FXY Series

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/DC
- Selectable Counter or Timer function by internal DIP switch selectable time ranges
- Built-in Microprocessor

**Ordering information**

<table>
<thead>
<tr>
<th>FX</th>
<th>Y</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIN W72×H36mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9999(4digit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>999999(6digit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counter/Timer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>FX4Y-I</th>
<th>FX6Y-I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digit</td>
<td>4digit</td>
<td>6digit</td>
</tr>
<tr>
<td>Digit size</td>
<td>W8×H14mm</td>
<td>W4×H8mm</td>
</tr>
<tr>
<td>Power supply AC Voltage type</td>
<td>100-240VAC 50/60Hz</td>
<td></td>
</tr>
<tr>
<td>AC/DC Voltage type</td>
<td>12-24VAC 50/60Hz, 12-24VDC universal</td>
<td></td>
</tr>
<tr>
<td>Allowable voltage range</td>
<td>90 to 110% of rated voltage</td>
<td></td>
</tr>
<tr>
<td>Power consumption AC Voltage type</td>
<td>Approx. 4.5VA(240VAC 60Hz)</td>
<td></td>
</tr>
<tr>
<td>AC/DC Voltage type</td>
<td>Approx. 4.5VA(24VAC 60Hz), Approx. 2.8W(24VDC)</td>
<td></td>
</tr>
<tr>
<td>Max. counting speed</td>
<td>Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch</td>
<td></td>
</tr>
<tr>
<td>Min. input signal width INHIBIT input</td>
<td>Min. 20ms</td>
<td></td>
</tr>
<tr>
<td>RESET input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input CP1, CP2 input</td>
<td>No voltage input - Impedance at short-circuit : Max. 470Ω, Residual voltage at short-circuit : Max. 1VDC</td>
<td></td>
</tr>
<tr>
<td>RESET input</td>
<td>Impedance at open-circuit : Min. 100kΩ</td>
<td></td>
</tr>
<tr>
<td>Memory protection</td>
<td>Approx. 10 years(When using non-volatile semiconductor memory)</td>
<td></td>
</tr>
<tr>
<td>External power</td>
<td>12VDC ±10% 50mA Max.</td>
<td></td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>Min. 100MΩ(at 500VDC megger)</td>
<td></td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>2000VAC 50/60Hz for 1 minute</td>
<td></td>
</tr>
<tr>
<td>Noise strength AC type</td>
<td>±2kV the square wave noise(pulse width : 1μs) by the noise simulator</td>
<td></td>
</tr>
<tr>
<td>DC type</td>
<td>±500V the square wave noise(pulse width : 1μs) by the noise simulator</td>
<td></td>
</tr>
<tr>
<td>Vibration Mechanical</td>
<td>0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1hour</td>
<td></td>
</tr>
<tr>
<td>Malfunction</td>
<td>0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes</td>
<td></td>
</tr>
<tr>
<td>Shock Mechanical</td>
<td>300m/s²(approx. 30G) in each of X, Y, Z directions for 3 times</td>
<td></td>
</tr>
<tr>
<td>Malfunction</td>
<td>100m/s²(approx. 10G) in each of X, Y, Z directions for 3 times</td>
<td></td>
</tr>
<tr>
<td>Environment Ambient temperature</td>
<td>10 to 55℃, storage: -25 to 65℃</td>
<td></td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>35 to 85%RH, storage: 35 to 85%RH</td>
<td></td>
</tr>
<tr>
<td>Approval</td>
<td>UL</td>
<td></td>
</tr>
<tr>
<td>Unit weight</td>
<td>Approx. 130g</td>
<td>Approx. 132g</td>
</tr>
</tbody>
</table>

※Environment resistance is rated at no freezing or condensation.

Please read “Caution for your safety” in operation manual before using.
Connections

Regarding sensors

(A) Photoelectric sensor
(B) Fiber optic sensor
(C) Door/Area sensor
(D) Proximity sensor
(E) Pressure sensor
(F) Rotary encoder
(G) Connector/Socket
(H) Temp. controller
(I) SSR/Power controller
(J) Counter
(K) Timer
(L) Panel meter
(M) Display unit
(N) Sensor controller
(P) Switching mode power supply
(Q) Stepper motor/Driver/Controller
(R) Graphic/Logic panel
(S) Field network device
(T) Software
(U) Other

Connections

- Photoelectric sensor (A)
- Fiber optic sensor (B)
- Door/Area sensor (C)
- Proximity sensor (D)
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Field network device (S)
Software (T)
Other (U)

Input connections

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- Software (T)
- Other (U)

Input connections

Using for no-voltage input (NPN)

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

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.

- PNP output type sensor
- PNP open collector output type sensor

Other

- Other (U)

Other

- Other (U)
### 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.

![Diagram of NPN and PNP sensors](image)

#### Dimensions

- **Panel cut-out** (unit: mm)

![Dimensions diagram](image)

#### Counting operation of indication type (Counter)

- **Up mode**
  - RESET
  - +Max. display value
  - 0

- **Up/Down-A, B, C mode**
  - RESET
  - +Max. display value
  - 0
  - -Max. display value

- **Down mode**
  - RESET
  - +Max. display value
  - 0
  - -Max. display value

- **Up/Down-D, E, F mode**
  - RESET
  - +Max. display value
  - 0
  - -Max. display value

#### Counting operation of indication type (Timer)

- **Up mode**
  - RESET
  - INHIBIT
  - +Max. time range
  - 0

- **Down mode**
  - RESET
  - INHIBIT
  - +Max. time range
  - 0
  - -Max. time range
**Description of inner DIP switches**

- **Up/Down mode**
  - SW1 4
    - OFF: Up mode
    - ON: Down mode
  - SW1 8
    - OFF: Disable the front panel reset function
    - ON: Enable the front panel reset function
  - SW1 9
    - OFF: Enable the memory protection
    - ON: Disable the memory protection
  - SW1 10
    - OFF: Timer
    - ON: Counter
  - SW1 CP1, CP2
    - 1cps
    - 30cps
    - 2kcps
    - 5kcps

- **Time setting mode(Timer)**

- **Count input mode(Counter)**

- **Max. counting speed**

- **Reset function of front panel(ON/OFF)**

- **Memory protection(ON/OFF)**

- **Counter/Timer**

- **Temp. controller**

- **SSR/Power controller**

- **Counter**

- **Panel meter**

- **Tacho/Speed/Pulse meter**

- **Display unit**

- **Sensor controller**

- **Switching mode power supply**

- **Stepper motor&Driver&Controller**

- **Graphic/Logic panel**

- **Field network device**

- **Software**

- **Other**

※Inner selection switch is changed from 8pin to 10pin with upgrade of counting speed.
Input mode (Counter)

<table>
<thead>
<tr>
<th>Input mode</th>
<th>SW1</th>
<th>4</th>
<th>Up mode</th>
<th>Input mode</th>
<th>SW1</th>
<th>4</th>
<th>Down mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up/Down-A (Command input)</td>
<td>OFF</td>
<td>2 3</td>
<td>CP1 H</td>
<td>CP2 L</td>
<td>Count value</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Up/Down-B (Individual input)</td>
<td>OFF</td>
<td>2 3</td>
<td>CP1 H</td>
<td>CP2 L</td>
<td>Count value</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Up/Down-C (Phase difference input)</td>
<td>OFF</td>
<td>2 3</td>
<td>CP1 H</td>
<td>CP2 L</td>
<td>Count value</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Up (Count up input)</td>
<td>OFF</td>
<td>2 3</td>
<td>CP1 H</td>
<td>CP2 L</td>
<td>Count value</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Down (Count down input)</td>
<td>OFF</td>
<td>2 3</td>
<td>CP1 H</td>
<td>CP2 L</td>
<td>Count value</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

※Ⓐ: 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.
※n : + max. display value (FX4Y-I : 9999, FX6Y-I : 999999)
Up/Down Counter/Timer

■ 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.

![Diagram of Reset Input](image)

※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 is occured.
※2: Signal input(CP1, CP2)is possible if there is no reset input for min. 50ms after reset input.

○ Min. signal width

![Diagram of Min. Signal Width](image)

※1: Please make duty ratio(ON/OFF) of 1 cycle as 1:1.
※2: Min. signal width

○ 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.

![Diagram of Counting Speed](image)

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.

![Diagram of Detaching Case](image)

※Be careful not to be wounded by tools.

○ Using switching pin of Reset / +12V

![Diagram of Using Switching Pin](image)

● When using terminal 3 for external reset terminal

![Diagram of External Reset Terminal](image)

Provide sensor power from external when use sensor and connect counter 0V terminal(No.4) to GND (0V) of external power.

● When using terminal 3 for sensor power terminal

![Diagram of Sensor Power Terminal](image)

○ INHIBIT[For timer]

![Diagram of INHIBIT](image)

● 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.

○ 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.

![Diagram of Power](image)