# 智能温控仪说明书 Intelligent temperature controller

## 型号说明 Model description:

M2 06 - TE / T1 R - TM1 A / □

**壳体样式分类 Housing style classification**

**面板样式分类 Panel style Classification**

**产品分类 Product classification**

TE：智能温控仪
Intelligent temperature controller

**控制输出 Control output**

TM1--控制输出SSR（DC12V）+继电器
Control output SSR (DC 12V)+Relay

TM2--控制输出SSR（DC12V）+双继电器
Control output SSR (DC 12V)+Double relay

M1---控制单继电器输出
Control the output of single relay

M2---控制双继电器输出(上限+下限输出)
Control the output of double relay

T ---控制输出SSR（DC12V）
Control output SSR (DC 12V)

V ---电压模拟量输出（0~10V）
Output of analog voltage (0~10V)

A ---电流模拟量输出（4~20mA）
Output of analog current (4~20mA)

**输入信号(温控仪) Input signal (Intelligent temperature controller)**

A---全功能输入（默认K型）
Input full function (Factory default K-type)

K---K型热电偶
K-type thermocouple

E---E型热电偶
E-type thermocouple

P---热电阻Pt100
Thermal resistance Pt100

C---热电阻Cu50
Thermal resistance Cu50

其它代码对照详见：表A
Other codes: Form A

**通 讯 Communication:**

R---RS485（MODBUS协议）
空置Blank---无通讯Non communication

**工作电源 Working power supply**

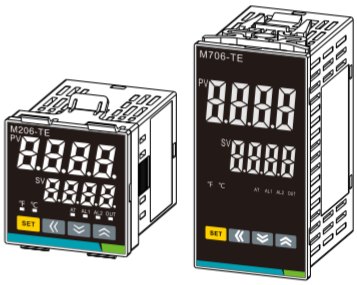
- T1--电源(变压器):AC-220V,50/60HZ
  Power supply (Transformer)
- T2--电源(变压器):AC-380V,50/60HZ
  Power supply (Transformer)
- S1--开关电源 :AC/DC - 20~80V
  Switching power supply
- S2--开关电源 :AC/DC - 80~260V
  Switching power supply

**功能定制备注 Function customization:**

功能代码为4位组合数(生产建档备查)
The function code is a 4-bit combination number

## 仪表使用环境 Working environment

- 大气压力Air pressure：86-106kPa
- 环境温度Environment temperature：0-50℃
- 相对湿度Relative humidity：45-85%RH




## 安装时应注意以下情况 Precautions for installation:

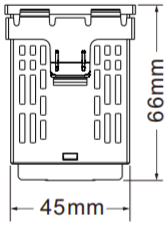
1、过多的灰尘、盐份或金属粉末 Excessive dust, salt, or metal powder;
2、腐蚀性、易燃气体 Corrosive and flammable gas;
3、直接震动或冲击主体结构 Direct vibration or impact on the main structure;
4、水、油、化学品、烟雾或蒸汽污染 Water, oil, chemical, smog or steam pollution;
5、环境湿度的急剧变化可引起的结露 A sharp change in environmental humidity may cause condensation;
6、空调直吹、阳光直射、热辐射积聚之处 Direct air conditioning, direct sunlight, heat radiation accumulation.

## 主要技术参数 Main technical parameters

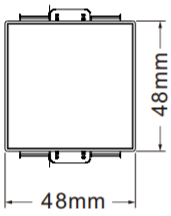
1、兼容输入Compatible input: 热电偶thermocouple（E.J.K.S.B）;热电阻Thermal resistance （Cu50.Pt100）
2、显示误差Display error:小于或等于满量程的1.0%±1个字 less than or equal to 1.0% ± 1 word of full scale
3、冷端补偿误差Cold end compensation error:≤2℃ / 分辨率Resolution ratio: 1℃或0.1℃(1℃ or 0.1℃)
4、采样周期Sampling period:300毫秒milliseconds
5、主控方式Main control mode: PID控制或位式控制PID control or Stepping control
6、主控输出Main control output : SSR驱动电平Drive voltage（DC12V, 负载能力Load capacity ≤30mA）
继电器输出Relay output （容量Capacity: AC 220V 阻性负载Resistive load 3A）
7、报警输出Alarm output:继电器触点Relay contact AC 250V 3A(阻性负载Resistive load)

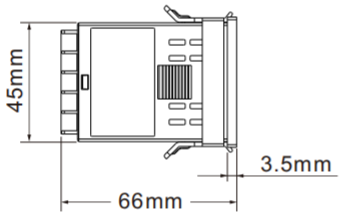
| 产品外形及安装开孔尺寸<br>Product appearance and installing size | | |
|---|---|---|
| 产品规格<br>Specifications | 外形尺寸<br>External dimension<br>高×宽×深(mm)<br>Height × width × depth | 面板开孔尺寸<br>Panel hole dimension<br>高×宽(mm)<br>Height × width |
| M2□ □- | 48×48×66 | 46×46 |
| M3□ □- | 72×72×66 | 68×68 |
| M5□ □- | 48×96×66 | 46×92 |
| M7□ □- | 96×48×66 | 92×46 |
| M9□ □- | 96×96×66 | 92×92 |

## M206-

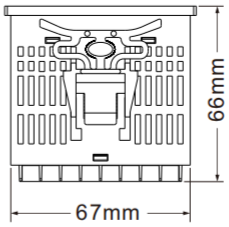




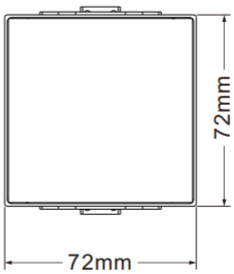


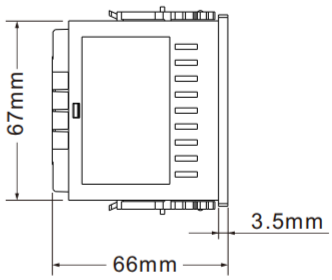




## M306-

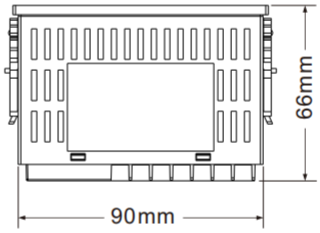


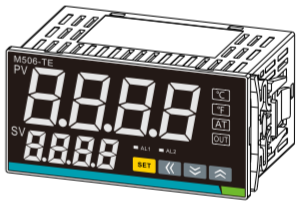


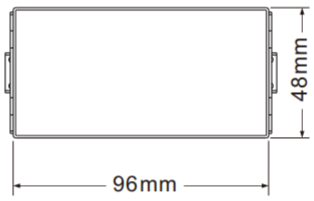


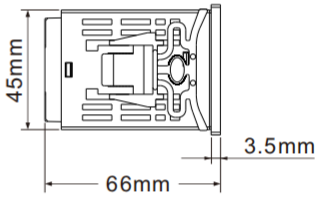




## M506-

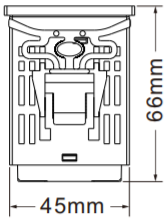


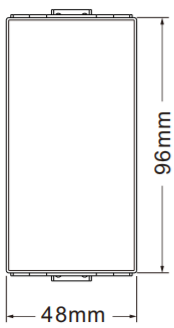



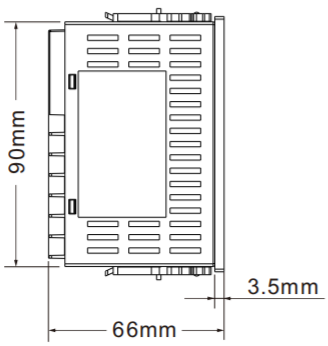




## M706-

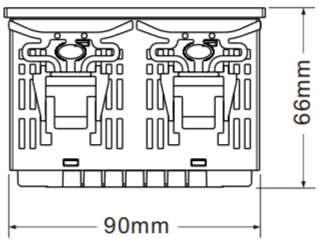




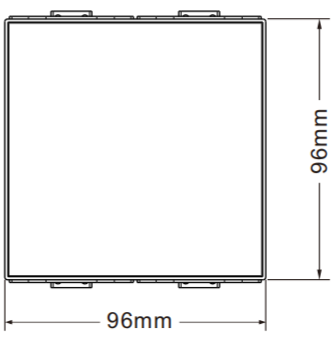


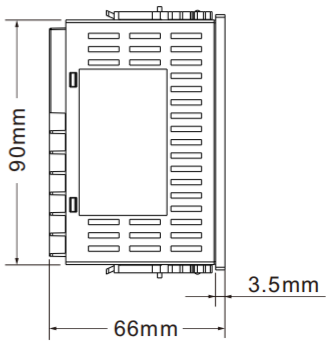




## M906-

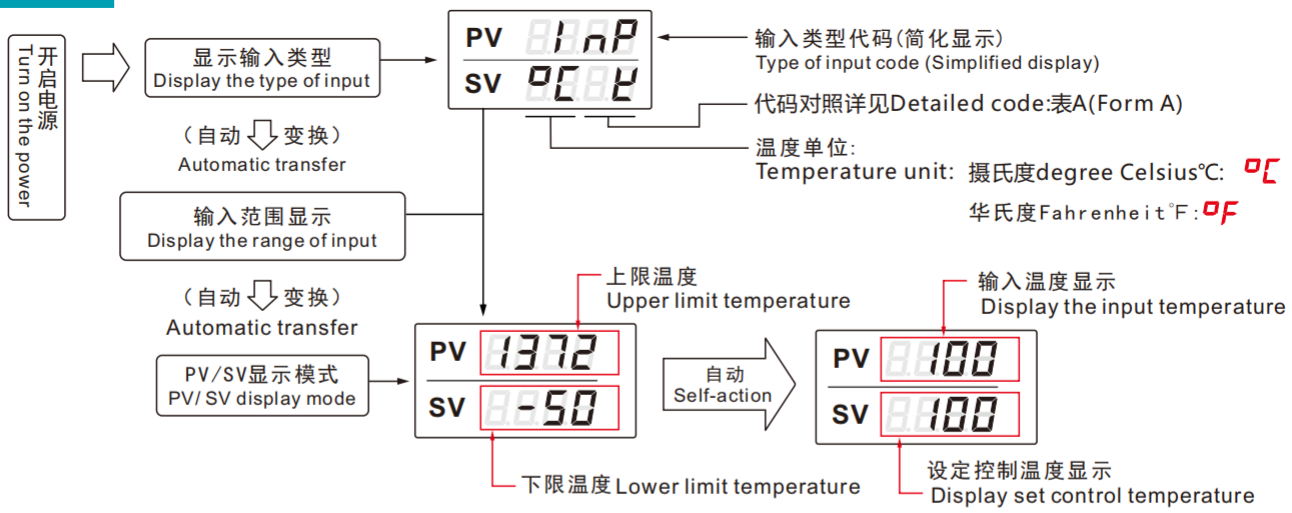






## 初始状态：




## 一级菜单(功能)对照表 First-level menu (function) comparison table:

长按"SET"键进入一级菜单参数设定模式,并通过点按"SET"键找到对应参数功能编号:(下表)

Press " SET " for a long time to enter the first-level menu parameter setting mode, and click " SET " to find the function number of the corresponding parameter: (The following table)

| AT自整顿 Automatic adjustment | 切换差设置 Setting the switching mode | PID切换差运算值 Switching operation value | |
|---|---|---|---|
| AT U | P | I | 积分时间 Integral time Original"0240" |
| 初始值Original"0000"<br>↓<br>调整为Adjusted"0001"<br>长按" SET "键自整顿启动,AT指示灯闪烁点亮,等待指示灯熄灭即自整顿最佳控温状态完成;<br>Long press " SET " to start the automatic adjustment,and the AT indicator lights up. After waiting for the indicator to go out, the best temperature control state is completed.<br>仪表首次启用AT自整顿功能将能更好的控制加温过程（智能加温），如只需"常规控温"可将" P "值设置" 0000 " 进入子菜单设置上下切换差值来选择设置;<br>Using AT auto-adjustment function for the first time can better control the heating process (intelligent heating), If only need "general temperature control", can set " P " to "0000" to enter the submenu to set up and down the switch difference to select the setting; | 初始值Original"0030"<br>(根据设备实际控温需要可将P值调整为"0010或0020"来获取PID最佳切换差运算值)<br>According to the actual temperature control needs of the equipment, the P value can be adjusted to "0010 or 0020" to obtain the optimal switching difference operation value of PID.<br>↓<br>调整为Adjusted"0000"<br>按" SET "键进入子菜单设置<br>Press " SET " to enter the submenu settings<br>上切换差Up switching difference : oH<br>下切换差Down switching difference : oHH<br>常规控温设置参数推荐（控温切换差为上下3度）:<br>Recommendation of conventional temperature control parameters（The switching difference is 3 degrees up and down.）<br>上切换差值Up" oH "设置为set to" 0001 "<br>下切换差值Down" oHH "设置为set to" 0002 " | d | 微分时间 Derivative time Original"0060" |
| | | Ar | 限制积分动作生效范围 Limit the effective range of integral action Original"0100" |
| | | AT自整顿后会自动生成<br>AT will be automatically generated after rectification. | |
| | | 在" P "值设置为"0000"时此三项将不显示<br>When " P " set to "0000", these three items will not be displayed. | |

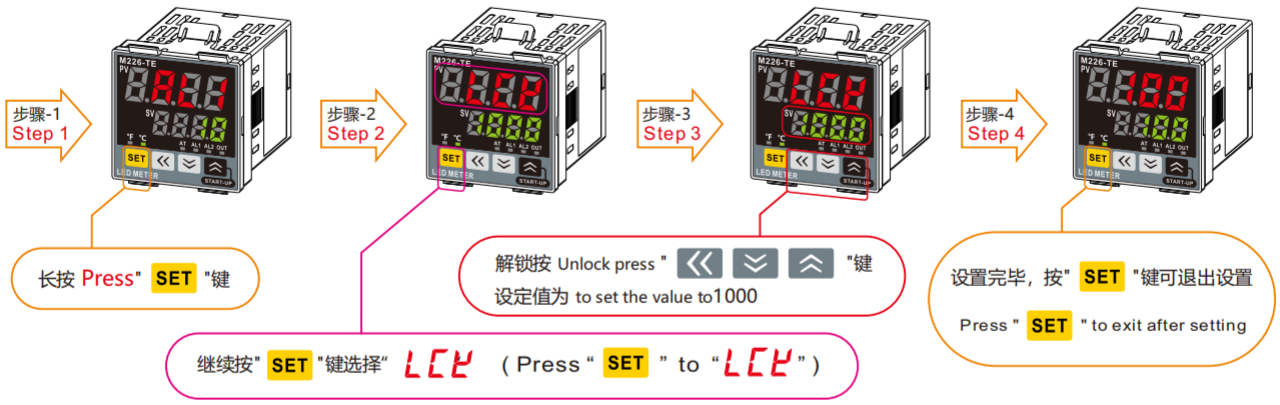
| Output response time | Temperature difference adjustment | Data lock |
|---|---|---|
| r | SC | LCY |
| 初始值"0020"(输出控制为继电器)<br>Initial value "0020" (output control is relay)<br>↓<br>输出控制如为"固态继电器"即SSR时,为能获得更快的响应可将输出响应时间值设置为"0002";<br>Output such as "solid state relay", namely SSR, in order to obtain a faster response,can set the output response time value to "0002" | 初始值 Initial value"0000"<br>↓<br>实测温度与显示温度的差值可通过" ≫ ≪ "键来加减值差，设置完成后长按" SET "键确认退出;<br>The difference between the measured temperature and the displayed temperature can be adjusted by " ≫ ≪ ",after setting, press " SET " to confirm the exit. | 初始值"1000"<br>（解锁状态）<br>Initial value "1000" (unlocked state) |

数据锁的设置 Data lock Settings

## 数据锁的设置 Data lock Settings

长按" SET "键进入参数设定模式并按" SET "键找到数据锁参数" LCY "，将其代码设置为" 1000 "即解锁状态（出厂默认为解锁状态），代码" 0000 "为上锁状态（上锁状态下数据二次菜单无法进入），设置完成后长按" SET "键确认退出；

Press " SET " to enter the setting mode, then press " SET " to find the data lock parameter " LCY ", set the code to "1000", that is, the unlocked state (the factory default is the unlocked state); Code "0000" is in the locked state (in this state, the data secondary menu cannot be accessed); Press " SET " to exit after setting.



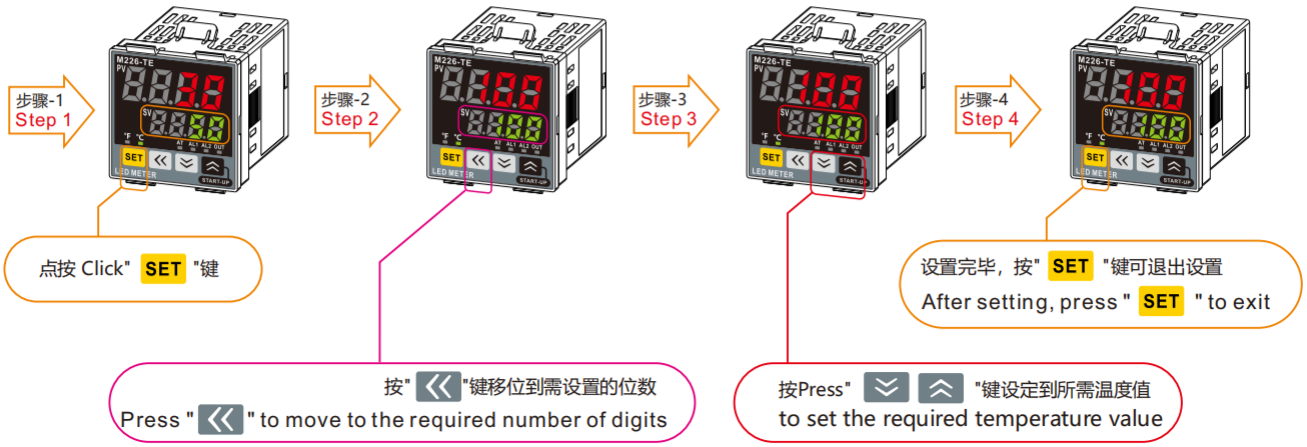

| 设定 Code | 各级锁保护范围<br>Protection range of locks at all levels |
|---|---|
| 0000 | Sv和所有参数可被设置<br>SV and all parameters can be set |
| 0001 | 只有SV和报警（AL1 、AL2）可被设置<br>Only SV and alarm (AL1 、AL2) can be set |
| 0010 | 除报警（AL1 、AL2）所有项目能被设定<br>All items can be set except alarm (AL1 、AL2) |
| 0100 | 除SV所有项目能被设定<br>All items except SV can be set |

| 设定 Code | 各级锁保护范围<br>Protection range of locks at all levels |
|---|---|
| 0011 | 只有SV能被设定<br>Only SV can be set |
| 0101 | 只有报警（AL1 、AL2）可被设置<br>Only alarm (AL1 、AL2) can be set |
| 0110 | 除SV和报警（AL1 、AL2）可被设定<br>SV and alarm (AL1 、AL2) can be set |
| 0111 | Sv和所有参数不能被设定<br>SV and all parameters cannot be set |

## SV(控制温度)的设置 SV（Temperature control）Setting:

在SV / PV正常显示状态下，点按" SET " 键使SV栏显示处于闪烁状态，通过按" " 找到所需设定温度的位数，再按" " "或" " "键设定到所需温度值，设定完毕后无操作20秒将自动退出，或可直接按" SET "键退出设置;

Under the normal display state of SV/PV, click " SET " to make the SV column display in a flashing state.Press " " to find the number of digits of the required temperature, and then press " " or " " to set the required temperature value.After setting, it will automatically exit if there is no operation for 20 seconds, or you can directly press " SET " to exit the setting;



## AT自整定功能的设置 SETTING OF AT SELF-TUNING FUNCTION

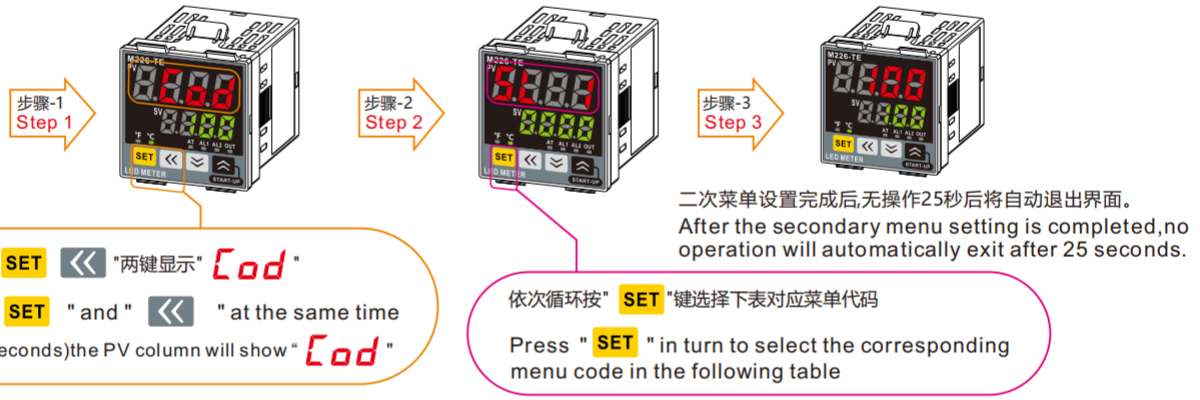
长按仪表" SET "键约3秒左右进入设置菜单，进入之后改为点按“ SET ”键，依次找到“ ATU ”，将其设置为“0001”，再点按“ SET ”确定并退出，此时仪表面板窗口“AT”指示灯闪烁亮起，说明仪表已经进入自整定模式。当仪表自整定完成之后，“AT”指示灯自行熄灭。此时仪表完成自整定功能，进入正常控温状态。

Press and hold the " SET " key for about 3 seconds to enter the SETting menu. After entering, click the " SET " key instead, find "ATU" in turn, set it to "0001", and then click " SET " to confirm and exit. AT this time, the "at" indicator light in the instrument panel window flashes, indicating that the instrument has entered the self-setting mode. When the self-setting of the instrument is completed, the "AT" indicator light goes out automatically. At this time, the instrument completes the self-tuning function and enters the normal temperature control state.

## 二级菜单(功能)进入方式 Secondary menu (function) access mode:

在数据锁解锁状态下，同时按住" SET 《 "两键(约2秒)PV显示栏将显示" Cod ",再依次按" SET "键参照"二次菜单（对照表）"选择对应代码，进入二次菜单设置。

When the data lock is unlocked, press " SET " and " 《 " at the same time (about 2 seconds)the PV column will show " Cod ", then press " SET " in turn to select the corresponding code according to "Secondary menu (comparison table)",enter the secondary menu settings.




在"Cod"= 0 0 0 0时，依次按"SET"键可得到并循环显示下列二次菜单（代码）：

When "Cod"= 0 0 0 0, press " SET " in turn to get and display the following secondary menus (codes) circularly:

| 二次菜单（代码）<br>Secondary menu (code) | 二次菜单（内容）<br>Secondary menu (content) | 二次菜单（对照表）<br>Secondary menu (comparison table) |
|---|---|---|
| SL 1 | 输入类型选择<br>Input type selection | 见表 1 ( See table 1 ) |
| SL 2 | 温度显示单位选择<br>Temperature display unit selection | 见表 2 ( See table 2 ) |
| SL 3 | “HBA”.“LBA”及“LBA”通道选择<br>“HBA”. “LBA” and “LBA” channel selection | 见表 3 ( See table 3 ) |
| SL 4 | 第一报警模式选择<br>The first alarm mode selection | 见表 4 ( See table 4 ) |
| SL 5 | 第二报警模式选择<br>Second alarm mode selection | 见表 5 ( See table 5 ) |
| SL 6 | 控制输出类型选择<br>Control output type selection | 见表 6 ( See table 6 ) |
| SL 7 | 报警继电器状态选择<br>Alarm relay state selection | 见表 7 ( See table 7 ) |
| SL 8 | 略 None | ———— |
| SL 9 | 略 None | ———— |
| SL 10 | RUN/STOP（运行/停止）及通讯功能选择<br>RUN/STOP and communication function selection | 见表 8 ( See table 8 ) |
| SL 11 | SV报警类型选择<br>Selection of SV alarm type | 见表 9 ( See table 9 ) |

## 输入传感器类型选择的设置: Enter the settings for sensor type selection: 二级菜单 secondary menu

同时按住" SET " " " "两键(约2秒)显示器PV内将显示" Cod ",再按" SET "键,PV显示栏选择" SL 1 ", 按 " " "移位键配合" " " "两键将SV显示栏(参照"表1")设置成对应传感器的数字代码（出厂默认为"K型热电偶"），设置完成同时长按 " SET " " "两键退出设置界面。

Press " SET " and " " " at the same time (about 2 seconds) and PV will display " Cod ",then press " SET ", PV selects "SL 1",and press " " " to cooperate with " " " " set SV (refer to" Table 1") to correspond to the digital code of sensor (factory default is Type K thermocouple), after setting, press " SET " and " " " at the same time, or automatically quit after 25 seconds of no operation.


### 表A(信号输入类型对照表) Table A (Comparison Table of Signal Input Types)

| 显示 Code | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 输入类型 Type of input | 热电偶 thermocouple (TC) | | | | | | | | | | | | RTD | | 电压 voltage (电流) (current) |
| | K | J | R | S | B | E | T | N | PL II | W5Re/ W26Re | U | L | Cu50 | Pt 100 | |

### 表1(Table 1) SL 1 输入类型选择 Input type selection

| 对应代码 Code | | | | 传感器输入类型Sensor input type | |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | K | |
| 0 | 0 | 0 | 1 | J | |
| 0 | 0 | 1 | 0 | R | |
| 0 | 0 | 1 | 1 | S | |
| 0 | 1 | 0 | 0 | B | 热电偶输入 Thermocouple input |
| 0 | 1 | 0 | 1 | E | ( TC ) |
| 0 | 1 | 1 | 0 | N | |

| 对应代码 Code | | | | 传感器输入类型Sensor input type | |
|---|---|---|---|---|---|
| 0 | 1 | 1 | 1 | T | |
| 1 | 0 | 0 | 0 | PT100 | 热电阻输入 Thermal resistance input |
| 1 | 0 | 0 | 1 | Cu50 | ( RTC ) |
| 1 | 0 | 1 | 0 | 0-400 Ω | 线性电阻输入 Linear resistance input |
| 1 | 0 | 1 | 1 | 0-50mV | 毫伏电压输入 Millivolt voltage input |
| 1 | 1 | 0 | 0 | 0-5V (0-20mA) | 连续输入 Continuous input |
| 1 | 1 | 0 | 1 | 1-5V (4-20mA) | 电压电流 Voltage and current |

1、电流输入时应设定为电压输入并在输入端子上并接一只250Ω电阻;
When the current is input, it should be set as voltage input, and a 250Ω resistor should be connected to the input terminal in parallel.

2、热电偶与热电阻之间可相互转换，若与电压输入转换请交与本公司调整。
Thermocouple and thermal resistance can be mutually converted. If it is converted with voltage input, please submit it to our company for adjustment.

注：无特殊要求的出厂默认（信号输入类型）为"K型热电偶"
Note: The factory default (signal input type) without special requirements is " Type K thermocouple "

## ℉与℃显示单位选择:
## ℉ and ℃ display unit selection: secondary menu

二级菜单
secondary menu

同时按住" SET " " "两键(约2秒)显示器PV内将显示" Cod ",再按" SET " 键,PV显示栏选择" SL 2 ", 按" " "移位键配合" " " "两键将SV显示栏( 参照"表2")设置成对应温度单位数字代码（出厂默认为℃，代码：0000），设置完成同时长按" SET " " 两键或无操作25秒后自动退出界面。

Press " SET " and " " at the same time (about 2 seconds) and PV will display " Cod " , then press " SET ", PV selects "SL 2", and press" " " to cooperate with " " " set SV (refer to" Table 2") to corresponding digital code of temperature unit (factory default is ℃, code: 0000), after setting, press " SET " and " " at the same time, or automatically quit after 25 seconds of no operation.

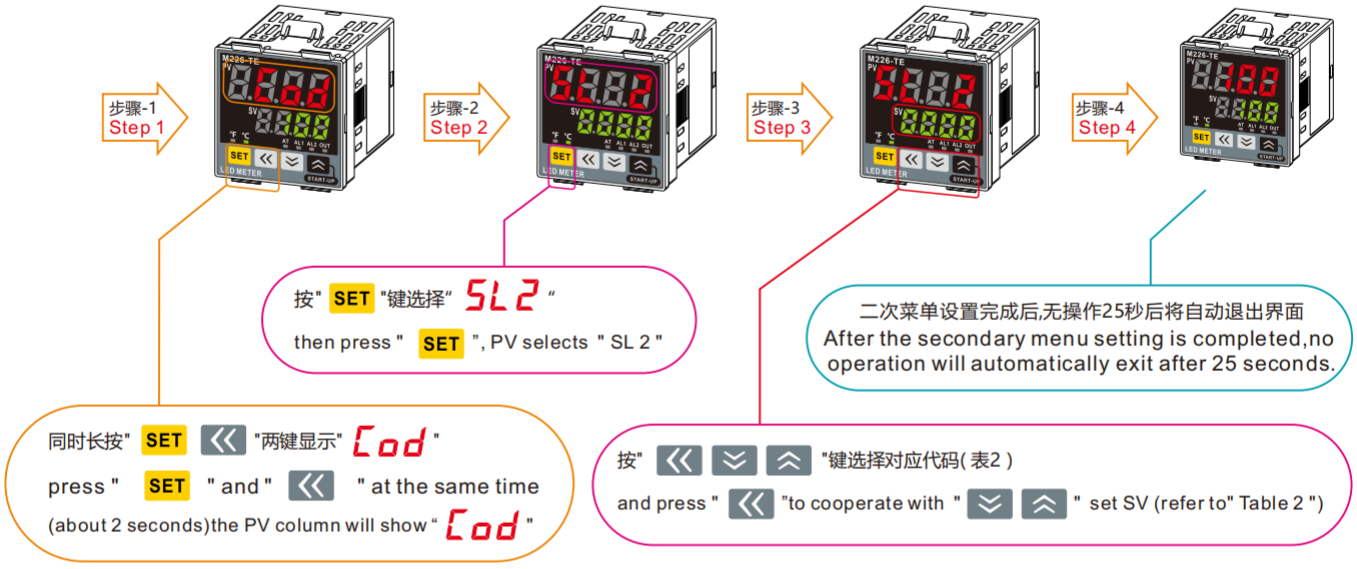



表2 ( Table 2 ) SL 2 温度显示单位选择 Temperature display unit selection

| 对应代码 Code | | | | 标称单位选择 Unit selection |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | ℃ |
| 0 | 0 | 0 | 1 | ℉ |

表3 ( Table 3 ) SL 3 通道选择 Channel selection

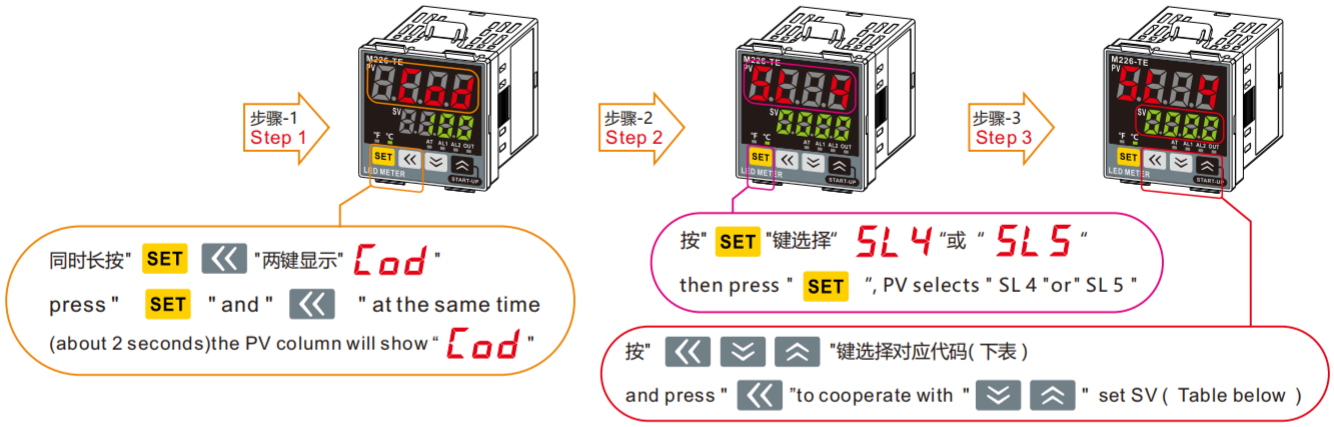
| 对应代码 Code | | | | 说 明 Comparison table | |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 未提供加热器断线报警<br>not provide | 加热器断线报警 （ HBA ） 选择<br>Heater break alarm (HBA) selection |
| 0 | 0 | 0 | 1 | 提供加热器断线报警<br>provide | |
| 0 | 0 | 0 | 0 | 未提供控制环断线报警<br>not provide | 控制环断线报警 （ LBA ） 选择<br>Loop break alarm (LBA) selection |
| 0 | 0 | 1 | 0 | 提供控制环断线报警<br>provide | |
| 0 | 0 | 0 | 0 | LBA 从第一报警输出<br>From the first alarm output | 控制环断线报警 （ LBA ） 输出通道选择<br>Loop break alarm (LBA) output channel selection |
| 1 | 0 | 0 | 0 | LBA 从第二报警输出<br>From the second alarm output | |

## 上下限报警输出的设置:
## Setting of upper and lower alarm output: secondary menu

二级菜单
secondary menu

在数据锁解锁状态下，同时按住" SET 《 "两键(约2秒)PV显示栏将显示" Cod ",再依次按" SET "键参照下表"二次菜单（对照表）"选择对应代码进入二次菜单设置,设置完成无操作25秒或同时长按" SET 《 "两键退出设置界面。

When the data lock is unlocked, press " SET " and " 《 " at the same time (about 2 seconds) the PV column will show " Cod ", then press " SET ", refer to the following table "Secondary Menu (Comparison Table)" to select the corresponding code to enter the secondary menu settings, after setting, press " SET and 《 " at the same time, or automatically quit after 25 seconds of no operation.




在"Cod"= 0 0 0 0时，依次按"SET"键可得到并循环显示下列二次菜单（代码）：

When "Cod"= 0 0 0 0, press " SET " in turn to get and display the following secondary menus (codes) circularly:

| 二次菜单（代码）Secondary menu (code) | 二次菜单（内容）Secondary menu (content) | 对照表 Comparison table |
|---|---|---|
| SL 4 | 第一报警模式选择 The first alarm mode selection | 见表 4 ( Table 4 ) |
| SL 5 | 第二报警模式选择 Second alarm mode selection | 见表 5 ( Table 5 ) |

表4( Table 4 ) SL 4

出厂设定值：订货时指定类型
Factory setting value: the type specified when ordering

| 设定值 Code | | | | 说 明 Comparison table | |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 未设定第一报警（ALM1）<br>The first alarm is not set（ALM1） | 第一报警（ALM1）类型选择<br>The first alarm (ALM1) type selection<br><br>报警功能开启的状态下"AL 1 "窗口将直接显示在一级菜单中<br>When the alarm function is turned on, the "AL 1" window will be directly displayed in the first-level menu. |
| 0 | 0 | 0 | 1 | 上限偏差报警<br>Upper limit deviation alarm | |
| 0 | 0 | 1 | 0 | 上 / 下限偏差报警<br>Upper/lower limit deviation alarm | |
| 0 | 0 | 1 | 1 | 过程值上限报警<br>Process value upper limit alarm | |
| 0 | 1 | 0 | 1 | 下限偏差报警<br>Lower limit deviation alarm | |
| 0 | 1 | 1 | 0 | 带报警 With alarm | |
| 0 | 1 | 1 | 1 | 过程值下限报警<br>Process value lower limit alarm | |

表5( Table 5 ) SL 5

出厂设定值：订货时指定类型
Factory setting value: the type specified when ordering

| 设定值 Code | | | | 说 明 Comparison table | |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 未设定第一报警（ALM2）<br>The first alarm is not set（ALM2） | 第一报警（ALM2）类型选择<br>The first alarm (ALM2) type selection<br><br>报警功能开启的状态下"AL 2 "窗口将直接显示在一级菜单中<br>When the alarm function is turned on, the "AL 2" window will be directly displayed in the first-level menu. |
| 0 | 0 | 0 | 1 | 上限偏差报警<br>Upper limit deviation alarm | |
| 0 | 0 | 1 | 0 | 上 / 下限偏差报警<br>Upper/lower limit deviation alarm | |
| 0 | 0 | 1 | 1 | 过程值上限报警<br>Process value upper limit alarm | |
| 0 | 1 | 0 | 1 | 下限偏差报警<br>Lower limit deviation alarm | |
| 0 | 1 | 1 | 0 | 带报警 With alarm | |
| 0 | 1 | 1 | 1 | 过程值下限报警<br>Process value lower limit alarm | |

## 控制输出类型选择 Selection of control output type

二级菜单 secondary menu

在数据锁解锁状态下，同时按住" SET 《 "两键(约2秒)PV显示栏将显示" Cod ",再依次按" SET "键参照下表"二次菜单（对照表）"选择对应代码进入二次菜单设置,设置完成无操作25秒或同时长按" SET 《 "两键退出设置界面。

When the data lock is unlocked, press " SET " and " 《 " at the same time (about 2 seconds) the PV column will show " Cod ", then press " SET ", refer to the following table "Secondary Menu (Comparison Table)" to select the corresponding code to enter the secondary menu settings, after setting, press " SET and 《 " at the same time, or automatically quit after 25 seconds of no operation.

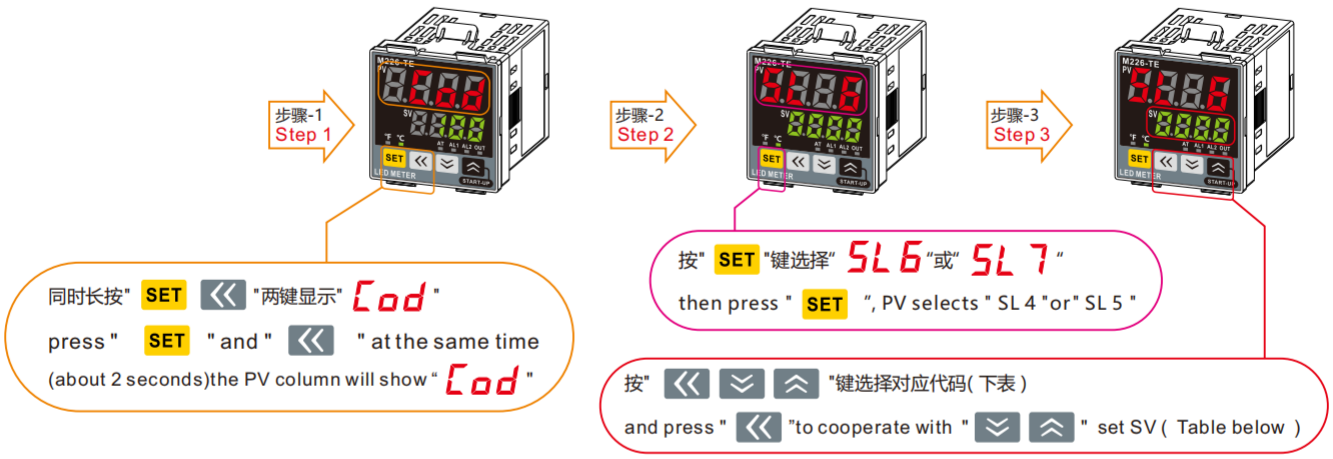



表6( Table 6 ) SL 6

Factory setting value: the type specified when ordering

| 设 定 值 Code | | | | 说 明 Comparison table | |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 正动作（D 型）Positive action (type D) | 正 / 逆动作选择 Positive/Reverse action selection |
| 0 | 0 | 0 | 1 | 逆动作（F，A 和 W 型）Reverse action (type F, A, W) | |
| 0 | 0 | 0 | 0 | PID 自整定( PID self-tuning ) ---------- *1 | 控制动作类型选择 Control action type selection |
| 0 | 0 | 1 | 0 | 加热 / 冷却 PID 自整定 ---------- *2<br>PID self-tuning of heating/cooling | |
| 0 | 0 | 0 | 0 | 加热侧时间比例输出（M，V，G 和 T 输出）---------- *3<br>Heating side time proportional output (M, V, G and T output) | 控制输出类型选择 （加热侧）<br>Selection of output type (heating side) |
| 0 | 1 | 0 | 0 | 加热侧连续输出（电流420mA.DC ）<br>Heating side continuous output (current 420mA.DC) | |
| 0 | 0 | 0 | 0 | 冷却侧时间比例输出（M，V 和 T 输出）---------- *3<br>Cooling side time proportional output (M, V and T output) | 控制输出类型选择（冷却侧）<br>Selection of output type (cooling side) |
| 1 | 0 | 0 | 0 | 冷却侧连续输出（电流420mA.DC ）<br>Cooling side continuous output (current 420mA.DC) | |

*1 D 型：PID 自整定（正动作）Type D: PID self-tuning (Positive action)
F 型：PID 自整定（逆动作）Type F: PID self-tuning (Reverse action)

*2 A 型：加热/冷却 PID 自整定（空冷）Type A: PID self-tuning of heating/cooling (AC air-cooled)
W型：加热/冷却 PID 自整定（水冷）Type W: PID self-tuning of heating/cooling (water-cooling)

*3 M 输出:接触器触点输出 Output: contactor contact output
G 输出:可控硅触发器输出 Output: SCR trigger output
V 输出:电压脉冲输出 Output: voltage pulse output
T 输出:可控硅输出 Output: SCR output

表7( Table 7 ) SL 7

出厂设定值：订货时指定类型
Factory setting value: the type specified when ordering

| 设 定 值 Code | | | | 说 明 Comparison table | |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 激励报警 Excitation alarm | 激励报警 / 非激励报警（第一报警侧）<br>Excitation alarm/non-excitation alarm (first alarm side) |
| 0 | 0 | 0 | 1 | 非激励报警 Non-excitation alarm | |
| 0 | 0 | 0 | 0 | 激励报警 Excitation alarm | 激励报警 / 非激励报警（第二报警侧）<br>Excitation alarm/non-excitation alarm (second alarm side) |
| 0 | 0 | 1 | 0 | 非激励报警 Non-excitation alarm | |
| 0 | 0 | 0 | 0 | 非移相输出 Non-phase shift output | 主控移相输出（设置后SL6第三位设置无效）<br>Master control phase shift output<br>(after setting, the third bit setting of SL6 is invalid) |
| 0 | 1 | 0 | 0 | 主控移相输出 Master control phase shift output | |
| 0 | 0 | 0 | 0 | 关闭计时 Turn off timing | — — — — — — — |
| 1 | 0 | 0 | 0 | 开启计时 Open timing | |

注：激励报警是指报警继电器触点由：NO变为NC / 非激励报警是指报警继电器触点由：NC变为NO
Note: Excitation alarm means that the contact of alarm relay changes from: NO to NC
Non-excitation alarm means that the contact of alarm relay changes from NC to NO.

## RUN/STOP（运行/停止）及通讯功能选择 / SV报警类型选择
## RUN/STOP and communication function selection/SV alarm type selection:

**二级菜单 Secondary menu**

在数据锁解锁状态下，同时按住" SET 《 "两键(约2秒)PV显示栏将显示" Cod ",再依次按" SET "键参照下表"二次菜单（对照表）"选择对应代码进入二次菜单设置,设置完成无操作25秒或同时长按" SET 《 "两键退出设置界面。

When the data lock is unlocked, press " SET " and " 《 " at the same time (about 2 seconds) the PV column will show " Cod ", then press " SET ", refer to the following table "Secondary Menu (Comparison Table)" to select the corresponding code to enter the secondary menu settings, after setting, press " SET and 《 " at the same time, or automatically quit after 25 seconds of no operation.

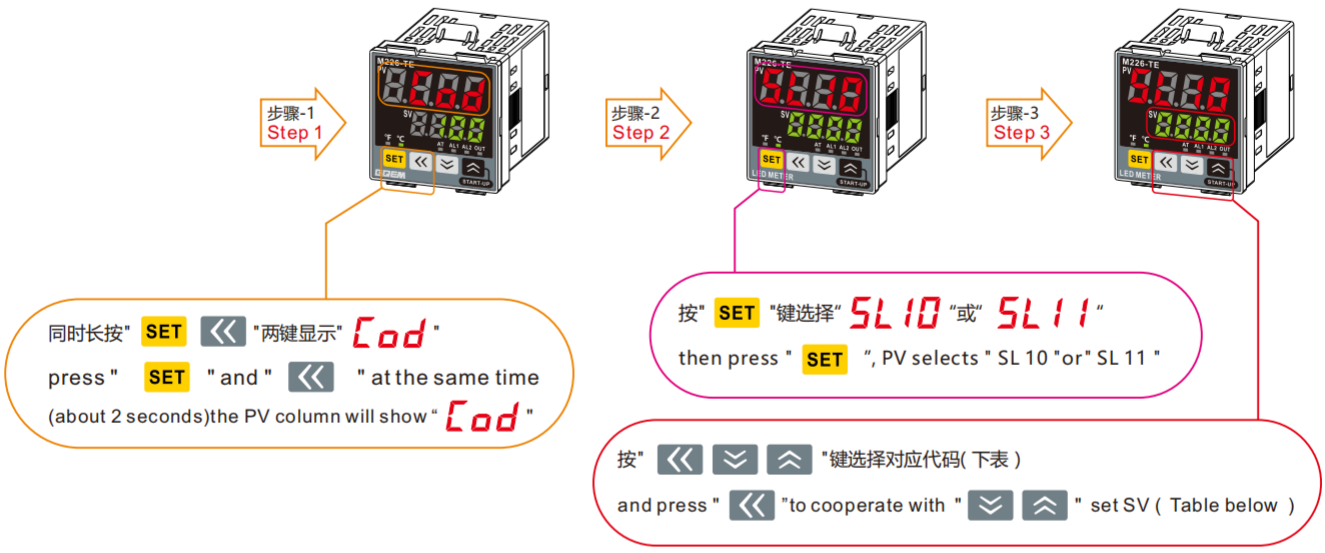



表8( Table 8 ) SL 10 RUN/STOP（运行/停止）及通讯功能选择 RUN/STOP and communication function selection

| 设 定 值 Code | | | | 说　明 Comparison table | |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 无 RUN / STOP（运行 / 停止）功能 No RUN/STOP function | RUN / STOP 功能选择<br>RUN/STOP function selection |
| 0 | 0 | 0 | 1 | 有 RUN / STOP（运行 / 停止）功能 Have RUN/STOP function | |
| 0 | 0 | 0 | 0 | 无 效 Invalid | |
| 0 | 0 | 0 | 0 | 无通讯功能 No communication function | 通讯功能选择<br>Communication function selection |
| 0 | 1 | 0 | 0 | 有通讯功能 Have communication function. | |
| 0 | 0 | 0 | 0 | 无自主校正功能 No autonomous correction function | 自主校正功能选择<br>Autonomous correction function selection |
| 1 | 0 | 0 | 0 | 有自主校正功能 Have autonomous correction function | |

表9( Table 9 ) SL 11 Sv报警类型选择 Selection of SV alarm type

| 设 定 值 Code | | | | 说　明 Comparison table | ( 保留功能 Reserved function ) |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 第一报警，无 SV 报警 No SV alarm | 第一报警，SV 报警选择<br>First alarm, SV alarm selection |
| 0 | 0 | 0 | 1 | 第一报警，有 SV 报警 Have SV alarm | |
| 0 | 0 | 0 | 0 | 第一报警，SV 下限报警 SV lower limit alarm | 第一报警，SV 报警方式选择<br>First alarm, SV alarm mode selection |
| 0 | 0 | 1 | 0 | 第一报警，SV 上限报警 SV upper limit alarm | |
| 0 | 0 | 0 | 0 | 第二报警，无 SV 报警 No SV alarm | 第二报警，SV 报警选择<br>Second alarm, SV alarm selection |
| 0 | 1 | 0 | 0 | 第二报警，有 SV 报警 Have SV alarm | |
| 0 | 0 | 0 | 0 | 第二报警，SV 下限报警 SV lower limit alarm | 第二报警，SV 报警方式选择<br>Second alarm, SV alarm mode selection |
| 1 | 0 | 0 | 0 | 第二报警，SV 上限报警 SV upper limit alarm | |

出厂设定值：订货时指定类型 Factory setting value: the type specified when ordering

在数据锁解锁状态下，同时按住" SET " " " 两键(约2秒)PV显示栏将显示" Cod ",再点按" " " 键将初始值" 0000 "调整为"0168 "再长按" SET " 键退出完成恢复出厂设置。

When the data lock is unlocked, press " SET " and " " " at the same time (about 2 seconds)the PV column will show " Cod ", press again " " ", adjust the initial value of "0000" to "0168", then press " SET " to exit, and the factory settings will be restored.


## 参数设定模式 Setting mode: 出厂默认值 Factory default value

此参数用于设定报警，PID 常数等参数。在正常显示状态下，按住" SET " 键三秒后，在PV显示器中显示出参数设定状态，在SV显示器中显示其对应的数值，依次按" SET " 键显示下表参数符号:

This parameter is used to set alarm, PID constant and other parameters.In the normal display state, after pressing and holding " SET " for three seconds,the PV display displays the parameter setting state,the SV display displays its corresponding value,press " SET " to display the following parameter symbols:

| 符号 Symbol | 名称 Name | 设定范围 Setting range | 说 明 Description | 出厂设定值 Factory setting value |
|---|---|---|---|---|
| CT1 | 电流检出器输入 1<br>Current detector input 1 | 0.0100.0A | 显示电流检出器输入值当有HBA报警时<br>Displays the input value of the current detector. When there is an HBA alarm | |
| AL1 | 第一报警<br>First alarm | 温度输入偏差报警，过程值报警，设定值报警：<br>Input temperature deviation alarm, process value alarm and set value alarm:<br>1999to+9999 ℃[℉]or<br>199. 9to+999. 99℃[℉]<br>SV报警同SV设定范围电压/电流输入:<br>SV alarm is the same as SV set range Voltage/Current input:<br>偏差报警Alarm deviation ±9999<br>输入报警同输入范围<br>Input alarm is the same as input range.<br>SV报警同SV设定范围<br>SV alarm is the same as SV setting range | 设定第一报警设定值和第二报警设定值<br>Setting a first alarm setting value and a second alarm setting value<br>报警动作间隙 Alarm action gap<br>温度输入2或2.0℃ [ ℉ ]<br>Enter the temperature of 2 or 2.0℃[℉]<br>电压/电流输入0. 2%<br>Voltage/current input 0.2% | 150 |
| AL2 | 第二报警<br>Second alarm | | | 150 |
| HBA1 | 加热器断线报警（HBA）见*1<br>Heater break alarm (HBA) See *1 | 0. 0100. 0A | 报警值参考电流检出器输入值予以设定（CT）仅用于单相<br>Alarm value refers to the input value of current detector,Set (CT) for single phase only | 0. 0 |
| LBA | 控制环断线报警（LBA）见*2<br>Control loop break alarm (LBA) See *2 | 0. 1200. 0min<br>（不能设定为0. 0）<br>(cannot be set to 0.0) | 设定控制环断线报警设定值<br>Set the alarm setting value of control ring break | 8. 0 |

| 符号 Symbol | 名称 Name | 设定范围 Setting range | 说 明 Description | 出厂设定值 Factory setting value |
|---|---|---|---|---|
| LBD | LBA 不感带<br>LBA No induction control | 温度范围09999℃[℉]<br>Temperature range 09999 ℃[℉]<br>动作间隙0.8℃[℉]<br>Action clearance 0.8℃[℉]<br>电压/电流输入( 0量程 )<br>Voltage/current input (0 range)<br>动作间隙，量程的0.8%<br>Action clearance, 0.8% of range | 设定为 0 则无 LBA 不感带<br>Set to 0, then there is no LBA and no induction control | 0 |
| ATU | 自动演算<br>Automatic calculus | 0自动演算完成或停止<br>0 Automatic calculation is completed or stopped.<br>1自动演算开始<br>1 Automatic calculus starts. | 实施自动演算的 ON / OFF<br>Implement ON/OFF of automatic calculation | 0 |
| STU | 自主校正<br>Self-calibration | 0自主校正完成或停止<br>0 Self-calibration completed or stopped.<br>1自主校正开始<br>1 Self-calibration starts. | 实施自主校正的 ON / OFF<br>Implement ON/OFF of self-calibration | 0 |
| P | 比例带<br>（加热侧）<br>Proportional band<br>(heating side) | 温度范围1（0.1）至全量程或<br>9999 ( 999.9 ) ℃ [ ℉ ]<br>电压/电流全量程的0.1至100.0%<br>temperature range1(0.1) to full scale or 9999 （999.9） ℃[℉]<br>Voltage/current 0.1 to 100.0% of full range<br>* 设定为0时，为位式控制<br>* When set to 0, it is bit control. | 执行PLPD或PID控制时需设定此值。<br>在加热/制冷PID动作时，比例带在加热侧<br>*设定为0 （ 0.0 ） 时成 ON/OFF 动作。<br>动作间隙 2℃[ ℉ ]<br>Set this value when performing PLPD or PID control.In the heating/cooling PID operation, the proportional band is turned ON/OFF when the heating side * is set to 0(0.0).<br>Action clearance 2℃[℉] | 温度输入30<br>( 30.0 ) 电压<br>电流输入3.0<br>Input temperature 30 ( 30.0 ) voltage current input 3.0 |
| OH | 主控下回差<br>Lower limit return difference of main control | 1–100 | 位式控制时下回差值P=0有效<br>Bit control, the lower limit return difference P=0 is effective. | 2 |
| OHH | 主控上回差<br>Upper limit return difference of main control | 0–100 | 位式控制时上回差值P=0有效<br>Bit control, the upper limit return difference P=0 is effective. | 0 |
| I | 积分时间<br>Integration time | 13600sec<br>*设定为0时，成PD控制<br>* When set to 0, PD control will be implemented. | 设定积分时间，<br>以解除比例控制所发生之残留偏差。<br>Set the integration time to remove the residual deviation caused by proportional control. | 240 |
| D | 微分时间<br>Derivative Time | 13600sec<br>*设定为0时，成PI控制<br>* When set to 0, PI control will be implemented. | 设定微分时间，以防止输出的波动提高控制安定<br>Set derivative time to prevent output fluctuation and improve control stability. | 60 |
| Ar | 限制积分动作生效范围<br>Limit the effective range of integral action | 比例带的1100%（加热侧）<br>1100% of Proportional band (heating side) | 防止依积分动作超限或欠限。<br>Prevent over-limit or under-limit according to integral action. | 100 |
| T | 比例周期<br>Proportional period | 1100sec（不能设定为 0 ）<br>*电流输出时无显示<br>1100sec (cannot be set to 0)<br>* No display when the current is output. | 设定控制的动作周期，加热 / 制冷PID动作：<br>加热侧比例周期。<br>Set the action cycle,Heating/cooling PID action:<br>Proportional period of heating side. | 见*3<br>See *3 |
| PC | 比例带（制冷侧）<br>Proportional band (cooling side) | 比例带的 1–1000%( 加热侧 )<br>1-1000% of Proportional band (heating side) | 加热 /制冷 PID 动作：<br>设定制冷侧比例带<br>Heating/cooling PID action:<br>Set proportional band of cooling side. | 100 |
| DB | 不感带<br>No induction control | 温度输入 Temperature input<br>10+10℃[℉]或10.0+10.0℃[℉]<br>10 +10℃[℉] or10.0 +10.0℃[℉]<br>电压 / 电流输入<br>Voltage/current input<br>全量程的10.0+10.0%<br>10.0+10.0% of full range | 设定(加热侧)比例带与(制冷侧)比例带之间控制动作不感带，设定负数即成重迭<br>Set the non-inductive control of the control action between the proportional band (heating side) and the proportional band (cooling side), and cannot set a negative number. | 0或0.0<br>0 or 0.0 |

| 符号 Symbol | 名称 Name | 设定范围 Setting range | 说 明 Description | 出厂设定值 Factory setting value |
|---|---|---|---|---|
| T | 比例周期（制冷侧）<br>Proportional period (cooling side) | 1100sec（不能设定为0）<br>* 电流输出时无显示<br>1100sec (cannot be set to 0)<br>* No display when the current is output. | 加热/制冷PID动作：设定制冷侧控制输出周期<br>Heating/cooling PID action:<br>Set the cooling side control output cycle. | 见 *4(See *4) |
| SC | 过程值偏差<br>Process value deviation | 温度输入 Temperature input<br>1999+9999℃[℉]或<br>199.9+999.9℃[℉]<br>1999 +9999℃[℉] or<br>199.9 +999.9℃[℉]<br>电压 / 电流输入 ±量程<br>Voltage/current input ±range | 传感器的测量值与此值相加作为PV值<br>The measured value of the sensor is added to this value.As PV value | 0或0. 0<br>0 or 0.0 |
| LCK | 设定数据禁锁功能<br>Set the data locking function. | 见 *5（See *5） | 使变更数据有效 / 无效<br>Make change data valid/invalid | 0000 |

注意Note：某些参数符号可能不被显示 Some parameter symbols may not be displayed.

*1 加热器断线报警的设定（HBA） Setting of heater break alarm (HBA)

- 当HBA选为第二报警时才显示 It is only displayed when HBA is selected as the second alarm.
- HBA HBA cannot be used for current output.
- HBA的设定值，请设定与电流检出器输入值约85%左右（CT）当电源变化较大时，请设定稍小之值。另遇当数支加热器并联装设时，请设定稍大之值（电流检出器输入值以内）。以使仅断一支状态下也可为ON.
  Set value of HBA,Please set it to about 85% (CT) of the input value of the current detector.When the power supply changes greatly, please set a slightly smaller value.In addition, when several heaters are installed in parallel, please set a slightly larger value.(within the input value of current detector).So that it can be ON even when only one branch is broken.
- 当HBA设定为"0. 0"时或未装电流检出器时，HBA即为ON请注意。
  When the HBA is set to "0.0" or the current detector is not installed, the HBA is ON. Please note.

*2 控制环断线报警的设定 Control ring break alarm setting

- 当LBA选为第一或第二报警时才显示 Only displayed when LBA is selected as the first or second alarm.
- LBA的设定值，通常设定于积分时间（ I ）的2倍左右 The setting value of LBA is usually set at about 2 times of the integration time ( I ).
- 加热 / 制冷PID动作无控制环断线报警 Heating/cooling PID action has no control loop break alarm.
- AT 功能使用时，LBA不能使用 LBA cannot be used when AT function is used.
- 当PID计算值为0%或100%时，LBA功能才能使用。因此，发生故障后，LBA作用时间在PID完成0%或100%的计算时间加上 LBA 的设定时间才能使用。
  When the PID calculation value is 0% or 100%,the LBA function can be used.Therefore, after a failure occurs,the LBA action time is 0% or 100% of the calculation time of PID.plus the set time of LBA, then can be used.
- LBA的设定时间过短或不适合控制对象时，将引起LBA发生ON-OFF或不变成 ON ，如遇此类情况，请将 LBA 设定时间设定的稍长些。
  When the setting time of LBA is too short,or it is not suitable for the control object, it will cause LBA to turn ON-OFF, or not turn ON,In this case, please set the LBA setting time slightly longer.

*3 继电器接点输出：20sec，电压脉冲输出 / 闸流控制管驱动用触发器输出 / 闸流控制管输出2sec。
Relay contact output: 20sec,Voltage pulse output/Thyratron control tube drive output by flip-flop/Thyratron control tube output 2sec.

*4 继电器接点输出：20sec，电压脉冲输出2sec（ Relay contact output: 20sec, Voltage pulse output 2sec ）。

*5 数据锁级别选择 Data lock level selection.

- 每个数据被锁后只能被监视 Every data can only be monitored after being locked.
- 每个报警资料（ HBA. LBA. LBD ）都可以在 " 0001. 0011. 0101. 0111 " 级别下被锁住。
  Every alarm data (HBA.LBA.LBD)Can be locked at the level of "0001.0011.0101.0111".

| 设定Code | 各级锁保护范围 Protection range of locks at all levels |
|---|---|
| 0000 | SV 和所有参数可被设置 SV and all parameters can be set |
| 0001 | 只有 SV 和报警（ AL1. AL2 ）可被设置 Only SV and alarm (AL1.AL2) can be set |
| 0010 | 除报警（ AL1. AL2 ）所有项目能被设定 All items can be set except alarm (AL1.AL2) |
| 0100 | 除 SV 所有项目能被设定 All items except SV can be set |
| 0011 | 只有 SV 能被设定 Only SV can be set |
| 0101 | 只有报警（ AL1. AL2 ）可被设置 Only alarm (AL1.AL2) can be set |
| 0110 | 除SV和报警（ AL1. AL2 ）可被设定 SV and alarm (AL1.AL2) can be set |
| 0111 | SV 和所有参数不能被设定 SV and all parameters cannot be set |