C

Counter / Timer

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■ Digital counter

Model	GE4-P4□	GE4-P6□	GE4-T60
Appearance (㎜)	 48(W) X 48(H)	 48(W) X 48(H)	 48(W) X 48(H)
Type	Pre-set counter		Total counter
Control function	Counter (batch function, UP, DOWN, UP/DOWN), timer function		
Displayable digit	4 digits	6 digits	6 digits
Stage setting	1 stage setting, 2 stage setting		-
Computation speed	1 / 30 / 1 K / 10 K cps		
Free scale	Yes		
Time unit	4 digits : 99 h 59 m / 99 m 59 s, 6 digits : 99 h 59 m 59 s and etc. 10 kinds (select either decimal system or sexagesimal system)		
Power supply voltage	100 - 240 V AC, 50 - 60 Hz, 24 - 60 V DC/AC		
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■ Digital counter

Model	GE6-P4□	GE6-P6□	GE6-T60
Appearance (㎜)	 72(W) X 36(H)	 72(W) X 36(H)	 72(W) X 36(H)
Type	Pre-set counter		Total counter
Control function	Counter (batch function, UP, DOWN, UP/DOWN), timer function		
Displayable digit	4 digits	6 digits	6 digits
Stage setting	1 stage setting, 2 stage setting		-
Computation speed	1 / 30 / 1 K / 10 K cps		
Free scale	Yes		
Time unit	4 digits : 99 h 59 m / 99 m 59 s, 6 digits : 99 h 59 m 59 s and etc. 10 kinds (select either decimal system or sexagesimal system)		
Power supply voltage	100 - 240 V AC, 50 - 60 Hz, 24 - 60 V DC/AC		
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■ Digital counter

Model	GE3-P6□	GE3-T60	GE7-P6□	GE7-T60
Appearance				
(㎜)	96(W) X 48(H)	96(W) X 48(H)	72(W) X 72(H)	72(W) X 72(H)
Type	Pre-set counter	Total counter	Pre-set counter	Total counter
Control function	Counter (batch function, UP, DOWN, UP/DOWN), timer function			
Displayable digit	6 digits			
Stage setting	1 stage setting, 2 stage setting	-	1 stage setting, 2 stage setting	-
Computation speed	1 / 30 / 1 K / 10 K cps			
Free scale	Yes			
Time unit	4 digits : 99 h 59 m / 99 m 59 s, 6 digits : 99 h 59 m 59 s and etc. 10 kinds (select either decimal system or sexagesimal system)			
Power supply voltage	100 - 240 V AC, 50 - 60 Hz, 24 - 60 V DC/AC			
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■ LCD displaying Counter/Timer

Model	LC1	LC1-F	LT1	LT1-F
Appearance				
(㎜)	48(W) X 24(H)		48(W) X 24(H)	
Type	LCD displaying counter		LCD displaying timer	
Input type	Non-voltage input	Voltage input	Non-voltage input	Voltage input
Reset	Non-voltage input		Non-voltage input	
Displayable digit	8 digits(UP)		8 digits(UP)	
Computation speed	1 / 30 / 100 / 1 K cps		-	
Time unit	-		9999h59m59s and etc (4 kinds)	
Power supply voltage	Lithium battery built in (approx. 7 years)		Lithium battery built in (approx. 10 years)	
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■ Digital counter/Timer

Model	GF4-P41N	GF4-T40N	GF4-P41S (8pin socket)
Appearance			
(㎜)	48(W) X 48(H)	48(W) X 48(H)	48(W) X 48(H)
Type	Pre-set counter	Total counter	Pre-set counter
Control function	Counter (UP, DOWN UP/DOWN), timer (range : 8 kinds, UP, DOWN)		
Displayable digit	4 digits		
Stage setting	1 stage setting	-	1 stage setting
Computation speed	30 / 5 K cps		
Free scale	NO		
Time unit	4 digits : 99 h 59 m / 99 m 59 s and etc. 8 kinds (select either decimal system or sexagesimal system)		
Power supply voltage	100 - 240 V AC 50/60 Hz		
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■ Digital counter/Timer

Model	GF7-P61E / P41E	GF7-P62E/ P42E	GF7-T60E
Appearance			
(㎜)	72(W) X 72(H)	72(W) X 72(H)	72(W) X 72(H)
Type	pre-set counter		total counter
Control function	counter (UP, DOWN UP/DOWN), timer (range : 8 kinds, display UP, DOWN)		
Displayable digit	4 digits, 6 digits	4 digits, 6 digits	6 digits
Stage setting	1 stage setting	2 stage setting	-
Computation speed	30 / 1 K / 3 K / 5 K cps (selected by the front volume)		
Free scale	YES		
Time unit	4 digits : 99 h 59 m / 99 m 59 s and etc. 8 kinds, 6 digits : 99 h 59 m 59 s and etc. 8 kinds (select either decimal system or sexagesimal system)		
Power supply voltage	100 - 240 V AC 50/60 Hz		
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■ Digital Timer

Model	TT4	TT7
Appearance		
(㎜)	48(W) X 48(H)	72(W) X 72(H)
Function	Twin Timer Dual Timer	Twin Timer
Displayable digit	4 digits	4 digits (ON Time : Red, OFF Time : Green)
Time specification	Multi range	59.99 sec (down indication)
Terminal structure	8 pin, 11 pin	Fixing terminal
Control output	Relay	Relay
Contact composition	(1 c) × 2 contact	(1 c) (time limit)
Power supply voltage	100 – 240 V AC 50 – 60 Hz	100 – 240 V AC 50 – 60 Hz
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■ Digital Timer

Model	TF4	TF2	LF4N
Appearance			
(㎜)	48(W) X 48(H)	48(W) X 96(H)	48(W) X 48(H)
Function	Select the time range by using the front deep switch		Bar-graph display,multi range, multi output operation
Displayable digit	4 digits	3 digits	3 digits
Time specification	Refer to the standard range	99.9 sec / 999 sec	0.01 s ~ 9990 h
Terminal structure	8 pin	Terminal structure	8 pin, 11 pin
Control output	Relay, None-contact	Relay, None-contact	Relay
Contact composition	Time-limit (1 c)	Time-limit (1 c)	1 c × 2 contact
Power supply voltage	100 – 240 V AC 50/60 Hz 24 – 60 V DC	100 – 240 V AC 50/60 Hz	24 – 240 V AC/DC
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■ Analog timer

Model	T21
Appearance (㎜)	 21.4(W) × 28(H)
Function	Timing Relay
Time specification	1 (0.1 sec ~ 10 min), 3 (0.3 sec ~ 30 min), 6 (0.6 sec ~ 60 min), 3H (0.3 hrs ~ 24 hrs)
Terminal structure	14 pin
Control output	Power on delay, Interval, Flicker OFF start, Flicker ON start
Contact composition	4a4b
Power supply voltage	AC : 200 – 230 V AC 50/60 Hz, DC : 24 V DC
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■ Analog timer

Model	T38N	T48N
Appearance (㎜)	 41(W) × 51(H)	 48(W) × 48(H)
Function	ON Delay Timer	
Time specification	0.01 s ~ 60 h (select the time unit (hour, min, sec and etc) by using the front deep switch)	
Terminal structure	8 pin	
Control output	Relay	
Contact composition	Time-limit (1c) + Instantaneous(1a), Time-limit (1c) + Instantaneous (1c), Time-limit (1c) + Time-limit (1c)	
Power supply voltage	24 – 240 V AC/DC 50/60 Hz (dual usage)	
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■ Analog Timer

Model	T57NE	T57NP	TF62NE	TF62NP
Appearance (㎜)	 50(W) × 62(H)	 58(W) × 85(H)	 50(W) × 62(H)	 58(W) × 85(H)
Function	ON Delay Timer		Twin timer	
Time specification	Select the time range among 3 types by using the front deep switch.			
Terminal structure	8 pin			
Control output	Relay			
Contact composition	Time-limit(1c)+Instantaneous(1a), Time-limit(1c) + Instantaneous(1c), Time-limit(1c)		Time-limit (1c)	
Power supply voltage	24 - 240 V AC/DC 50/60 Hz (Dual usage)			
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■ Analog timer

Model	TF62DE	TF62DP
Appearance (㎜)	 50(W) × 62(H)	 58(W) × 85(H)
Function	Dual timer	
Time specification	Select the time range among 3 types by using the front deep switch	
Terminal structure	8 Pin	
Control output	Relay	
Contact composition	time limit (1c) + time limit (1c)	
Power supply voltage	24 - 240 V AC/DC 50/60 Hz (Dual usage)	
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■ Analog timer

Model	MA4SD
Appearance (㎜)	 48(W) × 48(H)
Function	Star-Delta timer
Time specification	⅄ Operation time : 1.2 (1 ~ 12 sec), 3 (2.5 ~ 30 sec), 12 (10 ~ 120 sec), 30 (25 ~ 300 sec) ⅄-Δ Switching time : A (50 ㎳), B (100 ㎳), C (200 ㎳), D (300 ㎳), E (400 ㎳), F (500 ㎳)
Terminal structure	8 Pin
Control output	Instantaneous output, ⅄ output, Δ output
Contact composition	⅄ Contact : 1a, ΔContact : 1 a, Instantaneous contact : 1 a
Power supply voltage	100 - 240 V AC 50/60 Hz, 24 - 240 V DC
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■ Analog timer

Model	MA4N
Appearance (㎜)	 48(W) × 48(H)
Function	Multi range (4 kinds), multi output operation (6 kinds)
Time specification	0.12 s ~ 300 h
Terminal structure	8 Pin, 11 Pin
Control output	Relay
Contact composition	time limit (1c), instantaneous (1c)
Power supply voltage	24 - 240 V AC/DC 50/60 ㎐ (dual usage)
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■ LCD weekly / yearly time switch (LCD time switch)

Model	LY4		LY7	
Appearance				
(㎜)	48(W) × 48(H)	48(W) × 62(H)	72(W) × 72(H)	72(W) × 92(H)
Function	Weekly and yearly control, 24h/12h (AM/PM) display, holiday setting, season setting, summer time setting, power backup			
Time specification	Minimum setting gap : 1min			
Number of setting step	Weekly program 64 steps (Step), yearly program 32 steps (Step)			
Control output	Relay		Relay	
Contact composition	1 c contact, 15 A 250 V AC		1 c × 2 contact, 15 A 250 V AC	
Installation structure	Flush type and extended type (DIN rail) dual usage			
Power supply voltage	100 – 240 V AC 50 – 60 Hz			
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GE Series

Digital Batch Counter

- Batch function
- NPN/PNP input selectable
- Pre-scale setting
- Display up to 4 digits of decimal points
- Off set setting
- Display UP/DOWN between 2 contact inputs (Cp1, Cp2)

Suffix code

Model	Code						Description
GE	□–	□	□	□	□		Digital counter
Appearance(㎜)	3						96 X 48 ㎜
	4						48 X 48 ㎜
	6						72 X 36 ㎜
	7						72 X 72 ㎜
Type		P					Pre-set counter
		T					Total counter (only for indication)
Displayable digit			4				4 digits (9999) ※ GE3 and GE7 are not selectable
			6				6 digits (999999)
Setting stage (excludes the total counter)				1			1st stage setting
				2			2nd stage setting
Power supply voltage					A		100 – 240 V AC 50 – 60 Hz
					D		24 – 60 V DC / AC 50 – 60 Hz

Specification

Counter

Model selection	1st stage setting	Counter(CNT) / Timer(TIM) selectable
	2nd stage setting	2nd stage setting counter (2CNT)/Timer (TIM) selectable
Input action selectable		UP (U-A, U-b, U-Ab), DOWN (d-A, d-b, d-Ab), UP/DOWN (Ud-A, Ud-b, Ud-C, Ud-d, Ud-E, Ud-F)
Output action selectable		N, F, C, R, K, P, Q, A (Selectable by the internal parameter)
ONE SHOT time setting		ONE SHOT time setting (setting range: 0.01~99.99sec) of OUT1 and OUT2 (Out) or HOLD (self-holding) output selectable
Batch function		Compute the number of OUT1 and OUT2 output action (selectable by the internal parameter)
Computed input signal		CP1, CP2
RESET		auto reset, internal reset, external reset, external BAT.RESET (select the external reset min signal width)
Input computation speed		1 cps, 30 cps, 1 Kcps, 10 Kcps (ON/OFF ratio : 1:1, "H"stage : 5 – 30 V DC, "L"stage : 0 – 2 V DC)
Pre-scale setting		4digits (0001~9999), 6digits (0000001 ~999999)
Pre-scale decimal point setting		Set the decimal point of scale value (4digits : 0.001 ~ 99.99), (6digits : 0.00001 ~ 9999.99)
Displaying unit decimal point setting		Set the decimal point of displaying unit (0000 → 000.0 → 00.00 → 0.000)
Power failure memory setting		Save the computed value/select the computed value reset when turning OFF the power.

Input logic selection	NPN(none-voltage) input/PNP(voltage) input selectable (※ selectable by the deep switch)
Key lock selectable	4 stages front key lock function selectable
Computed value setting recognition	Recognize at all times (possible to change the setting during communication)
Power failure compensation	10 years (non-volatile memory)

Timer

Model selection	1st stage setting	Timer (TIM)/ Counter (CNT) selectable
	2nd stage setting	Timer (TIM)/ Twin Timer (TTIM)/ 2nd stage setting counter (2CNT) selectable
System selection		Select decimal system or sexagesimal system for time display
Time range		Refer to the timer time range (decimal system/sexagesimal system each 5 types)
Operation mode		Refer to the timer operation mode (Timer: 12 types, twin timer: 5 types, total: 2 types)
ONE SHOT time setting		ONE SHOT time setting (setting range: 0.0~99.99sec) of OUT2 (Out) or HOLD (self-holding) output selectable
Batch function		Compute the number of OUT1 and OUT2 output action (selectable by the internal parameter)
External input signal		START, INHIBIT, RESET, BAT.RESET (input time range selectable)
Power failure memory setting		Save the current time and batch counter value/select the computed value reset when turning OFF the power
Input logic selectable		NPN(none-voltage) input/PNP(voltage) input selectable (※ selectable by the deep switch)
Key lock selectable		4 stages front key lock function selectable
Computed value setting recognition		Recognize at all times (possible to change the setting during communication)
Power failure compensation		10 years (non-volatile memory)

Function

Timer action error	With power start : max ±0.01 % ±0.05 sec With reset start : max ±0.005 % ±0.003 sec
Noise resistance	Square wave by the noise simulator (1 ㎲ pulse per 16 ㎳) ±2 ㎸ (between power terminal - input terminal)
Insulation resistance	100 MΩ min (500 V DC) electric conduction terminal - none recharging metal
Dielectric strength	2000 V AC, 60 ㎐ for 1 min (different recharging terminal from each other)

General specification

Model	GE4	GE6	GE3	GE7
Power supply voltage	100 - 240 V AC 50 - 60 ㎐, 24 - 60 V DC/AC (voltage fluctuation: : ±10 %)			
Power consumption	approx. 13.5 VA (100 - 240 V AC), approx. 5 W (24 - 60 V DC), approx. 9 VA (24 - 60 V AC)			
External supplying power	12 V DC, 100 ㎃ max.			
Displaying characters	7 segments LED (computed value: red, set value: green)			
Character height(㎜)	11 (computed value) / 8 (set value)		13 (computed value) / 10 (set value)	
Displayable digit	4digits, 6digits		6digits	
Stage setting	1st, 2nd			
Ambient temperature	-10 ~ 55 ℃			
Ambient humidity	35 ~ 85 % RH			
Storage temperature	-20 ~ 65 ℃			
Vibration resistance	10 - 55 ㎐, peak amplitude 0.5 ㎜, 3 axis each direction for 2 hour			
Shock resistance	300 ㎨, 3 axis each three times			

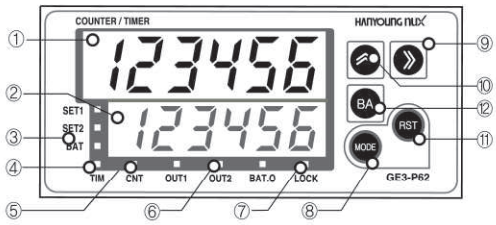
● Control output

Model		GE4	GE6	GE3	GE7
Contact	1st stage	1c (OUT)	1a (OUT)	1c (OUT)	
	2nd stage	1a (OUT 1), 1c (OUT 2)			
	capacity	a contact : 240 V AC, 3 A (resistive load), b contact : 240 V AC 2A			
Non-contact	1st stage	NPN 2contacts (OUT, BAT.O)			
	2nd stage	–	–	NPN 2contacts (OUT 1, OUT 2)	
	capacity	Open collector, 30 V DC, 100 ㎃ max.			

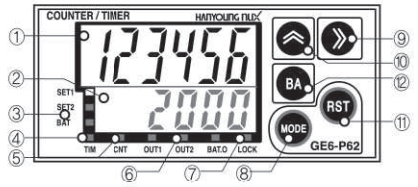
※ BAT.O : Batch-out

Name of each part

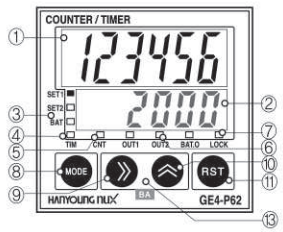
■ GE3



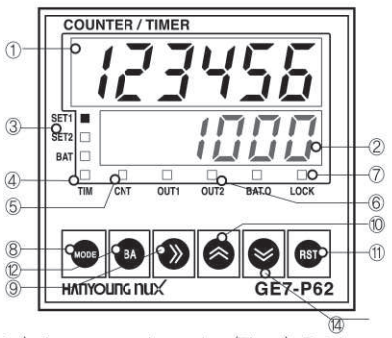
■ GE6



■ GE4



■ GE7



① Computed value displaying unit (RED FND): Computed value (Counter), time processing value (Timer), Batch computed value and setting list indication

② Setting displaying unit (GREEN FND): set value (Counter), set time (Timer), batch set value, instantaneous output setting (when timer batch setting is 0) and view setting information.

③ SET1, SET2 (SET), BAT: Display the status of computed part and setting part (BAT ramp indicates the batch status)

④ TIM (Timer): Flickers when timer runs and maintains the L.ON state when it stops because of INHIBIT input or RESET (Displayed when sets TIM/TTIM in the device changing mode)

⑤ CNT (Counter): Displayed when sets CNT/2CNT in the device changing mode.

⑥ OUT1, OUT2 (OUT), BAT.0 (output action indication)

· When batch set value is set, BAT.O flickers (BAT.O output)

· When batch set value is 0, it operates as instantaneous output. BAT.O flickers and output

· CP1, CP2, RST: Input state check (Only for TOTAL)

⑦ LOCK: KEY LOCK, flickers when sets the operation display LOCK

⑧ MODE: Enter into the function setting mode and key for changing the mode. It is also applied as ending function after change and save the set value

⑨ ≫: Enter into the set value changing mode and shift digits

⑩ ≪: UP direction key

⑪ RST : RESET key does not operate when indicates the RESET key ramp 3 (SET, BAT) at the same time

⑫ BA : In the operation mode, pressing the BA key approx 1 sec will change the mode to the 1st stage set value, 2nd stage set value and batch set value mode. When BAT ramp is turned ON and it means batch mode and operation will be continue.

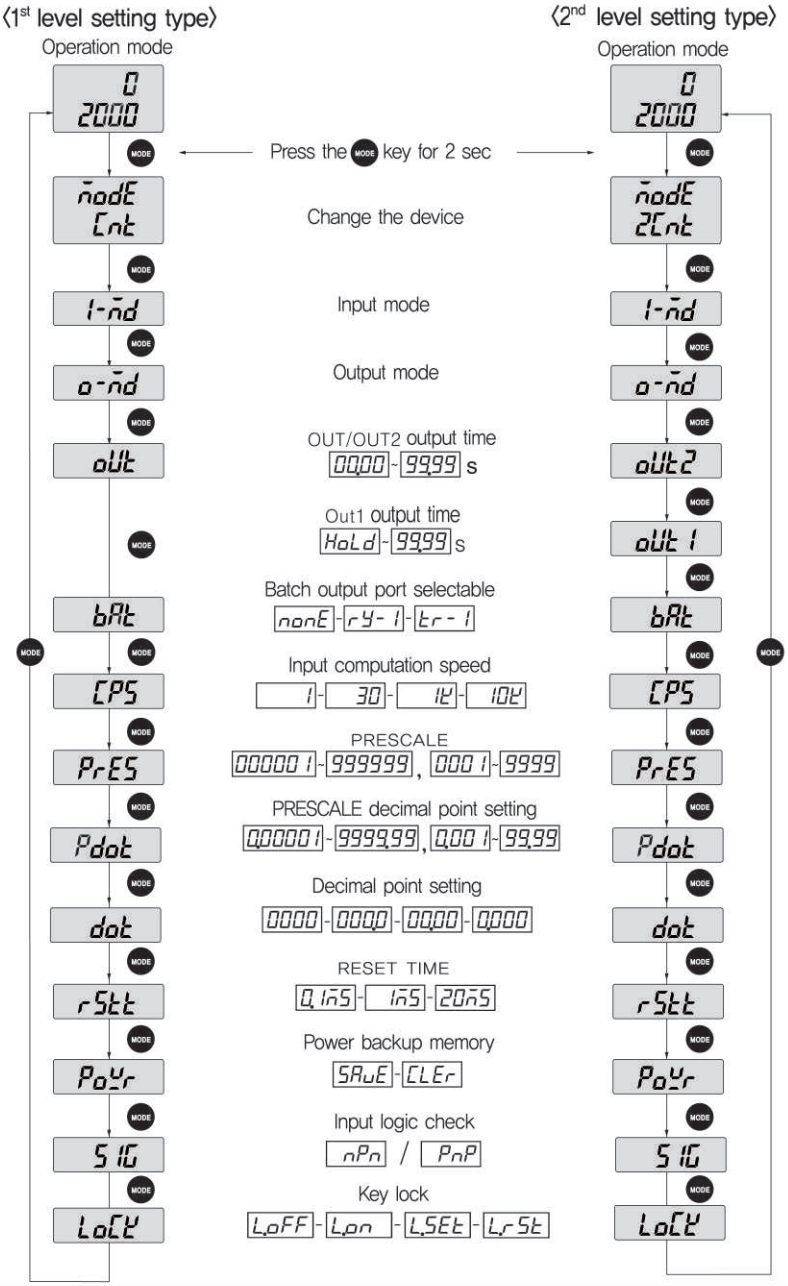
⑬ ≫ + ≪ : Pressing these synchronously will operates same as BA key function

⑭ ≪ : Down direction key

※ Set displaying part and SET 1, SET 2, BAT are not included in the model TOTAL and OUT1, OUT2, BAT.O is changed to the CP1, CP2, RST input status confirmation ramp.

1st stage setting mode does not have SET1, OUT1 ramp and SET 2 is indicated as SET and OUT2 is indicated as OUT.

Counter mode setting method



Counter function setting mode

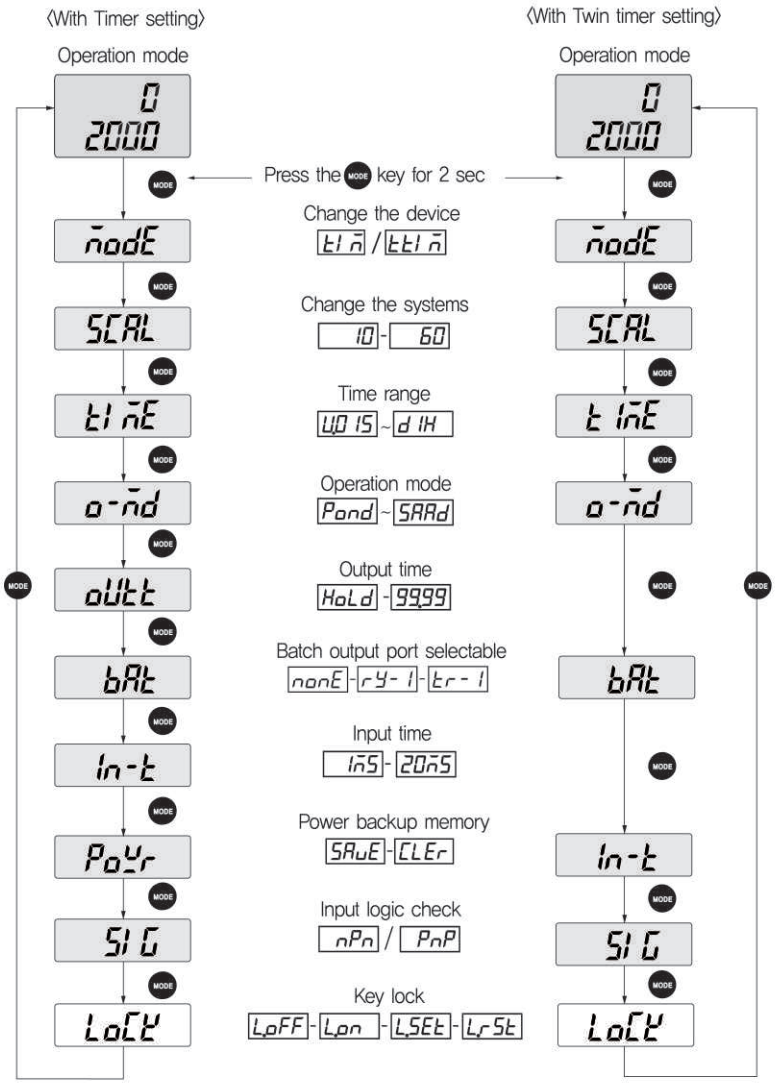
☐ Pressing the "MD" key in the operation mode for 2 sec will set the function setting mode (■ : Default set value)

Setting lists	Setting information	
Device change nodE	ti m - **Cnt** : 1st stage setting type ti m - tti m - **2Cnt** : 2nd stage setting type	Cnt : 1st stage setting counter 2Cnt : 2nd stage setting counter
Input mode I-md	**U-A** - d-A - U-b - d-b - U-Ab - d-Ab - Ud-A - Ud-b - Ud-C - Ud-d - Ud-E - Ud-F	U-Ab : CP1, CP2 dual input UP Mode action d-Ab : CP1, CP2 dual input DOWN Mode action # Refer to the input action (counter)
Output mode o-md	n-**F**-C-r-t-P-9-A	# Refer to the output action (counter)
Output time out2	**00.00** - 99.99	One shot delay time n-F (Self-maintenance output when setting is 0) One shot time setting C-r-t-P-9-A
Output time out1	**Hold** - 99.99	It is not displayed in the 1st stage output product
BATCH output bAt	**none** - ry-1 - tr-1	Set the batch output port (ry: Relay , tr : Transistor)
Computation speed CSPD	1 - **30** - 1t - 10t	Set 1 or 30 when using contact
Pre-scale PrES	00.001 - 99.999 0.001 - 9.999	Default value **1.000**
Pre-scale decimal point setting Pdot	0.0000 1 - 9999.99 0.00 1 - 9.999	Able to set up to 5 decimal points and able to shift up to 4 digits
Display unit decimal point setting dot	**0000** - 000.0 - 00.00 - 0.000	Applied when set decimal point on the display unit and able to set up to 3 decimal points
RESET TIME rSt	0.1mS - **1mS** - 20mS	Minimum signal range of external RESET signal input
Power backup memory PoWr	**SAvE** - CLEr	SAvE : Save the computed value when Power is OFF CLEr : Initialize the computed value when Power is OFF
Input logic SIG check	**nPn** / PnP	Varies depending on the handling of internal switch
Key lock LoCK	Key Lock **LoFF** - Lon - LSEt - LrSt	LoFF : Key lock cancellation Lon : All keys prohibited (MODE excluded) LSEt : Using BA , , , keys prohibited LrSt : Using front part RST prohibited

Pressing the RST key will return to the operation mode without saving. Return to the operation mode if there is no key input for more than 60 sec. In the function setting mode, it ignores an external signal input and maintains output as OFF state.

- TOTAL product does not display setting lists such as output mode, OUT2 output time, OUT1 output time, BATCH output and etc
- 1st stage setting product does not display OUT1 output time
- Selecting NONE in the BATCH output setting, it limits the setting function and display function.

Timer mode setting method



Twin Timer (TTIM) set time change method

(1) Upper side 7 segments red LED will start to flicker when pressing the ❯❯ key in the operation mode.
(2) Set value of "SET" setting mode. Shift the digits by pressing ❯❯ key and change the set time by pressing the ❮❮ and ❯❯ key and press the MODE key.
(3) SET 2 setting mode (green 7 segments LED) will be displayed. Shift the digits by pressing ❯❯ key and change the set time by pressing the ❮❮ and ❯❯ key and press the MODE key then operation mode will be displayed.

Function setting mode (Timer/Twin timer)

Setting lists	Setting information	
		■ Default value
Change the device modE	[tIm]-[Cnt] : 1st stage setting type [tIm]-[ttIm]-[2Cnt] : 2nd stage setting type	[tIm] : Timer [ttIm] : Twin timer
Change the system SCAL	[10]-[60]	Decimal system / Sexagesimal system
Time range tImE	[U0.01S]-[U.1S]-[U 1S]- [U 1m]-[U 1H]-[d0.01S]- [d.1S]-[d 1S]-[d 1m]-[d 1H]	[tIm] 0.01 s ~ 999999 h UP / DOWN selectable
Operation mode o-md	TIM (TIMER setting) [Pond]-[Sond]-[Sond]-[SoFd]- [S Int]-[S.Int]-[SFLt]-[SAAd] TTIM (TWN TIMER setting) [Pond]-[PoFd]-[Sond]-[SoFd]-[PoFt] Total(display only) [PrUn]-[SrUn]	1st stage output model does not support [ttIm] Please refer to the output action mode chart for detailed information
Output time oUtt	[HoLd]-[99.99] s OUT2(OUT)의 One shot or self-maintenance selectable	Not displayed in the product (display only) and some of operation mode in the TWIN TIMER
BATCH output bAt	[nonE]-[rY-1]-[tr-1]	Set the Batch output port (rY : relay tr : transistor)
Input time In-t	[1mS]-[20mS]	Input terminal minimum input time selectable 1 ms / 20 ms (INHIBIT, START, RESET)
Power backup memory PoUr	[SAUE]-[CLEr]	[SAUE] : Save current time and batch counter value when OFF the power [CLEr] : Initialize the computed value when OFF the power
Input logic check SIG	[nPn] : Non-voltage input [PnP] : Voltage input	Varies depending on the handling of internal switch Changing the setting in the menu is prohibited. Only reading
Key lock LoCK	Key lock setting in the operation state (4 stages) [LoFF]-[Lon]-[LSEt]-[LrSt]	[LoFF]: Key Lock cancel [Lon]: Using all keys on the front is prohibited (MODE key excluded) [LSEt]: Using BA, », ▲, ▼ key is prohibited [LrSt]: Using RST key on the front is prohibited

※ TOTAL (product) does not have output time list and BAT setting list
※ 1st stage output model does not support twin timer function

Setting method

■ Computed value setting method

(1) Every time when users press the BA key for 1 sec in the operation state, LED will be alternatively flicker in the SET-SET2-(BAT)
(2) Pressing the » key in each sate will display the setting mode and 1st digit will start to flicker. Here, pressing » key will shift the digits.
(3) Set the computed value by using ▲key and ▼key and press the MODE key then set value will be saved.
(But, in the BAT setting mode, it is displayed only when selected the internal parameter)

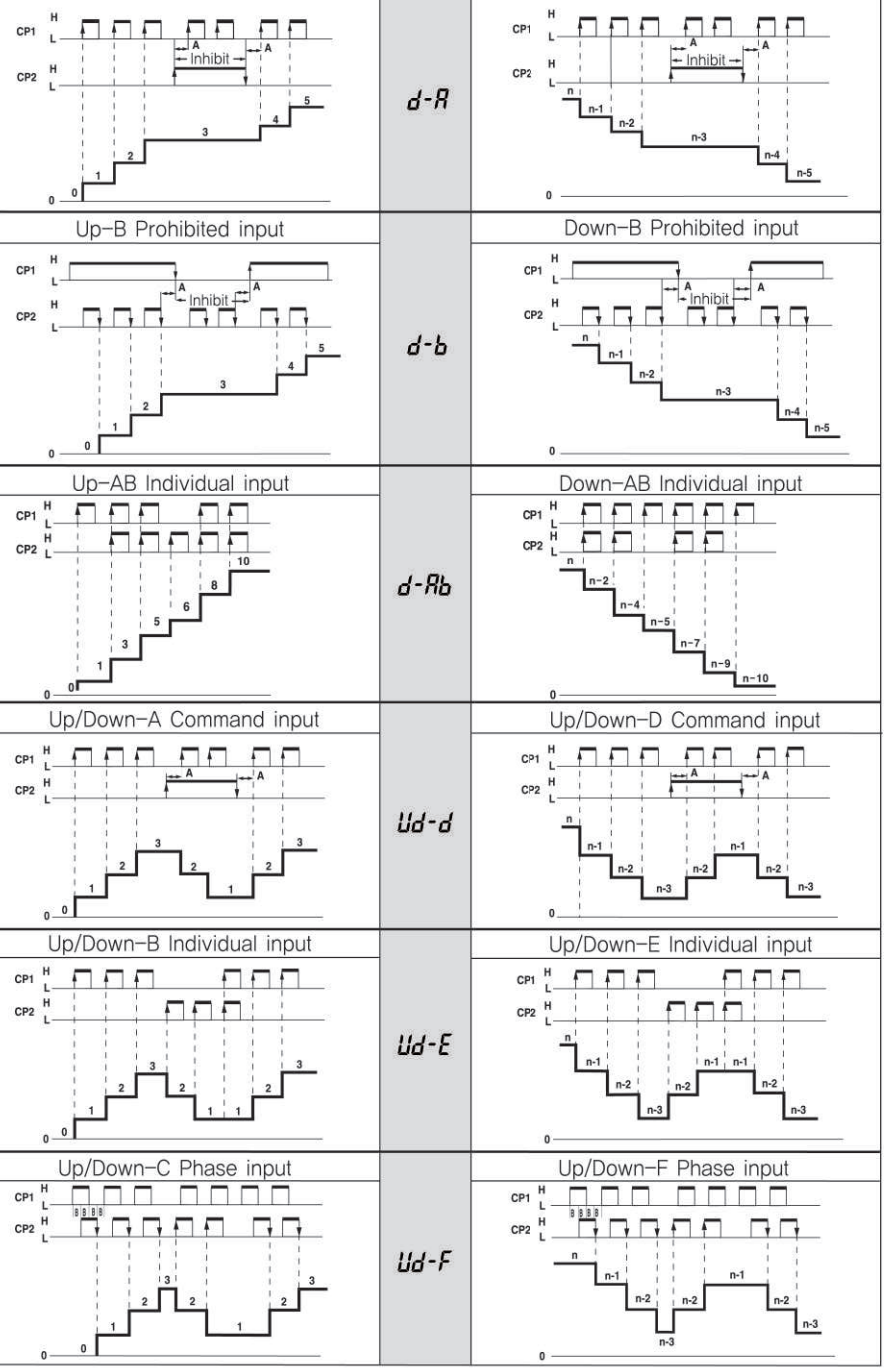
■ BATCH computed value setting method

(1) First of all, select the batch output as relay(rY-1)or transistor(tr-1) in the function setting mode.
(2) Pressing the BA key in the operation mode will flicker the "SET-)SET2-BAT-BAT.SET2 (flickers synchronously). Shift the setting digits by pressing » key in each setting mode and change the set value by pressing the ▲ and ▼ key and finally press the MODE key to complete the setting.
※ When BAT.SET2 flickers at the same time, it means it is in the batch operation display mode and batch set value and computed value will be displayed.

Counter input action

"A" need value greater than the min signal width, "B" needs the value greater than the half of min signal width

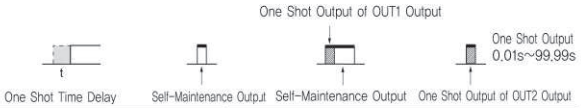
U-A	Up- A Prohibited input	d-A	Down-A Prohibited input
U-b	Up-B Prohibited input	d-b	Down-B Prohibited input
U-Ab	Up-AB Individual input	d-Ab	Down-AB Individual input
Ud-A	Up/Down-A Command input	Ud-d	Up/Down-D Command input
Ud-b	Up/Down-B Individual input	Ud-E	Up/Down-E Individual input
Ud-C	Up/Down-C Phase input	Ud-F	Up/Down-F Phase input

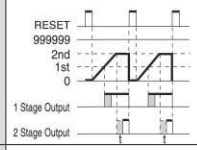
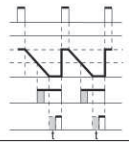
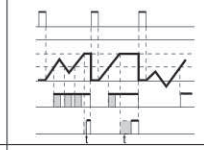
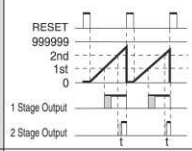
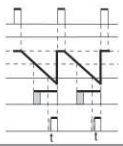
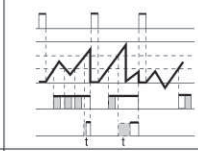
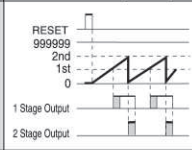
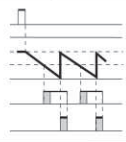
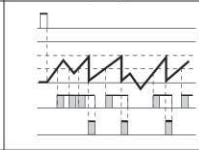
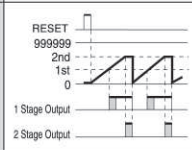
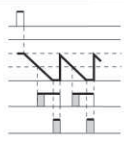
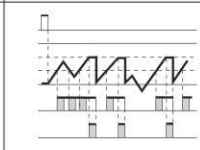
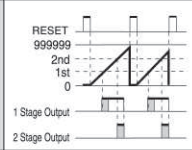
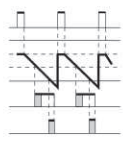
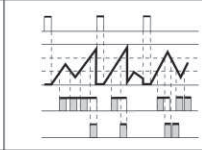
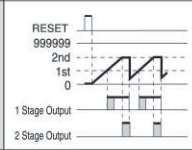
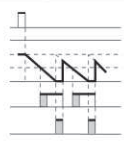
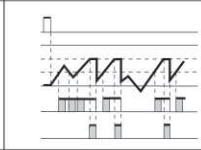
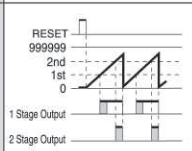
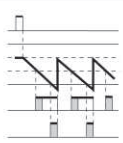
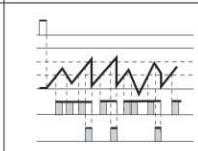
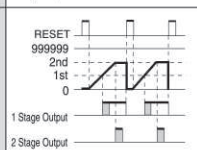
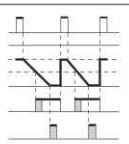
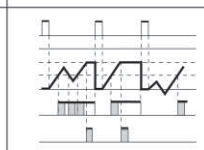


• When using encoder (incremental type), please use Ud-C , Ud-F

Counter output action mode

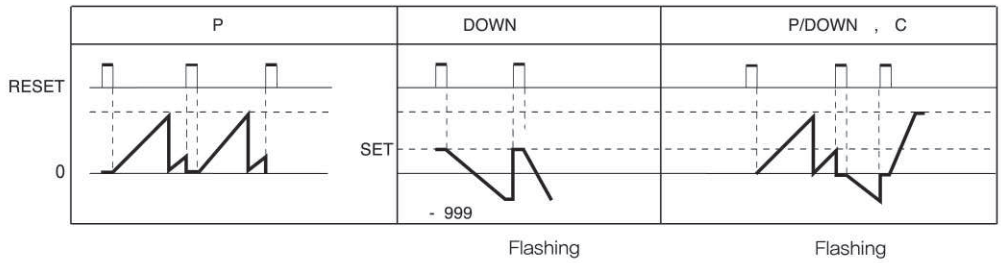
※1As for 1 Stage Counter (OUT), it is the same as 2ND Output (OUT2) Action.



Output Mode	Input Mode			Post Count Up Action
	UP	DOWN	UP/DOWN A.B.C	
n				Coefficient value indication is maintained and setting up HOLD (0) leads to self-maintenance output. Also, setting up time leads to OUT2 output after one sho: delay setup. OUT1 and OUT2 become OFF when reset and return to Start.
F				Coefficient value indication is continuously processed and setting up HOLD (0) leads to self-maintenance output. Also, setting up time leads to OUT2 output after one shot delay setup. OUT1 and OUT2 become OFF when reset and return to Start
C				Coefficient value indication is continuously processed during START state and OUT2 yields One Shot Output. Self-maintenance output of OUT1 is turned off when OUT2 is turned OFF (Repetitive Action)
r				Coefficient value indication is maintained during One Shot Time, and then resets. (Repetitive Action)
U				Coefficient value indication is continuously processed. OUT2 yields one shot output. Self-maintenance output of OUT1 is turned off after one shot time of out2
P				When coefficient value returns to initial state, then coefficient value indication is maintained for one shot time. After processing one shot time, it displays processed coefficient value. (Repetitive Action)
q				Coefficient value increases and OUT2 yields One Shot Output. The device is reset after the One Shot Output. (Repetitive Action)
A				Coefficient value is maintained and OUT2 yields one shot output. OUT1 and OUT2 are independent from each other. If OUT1 is same as setup value of SET1, it leads to one shot output or self-maintenance output. (In case of Stage 1 setup type, OUT1 and OUT2 are same each other) Reset refers to OUT1 and OUT2 become OFF and coefficient value being initialized.

Total counter output action

Indication only (GE-T) counter output operation



■ Set value is first to decrease within Down Mode
- 6 digits : -99999 (-999) it flashes and does not get counted
- Within UP MODE, it increases to the maximum display value, initializes to 0 and increases again

Timer time range

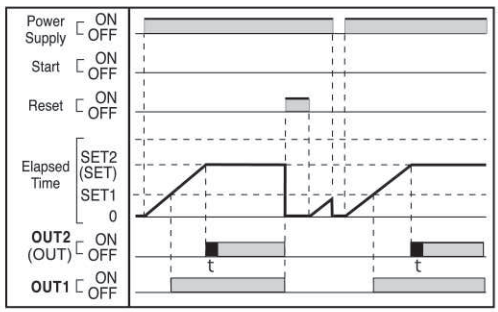
Range Selecting Symbol		4 digits time range		6 digits time range	
UP	DOWN	Decimal System	Sexagesimal System	Decimal System	Sexagesimal System
UD 15	dD 15	99.99 s	59.99 s	9999.99 s	59 m 59.99 s
U 15	d 15	999.9 s	9 m 59.9 s	99999.9 s	9 h 59 m 59.9 s
U 15	d 15	9999 s	9 m 59 s	999999 s	99 h 59 m 59 s
U 1h	d 1h	9999 m	99 h 59 m	999999 m	9999 h 59 m
U 1H	d 1H	9999 h	99 d 23 h	999999 h	9999 d 23 h

※ s: second, m: minute, h: hour, d: day

Timer output action mode

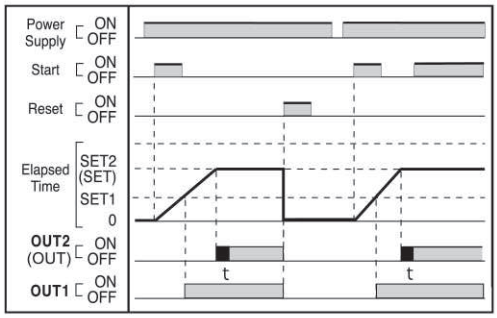
※ 1st stage setup type output is OUT
※ I INHIBIT (CP1) temporarily stops the time

■ Pond Power RUN / ON delay



- Runs when power is ON
- When Reset signal is supplied in, indicated value will be initialized and starts to run.

■ Sond Signal START / ON delay

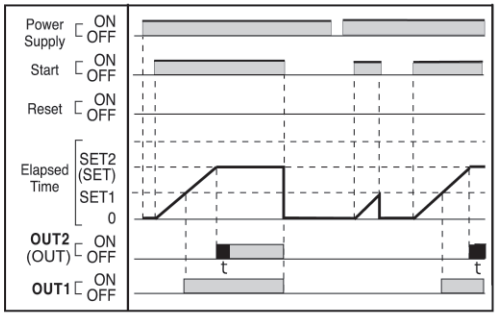


- Runs when START (CP2) is ON within the initial setup value
- When setup time is exceeded, it yields on shot output only when maintaining the indication value and setting up the (outt).

■ Son 1 Signal START / On delay (Counter F output mode action)

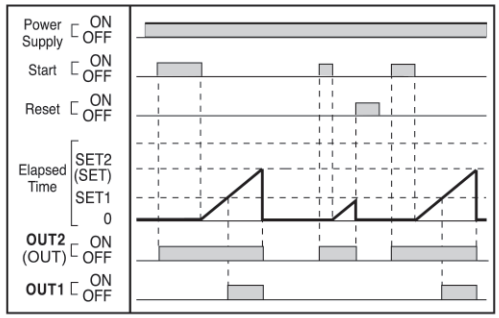
- Runs when START (CP2) is ON in the initial set value
- When setup time is exceeded, display value increases and yields output (Yields one shot output with out setting)

■ Sond Signal RUN / ON delay



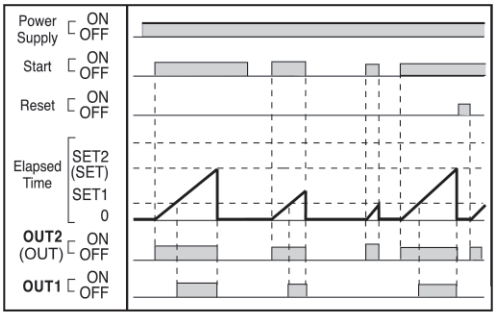
- Runs when CP2 (START) is ON and Resets when it is OFF within in the initial setup value.
- When setup time is exceeded, it maintains the displaying value and when sets the out , it yields the ON shot output.

■ SoFd Signal RUN / OFF delay



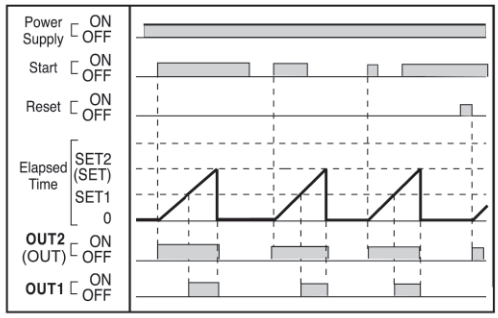
- Output will become ON only when START (CP2) is in ON state and time will display the initial value.
- Time activates the initial value to operate only when START (CP2) is in OFF state
- When setup time is elapsed, indication value will be initialized and output will become OFF.

■ SI nt Interval / Signal RUN



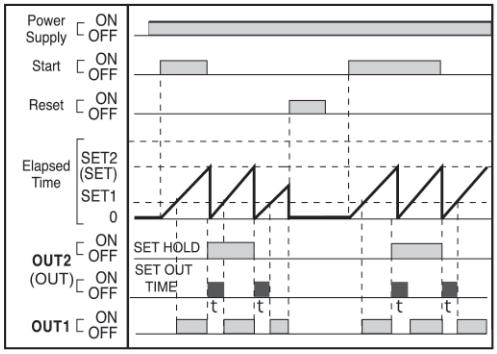
- Runs when START (CP2) is ON and Resets when it is OFF.
- Output is in ON state during the set time and initial value will be initialized and output will become OFF when set time elapses.

■ SI nt Interval / Signal START



- Runs when START (CP2) becomes ON
- Output is in ON state during the set time and initial value will be initialized and output will become OFF when set time elapses

■ FLIC Flicker / Signal START



[HOLD] Setup (when output time is set at HOLD)

– Setup Set Time in Run Mode

- Maintains the indication of initial value when Power is "ON"
- Runs when becomes START (CP2).
- ON/OFF Repetitious Action of control output after reaching the Set Time.
- Initializes and stops when Reset is "ON"

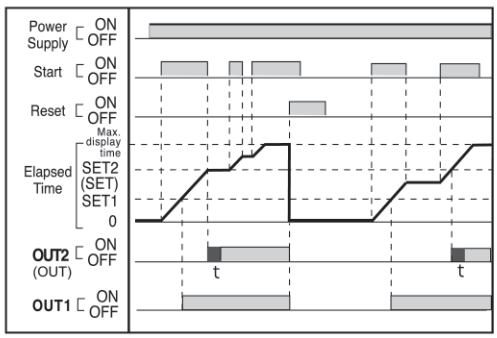
ONE SHOT TIME Setup (when output time is set at more than 1)

–Setup Set2 Time in Run Mode.

- Maintains the indication of initial value when Power is "ON"
- Runs when Power is "ON"
- One Shot Output after reaching the Set Time.
- Initializes and stops when Reset is "ON"

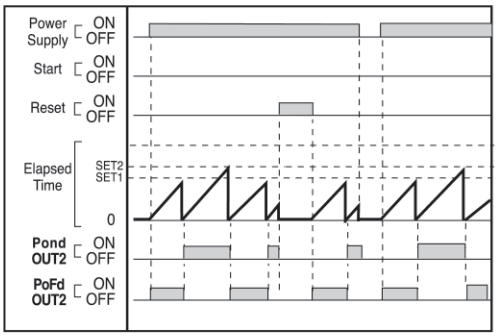
■ SF-r Flicker (Counter r Mode)
■ SF-P Flicker (Counter P Mode)
■ SF-9 Flicker (Counter 9 Mode)

■ SAdd Signal Addition



• Runs when maintaining START (CP2) as ON state and Holds when maintaining START (CP2) as OFF state (cumulative timer function)
※ does not operate within the DOWN time range

Twin timer output action

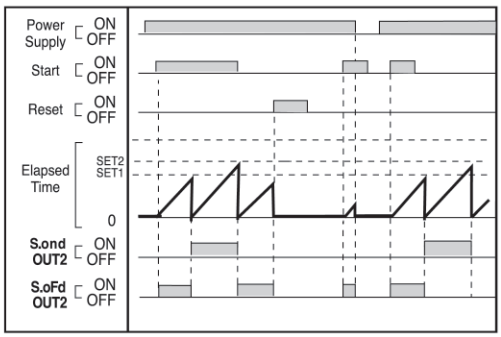


■ Pond Power RUN – ON delay

- RUNS when POWER is ON
- OFF Output for T1 Time / ON for T2 Time. Repetition
- Initializes and stops when RESET is ON

■ PoFd Power RUN – OFF delay

- RUNS when POWER is ON
- ON Output for T1 Time / OFF for T2 Time. Repetition
- Initializes and stops when RESET is ON

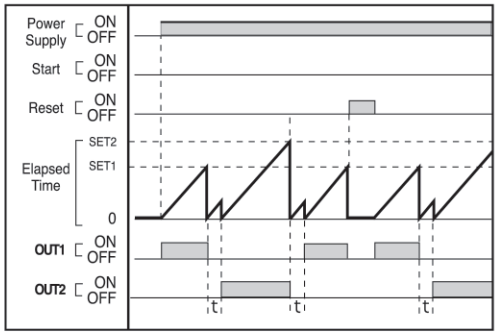


■ Sond Signal START – ON delay

- RUNS when POWER is ON
- Runs when START (CP2) is ON in the initial set value
- OFF Output for T1 Time / ON for T2 Time. Repetition
- Initializes and stops when RESET is ON

■ SoFd Signal START – OFF delay

- RUNS when POWER is ON
- Runs when START (CP2) is ON in the initial set value
- ON Output for T1 Time / OFF for T2 Time. Repetition
- Initializes and stops when RESET is ON



■ PoFt Power RUN / OFF time

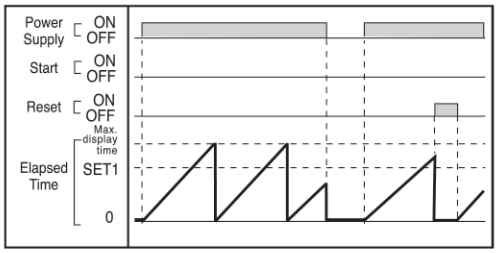
- Set the individual output control and fuse time
- Possible to set max 99.99sec when fuse time is set as outt .
- Runs when Power is ON
- ① Yields the output OUT1 during SET1 TIME AND OUT1 OFF during fuse time
- ② Yields the output OUT2 during SET2 TIME and OUT2 OFF during fuse time
- Repeats the operation ① and ②

- t: possible to set from 0 to 99.99 sec by setting fuse time with outt

Timer action of exclusive indication(GE-T)

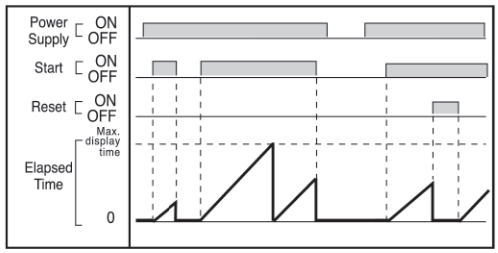
- OFF set is available for the up time range of decimal system (press ^ key for 2 sec)

■ PrUn Power RUN



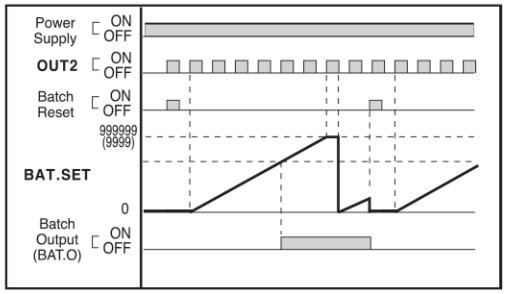
- In case of when Power is ON, supplying in the RUN RESET signal will initialize the indicating value and setting up the RUN Down mode will start to decrease the value from the set value.

■ SrUn Signal RUN



- Runs when turning ON the START (CP2) and Resets when turning OFF the START (CP2). Starts to decrease from the set time when Down Mode is being setup.

Batch counter



■ Batch computation and output operation

- Batch counting value continues to increase until Batch Reset is supplied in.
- When batch coefficient value exceeds 999999 (4 rows 9999), it initializes to 0 and display.
- In case of batch display state (BAT lamp is lighted), press the RST key (located on the front side) to reset the batch value.
- Even in the batch display state, counter/timer action still operates normally.
- Batch coefficient increases when yielding the output as OUT2 (OUT)
- Batch output yields the output as (BAT.O). (BAT.O lamp is lighted)

■ Instant output setup

- Function switches over to instant output when the batch value is set at 0. (BAT.O lamp is lighted)

Input and output connection method

● Input logic selection

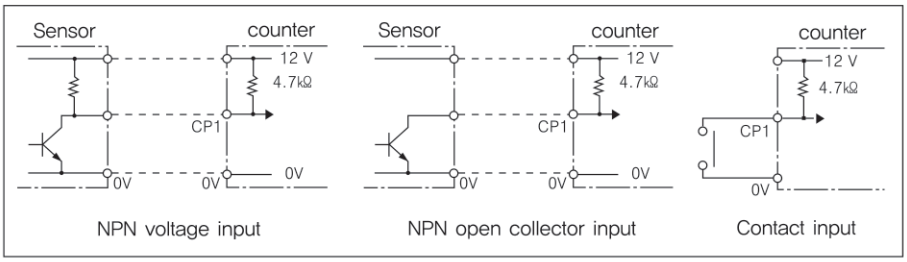
Operate the conversion switch after confirming the NPN/PNP indication which are stated in the above statement. (Please refer to the diagram)

Input type	PNP setting		NPN setting	
	Voltage input	Input PNP O.C	NPN voltage input	NPN O.C
H	5 – 30 V DC	5 – 30 V DC	0 – 2 V DC	0 – 2 V DC
L	0 – 2 V DC	OPEN	5 – 30 V DC	OPEN

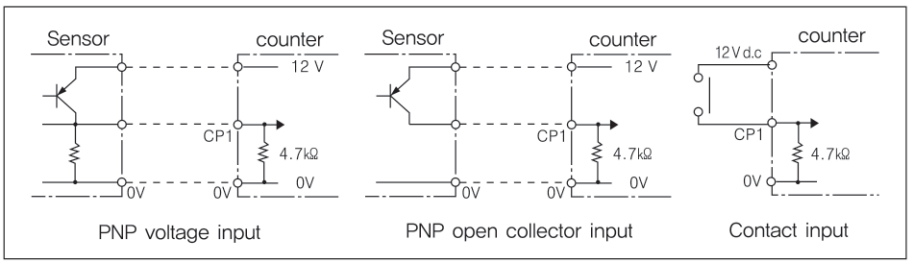
※ In order to receive the NPN/PNP open collector input, input logic (NPN/PNP) conversion switch is built in which can pull up/pull down 4.7 KΩ of internal resistance. (Default setting : NPN)

● Input connection

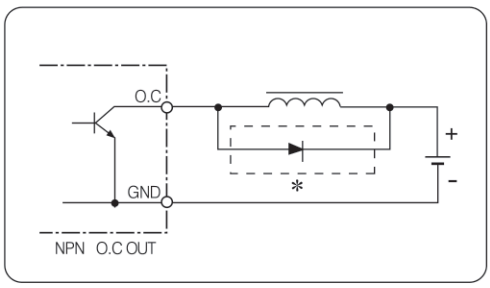
NPN (Non-voltage input) state



PNP (Voltage input) state

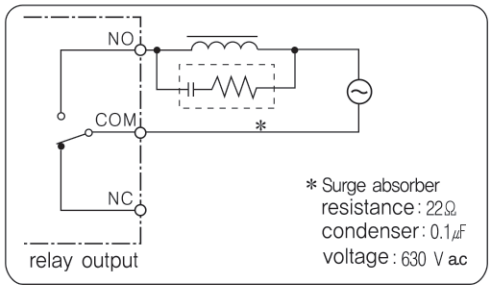


● Output connection



● Example of non-contact (transistor) output

- When using the inductive load (relay and etc), please connect the surge observer (diode and varistor) on the both ends of the load. Also please use with GND since the internal circuit and non-contact output are isolated from one another. Please select the proper power for load and load. Non-contact output cannot exceed the max 30V DC 100 mA.



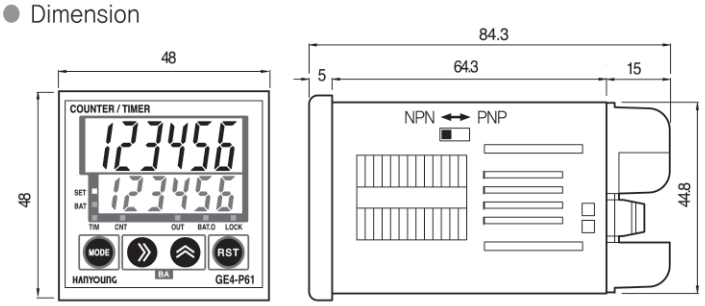
● Example of contact output

• Avoid the flow of excessive current since it is 250 V AC NO 3 A (resistive load) NC2A (resistive load) and the connection must corresponds to the standard connection method

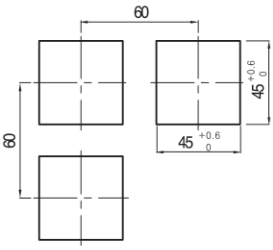
Dimension and panel cutout (unit : ㎜)

GE4

● Dimension

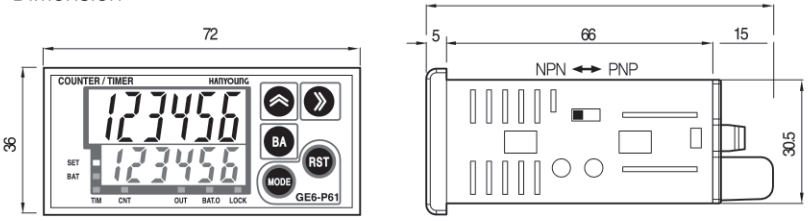


● Panel cutout

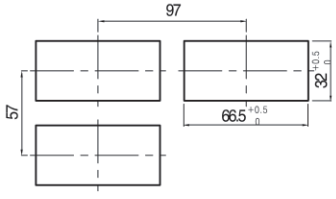


GE6

● Dimension

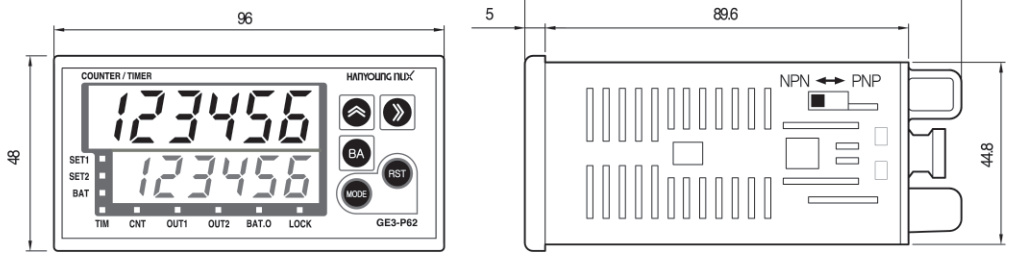


● Panel cutout

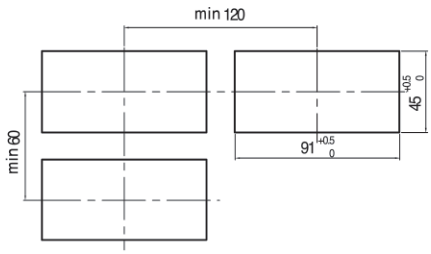


GE3

● Dimension

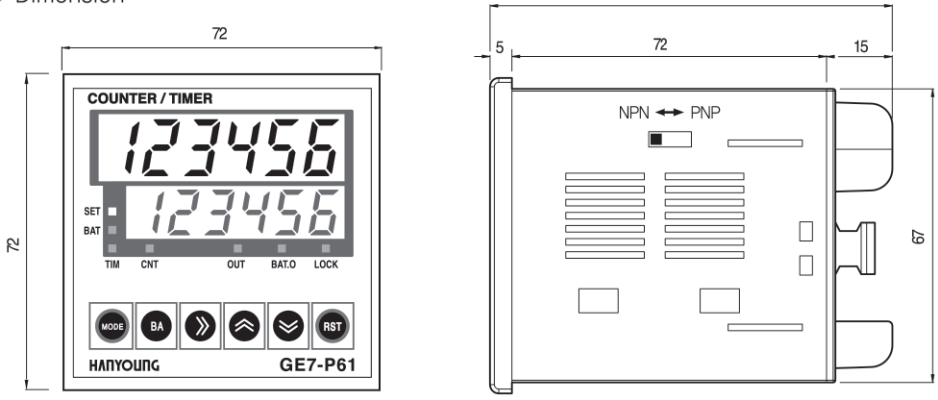


● Panel cutout

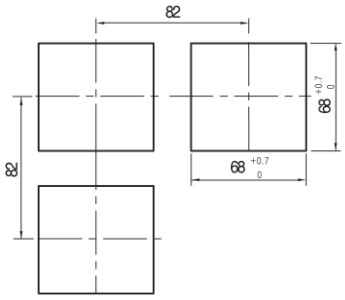


GE7

● Dimension

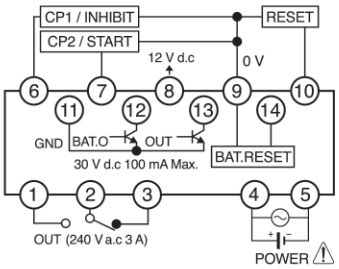


● Panel cutout

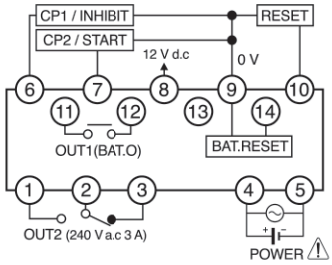


Connection diagram

●GE4-P□1



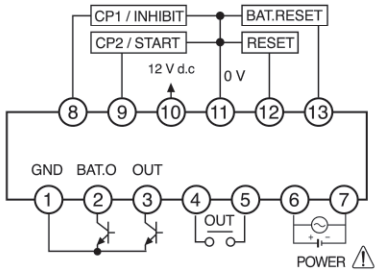
●GE4-P□2



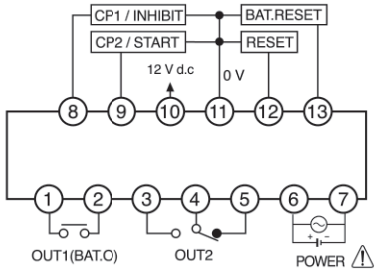
※ Connection of NPN input

※ GE4-T6: Total model does not have relay output with transistor.

●GE6-P□1



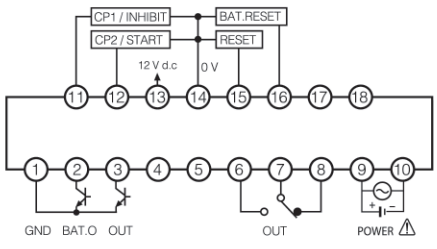
●GE6-P□2



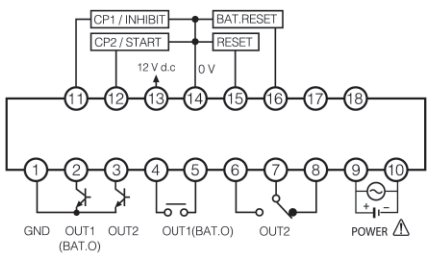
※ Connection of NPN input

※ GE6-T6 : Total model does not have relay output with transistor.

●GE3-P□1



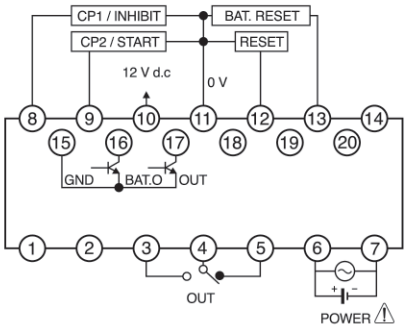
●GE3-P□2



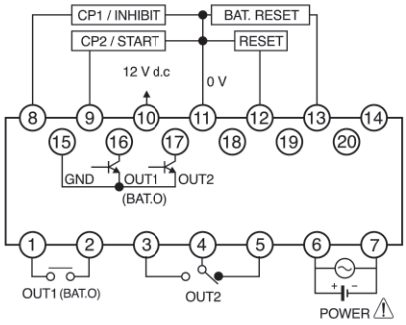
※ Connection of NPN input

※ GE3-T6 : Total model does not have relay output with transistor.

●GE7-P□1



●GE7-P□2



※ Connection of NPN input

※ GE7-T6 : Total model does not have relay output with transistor.

LC1

LCD display digital counter

- Compact LCD display total counter
- Battery built in type so external power not required
- Re-usage possible by replacing the battery
- Less power consumption so long life expectancy (approx 7 years at room temp)
- Non-voltage input or voltage input
- IP66 protective structure (front side)

Suffix code

Model	Code	Description
LC1-	□	Compact LCD display total counter (dimension : DIN 48 X 24 ㎜)
Input signal		Non voltage input (no indication)
	F	Voltage input (24 – 240 V AC, 6 – 240 V DC)

Specification

Input

Model		LC1	LC1-F
Input type		Non-voltage input	Voltage input
Power supply voltage		Lithium battery built in	
Dimension		DIN 48 X 24 mm	
Input action		UP Count	
Computation speed		1 / 30 / 100 / 1 K cps	20 cps
Input condition		Remaining voltage when breaks : 0.7 V Max impedance when breaks : max 10 ㏀ Min impedance when opens : min 1 ㏁	HIGH : 24 – 240 V AC / 6 – 240 V DC LOW : 0 – 2 V AC / DC
Reset	Input type	Non-voltage input	
	Min signal width	Min 20 ms	
Battery life expectancy		At least 7 years (approx. 25 ℃) ※This is calculated value so it is not certified value (Replacing cycle reference value)	
External setting switch		Switch1 : internal power/front reset selectable Switch2 : computing speed selectable (4 kinds)	Switch1 : internal power/front reset selectable
External connection		Terminal (4P)	
Display method		7 segments LCD (character height : 8.7mm)	
Displayable digits		8 digits	
Insulation resistance		Min 100 ㏁ (500 V DC), conductive terminal non-recharging metal	
Dielectric strength		2000 V AC 50/60 ㎐ for 1 min (conductive part-disposable metal)	

Installation environment

Vibration resistance	10 – 55 ㎐, double amplitude 0.75 ㎜, each direction in 3 axis, 2h
Shock resistance	300 ㎪, each direction in 3 axis each 3 times
Ambient temperature	–10 ~ 55 ℃
Ambient humidity	35 ~ 85 % RH
Storage temperature	–20 ~ 65 ℃
Degree of protection	IP66 (Front side)
Weight	58 g

Default function setting

Model		LC1	LC1-F
Switch-1	SW1 ON OFF 1 2	Internal battery : OFF	Internal battery : OFF
		Front reset key : Not used	Front reset key : Not used
Switch-2	SW2 ON OFF 1 2	Computing speed : 1 cps	NO (20 cps Fixed)

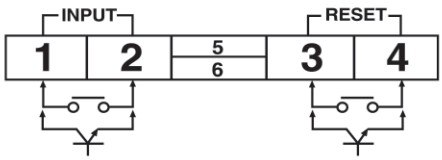
Function setting

Switch		Description
Function setting (Switch-1)	ON OFF 1 2	Internal battery ON
		Internal battery OFF
	ON OFF 1 2	Front reset key used
		Front reset key not used
Computing speed setting (Switch2)	ON OFF 1 2	1 cps
	ON OFF 1 2	30 cps
	ON OFF 1 2	100 cps
	ON OFF 1 2	1 K cps

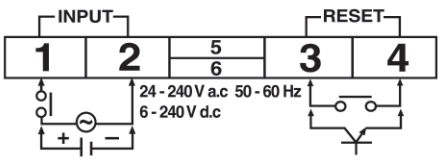
※ Computing speed of Model LC1-F is fixed to 20 cps.

Connection diagram

● Non-voltage input (LC1)



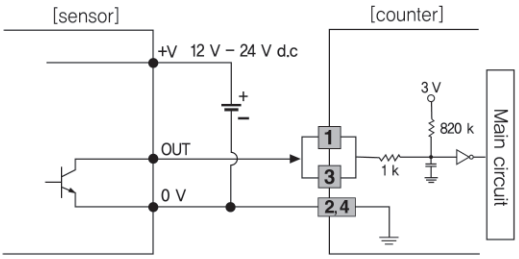
● Free-voltage input (LC1-F)



Input connection

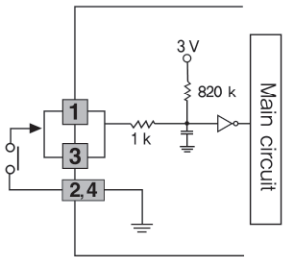
Non-voltage input

• Non voltage input



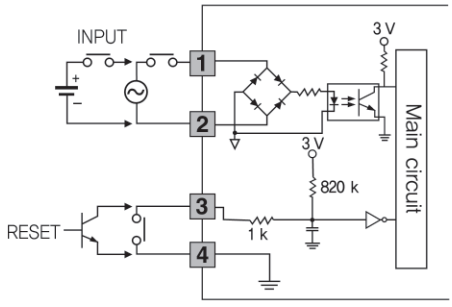
• Please use NPN open collector output type sensor and please supply the power externally
• Do not supply in the voltage to the terminal 1 and 3. Doing so may cause malfunction or damage the product

• Contact input

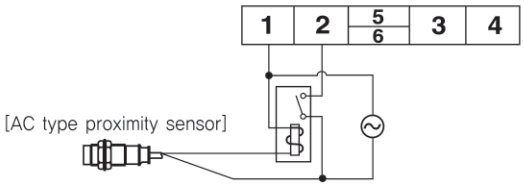


• Contact input (relay, switch) should sufficiently flow 3V DC 5uA
※ GND terminal 2 and 4 are connected internally

Voltage input

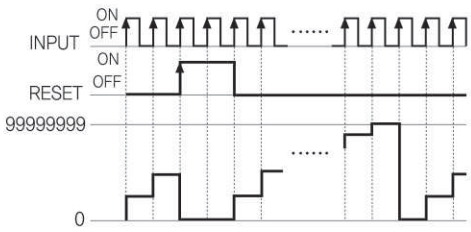


- Input 1 and 2 must use voltage input (24–240 V AC 50/60 Hz, 6–240 V DC) and input 3 and 4 use non–contact input (NPN transistor) or contact input (relay, switch).
- Terminal 1 and 2 and the terminal 3 and 4 are insulated internally
- Contact input (relay, switch) must sufficiently flow 3V DC 5uA
- Do not connect directly connect AC 2 wires type proximity sensor and use it. Using the AC proximity sensor will compute the value abnormally due to the leakage current so when users need to use AC 2 wire type proximity sensor, please operate the relay in the middle and compute it just like an image provided in the below.



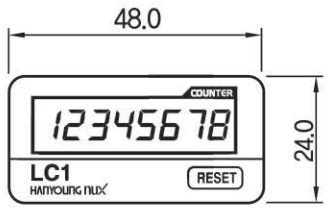
● Input action (operation chart)

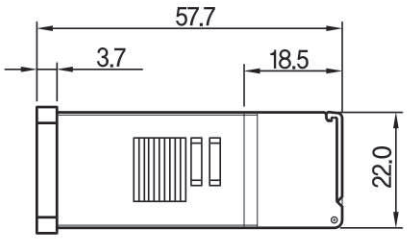
• counter action mode

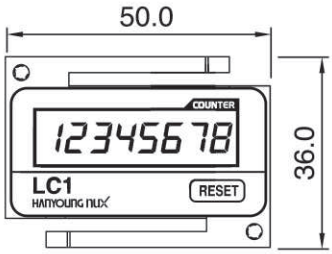


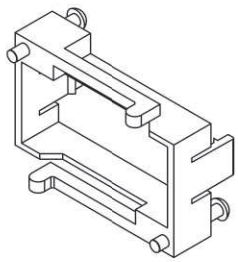
Dimension and panel cutout (unit : ㎜)

● Dimension



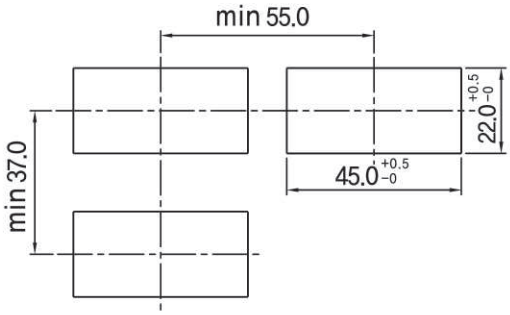






Fixing adapter (FA-241)

● Panel cutout



LT1

LCD display Timer

- Compact LCD display total counter
- Battery built in type so external power not required
- Re-usage possible by replacing the battery
- Less power consumption so long life expectancy (approx 10 years at room temp)
- Non-voltage input or voltage input
- IP66 protective structure (front side)

Suffix code

Model	Code	Description
LT1-	□	Compact LCD display total Timer (dimension : DIN 48 X 24 ㎜)
Input signal		Non voltage input (no indication)
	F	Voltage input (24 – 240 V AC, 6 – 240 V DC)

Specification

Input

Model		LT1	LT1-F
Power supply voltage		Lithium battery built in	
Dimension		DIN 48 X 24 mm	
Operation type		UP Timer	
Time display		9999 h 59 m 59 s / 99999 h59.9 m / 999999 h 59 m / 9999999.9 h	
Time accuracy		± 0.01 %	
Input condition		Remaining voltage when breaks : 0.7 V Max impedance when breaks : max 10 ㏀ Min impedance when opens : min 1 ㏁	HIGH : 24 – 240 V AC / 6-240 V DC LOW : 0 – 2 V AC / DC
Start	Input type	Non-voltage input	Voltage input
	Min signal width	Min 20 ms	
Reset	Input type	Non-voltage input	
	Min signal width	Min 20 ms	
Battery life expectancy		Expectancy : at least 10 years (approx. 25℃) ※This is calculated value so it is not certified value (Replacing cycle reference value)	
External setting switch		Switch 1 : internal power / front reset selectable Switch 2 : computing speed selectable (4 kinds) time range selectable	
External connection		Terminal (4P)	
Display method		7 segments LCD (character height : 8.7 ㎜)	
Displayable digits		8 digits	
Insulation resistance		Min 100 ㏁(500 V DC), conductive terminal-disposable metal	
Dielectric strength		2000 V AC 50/60 ㎐ for 1 min (conductive part-non-recharging metal)	

Installation environment

Vibration resistance	10 – 55 ㎐, double amplitude 0.75 ㎜, each direction in 3 axis, 2h
Shock resistance	300 ㎨, each direction in 3 axis each 3 times
Ambient temperature	–10 ~ 55 ℃
Ambient humidity	35 ~ 85 % RH
Storage temperature	–20 ~ 65 ℃
Degree of protection	IP 66 (Front side)
Weight	58 g

Default function setting

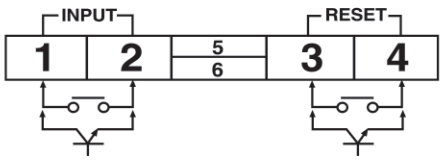
Model		LT1	LT1-F
Switch-1		Internal battery : OFF	
		Front reset key : Not used	
Switch-2		Time range : 9999 h 59 m 59 s	

Function setting

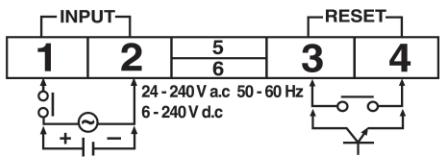
Switch		Description
Function setting (Switch-1)		Internal battery ON
		Internal battery OFF
		Front reset key used
		Front reset key not used
Time range setting (Switch-2)		9999 h 59 m 59 s
		99999 h 59.9 m
		999999 h 59 m
		9999999.9 h

Connection diagram

● Non-voltage input (LT1)



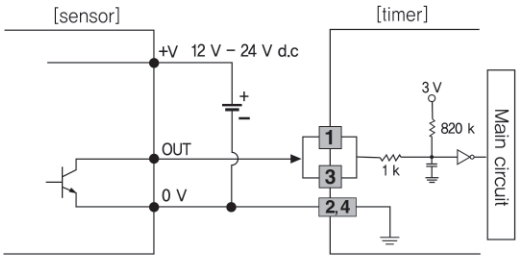
● Free-voltage input (LT1-F)



Input connection

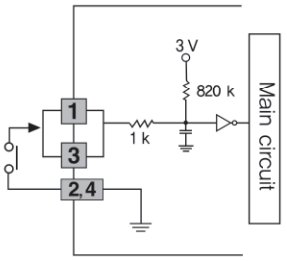
Non-voltage input

• Non voltage input



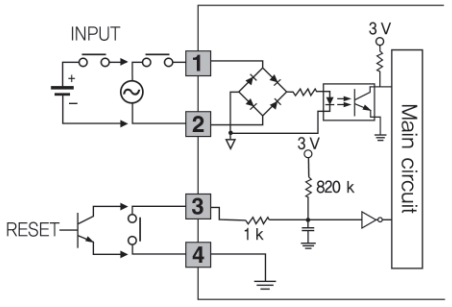
• Please use NPN open collector output type sensor and please supply the power externally
• Do not supply in the voltage to the terminal 1 and 3. Doing so may cause malfunction or damage the product

• Contact input

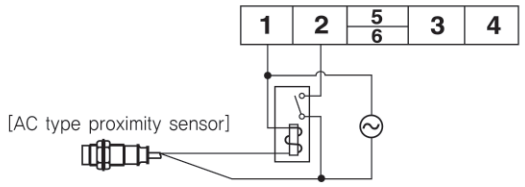


• contact input (relay, switch) should sufficiently flow 3V DC 5uA
※ GND terminal 2 and 4 are connected internally

Voltage input

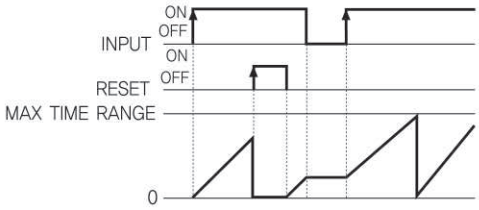


- Input 1 and 2 must use voltage input (24-240 V AC 50/60 Hz, 6-240 V DC) and input 3 and 4 use non-contact input (NPN transistor) or contact input (relay, switch).
- Terminal 1 and 2 and the terminal 3 and 4 are insulated internally
- Contact input (relay, switch) must sufficiently flow 3V DC 5uA
- Do not connect directly connect AC 2 wire type proximity sensor and use it. Using the AC proximity sensor will let timer to operate abnormally due to the leakage current so when users need to use AC 2 wire type proximity sensor, please operate the relay in the middle and operate the timer it just like an image provided in the below.



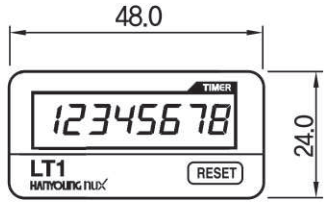
● Input action (operation chart)

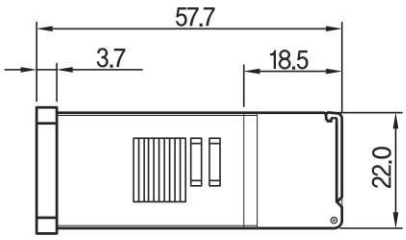
• Timer action mode

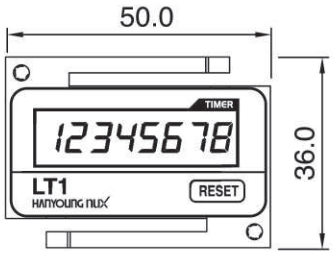


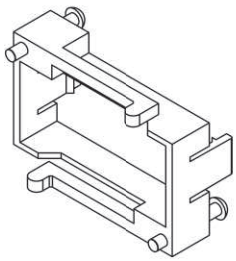
Dimension and panel cutout (unit : ㎜)

● Dimension



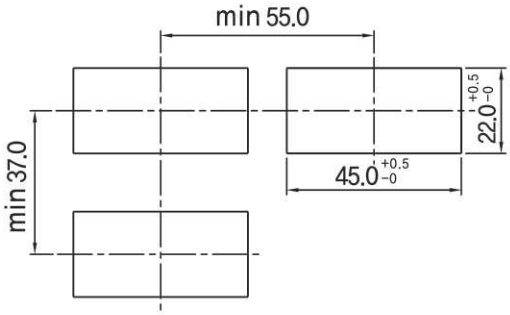






Fixing adapter (FA-241)

● Panel cutout



GF Series

Digital counter / Timer

- Counter & timer
- Pre-scale setting (GF7)
- Input action 14 kinds, output action 16 kinds
- Set up the digit of decimal points
- Timer range 16 kinds
  (10/60 decimal system each 8 kinds)
- NPN/PNP (voltage / non-voltage) input selectable

Suffix code

Model	Code				Description
GF7 -	□	□	□	□	Digital counter / Timer (72 X 72 ㎜)
Type	P				Pre-set counter
	T				Total counter
Displayable digits		4			4 digits (9999)
		6			6 digits (999999)
Setting stage			1		1st stage setting
			2		2nd stage setting
			0		Total counter
Pre-scale function				E	Pre-scale function built in (Pre-set counter)
				N	No pre-scale (Total counter)

Model	Code				Description
GF4 -	□	□	□	□	Digital counter / Timer (48 X 48 ㎜)
Type	P				Pre-set counter
	T				Total counter
Displayable digits		4			4 digits (9999)
Setting stage			1		1st stage setting (Pre-set counter)
			0		None (total counter)
Terminal structure				N	Terminal
				S	8 pin structure (suitable for 8 pin socket)

Specification

Input

Model	GF4	GF7
Input computation speed	30 cps, 5K cps (select by using the deep switch)	30 cps, 1K, 3K, 5K cps , select by using the volume (located on the front panel)
	ON/OFF ratio: when ratio is 1:1	
Input signal type	PNP input (voltage input) or NPN input (non-voltage input) Signal stage : "H" 5 – 30 V DC "L" 0 – 2 V DC	
Inhibit input	Computation stops when signal is ON (20 ㎳ min)	
Reset	Power reset (for more than 0.5 s), external reset (for more than 20 ㎳), auto reset	
Noise immunity	Square wave noise due to the noise simulator (1㎲ pulse width), ±2 ㎸ (between the operation power terminal)	

Function

Timer	setting error	Less than ± 0.01 % ± 0.05 sec (only with the power START)
	Repeating operation error	Less than ± 0.005 % ± 0.003 sec (only with the reset START)
Insulation resistance		100 MΩ min (500 V DC mega electric conduction terminal-non recharging metal)
Dielectric strength		2000 V AC 60 ㎐ for 1 min (different charging terminal from each other)

Function and output

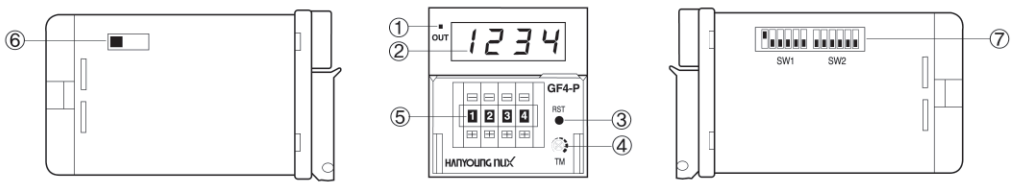
Model	GF4-P41N	GF4-T40N	GF7-P□□E	GF7-T60N
Counter/timer selection	Counter operation and timer operation selectable			
Input action	Up, down, and up/down selectable (refer to the input operation mode)			
Output action (counter)	F, N, C, R, K, P, Q, S, A selectable (refer to the output action mode) ※ With the total counter, it is displayed as F, K output mode			
Output type	ON delay and OFF delay selectable by the deep switch			
OUT1 function selectable	Hold, One-shot, Flickering (1 sec gap) function selectable (applicable only with 2 stages setting type)			
Pre-scale	Applicable only with free-set counter , 0.001 ~ 9999(4digits), 0.00001 ~ 999999(6digits)			
Recognizing computed value setting	Recognize at all times (possible to change the setting in the middle of applying electric current)			
Power backup selectable	Power failure compensation/Power reset selectable, semi-permanent when Selecting power failure compensation (use EEPROM)			
Displayable digits	4 digits (9999)		4 digits / 6 digits	6 digits (999999)
decimal points display	4 digits : 888.8 / 8888, 6 digits : 888888 / 88888.8 / 8888.88 / 888.888			
Setting stage	1st stage	None	1st stage / 2nd stage	None
ONE SHOT output	0.1 ~ 12.5 sec (set by the front TM volume)		0.05 sec – 5.8 sec (set by the front TM volume)	
External power supply	12 V DC 100 ㎃ max.		12 V DC 100 ㎃ max.	
Character display	height : 8 ㎜		height : 11 ㎜ (4 digits), height : 10 ㎜ (6 digits)	
Output	Relay 1st / 2nd : 1c, 250 V AC, 3 A (resistive load) (only 2nd output is valid for the 1st stage output)			
	Transistor 1st / 2nd : open collector, 30 V DC, 100 ㎃ max. (only 2nd output is valid for the 1st stage output)			

Standard specification

Model	GF4-P	GF4-T	GF7-P	GF7-T
Power supply voltage	100 - 240 V AC 50 - 60 Hz			
Voltage fluctuation	±10 % of the power supply voltage			
Power consumption	Approx 6.2 VA	Approx 4.3 VA	GF7-P61 : Approx 7.6 VA GF7-P62 : Approx 8.7 VA	Approx 6.4 VA
Ambient temperature	-10 ~ 55 ℃			
Ambient humidity	35 ~ 85 % RH			
Storage temperature	-20 ~ 65 ℃			
Vibration resistance	10 - 55 Hz, peak amplitude 0.75 ㎜, 3 axis each direction, 1h			
Shock resistance	300 ㎨, 3 times each in 3 axes each direction			
Weight	184 g	168 g	243 g	208 g

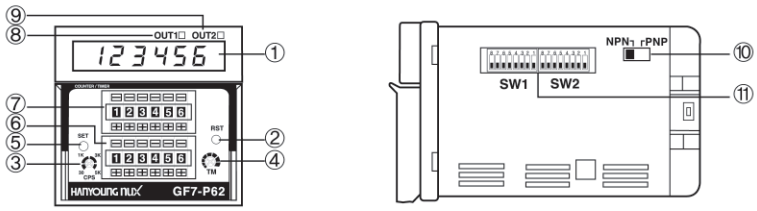
Name of each part

GF4



Number	Name	Description
①	Output action LED	Light ON when control output is ON
②	Computation/Time displaying unit	Display the computed value in counter action, display the action time in timer action
③	Reset key	Reset the computed value of counter or operation time of counter, Applied when changing the counter and timer action specification
④	TM volume	Set the operation time of control output by the One-short time (setting range: 0.1s~12.5s)
⑤	Digital switch	Set the computed value of counter or operation time of timer
⑥	PNP/NPN input switch	PNP/NPN input selectable by the deep switch
⑦	Function setting (SW1)	DOWN/UP, power backup memory/power reset, input mode (timer range), timer/counter
	Function setting(SW2)	Computation speed, decimal points, ON-DELAY / OFF-DELAY, output mode selectable

GF7

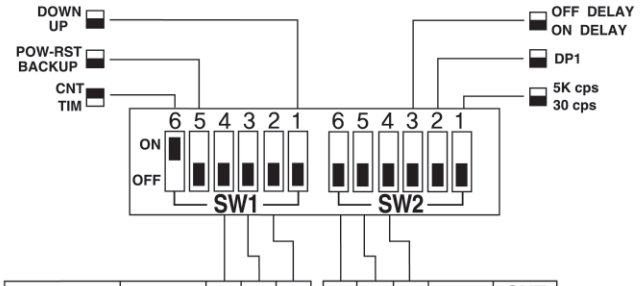


Number	Name	Description
①	Computation/time displaying unit	Display the computed value in counter action, display the action time in timer action
②	Reset key	Initialize the computed value or timer operation time of counter, Applied when changing the counter and timer action specification
③	CPS(Computation speed setting volume)	Counter computing speed selectable (30 cps, 1 Kcps, 3 Kcps, 5 Kcps)
④	TM volume	Set the operation time of control output by the One-short time (setting range: 0.1s~12.5s)
⑤	SET key	Used when setting the free-scale
⑥	2nd stage set value setting switch	2nd stage computation set value setting switch (time setting in case of timer)
⑦	1st stage set value setting switch	1st stage computation set value setting switch (time setting in case of timer)
⑧	1st stage output display LED	Light ON with 1st stage output action
⑨	2nd stage output display LED	Light ON with 2nd stage output action
⑩	PNP/NPN input switch	PNP/NPN input selectable by the deep switch
⑪	Function setting (SW1)	OFF-DELAY/ON-DELAY, DOWN/UP, power backup memory/power reset, input mode (timer range), timer/counter, pre-scale selectable
	Function setting (SW2)	1st stage output mode setting (Hold, Flicking, One-shot) 2nd output mode setting, decimal point setting

Cautious) operate as 2nd stage setting with 1st stage setting type

Function setting

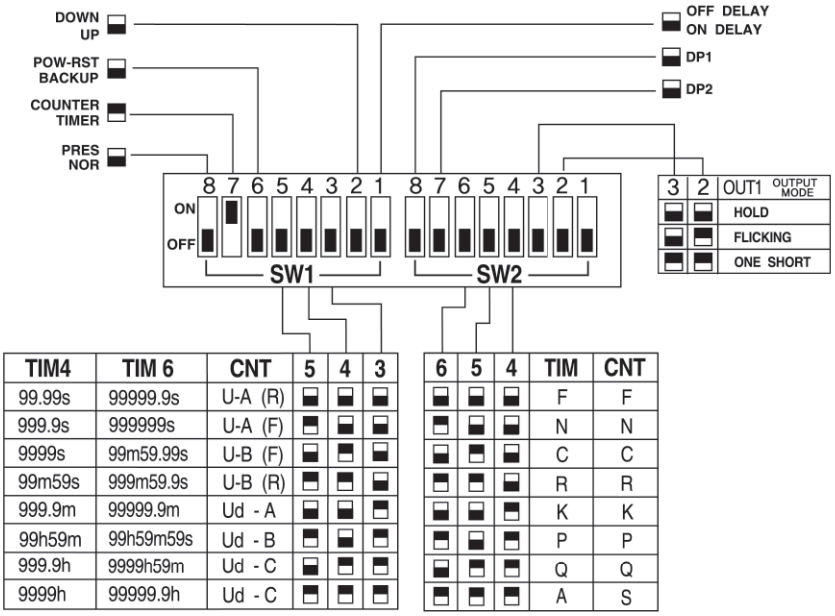
GF4



TIM	CNT	4	3	2	6	5	4	TIM	CNT
99.99s	U-A (R)							F	F
999.9s	U-A (F)							N	N
9999s	U-B (F)							C	C
99m 59s	U-B (R)							R	R
999.9m	Ud - A							K	K
99h 59m	Ud - B							P	P
999.9h	Ud - C							Q	Q
9999h	Ud - C							A	S

Switch classification		Name	Description
SW1	1	DOWN/UP	ON : DOWN OFF : UP
	2	Counter input mode (timer range)	Select the input mode of counter or time range of timer by ON/OFF the switch number 2, 3 and 4. ※ Input mode in the GF4 8 pin type is limited into 2 types (UP A(R) and UP A(F)) (1 computed input signal)
	3		
	4		
	5	POW-RST/ BACK-UP	ON : Power reset (POW-RST) OFF : Power backup memory (BACK UP)
	6	CNT/TIM	ON : Counter (CNT) OFF : Timer (TIM)
SW2	1	30 cps / 5 K cps	ON : 5 K cps OFF : 30 cps counter computing speed selectable
	2	Decimal point selectable	ON : 888.8 OFF : 8888
	3	OFF-DELAY/ ON-DELAY	ON : OFF-DELAY OFF : ON-DELAY
	4	Output mode selectable	Select the output mode by ON/OFF the switch number 4, 5 and 6 SW2 (UP/DOWN each 8 kinds)
	5		
	6		

GF7



TIM4	TIM 6	CNT	5	4	3
99.99s	99999.9s	U-A (R)	■	■	■
999.9s	999999s	U-A (F)	□	■	■
9999s	99m59.99s	U-B (F)	■	□	■
99m59s	999m59.9s	U-B (R)	□	□	■
999.9m	99999.9m	Ud - A	■	■	□
99h59m	99h59m59s	Ud - B	□	■	□
999.9h	9999h59m	Ud - C	■	□	□
9999h	99999.9h	Ud - C	□	□	□

6	5	4	TIM	CNT
■	■	■	F	F
□	■	■	N	N
■	□	■	C	C
□	□	■	R	R
■	■	□	K	K
□	■	□	P	P
■	□	□	Q	Q
□	□	□	A	S

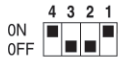
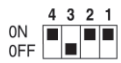
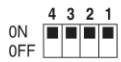
Switch classification		Name	Description
SW1	1	OFF-DELAY/ ON-DELAY	ON : OFF-DELAY OFF : ON-DELAY
	2	DOWN/UP	ON : DOWN OFF : UP
	3	Counter input mode (timer range)	Select the input mode of counter or time range of timer by ON/OFF the switch number 2, 3 and 4. SW1
	4		
	5		
	6	POW-RST/ BACK-UP	ON : Power reset (POW-RST) OFF : Power backup memory (BACK UP)
	7	CNT/TIM	ON : Counter (CNT) OFF : Timer (TIM)
	8	PRES/NOR	ON : PRES (Free-scale setting mode selectable) OFF : NOR (Free-scale mode lock selectable)
SW2	1	-	None
	2	1st stage (OUT1) output mode setting	1st stage (OUT1) output mode setting within 2nd stage setting type timer function ※ Hold, Flicking (ON : 0.5sec, OFF : 0.5sec), One-shot (0.5sec fixation)
	3		
	4	output mode selectable	2nd stage output mode with the 2nd stage setting type counter 1st output mode setting with the 1st setting type counter
	5		
	6		
	7	Decimal point digits setting	Position of decimal point setting by the switch composition (0~3 digits setting)
	8		

● Timer function

Selecting the timer function	Select the function by using the deep switch
Inhibit input	Processing time stops when signal is ON (20 ㎳ min)
Changing decimal system	Select 10 decimal system or sexagesimal system for the time displaying type
Time range	Select the time range and UP/DOWN indication by the deep switch (8 kinds)
Output action	F, N, C, R, K, P, Q, A (selection done by the deep switch)
Total timer indication	Indicated as the F, K output action mode
Output type	Select ON-Delay/OFF-Delay by the deep switch
Indication when reset	Up-0, Down-set value
1st stage (OUT1) output mode setting	1st stage (OUT1) output mode setting within 2nd stage setting type timer(GF7) function ※ Hold, Flicking (ON : 0.5sec, OFF : 0.5sec), One-shot (0.5sec fixed)

● Timer range selection

GF4

SW1	UP mode	SW1	DOWN mode
	99.99 s		99.99 s
	999.9 s		999.9 s
	9999 s		9999 s
	99 m 59 s		99 m 59 s
	999.9 m		999.9 m
	99 h 59 m		99 h 59 m
	999.9 h		999.9 h
	9999 h		9999 h

(Cautious)

0 is displayed when Reset signal is inputted in the UP mode

Set value is displayed when Reset signal is inputted in the DOWN mode

Time range of GF4 socket type is same as GF4 terminal type

GF7

SW1	UP mode		SW1	DOWN mode	
	4 digits time range	6 digits time range		4 digits time range	6 digits time range
	99.99 s	99999.9 s		99.99 s	99999.9 s
	999.9 s	999999 s		999.9 s	999999 s
	9999 s	99 m 59.99 s		9999 s	99 m 59.99 s
	99 m 59 s	999 m 59.9 s		99 m 59 s	999 m 59.9 s
	999.9 m	99999.9 m		999.9 m	99999.9 m
	99 h 59 m	99 h 59 m 59 s		99 h 59 m	99 h 59 m 59 s
	999.9 h	9999 h 59 m		999.9 h	9999 h 59 m
	9999 h	99999.9 h		9999 h	99999.9 h

(Cautious)
0 is displayed when Reset signal is inputted in the UP mode
Set value is displayed when Reset signal is inputted in the DOWN mode

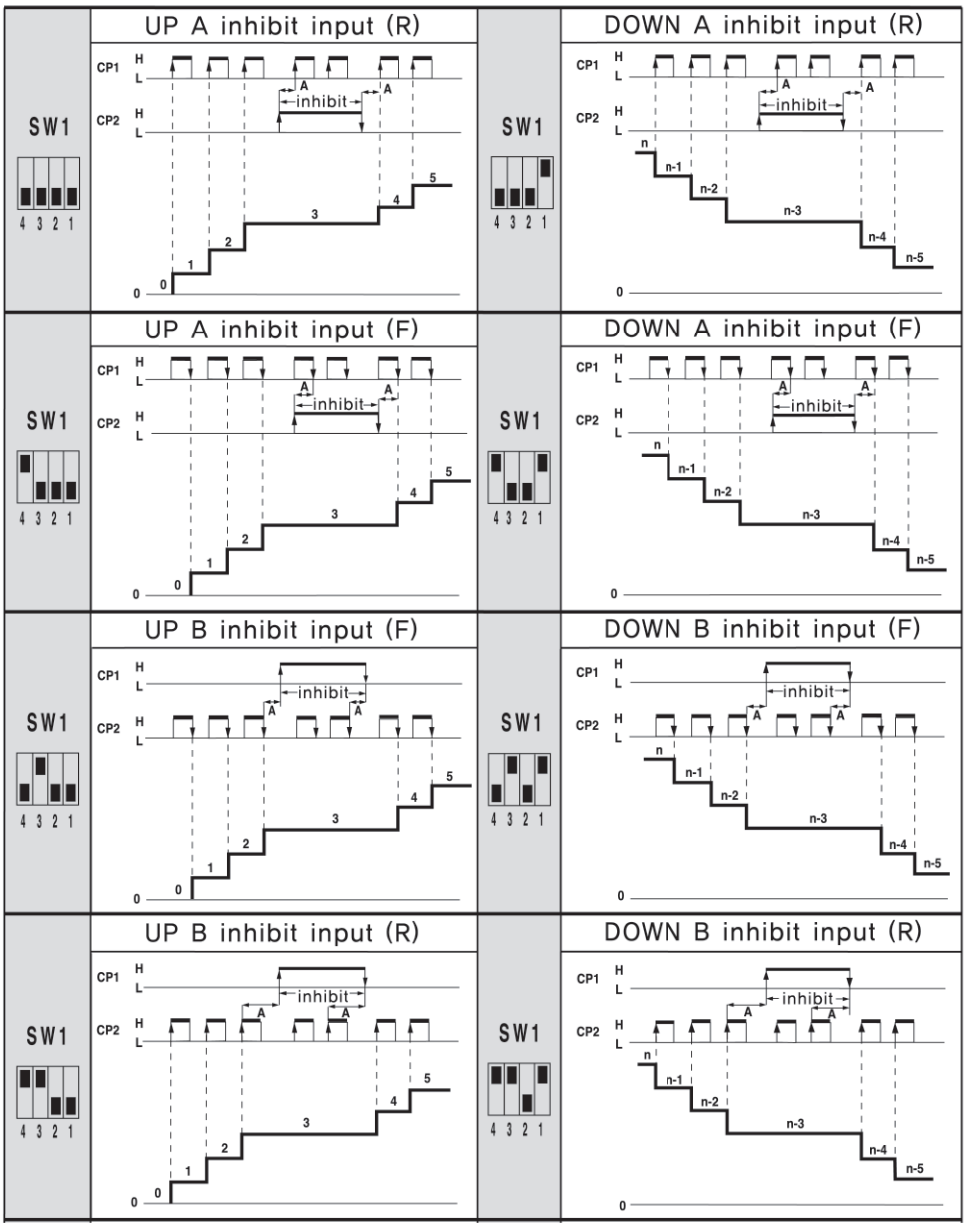
● Counter input action

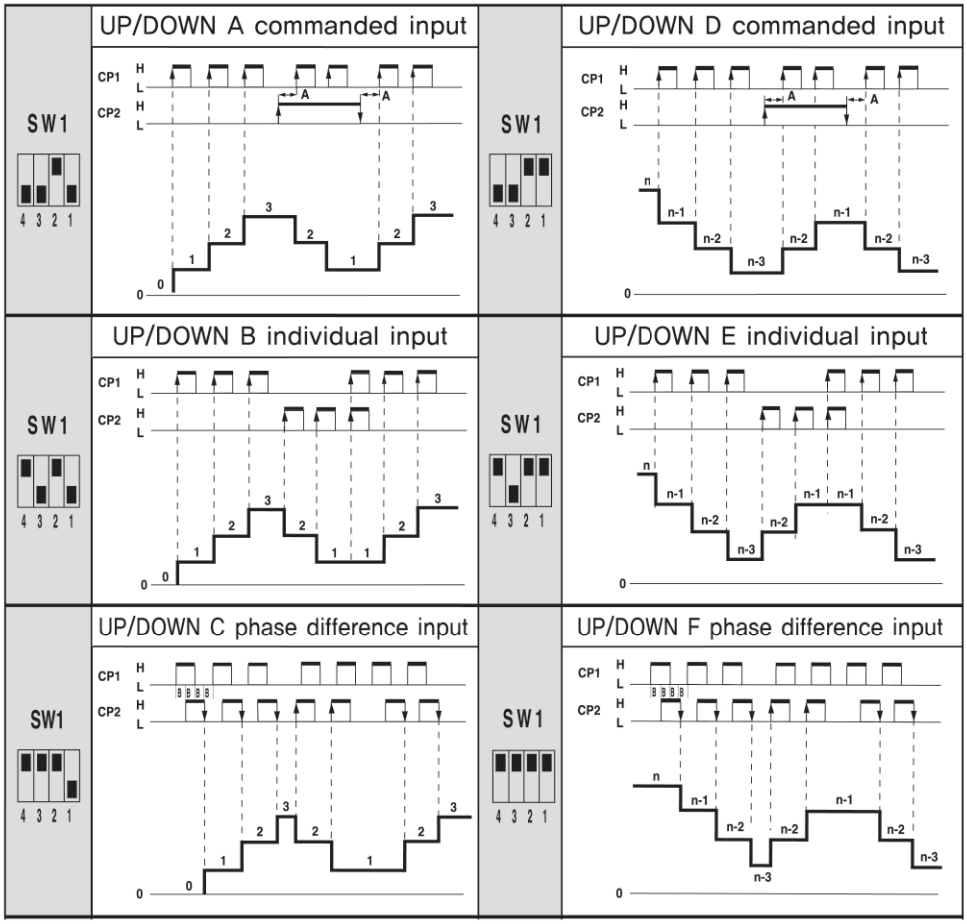
GF4

■ GF4-P41N / GF4-T40N

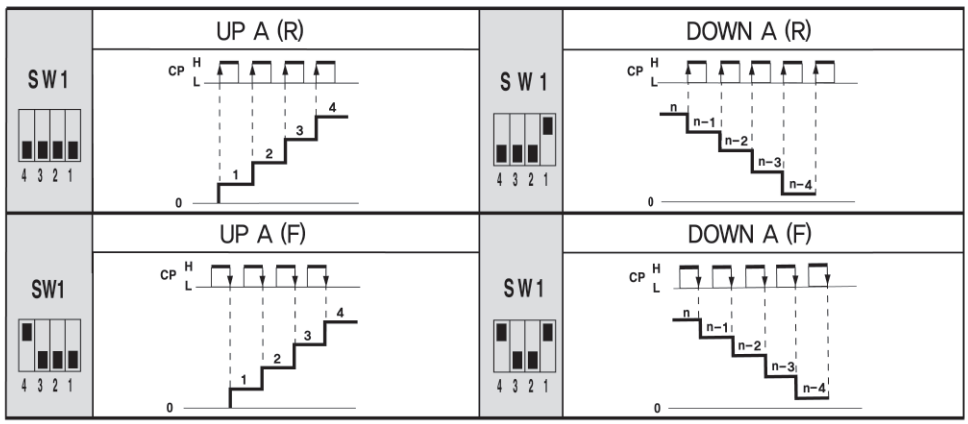
Caution) 'A' requires at least the min signal width and 'B' requires at least the half of min signal width.
Caution) The following input logic of counter input mode is for the 'PNP' mode.
Caution) When input logic is set as the 'NPN' mode, please use it as reverse of the 'PNP' mode.

• Rising state of the Input signal (⌐‾) • Falling state of the Input signal (‾⌐)




UP/DOWN A commanded input
UP/DOWN D commanded input
UP/DOWN B individual input
UP/DOWN E individual input
UP/DOWN C phase difference input
UP/DOWN F phase difference input
SW1
4 3 2 1
CP1
CP2
H
L
A
n
n-1
n-2
n-3
0
1
2
3

■ GF4-P41S

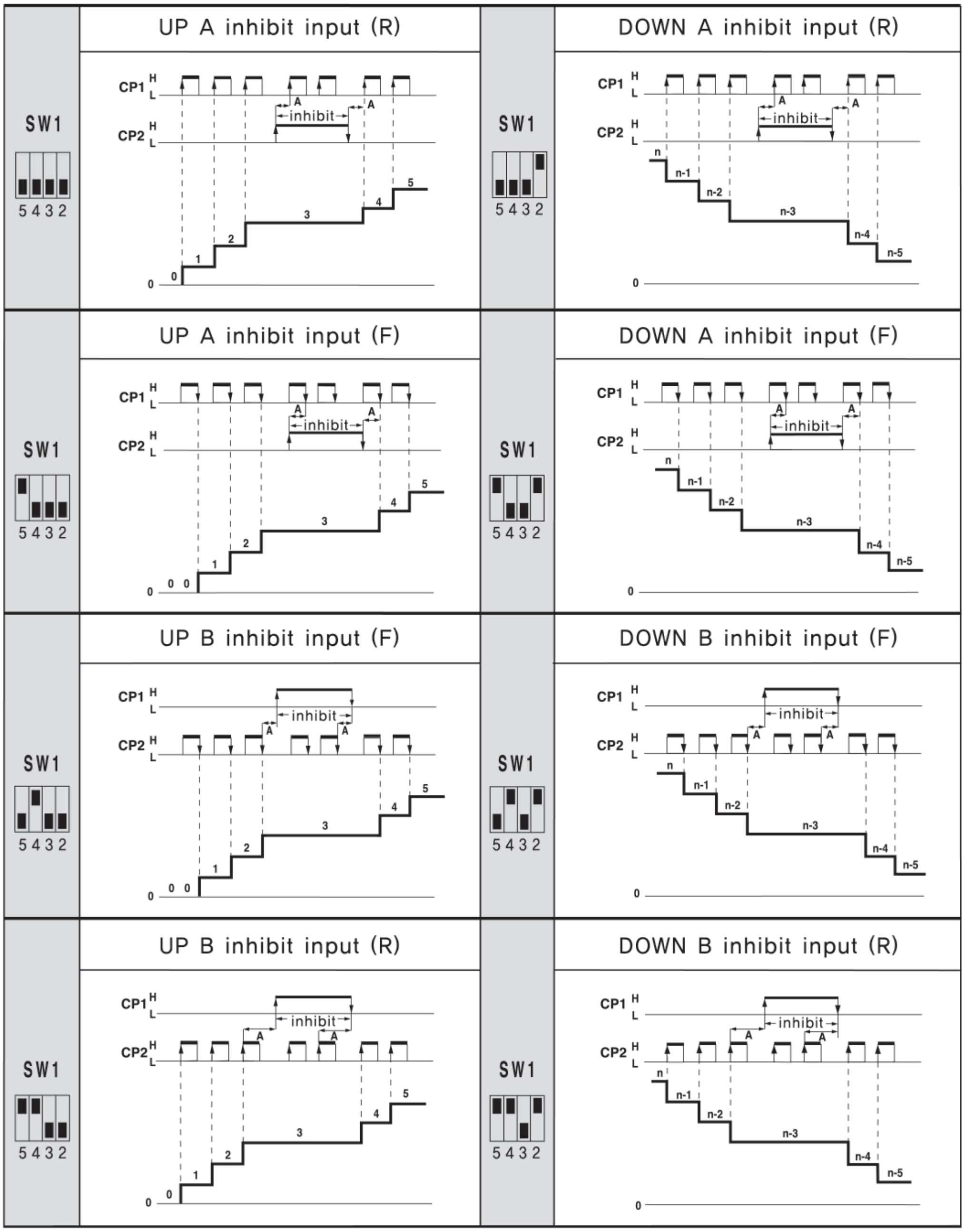

UP A (R)
DOWN A (R)
UP A (F)
DOWN A (F)
SW1
4 3 2 1
CP
H
L
n
n-1
n-2
n-3
n-4
0
1
2
3
4

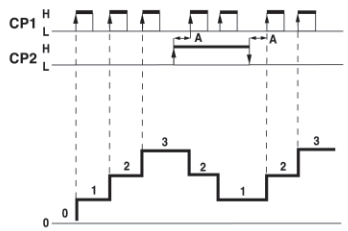
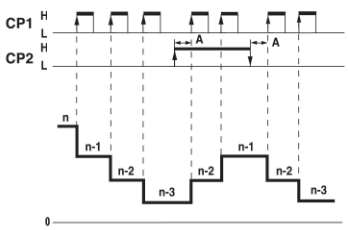
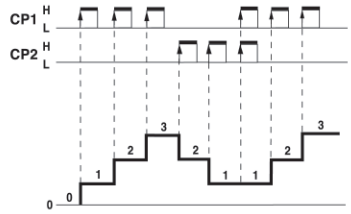
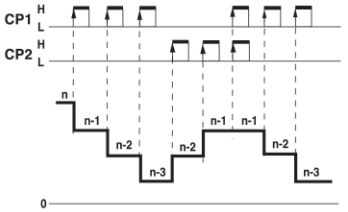
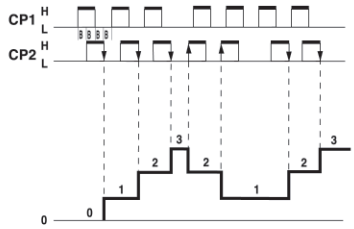
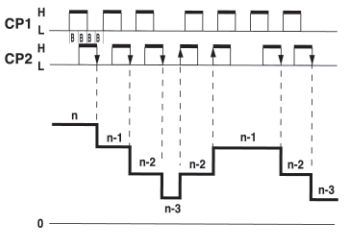
Counter input action

GF7

Caution) 'A' requires at least the min signal width and 'B' requires at least the half of min signal width.
Caution) The following input logic of counter input mode is for the 'PNP' mode.
Caution) When input log is set as the 'NPN' mode, please use it as reverse of the 'PNP' mode.

• Rising state of the Input signal (⌐) • Falling state of the Input signal (⌐)

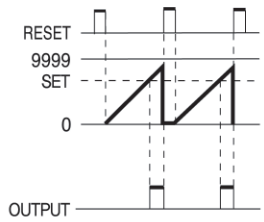
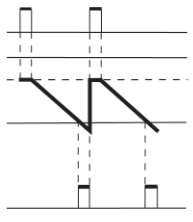
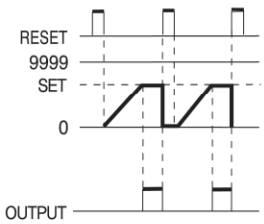
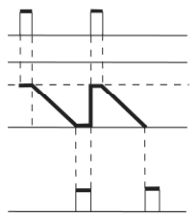
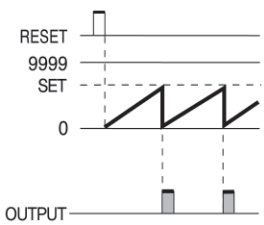
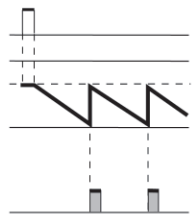
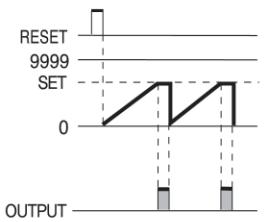
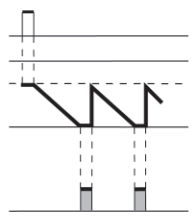
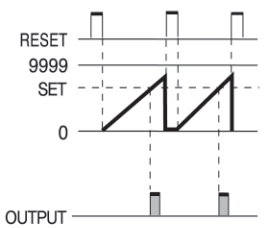
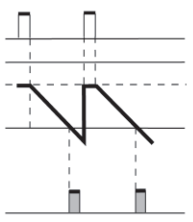


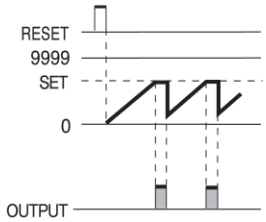
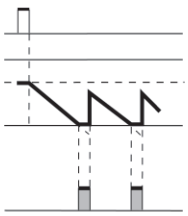
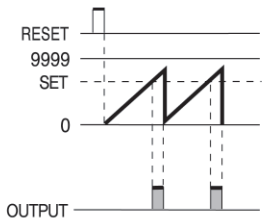
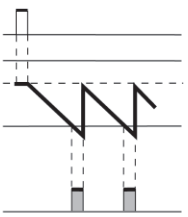
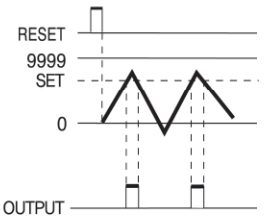
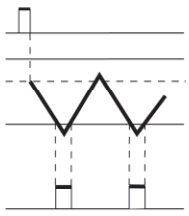
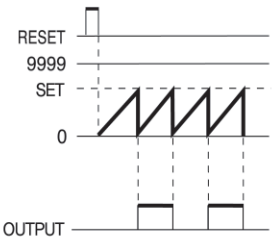
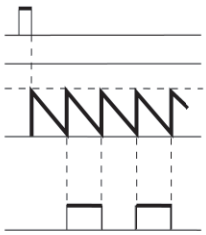
SW1 5 4 3 2	UP/DOWN A commanded input	SW1 5 4 3 2	UP/DOWN D commanded input
			
SW1 5 4 3 2	UP/DOWN B individual input	SW1 5 4 3 2	UP/DOWN E individual input
			
SW1 5 4 3 2	UP/DOWN C phase difference input	SW1 5 4 3 2	UP/DOWN F phase difference input
			

● Counter output operation

GF4

Self maintaining output ONE-SHOT output (0.1 ~ 12.5 sec setting)

Output mode \ Input mode		Up mode	Down mode	Operation explanation
F	SW2 6 5 4 Counter / Timer			• Disregarding the output occurrence, indicated value will continuously increase or decrease. • Until reset signal is applied in, indicated value will continuously increase or decrease and output state will be maintained.
N	SW2 6 5 4 Counter / Timer			• Indicated value will not be displayed once the output is generated. • Until Reset signal is applied in, indicated value and output state will be maintained.
C	SW2 6 5 4 Counter / Timer			• Indicated value will be initialized the output is generated. • Output state will be maintained for the output set time. • Output will be initialized once the output set time is elapsed. • Disregarding the set time of output, indicated value will continuously increase or decrease.
R	SW2 6 5 4 Counter / Timer			• Indicated value will not be displayed once the output is generated. • Output state will be maintained for the output set time • Indicated value and output will be initialized once the output set time is elapsed.
K	SW2 6 5 4 Counter / Timer			• Disregarding the output occurrence, indicated value will continuously increase or decrease. • Output state will be maintained for the output set time. • After passing the output set time, output will be initialized without indicated value being changed.

P	SW2 6 5 4 Counter / Timer			• Indicated value will not be displayed once the output is generated and computed value will be initialized. • Output state will be maintained for the output set time and computed value will continuously increase, decrease or stop. • Output will be initialized after passing the output set time and the increased or decreased computation value will be displayed.
Q	SW2 6 5 4 Counter / Timer			• Disregarding the output occurrence, indicated value will either be increased or decreased continuously. • Output state will be maintained for the output set time. • Indicated value and output will be initialized after passing the output set time.
S	SW2 6 5 4 Counter			• When using the UP mode and if the indicated value is higher than the set value then output will be generated and if the indicated value is lower than the set value then output state will be maintained. • When using the DOWN mode and if the indicated value is lower than 0 then output will be generated and if indicated value is higher than 0 then output will be initialized. • If Reset signal is applied in, indicated value and output will be initialized.
A	SW2 6 5 4 Timer			• When using the UP mode and if indicated value is higher than the set value then output will be reversed and indicated value will be initialized. • When using the DOWN mode and if indicated value is lower than 0 than output will be reversed and indicated value will be initialized. • If Reset signal is applied in, indicated value and output will be initialized.

● Counter output action

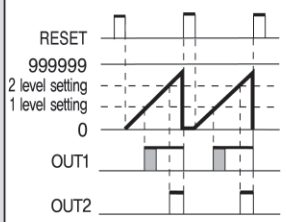
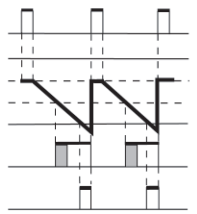
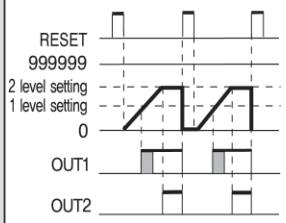
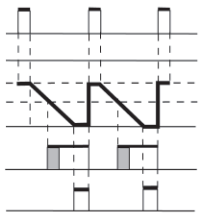
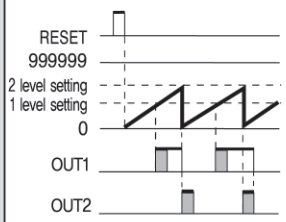
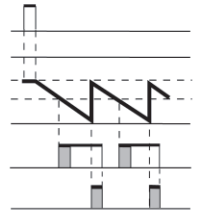
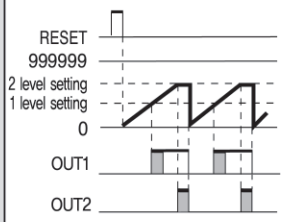
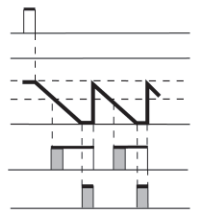
GF7

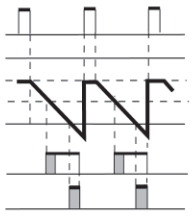
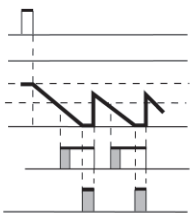
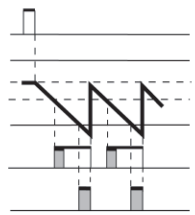
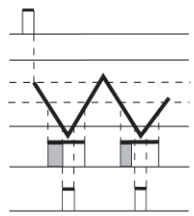
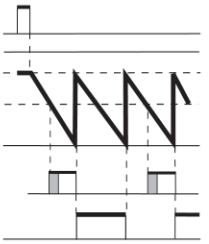
(Cautious) Model GF7-P61/P41 operate as the 2nd stage output (OUT2).
(Cautious) Setting the "number 2 of DIP SW2" as "ON" will make 1st stage output(OUT1) to operate as "Flickering(ON-0.5sec, OFF-0.5sec) output".(But number 3 of DIP SW2 must be in OFF state)

Self maintaining output (OUT2, Hold)

ONE-SHOT output (OUT2, 0.05~5.8 sec)

ONE-SHOT output (OUT1, 0.5 sec fix)
Self maintaining output (OUT1, Hold)

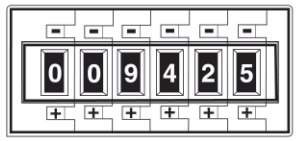
Output mode \ Input mode		Up mode	Down mode	Operation explanation
F	SW2 6 5 4 Counter / Timer			• Disregarding the 2nd stage output occurrence, the indicated value continuously increases or decreases and output state is maintained. • Once the Reset signal is supplied in, indicated value and output will be initialized.
N	SW2 6 5 4 Counter / Timer			• Indicated value will not be displayed once the 2nd stage output is generated and output state will be maintained. • Once Reset signal is supplied in, indicated value and output will be initialized.
C	SW2 6 5 4 Counter / Timer			• Indicated value will not be displayed once the 2nd stage output is generated and output state will be maintained. • Output state will be maintained for the output set time and output will be initialized once it passes the output set time. • 1st stage output will be initialized synchronously with the 2nd stage output. • Runs above operations repeatedly without supplying in the Reset signal.
R	SW2 6 5 4 Counter / Timer			• Indicated value will not be displayed once the 2nd stage output is generated and output state will be maintained. • Output state will be maintained for the output set time and indicated value and output will be initialized after passing the output set time. • 1st stage and 2nd stage output will be initialized at the same time. • Runs above operations repeatedly without supplying in the Reset signal.

K	SW2 6 5 4 Counter / Timer	RESET 9 99999 2 level setting 1 level setting 0 OUT1 OUT2		• Disregarding the 2nd stage output occurrence, indicated value will continuously increase or decrease. • Output state will be maintained for the output set time and once passing the set time, only the output will be initialized. (output state will not be changed) • 1st stage and 2nd stage output will be initialized at the same time. • When Reset signal is supplied in, indicated value and output will be initialized.
P	SW2 6 5 4 Counter / Timer	RESET 999999 2 level setting 1 level setting 0 OUT1 OUT2		• Indicated value will not be displayed once the 2nd stage output is generated and the computed value will be initialized. • Output state will be maintained for the output set time and computed value will continuously increase or decrease without indicated value being changed. • Output will be initialized after passing the output set time and the increased/decreased computation value will be displayed. • 1st stage and 2nd stage output will be initialized at the same time
Q	SW2 6 5 4 Counter / Timer	RESET 999999 2 level setting 1 level setting 0 OUT1 OUT2		• Disregarding the 2nd stage output occurrence, indicated value will continuously increase or decrease • Output state will be maintained for the output set time and indicated value/output will be initialized after passing the output set time • 1st stage and 2nd stage output will be initialized at the same time.
S	SW2 6 5 4 Counter	RESET 999999 2 level setting 1 level setting 0 OUT1 OUT2		• When using the UP mode, 1st stage output will be generated if the indicated value is higher than the 1st stage set value and 1st stage output will be initialized if the indicated value is lower than the 1st stage set value, 2nd stage output will be generated if the indicated value is higher than the 2nd stage set value and will be initialized if lower than the 2nd stage set value. • When using the DOWN mode, 1st stage output will be generated if the indicated value is lower than the 1st stage set value and if higher than the 1st stage output then it will initialize the indicated value, 2nd stage output will be generated if the indicated value is lower than 0, and if higher than 0, it will initialize the 2nd stage output.
A	SW2 6 5 4 Timer	RESET 999999 2 level setting 1 level setting 0 OUT1 OUT2		• when using the UP mode, 2nd stage output will be reversed if the indicated value is higher than the 2nd stage set value and indicated value will be initialized • when using the DOWN mode, 2nd stage output will be reversed if the indicated value is lower than 0 and indicated value will be initialized • 1st stage output will be generated when 2nd stage output is in "OFF" state and the indicated value is higher than the 1st stage set value.

Pre-Scale Setting type (Limits with GF7-P)

■ What is Pre-scale function?

• This is the function that computes the number of input signal and converts into the certain numerical value.



〈 Front digital switch 〉

■ Example of usage depending on the pre-scale setting

Example) By using the 6 digits counter, users want to display 0.09425 regarding the single input signal by setting the pre-scale value.

① Set the front side switch "DIP SW1 number 7" to the ON direction in order to select as counter.

② Set the front side switch "DIP SW1 number 8" to the ON direction in order to select as pre-scale mode.

③ Set #7 and #8 of deep switch SW2 as ON and press the reset (RST) key in order to set the counter display value and counter set value as 3 decimal points mode.

④ Pressing the front SET key will shift the position of decimal points so set the position of decimal point of pre-scale value to the 5th position.

⑤ Set the front digital switch as 0.09425 and press the reset (RST) switch to complete the pre-scale value setting.

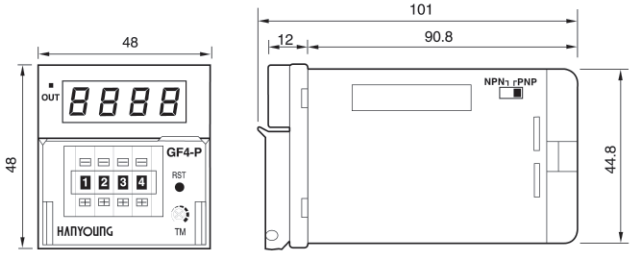
Default specification setting

Model	GF4	GF7	Reference
Position of the decimal point	none	none	Counter function
Counter/timer function	counter	counter	–
Pre-scale setting	no function	1 : 1	Counter function
Power backup memory	power backup	power backup	–
Computation speed	30 cps	30 cps	Counter function
Output type	ON Delay	ON Delay	–
Input action mode	U-A(R)	U-A(R)	–
Output action mode	F	F	–
2nd stage setting OUT1 output	no function	Hold	–
Auto reset time	100 ㎳	50 ㎳	Counter function

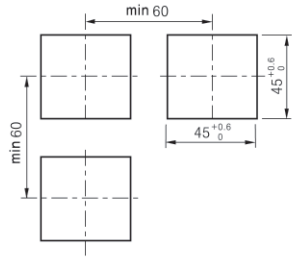
Dimension and panel cutout (unit : ㎜)

GF4

● Dimension

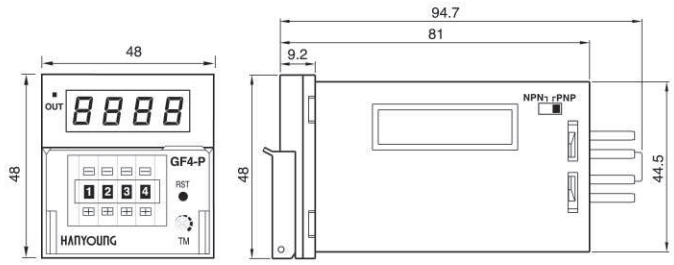


● Panel cutout

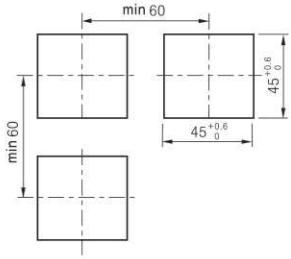


GF4-P41S

● Dimension

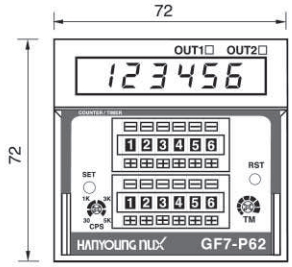


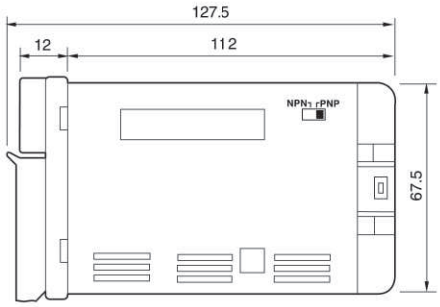
● Panel cutout



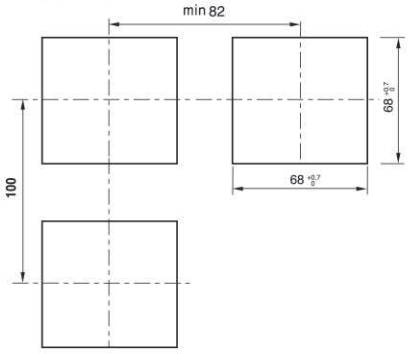
GF7

● Dimension





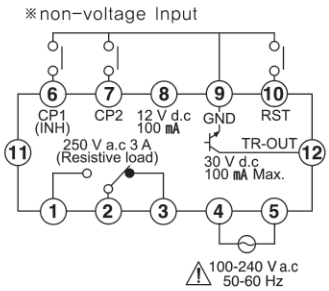
● Panel cutout

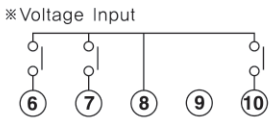


Connection diagram

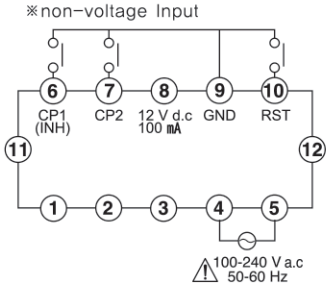
※ Voltage / Non-voltage selection by the deep switch

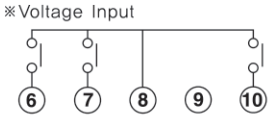
■ GF4-P41



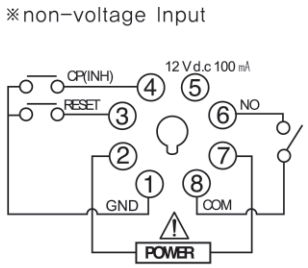


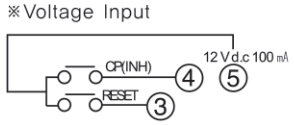
■ GF4-T40



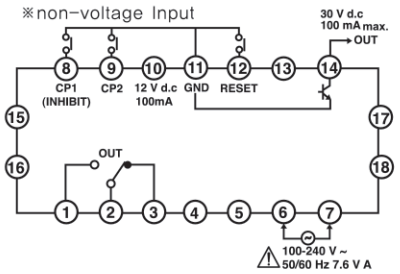


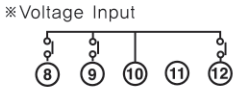
■ GF4-P41S



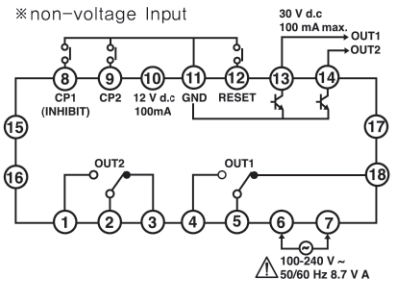


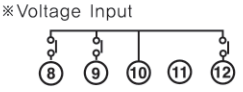
■ GF7-P41, GF7-P61



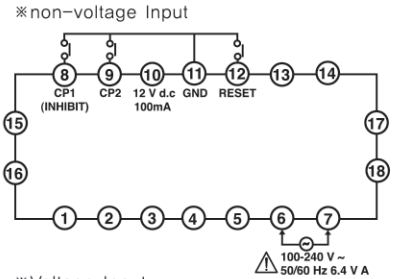


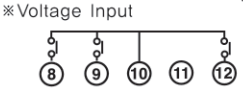
■ GF7-P42, GF7-P62





■ GF7-T60





TT4

Digital dual timer

- Free voltage (100 – 240 V AC 50 – 60 Hz)
- Plug in type (8 pin, 11 pin)
- Multi range (0.01 sec ~ 9999 hour)
- Dual timer & twin timer function
  (available to use as 2 independent timers)
- KEY-LOCK
- Output action control depending on the external input signal
  (START, RESET, INHIBIT)

Suffix code

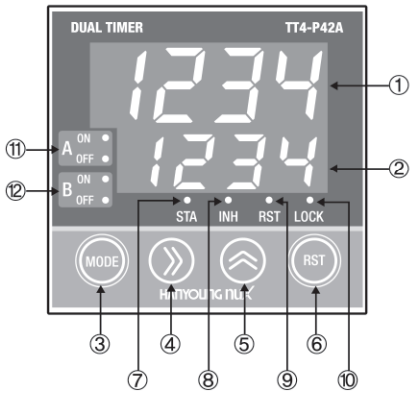
Model	Code	Description
TT4	□□□□	Digital dual timer (48 X 48 ㎜)
Setting division	P	Exclusive for setting
Displayable digit	4	4 digits (9999)
Setting stage	2	2nd stage setting
External connection	A	11 pins plug type
	B	8 pins plug type

Specification

Model		TT4-P42A	TT4-P42B
Power supply voltage		100 – 240 V AC 50 – 60 Hz	
Voltage fluctuation		±10 % of the power supply voltage	
Power consumption		Approximately 9.1 VA (220 V AC 60 Hz)	
Display method		7 Seg LED(red), PV : character height 11 ㎜, SV : character height 8 ㎜)	
External plug type		11 pin socket	8 pin socket
Output	Contact composition	OUT-A : time limit, 1c contact, OUT-B : time limit, 1c contact	
	Contact capacity	N.O : 250 V AC 3 A, N.C : 250 V AC 2 A (resistive load)	
Input	Non-voltage input	impedance when disconnected : 1 KΩ max, remaining voltage when disconnected : 2 V max Impedance when opened : 100 KΩ min	-
Min signal time		20 ㎳ min (START, RST/INH)	-
Power backup memory		Semi-permanent (applied EEPROM)	
Setting type		Recognize at all times (possible to modify in the middle of applying electric current)	
Time error		(repeated error, set error, voltage error, temperature error) With power start (±0.01 % max ±0.05 sec) With reset start (±0.01 % max ±0.05 sec)	
Relay life expectancy		100000 times min (250 V AC, 3 A resistive load)	
Insulation resistance		100 MΩ min, 500 V DC (electric conduction terminal-non recharging terminal)	
Dielectric strength		2000 V AC 50/60 Hz, 1 minute (electric conduction terminal-non recharging terminal)	

Noise immunity	Square wave noise due to the noise simulator (pulse width : 1㎲,2 ㎸ within operation power terminal)
Vibration resistance	10 – 55 ㎐ (cycle for 1min), Peak amplitude 0.75 ㎜ for 1 hour each in X, Y and Z direction
Shock resistance	300 ㎳ (30G), 3 times each in X, Y and Z direction
Ambient temperature	–10 ~ 55 ℃
Ambient humidity	35 ~ 85 % RH
Storage temperature	–20 ~ 65 ℃
Weight	Approx. 108 g

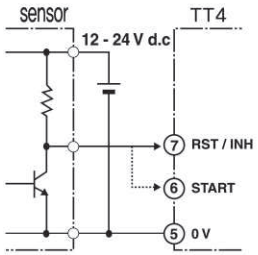
Name of each part



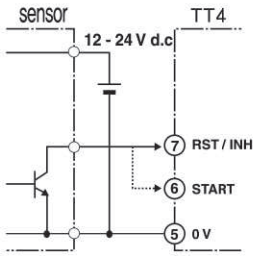
List	Description
① Running time indicator	Display current processing time
② Set time indicator	Time that is set in T1, T2, T3 and T4 are displayed. If the output mode is "DU", run time of the channel B is displayed.
③ MODE key	Used to change the function setting and the set time
④ SHIFT key	Shift to the time digit that wants to change when changing the set time
⑤ UP key	Used to increase the time value when changing the set time
⑥ RST key	Used to initialize the run time and output also used as down key when charging the set time
⑦ STA LED	Lighted when START signal becomes ON
⑧ INH LED	Lighted when INHIBIT signal becomes ON
⑨ RST LED	Lighted when RESET signal becomes ON
⑩ LOCk LED	Lighted when key lock setting is set as Loc1, Loc2 and Loc3
⑪ OUT-A on, off LED	Operation state of OUT-A displayed
⑫ OUT-B on, off LED	Operation state of OUT-B displayed

Input connection

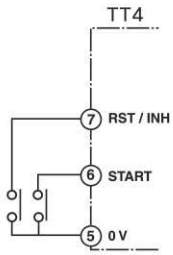
※ Non voltage input
(when sensor is NPN voltage output)



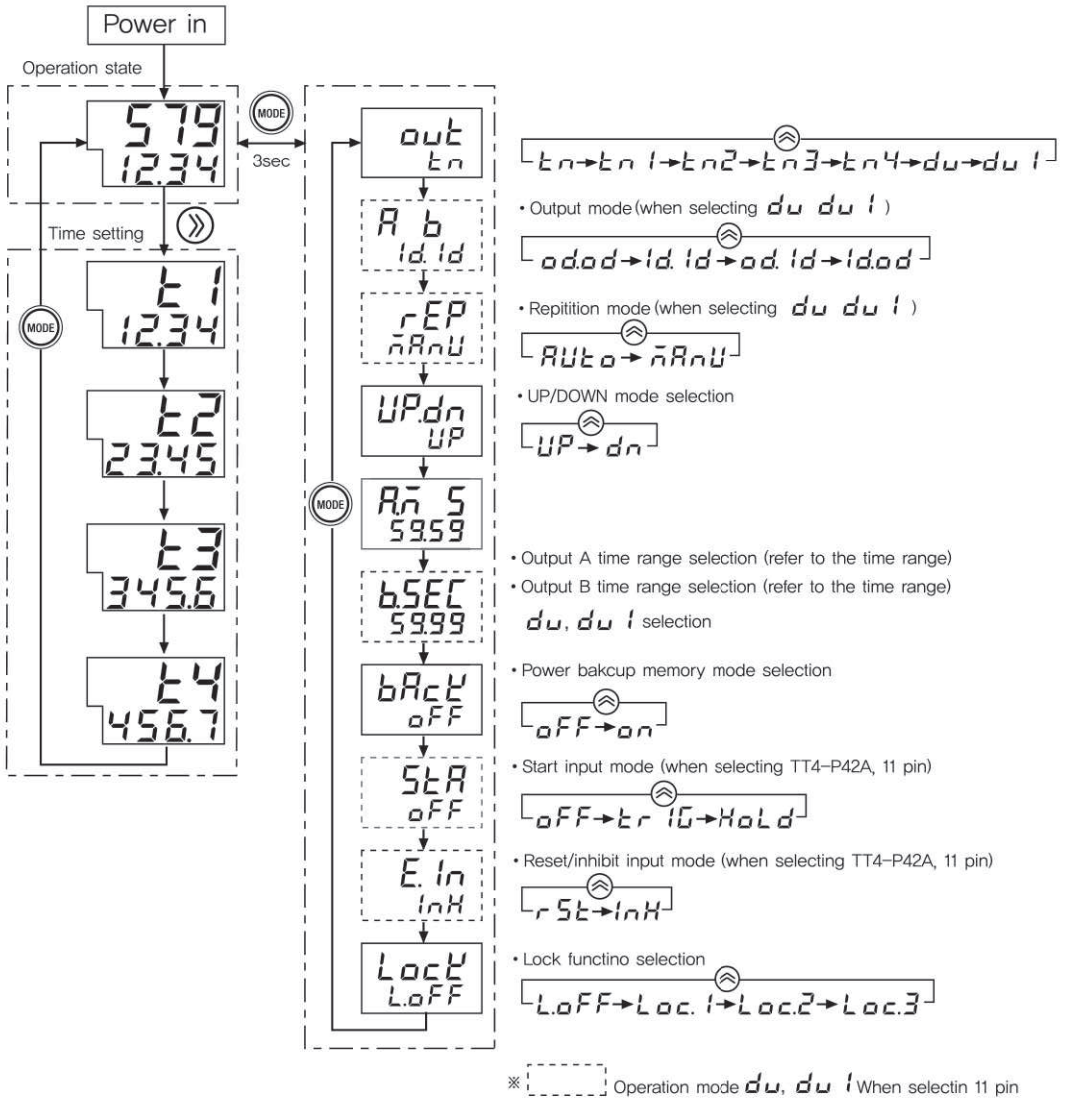
※ Non voltage input
(when sensor is open collector output)



※ Voltage input



Parameter composition



Time range

※ Output B is displayed only when dual timer is selected

Select the selecting range			Time specification
Output A	Output B	Range	
A.SEC	b.SEC	59.99 sec	0.01 sec ~ 59.99 sec
A.SEC	b.SEC	99.99 sec	0.01 sec ~ 99.99 sec
A.SEC	b.SEC	999.9 sec	0.1 sec ~ 999.9 sec
A.SEC	b.SEC	9999 sec	1 sec ~ 9999 sec
A.mS	b.mS	59 min 59 sec	1 sec ~ 59 min 59 sec
A.mS	b.mS	99 min 59 sec	1 sec ~ 99 min 59 sec
A.mIn	b.mIn	999.9 min	0.1 min ~ 999.9 min
A.mIn	b.mIn	9999 min	1 min ~ 9999 min
A.HM	b.HM	99 hour 59 min	1 min ~ 99 hour 59 min
A.Hor	b.Hor	99.99 hour	0.01 hour ~ 99.99 hour
A.Hor	b.Hor	999.9 hour	0.1 hour ~ 999.9 hour
A.Hor	b.Hor	9999 hour	1 hour ~ 9999 hour

Default function setting

Setting list		Default value		Reference
		TT4-P42A	TT4-P42B	
Output mode selection	out	tn	tn	Twin timer
Run mode selection	A b	od.od	-	Applied when selecting du, du1
Repeat mode selection	rEP	AUto	-	
Up/Down mode selection	UP.dn	UP	UP	-
Output A(OUT-A) time range selection	A.mS	59.59 (59min 59sec)	59.59 (59min 59sec)	-
Output B(OUT-B) time range selection	b.mS	-	-	Applied when selecting du, du1
Power backup memory mode	bAcK	oFF (OFF)	oFF (OFF)	-
Start input mode	StA	oFF	-	Applied to TT4-P42A (11 pins)
RST/INH input mode	E.In	rSt	-	
Lock function selection	LocK	L.oFF (Lock OFF)	L.oFF (Lock OFF)	-

Output mode selection

Output mode	Symbol	Contents	Time setting mode	Default value
out	tn	Twin timer	t1, t2	tn
	tn1	Twin timer (Mode-1)	t1, t2	
	tn2	Twin timer (Mode-2)	t1, t2	
	tn3	Twin timer (Mode-3)	t1, t2	
	tn4	Twin timer (Mode-4)	t1, t2, t3, t4	
	du	Dual timer	t1, t2, t3, t4	
	du1	Dual timer (Mode-1)	t1, t2, t3	

※ Time setting modes (t1, t2, t3, t4) display 4 types of time setting lists.

Run mode selection

※ Only applied when timer type is selected as DU or DU 1.

Operation mode	Symbol	Output A(OUT-A)	Output B(OUT-B)	Default value
A b	Id.Id	Interval	Interval	od.od
	od.Id	ON-Delay	Interval	
	Id.od	Interval	ON-Delay	
	od.od	ON-Delay	ON-Delay	

Repetition mode selection

※ Only applied when timer type is selected as DU or DU 1

Display mode	Symbol	Contents	Default value
rEP	AUto	Repeat output action	AUto
	nAnU	Stop after running the output 1 time	

Up/Down mode selection

Display mode	Symbol	Contents	Default value
UP.dn	UP	Up indication mode	UP
	dn	Down indication mode	

Output A(OUT-A) time range selection

OUT A	Symbol	Contents	Default value
ASEC	59.99	OUT-A output range selection ※ Refer to the time range	59.59

Output B(OUT-B) time range selection

※ Output B is displayed only when dual timer is selected.

OUT B	Symbol	Contents	Default value
b.SEC	59.99	OUT-A output range selection ※ Refer to the time range	59.99

Power backup memory mode selection

Backup mode	Symbol	Contents	Default value
bAcK	on	Power backup memory function	oFF
	oFF	No power backup memory function	

Start input mode

Start mode	Symbol	Contents	Default value
StA	oFF	When selecting OFF, output will perform repetitive operation for the setting time disregarding the start signal	oFF
	tr 1G	When selecting the TRIG, it will perform repetitive operation depending on the setting time if start signal becomes ON.	
	HoLd	When selecting the HOLD, it performs repetitive operation depending on the setting time only when start signal is in ON state and if signal becomes OFF then operation time will be initialized and output will become OFF state.	

RESET/INHIBIT input mode

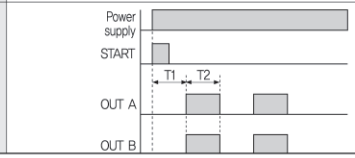
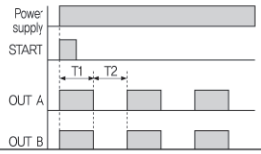
Signal mode	Symbol	Contents	Default value
E. In	InH	This is an Inhibit input mode which stops the time when signal is in ON state.	rSt
	rSt	This is a Reset input mode which makes processing time to be initialized and output will become OFF when signal is in ON state.	

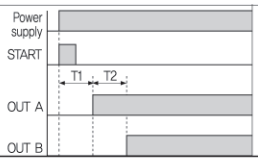
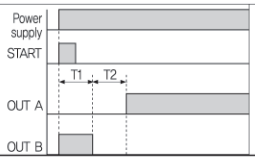
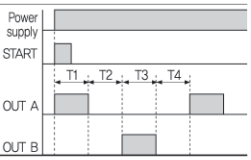
Lock function

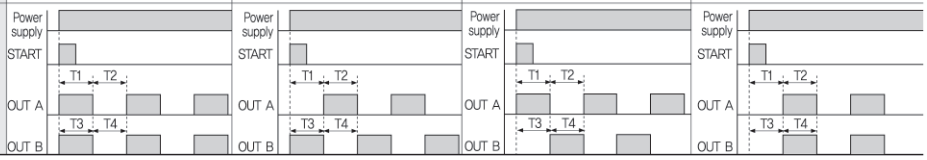
Lock mode	Symbol	Contents	Default value
LocK	L.oFF	Cancel lock	L.oFF
	Loc.1	Reset key lock	
	Loc.2	Shift key lock	
	Loc.3	Reset key + shift key lock	

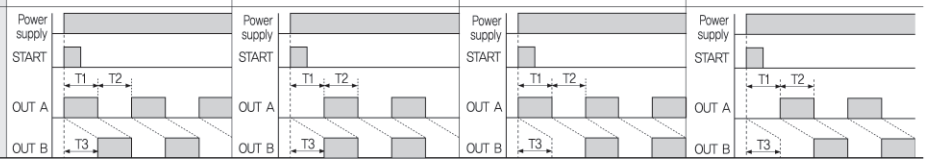
Output operation diagram

※ Time setting modes (t1, t2, t3, t4) display 4 types of time setting lists.

Output mode	TN (Start=trig)	TN1 (Start=trig)
Operation mode	none	
Standard operation		

Output mode	TN2 (Start=trig)	TN3 (Start=trig)	TN4 (Start=trig)
Operation mode	none		
Standard operation			

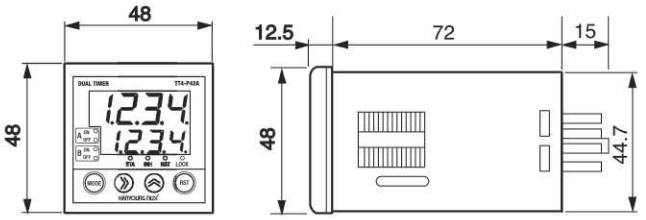
Output mode	DU (Start=trig)			
Operation mode	ld ld	od ld	ld od	od od
Standard operation				

Output mode	DU 1 (Start=trig)			
Operation mode	ld ld	od ld	ld od	od od
Standard operation				

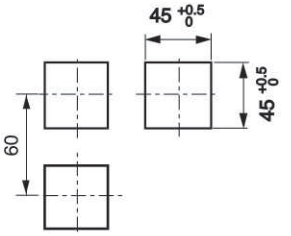
※ Above output operation diagram is an example of start = trig so when selecting HOLD, it only operates with input signal in ON state and with the OFF state, operation starts to operate repetitively at the same time when power is supplied in.

Dimension and panel cutout (unit : ㎜)

● Dimension

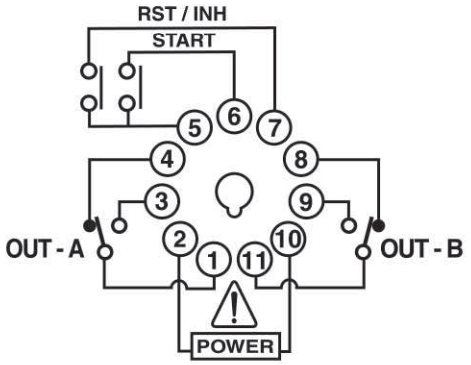


● Panel cutout

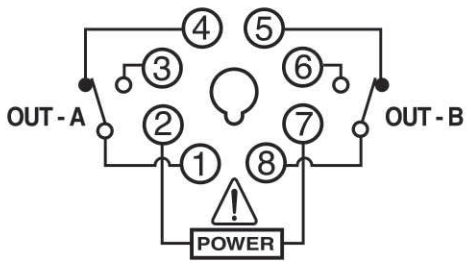


Connection diagram

■ TT4-P42A



■ TT4-P42B



TT7

Digital twin timer

- Free voltage (100-240 V AC/DC Dual usage)
- 1/100 sec resolving power (0.00s~59.99s)
- ON time and OFF time individual setting
- ON time red, OFF time green display
- ON signal Off-Start by the external contact signal

Suffix code

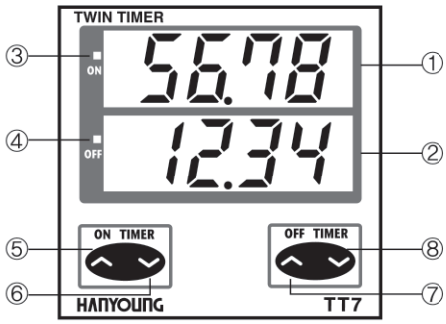
Model	Code	Description
TT7-	□□□	Digital twin timer (72 X 72 ㎜)
Setting division	P	Exclusive for setting
Displayable digit	4	4 digits (9999)
Setting stage	1	1 stage setting

Specification

Model		TT7 - P41
Power supply voltage		100 - 240 V AC 50 - 60 Hz
Voltage fluctuation		±10% of the power supply voltage
Power consumption		Approximately 9.6 VA (220 V AC 60 Hz)
Display type		7 Seg FND (Red 4 digits/green 4 digits, alphabet height 13.5mm)
Time processing direction		Subtract indication-DOWN DISPLAY
Return time		max 100 ㎳
Control output	Output mode	Twin timer Signal ON - OFF start
	Contact composition	Instantaneous action, 1c contact
	Contact capacity	250 V AC 10 A(resistive load)
Relay life expectancy		Mechanically : min 10 million times, Electrically: 500 thousand times (resistive load)
External input signal		Start input (ON : START / OFF : RESET), Impedance when breaks: max 1 KΩ
Time error		Repeated error(max ±0.3 %), set error(max ±5 %), Voltage error(max ±0.5 %), temperature error(max ±2 %)
Insulation resistance		Min 100㏁ (500 V DC mega standard) (electric conduction terminal-non recharging terminal)
Dielectric strength		2000 V AC 50/60 Hz for 1 min (electric conduction terminal-non recharging terminal)
Noise immunity		±2 ㎸ (between the actuating power terminal) Square wave noise due to the noise simulator (pulse width : 1㎲)
Power backup memory		Semi-permanent (EEPROM applied)
Setting type		Recognize at all times (possible to modify in the middle of applying electric current)

Vibration	Resistance	10 – 55 Hz (cycle for 1min), Peak amplitude 0.5㎜ for 2 hour each in X, Y and Z direction
	Error	10 – 55 Hz (cycle for 1min), Peak amplitude 0.5 ㎜ for 10 min each in X, Y and Z direction
Shock resistance	Resistance	300 ㎨, 3 times each in X, Y and Z direction
	Error	100 ㎨, 3 times each in X, Y and Z direction
Ambient temperature		−10 ~ 55 ℃ (No icing allowed)
Ambient humidity		30 ~ 85 % RH
Storage temperature		−20 ~ 65 ℃ (No icing allowed)
Weight		Approx. 220 g (excluded the weight of box)

Name of each part

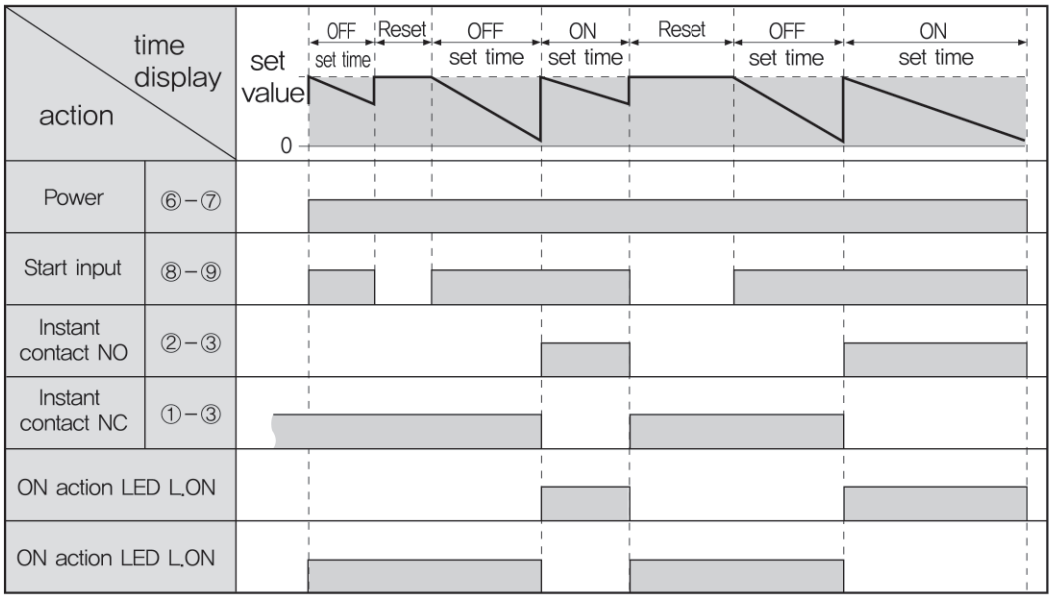


Lists	Description
① ON time displaying unit	Set the ON time and display the elapsed time when operating
② OFF time displaying unit	Set the OFF time and display the elapsed time when operating
③ ON output displaying lamp	Light ON when relay output becomes ON
④ OFF output displaying lamp	Light OFF when relay output becomes ON
⑤ ON time setting incremental key	Pressing the key will increase the ON time set value
⑥ ON time setting decrement key	Pressing the key will decrease the ON time set value
⑦ OFF time setting incremental key	Pressing the key will increase the OFF time set value
⑧ OFF time setting decrement key	Pressing the key will decrease the OFF time set value

Time specification

Classification	Setting range	Default value
ON time	0.00 sec ~ 59.99 sec	59.99 sec
OFF time	0.00 sec ~ 59.99 sec	59.99 sec

Output action and indication



Time setting and operation method

• Time setting method

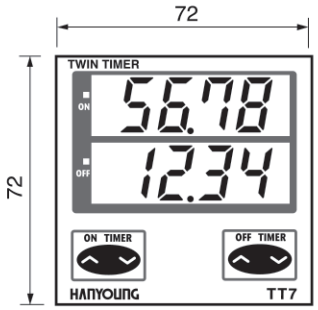
OFF the external contact input then it will become setting input mode. Set each of times by pressing the ON time and OFF time setting keys. (Setting range: 0.00~59.99 s) Also, it is possible to change the set time by pressing the time setting button during operation.

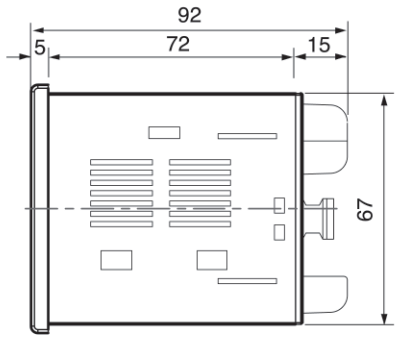
• Timer action

ON the external contact input after completing the time setting will start to run the OFF time. Once OFF time is completed, relay output (NO) becomes ON and ON time will start to run. Repeat stated actions.

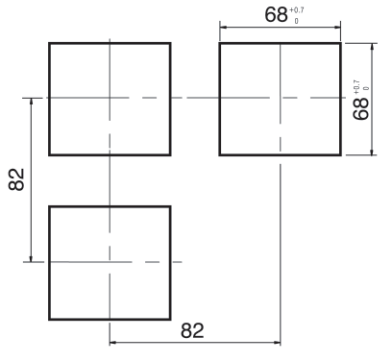
Dimension and panel cutout (unit : ㎜)

● Dimension

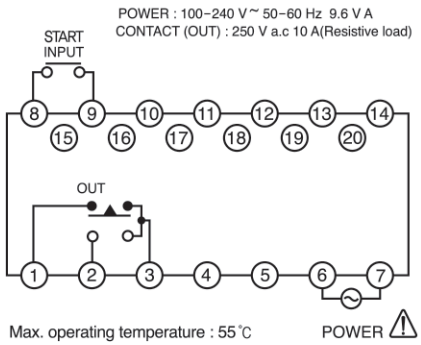




● panel cutout



Connection diagram



TF4
Digital timer

- Simple function, convenient setting
- Time range selection by using the front side deep switch (2 kinds)
- 10 decimal system, sexagesimal system
- Relay or transistor output
- Free voltage
  (100 – 240 V AC 50 – 60 Hz, 24 – 60 V DC)

Suffix code

Model	Code				Description
TF4–	□	□	□	□	Digital timer 48(W) X 48(H)
Time specification	A				999.9sec / 9999sec
	B				9min 59.9sec / 59min 59sec
	C				999.9min / 59hour 59min
Display method		U			Up display
		D			Down display
Power supply voltage			A		100 – 240 V AC 50 – 60 Hz
			D		24 – 60 V DC
Control output				R	Relay
				T	Open collector

Specification

Input

Reset	Power reset (500 ms min), external reset and manual reset (20 ms min)
Inhibit Input	Stop measuring the time due to the external signal (20 ms min)
Noise immunity	Square-shaped wave noise due to the noise simulator (1㎲ pulse width), ±2 ㎸ (between the operational power terminal)

Function

Repetition accuracy	Less than ±0.01 % of the set value ±0.05 s (when it is power start type)
	Less than ±0.005 % of the set value ±0.003 s (when it is RESET start type)
Insulation resistance	100 MΩ min (500 V DC) electric conduction terminal – non recharging metal
Dielectric strength	2000 V AC 60 Hz 1 minute (within different recharging terminal from each other)

Function and output

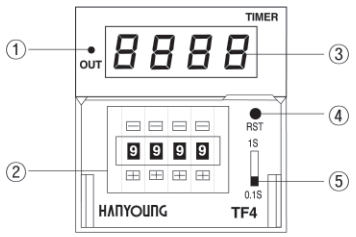
Operation type	Up display, down display (selected by the suffix code)	
Output action	Once indicated value becomes same as the set value, it becomes "ON" (UP). If indicated value becomes 0 within the set value then it becomes "ON" (Down) ※ Please refer to the output action mode	
Time setting recognition	Recognize at all times (possible to change the setting in the middle of applying electric current	
Alphabet display	height 11 ㎜, width 8 ㎜	
Control output	Relay	Instant 1 c, 250 V AC 3 A (resistive load)
	Transistor	Open collector, 30 V DC 100 ㎃ max.

	Code division	range
Time range	A	999.9sec / 9999sec
	B	9min 59.9sec / 59min 59sec
	C	999.9min / 59hour 59min

Standard specification

Power supply voltage	100 – 240 V AC 50 – 60 Hz
	24 – 60 V DC
Voltage fluctuation	±10 % of the power supply voltage
Power consumption	AC : approx. 4.8 VA (240 V AC 60 Hz)
	DC : approx. 0.7 W (24 V DC)
Ambient temperature	-10 ~ 50 ℃
Ambient humidity	35 ~ 85 % RH
Storage temperature	-20 ~ 65 ℃
Vibration resistance	10 – 55 Hz, peak amplitude 0.5 ㎜, for 2 hour each in 3 axis direction
Shock resistance	300 ㎨, 3 times each in 3 axes direction
Weight	Approx. 100 g

Name of each part



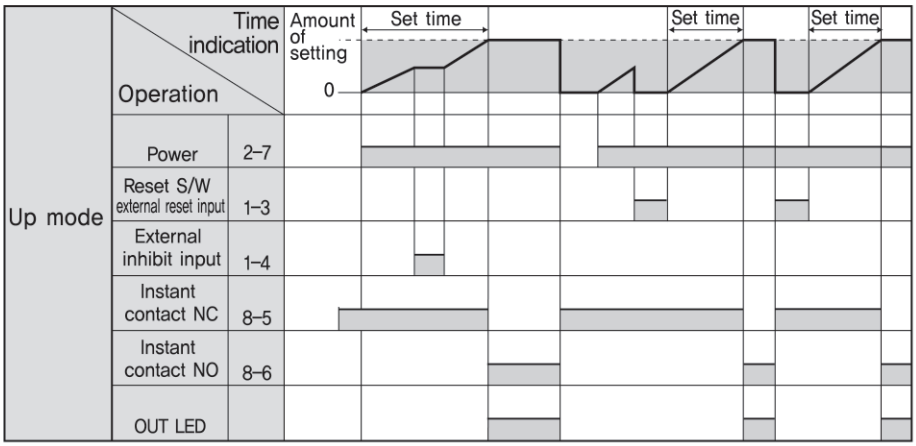
999.9s / 9999s (A Type)
9m 59.9s / 59m 59s (B Type)

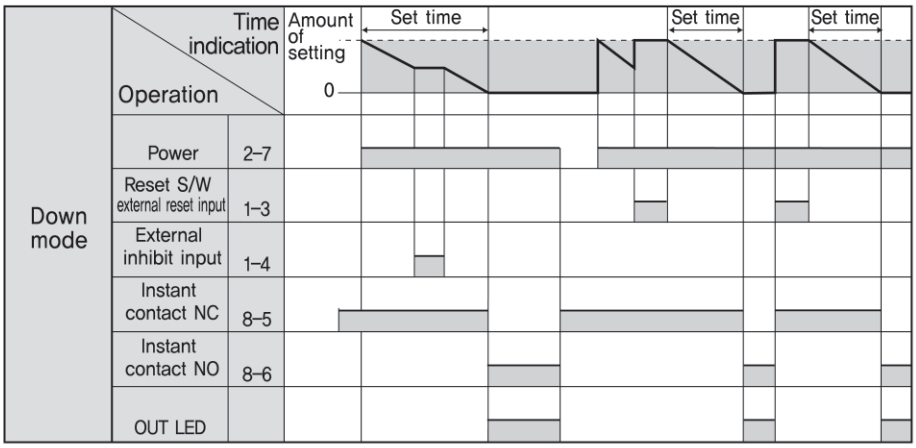
999.9m / 59h 59m (C Type)

① Output indication
② BCD switch for setting up the time
③ Indicating the elapsed time and remaining time
④ Push switch for manual reset
⑤ Time selecting switch

■ Output action mode

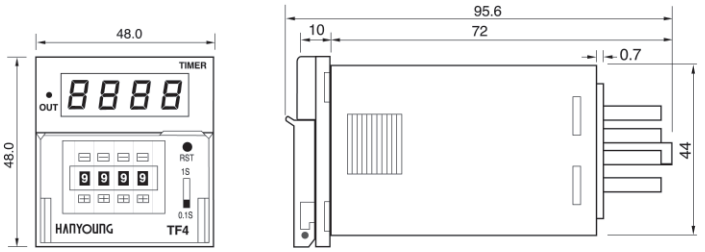
(Cautious) After output is generated, output and indication will be remained until the reset signal is inputted.



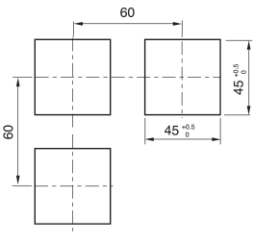


Dimension and panel cutout (unit : ㎜)

● Dimension

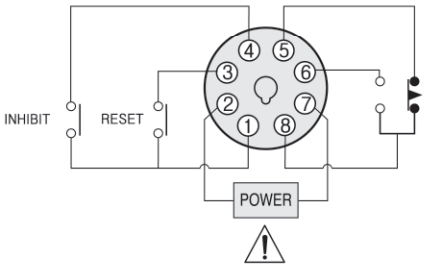


● Panel cutout



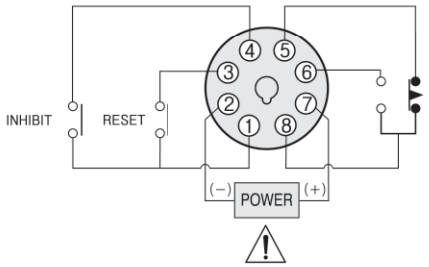
Connection diagram

AC input-relay output



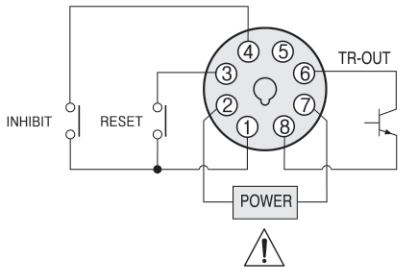
POWER : 100-240 V a.c 50/60 Hz
CONTACT : 250 V a.c 3 A RESISTIVE LOAD

DC input-relay output



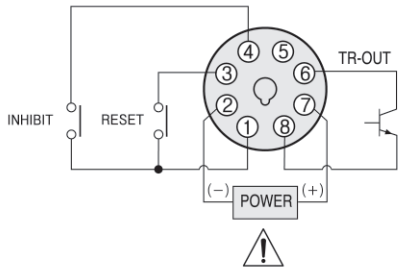
POWER : 24-60 V d.c
CONTACT : 250 V a.c 3 A RESISTIVE LOAD

AC input-open collector output



POWER : 100-240 V a.c 50/60 Hz

DC input-open collector output



POWER : 24-60 V d.c

TF2
Digital timer

- Simple function, convenient setting
- Select 0.1~99.9sec / 1~999sec by using the front deep switch
- Yield the output of relay and transistor synchronously
- Free voltage (100 – 240 V AC 50 – 60 Hz)
- Plug in type which makes it good for repairing and inspecting.

Suffix code

Model	Code			Description
TF2–	3	A	N	Digital timer 48(W) X 96(H) ㎜
Displayable digits	3			Display 3 digits (999)
Power supply voltage		A		100 – 240 V AC 50 – 60 Hz
Power backup memory function			N	None

Specification

Input

Reset	Power reset (500 ㎳ min), external reset and manual reset (20 ㎳ min)
Inhibit input	Stop measuring the time due to the external signal (20 ㎳ min)
Noise immunity	Square wave noise due to the noise simulator, ±2 ㎸ (between the operational power terminal), ±500 V (between the input terminal)

Function

Repetition accuracy	±0.01 % of the set value, less than ±0.05 s (Case of POWER START)
	±0.005 % of the set value, less than ±0.003 s(Case of RESET START)
Insulation resistance	100 MΩ min(500 V DC) electric conduction terminal – non recharging metal
Dielectric strength	2000 V AC 50/60 Hz 1 minute (within different recharging part from each other) terminal – non recharging metal

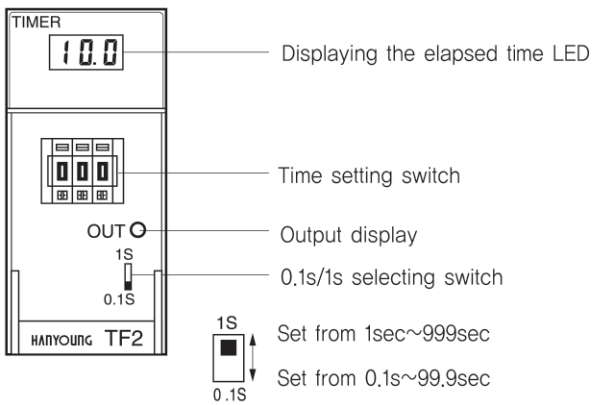
Function and output

Operation type	Up (10 decimal system)	
Output action	ON-Delay operation ※ please refer to the output action mode	
Time setting recognition	Recognize at all times (possible to change the setting in the middle of applying electric current)	
Alphabet display	height 11 ㎜, width 8.0 ㎜	
Time range	0.1 ~ 99.9 sec / 1 ~ 999 sec (selection done by using the front deep switch)	
Control output	Relay	Instant : 1 c, 250 V AC 3 A (resistive load)
	Transistor	Instant : open collector, 30 V DC 100 ㎃ max.

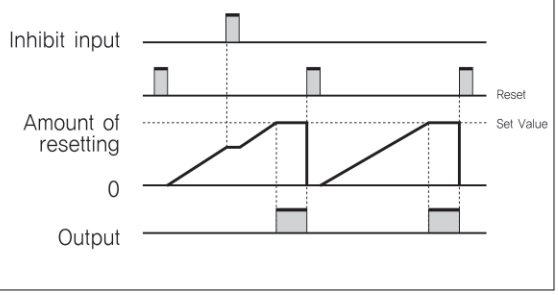
Standard specification

Power supply voltage	100 - 240 V AC 50 - 60 Hz
Voltage fluctuation	±10 % of the power supply voltage
Power consumption	Approx. 5 VA (220 V AC 60 Hz)
Ambient temperature	-10 ~ 50 ℃
Ambient humidity	35 ~ 85 % RH
Storage temperature	-20 ~ 65 ℃
Vibration resistance	10 - 55 Hz, double amplitude 0.75 ㎜, for 2 hour each in 3 axis direction
Shock resistance	300 ㎨, 3 times each in 3 axes direction
Weight	Approx. 380 g

Name of each part

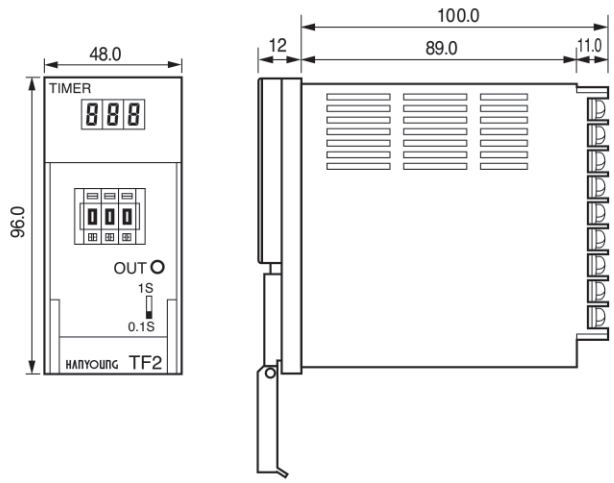


■ Output action mode

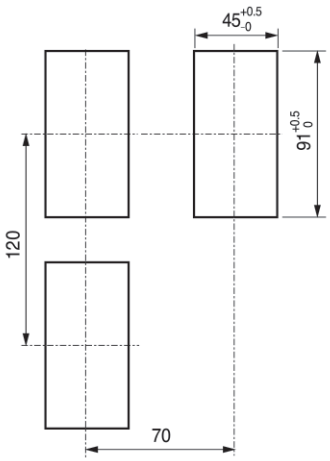
Mode	Up
N	

Dimension and panel cutout (unit : ㎜)

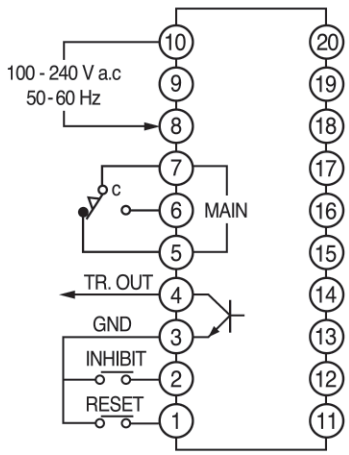
● Dimension



● Panel cutout



Connection diagram



LF4N Series

Digital timer

- LCD indication (display various functions)
- Multi input range 10 kinds
- Multi output action 10 kinds
- Display the elapsed time in bar graph
- Reset, start and inhibit input
- Free voltage (24 – 240 V DC / AC 50 – 60 Hz)

Suffix code

Model	Code	Description		
LF4N–	□	Digital timer 48(W) X 48(H) ㎜		
Device selection	A	Time limit : 1c	Operation mode (10 kinds)	8pin socket type
	B	Time limit : 1c, Instantaneous : 1c	ON Delay output (A mode fixed)	
	C	Time limit : 2c		
	D	Time limit : 1c	Operation mode (10 kinds)	11pin socket type
Power supply voltage		24 – 240 V DC / AC 50 – 60 Hz Dual usage		

Specification

Input

Input signal		Reset, Start, Inhibit. ※ only with LF4N–A and LF4N–D
Non–voltage input stage	Non voltage input	Short circuit stage (when transistor ON) : remaining voltage less than 0.7V DC impedance less than 2 KΩ
		Open stage (when transistor is OFF) : Impedance min 100 KΩ
	Contact input	Please use the contact that can sufficiently open and close 2 ㎂ 5V DC

Function

Repetition accuracy	±0.01 %, of the set value less than ±0.05 s (power start) ±0.005 %, of the set value less than ±0.03 s (signal start)
Returning time	Less than 0.1 s
Noise immunity	Square shaped wave noise due to the noise simulator (1 ㎲ pulse width), ±2 ㎸ (between the operational power terminal)
Insulation resistance	Min 100 MΩ (500 V DC) electric conduction terminal–non charging metal
Dielectric strength	2000 V AC 60 Hz for 1 min, (between the different charging part from each other)

Function and output

Model	LF4N-A	LF4N-B	LF4N-C	LF4N-D
Output action mode	Operation mode 10 kinds (selectable by the front digital switch) But, LF4N-B, LF4N-C (A mode : Power ON Delay fixed)			
Time display type	UP/DOWN selectable by the internal jumper, default value: UP mode			
Time range	Time range 10 kinds (selectable by the front digital switch)			
Set value recognition	Recognize at all times (possible to change the setting in the middle of applying electric current)			
Control output	Relay 1c contact, 250 V AC 3A (Resistive load)			
	1c	Time limit : 1c, Instantaneous : 1c	Time limit : 1c × 2	Time limit : 1c
Applying socket	8 pin socket			11 pin socket

Standard specification

Model	LF4N-A	LF4N-D	LF4N-B	LF4N-C
Power supply voltage	24 – 240 V AC/DC 50 – 60 Hz			
Voltage fluctuation	± 10 % of the power supply voltage			
Power consumption	Approx. 4.4 VA (240 V AC)		Approx. 7.2 VA (240 V AC)	
	Approx. 1.5 W (240 V DC)		Approx. 2.2 W (240 V DC)	
Ambient temperature	-10 ~ 55 ℃			
Ambient humidity	35 ~ 85 % RH			
Storage temperature	-20 ~ 65 ℃			
Vibration resistance	10 – 55 Hz, double amplitude 0.75 ㎜, for 2 hour each in 3 axis direction			
Shock resistance	300 ㎨, 3 times each in 3 axes direction			
Weight	Approx 110 g			

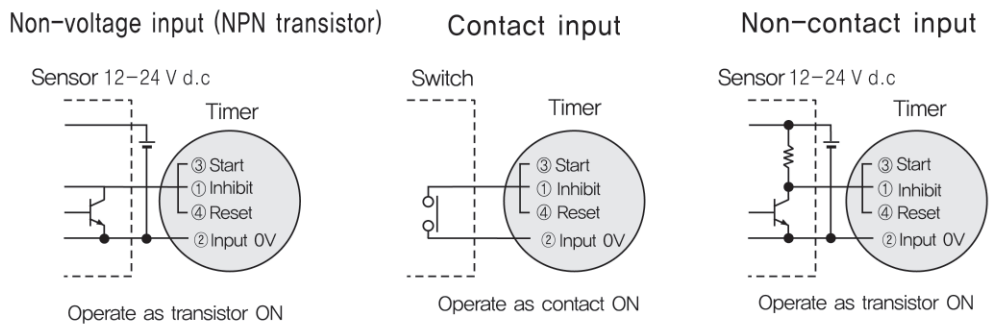
Output operation mode

Output operation mode selection	Output operation mode
A	Signal ON Delay
B	Flicker ON Start
C	Signal ON/OFF Delay
D	Signal OFF Delay
E	Interval
F	One Shot & Flicker
G	Integration
H	Interval Delay
I	Flicker One Shot
J	Power ON Start

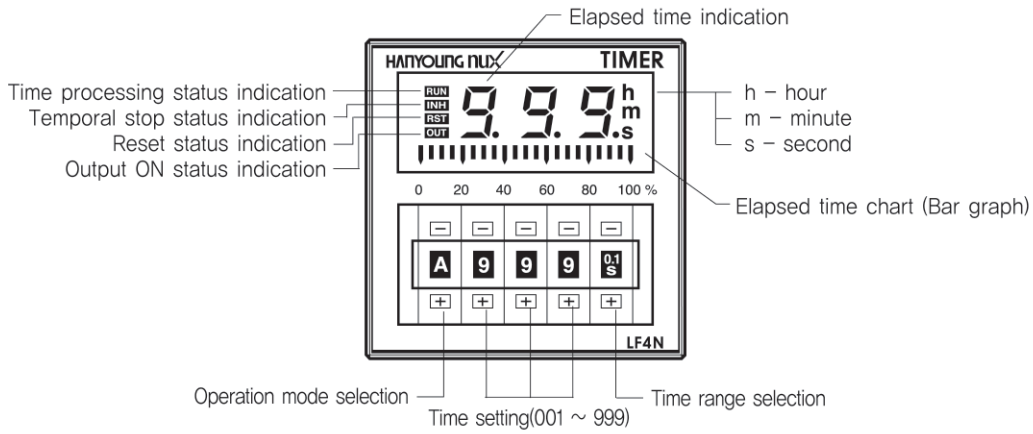
Time range

Time selecting mode	Time range
.01 S	0.01 s ~ 9.99 s
0.1 S	0.1 s ~ 99.9 s
S	1 s ~ 999 s
0.1 m	0.1 m ~ 99.9 m
m	1 m ~ 999 m
0.1 h	0.1 h ~ 99.9 h
h	1 h ~ 999 h
10 h	10 h ~ 9990 h
$\overline{S}$	0 m 01 s ~ 9 m 59 s
$\overline{M}$	0 h 01 m ~ 9 h 59 m

Input connection (LF4N-A)



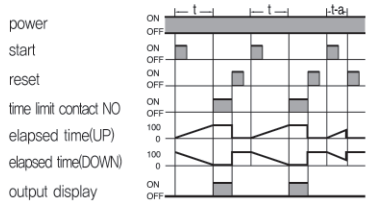
Name of each part



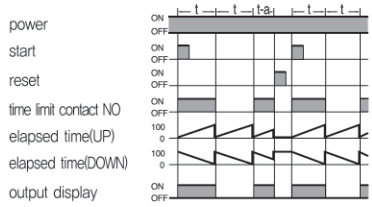
Output action mode

① LF4N-A, LF4N-D

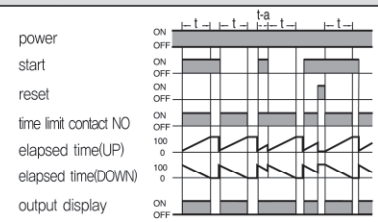
A mode : SIGNAL ON-DELAY



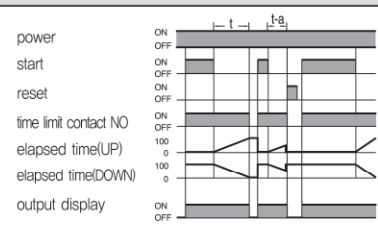
B mode : FLICKER ON START



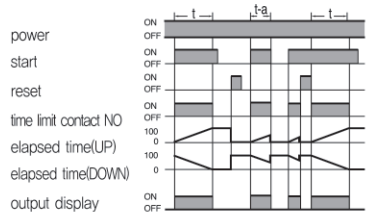
C mode : SIGNAL ON/OFF DELAY



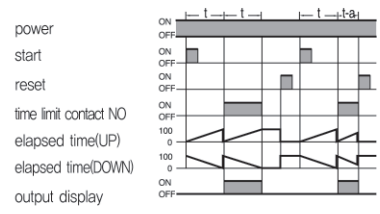
D mode : SIGNAL OFF DELAY



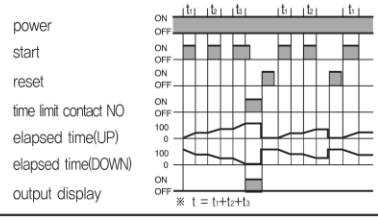
E mode : INTERVAL MODE



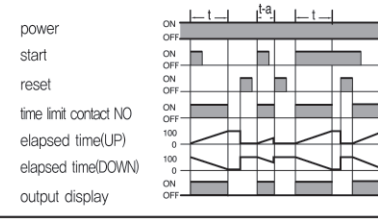
F mode : ONE-SHOT & FLICKER

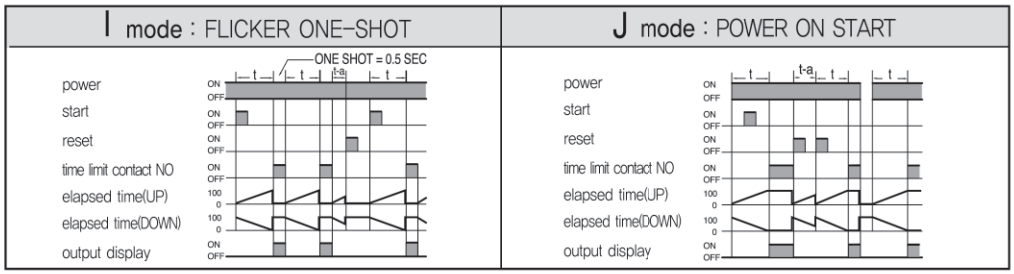


G mode : INTEGRATION



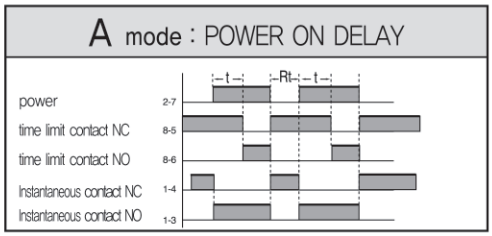
H mode : INTERVAL DELAY



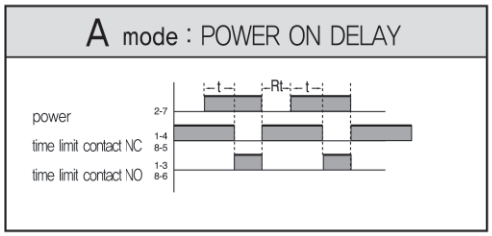


※ t : set time, t − a : display the time within set time

② LF4N-B



③ LF4N-C

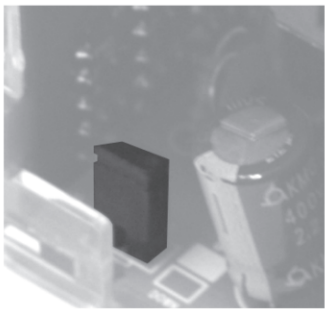


※ t : set time, Rt : return time (min 100 ms)

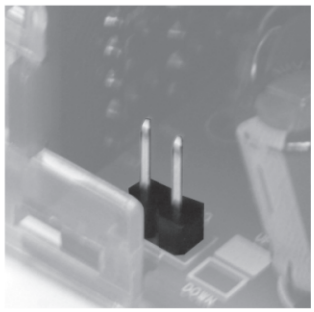
Up / Down selecting method

Output action mode operates as Up Mode or Down Mode depending on the Up/Down selection.

① Disassemble the case.
② Select as Jumper located inner side of Power Board.



UP mode
(Default setting)

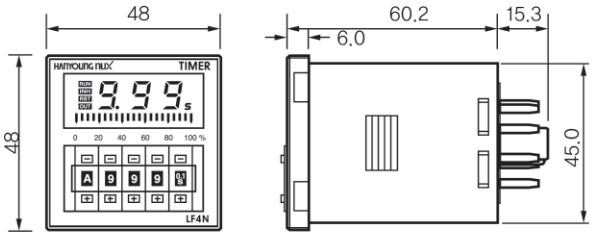


DOWN mode

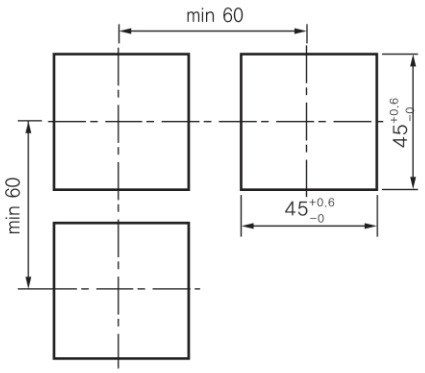
※ Up/Down setting pin is located in the PCB

Dimension and panel cutout (unit : ㎜)

● Dimension



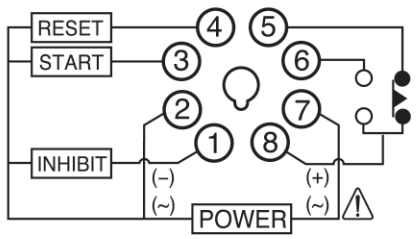
● Panel cutout



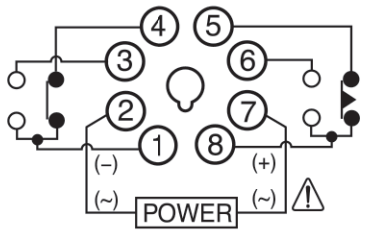
Connection diagram

LF4N LCD timer is free voltage so when using DC power, please be careful about polarity

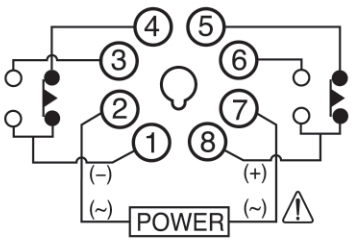
■ LF4N-A



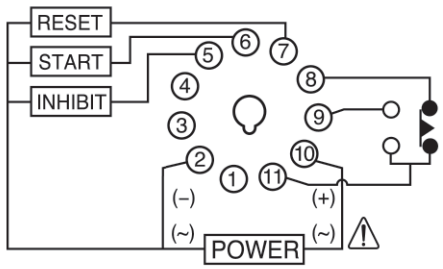
■ LF4N-B



■ LF4N-C



■ LF4N-D



T21

Digital counter

- Timing Relay (4a4b)
- Plug in type (14 pins)
- Appearance 21.4 (W) X 28 (H) mm Timing relay
- Customer sets time range and operation mode.
- Various time range
  (min/sec : 0.1 sec ~ 60 min, hrs : 0.3 hrs ~ 24 hrs)
- Multi operation mode
  (Power ON delay, Interval, Flicker OFF start, Flicker ON start)

Suffix code

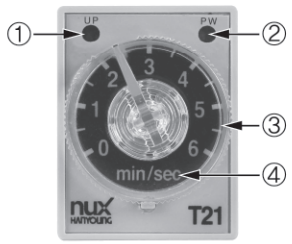
Model	Code			Description	
T21-	□-	□	□	Timing Relay	
Time Range	1			1 sec, 10 sec, 1 min, 10 min	Select by DIP switch
	3			3 sec, 30 sec, 3 min, 30 min	
	6			6 sec, 60 sec, 6 min, 60 min	
	3H			3 hrs, 6 hrs, 12 hrs, 24 hrs	
Contact		4		4a4b	
Power supply voltage			A20	200 – 230 V AC	
			D24	24 V DC	

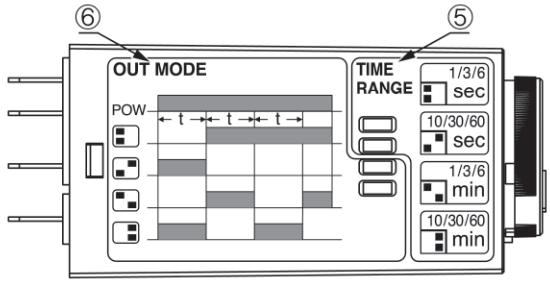
Specification

Model	AC	T21 – 1 / 3 / 6 / 3H – 4A20
	DC	T21 – 1 / 3 / 6 / 3H – 4D24
Power supply voltage	AC	200 – 230 V AC 50/60 Hz
	DC	24 V DC
Operating voltage range		Power supply voltage ±10 %
Power consumption	AC	3.1 VA max (230 V AC 60 Hz)
	DC	1.5 W max (24 V DC)
Reset time		100 ms max
Time Range	1	0.1 sec ~ 10 min
	3	0.3 sec ~ 30 min
	6	0.6 sec ~ 60 min
	3H	0.3 hrs ~ 24 hrs
Accuracy of operating time		±1 % FS max
Setting error		±10 % FS max
Control output	Output mode	Power on delay, Interval, Flicker OFF Start, Flicker ON Start
	Contact construction	4a4b
	Capacity	250 V AC 3A Resistive load
Life expectancy		Mechanical : 10 million operations min, Electrical : 200,000 operations min

Insulation resistance	100 MΩ min (at 500 V DC, Between current-carrying terminals and exposed noncurrent-carrying metal parts.)
Dielectric strength	2000 V AC 50/60 Hz 1 minute (Between current-carrying terminals and exposed noncurrent-carrying metal parts.)
Noise immunity	±2 kV (Between power terminal, pulse width ±1 ㎲, square wave noise by noise simulator)
Vibration resistance	10 – 55 Hz (For 1 min), Double amplitude 0.75mm, X,Y.,Z each direction for 1 hour
Shock resistance	300 ㎨ X, Y, Z each direction for 3 times
Ambient temperature	-10 ~ 50 ℃ (Without condensation)
Storage temperature	-25 ~ 65 ℃ (Without condensation)
Ambient humidity	35 ~ 85 % RH
Weight	Approx. 42 g

Part name and function





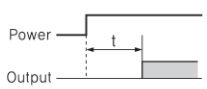
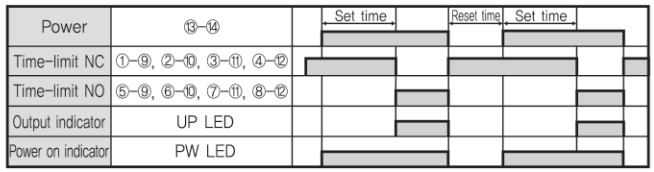
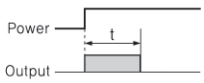
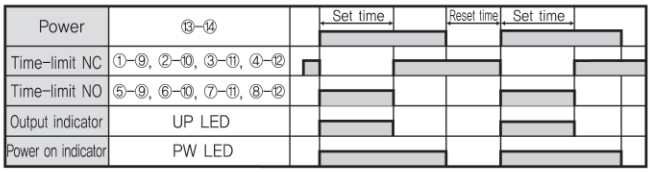
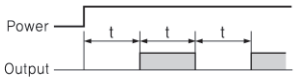
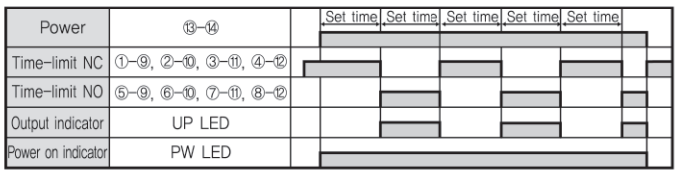
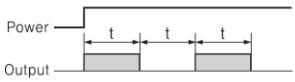
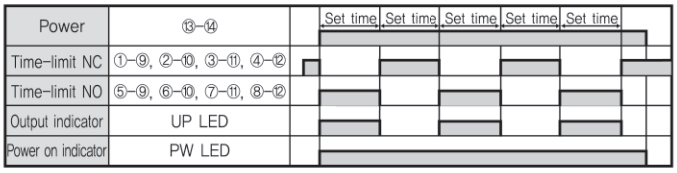
NO	Name	Function
①	Output ON indicator lamp (UP)	After setting time, light ON (Red) at the same time with output operation
②	Power indicator lamp (PW)	Light ON after power ON (Green)
③	Time setting knob	Set timer operation time, Setting time can be changed during operation of timer.
④	Time unit	Time unit of setting time (min/sec, hrs).
⑤	Time range setting (TIME RANGE)	Depend on suffix code, Select time range by DIP switches on the side
⑥	Operating mode setting (OUT MODE)	Select output mode by DIP switches on the side

Time Range

Model	Time Range	Time setting Range	Setting
T21-1-4A20 T21-1-4D24	1 sec	0.1 ~ 1 sec	 Factory set
	10 sec	1 ~ 10 sec	
	1 min	0.1 ~ 1 min	
	10 min	1 ~ 10 min	
T21-3-4A20 T21-3-4D24	3 sec	0.3 ~ 3 sec	 Factory set
	30 sec	3 ~ 30 sec	
	3 min	0.3 ~ 3 min	
	30 min	3 ~ 30 min	
T21-6-4A20 T21-6-4D24	6 sec	0.6 ~ 6 sec	 Factory set
	60 sec	6 ~ 60 sec	
	6 min	0.6 ~ 6 min	
	60 min	6 ~ 60 min	
T21-3H-4A20 T21-3H-4D24	3 hrs	0.3 ~ 3 hrs	 Factory set
	6 hrs	0.6 ~ 6 hrs	
	12 hrs	1.2 ~ 12 hrs	
	24 hrs	2.4 ~ 24 hrs	

※ Please turn off power to change Time range

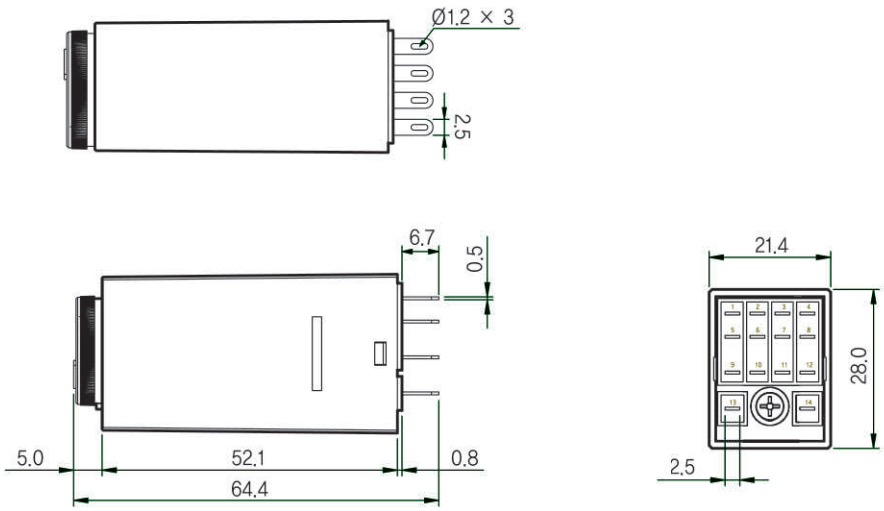
Operation

Output Mode	Timing Chart	Setting
ON-Delay  ※ t : Set time	When the power is ON, the output will be ON after setting time.  	 Factory set
Interval  ※ t : Set time	When the power is ON, the output is ON and it will be OFF after setting time.  	
Flicker OFF-start  ※ t : Set time	When the power is ON, the output is OFF and it repeatedly outputs OFF and ON with the setting time interval.  	
Flicker ON-start  ※ t : Set time	When the power is ON, the output is ON and it repeatedly outputs ON and OFF with the setting time interval.  	

※ Select output mode by 2 switches at the bottom of the four switches.

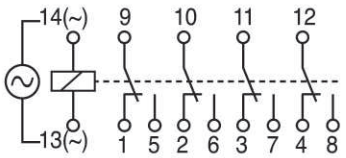
Appearance

[Unit : mm]

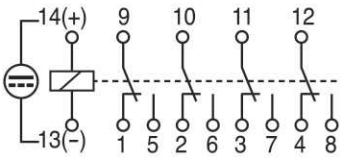


Connection diagram

■ T21 – 1 / 3 / 6 / 3H – 4A20



■ T21 – 1 / 3 / 6 / 3H – 4D24



T38N/T48N/T57N/TF62N/TF62D

Analog timer

- Display the time processing state by using ON LED
- Various time ranges (7 kinds)
- Users select the time unit (hour, min, sec)
- Made of 5 types depending on the output spec
- Free voltage (24 – 240 V DC/AC 50 – 60 Hz)

Suffix code

Model		Code			Description
Dimension	□ –	□	□	□	Analog timer
	T38N				T38N timer (40 X 50 ㎜)
	T48N				T48N timer (48 X 48 ㎜)
	T57N				T57N timer (58 X 84 ㎜)
	TF62N				TF62N twin timer (58 X 84 ㎜)
	TF62D				TF62D dual timer (58 X 84 ㎜)
Installation type		P			Panel type (T38N panel adapter sold separately)
		E			Exposure type (T48N only available exposure type)
Range (deep switch selection)			01		1 sec, 1 min, 1 hour
			03		3 sec, 3 min, 3 hour
			06		6 sec, 6 min, 6 hour
			10		10 sec, 10 min, 10 hour
			30		30 sec, 30 min, 30 hour
			60		60 sec, 60 min, 60 hour
			12		12 hour, 24 hour, 48 hour (※ But exclude the model TF62N and TF62D)
Control output				A	Time limit : 1c contact, Instantaneous : 1a contact
				B	Time limit : 1c contact, Instantaneous : 1c contact
				C	Time limit : 2 x 1c
				D	Only for TF62N
				F	Only for TF62D
Power supply voltage					24 – 240 V DC / AC 50 – 60 Hz (Dual usage)

※ Only T57N, TF62N and TF62D can select installation type.
※ We supply T38N adapter separately.

Specification

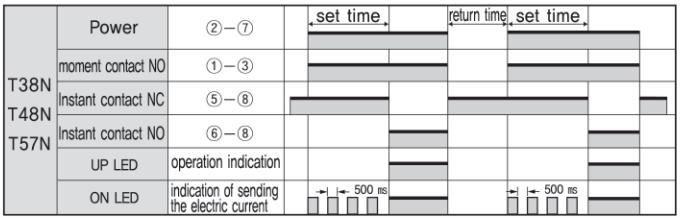
Repetition accuracy	Less than ±0.3 % of the max range (power start)
Return time	Less than 0.1s
Noise resistance	Square shaped wave noise due to the noise simulator. (1 ㎲ pulse width), ±2 ㎸ (between the operational power terminal)
Insulation resistance	100 MΩ min (500 V DC)
Dielectric strength	2000 V AC 60 ㎐ for 1 min (between the different charging part terminal)
Power supply voltage	24 – 240 V AC / DC 50 – 60 ㎐ (dual usage)
Voltage fluctuation	±10 % of the power supply voltage
Power consumption	Approx. less than 4.5 VA (240 V AC 60 ㎐), approx. less than 1.5 W (24 V DC)
Ambient temperature	–10 ~ 50 ℃
Ambient humidity	35 ~ 85 % RH
Storage temperature	–20 ~ 65 ℃
Vibration resistance	10 – 55 ㎐, peak amplitude 0.5 ㎜, for 2 hour each in 3 axis direction
Shock resistance	300 ㎨, 3 times each in 3 axes direction
Weight	Approx. 150 g

Function and output

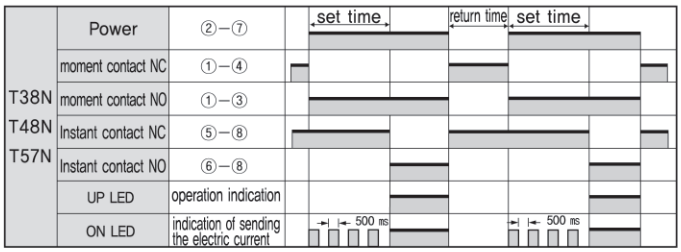
Output action mode	Model	Function
	T38N T48N T57N	ON Delay (time limit action)
	TF62N	twin timer ON Start
	TF62D	Dual timer
Time range (3 types of range selection by using the deep switch which varies by codes)	Range code	Time of each code
	01	1 sec, 1 min, 1 hour
	03	3 sec, 3 min, 3 hour
	06	6 sec, 6 min, 6 hour
	10	10 sec, 10 min, 10 hour
	30	30 sec, 30 min, 30 hour
	60	60 sec, 60 min, 60 hour
	12	12 hour, 24 hour, 48 hour
Recognizing the set value		Instant recognition (possible to change in the middle of applying electric current)
Control output	output	Description
	A	Time limit : 1c contact, 250 V AC 3 A(resistive load) Instantaneous : 1a contact, 250 V AC 3 A(resistive load)
	B	Time limit : 1c contact, 250 V AC 3 A(resistive load) Instantaneous : 1c contact, 250 V AC 3 A(resistive load)
	C	Time limit : 2 x 1c contact, 250 V AC 3 A(resistive load)
	D	Time limit : 1c contact, 250 V AC 3 A(resistive load) ※only with model TF62N
	F	Time limit : 1c x 2 contact, 250 V AC 3 A (resistive load) ※only with model TF62D

Output action mode

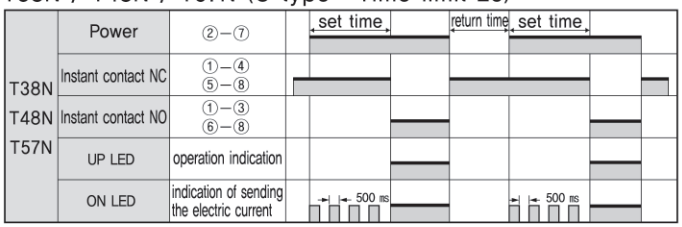
T38N / T48N / T57N (A type : Time limit 1c + Instantaneous 1a)



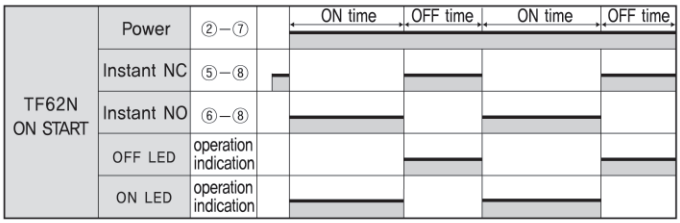
T38N / T48N / T57N (B type : Time limit 1c + Instantaneous 1c)



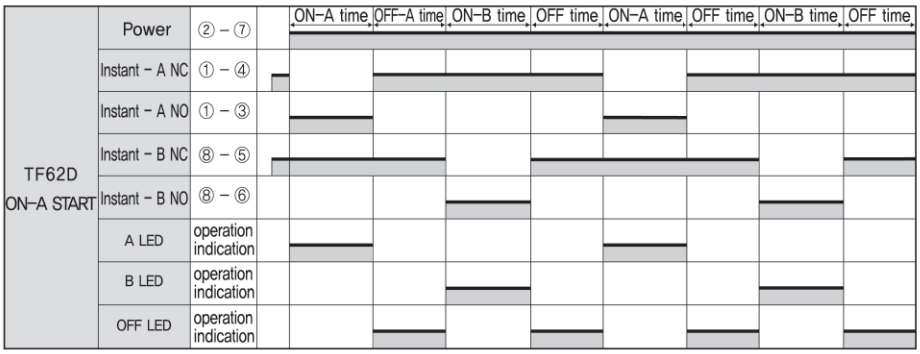
T38N / T48N / T57N (C type : Time limit 2c)



TF62N Twin timer (D type : Time limit 1c)

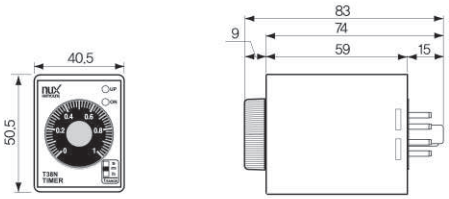


TF62D Dual timer (F type : Time limit 2c)

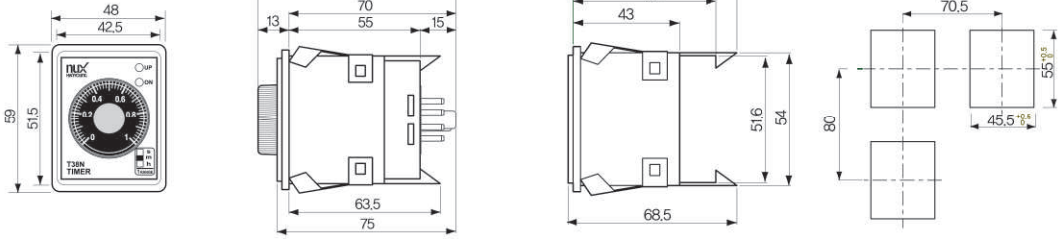


Dimension and panel cutout (unit : mm)

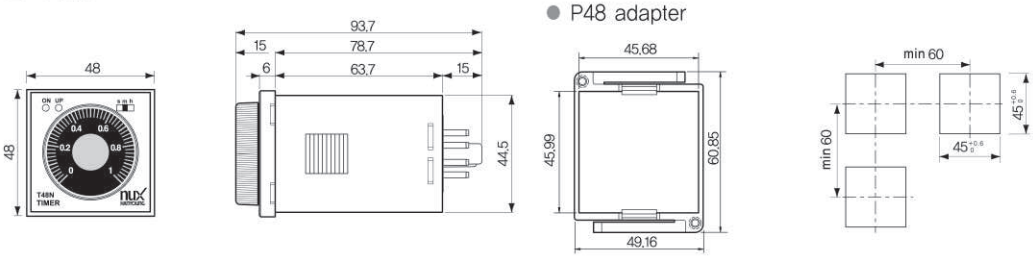
■ T38N



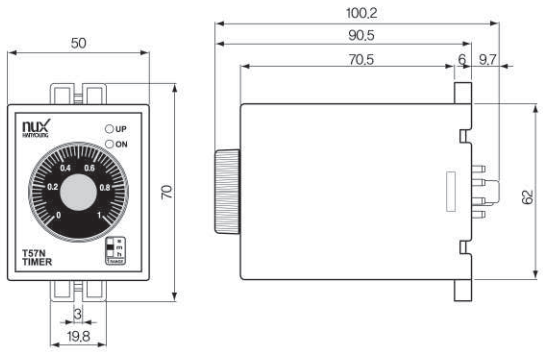
■ T38N-When using the T38N adapter



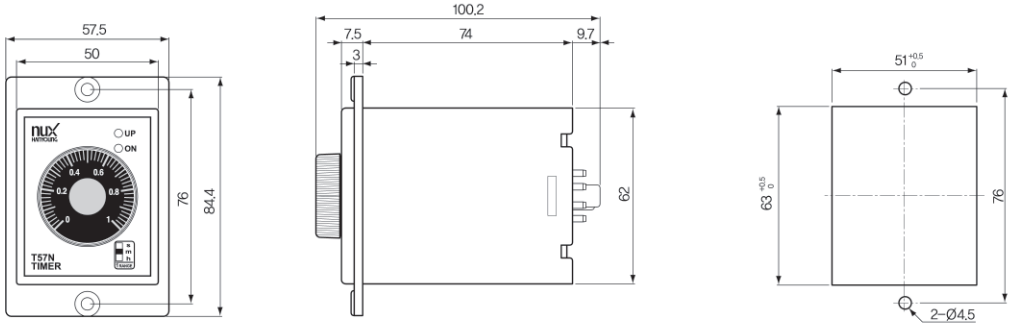
■ T48N



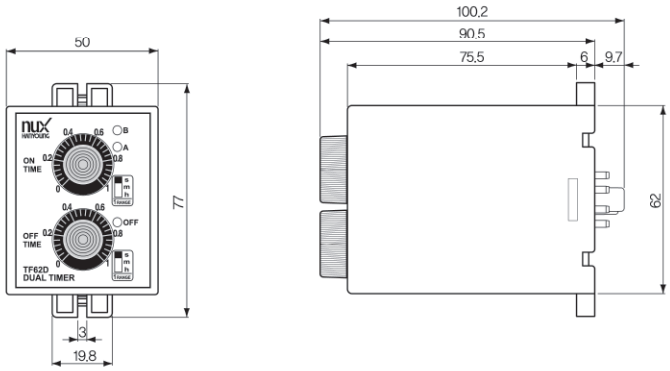
■ T57NE (Exposed type)



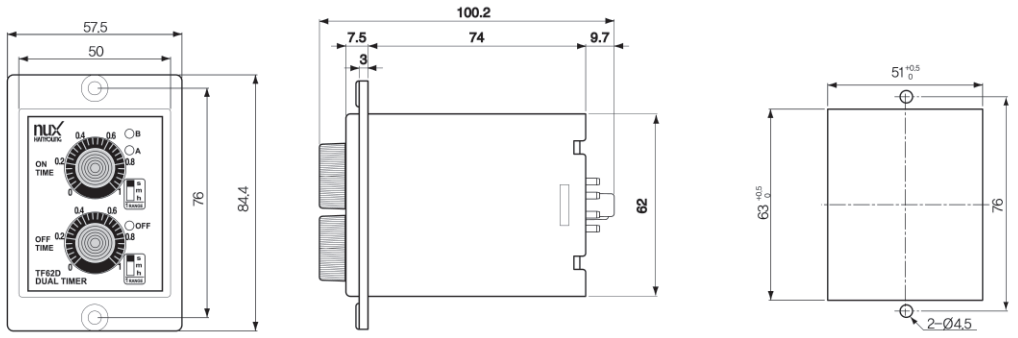
■ T57NP (Panel type)



■ TF62NE / TF62DE (Exposed type)

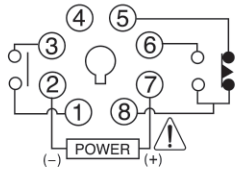


■ TF62NP / TF62DP (Panel type)



Connection diagram

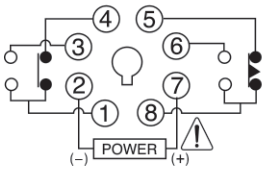
■ T38N / T48N / T57N (A : Time limit 1c + Instantaneous 1a)



POWER :
24-240 V~ 50-60 Hz
24-240 V⎓ 1.5 W

CONTACT :
250 V a.c 3 A
(RESISTIVE LOAD)

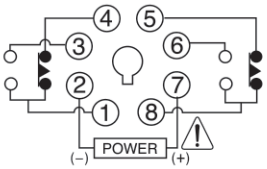
■ T38N / T48N / T57N (B : Time limit 1c + Instantaneous 1c)



POWER :
24-240 V~ 50-60 Hz
24-240 V⎓ 1.5 W

CONTACT :
250 V a.c 3 A
(RESISTIVE LOAD)

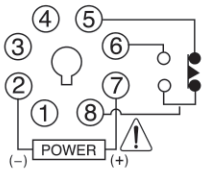
■ T38N / T48N / T57N (C : Time limit 2c)



POWER :
24-240 V~ 50-60 Hz
24-240 V⎓ 1.5 W

CONTACT :
250 V a.c 3 A
(RESISTIVE LOAD)

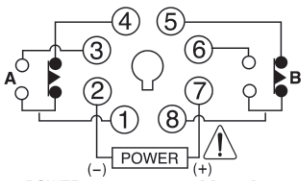
■ TF62N Twin timer (D)



POWER :
24-240 V~ 50-60 Hz
24-240 V⎓ 1.5 W

CONTACT :
250 V a.c 3 A
(RESISTIVE LOAD)

■ TF62D Dual timer (F)



POWER :
24-240 V~ 50-60 Hz
24-240 V⎓ 1.5 W

CONTACT :
250 V a.c 3 A
(RESISTIVE LOAD)

C
Counter / Timer

MA4SD

Star-Delta timer

- Star-delta timer
- 8 Pins plug type
- High capacity MOTOR start timer
- Instantaneous contact output, start contact output, DELTA contact output.
- Various power supply voltage (100 - 240 V AC 50/60 Hz, 24 - 240 V DC Dual usage)

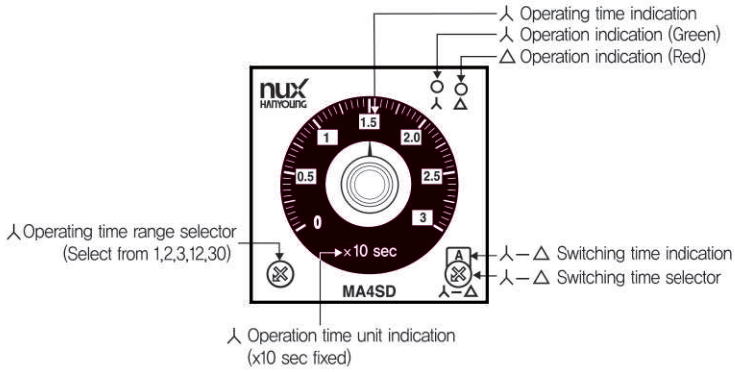
Suffix code

Model	Code	Description
MA4	□	Analog multi timer (STAR-DELTA Timer), 48 (W) × 48 (H) ㎜
Control output	SD	⅄ output, △ output
	SDI	Instantaneous output, ⅄output, △ output

Specification

Model		MA4SD	MA4SDI
Power supply voltage		100 - 240 V AC 50/60 Hz, 24 - 240 V DC	
Allowable voltage		Power supply voltage ±10 %	
Power consumption		Approx. 3.8 VA (100 - 240 V AC 60 Hz), Approx. 1.9 W (24 - 240 V DC)	
Resetting time		100 ms max	
Operating time range		1 ~ 300 sec	
⅄ Operating time difference		Repeated error : ±0.3 % max, Setting error : ±5 % max, Voltage error : ±0.5 % max, Temperature tolerance : ±2 % max (Percentage of full scale)	
△ Conversion time error		±25 % max	
Control output	Output mode	Power ON Start	
	Contact composition	⅄ Contact : 1 a, △Contact : 1 a	⅄ Contact : 1a, △Contact : 1 a, Instantaneous contact : 1 a
	Contact capacity	250 V AC 5 A resistive load	
Relay Life span		Mechanical : 5 million times min, Electrical : 100 thousand times min (250 V AC 5 A resistive load)	
Insulation resistance		100 ㏁ min (at 500 V DC Between current-carrying teminals and exposed noncurrent-carrying metal parts.)	
Dielectric strength		2000 V AC 50/60 Hz 2 minute (Between current-carrying terminal and exposed noncurrent-carrying metal parts.)	
Noise immunity		±2 kV (Between power terminal, pulse width ±1 ㎲, square wave noise by noise simulator)	
Vibration resistance		10 - 55 Hz (For 1 min), Double amplitude 0.75 mm, X,Y,Z each direction for 1 hour	
Shock resistance		300 ㎪(30G) X, Y, Z each direction for 3 times	
Ambient temperature		-10 ~ 55 ℃ (icing or dew condensation not allowed)	
Storage temperature		-25 ~ 65 ℃ (icing or dew condensation not allowed)	
Ambient humidity		35 ~ 85 % RH	
Weight		Approx. 95g (Including fixing bracket)	

Name of each part



人−△ Switching time	
A	50 ms
B	100 ms
C	200 ms
D	300 ms
E	400 ms
F	500 ms

Time

■ 人 Operation time specification

Operation time range	Operation time
1.2	1 ~ 12 sec
3	2.5 ~ 30 sec
12	10 ~ 120 sec
30	25 ~ 300 sec

※ 人 Select operation time by operation time range selector.

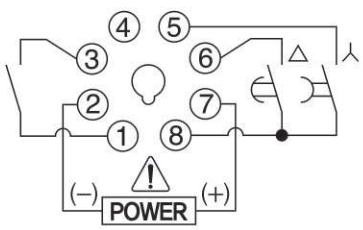
■ 人−△ Switching time specification

Switching time indication letter	Switching time
A	50 ms
B	100 ms
C	200 ms
D	300 ms
E	400 ms
F	500 ms

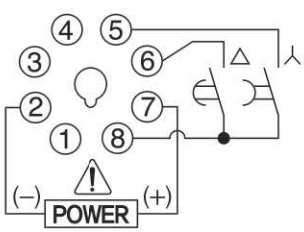
※ 人 −△ Select switching time by switching time selector.

Connection diagram

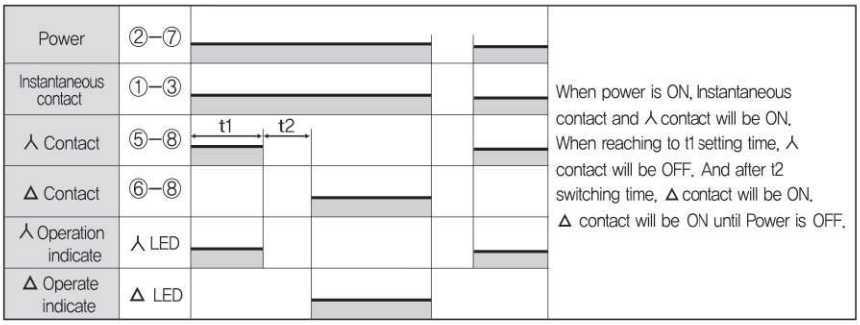
■ MA4SDI



■ MA4SD



Operation specification



※ t1 : 人 Operating time

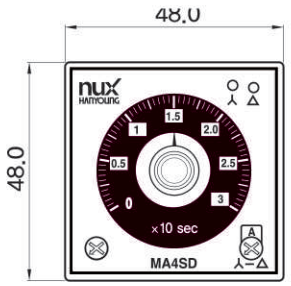
※ t2 : 人–Δ Conversion time

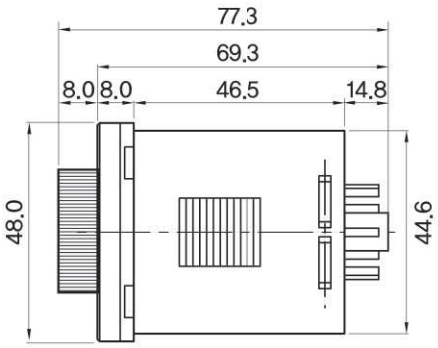
※ t3 : Δ Operating time

Caution) MA4SD does not have Instantaneous contact .

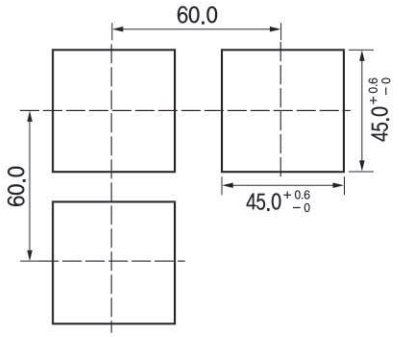
Dimension and panel cutout (unit : ㎜)

● Dimension





● Panel cutout



MA4N Series

Analog multi timer

- Output action mode 6 types
- Multi range 4 types
- Time unit 4 types
- Reset, start, inhibit input
- Free voltage (24 - 240 V DC/AC 50 - 60 Hz)

Suffix code

Model	Code	Description
MA4N-	□	Analog multi timer (48 X 48 ㎜)
Device selection	A	2c (time limit) ※11 pin type
	B	2c (time limit+ instantaneous) ※11pin type.
	C	2c (time limit), 2c (time limit+ instantaneous) ※ processed by mode selection (8pin type)
Power supply voltage		24 - 240 V DC/AC 50 - 60 Hz (Dual usage)

Specification

Input

Input signal	Reset, Start, Inhibit ※ Only with model MA4N-A, MA4N-B	
Non-voltage input stage	Non-contact input	Disconnected stage (when transistor is ON) : remaining voltage 0.7 V DC max Impedance : ON then max 2 ㏀
		Open stage (when transistor is OFF) : impedance 100 ㏁ min
	contact input	Please use the contact that can open/close 2 ㎂ 5 V DC, sufficiently.

Function

Repetition accuracy	Less than ±0.3 % of the max range (power start)
Return time	Less than 0.1 s
Noise immunity	Square shaped wave noise due to the noise simulator (1 ㎲ pulse width), ±2 ㎸, (between the operational power terminal)
Insulation resistance	100 MΩ min (500 V DC)
Dielectric strength	2000 V AC 60 Hz for 1 min (different recharging part terminal from each other)

Function and output

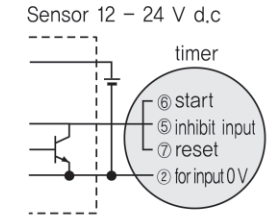
	Model	Mode	Output action function
Output action mode	MA4N-A MA4N-B	A	ON Delay
		B	Flicker OFF Start
		C	Interval
		D	Signal ON/OFF Delay
		E	Signal OFF Delay
		F	Flicker ON Start
	MA4N-C	A1	ON Delay
		B1	ON Delay 1
		C1	ON Delay 2
		D1	Flicker OFF Start
		E1	Flicker ON Start
		F1	Interval
Time unit selection	sec, min, hrs, 10h		

	Time unit 4 types	sec	min	hrs	10h
Range selection	Range selection 4 types	0.12 ~ 1.2			1.2 ~ 12
		0.3 ~ 3			3 ~ 30
		1.2 ~ 12			12 ~ 120
		3 ~ 30			30 ~ 300

Set value recognition	Recognize at all times (possible to change the setting in the middle of applying electric current)	
Control output	Model	Contact composition
	MA4N-A	2c (Time limit)
	MA4N-B	2c (Time limit+ Instantaneous)
	MA4N-C	2c (Time limit+ Instantaneous) 2c (Time limit)
	Contact capacity	
	N.O : 250 V AC 5A, 30 V 5 A DC (Load capacity) Resistive load N.C : 250 V AC 2A, 30 V 5 A DC (Load capacity)	

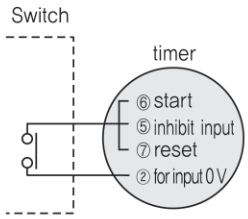
Input connection

Non-contact input (NPN transistor)



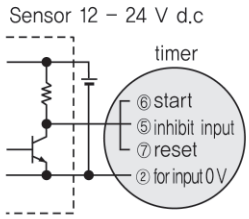
operate by transistor being ON

Contact input



operate as contact being ON

Non-contact input

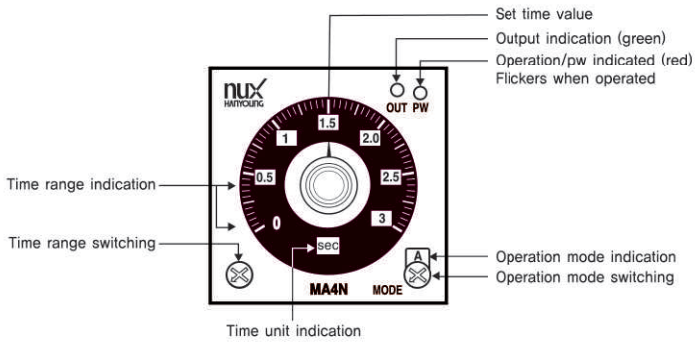


operate as transistor being ON

Standard specification

Power supply voltage	24 – 240 V DC/AC 50 – 60 Hz
Voltage fluctuation	± 10 % of the power supply voltage
Power consumption	4.4 VA (240 V AC), 2.1 W (240 V DC)
Ambient temperature	−10 ~ 55 ℃
Ambient humidity	35 ~ 85 % RH
Storage temperature	−20 ~ 65 ℃
Vibration resistance	10 – 55 Hz, double amplitude 0.75 ㎜, for 2 hour each in 3 axis direction
Resistance	300 ㎨, 3 times each in 3 axes direction
Weight	100 g (Included the adapter)

Name of each part

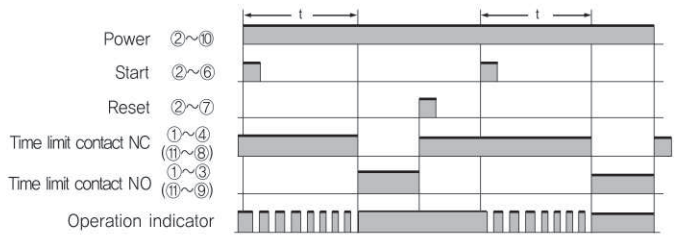


Output operation mode

■ MA4N – A, MA4N – B

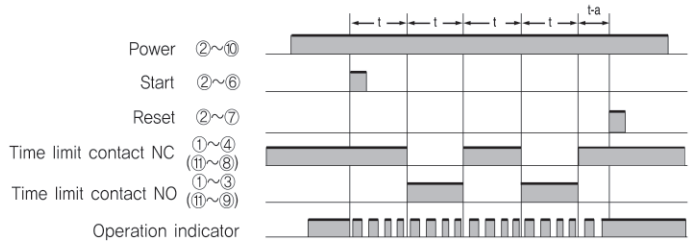
※ MA4N-A : output-time limit 2 c MA4N – B : output-time limit 1 c, instantaneous 1 c

A mode : ON DELAY



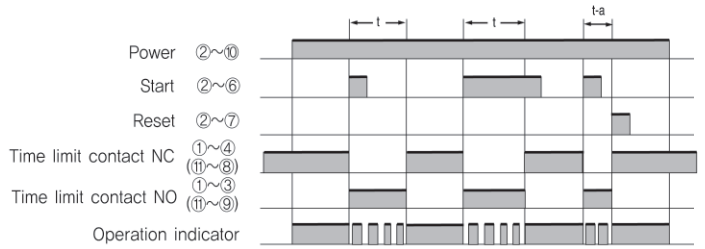
When supplying in the power, time will be processed once signal becomes ON and once reaches the set time, output will become ON.

B mode : FLICKER OFF START



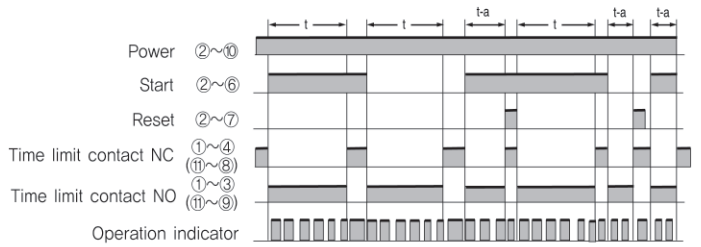
When supplying in the power, time will be processed once the start signal becomes ON and once reaches the set time, output will become ON and reaching the set time once again will make output become OFF.

C mode : INTERVAL



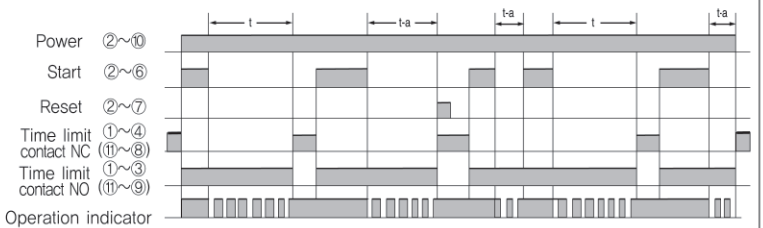
When supplying in the power, output will become ON once the start signal becomes ON and reaching the set time will make output become OFF.

D mode : SIGNAL ON / OFF DELAY



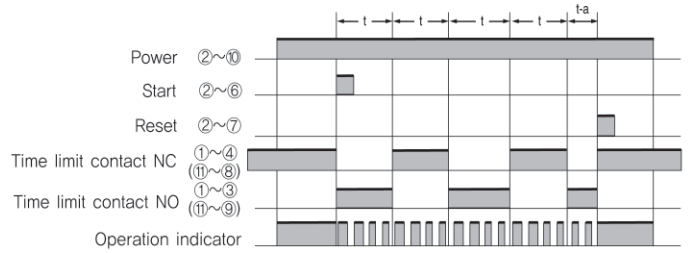
After supplying in the power, timer will start to operate once the start signal becomes ON and timer still operates when the start signal becomes OFF again.

E mode : SIGNAL OFF DELAY



After supplying in the power, output will be generated once the start signal becomes ON but time will not be processed. Time will be processed once the start signal becomes OFF.

F mode : FLICKER ON START



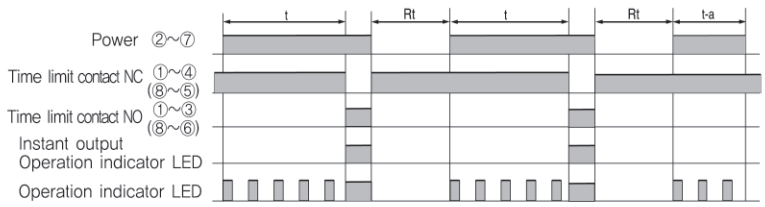
Operation principal is same as B mode but ON state is priority in the F mode
(Flicker On Start mode)

Output operation mode

■ MA4N - C

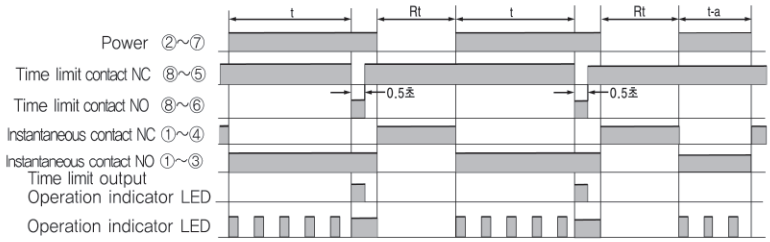
※ t : set time, t-a : within the set time, Rt : return time (100 ms max)

A1 mode : ON DELAY



Relay action operates as the instant 2C and after supplying in the power, time will be processed as the relay is in OFF state and output will become ON when it reaches the set time.

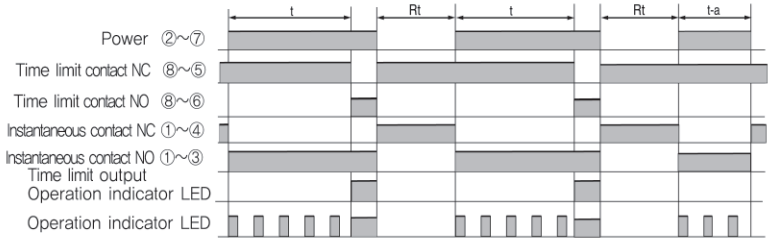
B1 mode (One-shot output) : ON DELAY1



※ Gap for ONE SHOT output is fixed to 0.5sec

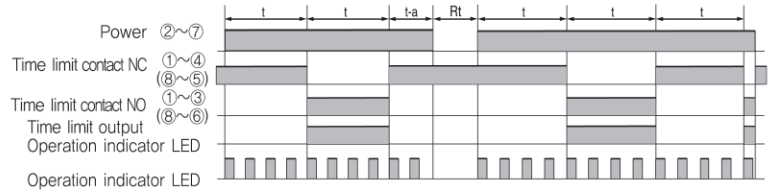
Relay action operates as the instant 1C and moment 1C and after supplying in the power, time will be processed as the relay in OFF state and output will become ON for 0.5 sec and becomes OFF again once it reaches the set time.

C1 mode : ON DELAY2



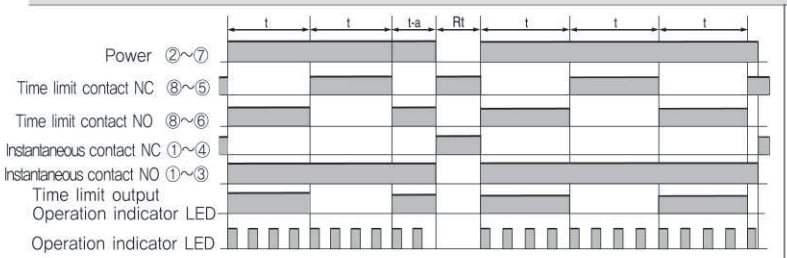
Relay action operates as the instant 1C and moment 1C and the operation principal is same as the A1 mode.

D1 mode : FLICKER OFF START



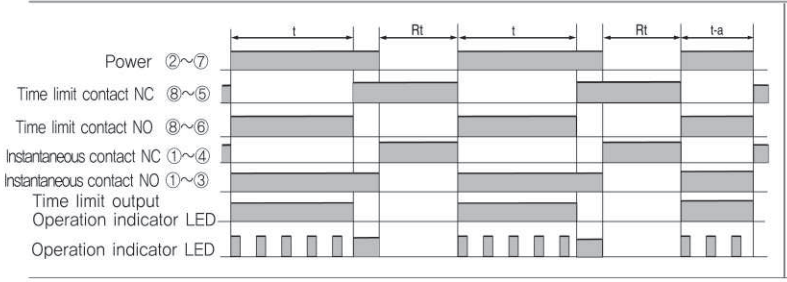
Relay action operates as the instant 2C and after supplying in the power, time will be process as the relay in OFF state and once it reaches the set time, output will become ON and reaching the set time again will make output OFF.

E1 mode : FLICKER ON START



Relay action operates as the instant 1C and moment 1C. After supplying in the power, time will be processed as the relay in ON state and output will become OFF once it reaches the set time. Lastly when it reaches the set time again, output will become ON again.

F1 mode : INTERVAL

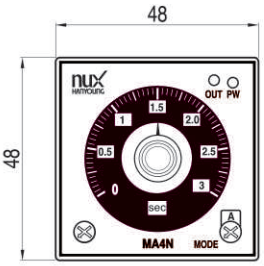


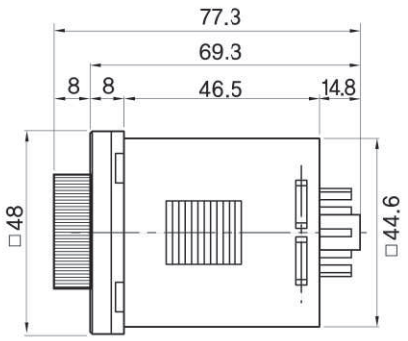
Relay action operates as the instant 1C and moment 1C. After supplying in the power, output becomes ON and reaching the set time will make output to become OFF.

※ In case of using the D1 and E1 output operation mode, we recommend to set the minimum set time above 100ms.
The reason for that is because setting excessively short time may cause the malfunction on the output operation due to the contact output responding time.

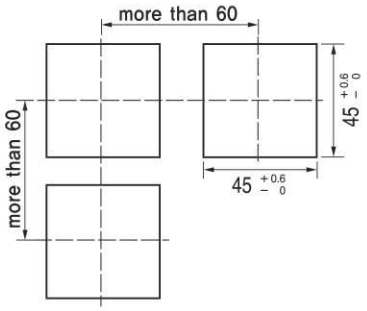
Dimension and panel cutout (unit : ㎜)

● Dimension



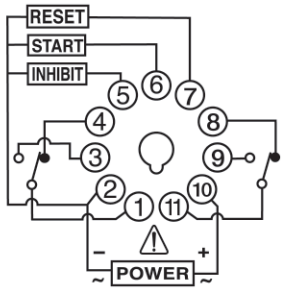


● Panel cutout



Connection diagram

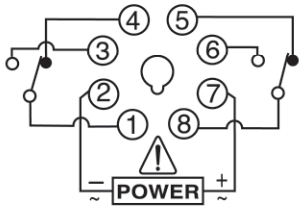
■ MA4N-A / MA4N-B



- 2 relays of MA4N-A model operate as the instant mode. For the model MA4N-B, relays connected in the order of 1, 3 and 4 operate as the moment mode and rest of relays operate as the instant mode.

※ Please refer to the output operation mode for the relay operation of connection diagram.

■ MA4N-C



- 2 of relays in the action mode A1 and D1 operate as the instant mode. For the operation mode B1, C1, E1 and F1, relays connected in the order of 1, 3 and 4 operate as the moment mode and rest of relays operate as the instant mode.

※ MA4N-C : Relay operates as the instant mode or moment mode depending on the operation mode.

※ Please refer to the output action mode of each model for the relay output action mode.