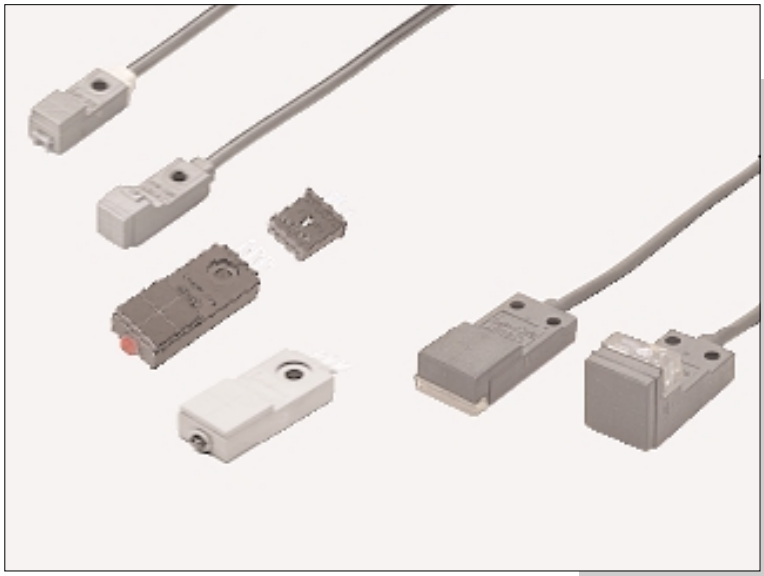
GXL SERIES

Micro-size Inductive Proximity Sensor **Amplifier Built-in**

2-wire type available | PNP output type available | Oil resistant | Flexible cable type available | Different freq. type available



High performance in micro-size design

Conforming to EMC Directive

UL Recognition (Only GXL-8F□ and GXL-8F□)

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.

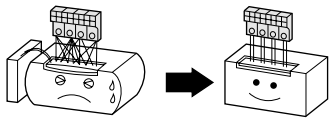
Reduced wiring operation

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.

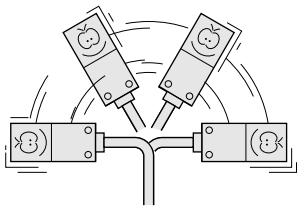
Wiring of the 3-wire type is cumbersome.

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



Flexible cable type

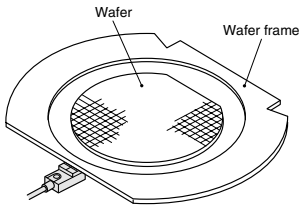
The bending durability of its cable is ten times that of the conventional model. The sensor can be mounted on a moving table or a robot arm.



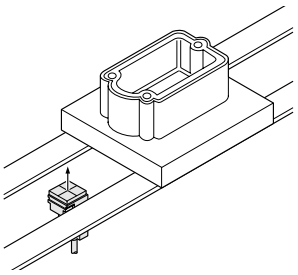
※ Except PNP output type and 5 m 16.404 ft cable attached NPN output type

APPLICATIONS

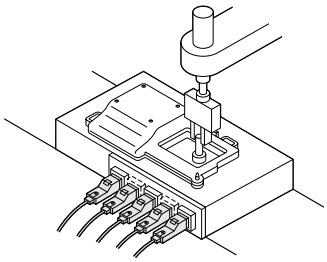
Detecting wafer frame



Detecting aluminum pallet



Code reading



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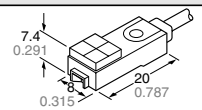
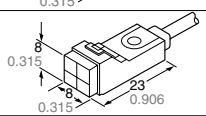
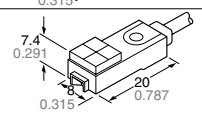
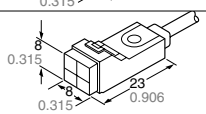
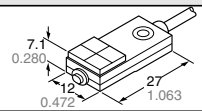
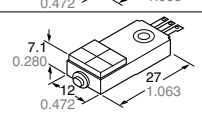
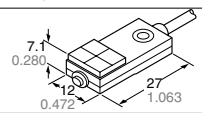
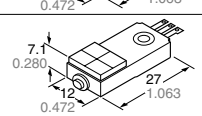
GXL-8 type

Type		Appearance (mm in)	Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation
DC 2-wire	Front sensing		Maximum operation distance 2.5 mm 0.098 in (0 to 1.8 mm) (0 to 0.071 in) Stable sensing range	**GXL-8FU**	Non-contact DC 2-wire type	Normally open
				GXL-8FUI		
				GXL-8FUB		Normally closed
				GXL-8FUIB		
	Top sensing			**GXL-8HU**		Normally open
				GXL-8HUI		
				GXL-8HUB		Normally closed
				GXL-8HUIB		
NPN output	Front sensing			**GXL-8F**	NPN open-collector transistor	Normally open
				GXL-8FI		
				GXL-8FB		Normally closed
				GXL-8FIB		
	Top sensing			**GXL-8H**		Normally open
				GXL-8HI		
				GXL-8HB		Normally closed
				GXL-8HIB		

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 in)	Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation
NPN output	Cable type		Maximum operation distance 3 mm 0.118 in (0 to 2 mm) (0 to 0.079 in) Stable sensing range	**GXL-N12F** (Note 3)	NPN open-collector transistor	Normally open
				GXL-N12FI (Note 3)		
				GXL-N12FB		Normally closed
				GXL-N12FIB		
	Terminal type			**GXL-N12FT** (Note 3)		Normally open
				GXL-N12FTI (Note 3)		
				GXL-N12FTB		Normally closed
				GXL-N12FTIB		
PNP output	Cable type			**GXL-N12F-P**	PNP open-collector transistor	Normally open
				GXL-N12FI-P		
				GXL-N12FB-P		Normally closed
				GXL-N12FIB-P		
	Terminal type			**GXL-N12FT-P**		Normally open
				GXL-N12FTI-P		
				GXL-N12FTB-P		Normally closed
				GXL-N12FTIB-P		

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 5 V supply voltage type. Please contact our office for details.

GXL

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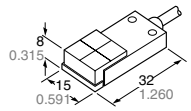
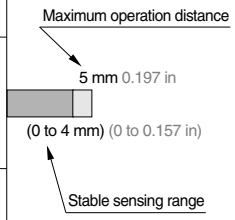
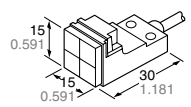
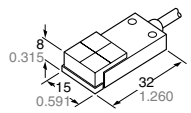
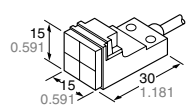
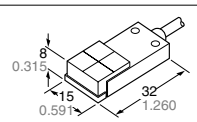
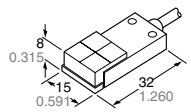
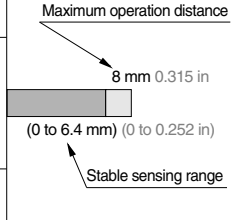
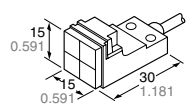
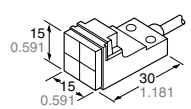
GXL-15 (Standard) type

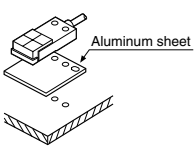
Type		Appearance (mm in)	Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation
DC 2-wire	Front sensing			**GXL-15FU**	Non-contact DC 2-wire type	Normally open
				GXL-15FUI		
				GXL-15FUB		Normally closed
				GXL-15FUIB		
	Top sensing			**GXL-15HU**		Normally open
				GXL-15HUI		
				GXL-15HUB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

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 in)	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
				GXL-15FLUI		
				GXL-15FLUB		Normally closed
				GXL-15FLUIB		
	Top sensing			**GXL-15HLU**		Normally open
				GXL-15HLUI		
				GXL-15HLUB		Normally closed
				GXL-15HLUIB		
NPN output	Top sensing			**GXL-15HL**	NPN open-collector transistor	Normally open
				GXL-15HLI		
				GXL-15HLB		Normally closed
				GXL-15HLIB		

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 × t 0.3 mm 1.181 × 1.555 × t 0.012 in (**GXL-15HLU**□ / **GXL-15HL**□: 30 × 30 × t 0.3 mm 1.181 × 1.181 × t 0.012 in), 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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Flexible cable type and 5 m 16.404 ft cable length type

Flexible cable type and 5 m 16.404 ft cable length type (standard: 1 m 3.281 ft) are also available.

• Table of Model Nos.

Type		Standard	Flexible cable type	5 m 16.404 ft cable length type	Flexible cable & 5 m 16.404 ft cable length type
DC 2-wire	Front sensing	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
	Top sensing	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
	Front sensing	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
	Top sensing	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
	Front sensing	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
	Top sensing	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
NPN output	Front sensing	GXL-8F	GXL-8F-R	GXL-8F-C5	GXL-8F-R-C5
		GXL-8FI	GXL-8FI-R	GXL-8FI-C5	GXL-8FI-R-C5
		GXL-8FB	GXL-8FB-R	GXL-8FB-C5	—
		GXL-8FIB	GXL-8FIB-R	GXL-8FIB-C5	GXL-8FIB-R-C5
	Top sensing	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	—
	Front sensing	GXL-N12F	GXL-N12F-R	GXL-N12F-C5	GXL-N12F-R-C5
		GXL-N12FI	GXL-N12FI-R	GXL-N12FI-C5	GXL-N12FI-R-C5
		GXL-N12FB	GXL-N12FB-R	GXL-N12FB-C5	GXL-N12FB-R-C5
		GXL-N12FIB	GXL-N12FIB-R	GXL-N12FIB-C5	GXL-N12FIB-R-C5
		GXL-N12FT	—	—	—
		GXL-N12FTI	—	—	—
		GXL-N12FTB	—	—	—
		GXL-N12FTIB	—	—	—
	Front sensing	GXL-15F	GXL-15F-R	GXL-15F-C5	GXL-15F-R-C5
		GXL-15FI	GXL-15FI-R	GXL-15FI-C5	GXL-15FI-R-C5
		GXL-15FB	GXL-15FB-R	GXL-15FB-C5	GXL-15FB-R-C5
		GXL-15FIB	GXL-15FIB-R	GXL-15FIB-C5	—
	Top sensing	GXL-15H	—	GXL-15H-C5	—
		GXL-15HI	—	—	—
		GXL-15HB	—	GXL-15HB-C5	—
		GXL-15HIB	—	—	—
	Top sensing	GXL-15HL	—	GXL-15HL-C5	—
		GXL-15HLI	—	—	—
		GXL-15HLB	—	—	—
		GXL-15HLIB	—	—	—
PNP output	Front sensing	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	—	—	—
	Front sensing	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	—

GXL

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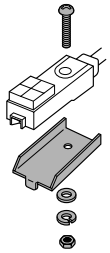
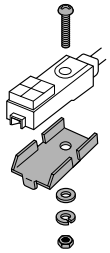
Accessories

- **MS-GXL8**
  (Sensor mounting bracket for **GXL-8F**, **GXL-8H** type)



1 pc. each of screw, nut, spring washer and plain washer is attached.

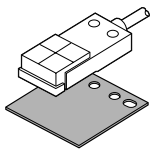
- **MS-GXL8-4**
  (Sensor mounting bracket for **GXL-8FU**, **GXL-8HU** type)
- **MS-GXL12-1**
  (Sensor mounting bracket for **GXL-N12** type)



1 pc. each of screw, nut, spring washer and plain washer is attached.

(Not included with the **MS-GXL12-1**. (Bracket only) Please use only the items included with the sensor.)

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

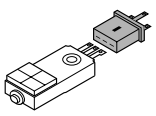


OPTIONS

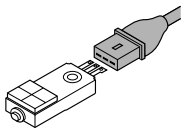
Designation	Model No.	Description	
Connector	**CN-13**	Connector for the terminal type	
	CN-13-C1	Length: 1 m 3.281 ft	Mating cable for the terminal type
	CN-13-C3	Length: 3 m 9.843 ft	
Sensor mounting bracket	**MS-GXL8-3**	Mounting bracket for NPN output of **GXL-8** type	
	MS-GXL12-2	Mounting bracket for **GXL-N12** type	
	MS-GXL15	Mounting bracket for **GXL-15** type	
	MS-GXL15-2	Mounting bracket for **GXL-15F** type	

Connector

- **CN-13**

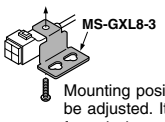


- **CN-13-C1**
- **CN-13-C3**



Sensor mounting bracket

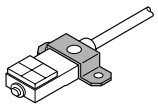
- **MS-GXL8-3**



Mounting position can be adjusted. It is rust-free, being stainless steel.

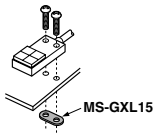
A set of one M2.6 (length: 8 mm 0.315 in) pan head screw and two M3 (length: 8 mm 0.315 in) screws with washers are attached.

- **MS-GXL12-2**



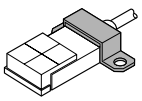
Screws are not supplied.

- **MS-GXL15**



Screws are not supplied.

- **MS-GXL15-2**



SPECIFICATIONS

DC 2-wire type

Item \ Type	GXL-8 type		GXL-15 type			
			Standard		Long sensing range (For mounting on non-magnetic body) (Note 1)	
Standard Model No.	Front sensing	Top sensing	Front sensing	Top sensing	Front sensing	Top sensing
	GXL-8FU	**GXL-8HU**	**GXL-15FU**	**GXL-15HU**	**GXL-15FLU**	**GXL-15HLU**
Max. operation distance (Note 2)	2.5 mm 0.098 in ± 20 %		5 mm 0.197 in ± 10 %		8 mm 0.315 in ± 10 %	
Stable sensing range (Note 2)	0 to 1.8 mm 0 to 0.071 in		0 to 4 mm 0 to 0.157 in		0 to 6.4 mm 0 to 0.252 in	
Standard sensing object	Iron sheet 15 × 15 × t 1 mm 0.591 × 0.591 × t 0.039 in		Iron sheet 20 × 20 × t 1 mm 0.787 × 0.787 × t 0.039 in		Iron sheet 30 × 30 × t 1 mm 1.181 × 1.181 × t 0.039 in	
Hysteresis	20 % or less of operation distance					
Repeatability	Along sensing axis, perpendicular to sensing axis: 0.04 mm 0.002 in or less					
Supply voltage	12 to 24 V DC ± 10 % Ripple P-P 10 % or less					
Current consumption (Note 3)	0.8 mA or less					
Output	Non-contact DC 2-wire type • Load current: 3 to 70 mA (Note 4) • Residual voltage: 3 V or less (Note 5)		Non-contact DC 2-wire type • Load current: 3 to 100 mA (Note 4) • Residual voltage: 3 V or less (Note 5)			
Utilization category	DC-12 or DC-13					
Short-circuit protection	Incorporated					
Max. response frequency	1 kHz					
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)					
Environmental resistance: Protection	IP67 (IEC), IP67 g (JEM)					
Environmental resistance: Ambient temperature	− 25 to + 70 °C − 13 to + 158 °F, Storage: − 30 to + 80 °C − 22 to + 176 °F					
Environmental resistance: Ambient humidity	45 to 85 % RH, Storage: 35 to 95 % RH					
Environmental resistance: EMC	EN 50081-2, EN 50082-2, EN 60947-5-2					
Environmental resistance: Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure					
Environmental resistance: Insulation resistance	50 MΩ, or more, with 250 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 amplitude in X, Y and Z directions for two hours each					
Environmental resistance: Shock resistance	1,000 m/s² acceleration (100 G approx.) in X, Y and Z directions for three times each					
Sensing range variation: Temperature characteristics	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					
Material	Enclosure: PBT, Indicator part: Polyalylate			Enclosure: PET (Glass fiber reinforced) Indicator part: Polyalylate	Enclosure: PBT Indicator part: Polyalylate	Enclosure: PET (Glass fiber reinforced) Indicator part: Polyalylate
Cable (Note 6)	0.15 mm² 2-core oil, heat and cold resistant cable, 1 m 3.281 ft long		0.2 mm² 2-core oil, heat and cold resistant cable, 1 m 3.281 ft long			
Cable extension	Extension up to total 50 m 164.042 ft is possible with 0.3 mm², or more, cable.					
Weight	12 g approx.		20 g approx.			
Accessories	**MS-GXL8-4** (Sensor mounting bracket): 1 set		———		**MS-A15F** (Aluminum sheet): 1 pc.	**MS-A15H** (Aluminum sheet): 1 pc.

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 × t 0.3 mm 1.181 × 1.555 × t 0.012 in (**GXL-15HLU** type: 30 × 30 × t 0.3 mm 1.181 × 1.181 × t 0.012 in), 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**' (p.691〜) 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 5 m 16.404 ft cable length type increases by 0.1 V.
6) The flexible cable type (model No. with suffix '**-R**') has a 0.15 mm² (**GXL-15** type: 0.2 mm²) flexible, oil, heat and cold resistant cabtyre cable, 1 m 3.281 ft long.

GXL

SPECIFICATIONS

NPN and PNP output type

Item \ Type	NPN output							PNP output		
	GXL-8 type		**GXL-N12** type		**GXL-15** type			**GXL-N12** type		**GXL-15** type
			Cable type	Terminal type	Standard		Long sensing range (For mounting on non-magnetic body (Note 1))	Cable type	Terminal type	Standard
Standard Model No.	Front sensing	Top sensing	Front sensing		Front sensing	Top sensing	Top sensing	Front sensing		Front sensing
	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)	2.5 mm 0.098 in ± 20 %		3 mm 0.118 in ± 10 %		5 mm 0.197 in ± 10 %		8 mm 0.315 in ± 10 %	3 mm 0.118 in ± 10 %		5 mm 0.197 in ± 10 %
Stable sensing range (Note 2)	0 to 1.8 mm 0 to 0.071 in		0 to 2 mm 0 to 0.079 in		0 to 4 mm 0 to 0.157 in		0 to 6.4 mm 0 to 0.252 in	0 to 2 mm 0 to 0.079 in		0 to 4 mm 0 to 0.157 in
Standard sensing object	Iron sheet 15 × 15 × t 1 mm 0.591 × 0.591 × t 0.039 in		Iron sheet 20 × 20 × t 1 mm 0.787 × 0.787 × t 0.039 in				Iron sheet 30 × 30 × t 1 mm 1.181 × 1.181 × t 0.039 in	Iron sheet 20 × 20 × t 1 mm 0.787 × 0.787 × t 0.039 in		
Hysteresis	20 % or less of operation distance									
Repeatability	Along sensing axis, perpendicular to sensing axis: 0.04 mm 0.002 in or less				Along sensing axis, perpendicular to sensing axis: 0.06 mm 0.002 in or less			Along sensing axis, perpendicular to sensing axis: 0.04 mm 0.002 in or less		
Supply voltage	12 to 24 V DC ± 10 % Ripple P-P 10 % or less									
Current consumption	15 mA or less									
Output	NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 1 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current)							PNP open-collector transistor • Maximum source current: 100 mA • Applied voltage: 30 V DC or less (between output and + V) • Residual voltage: 1 V or less (at 100 mA source current) 0.4 V or less (at 16 mA source current)		
Utilization category	DC-12 or DC-13									
Short-circuit protection	———									
Max. response frequency	500 Hz				250 Hz			500 Hz		250 Hz
Operation indicator	Red LED (lights up when the output is ON)									
Environmental resistance: Pollution degree	3 (Industrial environment)									
Environmental resistance: Protection	IP67 (IEC), IP67 g (JEM) except for the terminal type									
Environmental resistance: Ambient temperature	− 10 to + 55 °C 14 to + 131 °F, Storage: − 30 to + 80 °C − 22 to + 176 °F									
Environmental resistance: Ambient humidity	45 to 85 % RH, Storage: 35 to 95 % RH									
Environmental resistance: EMC	EN 50081-2, EN 50082-2, EN 60947-5-2									
Environmental resistance: Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure									
Environmental resistance: Insulation resistance	50 MΩ, or more, with 250 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 amplitude in X, Y and Z directions for two hours each									
Environmental resistance: Shock resistance	1,000 m/s² acceleration (100 G approx.) in X, Y and Z directions for three times each									
Sensing range variation: Temperature characteristics	Over ambient temperature range − 10 to + 55 °C + 14 to + 131 °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									
Material	Enclosure: PBT, Indicator part: Polyalylate					Enclosure: PET (Glass fiber reinforced) Indicator part: Polyalylate		Enclosure: PBT Indicator part: Polyalylate		
Cable (Note 3)	0.08 mm² 3-core oil, heat and cold resistant cabtyre cable, 1 m 3.281 ft long		0.15 mm² 3-core oil, heat and cold resistant cabtyre cable, 1 m 3.281 ft long	———	0.15 mm² 3-core oil, heat and cold resistant cabtyre cable, 1 m 3.281 ft long		———			0.15 mm² 3-core oil, heat and cold resistant cabtyre cable, 1 m 3.281 ft long
Cable extension	Extension up to total 100 m 328.084 ft is possible with 0.3 mm², or more, cable.									
Weight	12 g approx.		20 g approx.	5 g approx.	20 g approx.			5 g approx.		20 g approx.
Accessories	**MS-GXL8** (Sensor mounting bracket): 1 set		**MS-GXL12-1** (Sensor mounting bracket): 1 pc. M3 pan head screw, plain washer, spring washer and nut: 1 set **MS-R1** (Rubber washer): 1 pc.	———	———		**MS-A15H** (Aluminum sheet): 1 pc.	**MS-GXL12-1** (Sensor mounting bracket): 1 pc. M3 pan head screw, plain washer, spring washer and nut: 1 set **MS-R1** (Rubber washer): 1 pc.		———

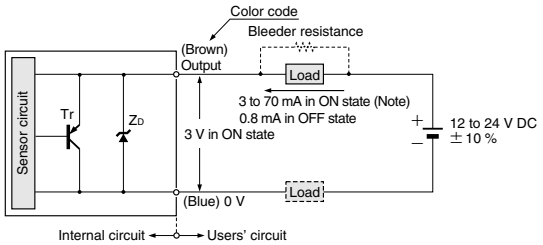
Notes: 1) To mount the long sensing range **GXL-15** type on a magnetic body, such as iron, the enclosed aluminum sheet or any other aluminum sheet having a minimum size of 30 × 30 × t 0.3 mm 1.181 × 1.181 × t 0.012 in, should be inserted between the sensor and the magnetic body.
However, it is not necessary 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 flexible cable type (model No. with suffix '**-R**') has a 0.15 mm² (**GXL-8** type: 0.1 mm²) flexible, oil, heat and cold resistant cabtyre cable, 1 m 3.281 ft long.

I/O CIRCUIT AND WIRING DIAGRAMS

DC 2-wire type

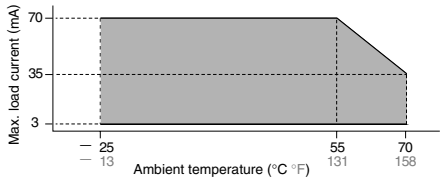
GXL-8FU / GXL-8HU type

I/O circuit diagram

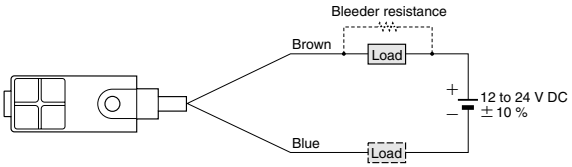


Symbols ... Z_D: Surge absorption zener diode
Tr: PNP output transistor

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



Wiring diagram

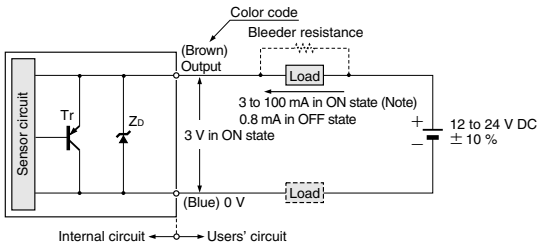


Conditions for the load

1) The load should not be actuated by the leakage current (0.8 mA) in the OFF state.
2) The load should be actuated by (supply voltage − 3 V) in the ON state.
3) The current in the ON state should be between 3 to 70 mA DC.
[In case the current is less than 3 mA, connect a bleeder resistance in parallel to the load so that a current of 3 mA, or more, flows.]

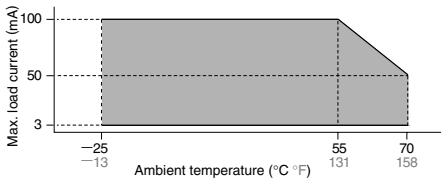
GXL-15FU / GXL-15HU / GXL-15FLU / GXL-15HLU type

I/O circuit diagram

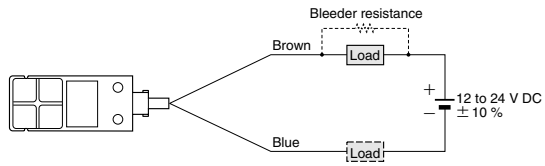


Symbols ... Z_D: Surge absorption zener diode
Tr: PNP output transistor

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



Wiring diagram



Conditions for the load

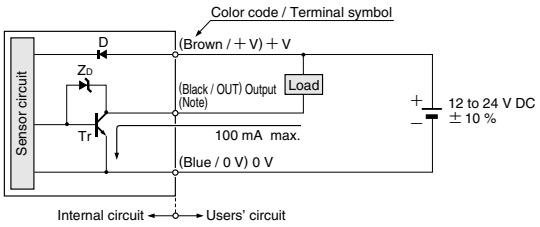
1) The load should not be actuated by the leakage current (0.8 mA) in the OFF state.
2) The load should be actuated by (supply voltage − 3 V) in the ON state.
3) The current in the ON state should be between 3 to 100 mA DC.
[In case the current is less than 3 mA, connect a bleeder resistance in parallel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

GXL

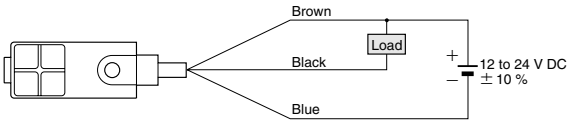
I/O CIRCUIT AND WIRING DIAGRAMS

NPN output type

I/O circuit diagram



Wiring diagram

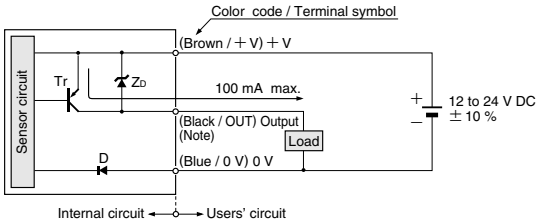


Note: The output does not incorporate a short-circuit protection circuit.
Do not connect it directly to a power supply or a capacitive load.

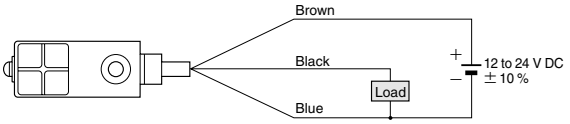
Symbols ... D : Reverse supply polarity protection diode
ZD: Surge absorption zener diode
Tr : NPN output transistor

PNP output type

I/O circuit diagram



Wiring diagram



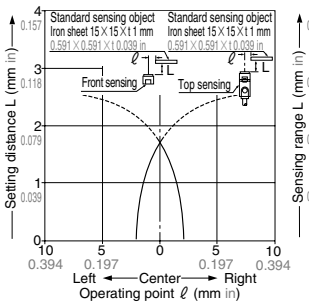
Note: The output does not incorporate a short-circuit protection circuit.
Do not connect it directly to a power supply or a capacitive load.

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

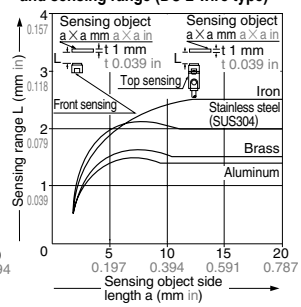
SENSING CHARACTERISTICS (TYPICAL)

GXL-8 type

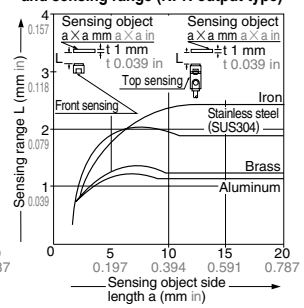
Sensing field (common)



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



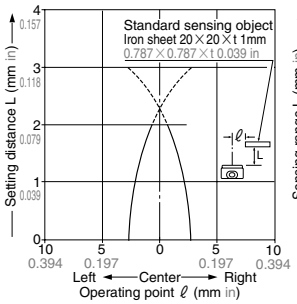
Correlation between sensing object size and sensing range (NPN output type)



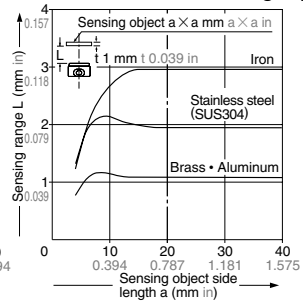
As the sensing object size becomes smaller than the standard size (iron sheet 15×15×t 1 mm 0.591×0.591×t 0.039 in), the sensing range shortens as shown in the left figures.

GXL-N12 type

Sensing field



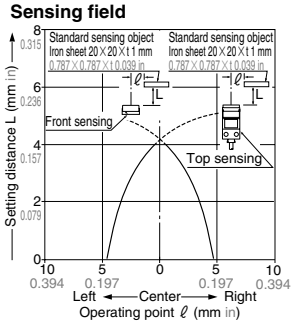
Correlation between sensing object size and sensing range



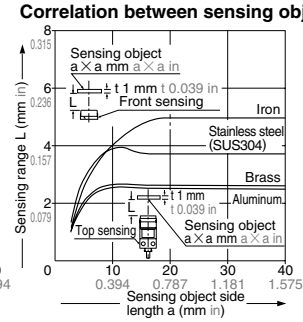
As the sensing object size becomes smaller than the standard size (iron sheet 20×20×t 1 mm 0.787×0.787×t 0.039 in), the sensing range shortens as shown in the left figure.

GXL-15 (Standard) type

Sensing field



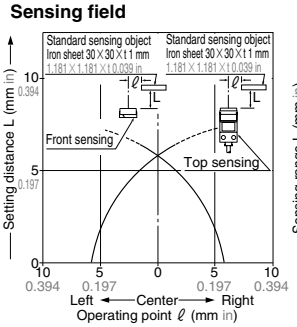
Correlation between sensing object size and sensing range



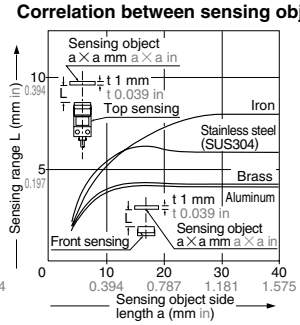
As the sensing object size becomes smaller than the standard size (iron sheet 20×20×t 1 mm 0.787×0.787×t 0.039 in), the sensing range shortens as shown in the left figure.

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×t 1 mm 1.181×1.181×t 0.039 in), the sensing range shortens as shown in the left figure.

GXL

PRECAUTIONS FOR PROPER USE

Refer to p.1152～ for general precautions.

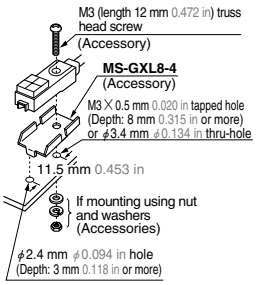
All models

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

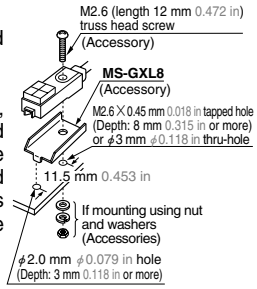
- The tightening torque should be 0.5 N·m or less.
- To mount the sensor with a nut, the thru-hole diameter should be ϕ3.4 mm ϕ0.134 in. With the attached mounting screw and nut, take care that the thickness of the mounting plate should be 2.3 mm 0.091 in or less.
- If a screw other than the attached 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

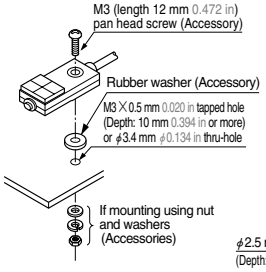
- The tightening torque should be 0.5 N·m or less.
- To mount the sensor with a nut, the thru-hole diameter should be ϕ3 mm ϕ0.118 in. With the attached mounting screw and nut, take care that the thickness of the mounting plate should be 2.3 mm 0.091 in or less.
- If a screw other than the attached screw is used, make sure to use a M2.6 truss head screw.

Note: Do not use a M3 screw.

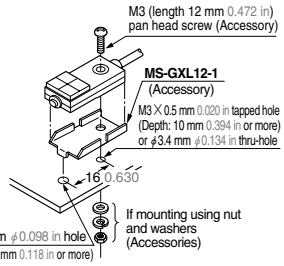


GXL-N12 type

<One point fixing>



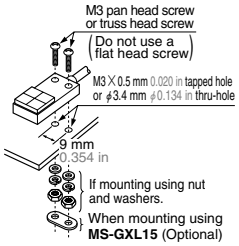
<Two point fixing>

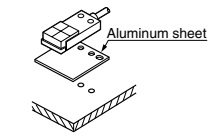


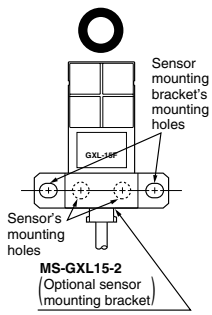
- The tightening torque should be 0.49 N·m or less.
- To mount the sensor with a nut, the thru-hole diameter should be ϕ3.4 mm ϕ0.134 in.

GXL-15 type

- The tightening torque should be 1 N·m or less.
- To mount the sensor with the optional sensor mounting bracket **MS-GXL15**, the thru-hole diameter should be ϕ3.4 mm ϕ0.134 in.
- 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 X 39.5 X t 0.3 mm 1.181 X 1.555 X t 0.012 in (**GXL-15HLU□** / **GXL-15HL□**: 30 X 30 X t 0.3 mm 1.181 X 1.181 X t 0.012 in), 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.



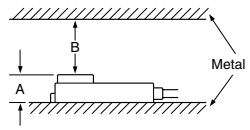


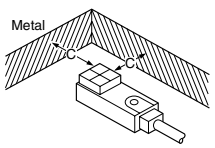


Influence of surrounding metal

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

Front sensing type

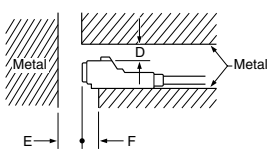


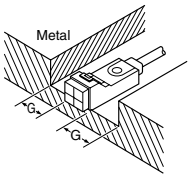


	GXL-8F type	GXL-N12F type	GXL-15FU / GXL-15F type	GXL-15FLU type
A	7 mm 0.276 in	7 mm 0.276 in	8 mm 0.315 in	8 mm 0.315 in (Note)
B	8 mm 0.315 in	20 mm 0.787 in	20 mm 0.787 in	30 mm 1.181 in
C	3 mm 0.118 in	10 mm 0.394 in	7 mm 0.276 in	10 mm 0.394 in

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-15H type	GXL-15HLU / GXL-15HL type
D	4 mm 0.157 in	6 mm 0.236 in	12 mm 0.472 in
E	10 mm 0.394 in	20 mm 0.787 in	30 mm 1.181 in
F	3 mm 0.118 in	0 mm 0 in	10 mm 0.394 in (Note)
G	3 mm 0.118 in	3 mm 0.118 in	10 mm 0.394 in

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.1152～ for general precautions.

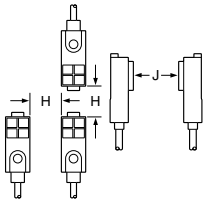
All models

Mutual interference prevention

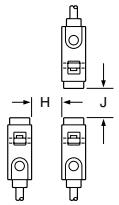
- When two or more sensors are installed in parallel or face to face, keep the minimum separation distance specified below to avoid mutual interference.

		H	J
GXL-8 type	Between '**I**' type and non '**I**' type	0 mm (Note 2) 0.591 in	15 mm 0.591 in
	Between two '**I**' types or two non '**I**' types	12 mm 0.472 in	30 mm 1.181 in
GXL-N12 type	Between '**I**' type and non '**I**' type	0 mm (Note 2) 0.591 in	15 mm 0.591 in
	Between two '**I**' types or two non '**I**' types	20 mm 0.787 in	40 mm 1.575 in
GXL-15F GXL-15FU GXL-15HU type	Between '**I**' type and non '**I**' type	0 mm (Note 2) 0.984 in	25 mm 0.984 in
	Between two '**I**' types or two non '**I**' types	30 mm 1.181 in	60 mm 2.362 in
GXL-15H type	Between '**I**' type and non '**I**' type	0 mm (Note 2) 0.984 in	25 mm 0.984 in
	Between two '**I**' types or two non '**I**' types	40 mm 1.575 in	60 mm 2.362 in
GXL-15FLU GXL-15HLU type	Between '**I**' type and non '**I**' type	0 mm (Note 2) 0.984 in	25 mm 0.984 in
	Between two '**I**' types or two non '**I**' types	75 mm 2.953 in	90 mm 3.543 in
GXL-15HL type	Between '**I**' type and non '**I**' type	0 mm (Note 2) 0.984 in	25 mm 0.984 in
	Between two '**I**' types or two non '**I**' types	80 mm 3.150 in	95 mm 3.740 in

Front sensing



Top sensing



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: 2 mm 0.079 in, **GXL-N12** type: 4 mm 0.157 in
GXL-15 (Standard) type: 7.5 mm 0.295 in
(**GXL-15H** type: 12.5 mm 0.492 in)
GXL-15 (Long sensing range) type: 30 mm 1.181 in
(**GXL-15HL** type: 32.5 mm 1.280 in)

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. / Metal	**GXL-8FU GXL-8HU** type	**GXL-8F GXL-8H** type	**GXL-N12** type	**GXL-15FU** type	**GXL-15HU GXL-15FLU GXL-15HLU** type	**GXL-15F GXL-15H** type	**GXL-15HL** type
Iron	1	1	1	1	1	1	1
Stainless steel (SUS304)	0.82 approx.	0.76 approx.	0.70 approx.	0.74 approx.	0.75 approx.	0.68 approx.	0.76 approx.
Brass	0.59 approx.	0.50 approx.	0.40 approx.	0.53 approx.	0.53 approx.	0.47 approx.	0.50 approx.
Aluminum	0.57 approx.	0.48 approx.	0.35 approx.	0.52 approx.	0.51 approx.	0.45 approx.	0.48 approx.

Others

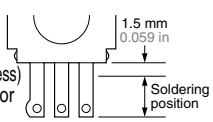
- Do not use during the initial transient time [10 ms (DC 2-wire type: 50 ms)] after the power supply is switched on.
- The output does not incorporate a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load (excluding the DC 2-wire type).

GXL-N12FT type CN-13

Soldering

- To solder the terminals of the sensor and connector **CN-13**, observe the following conditions.

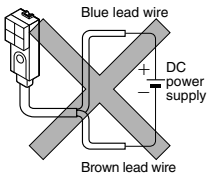
Soldering temperature: 260 °C 500 °F or less
Soldering time : 5 sec. or less (**CN-13**: 10 sec. or less)
Soldering position : 1.5 mm 0.059 in, or more, away from the sensor body.

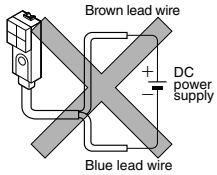


DC 2-wire type

Wiring

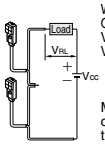
- The sensor must be connected to a power supply via a load. If the sensor is connected to a power supply without a load, the short-circuit protection makes the sensor inoperable. (The output stays in the OFF state and the indicator does not light up.) In this case, rectify by connecting the power supply 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.

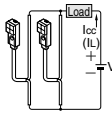
Series connection (AND circuit)



When all sensors are in the ON state, the load voltage V_{RL} is given by:
$V_{RL} = Vcc - n \times 3$ (V)
Vcc: supply voltage (24 V DC max.)
n: number of sensors
Make sure that the load can work properly at this voltage.

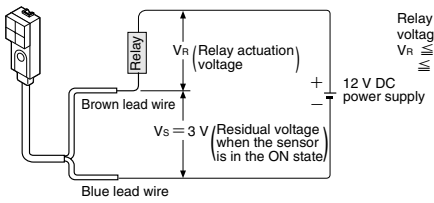
Note: The output is generated normally even if the indicator does not light up properly.

Parallel connection (OR circuit)



When all sensors are in the OFF state, the load leakage current Icc is given by:
$I_{cc} = n \times 0.8$ (mA)
(n: number of sensors)
Make sure that the load can work properly.
Note: The load current in the ON state is given by:
$I_L = \frac{Vcc - 3\ V}{\text{Load resistance}}$ (mA)
GXL-8 type :
$3\ mA \times n \leqq I_L \leqq 70\ mA$ (n: number of sensors turned ON)
GXL-15 type :
$3\ mA \times n \leqq I_L \leqq 100\ mA$ (n: number of sensors turned ON)

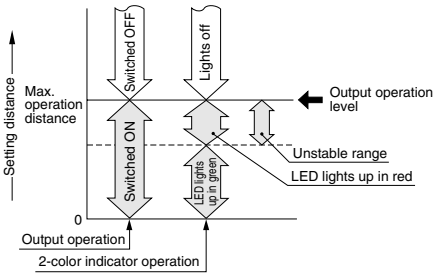
- The residual voltage of the sensor is 3 V. Before connecting a relay at the load, take care of its actuation voltage. (Some 12 V relays may not be usable.)



Relay actuation voltage:
$V_R \geqq 12 - 3\ V \geqq 9\ V$

2-color indicator (Normally open type only)

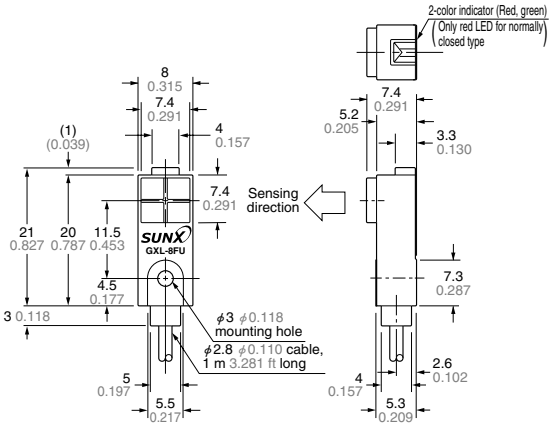
- When the sensing object is in the stable sensing range, the LED lights up in green, and when the sensing object is in the unstable sensing range, the LED lights up in red. While the LED lights up in green, the sensing is performed stably without being affected by temperature drifts or voltage fluctuations.



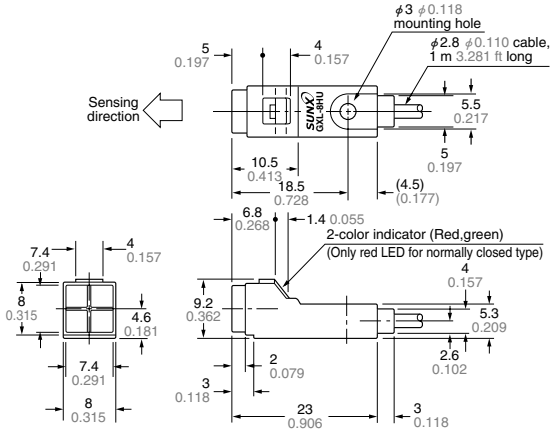
GXL

DIMENSIONS (Unit: mm in) The CAD data in the dimensions can be downloaded from the SUNX website: http://www.sunx.co.jp/

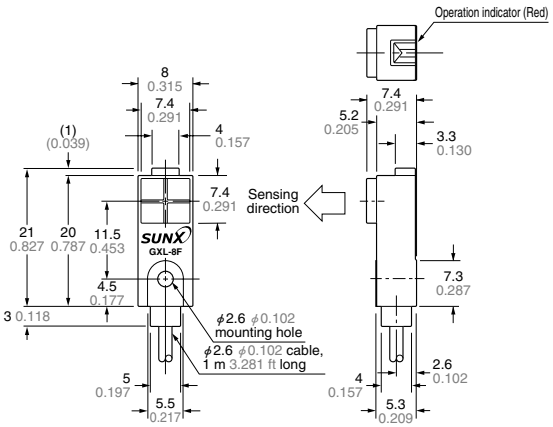
GXL-8FU type Sensor



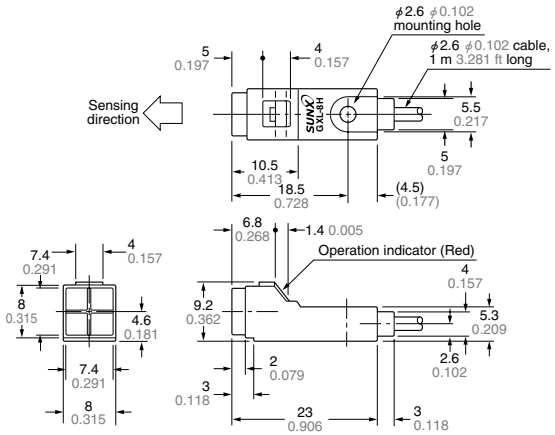
GXL-8HU type Sensor



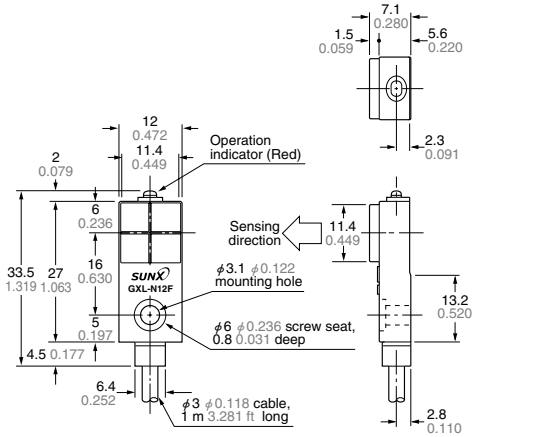
GXL-8F type Sensor



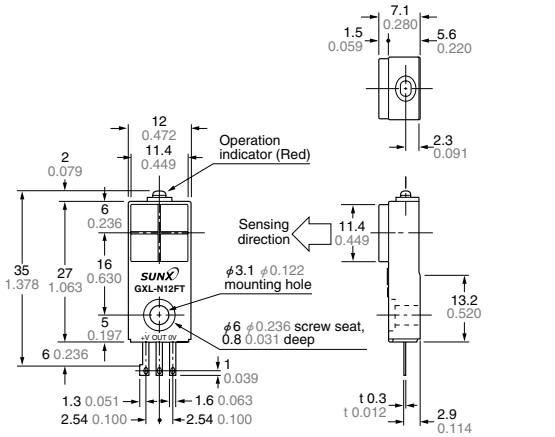
GXL-8H type Sensor



GXL-N12F type Sensor



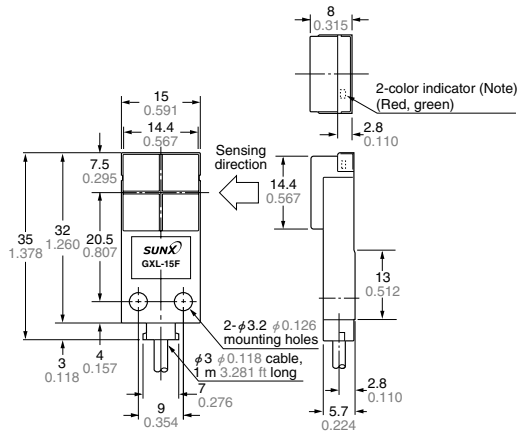
GXL-N12FT type Sensor



DIMENSIONS (Unit: mm in)

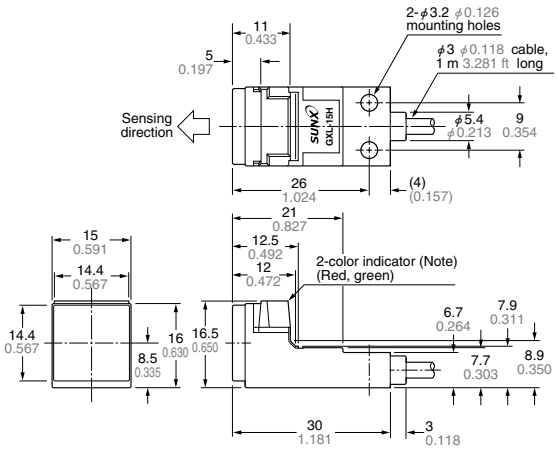
The CAD data in the dimensions can be downloaded from the SUNX website: http://www.sunx.co.jp/

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.

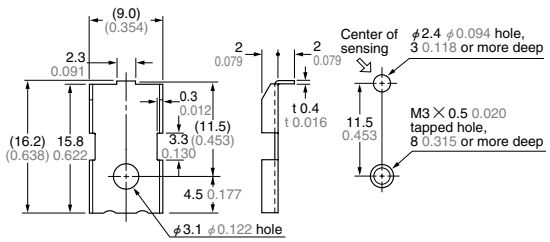
GXL-15H type Sensor



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

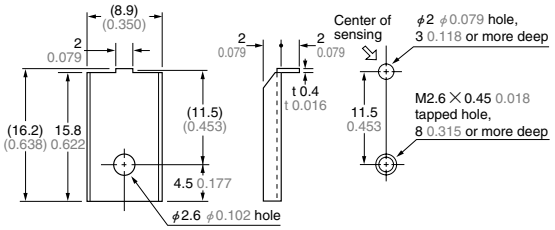


Material: Cold rolled carbon steel (SPCC)
(Nickel plated)

1 pc. each of M3 (length 12 mm 0.472 in) 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

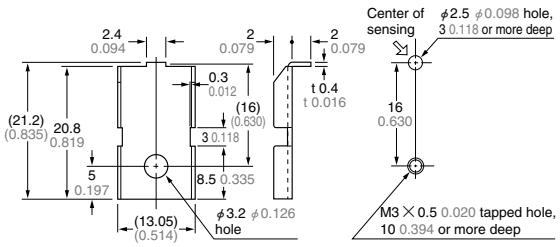


Material: Cold rolled carbon steel (SPCC)
(Nickel plated)

1 pc. each of M2.6 (length 12 mm 0.472 in) truss head screw, nut, spring washer and plain washer is attached.

MS-GXL12-1 Sensor mounting bracket for **GXL-N12** type (Accessory)

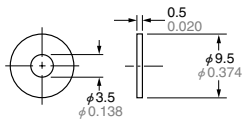
Mounting hole dimensions



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

1 pc. each of M3 (length 12 mm 0.472 in) pan head screw, plain washer, spring washer and rubber washer (φ9.5 × t 0.5 mm φ0.374 × t 0.020 in) is attached.

MS-R1 Rubber washer for **GXL-N12** type (Accessory)



Material: NBR

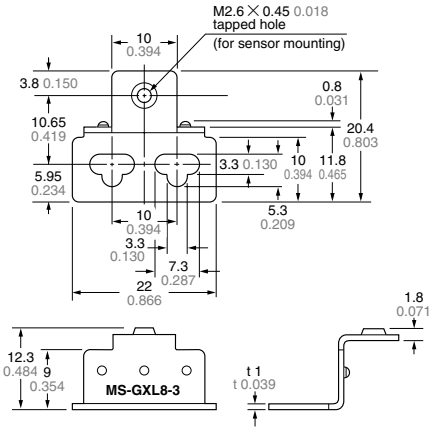
GXL

DIMENSIONS (Unit: mm in)

The CAD data in the dimensions can be downloaded from the SUNX website: http://www.sunx.co.jp/

MS-GXL8-3

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

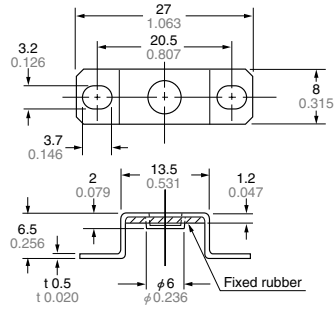


Material: Stainless steel (SUS304)

One M2.6 (length 8 mm 0.315 in) pan head screw and two M3 (length 8 mm 0.315 in) screws with washers are attached.

MS-GXL12-2

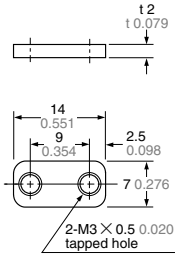
Sensor mounting bracket for **GXL-N12** type (Optional)



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

MS-GXL15

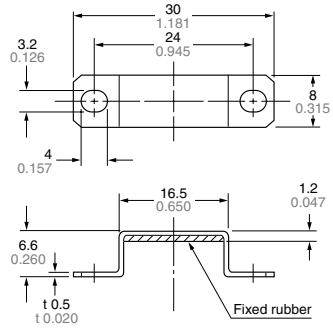
Sensor mounting bracket for **GXL-15** type (Optional)



Material: Cold rolled carbon steel (SPCC)

MS-GXL15-2

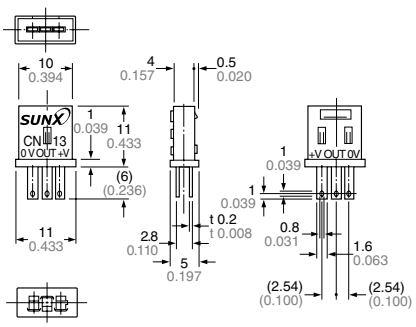
Sensor mounting bracket for **GXL-15F** type (Optional)



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)