### Panasonic<sup>®</sup> INSTRUCTION MANUAL

DC Three-wire Type Cylindrical Inductive Proximity Sensor **GX-300 Series** 

MJE-GX3ML No.0070-74V

Thank you very much for purchasing Panasonic products. Read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference

### **⚠ WARNING**

- Never use this product as a sensing device for personnel protection. In case of using sensing devices for personnel protection, use products which meet standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.
- Risk of explosion.Do not connect sensor to AC power supply. Do not use the product in an environment where flamma
- ble or explosive gas is present.

### 1 COMPLIANT STANDARDS / REGULATIONS

• This product complies with the following standards and

<EU Directives> **EMC Directives** 



## **2 PRECAUTIONS**

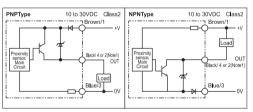
- This product has been developed / produced for industrial use only. • Do not install the product in the following locations. Doing so may result in product failure or malfunction.
  - Outdoor locations directly subject to sunlight, rain, snow, water droplets, or oil. Locations subject to atmospheres with chemical va-
- pors, in particular solvents and acids. Locations subject to corrosive gases • The Sensor may malfunction if used near ultrasonic clean-
- ing equipment, high-frequency equipment, transceivers, cellular phones, inverters, or other devices that generate a high-frequency electric field. Laying the Proximity Sensor wiring in the same conduit or
- duct as high-voltage wires or power lines may result in in-correct operation and damage due to induction. Wire the Sensor using a separate conduit or independent conduit. The following conditions shall be observed if you use the
- product under an environment using cutting oil that may affect product's life and/or performance. Usage in oil or water is prohibited.
- Impact on the product life may differ depending on the oil you use. Before using the cutting oil, make sure that it should not cause deterioration or degradation of sealing components.
- · Never use thinner or other solvents. Otherwise, the Sensor surface may be dissolved.
- When turning on the power by influence of temperature environment, an output mis-pulse sometimes occurs. After the sensor has passed for 300 ms after turning on, please use in the stable state. If the sensing object is located near the sensor's sensing surface, an output mis-pulse may be generated for 300 ms or longer at the time of power-on. Be sure to check the product for proper operation under actual operating condition before using
- The sensor is adjusted with a high degree of accuracy, so do not use in the environment with sudden temperature change.
- Do not attempt to disassemble, repair, or modify the product. . Do not use a voltage that exceeds the rated operating voltage range. Applying a voltage that is higher than the operating voltage range may result in damage or burnout.
- Be sure that the power supply polarity and other wiring is correct. Incorrect wiring may cause explosion or burnout.
- If the power supply is connected directly without a load, the internal elements may explode or burn. Be sure to insert a load when connecting the power supply. Please use gloves to protect yourself from injury caused by screw.
- For the connector type and pigtailed type, check the specifications of the connector cable to be used. Please do not use it under conditions that exceed the range of its specifications of both the product and the connector cable. Please make sure there is no foreign matter in connector
- part before connecting the connector cable to the connector type and pigtailed type. In the IO-Link mode, the cable between the IO-Link mas-

ter and sensor must have a length of 20m or less.

# 3 I/O CIRCUIT DIAGRAM

## Standard I/O mode (SIO mode)

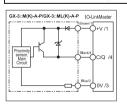
If using the product as a general sensor, it operates in the standard I/O mode (SIO mode).



Note:1): -A type: 4, -B type: 2

## IO-Link Communication mode (COM mode)

GX-3□M(K)-A-P、GX-3□ML(K)-A-P only



## Connector Pin Arrangement



Adaptive connector cable:

# **4** MOUNTING

# Tightening Force

- Do not tighten the sensor mounting nuts with excessive force. Secure the mounting nuts to the corresponding
- torque values in the following table. The allowable tightening strength depends on the distance from the edge of the head, as shown in the following table. (A is the distance from the edge of the head. B includes the nut on the head side. If the edge of the nut is in part A, the tightening torque for part A applies instead.)
- The following strengths assume washers are being used







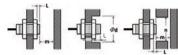
#### Model No. Part A Part B Shielded Type> Dimension (mm) Torque Torque GX-308M(K) 12N · m 9N • m GX-312M(K) GX-318M(K) 70N • m GX-330M(K)

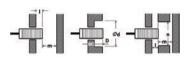
Model No.	Part A	١	Part B		
<unshielded type=""></unshielded>	Dimension (mm)	Torque	Torque		
GX-308ML(K)	3	9N • m	12N • m		
GX-312ML(K)	-	30N • m			
GX-318ML(K)	-	70N • m			
GX-330ML(K)	-	180N	• m		

### Influence of Surrounding Metal

- When the Proximity Sensor is mounted in metal, ensure that the minimum distance given in the following table are maintained.
- When mounting the Proximity Sensor using a nut and toothed washer, only use the provided nut.
- · Nuts that are supplied along with each models are different. Refer to Dimensions for details on shapes.

Mount A (Using the provided Nut)

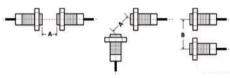




								(Ui	nit:mn
Model No.		Μοι	ıntA			N	1ount	В	
(Shielded Type)	L	d	m	n	- 1	d	D	m	n
GX-308M	0	8	4.5	12	0	8	0	4.5	12
GX-312M	0	12	8	18	0	12	0	8	18
GX-318M	0	18	20	27	0	18	0	20	27
GX-330M	0	30	40	45	0	30	0	40	45
GX-308MK	0	8	4.5	12	0	8	0	4.5	12
GX-312MK	0	18	12	18	2.4	18	2.4	12	18
GX-318MK	0	27	24	27	3.6	27	3.6	24	27
GX-330MK	0	45	45	45	6	45	6	45	45
Model No.		MountA MountB					В		
(Unshielded Type)	L	d	m	n	-1	d	D	m	n
GX-308ML	6	24	8	24	6	24	6	8	24
GX-312ML	11	40	20	36	15	40	15	20	36
GX-318ML	18	55	40	54	22	55	22	40	54
GX-330ML	25	90	70	90	30	90	30	70	90
GX-308MLK	9	24	8	24	12	24	12	8	24
GX-312MLK	11	40	20	40	15	40	15	20	40
GX-318MLK	21	70	48	70	25	70	25	48	70
GX-330MLK	40	120	90	120	45	120	45	90	120

### Mutual Interference

 When the Proximity Sensor is embedded in metal, ensure that the minimum distances given in the following table are



			T/		
				(1	Jnit:mm)
Model No. (Shielded Type)	Α	В	Model No. (Unshielded Type)	А	В
GX-308M(K)	20	15	GX-308ML(K)	80	60
GX-312M(K)	30	20	GX-312ML(K)	120	100
GX-318M	50	35	GX-318ML	200	110
GX-318MK	60	35	GX-318MLK	200	120
GX-330M	100	70	GX-330ML	300	200

**GX-330MK** 110 90 **GX-330MLK** 350 300

## Mounting Hole and Nut Dimensions

Mounting hole	
Nut dimensions	

		(Unit:mm)
Model No.	F	G
GX-308M(K) GX-308ML(K)	φ8.5 <sup>+0.5</sup>	13
GX-312M(K) GX-312ML(K)	$\phi$ 12.5 $^{+0.5}_{0}$	17
GX-318M(K) GX-318ML(K)	$\phi$ 18.5 $^{+0.5}_{0}$	24
GX-330M(K) GX-330ML(K)	φ 30.5 <sup>+0.5</sup>	36

### 5 TIMING CHART

		Non-sensing area	Sensing area	Proximity	,
Operati Mode(No		Sensing object Max.	Sensor	-	
Standard I/O mode (SIO)	N.O.	-		ON OFF ON OFF	Communication Indicator(Green) Operation Indicator(Orange
	N.C.			ON OFF ON OFF ON	Communication Indicator(Green) Operation Indicator(Orange
IO-Link mode (COM) (Note1)	N.O.			Flashing (1sec cycle) ON OFF ON OFF	Communication Indicator(Green) Operation Indicator(Orange
	N.C.			Flashing (1sec cycle) ON OFF ON	Communication Indicator(Green) Operation Indicator(Orange

Note: 1) The operation mode can be changed by the IO-Link communications. The timer function of the output can be set up by the IOLink communication Refer to GX-300 Series INDEXLIST.

## 6 ERROR INDICATION

(Common to the standard I/O mode and IO-Link mode)

,							
_ED indica (Note1)	ation	Condition	Action				
Orange	Green						
Alternate blinking of orange-color and green-color		The sensor might be broken internally, such as disconnection of the detection coil.	Start up (Turn ON) the senso again. If the error occurs again,replace the sensor.				
3 <b>l</b> inking	Not Lighting	The load is short-circuited	Check the wiring and connector connection again.				
Not _ighting	Blinking	Inconsistency has occurred on the settings (service data) written in by the IO-Link communications.	Execute the system command to "Restore Factory Settings" to initialize the settings. Refer to index 2 of service data.				

Note:1) Blinking at approx.0.3s intervals.

### **7 SPECIFICATIONS**

### Model No.

GX-3 1 1 2 3 4 - 5 - 6 - 7 7

- 1 :Size (08:M8 , 12:M12 , 18:M18 , 30:M30) 2 :Shape (M:Threaded type)
- 4 :Operation distance (None:Standard , K:Long sensing range) 3 None:Shielded type , L:Unshielded type
- 5 :Operating mode [ A: N.O. (Normally open) , B:N.C. (Normally closed)]
- 6 :Output configuration (N:NPN , P:PNP)
- 7 :Connecting method (None:Standard 2 m cable, C5:Standard 5m cable, R:Bending-resistant 2m cable, R5:Bending-resistant 5m cable, J: Pigtailed type, Z:Connector type)

Type					Shie <b>l</b> d	ed Type		B GX-318MK-B GX-330MK b 8mm±10% 15mm±10 n 0 to 6.4mm 0 to12mm m 24×24×1mm 45×45×1m of sensing distance  lector transistor 30 VDC,Class 2, 200 mA max, models:10 to 30 VDC,Class 2,					
	Norma <b>ll</b> y open	GX-308M-A	GX-312M-A	GX-318M-A	GX-330M-A	GX-308MK-A	GX-312MK-A	GX-318MK-A	GX-330MK-A				
Model No.	Normally closed	GX-308M-B	GX-312M-B	GX-318M-B	GX-330M-B	GX-308MK-B	GX-312MK-B	GX-318MK-B	GX-330MK-B				
Max. operation (Note1)	n distance	1.5mm±10%	2mm±10%	5mm±10%	10mm±10%	2mm±10%	4mm±10%	8mm±10%	15mm±10%				
Stable sensing	g range	0 to 1.2mm	0 to 1.6mm	0 to 4mm	0 to 8mm	0 to 1.6mm	0 to 3.2mm	0 to 6.4mm	0 to12mm				
Standard sens	sing object(iron)	8×8×1mm	12×12×1mm	18×18×1mm	30×30×1mm	8×8×1mm	12×12×1mm	24×24×1mm	45×45×1mm				
Hysteresis			10% max. of s	ensing distance			15% max. of se	ensing distance					
Supply voltage	•			10 to 3	30 VDC (including	10% ripple (p-p)),	Class 2						
Current consu	mption				16m/	A max.							
Output configu	ıration		GX-3□-□	]-P-□ :PNP open-	collector transistor	, GX-3□-□-N-□:	NPN open-collecto	-collector transistor					
Output	Load current	(GX-3	08M:1-output mod	/DC,Class 2, 200 rels:10 to 30 VDC,0 , 100 mA max., (7)	Class 2,	(GX-30	8MK:1-output mod		Class 2,				
	Residual voltage			dels: 2 V max. nA, Cable length: 2 m	1)			dels: 2 V max. nA, Cable length: 2 m	)				
Operating mod	de		GX	-3□-A-□-□ : N.C	). (Norma <b>l</b> y open)	, <b>GX-3□-B-</b> □-□ :	N.C. (Normally do	mally closed)					
Response fred	quency (Note1)	2,000Hz	1,500Hz	600Hz	400Hz	1,500Hz	1,000Hz	500Hz 250Hz					
Indicator		In the						ted by green-color sec intervals), resp					
Degree of prot	tection							IS C 0920 Annex 1: odels : Type1 (UL 5					
Pollution degre	эе					3							
A <b>l</b> titude					n or less								
Ambient tempe	erature		Operating/Storage: -40 to 85° C (with no icing or condensation)										
Ambient humid	dity			Operatin	g/Storage: 35% to	95% (with no cond	densation)						
Insulation resis	stance			50 MΩ min. (a	at 500 VDC) betwe	en current-carrying	g parts and case						
	Case	SUS303		Nicke <b>l-</b> plated brass	3	SUS303		Nickel-plated brass	3				
Materia <b>l</b>	Sensing surface				Polybutylene ter	rephthalate (PBT)							
	Cable				Vinyl chlo	ride (PVC)							
Cable			l, heat and cold re cable (Note3)	0.2mm3-core oil resistant 6 cabty	l, heat and cold /recable (Note4)	0.2mm3-core oil resistant 4 cabty		0.2mm3-core oil resistant 6 cabty					
IO-Link Comm specification (I		IO-Lin	k specification:Ver	.1.1 , Baud rate:C0	DM3 (230.4kbps),	PD size:2byte, OD	size:1byte (M-sec	quence type: TYP	E2_2)				
Accessories		Clamping nuts (Nickel-plated brass), Toothed washer (Zinc-plated iron)											

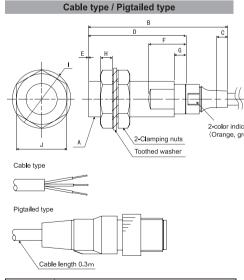
2) The UL temperature rating for M12 Pigtailed type is -25 to 70°C

3) Models with "-R" affixed to the Model No. have 0.2mf 3-core flexible  $\phi$ 4 cabtyre cable.

Type					Unshie <b>l</b> d	ed Type							
Madal Na	Norma <b>ll</b> y open	GX-308ML-A	GX-312ML-A	GX-318ML-A	GX-330ML-A	GX-308MLK-A	GX-312MLK-A	GX-318MLK-A	GX-330MLK-				
Model No.	Normally closed	GX-308ML-B	GX-312ML-B	GX-318ML-B	GX-330ML-B	GX-308MLK-B	GX-312MLK-B	GX-318MLK-B	GX-330MLK-I				
Max. operation	on distance	2mm±10%	5mm±10%	10mm±10%	18mm±10%	4mm±10%	8mm±10%	16mm±10%	30mm±10%				
Stable sensir	ig range	0 to 1.6mm	0 to 4mm	0 to 8mm	0 to 14.4mm	0 to 3.2mm	0 to 6.4mm	0 to 12.8mm	0 to 24mm				
Standard ser	sing object(iron)	8×8×1mm	15 × 15 × 1mm	30 × 30 × 1mm	54 × 54 × 1mm	12 × 12 × 1mm	24 × 24 × 1mm	48 × 48 × 1mm	90 × 90 × 1mm				
Hysteresis			10% max. of se	ensing distance			15% max. of se	ensing distance					
Supply voltag	e			10 to 30	VDC (including 1	0% ripple (p-p)),	Class 2						
Current cons	umption				16mA	max.		en-collector transistor					
Output config	uration		GX-3□-□-P-□ :PNP open-collector transistor , GX-3□-□-N-□: NPN open-collector trans										
Output	Load current	(GX-3	t models:10 to 30 \ 08ML:1-output mod ax., (-40 to 70° C)	lels:10 to 30 VDC,	Class 2,	(GX-308	BMLK:1-output mod	DC,Class 2, 200 n dels:10 to 30 VDC, 100 mA max., (70	Class 2,				
	Residual voltage		1-output mod (Load current: 200 m	iels: 2 V max. A, Cable length: 2 m	)	(		0 to 70° C), 100 mA max., (70 to 85° C) 1-output models: 2 V max. urrent: 200 mA, Cable length: 2 m)					
Operating mo	ode		GX-	3□-A-□-□ : N.O.	(Norma∎y open) ,	GX-3□-B-□-□ :	N.C. (Normally clos	sed)					
Response fre	quency (Note1)	1,000Hz	800Hz	400Hz	100Hz	1,000Hz	800Hz	400Hz 100Hz					
Indicator			the Standard I/O m										
Degree of pro	otection		type, Pigtailed typ Connector type: IE						P67G,				
Pollution deg	ree				3	3							
A <b>l</b> titude					2,000m	or less							
Ambient tem	perature		(	Operating/Storage:	-40 to 85° C (with	no icing or conde	nsation) (Note2)						
Ambient hum	idity			Operating	/Storage: 35% to 9	95% (with no cond	ensation)						
Insulation res	istance			50 MΩ min. (at	500 VDC) between	en current-carrying	parts and case						
	Case	SUS303		Nickel-plated brass	3	SUS303		Nickel-plated brass					
Materia <b>l</b>	Sensing surface				Polybutylene tere	phtha <b>l</b> ate (PBT)							
	Cable				Vinyl chlori	ide (PVC)							
Cable	<u>'</u>		I, heat and cold re cable (Note3)	0.2mm 3-core oi resistant 6 cabty	I, heat and cold re cable (Note4)	0.2mm 3-core oi resistant 4 cabty	I, heat and cold re cable (Note3)	0.2mm 3-core oil resistant 6 cabty					
IO-Link Come specification		IO-Link	specification:Ver.1	I.1、Baud rate:CO	M3 (230.4kbps) 、F	PD size:2byte, OD	size:1byte (M-seq	uence type : TYPE	E2_2)				
Accessories				Clamping nuts (N	ickel-plated brass)	, Toothed washer (	Zinc-plated iron)						

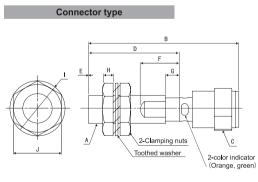
. I) The response requerity is an average value  $\gamma$  of the response requerity is an average value  $\gamma$ . 3) Models with "-R" affixed to the Model No. have 0.2mil 3-core flexible  $\phi$  4 cabtyre cable. 4) Models with "-R" affixed to the Model No. have 0.2mil 3-core flexible  $\phi$  6 cabtyre cable. 5) IO-Link is not supported for NC-type PNP outputs or all types of NPN outputs.

## 8 DIMENSIONS (Unit: mm)



	Shielded Type										
	Α	В	O	Д	Е	F	G	Ι	1	J	
GX-308M(K)	M8 × 1	37.8	4.4	26	-	10	4	3	15	13	
GX-312M(K)	M12×1	47.1	3.7	33	-	12	4	4	21	17	
GX-318M(K)	M18×1	55.3	8.5	38	-	12	4	4	29	24	
GX-330M(K)	M30×1.5	60.3	8.3	43	•	12	4	5	42	36	

		Unshielded Type										
	Α	В	C	Δ	Е	F	G	Ι	1	J		
GX-308ML(K)	M8 × 1	37.8	4.4	26	6	8	-	3	15	13		
GX-312ML(K)	M12×1	47.1	3.7	33	7	10	-	4	21	17		
GX-318ML(K)	M18×1	55.3	8.5	38	10	10	-	4	29	24		
GX-330ML	M30 × 1.5	60.3	8.3	43	13	10	-	5	42	36		
GX-330MLK	M30 × 1.5	82.3	8.3	65	15	10		5	42	36		



		Shielded Type									
	Α	В	С	Д	Е	F	G	Н	1	J	
GX-312M(K)	M12×1	48	M12×1	33	-	12	4	4	21	17	
GX-318M(K)	M18×1	53	M12×1	38	-	12	4	4	29	24	
GX-330M(K)	M30 × 1.5	58	M12×1	43	-	12	4	5	42	36	

	Unshielded Type									
	Α	В	С	D	Е	F	G	Η		J
GX-312ML(K)	M12×1	48	M12×1	33	7	10	-	4	21	17
GX-318ML(K)	M18×1	53	M12×1	38	10	10	-	4	29	24
GX-330ML	M30 × 1.5	58	M12×1	43	13	10	-	5	42	36
GX-330MLK	M30 × 1.5	80	M12×1	65	15	10		5	42	36

Note: Connector type M8 models are not available.

## **Panasonic Corporation**

Panasonic Industrial Devices SUNX Co., Ltd. https://panasonic.net/id/pidsx/global

Please visit our website for inquiries and about our sales network. © Panasonic Industrial Devices SUNX Co., Ltd. 2020 PRINTED IN CHINA