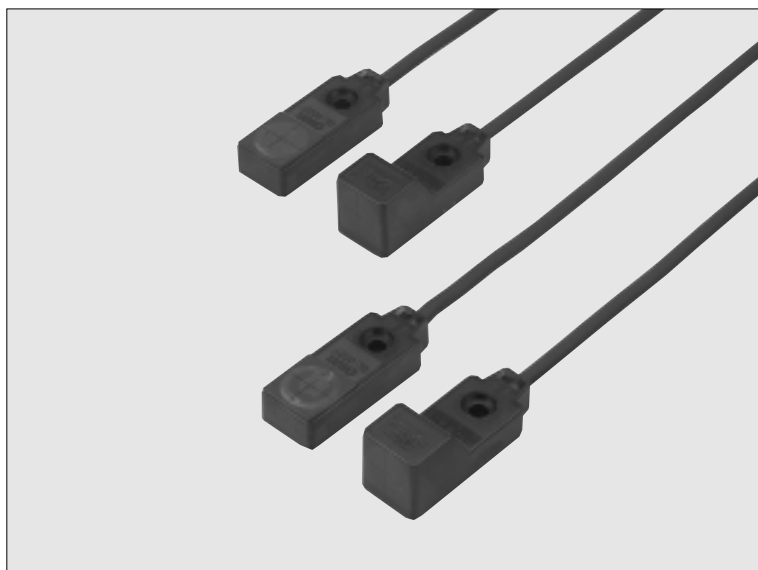# GL-N12 SERIES

NEW

Low Price Square-shaped Inductive Proximity Sensor
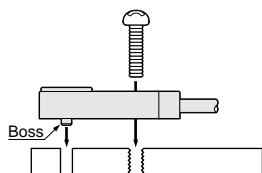
Wide Variety with Total Cost Reduction!

$C \in$ **Marked**
Conforming to EMC Directive

Exclusive Mounting Bracket is Needless

The **GL-N12** series can be reliably fixed even without an exclusive mounting bracket as a boss is provided on the bottom face of the sensor to prevent rotation.

Boss

Low Price

The **GL-N12** series is recommended to large volume users for cost reduction.

Exclusive mounting bracket

Cost saving

Sensor

Sensor

**Conventional model**
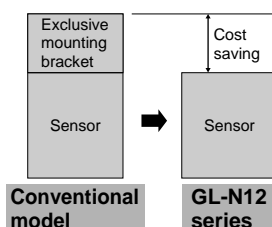
GL-N12 series

Cost saving is achieved as the exclusive mounting bracket is not required.

The **GL-N12** series is available in units of ten sensors.

Wide Variation

A wide variety of 16 types, front sensing type/top sensing type, normally open type/normally closed type, as well as, different frequency type, PNP output type, etc., is available.
You can choose from the vastly increased variety to suit your application.

Front sensing type

Top sensing type
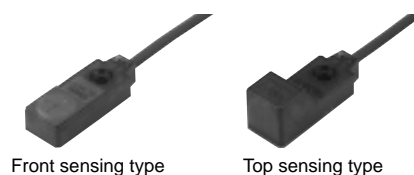
Long Sensing Range

It achieves a sensing range of 4mm with a 12mm square-size sensing part. It can reliably detect an object even if its position varies slightly.
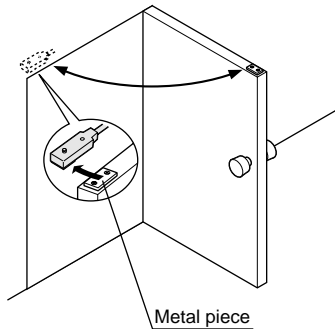
4mm
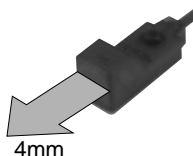
Waterproof

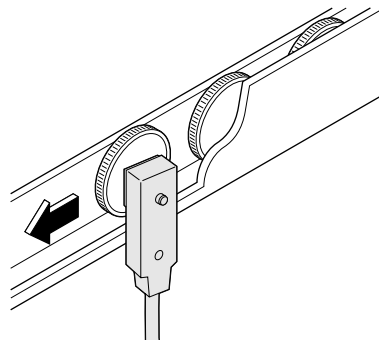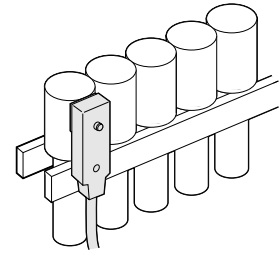Since the sensor has IP67 protection, it can withstand water splashes.

⊗SUNX

APPLICATIONS

Confirming shutting/opening of door

Metal piece

Detecting rolling coins

Detecting metal parts on a feeder

ORDER GUIDE

Type			Appearance (mm)	Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation
Boss type	Front sensing	NPN output	7.1 / 12 / 27.4	Maximum operation distance 4mm (0 to 3mm) Stable sensing range	**GL-N12F✕10**	NPN open-collector transistor	Normally open
					GL-N12FI✕10		
					GL-N12FB✕10		Normally closed
					GL-N12FIB✕10		
		PNP output			**GL-N12F-P✕10**	PNP open-collector transistor	Normally open
					GL-N12FI-P✕10		
					GL-N12FB-P✕10		Normally closed
					GL-N12FIB-P✕10		
	Top sensing	NPN output	13 / 12 / 27.4		**GL-N12H✕10**	NPN open-collector transistor	Normally open
					GL-N12HI✕10		
					GL-N12HB✕10		Normally closed
					GL-N12HIB✕10		
		PNP output			**GL-N12H-P✕10**	PNP open-collector transistor	Normally open
					GL-N12HI-P✕10		
					GL-N12HB-P✕10		Normally closed
					GL-N12HIB-P✕10		

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 (custom-order product).

NOTE: Low price square-shaped inductive proximity sensors (GL-N12 series) are available in units of ten.

Without boss type (Front sensing type, NPN output type and normally open type only) **Units of ten**

The without boss type is also available. (Standard: boss type)
Model No.: **GL-12F✕10** (front sensing type)
  MS-GL12✕10 (sensor mounting bracket)

⊗ **SUNX**

ECFA S.R.L. Av. San Juan 4063 (1233) Buenos Aires - Argentina- Tel.:+54 11 4923-6566 Fax:+54 11 4925-3232 Internet: www.ecfa.com.ar e-mail: ventas@ecfa.com.ar   647

GL-N12

SPECIFICATIONS

Item	Model No.	Type	Boss type (Note 1)							
			NPN output				PNP output			
			Front sensing		Top sensing		Front sensing		Top sensing	
				Different frequency		Different frequency		Different frequency		Different frequency
		Normally open	GL-N12F X10	GL-N12FI X10	GL-N12H X10	GL-N12HI X10	GL-N12F-P X10	GL-N12FI-P X10	GL-N12H-P X10	GL-N12HI-P X10
		Normally closed	GL-N12FB X10	GL-N12FIB X10	GL-N12HB X10	GL-N12HIB X10	GL-N12FB-P X10	GL-N12FIB-P X10	GL-N12HB-P X10	GL-N12HIB-P X10
Max. operation distance (Note 2)			4 ± 0.5mm							
Stable sensing range (Note 2)			0 to 3mm							
Standard sensing object			Iron sheet $20 \times 20 \times$ t1mm							
Hysteresis			20% or less of operation distance							
Supply voltage			12 to 24V DC $\pm$ 10% Ripple P-P 10% or less							
Current consumption			10mA or less				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							
Max. response frequency			1.3kHz							
Operation indicator			Orange LED (lights up when the output is ON)							
Environmental resistance	Pollution degree		3 (Industrial environment)							
	Protection		IP67 (IEC)							
	Ambient temperature		$-$ 10 to $+$ 55°C, Storage: $-$ 25 to $+$ 70°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 (100G approx.) acceleration in X, Y and Z directions for three times each							
Sensing range variation	Temperature characteristics		Over ambient temperature range $-$ 10 to $+$ 55°C: within $^{+15}_{-10}$ % of sensing range at 20°C							
	Voltage characteristics		Within $\pm$ 2% for $\pm$ 10% fluctuation of the supply voltage							
Material			Enclosure: Polyalylate							
Cable			0.18mm^2 3-core cabtyre cable, 1m long							
Cable extension			Extension up to total 100m is possible with 0.3mm^2, or more, cable.							
Weight			20g approx.							

Notes: 1) The without boss type is also available.
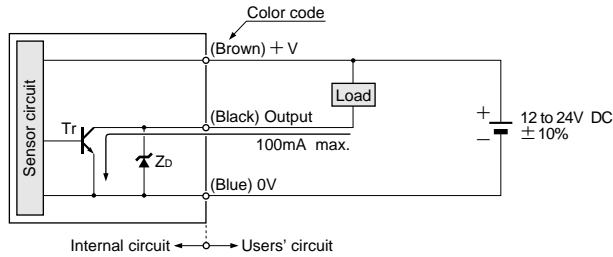The specifications are the same as for the boss type.
2) The maximum operation distance stands for the maximum distance for which the sensor can detect the standard sensing object.
The stable sensing range stands for the sensing range for which the sensor can stably detect the standard sensing object even if there is an ambient temperature drift and/or supply voltage fluctuation.
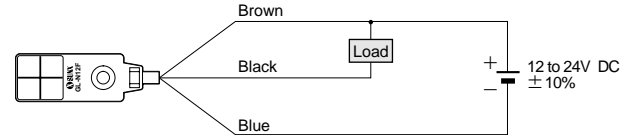
GL-N12

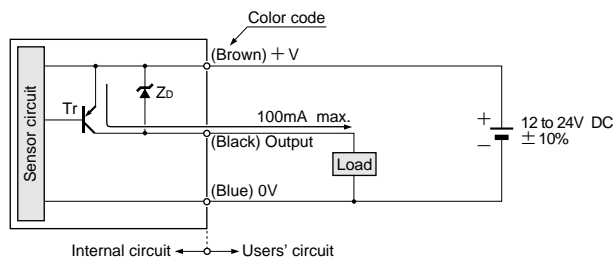## I/O CIRCUIT AND WIRING DIAGRAMS

NPN output type

I/O circuit diagram

Color code

(Brown) + V

(Black) Output
100mA max.

Z_D

(Black) Output

Load

Tr

(Blue) 0V

12 to 24V DC
± 10%

Internal circuit ← → Users' circuit

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

Wiring diagram

Brown

Black

Load

Blue

12 to 24V DC
± 10%

PNP output type

I/O circuit diagram

Color code

(Brown) + V

Z_D

Tr

100mA max.

(Black) Output

Load

(Blue) 0V

12 to 24V DC
± 10%

Internal circuit ← → Users' circuit

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

Wiring diagram

Brown

Black

Blue

Load

12 to 24V DC
± 10%
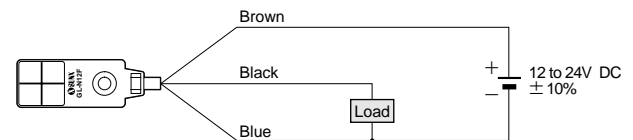
SENSING CHARACTERISTICS (TYPICAL)

Sensing field

Standard sensing object
Iron sheet 20 × 20 × t1mm

Standard sensing object
Iron sheet 20 × 20 × t1mm

Front sensing

Top sensing

Setting distance L (mm)

Left ← Center → Right
Operating point ℓ (mm)
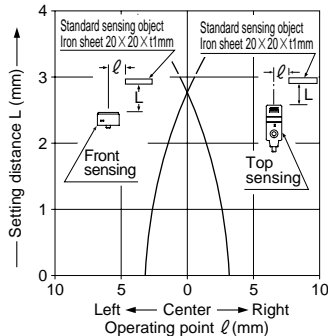
Correlation between sensing object size and sensing range

Iron
Stainless steel
(SUS304)

Brass

Aluminum

Sensing object
a × amm ± t1mm

Sensing object
a × amm ± t1mm

Front sensing

Top sensing

Sensing range L (mm)

Sensing object side
length a (mm)
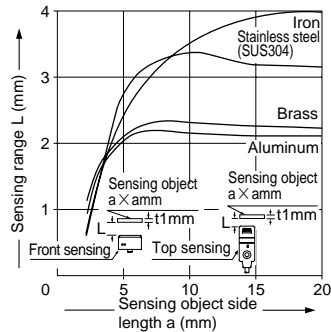
As the sensing object size becomes smaller than the standard size (iron sheet 20 × 20 × t1mm), the sensing range shortens as shown in the left figure.
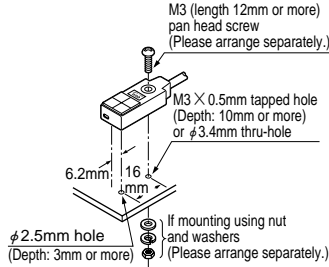
GL-N12

PRECAUTIONS FOR PROPER USE

Refer to P.836~ for general precautions.

⚠ 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

• The tightening torque should be 0.5N·m or less.

• To mount the sensor with a nut, the mounting hole diameter should be φ3.4mm. Further, the hole in which the boss is inserted should be φ2.5mm and 3mm, or more, deep.

M3 (length 12mm or more) pan head screw
(Please arrange separately.)

M3 × 0.5mm tapped hole
(Depth: 10mm or more) or φ3.4mm thru-hole

6.2mm 16 mm

φ2.5mm hole
(Depth: 3mm or more)

If mounting using nut and washers
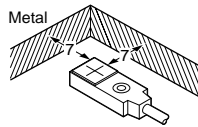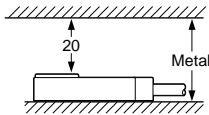(Please arrange separately.)

Influence of surrounding metal

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

GL-N12F□×10
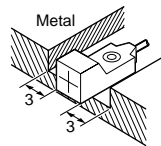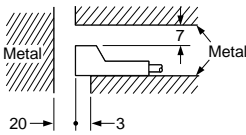(Unit: mm)

20 Metal

Metal
7 7

GL-N12H□×10
(Unit: mm)

Metal 7 Metal

20→ ←3

Metal

3

3

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.

GL-N12F□×10, GL-N12H□×10	Between 'I' type and non 'I' type	Between two 'I' types or two non 'I' types
A	0mm (Note 2)	25mm
B	25mm	50mm

GL-N12F□×10   GL-N12H□×10

→A←A   →A←B
←B→

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 A should be 6.5mm.

Sensing range

• The sensing range is specified for the standard sensing object (iron sheet 20×20×t1mm). With a non-ferrous metal, the sensing range is obtained by multiplying with the correction coefficient specified on the right. Further, the sensing range also change if the sensing object is smaller than the standard sensing object (iron sheet 20×20×t1mm) or if the sensing object is plated.

Correction coefficient

Model No. Metal	GL-N12F□×10 GL-N12H□×10
Iron	1
Stainless steel (SUS304)	0.79 approx.
Brass	0.56 approx.
Aluminum	0.53 approx.

Wiring

• The output is not incorporated with a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load.
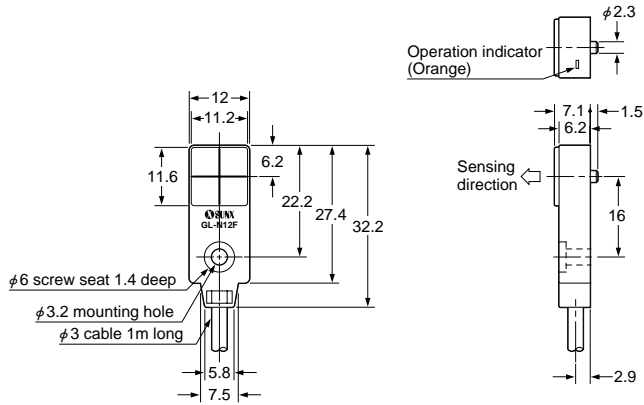
Others

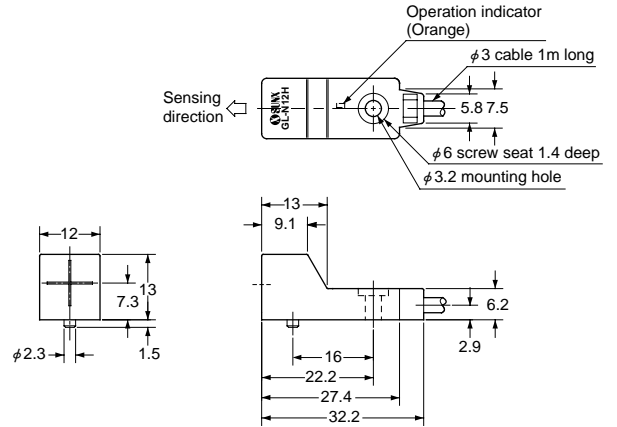• Do not use during the initial transient time (50ms) after the power supply is switched on.
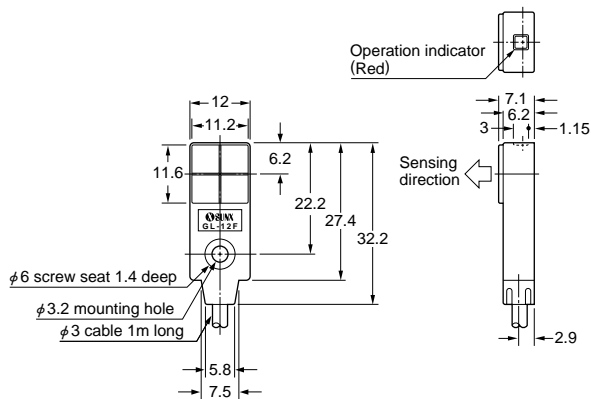
Ⓧ SUNX

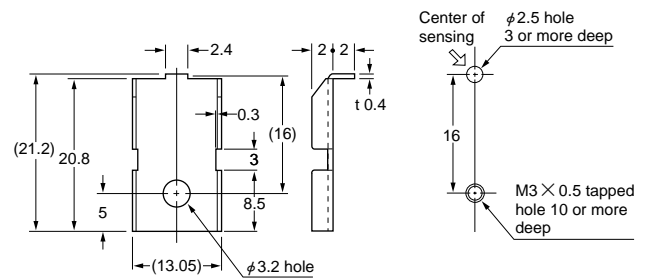## DIMENSIONS (Unit: mm)

GL-N12F☐×10 Sensor

- φ2.3
- Operation indicator (Orange)
- 12
- 11.2
- 11.6
- 6.2
- 22.2
- 27.4
- 32.2
- φ6 screw seat 1.4 deep
- φ3.2 mounting hole
- φ3 cable 1m long
- 5.8
- 7.5
- 7.1
- 6.2
- 1.5
- Sensing direction
- 16
- 2.9

GL-N12H☐×10 Sensor

- Operation indicator (Orange)
- φ3 cable 1m long
- Sensing direction
- 5.8 7.5
- φ6 screw seat 1.4 deep
- φ3.2 mounting hole
- 12
- 7.3
- φ2.3
- 1.5
- 13
- 9.1
- 16
- 22.2
- 27.4
- 32.2
- 6.2
- 2.9

GL-12F×10 Sensor

- Operation indicator (Red)
- 12
- 11.2
- 11.6
- 6.2
- 22.2
- 27.4
- 32.2
- φ6 screw seat 1.4 deep
- φ3.2 mounting hole
- φ3 cable 1m long
- 5.8
- 7.5
- 7.1
- 6.2
- 3
- 1.15
- Sensing direction
- 2.9

MS-GL12×10 Sensor mounting bracket (Optional)

Mounting hole dimensions

- 2.4
- 0.3
- (16)
- 3
- (21.2) 20.8
- 5
- 8.5
- (13.05)
- φ3.2 hole
- 2 2
- t 0.4
- Center of sensing
- φ2.5 hole 3 or more deep
- 16
- M3×0.5 tapped hole 10 or more deep

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×t 0.5mm) is attached.

SUNX

ECFA S.R.L. Av. San Juan 4063 (1233) Buenos Aires - Argentina- Tel.:+54 11 4923-6566 Fax:+54 11 4925-3232 Internet: www.ecfa.com.ar e-mail: ventas@ecfa.com.ar   651