G48 SERIES

Electronic Preset Counter Instruction Manual

G48

ATTENTION

Please note that misuse of this device may lead to injury to the user or damage to the device.
Please observe all safety precautions and warnings in this instruction manual.

Thank you for purchasing our G48 Preset Counter.
Please read this instruction manual carefully before using to ensure the correct usage of this device.
Please keep this instruction manual for future reference.

⚠ ATTENTION

POUR UTILISATION EN ATMOSPHERE CONTROLEE.
FOR USE IN A CONTROLLED ENVIRONMENT.

⚠ ATTENTION

- Do not use this device near machines that emit strong electromagnetic fields or objects that store static electricity.
- Do not drop or subject this device to strong impact.
- Do not use or store this device where it will be exposed to water or in places with wet conditions.
- Do not use or store this device where it can be exposed to direct sunlight, dust, high temperature and high humidity.
- Do not attempt to disassemble or modify this device.
- Mount to the front panel when using this device. (Indoor use)
- Do not use organic solvents such as thinners etc. to clean the front panel.
- Internal circuit may be destroyed if a voltage outside the rated voltage is applied.

⚠ Conformance to EN/IEC standards

- Basic insulation is provided between Power supply - Input circuit - Output circuit.
- (Non-insulation is provided between Power supply - Input circuit for model G48-306)
- When reinforced insulation (Double insulation) is required, apply basic insulation to the external-circuit-side.)
- Use external fuse (200mA) to the power supply input. (IEC60127)

■ MODELS

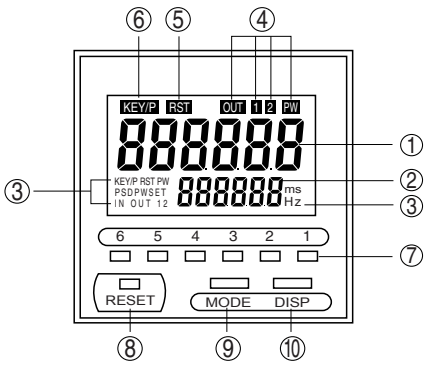
Model	Digit	Preset	Power source	Input	Body length
G48-305	6	1 level preset	AC100 - 240V	Contact / Open collector Voltage input (SELECTABLE)	100 mm
G48-306			DC12 - 24V		64 mm
G48-315		2 level preset	AC100 - 240V		100 mm
G48-325		1 level preset + prewarn			

■ FRONT PANEL FEATURES

① Count display
② Preset/Programming Setting display
③ Program item display

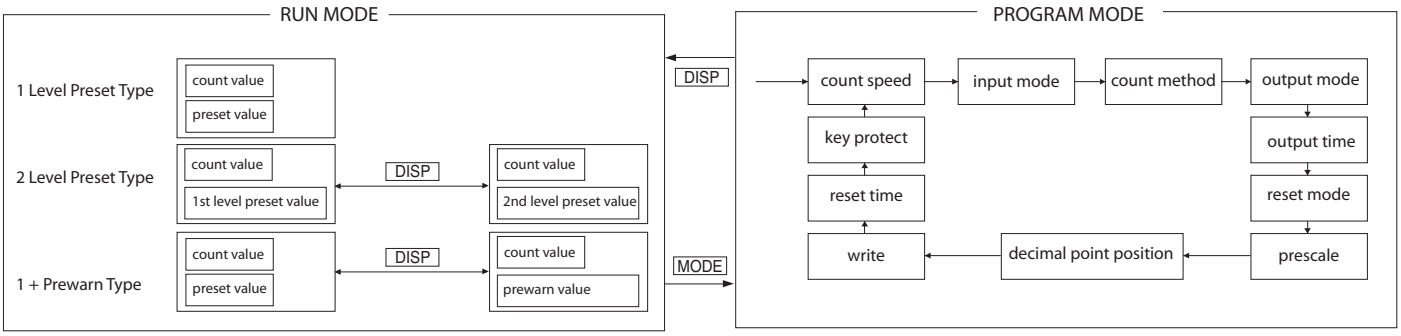
IN Hz	: count speed		W	: freewrite	
IN	: input mode / count mode		RST ms	: reset time	
OUT	: output mode		KEY/P	: key lock protection	
OUT ms	: output time		SET	: preset value setting	
PS	: prescale		PW	: prewarn value setting	
DP	: decimal point position				

④ Output indicator
⑤ External reset input indicator
⑥ External key lock indicator
⑦ Individual digit setting keys (Key 1 ….Key 6)
⑧ Reset key
⑨ Mode key
⑩ Display key



■ BASIC OPERATION

The G48 has 2 operation modes. Settings such as selection of input modes and count modes are done in the Program Mode.
Counting and Preset Values setting are done in the Run Mode. Use the [MODE] key to enter the Program Mode and the [DISP] key to return to the Run Mode.



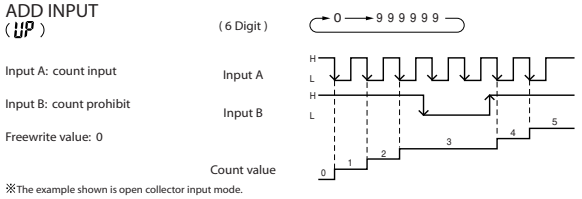
■ PROGRAMMING

● Count Speed 30Hz, 1000Hz, or 5000Hz can be selected. Default setting is 30Hz.

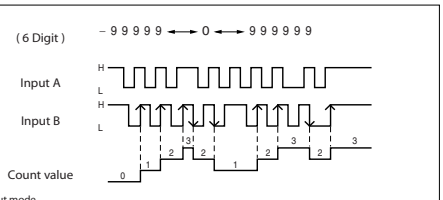
● Input Mode Contact / Open collector or Voltage input modes can be selected. Default setting is Contact/Open Collector.

● Count Mode One of the following 5 count modes can be selected. Default setting is UP :

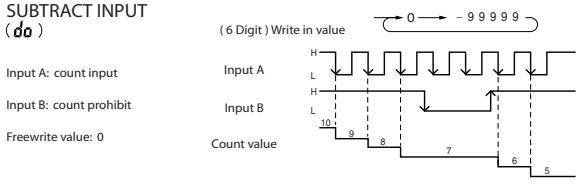
ADD INPUT (UP)



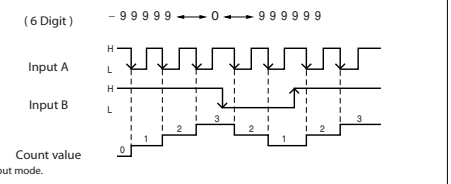
QUADRATURE INPUT (9uAd)



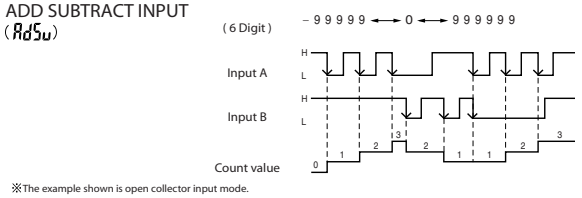
SUBTRACT INPUT (do)



DIRECTION INPUT (dir)



ADD SUBTRACT INPUT (AdSu)



● OUTPUT MODE One of the following 6 output modes can be selected. Default setting is Std .

Standard Output	Std	Output occurs when count value reaches preset value. Different output conditions can be set. (One-Shot (10~9990ms), Hold, Hold1, Hold2)
Equal Output	EquAL	Output occurs only when and continues as long as count value is equal to preset value.
Lower Limit Output	LL	Output occurs when count value reaches below the set value.
Upper Limit Output	UL	Output occurs when count value reaches above the set value.
Upper - Lower Limit Output	LL-UL	Output occurs when count value reaches below (Lower) or above (Upper) the set value.
Upper 1 - Upper 2 Limit Output	UL-HUL	Output occurs when count value reaches above the set value.

● Output Time

For Standard Output Mode, all the Output Time are available.

For other Output Modes other than Standard Output Mode, only HOLD output time is available.

Hold	HoLd	Output is Latched until a Reset signal is sent.	1 Level Preset, OUT2 of 2 Level Preset, OUT2 of Prewarn + 1 Level Preset
Hold 1	HoLd-1	Output is Latched until Output 2 goes away.	OUT1 of 2 Level Preset, PW or Prewarn + 1 Level Preset
Hold 2	HoLd-2	Output is Latched until a Reset signal is sent, independent from Output 2.	
One Shot	10~9990ms	Output time can be set from 10 ~ 9990ms (at 10ms steps).	All Models

● Reset Mode

There are 7 Reset Modes available.

The output below refers to the 1 Level Preset model, OUT2 of 2 Level Preset Model and to the OUT2 in the Prewarn + 1 Level Preset Model. Default setting is Mode A.

Mode A	A	Unit counts during output signal duration.	Overrun (Without Auto-Reset)
Mode B	b	Unit does not count during output signal duration.	
Mode C	C	Unit does not count during and after output signal duration.	
Mode D	d	Unit resets at rising edge of output signal.	Auto-Reset
Mode E	E	Unit resets at falling edge of output signal. (For One-Shot Output time only)	
Mode F	F	Unit resets at falling edge of output signal, unit display frozen during output signal duration. (For One-Shot Output time only)	
Mode G	G	Unit resets at falling edge of output signal, unit display frozen during output signal duration. (For One-Shot Output time only)	

● Prescale

Incoming pulses can be prescaled to display the desired measuring unit. The prescale can be set at any value within the range of 0.001 ~ 99.999. Default setting is 1.000.

Prescale Formula: $PS = \frac{\text{Desired Display Value (per unit)}}{\text{Pulse Number (per unit)}}$

<Examples>
1. To display 1 count per 10 pulses : PS value = 0.1
2. To display 1 count per 5 pulses : PS value = 0.2
3. To display 2 counts per 1 pulse : PS value = 2

● Decimal Point Position

Decimal point position can be selected from the following settings: 0, 0.0, 0.00, 0.000. Default setting is 0.

● Free Write

Any desired value can be set on the unit as the starting count value of the counter. The counter will add to or subtract from the set value. Upon every reset, the set value will be displayed. Default setting is 0.

● Reset Time

Reset time sets minimum pulse time of remote reset signal. Reset time can be set to 2ms or 20ms. Default setting is 20ms.

● Key Protect

There are 4 protection levels. Default setting is Level 1.

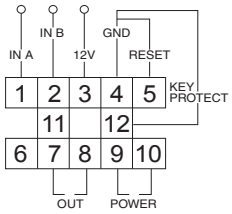
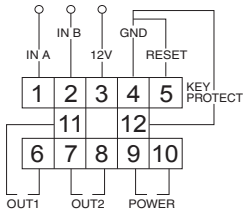
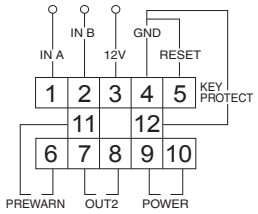
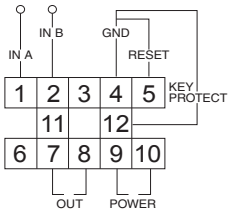
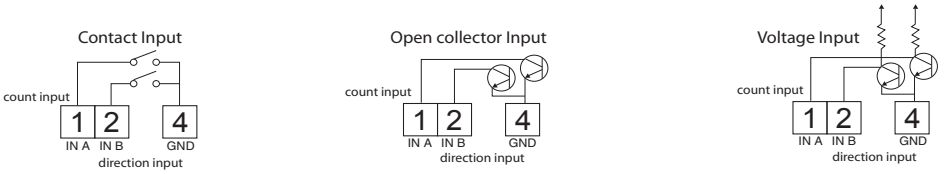
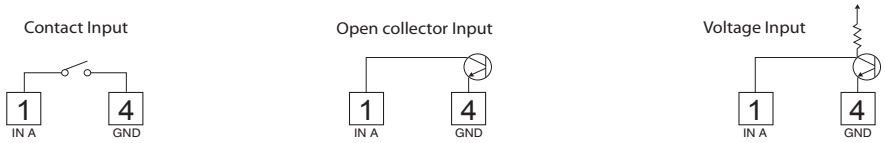
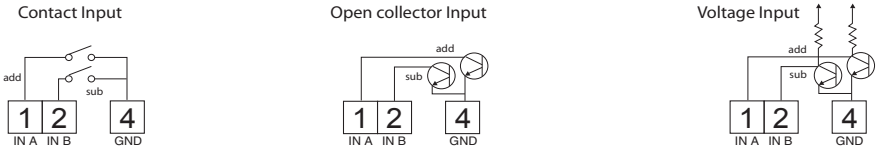
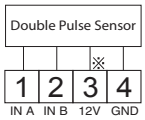
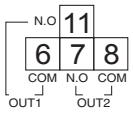
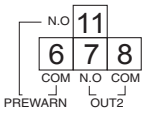
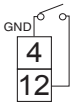
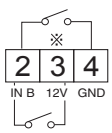
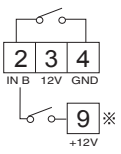
Level 1	L1	Lock program	Protection level can be selected in the Program Mode.
Level 2	L2	Lock program & front key reset	
Level 3	L3	Lock program & preset	
Level 4	L4	Lock program, front key reset & preset	

■PROGRAM MODE OPERATION

Press [MODE] to select program menu items. Press individual digit setting keys to change setting values.

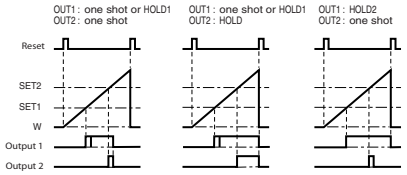
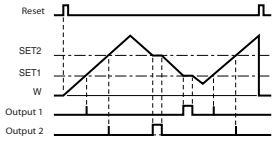
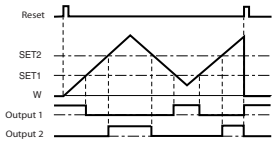
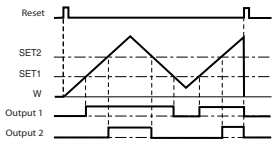
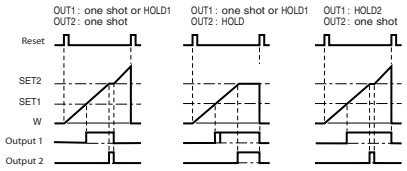
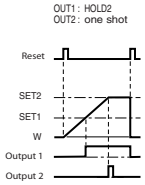
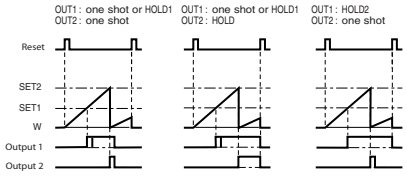
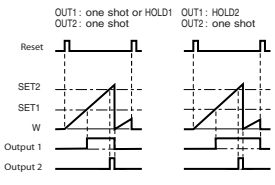
Program Item	Program Item Display	Setting Values	Setting Key	Default Value
Count Speed	IN Hz	30 → 1000 → 5000	Key 1 will select the desired value	30 (Hz)
[MODE]				
Input Mode	IN	n → P n is contact/open collector input mode. P is voltage input mode.	Key 1 will select the desired value	n (contact / open collector)
[MODE]				
Count Mode	IN	UP→do→AdSu→QuAd→di r	Key 1 will select the desired value	UP (Add)
[MODE]				
Output Mode	OUT (1 level preset)	Std→EQuAL→LL→UL	Key 1 will select the desired value	Std
	(2 level preset)	Std→EQuAL→LL-UL→UL-HUL		
[MODE]	(1 level preset + prewarn)	Std→EQuAL		
Output Time	OUT ms (1 level preset output)	0→1→2 ---------- 8→9	Keys 2 ~ 4 will change digits	HoLd
		1230 → HoLd The output time will automatically become Std if the output mode is different than HoLd	Key 1 will select the desired value	
[MODE]	OUT1 ms (1st preset of 2 level preset model) (prewarn output)	0→1→2 ---------- 8→9	Keys 2 ~ 4 will change digits	HoLd-1
		1230 → HoLd-1 → HoLd-2 The output time will automatically become Std if the output mode is different than HoLd	Key 1 will select the desired value	
[MODE]	OUT2 ms (2nd preset of 2 level preset model) (main output of 1P+1PW model)	0→1→2 ---------- 8→9	Keys 2 ~ 4 will change digits	HoLd
		1230 → HoLd The output time will automatically become Std if the output mode is different than HoLd	Key 1 will select the desired value	
Reset Mode	tP	A→b→C→d→(E)→(F)→(G) Only mode A can be set if the output mode is different than Std Mode E, F, G, can only be set if OUT or OUT 2 is programmed to one shot output.	Key 1 will select the desired value	tP_A (Mode A)
[MODE]				
Prescale	PS	0→1→2 ---------- 8→9 Prescaler setting range : 0.001 ~ 99.999	Keys 1 ~ 5 will change the corresponding digit	1.000
[MODE]				
Decimal Point Position	DP	0 → 0.0 → 0.00 → 0.000	Key 1 will select decimal point position	0
[MODE]				
Write	W	0→1→2 ---------- 8→9	Press corresponding numeric keys	0
[MODE]				
Reset	RST ms	2 → 20	Key 1 will select the desired value	20 (ms)
[MODE]				
Key Lock	KEY/P	L1→L2→L3→L4	Key 1 will select the desired protection level	L1 (Level 1)
[MODE]				

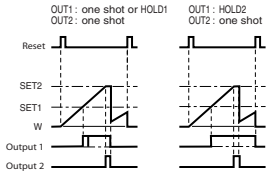
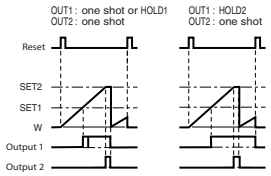
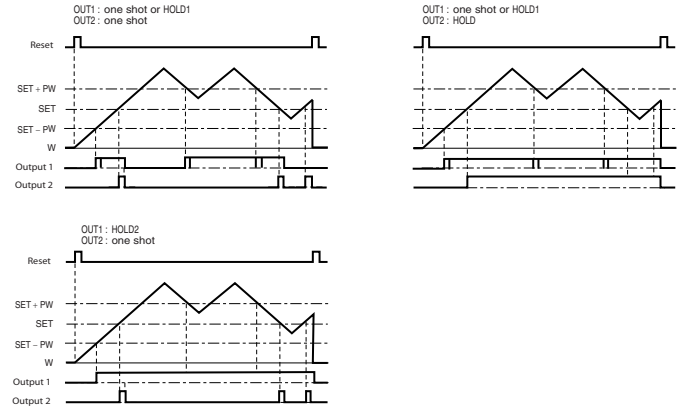
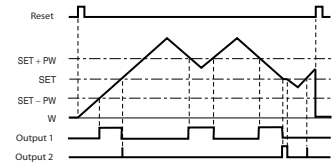
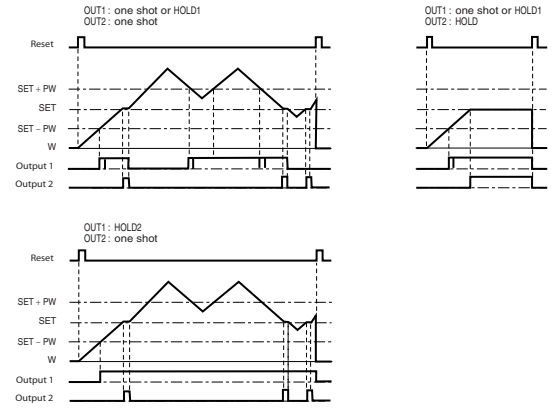
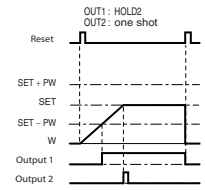
■ WIRING AND REAR TERMINALS

MODELS	G48-305	G48-315	G48-325	G48-306
PRESET LEVELS	1 level	2 levels	1 level + prewarn	1 level
REAR TERMINALS				
POWER SOURCE	 Supply 100~240VAC to terminals 9 & 10.			 Supply 12~24VDC to terminals 9 & 10.
INPUT	Add/Sub Direction Input (1 input) — Depending on the status of input B (ON/OFF), pulses at input A will be added to or subtracted from pulse register. Counter will add pulses while terminals 2 and 4 are disconnected, and subtract pulses while shorted.  Add or Subtract Input (1 input)  Individual Add and Subtract Input (2 inputs)  90°Quadrature Input (2 inputs)  ※ For DC Powered model, use terminal 9 instead of terminal 3. ⚠ Caution Be careful not to apply voltage exceeding DC30V. Internal circuit may be destroyed and may have the risk of electric shock if a voltage exceeding DC75V is applied in single-fault-conditions.			
OUTPUT				
RESET	 To reset remotely, short terminals 4 and 5 with a relay, microswitch, etc. (The unit does not count while shorted)			
KEY PROTECT	 To disable keys at any of the 4 protection levels short terminals 4 and 12. (See Program Mode).			
COUNT DISABLED	In case of Add or Subtract input (1 input), Terminal 1 is a count input terminal and terminal 2 is a count disable terminal. To disable counting, short the indicated terminals in the wiring diagrams below. Pulses will be ignored while these terminals remain shorted.			
	 For Contact/Open Collector input mode 2 and 4. ※ For Voltage input mode, 2 and 3.			 For Contact/ Open Collector, 2 and 4. ※For Voltage input mode, 2 and 9.

■ OPERATION MODE AND OUTPUT MODE

One of the following Operation mode tP and output mode OUT can be selected.

Type	Operation Mode	Output Mode	Operation Example
2 level (or 1 level) preset	Mode A tP_A [counts during output in overrun]	Standard Output Std	 [In case of 1 level preset models operation is the same as OUT 2 operation.]
		Equal Output EquAL	 [In case of 1 level preset models operation is the same as OUT 2 operation.]
		Upper and lower limit outputs LL-UL (LL)	 [In case of 1 level preset models operation is the same as OUT 1 operation.]
		Upper limit outputs 1 & 2 UL-HUL (UL)	 [In case of 1 level preset models operation is the same as OUT 1 operation.]
	Mode B tP_b [does not count during output in overrun]	Standard Output Std	 [In case of 1 level preset models operation is the same as OUT 2 operation.]
	Mode C tP_C [does not count during and after output in overrun]	Standard Output Std	 [In case of 1 level preset models operation is the same as OUT 2 operation.]
	Mode D tP_d [auto-reset at rising edge of output]	Standard Output Std	 [In case of 1 level preset models operation is the same as OUT 2 operation.]
	Mode E tP_E [auto-reset at falling edge of output]	Standard Output Std	 [In case of 1 level preset models operation is the same as OUT 2 operation.]

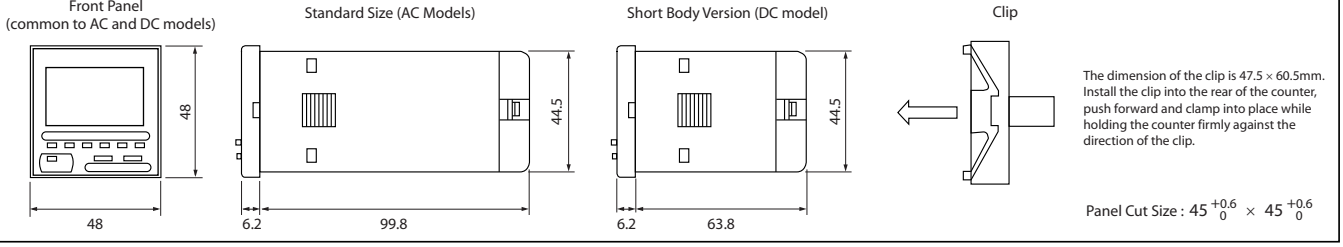
Type	Operation Mode	Output Mode	Operation Example
2 level (or 1 level) preset	Mode F tP_F [auto-reset at falling edge of output, display "frozen"during output]	Standard Output Std	 [In case of 1 level preset models operation is the same as OUT 2 operation.]
	Mode G tP_G [auto-reset at falling edge of output, display "frozen"during output]	Standard Output Std	 [In case of 1 level preset models operation is the same as OUT 2 operation.]
1 level preset + prewarn	Mode A tP_A [counts during output in overrun]	Standard Output Std	
		Equal Output EQuAL	
	Mode B tP_b [does not count during output in overrun]	Standard Output Std	
	Mode C tP_C [does not count during and after output in overrun]	Standard Output Std	

Modes D, E, F, & G in 1 level preset + prewarn models are similar to those in 2 preset level ones: the main output in these models corresponds to SET 2 and the prewarn corresponds to SET 1.
Latched (HOLD) output returns to the initial status of power interruption when the power is recovered after power interruption.

SPECIFICATIONS

MODEL	G48-305	G48-315	G48-325	G48-306
DISPLAY	LCD display with backlight ; Digit Size : 10mm x 5mm			
NO. OF DIGITS	6			
NO. OF DIGIT SETTING KEYS	6			
PRESET LEVEL	1 Level	2 Levels	1 level preset + prewarn	1 Level
SETTING RANGE	–99999 – 999999			
PREWARN FEATURE	—		0 – 999999	—
INPUT MODE	Contact / Open Collector / Voltage (selectable)			
INPUT SIGNAL	Open Collector (Sink current 10mA, DC power model: power supply volt / 1.2KΩ) L : 0 - 4V Voltage (Input impedance 7KΩ) L : 0 - 4V H: 6 - 30V (Available to duplex wire DC sensor.)			
COUNT SPEED	30Hz, 1kHz, 5kHz (selectable)			
COUNT MODE	Add, Subtract, Add/Subtract (Add/Subtract individual input, Add/Subtract direction, 90° quadrature input)			
COUNT RANGE	–99999 – 999999			
INPUT INHIBITION	Incoming pulses in either add or subtract mode can be inhibited at input B only.			
PRESCALE	0.001 – 99.999 (0 setting is not available)			
DECIMAL POINT POSITION	0.0, 0.00, 0.000, (No decimal point)			
WRITE	–99999 ~ 999999			
RESET	Front panel reset, Remote reset, Auto-reset			
REMOTE RESET TIME	2msec or 20msec (selectable)			
RESET MODE	Modes A, B, C, D, E, F, G can be selected. Except for standard output, Mode A only is available for other output modes.			
MEMORY	E^2PROM (10 years, can be used 100,000 times)			
OUTPUT	Relay output (1a) : load of 250VAC 5A / 30VDC 5A maximum			
OUTPUT DELAY	30Hz : 20msec, 1kHz & 5kHz : 7msec.			
TYPE OF OUTPUT	1 Level Preset: Standard, Equal, Lower Limit, Upper Limit / 2 Level Preset: Standard, Equal, Upper-Lower Limit, Upper-Upper Limit / 1 Level Preset + Prewarn: Standard, Equal			
OUTPUT TIME	Standard output : one shot (10 ~ 9990msec) or HOLD or HOLD 1 or HOLD 2 Equal, Upper, Lower output : Latched only when requirements are full			
KEY LOCK	Key operation can be disabled at 4 protection levels (L1, L2, L3, L4) by selecting in Program Mode and shorting key lock terminals.			
ERROR DISPLAY	In Add/subtract mode, error message will be displayed on the LCD if the count range is exceeded (overflow error : o-Er underflow error : u-Er)			
POWER SUPPLY	AC100 – 240V –15%, +10%			DC12~24V –15%, +10%
SENSOR POWER SOURCE	DC12V 100mA			—
POWER CONSUMPTION	Approx. 7VA for 240VAC			Approx. 1.2W for 24VDC
AMBIENT TEMP./HUMID. : OPERATING	–10°C – +50°C (non-freezing, non-condensing) 45 – 85%RH (non-freezing, non-condensing)			
ALTITUDE	2,000m max.			
INSTALLATION ENVIRONMENT	Over-voltage category II , Pollution degree 2 (IEC61010-1)			
FRONT PANEL	IP54 (panel surface)			
COMPLIANCE	CE, UL(UL508), cUL(CSA C22.2 No.14), RoHS			
WEIGHT	Approx. 170g			Approx. 110g

DIMENSIONS



This manual was last revised Feb. 27,2015. 4G48001C