

# 8 Digit Up/Down/Up • Down Counter

## DIN W72 × H72, W144 × H72mm of 8 Digit Up/Down counter

### ■ Features

- 8 Digits counter
- Selectable Up, Down, Up/Down mode
- Counting speed : 1cps, 30cps, 2kcps, 5kcps
- Selectable voltage input (PNP) or no-voltage input (NPN)
- Decimal point setting (Fixed decimal point of display)
- Wide range of power supply : 100–240VAC 50/60Hz  
12–24VAC/DC (Option)
- Built-in Microprocessor



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

### ■ Specifications

| Model                   | Single preset  |   | <b>F8A</b>                                | <b>L8A</b>   |
|-------------------------|--|---|---|--------------|
|                         | Totalizer(Indicator)   |   | <b>F8B</b>                                | <b>L8B</b>   |
| Digit                   |  |   | 8 (99999999)                              | 8 (99999999) |
| Digit size              |  |   | W4 × H8mm                                 | W6.3 × H10mm |
| Power supply            | 100–240VAC 50/60Hz, 12–24VAC/DC (Option)   |   |   |              |
| Allowable voltage range | 90 ~ 110% of rated voltage   |   |   |              |
| Power consumption       | <ul style="list-style-type: none"> <li>• Single preset : Approx. 6.1VA (240VAC 60Hz), Approx. 3.1W (24VDC), Approx. 6.3VA (24VAC 60Hz)</li> <li>• Indicator : Approx. 5.4VA (240VAC 60Hz), Approx. 2.6W (24VDC), Approx. 5.5VA (24VAC 60Hz)</li> </ul> |   |   |              |
| Max. counting speed     | Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch   |   |   |              |
| Min. signal width       | RESET input  | Approx. 20ms  |   |              |
| Input type              | CP1, CP2 Input   | [Voltage input] Input impedance : 5.4kΩ, "H" level voltage : 5–30VDC, "L" level voltage : 0–2VDC  |   |              |
|                         | RESET input  | [No-Voltage input] Impedance at short-circuit : Max. 1kΩ, Residual voltage at short-circuit : Max. 2VDC, Impedance at open-circuit : Max. 100kΩ |   |              |
| Control output          | Con-tact   | Type  | Single preset : SPDT (1c)                 |              |
|                         | Solid-state  | Capacity  | 250VAC 3A resistive load                  |              |
|                         |  | Type  | Single preset type : 1 NPN open collector |              |
| Capacity                | 30VDC Max. 100mA Max.  |   |   |              |
| Memory protection       | 10 years (When using non-volatile semiconductor memory)  |   |   |              |
| External power          | 12VDC ± 10% 50mA Max.  |   |   |              |
| Ambient temperature     | –10 ~ +55°C (at non-freezing status)   |   |   |              |
| Storage temperature     | –25 ~ +65°C (at non-freezing status)   |   |   |              |
| Ambient humidity        | 35 ~ 85%RH   |   |   |              |
| Insulation resistance   | 100MΩ (at 500VDC mega)   |   |   |              |
| 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 ~ 55Hz in each of X, Y, Z directions for 1 hour   |   |              |
|                         | Malfunction  | 0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes  |   |              |
| Shock                   | Mechanical   | 300m/s <sup>2</sup> (Approx. 30G) in X, Y, Z directions 3 times   |   |              |
|                         | Malfunction  | 100m/s <sup>2</sup> (Approx. 10G) in X, Y, Z directions 3 times   |   |              |
| Relay life cycle        | Mechanical   | Min. 10,000,000 times   |   |              |
|                         | Electrical   | Min. 100,000 times (250VAC 3A at resistive load)  |   |              |
| Unit weight             | AC power   | F8A : Approx. 287g, F8B : Approx. 253g  | L8A : Approx. 500g, L8B : Approx. 446g    |              |
|                         | DC power   | F8A : Approx. 283g, F8B : Approx. 253g  | L8A : Approx. 498g, L8B : Approx. 444g    |              |

(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/Speed/Pulse meter

(G) Display unit

(H) Sensor controller

(I) Switching power supply

(J) Proximity sensor

(K) Photo electric sensor

(L) Pressure sensor

(M) Rotary encoder

(N) Stepping motor & Driver & Controller

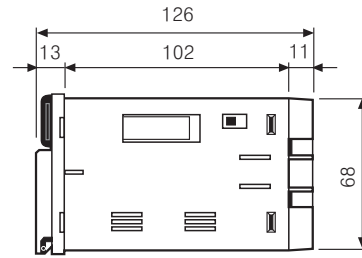
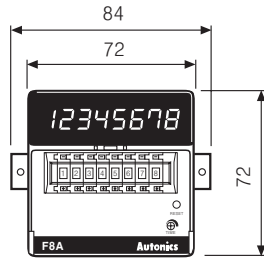
(O) Graphic panel

(P) Production stoppage models & replacement

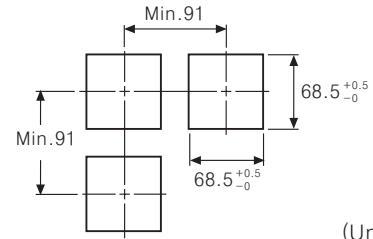
# F/L Series

## Dimensions

### F Series

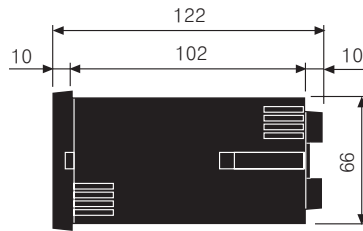
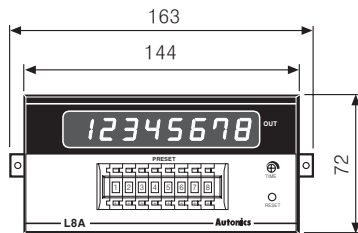


### Panel cut-out

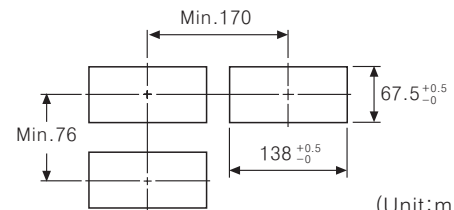


(Unit:mm)

### L Series



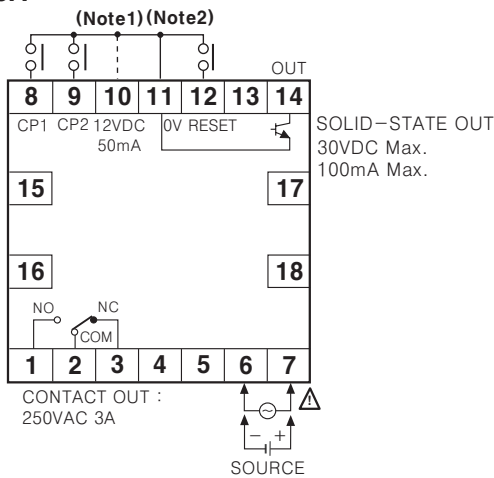
### Panel cut-out



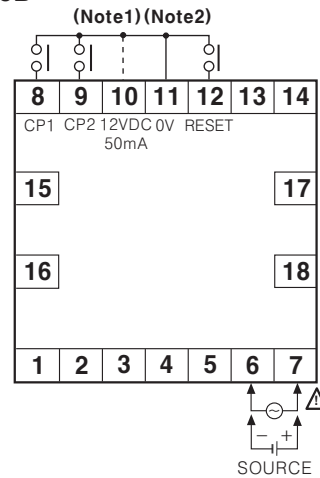
(Unit:mm)

## Connections

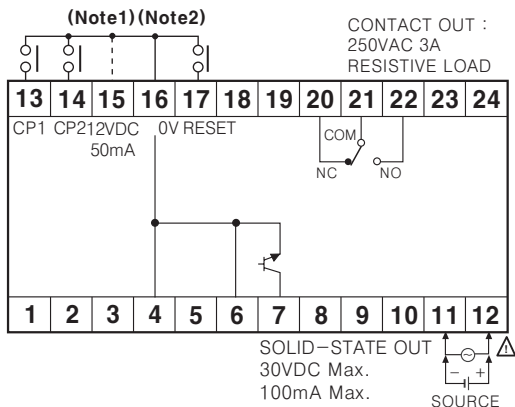
### F8A



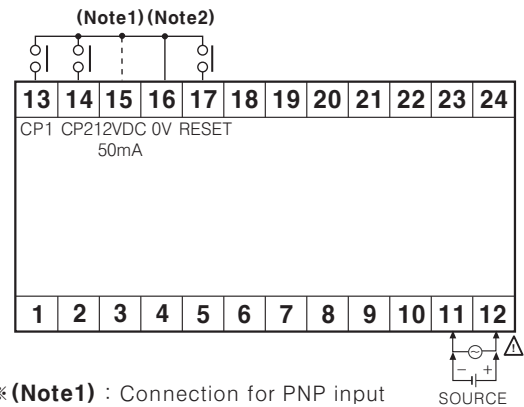
### F8B



### L8A



### L8B



※ (Note1) : Connection for PNP input  
(Note2) : Connection for NPN input

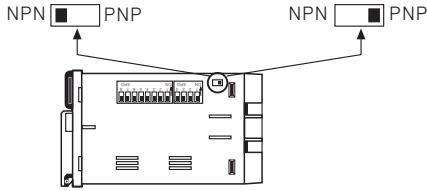
# 8 Digit Up/Down/Up • Down Counter

## Input logic selection

### ●F Series

Input logic is changeable by input logic selection switch located at the one-side of case.

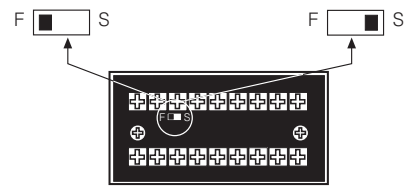
- No voltage input(NPN)
- Voltage input(PNP)



### ●L Series

Input logic is changeable by input logic selection switch located at the terminal block.

- No voltage input(NPN)
- Voltage input(PNP)

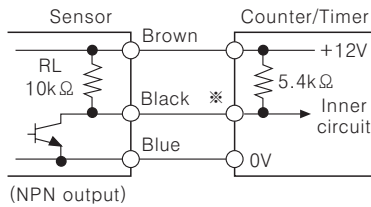


※Please be sure to turn OFF the power before changing input logic.

## Input connections

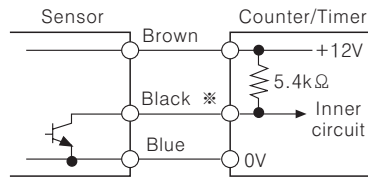
### ○No voltage input(NPN)

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



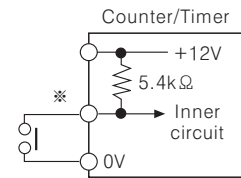
(NPN output)

※CP1, CP2, RESET input



(NPN open collector output)

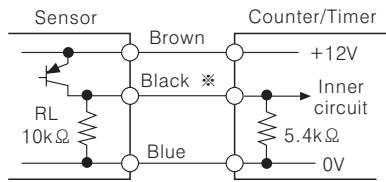
- Contact input



Counting speed :  
Set as 1 or 30cps

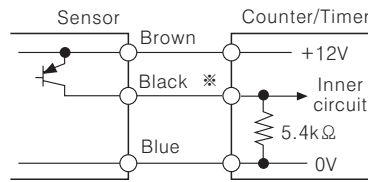
### ○Voltage input(PNP)

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



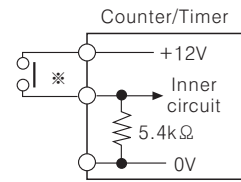
(PNP output)

※CP1, CP2(INHIBIT), RESET input



(PNP open collector output)

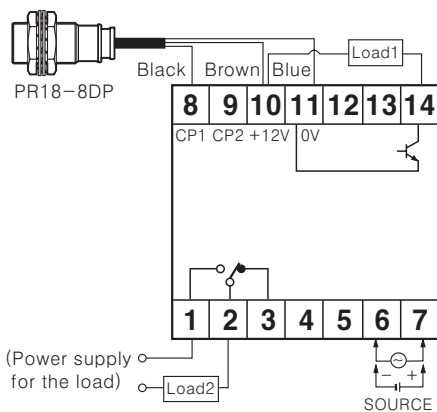
- Contact input



Counting speed :  
Set as 1 or 30cps

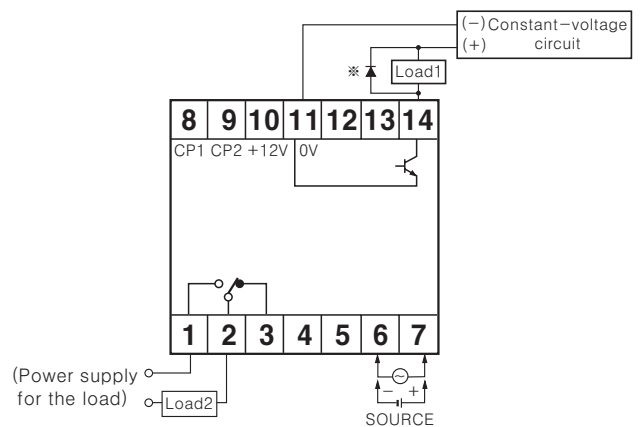
## Input & output connections

○In case of operating the load by power supply of the sensor



- Please select proper capacity of load, because total value of load capacity and current consumption should not be exceed current capacity (Max. 50mA).

○In case of operating the load by external power supply



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

(A)  
Counter

(B)  
Timer

(C)  
Temp.  
controller

(D)  
Power  
controller

(E)  
Panel  
meter

(F)  
Tacho/  
Speed/  
Pulse  
meter

(G)  
Display  
unit

(H)  
Sensor  
controller

(I)  
Switching  
power  
supply

(J)  
Proximity  
sensor

(K)  
Photo  
electric  
sensor

(L)  
Pressure  
sensor

(M)  
Rotary  
encoder

(N)  
Stepping  
motor &  
Driver &  
Controller

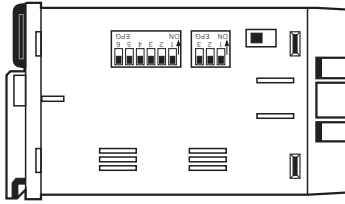
(O)  
Graphic  
panel

(P)  
Production  
stoppage  
models &  
replacement

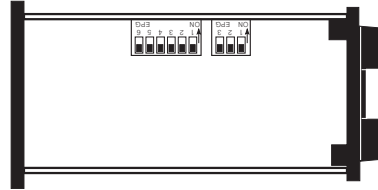
# F/L Series

## ■ Selection by DIP switches

●W72×H72 DIP switch position

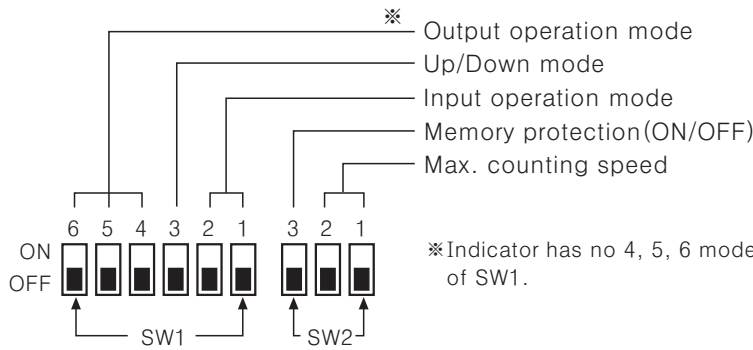


●W144×H72 DIP switch position



●Memory protection

| SW2   | Function                      |
|---|-------------------------------|
| ON <input type="checkbox"/> 3<br>OFF <input type="checkbox"/> | Disable the memory protection |
| ON <input type="checkbox"/> 3<br>OFF <input type="checkbox"/> | Enable the memory protection  |

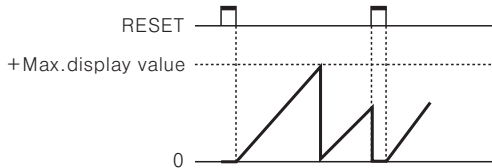


●Selecting max. counting speed

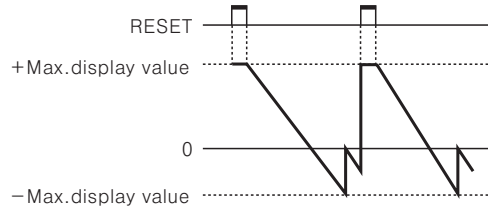
| SW2   | Max. counting speed |
|---|---------------------|
| ON <input type="checkbox"/> 1 2<br>OFF <input type="checkbox"/> | 1cps                |
| ON <input type="checkbox"/> 1 2<br>OFF <input type="checkbox"/> | 30cps               |
| ON <input type="checkbox"/> 1 2<br>OFF <input type="checkbox"/> | 2kcps               |
| ON <input type="checkbox"/> 1 2<br>OFF <input type="checkbox"/> | 5kcps               |

## ■ Counting function of indication type

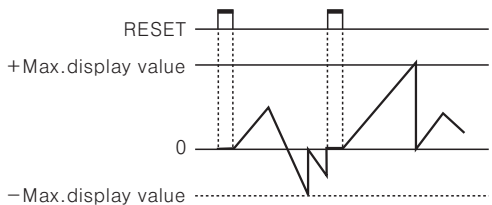
●Up mode



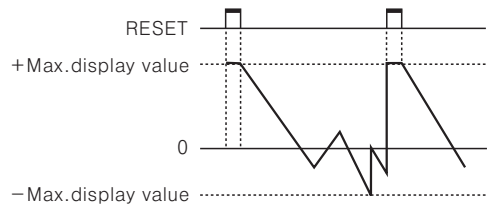
●Down mode



● Up / Down-A, B, C input mode

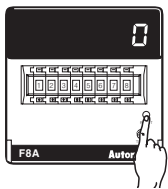


●Up / Down-D, E, F mode

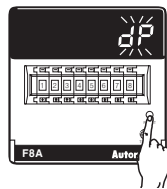


## ■ Decimal point setting

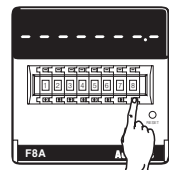
Display the decimal point.



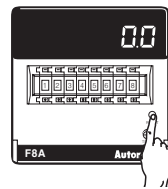
※Press RESET button for over 3sec., it advances to decimal point setting mode.



※When "dp" is flashing, one touch the Reset button.

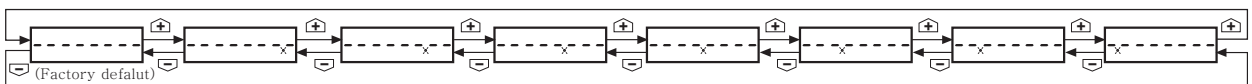


※Set the position of decimal point using  $\uparrow$ ,  $\downarrow$  button of digital switch.



※Press RESET button for over 3sec., it returns to RUN mode.

●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 existed in indication type.

# 8 Digit Up/Down/Up • Down Counter

## Input operation mode(Counter)

| Input mode(SW1)   |                                       | SW1   | No-voltage input type(NPN)  | Voltage input type(PNP)   |
|---|---------------------------------------|---|---|---|
| <b>Up mode</b><br>ON <br>OFF        | Up/Down-A<br>(Command input)          | ON <br>OFF      |  <p>cp1 H<br/>cp2 H<br/>Count value 0 1 2 3 2 1 2 3</p>                              |  <p>cp1 H<br/>cp2 H<br/>Count value 0 1 2 3 2 1 2 3</p>                              |
|   | Up/Down-B<br>(Individual input)       | ON <br>OFF      |  <p>cp1 H<br/>cp2 H<br/>Count value 0 1 2 3 2 1 1 2 3</p>                            |  <p>cp1 H<br/>cp2 H<br/>Count value 0 1 2 3 2 1 1 2 3</p>                            |
|   | Up/Down-C<br>(Phase difference input) | ON <br>OFF      |  <p>cp1 H<br/>cp2 H<br/>Count value 0 1 2 3 2 1 2 3</p>                              |  <p>cp1 H<br/>cp2 H<br/>Count value 0 1 2 3 2 1 2 3</p>                              |
|   | Up<br>(Count up input)                | ON <br>OFF      |  <p>cp1 H<br/>cp2 H<br/>Count value 0 1 2 3 4 5</p> <p>No counting</p>               |  <p>cp1 H<br/>cp2 H<br/>Count value 0 1 2 3 4 5</p> <p>No counting</p>               |
| <b>Down mode</b><br>ON <br>OFF  | Up/Down-D<br>(Command input)          | ON <br>OFF  |  <p>cp1 H<br/>cp2 H<br/>Count value 0 n-1 n-2 n-3 n-2 n-1 n-2 n-3</p>              |  <p>cp1 H<br/>cp2 H<br/>Count value 0 n-1 n-2 n-3 n-2 n-1 n-2 n-3</p>              |
|   | Up/Down-E<br>(Individual input)       | ON <br>OFF  |  <p>cp1 H<br/>cp2 H<br/>Count value 0 n-1 n-2 n-3 n-2 n-1 n-1 n-2 n-3</p>          |  <p>cp1 H<br/>cp2 H<br/>Count value 0 n-1 n-2 n-3 n-2 n-1 n-1 n-2 n-3</p>          |
|   | Up/Down-F<br>(Phase difference input) | ON <br>OFF  |  <p>cp1 H<br/>cp2 H<br/>Count value 0 n n-1 n-2 n-3 n-2 n-1 n-2 n-3</p>            |  <p>cp1 H<br/>cp2 H<br/>Count value 0 n n-1 n-2 n-3 n-2 n-1 n-2 n-3</p>            |
|   | Down<br>(Count down input)            | ON <br>OFF  |  <p>cp1 H<br/>cp2 H<br/>Count value 0 n n-1 n-2 n-3 n-4 n-5</p> <p>No counting</p> |  <p>cp1 H<br/>cp2 H<br/>Count value 0 n n-1 n-2 n-3 n-4 n-5</p> <p>No counting</p> |

\* Ⓐ: 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 is occurred.

(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/Speed/Pulse meter

(G) Display unit

(H) Sensor controller

(I) Switching power supply

(J) Proximity sensor

(K) Photo electric sensor

(L) Pressure sensor

(M) Rotary encoder






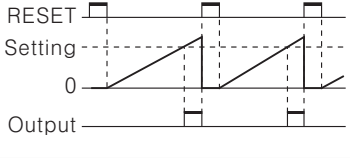
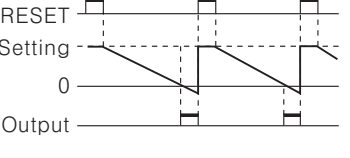

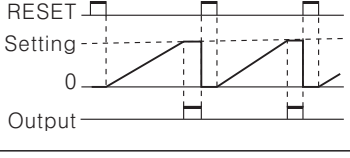
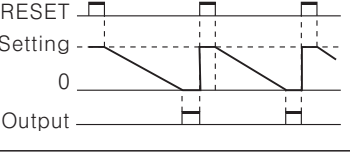

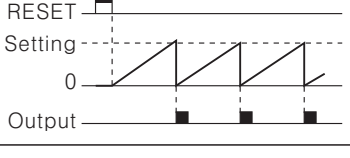
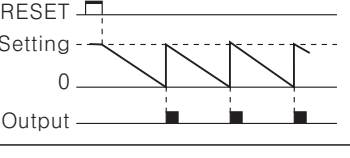

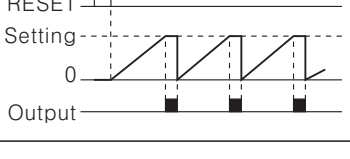
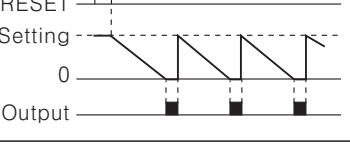

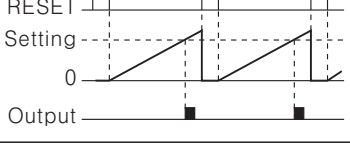
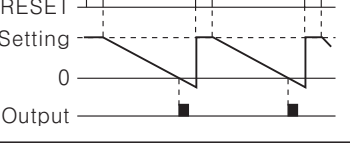

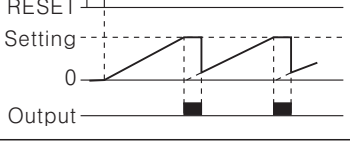
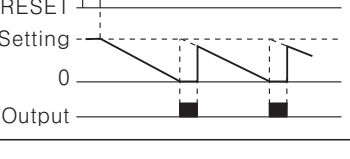

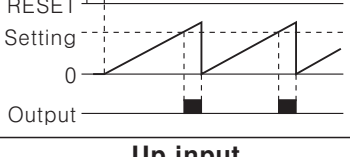


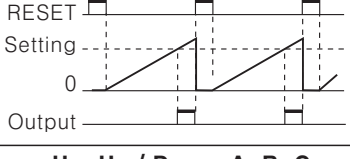
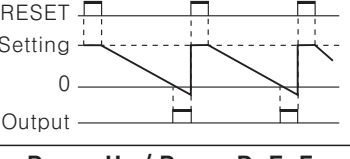
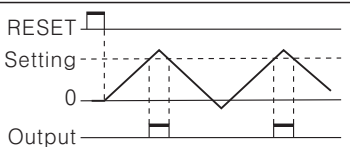
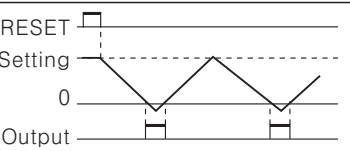
(N) Stepping motor & Driver & Controller

(O) Graphic panel

(P) Production stoppage models & replacement

# F/L Series

## Output operation mode

|  |   |  ← One-shot output (0.05 ~ 5sec) |  ← Retained output   |
|--|---|---|---|
| Output mode (SW1)  | ON  <b>Up mode</b> | ON  <b>Down mode</b>             | Operation after count up  |
|  | <b>Up, Up / Down-A, B, C</b>  | <b>Down, Up / Down-D, E, F</b>  |   |
| <b>F</b><br>ON  OFF   |                    |                                 | The display value continues until reset signal is applied and the output will be held.<br>• Retained output will be maintained until Reset signal is applied.   |
| <b>N</b><br>ON  OFF   |                    |                                 | Display value and retained output are maintained until Reset signal is applied.   |
| <b>C</b><br>ON  OFF   |                    |                                 | The display value returns to reset start status when display value is reached to setting value.   |
| <b>R</b><br>ON  OFF |                   |                                | The display value is held until output is OFF then returns to reset start status.   |
| <b>K</b><br>ON  OFF |                  |                               | The display value continues until reset signal is applied.  |
| <b>P</b><br>ON  OFF |                  |                               | The display value is held during one-shot output time, counting process is returned to reset start status when output is ON.  |
| <b>Q</b><br>ON  OFF |                  |                               | The display value continues during one-shot output time.  |
| <b>S</b><br>ON  OFF | <b>Up input</b>   | <b>Down input</b>   | <ul style="list-style-type: none"> <li>• Up, UP/Down-A, B, C input mode<br/>- Output is ON when (Display value) ≥ (Setting value)</li> <li>• Down, UP/Down-D, E, F input mode<br/>- Output is ON when (Display value) ≤ (Zero)</li> </ul> |
|  | <b>Up, Up / Down-A, B, C</b>  | <b>Down, Up / Down-D, E, F</b>  |   |
|                     |                 |   |   |
|                     |                 |   |   |

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

# 8 Digit Up/Down/Up • Down Counter

## ■ Proper usage

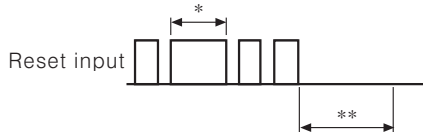
### ◎ Reset function

#### ● Reset

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

#### ● Reset signal width

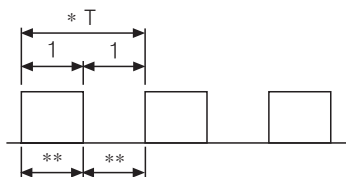
It is reset perfectly when the reset signal is applied during **max. 20ms** regardless of the contact input & solid-state input.



\*In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied during max. 20ms even though a chattering is occurred.

\*\*It can be input the signal of CP1 & CP2 after max. 50ms from closing time of reset signal.

### ◎ Min. signal width of CP1, CP2 input



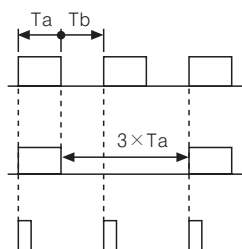
\*Please make duty ratio (ON/OFF) as 1:1.

\*\* Min. signal width

- 1cps : Max. 500ms
- 30cps : Max. 16.7ms
- 2kcps : Max. 0.25ms
- 5kcps : Max. 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 is getting slower against input signal. If either ON or OFF signal is shorter than minimum signal width, this product may not respond.



Therefore Ta(ON width) and Tb(OFF width) needed to be over min. signal width.

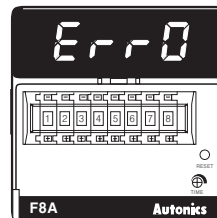
Max. counting speed is 1/2 value of catalog spec. when duty ratio is 1:3.

It can not respond because Max. signal width(1a) is small.

### ◎ Error display

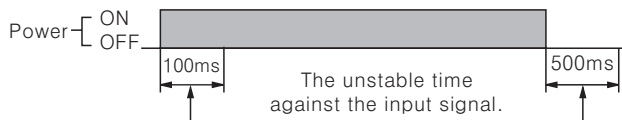
| Error signal | Error description   | Returning method                            |
|--------------|---------------------|---|
| Err0         | Zero setting status | Change the setting value to non zero status |

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



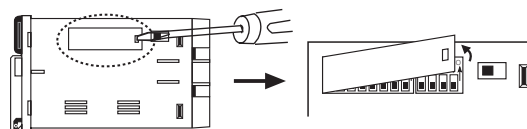
### ◎ Power

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.



## ■ Case & DIP switch detachment

### ● F Series

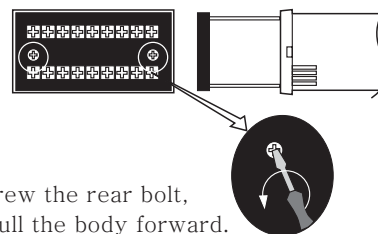


Push a lock part to front direction and widen it simultaneously.

\*Please be careful to use with tools, it may cause injury.

### ● L Series

Please turn off the power before detaching the case.



Unscrew the rear bolt, and pull the body forward.

\*Please be careful of the injury caused by tools.

(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/Speed/Pulse meter

(G) Display unit

(H) Sensor controller

(I) Switching power supply

(J) Proximity sensor

(K) Photo electric sensor

(L) Pressure sensor

(M) Rotary encoder

(N) Stepping motor & Driver & Controller

(O) Graphic panel

(P) Production stoppage models & replacement