

KCE Series

Micro Processor Controller

Operation Manual



KC-400

KC-600

KC-700

KC-800

KC-900

KCE [®]

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1 Safety Guide



Warning

- An external device must be installed if failure of this instrument could result damage to the instrument, equipment or injury to personnel.
- This instrument is not intended for use in locations subject to flammable or explosive gases.
- Do not touch high-voltage connections such as power supply terminals, ect. to avoid electric shock.
- All wiring must be completed before power is turned on to prevent electric shock, fire or damage instrument and equipment.
- This instrument must be used in accordance with the specifications to prevent fire or damage to instrument and equipment.
- KCE is not responsible if this instrument is repaired, modified or disassembled by other than factory-approved personnel. Malfunction can occur and warranty is void under these conditions.



Caution

- This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take adequate measures.
- This instrument is protected from electric shock by reinforced insulation. Provide reinforced insulation between the wire for the input signal and wires for instrument power supply, source of power and loads.
- If input/output or signal lines within the building are longer than 30 meters or If input /output or signal lines leave the building, regardless the length. Be sure to provide an appropriate surge control circuit respectively.
- This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock by operating personnel.
- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
- All wiring must be in accordance with local codes and regulations.
- To prevent instrument damage of failure, protect the power line and the input/output lines from high currents with a protection device such as fuse, circuit breaker, ect.
- Tighten each terminal screw to the specified torque found in the manual to avoid electric shock, fire or malfunction.
- Do not connect wires to unused terminal as this will interfere with proper operation of the instrument.
- Do not connect modular connectors to telephone line.



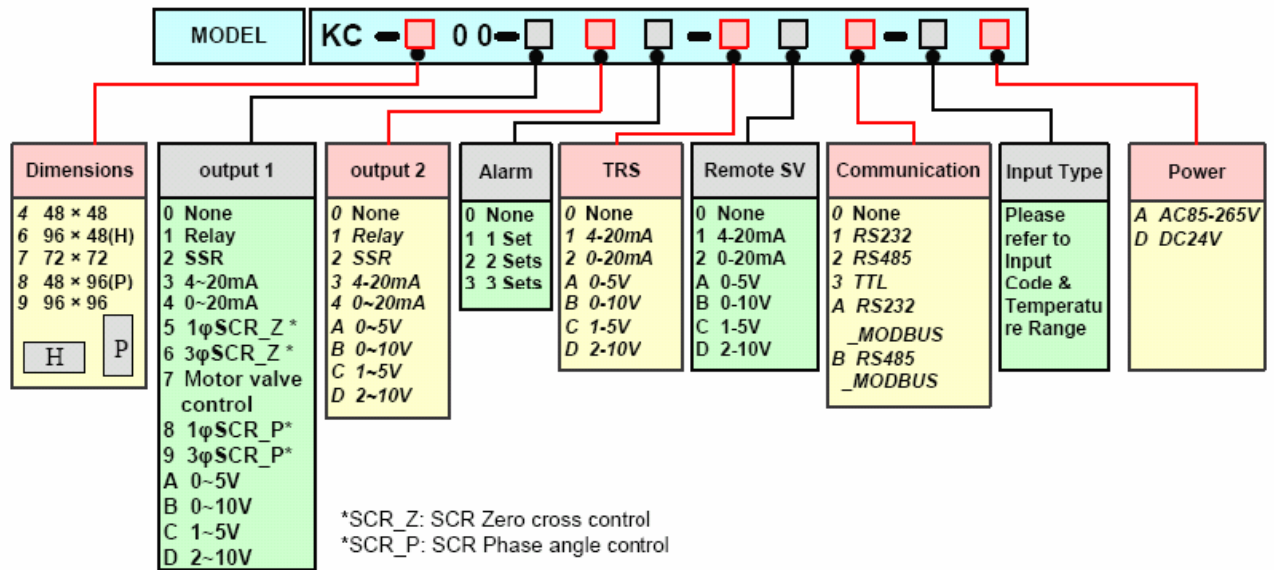
Maintenance

- All wiring must be completed before power is turned on to prevent electric shock, instrument failure, or incorrect action. The power must be turned off before repairing work for input break and output failure including replacement of sensor, contactor or SSR, and all wiring must be completed before power is turned on again.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
- For proper operation of this instrument, provide adequate ventilation for heat dispensation.
- Turn off the power supply before cleaning the instrument.
- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration will occur. Use a soft, dry cloth to remove stains from the instrument.
- To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.

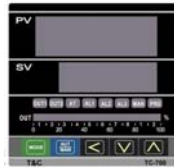
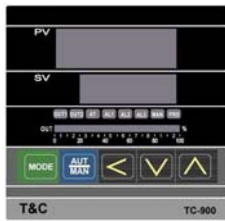
1.1 Specifications

Model	KC-400	KC-700	KC-600	KC-800	KC-900
Size	48 × 48 mm	72 × 72 mm	96 × 48 mm	48 × 96 mm	96 × 96 mm
Weight	170g	270g	250g	250g	330g
Power Consumption	3VA	3VA	4VA	4VA	4VA
General Specifications	Rated Power Supply Voltage & Frequency	A85~265V,50/60Hz			
	Ambient Temperature & Humidity	0~50℃ , 20-85%RH(Non condensing)			
PV Input	Input Type	TC	K,J,R,S,B,E,N,T,W,PLII,U,L		
		RTD	PT100,JPT100,JPT50		
		Linear	0~1V ,0~5V ,0~10V ,1~5V ,2~10V , -10~10 mV ,0~10 mV ,0~20 mV ,0-50 mV ,10~50 mV ,4~20 mA,0~20 mA		
	Input sampling Time	250ms			
	Input Resolution	16 bit (Each)			
Indication	PV/SP Indication	4-digit,7 segment display			
	Constant Value Storage System	Non-volatile memory (E ² PROM)			
	Indication Accuracy	0.5%FS			
Control Mode	Proportional Band(P)	0~200% (On/off action at P=3.0)			
	Integral Time(I)	0~3600 sec (PD action at I=120)			
	Derivative Time(D)	0~900 sec (PI action at D=30)			
	Cycle Time	0~150 sec(4~20mA→0,SSR→1,Relay→10)			
	Dead Band Time	0~1000 sec (Dead time compensation)			
Output	Relay Output Relay	Contact,SPDT,8A/240VAC			
	Voltage Output	Voltage Pulse,4VDC/20mA			
	Linear Output	4~20mA,0~5V,0~10V,1-5V,2-10V			
Alarm	Alarm Output	3A , 220V			
	Alarm Mode	17 alarm Modes Available			
	Alarm Timer	Flicker Alarm Continued Alarm On Delay Timer Alarm			

1.2 Model Selection Guide



1.3 Model Guide



KC-900(96×96mm) KC-800(48×96mm) KC-700(72×72mm) KC-600(96×48mm) KC-400(48×48mm)

1.4 Optional Spec.

○ Available × Unavailable

Model		KC-400	KC-600	KC-700	KC-800	KC-900
Output 1	1 φ Zero Crossing Control(1φSCR-Z)	○	○	○	○	○
	3 φ Zero Crossing Control(3φSCR-Z)	×	×	×	×	○
	Proportional Motor valve control	○	○	○	○	○
	1 φ Phase Angle Control(1φSCR-P)	×	○	○	○	○
	3 φ Phase Angle Control(3φSCR-P)	×	×	×	×	○
Programmable RATE / SOAK		○	○	○	○	○
Output 2		○	○	○	○	○
Alarm2		○	○	○	○	○
Alarm3		×	○	×	○	○
Heater Break Alarm (HBA)		○	○	○	○	○
Transmission (TRS)		○	○	○	○	○
Remote SV		×	○	○	○	○
Communication		○	○	○	○	○
DC 24V Power		○	○	○	○	○

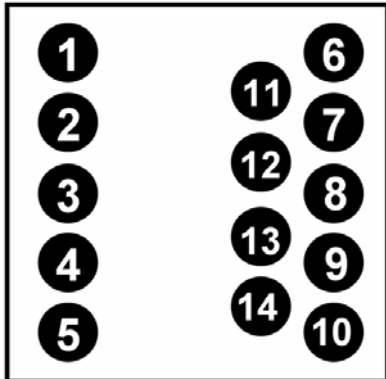
1.5 Dimension & Panel cutout (Unit : mm)

KC-400(48×48mm)		
KC-700(72×72mm)		
KC-600(96×48mm)		
KC-800(96×48mm)		
KC-900(96×96mm)		

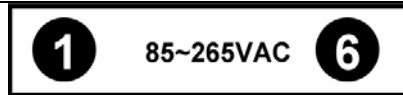
1.6 Wiring Terminals

1.6.1 KC-400

Terminals arrangement

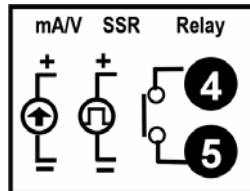


Power

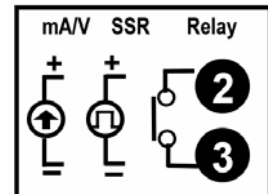


Output

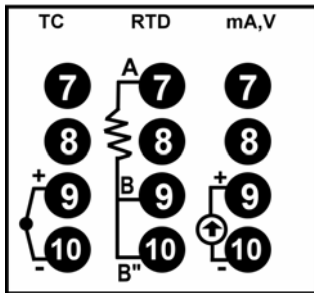
OUT1



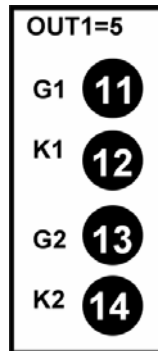
OUT2



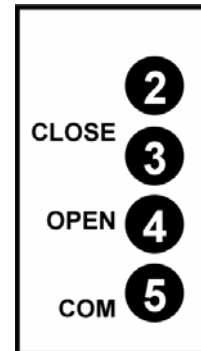
Input



OUT1 (1 ϕ Zero Crossing Control)

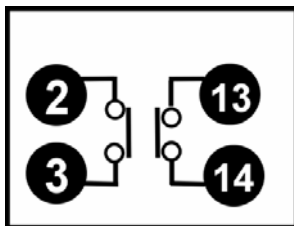


OUT1 (Proportional Motor valve control)

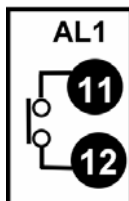


Alarm

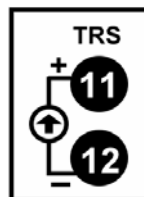
AL2 AL3



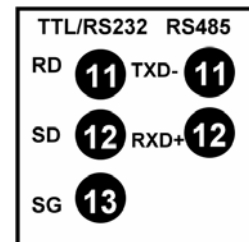
Double Output- Proportional Motor valve control



Transmission (TRS)

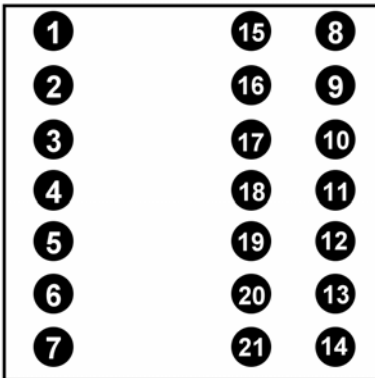


Communication



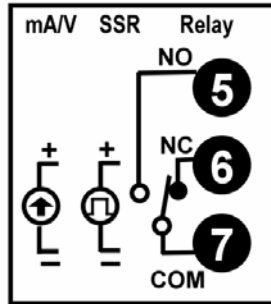
1.6.2 KC-700

Terminals arrangement

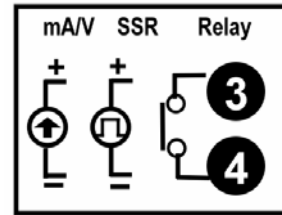


Output

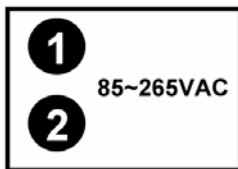
OUT1



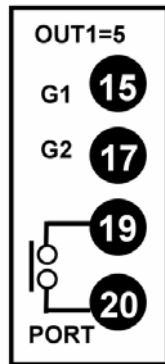
OUT2



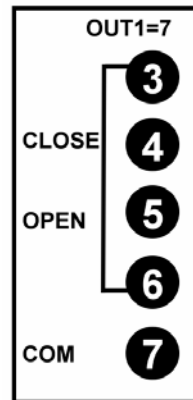
Power



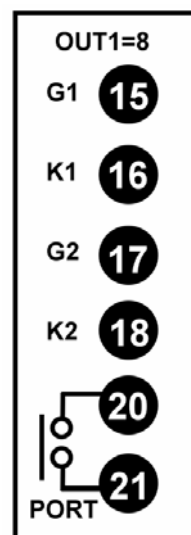
OUT1 (1 φ Zero Crossing Control)



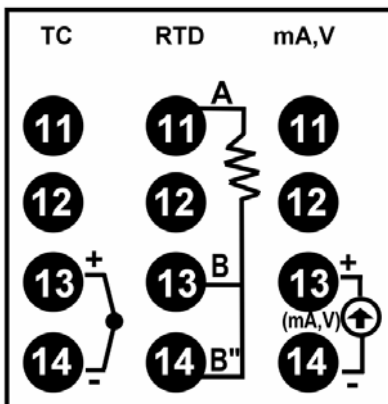
OUT1 (Proportional Motor valve control)



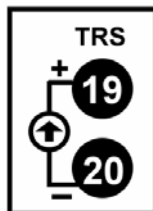
OUT1(1 φ Phase Angle Control)



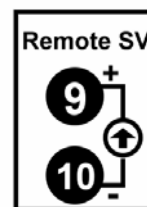
Input



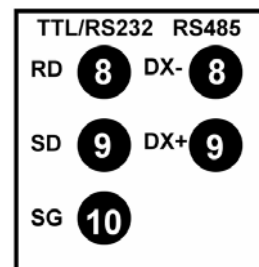
Transmission (TRS)



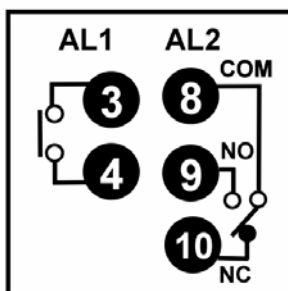
Remote SV



Communication

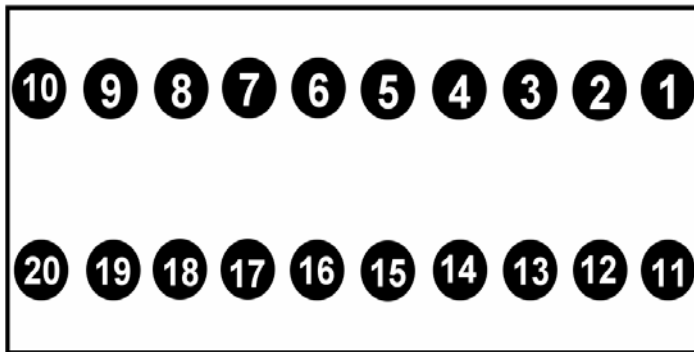


Alarm

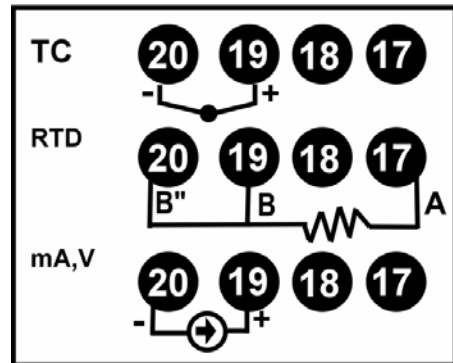


1.6.3 KC-600

Terminals arrangement



Input

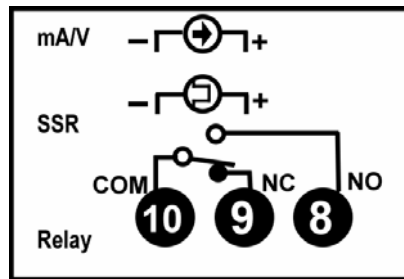


Power

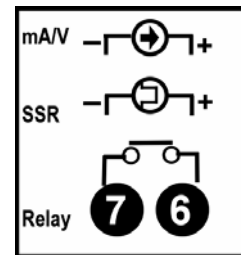


Output

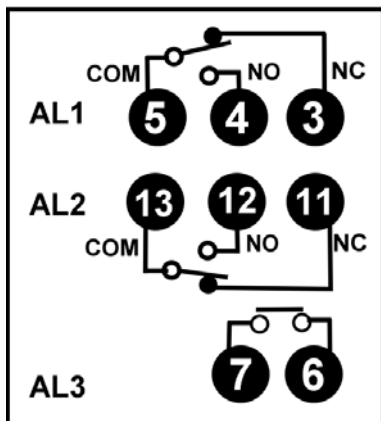
OUT1



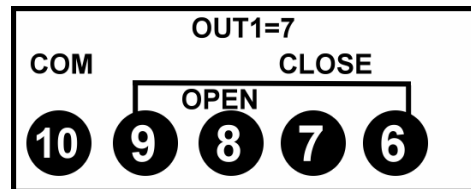
OUT2



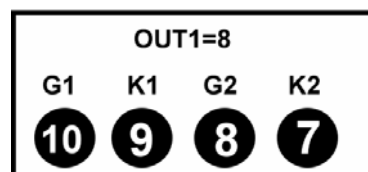
Alarm



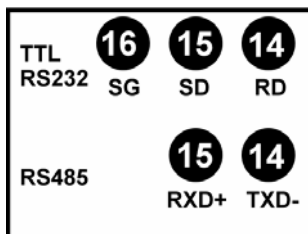
OUT1 (Proportional Motor valve control)



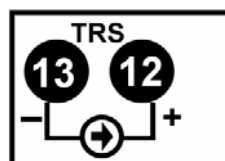
OUT1 (1 φ Zero Crossing Control)



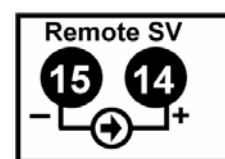
Communication



Transmission (TRS)

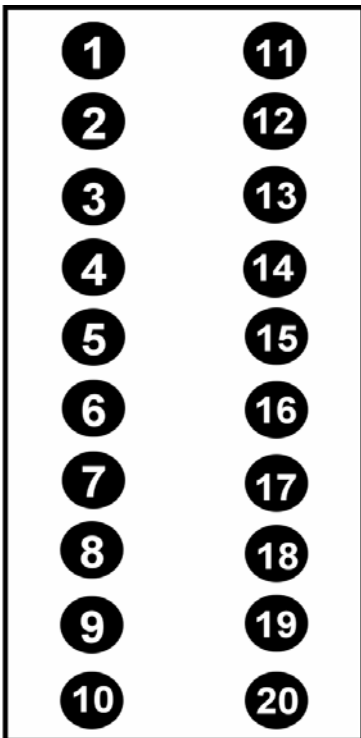


Remote SV

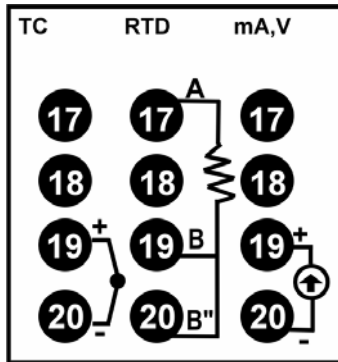


1.6.4 KC-800

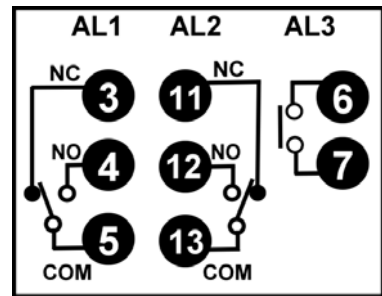
Terminals arrangement



Input

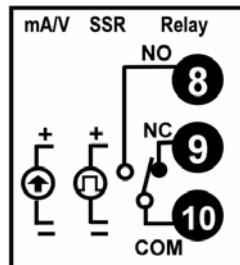


Alarm

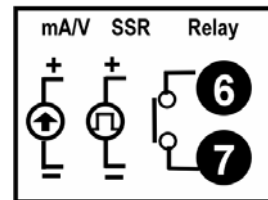


Output

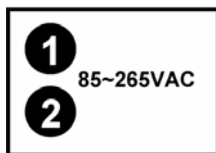
OUT1



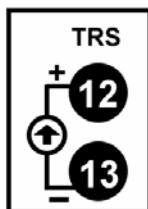
OUT2



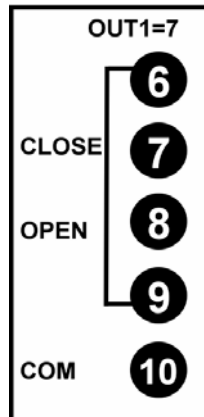
Power



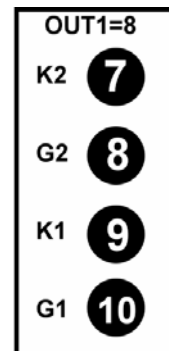
Transmission (TRS)



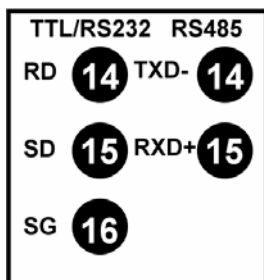
OUT1 (Proportional Motor valve control)



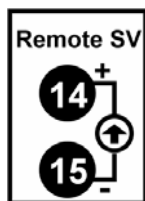
OUT1(1 φ Phase Angle Control)



Communication

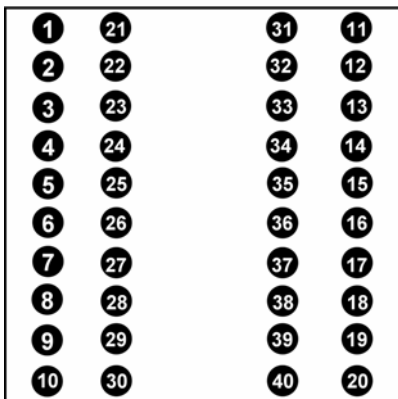


Remote SV

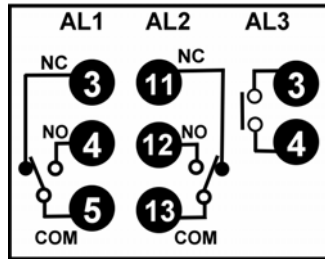


1.6.5 KC-900

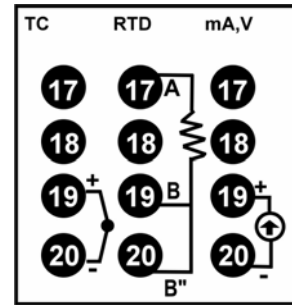
Terminals arrangement



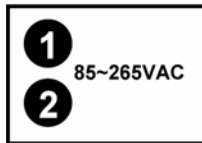
Alarm



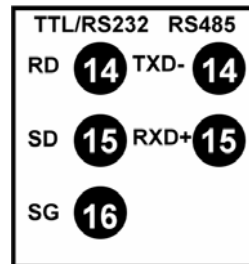
Input



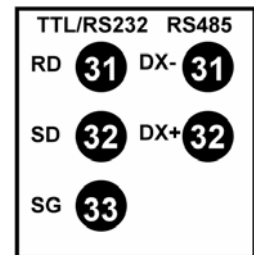
Power



Communication

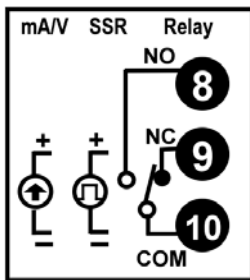


Remove SV +Communication

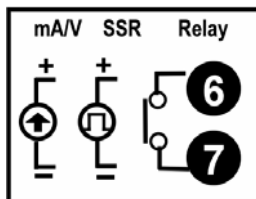


Output

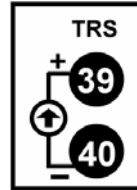
OUT1



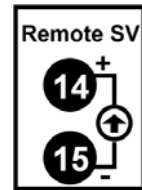
OUT2



Transmission (TRS)



Remote SV



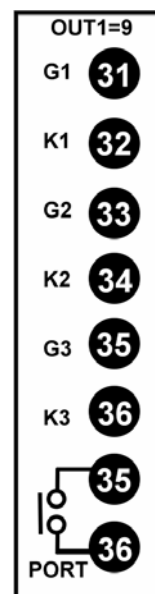
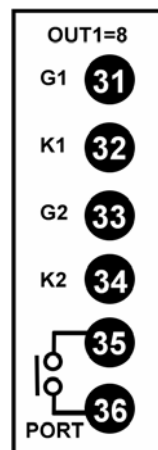
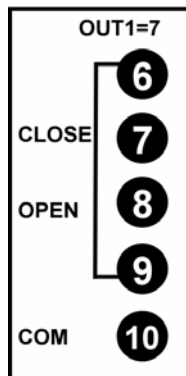
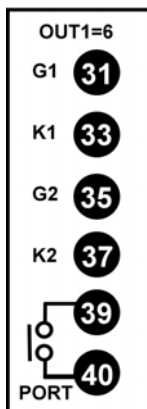
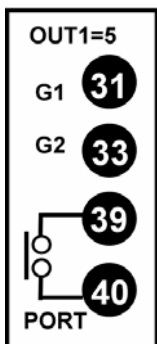
OUT1 (1 φ Zero Crossing Control)

OUT1 (3 φ Zero Crossing Control)

OUT1 (Proportional Motor valve control)

OUT1(1 φ Phase Angle Control)

OUT1(3 φ Phase Angle Control)



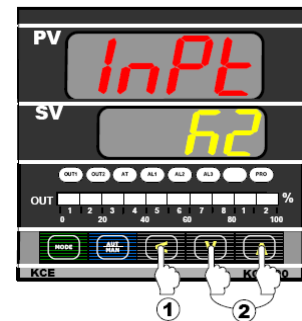
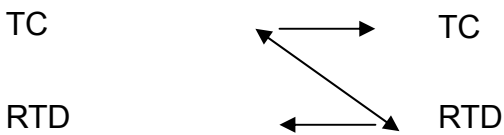
1.7 Input Actuations

TC	K	0.0~200.0,400.0,600.0,800.0,1000,1200°C	RTD	PT100Ω	-199.9~600.0,400.0,200.0°C 0.0~200.0,400.0,600.0°C
	J	0.0~200.0,400.0,600.0,800.0,1000,1200°C		J PT100Ω	-199.9~600.0,400.0,200.0°C 0.0~200.0,400.0,600.0°C
	R	0.0~1600,1769°C		JPT50Ω	-199.9~600.0,400.0,200.0°C 0.0~200.0,400.0,600.0°C
	S	0.0~1600,1769°C	Linear	AN1	-10~10mv , ±2V , ±5V , ±10V
	B	0.0~1820°C		AN2	0-10mV
	E	0.0~800,1000°C		AN3	0~20mV
	N	0.0~1200,1300°C		AN4	0~50mv , 0~20mA , 0~5V , 0~10V
	T	0.0~400.0,200.0°C , 0.0~350.0°C		AN5	4~20mv , 1~5V , 2~10V
	W	0.0~2000,2320°C			
	PLII	0.0~1300,1390°C			
U	-199.9~600.0,200.0°C , 0.0~400.0°C				
L	0.0~400.0,800.0°C				

1.8 Modify Input Type

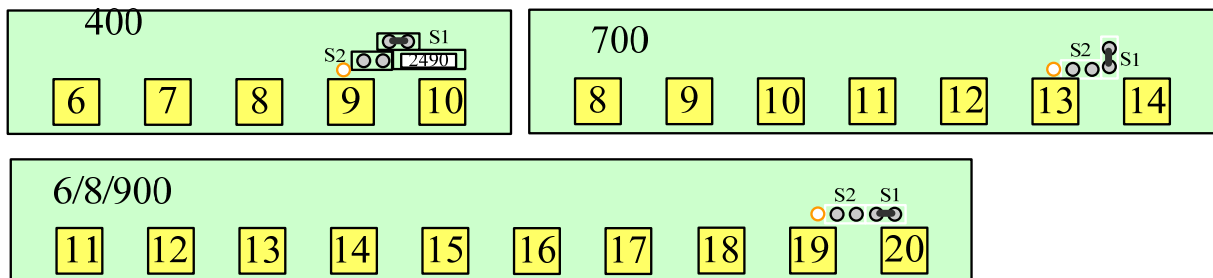
1.8.1 TC ↔ RTD Input type selection

To select Input type at INPT in Level 3 (SET Level).



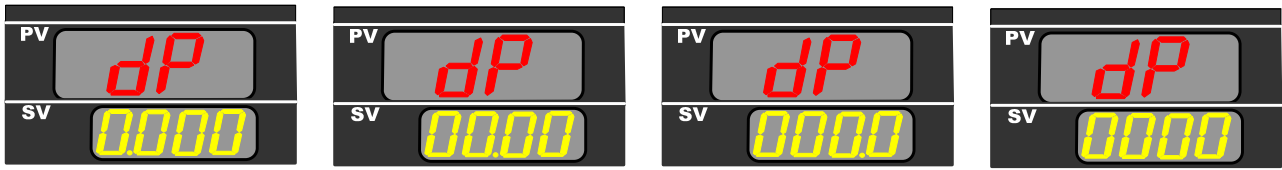
1.8.2 TC ↔ 4-20 mA (Linear) Modify Hardware

Please make S1 to be a short circuit as following drawing.

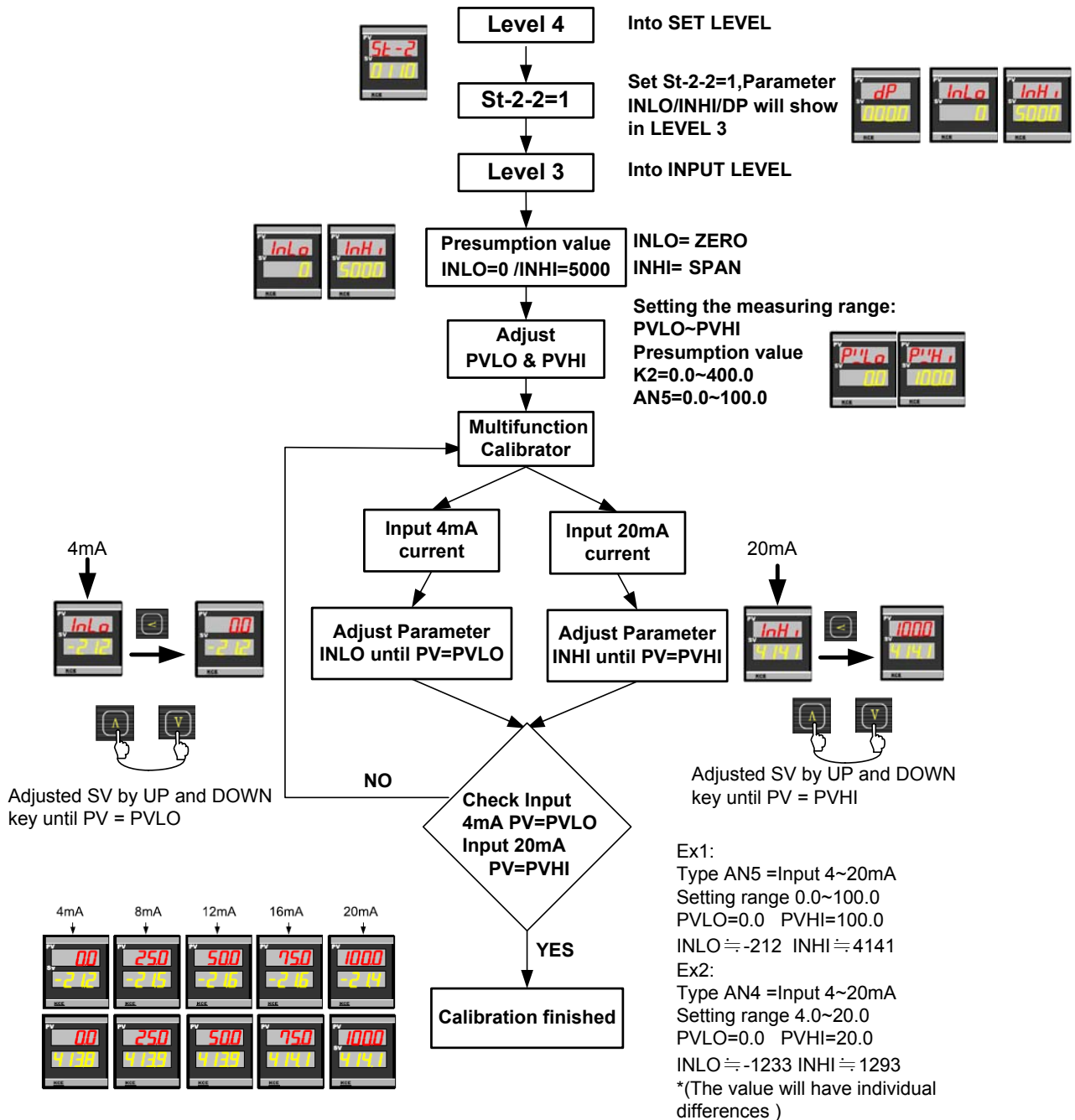


1.8.3 TC \leftrightarrow 4-20 mA (Linear) Modify Software

- Step:
1. Set St-2-2=1, Parameter INLO/INHI/DP will show in LEVEL 3
 2. Set INPT from K2 to AN5 in LEVEL 3(INPUT Level)
 3. Parameter DP can change the decimal point position

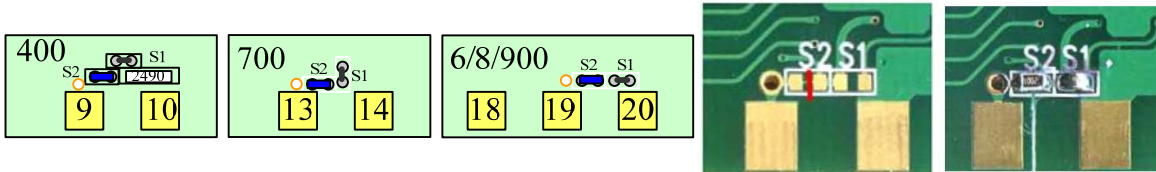


4. Use Multifunction Calibrator to adjust



1.8.4 TC \longleftrightarrow 0-10V (Linear) Modify Hardware

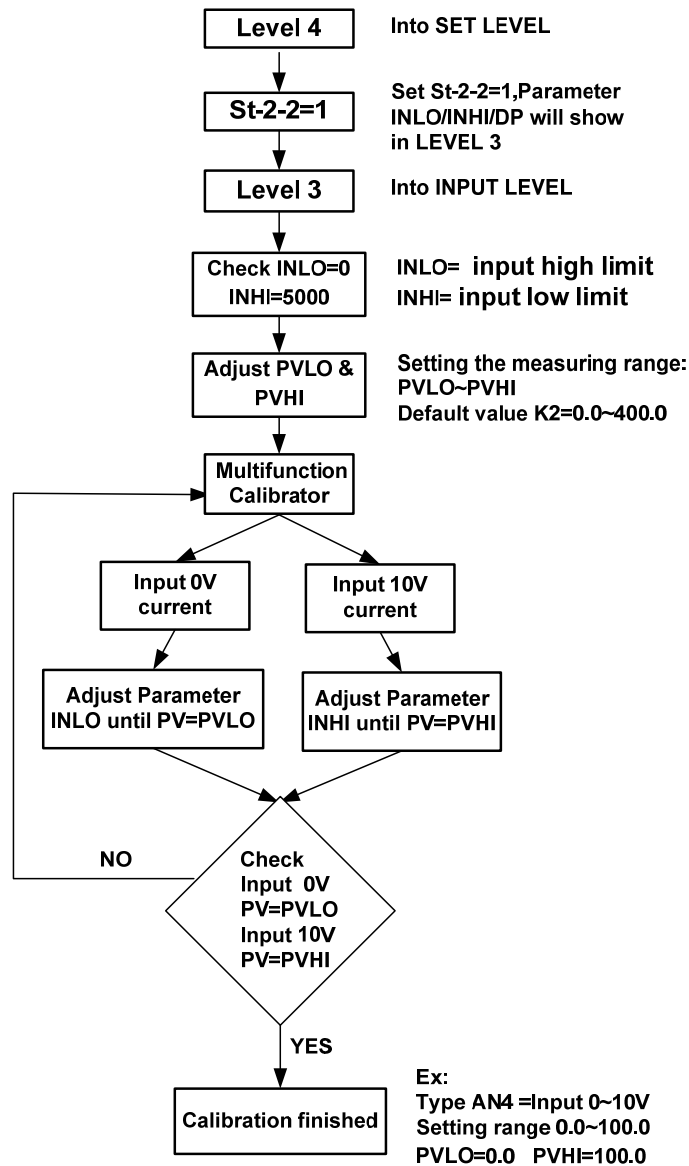
1. Please make S1 short circuit as following drawing.



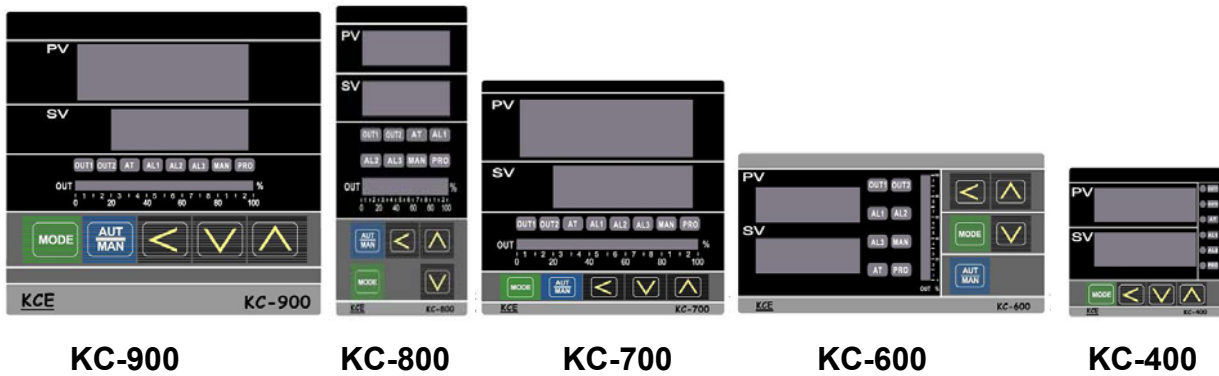
2. Cut the line between S2 and put a resistance (2K) on S2 and fixed it by soldering.

1.8.5 TC \longleftrightarrow 0-10V (Linear) Modify Software

- Step:
1. Set St-2-2=1, Parameter INLO/INHI/DP will show in LEVEL 3
 2. Set INPT from K2 to AN4 in LEVEL 3 (INPUT Level)
 3. Parameter DP can change the decimal point position
 4. Use Multifunction Calibrator to Calibration



1.9 Panel Appearance



1.9.1 LED Display

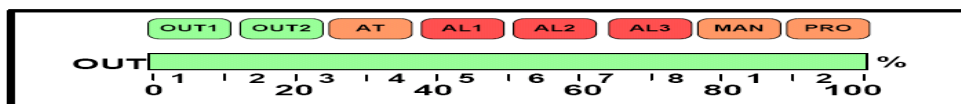
P V : Process Value, 4 LED display (Red color)

S V : Set Value, 4 LED display (Green color)

1.9.2 Key and Lamp instruction

Symbol	Name	Symbol	Name	Symbol	Name
	SET key	OUT1	Output1 , Green color	AL3	Alarm 3 , Red color
	Auto/Manual key.	OUT2	Output2 , Green color	MAN	Manual , Yellow color
	Shift key	AT	Auto Tuning , Yellow color	PRO	Program , Yellow color
	Down key	AL1	Alarm 1 , Red color	OUT%	Output percentage
	Up key	AL2	Alarm 2 , Red color		

1.9.3 Bar Graph indicators (Output percentage lamp instruction)



Output segment(8 segment s) Output pattern(2 patterns)

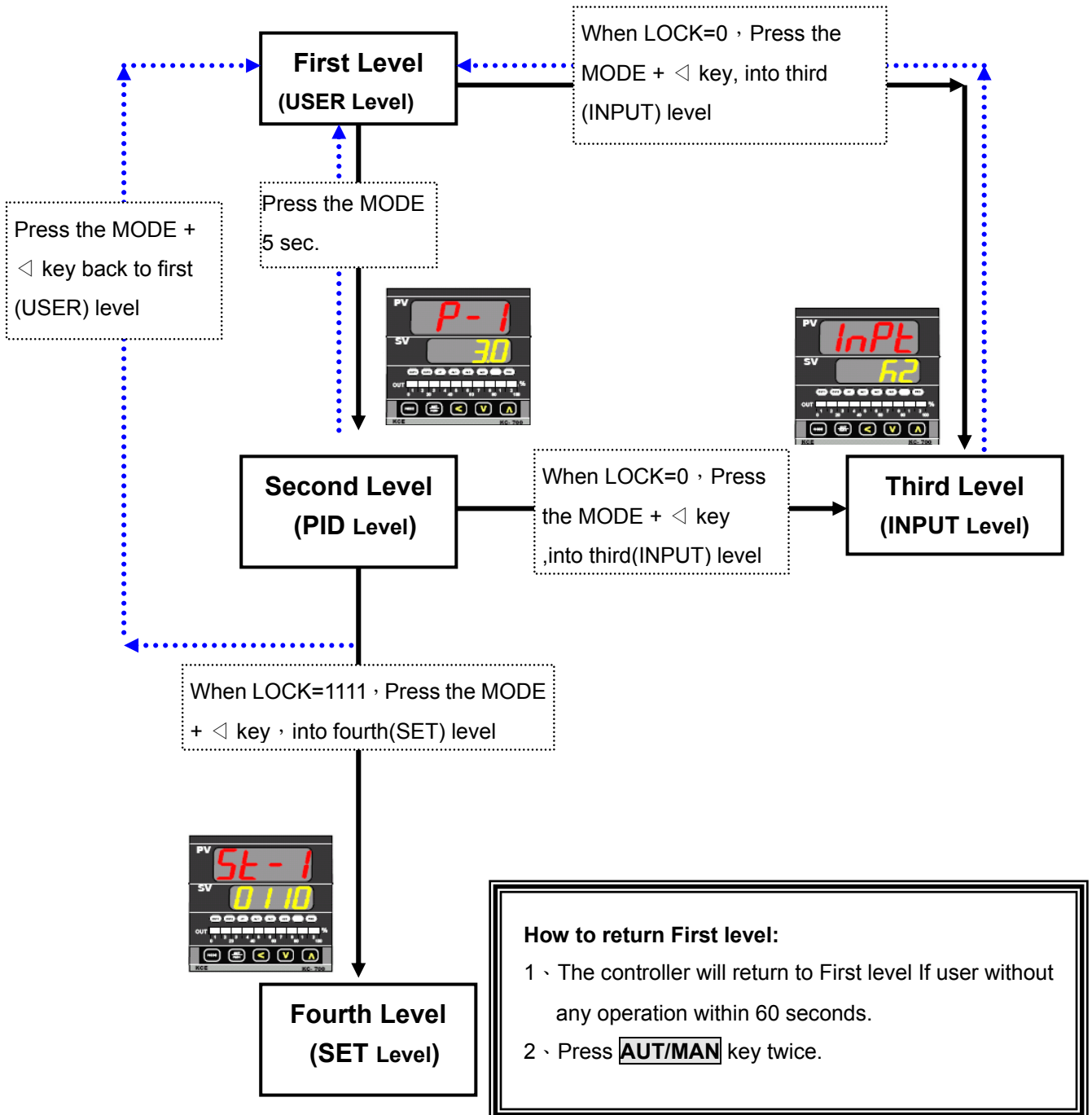
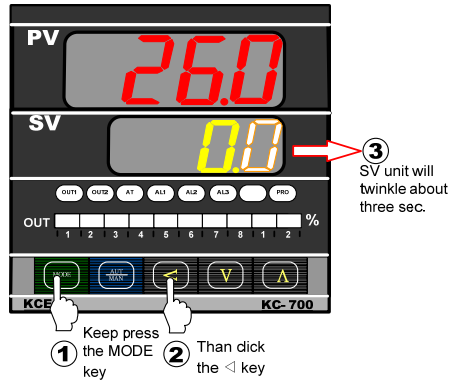
1.9.4 Auto tuning

When “AT” (USER LEVEL) is set to” YES” , auto tuning will start.

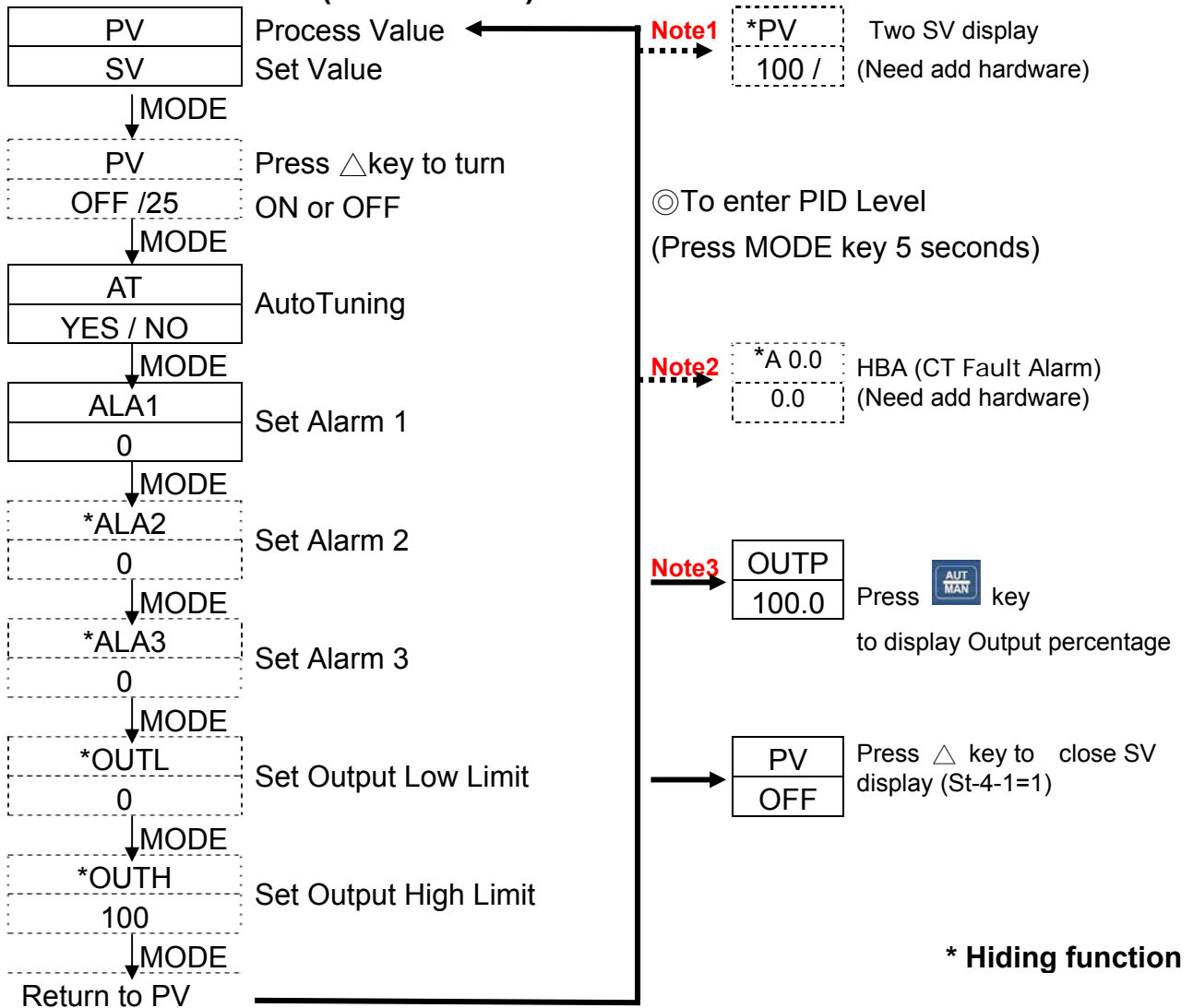
When set to” NO” , auto tuning will close.

2 Parameters

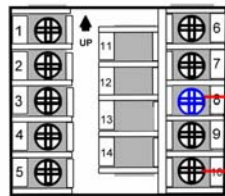
2.1 Level switch



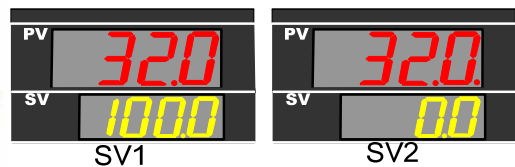
2.2 First Level list (USER Level)



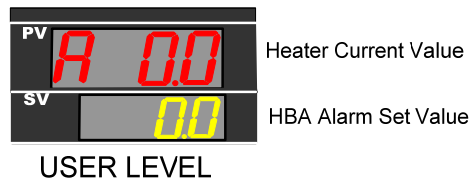
* Hiding function



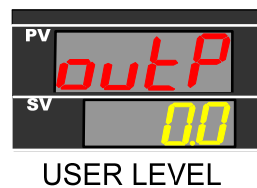
Note 1: Two SV display



Note 2: CT Fault Alarm (HBA)



Note 3: Output percentage



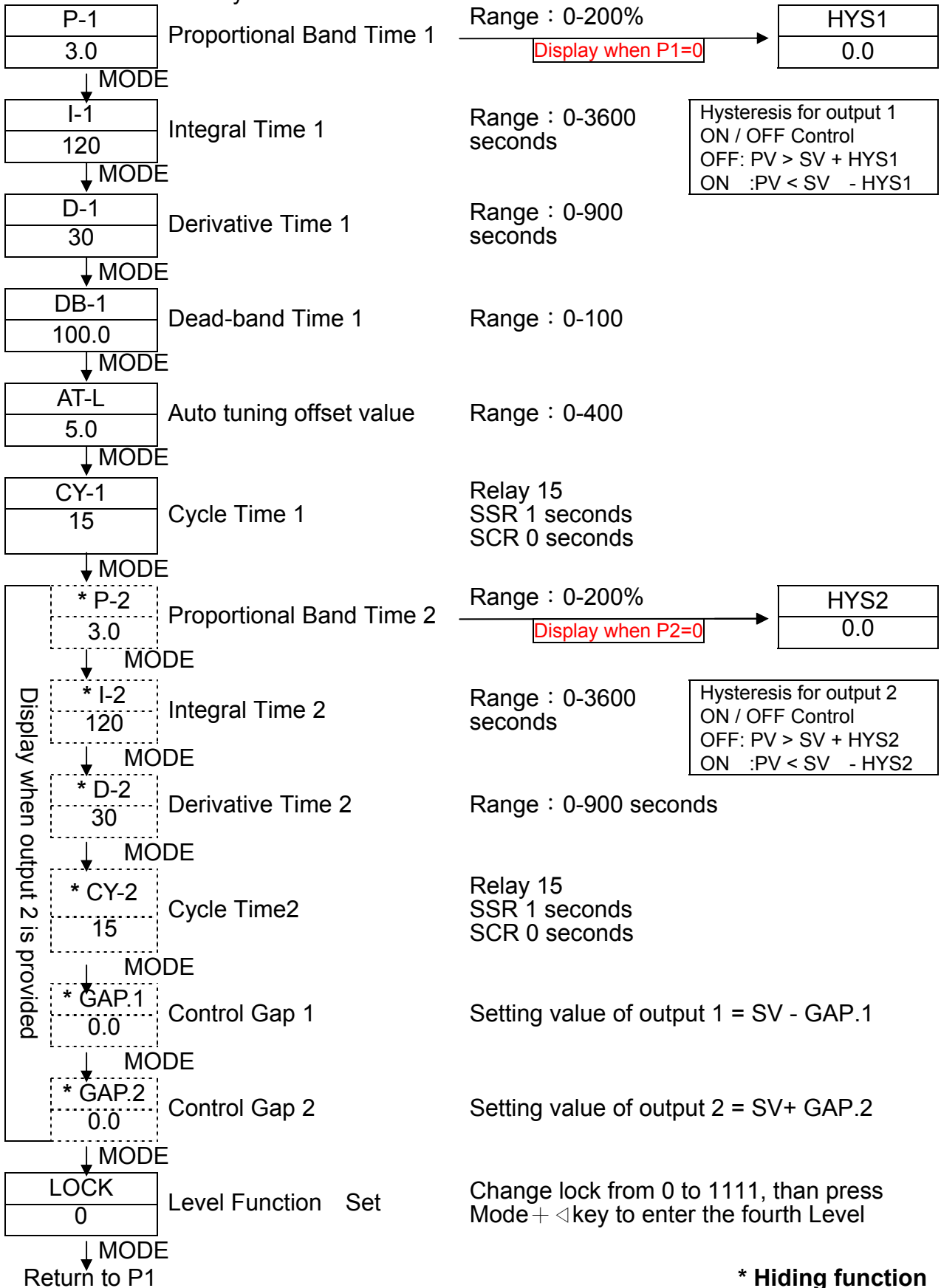
2.3 Error information

Display		Description	Note
1NER	<i>1nEr</i>	Input 1 error	
2NER	<i>2nEr</i>	Temperature is too high	
INHI	<i>1nH ,</i>	PV exceeds PVHI	
INLO	<i>1nLo</i>	PV under PVLO	
2NHI	<i>2nH ,</i>	PV2 exceeds PVHI	
2NLO	<i>2nLo</i>	PV2 under PVLO	
ATER	<i>AtEr</i>	Auto tuning failed.	
IFER	<i>IFEr</i>	Interface failed.	
ADER ☆	<i>AdEr</i>	A/D convert failed.	
CJER ☆	<i>CJEr</i>	Cold junction compensation failed.	
RDER ☆	<i>rdEr</i>	RAM failed.	

When the " ☆ " error marked show up , please send it to the nearest sales office or retail dealer .

2.4 Second Level list (PID Level)

Press MODE key for 5 seconds to enter Second Level



* Hiding function

2.5 LOCK (Security)

This parameter specifies which level are protected.

LOCK Value	Available entering level				Available change parameters
	First Level (USER Level)	Second Level (PID Level)	Third Level (INPUT Level)	Fourth Level (SET Level)	
0000	○	○	○	×	All parameters(Default value)
1111	○	○	×	○	Level 1、2、4
0100	○	○	×	×	Level 1、2
0110	○	○	×	×	Only Level1
0001	○	○	×	×	SV and LOCK
0101	○	○	×	×	Only LOCK

2.6 Third Level list (INPUT Level)

Press MODE + ◀ key 5 sec. to enter Third Level (LOCK=0)

Parameter	Description	Range	Level
INPT K2	Input type selection	See the step 2.6 Input selection	Third Level
↓MODE			
* INLO 0	Analog input low limit calibration	Range : -199.9 ~ 999.9	St-2-2
↓MODE			
* INHI 5000	Analog input high limit calibration	Range : 0~999.9	St-2-2
↓MODE			
* DP 000.0	Decimal point position	Four Types : 0000 , 000.0 , 00.00 , 0.000	St-2-2
↓MODE			
PVLO 0.0	Lower set-point limit	Range : -199.9~999.9	St-2-3
↓MODE			
PVHI 400.0	Upper set-point limit	Range : -199.9~999.9	St-2-3
↓MODE			
* 2NLO 0	Remove input low limit calibration	Range : -199.9 ~ 999.9	St-2-4
↓MODE			
* 2NHI 5000	Remove input low limit calibration	Range : -199.9~999.9	St-2-4
↓MODE			
A1D1 11	Alarm mode of AL1	Refer to the step 3.4 Alarm action description	St-1-3
↓MODE			
A1T1 99.59	Alarm time of AL1		St-1-3
↓MODE			
* A2D2 0	Alarm mode of AL2	Refer to the step 3.4 Alarm action description	St-1-4
↓MODE			
* A2T2 99.59	Alarm time of AL2		St-1-4
↓MODE			

Parameter	Description	Range	Level
* A3D3 0 ↓MODE	Alarm mode of AL3	Refer to the step 3.4 Alarm action description	St-2-1
* A3T3 99.59 ↓MODE	Alarm time of AL3		St-2-1
HYSA 0.0 ↓MODE	Hystersis of all alarm	Range : 0~100	St-4-3
LO01 200 ↓MODE	Output 1 low limit calibration	Range : 0~9999	St-4-4
HI01 3400 ↓MODE	Output 1 high limit calibration	Range : 0~9999	St-4-4
* LO02 200 ↓MODE	Output 2 low limit calibration	Range : 0~9999	St-5-1
* HI02 3400 ↓MODE	Output 2 high limit calibration	Range : 0~9999	St-5-1
* LO03 0 ↓MODE	Retransmission low limit calibration	Range : 0~9999	St-5-2
* HI03 5000 ↓MODE	Retransmission high limit calibration	Range : 0~9999	St-5-2
* R-Y 5 ↓MODE	Full run time of proportional motor	Range : 5~200 Seconds	St-5-3
* W-T 0.0 ↓MODE	Wait for continued operation(Used for programmable controller)	0=No wait Others=Wait value	St-5-3
* STAL 0000 ↓MODE	When need the alarm of "b point" , can use this function	Range : 0~1111	St-5-3

Parameter	Description	Range	Level
* ID. 2	ID number	Range:0~255	St-5-4
↓MODE			
* STOP 0-81	MODBUS	O-81 , E-81 , N-81 O-82 , E-82 , N-82	St-5-4
↓MODE			
* BAUD 9600	Baudrate	Selection:110 , 300 , 1200 , 2400 , 4800 , 9600 , 19200 , 38900bps	St-5-4
↓MODE			
SVOS 0.0	SV compensation	Range:-100~100	St-6-1
↓MODE			
PVHS 0.0	PV low compensation	Range:-100~100	St-6-1
↓MODE			
* C-F C.	Unit of PV & SV	C , F , A (Analog)	St-6-3
↓MODE			
S-F 600	Soft Filter	Range: 50~5000 Output response adjustment (slower If Soft Filter is lower)	St-6-4
↓MODE			
PVHS 0.0	PV high compensation	Range:-50~50	St-6-1
↓MODE			
* H-C HEAT	Control mode	Heating / Cooling	St-7-2
↓MODE			
+ 0.0	Digital Filter offset value		St-7-4
↓MODE			
FILT 2000	Digital Filter		St-7-4
↓MODE			

Return to INPT

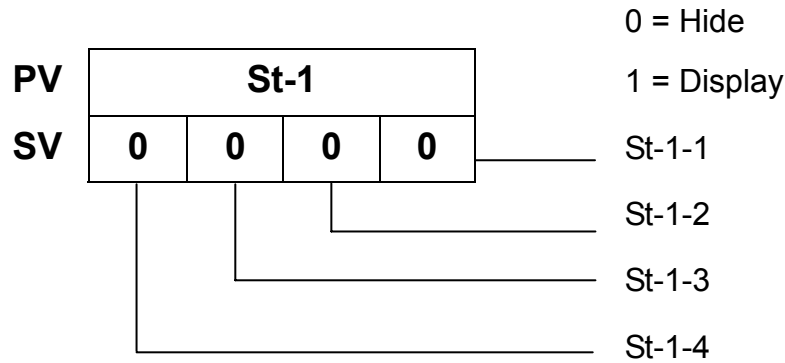
*** Hiding function**

2.7 INPT Code (Input type selection)

Type	1	2	3	4	5	6
K	K1,200.0°C	K2,400.0°C	K3,600°C	K4, 800°C	K5, 1000°C	K6, 1200°C
J	J1,200.0°C	J2,400.0°C	J3,600°C	J4,800°C	J5,1000°C	J6,1200°C
R	R1,1600°C	R2,1769°C				
S	S1,1600°C	S2,1769°C				
B	B1,1820°C					
E	E1,800°C	E2,1000°C				
N	N1,1200°C	N2,1300°C				
T	T1,400.0°C	T2,200.0°C	T3,350.0°C			
W	W1,2000°C	W2,2320°C				
PL	PL1,1300°C	PL2,1390°C				
U	U1,-199.9-600.0°C	U2,-199.9-200.0°C	U3,400.0°C			
L	L1,400°C	L2,800°C				
JP 100Ω	JP1,-199.9 600.0°C	JP2,-199.9 400.0°C	JP3,-199.9 200.0°C	JP4,200°C	JP5,400°C	JP6,600°C
DPT 100Ω	dP1,-199.9 600.0°C	dP2,-199.9 400.0°C	dP3,-199.9 200.0°C	dP4,200°C	dP5,400°C	dP6,600°C
JP. 50Ω	JP1,-199.9 600.0°C	JP2,-199.9 400.0°C	JP3,-199.9 200.0°C	JP4,200°C	JP5,400°C	JP6,600°C
AN1-5	AN1-5	An1/ -10~10mv -1999~9999	An2/ 0~10mv × 2 -1999~9999	An3/ 0~20mv × 2 -1999~9999	An4/0~50mv 0~20mA 0~5V -1999-9999	

2.8 Fourth Level list (SET Level)

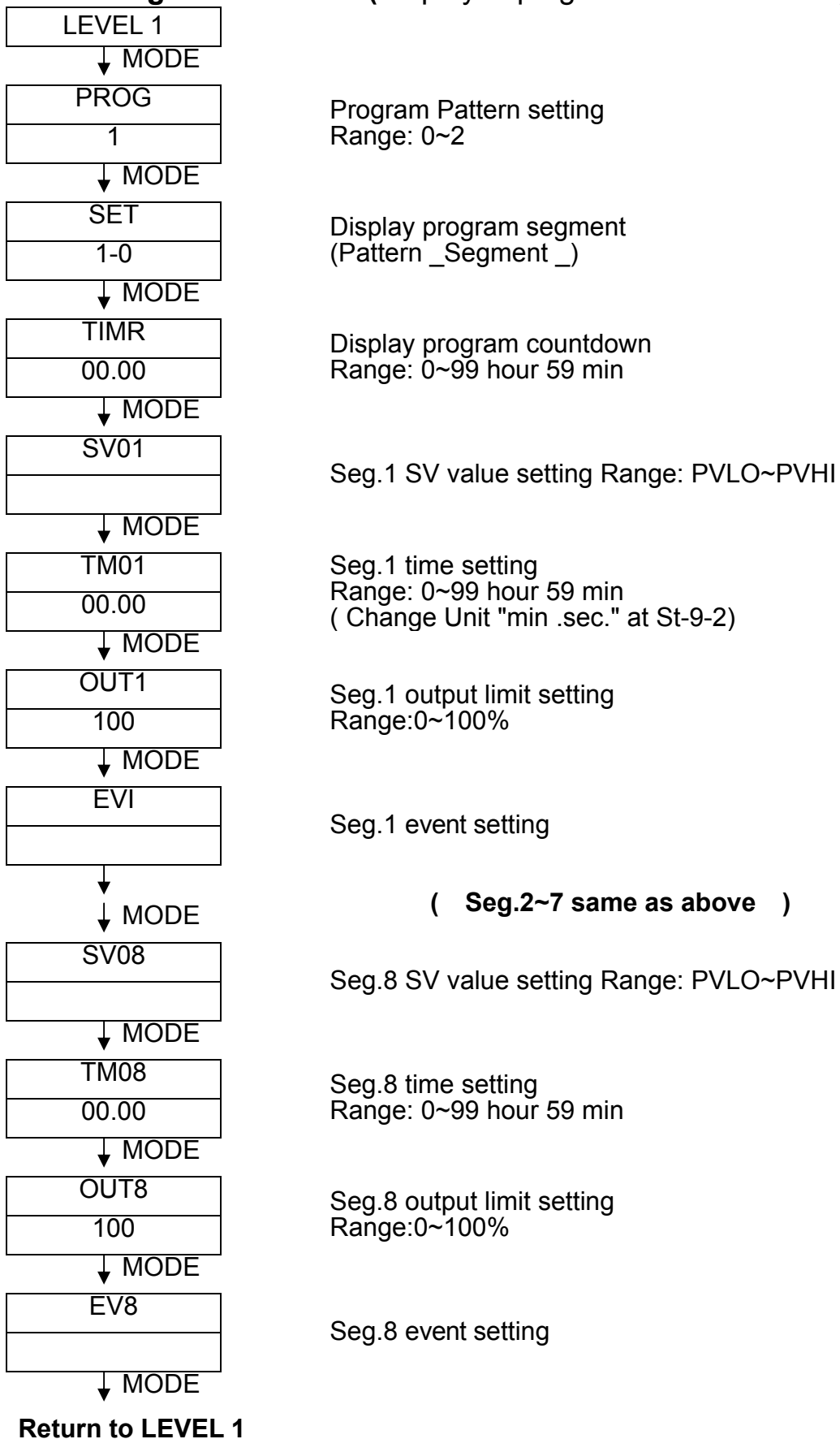
Press MODE + ◀ Key to enter the fourth level (LOCK =1111)



Description	Default value	MODE	4	3	2	1
Display/Hiding Parameters	0110	St-1	ALA2 , A2D2 , A2T2	ALA1 , A1D1 , A1T1	AT	OUTP , OUTL , OUTH
	0100	St-2	2NLO , 2NHI	PVLO , PVHI	1NLO , 1NHI , DP	ALA3 , A3D3 , A3T3
	0000	St-3	*	*	*	*
	1100	St-4	LO01 , HI01	HYSA (Hystercis of all alarm)	SV1 / SV2 (Event)	ON-OFF (OUT1 Controller switch)
	0000	St-5	ID , BAUD , STOP	R-Y , W-T , STAL	LO03 , HI03	LO02 , HI02
	1001	St-6	S-F (1= Automatic 0= Manual)	C-F (UNIT= C , F , A)	1=MODBUS 0= None	PVOS , PVHS , SVOS
	1000	St-7	FILT (Error value +1 or -1)	Power ON -Run AT	H-C(Heat / Cool)	OUT2 4-20mA Re-Transmission
Special Functions	0000	St-8	Program Function (Only available for programmable controller, refer to the step 2.11)			
	0000	St-9				
	1000	St-10				
Remote SV Setting	0	INP2	0 = None 2 = 0~50mV/0~20mA/0~5V/0~10V	1 = 10~50mV/4~20 mV/1~5v/2~10v 4 = CT input		
	0	OUTY	0 = Single output(OUT1) 2 = None 4 = 1 Phase angle control (1 φ SCR)	1 = Dual output(OUT1/ OUT2) 3 = Motor valve control 5 = 3 Phase angle control (3 φ SCR)		

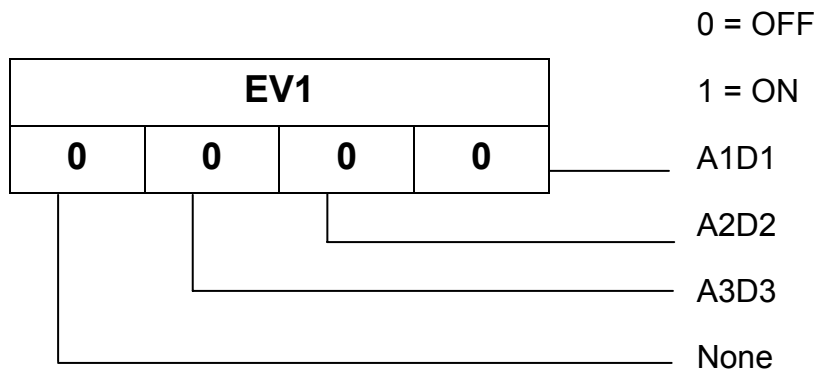
(* =None function)

2.9 Program Level list (Display in programmable controller)



2.10 Event (Display in programmable controller)

Alarm mode select " b" (refer to the step 3.5 Alarm mode)



2.10 Special Functions(Display in programmable controller)

If the LEVEL 4 St-8-4 = 1, reopen will run from Seg.1



2.11 Functions St 8 ~ 10 (Display in programmable controller)

MODE	4	3	2	1
St-8	0 = OFF 1 = Run from Seg.1	0 = Seg.1 run from 0 1= Seg.1 run from PV	0= No power failure option 1= With power failure option	0 =Program not repeat 1 = Program repeat
St-9	0 = 4 - 20 mA Transmission 1 = 20 - 4mA Transmission	0 = PV Transmission 1 = SV Transmission ※Need to add Transmission function	0 = TM Unit "Hour : Min." 1 = TM Unit " Min : Sec."	0 = Manual Output percentage 1 = Automatic Output percentage
St-10	0 = Motor valve closed and output relay use "b" contact (Default value) 1 = Motor valve closed and output relay use "a" contact	0 = Disable Remote SV function 1 = Enable Remote SV function	0 = Hide parameter "RATE" 1 = Display parameter "RATE" at LEVEL 1 ※Parameter ALA3 will be hide	0 = TTL Communication (Slave) 1 = TTL Communication (Master) ※ Used for TTL Communication

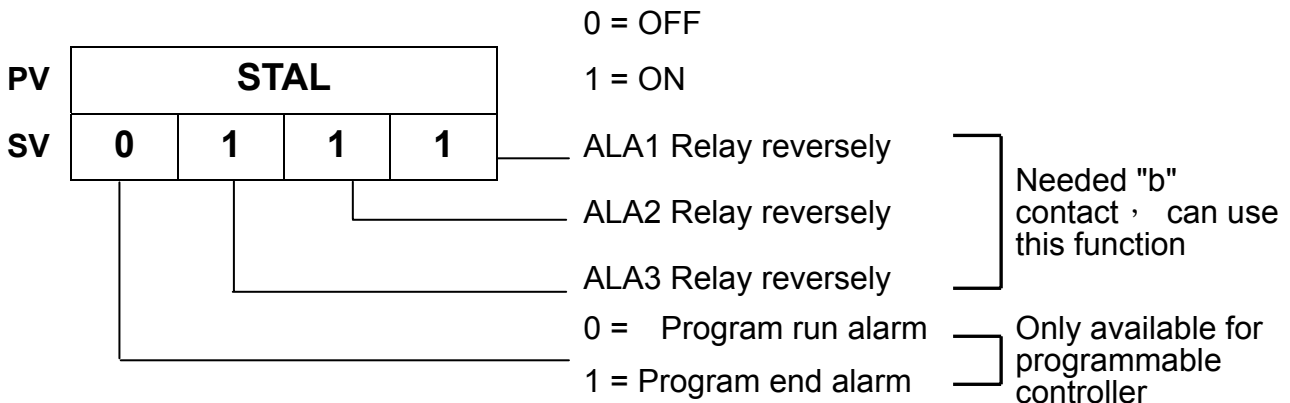
3 Applications

3.1 Alarm time (ALA1/ALA2/ALA3)

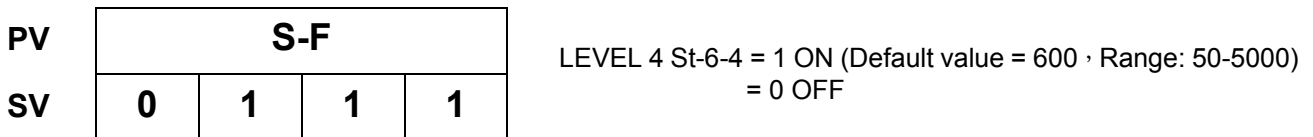
ALA1=0 Flicker alarm
 ALA1=99.59 Continued alarm
 ALA1=000.01~99.58 Delay Alarm time setting

3.2 STAL

STAL (When LEVEL 4 St-5-3 =1, display in LEVEL 3)



3.3 Soft Filter (Available for output type SCR)



- ⊙ When the value is low and the sensitivity will be diluted, suitable for slowly heating and equable environment.
- ⊙ When the value is high and the sensitivity will be augmented, suitable for quickly heating and instability environment.
 (If AT run once , S-F value will auto-add 200. The value will start from 200 when arrive to 1000.)

3.4 Alarm mode (ALA1/ALA2/ALA3)

▲ : SV Δ : Alarm start value

00 10	No alarm
01	Deviation high alarm (with hold action) OFF ON LOW Δ ▲ Δ HIGH
11	Deviation high alarm OFF ON LOW Δ ▲ Δ HIGH
02	Deviation low alarm (with hold action) ON OFF LOW Δ ▲ Δ HIGH
12	Deviation low alarm ON OFF LOW Δ ▲ Δ HIGH
03	Deviation high/low alarm (with hold action) ON OFF ON LOW Δ ▲ Δ HIGH
13	Deviation high/low alarm ON OFF ON LOW Δ ▲ Δ HIGH
04 14	Band alarm OFF ON OFF LOW Δ ▲ Δ HIGH
05	Process high alarm (with hold action) OFF ON LOW Δ HIGH
a	Heater Break Alarm(HBA)
b	Programmable
c d e f	The function is expanded

15	Process high alarm OFF ON LOW Δ HIGH
06	Process low alarm (with hold action) ON OFF LOW Δ HIGH
16	Process low alarm ON OFF LOW Δ HIGH
07	Segment end alarm (Only available for programmable controller) 1. A1D1~3 set = 07 2. ALA1~3=Alarm Segment 3. ALT1~3 set as follows: = 0 Flicker alarm = 99.59 Continued alarm = others Alarm ON time
17	Program run alarm (Only available for programmable controller) Run Stop ON OFF AL
08	System failed alarm (ON) Normal Failed OFF ON AL
18	System failed alarm (OFF) Normal Failed ON OFF AL
09	RAMP
19	SOAK