(K) Timer

Upgrade

LE4S Series

Upgrade

ATN Series

Product Overview

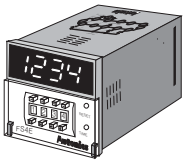
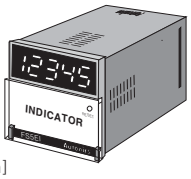
Item		Hour meter(LCD type)	
Model		LE8N-BN	LE8N-BF
Digit		8 Digits	
Appearances & Dimensions		[W48×H24×L54mm] 	
Display		LCD zero blanking type(Height : 8.7mm)	
Operation method		Count up mode	
Power supply		Internal lithium battery	
Input type		No-voltage input	Free voltage input
Start input		Residual voltage at short-circuit : Max. 0.5V Impedance at short-circuit : Max. 10kΩ(ON) Impedance at open-circuit : Min. 750kΩ(OFF)	"H" level voltage : 24-240VAC / 6-240VDC "L" level voltage : 0-2VAC / 0-2.4VDC
RESET input		No-voltage input	
Min.signal width of RESET		Min. 20ms	
Time range(TS1)		9999.59.59(h.m.s), 99999.59.9(h.m), 999999.59(h.m)	
Time range(TS2)		9999H59.9(h.m), 99999H59(h.m), 999999H.9(h)	
Time error		±0.01% ±50ms(Time error, Temperature error)	
Battery life cycle		Over 10 years(at 20℃)	
External switch		SW1(Front reset key for lock), SW2(Selectable time switch)	
Insulation resistance		Min. 100MΩ(at 500VDC megger)	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 1 hour	
	Malfunction	0.3mm amplitude at frequency of 10 to 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	
Reference		K-6 to 8	

Item		Digital timer(LCD type)			Digital timer(Backlight LCD type)	
Model		LE3S	LE3SA	LE3SB	LE4S	LE4SA
Appearances & Dimensions		[W48×H48×L67mm] 			Upgrade  [W48×H48×L70mm]	
Function		**Multi timer**(Includes 10 output modes)	**Multi timer**(Power ON Delay mode)		**Multi timer**(Includes 10 output modes)	**Multi timer**(Includes 8 output modes)
Time setting range		0.01sec. to 999hour			0.01sec. to 9999hour	
Power supply		24-240VAC 50/60Hz / 24-240VDC				
Allowable voltage range		90 to 110% of rated voltage				
Power consumption		Approx. 2.5VA(240VAC) Approx. 1W(240VDC)	Approx. 3.3VA(240VAC) Approx. 1.5W(240VDC)		Max. 4.5VA (24-240VAC), Max. 2W(24-240VDC)	Max. 4VA (24-240VAC), Max. 1.6W(24-240VDC)
Reset time		Max. 200ms	Max. 100ms			
Min. signal width		Min. 20ms	———		Selectable 1 or 20ms	———
Timing operation		Signal ON start	Power ON start		Signal ON start	Power ON start
Memory protection		———	———		10years (25℃,LCD display and continuous OFF the key input)	
Control output	Contact type	Time limit SPDT(1c)	Time limit DPDT(2c)	Time limit SPDT(1c), Instantaneous SPDT(1c)	Time limit SPDT(1c)	Time limit DPDT(2c), Time limit SPDT(1c)+Instantaneous SPDT(1c):Selectable
	Contact capacity	250VAC 5A resistive load	250VAC 3A resistive load		250VAC 5A resistive load	250VAC 3A resistive load
Relay life cycle	Mechanical	Min.10,000,000 times				
	Electrical	Min. 100,000 times(Rated contact capacity)				
Repeat error SET error Voltage error Temperature error		Max. ±0.01%± 0.05sec.(Power start) Max. ±0.005%± 0.03sec.(Signal start)	±0.01% ±0.05sec.		Max. ±0.01% ± 0.05sec.(Power start) Max. ±0.005% ± 0.03sec.(Signal start)	Max. ±0.01% ±0.05sec.
Reference		K-9 to 16			K-17 to 33	

Series		CTS Series		CTY Series	CTM Series
Digit		4 Digits	6 Digits	6 Digits	6 Digits
Model	Dual Preset	**CT4S-2P□□**	**CT6S-2P□□**	**CT6Y-2P□□**	**CT6M-2P□□**
	Single Preset	**CT4S-1P□□**	**CT6S-1P□□**	**CT6Y-1P□□**	**CT6M-1P□□**
	Indicator	**-**	**CT6S-I□□**	**CT6Y-I□□**	**CT6M-I□□**
Appearances & Dimensions		Upgrade  [W48×H48×L90mm]		Upgrade  [W72×H36×L77mm]	Upgrade  [W72×H72×L85mm]
Operation type		Count up, Count down, Count Up/Down			
Power Supply	AC Power	100-240VAC 50/60Hz			
	AC/DC Power	24VAC 50/60Hz / 24-48VDC			
Allowable voltage range		90 to 110% of rated voltage(AC Power type)			
Max. counting speed		Selectable 1cps, 30cps, 1kcps, 5kcps, or 10kcps			
Min. input signal width	Counter	Reset input : Selectable 1ms or 20ms			
	Timer	INA, INB, RESET : Selectable 1ms or 20ms			INA, INB, RESET, INHIBIT, BATCH RESET: Selectable 1ms or 20ms
Input		Selectable voltage input or No-voltage input -Voltage input : input impedance is 5.4kΩ, 'H' level : 5-30VDC, 'L' level : 0-2VDC -No-voltage input: short-circuit impedance : Max. 1kΩ, Residual voltage : Max. 2VDC			
One-shot output		Selectable 0.01s to 99.99s			
Control output	Without com. Contact output	Dual preset : SPST(1a) 2EA Single preset : SPDT(1c) 1EA		Dual preset : SPST(1a) 1EA, SPDT(1c) 1EA Single preset : SPDT(1c) 1EA	
	Without com. Solid state output	Dual preset : 1NPN open collector Single preset : 1NPN open collector			Dual preset:3NPN open collector Single preset:2NPN open collector
	Com. Contact output	Dual preset : SPST(1a)2EA Single preset : SPDT(1c)1EA			Dual preset: SPST(1a), SPDT(1c) Single preset: SPDT(1c)
	Com. Solid state output	—		Dual preset: - Single preset:1NPN open collector	Dual preset:2NPN open collector Single preset:2NPN open collector
	Capacity Contact output	250VAC 5A resistive load		250VAC 3A resistive load	250VAC 5A resistive load
	Capacity Solid state output	30VDC Max. 100mA Max.			
External sensor power		12VDC ±10%, 100mA Max.			
Reference		**See Counter J-6 to 33 for details about Counter/Timer products.**			

Itme		**Digital Timer/Counter (LED type)**									
Series		FXY Series		FXS Series		FX Series		FXH Series		FXL Series	
Digit		4 Digits	6 Digits	4 Digits	5 Digits	4 Digits	6 Digits	4 Digits	6 Digits	4 Digits	6 Digits
Model	Single preset type	—	—	**FX4S**	—	**FX4**	**FX6**	**FX4H**	—	—	—
	Dual preset type	—	—	—	—	**FX4-2P**	**FX6-2P**	**FX4H-2P**	—	**FX4L-2P**	**FX6L-2P**
	Indicator	**FX4Y-I**	**FX6Y-I**	—	**FX5S-I**	**FX4-I**	**FX6-I**	**FX4H-I**	—	**FX4L-I**	**FX6L-I**
Appearances & Dimensions		 [W72×H36×L93mm]		 [W48×H48×L91mm]		 [W72×H72×L112mm]		 [W48×H96×L100mm]		 [W144×H72×L112mm]	
Operation type		Count up, Count down, Count Up/Down									
Power supply		100-240VAC 50/60Hz, **12-24VAC/DC**(Option)									
Allowable voltage range		90 to 110% of power supply									
Max. counting speed		Selectable **1cps, 30cps, 2kcps, 5kcps** by internal DIP switch									
Min. signal range		Min. 20ms(Input INHIBIT, RESET)									
Input type	CP1, CP2 input	**[No-voltage input]** Impedance at short-circuit : Max. 470Ω, Residual voltage at short-circuit : Max. 1V, Impedance at open-circuit : Min. 100kΩ		**[No-voltage input]** ☞ Impedance at short-circuit : Max. 5.4kΩ, Residual voltage at short-circuit : Max. 2V, Impedance at open-circuit : Min. 100kΩ **[Voltage input]** ☞ Input impedance : 10kΩ, "H" level voltage : 5-30VDC, "L" level voltage : 0-2VDC								
	RESET input										
Control output	Con-tact Type	———		SPDT(1c)	———	Single preset type : SPDT(1c), Dual preset type : SPDT(1c)×2					
	Con-tact Capacity	———		250VAC 3A resistive load	———	250VAC 3A resistive load					
	Solid-state Type	———		1 NPN open collector	———	Single preset type : 1 NPN open collector, Dual preset type : 2 NPN open collectors					
	Solid-state Capacity	———		Max. 30VDC 100mA	———	Max. 30VDC 100mA					
Reference		**See Counter J-34 to 56 for details about Counter/Timer products.**									

Product Overview

Item		Digital timer(LED type)	
Model		FS4E	FS5EI
Appearances & Dimensions		 [W48×H48×L85mm]	 [W48×H48×L85mm]
Function		Count up, Count down Timer	
Time setting range		0.01sec. to 9999hour	0.01sec. to 9999.9hour
Power supply		• 100−240VAC 50/60Hz • 12−24VAC/DC(Option)	
Allowable voltage range		90 to 110% of rated voltage	
Reset time		Max. 500ms	
Min. signal width		Min. 20ms	
Time operation		Power ON start	
Memory protection		Approx. 10 year(When using non−volatile semiconductor memory)	
Control output	Contact type	Time limit SPDT(1c)	————
	Contact capacity	250VAC 3A resistive load	————
Relay life cycle	Mechanical	Min.10,000,000 times	————
	Electrical	Min. 100,000 operations at 250VAC 3A resistive load	————
Repeat error		Max. ±0.01% ±0.05sec.	
SET error			
Voltage error			
Temperature error			
Reference		K-34 to 38	

Item		Analog multi function timer		
Model		AT8N	AT11DN	AT11EN
Appearances & Dimensions		Upgrade  [W48×H48×L65mm]	Upgrade  [W48×H48×L65mm]	Upgrade  [W48×H48×L65mm]
Function		Multi function Timer(Includes 6 output modes)		
Time setting range		0.05sec. to 100hour		
Power supply		• 100−240VAC 50/60Hz, 24−240VDC • 24VAC 50/60Hz, 24VDC • 12VDC		
Allowable voltage range		90 to 110% of rated voltage		
Reset time		Max. 100ms		
Min. signal width		————	Min. 50ms	
Timing operation		Power ON start	Signal ON start	
Control output	Contact type	Time limit DPDT(2c), Time limit DPDT(1c)+ Instantaneous DPDT(1c) by selecting output operation mode	Time limit DPDT(2c)	Time limit SPDT(1c), Instantaneous SPDT(1c)
	Contact capacity	250VAC 5A resistive load		
Relay life cycle	Mechanical	Min. 10,000,000 times		
	Electrical	Min. 100,000 times(Rated contact capacity)		
Repeat error		Max. ±0.2 % ±10ms		
SET error		Max. ±5% ±50ms		
Voltage error		Max. ±0.5%		
Temperature error		Max. ±2%		
Reference		K-39 to 45		

Item		Analog timer		
Model		AT8SDN	AT8PSN	AT8PMN
Appearances & Dimensions		Upgrade  [W48×H48×L65mm]	Upgrade  [W48×H48×L65mm]	Upgrade  [W48×H48×L65mm]
Function		Star-delta timer	Power OFF delay timer	
Time setting range		0.5 to 100sec.	0.05 to 10sec.	0.05 to 10min.
Power supply		• 100-240VAC 50/60Hz / 24-240VDC	• 100-120VAC 50/60Hz • 100/110VDC	• 200-240VAC 50/60Hz • 24VAC 50/60Hz, 24VDC
Allowable voltage range		90 to 110% of rated voltage		
Reset time		Max. 100ms	————	
Timing operation		Power ON start	Power OFF start	
Control output	Contact type	⅄ contact : SPST(1a), Δ contact : SPST(1a)	Time limit DPDT(2c)	
	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)	
Repeat error		Max. ±0.2 % ±10ms		
Voltage error		Max. ±5% ±50ms		
Temperature error		Max. ±2%		
SET error		Max. ±25%	————	
Voltage error		Max. ±0.5%		
Reference		K-46 to 48	K-49 to 51	

Item		Analog timer		
Model		ATE-□S, □M, □H	ATE1-□S, □M, □H	ATE2-□S, □M, □H
Appearances & Dimensions		 [W48×H48×L65mm]	 [W48×H48×L79mm]	 [W48×H48×L79mm]
Function		Power ON delay timer(General purpose timer)		
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	• 220VAC 50/60Hz • 110VAC 50/60Hz • 24VDC • 12VDC	
Allowable voltage range		90 to 110% of rated voltage		
Reset time		Max. 200ms		
Timing operation		Power ON start		
Control output	Contact type	Time limit SPDT(1c), Instantaneous SPDT(1c)	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%		
SET error		Max. ±5% ±0.05sec.		
Voltage error		Max. ±0.5%		
Temperature error		Max. ±2%		
Reference		K-52 to 54		

Product Overview

Item		Digital weekly/yearly timer(LCD type)	
Model		LE7M-2	LE365S-41
Appearances & Dimensions		 [W72×H72×L60mm]	 [W48×H48×L60mm]
Function		Weekly/yearly timer	
Power supply		100-240VAC 50/60Hz	
Allowable voltage range		90 to 110% of rated voltage	
Timing program		48 steps for weekly, 24 steps for yearly	
Operation mode		ON/OFF mode, cycle mode, pulse mode	
Temperature error		0.01% ±0.05sec.	
Mounting		Front panel, surface, DIN rail	
Time deviation		±15sec/month(25℃) (±4sec/week)	
Memory protection		Over 5 years(at 25℃)	
Control Output	Contact type	SPDT(Single pole double contact)	SPST(Single pole single contact)
	Contact capacity	250VAC 10A resistive load	250VAC 15A resistive load
	Output number	Independent 2 output(1c × 2)	Independent 1 output(1a)
Relay life cycle	Mechanical	Min. 5,000,000 operations(Switching capacity 30 times/minute)	
	Electrical	50,000 operations<Switching capacity 20 times/1 minute, at 250VAC 10A(resistive load)>	50,000 operations<Switching capacity 20 times/1 minute, at 250VAC 15A(resistive load)>
Reference		K-55 to 66	K-67 to 77

DIN W48×H24mm, Indication only, LCD timer

▣Features

- **Upgraded version of LE7N series**
- Compact size indicator
- Internal lithium battery
- Screw terminal type(Terminal protection cover)
- LCD display
- Built-in microprocessor
- Protection structure IP66(Front panel only)

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

▣Ordering information

LE 8 N – B F

Input type	F	Free voltage input
	N	No-voltage(Small signal) input
Power supply	B	Internal lithium battery
Size	N	DIN W48×H24mm
Digit	8	99999999(8 Digit)
Item	LE	LCD Timer

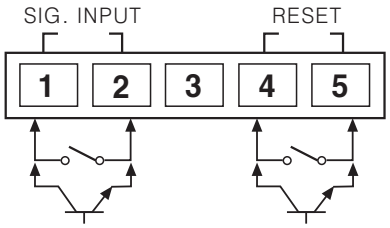
▣Specifications

Series		LE8N-BN	LE8N-BF
Digit		8 Digits	
Display		LCD Zero Blanking type(Height : 8.7mm)	
Operation method		Count up mode	
Power supply		Built-in lithium battery	
Input type		No-voltage input	Free voltage input
Start input		• Residual voltage : Max. 0.5VDC • Impedance at short-circuit : 10kΩ • Impedance at open-circuit : 750kΩ	High : 24-240VAC / 6-240VDC Low : 0-2VAC / 0-2.4VDC
RESET input		No-voltage input	
Min.signal width of RESET		Min. 20ms	
Time range (TS1)		**(★1)** 9999.59.59(h.m.s), 99999.59.9(h.m), 999999.59(h.m)	
Time range (TS2)		**(★1)** 9999H59.9(h.m), 99999H59(h.m), 999999H.9(h)	
Time error		±0.01% ±50ms(Repeat error, Time error, Temperature error)	
Battery life cycle		Approx. over 10 years(at 20℃)	
External switch		SW1(Front reset key Lock switch), SW2(Time range selection switch)	
Insulation resistance		Min. 100MΩ(at 500VDC megger)	
Dielectric strength		**(★2)** 2000VAC 60Hz for 1 minute	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 1 hour	
	Malfunction	0.3mm amplitude at frequency of 10 to 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	
Protection		IP66(When using waterproof rubber for front panel)	
Ambient Temperature		-10 to 55℃(at non-freezing status)	
Storage Temperature		-25 to 65℃(at non-freezing status)	
Ambient humidity		35 to 85%RH	
Approval			
Unit weight		Approx. 58g	

※**(★1)** Select TS1, TS2 using inner jump pin(JP1).
※**(★2)** No-voltage input : Between all terminals and case, Free voltage input : Between input terminal and reset input terminal, all terminals and case

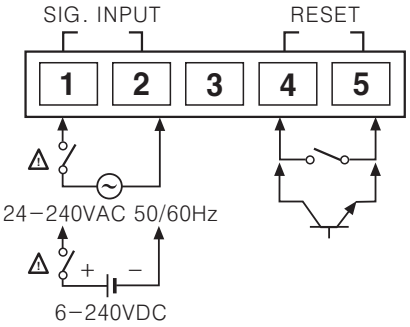
▣Connections

●No-voltage input



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

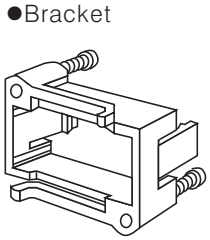
●Free voltage input

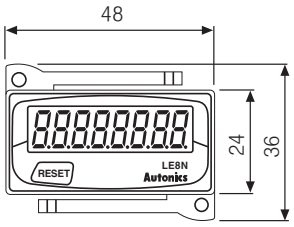


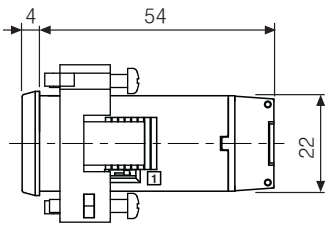
※Terminal 1, 2 and 4, 5 are isolated.

▣Dimensions

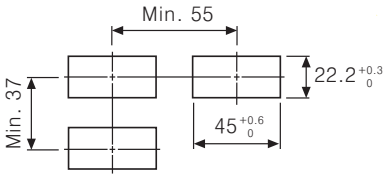
●Bracket







●Panel cut-out

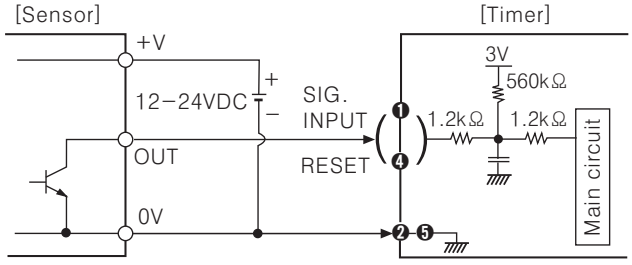


(Unit:mm)

▣Input connections

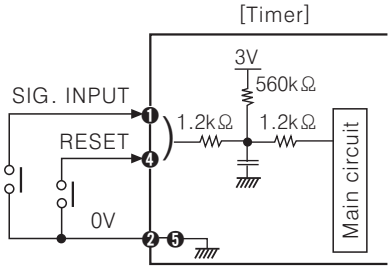
◎No-voltage input (Standard sensor: NPN open type sensor)

●Solid-state input



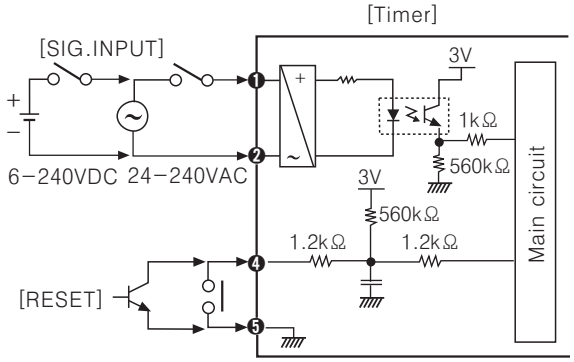
※When power is applied to terminal No ❶ and ❹, input terminal circuit can be broken and a malfunction can occur.
(NPN output, PNP output, PNP open collector output type sensor cannot be used.)
※❷ and ❺ are connected inside.

●Contact input



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

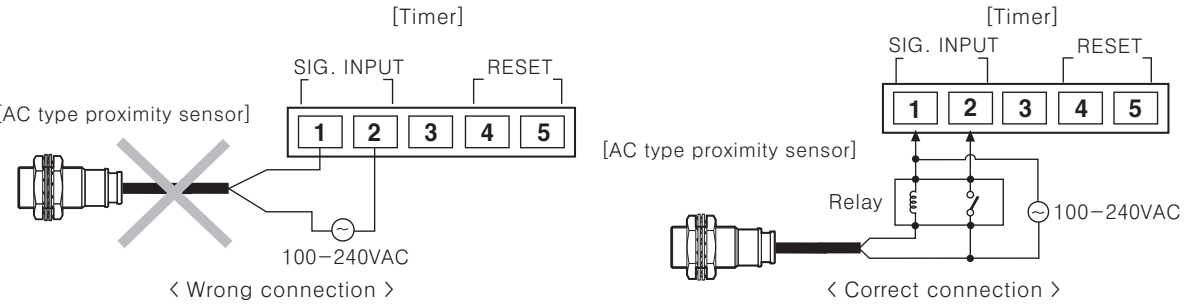
◎Free voltage input



※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.

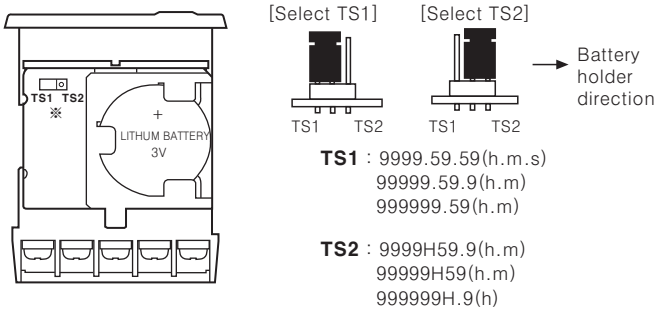
◎Input from AC type proximity sensor

Please add input relay as shown below to prevent malfunction caused by current leakage of the proximity sensor.



▣Time specification(TS1, TS2) and time range

●Selection of time specification(TS1, TS2)

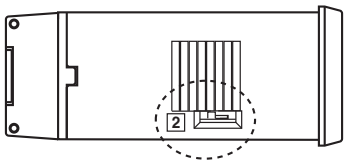


TS1 : 9999.59.59(h.m.s)
99999.59.9(h.m)
999999.59(h.m)

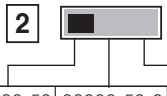
TS2 : 9999H59.9(h.m)
99999H59(h.m)
999999H.9(h)

※Please supply RESET signal(Front or external RESET terminal) after change time range during the operation.

●Selection of time range

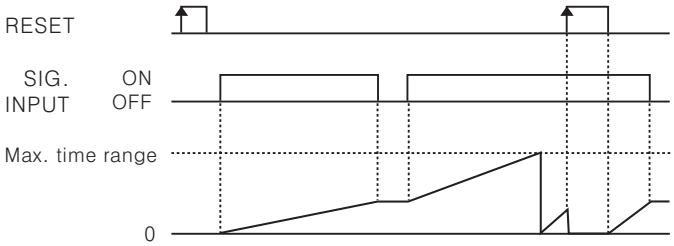


Terminal ◀▶ Front panel

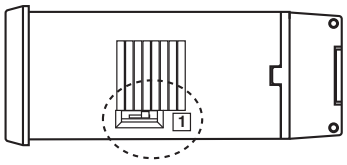


TS1	999999.59	99999.59.9	9999.59.59
TS2	999999H.9	99999H59	9999H59.9

▣Time operation



▣Enable / Disable front reset key

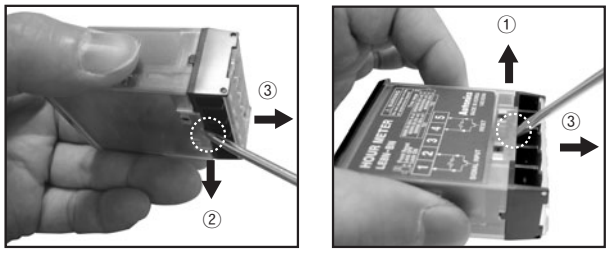


Front panel ◀▶ Terminal

Enable to use Disable to use

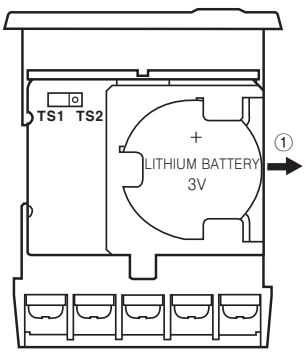
▣Case detachment and battery replacement

●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 sold separately.
※Do not burn up or disassemble the lithium battery.

Digital LCD timer DIN W48×H48mm

▣Features

- ●Upgraded power supply
  : 24−240VAC 50/60Hz / 24−240VDC
- ●Easy to switch Up/Down mode
- ●10 programmable output modes and timing ranges
- ●Selectable function by front digital switches
- ●Graphic output contact status display(NO/NC)
- ●BAR graph display of time progressing in 5% increments
- ●Compact size(Length:74mm)

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

▣Ordering information

LE **3** **S** **□**

Output	Blank	Time−limit contact 1c
	A	Time−limit contact 2c
	B	Time−limit contact 1c, Instantaneous contact 1c
Size	S	DIN W48×H48mm
Digit	3	999(3 Digit)
Item	LE	LCD Timer

※Socket required : PG−08, PS−08, PS−M08

▣Specifications

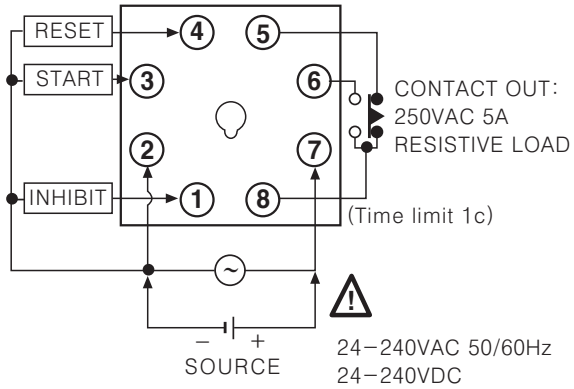
Model		LE3S	LE3SA	LE3SB
Function		Multi time and operation	Multi time range, power ON delay operation	
Display method		LCD display(Character size : W4×H8mm)		
Power supply		24−240VAC 50/60Hz / 24−240VDC		
Allowable voltage range		90 to 110% of rated voltage		
Power consumption		Approx. 2.5VA(240VAC 50/60Hz) Approx. 1W(240VDC)	Approx. 3.3VA(240VAC 50/60Hz) Approx. 1.5W(240VDC)	
Reset time		Max. 200ms	Max. 100ms	
Min. input signal	START input	Min. 20ms	———	
	INHIBIT input			
	RESET input			
Input	START input	●No−voltage input Impedance at short−circuit:Max. 1kΩ Residual voltage:Max. 0.5VDC Impedance at open−circuit: Min. 100kΩ	———	
	INHIBIT input			
	RESET input			
Timing operation		Signal ON start	Power ON start	
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		10 operation modes	Power ON delay mode	
Ambient temperature		−10 to 55℃(at non−freezing status)		
Storage temperature		−25 to 65℃(at non−freezing status)		
Ambient humidity		35 to 85%RH		

▣Specifications

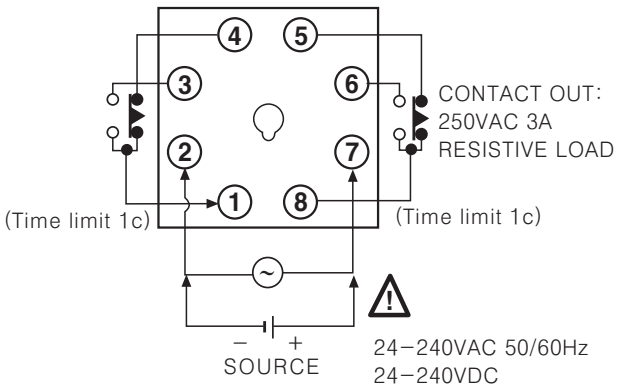
Model		LE3S	LE3SA	LE3SB
Repeat error		Max. ±0.01% ±0.05sec. (Power start) Max. ±0.005% ±0.03sec. (Signal start)	Max. ±0.01% ±0.05sec.	
SET error				
Voltage error				
Temperature error				
Insulation resistance		100MΩ (at 500VDC megger)		
Dielectric strength		2000VAC 50/60Hz for 1 minute		
Noise strength		±2kV the square wave noise(pulse width : 1μs) by the noise simulator		
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 1hour		
	Malfunction	0.5mm amplitude at frequency of 10 to 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		cULus CE		
Unit weight		Approx. 100g	Approx. 105g	

▣Connections

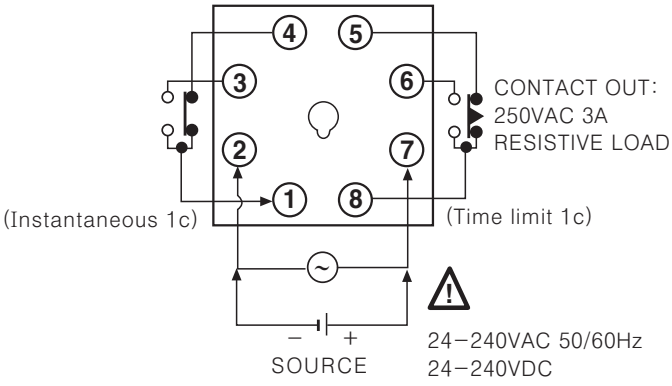
●LE3S



●LE3SA

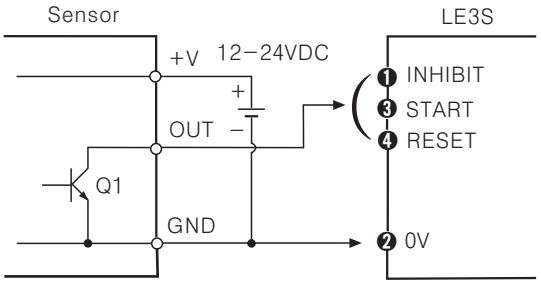


●LE3SB



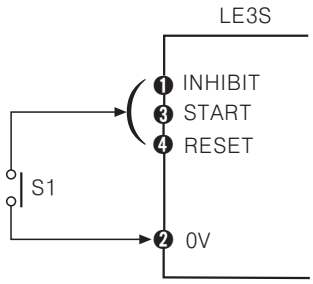
▣Input connections(LE3S only.)

◎Solid-state input

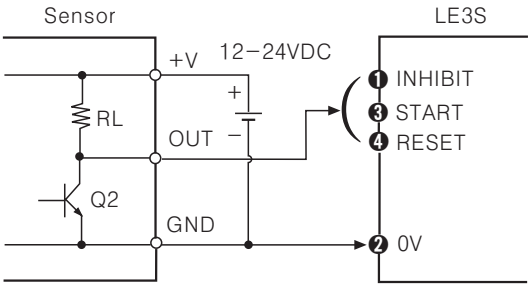


●Q1 is ON : Operating
●Sensor : NPN open collector output

◎Contact input



●S1 is ON : Operating
●S1 : Micro switch, push button switch, relay



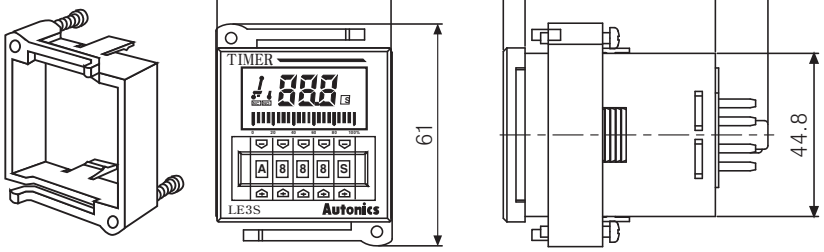
●Q2 is ON : Operating
●Sensor : NPN universal output

●Input level

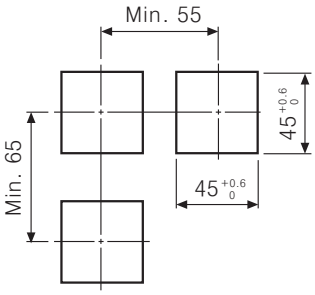
No voltage input	●Short-level(Transistor is ON) • Residual voltage : Max. 0.5V • Impedance : Max. 1kΩ
	●Open-level(Transistor is OFF) • Impedance : Min. 100kΩ
Contact input	Please use reliable contacts enough to flow 5VDC 1mA of current.

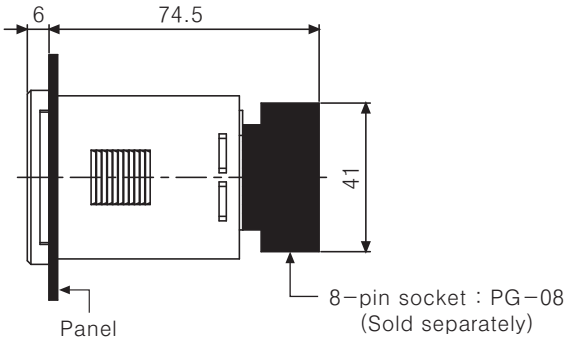
▣Dimensions

●Bracket



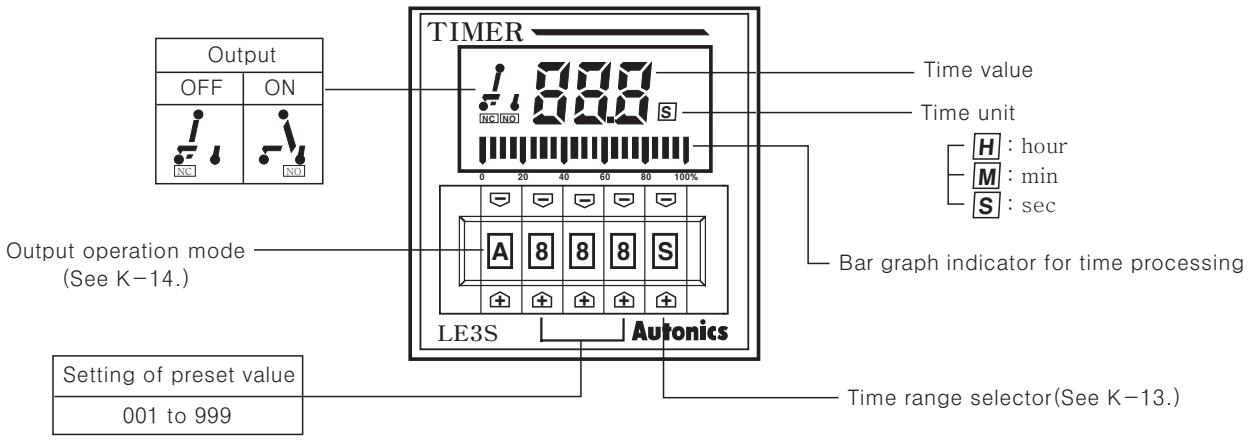
●Panel cut-out



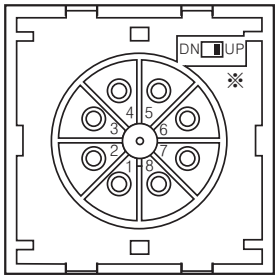


(Unit:mm)

▣Front panel identification



▣Up/Down mode



※Output operate as Up or Down mode by Up/Down switch location.

Up	Down
DN ■ UP	DN ■ UP

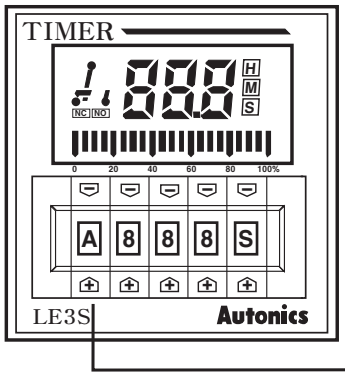
⚠ **Power must be cut off.**

●Default specifications

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

▣Output operation mode selection

●Please select operation mode by press the left of ⊕, ⊖ keys in 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 K−14 to 15 for details about 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.

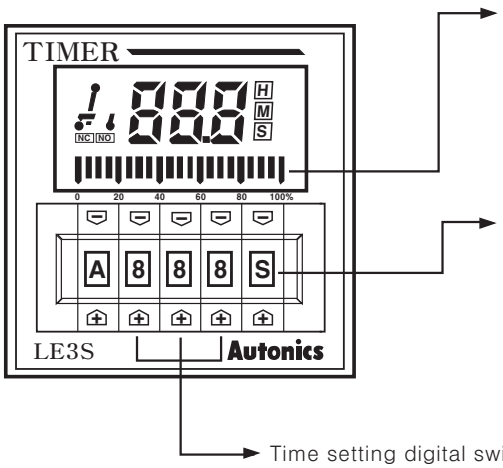
●Flicker Ⓐ of D mode and flicker Ⓑ of E mode are different.

※Output mode Ⓐ is operated as time progresses only when the start signal applied continuously.

※Output mode Ⓑ is operated as time progresses even the start singal is applied as One−shot signal. (One−shot input signal should be over 20ms.)

▣Time specifications and time range

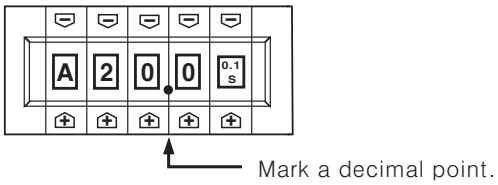
●Please select time unit and range by press the right of ⏶, ⏷ keys in front panel.



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

●Setting of operation time : Please select operation time by press the center of 3 ⏶, ⏷ keys in front panel.

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

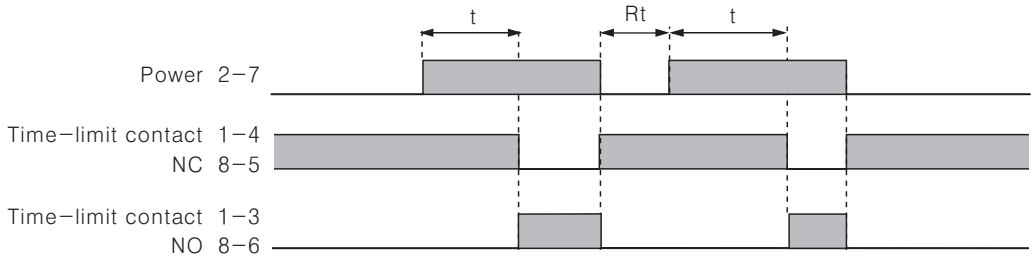


●Bar graph display : Display the progress rate of time for setting time with bar, it is calculated as below for 1bar.
Setting value (Operation time) ÷ 20(Total number of bars) = The time for 1 bar is lighted.

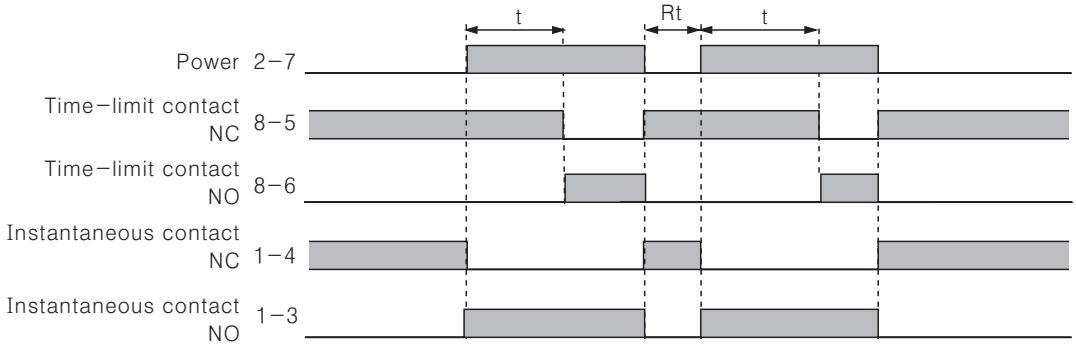
▣LE3SA, LE3SB output operation mode

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

LE3SA

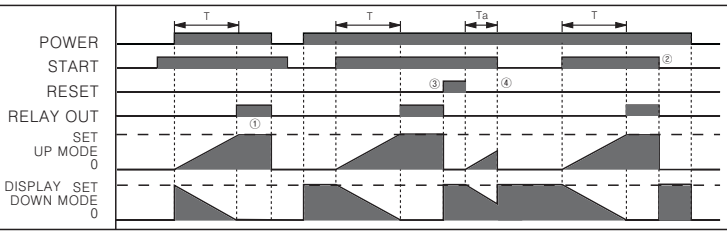
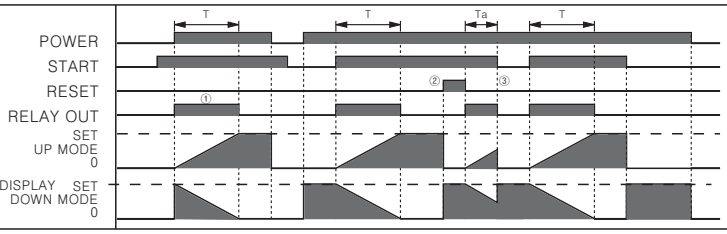
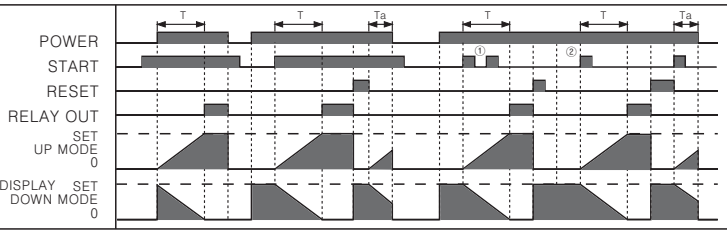
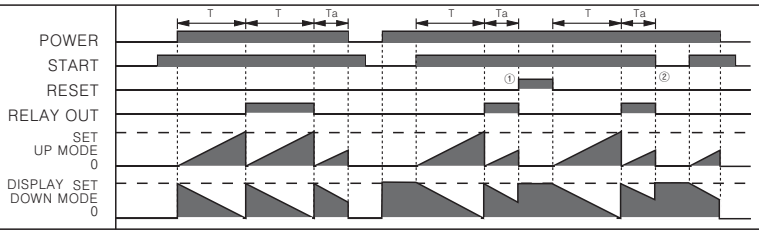
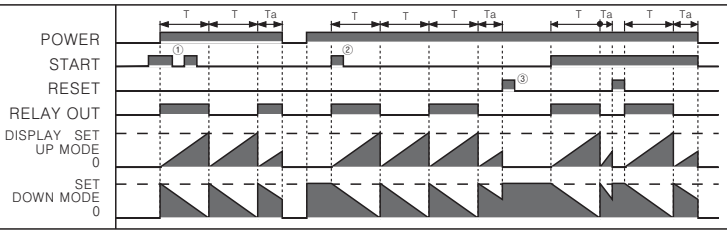


LE3SB



▣LE3S output operation mode

T=Setting time, T >Ta

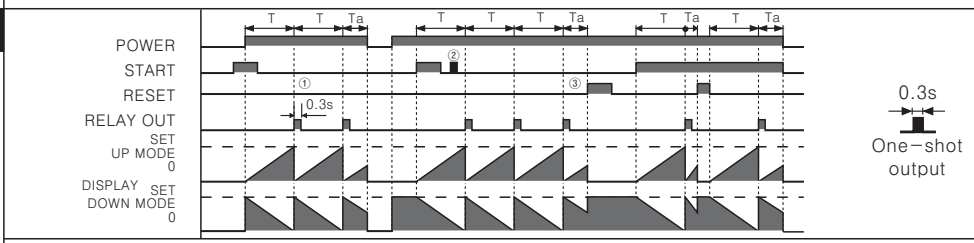
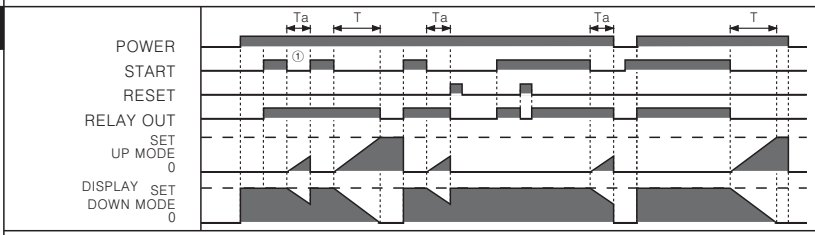
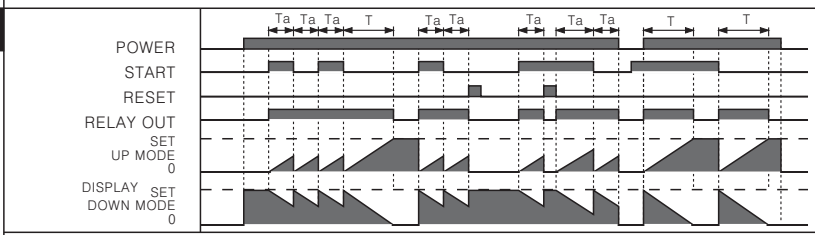
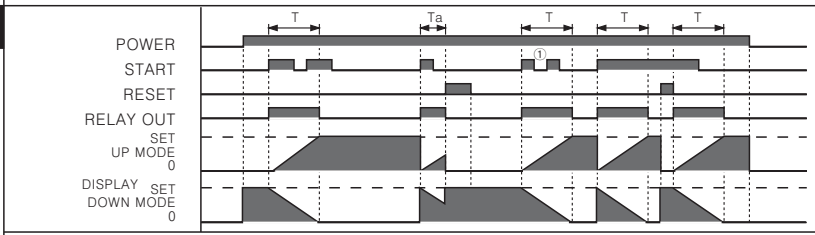
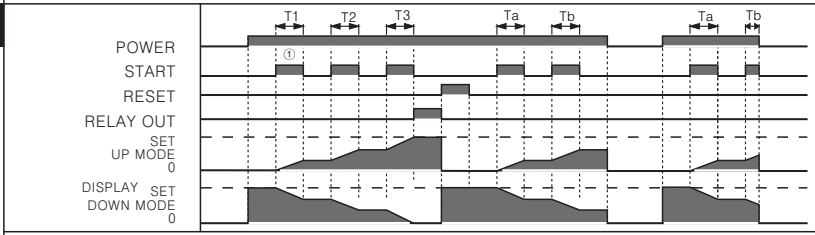
Mode	Time chart
A **ON Delay** Ⓐ	 1. Time progresses when START signal is ON. 2. The output will be ON when the setting value is equal to the display value. (Position ①) 3. When the RESET signal is ON, the display value is returned to the initial state. (Position ③) 4. When the setting value is equal to the display value, if START signal is OFF, the output turns off, the display value is held. (Position ②) **※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. The output will be ON when the setting 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 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. The output will be ON when the setting 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. **※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=Setting time, T=T1+T2+T3, T >Ta, T >Ta+Tb

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 (0.3 sec), 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 repeatedly, 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 setting 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 progressed.**
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 setting 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 setting 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 progresses 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, time progresses. 2. If START signal turns off before the display value reaches the setting 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 terminal ②) when the power is supplied.

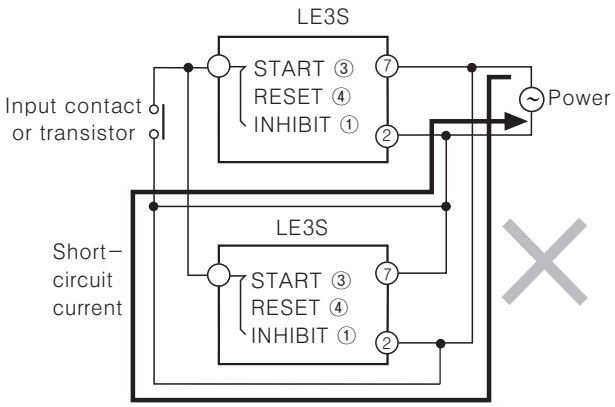
◎Power connection

- ●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 terminal(②−⑦), 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.

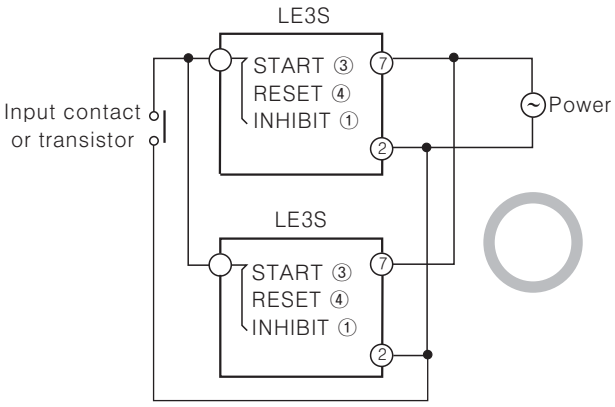
◎Input/Output

- ●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 reliable contact enough to flow 5VDC 1mA of current.(Short circuited : Contact resistance under 1kΩ, Open circuit : Residual voltage under 0.5V)
- ●In case of connecting 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.
  (Time error is occurred when time starts the moment power is supplied.)
- ●When power is applied to LE3SA, LE3SB, it starts to operate, please check operation specifi−cation before using.
  (It may cause breakdown of peripheral device when power is applied without any check.)

- ●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 connect as following <Fig. 2 >.

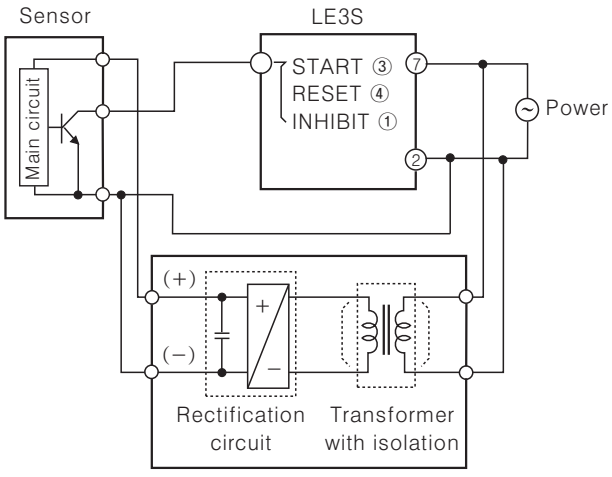


< Fig. 1 >



< Fig. 2 >

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



< External sensor power supply >

DIN W48×H48mm Digital backlight LCD timer

▣Features

Upgrade

■Powerful functions upgraded

- ●Mounting space saving with compact design
  : downsized by approx. 22% in depth compared to existing models(Length of panel on the back side is 56mm)
- ●Available to set each value and time range separately when choosing Flicker(FK, FK I) or ON−OFF Delay(ON OFF D, ON OFF D I) output mode(Existing model : setting value only)
- ●Add Flicker 1 mode(LE4SA)
- ●Set One−shot output time(0.01 to 99.99sec.)
  (Existing model : Fixed 0.5 sec.)
- ●Time range is configurable(Time setting range to 9.999sec.)
  : Able to set to 0.001sec.(Existing model : 0.01sec.)
- ●Choose Min. input signal : 1ms or 20ms(Existing model : Fixed 20ms)(LE4S)
- ●Improved return time : 100ms(Existing model : 300ms, 500ms)
- ●Back light ON/OFF function

■Original Features

- ●Wide time range(0.01sec. to 9999hour)
- ●Lock setting function for saving setting value.
- ●Function setting with soft touch
- ●High visibility display with back light

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

▣Ordering information

LE	4	S	□

Output	Blank	Time−limit contact 1c
	A	Time−limit contact 2c, Time−limit contact 1c+Instantaneous contact 1c(Selectable)
Size	S	DIN W48mm×H48mm
Digit	4	9999(4 Digit)
Item	LE	LCD Timer

※Socket required : PG−08, PS−08, PS−M08

▣Specifications

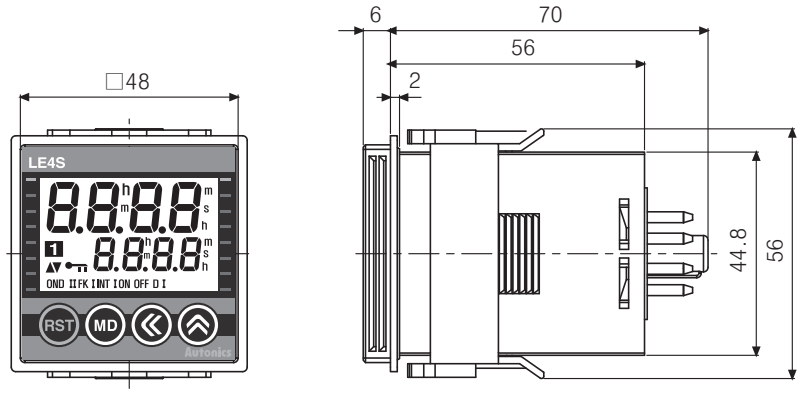
Model		LE4S	LE4SA
Function		Multi time and operation	
Display method		LCD display(Backlight)	
Power supply		24−240VAC 50/60Hz, 24−240VDC	
Allowable voltage range		90 to 110% of rated voltage	
Power consumption		24−240VAC: Max. 4.5VA, 24−240VDC: Max. 2W	24−240VAC: Max. 4VA, 24−240VDC: Max. 1.6W
Return time		Max. 100ms	
Min. input signal	START	1ms, 20ms(Selectable)	———
	INHIBIT		
	RESET		
Input	START	●No−voltage input Impedance at short−circuit : Max. 1kΩ, Residual voltage : Max. 0.5V, Impedance at open−circuit : Min. 100kΩ	———
	INHIBIT		
	RESET		
Timing operation		Signal ON start	Power ON start
Control output	Contact type	Time limit SPDT(1c)	Time limit DPDT(2c), Time limit SPDT(1c) + Instantaneous SPDT(1c) : Selectable
	Contact capacity	250VAC 5A resistive load	250VAC 3A resistive load
Relay life cycle	Mechanical	Min. 10,000,000 operations	
	Electrical	1Min. 100,000 operations at 250VAC 2A resistive load	
Output mode		10 kinds of operation mode	8 kinds of operation mode

▣Specifications

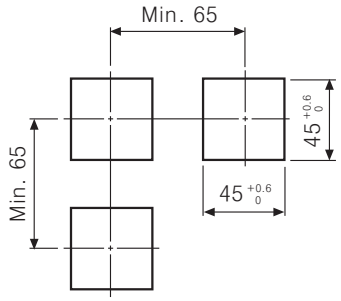
Ambient temperature		−10 to 55℃ (at non−freezing status)	
Storage temperature		−25 to 65℃ (at non−freezing status)	
Ambient humidity		35 to 85%RH	
Repeat error		Max. ±0.005% ±0.03sec. (Signal start) Max. ±0.01% ±0.05sec. (Power ON start)	Max. ±0.01% ±0.05sec.
Setting error			
Voltage error			
Temperature error			
Insulation resistance		100MΩ (500VDC megger)	
Dielectric strength		2000VAC 50/60Hz for 1 minute	
Noise strength		±2kV the square wave noise (pulse width : 1㎲) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55㎐ in each of X, Y, Z directions for 1hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 55㎐ in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s² (30G) X, Y, Z directions for 3 times	
	Malfunction	100m/s² (10G) X, Y, Z directions for 3 times	
Approval		CE cULus	
Unit weight		Approx. 98g	

▣Dimensions

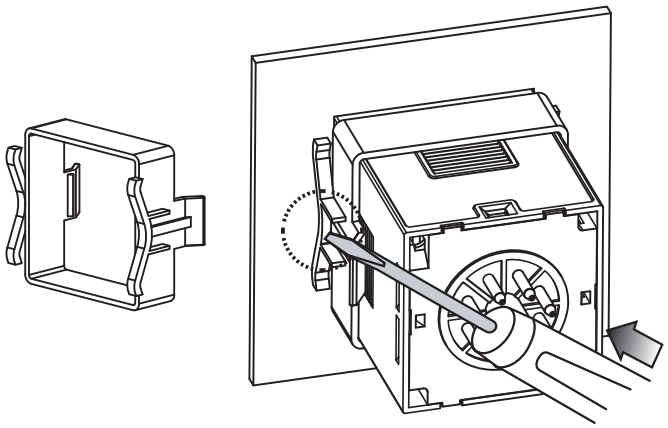
(Unit:mm)



●Panel cut−out



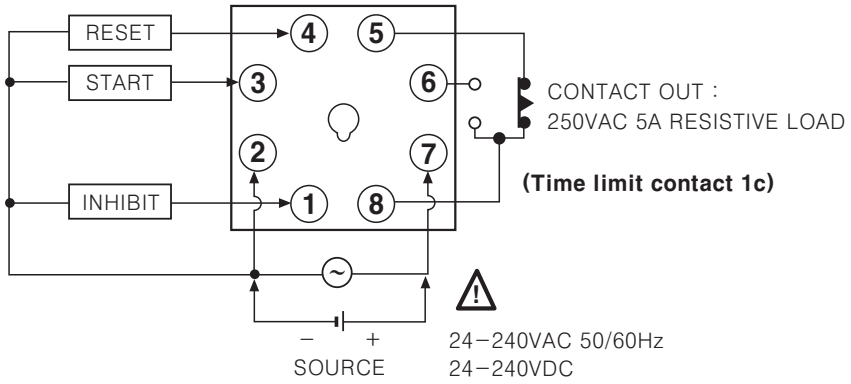
●Product mounting



※Insert product into a panel, fasten braket by pushing with tools as shown above.

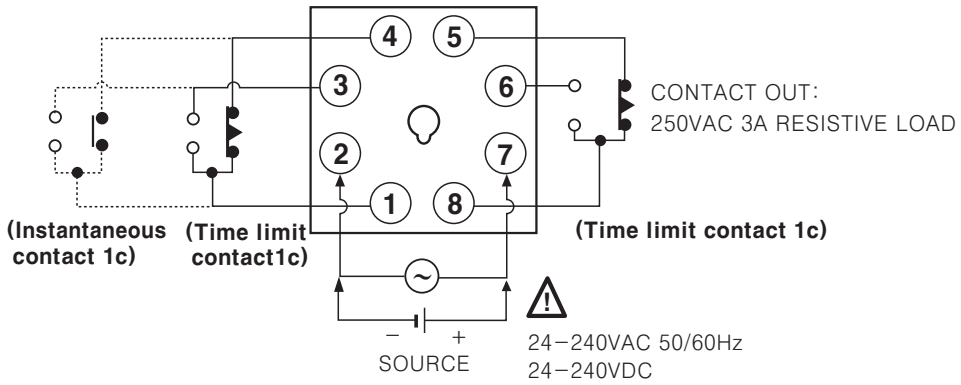
▣Connections

◎**LE4S**



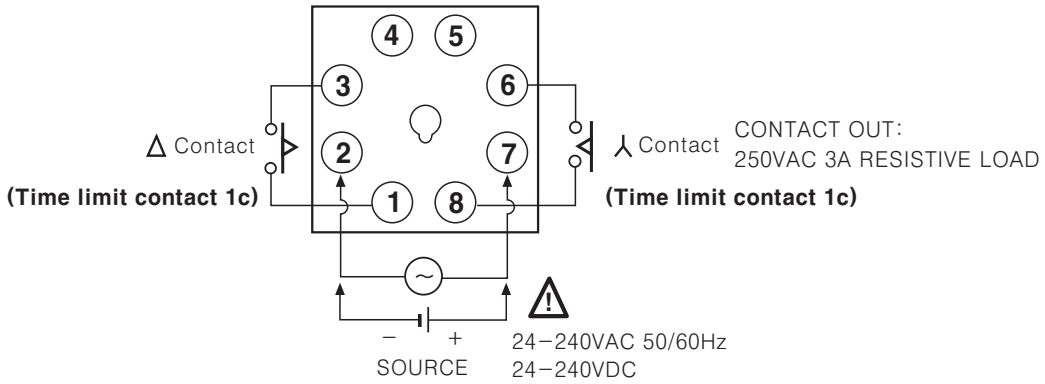
◎**LE4SA**

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



※Time limit contact 1c + Instantaneous contact 1c or Time limit contact 2c (Selectable)
([**T**] [**T.I**] : Time limit 2c only.)

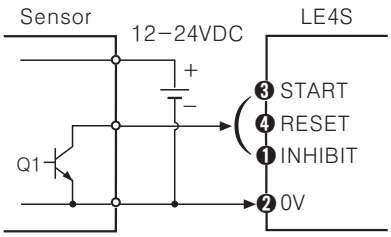
●[人-△] mode



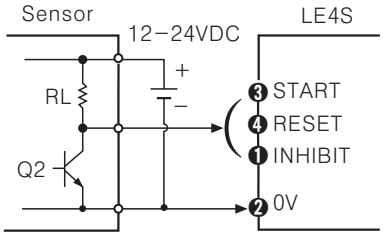
▣Input connections

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

◎Solid-state input

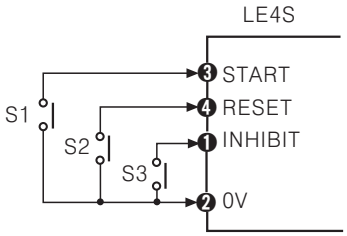


- ●Q1 is ON : Operating
- ●Sensor : NPN open collector output
- ●Short-circuit level(Transistor : ON)
  Residual voltage : Max. 1V,
  Impedance : Max. 1kΩ
- ●Open-circuit level(Transistor OFF)
  Impedance : Min. 100kΩ



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

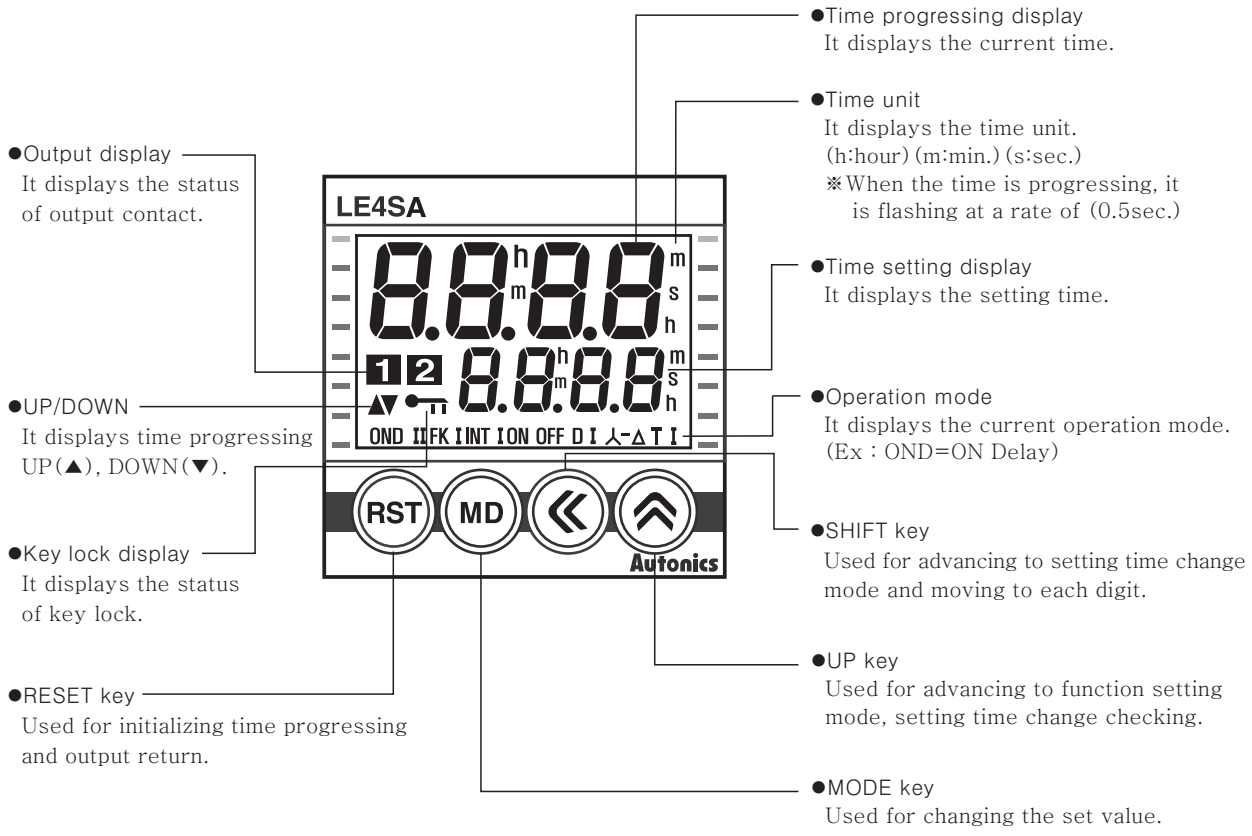
◎Contact input



- ●S1, S2, S3 are ON : Operating
- ●Please use reliable contact enough to flow 5VDC 1mA.

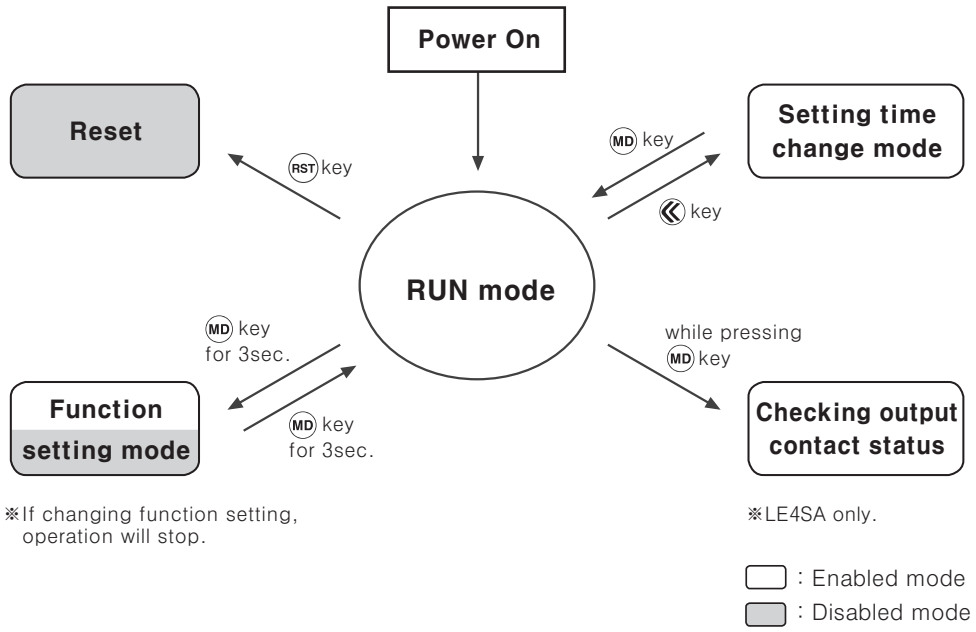
※Be sure that it is not insulated between power and input terminal block.

▣Front panel identification



▣Function and time setting

◎Configuration



●Reset

Reset using RST key in Run mode

●Run mode

The operation status(When power is on for the first time : factory default setting) is displayed.
It could enter into function setting mode, setting value change mode and output contact status mode.

●Function setting mode

If pressing MD key over 3 sec. in the Run mode, it will enter into function setting mode and if pressing MD key over 3 sec. in function setting mode, it will return to Run mode.

※Even if it enter into function setting mode in Run mode, time progressing and output control will continue.

※If operation settings are changed in function setting mode, all outputs will be off and reset on returning to run mode.

●Output contact status mode(**LE4SA only.**)

Output contact status are displayed while pressing MD key in Run mode.

※If pressing MD key over 3 sec., it will enter into function setting mode.

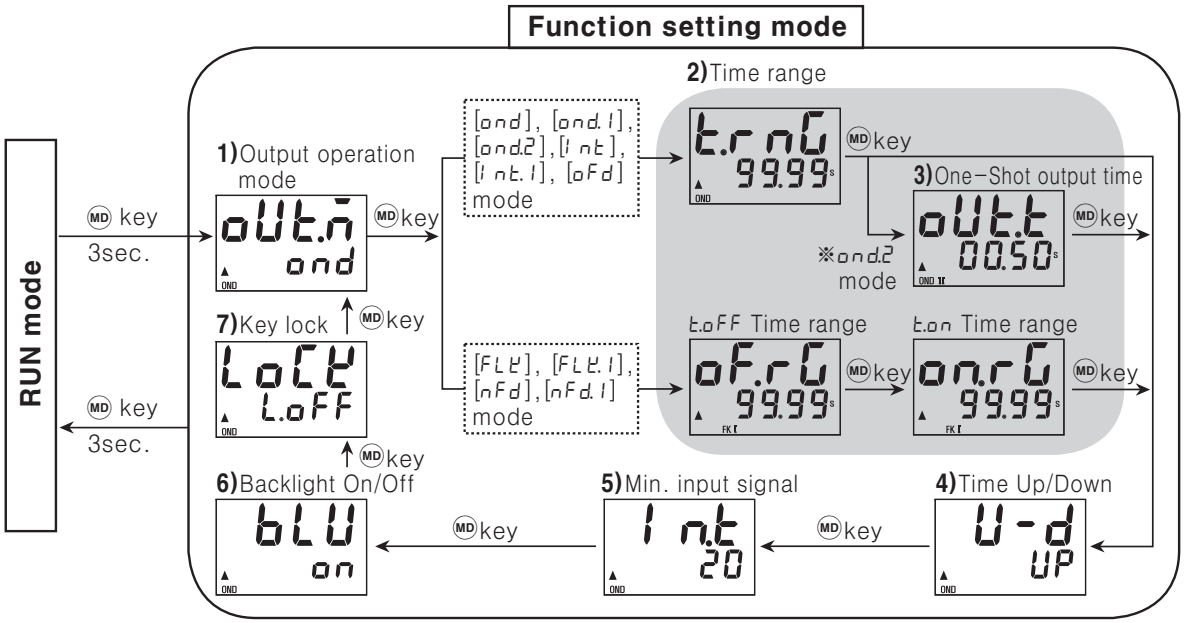
●Setting time change mode

Press key to enter into setting time change mode and press MD key to return to Run mode.
Even if signal is input when changing setting time, time progressing and output control will be continue.
If no key is pressed over 60 sec. in setting time change mode, it will return to Run mode.

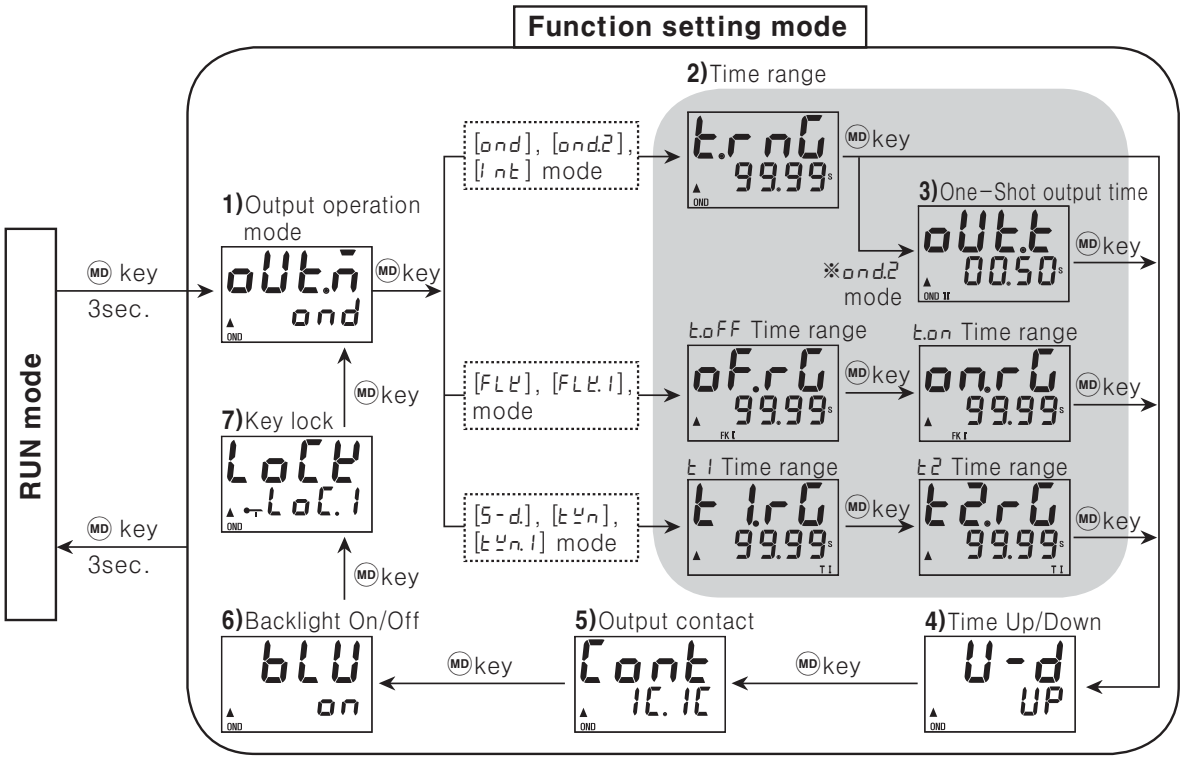
※If no key is pressed over 60 sec. in setting time change mode, it will return to Run mode and previous parameter value is not stored.

▣Function setting mode descriptions

◎LE4S



◎LE4SA



▣Factory default setting

◎LE4S

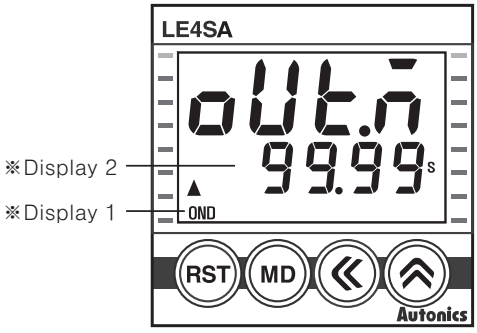
Parameter		Factory default setting
Output operation mode	oUt.n	ond
Time range	t.rnG	99.99 s
Time Up/Down	U-d	UP
Min. input signal	Int	20
Backlight On/Off	bLU	on
Key lock	LoCK	L.oFF
Setting time	-	50.00 s

◎LE4SA

Parameter		Factory default setting
Output operation mode	oUt.n	ond
Time range	t.rnG	99.99 s
Time Up/Down	U-d	UP
Output contact	Cont	1C.1C
Backlight On/Off	bLU	on
Key lock	LoCK	LoC.1
Setting time	-	50.00 s

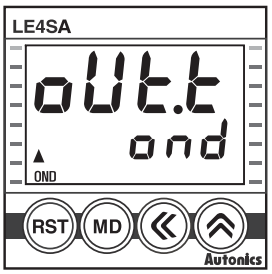
▣Output operation mode

●LE4S/LE4SA output operation mode



NO	※Display 1	※Display 2	Operation mode	LE4S	LE4SA
1	**OND**	ond	ON DELAY	○	○
2	**OND I**	ond.1	ON DELAY 1	○	—
3	**OND II**	ond.2	ON DELAY 2	○	○
4	**FK**	FLK	FLICKER	○	○
5	**FK I**	FLK.1	FLICKER 1	○	○
6	**INT**	Int	INTERVAL	○	○
7	**INT I**	Int.1	INTERVAL 1	○	—
8	**ON OFF D**	nFd	ON-OFF DELAY	○	—
9	**ON OFF D I**	nFd.1	ON-OFF DELAY 1	○	—
10	**OFF D**	oFd	OFF DELAY	○	—
11	**人-Δ**	S-d	STAR-DELTA	—	○
12	**T**	tYn	TWIN	—	○
13	**T I**	tYn.1	TWIN 1	—	○

●Output operation mode

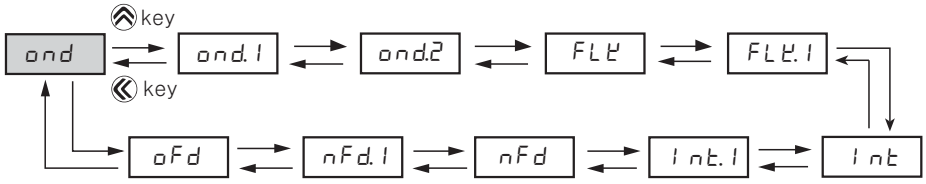


[Fig.1]

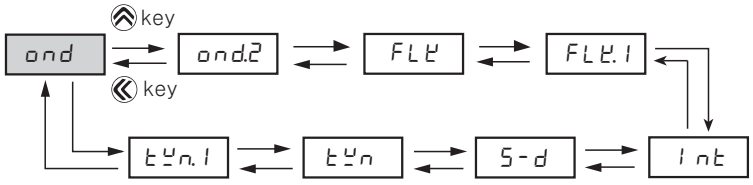
1) In function setting mode, it enter into output operation mode as shown in the [Fig. 1].
2) Select proper output operation mode using ≪ and ≫ key.
(Refer to Output operation flowchart)
3) Press (MD) key to set output operation mode and move to next mode.
4) If pressing (MD) key for 3 sec. in any function setting mode, it will return to Run mode.

※Output operation flowchart

〈 **LE4S** 〉



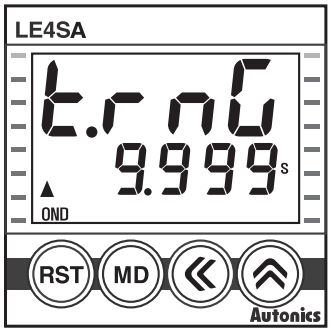
〈 **LE4SA** 〉



※Shaded part on flowchart is factory default setting.

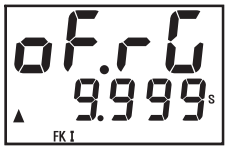
▣Time Range

●Time range specifications

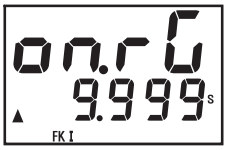


Parameter	Time range specification
9.999s **(9.999s)**	0.010sec. to 9.999sec.
99.99s **(99.99s)**	0.01sec. to 99.99sec.
999.9s **(999.9s)**	0.1sec. to 999.9sec.
9999s **(9999s)**	1sec. to 9999sec.
99m59s **(99m59s)**	0m01sec. to 99min. 59sec.
999.9m **(999.9m)**	0.1min. to 999.9min.
9999m **(9999m)**	1min. to 9999min.
99h59m **(99h59m)**	0h01min. to 99hour 59min.
99.99h **(99.99h)**	0.01hour to 99.99hour
999.9h **(999.9h)**	0.1hour to 999.9hour
9999h **(9999h)**	1hour to 9999hour

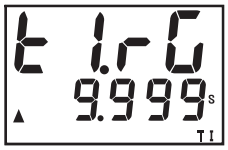
t.oFF Time range



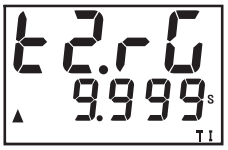
t.on Time range



t1 Time range



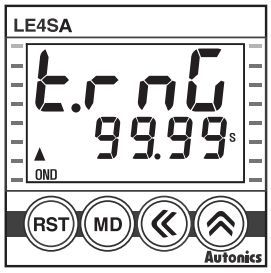
t2 Time range



※Time range according to output operation mode

- Time range(t.rnG)
  : When ond, ond.1, ond.2, Int, Int.1, oFd mode
- t.oFF / t.on Time range(oF.rG / on.rG)
  : When FLt, FLt.1, nFd, nFd.1 mode
- t1 / t2 Time range(t1.rG / t2.rG)
  : When S-d, tYn, tYn.1 mode

●Time range selection method



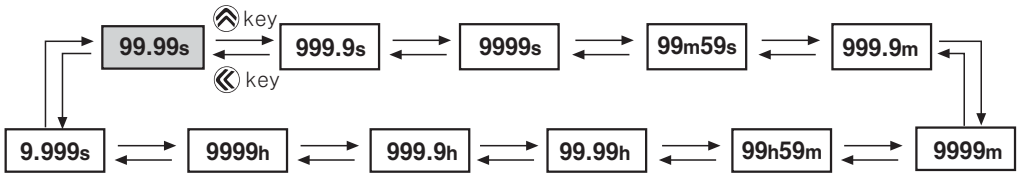
[Fig.1]

When ond, ond.1, ond.2, Int, Int.1, oFd mode

1) In function setting mode, if it enter into time range mode, the characters will be displayed as shown in the [Fig. 1].
2) Select the time range using ≪ and ≫ key.
(Refer to time range flowchart)
3) Press (MD) key to complete the time range setting and the next mode.
4) If pressing (MD) key for 3 sec., it will return to Run mode.

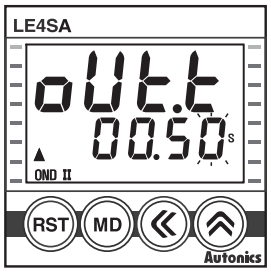
※When FLt, FLt.1, nFd, nFd.1, S-d, tYn, tYn.1 time range(oF.rG, on.rG or t1.rG / t2.rG) can be individually set.

※Time range flowchart



※Shaded part on flowchart is factory default setting.

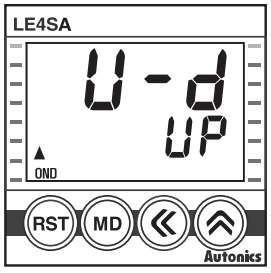
●One−shot output time setting



[Fig.2]
※Factory default setting

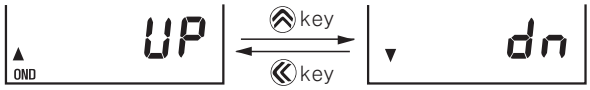
When output operation mode ON DELAY 2(ond.2) is set, it is activated.
1)In function setting mode, if it enter into One−shot output time setting mode as shown in the [Fig. 2], the last digit will flash.
2)Set One−Shot output time using ≪ and ≫ key.(Setting range: 0.01s to 99.99s)
3)Pressing (MD) key to complete one−shot output time setting and move to the next mode.
4)If pressing (MD) key for 3 sec. in any function setting mode, it will return to Run mode.

●Time progress UP/DOWN setting



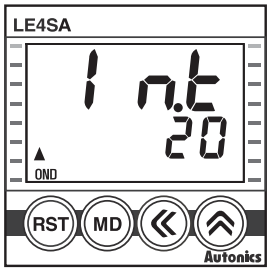
[Fig.3]
※Factory default setting

1)In function setting mode, if it advances to UP/DOWN setting mode, the characters will be displayed as shown in the [Fig. 3].
2)Select UP(▲), Dn(▼)using ≪, ≫key.



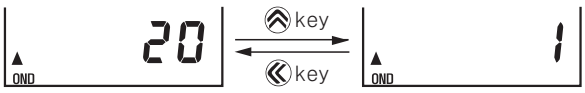
3)Press (MD) key to complete UP/DOWN setting and move to the next mode.
4)If pressing (MD) key for 3sec. in any function setting mode, it will return to Run mode.

●The minimum input signal setting(**LE4S only.**)



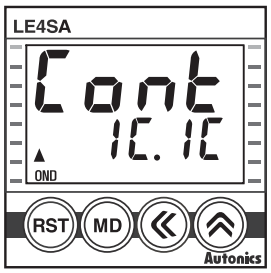
[Fig.4]
※Factory default setting

Reset, Start and Inhibit.
1)In function setting mode, if it enter into input signal setting mode, the characters will be displayed as shown in the [Fig. 4].
2)Select 1ms or 20 ms using ≪, ≫ key



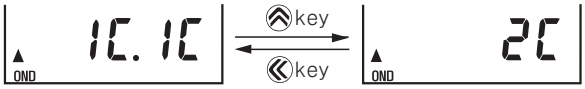
3)Press (MD) key to complete input signal width and move to the next mode.
4)If Pressing (MD) key over 3 sec. in any function setting mode, it will return to Run mode.

●Output contact setting(**LE4SA only.**)



[Fig.5]
※Factory default setting

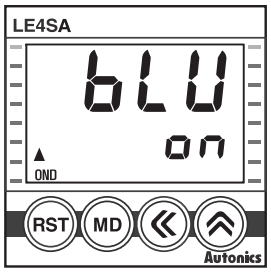
1)In function setting mode, if it enter into output contact setting mode, the characters will be displayed as shown in the [Fig. 5].
2)Select time limit contact 1c+instantaneous contact 1c or time limit contact 2c.
(Refer to LE4SA Connections on K−19 page for output contact connections)



3)Press (MD) key to complete output contact setting and move to the next mode.
4)If pressing (MD) key for 3 sec. in any function setting, it will return to Run mode.

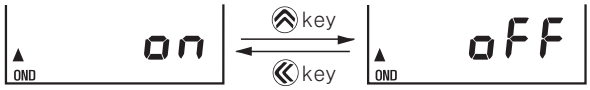
※Except for Star−Delta, Twin and Twin 1 modes(2c is set automatically)
※If pressing (MD) key in Run mode, output contact setting value will be displayed.
(If no key is pressed over 3 sec., it will enter into function setting mode.)

●Backlight ON/OFF setting



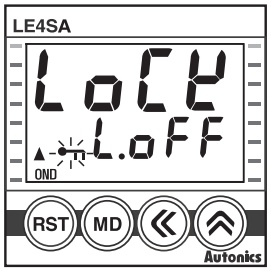
[Fig.6]
※Factory default setting

1) In function setting mode, if it enter into Backlight ON/OFF setting mode, the characters will be displayed as shown in the [Fig. 6].
2) Select Backlight ON or OFF using ≪, ≫ key.



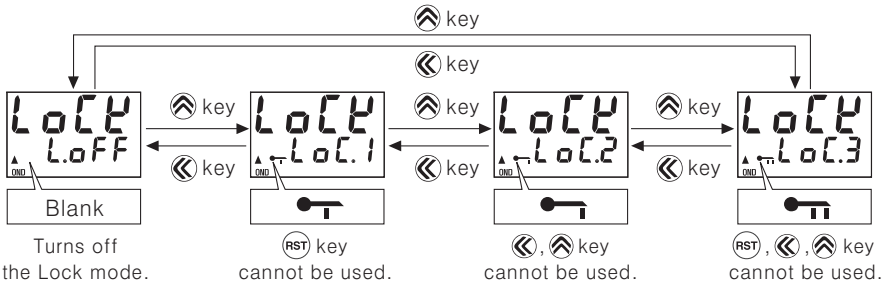
3) Press (MD) key to complete Backlight ON/OFF setting and move to the next mode.
4) If pressing (MD) key for 3 sec. in any function setting mode, it will return to Run mode.

●Key Lock setting



[Fig.7]
※Factory default setting

1) In function setting mode, if it enter into Key Lock setting mode, the characters will be displayed as shown in the [Fig. 7].
2) Select L.oFF, LoC.1, LoC.2 or LoC.3 using ≪, ≫ key.



3) Press (MD) key to complete key lock setting and move to the next mode.
4) If pressing (MD) key for 3 sec. in any function setting mode, it will return to Run mode.

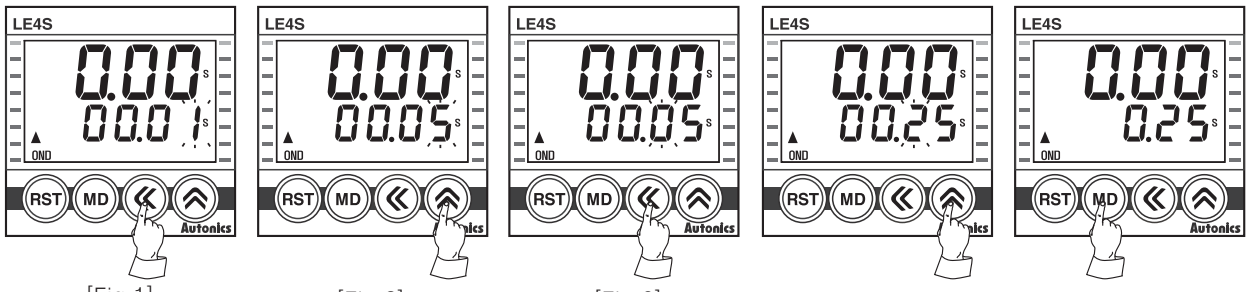
※Factory default for LE4S is L.oFF and Factory default for LE4SA is LoC.1.
※Key Lock function

Display	Function
L.oFF	Turns off the key Lock mode.
LoC.1	(RST) key cannot be used.
LoC.2	≪, ≫ key cannot be used.
LoC.3	(RST), ≪, ≫ key cannot be used.

▣Setting time change

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

●Output operation mode : **OND, OND I, OND II, INT, INT I, OFF D**
(There is no **OND I, INT I, OFF D** in **LE4SA**.)



[Fig.1]

[Fig.2]

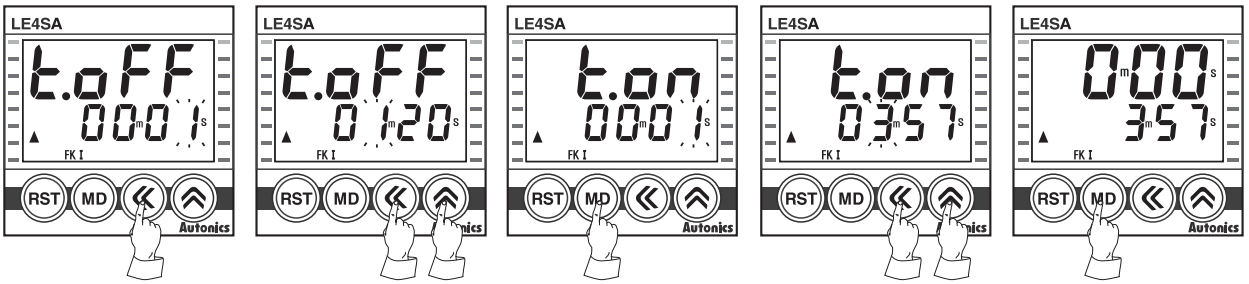
[Fig.3]

[Fig.4]

[Fig.5]

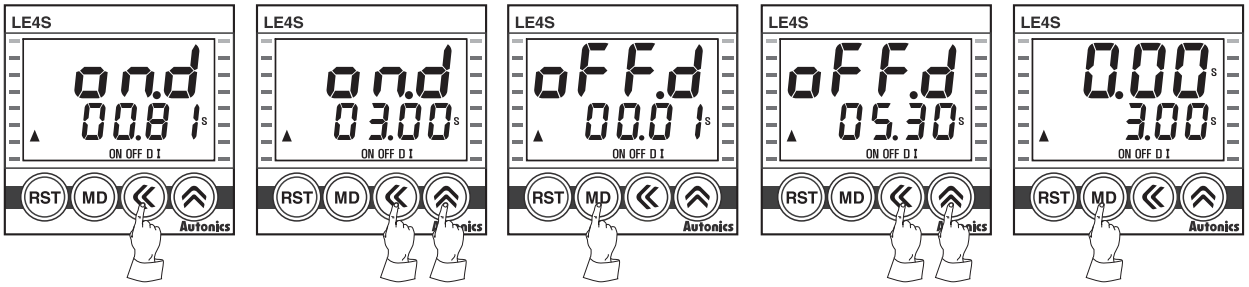
1) Press ≪ key in RUN mode, time set digits will flash. [Fig. 1]
2) Change setting time by using ≪ or ≫ key. [Fig. 2,3,4]
☞ ≪ key : Shift the setting digits.
☞ ≫ key : Shift the flashing position value. As press ≫ key once, it will increase by 1digit, number will increase faster by press ≫ key for over 2sec.
3) When the setting is completed, it will be stored and return to RUN mode by pressing (MD) key. [Fig. 5]

●Output operation mode : **FK, FK I**



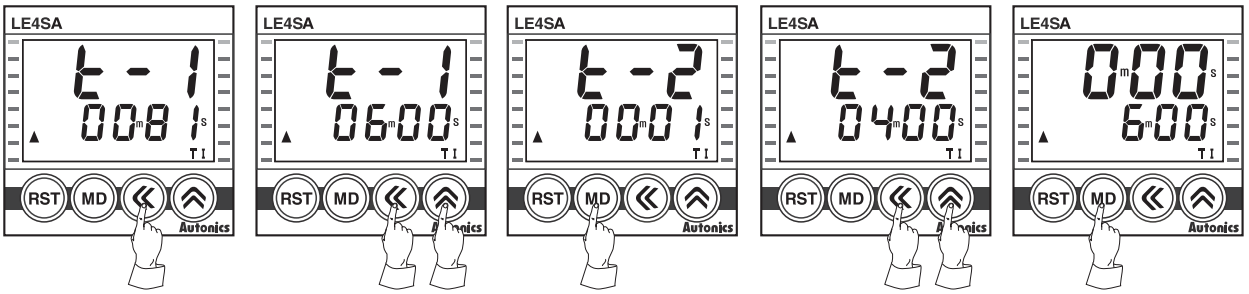
Run mode → Setting of t.oFF Time → Setting the time → (MD) Setting of t.on Time → Setting the time → (MD) Run mode

●Output operation mode : **ON OFF D, ON OFF D I** (**LE4S only.**)



Run mode → Setting of on.d Time → Setting the time → (MD) Setting of oFF.d Time → Setting the time → (MD) Run mode

●Output operation mode : **Δ-Δ, T, T I** (**LE4SA only.**)



Run mode → Setting of t-1 Time → Setting the time → (MD) Setting of t-2 Time → Setting the time → (MD) Run mode

※It is able to change the setting time during the time progressing, but be sure about the time progressing while changing of the time.

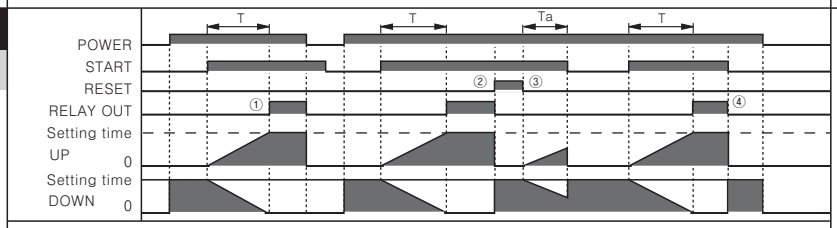
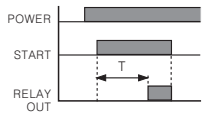
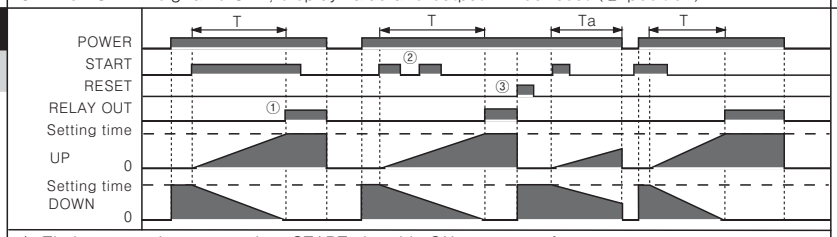
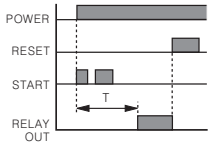
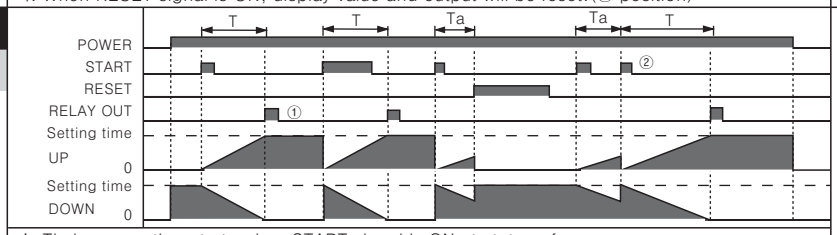
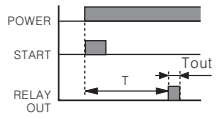
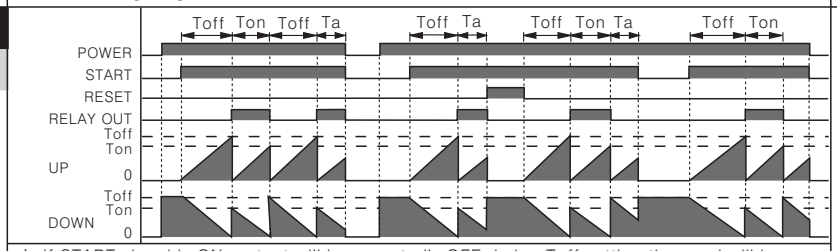
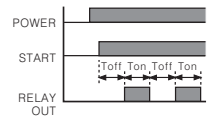
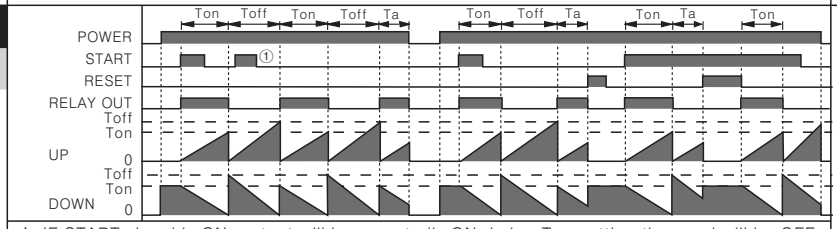
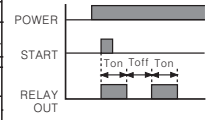
※If pressing (MD) key while setting time is shorter than min. setting time, setting value will be flickering three times and it will be returned to setting mode again, not to RUN mode.

※If there is no additional key operations after entering into setting mode, it will be return to RUN mode. (Setting value is not stored.)

※ Min. setting time : 0.01 sec.
(In case of on.d, on.d.1 and on.d.2 modes, it is able to set "0" since no min. setting time is applied.)

▣LE4S Output operation mode

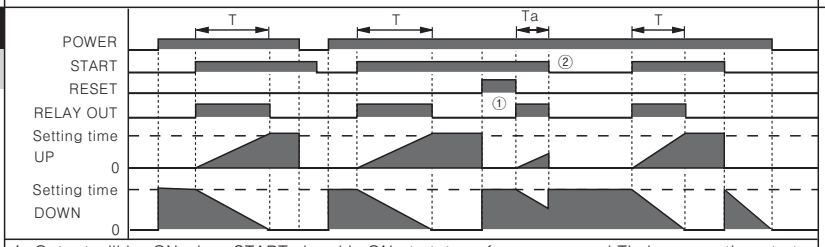
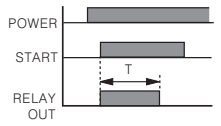
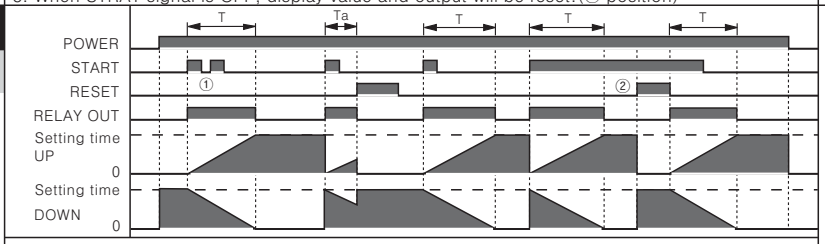
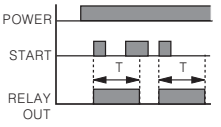
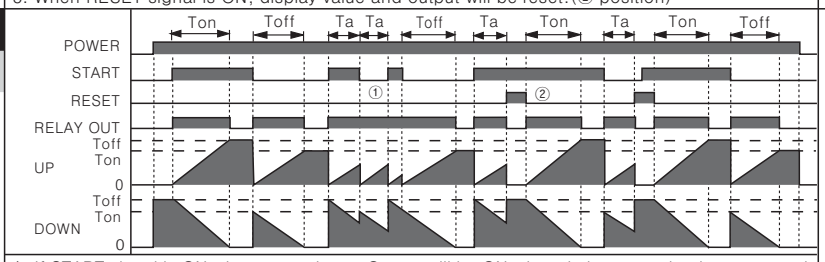
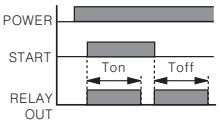
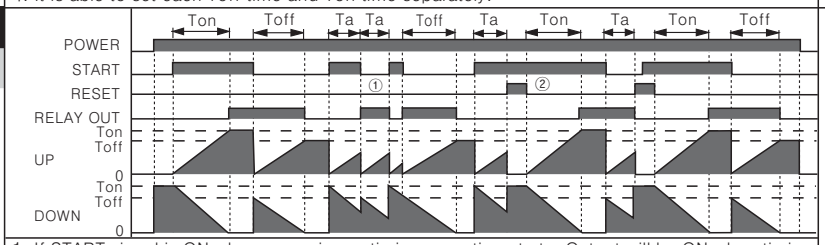
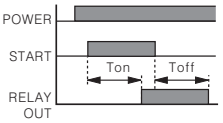
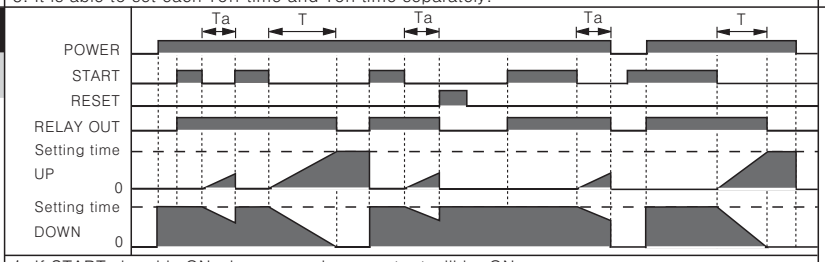
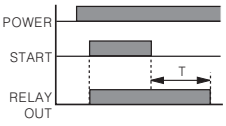
T = Setting time, T > Ta

Mode	Time chart	Operation
[ond] **OND** **ON-Delay** T >Ta	 1. Timing operation starts when START signal is ON at status of power on. 2. Output will be ON when timing operation is progressed up to the setting time. Display value will be HOLD.(① position) 3. When RESET signal is ON, display value and output will be reset.(② position) 4. If RESET signal is OFF while START signal is ON, "STEP 1" will be restarted.(③ position) 5. When START signal is OFF, display value and output will be reset.(④ position)	 T = Setting time
[ond.I] **OND I** **ON-Delay 1** T >Ta	 1. Timing operation starts when START signal is ON at status of power on. 2. Output will be ON when timing operation is progressed up to the setting time. Display value will be HOLD.(① position) 3. Even though START signal is applied repeatedly, only the initial signal is recognized.(② position) 4. When RESET signal is ON, display value and output will be reset.(③ position)	 T = Setting time
[ond.2] **OND II** **ON-Delay 2 (One-Shot Output)** T >Ta	 1. Timing operation starts when START signal is ON at status of power on. 2. Time limit output will be ON and goes OFF during Tout setting time when timing operation is progressed up to the setting time. Display value will be HOLD.(① position) 3. When RESET signal is ON, display value and output will be reset. 4. If START signal is applied while time is progressing, Timing operation will be reset and started again.(② position) 5. Tout setting range: 0.01 sec~99.99 sec.	 Tout = Output time T = Setting time
[FLK] **FK** **Flicker (Toff operation precedes Ton operation)** Ton, Toff >Ta	 1. If START signal is ON, output will be repeatedly OFF during Toff setting time and will be OFF during Ton setting time when power is ON. 2. When RESET signal is ON, display value and output will be reset. 3. If RESET signal is OFF when START signal is ON, "STEP 1" will be restarted. 4. When START signal is OFF, display value and output will be reset. 5. It is able to set each Toff time and Ton time separately. In [FLK] mode, timing operation starts with Toff.	 Ton, Toff = Setting time **Able to set Ton and Toff time differently.**
[FLK.I] **FK. I** **Flicker 1 (Ton operation precedes Toff operation)** Ton, Toff >Ta	 1. IF START signal is ON, output will be repeatedly ON during Ton setting time and will be OFF during Toff setting time when power is ON. 2. Even though START signal is applied repeatedly, only the initial signal is recognized.(① position) 3. When START signal is ON, display value and output will be reset. If START signal is ON, it will be restarted. 4. It is able to set each Toff time and Ton time separately. In [FLK.I] mode, timing operation starts with Ton.	 Ton, Toff = Setting time **Able to set Ton and Toff time differently.**

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

▣LE4S Output operation mode

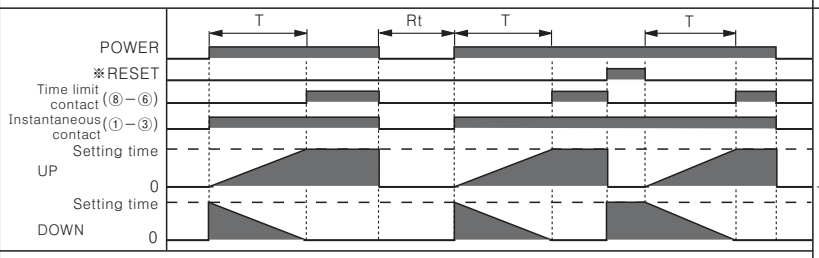
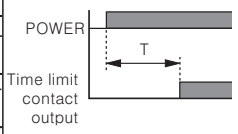
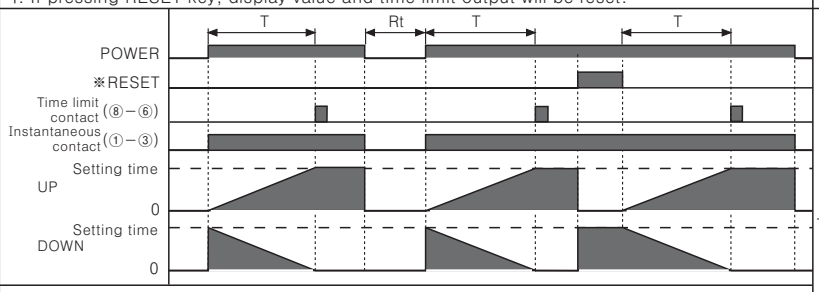
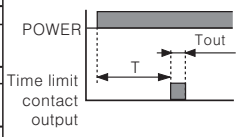
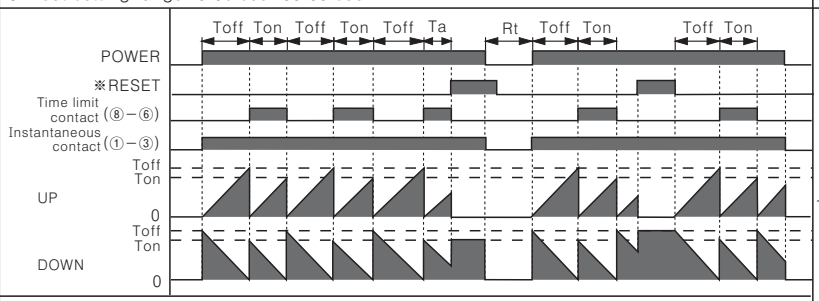
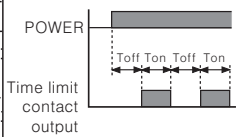
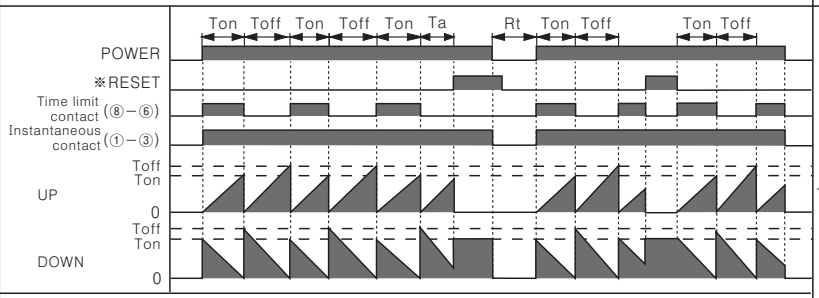
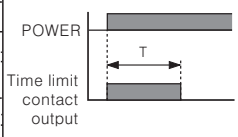
T = Setting time, T > Ta

Mode	Time chart	Operation
[I nt] **INT** **Interval** T >Ta	 1. Output will be ON when START signal is ON at status of power on and Timing operation starts. 2. Output will be OFF when timing operation is progressed up to the setting time. Display value will be HOLD. 3. When RESET signal is ON, display value and output will be reset.(① position) 4. If RESET signal is OFF when START signal is ON, "STEP 1" will be restarted. 5. When STRAT signal is OFF, display value and output will be reset.(② position)	 T = Setting time
[I nt.1] **INT I** **Interval 1** T >Ta	 1. Output will be ON when START signal is ON at status of power on and Timing operation starts. 2. Output will be OFF when timing operation is progressed up to the setting time. Display value will be HOLD. 3. Even though START signal is applied repeatedly, only the initial signal is recognized.(① position) 4. If START signal is ON after timing operation is progressed up to the setting time, Output will be ON and setting time will be reset and then timing setting starts. 5. When RESET signal is ON, display value and output will be reset.(② position)	 T = Setting time
[nFd] **ON OFF D** **ON OFF Delay** T >Ta	 1. If START signal is ON when power is on, Output will be ON when timing operation is progressed up to the Ton setting time(On-Delay). IF START signal is OFF, output will be ON when timing operation is progressed up to the Toff setting time (OFF-Delay). 2. If START signal is applied repeatedly, output is ON and display value will be reset.(① position) 3. When RESET signal is ON, display value and output will be reset. When RESET signal is OFF while START signal is ON, it will be operating as On-Delay.(② position) 4. It is able to set each Toff time and Ton time separately.	 Ton, Toff = Setting time
[nFd.1] **ON OFF D I** **ON OFF Delay 1** T >Ta	 1. If START signal is ON when power is on, timing operation starts. Output will be ON when timing operation is progressed up to the Ton setting time(On-Delay). IF START signal is OFF, output will be ON when timing operation is progressed up to the Toff setting time (OFF-Delay). 2. Output will be ON when START signal is ON and goes OFF during setting time and display value will be reset.(① position) 3. Output will be OFF when START signal is OFF and goes ON during setting time and display value will be reset.(① position) 4. When RESET signal is ON, display value and output will be reset. When RESET signal is OFF while START signal is ON, it will be operating as On-Delay.(② position) 5. It is able to set each Toff time and Ton time separately.	 Ton, Toff = Setting time
[oFd] **OFF D** **OFF Delay** T >Ta	 1. If START signal is ON when power is on, output will be ON. 2. When START signal is OFF, timing operation starts. Output will be OFF when timing operation is progressed up to the setting time. Display value will be HOLD. 3. When RESET signal is ON, display value and output will be reset.	 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 Output operation mode

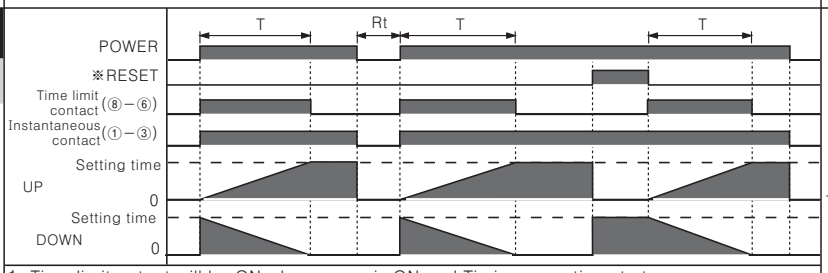
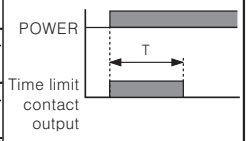
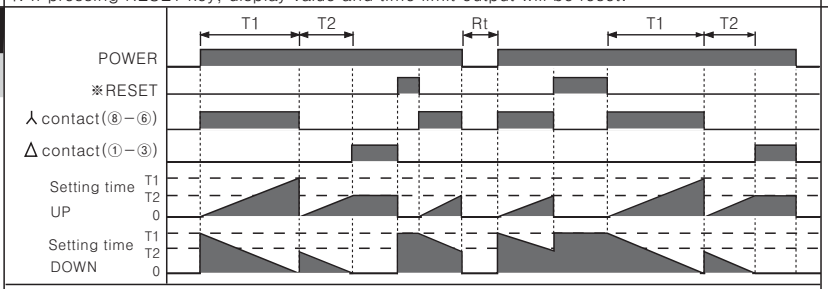
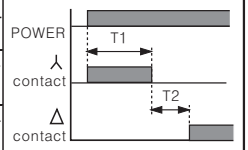
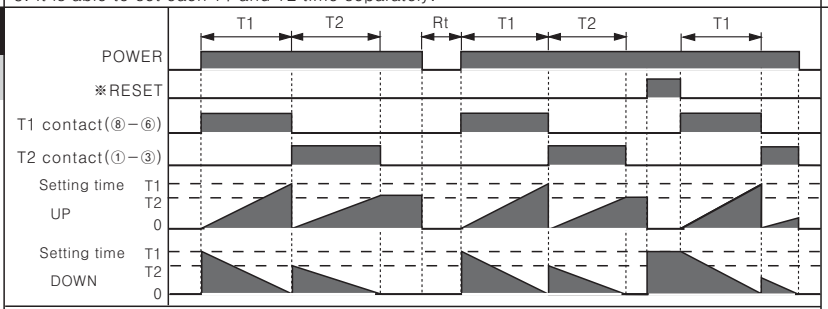
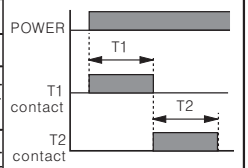
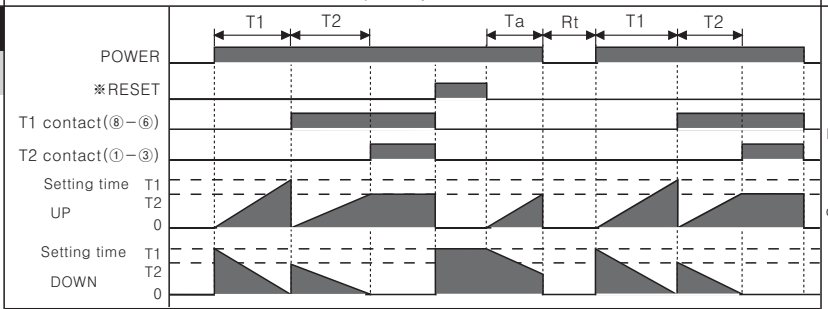
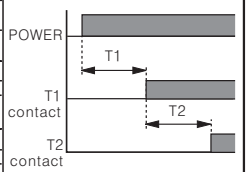
T = Setting time, T > Ta, Rt = Reset time

Mode	Time chart	Operation
[ond] **OND** **ON Delay**	 1. Timing operation starts when power is ON. 2. Time limit output will be ON when timing operation is progressed up to the setting time. Display value will be HOLD. 3. If selecting time limit 1c + instantaneous 1c mode, instantaneous output will be ON when power is ON and goes OFF when power is OFF. 4. If pressing RESET key, display value and time limit output will be reset.	 T = Setting time
[ond.2] **OND II** **ON Delay 2 (One-Shot Output)**	 1. Timing operation starts when power is ON. 2. Time limit output will be ON during Tout setting time and goes OFF when timing operation is progressed up to the setting time. Display value will be HOLD. 3. If selecting time limit 1c + instantaneous 1c mode, instantaneous output will be ON when power is ON and goes OFF when power is OFF. 4. If pressing RESET key, display value and time limit output will be reset. 5. Tout setting range: 0.01 sec~99.99 sec.	 Tout = Output time T = Setting time
[FLK] **FK** **Flicker (Toff operation precedes Ton operation)** Ton, Toff >Ta, Tb	 1. Control output will be repeatedly OFF during Toff setting time and will be ON during Ton setting time when power is ON. 2. If selecting time limit 1c + instantaneous 1c mode, instantaneous output will be ON when power is ON and goes OFF when power is OFF. 3. If pressing RESET key, display value and time limit output will be reset. 4. It is able to set each Toff time and Ton time separately. In [FLK] mode, timing operation starts with Toff.	 Ton, Toff = Setting time **Able to set T-ON and T-OFF time differently.**
[FLK.1] **FK I** **Flicker 1 (Ton operation precedes Toff operation)**	 1. Control output will be repeatedly ON during Ton setting time and will be OFF during Toff setting time when power is ON. 2. If selecting time limit 1c + instantaneous 1c mode, instantaneous output will be ON when power is ON and goes OFF when power is OFF. 3. If pressing RESET key, display value and time limit output will be reset. 4. It is able to set each Ton time and Toff time separately. In [FLK.1] mode, timing operation starts with Ton.	 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(OUT2) will be returned when power is off.
※RESET key is locked for default set and release the lock to use.

▣LE4SA Output operation mode

Rt : Reset time(Min. 500ms)

Mode	Time chart	Operation
[INt] **INT** **Interval**	 1. Time limit output will be ON when power is ON and Timing operation starts. 2. Time limit output will be OFF when timing operation is progressed up to the setting time. Display value will be HOLD. 3. If selecting time limit 1c + instantaneous 1c mode, instantaneous output will be ON when power is ON and goes OFF when power is OFF. 4. If pressing RESET key, display value and time limit output will be reset.	 T = Setting time
[S-d] **人-Δ** **Star-Delta** **(Output will be set automatically as Time limit 2c)**	 1. 人 contact will be ON when power is ON and Timing operation starts. 2. 人 contact will be OFF when timing operation is progressed up to the T1 setting time. Timing operation will be reset and started again. 3. Δcontact will be ON when timing operation is progressed up to the T2 switching time. Display value will be HOLD. 4. If pressing RESET key, display value and 人−Δcontacts will be reset. 5. It is able to set each T1 and T2 time separately.	 ※T1 : Setting time T2 : Return time (人−Δ Return time)
[tWn] **T** **Twin** **(Output will be set automatically as Time limit 2c)**	 1. T1 contact will be ON when power is ON and Timing operation starts. 2. T1 contact will be OFF and T2 contact will be ON when timing operation is progressed up to the T1 setting time. Timing operation will be reset and started again. T2 contact will be OFF when timing operation is progressed up to the T2 setting time. Display value will be HOLD. 3. If pressing RESET key, display value and T1, T2 contacts will be reset. 4. It is able to set each T1 and T2 time separately.	 T1, T2 = Setting time Able to set T1 and T2 time differently.
[tWn.I] **T I** **Twin 1** **(Output will be set automatically as Time limit 2c)** T1, T2 > Ta	 1. Timing operation starts when power is ON. 2. T1 contact will be ON when timing operation is progressed up to the T1 setting time. Timing operation will be reset and started again. 3. T2 contact will be ON when timing operation is progressed up to the T2 setting time. Display value will be HOLD. 4. If pressing RESET key, display value and T1 and T2 contacts will be reset. 5. It is able to set each T1 and T2 time separately.	 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" .
※Instantaneous contact(OUT2) will be returned when power is off.
※RESET key is locked for default set and release the lock to use.

▣Proper usage

⚠ Caution

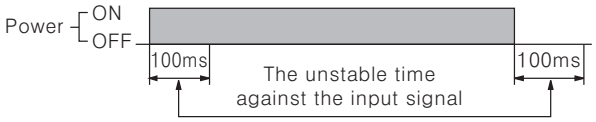
It may give an electric shock if touch the input signal terminal(Between START, RESET, INHIBIT and terminal ②) when the power is supplied.

◎Power connection

- ●Connect AC power line between (②−⑦) for LE4S, LE4SA AC power type. Be careful 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(100ms) after power off.

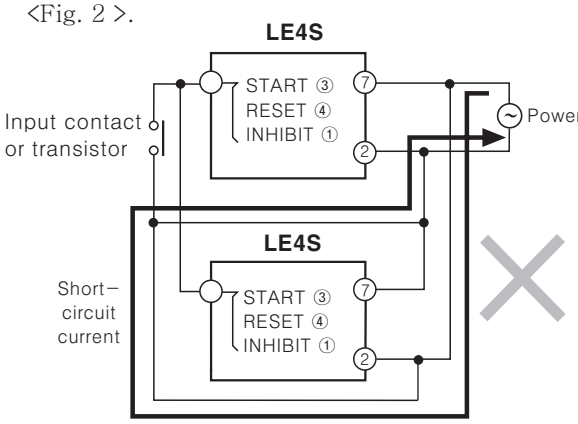


- ●Power start
  LE4SA model is starting after 100ms of applying power(Refer to the above figure.)
  (Pleaes use over 100ms setting)
  When you need under 100ms setting, please use Signal start type LE4S.
- ●Please supply power quickly as using switch or relay contact, otherwise it may cause timing error.

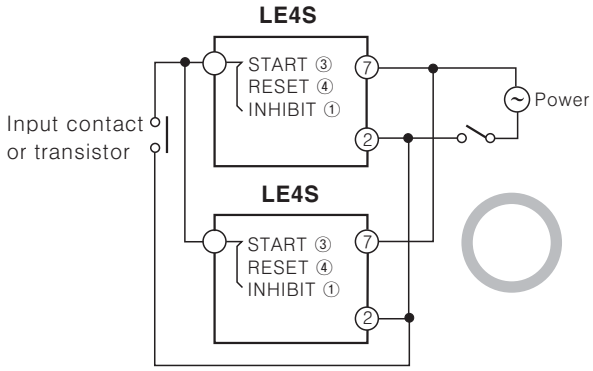
◎Input/Output

- ●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 8 Pin 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 connecting 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.
  (Time error can be occurred 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 <Fig. 2 >.

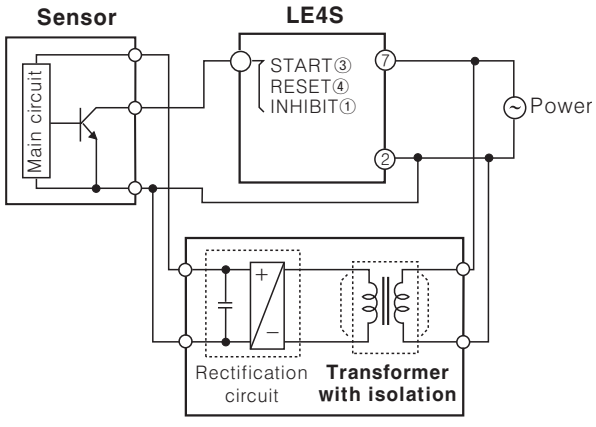


< Fig. 1 >



< Fig. 2 >

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

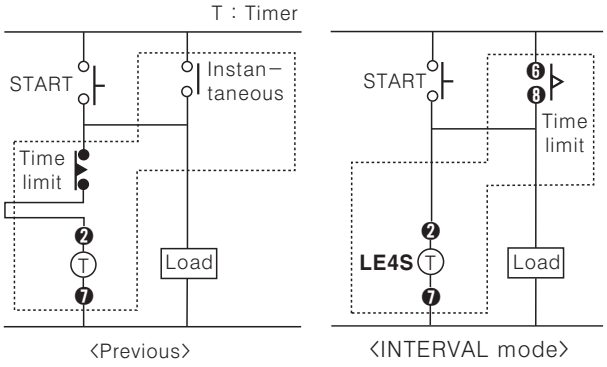


< External sensor power supply >

- ●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.



◎Change of output operation mode and timer range

If changing output operation mode or time range, previous reset value will be deleted.

But, Up/Down selection mode and lock mode are exception.

◎Change of preset value

- ●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.

◎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 to 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.

DIN W48×H48mm Digital timer

▣Features

- ●Wide range of the time selection(0.01sec. to 9999.9 hour)
- ●Power supply : 100−240VAC 50/60Hz, 12−24VAC/DC(Option)
- ●Memory protection : 10years
  (When using non−volatile semiconductor memory)
- ●Built−in microprocessor
- ●8 Pin plug connection type

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

▣Ordering information

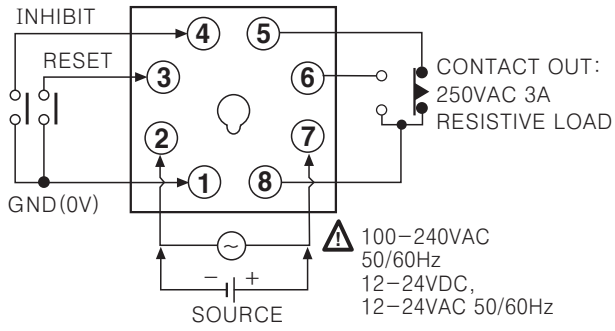
FS	4	E	☐		
Item	Digit	Counter/Timer	Output		
				Blank	Single preset
				I	Indicator
		E			Timer
	4				9999(4 Digit)
	5				99999(5 Digit)
FS					8 Pin Plug Timer

▣Specifications

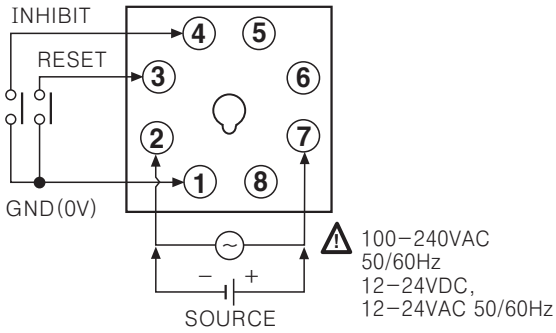
Model		FS4E	FS5EI
Function		Single preset Up/Down Timer	Up/Down indicator
Character size		W4×H8mm	
Power supply		100−240VAC 50 /60Hz, 12−24VAC/DC(Option)	
Allowable voltage range		90 to 110% of rated voltage	
Power consumption		Approx. 4.5VA(240VAC 60Hz), Approx. 2.5W(24VDC)	Approx. 3.5VA(240VAC 60Hz), Approx. 2.2W(24VDC)
Reset 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		
Timing operation		Power ON Start	
One−shot output time		0.05 to 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 protection		10 years(When using non−volatile semiconductor memory)	
Repeat error		Max. ±0.01% ±0.05sec.	
SET error			
Voltage error			
Temperature error			
Insulation resistance		100MΩ(at 500VDC megger)	
Dielectric strength		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 to 55Hz in each of X, Y, Z directions for 1hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 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 to 55℃(at non−freezing status)	
Storage temperature		−25 to 65℃(at non−freezing status)	
Ambient humidity		35 to 85%RH	
Unit weight	AC power	Approx. 122g	Approx. 112g
	DC power	Approx. 130g	Approx. 120g

▣Connections

●**FS4E**

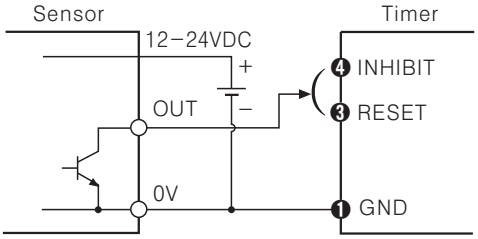


●**FS5EI**



▣Input connections

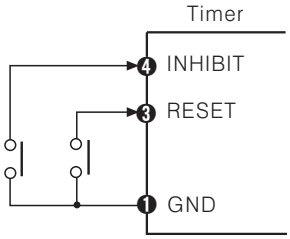
◎Solid-state input



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

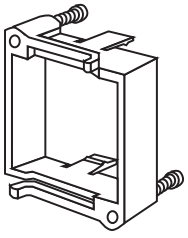
※Above numbers are terminal block.

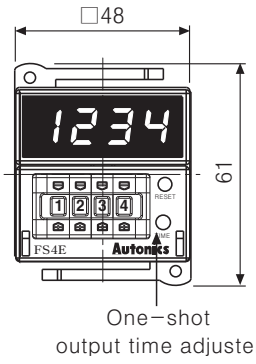
◎Contact input

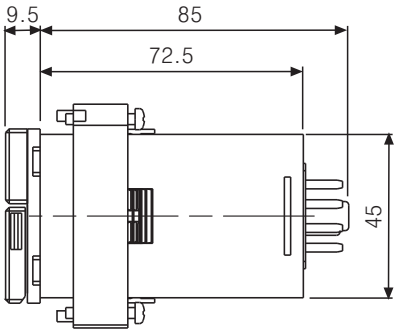


●Contact ON → INHIBIT, RESET
●Limit switch, Micro switch, Relay contact
●Please use reliable contacts enough to flow 5VDC 1mA of current.

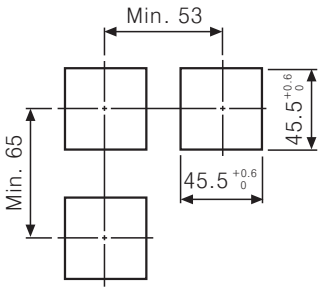
▣Dimensions

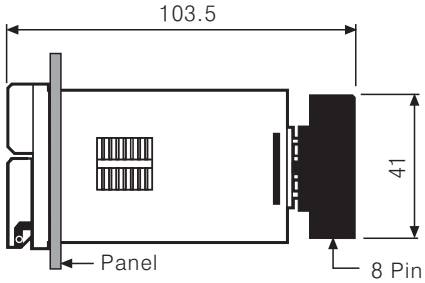






●Panel cut-out

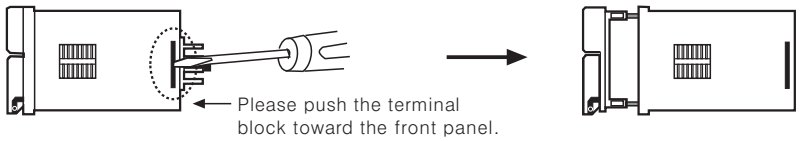




(Unit:mm)

▣Case detachment

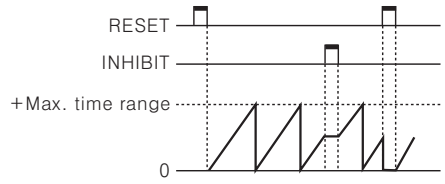
Please cut off the power and detach the case from body.



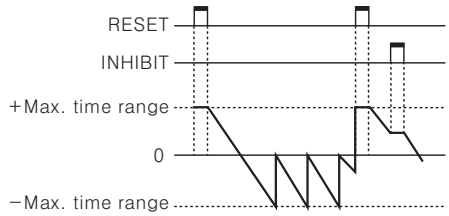
Please widen the Lock of product with driver and push it toward the front panel with, it will be detached.
※Please be careful of the injury cause by tools.

▣Time operation of indication type

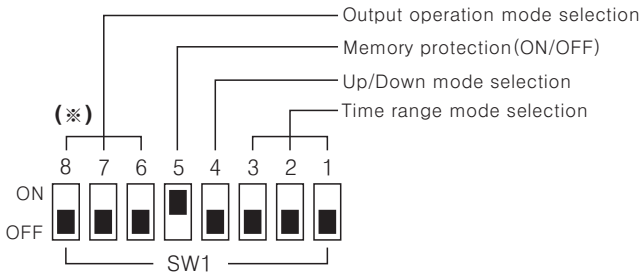
●Up mode

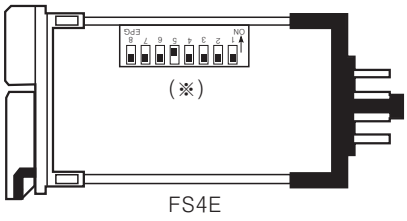


●Down mode



▣Description of inner DIP switches





※In case of indicator(FS5EI), 5 Pin DIP switch is included, because there is no output operation mode.

※As upgraded model do not have unnecessary functions (No.5 : Timer, No.6 : NC), inner DIP switch is changed as 8 Pin.

●Up/Down mode

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

●Memory protection

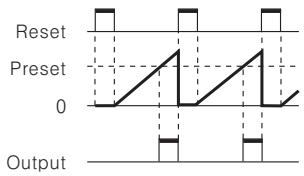
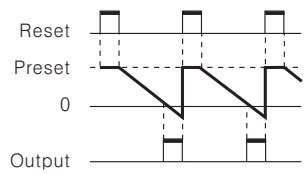
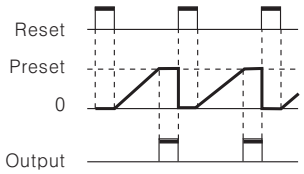
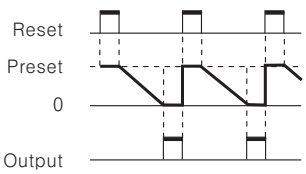
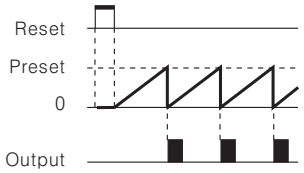
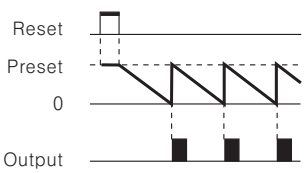
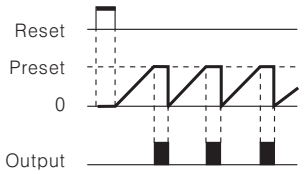
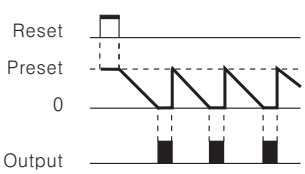
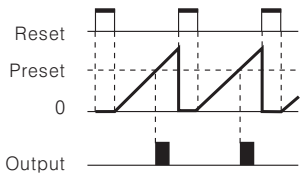
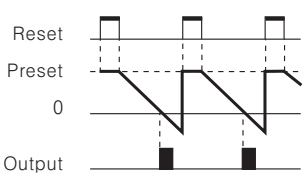
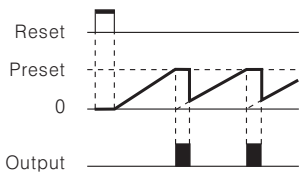
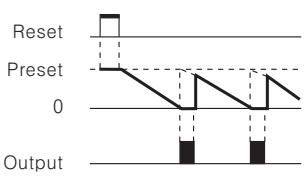
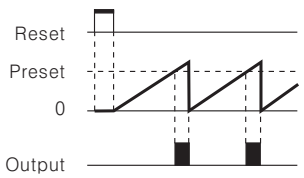
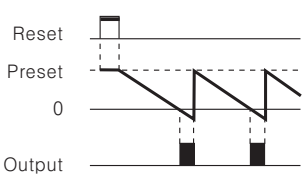
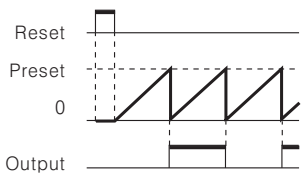
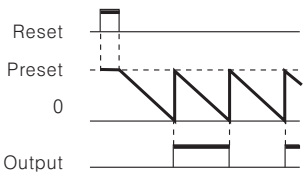
SW1		Function
5	ON / OFF	Disable the memory protection
	ON / OFF	Enable the memory protection

▣Time range mode

Model / SW1	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

▣FS4E Output operation mode

← One-shot output(0.05 to 5sec.) ← Retained output

Mode	4 ON OFF Up mode	4 ON OFF Down mode	Operation after time up
F SW1 6 7 8 ON OFF			The display value continues until Reset signal applied and the output will be held.
N SW1 6 7 8 ON OFF			The display value and output will be held until Reset signal.
C SW1 6 7 8 ON OFF			The processing time restarts at the same time when reset automatically regardless of output. The output is one-shot.
R SW1 6 7 8 ON OFF			The process time will be held until output is OFF and restarts at the same time when reset automatically. The output is one-shot.
K SW1 6 7 8 ON OFF			The time continues until Reset signal is applied. The output is one-shot.
P SW1 6 7 8 ON OFF			The processing time will be held until output is OFF and restarts at the same time when reset automatically. It progresses displaying one-shot output when restarting.
Q SW1 6 7 8 ON OFF			The processing time will be held until output is OFF and restarts at the same time when reset automatically. The output is one-shot.
S SW1 6 7 8 ON OFF			The output will be OFF and ON for setting time and repeats (flashing) 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).

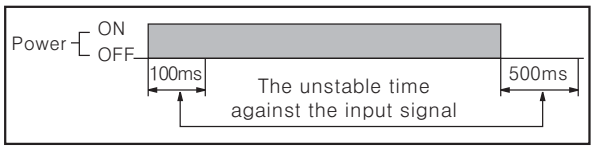
▣Proper usage

◎Preset value

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

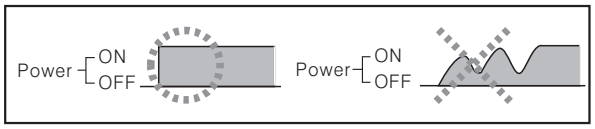
◎Power

●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 rated power and apply or cut the power quickly to prevent chattering.

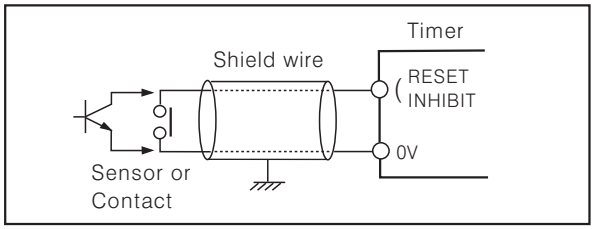


◎Input signal line

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

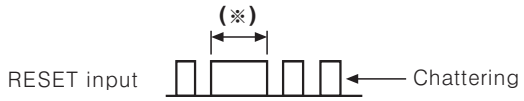
●Please use shield wire for input signal.

●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 display

If setting value is "0000", "Err0" will be displayed.
If setting 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 Error display function.

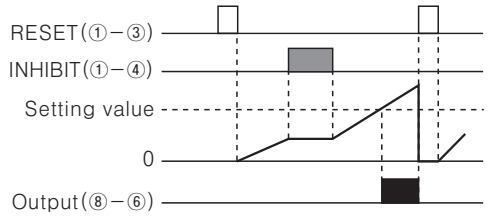
◎RESET

RESET has two function, which are memorizing DATA function and resetting output function.
When changing an inner selection switch, manual RESETor 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 the 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 to 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×H48mm, Universal voltage multi-function timer

Upgrade

▣Features

- ●Realization of wide range of power supply : 100-240VAC 50/60Hz / 24-240VDC, 24VAC 50/60Hz / 24VDC, 12VDC
- ●Various output operation(6 kinds modes)
- ●Multi time range(16 kinds of time range)
- ●Wide control time(0.05sec. to 100hour)
- ●Easy setting of time, time range, output operation mode
- ●Easy to check output status by LED display

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

▣Ordering information

AT 8 N - □

Power supply	Blank	100-240VAC/24-240VDC
	1	12VDC
	2	24VAC/DC
Output	N	Time limit contact 2c or time limit contact 1c with instantaneous contact 1c by selecting output operation mode.
Plug type	8	8 Pin plug type
Item	AT	Analog Timer

※Socket required : PG-08, PS-08

AT 11 DN - □

Power supply	Blank	100-240VAC/24-240VDC
	1	12VDC
	2	24VAC/DC
Output	DN	Time limit 2c
	EN	Time limit 1c, Instantaneous contact 1c
Plug type	11	11 Pin plug type
Item	AT	Analog Timer

※Socket required : PG-11, PS-11

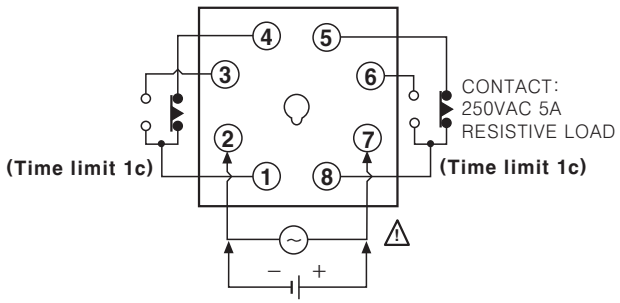
▣Specifications

Model		AT8N-□	AT11EN-□	AT11DN-□
Function		Multi function timer		
Control time setting range		0.05 sec. to 100 hour		
Power supply		• 100-240VAC 50/60Hz, 24-240VDC • 24VAC 50/60Hz, 24VDC • 12VDC		
Allowable voltage range		90 to 110% of rated voltage		
Power consumption		• 100-240VAC : 4.3VA, 24-240VDC : 2W • 24VAC : 4.5VA, 24VDC : 2W • 12VDC : 1.5W		• 100-240VAC:3.5VA, 24-240VDC:1.5W • 24VAC:4VA, 24VDC:1.5 • 12VDC:1W
Reset time		Max. 100ms		
Min.input signal width	START input	———	Min. 50ms	
	INHIBIT input			
	RESET input			
Input	START input	———	No-voltage input ☞ Short-circuit impedance : Max. 1kΩ Residual voltage : Max. 0.5V Open-circuit impedance : Min. 100kΩ	
	INHIBIT input			
	RESET input			
Timing operation		Power ON start type	Signal ON Start type	
Control output	Contact type	Time limit DPDT(2c), Time limit DPDT(1c)+ Instantaneous DPDT(1c) by selecting output operation mode	Time limit SPDT(1c), Instantaneous SPDT(1c)	Time limit DPDT(2c)
	Contact capacity	250VAC 5A resistive load		
Relay life cycle	Mechanical	Min. 10,000,000 operations		
	Electrical	Min. 100,000 operations(250VAC 5A resistive load)		
Repeat error		Max. ±0.2 % ±10ms		
SET error		Max. ±5% ±50ms		
Voltage error		Max. ±0.5%		
Temperature error		Max. ±2%		
Insulation resistance		Min. 100MΩ (at 500VDC megger)		
Dielectric stength		2000VAC 50/60Hz for 1 minute		
Ambient temperature		-10 to 55℃ (at non-freezing status)		
Storage temperature		-25 to 65℃ (at non-freezing status)		
Ambient humidity		35 to 85%RH		
Approval		CE cULus		
Unit weight		Approx. 90g		

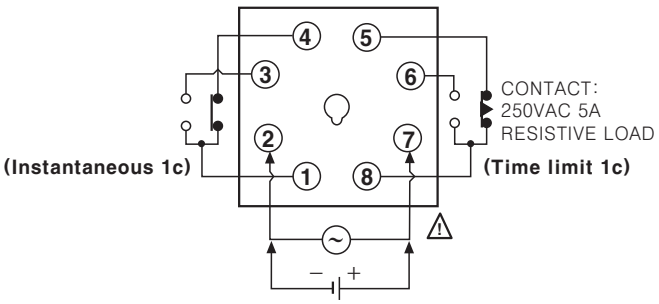
▣Connections

◎AT8N

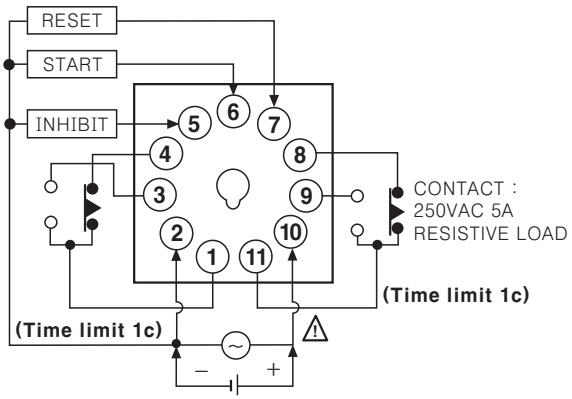
●[**A**], [**F**] mode



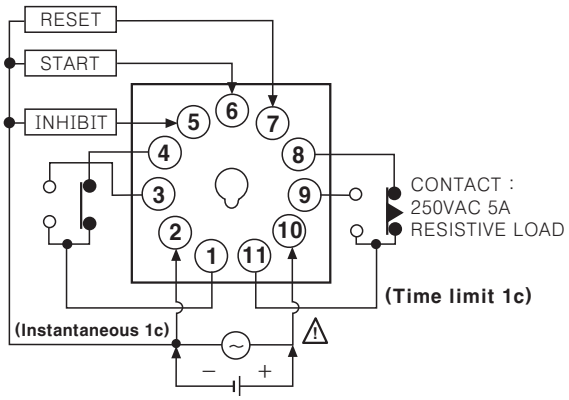
●[**A1**], [**B**], [**F1**], [**I**] mode



◎AT11DN

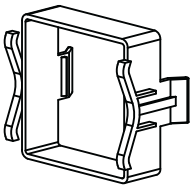


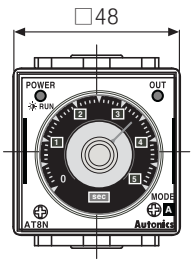
◎AT11EN

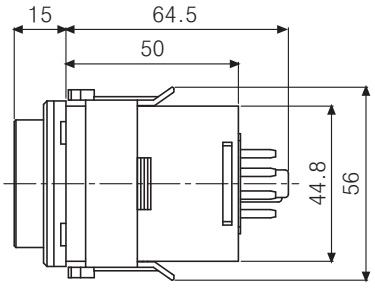


▣Dimensions

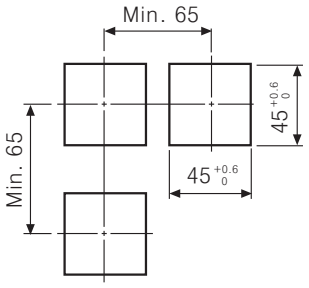
●Bracket

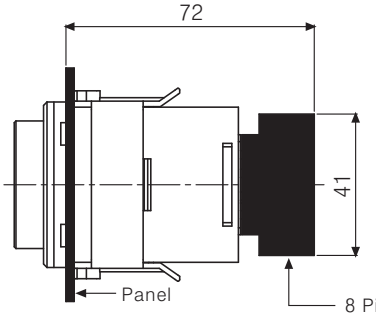






●Panel cut−out

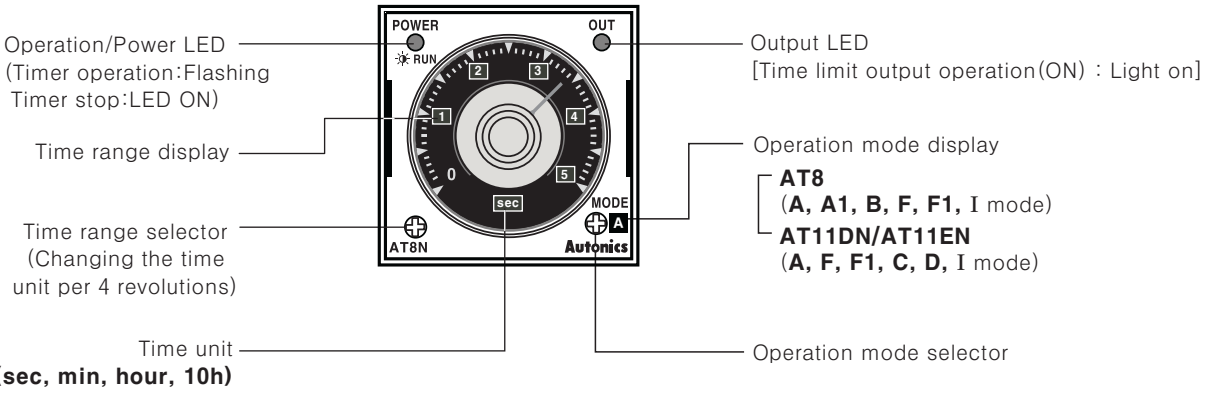




8 Pin socket : PG−08 (Sold separately)
11 Pin socket : PG−11 (Sold separately)
※Refer to G−11 page.

(Unit:mm)

▣Front panel identification



※Please rotate the time range switch and operation mode switch to CW(Clockwise) direction.

▣Time specifications

Time range	Time unit	Time setting range
0.5	**sec**	0.05 to 0.5 sec.
1.0		0.1 to 1.0 sec.
5		0.5 to 5 sec.
10		1 to 10 sec.
0.5	**min**	0.05 to 0.5 min.
1.0		0.1 to 1.0 min.
5		0.5 to 5 min.
10		1 to 10 min.
0.5	**hour**	0.05 to 0.5 hour
1.0		0.1 to 1.0 hour
5		0.5 to 5 hour
10		1 to 10 hour
0.5	**10h**	0.5 to 5 hour
1.0		1 to 10 hour
5		5 to 50 hour
10		10 to 100 hour

▣Output operation mode of each model

●AT8N

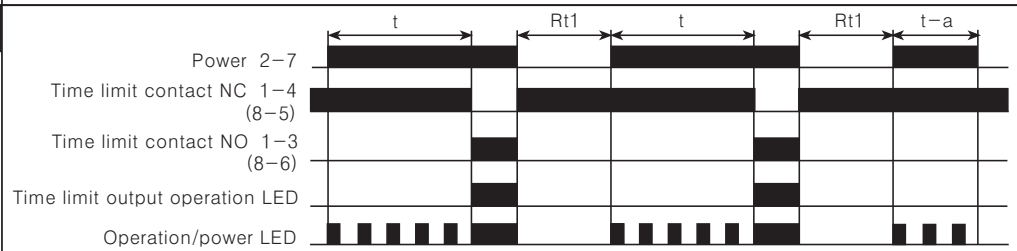
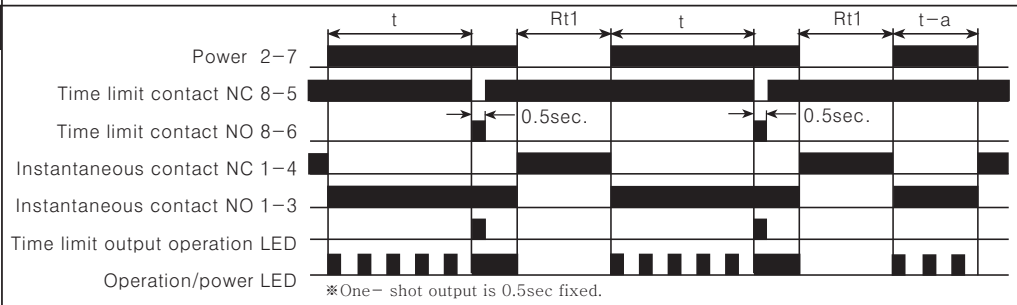
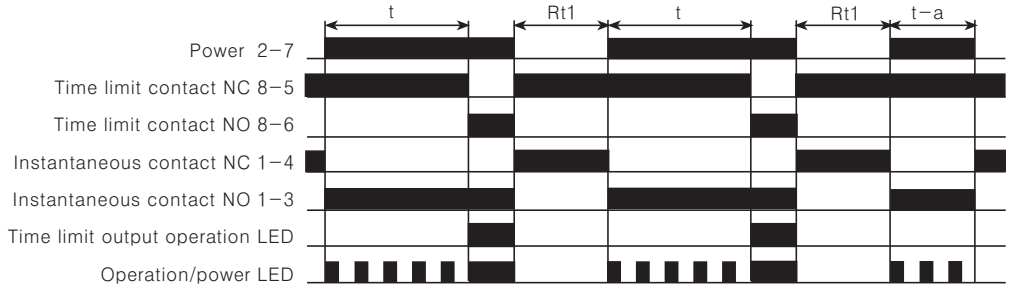
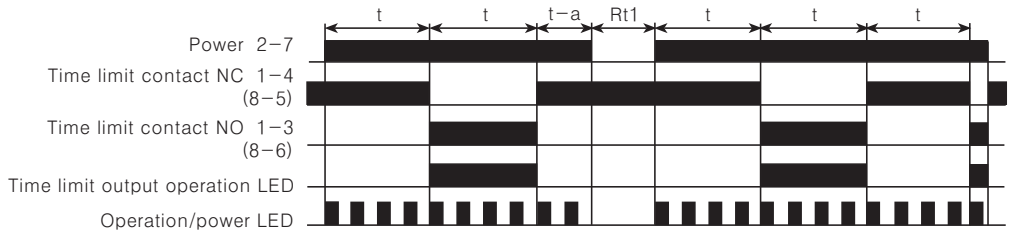
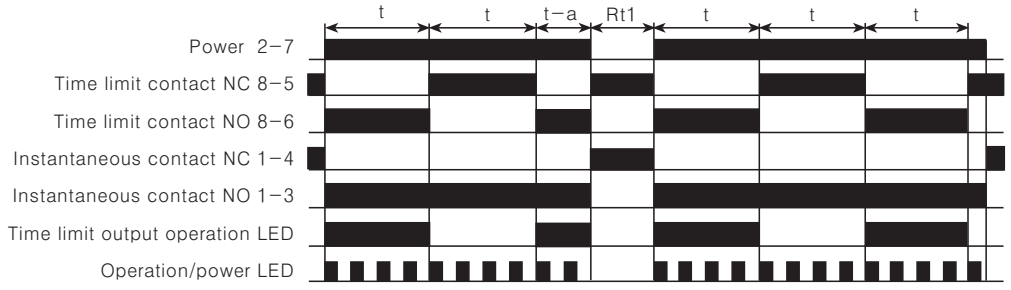
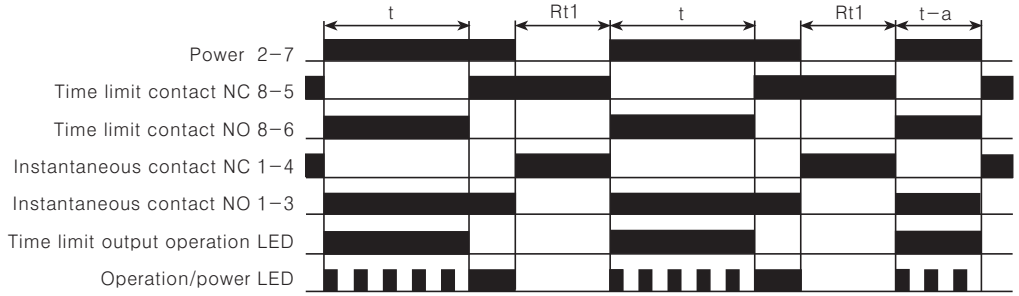
Display	Output operation mode
A	POWER ON DELAY
A1	POWER ON DELAY 1
B	POWER ON DELAY 2
F	FLICKER (OFF START)
F1	FLICKER 1 (ON START)
I	INTERVAL

●AT11DN/AT11EN

Display	Output operation mode
A	SIGNAL ON DELAY
F	FLICKER (OFF START)
F1	FLICKER 1 (ON START)
C	SIGNAL OFF DELAY
D	SIGNAL ON/OFF DELAY
I	INTERVAL

▣AT8N Output operation mode

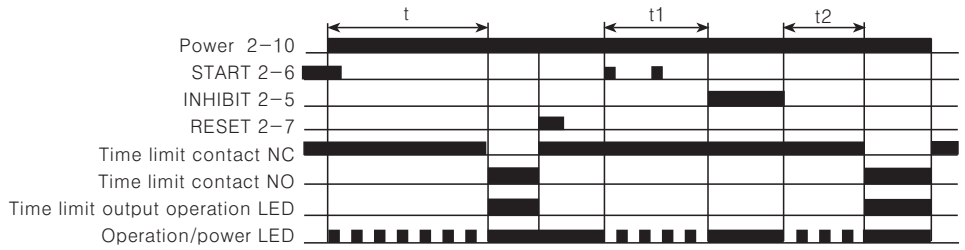
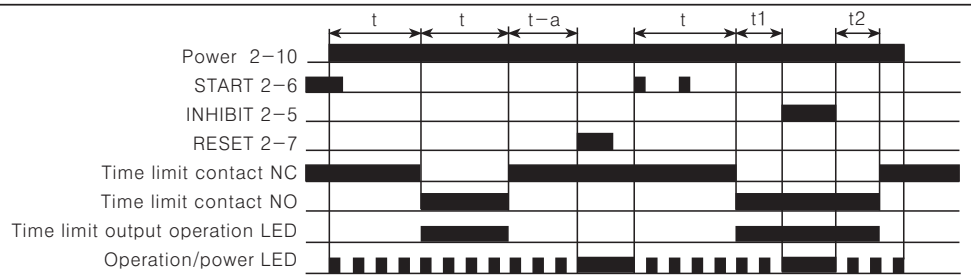
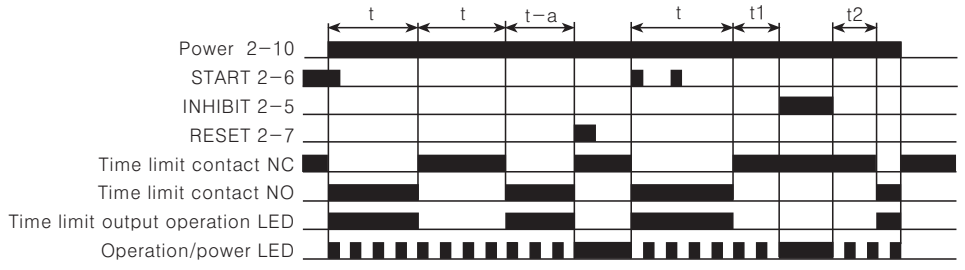
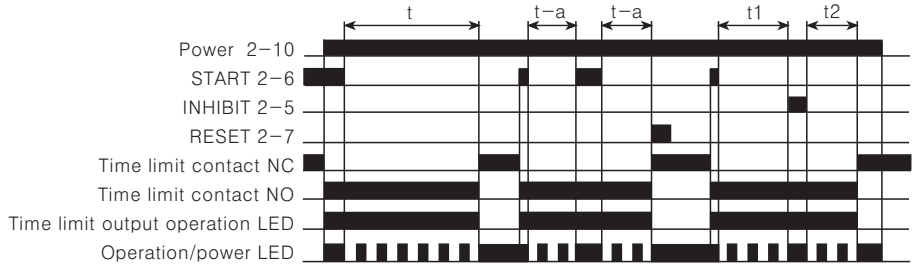
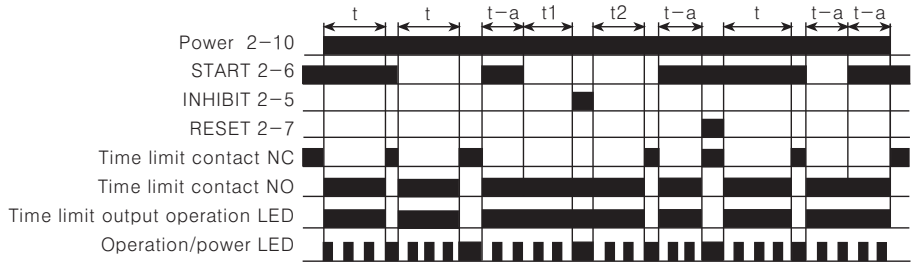
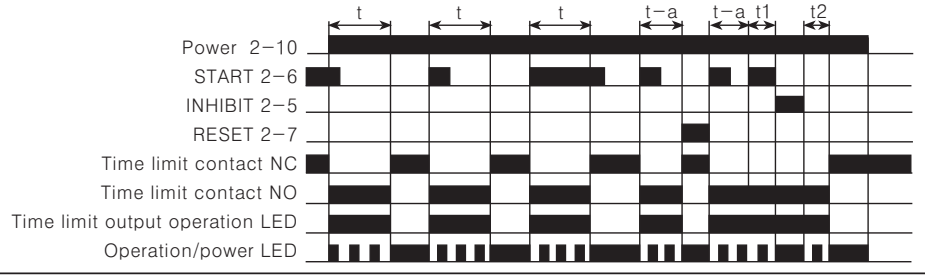
t:Setting time, t > t−a, Rt:Return time, Rt1>Rt

Mode	Time chart
A **POWER ON DELAY MODE**	
A 1 **POWER ON DELAY 1 MODE (One-shot output)**	 ※One− shot output is 0.5sec fixed.
B **POWER ON DELAY 2 MODE**	
F **FLICKER MODE**	
F 1 **FLICKER 1 MODE**	
I **INTERVAL MODE**	

※When using F, F1 output operation modes, if the time is set too short, the output may not work properly.
Please set the time at least over 100ms.

▣AT11DN/AT11EN Output operation mode

t:Setting time, t=t1+t2, t>t−a

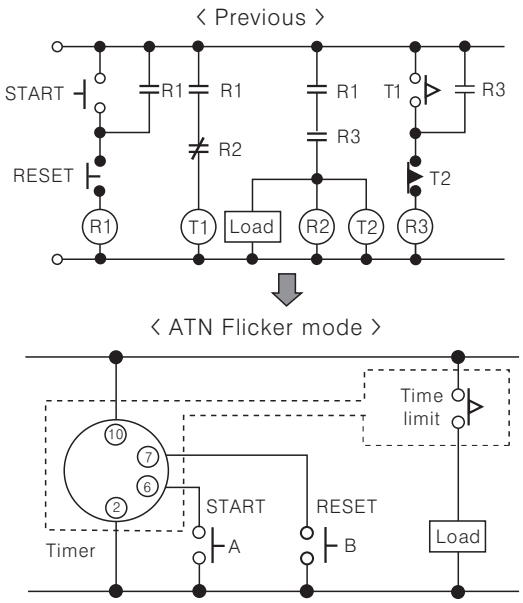
Mode	Time chart
A **SIGNAL ON DELAY MODE**	
F **FLICKER MODE**	
F 1 **FLICKER1 MODE**	
C **SIGNAL OFF DELAY MODE**	
D **SIGNAL ON /OFF DELAY MODE**	
I **INTERVAL MODE**	

Note) 1. If power is removed or the RESET terminal is short−circuited, the timer will be reset.
2. If the INHIBIT terminal is short−circuited during a timing cycle, the time will stop.
3. When using F, F1 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

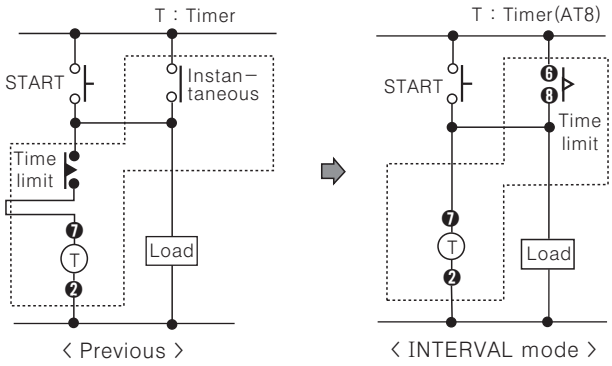
◎Repeat function(Flicker)

- It enables to use one ATN timer for 3 sub relays and 2 timers(Flicker function).
  Simple to use flicker function with only one ATN timer.
- Switch A : Start, Switch B : Reset.



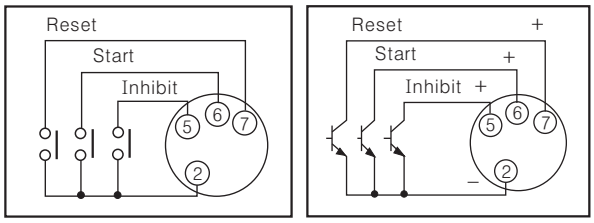
◎INTERVAL mode

It enables to make instantaneous ON and time limit OFF(Remained circuit) with using INTERVAL mode.

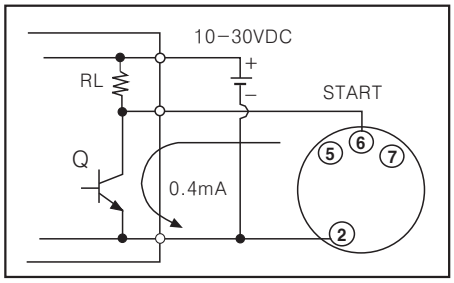


◎Input signal condition(AT11DN, AT11EN)

1. Relay contact input
   Please use gold-plated switches with good contact assurance and short bouncing time for contact input. (Open resistance : Over 100kΩ, Short-circuit resistance : Under 1kΩ)
   ※Please use a contact that can function reliably at 5VDC 0.4mA.
2. NPN open collector transistor input
   Please use the characteristic of transistor as follow;
   Vceo : Min. 25V
   Ic : Min. 10mA
   Icbo : Max. 0.2μA
   Residual voltage : Max. 0.5V



3. NPN universal input
   It enables to use voltage output type as input signal source instead of open collector output in solid-state circuit(Proximity sensor, photo-electric sensor) which has range of 10-30VDC output voltage.
   When H signal change to L, timer will start.
   When transistor(Q) is ON status, please make residual voltage under 0.5V.



◎Terminal connection

1) Please wire correctly with wiring instructions
2) Power connection
   Connect the power line without observing polarity for ATN series AC power type, but please be careful of power connection for DC power type.

Power supply	8 Pin type	11 Pin type
AC Type	Terminal ② - ⑦	Terminal ② - ⑩
DC Type	Terminal ② ← ⊖ Terminal ⑦ ← ⊕	Terminal ② ← ⊖ Terminal ⑩ ← ⊕

- When turning off the power, be careful of inductive voltage.(If using power line with another high voltage line or energy line near by, it may cause inductive voltage).
- Power ripple should be under 10% and power supply should be within range of allowable voltage for DC power type.
- Please supply the power quickly when using a switch or a relay contact. Otherwise, it may cause time error or power reset failure.

3) The load of Control output should be under rated load capacity.

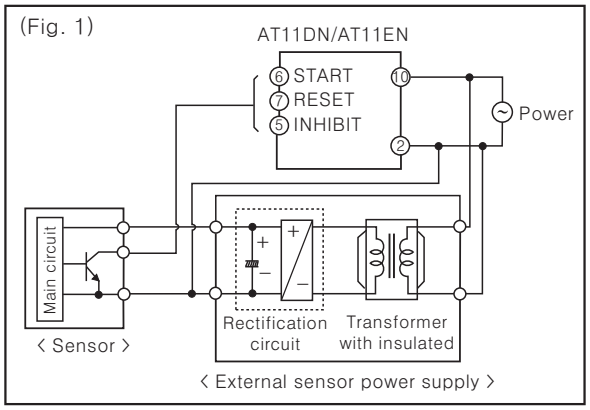
◎Setting time, time range, operation mode

Do not change time range or operation mode while time operating. When changing it, please power off or apply reset signal.

◎Input connection

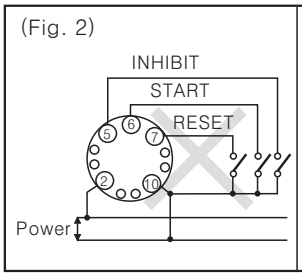
1) AT11DN/AT11EN Timer is transformerless type, therefore please check following for connecting relay contact for input signal and transistor.

(Fig. 1)

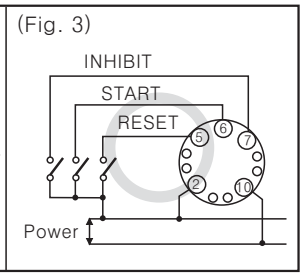


2) When using the terminal ⑩ as a common terminal of input signal as (Fig. 2), it may cause damage to the inner circuit of AT11DN/AT11EN, please use the terminal ② for common terminal as (Fig. 3).

(Fig. 2)

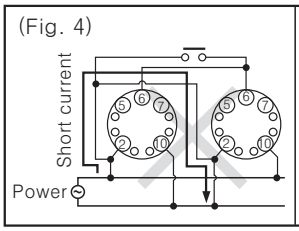


(Fig. 3)

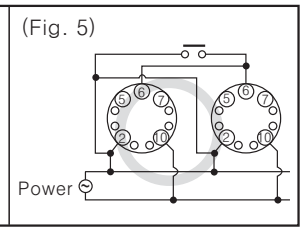


3) When using more than one timer with one contact or transistor input, the short current is flowed when it is connected as (Fig. 4). Please connect the power phase correctly as (Fig. 5) correctly.

(Fig. 4)



(Fig. 5)



4) INHIBIT, START, RESEST signal applied by short-circuting input terminal ②-⑤, ②-⑥ or ②-⑦.

It may cause internal circuit damaged by wrong connection.

5) If using power line with another high voltage line or energy line at the same conduit, it may cause inductive voltage. Therefore please use seperated conduit for power line.

6) When input(INHIBIT, START, RESEST) wire is long, plese use shield wire and it should be short.

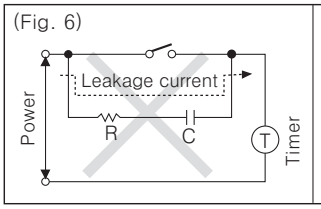
◎Common

1) For DC power supply type, be sure to check the polarity of terminals.

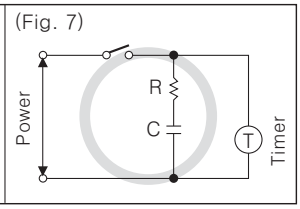
2) In case of 12VDC, 24VAC/DC model, isolated and limited voltage/current or Class 2 source should be provided for power supply.

3) When supply the power to the timer, connection shown in (Fig. 6) might cause malfunction due to leakage current through R and C. Please connect R and C as shown in (Fig. 7) to prevent malfunction.

(Fig. 6)



(Fig. 7)



4) It might cause malfunction if changing the setting time, time range or operation mode during operating unit. Please change the the setting time, time range or operation mode after cut the power off.

5) Do not use this unit at below places.

- ●Place where there are severe vibration or impact.
- ●Place where strong alkalis or acids are used.
- ●Place where there are direct rays of the sun
- ●Place where strong magnetic field or electric noise are generated.

6) Installation environment

- ●It shall be used indoor
- ●Altitude Max. 2000m
- ●Pollution Degree 2
- ●Installation Category Ⅱ.

DIN W48×H48mm Star-delta timer

Upgrade

▣Features

- ●Realization of wide range of power supply
  : 100-240VAC 50/60Hz / 24-240VDC
- ●Wide range of setting time and switching time
  - T1(Setting time) : Selectable 5 to 100sec.
  - T2(Switching time) : Selectable 0.05, 0.1, 0.2, 0.3, 0.4, 0.5sec.
- ●Simple setting time, switching time operation
- ●Easy to check output status by LED display
- ●Application : Starting large capacity motors

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

▣Ordering information

AT 8 SDN

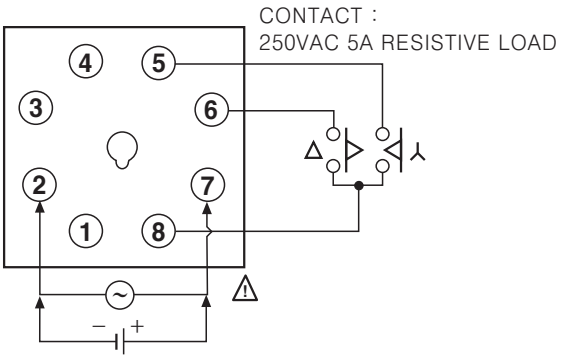
Function type	SDN	Star delta type
Plug type	8	8 Pin plug type
Item	AT	Analog Timer

※Socket required : PG-08, PS-08

▣Specifications

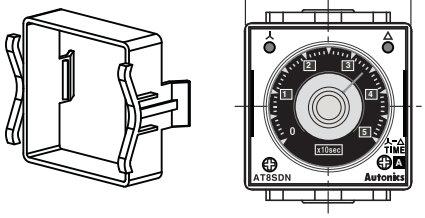
Model		AT8SDN
Function		**Star-delta timer**
Control time setting range		0.5 to 100 sec.
Power supply		100-240VAC 50/60Hz / 24-240VDC
Allowable voltage range		90 to 110% of rated voltage
Power consumption		100-240VAC : 3.2VA, 24-240VDC : 1.5W
Reset time		Max. 100ms
Timing operation		Power ON start type
Control output	Contact type	⅄ contact : SPST(1a), Δ contact : SPST(1a)
	Contact capacity	250VAC 5A resistive load
Relay life cycle	Mechanical	Min. 10,000,000 times
	Electrical	Min. 100,000 times(250VAC 5A resistive load)
Repeat error		Max. ±0.2 % ±10ms
⅄ Setting error		Max. ±5% ±50ms
Voltage error		Max. ±0.5%
Temperature error		Max. ±2%
Δ Switching time error		Max. ±25%
Insulation resistance		100MΩ(at 500VDC megger)
Dielectric strength		2000VAC 50/60Hz for 1 minute
Noise strength		±2kV the square wave noise(pulse width : 1㎲) by the noise simulator
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 1 hours
	Malfunction	0.5mm amplitude at frequency of 10 to 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 to 55℃(at non-freezing status)
Storage temperature		-25 to 65℃(at non-freezing status)
Ambient humidity		35 to 85%RH
Approval		CE cULus
Unit weight		Approx. 90g

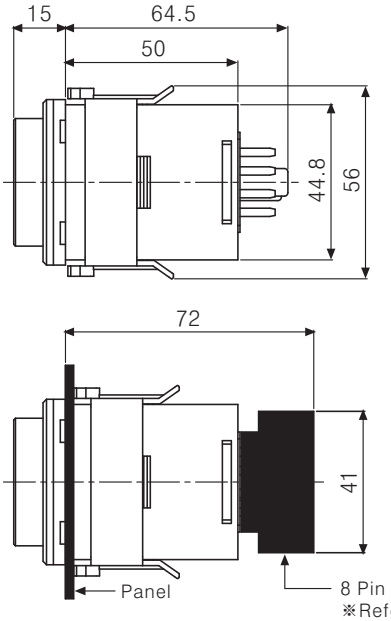
▣Connections



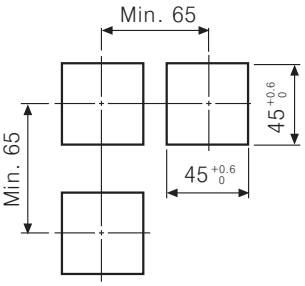
▣Dimensions

●Bracket



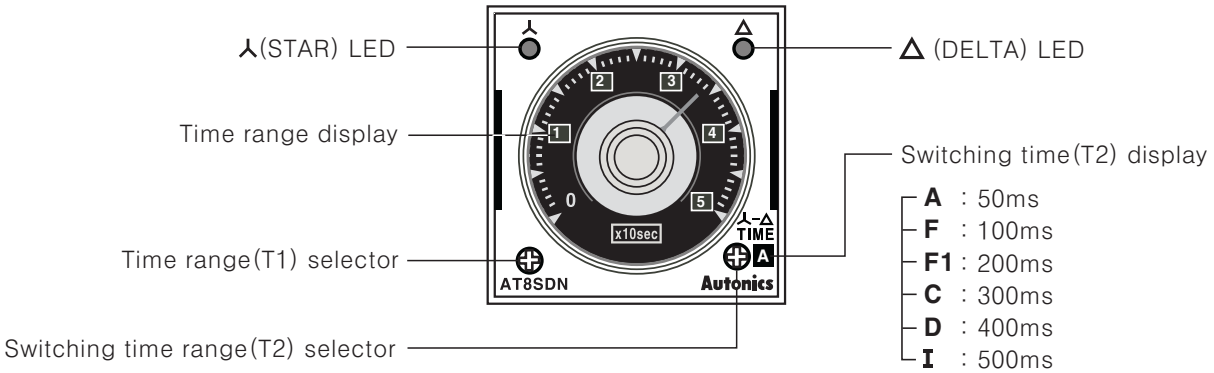


●Panel cut−out



(Unit:mm)

▣Front panel identification



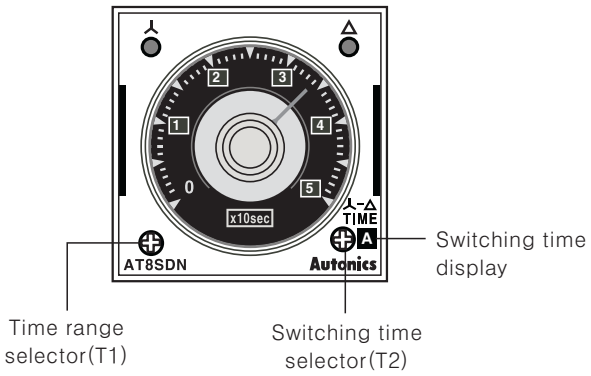
▣Time specifications

1. T1(Setting time)

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

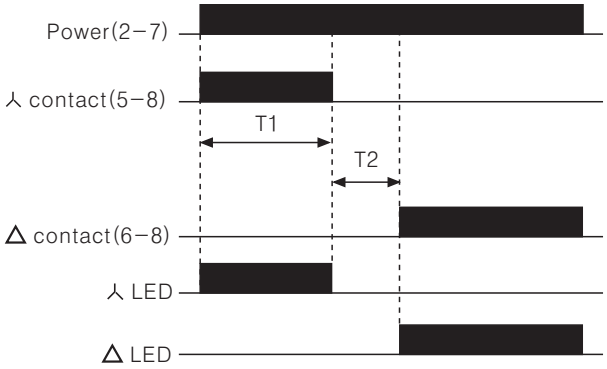
2. T2(Switching time)

Display	A	F	F1	C	D	I
T2 switching time	0.05 sec.	0.1 sec.	0.2 sec.	0.3 sec.	0.4 sec.	0.5 sec.



▣Output operation mode

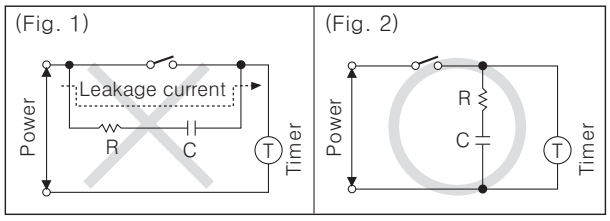
When power is applied, 人 contact will be ON. When reaching to T1 setting time, 人 contact will be OFF and △ contact will be ON after switching time of T2 is passed. If the power is OFF, 人 contact will be OFF.



※T1 : Setting time (人 contact operation time)
※T2 : Switching time (人 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. When supply the power to the timer, connection shown in (Fig. 1) might cause malfunction due to leakage current through R and C. Please connect R and C as shown in (Fig. 2) to prevent malfunction.



3. It might cause malfunction if changing the setting time, time range or operation mode during operating unit. Please change the the setting time, time range or operation mode after cut the power off.
4. When performing dielectric voltage test or insulation resistance test while the unit is installed on control panel,
   - ●Please isolate this unit from the circuit of control panel.
   - ●Please make all terminals of this unit short-curcuited.
5. Do not use this unit at below places.
   - ●Place where there are severe vibration or impact.
   - ●Place where strong alkalis or acids are used.
   - ●Place where there are direct rays of the sun
   - ●Place where strong magnetic field or electric noise are generated.
6. Installation environment
   - ●It shall be used indoor
   - ●Altitude Max. 2000m
   - ●Pollution Degree 2
   - ●Installation Category Ⅱ.

AT8PSN / AT8PMN

DIN W48×H48mm Solid-state, power OFF delay timer

Upgrade

▣Features

- ●Time setting range
  (AT8PSN : 0.05 to 10sec., AT8PMN : 0.05 to 10min.)
- ●Simple time setup and direct read of time range
- ●Power supply : 100-120VAC 50/60Hz, 200-240VAC 50/60Hz
  100/110VDC, 24VAC 50/60Hz / 24VDC
- ●Application : Protect circuit when momentary power failure and start it again.

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

▣Ordering information

AT 8 P SN - □

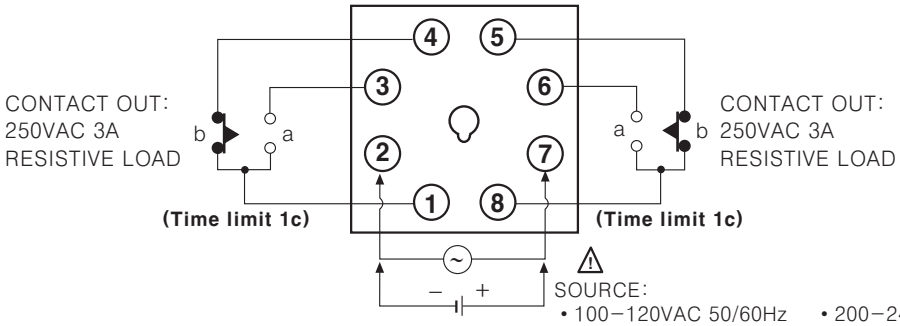
Power supply	Blank	200-240VAC
	2	24VAC/DC
	6	100-120VAC
	7	100/110VDC
Time range	SN	sec
	MN	min
Function type	P	Power off delay
Plug type	8	8 Pin plug type
Item	AT	Analog Timer

※Socket required : PG-08, PS-08

▣Specifications

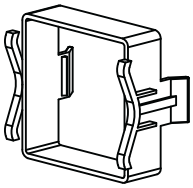
Model		AT8PSN-□	AT8PMN-□
Function		**Power OFF delay timer**	
Control time setting range		0.05 to 10 sec.	0.05 to 10 min.
Power supply		• 100-120VAC 50/60Hz • 200-240VAC 50/60Hz • 100/110VDC • 24VAC 50/60Hz, 24VDC	
Allowable voltage range		90 to 110% of rated voltage	
Power consumption		• 100-120VAC : 1.5VA • 200-240VAC : 1.5VA • 100/110VDC : 0.8W • 24VAC : 0.2VA, 24VDC : 0.2W	
Timing operation		Power OFF start type	
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. ±0.2 % ±10ms	
Setting error		Max. ±5% ±50ms	
Voltage error		Max. ±0.5%	
Temperature error		Max. ±2%	
Insulation resistance		100MΩ(at 500VDC megger)	
Dielectric strength		2000VAC 50/60Hz for 1 minute	
Noise strength		±2kV the square wave noise(pulse width : 1㎲) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 1 hours	
	Malfunction	0.5mm amplitude at frequency of 10 to 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 to 55℃(at non-freezing status)	
Storage temperature		-25 to 65℃(at non-freezing status)	
Ambient humidity		35 to 85%RH	
Approval		CE c UL us	
Unit weight		Approx. 100g	

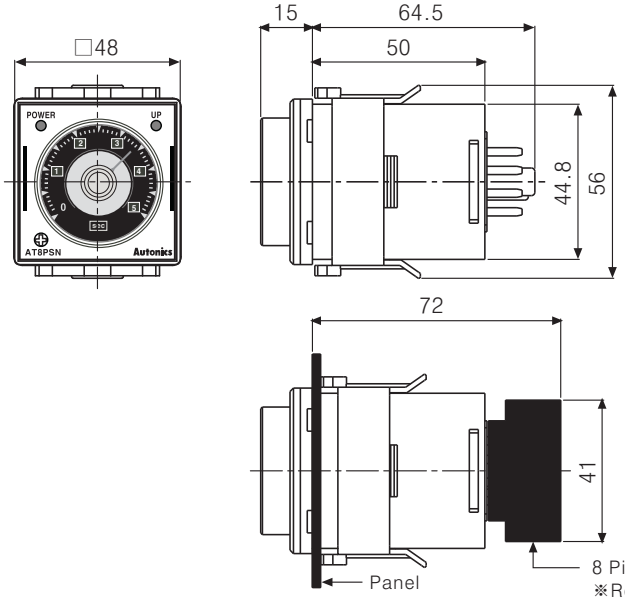
▣Connections



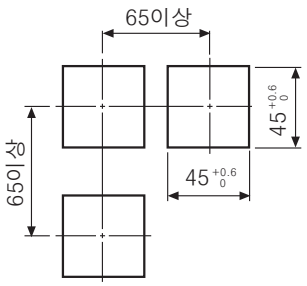
▣Dimensions

●Bracket



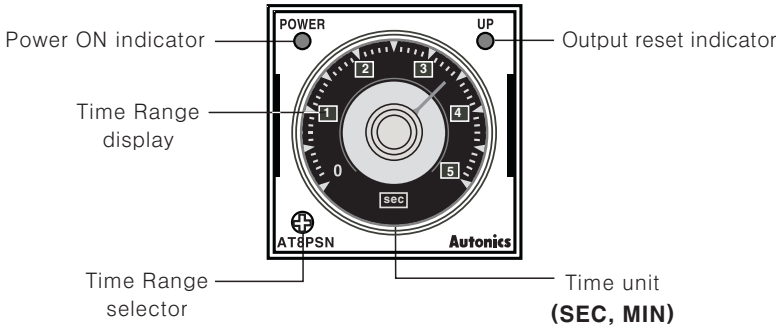


●Panel cut–out



(Unit:mm)

▣Front panel identification

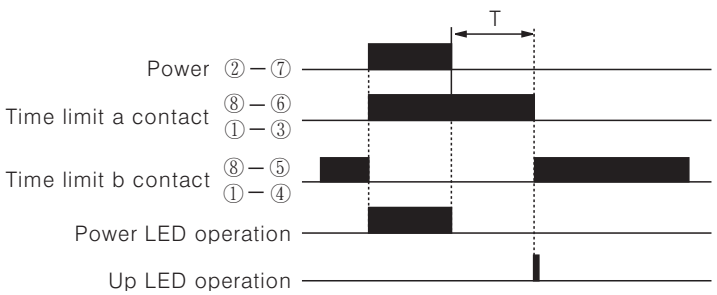


●**Time specification**

Model	AT8PSN-□	AT8PMN-□
Unit	sec	min
Setting time range(T)	0 to 0.5 sec.	0 to 0.5 min.
	0 to 1.0 sec.	0 to 1.0 min.
	0 to 5 sec.	0 to 5 min.
	0 to 10 sec.	0 to 10 min.
Min. time to supply the power	0.1 sec.	2 sec.

▣Output operation mode

Contact a turns ON when the power applied and then turns off after setting time(T) is passed when the power off.



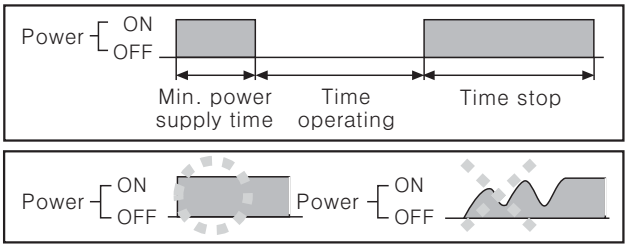
※ T : Setting time

▣Proper usage

1) Power

①This product is power OFF delay timer, the time of min. power supply is 0.1sec. for AT8PSN−□ type and 2sec. for AT8PMN−□. Therefore be sure that this product will operation after power off.

②Please observe the allowable voltage range and apply or cut the power at once to prevent from chattering.



※Please use the power within rating power and apply.

2) In case of 24VDC/DC, 100/110VDC model, isolated and limited voltage/current or Class 2 source should be provided for power supply.

3) When supplying the power to the timer with 100−120VAC or 200−240VAC, approx. 0.5A will flow for 0.5 sec. (AT8PMN−□), or for 0.05 sec. (AT8PSN− □). When supplying the power to the timer with 24VDC, 100/110VDC approx. 1.5A will flow for 0.5 sec. (AT8PMN−□), or for 0.05 sec.(AT8PSN−□). Therefore be sure about the rating of contact and the power capacity.

4) When performing dielectric voltage test or insulation resistance test while the unit is installed on control panel,

- ●Please isolate this unit from the circuit of control panel.
- ●Please make all terminals of this unit short−curcuited.

5) Do not use this unit at below places.

- ●Place where there are severe vibration or impact.
- ●Place where strong alkalis or acids are used.
- ●Place where there are direct rays of the sun
- ●Place where strong magnetic field or electric noise are generated.

6) Installation environment

- ●It shall be used indoor
- ●Altitude Max. 2000m
- ●Pollution Degree 2
- ●Installation Category Ⅱ.

DIN W48×H48mm Solid state ON delay timer

▣Features

- ●DIN W48×H48mm
- ●Easy and simple time setting
- ●Cost-effective
- ●Easy time setting
- ●Wide range of time
- ●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

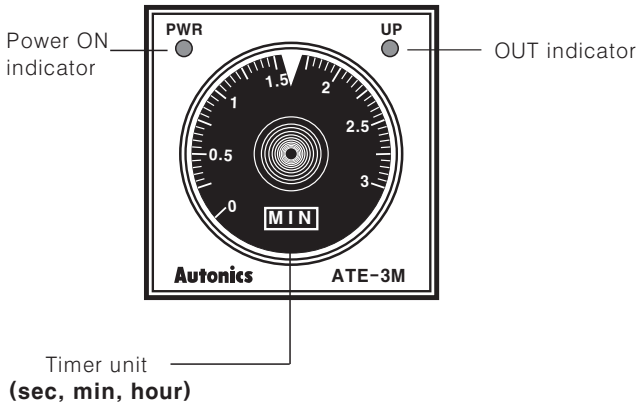
ATE □ — **10** **S**

Time unit	s	sec.(1, 3, 6, 10, 30, 60)
	m	min.(3, 6, 10, 30, 60)
	h	hour(3, 6, 12, 24)
Time range	Number	Max. time range
Output	Blank	Time-limit SPDT(1c), Instantaneous SPST(1a)
	1	Time-limit DPDT(2c)
	2	Time-limit SPDT(1c), Instantaneous SPDT(1c)
Item	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 to 110% of rated voltage		
Power consumption		Approx. 10VA(240VAC 60Hz), Approx. 2W(24VDC, 12VDC)		
Reset time		Max. 200ms		
Timing operation		Power ON start type		
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%		
SET error		Max. ±5% ±0.05sec.		
Voltage error		Max. ±0.5%		
Temperature error		Max. ±2%		
Insulation resistance		100MΩ(at 500VDC megger)		
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 to 55Hz in each of X, Y, Z directions for 1 hours		
	Malfunction	0.5mm amplitude at frequency of 10 to 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 to 55℃(at non-freezing status)		
Storage temperature		-25 to 65℃(at non-freezing status)		
Ambient humidity		35 to 85%RH		
Unit weight		Approx. 75g		

▣Front panel identification

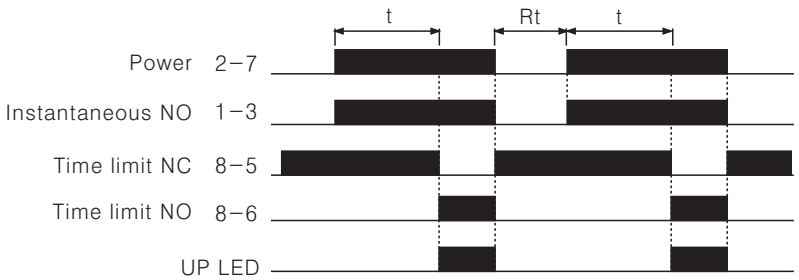
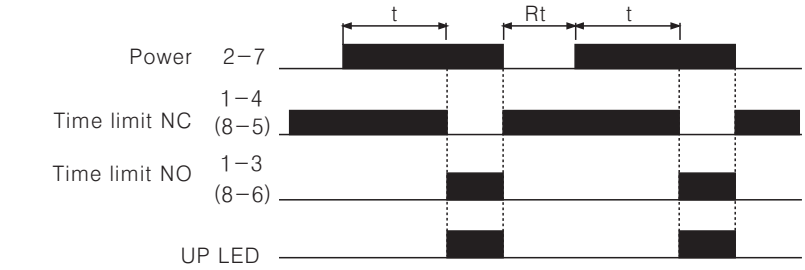
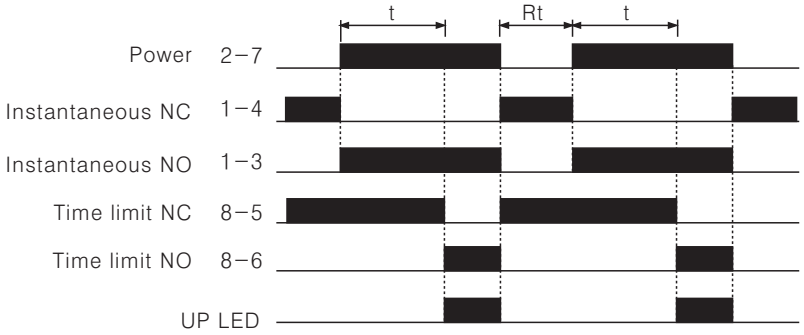


▣Time setting range

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

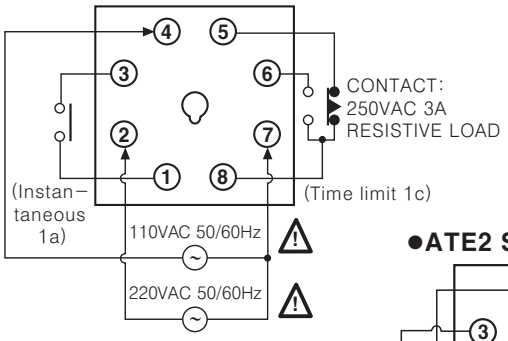
▣Output operation mode

t : Setting time, Rt : Reset time

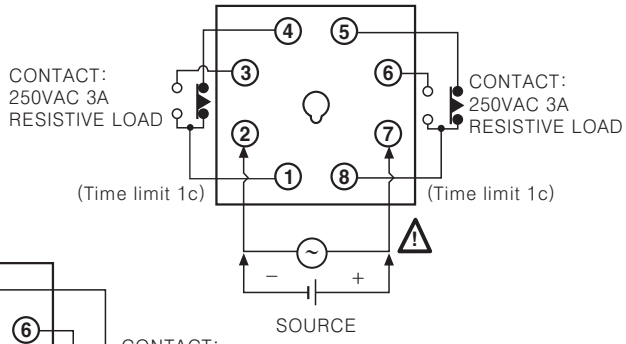
Model	Time chart
ATE	
ATE1	
ATE2	

▣Connections

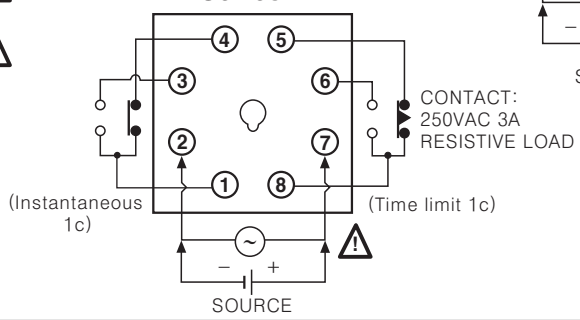
●ATE Series



●ATE1 Series

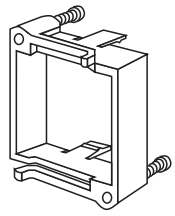


●ATE2 Series

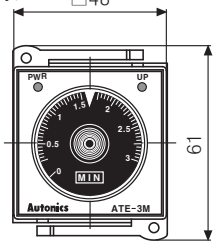


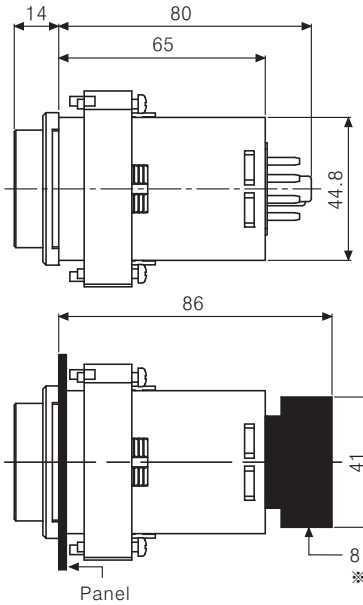
▣Dimensions

●Bracket(Sold separately)

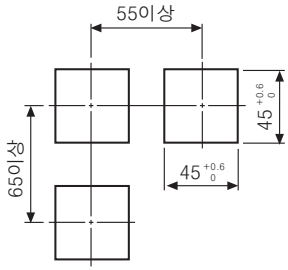


(Model:PGB48-W)





●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 condenser(0.1 to 1㎌) or oil condenser 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.)

W72×H72mm, Weekly/Yearly timer

▣Features

- ●Easy to check and change the program setting.
- ●Customizable weekly or yearly unit time setting and control by user
- ●Includes daylight saving time function
- ●2 independent control output.(Relay)
- ●Flush and surface mounting are in one unit.
- ●Enable to mount on DIN rail with base plate.

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

c UL us

▣Ordering information

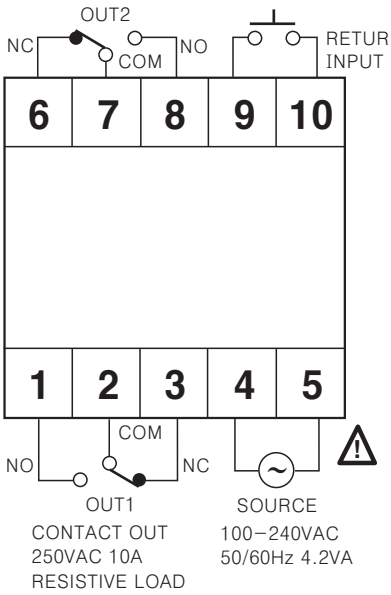
LE7 M – 2

Output	2	2 Relay outputs
Size	M	DIN W72×H72mm
Item	LE7	Weekly/Yearly Timer

▣Specifications

Model		**LE7M-2**
Power supply		100-240VAC 50/60Hz
Allowable voltage range		90 to 110% of rated voltage
Power consumption		4.2VA
RETURN input		Short-circuit or open by switch or relay
Timing program		48 steps for weekly, 24 steps for yearly
Operation mode		ON/OFF mode, cycle mode, pulse mode
Temperature error		0.01% ±0.05sec.
Mounting		Front panel, surface, DIN rail
Time deviation		±15sec. /month(25℃) (±4sec. /week)
Memory protection		Over 5 years(at 25℃)
Control Output	Contact type	SPDT(Single pole double contact)
	Contact capacity	250VAC 10A resistive load
	Output number	Independent 2 output(1c × 2)
Relay life cycle	Mechanical	Min. 5,000,000 operations(Switching capacity 30 times/minute)
	Electrical	50,000 operations<Switching capacity 20 times/1 minute, at 250VAC 10A(resistive load)>
Insulation resistance		Min. 100MΩ(at 500VDC megger)
Dielectric strength		2000VAC 50/60Hz for 1minute
Noise strength		±2kV the square wave noise(pulse width : 1㎲) by the noise simulator
Ambient temperature		-10 to 55℃(at non-freezing status)
Storage temperature		-25 to 65℃(at non-freezing status)
Ambient humidity		35 to 85%RH
Unit weight		Approx. 272g

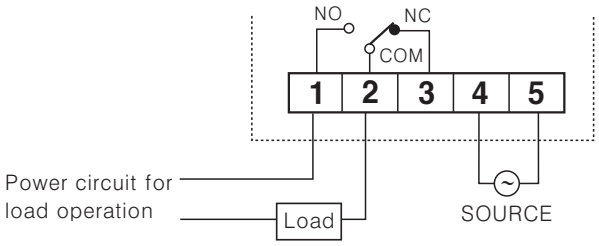
▣Connections



▣Load connection

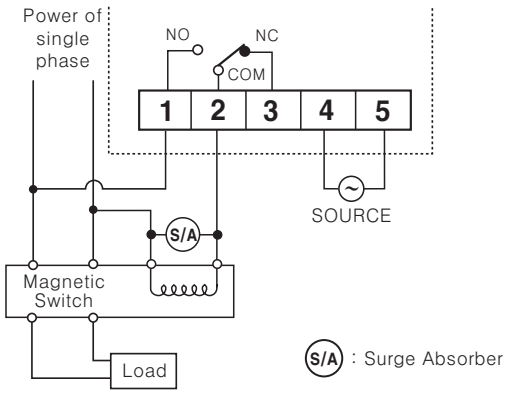
Please connect surge absorber (R+C) to the both ends to control non-resistive load(Ex : Magnetic switch etc).

●In case of controlling the load directly

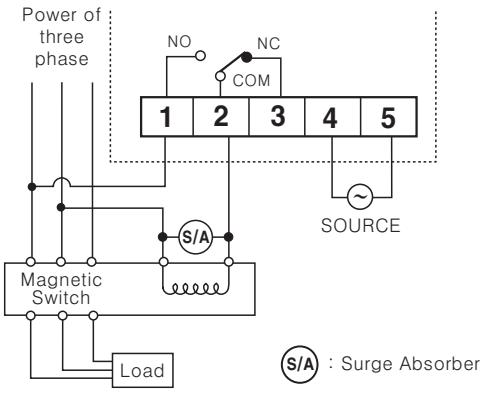


●In case of controlling the load by using a magnetic switch

[Single phase]

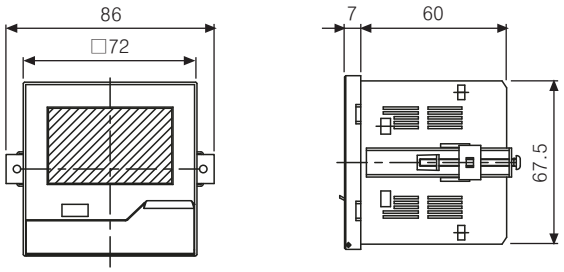


[Three phase]

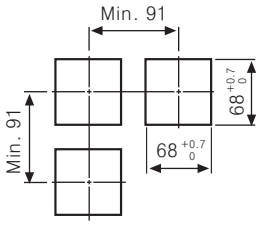


▣Dimensions & Mounting

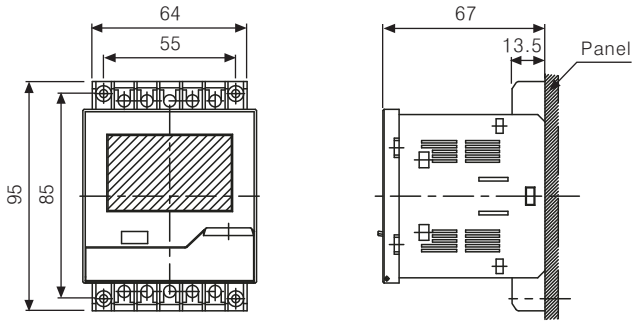
1)Front panel mounting



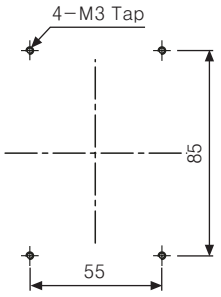
●Panel cut-out



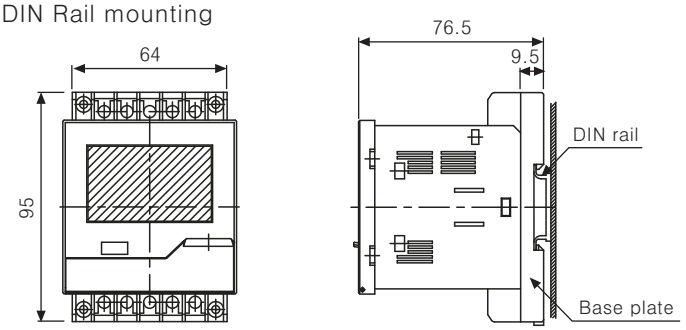
2)Surface mounting



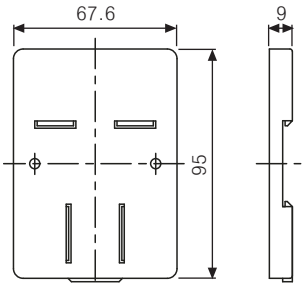
●Panel hole cut-out



3)DIN Rail mounting



●Base Plate

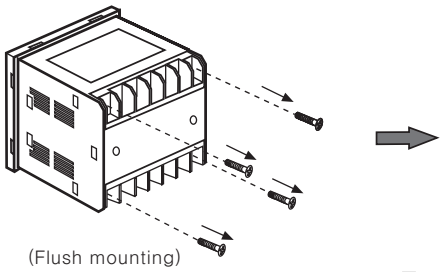


(Unit:mm)

▣How to switch from the flush mounting to surface mounting type

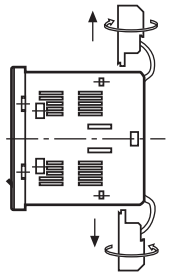
Remove terminals from the body after unscrewing terminal screws, and then assemble terminals to the body after rotating terminals as shown below.

①Unscrew 4 bolts from terminal block.

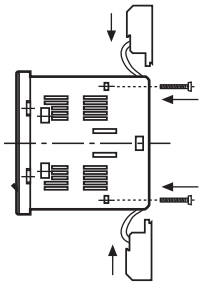


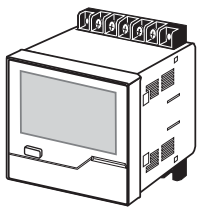
(Flush mounting)

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



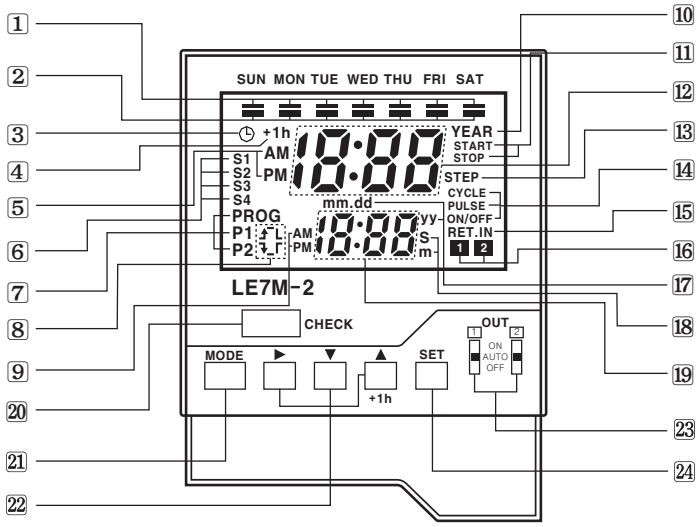
③Assemble terminal block to case by using the 4 bolts.





(Surface mounting)

▣Front panel identification



1 Day indicator
2 Day display
- ●Light : Day is selected.
- ●Light-out : Day is not selected.

3 Current time setting mode indicator
4 DST display(Daylight saving time)
5 AM/PM display
6 Season display
7 Program display
8 Display ON time/day, OFF time/day, ON time width, OFF time width
9 AM/PM display
10 YEAR display : It is lighted when set, check, modify, delete yearly program, set yearly holidays and operate yearly program.
11 Yearly START/STOP day display
12 Main display
13 Remaining step display
14 Operation mode display
15 Power restore input display
16 Output mode display
17 Year, month, date display
18 Unit of pulse width display
19 Sub-display
20 CHECK key
21 MODE key
22 Operation key
23 Output selection switch
- ●AUTO : Control output according to the set program.
- ●ON : Output is ON.(Operation)
- ●OFF : Output is OFF.
- ※Output 1(OUT1) and Output 2(OUT2) are selected independently.

24 SET key

▣Functions

◎Program setting and output operation

Output1/Output2 operates according to Program1 and Program2.

◎Definitions

- ●Record : A part of program that controls output operation.
- ●Step : Basic component of record.

◎Operation modes

If the operation mode of Program1(Program2) is set on pulse mode initially, the pulse mode is fixed for additional programs.

If the operation mode of Program1(Program2) is set on ON/OFF or cycle mode initially, pulse mode cannot be used for additional programs.

●Weekly ON/OFF mode

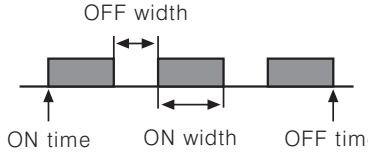
Output operation by ON/OFF set time.

- Min. time setting unit : 1 min.
- It is able to set ON/OFF day separately.
- One record in two Steps(ON day/ON time, OFF day/OFF time)

●Weekly Cycle mode

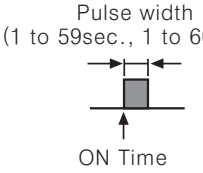
Output turns ON for ON time and turns OFF for OFF time. And the ON/OFF cycle is repeated.

- Range of ON/OFF time : 1 min. to 12:59
- One record in three steps(ON day/ON time, OFF day/OFF time, ON width/OFF width)



▣Functions

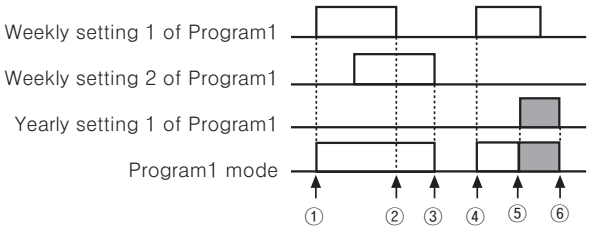
●Weekly pulse mode
Output turns ON at ON time for a specified pulse width.(Pulse width : 1 to 59sec., 1 to 60min.)
• One record in two steps(ON day/ON time, pulse width)



●Yearly ON/OFF mode
Output turns ON at ON time on START date and turns OFF at OFF time on STOP date.
• One record in three steps(START/STOP date, ON/OFF time)

●Yearly pulse mode
Output turns ON at ON time on START date and turns OFF at OFF time on STOP time for a specified pulse width repeatedly.(Pulse width : 1 to 59sec., 1 to 60min.).
• One record in three steps(START/STOP date, ON time, pulse width)

◎Program operation



●① to ② : Operated by weekly setting 1 of Program 1.
●② to ③ : Operated by weekly setting 2 of Program 1.
●④ to ⑤ : Operated by weekly setting 1 of Program 1.
●⑤ to ⑥ : Operated by yearly setting 1 of Program 1.
(During weekly program operation at 12:00 AM on START date, the weekly program operation stops, and it changes to yearly program operation mode. The yearly program operation stops at 12:00 AM on the next day of STOP date.)

◎Display and change of next mode

●The day of next mode in Program1 or Program2 is displayed on the day indicator, and the time of next mode is displayed on the lower row of screen. Press SET + CHECK in RUN mode it is changed from program1 to program2 or from program2 to program1.

●In ON/OFF operation mode, set ON time and OFF time to next mode. In Pulse operation mode, set Pulse ON time to next mode.

◎Power restore mode

In setting group 2-Level 2(Power restore), select auto("AUt") or normal ("nor") by ▲ or ▼ key, and press SET key to set.

●Auto("AUt") power restore mode
Output(OUT1, OUT2) operates according to program when power turns on again after power failure.

●Normal("nor") power restore mode
When power turns on again after power failure, output is kept OFF and "**RET.IN**" flashes on the panel. When power restore input is detected, "**RET.IN**" turns off and output operates according to program.

●Power restore input
Input contact signal in external "Return input terminals(⑨ to ⑩)" by switch or relay, or press SET key for 3sec. in RUN mode.
Please use reliable contacts enough to flow 0.1mA of current at 5VDC when use switch or relay.

◎Season switching mode

This feature uses for setting seasonal weekly operation mode. To operate this mode, save starting month and date, ending month and date of each season which displays S1, S2, S3, S4 then set day and time of each season in weekly program setting. It is also able to operate only in summer and winter season. (S1: set summer season, S2: set winter season, S3/S4: do not set)

In setting group 2-Level 2("SEn" is lighted, "oFF" is flashed.), select ON("on") by ▲ or ▼ key and press SET key to save.

***Note : When the season switching mode changed from "oFF" to "on" or vice versa, previous set programs are deleted.**

●ON("on") mode
Weekly program is switched automatically by season switching.
• Period setting per season
①Press MODE key in period setting per season mode of setting group 2. ("SEn" is flashed, season with preset period is lighted and **"START"** and **"STOP"** are lighted.)
②Advance to the flashing position of season selection among S1, S2, S3, S4 by ▲ or ▼ key and press SET key.
③After set **START** month, date per season and press SET key.
④SET key is pressed after set **STOP** month, date per season, it is advanced to LEVEL1 of period setting per season. Add or adjust the period setting by SET key.
●It is disable to use when it is OFF("oFF").
●If season terms are overlapped, these are prioritized in S4>S3>S2>S1 order.

▣Functions

◎Daylight saving time

To utilize daylight during the summer season, daylight saving time is adjusted forward one hour from standard time.

In setting group 2-LEVEL 2("dSt" is lighted, "At" or "nor" is flashed.), select Auto("At") or Normal ("nor") by ▲ or ▼ key and press SET key to set.

●Auto("At") Daylight Saving Time mode

Current time will be faster as an hour when it is started and slower as an hour when it is finished.

• Automatic Daylight Saving Time period setting

①Automatic Daylight Saving Time period setting LEVEL 1 of setting group 2.
("dSt" is flashed and "**START**" and "**STOP**" are lighted.)

②Set START date(Month, date) of automatic Daylight Saving Time mode and press SET key.

③Set START time(AM/PM, Hour) of automatic Daylight Saving Time mode and press SET key. But, the minute will be fixed as 00.

④Set STOP date(Month, date) of automatic Daylight Saving Time mode and press SET key.

⑤Set STOP time(AM/PM, Hour) of automatic Daylight Saving Time mode and press SET key. But, the minute will be fixed as 00.

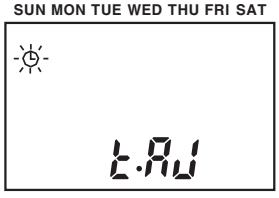
●Normal("nor") daylight saving time mode

Press +1h key over 3sec. in RUN mode, "+1h" is lighted and current time is faster as an hour and "+1h" is lighted out or vice versa, when press +1h key over 3sec. again.

◎Current time setting

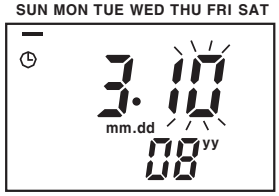
(Ex)Set the current time as 10, Mar, 2008, 5:10 PM.

①Advance to the current time setting mode



MODE + SET keys are pressed over 3sec. in RUN mode, it is advanced to current time setting of setting group 2 and clock will be flashed and t.AJ will be lighted in second display part, press SET key.

②Year, month, date setting

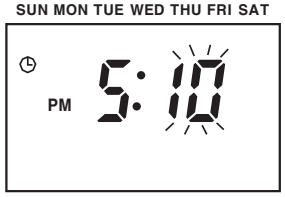


Press ▲ or ▼ key to set 08 (year 2008) and move the flashing digit to position month by ▶ key.
Press SET key after press ▲ or ▼ key to set date 10.

③Current time(AM, PM) setting

Press ▲ or ▼ key to select PM and move the flashing digit to position hour by ▶ key.

④Current time(Hour, Min.) setting



Press ▲ or ▼ key to set 5 PM and move the flashing digit to position min. by ▶ key. Press ▲ or ▼ key to set 10min. and press SET key and it is returned to RUN mode when press MODE key over 3sec.

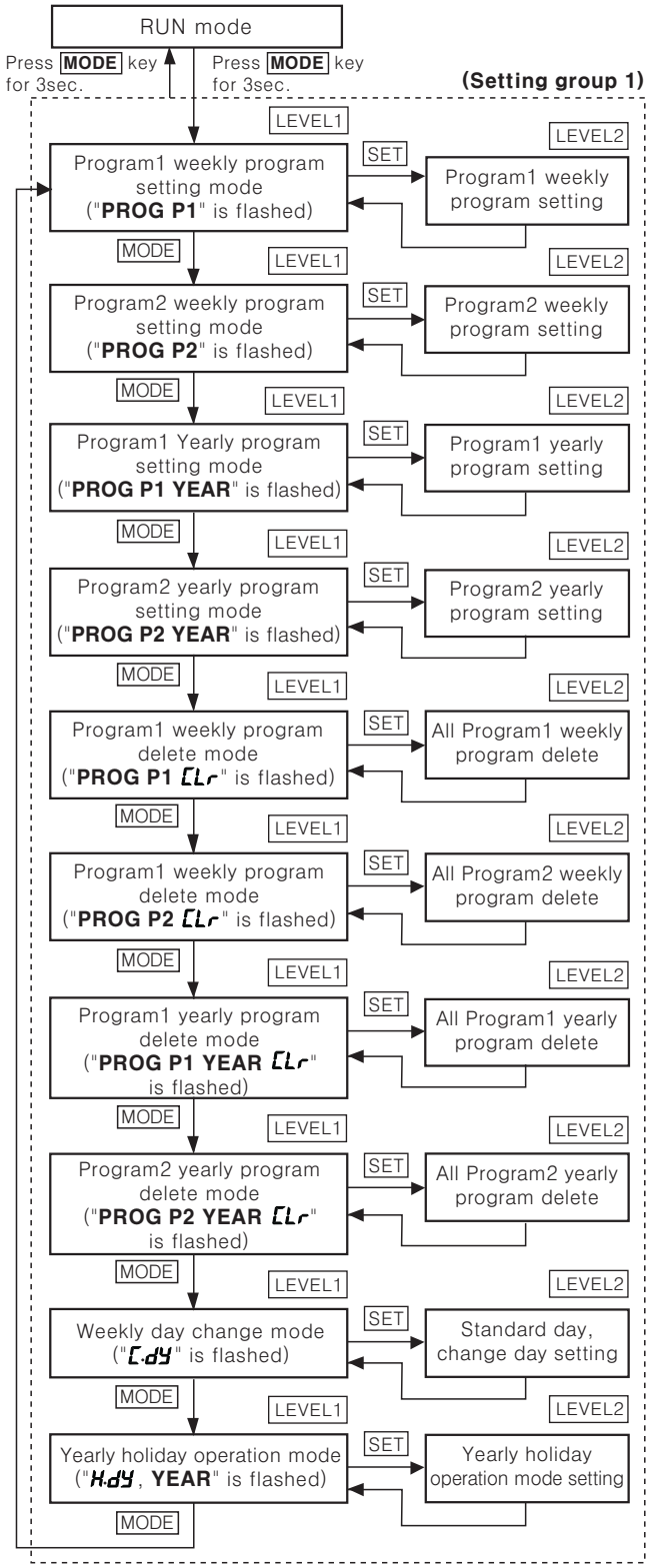
●It advances to "①Current time setting mode" in ON status and set current time as shown above ② to ④ by SET key.

●Current time is set up to 31, Dec., 2099.

●Check current year/month/date in RUN mode
When ▶ key is pressed over 3sec. in RUN mode, it advances to current year/month/date display. After display current year/month/date for 3sec., it returns to RUN mode displaying current display.

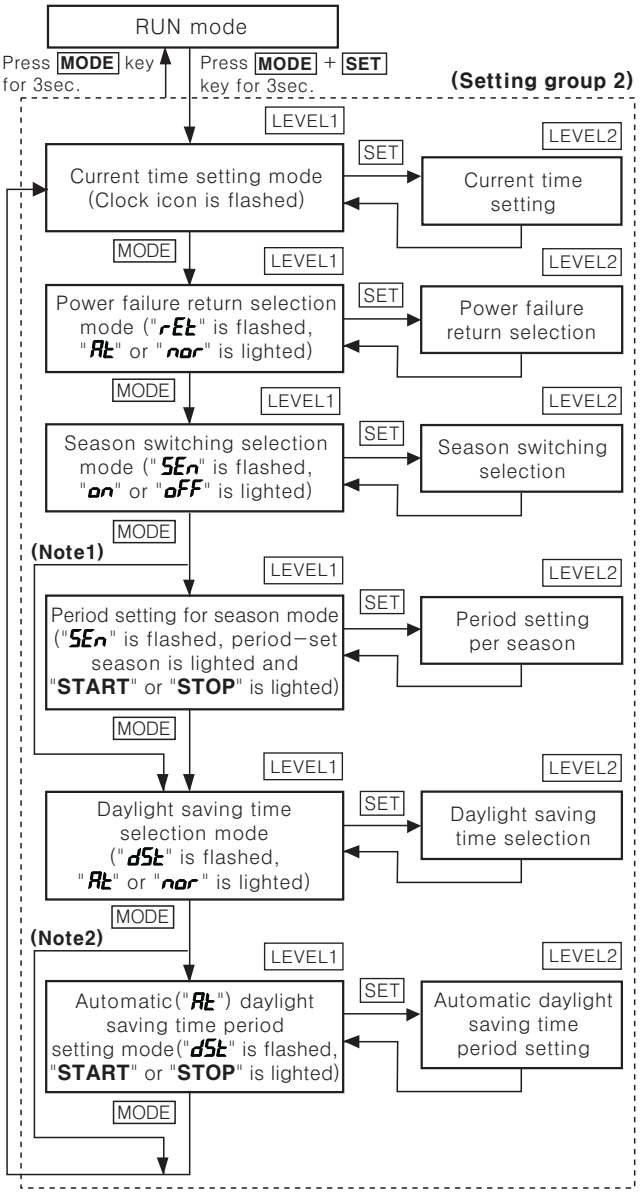
▣Program setting

◎Setting group 1



- When it advances to setting group 1 in RUN mode, output (OUT1, OUT2) will be OFF.
- It returns to previous setting group 1 when power of time switch is ON again in setting group 1.
- When **MODE** key is pressed in LEVEL2 of setting group 1, current setting will be canceled and it returns to previous LEVEL1.

◎Setting group 2



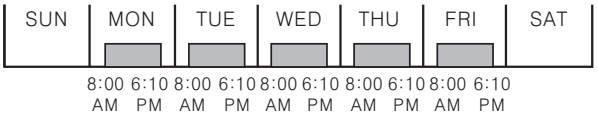
- **(Note1)** Season switching selection is "oFF".
  (Note2) Automatic switching selection of Daylight Saving Time is Normal("nor").
- When it advances to setting group 2 in RUN mode, output(OUT1, OUT2) will be OFF.
- When power of time switch is ON again in setting group 2, it returns to previous setting group 1.
- Front **MODE** key is pressed in LEVEL2 of setting group 2, it returns to previous LEVEL1.
- When season switching selection is changed from "oFF " to "on" or "on" to "oFF", previous set weekly program will be deleted.

▣Program setting

◎Weekly program setting

●Weekly ON/OFF mode

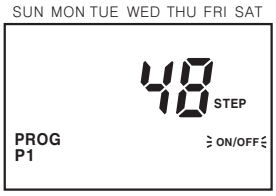
(Ex) Output1 (OUT1) is ON from Monday to Friday at 8:00 AM and OFF at 6:10 PM.



①Advance to program1 (P1) weekly program setting mode

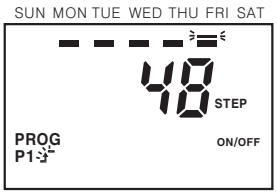
MODE key is pressed over 3sec. in RUN mode, "**PROG P1**" is flashed and press **SET** key.

②Mode type setting



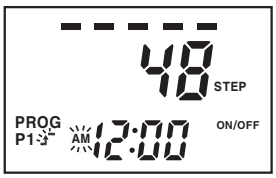
Press **SET** key in ON/OFF mode.

③ON day setting



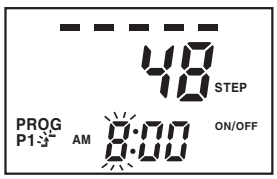
Press ▶ key to move the indicator to monday, it will be lighted when ▲ or ▼ key are pressed and move it to tuesday by ▶ key. Press **SET** key after tuesday, wednesday, thursday, friday are lighted.

④ON time setting (AM, PM)



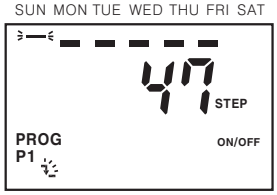
▶ key is pressed, move the flashing to hour position and select PM by ▲ or ▼ key when ON time is afternoon.

⑤ON time setting (Hour, Min.)



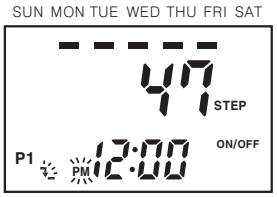
Set 8:00 by ▼ key and press **SET** key.

⑥OFF day setting



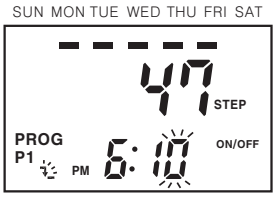
Press **SET** key to check ON/OFF day.

⑦OFF time setting (AM, PM)



Select PM by ▲ or ▼ key and move the flashing to hour position by ▶ key.

⑧OFF time setting (Hour, Min.)



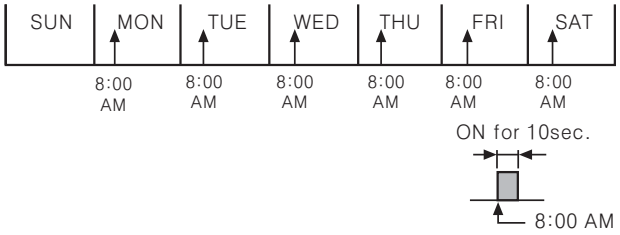
Move the flashing to minute position after set 6:00 by ▲ key and set the minute as 10 and press **SET** key.

⑨Complete to set

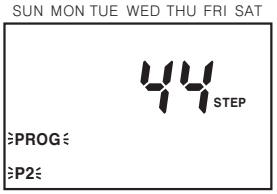
Press **SET** key to set additional program.

●Weekly pulse mode

Output2 (OUT2) is ON for 10sec. at 8:00AM from monday to friday during S2 season in case, period of S1, S2, S3, S4 is set.

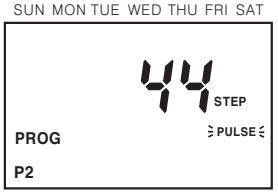


①Program2 (P2) advance to weekly program setting mode



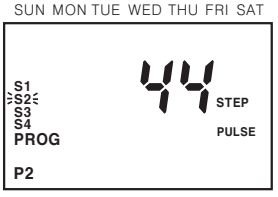
MODE key is pressed for 3sec. in RUN mode, "**PROG P1**" is flashed and press **MODE** key again, "**PROG P2**" is flashed and press **SET** key.

②Mode type setting



Press ▲ key when ON/OFF is flashed, Pulse is flashed and press **SET** key.

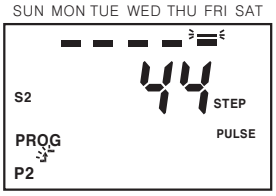
③Season selection



Press ▼ key to select season S2 and press **SET** key.

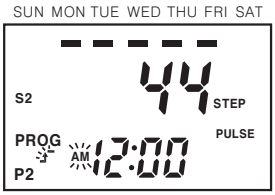
▣Program setting

④ON day setting



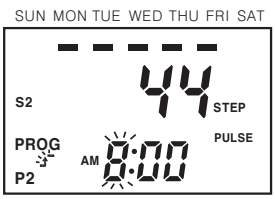
Press ▶ key to move the indicator to Monday, it will be lighted when ▲ or ▼ key is pressed and move it to Tuesday by ▶ key.
Press **SET** key after light Tuesday, Wednesday, Thursday and Friday.

⑤ON time setting(AM, PM)



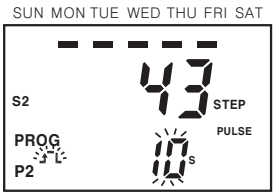
Press ▶ key, move the flashing to hour position and select PM by ▲ or ▼ key when ON time is afternoon.

⑥ON time setting(Hour, Min.)



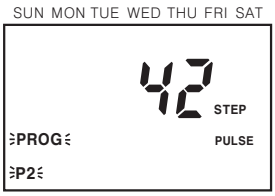
Set 8:00 by ▼ key and press **SET** key.

⑦Pulse width setting



Press ▲ key to select pulse width as 10s(10sec.) and press **SET** key.

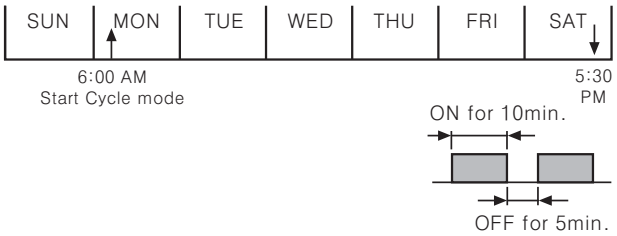
⑧Complete to set



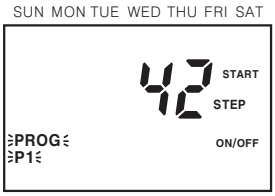
Press **SET** key to set additional program.

●Weekly cycle mode

(Ex) Output1(OUT1) is ON for 10min and OFF for 5min from monday 6:00AM to saturday 5:30PM.



①Advance to program1(P1) weekly program setting mode



Press **MODE** key for 3sec. in RUN mode, "**PROG P1**" is flashed.

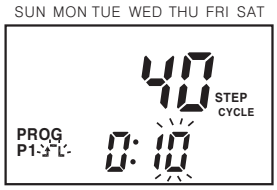
②Mode type setting

Press ▲ key when ON/OFF is flashed, CYCLE is flashed and press **SET** key.

③ ~ ⑧

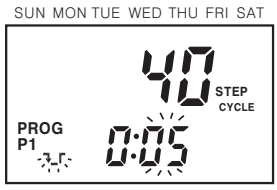
Refer to ③~⑧ of "**●Weekly ON/OFF mode**" to set ON day, ON time, OFF day and OFF time.

⑨ON time width setting



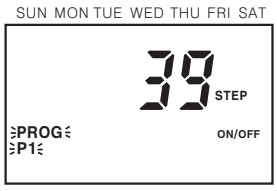
Press ▶ key to move the flashing to minute position and set as 10min. by ▲ key and press **SET** key.

⑩OFF time width setting



Press ▶ key to move the flashing to minute position and set as 5min. by ▲ key and press **SET** key.

⑪Complete to set



Press **SET** key to set additional program.

◎Weekly day change

It operates when the specified day mode is required to install in other day from the set day and it returns to previous program setting automatically when it is finished.
It is applied to program1(P1) and program2(P2).

●Weekly day change cancellation

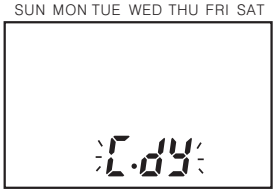
①Change current year, month, date in current time setting mode
②Change standard day
③Delete all program in program1(P1) and program2(P2)
④Season switching

●Setting example

Output1(OUT1) is ON in Saturday at 9:00AM and OFF at 12:00PM and it is ON 8:30AM and OFF at 6:00PM from Monday to Friday and the mode of Monday and Tuesday is operated temporarily as Saturday(standard) program.

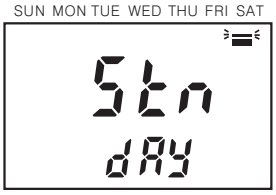
▣Program setting

①Advance to weekly day change mode



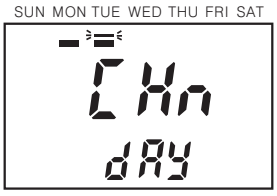
Press **MODE** key over 3sec. to move to the setting group1 in RUN mode and press it repeatedly until "C.dY" is flashed in second display part and press **SET** key.

②Standard day selection



Press ▶ key to move the indicator to saturday and press **SET** key. after select saturday as standard day(Sat is lighted) by ▲ or ▼ key.

③Change day selection



Press ▶ key to move the indicator to monday and select monday to change(Mon is lighted) by ▲ or ▼ key and repeat the procedure to select tuesday to change (Tue is lighted) and press **SET** key to complete.

◎Yearly holiday mode

It operates to off the output without program adjustment during previously set yearly holiday period available from present year to 31, Dec. of the next year.

Designate the start date of yearly holiday and year of end date as every year("--") to repeat the holiday mode for specified in every year.

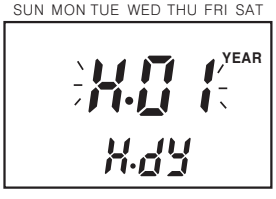
●Setting example

Set every year 5, May to off the output(OUT1, OUT2).

①Advance to yearly holiday mode

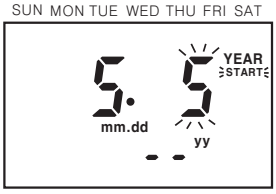
Press **MODE** key over 3sec. to move to the setting group1 in RUN mode and press it repeatedly until "H.dY" is flashed in second display part and press **SET** key.

②Yearly holiday No. display



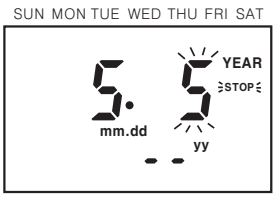
Press **SET** key after check yearly holiday No.

③Start date of yearly holiday setting



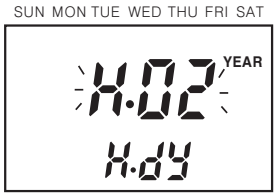
Press ▶ key until month position is flashed and set May by ▲ key and press ▶ key until date position is flashed. Press **SET** key after set 5th by ▲ key.

④End date of yearly holiday setting



The flashing is moved to month position directly and press ▲ key to set May and press ▶ key until date position is flashed. Press **SET** key after set 5th by ▲ key.

⑤Complete to yearly holiday



Press **MODE** key to finish the additional yearly holiday setting and press **SET** key to set .

※It is able to set yearly holiday up to 12 times.

◎Yearly program setting

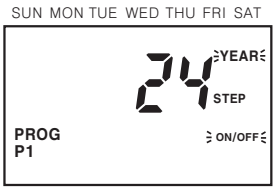
●Yearly ON/OFF mode

(Ex)Output1(OUT1) is ON from every 5, Apr to 7, Apr at 9:00AM and OFF 5:10PM.

①Advance to program1(P1) yearly program setting mode

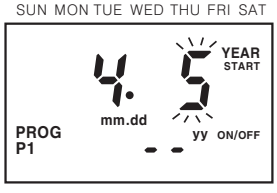
Press **MODE** key for 3sec. in RUN mode, "**PROG P1**" is flashed and press **MODE** key 3 times more until "**PROG P2 YEAR**" is flashed and press **SET** key.

②Mode type setting



Press **SET** key when ON/OFF is flashed.

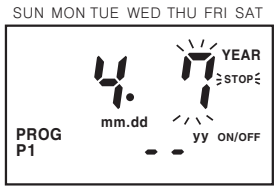
③Start date setting



Press ▶ key until month position is flashed and set April by ▲ key and press ▶ key until date position is flashed. Press **SET** key after set 5th by ▲ key.

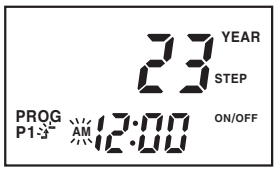
▣Program setting

④End date setting



The flashing is moved to month position directly and press ▲ key to set April and press ▶ key until date position is flashed.
Press **SET** key after set 7th by ▲ key.

⑤ON time setting(AM, PM)



▶ key is pressed, move the flashing to hour position and select PM by ▲ or ▼ key when ON time is afternoon.

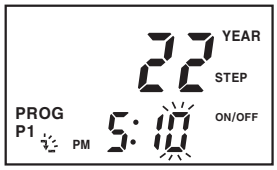
⑥ON time setting(Hour, Minute)

Press ▼ key to set 9 and press **SET** key after check 00min.

⑦OFF time setting(AM, PM)

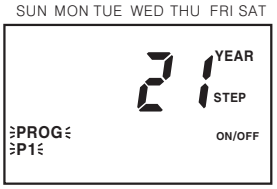
Select PM by ▲ or ▼ key and move the flashing to hour position by ▶ key.

⑧OFF time setting(Hour, Minute)



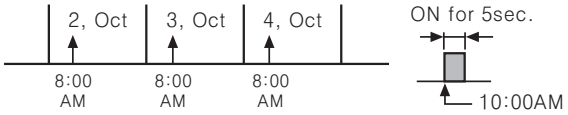
Move the flashing to minute position after set 5 by ▲ key and set the minute as 10 and press **SET** key.

⑨Complete to set

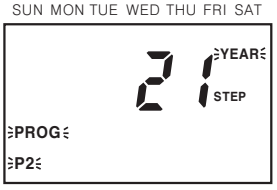


Press **SET** key to set additional program.

●Yearly pulse mode
(Ex)Output2(OUT2) is ON from 2, Oct, 2008 to 4, Oct, 2008 at 10:00AM and OFF after 5sec. (Present is 2007.)

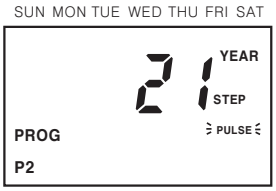


①Advance to program2(P2) yearly program setting mode



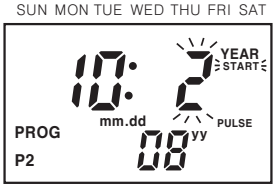
MODE key is pressed for 3sec. in RUN mode, "**PROG P1**" is flashed and press **MODE** key again, "**PROG P2 YEAR**" is flashed and press **SET** key.

②Mode type setting



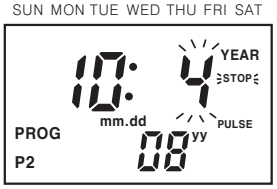
▲ key is pressed when ON/OFF is flashed to set pulse mode and press **SET** key.

③Start date setting



Press ▲ key twice to set 08(year 2008) and move to month position by ▶ key.
Set Oct. by ▼ key and move to date position by ▶ key and press **SET** key after set 2nd by ▲ key.

④End date setting



The flashing is moved to month position directly by ▶ key and set 4th by ▲ key after move it to date position by ▶ key, then press **SET** key.

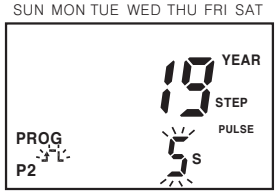
⑤ON time setting(AM, PM)

▶ key is pressed, move the flashing to hour position and select PM by ▲ or ▼ key when ON time is afternoon.

⑥ON time setting(Hour, Minute)

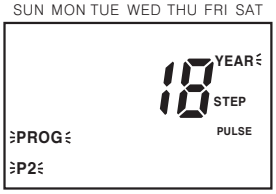
Press ▼ key twice to set 10 and press **SET** key after check 00min.

⑦Pulse width setting



Press ▲ key 4 times to select pulse width as 5s and press **SET** key.

⑧Complete to set

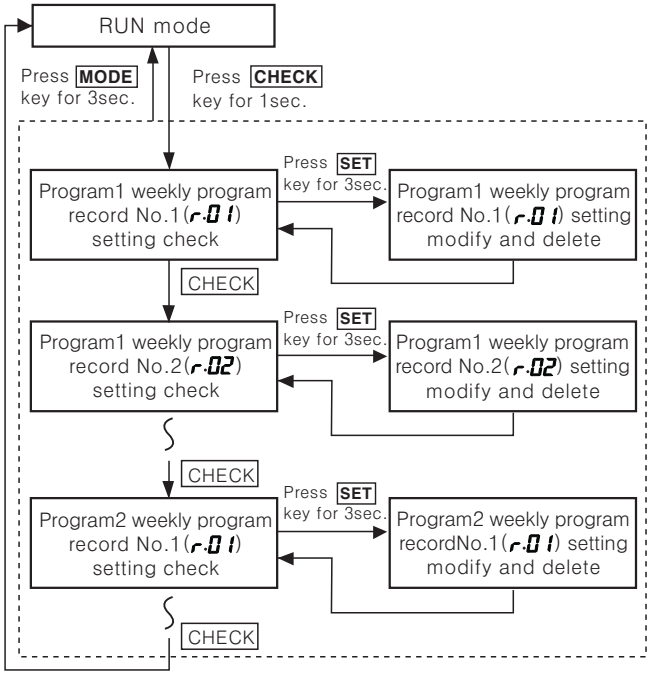


Press **SET** key to set additional program.

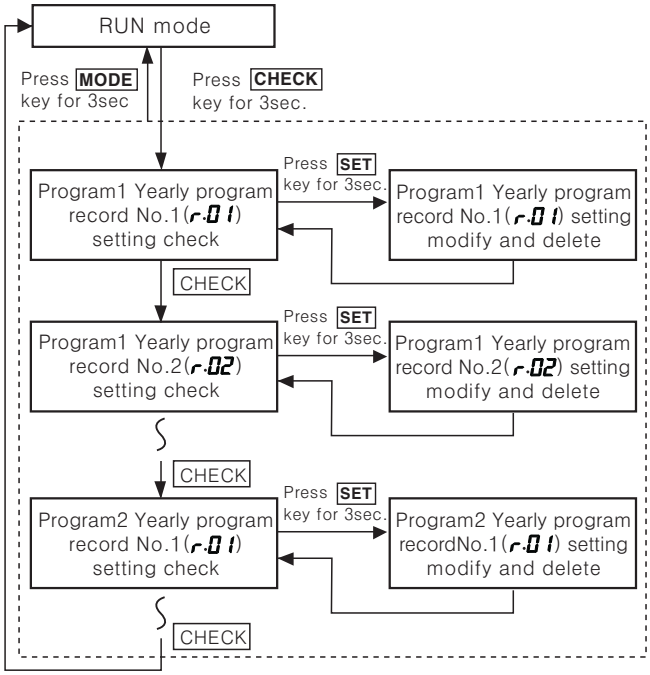
※It is able to set year of start/end date in yearly program setting up to 2 years later from the present year.

▣Program check, modify and delete

◎Weekly program check, modify and delete



◎Yearly program check, modify and delete



※"**YEAR**" is lighted when check, modify or delete yearly program.

- If any key is untouched for 60sec, it is returned to RUN mode in weekly or yearly program check.
- In weekly or yearly program check, it controls output according to program setting and output is OFF in modify or delete mode.
- When **MODE** key is pressed in weekly or yearly program record modify, delete stand by or delete mode, current work is cancelled and it is returned to check mode.
- Weekly or yearly program record modify and delete

(1)Program record modify

①When press **SET** key over 3sec. in program check, "Edt" is flashed in second display part, press **SET** key.

②It returns to check mode when finish the modify same as the above procedure.

(2)Program record delete

①When press **SET** key over 3sec. in program check, "Edt" is flashed in second display part, press ▲ or ▼ key until "CLr" is flashed in second display part and press **SET** key.

②Press **SET** key over 3sec. when "CLr" is lighted in second display part, it returns to program check.

LE365S-41

W48×H48mm, Weekly/Yearly timer

▣Features

- ●Easy to check and change the program setting.
- ●Customizable weekly or yearly unit time setting and control by user
- ●Includes daylight saving time function
- ●1 independent control output.(Relay)
- ●Flush and surface, DIN rail mounting are in one unit.

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

▣Ordering information

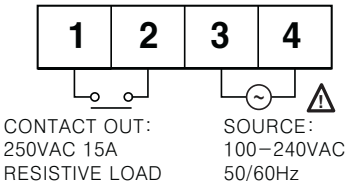
LE365 S – 4 1

Output	1	1 Relay outputs
Power supply	4	100–240VAC
Size	S	DIN W48×H48mm
Item	LE365	Weekly/Yearly Timer

▣Specifications

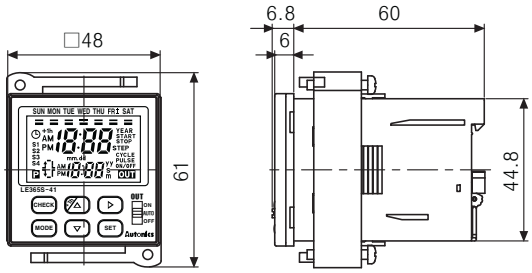
Model		LE365S-41
Power supply		100–240VAC 50/60Hz
Allowable voltage range		90 to 110% of rated voltage
Power consumption		2.4VA
Timing program		48 steps for weekly, 24 steps for yearly
Operation mode		ON/OFF mode, cycle mode, pulse mode
Temperature error		±0.01% ±0.05sec.
Mounting		Panel flush, surface, DIN rail
Time deviation		±15sec/month(25℃) (±4sec/week)
Memory protection		Over 5 years(at 25℃)
Control Output	Contact type	SPST(Single pole single contact)
	Contact capacity	250VAC 15A resistive load
	Output number	Independent 1 output(1a)
Relay life cycle	Mechanical	Min. 5,000,000 operations(Switching capacity 30 times/minute)
	Electrical	50,000 operations<Switching capacity 20 times/1 minute, at 250VAC 15A(resistive load)>
Insulation resistance		Min. 100MΩ(at 500VDC megger)
Dielectric strength		2000VAC 50/60Hz for 1minute
Noise strength		±2kV the square wave noise(pulse width : 1μs) by the noise simulator
Ambient temperature		−10 to 55℃(at non−freezing status)
Storage temperature		−25 to 65℃(at non−freezing status)
Ambient humidity		35 to 85%RH
Unit weight		Approx. 110g

▣Connections

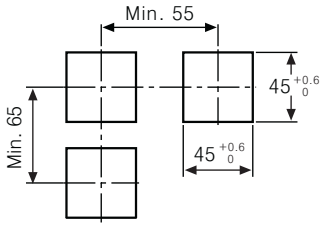


▣Dimensions & Mounting

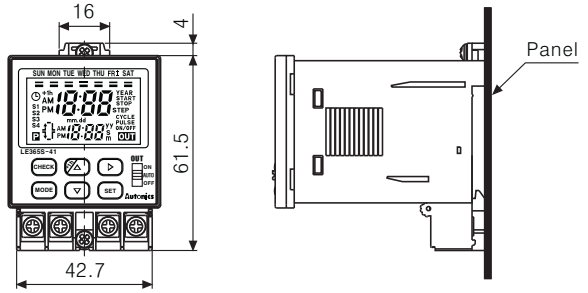
1)Front panel mounting



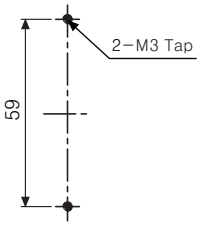
●Panel cut-out



2)Surface mounting

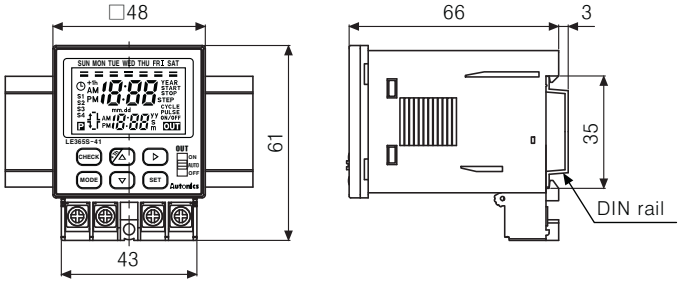


●Panel hole cut-out



※Fix the Weekly/Yearly timer on the panel with M3 tapping screws.

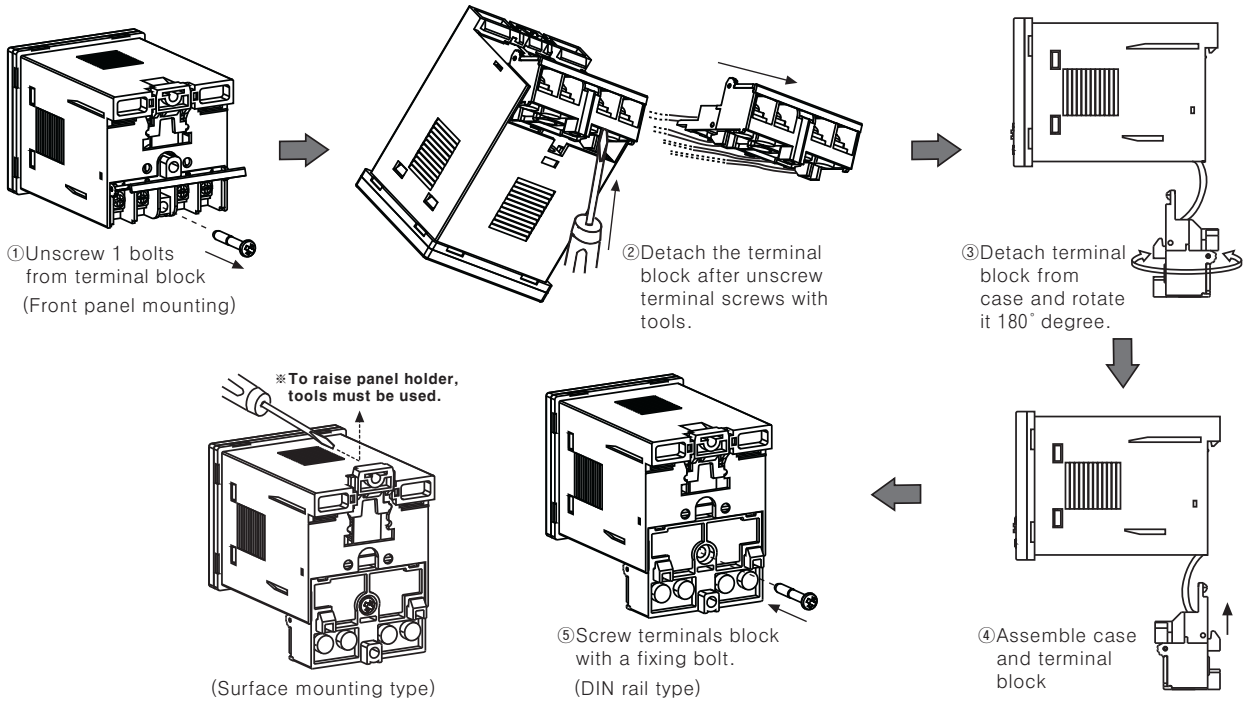
3)DIN Rail mounting



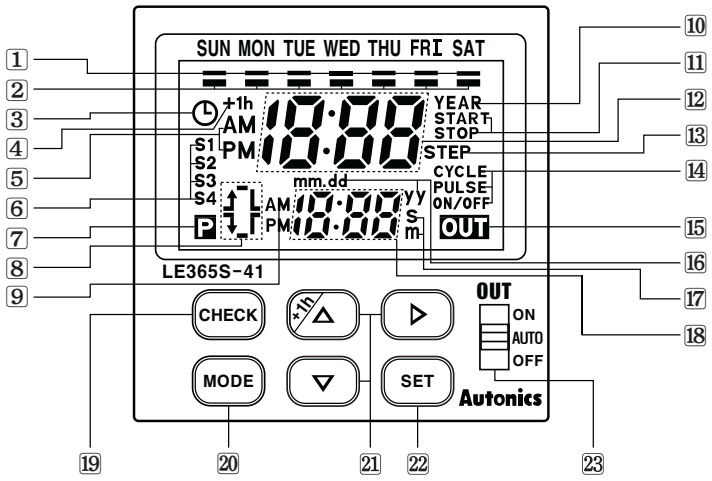
(Unit:mm)

▣How to switch from the flush mounting to surface or DIN rail mounting type

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



▣Front panel identification



1 Day indicator
2 Day display
- ●Light : Day is selected.
- ●Light-out : Day is not selected.

3 Current time setting mode indicator
4 DST display(Daylight saving time)
5 AM/PM display(Main display)
6 Season display
7 Program display
8 Display ON time/day, OFF time/day, ON time width, OFF time width
9 AM/PM display(Sub-display)
10 YEAR display : It is lighted when set, check, modify, delete yearly program, set yearly holidays and operate yearly program.
11 Yearly START/STOP day display
12 Main display
13 Remaining step display
14 Operation mode display
15 Output mode display
16 Year, month, date display
17 Unit of pulse width display
18 Sub display
19 CHECK key
20 MODE key
21 Operation key : Press +1h key over 3sec. in RUN mode, DST mode is set and released.
22 SET key
23 Output selection switch
- ●AUTO : Control output according to the set program.
- ●ON : Output is ON.(Operation)
- ●OFF : Output is OFF.(Block)

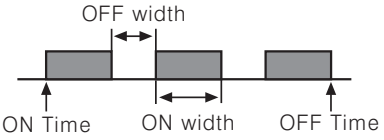
▣Functions

◎Definitions
- ●Record : A part of program that controls output operation.
- ●Step : Basic component of Record.

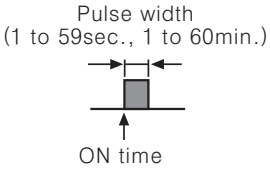
◎Operation modes
- ●If the operation mode of Program1 (program2) is set on pulse mode initially, the pulse mode is fixed for additional programs. If the operation mode of Program1 (program2) is set on ON/OFF or cycle mode initially, pulse mode cannot be used for additional pulse programs.
- ●If the weekly operation mode is set on ON/OFF or cycle mode, the yearly operation mode is fixed on ON/OFF mode. If the yearly operation mode is set on ON/OFF, the weekly operation mode is fixed on ON/OFF or cycle mode.
- ●If the weekly operation mode is set on pulse mode, the yearly operation mode is fixed on pulse mode. If the yearly operation mode is set on pulse mode, the weekly operation mode is fixed on pulse.
- ●Weekly ON/OFF mode
  Output operation by ON/OFF set time.
  • Min. time setting unit : 1 min.
  • It is able to set ON/OFF day separately.
  • One record in two steps
  (ON day/ON time, OFF day/OFF time)

▣Functions

●Weekly cycle mode
Output operation by ON/OFF set time.
- Min. time setting unit : 1 min. to 12:59
- Range of ON/OFF time : 1 min. to 12:59
- One record in three steps(ON day/ON time, OFF day/OFF time, ON width/OFF width)



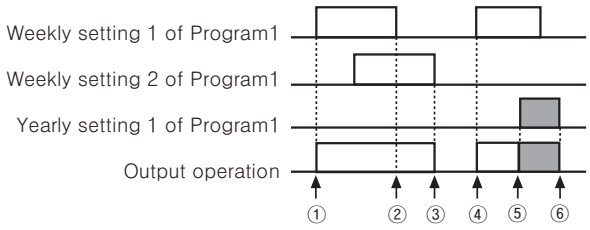
●Weekly pulse mode
Output turns ON at ON time for a specified pulse width.(Pulse width : 1 to 59sec., 1 to 60min.)
- One record in two steps(ON day/ON time, pulse width)



●Yearly ON/OFF mode
Output turns ON at ON time on START date and turns OFF at OFF time on STOP date.
- One Record in three Steps(START/STOP date, ON/OFF time)

●Yearly pulse mode
Output turns ON at ON time on START date and turns OFF at OFF time on STOP time for a specified pulse width repeatedly.
- One record in three steps(START/STOP date, ON time, Pulse width)

◎Program operation



●① to ② : Operated by weekly setting 1 of Program 1.
●② to ③ : Operated by weekly setting 2 of Program 1.
●④ to ⑤ : Operated by weekly setting 1 of Program 1.
●⑤ to ⑥ : Operated by yearly setting 1 of Program 1.
(During weekly program operation at 12:00 AM on START date, the weekly program operation stops, and it changes to yearly program operation mode. The yearly program operation stops at 12:00 AM on the next day of STOP date.)

◎Display and change of next mode
●The day of next mode in Program is displayed on the day indicator, and the time of next mode is displayed on the lower row of screen.
●In ON/OFF operation mode, set ON time and OFF time to next mode. In Pulse operation mode, set Pulse ON time to next mode.

◎Power restore mode
In setting group 2-Level 2, select auto("AUt") or normal("nor") by ▲ or ▼ key, and press SET key to set.
●Auto("AUt") power restore mode
Output operates according to program when power turns on again after power failure.
●Normal("nor") power restore mode
When power turns on again after power failure, output is kept OFF and "rJ n" flashes on the panel. When Power Restore input is detected, "rJ n" turns off and output operates according to program.

◎Season switching mode
This feature uses for setting seasonal weekly operation mode. To operate this mode, save starting month and date, ending month and date of each season which displays S1, S2, S3, S4 then set day and time of each season in weekly program setting. It is also able to operate only in summer and winter season. (S1: set summer season, S2: set winter season, S3/S4: do not set)
In setting group 2-Level 2("SEn" is lighted, "oFF" is flashed.), select ON("on") by ▲ or ▼ key and press SET key to save.

***Note:When the season switching mode changed from "oFF" to "on" or vice versa, previous set programs are deleted.**

●ON("on") mode
Weekly program is switched automatically by season switching.
- Period setting per season

①Press SET key in period setting per season mode of setting group 2. ("SEn" is flashed, season with preset period is lighted and **"START"** and **"STOP"** are lighted.)
②Advance to the flashing position of season selection among S1, S2, S3, S4 by ▲ or ▼ key and press SET key.
③After set **START** month, date per season and press SET key.
④SET key is pressed after set **STOP** month, date per season, it is advanced to LEVEL1 of period setting per season. Add or adjust the period setting by SET key.
●It is disable to use when it is OFF("oFF").
●If season terms are overlapped, these are prioritized in S4>S3>S2>S1 order.

▣Functions

◎Daylight saving time

In setting group 2-LEVEL 2("dSt" is lighted, "At" or "nor" is flashed.), select Auto("At") or Normal ("nor") by ▲ or ▼ key and press SET key to set.

●Auto("At") daylight saving time mode

Current time will be faster as an hour when it is started and slower as an hour when it is finished.

• Automatic daylight saving time period setting

①Automatic daylight saving time period setting LEVEL 1 of setting group 2.
(Press SET key when " dSt " is flashed and "**START**" and "**STOP**" are lighted.)

②Set START date(Month, date) of automatic daylight saving time mode and press SET key.

③Set START time(AM/PM, Hour) of automatic daylight saving time mode and press SET key. But, the minute will be fixed as 00.

④Set STOP date(Month, date) of automatic daylight saving time mode and press SET key.

⑤Set STOP time(AM/PM, Hour) of automatic daylight saving time mode and press SET key. But, the minute will be fixed as 00.

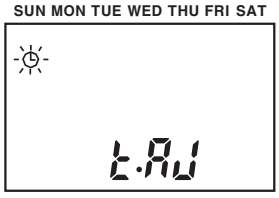
●Normal("nor") daylight saving time mode

Press +1h key over 3sec. in RUN mode, "+1h" is lighted and current time is faster as an hour and "+1h" is lighted out or vice versa, when press +1h key over 3sec. again.

◎Current time setting

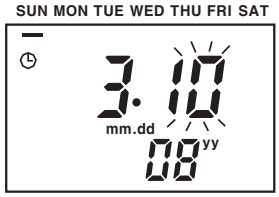
(Ex)Set the current time as 10, Mar, 2008, 5:10 PM.

①Advance to the current time setting mode



MODE + SET keys are pressed over 3sec. in RUN mode, it is advanced to current time setting of setting group 2 and clock will be flashed and t.AJ will be lighted in second display part, press SET key.

②Year, Month, Date setting

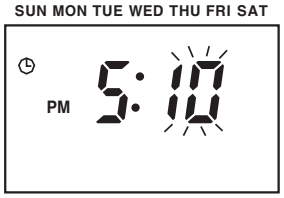


Press ▲ or ▼ key to set 08 (year 2008) and move the flashing digit to position month by ▶ key.
Press SET key after press ▲ or ▼ key to set date 10.

③Current time(AM, PM) setting

Press ▲ or ▼ key to select PM and move the flashing digit to position hour by ▶ key.

④Current time(Hour, Min.) setting



Press ▲ or ▼ key to set 5 PM and move the flashing digit to position min. by ▶ key. Press ▲ or ▼ key to set 10min. and press SET key and it is returned to RUN mode when press MODE key over 3sec.

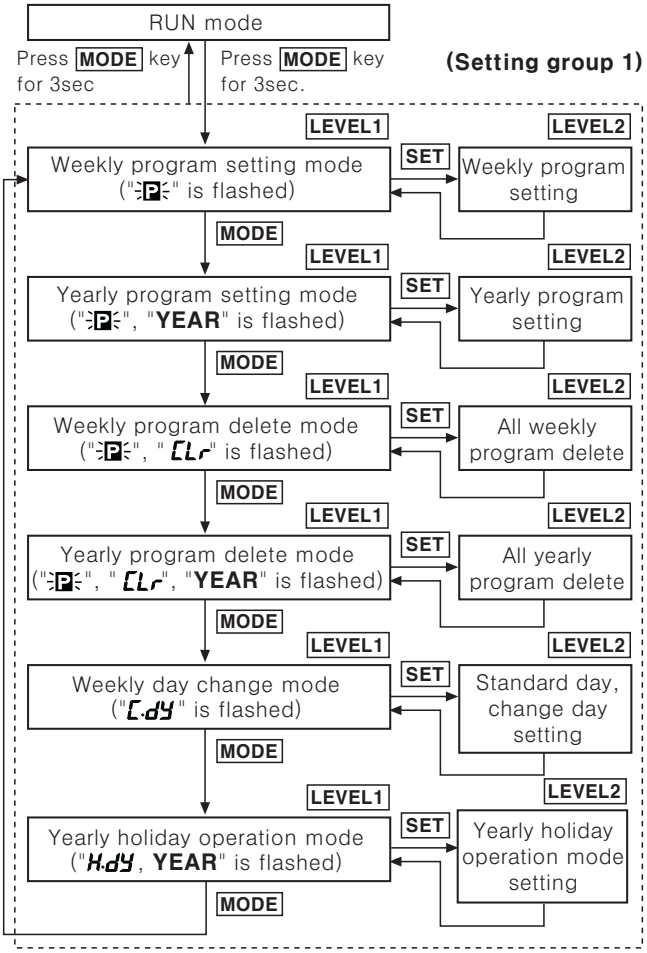
●It advances to to "①Current time setting mode" in ON status and set current time as shown above ② to ④ by SET key.

●Current time is set up to 31, Dec., 2099.

●Check current year/month/date in RUN mode
When ▶ key is pressed over 3sec. in RUN mode, it advances to current year/month/date display. After display current year/month/date for 3sec, it returns to RUN mode displaying current display.

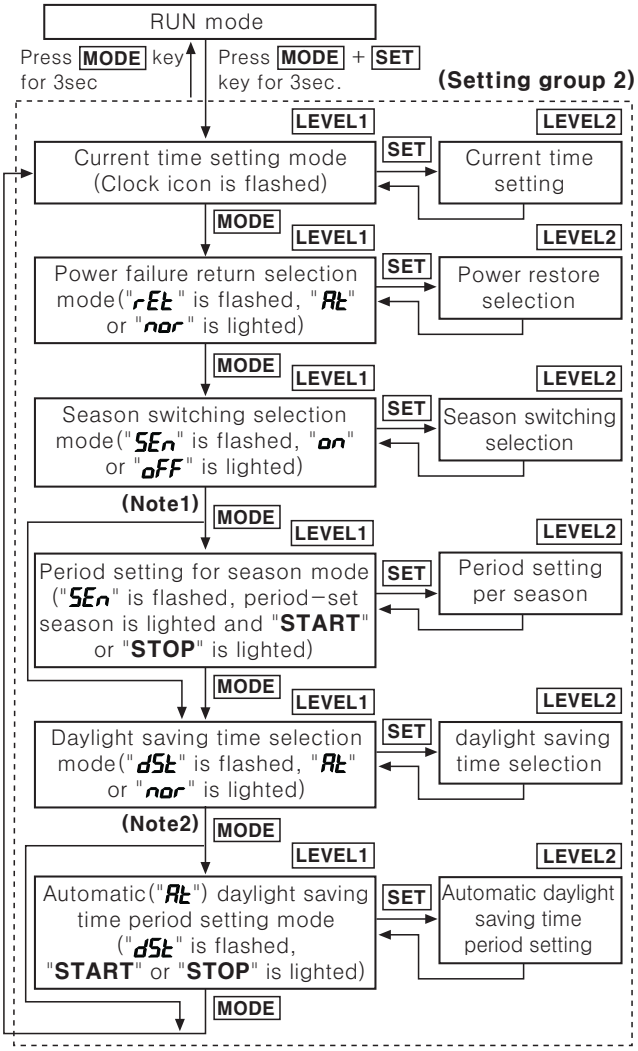
▣Program setting

◎Setting group 1



- When it is advanced to setting group 1 in RUN mode, output (OUT1, OUT2) will be OFF.
- It is returned to previous setting group 1 when power of time switch is ON again in setting group 1.
- When MODE key is pressed in LEVEL2 of setting group 1, current setting will be canceled and it is returned to previous LEVEL1.
- When press SET key to program over max. number of steps for weekly program in Weekly program setting mode of setting group 1−LEVEL 1, number of remaining steps and "STEP" are flashed and it returns to LEVEL 1 status.
- When press SET key to program over max. number of steps for yearly program in Yearly program setting mode of setting group 1−LEVEL 1, number of remaining steps and "STEP" are flashed it returns to LEVEL 1 status.

◎Setting group 2



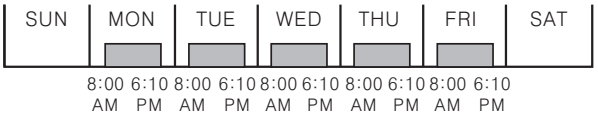
- **(Note1)** Season switching selection is "oFF".
  (Note2) Automatic switching selection of Daylight Saving Time is Normal("nor").
- When it advances to setting group 2 in RUN mode, output(OUT1, OUT2) will be OFF.
- When power of time switch is ON again in setting group 2, it is returned to previous setting group 1.
- Front MODE key is pressed in LEVEL2 of setting group 2, it is returned to previous LEVEL1.
- When season switching selection is changed from "oFF" to "on" or "on" to "oFF", previous set weekly program will be deleted.

▣Program setting

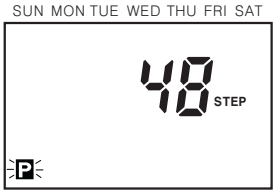
◎Weekly program setting

●Weekly ON/OFF mode

(Ex) Output1 (OUT1) is ON from Monday to Friday at 8:00 AM and OFF at 6:10 PM.

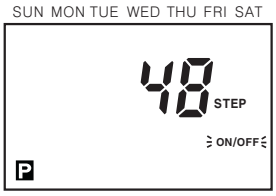


①Advance to weekly program setting mode



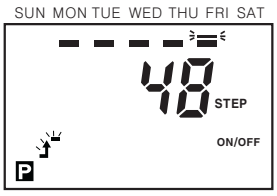
MODE key is pressed over 3sec in RUN mode, " P " is flashed and press **SET** key.

②Mode type setting



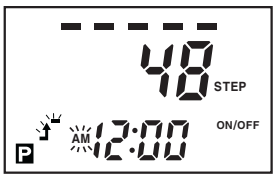
Press **SET** key in ON/OFF mode.

③ON day setting



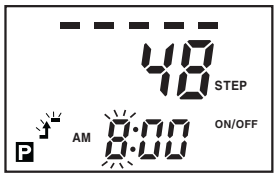
Press ▶ key to move the indicator to Monday, it will be lighted when ▲ or ▼ key are pressed and move it to Tuesday by ▶ key. Press **SET** key after Tuesday, Wednesday, Thursday, Friday are lighted.

④ON time setting(AM, PM)



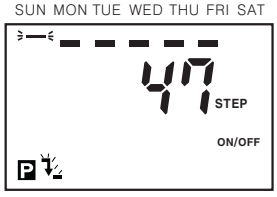
▶ key is pressed, move the flashing to hour position and select PM by ▲ or ▼ key when ON time is afternoon.

⑤ON time setting(Hour, Min.)



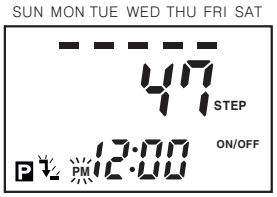
Set 8:00 by ▼ key and press **SET** key.

⑥OFF day setting



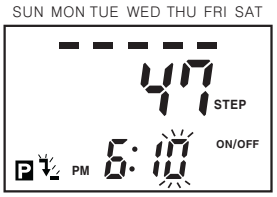
Press **SET** key to check ON/OFF day.

⑦OFF time setting(AM, PM)



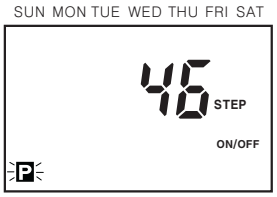
Select PM by ▲ or ▼ key and move the flashing to hour position by ▶ key.

⑧OFF time setting(Hour, Min.)



Move the flashing to minute position after set 6:00 by ▲ key and set the minute as 10 and press **SET** key.

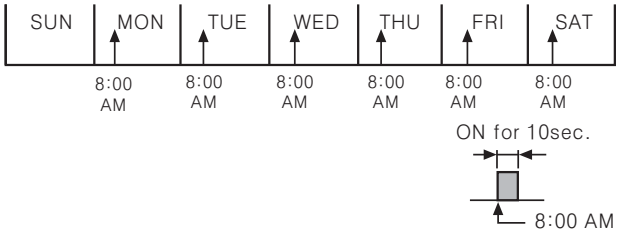
⑨Complete to set



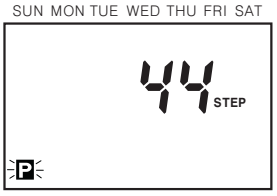
Press **SET** key to set additional program.

●Weekly Pulse mode

Output2 (OUT2) is ON for 10sec at 8:00AM from Monday to Friday during S2 season in case, period of S1, S2, S3, S4 is set.

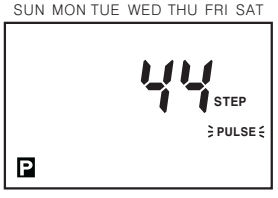


①Advance to weekly program setting mode



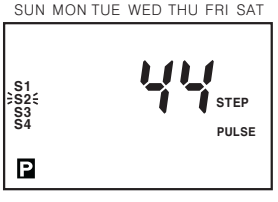
MODE key is pressed for 3sec. in RUN mode, " P " is flashed and press **SET** key.

②Mode type setting



Press ▲ key when ON/OFF is flashed, pulse is flashed and press **SET** key.

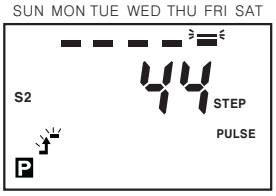
③Season selection



Press ▼ key to select season S2 and press **SET** key.

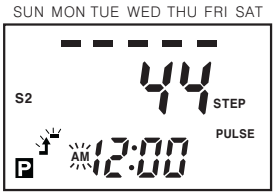
▣Program setting

④ON day setting



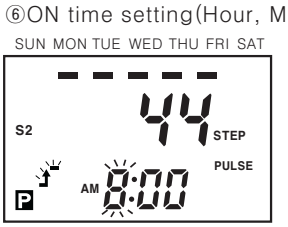
Press ▶ key to move the indicator to Monday, it will be lighted when ▲ or ▼ key is pressed and move it to tuesday by ▶ key.
Press SET key after light tuesday, wednesday, thursday and friday.

⑤ON time setting(AM, PM)



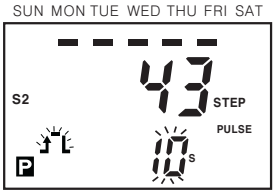
Press ▶ key, move the flashing to hour position and select PM by ▲ or ▼ key when ON time is afternoon.

⑥ON time setting(Hour, Min.)



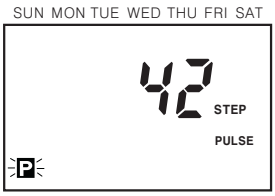
Set 8:00 by ▼ key and press SET key.

⑦Pulse width setting



Press ▲ key to select pulse width as 10s(10sec.) and press SET key.

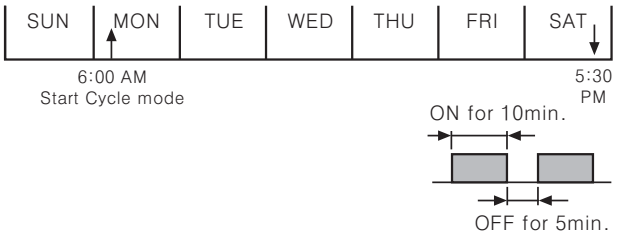
⑧Complete to set



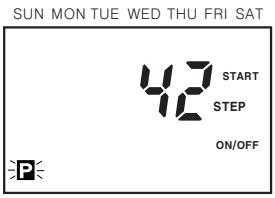
Press SET key to set additional program.

●Weekly Cycle mode

(Ex)Output1(OUT1) is ON for 10min and OFF for 5min from Monday 6:00AM to Saturday 5:30PM.

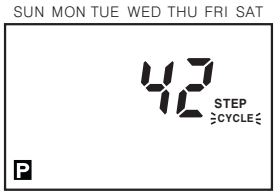


①Advance to weekly program setting mode



Press MODE key for 3sec. in RUN mode, " P " is flashed.

②Mode type setting

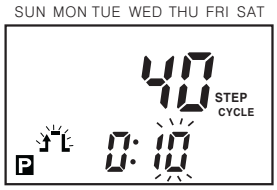


Press ▲ key when ON/OFF is flashed, cycle is flashed and press SET key.

③ to ⑧

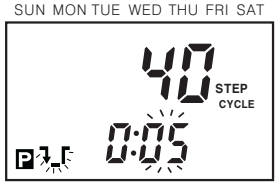
Refer to ③ to ⑧ of "●**Weekly ON/OFF mode**" to set ON day, ON time, OFF day and OFF time.

⑨ON time width setting



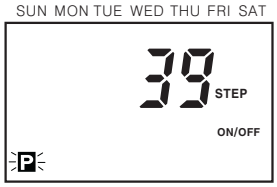
Press ▶ key to move the flashing to minute position and set as 10min. by ▲ key and press SET key.

⑩OFF time width setting



Press ▶ key to move the flashing to minute position and set as 5min. by ▲ key and press SET key.

⑪Complete to set



Press SET key to set additional program.

◎Weekly day change

When the specified day mode is required to install in other day, it is started from the set day and returned to previous program setting automatically when it is finished.

●Weekly day change cancellation

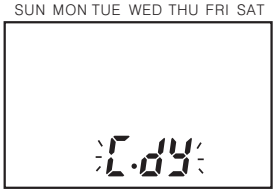
①Change current year, month, date in current time setting mode
②Change standard day
③Delete all program in program
④Season switching

●Setting example

Output is ON in saturday at 9:00AM and OFF at 12:00PM and it is ON 8:30AM and OFF at 6:00PM from monday to friday and the mode of monday and Tuesday is operated temporarily as saturday (standard) program.

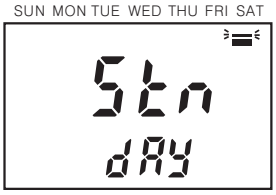
▣Program setting

①Advance to weekly day change mode



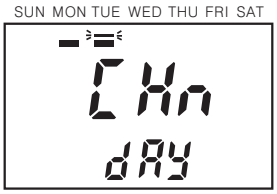
Press **MODE** key over 3sec. to move to the setting group1 in RUN mode and press it repeatedly until "C.dY" is flashed in second display part and press **SET** key.

②Standard day selection



Press ▶ key to move the indicator to saturday and press **SET** key. after select saturday as standard day(Sat is lighted) by ▲ or ▼ key.

③Change day selection



Press ▶ key to move the indicator to monday and select monday to change(Monday is lighted) by ▲ or ▼ key and repeat the procedure to select tuesday to change (Tue is lighted) and press **SET** key to complete.

◎Yearly holiday mode

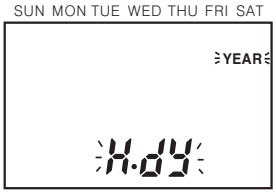
It operates to off the output without program adjustment during previously set yearly holiday period available from present year to 31, Dec. of the next year.

Designate the start date of yearly holiday and year of end date as every year("--") to repeat the holiday mode for specified in every year.

●Setting example

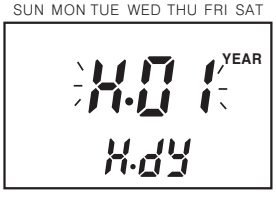
Set every year 5, May to off the output .

①Advance to yearly holiday mode



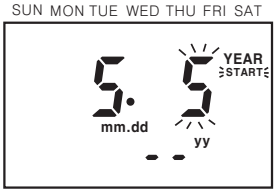
Press **MODE** key over 3sec. to move to the setting group1 in RUN mode and press it repeatedly until "H.dY" is flashed in second display part and press **SET** key.

②Yearly holiday No. display



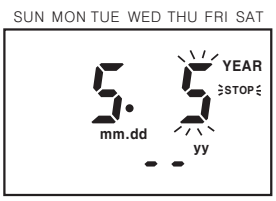
Press **SET** key after check yearly holiday No.

③Start date of yearly holiday setting



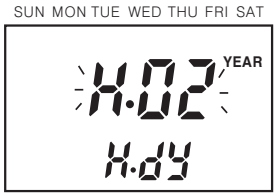
Press ▶ key until month position is flashed and set May by ▲ key and press ▶ key until date position is flashed. Press **SET** key after set 5th by ▲ key.

④End date of yearly holiday setting



The flashing is moved to month position directly and press ▲ key to set May and press ▶ key until date position is flashed. Press **SET** key after set 5th by ▲ key.

⑤Complete to yearly holiday



Press **MODE** key to finish the additional yearly holiday setting and press **SET** key to set .

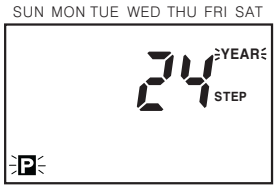
※It is able to set yearly holiday up to 12 times.

◎Yearly program setting

●Yearly ON/OFF mode

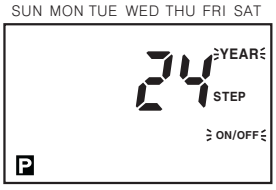
(Ex)Output(OUT) is ON from every 5, Apr to 7, Apr at 9:00AM and OFF 5:10PM.

①Advance to Program1(P1) yearly program setting mode



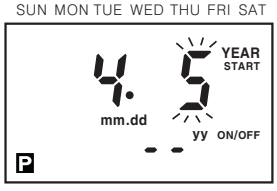
Press **MODE** key for 3 sec. in RUN mode, "P" is flashed and press **MODE** key once, then, "P" and YEAR are flashed and press **SET** key to set.

②Mode type setting



Press **SET** key when ON/OFF is flashed.

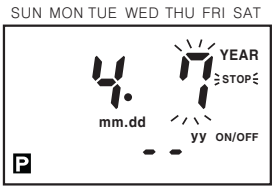
③Start date setting



Press ▶ key until month position is flashed and set Apr by ▲ key and press ▶ key until date position is flashed. Press **SET** key after set 5th by ▲ key.

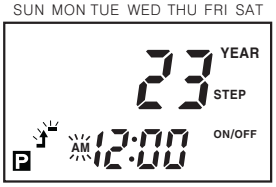
▣Program setting

④End date setting



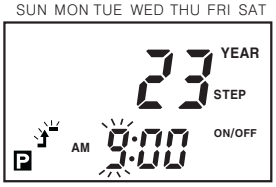
The flashing is moved to month position directly and press ▲ key to set April and press ▶ key until date position is flashed.
Press SET key after set 7th by ▲ key.

⑤ON time setting(AM, PM)



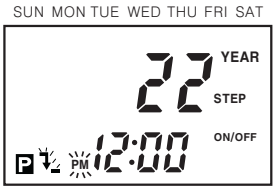
▶ key is pressed, move the flashing to hour position and select PM by ▲ or ▼ key when ON time is afternoon.

⑥ON time setting(Hour, Min.)



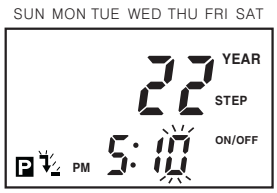
Press ▼ key to set 9 and press SET key after check 00min.

⑦OFF time setting(AM, PM)



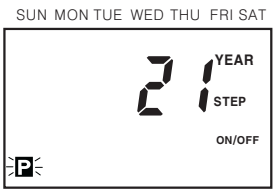
Select PM by ▲ or ▼ key and move the flashing to hour position by ▶ key.

⑧OFF time setting(Hour, Min.)



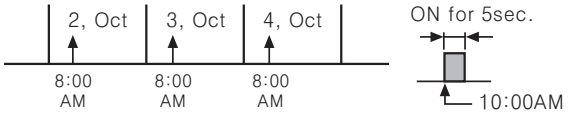
Move the flashing to minute position after set 5 by ▲ key and set the minute as 10 and press SET key.

⑨Complete to set

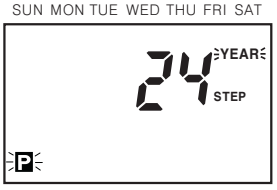


Press SET key to set additional program.

●Yearly pulse mode
(Ex)Output(OUT) is ON from 2, Oct., 2008 to 4, Oct, 2008 at 10:00AM and OFF after 5sec. (Present is 2007.)

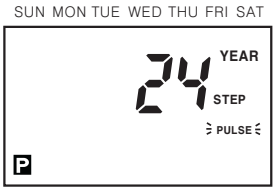


①Advance to yearly program setting mode



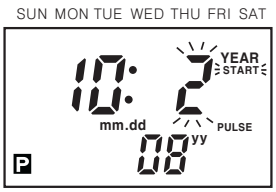
MODE key is pressed for 3sec in RUN mode, "**PROG P1**" is flashed and press MODE key again, "**PROG P2 YEAR**" is flashed and press SET key.

②Mode type setting



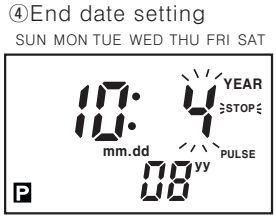
▲ key is pressed when ON/OFF is flashed to set pulse mode and press SET key.

③Start date setting



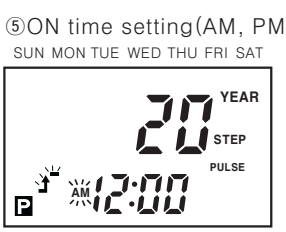
Press ▲ key twice to set 08(year 2008) and move to month position by ▶ key.
Set Oct. by ▼ key and move to date position by ▶ key and press SET key after set 2nd by ▲ key.

④End date setting



The flashing is moved to month position directly by ▶ key and set 4th by ▲ key after move it to date position by ▶ key, then press SET key.

⑤ON time setting(AM, PM)

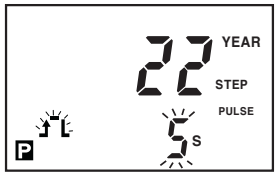


▶ key is pressed, move the flashing to hour position and select PM by ▲ or ▼ key when ON time is afternoon.

⑥ON time setting(Hour, Min.)

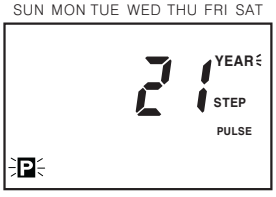
Press ▼ key twice to set 10 and press SET key after check 00min.

⑦Pulse width setting



Press ▲ key 4 times to select pulse width as 5s and press SET key.

⑧Complete to set

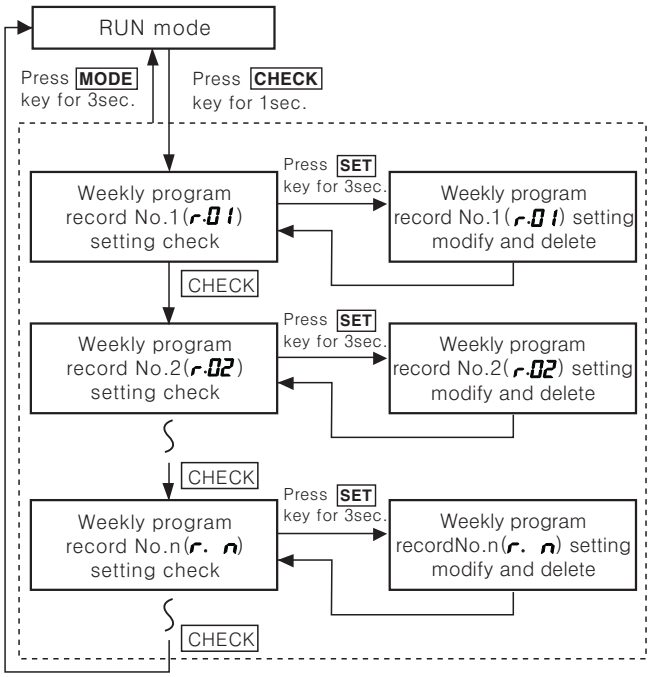


Press SET key to set additional program.

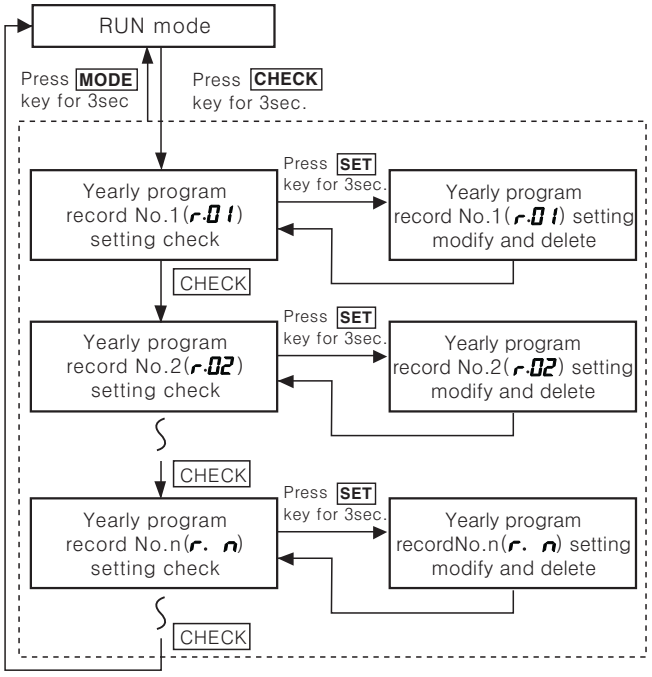
※It is able to set year of start/end date in yearly program setting up to 2 years later from the present year.

▣Program check, modify and delete

◎Weekly program check, modify and delete



◎Yearly program check, modify and delete



※"**YEAR**" is lighted when check, modify or delete yearly program.

- If any key is untouched for 60sec., it is returned to RUN mode in weekly or yearly program check.
- In weekly or yearly program check, it controls output according to program setting and output is OFF in modify or delete mode.
- When **MODE** key is pressed in weekly or yearly program record modify, delete stand by or delete mode, current work is cancelled and it is returned to check mode.
- Weekly or yearly program record modify and delete

(1)Program record modify

①When press **SET** key over 3sec. in program check, "Edt" is flashed in second display part, press **SET** key.

②It returns to check mode when finish the modify same as the above procedure.

(2)Program record delete

①When press **SET** key over 3sec. in program check, "Edt" is flashed in second display part, press ▲ or ▼ key until "CLr" is flashed in second display part and press **SET** key.

②Press **SET** key over 3sec. when "CLr" is lighted in second display part, it returns to program check.

◎ON time

The period of time during a required voltage is being applied to the timer or Start Signal.

◎OFF time

The period of time between the moment that resetting begins and the moment that the operating voltage is applied to the operating circuit. Therefore, the OFF time of the timer is larger than the resetting time.

◎Operating time

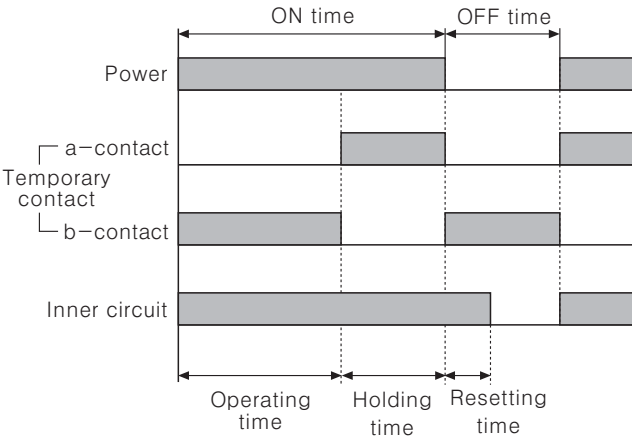
The period of time from ON time to the time convert b-contact to a-contact.

◎Holding time

The period of time from temporary b-contact acts to return.

◎Resetting time

The period of time after the power is cut until the return of the timer to its initial state.



(Figure a) Time temporary work chart

Resetting time is indicated on the specification of each series. When the timer is operated less than indicated OFF time, the timer running time will be short or will not work.

Therefore, OFF time should be longer than resetting time.

◎Self-reset

Turn off the power to reset. Called Power Reset.

◎Electrical reset

To reset timer by applying a required voltage to the reset circuit.

◎Manual reset

To mechanically reset the timer by manual operation.

◎ Timer error

Hour timer is represented by 5 articles, imbalance of operating time, set error, power of properties, effect of ambient temperature, and characterizes of OFF time.

But, sometimes almost unaffected items are not listed in the individual specifications.

●Repeat error

Error occurs when after set at random times, repeat an action under the same conditions. Repeat error is calculated by following formula, and the number of calculation should be more than 5 times.

$$\text{Repeat error} = \pm\frac{1}{2} \times \frac{\text{Tmax}-\text{Tmin}}{\text{TMs}} \times 100(\%)$$

- Tmax : Maximum value of operating times measured at the same time
- Tmin : Minimum value of operating times measured at the same time
- TMs : Maximum scale time (TMs is a set value in the case of a digital timer)

●Setting error

Difference between the actual operation time and scale time. Measurement position can be any position as long as it is set to $\frac{1}{3}$ min. of the maximum scale time.

$$\text{Setting error} = \pm\frac{\text{TM}-\text{TS}}{\text{TMs}} \times 100(\%)$$

- TM : Average value of measured times (min. 5 times)
- TS : Set time (any scale time)
- TMs : Maximum scale time (TMs is a set value in the case of the digital timer)

●Influence of voltage

Fluctuation range about operating time when the current of operating power is fluctuating within allowable current fluctuation range.

$$\text{Influence of voltage} = \pm\frac{\text{TMx1}-\text{TM1}}{\text{TMs}} \times 100(\%)$$

- TMx1 : The average current time when the TM1 deviation is maximum within allowable voltage fluctuation range.
- TM1 : Average value of operating times at rated voltage.
- TMs : Maximum setting time (TMs is a set vale in the case of the digital timer.)

●OFF time characteristics

A change in operating time when the operating time is a given OFF time are changed.

$$\text{OFF time characteristics} = \pm\frac{TMx3-TM3}{TMs}\times 100(\%)$$

- TMx3 : Average value of operating times measured with an OFF time that causes the maximum deviation from TMx3 within the specified OFF time range of 1 hour from the specified resetting time.
- TM3 : Average value of operating times measured with 1 second OFF time
- TMs : Maximum setting time (TMs is a set value in the case of the digital timer.)

OFF time characteristics are determined by the charging and discharging of a capacitor and resistor used in combination as an electronic timer. The characteristics vary by ±1.5 to ±5%.

●Influence of temperature

It converts and displays the effect that the change of temperature affects to the operating time in the range of the ambient temperature to the change of operating time.

$$\text{Influence of temperautre} = \pm\frac{TMx2-TM2}{TMs}\times 100(\%)$$

- TMx2 : Average value of operating time measured at a temperature which causes the maximum deviation from TM2 within the ambient temperature range.
- TM2 : Average value of operating times measured at 20℃.
- TMs : Maximum setting time (TMs is a set value in the case of the digital timer.)

◎Contact organization

●SPST (Single Pole Single Throw)

Organized one COM and one a-contact or b-contact. Indicates as SPST(1a) or SPST(1b).

●SPDT (Single Pole Double Throw)

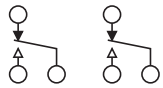
Organized one COM and one a-contact and one b-contact. Indicates as SPDT(1a1b) or SPDT(1c).

●DPST (Double Pole Single Throw)

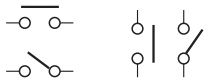
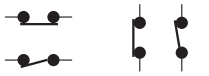
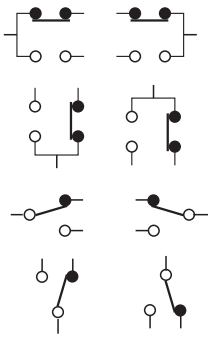
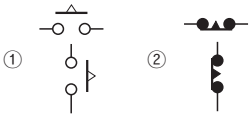
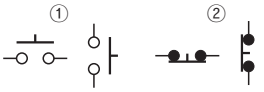
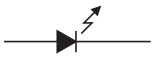
Organized two COMs and two a-contact or b-contact. Indicates as DPST(2a) or DPST(2b).

●DPDT (Double Pole Double Throw)

Organized two COMs and two a-contact and two b-contact. Indicates as DPDT(2a2b) or DPDT(2c).

SPST (1a) (Single Pole Single Throw)	
SPST (1b) (Single Pole Single Throw)	
SPDT (1a1b) or SPDT (1c) (Single Pole Double Throw)	
DPST (2a) (Double Pole Single Throw)	
DPST (2b) (Double Pole Single Throw)	
DPDT (2a2b) or DPDT (2c) (Double Pole Double Throw)	

◎Symbols at internal connection diagram

Title	Symbol	Description
a-contact		Normally open contact when no relay input is applied
b-contact		Normally closed contact when no relay input is applied
c-contact		a-contact and b-contact are contacted at one line. b-contact is located right hand side or up side.
Time-limit operation		Instantaneous returning contact = ① is a-contact, ② is b-contact
Manually operation		Automatic returning contact = display push button switch control contact, ① is a-contact, ② is b-contact
Relay		Electromagnetic relay
LED		Used to indicate the operating state of the timer.