

XMTG- 818PK 64 Programable segment temperature controller

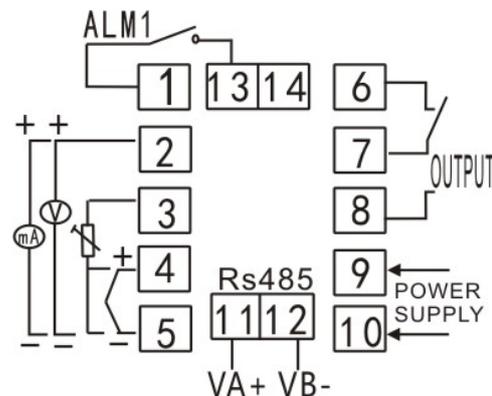
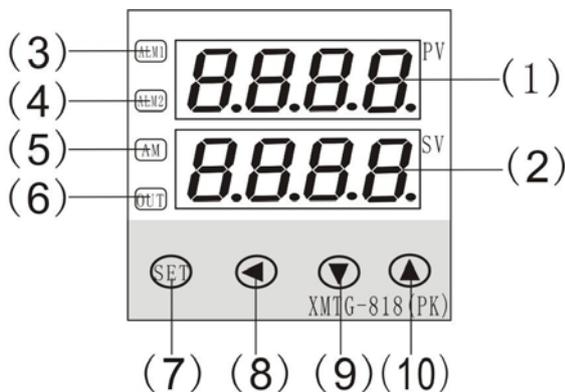
Operation Instruction



I、Main Technical Indexes

- 1-1、Basic error: $\pm 0.5\%F.S \pm 1B$
- 1-2、Cold end compensation error: $\leq \pm 2.0^{\circ}C$
- 1-3、Sampling period: 0.5 second
- 1-4、Alarm output return difference: 0.5 or 5
- 1-5、Relay output contact capacity: AC220V/5A (resistance load) or AC220V/0.3A (inductive load)
- 1-6、Overall dimension (mm): 48×48×110 Hole Size (mm): 44×44
- 1-7、Power: AC85~242V or AC100~250V, 50/60Hz
- 1-8、Work environment: temperature 0~50.0℃, relative humidity $\leq 85\%RH$, without corrode and strong electric radiation.

II、Panel and wiring diagram description (Consult):



- (1) PV display window: In the normal display state, it displays measured value; In the parameter modification state, it displays parameter symbol.
- (2) SV display window: In the normal display state, it displays setting value of program segment running ; In the parameter modification state, display parameter value.
- (3) ALM1 indicator: When this indicator light on, the ALM1 relay of controller have output (that is,terminal No. 1 and 13 are connected).
- (4) ALM2 indicator: It is not use for this type controller.
- (5) A-M Indicator: This indicator is light when the controller is in the program segment running state. This indicator flashes.when the program segment is in a pause state.
- (6) OUT indicator: When this indicator light on, the controller have output.(That is , terminal No.7 and 8 are connected).
- (7) Function key (SET): Press the key for 3 seconds to enter the parameters modification state; To use this key with the Shift key to enter the setting area of program segment.
- (8) Shift key: In the parameter modification state, press the key to realize the movement of number location ; in the normal circumstance, press the key for 3 seconds to enter or exit manual adjustment.
- (9) Number reduced key: In the parameters modification, setting value modification or manual adjustment state, it can decrease.the number.
- (10) Number increased key: In the parameters modification, setting value modification or manual adjustment state, it can increase the number; In the program segment running state, press the key for 3 seconds to switchover between the pause state and running state; If program segment complete running and enter the stopped state, press the key for 3 seconds to return to the first paragraph run; when the program segment is off (run = 0), press the key for 3 seconds to enter to the modification state of setting value (SP).

Wiring instruction: When 0-10mA or 4-20mA current signal input, the input terminals require splice 1K or a 250Ω resistor, the current signal switch into voltage signal.

III、 Internal Parameters

Series	Code	Name	Setting range	explaining	Preset value
0	SP	temperature Setting value	Determined by P-SL, P-SH	This parameter can be set only when the parameter run = 0 , Please see "4.1、 Setting value modification "	50
The first setting area: Parameter modification					
1	AL-1	The first alarm	Deviation alarm and zone alarm range are 0.5 to 100.0; and other alarm range is determined by P-SL, P-SH	Please refer to Alarm Parameter "ALP" When release from alarm, the return difference is fixed for 0.5 or 5. XMTG-818PK is no AL-2 function.	300
2	AL-2	The second alarm			100
3	Pb	Sensor error amendment	±20.0	If the sensor have deviation, it is used to make correction	.0
4	P	Rate parameter	1~5000	P value is similar to the proportion of conventional PID regulator, but change is contrary, P value is greater, the role of proportion and differential increase proportionally, P value is smaller, the role of proportion and differential decrease proportionally, P parameter value has nothing to do with the integral action. Set P = 0, the controller is ON/OFF -type control.	100
5	I	Maintaining parameter	0~3000	—	500
6	d	Delay time	0~2000S	—	100
7	T	Control period	2~120S	In the PID control mode, it is the relay control cycle, the shorter the time, the better control effect, but it will affect the relay life. The value of the general factory relay set to 10 seconds.	10
8	FILT	Filt modulus	0~50	It is the software filter constants of measurement sampling. The constant ↑, the measurements antijamming capability measurements antijamming capability↑, but the measurement and system time ↓	20
9	Hy	The main control return difference (unilateral)	0.1~50.0	When the controller is ON/OFF control, the value is lower, the control is better, But when it is the relay output for controller, it will affect the use life.	0.5
10	dp	Decimal point position	0~3	When thermocouple and thermal resistance input, the decimal point set up the range of 0~1; when current and voltage input, the decimal point set up the range of 0~3 dp=0 , display format is 0000; dp=1 , display format is 000.0 dp=2 , display format is 00.00; dp=3 , display format is 0.000	0
11	outH	The max. value of allowable output	outL~200	When the controller is for control output of the voltage or current, it has the lowest and highest output limit function. The ON/OFF control is meaningless.	200
12	outL	The min. value of allowable output	0~outH		0

13	AT	Setting itself	0~1	0: Close setting itself; 1: Open setting itself Please refer to “V、Setting itself”	0																															
14	LockK	Code lock	0~50	LOCK=0, all the parameters can be revised; LOCK=1, only the SP and the parameters in the second setting area can be revised LOCK > 1, all the parameters are prohibited to change.	0																															
15	Sn	Input type	CU50(0.50) PT100(PT 1) PT100(PT 2) K(E)、E(E) J (J)、T (t) S (S)、R (r) WR25 (r 25) N (n) CCCC (CCCC) 0~50mV (0.5u) 10~50mV (1.5u) 0~5V/0~10mA (0.5u) 1~5V/4~20mA (1.5u)	<table border="1"> <thead> <tr> <th>Input type</th> <th>Measuring range</th> </tr> </thead> <tbody> <tr> <td>CU50</td> <td>-50.0~150.0°C/-58.0~302.0°F</td> </tr> <tr> <td>PT100</td> <td>-199.9~200.0°C/-199.9~392.0°F</td> </tr> <tr> <td>PT100</td> <td>-199.9~600.0°C/-199.9~1112°F</td> </tr> <tr> <td>K</td> <td>-30.0~1300°C/-22.0~2372°F</td> </tr> <tr> <td>E</td> <td>-30.0~700.0°C/-22.0~1292°F</td> </tr> <tr> <td>J</td> <td>-30.0~900.0°C/-22.0~1652°F</td> </tr> <tr> <td>T</td> <td>-199.9~400.0°C/-199.9~752.0°F</td> </tr> <tr> <td>S</td> <td>-30~1600°C/-22~2912°F</td> </tr> <tr> <td>R</td> <td>-30.0~1700.0°C/-22~3092°F</td> </tr> <tr> <td>WR25</td> <td>-30.0~2300°C/-22~4172°F</td> </tr> <tr> <td>N</td> <td>-30.0~1200.0°C/-22~2192°F</td> </tr> <tr> <td>CCCC</td> <td>Special thermocouple standby</td> </tr> <tr> <td>0~50mV</td> <td rowspan="4">-1999~9999</td> </tr> <tr> <td>10~50mV</td> </tr> <tr> <td>0~5V/0~10mA</td> </tr> <tr> <td>1~5V/4~20mA</td> </tr> </tbody> </table>	Input type	Measuring range	CU50	-50.0~150.0°C/-58.0~302.0°F	PT100	-199.9~200.0°C/-199.9~392.0°F	PT100	-199.9~600.0°C/-199.9~1112°F	K	-30.0~1300°C/-22.0~2372°F	E	-30.0~700.0°C/-22.0~1292°F	J	-30.0~900.0°C/-22.0~1652°F	T	-199.9~400.0°C/-199.9~752.0°F	S	-30~1600°C/-22~2912°F	R	-30.0~1700.0°C/-22~3092°F	WR25	-30.0~2300°C/-22~4172°F	N	-30.0~1200.0°C/-22~2192°F	CCCC	Special thermocouple standby	0~50mV	-1999~9999	10~50mV	0~5V/0~10mA	1~5V/4~20mA	2
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16	OP-A	The main control output method	0~7	‘0’no output; ‘1’relay output; ‘2’Solid state relay output; ‘3’ Zero-crossing trigger; ‘4’ Phase-shift trigger; ‘5’0~10mA or 0~5V; ‘6’4~20mA or 1~5V; ‘7’ valve-position control	1																															
17	OP-B	Vice control output method	0~4	‘0’ no output; ‘1’ RS232 or RS485 communication; ‘2’ Connect micro-printer; ‘3’ 0~10mA or 0~5V transmission output; ‘4’ 4~20mA or 1~5V transmission output	1																															
18	ALP	Alarm method	0~10	‘0’ no alarm; ‘1’ high limit alarm; ‘2’ low limit alarm; ‘3’ high,low limit alarm ‘4’ positive deviation alarm; ‘5’ negative deviation alarm; ‘6’ positive,negative deviation alarm; ‘7’ outside the interval alarm; ‘8’ inside the interval alarm; ‘9’ high high limit alarm; ‘10’ low low limit alarm The shaded can not be selected for XMTG-818PK	1																															
19	COOL	System function choice	0~1	0:reverse control(heating).; 1: .positive control(cooling)	0																															
20	P-SH	The max. value of temperature range	—	When the input is thermocouple or thermal resistance,P-SH, P-SL decide the setting value range and alarm setting value range. When the input is voltage or current, P-SH and P-SL decide the display range. As for the Max. temperature range for different inputs, please refer to Sn, P-SH≥P-SL	1300																															
21	P-SL	The min. value of temperature range	—		0																															

22	Addr	Communication address	0~63	The controller's number in the control system.	1
23	bAud	Communication baud rate	0~3	'0'1200; '1'2400; '2'4800; '3'9600	9600
24	CF	Fahrenheit and degree centigrade selecting	C or F	C : °C; F : °F	C
The second setting area: Parameter modification					
25	AL_P	Automatic Pause strip	0~100.0	Please refer to “6.2、The controller several working states”	10
26	Run	Running state	0~3	<p>'0' Stop: The controller is used as the constant temperature control in the base of setting value (SP).</p> <p>'1' Standby: When the controller finish the curve program, the controller will enter into the standby state, this time control output close, It is in the single-display state,</p> <p>'2' Pause: The controller stop timing, it is used as the constant temperature control according to the current set value in the pause state.</p> <p>'3' Run: The controller do curve –control operation according to preset ramp temperature and time parameter.</p> <p>Please refer to “6.2、The controller several working states”</p>	0
27	Pro	Program segment	0~64	It is the present running segment, changing this parameter can skip at random,	1
28	TE	Run time	the segment Setup time, Unit is minute	The current segment running time (read-only)	0
29	r1	Slope of ramp 1	0~200.0 °C/min	The unit is °C/min, when r=0 finish this curve control, and enter the standby state (run=1 pro=1) when r=200.0, skip to the next platform directly . without ramp segment	10
30	T1	Running time of platform 1	0 ~ 9999 minutes	Soak time of Platform 1, when the time is 0, the program will skip to next segment.	10
31	C1	Target temperature value of platform 1	Determined by P-SL, P-SH	The target temperature value of the ramp segment 1 and soak segment 1.	50
122	r32	The slope of ramp 32	The same as above	The same as above	—
123	t32	The running time of platform 32	The same as above	The same as above	—

124	C32	Target temperature value of platform 32	The same as above	The target temperature value of the ramp segment 32 and soak segment 32	—
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IV、Parameters setting method:

4.1、Setting value modification

When the controller is set up with the electricity, press the ▲ key for 3 seconds, this time the upper row LED displays setting value symbol “SP”, the modification method please refer to “4.2”. When close program segment function (run = 0), the parameter makes sense.

4.2、The first setting area: Parameter modification

When the controller is set up with the electricity, press the SET key for 3 seconds to enter into the first setting area, the controller will display the parameter symbol 1~24 in the upper row window and display the parameter value at the lower row window in sequence. In this time press the ▲、▼ or ◀ key to adjust the parameter value, then press the SET key to save the data and enter into the next parameter to continue, keep pressing the SET key to exit quickly or press SET +◀ keys to exit directly. If no operation within 10 seconds during setting, it will to preserve the data and withdraw the setting state automatically.

4.3、The second setting area: Program segment set

Press the SET+◀ for 3 seconds at the same time to enter into the program segment modification state, the controller will display the parameter symbol 25~124 in the upper row window and display the parameter value at the lower row window in sequence. The operation way is same as “4.2”.

4.4、Manual regulation:

When the controller is set up with the electricity, press the ◀ key for about 3 seconds to enter into the manual regulation state, the lower row LED display “H”, in this time to set the output power percentage by pressing the ▼ or ▲, set range is 0~100, press the ◀ key for about 3 seconds again, it will withdraw the manual regulation state.

4.5、Reset function:

Press the ◀+▼ about 1 second, the program will reset to the first segment for running according to the running state.

4.6、In the normal display state, the upper display window display the measured value, the lower display window display setting value, press the ▼ key to switchover to display the main control output value in the lower display window which displays “F” in the front and display output value of 0~100 in the latter three digit.

4.7、Pause and recycling operation:

When the controller is in the normal operation state, press the ▲ key for 3 seconds, program segment enter into the pause state, in this time the A-M indicator is flashing, press the ▲ key for 3 seconds again, the program segment resume running. When the program segment finish running and enter the standby state, press the ▲ key for 3 seconds, program segment restart running from the first segment.

V、Setting itself

When the controller is used at the first time or the condition changes, the control performance of controller may be bad. In this condition, the some parameters, such as P、I、D, should be reset, the setting method is as below:

1、Set parameter “run” for 0 in the second setting area menu (that is, entering into the conventional constant temperature control state), the setting value “SP” is set to the around middle point of the curve.

2、Press the SET key to enter the parameters setting state, set “HY” (main control return difference) to be 0.5~1.0℃, set “AT” is 1, the controller enter into the setting itself state, the lower display window will alternately display the “AT” characters and setting value, and the controller is operating ON/OFF control; After three circle vibrations, the controller save P、I、D parameters automatically, the process of setting itself is over.

Note: ① If the power goes off during setting, it will restart setting after switching on the controller next time. It is because the controller has memory function,

② If the setting should be stopped and exited artificially during setting,, set “AT” to be “0”, then it can exit immediately, In this case, the setting result will be of no effect.

VI、 Description of program segment and processing of power cut off

6.1、 Basic concept:

Users can design setting value curves changed by time on request including the heating by the ramp segment, cooling by the ramp segment and platform segment. There are 32 ramp program segments and 32 soak program segments totally for This controller.

6.2、 The controller several working states:

Stop state (run=0):

When the controller is in the stop state, the controller is used as the constant temperature control. To set on base of setting value (SP) which displays in the lower window. the running indicator **A-M** turn off.

Standby state (run=1):

After the controller finish the curve program or when $r=0$ in some segment, the controller will enter into the standby state (run=1), in this time, the main control output close and the running indicator **A-M** turns off, the lower display window display the first segment setting value. When the outer switch touch off or set Run parameter of the controller to be 3, it can restart.

Pause state (run=2):

When the controller is in the pause state, the program segment stop timing and the running setting value (SV) remain unchanged, the main control output work according to the setting value in the pause state. The controller with setting in the pause state will prolong the running time of the curve program. The running indicator light **A-M** will flash.

Run state (run=3):

When the controller is in the run state, the controller constantly modify the setting value (SV) according to the setting curve, enable the measured value (PV) to change according to the curve program, so as to achieve the purpose of curve program control. The indicator **A-M** turn on.

Automatic pause state:

The automatic pause state is the special form of pause state, created by the controller itself, can not be controlled by people. In the running state, when the deviation absolute value between the measured value and present running setting value (SV) > automatic pause strip (AL_P), the controller will enter into the pause state automatically, the **A-M** indicator will flash and the timer stop work, the setting value (SV) will remain unchanged. When the deviation absolute value between the measured value and present setting value (SV) < automatic pause strip (AL_P), the controller will return to the running state automatically.

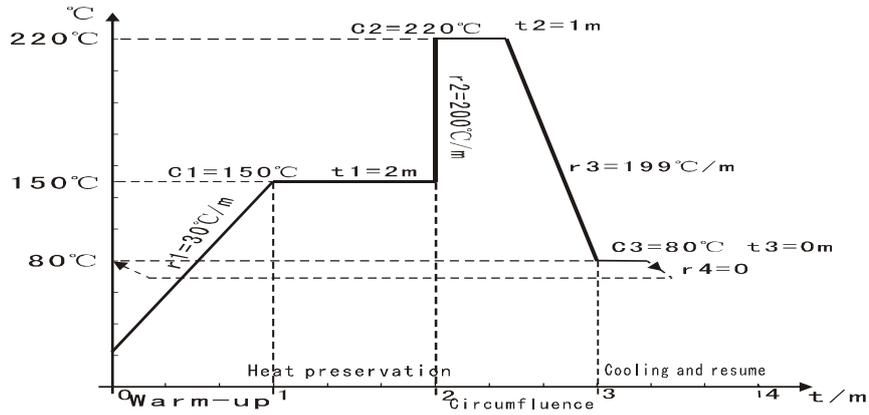
6.3、 Processing of power cut off:

During the curve program running, the controller save the data of running state every 5 minutes. When powering off and then powering on, the controller only go ahead with curve program running from the last saved data, not from beginning of the curve (if it is necessary to start from beginning of the curve, please reset and run it according to "4-5, reset function")

VII、 Taking the soldering equipment of surface paste for example of setting the parameter of program segment as below:

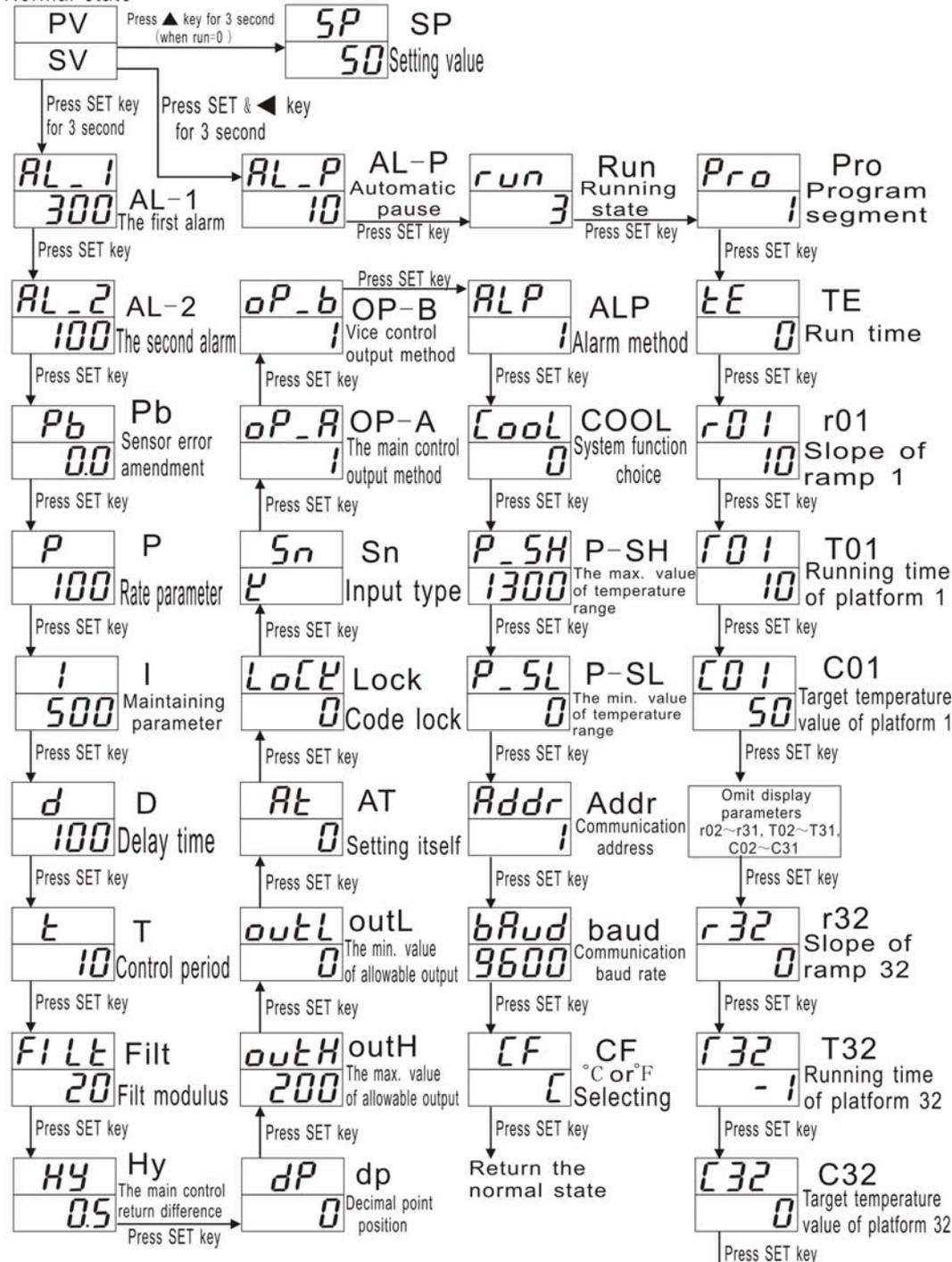
- 1、 Preheating segment: To be warmed up from the initial temperature by the ramp of $30^{\circ}\text{C}/\text{min}$ ($r1$), when the furnace temperature reach to 150°C ($C1$), it enters into the soak segment,. Set $r1 = 30^{\circ}\text{C}/\text{min}$;
- 2、 Soak segment: When the furnace temperature reach 150°C ($C1$) and enter into the first platform segment (soak segment), the soak time $T1 = 2$ minutes
- 3、 Return segment: The program directly jump from the first platform segment to the second platform (set $r2 = 200^{\circ}\text{C}/\text{min}$, at this time, it skip directly to the second ramp segment) to enable the furnace temperature quickly rise to welding temperature $C2 = 220^{\circ}\text{C}$, and soak $T2 = 1$ minute;
- 4、 Cooling segment: For the third ramp segment, set $r3 = 199^{\circ}\text{C}/\text{min}$, $C3 = 80^{\circ}\text{C}$, $199^{\circ}\text{C}/\text{min}$ rate cooling in order to achieve rapid cooling to 80°C ;
- 5、 Reset into standby mode: After the temperature decrease to 80°C , it enters into the third platform segment (soak segment); but, because of $T3 = 0$, it skip the third platform segment and enter into the fourth ramp segment directly; but, because of $r4 = 0$, so the controller skip the first program segment and enter into the standby state (pro=1; run=1) .

Temperature Curve chart is as below:



VIII 、 Flow Chart

Normal state



Return the normal state

IX、 Fault analysis and clearance

XMTG-818PK controller with advanced production process, has the strict test before leaving factory, it improve the reliability of the meter. The usual fault is caused by the wrong operation or parameter setting. If you find the fault couldn't be cope with, please record it, and contact with the agent or us. Sheet 8-1 is the usual fault of XMTG-818PK in the daily application:

Sheet 8-1 Clearance for Common fault

Fault symptom	Analysis of causes	Clearance
Abnormal power	1、 Poor contact of power cord 2、 Power switch does not close well	Check the power
Signal display do not correlate with the facts. (display 'HH' or 'LL')	1、 Sensor model mismatch 2、 Wrong signal connection	1、 Check sensor model and controller interior input parameter 2、 Check signal wire
Abnormal output control	1、 Wrong connecting of output wire 2、 Parameter setting error	1、 Check output connection 2、 Check the parameters setting related to output
Program segment does not run	1、 Parameter "run" is not equal to 3 2、 The controller enter into the automatic pause state	1、 The parameter "run" is changed to be 3 2、 To change "AL-P" value within the allowable range
Communication is not normal	1、 Parameter setting is not right 2、 The controller communication wiring error	1、 Check communications parameter setting of the controller and the host computer 2、 Check communication wiring

Attached 1: Statement between controller's parameter letter and English letter

A	B	C	D	E	F	G	H	I	J	K	L	M
<i>A</i>	<i>b</i>	<i>C</i>	<i>d</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>	<i>J</i>	<i>K</i>	<i>L</i>	<i>M</i>
N	O	P	Q	R	S	T	U	Y				
<i>n</i>	<i>o</i>	<i>P</i>	<i>q</i>	<i>r</i>	<i>S</i>	<i>t</i>	<i>u</i>	<i>y</i>				

★Note: Our company will continue to improve product technology, design specification. If change, please subject to the material object, without notice.