FXS Series

DIN W48×H48mm, Preset Counter/Timer

▣ Features

● Upgraded counting speed: 1cps/30cps/2kcps/5kcps
● Selectable voltage input (PNP) or No-voltage input (NPN)
● Addition of Up/Down input mode
● Available to set a decimal point (Fixed decimal point of display)
● Wide range of input power supply: 100-240VAC 50/60Hz
  12-24VAC 50/60Hz, 12-24VDC universal
● Selectable Counter/Timer by internal DIP switch
● Various time range: Built-in micro computer (Micom)

⚠ **Please read "Caution for your safety" in operation manual before using.**

c**ᴙᴜ**us

▣ Ordering Information

FX	4	S	—	I

Output	No mark	Single preset
	I	Indicator
Size	S	DIN W48×H48mm
Digit	4	9999 (4digit)
	5	99999 (5digit)
Item	FX	Counter/Timer

▣ Specifications

Model	Single preset	**FX4S**	—
	Indicator	—	**FX5S-I**
Digit		4digit	5digit
Digit size		W3.8×H7.6mm	W4×H8mm
Power supply	AC power	100-240VAC 50/60Hz	
	AC/DC power	12-24VAC 50/60Hz, 12-24VDC	
Allowable voltage range		90 to 110% of rated voltage	
Power consumption	AC power	• Indication type: Max. 4.7VA, • Single preset: Max. 5.7VA (100-240VAC 50/60Hz)	
	AC/DC power	• Indication type: Max. 4.5VA, • Single preset: Max. 5.6VA (12-24VAC 50/60Hz) • Indication type: Max. 2.8W, • Single preset: Max. 3W (12-24VDC)	
Max. counting speed for CP1, CP2		Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch	
Min. input signal width	INHIBIT input	Approx. 20ms	
	RESET input		
Input	CP1, CP2 input (INHIBIT)	Input logic is selectable [Voltage input] Input impedance: 5.4kΩ "H" level: 5-30VDC, "L" level: 0-2VDC [No-voltage input] Impedance at short-circuit: Max. 1kΩ, Residual voltage at short-circuit: Max. 2VDC, Impedance at open-circuit: Min. 100kΩ	
	RESET input		
One-shot output time		0.05 to 5sec	—
Control output	Contact	Type	SPDT (1c)	—
		Capacity	250VAC 3A at resistive load	—
	Solid-state	Type	NPN open collector	—
		Capacity	30VDC Max. 100mA Max.	—
Memory protection		Approx. 10 years (When using non-volatile semiconductor memory)	
External power		12VDC±10% 50mA Max.	
Insulation resistance		Min. 100MΩ (at 500VDC megger)	
Dielectric strength		2000VAC 50/60Hz for 1 minute	
Noise strength	AC power	±2kV the square wave noise (pulse width: 1μs) by the noise simulator	
	DC power	±500V the square wave noise (pulse width: 1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each X, Y, Z direction for 1 hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each X, Y, Z direction for 10 min.	
Shock	Mechanical	300m/s² (approx. 30G) in each X, Y, Z direction for 3 times	
	Malfunction	100m/s² (approx. 10G) in each X, Y, Z direction for 3 times	
Relay life cycle	Mechanical	Min. 10,000,000 operations	
	Electrical	Min. 100,000 operations (250VAC 3A at resistive load)	
Environment	Ambient temperature	10 to 55℃, storage: -25 to 65℃	
	Ambient humidity	35 to 85%RH	
Approval		c**ᴙᴜ**us	
Unit weight		Approx. 153g	Approx. 143g

※Environment resistance is rated at no freezing or condensation.

■ Connections

● FX4S

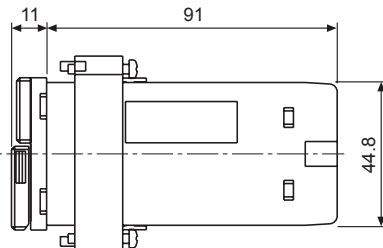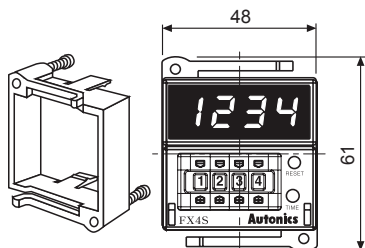CP1 CP2 ※**1** ※**2**

RESET

6	7	8	9	10

(INHIBIT) +12VDC 0V
         (50mA)

12 SOLID STATE OUT

1	2	3	4	5
⚠

CONTACT OUT: 250VAC 3A RESISTIVE LOAD

SOURCE − +

100-240VAC 50/60Hz, 12-24VAC 50/60Hz, 12-24DC

● FX5S-I

CP1 CP2 ※**1** ※**2**

RESET

6	7	8	9	10

(INHIBIT) +12VDC 0V
         (50mA)

1	2	3	4	5
⚠

SOURCE − +

100-240VAC 50/60Hz, 12-24VAC 50/60Hz, 12-24DC

※1: Connection of PNP input
※2: Connection of NPN input
※CP2 (INHIBIT): Time Hold terminal when using for timer.
※Operated by a power ON start when it is used as a timer.

■ Dimensions

● Bracket

48

61

11 91

44.8

● Panel cut-out

Min. 55

Min. 65

$45 ^{+0.6}_{0}$

$45 ^{+0.6}_{0}$

(unit: mm)
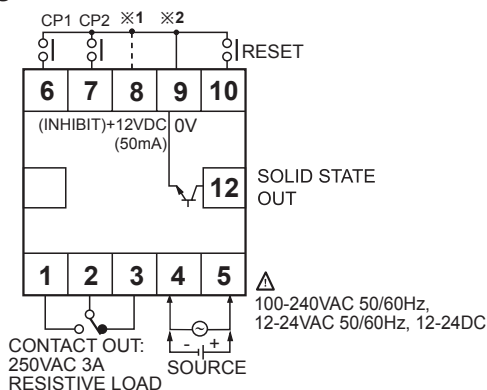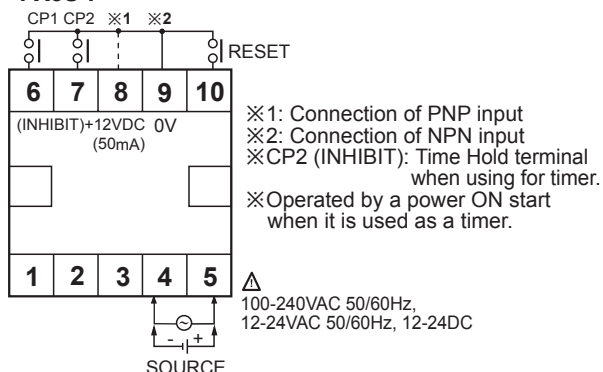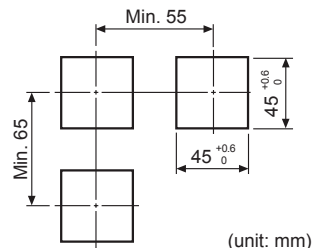
■ Input Connections

◎ Input logic: No-voltage (NPN) input

● Solid-state input (Standard sensor: NPN output type sensor)

Sensor   FXS Series

Brown   +12V
RL 10kΩ   5.4kΩ
Black ※   Inner circuit
Blue   0V

(NPN output)

※ CP1, CP2 (INHIBIT), RESET input

Sensor   FXS Series

Brown   +12V
               5.4kΩ
Black ※   Inner circuit
Blue   0V

(NPN open collector output)

● Contact input
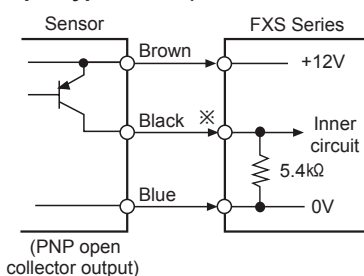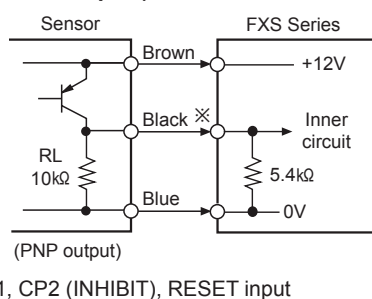
FXS Series

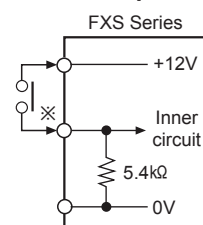+12V
※   5.4kΩ
          Inner circuit
0V
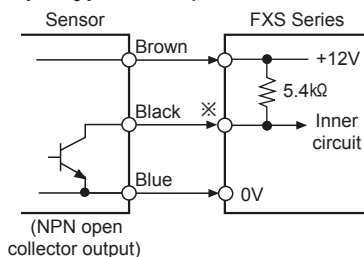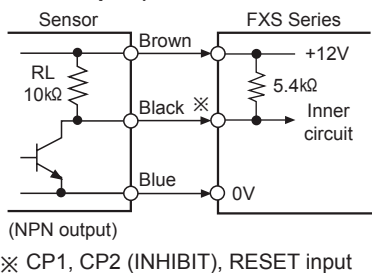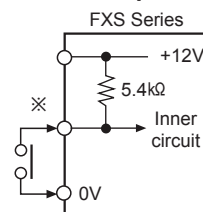
※Please select the counting speed as 1cps or 30cps when it is used for counter.

◎ Input logic: Voltage (PNP) input

● Solid-state input (Standard sensor: PNP output type sensor)

Sensor   FXS Series

Brown   +12V
Black ※   Inner circuit
RL 10kΩ   5.4kΩ
Blue   0V

(PNP output)

※CP1, CP2 (INHIBIT), RESET input

Sensor   FXS Series

Brown   +12V
Black ※   Inner circuit
               5.4kΩ
Blue   0V

(PNP open collector output)

● Contact input

FXS Series

+12V
※
          Inner circuit
          5.4kΩ
0V

※Please select the counting speed as 1cps or 30cps when it is used for counter.

FXS Series

▣ Input Logic Selection

● **Select NPN (No-voltage input) (Factory default)**   ● **Select PNP (Voltage input)**

NPN ■ PNP   NPN ■ PNP
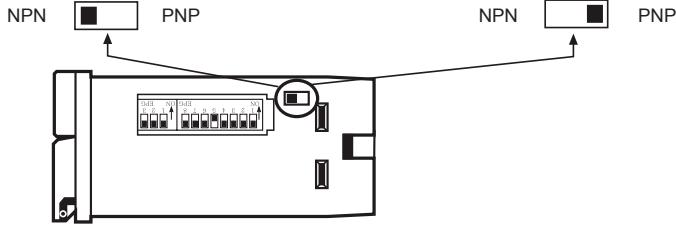
※Please be sure to turn OFF the power before changing input logic.
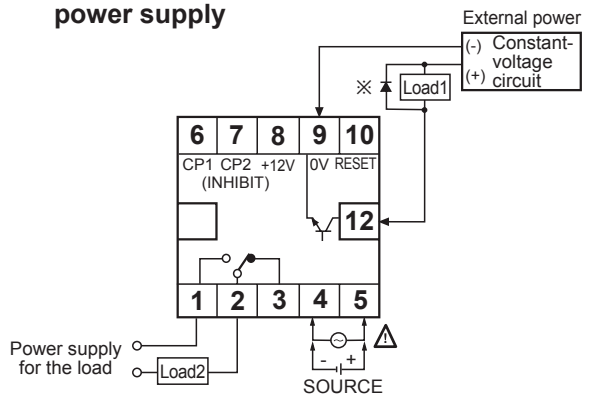
▣ Input & Output Connections

◎ **In case of operating the load by power supply of the sensor**
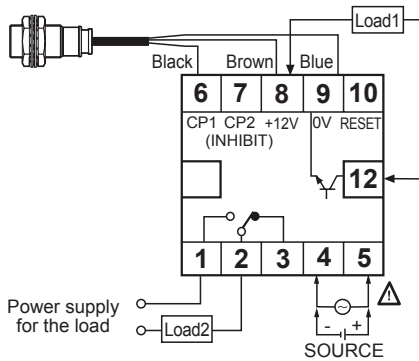
● Please select proper capacity of load, because total current consumption should not be exceed current capacity. (Max. 50mA)
● Contact capacity: Max. 250VAC 3A

◎ **In case of operating the load by external power supply**

● The capacity of Load1 must not be exceed Max. 30VDC, Max. 100mA of the switching capacity of the transistor.
● Please do not supply the reverse polarity voltage.
※Please connect the surge absorber (Diode) at both terminals of Load1, in case of using the inductive load. (Relay, etc.)

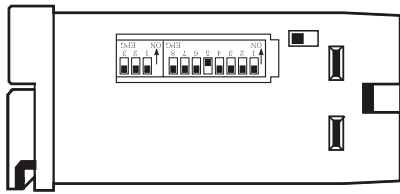◎ **Using 2 counters with one sensor**

It is available to use 2 counters with one sensor.
Please connect as the power of sensor is supplied from only one way of counters and design input logic with same way.


<FX4S>   <FX5S-I>

Up/Down Counter/Timer

(A)
Photoelectric
Sensors

(B)
Fiber
Optic
Sensors

(C)
Door/Area
Sensors

(D)
Proximity
Sensors

(E)
Pressure
Sensors

(F)
Rotary
Encoders

(G)
Connectors/
Sockets

(H)
Temperature
Controllers

(I)
SSRs / Power
Controllers

(J)
Counters

(K)
Timers

(L)
Panel
Meters

(M)
Tacho /
Speed / Pulse
Meters

(N)
Display
Units

(O)
Sensor
Controllers

(P)
Switching
Mode Power
Supplies

(Q)
Stepper Motors
& Drivers
& Controllers

(R)
Graphic/
Logic
Panels

(S)
Field
Network
Devices

(T)
Software

▣ Description Of Inner DIP Switches

Output mode selection
Memory protection (ON/OFF)
Max. counting speed
Counter/Timer
Up/Down mode selection
Count input mode (Counter)
Time setting mode (Timer)

※ **Inner selection switch is changed from 10pin to 11pin with upgrade of counting speed.**

※ **There is no output operation mode in indication type (FX5S-I) and SW2 selection switch.**
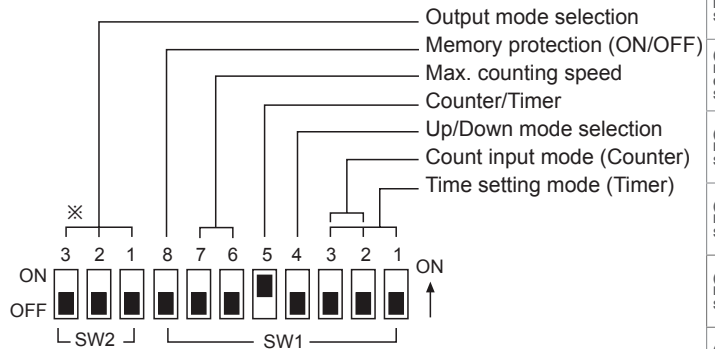
● Up/Down mode

SW1		Function
4	ON ■ / OFF	Down mode
	ON / OFF ■	Up mode

● Counter/Timer selection

SW1		Function
5	ON ■ / OFF	Counter
	ON / OFF ■	Timer

● Memory protection

SW1		Function
8	ON ■ / OFF	Disable the memory protection
	ON / OFF ■	Enable the memory protection

● Max. counting speed

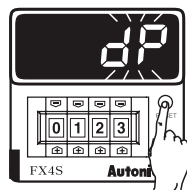| SW1	CP1, CP2
6 ON ■ / 7 OFF ■	1cps
6 OFF ■ / 7 OFF ■	30cps
6 ON ■ / 7 ON ■	2kcps
6 ON ■ / 7 ON ■	5kcps

▣ Setting Function Of Decimal point
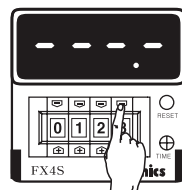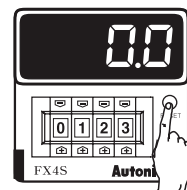
Displays the decimal point.
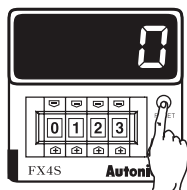
RUN mode
※If pressing RESET button for over 3sec. it advanced to decimal point setting mode.
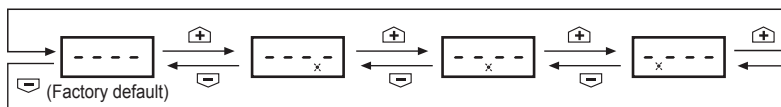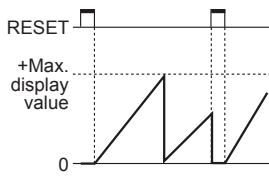
※When "dP" flashes, touch RESET button once.

※Set the position of decimal point using ⊕, ⊟ buttons of digital switch.

Return to RUN mode
※It returns to RUN mode by press RESET button over 3sec.

● Changing the decimal point

※It returns to RUN mode if no RESET button or digital switch is applied for 60sec. in decimal point setting status.
※The decimal point setting is not existed in indication type.

FXS Series

▣ Input Operation Mode (Counter)

Input mode		SW1	No-voltage input (NPN)	Voltage input (PNP)
Count up mode ON 4 OFF	Up/Down-A (Command input)	ON 2 3 OFF		
	Up/Down-B (Individual input)	ON 2 3 OFF		
	Up/Down-C (Phase difference input)	ON 2 3 OFF		
	Up (Count up input)	ON 2 3 OFF		
Count down mode ON 4 OFF	Up/Down-D (Command input)	ON 2 3 OFF		
	Up/Down-E (Individual input)	ON 2 3 OFF		
	Up/Down-F (Phase difference input)	ON 2 3 OFF		
	Down (Count down input)	ON 2 3 OFF		

※Ⓐ: Over Min. signal width, Ⓑ: Over 1/2 of Min. signal width. Counting miss by one (±1) occurs if the signal width of or is less than min. signal width.
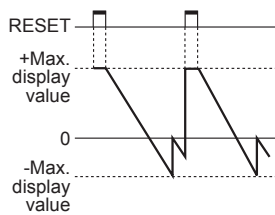
Autonics

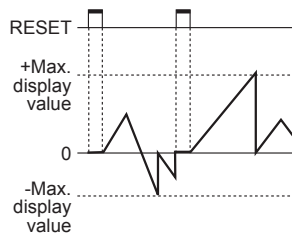# Up/Down Counter/Timer

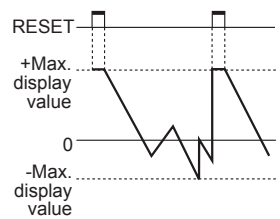## ◼ Counting Operation Of Indication Type (Counter)

● **Up input mode**

RESET

+Max.
display
value

0

● **Down input mode**

RESET

+Max.
display
value

0

-Max.
display
value

● **Up/Down-A, B, C
input mode**

RESET

+Max.
display
value

0

-Max.
display
value

● **Up/Down-D, E, F
input mode**

RESET

+Max.
display
value

0

-Max.
display
value

◼ Time Operation Of Indication Type (Timer)

● **Up input mode**

RESET

INHIBIT

+ Max.
time range

0

● **Down input mode**

RESET

INHIBIT

+ Max.
time range

0
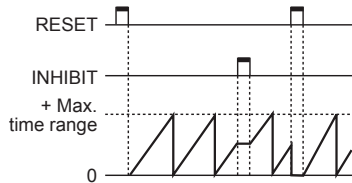
- Max.
time range
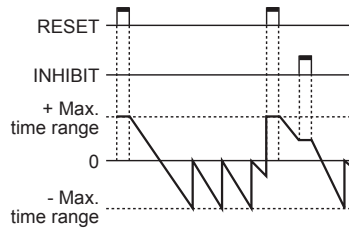
◼ Time Setting Mode (Timer)

SW1	4digit	5digit
ON 1 2 3 / OFF	99.99sec	9999.9sec
ON 1 2 3 / OFF	999.9sec	99999sec
ON 1 2 3 / OFF	9999sec	9min 59.99sec
ON 1 2 3 / OFF	99min 59sec	99min 59.9sec
ON 1 2 3 / OFF	999.9min	9999.9min
ON 1 2 3 / OFF	99hour 59min	9hour 59min 59sec
ON 1 2 3 / OFF	999.9hour	999hour 59min
ON 1 2 3 / OFF	9999hour	9999.9hour

FXS Series

◨ Output Operation Mode (By Internal DIP Switch)

■ ← One-shot output (0.05 to 5sec.)   ☐ ← Retained output

Output mode (SW2)	SW1 ON 4 OFF ■ **Up mode**	SW1 ON 4 OFF ■ **Down mode**	Operation after count up
	Up, Up / Down-A, B, C	Up, Up / Down-D, E, F	
F ON 1 2 3 / OFF ■ ■ ■			• The display value continues until reset signal is applied then output is held. • Retained output will be maintained until reset signal is applied.
N ON 1 2 3 / OFF			Display value and retained output are maintained until Reset signal is applied.
C ON 1 2 3 / OFF			The display value returns to reset start status as soon as display value is reached to preset value.
R ON 1 2 3 / OFF			The display value is held until output is OFF then returns to reset start status.
K ON 1 2 3 / OFF			The display value continues until reset signal is applied.
P ON 1 2 3 / OFF			The display value is held during one-shot output time, counting process is returned to reset start status as soon as output is ON.
Q ON 1 2 3 / OFF			The display value continues during one-shot output time.
S Counter ON 1 2 3 / OFF	Up input Up / Down-A, B, C	Down input Up / Down-D, E, F	• Up, UP/Down-A, B, C input mode -Output is ON when (Display value) ≥ (Preset value) • Down, UP/Down-D, E, F input mode-Output is ON when (Display value) ≤ (Zero)
S Timer ON 1 2 3 / OFF			The output turns ON after the setting time and then turns OFF after the setting time. This operation is repeated sequentially. (Flicker operation)

※One-shot output time is set by front TIME adjuster.
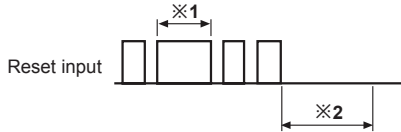
■ Proper Usage

◎ Reset function

● Reset

In case of changing the input mode after supplying the power, please take external reset or manual reset.
If reset is not executed, the counter will be working as previous mode.

● Reset signal width

It is reset perfectly when the reset signal is applied during **min. 20ms** regardless of the contact input & solid-state input.
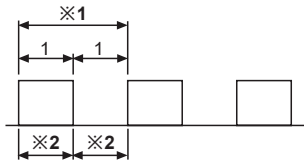
Reset input ※1 ※2

※1: In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied during min. 20ms even though a chattering occurs.

※2: It can be input the signal of CP1, CP2 after min.50ms from closing time of reset signal.

◎ Sensor power

The power 12VDC which is provided to sensor is built in it. Please use it under Max. 50mADC.

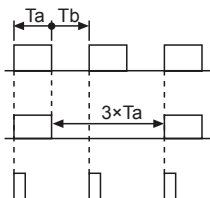### ◎ Min. signal width

※1: Please make duty ratio (ON/OFF) 1:1

※2: Min. signal width
- 1cps: Min. 500ms
- 30cps: Min. 16.7ms
- 2kcps: Min. 0.25ms
- 5kcps: Min. 0.1ms

◎ Max. counting speed

This is a response speed per 1 sec. when the duty ratio (ON:OFF) of input signal is 1:1.
If the duty ratio is not 1:1, the width between ON and OFF should be over min. signal width and the response speed will getting slower against input signal. And one of ON width and OFF width is under min. signal width, this product may not respond.
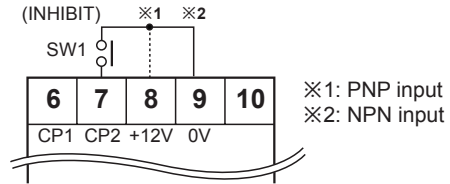
Width of Ta (ON)and Tb (OFF) must be larger than Min. signal width.
Max. counting speed is 1/2 value of rated spec. when duty ratio is 1:3.
It can not respond if it is smaller than min. signal width (Ta).

◎ INHIBIT (For timer)

(INHIBIT) ※1 ※2
SW1

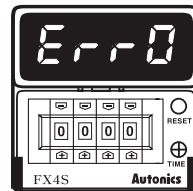| 6	7	8	9	10
CP1	CP2	+12V	0V	

※1: PNP input
※2: NPN input

- If SW1 is ON, it becomes INHIBIT. (Time Hold)
- When power is applied, it starts to progress and INHIBIT mode is used to stop the time is under the progress at the moment.
- When SW1 is OFF, timer starts to progress again.

INHIBIT
Setting value
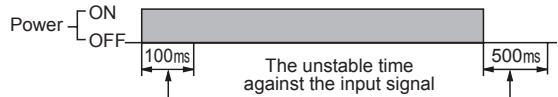Time display value
0
(Up mode)
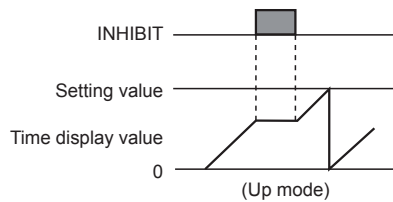
◎ Error display

Error signal	Error description	Returning method
$Err0$	Zero setting status	Change the setting value to non zero status

※When Error is displayed, the output continues OFF state.
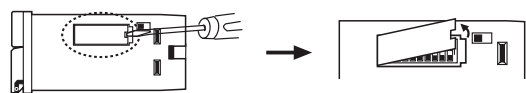※There is no Error function in indicator.

◎ Power

The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.

Power ON OFF
100ms The unstable time against the input signal 500ms

◎ Case & DIP switch detachment

Push a lock part to front direction and widen it simultaneously.
※Please be careful of the injury caused by tools.