

* Typical

Ramco National

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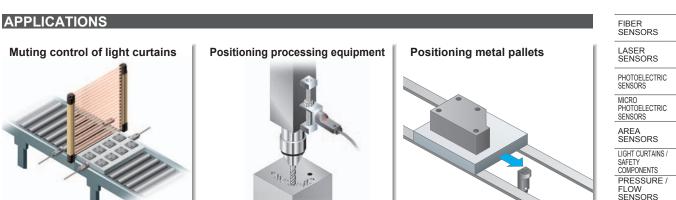
mod

Maximum operation distance: 2.5 mm 0.098 in ± 20 %

* Not including temperature characteristics.

(2.0 to 3.0 mm 0.079 to 0.118 in)

808



ENVIRONMENTAL RESISTANCE

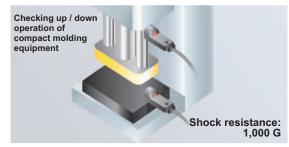
Highly resistant to water or oil!

IP68G* protective construction

environmental resistance performance.

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.



The new integrated construction method used improves

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

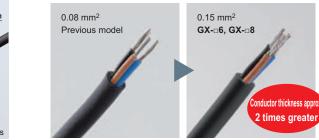
A prism with a wide field of view has been developed. This has greatly improved the visibility of the operation indicators.





Conductor thickness doubled to make wiring much easier! (GX-06/08 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.



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1-800-280-6933

The IP68G prevents damage to the sensor by stopping water and oil getting inside. * For details, refer to the "SPECIFICATIONS (p.812~)".

MOUNTING

Tightening strength increased with no damage! (excluding GX-__6)

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



Ramco National

GX-H



	GX-F/H
	GXL
)	GL
!.	GX-M
	GX-U/GX-FU/ GX-N
	GX

FLOW

PARTICULAR USE SENSORS

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

MEASUREMENT SENSORS STATIC ELECTRICITY

PREVENTION DEVICES LASER MARKERS

PLC

HUMAN MACHINE INTERFACES ENERGY CONSUMPTION

VISUALIZATION COMPONENTS

FA COMPONENTS

MACHINE VISION SYSTEMS

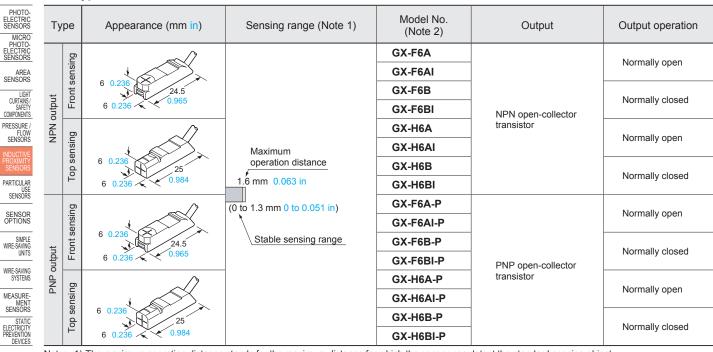
UV CURING SYSTEMS

Guide Amplifier-separated

LASER SENSORS

ORDER GUIDE

GX-6 type



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

CONSUMPTION VISUALIZATION COMPONENTS FA COMPONENTS	Туре	Appearance (mm in)	Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation	
MACHINE VISION SYSTEMS	Ð	\sim		GX-F8A		Normally open	
	ensi	7.4 0.291		GX-F8AI		Normally open	
UV CURING SYSTEMS	put Front sensing	8 0.315		GX-F8B		Normally closed	
	Dutpu			GX-F8BI	NPN open-collector	Normally closed	
	NPN output ng Froi	~ \>		GX-H8A	transistor	Normally open	
	NP sensing		Maximum	GX-H8AI			
0.1.11	Top se	8.2 0.323	operation distance	GX-H8B		Normally closed	
Selection Guide	⊢ I	8 0.315	2.5 mm 0.098 in	GX-H8BI			
Amplifier Built-in Amplifier-	бĽ	~~	(0 to 2.1 mm 0 to 0.083 in)	GX-F8A-P		Normally open	
separated	sensing	7.4 0.291		GX-F8AI-P			
	E	8 0.315	Stable sensing range	GX-F8B-P	PNP open-collector	Normally closed	
GX-F/H GXL	Putpt.			GX-F8BI-P		Normally closed	
GL	NP output			GX-H8A-P	transistor	Normally on an	
GX-M	PN			GX-H8AI-P		Normally open	
GX-U/GX-FU/	Top se	8.2 0.323		GX-H8B-P		Normally closed	
GX-N GX	Ĕ	8 0.315		GX-H8BI-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.

ORDER GUIDE

GX-12 type

Ţ	ype	Appearance (mm in)	Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation	PHOTO- ELECTRIC SENSORS
	БL			GX-F12A		Normally on an	MICRO PHOTO- ELECTRIC SENSORS
	sensing	7.1 0.280		GX-F12AI		Normally open	AREA SENSORS
÷	Front s	12 27.8		GX-F12B		Normally closed	LIGHT
outpu	L L	0.472		GX-F12BI	NPN open-collector	Normally closed	CURTAINS / SAFETY COMPONENTS
NPN output	g			GX-H12A	transistor	Normally open	PRESSURE / FLOW
z	sensing	12 0.472	Maximum	GX-H12AI	-		SENSORS
	Top se	27.4	operation distance	GX-H12B		Normally closed	INDUCTIVE PROXIMITY SENSORS
		12 0.472	4.0 mm 0.157 in	GX-H12BI			PARTICULAR USE
	βĽ		(0 to 3.3 mm 0 to 0.130 in)	GX-F12A-P		Normally on an	SENSORS
	sensing	7.1 0.280		GX-F12AI-P		Normally open	SENSOR OPTIONS
÷	Front s		Stable sensing range	GX-F12B-P		No	SIMPLE WIRE-SAVING
output	Ш	12 0.472 1.094		GX-F12BI-P	PNP open-collector	Normally closed	UNITS
NP G	PNP o Top sensing			GX-H12A-P	transistor		WIRE-SAVING SYSTEMS
٩		12 0.472		GX-H12AI-P		Normally open	MEASURE- MENT
		27.4	21.4	GX-H12B-P		No It	SENSORS STATIC
	Ĕ	12 0.472		GX-H12BI-P		Normally closed	STATIC ELECTRICITY PREVENTION 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

		CONSUMP							
Ту	pe	Appearance (mm in)	Sensing range (Note 1)	Model No. (Note 2)	Output	Output operation	FA CONSUMPTION VISUALIZATION COMPONENTS		
	БГ			GX-F15A		Normally open	MACHINE		
	sensing	8 0.315		GX-F15AI		Normally open	VISION SYSTEMS		
÷	Front s	31.5		GX-F15B		Newsellsseed	UV CURING SYSTEMS		
NPN output	Ъ	15 0.591		GX-F15BI	NPN open-collector	Normally closed			
PN	b			GX-H15A	transistor	Normally open	-		
z	sensing	16.5 0.650	15 0 59 h c 1 161	GX-H15AI	-				
	Top se			GX-H15B			-		
	Ĕ	15 0.591 1.161		GX-H15BI			Selection Guide		
	бL			(0 to 4.2 mm 0 to 0.165 in)	GX-F15A-P		Normally open	Amplifier Built-in Amplifier-	
	sensing	8 0.315	\ \	GX-F15AI-P		Normally open	separated		
÷	Front s	31.5	Stable sensing range	GX-F15B-P			OV FUL		
outpr	Ē	15 0.591		GX-F15BI-P	PNP open-collector	Normally closed	GX-F/H GXL		
NP	PNP output			GX-H15A-P	transistor	Normally open	GL		
₽.	sensing	16.5 0.650		GX-H15AI-P		Normally open	GX-M		
	Top s€	29.5		GX-H15B-P		Normally closed	GX-U/GX-FU/ GX-N		
	μ	15 0.591 1.161		GX-H15BI-P		Normany Closed	GX		

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

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LASER MARKERS

PLC

HUMAN MACHINE INTERFACES

ENERGY

FIBER SENSORS

PHOTO-ELECTRIC SENSORS

AREA SENSORS

PRESSURE /

PARTICULAR

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

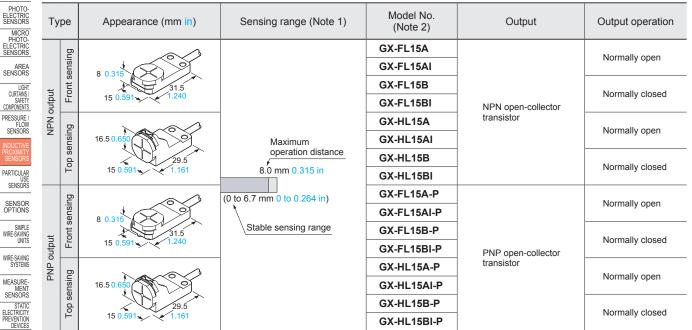
WIRE-SAVING SYSTEMS

SENSORS

FLOW SENSORS

ORDER GUIDE

LASER SENSORS GX-15 (Long sensing range) type



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

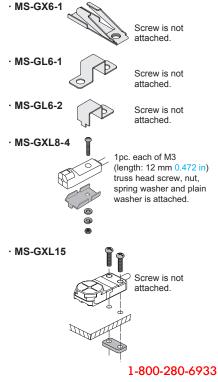
5 m 16.404 ft cable length type (standard: 1 m 3.281 ft) and flexible cable (excluding 5 m 16.404 ft cable length type) are available. However, long sensing range type is not available. When ordering 5 m 16.404 ft cable length type, suffix "-C5" to the model No. When ordering flexible cable type, suffix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

SYSTEMS						
	Designation	Model No.	Desc	ription Se		
		MS-GX6-1	Mounting bracket for GX-6 type (recommended). Sensors can be mounted closely together for space-saving.			
Selection Guide Amplifier Built-in Amplifier- separated	Sensor	MS-GL6-1	Mounting brackets for GX-6 type Sensor mounting brackets for GL-6 can be used. Interchange is possible.			
	mounting bracket	MS-GL6-2				
		MS-GXL8-4	Mounting bracket for GX-8 type			
		MS-GXL15	Mounting bracket for GX-15 typ	• • • • • • • • • • • • • • • • • • •		
GX-F/H	Aluminum	MS-A15F	For GX-FL15 □(-P)	Mounting example when		
GXL	sheet	MS-A15H	For GX-HL15□(-P)	mounted onto a steel or stainless steel plate		
GL			Mounting sleeve for GX-8 type			
GX-M	Mounting	MS-GX8-1×10		series can be used by inserting		
GX-U/GX-FU/ GX-N	sleeve	10 pcs. per set		ole of GX-8 type when replacing ontinued model) with GX-8 type.		
GX				shanded modely war GX-0 type.		

ensor mounting bracket



MEASURE-MENT SENSORS STATIC ELECTRICITY PREVENTION DEVICES LASER MARKERS PLC HUMAN MACHINE ENERGY CONSUMPTION

VISUALIZATION COMPONENTS FA COMPONENTS MACHINE VISION SYSTEMS

U١ CURING

www.PanasonicSensors.com

Aluminum sheet

· MS-A15F

· MS-A15H

Rectangular-shaped Inductive Proximity Sensor GX-F/H SERIES

812

FIBER SENSORS

LASER SENSORS

SPECIFICATIONS

GX-6 type

	Туре	NPN	output	PNP o	output		
	E Front 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. operat	tion distance (Note 3)		1.6 mm 0.0	163 in ± 8 %			
Stable sens	sing range (Note 3)		0 to 1.3 mm	0 to 0.051 in			
Standard se	ensing object		Iron sheet 12 × 12 × t 1 mr	n 0.472 × 0.472 × t 0.039 in			
Hysteresis			20 % or less of operation distant	ce (with standard sensing object)			
Repeatabili	ity	Along		ensing axis: 0.04 mm 0.0016 in o	r less		
Supply volt	age		12 to 24 V DC ⁺¹⁰ ₋₁₅ %	Ripple P-P 10 % or less			
Current cor	nsumption		15 mA	or less			
Output			or less (between output and 0 V)	PNP open-collector transistor • Maximum source current: 1 • Applied voltage: 30 V DC o	l00 mA r less (between output and +V)		
		 Residual voltage: 2 V or le 	ess (at 100 mA sink current)	Residual voltage: 2 V or les	ss (at 100 mA source current)		
Utiliza	ation category		DC-12 0	or DC-13			
Outpu	ut operation	Normally closed	Normally closed	Normally closed	Normally closed		
Max. response frequency		400 Hz					
Operation i	ndicator	Orange LED (lights up when the output is ON)					
Pollut	ion degree	3 (Industrial environment)					
e Proteo	ction	IP68 (IEC), IP68G (Note 4, 5)					
Ambie Stan	ent temperature	–25 to +70 °C –13 to +158 °F, Storage: –40 to +85 °C –40 to +185 °F					
Ambie	ent humidity	35 to 85 % RH, Storage: 35 to 95 % RH					
EMC Enta		EN 60947-5-2					
ō — _ `	ge withstandability	· · · ·		terminals connected together and			
	ation resistance		50 M Ω , or more, with 500 V DC megger between all supply terminals connected together and enclosure				
Vibrat	tion resistance			lax. 20 G) in X, Y and Z directions			
	k resistance			in X, Y and Z directions for three			
Sensing range	Temperature characteristics	Over ambient temperat		+158 °F: Within ± 8 % of sensing I	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 exter	nsion	Extension up to total 100 m 328.084 ft is possible with 0.3 mm ² , or more, cable.					
Net weight			15 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) Panasonic Industrial Devices 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 with standability, 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.

Please check the resistivity of the sensor against the cutting oil you are using beforehand.

Selectio Guide Amplif Built-ir

GX-F/H
GXL
GL
GX-M
GX-U/GX-FU/ GX-N
GX

LASER SENSORS

SPECIFICATIONS

GX-8 type

PHOTO- ELECTRIC	$ \subset $		Туре	NPN c	tutout	PNP	output		
SENSORS			PRI Front sensing	GX-F8A(I)	GX-F8B(I)	GX-F8A(I)-P	GX-F8B(I)-P		
MICRO PHOTO- ELECTRIC SENSORS	Iten		Top sensing	GX-H8A(I)	GX-H8B(I)	GX-H8A(I)-P	GX-H8B(I)-P		
AREA SENSORS	Max. operation distance (Note 3)				2.5 mm 0.0	198 in ± 8 %			
LICUT	Stat	le sens	ing range (Note 3)		0 to 2.1 mm	0 to 0.083 in			
CURTAINS / SAFETY COMPONENTS	Star	ndard se	ensing object		Iron sheet 15 × 15 × t 1 mr	n 0.591 × 0.591 × t 0.039 in			
PRESSURE / FLOW SENSORS	Hys	teresis			20 % or less of operation distan	ce (with standard sensing object))		
INDUCTIVE PROXIMITY SENSORS	Rep	eatabili	ty	Along	sensing axis, perpendicular to s	ensing axis: 0.04 mm 0.0016 in o	or less		
	Sup	ply volt	age		12 to 24 V DC ⁺¹⁰ ₋₁₅ %	Ripple P-P 10 % or less			
PARTICULAR USE SENSORS	Curr	ent cor	sumption		15 mA	or less			
SENSOR OPTIONS	Out	out		NPN open-collector transistor • Maximum sink current: 100 • Applied voltage: 30 V DC o	nA r less (between output and 0 V)	PNP open-collector transistor • Maximum source current: • Applied voltage: 30 V DC of	100 mA or less (between output and +V		
SIMPLE WIRE-SAVING UNITS				Residual voltage: 2 V or les	,		ess (at 100 mA source current)		
WIRE-SAVING SYSTEMS		Utiliza	tion category		DC-12 0	or DC-13			
MEASURE- MENT		Outpu	t operation	Normally open	Normally closed	Normally open	Normally closed		
SENSORS	Max	. respo	nse frequency	500 Hz					
STATIC ELECTRICITY PREVENTION DEVICES	Ope	ration i	ndicator	Orange LED (lights up when the output is ON)					
LASER MARKERS		Pollution degree 3 (Industrial environment)							
MARKÉRS	e	Proteo	ction		IP68 (IEC), IP68G (Note 4, 5)				
PLC	Environmental resistance	Ambie	ent temperature	–25 to +70 °C –13 to +158 °F, Storage: –40 to +85 °C –40 to +185 °F					
HUMAN MACHINE INTERFACES	l resi	Ambie	ent humidity	35 to 85 % RH, Storage: 35 to 95 % RH					
	enta	EMC			EN 60947-5-2				
ENERGY CONSUMPTION VISUALIZATION COMPONENTS	onm	Voltag	e withstandability	1,000 V AC	for one min. between all supply	terminals connected together an	d enclosure		
FA	Envir	Insula	tion resistance	50 MΩ, or more, wit	h 500 V DC megger between al	I supply terminals connected tog	ether and enclosure		
COMPONENTS		Vibrat	ion resistance	10 to 500 Hz frequer	ncy, 3 mm 0.118 in amplitude (M	lax. 20 G) in X, Y and Z direction	s for two hours each		
MACHINE VISION SYSTEMS		Shock	resistance	10,000 m/s ²	acceleration (1,000 G approx.)	in X, Y and Z directions for three	times each		
LIV	Sen rang	0	Temperature characteristics	Over ambient temperatu	Over ambient temperature range –25 to +70 °C –13 to +158 °F: Within ± 8 % of sensing range at +23 °C +73 °F				
CURING SYSTEMS	varia		Voltage characteristics		Within ± 2 % for $^{+10}_{-15}$ % fluctuation of the supply voltage				
	Mate	erial			Enclosure: PBT, Ind	icator part: Polyester			
	Cab	le		0.15 r	nm ² 3-core oil, heat and cold rea	sistant cabtyre cable, 1 m 3.281 f	t long		
	Cab	le exter	nsion	Extensi	on up to total 100 m 328.084 ft i	s possible with 0.3 mm ² , or more	, cable.		
Selection Guide	Net	weight		F	Front sensing type: 15 g approx.	, Top sensing type: 20 g approx.			

Selectio Guid Amplifier Built-in Amplifier-separated

GX-F/H
GXL
GL
GX-M
GX-U/GX-FU/ GX-N
GX

- 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 Industrial Devices SUNX's IP68 test method

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

- 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.

Please check the resistivity of the sensor against the cutting oil you are using beforehand.

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

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FIBER SENSORS

LASER SENSORS

SPECIFICATIONS

GX-12 type

	Туре	NPN	output	PNP	output		
	2 Right Front 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	ation distance (Note 3)		4.0 mm 0.1	57 in ± 8 %			
Stable se	nsing range (Note 3)		0 to 3.3 mm	0 to 0.130 in			
Standard	sensing object	Iron sheet 20 × 20 × t 1 mm 0.787 × 0.787 × t 0.039 in					
Hysteresis	s	20 % or less of operation distance (with standard sensing object)					
Repeatab	ility	Along	• • • •	ensing axis: 0.04 mm 0.0016 in o	or 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 • Applied voltage: 30 V DC of) mA or less (between output and 0 V)	PNP open-collector transistor • Maximum source current: • Applied voltage: 30 V DC of	100 mA or less (between output and +V)		
		Residual voltage: 2 V or lease	,		ss (at 100 mA source current)		
Utiliz	zation category		DC-12 c	or DC-13			
Outp	out operation	Normally open	Normally closed	Normally open	Normally closed		
Лах. resp	oonse frequency	500 Hz					
Operation	indicator	Orange LED (lights up when the output is ON)					
Pollu	ution degree	3 (Industrial environment)					
	ection	IP68 (IEC), IP68G (Note 4, 5)					
Amb	pient temperature	-25 to +70 °C -13 to +158 °F, Storage: -40 to +85 °C -40 to +185 °F					
Amb	pient humidity	35 to 85 % RH, Storage: 35 to 95 % RH					
EMC enta	2	EN 60947-5-2					
Amb Amb EMC Volta Insu	age withstandability	1,000 V AC	for one min. between all supply	terminals connected together an	d enclosure		
Insu	lation resistance	50 MΩ, or more, wit	th 500 V DC megger between all	supply terminals connected tog	ether and enclosure		
	ation resistance	10 to 500 Hz frequer	ncy, 3 mm 0.118 in amplitude (M	ax. 20 G) in X, Y and Z direction	s for two hours each		
Sho	ck resistance	10,000 m/s ²	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	range at +23 °C +73 °F		
variation	Voltage characteristics		Within ± 2 % for $^{+10}_{-15}$ % fluct	uation of the supply voltage			
Material			Enclosure: PBT, Ind	icator part: Polyester			
Cable		0.15 mm ² 3-core oil, heat and cold resistant cabtyre cable, 1 m 3.281 ft long					
Cable ext	ension	Extensi	ion up to total 100 m 328.084 ft i	s possible with 0.3 mm ² , or more	, cable.		
Net weigh	nt		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.

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temperature drift and/or supply voltage fluctuation.

4) Panasonic Industrial Devices SUNX's IP68 test method

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(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.

Please check the resistivity of the sensor against the cutting oil you are using beforehand.

GX-F/H
GXL
GL
GX-M

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

Amplifi Built-in

LASER SENSORS

SPECIFICATIONS

GX-15 type

PHOTO-ELECTRIC SENSORS \checkmark MICRO PHOTO-ELECTRIC SENSORS AREA SENSORS LIGH COMPONENTS PRESSURE FLOW PARTICULAR USE SENSORS SENSOR SIMPLE WIRE-SAVING UNITS WIRE-SAVING SYSTEMS MEASURE-MENT SENSORS STATIC ELECTRICIT PREVENTION DEVICES LASER MARKERS PLC HUMAN MACHINE INTERFACES ENERGY CONSUMPTION VISUALIZATION COMPONENTS FA COMPONENTS MACHINE VISION SYSTEMS UV CURING SYSTEMS

\sim		Typo		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	ion distance (Note 3)	5.0 mm 0.1	97 in ± 8 %	8.0 mm 0.315 ir	1 ± 8 % (Note 4)	5.0 mm 0.1	97 in ± 8 %	8.0 mm 0.315 ir	± 8 % (Note 4)
Stat	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 se	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	
Hys	teresis				20 % or less of o	operation distand	ce (with standard	I sensing object))	
Rep	eatabili	ty		Along	sensing axis, pe	erpendicular to s	ensing axis: 0.04	4 mm 0.0016 in o	or less	
Sup	ply volta	age			12 to 24	4 V DC ⁺¹⁰ 15 %	Ripple P-P 10 %	or less		
Curr	rent cor	sumption				15 mA	or less			
Out	put		 Maximum Applied vo 	I 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) • Applied voltage: 30 V DC or less (between output and 0 V) Residual voltage: 2 V or less (at 100 mA sink current) • Residual voltage: 2 V or less (at 100 mA so			• • •			
	Utiliza	tion category	DC-12 or DC-13							
	Outpu	t operation	Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed	Normally open	Normally closed
Max	. respo	nse 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)							
e	Proteo	ction	IP68 (IEC), IP68G (Note 6, 7)							
tanc	Ambie	ent temperature	-25 to +70 °C -13 to +158 °F, Storage: -40 to +85 °C -40 to +185 °F							
Environmental resistance	Ambie	ent humidity	35 to 85 % RH, Storage: 35 to 95 % RH							
intal	EMC			EN 60947-5-2						
nme	Voltag	ge withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure							
inviro	Insula	tion resistance	50 M Ω , or more, with 500 V DC megger between all supply terminals connected together and enclosure							
ш	Vibrat	ion resistance	10 to 500 Hz frequency, 3 mm 0.118 in amplitude (Max. 20 G) in X, Y and Z directions for two hours each							
	Shock	resistance		10,000 m/s ² acceleration (1,000 G approx.) in X, Y and Z directions for three times each						
Sen rang		Temperature characteristics	Over ambient temperature range –25 to +70 °C –13 to +158 °F: Within ± 8 % of sensing range at +23 °C +73 °F							
	ation	Voltage characteristics	Within ± 2 % for $^{+10}_{-15}$ % fluctuation of the supply voltage							
Mate	erial				Enc	losure: PBT, Ind	icator part: Polye	ester		
Cab	le			0.15	mm ² 3-core oil, h	eat and cold res	sistant cabtyre ca	able, 1 m <mark>3.281</mark> f	t long	
Cab	le exter	nsion		Extens	ion up to total 10	00 m 328.084 ft i	s possible with 0	.3 mm ² , or more	, cable.	
Net	weight					20 g a	approx.			

Amplifier Built-in Amplifierseparated

Selection Guide

GX-IIII GXL GL GX-M GX-UIGX-FU/ GX-W GX-W GX

- 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 Industrial Devices SUNX's IP68 test method

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.

Please check the resistivity of the sensor against the cutting oil you are using beforehand.

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

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I/O CIRCUIT DIAGRAMS FIBER SENSORS LASER SENSORS NPN output type PHOTO-ELECTRIC SENSORS I /O circuit diagram Wiring diagram MICRO PHOTO-ELECTRIC SENSORS Color code Brown D1 (Brown) +V AREA SENSORS Load (Black) Output Load Sensor circuit Black 12 to 24V DC LIGHT CURTAINS / SAFETY COMPONENTS Ο 12 to 24V DC D2 +10 % -15 % 14 +10 % -15 % 100 mA max Blue 🖌 ZD PRESSURE / FLOW SENSORS (Blue) 0 V Users' circuit Internal circuit -PARTICULAR USE SENSORS Symbols ... D1: Reverse supply polarity protection diode D2: Reverse output polarity protection diode ZD: Surge absorption zener diode Tr : NPN output transistor SENSOR OPTIONS Note: The output does not incorporate a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load. SIMPLE WIRE-SAVING UNITS **PNP** output type WIRE-SAVING SYSTEMS I/O circuit diagram MEASURE-MENT SENSORS Wiring diagram Color code STATIC ELECTRICITY PREVENTION DEVICES Brown (Brown) +V **¥**Z⊳ Sensor circuit 12 to 24V DC LASER MARKERS 100 mA max. Black Tr 12 to 24V DC Ο +10 % D2 +10 -15 % (Black) Output (Note) Load Blue Load PLC D1 (Blue) 0 V HUMAN MACHINE INTERFACES Internal circuit + - Users' circuit --ċ-ENERGY CONSUMPTION VISUALIZATION COMPONENTS Symbols ... D1: Reverse supply polarity protection diode D2: Reverse output polarity protection diode ZD: Surge absorption zener diode Tr : PNP output transistor FA COMPONENTS Note: The output does not incorporate a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load. MACHINE VISION SYSTEMS UV CURING SYSTEMS



GX-F/H
GXL
GL
GX-M
GX-U/GX-FU/

GX

LASER SENSORS

SENSING CHARACTERISTICS (TYPICAL)

Ē

mm)

range L

Sensing

3 0.118

2

0

5

0.

Ī





 Standard sensing object
 Standard sensing object

 Iron sheet 12 × 12 × 11 mm
 Iron sheet 12 × 12 × 11 mm

 0.472 × 0.472 × 10.039 in
 0.472 × 0.472 × 10.039 in

ò

-Center

Operating point { (mm in)

Front sensing

2 0.079 Left ←

<u>_</u>____

Top sensing

2 0.079 → Right

0.157

Ī

10

0 3

Correlation between sensing object size and sensing range

Iron

Aluminum

20 0.787

15

591

Sensing object Sensing object a×amma×ain a×amma×ain

Brass

10

0.39

Sensing object side length a (mm in)

ront sensing

Stainless steel (SUS304)

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

Setting distance L (mm

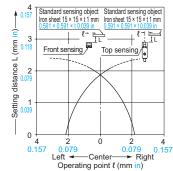
3

2

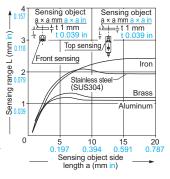
0

0.157

Sensing field



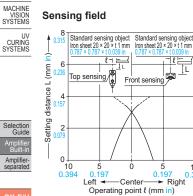
Correlation between sensing object size and sensing range



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 figure.

GX-12 type

Sensing field



Correlation between sensing object size and sensing range

Sensing object a × a mm a × a in object a × a mm +⊈+t1 mm ġ Top sensing L (mm in) 6 Front sensing Iror Sensing range Stainless s (SUS304) Brass 2 Aluminum 0 20 30 1.181 40 1.575 10 0.394 0.787 1.10 Sensing object side length a (mm in)

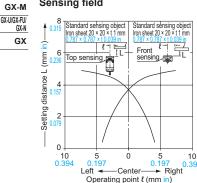
As the sensing object size becomes smaller than the standard size (iron sheet 20 × 20 × t 1 mm $0.787 \times 0.787 \times t \ 0.039$ in), the sensing range shortens as shown in the left figure.

GX-15 type

Sensing field

GXL

GL



Correlation between sensing object size and sensing range

Sensing object a x a mm a x a + t 1mm t 0.039 in 6 Top sensing L (mm Iron sensing range 4 157 Stainless stee (SUS304 Brass Sensing 2 Åluminur 0 10 0.39 20 0.787 30 1.181 40 1.575 Sensing object side 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.

As the sensing object size becomes smaller than

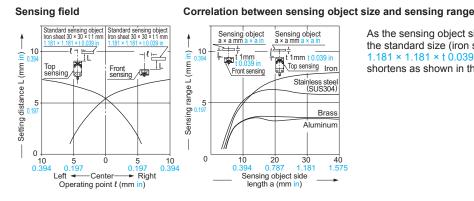
the standard size (iron sheet 30 × 30 × t 1 mm

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

shortens as shown in the left figure.

SENSING CHARACTERISTICS (TYPICAL)

GX-15 (Long sensing range) type



PRECAUTIONS FOR PROPER USE

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

personnel protection, use products which

meet laws and standards, such as OSHA,

ANSI or IEC etc., for personnel protection

Hoo Cable

Groove

ø3.4 mm

34 in hole

· In case of using sensing devices for

applicable in each region or country.

Mounting

GX-6 type

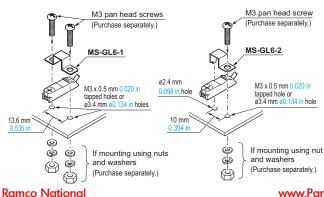
· Use the optional sensor mounting bracket when installing.

<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.



GX-8 type

 Make sure to use a M3 (length: 12 mm 0.472 in or more) truss head screw. The tightening torque should be 0.7 N·m or less. /Do not use a flat head screw or a pan head screw.

GX-12 type

- The tightening torque 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 inserted should be ø2.5 mm ø0.098 in and 3 mm 0.118 in, or more, deep.

GX-15 type

M3 pan head screw

MS-GX6-1

6

٢

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Þ

22 mm

(Purchase separately.)

M3 x 0.5 mm 0.020 in tapped hole or

tapped hole or ø3.4 mm ø0.134 in hole

If mounting using nut

and washers

- The tightening torque
- should be 1 N·m or less. (Purchase separately.) · To mount the sensor with a nut, the mounting hole

· When installing the long

sensing range type on iron

or stainless steel plate, put

in between the sensor and

the optional aluminum sheet

diameter should be ø3.4 mm ø0.134 in.

screws M3 x 0.5 mm 0.020 in tapped holes or ø3.4 mm ø0.134 in holes ПП. 9 mm ₹II If mounting using nuts and washers (Purchase separately.) MS-GXL15

Refer to p.1485~ for general precautions.

M3 (length 12 mm 0.472 in) truss head screw (Accessory for MS-GXL8-4)

MS-GXL8-4 (Accessory)

(Depth: 8 mm

ø2.4 mm ø0.098 in hole (Depth: 3 mm 0.315 in or more)

16 mm 0.630 in

Ø2.5 mm Ø0.098 in hole (Depth: 3 mm 0.118 in or more)

If mounting using nut
 and washers
 (Purchase separately.)

<11.5 mm 0.453 in

M3 × 0.5 mm 0.020 in tapped hole

or ø3.4 mm ø0.134 in thru-hole

M3 (length 12 mm 0.472 in or more) pan head screw (Purchase separately.)

M3 × 0.5 mm 0.020 in tapped hole (Depth: 10 mm 0.394 in or more) or ø3.4 mm ø0.134 in thru-hole

M3 pan head screws or

Do not use flat head

truss head screws

 If mounting using nut
 and washers
 (Accessories for MS-GXL8-4) If mounting using nut

n or more)

 MS-A15F
 MS-A15H

FIBER SENSORS LASER SENSORS

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PARTICULAR

USE SENSORS SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS WIRE-SAVING SYSTEMS

MEASURE-MENT SENSORS

STATIC ELECTRICITY PREVENTION DEVICES

LASER MARKERS

HUMAN MACHINE INTERFACES ENERGY

PLC

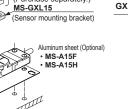
CONSUMPTION VISUALIZATION COMPONENTS FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide Amplifi Built-in

GXL GL GX-M GX-U/GX-FU/ GX-N



the plate.



LASER SENSORS

Meta

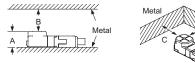
PHOTO-ELECTRIC SENSORS MICRO PHOTO-ECTRIC ENSORS AREA SENSORS CURTAIN COMPONENTS PRESSURE FLOW PARTICULAR USE SENSORS SENSOR OPTIONS SIMPLE WIRE-SAVING UNITS WIRE-SAVING SYSTEMS MEASURE-MENT SENSORS STATI ELECTRICITY DEVICES LASER MARKERS PLC HUMAN MACHINE INTERFACES ENERGY COMPONENTS MACHINE VISION SYSTEMS

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





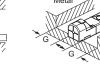
A	(Note 1)	7.4 mm 0.291 in	7.1 mm 0.280 in	8 mm 0.315 in	(Note 2)
В	8 mm 0.315 in	8 mm 0.315 in	20 mm 0.787 in	20 mm 0.787 in	30 mm 1.181 in
С	3 mm 0.118 in	3 mm 0.118 in	7 mm 0.276 in	7 mm 0.276 in	10 mm 0.394 in

Notes: 1) When using MS-GX6-1 (recommended mounting bracket), the distance "A" including the thickness of mounting bracket will be 6.4 mm 0.25

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





	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

Between "I" type

and non "I" type

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

J

15 mm

н

0 mm

Note 2

13 mm 25 mm

Selection Guide	
Amplifier Built-in	
Amplifier- separated	

GX-F6

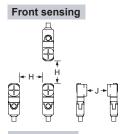
GX-H6

UV CURING SYSTEMS

	G)
GX-F/H	G)
GXL	ty
GAL	G)
GL	G)
GX-M	ty

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

or two non "I" types	0.512 in	0.984 in
Between "I" type	0 mm	15 mm
and non "I" type	(Note 2)	0.591 in
Between two "I" types	20 mm	35 mm
or two non "I" types	0.787 in	1.378 in
Between "I" type	0 mm	25 mm
and non "I" type	(Note 2)	0.984 in
Between two "I" types	25 mm	50 mm
or two non "I" types	0.984 in	1.969 in
Between "I" type	0 mm	25 mm
and non "I" type	(Note 2)	0.984 in
Between two "I" types	45 mm	70 mm
or two non "I" types	1.772 in	2.756 in
Between "I" type	0 mm	25 mm
and non "I" type	(Note 2)	0.984 in
Between two "I" types or two non "I" types		170 mm 6.693 in
	or two non "I" types Between "I" type and non "I" type Between two "I" types or two non "I" types Detween "I" type Between two "I" types Between two "I" type and non "I" type Between two "I" types Detween two "I" types Detween two "I" types Between two "I" type Between two "I" type Between two "I" type Between two "I" type	or two non "I" types 0.512 in Between "I" type 0 mm and non "I" type 0 mm and non "I" type 20 mm or two non "I" types 20 mm or two non "I" types 0.787 in Between two "I" type 0 mm and non "I" type 0 mm or two non "I" types 25 mm or two non "I" types 0.984 in Between two "I" type 0 mm and non "I" type 0 mm or two non "I" types 45 mm or two non "I" types 45 mm or two non "I" type 0 mm and non "I" type 0 mm and non "I" type 0 mm and non "I" type 10 mm Between two T" type 110 mm







the different frequency type.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 in

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 GX-FL15 / HL15 type: 47.5mm 1.870 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 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.	

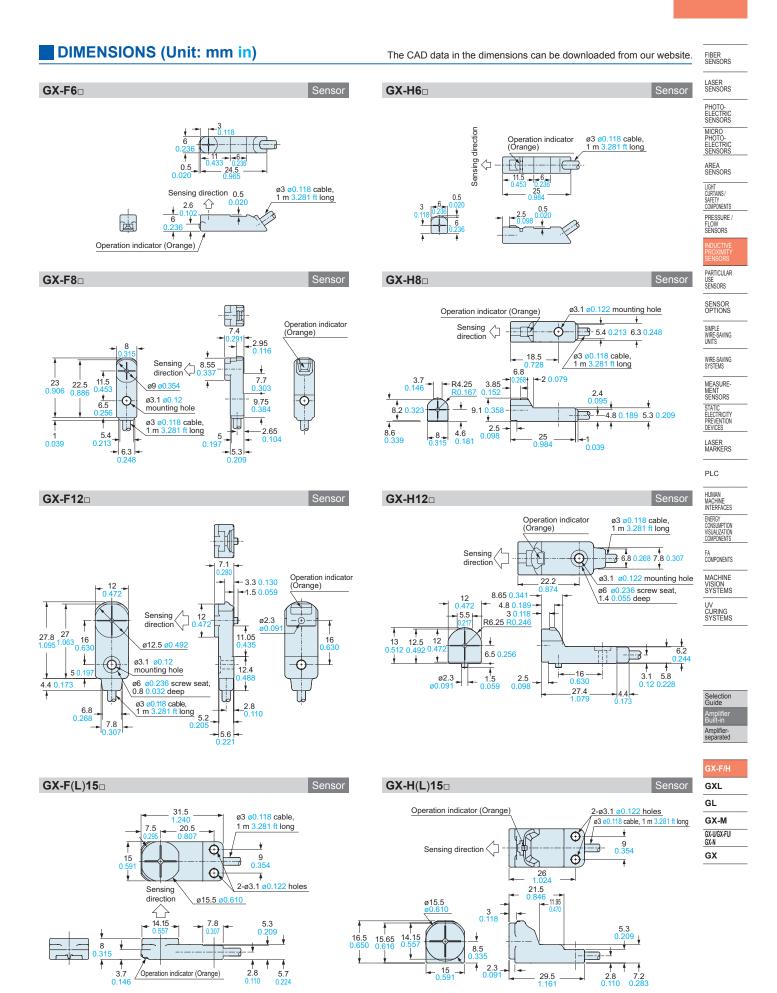
Wiring

· 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.

820



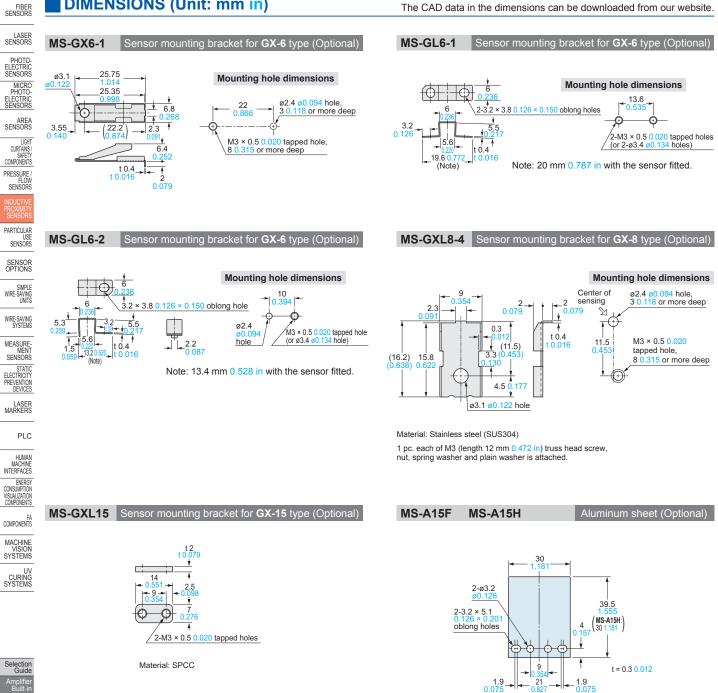
Ramco National

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LASER SENSORS PHOTO-ELECTRIC SENSORS MICRO PHOTO-ELECTRIC SENSORS AREA SENSORS LIGHT CURTAINS / SAFETY COMPONENTS PRESSURE FLOW SENSORS PARTICULAR USE SENSOR SIMPLE WIRE-SAVING UNITS WIRE-SAVING SYSTEMS MEASURE-MENT SENSORS STATIC ELECTRICITY PREVENTION DEVICES LASER MARKERS





GX

1.9 0.075