# INSTRUCTIONS FOR TEMPERATURE CONTROLLER UNIVERSAL MODEL

More function scan code access

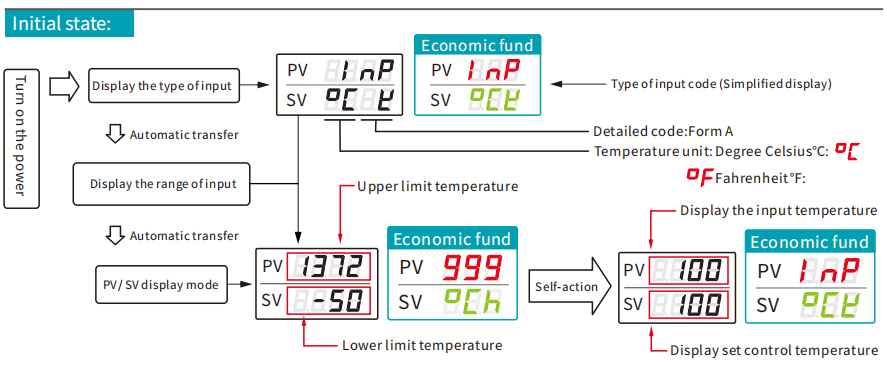
## 主要技术参数 Main technical parameters

- 1、Compatible input: Thermocouple（E.J.K.S.B）;Thermal resistance （Cu50.Pt100）
- 2、Sampling period:300milliseconds; Main control mode: PID control or Stepping control
- 3、Display error:Less than or equal to 1.0% ± 1 word of full scale
- 4、Cold end compensation error:⩽2℃ / Resolution ratio:1℃ or 0.1℃
- 5、Main control output : SSR Drive voltage / DC12V, Load capacity ⩽30mA
- 6、Main control relay output / Capacity:AC 250V ,Resistive load 10A(Partial space limited product resistive load 3A)
- 7、Alarm output:AC 250V ,Resistive load 10A(Partial space limited product resistive load 5A)

## Product appearance and installing size

| Specifications | External dimension Height×Width×Depth(mm) | Panel hole dimension Height×Width(mm) |
|---|---|---|
| M2□□- / S2□□- | 48×48×66 | 46×46 |
| M3□□- / S3□□- | 72×72×66 | 68×68 |
| M5□□- / S5□□- | 48×96×66 | 46×92 |
| M7□□- / S7□□- | 96×48×66 | 92×46 |
| M9□□- / S9□□- | 96×96×66 | 92×92 |

## Initial state:




## First-level menu (function) comparison table:

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)

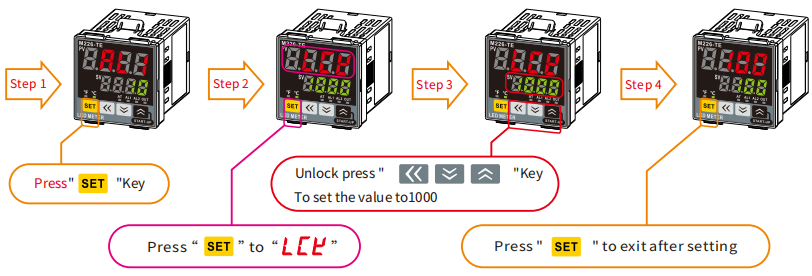
| AT- Automatic adjustment | Setting the switching mode | PID- Switching operation value | |
|---|---|---|---|
| AT U | P | I | Integral time Original"0240" |
| Original"0000" ⇩ Adjusted"0001" | Original"0030" | d | Derivative time Original"0060" |
| Long press " SET " to start the automatic adjustment,and the AT indicator lights up. After waiting for the indicator to go out, the best temperature control state is completed. | 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. ⇩ Adjusted"0000" | Ar | Limit the effective range of integral action Original"0100" |
| 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; | Press " SET " to enter the submenu settings<br>Up switching difference : oH<br>Down switching difference : oHH<br>Recommendation of conventional temperature control parameters （The switching difference is 3 degrees up and down.)<br>Up" oH "set to" 0001 "<br>Down" oHH "set to" 0002 " | AT will be automatically generated after rectification.<br>When " P " set to "0000", these three items will not be displayed. | |

| Output response time | Temperature difference adjustment | Data lock |
|---|---|---|
| r | SC | LCY |
| Initial value "0020" (output control is relay) ⇩ Output such as "solid state relay", namely SSR, in order to obtain a faster response,can set the output response time value to "0002" | Initial value"0000" ⇩ The difference between the measured temperature and the displayed temperature can be adjusted by " ⩒ ⩓ ",after setting, press " SET " to confirm the exit. | Initial value "1000" (unlocked state) |

Data lock Settings

## Data lock Settings

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.




| Data lock code comparison table (general model) | | | |
|---|---|---|---|
| Code | Protection range of locks at all levels | Code | Protection range of locks at all levels |
| 0000 | SV and all parameters can be set | 0011 | Only SV can be set |
| 0001 | Only SV and alarm (AL1 、AL2) can be set | 0101 | Only alarm (AL1 、AL2) can be set |
| 0010 | All items can be set except alarm (AL1 、AL2) | 0110 | SV and alarm (AL1 、AL2) can be set |
| 0100 | All items except SV can be set | 0111 | SV and all parameters cannot be set |

| Data lock code comparison table (economic model) | | | |
|---|---|---|---|
| Code | Protection range of locks at all levels | Code | Protection range of locks at all levels |
| 000 | SV and all parameters can be set | 001 | Only SV can be set |
| 011 | Only SV and alarm (AL1 、AL2) can be set | 111 | SV and all parameters cannot be set |

## SETTING OF AT SELF-TUNING FUNCTION

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.

## SV (Temperature control) Setting:

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;

## Enter the settings for sensor type selection: secondary menu

Press " SET " and " ⩔ " at the same time (about 2 seconds) and PV will display " Cod ",then press " SET ", PV selects "SL1",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.

Table A (Comparison Table of Signal Input Types)

| Code | E | J | r | S | b | E | T | n | P | U | U | L | Cu50 | Pt | 0-5V / 4-20mA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of input | Thermocouple（TC） | | | | | | | | | | | | RTD | | Voltage / Current |
| | K | J | R | S | B | E | T | N | PL II | W5Re/ W26Re | U | L | Cu50 | Pt 100 | |

Table 1 SL 1 Input type selection

| Code | | | | 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 | Thermocouple input |
| 0 | 1 | 0 | 1 | E | （TC） |
| 0 | 1 | 1 | 0 | N | |

| Code | | | | Sensor input type | |
|---|---|---|---|---|---|
| 0 | 1 | 1 | 1 | T | |
| 1 | 0 | 0 | 0 | PT100 | Thermal resistance input |
| 1 | 0 | 0 | 1 | Cu50 | （RTC） |
| 1 | 0 | 1 | 0 | 0-400 Ω | Linear resistance input |
| 1 | 0 | 1 | 1 | 0-50mV | Millivolt voltage input |
| 1 | 1 | 0 | 0 | 0-5V (0-20mA) | Continuous input |
| 1 | 1 | 0 | 1 | 1-5V (4-20mA) | Voltage and current |

1、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、Thermocouple and thermal resistance can be mutually converted. If it is converted with voltage input, please submit it to our company for adjustment.

Note: The factory default (signal input type) without special requirements is " Type K thermocouple"

# INSTRUCTIONS FOR TEMPERATURE CONTROLLER COMMUNICATION

More function scan code access

## 主要技术参数 Main technical parameters

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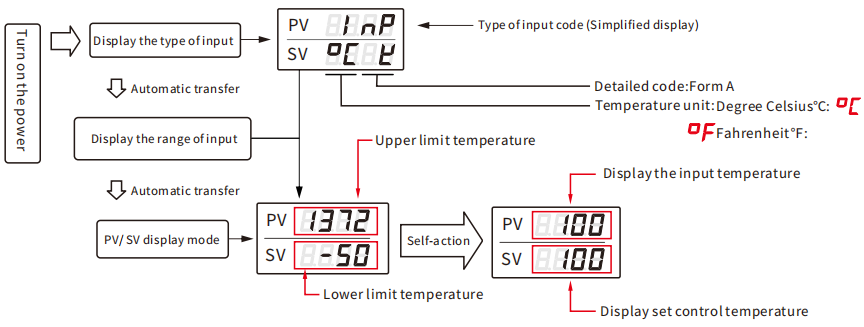


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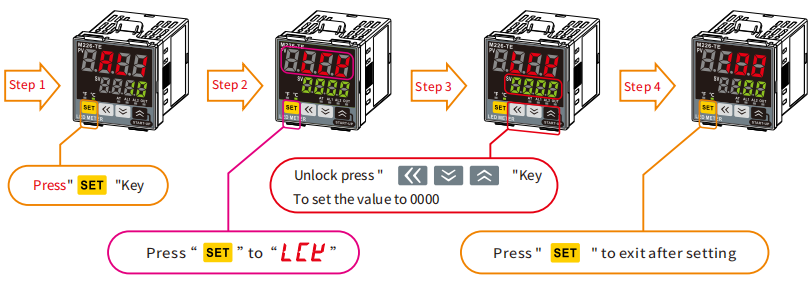
| Using AT auto-adjustment function for the first time can better control the heating process (intelligent heating), If only need "general temperature control", can set " P " to "0000" to enter the submenu to set up and down the switch difference to select the setting; | ⇩ Adjusted"0000" Press " SET " to enter the submenu settings Up switching difference : oH Down switching difference: oHH Recommendation of conventional temperature control parameters （The switching difference is 3 degrees up and down.) Up" oH "set to" 0001 " Down"oHH "set to" 0002 " | AT will be automatically generated after rectification. When " P " set to "0000", these three items will not be displayed. | |

| Output response time | Temperature difference adjustment | Data lock |
|---|---|---|
| r | SC | LCk |
| Initial value "0020" (output control is relay) ⇩ Output such as "solid state relay", namely SSR, in order to obtain a faster response,can set the output response time value to "0002" | Initial value"0000" ⇩ The difference between the measured temperature and the displayed temperature can be adjusted by " ⩔ ⩓ ",after setting, press " SET " to confirm the exit. | Initial value "1000" (unlocked state) ⇩ Data lock Settings |

## Data lock Settings

Press " SET " to enter the setting mode, then press " SET " to find the data lock parameter " LCk " ,set the code to "0000", that is, the unlocked state (the factory default is the unlocked state);Code "0001" is in the locked state (in this state, the data secondary menu cannot be accessed);Press " SET " to exit after setting.

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|---|---|---|---|
| 0000 | SV and all parameters can be set | 0001 | Only SV can be set |
| 0011 | Only SV and alarm (AL1 、AL2) can be set | 0100 | SV and all parameters cannot be set |

## SETTING OF AT SELF-TUNING FUNCTION

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.

## SV (Temperature control) Setting:

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;

## Secondary menu (function) access mode:

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.

## Enter the settings for sensor type selection: secondary menu

Press and hold the " SET ⩔ "key at the same time ( about 2 seconds ), " Cod "will be displayed in the display PV, select " 0020 " in the SV display column, and press the " SET "key.The PV display column shows " SN ",and set the digital code of the corresponding sensor with " ⩓ ⩔ "( the factory default is " K-type thermocouple " ) , Press and hold the " SET ⩔ "key at the same time to exit the setting interface.

### Table A (Comparison Table of Signal Input Types)

| Code | U | J | E | S | n | T | b | R | rE3 | rE5 | Pt | Cu50 | Pt | Cu50 | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of input | Thermocouple (TC) | | | | | | | | | | RTD (1°) | | RTD (0.1°) | | Voltage 0~5V/1~5V |
| | K | J | E | S | N | T | B | R | Re3 | Re5 | Pt 100 | Cu50 | Pt 100 | Cu50 | |

1、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、Thermocouple and thermal resistance can be mutually converted. If it is converted with voltage input, please submit it to our company for adjustment.

Note: The factory default (signal input type) without special requirements is " Type K thermocouple "

## °F and °C display unit selection: secondary menu secondary menu

Press and hold the " SET ⩔ " key at the same time ( about 2 seconds ) to display " Cod " in the display PV, select " 0020 "in the SV display column, press the " SET " key to display " Unit " in the PV display column, and set the corresponding degree-day code in coordination with " ⩔ " ( factory default is ℃--- °C ). When the setting is completed, press and hold the " SET ⩔ " key for a long time to exit the setting interface.

| Degree-day chooses. | °C | °F |
|---|---|---|
| Corresponding code | °C | °F |