CT Series Multi-function Counter / Timer
User's Maual

Features:

⊙ With quantity counting/length counting/batch counting
  & timing function

⊙ Max counting speed can reach to 10K cps

⊙ Batch counting and quantity counting are separated output

⊙ Voltage input (PNP) and no-voltage input (NPN) be selectable

⊙ Pulse width of control signal is adjustable

⊙ With key lock function

For your safe, please read the below content carefully before you use the timer/counter!

◼ Safe Caution

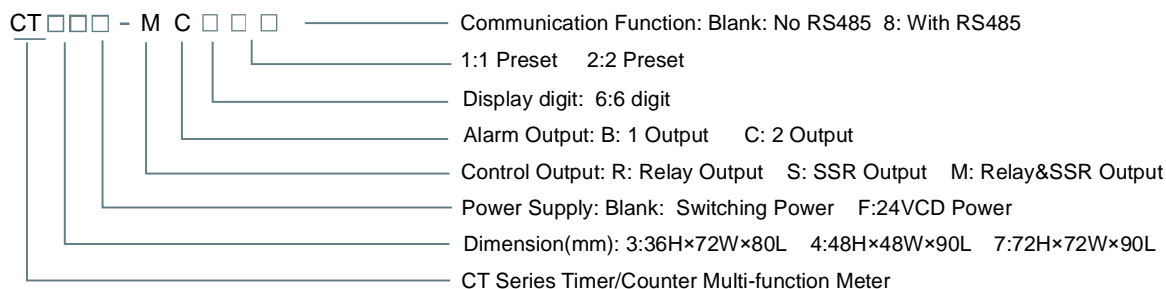| ※ For your safe, please read the below content carefully before you use the timer/counter! |
|---|
| Please comply with the below important points: |
| ⚠ Warning   An accident may happen if the operation does not comply with the instruction. |
| ⚠ Notice   An operation that does not comply with the instruction may lead to product damage. |
| ※   The instruction of the symbol in the manual is as below: |
| ⚠ An accident danger may happen in a special condition. |

⚠ Warning

1. A safety protection equipment must be installed or please contact with us for the relative information if the product is used under the circumstance such as nuclear control, medical treatment equipment ,automobile, train, airplane, aviation, entertainment or safety equipment, etc. Otherwise, it may cause serious loss, fire or person injury.
2. Apanel must be installed, otherwise it may cause creepage (leakage).
3. Do not touch wire connectors when the power is on, otherwise you may get an electric shock.
4. Do not dismantle or modify the product, If you have to do so, please contact with us first. Otherwise it may cause electric shock and fire.
5. Please check the connection number while you connect the power supply wire or input signal, otherwise it may cause fire.

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⚠ Caution

1. This product cannot be used outdoors. Otherwise the working life of the product will become shorter, or an electric shock accident may happen.
2. When you connect wire to the power input connector or signal input connectors, the moment of the No.20AWG (0.50 mm2) scrwew tweaked to the connector is 0.74n.m-0.9n.m. Otherwise the connectors may be damaged or get fire.
3. Please comply with the rated specifications. Otherwise it may cause fire after the working life of the product becomes shorter.
4. Do not use water or oil base cleaner to clean the product. Otherwise it may cause electric shock or fire, and damage the product.
5. This product should be avoid working under the circumstance that is flammable, explosive, moist, under sunshine, heat radiation and vibration.
6. In this unit it must not have dust or deposit, otherwise it may cause fire or mechanical malfunction.
7. Do not use gasoline, chemical solvent to clean the cover of the product because such solvent can damage it. Please use some soft cloth with water or alcohol to clean the plastic cover.

1. Model Indication

CT☐☐☐ – M C ☐ ☐ ☐ ──────── Communication Function: Blank: No RS485 8: With RS485

└──────── 1:1 Preset   2:2 Preset

└──────── Display digit: 6:6 digit

└──────── Alarm Output: B: 1 Output   C: 2 Output

└──────── Control Output: R: Relay Output   S: SSR Output   M: Relay&SSR Output

└──────── Power Supply: Blank: Switching Power   F:24VCD Power

└──────── Dimension(mm): 3:36H×72W×80L   4:48H×48W×90L   7:72H×72W×90L

└──────── CT Series Timer/Counter Multi-function Meter

＊ 24 Power Supply is also available as special order. Please indicate your requirement in your order

# 2. Model Specification (The below model is our common model)

No.	Model	Panel Size(mm)	SSR Sychronization Output	Display Digit	Relay Output	Batch Output
1	CT7-MC62	72H×72W	2	6 digit	2	1 SSR output
2	CT7-MB61	72H×72W	1	6 digit	1	1 SSR output
3	CT4-MC62	48H×48W	1	6 digit	2	No
4	CT4-MB61	48H×48W	1	6 digit	1	No
5	CT3-MC62	36H×72W	1	6 digit	2	No
6	CT3-MB61	36H×72W	1	6 digit	1	No

3. Technical Specification

Power Supply		AC 85-265V 50/60Hz
Allowable Voltage Range		90~110% of rated voltage(AC power)
Count Speed of INA, INB		Selectable 1/30/1k/5k/10 kcps
Min.input Signal width	Counter	Reset input: Selectable 1ms or 20ms
	Timer	INA, INHIBIT, RESET, BATCH RESET: Selectable 1ms or 20ms
Input		Selectable voltage input or No-voltage input ［Voltage input］Input impedance:5.4k$^\Omega$, "H" level:5-30VDC, "L" level:0-2VDC, "L" level: Max.2VDC, ［No-voltage input］Short-circuit impedance:Max.1k,Residual voltage:Max.2VDC, OPen-circuit impedance:Min.100k$^\Omega$
One-shot output		10/50/100/200/500/1000/2000/5000ms
Control Output	Contact Point Capacity	NO:250VAC 3A at resistive load, NC:250VAC 2A at resistive load
	Solid State Relay Capacity	Max.30VDC, Max.100mA
Memory retention		10 years(When using non-volatile semiconductor memory)
External sensor power		12VDC ±10%,Max.100mA
Time accuracy	Repeat error Set error Voltage error Temperature error	Power On Start:Max.±0.01% 0.05sec Signal Start:Max.±0.01% 0.03sec
Insulation resistance		Min.100MΩ(at 500VDC)
Dielectric strength		2000VAC 50/60Hz for 1 minute
Noise strength		±2kV 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^2 (Approx.30G) in X,Y,Z directions for 3 times
	Malfunction	100m/s^2 (Approx.10G) in X,Y,Z directions for 3 times
Relay life cycle	Mechanical	Min.10,000,000 times
	Electrical	Min.100,000 times(NO:250VAC 3A at resistive load,NC:250VAC 2A at resistive load)
Ambient temperature		-10 ~ +50℃(at non-freezing status)
Storage temperature		-25 ~ +65℃(at non-freezing status)
Ambient humidity		35~85% RH

4. Panel Indication of CT4 & CT3

- CT4 Panel
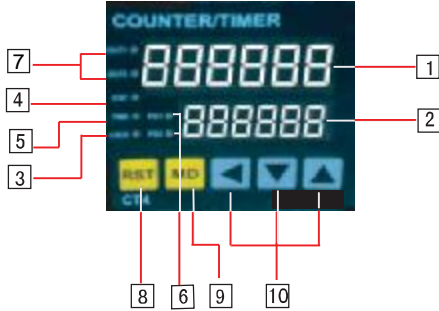
1	Display process value (Red LED)
2	Display settting value (Green LED)
3	LOCK: Key Lock Display
4	CNT: Counter Display
5	TMR: Timer Display
6	PS1,PS2: To check the change of preset and display value
7	OUT1,OUT2: Display output status
8	(RST) Reset Key
9	(MD) Mode Key
10	◄ , ▼ , ▲ Setting Key

- CT3 Panel
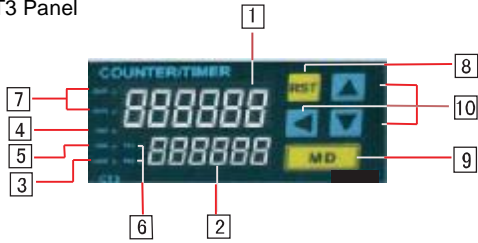
4.1. Change the setting value of Counter

How to change in the preset type: To change the preset value from 175 to180.

1 Press ◄ Key to enter in state of changing preset value. The prior preset value is indicated and the first digit "5" flashes. (PS LED ON)

2 Change "5" to "0" by pressing ▼ key 5 times, and shift the flickering to the second digit by ◄ key once.
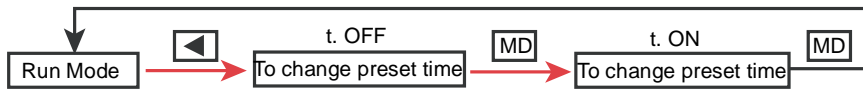

∴ No matter when to press ◄ key to chang the preset value status, the flickering digit is always shifted from right to left.

3 Change "7" to "8" by pressing ▲ key once.

4 The change to the preset value is completed. To return to RUN mode, press MD key. (PS LED OFF)

4.2. Change the setting time of Timer

Change the setting time in FLK output mode

In the status of changing preset value, if no press key for 60 seconds, the timer will return to Run Mode.
Change t. OFF time from 30 sec. to 50 sec., t.ON setting from 40 sec. to 20 sec.
(Output mode: FLK, Timer range: 0.1s-99999.9s)

1 Pressing ◄ key to enter into the status of changing preset time. Shift the flicking digit to "3" position on by pressing ◄ key twice.

2 Change "3" to "5" by pressing ▲ key twice. Pressing MD key to complete t.OFF time then enter into the status of changing t.ON time. The right first digit is flickering.

∴ No matter when to press ◄ key to chang the preset value status, the flickering digit is always shifted from right to left.

3 Pressing ◄ key twice to move the flickering digit to the "4" position.

4 Pressing ▼ key twice to change "4" to "2". Pressing MD key to complete the setting time then return to RUN mode.

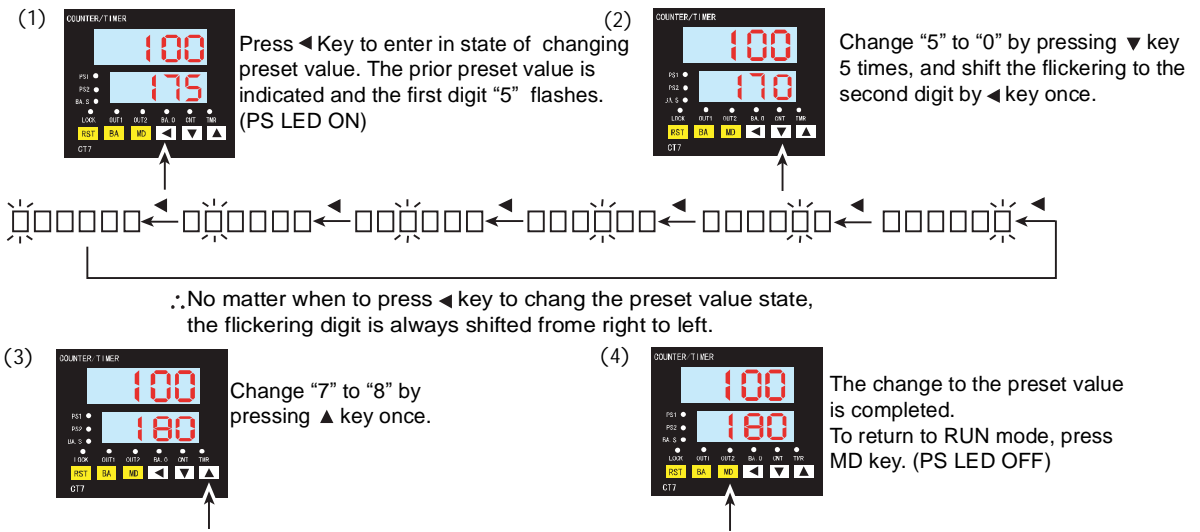KKCTE01B-3

5.Panel Indication of CT7
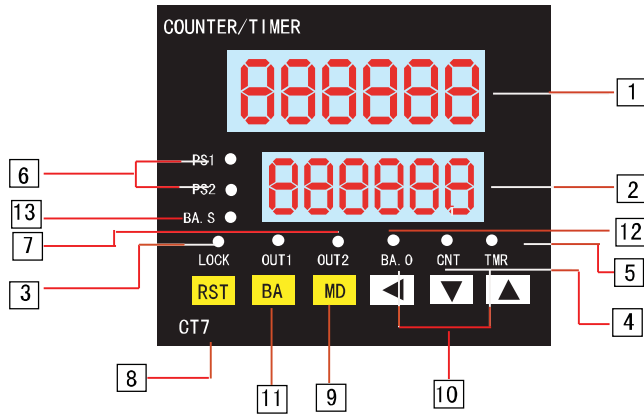
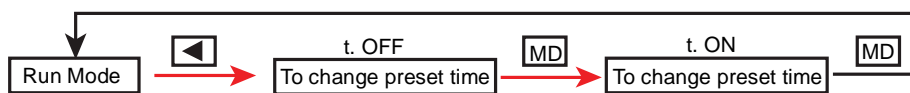|	
1	Display process value(Red LED)
2	Display setting value(Green LED)
3	LOCK: Key Lock Display
4	CNT: Counter DIsplay
5	TMR: Timer Display
6	PS1,PS2: To check the change of preset and display value
7	OUT1,OUT2:Display output status
8	RST :Reset Key
9	MD :Mode Key
10	◄ , ▼ , ▲ :Setting Key
11	BA :Batch Key
12	BA.O: Indicate the output action of BATCH
13	BA.S: Check the BATCH value and its display change

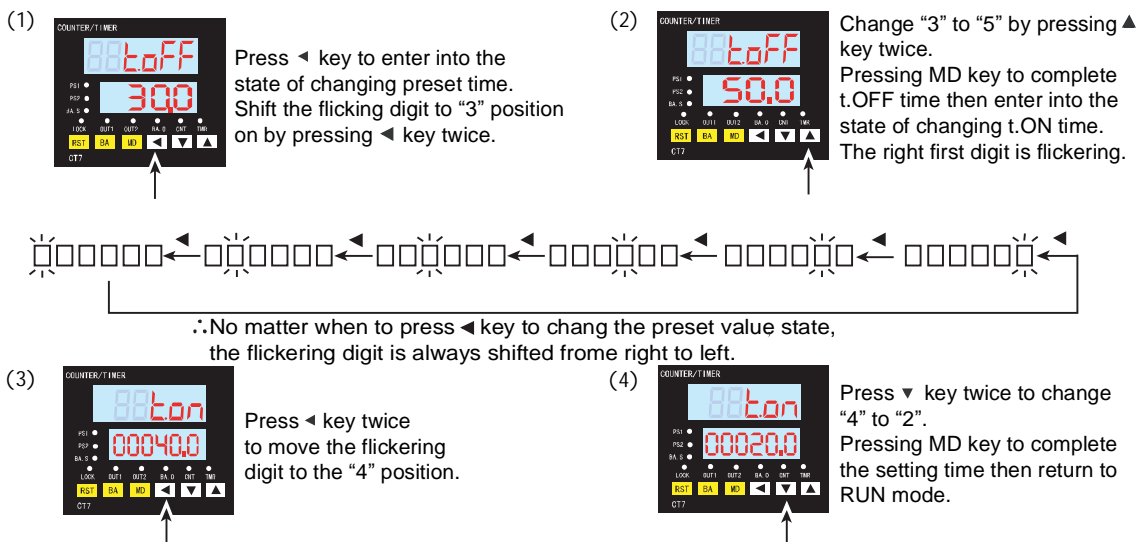## Operation Procedure:

5.1. Change of the setting value of Counter

How to change in the preset type: To change the preset value from 175 to 180.

(1)

Press ◄ Key to enter in state of changing preset value. The prior preset value is indicated and the first digit "5" flashes. (PS LED ON)

(2)

Change "5" to "0" by pressing ▼ key 5 times, and shift the flickering to the second digit by ◄ key once.

∴No matter when to press ◄ key to chang the preset value state, the flickering digit is always shifted frome right to left.

(3)

Change "7" to "8" by pressing ▲ key once.

(4)

The change to the preset value is completed.
To return to RUN mode, press MD key. (PS LED OFF)

5.2. Change of the setting of Timer
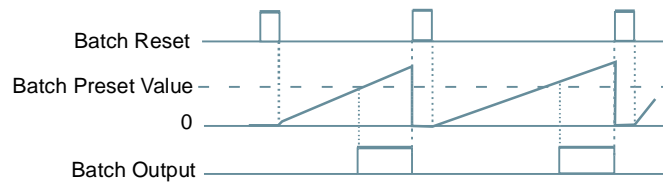change of the setting time in FLK output mode

In the status of changing preset value, if no press key for 60 seconds, the timer will return to Run Mode.
Change t. OFF time from 30 sec. to 50 sec., t.ON setting from 40 sec. to 20 sec.
(Output mode: FLK, Timer range: 0.1s-99999.9s)

(1)

Press ◄ key to enter into the state of changing preset time. Shift the flicking digit to "3" position on by pressing ◄ key twice.

(2)

Change "3" to "5" by pressing ▲ key twice.
Pressing MD key to complete t.OFF time then enter into the state of changing t.ON time. The right first digit is flickering.

∴No matter when to press ◄ key to chang the preset value state, the flickering digit is always shifted frome right to left.

(3)

Press ◄ key twice to move the flickering digit to the "4" position.

(4)

Press ▼ key twice to change "4" to "2".
Pressing MD key to complete the setting time then return to RUN mode.

# 6.Batch Counting and Batch Preset

6.1. Batch Counting Action

※ When the Batch counting value reaches to the Batch set value, the Batch count value is coutinuously increased and the Batch output remains in the ON state until the Batch reset is applied.

※ When the Batch output turns on and if the power turns off and then turns on again, the Batch output remains in the ON status until the Batch reset signal is applied.

※ When the Batch counting value counts over 999999, it resets to "0", and it counts up again.

※ If the Batch set value is "0(ZERO)", the Batch counting value counts up, but output remains in the OFF state.

※ The Batch counting value is not changed by front [RST] key or external reset signal.

6.2. Check the Batch counting value

※ In order to check the Batch counting value during the Counter operation,press the [BA] key to display both the Batch counting value and setting value.·

※ After checking Batch counting value, it will return to RUN mode by pressing [MD] key.

※ There is no [BA] key lock function for Batch function.

### 6.3. The setting of Batch preset value
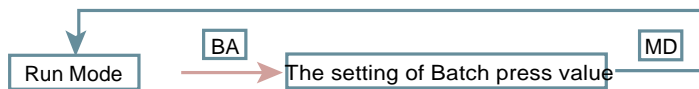
Press [BA] key in RUN model, it will enter into the program state of Batch setting value.(BA.S LEED ON display)
After entering into the state of setting, the first digit will flicker and the remaining digits will be on steady..
Move to the second position by pressing [◄] key one time. The second digit will flicker.
Then press increase or decrease key to change the parameter. At last, pressing [MD] key to complete
the Batch setting, and it will return the Counter to the RUN mode. (BA.S LED ON display)
If don't press the key for 60 seconds, it will return to Run Mode automatically.

7.Application of Predscale Function

For Example:Pulse number is a number of pulse created by rotary encoder, L is the measured length, Prescale value is equal to L divides P.

○ To use counter and rotary to control length
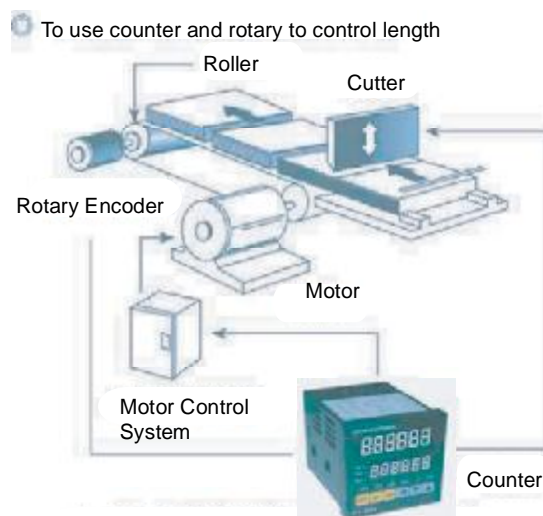
$$\text{Prescale Value} = \frac{\pi \times \text{Diameter of the roller (D)}}{\text{Pulse number per 1 revolution of the encoder}}$$

$$= \frac{3.1416 \times 22}{1000}$$

$$= 0.069 \text{mm/pulse}$$

Set 0.069 of prescale value at prescale value ste mode.

The diameter of the roller connected to the rotary encoder is 22mm.
The pulse number per 1 revolution of the encoder is 1000.

8. Lock Key Setting

Lock Key function is used for avoiding key mis-pressing.
L.OFF (LOCK OFF): Cancel Lock Key function.
LOC.1(LOCK LEVEL1): Lock RST Key
LOC.2(LOCK LEVEL2): Lock◄ and ▲ and ▼ Key.
LOCK.3(LOCK LEVEL3): Lock RST and ◄ and ▲ and ▼ Key.

9. Setting of Counter function modes

Press MD key to display the next mode. (Ⓜ key: Use the▲ or ▼key to change the setting)

Setting mode	How to set (▲ ,▼)	
Input mode (ın)	U → d → Ud-A → Ud-b → Ud-C	※When " U "or " d " of input mode is set, " 5 , t , d " of output mode will not be displayed.
Maximum counting speed (CPS)	1 → 30 → 1K → 5K → 10K	※ Counting speed is deteriminded one by one (1:1) duty ratio of INA or INB input signal, and it is applied to both INA or INB. ※When using setting " d " in output mode,5kcps and 10kcps are ont indicated in the display.
Output mode (oUt)	● Up or Down inut mode F → n → C → r → K → P → q → A ● Up/Down- A, B, C inut mode F → n → C → r → K → P → q → A → 5 → t → d	※When setting output mode as " F , n ", if counting value reaches the preset value, output will be held. So there is no "OUT2 output time" in function setting mode. ※If the maximum counting speed is 5kcps or 10kcps, when you change output mode to " d ", the maximum counting speed will be changed to 1Kcps.
OUT2 output time (oUt2)	10→50→100→200→500→1000→2000→5000 Unit: ms	※ There is no "OUT1 output time" in single preset model, "OUT2 output time" will be shown as "OUT output time(oUt t) ".
OUT1 output time (oUt1)	10→50→100→200→500→1000→2000→5000→Hold Unit: ms	
Input logic (5, G)	PnP : Voltage input nPn : No- voltage input Use ▲ or ▼ to select PnP or nPn	
Min.reset time (rSt)	1 ⇌ 20 Unit: ms	※ Min. external RESET signal width
Decimal point (dP)	● 6 Digit · · · · · · → · · · · · · · → · · · · ※ · → · · · ※ ·	※ Decimal point setting is applied to counting value and setting value at the same.
Prescale value (SCL)	※ ◄ Key: Shift the flickering digit ※ ▲ ,▼ Key: Change the prescale value ※ Prescale value: It is actual value of length and position, liquid measure from counting input of 1 pulse.	※Set range of prescale value 6 Digit: 0.001 ~ 99.999
Memory retention (dAtA)	CLEr ⇌ rEC	※ CLEr : Power reset for counting value. (Reset counting value when power off) rEC : Memorize counting value (Memorize counting value when power off)
Lock key (LoCK)	L.oFF→LoC.1→LoC.2→LoC.3	
Counter/Timer (C-t)	CoUn ⇌ tınE	※ CoUn : Counter tınE : Timer

10.Setting of Timer function modes

Press MD key to display the next mode ([MD] key : Use the [▲] or [▼] key to Change the setting)

Setting mode	How to set
Time range (SEC / ᄆ n / HoUr)	SEC 9999.99 → SEC 99999.9 → SEC 999999 → ᄆ S 99.59.99 → ᄆ S 9999.99 → ᄆ 99999.9 → ᄆ 999999 → Hᄆ S 99.59.99 → Hᄆ 9999.59 (loops back)
UP/DOWN mode (U-d)	U ⟷ d ※Up : Time proceeds from 0(zero) to the set value Down : Time proceeds from the set value to 0(zero)
Output mode (oUt)	ond → ond.1 → ond.2 → FL𝗞 → FL𝗞.1 → FL𝗞.2 → ᵢ nt → ᵢ nt.1 → oFd (loops)
Output time (oUt.t)	10 → 50 → 100 → 200 → 500 → HoLd ← 5000 ← 2000 ← 1000 Unit: ms ※It is operation time of control output according to output mode.
Input logic (5 ᵢ𝗚)	PnP : Voltage input nPn : No−voltage input Use[▲]or[▼] to select PnP or nPn
Input signal time (ᵢ n-t)	1 ⇄ 20 Unit: ms Min. INA, INHIBIT, RESET, BATCH RESET signal width
Lock key(Lock) (LoC𝗞)	LoFF → LoC.1 → LoC.2 → LoC.3 (loops)
Counter/Timer (C-t)	CoUn ⇄ tᵢ ᄆE ※ CoUn : Counter tᵢ ᄆE : Timer

※ When it is in the function setting mode, input signal and output are still going on, but they will be reset when the counter exits the setting mode.

※ In case of output mode is FLK, INT, INT1, OFD, there is no output time setting in the function setting mode.

※ When in the function setting mode, if no key is touched for 60 sec., the timer will return to RUN mode.

11. Time Range

Time range	Function setting mode	
	Timing display	Preset display
0.01s to 9999.99s	SEC	9999. 99
0.1s to 99999.9s	SEC	99999. 9
1s to 999999s	SEC	999999
0.01s to 99m 59.99s	ᄆ S	99. 59. 99
0.1s to 999m 59.9s	ᄆ S	999. 59. 9
0.1m to 99999.9m	ᄆ	99999. 9
1m to 999999m	ᄆ	999999
1s to 99h 59m 59s	H ᄆ S	99. 59. 59
1m to 9999h 59m	H ᄆ	9999. 59

12. Input operation mode for counter

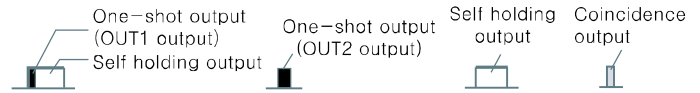※Ⓐ : Over Min. signal width, Ⓑ : Over 1/2 of Min. signal width.

Input mode	Counting chart	Notice
U (UP)		※INA : Counting input ※INB : Inhibit input (Limit counting input of INA) ※When INB changes from L to H, up count signals on INA will not be accepted.
		※INA : Inhibit input (Limit counting input of INB) ※INB : Counting input ※When INA changes from H to L, up count signals on INB will not be accepted.
d (DOWN)		※INA : Counting input ※INB : Inhibit input (Limit counting input of INA) ※When INB changes from L to H, down count signals on INA will not be accepted. ※n=Preset value
		※INB : Counting value input ※INA : Inhibit input (Limit counting input of INB) ※n=Preset value ※When INA changes H to L, down count signals on INB will not be accepted.
Ud-A (Up/Down−A) Command input		※INA : Counting input ※INB : Command input for Up/Down counting ※When INB is L, count increases. When INB is H, count decreases.
Ud-b (Up/Down−B) Individual input		※INA : Up count input ※INB : Down count input ※When INA and INB are applied L to H at same time, the count remains unchanged.
Ud-C (Up/Down−C) Phase difference input		※When using A, B phase of encoder and connecting to INA, INB, Please set counter input mode(in) as phase difference input(Ud-C).

Counting miss by one(±) is occurred if the signal width of Ⓐ or Ⓑ is less than Min. signal width.
When you use an encoder and connect its phase A and Phase B output to the INA and INB input
of the counter, please set the mode of the counter as Ud-C.

	Voltage input (PNP)	Contact input (NPN)
H	5−30VDC	Short circuit
L	0−2VDC	Open

13.Output operation mode(Counter)

Legend (top): One-shot output (OUT1 output), Self holding output, One-shot output (OUT2 output), Self holding output, Coincidence output

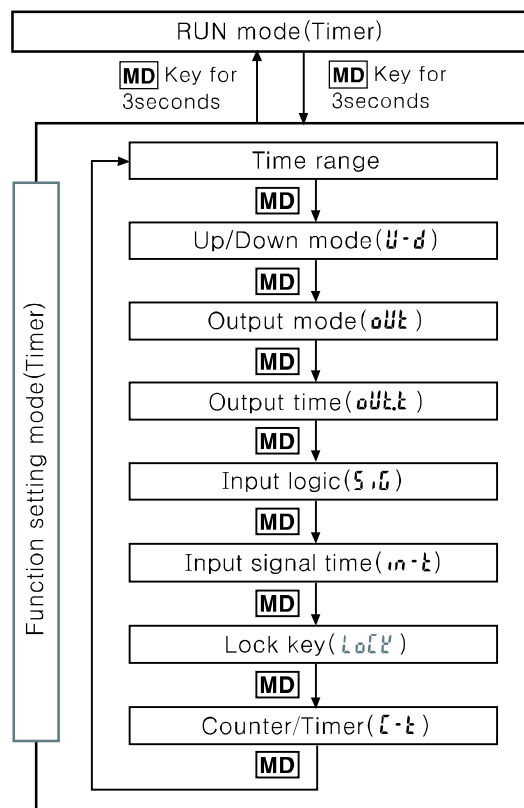| Output mode	Input mode			Operation
	Up	Down	Up/Down A, B, C	
F (F)	RESET / 999999 / PRESET2 / PRESET1 / 0 / OUT1 / OUT2 (OUT)			※After Counting up, the display value increases or decreases until the reset signal is applied, and hold outputs will be held.
n (N)	RESET / 999999 / PRESET2 / PRESET1 / 0 / OUT1 / OUT2 (OUT)			※After counting up, display value and hold output will be held until reset signal is applied.
C (C)	RESET / 999999 / PRESET2 / PRESET1 / 0 / OUT1 / OUT2 (OUT)			※The display value will be Reset Start at the same time counting up. ※The hold output of OUT1 turns off after one-shot time of OUT2. ※The one-shot output of OUT1 operates regardless to OUT2.
r (R)	RESET / 999999 / PRESET2 / PRESET1 / 0 / OUT1 / OUT2 (OUT)			※After one shot Time of OUT2, display value will be Reset start counting operation starts again. ※The hold output of OUT1 turns off after one-shot time of OUT2. ※The one-shot output of OUT1 operates regardless to OUT2.
K (K)	RESET / 999999 / PRESET2 / PRESET1 / 0 / OUT1 / OUT2 (OUT)			※After counting up, the display value increases or decreases until the reset signal is applied. ※The hold output of OUT1 turns off after one-shot time of OUT2. ※The one-shot output of OUT1 operates regardless to OUT2.
P (P)	RESET / 999999 / PRESET2 / PRESET1 / 0 / OUT1 / OUT2 (OUT)			※After counting up, display value is held for the one-shot time of OUT2, Counter operation starts again at the same time of OUT2 output is ON and count value will be Reset start. ※The hold output of OUT1 turns off after one-shot time of OUT2. ※The one-shot output of OUT1 operates regardless to OUT2.
q (Q)	RESET / 999999 / PRESET2 / PRESET1 / 0 / OUT1 / OUT2 (OUT)			※After counting up, display value increases or decreases for the one-shot time of OUT2. ※The hold output of OUT1 turns off after one-shot time of OUT2. ※The one-shot output of OUT1 operates regardless to OUT2.
A (A)	RESET / 999999 / PRESET2 / PRESET1 / 0 / OUT1 / OUT2 (OUT)			※After counting up, display value and the hold output of OUT1 is held until applying the reset signal. ※The one-shot output of OUT1 operates regardless to OUT2. ※OUT2 returns automatically after one shot time.

Output mode	Up/Down — A, B, C	Operation
5 (S)	RESET / 999999 / PRESET2 / PRESET1 / 0 / −999999 / OUT1 / OUT2 (OUT)	※OUT1 and OUT2 keeps ON status in following condition ; Display value ≧ Preset 1 Display value ≧ Preset 2
╘ (T)	RESET / 999999 / PRESET2 / PRESET1 / 0 / −999999 / OUT1 / OUT2 (OUT)	※OUT1 keeps ON status when display value is smaller than Preset 1 value, but if Preset 2 is "0", OUT1 keeps ON status ※OUT2 keeps ON status when display value is equal or larger than Preset 2.
d (D)	RESET / 999999 / PRESET2 / PRESET1 / 0 / −999999 / OUT1 / OUT2 (OUT)	※When display value is equal to set value(Preset 1, Preset 2) only, OUT1 or OUT2 output keeps ON status ※When set 1kcps for counting speed, solid state contact output should be used.

14. Operation Mode Changing

◎ Operation mode in Counter

RUN mode(Counter)

MD Key for 3seconds ↑   MD Key for 3seconds ↓

Function setting mode(Counter)

- Input mode(ı n)
  - MD
- Maximum counting speed(CPS)
  - MD
- Output mode(oUt)
  - MD
- OUT2 output time(oUt2)
  - MD
- OUT1 output time(oUt1)
  - MD
- Input logic(S,ū)
  - MD
- Minimum reset time(rSt)
  - MD
- Decimal point(dP)
  - MD
- Prescale value(SCL)
  - MD
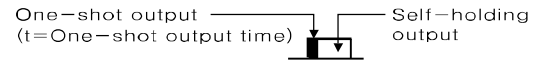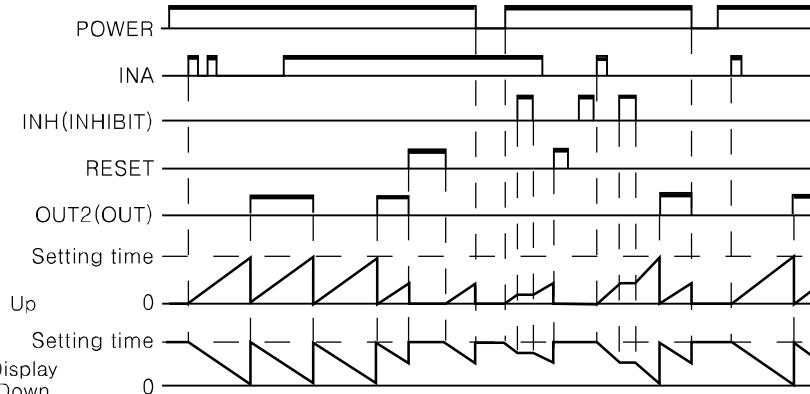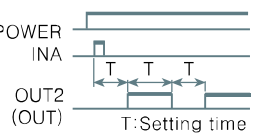- Memory retention(dAtA)
  - MD
- Lock key(LoCƘ)
  - MD
- Counter/Timer(C-t)
  - MD

◎ Operation mode in Timer

RUN mode(Timer)

MD Key for 3seconds ↑   MD Key for 3seconds ↓

Function setting mode(Timer)

- Time range
  - MD
- Up/Down mode(U-d)
  - MD
- Output mode(oUt)
  - MD
- Output time(oUt.t)
  - MD
- Input logic(S,ū)
  - MD
- Input signal time(ın-t)
  - MD
- Lock key(LoCƘ)
  - MD
- Counter/Timer(C-t)
  - MD

- Pressing MD for over 3sec., it will enter into Timer or Counter function setting mode
- Pressing MD for over 3sec., it will return to Timer RUN or Counter RUN mode.
- When using this unit as a counter, you can change its mode to Timer(t) in Counter/Timer setting.
- If no keys are touched for over 60sec., it will return to Timer RUN mode or Counter RUN mode.

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◨ Output operation mode(Timer)

One—shot output —— ┌── Self—holding
(t=One—shot output time) ▮ ▼ output
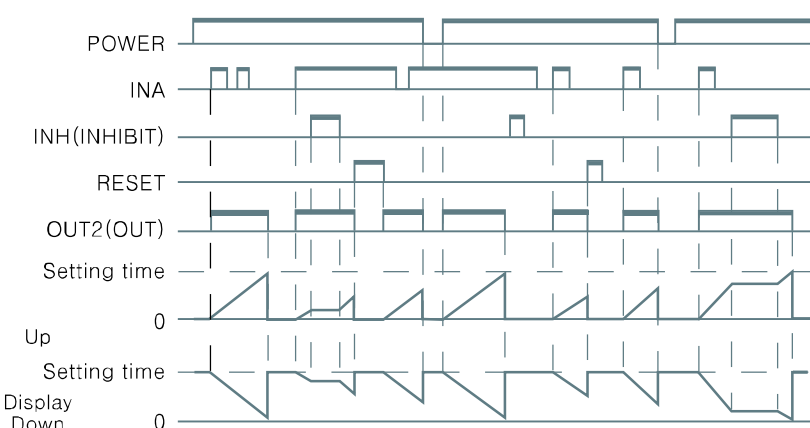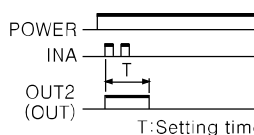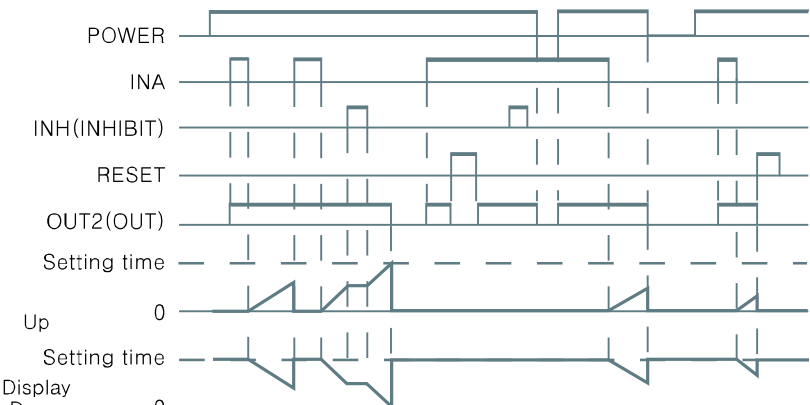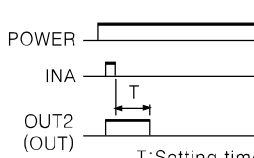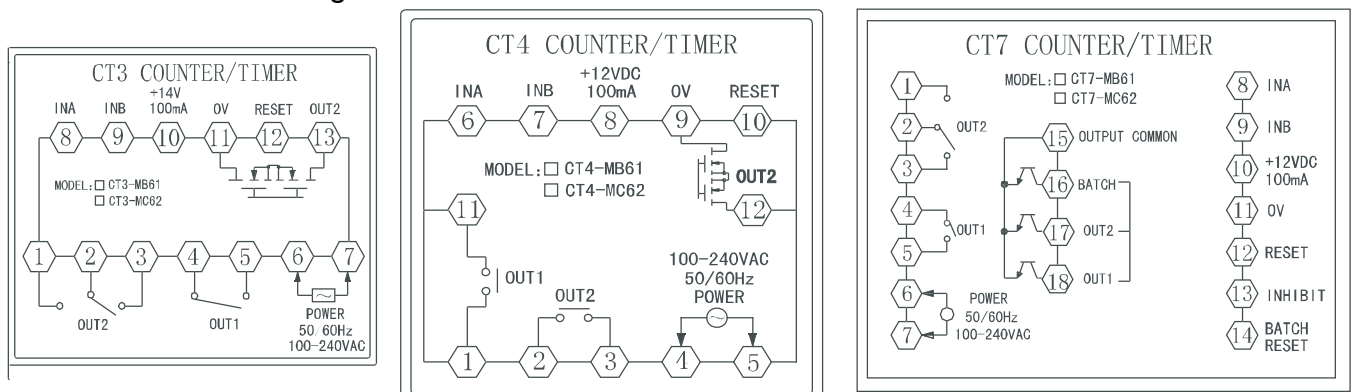
Output mode	Time chart	Operation
ond (OND)	**SIGNAL ON DELAY(POWER RESET)** POWER / INA / INH(INHIBIT) / RESET / OUT2(OUT) / Setting time Up Display 0 / Setting time Down 0	1)Time starts when INA signal turns on. When INA signal turns off, time resets. 2)Time starts when power turns on and when reset turns off during INA signal on. 3)Control output operates as hold or one—shot time. POWER ___ INA ⟵ T ⟶ OUT2 (OUT) T=Preset time
ond.1 (OND.1)	**SIGNAL ON DELAY 1(POWER RESET)** POWER / INA / INH(INHIBIT) / RESET / OUT2(OUT) / Setting time Up Display 0 / Setting time Down 0	1)Time starts when INA signal turns on, if INA signal is applied repeatedly, only initial signal is recognized. 2)Time starts when power turns on and when reset turns off during INA signal on. 3)Control output operates as hold or one—shot time. POWER ___ INA ⊓⊓ ⟵ T ⟶ OUT2 (OUT) T=Preset time
ond.2 (OND.2)	**POWER ON DELAY(POWER HOLD)** POWER / INA / INH(INHIBIT) / RESET / OUT2(OUT) / Setting time Up Display 0 / Setting time Down 0	1)Time starts when power turns on. (There is no INA function) 2)Time resets when reset turns on. Time starts when reset turns off. 3)Control output operates as hold output or one—shot output. ┌── HOLD POWER ⟵ T ⟶▼ (Setting time) OUT2 (OUT)
FLK (FLK)	**FLICKER(POWER RESET)** POWER / INA / INH(INHIBIT) / RESET / Toff Ton Ta Tb Ton Toff Ton Toff Ton Toff OUT2(OUT) / Toff setting time Ton setting time Up Display Down 0 / Toff setting time Ton setting time 0	1)Time starts when INA signal turns on. If INA signal is applied repeatedly, only initial signal is recognized. 2)Time starts when power turns on and when reset turns off during INA signal on. 3)Control output operates as hold output, output turns off for the Toff time and turns on for the Ton time repeatedly. 4)The Ton time and the Toff time must be set individually. 5)In case of using the contact output, min. setting time must be set over 100ms. POWER ___ INA ⊓⊓ ⟵Toff⟶⟵Ton⟶⟵Toff⟶ OUT2 (OUT)

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Output mode	Time chart	Operation
FLU.1 (FLK.1)	**FLICKER 1(POWER RESET)** **Hold output** POWER INA INH(INHIBIT) RESET OUT2(OUT) Setting time Up　　　0 Setting time Display Down　　0 	1)Time starts when INA signal turns on. If INA signal is applied repeatedly, only initial signal is recognized. 2)Time starts when power turns on and when reset turns off during INA signal on. 3)Control output operates as hold output. In case of using the contact output, min. setting time must be set over 100ms. POWER INA OUT2 (OUT) T:Setting time
	One-shot output POWER INA INH(INHIBIT) RESET OUT2(OUT)　t　t　t Setting time Up　　　0 Setting time Display Down　　0	1)Time starts when INA signal turns on, if INA signal is applied repeatedly, only initial signal is applied. 2)Time starts when power turns on and when reset turns off during INA signal on. 3)Control output operates as one-shot. In case of using the contact output, min. setting time must be set over 100ms. POWER INA OUT2 (OUT) T:Setting time
FLU.2 (FLK.2)	**FLICKER 2(POWER HOLD)** **Hold output** POWER INA INH(INHIBIT) RESET OUT2(OUT) Setting time Up　　　0 Setting time Display Down　　0 ※EEPROM:10 years	1)Time starts when INA signal turns ON. If INA signal is applied repeatedly, only initial signal is recognized. 2)Control output operates as hold output when reaches to the set time. 3)Time starts when power turns ON and when reset turns OFF during INA signal on. 4)In case of using the contact output, min. setting time must be set over 100ms. POWER INA　　T T-c c T OUT2 (OUT)　　Hold T:Setting time
	One-shot output POWER INA INH(INHIBIT) RESET OUT2(OUT)　t　t　　t　　　　t Setting time Up　　　0 Setting time Display Down　　0 ※EEPROM:10 years	1)Time starts when INA signal turns ON. If INA signal is applied repeatedly, only initial signal is recognized. 2)Control output operates as one-shot output when reaches to the set time. 3)Time starts when power turns ON and when reset turns OFF during INA signal on. 4)In case of using the contact output, min. setting time must be set over 100ms. POWER INA　　T T-c c T OUT2 (OUT) Hold T:Setting time

Output mode	Time chart	Operation
ınt (INT)	**INTERVAL(POWER RESET / SIGNAL RESET)** POWER INA INH(INHIBIT) RESET OUT2(OUT) Setting time / Up ... 0 Setting time / Display Down ... 0	1) During INA is ON, time starts and control output turns on. When time reaches to set value, display value and control output will be reset automatically. 2) When INA is OFF, time resets. 3) During INA signal on Power OFF:Processing time and control output Reset Power ON:Time Reset Reset ON:Processing time and control output Reset Rset OFF:Time Reset POWER INA OUT2 (OUT) T:Setting time
ınt.1 (INT.1)	**INTERVAL 1(POWER RESET)** POWER INA INH(INHIBIT) RESET OUT2(OUT) Setting time / Up ... 0 Setting time / Display Down ... 0	1) Control output turns ON and time starts when INA signal turns ON. 2) If INA signal is applied repeatedly, only initial signal is recognized. 3) When reaches to set value, display value and control output are reset automatically. 4) Time starts when power turns ON and when reset turns OFF during INA signal on. 5) Time processes normally while INA signal keeps ON status. POWER INA OUT2 (OUT) T:Setting time
oFd (OFD)	**SIGNAL OFF DELAY(POWER RESET)** POWER INA INH(INHIBIT) RESET OUT2(OUT) Setting time / Up ... 0 Setting time / Display Down ... 0	1) If INA is ON, control output remains ON. 2) When INA signal is OFF, time processes. 3) When time reaches to set value, display value and control output will be reset automatically. POWER INA OUT2 (OUT) T:Setting time

15. Connection Drawing

CT3 COUNTER/TIMER

INA	INB	+14V 100mA	0V	RESET	OUT2
8	9	10	11	12	13

MODEL:☐ CT3-MB61 ☐ CT3-MC62

1	2	3	4	5	6	7

OUT2   OUT1   POWER 50/60Hz 100-240VAC

CT4 COUNTER/TIMER

INA	INB	+12VDC 100mA	0V	RESET
6	7	8	9	10

OUT2

11

MODEL:☐ CT4-MB61 ☐ CT4-MC62

12

OUT1   OUT2   100-240VAC 50/60Hz POWER

1	2	3	4	5

CT7 COUNTER/TIMER

MODEL:☐ CT7-MB61 ☐ CT7-MC62

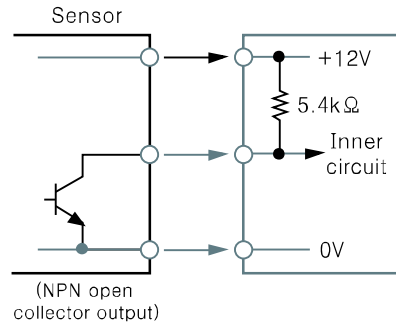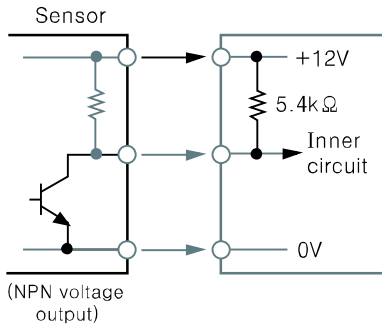| 1 | | 8 | INA |
2	OUT2	9	INB
3	15 OUTPUT COMMON	10	+12VDC 100mA
4	16 BATCH	11	0V
5	OUT1 17 OUT2	12	RESET
6	18 OUT1	13	INHIBIT
7	POWER 50/60Hz 100-240VAC	14	BATCH RESET

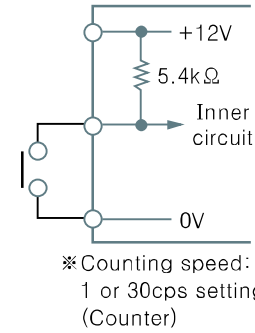Please refer to the connection drawing on the meter if any changes.

16. Input connections

◎ Input logic: No-Voltage input(NPN)

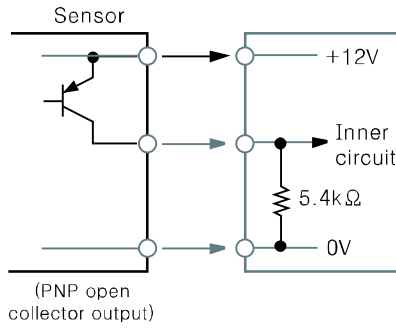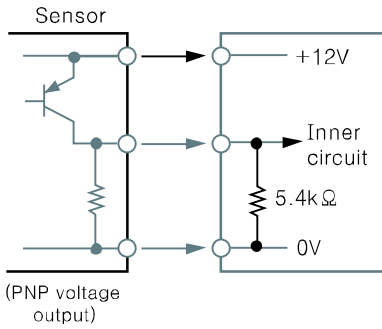● Solid state input(Standard sensor : NPN output type sensor)

Sensor

+12V
5.4kΩ
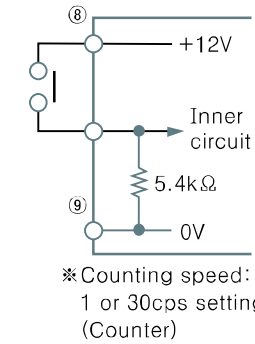Inner circuit
0V

(NPN voltage output)

Sensor

+12V
5.4kΩ
Inner circuit
0V

(NPN open collector output)

● Contact input

+12V
5.4kΩ
Inner circuit
0V

※Counting speed: 1 or 30cps setting (Counter)

◎ Input logic: Voltage input(PNP)

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

Sensor

+12V
Inner circuit
5.4kΩ
0V

(PNP voltage output)

Sensor

+12V
Inner circuit
5.4kΩ
0V

(PNP open collector output)

● Contact input

⑧
+12V
Inner circuit
5.4kΩ
⑨
0V

※Counting speed: 1 or 30cps setting (Counter)

17. Output connections

◎ Contact output

Counter/Timer

(Power of load)
Load
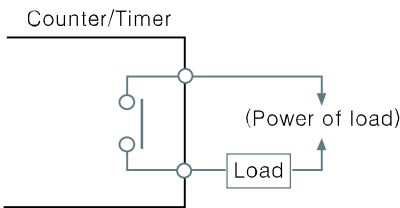
※Relay contact is 250VAC 3A Max.
※Use proper load not to exceed relay contact.

◎ Solid state output

Counter/Timer

Load
(+) Power for load (DC)
(−)
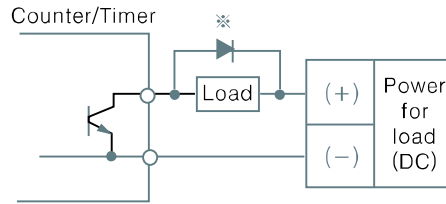
※When using inductive load(Relay etc), surge absorber(Diode, Varistor etc.) must be connected across the load.
※Use proper load and power for load not to exceed ON/OFF capacity(30VDC Max. 100mA max.) of solid state output.
※Be sure not to apply reverse polarity of power.

18. Outlook and Installation Dimension (mm)

CT3
72 / 36
80 / 30
$60^{+0.5}_{-0}$ / 30
$30^{+0.5}_{-0}$ / 25

CT4
48 / 48
90 / 45
$45^{+0.5}_{-0}$ / 30
$45^{+0.6}_{-0}$ / 25

CT7
72 / 72
90 / 67
32 / $67.5^{+0.8}_{-0}$
$67.5^{-0.8}_{-0}$ / 14