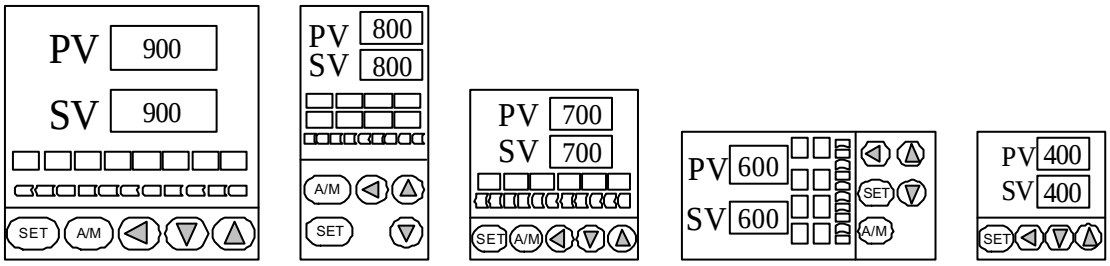
TEMPERATURE CONTROLLER

OPERATION MANUAL

Before using please check whether range, input and output match your requirement.

Thank you for using our microprocessor temperature controller, we have obtained CE certification (LDV: D/N EN61010-1; EMC EN 55 022 1994/A1: 1995/A2: 1997, EN 61 000-3-2: 1995/ -3-3: 1995, EN 61 000-4-2: 1995/ -4-3: 1996/ -4-5: 1995/ -4-6: 1996/ -4-8: 1993/ -4-11: 1996/ EN 50 204: 1995) for all our products since January, 2002. We have also computerized our QC process and testing to provide high quality standard, low price and high functionality in our products.

1. Front panel instruction



FY900 FY800 FY700 FY600 FY400

1.1 DISPLAY

PV：Process value，4 digit display (red color)

SV：Setting value，4 digit display (green color)

1.2 LED

OUT1 ：Output 1，green color

OUT2 ：Output 2，green color

AT ：Auto Tuning，yellow color

PRO ：Program，yellow color --- Only available for PFY models.

AL1 ：Alarm 1，red color

AL2 ：Alarm 2，red color

AL3 ：Alarm 3，red color

MAN ：Manual，yellow color

*Note: When error occurs, the MAN will light up, and will reset output percentage to zero.

1.3 KEY

SET : MODE & SET key

◁ : SHIFT key

▽ : DOWN key (Setting value –1, -10, -100, -1000)

△ : UP key (Setting value +1, +10, +100, +1000)

A/M : Auto/Manual key.

Automatic : The output percentage is determined by internal calculation.

Manually : The output percentage is determined by manually set OUTL at User Level.

2 Auto tuning

2.2 Once AT is set YES, auto tuning is to be performed.

2.3 After auto tuning is finished, a new set of PID parameter is generated internally to replace the existing PID parameter.

* Auto tuning allows the controller to automatically adjust the PID parameter, and is suitable for use when temperature control is not accurate enough.

2.4 ATVL=auto tuning offset, and it will be deduced from SV (it can prevent over shoot during auto tuning)

SV-ATVL=Auto-tuning value, ATVL=auto tuning offset

Ex.SV=200℃, ATVL=5, Auto tuning point is at 195℃

During auto tuning the PV value will oscillate around 195℃.

Hence PV will not go over 200℃.

＊ In programmable model, ATVL means Auto-tuning point

2.5 Auto tuning failure

Possible Cause 1： ATVL is too big. (If not sure, set ATVL=0)

Possible Cause 2： System time is too long. (Set PID parameter individually)

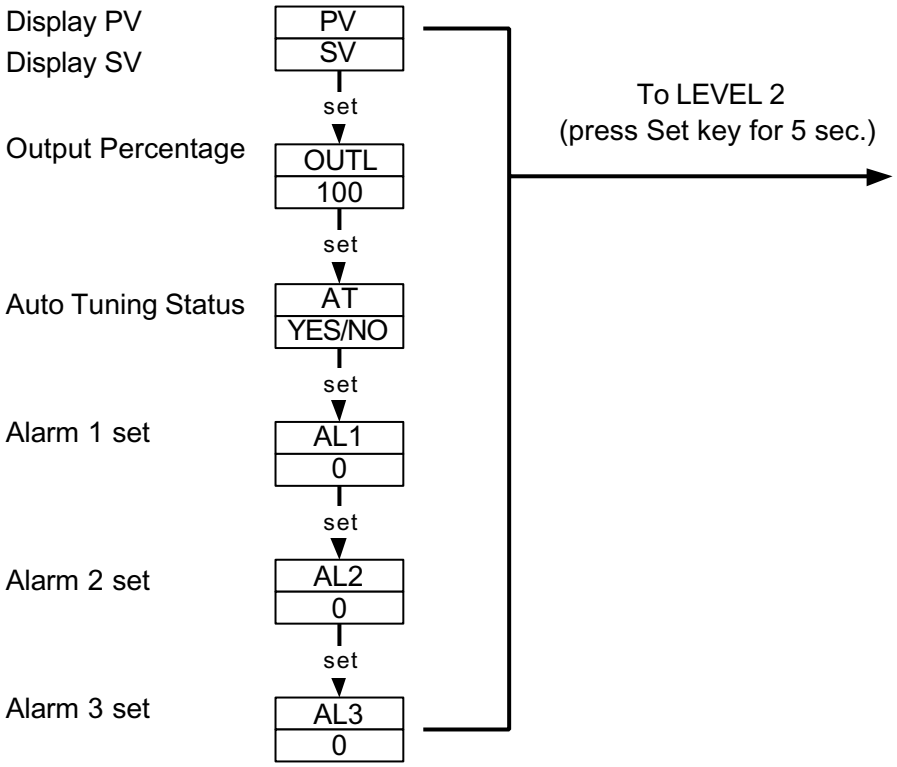
3. Error information

DISPLAY	DESCRIPTION
IN1E	Open circuit of main control sensor.
＊ **ADCF**	A/D converter failed.
＊ **CJCE**	Cold junction compensation failed.
IN2E	Open circuit of sub control sensor.
UUU1	PV exceeds USPL.
NNN1	PV under LSPL.
UUU2	Input signal of sub control exceeds the upper limit.
NNN2	Input signal of sub control under the lower limit.
＊ **RAMF**	RAM failed.
INTF	Interface failed.
AUTF	Auto tuning failed.

NOTE： If the "＊" marked error comes up， the Controller needs repair.
Please send it to the nearest sales office or retail dealer.

4. Operating flow

4.1 LEVEL 1 (User Level)



4.1.1 Press the **SHIFT KEY** (◁) to change the parameters. If the **SHIFT KEY** is pressed, the first digit begins blinking. Press the **UP KEY**(△) or **DOWN KEY**(▽) to increase or decrease the value of the digit, then press the **SHIFT KEY**(◁ again to go to the next digit. As all the digit are written, press **SET KEY** to enter the value.

4.1.2 **SET KEY** also has the function of changing MODEs, if the **SET KEY** is pressed, the display shows the next MODE.

4.1.3 Press **SET KEY** for 5 sec. the display goes to LEVEL 2, and do the same to return LEVEL 1.

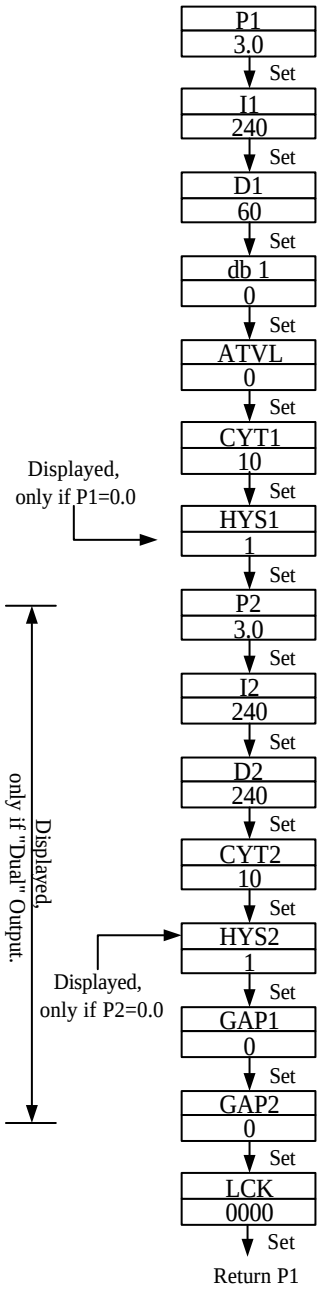
4.1.4 If any key were not pressed for 1 minute, the display would go to LEVEL 1.

4.1.5 Press **A/M KEY** twice will go to LEVEL 1, no matter where it is.

4.1.6 If **OUTL** set "0", it means the controller has no output,

4.2 LEVEL 2 (PID Level)

press SET key for 5 seconds to enter Level 2



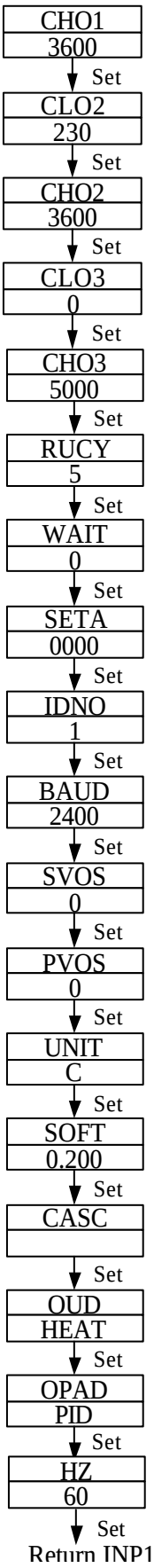
Main Control Proportional Band	Range：0.0-200.0% ON/OFF at P=0
Main Control Integral Time	Range：0~3600 Sec Integral OFF at I=0
Main Control Derivative Time	Range：0~900 Sec Derivative OFF at D=0
Main Control Dead-band Time	Don t care
Main Control Auto tuning off-set	Range：0~USPL
Main Control Proportional Cycle	Output (SSR=1, 4 ~ 20mA=0, Relay=over 10) Range：0~150 Sec
Main Control Hysteresis	Range：0~1000 (For ON/OFF control only) OFF: PV > (SV+HYS1) ON: PV <= (SV-HYS1)
Sub Control Proportional Band	Sames as P1
Sub Control Integral Time	Sames as I1
Sub Control Derivative Time	Sames as D1
Sub Control Proportional Cycle	Sames as CYT1
Sub Control Hysteresis	Sames as HYS1
Main Control Gap (Output 1)	OUT1(HEAT) Setting Point=SV - GAP1
Sub Control Gap (Output 2)	OUT2(COOL) Setting Point=SV + GAP2
Function Lock	

LCK=0000, To enter any Level (not include SET Level) and change their parameters
LCK=1111, To enter any Level (include SET Level) and change their parameters
LCK=0100, To enter Level 1 & 2 and to change their parameters.
LCK=0110, To enter Level 1 & 2 and to change Level 1parameters only .
LCK=0001, To enter Level 1 only and to change SV only.
LCK=0101, it can t change any parameter except LCK.

4.3 LEVEL 3 (INPUT Level)

When LCK=0000, press SET key and SHIFT KEY ◁ for 5 seconds to enter LEVEL 3

INP1 K2	Main Control input selection	select the input range, refer to input selection (P.12 ~ 13)
Set ↓		
ANL1 0	Main Control Analog Zero set	It is used when INP1=AN1~AN5 Range：LSPL~USPL
Set ↓		
ANH1 5000	Main Control Analog Span set	Same as ANL1
Set ↓		
DP 0000	Decimal point	To set the position of decimal point (Only applicable when INP1=AN1~AN5)
Set ↓		
LSPL 0.0	Lower set-point limit	To set the lowest point within INP1
Set ↓		
USPL 400.0	Upper set-point limit	To set the highest point within INP1
Set ↓		
ANL2 0	Sub Control Analog Zero set	It is used as input code are AN1 to AN5 Range：LSPL~USPL
Set ↓		
ANH2 5000	Sub Control Analog Span set	Sames as ANL2
Set ↓		
ALD1 01	Alarm mode of AL1	Range:00~19 (see P.14~15)
Set ↓		
ALT1 10	Time set of Alarm 1	Range：0~99.59 min. 0=flicker alarm, 99.59=continued, and other=on delay time Note:In program model,ALT=Alarm on time
Set ↓		
ALD2 01	Alarm mode of AL2	Range:00~19 (see P.14~15)
Set ↓		
ALT2 0	Time set of Alarm 2	Sames as ALT1
Set ↓		
ALD3 01	Alarm mode of AL3	Range:00~19 (see P.14~15)
Set ↓		
ALT3 0	Alarm 3 time set	Sames as ALT1
Set ↓		
HYSA 0	Hysteresis of alarm	Range：0~1000
Set ↓		
CLO1 230	Main Control calibration	Calibrate the low value of output Range：LSPL~USPL(current output only)
Set ↓		

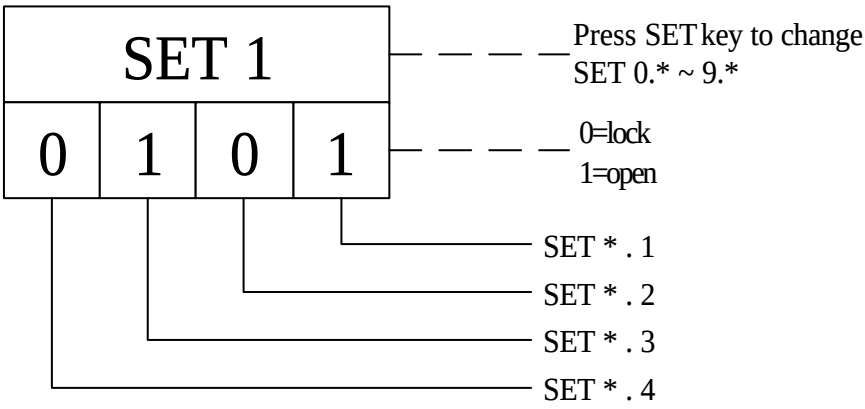


Main Control Calibration high	To calibrate the high value of output Range:0~9999(current output only)
Sub control Calibration low	Same as CLO1
Sub control Calibration high	Same as CHO1
Transmitter control Calibration low	Same as CLO1
Transmitter control Calibration high	Same as CHO1
Timer of motor	Full run time of proportional motor (without potentiometer) Range：5~200 sec.
Use in program for waiting continued operation	0=No Wait Other=Wait volume
	Refer to "SETA" description. (see P.22)
ID number (don t care)	Communication ID number
Baud rate (don t care)	UART baud rate selection Range：110~9600 BIT/sec
Compensate SV	Range：-1000~1000
Compensate PV	Range：LSPL~USPL
Unit of PV & SV	Range：C, F, A(analog)
Soft filter (don t care)	Adjust the response time of PV (the bigger, the faster) Range：0.05~1.00
don t care	
Action mode	Range：heat, cool
Control action	Range：PID, Fuzzy
Frequency	Range：50, 60HZ

4.4 LEVEL 4 (SET Level)

When LCK=1111, press SET key and SHIFT KEY ◁ for 5 seconds to enter Level 4. There are SET 0.1 to SET 9.4 for use.

4.4.1 Display：



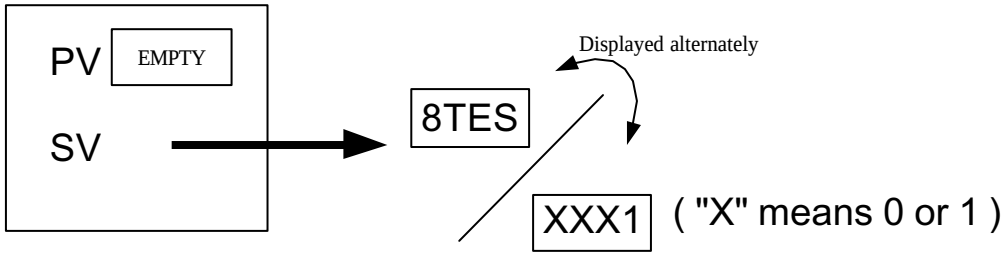
4.4.2 Function of SETs

SET	Function	SET	Function
1.1	OUTL	5.1	CLO2, CHO2
1.2	AT	5.2	CLO3, CHO3
1.3	AL1	5.3	RUCY, WAIT, SETA
1.4	AL2	5.4	IDNO, BAUD
2.1	AL3	6.1	SVOS
2.2	ANL1, ANH1, DP	6.2	PVOS
2.3	LSPL, USPL	6.3	UNIT
2.4	ANL2, ANH2	6.4	SOFT
3.1	ALD1	7.1	CASC
3.2	ALT1	7.2	OUD
3.3	ALD2	7.3	OPAD
3.4	ALT2	7.4	HZ
4.1	ALD3		
4.2	ALT3		
4.3	HYSA		
4.4	CLO1, CHO1		

SET	Function	Remarks
8.1	0=No repeat	Programmable Model Only
	1=Program repeat	
8.2	0=No power failure	
	1=With power failure	
8.3	0=Start from 0	
	1=Start from PV	
9.3	TRS SV	Auxiliary Output Use
9.4	TRS PV	
0.3	0=No Remote SV	
	1=Remote SV	

- When SET8.3=1 (The programmable controller will initiate the SV value to be the current PV value.) The controller will be more energy efficient, and also decreases the time needed to achieve the desired SV value. The remaining time left to reach the SV value will be shown in the parameter "TIMR". Hence the time of countdown is related to the PV value, not related to segment setting.
- Please don't operate **SET 8.4**, otherwise the controller's process will be in confusion.

If SET8.4 is set to "1", the controller will enter into "Single Display" mode, the PV LED will not display any values. The SV LED will display both the parameter value and the setting value alternately as shown in the diagram below.

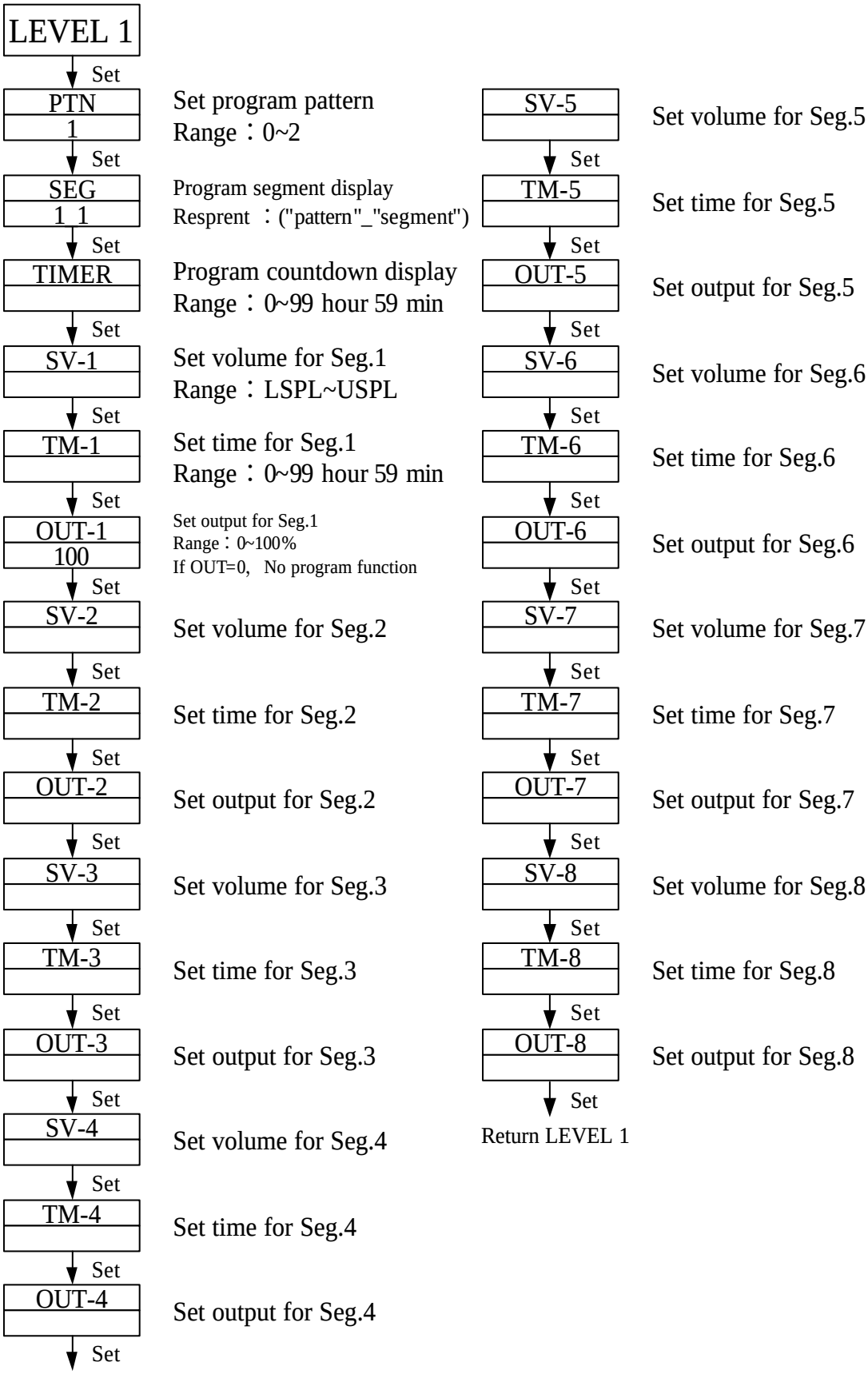


To rectify the problem please press the SHIFT KEY (◁) and change the setting value to "XXX0".

4.4.3 FUNCTION OF LCK

LCK=**0000**, It can enter Level 3 (press SET + ◁ for 5 sec.)
LCK=**1111**, It can enter Level 4 (press SET + ◁ for 5 sec.)
LCK=**0100**, It can enter Level 1 & 2 and change their parameters.
LCK=**0110**, It can enter Level 1 & 2 but change Level 1 parameters only.
LCK=**0001**, It can enter Level 1 only and change SV only.
LCK=**0101**, It can't change any parameters except LCK.

4.5 PROGRAM LEVEL (to be ordered)



4.5.1 This program has 2 patterns， each pattern contains 8 segments.

4.5.2 Terminologies

Pattern ：A program consists of some steps.

Step ：A Ramp status + a Soak status.

Ramp status：The status with changing SV.

Soak status ：The status with fixed SV.

4.5.3 Operating

1. **"KEY" function (no changing parameter)**

△ (RUN) : To start program procedure， **PRO** in panel flicker.

▽ (HOLD) : To suspend program procedure， **PRO** in panel will stop flicker but light.

△ + **SET**(JUMP) ：To jump segment.

▽ + **SET** (RESET)：To reset program procedure， PRO in panel will be "off".

2. **Alarm Function：**

If **ALD1** to be set "07" (＊refer to the selection， p.14~15),

AL1 to be set "2"(AL1=2， it means alarm in segment 2 end),

ALT1 to be set "00.10" (alarm time 10 sec.).

＊ In this case， when program proceeds to segment 2 end， ALM1 relay will be on 10 sec.

3. **END function：**

This controller doesn' t have END order, so if program procedure are less than 8 segments, please set segment' s out = 0, then this program will end in last set segment. Otherwise， it will proceed 8 or 16 segments.

4. **Linking Function：**

PTN=1 proceed pattern 1， contains 8 segments.

PTN=2 proceed pattern 2， contains 8 segments.

PTN=0 linking proceed pattern 1 and 2 totally 16 segments.

(set PTN1 and PTN2 at first， then set PTN=0)

5. **Other function(＊refer to LEVEL 4)**

SET 8.1=1 program repeat.

SET 8.2=0 No power fail function.

SET 8.2=1 with power fail function

(if power suspend， the controller will keep memory)

SET 8.3=0 program start from 0.

SET 8.3=1 program start from PV.

5. INPUT

5.1 Input selection (INP1)

TYPE	*CODE*	*RANGE*
K	**K1**	0.0 ~ 200.0℃ / 0.0 ~392.0℉
	K2	0.0 ~ 400.0℃ / 0.0 ~752.0℉
	K3	0 ~ 600℃ / 0 ~1112℉
	K4	0 ~ 800℃ / 0 ~1472℉
	K5	0 ~ 1000℃ / 0 ~1832℉
	K6	0 ~ 1200℃ / 0 ~2192℉
J	**J1**	0.0 ~ 200.0℃ / 0.0 ~392.0℉
	J2	0.0 ~ 400.0℃ / 0.0 ~752.0℉
	J3	0 ~ 600℃ / 0 ~1112℉
	J4	0 ~ 800℃ / 0 ~1472℉
	J5	0 ~ 1000℃ / 0 ~1832℉
	J6	0 ~ 1200℃ / 0 ~2192℉
R	**R1**	0 ~ 1600℃ / 0 ~2912℉
	R2	0 ~ 1769℃ / 0 ~3216℉
S	**S1**	0 ~ 1600℃ / 0 ~2912℉
	S2	0 ~ 1769℃ / 0 ~3216℉
B	**B1**	0 ~ 1820℃ / 0 ~3308℉
E	**E1**	0 ~ 800℃ / 0 ~1472℉
	E2	0 ~ 1000℃ / 0 ~1832℉
N	**N1**	0 ~ 1200℃ / 0 ~2192℉
	N2	0 ~ 1300℃ / 0 ~2372℉
T	**T1**	0.0 ~ 400.0℃ / 0.0 ~752.0℉
	T2	0.0~ 200.0℃ / 0.0 ~392.0℉
	T3	0.0 ~ 350.0℃ / 0.0 ~662.0℉
W	**W1**	0 ~ 2000℃ / 0 ~3632℉
	W1	0 ~ 2320℃ / 0 ~2372℉
PLⅡ	**PL 1**	0 ~ 1300℃ / 0 ~2372℉
	PL 2	0 ~ 1390℃ / 0 ~2534℉
U	**U1**	-199.9 ~ 600.0℃ / -199.9 ~999.9℉
	U2	-199.9 ~ 200.0℃ / -199.9 ~392.0℉
	U3	0.0 ~ 400.0℃ / 0.0 ~752.0℉

TYPE	*CODE*	*RANGE*
L	**L1**	0 ~ 400℃ / 0 ~752℉
	L2	0 ~ 800℃ / 0 ~1472℉
JIS PT100	**JP 1**	-199.9 ~ 600.0℃ / -199.9 ~999.9℉
	JP 2	-199.9 ~ 400.0℃ / -199.9 ~752.0℉
	JP 3	-199.9 ~ 200.0℃ / -199.9 ~392.0℉
	JP 4	0 ~ 200℃ / 0 ~392℉
	JP 5	0 ~ 400℃ / 0 ~752℉
	JP 6	0 ~ 600℃ / 0 ~1112℉
DIN PT100	**DP 1**	-199.9 ~ 600.0℃ / -199.9 ~999.9℉
	DP 2	-199.9 ~ 400.0℃ / -199.9 ~752.0℉
	DP 3	-199.9 ~ 200.0℃ / -199.9 ~392.0℉
	DP 4	0 ~ 200℃ / 0 ~392℉
	DP 5	0 ~ 400℃ / 0 ~752℉
	DP 6	0 ~ 600℃ / 0 ~1112℉
JIS PT50	**JP.1**	-199.9 ~ 600.0℃ / -199.9 ~999.9℉
	JP.2	-199.9 ~ 400.0℃ / -199.9 ~752.0℉
	JP.3	-199.9 ~ 200.0℃ / -199.9 ~392.0℉
	JP.4	0 ~ 200℃ / 0 ~392℉
	JP.5	0 ~ 400℃ / 0 ~752℉
	JP.6	0 ~ 600℃ / 0 ~1112℉
AN1	**AN1**	-10 ~ 10mV / -1999~9999
AN2	**AN2**	0 ~ 10mV / -1999~9999
AN3	**AN3**	0 ~ 20mV / -1999~9999
AN4	**AN4**	0 ~ 50mV / -1999~9999
AN5	**AN5**	10 ~ 50mV /-1999~9999

＊The initial set in factory is “K2” without any certain requirement

6. ALARM

6.1 Alarm function selection

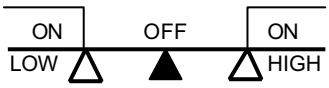
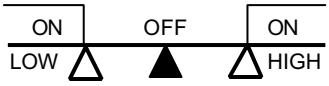
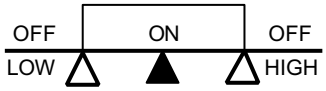
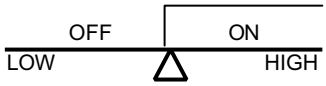
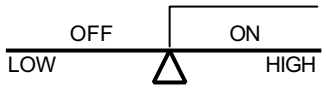
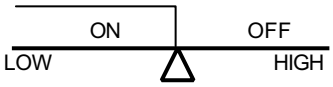
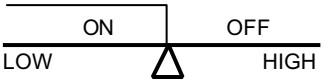
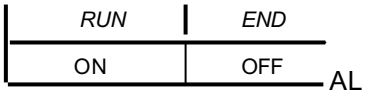
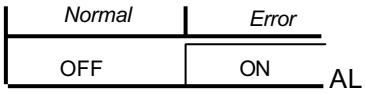
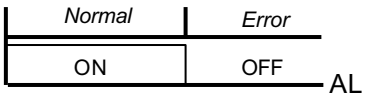
CODE	*DESCRIPTION*	*INHIBIT*
00 / 10	**None**	
01	**Deviation high limit alarm**	**YES**
11	**Deviation high limit alarm**	**NO**
02	**Deviation low limit alarm**	**YES**
12	**Deviation low limit alarm**	**NO**
03	**Deviation high / low limit alarm**	**YES**
13	**Deviation high / low limit alarm**	**NO**
04 / 14	**Deviation high / low limit range alarm**	**NO**
05	**Absolute value high limit alarm**	**YES**
15	**Absolute value high limit alarm**	**NO**
06	**Absolute value low limit alarm**	**YES**
16	**Absolute value low limit alarm**	**NO**
07	**Segment end alarm** **(use for program model only)**	**-**
17	**Program run alarm** **(use for program model only)**	**-**
08	**System error alarm-on**	**-**
18	**System error alarm-off**	**-**
09		**-**
19	**On delay timer alarm**	**-**

Note：the word "**INHIBIT**" means that alarm does not work at the first time.

6.2 Alarm action description

▲ : **SV**

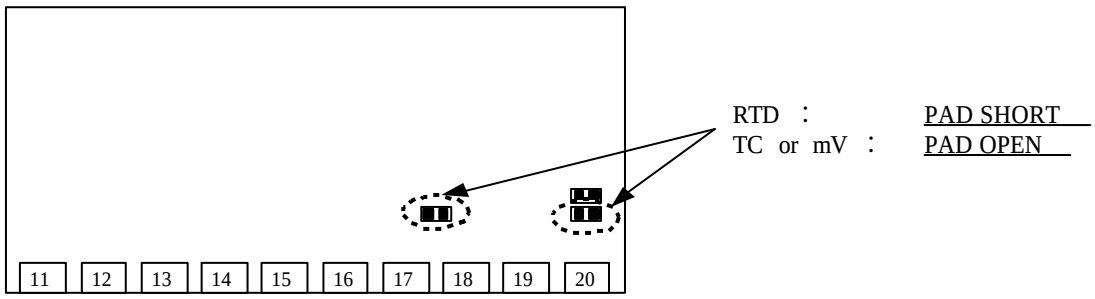
△ : **Alarm set value**
(**inhibit** means alarm doesn't work at the first time)

00 10	**Non**
01	**Deviation high alarm inhibit** 
11	**Deviation high alarm no inhibit** 
02	**Deviation low alarm inhibit** 
12	**Deviation low alarm no inhibit** 
03	**High low alarm inhibit** 
13	**High low alarm no inhibit** 
04 14	**Band alarm** 
05	**Absolute high alarm inhibit** 
15	**Absolute high alarm no inhibit** 
06	**Absolute low alarm inhibit** 
16	**Absolute low alarm no inhibit** 
07	**Segment end alarm** **(use for PFY Model only)** (1) ALD1~3, set **07** (2) AL1~3=alarm segment No.set (3) ALT1~3 if set **0**=flicker alarm ALT1~3 if set **99.59**=continued alarm ALT1~3 if set **others**=ON delay time
17	**Program Run alarm(Refer to SETA.4,** P.22**)** **(use for PFY Model only)** 
08	**System error alarm - ON** 
18	**System error alarm - OFF** 
09	
19	**On delay timer** When PV=alarm SV, it keeps a certain period(set time)before alarm action. Range:00H.00M~99H.59M

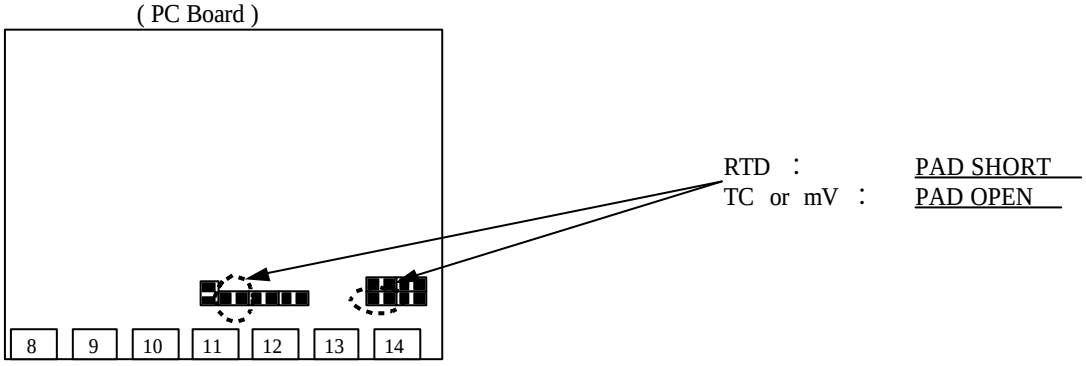
7. Modification of input “TC” ⇄ “RTD”(on PC board)

If the controller needs modification from **TC** or **mV** to **RTD** type, please make PAD short on PC board back as following diagram and changing input selection. On the contrary, modify from **RTD** to **TC** or **mV**, make PAD open.

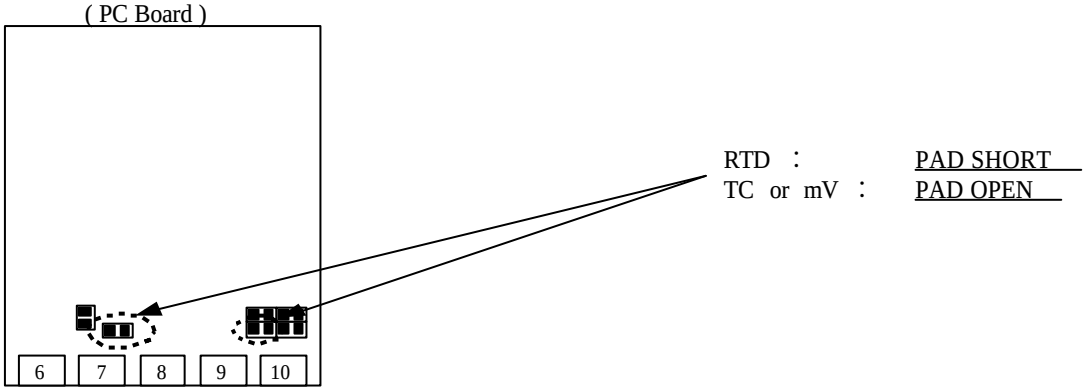
96×96, 48×96, 96×48
(PC Board)



72×72
(PC Board)



48×48
(PC Board)



8.Modification of output “Relay” ⇄ “SSR” ⇄ “4~20mA”

It just needs to change a module at the same position, and modify parameter **CYT1** in LEVEL 2 .

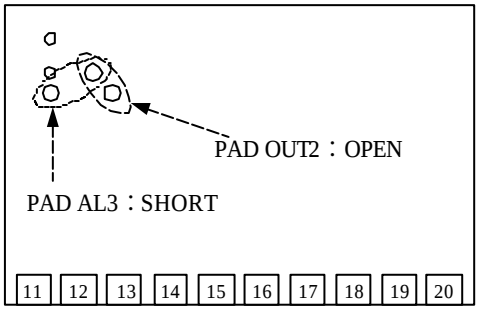
9. Modification of output

“HEAT/ALARM” ⇄ “HEAT/COOL” (on PC board)

HEAT / ALARM

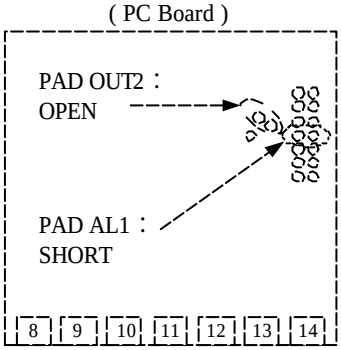
96×96, 48×96, 96×48

(PC Board)



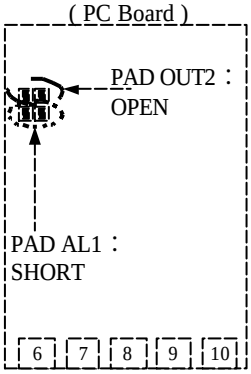
72×72

(PC Board)



48×48

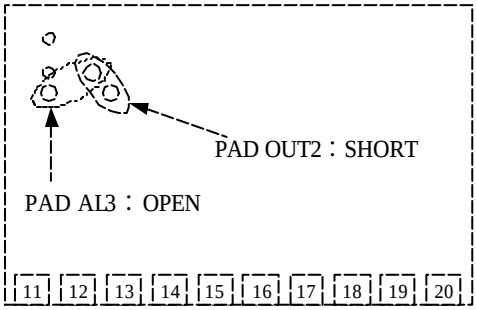
(PC Board)



HEAT / COOL

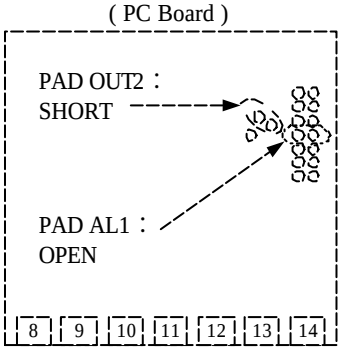
96×96, 48×96, 96×48

(PC Board)



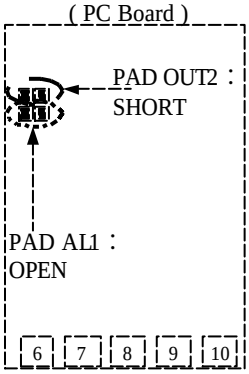
72×72

(PC Board)



48×48

(PC Board)



10. Modification of INPUT：0~1V，0~5V，0~10V，mA

10.1 Hardware part：

	96×96，48×96，96×48	72×72	48×48
INPUT (+)	PIN 17	PIN 11	PIN 7
INPUT (-)	PIN 20	PIN 14	PIN 10

0~20mA (INP1=AN4) : (R3 use 100Ω， R5 use 2.4Ω， S3&S5 SHORT)

4~20mA (INP1=AN5) : (R3 use 100Ω， R5 use 2.4Ω， S3&S5 SHORT)

0 ~ 1V (INP1=AN4) : (R1 use 2KΩ， R4 use 100Ω， S1&S4 SHORT)

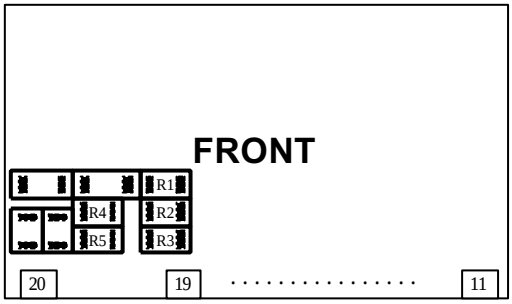
0 ~ 5V (INP1=AN4) : (R2 use 10KΩ， R4 use 100Ω， S2&S4 SHORT)

1 ~ 5V (INP1=AN5) : (R2 use 10KΩ， R4 use 100Ω， S2&S4 SHORT)

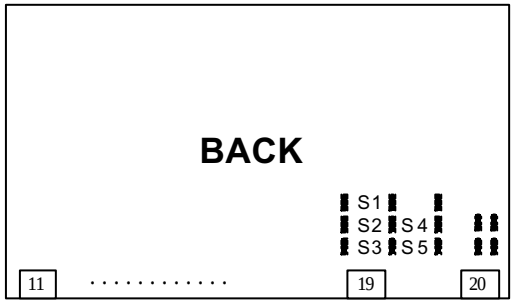
0 ~ 10V (INP1=AN4) : (R3 use 22KΩ， R4 use 100Ω， S3&S4 SHORT)

2 ~ 10V (INP1=AN5) : (R3 use 22KΩ， R4 use 100Ω， S3&S4 SHORT)

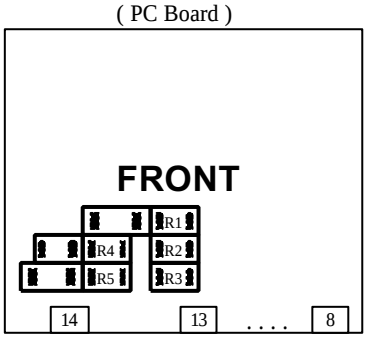
96×96，48×96，96×48
(PC Board)



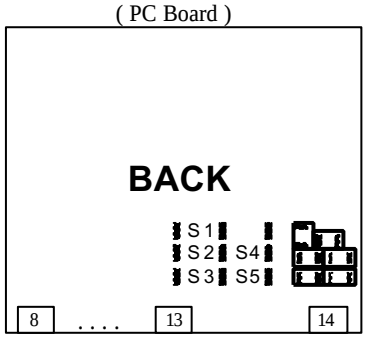
96×96，48×96，96×48
(PC Board)



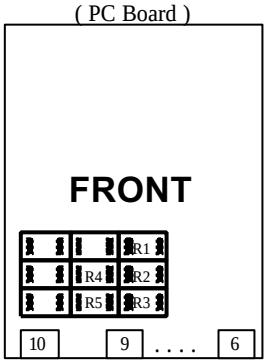
72×72
(PC Board)



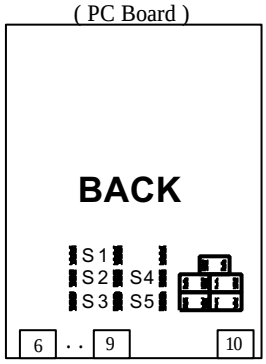
72×72
(PC Board)



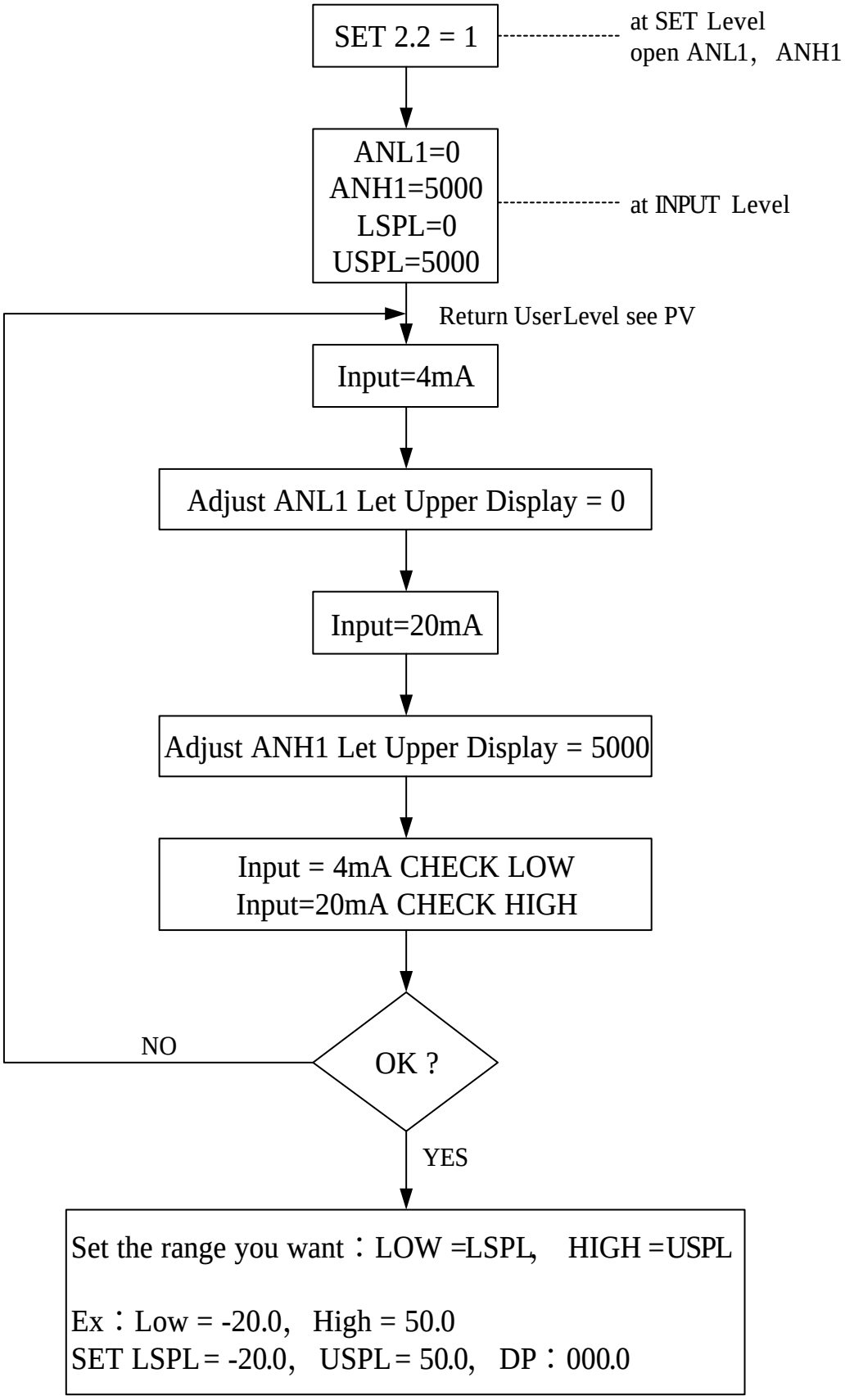
48×48
(PC Board)



48×48
(PC Board)

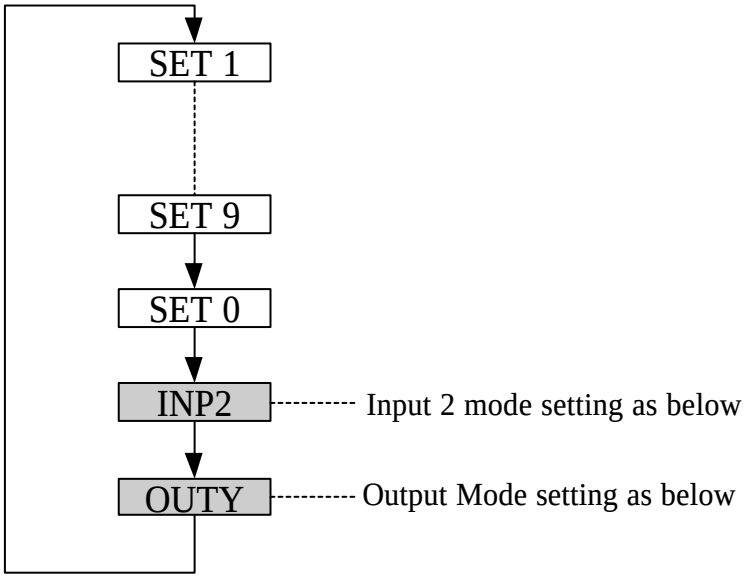


10.2 Software part (Calibrate input)



11. Special Function Description：

11.1 LEVEL 4 (Set Level)



11.1.1 Second input mode (FY MODEL ONLY)

INP2=0 None

INP2=1 10~50mV / 4~20mA / 1~5V / 2~10V

INP2=2 0~50mV / 0~20mA / 0~5V / 0~10V

*Second Input is for Remove SV function, but the PFY model`s SV can only be controlled by the program, so INP2=0 is not applicable.

11.1.2 Output mode

OUTY=0 Single Output

OUTY=1 Double Output

OUTY=2 None

OUTY=3 Motor Valve

OUTY=4 1φSCR (Single Phase Control)

OUTY=5 3φSCR (Three Phase Control)

11.2 RAMP & SOAK (Only Applicable for FY MODEL)

11.2.1 RAMP：

I. Please set "SET2.1=1"(Display AL3), "SET4.1=1" (Display ALD3)

II. ALD3=9 at INPUT Level

III. RAMP menu will be displayed (replace AL3)

RAMP
0 0.0 0

Range：00.00 ~ 99.99
Unit：℃ / min
(If RAMP not used, set ALD3=0)

11.2.2 SOAK：

I. ALD1 / ALD2=19

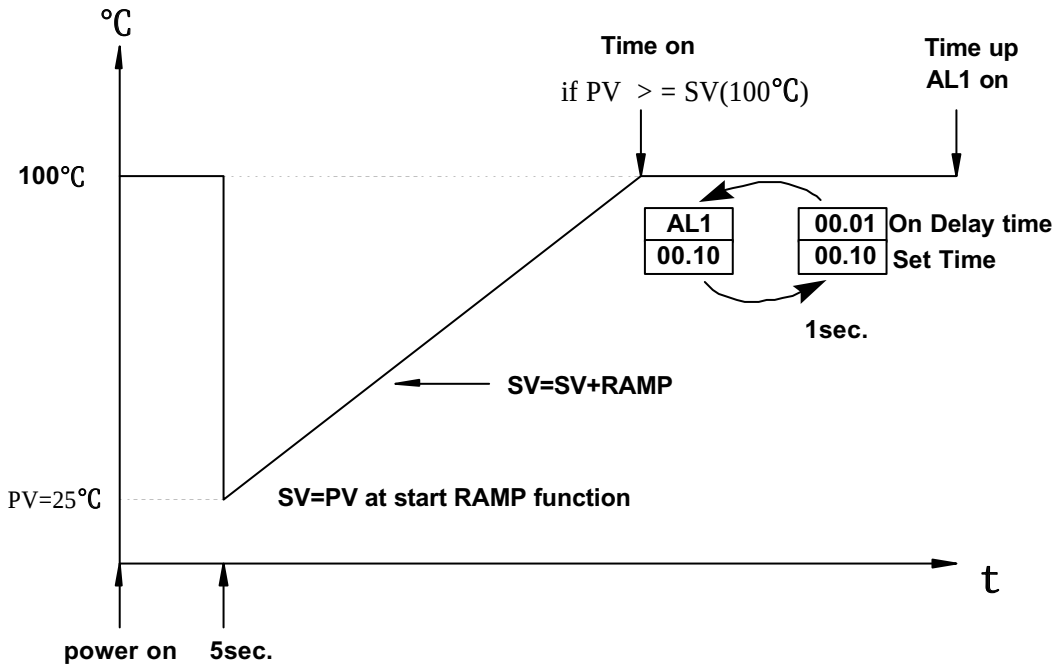
II. AL1 / AL2 will be display

AL1
0 0 . 0 0

Range：00.00 ~ 99.59(Hour.Minute)

11.2.3 Example：

SV=100℃, RAMP=10.00 (℃/min), AL1=00.10 min, PV=25℃



11.3 REMOTE SV (Only applicable for FY MODEL)

11.3.1 Hardware must be mounted

11.3.2 Set INP2 to1 or 2 (calibration use ANL2, ANH2)

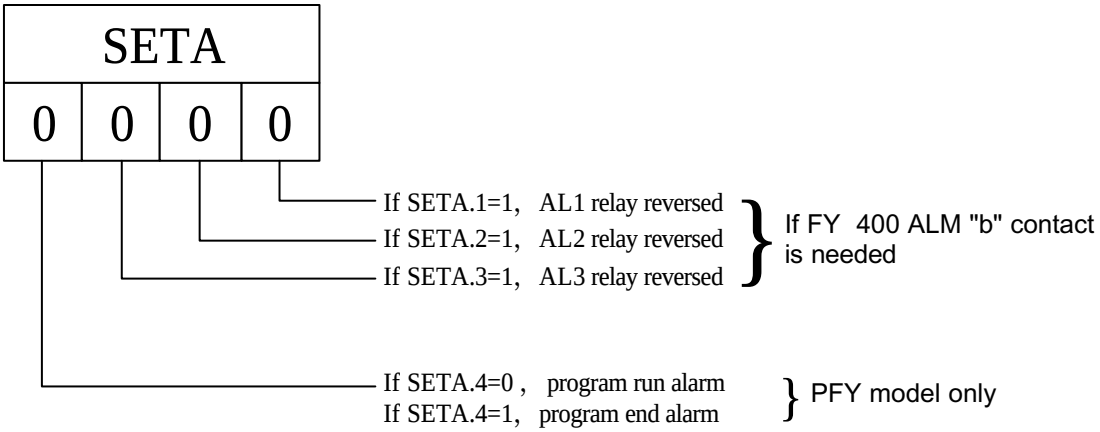
11.3.3 SET 0.3=0 means local SV

11.3.4 SET 0.3=1 means remote SV from Input 2 channel

11.4 Alarm Time ALT1/ALT2/ALT3 description (FY MODEL ONLY)

1. ALT1=0 means flicker if AL1 is on
2. ALT1=99.59 means alarm if AL1 is on
3. ALT1=00.01 ~ 99.58 means AL1 is on delay timer
   (＊ use for large EMI affect controller)

11.5 Renew function "HYSM" ⟶ "SETA"



11.6 Function SET8

11.6.1 SET8.1=0 None
SET8.1=1 program repeat (PFY model)

11.6.2 SET8.2=0 Non (PFY only)
SET8.2=1 Power failure access

11.6.3 SET8.3=0 Zero start (PFY only)
SET8.3=1 PV start (PFY only)

11.6.4 SET8.4=0 None
SET8.4=1 display will be transferred to single display
(Don' t set this Bit)
＊SET8=0000 can return double display

11.7 Function SET9

11.7.1 SET9.1=0 None

SET9.1=1 PV / SV switching

(use for single display so please don't set this Bit.)

11.7.2 SET9.2=0 None

SET9.2=1 PFY models : Timer change from H.M to M.S

11.7.3 SET9.3=0 None

SET9.3=1 Transmission SV

11.7.4 SET9.4=0 None

SET9.4=1 Transmission PV

11.8 SET0

11.8.1 SET0.1=0 None

SET0.1=1 TTL communication SV output

11.8.2 SET0.2=0 None

SET0.2=1 Rate for AL3 (ALD3=0) (see Application 1, P.25)

11.8.3 SET0.3=0 None

SET0.3=1 Remote SV

11.8.4 SET0.4=0 Motor Valve close = "b" out

SET0.4=1 Motor Valve close = "a" out (Don't care)

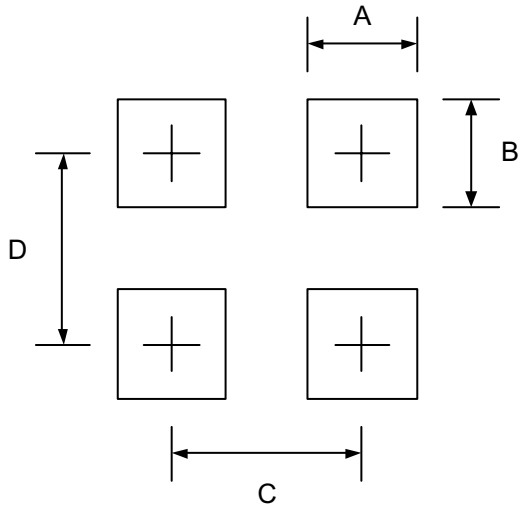
11.9 WAIT at INPUT Level

WAIT=0 means "no wait"

WAIT≠0 means "wait"

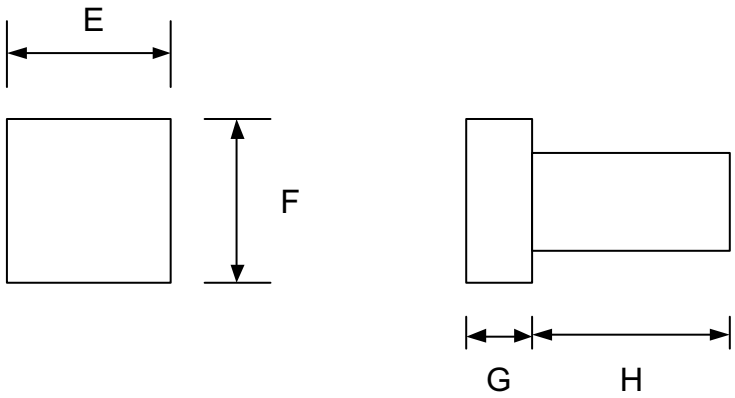
12.Panel cut & Outline Dimension：

12.1 Panel Cut Dimension(Units：mm)



	A	B	C	D
FY400	44.5+0.5	44.5+0.5	65	70
FY600	90.5+0.5	44.5+0.5	111	70
FY700	68.5+0.5	68.5+0.5	89	94
FY800	44.5+0.5	90.5+0.5	65	116
FY900	90.5+0.5	90.5+0.5	111	116

12.2 Outline Dimension (Units：mm)



	E	F	G	H
FY400	50	50	17	80
FY600	96	50	17	80
FY700	74	74	17	80
FY800	50	96	17	80
FY900	96	96	17	80

Application

App1. TTL communication：SV output & RATE function

- **Open RATE function (use for slave)**

11.10 Open Rate ：SET0.2=1

11.11 Open AL3 ：SET2.1=1

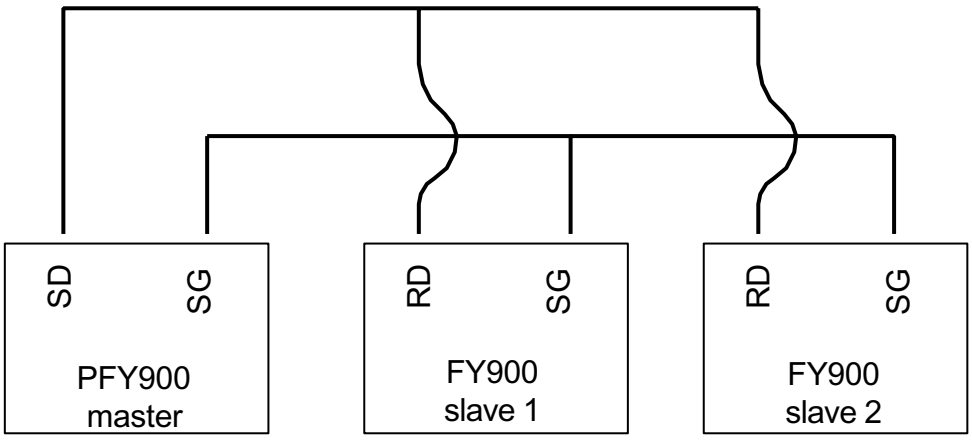
11.12 Open ALD3：SET4.1=1

11.13 ALD3=0 at INPUT Level

11.14 Slave SV = (**RATE**÷9999)×master SV

- **Example：**

Connect Diagram

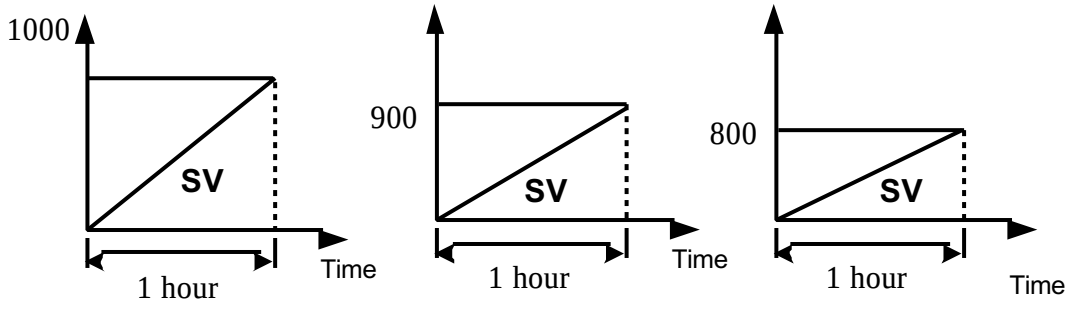


SV OUT (SET0.1=1)
IDNO=0 (SET5.4=1)
BAUD=2400 (SET5.4=1)

IDNO=1 (SET5.4=1)
BAUD=2400 (SET5.4=1)
open RATE function

IDNO=2 (SET5.4=1)
BAUD=2400 (SET5.4=1)
open RATE function

Time Chart



SV_1=1000
TM_1=01.00 hour
OUT_1=100%
OUT_2=0%

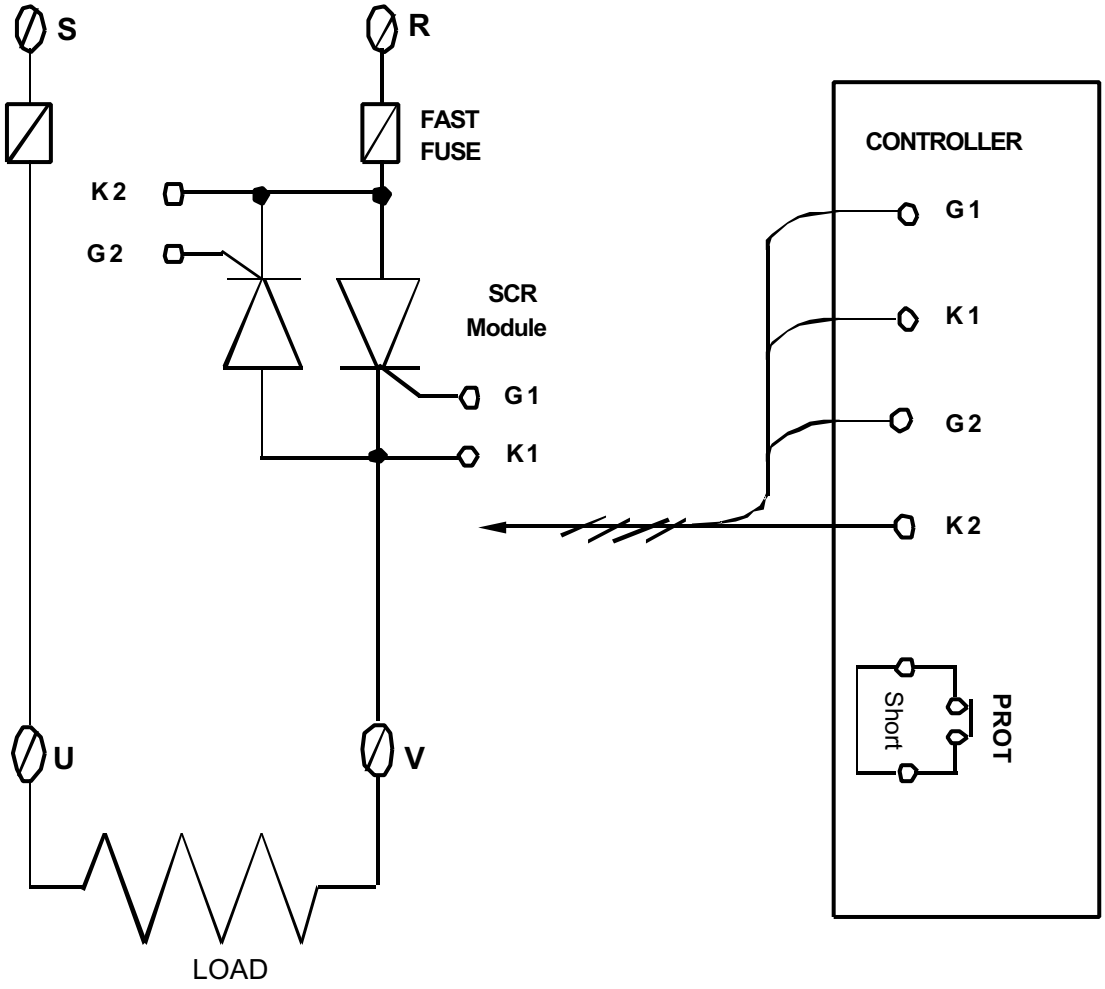
RATE = 9000
slave 1 SV=900

RATE =8000
slave 2 SV=800

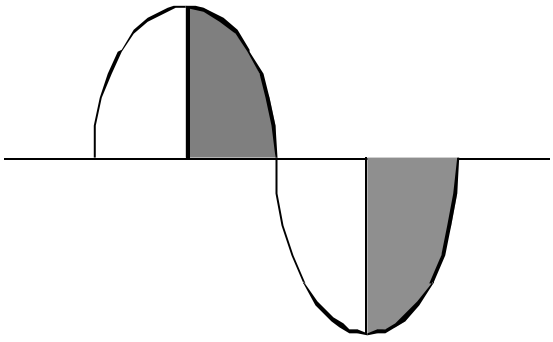
(All reach to the max value at the same time)

App2. Single Phase Control (for SCR module)

- **Available Models：FY900 / PFY900，FY700 / PFY700**
- **Data Change： OUTY=4**
  CLO1=0，CHO1=4500 if use for resistance load
  CLO1=0，CHO1=4000 if use for inductor load

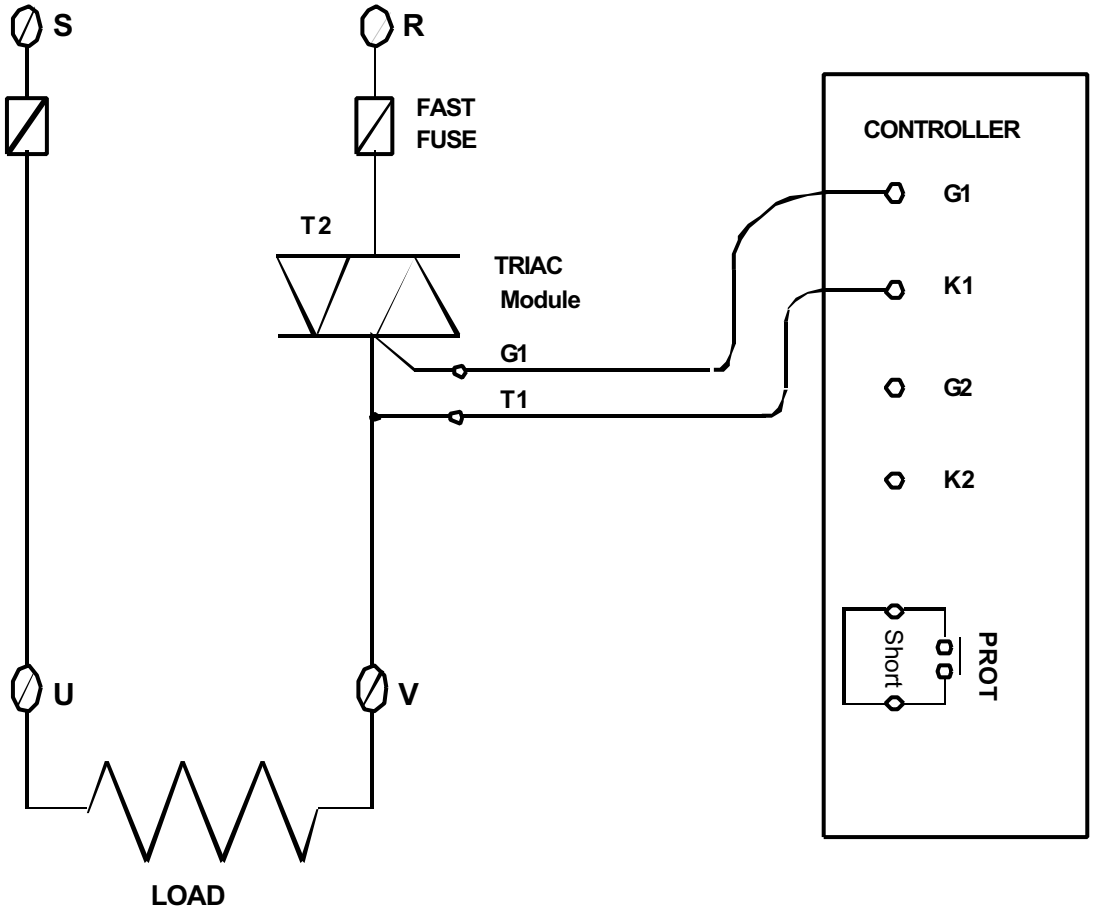


** Controller source phase must be same as load source phase

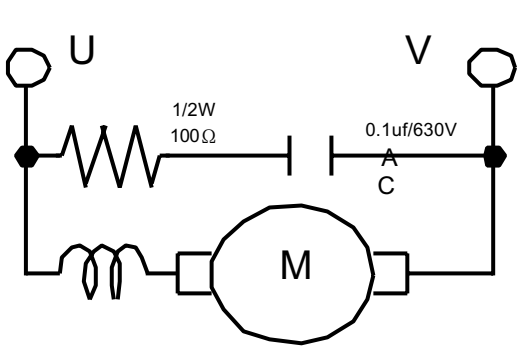


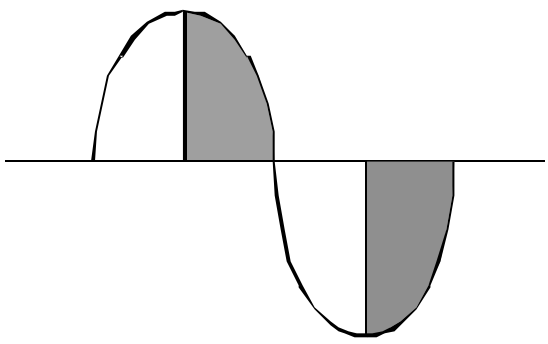
App3. Single Phase Control (for TRIAC module)

- **Available Models：FY900 / PFY900，FY700 / PFY700**
- **Data Change： OUTY=4**
  CLO1=0，CHO1=4500 if use for resistance load
  CLO1=0，CHO1=4000 if use for inductor load



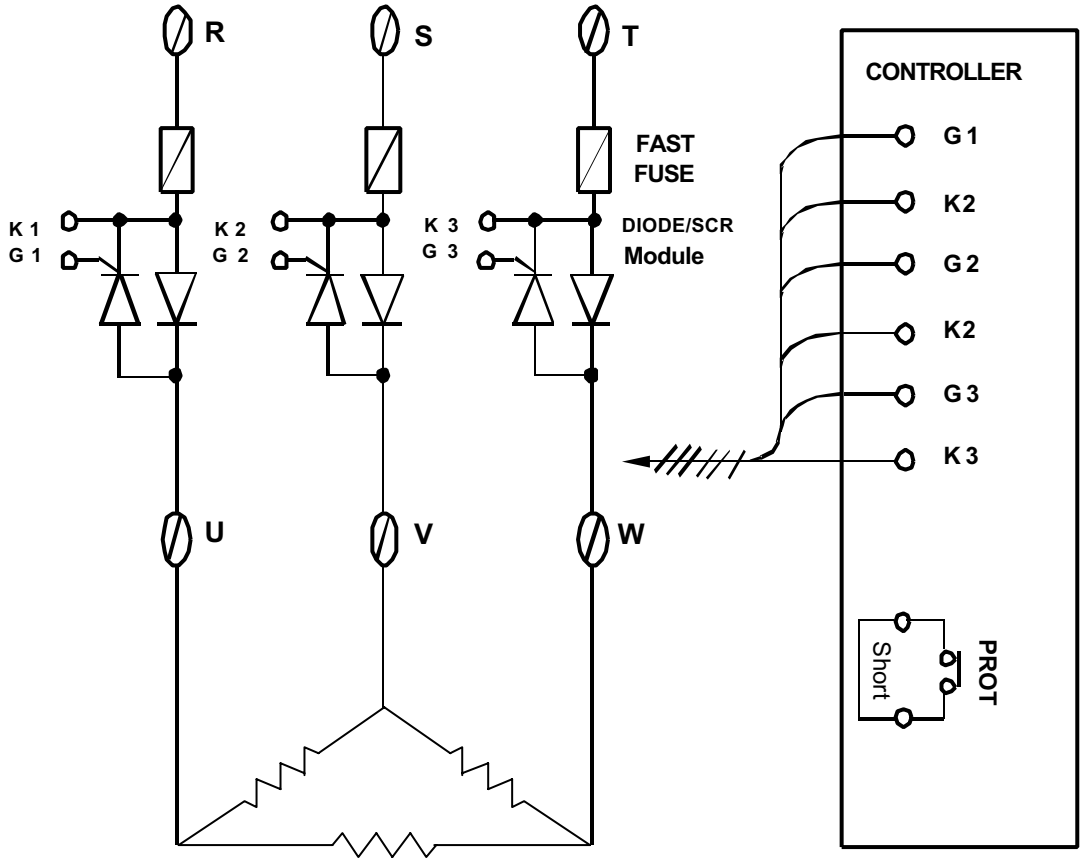
** Controller source phase must be same as load source phase





App4. Three Phase Control

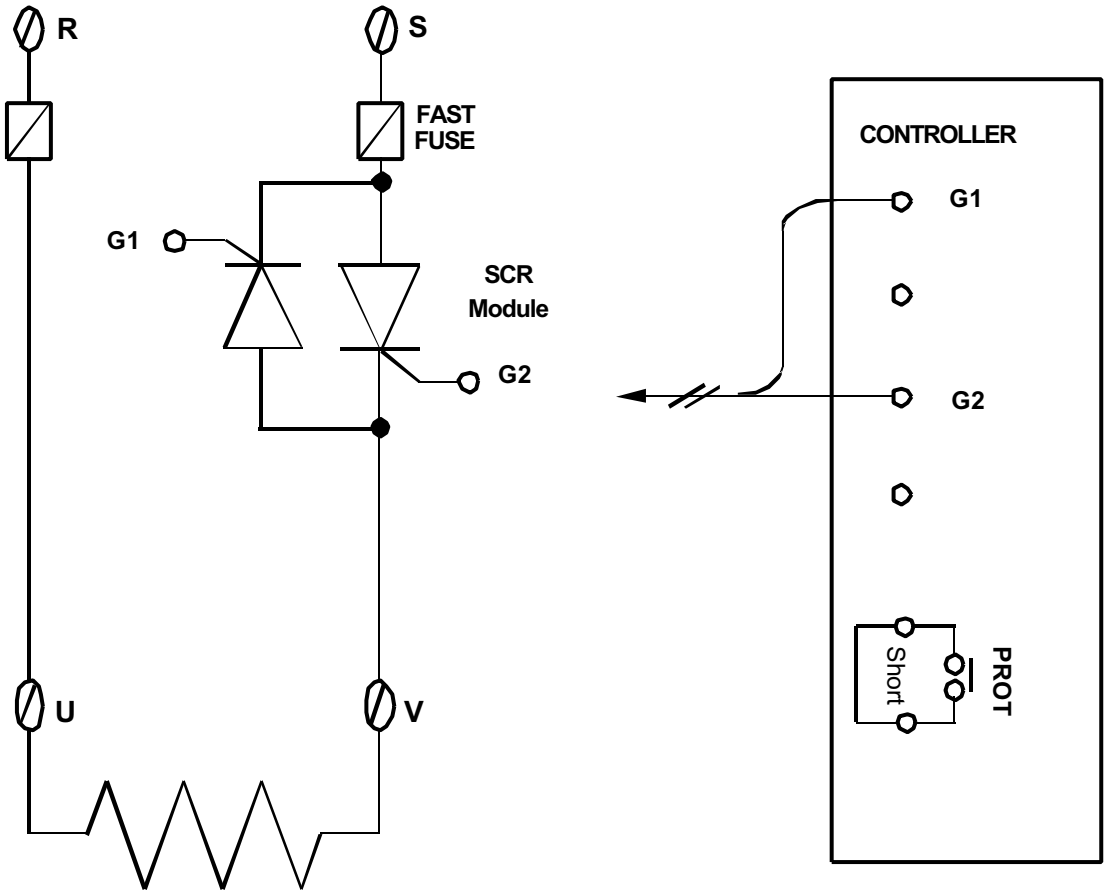
- **Available Models：FY900 / PFY900**
- **Data Change： OUTY=5**
  CLO1=0，CHO1=4500 only if use for resistance load

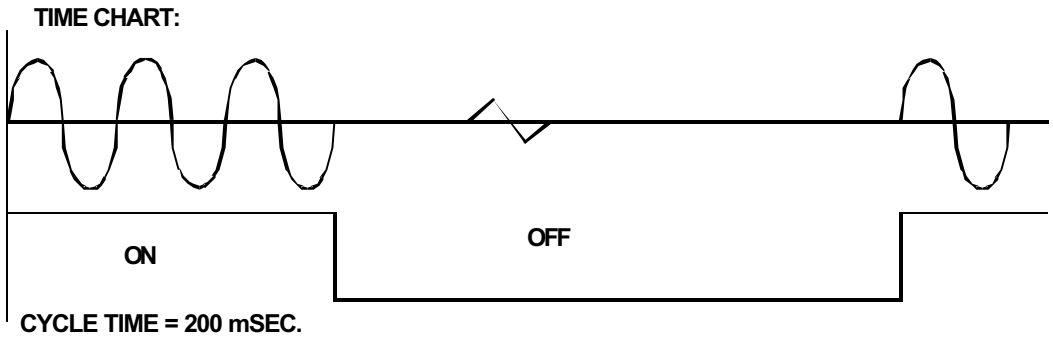


3φ LOAD

App5. Single Phase Zero Control

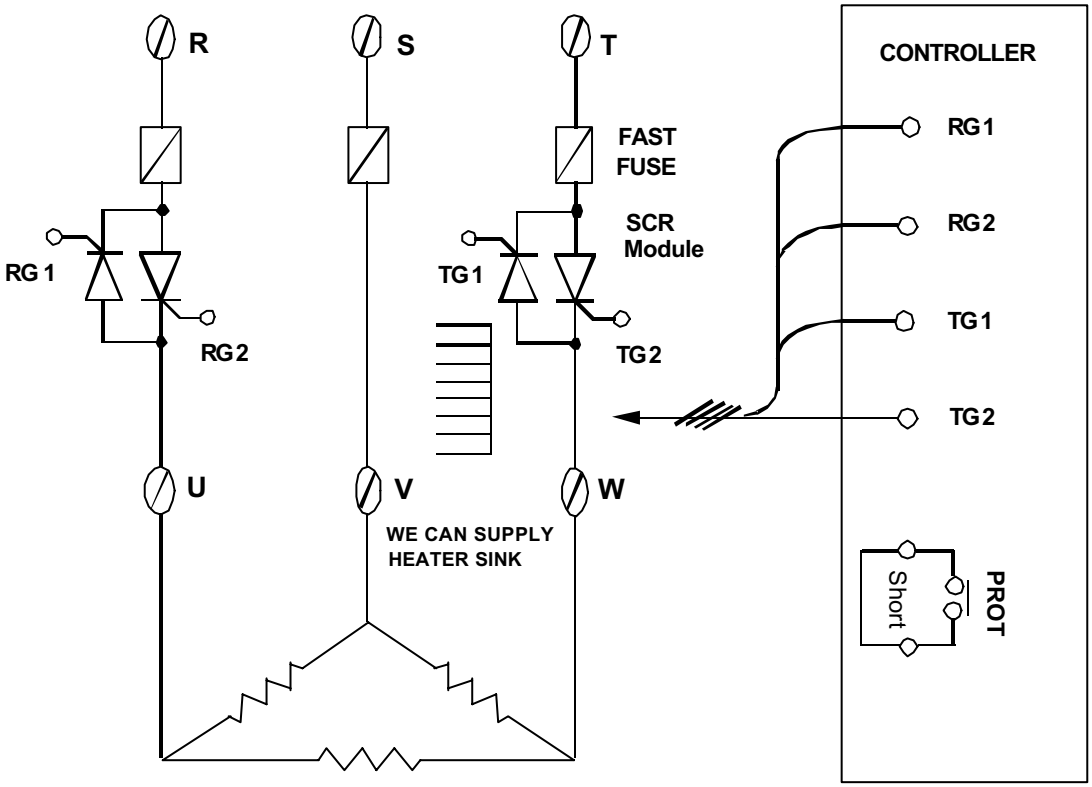
- **Available Models：FY900 / PFY900，FY700 / PFY700**
  FY400 / PFY400
- **Data Change： OUTY=0**
  CYT1=1



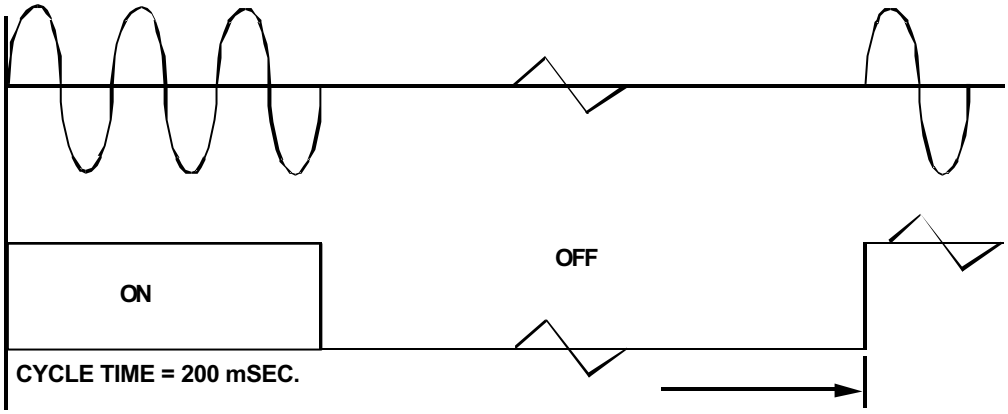


App6. Three Phase Zero Control

- **Available Models：FY900 / PFY900**
- **Data Change： OUTY=0**
  CYT1=1



TIME CHART:

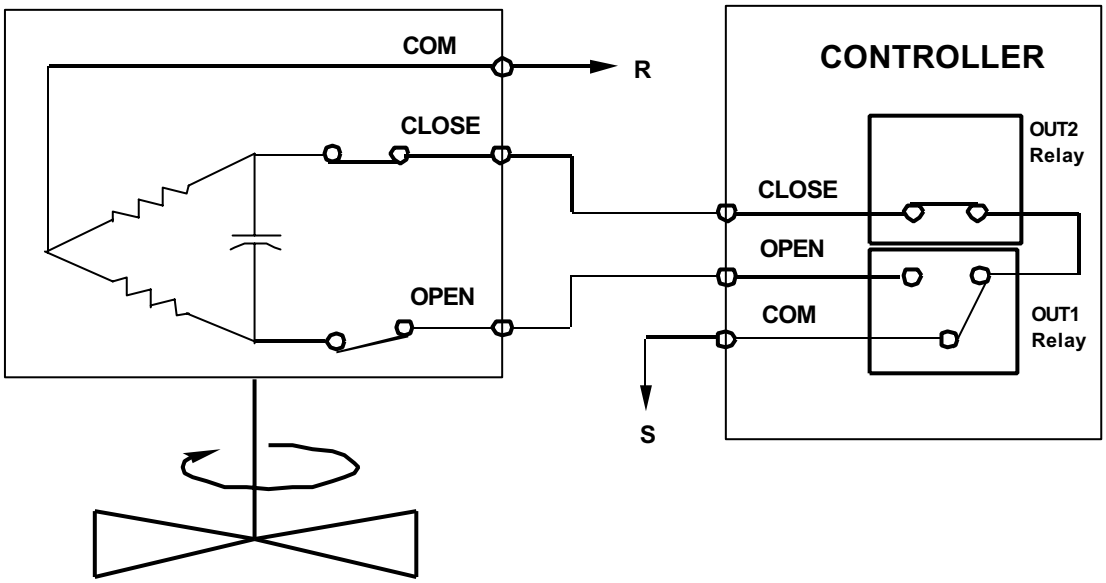


App7. Motor Valve Control

- **Available Models：FY900 / PFY900，FY700 / PFY700**
  FY800 / PFY800，FY600 / PFY600
  FY400 / PFY400
- **Data Change：OUTY=3**
  CYT1=1 ~ 100sec.
  (Manufacturing default setting “5” sec.)
  RUCY=5 ~ 200 sec.

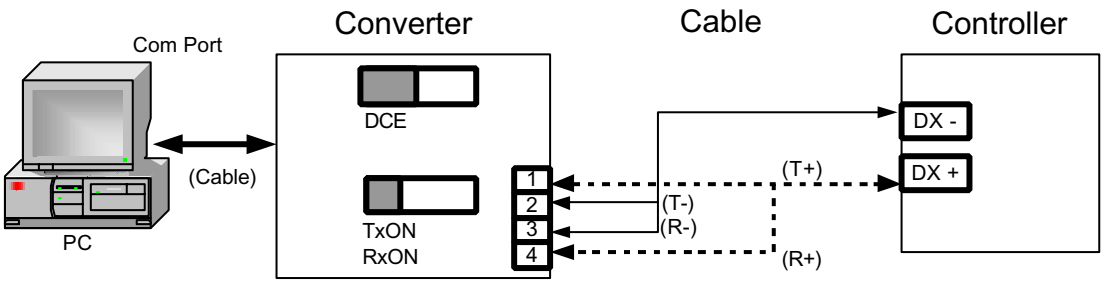
1. **CYT1 is the cycle time of Open / Close**
2. **RUCY is the running time of motor valve 0 ~ 100%**

MOTOR VALVE



App8. RS485 Communication

RS485 Connection Diagram



NOTE:

1.The length of the cable line between Converter and Controller can't exceed 1.2 KM.

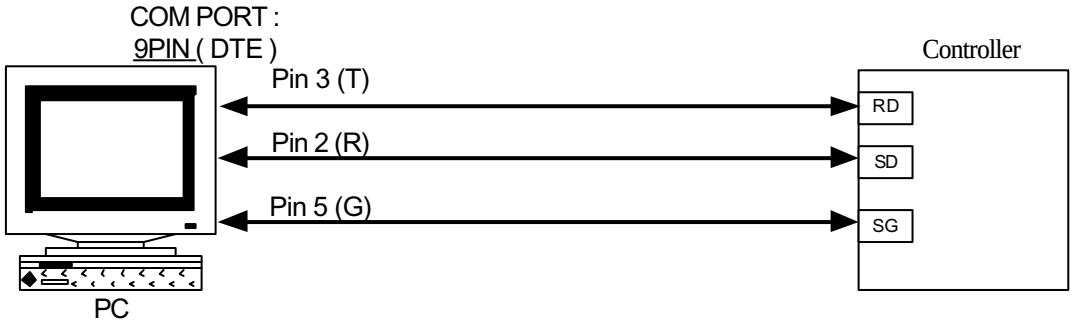
2.One Com Port can be connected up to a maximum of 30 Controllers.

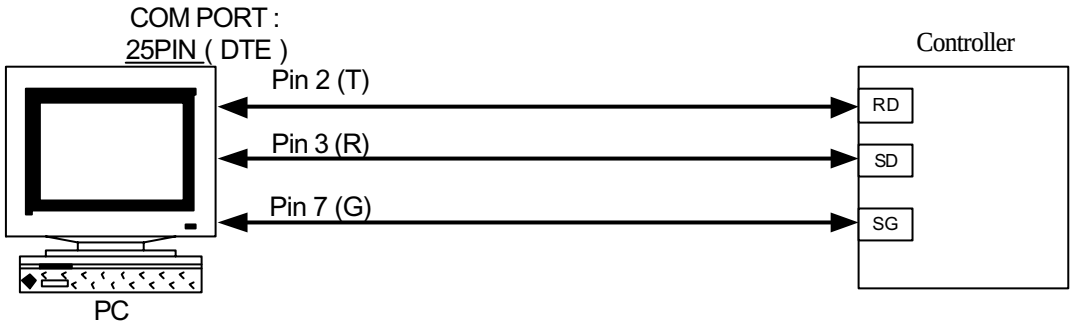
3.Ensure that the Controller's IDNO and BAUD have the same value as the software's setting.

4.For the software communication format please refer to the "Protocol" file in the CD.

App9. RS232 Communication

RS232 Connection Diagram





NOTE:

1.The length of the cable line can't exceed 15 meter.

2.One Com Port can only be connected to one controller.If more than one controller is connected to one Com Port, communication will be failed.

3.Ensure that the controller's IDNO and BAUD have the same value as the software's setting.

4.For the software communication format please refer to the "Protocol" file in the CD.