Digital LCD Timer DIN size W48×H48mm

▣Features

- ●10 programmable output modes
- ●10 programmable timing ranges
- ●Select the function by Digital S/W in front
- ●Power supply : 100−240VAC 50/60Hz / 24−240VDC
- ●Graphic output contact status display(NO/NC)
- ●BAR graph display of time progressing in 5% increments
- ●Compact size(Length:74mm)
- ●Selectable wide time range
- ●International approvals

⚠ **Please read "Caution for your safety" in operation manual before using.**

▣Ordering information

L E 3 S □

	Time−limit 1c(SPDT)□
A	Time−limit 2c(DPDT)□
B	Time−limit 1c, Instantaneous−contact 1c
S	DIN Size W48×H48mm
3	999(Digit)
E	Timer
L	LCD Display

▣Specifications

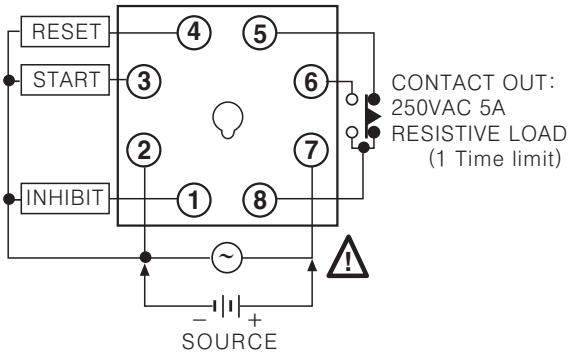
Model		LE3S	LE3SA	LE3SB
Function		Multi time range, Multi function	Multi time, Power ON Delay	
Display method		LCD Display(Character size : W4×H8mm)		
Power supply		100−240VAC 50/60Hz / 24−240VDC		
Allowable voltage range		90 ~ 110% of rated voltage		
Power consumption		Approx. 3VA(240VAC 50/60Hz) Approx. 1W(240VDC)	Approx. 4VA(240VAC 50/60Hz) Approx. 1.5W(240VDC)	
Return time		Max. 100ms		
Min. input signal	START input	Min. 20ms	——	
	INHIBIT input			
	RESET input			
Input	START input	●No−voltage input Short−circuit impedance:Max. 1kΩ Residual voltage:Max. 0.5VDC Open−circuit impedance: Min. 100kΩ	——	
	INHIBIT input			
	RESET input			
Control output	Contact type	Time limit SPDT(1c)	Time limit DPDT(2c)	Time limit SPDT(1c), Instantaneous SPDT(1c)
	Contact capacity	250VAC 5A resistive load	250VAC 3A resistive load	
Relay life cycle	Mechanical	Min. 10,000,000 times		
	Electrical	Min. 100,000 times (250VAC 5A resistive load)	Min. 100,000 times (250VAC 3A resistive load)	
Output mode		10kinds of operation modes	Power ON Delay mode	
Ambient temperature		−10 ~ +55℃(at non−freezing status)		
Storage temperature		−25 ~ +65℃(at non−freezing status)		
Ambient humidity		35~85%RH		

▣Specifications

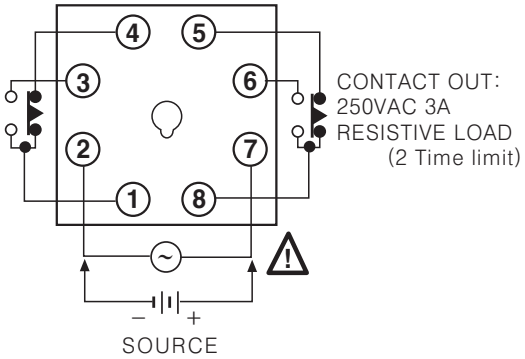
Model		LE3S	LE3SA	LE3SB
Repeat error		Max. ±0.01% ±0.05sec (Power Start) Max. ±0.005% ±0.03sec (Signal Start)	±0.01% ±0.05sec	
Setting error				
Voltage error				
Temperature error				
Insulation resistance		100MΩ (at 500VDC)		
Dielectric strength		2000VAC 50/60Hz for 1 minute		
Noise strength		±2kV the square wave noise (pulse width:1μs) by the noise simulator		
Vibra-tion	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1hour		
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes		
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions for 3 times		
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions for 3 times		
Approval		c UL us, DVE, CE	———	
Weight		Approx. 100g	Approx. 105g	

▣Connections

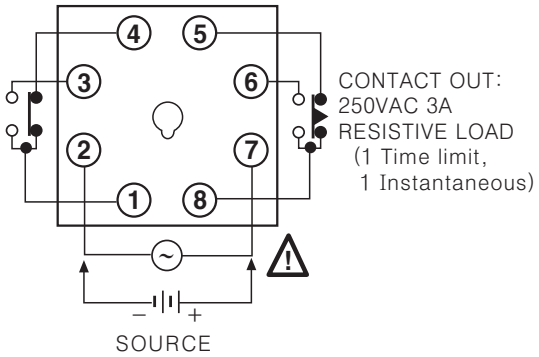
●LE3S



●LE3SA

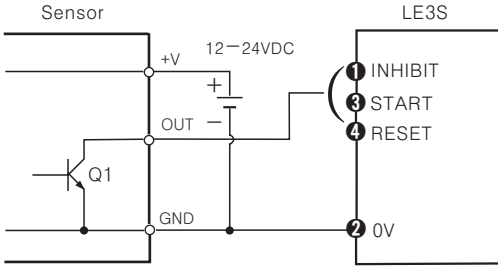


●LE3SB



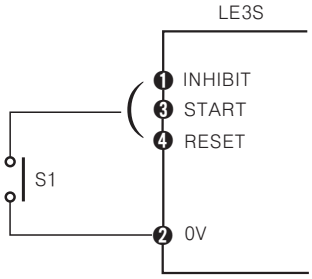
▣Input connections(LE3S Series)

◎Solid-state input

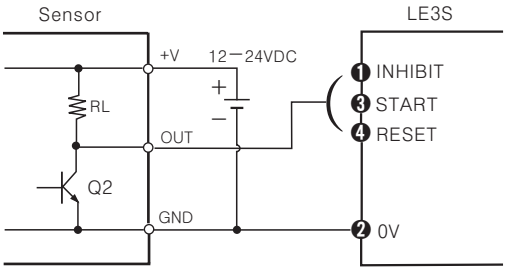


●Q1 is ON : Operating
●Sensor : NPN open collector output

◎Contact input



●S1 is ON : Operating
●S1 : Micro switch, Push button switch, Relay



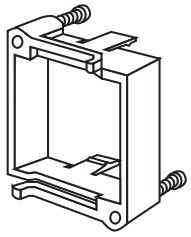
●Q1 is ON : Operating
●Sensor : NPN universal output

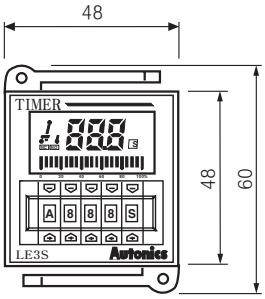
●Input level

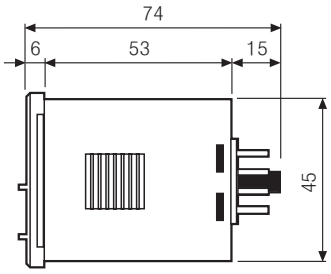
No voltage input	●ON(Short-level) · Residual voltage : Max. 0.5V · Impedance : Max. 1kΩ
	●OFF(Open-level) · Impedance : Min. 100kΩ
Contact input	Please use a contacts that can function reliably at 5VDC 1mA.

▣Dimensions

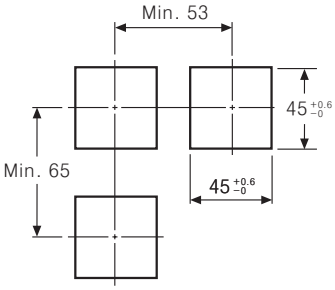
●Bracket

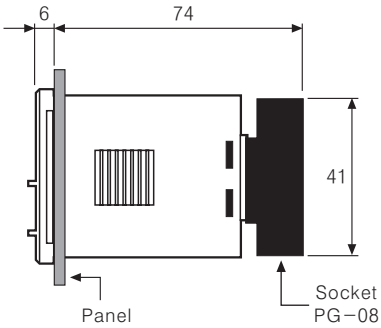






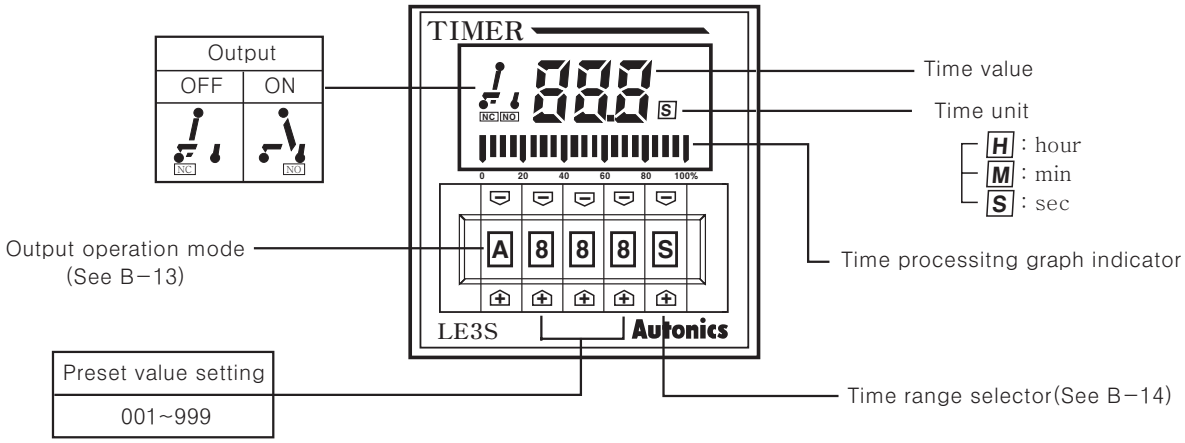
●Panel cut-out



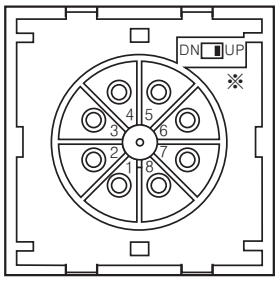


Unit:mm

▣Front panel indentification



▣Up/Down Mode



※The output will operate as Up mode or Down mode according to location of Up/Down selection switch.

Up	Down
DN ■ UP	DN ■ UP

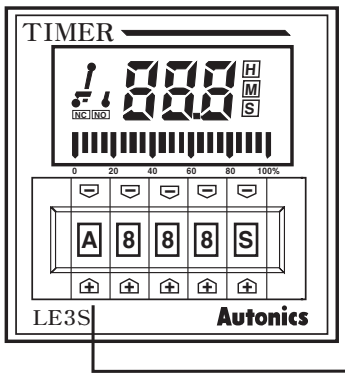
⚠ **Power must be cut off.**

●Factory specification

LE3S	LE3SA, LE3SB
Up/Down mode : Up	• Up/Down mode : Up • Output mode : Fixed A mode ※Down mode is optional

▣Output operation mode selection

●Please select operation mode by pressing ⊕, ⊖ keys located on left front panel.



Output operation mode	
A	ON Delay Ⓐ
B	Interval Delay Ⓐ
C	ON Delay Ⓑ
D	Flicker Ⓐ
E	Flicker Ⓑ
F	One-shot Out Flicker
H	OFF Delay
K	ON/OFF Delay
L	Interval Delay Ⓑ
N	Integration Time

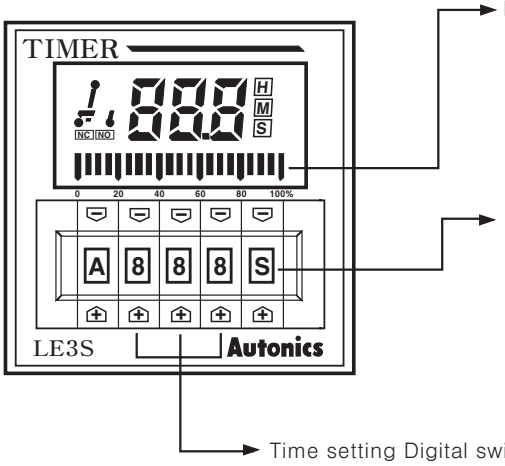
※See B-15 and B-16 for the specification information of output operation mode.

●On delay Ⓐ of A mode and ON delay Ⓑ of C mode are different
●Interval delay Ⓐ of B mode and Interval delay Ⓑ of L mode are different.
●Flicker Ⓐ of D mode and Flicker Ⓑ of E mode are different.

※ Ⓐ mark from output operation mode is one of output operation mode and working with the time progressing when the start signal applied continuously.
※ Ⓑ mark from output operation mode is one of output operation mode and working with the time progressing even the start singal is applied as One-shot signal. (One-shot input signal should be over 20ms)

▣Operation time and time specification mode selection

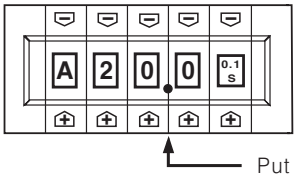
●Please select time unit mode by pressing ⊕ , ⊖ keys located on right hand push buttons.



Time range mode	
0.01s	0.01sec~9.99sec
0.1s	0.1sec~99.9sec
s	1sec~999sec
0.1m	0.1min~99.9min
m	1min~999min
0.1h	0.1hour~99.9hour
h	1hour~999hour
10h	10hour~9990hour
s	0 min 01sec~9min 59sec
M	0 hour 01min~9hour 59min

●Operation time setting : Please select operation time by pressing ⊕ , ⊖ 3 keys located on middle front panel.

※EX) When using this unit with 20.0 sec of operation time.
After selecting 0.1 s as time range, then set operation time setting with digital switches as 20.0sec.
In this case it is convenient to put a decimal point as below picture.

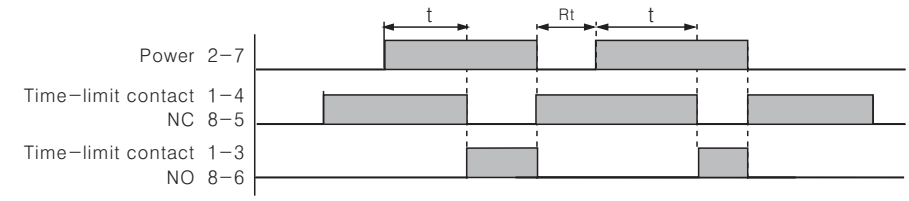
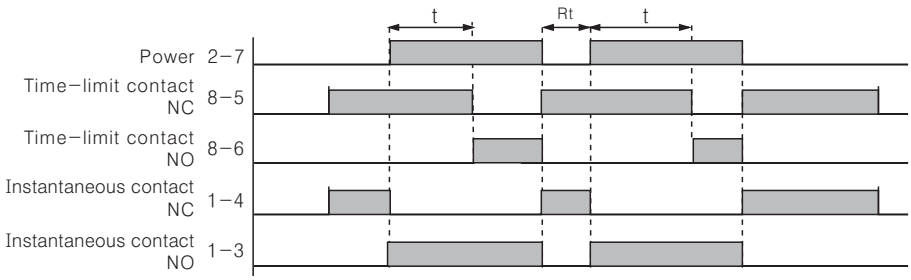


• Bar graph : Display the time processing rate of setting time by bar.
Setting value(Operation time) ÷ 20(Total bar)
= The time value of 1 Bar

●Each bar on the bar graph represents 5% of the total setting value(Operation time) simply divide the setting value by 20 to determine the time value of each bar.

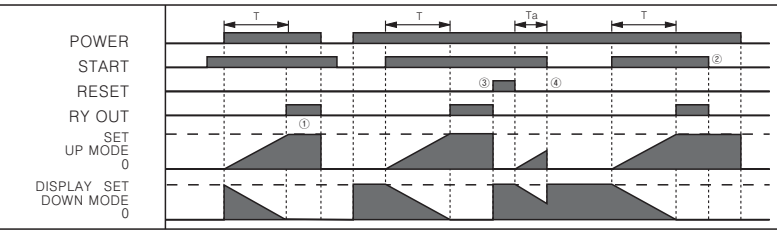
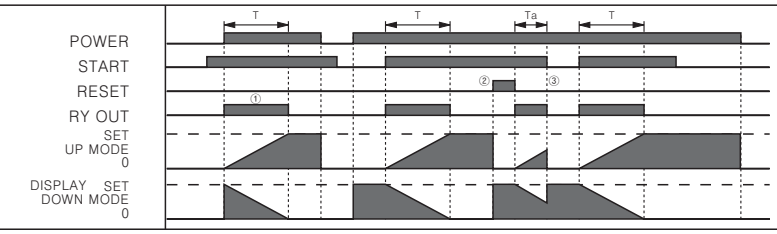
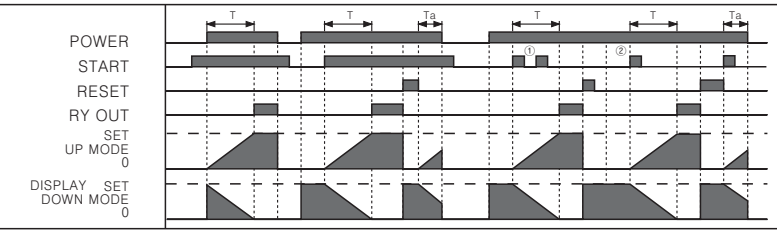
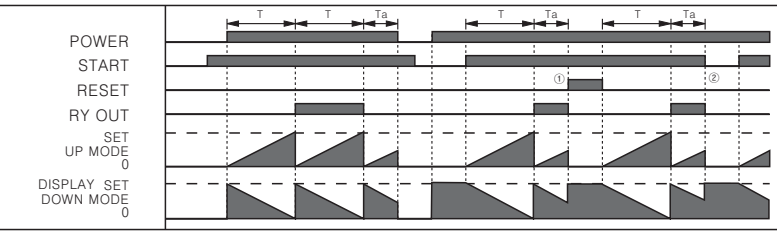
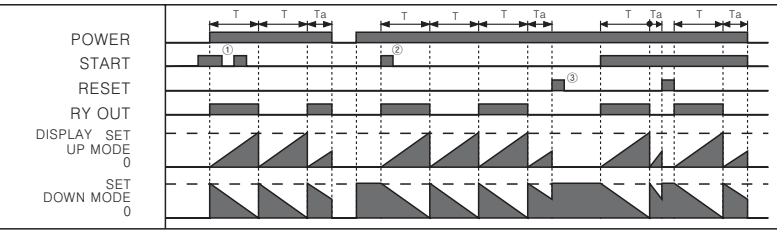
▣LE3SA, LE3SB output operation mode

※t=Setting time, Rt= Resetting time(Min. 100ms)

LE3SA	
LE3SB	

▣LE3S output operation mode

T=Preset value, T >Ta

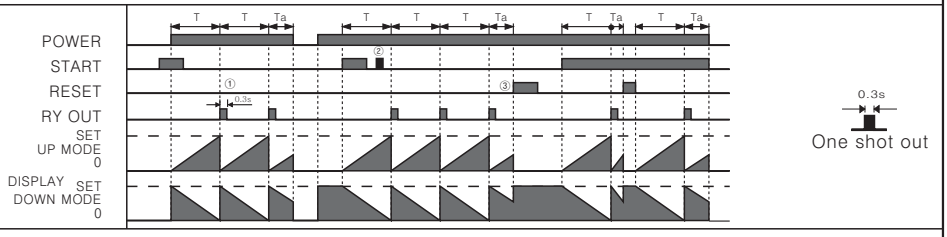
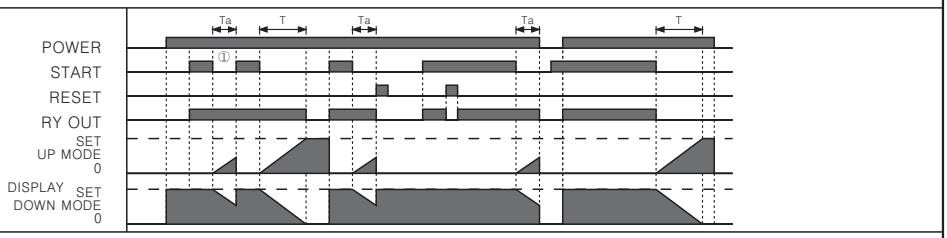
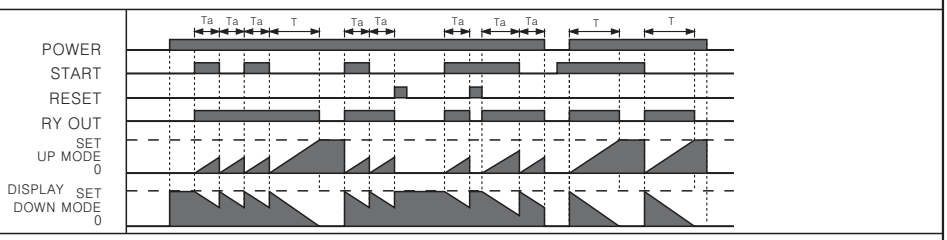
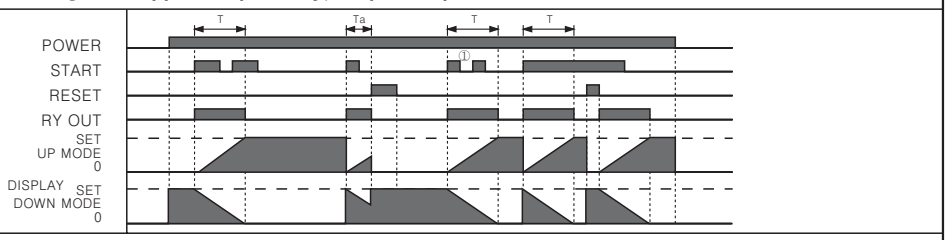
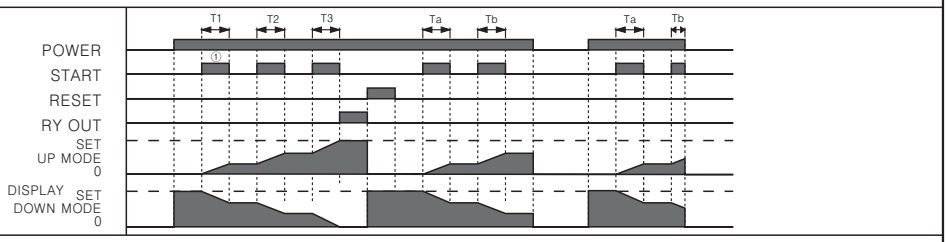
Mode	Time chart
A ON Delay Ⓐ	 1. Time progresses when START signal is ON. 2. The output will be ON when the preset value is equal to the display value. (Position ①) 3. When the RESET signal is ON, the display value is returned to the initial state. (Position ③) 4. When the preset value is equal to the display value, if START signal is OFF, the output turns off, the display value is held. (②area) **※If START signal is OFF when the output is OFF the display value is returned to initial state(Position ④).**
B Interval Delay Ⓐ	 1. The output turns ON and time progresses when START signal is ON. 2. When the preset value is equal to the display value, the output will turn OFF and the display is held. (Position ①) 3. When the RESET signal is ON, the display value is returned to the initial state. (Position ②) **※If START signal is OFF when the output is OFF the display value is returned to initial state. (Position ③)**
C ON Delay Ⓑ	 1. Time proceeds when START signal is ON. 2. When the preset value is equal to the display value the output will turn ON and the display is held. 3. When the RESET signal is ON, the display value is returned to the initial state. **※When start signal is applied repeatedly(Position ①), only the initial signal is recognized.** **※Even if the START signal is not applied, time progresses. (Position ②)**
D Flicker Ⓐ	 1. Time progresses repeatedly when the START signal is ON. 2. The output operates from NC to NO, and from NO to NC repeatedly. 3. If RESET signal is ON, it is reterned to initial state. (Position ①) **※If the START signal is OFF, the display value and output is returned to initial state. (Position ②)**
E Flicker Ⓑ	 1. Time progresses repeatedly when the START signal is ON. 2. The output operates from NC to NO, and from NO to NC repeatedly. 3. If RESET signal is ON, it is returned to initial state. (Position ③) **※When START signal is applied repeatedly, only the initial signal is recognized. (Position ①)** **※Even if the START signal is not applied, time progresses. (Position ②)**

※Initial state : The output is OFF, the display value is "0". (At Up mode)
The output is OFF and the display value is the setting value(At Down mode)

※When using D, E output operation modes, if the time is set too short, the output may not work properly.
Please set the time at least over 100ms.

▣LE3S output operation mode

T=Preset value, T=T1+T2+T3, T >Ta

Mode	Time chart
F One-shot Out Flicker	 1. Time progresses from initial value to the preset value repeatedly and the output operates as one-shot (0.3sec), when the START signal is ON. (Position ①) 2. If the RESET signal is ON, it is returned to initial state. (Position ③) **※When START signal is applied repeateadly, only the initial signal is recognized. (Position ②)**
H OFF Delay	 1. The START signal & the output are ON at the same time. The output will return and the display value is held after the preset time. 2. If the RESET signal is ON, the display value is returned to initial state. **※If the START signal is applied continuously, the output will be ON but time is not progressing. (Position ①)**
K ON/OFF Delay	 1. When the START signal is ON the output is ON the output will be reset and display value is held when preset value is equal to display value. 2. The START signal turns OFF, the output turns ON, the output will be reset and display value is held when preset value is equal to display value, 3. If RESET signal is ON, it is returned to initial state. **※If START signal is applied repeatedly, output keeps ON but be sure that the time will be initialized.**
L Interval Delay Ⓑ	 1. When START signal is ON, the output turns ON and the time is progressing at the same time. 2. When the time reaches at the preset value the output will be reset, and the display value is held. 3. If RESET signal is applied, the display value is returned to initial state. **※When START signal is applied repeatedly, only the initial signal is recognized.** (Position ①)
N Integration Time	 1. When START signal is ON, the time proceeds. 2. If START signal turns off before the display value reaches the preset value, the time(display value)will be held. 3. If RESET signal is ON, it is returned to initial state.

※Initial state : The output is OFF, the display value is "0". (At Up mode)
The output is OFF and the display value is setting value. (At Down mode)

※※When using F output operation modes, if the time is set too short, the output may not work properly.
Please set the time at least over 100ms.

▣Proper usage

⚠Caution

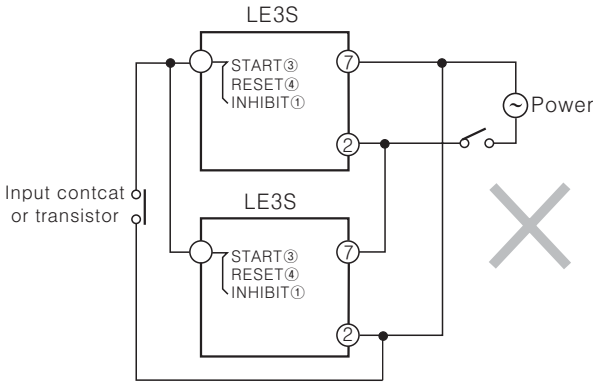
It may give an electric shock if touch the input signal terminal(Between Start, Reset, Inhibit and ② terminal) when the power is supplied.

◎Power connection

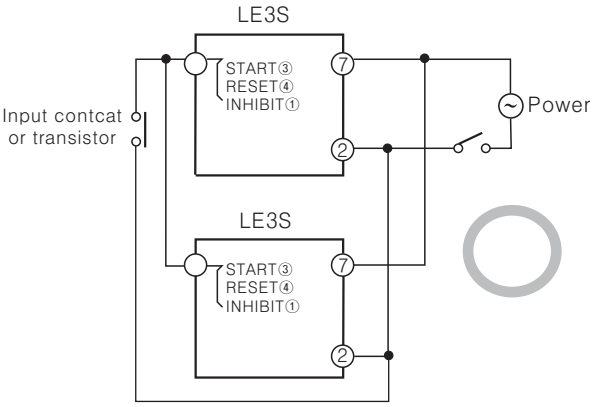
- Connect AC power line between (②−⑦) for LE3S AC power type.
  But please aware power connection for DC power type. (② ← ⊖ , ⑦ ← ⊕)
- When turning off power, be sure about inductive voltage, residual voltage between(②−⑦) terminals, it may cause problem with low voltage because power consumption is low and impedance is high.
  (If using power line in with another high voltage line or energy line in the same conduit, it may cause inductive voltage. Therefore please use seperate conduit for power line).
- Power ripple should be under 10% and power supply should be within range of allowable voltage for DC power type.
- Please supply power quickly as using a switch or relay contact, otherwise it may cause timing error.
- When using SSR(Solid State Relay) for switching power source of Timer, dielectric strength voltage should be 2 times higher than power source.

◎Input/Output

- Please check operation mode of this unit before connecting the power.
- If setting「000」for operation time, output may not work.
- When using a relay contact as input signal, please use a contact that can function reliable at 5VDC 2㎂(Short circuited:Contact resistance under 1kΩ, Open circuit:Residual voltage under 0.5V).
- In case of connectiing START terminal (③) and power terminal(②) of LE3S, do not start time at the same time applying power.
  Please use relay contact or transistor to start.
  (If starting time at the same time applying power, it will occur time error)
- Please supply power to LE3SA, LE3SB after checking operation specification.
- LE3S is transformer−less type, therefore please check following for connecting a relay contact, input signal and transistor.
  ①When connecting 2 or more than 2 Timers with 1 relay contact for input or transistor, please connct as following <Fig. 2 >.

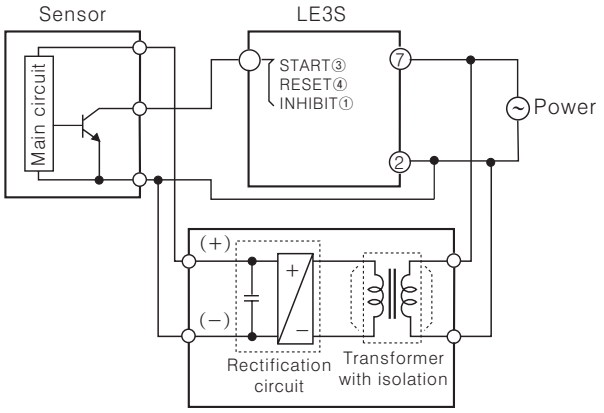


< Fig. 1 >



< Fig. 2 >

②Please use transformer with primary and secondary isolated power for input.



<External sensor power supply >

DIN size W48×H48mm, Digital LCD Timer(Back Light type)

▣Features

- ●Built in battery allows program change with power off
- ●Power supply : 100−240VAC 50/60Hz / 24−240VDC
- ●Wide range of time settings(0.01sec. ~ 9999hour)
- ●Lock function for saving data
- ●Various output modes
- ●Soft touch setting type
- ●High visibility LCD display with backlight
- ●Independent ON/OFF times can be programmed in flicker output mode

⚠ **Please read "Caution for your safety" in operation manual before using.**

CE

▣Ordering information

L E 4 S □

	Time limit 1c
A	Time limit 2c, Instantaneous 1c+Time limit 1c(Selectable)
S	DIN Size W48mm×H48mm
4	9999(Digit)
E□	Timer
L	LCD Display

▣Specifications

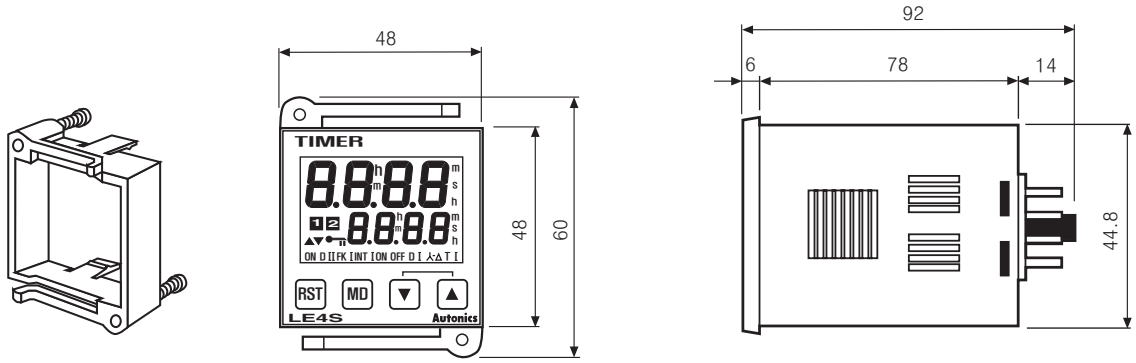
Model		LE4S	LE4SA
Function		Multi operation, Multi time range	
Display method		Backlight LCD type(Character size ☞ Processing part:W6.3×H10mm, setting part:W4×H7.6mm)	
Power supply		100−240VAC 50/60Hz / 24−240VDC	
Allowable voltage range		90 ~ 110% of rated voltage	
Power consumption		Approx. 3VA(240VAC 60Hz), Approx. 1W(240VDC)	
Return time		Min. 200ms	
Min. input signal	START input	Min. 200ms	————
	INHIBIT input		
	RESET input		
Input	START input	●No−voltage input Short−circuit impedance : Max. 1kΩ Residual voltage : Max. 1V Open−circuit impedance : Min. 100kΩ	POWER ON START type
	INHIBIT input		
	RESET input		
Control output	Contact type	Time limit SPDT(1c)	Time limit DPDT(2c), Time limit SPDT(1c) + Instantaneous SPDT(1c):Selectable
	Contact capacity	NO : 250VAC 3A resistive load, NC : 250VAC 2A resistive load	
Relay life cycle	Mechanical	Min. 10,000,000 operations	
	Electrical	Min. 100,000 operations at 250VAC 2A resistive load	
Memory retention		10 years at 25℃ and when LCD and input key turns OFF, 40 days at 25℃ and when LCD and input key turns ON continually	
Output mode		10 kinds of operating mode	7 kinds of operating mode
Ambient temperature		−10 ~ +55℃(at non−freezing status)	
Storage temperature		−25 ~ +65℃(at non−freezing status)	
Ambient humidity		35 ~ 85%RH	

▣Specifications

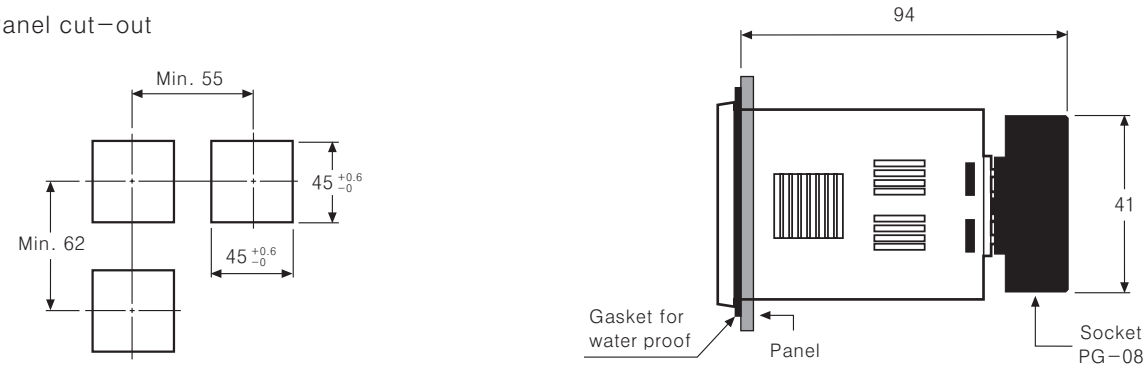
Repeat error		Max. ±0.01% ±0.05sec(Power Start) Max. ±0.005% ±0.03sec(Signal Start)	
Setting error			
Voltage error			
Temperature error			
Insulation resistance		Min. 100MΩ(at 500VDC)	
Dielectric strength		2000VAC 50/60Hz for 1 minute	
Noise strength		±2kV the square wave noise(pulse width:1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1hour	
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s² (30G) in X, Y, Z directions for 3 times	
	Malfunction	100m/s² (10G) in X, Y, Z directions for 3 times	
Approval		CE	
Weight		Approx. 126g	Approx. 130g

▣Dimensions

●Bracket



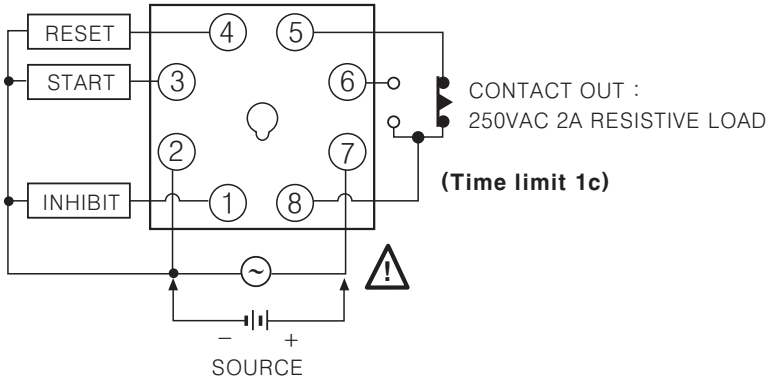
●Panel cut-out



Unit:mm

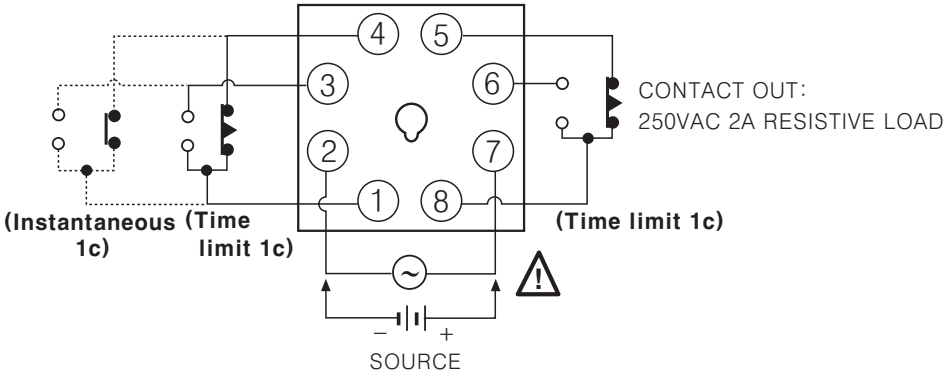
▣Connections

◎**LE4S**



◎**LE4SA**

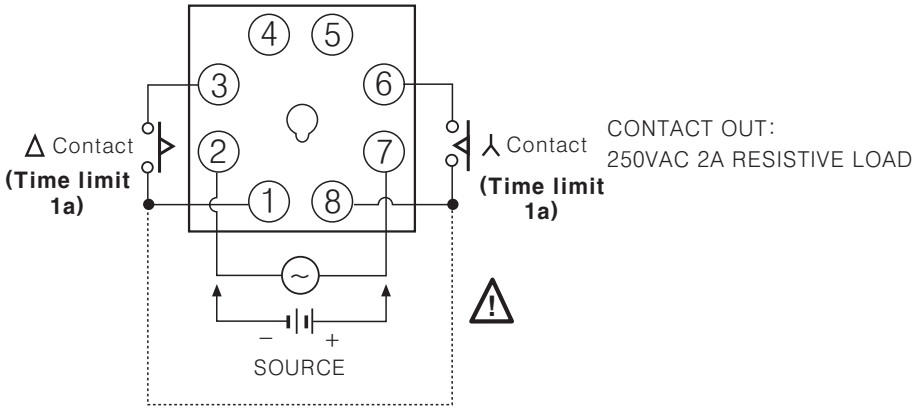
●[**ON.D**] [**ON.D.II**] [**FK**] [**INT**] [**T**] [**T.I**] mode



※[**ON.D**] [**ON.D.II**] [**FK**] [**INT**] mode : Instantaneous 1c + Time limit 1c, Time limit 2c(Selectable)
(See B−24 for selecting the output contact)

※[**T**] [**T.I**] mode : Fixed Time limit 2c

● [⅄-Δ] mode

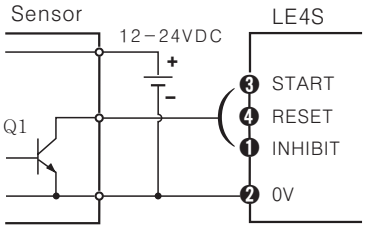


※Please connect ①, ⑧ from external.

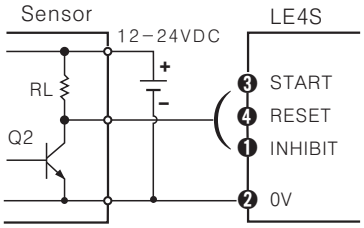
▣Input connections

LE4S is No-voltage input(Short-circuit and open) type.

◎Solid-state input

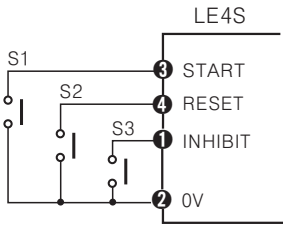


●Q1 is ON : Operating
●Sensor : NPN open collector output
●Short-circuit level(Transistor:ON)
Residual voltage : Max. 1V,
Impedance : Max. 1kΩ
●Open-circuit level(Transistor OFF)
Impedance : Min. 100kΩ



●Q2 is ON : Operating
●Sensor : NPN universal output

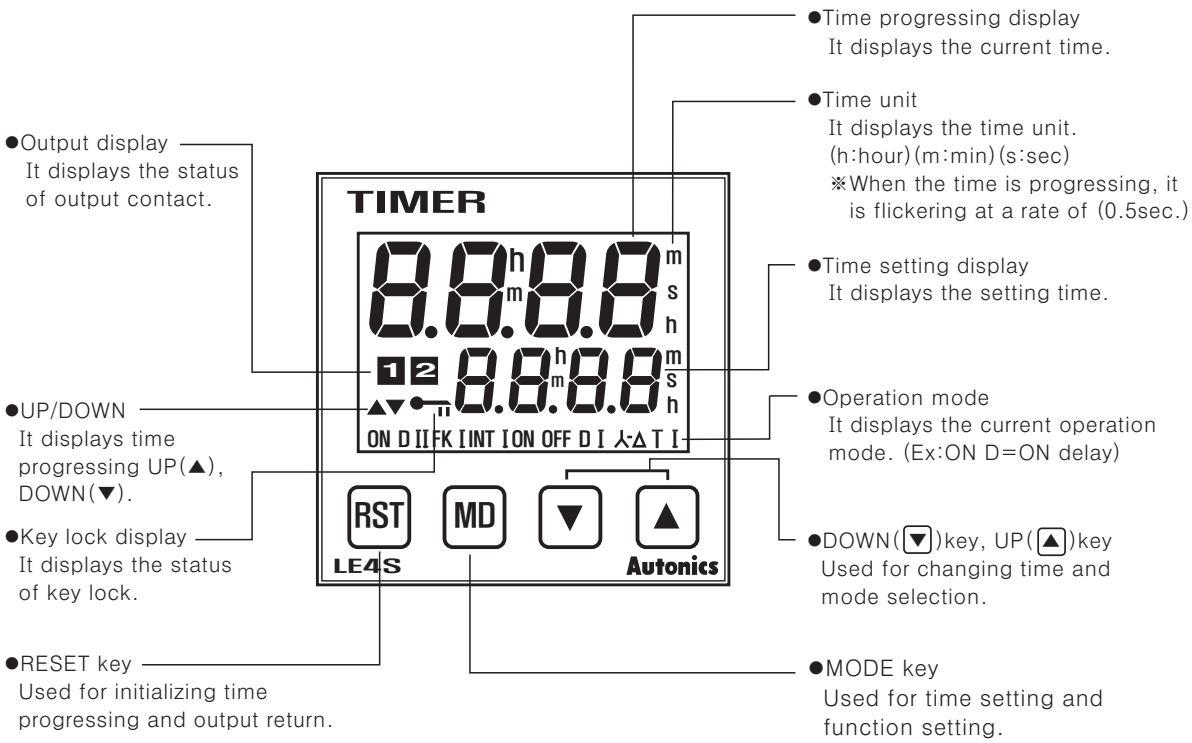
◎Contact input



●S1, S2, S3 are ON : Operating
●Please use a contacts that can function reliably at 5VDC 1mA.

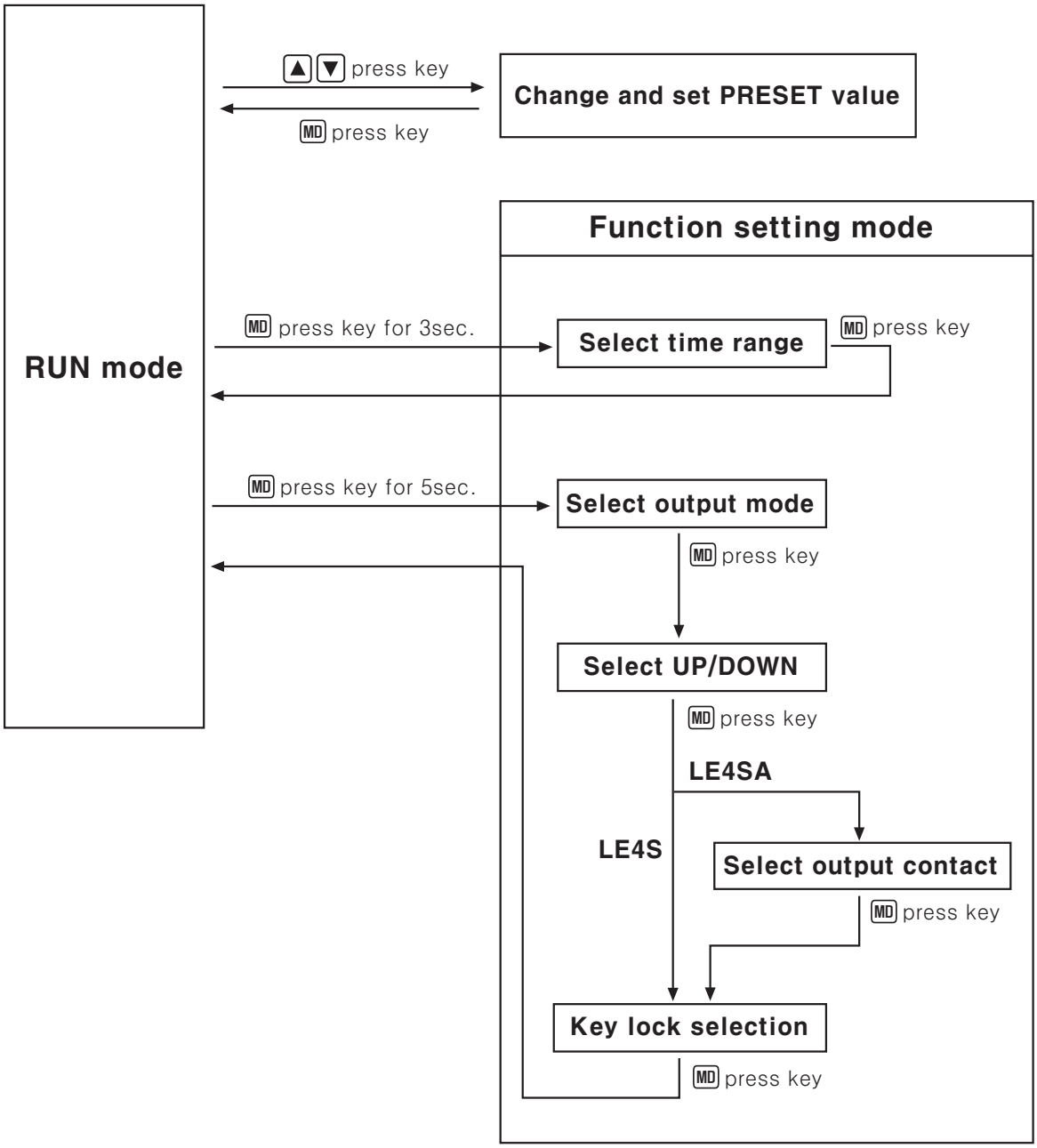
※Be cautions about the connecting since power terminal and signal input terminal are not insulated.

▣Front panel identification



▣Operation flow chart

This is the operation flowchart of **LE4S and LE4SA**. (See B-23~27 for the specific description)
Always program the Timer range, the output operation mode and the setting value in that sequence.
Note) If changing the previous output operation mode, the setting value might be deleted.

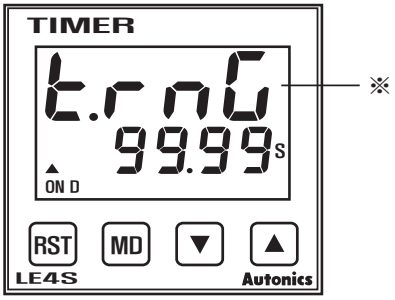


◎Factory Default setting

Model	Output mode	Up/Down mode	Output contact	Time range	Key lock
LE4S	ON DELAY	UP	Time limit 1c	99.99sec	LoFF(Lock off)
LE4SA	ON DELAY	UP fixed	Time limit 1c + Instantaneous 1c	99.99sec	Lock1(RST key inhibited)

■Time range (MD press key for 3sec)

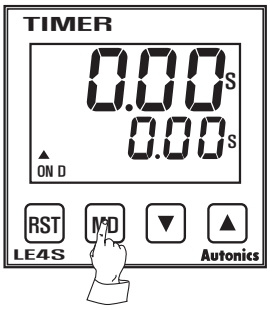
●Time range specification



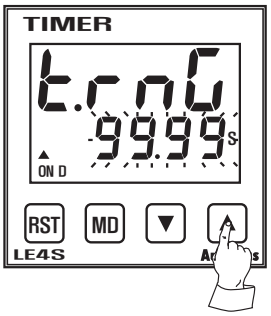
※t.rnG is displayed characteristic in LCD of Time range. It will be displayed continuously until the time range selection is completed.

Time range	Time range specification
99.99s	0.01sec ~ 99.99sec
999.9s	0.1sec ~ 999.9sec
9999s	1sec ~ 9999sec
99m59s	1m01sec ~ 99min 59sec
999.9m	0.1min ~ 999.9min
9999m	1min ~ 9999min
99h59m	1h01min ~ 99hour 59min
99.99h	0.01hour ~ 99.99hour
999.9h	0.1hour ~ 999.9hour
9999h	1hour ~ 9999hour

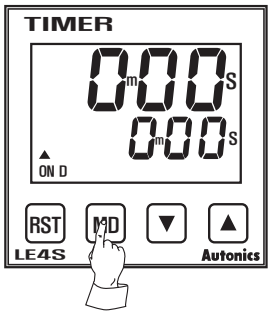
●Time range selection method(**99m 59sec**)



(Picture 1)



(Picture 2)

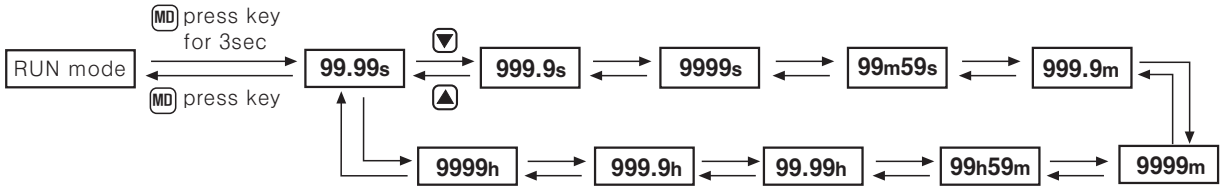


(Picture 3)

1) Pressing MD key for 3sec.in RUN mode, it will enter into Time range selection mode. (Picture 1)
2) After entering into the time range mode, "**99.99s**" will be displayed as factory default setting. (Picture 2)
3) Select time range as **99m59s** by pressing ▼ and ▲ keys (Press ▲ key 3times)
4) Press MD key and Time range selection will be completed and return to RUN mode. (Picture 3)

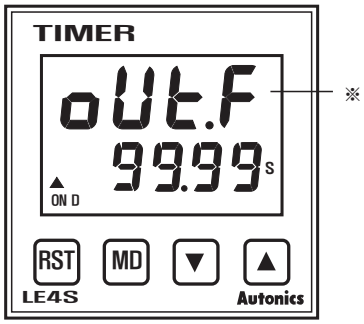
※If no keys touched for 30sec., it will return to RUN mode.
※Pressing MD key, output contact(1c.1c) of factory default setting(**LE4SA**) will be displayed before entering into setting mode.

※Time range flow chart



▣Output operation mode and function selection(MD press key for 5sec)

●Output operation mode by each model

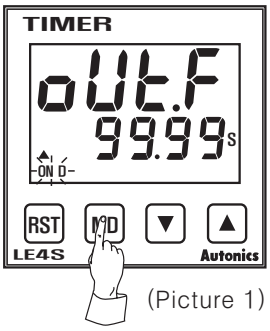


※"oUt.F" is a displayed characteristic in LCD display. It will be displayed continuously until the output operation selection is completed.

NO	Display	LE4S	LE4SA	Note
1	ON D	ON DELAY	ON DELAY	
2	ON D I	ON DELAY1	Non function	
3	ON D II	ON DELAY2(One-shot out)	ON DELAY2	※1
4	F K	FLICKER	FLICKER	※2
5	F K I	FLICKER1	Non function	
6	INT	INTERVAL-DELAY	INTERVAL-DELAY	
7	INT I	INTERVAL-DELAY1	Non function	
8	ON OFF D	ON-OFF DELAY	Non function	
9	ON OFF D I	ON-OFF DELAY1	Non function	
10	OFF D	OFF DELAY	Non function	
11	人-Δ	Non function	人-Δ TIMER	
12	T	Non function	TWIN TIMER	
13	T I	Non function	TWIN TIMER 1	

(※1)Output of **ON D II**mode is One-shot output and output operation time is fixed as 0.5sec.
(※2)Able to set Ton and Toff time differently in "FK, FK 1".

●Output operation selection



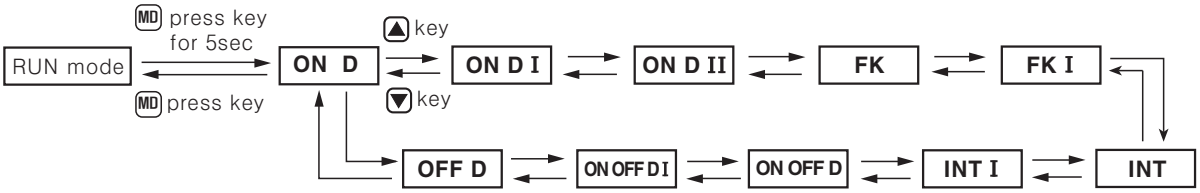
(Picture 1)

1)Pressing MD key for 5sec.in RUN mode, it will enter into output operation selection mode then "ON D"will flicker. (Picture1)
2)After selecting output operation mode by pressing ▼, ▲ key then press MD key.
※▲ key : Shift to CW
※▼ key : Shift to CCW
3)Pressing MD key to complete output operation then will move to UP/DOWN selection mode.

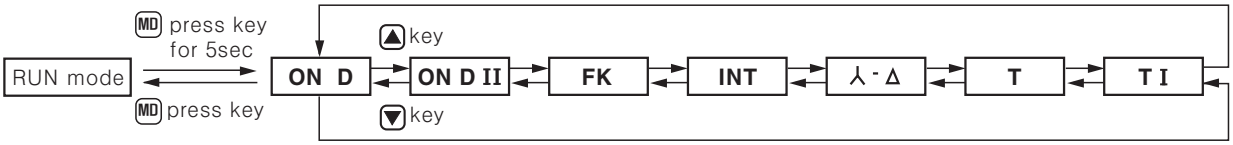
※If no key touched for 30sec. it will return to RUN mode
※Pressing MD key, output contact(1c.1c) of factory default setting(**LE4SA**) will be displayed before entering into setting mode.

※Output operation mode flow chart

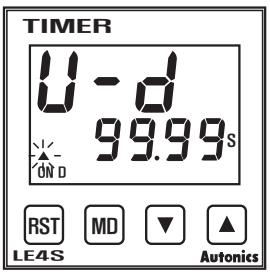
〈LE4S 〉



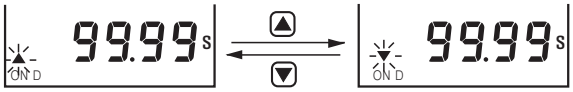
〈LE4SA 〉



●UP/DOWN selection



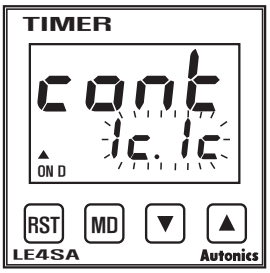
1) After entering into this mode, "U−d"will be displayed then "▲" will flicker.
2) After selecting UP(▲), DOWN(▼) by pressing ▼, ▲ then press MD key.



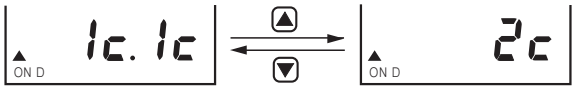
3) Press MD key, UP/DOWN will be completed then move to key lock(LE4S) mode or move to output contact selection mode(LE4SA).

※"U-d " is a display of UP−DOWN in LCD display.It will be displayed continuously until the selection is completed.
※If no key touched for 30sec., it will return to RUN mode.

●Output contact selection(Available in **LE4SA** only)



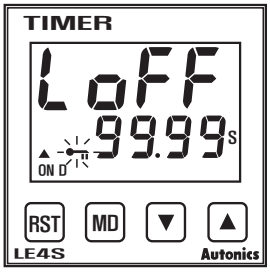
1) Factory default setting is Instantaneous 1c + Time limit 1c.
2) Select proper output contact for output operation mode by ▼ and ▲ key.



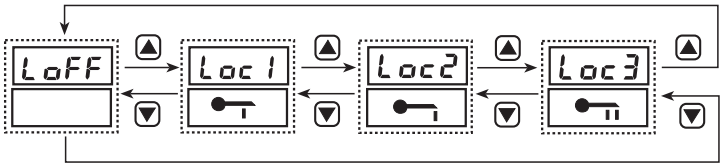
3) After selecting output contact then press MD key.
4) Pressing MD key will complete output contact selection then move to key lock selection mode.

※Pressing MD key in RUN mode, will enable you to check the output contact. Be sure not to press MD more than 3 sec. (It will enter into another mode)
※"cont" is a displayed characteristic of output contact in LCD display.It will be displayed continuously until the selection is completed.
※If no key touched for 30sec., it will return to RUN mode.

●Key Lock selection

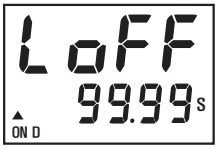


1) Factory default setting is Lock OFF.
2) Please select Key Lock by pressing ▼, ▲.

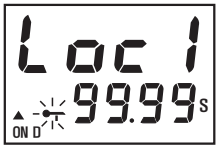


3) Press MD key to complete key lock selection and then return to RUN mode.
※If no key touched for 30sec., it will return to RUN mode.

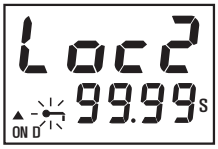
※Key Lock function



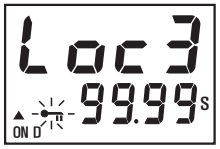
Lock mode turns off



RST key cannot use



▼, ▲ key cannot use at setting time range and mode.

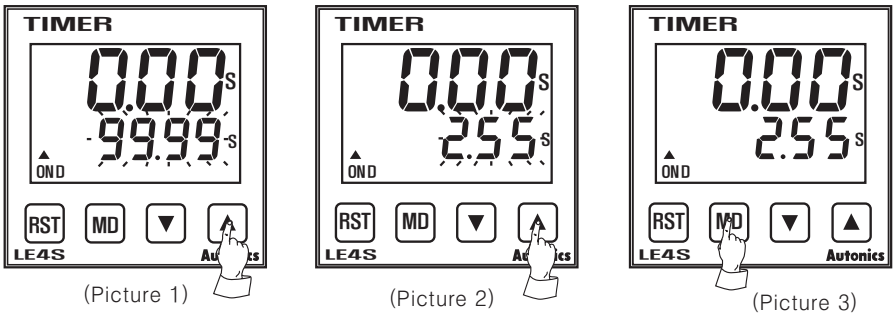


RST key, ▼, ▲ key cannot use

■The time setting

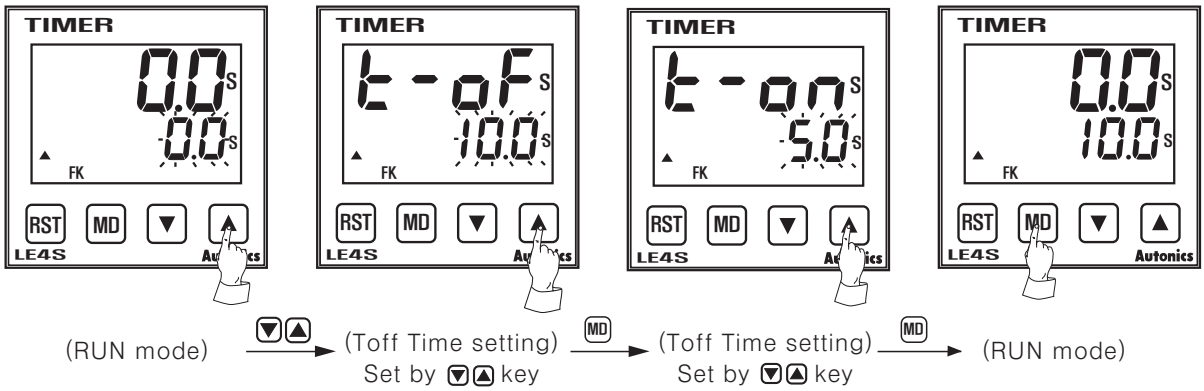
Please set operation time according to following instruction as the setting is different depending on the output operation mode.

●Output operation mode : **ON D, OND I, OND II, INT, INT I, ON OFF D, ON OFF D I, OFF D**



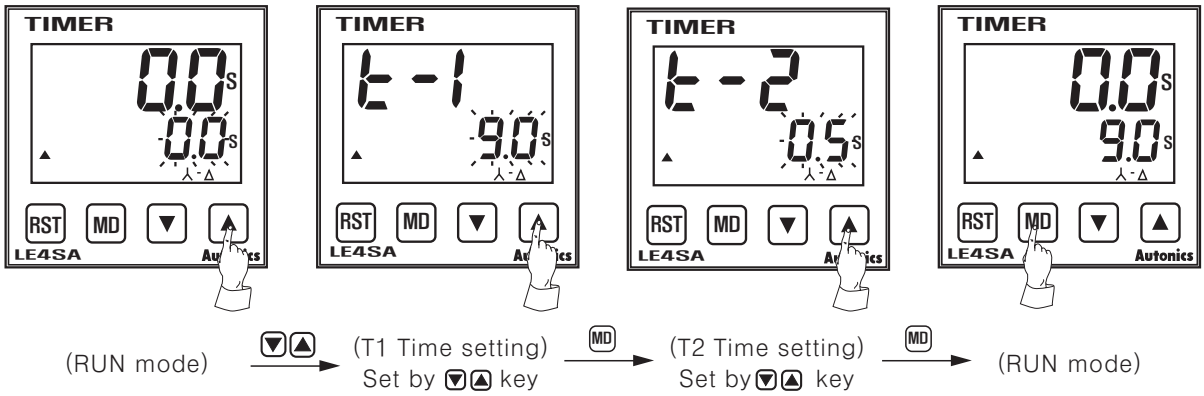
1) Display of setting time will be flickering when you press ▼ or ▲ key at RUN mode. (Picture 1)
2) And then set the setting time with ▼ or ▲ key. If you press ▲ key once, it will increase by 1 digit. If you keep it pressed, the number will continually increase. Pressing the key longer than 2sec, will cause the number to increase faster. (Picture 2)
If you press ▼ key once, the number will decrease in the same manner. (Picture 3)
3) When the setting is complete, it will be saved and return to RUN mode by pressing MD key. (Picture 4)
※You change the setting time while the unit is timing.
※If the set value is 0, "Err" will be displayed. ("Err" will be removed by pressing ▼ , ▲ key)
※If no key touched for 30sec., it will return to RUN mode.

●Output operation mode : **FK, FK I (**There is no **[FK I]** in **LE4SA)**



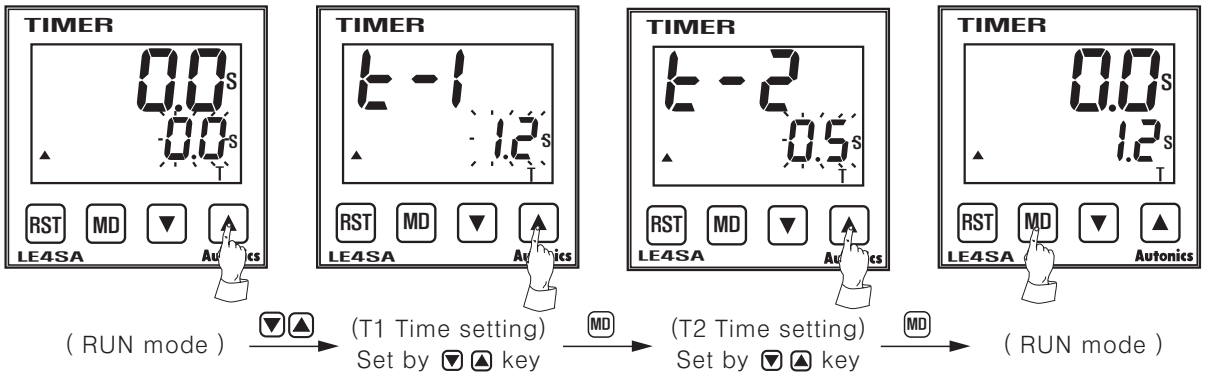
※Ton and Toff can be set differently.

●Output operation mode : START – DELTA (⅄-Δ) (**LE4SA only.**)



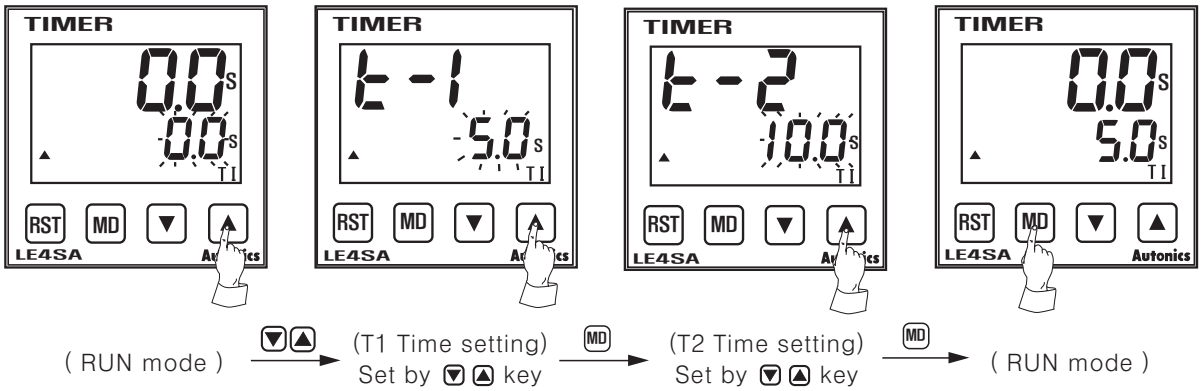
※T1 : Setting time, T2 : ⅄-Δ switching time
※ T1 setting time range : 0.1s~9999h, T2 setting time range : 0.05s~9999h
☞ If T2 is longer than 0.05sec, "Err" will be displayed.

●Output operation mode : TWIN TIMER [**T**] (**LE4SA** only)



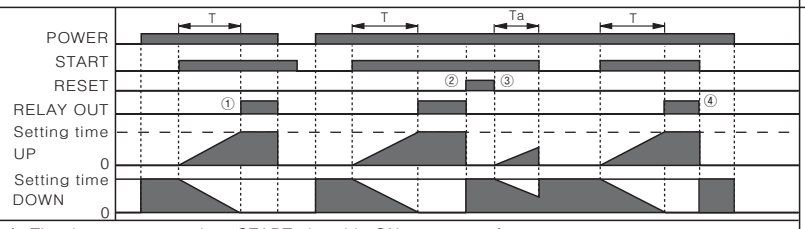
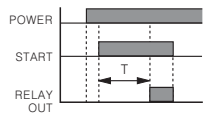
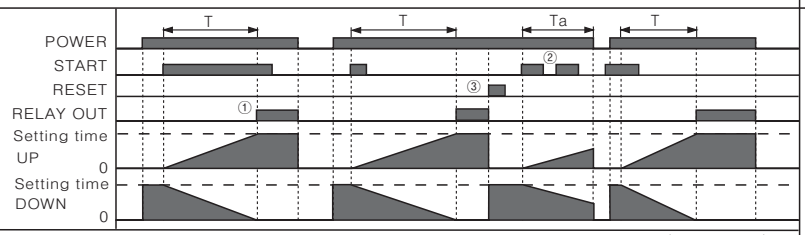
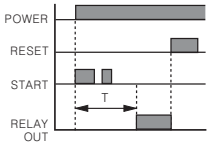
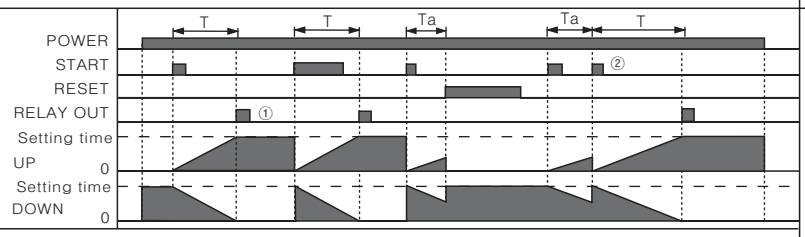
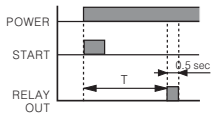
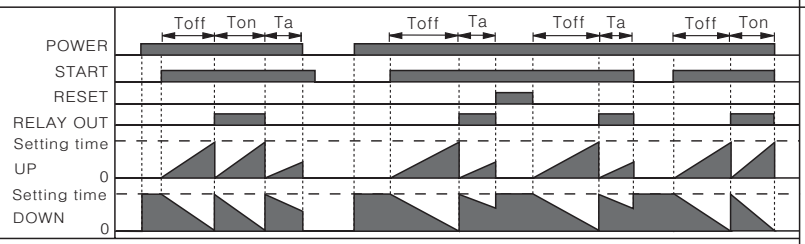
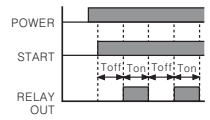
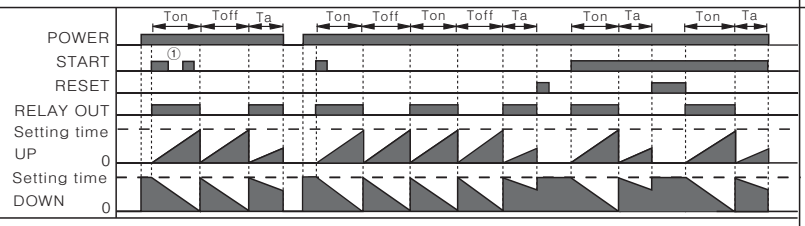
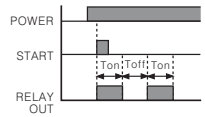
※T1 and T2 can be set differently.

●Output operation mode : TWIN TIMER(**T I**) (**LE4SA** only)



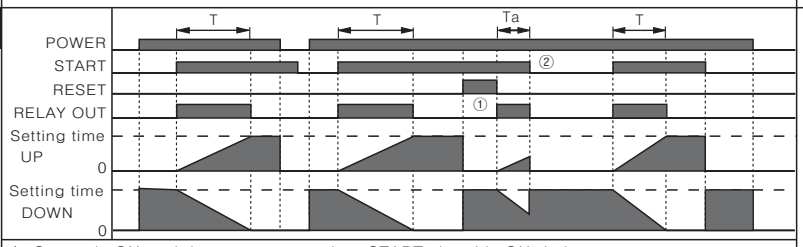
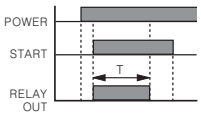
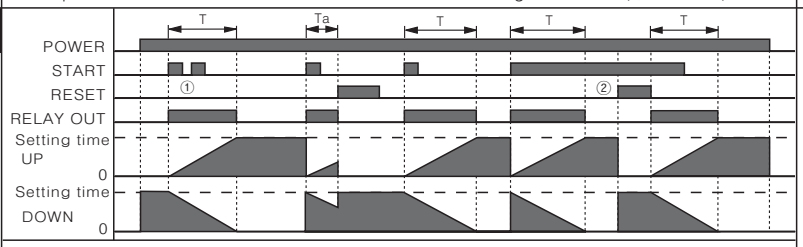
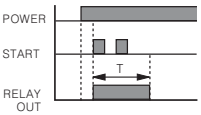
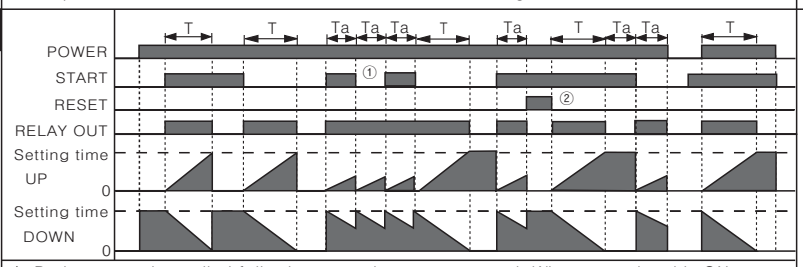
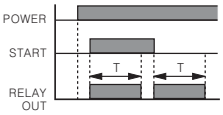
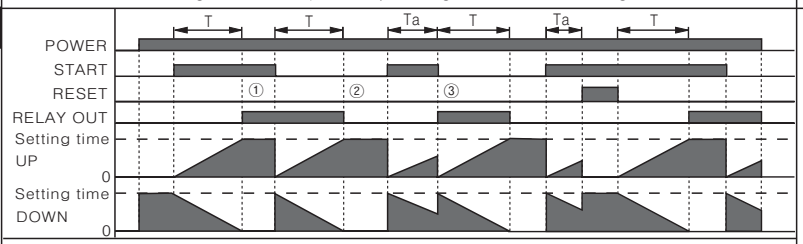
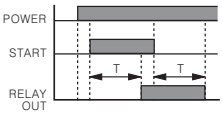
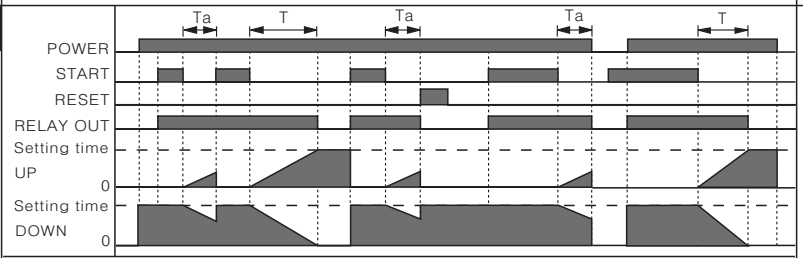
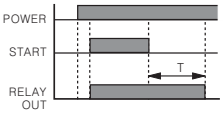
※T1 and T2 can be set differently.

▣LE4S Time charts(Output mode)

Mode	Time chart	Operation
[ON.D] **ON-Delay** T >Ta	 1. The time progress when START signal is ON at status of power on. 2. Output(Relay output) turns on at setting time. (Position ①) 3. Output and display value will be initialized when RESET signal is ON.(Position ②) 4. The time will progress when RESET signal is OFF.(Position ③) 5. When START signal is OFF, time progressing will be initialized and output is returned. (Position ④)□	 T = Setting time
[ON.D.I] **ON-Delay 1** T >Ta	 1. Time progress when START signal is ON, output will be ON at setting time. (Position ①) 2. Even though the START signal is applied repeatedly, only the initial signal is recognized. (Position ②) 3. Output and display value will be initialized when RESET signal is ON. (Position ③) 4. When power ON again after power off, then it will be operating as "STEP1".	 T = Setting time
[ON.D.II] **ON-Delay 2** **(One-shot output)** T >Ta	 1. The time progress when START signal is ON at status of power on. 2. Output will be ON for 0.5sec(one-shot output) at setting time and then OFF. (Position ①) 3. If START signal is ON again while time is progressing, the time progressing will be initialized then progress again. (Position ②)	 T = Setting time
[F K] **Flicker** **(Ton=Toff)** Ton, Toff >Ta	 1. Output will be OFF for T-OFF time when START signal is ON and then ON status will be held for T-ON time and then OFF again. 2. T-ON is the time while output is ON, T-OFF is the time while output is OFF. 3. T-ON & T-OFF can be set individually. 4. T-OFF time start in [FK] mode first.	 Ton, Toff = Setting time Able to set T-ON and T-OFF time differently.
[FK.I] **Flicker 1** **(Ton=Toff)** Ton, Toff >Ta	 1. Output is ON and OFF repeatedly at setting time when START signal is ON. 2. Even though the START signal is applied repeatedly, only the initial signal is recognized. (Position ①) 3. Output and display value return to initial status when RESET signal is applied. 4. T-ON time start in [FK. I] mode first.	 Ton, Toff = Setting time Able to set T-ON and T-OFF time differently.

※Initial status : UP mode-display value is "0", output is "OFF".
DOWN mdoe-display value is "setting time", output is "OFF".

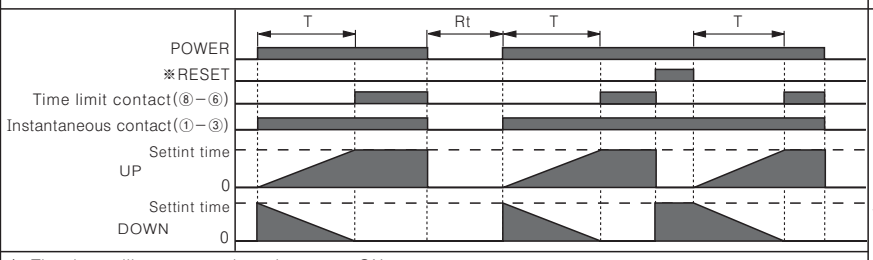
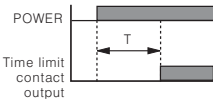
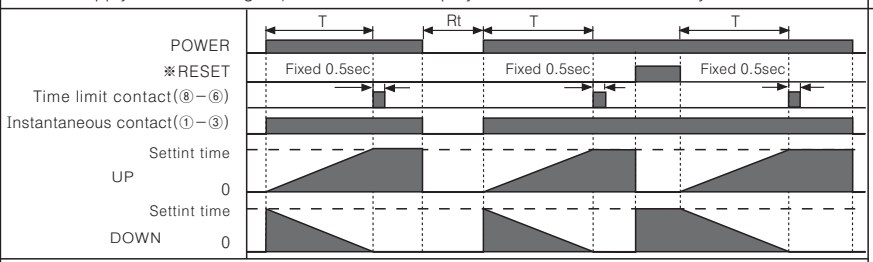
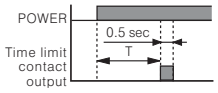
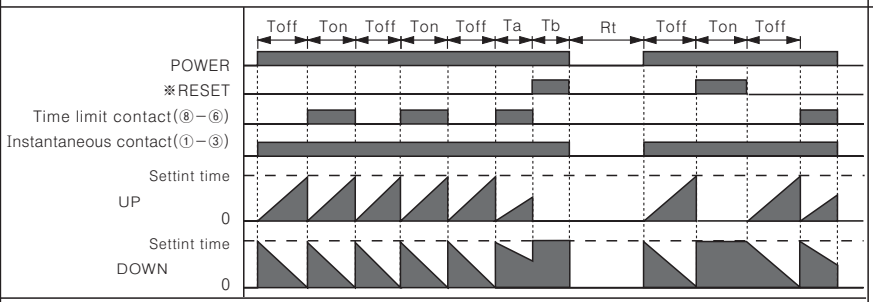
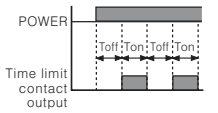
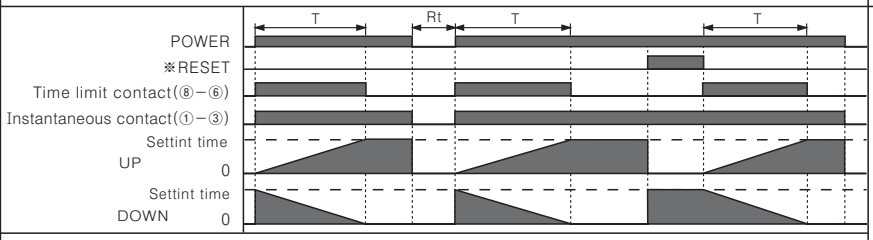
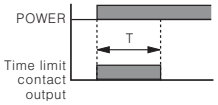
▣LE4S Time charts(Output mode)

Mode	Time chart	Operation
[INT] **Interval-Delay** T >Ta	 1. Output is ON and time processes when START signal is ON during power. 2. When processing time reaches to setting time, the output will be OFF and the display value will be held. 3. Applying reset signal, display value will return to "0" and then start again from number 1. (Position ①) 4. Output and the time return to initial status when START signal is OFF. (② Position)	 T = Setting time
[INT. I] **Interval-Delay 1** T >Ta	 1. Output is ON and time processes when START signal is ON during power. 2. When processing time reaches to setting time, the output will be OFF and the display value will be held. 3. Applying reset signal, display value will return to "0" and it is operated when start signal is appled. (Position ②) 4. Output and the time return to initial status when START signal is OFF. (② Position)	 T = Setting time
[ON.OFF.D] **ON-OFF-Delay** T >Ta	 1. During power is applied following operations are repeated. When start signal is ON, output is OFF. When start signal is OFF, output is ON, and when processing time is equal to setting time is OFF. 2. If the START signal is applied repeatedly, the output keeps ON status, progressing time will return to initial status. (① Position) 3. When the START signal turn on, the output is on for the setting time. When the START signal turns off, the output is again on for the setting time.	 T = Setting time
[ON.OFF.D. I] **ON-OFF-Delay 1** T >Ta	 1. After the START signal is ON, the output will be ON after setting time(① Position). When the START signal becomes OFF, the output will be OFF after setting time. (Position ②) 2. When the START signal shorter than the setting time, the output will be ON when START signal becomes OFF then the output will be OFF after the setting time. (Position ③) 3. RESET signal is ON, the progressing time and output will return to the initial status.	 T = Setting time
[OFF.D] **OFF-Delay** T >Ta	 1. Output is ON when START signal is applied.Timing begins when START signal is off. The output will be OFF after the setting time. 2. RESET signal is ON, the progressing time and output will return to the initial status.	 T = Setting time

※Initial status : UP mode−display value is "0", output is "OFF".
DOWN mode−display value is "setting time", output is "OFF".

▣LE4SA Time charts(Output mode)

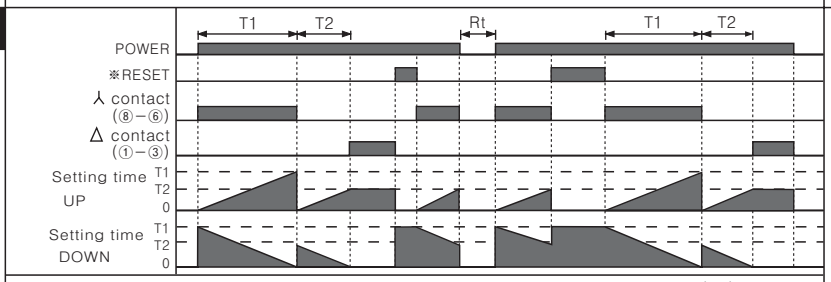
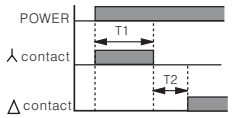
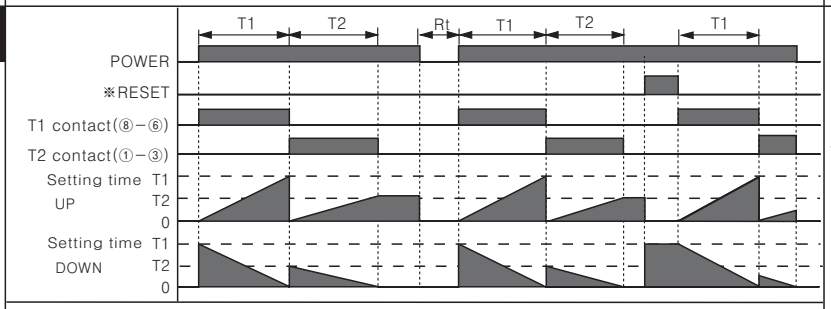
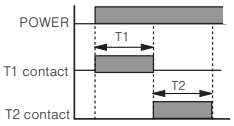
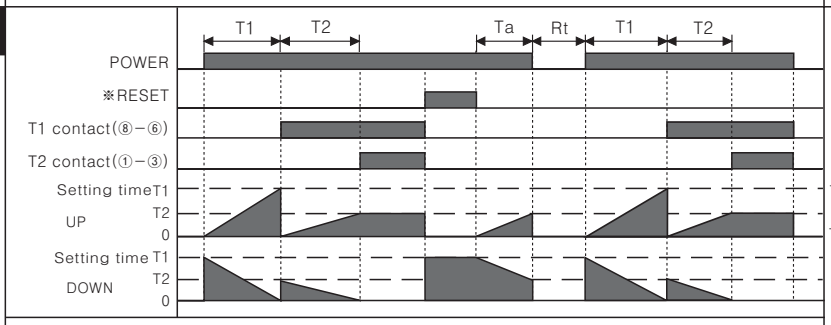
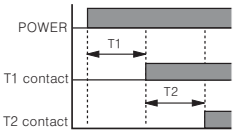
Rt : Return time(Min. 200ms)

Mode	Time chart	Operation
[ON.D] **ON-Delay**	 1. The time will progress when the power ON. 2. Time limit contact will be ON, when the progressing time reaches to the setting time at the Time limit 2c output mode. 3. When set Time limit contact 1c + Instantaneous contact 1c output mode, Time limit will be ON at the setting time, instantaneous contact will be ON and OFF by power on and off. 4. When the power is cut off, Time limit contact, Instantaneous contact, display value will be initialized. When apply the RESET signal, Time limit and display value will be initialized only.	 T = Setting time
[ON.D. II] **ON-Delay 2 (One-shot output)**	 1. The time will progress when the power ON. 2. When set Time limit contact 2c output mode, Time-limit contact will be ON at the setting time, then OFF after one-shot output(Fixed 0.5sec) 3. When set Time limit contact 1c + instantaneous contact 1c output mode, Time limit will be ON at the setting time then OFF after One-shot output(Fixed 0.5sec.). The instantaneous contact will be ON and OFF by power on and off. 4. When the power is cut off, Instantaneous contact, display value will be initialized. When apply the RESET signal, display value will be initialized only.	 T = Setting time
[F K] **Flicker (Ton=Toff)** Ton, Toff >Ta, Tb	 1. The time will progress when the power ON. 2. When set Time limit contact 2c, Time limit contact will be OFF for T-OFF setting time then ON for T-ON setting time after T-OFF time. It will be OFF/ON for the setting time(T-OFF/T-ON) before applying RESET or removing power. 3. When set Time limit contact 1c+Instantaneous contact 1c output mode, Time limit will be OFF/ON repeatedly for T-OFF/T-ON setting time.	 Ton, Toff = Setting time Able to set T-ON and T-OFF time differently.
[INT] **Interval -Delay**	 1. The time will progress when the power ON. 2. When set Time limit contact 2c, Time limit contact will be ON at the power on. Then it will be OFF after the setting time. 3. When the power is cut off, Time limit contact, Instantaneous contact, display value will be initialized. When apply RESET signal, Time limit and display value will be initialized.	 T = Setting time

※Initial status : UP mode-display value is "0", output is "OFF".
DOWN mode-display value is "setting time", output is "OFF" .
※Instantaneous contact will be returned when power is off.
※RESET Key can be used at Loff or Loc2 setting only.

▣LE4SA Time charts(Output mode)

Rt : Return time(Min. 200ms)

Mode	Time chart	Operation
⅄-Δ **STAR-DELTA** **(Output will be set automatically to Time limit 2c)**	 1. When the power on, ⅄ contact will be ON then OFF after the setting time(T1). And Δ contact will be ON after switching time(T2). 2. When cut the power off or apply the RESET signal, ⅄-Δ contact will be OFF then display value will be initialized. And it will be run again when the power on or RESET signal is OFF. 3. If set T2(⅄-Δ changeover time) less than 0.05sec., "Err" will be displayed. ※T1:Setting time, T2: ⅄-Δ switching time T1 Setting time: 0.01s ~ 9999h T2(⅄-Δ) Switching time: 0.05s ~ 9999h	 ※T1 : Setting time T2 : Return time (⅄ - Δ Return time)
[T] **TWIN TIMER** **(Output will be set automatically to Time limit 2c)**	 1. T1 contact will be ON at the power on, then OFF after T1 setting time. T2 contact will be ON at T1 contact is OFF, then T2 contact will be OFF after T2 setting time. 2. T1 contact ,T2 contact and the progressing time will be initialized during apply power again or RESET signal is ON to OFF.	 T1, T2 = Setting time Able to set T1 and T2 time differently.
[T. I] **TWIN TIMER 1** **(Output will be set automatically to Time limit 2c)** T1, T2 >Ta	 1.The time will progress when the power is on when progressing time reaches T1setting time. T1 contact will be ON and T2 setting time begin, when progressing time reaches T2 settting time. T2 contact will be ON 2. T1 contact ,T2 contact and the progressing time will be initialized during apply power again or RESET signal is ON to OFF.	 T1, T2 = Setting time Able to set T1 and T2 time differently.

※Initial status : UP mode-display value is "0", output is "OFF".
DOWN mode-display value is "setting time", output is "OFF" .
※Inatantaneous contact will be returned when power is off.
※RESET key is locked by factory default setting, so please use it after cancel the lock.

▣Proper usage

⚠ Caution

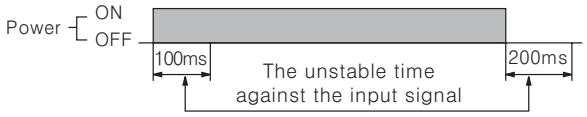
It may give an electric shock if touch the input signal terminal(Between START, RESET, INHIBIT and ② terminal) when the power is supplied.

◎Power connection

- ●Connect AC power line between (②−⑦) for LE4S, LE4SA AC power type. But be aware of power connection for DC power type. (② ← ⊖ , ⑦ ← ⊕)
- ●LE4S, LE4SA work stably within range of rated power. (If using power line with another high voltage line or energy line in the same conduit, it may cause inductive voltage. Therefore please use seperate conduit for power line)

◎Power start

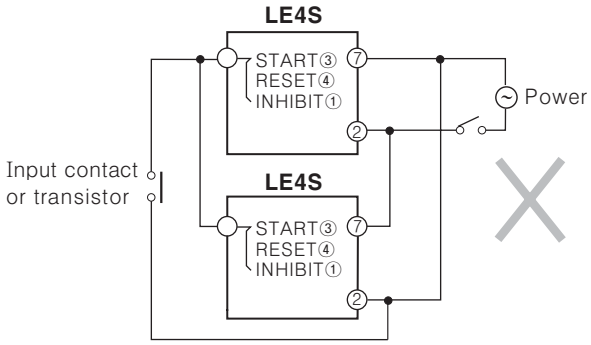
- ●Caution for power rising time(100ms) after power on and power falling time(200ms) after power off.



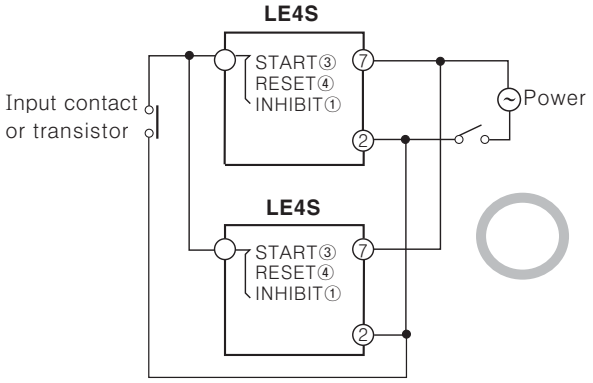
- ●Power start
  LE4SA model is starting after 100ms of applying power(Above picture)
  (Pleaes use over 100ms setting)
  When you need under 100ms setting, please use Signal start type LE4S.
- ●Please supply power quickly as using switch or Relay contact.
  Otherwise it may cause timing error.

◎Input/Output

- ●Power terminal and Input terminal have not been insulated because there is no power transformer in this Timer.
  ①When using the sensor of SSR output type with input terminal of timer, please check whether Double insulated or not.
  ②Please use double insulated relay when connecting relay output with input terminal.
- ●Please use 8pin socket when connecting this Timer with other equipment and do not touch the socket when power on.
- ●Please use Power supply with over current protection circuit.(250V 1A fuse)
- ●When using relay contact as input signal, please use a contact that can function reliable at 5VDC, 1mA.
- ●In case of connectiing START terminal (③) and power terminal(②) of LE4S, do not use it to start at the same time applying power.
  Please use relay contact or transistor to start.
  (It will occur time error under 100ms setting because of rising time of Timer).
- ●LE4S is Transformer Less type, therefore please check following for connecting relay contact for input signal and transistor.
  ①When connecting more than 2 Timers with 1 relay contact for input or transistor, please wire following <Picture 2 >.

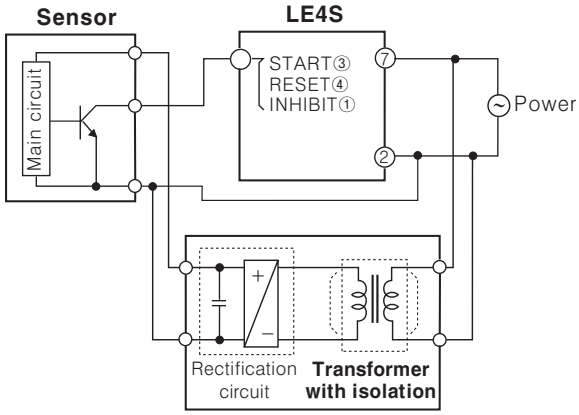


<Picture 1>



<Picture 2>

②Please use transfomer with primary and secondary isolated for input.

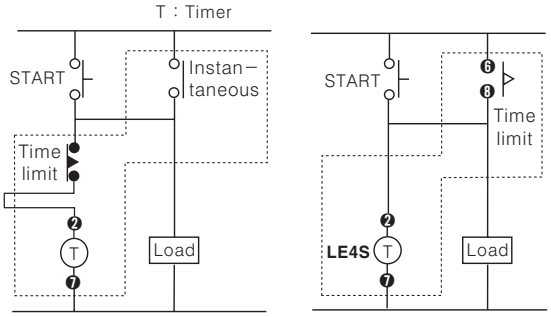


<External sensor power supply>

- Please supply power to LE4SA after checking operation specification.
- If setting 「0000」 for operation time, output may not work.

◎Interval mode

Able to make Instantaneous ON and Time limit OFF (Holding device) with using interval mode.



(Previous) (INTERVAL mode)

◎Change output operation mode and Timer range

If changing output operation mode or Time range, previous PRESET value will be deleted.
But, Up/Down selection mode and Lock mode are exception.

◎Each mode and time setting by internal battery

- You are able to set or change the time setting and function without external power supply because there is a lithium battery built in LE4S, LE4SA.
- If pressing any keys on front after purchasing this product, factory specification will be displayed in LCD window. (But, LCD Backlight and output are OFF) Time range mode, output operation mode, Up/ Down mode, Setting time are set in sequence. LCD backlight will be on after setting complete.
- When turning off
  ①LCD and output are OFF
  ②If pressing any key on front, time progressing will be "0".
  ※LCD Backlight, input signal and output do not work.
  ※If no keys are touched for 30sec after LCD is ON, LCD will be OFF.
  ③At this time, it is able to set or change values of each mode and setting time.
  ④When supplying power again, setting will be saved and time progressing and output will be intialized.

◎Preset value change

- If changing setting value while time progressing, new preset value should be higher than previous preset value. Otherwise output may work while changing setting value.
- If changing setting value while it is running, it will work as changed setting value. Please use LOCK function in order to avoid malfunction.

◎Internal battery

- Data will not be lost when power failure because of internal battery.
- Battery life cycle is about 10years(No key operation). This product can work for 40days without external power supply.(25℃)
- Do not use this product near by fire, there is Lithium battery built in.

◎Noise

We test 2kV, Pulse width 1㎲ against IMPULSE voltage between power terminals and 1kV, Pulse width 1㎲ at noise simulator against external noise voltage. Please install MP condensor(0.1~1㎌) or Oil condensor between power teminals when over IMPULSE noise voltage occurs.

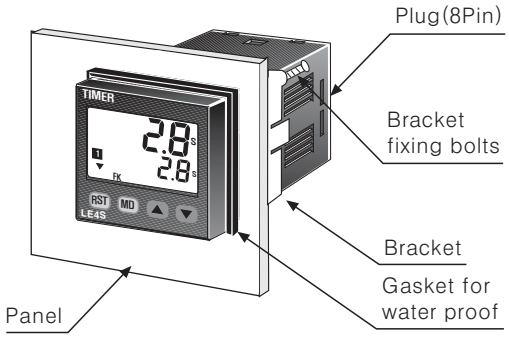
◎Environment

Please avoid the following places;

- Where this product may be damaged by strong impact or vibration.
- Where there are corrosive gas or flammable gas and water,oil, dust exist.
- Where magnetic and electrical noise occurs.
- Where there are high temperature and humidity beyond rated specification.
- Where there are strong alkalis and acids.
- Where there are direct rays of sun.

◎Mounting

1) Insert LE4S, LE4SA into hole on the panel
2) Fix the body by pushing the bracket against the panel
3) Tighten 2 screws in the bracket.



DIN size W72×H36mm, Indication only Counter/Timer

▣Features

- ●Upgraded count speed : 5kps
- ●Wide range of input power supply : 100−240VAC 50/60Hz, 12−24VDC(Option)
- ●Microprocessor controlled
- ●Selectable Counter or Timer function by internal DIP switch
- ●Selectable timing ranges

⚠ **Please read "Caution for your safety" in operation manual before using.**

c UL us

▣Ordering information

FX 4 Y − I

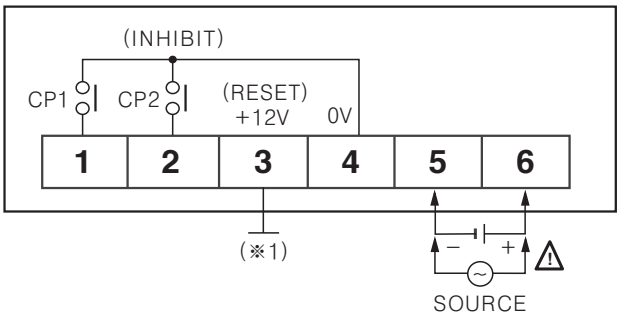
I	Indicator
Y	DIN Size W72×H36mm
4	9999(Digit)
6	999999(Digit)
FX	Counter/Timer type

▣Specifications

※A blacked(□) item is upgraded function.

Model		FX4Y-I	FX6Y-I
Digit		4	6
Digit size		W8×H14mm	W4×H8mm
Power supply		100−240VAC 50/60Hz, 12−24VDC(Option)	
Allowable voltage range		90 ~ 110% of rated voltage	
Power consumption		Approx. 4.5VA(240VAC 60Hz), Approx. 2.5W(24VDC)	
Max. counting speed		**Selectable 30cps/5kcps by internal DIP switch**	
Min. input signal width	INHIBIT input	Min. 20ms	
	RESET input		
Input	CP1, CP2 input	□ No voltage input☞ Impedance at short−circuit : Max. 470Ω, Residual voltage at short−circuit : Max. 1VDC, Impedance at open−circuit : Min. 100kΩ	
	RESET input		
Memory retention		10years(When using non−volatile semiconductor memory)	
Power for external sensor		12VDC±10% 50mA Max.	
Insulation resistance		Min. 100MΩ(at 500VDC)	
Dielectric strength		2000VAC 50/60Hz for 1 minute	
Noise strength	AC Type	±2kV the square wave noise(pulse width:1㎲) by the noise simulator	
	DC Type	±500V the square wave noise(pulse width:1㎲) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1hour	
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions for 3 times	
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions for 3 times	
Ambient temperature		−10 ~ +55℃(at non−freezing status)	
Storage temperature		−25 ~ +65℃(at non−freezing status)	
Ambient humidity		35 ~ 85%RH	
Life cycle		semi−permament	
Weight		AC type:Approx. 126g, DC type:Approx. 130g	AC type:Approx. 128g, DC type:Approx. 132g
Approval		c UL us	

▣Connections

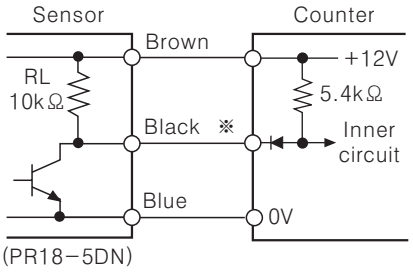


(※1)It can be selected reset or sensor power(+12VDC 50mA) by controlling internal jump pin.
(※2)CP1, CP2 : When using for counter
(※3)INHIBIT(CP2) : Time Hold terminal when using for timer(Connect S/W to ❷+❹ in exterior)
(※4)Operated by a Power ON Start method when it is used as a timer.

▣Input connections

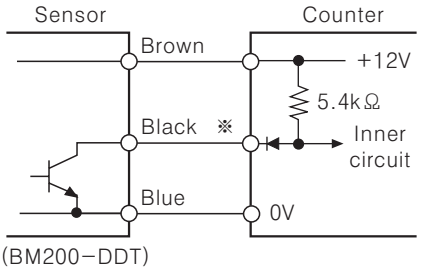
◎Solid-state input

●Standard input sensor : NPN universal output type sensor



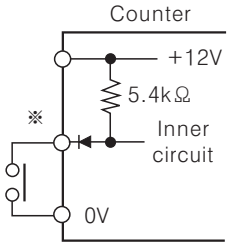
●Transistor ON → Counting
●NPN universal output type sensor

※CP1, CP2(INHIBIT), RESET input



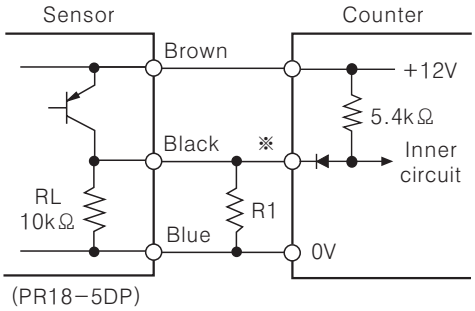
●Transistor ON → Counting
●NPN open collector output type sensor

◎Contact input



●Contact ON → Counting
●Limit S/W, Micro S/W
●Please use a reliable contacts

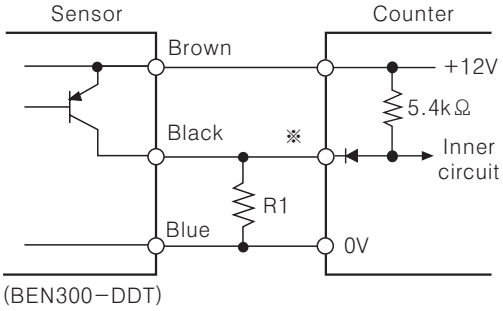
●Using PNP universal output type sensor



●Since PNP universal output type of sensors has high output impedance, please make sure to keep under condition.
: Please set R1 value to make the composed resistance of RL + R1 is Max. 470kΩ

※CP1, CP2(INHIBIT), RESET input

●Using PNP open collector output type sensor

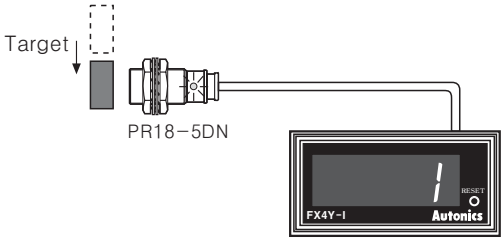


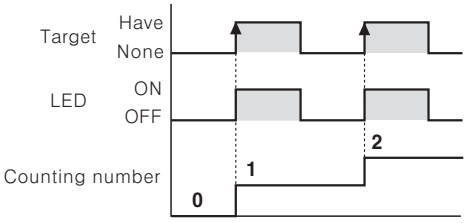
●In case of PNP open collector output type sensor, please connect lower than 470Ω of R1 to input terminal before using.

◎Counting method

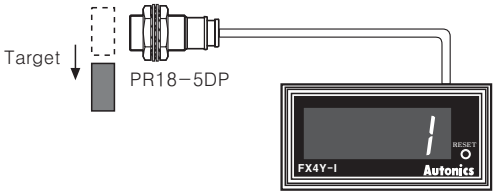
Please take care of the selection of sensor because the counting method of NPN output type sensor is different from PNP output type sensor.

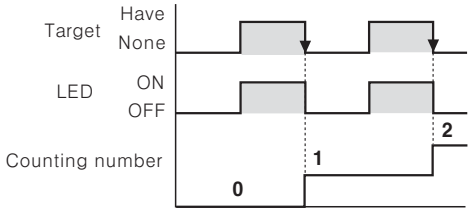
●NPN universal output type
: When the sensor changes OFF to ON, it is counting



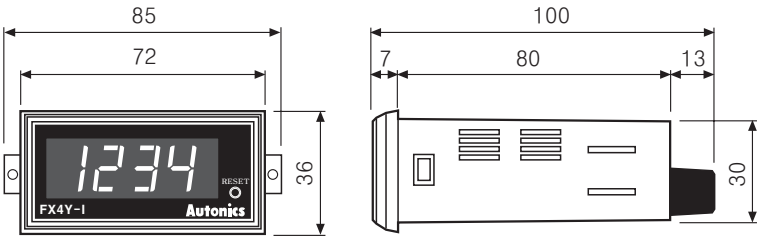


●PNP universal output type
: When the sensor changes ON to OFF, it is counting

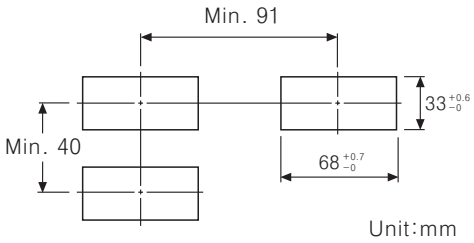




▣Dimensions

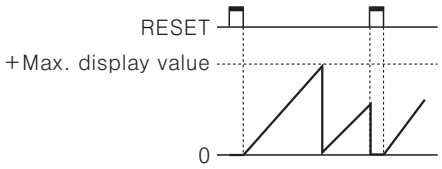


●Panel cut-out

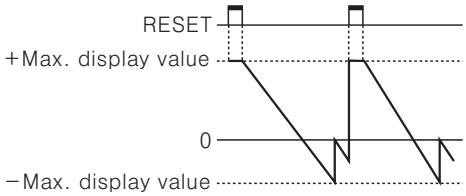


▣Counting function

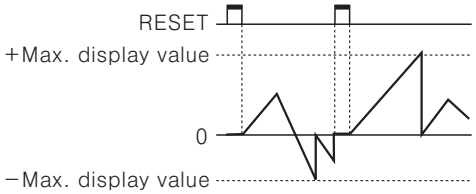
●Up mode



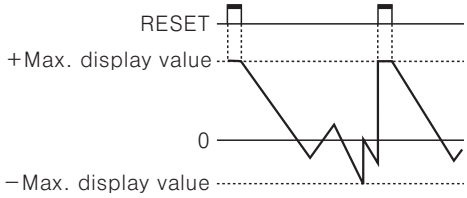
●Down mode



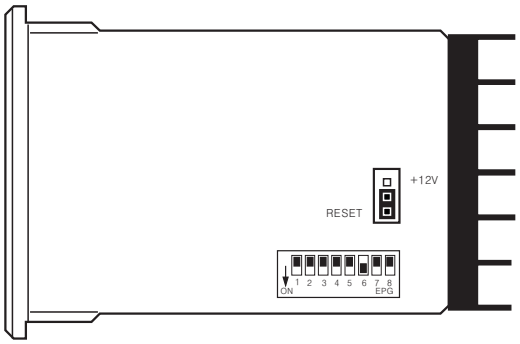
●Up/Down-A, B, C Mode

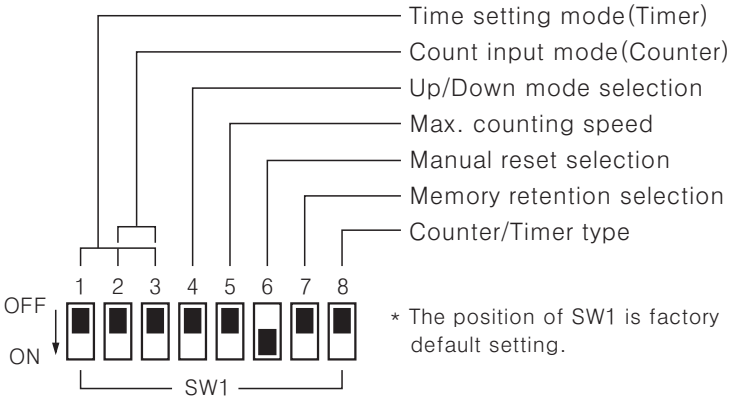


●Up/Down-D, E, F Mode



▣Selection by DIP switches





* The position of SW1 is factory default setting.

●Up/Down mode

SW1		Function
4	OFF ON	Up mode
	OFF ON	Down mode

●Memory retention

SW1		Function
7	OFF ON	Memory
	OFF ON	Power reset(No memory)

●Max. counting speed

SW1		CP1, CP2
5	OFF ON	30cps
	OFF ON	**5kcps**

●Counter/Timer selection

SW1		Function
8	OFF ON	Timer
	OFF ON	Counter

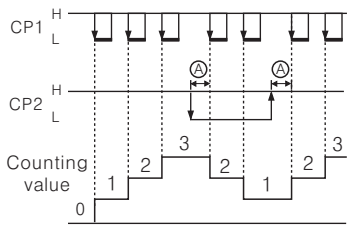
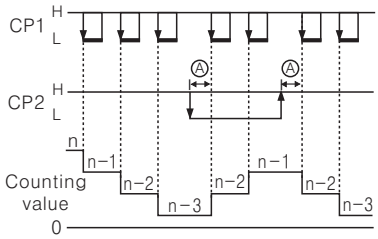
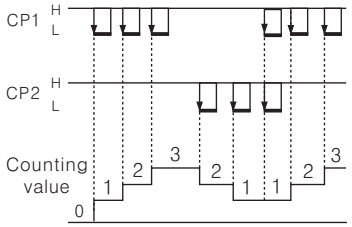
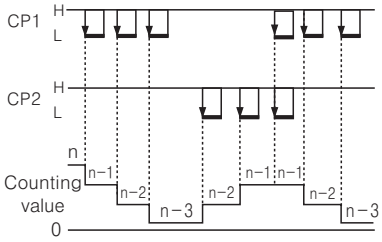
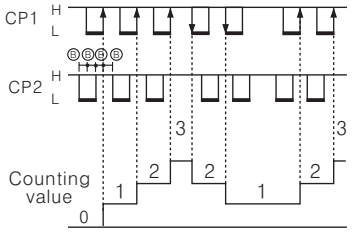
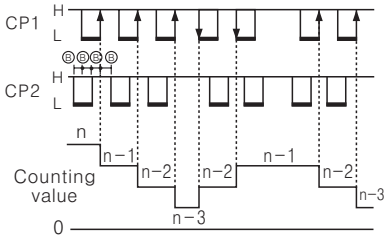
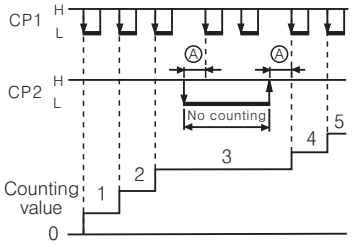
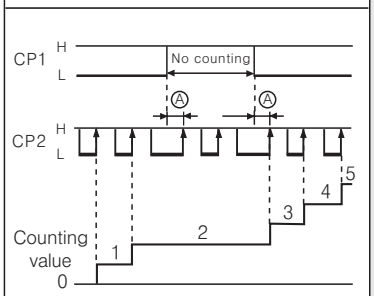
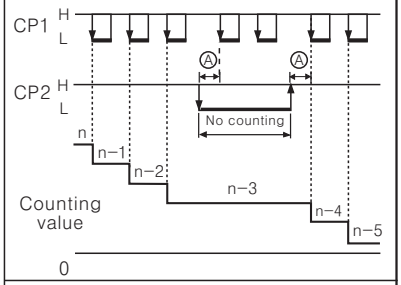
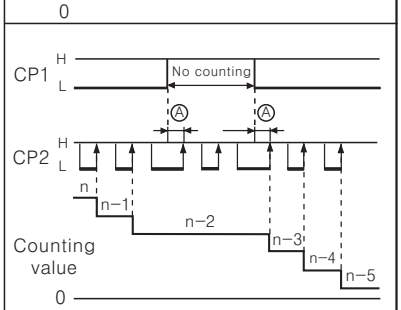
●Manual reset selection

SW1		Function
6	OFF ON	Reset switch disabled
	OFF ON	Reset switch enabled

▣Time setting mode(Timer)

SW1	4Digit	6Digit	SW1	4Digit	6Digit
A 1 2 3 OFF ON	**99.99sec**	**99999.9sec**	**E** 1 2 3 OFF ON	**999.9min**	**99999.9min**
B 1 2 3 OFF ON	**999.9sec**	**999999sec**	**F** 1 2 3 OFF ON	**99hour 59min**	**99hour 59min 59sec**
C 1 2 3 OFF ON	**9999sec**	**99min 59.99sec**	**G** 1 2 3 OFF ON	**999.9hour**	**9999hour 59min**
D 1 2 3 OFF ON	**99min 59sec**	**999min 59.9sec**	**H** 1 2 3 OFF ON	**9999hour**	**99999.9hour**

▣Input mode(Counter)

Input mode(SW1)		Up mode (4: OFF / ON)	Input mode(SW1)		Down mode (4: OFF / ON)
Up/Down−A Command input	2 3: OFF / ON		Up/Down−D Command input	2 3: OFF / ON	
Up/Down−B Individual input	2 3: OFF / ON		Up/Down−B Individual input	2 3: OFF / ON	
Up/Down−C Phase difference input	2 3: OFF / ON		Up/Down−F Phase difference input	2 3: OFF / ON	
Up input	2 3: OFF / ON	 	**Down input**	2 3: OFF / ON	 

※ Ⓐ: Over Min. signal width, Ⓑ: Over 1/2 of Min. signal width.
Counting miss by one(±) is occurred if the signal width of Ⓐ or Ⓑ is less than Min. signal width.
※n : + Max.display value(FX4Y−I : 9999, FX6Y−I : 999999)

▣Proper usage

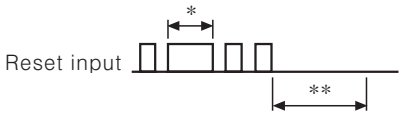
◎Reset

●Reset

When select a reset input/output mode again, after applying power, please reset or reset manually.
Otherwise it previous mode will be operating.

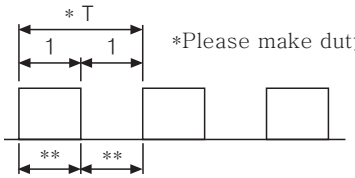
●The reset signal width

It is reset perfectly when the reset signal is applied for **max. 20ms** regardless of the contact input & solied-state input.



*In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied for max. 20ms even though a chattering is occured.
**Signal input(Cp1, Cp2)is possible if there is no reset input for min. 50ms after reset input.

◎Min.signal width

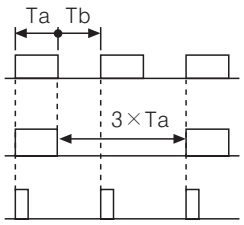


*Please make duty rate of 1 cycle 1:1.

** Min. signal width [30cps : Over 16.7ms
2kcps : Over 0.25ms

◎Maximum counting speed

This is rspond speed per 1 sec. when the duty rate (ON/OFF) of input signal is 1:1 if duty rate is not 1:1, the respond speed will be getting slow against input signal and also the width between ON and OFF should be over min. signal width.
And one of ON width and OFF width is under min. signal width, this product may not response.



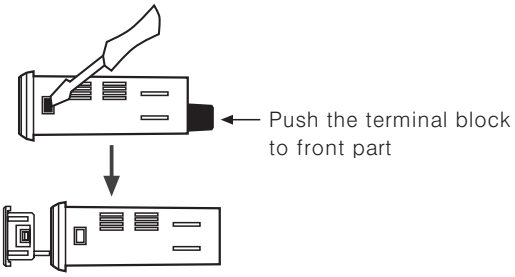
Therefore Ta(ON width) and Tb (OFF width) needed to be over min. signal width.

When duty rate is 1:3, the max. counting speed will be 1/2 from the our catalogue.

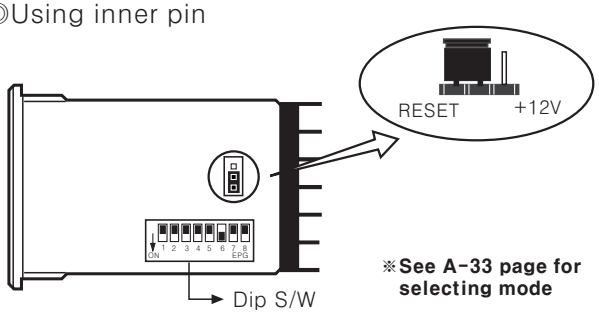
This product does not response.

◎Detach the case from body

While pushing the lock eguipment with with driver to the way of front, push the terminal block.

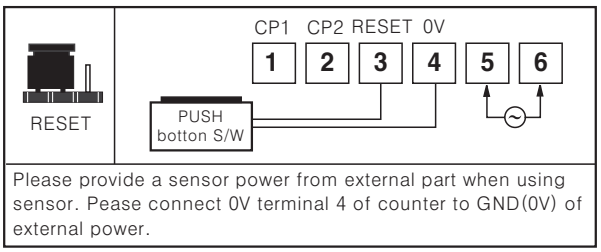


◎Using inner pin

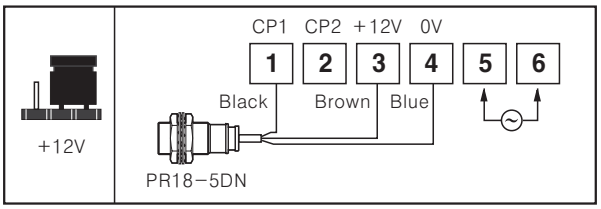


※See A-33 page for selecting mode

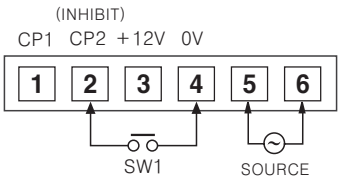
●When using terminal 3 for external reset terminal



●When using terminal 3 for sensor power terminal



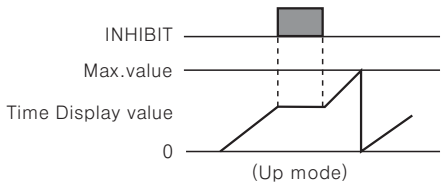
◎INHIBIT Only timer



●It becomes the INHIBIT mode when SW1 turns on. (Time Hold)

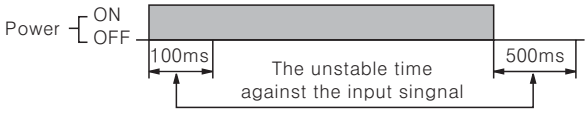
●In case of stopping time at a moment while the timer is progrossing, the Inhibit mode can be used.

●When the Inhibit input is cut off, time is progro-ssing again.



◎Power

The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.



DIN size W48×H48mm, Digital timer

▣Features

- ●Wide range of the time selection(0.01sec ~ 9999.9 hour)
- ●Power supply : 100-240VAC 50/60Hz, 12-24VDC(Option)
- ●Memory retention(10years)
- ●Micro computer built-in
- ●8 PIN plug connection type

⚠ **Please read "Caution for your safety" in operation manual before using.**

※Up graded since 2003. 07.

▣Ordering information

FS 4 E □

	Single preset
I	Indication type
E	Timer
4	9999(Digit)
5	99999(Digit)
FS	Series(FSE)

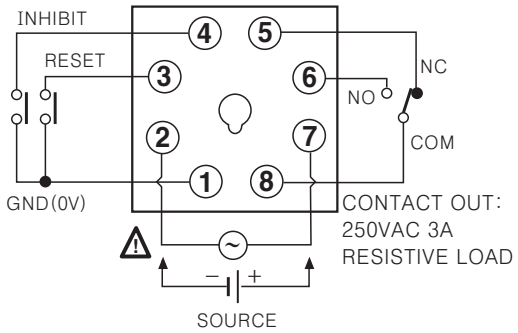
▣Specifications

※A blacked(▭) item is upgraded function.

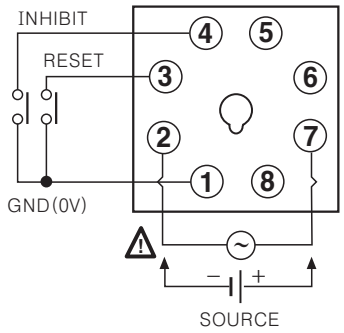
Model		FS4E	FS5EI
Function		Single preset Up/Down Timer	Indication type Up/Down Timer
Character size		W4×H8mm	
Power supply		100-240VAC 50 /60Hz, 12-24VDC(Option)	
Allowable voltage range		90 ~ 110% of rated voltage	
Power consumption		Appox. 4.5VA(240VAC 60Hz), Appox. 2.5W(24VDC)	Approx. 3.5VA(240VAC 60Hz), Approx. 2.2W(24VDC)
Return time		Max. 500ms	
Min. input signal width	RESET input	Approx. 20ms	
	INHIBIT input		
Input	RESET input	• NO-voltage input -Impedance at short-circuit : Max. 470Ω, Residual voltage at short-circuit : Max. 1VDC Impedance at open circuit: Min. 100kΩ	
	INHIBIT input		
One-shot output time		**(※)**	**0.05~5sec**
Control output	Contact type	Time-limit SPDT(1c)	————
	Contact capacity	250VAC 3A at resistive load	————
Relay life cycle	Mechanical	Min. 10,000,000 times	————
	Electrical	Min. 100,000 times(250VAC 3A resisitive load)	————
Memory retention		10 years(EEPROM)	
Repeat error		Max. ±0.01% ±0.05sec	
Set error			
Voltage error			
Temperature error			
Insulation resistance		100MΩ(at 500VDC)	
Dielectric strength		2000VAC 50/60Hz for 1 minute	
Noise strength	AC power	±2kV the square wave noise(pulse width:1μs) by the noise simulator	
	DC power	±500V 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 1hour	
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions 3 times	
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions 3 times	
Ambient temperature		-10 ~ +55℃(at non-freezing status)	
Storage temperature		-25 ~ +65℃(at non-freezing status)	
Ambient humidity		35~85%RH	
Weight	AC power	Approx. 122g	Approx. 112g
	DC power	Approx. 130g	Approx. 120g

▣Connections

●FS4E

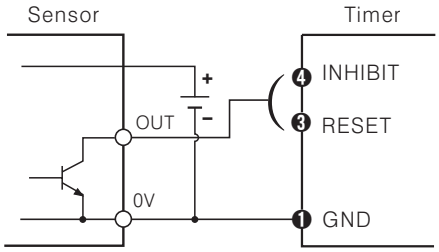


●FS5EI



▣Input connections

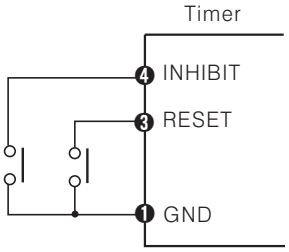
◎Solid-state input



●Transistor ON → INHIBIT, RESET
●NPN open collector output sensor

※Above number are number of terminal block.

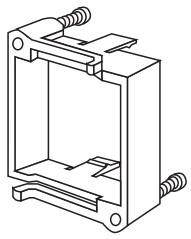
◎Contact input

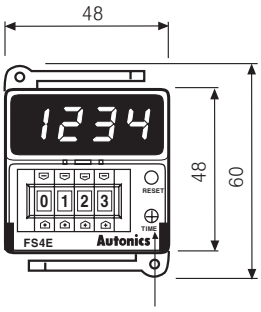


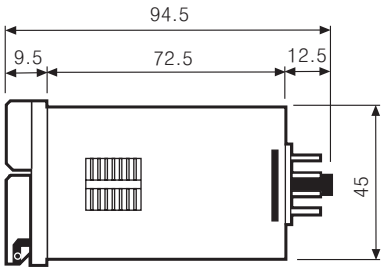
●Contact ON → INHIBIT, RESET
●Limit S/W, Micro S/W, Relay contact
●Please use a contact that can function reliable at 5VDC 1mA.

▣Dimensions

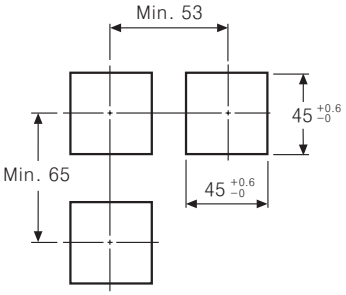
●Bracket

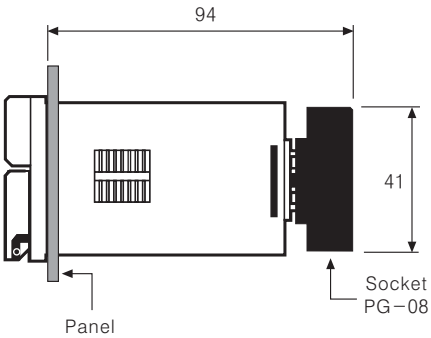






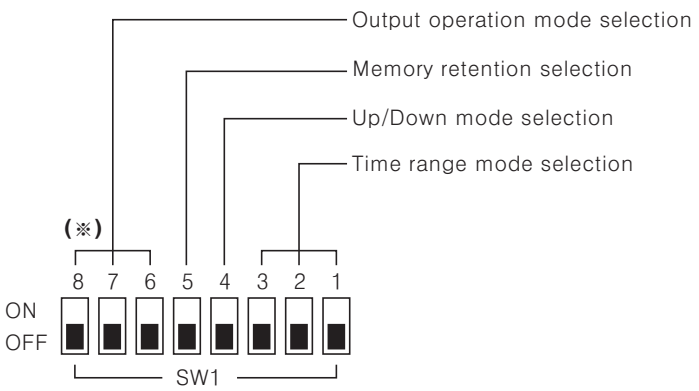
●Panel cut-out

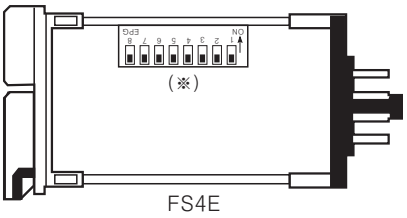




Unit:mm

▣Selection by DIP switches





※Indication type(FS5EI) has no output mode.
(NO. 6, 7, 8 of S/W1)

※Because number 5 of Timer and number 6 of NC are dispensable, the inner selecting switch, DIP S/W is changed from 10pin to 8pin. See former catalog for outmoded items.

●Up/Down mode

SW1		Function
4	ON / OFF	Down mode
	ON / OFF	Up mode

●Memory retention

SW1		Function
5	ON / OFF	No memory retention
	ON / OFF	Memory retention

▣Time range mode

SW 1 \ Model	FS4E	FS5EI
1 2 3 ON OFF	99.99sec	9999.9sec
1 2 3 ON OFF	999.9sec	99999sec
1 2 3 ON OFF	9999sec	9min 59.99sec
1 2 3 ON OFF	99min 59sec	99min 59.9sec
1 2 3 ON OFF	999.9min	9999.9min
1 2 3 ON OFF	99hour 59min	9hour 59min 59sec
1 2 3 ON OFF	999.9hour	999hour 59sec
1 2 3 ON OFF	9999hour	9999.9hour

▣Output operation mode (FS4E)

← One-shot output(0.05 ~ 5sec.) ← Self-holding output

Mode	4 ON OFF Up mode	4 ON OFF Down mode	Operation after time up
F SW1 6 7 8 ON OFF	Reset Preset 0 Output	Reset Preset 0 Output	●The display value continues until Reset signal applied and the output will be held.
N SW1 6 7 8 ON OFF	Reset Preset 0 Output	Reset Preset 0 Output	●The display value and output will be held until Reset signal.
C SW1 6 7 8 ON OFF	Reset Preset 0 Output	Reset Preset 0 Output	●The display returns to initial status and output will be OFF after one-shot time. ●The output is one-shot.
R SW1 6 7 8 ON OFF	Reset Preset 0 Output	Reset Preset 0 Output	●The display value will be held until output is OFF. The output will be OFF after one-shot time. ●The output is one-shot.
K SW1 6 7 8 ON OFF	Reset Preset 0 Output	Reset Preset 0 Output	●The display value continues until Reset signal applied. The output will be OFF after one-shot time. ●The output is one-shot.
P SW1 6 7 8 ON OFF	Reset Preset 0 Output	Reset Preset 0 Output	●The output and display value are held for one-shot time, but timer is reset and begins timing when set point is reached. ●The output is one-shot.
Q SW1 6 7 8 ON OFF	Reset Preset 0 Output	Reset Preset 0 Output	●The display value continues until OFF. The output will be OFF after one-shot time.
S SW1 6 7 8 ON OFF	Reset Preset 0 Output	Reset Preset 0 Output	●The output will be OFF for set time and then ON for set time and will repeat this cycle.

※Time Up : When processing time reaches to setting time.

※Applying reset signal after time up, it will display zero for up mode and time range for down mode(displaying max. value in case of indication type).

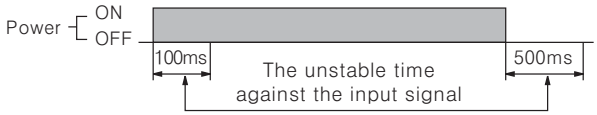
■Proper usage

◎Preset value

Able to change setting value while it is running but setting value should be higher than previous setting value.

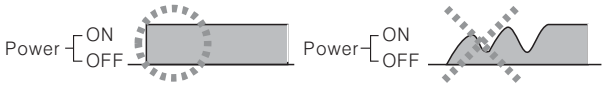
◎Power

●The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.



●Even though the power is applied, and the display does not turn on, please check the reset terminal.

●Please supply the power within rating power and apply or cut the power quickly to prevent chattering.

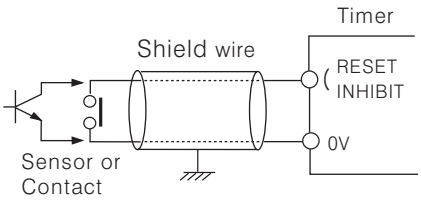


◎Input signal line

●Shorten the cable distance between the sensor and this product.

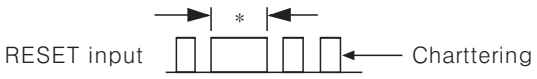
●Please use shielded wire for input signal.

●Please wire input signal line separated from power line.



◎The reset signal width

It is reset perfectly when the reset signal is applied for max. 20ms regardless of the contact input & solid-state input.



*In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied for max. 20ms even though a chattering is occured.

◎Error

If set value is "0000", "ErrO" will be displayed.
If set value is changed to non-zero, this function is cancelled. However, the output in the status of Error signal will be OFF.

※The indicator does not have the function of indication.

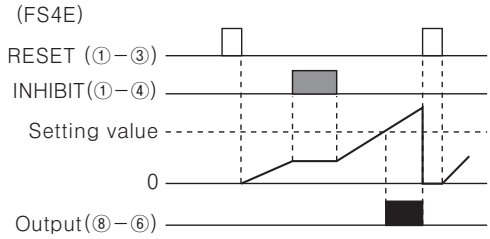
◎Reset

Reset has two function, which are memorizing DATA function and resetting output function. When changing an inner selection SW, manual reset or external reset must be held after applying the power by all means. Otherwise it will operate as previous mode. Selecting a reset input/output mode again after applying power, please reset or reset manually, otherwise the previous mode will be operating.

◎INHIBIT

●When you need to check the real operating time, please use INHIBIT function.

●If you need to stop the time progressing, please use INHIBIT function.



◎Environment

Please avoid the following places:

●Where this product may be damaged by strong impact or vibration.

●Where there are corrosive gas or flammable gas and water,oil, dust.

●Where magnetic and electrical noise occurs.

●Where there are High temperature and humidity beyond rated specification.

●Where there are strong alkalis and acids.

●Where there are direct rays of sun.

◎Noise

We test 2kV, Pulse width 1㎲ against Impulse voltage between power terminals and 1kV, pulse width 1㎲ at noise simulator against external noise voltage. Please install MP condensor(0.1~1㎌) or Oil condensor between power teminals when over Impulse noise voltage occurs.

●When testing dielectric voltage and insulation resistance of the control panel with this unit installed.

①Please isolate this unit from the circuit of control panel.

②Please make all terminals of this unit short-circuited.

●Sudden function stop while it is running (When displaying wrong numbers or nothing)
In this case, please power off and turn on again. This is due to strong noise flows into this product therefore please try to separate inductive load from input signal line of this product or install surge absorber between inductive loads.

DIN W48×H24mm, Indication only, LCD Counter

▣Features

- **Upgraded version of LA7N series**
- Small size and count up mode only
- Internal lithium battery
- Signal input
  - No-voltage input ☞ Please use reliable contacts enough to flow 3VDC 5μA of current.
  - Universal voltage input ☞ "H" : 6-240VDC, 24-240VAC
    "L" : 0-2.4VDC, 0-2VAC
- Screw Terminal type(Terminal protection cover)
- LCD Display
- Built-in Microprocessor
- Protection structure IP66

⚠ **Please read "Caution for your safety" in operation manual before using.**

CE

▣Ordering information

L A 8 N - B F

F	Universal voltage input
N	No-voltage(Small signal) input
B	Internal lithium battery
N	DIN W48×H24mm
8	99999999(Digit)
A	Counter
L	LCD Display

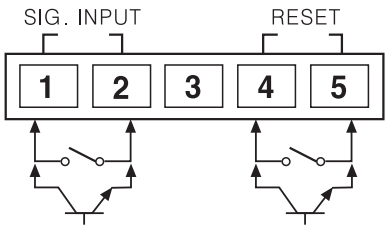
▣Specifications

Series		LA8N-BN	LA8N-BF
Digit		8digits	
Display		LCD Zero Blanking type(Height : 8.7mm)	
Operation method		Count up mode	
Power supply		Internal lithium battery	
Input type		No-voltage input	Universal voltage input
Counting speed		Selectable 1cps / 30cps / 1kcps	20cps
Count input		• Impedance at short-circuit : 10kΩ(ON), residual voltage : Max. 0.5V • Impedance at open-circuit : 500kΩ(OFF)	High : 24-240VAC / 6-240VDC Low : 0-2VAC / 0-2.4VDC
Reset input		No-voltage input	
Min.signal width of Reset		Min. 20ms	
Battery life cycle		Over 7 years(Approx. 20℃)	
External switch		SW1(★1), SW2(★2)	SW1(★1)
Insulation resistance		Min. 100MΩ(at 500VDC)	
Dielectric strength		(★3) 2000VAC 60Hz for 1 minute	
Vibra-tion	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1 hour	
	Malfunction	0.3mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions for 3 times	
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions for 3 times	
Ambient Temperature		-10 ~ +55℃(at non-freezing status)	
Storage Temperature		-25 ~ +65℃(at non-freezing status)	
Ambient humidity		35 ~ 85%RH	
Approval		CE	
Unit weight		Approx. 58g	

(★1) SW1 is a switch ENABLE / DISABLE the front RESET.
(★2) SW2 is a switch setting counting speed.
(★3) No-voltage input: Between all terminals and case, Universal voltage input: Between input terminal and reset input terminal, all terminals and case

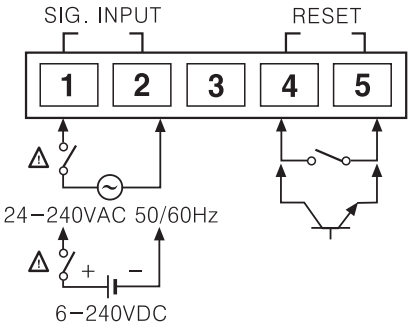
▣Connections

●No-voltage input



※Use reliable contacts enough to flow 5㎂ of current.
※Terminal 2 and 5 are connected inside.(Non-isolation)

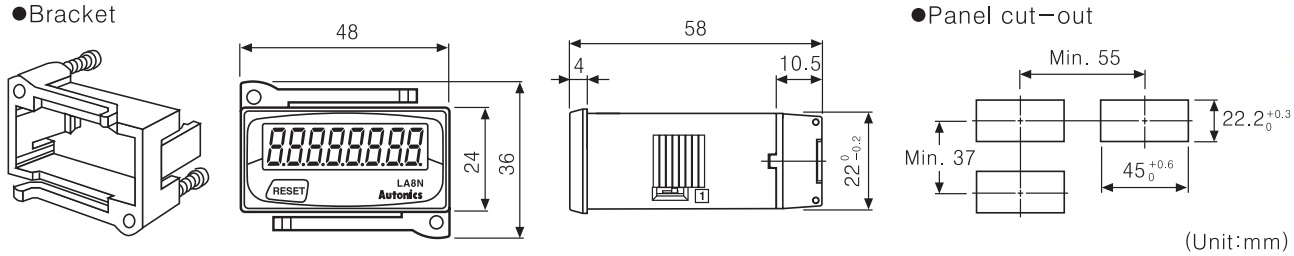
●Universal voltage input



※Terminal 1, 2 and 4, 5 are isolated.

▣Dimensions

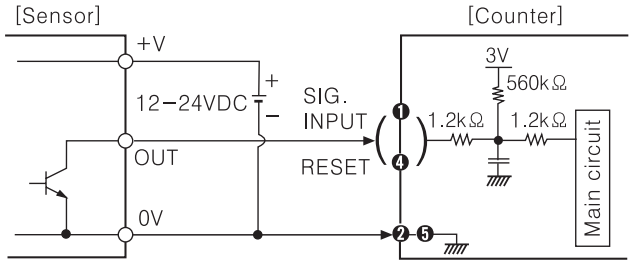
●Bracket



▣Input connections

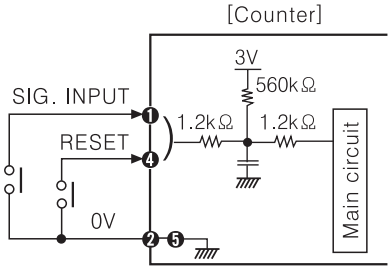
◎No-voltage input (Standard sensor: NPN open type sensor)

●Solid-state input



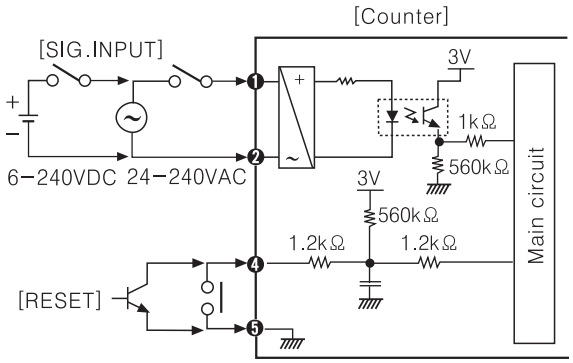
※When power is applied to terminal No ❶ and ❹, input terminal circuit can be broken and a malfunction can occur.
(NPN output, PNP output, PNP open collector output type sensor cannot be used.)
※❷ and ❺ are connected inside.

●Contact input



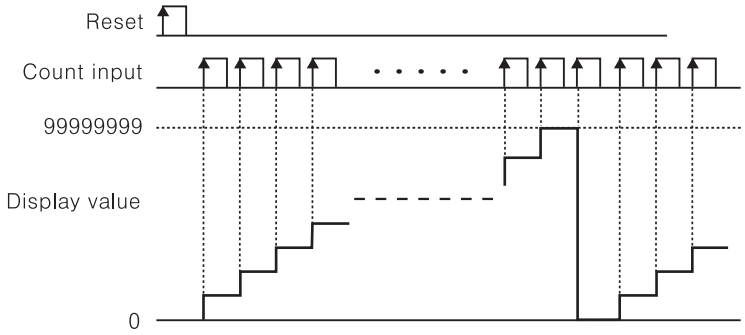
※Please use reliable contacts enough to flow 3VDC 5㎂ of current.

◎Universal voltage input

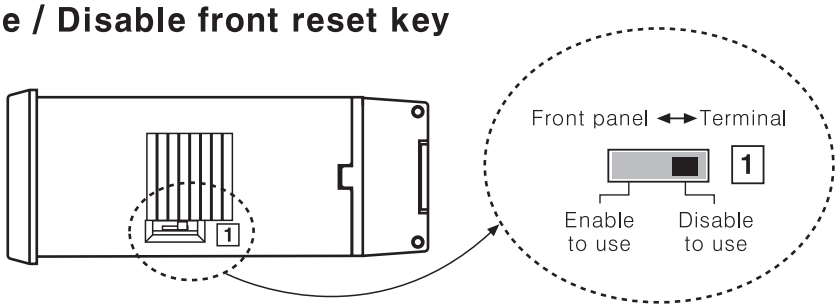


※AC type proximity sensor cannot be used as the source of count input signals.
※Input terminal ❶, ❷ and Reset terminal ❹, ❺ are insulated inside.
※It is not possible to reset with AC power or DC power.
※When relay contact is used as the source of Reset signal, please use reliable contacts enough to flow 3VDC 5㎂ of current.

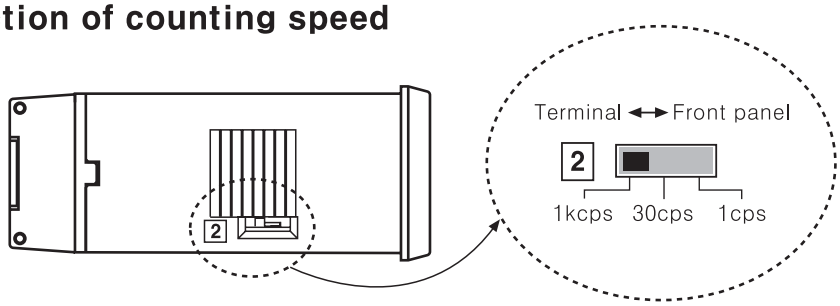
▣Counter operation mode



▣Enable / Disable front reset key



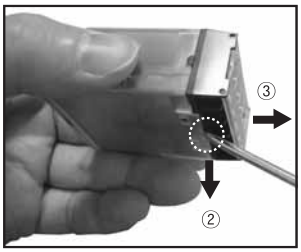
▣Selection of counting speed

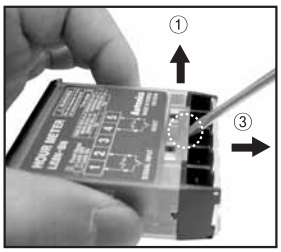


※Please supply Reset signal(Front or external reset terminal) after changing counting speed during the operation.
※Switch 2 is available in LA8N-BF.(20cps fixed)

▣Case detachment and battery replacement

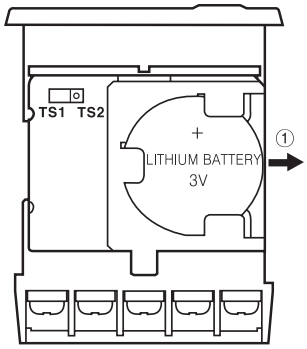
●Case detachment





※Hold up Lock part toward ①, ② of the product with the tool and pull toward ③, the case is detached.
⚠Please be careful of the injury caused by tools.

●Battery replacement



1)Detach the case.
2)Push the battery and detach toward ①.
3)Insert new battery with correct alignment of polarity pushing toward opposite of ①.
※Battery is optional.
※Do not burn up or disassemble the lithium battery.

DIN size W48×H48mm, Preset Counter/Timer

▣Features

- ●Count Up, Count Down, Count Up/Down function
- ●Multi function unit in a small size
- ●Wide range of input power supply : 100−240VAC 50/60Hz, 12−24VDC(Option)
- ●Selectable Counter or Timer function by internal DIP switch
- ●Counting speed upgrade : 5kcps
- ●Various Timing ranges programmable
  4Digit type : 0.01sec. ~ 9999hour
  5Digit type : 0.01sec. ~ 9999.9hour
- ●Available to set a decimal point

⚠ **Please read "Caution for your safety" in operation manual before using.**

c UL us

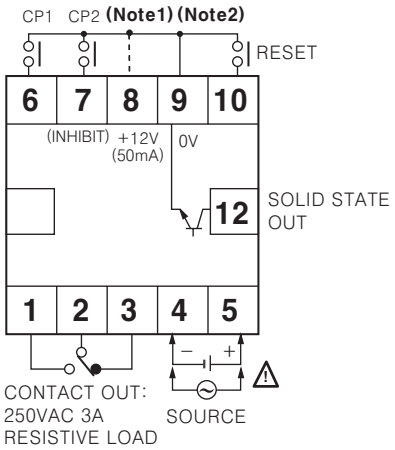
▣Specifications

※A blacked( ) item is upgraded function.

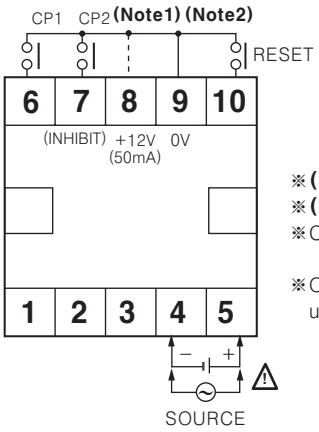
Model	Single preset		**FX4S**	————
	Double preset		————	**FX5S-I**
Digit			4	5
Digit size			W4×H8mm	
Power supply			100−240VAC 50/60Hz, 12−24VDC(Option)	
Allowable voltage range			90 ~ 110% of rated voltage	
Power consumption			• Indication type : Approx. 4.7VA (240VAC 60Hz), Approx. 2.8W(24VDC) • single preset : Approx. 5.7VA(240VAC 60Hz), Approx. 3W(24VDC)	
Max. counting speed for CP1, CP2			**Selectable 30cps/5kcps by internal DIP switch**	
Min. input signal width	INHIBIT input		Approx. 20ms	
	RESET input			
Input	**CP1, CP2 input (INHIBIT)**		**Input logic is selectable** **[Voltage input] Input impedance : 5.4kΩ "H" level : 5-30VDC, "L" level : 0-2VDC** **[No-voltage input] Impedance at short-circuit : Max. 1kΩ, Residual voltage at short-circuit : Max. 2VDC, Impedance at open-circuit : Max. 100kΩ**	
	RESET input			
One-shot output time			**0.05 ~ 5sec**	
Control output	Contact	Type	SPDT(1c)	————
		Capacity	250VAC 3A at resistive load	————
	Solid-state	Type	NPN open collector	————
		Capacity	30VDC Max. 100mA Max.	————
Memory retention			10 years(When using non−volatile semiconductor memory)	
External sensor power			12VDC±10% 50mA Max.	
Dielectric strength			Min. 100MΩ(at 500VDC)	
Insulation resistance			2000VAC 50/60Hz for 1 minute	
Noise strength	AC power		±2kV the square wave noise(pulse width:1㎲) by the noise simulator	
	DC power		±500V the square wave noise(pulse width:1㎲) 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/s² (Approx. 30G) in X, Y, Z directions for 3 times	
	Malfunction		100m/s² (Approx. 10G) in X, Y, Z directions for 3 times	
Relay life cycle	Mechanical		Min. 10,000,000 times	
	Electrical		Min. 100,000 times(250VAC 3A at resistive load)	
Ambient temperature			−10 ~ +55℃(at non−freezing status)	
Storage temperature			−25 ~ +65℃(at non−freezing status)	
Ambient humidity			35 ~ 85%RH	
Weight			AC type : Approx. 147g, DC type : Approx. 153g	AC type : Approx. 137g, DC type : Approx. 143g
Approval			c UL us	

▣Connections

●FX4S



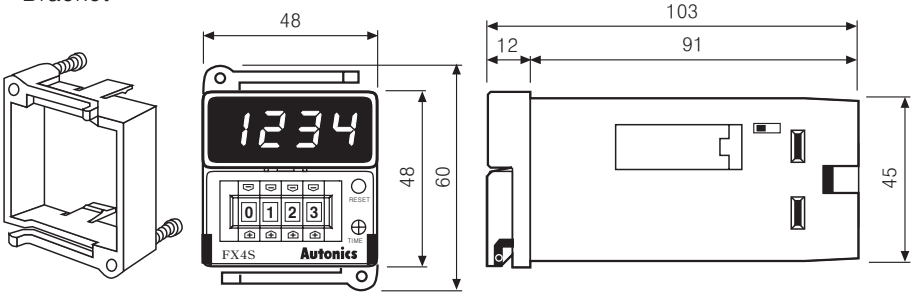
●FX5S−I



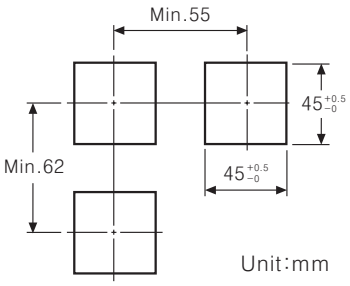
※**(Note1)** : PNP input
※**(Note2)** : NPN input
※CP2(INHIBIT): Time Hold terminal when using for timer.
※Operated by a power ON start when it is used as a timer.

▣Dimensions

●Bracket



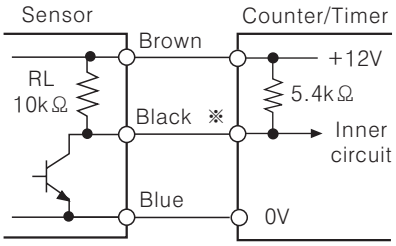
●Panel cut−out



▣Input connections

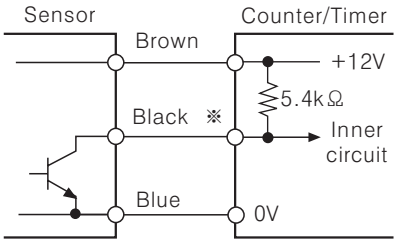
◎Input logic : No−voltage(NPN) input

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



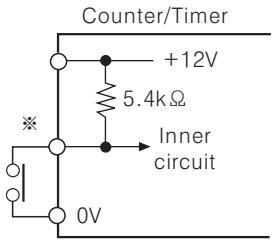
• Transistor ON → Counting
• NPN output type sensor

※CP1, CP2(INHIBIT), RESET input



• Transistor ON → Counting
• NPN open collector output type sensor

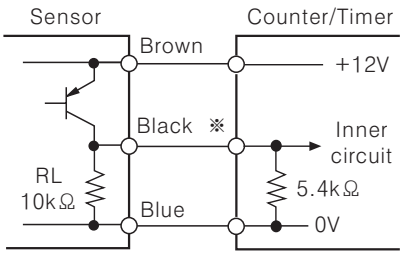
●Contact input



• Contact ON → Counting
• Counting speed : 30cps setting(Counter)

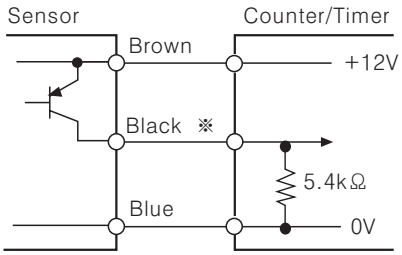
◎Input logic : Voltage(PNP) input

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



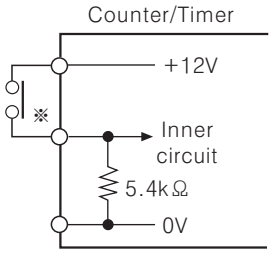
• Transistor ON → Counting
• PNP output type sensor

※CP1, CP2(INHIBIT), RESET input



• Transistor ON → Counting
• PNP open collector output type sensor

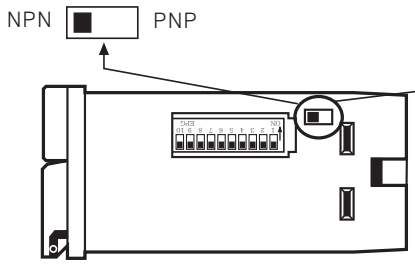
●Contact input



• Contact ON → Counting
• Counting speed : 30cps setting(counter)

▣Input logic selection

●Select NPN(No-voltage input)

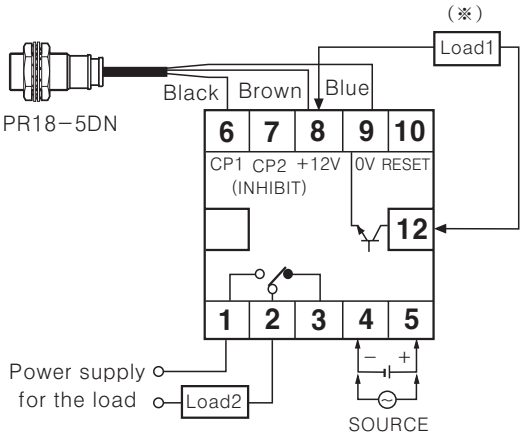


●Select PNP(voltage input)

※Please be sure to turn OFF the power before changing input logic.

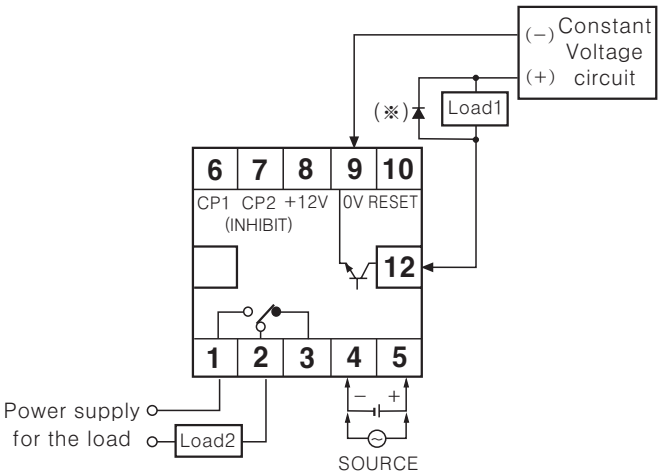
▣Input & Output connections

◎In case of operating the load by power supply of the sensor



●(※)Please select proper capacity of load, because total current consumption should not be exceed current capacity. (Max. 50mA)
●Contact capacity : Max. 250VAC 3A

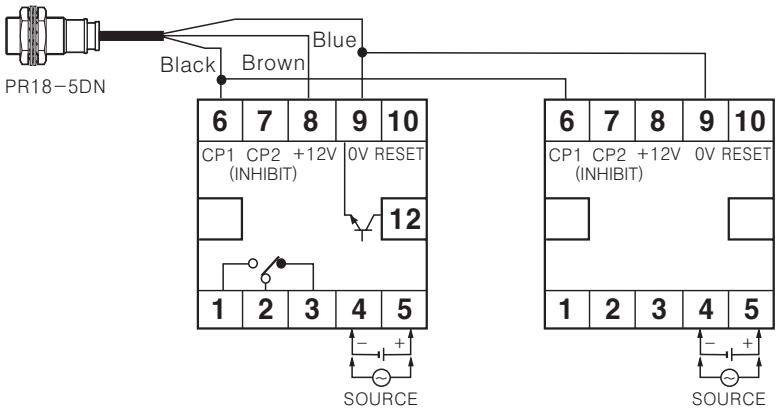
◎In case of operating the load by external power supply



●The capacity of Load1 must not be exceed Max. 30VDC, Max. 100mA of the switching capacity of the transister.
●Please do not supply the reverse polarity voltage.
●(※)Please connect the surge absorber(Diode) at both terminals of Load1, in case of using the inductive load. (Relay, etc.)

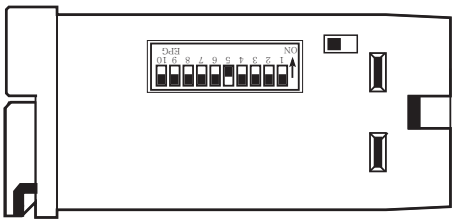
◎Using 2 counters with one sensor

●It is available to use 2 counters with one sensor.
The power of sensor must be connected to only one of counter.

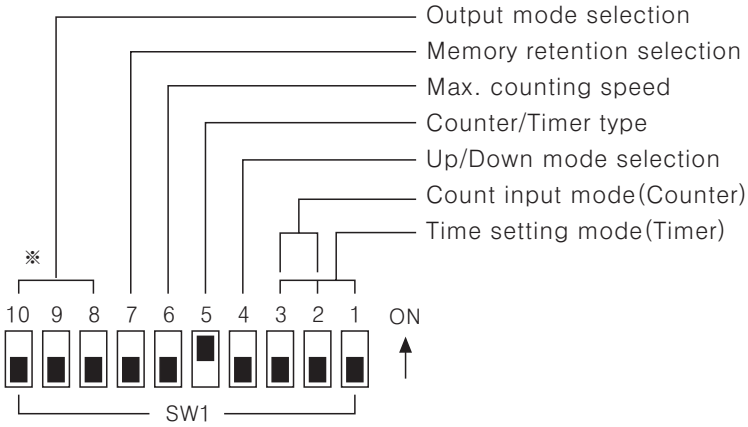


<FX4S> <FX5S-I>

■Selection by DIP switches



※The direction of DIP S/W is reverse on this product. If S/W is up, it will be ON. If S/W is down, it will be off.
※There is no output operation mode in indication type(FX5S-I) so 7 Pin DIP S/W is built in.



●Up/Down mode

SW1		Function
4	ON	Down mode
	OFF	
	ON	Up mode
	OFF	

●Max. counting speed

SW1		CP1, CP2
6	ON	**5kcps**
	OFF	
	ON	30cps
	OFF	

●Counter/Timer

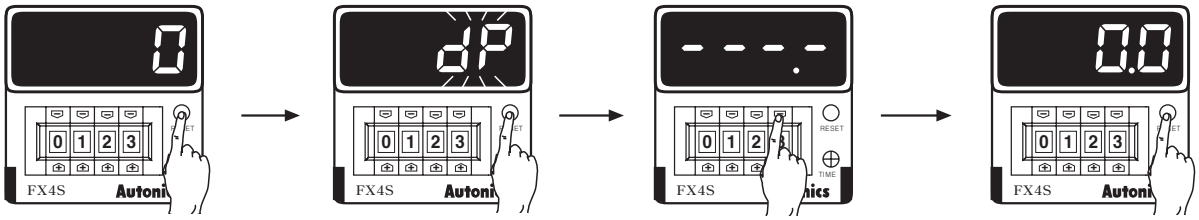
SW1		Function
5	ON	Counter
	OFF	
	ON	Timer
	OFF	

●Memory retention

SW1		Function
7	ON	No memory retention
	OFF	
	ON	Memory retention
	OFF	

■ Decimal point setting

Dispaly the decimal point.



RUN mode

※It returns to decimal point setting status if pressing RESET button for over 3sec. in RUN mode.

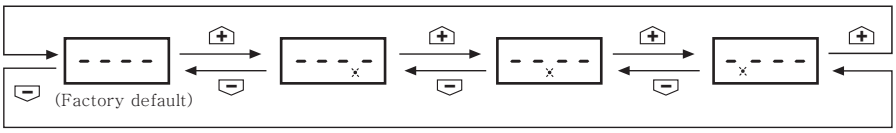
※When "dp" is flickering, one touch the Reset button.

※If pressing one of digital switch buttons(⊕ , ⊖) in decimal point setting mode, decimal point will be moved to Up(+)direction.

Return to RUN mode

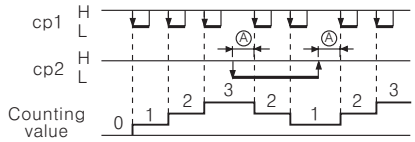
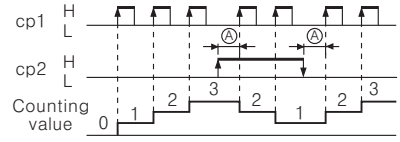
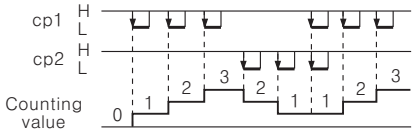
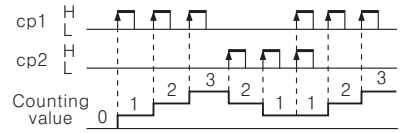
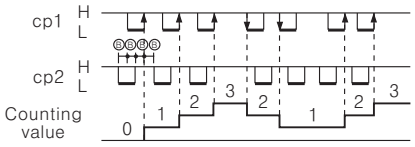
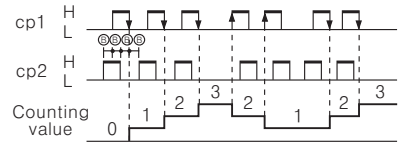
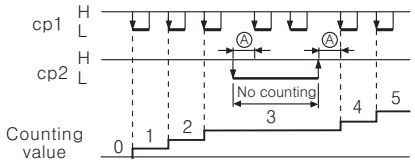
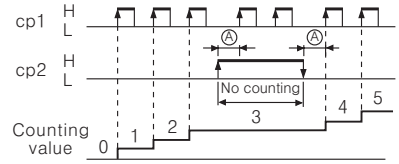
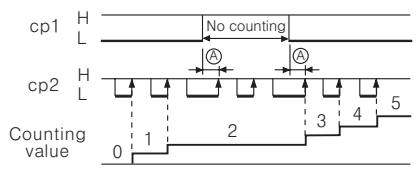
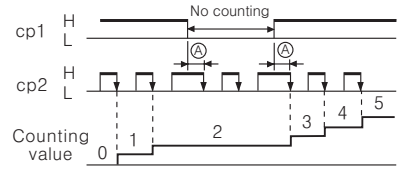
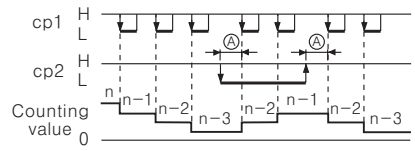
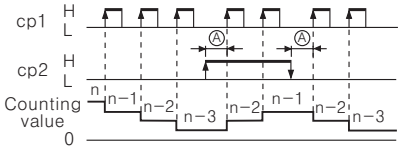
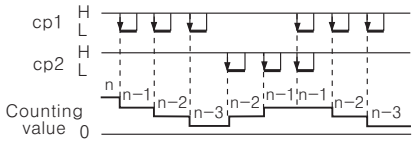
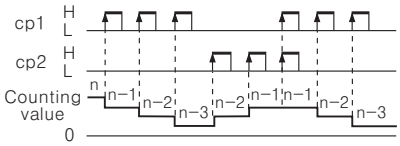
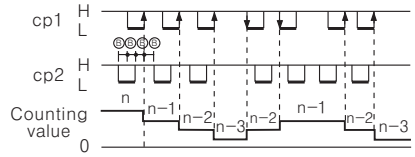
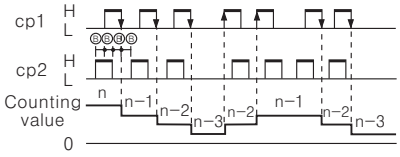
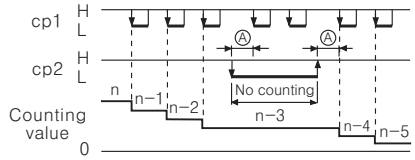
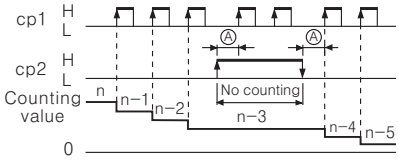
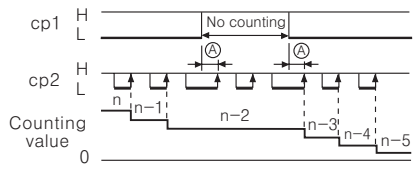
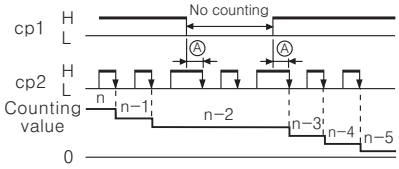
※It returns to RUN mode if pressing RESET button for over 3sec. in decimal point setting status.

●Changing the decimal point



※It returns to RUN mode if no RESET button or digital switch is applied for 60sec. in decimal point settingstetus.
※The decimal point setting is existed in indication type.

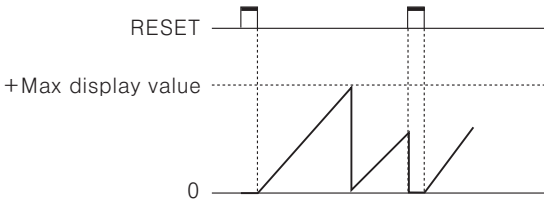
▣Input operation mode(Counter)

INput mode(SW1)			No voltage input(NPN)	voltage input(PNP)
Count up mode	Up/Down-A Command input	ON 4 OFF; ON 2 3 OFF		
	Up/Down-B Individual input	ON 2 3 OFF		
	Up/Down-C Phase difference input	ON 2 3 OFF		
	Count up input	ON 2 3 OFF		
				
Count down mode	Up/Down-D Command input	ON 4 OFF; ON 2 3 OFF		
	Up/Down-E Individual input	ON 2 3 OFF		
	Up/Down-F Phase difference input	ON 2 3 OFF		
	Count down input	ON 2 3 OFF		
				

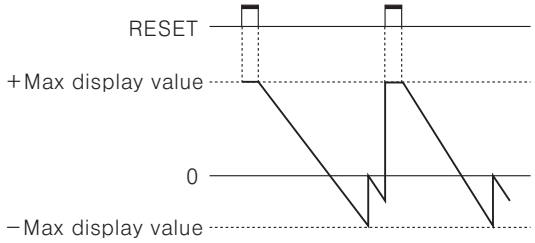
*Ⓐ : Over Min. signal width, Ⓑ : Over 1/2 of Min. signal width.
Counting miss by one(±) is occurred if the signal width of A or B is less than Min. signal width.

▣Counting operation of indication model(Indication type)

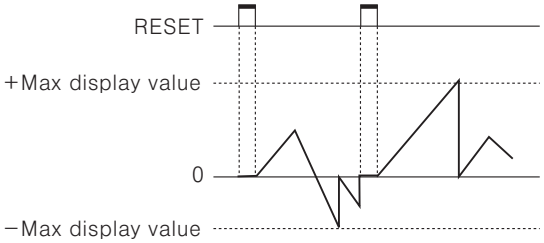
●Up input mode



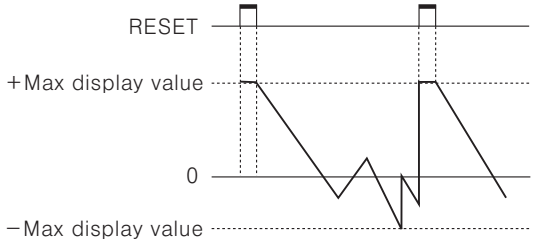
●Down input mode



●Up / Down-A, B, C input mode



●Up / Down-D, E, F input mode

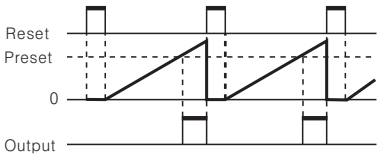
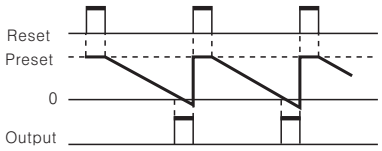
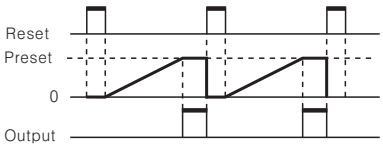
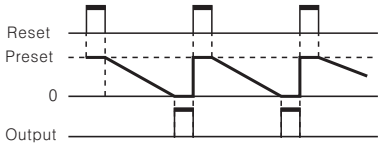
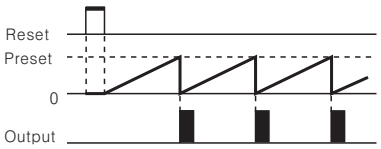
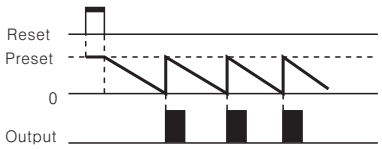
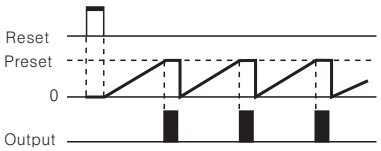
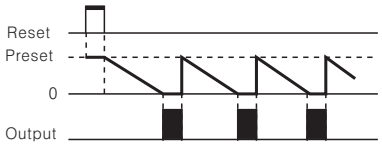
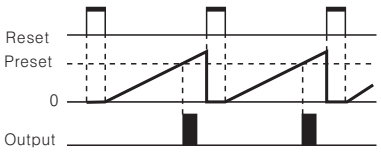
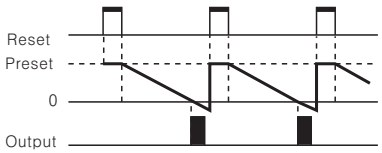
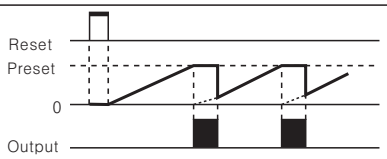
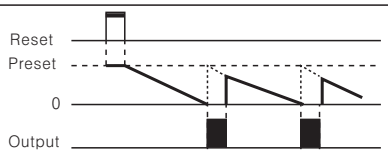
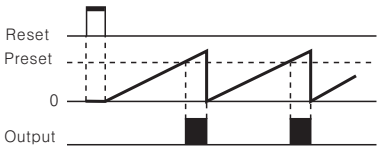
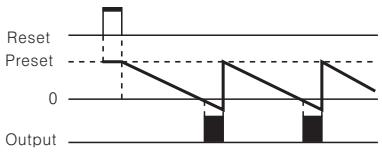
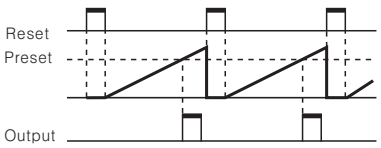
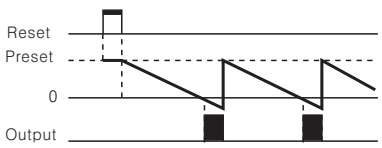
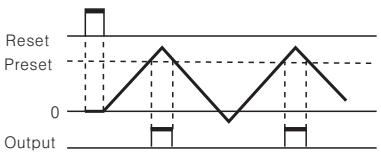
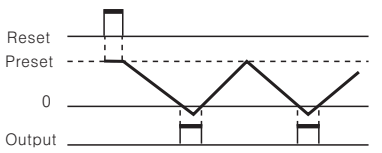
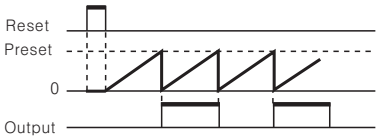
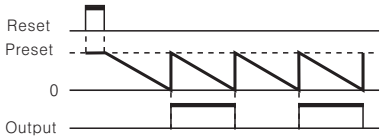


▣Time setting mode(Timer)

SW1	4Digit	5Digit
1 2 3 ON OFF	99.99sec	9999.9sec
1 2 3 ON OFF	999.9sec	99999sec
1 2 3 ON OFF	9999sec	9min 59.99sec
1 2 3 ON OFF	99min 59sec	99min 59.9sec
1 2 3 ON OFF	999.9min	9999.9min
1 2 3 ON OFF	99hour 59min	9hour 59min 59sec
1 2 3 ON OFF	999.9hour	999hour 59min
1 2 3 ON OFF	9999hour	9999.9hour

▣Output operation mode(by internal DIP switch)

← One-shot output**(0.05~5sec)** ← Self-holding output

Output mode (SW1)	4 ON OFF **UP mode**	4 ON OFF **Down mode**	Operation after count up
F 8 9 10 ON OFF			The display value continues until reset signal is applied then output is held • Self-holding output is held until reset signal is applied.
N 8 9 10 ON OFF			The display value and hold output are held until reset signal is applied.
C 8 9 10 ON OFF			The display value returns to reset start status as soon as display value is reached to preset value.
R 8 9 10 ON OFF			The display value is held until output is OFF then returns to reset start status.
K 8 9 10 ON OFF			The display value continues until reset signal is applied.
P 8 9 10 ON OFF			The display value is held during one-shot output time, counting process is returned to reset start status as soon as output is ON.
Q 8 9 10 ON OFF			The display value continues during one-shot output time.
S Count 8 9 10 ON OFF	**Up input** 	**Down input** 	• Up, UP/Down-A, B, C input mode -Output is ON when (Display value) ≥ (Preset value) • Down, UP/Down-D, E, F input mode -Output is ON when (Display value) ≤ (Zero)
			
S Timer 8 9 10 ON OFF			The output turns ON after the setting time and then turns OFF after the setting time. This operation is repeated sequentially.

▣Proper usage

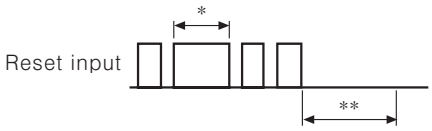
◎Reset function

●Reset

In case of changing the input mode after supplying the power, please take a external reset or manual reset. **If reset is not executed, the counter will be working as previous mode**.

●Reset signal width

It is reset perfectly when the reset signal is applied during **max. 20ms** regardless of the contact input & solid-state input.



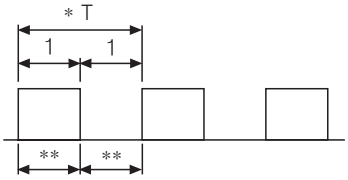
*In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied during max. 20ms even though a chattering is occurred.

**It can be input the signal of CP1 & CP2 after max. 50ms from closing time of reset signal.

◎Sensor power

The power 12VDC which is provided to sensor is built in it. Please use it under Max. 50mADC.

◎Min.signal width of CP1, CP2 input



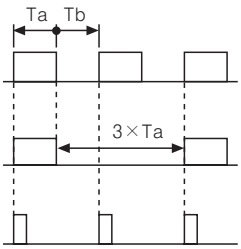
*Please make duty ratio(ON/OFF) 1:1

** Min. signal width [30cps : Max. 16.7ms / 5kcps : Max. 0.1ms]

◎Max. counting speed

This is respond speed per 1sec. when the duty ratio (ON/OFF) of input signal is 1:1.

If duty ratio is not 1:1, the respond speed will be getting slow against input signal and also the width between ON and OFF should be over min. signal width and also one of ON width and OFF width is Under min. signal width, this product may not response.

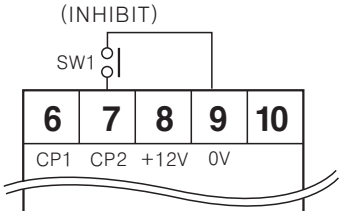


Width of Ta(ON)and Tb(OFF) must be larger than Min. signal width.

Max.counting speed is 1/2 value of catalog spec. when duty rate is 1:3.

It can not respond because Max. signal width(1a) is little.

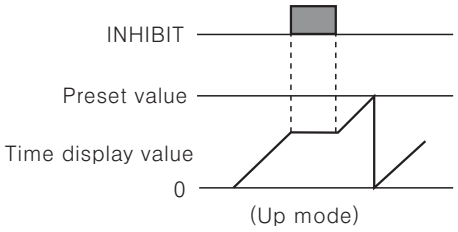
◎INHIBIT(When using as Timer)



●If SW1 is ON, it becomes INHIBIT. (Time Hold)

●Plesae apply INHIBIT signal when stopping the time processing in a while.

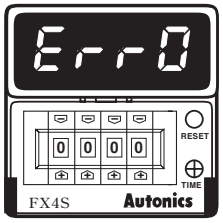
●The time continues when taking off INHIBIT signal.



◎Error display

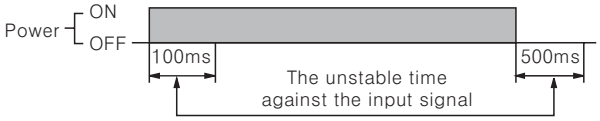
Error signal	Error description	Returning method
Err0	Zero set state	Change the set value to non zero state

※When Error is displayed, the output continues OFF state.
※There is no Error function in the indication type.



◎Power

The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.



Размеры Ш48×В48, универсальный многофункциональный таймер

▣Особенности

- ●Широкий диапазон напряжения питания
  : 24−240VAC 50/60 Гц / 24−240VDC, 12VDC(Опция) ●

Большой набор режимов работы выходов(6 типов режимов)

- ●Различные режимы времени(16 типов временных режимов)
- ●Широкий диапазон времени регулирования(0.05с − 100ч)
- ●Простота установки времени, диапазона регулирования, режима работы выхода
- ● При помощи LED дисплея легко проверить состояние выхода

⚠ **Перед использованием прочитайте Инструкцию по эксплуатации.**

CE c UL us

▣Информация для заказа

AT 8 N

N	Предел времени 2с или предел времени 1с с мгновенным контактом 1с и выбором режимов работы выхода
8	8 штырьковый тип разъема
AT	Аналоговый таймер

※Розетка : PG−08, PS−08

AT 11 DN

DN	Предел времени 2с
EN	Предел времени 1с, мгновенный контакт 1с
11	11 штырьковый тип разъема
AT	Аналоговый таймер

※Розетка : PG−11, PS−11

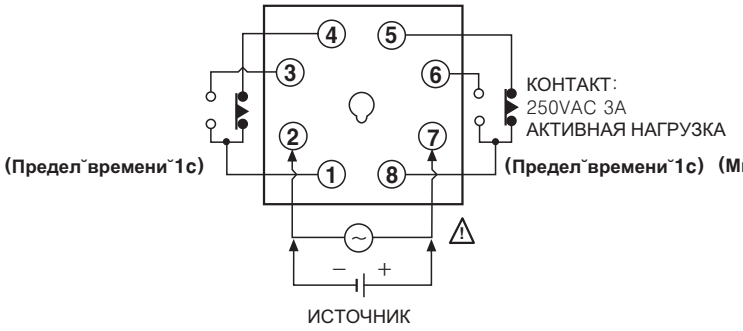
■ Характеристики

Серия		AT8N	AT11DN	AT11EN
Функция		МНОГОФУНКЦИОНАЛЬНЫЙ ТАЙМЕР		
Диапазон установок времени		0.05с~100ч		
Напряжение питания		24−240VAC 50/60Гц / 24−240VDC, 12VDC(Опционально)		
Диапазон раб.напряжения		90 ~ 110% от номинального напряжения		
Потребляемая мощность		Приблизит. 3.3ВА(24−240VDC 60Гц), Приблизит. 1.5Вт(24−240VDC), Приблизит. 0.5Вт(12VDC)		
Время сброса		Макс. 100мсек		
Мин. входной сигнал	Вход ПУСК	———	Мин. 50 мс	
	Вход ЗАДЕРЖКА			
	Вход СБРОС			
Вход	Вход ПУСК	———	Вход при нулевом напряжении ☞ Полное сопротивление при КЗ : макс. 1кОм Остаточн. напряжение: макс. 0.5В Сопротивление при разомкнутой цепи : мин. 100 кОм	
	Вход ЗАДЕРЖКА			
	Вход СБРОС			
Работа функций времени		Тип ПУСКА при включенном питании	Тип ПУСКА при включенном сигнале	
Выход	Тип контакта	Контакт предела времени DPDT(2c), Контакт предела времени DPDT(1c)+ мгновенный контакт DPDT(1c) с выбором режима работы выхода	Предел времени DPDT(2c)	Предел времени SPDT(1c), мгновенный контакт SPDT(1c)
	Мощность контакта	250VAC 3A активная нагрузка		
РесурсО реле	Механический	Мин. 10,000,000 срабатываний		
	Электрический	Мин. 100,000 срабатываний(Номинальная мощность контакта)		
Ошибка повторения		Макс. ±0.3%		
Ошибка установки		Макс. ±5% ±0.05с		
Ошибка напряжения		Макс. ±0.5%		
Температ. ошибка		Макс. ±2%		
Сопртивление изоляции		Мин. 100МОм(при 500VDC)		
Диэлектрич. прочность		2000VAC 50/60 Гц в течение 1 мин		
Уровень шума		±2кВ прямоугольный сигнал шума (ширина импульса:1мксек) при имитации помех		
Вибрация	Механическая	Амлитуда 0.75мм при частоте10 ~ 55Гц в каждом направлении X, Y, Z в течение1 часа		
	Ложн. срабат	Амлитуда 0.5мм при частоте 10 ~ 55Гц в каждом направлении X, Y, Z в течение 10 мин		
Ударопрочн	Механическая	300м/с² (Приблизит. 30G) 3 раза в направлении X, Y, Z 1		
	Ложн. срабат	100м/с² (Приблизит. 10G) 3 раза в направлении X, Y, Z		
Темпер.окр.среды		−10 ~ +55℃(в незамерзающем состоянии)		
Темпер.хранения		−25 ~ +65℃(в незамерзающем состоянии)		
Влажность окр.среды		35 ~ 85%относит. влажн.		
Сертификат		CE c UL us	c UL us	
Вес		Приблизит. 100г		

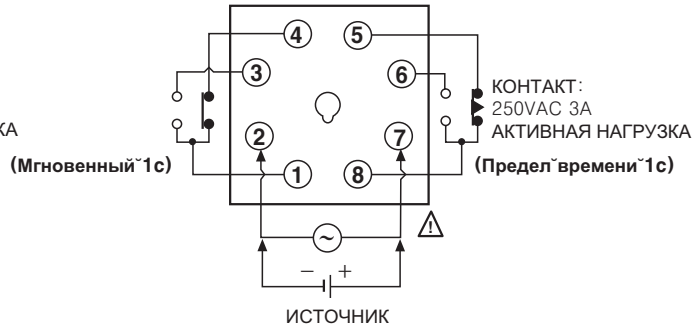
■Подключение

◎AT8N

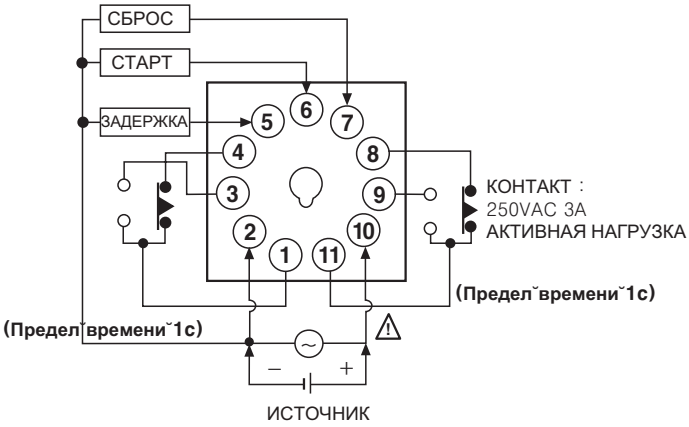
●Режимы [**A**], [**F**]



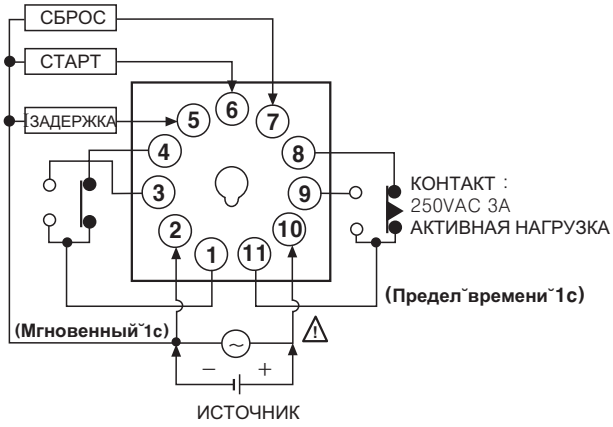
●Режимы [**A1**], [**B**], [**F1**], [I]



◎AT11DN

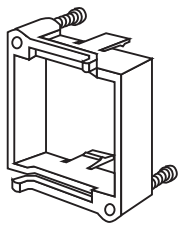


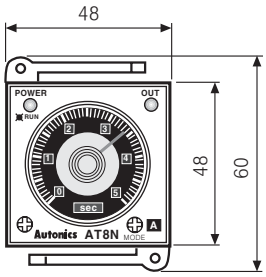
◎AT11EN

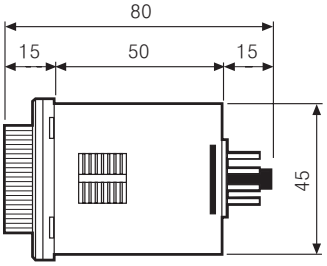


■˘Размеры

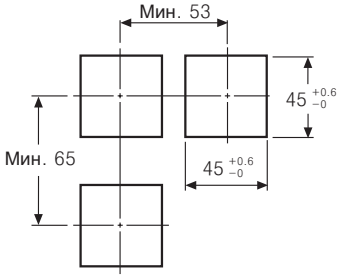
●˘Кронштейн

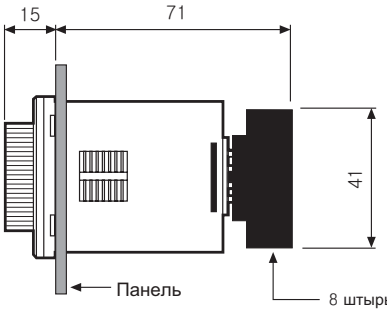






●Установочное˘отверстие в панели

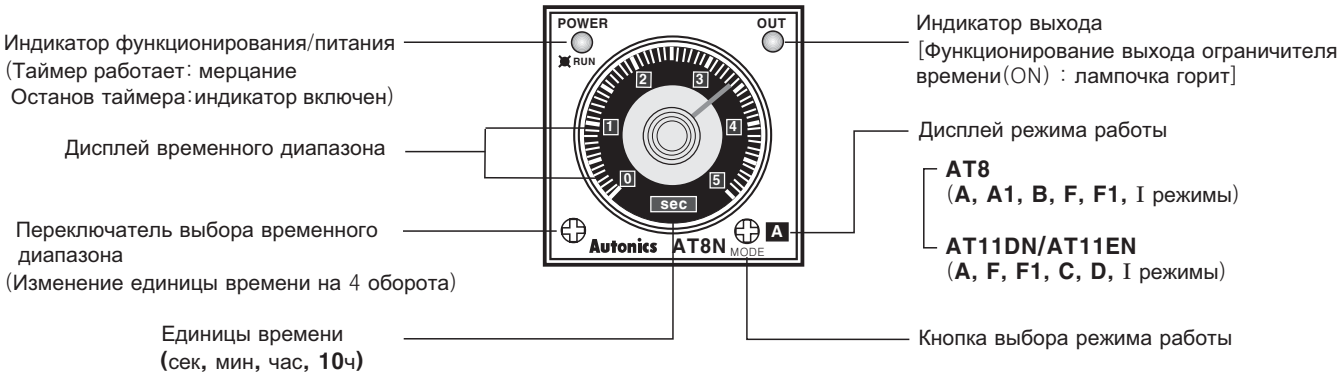




8 штырьковая розетка: PG−08 (поставляется отдельно)
11 штырьковая розетка : PG−11 (Sпоставляется отдельно) ※См.стр B−5.

(Ед.измерения:мм)

■Лицевая панель



※Переключатели временного диапазона и режима работы поворачиваются по часовой стрелке.

■Характеристики времени

Диапазон времени	Ед. изм. времени	Диапазон временных уставок
0.5	сек	0.05~0.5
1.0		0.1~1.0
5		0.5~5
10		1~10
0.5	мин	0.05~0.5
1.0		0.1~1.0
5		0.5~5
10		1~10
0.5	час	0.05~0.5
1.0		0.1~1.0
5		0.5~5
10		1~10
0.5	**10**ч	0.05~0.5
1.0		0.1~1.0
5		0.5~5
10		1~10

■Режим функционирования выхода каждой модели

●AT8N

Дисплей	Режим функционирования выхода
A	ЗАДЕРЖКА ВКЛЮЧЕНИЯ ПИТАНИЯ
A1	ЗАДЕРЖКА ВКЛЮЧЕНИЯ ПИТАНИЯ 1
B	ЗАДЕРЖКА ВКЛЮЧЕНИЯ ПИТАНИЯ 2
F	МЕРЦАНИЕ (ПУСК ВЫКЛЮЧЕН)
F1	МЕРЦАНИЕ 1 (ПУСК ВКЛЮЧЕН)
I	ИНТЕРВАЛ

●AT11DN/AT11EN

Дисплей	Режим функционирования выхода
A	ЗАДЕРЖКА ВКЛЮЧЕНИЯ СИГНАЛА
F	МЕРЦАНИЕ (ПУСК ВЫКЛЮЧЕН)
F1	МЕРЦАНИЕ 1 (ПУСК ВКЛЮЧЕН)
C	ЗАДЕРЖКА ВЫКЛЮЧЕНИЯ СИГНАЛА
D	ЗАДЕРЖКА ВКЛ / ВЫКЛ СИГНАЛА
I	ИНТЕРВАЛ

▣AT8N Режим работы выхода

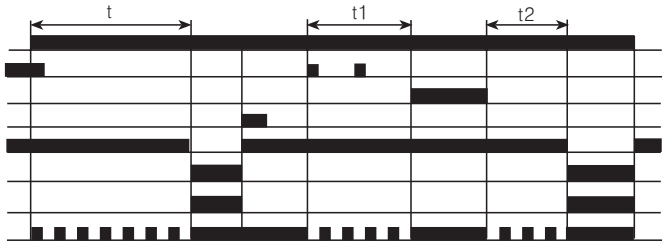
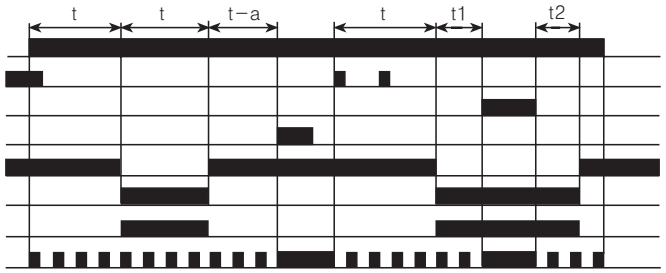
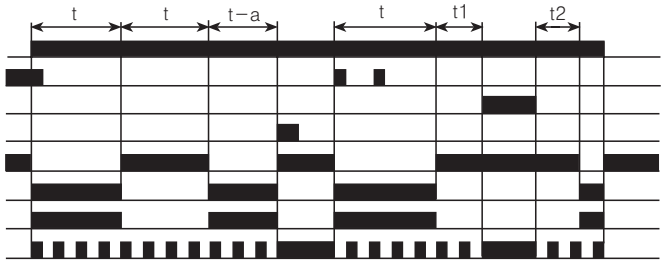
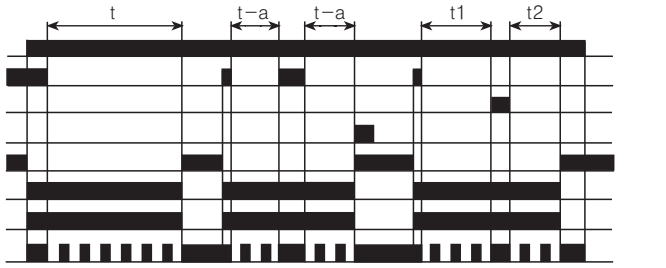
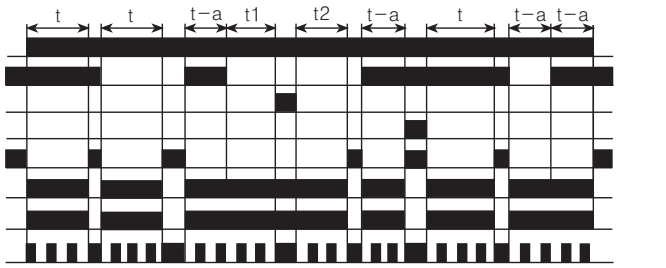
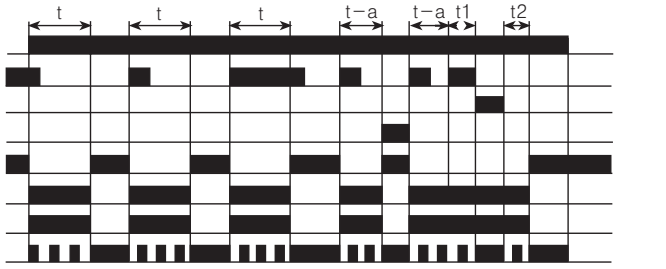
t:Время уставки, t > t−a, Rt:Время возврата(Макс. 100мс)

Режим	Временная диаграмма
A РЕЖИМ ЗАДЕРЖКИ ВКЛЮЧЕНИЯ ПИТАНИЯ	t, Rt, t, Rt, t−a Мощность 2−7 Контакт предела времени NC 1−4 (8−5) Контакт предела времени NO 1−3 (8−6) Индикатор работы выхода предела времени Индикатор работы/питания
A 1 РЕЖИМ ЗАДЕРЖКИ ВКЛЮЧЕНИЯ ПИТАНИЯ **1** (Выход однократного действия)	t, Rt, t, Rt, t−a Мощность 2−7 Контакт предела времени NC 8−5 Контакт предела времени NO 8−6 0.5сек, 0.5сек Мгновенный контакт NC1−4 Мгновенный контакт NO1−3 Индикатор работы выхода предела времени Индикатор работы/питания ※Выход однократного действия зафиксирован на 0.5сек
B РЕЖИМ ЗАДЕРЖКИ ВКЛЮЧЕНИЯ ПИТАНИЯ **2**	t, Rt, t, Rt, t−a Мощность 2−7 Контакт предела времени NC 8−5 Контакт предела времени NO 8−6 Мгновенный контакт NC 1−4 Мгновенный контакт NO 1−3 Индикатор работы выхода предела времени Индикатор работы/питания
F Режим мерцания	t, t, t−a, Rt, t, t, t Мощность 2−7 Контакт предела времени NC 1−4 (8−5) Контакт предела времени NO 1−3 (8−6) Индикатор работы выхода предела времени Индикатор работы/питания
F 1 Режим мерцания **1**	t, t, t−a, Rt, t, t, t Мощность 2−7 Контакт предела времени NC8−5 Контакт предела времени NO8−6 Мгновенный контакт NC 1−4 Мгновенный контакт NO 1−3 Индикатор работы выхода предела времени Индикатор работы/питания
I Режим интервал	t, Rt, t, Rt, t−a Мощность 2−7 Контакт предела времени NC 8−5 Контакт предела времени NO 8−6 Мгновенный контакт NC 1−4 Мгновенный контакт NO 1−3 Индикатор работы выхода предела времени Индикатор работы/питания

※Если при использовании режимов работы выходов F, F1, установленное время слишком мало , выход может работать некорректно. Установите время по крайней мере свыше 100мс.

▣AT11DN/AT11EN Режим работы выхода

t=t1+t2, t>t−a

Режим	Временная диаграмма
A РЕЖИМ ЗАДЕРЖКИ ВКЛЮЧЕНИЯ СИГНАЛА	
F Режим Мерцания	
F 1 Режим Мерцания1	
C РЕЖИМ ЗАДЕРЖКИ ВЫКЛЮЧЕНИЯ СИГНАЛА	
D РЕЖИМ ЗАДЕРЖКИ ВЫКЛЮЧЕНИЯ / ВКЛЮЧЕНИЯ СИГНАЛА	
I РЕЖИМ ИНТЕРВАЛ	

Замечание) 1. Если питание отключено или клеммы СБРОСА закорочены, то таймер осуществит сброс данных.
2. Если клеммы ЗАДЕРЖКИ закорочены в течение цикла синхронизации, таймер остановится.
3. Если при использовании режимов выхода F, F1 установленное время слишком мало, выход может работать некорректно. Установоите время по крайней мере более 100мс.

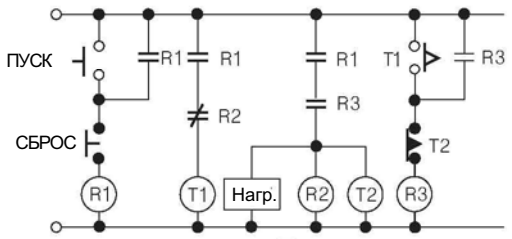
▣ Использование по назначению

◎ Функция Повторения (Flicker-Мерцание)

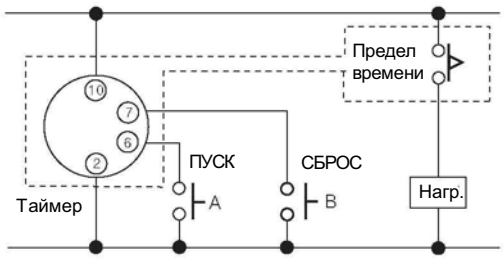
• Эта функция (Мерцание) позволяет применять один таймер ATN с тремя суб-реле и двумя таймерами. Простота использования функции Мерцания с одним таймером ATN.

•Выключатель A : Пуск, Выключатель B: Сброс.

< Предшествующий >

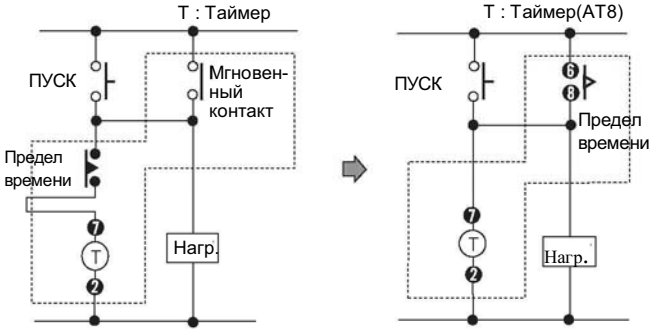


< Режим Мерцания таймера ATN >



◎ Режим ИНТЕРВАЛ

Режим Интервал позволяет осуществить ВКЛЮЧЕНИЕ (ON) Мгновенного контакта и ВЫКЛЮЧЕНИЕ (OFF) Предела времени (при сохранении цепи).



< Предшествующий> <Режим ИНТЕРВАЛ>

◎ Условия входного сигнала (AT11 DN, AT11EN)

1. Вход релейного контакта

Для контактного входа применяйте позолоченные выключатели с хорошими контактными качествами и малым временем дребезга контактов. (Сопротивление холостого хода: более 100 кОм, сопротивление короткого замыкания: менее 1кОм)

*Для обеспечения бесперебойной работы используйте контакт при 5VDC 0.4мА.

2. NPN вход транзистора с открытым коллектором

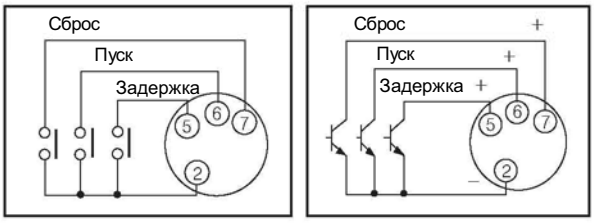
Для транзистора используйте следующие характеристики:

Vceo : мин. 25В

Ic : мин. 10мА

Icbo : макс. 0.2мкА

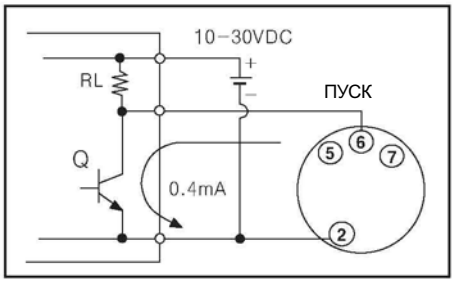
Остаточное напряжение : макс. 0.5В



3. Универсальный вход NPN

Позволяет использовать выход по напряжению в качестве источника входного сигнала вместо выхода с открытым коллектором в полупроводниковой схеме (Датчики приближения, фотодатчики), имеющий выходное напряжение порядка 10 – 30VDC.

Таймер запускается, когда сигнал H изменяется на L . Если транзистор (Q) находится во включенном состоянии, установите остаточное напряжение меньшим 0,5В.



◎ Подключение клемм

1) Осуществляйте прокладывание проводки согласно инструкции.

2) Подключение силовых проводов

Силовой кабель подключается к таймеру ATN переменного тока без учета полярности, но при подключении к таймеру на постоянном токе полярность необходимо соблюдать.

Источник питания	8 штырьковый тип	11 штырьковый тип
Перем. тока	Клеммы ② − ⑦	Клеммы ② − ⑩
Пост. тока	Клеммы ② ← ⊖ Клеммы ⑦ ← ⊕	Клеммы ② ← ⊖ Клеммы ⑩ ← ⊕

•При отключении питания учитывайте индуцированное напряжение. (При использовании силового кабеля в другой высоковольтной линии или вблизи напорной линии могут возникнуть индуцированные напряжения.)

•Пульсации мощности не должны превышать 10%, напряжение источника питания должно находится в рамках допустимого диапазона напряжения постоянного тока.

•Подключение силового кабеля при использовании выключателя или релейного контакта должно осуществляться быстро, иначе это может привести к временной ошибке или ошибочному сбросу питания.

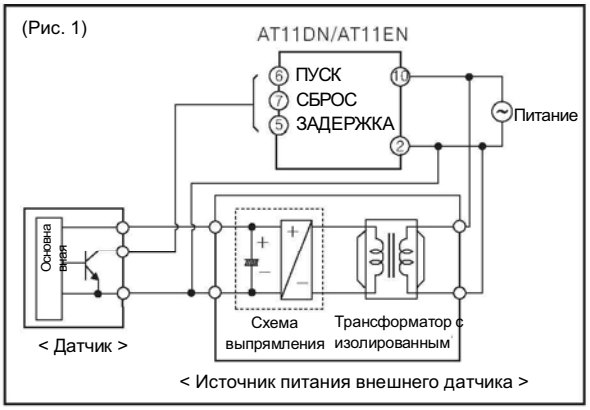
3) Нагрузка регулирующего выхода не должна превышать номинальной нагрузочной способности.

Установочное время, временной диапазон, рабочий режим

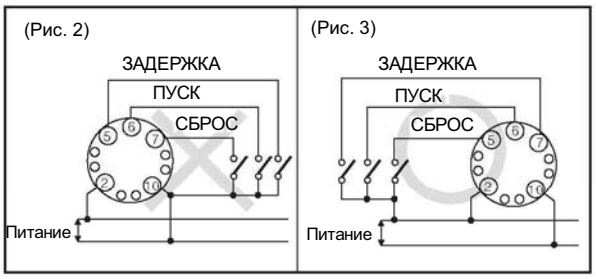
Не изменяйте временной диапазон и режим работы в процессе функционирования. При изменении этих параметров отключайте питание или подайте сигнал сброса.

Подключение входа

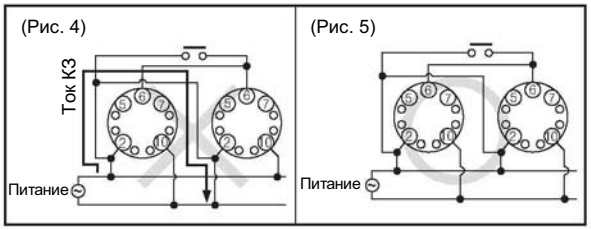
1) Таймер AT11DN/AT11EN является бестрансформаторным, поэтому проверьте подключение релейного контакта для входного сигнала и транзистора.



2) Использование клеммы 10 в качестве общей клеммы для входного сигнала, как показано на рис. 2, может повредить внутреннюю схему таймера AT11DN/AT11EN. Используйте клемму 2 в качестве общей, как это показано на рис.3



3) Если при использовании более чем одного таймера с одним контактом или транзисторным входом схема соединений соответствует приведенной на рис. 4, возникнет ток короткого замыкания. Во избежание этого соблюдайте фазировку питающих шин и соединяйте их как показано на рис.5.



4) ЗАДЕРЖКА, ПУСК, СБРОС сигнала осуществляются закорачиванием входных клемм 2-5, 2-6 или 2-7.
Это может привести к повреждению внутренней схемы, вызванному неправильным соединением.

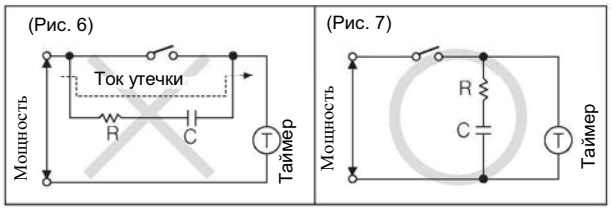
5) Использование шины питания с другой линией высокого напряжения или напорной линией в одном кабелепроводе может привести к возникновению индуцированных напряжений. Поэтому во избежание этого используйте отдельный кабелепровод.

6) Если провод входа (ЗАДЕРЖКА, ПУСК, СБРОС) длинный, то вместо него следует использовать короткий экранированный провод.

Общий

1) Использование оборудования при высоких температурах может привести к повреждению его внутренних компонентов (электролитический конденсатор и др.).

2) Используйте таймер как показано на рис.7 во избежание возникновения в нем токов утечки.



3) Окружающая среда

4) Не устанавливайте таймер в следующих местах:

- В местах возможных сильный вибраций.
- В местах присутствия коррозийных или воспламеняющихся газов, а также воды, масла, пыли.
- В местах присутствия магнитных и электрических шумов.
- В местах, где значения температуры и влажности превышают допустимые.
- В местах присутствия сильных щелочей и кислот.
- В местах воздействия прямого солнечного излучения.

DIN size W72×H72, W48×H96, W144×H72mm COUNTER/TIMER

▣Features

- Easy to select 36 kinds of input operation mode or 20 output operation modes by internal DIP switch.
- Counting speed Up grade : 1cps / 30cps / 2kcps / 5kcps
- Wide range of input power supply : 100−240VAC 50/60Hz, 12−24VDC(Option)
- Built−in a micro computer
- Display the set function of decimal point

⚠ **Please read "Caution for your safety" in operation manual before using.**

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▣Specifications

※Blacked( ) items are upgraded function.

Model	Single preset	FX4	FX6	FX4H	———	———
	Double preset	FX4-2P	FX6-2P	FX4H-2P	FX4L-2P	FX6L-2P
	Indication	FX4-I	FX6-I	FX4H-I	FX4L-I	FX6L-I
Digit		4	6	4	4	6
Digit size		W8×H14mm	W4×H8mm	W6×H10mm	W8×H14mm	
Power supply		100−240VAC 50/60Hz, 12−24VDC(option)				
Allowable voltage range		90 ~ 110% of rated voltage				
Power consumption		• Indicator : Approx. 6VA(240VAC 60Hz), Approx. 2.7W(24VDC) • Single preset : Approx. 7VA(240VAC 60Hz), Approx. 3.3W(24VDC) • Double preset: Approx. 8VA(240VAC 60Hz), Approx. 3.8W(24VDC)				
Max. counting speed for CP1, CP2		**1cps/30cps/2kcps/5kcps selectable by internal DIP switch**				
Min. input signal width	RESET input	Approx. 20ms				
	INHIBIT input					
Input	**CP1, CP2 input (INHIBIT)**	**Input logic is selectable** **[Voltage input] Input impedance : 5.4kΩ, "H" level : 5-30VDC, "L" level : 0-2VDC** **[No-voltage input] Impedance at short-circuit : Max. 1kΩ, Residual voltage at short-circuit : Max. 2VDC, Impedance at open-circuit : Min. 100kΩ**				
	RESET input					
One-shot output time		1st. output : 0.5sec				
		2nd output : 0.05~5sec				
Control output	Contact / Type	Single preset type : SPDT(1c), Double preset type : 1st output SPDT(1c), 2nd output SPDT(1c)				
	Contact / Capacity	250VAC 3A at resistive load				
	Solid−state / Type	Single preset type : 1 NPN open collector Double preset type : 1st output 1 NPN open collector, 2nd output 1 NPN open collector				
	Solid−state / Capacity	30VDC Max. 100mA Max.				
Memory retention		10 years(when using non−volatile semiconductor memory)				
External sensor power		12VDC±10% 50mA Max.				
Ambient temperature		−10 ~ +55℃(at non−freezing status)				
Storage temperature		−25 ~ +65℃(at non−freezing status)				
Ambient humidity		35 ~ 85%RH				

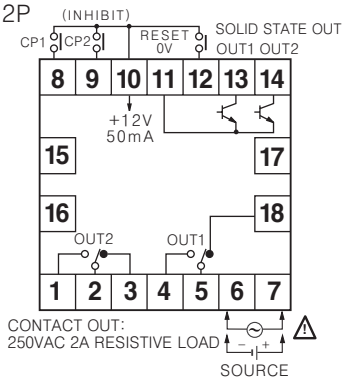
▣Specifications

Insulation resistance		Min. 100MΩ (at 500VDC)				
Dielectric strength		2000VAC 50/60Hz for 1 minute				
Noise strength	AC power	±2kV the square wave noise (pulse width:1μs) by the noise simulator				
	DC power	±500V 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/s² (Approx. 30G) in X, Y, Z directions for 3 times				
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions for 3 times				
Relay life cycle	Mechanical	Min. 10,000,000 operations				
	Electrical	Min. 100,000 operations at 250VAC 2A (resistive load)				
Weight		FX4 : Approx. 295g FX4-2P : Approx. 305g FX4-I : Approx. 260g	FX6 : Approx. 305g FX6-2P : Approx. 315g FX6-I : Approx. 265g	FX4H : Approx. 325g FX4H-2P : Approx. 353g FX4H-I : Approx. 297g	FX4L-2P : Approx. 544g FX4L-I : Approx. 455g	FX6L-2P : Approx. 550g FX6L-I : Approx. 461g
Approval		c UL us		———		

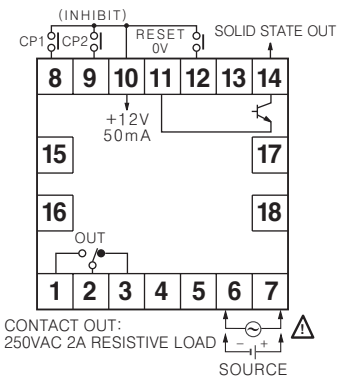
※Qualification mark for FX4, FX4-I, FX6, FX6-I.

▣Connections

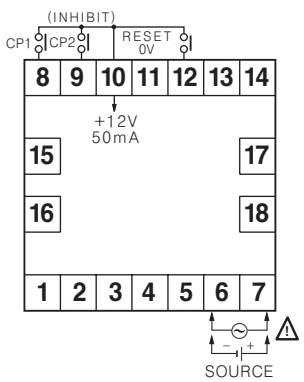
●FX-2P



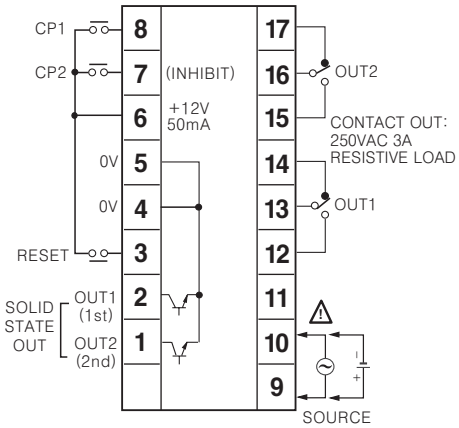
●FX



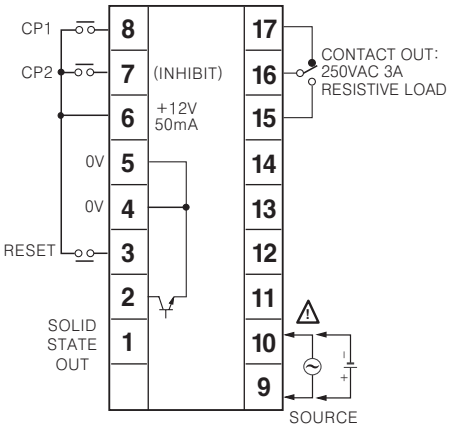
●FX-I



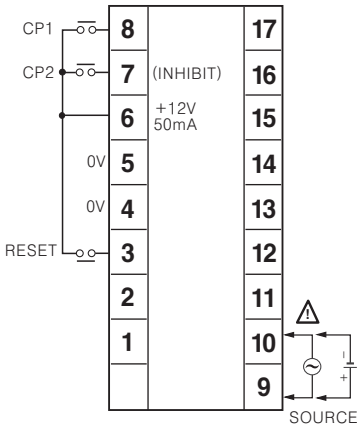
●FXH-2P



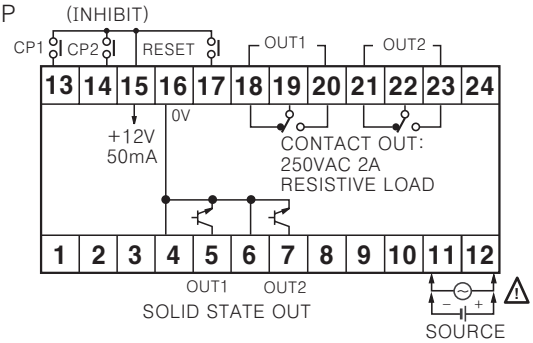
●FXH



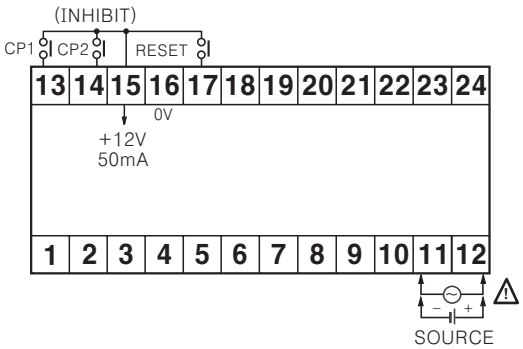
●FXH-I



●FXL-2P



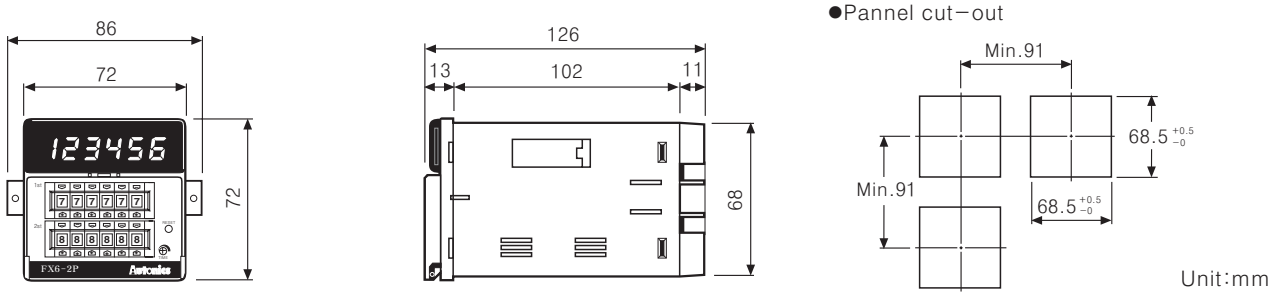
●FXL-I



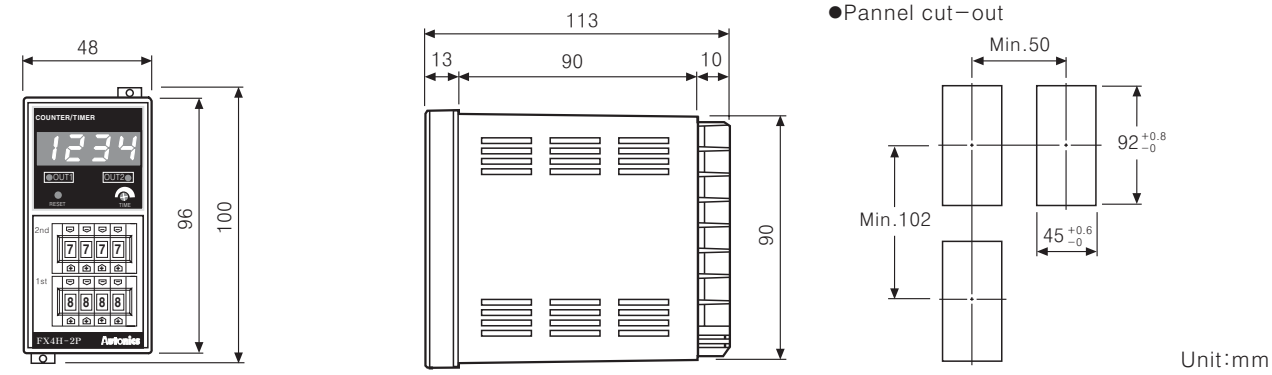
※CP2(INHIBIT) : Time hold terminal when using for timer.
※It is operated by power ON start type when using for timer.

▣Dimensions

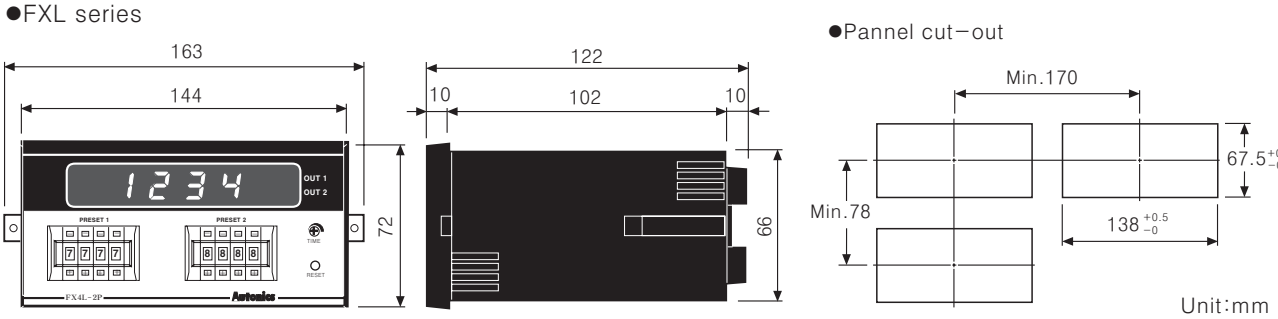
●FX series



●FXH series



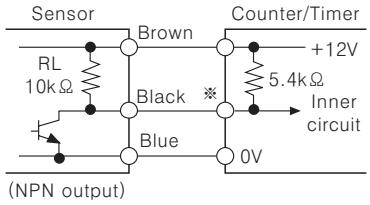
●FXL series

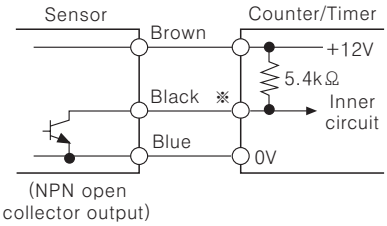


▣Input connections

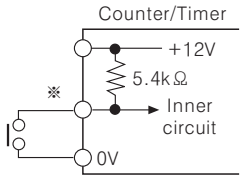
◎Input logic : No-voltage input(NPN)

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





●Contact input

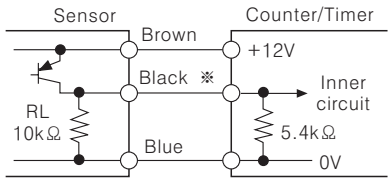


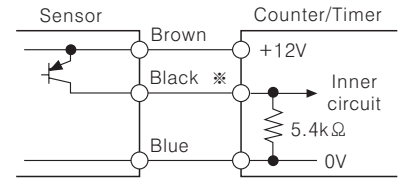
Counting speed :
1 or 30cps setting(Counter)

※CP1, CP2(INHIBIT), RESET input

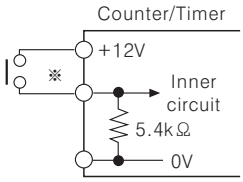
◎Input logic : voltage input(PNP)

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





●Contact input



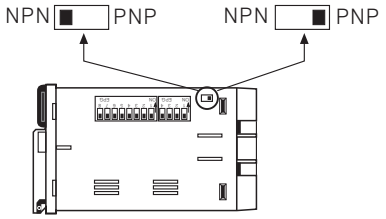
Counting speed :
1 or 30cps setting(Counter)

※CP1, CP2(INHIBIT), RESET Input

▣Input logic selection

●FX series
Input logic is changeable by input logic selection switch located at the one-side of case.

• No voltage input (NPN) • Voltage input(PNP)



●FXL series
Input logic is changeable by input logic selection switch located at the terminal block.

• No voltageinpu(NPN)

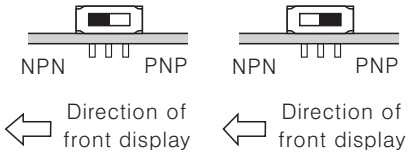
F S

• Voltage input(PNP)

F S

●FXH series
Input logic is changeable by input logic selection switch (SW3) located at inside of the case.

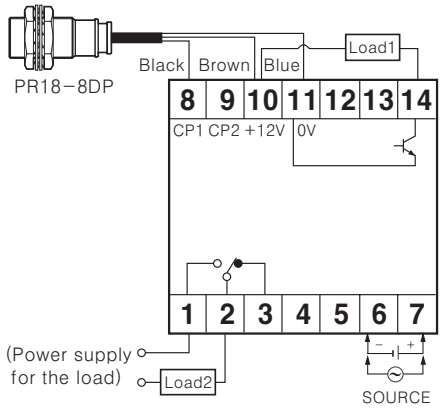
• No voltage input (NPN) • Voltage input (PNP)



※Please be sure to turn power OFF before changing input logic.

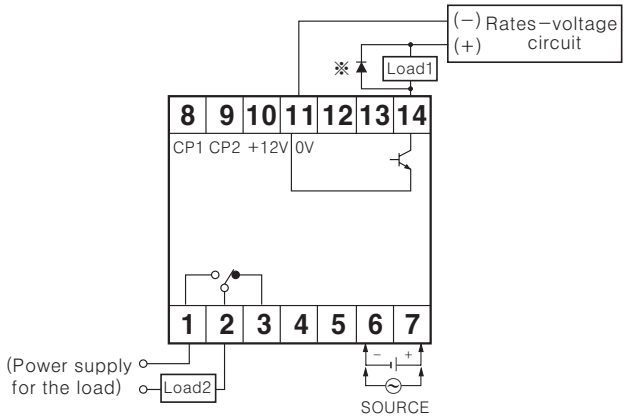
▣Input & output connections

◎In case of operating the load by power supply of the sensor



●Please select proper capacity of load, because total value of load capacity and current consumption should not be exceed current capacity.(Max. 50mA)

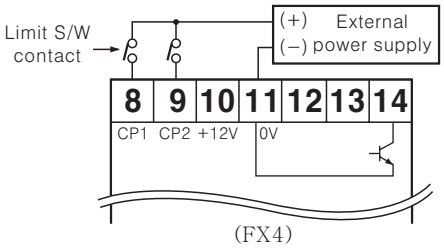
◎In case of operating the load by external power supply



●The capacity of the load must not be exceed max. 30VDC, max. 100mA of the switching capacity of the transister.
●Please do not supply the reverse polarity voltage.
※Please connector the surge absorber(Diode) at both terminals of the load, in case of using the inductive load. (Relay, etc.)

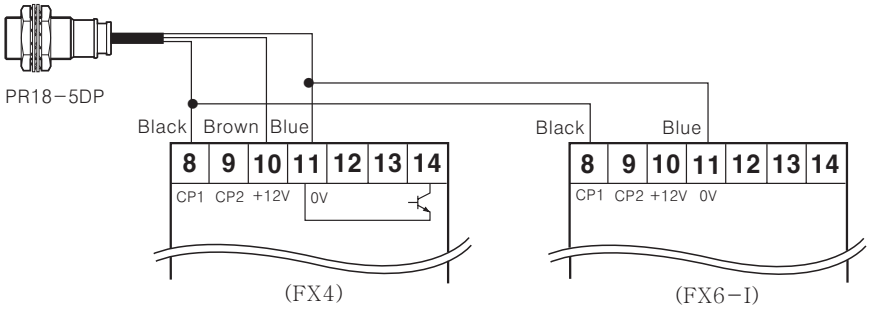
◎How to count by external power supply

This unit counting when "H" level (5−30VDC) is applied at CP1 or CP2("Low" : 0−2VDC)



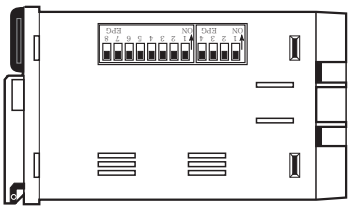
◎Using 2 counters with one sensor

●It is available to use 2 counters with one sensor.
The power of sensor must be connected to only one of counter.

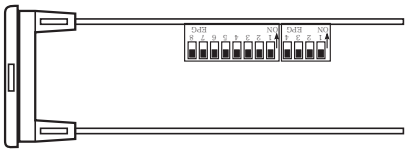


▣Selection by DIP switches

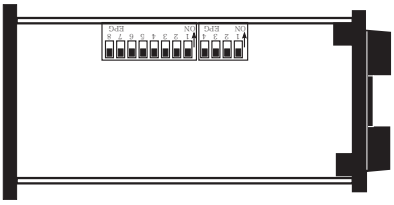
●72×72 DIP switch position

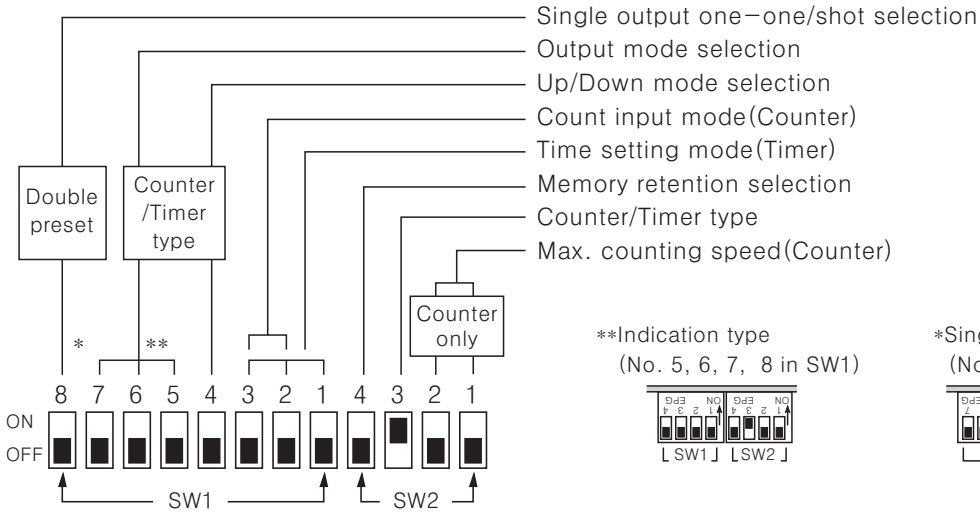


●48×96 DIP switch position



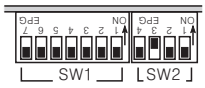
●144×72 DIP switch position





**Indication type
(No. 5, 6, 7, 8 in SW1)

*Single preset
(No. 8 in SW1)



●Max. counting speed

SW2	Functions
1 2 ON OFF	**1cps**
1 2 ON OFF	30cps
1 2 ON OFF	2kcps
1 2 ON OFF	**5kcps**

●Conter/Timer

SW2	Functions
3 ON OFF	Conter
3 ON OFF	Timer

●Up/Down mode

SW1	Functions
4 ON OFF	Down mode
4 ON OFF	Up mode

●Memory retention

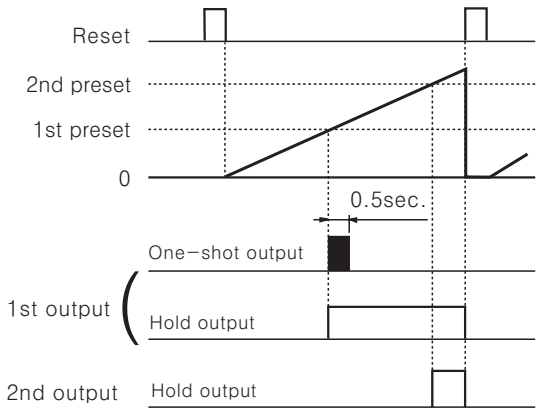
SW2	Functions
4 ON OFF	Power reset (Non memory)
4 ON OFF	Memory

●Selection of one-shot output or hold output for 1st output.

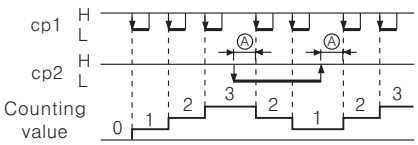
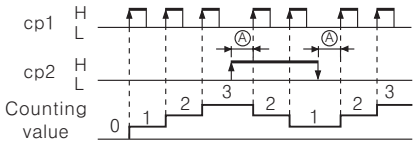
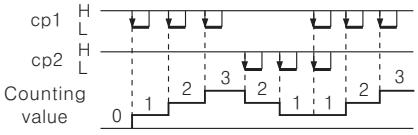
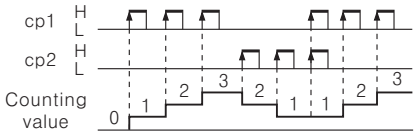
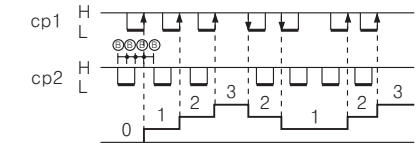
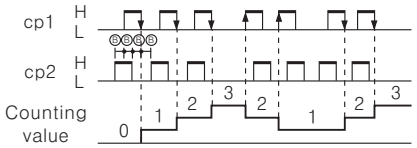
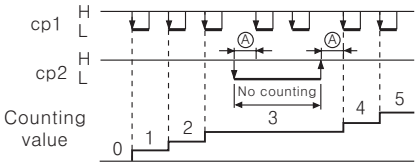
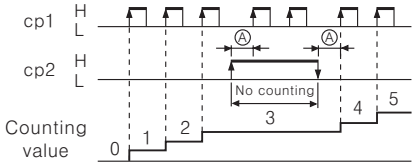
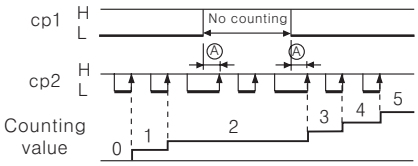
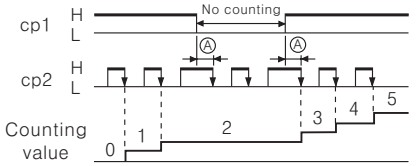
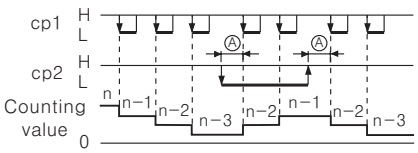
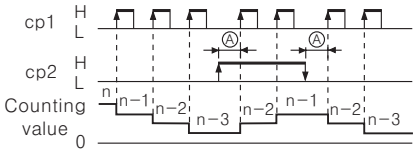
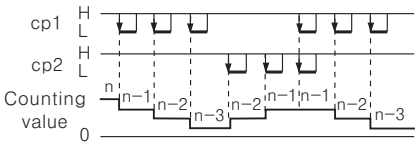
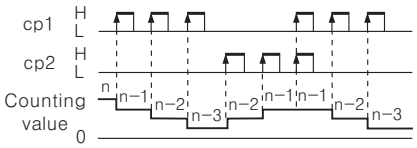
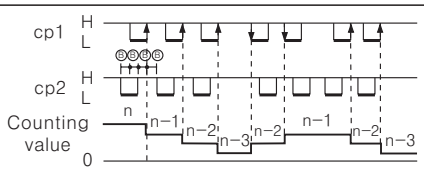
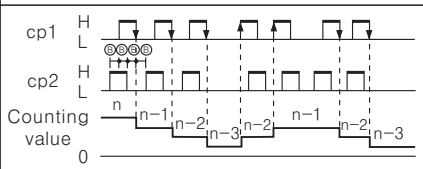
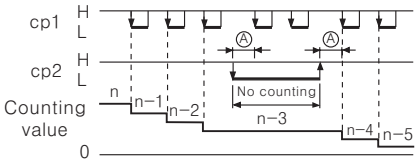
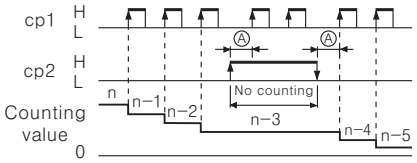
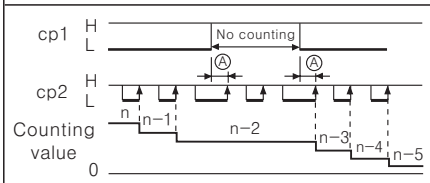
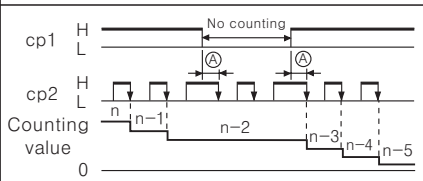
SW1	Function
8 ON OFF	1st output : One-shot output
8 ON OFF	1st output : Hold output

※This mode selects a one-shot output(0.5sec fixed) or Hold output(Until 2nd output turns off) for 1st output in the double preset counter.

※Example of F output operation mode



▣Input operation(Counter)

Input mode(SW1)			No-voltage input type(NPN)	Voltage input type(PNP)
Up mode	Up/Down-A Command input	4 ON OFF; 2 3 ON OFF		
	Up/Down-B Individual input	2 3 ON OFF		
	Up/Down-C Phase difference input	2 3 ON OFF		
	Up Up input	2 3 ON OFF		
				
Down mode	Up/Down-D Command input	4 ON OFF; 2 3 ON OFF		
	Up/Down-E Individual input	2 3 ON OFF		
	Up/Down-F Phase difference input	2 3 ON OFF		
	Down Down input	2 3 ON OFF		
				

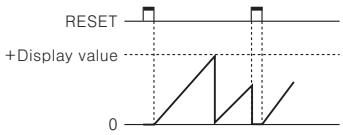
※ Ⓐ : Over Min. signal width, Ⓑ : Over 1/2 of Min. signal width.
Counting miss by one(±1)is occured if the signal width of Ⓐ or Ⓑ is less than min. signal width .

■Time setting mode(timer)

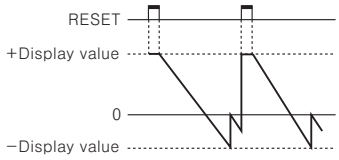
	SW1	4Digit	6Digit
A	1 2 3 ON OFF	99.99sec	99999.9sec
B	1 2 3 ON OFF	999.9sec	999999sec
C	1 2 3 ON OFF	9999sec	99min 59.99sec
D	1 2 3 ON OFF	99min 59sec	999min 59.9sec
E	1 2 3 ON OFF	999.9min	99999.9min
F	1 2 3 ON OFF	99hour 59min	99hour 59min 59sec
G	1 2 3 ON OFF	999.9hour	9999hour 59min
H	1 2 3 ON OFF	9999hour	99999.9hour

■Counting function(Indication model)

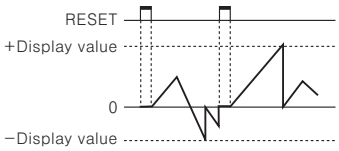
●Up mode



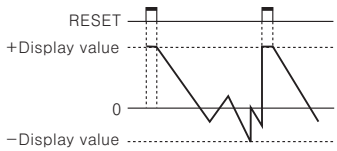
●Down mode



●Up / Down-A, B, C mode

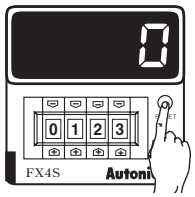


●Up / Down-D, E, F mode



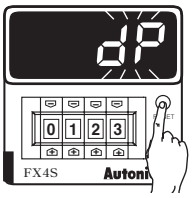
■ Decimal point setting

Dispaly the decimal point.

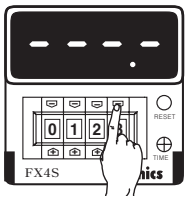


RUN mode

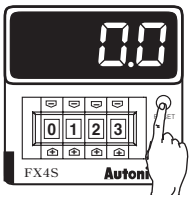
※It returns to decimal point setting status if pressing RESET button for over 3sec. in RUN mode.



※When "dp" is flickering, one touch the Reset button.



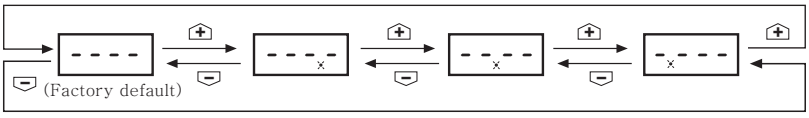
※If pressing one of digital switch buttons (⊞, ⊟) in decimal point setting mode, decimal point will be moved to Up(+)direction.



Return to RUN mode

※It returns to RUN mode if pressing RESET button for over 3sec. in decimal point setting status.

●Changing the decimal point



※It returns to RUN mode if no RESET button or digital switch is applied for 60sec. in decimal point settingstetus.
※The decimal point setting is existed in indication type.

▣Output operation mode

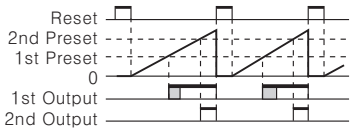
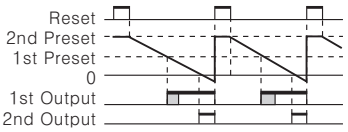
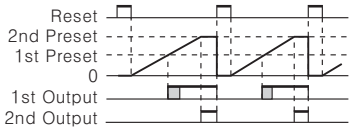
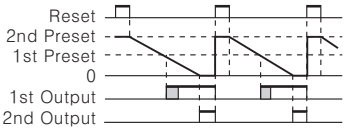
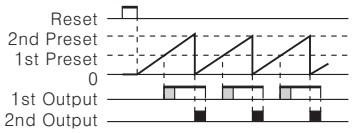
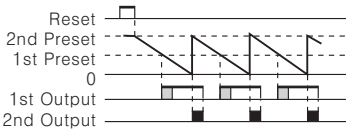
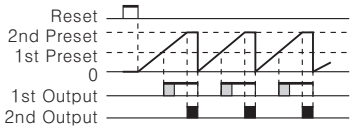
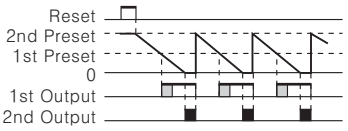
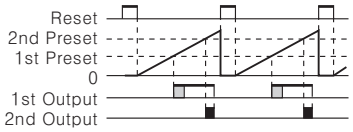
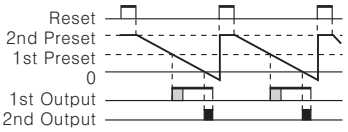
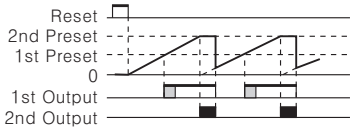
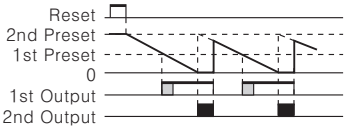
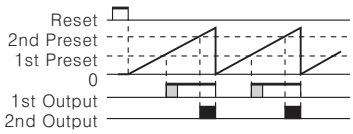
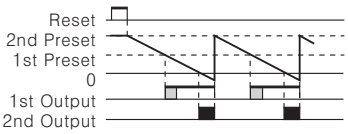
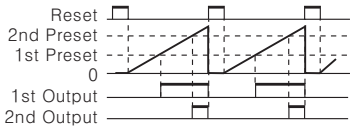
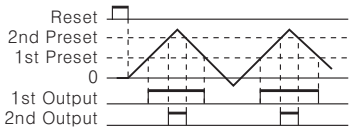
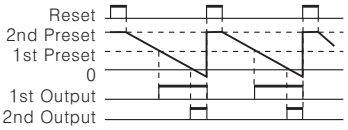
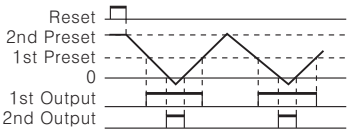
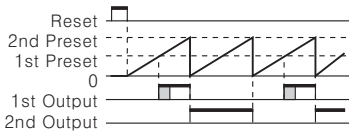
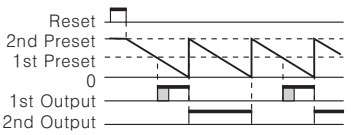
One-shot output **(0.05~5sec)** of 2nd output

Hold output

One-shot output(0.5sec) of 1st output

Self-holding output

※The output of single preset type is operated at the status of the second output mode

Output mode (SW1)	Up mode (4: ON / OFF)	Down mode (4: ON / OFF)	Operation after count up
F (5 6 7: ON / OFF)			The display value continues until Reset signal applied and the output is held. • 1st self-holding output and 2nd output is held until Reset signal applied. • When using 1st output as one-shot output, it will return after operating for 0.5sec.
N (5 6 7: ON / OFF)			The display value and output will be held until Reset input is applied.
C (5 6 7: ON / OFF)			The display returns to initial status and 2nd output will be reset after one-shot time. • 1st self-holding output will be OFF after one-shot output time of 2nd output. • 1st one-shot output will be reset after operating 0.5sec., and it is not related to 2nd output.
R (5 6 7: ON / OFF)			The display value will be held until 2nd output is OFF then reset. • 1st hold output will be OFF after one-shot time of 2nd output. • 1st one-shot output will be reset after operating 0.5sec., and it is not related to 2nd output.
K (5 6 7: ON / OFF)			The display value continues until Reset signal applied. • 1st hold output will be OFF after one-shot time of 2nd output. • 1st one-shot output will be reset after operating 0.5sec., and it is not related to 2nd output.
P (5 6 7: ON / OFF)			The display value is held during 2nd output one-shot time, counting process is returned to reset start status as soon as 2nd output ON. • 1st hold output will be OFF after one-shot time of 2nd output. • 1st one-shot output will be reset after operating 0.5sec., and it is not related to 2nd output.
Q (5 6 7: ON / OFF)			The display continues until 2nd output is OFF. • 1st hold output will be OFF after one-shot time of 2nd output. • 1st one-shot output will be reset after operating 0.5sec. not related to 2nd output.
S Counter (5 6 7: ON / OFF)	**Up**  	**Down**  	• Up, Up/Down-A, B, C input mode -OUT1 is ON when(Display value) ≥ (1st preset value) -OUT2 is ON when(Display value) ≥(Double preset value) • Down, Up/Down-D, E, F input mode -OUT1 is ON when(Display value) ≤ (1st preset value) -OUT2 is ON when(Display value) ≤ (Zero)
S Timer (5 6 7: ON / OFF)			When it is used as Timer, 1st output and 2nd output are flickering repeatedly.

▣Proper usage

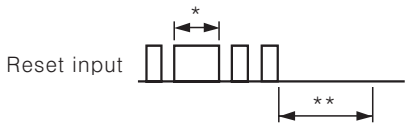
◎Reset

●Reset

In case of changing the input mode after supplying the power, please provide an external reset or manual reset. **If reset is not executed, the counter will be working in previous mode.**

●Reset signal width

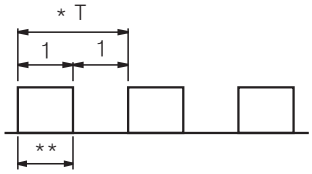
To guarantee proper reset, the signal must be supplied for a minimum of **min. 20ms** regardless it the signal comes from a contact or a solid-state input.



*In case of a contact reset, contact chattering will not affect the reset as long as it is applied for a minimum of 20ms.

**Input signal at CP1 & CP2 must be applied for a minimum of 50ms after the reset is removed.

◎Minimum count signal width



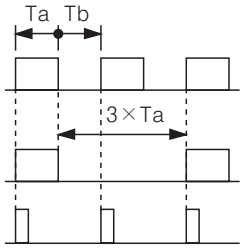
* Assume duty cycle(ON/OFF) of 1:1 period.

**Minimum signal width [30cps : Min. 16.7ms / 2kcps : Min. 0.25ms]

◎Maximum counting speed

This is the maximum count speed when the duty cycle(ON/OFF) of input signal is 1:1. If duty cycle is not 1:1, the maximum count speed will be slower. The width of ON and OFF signals must always be larger than the minimum signal width.

If either ON or OFF signal is shorter than minimum signal width, this product may not respond.



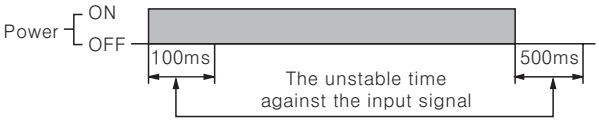
Therefore Ta(ON width) and Tb(OFF width) needed to be over min.signal width.

When duty cycle is 1:3, the maximun counting speed will be ½ from that in our catalog.

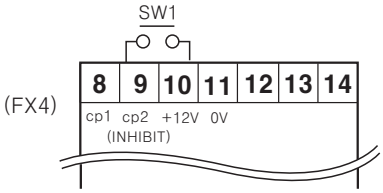
This product does not respond.

◎Power

The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.



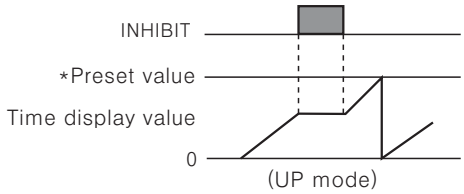
◎INHIBIT(Only Timer)



●INHIBIT mode is active when SW1 turns ON. (Time Hold)

●When it is necessary to stop time while the timer is progressing, the INHIBIT mode can be used.

●When the INHIBIT input is turned off, time is progressing again.

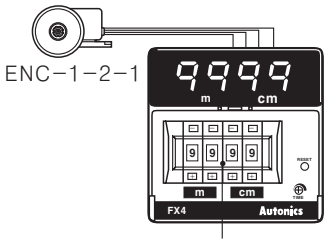


◎How to use the sticker

The below sticker can be found inside the box. Use the sticker according to application as follow;

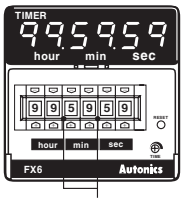
COUNTER	mm	inch	mm	inch
TIMER	m	hour	m	hour
COUNTER	sec	cm	sec	cm
TIMER	min	yd	min	yd

Ex1)Measurement of length by the rotary encoder



Please put black dot.

EX2)Timer[F mode]



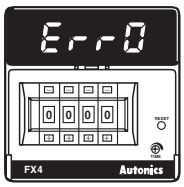
Please put black dot.

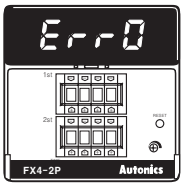
◎Error display

Error signal	Error description	Returning method
Err0	Zero set state	Change the set value to non zero state

※There is no Error display function in indication type.

※When Error is displayed, the output continues OFF state.





DIN size W48×H48mm Star-Delta Timer

▣Features

- ●This is upgraded model from AT8SD series.
- ● Wide range of setting time and switching time.
  - • T1(Setting time) : Selectable 5, 10, 50, 100sec
  - • T2(Switching time) : Selectable 0.05, 0.1, 0.2, 0.3, 0.4, 0.5sec
- ●Easy to set the setting time and switching time on front panel.
- ●LED indicators show status of Start and Delta output.
- ●Power supply : 100-240VAC 50/60Hz / 24-240VDC
  12VDC(Option)
- ●Application : Starting large capacity motors

⚠ **Please read "Caution for your safety" in operation manual before using.**

▣Ordering information

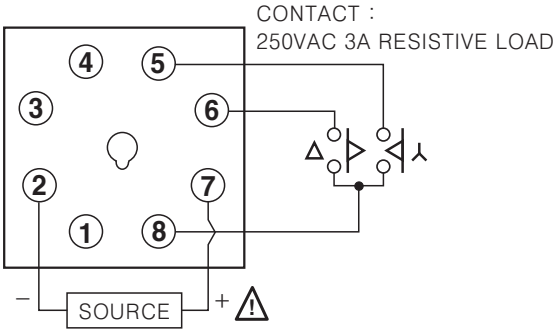
AT **8** **SDN**

SDN	Star Delta New Type
8	8pin plug Type
AT	Analog Timer

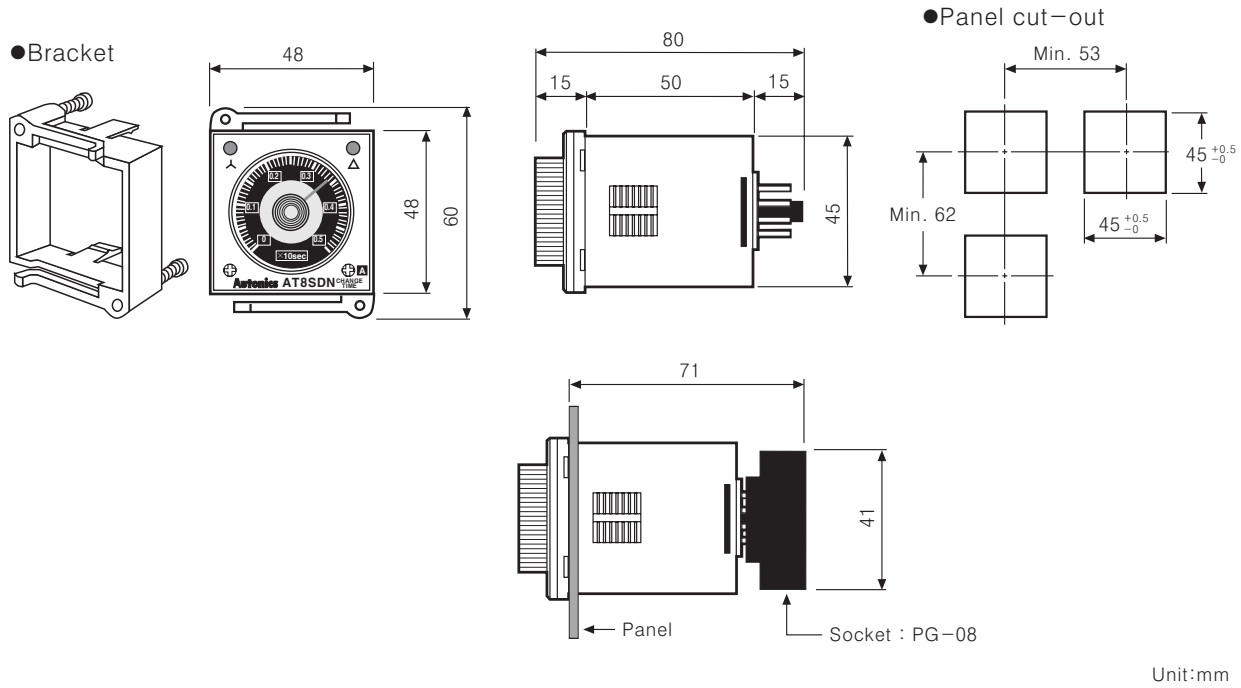
▣Specifications

Model		**AT8SDN**
Function		**Star-Delta TIMER**
Control time setting range		0.5sec~100sec(Max. time)
Power supply		100-240VAC 50/60Hz / 24-240VDC , 12VDC(Option)
Allowable voltage range□		90 ~ 110% of rated voltage□
Power consumption		Approx. 4VA(240VAC 60Hz), Approx. 1.3W(240VDC), Approx. 0.5W(12VDC)
Return time□		Max. 100ms
Control output□	Contact type	⅄ contact : SPST(1a), Δ contact : SPST(1a)
	Contact capacity	250VAC 3A resistive load
Relay life cycle	Mechanical	Min.10,000,000 times
	Electrical	Min. 100,000 times(250VAC 3A resistive load)
Repeat error		Max. ±0.3%
⅄ Setting error		Max. ±5% ±0.05sec.
Voltage error		Max. ±0.5%
Temperature error		Max. ±2%
Δ Switching time error		±25%
Insulation resistance		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 hours
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions 3 times
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions 3 times
Ambient temperature		-10 ~ 55℃(at non-freezing status)
Storage temperature		-25 ~ 65℃(at non-freezing status)
Ambient humidity		35 ~ 85%RH
Approval		
Weight		Approx. 100g

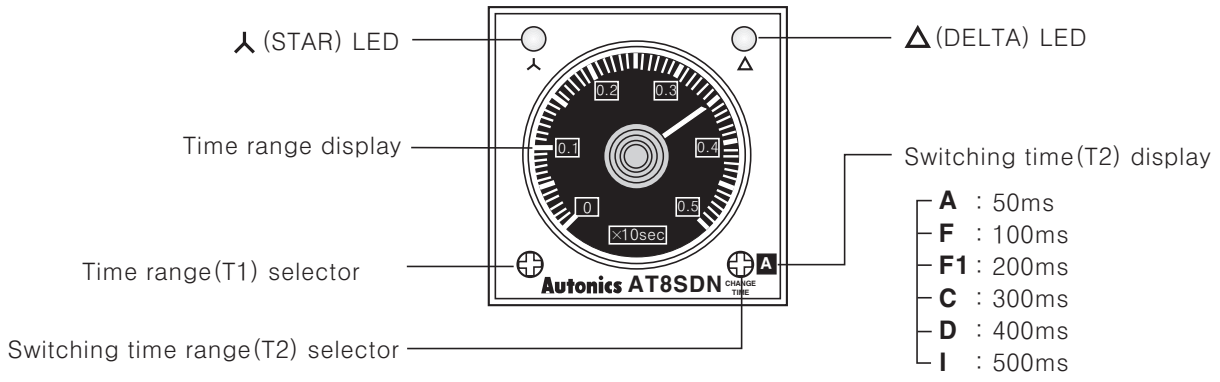
▣Connections



▣Dimensions



▣Front panel identification



▣Time specification

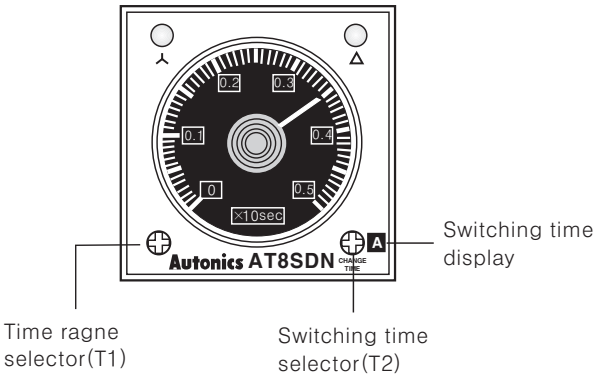
1. T1(Setting time)

Time range	Time unit	Time setting range
0.5	×**10sec**	0.5 ~ 5sec
1.0		1 ~ 10sec
5		5 ~ 50sec
10		10 ~ 100sec

2. T2(Switching time)

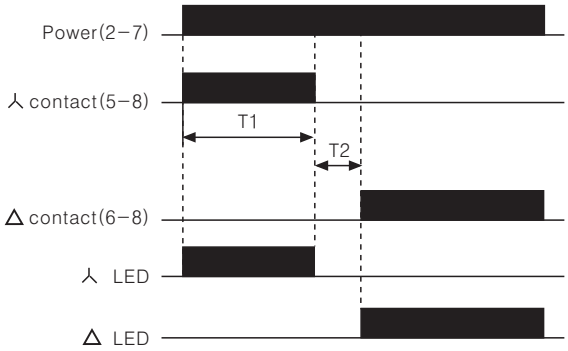
(Unit:ms)

Display	**A**	**F**	**F1**	**C**	**D**	**I**
T2 switching time	50	100	200	300	400	500



▣Operation

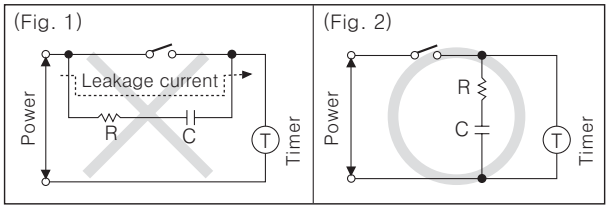
When power is applied, ⅄ contact will be ON. When reaching to T1 setting time, ⅄ contact will be OFF and after T2 switching time, △ contact will be ON.
It the power is OFF, ⅄ contact will be OFF.



※T1 : Setting time (⅄ contact operation time)
※T2 : Switching time (⅄ contact and △ contact are OFF simultaneously at power ON)

▣Proper usage

1. Please supply power quickly at once with using switch or Relay contact. Otherwise it may cause time error or power reset failure.
2. Connect power line without concerning polarity for ATN series AC power type.
   But please aware power connection for DC power type.
3. Please use like (Fig. 2) in order not to flow leakage current into Timer.
4. Please use it like (Fig. 2) in order not to flow leakage current into timer.



5. Do not change Timer range, setting time, switching time while time oprating. When changing setting, plese power off.
6. Environment
   Please avoid the following places:
   - ●Where this product may be damaged by strong impact or vibration.
   - ●Where there are corrosive gas or flammable gas, water, oil and dust.
   - ●Where magnetic and electrical noise occurs.
   - ●Where there are High temperature and humidity beyond rated specification.
   - ●Where there are strong alkalis and acids.
   - ●Where there are direct rays of sun.

AT8PSN/AT8PMN

DIN Size W48×H48mm Solid State, Power OFF Delay TIMER

▣Features

- Time setting range
  (AT8PSN : 0.5~10sec, AT8PM : 0.5~10min)
- Easy to set the setting time and switching time on front panel
- Power supply : 100−120VAC 50/60Hz, 200−240VAC 50/60Hz
  100/110VDC, 48VDC, 24VDC
- Application : Output remains energized and timing

⚠ **Please read "Caution for your safety" in operation manual before using.**

▣Ordering information

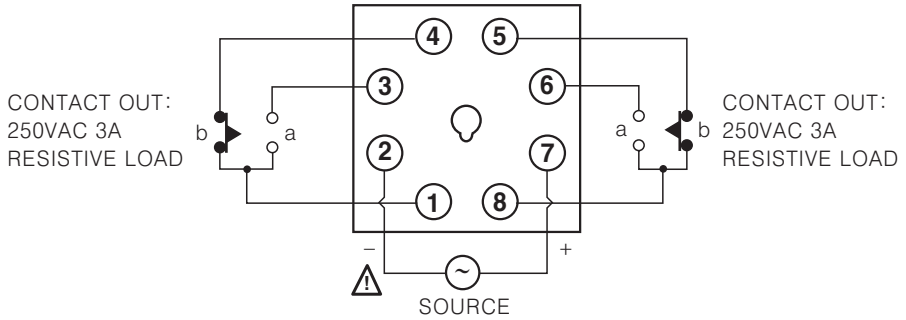
AT 8 P SN

SN	sec
MN	min
P	Power Off Delay
8	8pin plug type
AT	Analog Timer

▣Specifications

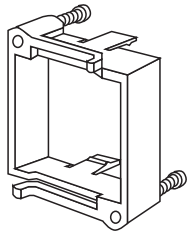
Model		AT8PSN	AT8PMN
Function		**Power OFF Delay**	
Control time setting range		0.5, 1, 5, 10sec	0.5, 1, 5, 10min
Power supply		• 100−120VAC 50/60Hz • 200−240VAC 50/60Hz • 100/110VDC • 48VDC • 24VDC	
Allowable voltage range□		90 ~ 110% of rated voltage□	
Power consumption		• Approx. 0.5VA(120VAC 60Hz), Approx. 0.9VA(240VAC 60Hz) • Approx. 0.5W(110VDC), Approx. 0.2W(48VDC), Approx. 0.1W(24VDC)	
Control output□	Contact type	Time limit DPDT(2c)	
	Contact capacity	250VAC 3A resistive load	
Relay life cycle	Mechanical	Min.10,000,000 times	
	Electrical	Min. 100,000 times(250VAC 3A resistive load)	
Repeat error		Max. ±0.3%	
Setting error		Max. ±5% ±0.05sec.	
Voltage error		Max. ±0.5%	
Temperature error		Max. ±2%	
Insulation resistance		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 hours	
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions 3 times	
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions 3 times	
Ambient temperature		−10 ~ 55℃(at non−freezing status)	
Storage temperature		−25 ~ 65℃(at non−freezing status)	
Ambient humidity		35 ~ 85%RH	
Weight		Approx. 98g	Approx. 105g

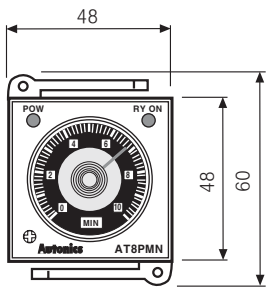
■Connections

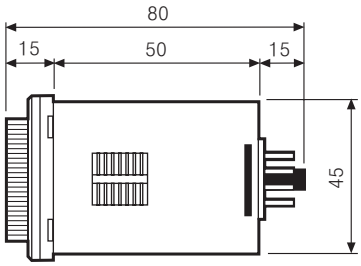


■Dimensions

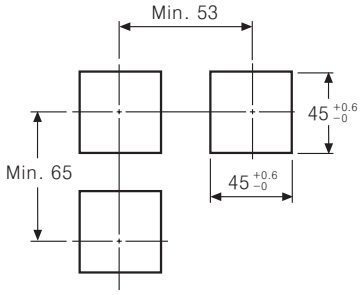
●Bracket

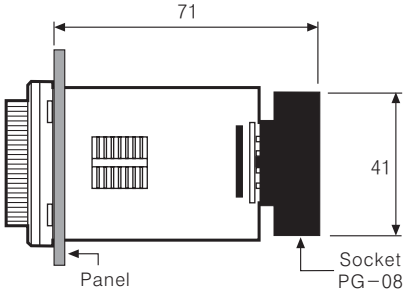






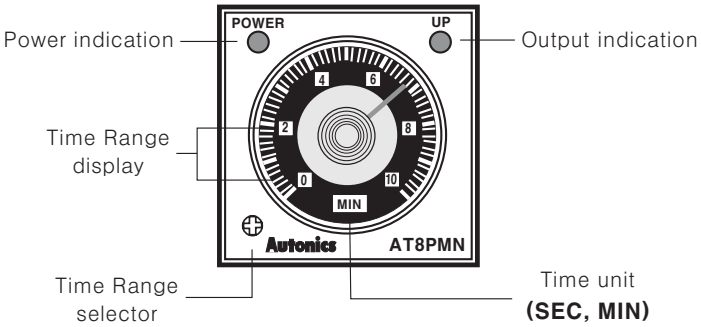
●Panel cut−out





Unit:mm

■Front panel identification

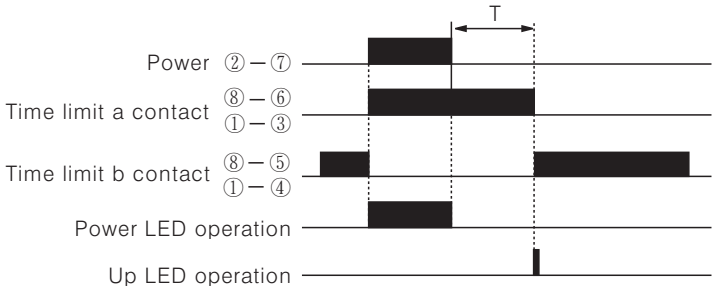


●**Time specification**

Unit	SEC	MIN
Setting time range(T)	0 ~ 0.5	
	0 ~ 1.0	
	0 ~ 5	
	0 ~ 10	
Min. time to supply the power	0.1sec	2sec

■Operation

※A contact turns ON when the power applied and then turns off after passing T setting time when the power off.

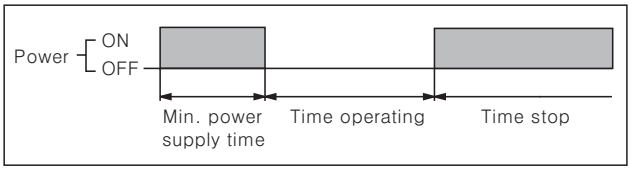


※ T : Setting time

▣Proper usage

◎Power

This product is power OFF dealy timer, the min. power supplying time is 0.1sec. for AT8PSN type and 2sec. for AT8PMN. Therefore ne sure that this product will operation after power off.



※Please use the power within rating power and apply.

◎Noise

1) We test 2kV, Pulse width 1㎲ against impulse voltage between power terminals and 1kV, Pulse width 1㎲ at noise simulator against external noise voltage.
Please install MP condensor(0.1~1㎌) or Oil condensor between power teminals when over Impulse noise voltage occurs.

2) When testing dielectric voltage and insulation resistance of the control panel with this unit installed.
- ●Please isolate this unit from the circuit of control panel.
- ●Please make all terminals of this unit shor-circuited.
(It prevents the damage of inner circuit.)

◎Environment

Please avoid the following places:

- ●A place where this product may be damaged by strong impact or vibration.
- ●A place where corrosive gas or flammable gas, water, oil and dust exist.
- ●A place where magnetic and electrical noise occur.
- ●A place where high temperature and humidity are beyond rated specification.
- ●A place where there are strong alkalis and acids.
- ●A place where there are direct rays of sun.

DIN Size W48×H48mm Solid State ON Delay Timer

▣Features

- ●DIN Size W48×H48mm
- ●Single range Timer
- ●Economical price
- ●Easy time setting
- ●15 time ranges available
- ●Power supply
  - • ATE : 110/220VAC 50/60Hz
  - • ATE1, ATE2 : 110VAC, 220VAC 50/60Hz, 12VDC, 24VDC(Option)

⚠ **Please read "Caution for your safety" in operation manual before using.**

▣Ordering information

ATE □ — **10** **S**

s	sec(1, 3, 6, 10, 30, 60)
m	min(3, 6, 10, 30, 60)
h	hour(3, 6, 12, 24)

Number	Max. range

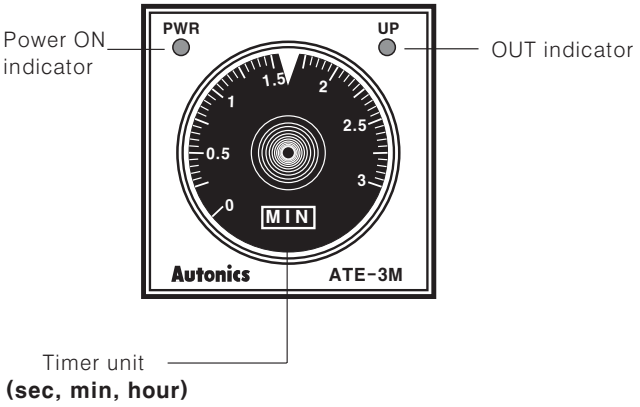
	Time-limit (1c), Instantaneous SPST(1a)
1	Time-limit DPDT(2c)
2	Time-limit SPDT(1c), Instantaneous SPDT(1c)

ATE	ON Delay Timer

▣Specifications

Model		ATE- s m h	ATE1- s m h	ATE2- s m h
Function		**Power ON Delay**		
Control time setting range		**sec**(1, 3, 6, 10, 30, 60), **min**(3, 6, 10, 30, 60), **hour**(3, 6, 12 ,24)		
Power supply		110/220VAC 50/60Hz	110VAC, 220VAC 50/60Hz, 12VDC, 24VDC(Option)	
Allowable voltage range		90 ~ 110% of rated voltage□		
Power consumption		Approx. 10VA(240VAC 60Hz), Approx. 2W(24VDC, 12VDC)		
Return time		Max. 200ms		
Control output	Contact type	Time limit SPDT(1c), Instantaneous SPST(1a)	Time limit DPDT(2c)	Time limit SPDT(1c), Instantaneous SPDT(1c)
	Contact capacity	250VAC 3A resistive load		
Relay life cycle	Mechanical	Min.10,000,000 times		
	Electrical	Min. 100,000 times(250VAC 3A resistive load)		
Repeat error		Max. ±0.3%		
Setting error		Max. ±5% ±0.05sec		
Voltage error		Max. ±0.5%		
Temperature error		Max. ±2%		
Insulation resistance		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 hours		
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes		
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions 3 times		
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions 3 times		
Ambient temperature		-10 ~ 55℃(at non-freezing status)		
Storage temperature		-25 ~ 65℃(at non-freezing status)		
Ambient humidity		35 ~ 85%RH		
Weight		Approx. 75g		

▣Front panel identification

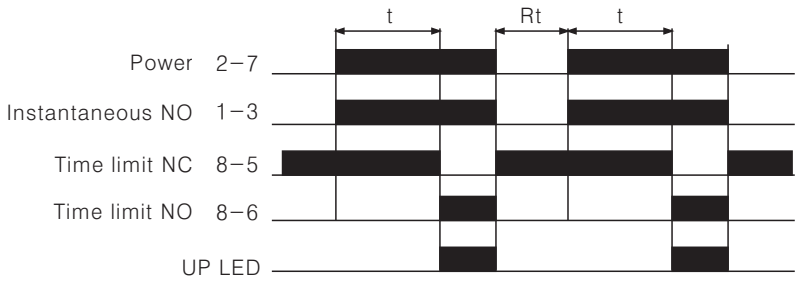
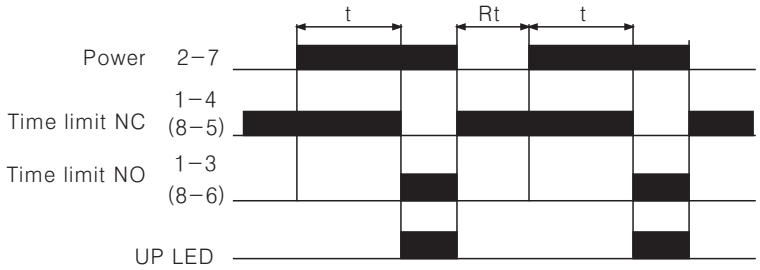
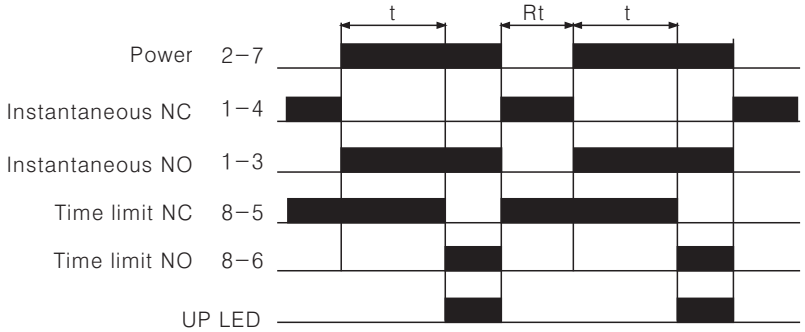


▣Time setting range

Max. setting time	Setting range
1sec	0~1sec
3sec	0~3sec
6sec	0~6sec
10sec	0~10sec
30sec	0~30sec
60sec	0~60sec
3min	0~3min
6min	0~6min
10min	0~10min
30min	0~30min
60min	0~60min
3hour	0~3hour
6hour	0~6hour
12hour	0~12hour
24hour	0~24hour

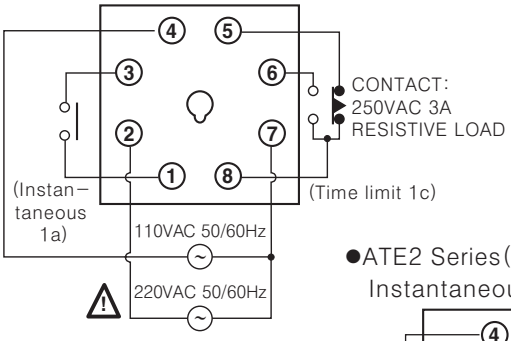
▣Operation mode

t : Setting time, Rt : Return time

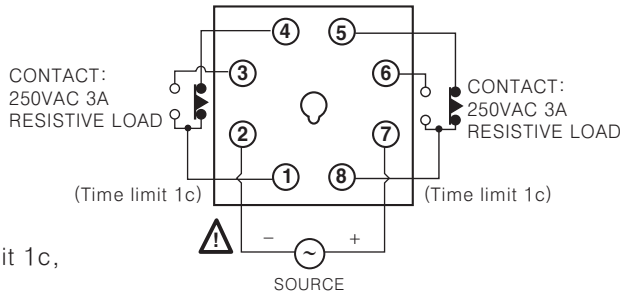
Model	Time chart
ATE	
ATE1	
ATE2	

■Connections

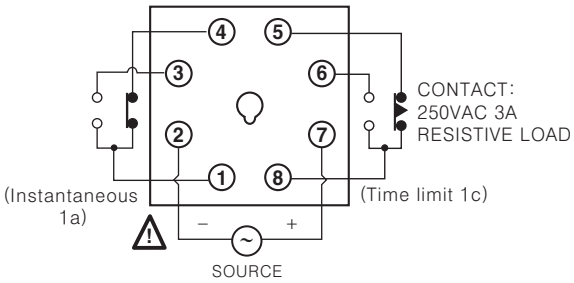
●ATE Series(Time limit 1c, Instantaneous 1a)



●ATE1 Series(Time limit 2c)

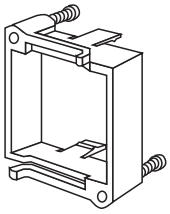


●ATE2 Series(Time limit 1c, Instantaneous 1c)



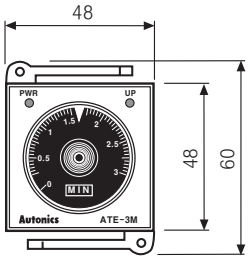
■Dimensions

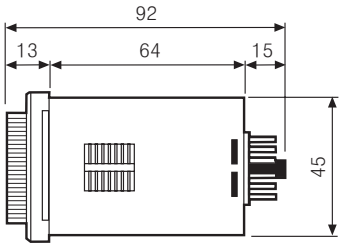
●Bracket(Option)



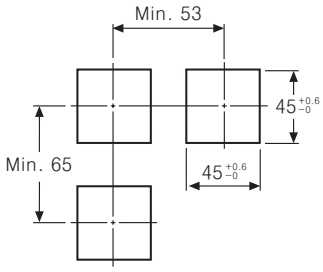
PGB48

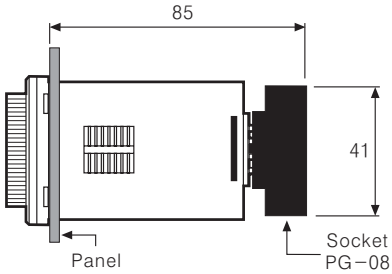
※PGB48 is optional.





●Panel cut-out





Unit:mm

■Proper usage

◎Environment

Please avoid the following places:

- ●A place where this product may be damaged by strong impact or vibration.
- ●A place where corrosive gas or flammable gas and water,oil, dust exist.
- ●A place where magnetic and electrical noise occur.
- ●A place where high temperature and humidity are beyond rated specification.
- ●A place where there are strong alkalis and acids.
- ●A place where there are direct rays of sun.

◎Noise

1) We test 2kV, Pulse width 1㎲ against Impulse voltage between power terminals and 1kV, Pulse width 1㎲ at noise simulator against external noise voltage.

Please install MP condensor(0.1~1㎌) or Oil condensor between power teminals when over Impulse noise voltage occurs.

2) When testing dielectric voltage and insulation resistance of the control panel with this unit installed.

- ●Please isolate this unit from the circuit of control panel.
- ●Please make all terminals of this unit shor-circuited.
  (It prevents the damage of inner circuit.)

DIN size W48×H48mm 8Pin plug Counter

▣Features

- ●Available to count from low speed to high speed
  : selectable 1cps, 30cps, 2kcps, 5kcps
- ●Wide range of input power
  : 100−240VAC 50/60Hz, 12−24VDC(Option)
- ●Memory retention function when the power fails
- ●Count Up, Count Down function
- ●Available to set decimal point
- ●Microprocessor built−in

⚠ **Please read "Caution for your safety" in operation manual before using.**

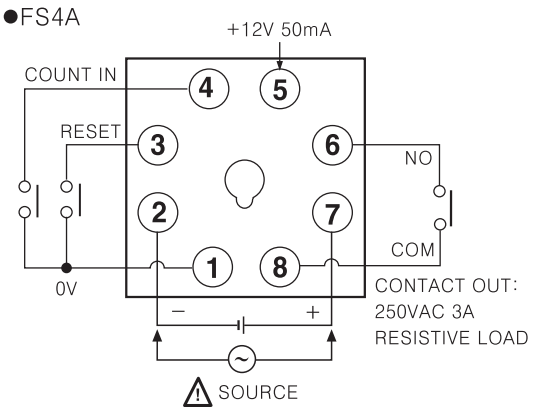
▣Specifications

※A blacked( ) item is upgraded function.

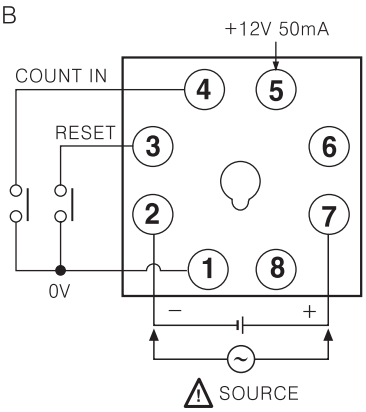
Model	Single preset	**FS4A**	———
	Indication type	———	**FS5B**
Digit		4	5
Digit size		W4×H8mm	
Power supply		100−240VAC 50/60Hz, 12−24VDC(Option)	
Allowable voltage range		90 ~ 110% of rated voltage	
Power consumption		4VA	
Max. counting speed for CP1, CP2		**Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch**	
Min. input signal width	RESET input	Approx.20ms	
Input	COUNT IN	No−voltage input • Impedance at short−circuit : Max. 470kΩ • Residual voltage at short−circuit : Max. 1VDC • Impedance at open−circuit : Min. 100kΩ	
	RESET		
One-shot output time		**0.05 ~ 5sec**	
Control output	Contact Type	SPST(1a)	———
	Contact Capacity	250VAC 3A resistive load	
Memory retention		10 years(When using non−voltage semiconductor memory)	
External sensor power		12VDC ±10% 50mA max.	
Insulation resistance		100MΩ(at 500VDC)	
Dielectric strength		2000VAC 50/60Hz for 1 minute	
Noise strength	AC power	±2kV the square wave noise(pulse width:1μs) by the noise simulator	
	DC power	±500V 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/s² (Approx. 30G) in X, Y, Z directions 3 times	
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions 3 times	
Relay life cycle	Mechanical	Min. 10,000,000 times	———
	Electrical	Min. 100,000 times (250VAC 3A at resistive load)	———
Ambient temperature		−10 ~ +55℃(at non−freezing status)	
Storage temperature		−25 ~ +65℃(at non−freezing status)	
Ambient humidity		35 ~ 85%RH	
Weight	AC power	Approx. 122g	Approx. 112g
	DC power	Approx. 130g	Approx. 120g

▣Connections

●FS4A

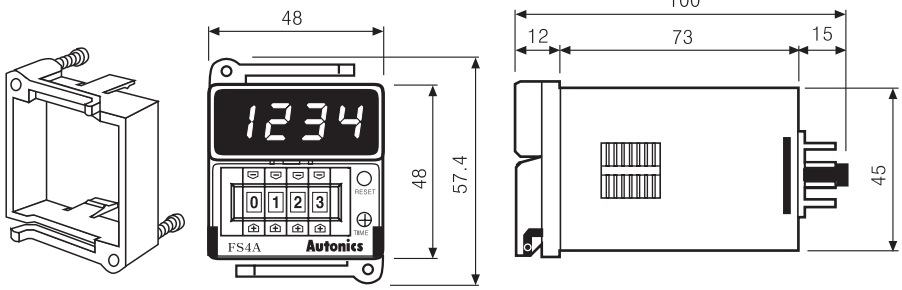


●FS5B

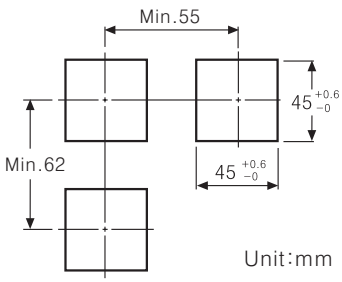


▣Dimensions

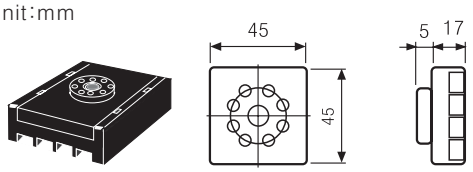
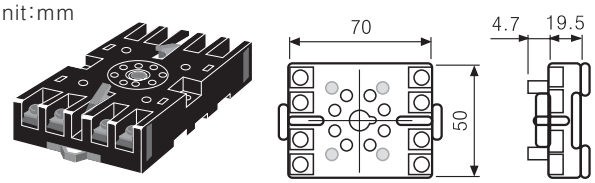
●Bracket



●Pannel cut-out



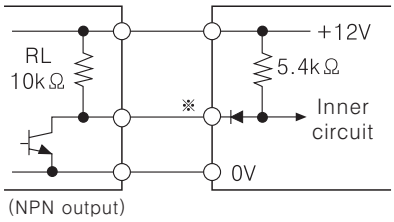
●Socket (Accessory)

PG-08	PS-08
Unit:mm 	Unit:mm 

▣Input connections

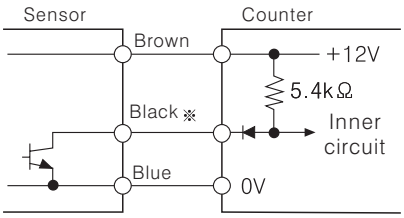
◎Input logic : No-voltage input(NPN)

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



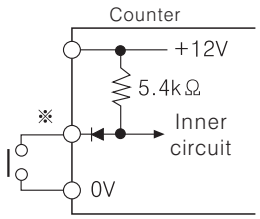
(NPN output)

※COUNT IN, RESET input



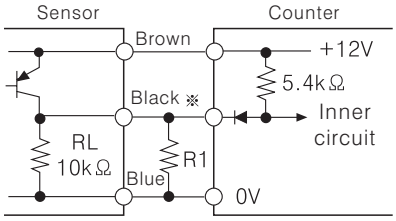
(NPN open collector output)

●Contact input



Counting speed:
1 or 30cps setting

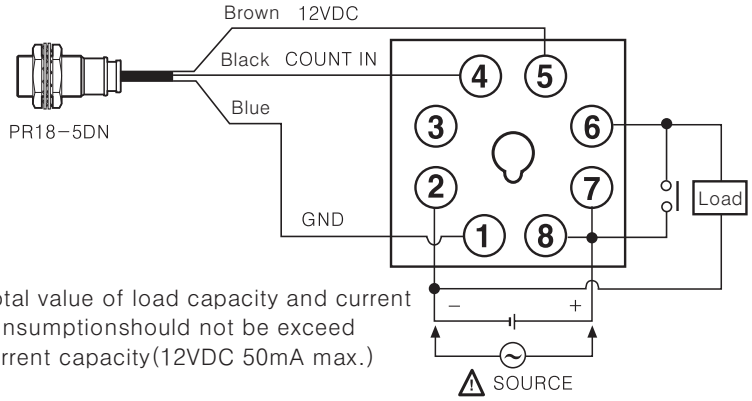
◎PNP output type sensor



(PR18-5DP)

- PNP output type sensor cannot be used directly.
- RL : Resistive load of proximity sensor (Built in the sensor)
  R1 : Resister to be connected at out side
- Please set R1 value to make the composed resistance of RL+R1 is max. 470Ω
  (Be sure that RL value will be different by sensors)

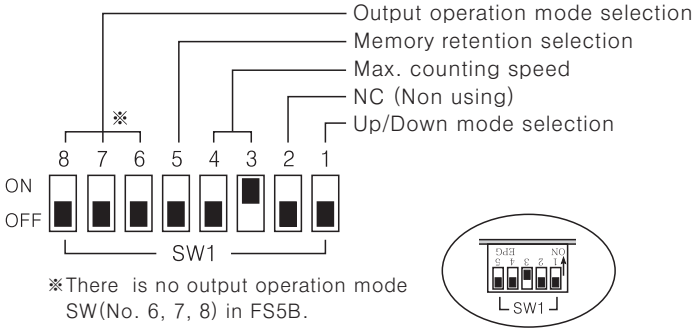
◎Input & output connections



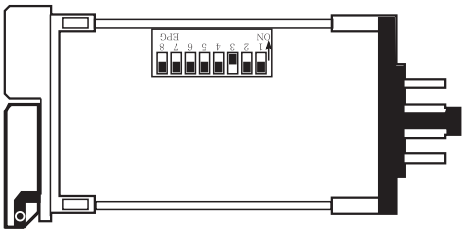
●Please select proper capacity of load not to exceed contact capacity.
Contact capacity : 250VAC 3A Max.
Contact type : 1a

●Total value of load capacity and current consumptionshould not be exceed current capacity(12VDC 50mA max.)

■ Selection by DIP switches



※There is no output operation mode SW(No. 6, 7, 8) in FS5B.



※ **DIP SW numbers are changed from 7 to 8**

●Max. counting speed

SW1	Function
3 4 ON OFF	**1cps**
3 4 ON OFF	30cps
3 4 ON OFF	2kcps
3 4 ON OFF	**5kcps**

●Up/Down mode

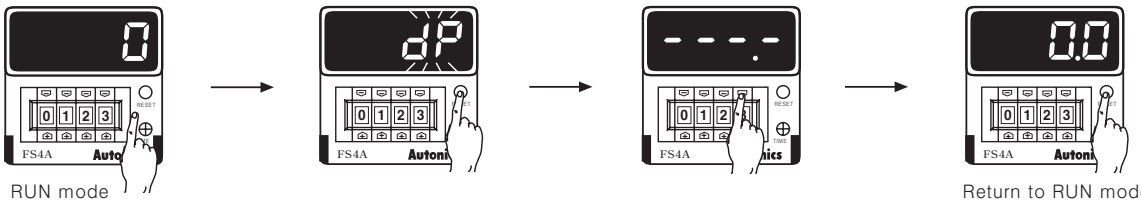
SW1		Function
1	ON OFF	Down mode
	ON OFF	Up mode

●Memory retention

SW1		Function
5	ON OFF	Power reset (Non memory)
	ON OFF	Memory

■ Decimal point setting

Dispaly the decimal point.



RUN mode

※It returns to decimal point setting status if pressing RESET button for over 3sec. in RUN mode.

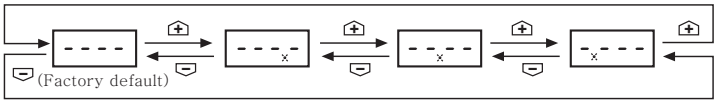
※When "dp" is flickering, one touch the Reset button.

※If pressing one of digital switch buttons(⊕, ⊖)in decimal point setting mode, decimal point will be moved to Up(+)direction.

Return to RUN mode

※It returns to RUN mode if pressing RESET button for over 3sec. in decimal point setting status.

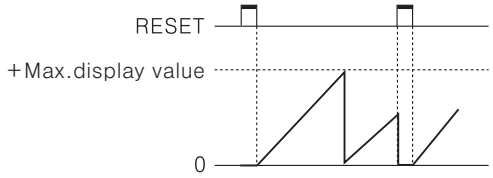
●Changing the decimal point



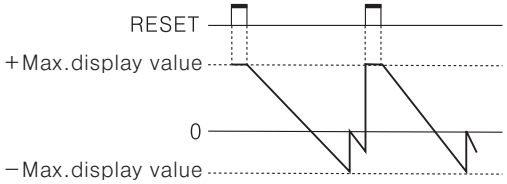
※It returns to RUN mode if no RESET button or digital switch is applied for 60sec. in decimal point setting status.
※The decimal point setting is existed in indication type.

▣Counting operation of indication mode(Indication model)

●Up input mode



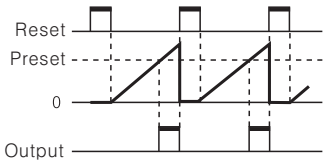
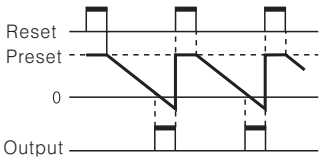
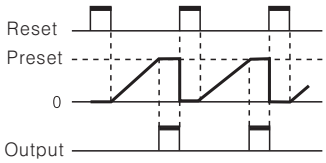
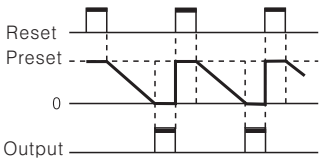
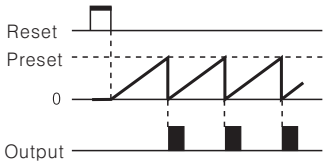
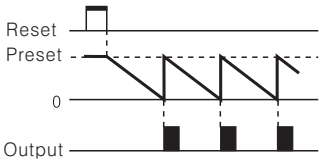
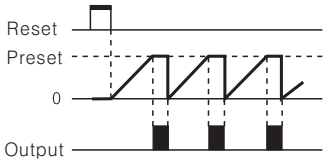
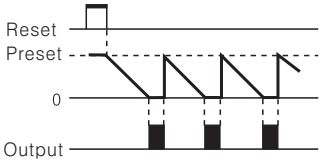
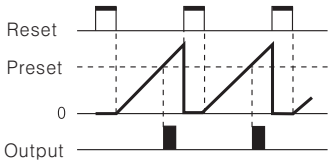
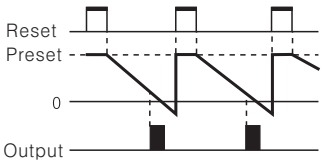
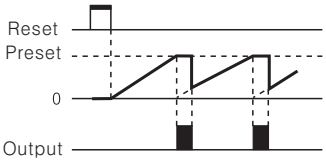
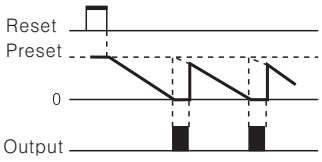
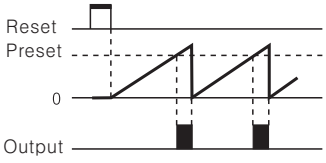
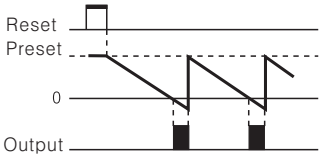
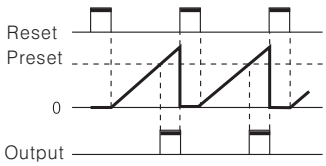
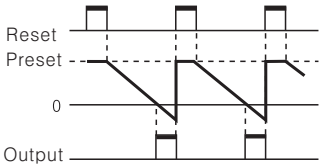
●Down intput mode



▣Output operation mode

 ← One−shot output**(0.05 ~ 5sec)**

 ← Self−holding output

Output mode (SW1)	ON / OFF 4 **Up mode**	ON / OFF 4 **Down mode**	Operation after count up
F 			The display value continues until reset signal is applied then output is held • Self−holding output is held until reset signal is applied.
N 			The display value and Self−holding output are held until reset signal is applied.
C 			The display value returns to reset start status when display value is reached to preset value.
R 			The display value is held until output is OFF then returns to reset start status.
K 			The display value continues until reset signal is applied.
P 			The display value is held during one−shot output time, counting process is returned to reset start status as soon as output is ON.
Q 			The display value continues during one−shot output time.
S 			• Up input mode −Output is ON when (Display value) ≥ (Preset value) • Down input mode −Output is ON when (Display value) ≤ (Zero)

▣Proper usage

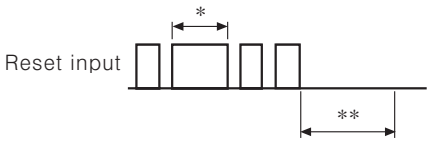
◎Reset function

●Reset

In case of changing the input mode after supplying the power, please take a external reset or manual reset. **If reset is not executed, the counter will be working as previous mode.**

●Reset signal width

It is reset perfectly when the reset signal is applied during **min. 20ms** regardless of the contact input & solid-state input.



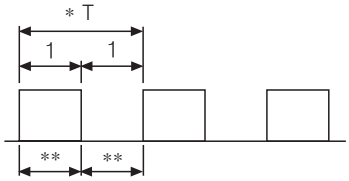
*In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied during min. 20ms even though a chattering is occurred.

**It can be input the signal of CP1&CP2 after min. 50ms from closing time of reset signal.

◎Sensor power

The power 12VDC which is provided to sensor is built in it. Please use it under Max. 50mADC.

◎Min. signal width of CP1, CP2 input



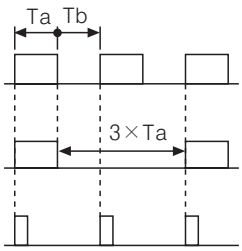
*Please make duty ratio(ON/OFF) 1:1.

** Min. signal width
- 1cps : Max. 0.5sec
- 30cps : Max.16.7ms
- 2kcps : Max. 0.25ms
- 5kcps : Max.0.1ms

◎Max. counting speed

This is respond speed per 1sec. when the duty ratio (ON/OFF) of input signal is 1:1.

If duty ratio is not 1:1, the respond speed will be getting slow against input signal and also the width between ON and OFF should be over min. signal width and also one of ON width and OFF width is Under min. signal width, this product may not response.



Width of Ta(ON) and Tb(OFF) must be larger than Min. signal width.

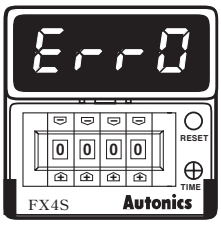
Max.counting speed is 1/2 value of catalog spec. when duty rate is 1:3.

It can not respond because Max. signal width(1a) is little.

◎Error display

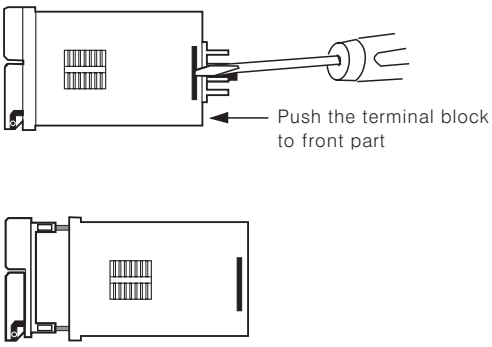
Error signal	Error description	Returning method
Err0	Zero set state	Change the set value to non zero state

※When Error is displayed, the output continues OFF state.
※There is no Error function in the indication type.



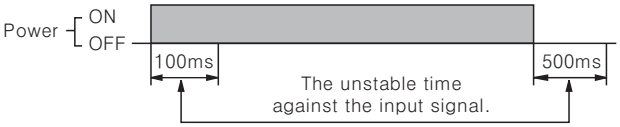
◎Detach the case from body

While pushing the lock eguipment with with driver to the way of front, push the terminal block.



◎Power

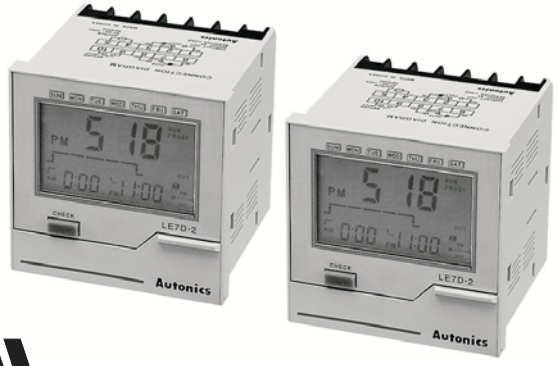
The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.



DIN Size W72×H72mm, Weekly Timer

▣Features

- ●Program is easily checked or changed while operating
- ●Individual programming of each day or each week
- ●Independently controlled two outputs, relay, built-in
- ●Hardware included for both panel and DIN rail mounting
- ●When mounting base plate, DIN rail mounting is available



⚠ **Please read "Caution for your safety" in operation manual before using.**

c UL us

▣Ordering information

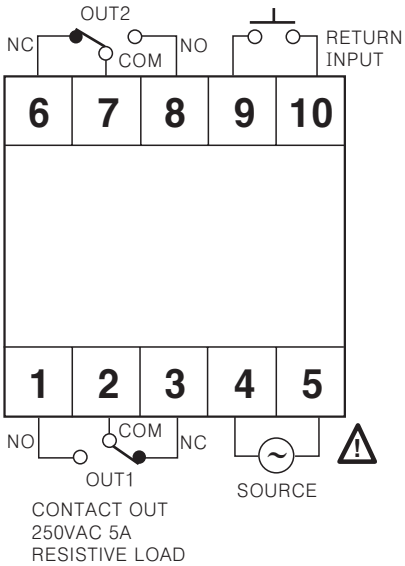
L E 7D – 2

2	2 Relay output
7D	Weekly setting
E	Timer
L	LCD display

▣Specifications

Model		LE7D-2
Power supply		100-240VAC 50/60Hz
Allowable voltage range		90 ~ 110% of rated voltage
Power consumption		Approx. 3VA(240VAC 60Hz)
RETURN input		Short-circuit or open by switch or relay
Timing program		Programmable 24 STEP
Operation mode		ON/OFF mode, Cycle mode, Pulse mode
Operation cycle		1 week(7days)
Mounting		Front panel, Surface, DIN rail
Time deviation		±15sec/month(25℃) (±4sec/week)
Memory retention		5years without power, 10years with power applied
Control Output	Contact type	Time limit DPDT(2c)
	Contact capacity	250VAC 5A resistive load
	Output number	Independent 2 output(1c × 2)
Relay life cycle	Mechanical	Min.10,000,000 times
	Electrical	Min. 100,000 times(250VAC 5A resistive load)
Insulation resistance		Min. 100MΩ(at 500VDC)
Dielectric strength		2000VAC 50/60Hz for 1minute
Noise strength		±2kV the square wave noise(pulse width:1μs) by the noise simulator
Ambient temperature		-10 ~ 55℃(at non-freezing status)
Storage temperature		-25 ~ 65℃(at non-freezing status)
Ambient humidity		35 ~ 85%RH
Approval		c UL us
Weight		Approx. 250g

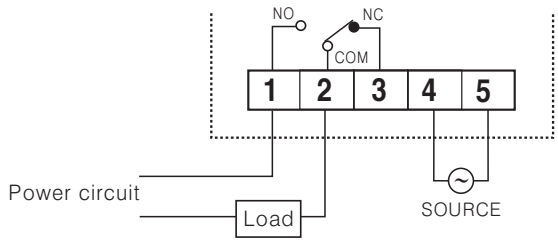
▣Connections



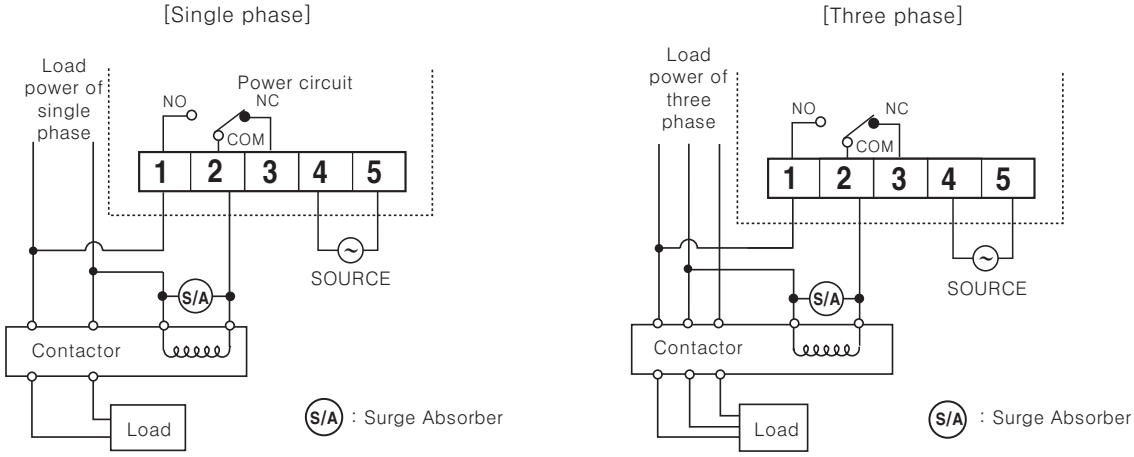
▣Load connections for load

When controlling a non-resistive load, please use a contactor and also connect a surge absorber across the coil of the contactor.

●In case of controlling the load directly

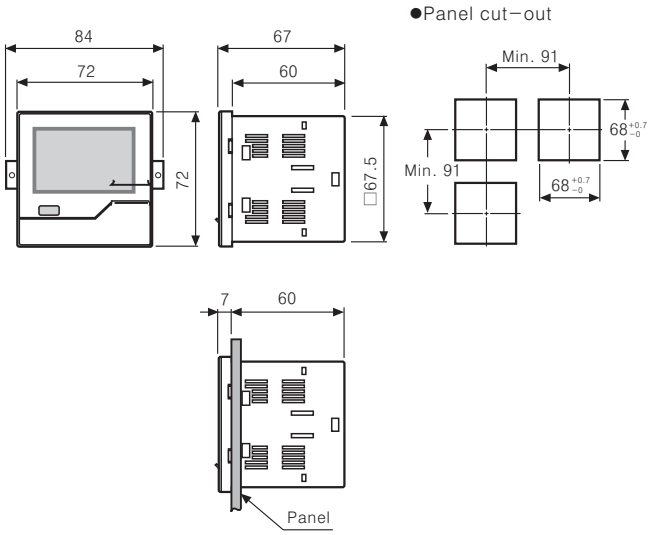


●In case of controlling the load by using a contactor

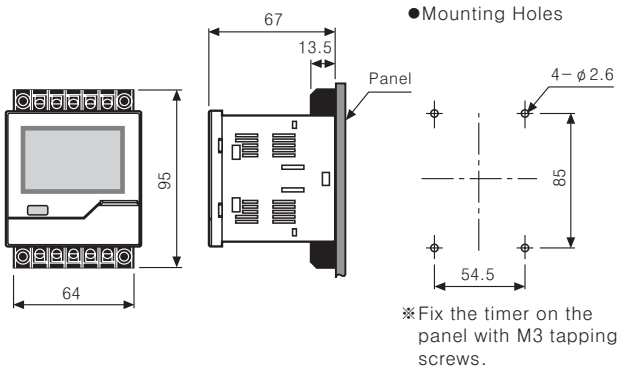


▣Dimension & Mounting

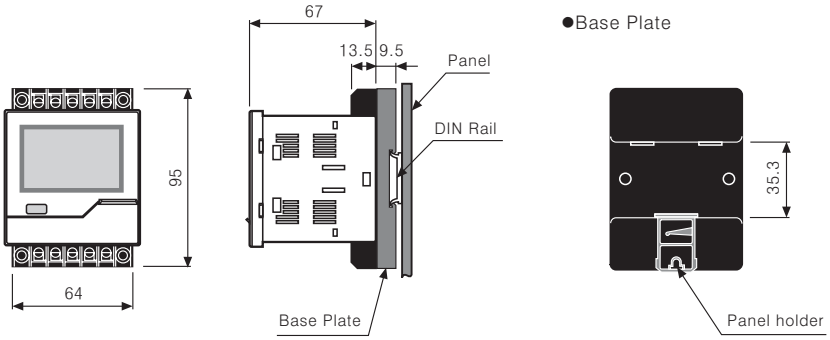
1) Panel mounting



1) Surface mounting



3) Mounting ON DIN Rail

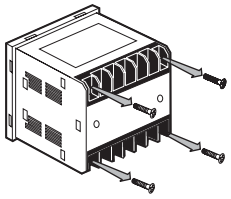


Unit:mm

▣How to modify the mounting method from the front panel to surface mount

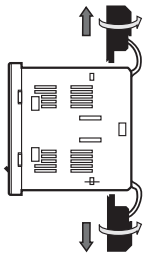
Remove terminals from the body after unscrewing terminal screws, and then assemble terminals to the body after rotating terminals as below figure.

①Unscrew 4bolts from terminal block.

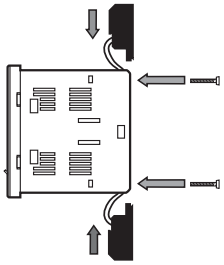


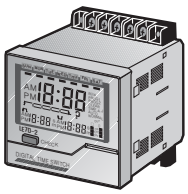
(Front panel mounting)

②Detach terminal block from case and then rotate it 180°.



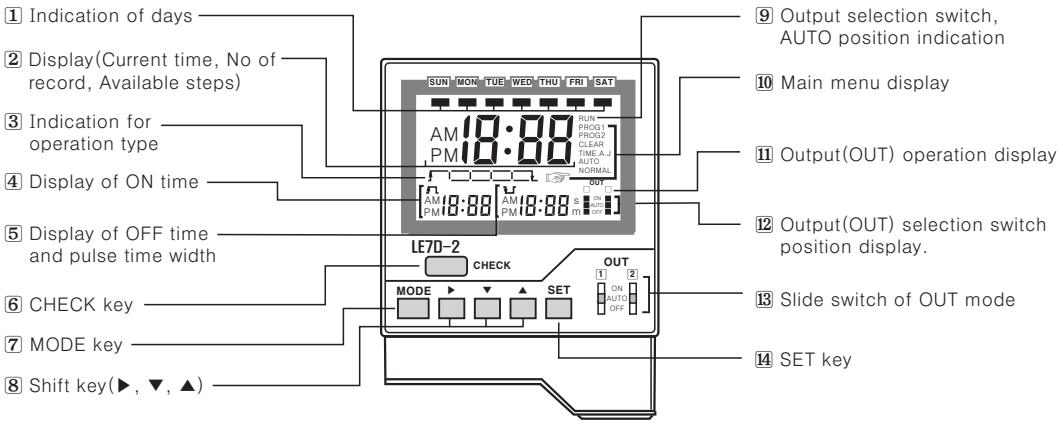
③Assemble terminal block to case by using the 4 bolts





(Surface mounting)

■Front Panel identification



■Front panel

1 Indication of week day(s)
- Light ON:Status of the day has been set.
- Light OFF:Status of the day has not been set.

☞ When the flicker is on the day has been set : Repeatedly flickers by turn(0.25sec)

☞ When the flicker is on the day has not been set : Repeatedly flickers by turn(0.5sec)

2 Display(Current time, No of record, Available steps)
- RUN mode : Display the current time
- Program modify and check mode : Display the record No. of program that has been set.
- Program setting mode : Display available steps remaining, Total steps:24 steps

3 Indication of operation type

Display the type of operation which have been set at "PROG1" and "PROG2".

●ON/OFF operation

●Cycle operation

●Pulse operation

4 Display of ON time

Display ON time that has been set in "PROG1" and "PROG2".

5 Display of OFF time and pulse time width

Display ON time that has been set in "PROG1" and " PROG2".

●It displays OFF time during ON/OFF operation and Cycle operation.

●It displays the width of pulse time during Pulse operation.

6 CHECK Key

This key can be used to set, modify program or change day.

7 MODE Key

This key can be used to set, modify, remove program and set current time, select AUTO or NORMAL mode.

8 Shift key(▶, ▼, ▲)

This key can be used to set, modify program or change day.

9 Output selection switch, AUTO position indication

Display status of OUT selection switches.

●RUN Indicator ON : The OUT selection switches are both set on AUTO position.

●RUN indicator OFF : One of OUT selection switches is set on ON or OFF position.

Note)RUN indicator is shown during RUN mode.

10 Main menu display

●"PROG1"

PROGRAM1 operation(Light ON), modification and setting of PROGRAM1, Check PROGRAM1(Flicker)

●"PROG2"

PROGRAM2 operation(Light ON), modification and setting of PROGRAM2, Check PROGRAM2(Flicker)

※If PROG1"and "PROG2" are operationg at the same time, "PROG1" will be illuminated.

●"PROG1" and "CLEAR"

This mode is to delete the content of "PROG1".

※When it is flickering, it will be deleted by pressing SET key for 3sec.

●Select returning to origin.

※AUTO

After power failure, Operation continues according to program setting.

※NORMAL

When it turns on after power failure("☞" Mark flashes) apply Return input signal(Terminal ⑨, ⑩) ("☞" mark turn off), and then the output operates as set program. "☞" mark applies for "NORMAL" mode only and indicates when it turns on after power failure.

11 OUTPUT(OUT) operation display

Display operation of OUT1 and OUT2.

●No output : Blank

●Output : OUT1 : Display 1

OUT2 : Display 2

12 Output(OUT) selection switch position display

Display position of Output(OUT) selection switches.

13 Slide switch of OUT mode

This switch is used to select between operating the output(OUT1,2) according to the program or manually.

●ON

: Output always ON not related to program.

●OFF

: Output always OFF not related to program.

●AUTO

: Output operates according to program.

<Output1(OUT1) & Output2(OUT2) are selected independently>□

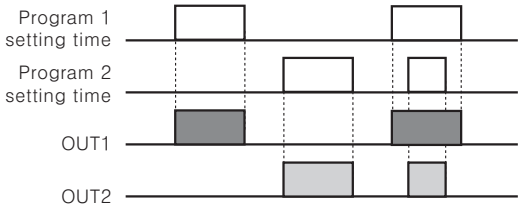
14 SET key

Using when set the programed, corrected or changed data.

▣Function

1)Programs

There are PROG1 and PROG2 in this unit and 2 outputs. These programs work independantly then drive OUT1 and OUT2. (PROG1 : OUT1, PROG2 : OUT2)

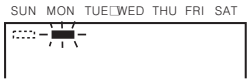


2)Select the day

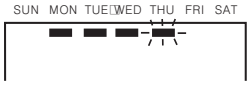
①Cursor operation when setting the day

When entering into the mode in order to set the day, Sunday will flicker first. After moving the day cursor by pressing ▶ key, select the day by pressing ▼, ▲key.

Ex)When intending to set Monday, Tuesday, Wednesday



Move the cursor to Monday from Sunday by pressing ▶ .



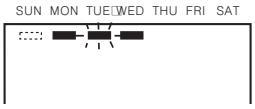
It will be selected as shown in LCD by pressing ▲ , ▼ key. (Monday, Tuesday, Wednesday are steady on and Thursday will flicker.)

The day selection is completed by pressing SET key.

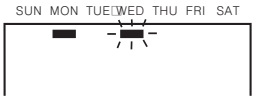
②Cursor operation when changing the day

Move the flickering cursor to target day by ▶ key, then turn off the cursor by ▼ , ▲ key to complete the day change.

Ex)When need to change Monday, Tuesday, Wednesday to Monday, Wednesday.



When entering into the mode in order to set the day, Sunday will flicker first. (It will flicker by turning on 0.5sec. cycle)
Move the flickering cursor to Tuesday by ▶ key.



Turn off the light on Tuesday cursor and change the flickering cursor to Wednesday by ▲ , ▼ key. (It will flicker by turning on 0.25sec. cycle)

Press SET key to complete setting.

※If move the cursor with wrong key operation, the previous setting day cursor will be turned off and target setting day cursor will be turned on.

※If the flickering cursor is located on a previously set day, it will flicker by turning on 0.25sec. and it will flicker by turning on 0.5sec. cycle when the cursor is located on the target setting day that is not previously set.

3)Step

●Programmable number of STEPS is 24STEP
This is total number of PROG1 and PROG2.
Also when entering into program setting mode, available STEPS will be displayed.

●Required number of STEP for 1 time setting by each operation form.

*ON/OFF operation : Total 2 Step

ON day, ON time	OFF day, OFF time
1 Step	1 Step

*CYCLE operation : Total 4 Step

ON day, ON time	OFF day, OFF time
1 Step	1 Step
ON time width	OFF time width
1 Step	1 Step

*PULSE operation : Total 1 STEP

ON day, ON time, ON time width
1 Step

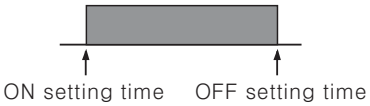
4)Operation

①ON/OFF operation

Output will be ON at ON time that has been set in Program and output will be OFF at OFF time that has been set in Program.

−You can set ON day and OFF day differently.

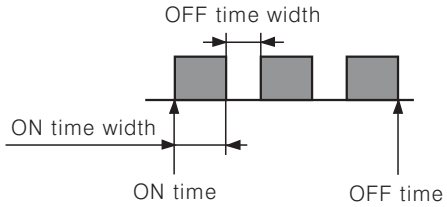
−Min. time setting unit : 1 minute



②CYCLE operation

Output will be ON for ON time width and OFF for OFF time width for ON time and OFF time that have been set in Program.

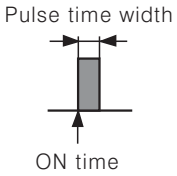
−Min. time width of ON or OFF setting unit : 1 minute.



③PULSE operation

Output will be ON for programmed time at ON time that has been set in Program then OFF.

−Output ON pulse time width : 1sec. ~ 59min.



5)Time indication

PM 12:00 will be displayed PM0:00.
Ex)PM 12:20 will be displayed PM 0:20.

■Function

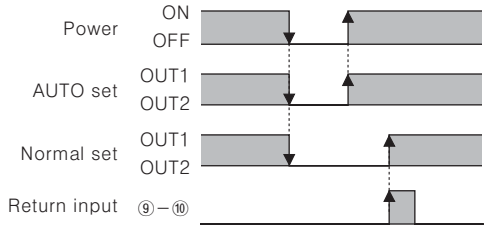
6) Memory retention

●In case of setting AUTO

When power on again after power off, the output (OUT1, OUT2) operates according to program status.
When selecting "AUTO", the power will be supplied after power failure automatically. Therefore it might cause accident. Please select NORMAL instead of "AUTO" if the possibility of an accident exists.

●In case of setting Normal

When power on again after power off, the output (OUT1, OUT2) operates when the signal is applied at external return input terminal. When power on again after power off, "☞" mark in display window appears and flickers. The output operates according to program status by applying Return input.



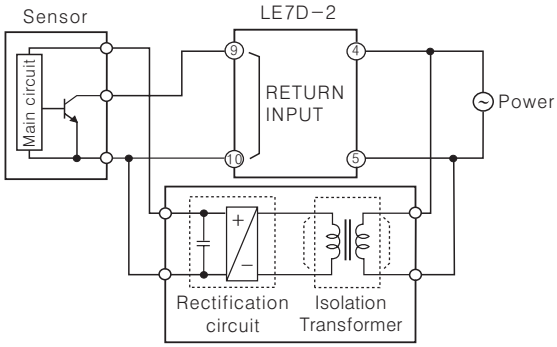
7) How to apply Return input

●Contact signal input

Please select reliable contact if using a switch or Relay

●Solid state signal input

When using solid state input, please use isolation transformer with a separated primary and secondary.
If cannot use isolated transformer, please use photo-coupler to separat the input device.
Also be sure to check polarity when using solid state element.



<External power supply for sensor >

8) RECORD

①This is basic unit of Program to control output.
When checking Program, "r01 to r24" as RECORD will be displayed in LCD.

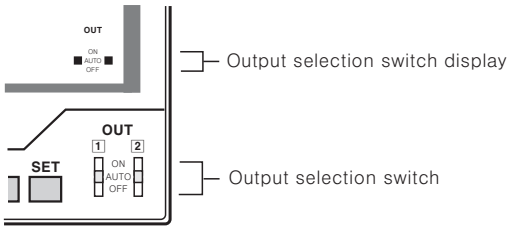
②Setable number of STEP in 1 RECORD

●ON/OFF operation : 2 STEP per 1 RECORD
(ON day, ON time, OFF day, OFF time setting will be 1RECORD)

●CYCLE operation : 4 STEP per 1 RECORD
(ON day, ON time, OFF day, OFF time, ON time width, OFF time width setting will be 1 RECORD)

●PULSE operation : 1 STEP per 1 RECORD.
(ON day, ON time, Output operation time width setting will be 1 RECORD)

9) Manual output ON/OFF operation



●Output selection switch AUTO position
: Output operation as programmed.

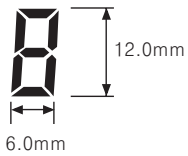
●Output selection switch ON position
: Output is ON not related to program.

●Output selection switch OFF position
: Output is OFF not related to program.

※Output selection switch position is displayed in LCD always.

10) Display in LCD

①The size of Display (Time display)



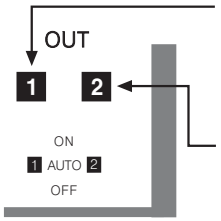
②Operation type display

●ON/OFF operation display :

●CYCLE operation display :

●PULSE operation display :

③Output operation display



●OUT 1 is ON, it will be light on.
(Relay contact is in energized state)
●OUT1 is OFF, it will be light off.
(Relay contact is in normal state)

●OUT2 is ON, it will be light on.
(Relay contact is in energized state)
●OUT2 is OFF, it will be light off.
(Relay contact is in normal state)

④Time/Time width display

●ON time display :

●OFF time display :

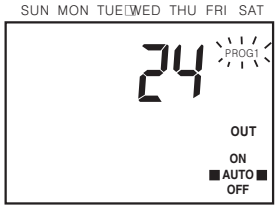
●ON operation time width display:

●OFF operation time width display :

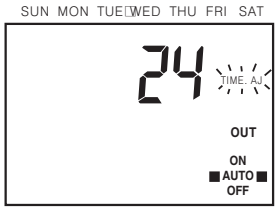
▣The current time setting

When supplying the power for the first time, the display will appear as shown.
Then please set the current time.

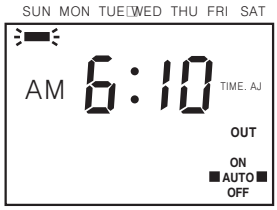
Ex)When setting the current time as AM 9:00 Monday



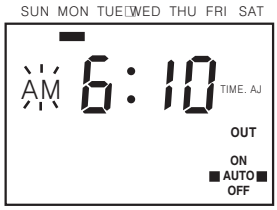
Pressing MODE key for more than 1sec., "PROG1" will be flickering and the total number of STEPS will be displayed.



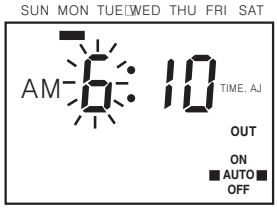
Then press MODE key 4 times, "TIME.AJ" will be flickering.



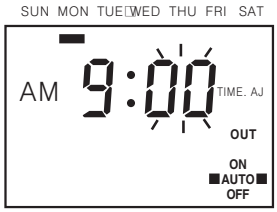
Press SET key.
The time will be displayed as shown and the cursor will flicker on Sunday.



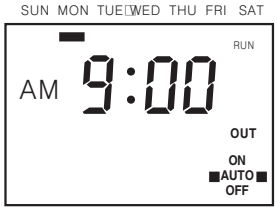
After moving the day cursor to Monday by pressing ▶ key press the ▼ , ▲ key to select Monday. It will change from flickering to steady. "AM" is now flickering.



Pressing ▶ key.
Then "AM" is steady on and "Hour" position is flickering.
If the setting time is PM, change AM to PM by pressing ▼, ▲ key then press ▶ key.

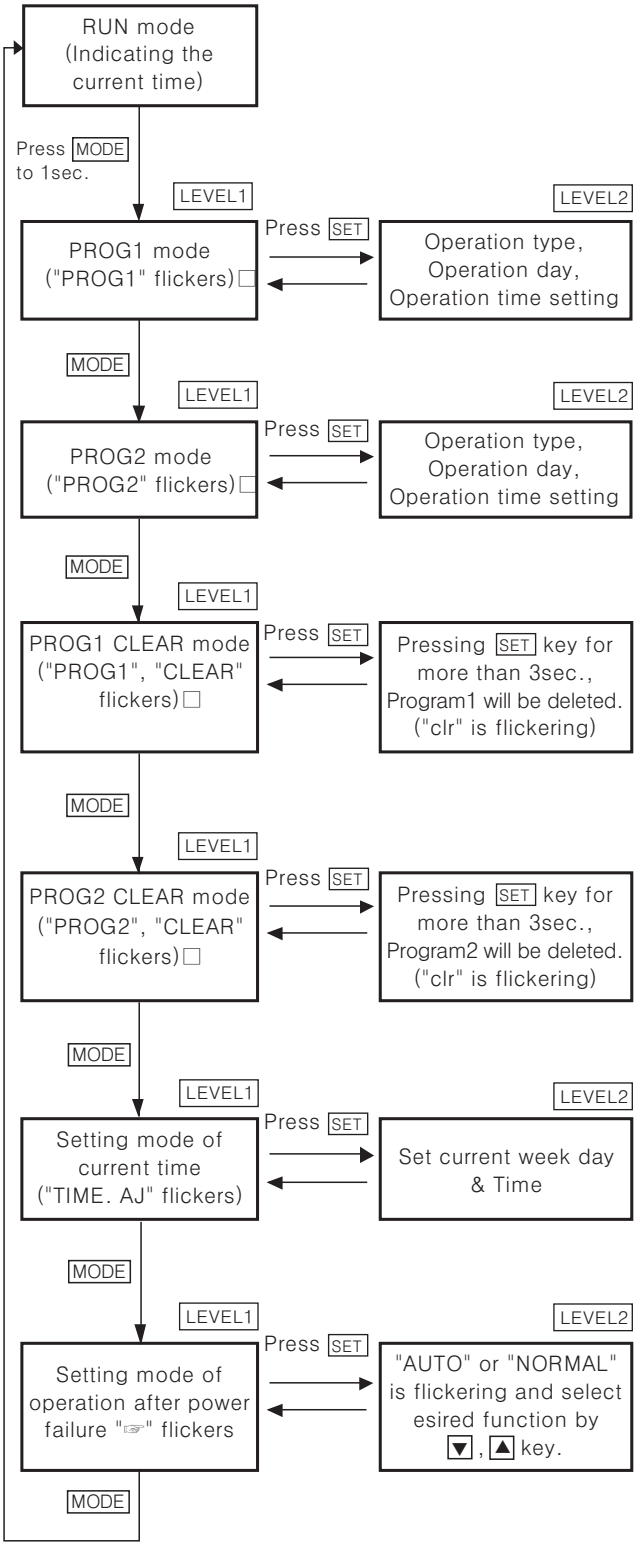


After changing to 9 o'clock with ▲ key then "9" will be steady on by pressing ▶key and "Minute" position is flickering.
After changing to "00"minute by pressing ▲ key then press SET key to complete the current time setting.



Pressing MODE key 2times, it will return to RUN mode then display the current time.

▣Program setting

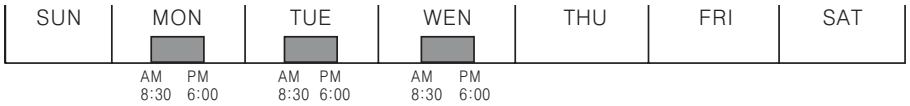


- ●It no key is touched for 30sec. at LEVEL1 , it will be returned to operating mode automatically.
- ●It no key is touched for 30sec. at LEVEL2 , it will be returned to LEVEL1 automatically.
- ●If MODE key is pushed at LEVEL2, modified program is cancelled and returned to LEVEL1 automatically.

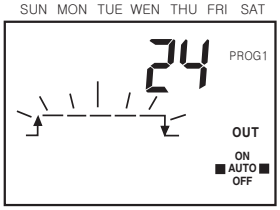
■Program setting

1)Set ON/OFF mode in PROG1

Every week Monday, Tuesday, Wednesday OUT1 is ON at AM 8:30 and OUT1 is OFF at PM 6:00.

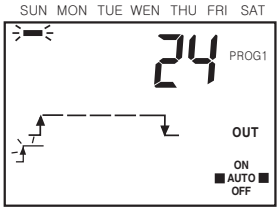


①PROGRAM selection



Press MODE key for more 1sec. then "PROG1" will flicker.
Press SET key to turn on "PROG1" then ON/OFF operation is flickering.

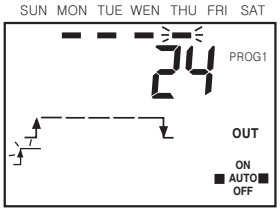
②Select operation mode



ON/OFF operation is being displayed, so press SET key to complete setting of ON/OFF operation.
(The day cursor is flickering on Sunday, " " is flickering indication.)

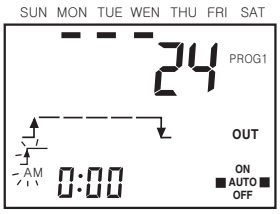
MODE

③ON day(s) setting



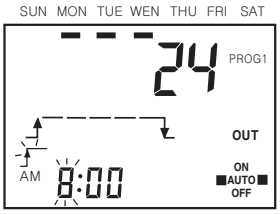
After move the day cursor to Monday by pressing ▶ key 1time(Moday is flickering) then set ON day by pressing ▲ , ▼ key.
(Monday, Tuesday, Wednesday curse will be light on, Thursday cursor is flickering) Then press SET key to complete the ON day setting.
(Thursday cursor is light off and "AM" is flickering)

④AM/PM setting of ON time



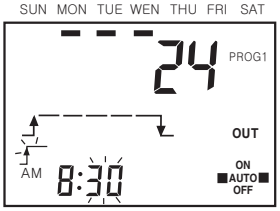
Because ON time is "AM", press ▶ key to complete AM setting.
(" ", and Hour position are flickering)
※If ON time is "PM", press ▲, ▼ key to select "PM" then ▶ key.

⑤ON time "Hour" setting



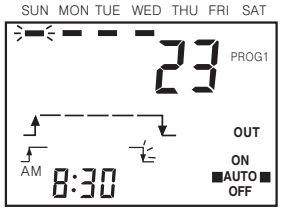
After setting "8" with ▲ key, press ▶ key to complete ON time "Hour" setting. "AM" and "8" are steady on, " " and "Minute" position are flickering)

⑥ON time "Minute" setting



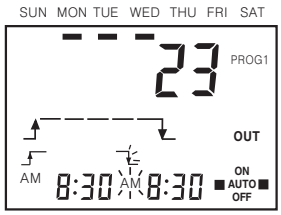
After setting 30minutes by pressing ▲key then press SET key to complete ON time "Minute" setting.
(Sunday cursor is flickering, " " is flickering indication)
※ON time "Minute" setting will be completed and STEP indication will be decreased by 1.

⑦OFF day(s) setting



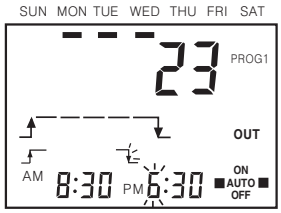
Because ON day and OFF day are the same, therefore press SET key, OFF day setting will be completed.
("AM" and " " are flickering while ON time of ON day is displayed at OFF time display)

⑧AM/PM setting of OFF time



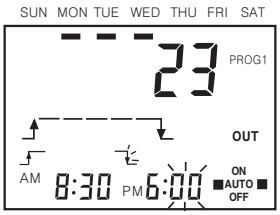
Because OFF time is "PM", after selecting "PM" by ▲ or ▼ key then press ▶ key to complete setting.
(" " and "Hour" position are flickering indication)

⑨"Hour" setting of OFF time



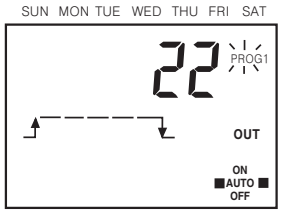
After changing it to "6" at "Hour" position by ▼ key then press ▶ key to complete OFF time "Hour"setting.
("PM" and "6" : On steady, " " and "Minute"position : Flickering)

⑩"Minute"setting of OFF time



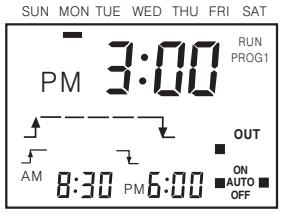
After changing it to "00" minute by ▼key then press SET key to complete OFF time "Minute" setting.
※STEP indication will be decreased by 1 when OFF time "Minute" setting is completed.

⑪Setting complete display



After completing the ON/OFF operation setting, PROG1 will be flickering which would allow you to enter another program.

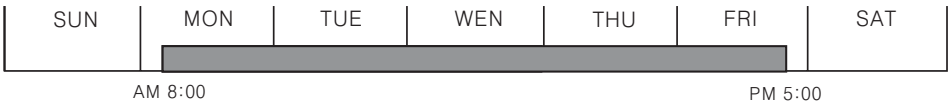
⑫RUN mode



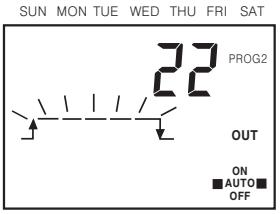
If programming is completed, press the MODE key 6 times to return to the RUN mode.
The current day, time and program will be displayed.

2)Set ON/OFF mode in PROG2

Turn OUT2 on at AM 8:00 every Monday and turn OUT2 off at PM 5:00 Friday.

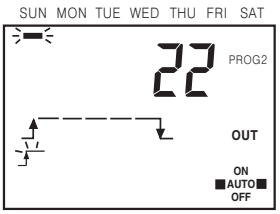


①PROGRAM selection



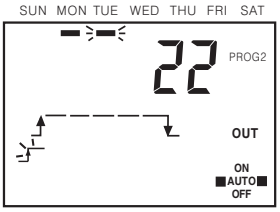
Press MODE key for more than 1sec. PROG1 flashes.
Press MODE key once again. then PROG2 flashes.
Then press SET key, "PROG2" turns on and ON/OFF mode flashes.

②Select operation mode



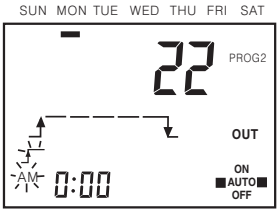
ON/OFF mode is displayed then press SET key ON/OFF mode is set.
※If desired mode is Cycle mode, press ▶ to select Cycle mode (Day cursor flashes at SUN(Sunday), and " " mark flashes.

③Select ON weekday



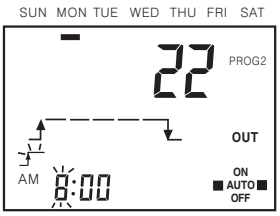
Press ▶ key to move the day cursor to MON and then press ▼ or ▲ once. (MON turns on, TUE flashes)
If press SET key, ON weekday is set. (TUE cursor turns off, " " and"AM" flash)

④Select AM/PM of ON time



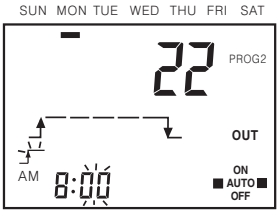
Press ▶ key to set "AM" ON time then AM is set.
(, Hour digit flash)
※If ON time is "PM", press ▼ , ▲ key to select "PM" then ▶ key.

⑤Select "Hour" of ON time



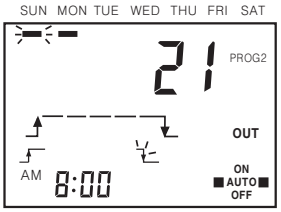
Press ▲ key to set 8 hour, and then press ▶ key, Hour time is set.
("AM" and "8" turn on steady, and minute digits flash) press.

⑥Select "Minute" of ON time



Set value is "00", so press SET key then Minute is set.
(Day cursor flashes at SUN. " " flashes)
※Minute of ON time is set and STEP indication is reduced by 1.

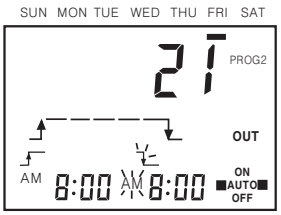
⑦Select OFF weekday



Press ▶ key to move the day cursor to MON then press ▼ or ▲ key once. MON turns off and TUE flashes.
Move the day cursor to FRI by pressing ▶ , then press ▼ or ▲ key once. (FRI turns on SAT flashes)
Press SET key,OFF weekday is set.

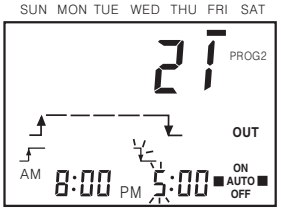
(SAT cursor turns off and ON time of ON day is displayed in OFF time display "AM" and " " are flashing.)

⑧AM/PM setting of OFF time



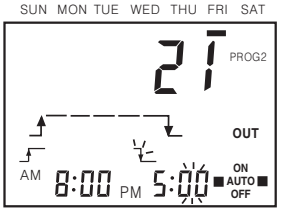
OFF time is "PM", therefore press ▼ or ▲ key to select "PM".
Then press ▶ key to set PM.
(" " and Hour digit flash)

⑨Select "Hour" of OFF time



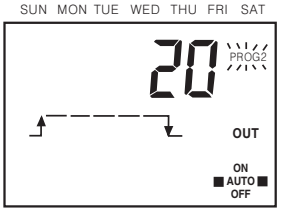
After changing it to 5 at "Hour position by pressing ▼ key, then press ▶ key, Hour time is set.
("PM", Hour digit turn on, and Minute digit flash)

⑩Select "Minute" of OFF time



Set value is "00", so press SET key, then Minute is set.
※Minute of OFF time is set and STEP indication is reduced by 1.

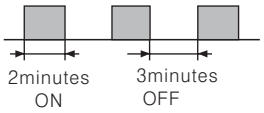
⑪End setting display



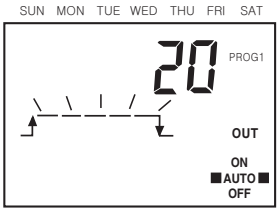
When ON/OFF setting is complete the display to set next program mode appears.

3) Set Cycle mode

From Wednesday AM 8:00 to Thursday PM 5:30, OUT1 turns on for 2 minute and turns off for 3 minute repeatedly.

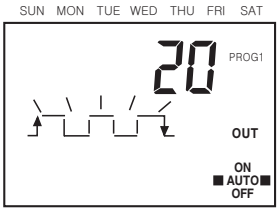


①PROGRAM selection



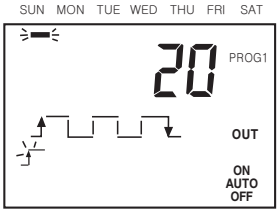
Press MODE key for more than 1sec. then "PROG1" flashes.
Press SET key to turn on "PROG1". (ON/OFF mode flashes)

②Select Cycle mode



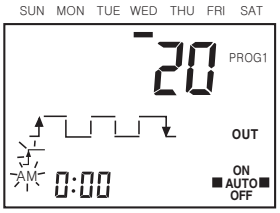
Press ▶ key to select Cycle mode, then Cycle mode flashes.
Press SET key. Cycle mode is set (SUN cursor flashes, flashes)

③Select ON weekday



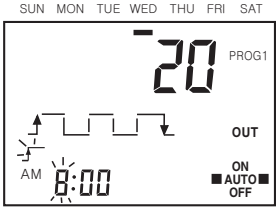
Press ▶ key to move SUN cursor to WED then press ▼ or ▲ once. (WED turns on THU flashes)
Press SET key, then ON weeday is set(WED cursor turns on steady, " " flashes)

④Select AM/PM of ON time



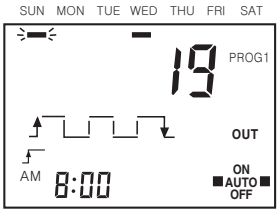
Press ▶ key to set AM of ON time then AM is set.
(" ", Hour digit flash)

⑤Select Hour of ON time



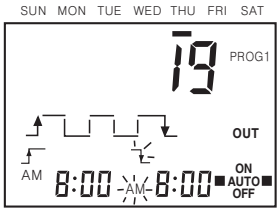
Set 8 hour by pressing ▲ key then Press SET key, then Hour of ON time is set.
(SUN cursor flashes, " " flashes)
※If select minute, press ▶ key instead of SET key. then press ▲ or ▼ key to set minute..
※Hour of ON time is set and STEP indication is reduced by 1.

⑥OFF day setting□



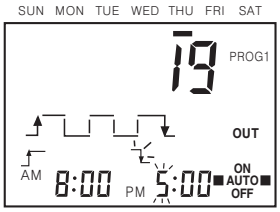
Press ▶ key to move SUN cursor to WED, then press ▲ or ▼ once (WED cursor turns off, THU cursor flashes) press ▲ or ▼ once, then THU cursor turns on, FRI cursor flashes). Then press SET key, OFF weekday is set. "AM" and are flashing while ON time of ON day is displayed at OFF time display.)

⑦Select AM/PM of OFF time



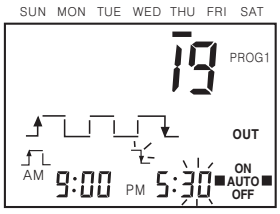
OFF time is PM, therefore press ▼ or ▲ key to select PM, then press ▶ to set. (" ", Hour digit flash)

⑧"Hour" setting of OFF time



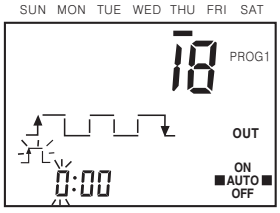
Press ▲ or ▼ key to select 5 then press SET key to set Hour of OFF time.
("PM" & "5" are on steady and " " and digit of Minute flash.)

⑨"Minute"setting of OFF time



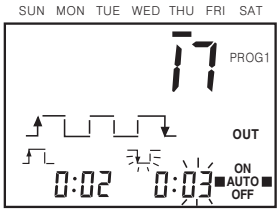
Press ▲ or ▼ key to select 30, then press SET key to set Minute of OFF time. (" " & Hour digit of ON time width flash).
※Hour of OFF time is set and STEP indication is reduced by 1.

⑩Select time width of ON time



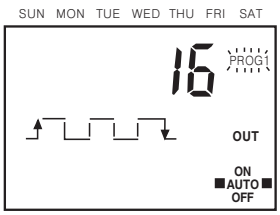
Press ▶ key to shift to MInute digit, then press ▲ key to select 2 of ON time width.
Press SET key to set time width of ON time. (" " & Hour digit of OFF time width flash)
※Minute of ON time width is set and STEP indication is reduced by 1.

⑪Select time width of OFF time



Press ▶ to shift to minute digit, then press ▲ key to select 3 of OFF time width, then press SET key to set time width of OFF time.
※Minute of OFF time width is set and STEP indication is reduced by 1.

⑫Setting end display

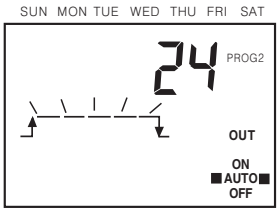


When Cycle setting is complete, the display to set next program appears.

4) Set PULSE mode

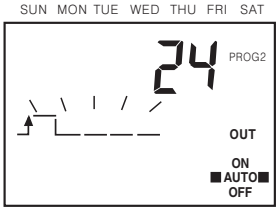
OUT2 turns on for 10sec. at AM 8:50 in Mon.Tue.& Wed.

①PROGRAM selection



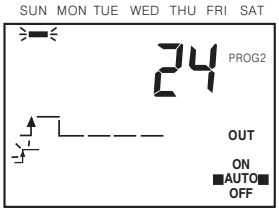
Select PROG2 use OUT2.
Press MODE key for more than 1sec. PROG1 flashes, if press MODE once again. PROG2 flashes, then press SET key to set PROG2.
("PROG2" turns on, "⅃‾‾‾‾‾⅃" flashes)

②Select the operation mode



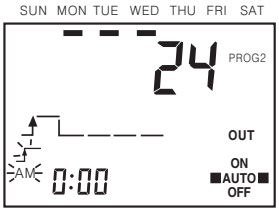
Press ▶ key twice to select pulse mode, then pulse mode flashes.
Press SET key to set pulse mode.
(SUN cursor flashes, " ⅃‾ " flashes)

③Select ON weekday



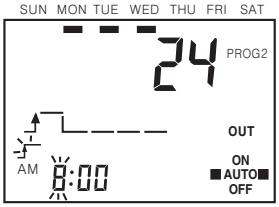
Press ▶ key once to shift SUN cursor to MON, and press ▼ or ▲ key to set ON weekday.
(MON, TUE, Wed cursor turn on steady, THU cursor flashes)
Press SET key to set ON weekday
(THU cursor turns off, "AM" of ON time flashes)

④Select AM/PM of ON time



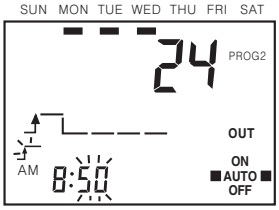
ON time is AM, therefore press ▶ key to set AM.
(" ⅃‾ ", Hour digit flash)
※If ON time is PM, select PM by ▼ or ▲ key, then set PM by pressing ▶ key.

⑤Select Hour of ON time



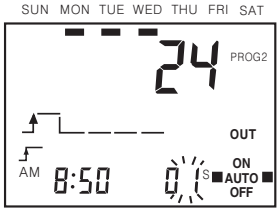
Select 8 by ▲ key, then press ▶ to set hour of ON time.
("AM" & "8" turn on steady, ⅃‾ & minute digit flash)

⑥Select Minute digit of ON time□



Press ▲ or ▼ key to set 50minute, then press SET key to set minute of ON time.
(" ⅃‾ "& "50" turn on steady, "01s" flashes)

⑦Select operation time of output



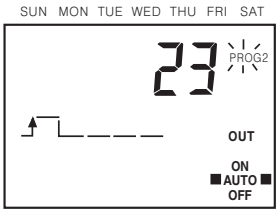
Select 10sec. by pressing ▲ key, then press SET key to set PROG2.
※Output operation time is set and STEP indication is reduced by 1.

Note) Output operation time can be selected from 1sec. to 59min.

If press ▲ key, it can select time range as follows: → 1sec → 59sec → 1min → 59min

If press ▼ key, it can select time range as follows: → 59min → 1min → 59sec → 1sec

⑧Setting end display



If PULSE mode setting is complete. the display to set next program appears.

※When returning to RUN mode, if current time is later than programmed time, only current time is displayed and output does not operate that day.

※Indication of set time will appear at TUE & WED AM 0:00 of next operation, and when current time reaches set time, output operates 10sec. Then indication of set time disappears.
(Note) Set program does not cancel.

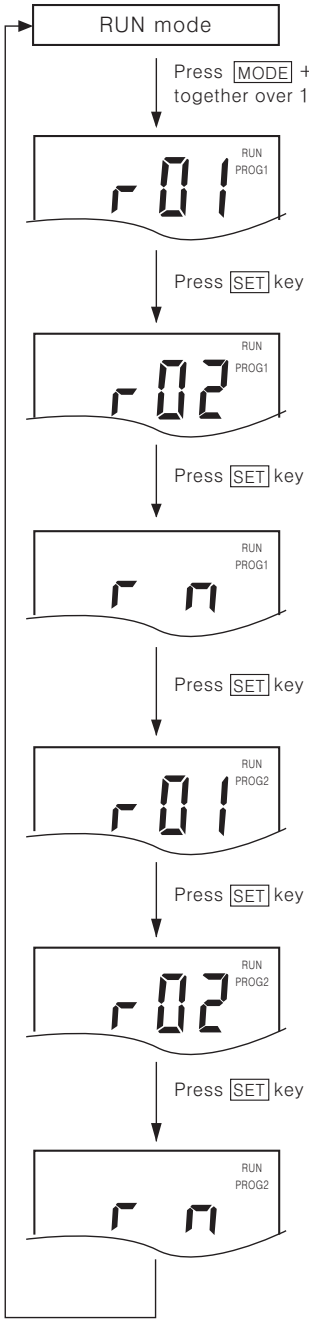
※When selecting pulse (⅃‾⅃_____) mode at PROG1(or PROG2). If adding program at PROG1(or PROG2), operation mode of PROG1 (or PROG2) is fixed as pulse(⅃‾⅃_____) mode.

※When ON/OFF(⅃‾‾‾‾‾⅃) or cycle mode(⅃‾⅃_⅃_⅃‾⅃) was selected at PROG1(or PROG2), pulse mode (⅃‾⅃_____) cannot be added at PROG1(or PROG2).

■How to change program

1)Program modify

The status of several programs are set, this function is used to modify particular part without erasing program.



※To check program of each record, Use SET key. Press 4 times for ON/OFF mode, press 6times fo CYCLE mode, press 3times for PULSE mode, then display will shift to next RECORD.

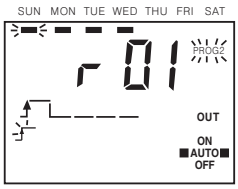
※Change set value each record, then press SET key to set it. If press MODE key instead of SET key, program is not changed.

※If no key is touched for 30sec., the status will be retruned to RUN mode should put External key input within 30second otherwise the status will be returned to RUN mode.

2)Example of program modify

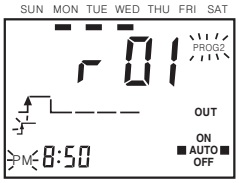
If you want to modify the operation of OUT2 which is ON for 10 second every AM 8:50 on Monday, Tuesday, Wednesday to the operation of OUT2 is ON for 3minute every PM 8:50 on Monday, Tuesday, Wednesday.

①ON day modify



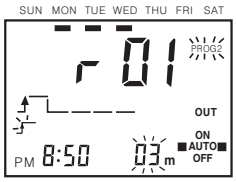
Press SET key because there is no change of day.
If there is modification of ON day, change to ON day setting.

②ON time modify



Change AM to PM by pressing ▼ key then SET .

③PULSE time width modify

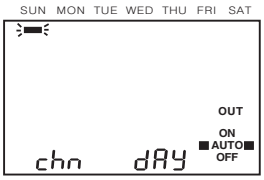


Set 3 minute with ▲ key then SET.

■Day modify

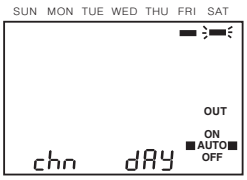
The program is set to turn on OUT1 at AM 8:30 and turn off at PM 6:00 from every Monday to Saturday. This Friday is special holiday. To change this Friday to Sunday(Holiday) program as follow:

①Day change operation



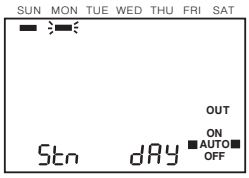
Able to enter the status of day change operation by pressing CHECK key for 3second continuously in RUN mode.

②Changing day selection



Move day cursor to Friday with ▶ key and select Friday with ▲ or ▼ key then SET.

③Standard day selection

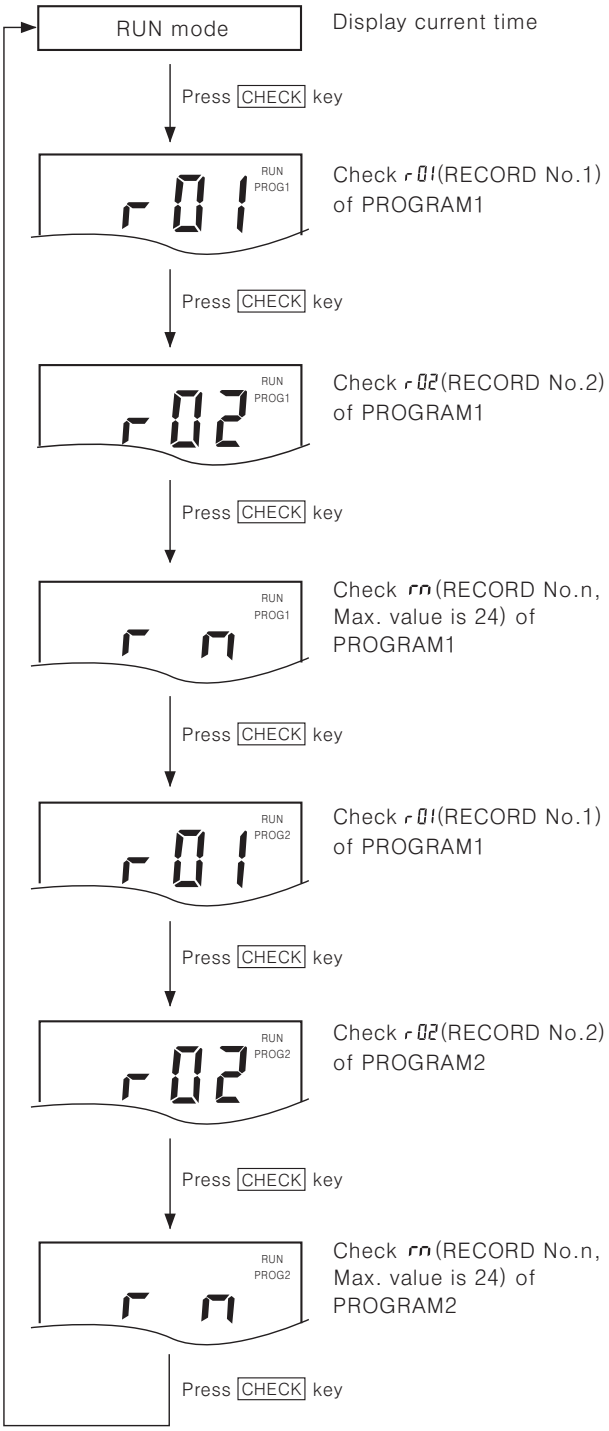


Select Sunday as standard day with ▲ or ▼ key then SET (Setting will be completed and return to RUN mode)

- Change of Weekday applies to next modified day.
- When output of special weekday complete, program of special weekday is cancelled automatically, then returns to prior program.
- If you set full week as holiday, it cannot select standard weekday, therefore it is impossible to change full week.

▣Program check

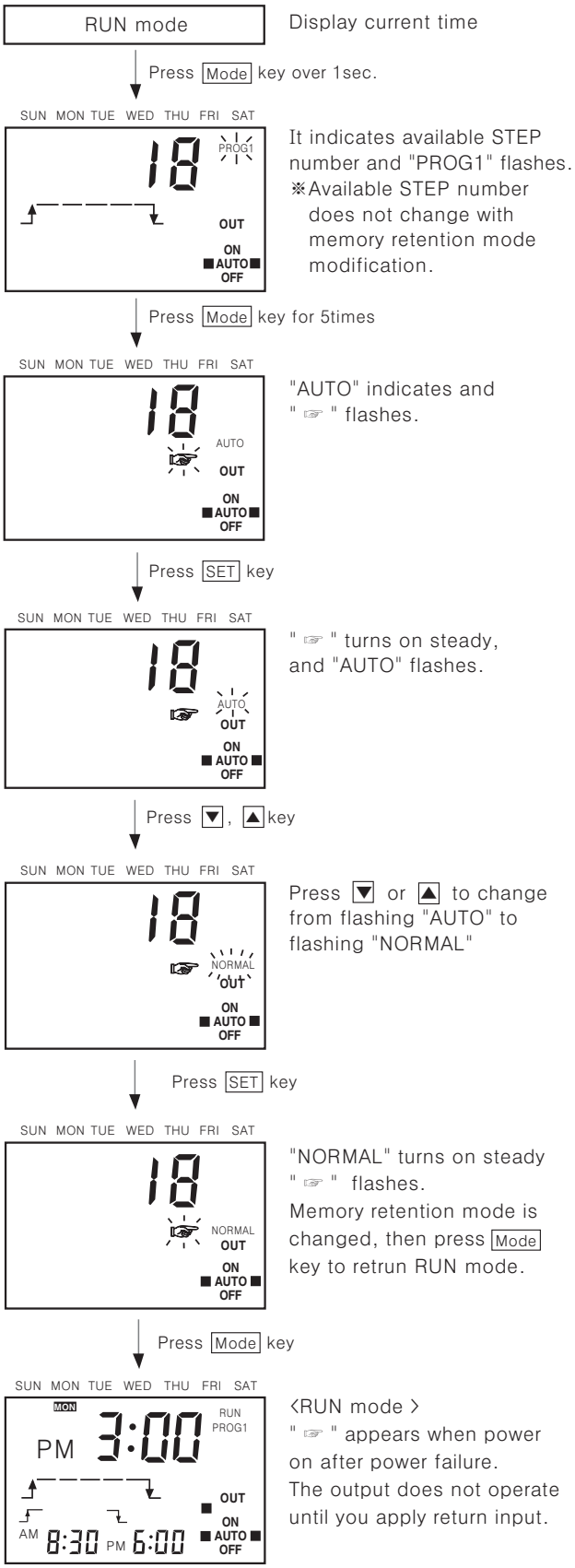
: Press CHECK key to check program for PROG1 and PROG2.



※On checking each RECORD, if you press MODE key, or do not touch any key for 30sec.It will return to RUN mode.

▣How to change memory retention mode

: Change "AUTO" of memory retention mode to "NORMAL" of non-memory retention mode as follow.



DIN size W72×H72, W144×H72mm 8Digit Up/Down counter

▣Features

- ●Counting speed : 1cps, 30cps, 2kcps, 5kcps
- ●Display digit : 8digit(0~99999999)
- ●Ease to select 20 kinds of input operation modes and 18 kinds of output operation modes by internal DIP switch.
- ●Available to set a decimal point
- ●Wide range of input power supply: 100−240VAC 50/60Hz, 12−24VDC(Option)
- ●Micro computer built−in

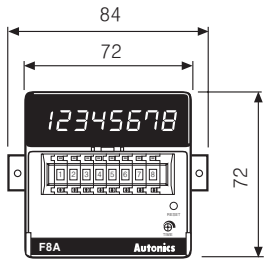
⚠ **Please read "Caution for your safety" in operation manual before using.**

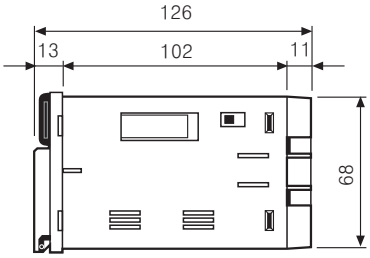
▣Specifications

Model	Single preset		**F8A**	**L8A**
	Indication type		**F8B**	**L8B**
Digit			8(99999999)	8(99999999)
Digit size			W4×H8mm	W6.3×H10mm
Power supply			100−240VAC 50/60Hz, 12−24VDC(Option)	
Allowable voltage range			90 ~ 110% of rated voltage	
Power consumption			• Preset : Approx. 5.4VA(240VAC 60Hz), Approx. 3W(24VDC) • Indication type :Approx. 4.7VA(240VAC 60Hz), Approx. 2.6W(24VDC)	• Preset : Approx. 6.1VA(240VAC 60Hz), Approx. 3.1W(24VDC) • Indication type : Approx. 5.4VA(240VAC 60Hz), Approx. 2.6W(24VDC)
Max.counting speed			Selectable **1cps/30cps/2kcps/5kcps** by internal DIP switch	
Min. signal width	RESET input		Approx. 20ms	
Input type	CP1, CP2 Input		**[Voltage input]** Input impedance : 5.4kΩ, "H" level voltage : 5−30VDC, "L" level voltage : 0−2VDC **[No-Voltage input]** Impedance at short−circuit : Max. 1kΩ, Residual voltage at short−circuit : Max. 2VDC, Impedance at open−circuit : Max. 100kΩ	
	RESET input			
Control output	Con−tact	Type	Single preset : SPDT(1c)	
		Capacity	250VAC 3A resistive load	
	Solid−state	Type	Single presetType : 1 NPN open collector	
		Capacity	30VDC Max. 100mA Max.	
Memory retention			10 years(when using non−volatile memory semiconductor)	
External sensor power			12VDC±10% 50mA Max.	
Ambient temperature			−10 ~ +55℃(at non−freezing status)	
Storage temperature			−25 ~ +65℃(at non−freezing status)	
Ambient humidity			35 ~ 85%RH	
Insulation resistance			100MΩ(at 500VDC)	
Dielectric strength			2000VAC 50/60Hz for 1 minute	
Noise strength	AC power		±2kV the square wave noise(pulse width:1μs) by the noise simulator	
	DC power		±500V 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/s² (Approx. 30G) in X, Y, Z directions 3 times	
	Malfunction		100m/s² (Approx. 10G) in X, Y, Z directions 3 times	
Relay life cycle	Mechanical		Min. 10,000,000 times	
	Electrical		Min. 100,000 times(250VAC 3A at resistive load)	
Weight	AC power		F8A : Approx. 287g, F8B : Approx. 253g	L8A : Approx. 500g, L8B : Approx. 446g
	DC power		F8A : Approx. 283g, F8B : Approx. 253g	L8A : Approx. 498g, L8B : Approx.444g

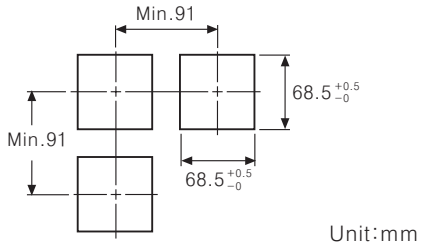
▣Dimensions

●F Series

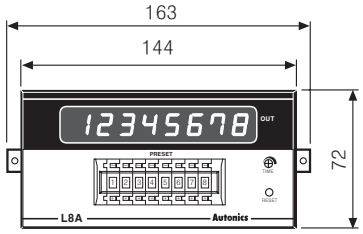


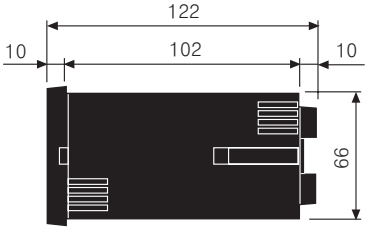


●Panel cut-out

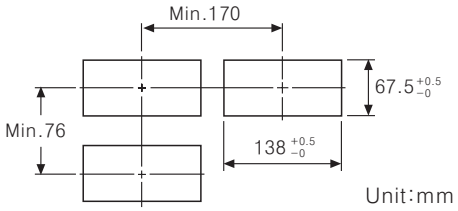


●L Series



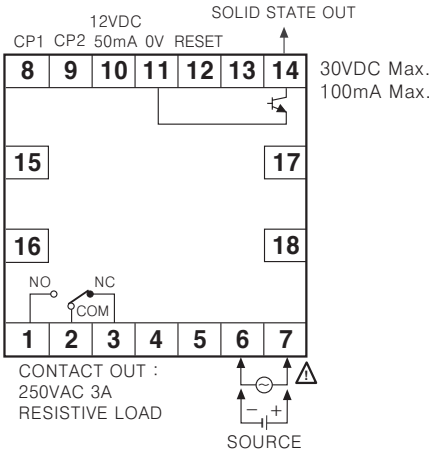


●Panel cut-out

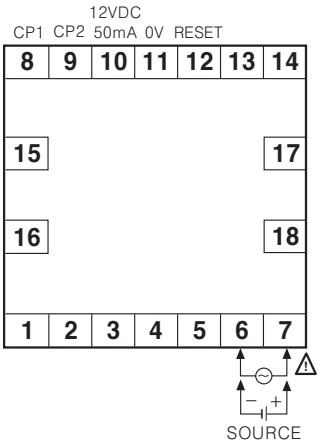


▣Connections

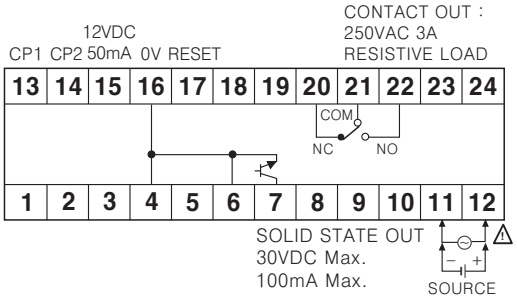
●F8A



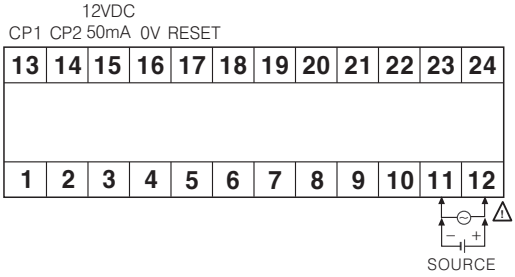
●F8B



●L8A



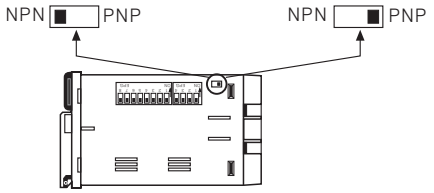
●L8B



▣Input logic selection

●F Series
Input logic is changeable by input logic selection switch located at the one-side of case.

• No voltage input(NPN) • Voltage input(PNP)



※Please be sure to turn OFF the power before changing input logic.

●L Series
Input logic is changeable by input logic selection switch located at the terminal block.

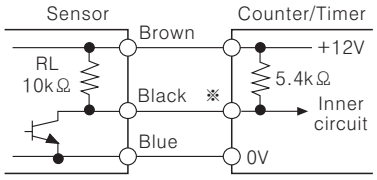
• No voltageinput(NPN)

• Voltage input(PNP)

▣Input connections

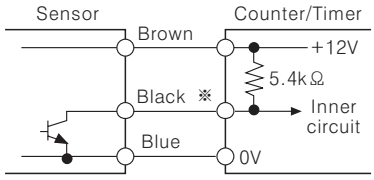
◎Input logic : No-voltage input(NPN)

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



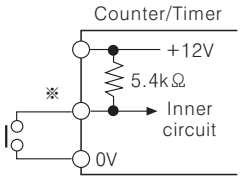
(NPN output)

※CP1, CP2(INHIBIT), RESET input



(NPN open collector output)

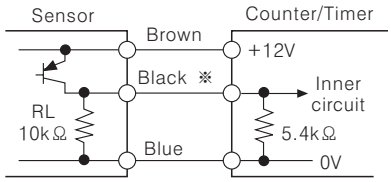
●Contact input



Counting speed : 1 or 30cps setting

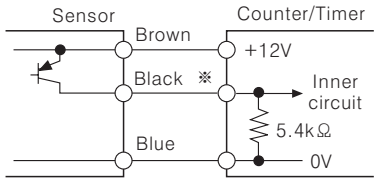
◎Input logic : voltage input(PNP)

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



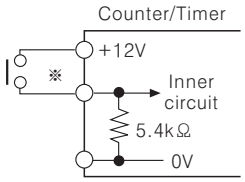
(PNP output)

※CP1, CP2(INHIBIT), RESET input



(PNP open collector output)

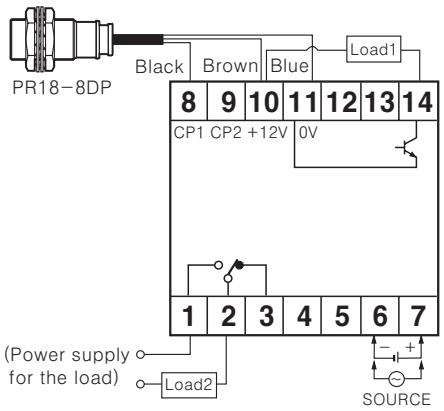
●Contact input



Counting speed : 1 or 30cps setting

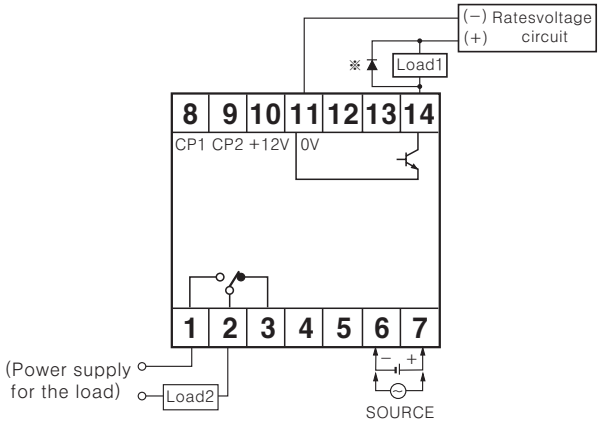
▣Input & output connections

◎In case of operating the load by power supply of the sensor



●Please select proper capacity of load, because total value of load capacity and current consumption should not be exceed current capacity(Max. 50mA).

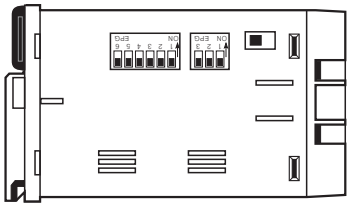
◎In case of operating the load by external power supply



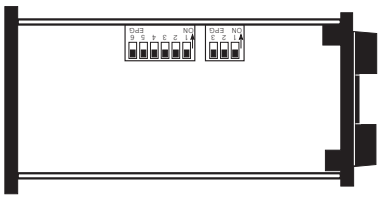
●The capacity of the load must not be exceed Max. 30VDC, Max. 100mA of the switching capacity of the transister.
●Please do not supply the reverse polarity voltage.
※In case of using the inductive load(Relay, etc.), please connector the surge absorber(Diode)at both terminals of the load, in case of using the inductive load.

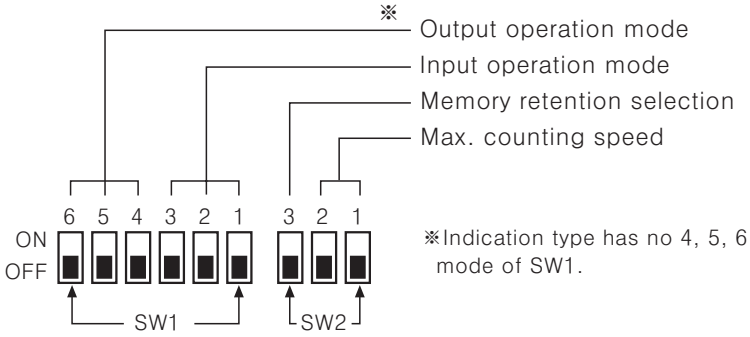
▣Selection by DIP switches

●W72×H72 DIP switch position



●W144×H72 DIP switch position





※Indication type has no 4, 5, 6 mode of SW1.

●Selecting memory retention

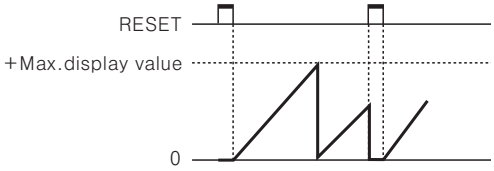
SW2	Function
3 ON OFF	Non memory
3 ON OFF	Memory

●Selecting max. counting speed

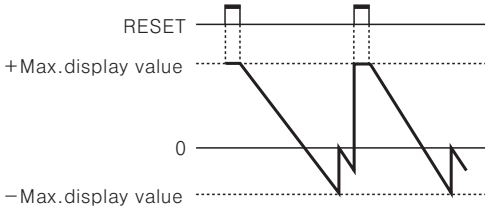
SW2	Max. counting speed
1 2 ON OFF	1cps
1 2 ON OFF	30cps
1 2 ON OFF	2kcps
1 2 ON OFF	5kcps

▣Counting function(Indication type-F8B, L8B)

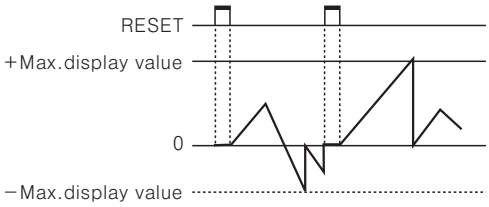
●Up mode



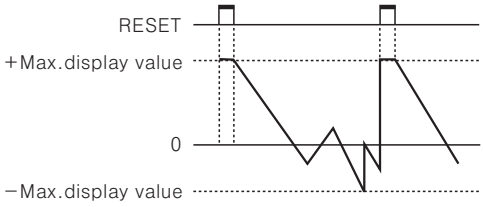
●Down mode



● Up / Down-A, B, C input mode

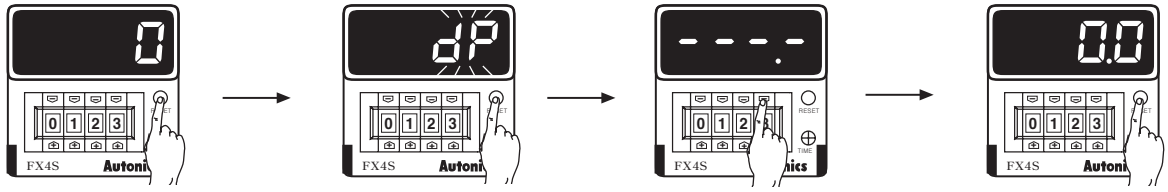


●Up / Down-D, E, F mode



▣Decimal point setting

Dispaly the decimal point.



RUN mode

※It returns to decimal point setting status if pressing RESET button for over 3sec. in RUN mode.

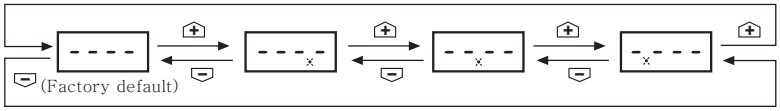
※When "dp" is flickering, one touch the Reset button.

※If pressing one of digital switchbuttons(⊞, ⊟) in decimal point setting mode, decimal point will be moved to Up(+) direction.

Return to RUN mode

※It returns to RUN mode if pressing RESET button for over 3sec. in decimal point setting status.

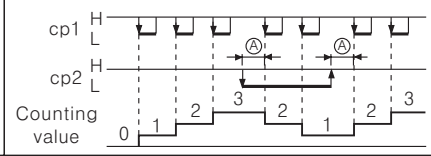
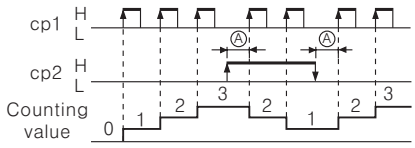
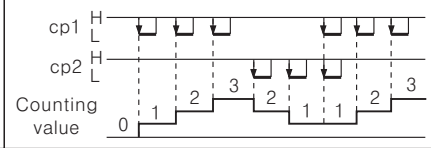
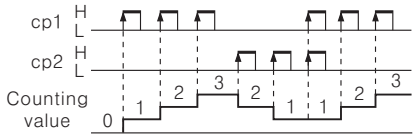
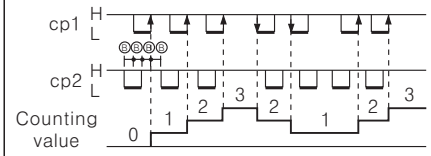
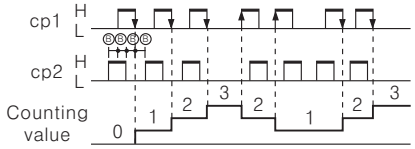
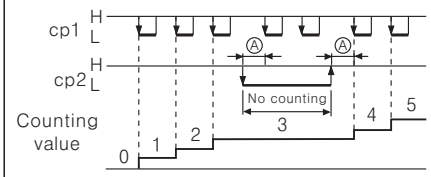
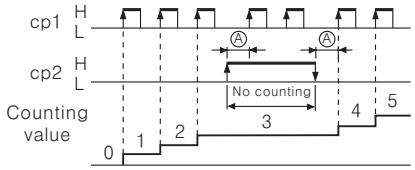
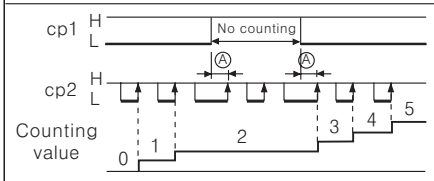
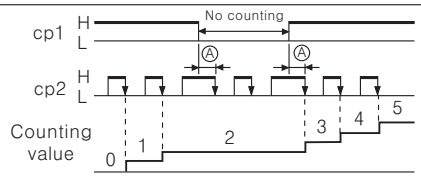
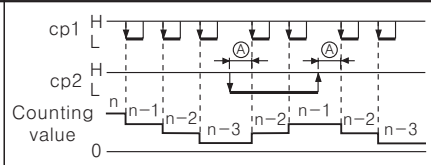
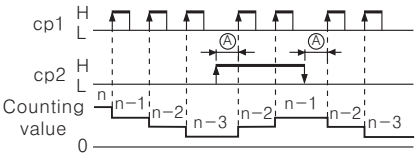
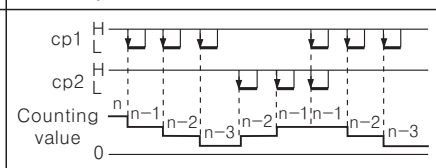
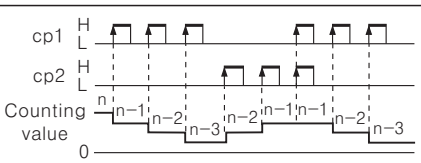
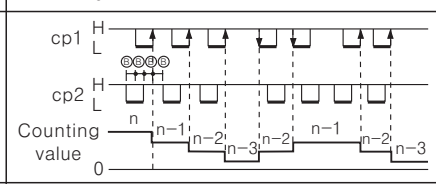
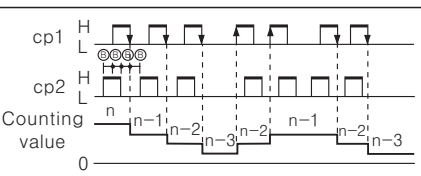
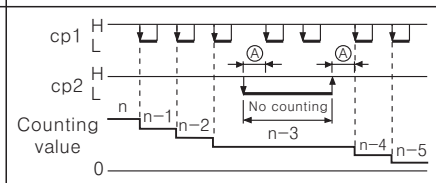
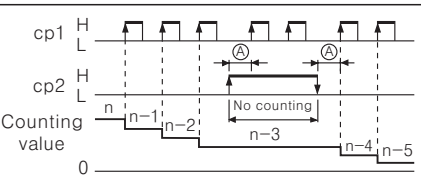
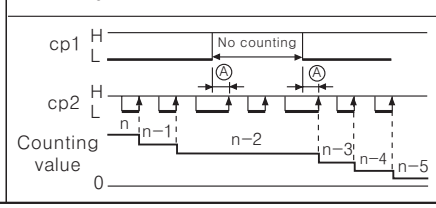
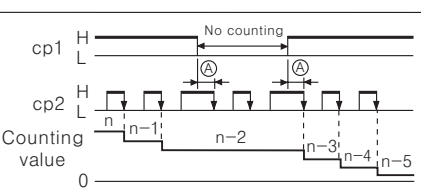
●Changing the decimal point



※It returns to RUN mode if no RESET button or digital switch is applied for 60sec. in decimal point settingstetus.

※The decimal point setting is existed in indication type.

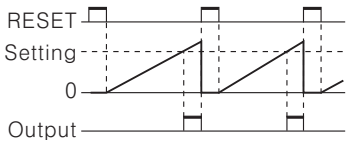
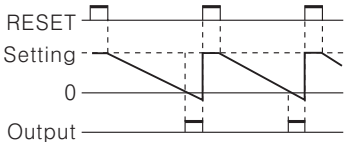
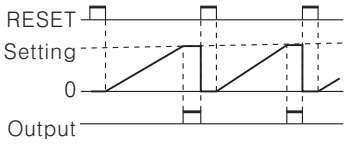
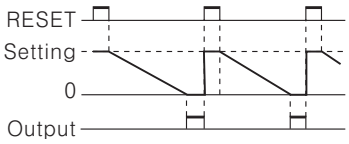
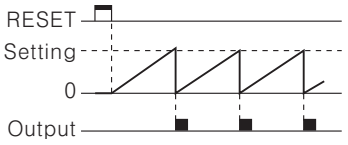
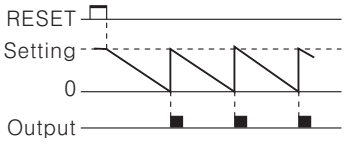
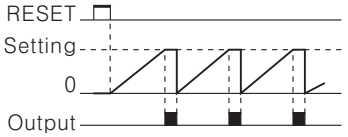
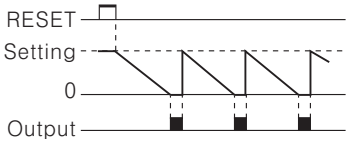
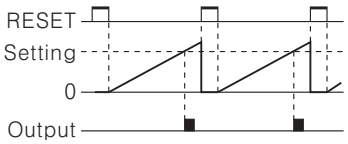
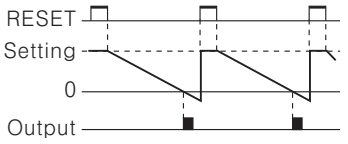
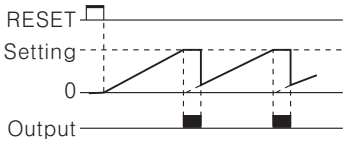
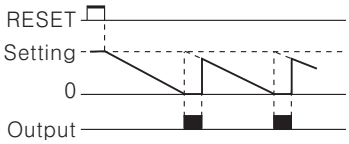
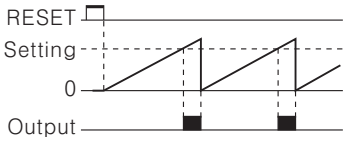
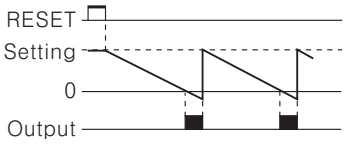
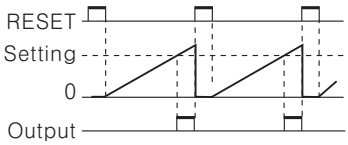
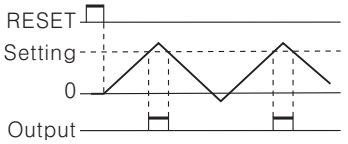
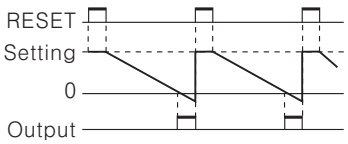
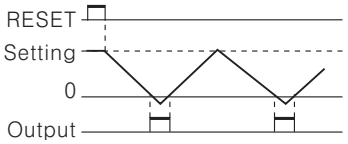
▣Input operation mode(Counter)

Input mode(SW1)			No-voltage input type(NPN)	Voltage input type(PNP)
Up mode	Up/Down-A Command input	ON / OFF (2 3)		
	Up/Down-B Individual input	ON / OFF (2 3)		
	Up/Down-C Phase difference input	ON / OFF (2 3)		
	Up Up input	ON / OFF (2 3)		
				
Down mode	Up/Down-D Command input	ON / OFF (2 3)		
	Up/Down-E Individual input	ON / OFF (2 3)		
	Up/Down-F Phase difference input	ON / OFF (2 3)		
	Down Down input	ON / OFF (2 3)		
				

※Ⓐ : Over Min. signal width, Ⓑ: Over 1/2 of Min. signal width.
Counting miss by one(±1) is occured if the signal width of Ⓐ or Ⓑ is less than min. signal width.

▣Output operation mode

One-shot output **(0.05 ~ 5sec)** Self-holding output

Output mode (SW1)	ON 4 OFF **Up mode**	ON 4 OFF **Down mode**	Operation after count up
F ON 4 5 6 OFF			The display value continues until reset signal is applied and the output will be held. • Self-holding output is held until reset signal is applied.
N ON 4 5 6 OFF			The display value and self-holding output are held until reset signal is applied.
C ON 4 5 6 OFF			The display value returns to reset start status when display value is reached to preset value.
R ON 4 5 6 OFF			The display value is held until output is OFF then returns to reset start status.
K ON 4 5 6 OFF			The display value continues until reset signal is applied.
P ON 4 5 6 OFF			The display value is held during one-shot output time, counting process is returned to reset start status when output is ON.
Q ON 4 5 6 OFF			The display value continues during one-shot output time.
S ON 4 5 6 OFF	**Up**  	**Down**  	• Up, UP/Down-A, B, C input mode -Output is ON when (Display value) ≥ (Preset value) • Down, UP/Down-D, E, F input mode -Output is ON when (Display value) ≤ (Zero)

▣Proper usage

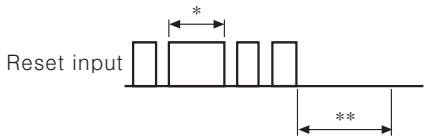
◎Reset function

●Reset

In case of changing the input mode after supplying the power, please take a external reset or manual reset. **If reset is not executed, the counter will be working as previous mode.**

●Reset signal width

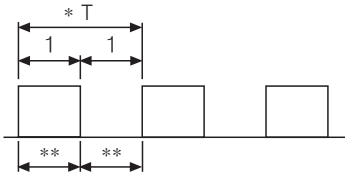
It is reset perfectly when the reset signal is applied during max. 20ms regardless of the contact input & solid-state input.



*In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied during max. 20ms even though a chattering is occurred.

**It can be input the signal of CP1 & CP2 after max. 50ms from closing time of reset signal.

◎Min.signal width of CP1, CP2 input

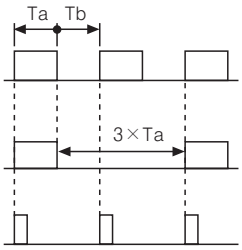


*Please make duty ratio(ON/OFF) 1:1.

** Min. signal width
- 1cps : Max. 500ms
- 30cps : Max. 16.7ms
- 2kcps : Max. 0.25ms
- 5kcps : Max. 0.1ms

◎Max. counting speed

This is respond speed per 1 sec. when the duty ratio (ON/OFF) of input signal is 1:1. If duty ratio is not 1:1, the respond speed will be getting slow against input signal and also the width between ON and OFF should be over min. signal width and also one of ON width and OFF width is under min. signal width, this product may not response.



Width of Ta(ON) and Tb(OFF) must be larger than Min. signal width.

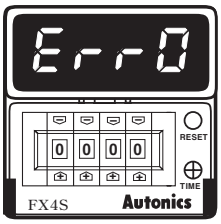
Max.counting speed is 1/2 value of catalog spec. when duty rate is 1:3.

It can not respond because Max. signal width(1a) is little.

◎Error display

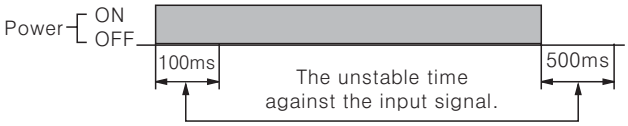
Error signal	Error description	Returning method
Err0	Zero set state	Change the se value to non zero state

※When Error is displayed, the output continues OFF state.
※There is no Error function in the indication type.



◎Power

The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.



DIN size W72×H36mm, W48×H48mm, W72×H72mm Counter/Timer

▣Features

- ●Selectable Counter or Timer function
- ●The most various function(829,928 kinds of function)
- ●Prescale function
- ●Programmable count speed to 10kcps
- ●Batch counter function for CT6, CT6-2P only
- ●Selectable Voltage input(PNP) or No voltage input(NPN)
- ●Ability to set ON/OFF time individually in Flicker (FLK) mode
- ●Key Lock function

⚠ **Please read "Caution for your safety" in operation manual before using.**

▣Ordering information

CT 6 S – 2P

I	Indicator
	Single preset
2P	Double preset
Y	DIN Size W72×H36mm
S	DIN size W48×H48mm
	DIN size W72×H72mm
4	9999(Digit)
6	999999(Digit)
CT	Counter/Timer

※When using double preset type as timer mode, setting time is limited in one preset time.

▣Specifications

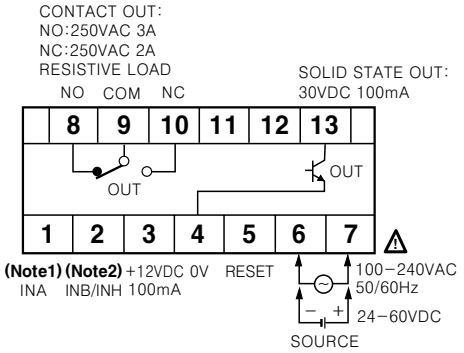
Model	Single preset		CT6Y	CT4S	CT6S	CT6
	Double preset		CT6Y-2P	CT4S-2P	CT6S-2P	CT6-2P
	Indicator		CT6Y-I	———	CT6S-I	CT6-I
Digit			6	4	6	6
Digit size			Counting part:W4.5×H10mm Setting part:W3.5×H7mm	Counting part:W7×H11mm Setting part:W5×H8mm	Counting part:W4.5×H10mm Setting part:W3.5×H7mm	Counting part:W7×H13mm Setting part:W5×H9mm
Power supply	AC power		100-240VAC 50/60Hz			
	DC power		24-60VDC			
Allowable voltage range			90 ~ 110% of rated voltage(AC power)			
Power consumption	AC power		Indicator : Approx. 9VA, Single & Double preset : Approx. 10VA			
	DC power		Indicator & Single preset : Approx. 5W, Double preset : Approx. 6W			
Count speed of INA, INB			Selectable 1 / 30 / 1 / 5 / 10kcps			
Min. input signal width	Counter		Reset input : Selectable 1ms or 20ms			
	Timer		INA, INHIBIT, RESET : Selectable 1ms or 20ms			INA, RESET, INHIBIT, BATCH RESET (except CT6-I) : Selectable 1ms or 20ms
Input			Selectable voltage input or No-voltage input [Voltage input] Input impedance : 5.4kΩ, "H" level : 5-30VDC, "L" level : 0-2VDC [No-voltage input] Short-circuit impedance : Max. 1kΩ, Residual voltage : Max. 2VDC, Open-circuit impedance : Min. 100kΩ			
One-shot output			10 / 50 / 100 / 200 / 500 / 1000 / 2000 / 5000ms			
Control output	Con-tact	Type	Single preset type : SPDT(1c) Double preset type : SPST(1a) for first output SPDT(1c) for second output	Single preset type : SPDT(1c), Double preset type : SPST(1a) for first output, SPST(1a) for second output		
		Capacity	NO : 250VAC 3A at resistive load, NC : 250VAC 2A at resistive load			
	Solid-state	Type	Single preset type : 1 NPN open collector(OUT) Double preset type : 1 NPN open collector(OUT2)			Single preset type : 2 NPN open collector Double preset type : 3 NPN open collector
		Capacity	Max. 30VDC, Max. 100mA			
Memory retention			10 years(When using non-volatile semiconductor memory)			
External sensor power			12VDC ±10%, Max. 100mA			

■Specifications

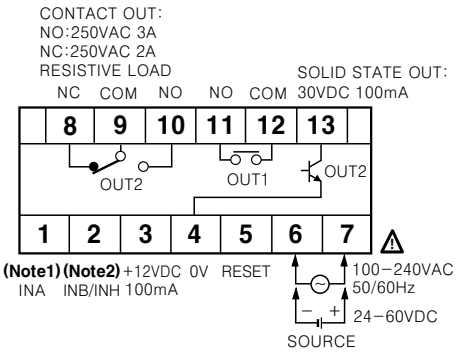
Time accurancy	Repeat error	Power ON start : ±0.01% ±0.05sec Signal start : ±0.01% ±0.03sec			
	Set error				
	Voltage error				
	Temperature error				
Insulation resistance		Min. 100MΩ (at 500VDC)			
Dielectric strength		2000VAC 50/60Hz for 1 minute			
Noise strength		±2kV the square wave noise(pulse 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/s² (Approx. 30G) in X,Y,Z directions for 3 times			
	Malfunction	100m/s² (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)			
Protection		IP65(Front panel only)			
Ambient temperature		−10 ~ +55℃(at non−freezing status)			
Storage temperature		−25 ~ +65℃(at non−freezing status)			
Ambient humidity		35 ~ 85%RH			
Weight	AC power	CT6Y:Approx. 160g CT6Y−2P:Approx. 163g CT6Y−I:Approx. 127g	CT4S:Approx. 155g, CT4S−2P:Approx. 162g	CT6S:Approx. 155g CT6S−2P:Approx. 162g CT6S−I:Approx. 136g	CT6:Approx. 264g CT6−2P:Approx. 271g CT6−I:Approx. 244g
	DC power	CT6Y:Approx. 164g CT6Y−2P:Approx. 167g CT6Y−I:Approx. 130g	CT4S:Approx. 152g CT4S−2P:Approx. 159g	CT6S:Approx. 152g CT6S−2P:Approx. 159g CT6S−I:Approx. 133g	CT6:Approx. 263g CT6−2P:Approx. 270g CT6−I:Approx. 243g
Approval		————	CE c UL us		

■Connections

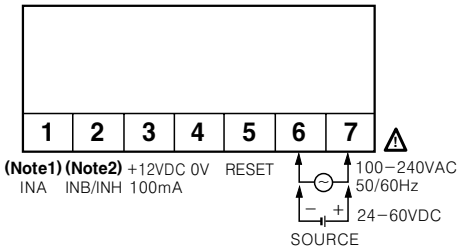
◎ CT6Y



◎ CT6Y−2P



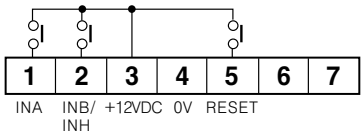
◎ CT6Y−I



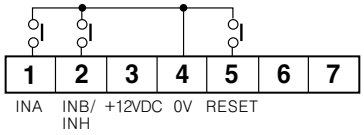
※**(Note1)**INA terminal
- Operation of Counter : Operating as INA signal or INH signal
- Operation of Timer : Operating as "START"

※**(Note2)**INB/INH terminal
- Operation of Counter : Operating as INB signal
- Operation of Timer : Operating as INH signal
  If the INH signal applied when it is used as Timer, the processing time stops.(Hold)

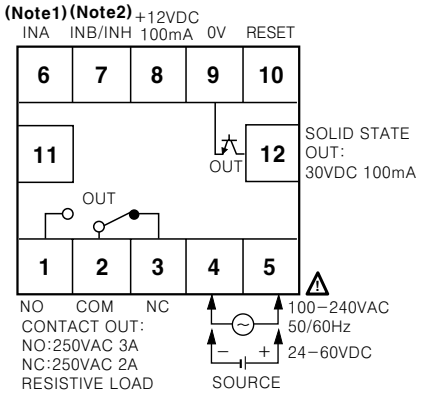
※Connection of relay contact input when voltage input(PNP) is selected



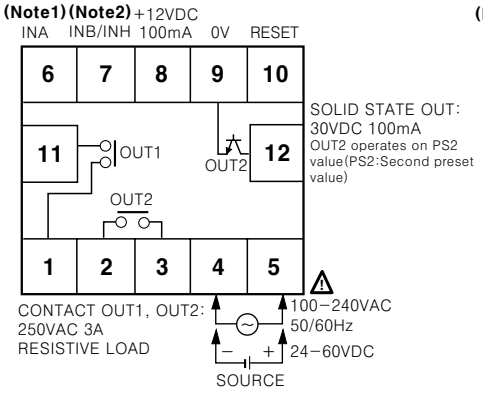
※Connection of relay contact input when No−voltage input(NPN) is selected



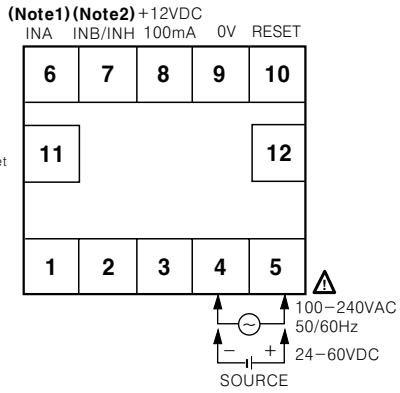
◎ CT4S, CT6S



◎ CT4S-2P, CT6S-2P



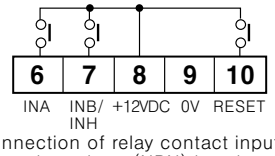
◎ CT6S-I



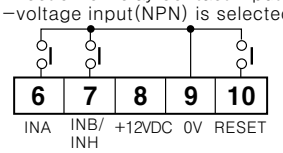
(Note1) INA terminal
- Counter : It will be as input terminal of counting input or counting no input signal.
- Timer : It will be input terminal of START signal.

(Note2) INB/INH terminal
- Operation of Counter : Operating as INB signal
- Operation of Timer : Operating as INH signal
  If the INH signal applied when it is used as Timer, the processing time stops.(TimeHold)

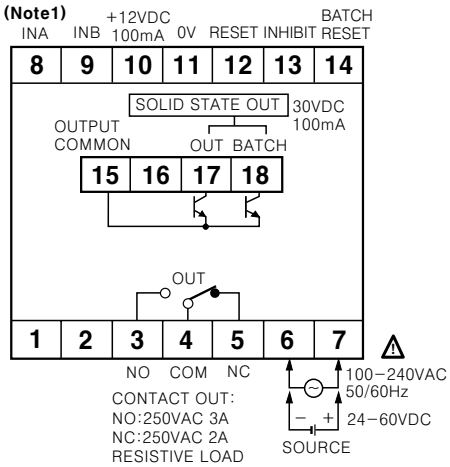
●Connection of relay contact input when voltage input(PNP) is selected



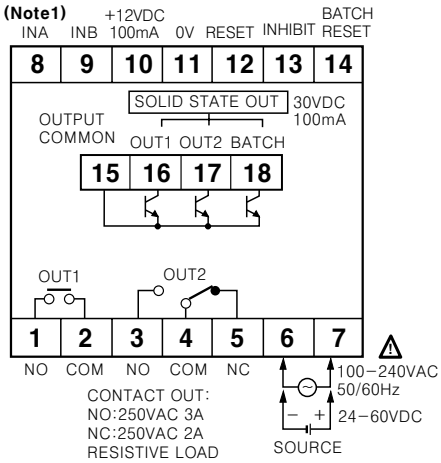
●Connection of relay contact input when No-voltage input(NPN) is selected



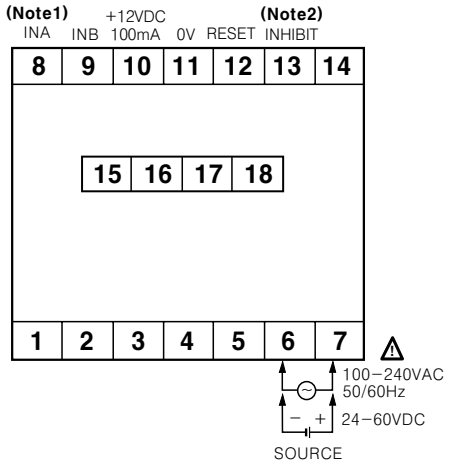
◎ CT6



◎ CT6-2P



◎ CT6-I

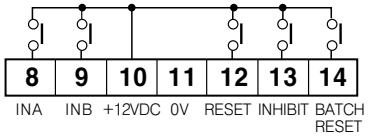


※**(Note1)** INA terminal
- Counter : It will be as input terminal of counting input or counting no input signal.
- Timer : It will be input terminal of START signal.

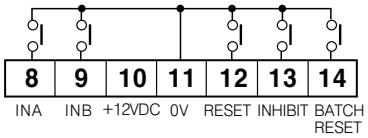
※**(Note2)** INHIBIT signal
- When INHIBIT signal is applied at Timer operation:Processing time stops

※Solid state output is insulated from inner circuit by photocoupler. (Time Hold) (Power supply : 5-30VDC Max.)

●Connection of contact input in state of selected voltage input(PNP)



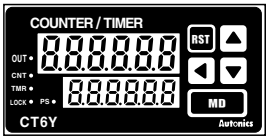
●Connection of contact input in state of selected No-voltage input



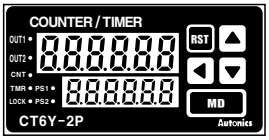
▣Dimensions

◎ CTY Series

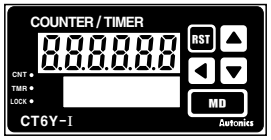
●CT6Y

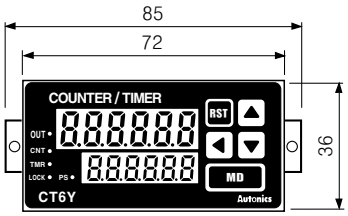


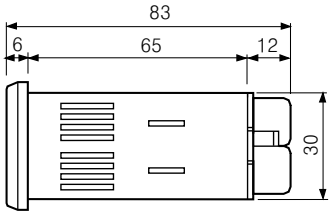
●CT6Y−2P



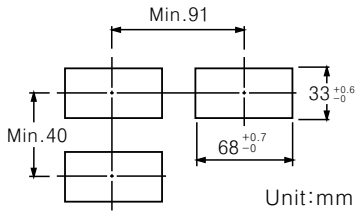
●CT6Y−I







●Panel cut−out



◎ CTS Series

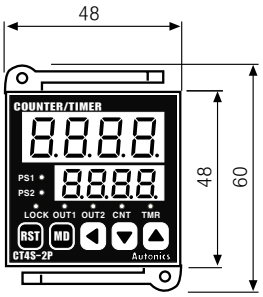
●CT4S

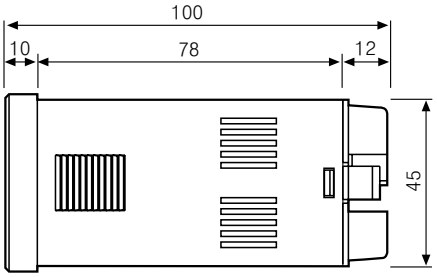
●CT4S−2P

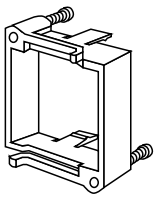
●CT6S

●CT6S−2P

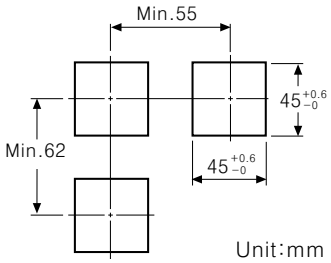
●CT6S−I







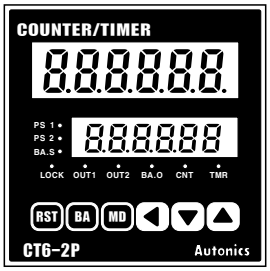
●Panel cut−out



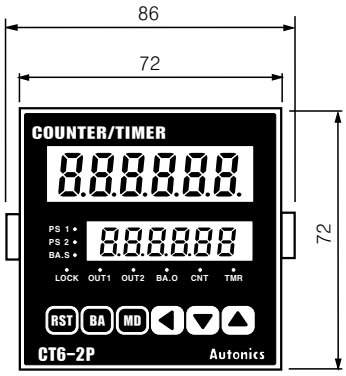
◎ CT Series

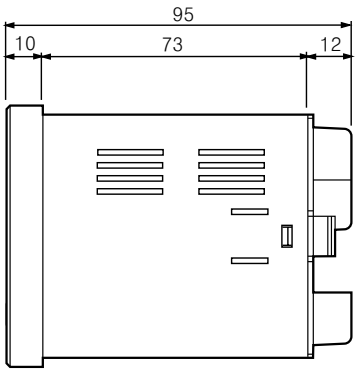
●CT6

●CT6−2P

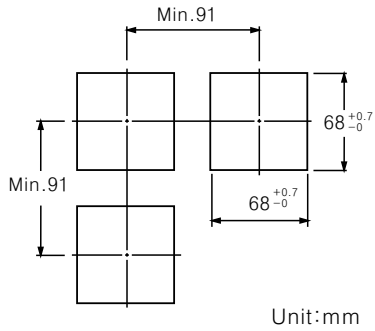


●CT6−I



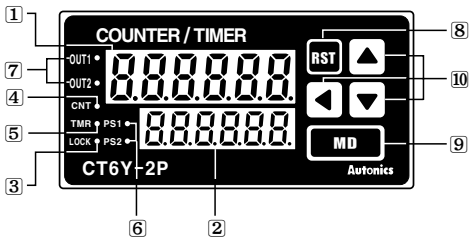


●Panel cut−out



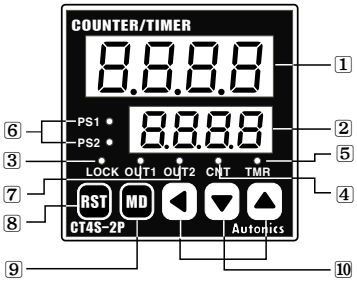
■Front panel identification

◎ CTY series

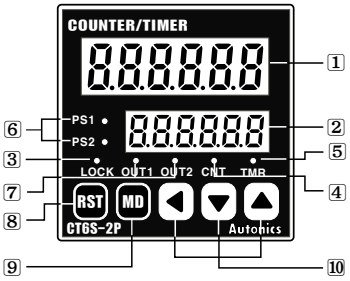


◎ CTS series

●4 Digit



●6 Digit



1 Display for processing value(Red LED)
Counting value(Counter) / Processing time(Timer) / Setting symbols
LED height : 11mm for 4digit, 10mm for 6digit

2 Preset value display(Yellow-Green LED)
Preset value(Counter)/Preset time(Timer) and setting symbols.
LED height : 8mm for 4digit, 7mm for 6digit

3 LOCK : Key Lock indication
LOCK OFF: Light OFF
LOCK O N: Light ON

4 CNT : Indicates operation as a counter

5 TMR : Indicates operation as a timer
-LED flickers when the timer is processing
-LED turns on when the processing time stops

6 PS1, PS2 : Indicates that preset is being displayed or changed.

7 OUT1, OUT2 : Indicating operation of output

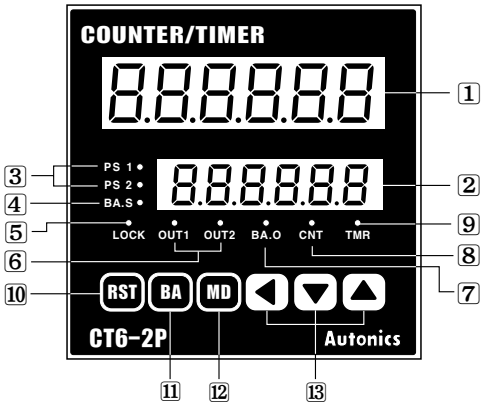
8 RST : Reset key

9 MD : Mode key

10 ◀, ▼, ▲: Set key

※There is no 6, 7 LED in CT6Y-I, CT6S-I.
※In CT4S, CT6S, CT6Y, PS2 will be changed to PS and OUT2 is OUT and there is no PS1, OUT1 LED.

◎ CT Series



※In CT6, PS2 will be changed to PS and OUT2 to OUT, since there is no PS1, OUT1 LED.
※There is no PS1, PS2, BA.S, OUT1, OUT2, BA.0 LED in CT6-I.
※There are no BA key in CT6-I.

1 Display for processing value(Red LED)
Counting value(Counter)/Processing time(Timer)/Setting symbols
LED height : 13mm

2 Preset value display(Yellow-Green LED)
Preset value(Counter)/Preset time(Timer) and setting symbols
LED height : 9mm

3 PS1, PS2 : Indicates which preset is being displayed or changed

4 BA.S : Indicates a batch value has been preset

5 LOCK : Key lock display

6 OUT1, OUT2 : Preset the operation of output(Single & Double)

7 BA.O : Indication the operation of BATCH output

8 CNT : Indication the operation of counter

9 TMR : Indication the operation of timer
-LED flickers when the timer is operating
-LED turns off when the operating time stops

10 RST : Reset key

11 BA : Batch key

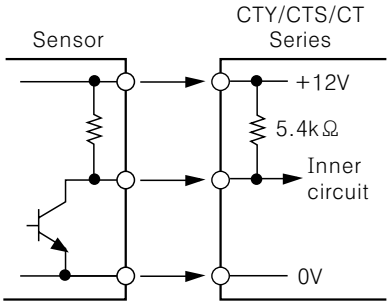
12 MD : Mode key

13 ◀, ▼, ▲ : Set key

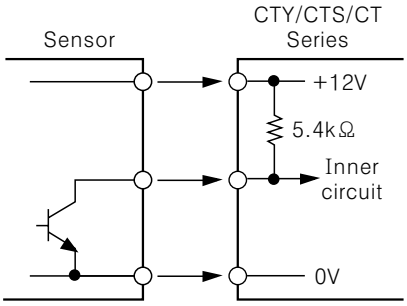
▣Input connections

◎Input logic : No-voltage input(NPN)

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

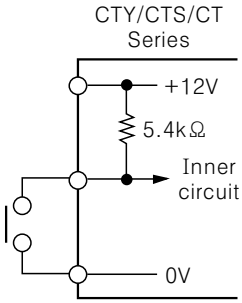


(NPN voltage output)



(NPN open collector output)

●Contact input

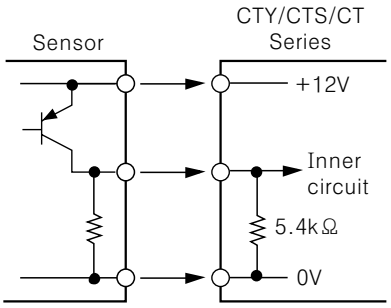


※Counting speed: 1 or 30cps setting (Counter)

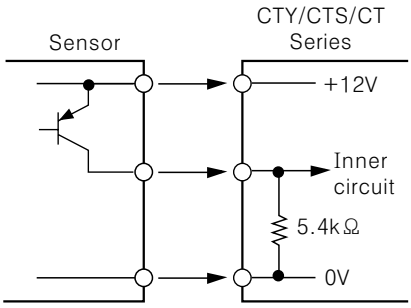
※INPUT circuit of INA, INB, INH(INHIBIT), BATCH RESET, RESET are the same.

◎Input logic : Voltage input(PNP)

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

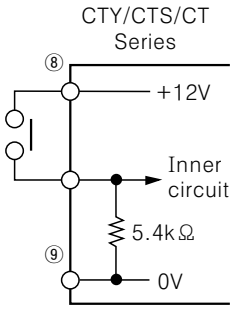


(PNP voltage output)



(PNP open collector output)

●Contact input



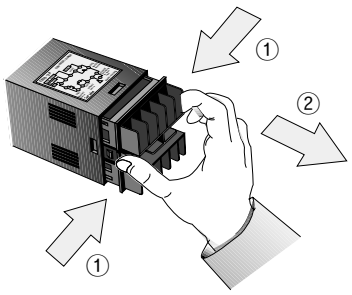
※Counting speed: 1 or 30cps setting (Counter)

※INPUT circuit of INA, INB, INH(INHIBIT), BATCH RESET, RESET are the same.
※INA is input terminal when it is used for Counter and can be START signal input terminal when it used for Timer.

▣Input logic selection

◎CTS series

1. The power must be cut off.
2. Detach the case from body.

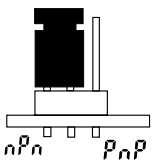


*Case detachment
Squeeze toward ① and pull toward ② as shown in picture.

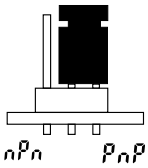
**** Please check if the power is cut off!! ****

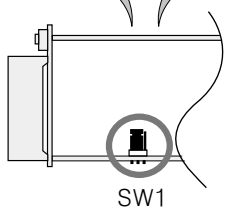
3. Select input logic by using input logic S/W inside Counter/Timer.

●Select No-voltage input(NPN)



●Select voltage input(PNP)





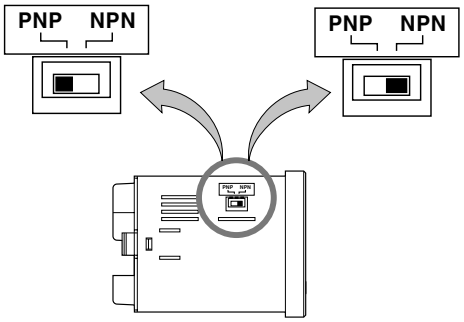
4. Please assemble opposite way of the case detachment.
5. Then apply the power to Counter/Timer.

◎CT / CTY series

It is easy to change input logic by S/W for input logic conversion.

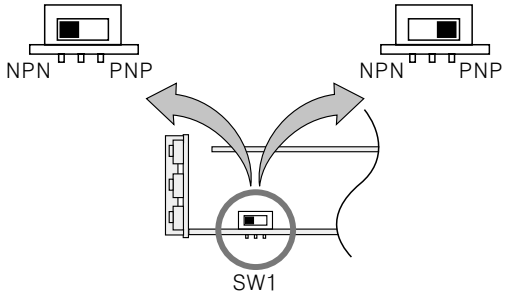
< CT series >

●Select PNP(Voltage input) ●Select NPN(No-Voltage input)



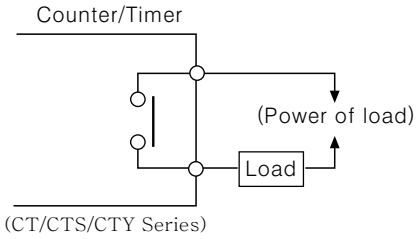
< CTY series >

●Select NPN(No-Voltage input) ●Select PNP(Voltage input)



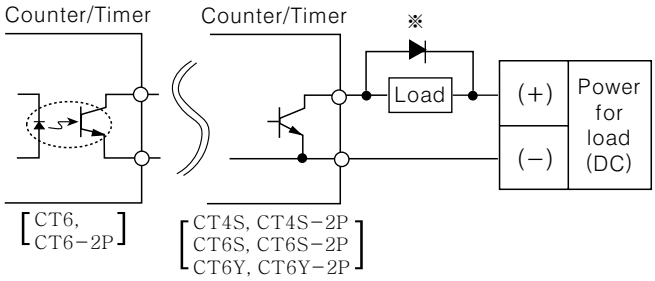
■Output connections

◎Contact output



※Relay contact is 250VAC 3A Max.
※Use proper load not to exceed relay contact.

◎Solid state output



※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.

■Factory Default settings

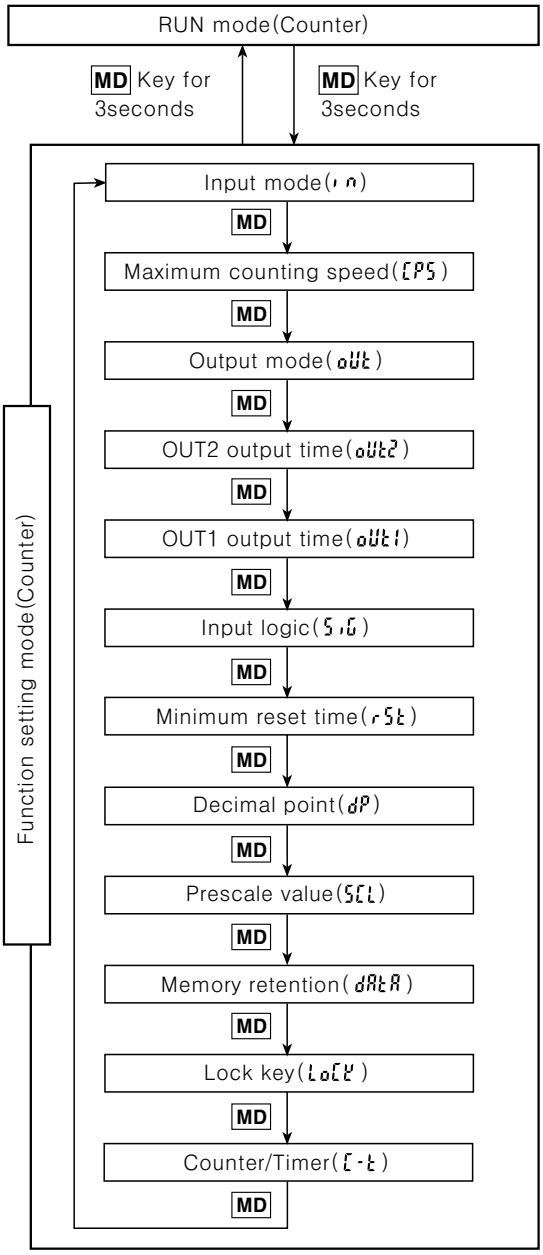
Set item \ Model		CT6-2P CT6S-2P CT4S-2P CT6Y-2P	CT6 CT6S CT4S CT6Y	CT6-I CT6S-I CT6Y-I
COUNTER	Input mode	Up/Down-C(U/D-C)		
	Output mode	F		——
	OUT1	100ms	——	
	OUT2(OUT)	Hold		——
	CPS	30cps		
	Min. reset time	20ms		
	Decimal point	No decimal point		
	Prescale value	6digit : 1.000, 4digit : 1.00		
	Counting memory	CLEr(Power reset)		
TIMER	Time range	6digit : 0.01s ~ 9999.99s 4digit : 0.01s ~ 99.99s		
	Up/Down mode	U(UP)		
	Output mode	OND(ON Delay)		——
	Output time	Hold		——
	Input signal mode	20ms		
Input method		No-voltage input(NPN)		
Lock key		L.oFF(Lock OFF)		
Counter / Timer		Counter		

■Error code display

Error display	Errors	Output status	How to return
Err 1	CPU error	OFF	RST key, RESET input

▣Counter mode

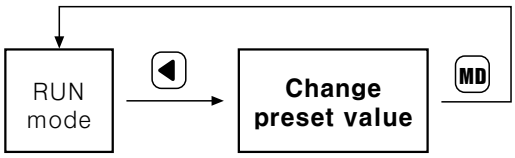
◎Operation mode in Counter



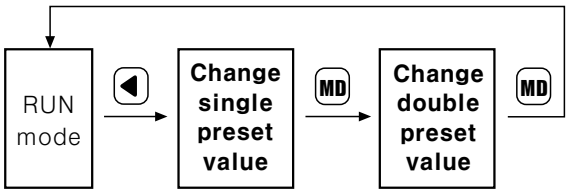
- Pressing MD for over 3sec., it wil enter into Counter function setting mode.
- Pressing MD for over 3sec.,it will return to Counter RUN mode.
- If no keys are touched for over 60sec., it will return to Counter RUN mode.
- When using this is unit as a counter, please change to Timer(t) in Counter/Timer setting.
  Then press MD for over 3sec. to move to counter RUN mode and change the setting value.

▣Change of preset value in Counter operation

◎Change the preset value in the single preset type(CT6)



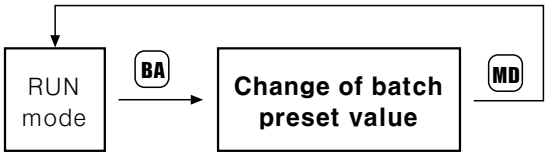
◎Change the preset value in the double preset type(CT6Y-2P)



※While changing preset value,input counter signals are still accepted.
When changing preset value, if no key is touched for 60 sec., the counter will return to RUN mode.
After changing the preset value as "0", there is RST key input or RESET input at RUN mode, the output will be maintained as OFF. (But in state of the output mode is "T", if changing single preset value as "0", the single output will be maintained as ON.)

◎Change of Batch preset value

Batch counter function is only available in CT6, CT6-2P type.



- If you press BA key in RUN mode, it will allow you to make change to the batch preset value.
  After changing the batch preset value using same method as the method of Counter preset value changes by ◀,▼, ▲ keys, it will return to RUN mode by pressing MD key.
  When proceeding to change the batch preset value, the current batch counting value is also displayed.

▣How to set Lock key

Be sure to set the lock mode in order to protect against accidental or unauthorized key operation.

LoFF (LOCK OFF) : Cancellation of the lock mode

LoC.1 (LOCK LEVEL 1) : Lock RST key

LoC.2 (LOCK LEVEL 2) : Lock ◀ & ▼ & ▲ key

LoC.3 (LOCK LEVEL 3) : Lock RST & ◀ & ▼ & ▲ key

■Setting of Counter function modes

(MD key : Use the ▲ or ▼ key to change the setting)

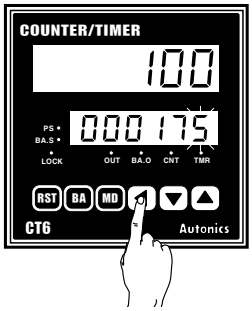
Setting mode	How to set(▲, ▼)
Input mode (in)	U → d → Ud-A → Ud-b → Ud-C ※When "U" or "d" of input mode is set, "S, t, d" of output mode will not be displayed.
Maximum counting speed (CPS)	1 → 30 → 1K → 5K → 10K ※Counting speed is determinded by one by one(1:1) duty ratio of INA or INB input signal, andit is applied to both INA or INB. ※When using setting "d" in output mode, 5kcps and 10kcps are not indicated in the display.
Output mode (oUt)	●Up or Down input mode F → n → C → r → K → P → 9 → A ●Up/Down-A, B, C input mode F → n → C → r → K → P → 9 → A → S → 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 1cps.
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 (S, G)	nPn : Voltage input PnP : No-voltage input ※It indicates according to internal position, and it can't be set by ▲ & ▼ key.
Min. reset time (rSt)	1 ⇄ 20 Unit:ms ※Min. external RESET signal width
Decimal point (dP)	● 6 Digit ● 4 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 1pulse. ※Set range of prescale value 6Digit : 0.001 ~ 99.999 4Digit : 0.01 ~ 9.99
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 ⇄ tiME ※CoUn : Counter tiME : Timer

※When selecting the "d" output mode and if 1kcps is used, the output may not operate normally because of response time of the contact. Therefore, in this case be sure to use the solid state output.
※When it is in function setting mode, no external input signal will be accepted and the output will stay in the OFF state.
※There are no output mode and output time setting mode of function setting mode in CT6Y-I, CT6S-I, CT6-I models.

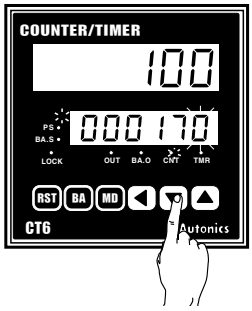
▣Change of Counter preset value

◎Change the set preset value of single preset type(CT6)

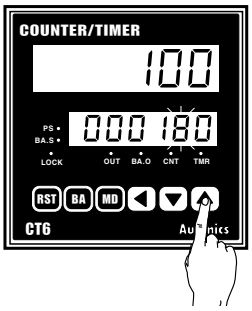
●How to change in the single preset type : To change the preset value from **175 to 180.**

1 

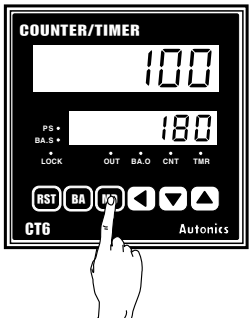
Press ◀ key to enter in state of changing preset value. The prior preset value is indicated and the first digit "5" flashes. (PS LED ON)

2 

Change "5" to "0" by pressing ▼ key 5 times, and shift the flickering to the second digit by ◀ key once. ("7" is flickering digit)

3 

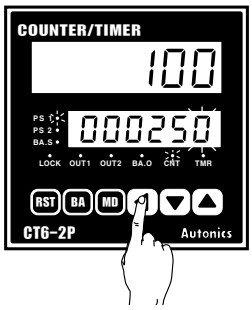
Change "7" to "8" by pressing ▲ key once.

4 

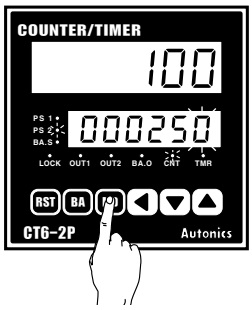
The change to the preset value is completed. To return to RUN mode, press MD key. (PS LED OFF)

◎Change the preset value of double preset type(CT6-2P)

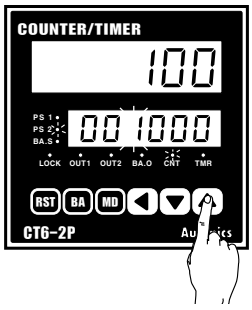
●How to change in the double preset type : To change the double preset value **from 500 to 100** when the single preset value is **250**.

1 

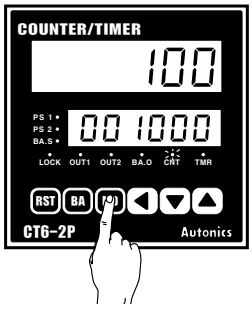
Pressing ◀ key, it will enter into the change of single preset. The previous setting value will be displayed and "0" will flickers. (PS1 LED ON, PS2 LED OFF)

2 

The single preset value is not changed. Move to the change of double preset value by pressing MD key. The previous double preset value "500" is displayed and the "0" will flicker. (PS1 LED OFF, PS2 LED ON)

3 

Change "500" to "1000" with ◀, ▼, ▲. (The change method is the same as Single preset type Counter)

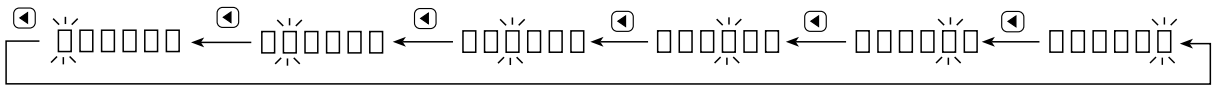
4 

Press MD key to complete the setting and return to RUN mode. (PS1 LED OFF, PS2 LED ON)

※When changing preset value, if no key is touched for 60 sec., the counter will return to RUN mode.

※After changing the preset value to "0", there is RST key input or RESET input at RUN mode, the output will be maintained as OFF. (But if state of the output mode is "T", if change single preset value to "0", the single output will be maintained as ON.) Also applies to OUT2 in double preset value.

※Whenever ◀ key is pressed in the state of changing preset value, the flickering digit shifts from the right to the left.

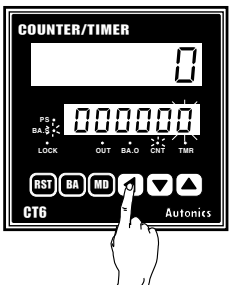


■Batch Counter function(Counter)

◎Change the setting value of Batch counter

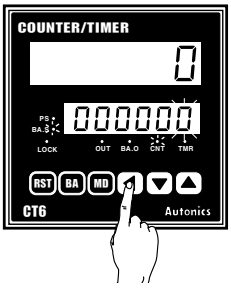
●In case of setting Batch setting value as "**50**"

1



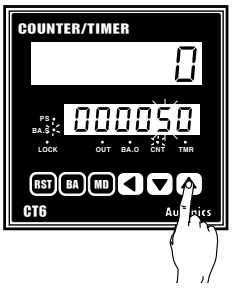
Press BA key in RUN mode, it will enter into the program state of Batch setting value. (BA.S LED ON display) After entering into the state of setting the first "0" will flicker and the remaining digits will be on steady.

2



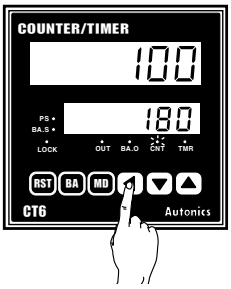
Move to the second position by pressing ◀ key one time. The second "0" will flicker.

3



Change "0" to "5" by pressing ▲ 5times.

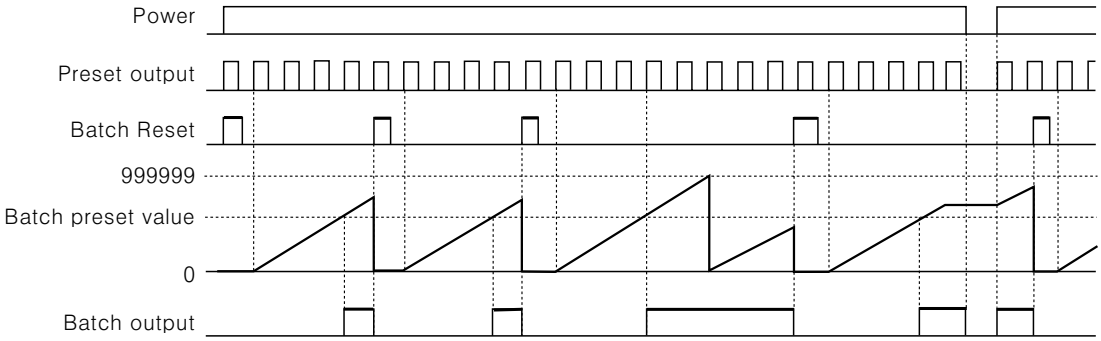
4



Pressing MD key to complete the Batch setting will return Counter to the RUN mode. (BA.S LED OFF display)

※Batch Counter function is only in CT6 and CT6-2P.
※When entering into Batch setting, if no key is touched for 60sec., it will return to Counter operation mode.

◎Batch Counter function



※When the Batch counting value reaches 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 state 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.
※In the CT6-2P, "Count up" refers to reacting the second set value.

◎Reset the Batch counting value

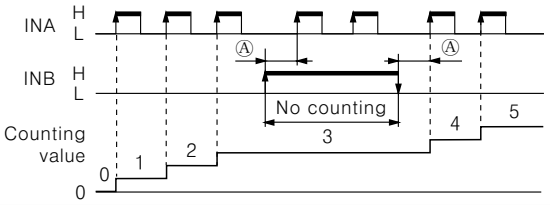
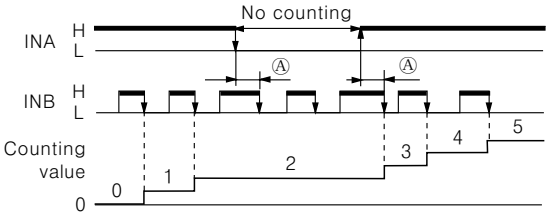
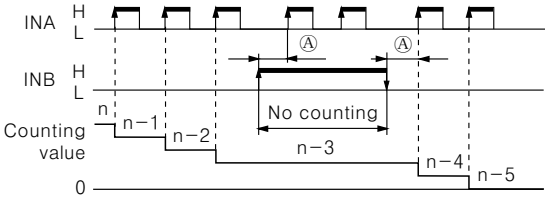
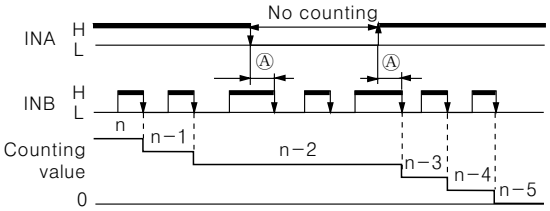
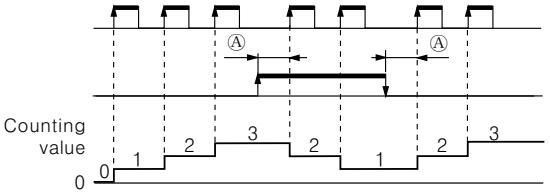
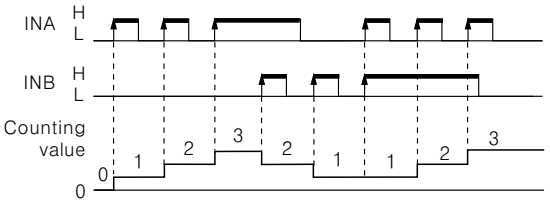
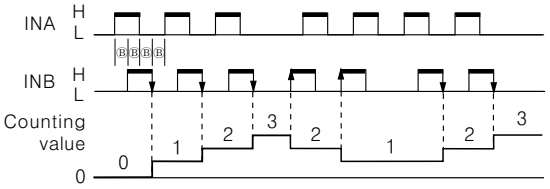
When the terminal of Batch RESET is externally short-circuited, the BATCH counting value will be reset.
But the Batch RESET is different dependent on the input logic setting.
: When Voltage input type(PNP) is selected, please make terminal numbers **10** and **14** short-circuited.
And when No-voltage input type(NPN) is selected, please make terminal number of **11** and **14** short-circuited.

◎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.

▣Input operation mode for counter

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

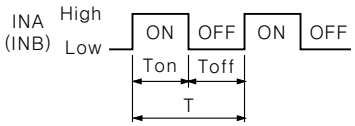
Input mode	Counting chart	Notice
U (UP)		※INA : Counting input ※INB : Inhibit input (Limit counting input of INA) ※When INB changes from L to H, up count signals on INA will not be accepted.
		※INA : Inhibit input (Limit counting input of INB) ※INB : Counting input ※When INA changes from H to L, up count 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).

※"H" and "L"

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

※Min. signal width by counting speed

Counting speed	Min. signal width
1cps	500ms
30cps	16.7ms
1kcps	0.5ms
5kcps	0.1ms
10kcps	0.05ms



※Ton, Toff : Min. signal width

▣Application of Prescale function

This function is to set and indicate calculated unit for actual length, liquid measure, position, etc. It is called "Prescale value" for measured length, measured liquid, measured position per 1 pulse.

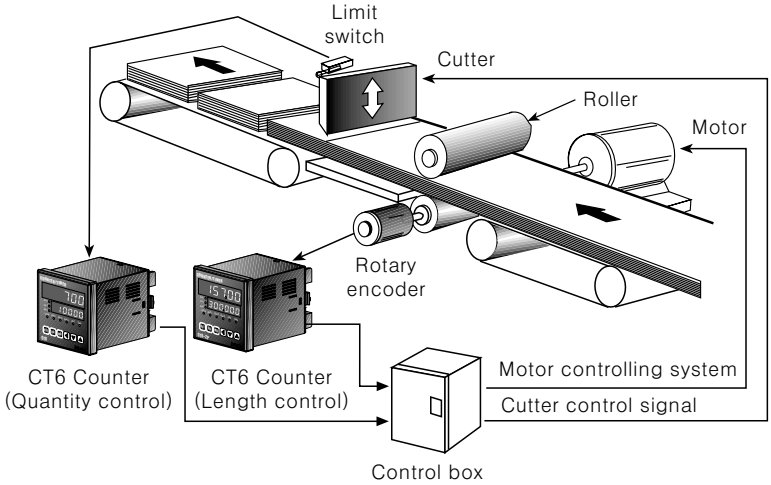
Ex1)Counting control by Counter(CT6) and Limit Switch

: As below application, when the cutter operates 1 time, 10 sheets of paper are produced. In this case, if we set 10 as prescale setting value of function mode, Counter indicates 10, 20, 30.....whenever limit switch operates 1st time, 2nd time, 3rd time....(no need to set decimal point)

Ex2)Length control by Counter(CT6) and Encoder

: In case of cutting paper each 300mm using a 50mm diameter(D) roller connected with Encoder of 1000 pulse.

- ●Set decimal point 3 digit at decimal set mode of function set mode. Set 0.157 of prescale value at prescale value set mode.
- ●If set preset value 300.000 at RUN mode, Counter will count each 0.157 per 1 input signal.



●Prescale value = $\frac{\pi \times \text{Diameter of the roller(D)}}{\text{Pulse numbers per 1 revolution of the encoder}}$

$= \frac{3.1416 \times 50}{1000}$

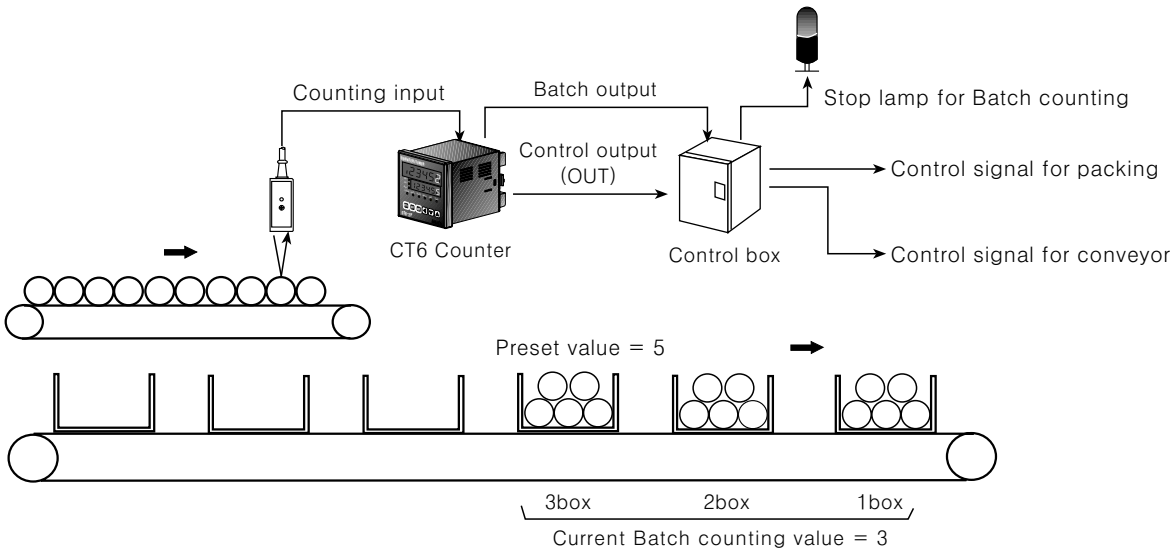
= 0.157mm/pulse

●Counting input value × Prescale value
= Display value
1911 × 0.157 = 300.027

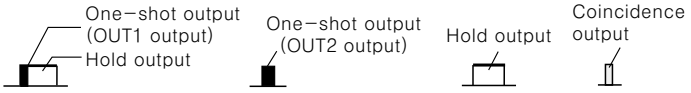
▣Application of Batch Counter function

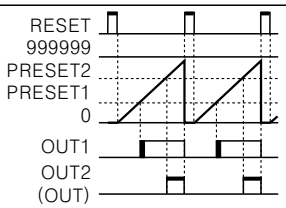
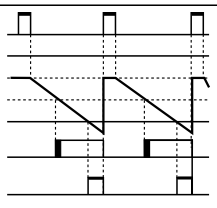
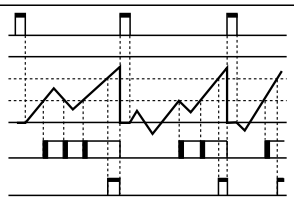
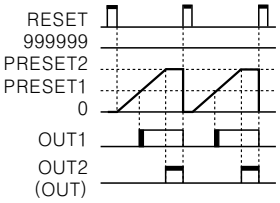
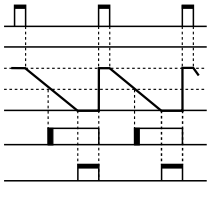
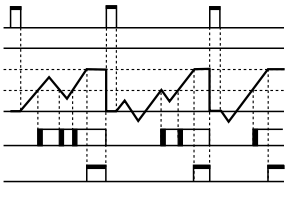
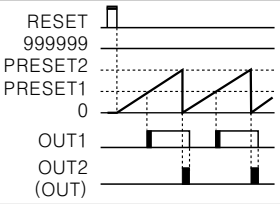
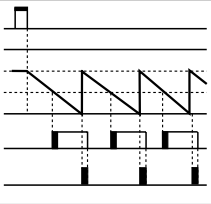
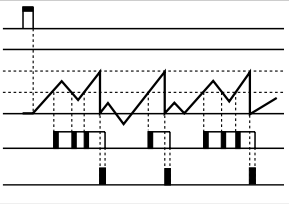
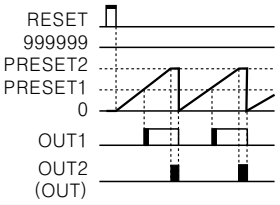
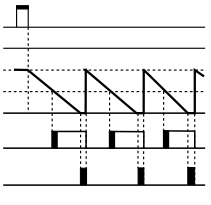
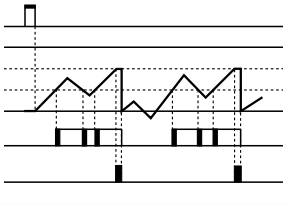
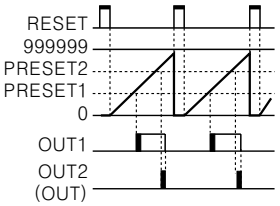
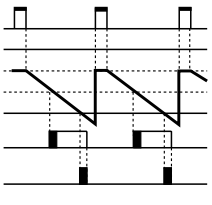
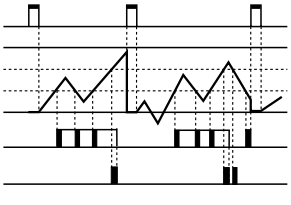
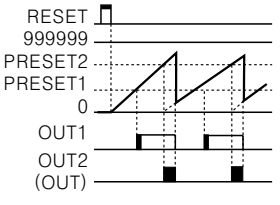
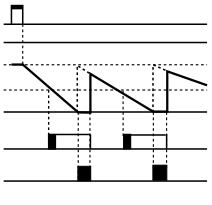
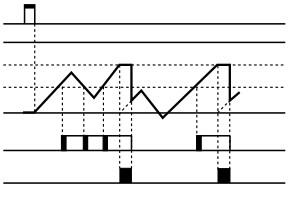
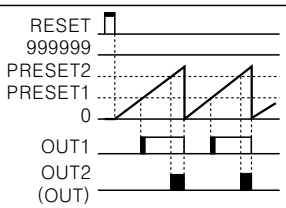
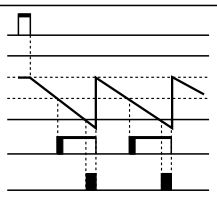
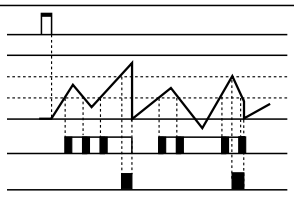
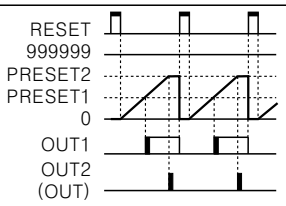
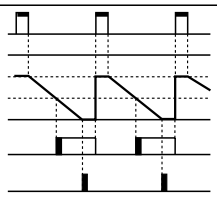
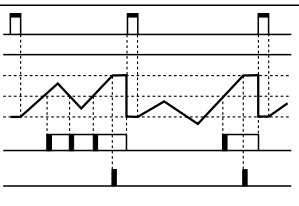
◎Put 5pieces of product in a box then pack the boxes together when the number of boxes reaches to 200pieces.

- ●Counter preset value : PRESET value(setting value)="5", Batch setting value = "200"
- ●When the counting value of Counter reaches to the preset value"5", the counting value of Batch Counter will be increased by "1" and the control output(OUT) will be on. When the control box receives the control output(OUT), it moves the conveyor so the next empty box can be filled.
  When the counting value of Batch reaches to "200", Batch output will be ON.
  Then the control box stops conveyor and provides a control signal for packing.



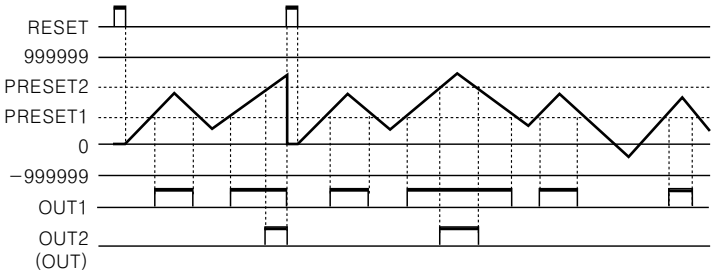
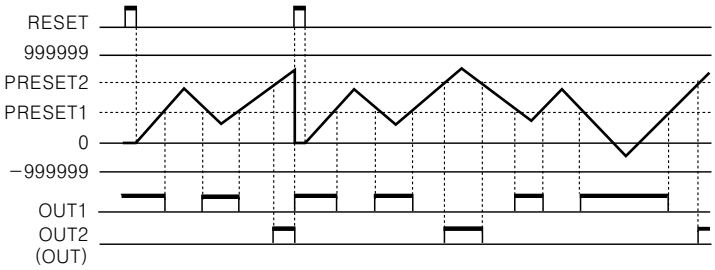
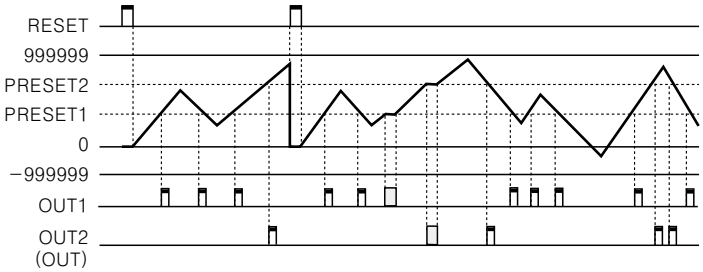
▣Output operation mode(Counter)



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

※Output of single preset type is operating the same as OUT2 of double preset type.

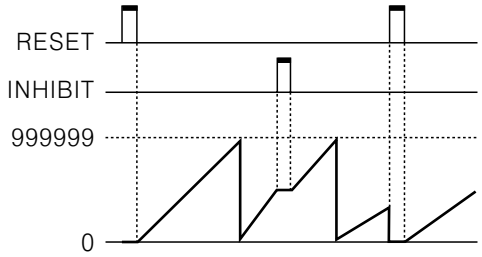
Hold output Coincidence output

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

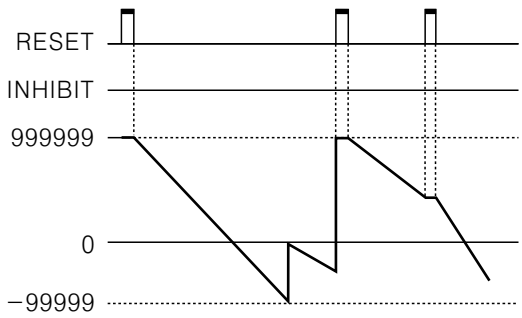
※The output of single preset operates of double prese type.

▣Counter operation of Indication model(CT6Y-I, CT6S-I, CT6-I)

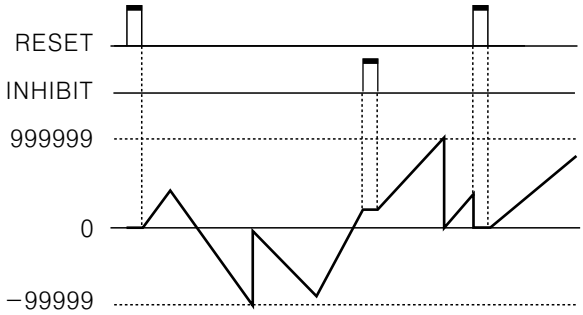
●In case of input mode is Up(U)



●In case of input mode is Down(d)

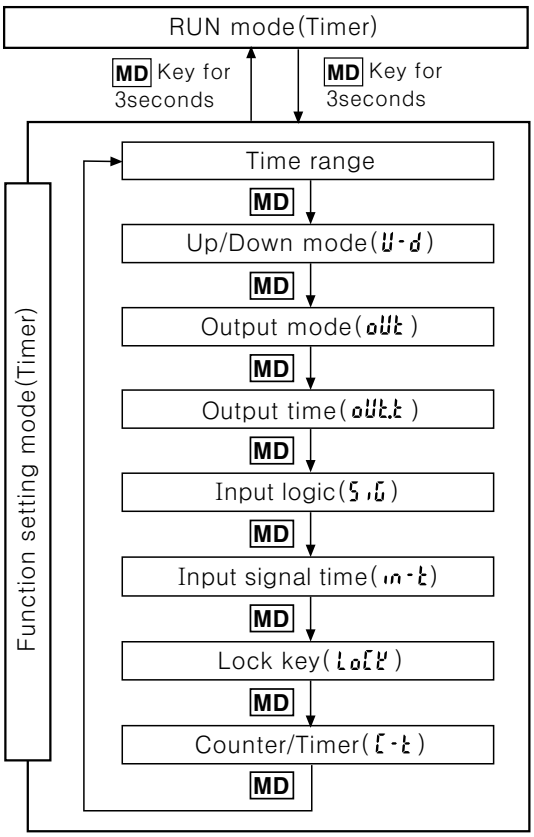


●In case of the input mode is command input(Ud-A), Individual input(Ud-b), Phase difference input(Ud-C)



■Timer mode

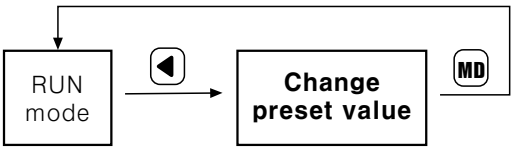
◎Operation mode in Timer



- Pressing MD for over 3sec., it will enter into Timer function setting mode
- Pressing MD for over 3sec.,it will return to Timer RUN mode.
- When using this unit as a Timer, please change to Timer(t) in Counter/Timer setting.
  Then press MD for over 3sec. to move to Timer RUN mode and change the setting value.
- If no keys are touched for over 60sec.,it will return to Timer RUN mode.

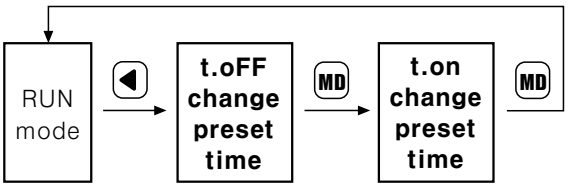
■Change of preset value in Timer operation

◎To change preset time in case of the output is not FLK



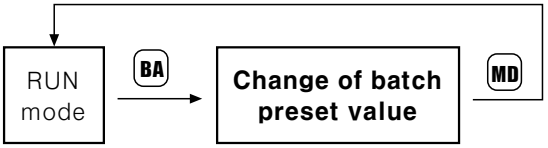
- In state of changing preset value, if no key is touched for 60sec., the timer will return to RUN mode.

◎To change preset time in case of the output is FLK



- In state of changing preset value, if no key is touched for 60sec., the timer will return to RUN mode.

◎Change of Batch preset value



- If press BA key at RUN mode, it will move to the state of batch preset value changes. After change the batch preset value same as the method of Counter preset value changes by ◀, ▼, ▲ keys, it will move to RUN mode by pressing MD key.
  When it moves to the state of batch preset value, the previous batch counting value will be displayed.

■Time range

1)6 Digit type 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	m S	9959.99
0.1s to 999m 59.9s	m S	99959.9
0.1m to 99999.9m	m	99999.9
1m to 999999m	m	999999
1s to 99h 59m 59s	H m S	995959
1m to 9999h 59m	H m	999959

※Model : CT6Y-2P, CT6Y, CT6Y-I,
CT6S-2P, CT6S, CT6S-I,
CT6-2P, CT6, CT6-I

2)4 Digit type Time range

Time range	Function setting mode	
	Timing display	Preset display
0.01s to 99.99s	SEC	99.99
0.1s to 999.9s	SEC	999.9
1s to 9999s	SEC	9999
1s to 99m 59s	m S	9959
0.1m to 999.9m	m	999.9
1m to 9999m	m	9999
1m to 99h 59m	H m	9959
1h to 9999h	H	9999

※Model : CT4S-2P, CT4S

■Setting of Timer function modes

(MD key : Use the ▲ or ▼ key to Change the setting)

Setting mode	How to set
Time range (SEC / min / HOUR)	※The time range for 6digit type SEC 999999 → SEC 999999 → SEC 999999 → min S 995959 → min S 999959 → min 999999 → min 999999 → HOUR min S 995959 → HOUR min 999959 ※The time range for 4digit type SEC 9999 → SEC 9999 → SEC 9999 → min S 9959 → min 9999 → min 9999 → HOUR min 9959 → HOUR 9999
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 → FLY → FLY.1 → FLY.2 → int → int.1 → oFd
Output time (oUt.t)	10 → 50 → 100 → 200 → 500 → 1000 → 2000 → 5000 → HoLd Unit: ms ※It is operation time of control output according to output mode.
Input logic (S.G)	nPn : Voltage input PnP : No-voltage input ※It indicates according to internal position, and it can't be set by ▲ & ▼ key.
Input signal time (in-t)	1 ⇄ 20 Unit: ms ※CTS series : Min. external INA, INH, RESET signal width CT series : Min. external INA, INHIBIT, RESET, BATCH, RESET signal width
Lock key(Lock) (LoCY)	L.oFF → LoC.1 → LoC.2 → LoC.3
Counter/Timer (C-t)	CoUn ⇄ tiME ※ CoUn : Counter tiME : Timer

※When it is in the function setting mode, no external input signal will be accepted and the output will stay in the OFF state.
※In case of output mode is FKL, INT, INT1, OFD, there is no output time setting in the function setting mode.
※In the indicator type(CT6Y-I, CT6S-I, CT6-I), there are no output modes or output times in the function setting mode.
※Control output operates as OUT2 in the double preset type(CT6Y-2P, CT6S-2P, CT4S-2P, CT6-2P), and OUT1 always remains in "OFF" status.
※When in the function setting mode, if no key is touched for 60 sec. the timer will return to RUN mode.

■How to set Lock key

Be sure to set the lock mode in order to protect against accidental or unauthorized key operation.

LoFF (LOCK OFF) : Cancellation of the lock mode

LoC.1 (LOCK LEVEL 1) : Lock RST key

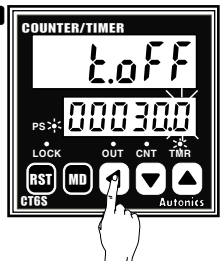
LoC.2 (LOCK LEVEL 2) : Lock ◀ & ▼ & ▲ key

LoC.3 (LOCK LEVEL 3) : Lock RST & ◀ & ▼ & ▲ key

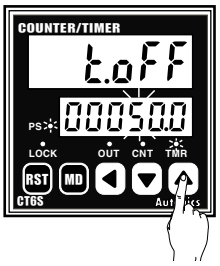
▣Change of the setting time of Timer

◎Change of the setting time in FLK output mode(CT6S)

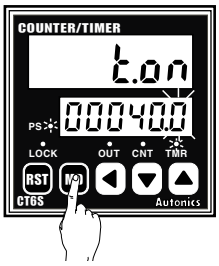
: Change t.oFF time from 30sec. to 50sec., t.on setting from 40sec. to 20sec.
(Output mode:FLK, Time range:tr-2)

1 

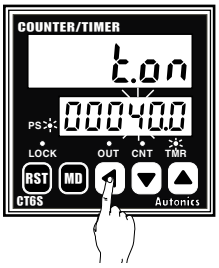
Pressing ◀ key to enter into the state of changing preset time. Shift the flickering digit to "3" position by pressing ◀ key twice.

2 

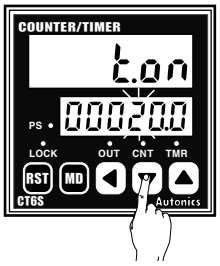
Change "3" to "5" by pressing ▲ twice.

3 

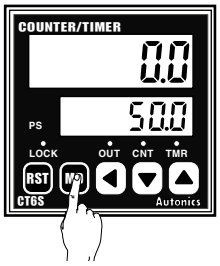
Pressing MD key to complete t.oFF time then enter into the state of changing t.on time.

4 

Pressing ◀ key twice to move to the "4" position.

5 

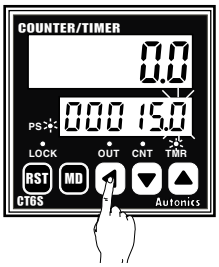
Pressing ▼ key twice to change "4" to "2".

6 

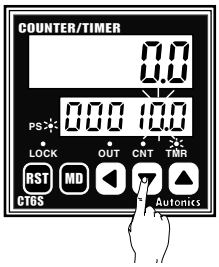
Pressing MD key to complete the setting time then return to RUN mode.

◎Change of the preset time when output mode is not FLK(CT6S)

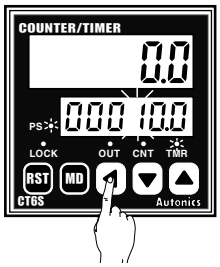
: Change time from 15.0sec. to 20.0sec.(Output mode : OND, Time range : tr-2)

1 

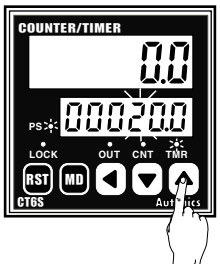
Pressing ◀ key to enter into the state of changing preset time. Pressing ◀ key once to move to the "5" position.

2 

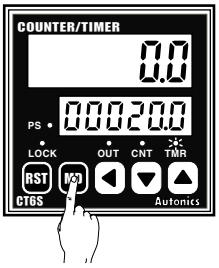
Pressing ▲ key 5times to change "5" to "0".

3 

Pressing ◀ key once to move to "1" position.

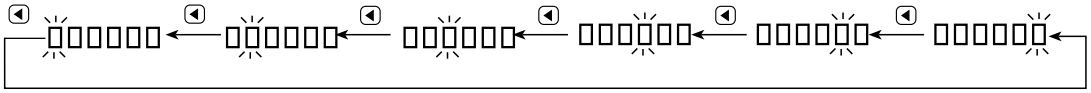
4 

Pressing ▲ key once to change "1" to "2".

5 

Pressing MD key to complete the change of preset time then return to RUN mode of Timer.(PS LED OFF)

※When entering into the state of changing preset time, the time will progress continously.
※When changing preset value, if no key is touched for 60sec., the timer will return to RUN mode.
※Whenever ◀ key is pressed in the state of changing preset value, the flickering digit shifts from the right to the left.



▣Batch Counter function(Timer)

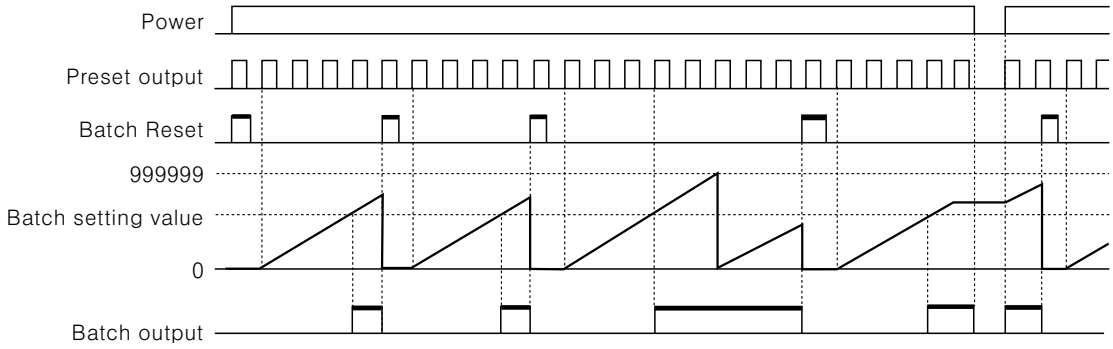
: When it reaches the Batch setting value to count the number of Time-ups, Batch output will be ON.
But when the output mode is "FLK", the number of Time-ups will be 2 times because it will count both Toff, and Ton time-ups.

☞ When time reaches the Toff setting time, Batch counting value will be increasd.
And when it reaches the Ton time, Batch counting value will be increased.

◎How to set the Batch setting value

: Batch setting value is not for setting the time, it sets the counting value like a Counter.
When using it as Timer, the method of Batch setting is the same as Batch setting method of Counter.
Please see A-18page.

◎Batch Counter function



※When the batch counting value reaches the batch set value, the batch reset signal is applied and the batch output returns to the OFF state.
※When the batch output turns on and if the power turns off and then turns on again, the batch output remains in the ON state until the batch reset signal is applied.
※When the batch counting value counts over 999999, it resets to 0(ZERO), and it counts up again.
※If batch set value is 0(ZERO), the batch counting value counts up, but the batch output remains OFF state.
※The batch counting value is not changed by front RST key or external reset signal.

◎Reset the Batch counting value

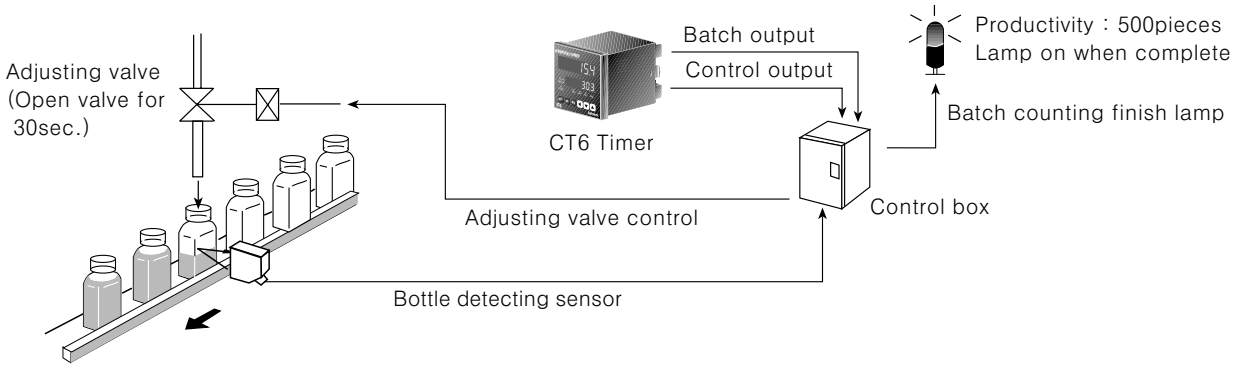
When the terminal of Batch RESET is externally short-circuited, the BATCH counting value will be reset.
But the Batch RESET is different dependent on the input logic setting.
: When Voltage input type(PNP) is selected, please make terminal numbers **10** and **14** short-circuited.
And when No-voltage input type(NPN) is selected, please make terminal number of **11** and **14** short-circuited.

◎Check the Batch counting value

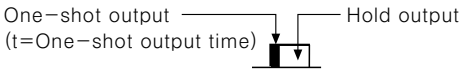
In order to check the Batch counting value during the Timer operation, press the BA key to display both the Batch counting value and setting value. After checking Batch counting value, it will return to RUN mode by pressing MD key.
※There is no BA key lock function for Batch function.

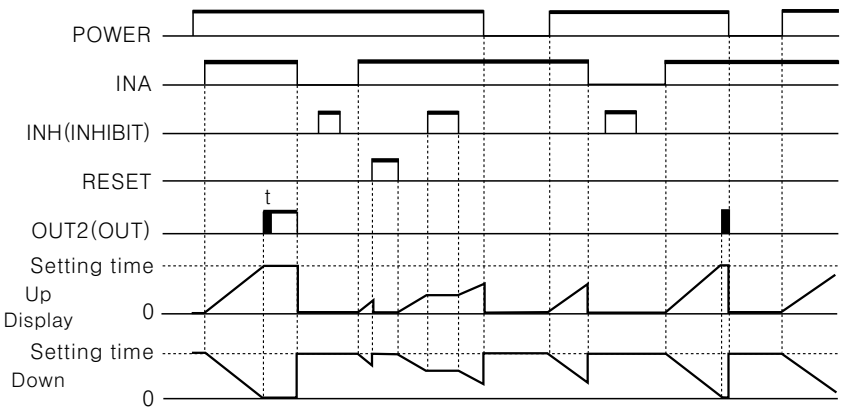
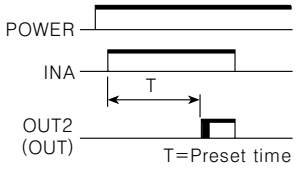
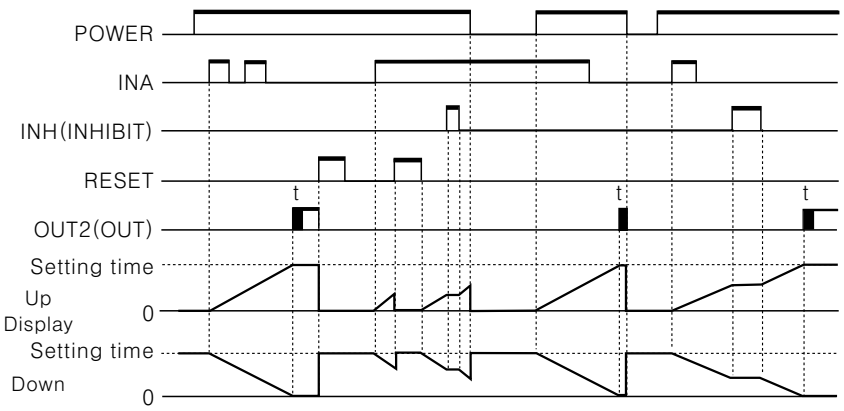
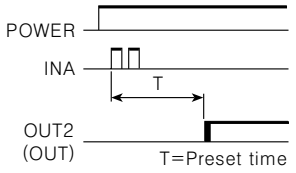
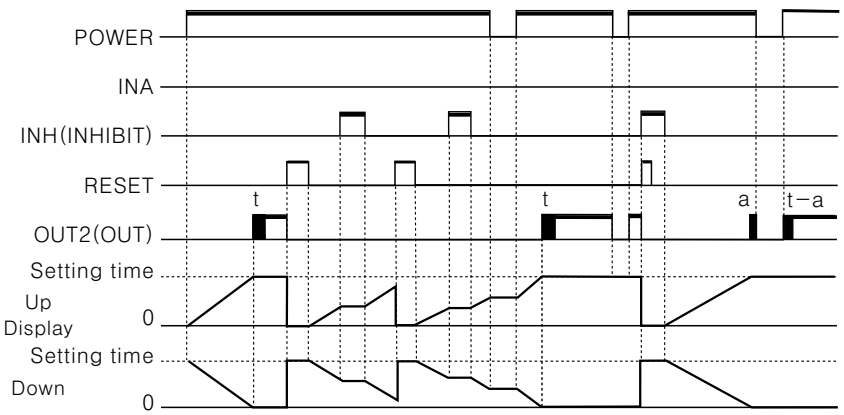
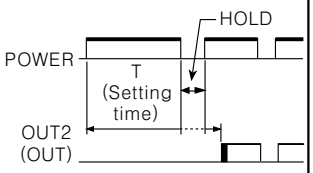
◎Application of Batch counter

: Fill milk into the bottle for 30sec.(Setting time), then when 500 bottles are completed, turn Batch counting finish lamp on. (Setting time : 30sec., Batch setting value : 500)



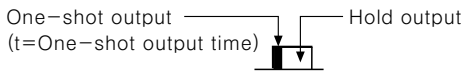
▣Output operation mode(Timer)

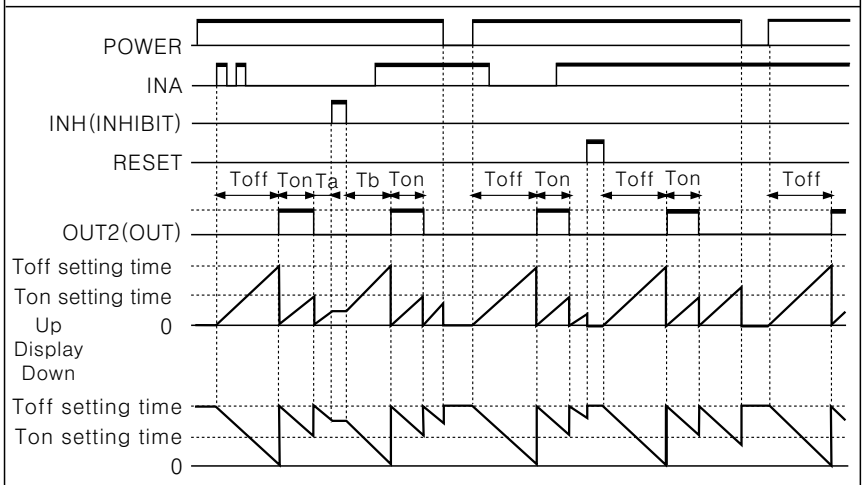
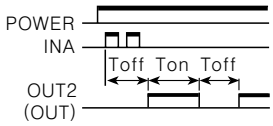
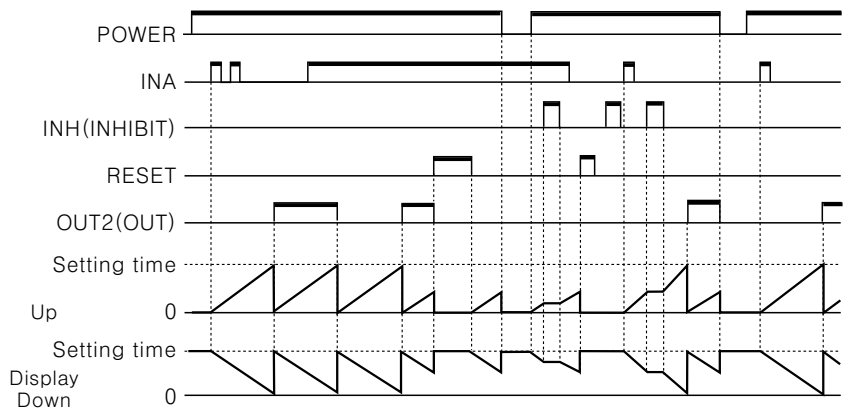
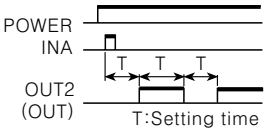
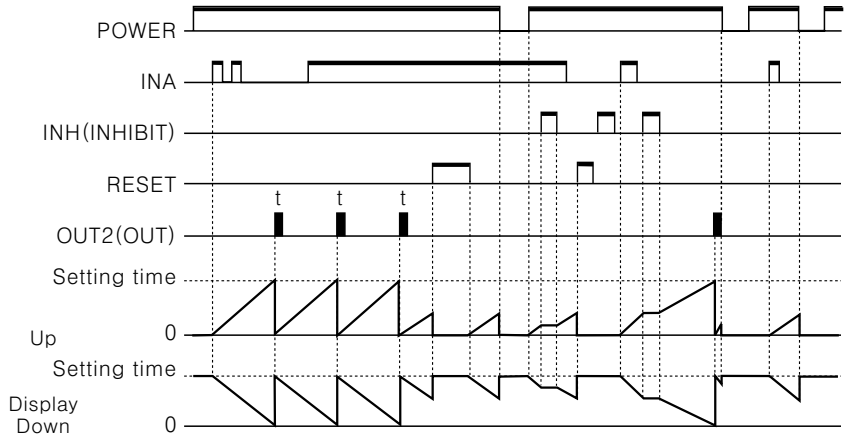
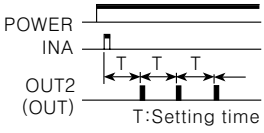


Output mode	Time chart	Operation
ond (OND)	SIGNAL ON DELAY(POWER RESET) 	1)Time starts when INA signal turns on, if INA signal turns off, time resets. 2)Time starts when power turns on and when reset turns off during INA signal on. 3)Control output operates as hold or One-shot time. 
ond.1 (OND.1)	SIGNAL ON DELAY 1(POWER RESET) 	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. 
ond.2 (OND.2)	POWER ON DELAY(POWER HOLD) 	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. 4)It memorizes display value when power turns off. 

※POWER RESET : There is no memory retention. (Timer resets to initial value)
※POWER HOLD : There is memory retention. (It memorizes the indicating value when power is cut off and displays the same value when power returns)

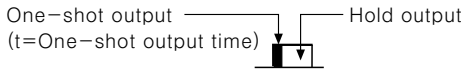
▣Output operation mode(Timer)

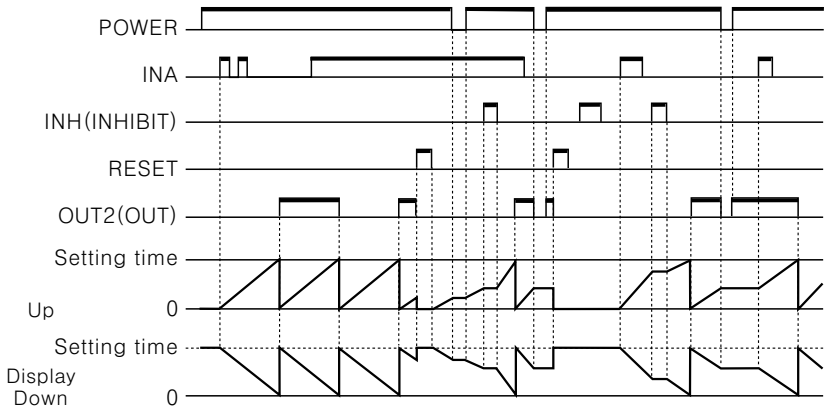
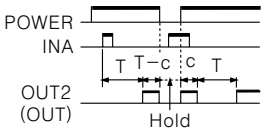
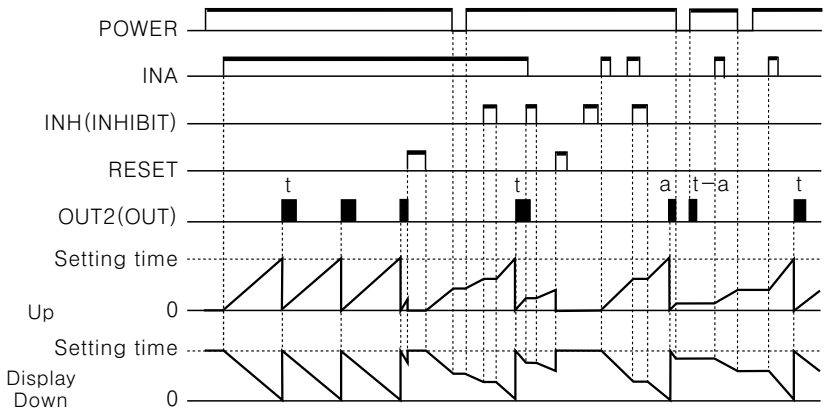
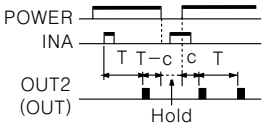
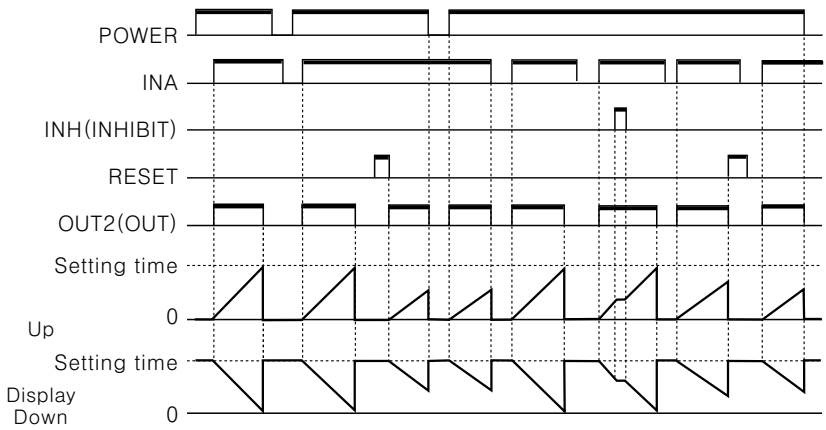
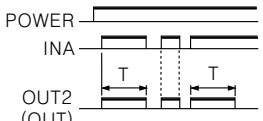


Output mode	Time chart	Operation
FLK (FLK)	FLICKER(POWER RESET) 	1)Time starts when INA signal turns on, if INA signal is applied repeatedly, only initial signal is recognized. 2)Time starts when power turns on and when reset turns off during INA signal on. 3)Control output operates as hold output, output 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. 
FLK.1 (FLK.1)	FLICKER 1(POWER RESET) **Hold output** 	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. 
	One-shot output 	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 RESET : There is no memory retention. (Timer resets to initial value)
※POWER HOLD : There is memory retention. (It memorizes the indicating value when power is cut off and displays the same value when power returns)

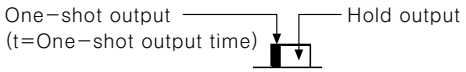
▣Output operation mode(Timer)

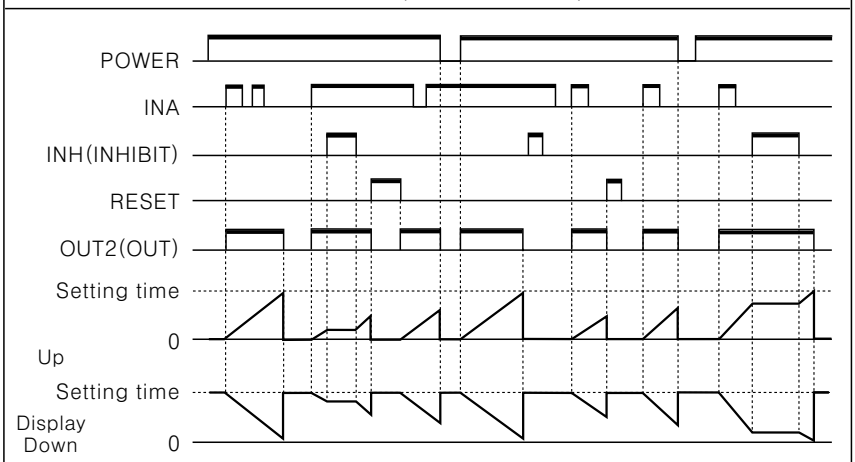
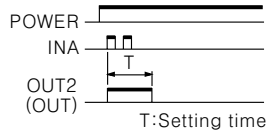
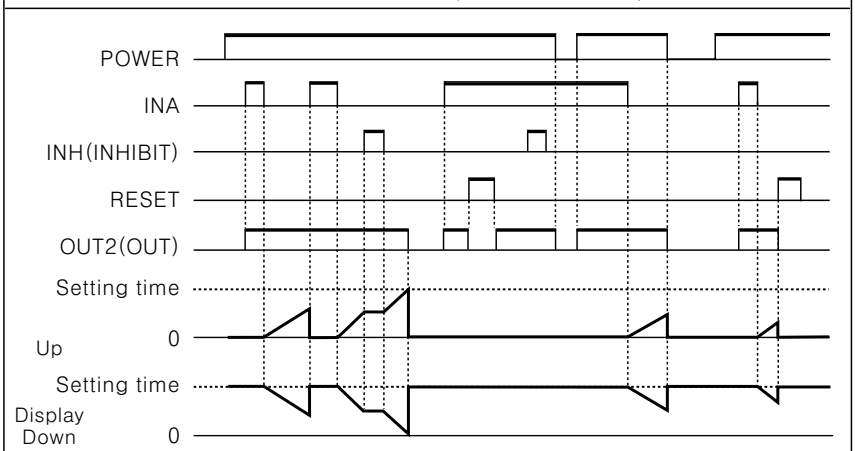
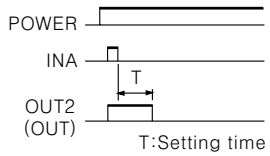


Output mode	Time chart	Operation
FLK.2 (FLK.2)	FLICKER 2(POWER HOLD) **Hold output**  ※EEPROM:10 years	1)Time starts when INA signal turns ON, if INA signal is applied repeatedly, only initial signal is recognized. 2)Control output operates as hold output when reaches to the set time. 3)Time starts when 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.  T:Setting time
	One-shot output  ※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.  T:Setting time
int (INT)	INTERVAL(POWER RESET / SIGNAL RESET)  	1)When INA is ON, time starts and control output turns on 2)When INA is OFF, time resets. 3)Time starts when power turns ON and when reset turns OFF during INA signal on. 4)When time reaches to set value, display value and control output will be reset automatically. 5)Control output turns ON, during time processes.  T:Setting time

※POWER RESET : There is no memory retention. (Timer resets to initial value)
※POWER HOLD : There is memory retention. (It memorizes the indicating value when power is cut off and displays the same value when power returns)

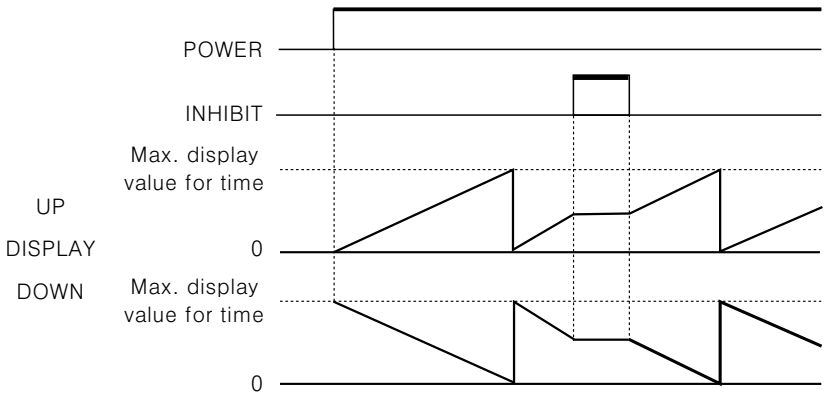
▣Output operation mode(Timer)



Output mode	Time chart	Operation
int.1 (INT.1)	INTERVAL 1(POWER RESET) 	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. 
ofd (OFD)	SIGNAL OFF DELAY(POWER RESET) 	1)If power is on and reset is OFF, control output remains ON while INA signal is ON. 2)When time reaches to set value, display value and control output will be reset automatically. 

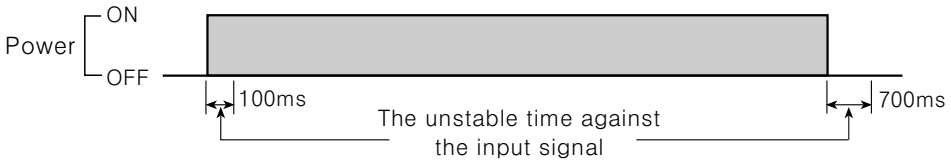
※POWER RESET : There is no memory retention. (Timer resets to initial value)

▣Timer operation of Indication model(CT6-I, CT6S-I)



▣Proper usage

◎Turning power ON/OFF



●Power voltage rises for 100ms after power on and falls for 700ms after power off.
Therefore do not apply any input signal during these times.
●When applying the power into CT series, please apply the power quickly by using Switch or Relay.

◎Input signal line
●Use as short a cable from the sensor to this unit as possible.
●Use shielded cable for long input line.
●Keep input cables separate from power cables.

◎Input logic selection
When selecting or changing the input logic, the power source must be cut off.
Then select the input logic according to the method of changing input logic.

◎Contact counting input
If applying contact input at high speed mode(1k,5k,10k), it may miscount by chattering.
Therefore, set low speed mode. (1 or 30cps)

◎When testing dielectric voltage and insulation resistance of the control panel with this unit installed.
●Please isolate this unit from the circuit of control panel.

◎Do not use this unit in the following places
●Place where ambient temperature is over 55℃ or less than −10℃.
●Place where ambient humidity is over 85%RH or where condensation occurs by temperature changes.
●Place where there is severe vibration or impact.
●Place where strong magnetic field or electric noise is generated.
●Place where strong alkalis or acids are used.
●Place where there are direct rays of the sun.

◎Use under these conditions
●Indoors
●Maximnm height 2000m
●Pollution Degree 2
●Iustallation category II

※Above cautions must be kept because malfuction or failure of unit can be occured.

Размеры Ш48×В24мм, только для индикации, ЖК дисплей

■Особенности

- **Модернизированная версия таймера серии LE7N**
- Компактный таймер
- Встроенная батарея литиевых аккумуляторов
- Тип с зажимным контактом(Контакт имеет защитное покрытие)
- Жидкокристаллический дисплей
- Встроенный микропроцессор
- Класс защиты IP66(только лицевая панель)

⚠ **Перед использованием таймера прочитайте инструкцию по эксплуатации.**

■Информация для заказа

L E 8 N – B F

F	Универсальный вход по напряжению
N	Вход нулевого напряжения(малый сигнал)
B	Встроенн.батарея литиевых аккумуляторов
N	Размеры Ш48×В24мм
8	99999999(разряды)
E	Таймер
L	ЖК дисплей

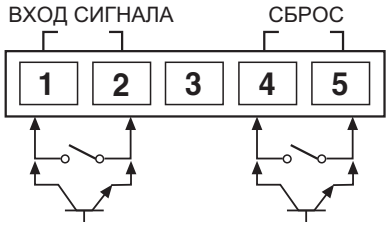
■Характеристики

Серия		LE8N-BN	LE8N-BF
Разряды		8 разрядов	
Дисплей		ЖК тип с гашением нуля(Высота : 8.7мм)	
Принцип работы		Режим счета в прямом направлении	
Напряжение питания		Встроенная батарея литиевых аккумуляторов	
Тип входа		Вход нулевого напряжения	Универсальный вход по напряжению
Вход Пуск		• Полное сопротивление при КЗР10кОм(ON), остаточное напряжение : Макс. 0.5В • Полное сопротивление при октр. цепи : 500кОм(OFF)	Высокое : 24–240VAC / 6–240VDC Низкое : 0–2VAC / 0–2.4VDC
Вход СБРОС		Вход нулевого напряжения	
Мин.сигнал СБРОСА		Мин. 20мс	
Период времени (TS1)		(★1) 9999.59.59(ч.мин.сек), 99999.59.9(ч.мин.), 999999.59(ч.мин.)	
Период времени (TS2)		(★1) 9999H59.9(ч.мин.), 99999H59(ч.мин.), 999999H.9(ч.)	
Сбой счета времени		±0.01%(Сбой счета времени, температурная ошибка)	
Срок службы аккумулятора		Приблизит. более 10 лет(при 20℃)	
Внешний переключатель		SW1(Кнопка сброса на передней панели для блокировки), SW2(Переключатель выбора времени)	
Сопротивление изоляции		Мин. 100МОм(при 500VDC)	
Диэл.прочность		(★2) 2000VAC 60Гц в течение 1 минуты	
Вибрации	Механические	амплитуда 0.75мм при частоте 10 ~ 55Гц в каждом из трех направлений X, Y, Z в течение 1часа	
	Ложн. срабатыв.	амплитуда 0.3мм при частоте 10 ~ 55Гц в каждом из трех направлений X, Y, Z в течение 10 мин	
Ударопрочн.	Механическая	300м/с² (Приблизит. 30G) в каждом из трех направлений X, Y, Z три раза	
	Ложн. срабатыв.	100м/м² (Приблизит. 10G) в каждом из трех направлений X, Y, Z три раза	
Темпер.окр.среды		−10 ~ +55℃(в незамерзающем состоянии)	
Темпер.хранения		−25 ~ +65℃(в незамерзающем состоянии)	
Влажн.окр.среды		35 ~ 85%отн.влажн.	
Сертификаты		CE c UL us	
Вес		Приблизит. 58г	

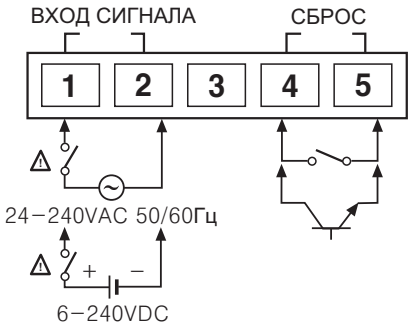
(★1) Выберите TS1, TS2, используя внутренюю кнопку навигации по меню(JP1).
(★2) Вход нулевого напряжения: между всеми клеммами и корпусом, Универсальный вход по напряжению: между входными клеммами и клеммой входа сброса, между всеми клеммами и корпусом

■Присоединение

●Вход нулевого напряжения



●Универсальный вход по напряжению

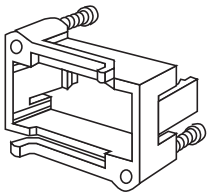


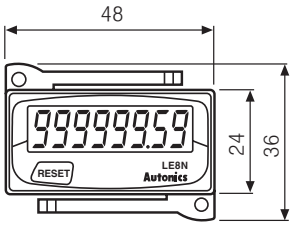
※Применяйте надежные контакты, способные выдерживать ток 5мкА.
※Клеммы 2 и 5 соединены внутри.(не изолированы)

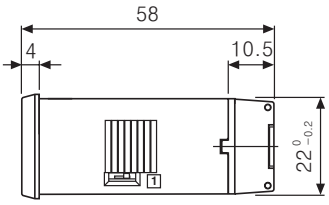
※Клеммы 1, 2 и 4, 5 изолированы.

■Размеры

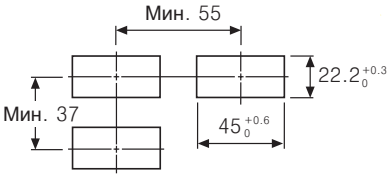
●Кронштейн







●Установочное отверстие в панели

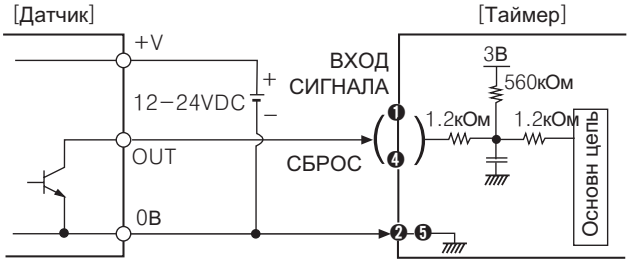


(Ед.измерения:мм)

■Подключение входов

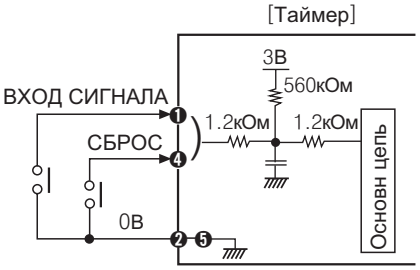
◎Вход нулевого напряжения (Стандартный датчик: NPN открытого типа)

●Твердотельный вход



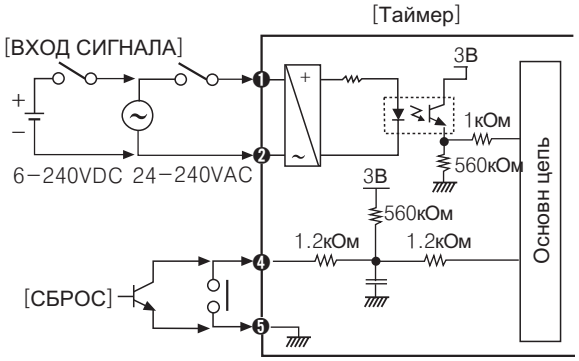
※При подаче питания к клеммам ❶ и ❹, может быть нарушена цепь входных клемм и может произойти ложное срабатывание. (нельзя использовать датчик с выходом NPN , выходом PNP, выходом PNP с открытым коллектором.)
※КлеммыР❷ и ❺ соединены внутри.

●Вход контакта



※Используйте надежные контакты, выдерживающие ток 3VDC 5 мкА.

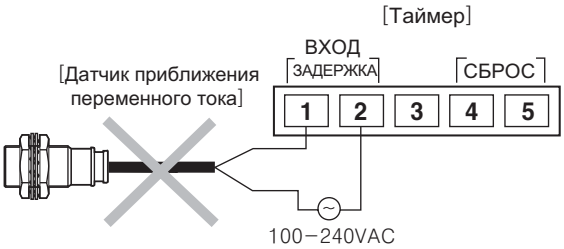
◎Универсальный выход по напряжению



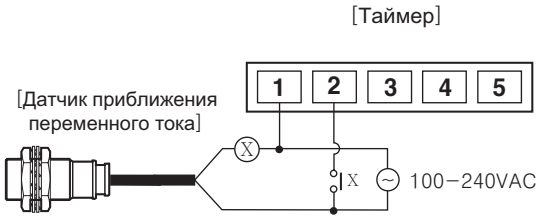
※В качестве источника входного сигнала счета нельзя использовать датчик приближения переменного тока.
※Входные клеммы ❶, ❷ и клеммы Сброса ❹, ❺ изолированы внутри.
※Невозможно осуществить сброс на постоянном или переменном токе.
※При использовании релейного контакта в качестве источника сигнала СБРОС, применяйте надежные контакты, выдерживающие ток 3VDC 5 мкА.

◎Входной датчика приближения переменного тока

Во избежание возникновения ложных срабатываний, вызванных утечками тока в датчике приближения, подключите входное реле, как показано на нижеприведенном рисунке.



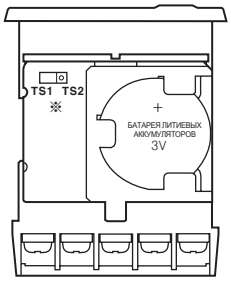
〈 Неправильное подключение 〉

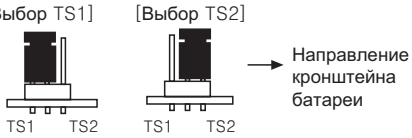


〈 Правильное подключение 〉

■Характеристики времени(TS1, TS2) и период времени

●Выбор характеристик времени(TS1, TS2)



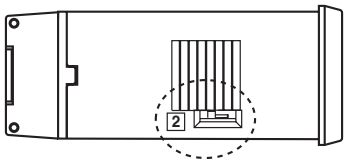


TS1 : 9999.59.59(ч.м.сек)
99999.59.9(ч.м.)
999999.59(ч.м.)

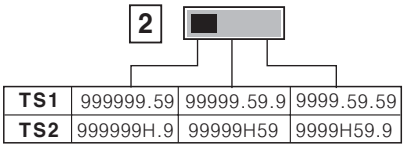
TS2 : 9999H59.9(ч.м.)
99999H59(ч.м.)
999999H.9(ч.)

※После изменения периода времени в процессе работы подайте сигнал СБРОС(Клемма СБРОС на лицевой пенели или внешняя).

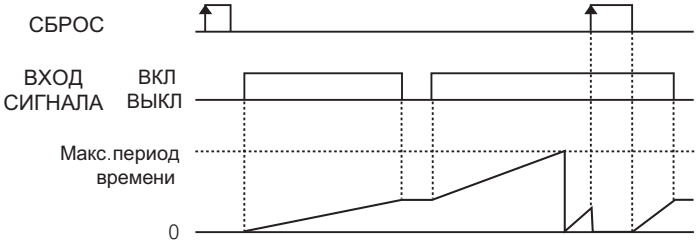
●Выбор периода времени



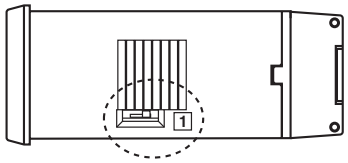
Клемма ←→ Лицевая панель



■Работа функции времени



■Активация / Деактивация лицевой панели

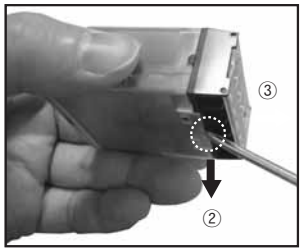


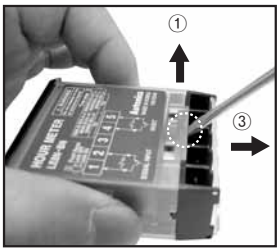
Лицевая панель ←→ Клемма

Работает Отключено

■Отсоедение корпуса и замена батареи аккумуляторов

●Отсоединение корпуса

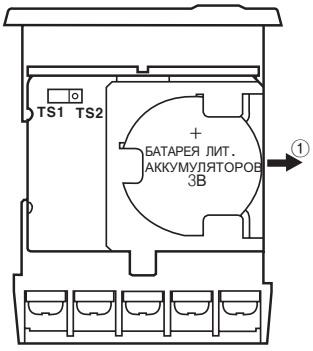




※Сместите кнопку блокировки в направлениях ①, ② и потяните в направление ③, при этом корпус отсоединиться.

⚠ При выполнении операции необходимо проявлять осторожность во избежание получения травм.

●Замена батареи аккумуляторов



1)Отсоедините корпуса.
2)Нажмите на батарею и отсоедините в направлении ①.
3)Установите новую батарею, соблюдая полярность, нажав в направлении, противоположном указанному стрелкой ①.
※Батарея поставляется отдельно.
※Не поджигайте и не разбирайте литиевый аккумулятор.

DIN Size W48×H24mm, LCD Miniature Elapsed Time indicator

■Features

- ●Compact size(DIN size W48×H24mm)
- ●Internal lithium battery
- ●Screw terminal connections
- ●LCD display
- ●Micro computer built-in

⚠ **Please read "Caution for your safety" in operation manual before using.**

CE

■Ordering information

L E 7 N – H F R

R	Front Reset switch
	No front Reset switch
F	Free voltage input
	No-voltage input
H	hour
M	min
S	sec
N	DIN Size W48×H24mm
7	9999999(Digit)
E	TIMER
L	LCD Display

※When selecting a model, please refer specifications.

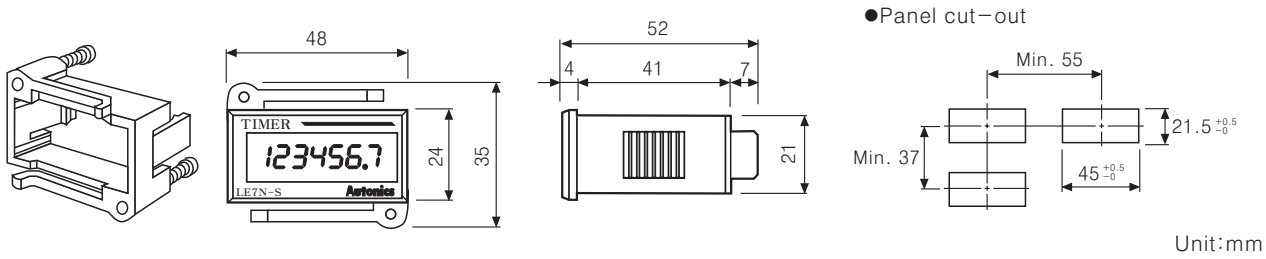
■Specifications

Item		No-voltage input type				Universal voltage input type			
Model		LE7N-S	LE7N-M	LE7N-H	LE7N-HR	LE7N-SF	LE7N-MF	LE7N-HF	LE7N-HFR
Digit		7digit							
Operation method		Up mode only							
Power supply		Not required(Battery built-in)							
Display method		LCD Zero Blanking method(Display size : H7mm × W3mm)							
Time range		0.0s~ 99h59m59.9s	0.0m~ 9999h59.9m	0.0h ~ 999999.9h	0.0h~ 999999.9h	0.0s~ 99h59m59.9s	0.0m~ 9999h59.9m	0.0h ~ 999999.9h	0.0h~ 999999.9h
Reset	Manual(Front)	None			Have	None			Have
	External(Terminal)	Have							
Start input		●No-voltage input · Impedance at short-circuit:Max. 10kΩ(ON) · Impedance at open:Min. 500kΩ(OFF)				●Voltage input ☞ ON voltage:24-240VAC, 6-240VDC OFF voltage:0-1.5VAC, 0-2VDC			
Reset input									
Battery life cycle		Approx. 7 years at 25℃							
Insulation resistance		100MΩ(at 500VDC)							
Dielectric strength		1000VAC 50/60Hz for 1 minute							
Vibration	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1 hour							
	Malfunction	0.3mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes							
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions 3 times							
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions 3 times							
Ambient temperature		-10 ~ +55℃(at non-freezing status)							
Storage temperature		-25 ~ +65℃(at non-freezing status)							
Ambient humidity		35 ~ 85%RH							
Approval		CE				————			
Weight		Approx. 55g							

▣Specifications

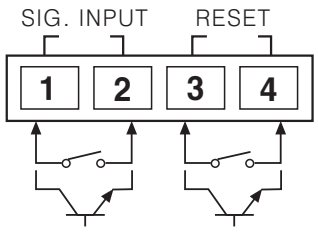
Input	Model	Time range	Reset switch	Power supply
No-voltage input	**LE7N-S**	99h59m59.9s	None	Not required (3VDC Battery built-in)
	LE7N-M	9999h59.9m		
	LE7N-H	999999.9h		
	LE7N-HR	999999.9h	Have	
Universal voltage input	**LE7N-SF**	99h59m59.9s	None	
	LE7N-MF	9999h59.9m		
	LE7N-HF	999999.9h		
	LE7N-HFR	999999.9h	Have	

▣Dimensions



▣Connections

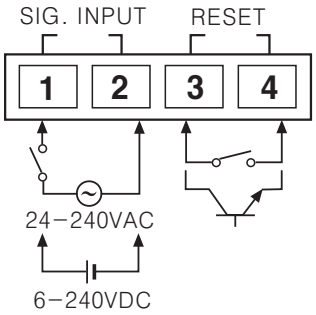
●No-voltage input



※Please use reliable contact enough to flow 10㎂ current.

※No. 2 and No.4 have been connected inside.

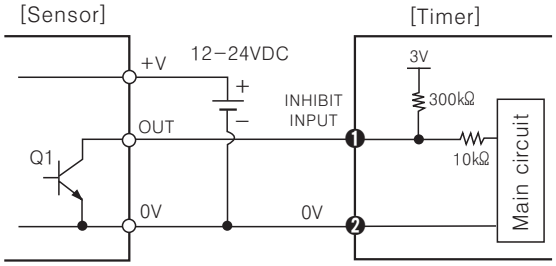
●Universal voltage input



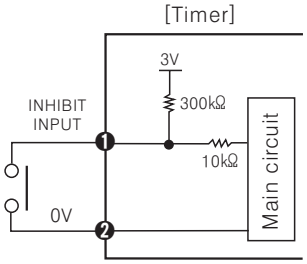
※Power terminal(No. 1, 2) and Reset terminal (No. 3, 4) are isolated.

▣Input(Start) and Inhibit

◎No-voltage input type



(Solid state type)



(Relay contact)

●Operation

①Q1 or relay contact is ON, the time progresses.

②Q1 or relay contact is OFF, the time is on inhibit states. When turn on the switch again, the time progresses again.

③When the time reaches to Full scales, it will return to zero then progressign again.

●Caution for using

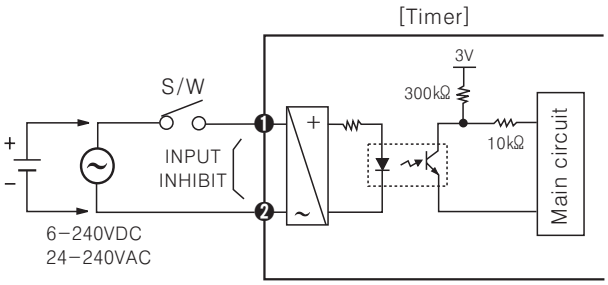
※Please use NPN open collector output type sensor.

※Please supply the power for sensor from external.

※Beware not to supply the power into INPUT terminal. (No. ①, ②)

※Please use reliable contacts enough to flow 10㎂ current.

◎Universal voltage input type



●Operation

①S/W ON, time progresses.

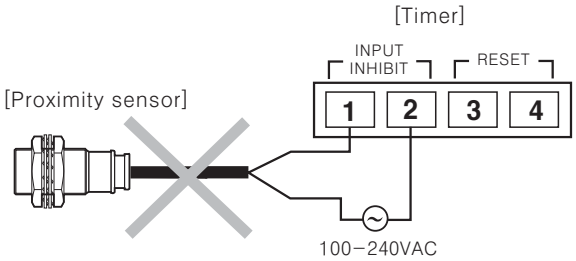
②S/W OFF, the time is on inhibit states. When turn on the switch again, the time progresses again.

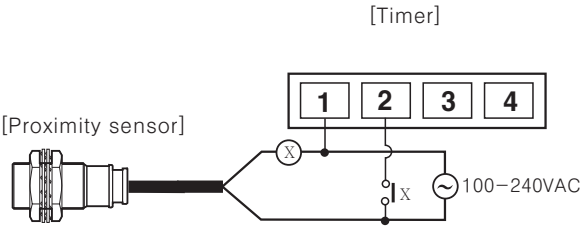
③When the time reached to Full scales, it will return to zero when progressing again.

●Caution for using

Do not use the AC type of the proximity sensors as a switch without any load like below.

Please put some load to prevent malfunction occurring because of leakage current of the proximity sensor.



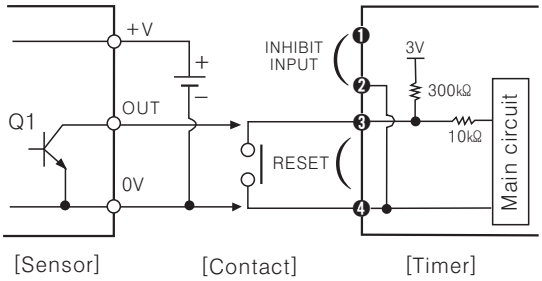


▣Reset

●Operation

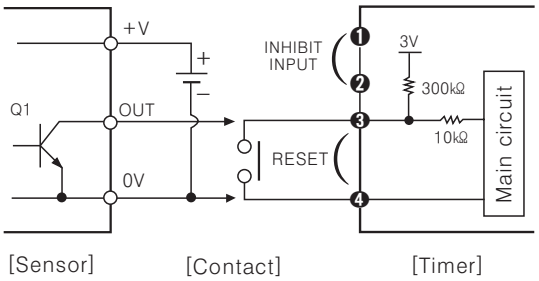
When input transistor(Q1) or relay contact is ON, it will be RESET.

●No voltage input type



※❷, ❹ are GND terminals and connected inside.

●Universal voltage input type



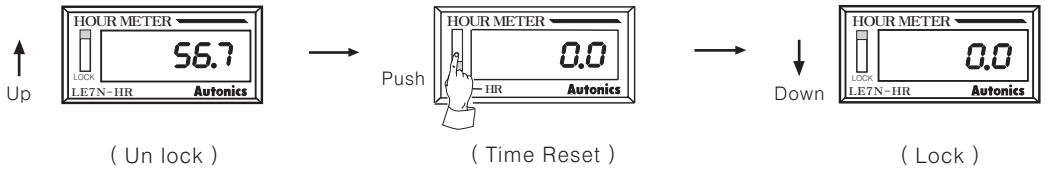
※Between not to supply the voltage in No. ❸, ❹ RESET terminal.

※Input terminal(No. ❶, ❷) and RESET terminal(No. ❸, ❹) are insolated inside.

※When RESET required with relay contact. Please use a contacts that can function reliably at 10㎂ max.

※Please supply the power for sensor from external.

●How to use front reset switch



※Model : LE7N-HR, LE7N-HFR

※Lock switch up for reset.