

G40 SERIES
INSTRUCTION MANUAL

LINE SEIKI CO., LTD.

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TOTAL COUNT DISPLAY
Model:G40-101, 211, 311
102,212,312



COUNT/PRESET 1 LEVEL DISPLAY
Model: All models except for
G40-101,102



BATCH/BATCH PRESET DISPLAY
Model:G40-211, 311
212,312



RATE DISPLAY
Model:All models.



COUNT/PRESET 2 LEVEL DISPLAY
Model:G40-301, 311
302,312



COUNT/RATE DISPLAY
Model:All models except for
G40-101,102

- 1) Using dot matrix is capable of displaying characters and symbols which cannot be displayed by using 7 segments LCD. Further, installing high luminous LCD backlight as standard is capable of displaying darkness.
- 2) As transmission circuit of RS-485 is installed on all models, data of counter can be called, and parameters can be set by host computer. Up to 100 units of G40 can communicate with 1 set of host computer.

1. FEATURES

- 8 digit total counter *
- 6 digit rate meter
- 6 digit preset counter *
- 6 digit batch preset counter *
- 9 count input mode
- 4 external direction input
- Prescale for preset counter
- Prescale for rate meter
- Decimal point positioning for counter and rate meter
- Direction of output port and type
- RS-485 serial interface
- High count speed: 20 kHz
- Dot matrix display: 16 characters (7.6mm)
- LCD with backlight
- Flat keyboard
- Dust/water proof front panel

Some models do not have the function marked *.

2. MODELS

Function Model	Preset counter		Batch Preset counter	Total Counter	Rate (Tachometer)	Power Source	
	1 Level	2 Level				100V AC	200V AC
G40-101	—	—	—	○	○	○	—
G40-102	—	—	—	○	○	—	○
G40-201	○	—	—	—	○	○	—
G40-202	○	—	—	—	○	—	○
G40-211	○	—	○	○	○	○	—
G40-212	○	—	○	○	○	—	○
G40-301	—	○	—	—	○	○	—
G40-302	—	○	—	—	○	—	○
G40-311	—	○	○	○	○	○	—
G40-312	—	○	○	○	○	—	○

3. SPECIFICATION

3-1. SPECIFICATION (1)

Model	G40-101, 201, 211, 301, 311	G40-102, 202, 212, 302, 312
Power Source	100V AC $\pm 15\%$	200V AC $\pm 15\%$
Power Consumption	Approximately 7VA	
Temp. / Humidity	Temp : 0 ~ 55° C	Humidity : 85% RH (Non-condensing)
Storage Temp.	-20 ~ 70° C (Non-freezing)	
Material / Color	Noryl mold case / Black	
Dimensions	75(W) × 75(H) × 142(D) mm	
Panel Cutout	68 × 68 mm	
Connection	Type: Dual depluggable screw terminal strips. Conductor Size: #14-22 AWG solid standard or fused	
Dust / Water Proof	Front panel is water/dust proof.	
Weight	Apporoximaterly 540g	
DC Power Output	12V DC $\pm 25\%$ 100mA Max	
Reset	Panel reset / Remote reset (From external direction)/ Auto reset (Available with P1/P2 output)	
Decimal Point Positioning	5 positionings programmable on both preset counter and rate meter.	
Memory	E ² PROM	

3-2. SPECIFICATION (2)

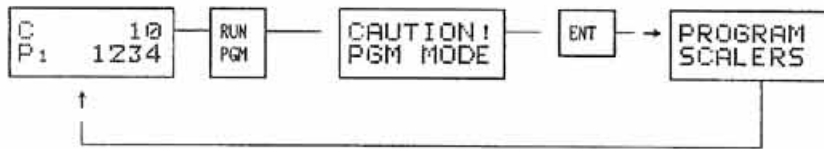
Model	G40-101 102	G40-201 -202	G40-211 -212	G40-301 -302	G40-311 -312
Display	Dot matrix LCD (with backlight), 16 characters, size: 7.6 × 5.5 mm				
Display Contents	Total counter Rate	Preset counter 1 level Rate	Preset counter 1 level Batch preset 1 level Total counter Rate	Preset counter 2 level Rate	Preset counter 2 level Batch preset 1 level Total counter Rate
Counting Range	Preset counter / Batch preset counter / Rate : 0 ~ 999999, Total counter : 0 ~ 99999999				
Prescale	Counter : 0.00001 ~ 9.99999, Rate : 0.00001 ~ 99999				
Writing	—	P1 value is written by reset signal		P2 value is written by reset signal	
Input	Contact, Open collector input (H : 3.5 ~ 30 V, L : 0 ~ 1.9 V) Magnetic sensor input (H : 0.6 ~ 17 V, L : -0.6 ~ -17 V) DC voltage input (H : 3.5 ~ 17 V, L : 0 ~ 1.9 V)				
Input Method	Add/Sub, Add/Add, Quadrature, Count/Direction, Quadrature ×2, Count ×2/Direction				
Counting Speed	Contact input: 40 Hz, Non-contact(individual input: 20kHz, direction input: 15kHz, quadrature input/(×2): 6.5kHz)				
Minimum Pulse Width	Contact input: 12.5 mS, Non-contact(individual input: 25 μS, direction input: 33.3 μS, quadrature input/(×2): 77 μS)				
Input Impedance	Contact/Open collector input: 4.6kΩ, Magnetic sensor input: 2.3kΩ, DC voltage input: 2.3kΩ				
Setting Items		Preset counter 1 level	Preset counter 1 level Batch counter 1 level	Preset counter 2 level	Preset counter 2 level Batch counter 1 level
Setting Range	—	1 ~ 999999			
Setting Method	—	Flat keyboard			
Output	Open collector transistor output ×2	Open collector transistor output ×2 Relay output(1c) ×1		Open collector transistor output ×2 Relay output(1c) ×2	
Capacity of Transistor	Selection (Positive/Negative) available 30 VDC 200 mA Max				
Capacity of Contact	—	Relay: 250V AC 5A, 28V DC 5A Max (Load)			
Output Time	One shot : 0.01 ~ 99.99 sec Latch : ∞				
Output Delay Time	700 μS ~ 2.7 μS				
External Direction	Select 4 items from 10 direction items.				
Contents of Direction Input	1. Edge reset of preset counter 2. Level reset of preset counter 3. Edge reset of batch counter 4. Edge reset of total counter 5. Count inhibition 6. Program changing inhibition 7. ON/OFF of relay or transistor output 8. Inhibition of all changing 9. P1 output disabled (Select up to 4 items.)				
Rate Measuring Range	1 Hz ~ 10 KHz (When prescale > 10, minimum speed is 0.1Hz.)				
Rate Accuracy	±0.015% FS ±1digit				
Rate Update Time	1 sec				
Rate Over-flow	"EEEEEE" is displayed.				
Interface	RS-485 serial interface				
Format	ASCII (1 start bit, 7 data bit, 1 parity bit, 1 stop bit)				
Baud Rate	300 / 1200 / 2400 / 4800 baud (selection)				
Parity	Odd number / Even number / No use (selection)				
Conn. for Transmission	RJ-11 (Moduler jack for telephone)				

4. MODE SELECTION

For mode selection, press RUN/PGM key and ENT key. When ENT key is not pressed within 5 sec after pressing RUN/PGM key, Run mode is appeared automatically.

< Run mode display >

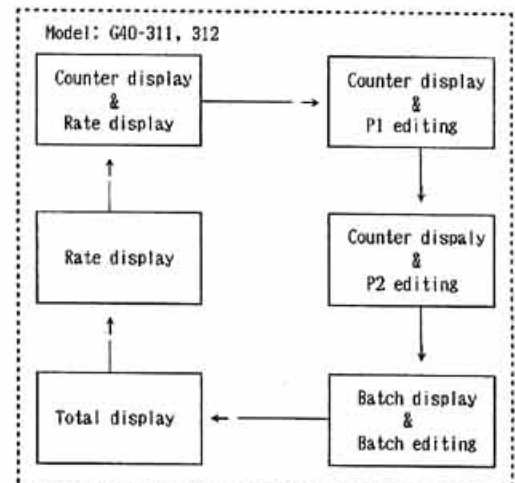
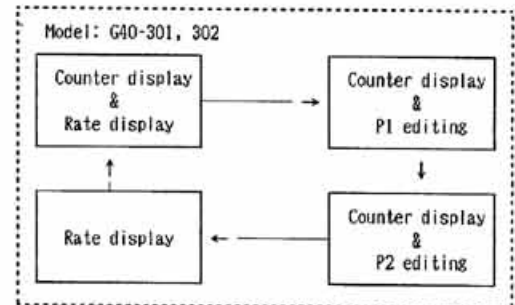
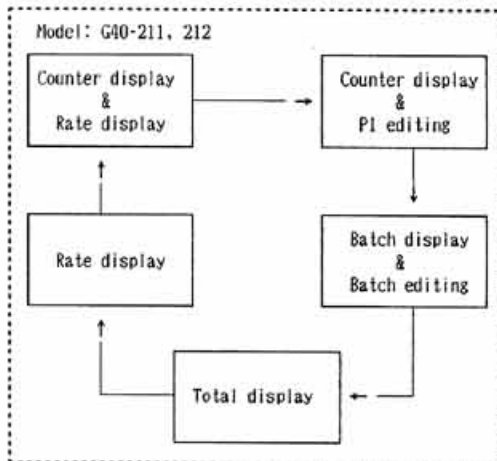
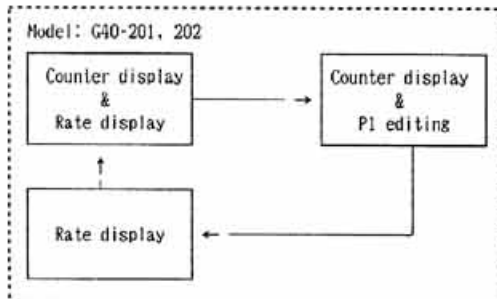
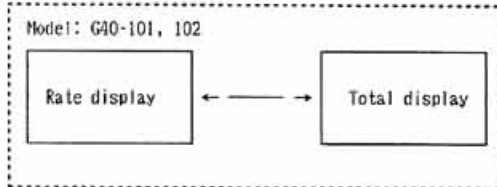
< Program mode display >



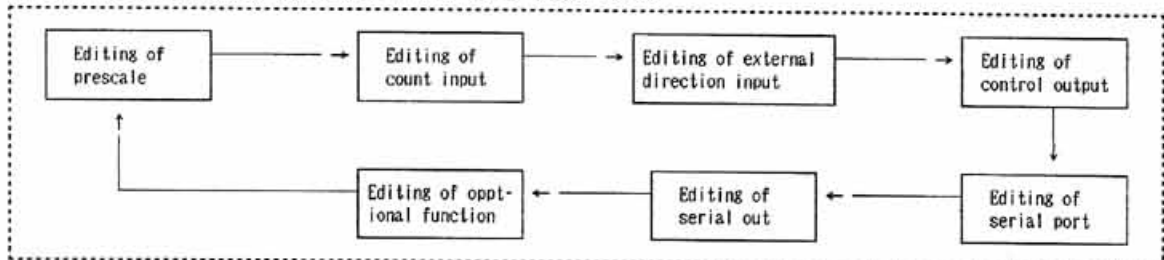
5. FLOW-CHART OF DISPLAY SELECTION

(Note that the contents of display is different by type of models.)

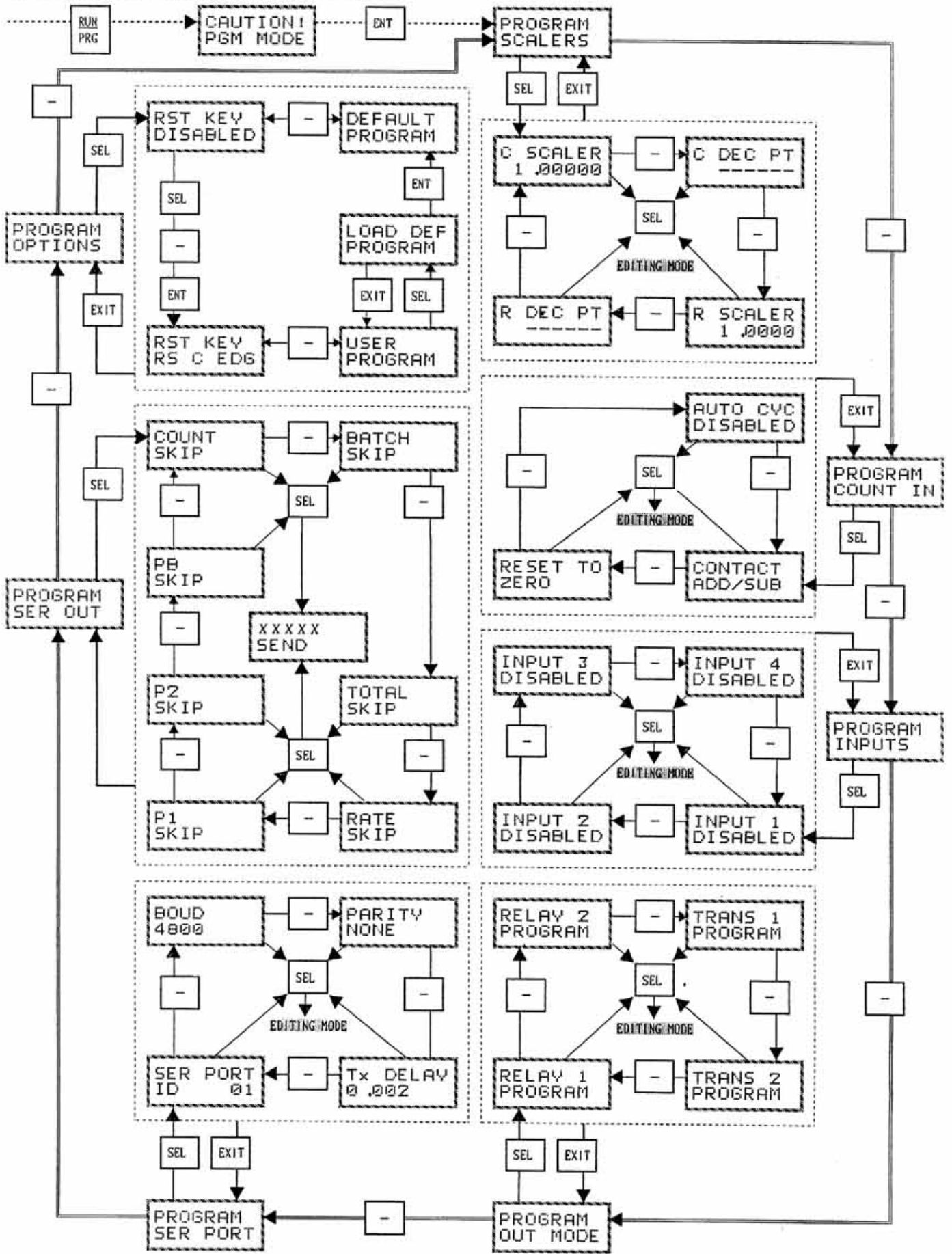
RUN MODE



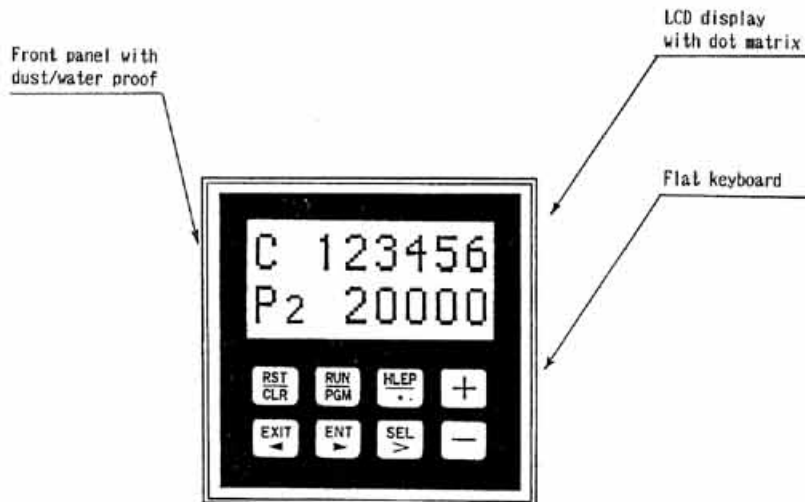
PROGRAM MODE (For details, see pages of initial set of program mode.)



6. OPERATION CHART OF PROGRAM MODE



7. FRONT PANEL



KEY FUNCTION



In the run mode this key can reset count value.
In the preset editing mode this zeros preset.
In the program mode this key zeros numerical data.



This key switches to either Run mode or Program mode.



In the Run mode this key causes the HELP screens.
In the program mode this key sets decimal point positions for count or rate scale.



In the preset editing mode this key allows the preset editing process to be exited.
In the program mode this key exits program mode but not yet entered.



In the run mode this key causes preset changes to take effect.
In the program mode it causes the displayed program changes to be entered.



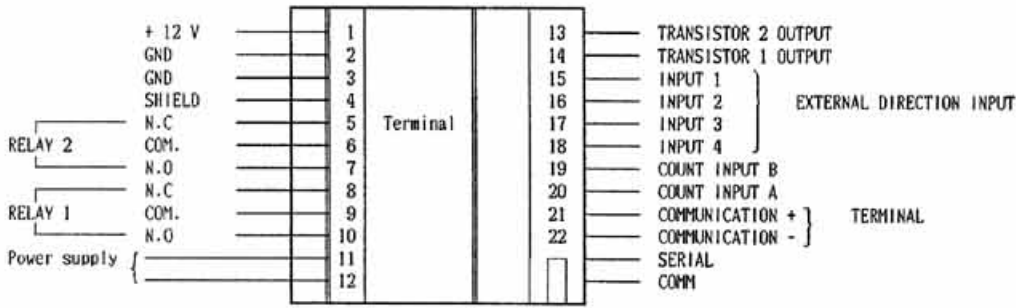
In the numerical data editing this key selects the editing digit.



In each mode this key selects the contents of program.
In numerical data editing this key add 1 to or subtract 1 from the value of selected digit.



8. TERMINAL LOCATION AND WIRING



* Note that the appearance of output terminal might be different due to type of models.

MODEL	TERMINAL LOCATION
G40-101,102	Terminal No.5 ~10 not used.
G40-201,202	Terminal No.5 ~7 not used.
G40-211,212 301,302 311,312	Terminal location is the same as the above terminal figure.

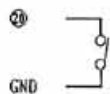
* Terminal Block can be removed.

When removing terminal block, make the space between unit and terminal block gradually, equally for each side by using minus driver.

COUNT INPUT

CONTACT INPUT

< Addition >



Addition is affected each time shorted ⑳ and GND by contact.

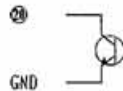
< Subtraction >



Subtraction is affected each time shorted ⑳ and GND by contact.

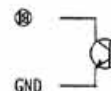
OPEN COLLECTOR INPUT

< Addition >



Addition is affected each time shorted ⑳ and GND by open collector

< Subtraction >

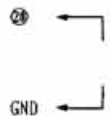


Subtraction is affected each time shorted ⑳ and GND by open collector.

DC VOLTAGE INPUT

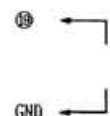
Input DC voltage pulse to each input terminal.
The range of DC voltage must be in the following.
"L" 0 V ~ 1.9 V
"H" 3.2 V ~ 30 V

< Addition >



Input DC voltage pulse between ⑳ and GND.

< Subtraction >



Input DC voltage pulse between ⑳ and GND.

AC SIGNAL INPUT (MAGNETIC PICKUP)

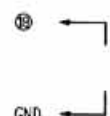
Input AC voltage to each input terminal.
The range of AC voltage must be in the following.
"L" -0.6 ~ -17 V
"H" 0.6 ~ 17 V

< Addition >



Input AC voltage between ⑳ and GND.

< Subtraction >



Input AC voltage between ⑳ and GND.

If Add/Add is selected on programing mode, both ⑳ and ㉑ are additional input terminals.

Power Source Supply power source between terminal No.① and ②.
 Since the model for 100 VAC power source is different from that of 200 VAC one, make attention to the voltage level on unit when power is supplied. Supplying incorrect voltage might broke G40.

External Power Supply External power supply can be outputted from terminal No.④.
 12 VDC \pm 25% 100 mA.

External Direction Input Contact input or open-collector input to terminal No.⑤~⑩ .
 Select on program mode whether external direction input is used or not, and what function is assigned if used.

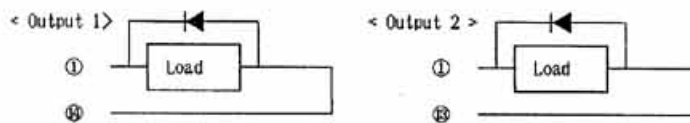
Shield Connect to earth by using terminal No.④.

Serial Data Communication
 For serial data communication use terminal No.⑳,㉑ or phone jack.
 As to this function, see the explanation in other sentence.

Output Relay output

	Relay No.1		Relay No.2
	③ — N.C		⑤ — N.C
	④ — COM.		⑥ — COM.
	⑩ — N.O		⑦ — N.O

Non-contact output (use internal power source)

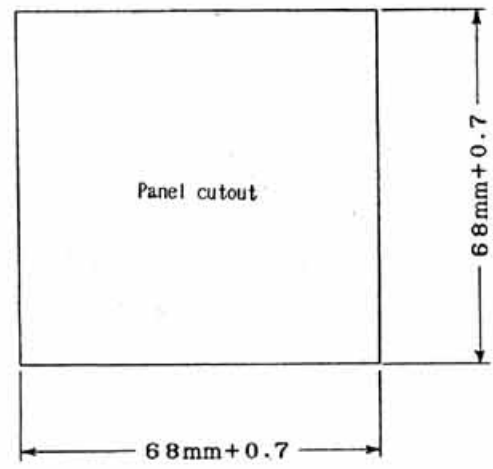
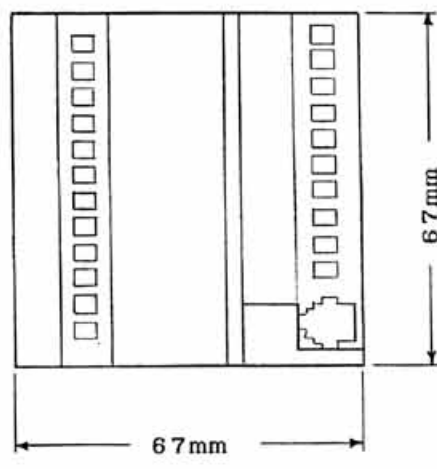
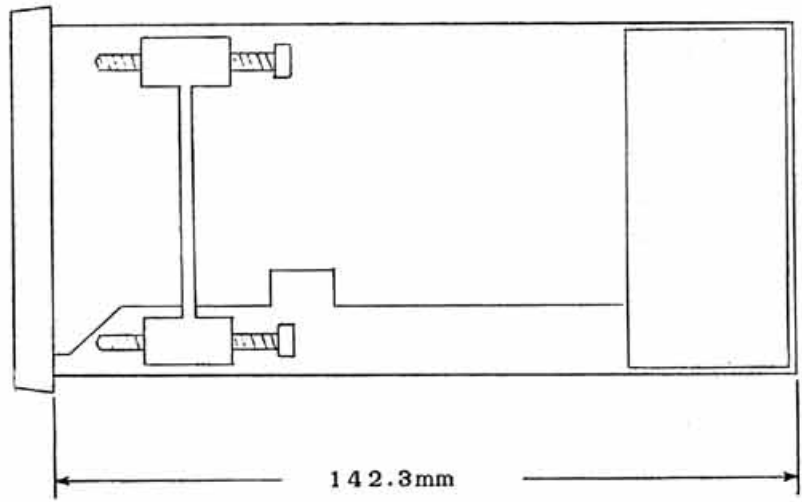
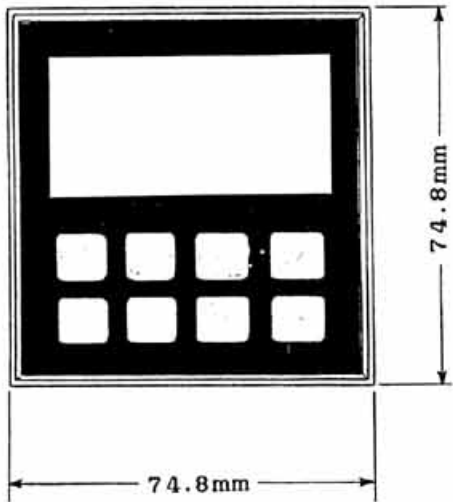


9. DIP-SWITCH

Set the dip-switch at the bottom of G40 for following, according to the type of count input signal.
 (At factory, the dip-switch is set to contact/open collector input.)

SV No.	TYPE		Contact/Open-collector input		DC voltage input		Magnetic sensor input	
	Input A	Input B	Input A	Input B	Input A	Input B	Input A	Input B
Switch 1.	OFF	—	ON	—	ON	—	ON	—
Switch 2.	—	OFF	—	ON	—	ON	—	ON
Switch 3.	OFF	—	OFF	—	ON	—	ON	—
Switch 4.	—	OFF	—	OFF	—	ON	—	ON

10. DIMENSIONS



Panel thickness : 12 mm Max.

11. CONTENTS OF PROGRAM MODE

PROGRAM MODE		PROGRAM ITEMS			
NAME	DISPALY	ITEMS	DISPLAY	CONTENTS	
Prescale (Common to all models)	PROGRAM SCALERS	Counter prescale	C SCALER 1.00000	-decides input rate(Prescale) of counter. Must be in range from 0.00001-9.99999.	
		Counter decimal point positioning	C DEC PT -----	-sets the position of decimal point of counter display. Must be in range from 2nd digit to 5th digit.	
		Rate meter prescale	R SCALER 1.0000	-decides input rate(Prescale) of rate. Must be in range from 0.00001-99999.	
		Rate meter decimal point positioning	R DEC PT -----	-sets the position of decimal point of rate display. Must be in range from 2nd digit to 5th digit.	
Count input	PROGRAM COUNT IN	Contact with Add/Sub input	CONTACT ADD/SUB	-requires contact input. Input A adds count and input B subtracts counts.	Select one(1) item only.
		Contact with Add/Add input	CONTACT ADD/ADD	-requires contact input. Both input A and B add counts.	
		Contact input with count direction	CONTACT C/DIR	-counts with direction control. Input A adds/subtracts when input B is high/low.	
		Non-contact with quadrature input	SOLID ST QUADx1	-requires a quadrature signal input.	
		Non-contact with quadrature x2 input	SOLID ST QUADx2	-same as the quadrature x2 mode except that counts occur on both edge of input signal for increased resolution.	
		Non-contact with Add/Sub input	SOLID ST ADD/SUB	-same as the contact add/sub mode but can be used with high speed count signal	
		Non-contact with Add/Add input	SOLID ST ADD/ADD	-same as the contact add/add mode but can be used with high speed count signal	
		Non-contact input with count direction	SOLID ST Cx1/DIR	-same as the contact count/direction mode but used with high speed count signal.	
		Non-contact input with count direction x2	SOLID ST Cx2/DIR	-same as the above except counts occur on both edges of input signal for increased resolution.	
		Zero reset	RESET TO ZERO	The counter resets to zero.	Select one(1) item only.
		P2 reset	RESET TO P2()	The counter resets to preset value(P2) when a counter reset occurs. But 1 level preset counter resets to P1. P1()	
		Auto reset disabled	AUTO CVC DISABLED	The counter does not automatically reset when reaches the preset value.	Select one(1) item only.
		P1 auto reset	AUTO CVC P1	The counter automatically resets as programmed when reaches to P1.	
		P1 P2 auto reset	AUTO CVC P1 P2()	The counter automatically resets as programmed when reaches to P1 or P2.	
P2 auto reset	AUTO CVC P2()	The counter automatically resets as programmed when reaches to P2.			

PROGRAM MODE		PROGRAM ITEMS			
NAME	DISPLAY	ITEMS	DISPLAY	CONTENTS	
External direction input	<div style="border: 1px solid black; padding: 2px; display: inline-block;">PROGRAM INPUTS</div> INPUT 1 } INPUT 4 *	Inhibition of external direction input	INPUT 1 DISABLED	Input 1 does not perform any function when turned on.	Select one(1) item only.
		Ignore of output	INPUT 1 BVP P1	When input 1 is turned on, output of P1 is not performed.	
		Output control	INPUT 1 OUTCTRL	When input 1 is turned on, output relay and transistor is controlled.	
		Counter reset * edge trigger	INPUT 1 RS C EDG	The counter resets when input 1 is turned on (edge sensitive).	
		Counter reset * level	INPUT 1 RS C LVL	The counter is held at the reset value while input 1 is on (level sensitive).	
		Batch counter reset * edge trigger	INPUT 1 RS B EDG	The batch counter resets when input 1 is turned on (edge sensitive).	
		Total counter reset * edge trigger	INPUT 1 RS T EDG	The total counter resets when input 1 is turned on (edge sensitive).	
		Inhibition of counting	INPUT 1 STOP CNT	All count functions is inhibited while input is on (level sensitive).	
		Programming locked	INPUT 1 LOCK PGM	All program editing is disabled while input 1 is on (level sensitive).	
Programming and preset editing locked	INPUT 1 LOCK ALL	All program and preset editing is disabled while input 1 is on(level sensitive)			
Output mode	<div style="border: 1px solid black; padding: 2px; display: inline-block;">PROGRAM OUT MODE</div> RELAY 1 } RELAY 2 * TRANS 1 } TRANS 2 *	Normal *	RELAY 1 NORMAL	Relay 1 turns on when receives a pick-up signal and off when receives a drop-out signal.	Select one(1) item only.
		Reverse *	RELAY 1 REVERSE	Relay 1 turns on when receives a drop-out signal and off when receives a pick-up signal.	
		Pulse output	RELAY 1 PULSED	Relay 1 turns on(off) during edited time. Pressing SEL key can enter output time editing mode.	Select one(1) item only.
		Latch output	RELAY 1 LATCHED	Relay 1 turns on(off) when receives a pick-up signal and stays on(off) until it receives a drop-out signal.	
		P1 no action *	RELAY 1 P1 NA	Relay 1 can be programmed for no action when the main counter reaches to P1.	Select one(1) item only.
		P1 pick-up *	RELAY 1 P1 PU	Relay 1 can be programmed for pick-up when the main counter reaches to P1.	
		P1 drop-out	RELAY 1 P1 DO	Relay 1 can be programmed for drop-out when the main counter reaches to P1.	

PROGRAM MODE		PROGRAM ITEMS					
NAME	DISPLAY	ITEMS	DISPLAY	CONTENTS			
Output mode	PROGRAM OUT MODE	P2 no action	RELAY 1 P ₂ NA	Relay 1 can be programmed for no action when the main counter reaches to P2.	Select one(1) item only.		
		P2 pick-up	RELAY 1 P ₂ PU	Relay 1 can be programmed for pick-up when the main counter reaches to P2.			
		P2 drop-out	RELAY 1 P ₂ DO	Relay 1 can be programmed for drop-out when the main counter reaches to P2.			
		Batch preset no action	RELAY 1 PB NA	Relay 1 can be programmed for no action when the batch counter reaches to PB.	Select one(1) item only.		
		Batch preset pick-up	RELAY 1 PB PU	Relay 1 can be programmed for pick-up when the batch counter reaches to PB.			
		Batch preset drop-out	RELAY 1 PB DO	Relay 1 can be programmed for drop-out when the batch counter reaches to PB.			
		RELAY 1 } RELAY 2 ※	TRANS 1 } TRANS 2 ※	Output control no action	RELAY 1 OCTRL NA	Relay 1 can be programmed for no action when an output control signal occurs.	Select one(1) item only.
				Output control pick-up	RELAY 1 OCTRL PU	Relay 1 can be programmed for pick-up when an output control signal occurs.	
				Output control drop-out	RELAY 1 OCTRL DO	Relay 1 can be programmed for drop-out when an output control signal occurs.	
		Counter reset no action	RELAY 1 RS C NA	Counter reset no action	RELAY 1 RS C NA	Relay 1 can be programmed for no action when a reset counter signal occurs.	Select one(1) item only.
				Counter reset pick-up	RELAY 1 RS C PU	Relay 1 can be programmed for pick-up when a reset counter signal occurs.	
				Counter reset drop-out	RELAY 1 RS C DO	Relay 1 can be programmed for drop-out when a reset counter signal occurs.	
Serial port #	PROGRAM SER PORT	Serial port ID	SER PORT ID 0	-enters the desired two digit serial ID number (00-99 decimal).			
		Baud rate	BAUD 4800	-selects the baud rate. Allowable rate are 300, 1200, 2400, and 4800.			
		None parity	PARITY NON	-selects none parity	Select one(1) item only.		
		Odd parity	PARITY ODD	-selects odd parity			
		Even parity	PARITY EVEN	-selects even parity			
Transmitting delay	Tx DELAY 0.002	-selects a transmission delay of either 0.002 sec or 0.1 sec.					

PROGRAM MODE		PROGRAM ITEMS			
NAME	DISPLAY	ITEM	DISPLAY	CONTENTS	
Serial output	PROGRAM SER OUT	Count data skip	COUNT SKIP	-does not transmit the counter data to host computer	Select one(1) item only.
		Count data send	COUNT SEND	-transmits the counter data to host computer	
		Batch count data skip	BATCH SKIP	-does not transmit the batch counter data to host computer.	Select one(1) item only.
		Batch count data send	BATCH SEND	-transmits the batch counter data to host computer.	
		Total count data skip	TOTAL SKIP	-does not transmits the total counter data to host computer.	Select one(1) item only.
		Total count data send	TOTAL SEND	-transmits the total counter data to host computer.	
		Rate meter data skip	RATE SKIP	-does not transmit the rate meter data to host computer.	Select one(1) item only.
		Rate meter data send	RATE SEND	-transmits the rate meter data to host computer.	
		P1 data skip	P1 SKIP	-does not transmit P1 data to host computer.	Select one(1) item only.
		P1 data send	P1 SEND	-transmits P1 data to host computer.	
		P2 data skip	P2 SKIP	-does not transmit P2 data to host computer.	Select one(1) item only.
		P2 data send	P2 SEND	-transmits P2 data to host computer.	
		Batch preset data skip	PB SKIP	-does not transmit PB data to host computer.	Select one(1) item only.
		Batch preset data send	PB SEND	-transmits PB data to host computer.	

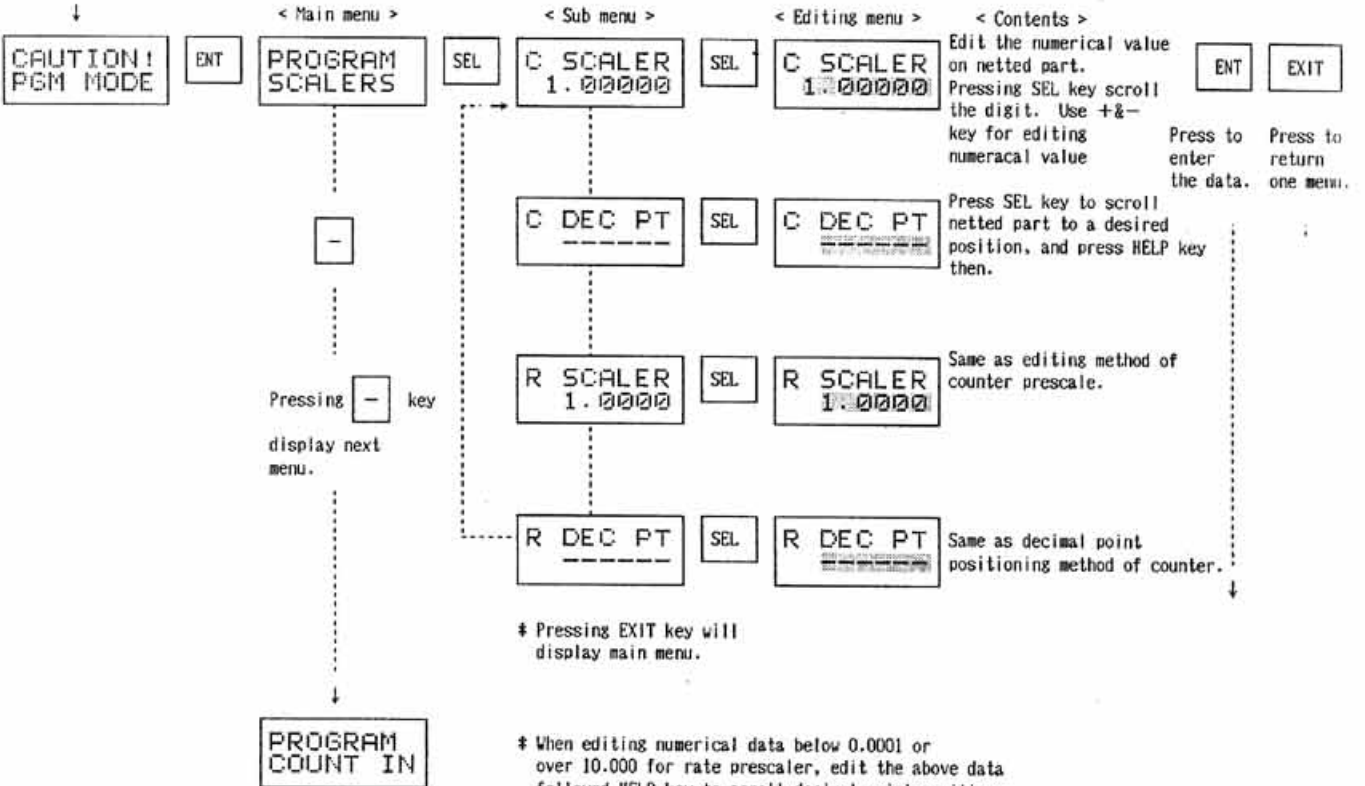
PROGRAMMING MODE		PROGRAMMING ITEMS			
NAME	DISPLAY	ITEM	DISPLAY	CONTENTS	
Option program	PROGRAM OPTIONS	Inhibition of reset	RST KEY DISABLED	-inhibit the key operation.	Select one(1) item only.
		Counter reset edge trigger	RST KEY RS C EDG	The counter resets when RST key is pressed (edge sensitive).	
		Counter reset level	RST KEY RS C LVL	The counter resets while RST key is pressed (level sensitive).	
		Batch counter reset edge trigger	RST KEY RS B EDG	The batch counter resets when RST key is pressed (edge sensitive).	
		Total counter reset edge trigger	RST KEY RS T EDG	The total counter resets when RST key is pressed (edge sensitive).	
		Displayed value reset edge trigger	RST KEY RS D EDG	The present displayed value resets when RST key is pressed (edge sensitive).	
		User's program	USER PROGRAM	Select when programming by user.	Select one(1) item only.
		Default program loading	LOAD DEF PROGRAM	-loads the default program.	
		Default program	DEFAULT PROGRAM	-writes on memory after loading default program.	

12-1 PRESCALE (Prescale editing and decimal point positioning)

Run mode display

```
C  1234
P1  10
```

RUN
PGM



12-2. Count input (input and reset)

