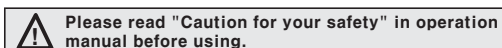
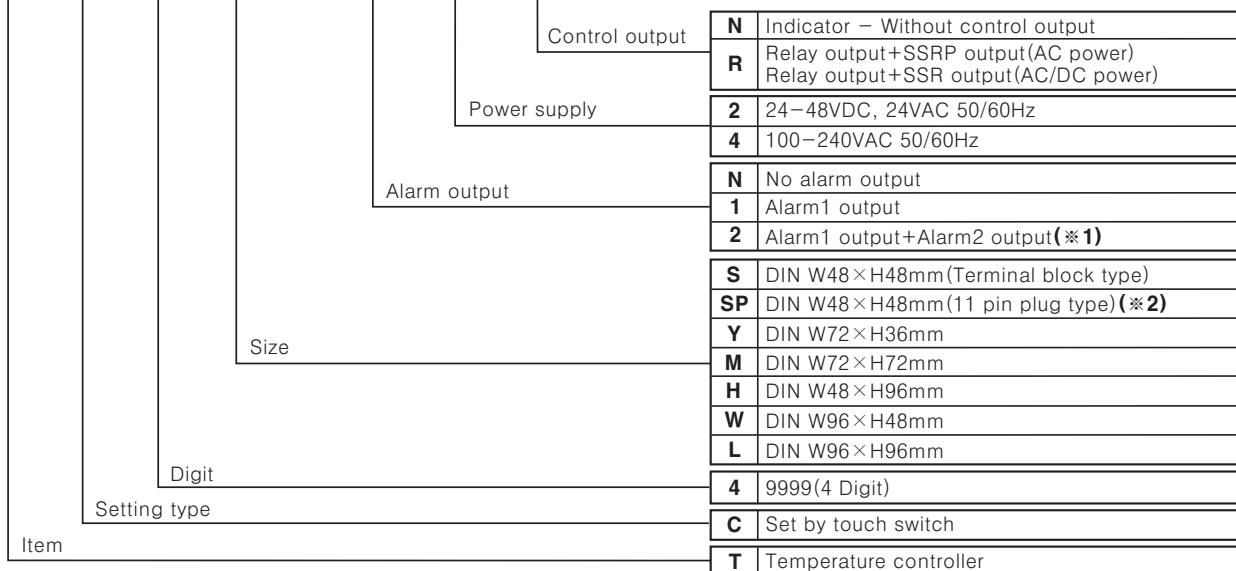


NEW



T C 4 S — 1 4 R



(※2) 11 pin socket (PG-11, PS-11) for TC4SP : sold separately.

Series		TC4S	TC4SP	TC4Y	TC4M	TC4H	TC4W	TC4L
Power supply	AC power	100–240VAC 50/60Hz						
	AC/DC power	24VAC 50/60Hz, 24–48VDC						
Allowable voltage range		90 to 110% of rated voltage						
Power consumption	AC power	Max. 5VA (100–240VAC 50/60Hz, 24VAC 50/60Hz)						
	AC/DC power	Max. 3W (24–48VDC)						
Display method		7Segment (Red), Other display (Green, Yellow, Red) LED						
Character size		W7×H15mm	W7.4×H15mm	W9.5×H20mm	W7×H14.6mm	W9.5×H20mm	W11×H22mm	
Input type	RTD	DPT100Ω (Allowable line resistance max. 5Ω per a wire)						
	TC	K (CA), J (IC), L (IC)						
Display method	RTD, TC	(PV ±0.5% or ±1℃ higher one) rdg ±1Digit(*1) ※TC4SP (Plug type) is (PV ±0.5% or ±2℃ higher one) rdg ±1Digit(*2) ※ Based on room temperature (23℃ ±5℃)						

L(IC) and RTD CU50: (PV $\pm 0.5\%$ or $\pm 4^\circ\text{C}$ higher one)rdg ± 1 Digit

Economical PID Control

Specifications

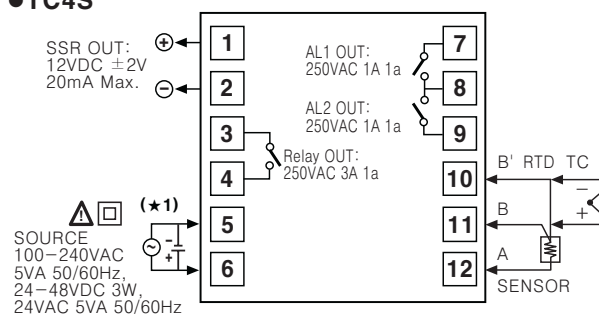
Series		TC4S	TC4SP	TC4Y	TC4M	TC4H	TC4W	TC4L
Control output	Relay	250VAC 3A 1a						
	SSR	12VDC $\pm$ 2V 20mA Max.						
Sub output		AL1, AL2 relay output : 250VAC 1A 1a(*TC4SP, TC4Y have AL1 only.)						
Control method		ON/OFF and P, PI, PD, PID control						
Hysteresis		1 to 100°C/°F [P.E.R., J.I.C., L.I.C., dP.E.H., C.U.S.H.] / 0.1 to 50.0°C/°F [dP.E.L., C.U.S.L.]						
Proportional band		0.1 to 999.9°C/°F						
Integral time(I)		9999sec.						
Derivative time(D)		9999sec.						
Control period		0.5 to 120.0sec.						
Manual reset		0.0 to 100.0%						
Sampling period		100ms						
Dielectric strength	AC power	2000VAC 50/60Hz for 1min.(Between input terminal and power terminal)						
	AC/DC power	1000VAC 50/60Hz for 1min.(Between input terminal and power terminal)						
Vibration		0.75mm amplitude at frequency of 5 to 55Hz in each X, Y, Z directions for 2 hours						
Relay life cycle	Control output	Mechanical: Min. 5,000,000 operations, Electrical: Min. 200,000 operations (250VAC 3A resistive load)						
	Alarm output	Mechanical: Min. 5,000,000 operations, Electrical: Min. 300,000 operations (250VAC 1A resistive load)						
Insulation resistance		Min. 100M Ω (at 500VDC megger)						
Noise		Square shaped noise by noise simulator(pulse width 1 μ s) $\pm$ 2kV R-phase and S-phase						
Memory retention		Approx. 10 years (When using non-volatile semiconductor memory type)						
Ambient temperature		-10 to 50°C (at non-freezing status)						
Storage temperature		-20 to 60°C (at non-freezing status)						
Ambient humidity		35 to 85%RH						
Insulation type		(*3)						
Approval		CE C US (Except for AC/DC power type)						
Unit weight		Approx. 97g	Approx. 84g	Approx. 127g	Approx. 127g	Approx. 118g	Approx. 118g	Approx. 172g

(*3) "□" Mark indicates that equipment protected throughout by double insulation or reinforced insulation.

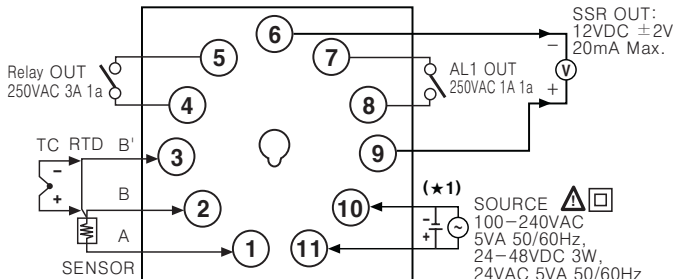
Connections

*TC4 series has selectable control output; Relay output, and SSRP output. AC/DC voltage type has Relay output and SSR output and it is selectable.

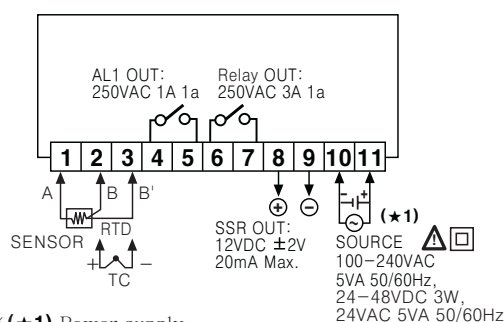
TC4S



TC4SP

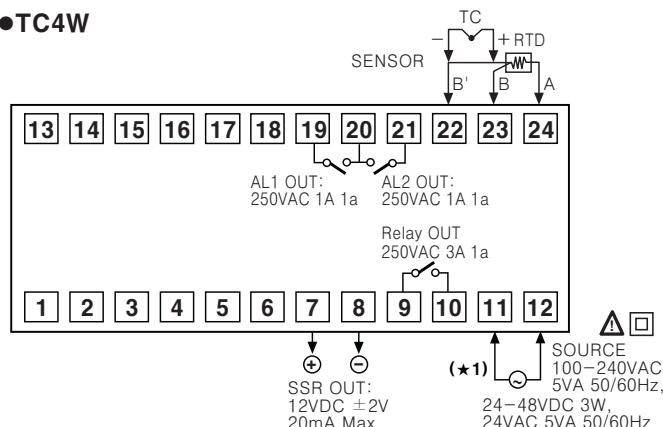


TC4Y



(*1) Power supply
 -AC power : 100-240VAC 50/60Hz
 -Low voltage : 24-48VDC, 24VAC 50/60Hz

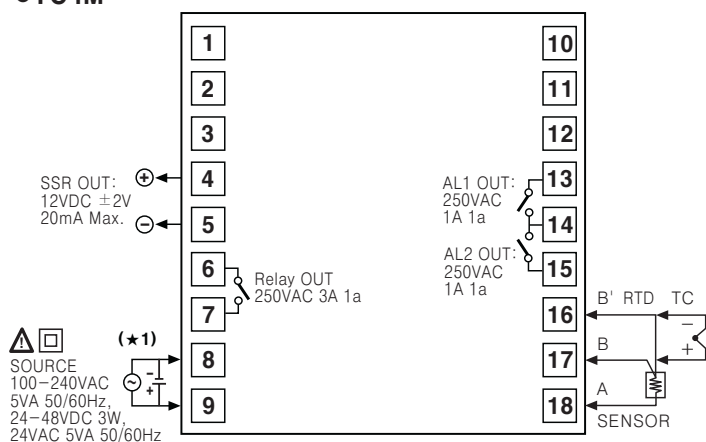
TC4W



(A)	Photo electric sensor
(B)	Fiber optic sensor
(C)	Door/Area sensor
(D)	Proximity sensor
(E)	Pressure sensor
(F)	Rotary encoder
(G)	Connector/Socket
(H)	Temp. controller
(I)	SSR/Power controller
(J)	Counter
(K)	Timer
(L)	Panel meter
(M)	Tacho/Speed/Pulse meter
(N)	Display unit
(O)	Sensor controller
(P)	Switching power supply
(Q)	Stepping motor & Driver & Controller
(R)	Graphic/Logic panel
(S)	Field network device
(T)	Production stoppage models & replacement

TC Series

●TC4M

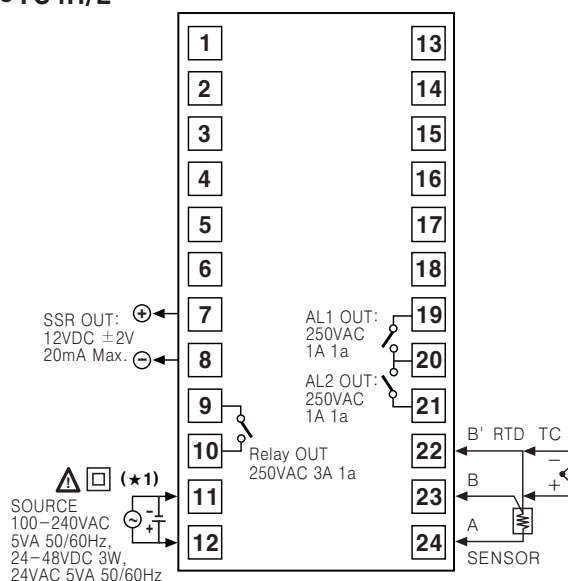


*(★1) Power supply

—AC power : 100–240VAC 50/60Hz

—AC/DC power : 24–48VDC 3W, 24VAC 50/60Hz

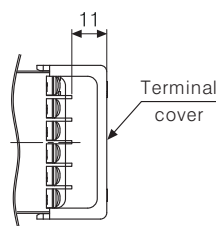
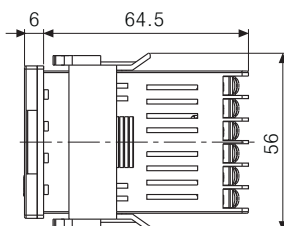
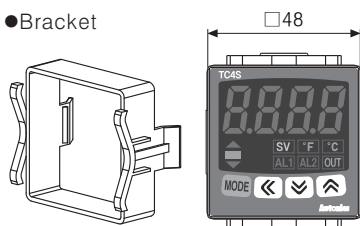
●TC4H/L



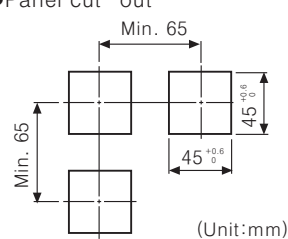
■Dimensions

●TC4S

●Bracket

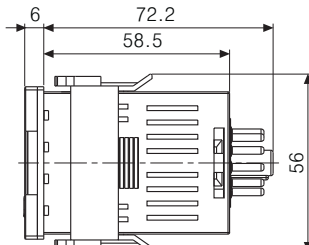
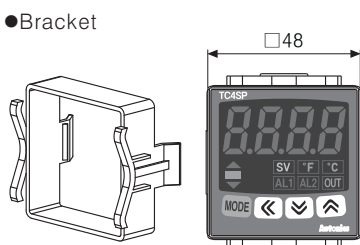


●Panel cut-out

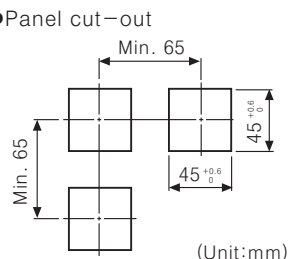


●TC4SP

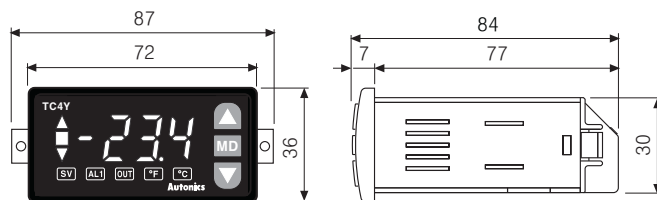
●Bracket



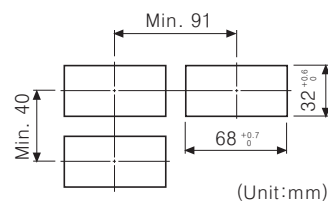
●Panel cut-out



●TC4Y

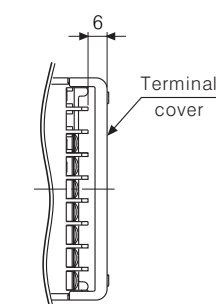
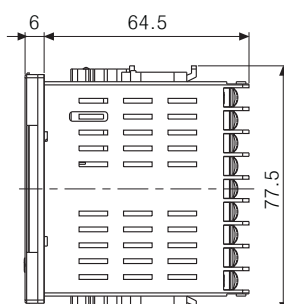
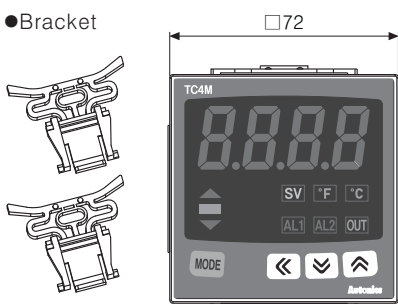


●Panel cut-out

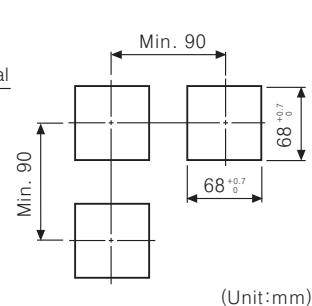


●TC4M

●Bracket



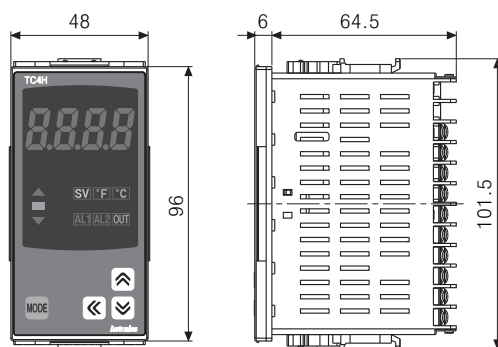
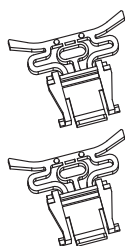
●Panel cut-out



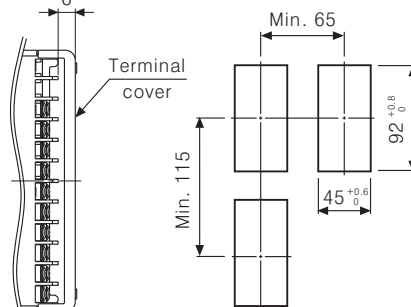
Economical PID Control

●TC4H

●Bracket



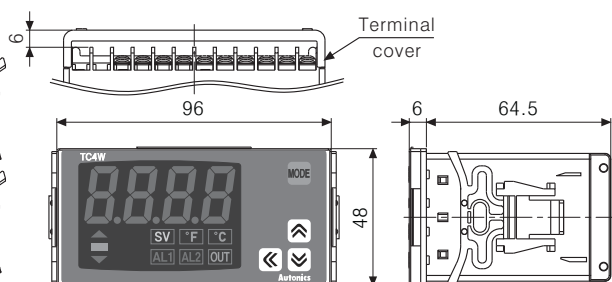
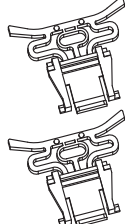
●Panel cut-out



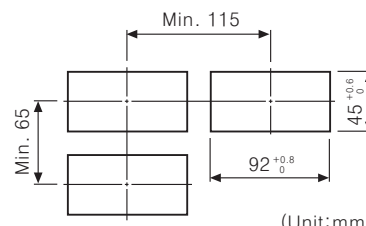
(Unit:mm)

●TC4W

●Bracket



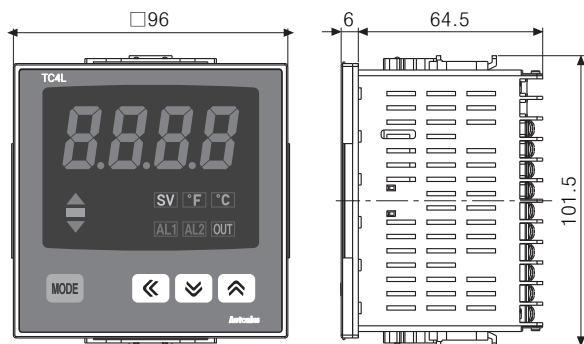
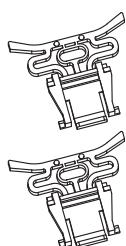
●Panel cut-out



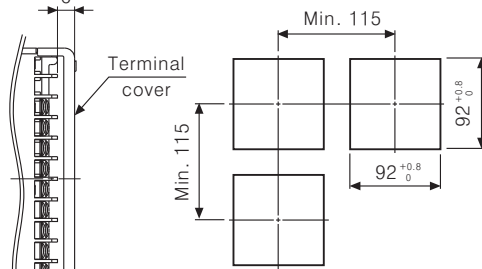
(Unit:mm)

●TC4L

●Bracket



●Panel cut-out

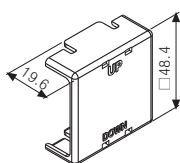


(Unit:mm)

●Terminal cover(Sold separately)

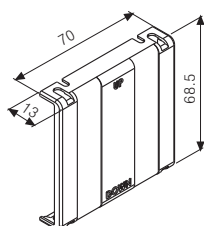
●RSA-Cover

(48×48mm size)



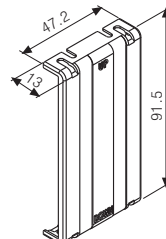
●RMA-Cover

(72×72mm size)



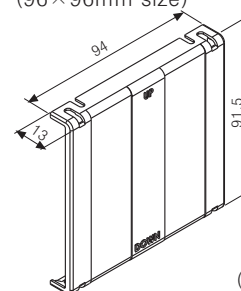
●RHA-Cover

(48×96mm, 96×48mm size)



●RLA-Cover

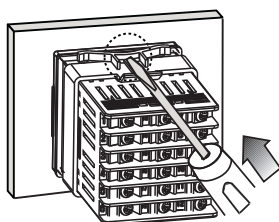
(96×96mm size)



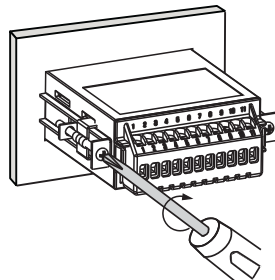
(Unit:mm)

■Product mounting

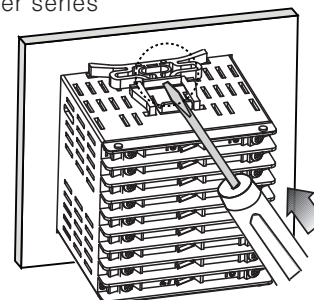
●TC4S/SP(48×48mm) series



●TC4Y(72×36mm) series



●Other series



※Insert product into a panel, fasten bracket by pushing with tools as shown above.
(In case of TC4Y, fasten bolts for bracket.)

(A)	Photo electric sensor
(B)	Fiber optic sensor
(C)	Door/Area sensor
(D)	Proximity sensor
(E)	Pressure sensor
(F)	Rotary encoder
(G)	Connector/Socket
(H)	Temp. controller
(I)	SSR/Power controller
(J)	Counter
(K)	Timer
(L)	Panel meter
(M)	Tacho/Speed/Pulse meter
(N)	Display unit
(O)	Sensor controller
(P)	Switching power supply
(Q)	Stepping motor & Driver & Controller
(R)	Graphic/Logic panel
(S)	Field network device
(T)	Production stoppage models & replacement

TC Series

■SSRP(Solid State Relay Phase Output) output function[55r.ñ]

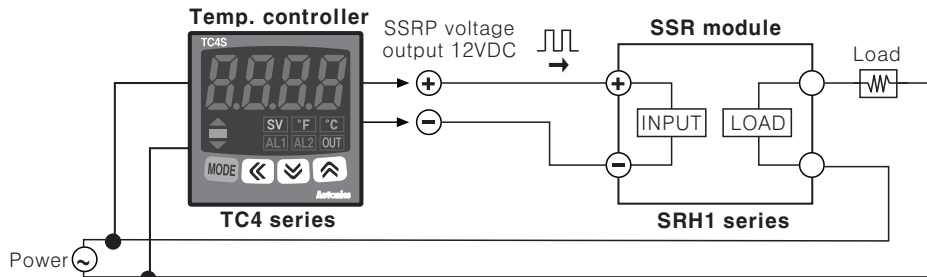
※AC/DC power type supports ON/OFF output only when selecting control output [55r.].

(Not support to select SSRP output method function. [55r.ñ])

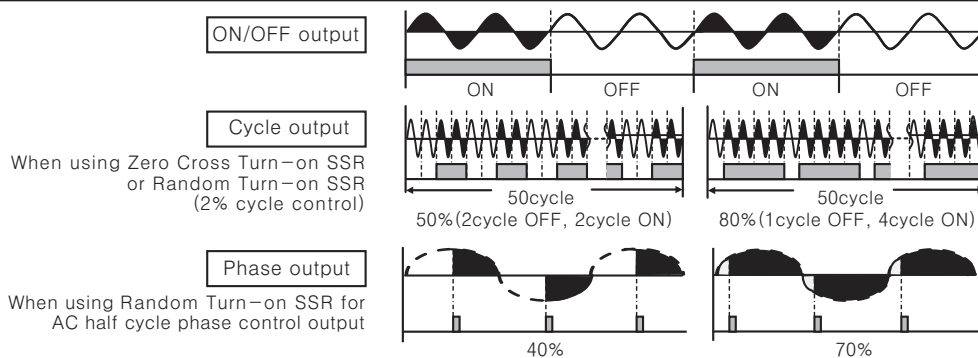
●SSRP is a user selectable output type which phase control and cycle control are added to standard SSR drive output.

●Standard SSR output is still available by internal parameter setting [55r.ñ]; in addition, "cycle control" with connecting Zero cross turn-on type SSR or Random turn-on type SSR and "phase control" with connecting Random turn-on type SSR are also available.

●Realizing high accuracy and cost effective temperature control with both current output (4~20mA) and linear output(cycle control and phase control).



※You can select the functions with parameter settings.



●Standard control mode[5tnd]

A mode to control the load in the same way as RELAY output type. (ON: output level 100%, OFF: output level 0%)

●Cycle control mode[59cl]

A mode to control the load by repeating output ON / OFF according to the rate of output within setting cycle

Having improved ON / OFF noise feature (ZERO CROSS type)

●Phase control mode[5pha5]

A mode to control the load by controlling the phase within AC half cycle.

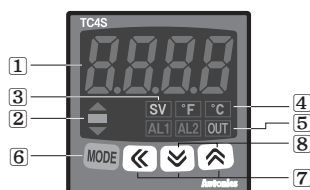
Serial control is available

RANDOM Turn-on type SSR must be used for this mode.

※When selecting phase or cycle control mode, the power supply for load and temperature controller must be the same.

※In case of selecting PID control type and phase / cycle control output modes, control cycle (t) is not allowed to set.

■Parts description



① Temperature display

It shows current temperature (PV) in RUN mode and parameter and set value for each setting group in parameter change mode.

② Deviation indicator, Auto-tuning indicator

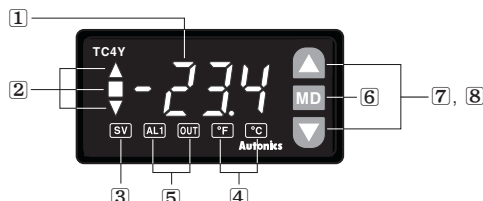
It shows current temperature (PV) deviation based on set temperature (SV) by LED.

No	PV deviation temp.	Deviation display
1	Over 2°C	▲ lamp on
2	Below ±2°C	■ lamp on
3	Under -2°C	▼ lamp on

–Deviation indicator (▲, ■, ▼) is flashed by every 1sec when operating auto tuning.

③ Set temperature (SV) indicator

Press any front key once to check or change current set temperature (SV), set temperature (SV) indicator is on and preset set value is flashed.



④ Temperature unit (°C/°F) indicator: It shows current temperature unit.

⑤ Control/alarm output indicator

–OUT : It will light up when control output (Main Control Output) is on.

※In case of CYCLE/PHASE control, it will light up when MV is over 3.0%. (Except for AC/DC power type)

–AL1/AL2 : It will light up when alarm output AL1/AL2 are on.

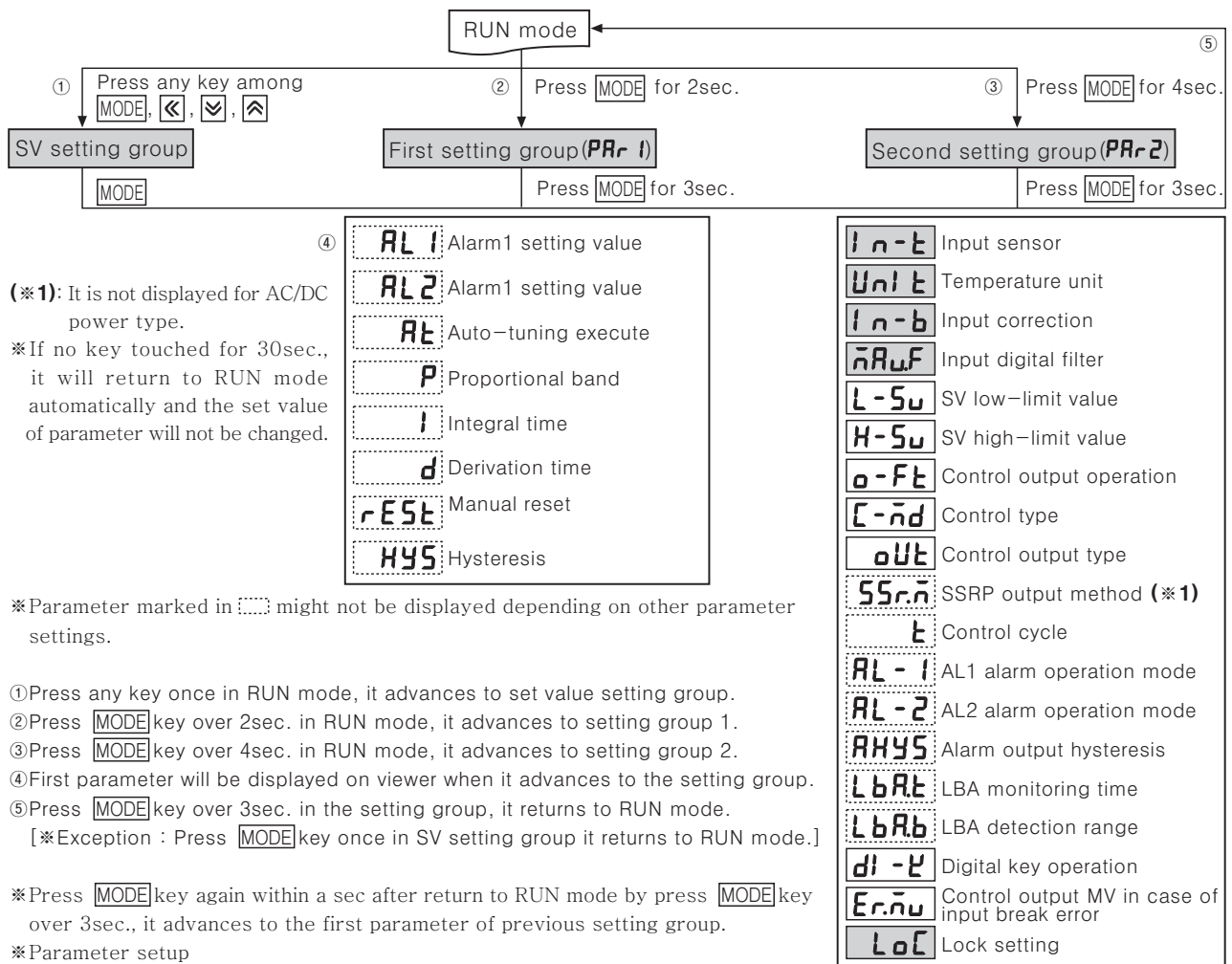
⑥ MODE Key : Used when entering into parameter setting group, returning to RUN mode, moving parameter and saving setting values.

⑦ Adjustment : Used when entering into set value change mode, Digit moving and Digit Up/down.

⑧ FUNCTION key : Press (⏏)+(⏏) keys for 3 sec. to operate function (RUN/STOP, alarm output cancel) set in inner parameter [dl -t].

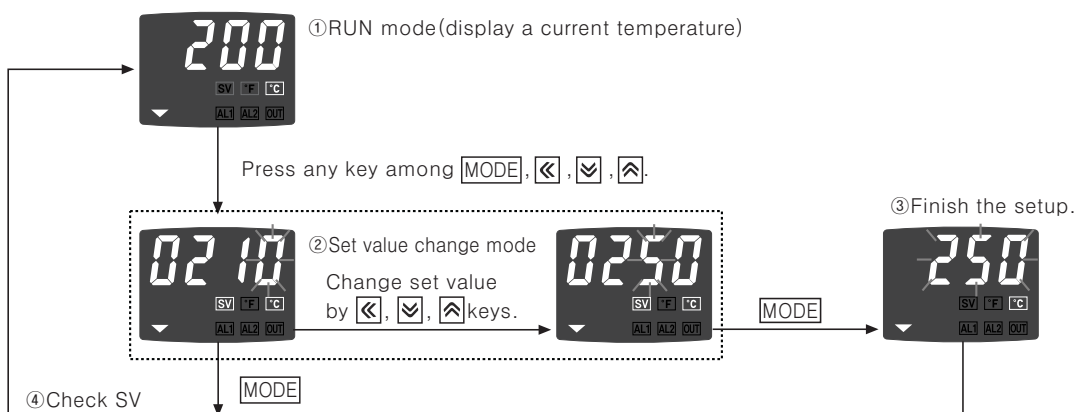
※Press (⏏)+(⏏) keys once in set value operation to move digit.

■ Flow chart for setting group

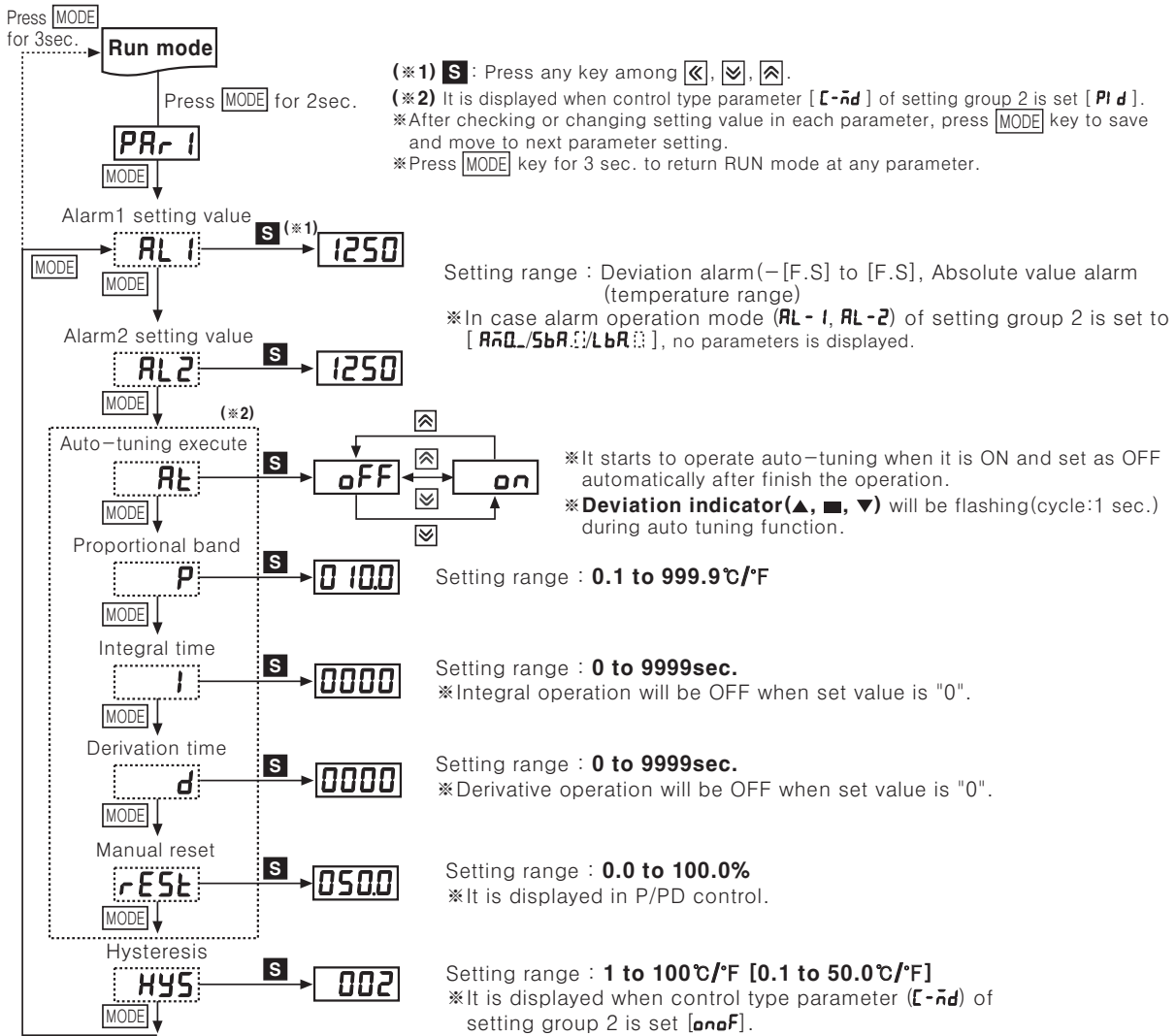


- (A) Photo electric sensor
- (B) Fiber optic sensor
- (C) Door/Area sensor
- (D) Proximity sensor
- (E) Pressure sensor
- (F) Rotary encoder
- (G) Connector/Socket
- (H) Temp. controller
- (I) SSR/Power controller
- (J) Counter
- (K) Timer
- (L) Panel meter
- (M) Tacho/Speed/Pulse meter
- (N) Display unit
- (O) Sensor controller
- (P) Switching power supply
- (Q) Stepping motor & Driver & Controller
- (R) Graphic/Logic panel
- (S) Field network device
- (T) Production stoppage models & replacement

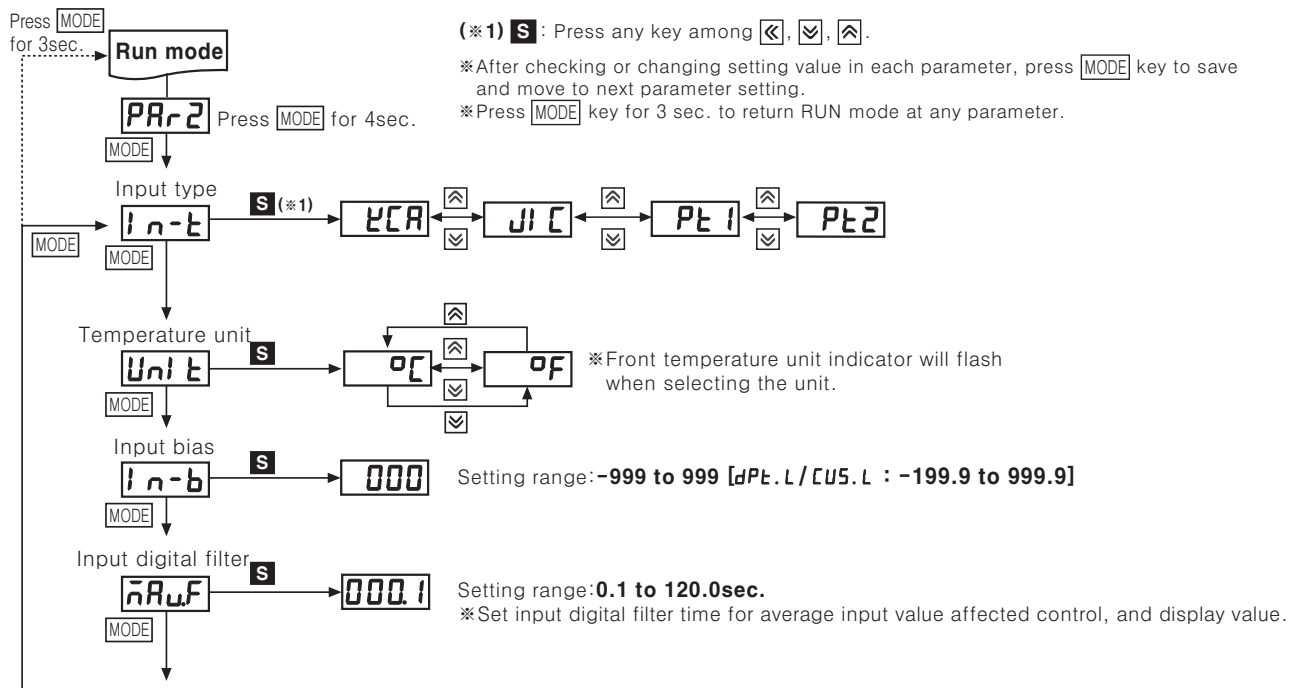
■ Flow chart for SV setting group(*In case of changing set temperature from 210℃ to 250℃.)



■ Flow chart for setting group 1



■ Flow chart for setting group 2



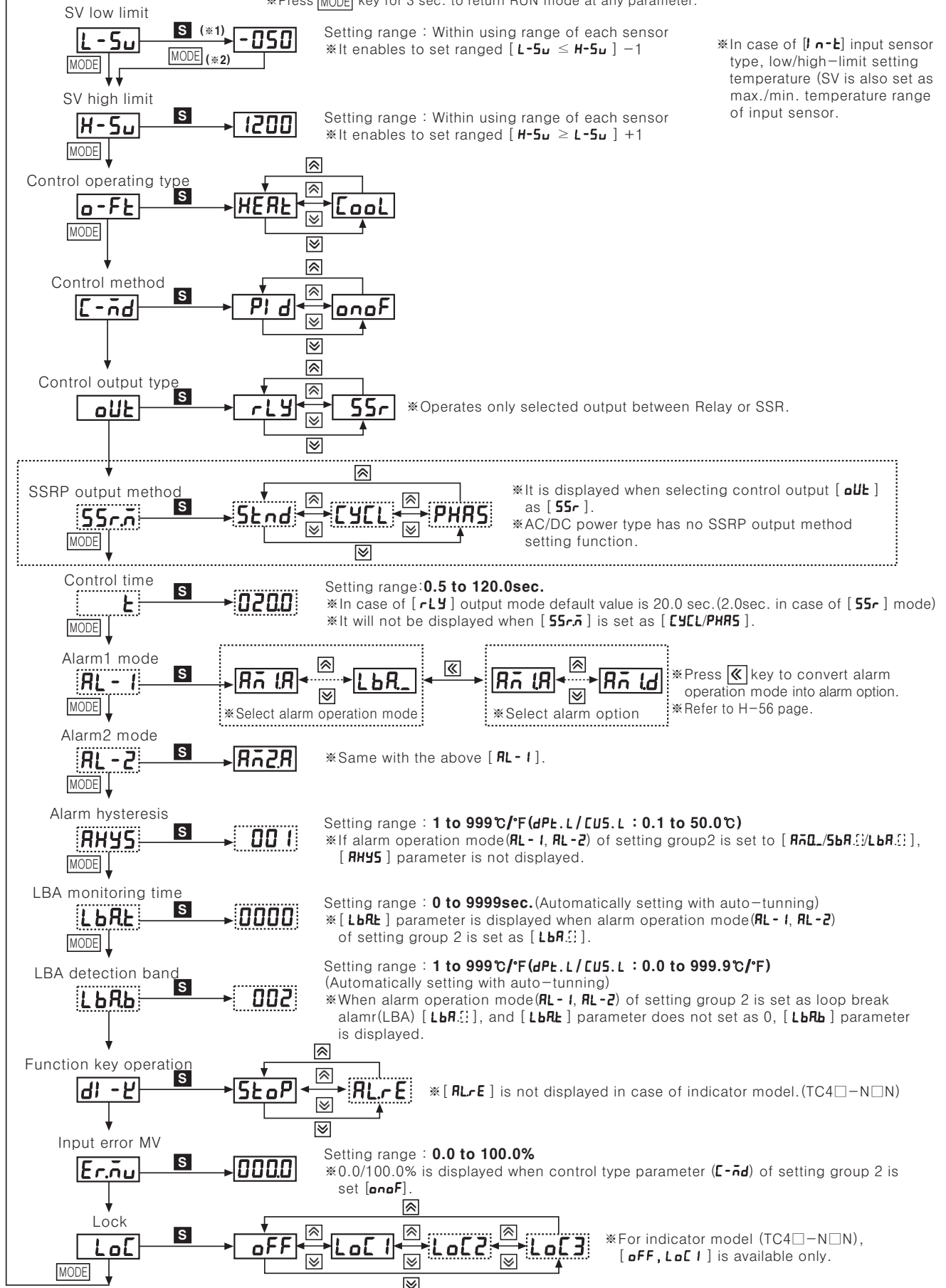
Economical PID Control

(※1) **S** : Press any key among $\leftarrow$, $\rightarrow$, $\uparrow$, $\downarrow$.

(※2) After checking or changing setting value in each parameter, press **MODE** key to save setting value. Saved setting value will flash twice and then moves to next parameter setting automatically.
※Press **MODE** key for 3 sec. to return RUN mode at any parameter.

※In case of [P n-E] input sensor type, low/high-limit setting temperature (SV is also set as max./min. temperature range of input sensor).

(A)	Photo electric sensor
(B)	Fiber optic sensor
(C)	Door/Area sensor
(D)	Proximity sensor
(E)	Pressure sensor
(F)	Rotary encoder
(G)	Connector/Socket
(H)	Temp. controller
(I)	SSR/Power controller
(J)	Counter
(K)	Timer
(L)	Panel meter
(M)	Tacho/Speed/Pulse meter
(N)	Display unit
(O)	Sensor controller
(P)	Switching power supply
(Q)	Stepping motor & Driver & Controller
(R)	Graphic/Logic panel
(S)	Field network device
(T)	Production stoppage models & replacement



TC Series

■ Factory default

●SV setting group

Parameter	Factory default
-	0

●Setting group 1

Parameter	Factory default
AL1	1250
AL2	
AL	OFF
P	0.100
I	0000
d	
rEST	0500
HYS	002

●Setting group 2

Parameter	Factory default	Parameter	Factory default
In-t	ECT	t	0200
Unit	°C	AL-1	AN1A
In-b	0000	AL-2	AN2A
ARAF	000.1	AKYS	000.1
L-Su	-050	LbAt	0000
H-Su	1200	LbAS	008
a-Ft	HEAt	LbAb	002
C-Ad	PI d	dl-Y	StoP
oUt	rLY	ErAu	0000
SSr.n	Stnd	LoC	OFF

※AC/DC power type has no SSRP output method setting function and supports only ON/OFF output when selecting [55r] in control output setting function [oUt].

■ Input sensor and range[In-t]

- Select proper input sensor type by user application.

Input sensor		Display	Input range (°C)	Input range (°F)
Thermocouple	K(CA)	ECT	-50 to 1200	-58 to 2192
	J(IC)	JIC	-30 to 500	-22 to 932
	L(IC)	LIC	-40 to 800	-40 to 1472
RTD	DPT00Ω	Pt1	-100 to 400	-148 to 752
		Pt2	-100.0 to 400.0	-148.0 to 752.0
	CU50Ω	CU5.H	-50 to 200	-58 to 392
		CU5.L	-50.0 to 200.0	-58.0 to 392.0

■ Functions

See H-56 to 59 page for TC / TD common features.

◎Lock setting[LoC]

- A function to prevent changing SV and parameters of each setting group.
- Parameter setting values are still possible to check while Lock mode is ON.

Display	Description
OFF	Lock off
LoC1	Lock setting group 2
LoC2	Lock setting group 1, 2
LoC3	Lock setting group 1, 2, SV setting group

※[OFF], [LoC1] are available only for indicator(TC4 □-N□N).

◎Error

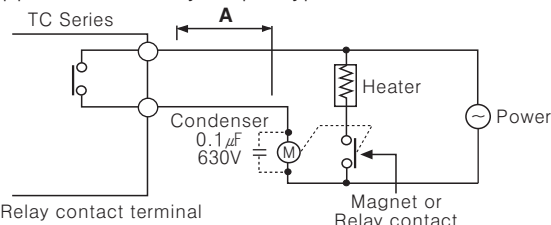
- Error mark will flash(every 1sec.) in PV viewer when error is occurred during the control operation.

Display	Description
oPEn	If input sensor is disconnected or sensor is not connected.
HHHH	If measured sensor input is higher than temperature range.
LLLL	If measured sensor input is lower than temperature range.

- It will operate normally, if input sensor is connected or returned to normal range under error oPEn / HHHH / LLLL status.

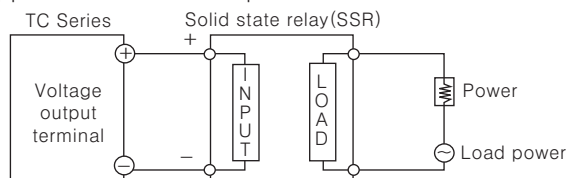
◎Output connections

- Application of relay output type



Keep power relay as far away as possible from temperature controller. If wires length of **A** is short, electromotive force occurred from a coil of magnet switch & power relay may flow in power line of the unit, it may cause malfunction. If wires length of **A** is short, please connect a mylar condenser 104(630V) across coil of the power relay "M" to protect electromotive force.

- Application of SSRP output method



※SSR should be selected by the capacity of load, otherwise, it may short-circuit and result in a fire. Indirect heated should be used with SSR for efficient working.

※Please use a cooling plate or it may cause the capability deterioration, breakdown of SSR for a long usage.

※Refer to H-43 page for phase / cycle control connections.