E48 Series

Electronic Preset Counter Instruction Manual

E48 Series

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 E48 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.

Customer Service

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⚠ 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 E48-☐☐2)
- 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
E48-101(K) / E48-111(K)	6	1 level preset	AC100 - 240V	Contact / Open collector Voltage input (SELECTABLE)	100mm
E48-102(K) / E48-112(K)			DC12 - 24V		64mm
E48-201(K) / E48-211(K)		2 level preset	AC100 - 240V		100mm
E48-301(K) / E48-311(K)		1 level preset + prewarn			

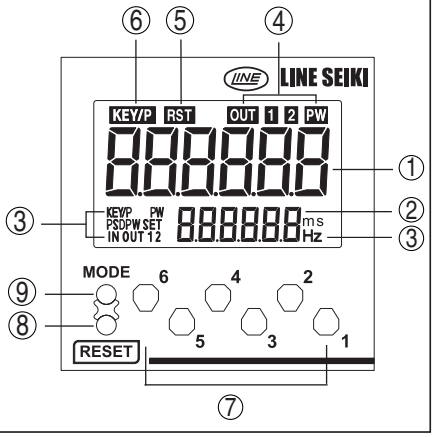
"K" should be added to the model number : Remote Key Protect

■ FRONT PANEL FEATURES

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

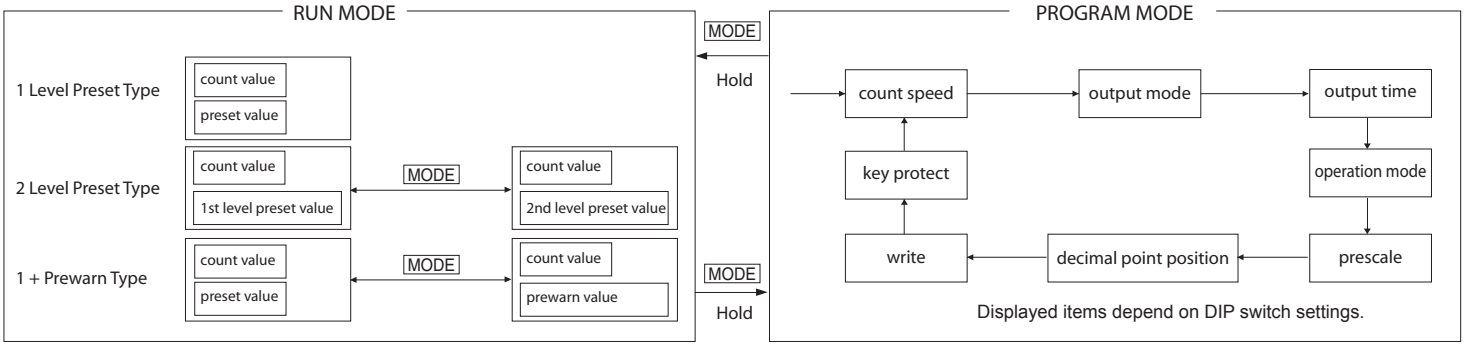
IN Hz	count speed
OUT	output mode
OUT ms	output time
PS	prescale
DP	decimal point position
W	write
KEY/P	key lock protection
SET	preset value setting
PW	prewarn value setting

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



BASIC OPERATION

The E48 has 2 operation modes. "Counting" and "Preset Values setting" are done in the Run Mode. Settings such as selection of countspeed and output mode etc. are done in the Program Mode. By pressing and holding the MODE key for more than 2 seconds, selection of mode becomes possible.

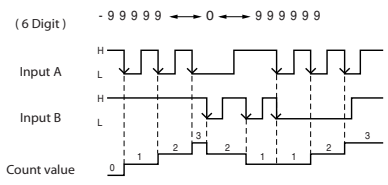


PROGRAMMING

The setting of the unit is configured using the DIP switch and the Program mode. Set the DIP switch first. The DIP switch enables to set the Input mode, Count speed, Count mode, Reset time, etc. The Program mode enables to set the Output mode, Operation mode, Prescale, Decimal point, etc.

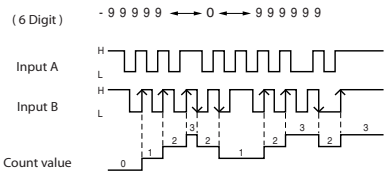
- Count Speed — Low Speed (30Hz) or High Speed (1kHz, 5kHz or 10kHz selectable; default setting is 1kHz)
- Input Mode — Contact / Open collector or Voltage input modes can be selected.
- Count Mode — Individual Add/Subtract mode or Quadrature input mode selectable

ADD SUBTRACT INPUT (AdSu)



The example shown is open collector input mode.

QUADRATURE INPUT (QuAd)



The example shown is open collector input mode.

- 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

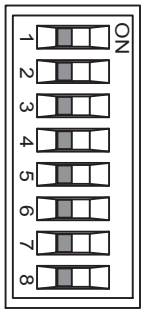
For Standard Output Mode, all the Output Time are available.
For other Output Modes other than Standard Output Mode, only HOLD output time is available.

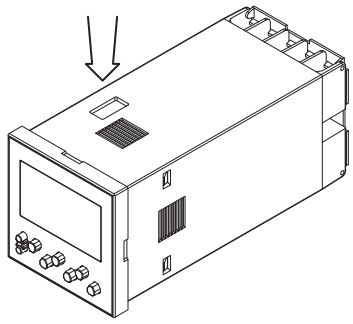
Hold	HoLd	Output is Latched until a Reset signal is sent.	1 Level Preset, OUT2 of 2 Level Preset, OUT2 of Prewarn + 1 Level Preset
Hold 1	HoLd-1	Output is Latched until Output 2 goes away.	OUT1 of 2 Level Preset, PW or Prewarn + 1 Level Preset
Hold 2	HoLd-2	Output is Latched until a Reset signal is sent,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

DIP SWITCH SETTINGS

		OFF		ON
DP1	INPUT MODE	CONTACT/OPEN COLLECTOR INPUT		VOLTAGE INPUT
DP2	COUNT SPEED	LOW_SPEED(30Hz)		HIGH_SPEED(1kHz,5kHz,10kHz) Select in the Program Mode
DP3	COUNT MODE	ADD/SUBTRACT INPUT		QUADRATURE INPUT
DP4	OUTPUT TIME	HOLD		100ms
DP5	OPERATION MODE	OVER RUN		AUTO_RESET
DP6	DP4 & DP5 ENABLE	DISABLE		ENABLE
DP7	RESET TIME	20ms		2ms
DP8	KEY PROTECT ENABLE	DISABLE		ENABLE

Operation mode and Output time can be set simply





		DP5 (OPERATION MODE)	
		OFF (OVER RUN)	ON (AUTO RESET)
DP4 (OUTPUT TIME)	OFF (HOLD)	MODE A STANDARD OUTPUT HOLD	MODE D STANDARD OUTPUT HOLD
	ON (ONE SHOT : 100ms)	MODE A STANDARD OUTPUT ONE SHOT (100ms)	MODE D STANDARD OUTPUT ONE SHOT (100ms)

Note

Turn OFF the unit before changing the DIP switch settings.
Any changes in the DIP switch settings will not take effect until the unit is switched OFF then powered ON.
Default of DIP switch is all OFF.

● Operation Mode

There are 7 Operation Modes available.
The output below refers to the 1 Level Preset model, OUT2 of 2 Level Preset Model and to the OUT 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
2. To display 1 count per 5 pulses
3. To display 2 counts per 1 pulse : PS value = 0.1
: PS value = 0.2
: 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.

● 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.

● Key Protect

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

Level 1	L1	Lock program	Key protection becomes effective when DIP switch (DP8) is ON.	Dip SW8 of K Type is deactivated.
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 and hold 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	1000 → 5000 → 10000 If DP2 is OFF(30Hz; see DIP switch setting), "Count Speed" is not displayed.	Key 1 will select the desired value	1000 (Hz)
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		
	(1 level preset + prewarn)	Std→EquAL If DP6 is ON(see DIP switch setting), "Output Mode" is not displayed.		
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 HoLd if the output mode is different than Std	Key 1 will select the desired value	
	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 HoLd if the output mode is different than Std	Key 1 will select the desired value	
	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 HoLd if the output mode is different than Std If DP6 is ON (see DIP switch setting), "Output Time" is not displayed.	Key 1 will select the desired value	
Operation 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. If DP6 is ON (see DIP switch setting), "Operation Mode" is not displayed.	Key 1 will select the desired value	tP_A (Mode A)
Prescale	PS	0→1→2 ---------- 8→9 Prescaler setting range : 0.001 ~ 99.999	Keys 1 - 5 will change the corresponding digit	1.000
Decimal Point Position	DP	0 → 0.0 → 0.00 → 0.000	Key 1 will select decimal point position	0
Write	W	0→1→2 ---------- 8→9	Press corresponding numeric keys	0
Key Lock	KEY/P	L1→L2→L3→L4	Key 1 will select the desired protection level	L1 (Level 1)

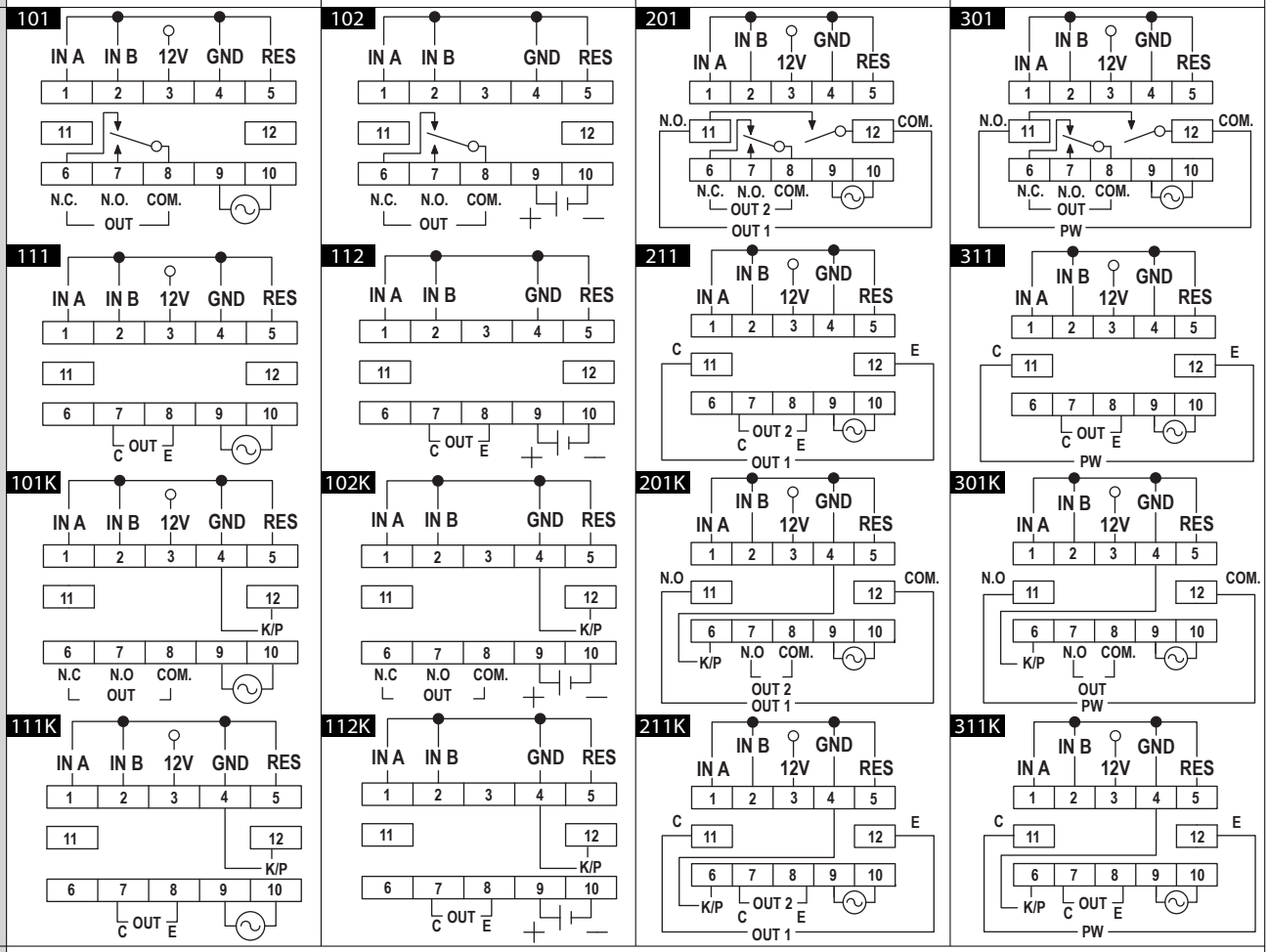
MODE

■ WIRING AND REAR TERMINALS

MODELS	E48-101(K),E48-111(K)	E48-102(K),E48-112(K)	E48-201(K),E48-211(K)	E48-301(K),E48-311(K)
PRESET LEVELS	1 level	1 level	2 levels	1 level + prewarn

REAR TERMINALS

Note(K Type) :
K Type is Remote Key Protect Type.
Short terminals to activate key protect.
Dip SW8 is deactivated.



POWER SOURCE

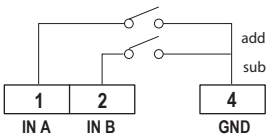
Supply 100 - 240VAC to terminals 9 & 10.

Supply 12 - 24VDC to terminals 9 & 10.

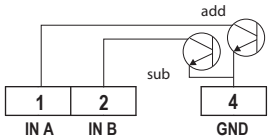
INPUT

Individual Add and Subtract Input (2 inputs)

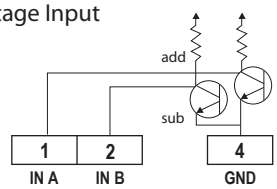
Contact Input



Open collector Input

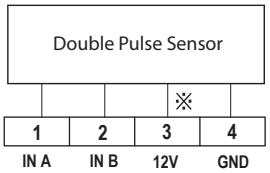


Voltage Input



90° Quadrature Input (2 inputs)

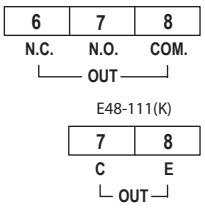
Double Pulse Sensor

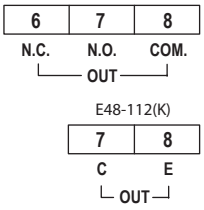


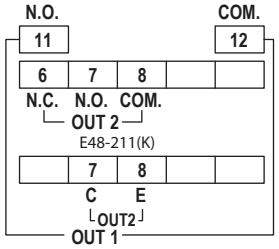
※ For DC Powered model, use terminal [9] instead of terminal [3]

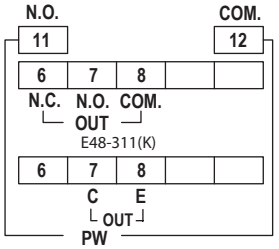
⚠ Caution
Be careful not to apply voltage exceeding DC30V. Internal circuit may be destroyed and may have the risk of electric shock if a voltage exceeding DC75V is applied in single-fault-conditions.

OUTPUT

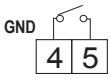








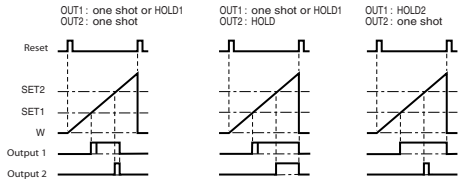
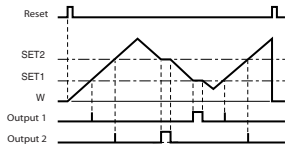
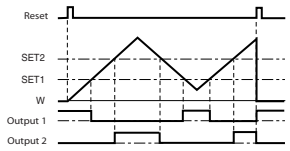
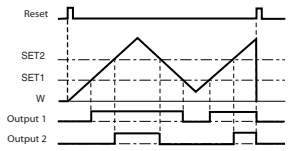
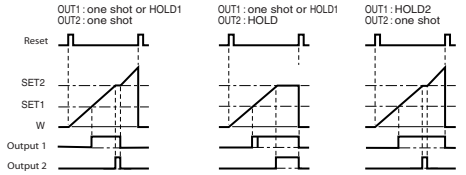
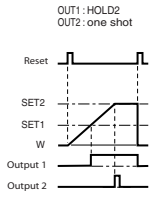
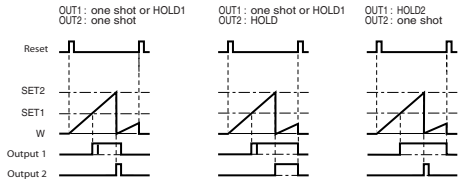
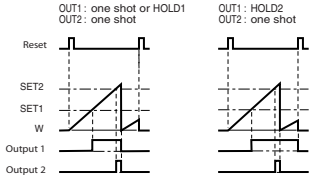
RESET

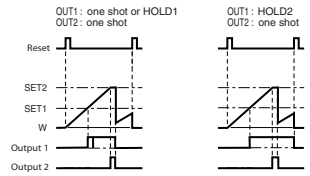
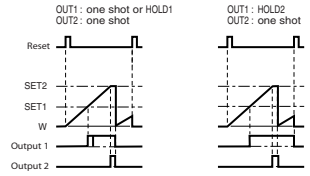
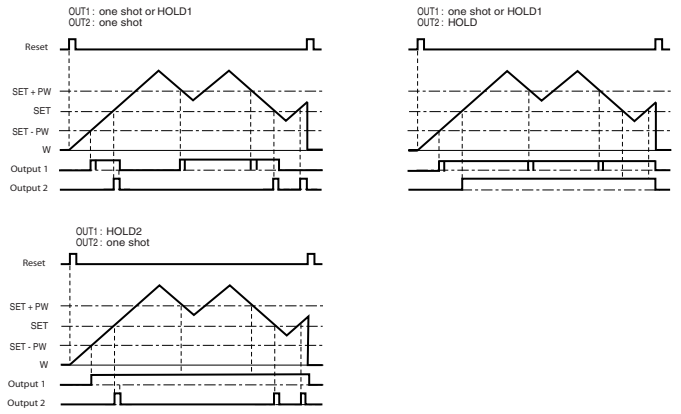
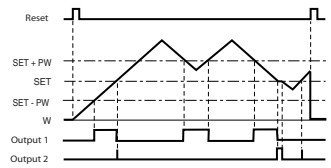
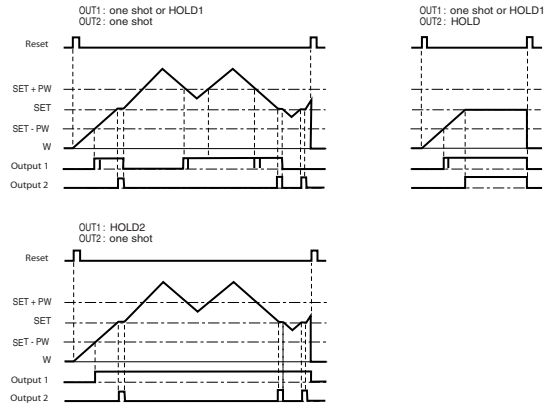
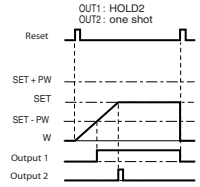


To reset remotely, short terminals 4 and 5 with a relay, microswitch, etc.
(The unit does not count while shorted)

■ 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	

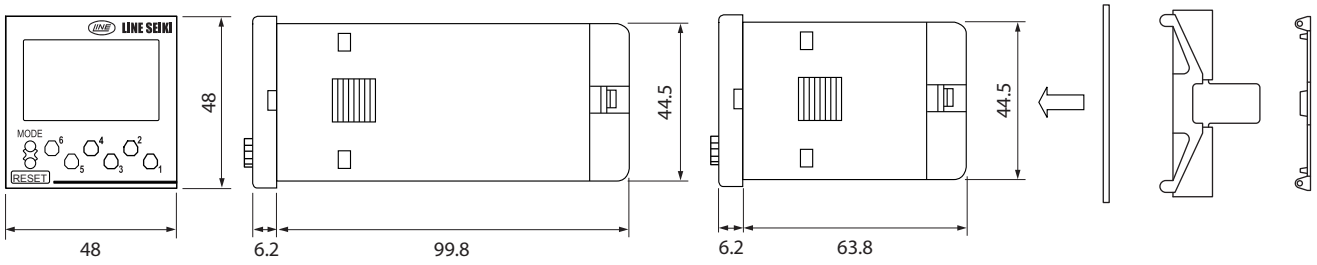
Modes D, E, F, & G in 1 level preset + prewarn models are similar to those in 2 preset level ones: the main output in these models corresponds to SET 2 and the prewarn corresponds to SET 1.
Latched (HOLD) output returns to the initial status of power interruption when the power is recovered after power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

SPECIFICATIONS

MODEL	E48-101(K),E48-111(K)	E48-102(K),E48-112(K)	E48-201(K),E48-211(K)	E48-301(K),E48-311(K)
DISPLAY	Blue STN LCD display with white backlight ; Digit Size : 10mm x 5mm			
NO. OF DIGITS	6			
NO. OF DIGIT SETTING KEYS	6			
PRESET LEVEL	1 Level	1 Level	2 Levels	1 level preset + prewarn
SETTING RANGE	-99999 - 999999			
PREWARN FEATURE	—	—	—	0 - 999999
INPUT MODE	Contact / Open Collector / Voltage (selectable)			
INPUT SIGNAL	Open Collector (Sink current approx. 11mA) L : 0 - 4V / Voltage (Input impedance 7KΩ) L : 0 - 4V H: 6 - 30V (Available to duplex wire DC sensor.)			
COUNT SPEED	30Hz, 1kHz, 5kHz , 10kHz (selectable)			
COUNT MODE	Add/Subtract (Add/Subtract individual input, 90° quadrature input)			
COUNT RANGE	-99999 - 999999			
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	2ms or 20ms (selectable)			
OPERATION 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	1level (101/102): Relay output (1c) : load of AC250V 5A / DC30V 5A MAX.	2level (201): 1 level preset + prewarn (301): AC250V 5A / DC30V 5A MAX. Relay output (1a,1c) : load of AC250V 5A / DC30V 5A MAX.	☐1☐ Type: DC45V / 100mA MAX. Non-contact output NPN Open-collector : DC45V / 100mA MAX.	
OUTPUT DELAY	☐0☐Type 30Hz: 17ms MAX. ; 1kHz,5kHz,10kHz: 12ms MAX.	☐1☐ Type 30Hz: 7ms MAX. ; 1kHz,5kHz,10kHz: 2ms MAX.		
OUTPUT MODE	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 - 9990ms) or HOLD or HOLD 1 or HOLD 2 Equal, Upper, Lower output : Latched only when requirements are full			
ERROR DISPLAY	In 90° quadrature 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%	AC100 - 240V -15%, +10%	AC100 - 240V -15%, +10%
SENSOR POWER SOURCE	DC12V 100mA	—	DC12V 100mA	DC12V 100mA
POWER CONSUMPTION	Approx. 7VA for AC240V	Approx. 2.5W for DC24V	Approx. 7VA for AC240V	Approx. 7VA for AC240V
OPERATING TEMPERATURE	-10°C - +50°C (non-freezing) 45 - 85%RH (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. 160g	Approx. 120g	Approx. 160g	

DIMENSIONS

Front Panel(common to AC and DC models) Standard Size (AC Models) Short Body Version (DC model) Accessories (Gasket, Clip, and Terminal Cover)



Panel Cut Size : $45\ ^{+0.6}_{0} \times 45\ ^{+0.6}_{0}$

The dimension of the clip is 47.5 x 60.5mm.Install the clip into the rear of the counter, push forward and clamp into place while holding the counter firmly against the direction of the clip.

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*Subject to change without prior notice.