Panasonic Instruction MANUAL

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

MJE-GX3ML No.0070-74V

Questions? - (800)-280-6933 nsales@ramcoi.com

⚠ 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**



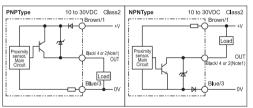
2 PRECAUTIONS

- 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 Sen-
- sor surface may be dissolved. · When turning on the power by influence of temperature environ-
- ment, 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)

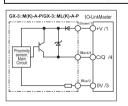
If using the product as a general sensor, it operates in the standard I/O mode (SIO mode).



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.





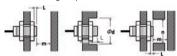


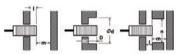
Model No. Part A Part B Shielded Type> Dimension (mm) Torque Torque GX-308M(K) 12N · m 9N • m GX-312M(K) GX-318M(K) 70N • m GX-330M(K)

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		

- 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)

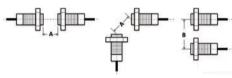




								(Ui	nit:mm
Model No.		Μοι	ıntA			N	/lount	В	
(Shielded Type)	L	d	m	n	- 1	d	D	m	n
GX-308M	0	8	4.5	12	0	8	0	4.5	12
GX-312M	0	12	8	18	0	12	0	8	18
GX-318M	0	18	20	27	0	18	0	20	27
GX-330M	0	30	40	45	0	30	0	40	45
GX-308MK	0	8	4.5	12	0	8	0	4.5	12
GX-312MK	0	18	12	18	2.4	18	2.4	12	18
GX-318MK	0	27	24	27	3.6	27	3.6	24	27
GX-330MK	0	45	45	45	6	45	6	45	45
Model No.	MountA					N	/lount	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



				(Unit:mm)
Model No. (Shielded Type)	Α	В	Model I (Unshielded	Δ	В
GX-308M(K)	20	15	GX-308N	IL(K) 80	60
GX-312M(K)	30	20	GX-312N	IL(K) 120	100
GX-318M	50	35	GX-318	ML 200	110
GX-318MK	60	35	GX-318	VILK 200	120
GX-330M	100	70	GX-330	ML 300	200
GX-330MK	110	90	GX-330	VILK 350	300

Mounting Hole and Nut Dimensions

Mounting hole		Ċ
Nut dimensions		Ċ
	- 0 -	Ġ

		(Unit:mm
Model No.	F	G
GX-308M(K) GX-308ML(K)	φ8.5 ^{+0.5}	13
GX-312M(K) GX-312ML(K)	φ 12.5 ^{+0.5}	17
GX-318M(K) GX-318ML(K)	φ 18.5 ^{+0.5}	24
GX-330M(K) GX-330ML(K)	φ 30.5 ^{+0.5}	36

5 TIMING CHART

		Non-sensing area	Sensing area	Proximity	,
Operati Mode(No		Sensing object Max.	operation distance	Sensor	-
		(%) 101)	0	
Standard	N.O.			ON OFF ON OFF	Communication Indicator(Green) Operation Indicator(Orange
I/O				ON OFF	OUT
mode (SIO)	N.C.			ON OFF ON OFF ON	Communication Indicator(Green) Operation Indicator(Orange
IO-Link mode	N.O.			Flashing (1sec cycle) ON OFF ON OFF	Communication Indicator(Green) Operation Indicator(Orange
(COM) (Note1)	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 communicati Refer to **GX-300** Series INDEXLIST.

6 ERROR INDICATION

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

•			,				
LED 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.				
Blinking	Not Lighting	The load is short-circuited	Check the wiring and connector connection again.				
Not Lighting	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.

To place your order Contact Ramco Innovations -

GX-3 1 1 2 3 4 - 5 - 6 - 7 7 2 :Shape (M:Threaded type) (800)-280-6933 1 :Size (08:M8 , 12:M12 , 18:M18 , 30:M30)

- 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)

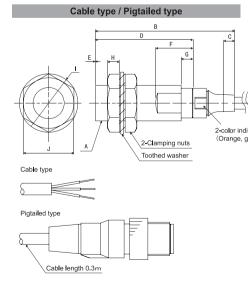
Type					Shie l d	ed Type				
	Norma ll y open	GX-308M-A	GX-312M-A	GX-318M-A	GX-330M-A	GX-308MK-A	GX-312MK-A	GX-318MK-A	GX-330MK-A	
Model No.	Normally closed	GX-308M-B	GX-312M-B	GX-318M-B	GX-330M-B	GX-308MK-B	GX-312MK-B	GX-318MK-B	GX-330MK-B	
Max. operation (Note1)	n distance	1.5mm±10%	2mm±10%	5mm±10%	10mm±10%	2mm±10%	4mm±10%	8mm±10%	15mm±10%	
Stable sensing	g range	GX-308Mr-B GX-312Mr-B GX-318Mr-B GX-330Mr-B GX-308Mr-B 1.5mm±10% 2mm±10% 5mm±10% 10mm±10% 2mm±10% 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	Э			10 to 3	30 VDC (including	10% ripple (p-p)),	Class 2			
Current consu	mption				16m	4 max.				
Output configu	uration		GX-3□-□]-P-□ :PNP open-	collector transistor	, GX-3□-□-N-□:	NPN open-collecto	or transistor		
Output	Load current	(GX-3	t models:10 to 30	els:10 to 30 VDC,0	Class 2,	(GX-30	8MK: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	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.O. (Normally open) , GX-3□-B-□-□:N.C. (Normally 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 prof	tection							IS C 0920 Annex 1: odels : Type1 (UL 5		
Pollution degre	ee					3				
A l titude					2,000n	n or less				
Ambient temp	erature			Operating/Storage	: -40 to 85° C (wit	th no icing or conde	ensation) (Note2)			
Ambient humi	dity			Operatin	g/Storage: 35% to	95% (with no cond	densation)			
Insulation resi	stance			50 MΩ min. (a	at 500 VDC) betwe	en current-carrying	g parts and case			
	Case	SUS303		Nicke l- plated brass	3	SUS303		Nicke l- plated brass	3	
Material	Sensing surface				Polybutylene ter	ephtha l ate (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	, heat and cold recable (Note3)	0.2mm3-core oil resistant 6 cabty		
IO-Link Comm specification (I		IO-Lin	k specification:Ver	.1.1 , Baud rate:C0	OM3 (230.4kbps),	PD size:2byte, OD	size:1byte (M-sec	quence type : TYP	E2_2)	
opeomeation (Clamping nuts (Nickel-plated brass) . Toothed washer (Zinc-plated iron)								

- 1) The Plant response frequency is an average value.
 2) The UL temperature rating for M12 Pigtailed type is -25 to 70°C.
 3) Models with "-R" affixed to the Model No. have 0.2mll 3-core flexible \$\phi\$ 4 cabtyre cable.
 4) Models with "-R" affixed to the Model No. have 0.2mll 3-core flexible \$\phi\$ 6 cabtyre cable.

Type					Unshie l d	led Type					
Madal No	Norma ll 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-E		
Max. operation	on distance	2mm±10%	5mm±10%	10mm±10%	18mm±10%	4mm±10%	8mm±10%	16mm±10%	30mm±10%		
Stable sensir	ng 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	nsing 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	је			10 to 30	VDC (including 1	0% ripple (p-p)), (Class 2				
Current cons	umption				16mA	max.					
Output config	guration		GX-3□-□-P-□ :PNP open-collector transistor , GX-3□-					tor transistor VDC,Class 2, 200 mA max., iodels:10 to 30 VDC,Class 2,), 100 mA max., (70 to 85° C			
Output	Load current	(GX-30	08ML:1-output mod	/DC,Class 2, 200 r lels:10 to 30 VDC,0 , 100 mA max., (70	Class 2,	(GX-308	BMLK:1-output mod	dels:10 to 30 VDC,	Class 2,		
	Residual voltage		1-output models: 2 V max. (Load current: 200 mA, Cable length: 2 m) GX-3□-A-□-□: N.O. (Normally open), GX-3□-B-□-□: N.C. (Normally dosed)								
Operating me	ode		GX-	3□-A-□-□ : N.O.	(Norma∎y open) ,	GX-3□-B-□-□ : I	N.C. (Normally clos	sed)			
Response fre	equency (Note1)	1,000Hz	800Hz	400Hz	100Hz	1,000Hz	800Hz	400Hz	100Hz		
Indicator				node (SIO mode): (COM mode): Op							
Degree of pr	otection			e: IEC 60529:IP67, C 60529:IP67, ISO					P67G,		
Pollution deg	ree				3	3					
A l titude					2,000m	or less					
Ambient tem	perature		(Operating/Storage:	-40 to 85° C (with	n no icing or conde	nsation) (Note2)				
Ambient hum	nidity			Operating	/Storage: 35% to 9	95% (with no conde	ensation)				
Insulation res	sistance			50 MΩ min. (at	500 VDC) between	en current-carrying	parts and case				
	Case	SUS303		Nickel-plated brass	3	SUS303		Nickel-plated brass	3		
Materia l	Sensing surface				Polybutylene tere	ephtha l ate (PBT)					
	Cable				Vinyl chlori	ide (PVC)					
		0.044.2	0.2mm 3-core oil, heat and cold 0.2mm 3-core oil, heat and col								
Cable				resistant 4 cabtyre cable (Note3) resistant 6 cabtyre cable (Note4) resistant 4 cabtyre cable (Note3) resistant 6 cabtyre cable (Note3) resist							
Cable IO-Link Com specification		resistant 4 cabty	re cable (Note3)	,		,		,			

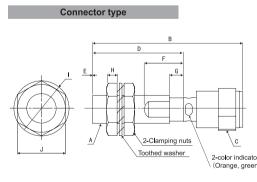
- : 1) I ne response frequency is an average value. 2) The UL temperature rating for M12 Pigtalled type is -25 to 70°C. 3) Models with "-R" affixed to the Model No. have 0.2mil 3-core flexible ϕ 4 cabtyre cable. 4) Models with "-R" affixed to the Model No. have 0.2mil 3-core flexible ϕ 6 cabtyre cable. 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	С	D	Е	F	G	Н	1	۲	
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	O	Д	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	ш	F	G	Ι	1	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

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