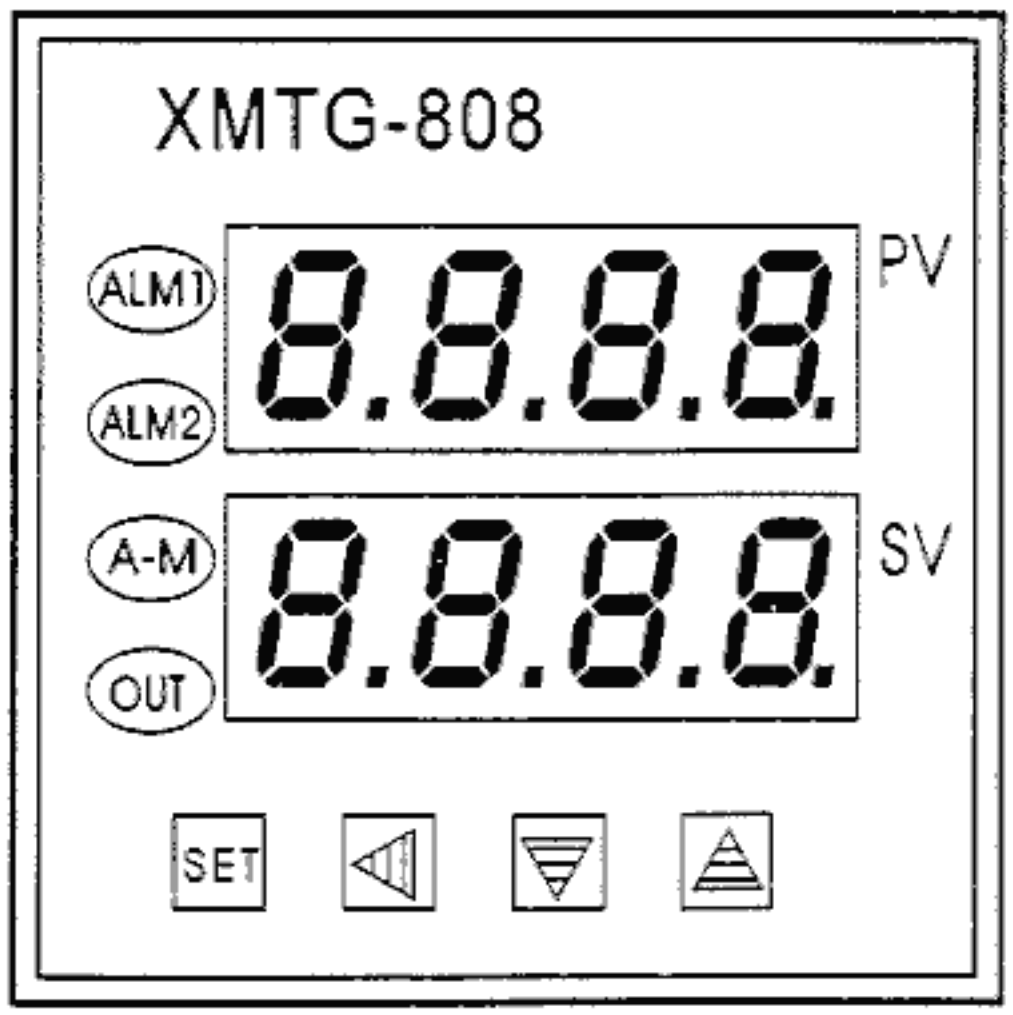
INSTRUCTION MANUAL

FOR

MICROCOMPUTER BASED

DIGITAL INDICATING CONTROLLER

XMT*-808



Preface

Thank you for the purchase of our microcomputer based temperature indicating controllers XMT*-808
This manual contains instructions for the mounting, functions, operations and notes when operating the XMT*-808
For model confirmation and unit specifications, please read this manual carefully before starting operation.

To prevent accidents arising from the misuse of this controller, please ensure the operator using it receives this manual.

Caution

- This instrument should be used according to the specifications described in the manual. If it is used according to the specifications, it may malfunction or cause fire.
- Be sure to follow the warnings, cautions and notices. If not, it could cause serious injury or malfunction.
- Specifications of the XMT*-808 and the contents of this instruction manual are subject to change without notice.
- Care has been taken to assure that the contents of this instruction manual are correct, but if there are any doubts, mistakes or questions, please inform our sales department.
- This instrument is designed to be installed in a control panel. If not, measures must be taken to ensure that the operator cannot touch power terminals or other high voltage sections.
- Any unauthorized transfer or copying of this document, in part or in whole, is prohibited.

SAFETY PRECAUTIONS

(Be sure to read these precautions before using our products.)
The safety precautions are classified into categories: "Warning" and "Caution".
Depending on circumstances, procedures indicated by ⚠Caution may be linked to serious results, so be sure to follow the directions for usage.

⚠Warning

Procedures which may lead to dangerous conditions and cause death or serious injury, if not carried out properly.

⚠Caution

Procedures which may lead to dangerous conditions and cause superficial to medium injury or physical damage or may degrade or damage the product, if not carried out properly.

1. Installation precautions

⚠ Caution

This instrument is intended to be used under the following environmental conditions:
Mount the controller in a place with:
- **A minimum of dust, and an absense of corrosive gasses**
- **No flammable, expolsive gasses**
- **No mechanical vibrations or shocks**
- **No exposure to direct sunlight, an ambient temperature of 0 to 50℃ (32 to 122℉) that does not change suddenly**
- **An ambient non-condensing humidity of 35 to 85%RH**
- **No large capacity electromagnetic switches or cables through which large current is flowing.**
- **No water, oil or chemicals or where the vapors of these substances can come into direct contact with the unit**

Note: Do not install this instrument near flammable material even though the case +this instrument is made of flame resisting resin.
Avoid setting this instrument directly on flammable material.

2. Wiring precautions

⚠ Caution

- **Use the solderless terminal with an insulation sleeve that fits in the M3 screw when wiring theXMT*-808.**
- **The terminal block of this instrument is designed to be wired from the left side. The lead wire must be inserted from the left side of the terminal, and fastened with the terminal screw.**
- **Tighten the terminal screw within the specified torque. If excessive force is applied to the screw when tightening, the screw or case may be damaged.**
- **Do not apply a commercial power source to the sensor which is connected to the input terminal nor allow the power source to come into contact with the sensor, as the input circuit may be burnt out.**
- **This controller has no built-in power switch, circuit breaker or fuse. It is necessary to install them near the controller. (Recommended fuse: Time-lag fuse, rated voltage 250V AC, rated current 2A)**
- **When using a 24V AC/DC for the power source, do not confuse the polarity when it is DC.**

3. Running and maintenance precautions

⚠ Caution

- **It is recommended that PID auto-tuning be performed on the trial run.**
- **Do not touch live terminals. This may cause electric shock or problems in operation.**
- **Turn the power supplied to the instrunment OFF when retightening the terminal and cleaning Working or touching the terminal with the power switched ON may result in Electric Shock causing severe injury or death.**
- **Use a soft, dry cloth when cleaning the instrument. (If paint thinner is used, it might deform or tarnish the unit.)**
- **As the display section is vulnerable, do not strike or scratch it with a hard object or press hard on them**

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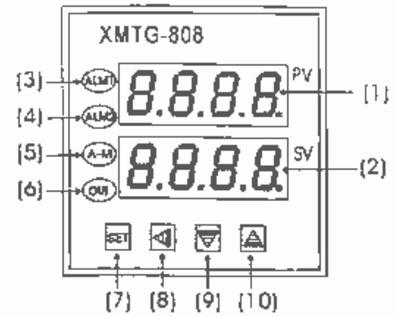
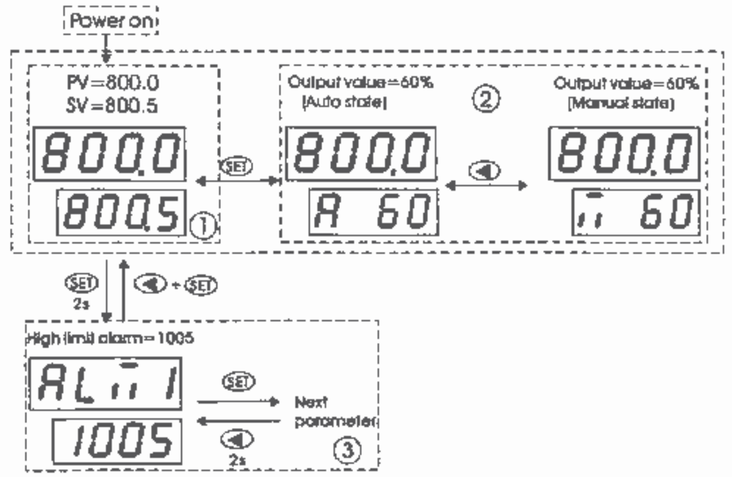
1. Name and functions of the sections



(1) PV display
Indicates the process variable (PV) with a red LED.
(2) SV display
Indicates the setting value (SV) or manipulated variable (MV) with a green LED.
(3) ALM1 indicator
When ALM1 output is ON, a red LED lights
(4) ALM2 indicator
When ALM2 output is ON, a red LED lights
(5) A-M indicator
When Manual adjust is ON, a green LED lights.
(6) OUT indicator
When OUT is ON, a green LED lights.
(In the case of DC current output type, it blinks in a 1 second cycle corresponding to the output manipulated variable.)
(7) Mode key (SET)
Switches the setting mode and registers the setting value and selected value.
(Setting value and selected value are registered by pressing the mode key.)
(8) Data shift key OR Auto/Manual function key (◁)
(9) Decrease key (▽)
Decreases numeric value of the setting value.
(10) Increase key (△)
Increases numeric value of the setting value.

2. Display Status



After power on, display status ① will be shown the upper display window displays four digit measured value (PV). The lower display window displays four-digit setpoint value.

Press SET key and change the display status into mode ②, then output value will be displayed in the lower display window. ① and ② are the basal status of the instrument. During the basal status, "SV" display window can indicate certain state of the system by means of the alternate symbol. They are as follows

- If the input measurement signal beyond the measurement range (caused by wrong setting of sensor spec. or open (short) circuit), "orAL" will be displayed with blinking. Then the instrument terminate its control function automatically, and the output value is fixed according to the parameter outL.
- When alarm occurred, it will display "ALM1", "ALM2", "Hy-1", or "Hy-2", they indicate the high limit alarm, lower limit alarm, positive deviation alarm, and negative deviation alarm.

2.1 Basal operation description

2.1.1 Display transfer

Press SET key can change the display status. XMT-808 can be transferred between display status ① and display status ②.

2.1.2 Data setup

If the parameter lock isn't locked, we can setup most of the data displayed in the lower display window. For example, setpoint input of XMT-808 is as follows:
Press SET key to change the status to setpoint input. Now the decimal point of the last one digit (unit's place) of the displayed SV value begins blinking (like curse). Press ▽ key to decrease the value, press △ key to increase the value, and ◁ key to move to the digit expected to modify. To complete the set point changing, press SETagain.

2.1.3 Man/Auto mode switch

Bumpless switching between AUTO and MAN can be performed by pressing SET key once. If the instrument works on Manual mode, its output value can be increased or decreased by pressing △ key and ▽ key under display status ②.

2.1.4 Setting parameters

If the instrument is on its basal display status (display status ① or ②), press SET and hold for about 2 seconds until parameter is displayed (display status ③). Then the key ◁ △ ▽ can be used to modify parameters. Press and hold the ◁ key can return to the preceding parameter. Press ◁ key (don't release) and then press SET key simultaneously can escape from the parameter setup. The instrument will escape auomatically from the parameter setup operation if no key is pressed within 30 seconds.
Note: refer to the instrument whose parameters are locked by setting parameter "Lock", most of its parameters are inhabited except those defined by field parameter "EP".

2.2 Artificial intelligence control and auto tuning

So if you want to execute auto tuning, you must adjust setpoint to an often-used value first, and then press and hold the ◁ key for about 2 seconds until the "At" symbol is displayed in the lower display window if you want to start up auto tuning function (Auto tuning is not allowed to start up again unless you set parameter Ctrl to 2 manually if the function has been executed once). During auto tuning, the instrument executes on-off control. After 2-3 times on-off action, the microprocessor in the instrument will analyze the period, amplitude, waveform of the oscillation generated by the on-off control, and calculate the optimal control parameter value. The instrument begins to perform accurate artificial intelligence control after parameter auto tuning is finished. If you want to escape from auto tuning status, press and hold the ◁ key for about 2 seconds until the blinking of "At" symbol is stopped in the lower display window. Generally it will meet you need to perform auto tuning one time only. After the auto tuning is finished, the instrument will set parameter "At" to 3 (factory set is 1), and now it is not allowed to start up auto tuning by pressing ◁ key on front panel. This will avoid repeat

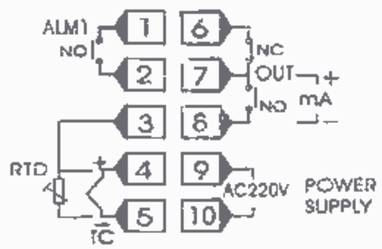
auto tuning by mistake

3. Wiring connection

⚠Warning

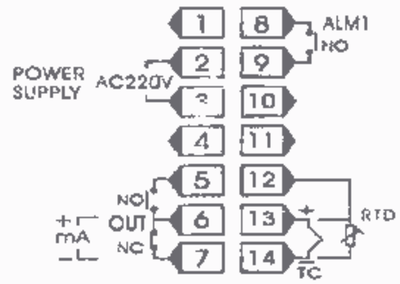
Turn the power supply to the instrument off before wiring or checking.
Working or touching the terminal with the power switched on may result in Electric Shock causing severe injury or death.
Moreover, the instrument must be grounded before the power supply to the instrument is turned on.

Terminal arrangement



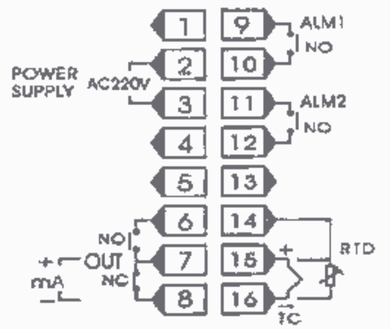
- OUT
  Relay control output
- mA
  DC current control output
- ALM1
  Alarm 1 output
- TC
  Thermocouple input
- RTD
  Resistance temperature input

48×48mm, Front panel specification and wiring



- OUT
  Relay control output
- mA
  DC current control output
- ALM1
  Alarm 1 output
- TC
  Thermocouple input
- RTD
  Resistance temperature input

72×72mm, Front panel specification and wiring

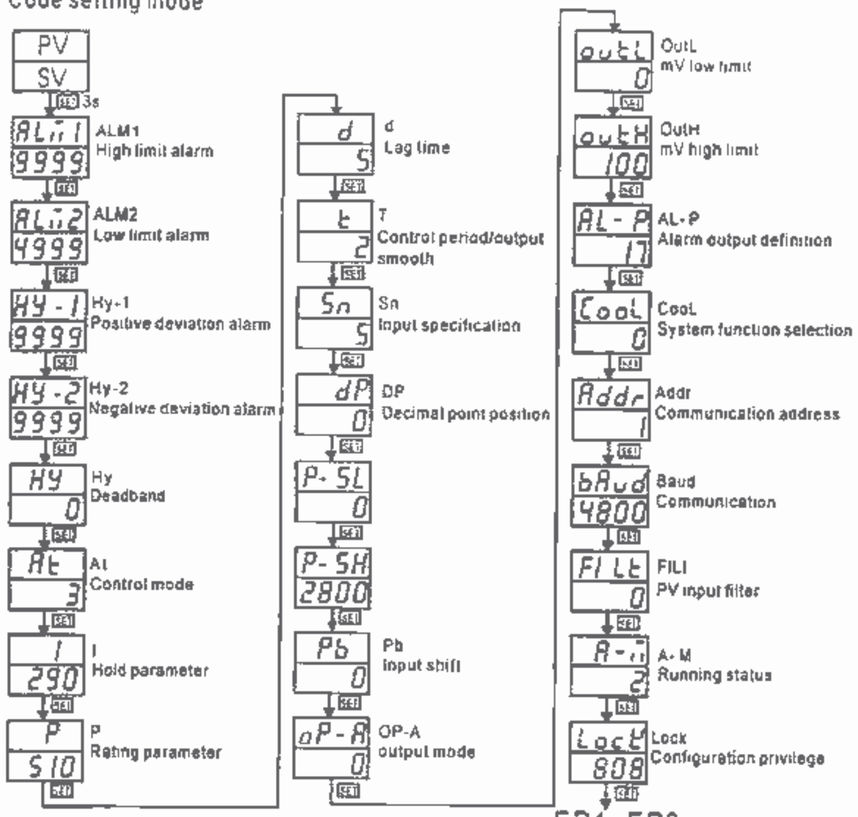


- OUT
  Relay control output
- mA
  DC current control output
- ALM1
  Alarm 1 output
- ALM2
  Alarm 2 output
- TC
  Thermocouple input
- RTD
  Resistance temperature input

96×96mm, 48×96mm, 96×48mm, Front panel specification and wiring

4. Setup flow chart

Code setting mode



Code	Description	Setting Range	Engineer Unit	Remarks
ALM1	High limit alarm	-1999～+9999	℃ or 1 defined unit	Linear unit defined by para P-SL and P-SH when linear voltage/resistance input is selected
ALM2	Low limit alarm	-1999～+9999	℃ or 1 defined unit	
Hy-1	Positive deviation alarm	0～9999	0.1 ℃ or 1 defined unit	
Hy-2	Negative deviation alarm	0～9999	0.1 ℃ or 1 defined unit	
Hy	Deadband	0～20℃ or 0～2000		ON/OFF control and alarm only
At	Control mode	0～3 see the following text for details		
I	Hold parameter	0～9999	0.1 ℃ or 1 defined unit	0disable integral function
P	Rating parameter	1～9999		

d	Lag time	0～2000	sec	
t	Control period/output smooth	0～125	sec	
Sn	Input specification	0,1,4,5,20,21 see the following text for details		Configure varied resolution
dIP	Decimal point position	0～1 see the following text for details		
P-SL	standby			
P-SH				
Pb	Input shift	-1999～+4000	0.1 ℃ or 1 defined unit	
OP-A	Output mode	0～2 see the following text for details		
OUTL	Low limit	0～110	1%	
OUTH	High limit	0～110	1%	
AL-P	Alarm output definition	17		
COOL	System function selection	0～1		
Addr	Communication address	0～100		Retransmission low limit current
bAud	Communication baud rate	0～19200		Retransmission high limit current
FILT	PV input filter	0～20		Define digital filter intensity
A-M	A-M status	0. Manual 1. Automatic 2. Manual suppressing		
Lock	Configuration privilege	0～9999		
EP1-EP8	Field parameter definition	nonE-A-M		

4.1 Alarm parameter "ALM1", "ALM2", "Hy-1", "Hy-2"

These 4 parameters set instrument's alarm function. Alarm signal will be triggered to make instrument's relay contact close (NC contact open), if alarm condition is satisfied. Alarm messages is displayed in turn in SV display window. When the cause of alarm is removed, then the alarm is cleared automatically.

Alarm condition is following:

- **ALM1**: High limit absolute alarm. If the process value is greater then the value specified as "ALM1+Hy", then the alarm is set, and the alarm will be cancelled if the process value is less than the value of "ALM1-Hy".
- **ALM2**: Low limit absolute alarm. If the process value is greater then the value specified as "ALM2+Hy", then the alarm is set, and the alarm will be cancelled if the process value is less than the value of "ALM2-Hy".
- **Hy-1**: Positive alarm. If PV minus SV is greater than the value specified as "Hy-1 +Hy", the alarm is set, and the alarm will be cancelled if the process value is less than the value of "Hy-1 -Hy". It also used as the second high limit alarm in case of on-off control.
- **Hy-2**: Negative deviation alarm. If PV minus SV is greater than the value specified as "Hy-2 +Hy", the alarm is set, and the alarm will be cancelled if the process value is less than the value of "Hy-2 -Hy". It also used as the second high limit alarm in case of on-off control.

● orAL. Input over range or under range

Process variable exceeds the configured range (High limit or low limit), caused by error configuration of sensor type, sensor disconnection or short-circuit. In the event of input over range, instrument will stop control automatically and the value specified in advance as the parameter "outL" is output as the manipulated value.

Among which "orAL" don't need to be configured. Generally users don't need the whole 4 alarm. Limit value can be set to those parameters not used to avoid alarm function. Ex, the following configuration: ALM1=9999, ALM2=-1999. When the configuration Hy-1=9999 (999.9℃ for temperature) or Hy-2=9999 (999.9℃ for temperature) is set, even if the difference value is greater than 9999, Hy-1 or Hy-2 alarm will not be triggered.

4.2 Dead band parameter "Hy"

Dead band parameter Hy is set to permits protection of position control output from high switching frequencies caused by process input fluctuation. Dead band parameter is used for position control, 4-alarm control as well as the position control at auto tuning

For example: Hy parameter can affect upper absolute alarm as the following, provided upper alarm parameter "ALM1" is set as 800℃, Hy parameter is set as 2.0℃.

● Instrument is in normal status at the beginning, when process value is greater than 802℃ (ALM1+Hy), the upper absolute alarm can be triggered.

● Instrument is in upper alarm status at the beginning, when process value is less than 798℃ (ALM1-Hy), the alarm can becleared.

4.3 Control mode parameter "At"

At=0 ON OFF control, suitable for the application which don't need high precision.

At=1 It is improved on the basis of PID control and fuzzy control, having more extensive adaptability to the process, and it is possible to get a good control for processes can be started up from front panel on this setting.

At=2 Starting up auto tuning, points for attention have been described in preceding text. The function is the same as starting auto tuning from front panel. After auto tuning is done, once setting parameter At to 2 can start up more auto tuning.

At=3 this configuration is automatically set after auto tuning is done. At this setting, starting auto tuning from front panel is inhibited to prevent error operation from starting auto tuning repeatedly.

4.4. Control action explanations

4.4.1 PID

(1) Proportional band "P"

Proportional action is the action which the control output varies in proportion to the deviation between the setting value and the processing temperature.

If the proportional band is narrowed, even if the output changes by a slight variation of the processing temperature, better control results can be obtained as the offset decreases.

However, if the proportional band is narrowed too much, even slight disturbances may cause variation in the processing temperature, control action changes to ON/OFF action and the so called hunting phenomenon occurs.

Therefore, when the processing temperature comes to the balanced position near the setting value and a constant temperature is maintained, the most suitable value is selected by gradually narrowing the proportional band while observing the control results

(2) Integral time "I"

Integral action is used to eliminate offset. When the integral time is shortened, the returning speed to the setting point is accelerated. However, the cycle of oscillation is also accelerated and the control becomes unstable.

(3) Derivative time "D"

Derivative action is used to restore the change in the processing temperature according to the rate of change. It reduces the amplitude of overshoot and undershoot width.

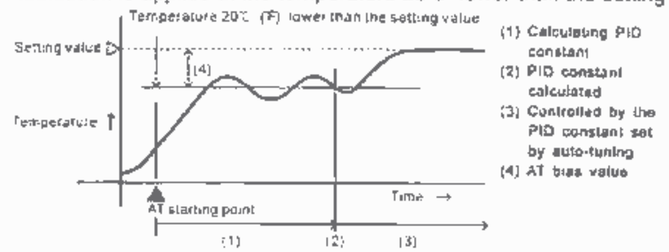
If the derivative time is shortened restoring value becomes small and if the derivative time is made longer, an excessive returning phenomenon may occur and the control system may be oscillated.

4.4.2 PID auto-tuning of this controller

In order to decide each value of P, I, D and ARW automatically this system forcibly fluctuates the object being controlled

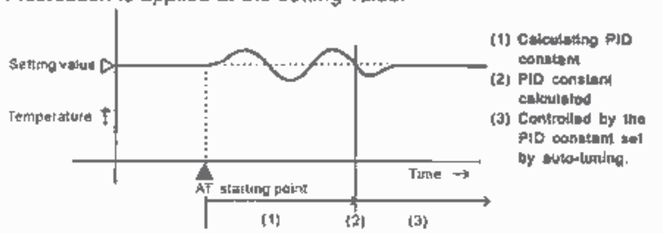
(1) When the difference between the setting value and processing temperature is large as the temperature rises.

Fluctuation is applied at the temperature 20℃ lower than the setting value.



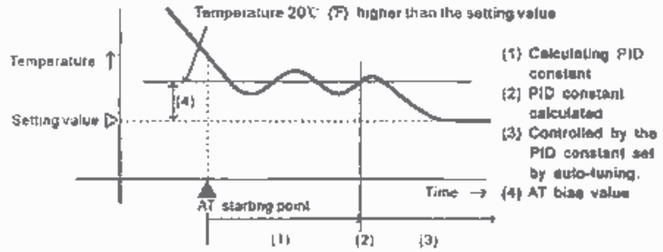
(2) When the control is stable or when control temperature is within ±20℃ of setting value.

Fluctuation is applied at the setting value.



(3) When the control temperature is 20℃ or higher than the setting value.

Fluctuation is applied at the temperature 20℃ higher than the setting value.

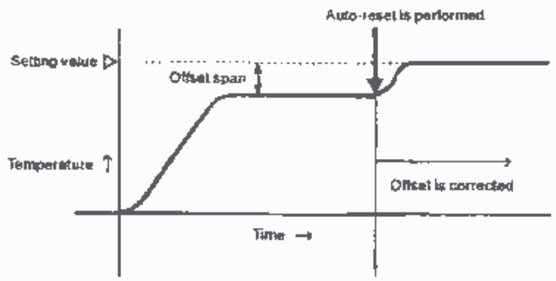


4.4.3 Auto-reset (offset correction)

Auto-reset is performed to correct the offset at the point at which PV indication is stabilized within the proportional band during the PD action.

Since the corrected value is internally memorized, it is not necessary to perform the auto-reset again as long as the process is the same.

However, when the proportional band is set to 0, the corrected value is cleared.



4.5 Output period "T"

Parameter T can be set between 0.5 to 125 seconds. It represent the calculate speed of the instrument. When T increased, proportion function will be increased and derivative function will be decreased. If T≥5s, derivative function is absolutely eliminated, then the system is a proportional or proportional-integral system. The change of this parameter will nearly have no influence to the system if T is less than 1/5 of its original value.

The following principle is for adjusting parameter "T".

- In case of time proportional output mode, if SSR (Solid state relay) or PBR is used as executive bodies, then control period can be set smaller (generally 0.5 through 2 seconds) to improve control precision. If relay contact output is used, then parameter "T" should be set to be larger than or equal 4 seconds generally, because a small value set will decrease service life of mechanical comacts. A large value set will increase service life of relay, but will decrease control precision, so select a value to satisfy both sides.
- In case of liner current output, decreasing parameter T will speed up output responsibility and improve control precision, but will lead to frequently changed output current and arising there from frequent movement of executive bodies (ex. Control value). Now increasing parameter T appropriately will make value move smoothly.

4.6 Input specification parameter "Sn"

Instrument is available with varied input function. Different input type such as thermocouple and RTD can be selected in the same instrument through parameter setting. Automatic non-linear calibration of nogh precision for thermocouple and RTD is available in the instrument, with measurement input accuracy less than 0.2%F.S. The following stable shows input specifition corresponding to the set value of parameter Sn.

Sn	Input spec.	Sn	Input spec.
0	K	5	J
1	S	20	Cu50
4	E	21	Pt100

4.7 Decimal point setting parameter "dIP"

In case of thermocouple or RTD input, dIP is used to define temperature display resolution.

dIP=0, temperature display resolution is 1℃.

dIP=1, temperature display resolution is 0.1℃.

Adjustment of this parameter only affects the display, and gives no effect on control or retransmission output because the internal temperature measurement resolution is fixed at 0.1℃, then temperature will be displayed at the resolution of 0.1℃ for input below 1000℃ and 1℃ for input over 1000℃.

4.8 "P-SH"and "P-SL": Scale definition parameter for linear input/retransmission output

Parameter "P-SH" and "P-SL" are used to define the display span for linear input, and to set the engineering unit for measurement. In case of thermocouple or RTD input Parameter "P-SH" and "P-SL" are not used.

4.9 Input shift parameter "Pb"

Parameter Pb is used to make input shift to compensate the error produced by sensor or input signal itself.

For thermocouple input, parameter Pb is used to correct reference junction compensation error.

The instrumem itself will not produce error after a long time used, because the technology of digital calibration is used in the instrument to substitute potentiometer of bad stability, and function of automatic zero modulation will guarantee no zero drift produced in the instrument.

Parameter "Pb" is used to make input shift to compensate the error produced by measurement. For example, provided input signal keep unchanged, if when parameter "Pb" is set to 0.0℃, the temperature measurement of the instrument is 500.0℃, then when parameter "Pb" is set to 10.0℃, the temperature measurement display will be 510.0℃.

Note: Instruments are all calibrated before delivering, and so the default value of parameter "Pb" is zero. Only adjust this parameter when recalibration of measurement is necessary.

4.10 Output definition parameter "OP-A", "outL", and "outH"

Parameter OP-A is used to define the mode of main output signal, and parameter "outL" and "outH" is used to define output lower limit and upper limit. Note: setting of parameter "OP-A" must conform to the module type installed as main output

- **OP-A=0**, the mode of main output is time-proportional output of on-off mode (for on-off control). If output modules such as SSR voltage output, relay contact discrete output, BCR cross zero trigger output, and BCR n0-contact discrete output are installed as main output, then "OP-A=0" should set.
- **OP-A=1**, any specification DC current output, continuous output mode. Linear current output module should be installed to main output.
- **OP-A=2**, Actuation is time proportional output of on-off mode.
- **outL**, Restrain minimum value of adjust output. When the function of sectional power restriction is executed, it is the output upper limit if output value is lower than the value of lower limit alarm. If bi-directional adjustment software is installed, then instrument is turned to be duo directional output system, when outL<0, it represents the maximum output of refrigeration output..
- **outH**, Restrain maximum value of adjust output.
- If linear current output module is installed in the instrument as auxiliary function module, then parameter "**outL**" and "**outH**" is used to define the scale of liner current for the corresponding retransmission output. And parameter "**outL**" is used to define output low limit and parameter "outH" is used to define output high limit. The unit is 0.1mA. For example, if a 4-20mA retransmission output need to be defined, then you can set like below: **outL**=40, **outH**=200.

4.11 Alarm output definition parameter "AL-P"

- Setup "AL-P" =17
  "ALM1" is High limit alarm;
  "ALM2" is Low limit alarm;
  "Hy-1" is Positive deviation alarm;
  "Hy-2" is Negative deviation alarm.

4.12 Function parameter "CooL"

Parameter "CooL" is used to select some system functions

- **Cool=0**, reverse action control mode. When this mode is selected, an increase in PV results in decrease in the control output. Ex, heating control.
- Cool=1, direct action control mode. When this mode is selected, an increase in PV results an increase in the control output. Ex, cooling control.

4.13 Communication interface related parameters "Addr" and "bAud"

When RS232C or RS485 communication interface is installed as auxiliary function, parameter "Addr" and "bAud" is used to define the communication address and baud rate define respectively for communication modules in the instrument. .

4.14 Input digital filter parameter "FILT"

If measurement input fluctuates due noise, then digital filter can be used to smooth the input. Parameter "FILT" may be configured in the range of 0 to 20, among which, 0 means no filter, 1 means intermediate-value filter and 2-20 means that intermediate-value filter and second order integral filter can be selected simultaneously.

The multiples of second integral filter is the square parameter "FILT", and can be up to hundreds times. When a large value is set, the measurement input is stabilized but the responsibility at the time is deteriorated. Generally if great interference exist, then you can increase parameter "FILT" gradually to make momentary fluctuation of measurement input less than 2 to 5 values. If the instrument is being tested at laboratory, then parameter "FILT" should be sit to 0 or 1 to short the time responsibility.

4.15 System parameter "A-M"

Parameter A-M is used to define auto/man be working status as below.

- A-M=0, manual control state
- A-M=1, automatic control state
- A-M=2, automatic control state, in this state manual operation is prohibited. When the manual

4.16 Privilege for parameter set "Lock"

If parameter LocK is set to other values than 808, then only field parameters the range of 0 to 8 and parameter LocK itself can be set. When parameter LocK is set to 808, user can set al parameters.

Parameter LocK provides several operation privileges. See the following:

- LocK=0, modification field parameters and set point is allowed.
- LocK=1, allowed to display and view field parameters, and to set point. But the modification of field parameters (except parameter LocK itself) is not allowed.
- LocK=2, allowed to display and view field parameters, but the modification of field parameters and set point (except parameter LocK itself) is not allowed.
- LocK=808, configuration of all parameters and set point is allowed.

If LocK is set to other values than the above mentioned, the result may be one of those above mentioned, and most of them are the same as when LocK=1 is set.

If you set LocK to be 808 during field parameter (EP1-EP8) setting, parameter LocK will automatically turned to be 0 when you finished setting field parameter, but if you set LocK to be 808 after the parameters are unlocked, parameter LocK will be saved as 808 permanently.

4.17 Field parameter definition: "EP1-EP8"

EP1-EP8 define 1-8 field parameters for operators' use in parameter table. Their parameter values are parameters except parameter EP itself like ALM1, ALM2, etc. when LocK is set to 0, 1, 2, and so on, only parameters or setting values of program defined can be displayed, other parameters can not be displayed and modified. This function can speed up the parameter modification and prevent important parameters (like input, output parameters) form modifying falsely.

Parameters from EP1 to EP8 can define 8 field parameters at most, if the number of field parameters is less than 8 (sometimes even none), it is necessary t define useful parameters from EP1 to EP8 in order, the first (parameter which are not used is defined as none. For example, two parameters of ALM1 and ALM2 are need to be modified by field operators, the parameter EP can be set as following:

LocK=0, EP1=ALM1, EP2=ALM2, EP3=nonE.

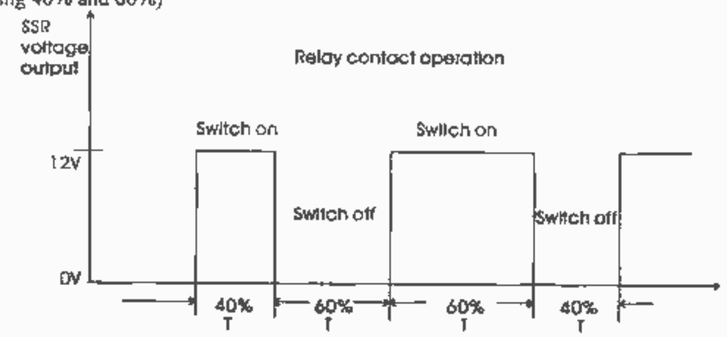
Sometimes field parameters are not needed after we finish adjusting the instrument, we can set EP1 parameter an nonE.

5 Additional remarks of Time proportional output (when OP-A=0)

In case of time proportional output mode, the output value can change by adjusting, during a fixed base period, the ratio of relay on-off time (or the ratio of the time during which SSR high voltage output or low voltage output is activated).

Time proportional output can be regarded as a square wave, the base period of which equals to control period "T", and the output value of which direct proportional to the on-off ratio of the square wave. The on-off ratio may be configured to be in the range of 0% to 100%. For special applications, the range of time proportional output can be clamped by tuning parameters "outL" and "outH". Fox example, if the output need to be clamped to between 20% and 60%, then "outL=20, outH=60" may just be set. Normally in case of time proportional output, if "outL=0, outH=100" is set, then there will be no output limit.

Below is a schematic diagram for time proportional output (waveform respectively for output being 40% and 60%)



6 Further description about general work mode

6.1 ON-OFF control instrument (simple temperature controller)

Dead band of ON-OFF control can be set by parameter Hy. When Instruments are used for ON-OFF control, is should be set as below: At=0, OP-A=0.

Parameters for artificial intelligence control, such as I, P, t and T, have no function in this occasion.

LocK=1: inhibit the modification of field parameters, inhibit the display and modification of other parameters.

EP1=nonE: field parameters are not defined.

6.2 3-point (upper, lower alarm) control instrument

To make the instrument have upper, lower alarm function, the parameters should be set as below:

At=0, OP-A=2, COOL=0, AL-P=17, LocK=0, EP1=ALM1, EP2=nonE.

6.3 Temperature transmitter

Instrument can retransmit its analog input signal into linear current output of any range, and can be used as an instrument with the display and temperature retransmission function. You can set various thermocouple/RTE input, and any temperature retransmission range and current output specification, with the retransmission accuracy less than 0.1mA in the range of 0-20mA (i.e., less that 0.5%F.S). Related parameters are as below:

Sn: select thermocouple/RTD input specification

At=0 (ON-OFF control mode)

OP-A=1, (linear current output)