

Multifunctional digital counter/length counter TMC7X

Technical Manual

Version number: EN-V1-03



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Thank you very much for choosing TMCON products,
In order to better use this product, please read the following before using.

■ Safety precautions

Attention

Do not touch the terminals while power is on, otherwise minor injuries may occur due to electric shock.



Do not allow metal objects, conductors, debris (such as cuttings) from installation work, moisture, or other foreign matter to enter the digital controller, the setup tool ports, or between the pins on the connectors on the Setup Tool cable. Otherwise it may cause electric shock, short circuit or machine malfunction.



Do not use the product where subject to flammable or explosive gas. Otherwise, it may cause mild injury due to the explosion.



Never disassemble, modify, or repair the product or touch any of the internal parts. Otherwise, it may cause mild electric shock, fire, and equipment failure.



This equipment is an open processing controller. Do not use it in a control cabinet where fire may occur. When using more than 2 open-circuit switches, please turn off all switches before repair inspection, so that the product is in a power-off state.



If the output relays are used past their life expectancy, contact fusing or burning may occasionally occur. Always consider the application conditions and use the output relays within their rated load and electrical life expectancy. The life expectancy of output relays varies considerably with the output load and switching conditions.



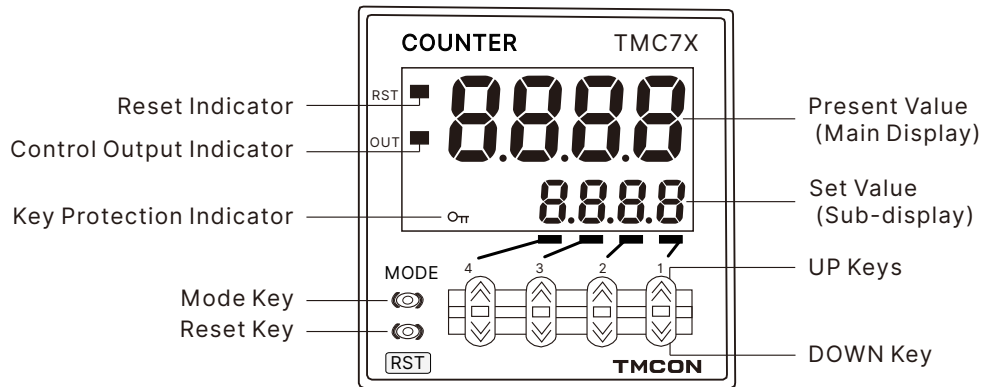
■ Main features

- Bright and easy to read color LCD display.
- Independent setting Up/Down keys are provided for all four digits, So the setting is very convenient and fast, and it also has keys protection switches to prevent misoperation.
- Detachable terminal protection cover, convenient wiring and can prevent electric shock.
- Multiple input and output modes can be selected and set to meet different application requirements.
- There are two models to choose from, TMC7X-C as the standard counter, and TMC7X-P adds a prescaling function (signal and display ratio) function on top of TMC7X-C, which can convert counter into length counter.
- Equipped with power outage memory data storage function.
- NPN/PNP input signals can be selectable settings.

■ Technical reference

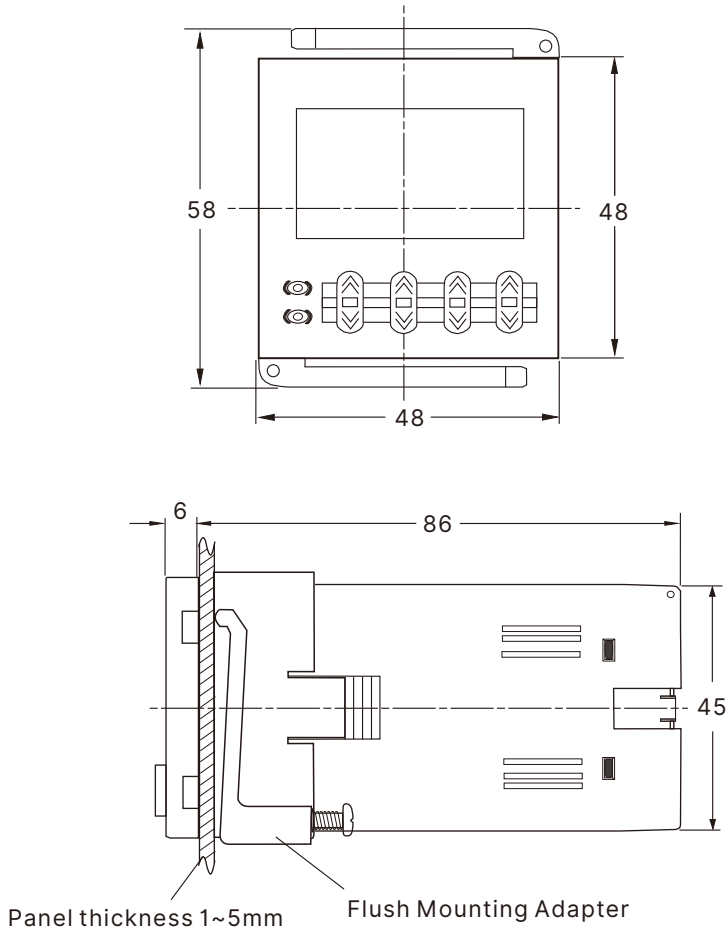
Models	TMC7X-C	TMC7X-P
Functional categories	Standard counter	Counter/length counter
External dimension (mm)	48(high)×48(wide)×86(depth)	
Hole size (mm)	45(high)×45(wide)	
Power supply	AC100~240V 50/60Hz or AC/DC12~24V (The default delivery is 100~240V, If you need 12~24V, please declare the voltage at the time of ordering)	
Permissible voltage range	85~110%	
Power consumption	About 5VA (AC240V) , about 3.2 VA (DC24V)	
Prescaling function	None	Yes (0.001~9.999 can be freely set)
Decimal Point	None	Yes (up to 3 decimal places)
Display mode	Color LCD display	
Display Range	-999~9999 (-3~4 digits)	
Counting speed	5Hz, 30Hz, 1KHz, 5KHz (selectable settings)	
Input signal	CP1, CP2, RESET1, RESET2	
Input mode	No-voltage (NPN) input/voltage (PNP) input (switchable) No-voltage inputs: ON impedance: 1KΩ max (Leakage current: 12mA at 0Ω) ON residual voltage: 3V max OFF impedance: 100KΩ min Voltage input: High (logic) level: 4.5 to 30VDC Low (logic) level: 0 to 2VDC (Input resistance: approx 4.7KΩ)	
Input mode	UP (Increment) , DOWN (decrement), increment/decrement UP/DOWN-A (command input), UP/DOWN-B (individual inputs), or UP/DOWN-C (quadrature inputs)	
Output time	N, F, C, R, L	
Reset mode	Manual reset, external signal reset, automatic reset (depending on output mode)	
Automatic reset time	0.01~99.99 seconds	
Control output	Relay output (standard configuration), contact capacity: 3A/AC250V resistive load Customizable transistor output: NPN open collector output Customizable SSR drive voltage (DC12V/100mA) output	
Auxiliary power output	12VDC ±10% 100mA Max	
Power outage memory	EEP-ROM Data held for more than 10 years	
Insulation withstand voltage	AC2000V 50/60Hz 1min	
Usage environment	Temperature -10~+55°C (not freezing or exposed), humidity: 25~85% RH	

■ Panel

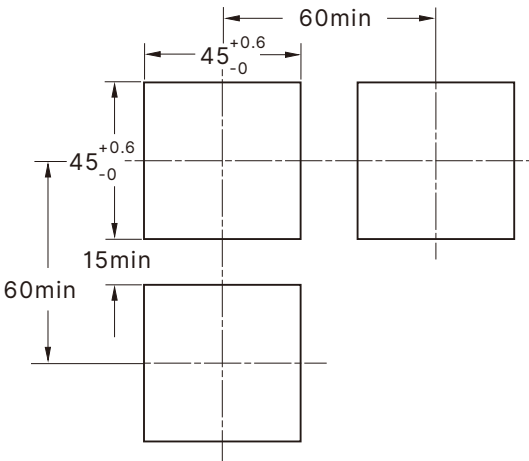


■ Size (mm)

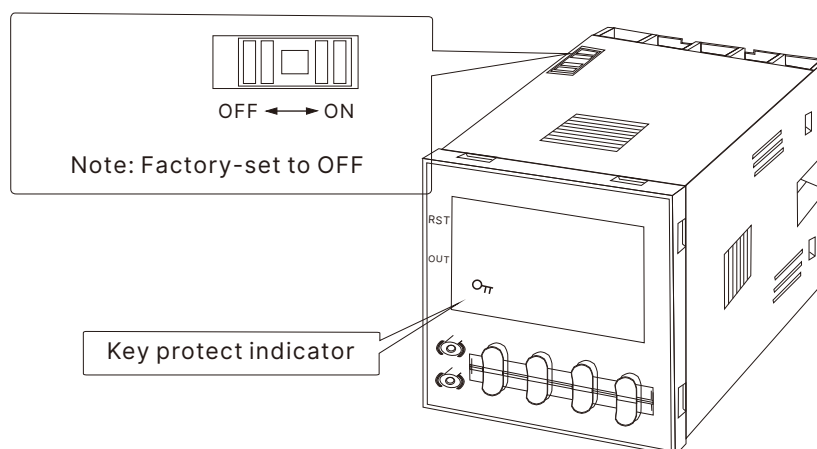
● Outline dimensions



● Mounting hole size

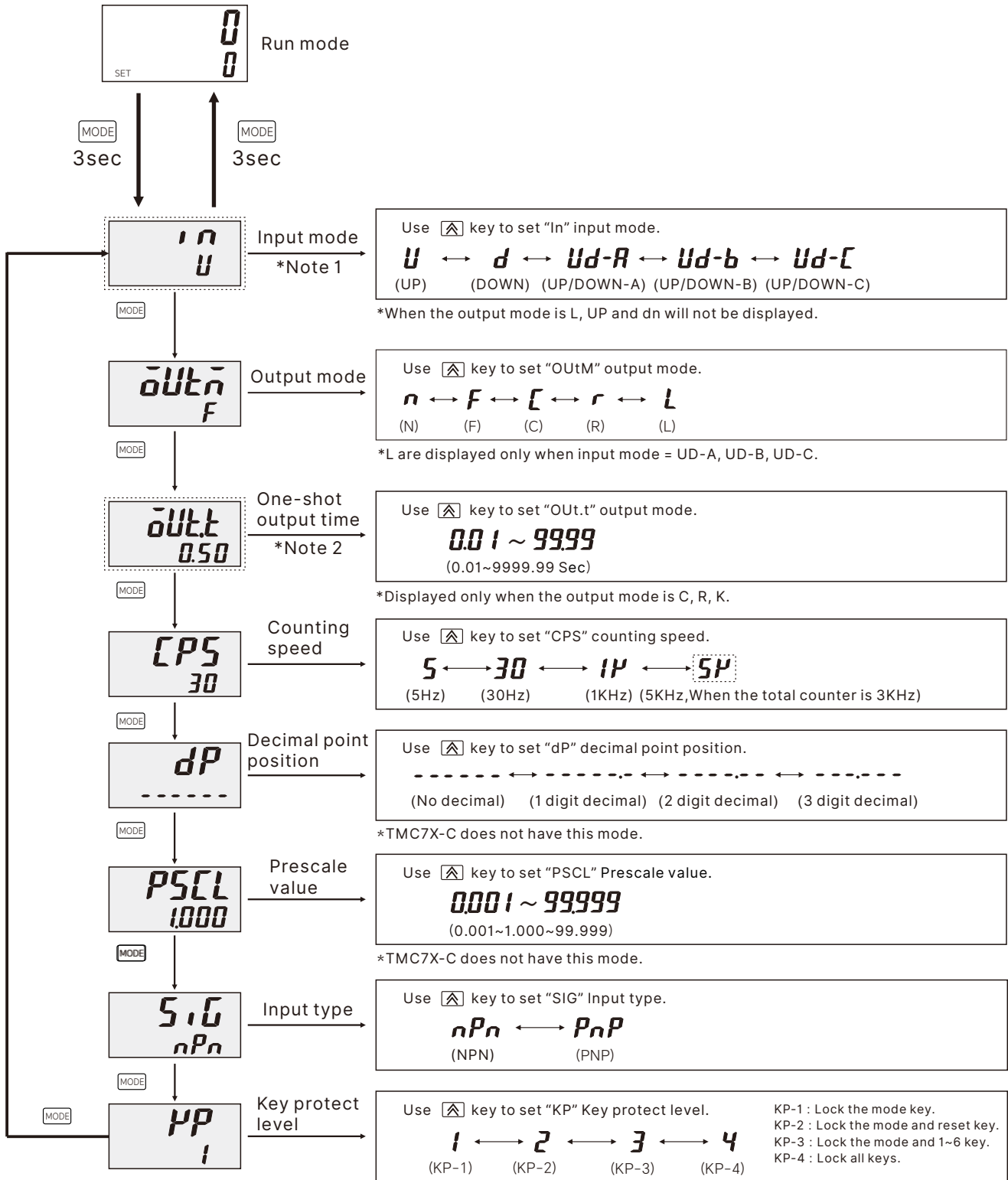


■ Key protection switch



Set the key protect level.

When the key-protect switch is set to ON, it is possible to prevent setting errors by prohibiting the use of certain operation keys by specifying the key protect level (KP-1 to KP-4). The key protect indicator is lit while the key-protect switch is set to ON. Confirm the ON/OFF status of the keyprotectswitch after the TMC7X is mounted to the panel.




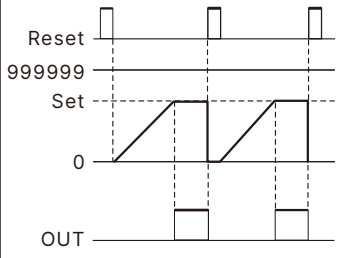
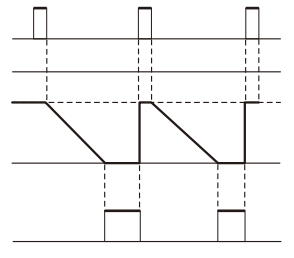
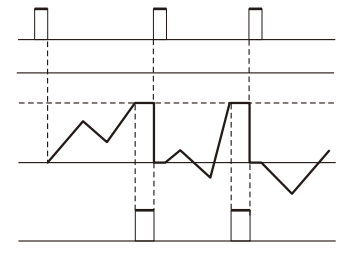
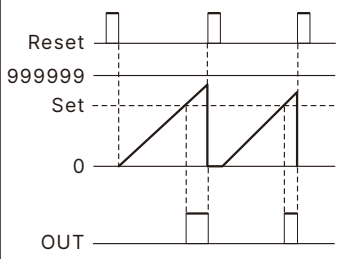
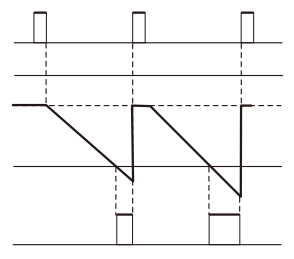
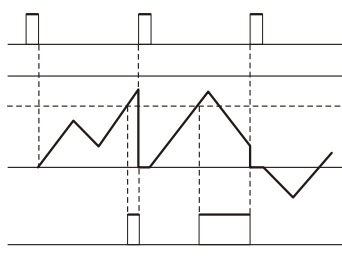
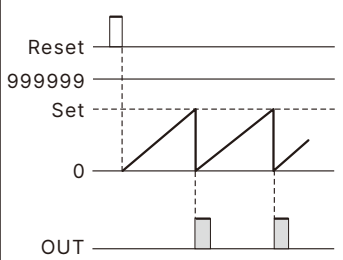
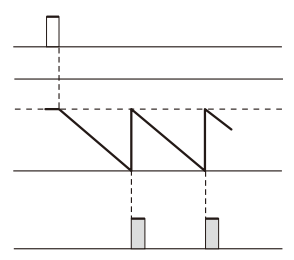
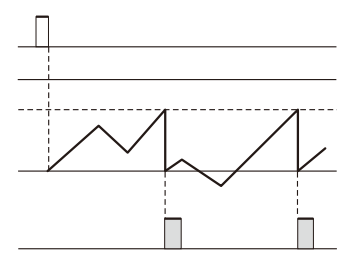
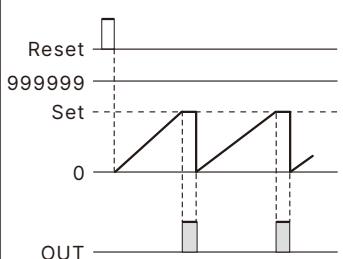
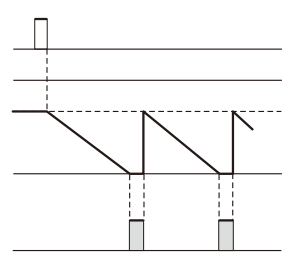
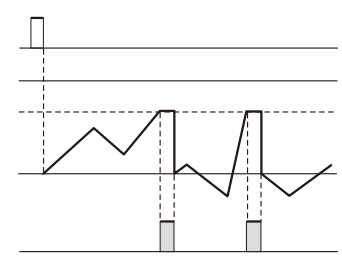
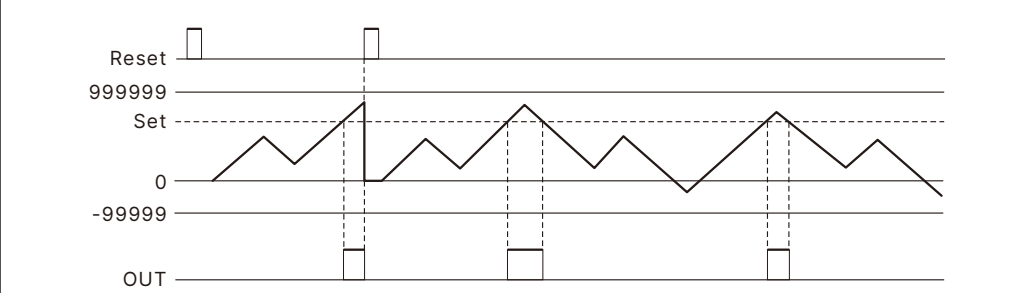
Input Modes and Present Value

UP (Increment) Mode	DOWN (Decrement) Mode									
<p>CP1: Count input; CP2: Prohibit (gate) input</p> <p>Present value: 0, 1, 2, 3, 4, 5</p> <p>Ⓐ must be greater than the minimum signal width. (See note 2.)</p>	<p>CP1: Count input; CP2: Prohibit (gate) input</p> <p>Present value: n, n-1, n-2, n-3, n-4, n-5</p> <p>Ⓐ must be greater than the minimum signal width. (See note 2.)</p>									
<p>CP1: Prohibit (gate) input; CP2: Count input</p> <p>Present value: 0, 1, 2, 3, 4, 5</p> <p>Ⓐ must be greater than the minimum signal width. (See note 2.)</p>	<p>CP1: Prohibit (gate) input; CP2: Present value</p> <p>Present value: n, n-1, n-2, n-3, n-4, n-5</p> <p>Ⓐ must be greater than the minimum signal width. (See note 2.)</p>									
UP/DOWN A Command Input Mode	UP/DOWN B Individual Input Mode									
<p>CP2 did not enter CP1 plus count, the CP2 input is valid CP1 count down</p> <p>Present value: 0, 1, 2, 3, 2, 1, 2, 3</p> <p>Ⓐ must be greater than the minimum signal width. (See note 2.)</p>	<p>input CP1 UP count, input CP2 count down</p> <p>Present value: 0, 1, 2, 3, 2, 1, 1, 2, 3</p>									
UP/DOWN C Quadrature Input Mode	<p>Note: 1. If the configuration selection is set to dual counter, CP1 and CP2 input will operate in the same way as the count input (CP1) of UP (increment) mode.</p> <p>2. Ⓐ must be greater than the minimum signal width and Ⓑ must be at least 1/2 the minimum signal width. If they are less, a count error of ±1 may occur.</p> <p>Minimum signal width: 100ms (when maximum counting speed=5Hz) 16.7ms (when maximum counting speed=30Hz) 500μs (when maximum counting speed=1KHz) 100μs (when maximum counting speed= 5KHz)</p> <p>3. Counting starts when the CP1 is turned ON after turning ON the power.</p> <p>4. The meaning of the H and L symbols in the tables is explained below.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Input method Symbol</th> <th>No-voltage input (NPN input)</th> <th>Voltage input (PNP input)</th> </tr> </thead> <tbody> <tr> <td>H</td> <td>Short-circuit</td> <td>DC4.5~30V</td> </tr> <tr> <td>L</td> <td>Open</td> <td>DC0~2V</td> </tr> </tbody> </table>	Input method Symbol	No-voltage input (NPN input)	Voltage input (PNP input)	H	Short-circuit	DC4.5~30V	L	Open	DC0~2V
Input method Symbol		No-voltage input (NPN input)	Voltage input (PNP input)							
H	Short-circuit	DC4.5~30V								
L	Open	DC0~2V								
<p>Automatically determine the forward or reverse</p> <p>Present value: 0, 1, 2, 3, 2, 1, 2, 3</p> <p>Ⓑ must be at least 1/2 the minimum signal width. (See note 2.)</p>										

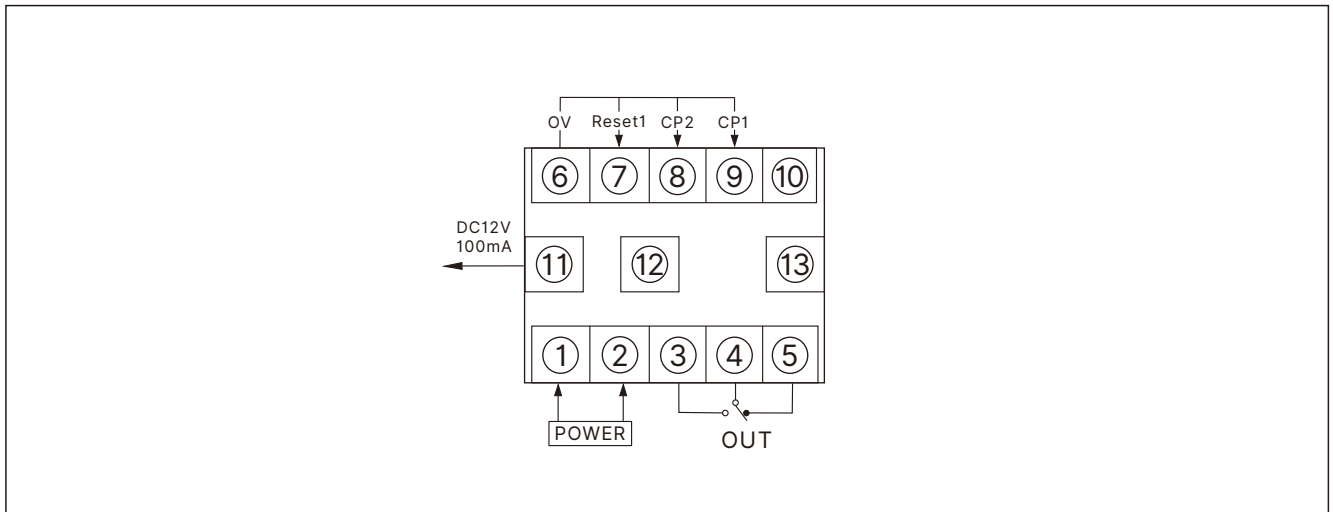
Input/Output Mode Settings

 Output Hold

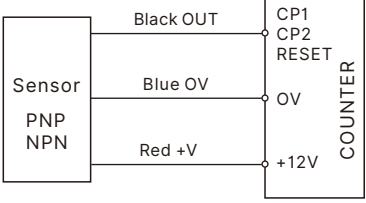
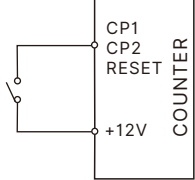
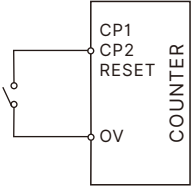
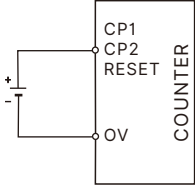
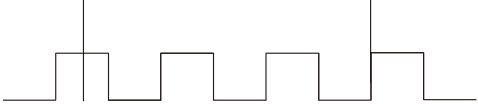
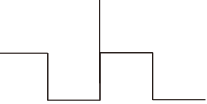
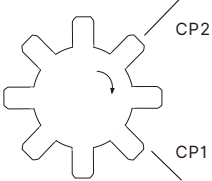
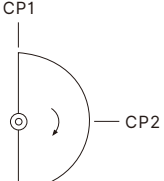
 One-shot output (The one-shot output time 0.01 to 99.99s.)

Output mode	Input mode			Operation after count completion
	UP	DOWN	U/D-A, B, C	
N				The outputs and present value display are held until reset is input.
F				The present value display continues to increase/decrease. The outputs are held until reset is input.
C				As soon as the count reaches SV, the present value display returns to the reset start status. The present value display does not show the present value upon count-up. The outputs repeat oneshot operation.
R				The present value display returns to the reset start status after the one-shot output time. The outputs repeat oneshot operation.
L				The display continues to increase/decrease until the overflow or underflow value is reached. OUT is held while the present value is less than or equal to set value

■ Wiring diagram



Signal input connection diagram

<p>●Sensor input:</p> 	<p>●Contact Input:</p>  <p style="text-align: right;">Input signal is set to PNP</p>
<p>●Contact Input:</p>  <p style="text-align: right;">Input signal is set to NPN</p>	<p>●DC voltage pulse signal input:</p>  <p style="text-align: right;">1:Active-high internal set PNP 2:Active-Low internal set NPN</p>
<p>●The UP / DOWN-C output mode of the sensor installation method: *CP1 and CP2 ready position by 90 °</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>The CP1 sensor installation location</p>  </div> <div style="text-align: center;"> <p>The CP2 sensor installation location</p>  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <p>*The UP / DOWN-C mode can automatically determine the forward reverse movement, Forward will be added to UP count, the reverse will count down.</p>	

■ Note

1: before use, make sure that the voltage and connection, to avoid lead to instrument damage due to incorrect wiring.

2: Avoid the instrument used in high temperature, flammable, explosive, corrosive, dust, severe shock, humidity, static electricity, oil and other occasions.

3: Twist of the instrument signal lines and power lines may cause interference Please try to stay away from these strong electric wires, to conduct an independent wiring, and signal lines as far as possible to shorten the wiring distance.

4: Contact signal input, the CPS count rate should be set for low-speed 30Hz, can Prevent switch bounce error count. Reasonable speed settings, you can make the count more accurate.

5: Output relay, please do not exceed the switching capacity, according to the rated load, otherwise it would contact burned, such as an external high current relay or contactor exceeds its capacity.