



FY Series Digital PID Controller

FY900 (96mm x 96mm)

Application: Control temperature, humidity,

FY series controllers are microprocessor based controllers.

Which have been

Designed with high accuracy input,

various output selection, useful options

and good reliability at a competitive price.



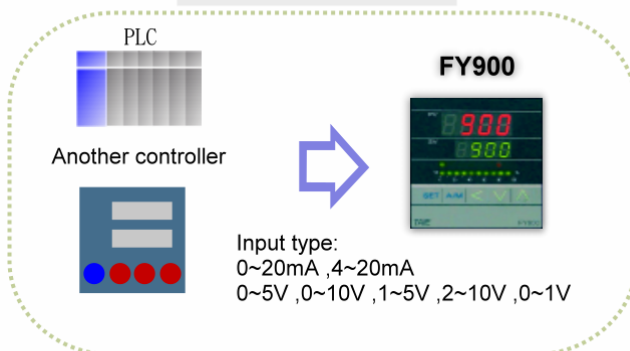
## Features

Various I/O Types

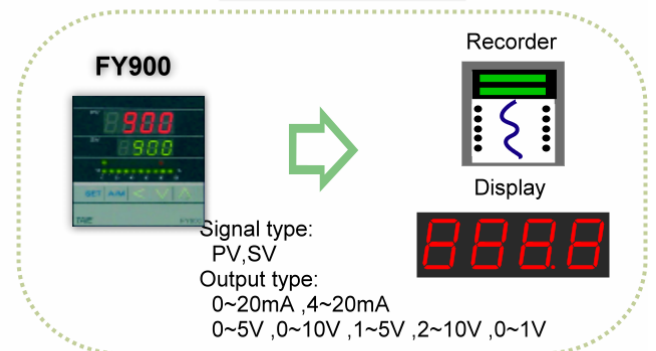


Peripheral Option

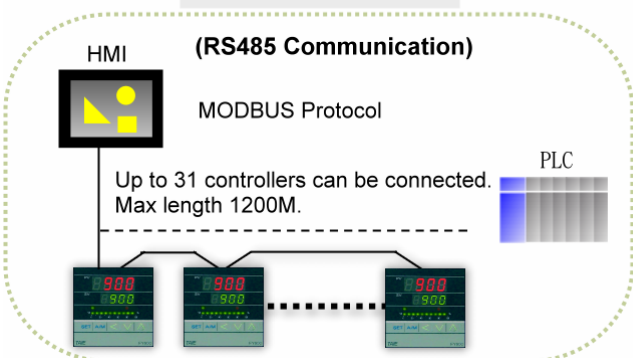
### Remote SV



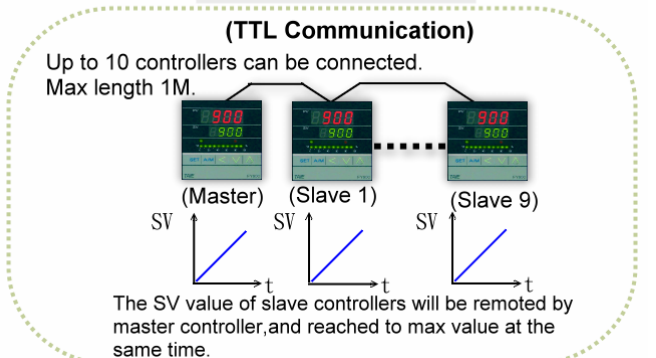
### Transmission



### Communication



### Communication



## Specifications

- Standard spec.

<b>Model</b>	<b>FY900</b>	
<b>Dimension</b>	96X96mm	
<b>Supply voltage</b>	AC 85~265V · DC 15~50V (Option)	
<b>Frequency</b>	50 / 60 HZ	
<b>Power consumption</b>	approx 4VA	
<b>Input</b>	<b>Accuracy</b>	0.2 % FS ± 1digit
	<b>Sample time</b>	250ms
	<b>TC</b>	K , J , R , S , B , E , N , T , W5Re/W26Re , PLII , U , L
	<b>RTD</b>	PT100,JPT100,JPT50
	<b>mA dc</b>	4~20mA , 0~20mA
	<b>mV / V dc</b>	0~1V,0~5V,0~10V,1~5V,2~10V -10~10mV,0~10mV,0~20mV,0~50mV,10~50mV
	<b>Decimal point position</b>	0000 , 000.0 , 00.00 , 0.000 Available for linear input (mA / mV / V)
<b>Output 1</b>	<b>Relay</b>	SPDT type 3A , 220V , electrical life:100,000 times or more (under rated load)
	<b>Voltage pulse</b>	For SSR drive. ON : 24V , OFF : 0V , max load current : 20mA
	<b>mA dc</b>	4~20mA, 0~20mA. Maximum load resistance:560 Ω
	<b>Voltage dc</b>	0~5V , 0~10V , 1~5V , 2~10V . Max load current:20mA
<b>Alarm 1</b>	3A , 220V , electrical life:100,000 times or more (under rated load)	
<b>Control algorithm</b>	PID , PI , PD , P , ON / OFF(P=0) , FUZZY ◦	
<b>PID range</b>	P: 0.0 ~ 200.0 % , I: 0~3600s , D: 0~900s	
<b>Isolation</b>	Output terminals(control output , alarm , transmission) and input terminals are isolated separately	
<b>Isolated resistance</b>	10MΩ or more between input and case (ground) at DC 500 V 10MΩ or more between output and case (ground) at DC 500 V	
<b>Dielectric strength</b>	1000V AC for 1 minute between input terminal and case (ground) 1500V AC for 1 minute between output terminal and case (ground)	
<b>Operating temperature</b>	0~50℃	
<b>Humidity range</b>	20~90%RH	
<b>Weight</b>	300g	
<b>Display Height</b>	PV:14mm SV:10mm	

● **Optional Spec.**

Model	FY900
<b>Output 2</b>	For heating and cooling control use. Relay , SSR , 4~20mA , 0~20mA , 0~5V , 0~10V , 1~5V , 2~10V
<b>Alarm 2</b>	SPST type 3A , 220V , electrical life:100,000 times or more (under rated load)
<b>Alarm 3</b>	SPST type 3A , 220V , electrical life:100,000 times or more (under rated load)
<b>Heater Break Alarm (HBA)</b>	Display range of heater current : 0.0~99.9A , Accuracy : 1%FS Included CT : SC-80-T (5.8mm dia , 0.0~80.0A) or SC-100-T (12mm dia , 0.0~99.9A) Alarm relay : AL1
<b>Transmission</b>	Available for PV or SV transmission 4~20mA , 0~20mA , 0~1V , 0~5V , 0~10V , 1~5V , 2~10V
<b>Remote SV</b>	4~20mA , 0~20mA , 0~1V , 0~5V , 0~10V , 1~5V , 2~10V
<b>Communication</b>	Protocol : MODBUS RTU , MODBUS ASCII , TAIE RS232 , RS485 , TTL Baud rate: 2400 , 4800 , 9600 , 19200 , 38400 bps. Data bits : 8 , Stop bit : 1 or 2bit , Odd or Even parity.
<b>Water/Dust proof</b>	IP65

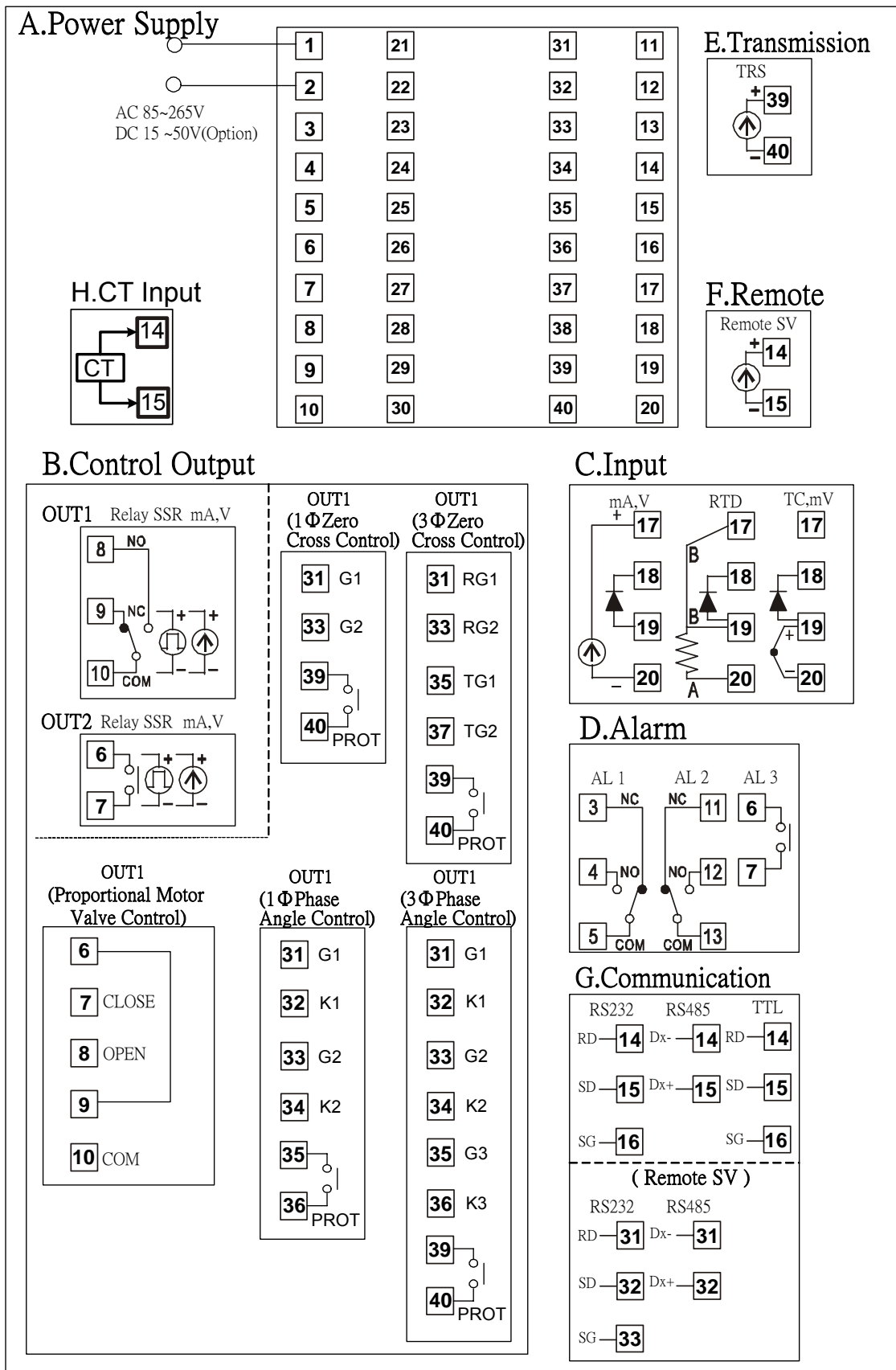
Model	FY900
1φ zero crossing control(1φSSR)	<b>Available</b>
3φ zero crossing control(3φSSR)	<b>Available</b>
<b>Motor valve control</b>	<b>Available</b>
1φ phase angle control(1φSCR)	<b>Available</b>
3φ phase angle control(3φSCR)	<b>Available</b>

● **Programmable RAMP/SOAK**

Model	PFY900
<b>Programmable RAMP/SOAK</b>	2 patterns with 8 segments each. The 2 patterns can be linked together as 16 segments use.

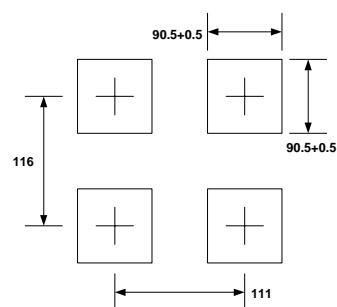
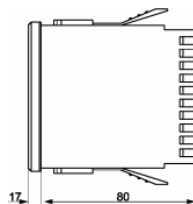
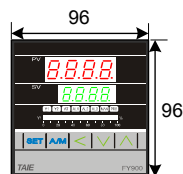
## Terminal arrangement

FY900 Terminals ( 96mm x 96mm , DIN 1/4 )

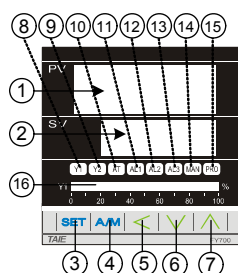


## External dimension and panel cutout (Unit : mm)

### FY900



### Parts description

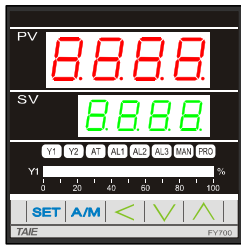


SYMBOL	NAME	FUNCTION
PV	① Measured value (PV) display	Displays PV or various parameter symbols (Red)
SV	② Set value (SV) display	Displays SV or various parameter set values (Green)
SET	③ Set key	Used for parameter calling up and set value registration
A/M	④ Auto/Manual key	Switches between Auto(PID) output mode and Manual output mode.
<	⑤ Shift key	Shift digits when settings are changed
∨	⑥ Down key *Program hold	Decrease numbers (-1000,-100,-10,-1) * Program hold (Programmable controller)
∧	⑦ Up key *Program run	Decrease numbers (+1000,+100,+10,+1) * Program run (Programmable controller)
OUT1	⑧ OUT1 lamp	Lights when OUT1 is activated (Green)
OUT2	⑨ OUT2 lamp	Lights when OUT2 is activated (Green) ◦
AT	⑩ Auto tuning lamp	Lights when Auto tuning is activated (Orange)
AL1	⑪ Alarm 1 lamp	Lights when Alarm 1 is activated (Red)
AL2	⑫ Alarm 2 lamp	Lights when Alarm 2 is activated (Red)
AL3	⑬ Alarm 3 lamp	Lights when Alarm 3 is activated (Red)
MAN	⑭ Manual output lamp	Lights when manual output is activated (Orange)
PRO	⑮ *Program running lamp	*Flashes when program is running (Programmable controller) ◦
OUT1%	⑯ OUT% bar-graph display	Output% is displayed on 10-dot LED.

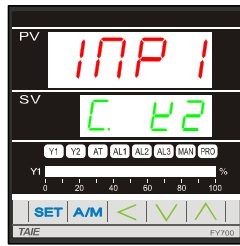
## Operations

### Power On

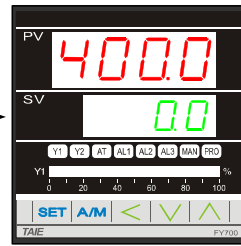
Controller will display as below



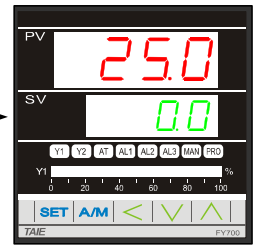
All LED and 7 segment displays will be lighted



Display input type (K2)



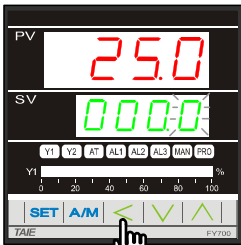
Display range (0.0~400.0)



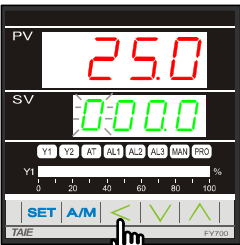
Ready for use

### Change the Set Value (SV)

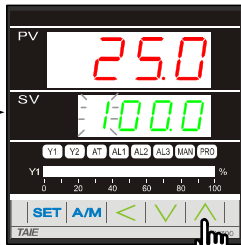
Change SV from 0.0 to 100.0



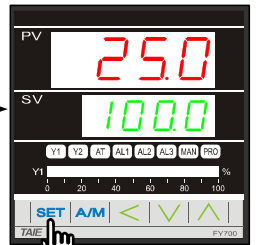
Press key. The SV number started to flash. The flashing digit indicates which digit can be set.



Press key to select the hundreds digit.



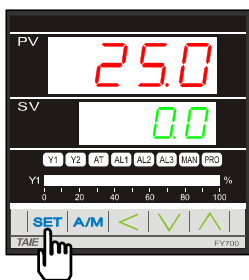
Press key to change the number to 1



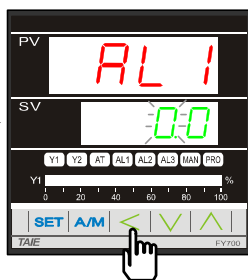
Press key to store the new set value.

### Change the Alarm Value

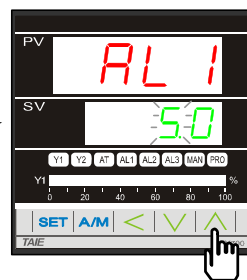
Change AL1 value to "5.0" (AL1 active, if PV exceeds SV over 5.0)



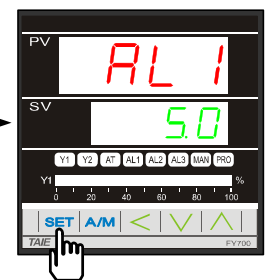
Press key to display parameter AL1



Press key to change AL1 value



Press key increase AL1 value



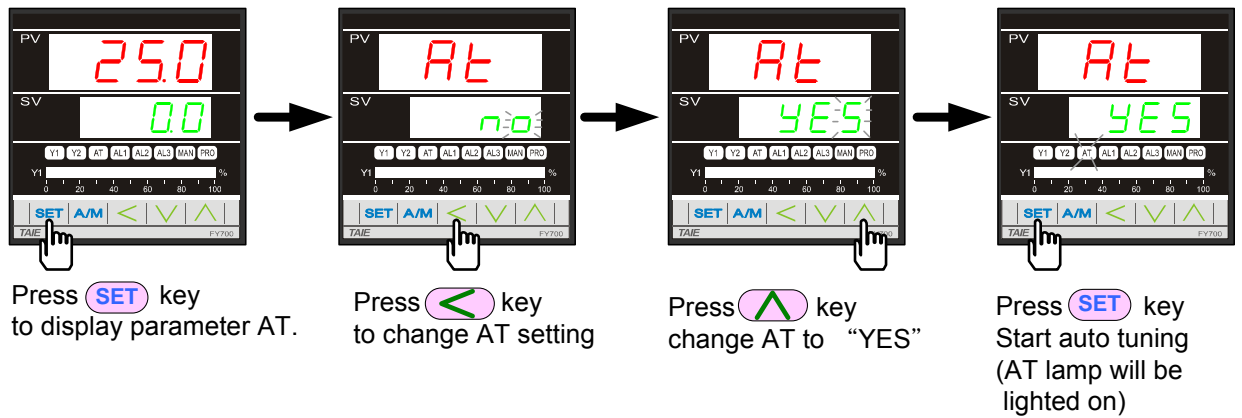
Press key store the new value of AL1

\* There are total 16 alarm mode types, please refer to "alarm mode" in page 30

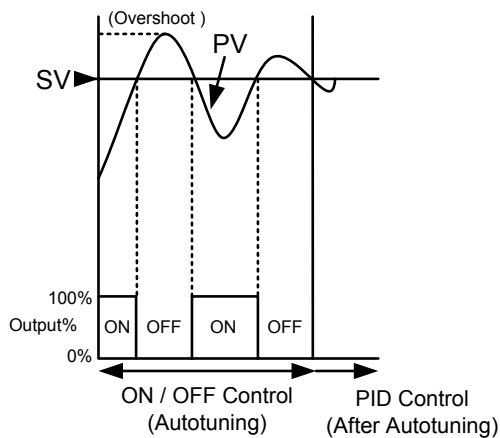
\* To change alarm mode, press + key 5 seconds to enter Level 3 (Input Level) and then change ALD1/ALD2/ALD3 value.

## Autotuning (AT)

Use AT function to automatically calculate and set the optimize PID value for your system.



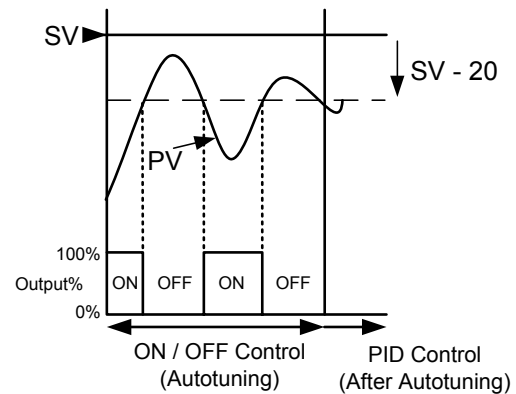
### Autotuning ATVL=0



### Autotuning ATVL=20

\*Set ATVL to prevent overshoot occurred during autotuning process.

To set ATVL, press **SET** key 5 seconds to enter Level 2 (PID Level) and then change the value.



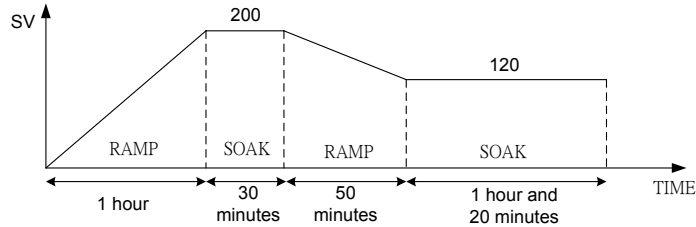
### Autotuning failure

- Possible cause 1 : ATVL is too big. (If not sure, set ATVL=0)
- Possible cause 2 : Calculation time is too long. (Set PID parameter manually)

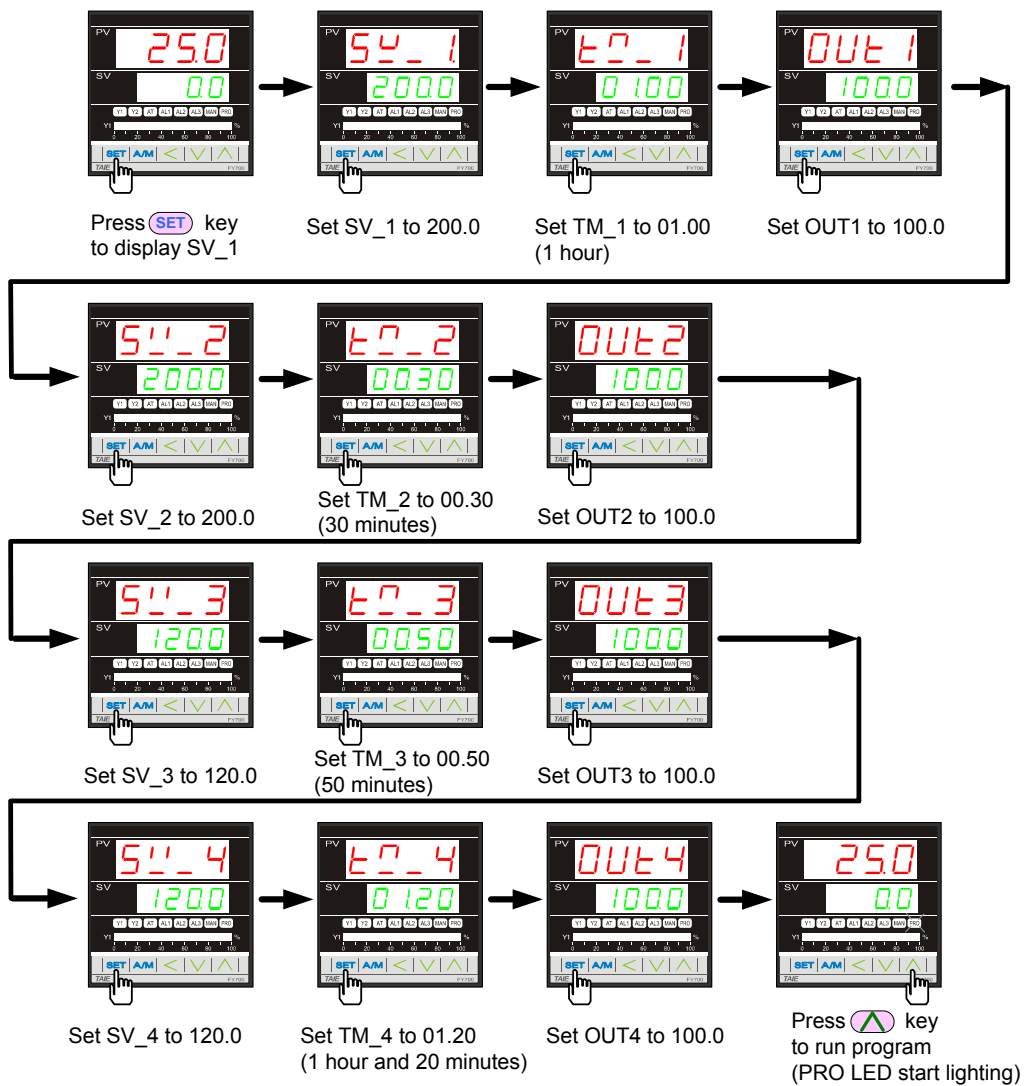
# Programmable RAMP / SOAK (Only available for PFY model)

\*For detail of the programmable instruction, please refer with page 25.

Assume the temperature profile is as below (use total 4 segments )



Please operate controller as following steps:





# Operation levels

## Levels diagram

