【INSTRUCTION MANUAL】

Reversible Counter

MODEL : CU-666 Series

Series name	Display	Output			Input signal			Sensor power	Power supply	Shape	Body color	Function
CU-666												Two-row open collector output
	No entry											7-segment red LED
	GL											7-segment green LED
		P2										Two-row Photo MOS relay output
		AV3										Analog voltage output DC 1-5V, 5V-1V
		AV4										Analog voltage output DC 0-5V, 5V-0V
		AV5										Analog voltage output DC 0-10V, 10V-0V
		AI										Analog current output DC4-20mA, 20-4mA
			B＊									BCD output
				BI＊								BCD input
					No entry							NPN open collector pulse input
					F							Voltage pulse input
					V3							Tacho-generator signal input AC 0.8V-80V(P-P)
					N							Sine wave signal input AC 0.05V-20V(P-P)
					L1							Line receiver 1CH (A・$\overline{A}$) input
					L2							Line receiver 1CH (A・$\overline{A}$) (B・$\overline{B}$) input
					F2							Current modulation pulse input (A-input)
					F2W							Current modulation pulse input (A-input, B-input)
						RE						90-deg. phase difference input
						RE-2T						90-deg. phase difference input 2twice
						RE-4T						90-deg. phase difference input 4twice
							HI					High-speed input (0.01Hz to 120kHz)
								No entry				Sensor power : DC12V 100mA max.
								S24				Sensor power : DC24V 60mA max.
									No entry			Power source : AC 85V to 264V
									DC			Power source : DC 12V to 24V
										DM		leaving untouched
											No entry	Gray
											K	Black
											No entry	Not terminal stand cover
											C	With terminal stand cover (Tow pieces)

＊ B option and the BI option cannot be selected at the same time.
Thank you for your purchase of out products.

UINICS CO., LTD.

■ Precautions

We thank you very much for buying our products. Please read the following matters that require attention and the contents of this booklet for safe use of the product.

⚠ Caution

- Use a power supply voltage within the working range.
- Avoid a load exceeding the rating.
- Avoid the direct rays of the sun.
- Avoid places where inflammable gas and combustibles are present.
- Avoid temperature and humidity exceeding the rating.
- Do not apply heavy shocks or vibration to the body.
- Avoid the penetration of metal powder, dust, water, and the like into the body.
- Pay attention to an electric shock in wiring the power supply.
- Do not touch a live terminal, which is likely to cause an electric shock.
- Do not disassemble the product nor touch its inside while it is activated.
- User-conducted alterations and modifications of the unit should not be performed as they may impair functioning or cause failure and accidents.

■ Contents

1. About confirmation of an attachment and a guaranteed period

About confirmation of an attachment.

When you received as a product, please confirm whether it includes the following.
   (1) CU-666 (the chosen specification) ・・・・1
   (2) CU-666 Operation manual (Attachment)・・・1
   (3) Unit label・・・・・・・・・・・・・・・・1
   (4) User-specified accessories.
     (In the case of the absence of such specifications, these accessories are not attached.)

If there are the mistaking parts and the missing parts, please inform a dealer or us.
(There is a case that you do not attach by convenience.)

About a guaranteed period and a guaranteed area.

 1. Guaranteed period
   The period a product guarantees is 1 year from a delivered day.

 2. Guaranteed area
   If we trouble by responsibility in whole guaranteed period, it is repaired without charge at our factory.
   But if a product conflicted in the following matter, it is not a guarantee target.
   Please understand.

     ① Case of outside of the product specifications.

     ② Case of User-conducted alterations and modifications of the unit.

     ③ Case of besides our responsibility.

     ④ Case of safekeeping and transportation beyond the product specification condition.

     ⑤ Case of an accident.

2. Specifications

(1) Standard specifications

Item		Specifications
Totalizer	Scaling	1×10^{-9} to 9999 (selectable)
	Accuracy	± 0 (Scaling is set to 1.)
	Display	7-segment red LED (14 mm character height) : 6 digits
	GL-type	7-segment green LED (14 mm character height) : 6 digits
	Indication change	D1 LED (green) lighting at display 1, D2 LED (green) lighting at display 2. 'Enter' change type
	Indication area	-99999 to 999999
	Overflow Indication	The third round stop (999999 or -99999 blinking display the third exaggerated times it) endless Over frequency display (Two high rank digits are displayed while the UP key is being pushed). Selection
	Decimal point setting	Optional digits selectable for DP-1 to 3 (fixed decimal point calculation)
	Reset	Reception desk part reset key and terminal stand reset input (The reset display is selected by the mode.)
	Offset	Offset value setting can establish the indication value after a reset at the reach of -99999 to 999999 (selectable)
Sensor input	Sensor input signal	Open collector pulse input (over MIN 10mA) or non-voltage contact
	Option input (F)	Voltage pulse input (Low : less than 2V, Hi : 3.8 to 30V)
	Option input (V3)	Tacho-generator signal input AC 0.8V to 80V (p-p) 3kHz MAX
	Option input (N)	Sine wave signal input AC 50mV to 20V (p-p) 3kHz MAX
	Option input (L1)	Line receiver 1CH (A・$\overline{\text{A}}$) input
	Option input (L2)	Line receiver 2CH (A・$\overline{\text{A}}$, B・$\overline{\text{B}}$) input
	Sensor input response	0.01Hz to 10kHz, whereas, duty 50% (Low : 0.01 to 50Hz, Mid : 0.01Hz to 1kHz, Hi : 0.01Hz to 10kHz switch shifting)
	Sensor input (HI) response (option)	0.01Hz to 120kHz, whereas, duty 50%
	Sensor supply power source	DC 12V (± 10%) 100mA MAX Option : DC 24V (± 10%) 60mA MAX
Auxiliary input	Reset input	Rear face terminal stand input (open collector input)
	Hold selection input	Inhibit /Hold /Lap count / Indication change (selectable) (open collector)
Preset output	Output terminal	Output terminals No.9-6(OUT1),10-6(OUT2) (6 is "GND" common)
	Comparative System	Upper limit ,lower limit(delay) ,Synchronization pulse output (Selectable)
	Output mode	Comparison ,maintenance ,1shot ,1shot 0 return ,synchronous output (Selectable)
	1shot time	Up to 10 ms-2 s, 10 stages. (selectable)
	Preset value setting	The Presetting program setting is also selectable. (-99999 to 999999)
	Output judgment	Judgment output is compared with the indication value by pre-set value.
	Output circuit	Tow-points NPN open collector output, maximum rating:DC30V 50mA max
	Output indication	OUT1 is presetting output the OUT1 LED(red)are activated

		OUT2 is presetting output the OUT2 LED(red)are activated
	Output reset	Front face reset input / rear part terminal base input (signal width over 50ms)
	Synchronization 　　　pulse output	Width of output: Selection setting even of 10ms to 2s from ten stages Output timing: It outputs it synchronizing with the update of the set display digit. The display digit is arbitrarily set from 1 to 6 digits.

Others	Mode protect function	The function according to the down key operation. The mode setting cannot be changed.
	Data backup	Each mode setting value and totalized value is memorized by FRAM (The memory number of times is within 100,000 times, About 10 year safekeeping.)
	Power supply voltage	AC 85 to 264V (50/60Hz) about 20VA
	Option: DC type	DC 12 to 24V ±10%
	Operating temperature / humidity range	0 to 50℃　30 to 80%RH (whereas, there shall be no dewing)
	Dimensions/ weight	W96 × H48 × D130 (㎜) About 400g
	Case-material	Containing ABS-resin glass, Gray color (Terminal board PBT Black color)
	Color　No code	Gray
	Option: K type	Black
	Safety class	IP66 (front)

【 Option 】

《 Photo MOS relay output：P2 option 》

Preset output	Output terminal	Output terminals No.15-16(OUT3), 17-18(OUT4)
	Comparative System	Upper limit ,lower limit(delay) ,Synchronization pulse output (Selectable)
	Output mode	Comparison ,maintenance ,1shot (Selectable)
	1shot time	Up to 10 ms-2 s, 10 stages. (selectable)
	Preset value setting	The Presetting program setting is also selectable. (-99999 to 999999)
	Output judgment	Judgment output is compared with the indication value by pre-set value.
	Output circuit	Photo MOS relay output 2 stages (MAX. rating load current 0.12A load voltage AC140V　DC30V)
	Output indication	OUT3 is presetting output the OUT3 LED(red)are activated OUT4 is presetting output the OUT4 LED(red)are activated
	Output reset	Front face reset input / rear part terminal base input (signal width over 50ms)
	Synchronization 　　　pulse output	Width of output: Selection setting even of 10ms to 2s from ten stages Output timing: It outputs it synchronizing with the update of the set display digit. The display digit is arbitrarily set from 1 to 6 digits.

《 Analog output：AV / AI option output 》

Analog output	Output terminal	Output terminal No.19-20
	Voltage output(AV3 to 5)	DC1 to 5V/ DC0 to 5V/ DC0 to 10V load resistance over 2KΩ
	Current output(AI)	DC4 to 20mA less than 500Ω of load resistance
	Output accuracy	Within ±0.3%F.S.for display value (23℃)
	The temperature characteristic	±100 ppm/℃
	Output response	Less than about 50ms (Analog change time 0 %- 90 %)

	Max Output resolution	12-bit D/A system 4000 ・ AI DC4 to 20mA:4000 ・ AV3 DC1 to 5V :4000 ・ AV4 DC0 to 5V :4000 ・ AV5 DC0 to 10V :4000 ※ Max output area: It is possible to output to 102.4%(4096bit) to the max of each output. ※ An analog output is outputting calculation to the indication value shown to 7segment LED therefore the resolution sometimes falls from 4000 by setting of mode 11,12
	Reverse output	Voltage output / Current output The output is reversed and it outputs it.

《 BCD output : B option output 》

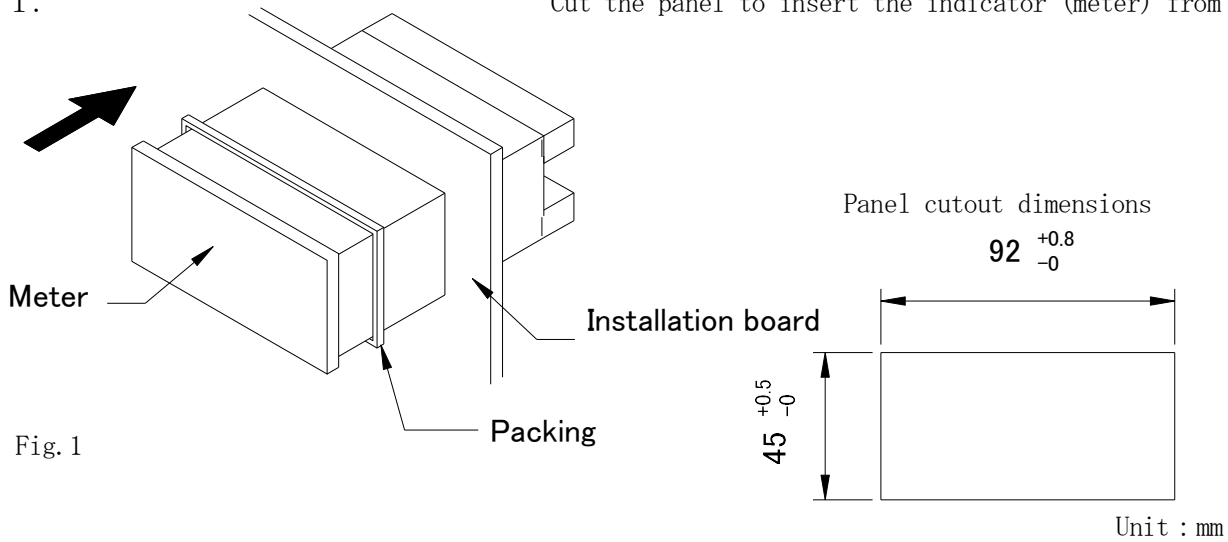|		
BCD output	Output terminal	Output from BCD optional connector
	Output type	All digits parallel open collector output
	Output timing	Output is synchronizing with the display update.
	Output operation	At time of output ” H” level, it is shorted with GND
	TI (take-up inhibition)	“H” level (about 25ms width) at time renewing the data
	Output logic	Positive / negative logic is possible to change(Data TI output each)
	Rating	DC 30V 10mA MAX

《 BCD input : BI option input 》

|		
BCD input	Input terminal	Input from BCD optional connector
	Input type	All digits parallel open collector output
	Input timing	Every operation cycle
	Input operation	The input signal is GND and short, or it takes it by the opening.
	Latch signal	Taking prohibition of data when latch signal is input.
	Input logic	Positive / negative logic is possible to change(Data LACH input each)
	Rating	Outflow current when input terminal is short-circuited About 3mA

3. Mounting meter

How to mount indicator (meter)

1.   Cut the panel to insert the indicator (meter) from the front.

Meter

Installation board

Panel cutout dimensions

$92 \; ^{+0.8}_{-0}$

$45 \; ^{+0.5}_{-0}$

Packing

Fig.1

Unit : mm

2.   Please push the Fitting for fixing the body. Into a right and left both sides of
the meter.

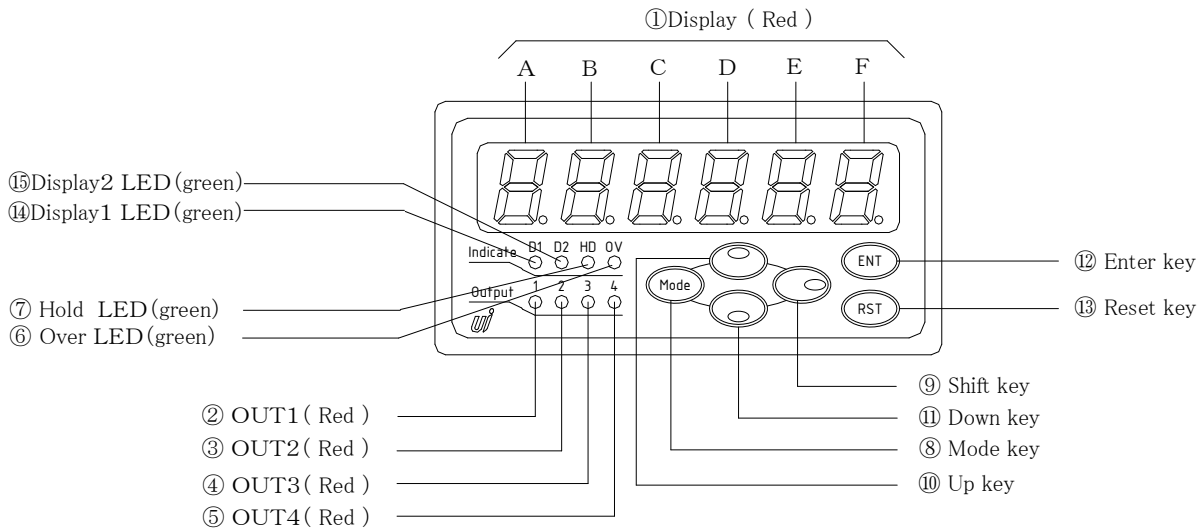Fitting for fixing the body

Fig.2
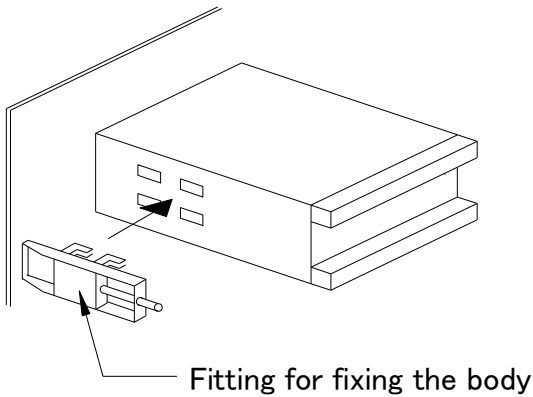
3.   Slide in the rear side (terminal stand side) as for the fitting for fixing the body.
It turns a screw by the driver.
The meter is fixed (right and left both sides)

Driver

Fig.3   Fitting for fixing the body
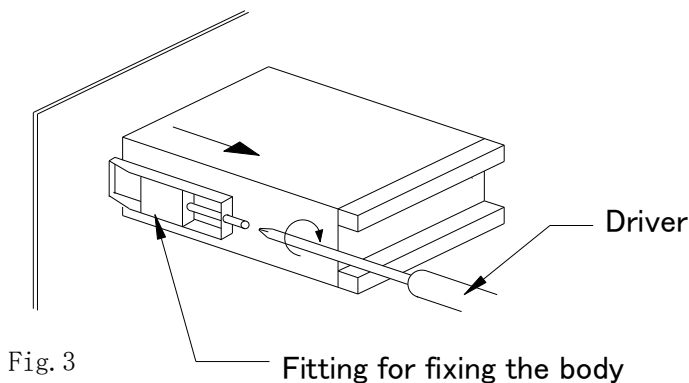
1. Please install it horizontally.
2. Fit the body on to a panel 1.0-4.0 mm in thickness.
3. Please do not tighten the screw of the mounting bracket too much.
   (The case might be damaged when tightening too much.)

4. Each part-name and its function of front section

①Display（Red）

A B C D E F

⑮Display2 LED(green)

⑭Display1 LED(green)

Indicate D1 D2 HD OV

⑦ Hold LED(green)

⑥ Over LED(green)

Output 1 2 3 4

② OUT1（Red）

③ OUT2（Red）

④ OUT3（Red）

⑤ OUT4（Red）

⑫ Enter key

⑬ Reset key

⑨ Shift key

⑪ Down key

⑧ Mode key

⑩ Up key

①Display unit (A to F)

   Measurement state: The measured value is indicated.

   Setting state:

       A・・・・・Mode No. is indicated.

       B to E・・・The present set value is indicated.

        : Whole pre-set value setting indicates the present set value.

        : Whole offset value setting indicates the offset value.

② to ⑤ OUT1 to OUT4 Presetting output LED (Red)

   This lamp lights at time of ON of each preset output (OUT1 to OUT4)

⑥ Over display LED

   When the display 999999 or more,-99999 or less, it blinks.

⑦ Hold display LED

   Auxiliary input (terminal No.2 and No.3 is shorted) it lighting.

⑧ Mode key (Mode)

   Turning on the power state: When a power on while is pushing down (Mode), a test mode functions.

                  (A stop of the test mode function is power off.)

  Measurement state: When ◯ is pressing for 2 sec. or more while is pushing down (Mode), mode setting is

                   called.

       : When (Mode) is pressing for 2 sec. or more, pre-set value is called.

       : When ◯ is pressing for 2 sec. Or more, while is pushing down (Mode),

          offset value setting is called.

  Setting state: Mode No. (indicator A, B)is switched.

          : OUT1 to OUT4 is switched at the time of pre-set value setting.

          : Display1, Display2, is switched at the time of offset value setting.

⑨ Shift key ⬭

    Measurement state: ⬭ is used to call the mode setting.

                                  (It's on for mode then 2 second with (Mode).)

    Setting state: ⬭ moves the flash figure when each setting, to the right.

⑩ Up key ⬭

    Measurement state: ⬭ is used to call the offset value setting.

                                  (It's on for mode then 2 second with (Mode).)

                    : When ⬭ is pushing over frequency is display it's necessary to set it to this function.

                      Please refer to "Mode 09 [Over display method]".

    Setting state: Changes the value of the blinking digit during setup procedures. (UP side)

⑪ Down key ⬭

    Setting state: Changes the value of the blinking digit during setup procedures. (DOWN side)

               : Calls up mode protect function or when changing it uses it.

⑫ Enter key (ENT)

    Turning on the power state: When a power on while is pushing down (ENT), a each setting is initialized.

    Measurement state: (ENT) is pushed, display1(D1) and display2(D2) are switched.

    Setting state: A set value is registered and make it returns to the measurement status.

⑬ Reset key (RST)

    Measurement state: (RST) is pushed, reset is made, and the display shows "0".

    Setting state: Returns to the measurement status, without registering.
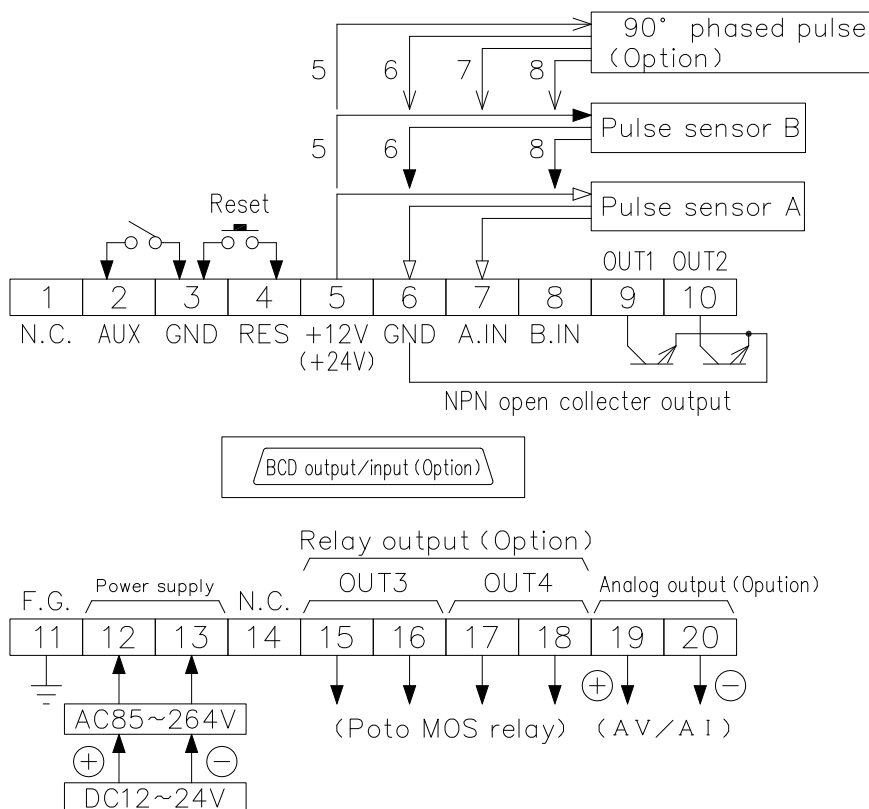
⑭ Display 1 LED

    It lights at display 1.

⑮ Display 2 LED

    It lights at display 2.
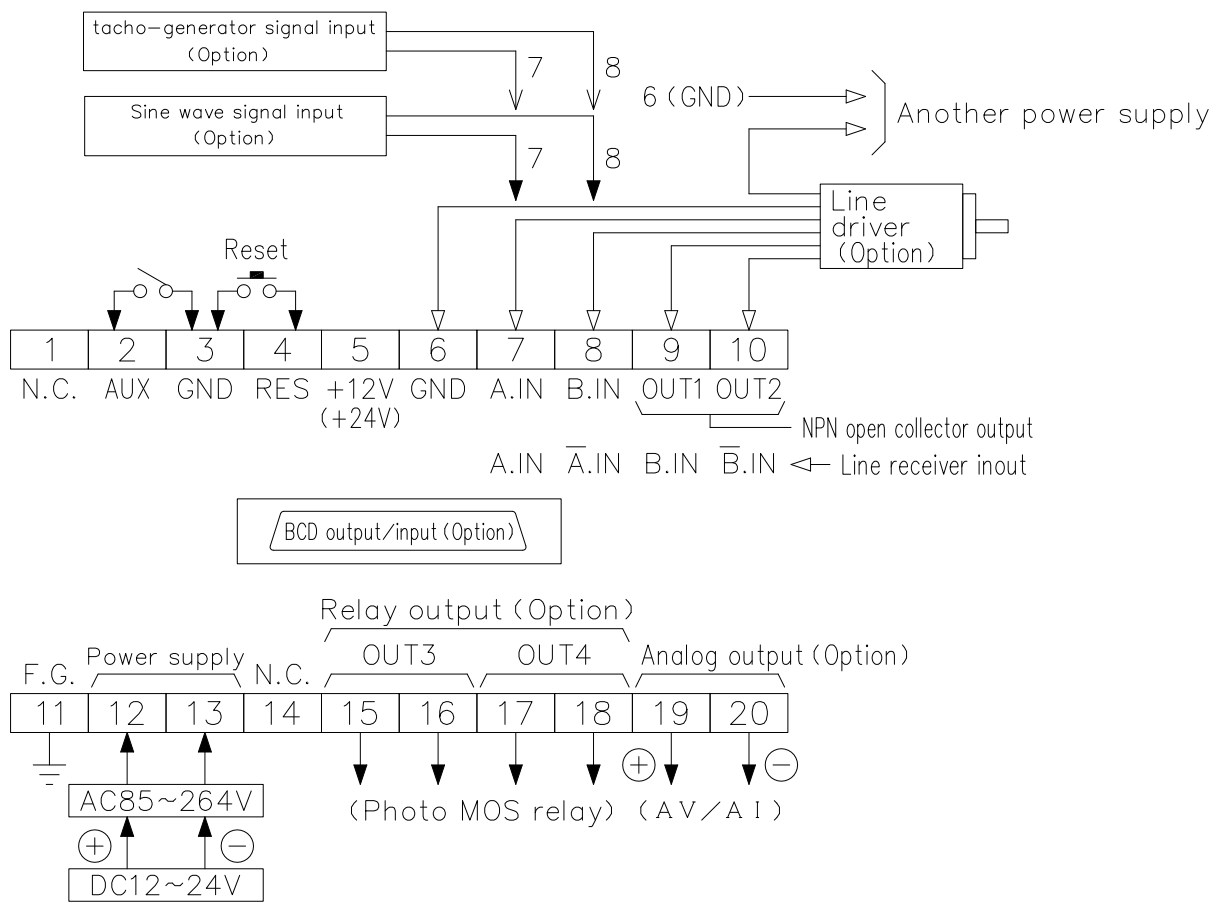
5. Connection method of terminal board

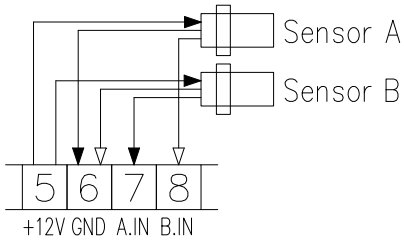《 NPN open collector pulse, Voltage pulse input 》   Fig.5

90° phased pulse (Option)
5 6 7 8

Pulse sensor B
5 6   8

Reset

Pulse sensor A

OUT1 OUT2

1	2	3	4	5	6	7	8	9	10
N.C.	AUX	GND	RES	+12V (+24V)	GND	A.IN	B.IN		

NPN open collecter output

BCD output/input(Option)

Relay output（Option）

F.G.   Power supply   N.C.   OUT3   OUT4   Analog output(Opution)

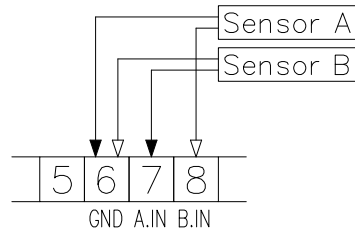| 11	12	13	14	15	16	17	18	19	20

AC85~264V
DC12~24V

(Poto MOS relay)   （AV／AI）

! Caution

・Always turn the power off before commencing any wiring work.
・Please confirm the specification.
・Confirmation of power supply input
  Confirm the input voltage specification (AC or DC) once again. Pay much attention to this matter.
  If this is not right, a protective part and the like may be damaged.
・For DC power supply input
  If ⊕ and ⊖ are connected reversely, the internal protective circuit will function to stop
  the reverse current. In this case, disconnect the wires, and after about 30 seconds, connect
  the wires to ⊕ and ⊖ correctly. The system will work normally.
・Since the input and output wirings differ depending on the type of the sensor, make wiring work
  with the next-mentioned diagrams
・Tighten the screw of the terminal boards securely.
・Use the terminal No.5 - 8 as power supply for the sensor. Do not use these terminals for
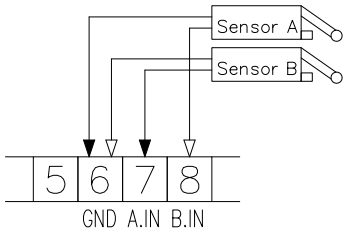 other things.

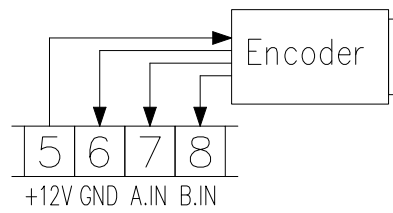A. Pulse output 3-wire type sensor   Fig. 7

Sensor A

Sensor B

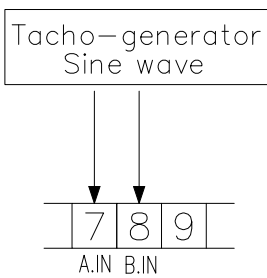| 5 | 6 | 7 | 8 |
+12V GND A.IN B.IN

B. Pulse output 2-wire type sensor   Fig. 8

Sensor A

Sensor B

| 5 | 6 | 7 | 8 |
GND A.IN B.IN

C. Ground contact output sensor   Fig. 9

Sensor A

Sensor B

| 5 | 6 | 7 | 8 |
GND A.IN B.IN

D. 90° phased pulse input   Fig. 10

Encoder

| 5 | 6 | 7 | 8 |
+12V GND A.IN B.IN

E. Tacho-generator / Sine wave   Fig. 11

Tacho-generator
Sine wave

| 7 | 8 | 9 |
A.IN B.IN

F. Line receiver signal   Fig. 12

Line driver
Encoder

| 5 | 6 | 7 | 8 | 9 | 10 |
+12V GND A.IN $\overline{\text{A}}$.IN B.IN $\overline{\text{B}}$.IN
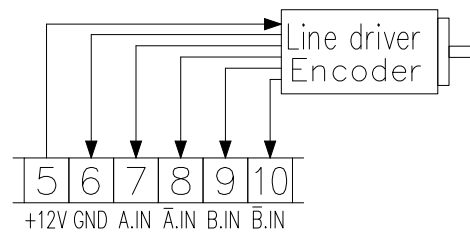
G. Current pulse input (3-wire pulse sensor) Fig. 13

Sensor
+   −   OUT

| 5 | 6 | 7 | 8 |
+12V GND A.IN
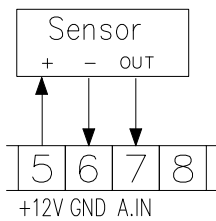
H. Current pulse input (2-wire pulse sensor)

Fig. 14

Sensor
+   −

| 5 | 6 | 7 | 8 |
+12V GND A.IN
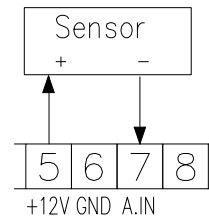
6. Construction of input circuit

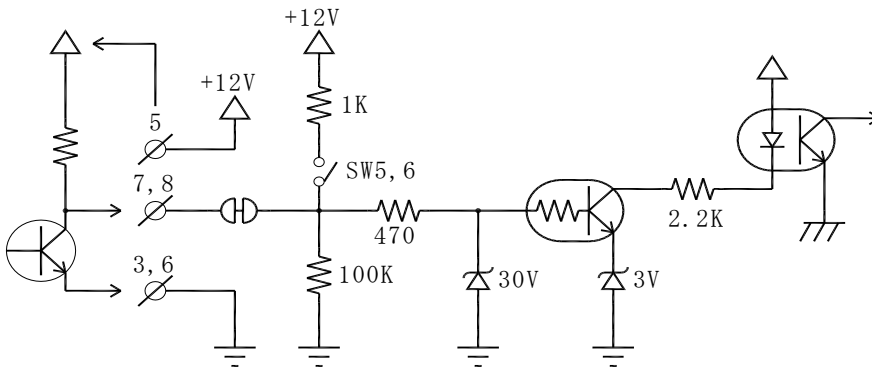① Sensor input :NPN open collector pulse input   Fig.15

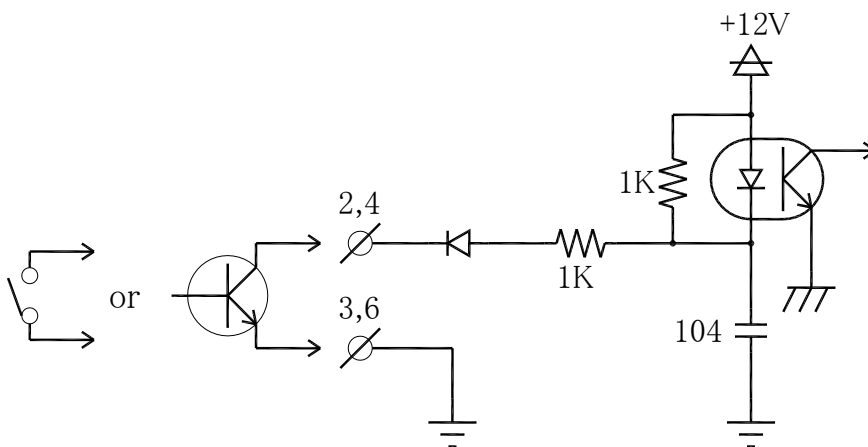Sensor power
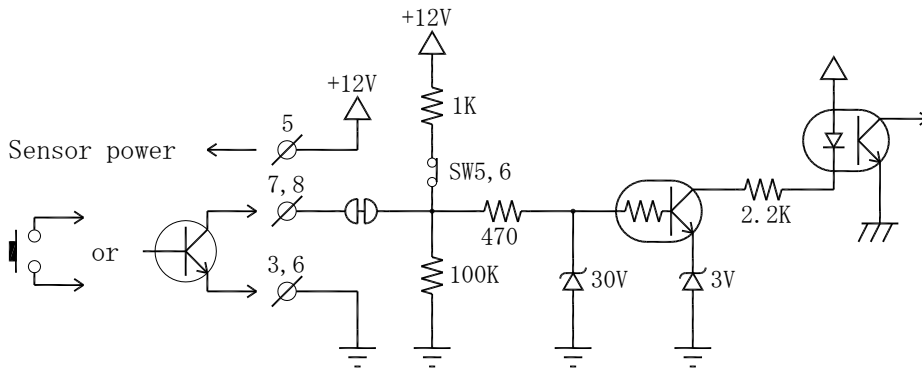
② Sensor input : Voltage pulse input   Fig.16

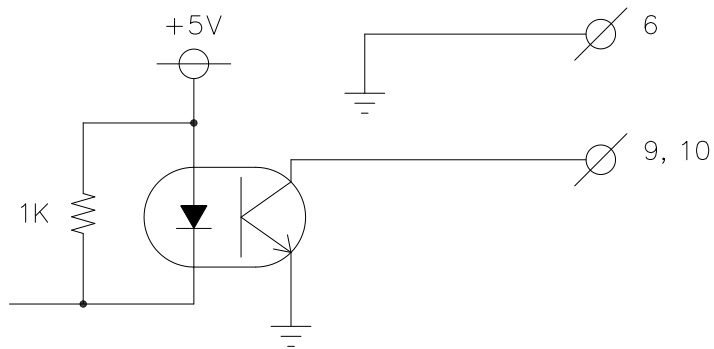④ Reset/AUX input(NPN open collector pulse input)   Fig.17

7.Construction of output circuit
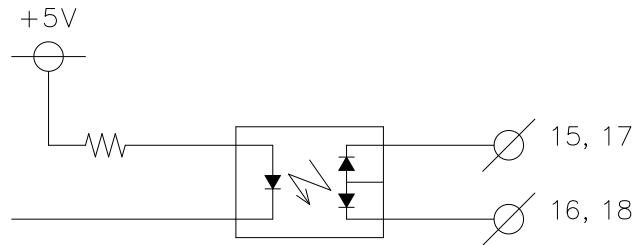
1. Alarm output (OUT1 OUT2) NPN open collector pulse output   Fig.18

2. Alarm output (OUT3 OUT4) Photo MOS relay output (Option: P2 type)   Fig.19
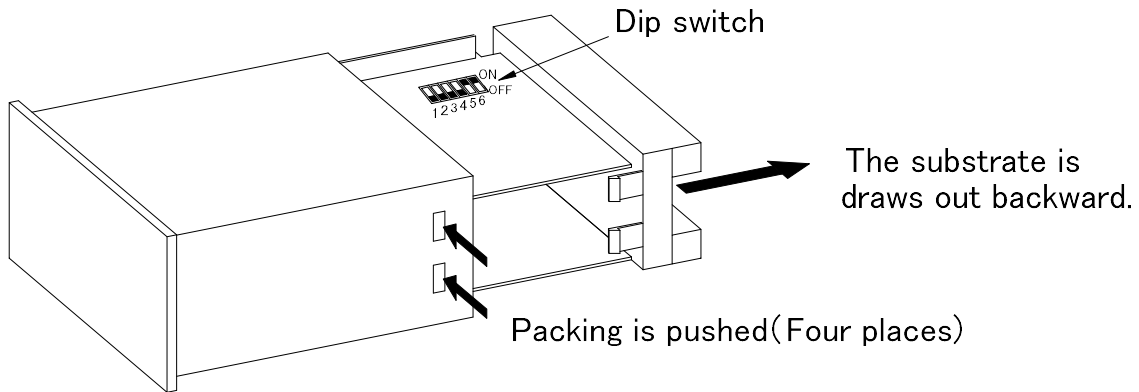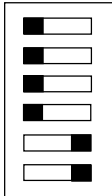
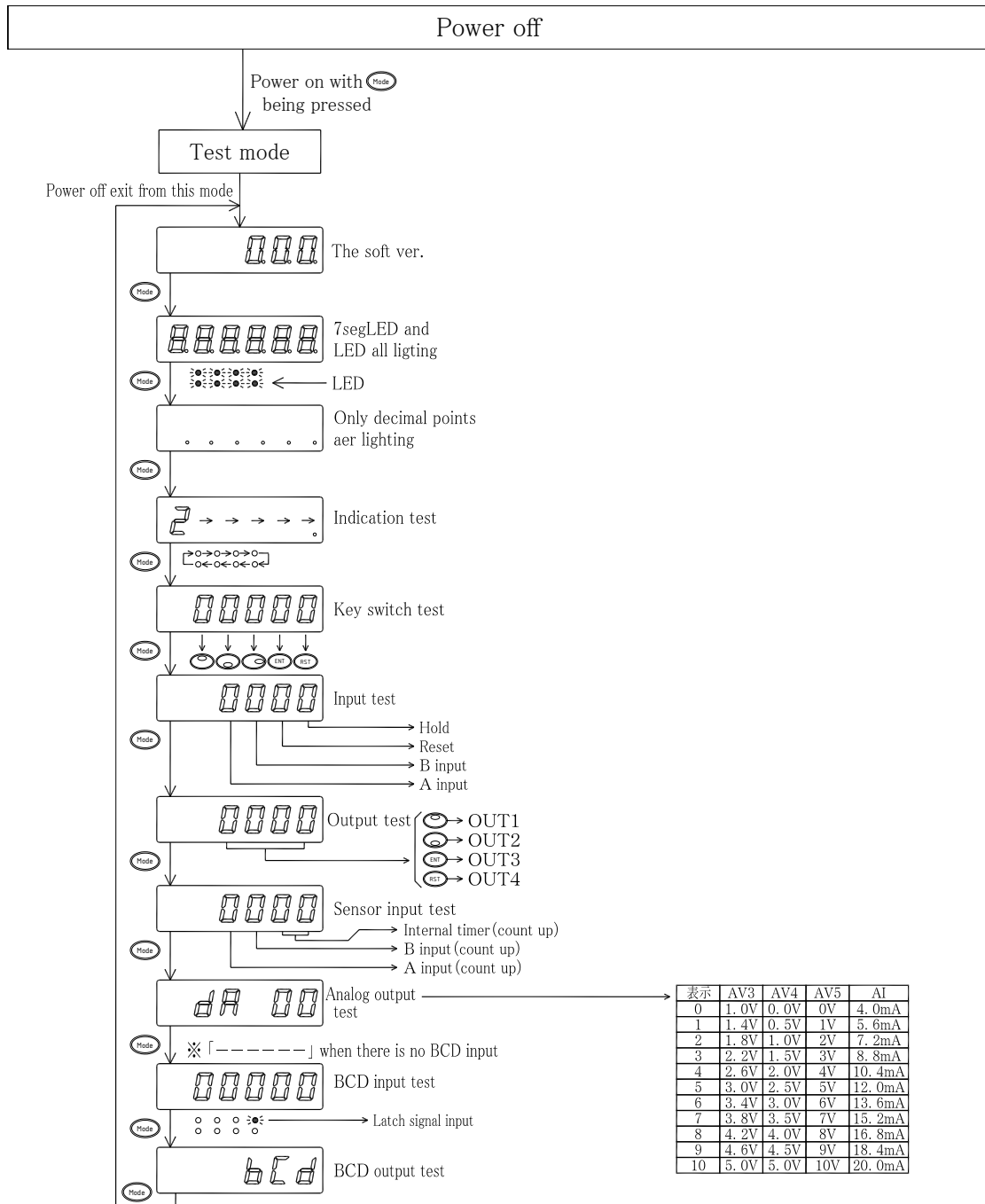# 8. Setting the dip switch

Fig.20

Dip switch

ON / OFF
1 2 3 4 5 6

The substrate is draws out backward.

Packing is pushed(Four places)

Table 1

	B. IN		A. IN		B. IN	A. IN	OFF ⇔ ON
	1	2	3	4	5	6	
Input frequency 0.01Hz to 50Hz LOW	ON	OFF	OFF	ON			
Input frequency 0.01Hz to 1kHz MID	OFF	ON	ON	OFF			
Input frequency 0.01Hz to 10kHZ HI	OFF	OFF	OFF	ON			
Input frequency 0.01Hz to 120kHz ※	OFF	OFF	OFF	OFF			
Open collector input					ON	ON	
Voltage pulse input					OFF	OFF	

Setting ※ is HI type

1) There is a SW under the switch mark of terminal-stand label, remove the label, and make setting.
   Whereas, shipment is made with the standard specifications of open collector input
   (both A, B-input) and input frequency : HI.
2) Do not touch for line-driver input, tacho-generator input, sine wave input.
3) 90-deg. Phase difference input (RE) type is both A and B input use the input frequency without fail in factory
   setting (HI).
4) Upon combination other than above, normal operation may not be made, therefore, make setting in accordance
   with the above table.

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9. Setting menu

< Test mode >

Power off

Power on with (Mode) being pressed

Test mode

Power off exit from this mode

The soft ver.

7segLED and LED all ligting

← LED

Only decimal points aer lighting

Indication test

Key switch test

Input test
→ Hold
→ Reset
→ B input
→ A input

Output test
→ OUT1
→ OUT2
→ OUT3
→ OUT4

Sensor input test
→ Internal timer(count up)
→ B input(count up)
→ A input(count up)

Analog output test

※「－－－－－－」when there is no BCD input

BCD input test
→ Latch signal input

BCD output test

表示	AV3	AV4	AV5	AI
0	1.0V	0.0V	0V	4.0mA
1	1.4V	0.5V	1V	5.6mA
2	1.8V	1.0V	2V	7.2mA
3	2.2V	1.5V	3V	8.8mA
4	2.6V	2.0V	4V	10.4mA
5	3.0V	2.5V	5V	12.0mA
6	3.4V	3.0V	6V	13.6mA
7	3.8V	3.5V	7V	15.2mA
8	4.2V	4.0V	8V	16.8mA
9	4.6V	4.5V	9V	18.4mA
10	5.0V	5.0V	10V	20.0mA

< Set menu >

Power off

Power on with (ENT) being pressed

Power on

(ON) → Over frequency display

(OFF)

Initialization → Measurement state

(Mode protect)

(Mode) + press (○) for 2 sec or more   (Display offset value setting)

| (Mode) | 0 | 0 | 0 | 0 | 0 | 0 | Display 1 offset value setting |
| (Mode) | 0 | 0 | 0 | 0 | 0 | 0 | Display 2 offset value setting |

(Mode)

(ENT) Registered   (RST) Doesn't registered

(○) for 2 sec or more

(Mode) for 2 sec or moer   (The preset value setting)

(Mode)	9	9	9	9	9	9	Preset value setting of alarm output OUT1
(Mode)	9	9	9	9	9	9	Preset value setting of alarm output OUT2
(Mode)	9	9	9	9	9	9	Preset value setting of alarm output OUT3
(Mode)	9	9	9	9	9	9	Preset value setting of alarm output OUT4

(Mode)

For 8 sec or more

| L | – | O | N | Mode protect ON |
| L | – | O | F | F | Mode protect OFF |

(ENT) Registered
(RST) Doesn't registered

(Mode) + press (○) for 2 sec or more   (Mode setting)

(Mode)	0	0.	2	4	0	0	Measurement selection, Measurement unit , decimal point
(Mode)	0	1.	1	0	0	0	A input : setting of scaling data
(Mode)	0	2.	3	0	0	1	A input : setting of EXP value, Divided value
(Mode)	0	3.	1	0	0	0	B input : setting of scaling data
(Mode)	0	4.	3	0	0	1	B input : setting of EXP value, Divided value
(Mode)	0	5.	0	0	0	0	OUT1 : Setting of alarm output synchronization pulse output configuration
(Mode)	0	6.	0	0	0	0	OUT2 : Setting of alarm output
(Mode)	0	7.	0	0	0	0	OUT3 : Setting of alarm output
(Mode)	0	8.	0	0	0	0	OUT4 : Setting of alarm output synchronization pulse output configuration
(Mode)	0	9.	0		0	0	Setting of blank display, external input function, over how to display
(Mode)	1	0.		0	1	4	Reset mode when the power on, function of reset key, selection of reset display
(Mode)	1	1.	0	0	0	0	Analog output : setting of output method, output digit, indication selection
(Mode)	1	2.	1	0	0	0	Analog output : maximum output indication
(Mode)	1	3.	0		0	0	BCD output : setting of output logic indication
(Mode)	1	4.	0		0	1	BCD input : setting of input logic indication

(Mode)

Set value of each setting reaches an initial value (right picture) everything

(Mode) Mode key
(○) Up key
(○) Lower key
(◐) Shift key
(ENT) Entor key
(RST) Reset key

(ENT) Registered
(RST) Doesn't registered

We will recommend set mode setting value and preset value to be taken notes.

１０. Initial setting values and initialization

・Initial setting value of each mode

<div style="text-align: right">(Table 1-1)</div>

Mode No.		Initial setting value				Setting memo column			
A	B	C	D	E	F	C	D	E	F
0	0.	2	4	0	0				
0	1.	1	0	0	0				
0	2.	3	0	0	1				
0	3.	1	0	0	0				
0	4.	3	0	0	1				
0	5.	0	0	0	0				
0	6.	0	0	0	0				
0	7.	0	0	0	0				
0	8.	0	0	0	0				
0	9.	0	—	0	0		—		
1	0.	—	0	1	4	—			
1	1.	0	0	0	0				
1	2.	1	0	0	0				
1	3.	1	—	0	0		—		
1	4.	0	—	0	1		—		

・Initial setting value of preset value

<div style="text-align: right">(Table 1-2)</div>

Alarm No.	Initial setting value	Setting memo column
OUT 1	9 9 9 9 9 9	
OUT 2	9 9 9 9 9 9	
OUT 3	9 9 9 9 9 9	
OUT 4	9 9 9 9 9 9	

・Initial setting value of off set value

<div style="text-align: right">(Table 1-3)</div>

	Initial setting value	Setting memo column
Display 1	0 0 0 0 0 0	
Display 2	0 0 0 0 0 0	

In case informed of the specification by user previously, its setting is made, while usually,
Initial setting value is put in as shown in the Table 1-1, Table 1-2, Table 1-3.
This initial writing (initial parameter setting) can be set by setting the power-supply
to ON while pushing ENT key.
Even in case of run away of computer of the inside by noise, etc, make initialization by this method,
and thereafter, set to the desired setting value.

11. Key operation method of mode setting

Upon setting each mode, operate each key as in the following diagram.   (Table 5)

Operating key	Display unit	Operation procedure
(Mode) + (⬭)	A B C D E F 0 0. **2** 4 0 0	Push (Mode) key and (⬭) key for over 2 seconds. Thereby, display-unit A・B shows "00", it means the calling of mode No. "00".
(⬭)	A B C D E F 0 0. 2 **4** 0 0 ↑ → → →⌐	Push this key for changing the position of flashing. At each time pushing it once, setting digit (flashing) is moved right-ward.
(⬭)	A B C D E F 0 0. 2 **4** 0 0 ↑ 0 to 9	Push this key for changing the value flashing. (0 → 1 → 2・・・8 → 9 to UP)
(⬭)	A B C D E F 0 0. 2 **4** 0 0 ↑ 9 to 0	Push this key for changing the value flashing. (9 → 8 → 7・・・1 → 0 to DOWN)
(Mode)	A B C D E F <u>0 1.</u> 1 0 0 0 ↑⌐ 00 to 14	Push this key for changing the Mode No. (00 → 01 → ・・・→ 14 → 00 　　　　　　　　→ 01 →・・・)
(ENT)		After adjusting the setting, use this key to register it. The display returns to the readings following registration.
(RST)		It returns to the register. Pay attention to the fact that the set data is not memorized.

⚠ 〈 Caution 〉

　　Please make the mode protect function "L-off" at the mode setting.

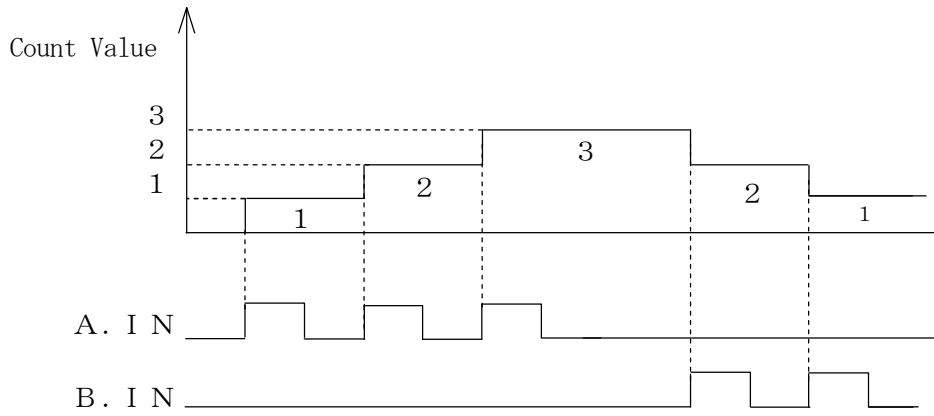　　If it's a condition of "L-on", it can't be changed.

　　About the contents of the mode protect function, please refer to," 10.The mode protect function".

9. Mode No. and setting value as contents

Mode No.	Measurement selection, Display decimal point

0 0	
	
	    A B C D E F
	    0 0. 2 4 0 0
	
	→ Display 2 decimal point setting
	    0・・・ 0
	    1・・・ 0.0
	    2・・・ 0.00
	    3・・・0.000
	
	→ Display 1 decimal point setting
	    0・・・ 0
	    1・・・ 0.0
	    2・・・ 0.00
	    3・・・0.000
	
	→ Measuring operation method
	
	→ Display select
	    0・・・Display1(fixation)
	    1・・・Display2(fixation)
	    2・・・Display1・Display2(change)
	
	〔Display select〕
	When Push (ENT) display change or fixation.
	
	〔Measuring operation method〕
	A−B・・The signal input to A input is added, and the signal input to B input is subtracted.
	A+B・・The signal input to A input and B input is added.
	A or -A・・The signal input to A input when B input is LOW level is added, and the signal input to A input when B input is HI level is subtracted.
	
	〔Decimal point setting〕
	The display digit below the decimal point is set.

Measuring operation method

No	Display1	Display2
※0	A−B	A
1	A+B	A
2	A or -A	---
※3	A−B	B
4	A	B
5	A	−B
6	−A	−B

※90° phased pulse input type select 0 or 3

[Measuring operation method]

0 : A-B(Adding and subtracting individual input)

0:A-B(90° phased pulse input)

1:A+B

2:A or -A

Count Value

A.IN

B.IN   ON UP(addition)
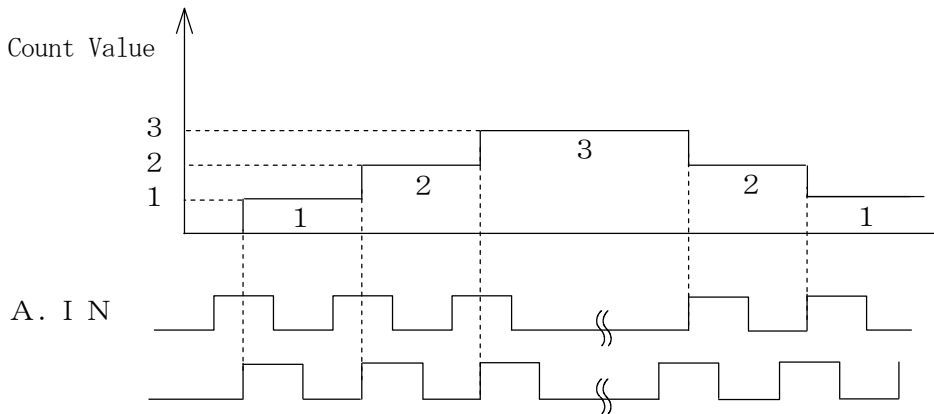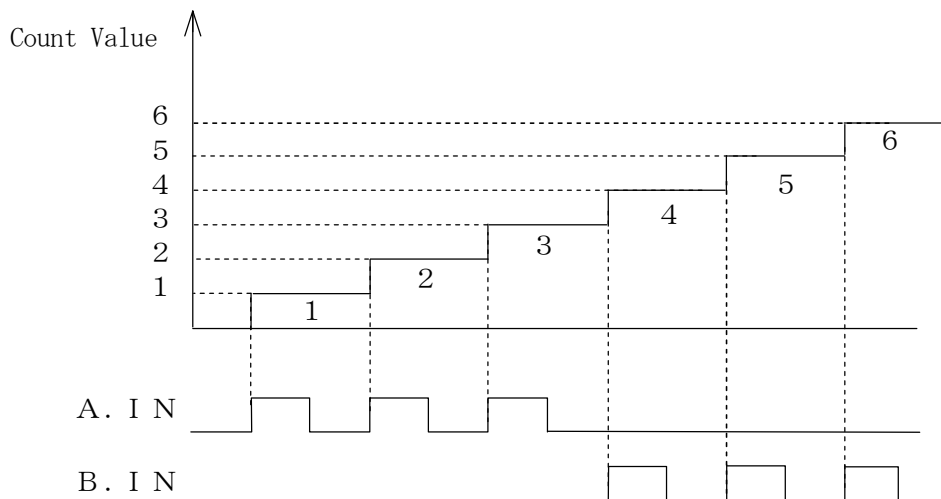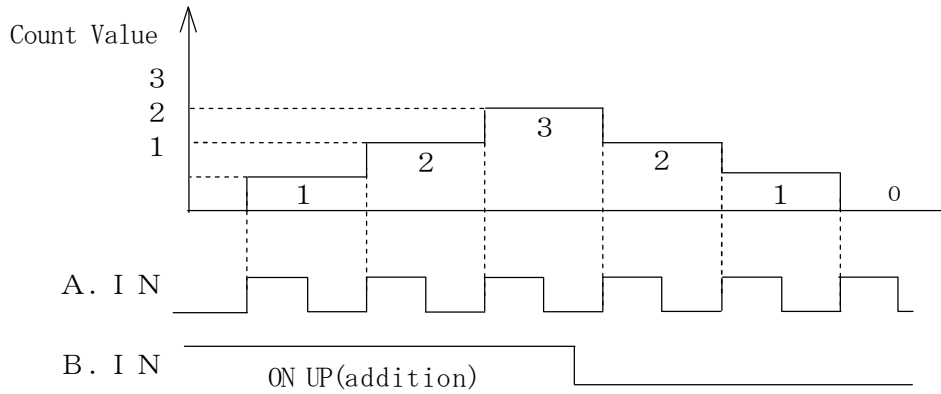
Caution
Please do not set display 2 of the warning display selection and the analog output display selection
when you select this computing type.
When display 2 is set, it is likely to be output regardless with the display.

Mode No.	A-input : Setting of converting value (scaling)

0 1	
	 A B C D E F
	 ┌──────┬──────────┐
	 │ 0 1.│ 1 0 0 0 │
	 └──────┴──────────┘
	     └──────┬──────┘
	        → Converted value : 0001 to 9999 (Do not set 0000)
	
	 With input of this converter and EXP-value, it is possible to set the
	 magnification per 1 pulse. This EXP-value is set with Mode "02".
	
	 -
	
	 For instance, with display of instant flow-rate by L/min in the use of flow sensor of 2.5mL per 1 pulse,
	 the following is shown.
	
	    2.5mL ⇒ 0.0025L ⇒ 2500 × 10^{-6}
	              Converted to the
	              intended value(L)
	              to display Converter EXP-value
	
	           A B C D E F
	 Mode "01" │ 0 1.│ 2 5 0 0 │
	
	           A B C D E F
	 Mode "02" │ 0 2.│ 6 * * * │

Mode No.	A-input : EXP-value, Divided Value setting
0 2	 A B C D E F `0 2. 3 0 0 1` Divided Value 1/1〜1/999(000=1/1000) ⟶ Exp-value : 0 to 9
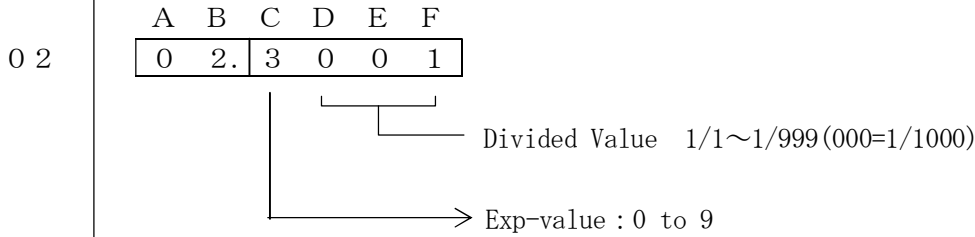
〔Exp value〕
With input of this converter and EXP-value, it is possible to set the
magnification per 1 pulse. This EXP-value is set with Mode "01"

〔Divided Value〕
What you assume to be one if the pulse is input is set.
The error margin in the calculation might become small if it inputs it when the pulse number per rotation
is understood.

Caution
The value of divided value multiplied internally is not cleared though the display returns to 0 or
the display offset value when resetting it when the machine of divided value is used.

For instance If the machine of dividing frequency specifies reset by 003(1/3), it becomes as follows.

When you use the sending roller of 0.5m rotation by three pulse output per rotation.

It is not cleared even if it resets it.
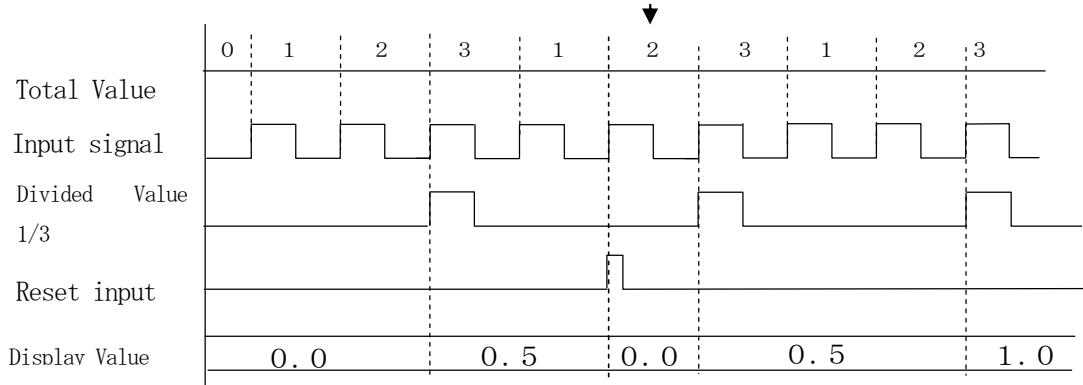
The error margin is caused only by the scaling data. For this case, the input is divided.

Setting
Mode "01"   `0 1. 5 0 0 0` $0.5 = 5000 \times 10^{-4}$
Mode "02"   `0 2. 4 0 0 3` The machine of divided Value becomes three because it outputs
three pulses per rotation.
As a result, 0.5 integrated values go up whenever the sensor is made one rotation.

Caution
Please change the scaling data, the EXP value, and the machine of dividing frequency of A input and
B input to the same setting at 90° phase pulse input.

Mode No.	B-input : Setting of converting value (scaling)

0 3	A B C D E F
	┌─────────┐
	│ 0 3.│1 0 0 0 │
	└─────────┘
	    └───┬───┘
	       └────→ Converted value : 0001 to 9999 (Do not set 0000)

	Setting method same "Mode 01 : A-input : Setting of converting value (scaling)"

Mode No.	B-input : EXP value, Divided Value setting

0 4	A B C D E F
	┌─────────┐
	│ 0 4.│3 0 0 1 │
	└─────────┘
	    │ └──┬──┘
	    │ └────── Divided Value 1/1～1/999(000=1/1000)
	    └──────────→ Exp value : 0 to 9

	Setting method same "Mode 02 : A-input : EXP-value, Divided Value setting"

Mode No.	OUT1 : Set preset output・synchronization pulse output configuration(open collector output)
0 5	※Enter an optional line receivers(L1,L2)with the type, OUT1 output terminal will be entered.


```
    A  B    C  D    E  F
  ┌─────┬──────────────┐
  │ 0  5.│ 0  0    0  0 │
  └─────┴──────────────┘
                    └── Output width
                          0 :   10ms        5 : 250ms
                          1 :   20ms        6 : 500ms
                          2 :   50ms        7 : 750ms
                          3 : 100ms         8 :   1sec
                          4 : 200ms         9 :   2sec

                          ⚠ <caution>
                             If you choose to 10ms, OUT1 there are things in
                              the front does not light up.
                             But the output is.
                      ─ Output mode
                          0 : Comparative output
                          1 : Hold output
                          2 : One-shot output

                      ─ Upper and Lower limit or sync output selection
                          0 : Upper limit
                          1 : Lower limit
                          2 : Sync output, First digit (One-shot)
                          3 : Sync output, Second digit (One-shot)
                          4 : Sync output, Third digit (One-shot)
                          5 : Sync output, Fourth digit (One-shot)
                          6 : Sync output, Fifth digit (One-shot)
                          7 : Sync output, 6th digit (One-shot)

                      ─ Select the display of preset output
                          0 : View 1
                          1 : View 2
  ⚠ <caution>
        "00 mode"  operation system measuring  "" A or -A when you choose to View please
        do not set the two.
```

〔Alarm output〕
  Preset output is determined by comparison with the output display value and preset
 value.

〔Select the display of alarm output〕
 View 1 … Display the output to 1.
 View 2 … Display the output to 2.

〔Upper and Lower limit or sync output selection〕Set the output conditions.
 Upper limit … " Value display ≧ Preset value " is output.
 Lower limit … " Value display ≦ Preset value " is output.
 Sync output … The display is updated every digit higher than the one-shot output
                digit set.

〔Output mode〕
 Comparison … Alarm is outputted when the indication value exceeds the upper/lower
                limit (preset values) . When the input returns to normal, the output
                is turned off.
 Hold … Alarm is outputted when the indication value exceeds the upper/lower limit
         (preset values). The alarm output, once activated, is sustained until reset.
 One shot … A pulse of pre-specified width is outputted once when the indication
              value exceeds the upper/lower limit (preset values) .

[One-shot output width]
　　Preset output, set the output time of the output or synchronization.
　Compare the output when the output will hold off.

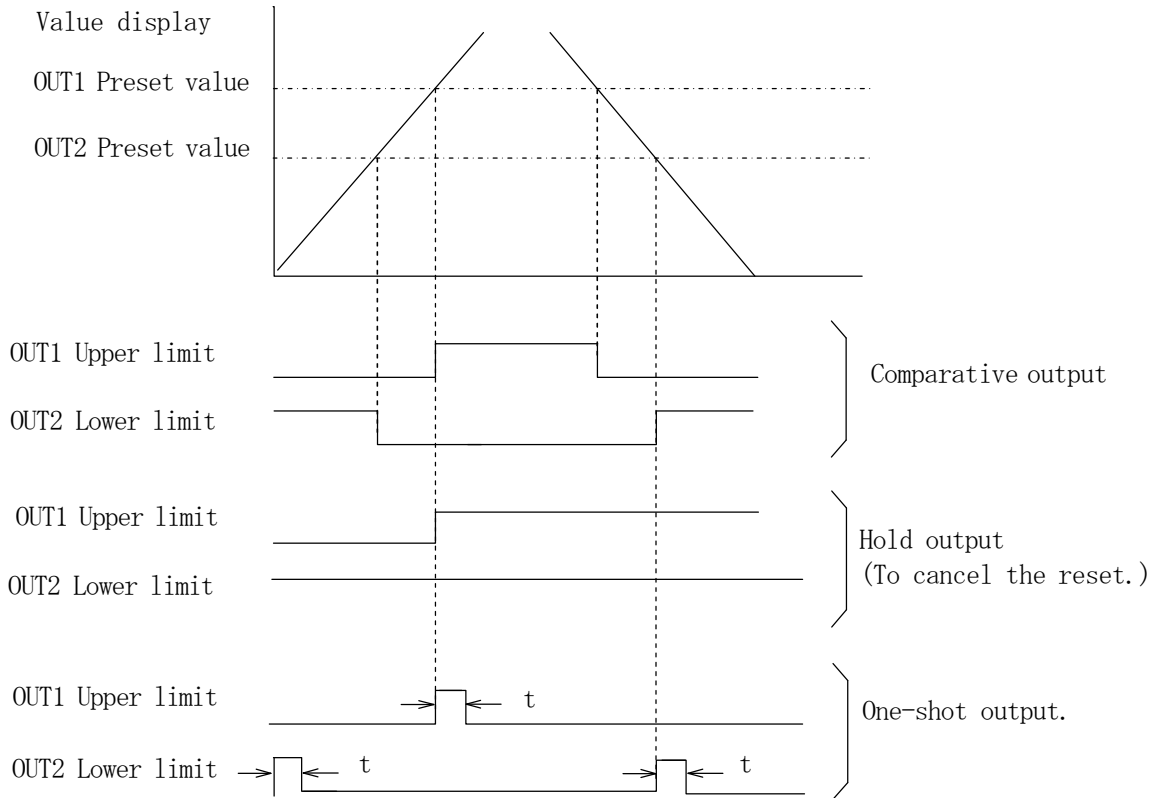| Mode No.	OUT2：Set preset output (open collector output)
0 6	※ Enter an optional line receivers(L1,L2)with the type, 　OUT1 output terminal will be entered. 　　　　A　B　C　D　E　F 　　　　0　6.　0　0　0　0 　　　　　　　　　　　　Output width 　　　　　　　　　　　　0 ：　10ms　　　5 ：　250ms 　　　　　　　　　　　　1 ：　20ms　　　6 ：　500ms 　　　　　　　　　　　　2 ：　50ms　　　7 ：　750ms 　　　　　　　　　　　　3 ： 100ms　　　8 ：　1sec 　　　　　　　　　　　　4 ： 200ms　　　9 ：　2sec 　　　　　　　　　　　／!＼ ＜caution＞ 　　　　　　　　　　　　　If you choose to 10ms, OUT2 there are things in 　　　　　　　　　　　　　the front does not light up. 　　　　　　　　　　　　　But the output is. 　　　　　　　　　　Output mode 　　　　　　　　　　0 ： Comparative output 　　　　　　　　　　1 ： Hold output 　　　　　　　　　　2 ： One-shot output 　　　　　　　　　　3 ： One-shot output return 0 　　　　　　　Upper and Lower limit selection 　　　　　　　0 ： Upper limit 　　　　　　　1 ： Lower limit 　　　　　　Select the display of preset output 　　　　　　0 ： View 1 　　　　　　1 ： View 2 ／!＼ ＜caution＞ 　　　　"00 mode" operation system measuring "" A or-A when selected, 　　　displays two Please do not choose.
	How to set mode "05" OUT1: Set preset output "" is similar.

Mode No.	OUT3 : Set preset output (Photo MOS relay output)
0 7	※ Option "P2" is a feature with. 　 "P2" if not with the type, the output does not alarm.＜LED is lit.＞ 　　　　　　A　B　C　D　E　F 　　　　　　┌─┬───┬─┬─┬─┬─┐ 　　　　　　│0　7.│0　0　0　0│ 　　　　　　└─┴───┴─┴─┴─┴─┘ 　　　　　　　　　　　　　　　Output width 　　　　　　　　　　　0 : 　10ms　　　5 : 　250ms 　　　　　　　　　　　1 : 　20ms　　　6 : 　500ms 　　　　　　　　　　　2 : 　50ms　　　7 : 　750ms 　　　　　　　　　　　3 : 100ms　　　8 : 　 1sec 　　　　　　　　　　　4 : 200ms　　　9 : 　 2sec 　　　　　　　　　　　⚠ ＜caution＞ 　　　　　　　　　　　　If you choose to 10ms, OUT2 there are things in 　　　　　　　　　　　　the front does not light up. 　　　　　　　　　　　　But the output is. 　　　　　　　　　　Output mode 　　　　　　　　　　0 : Comparative output 　　　　　　　　　　1 : Hold output 　　　　　　　　　　2 : One-shot output 　　　　　　　　　Upper and Lower limit selection 　　　　　　　　　0 : Upper limit 　　　　　　　　　1 : Lower limit 　　　　　　　　Select the display of preset output 　　　　　　　　0 : View 1 　　　　　　　　1 : View 2
	How to set mode "05" OUT1: Set preset output "" is similar.

Mode No.	OUT4：Set preset output・Synchronization pulse output configuration(Photo MOS relay output)

0 8	※ Option ″P2″ is a feature with.
	″P2″ if not with the type, the output does not alarm.＜LED is lit.＞
	
	    A B C D E F
	
		0 8 . 0 0 0 |
		
		                    Output width
		             0 : 10ms 5 : 250ms
		             1 : 20ms 6 : 500ms
		             2 : 50ms 7 : 750ms
		             3 : 100ms 8 : 1sec
		             4 : 200ms 9 : 2sec
		
		             ⚠ ＜caution＞
		                If you choose to 10ms, OUT2 there are things in
		                the front does not light up.
		                But the output is.
		
		           Output mode
		           0 : Comparative output
		           1 : Hold output
		           2 : One-shot output
		
		         Upper and Lower limit or sync output selection
		        0 : Upper limit
		        1 : Lower limit
		        2 : Sync output, First digit (One-shot)
		        3 : Sync output, Second digit (One-shot)
		        4 : Sync output, Third digit (One-shot)
		        5 : Sync output, Fourth digit (One-shot)
		        6 : Sync output, Fifth digit (One-shot)
		        7 : Sync output, 6th digit (One-shot)
		
		       Select the display of preset output
		      0 : View 1
		      1 : View 2

	How to set mode ″05″ OUT1: Set preset output ″″ is similar.

Preset output timing

OUT1 upper limit, OUT2 Lower limit output when the timing chart.

Figure 21

Value display

OUT1 Preset value

OUT2 Preset value

OUT1 Upper limit

OUT2 Lower limit

Comparative output

OUT1 Upper limit

OUT2 Lower limit

Hold output
(To cancel the reset.)

OUT1 Upper limit

OUT2 Lower limit

One-shot output.

t

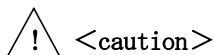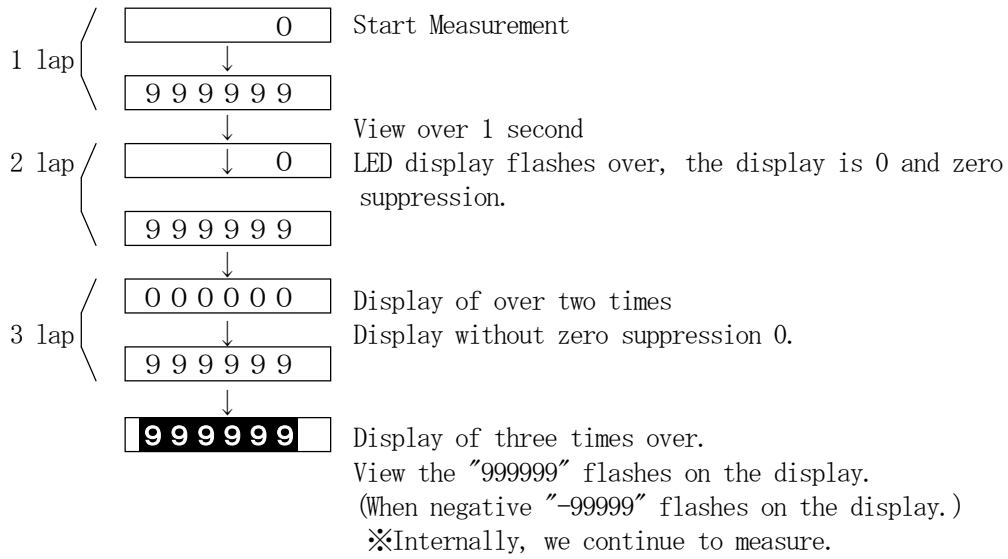| Mode No.	Blank display・External input function・Over how to display settings

0 9	A B C D E F
	┌─────────────┐
	│ 0 9 . 0 0 │
	└─────────────┘
	
	        └─ Over how to view
	        0 : Stop Round 3
	        1 : Endless
	        2 : View the number of times over for ⬯ key.
	          (Upper two digits)
	     └──── External input function
	       0 : Prohibit input
	       1 : Hold input
	       2 : Wrap count input
	       3 : Switching the display input
	
	   └──────────── Blank display
	       0 : Not blank display (Display the measurement.)
	       1 : A blank display　(Do not display the measurement.)

	〔Blank display〕 How to display the measured values, set the display or not. "A blank display" If you set the　Measuring only turns off the display value. Alarm output LED, LED will hold regular feature.

	〔External input function〕　Terminal Blocks feature set between 2-3.
	            When ON, hold the LED is lit.
	
	 0 : Prohibit input・・・・ ON between the Sensor Input prohibited.
	
	 1 : Hold input・・Between ON holds the current display value.
	      〔When functional status lights〕
	       Inside is still measured.
	       (Operation LED display over at the start of the state is retained.)
	
	 2 : Wrap count input・・Once turned ON, the display keeps flashing display
	        the current value.
	       Will start within the measurement instrumentation is reset again.
	       ON again, and displays the measured values were inside.
	      〔When functional blinking〕
	       (Operation LED display over at the start of the state is retained.)
	 ⚠ \<caution>
	Hold laptop running count input, alarm output for each output value has been measured in the internal
	operations. For analog output, 11 modes. "Setting the analog output" by the change in value or
	measurement value currently displayed or internal operations.
	 "Top two-digit ⬯ key" feature, hold, wrap the count entered during operation
	 does not work.
	
	 3 : Switching the display input・・・Every ON to display one display to switch between the two.

〔Over how to view〕
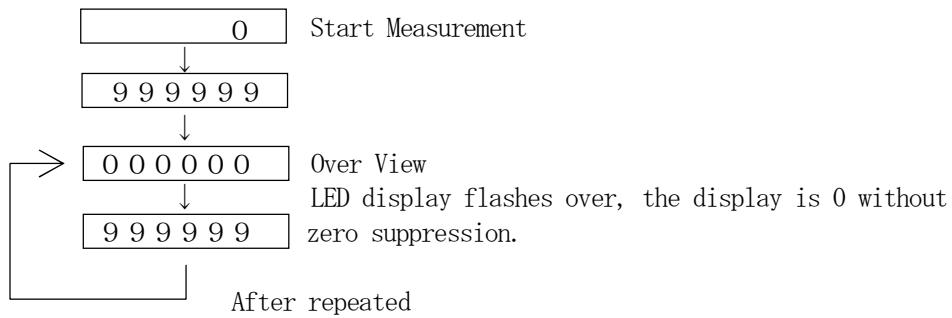　Display value "999999", or to "-99999" to choose how to display the time as below.

　O : Stop Round 3
　In view of the display three times over,"999999", or"-99999" flashes on the display.

```
            ┌─────────────────┐
1 lap       │               0 │   Start Measurement
       │  ┌─────────────────┘
       │  │           ↓
       │  │ ┌─────────────────┐
       │  │ │ 9 9 9 9 9 9     │
       └──┘ └─────────────────┘
                     ↓            View over 1 second
            ┌─────────────────┐   LED display flashes over, the display is 0 and zero
2 lap       │         ↓     0 │    suppression.
       │  ┌─────────────────┘
       │  │ ┌─────────────────┐
       └──┘ │ 9 9 9 9 9 9     │
            └─────────────────┘
                     ↓
            ┌─────────────────┐   Display of over two times
3 lap       │ 0 0 0 0 0 0     │   Display without zero suppression 0.
       │  ┌─────────────────┘
       │  │           ↓
       │  │ ┌─────────────────┐
       └──┘ │ 9 9 9 9 9 9     │
            └─────────────────┘
                     ↓
            ┌─────────────────┐   Display of three times over.
            │ 9 9 9 9 9 9     │   View the "999999" flashes on the display.
            └─────────────────┘   (When negative "-99999" flashes on the display.)
                                   ※Internally, we continue to measure.
```

　1 : Endless
　　Endless displays.

```
            ┌─────────────────┐
            │               0 │   Start Measurement
            └─────────────────┘
                     ↓
            ┌─────────────────┐
            │ 9 9 9 9 9 9     │
            └─────────────────┘
                     ↓
       ┌──→ ┌─────────────────┐
       │    │ 0 0 0 0 0 0     │   Over View
       │    └─────────────────┘   LED display flashes over, the display is 0 without
       │            ↓              zero suppression.
       │    ┌─────────────────┐
       │    │ 9 9 9 9 9 9     │
       │    └─────────────────┘
       │            │
       └────────────┘
                  After repeated
```
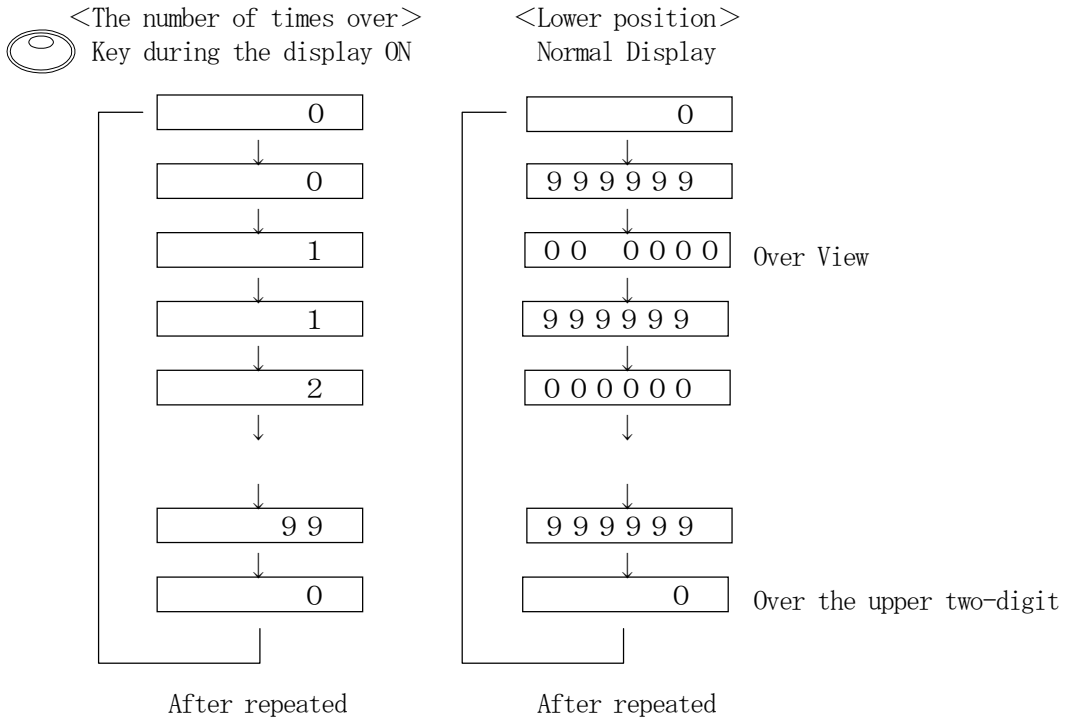
| 09 | 2 : View the number of times over (Upper two digits)
Press the ◯ key while on display over the display to show the number of times over today.
Displays the number of times over while pressing the ◯ key is over the LED turns off, the number of times over 99 times over and LED blinks. |

<The number of times over>   <Lower position>
◯ Key during the display ON   Normal Display

```
┌─ ┌──────────0──────────┐      ┌─ ┌──────────0──────────┐
│        ↓                      │        ↓
│  ┌──────────0──────────┐      │  ┌────────999999───────┐
│        ↓                      │        ↓
│  ┌──────────1──────────┐      │  ┌──00    0000─────────┐  Over View
│        ↓                      │        ↓
│  ┌──────────1──────────┐      │  ┌────────999999───────┐
│        ↓                      │        ↓
│  ┌──────────2──────────┐      │  ┌────────000000───────┐
│        ↓                      │        ↓
│        ↓                      │        ↓
│  ┌─────────99──────────┐      │  ┌────────999999───────┐
│        ↓                      │        ↓
└─ ┌──────────0──────────┐      └─ ┌─────────────0───────┐  Over the upper two-digit
```

After repeated   After repeated

Zero suppression : Erase the display of the upper digit 0.

  Case : If the display 100.

      View | 0 0 0 1 0 0 | ← Without any zero suppression.

            ↓ To the zero suppression.

      View | 1 0 0 |

Mode No.	Setting of reset mode when the power supply, function of reset key, selection of reset display
1 0	A B C D E F ┌──┬────────────┐ │1 0.│ 0 1 4 │ └──┴────────────┘ └─Selection of reset display 　 0 : Display1,Display2(Key and terminal input are same function) 　 1 : Present display(Key and terminal input are same function) 　 2 : Display1 (Key and terminal input are same function) 　 3 : Display2 (Key and terminal input are same function) 　 4 : Key input: Present display, Terminal input: Display1,Display2 └─Function of reset key 　 0 : Not function 　 1 : Reset key is pressed, reset is enabled at once. 　 2 : Reset key is pressed more than one second, reset is enabled 　 3 : Reset key is pressed more than 2 seconds, reset is enabled. 　⚠ <Caution> 　　 The terminal input is always immediately　reset. └─Reset mode when the power supply 　 0 : Not reset 　 1 : Reset
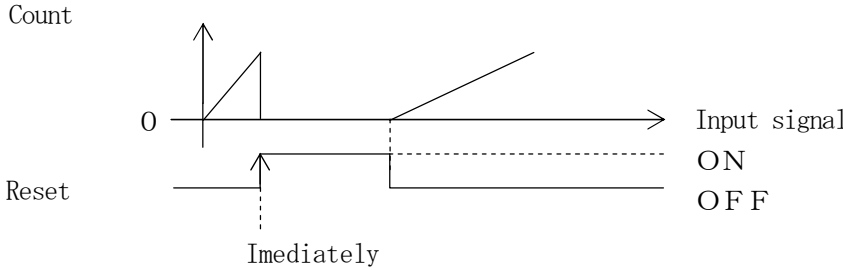
〔Reset mode when the power supply〕
Choice of the display that indicates the previous measurement values or reset, when the power supply.
0: Measurements start from the previous measurement values.
1: Resetting the previous measurement values, measurements start from offset value.
　Display indicates the display1 when the power supply.

〔Function of reset key〕

1 :Reset key is pressed, reset is enabled　at once.
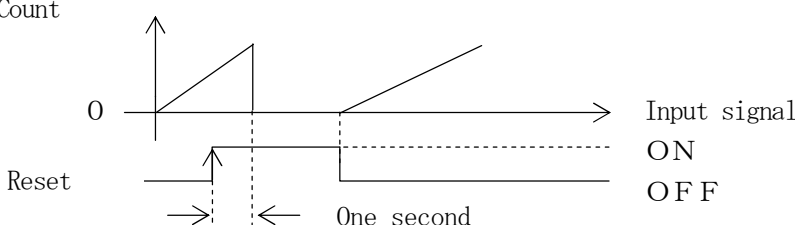
2 :Reset key is pressed more than one second, reset is enabled

10	3 : Reset key is pressed more than 2 seconds, reset is enabled Count Input signal ON OFF 2 seconds
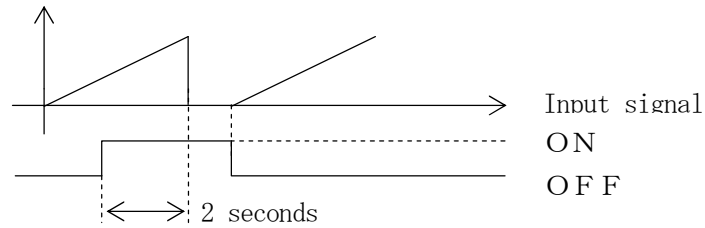
〔Selection of reset display 〕

  Display1, Display2 ···Reset input returns the measurement value of Display1 and Display2 to Offset value.
                   Preset outputs are all clear.
   Present display ···Reset input returns the present value to Offset value.
                   Preset outputs for the present value are clear.
   Display1   ···Reset input returns the measurement value of Display1 to Offset value.
                   Preset outputs for Display1 are clear.
   Display2   ···Reset input returns the measurement value of Display2 to Offset value.
                   Preset outputs for Display2 are clear.
   Key input: Present display, Terminal input: Display1,Display2···
                   Input to the reset key returns the present value to Offset value.
                   Preset outputs for the present value are clear.
                   Input to terminal returns measurement values of Display1 and Display2 to Off set
                   value.
                   Preset outputs are all clear.
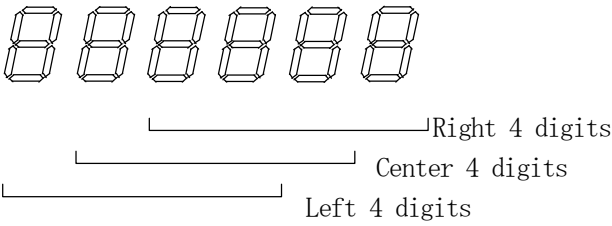
⚠ <Caution>
   If Offset value and Preset value are equal, Preset output is not clear.

Mode No.	Setting of analog output

1 1	※ Mode No.11 is an analog output option only.(AV3～AV5/AI type)
	
	    A B C D E F
	    1 1. 0 0 0 0
	
	                          Analog output system
	                          0 : Synchronized with the indication value
	                          1 : Synchronized with the measurement value
	
	                    Output digits
	                      0 : Right 4 digit (Display CDEF)
	                      1 : Center 4 digit (Display BCDE)
	                      2 : Left 4 digit (Display ABCD)
	
	                Reverse output
	                0 : Normal output(0～10V, 0～5V, 1～5V, 4～20mA)
	                1 : Reverse output(10～0V, 5～0V, 5～1V, 20～4mA)
	
	            Display with analog output
	            0 : Display1
	            1 : Display2
	
	⚠ <Caution>
	      If measurement system on Mode00 is No.2, don't choice Display2.

	〔Display with analog output〕 Choice of the display that the analog output is compared to either Display1 or Display2.

	〔Reverse output〕
	   Analog output is reversed.
	
	⚠ <Caution>
	     Normal output is able to output until 102.4% (4096bit).
	     Reverse output is able to output until 100% (4000bit).

	〔Output digits〕
	   It choices 4 digits for analog output.
	   Analog output synchronizes with 4 digits.
	
	                                           Right 4 digits
	                                    Center 4 digits
	                              Left 4 digits
	
	<Addiction>
	Analog output sets 4 digits of left, center and right.
	That is compared up to 6 digits (left 4 digits) on the calculation.
	The analog output is updated in synchronization with the display value that is divided by 4000
	 resolutions as a range from least significant digit to most significant digit above the selected in
	 relation to mode No.12.
	(the display value to 1 bit)

〔Analog output system 〕

    O : Synchronized with the indication value

       Analog output synchronizes with the display value.

       Analog output synchronizes with the display value that is hold by the external input of Hold
        and Lap count on Mode No.9.

    1 : Synchronized with the measurement value

       Analog output synchronizes with the measurement value.

       Analog output does not synchronize with the display value that is hold by external input.

Mode No.	Setting the display value of the maximum analog output
1 2	※ Mode No.12 is an analog output option only.(AV3～AV5/AI type) 　　　A　B　　C　D　E　F 	1　2.	1　0　0　0 | 　　　　　　　　　⌐＿＿＿⌐ 　　　　　　　　　　⌐＿＿＿ Display value　0 0 0 1～9 9 9 9 　　　　　　　　　　　　　　(Do not set 0 0 0 0)

〔Display value of the maximum analog output〕
　Set the display value of the maximum analog output.
　Set 4 digits value and ignore the decimal point.
　For example both "50.00" and "500.0" set the display value to "5000".

⚠ <Caution>
　If the display value exceeds the display value of the maximum analog output, analog output is up
　　to 102.4% and holds the output value.
　If setting the display value of the maximum analog output is the maximum value and digit selection
　　is Left 4 digits, analog output is not up to 102.4% on the over value.

- -

〔Example 1〕If you want to set the display value of the maximum analog output to □□1000 on the
type of AV5(0-10V), the setting is as follow.

　　　A　B　C　D　E　F　　　Mode 1 1
　　　| 1　1.　　　　　0　|　　E：0 (right 4 digit comparison)

　　　A　B　C　D　E　F　　　Mode 1 2
　　　| 1　2.　1　0　0　0 |　　C～F (The display value of the maximum analog output is 1000.)

⚠ <Caution>
　　Analog output is absolute value on the display value.

　Example 1 is as follow.
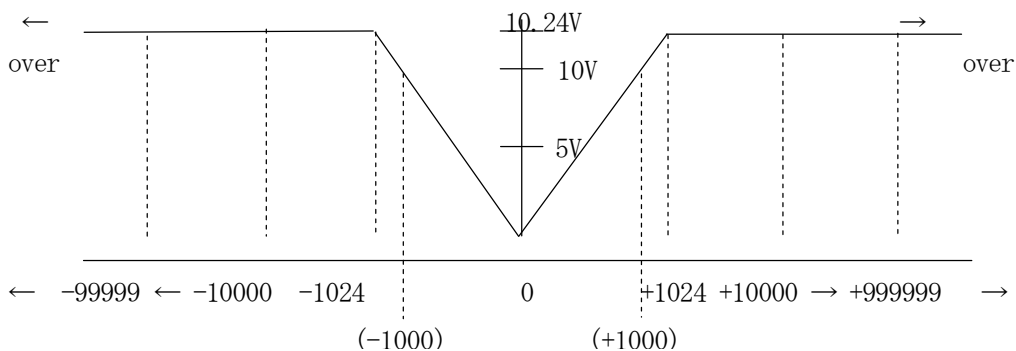
⚠ <Caution>
　　Analog output is linear to 102.4%.
　　If you set the display value of the maximum analog output to "0000", analog output is always
　　　10.24V.
　　So do not set the display value of the maximum analog output to "0000". If "Mode 11"
　　　is reverse output, analog output is always minimum value.

〔Example 2〕 If you set that the digit selection is Left 4 digit, the display value of the maximum analog output is "2000" and the range of analog output is "DC0-10V", so it is as follow.

Analog output

10.24V
10V
5V

Over −99900 O   ＋204600   display value

⚠ <Caution>
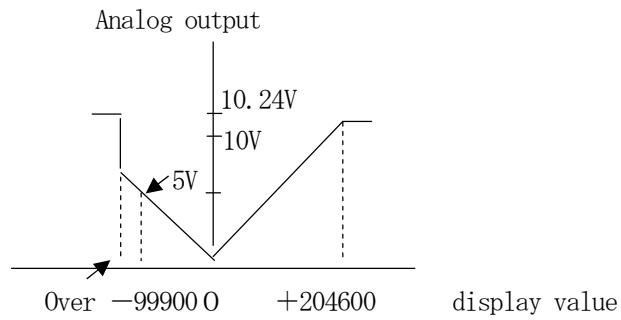
If the display value is minus value on the left 4 digit that digit selection is, analog output is ignored minus sign and compared 3 digits.

While the display value is over (the over lamp is blinking), analog output is 102.4%.

Mode No.	BCD output logic selection
1 3	※It functions in the option at B. 　A　B　C　D　E　F 　1　3.　0　　0　0 　　BCD output (logic selection) 　　　0 :Data (positive)・TI (positive) 　　　1 :Data (negative)・TI (positive) 　　　2 :Data (positive)・TI (negative) 　　　3 :Data (negative)・TI (negative) 　　　※The parity output is output to six data 　　　 digits (24 bits) by the odd parity. 　　BCD data output timing 　　　0 : The TI signal is used. 　　　1 : The request signal is used. 　　BCD output display selection 　　　0 : display 1 　　　1 : display 2

〔BCD output display selection〕
It is a selection to which display 1 and display 2 to output the BCD output.
※They are the outputs to the internal operation results of displays 1 and 2.

〔BCD data output timing〕
 0 : TI signal
　It is a taking prohibition signal. When data has been updated in the meter, it is output.
　Please take data when this TI signal is turning off.

/!\ <Caution>
Please note keeping the output of the TI signal and not becoming turning off if it continues by 25ms
 or less and data is updated though the TI signal is output with about 25ms.
 1 : Request signal
　 The update of data is demanded. When you send the meter this signal when it wants present data,
　 the output BCD data is updated to the latest data, and outputs it.
/!\ <Caution>
　　Within 10ms after request signal is accepted, Data is an uncertainty.
　　 The signal is read by the rising edge.
　　When the request signal is used, the TI signal cannot be used.

〔BCD output logic〕The logic of output displayed data, TI signal, and parity is set.

Positive logic : When data output, the collector of the output transistor is connected with the emitter.

Negative logic : When data output, the collector of the output transistor is not connected with the emitter.

The output of the positive (negative) logic of the data when the indicated value is assumed to be one is a table below.

logic	Indicated value	Bit date				NPN open collector output			
		8	4	2	1	8	4	2	1
positive	1	0	0	0	1	OFF	OFF	OFF	ON
negative	1	0	0	0	1	ON	ON	ON	OFF

Mode No.	BCD input logic selection
1 4	※It functions in the option at BI. 　　A　B　C　D　E　F 　　1　4.　0　　0　1 　　　　　　　　　　BCD input (logic selection) 　　　　　　　　　　　0…High active (Input terminal opens with GND) 　　　　　　　　　　　1…Low active (Input terminal connects with GND) 　　　　　　　　Latch input (logic selection) 　　　　　　　　　0・・・Input prohibition with "short" 　　　　　　　　　1・・・Input prohibition with "open" 　　　　　　Selection of BCD input 　　　　　　　0・・・Function-stop 　　　　　　　1・・・Preset value OUT1 　　　　　　　2・・・Preset value OUT2 　　　　　　　3・・・Preset value OUT3 　　　　　　　4・・・Preset value OUT4
	〔 Selection of BCD input 〕 　To which preset value BCD is input is selected. 　⚠ <Caution> The one with line receiver input (L1,L2) type cannot use OUT1 and OUT2 of the alarm output Alarm output OUT3 and OUT4 function in the option with the P2 type. Please select it in the output mode excluding a synchronous output when you use OUT1 and OUT4. When a synchronous output is selected, it doesn't operate as an alarm output.
	〔 Latch input (logic selection) 〕 　It uses it as a taking prohibition signal of data. 　When this signal is input, the data input is not accepted. 　O : Input prohibition with "short" …Taking prohibition, when the latch signal pin is short with 　　　GND. 　1 : Input prohibition with "open" …Taking prohibition, when the latch signal pin is open with GND.
	〔 BCD input (logic selection)〕 　Setting of BCD input logic. 　O : High active…Input terminal opens with GND. 　1 : Low active …Input terminal connects with GND.

１２. Key operation method of preset value

・Please set the preset value of the alarm output by the following key operation.
・The setting range is "－９９９９９～９９９９９９".
 (The decimal point position synchronizes with the one set by "Mode 00" of P.17.)
・When there is no specification, initialization are "999999. "

Please refer to "Mode 05", "Mode 06", "Mode 07", and "Mode 08" that has been described since P.23 for the setting
 of the limit and the lower bound after each alarm output (OUT1, 2, 3, 4).

Fig. 6

Operating key	Display unit	Operation procedure
Mode	A B C D E F 9 9 9 9 9 9 OUT1 OUT2 OUT3 OUT4 ● ○ ○ ○	Push (Mode) key for over 2 seconds. Thereby, display-unit shows preset value of OUT1.
	A B C D E F 9 9 9 9 9 9 OUT1 OUT2 OUT3 OUT4 ○ ● ○ ○	The preset value is switched. ┌→ OUT1 → OUT2 → OUT3 → OUT4 →┐ At each time pushing this key, alarm lamp moves.
◯	A B C D E F 9→9→9→9→9→9 ↑ OUT1 OUT2 OUT3 OUT4 ○ ● ○ ○	At each time pushing this key once, the set digit (flashing) is moved rightward.
◯ or ◯	A B C D E F 9 9 9 9 9 9 OUT1 OUT2 OUT3 OUT4 ○ ● ○ ○	Push this key for changing the value flashing. One figure moves up and down every time it pushes once. ┌ ⇔ 0 ⇔ 1 ⇔ … ⇔ 9 ┐ Only display digit A displays "－" ┌ ⇔ 0 ⇔ 1 ⇔ … ⇔ 9 ⇔ "－ ┐
ENT	A B C D E F 9 9 9 9 9 9 OUT1 OUT2 OUT3 OUT4 ○ ● ○ ○	A set value is registered.　Make registration by (ENT) key. It returns to the measuring mode after registration.
RST		It returns to the measuring mode. Pay attention to the fact that the set data is not memorized.

⚠ <Caution>

1. When the P2 type doesn't adhere in the option, Please only set OUT1 and OUT2 (NPN open
   collector pulse output).
   OUT3 and OUT4 (Photo MOS relay output) is output in case of the P2 type. (Alarm output lamp OUT3 and 4 light by
    the judgment result with this preset value. When you do not want to light, use it by an initial value
    "999999". However, it lights when the display exceeds.)
2. The mode protect doesn't function.
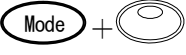   (Please refer to P.42 "Mode protect function".)

13. Key operation method of display offset value

The indicated value when resetting it is set. For example, if the offset value is set at "001000", the reading becomes "1000" when reset, and the count resumes from "1000".

In order to start the count from "0", the offset value should be set as "000000".

・Please set the offset value by the following key operation.

・The setting range is "－99999～999999".

  (The decimal point position synchronizes with the one set by "Mode 00" of P.17.)

・When there is no specification, initialization are "000000".

<div align="right">Fig. 7</div>

Operating key	Display unit	Operation procedure
(Mode)＋(○)	A B C D E F 0 0 0 0 0 0 D1 D2 ● ○	Push the key for over 2 seconds. D1LED lights, and the display offset value of D1 is called.
(Mode)	A B C D E F 0 0 0 0 0 0 D1 D2 ○ ●	The display offset value is switched. → D1 → D2 → D1 → D2 → At each time pushing this key, it changes.
(○)	A B C D E F 0→**0**→0→0→0→0	At each time pushing this key once, the set digit (flashing) is moved rightward.

(○)
or
(○)
	A B C D E F
	0 **1** 0 0 0 0
		Push this key for changing the value flashing. One figure moves up and down every time it pushes once.
		  ⇔ 0 ⇔ 1 ⇔ … ⇔ 9
		Only display digit A displays "－"
		  ⇔ 0 ⇔ 1 ⇔ … ⇔ 9 ⇔ －

(ENT)	A B C D E F 0 **1** 0 0 0 0	A set value is registered. Make registration by (ENT) key. It returns to the measuring mode after registration.
(RST)		It returns to the measuring mode. Pay attention to the fact that the set data is not memorized.

≪ After registration ends ≫

	Display unit	Operation procedure
(RST)	A B C D E F 1 0 0 0 0	The registered offset value can be displayed by pressing this key. The totalizer count is resumed from this value (setting).

⚠ <Caution>

The mode protect doesn't function.

  (Please refer to P.42 "Mode protect function".)

Please set the setting of the preset value on the following condition. When you use "Output one shot 0 returns" in the output mode of P.24 mode 06"Setting of the OUT2 warning output".

<u>Please reset it before starting measuring.</u>

Upper: Preset value ＞ Offset value

Lower: Preset value ＜ Offset value

１４．Mode protect function

If this function is turned ON, change of mode setting will be made impossible.
(⬭ key and ⬭ key is canceled.)

The mode protect at the time of the shipment becomes OFF.

Operation of the mode protect

1. If setting it, finish setting.
   ※When you set mode, the alarm preset value, the offset value, you can not operate mode protect function.
2. ⬭ Activated for 2 sec or more.
3. Current mode protect state is displayed when it passes for 2 sec.

Mode protect ON   A B C D E F

	L	—	O	N	

Mode protect OFF   A B C D E F

	L	—	O	F	F

4. Keeps pushing ⬭ key for 8 sec as it is continuously, the state of mode protect is changed.
5. It usually returns when ⬭ key is stopped being pushed.

⚠ <Caution>
   If the mode protect is set, change of mode setting will be made impossible.
   (⬭ key and ⬭ key is canceled.)
   ※The preset value setting and the offset value setting always can be changed.

The analog output (AV3-5,AI) range is adjusted correctly at a factory.
Please do not touch except necessity.

・《Method of the adjustment》

1. Power on the (Mode) key being pressed to put the instrument into the test mode.
2. Press the (Mode) key until the analog output test "Ad" appears.
   (Please refer to P.13「Key operation method of preset value」)
3. It adjusts so that it may become the output value corresponding to indication value
   as follows.　Be sure to start the adjustment from the zero volume.

　　　For the voltage output (AV3) type unit

| Indication	Output voltage	
0	1 V	Turn the zero volume to adjust
100	5 V	Turn the span volume to adjust

　　　For the voltage output (AV4) type unit

Indication	Output voltage	
0	0 V	Turn the zero volume to adjust
100	5 V	Turn the span volume to adjust

　　　For the voltage output (AV5) type unit

Indication	Output voltage	
0	0 V	Turn the zero volume to adjust
100	10 V	Turn the span volume to adjust

　　　For the current output (AI) type unit

Indication	Output current	
0	4 mA	Turn the zero volume to adjust
100	20 mA	Turn the span volume to adjust

ZERO-volume　　　SPAN-volume
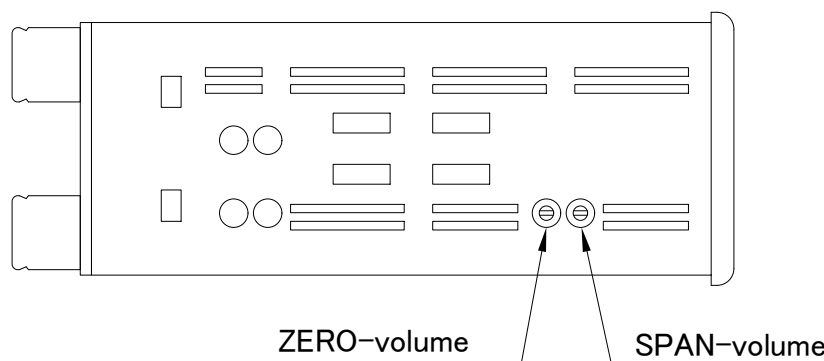
１６．Adjusting the tacho-generator signal, sine wave signal input (with V3/N option)

The input (V3, N) range is adjusted correctly at the factory.
Please do not touch except necessity. **When it is necessary to set it, please adjust it by self-responsibility.**

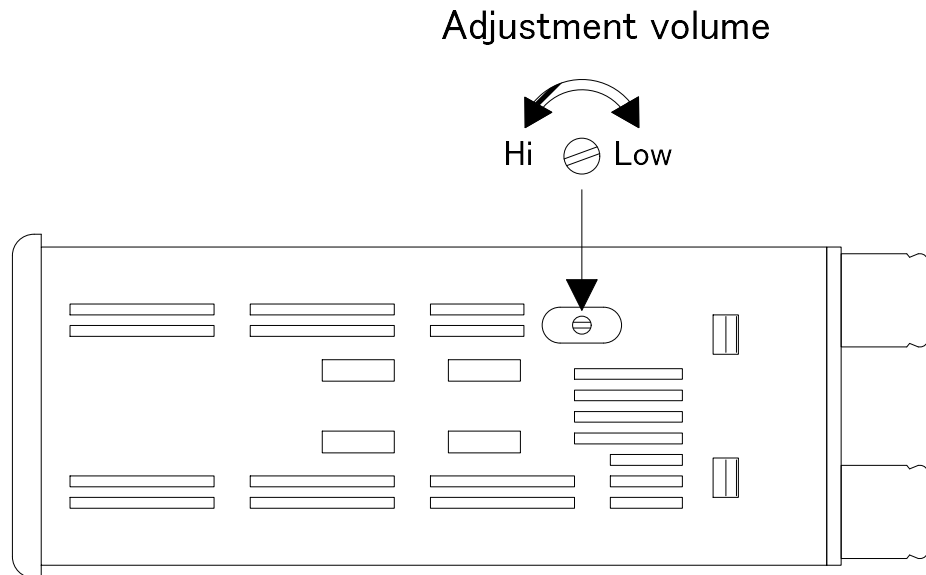   V3-type : Tacho-generator signal input AC 0.8 to 80V(P-P)
    N-type : Sine wave signal input AC 0.05 to 20V(P-P)

《How to adjust》
①Please take off installation metal fittings.

②The sensitivity adjustment volume is seen from a round hole on meter left side.
   Please adjust it while seeing the display.

Adjustment volume

Hi ⊖ Low

１７．Connection diagram for BCD output　　　　　　　　（with B option）

1. BCD codes are open collector output (DC30V 10mA max.) using parallel output.
2. Sign logic for the BCD output can be changed. (Please refer to P.37 mode 13)
   Positive logic: the collector and emitter of the output transistor show current-carrying status when outputting data.
   Negative logic: the collector and emitter of the output transistor don't show current-carrying status when outputting data.
3. When updating data, TI signal (data receive inhibit signal) is output.
   Accordingly, data receive shall be performed while TI signal is OFF.
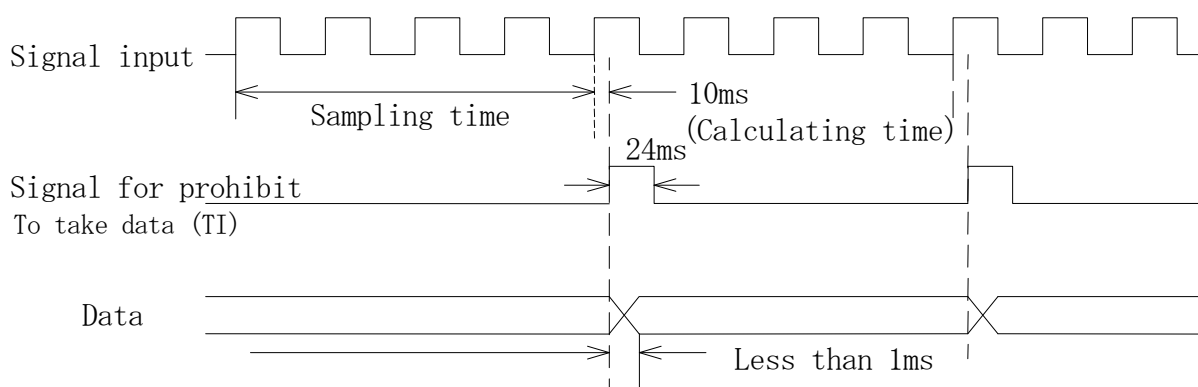   Sign logic of TI signal can be also switched. (Please refer to P.37 mode 13)

〔BCD output pin assign(Body side D-sub 37pin socket)〕
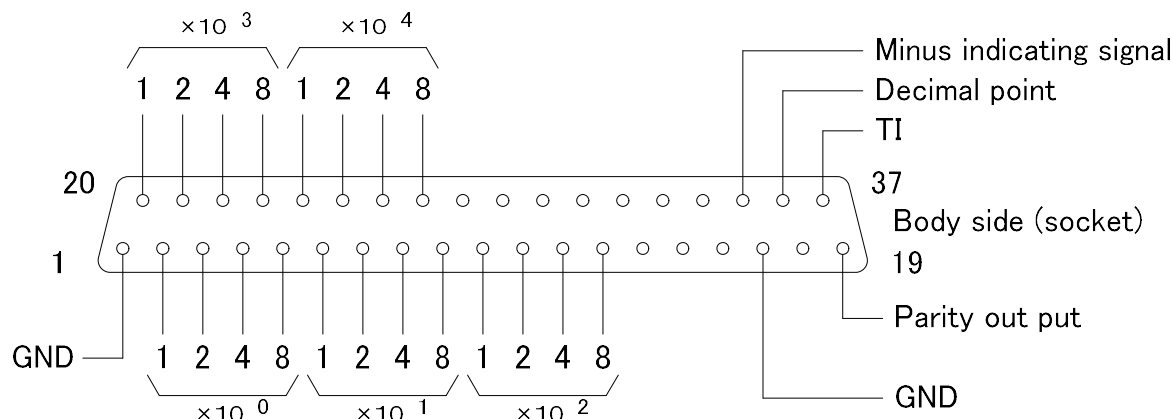
〔Circuit diagram for BCD output〕

Pin 2 to 13, 19, 20 to 27, 35 to 37
(DC30V 10mA)

Pin 1, 17 (GND)
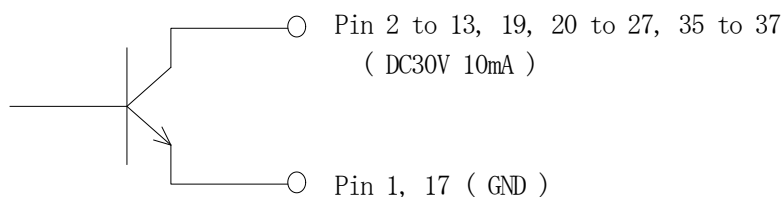
〔Timing chart of output〕

《At the time of TI signal use》
While a TI signal outputs it, the update of data is performed and it is in an uncertain condition. TI signal please perform it at the time of OFF when you take in data. In addition, when the update of data is less than 25msec, and it is performed in succession, a TI signal continues being output, and please warn it in not becoming OFF.
《At the time of REQ input use》
・The request signal reads it in the start of the edge.
・It updates data after receiving request signal. In these time the data are in an uncertain state.
《At the time of parity output use》
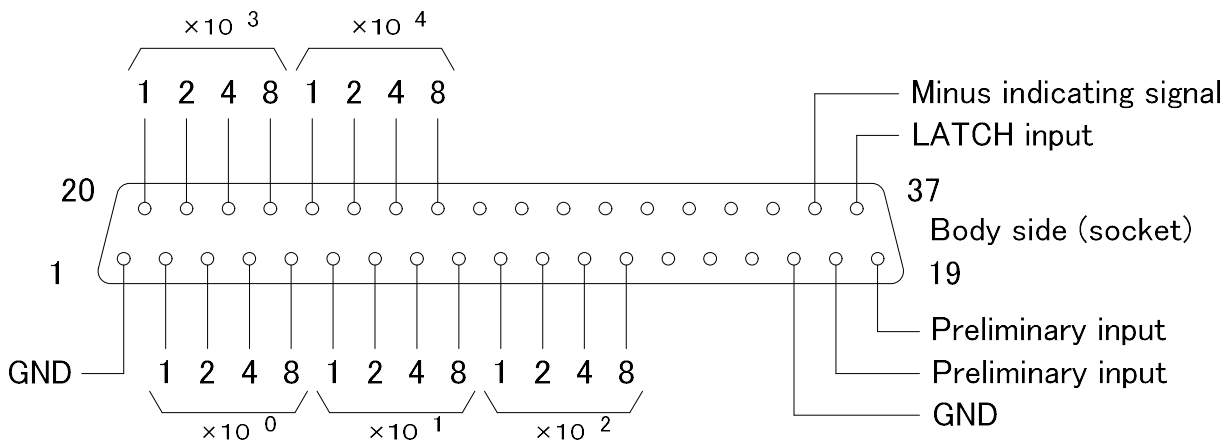・Parity output always outputs it in odd parity for 6-digit(24 bits).

18. Connection diagram for BCD input　　　　　　　　　　　(with BI option)

1. BCD code is NPN open collector pulse input, all figures are parallel output.
2. Sign logic for the BCD input can be changed. (Please refer to P.39 mode 14)
   High active: each pin of input data and GND do not short-circuit.
   Low active: each pin of input data and GND short-circuit.
3. Latch input: It prohibits the uptake of data. Therefore, Data of latch state does not change afterwards even
   if input data changes. When you want to update data, turn off latch (data receive inhibit state) and uptake
   data, turn on latch (data receive available state) again.
   Latch by short: When latch (Pin 37) and "GND" short-circuit, the uptake of data is prohibited.
   Latch by open: When latch (Pin 37) and "GND" do not short-circuit, the uptake of data is prohibited.
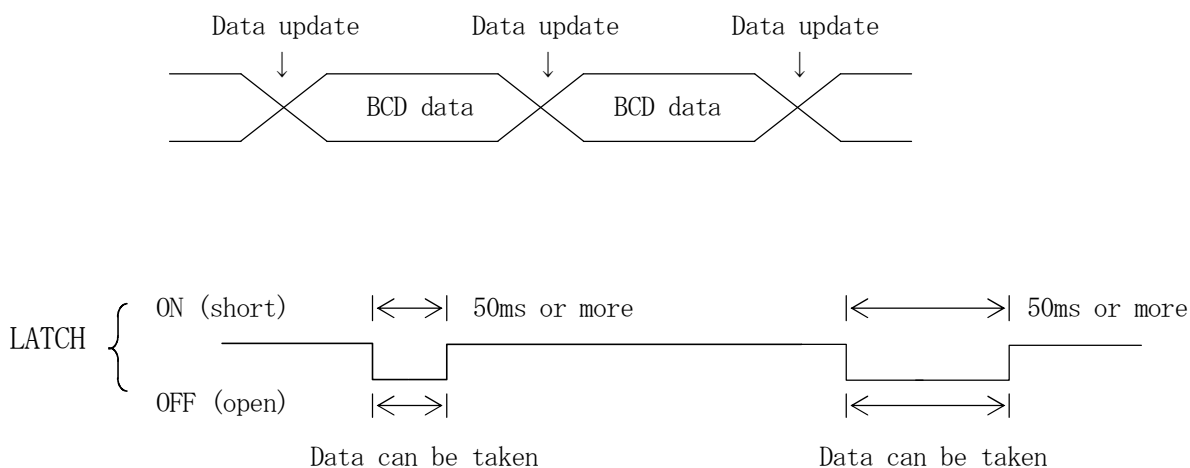
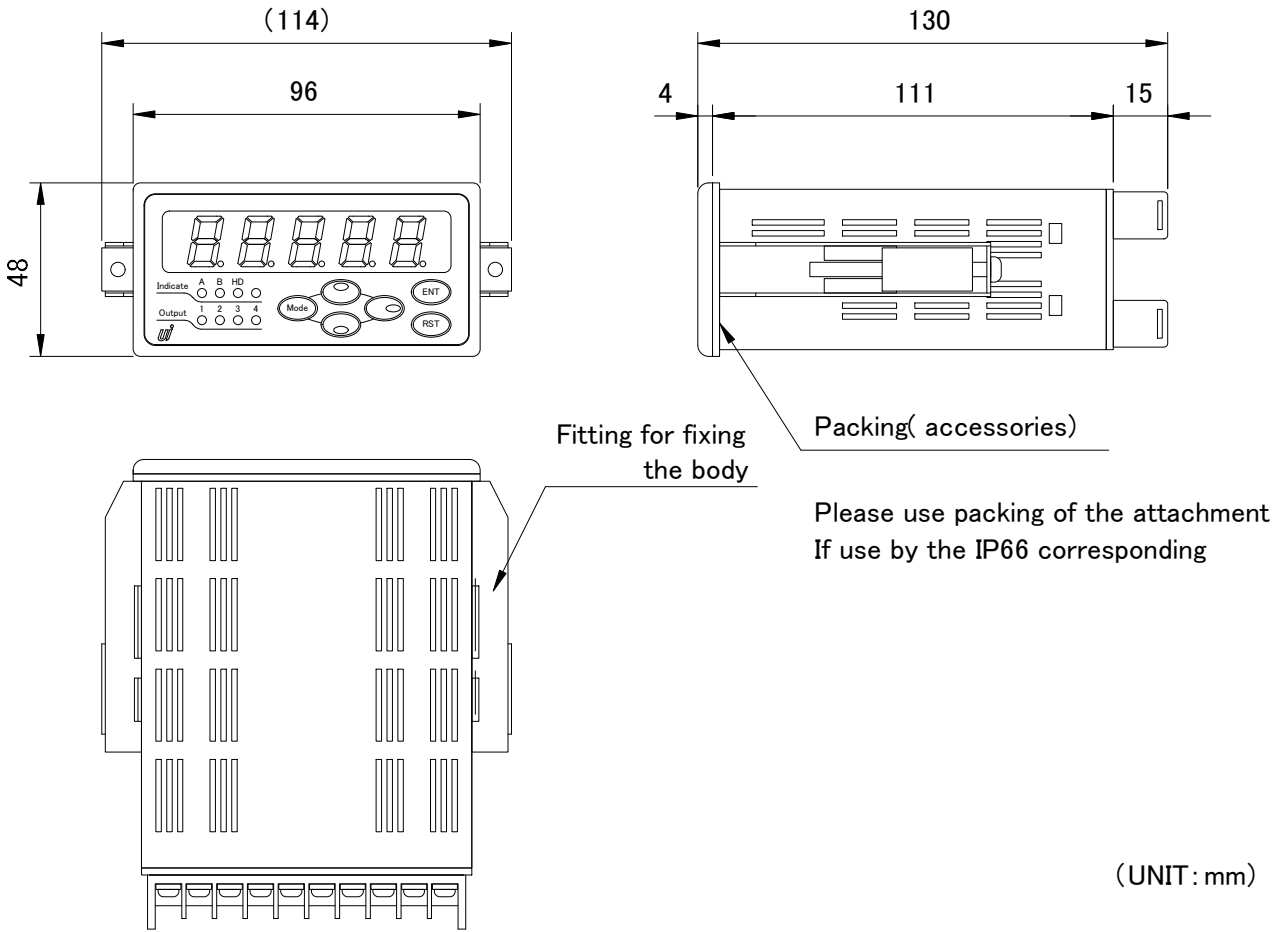〔BCD input pin assign(Body side D-sub 37pin socket)〕　　　　　　　Fig.27

Taking of data (Input prohibition with "open")　　　　　Fig 28

– 46 –

１９．External dimensions

(114)

96

48

Indicate A B HD
Output 1 2 3 4
Mode ENT RST

Fitting for fixing
the body

130

4   111   15

Packing(accessories)

Please use packing of the attachment
If use by the IP66 corresponding

（UNIT：mm）

※The terminal board cover with an option separately (SH-920)

$92 \, ^{+0.8}_{-0}$

$45 \, ^{+0.5}_{-0}$

70 or more

130 or more

（UNIT：mm）