COUNTER/TIMER CNT-400 MANUAL

Thank you for your purchase of our Counter/Timer CNT-400 series. Please read this manual carefully and understand totally before use this device. This manual contains important information to use safely for this product.

1) Symbols and meaning

The following symbol is very important to use this device safely. Please be sure to handling to carefully this manual of this symbol.

! △ (Warning)

This devices dose not verify as safety devices, when you use together with dangerous devices, so please use after install 2nd safety device before this devices.

△ (Danger)

①electric shock – Never touch the AC terminal with bare or wet hand during power on. It may cause electric shock.

②Please make sure turn off power when you check power line .

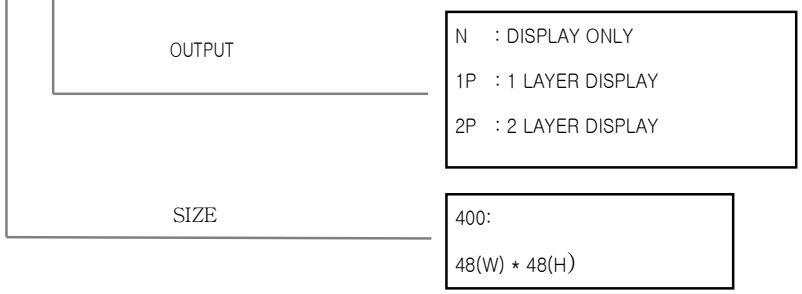
! (Caution)

1. Please use over M 3.5, width max 7.2m terminal wire for AC power line.
2. Do not use without manufacture recommended application, it may cause damage of body or broken of product.
3. Please prevent the dust, water, oil and debris of wire into the devices. It may cause the fire or damage of products.
4. Do not disassemble or convert or remodel without permission from manufacture. it may cause error and cannot guarantee the quality.
5. Please be sure making wire separately with power line to reduce inducts noise.
6. Please install the switch or circuit Breaker to protect from over voltage.
7. Please be sure make wire separately with signal line and power line to reduce induct noise
8. Please do not install the devices near high frequency noise generating devices (likes high frequency welding M/C, high capacity SCR controller, Inverter, etc.)

- **The above mentioned note is can make error to devices.**
- **Please be sure for follow as described at manual.**

1.MODEL & SUFFIX CODE

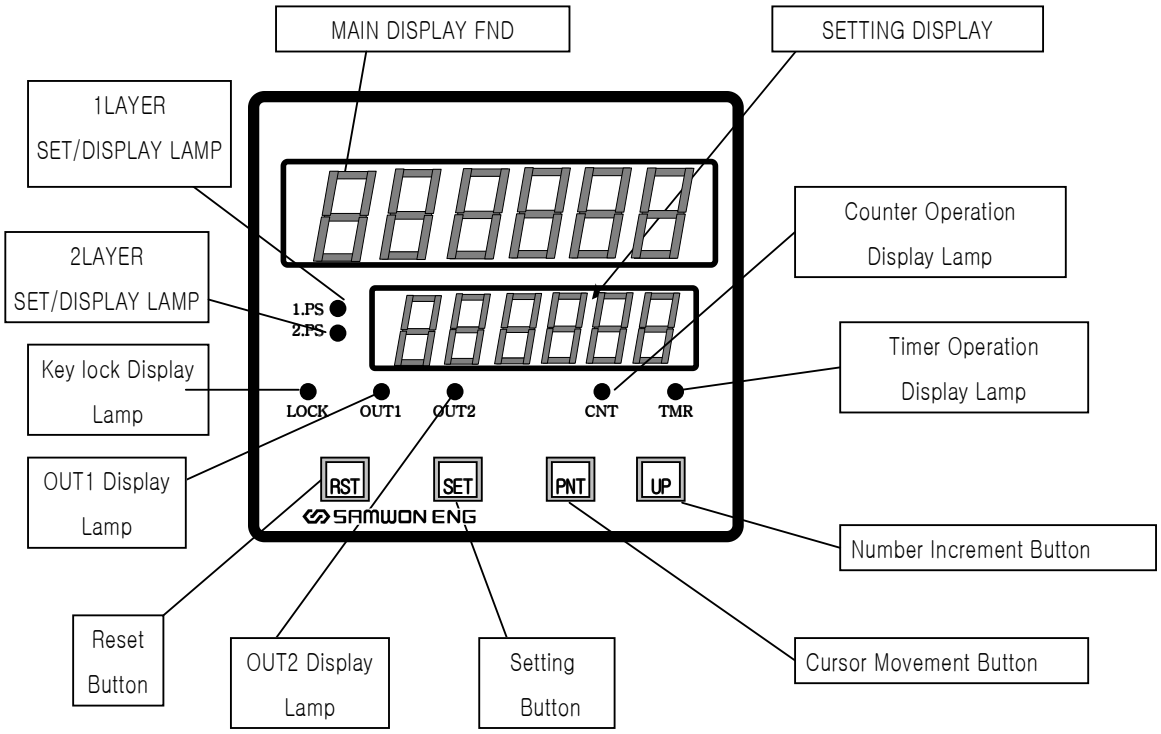
CNT – 400–2P



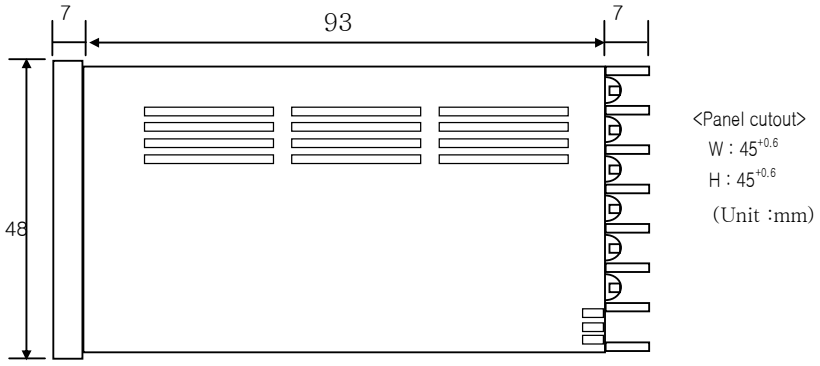
2.SPECIFICATIONS

Measurement Display	Counter measurement value display / Timer time progress value
Parameter Setting value Display	Counter setting values display / Timer setting values display
1/2layer setting/display LAMP	Blinking when check Setting values and change of set values
Key lock display lamp	Key lock operation display
OUT1/2 display lamp	OUT1/OUT2 operate display
Counter operate display lamp	Turn on when counter operate
Timer operate display lamp	Turn on when Timer operate
Reset button	Counter/timer reset button
Setting button	Counter/Timer function selection
Cursor move button	Setting cursor change
Increase button	Setting values increase and change

3. PART NAME & FUNCTIONS

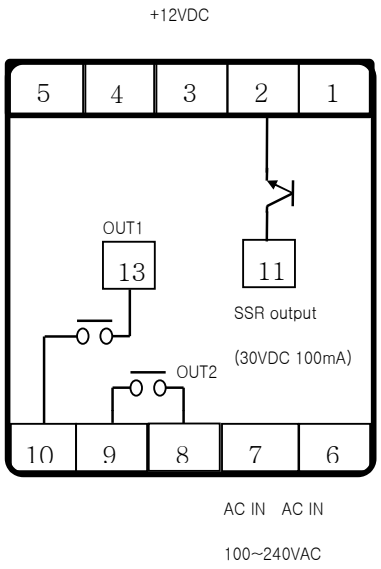


4. DIMENSIONS & PANEL CUTOUT

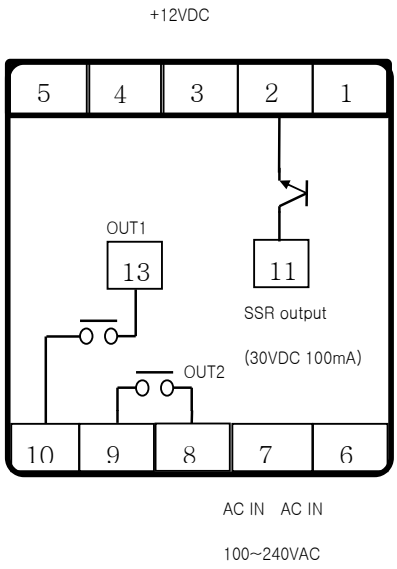


5. TERMINAL WIREING DIAGRAM

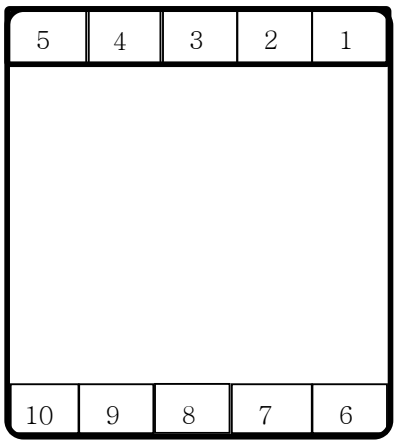
1) CNT-400-1P



2) CNT-400-2P



3) CNT-400-N



Note) INA terminal

•When use as a counter : " count input" or "count stop input" signal input terminal

•When use as a timer : "START"signal input terminal.

Note) INB/INH terminal

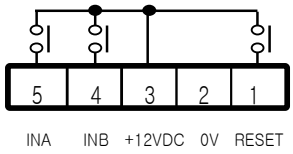
• When use with counter : INB become signal input terminal.

• When use with timer : INH(Inhibit) become signal input terminal.

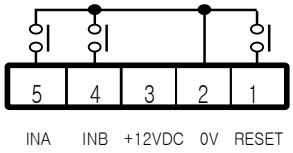
If signal of the INH terminal active the timer become stop timer

.(Time Hold)

* when select voltage input(PNP) , electric contact input connect



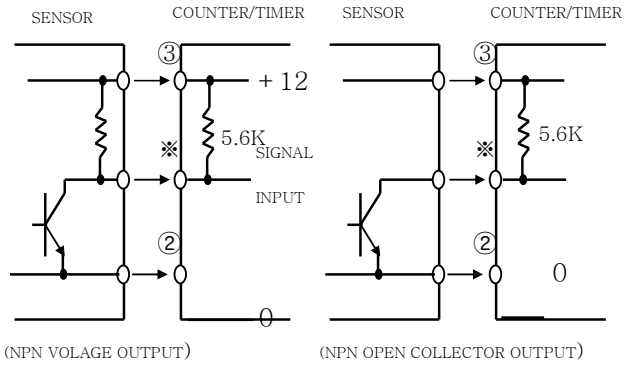
* when select non voltage input(NPN) , electric contact input connect



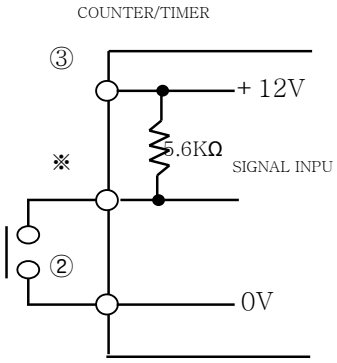
6.INPUT TERMINAL WIREING DIAGRAM

1) INPUT: NON VOLTAGE INPUT(NPN)

(1) NO ELECTRIC CONTACT INPUT



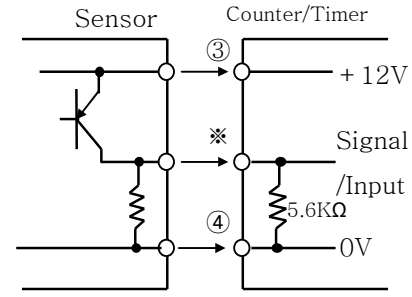
(2) ELECTRIC CONTACT INPUT(SET THE COUNTER COUNT TIME SPEED BETWEEN 1 AND 30cps.)



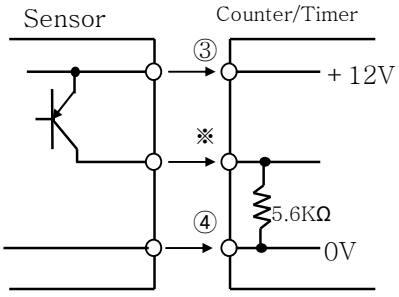
※ INA(⑤), INB/INH(④),
RESET(①) INPUT

2) INPUT: VOLTAGE INPUT(PNP)

(1) NO ELECTRIC CONTACT INPUT

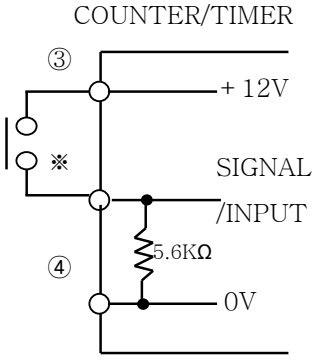


(PNP Voltage output



(PNP Open collector Output)

(2) ELECTRIC CONTACT INPUT(COUNTING SPEED SET WITHIN 1~ 30cps.)



※ INA(⑤), INB/INH(④),
RESET(①) INPUT

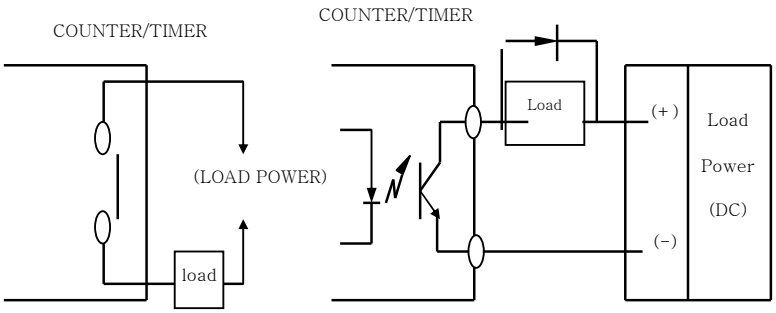
* INH(Inhibit) input

(1) INH(Inhibit) input during counter operation : count input ignore

(2) INH(Inhibit) input during Timer operation : timer progress stop

7. OUTPUT WIRING DIAGRAM

1) DRY CONTACTOUTPUT 2) OPEN COLLECTOR OUTPUT



8. PROGRAMING (HOW TO SETTING)

1) BUTTON AND FUNCTIONS

RST

SET

PNT

UP

2) COUNTER PRE SETTED VALUES CHANGE.

(1) 1 Layer Display Model Setting

▶ Push one time PNT Key during operation mode.

First number will blinking and become setting mode

▶ Change setting values use PNT and UP key.

▶ After change with wanted setting value, save new values push by SET key

(2) 2 Layer Display Model Setting

▶ push one time PNT Key during operation mode.

First number will blinking and become setting mode.

▶ Change setting values use PNT and UP key.

▶ After change setting values, move 2 layer display setting mode with SET key.

▶ After change with wanted setting value, save new values push by SET key.

* During change of the setting values, the count and control output operate automatically.

* After change of setting value to “0” if push RST key or input RESET during operate mode, output keep OFF status.

(but when output mode ”T” status, if set 1layer setting value as “0”,then1 layer display output keep ON status).

3) TIMER PRE SETTED VALUES CHANGE.

1) In case of the output mode is not FLK

▶ push one time PNT Key during operation mode.

First number will blinking and become setting mode.

▶ Change setting values use PNT and UP key.

▶ After change with wanted setting value, save new values push by SET key.

2) In case of the output mode is FLK

▶ Push one time [PNT] Key during operation mode.

First number will blinking and become t.oFF set vales setting mode.

▶ Change setting values use [PNT] and [UP] key

▶ After change with wanted setting value, move to t.on setting mode push by [SET] key.

(when timer is on mode status, even if change the setting value, the timer operate normally)

4) KEY LOCK SETTED VALUES CHANGE

To prevent error operation During operate, key lock function can use with this mode .

L.oFF : key unlock

LoC.1 : [RST] key cannot use "lock"

LoC.2 : [PNT] and [UP] key cannot use "lock"

LoC.3 : [RST] key, [PNT] key, [UP] key cannot use " lock"

5) SCALE VALUES SETTING

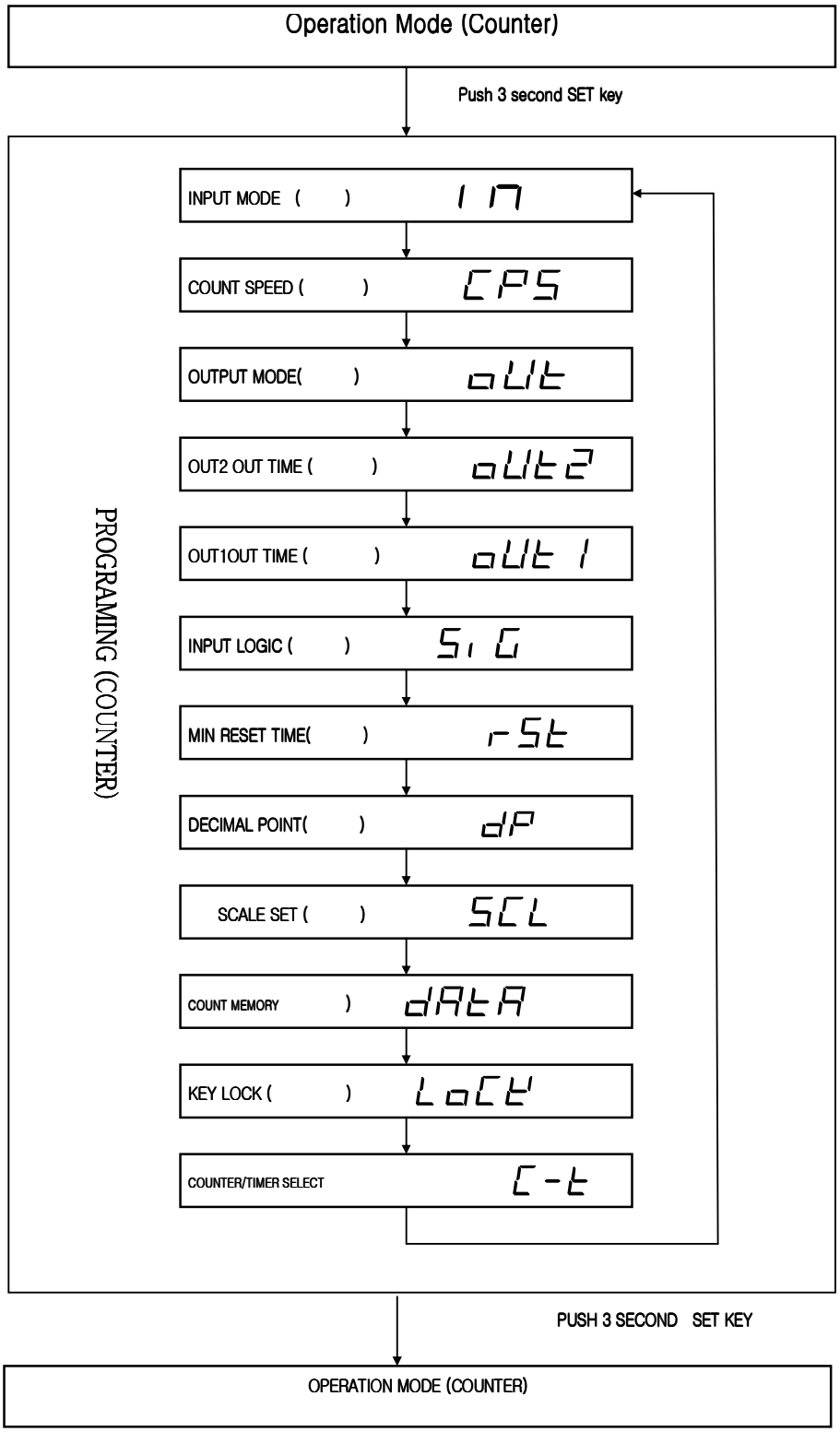
It is useful to change the input pulse value to real change scale values.

Ex) Position control using by counter and encoder. In case of the encoder 1 pulse can show conveyer 0.025mm movement, set the decimal point at ---*--- and set scale values 0.025 at scales setting mode.

6) PROGRAMING FLOW CHART(COUNTER)

Change the setting values use by [PNT] and [UP] key.

If push the [SET] key, the cursor will move to next step one by one.


Operation Mode (Counter)
Push 3 second SET key
PROGRAMING (COUNTER)
INPUT MODE ( ) 1 17
COUNT SPEED ( ) CPS
OUTPUT MODE( ) oUt
OUT2 OUT TIME ( ) oUt2
OUT1OUT TIME ( ) oUt 1
INPUT LOGIC ( ) Si G
MIN RESET TIME( ) r-St
DECIMAL POINT( ) dP
SCALE SET ( ) SCL
COUNT MEMORY) dAtA
KEY LOCK ( ) LoCK
COUNTER/TIMER SELECT C-t
PUSH 3 SECOND SET KEY
OPERATION MODE (COUNTER)

* 1 Layer setting model cannot display “OUT 1 output time” setting more at

oUt.t Function setting mode, the “OUT2 output time” setting items substitute with “OUT output timer (oUt.t)”.

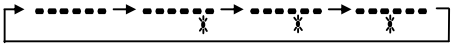
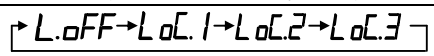
* In case of the output mode set as “ F,N “ , count values reach to set values it hold output ON status, “ OUT2 output time” items do not show.

* In case of the output mode set as “ S, T , D “ , “OUT1, OUT2 output time” items do not show. The input mode fixed one within Ud-A, Ud-B, Ud-C. Please change output mode except S.T.D to change input mode UP or DOWN status.

* In case of output mode with “D”, and max count speed with 1kcps, electric contact out cannot normal operate by responds time. So please use as dry contact output mode.

* If output mode change to “D” at the max count speed 5kcps or 10kcps,the max count speed change to 1cps automatically. if you want change the max count to 30 or 1kcps,you need resetting that at count speed setting mode. The function setting modes external input will be ignore and out become OFF. Display only type model cannot display output mode, output time setting item.

Input mode in ( )	U→d→Ud-A→Ud-b→Ud-C In case of output mode is S, T, D, input mode fixed to Ud-A, B, C.
Max count Speed (CPS)	1→30→1K→5K→10K Maxcount speed base on the INA or INB input signal is1:1 Max count speed setting is applied same time at INA,INB. In case output mode is “D” can select one from 1, 30, 1kcps.
oUt outputmode ( )	in case of input mode is Up or Down F→n→C→r→U→P→9→A in case of input mode is Up/Down-A, B, C F→n→C→r→U→P→9→A→S→t→d
oUt2 OUT2 outtime ( )	10→50→100→200→500→1000→2000→5000 Unit:ms
oUt 1 OUT1 outtime ( )	10→50→100→200→500→1000→2000→5000→HoLd Unit :ms
SiG Input logic ( )	Select input logic. voltage : PnP non voltage : nPn
rSt min Reset time ( )	1⇄20 external RESET signal input min time interval(Unit : ms)

dP Decimal point ( )	
Scale setting ( )	Scale setting range : 0.001 ~ 99.999 Scale values(K-Factor) : 1counter value of convert to real scale
Count memory ( )	CLEr : count power off reset (If power off, count reset to 0) CLEr⇄rEC rEC : count power off memory (If power off ,count memory before power off)
Key lock LoCK( )	
Counter/Timer select ( ) C-t	CoUn⇄ti mE CoUn : Counter ti mE : Timer

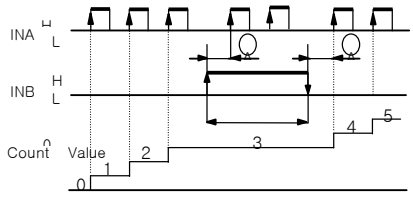
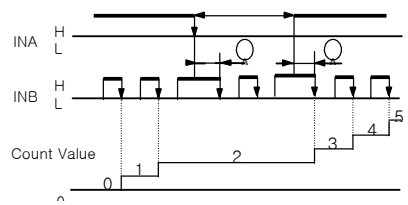
* A" more than min signal width, "B" more 1/2 then min signal width

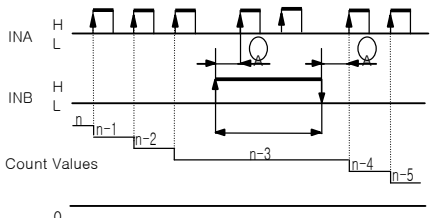
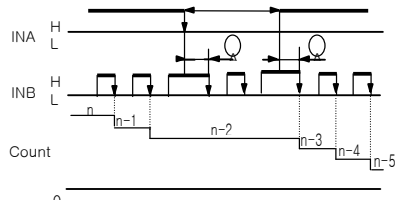
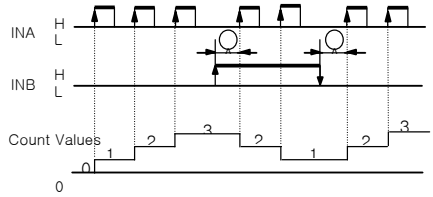
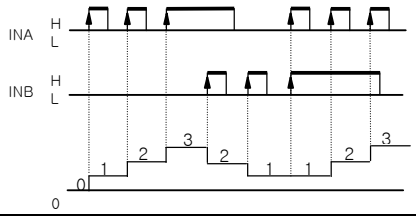
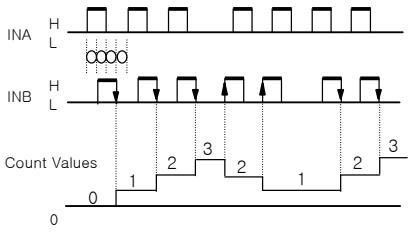
If the signal width is under that, the count can make error ±1 count.

* The meaning of "H", "L" at count table

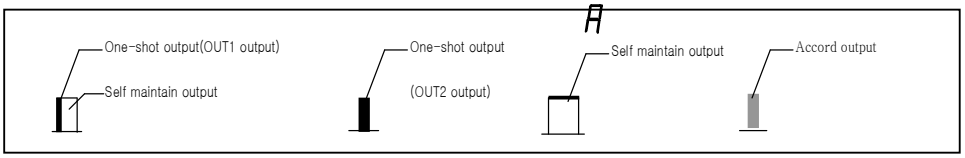
	Voltage input(PNP)	Dry contact input(NPN)
H	5-30VDC	(Short)
L	0-2VDC	(Open)

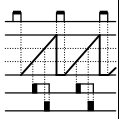
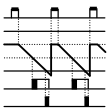
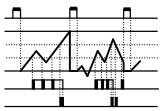
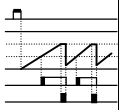
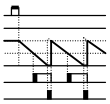
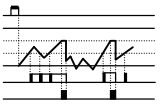
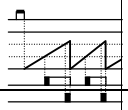
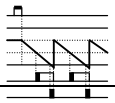
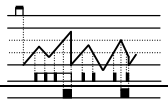
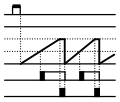
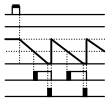
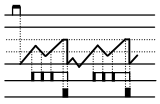
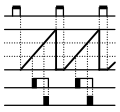
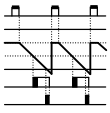
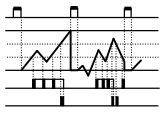
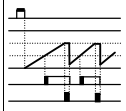
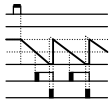
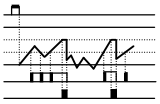
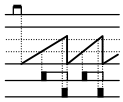
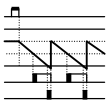
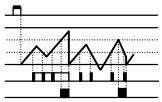
7) INPUT MODE OF OPERATION (COUNTER)

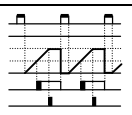
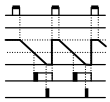
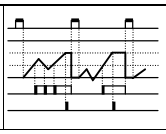
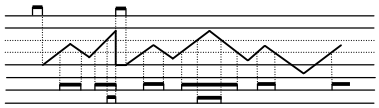
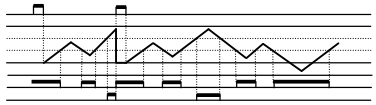
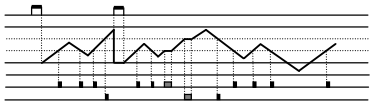
Input mode	Count diagram	Remarks
U (Up)		INA: count input INB: count input stop (limitation of count of INA) In case of INA is "L", count stop setting (INB:"L"->"H")or unlock of count stop (INB:"H"->"L")
		INA: count stop input ((limitation of count of INB) INB: count input In case of INB is "H" count stop setting (INA:"H"->"L") or unlock of count stop (INA:"L"->"H")

d (Down)		INA: Count input INB: Count input stop (limitation of count input of INA) n=setting values(Preset values) In case of INA is "L" count stop setting (INB:"L"->"H") or unlock of count stop (INB:"H"->"L") .
		INA: Count input stop (limitation of the count input of INB) INB: count input n=setting Values(Preset Values) In case of INB is "H" count stop setting (INA:"H"->"L")or unlock of count stop (INA:"L"->"H") .
Ud-A (Up/ Down-		INA: Count input INB:PLUS(Up)/MINUS(Down) count order input Incase of INBis "L" , PLUS Count(Up) Incase of INBis "H" , MNUS Count(Down)
Ud-b (Up/ Down-		INA:PULS(Up)Count input INB:MINUS(Down)Count input INA and INBis input from "L"to "H" simualtanously It sustain before count input status.
Ud-C (Up/ Down-C)		Incase of Encorder output A,B pole connect to couter input INA, INB, counter mode need set to (Ud-C) mode.

8) OUTPUT MODE OF OPERATION (COUNTER)



Output Mode	Input mode			Explanations
	Up	Down	Up/Down – A, B, C	
(F)				After Count-up, Display Values increase or decrease according to input and the output sustain self output until before initialize of RESET input
(N)				After Count-up output sustain the Display and self values until input signal is initialized.
(C)				The display values will be reset start status at the same time with Count-up. Self sustain output of OUT1 After One-shot Time of OUT2 become OFF The One-shot output time of OUT1 is not connected with OUT2 output.
(R)				After One-shot Time of OUT2 the display values will be recover to Reset Start status The Self sustain output of OUT1 will be OFF after One-shot time off OUT2. The One-shot output time of OUT1 is not connected with OUT2
(K)				After Count-up, Display Values increase or decrease according to input and the output sustain self output until before initialize of RESET input Self sustain output of OUT1 After One-shot Time of OUT2 become OFF The One-shot output time of OUT1 is not connected with OUT2
(P)				The Display values after count up will sustain until during One -Shop time of OUT2 and the Count will restore to Reset Start Status in same time OUT2 is ON The self sustain output of OUT1 will be OFF after One Shot time of OUT2 The One-shot output time of OUT1 is not connected with OUT2
(Q)				After Count-up, Display Values increase or decrease while One Shot Time of OUT2. Self sustain output of OUT1 After One-shot Time of OUT2 become OFF The One-shot output time of OUT1 is not connected with OUT2

(A)	  	The Display values and the self sustain output of OUT1 will sustain after count up until Reset input is initialized The One-shot output time of OUT1 is not connected with OUT2 다.
Up/Down – A, B, C		
(S)		OUT1 output (while Display ≧ (PRESET1) Sustain ON. OUT2 output (while Display ≧ (PRESET1) Sustain ON .
(T)		OUT1 output (Display Values) ≧ (PRESET1) become OFF . (but , in case of PRESET1is 0, the OUT1 output Sustain ON status) OUT2 output (While Display values ≧ (PRESET2) Sustain ON status.
(D)		ON status sustain only Preset values (PRESET1, PRESET2)and Display Values is accord Please use non contact output when you seted count speed to 1kcps

* Output of 1 layer Preset time and OUT2 of 2 layer Preset time is operate same

9) TIME RANGE SETTING (TIMER)

TIME RANGE	FUNCTION SETTING MODE AND SETTING VALUES	
	COUNT DISPLAY	SETTING DISPLAY
0.01s ~ 9999.99s	SEC	9999.99
0.1s ~ 99999.9s	SEC	99999.9
1s ~ 999999s	SEC	999999
0.01s ~ 99m59.99s	n S	9959.99
0.1s ~ 999m59.9s	n S	9995.9
0.1m ~ 99999.9m	n	99999.9
1m ~ 999999m	n	999999
1s ~ 99h59m59s	H n S	995959
1m ~ 9999h59m	H n	999959

10) TIME SETTING MODE (TIMER)

* DURING FUNCTION SETTING MODE,THE INPUT SIGNAL IGNOR AND OUTPUT WILL BE OFF.

* IN CASE OF THE OUTPUT MODE IS FLK, INT, INT1, OFD,THE OUTPUT TIME SETTING MENU DISAPPEAR AT FUNCTION SETTING MODE .

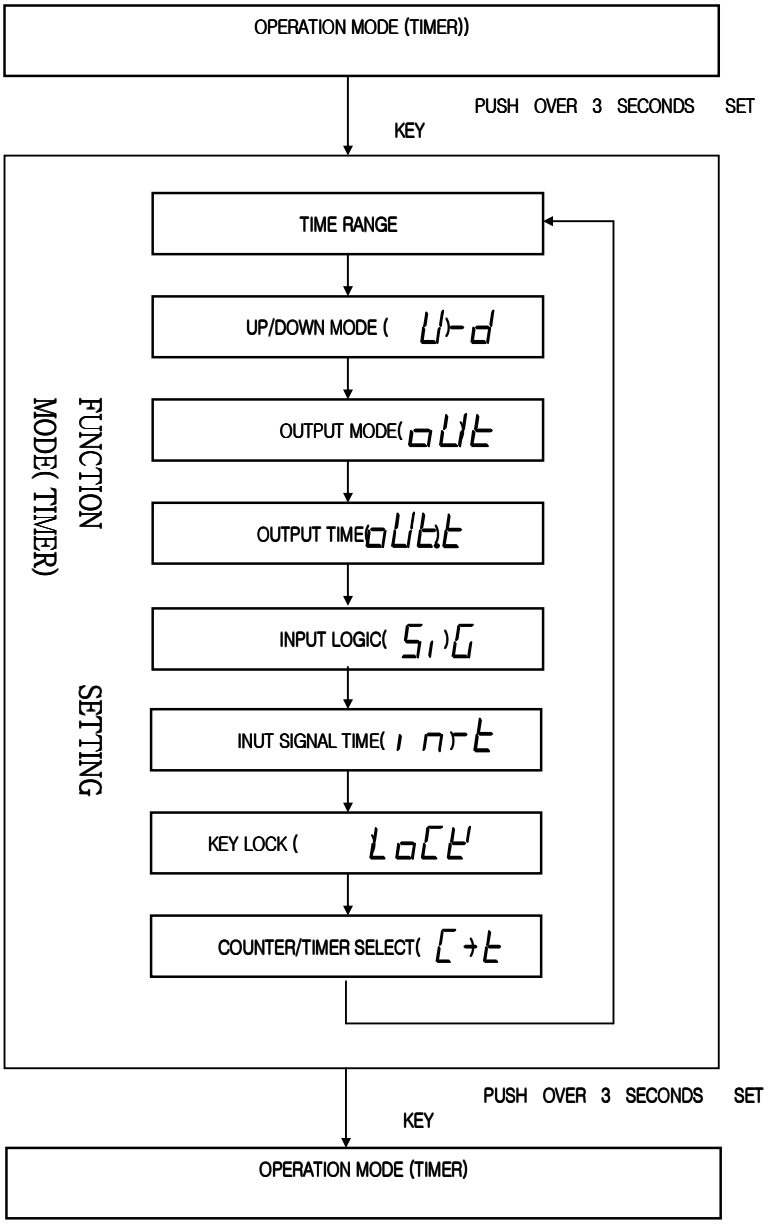
* IN CASE OF ONLY DISPLAY MODE, THE OUTPUT MODE AND OUTPUT TIME SETTING MENU DISAPPEAR AT FUNCTION

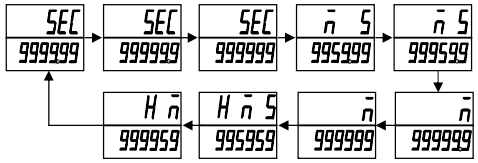
SETTING MODE .

* IN CASE OF 2LAYER DISPLAY MODEL,DURING TIMER OPERATION MODE THE OUTPUT WILL LIMITED ONLY TO OUTPUT ,THE OUTPUT 1 ALWAYS MAINTAIN OFF STATUS.

Change the setting values use by PNT and UP key.

If push the SET key, the cursor move to next step one by one.



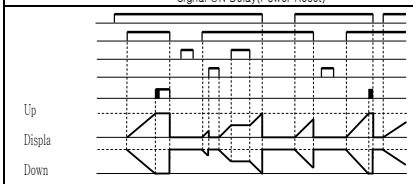
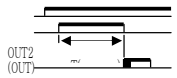
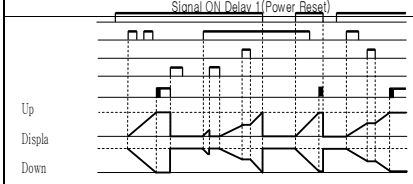
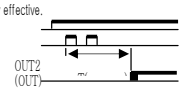
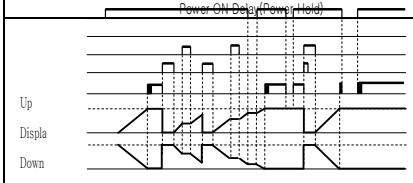
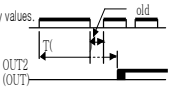
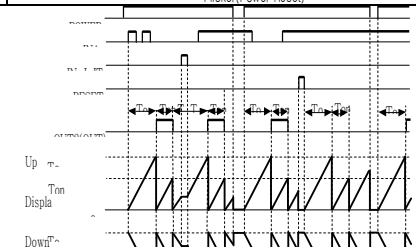
TIME RANGE	
Up/Down MODE (U-d)	U ⇄ d Up: Count up from 0 to preset time (Up) (Down) Down : Count down from preset time to 0

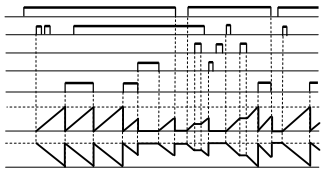
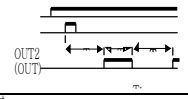
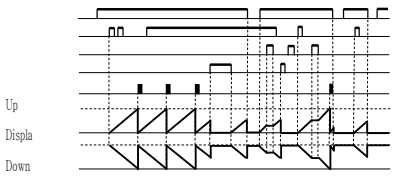
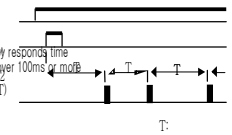
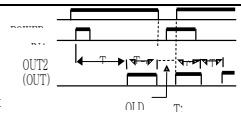
Output Mode (oUt)	ond→ond.1→ond.2→FLY→FLY.1 ↵ oFd←1nt.1←1nt←FLY.2
Output time (oUtt)	Unit (ms) ►10►50►100►200►500►1000►2000►5000►Hold┐ Control output (OUT2 or OUT) operate time selection depend on output mode.
Input logic (SIG)	Selection of the input logic. Voltage input : PnP Non Voltage input : nPn
Input signal Time (1n-t)	1⇄20 Unit (ms) Selection of the INA, INHIBIT, RESET signal minimum width
Key Lock (LoCY)	►L.oFF→LoC.1→LoC.2→LoC.3┐
Select of Counter/Timer (C-t)	: Counter operate CoUn→tIME CoUn ←tIME tIME : Timer operate

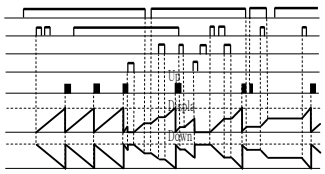
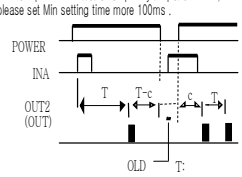
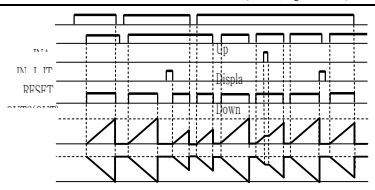
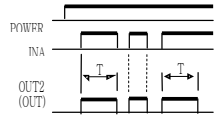
11. OUTPUT OPERATION MODE(TIMER)

* Power Reset : Do not compensate the display values when it power off .(In case of power off the display values initialized)

* Power Hold : Compensate the display values when it power off .(Memorized the display values when it power off before. Restore Display memorized values before power off when recover to power on)

Output Mode	Time FLOW CHART	Operation Explanation
(OND) ond	Signal ON Delay(Power Reset) 	1) While INA input is ON the Timer Start . 2)In case of the INA input is OFF, Reset operate. 3)) In case of INA ON : Power ON Time Start Reset OFF Time Start 4) Control Out self sustain operate or One-shot operate Ch. 
(OND.1) ond.1	Signal ON Delay 1(Power Reset) 	1)While INA input is ON the Timer Start. 2)) In case of INA ON : Power ON Time Start Reset OFF Time Start 3)Control Out self sustain operate or One-shot operate. 4)If repeat INA input ,the first signal only effective. 
(OND.2) ond.2	Power ON Delay(Power Hold) 	1)while Power ON Time Start 2) No INA Function. 3)RESET ON : Time Reset RESET ON -> when change to OFF Time Start 4) Control out self sustain operate or One-shot operate. 5) Memorize before Power OFF display values. 
(FLK)	Flicker(Power Reset) 	1)) When INA input is ON, the Time Start.

		2) In case of INA ON : Power ON Start Reset OFF Start 3) Control out self sustain operate .. 4) At pointof INA is ON, during T off setting time Output become OFFand During Ton setting time,Output become ON Repeate . Toff setting Time : Output OFF Time Ton setting Time : Output ON Time Ta+Tb=Toff Setting Time 5)OFF setting time (off) and ON setting time (Ton) must sett saperatley. 6)During FLK output Mode, no One-shot output i.e Hold output. 7) Please set minimum setting time is over 100ms or more
(FLK.1) FLK.1	Flicker1 (Power Reset): 자기 유지 출력인 경우 	1)I) When INA input is ON, the Time Start. 2) In case of INA ON : Power ON Start Reset OFF Start 3) Control out self sustain operate. 4) In case of too small time setting, Contact put make error of output by responds time Please set minimum setting time is over 100ms or more 
	Flicker1 (Power Reset): One-shot 출력인 경우 	1) When INA input is ON, the Time Start. 2) In case of INA ON : Power ON Start Reset OFF Start 3)Contorl output poerate One-shot 4) In case of too small time setting, Contact out put make error of output by responds time Please set minimum setting time is over 100ms or more . 
(FLK.2) FLK.2	Flicker2 (Power Hold):In case of Self sustain output	1) Timer start while INA input is ON. 2) During INA ON status : Power ON Start Reset OFF Start 3) Control out self sustain operate 4) If reached preseted time values Control output change(But,Initial Start OUT2 control output is OFF) 5) In case of too small time setting, Contact out put make error of output by responds time Please set minimum setting time is over 100ms or more 

(FLK.2) FLK.2	Flicker2 (Power Hold): In case of One-shot output 	1) Timer start while INA input is ON. 2) During INA ON status : Power ON Start Reset OFF Start 3) Control output will One-shot operation. 4)In case of set too small time Contact out put make error of output by responds time , So please set Min setting time more 100ms . 
(INT) int	Interval(Power/Signal Reset) 	1)) Timer start while INA input is ON. 2) Reset operate while IINA is OFF. 3)During INA ON status : Power ON Start Reset OFF Start 4)If reached preseted time values it become Auto Reset. 5) Control output will ON while time processing 

Up

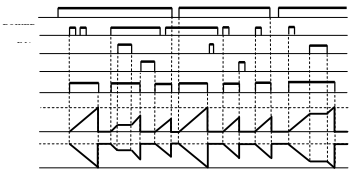
Displa

Down

OUT2
(OUT)

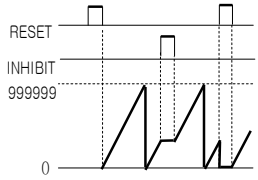
T:

Up

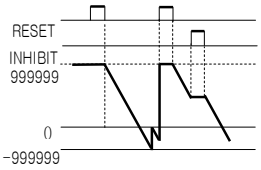
(INT1)	Interval 1(Power Reset) 	1) Timer start while INA input is ON.. 2 During INA ON status : Power ON Start Reset OFF Start 3) During timer process INA Input ignores. 4) If reached preset time values it become Auto Reset. 5) Control output will ON while time processing
(OFD)	Signal OFF Delay(Power Reset)	1) During INA ON status, control output sustain ON status. (But, except when Power is OFF and Reset is ON) 2) If reached preset time values it become Auto Reset

12. ONL DISPLA MODE OPERATION

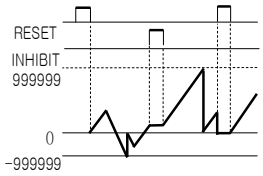
1) Counter(In case of Input mode is UP)



2) Counter(In case of Input mode is DOWN)



3) Counter(In case of the Input modeisUd-A),



4) Incase of timer individual input(Ud-B), or (Ud-C))