PHOTOELECTRIC SENSORS

LIGHT CURTAINS PRESSURE / FLOW SENSORS

PARTICULAR USE SENSORS OPTIONS SIMPLE WIRE-SAVING UNITS WIRE-SAVING SYSTEMS

MEASUREMENT SENSORS

STATIC CONTROL DEVICES

ENDOSCOPE

HUMAN MACHINE INTERFACES

ENERGY CONSUMPTION VISUALIZATION COMPONENTS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

> Selection Guide

Amplifier Built-in

Amplifierseparated

GXL

GL

GX

GX-U/GX-FU/ GX-N

LASER MARKERS PLC / TERMINALS

LASER SENSORS

MICRO PHOTOELECTRIC SENSORS AREA SENSORS

Rectangular-shaped Inductive Proximity Sensor Amplifier Built-in **GX-F/H SERIES**

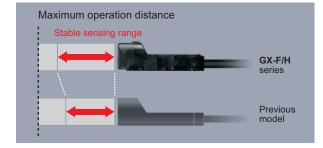


Industry No. 1* in stable sensing



Can be installed with ample space

This sensor has the longest stable sensing range among the same level of rectangular inductive proximity sensors in the industry. It is easy to install the sensor.



Variation at the maximum operation distance is within ±8 %

Thorough adjustment and control of sensing sensitivity greatly reduces individual sensor differences and variations.

The work of adjusting sensor positions when using multiple sensors and when sensors have been replaced is much easier.

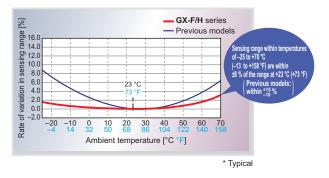


	Maximum	Stable sen	sing range	
Туре	operation distance	GX-F/H series	Previous model	
GX-□6	1.6 mm 0.063 in	0 to 1.3 mm 0.051 in	0 to 1.2 mm 0.047 in	
GX-□8	2.5 mm 0.098 in	0 to 2.1 mm 0.083 in	0 to 1.8 mm 0.709 in	
GX-⊡12	4.0 mm 0.157 in	0 to 3.3 mm 0.130 in	0 to 3.0 mm 0.118 in	
GX-□15	5.0 mm 0.197 in	0 to 4.2 mm 0.165 in	0 to 4.0 mm 0.157 in	
Long sensing range	8.0 mm 0.315 in	0 to 6.7 mm 0.264 in	0 to 6.4 mm 0.252 in	

* With standard sensing object

Temperature characteristics vary within ±8 %

Components such as the sensor coil and core and product design have been totally revised to provide excellent temperature characteristics. Stable sensing can be obtained regardless of the time of day or the yearly season.



* Not including temperature characteristics. (2.0 to 3.0 mm 0.079 to 0.118 in)

PARTICULAR USE SENSORS

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING

STATIC CONTROL DEVICES

ENDOSCOPE

LASER MARKERS

PLC / TERMINALS

HUMAN MACHINE INTERFACES

ENERGY CONSUMPTION VISUALIZATION

FA COMPONENTS

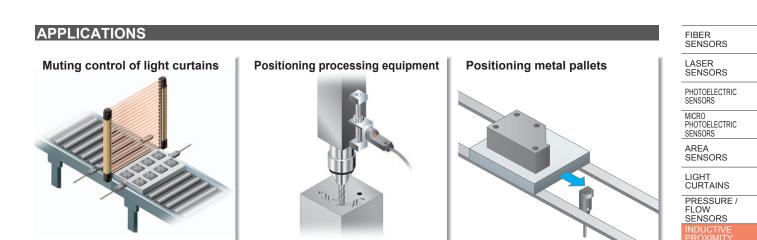
MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide Amplifier Built-in

COMPONENTS

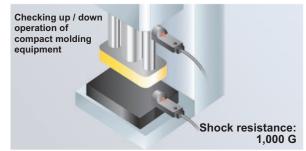
SYSTEMS MEASUREMENT SENSORS



ENVIRONMENTAL RESISTANCE

10 times the durability! (Compared to previous models)

The new integrated construction method used provides shock resistance of 10,000 m/s² (approx. 1,000 G in X, Y and Z directions for three times each), and vibration resistance clears durability tests of between 10 and 500 Hz (3 mm 0.118 in amplitude in X, Y and Z directions for 2 hours each). In addition, resistance to impulse noise is approx. three times greater than for previous models.



Highly resistant to water or oil! **IP68g*** protective construction

The new integrated construction method used improves environmental resistance performance. The IP68g prevents damage to the sensor by stopping

water and oil getting inside.

* For details, refer to the "SPECIFICATIONS".



Sensing presence of metallic objects on a part feeder Vibration resistance: 500 Hz

FUNCTIONS

Indicators are easy to see over a wide field of view

A prism with a wide field of view has been developed. This has greatly improved the visibility of the operation indicators. GX-H□









Amplifierseparated GXL

GL GX-U/GX-FU/ GX-N GX

MOUNTING

Tightening strength increased with no damage! (excluding GX-06)

A metal sleeve has been inserted. It prevents the sensor from being damaged by tightening too much.



Conductor thickness doubled to make wiring much easier! (GX-_6/_8 only)

The conductor's thickness was doubled for the GX-_6/_8. This makes it easier to handle and perform crimping work on the cables. In addition, the tensile strength of the crimping area has become higher.



M3 screw Tightenir Buyew WWW: Valin Optine.com 1 Phone: 844-385-3099 | Email: Customer Service@valin.com

ENDOSCOPE

LASER MARKERS

PLC / TERMINALS

ORDER GUIDE

LASER SENSORS	GX	GX-6 type									
PHOTO- ELECTRIC SENSORS MICRO	Туре		Appearance (mm in)	Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation				
PHOTO- ELECTRIC SENSORS		бĽ	\sim		GX-F6A		Nermelluserer				
AREA		Front sensing			GX-F6AI		Normally open				
	Ħ	ont s	6 0.236 24.5 0.965		GX-F6B		Normally closed				
LIGHT CURTAINS	output	ц	6 0.236		GX-F6BI	NPN open-collector					
PRESSURE / FLOW SENSORS	NPN	b	\sim		GX-H6A	transistor	Normally open				
	2		Maximum	GX-H6AI							
INDUCTIVE PROXIMITY SENSORS			8	operation distance 1.6 mm 0.063 in	GX-H6B	-	Normally closed				
PARTICULAR USE SENSORS		-	6 0.236		GX-H6BI						
		bu	$\sim \sqrt{1}$	(0 to 1.3 mm 0 to 0.051 in)	GX-F6A-P	_	Normally open				
SENSOR		sensi	6 0.236		GX-F6AI-P	_					
SIMPLE WIRE-SAVING UNITS	nt	Front sensing	24.5	Stable sensing range	GX-F6B-P	_	Normally closed				
	output	Ē	6 0.236 🔨 🔨 0.965		GX-F6BI-P	PNP open-collector					
WIRE-SAVING SYSTEMS	PNP	p	~ 1		GX-H6A-P	transistor	Normally open				
MEASURE- MENT SENSORS	PNI Top sensing				GX-H6AI-P	-					
STATIC			6 0.236		GX-H6B-P		Normally closed				
CONTROL DEVICES		T	6 0.236 🔨 0.984		GX-H6BI-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.

GX-8 type

TERMINALS							
HUMAN MACHINE	GX	-8 ty	/ре		1		
INTERFACES ENERGY CONSUMPTION VISUALIZATION COMPONENTS	Ту	Type Appearance (mm in) Sensing range (Note 1)		Model No. (Note 2)	Output	Output operation	
COMPONENTS FA COMPONENTS		βĽ	~^		GX-F8A		Normally anon
		sensing	7.4 0.291		GX-F8AI		Normally open
MACHINE VISION SYSTEMS	Ħ	Front s	8 0.315		GX-F8B	NPN open-collector	Normally closed
UV CURING SYSTEMS	outpr	ц			GX-F8BI		Normally closed
SYSTEMS	0)			GX-H8A	transistor	Normally open	
		ensir	8.2 0.323	Maximum operation distance 2.5 mm 0.098 in	GX-H8AI	-	
Selection		ob s	8 0.315 0.984		GX-H8B		Normally closed
Selection Guide		-			GX-H8BI		
Amplifier Built-in Amplifier-		БП		(0 to 2.1 mm 0 to 0.083 in)	GX-F8A-P		Normally open
separated		sensi	7.4 0.291		GX-F8AI-P		
GX-F/H	t	Front sensing	8 0.315	Stable sensing range	GX-F8B-P		Normally closed
GXL	output	Ē		_	GX-F8BI-P	PNP open-collector	
GL		p	\sim		GX-H8A-P	transistor	Normally open
GX-U/GX-FU/ GX-N		sensing	8.2 0.323		GX-H8AI-P		
GX		Top s	25		GX-H8B-P		Normally closed
		Т	8 0.315		GX-H8BI-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.

LASER SENSORS

ENDOSCOPE

LASER MARKERS

PLC / TERMINALS

ORDER GUIDE

GX-12 type

0,											
T	уре	Appearance (mm in)	Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation	PHOTO- ELECTRIC SENSORS				
	D	\sim		GX-F12A			MICRO PHOTO- ELECTRIC SENSORS				
	NPN output Top sensing Front sensing	7.1 0.280		GX-F12AI	NPN open-collector transistor	Normally open	AREA SENSORS				
Ħ		-27.8		GX-F12B		Normally closed					
outpu		0.472		GX-F12BI			LIGHT CURTAINS				
IPN 6		12 0.472 12 0.472 12 0.472 1.079		GX-H12A		Normally open	PRESSURE / FLOW SENSORS				
2			Maximum	GX-H12AI			INDUCTIVE PROXIMITY SENSORS				
			operation distance	GX-H12B		Normally closed					
			4.0 mm 0.157 in	GX-H12BI			PARTICULAR USE SENSORS				
	bu		(0 to 3.3 mm 0 to 0.130 in)	GX-F12A-P		Normally open	SENSOR				
	sensing	7.1 0.280		GX-F12AI-P							
t	Front s	12 27.8 0.472 1.094	Stable sensing range	GX-F12B-P		Normally closed	SIMPLE WIRE-SAVING UNITS				
PNP output	Ē	0.472 🔨 1.094	_	GX-F12BI-P	PNP open-collector		WIRE-SAVING				
NP	p			GX-H12A-P	transistor	Normally open	SYSTEMS				
LL.	PN	12 0.472	472	GX-H12AI-P			MEASURE- MENT SENSORS				
	Top s	27.4		GX-H12B-P		Normally closed	STATIC CONTROL DEVICES				
	F	12 0.472		GX-H12BI-P			DEVICES				

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.

GX-15 type

GX	-15 1	ype					HUMAN MACHINE
Ту	pe	Appearance (mm in)	Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation	INTERFACES ENERGY CONSUMPTION VISUALIZATION COMPONENTS
	b			GX-F15A		N	
	NPN output Top sensing Front sensing	8 0.315		GX-F15AI		Normally open	FA COMPONENTS
Ŧ		31.5		GX-F15B	NPN open-collector transistor	Normally closed	MACHINE VISION SYSTEMS
outpr		15 0.591		GX-F15BI			UV CURING SYSTEMS
PNG		16.5 0.650 29.5 15 0.591 1.161		GX-H15A		Normally open	SYSTEMS
Z			Maximum	GX-H15AI			
			operation distance	GX-H15B	Normally closed	-	
			5.Ó mm 0.197 in	GX-H15BI			Selection Guide
	БL	8 0.315	(0 to 4.2 mm 0 to 0.165 in)	GX-F15A-P	-	Normally open	- Amplifier Built-in Amplifier-
	ensir			GX-F15AI-P			separated
ŧ	Front sensing	31.5	Stable sensing range	GX-F15B-P		Nerrolly, sloped	GX-F/H
utpu	Ц Ц Ц	15 0.591		GX-F15BI-P	PNP open-collector	Normally closed	- GXL
PNP output	b			GX-H15A-P	transistor	Normally on an	GL
۵.	PN	16.5 0.650		GX-H15AI-P	1	Normally open	GX-U/GX-FU/
	Top se	29.5		GX-H15B-P		Normally alogged	GX-N
	To	15 0.591		GX-H15BI-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.

LASER SENSORS

PHOTO-ELECTRIC SENSORS MICRO PHOTO-ELECTRIC SENSORS AREA SENSORS

LIGHT CURTAINS PRESSURE / FLOW SENSORS

PARTICULAR USE SENSORS SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

MIRE-SAVING SYSTEMS MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

ENDOSCOPE

LASER MARKERS

PLC / TERMINALS

HUMAN MACHINE INTERFACES

ENERGY

VISUALIZATION COMPONENTS

COMPONENTS

GX-U/GX-FU/ GX-N

GX

ORDER GUIDE

GX-15 (Long sensing range) type

Ту	vpe	Appearance (mm in)	arance (mm in) Sensing range (Note 1) Model (Note		Output	Output operation
	ng	\sim		GX-FL15A		Normally open
	ensi	8 0.315 31.5 15 0.591 1.240		GX-FL15AI	NPN open-collector transistor	Normally open
Ŧ	NPN output ng Front sensing			GX-FL15B		Normally closed
outpu				GX-FL15BI		
PN	D	16.5 0.650 29.5 15 0.591 1.161		GX-HL15A		Normally open
z	sensing		Maximum	GX-HL15AI		
	Top se		operation distance	GX-HL15B		Nerrolly deced
	Ĕ		8.0 mm 0.315 in	GX-HL15BI		Normally closed
	βĽ		(0 to 6.7 mm 0 to 0.264 in) GX-FL15A-F	GX-FL15A-P		Nemelli
	sensing	8 0.315		GX-FL15AI-P	Normali	Normally open
t	Front s	31.5	Stable sensing range	GX-FL15B-P		No
output	ц Е	15 0.591		GX-FL15BI-P	PNP open-collector	Normally closed
PNP 0	6			GX-HL15A-P	transistor	N
٩	sensing	16.5 0.650		GX-HL15AI-P	1	Normally open
	pp se	29.5		GX-HL15B-P		
	Top	15 0.591		GX-HL15BI-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.

5 m 16.404 ft cable length type, flexible cable type

5 m 16.404 ft cable length type (standard: 1 m 3.281 ft) and flexible cable (excluding 5 m 16.404 ft cable length type) are available. However, long sensing range type is not available. When ordering 5 m 16.404 ft cable length type, suffix "-**C5**" to the model No. When ordering flexible cable type, suffix "-**R**" to the model No.

(e.g.) 5 m 16.404 ft cable length type of GX-F15AI-P is "GX-F15AI-P-C5". Flexible cable type of GX-F15AI-P is "GX-F15AI-P-R".

OPTIONS

		3				
MACHINE VISION SYSTEMS						
UV CURING SYSTEMS	Designation	Model No.	Desc	ription		
Selection Guide	Sensor	MS-GX6-1	Mounting bracket for GX-6 type Sensors can be mounted close			
Guide Amplifier Built-in		MS-GL6-1	Mounting brackets for GX-6 type			
Amplifier-	mounting bracket	MS-GL6-2	Sensor mounting brackets for GL-6 can be used. Interchange is possible.			
separated		MS-GXL8-4	Mounting bracket for GX-8 type	Mounting bracket for GX-8 type		
GX-F/H		MS-GXL15	Mounting bracket for GX-15 type			
GXL	Aluminum	MS-A15F	For GX-FL15 □(-P)	Mounting example when		
GL	sheet	MS-A15H	For GX-HL15 (-P)	mounted onto a steel or stainless steel plate		

Sensor mounting bracket



Aluminum sheet

SPECIFICATIONS

GX-6 type

	Туре	NPN	output	PNP o	utput		
	Pront sensing	GX-F6A(I)	GX-F6B(I)	GX-F6A(I)-P	GX-F6B(I)-P		
Item	Top sensing	GX-H6A(I)	GX-H6B(I)	GX-H6A(I)-P	GX-H6B(I)-P		
Max. opera	ation distance (Note 3)		1.6 mm 0.0	063 in ± 8 %			
Stable ser	nsing range (Note 3)		0 to 1.3 mm	0 to 0.051 in			
Standard	sensing object		Iron sheet 12 × 12 × t 1 mr	n 0.472 × 0.472 × t 0.039 in			
Hysteresis	s		20 % or less of operation distant	ce (with standard sensing object)			
Repeatab	pility	Along	• • •	ensing axis: 0.04 mm 0.0016 in o	r less		
Supply vo	oltage		12 to 24 V DC ⁺¹⁰ ₋₁₅ %	Ripple P-P 10 % or less			
Current co	onsumption		15 mA	or less			
Output		NPN open-collector transistor • Maximum sink current: 100		PNP open-collector transistor • Maximum source current: 1	00 mA		
Output		Applied voltage: 30 V DC o Residual voltage: 2 V or le	or less (between output and 0 V) ss (at 100 mA sink current)		r less (between output and +V) ss (at 100 mA source current)		
Utiliz	zation category		DC-12 (or DC-13			
Outp	put operation	Normally closed	Normally closed	Normally closed	Normally closed		
Max. resp	oonse frequency		400) Hz			
Operation	nindicator		Orange LED (lights up	when the output is ON)			
Pollu	ution degree	3 (Industrial environment)					
Prot	ection	IP68 (IEC), IP68g (JEM) (Note 4, 5)					
Amb Bunironmental resistance EMC Volta Insu	pient temperature	-25 to +70 °C -13 to +158 °F, Storage: -40 to +85 °C -40 to +185 °F					
	pient humidity	35 to 85 % RH, Storage: 35 to 95 % RH					
EMC ENT	0		EN 60	947-5-2			
Uolta	age withstandability	1,000 V AC	for one min. between all supply	terminals connected together and	l enclosure		
Insu	lation resistance	50 M Ω , or more, with 500 V DC megger between all supply terminals connected together and enclosure					
	ation resistance	10 to 500 Hz freque	ncy, 3 mm 0.118 in amplitude (M	lax. 20 G) in X, Y and Z directions	for two hours each		
Sho	ck resistance	10,000 m/s	² acceleration (1,000 G approx.)	in X, Y and Z directions for three	times each		
Sensing range	Temperature characteristics	Over ambient temperat		+158 °F: Within ± 8 % of sensing	ange at +23 °C +73 °F		
variation	Voltage characteristics		Within ± 2 % for $^{+10}_{-15}$ % fluctuation of the supply voltage				
Material			Enclosure: PBT, Ind	icator part: Polyester			
Cable		0.15	mm ² 3-core oil, heat and cold rea	sistant cabtyre cable, 1 m 3.281 ft	long		
Cable exte	ension	Extension up to total 100 m 328.084 ft is possible with 0.3 mm ² , or more, cable.					
Net weigh	nt		15 g a	ipprox.			

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C +73 °F.

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

3) 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.

4) Panasonic Electric Works SUNX's IP68 test method

① Immerse at 0 m below 0 °C +32 °F water surface and leave for 30 min. Then, immerse at 0 m below +70 °C +158 °F water surface and leave for 30 min. (2) Regard the heat shock test in (1) as one cycle and perform 20 cycles.

③ Leave in water at a depth of 1 m 3.281 ft in water for 500 hours.

(a) After tests (1) to (3), insulation resistance, voltage withstandability, current consumption, and sensing range must meet the standard values. 5) If using the sensor in an environment where cutting oil droplets splatter, the sensor may be deteriorated due to added substances in the oil.

Selection Guide Amplifie separate

766

FIBER SENSORS

LASER SENSORS

GXL

LASER SENSORS

SPECIFICATIONS

GX-8 type

PHOTO- LECTRIC ENSORS	$ \subset $		Туре	NPN	output	PNP (output			
MICRO			Front sensing	GX-F8A(I)	GX-F8B(I)	GX-F8A(I)-P	GX-F8B(I)-P			
PHOTO- LECTRIC ENSORS	Iten	1 \;	Top sensing	GX-H8A(I)	GX-H8B(I)	GX-H8A(I)-P	GX-H8B(I)-P			
AREA ENSORS	Max	. operat	ion distance (Note 3)		2.5 mm 0.0	98 in ± 8 %				
LIGHT	Stat	ole sens	sing range (Note 3)		0 to 2.1 mm 0 to 0.083 in					
	Star	ndard s	ensing object		Iron sheet 15 × 15 × t 1 mm 0.591 × 0.591 × t 0.039 in					
RESSURE / FLOW SENSORS	Hysteresis				20 % or less of operation distance	e (with standard sensing object)				
IDUCTIVE ROXIMITY SENSORS	Repeatability		ty	Along	sensing axis, perpendicular to se	ensing axis: 0.04 mm 0.0016 in o	or less			
ARTICULAR	Sup	ply volt	age		12 to 24 V DC ⁺¹⁰ ₋₁₅ % F	Ripple P-P 10 % or less				
USE SENSORS	Curi	ent cor	sumption		15 mA	or less				
SENSOR DPTIONS SIMPLE IRE-SAVING UNITS	Output			NPN open-collector transistor • Maximum sink current: 100 • Applied voltage: 30 V DC o • Residual voltage: 2 V or le:	or less (between output and 0 V)		100 mA or less (between output and +V) ss (at 100 mA source current)			
IRE-SAVING SYSTEMS	Utilization category		tion category		DC-12 c	or DC-13				
EASURE- MENT SENSORS		Outpu	it operation	Normally open	Normally closed	Normally open	Normally closed			
	Max	. respo	nse frequency		500	Hz				
STATIC ONTROL DEVICES	Ope	ration i	ndicator	Orange LED (lights up when the output is ON)						
DOSCOPE		Pollut	ion degree	3 (Industrial environment)						
	e	Prote	ction	IP68 (IEC), IP68g (JEM) (Note 4, 5)						
LASER ARKERS	stano	Ambie	ent temperature	–25 to +70 °C –13 to +158 °F, Storage: –40 to +85 °C –40 to +185 °F						
PLC / RMINALS	Environmental resistance		ent humidity		35 to 85 % RH, Stor	age: 35 to 95 % RH				
HUMAN	lenta	EMC			EN 609	47-5-2				
RFACES	ronm	Voltag	ge withstandability	· · · · · ·	for one min. between all supply	5				
ENERGY SUMPTION ALIZATION PONENTS	Envi		tion resistance	· _ · _ ·	th 500 V DC megger between all	,				
FA			ion resistance	· · ·	ncy, 3 mm 0.118 in amplitude (M					
IPONENTS			resistance		² acceleration (1,000 G approx.)					
CHINE VISION STEMS	Sen rang	je	Temperature characteristics	Over ambient temperate	ure range –25 to +70 °C –13 to +		range at +23 °C +73 °F			
LIV		ation	Voltage characteristics		Within ±2 % for ⁺¹⁰ / ₋₁₅ % flucto					
STEMS	Mat				Enclosure: PBT, Ind					
	Cab				mm ² 3-core oil, heat and cold res	-				
action		le exter	ISION		ion up to total 100 m 328.084 ft is	•	<u>.</u>			
ection Guide plifier suilt-in		weight		I	Front sensing type: 15 g approx.					

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

3) 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.

4) Panasonic Electric Works SUNX's IP68 test method

1) Immerse at 0 m below 0 °C +32 °F water surface and leave for 30 min. Then, immerse at 0 m below +70 °C +158 °F water surface and leave for 30 min. 2 Regard the heat shock test in 1 as one cycle and perform 20 cycles.

③ Leave in water at a depth of 1 m 3.281 ft in water for 500 hours.

After tests ① to ③, insulation resistance, voltage withstandability, current consumption, and sensing ranges must meet the standard values.

5) If using the sensor in an environment where cutting oil droplets splatter, the sensor may deteriorate due to added substances in the oil.

SPECIFICATIONS

GX-12 type

Туре		NPN	output	PNP	output		
	Pront sensing	GX-F12A(I)	GX-F12B(I)	GX-F12A(I)-P	GX-F12B(I)-P		
Item	Top sensing	GX-H12A(I)	GX-H12B(I)	GX-H12A(I)-P	GX-H12B(I)-P		
Max. oper	ration distance (Note 3)		4.0 mm 0.1	57 in ± 8 %			
Stable se	ensing range (Note 3)		0 to 3.3 mm	0 to 0.130 in			
Standard	sensing object		Iron sheet 20 × 20 × t 1 mr	n 0.787 × 0.787 × t 0.039 in			
Hysteresi	is		20 % or less of operation distan	ce (with standard sensing object)		
Repeatab	bility	Along		ensing axis: 0.04 mm 0.0016 in	or less		
Supply vo	oltage		12 to 24 V DC ⁺¹⁰ ₋₁₅ %	Ripple P-P 10 % or less			
Current c	onsumption		15 mA	or less			
0.1.1		NPN open-collector transistor • Maximum sink current: 100) mA	PNP open-collector transistor • Maximum source current:	100 mA		
Output		 Applied voltage: 30 V DC c Residual voltage: 2 V or le 	or less (between output and 0 V) ss (at 100 mA sink current)		or less (between output and +V) ess (at 100 mA source current)		
Utili	zation category		DC-12 or DC-13				
Out	put operation	Normally open	Normally closed	Normally open	Normally closed		
Max. resp	oonse frequency		500) Hz			
Operatior	n indicator		Orange LED (lights up	when the output is ON)			
Poll	ution degree	3 (Industrial environment)					
e Prot	tection	IP68 (IEC), IP68g (JEM) (Note 4, 5)					
Amt	bient temperature	-25 to +70 °C -13 to +158 °F, Storage: -40 to +85 °C -40 to +185 °F					
Amt	bient humidity	35 to 85 % RH, Storage: 35 to 95 % RH					
EMG EMG	С		EN 60	947-5-2			
Volt	age withstandability	1,000 V AC	for one min. between all supply	terminals connected together ar	nd enclosure		
Amt Lesistance	lation resistance	50 MΩ, or more, wi	th 500 V DC megger between al	I supply terminals connected tog	ether and enclosure		
	ration resistance	10 to 500 Hz freque	ncy, 3 mm 0.118 in amplitude (M	lax. 20 G) in X, Y and Z direction	is for two hours each		
Sho	ock resistance	10,000 m/s	² acceleration (1,000 G approx.)	in X, Y and Z directions for three	e times each		
Sensing range	Temperature characteristics	Over ambient temperat	ure range –25 to +70 °C –13 to	+158 °F: Within ±8 % of sensing	range at +23 °C +73 °F		
variation	Voltage characteristics	Within ± 2 % for $^{+10}_{-15}$ % fluctuation of the supply voltage					
Material		Enclosure: PBT, Indicator part: Polyester					
Cable		0.15 mm ² 3-core oil, heat and cold resistant cabtyre cable, 1 m 3.281 ft long					
Cable ext	tension	Extension up to total 100 m 328.084 ft is possible with 0.3 mm ² , or more, cable.					
Net weigh	at	Front sensing type: 20 g approx., Top sensing type: 20 g approx					

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C +73 °F.

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

3) 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.

4) Panasonic Electric Works SUNX's IP68 test method

(1) Immerse at 0 m below 0 °C +32 °F water surface and leave for 30 min. Then, immerse at 0 m below +70 °C +158 °F water surface and leave for 30 min. (2) Regard the heat shock test in (1) as one cycle and perform 20 cycles.

③ Leave in water at a depth of 1 m 3.281 ft in water for 500 hours.

4 After tests 1 to 3, insulation resistance, voltage withstandability, current consumption, and sensing ranges must meet the standard values. 5) If using the sensor in an environment where cutting oil droplets splatter, the sensor may deteriorate due to added substances in the oil. FIBER SENSORS

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SPECIFICATIONS

GX-15 type

Selection Guide Amplifier Built-in Amplifierseparated

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\wedge		Time		NPN	output		PNP output				
	$\langle \ \rangle$	Туре			Long sens	sing range			Long sens	sing range	
		Eront sensing	GX-F15A(I)	GX-F15B(I)	GX-FL15A(I)	GX-FL15B(I)	GX-F15A(I)-P	GX-F15B(I)-P	GX-FL15A(I)-P	GX-FL15B(I)-P	
Iten	n 🔪	Top sensing	GX-H15A(I)	GX-H15B(I)	GX-HL15A(I)	GX-HL15B(I)	GX-H15A(I)-P	GX-H15B(I)-P	GX-HL15A(I)-P	GX-HL15B(I)-P	
Max	. operat	tion distance (Note 3)	5.0 mm 0.1	5.0 mm 0.197 in ± 8 % 8.0 mm 0.315 in ± 8 % (Note 4)		n ± 8 % (Note 4)	5.0 mm 0.1	97 in ± 8 %	8.0 mm 0.315 ir	1 ± 8 % (Note 4)	
Stab	ole sens	sing range (Note 3)	0 to 4.2 mm	0 to 0.165 in	0 to 6.7 mm 0 to	0.264 in (Note 4)	0 to 4.2 mm	0 to 0.165 in	0 to 6.7 mm 0 to	0.264 in (Note 4)	
Star	ndard s	ensing object	Iron sheet 20 0.7874 × 0.78	× 20 × t 1 mm 74 × t 0.039 in		× 30 × t 1 mm 1 × t 0.039 in		× 20 × t 1 mm 74 × t 0.039 in	Iron sheet 30 1.181 × 1.18		
Hyst	teresis				20 % or less of o	operation distance	ce (with standard	sensing object))		
Rep	eatabili	ity		Along	sensing axis, pe	erpendicular to s	ensing axis: 0.04	4 mm 0.0016 in (or less		
Sup	ply volt	age			12 to 24	4 V DC ⁺¹⁰ %	Ripple P-P 10 %	or less			
Curr	rent cor	nsumption				15 mA	or less				
Outp	out		 Maximum Applied vol 	NPN open-collector transistor PNP open-collector transistor • Maximum sink current: 100 mA • Maximum source current: 100 mA • Applied voltage: 30 V DC or less (between output and 0 V) • Maximum source current: 100 mA • Residual voltage: 2 V or less (at 100 mA sink current) • Residual voltage: 2 V or less (at 100 mA source)				. ,			
	Utiliza	ation category				DC-12 c	or DC-13				
	Outpu	ut operation	Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed	
Max	. respo	inse frequency	250	Hz	150 Hz	(Note 5)	250) Hz	150 Hz	(Note 5)	
Ope	ration i	ndicator	Orange LED (lights up when the output is ON)								
	Pollut	ion degree	3 (Industrial environment)								
Ð	Prote	ction			IF	P68 (IEC), IP68g	(JEM) (Note 6,	7)			
stanc	Ambie	ent temperature		-2	5 to +70 °C <mark>-13</mark>	to +158 °F, Stor	age: -40 to +85	°C - 40 to +185	35 °F		
Environmental resistance	Ambie	ent humidity			35 t	to 85 % RH, Stor	rage: 35 to 95 %	RH			
ental	EMC					EN 609	947-5-2				
onme	Volta	ge withstandability		1,000 V AC	for one min. bet	ween all supply	terminals conne	cted together an	d enclosure		
Envire	Insula	ation resistance	50	MΩ, or more, wi	th 500 V DC me	gger between all	l supply terminal	s connected tog	ether and enclos	ure	
ш	Vibrat	tion resistance	10 to	500 Hz frequer	ncy, 3 mm 0.118	in amplitude (N	1ax. 20 G) in X, `	Y and Z directior	s for two hours	each	
	Shoc	k resistance		10,000 m/s	² acceleration (1	,000 G approx.)	in X, Y and Z dir	ections for three	times each		
Senar		Temperature characteristics	Over ar	nbient temperat	ure range –25 to	+70 °C –13 to +	158 °F: Within ±	8 % of sensing	range at +23 °C	+73 °F	
	ation	Voltage characteristics			Within ±2 9	% for ⁺¹⁰ / ₋₁₅ % fluct	tuation of the supply voltage				
Mate	erial				Enc	losure: PBT, Ind	icator part: Polye	ester			
Cab	le			0.15	mm ² 3-core oil, h	neat and cold res	sistant cabtyre ca	able, 1 m 3.281 f	t long		
Cab	le exte	nsion		Extens	ion up to total 10	00 m 328.084 ft i	s possible with 0	.3 mm ² , or more	, cable.		
Net	Net weight 20 g approx.					20 g a	pprox.				

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C +73 °F. 2) "I" in the model No. indicates a different frequency type.

3) 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.

4) This is the numerical value which the sensor mount onto an insulant plate. When mounted onto a steel or stainless steel plate, insert the optional aluminum sheet between the sensor and the plate.

5) This is the numerical value which the sensor mount onto an insulant plate. When mounted onto a metallic plate, max. response frequency will decrease. 6) Panasonic Electric Works SUNX's IP68 test method

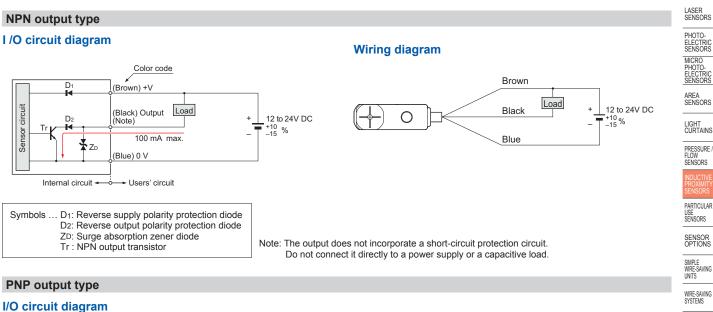
(1) Immerse at 0 m below 0 °C +32 °F water surface and leave for 30 min. Then, immerse at 0 m below +70 °C +158 °F water surface and leave for 30 min. (2) Regard the heat shock test in (1) as one cycle and perform 20 cycles.

③ Leave in water at a depth of 1 m 3.281 ft in water for 500 hours.

(4) After tests (1) to (3), insulation resistance, voltage withstandability, current consumption, and sensing range must meet the standard values.

7) If using the sensor in an environment where cutting oil droplets splatter, the sensor may be deteriorated due to added substances in the oil.

I/O CIRCUIT DIAGRAMS



Wiring diagram Color code Brown (Brown) +V circuit ₹ZD 12 to 24V DC 100 mA max. Black Tr 12 to 24V DC +10 -15 % Ο +10 % ► D2 Sensor (Black) Output (Note) Load Blue Load D1 (Blue) 0 V Internal circuit Symbols ... D1: Reverse supply polarity protection diode D2: Reverse output polarity protection diode ZD: Surge absorption zener diode Note: The output does not incorporate a short-circuit protection circuit. Tr : PNP output transistor Do not connect it directly to a power supply or a capacitive load.

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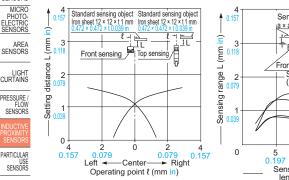
GX-U/GX-FU/ GX-N

SENSING CHARACTERISTICS (TYPICAL)

GX-6 type Sensing field

Correlation between sensing object size and sensing range

Correlation between sensing object size and sensing range



Sensing object Sensing object <u>a×amma×ain</u> a×amm t 1 mm t 0.039 in t 1 mm t 1 ÷,ġt Front sensing Stainless (SUS304) Iron Aluminu Brass-10 0.39/ 15 0.591 20 0.78 Sensing object side length a (mm in)

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

GX-8 type

4 0.157

3 118

2)79

0

4

0.157

distance L (mm i

-Setting 1

Sensing field

Standard sensing object Iron sheet 15 × 15 × t 1 mm

Front sensing

2 079

Left

Ò

-Center-

Operating point { (mm in)

2 0.079

l-Ħ

Sensing object <u>a × a mm a × a in</u> <u>+</u> t 1 mm t 0 030 in Standard sensing object Iron sheet 15 × 15 × t 1 mm 0.591 × 0.591 × t 0.039 in Sensina object a × a mm a × a → + t 1 mm 0.591 × 0.591 ∧ 0.000 ange L (mm in) ġ 0.039 in 3 /Front sensing Iron 2 Stainless steel (SUS304) Sensing I Brass Aluminum 0 10 0.39 15 0.591 20 0.787 4 5 0.197 0.157 Sensing object side length a (mm in) + Right

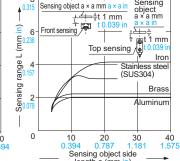
As the sensing object size becomes smaller than the standard size (iron sheet 15 × 15 × t 1 mm $0.591 \times 0.591 \times t \ 0.039$ in), the sensing range shortens as shown in the left figure.

GX-12 type

Sensing field

MACHINE Standard sensing object Standard sensing object Iron sheet 20 × 20 × t 1 mm Iron sheet 20 × 20 × t 1 mm VISION SYSTEMS Setting distance L (mm in). range L (mm in) UV CURING SYSTEMS 6 6 Top sensing 南 Front sensing 4 157 4 Sensing I Selection Guide 2 079 2 Amplifier Built-in 0↓ 10 35 Amplifier 0 ò 5 10 separated 0.197 0.394 → Right 197 -Center-Left Operating point { (mm in)

Correlation between sensing object size and sensing range Sensing

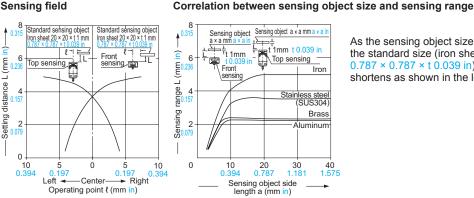


length a (mm in)

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

GX-15 type

Sensing field



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

As the sensing object size becomes smaller than

the standard size (iron sheet 30 × 30 × t 1 mm

 $1.181 \times 1.181 \times t \ 0.039$ in), the sensing range

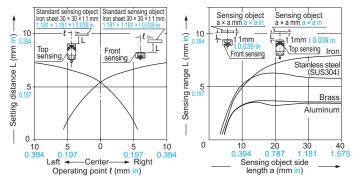
shortens as shown in the left figure.

SENSING CHARACTERISTICS (TYPICAL)

GX-15 (Long sensing range) type

Sensing field

Correlation between sensing object size and sensing range



PRECAUTIONS FOR PROPER USE

· Never use this product as a sensing device for personnel protection.

· In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

Mounting

GX-6 type

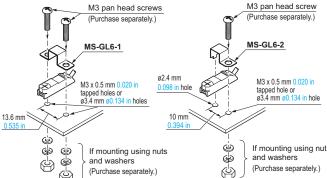
· Use the optional sensor mounting bracket when installing.

<When using MS-GX6-1 (recommended)>

- · To mount the sensor with a nut, the mounting hole diameter should be ø3.4 mm ø0.134 in.
- ① Insert the sensor into the bracket as shown on the right.
- 2 Push the sensor until the bracket hook is lodged in the groove on the upper portion of the sensor.
- ③ Fix the bracket in place with M3 pan head screw.

<When using MS-GL6-1 / MS-GL6-2>

· To mount the sensor with a nut, the mounting hole diameter should be ø3.4 mm ø0.134 in.



(Purchase separately.) MS-GX6-1 Cable Hooł M3 x 0.5 mm 0.020 in tapped hole or ø3.4 mm ø0.134 in hole Groove ė. ø 22 mm (تى ø3.4 mm If mounting using nut ٩ 34 in hole and washers (a)(Purchase separately.)

M3 pan head screw

GX-15 type

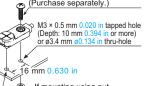
· When installing the long sensing range type on iron or stainless steel plate, put the optional aluminum sheet in between the sensor and

Refer to General precautions. M3 (length 12 mm 0.4 truss head screw (Accessory for MS-GXL8-4) MS-GXL8-4 (Accessory) M3 × 0.5 mm 0.020 in tapped hole



(Accessories for MS-GXL8-4)

M3 (length 12 mm 0.472 in or more)



 and washers
 (Purchase separately.) ø2.5 mm ø0.098 in hole (Depth: 3 mm 0.118 in or more)



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GL GX-U/GX-FU GX-N GX

and washers (Purchase separately.) MS-GXL15 (Sensor mounting bracket)

If mounting using nuts

M3 pan head screws or

Do not use flat head

M3 x 0.5 mm 0.020 in

tapped holes or ø3.4 mm ø0.134 in holes

truss head screws

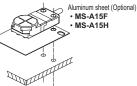
screws

D

T

Ā 南

9 mm



Do not use a flat head screw or a pan head ٢ and washe P ø2.4 mm ø0.098 in hole (Depth: 3 mm 0.315 in or more) pan head screw (Purchase separately.) inserted should be ø2.5 If mounting using nut mm Ø0.098 in and 3 mm 0.118 in, or more, deep.

GX-12 type The tightening torque

screw.

GX-8 type

· Make sure to use a M3

The tightening torque

(length: 12 mm 0.472 in or

should be 0.7 N·m or less.

more) truss head screw.

should be 0.7 N·m or less. · To mount the sensor with a nut, the mounting hole diameter should be ø3.4 mm ø0.134 in. Further, the hole in which the boss is

 The tightening torque should be 1 N·m or less. To mount the sensor with a nut, the mounting hole diameter should be ø3.4 mm ø0.134 in.

the plate.

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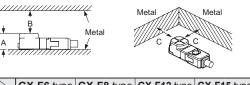
GX-U/GX

PRECAUTIONS FOR PROPER USE

Influence of surrounding metal

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

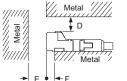
Front sensing type

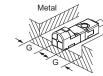


\geq	GX-F6 type	GX-F8 type	GX-F12 type	GX-F15 type	GX-FL15 type
А	6 mm 0.236 in (Note 1)	7.4 mm 0.291 in	7.1 mm 0.280 in	8 mm 0.315 in	8 mm 0.315 in (Note 2)
В	8 mm 0.315 in	8 mm 0.315 in	20 mm 0.787 in	20 mm 0.787 in	30 mm 1.181 in
С	3 mm 0.118 in	3 mm 0.118 in	7 mm 0.276 in	7 mm 0.276 in	10 mm 0.394 in

- Notes: 1) When using MS-GX6-1 (recommended mounting bracket), the distance "A" including the thickness of mounting bracket will be 6.4 mm 0.2
 - 2) The GXL-FL15 type should be mounted on an insulator. To mount it on an iron or stainless steel, use the enclosed aluminum sheet.

Top sensing type





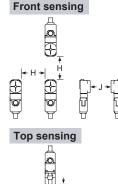
\geq	GX-H6 type	GX-H8 type	GX-H12 type	GX-H15 type	GX-HL15 type
D	3 mm 0.118 in	4 mm 0.157 in	7 mm 0.276 in	6 mm 0.236 in	12 mm 0.472 in
Е	10 mm 0.394 in	10 mm 0.394 in	20 mm 0.787 in	20 mm 0.787 in	30 mm 1.181 in
F	2 mm 0.079 in	3 mm 0.118 in	3 mm 0.118 in	0 mm 0 in	10 mm 0.394 in (Note)
G	2 mm 0.079 in	3 mm 0.118 in	3 mm 0.118 in	3 mm 0.118 in	10 mm 0.394 in

Note: When GX-HL15 type is mounted on an insulator or seated on the enclosed aluminum sheet, the distance "F" can be zero.

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.

_			Н	J
-	SX-F6	Between "I" type and non "I" type	0 mm (Note 2)	15 mm 0.591 in
	GX-H6 type GX-F8 GX-H8 type	Between two "I" types or two non "I" types	13 mm 0.512 in	25 mm 0.984 in
luilt-in		Between "I" type and non "I" type	0 mm (Note 2)	15 mm 0.591 in
iplifier-		Between two "I" types or two non "I" types	20 mm 0.787 in	35 mm 1.378 in
	GX-F12 GX-H12	Between "I" type and non "I" type	0 mm (Note 2)	25 mm 0.984 in
	ype	Between two "I" types or two non "I" types	25 mm 0.984 in	50 mm 1.969 in
	GX-F15 GX-H15	Between "I" type and non "I" type	0 mm (Note 2)	25 mm 0.984 in
	type	Between two "I" types or two non "I" types	45 mm 1.772 in	70 mm 2.756 in
GX G	X-FL15 X-HL15	Between "I" type and non "I" type	0 mm (Note 2)	25 mm 0.984 in
	type	Between two "I" types or two non "I" types	110 mm 3.059 in	170 mm 6.693 in



the different frequency type.

GX-FL15 / HL15 type: 47.5mm 1.870 in

2) Close mounting is possible for up to two sensors. When mounting three sensors or more at an equal spacing, align the model with "I" and the model without "I" alternately. The minimum value of dimension "H" should be as given below. GX-F6 / H6 type: 3.5mm 0.138 GX-F8 / H8 type: 6mm 0.236 in GX-F12 / H12 type: 6.5mm 0.256 in GX-F15 / H15 type: 15mm 0.591 in

Refer to General precautions.

Sensing range

· The sensing range is specified for the standard sensing object. With a non-ferrous metal, the sensing range is obtained by multiplying with the correction coefficient specified below. Further, the sensing range also changes if the sensing object is smaller than the standard sensing object or if the sensing object is plated.

Correction coefficient

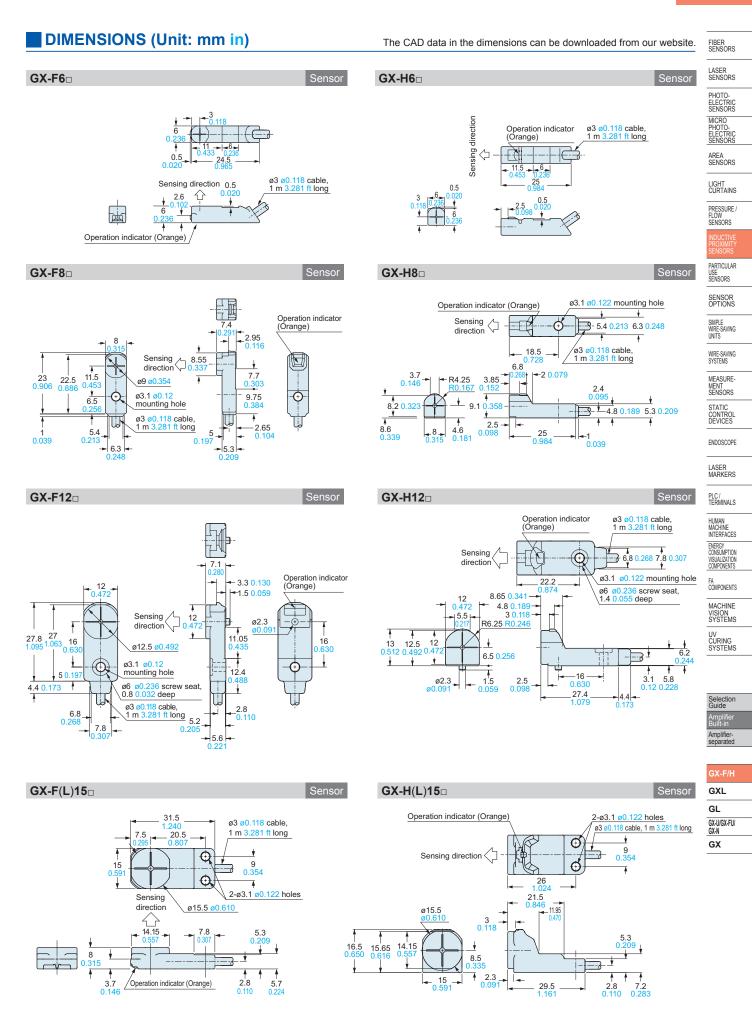
Model No. Metal	GX-F6 GX-H6 type	GX-F8 GX-H8 type	GX-F12 GX-H12 type	GX-F15 GX-H15 type	GX-FL15 type	GX-HL15 type
Iron	1	1	1	1	1	1
Stainless steel (SUS304)	0.76 approx.	0.76 approx.	0.79 approx.	0.68 approx.	0.70 approx.	0.76 approx.
Brass	0.50 approx.	0.50 approx.	0.56 approx.	0.47 approx.	0.45 approx.	0.50 approx.
Aluminum	0.48 approx.	0.48 approx.	0.53 approx.	0.45 approx.	0.43 approx.	0.48 approx.

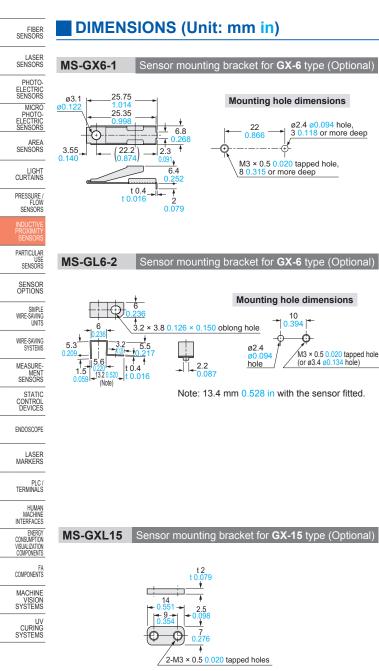
Wiring

 The output does not incorporate 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 (50 ms) after the power supply is switched on.





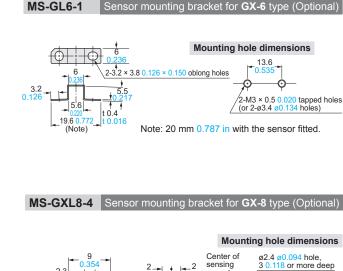
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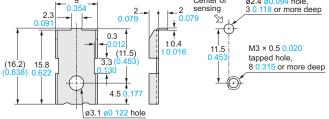
Selection Guide

Amplifier Built-in

Amplifierseparated

GXL GL GX-U/GX-FU/ GX-N GX The CAD data in the dimensions can be downloaded from our website.

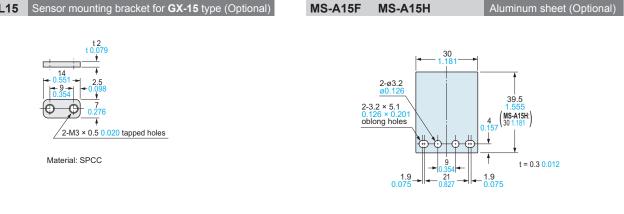




Material: Stainless steel (SUS304)

1 pc. each of M3 (length 12 mm 0.472 in) truss head screw,

nut, spring washer and plain washer is attached.



MEMO

