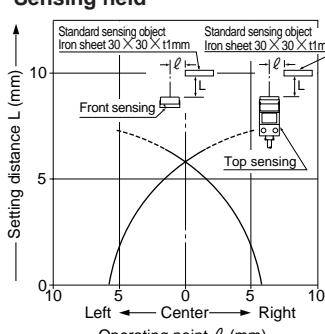
Correlation between sensing object size and sensing range



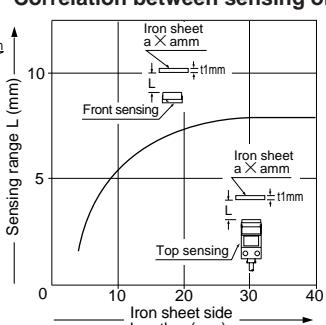
As the sensing object size becomes smaller than the standard size (iron sheet 20 × 20 × t1mm), the sensing range shortens as shown in the left figure.

GXL-15 (Long sensing range) type

Sensing field



Correlation between sensing object size and sensing range



As the sensing object size becomes smaller than the standard size (iron sheet 30 × 30 × t1mm), the sensing range shortens as shown in the left figure.

PRECAUTIONS FOR PROPER USE

Refer to P.836~ for general precautions.

All models

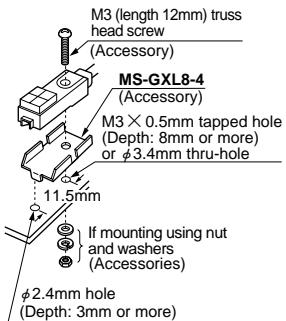
! This product is not a safety sensor. Its use is not intended or designed to protect life and prevent body injury or property damage from dangerous parts of machinery. It is a normal object detection sensor.

Mounting

GXL-8 (DC 2-wire) type

- The tightening torque should be 0.5N·m or less.
- To mount the sensor with a nut, the thru-hole diameter should be $\phi 3.4$ mm. With the attached mounting screw and nut, take care that the thickness of the mounting plate should be 2.3mm or less.

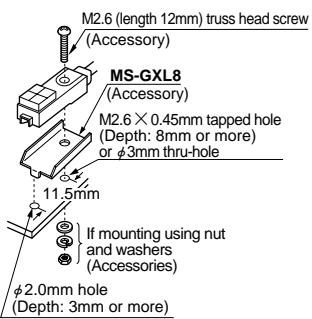
- If a screw other than the attached screw is used, make sure to use a M3 truss head screw.
(Do not use a flat head screw or a pan head screw.)



GXL-8 (NPN output) type

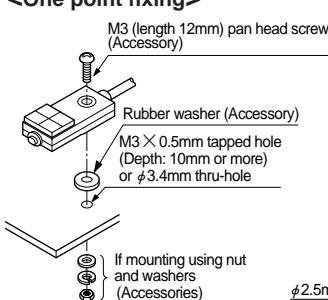
- The tightening torque should be 0.5N·m or less.
- To mount the sensor with a nut, the thru-hole diameter should be $\phi 3$ mm. With the attached mounting screw and nut, take care that the thickness of the mounting plate should be 2.3mm or less.

- If a screw other than the attached screw is used, make sure to use a M2.6 truss head screw.
Note: Do not use a M3 screw.



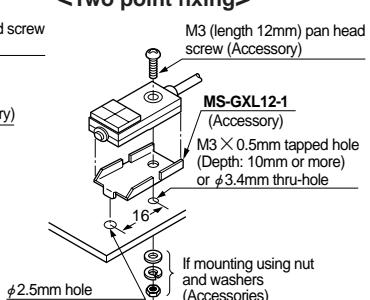
GXL-N12 type

<One point fixing>



- The tightening torque should be 0.49N·m or less.
- To mount the sensor with a nut, the thru-hole diameter should be $\phi 3.4$ mm.

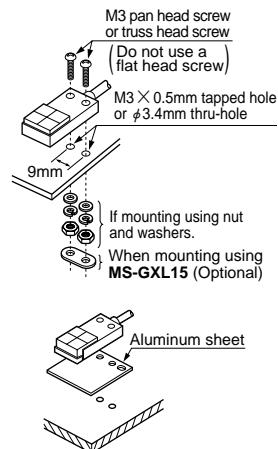
<Two point fixing>



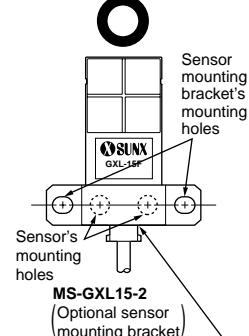
- The tightening torque should be 0.49N·m or less.
- To mount the sensor with a nut, the thru-hole diameter should be $\phi 3.4$ mm.

GXL-15 type

- The tightening torque should be 1N·m or less.
- To mount the sensor with the optional sensor mounting bracket **MS-GXL15**, the thru-hole diameter should be $\phi 3.4$ mm.
- Screw, nut or washers are not supplied. Please arrange them separately.
- To mount the long sensing range **GXL-15** type on a magnetic body, such as iron, the enclosed aluminum sheet, or any other aluminum sheet having a minimum size of $30 \times 39.5 \times 0.3$ mm (**GXL-15HLU** / **GXL-15HL**: $30 \times 30 \times 0.3$ mm), should be inserted between the sensor and the magnetic body.



- However, it is not necessary to use the aluminum sheet when mounting on a non-magnetic body, such as, aluminum or an insulator.
- When mounting the inductive proximity sensor with the optional sensor mounting bracket **MS-GXL15-2**, if the bracket is mounted close to the sensing part, the bracket itself gets sensed and the operation becomes unstable. Make sure to mount such that the mounting holes of the sensor and those of the mounting bracket are in one horizontal straight line.



Influence of surrounding metal

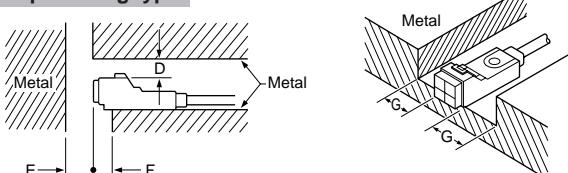
- When there is a metal near the sensor, keep the minimum separation distance specified below.

Front sensing type

	GXL-8F type	GXL-N12F type	GXL-15FU/GXL-15 type	GXL-15FLU type
A	7mm	7mm	8mm	8mm (Note)
B	8mm	20mm	20mm	30mm
C	3mm	10mm	7mm	10mm

Note: The **GXL-15FLU** type should be mounted on an insulator or a non-magnetic body. To mount it on a magnetic body, such as iron, use the enclosed aluminum sheet.

Top sensing type



	GXL-8H type	GXL-15HU/GXL-15 type	GXL-15HLU/GXL-15HL type
D	4mm	6mm	12mm
E	10mm	20mm	30mm
F	3mm	0mm	10mm (Note)
G	3mm	3mm	10mm

Note: When **GXL-15HLU/GXL-15HL** type is mounted on an insulator or a non-magnetic body, or seated on the enclosed aluminum sheet, the distance 'F' can be zero.

PRECAUTIONS FOR PROPER USE

Refer to P.836~ for general precautions.

All models

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.

	H	J
GXL-8 type	Between 'I' type and non 'I' type	0mm (Note 2)
	Between two 'I' types or two non 'I' types	15mm
GXL-N12 type	Between 'I' type and non 'I' type	0mm (Note 2)
	Between two 'I' types or two non 'I' types	15mm
GXL-15F GXL-15FU GXL-15HU type	Between 'I' type and non 'I' type	0mm (Note 2)
	Between two 'I' types or two non 'I' types	25mm
GXL-15H type	Between 'I' type and non 'I' type	0mm (Note 2)
	Between two 'I' types or two non 'I' types	25mm
GXL-15FLU GXL-15HLU type	Between 'I' type and non 'I' type	25mm
	Between two 'I' types or two non 'I' types	75mm
GXL-15HL type	Between 'I' type and non 'I' type	0mm (Note 2)
	Between two 'I' types or two non 'I' types	25mm
		80mm
		95mm

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, in a row, the minimum value of dimension H should be as given below.
 GXL-8 type: 2mm, GXL-N12 type: 4mm
 GXL-15 (Standard) type: 7.5mm (GXL-15H type: 12.5mm)
 GXL-15 (Long sensing range) type: 30mm (GXL-15HL type: 32.5mm)

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 plated.

Correction coefficient

Model No.	GXL-8FU GXL-8HU type	GXL-8F GXL-8H type	GXL-N12 type	GXL-15FU GXL-15HU GXL-15HLU type	GXL-15F GXL-15H type	GXL-15HL type
Iron	1	1	1	1	1	1
Stainless steel (SUS304)	0.82 approx.	0.76 approx.	0.7 approx.	0.74 approx.	0.75 approx.	0.68 approx.
Brass	0.59 approx.	0.5 approx.	0.4 approx.	0.53 approx.	0.53 approx.	0.47 approx.
Aluminum	0.57 approx.	0.48 approx.	0.35 approx.	0.52 approx.	0.51 approx.	0.45 approx.

Others

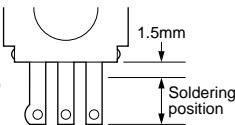
- Do not use during the initial transient time (50ms) after the power supply is switched on.
- The output is not incorporated with a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load (excluding the DC 2-wire type).

GXL-N12FT type

Soldering

- To solder the terminals of the sensor, observe the following conditions.

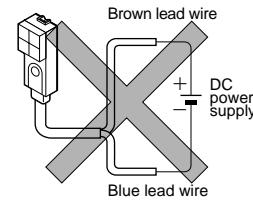
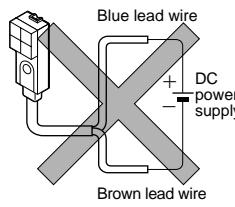
Soldering temperature: 260°C or less
 Soldering time : 5 sec. or less
 Soldering position : 1.5mm, or more, away from the sensor body.



DC 2-wire type

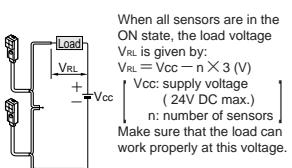
Wiring

- The sensor must be connected to a power supply via a load. If the sensor is connected to a power supply without a load, the short-circuit protection makes the sensor inoperable. (The output stays in the OFF state and the indicator does not light up.) In this case, rectify by connecting the power supply via a load. Now, the sensor becomes operable. Further, take care that if the power supply is connected with reverse polarity without a load, the sensor will get damaged.



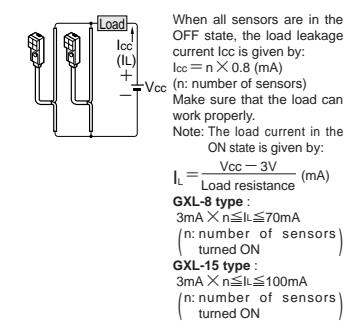
- For series connection (AND circuit) or parallel connection (OR circuit) of sensors, take care of the following.

Series connection (AND circuit)

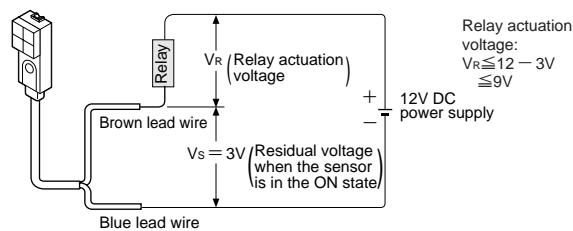


Note: The output is generated normally even if the indicator does not light up properly.

Parallel connection (OR circuit)

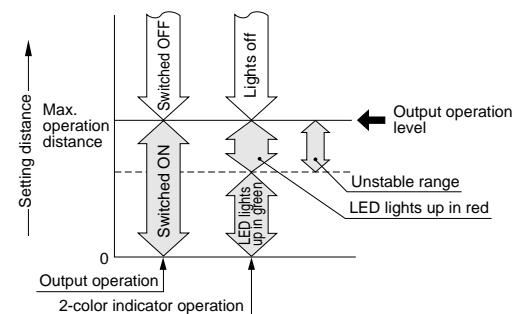


- The residual voltage of the sensor is 3V. Before connecting a relay at the load, take care of its actuation voltage. (Some 12V relays may not be usable.)



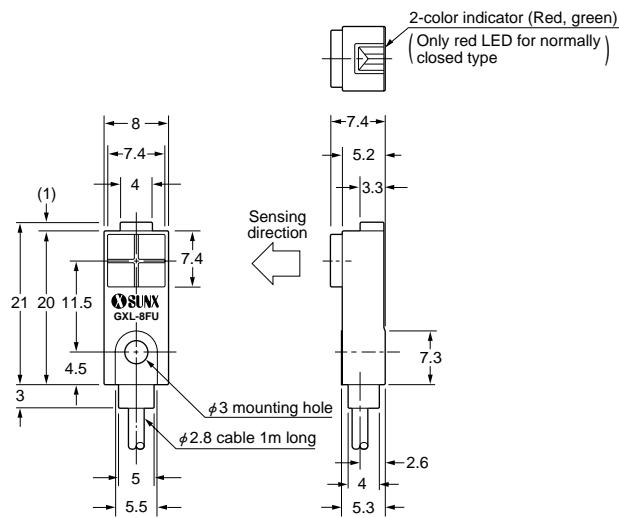
2-color indicator (Normally open type only)

- When the sensing object is in the stable sensing range, the LED lights up in green, and when the sensing object is in the unstable sensing range, the LED lights up in red. While the LED lights up in green, the sensing is performed stably without being affected by temperature drifts or voltage fluctuations.

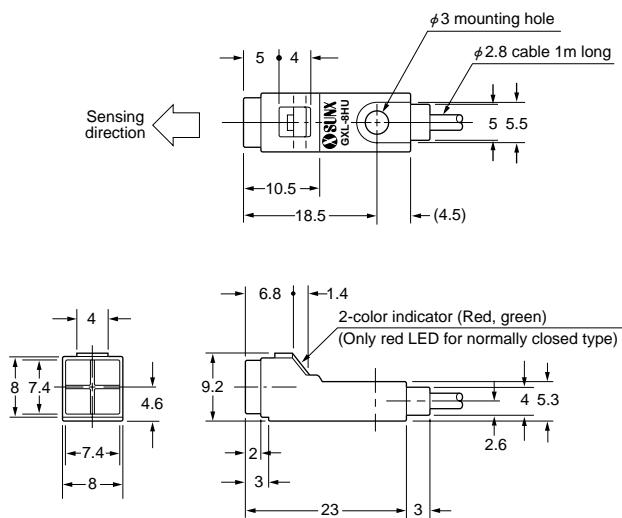


DIMENSIONS (Unit: mm)

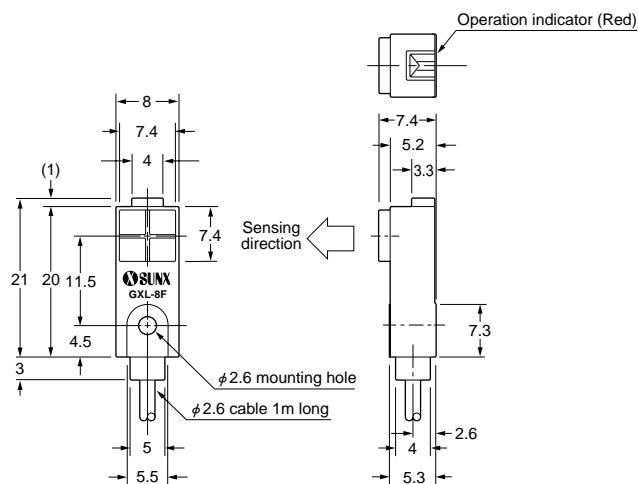
GXL-8FU type Sensor



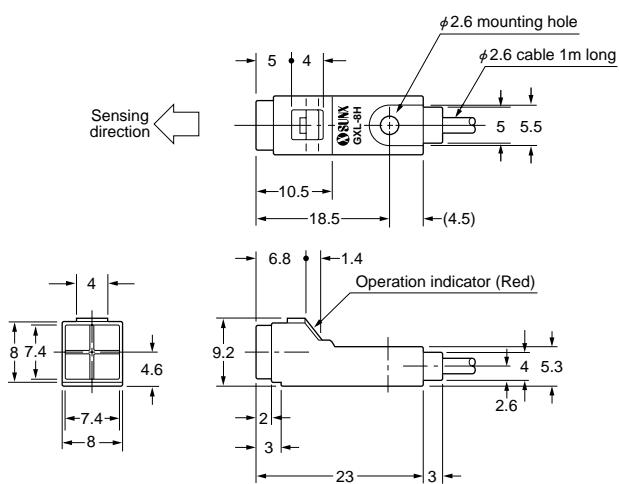
GXL-8HU type Sensor



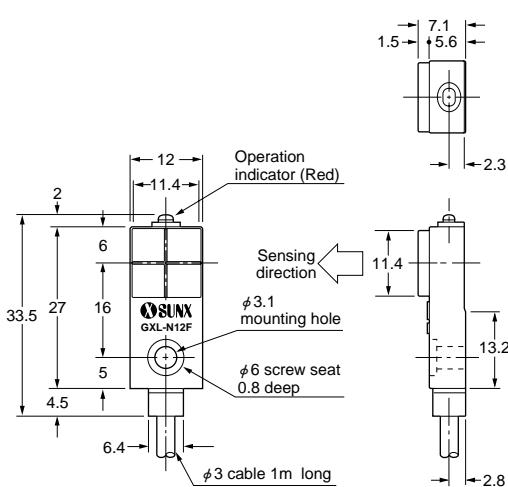
GXL-8F type Sensor



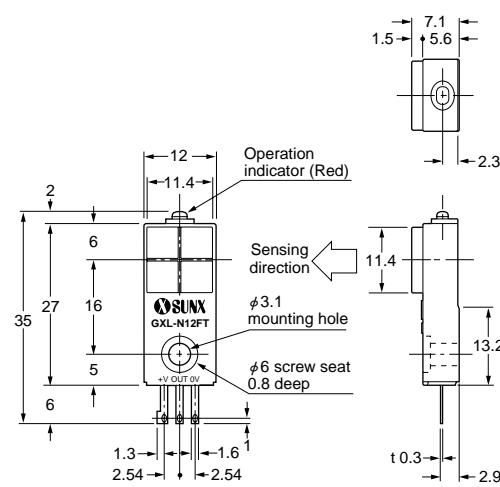
GXL-8H type Sensor



GXL-N12F type Sensor

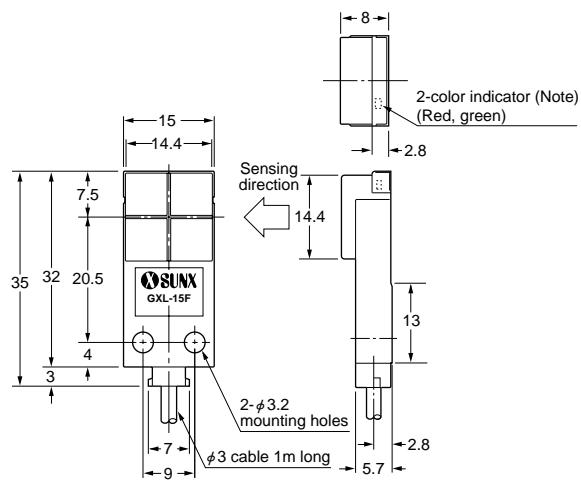


GXL-N12FT type Sensor



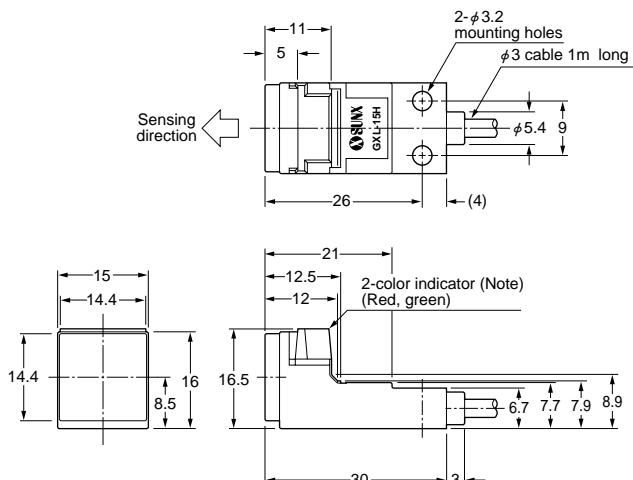
DIMENSIONS (Unit: mm)

GXL-15F type Sensor



Note: Normally closed DC 2-wire type, NPN output type and PNP output type have an operation indicator (red) instead of the 2-color indicator.

GXL-15H type Sensor

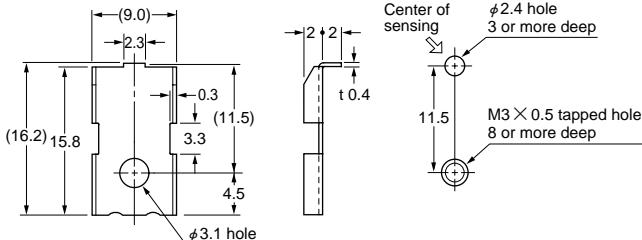


Note: Normally closed DC 2-wire type and NPN output type have an operation indicator (red) instead of the 2-color indicator.

MS-GXL8-4

Sensor mounting bracket for GXL-8FU/GXL-8HU type (Accessory)

Mounting hole dimensions



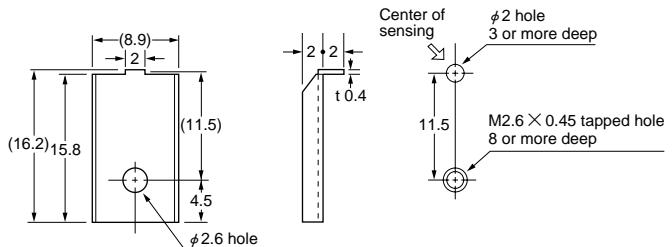
Material: Cold rolled carbon steel (SPCC)
(Nickel plated)

1 No. each of M3 (length 12mm) truss head screw, nut, spring washer and plain washer is attached.

MS-GXL8

Sensor mounting bracket for GXL-8F/GXL-8H type (Accessory)

Mounting hole dimensions



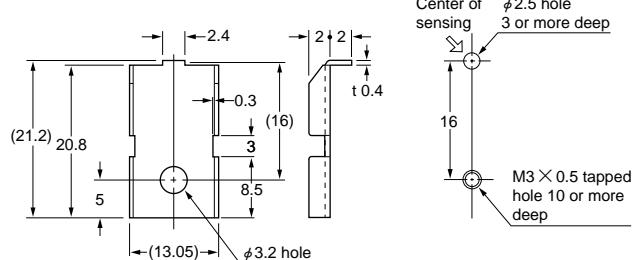
Material: Cold rolled carbon steel (SPCC)
(Nickel plated)

1 No. each of M2.6 (length 12mm) truss head screw, nut, spring washer and plain washer is attached.

MS-GXL12-1

Sensor mounting bracket for GXL-N12 type (Accessory)

Mounting hole dimensions

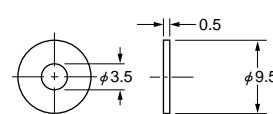


Material: Cold rolled carbon steel (SPCC)
(Nickel plated)

1 No. each of M3 (length 12mm) pan head screw, plain washer, spring washer and rubber washer (φ9.5×t0.5mm) is attached.

MS-R1

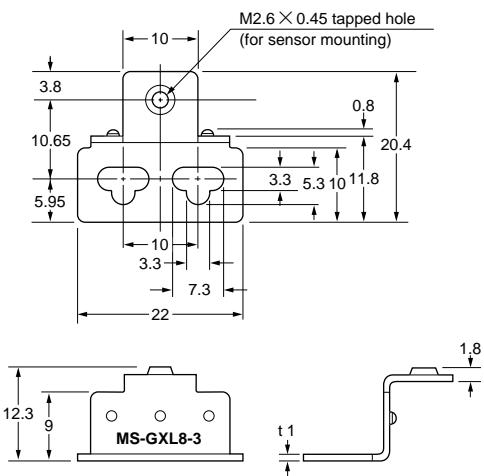
Rubber washer for GXL-N12 type (Accessory)



Material: NBR

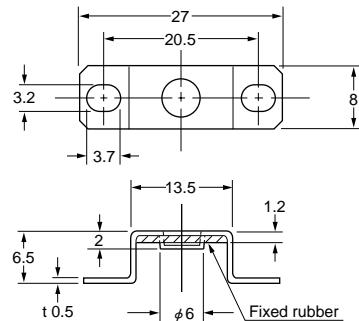
DIMENSIONS (Unit: mm)

MS-GXL8-3 Sensor mounting bracket for GXL-8F/GXL-8H type (Optional)



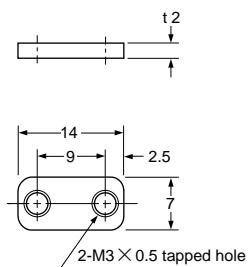
Material: Stainless steel (SUS304)
One M2.6 (length 8mm) pan head screw and two M3 (length 8mm) screws with washers are attached.

MS-GXL12-2 Sensor mounting bracket for GXL-N12 type (Optional)



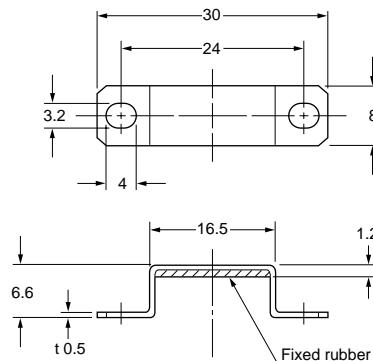
Material: Bracket ... stainless steel (SUS304)
Fixed rubber ... FKM (Fluorine rubber)

MS-GXL15 Sensor mounting bracket for GXL-15 type (Optional)



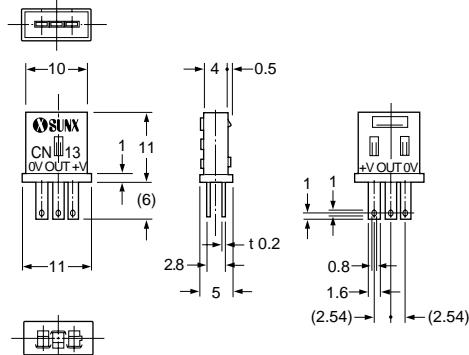
Material: Cold rolled carbon steel (SPCC)

MS-GXL15-2 Sensor mounting bracket for GXL-15F type (Optional)



Material: Bracket ... stainless steel (SUS304)
Fixed rubber ... FKM (Fluorine rubber)

CN-13 Connector for terminal type (Optional)

MS-A15F
MS-A15H Aluminum sheet (Accessory for GXL-15FLU, GXL-15HLU and GXL-15HL type)