DIN W72×H36mm Of Counter/Timer With Indication Only
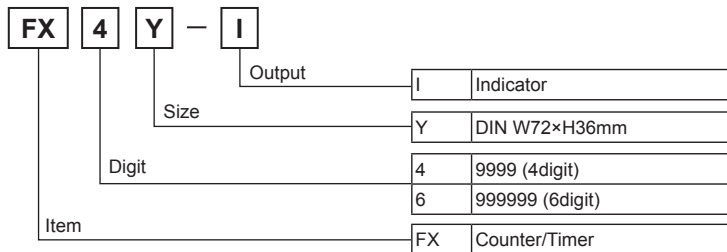
◾ Features

- Upgraded counting speed: 1cps/30cps/2kcps/5kcps
- Application of Up/Down input mode
- Selectable Up/Down indication of display value
- Wide range of input power supply:
  100-240VAC 50/60Hz
  12-24VAC 50/60Hz, 12-24VDC universal
- Selectable Counter or Timer function by internal DIP switch
  selectable time ranges
- Built-in Microprocessor

⚠ Please read "Caution for your safety" in operation manual before using.
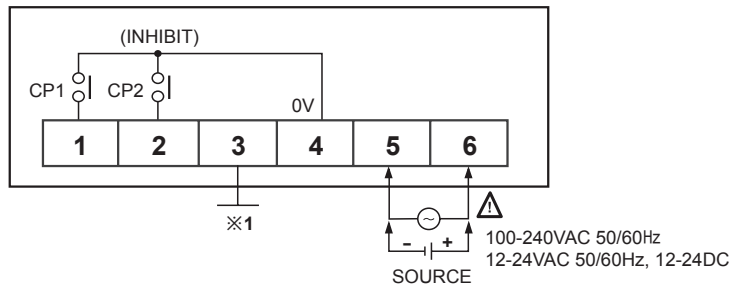
c ℞ us

◾ Ordering Information

| FX | 4 | Y | – | I |

```
                          Output
                               ┌── I    Indicator
                Size           │
                  └──────── Y     DIN W72×H36mm
           Digit
             ├──────────── 4     9999 (4digit)
             └──────────── 6     999999 (6digit)
       Item
         └──────────────── FX    Counter/Timer
```

◾ Specifications

Model		FX4Y-I	FX6Y-I
Digit		4digit	6digit
Digit size		W8×H14mm	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	Max. 4.5VA (100-240VAC 50/60Hz)	
	AC/DC power	Max. 4.5VA (12-24VAC 50/60Hz), Max. 2.8W (12-24VDC)	
Max. counting speed		Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch	
Min. input signal width	INHIBIT input	Min. 20ms	
	RESET input		
Input	CP1, CP2 input	No voltage input - Impedance at short-circuit: Max. 470Ω, Residual voltage at short-circuit: Max. 1VDC	
	RESET input	Impedance at open-circuit: Min. 100kΩ	
Memory protection		Approx. 10 years (When using non-volatile semiconductor memory)	
Eexternal power		12VDC ±10% 50mA Max.	
Insulation resistance		Min. 100MΩ (at 500VDC megger)	
Dielectric strength		2000VAC 50/60Hz for 1 minute	
Noise strength	AC type	±2kV the square wave noise (pulse width: 1μs) by the noise simulator	
	DC type	±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 1hour	
	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	
Environment	Ambient temperature	10 to 55℃, storage: -25 to 65℃	
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH	
Approval		℞us	
Unit weight		Approx. 130g	Approx. 132g

※Environment resistance is rated at no freezing or condensation.

■ Connections

```
                    (INHIBIT)
        CP1   CP2
                            0V
         1    2    3    4    5    6

                   ※1        ⚠
                        ─    +   100-240VAC 50/60㎐
                        SOURCE    12-24VAC 50/60㎐, 12-24DC
```

※1: It can be selected RESET or sensor power (+12VDC 50mA) by internal PIN operation. (Refer to J-40)
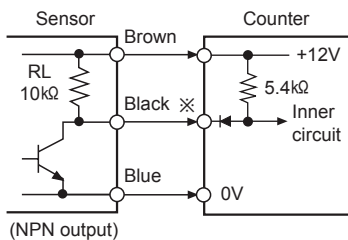※CP1, CP2: Input signal terminals when using as counter.
※INHIBIT (CP2): Time Hold terminal when using for timer (Connect switch to ❷+❹ from the external.)
※Operated by a Power ON Start method when it is used as a timer.

■ Input Connections

◎ Using for no-voltage input (NPN)

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

```
Sensor          Counter
        Brown
                    +12V
RL              5.4kΩ
10kΩ    Black ※      Inner
                    circuit
        Blue
                    0V
(NPN output)
```

※CP1, CP2 (INHIBIT), RESET input

```
Sensor          Counter
        Brown
                    +12V
                5.4kΩ
        Black ※      Inner
                    circuit
        Blue
                    0V
(NPN open
collector
output)
```

● Contact input

```
            Counter
                    +12V
                5.4kΩ
    ※              Inner
                    circuit
                    0V
```
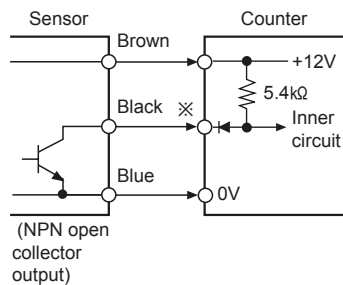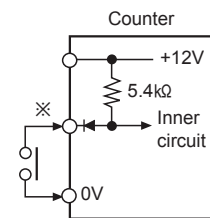
※Please select the counting speed as 30cps when using for counter.

◎ Using for voltage input (PNP)

FXY series is for no-voltage input type, it is not available to count applying DC voltage from the external.
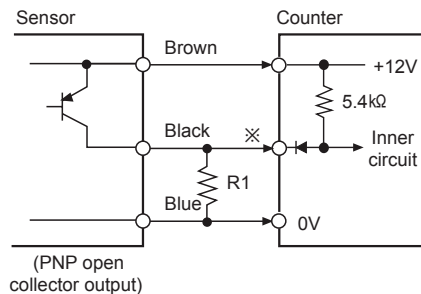For using PNP type sensor, please use as the following to count.

● PNP output type sensor

```
Sensor          Counter
        Brown
                    +12V
                5.4kΩ
        Black ※      Inner
                    circuit
RL      R1
10kΩ    Blue
                    0V
(PNP output)
```
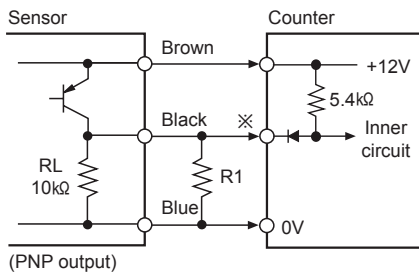
※Please set R1 value to make the composed resistance of RL + R1 as Max. 470kΩ is an impedance for short-circuit.
※CP1, CP2 (INHIBIT), RESET input

● PNP open collector output type sensor

```
Sensor          Counter
        Brown
                    +12V
                5.4kΩ
        Black ※      Inner
                    circuit
            R1
        Blue
                    0V
(PNP open
collector output)
```

※In case of PNP open collector output type sensor, please connect lower than 470Ω of R1 to input terminal before using.
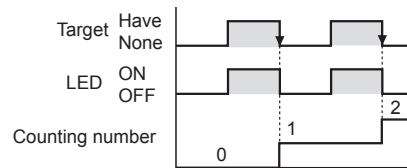
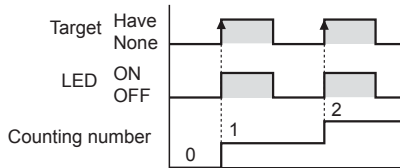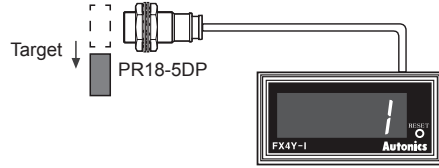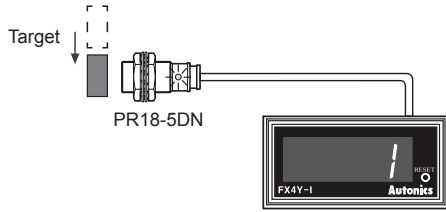# FXY Series

▣ Counting Method

Be careful to select sensor because the counting method of NPN output type sensor is different from PNP output type sensor.

● **NPN output type sensor**
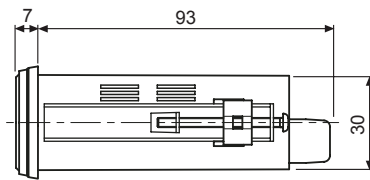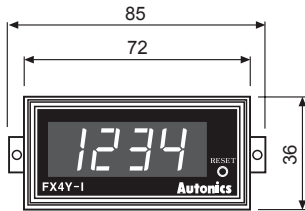: When the sensor is changed from OFF to ON, it counts.

● **PNP output type sensor**
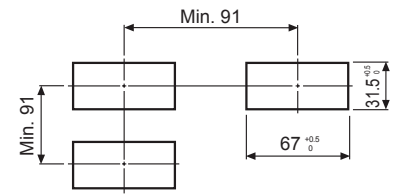: When the sensor is changed from ON to OFF, it counts.
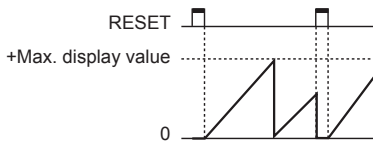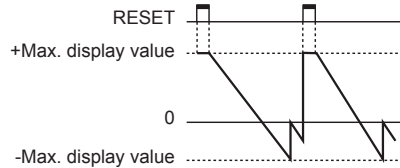

▣ Dimensions

(unit: mm)

● **Panel cut-out**

▣ Counting Operation Of Indication Type (Counter)

● **Up mode**

● **Down mode**
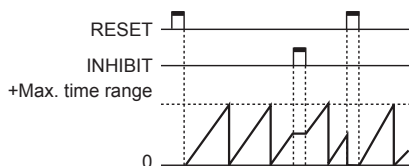

● **Up/Down-A, B, C mode**
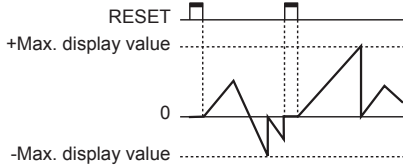
● **Up/Down-D, E, F mode**
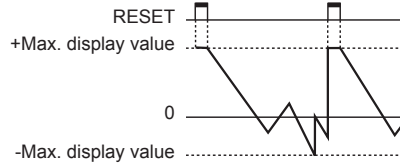
▣ Counting Operation Of Indication Type (Timer)

● **Up mode**

● **Down mode**
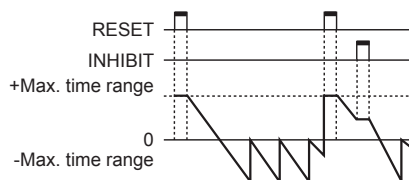
▣ Description Of Inner DIP Switches

Time setting mode (Timer)
Count input mode (Counter)
Up/Down mode
Max. counting speed (Counter)
Reset function of front panel (ON/OFF)
Memory protection (ON/OFF)
Counter/Timer

N·C

SW1
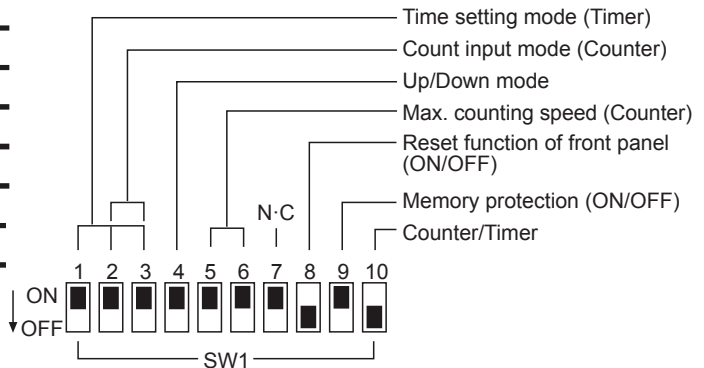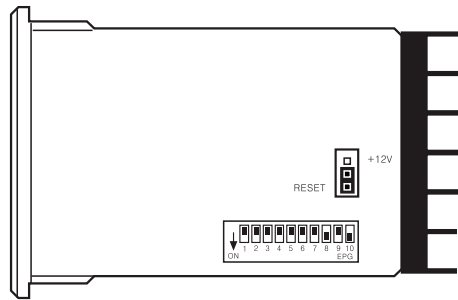
※Inner selection switch is changed from 8pin to 10pin with upgrade of counting speed.

● Up/Down mode

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

● Reset function of front panel (ON/OFF)

SW1		Function
8	ON ■ / OFF	Disable the front panel reset function
	ON / OFF ■	Enable the front panel reset function

● Memory protection (ON/OFF)

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

● Counter/Timer

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

● Max. counting speed

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

▣ Time Setting Mode (Timer)

SW1	4digit	6digit	SW1	4digit	6digit
1 2 3 ON ■ ■ ■ / OFF	99.99sec	99999.9sec	1 2 3 ON ■ ■ / OFF ■	999.9min	99999.9min
1 2 3 ON ■ ■ / OFF ■	999.9sec	999999sec	1 2 3 ON ■ / OFF ■ ■	99hour 59min	99hour 59min 59sec
1 2 3 ON ■ / OFF ■	9999sec	99min 59.99sec	1 2 3 ON ■ / OFF ■ ■	999.9hour	9999hour 59min
1 2 3 ON / OFF ■ ■	99min 59sec	999min 59.9sec	1 2 3 ON ■ / OFF ■ ■	9999hour	99999.9hour

FXY Series

▣ Input Mode (Counter)

Input mode	SW1	Up mode	Input mode	SW1	Down mode
Up/Down-A (Command input)	2 3 ON / OFF	CP1 H/L, CP2 H/L, Count value 0 1 2 3 2 1 2 3	Up/Down-D (Command input)	2 3 ON / OFF	CP1 H/L, CP2 H/L, Count value n n-1 n-2 n-3 n-2 n-1 n-2 n-3
Up/Down-B (Individual input)	2 3 ON / OFF	CP1 H/L, CP2 H/L, Count value 0 1 2 3 2 1 1 2 3	Up/Down-E (Individual input)	2 3 ON / OFF	CP1 H/L, CP2 H/L, Count value n n-1 n-2 n-3 n-2 n-1 n-1 n-2 n-3
Up/Down-C (Phase difference input)	2 3 ON / OFF	CP1 H/L, CP2 H/L, Count value 0 1 2 3 2 1 2 3	Up/Down-F (Phase difference input)	2 3 ON / OFF	CP1 H/L, CP2 H/L, Count value n n-1 n-2 n-3 n-2 n-1 n-2 n-3
UP (Count up input)	2 3 ON / OFF	CP1 H/L, CP2 H/L, No counting, Count value 0 1 2 3 4 5 ; CP1 H/L No counting, CP2 H/L, Count value 0 1 2 3 4 5	Down (Count down input)	2 3 ON / OFF	CP1 H/L, CP2 H/L, Count value n n-1 n-2 n-3 n-4 n-5 ; CP1 H/L No counting, CP2 H/L, n n-1 n-2 n-3 n-4 n-5

※Ⓐ: Over min. signal width, Ⓑ: Over 1/2 of min. signal width.
　　If the signal width of Ⓐ or Ⓑ is less than min. signal width, ±1 of count error occurs.
※n: + max. display value (FX4Y-I: 9999, FX6Y-I: 999999)
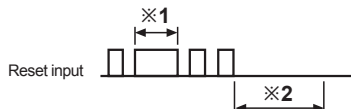
■ Proper Usage

◎ Reset

● Reset
When selecting a reset input/output mode, please apply the external reset or manual reset signal.
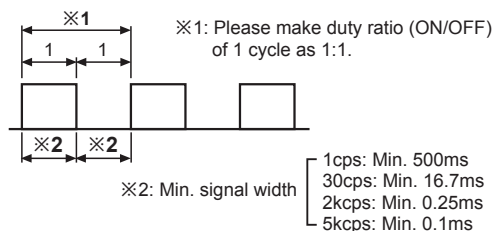**If it is not reset, it is operated as the prior mode.**

● Reset signal width
It is reset perfectly when the reset signal is applied for **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 for min. 20ms even though a chattering occurs.
※2: Signal input (CP1, CP2)is possible if there is no reset input for min. 50ms after reset input.

◎ Min.signal width

※1: Please make duty ratio (ON/OFF) of 1 cycle as 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 response.
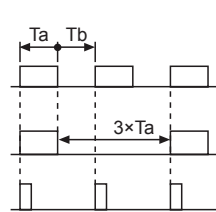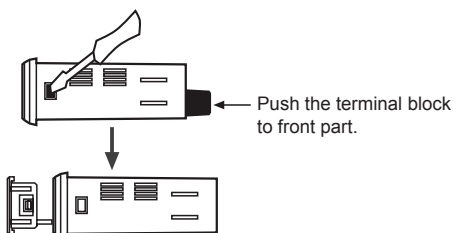
Ta (ON width) and Tb (OFF width)need to be over min. signal width.

When duty ratio is 1:3, the max.counting speed will be 1/2 from the rated spec.

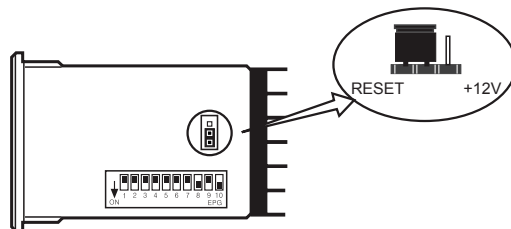It can not respond if it is smaller than min. signal width (Ta).

◎ Detach the case from body
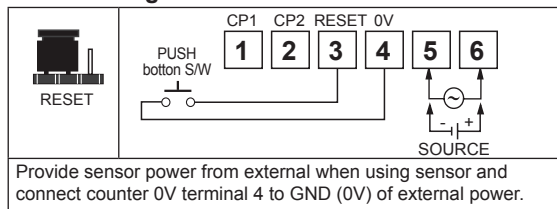While pushing the Lock part with driver to the front, push the terminal block.

Push the terminal block to front part.

※Be careful not to be wounded by tools.

◎ Using switching pin of Reset / +12V

RESET   +12V

● When using terminal 3 for external reset terminal
CP1 CP2 RESET 0V
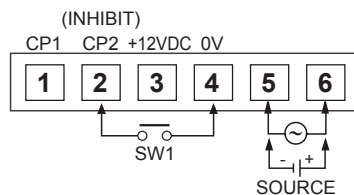| 1 | 2 | 3 | 4 | 5 | 6 |

Provide sensor power from external when using sensor and connect counter 0V terminal 4 to GND (0V) of external power.

● When using terminal 3 for sensor power terminal
CP1 CP2 +12VDC 0V
| 1 | 2 | 3 | 4 | 5 | 6 |
Black Brown Blue
PR18-5DN   SOURCE

◎ INHIBIT[For timer]
(INHIBIT)
CP1 CP2 +12VDC 0V
| 1 | 2 | 3 | 4 | 5 | 6 |
SW1   SOURCE
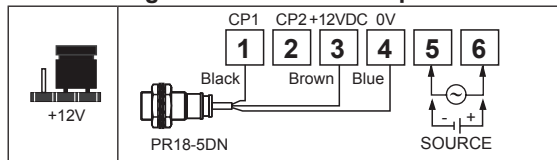
● It becomes the INHIBIT mode when SW1 turns on. (Time Hold)
● When power is applied, it starts to progress and INHIBIT mode is used to stop the time is under the progress at the moment.
● When SW1 is OFF, timer starts to progress again.

INHIBIT
Max. value
Time Display value 0
(Up mode)
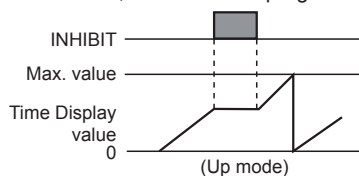
◎ Power
The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.

Power ON/OFF 100ms Unstable time against the input signal 500ms