LINE SEIKI

G60 SERIES

ELECTRONIC PRESET COUNTER

- 4 or 6 DIGITS (2 Line LED Display)
- POWER SUPPLY (AC100 ~ 240V)
- PRESCALE FUNCTION
- KEY PROTECT, MEMORY
- DECIMAL POINT POSITIONING
- DUST / SPLASH PROOF

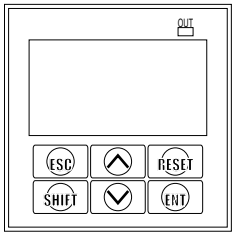
G60 - 101

G60 - 111

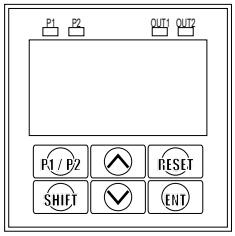
MODEL SELECTION

Models	Figures	Preset Level	Input		Prescale
G60 - 101	4	1	1 Input	Add / Subtract Input	—
G60 - 102			2 Input	90°Quadrature / Individual add, subtract Input	—
G60 - 111		2	1 Input	Add / Subtract Input	—
G60 - 112			2 Input	90°Quadrature / Individual add, subtract Input	—
G60 - 201	6	1	1 Input	Add / Subtract Input	—
G60 - 202			2 Input	90°Quadrature / Individual add, subtract Input	—
G60 - 203			1 Input	Add / Subtract Input	○
G60 - 204			2 Input	90°Quadrature / Individual add, subtract Input	○
G60 - 211		2	1 Input	Add / Subtract Input	—
G60 - 212			2 Input	90°Quadrature / Individual add, subtract Input	—
G60 - 213			1 Input	Add / Subtract Input	○
G60 - 214			2 Input	90°Quadrature / Individual add, subtract Input	○

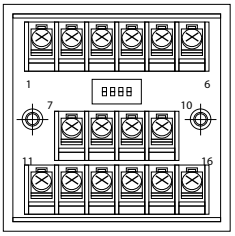
FRONT PANEL AND REAR TERMINALS



1 Level Preset
G60-101, 102, 201, 202, 203, 204



2 Level Preset
G60-111, 112, 211, 212, 213, 214



Rear Terminals
Common to all models

ESC — Use this button to exit from the setting mode. (1 level preset only)

SHIFT — Use this button to enter the setting mode from count mode.
In setting mode, use this button to shift from each digit to edit or to change decimal point position.

RESET — Use this button to reset the count value of the counter.

ENT — Use this button to save the settings made.

P1 / P2 — Use this button to enter and exit the setting mode for P1 or P2 from count mode. (2 level preset only)

∧ — Increments the selected digit.

∨ — Decrements the selected digit.

OPERATIONS

In entering the setting mode to edit the preset values, prescale or decimal position, make sure that the key protect feature is disabled by unshorting terminals No. 9 and No. 10.

A. Setting the Preset Value

<1 Level Preset>

SHIFT

Press the SHIFT key to enter Preset setting mode. This will cause left most digit of the editing display to blink.

000000 ← Count Display
0 00000 ← Editing Display

△ ▽

Set the desired value of the blinking digit by using the △ key to increment or ▽ key to decrement.

SHIFT

Press the SHIFT key to move the cursor to the next digits. Press successively to reach desired digit to set. A blinking digit indicates the editable digit.

000000 ← Count Display
00 0000 ← Editing Display

△ ▽

Set the desired value of the blinking digit by using the △ key to increment or ▽ key to decrement.

ENT

Repeat the above steps unitl setting is finished.
When editing is finished, press the ENT key to save the settings in the memory and to exit the setting mode.
To exit from setting mode without saving, press the ESC key.

※ If " - " (minus) sign is desired, press the ▽key,while the SHIFT key is pressed, while the left most digit of the editing display is set to "0" The " - " character will be displayed. To remove the " - " (minus) sign, press the △ key while the SHIFT key is pressed.

<2 Level Preset>

P1/P2

Select which preset level (P1 or P2) to set by pressing the P1/P2 key. The chosen preset level is indicated by the lighted lamp.

SHIFT

Press the SHIFT key to enter setting mode. This will cause left most digit of the editing display to blink.

000000 ← Count Display
0 00000 ← Editing Display

△ ▽

Set the desired value of the blinking digit by using the △ key to increment or ▽ key to decrement.

SHIFT

Press the SHIFT key to move the cursor to the next digits. Press successively to reach desired digit to set. A blinking digit indicates the editable digit.

000000 ← Count Display
00 0000 ← Editing Display

△ ▽

Set the desired value of the blinking digit by using the △ key to increment or ▽ key to decrement.

ENT

Repeat the above steps unitl setting is finished.
When editing is finished, press the ENT key to save the settings in the memory and to exit the setting mode.
To exit from setting mode without saving, press the P1/P2 key.

※ If " - " (minus) sign is desired, press the ▽key,while the SHIFT key is pressed, while the left most digit of the editing display is set to "0" The " - " character will be displayed. To remove the " - " (minus) sign, press the △ key while the SHIFT key is pressed.

B. Setting the Prescale

ENT + SHIFT

While pressing the ENT key, press the SHIFT key to show Prescale setting display. While on Prescale setting display, press the SHIFT key once more to enter the Prescale setting mode. This will cause the left most digit of the Multiplier display to blink. (If SHIFT key is not pressed within 3 secs. while on Prescale setting display, the display will automatically return to count mode display.

SHIFT

※ Prescale Setting Display

0 0.0000 ← Multiplier (×) Display
0000 ← Divider (÷) Display

△ ▽

Set the desired value of the blinking digit by using the △ key to increment or ▽ key to decrement.

SHIFT

Press the SHIFT key to move the cursor to the next digits. Press successively to reach desired digit to set. A blinking digit indicates the editable digit.

0 0.0000 ← Multiplier (×) Display
0000 ← Divider (÷) Display

△ ▽

Set the desired value of the blinking digit by using the △ key to increment or ▽ key to decrement.

ENT

Repeat the above steps unitl setting is finished.
When editing is finished, press the ENT key to save the settings in the memory and to exit the setting mode.
To exit from setting mode without saving, press the ESC key.

※ Explanation for the Prescale Formula

$$\text{Prescale Formula} = \frac{\text{Desired Display Value (per unit)}}{\text{Pulse Number (per unit)}} \quad \begin{matrix} \leftarrow \text{Multiplier} \\ \leftarrow \text{Divider} \end{matrix}$$

<Examples>

1. To display 1 count per 10 pulses, set : Multiplier = 01.0000
   Divider = 0010
2. To display 10 counts per 1 pulse, set : Multiplier = 10.0000
   Divider = 0001

C. Setting the Decimal Position

△ + ▽

While pressing simultaneously the △ and ▽ keys, press the SHIFT key to change the Decimal Point Position setting.
Press the SHIFT key successively to scroll through the different decimal point positions.

SHIFT

0
0

SHIFT

0.0
0.0

SHIFT

0.00
0.00

△ + ▽

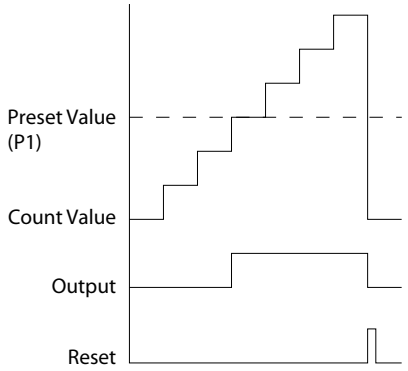
When the desired Decimal Point Position setting is set, release the △ and ▽ keys.
The display will automatically changed to the chosen decimal point position setting chosen..

※ Changing the decimal point position while counting may cause changes in the count value and setting values of the counter. Please change settings when counter is not in operation.

SAMPLE OPERATIONS

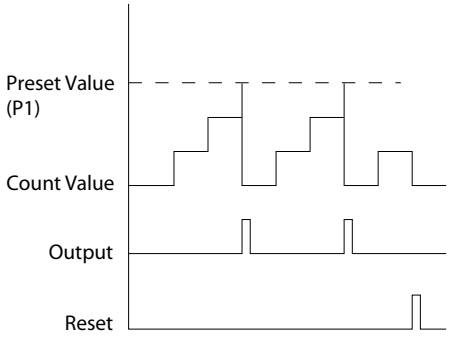
<1 LEVEL PRESET>

Overrun Mode
Input Type : Add Input / Quadrature Input / Individual add, sub Input
Output Time: Latch



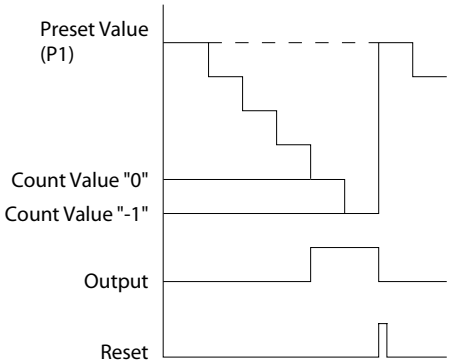
Auto-Reset Mode
Input Type : Add Input / Quadrature Input / Individual add, sub Input
Output Time: 0.1 sec.

* Output time on auto reset mode will be 0.1 sec. even if set to latch



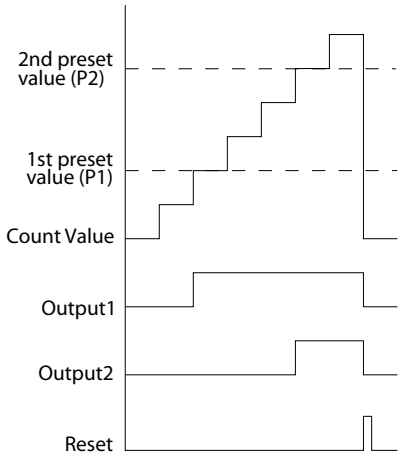
Overrun Mode
Input Type : Sub Input
Output Time: Latch

* Subtracts from 1st preset (P1) value and outputs when reaches to 0.



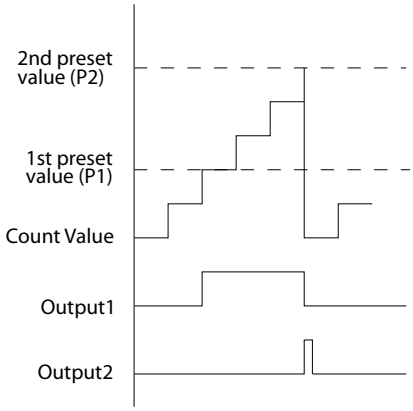
<2 LEVEL PRESET>

Overrun Mode
Input Type : Add Input / Quadrature Input / Individual add, sub Input
Output Time: Latch



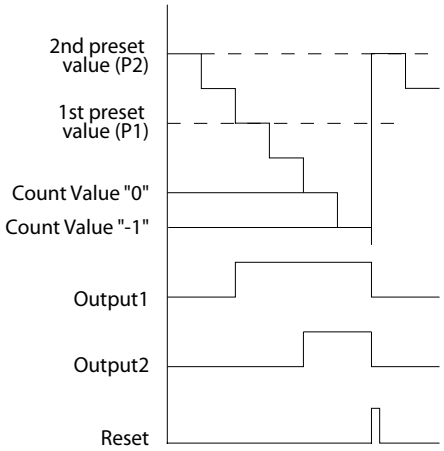
Auto-Reset Mode
Input Type : Add Input / Quadrature Input / Individual add, sub Input
Output Time: Latch

* Output time of the P2 preset level on on auto reset mode will be 0.1 sec. even if set to latch

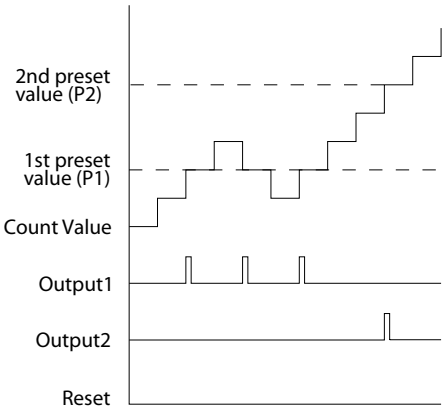


Overrun Mode
Input Type : Sub Input
Output Time: Latch

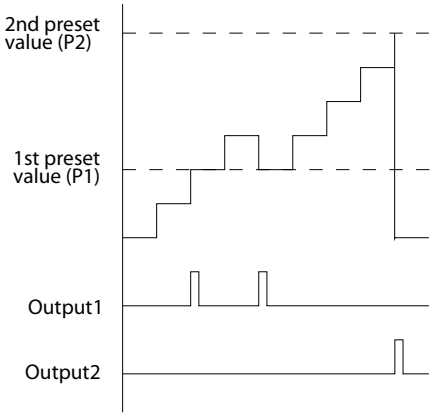
* Subtracts from 2nd preset (P2) value and outputs when reaches to 0.



Overrun Mode
Input Type : Quadrature Input / Individual add, sub Input
Output Time: One Shot (0.1sec.)

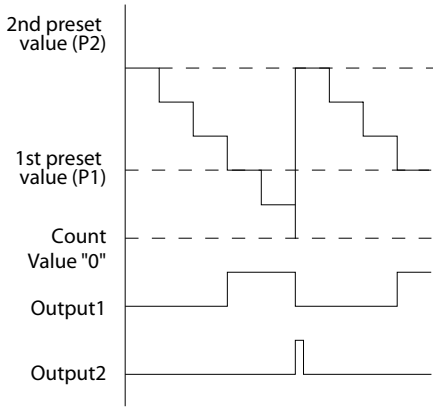


Auto-Reset Mode
Input Type : Quadrature Input / Individual add, sub Input
Output Time: One Shot (0.1 sec.)



Auto-Reset Mode
Input Type : Sub Input
Output Time: Latch

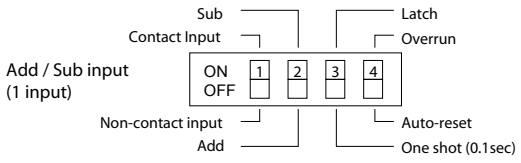
* Subtracts from 2nd preset (P2) value and outputs when reaches to 0. Then, returns to P2 automatically.

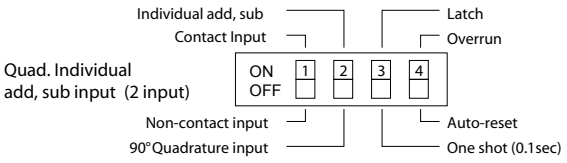


WIRING

	1 Level Preset		2 Level Preset	
	1 Input (Add / Sub)	2 Input (Quad/Individual add, sub)	1 Input (Add / Sub)	2 Input (Quad/Individual add, sub)
Terminal Locations	No. 1 Input 2 —— 3 DC12V 4 GND 5 Reset 6 Input inhibition 7 —— 8 Open Collector output 9 GND 10 Key Protection 11 —— 12 —— 13 COM } Relay output 14 N. O. 15 AC 0V } Power Source 16 AC85 ~ 264V	No. 1 Input A 2 Input B 3 DC12V 4 GND 5 Reset 6 Input inhibition 7 —— 8 Open Collector output 9 GND 10 Key Protection 11 —— 12 —— 13 COM } Relay output 14 N. O. 15 AC 0V } Power Source 16 AC85 ~ 264V	No. 1 Input 2 —— 3 DC12V 4 GND 5 Reset 6 Input inhibition 7 Open Collector output (P1) 8 Open Collector output (P2) 9 GND 10 Key Protection 11 COM } Relay output (P1) 12 N. O. 13 COM } Relay output (P2) 14 N. O. 15 AC 0V } Power Source 16 AC85 ~ 264V	No. 1 Input A 2 Input B 3 DC12V 4 GND 5 Reset 6 Input inhibition 7 Open Collector output (P1) 8 Open Collector output (P2) 9 GND 10 Key Protection 11 COM. } Relay output (P1) 12 N. O 13 COM } Relay output (P2) 14 N. O. 15 AC 0V } Power Source 16 AC85 ~ 264V
Power Source	Power Source 15 16 Supply power source AC85 ~ 264V to terminal No. 15, 16.			
Input	Add or Sub input (1 input only) G60 - 101, 111, 201 203, 211, 213 Select from Add Input or Sub Input by setting dip-switch No. 2. For Add Input, dip-switch No. 2 should be OFF. For Sub Input, dip-switch No. should be ON. * Setting of dip-switch should be done during power off. Contact, add input Switch 1 2 3 4 Input A GND Contact, sub input Switch 1 2 3 4 Input A GND Non - contact, add input Open Collector Transistor 1 2 3 4 Input A GND Non - contact, sub input Open Collector Transistor 1 2 3 4 Input A GND Quad. / Individual add,sub. input (2 input) G60 - 102, 112, 202 204, 212, 214 Select from Quadrature or Individual Add/Sub by setting dip-switch No. 2. For Quadrature Input, dip-switch No. 2 should be OFF. For Individual Add/Sub Input, dip-switch No. 2 should be ON. * Setting of dip-switch should be done during power off. Contact Input 1 2 3 4 Input A Input B GND Non-contact Input 1 2 3 4 Input A Input B GND 90° Quadrature Input Double pulse sensor 1 2 3 4 Input A Input B 12VDC GND			
Output	Open Collector output (Internal power supply is used.) Load 3 8 DC12V Relay output Output 13 14 COM N.O Open Collector output (External power supply is used Load 8 Power Supply 9 DC12 ~ 24V GND		Open Collector output (Internal power supply is used.) Load2 Load1 3 7 8 DC12V Relay output Output 1 Output 2 11 12 13 14 COM N.O COM N.O Open Collector output (External power supply is used Load2 Load1 4 Power Supply 7 8 GND DC12 ~ 24V	
Inhibition and Protection	Input inhibition Key protection 6 7 8 9 10 Input inhibition : Pulses will not be counted while terminal nos. 6 and 9 are shorted. Key protection : Prescale, Preset Values, Decimal Point Position and Front Key Resetting will be disabled while terminal nos. 10 and 9 are shorted.			
Reset	4 5 Remote reset : Resetting of the counter can be done remotely while terminal nos. 4 and 5 are shorted by a Relay, Microswitch. Counter remains reset while 4 and 5 are shorted.			

DIP - SWITCH



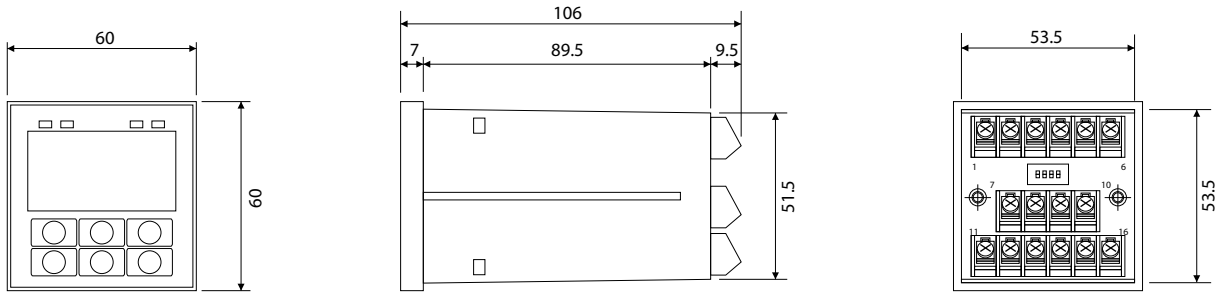


SPECIFICATIONS

Models	G60-101, 102, 201, 202, 203, 204	G60-111, 112, 211, 212, 213, 214
Preset Level	1 level	2 level
Display	4 digit : Red LED Count figures : 10.0 x 5.5mm Editing figures : 8.0 x 4.0mm 6 digit : Red LED Count figures : 8.0 x 4.0mm Editing figures : 6.3 x 3.4mm	
Preset Range	4 digit : -999 - 0 - 9999 / 6 digit : -99999 - 0 - 999999	
Prescale	0.0001 - 100 (Multiplier : 0.0001 - 100, Divider : 1 - 1/9999)	
Input	1 input type : Add / Sub input (selectable by dip-switch) 2 input type : 90°Quadrature / Individual add, sub. input (selectable by dip-switch)	
Input Method	Non-contact input : Open collector / Contact input : Relay, Microswitch	
Count Speed	Non-contact input : 10 kHz (with Prescale: 6kHz max.)* / Contact input : 25 Hz maximum	
Pulse Width	Non-contact input : 50 μsec minimum. / Contact input : 20 msec minimum	
Make (Duty)	1:1	
Output Type	Contact output : Relay Type 1A only (AC250V, 0.5A / DC30V, 2A maximum Load) * for each output Non-contact output : NPN open collector (DC30V, 100mA maximum)	
Output Time	0.1 sec or latch. (However, in Auto-reset mode, output time will be 0.1 sec, even if set to latch).	
Output Delay	10kHz : 5msec maximum 6 kHz : 30msec maximum (with Prescale model)	
Reset	Front reset, Remote reset (50msec min.), Auto-reset	
Inhibition Function	When the Inhibition terminals are enabled, count input, preset editing, prescale editing and front reset are disabled.	
Preset Lamp	None	Turns on while each preset value are shown on the display.
Operation Mode	Overrun / Auto-reset	
Decimal Point Position	4 digit : 0 / 0.0 / 0.00 6 digit : 0 / 0.0 / 0.00 / 0.000 / 0.0000	
Output Lamp	Turns ON during output time	
Memory	E^2PROM	
Power Source for Sensor	DC12V 100mA maximum	
Power Source	AC100 - 240V -15%/+10%	
Power Consumption	Approximately 5VA	
Operating Temperature	-10 - +50°C (Non-freezing)	
Operating Humidity	45 - 85%RH (Non-condensing)	
Weight	Approximately 230g	Approximately 240g

* If rotary encoder is used and prescale factor is not used at the counter, maximum count speed should be 10 kHz when the phase of quadrature is 90° ± 20° and 6kHz when that is 90° ± 45°.
If prescale factor is used at the counter, maximum count speed should be 6kHz in any case.

DIMENSION



Panel cutout : $54^{+0.7}_{-0}$ x $54^{+0.7}_{-0}$

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