Multi -function temperature controller instructions

INSTRUCTION MANUAL

BRIEF SUMMARIZATION

MX-102 Series Intelligent Temperature Controller is a kind of multi-functional adjustable instrument with special microprocessor, it has exquisite appearance and reliable performance, it adopts switching power supply and surface mounting technologies(SMT),the specify self-diagnosing function, auto-tuning function and intelligent control function

MAIN TECHNICAL PARAMETER

● Input of diversiform
Thermocouple(TC),Thermal Resistance (RTD),
Standard Current and Voltage Signal (Table B)
● Precision
Measurement Precision:±0.5%FS
Compensation error of the junction:±2℃(the software modification between 0~50℃ can be done)
Resolution:14 Bit
Sampling Time:0.5 sec
● Displaying
Process Value (PV), Setting Value (SV):-1999-+9999
Output alarm auto-tuning state display: LED
● Control Modes
1、PID control (including ON/OFF,potential PID and successive PID)
2、Auto-tuning control
● Control Output
1、Current Output:DC 0-10mA,4-20mA(RL＜500Ω)
2、Voltage Output:DC 0-5V,1-5V(RL＞10K)
3、Relay Output:contact capacity 250VAC 3A (dissipative load)
4、Voltage pulse output:0-12V(it is suitable for solid-state relay)
5、Controllable SCR Output: zero cross trigger or phase-shift trigger (dissipative load)
6、Alarm function output: it can output maximum two sets with 12 modes contact capacity output:250VAC 3A (dissipative load)
● Setting Range
Setting Value (SV):proportional process value (PV)
Proportional Band:0-full scale (when setting o, the on/off control)
Integral Time:0-3600 sec,(set o as the integral off)
Derivative Time:0- 3600 sec,(set o as the derivative off)
Proportional Cycle:1-100 sec.
Sluggish width of bit control output:1-100℃ (or other PV units)
● Others
1、Insulation Resistance:＞50MΩ (500VDC)
2、Insulation Intensity:1500VAC/minute
3、Power Consumption:＜10VAC
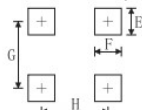4、Using Condition:0-50℃，30-85%RH no erosive location
5、Weight:0.25kg （C809）

APPEARANCE OPENING AND WIRE CONNECTION

● Appearance And Opening Size
Appearance size
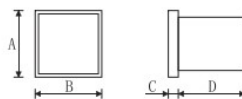
Panel surface opening

	A	B	C	D	E	F	G	H
MX-102	48	48	8	70	45	45	80	80

● Wiring Diagram（standard by diagram attached to controller）

PANEL DESCRIPTION AND FUNCTIONS OF ALL PARTS

NO	Panel Illustration	Contents specifications
1.	PV	Measured Value
2.	SV	Set Value
3.	OUT1	Output 1 Indicator
4.	OUT2	Output 2 Indicator
5.	AT	PID Auto-tuning
6.	ALM1	Alarm 1 Indicator
7.	ALM2	Alarm 2 Indicator
8.	▲	Up Key
9.	▼	Down Key
10.	◄	Shift Key
11.	SET	Mode/Setting Key

OPERATING FLOW

● Power On Flow

Power-ON

Input Code（Change Automatically）

PV: InP
SV: ℃℃

① Input Type Code
Input Abbreviation Indication(Table A)

Input Range Display（Change Automatically）

PV: 1372
SV: 0

② Display The Input Range

SV/PV Display Mode
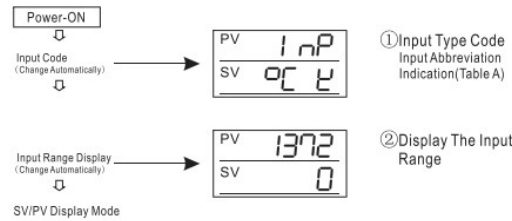
Table A

Display	ʁ	J	r	S	b	E	n	r	Pr	CU	oñ	ñɣ	ñA	ᵘᵘ
			(TC)						(RTD)		CURRENT VOLTAGE			
Input Mode	K	J	R	S	B	E	N	T	PT 100	CU 50	oM	mV	mA	V

● SV Setting Mode
Under sv/pv normal display status, press "set" key, so that sv displaying is blinking status, by pressing " ＜ " key,find the bit that you need temperature, press again up or down keys, set the temperature value you need ,after setting, repressset "key" ,shift the instrument into sv/pv display status normal.

● Parameter Setting Mode
The parameter is used for alarm, PID and so on,undernormal display status, after pressingset "key" for 3 second, show the parameter set status in the PV microprocess, show the relative value in sv micro process, press "set" key to show the below parameter symble.
NOTE:The function of resume automatical, when the operator modify the parameter, and forget to return the main display mode, the instrument automaticalreturn the main display mode after 30 seconds. Before using or when modifying the parameter, read the below content carefully
If the Instrument hasn t such the function, it will ben t displayed in the below flow.

Symble	Name	Description	Setting Range	Initival Value
	PV SV	Measure Vlue Set Value	Full scale	
AL1	AL1	First alarm	Full scale	
AL2	AL2	Second alarm	Full scale	
ARU	ATU	Auto-tuning	0：Auto-tuing stop 1：Auto-tuing start	0
P	P	Proportinal band(*1)	0-Full scale when setting 0 ON/OFF control	15
I	I	Integral time(sec)	0-999(sec) when setting 0 the integral don`t work	240
d	D	Derivate time(sec)	0-999(sec) when setting 0 the dervate don`t work	60
Ar	Ar	Reference value(*2)	After AT,set automatical	25
Γ	T	Working cycle(sec)	Time proportional cycle 1-100(sec)	(*3)
oH	OH	Control output invariable bandwidth	0-100 or 0.0-10.0	2(2.0)
Pb	Pb	PV value modify	-200-200 unit the same as PV	0
LCʁ	LCK	Data lock(*4)	000-999	000

*1. When P≠0,PID control the instrument, and set "I D" value reasonable, when use first, the user can open "AT" auto-tuning function, so that the controlling can reach the best status when p=0,ON/OFF control the instrument,set to control margin the value of "OH"
*2. The reference value can`t be manually setted within PID, after "AT" auto-tuning, set the value automatical.
*3. Relay contact output 20 sec the voltage pulse output/valve control the tube by trigger output/the valve control the tube output for 2 second.
*4. Set Data Lock Function
Set data lock function is used for parameter isn`t setted from operating wrong, there is three grade forbid locking statue, the parameter is forbad by every statue after locking the parameter, the parameter can`t be setted or changed but can keep watch on it.
1、When LCK=0000,all data can modify
2、When LCK=0001,all data can`t revise expect SV ,AL1,AL2
3、When LCK=0011,all data can`t revise expect SV
4、When LCK=0111,all data can`t revise

● Table B inout Mode Form:

NO.	Input Type	Process Volume Range	
0	K	0～1372℃	
1	J	0～1200℃	
2	R	0～1769℃	
3	S	0～1769℃	
4	B	0～1820℃	
5	E	0～800℃	
6	N	0～1300℃	
7	T	-200～400℃	-199.9～400.0℃
8	PT100	-200～650℃	-199.9～650.0℃
9	CU50	-50～150℃	-50.0～150.0℃
10	0-400Ω	-1999～9999	
11	0-50mV	-1999～9999	
12	0-20mA	-1999～9999	
13	0-5V	-1999～9999	

DEFAULT MESSAGE INDICATION

● When the instrument can`t work innormal,after self-judgement,the instrument will show the message indication.

Message	Specification	Handling method
Err	Default	Please repair it
0000	Input broken circuit,wrong circuit or exceeding input range	Please check if input signal is error
UUUU	Input broken circuit,wrong circuit or exceeding input range	Please check if input signal is error

● when Cod = 0001, ordinally press "SET" key and show circularly the following parameter:

SYMBOL	ORIGINAL VALUE	DESCRIPTION	SETTING RANGE
SLH	According to the order	Set measurement range upper limit	See the left table
SLL	According to the order	Set measurement range down limit	See the left table
dP	0	Decimal digits	0-3
oH	2 or 2.0	Control output invariable bandwidth	0-100 or 0.0-100.0
AH1	2 or 2.0	ALM1 output invariable bandwidth	0-100 or 0.0-100.0
AH2	2 or 2.0	ALM2 output invariable bandwidth	0-100 or 0.0-100.0
dF	1	Digital filter constant	0-100

SET THE PARAMETER MODE

● After the instrument switch on, press the parameter mode to enter and find the data "LCK", its code is setted for "1000", by pressing "SET" key again and make the instrument confirm, press "SET" and "<R/S" simultaneous, after 3 seconds, the PV display show "Cod". When "COD"=0000, ordinally press "SET" key and show circularly the following parameter:

SYMBOL	SETTING VALUE				DESCRIPTION	
SL 1	0	0	0	0	K	0～1372℃/0～400.0℃
	0	0	0	1	J	0～1200℃/0～400.0℃
	0	0	1	0	R	0～1769℃
	0	0	1	1	S	0～1769℃
	0	1	0	0	B	0～1820℃
	0	1	0	1	E	0～800℃
	0	1	1	0	N	0～1300℃
	0	1	1	1	T	-200～400℃/-199.9～400.0℃
	1	0	0	0	Pt100	-200～650℃/-199.9～650.0℃
	1	0	0	1	Cu50	-50～150℃/-50.0～150.0℃
	1	0	1	0	0-400Ω	-1999～9999
	1	0	1	1	0-50mV	-1999～9999
	1	1	0	0	0-20mA(4-20mA)*1	-1999～9999
	1	1	0	1	0-5V(0-10V)	-1999～9999
SL 2	0	0	1	0	℃	Nominal unit selection
	0	0	0	1	℉	
SL 3	0	0	0	0	Omit	
SL 4		0	0	0	Non set ALM1	ALM1 type choice
		0	0	1	The upper limit dviation alarm	
		0	1	0	The upper/down limit deviation alarm	
		0	1	1	Process value upper limit alarm	
		1	0	1	The down limit deviation alarm	
		1	1	0	With alarm	
		1	1	1	Process value down limit alarm	
	0				Non idle alarm function	ALM1 idle fuuction choice
	1				Idle alarm function	
SL 5	0	0	0	0	Set ALM2	Do ditto
SL 6				0	Positive action (cooling)	Main control positive/restores action choice
				1	Restores action(heating)	
		0			Calefaction test time proportional output	Controlling output tybe choice
		1			Calefaction test continual output(4-20mA)	
SL 7				0	Driven alarm	Driven alarm/non driven alarm (ALM1 test)
				1	Non driven alarm	
			0		Driven alarm	Driven alarm/non driven alarm (ALM2 test)
			1		Non driven alarm	
SL 8	0	0	0	0	Omit	
SL 9	0	0	0	0	Omit	

*1.When the instrument input 4-20mA current signal, the input terminal need connect with 250 ohm resister .

Power terminals

AC L
100 to 240V
1
N
2

Control output terminals

Relay contact
4
OUT1
5
NO
NC
6

Input terminals

RTD Input
10 A
RTD
11 B
12 B

1   7
2   8
3   9
4   10
5   11
6   12

Alarm output terminals

First alarm
NO
8
ALM1
9