XMT□-7000P

Intelligent Thermoregulatory Operating Handbook

Warning

1.Connecting warning

Installed the outside protection circuit can prevent system malfunction caused by the invalidation and fault of the instrument.

2.Power supply

To avoid the invalidation and fault of the instrument, choose the power source with rated voltage.

To avoid the electronic shock and instrument invalidation, just supply the power after all the connections are finished.

3.Forbid to use the instrument close to explosive gas

To avoid the fire, explosion and instrument damage, forbid to use the instruments in the location with explosive, inflammable and steamy gas.

4.Forbid to touch the inside of instruments.

To avoid the electronic shock or combustion, forbid to touch the inside of the instrument. Only the service engineer of our company can check the inside lines or change exchange the components. There is high voltage inside, so touch the inside is very dangerous.

5.Forbid to change the instruments' structure.

To avoid the accident and invalidation of instruments, it's forbidding

to change the instruments' structure. Only the service engineer of our company can change the components.

To ensure the durative and safe using of the instruments, please maintain the instruments termly. Some parts or components may be damaged with the time flying.

Brief introduction

XMT -7000P intelligent program controllers are the multi-functional regulators adopting the micro processing units. As also adopting advanced design and production technology, it is small and has great performance. The special self-conditioning and intelligent controlling functions bring good efforts through simple operating.

Main technologies indicates

1. Input

Any kind of TC, RTD's standard signal of current and voltage (see the kinds sheet of input)

2. Accuracy

Measure accuracy: ±0.5%FS

Cold-end Compensation deviation: in the range of ±2℃(0~50℃ can be amended by the software)

Resolving power: 1°C , 0.1°C

Sampling cycle: 0.5 Sec

3. Display

PV, SV: -1999 ~ +1999

Indicates of output, alarm, self-conditioning: LED

4. **Control mode**

PID control(including ON/OFF, position type PID

and continuous PID)

Self-conditioning control

5. Controlling output

1. Current output: DC 0 ~ 10 mA, 4 ~ 20 mA (RL< 500Ω)

2. Voltage output: DC 0 ~ 5 V, 1 ~ 5 V (RL>10K)

3. Relay output: contact capacity 250V AC 3 A(resistance load)

4. Voltage pulse output: 0 ~12V, (suitable for the solid relay SSR)

5. Controlled Silicone SCR output: over zero trigger or phase trigger （resistant load）

6. Alarm function output: 2 groups output at most, 6 modes. (see the alarm type)

Capacity of the output contact: 250V AC 3A (resistant load)

6. Setting range

Setting value (SV): Whole Measured Range

7. Others:

Insulation resistance: >500 MΩ (500VDC)

Insulation strength: 1500VAC/1min

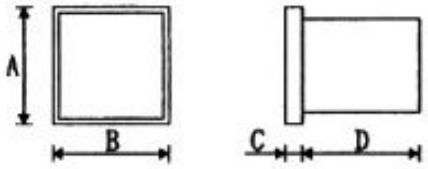
Power consumption: <10VA

Using environment: 0~50℃, 30~85% RH no corrosive atmospheres environment

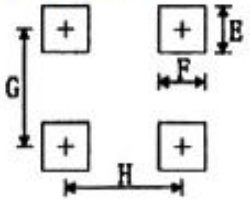
Weight: about 0.5kg **(XMTA-7□□□P)**

Size

Frame Size

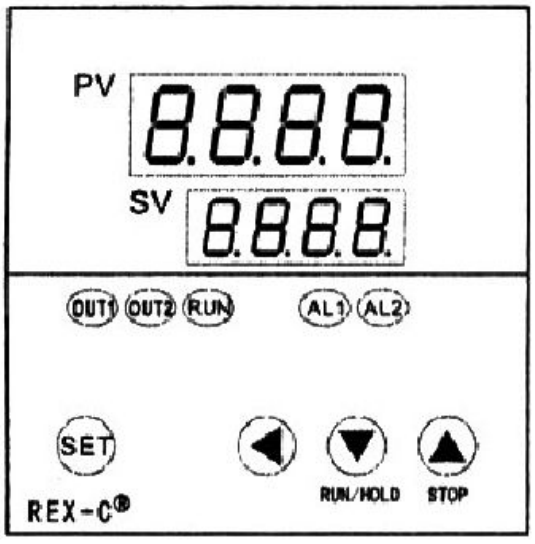


Hole Size



	A	B	C	D	E	F	G	H
XMT	80	160	10	100	76	152	106	180
XMTA	96	96	10	100	92	92	116	116
XMTD	72	72	10	100	68	68	96	96
XMTE	96	48	10	100	92	45	116	80
XMTF	48	96	10	100	45	92	80	116
XMTG	48	48	10	100	45	45	80	80
XMTS	160	80	10	100	152	76	180	106

Face board name and the functions



NO	Face board description	Content description
1.	PV	Measured present value/mode displayed value
2.	SV	Setting value/mode content displayed value
3.	OUT1	Output 1 indicating light
4.	OUT2	Output 2 indicating light
5.	RUN	Program running light
6.	AL1	Alarm 1 indicating light
7.	AL2	Alarm 2 indicating light
8.	▲	Addend key
9.	▼	Subtrahend key
10.	〈	Phase shift key
11.	SET	Set/mode key

Type Named and Selection

XMT□-7□ □ □P
① ② ③

① adjustment method:

0: thyristor regulator

4: position type PID of relay output

5: PID Adjustment of SSR solid relay output

6: PID Adjustment of Silicon controlled phase shifting output

7: PID Adjustment of Silicon controlled over-zero signal output

9: PID Adjustment of output 0-10mA or 4-20mA

②Alarm function:

1: upper limit deviation alarm

2: lower limit deviation alarm

3: upper and lower limit deviation alarm

4: upper input value alarm

5: lower input value alarm

6: upper and lower input value alarm

7: end-of-run alarm function

③Input signal：

1. TC (mv)

2. RTD (Ω)

Selection table of input mode

Input type	Display	Measure range	
K		0.0～999.9℃	0～1372℃
J		0.0～999.9℃	0～1200℃
R		0～1768℃	
S		0～1768℃	
B		0～1820℃	
E		0～800℃	
N		0～1200℃	
T		-199.9～400.0℃	-200～400℃
Pt100		-199.9～800.0℃	-200～800℃
Cu50		-50.0～150.0℃	-50～150℃

Note: Please fill in detailed according to the above content.

For example: XMTA- 7 4 1 1 P K 0-400

Basic Operating

1. Press the “SET” key to enter or exit the program parameter setting mode.

2. Press the “SET” key for 2.5 seconds, then enter or exit the program parameter setting mode.

3. When entering the numerical modification that one of SV is shining, press “ ◀▼▲“ key to modify. Press the“ ◀” key can set value of other position. After finishing the modification, press the “SET” key to enter the next parameters.

Note: you must press the “SET” key to save settings after the modification of value, or this modification is invalid.

Note: When you modify the data, please keep the “LCK “lock to the state that allowing setting.

4. When the program is running, press “◀” to view a modified operation and running time.

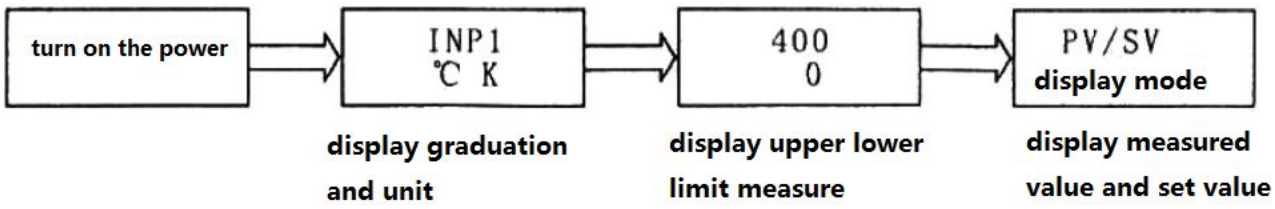
5. Press “▲” to stop the running of program, SV displays STOP.

6. Press “▼” to run the program , SV displays the setting value.

7. Press “▼” again to stop running the program, SV alternately displays the HOLD and the setting value.

Menu and setting

Power display process



1. Temperature time setting of each program segment

Display	Name	Description	Setting range	Display	Name	Description	Setting range
C-01	C-01	1st set value	full-range	T-01	T-01	1st segment time	0-9999
C-02	C-02	2nd set value	full-range	T-02	T-02	2nd segment time	0-9999
C-03	C-03	3rd set value	full-range	T-03	T-03	3rd segment time	0-9999
C-04	C-04	4th set value	full-range	T-04	T-04	4th segment time	0-9999
C-05	C-05	5th set value	full-range	T-05	T-05	5th segment time	0-9999
C-06	C-06	6th set value	full-range	T-06	T-06	6th segment time	0-9999
C-07	C-07	7th set value	full-range	T-07	T-07	7th segment time	0-9999
C-08	C-08	8th set value	full-range	T-08	T-08	8th segment time	0-9999
...	...	...	...	...	...	...	...

1. Press the “SET” key, the upper row displays C-01, the lower row displays the setting value. Press “ ◀▼▲ ” to the first segment set value that it needs.

2. Press the “SET” key, the upper row displays T-01, the lower row displays time(unit minute) . Press “◀▼▲” to the first segment set value it needs.

3. Press the “SET” key, the upper row displays C-02, set the second segment temperature.

4. Press the “SET” key, the upper row displays T-02, set the second segment time.

5. Repeat the above operating to the last segment.

Set the last segment time to “0”. Automatically stop running when the program runs to the segment that the time is“0”.

2. Check and change time in the program running

In the program running, press “◀” , PV displays SrEP, SV displays the current segment, press “◀▼▲” to set the segment. Press the “SET” key

again, the program will continuously run from the setting segment. At the same time, the upper row displays rUnE, the lower row displays the time that have run, you can also press "◀▼▲" to change the time.

3. Program operation mode and segment

Press the "SET" key and "◀" simultaneously for 3 seconds, PV displays d- , SV displays the total segment , press the "◀▼▲" key to modify segment, press the "set" key , PV displays n1, SV displays the program operation mode, press the "SET" key again, PV displays n2, SV displays program state at power-on.

Display	Name	Description	Range	value	Description
d-	D-	**Program segment**	**1-32**		
n1	M1	**Program operation mode**	**0-2**	**0**	**No slope, stop running when Tx=0 or the last segment.**
				1	**A slope,stop running when Tx=0 or the last segment.**
				2	**A slope,stop running when Tx=0. The last segment goes back to the first segment.**
n2	M2	**Boot program state**	**0-1**	**0**	**Stay at the stopped state after power-on.**
				1	**Run from the first segment after power-on.**

4. Control parameter function

Note: Please follow contents detail before you change the parameters.

If the instrument doesn't have some functions, then the follow flow sheet will not show such functions.

Display	Name	Description	Setting range	Factory Default
AL 1	AL1	alarm 1 setting	whole measured range	
AL2	AL2	alarm 2 setting	whole measured range	
ATU	ATU	adjustment automatic	0: close ATU 1: open ATU	0
P	P	proportional band	0-200 set 0 to stepping control	10
I	I	integral time (s)	0-3600(s) when o, no integral time effect.	200
d	D	derivative time(s)	o-3600(s) when 0, no derivative time effect.	50
T	T	work cycle(s)	cycle of time proportion: 1-100s	20 SSR 2
HY	HY	main control hysteresis width	1-100 0.1-10.0	1 0.5
Sc	SC	the correction of measured value	-100～100 -10.0～10.0	0 0.0
LCK	LCK	data's lock	0000 all the parameters can be modified 0001 only main setting can be modified 0002 all the parameters can't be modified	0000

System menu and setting

Press the “SET” key and “ ▼ ” simultaneously for 3 seconds to enter the system parameter setting.

 # System parameters is very important, if you set the wrong value, the instrument will can’t work normally.

Display	Name	Description	Setting range	Value leaving factory
Sn	Sn	input type	0-9	0000
dP	DP	radix point	0-1	0000
SLL	SLL	lower limit of the range	depend on the input type	0000
SLH	SLH	upper limit of the range	depend on the input type	0400
AL 1	MAL1	the 1st alarm mode	0-118	0003
AL2	MAL2	the 2nd alarm mode	0-118	0008
AHY	AHY	alarm hysteresis band width	0-9999	000.5
oUT	MOUT	control mode	0-5	0000
LAT	LAT	percentage of self-tuning	1-100	0100
M3	M3	remain	0-1	0000
SL9	SL9	remain	0-3	0000

Input type: **the 1st alarm mode**

data setting	0	1	2	3	4	5	6	7	8	9
input type	K	J	E	N	R	S	T	B	Pt100	Cu50
display	K	J	E	N	r	S	T	b	Pt	Cu

decimal point:

when setting the data to 0, the measured value has no decimal.

When setting the data to1, the measured value has one decimal.

Measure range:

Input type	Measure range	Input type	Measure range
K	0-1372℃	S	0-1769℃
J	0-1200℃	T	-200-400℃
E	0-1000℃	B	0-1820℃
N	0-1300℃	Pt100	-200-800℃
R	0-1769℃	Cu50	-50-150℃

Alarm mode:

Data setting	Alarm mode	Data setting	Alarm mode
0	no alarm function	5	large deviation alarm
1	upper input value alarm	6	0k alarm
2	lower input value alarm	7	
3	upper limit deviation alarm	8	alarm continuously when program finishes its run
4	lower limit deviation alarm	9	alarm 5 times (s) when program finishes its run

1. When Setting the ten-digit of data to 1, the alarm will not output at power-on until the alarm has been lifted.

2. When Setting the hundred-digit of data to 1, the alarm output reverses (ALM light turns on, no action output. ALM light is off, action can output.

Caution:

1.When inserting the instrument to control cabinet hole, the hole size should be moderate fitted with a mounting plate screw and then tighten moderately. The instrument that its shell with self-locking can be just inserted into the hole.

2. Check the instrument’s graduation specification and supply voltage whether the same as the instrument ordered.

3. Please connect according to the nameplate or manual of wiring diagram.

4. For the input signal of thermocouple, please use compensating lead wires that the material is the same as the thermocouple .

5. For the input signal of thermocouple, please use low resistance lead wire of the same specification and the length and thickness of three wires should be equal as far as possible.

6. Pay special attention to the wire of power input in order to avoid misconnection, and pay attention to the output terminals are short circuit by strong current.

7. The instrument power cord and signal lines should wiring separately with large current transmission line as far as possible so that to reduce the effect of electromagnetic radiation to instrument. If the condition permits, please choose shielded wire for instrument connection .

8. Please specify when ordering: 1, instrument model; 2, graduated number of matched sensors; 3, measure range; 4, supply voltage of instrument; 5, any other special technical requirements; 6, quantity and delivery time.

9. Under the condition of the complete packaging , the instrument should stored in a dry ventilated and no corrosive atmospheres environment.

Temperature: -5~50℃, Humidity: 20~85%

10. Without sealing off, any instrument damage that comes from the quality problem of the manufacturer, the manufacturer is responsible for free maintenance within one year.

Instrument repair and maintenance

1. Unplug the refrigerator before cleaning, the instrument and use soft cloth or cotton paper.it is prohibited to use hard objects and solvent to clean.

2. It is prohibited to use screwdriver , nails and other hard objects to operate the buttons, otherwise it will damage the panel and buttons.

3. If the instrument works abnormal, please change the instrument or sensors to determine the fault position when condition permits.

4. It is not recommended that user repairs the internal of instrument . If it must be repaired, please contact our company's service engineer.

When the instrument can not work normally, instrument will show the message after the self-diagnosis of instrument.

Message	Description	Elimination methods
	Measured value exceeds the upper limit range	Check whether there is any break on sensors and wires.
	Measured value is below the lower limit range	Check whether there is any short circuit or reverse connection on sensor and wires.

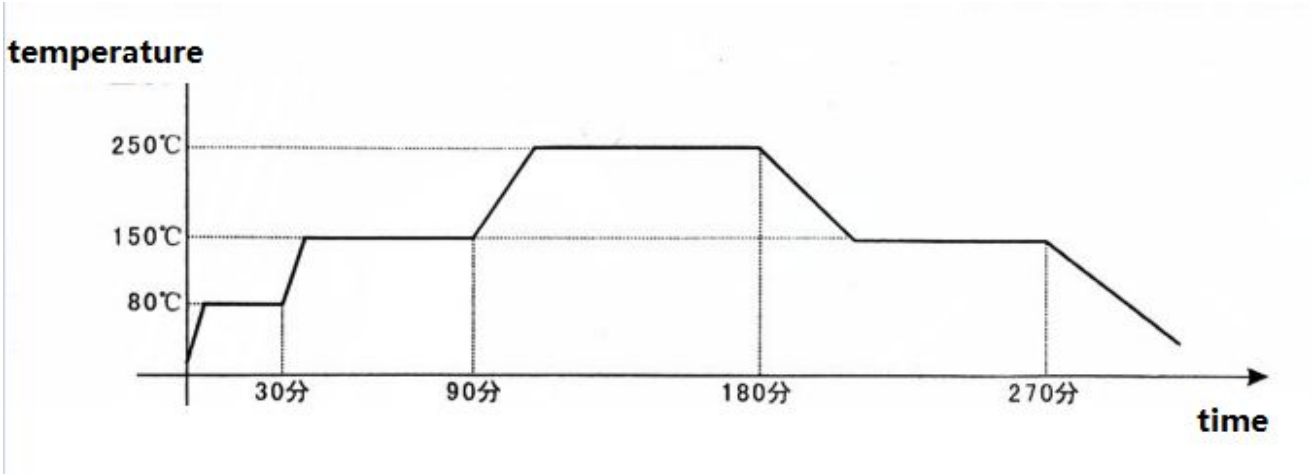
1. When the instrument display abnormal, first check the power supply whether meets the requirements and the sensor whether break or damage.

2. When there is no control output of instrument , please check the output wiring and the instrument output part whether have short circuit to burned.

3. When control error of instrument is big, please check whether the set of PID control parameters is wrong.

4. If the instrument buttons have no reaction, please press the “SET “key for three seconds, enter the menu and check the set of LCK menu whether is 0. If not, please set it to 0.

Program set samples



example1:

the 1st segment: reach to 80 ℃ for 30minutes, the 2nd segment: hold 150℃ for 60 minutes, the 3rd segment: hold 250℃ for 90 minutes, the 4th segment: hold 150℃ for 90 minutes, then cool the kiln down.

we can set :

M1=0 ; no slope.

M2=0; boot is in a stopped state, need to press” ▼ to start.

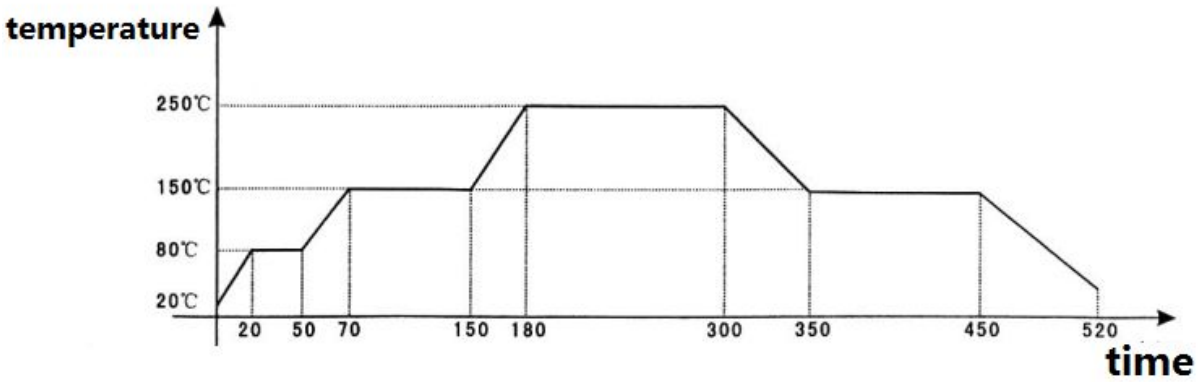
C01=80, T01=30; the 1st segment: to reach 80℃ for 30minutes.

C02=150,T02=60; the 2nd segment: hold 150 ℃ for 60 minutes.

C03=250,T03=90; the 3rd segment: hold 250℃ for 90 minutes.

C04=150,T04=90; the 4th segment: hold 150 ℃for 90 minutes.

C05=150,T05=0; C05 can be arbitrary value, T05=0 shows that after running to the current period, it will stop output, product cools down.



example 2:

The 1st segment : reach to 80℃ from 20 ℃ (need 20 minutes) , the 2nd segment : hold 80℃ for 30minutes, the 3rd segment : reach to 150℃(need 20minutes) , the 4th segment :hold 150℃ for 80 minutes, the 5th segment: reach to 250℃(need 30minutes), the 6th segment:hold 250℃ for 120 minutes, the 7th segment: cool to 150℃(need 50 minutes), the 8th segment: hold 150 ℃ for 100 minutes, the 9th segment: cool to 40℃(need 70 minutes), then stop , ALM2 outputs and complete the control cycle.

We can set:

M1=1; a slope.

M2=1; automatically start up at boot.

MAL2=8; the program runs and finish the alarm.

C01=20, T01=20; reach to 80℃ (need 20 minutes).

C02=80,T02=30; hold 80℃ for 30minutes.

C03=80,T03=20; reach to 150℃(need 20minutes).

C04=150,T04=80;	hold 150℃ for 80 minutes.
C05=150,T05=30;	reach to 250℃ (need 30minutes).
C06=250,T06=120;	hold 250℃ for 120 minutes.
C07=250,T07=50;	cool to 150℃ (need 50 minutes)
C08=150,T08=100;	hold 150℃ for 100 minutes.
C09=150,T09=70;	cool to 40℃ (need 70 minutes).
C10=40,T10=0;	stop the program.