

CB Series Multi-function Counter / Timer User Manual



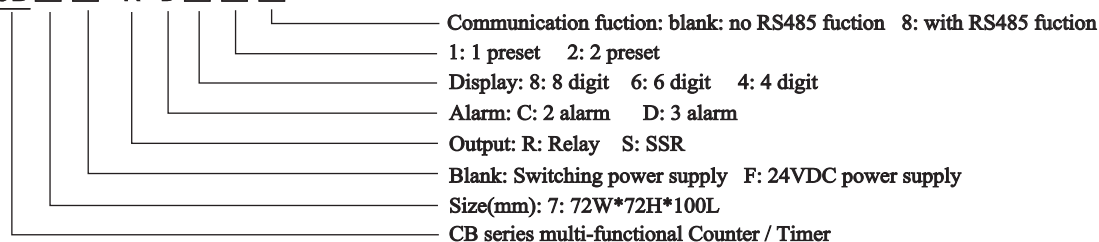
72H X 72W X 100L mm

Feature

- ⊙ Optional counting speed 1CPS/30CPS/1KCPS/10KCPS
- ⊙ Prescale value can be set to 0.000000 - 99999999 (8digit)
- ⊙ Power fail memory function
- ⊙ 4, 6, 8 digit LED display for option
- ⊙ 4 kinds of input modes and 8 kinds of output modes for counting
- ⊙ Up to 3 relay output
- ⊙ 9 kinds of timing modes
- ⊙ Batch counting and output function, one counter with two counting function.
- ⊙ For rotary encoder signal input, no need to connect a pull-up resistor.
- ⊙ Modbus RS485 communication (optional function)
- ⊙ Applied to the field of light industry, machinery, packing and food industry to measure length and count signal input, etc.

1. Code Illustration

CB □ □ -R D □ □ □



24V power supply can be special ordered.

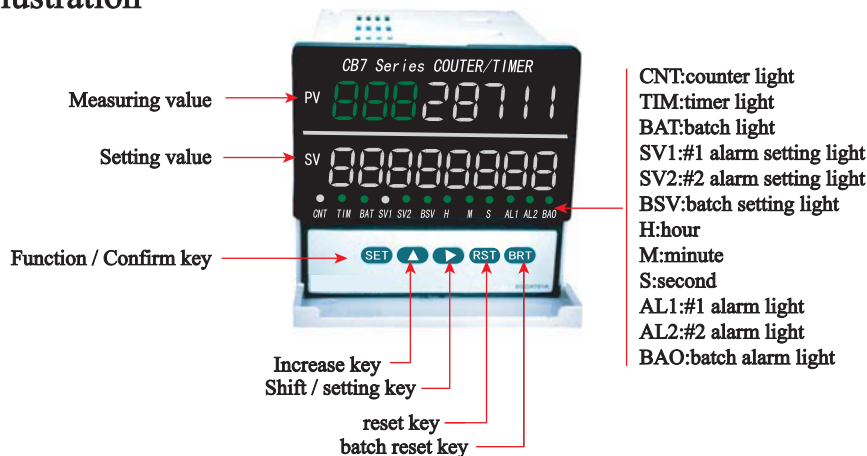
2. Ordering code

No.	Code	Size (mm)	Function			
			Display	Outpt no.	Batch output	Communication
1	CB7-RC41	72×72	4 digit	2	yes	no
2	CB7-RD428	72×72	4 digit	3	yes	yes
3	CB7-RC61	72×72	6 digit	2	yes	no
4	CB7-RD628	72×72	6 digit	3	yes	yes
5	CB7-RC81	72×72	8 digit	2	yes	no
6	CB7-RD828	72×72	8 digit	3	yes	yes

3. Technical Secification

Power supply	Switching power AC/DC 85~265V (DC24V power to be special ordered.)
Consumption	< 5W
Input signal (sine, square)	Voltage :High: 3 ~ 30V Low: 0 ~ 2V
Trigger mode	Up edge or down edge
Counter speed	≤ 10Kcps
Data reserve time	10 years
Ambient temperature	0 ~ 50 °C
Anti-interference	Power: 2000Vp-p I/O connector: 100Vp-p
Counter range	-19999999 ~ 99999999 (8digit) -199999 ~ 999999 (6digit) -1999 ~ 9999 (4 digit)
Output delay time	0000000.1 ~ 9999999.9S (8digit) 00000.1 ~ 99999.9S (6digit) 000.1 ~ 999.9S (4 digit)
Input impedance	5.4 KΩ
Relay capacity	AC 250V 3A (Resistive load)
Counting output mode	F N C R K P Q A (counting up or down)
Timing output mode	ond ond1 ond2 FLk FLk1 FLk2 Int Int1 ofd
Insulated impedance	≥ 20MΩ (Power supply connector & Outside connector)
Dielectric strength	AC 1.5KV 1min (Power supply connector & Outside connector)
Timing accuracy	0.2%FS
Timing range	0.01S ~ 9999H59M59S(8digit) 0.01S ~ 9999H59M(6digit) 0.01S ~ 99H 59M (4 digit)
Dimension (mm)	72H×72W×100L

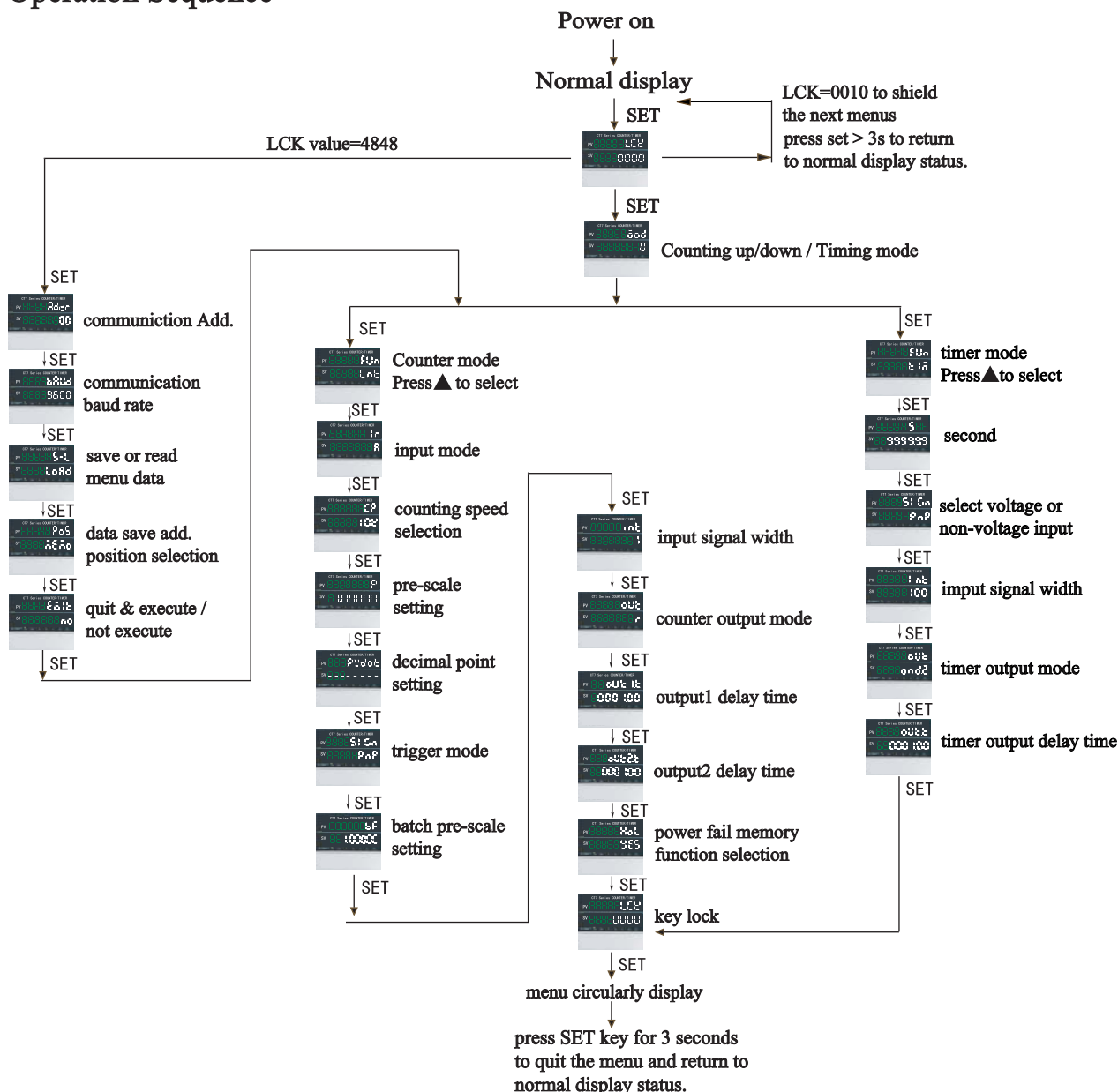
4. Panel Illustration



5. Key Operation

- The counter should be checked if the connections are all correct before power on.
- There are 5 keys on the panel
 - SET: In normal status, press SET for 3 seconds to show the setting menu.
 - ▲: increase key: In SV setting menu, press it to increase the value; in Setting menu, press it to switch function.
 - RST: Reset key. In normal display status, press it to reset the measured value; in setting menu, press it to shift the decimal point rightward.
 - ▶: Shift key. In normal display status, press it to show SV setting menu. In setting menu, press it to shift the flickering digit rightward.
 - BRT: Batch reset key. In batch counting status, press it to reset the batch value.
- In setting menu, press SET key for 3S to quit the menu and return to normal display status. If no button operation for long time in the setting menu, it will automatically quit and return to normal display status, but the data will not be saved.

6. Operation Sequence



Form1: parameter setting

serial	code	meaning	specification
1	LCK	function selection	If LCK=4848, counter shows advanced function setting menu; LCK=4848→ADDR→BAUD→S-L→POS→EXIT→measuring status. Press △▷ to change value.
2	S-L	save/read menu setting data	SAVE→LOAD: SAVE: save the data to the appointed room; LOAD: load data from the appointed room.
3	Pos	select the position to save data	MEMO→MEM1→MEM2→MEM3→
4	Exit	exit menu	YES→NO→ YES: save or load data when exit. NO: not save or load data when exit. press RST : clear all memory and exit
5	Fun	function selection	use"▲"select: CNT→TIM select counter or timer
6	mod	up / down timing or counting mode	use"▲"select U→d U: Counting / Timing Up. d: Counting / Timing Down.
7	In	input mode selection	Use ▲ to select, total 4 input modes: (Please refer to Picture A: Input Mode Logic Chart) A: CP1 counts when it is high electrical level, CP2 is invalid. B: CP1 counts down when CP2 is high level. CP1 counts up when CP2 is low level. (Up mode) C: CP1 counts up, CP2 counts down, display value=CP1-CP2 (Up mode). D: CP1 counts up when the phase of CP1 leads the one of CP2; CP1 counts down when the phase of CP1 lags the one of CP2. This mode is applicable to rotary encoders input, it is not necessary to connect pull-up resistors, but only for NPN mode.
8	CP	counting speed selection	press ▲ to select different counting speed 1→30→100→1K→10K→
9	P	prescale value setting	▶: shift the flickering digit ▲ change the flickering digit value Prescale value setting range : 0.0000001 ~ 99999999 Prescale function: converting pulse input to the direct display of length, position or flow value
10	P:dot (dot)	display value decimal point setting	use ▲ to choose different decimal point position.
11	SI On	Trigger mode	use ▲ key to select rising edge or falling edge triggering / voltage or non voltage input
12	t1n	timer range selection	"▲": choose different timing range S→M.S→H.M→H.M.S→ S: 0.01s ~ 9999.99s M.S: 0.01s ~ 9999m59s H.M: 1m ~ 9999h59m; H.M.S: 0.01h ~ 99h 59m 59s 99
13	int	input control signal pulse width	use"▲"choose different timing range 1→30→100→1000→ Pulse Width setting range: 1~1000; unit: ms setting input signal width, such as RESET, BATCH RESE and PAUSE signal
14	out	output mode selection	use"▲": choose different output control mode Counting Mode F N R C K P Q A (see chart B: Counter output mode) Batch Counting / Linespeed Output Mode: F, N, R, C (please refer to chart B) Timing Mode ond→ond1→ond2→FLK→FLK1→FLK2→int→int1→ofd (see chart C: Timer output mode)
15	out1.t (t1.t) out2.t (t2.t)	The delay time of output #1, #2	▶: shift the flickering digit ▲: change the flickering digit value RST: change the delay time decimal point position Delay time setting range: same as counter Min. Delay Time: 0.01Second. The setting range is same as t1n (Counting range selection)
16	HoL	power fail memory function selection	YES: with power fail memory (After power on, the counting / timing is from the saved value after the last power off.) NO: no power fail memory (After power on, all value will be reset.)
17	LCK	key lock	▶ key: shift the flickering digit ▲ key: change the flickering digit The setting range of password: 0000-9999 System locks or unlocks 4 different function as per the password value set by users: 1) Lock or unlock SV value. Only if LCK=0001, SV value cannot be changed. Otherwise it can be changed; 2) Lock or unlock RST, BRT value. Only if LCK=1000, RST & BRT key is locked, i.e., value cannot be reset even RST or BRT is pressed. Otherwise, RST & BRT key has reset function. (But the connectors of RST & BRT is not locked, i.e., users can still reset value by connecting the connectors.) 3) Lock or unlock ex-factory value. Only if LCK=0100, users can reset all setting to ex-factory value by pressing SET + ▲key for 3S in normal display status (At this moment it shows INIT for 1S, and then setting value is reset.) 4) Lock or unlock menu. Only if LCK=0010, menu is locked and users cannot change menu value; otherwise users can change menu value.

Form 2: SV Value setting parameter

No.	Code Name	Parameter meaning	Indication	Setting range
1	SV1	Setting value #1 (SV1 light is on)	<p>up mode, when measuring value raises to setting value SV1, AL1 outputs, AL1 light turns on, reset state is 0.</p> <p>down mode, when measuring value falls to 0, AL1 outputs, AL1 light turns on, reset state is SV1.</p> <p>“△”key: change flickering digital value</p> <p>“>” key: shift digit</p> <p>SET key: confirm all changed parameter. if setting value is “0”, press SET key will display“Error”or“Erro”, can’t exit.</p> <p>RST key : decimal point shift key. Press it once, the decimal point shifts rightwards by 1 digit.</p>	<p>0.001-9999 (4 digit display)</p> <p>0.00001-999999 (6 digit display)</p> <p>0.0000001-99999999 (8 digit display)</p>
2	SV2	Setting value #2 (SV2 light is on)	<p>up mode, when measuring value raise to setting value SV2, AL2 outputs, AL2 light turns on.</p> <p>down mode, measuring falls by setting value SV2, it becomes SV1-SV2, AL2 outputs. AL2 light turns on. SET, RST setting same as above.</p>	<p>$SV1 \geq P$</p> <p>$SV2 \geq P$</p> <p>$P \geq 0$</p>
3	BSV	Batch setting value (BSV light is on)	<p>up mode, when measuring value raises to setting value BSV, BAO output, BAO light turns on.</p> <p>down mode, when measuring value falls to setting value BSV, BAO outputs, BAO light turns on. SET, RST key setting same as above</p>	<p>$BSV \geq BP$</p> <p>$BP \geq 0$</p>

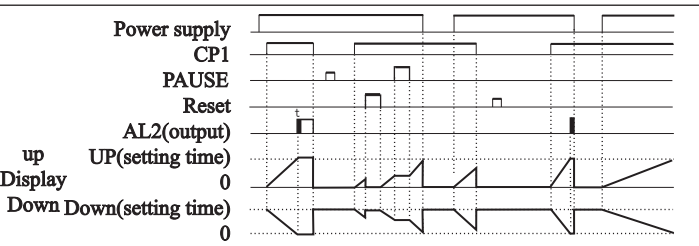
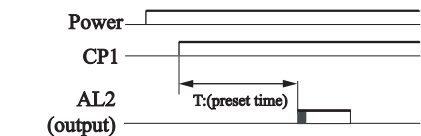
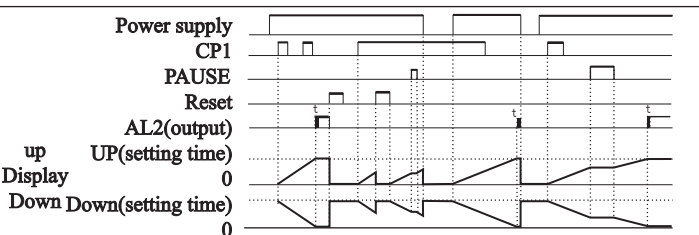
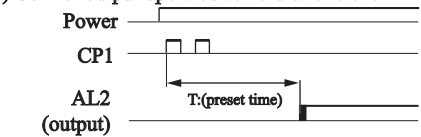
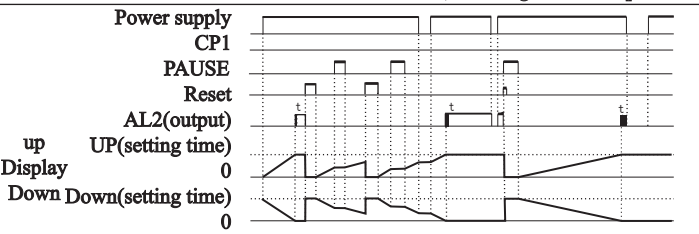
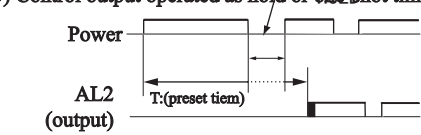
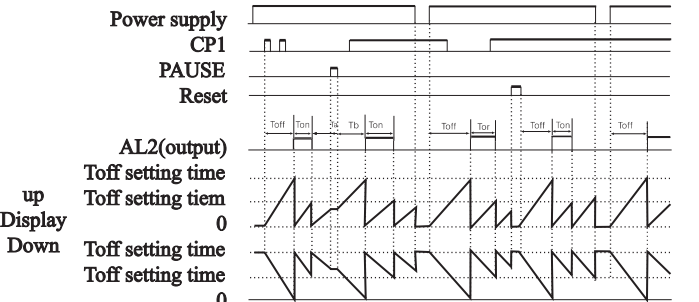
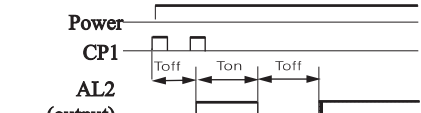
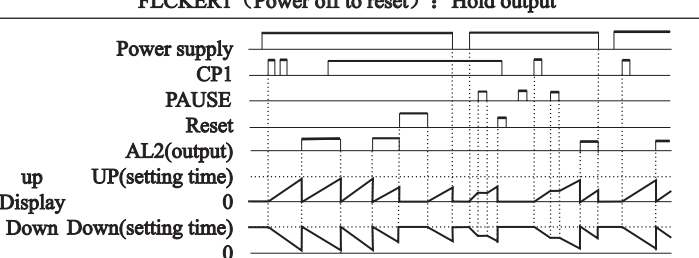
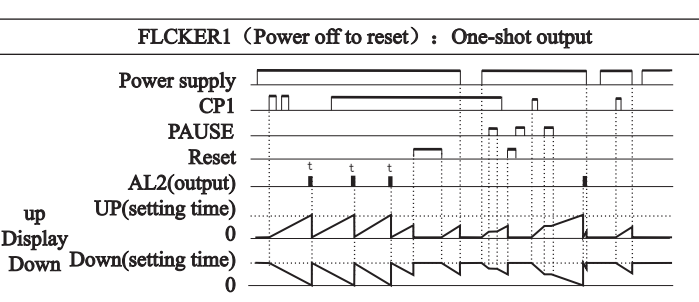
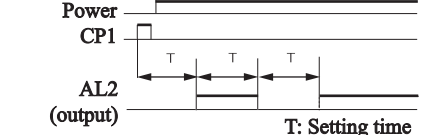
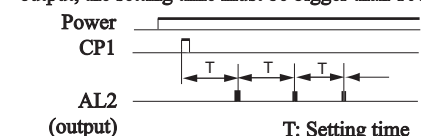
Chart A Input logic relation chart

mode	up	down	indication
A			<p>CP2: not counting input</p> <p>CP1: counting input</p>
B			<p>Up mode: CP2 Low ,CP1 counts up CP2 high ,CP1 counts down</p> <p>Down mode: CP2 low,CP1 counts down CP2 high,CP1 counts up</p>
C			<p>Up mode: CP1 counts up, CP2 counts down display value=CP1-CP2</p> <p>Down mode: CP1 counts down CP2 counts up display value=CP2-CP1</p>
D			<p>Up mode: CP1 leads CP2, counter counts up CP2 leads CP1, counter counts down</p> <p>Down mode: CP1 leads CP2, counter counts down CP2 leads CP1, counter counts up</p>

Chart B: Counter Output Mode

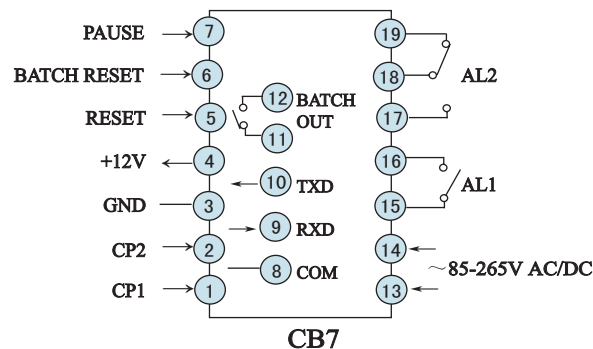
		Input Mode		Action after the counting value reaches preset value
		Counting up / Timing up	Counting down / Timing down	
Output Mode	F			Display value continues to increase or decrease, output remains until reset signal input.
	N			Display value and output remains until reset signal input.
	C			Display value is reset automatically, output remains for the preset delay time and then is reset. (Output action is repeat single output)
	R			Display value and output remains until preset delay time. (Output action is repeat single output)
	K			Display value continues to increase or decrease until reset signal input. Output remains preset delay time and then is reset. (Output action is repeat single output)
	P			Display value remains the delay time of single output, and then displays the next cycle value. (During the delay time the display value starts the counting of next cycle, timing output action is repeat single output)
	Q			Display value continues to increase or decrease in the delay time of single output, and is reset when delay time is up. Output remains for delay time and then is reset. (Output action is repeat single output)
	A			Min.preset value & AL2 output remains till manual reset signal input, AL1 output remains for preset time and then is reset. (Output action is repeat single output)

Chart C: Timer Output Mode

Output mode	Time chart	Action
<p><i>ond</i> (OND)</p>	<p>SIGNAL ON DELAY (Power off to reset)</p> 	<p>1) Timing starts when CP1 signal turns ON, and resets if CP1 signal turns OFF. 2) When reset signal is OFF, CP1 signal is ON, timing starts when power turns ON. 3) Control output operated as hold or one-shot time.</p> 
<p><i>ond.1</i> (OND.1)</p>	<p>SIGNAL ON DELAY 1 (Power off to reset)</p> 	<p>1) Timing starts when CP1 signal turns ON, and continues when CP1 signal turns OFF. 2) When reset signal is OFF, CP1 signal is ON, timing starts when power turns ON. 3) Control output operated as hold or one-shot time.</p> 
<p><i>ond.2</i> (OND.2)</p>	<p>POWER ON DELAY (Power Off, counting value is kept)</p> 	<p>1) Timing starts when power turns ON, and continues when power turns OFF. 2) When reset signal is OFF, PAUSE signal is OFF, timing starts when power turns ON. 3) Control output operated as hold or one-shot time.</p> 
<p><i>FLK</i> (FLK)</p>	<p>FLCKER (Power off to reset)</p> 	<p>1) Timing starts when CP1 signal turns ON, If CP1 signal is applied repeatedly, only initial signal is recognized. 2) When power turns ON and reset signal turns OFF, timing starts when CP1 signal turns ON. 3) Control output operated as hold output, when timing to Toff or Ton setting time, output is ON or OFF. (no One-shot output) 4) Each single Ton time and Toff time must be set separately. 5) For contact output, the setting time must be bigger than 100ms.</p> 
<p><i>FLK.1</i> (FLK.1)</p>	<p>FLCKER1 (Power off to reset) : Hold output</p>  <p>FLCKER1 (Power off to reset) : One-shot output</p> 	<p>1) Timing starts when CP1 signal turns ON, if CP1 signal is recognized, only is the initial one effective. 2) When power turns ON and reset signal turns OFF, timing starts when CP1 signal turns ON. 3) Control output operated as hold output. For contact output, the setting time must be bigger than 100ms.</p>  <p>T: Setting time</p> <p>1) Timing starts when CP1 signal turns ON, if CP1 signal is recognized, only is the initial one effective. 2) When power turns ON and reset signal turns OFF, timing starts when CP1 signal turns ON. 3) Control output operated as One-shot output. For contact output, the setting time must be bigger than 100ms.</p>  <p>T: Setting time</p>

<i>FLK.2</i> (FLK)	<p>FLCKER2 (Power OFF Hold): Hold output</p>	<ol style="list-style-type: none"> 1) Timing starts when CP1 signal turns ON, if CP1 signal is recognized, only is the initial one effective. 2) Control output operated as Hold output, maintained to the next setting value. 3) When power turns ON and reset signal turns OFF, timing starts when CP1 signal turns ON. 4) For contact output, the setting time must be bigger than 100ms. <p>T: Setting time</p>
	<p>FLCKER2 (Power OFF Hold): One-shot output</p>	<ol style="list-style-type: none"> 1) Timing starts when CP1 signal turns ON, if CP1 signal is recognized, only is the initial one effective. 2) Control output operated as One-shot output, it outputs when the setting value is reached. 3) When power turns ON and reset signal turns OFF, timing starts when CP1 signal turns ON. 4) For contact output, the setting time must be bigger than 100ms. <p>T: Setting time</p>
<i>INT</i> (INT)	<p>INTERVAL (Power / signal reset)</p>	<ol style="list-style-type: none"> 1) Timing starts when CP1 signal turns ON. 2) Timing resets when CP1 signal turns OFF. 3) When power turns ON and reset signal turns OFF, timing starts when CP1 signal turns ON. 4) When timing value is reached, display value and control output will be reset automatically. 5) During the timing process, control output is ON. <p>T: Setting time</p>
	<p>INTERVSL1 (Power OFF reset)</p>	<ol style="list-style-type: none"> 1) Timing starts and control output is ON when CP1 signal turns ON. 2) If CP1 signal is applied repeatedly, only is the initial one recognized. 3) When timing value is reached, display value and control output will be reset automatically. 4) When power turns ON and reset signal turns OFF, timing starts when CP1 signal turns ON. 5) When CP1 signal maintains ON status, the timing process is normal. <p>T: Setting time</p>
<i>OFD</i> (OFD)	<p>INTERVSL1 (Power OFF reset)</p>	<ol style="list-style-type: none"> 1) When power turns ON and reset signal turns OFF, control output keeps ON status when CP1 signal is ON. 2) When timing value is reached, display value and control output will be reset automatically. <p>T: Setting time</p>

7. Connection Drawing



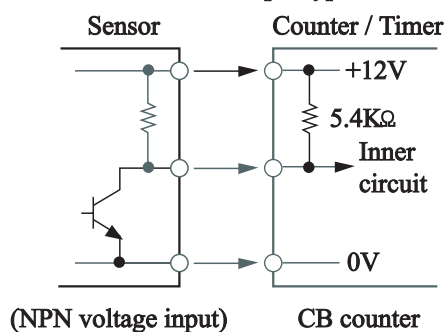
Please refer to the connection drawing on the product if any changes.

8. Input connection

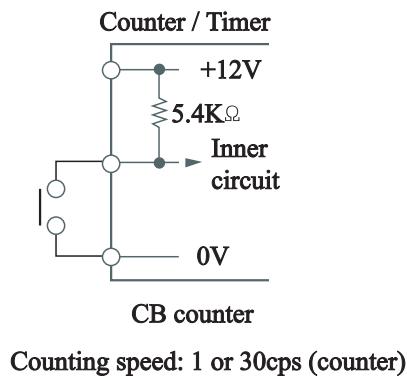
1) Input logic: No-voltage input (NPN)

(1) Solid state input

Standard sensor: NPN output type sensor



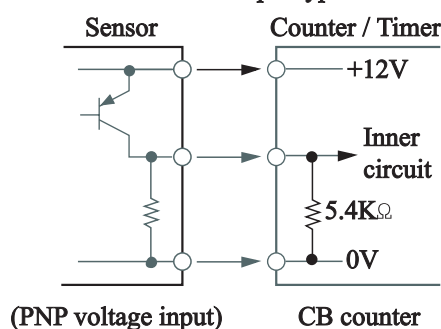
(2) Contact input



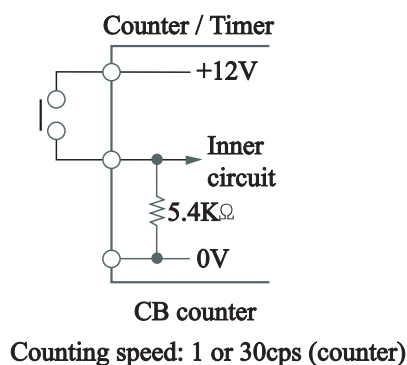
2) Input logic: Voltage input (PNP)

(1) Solid state input

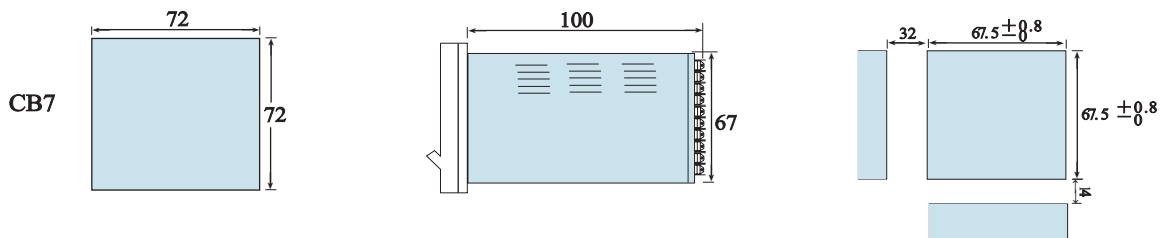
Standard sensor: PNP output type sensor



(2) Contact input



9. Outlook and installation dimension



10. Notice

- 1) In normal measuring status, the timing value, counting value and output will be reset if outer RST connectors are short connected or RST key is pressed manually.
- 2) When the counter input mode is set to D mode, it is for rotary encoder signal input, there is no need to connect a pull-up resistor (only for NPN).
- 3) After changing modes, please press RST key to make value reset, after that the counter / timer can work accurately.
- 4) If the counter / timer displays Error or Erro message, please check if the parameter SV1, SV2 and P is according to the logic relationship (please refer to chart 2).
- 5) Input signal: The distance between a sensor and the counter should be as short as possible. If the signal wire has to be extended, please use shielding wire. The signal wire should be apart from power supply wire.
- 6) Counter input connection: when in high speed mode (1K, 5K, 10K), if the input mode is contact input (such as relay connectors), the counting value may be more than the actual one. So for this input mode, please set the input speed as a small value (1 or 30cps).
- 7) The product should not be used in below environment: heavy shaking and shocking place, heavy acid and alkali place, direct sun shine place, strong magnetic field and electronic interference environment.
- 8) Installation environment: Only indoor, below altitude 2000M, pollution level is 2.

The product may get malfunction if the operation is not followed to the above instruction.