TMCON

Small intelligent counter/length counter

T3C

Technical Manual

Version number: EN-V1-03

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

Contact Us

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website to answer your questions online

■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 installationwork, 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 theinternal 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 switchesbefore 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

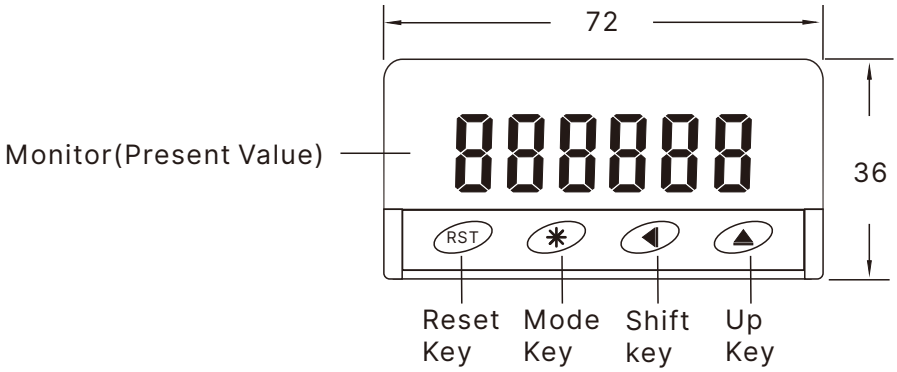
● DIN 36×72mm standard size, arc-shaped“Sunglasses filter lens” panel display, bright visual experience.
● User-friendly interface design, so that the single-row display mode parameter settings also become easy to operate.
● The prescaling function (signal and display ratio) is 0.0001~99.9999, which can convert the counter into a length counter for use.
● Multiple input and output modes, as well as power outage memory data storage function.
● Strong anti-interference performance, accurate and reliable counting.
● NPN/PNP input signals can be selectable settings.

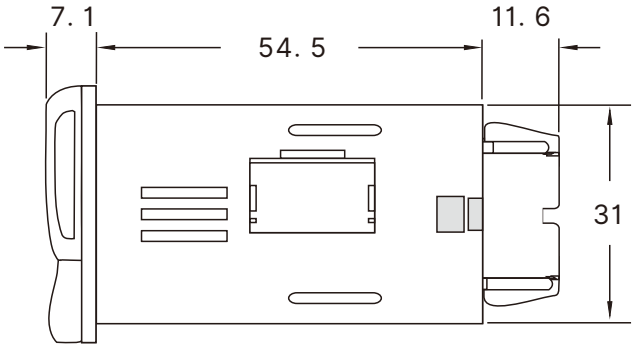
■Technical reference

Models	T3C-N	T3C-1P
Functional categories	Display type counter (no control output)	1-stage preset type counter
External dimension (mm)	36(high)×72(wide)×66(depth)	
Hole size (mm)	31(high)×67(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)	
Display mode	LED Nixie tube display	
Display Range	-99999~999999 (-5~6 digits)	
Input mode	UP (Increment), increment/decrement UP/DOWN-A (command input), UP/DOWN-B (individual inputs), or UP/DOWN-C (quadrature inputs)	UP (Increment), DOWN (decrement), increment/decrement UP/DOWN-A (command input), UP/DOWN-B (individual inputs), or UP/DOWN-C (quadrature inputs)
Output mode	None	N, F, C, R, L, K, D
Prescaling function	Yes (0.0001~99.9999 can be freely set)	
Decimal point adjustment	Yes (right most 4 digits)	
Counting speed	5Hz, 30Hz, 1KHz, 5KHz (selectable settings)	
Input signal	CP1, CP2, RESET	
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)	
Reset mode	Manual reset, external signal reset, power reset (except for power outage memory function)	Manual reset, external signal reset, power reset (excluding power outage memory function), automatic reset (adjustable from 0.01 to 99.99 seconds) (depending on mode)
Control output	None	Relay output, contact capacity: 3A/AC250V resistive load
Auxiliary power output	12VDC ±10% 100mA Max	
Power outage memory	EEP-ROM Data held for more than 10 years	

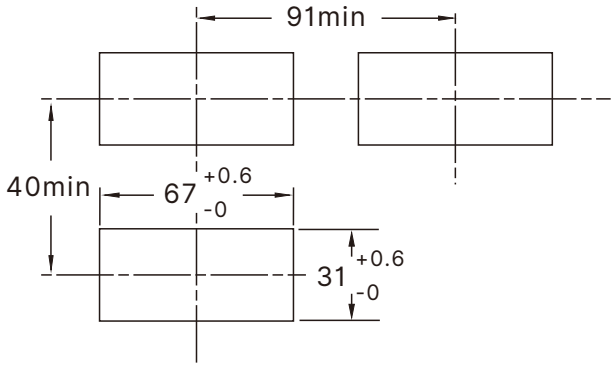
Insulation withstand voltage	AC2000V 50/60Hz 1min
Usage environment	Temperature -10~+60°C (not freezing or exposed), humidity ≤90%RH

■The panel and the size(mm)



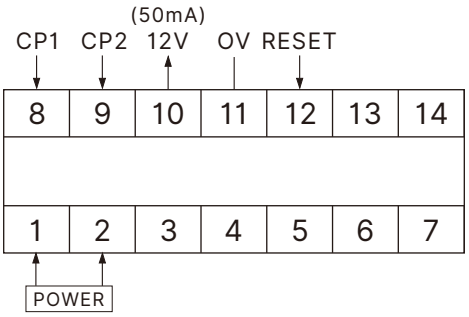


Panel cut-out:

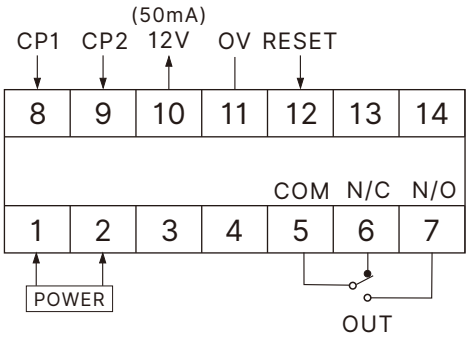


■Wiring diagram

●T3C-N

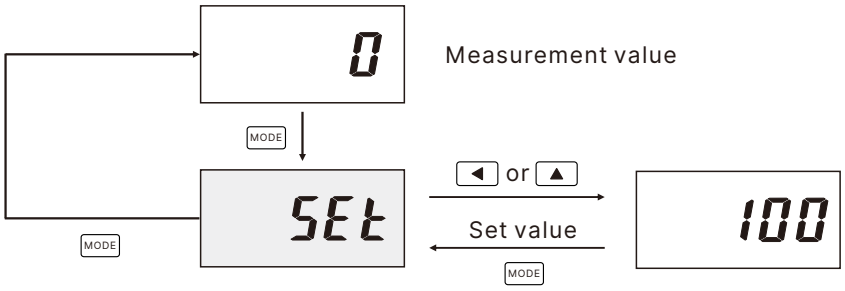


●T3C-1P

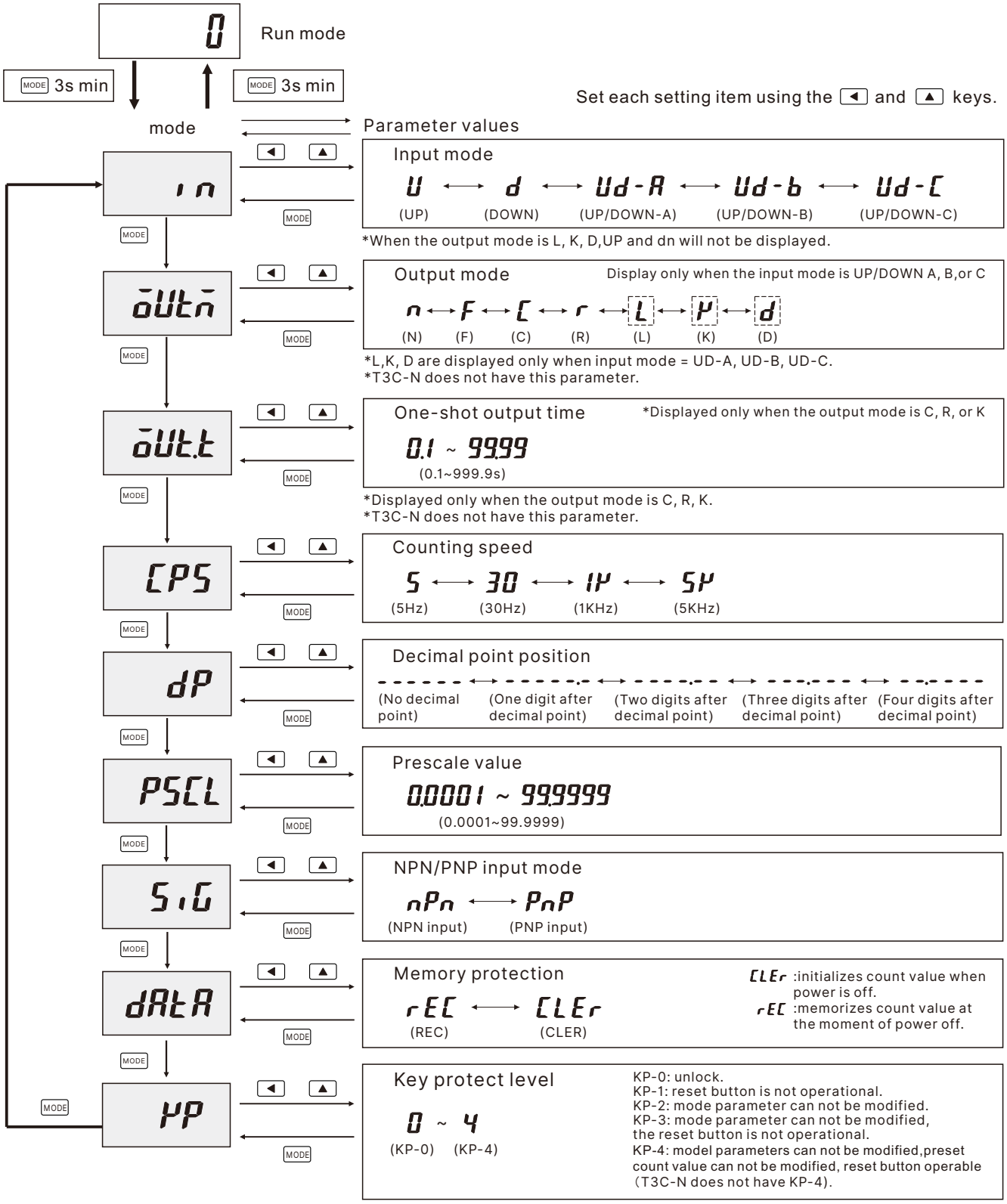


■T3C-1P Preset count value (T3C-N doesn't have this set)

●T3C-1P first section setting type



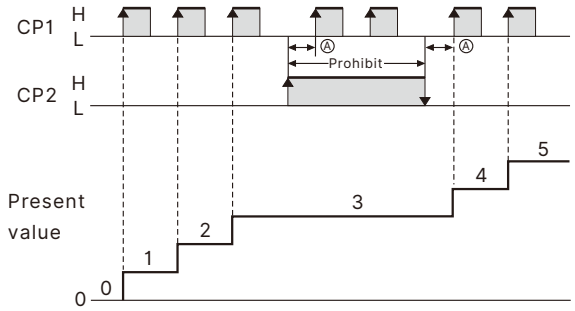
■T3C-1P Settings for All Functions



■Input Modes and Present Value

UP (Increment) Mode

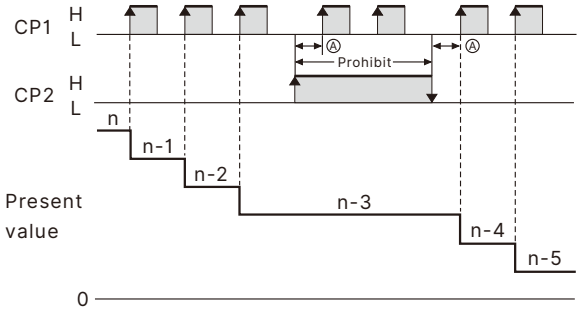
CP1: Count input; CP2: Prohibit (gate) input



Ⓐ must be greater than the minimum signal width. (See note 2.)

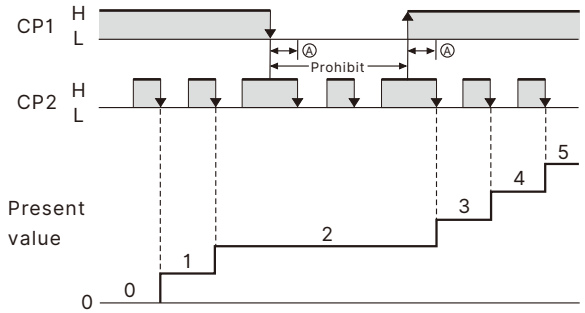
DOWN (Decrement) Mode

CP1: Count input; CP2: Prohibit (gate) input



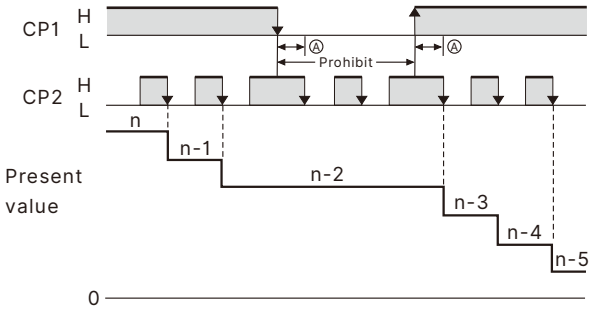
Ⓐ must be greater than the minimum signal width. (See note 2.)

CP1: Prohibit (gate) input; CP2: Count input



Ⓐ must be greater than the minimum signal width. (See note 2.)

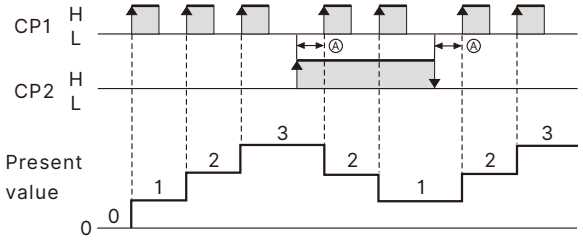
CP1: Prohibit (gate) input; CP2: Present value



Ⓐ must be greater than the minimum signal width. (See note 2.)

UP/DOWN A Command Input Mode

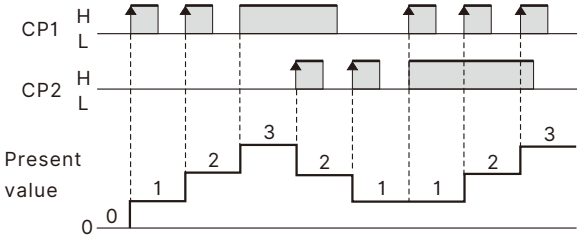
CP2 did not enter CP1 plus count, the CP2 input is valid
CP1 count down



Ⓐ must be greater than the minimum signal width. (See note 2.)

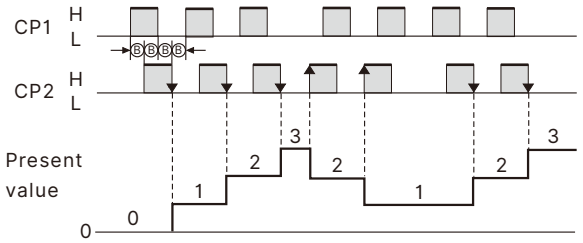
UP/DOWN B Individual Input Mode

input CP1 UP count, input CP2 count down



UP/DOWN C Quadrature Input Mode

Automatically determine the forward or reverse



Ⓑ must be at least 1/2 the minimum signal width. (See note 2.)

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.

2. Ⓐ must be greater than the minimum signal width and Ⓑ must be at least ½ the minimum signal width. If they areless, a count error of ±1 may occur.

Minimum signal width:100ms (when maximum countingspeed=5Hz)
16.7ms (when maximum countingspeed=30Hz)
500μs (when maximum countingspeed=1KHz)
100μs (when maximum countingspeed= 5kHz)

3. Counting starts when the CP1 is turned ON after turning ON the power.

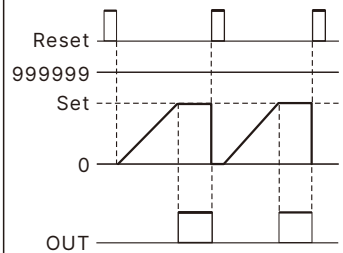
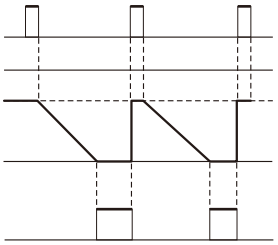
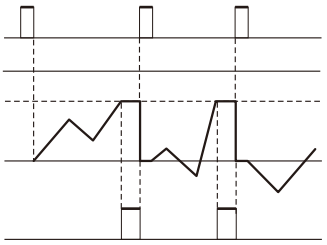
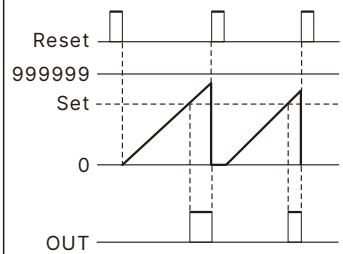
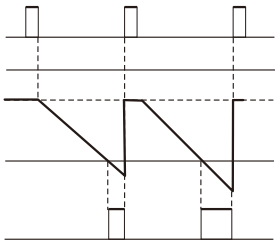
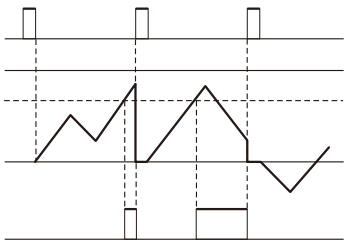
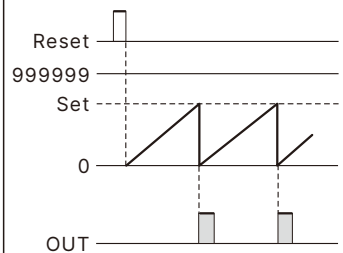
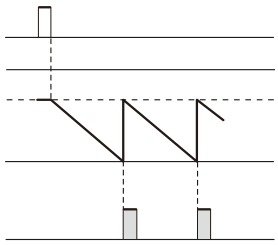
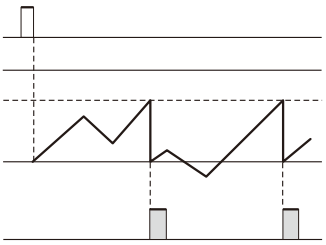
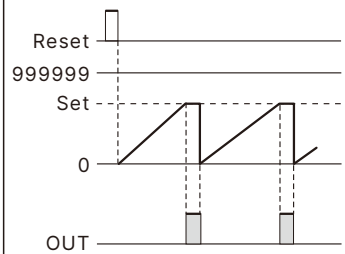
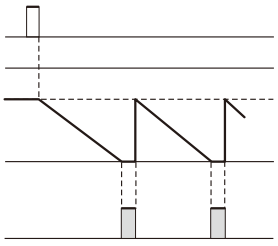
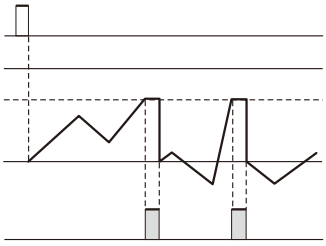
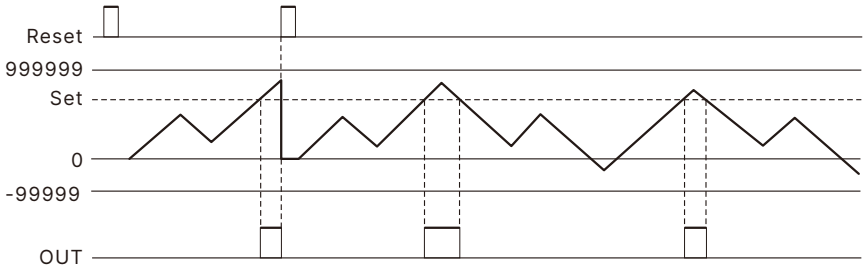
4. The meaning of the H and L symbols in the tables is explained below.

Input method Symbol	No-voltage input (NPN input)	Voltage input (PNP input)
H	Short-circuit	DC4.5~30V
L	Open	DC0~2V

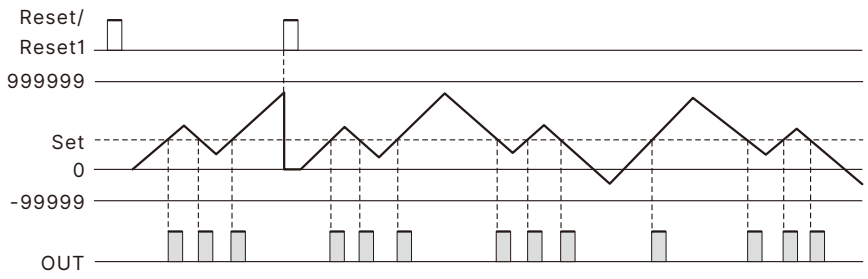
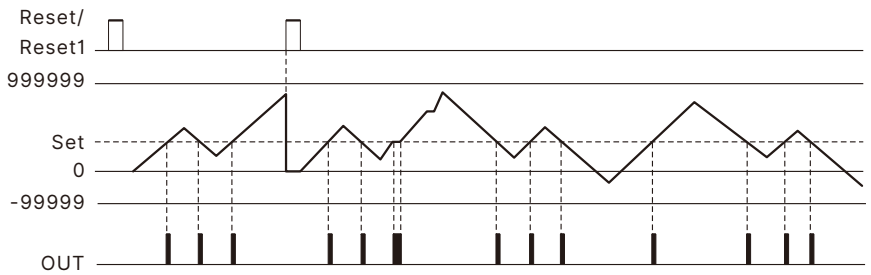
■Input/Output Mode Settings

□ Output Hold

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

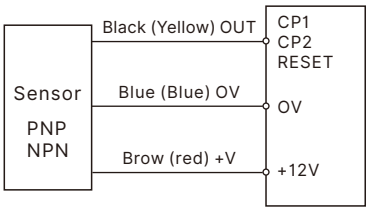
Output mode	Input mode			Operation after count completion
	UP	DOWN	U/D-A、B、C	
N				The outputs and present value displayare held until reset is input.
F				The present value display continues to increase/decrease. The outputs are held until reset is input.
C				As soon as the count reaches SV, the present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

Self-holding output　　Instantaneous(equals) output　　One-shot output　　(The one-shot output time can be set in the range 0.01 to 99.99s.)

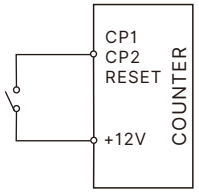
Output mode	Input mode U/D-A、B、C	Operation after count completion
K		The display continues to increase/decrease until the overflow or underflow value is reached. One-shot output only.
D		The display continues to increase/decrease until the overflow or underflow value is reached. The outputs are ON while the count is equal.

■Signal input connection diagram

●Sensor input:

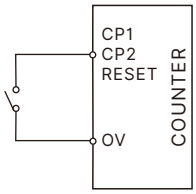


●Contact Input:



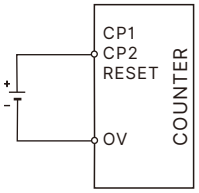
Input signal is set to PNP

●Contact Input:



Input signal is set to NPN

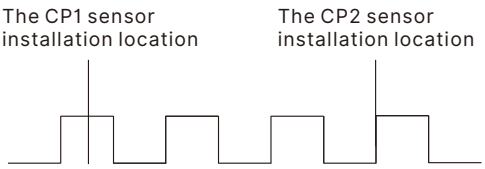
●DC voltage pulse signal input:

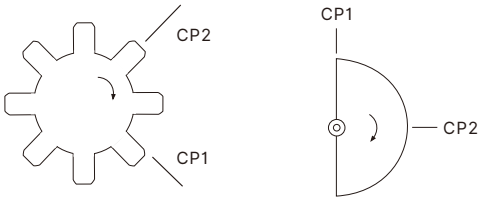


1:Active-high internal set PNP
2:Active-Low internal set NPN

●The UP / DOWN-C output mode of the sensor installation method:

*CP1 and CP2 ready position by 90 °





*The UP / DOWN-C mode can automatically determine the forward reverse movement, Forward will be added to UP count, the reverse will count down.

■Before the use of attention

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.