

# T7-SCR Power Regulator Use Manual

# TAISEE

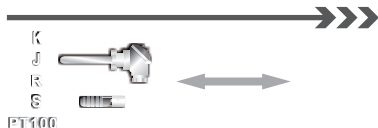
PID temperature control function



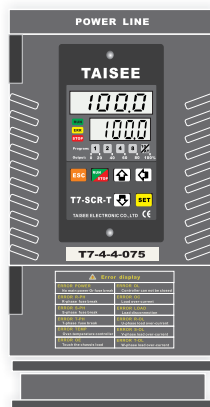
## AC24V~660V Class



INPUT:(0~20mA)(4~20mA)(0~5V)(1~5V)  
(0~10V)(2~10V)(KEY (VR)(Rs485)



**Universal output mode change**  
**Zero phase. Current limiting.**  
**Zthe limit voltage constant curren**  
**constant voltage.**




**Control Panel**

1Ø 28A~2,000A

3Ø 28A~2,000A

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 Four key for 4 seconds all command parameter recovery factory value

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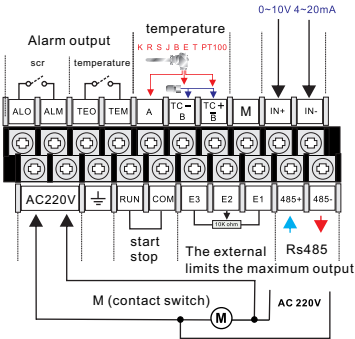
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# Installation notes

## Control terminal function description

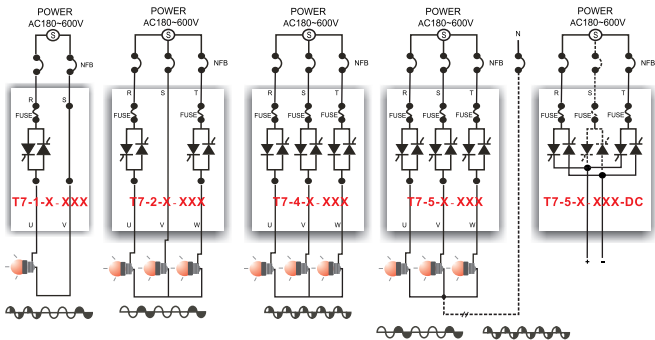


## AC180-480V

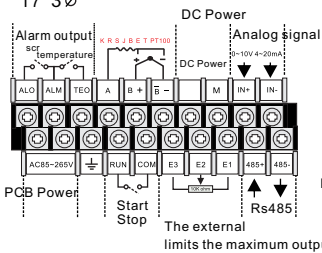


The main power supply circuit with a switch must be synchronous control of PCB power supply.

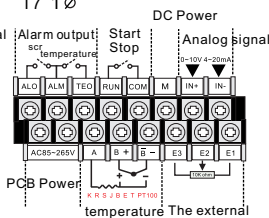
## The models of equivalent circuit



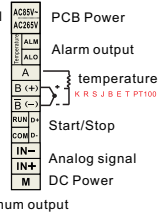
## T7 3Ø



## T7 1Ø



## ST7

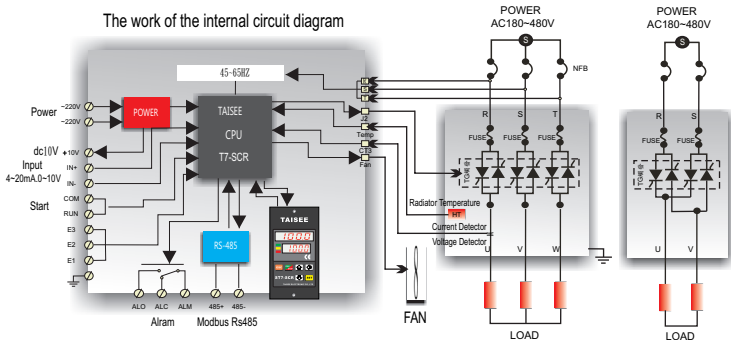


## Chapter 1: Introduction

First of all thank you for using TAISEE power regulator ST6-SCR/T6-SCR series and the latest high-quality components made of micro-computer control technology

This manual provides users with installation. Parameter setting. Unusual diagnosis.

Excluded and routine maintenance. In order to really be able to properly install and operate the controller. Please installed before. Carefully read this instruction manual And proper preservation. To the end-use equipment manufacturers



### Anomaly detection

A variety of anomaly detection: an exception occurs immediately alarm And stop the output of

### First (cycle power regulator. Phase shift) from software change

Output mode: (cycle) (phase-shift) (phase-shift operation to start cycle) (cycle start phase-shift operation) function

### Input mode: change the settings from the software

Input mode: / KEY/Dip/0 ~ 20mA / 4 ~ 20mA / 0 ~ 5V / 1 ~ 5V / 0 ~ 10V / / 2 ~ 10V/RS485 / by a software change

### Fan protection Function

Now the temperature display SCR / SCR temperatures above 45 C when the cooling fan starts automatically. Less than 42 C the fan stops

### Precision SMD Original

SMD Chip Original, PC board circuit is more simple and more durable / 12bit digital control / EEPROM memory test process. To achieve high quality. Precision requirements

### The main supply voltage range

Main supply voltage range AC180V ~ AC480V / Built-in phase order tracking

### Modbus Rs485 Communication

Send SCR working condition. Data processing analysis

## The 3 chapter installation environment

### Storage Precautions

of the company's warranty and future maintenance. Save important to note

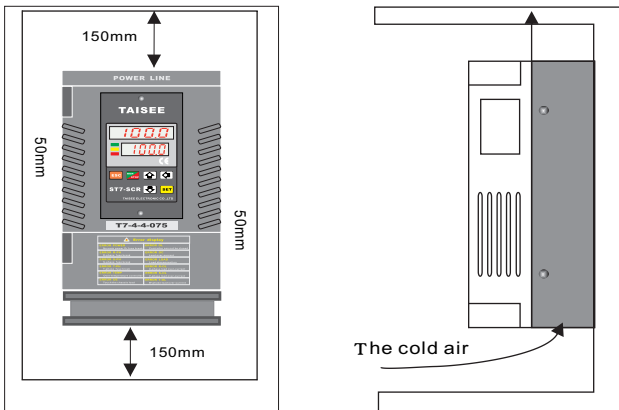
#### The following matters:

- ★ Must be placed no dust. Dry. The best properly packaged and stored in racks
- ★ Storage location of the ambient temperature must be  $-20^{\circ}\text{C} \sim 65^{\circ}\text{C}$  range  
Humidity 0% ~ 95% within the
- ★ Avoid stored in containing corrosive gases. Liquids of the surrounding environment
- ★ Stored in a long time when used. Must carefully check the controller is intact

### Installation Notes

Power regulator for high fever original power regulator must be mounted vertically

The use of ambient temperature  $-10^{\circ}\text{C} \sim 40^{\circ}\text{C}$ . If the ambient temperature exceeds  $40^{\circ}\text{C}$  or more cooling devices must be installed



### Installation Environment

- ▲ No water droplets. Steam. Dust. And oily dust of the place
- ▲ No corrosion. Flammable gas. Liquids
- ▲ No floating particles of dust and metal
- ▲ Strong no vibration-free workplace
- ▲ No electromagnetic noise interference of the premises


## The 4 chapter specifications

Before installation, make sure: the load capacity is in the context of SCR







Calculation: (Single phase):  $\text{load (KW)} / \text{Voltage (V)} = \text{Amps (A)} * (1.15) = \text{should use SCR Amps (A)}$   
 (Three-phase):  $[\text{load (KW)} / \text{Voltage (V)}] / \sqrt{3} = \text{ampere (A)} * (1.15) = \text{should use SCR Amps (A)}$

Model Option: Three-phase 100A Current Limit: Corresponding Model: T6-5-4-100-CT  
 Single-phase 75A (Phase): Corresponding Model: T6-1-4-075P

| Type                | Mode   | Main power   | Output current             | Output control mode  | Temperature                  | Communication |
|---------------------|--|--------------|----------------------------|--|------------------------------|---------------|
| T7<br>Standard      | 1<br>1 phase<br>Phase / zero<br>can be changed   | 0 AC12-80V   | 028 28A 150 150A           | Z<br>Zero-cycle control  | T<br>Temperature             | R<br>Yes      |
| ST7<br>Compact      |  | 1 AC85-160V  | 030 30A 175 175A           | P<br>Phase shift control   | TP<br>Program<br>temperature | N<br>No       |
| WT7<br>Water cooled | 2<br>Control<br>two-phase<br>Cycle had zero<br>power adjustment                                    | 4 AC180-440V | 040 40A 200 200A           | CT<br>Current limit  | N<br>No                      |               |
|                     |  | 6 AC460-600V | 050 50A 225 225A           | C<br>Constant current  |                              |               |
|                     | 4<br>3-phase half<br>wave control<br>Phase / zero<br>can be changed                                |              | 060 60A 250 250A           | VT<br>Voltage limit  |                              |               |
|                     |  |              | 075 75A 300 300A           | V<br>Constant voltage  |                              |               |
|                     |  |              | 080 80A 400 400A           | AT<br>3 $\phi$ Current control   |                              |               |
|                     |  |              | 100 100A 500 500A          | CV<br>Voltage and current control  |                              |               |
|                     |  |              | 125 125A 800 800A          | DC<br>DC Output Control  |                              |               |
|                     |  |              | 1200 1200A<br>Water cooled | KW<br>limit KW   |                              |               |
|                     | 5<br>Phase / zero can be changed<br>3-phase full-controlled load<br>center can be accessed 0V line |              |                            | KWT<br>Constant KW   |                              |               |
|                     |  |              |                            | CYC<br>Change the cycle of output<br>OUT 30% <input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF |                              |               |

| The purchase of goods | Map  | Set the device to extend the line | Mode   | T7K-2 | T7K-4 |
|-----------------------|---|-----------------------------------|--------|-------|-------|
|                       |   |                                   | Length | 2M    | 4M    |

### Output waveform

| Zero: For purely resistive wire load (cycle power regulator)                                   | Output state  | Full-wave as a unit. No half-wave component. Does not produce ramp-wave interference. Output ammeter are chattering                          |
|--|---------------|--|
| 10% OUTPUT    | Load          | Fixed resistance wire heating wire (not for use in lighting control. Inductive load)   |
| 30% OUTPUT   | For Occasions | Air-conditioning thermostat. Heat treatment furnace. Baking furnace. Extruder Machine  |
| 90% OUTPUT  |               |  |
| Phase-shifted output: lamp. Transformers. Silicon carbide load                                 | Output state  | Linear excellent output stability. Ammeter does not shake. Output accuracy of 0.1%, non-interference ramp                                    |
| 30% OUTPUT  | Load          | Resistance heating wire. Change type load lighting controls, inductive load, a drastic change Infra-red lamp. Silicon carbide                |
| 50% OUTPUT  | For Occasions | May limit the maximum output current. Caused by changes in voltage or load current is increased Auto-off within the limits of a small output |
| 90% OUTPUT  |               |  |

## The 4 chapter outline dimensions and mounting dimensions

### Compact (1-phase 28A~70A / 3-phase 28A~40A) ST7 series



| Specifications |             | Appearance size   | Installation size |
|----------------|-------------|-------------------|-------------------|
| 1 $\emptyset$  | ST7-1-4-028 | L=180 W=110 D=110 | L=95 W=105        |
|                | ST7-1-4-030 | L=180 W=110 D=110 | L=95 W=105        |
|                | ST7-1-4-040 | L=180 W=110 D=110 | L=95 W=105        |
|                | ST7-1-4-050 | L=180 W=110 D=110 | L=95 W=105        |
|                | ST7-1-4-070 | L=180 W=110 D=110 | L=95 W=105        |
| 3 $\emptyset$  | ST7-4-4-030 | L=180 W=110 D=120 | L=95 W=105        |
|                | ST7-4-4-040 | L=180 W=110 D=150 | L=95 W=105        |

### The general 1 phase 50A~175A) T7 series




| Specifications |            | Appearance size   | Installation size |
|----------------|------------|-------------------|-------------------|
| 1 $\emptyset$  | T7-1-4-050 | L=210 W=110 D=183 | L=170 W=105       |
|                | T7-1-4-070 | L=210 W=110 D=183 | L=170 W=105       |
|                | T7-1-4-075 | L=210 W=110 D=183 | L=170 W=105       |
|                | T7-1-4-080 | L=210 W=110 D=183 | L=170 W=105       |
|                | T7-1-4-100 | L=240 W=110 D=183 | L=170 W=105       |
|                | T7-1-4-125 | L=240 W=110 D=183 | L=170 W=105       |
|                | T7-1-4-150 | L=240 W=110 D=183 | L=170 W=105       |
|                | T7-1-4-175 | L=240 W=110 D=183 | L=170 W=105       |

### General (1-phase 225A~300A / 3-phase 50A~175A) T7 series

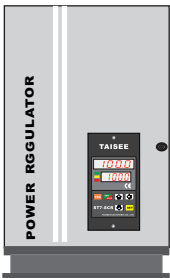


| Specifications |            | Appearance size   | Installation size |
|----------------|------------|-------------------|-------------------|
| 1 $\emptyset$  | T7-1-4-225 | L=250 W=145 D=205 | L=170 W=135       |
|                | T7-1-4-250 | L=300 W=145 D=205 | L=170 W=135       |
|                | T7-1-4-300 | L=300 W=145 D=205 | L=170 W=135       |
| 3 $\emptyset$  | T7-4-4-050 | L=250 W=145 D=205 | L=170 W=135       |
|                | T7-4-4-070 | L=250 W=145 D=205 | L=170 W=135       |
|                | T7-4-4-075 | L=250 W=145 D=205 | L=170 W=135       |
|                | T7-4-4-080 | L=250 W=145 D=205 | L=170 W=135       |
|                | T7-4-4-100 | L=250 W=145 D=205 | L=170 W=135       |
|                | T7-4-4-125 | L=300 W=145 D=205 | L=170 W=135       |
|                | T7-4-4-150 | L=300 W=145 D=205 | L=170 W=135       |
|                | T7-4-4-175 | L=335 W=170 D=230 | L=170 W=160       |

## General (1-phase 400A~500A / 3-phase 200A~300A) T7 series

|  | Specifications |                   | Appearance size   | Installation size |
|---|----------------|-------------------|-------------------|-------------------|
|   | 1 Ø            | T7-1-4-400        | L=335 W=275 D=235 | L=275 W=255       |
|   | T7-1-4-500     | L=335 W=275 D=235 | L=275 W=255       |                   |
| 3 Ø   | T7-4-4-200     | L=335 W=170 D=235 | L=275 W=160       |                   |
|   | T7-4-4-225     | L=335 W=170 D=235 | L=275 W=160       |                   |
|   | T7-4-4-250     | L=335 W=275 D=235 | L=275 W=255       |                   |
|   | T7-4-4-300     | L=335 W=275 D=235 | L=275 W=255       |                   |

## General (1-phase 600A~1200A / 3-phase 400A~800A) T7 series

|  | Specifications |                   | Appearance size   | Installation size |
|---|----------------|-------------------|-------------------|-------------------|
|   | 1 Ø            | T7-1-4-800        | L=390 W=275 D=255 | L=275 W=255       |
| 3 Ø   | T7-4-4-400     | L=390 W=275 D=255 | L=275 W=255       |                   |
|   | T7-4-4-500     | L=390 W=275 D=255 | L=275 W=255       |                   |
|   | T7-4-4-800     | L=700 W=275 D=255 | L=325 W=255       |                   |

\* special specifications: voltage / current order mode of production



## Chapter 5: User Guide

Quick Installation Guide will help Thailand silicon power regulators (SCR) to the most basic way to achieve optimal control wiring

### (1) Installation of power regulators:

Please do read the manual in detail. If in doubt please contact the professional and technical personnel (failure to comply may result in damage to personnel or equipment)

- Before installation to confirm the selection (Electricity Regulator) Rated full load current is greater than the load current

Calculation:

(Single phase):  $\text{load (KW)} / \text{Voltage (V)} = \text{Amps (A)} * (1.15) = \text{should use SCR Amps (A)}$

(Three-phase):  $[\text{load (KW)} / \text{Voltage (V)}] / \sqrt{3} = \text{ampere (A)} * (1.15) = \text{should use SCR Amps (A)}$

Wiring:

- Remove (power regulator) up cover: The AC power connected to the terminals on the R.S & T
- Remove (Electricity Regulator) down cover: the load connected to the U.V&W

### (2) power transmission

- AC input wiring before you do check whether the scope of the requirements go along with technical manuals
- After the input alternating current. Seven-segment display first full-bright "display TISEE SCR-> INPUT 4 ~ 20mA-> OUTPUT PHASE-> display analog input%. Output%

### (3) Display Interface:

#### Input Display

Display input value; keyboard input, or RS485 communication control  
I mode: (shown input 0 ~ 100%):

0~20mA 4~20mA input mode: (Display Input Current 0.0 ~ 20.0mA)

1~5V 0~10V input mode: (shown input voltage 0.0 ~ 10.0V)

Constant current models: (Display settings current value 1 ~ 800A)

Constant voltage models: (Display Settings voltage value 1 ~ 600V)



#### Output Display

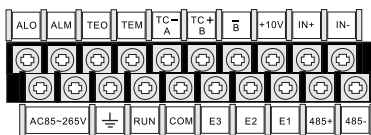
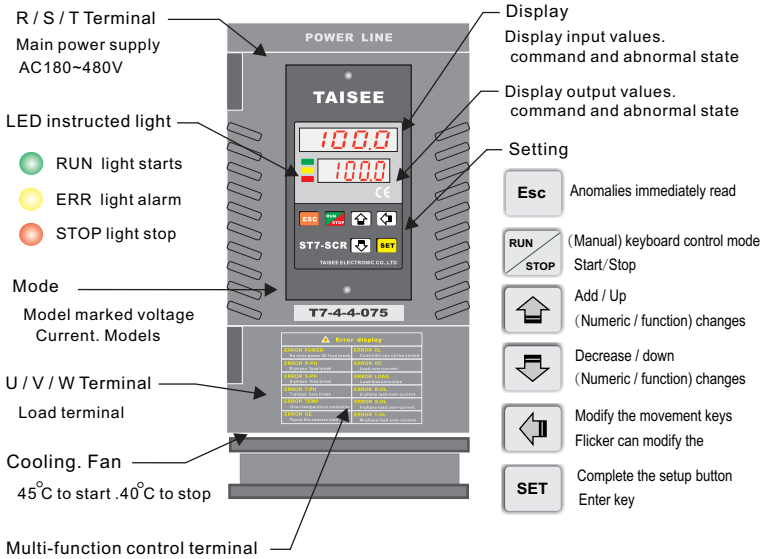
Zero.-Phase models (show output of 0.0 ~ 100%)

Current Limit. Constant current models (show output current value of 0.0 ~ 800.0A)

Fixed voltage models (show the output voltage of 0.0 ~ 600.0V)

## Chapter 6: Controller Function Description

### Power regulator configuration instructions



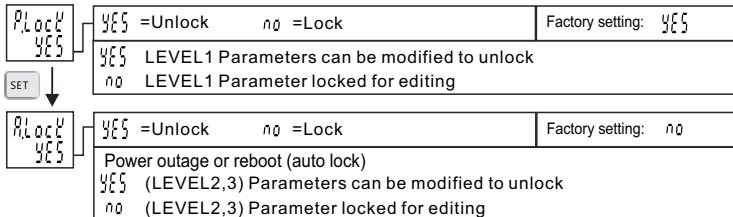
PC board terminal voltage ~ 220V  
Start / stop contacts COM RUN  
Analog input contact IN + IN-  
External maximum output limit E3 E2 E1  
Abnormal alarm output contact ALM ALC ALO  
Modbus RS485 communications contact D + D -

### Command parameter lock function



#### step 1.

- Modify (Level 2 3) restricted reference materials values.  
must enter (Level 3) modify the following parameters

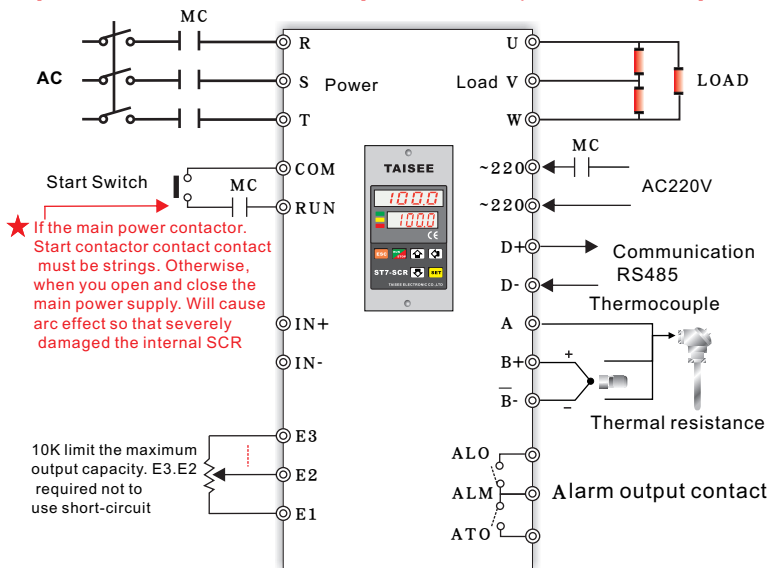


- A.LOCK. Unlock mode can modify the parameters of LEVEL2.3 (when the SCR reboot A. LOCK will automatically return to lock mode)To change repeat step 1.

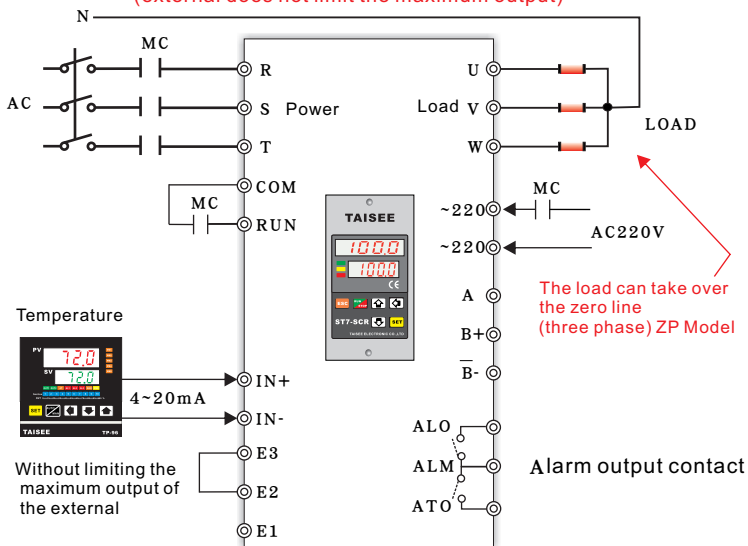
| Symbol | Terminal Function Description  |              |
|--------|--|--------------|
| R      | Main circuit terminal  |              |
| S      | The main power output: range AC180V ~ 480V<br>1 Ø Type: R / S    3 Ø Type: R / S/T   |              |
| T      |  |              |
| U      | Main circuit terminal  |              |
| V      | Power regulator output: Next load  |              |
| W      | 1 Ø Type: U / V    3 Ø Type: U / V/W   |              |
| AC1    | Auxiliary Power  |              |
| AC2    | Control Power Input: T6 Type AC220V ±10%<br>T7 Type AC85V~265V   |              |
| COM    | Start contact:    COM / RUN short-circuit. Start state RUN lights<br>COM / RUN open. To stop the state STOP lights   |              |
| RUN    |  |              |
| +10V   | DC10V voltage output   |              |
| IN+    | Analog Signal Input: Input% corresponds to the output%   |              |
| IN-    | Mode: 0~20mA/4~20mA/DC0~5V/DC1~5V/DC0~10V/DC2~10V<br>Input mode selection: from the software configuration changes   |              |
| E3     | <p>External potentiometer regulator limits the maximum output power%</p> <p>Right example: maximum output is limited to 80% of the corresponding input and output curve</p> <p>----- Input curve    ——— Output curve</p> |              |
| E2     |  |              |
| E1     |  |              |
| A      | Thermal resistance   |              |
| B TC+  |  | Thermocouple |
| B TC-  |  |              |
|        |  | PT100        |
| D+     | Modbus Rs485   |              |
| D-     | Can be a maximum of 32 concurrent connections 1200M  |              |

## 7-1 The 7 chapter circuit wiring

Temperature control mode (control panel to directly control the temperature)

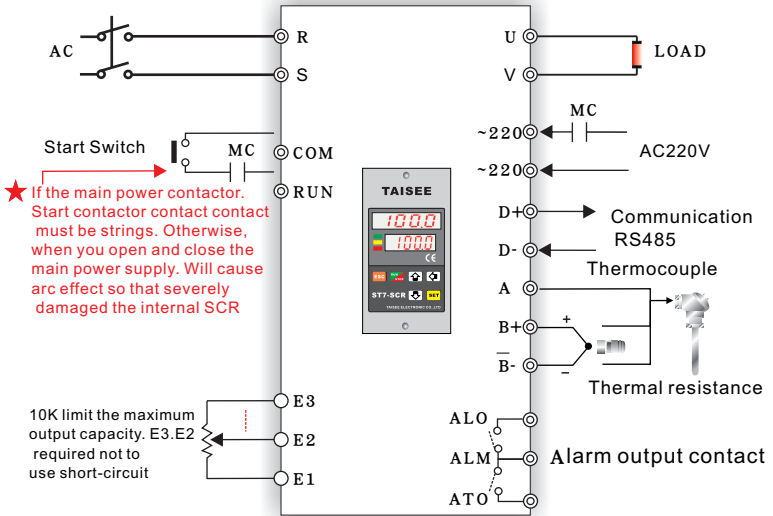


Thermostat 4~20mA current signal control (external does not limit the maximum output)

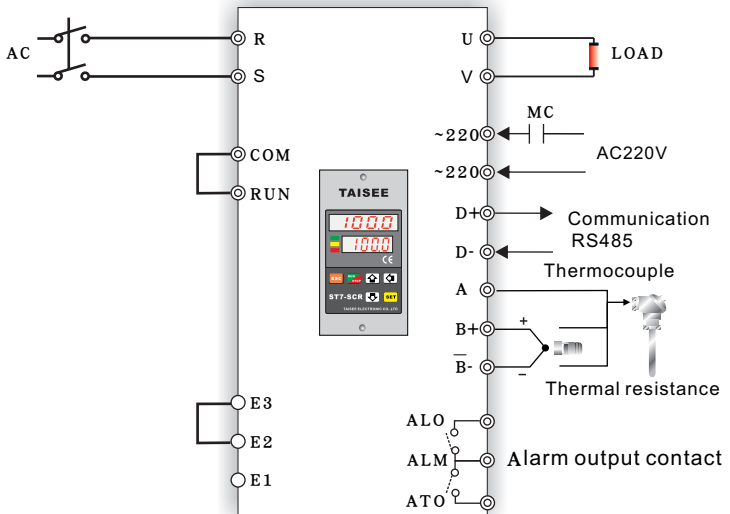


7-3

1-phase. Loop wiring (1)

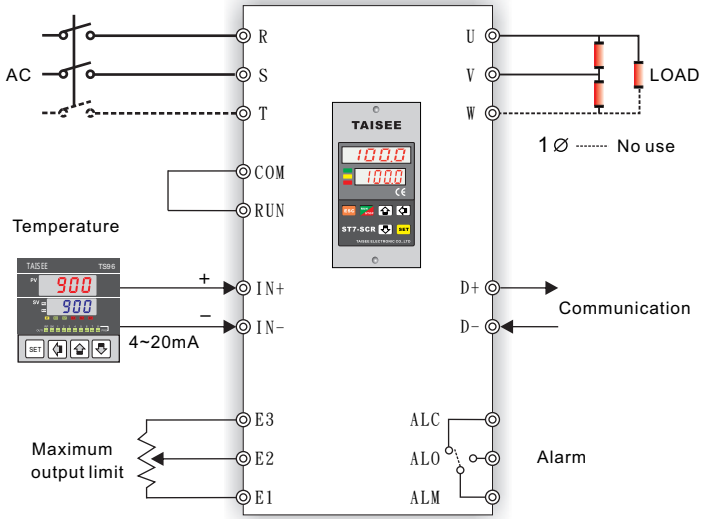


1-phase. Loop wiring (2)

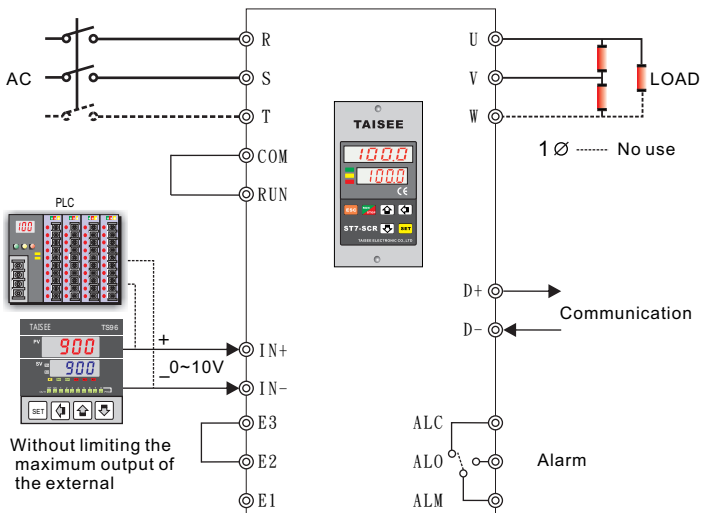


7-2

Temperature 4 ~ 20mA current signal - "control the proportion of output (external VR limit the maximum output volume)"

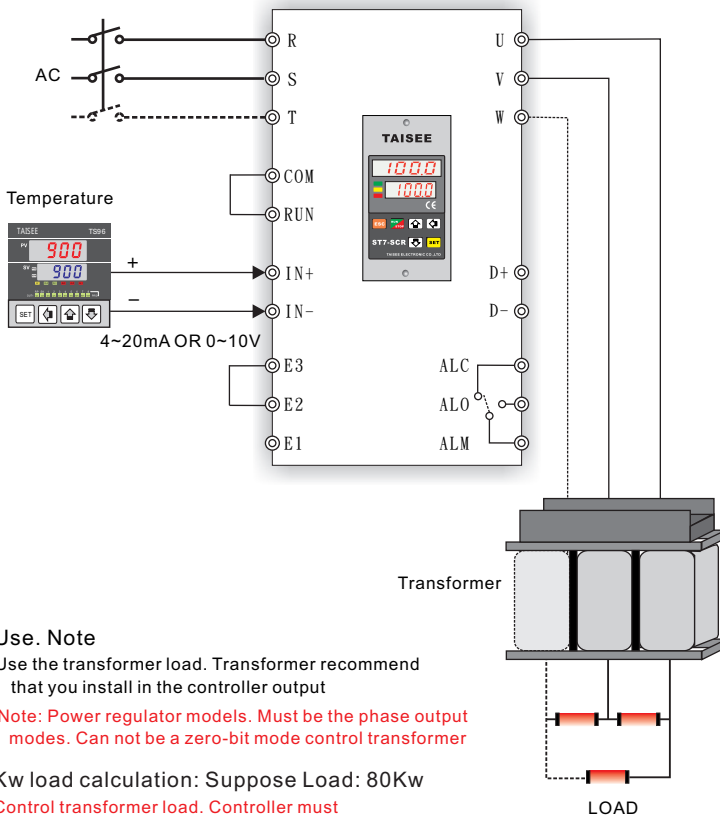


External 0 ~ 10V voltage signal - "control the proportion of output (external Without limiting the maximum output volume)"



7-4

Reactance. Transformer load wiring and control



Use. Note

Use the transformer load. Transformer recommend that you install in the controller output

Note: Power regulator models. Must be the phase output modes. Can not be a zero-bit mode control transformer

Kw load calculation: Suppose Load: 80Kw

Control transformer load. Controller must increase 1.3 times higher than

Example 1: transformer step-down mode (220V load voltage)

Transformer. input = 380V output = 220V

Multiples of the value of transformer  $T = (220/380)$

Should use the following formula for calculating controller amps example:

$$1 \varnothing = (80,000/220) * T = 210A$$

$$(Load/Voltage) * Multiples = Current$$

Selected controller amps (210 \* 1.3) = 273A corresponds to Model T6-1-4-300P

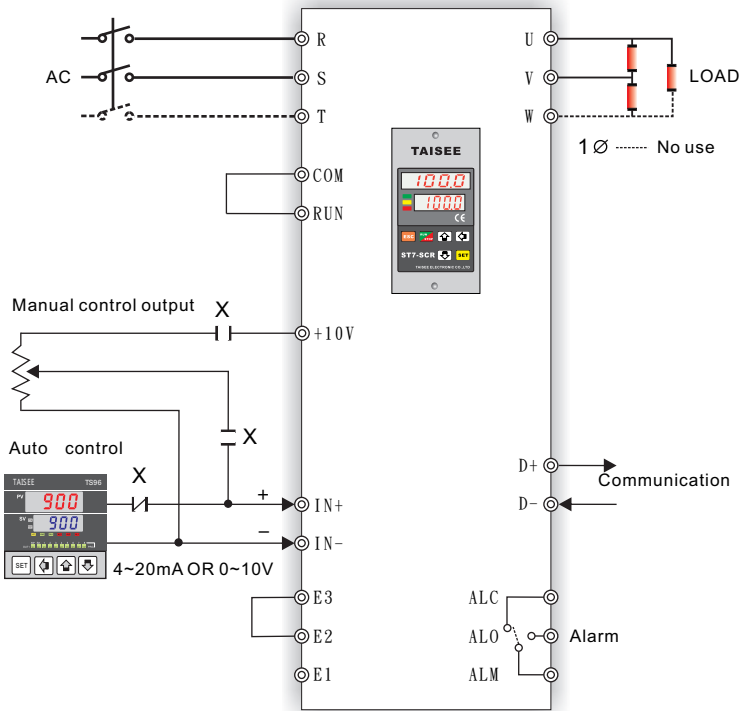
$$3 \varnothing = (80,000/220) * T = 210 / \sqrt{3} = 154A$$

$$(Load/Voltage) * Multiples / \sqrt{3} = Current$$

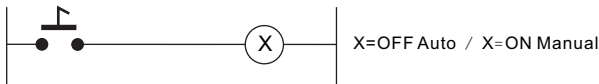
Selected controller amps (154 \* 1.3) = 200A corresponds to Model T6-5-4-200P

7-5

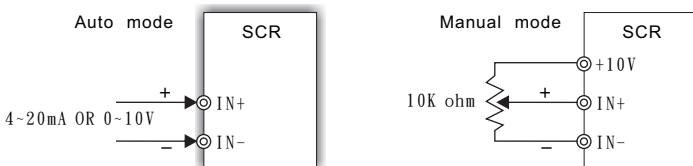
Auto / Manual Switching Control Wiring



Auto / Manual switch control circuit



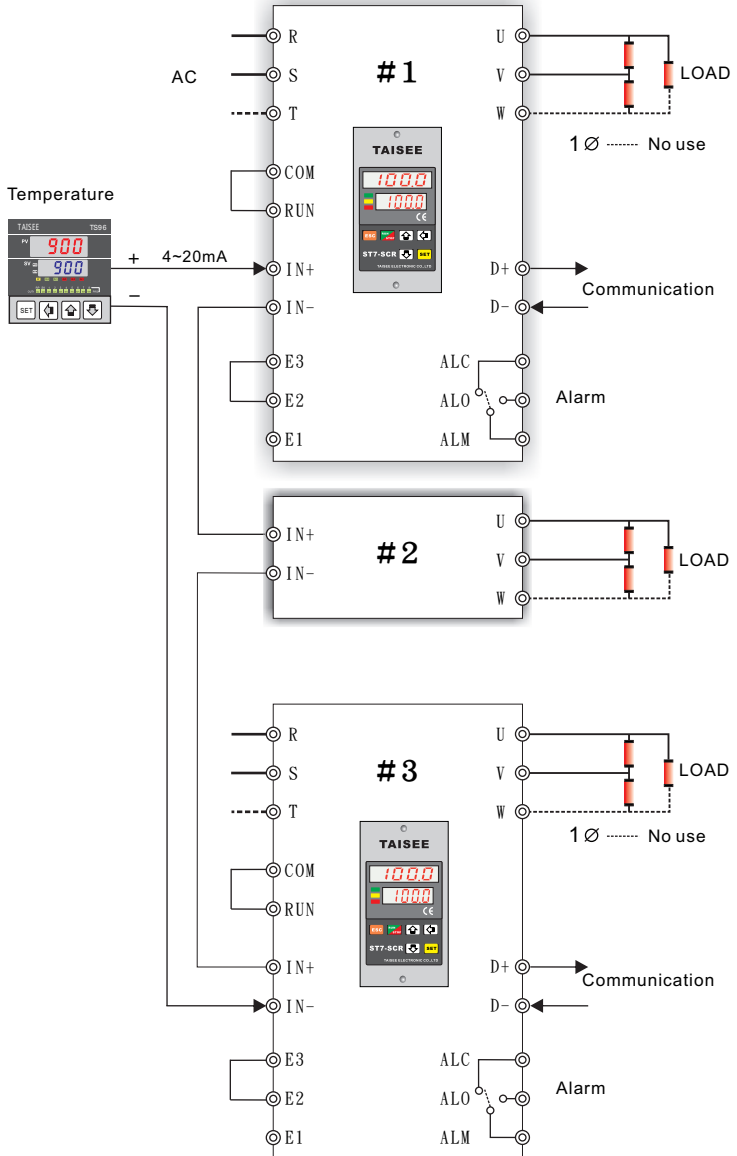
Equivalent circuit





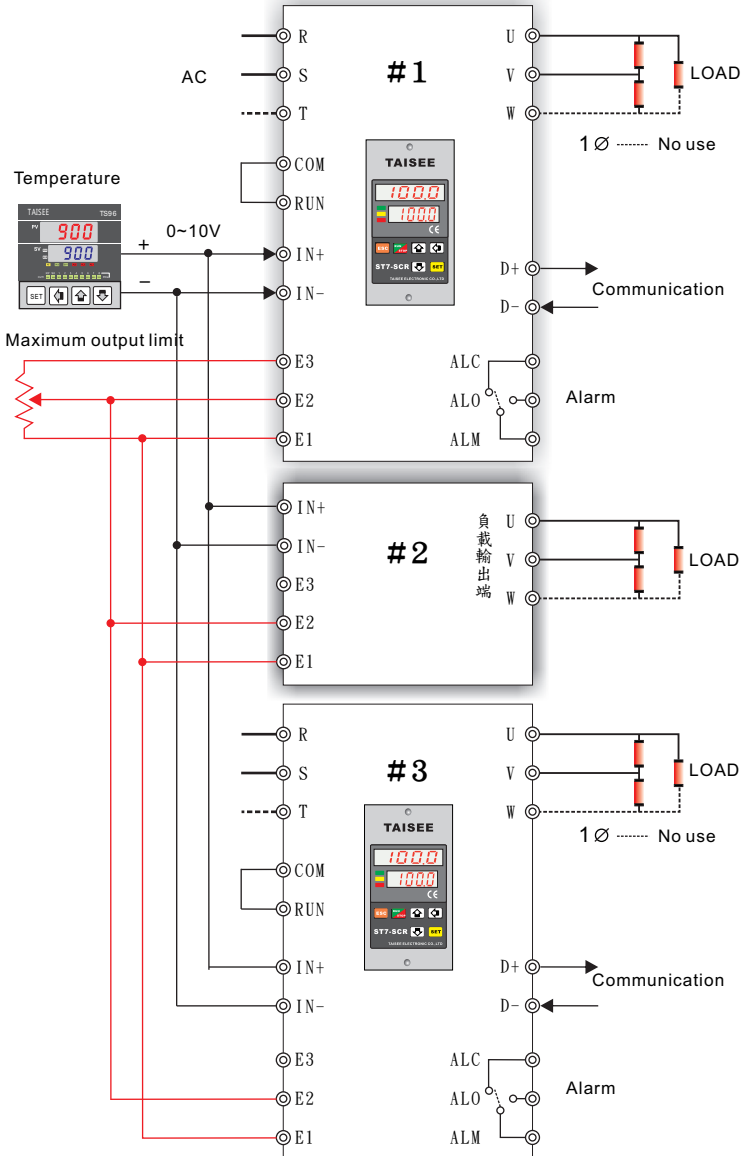
7-7

Temperature 4~20mA control more than one connection - "(external without limiting the maximum output volume) to connect up to 4 units



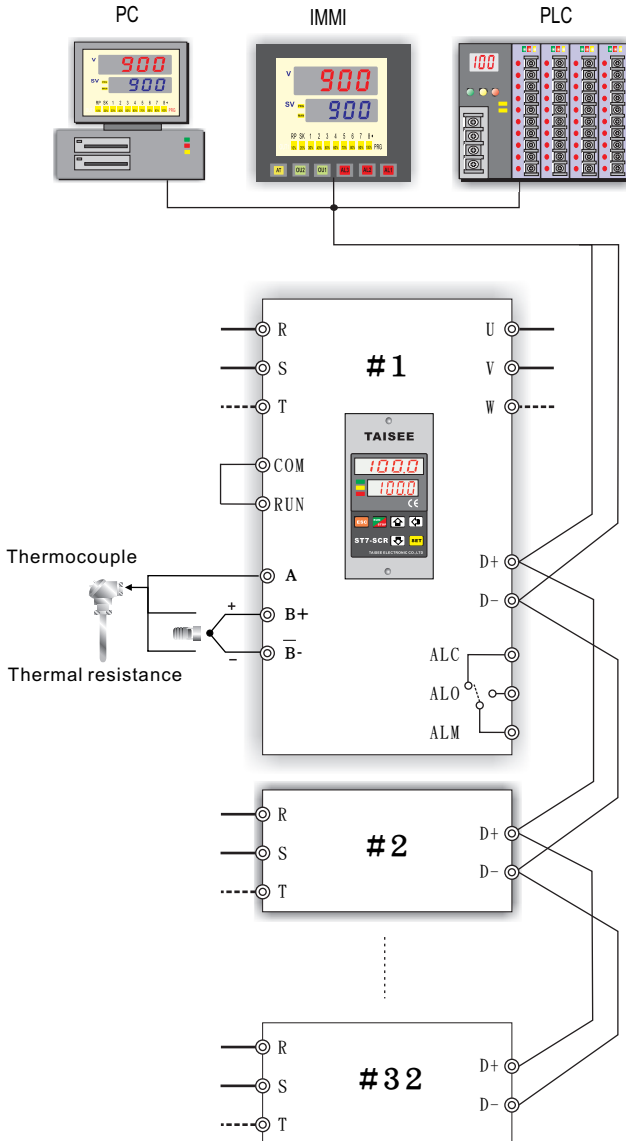
7-7

0~10V thermostat control more than one connection the-  
maximum output volume) to connect up to 5 units



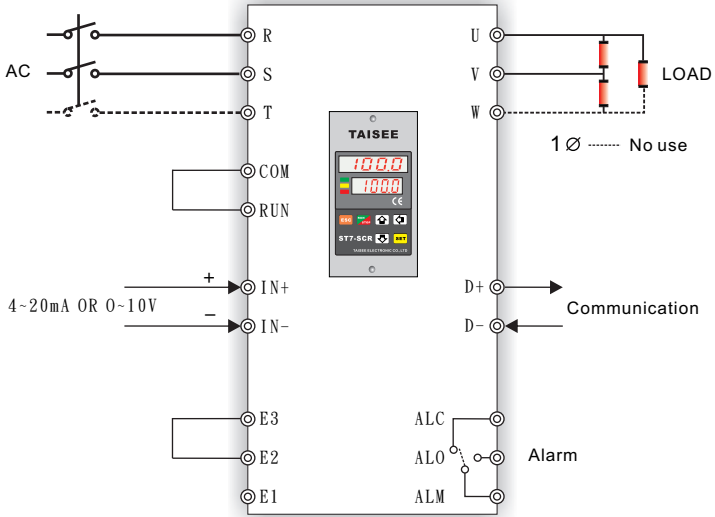
7-8

Modbus RS485 communication control up to 256 sets from 1200M.



### 8-1 The 8 chapter special control (constant current / voltage)

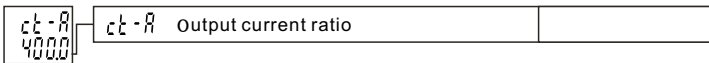
C-Type (constant current models) input analog signal  
 "control the current output (automatic constant current)"



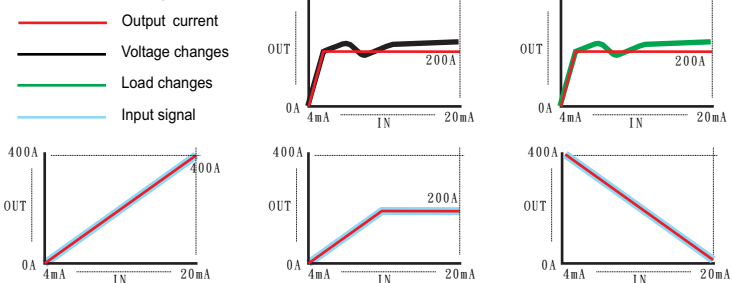
#### Constant current (set. Note)

1. PC board analog input signal terminals (IN + IN-) give as gifts DC0 ~ 10V. control the output current value : for example, is a model 500A, the largest factory settings

Example 2: the actual load is 400A: set (Class 1) the ct-A output current range is set 400 (IN+ IN-) terminal input DC0~10V, the corresponding 0~400A proportional output

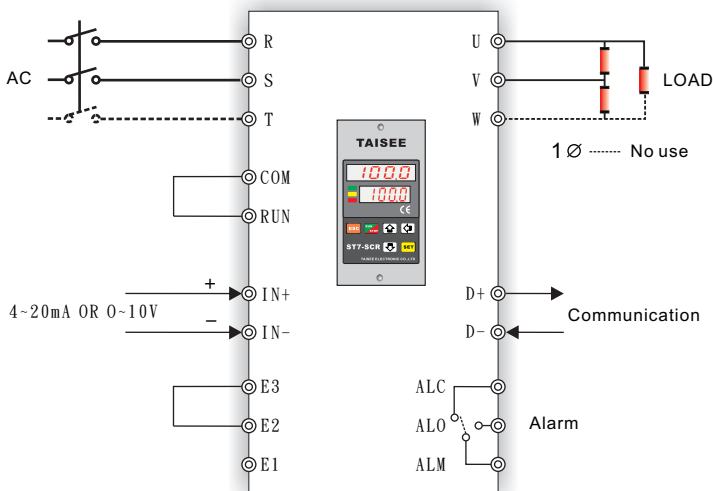


Constant current output waveform



8-2

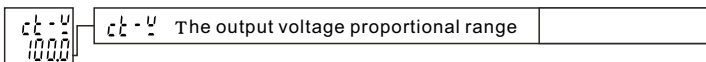
V-type (fixed-voltage models) input analog signal - "control voltage output (automatic constant voltage)



Constant voltage (set. Note)

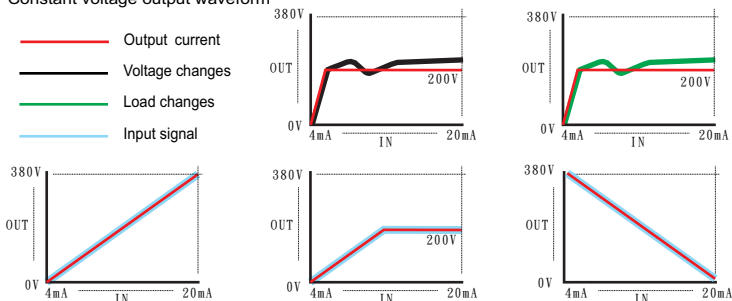
1. Analog input signal terminals (IN + IN-) give as gifts DC0 ~ 10V. Control the output voltage values: cases of the primary analog input voltage is 380V corresponding to (IN + IN-) terminal input DC0 ~ 10V, corresponding to 0 ~ 380V Output

For example: 2 main voltage 380V: is set to ct-V (Class 1) output voltage range is set 100 (IN+ IN-) terminal input DC0~10V, the corresponding 0~100V proportional output



Constant voltage output waveform

- Output current
- Voltage changes
- Load changes
- Input signal

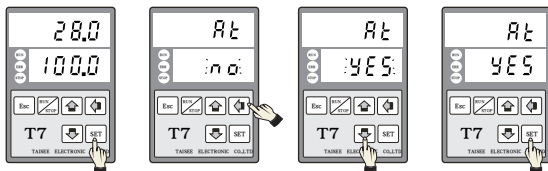


9-2

## Directive parameter operation example:



AT (auto tuning) to achieve the best effect of proportional control



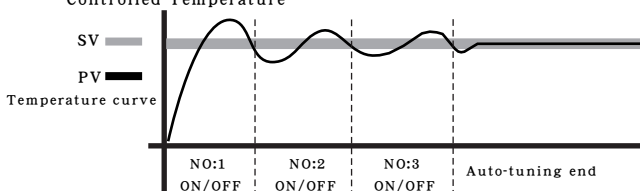
AT (auto-tuning) will get three ON / OFF process.

In the whole process of controller switch-mode setting to complete. Three ON / OFF to complete.

So, the process of speech super-AT is a normal temperature. Auto-tuning to complete. AT lights go out  
Controller Hui pants complex ratio of output mode

(Auto-tuning) to enable the controller to select the best

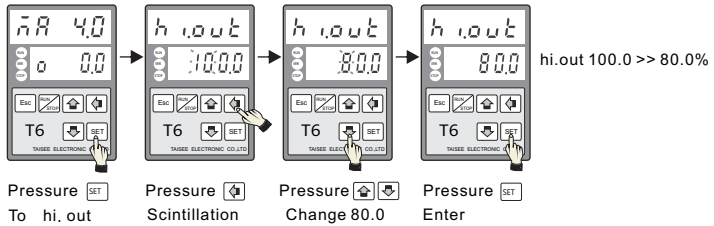
T self-tuning PID values. Achieve precise temperature Control requirements. If the load special. (Auto-tuning) To complete. Temperature fluctuations in a small margin error. Can increase / decrease P value. Can be precisely Controlled Temperature



9-3

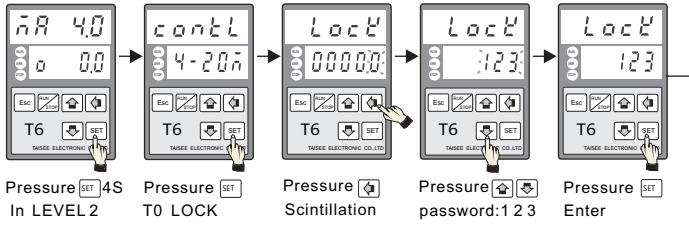
Command parameter operations (Example):

Example 1: Software to set the maximum output is limited to 80%

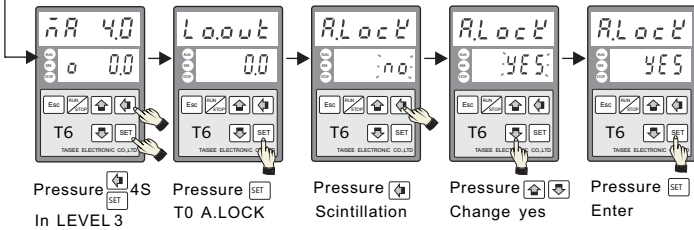


★ Each reboot LEVEL 3 (A. LOCK) command to lock automatically. Must be lifted before they can change the class parameter lock: LEVEL 2 LEVEL 3 command parameters Mode cases of the steps

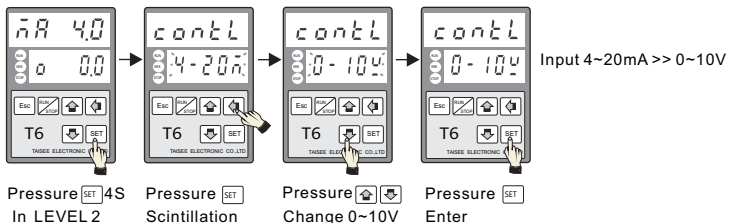
Step 1: Enter Password:



Parameter settings to unlock (LEVEL1 2 may change)



Example 2: 4 ~ 20mA input mode. DC0 ~ 10V input mode changes to step 1 (confirmation LEVEL 3 instruction (A. LOCK) = yes)



## 10-1 Chapter 11: Directive parameter list

LEVEL3  $P_{Lock}$  and  $R_{Lock}$  = YES The following parameters can be changed

| LEVEL1 user layer                             |  |   |   |                                |      |
|---|--|---|---|--------------------------------|------|
| Directive                                     | Explained  | Function Description  | Setting range & setting mode  | Factory                        | Page |
| $\bar{n}\bar{r}$                              | $\bar{n}\bar{r} = \text{mA}$<br>$\bar{v} = \text{V}$<br>$\bar{i} = \text{I}$<br>$\bar{r} = \text{r}$ | Input:<br>$\bar{n}\bar{r}$ - 4~20mA<br>$\bar{v}$ - 0~10V<br>$\bar{i}$ - Key<br>$\bar{r}$ - Modbus | Show only. To change the input mode mode. LEVEL2 within contI command from the input mode changes | Show only<br>Model corresponds | 22   |
| $\bar{o}$                                     | $\bar{o} = \text{O}$<br>$\bar{v} = \text{V}$<br>$\bar{r} = \text{A}$                                 | Output:<br>$\bar{o}$ - 2~20mA<br>$\bar{v}$ - 0~10V<br>$\bar{r}$ - Key                             | Show only. To change the input mode mode. LEVEL3 within modE command from the output mode changes | Show only<br>Model corresponds | 22   |
| $\bar{c}\bar{t}\bar{r}$                       | C.tA   | Output current limit  | imited / constant current models  | Model corresponds              | 22   |
| $\bar{t}\bar{e}\bar{m}\bar{p}$                | tEmP   | Radiator temperature  | Temperature exceeds 85°C. Warning   | Show only                      | 22   |
| $\bar{h}\bar{i}\bar{o}\bar{u}\bar{t}$         | hi.out   | Limit the output %  | Setting range: 40.0 ~ 100.0 %   | 100.0                          | 22   |
| LEVEL2 input layer                            |  |   |   |                                |      |
| $\bar{c}\bar{o}\bar{n}\bar{t}\bar{l}$         | contL  | Input mode selection  | Following settings  |                                | 23   |
| $\bar{k}\bar{e}\bar{y}$                       | KEY  | Panel to manually set input%  | Setting range: 0.0 ~ 100.0 %  |                                |      |
| $\bar{0}\text{-}\bar{2}\bar{0}\bar{m}\bar{a}$ | 0~20mA   | 0~20mA  | Corresponds to the proportion of output of 0.0 ~ 100.0 %  | Model corresponds              | 23   |
| $\bar{4}\text{-}\bar{2}\bar{0}\bar{m}\bar{a}$ | 4~20mA   | 4~20mA  |   |                                |      |
| $\bar{0}\text{-}\bar{5}\bar{v}$               | 0~5V   | DC 0~5V   |   |                                |      |
| $\bar{1}\text{-}\bar{5}\bar{v}$               | 1~5V   | DC 1~5V   |   |                                |      |
| $\bar{0}\text{-}\bar{1}\bar{0}\bar{v}$        | 0~10V  | DC 0~10V  |   |                                |      |
| $\bar{2}\text{-}\bar{1}\bar{0}\bar{v}$        | 2~10V  | DC 2~10V  |   |                                |      |
| $\bar{r}\bar{s}\bar{4}\bar{8}\bar{5}$         | r485   | Rs485 communication control   |   |                                |      |
| $\bar{t}\bar{s}\bar{o}\bar{f}\bar{t}$         | tsoFt  | Sdft start-up time  | Setting range: 0 ~ 190Sec   | 5.0                            | 23   |
| $\bar{t}\bar{d}\bar{w}\bar{o}\bar{n}$         | t.dwon   | Soft stop time  | Setting range: 0 ~ 30Sec  | 0.0                            | 23   |
| $\bar{t}\bar{d}\bar{e}\bar{s}\bar{p}$         | t.dESP   | Software Filter Time  | The average analog signal detection   | 3.0                            | 23   |
| $\bar{l}\bar{o}\bar{c}\bar{k}$                | Lock   | Password Input  | Setting range: 0 ~ 99999  | 0000                           | 23   |
| $\bar{c}\bar{u}\bar{r}\bar{r}\bar{E}$         | currE  | Load-full load current setting  | AT models: load-break test set  |                                | 23   |
| $\bar{E}\bar{r}\bar{r}\bar{s}\bar{c}$         | Errsc  | set the percentage error  | (currE)set the percentage error   | 85                             | 23   |



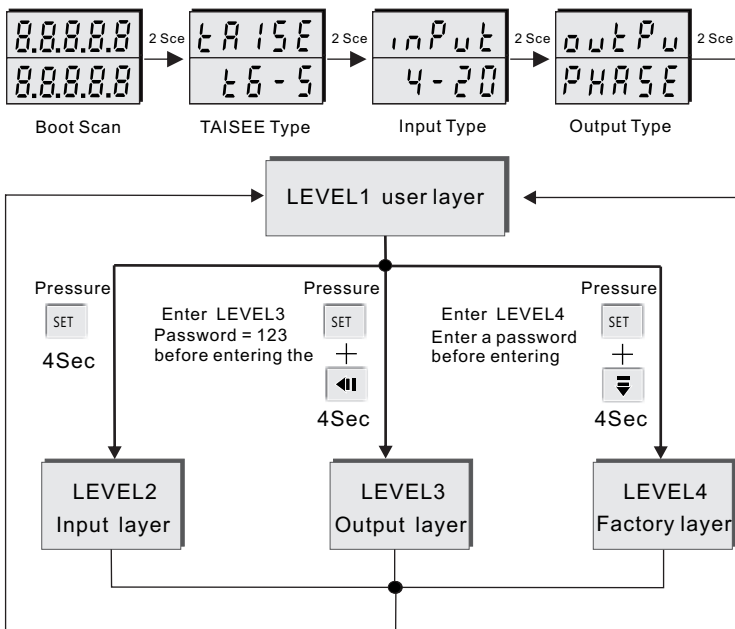
## 10-2

LEVEL3 P<sub>Lock</sub> and R<sub>Lock</sub> = YES The following parameters can be changed

| LEVEL3 control layer |           |   |   |                   |      |
|----------------------|-----------|---|---|-------------------|------|
| Directive            | Explained | Function Description                              | Setting range & setting mode                                  | Factory           | Page |
| L <sub>out</sub>     | Lo.out    | Minimum output% setting                           | Setting range: 0.0 ~ 40.0 %                                   | 0.0               | 24   |
| m <sub>odE</sub>     | modE      | Output mode selection                             | Following settings  |                   | 24   |
| Ph <sub>ASE</sub>    | PhASE     | Phase (phase-shifting. Tune voltage) model output | Input analog signal corresponding to the proportion of output | Model corresponds | 24   |
| P <sub>Er0</sub>     | Zero      | Zero bit (cycle power regulator) model output     |   |                   |      |
| P <sub>ZEr0</sub>    | P.ZEr0    | Phase starts. Zero model output                   |   |                   |      |
| Z <sub>PhAS</sub>    | Z.PhAS    | Zero start. Phase model output                    |   |                   |      |
| b <sub>curr</sub>    | b.curr    | Limit the maximum output current-mode             |   |                   |      |
| A <sub>curr</sub>    | A.curr    | Constant-current output mode                      |   |                   |      |
| A <sub>Volt</sub>    | A.Volt    | Constant voltage output mode                      |   |                   |      |
| P <sub>Lock</sub>    | P.Lock    | LEVEL1 Parameter Lock                             | =yes (can change) =no (no change)                             | yes               |      |
| R <sub>Lock</sub>    | A.Lock    | LEVEL2,3 parameters lock                          | =yes (can change) =no (no change)                             | no                | 24   |
| t <sub>Exit</sub>    | tExit     | Automatically return to the main screen of time   | Setting range: 10 ~ 30 seconds                                | 25                | 24   |
| A <sub>ddr</sub>     | Addr      | Communication: Address Set                        | Setting range: 1 ~ 32   | 1                 | 24   |
| b <sub>And</sub>     | bAnd      | Communication speed                               | Range: 4800 9600 19200 38400                                  | 19200             | 24   |
| b <sub>uS</sub>      | bAnd      | RTU Communication Format                          | Setting range :8-n-0 8-n-1 8-n-2                              | 19200             | 24   |
| c <sub>Pt</sub>      | cPt       | Detection of current transfer ist                 | Setting range :50~190 %                                       | 19200             | 24   |

9-1

The ninth chapter command parameter set an example



Pressure  4 seconds. Or not press a key within 15 seconds back LEVEL1 user layer

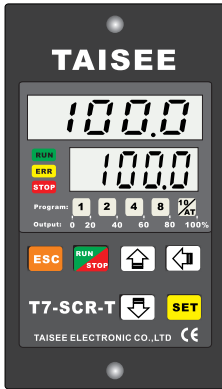


Press     4 seconds the value of all the command parameters back to factory

### LEVEL Class Parameters

|         |  |
|---------|--|
| LEVEL 1 | 1. Temperature control function (PV.SV value and temperature control of various parameters (program) curve set)<br>2. Set the maximum output%. Current / voltage |
| LEVEL 2 | 1. Input setting 0~20mA / 4~20mA / 0~5V / ~5V / 0~10V / 2~10V/KEY<br>2. Slow start / slow stop. Time settings (load disconnected setting)                        |
| LEVEL 3 | 1. Out-mode change: Zero/phase/constant voltage/current/current limit<br>2. Parameter lock / unlock. Communication protocol setting                              |
| LEVEL 4 | Special Features Set: Non-professionals can not enter the  |

## Operation Panel



- PV 1000 Temperature detection value
- SV 1000 Temperature set value
- 1 2 4 8 f0 AT Display output%  
0 20 40 60 80 100% Program display
- RUN Start Lights ◀ Move Key
- ERR Error Lights ↑ Increased (up) Key
- STOP Stop Lights ↓ Reduced down Key
- SET Setting Key RUN STOP Manual / automatic
- ESC Error display

### Program RUN light

|   |   |  |
|---|---|--|
| Run NO:1<br><span style="background-color: red; color: white; padding: 2px;">1</span> <span style="border: 1px solid black; padding: 2px;">2</span> <span style="border: 1px solid black; padding: 2px;">4</span> <span style="border: 1px solid black; padding: 2px;">8</span> <span style="border: 1px solid black; padding: 2px;">f0</span> <span style="border: 1px solid black; padding: 2px;">AT</span> | Run NO:2<br><span style="border: 1px solid black; padding: 2px;">1</span> <span style="background-color: red; color: white; padding: 2px;">2</span> <span style="border: 1px solid black; padding: 2px;">4</span> <span style="border: 1px solid black; padding: 2px;">8</span> <span style="border: 1px solid black; padding: 2px;">f0</span> <span style="border: 1px solid black; padding: 2px;">AT</span> | Run NO:3<br><span style="background-color: red; color: white; padding: 2px;">1</span> <span style="background-color: red; color: white; padding: 2px;">2</span> <span style="border: 1px solid black; padding: 2px;">4</span> <span style="border: 1px solid black; padding: 2px;">8</span> <span style="border: 1px solid black; padding: 2px;">f0</span> <span style="border: 1px solid black; padding: 2px;">AT</span>              |
| Run NO:5<br><span style="border: 1px solid black; padding: 2px;">1</span> <span style="border: 1px solid black; padding: 2px;">2</span> <span style="background-color: red; color: white; padding: 2px;">4</span> <span style="border: 1px solid black; padding: 2px;">8</span> <span style="border: 1px solid black; padding: 2px;">f0</span> <span style="border: 1px solid black; padding: 2px;">AT</span> | Run NO:8<br><span style="border: 1px solid black; padding: 2px;">1</span> <span style="border: 1px solid black; padding: 2px;">2</span> <span style="border: 1px solid black; padding: 2px;">4</span> <span style="background-color: red; color: white; padding: 2px;">8</span> <span style="border: 1px solid black; padding: 2px;">f0</span> <span style="border: 1px solid black; padding: 2px;">AT</span> | Run NO:16<br><span style="border: 1px solid black; padding: 2px;">1</span> <span style="background-color: red; color: white; padding: 2px;">2</span> <span style="background-color: red; color: white; padding: 2px;">4</span> <span style="background-color: red; color: white; padding: 2px;">8</span> <span style="border: 1px solid black; padding: 2px;">f0</span> <span style="border: 1px solid black; padding: 2px;">AT</span> |

### Programs control panel instructions for use

RUN STOP Press 3 seconds (start the program) Paragraph indicator light in the press 3 seconds (program pause) indicator blinks segments

RUN STOP Change (start the program) (program pause)

Starts Mode selection: 5 t A r t =Key STOP Start Stop  
h e y =tb Terminal RUN COM (short start. Open Stop)

Press ↓ in ← 2 seconds

Jump to the next program

Press ↩ in ESC 2 seconds

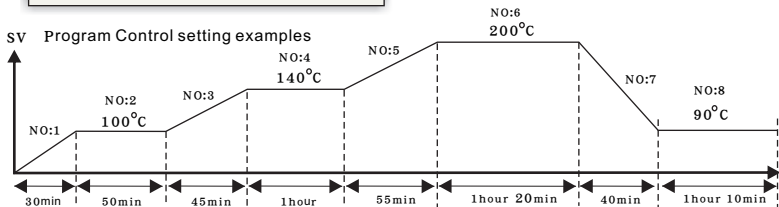
Stop and Clear procedures

Cancel the current program memory segment (PRO)

Press ↑ in ← 2 seconds

Jump to the up program

End of the program PRO lights out PV value: (Show End and current actual temperature) exchange flashing



### Program control curve (8 segments. Percentage does not limit each output)

- NO:1(1V-1=100.0 tm=00:30 out=100.0)
- NO:2(1V-2=100.0 tm=00:50 out=100.0)
- NO:3(1V-3=140.0 tm=00:45 out=100.0)
- NO:4(1V-1=140.0 tm=01:00 out=100.0)
- NO:5(1V-2=200.0 tm=00:55 out=100.0)
- NO:6(1V-3=200.0 tm=01:20 out=100.0)
- NO:7(1V-1=90.0 tm=00:40 out=100.0)
- NO:8(1V-2=90.0 tm=01:10 out=100.0)

# 11-1 User level Chapter 11 Command Parameter Description

SET Press 3 seconds (LEVEL 2) →

LOCK = 123 SET + ◀ Press 3 seconds (LEVEL 3)

## LEVEL 1

cont Input mode selection →

Analog signal input mode

rr 00  
o 00

Temperature Input Mode

TO 31 Page

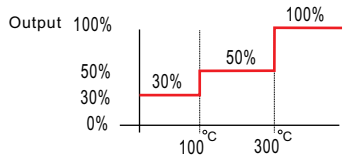
|              |   |                |
|--------------|---|----------------|
| 1000<br>2000 | PV detection value<br>SV set value  |                |
| SET          |   |                |
| At<br>no     | AT Auto-tuning<br>YES=Start NO=Stop   | Factory<br>no  |
| SET          |   |                |
| AL1<br>10    | AL1 Alarm setting<br>ALd1≠0   | Factory<br>10  |
| SET          |   |                |
| P<br>3.0     | P Output ratio<br>0.0~200.0<br>P1=0 OutON/OFF   | Factory<br>3.0 |
| SET          |   |                |
| I<br>240     | I Integration time<br>0~3700 Sec<br>I=0 Clase   | Factory<br>240 |
| SET          |   |                |
| d<br>60      | D Derivative time<br>0~900 Sec<br>D=0 Close   | Factory<br>60  |
| SET          |   |                |
| nr<br>-50.0  | Output compensation<br>-50~50   | SV=PV          |
| SET          |   |                |
|              | Output value adjustments  | OUT%           |
| SVH1<br>0    | Sv maximum setting limit<br>=0 in (Table 3) factory<br>maximum value<br>Example: setting = 150 (SV value max 150) | Factory<br>0   |
| SET          |   |                |
| SVL1<br>0    | Sv minimum setting limit<br>=0 in (Table 3) factory<br>minimum value<br>Example: setting = 10 (SV value min 10)   | Factory<br>0   |
| SET          |   |                |
| ALd1<br>11   | ALD1 Alarm mode<br>(0=Close alarm)  | Factory<br>11  |
| SET          |   |                |

|             |  |                |
|-------------|--|----------------|
| PVOF<br>0.0 | Temperature detection<br>correction<br>Setting range (-200.0~200.0)  | Factory<br>0.0 |
| SET         |  |                |
| PV+V        | PV=PV+VOF  |                |
| LPUR<br>0.0 | Detection value low<br>slope correction<br>Setting range (-100~100)  | Factory<br>0.0 |
| SET         |  |                |
| HPUR<br>0.0 | Detection value high<br>slope correction<br>Setting range (-100~100) | Factory<br>0.0 |

Multi-stage temperature range -> Output% limit function

|             |  |                |
|-------------|--|----------------|
| SV1<br>0    | NO:1 paragraph of the<br>temperature range setting<br>(0 = off function)         | Factory<br>0   |
| OUT1<br>100 | NO:1 Paragraph Temperature<br>Range Output% limit<br>Setting range (10% to 100%) | Factory<br>100 |
| SET         |  |                |
| SV2<br>0    | NO:2 paragraph of the<br>temperature range setting<br>(0 = off function)         | Factory<br>0   |
| OUT2<br>100 | NO:2 Paragraph Temperature<br>Range Output% limit<br>Setting range (10% to 100%) | Factory<br>100 |

Example:  
(SV1=100 OUT1=30)(SV2=300 OUT2=50)  
SV=1000



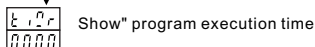
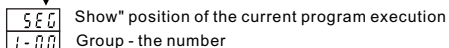
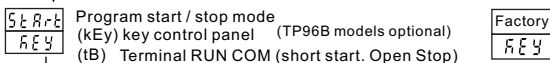
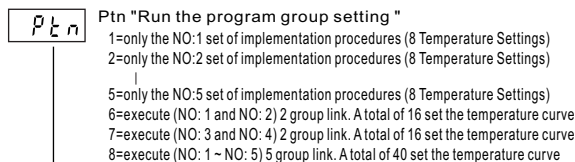
TO 31 Page

rr 00  
o 00

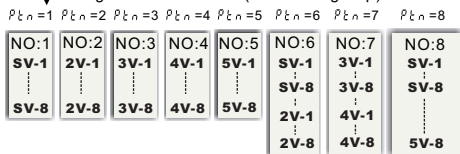
Thermostat mode TO PVOF  
Multi-segment. Program. Thermostat mode TO  
TO 28 Page

PLn → PLn Program control group selection  
=MAN > Standard Mode

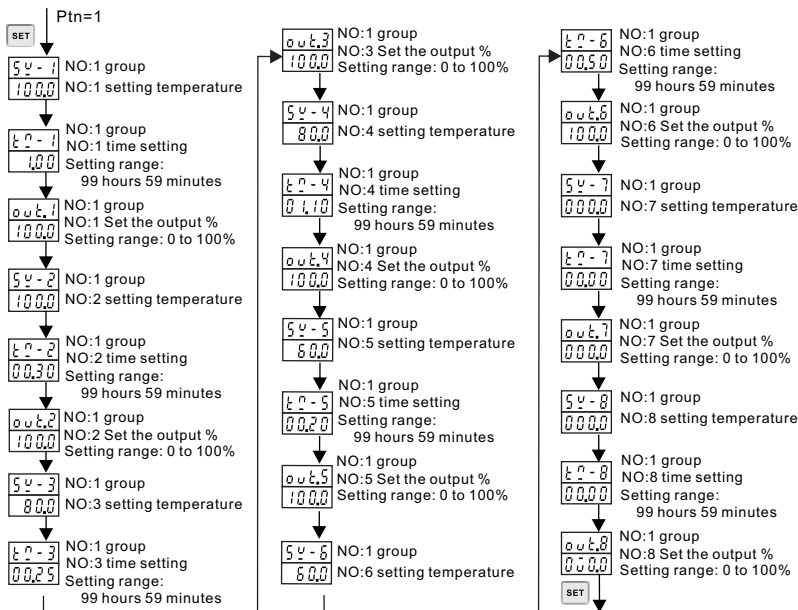
## Using examples illustrate the curve



Program control mode (execution group)

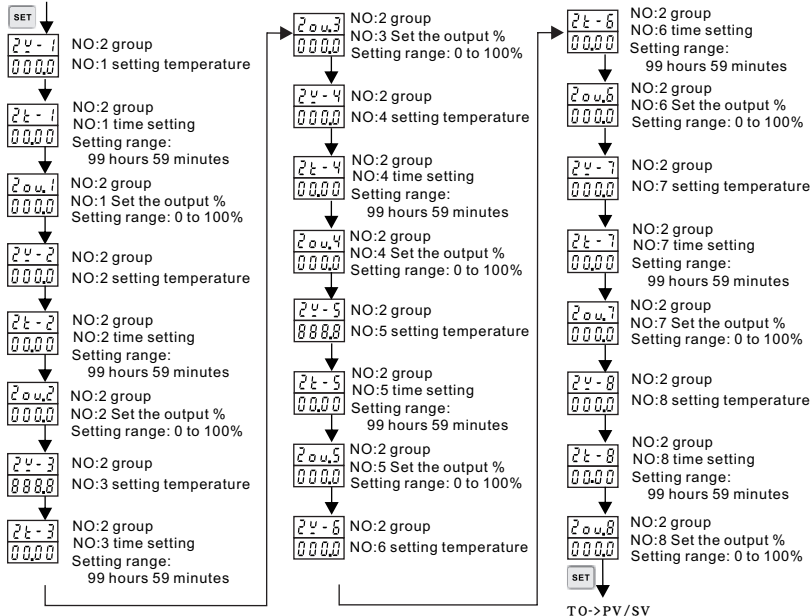


## Program temperature curve setting



## Using examples illustrate the curve

## Ptn=2 Operations Group 2 process

Ptn=3  
Operations Group 3 process

3V-1 NO:1 setting temperature  
↓  
3t-1 NO:1 time setting  
↓  
3ou.1 NO:1 Set the output %  
↓  
3V-2 NO:2 setting temperature  
↓  
3t-2 NO:2 time setting  
↓  
3ou.2 NO:2 Set the output %  
↓  
⋮  
↓  
3V-8 NO:8 setting temperature  
↓  
3t-8 NO:8 time setting  
↓  
3ou.8 NO:8 Set the output %

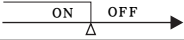
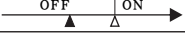







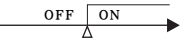
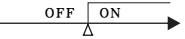
Ptn=4  
Operations Group 4 process

4V-1 NO:1 setting temperature  
↓  
4t-1 NO:1 time setting  
↓  
4ou.1 NO:1 Set the output %  
↓  
4V-2 NO:2 setting temperature  
↓  
4t-2 NO:2 time setting  
↓  
4ou.2 NO:2 Set the output %  
↓  
⋮  
↓  
4V-8 NO:8 setting temperature  
↓  
4t-8 NO:8 time setting  
↓  
4ou.8 NO:8 Set the output %

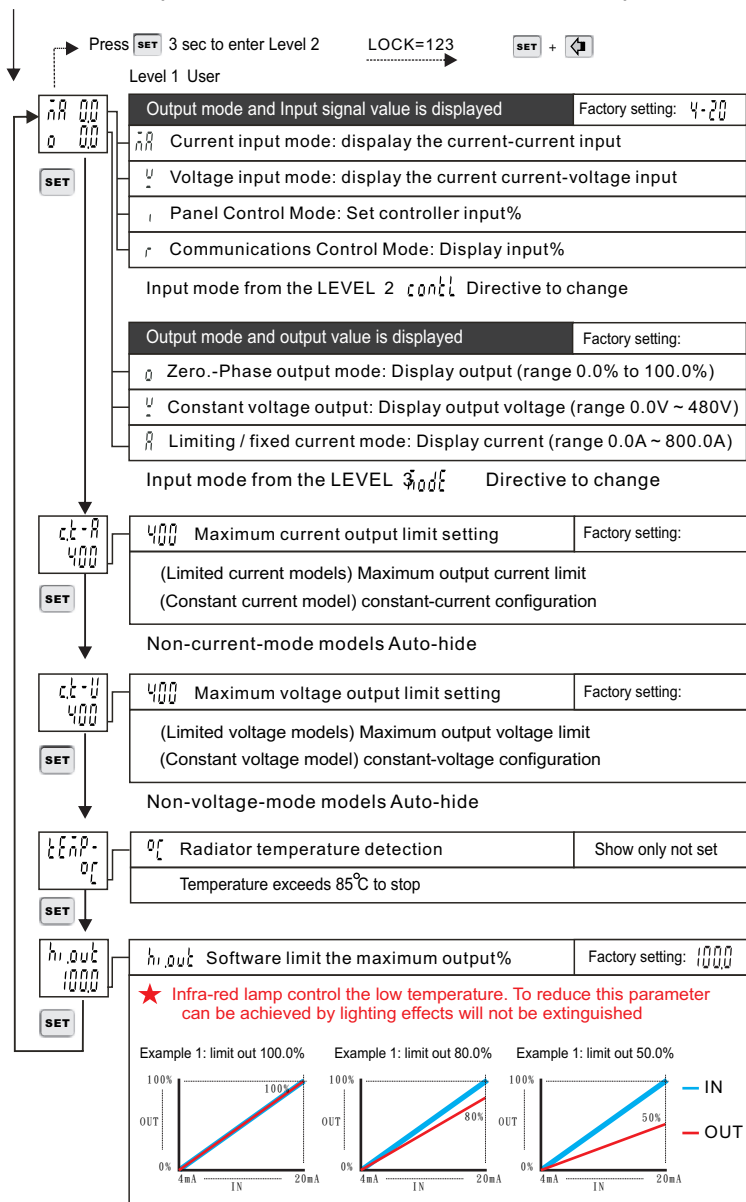
Ptn=5  
Operations Group 5 process

5V-1 NO:1 setting temperature  
↓  
5t-1 NO:1 time setting  
↓  
5ou.1 NO:1 Set the output %  
↓  
5V-2 NO:2 setting temperature  
↓  
5t-2 NO:2 time setting  
↓  
5ou.2 NO:2 Set the output %  
↓  
⋮  
↓  
5V-8 NO:8 setting temperature  
↓  
5t-8 NO:8 time setting  
↓  
5ou.8 NO:8 Set the output %

**ALD1 Table C**
**Alarm mode setting**

|           |   |           |   |
|-----------|---|-----------|---|
| <b>0</b>  | Not alarm   | <b>06</b> | Absolute low alarm<br>(The first no-alarm)<br> |
| <b>01</b> | Deviation high alarm<br>(The first no-alarm)<br>         | <b>16</b> | Absolute low alarm<br>                         |
| <b>11</b> | Deviation high alarm<br>                                 | <b>07</b> | CT-MODE Heating wire break alarm<br>Test current of less than curr. Set value output  |
| <b>02</b> | Deviation low alarm<br>(The first no-alarm)<br>          | <b>17</b> | Programmable alarm start in   |
| <b>12</b> | Deviation low alarm<br>                                  | <b>18</b> | Programmable pause in the alarm   |
| <b>03</b> | Deviation high and low alarm<br>(The first no-alarm)<br> | <b>19</b> | NO: 1 alarm output end  |
| <b>13</b> | Deviation high and low alarm<br>                         | <b>20</b> | NO: 2 alarm output end  |
| <b>04</b> | Zone Alarm<br>   | <b>21</b> | NO: 3 alarm output end  |
| <b>05</b> | Absolute high alarm<br>(The first no-alarm)<br>        | <b>22</b> | NO: 4 alarm output end  |
| <b>15</b> | Absolute high alarm<br>                                | <b>23</b> | NO: 5 alarm output end  |
|           |   | <b>24</b> | End of program alarm output   |

## 11-1 Chapter 11 Command Parameter Description





## 11-2 The eleventh chapter command parameters

LEVEL2 **SET** And 3 seconds into the Level

| Input mode selection (software change) |   | Factory setting: 4-20 |
|--|---|-----------------------|
| KEY                                    | Manual mode by the keyboard control output% | IN Show   i           |
| slp                                    | Standby                                     | IN Show   -           |
| 0-20                                   | 0~20mA current input mode                   | IN Show   0           |
| 4-20                                   | 4~20mA current input mode                   | IN Show   20          |
| 0-5V                                   | 0~5V voltage input mode                     | IN Show   U           |
| 1-5V                                   | 1~5V voltage input mode                     |                       |
| 0-10V                                  | 0~10V voltage input mode                    |                       |
| 2-10V                                  | 2~10V voltage input mode                    |                       |
| rS485                                  | Rs485 Communications Control Mode           | IN Show   r           |

(Temp built-in temperature control T models)

| Model                | Test temperature range       | Model                        | Test temperature range |
|----------------------|------------------------------|------------------------------|------------------------|
| K                    | K1 0.0~200.0 C (392.0 F)     | K2 0.0~400.0 C (725.0 F)     |                        |
|                      | K3 0~600 C (1112 F)          | K4 0~800 C (1472 F)          |                        |
|                      | K5 0~1000 C (1832 F)         | K6 0~1200 C (2192 F)         |                        |
|                      | J1 0.0~200.0 C (392.0 F)     | J2 0.0~400.0 C (725.0 F)     |                        |
|                      | J4 0~600 C (1112 F)          | J4 0~800 C (1472 F)          |                        |
| J                    | J5 0~1000 C (1832 F)         | J6 0~1200 C (2192 F)         |                        |
|                      | R1 0~1600 C (2912 F)         | R2 0~1769 C (3216 F)         |                        |
|                      | S1 0~1669 C (2912 F)         | S2 0~1769 C (3216 F)         |                        |
|                      | T1 -199.9~400.0 C (999.9 F)  | T2 -199.9~200.0 C (999.9 F)  |                        |
|                      | B B 0~1800 C (3300 F)        |                              |                        |
| E E 0~900 C (1472 F) |                              |                              |                        |
| RTD                  | PT1 -199.9~200.0 C (392.0 F) | PT2 -199.9~400.0 C (725.0 F) |                        |
|                      | PT3 -199.9~600.0 C (999.9 F) | PT4 0~200 C (392 F)          |                        |
|                      | PT5 0~400 C (725 F)          | PT6 0~600 C (1112 F)         |                        |
|                      |                              |                              |                        |

**5.0** Soft start time  
**SET**

|   |                     |  |
|---|---------------------|--|
| <b>5.0</b> Soft start time<br>Setting range 0 ~ 199 seconds | Example: time=5<br> | Factory setting: 50<br>--- Input %<br>——— Output % |
|---|---------------------|--|

**0.0** Soft stop time  
**SET**

|   |                     |  |
|---|---------------------|--|
| <b>0.0</b> Soft stop time<br>Setting range 0 ~ 30 seconds | Example: time=5<br> | Factory setting: 00<br>--- Input %<br>——— Output % |
|---|---------------------|--|

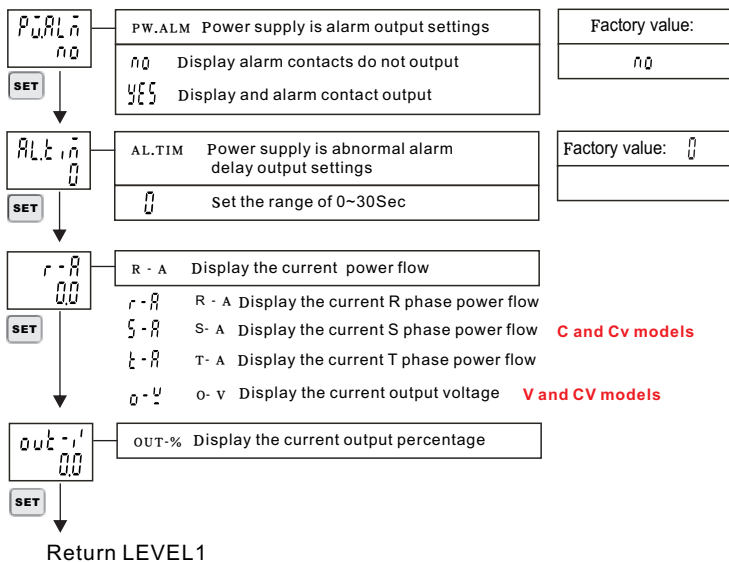
**1.0** Reaction time setting range 0 ~ 10.0  
**SET**

|  |                     |
|--|---------------------|
| <b>1.0</b> Reaction time setting range 0 ~ 10.0<br>(Analog input average) number of the more stable the larger the input | Factory setting: 30 |
|--|---------------------|

↓ The next

## 11-1 Chapter 11 Command Parameter Description

Continued



## 11-2 Chapter 11 Command Parameter Description

Continued LEVEL2 LOCK=123 SET + [ ] And 3 seconds into the Level

|               |  |                        |
|---------------|--|------------------------|
| anPEr<br>300  | anPEr Zero correction (minimum output adjustment)<br>(transformer / inductive load must be greater than 500~1200)<br>(general phase output (300~1000) zero output mode 900~1500) | Factory setting: 300   |
| SET           |  |                        |
| Locn<br>00000 | Locn Password protected settings (class locking)<br>(reboot automatically the password reset)  | Factory setting: 00000 |

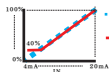



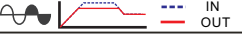


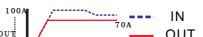

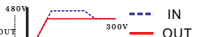
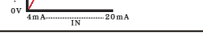
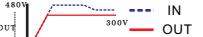

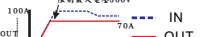
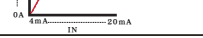
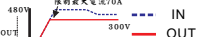







|   |  |                     |
|---|--|---------------------|
| CT C AT CV Mode : Load disconnection detection function set                                 |  |                     |
| RoYEr<br>n0   | RoYEr (AT models can be used)<br>= no (function is cancelled) = Yes (function. Start)  | Factory setting: n0 |
| Load break detection set (the load current is less than 85% the following warning example): |  |                     |
| CurrE<br>1  | CurrE Maximum load (rated) current setting<br>Example: the three-phase load voltage of 20Kw. 380V<br>Value: $(20000/380) / \sqrt{3} = 30.3$ (An Pei) The CurrE value is set as: 30.3<br>CurrE=0 cancels this function  | Factory setting: 1  |
| ErrSc<br>85   | ErrSc The current error% set<br>Current (actual) detection value. And current setting percentage.<br>Set the load break detection (random detection output in 50%~100%)<br>Example: 20Kw. load voltage 380V 3 phase calculation: $(20000/380) / \sqrt{3} = 30.3$<br>1 phase calculation: $(20000/380) = 52.7$<br>Curre value 3 Phase=30.3 Curre value 1 Phase=52.7 The ErrSc value is set as: 85 | Factory setting: 85 |
| LoErr<br>n0   | Lo.ERR Load break stop output settings<br>n0 Continue to output YCC Stop output  | Factory setting: n0 |
| oPEni'<br>30  | Open% Output over (set%) above the start function<br>30 (Range 10~50)  | Factory setting: 30 |

|   |   |                    |
|---|---|--------------------|
| CT C AT CV Mode : load short-circuit detection set (random detection output 0%~100%)<br>current control type to take effect   |   |                    |
| PERcE<br>0  | PERcE Output load% set<br>0 Set the range of 0.0~100.0%<br>(set 0 function is cancelled)            | Factory setting: 0 |
| ANPEr<br>0  | AMPER Output load current setting<br>0 Set the range of 0.0~800.0A<br>(set 0 function is cancelled) | Factory setting: 0 |
| PERcE ANPEr Function set an example as follows: any parameter =0 cancel function<br>PERcE Set to 10 ANPEr Set to 30 <b>Interface display (Error OC)</b><br>(the controller output 10%). Current is more than 30A. |   |                    |
| <ul style="list-style-type: none"> <li>Please calculate the load current and the set points. Otherwise the controller may not work properly</li> </ul>  |   |                    |

Return LEVEL2

# 11-3 Chapter 11 Command Parameter Description

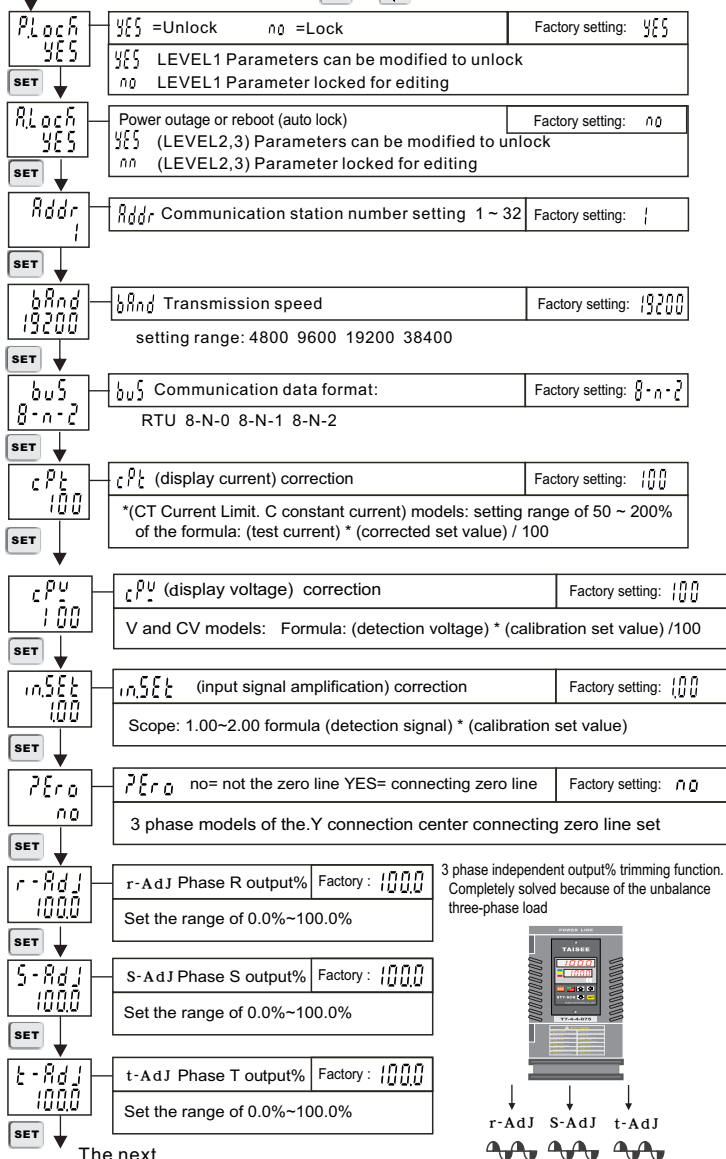
LEVEL3 LOCK=123 SET + [Left Arrow] 3 seconds into the Level 3 class 3

|                  |   |   |                             |
|------------------|---|---|-----------------------------|
| L.o.u.t<br>00    | L.o.u.t Set the minimum output range<br>Example: 40%.set the minimum output         |    | Factory setting: 00         |
| SET              |   |   |                             |
| mode<br>PHASE    | Select the output mode  |   |                             |
| SET              |   |   |                             |
| PHASE            | Phase output .waveform output   |    | OUT显示<br>0                  |
| PERO             | Zero output .waveform output  |    |                             |
| PPERO            | Phase start zero output waveform  |    |                             |
| PCURR            | Zero output current limit   |    |                             |
| b.curr           | Limiting current output control   |    | Mode<br>C<br>CT<br>AT<br>CV |
| b.Curr           |    |   |                             |
| R.curr           | Constant current output   |    |                             |
| A.Curr           |    |   |                             |
| b.volt           | Output voltage limit  |    | V<br>CV                     |
| b.volt           | Limit the max output voltage  |    |                             |
| R.volt           | Constant voltage output   |    |                             |
| A.volt           |    |   |                             |
| c.curr           | Limited voltage   |    | CV                          |
| C.Curr           | Constant current  |    |                             |
| c.volt           | Constant voltage  |    |                             |
| C.VOLT           | Limited current   |   |                             |
| b.cV             | Limited voltage   |  | C<br>CT<br>AT<br>CV         |
| b.CV             | Limited current   |  |                             |
| b-KW             | Limited Kw output control   |  |                             |
| b-KW             |  |   |                             |
| R-KW             | Constant Kw output control  |  | f                           |
| A-KW             |  |   |                             |
| V.o.l.t.A<br>380 | The main power supply voltage setting   | 380   |                             |
| SET              | Output mode = (Kw only)   |   |                             |
| The next         |   |   |                             |

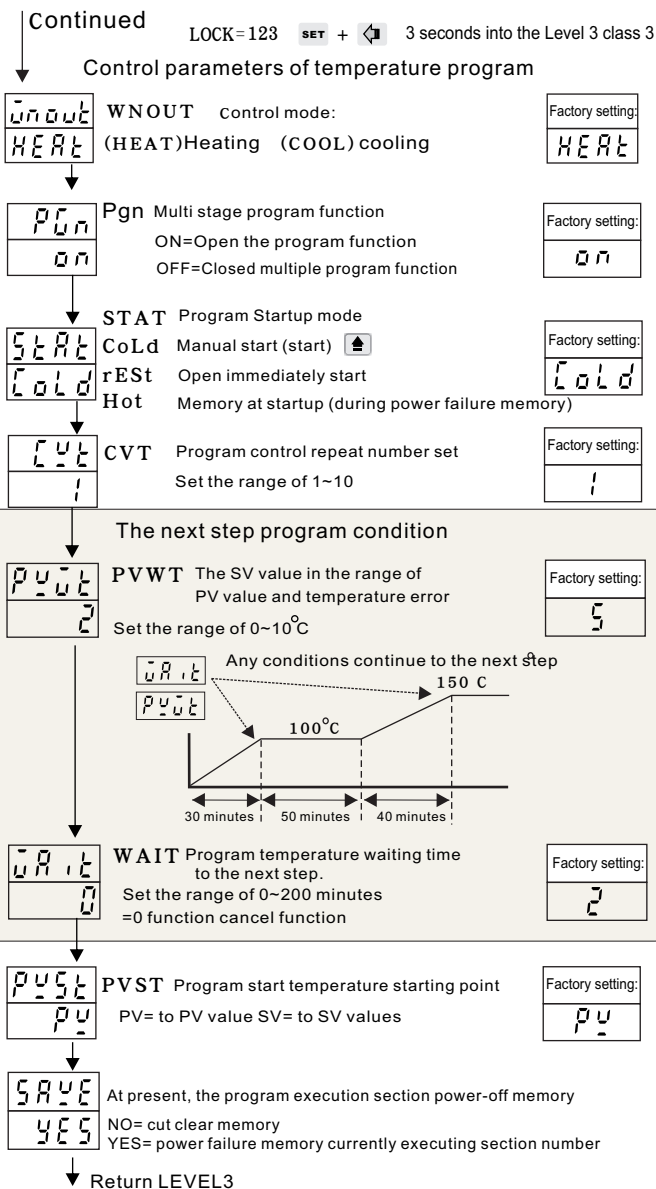
## 11-3 Chapter 11 Command Parameter Description

Continued

LOCK=123 [SET] + [←] 3 seconds into the Level 3 class 3



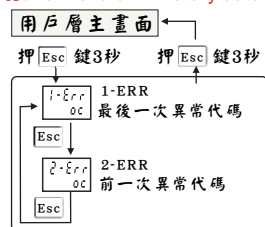
### 11-3 The 11 chapter temperature control command parameters



## Chapter 12: Alarm Descriptions and treatment methods

| Abnormal display | Cause of the malfunction                          | Approach and improvement |   |
|------------------|---|--------------------------|---|
| ERROR R-OL       | R-phase load current exception Error ALP setting  | AT models feature        | Check the R-phase load hot wire. Whether the abnormal current caused by burning   |
| ERROR S-OL       | S-phase load current exception Error ALP setting  | AT models feature        | Check the S-phase load hot wire. Whether the abnormal current caused by burning   |
| ERROR T-OL       | T-phase load current exception Error ALP setting  | AT models feature        | Check the T-phase load hot wire. Whether the abnormal current caused by burning   |
| ERROR POWER      | No main power                                     |                          | 1. Check the RST three-phase power supply is normal<br>2. Check whether the burning fuse within SCR   |
| ERROR R-PH       | Main power. R-phase NO power                      |                          | 1. Check whether the lack of R-phase power phase<br>2. Check the internal R-phase SCR whether the burning fuse  |
| ERROR S-PH       | Main power. S-phase NO power                      |                          | 1. Check whether the lack of S-phase power phase<br>2. Check the internal R-phase SCR whether the burning fuse  |
| ERROR T-PH       | Main power. T-phase NO power                      |                          | 1. Check whether the lack of T-phase power phase<br>2. Check the internal R-phase SCR whether the burning fuse  |
| ERROR TEMP       | Radiator overheating                              |                          | 1. Pressure  Check SCR internal working temperature be greater than 85°C, when when over 85°C to stop the output when the SCR 2. Pressure   Test fans |
| ERROR OE         | Load ground (leakage)                             | AT models feature        | 1. The load has to touch Case<br>2. Check whether there is ground heating wire inside the phenomenon of   |
| ERROR OL         | (Can not turn off) SCR internal fault             | AT models feature        | 1. Non-full-wave control models. Load caused by the zero line then<br>2. Check whether there are short-circuit SCR phenomenon of internal modules     |
| ERROR LOAD       | (Load disconnected) or the load is less than 0.6A | AT models feature        | 1. The output load is not received 2. Check the SCR output load is normal   |
| ERROR OC         | (Over current) Load Overload                      | AT models feature        | 1. Load KW number is greater than the amount of SCR Amp<br>2. Check whether the SCR output load short-circuit phenomenon                              |
| IN 1 E           | 溫度訊號錯誤  |                          | IN 1 E 輸入訊號錯誤(開路,極性反接)  |
| UUU 1            | 溫度訊號過高  |                          | UUU 1 輸入訊號(大於USPL) 無感溫線,或是型號不符  |
| NNN 1            | 溫度訊號過低  |                          | NNN 1 輸入訊號(小於LSPL) 感溫線 + - 極性接錯   |

## Abnormal alarm history data query

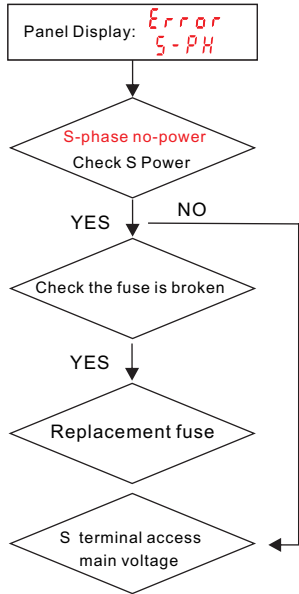
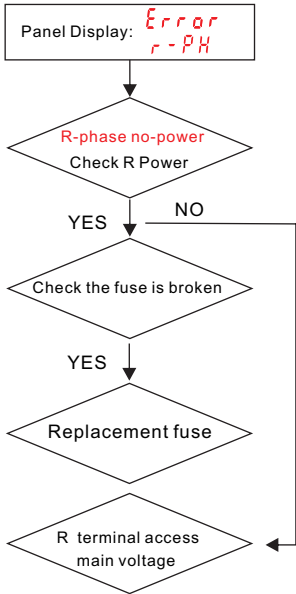
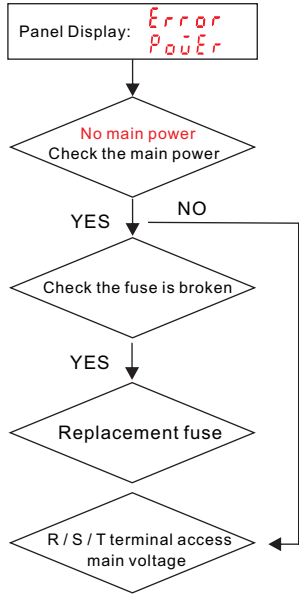
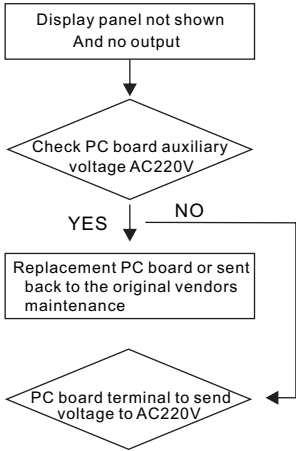


清除異常記憶代碼

押 [Esc] + 鍵3秒清除記憶

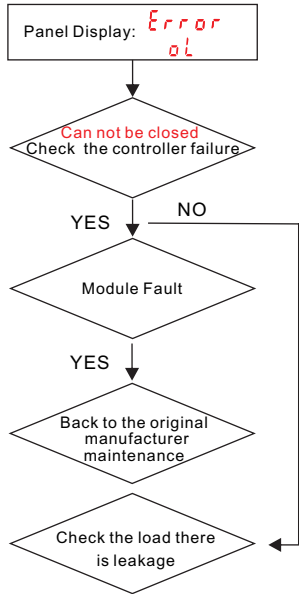
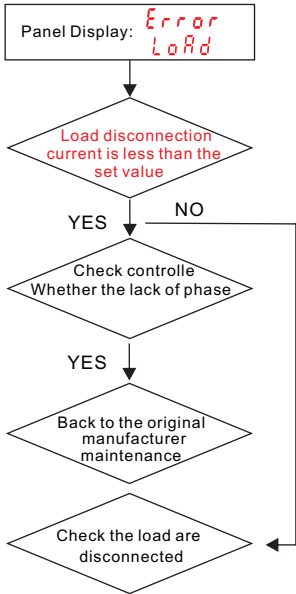
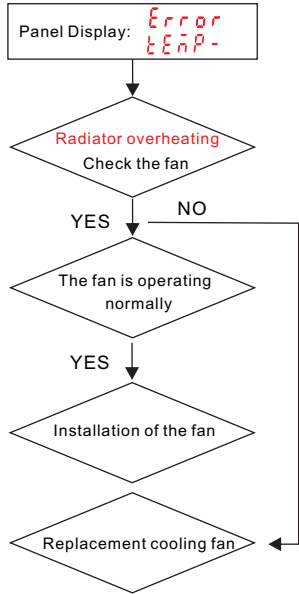
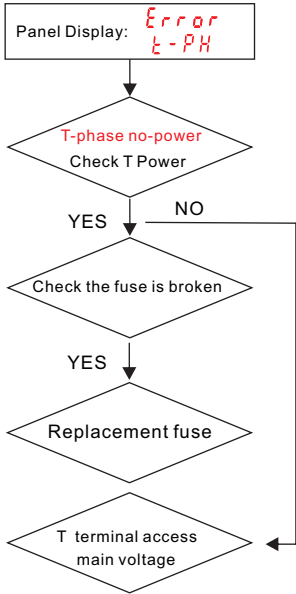
● 電源異常不在記憶代碼範圍

12-2





12-3



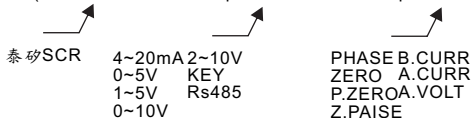
## Chapter 13: Load Test

### 1. PC board auxiliary voltage

- T6-SCR auxiliary voltage range AC200 ~ 240V (input terminal ~ 220 ~ 220)

### 2. SCR type scanning

- Boot scan (show TAISEE SC -> Input = 4 ~ 20mA->Output = PHASE



### 3. Load test

- Load U / V / W terminal to take the load. For example, hot wire and other bulbs. Failure to take direct measurements of the load. There will be induced voltage generated
- Testing methods 1: To +10 V with the IN + terminal short-circuit. COM Short E3 E2 E1 and RUN then 10K potentiometer. Output from 0 to 100.0% for change (lamp shade a smooth change in brightness.-Phase output models) (light bulb flashes change. Zero-bit output models) the load must be 60W light bulb above (input mode setting: 0 ~ 10V) to potentiometer clockwise rotation. 0.0V ~ 10.0V input display changes. output shows 0.0 ~ 100.0% change
- Testing methods 2. Keyboard directly to set the output: the input mode is set manually to adjust the output% KEY

#### Setting



(Manual)  
Start/Stop



Add / Up  
(Numeric / function) changes



Decrease / down



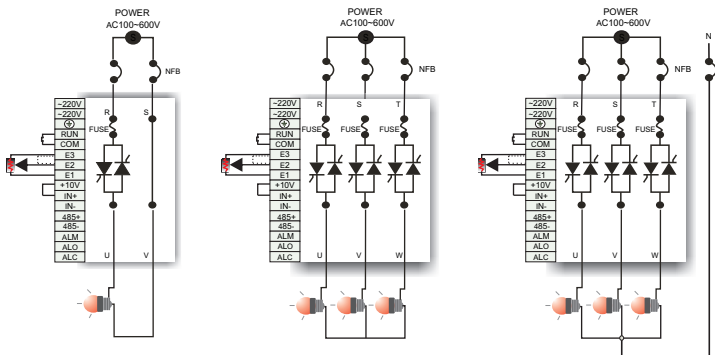
Modify the  
movement keys



Enter key



LED instructed light   ● RUN light starts   ● ERR light alarm   ● STOP light stop

(Phase output models) smooth changes in light bulb brightness of light and shade  
(Zero-bit output models) changes in the output light bulb flashes.



## 14-1 Chapter 14: Communications

## Data Address:

| Definition  | Parameter Address | R / W | Function Description                           |                              |  |
|---|-------------------|-------|--|------------------------------|--|
| Output value  | 000H              | R/W   | Output 0~100%                                  |                              |  |
| Current limit   | 001H              | R/W   | limit-Current type                             |                              |  |
| Current Setting<br>Voltage Setting                    | 002H              | R/W   | Constant-current type<br>Constant-voltage type |                              |  |
| Output ON / OFF                                       | 003H              | R/W   | Output ON / OFF status                         |                              |  |
| The above control method must be a way to write Rs485 |                   |       | Bit0   | 0=Start 1=Stop               |  |
|   |                   |       | Bit1~15  |                              |  |
| Max output %  | 004H              | R     | Maximum output adjustment                      |                              |  |
| Min Output %  | 005H              | R     | Minimum output adjustment                      |                              |  |
| Soft time up  | 006H              | R     | Slow increase in output                        |                              |  |
| Soft time down  | 007H              | R     | Slowly reduce the output                       |                              |  |
| Signal reaction                                       | 008H              | R     | Signal averaged over a sampling                |                              |  |
| Input mode  | 009H              | R     | 01H  | KEY                          | Key   control output |
|   |                   |       | 02H  | DIP                          |  |
|   |                   |       | 03H  | 0~20mA                       | Analog signal control output   |
|   |                   |       | 04H  | 4~20mA                       | Analog signal control output   |
|   |                   |       | 05H  | 0~5V                         | Analog signal control output   |
|   |                   |       | 06H  | 1~5V                         | Analog signal control output   |
|   |                   |       | 07H  | 0~10V                        | Analog signal control output   |
|   |                   |       | 08H  | 2~10V                        | Analog signal control output   |
|   |                   |       | 09H  | Rs485                        | Communication control  |
|   |                   |       | Input values                                   | 00AH                         | R  |
| Output values   | 00BH              | R     | Output%  |                              |  |
| Temperature   | 00CH              | R     | Radiator Temperature                           |                              |  |
| Exception Alarm                                       | 00DH              | R     | Bit0   | 1=no main power 0=Normal     |  |
|   |                   |       | Bit1   | 1=R-phase no power 0=Normal  |  |
|   |                   |       | Bit2   | 1=S-phase no power 0=Normal  |  |
|   |                   |       | Bit3   | 1=T-phase no power 0=Normal  |  |
|   |                   |       | Bit4   | 1=over-Temperature 0=Normal  |  |
|   |                   |       | Bit5   | 1=Temperature fault 0=Normal |  |
|   |                   |       | Bit6   | 1=over-current 0=Normal      |  |
|   |                   |       | Bit7   | 1=Load Break 0=Normal        |  |
|   |                   |       | Bit8   | 1=load short 0=Normal        |  |
|   |                   |       | Bit9~15  |                              |  |
| Output (A, V)   | 00EH              | R     | Output (voltage, Current) value                |                              |  |

## 14-1 The 14 chapter communication protocol

## Data address

| Defined         | address | Read<br>Write | Function description     |              |
|-----------------|---------|---------------|--------------------------|--------------|
| Phase R current | 014H    | R             | A phase R output current | CT/C/AT Mode |
| Phase S current | 015H    | R             | A phase S output current |              |
| Phase T current | 016H    | R             | A phase T output current |              |

## Temperature control function parameters

| Defined | address | Read<br>Write | Function description                     |
|---------|---------|---------------|--|
| Pv      | 023H    | R             | The temperature detection value          |
| Sv      | 024H    | R/W           | Temperature setting value                |
| OUT     | 025H    | R/W           | Output %                                 |
| AT      | 026H    | R/W           | Auto tuning Bit0 =1 Start =0 Stop        |
| AL1     | 027H    | R/W           | The alarm value setting                  |
| P       | 028H    | R/W           | Output proportional band                 |
| I       | 029H    | R/W           | The integral time                        |
| D       | 02AH    | R/W           | The Differential time                    |
| ATVL    | 02BH    | R/W           | Auto tuning offset value                 |
| SVHI    | 02DH    | R/W           | The SV value maximum setting value limit |
| ALd1    | 02EH    | R/W           | Alarm function mode                      |

|     |   |     |   |
|-----|---|-----|---|
| 01H | Deviation high alarm ( first time not alarm)            | 07H | Zone alarm                                      |
| 02H | Deviation high alarm                                    | 08H | The absolute high alarm ( first time not alarm) |
| 03H | Deviation low alarm ( first time not alarm)             | 09H | The absolute high alarm                         |
| 04H | Deviation low alarm                                     | 10H | The absolute low alarm ( first time not alarm)  |
| 05H | Deviation high and low alarm<br>( first time not alarm) | 11H | The absolute low alarm                          |
| 06H | Deviation high and low alarm                            | 00H | Not alarm                                       |

|       |  |     |   |          |
|-------|--|-----|---|----------|
| PVOF  | 02CH   | R/W | Detection error correction                  |          |
| L.PVR | 02FH   | R/W | Detection of low slope correction value     |          |
| H.PVR | 030H   | R/W | Detection of hi high slope correction value |          |
| ERROR | 031H   | R   | Temperature function abnormality alarm      |          |
| nnll  | The temperature sensing signal<br>error (open. Reverse polarity) |     | Bit0  | =1 Error |
| uuul  | Lower than the temperature sensing type low                      |     | Bit1  | =1 Error |
| nnnl  | higher than the temperature sensing type high                    |     | Bit2  | =1 Error |

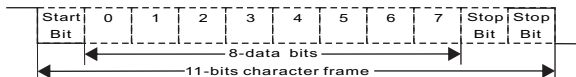
14-2

Modbus Format and means of communication

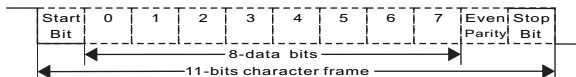
Communication mode: Rs485 Communication speed: 4800/9600/19200/38400 bps

Communications format: (11-bit characters) Character structure: (8-bit data)

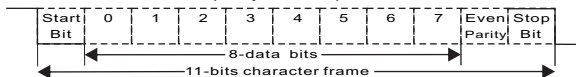
<8: N: 2:> 8-bit data, a single parity bit, 2 stop bit.



<8: E: 1:> 8-bit data, a single parity bit, 1 stop bit.



<8: 0: 1:> 8-bit data, double-parity bit, 1 stop bit.



Communications data structure:

|              |   |
|--------------|---|
| Start        | Still time for more than 10ms                 |
| ADR          | Address :8-bit address                        |
| CMD          | Instruction: 8-bit address                    |
| DATA (n-1)   | Data content                                  |
| .....        | n X 8-bit data, n<=25                         |
| DATA0        |   |
| CRC CHK Low  | CRC error detection code                      |
| CRC CHK High | 16-bit detection code by (2 8-bit) characters |
| END          |   |

Read Format: reading is output 0BH

RTU command message

|   |               |     |     |
|---|---------------|-----|-----|
| 0 | ADR           |     | 01H |
| 1 | CMD           |     | 03H |
| 2 |               | MSB | 00H |
| 3 | Data Address  | LSB | 0BH |
| 4 | Data length   | MSB | 00H |
| 5 | WORD          | LSB | 01H |
| 6 |               | LSB | F5H |
| 7 | CRC checksums | MSB | C8H |

RTU to respond to messages

|   |               |     |     |
|---|---------------|-----|-----|
| 0 | ADR           |     | 01H |
| 1 | CMD           |     | 03H |
|   | Data Length   |     |     |
| 2 | byte          | LSB | 02H |
| 3 | Add Content   | MSB | 03H |
| 4 |               | LSB | E8H |
| 5 |               | LSB | E4H |
| 6 | CRC checksums | MSB | B4H |

Write Format: write controller input and output volume. 00H

RTU command message

|   |               |     |     |
|---|---------------|-----|-----|
| 0 | ADR           |     | 01H |
| 1 | CMD           |     | 06H |
| 2 |               | MSB | 00H |
| 3 | Data Address  | LSB | 00H |
| 4 |               | MSB | 02H |
| 5 | Data content  | LSB | BCH |
| 6 |               | LSB | 89H |
| 7 | CRC checksums | MSB | 1BH |

RTU to respond to messages

|   |               |     |     |
|---|---------------|-----|-----|
| 0 | ADR           |     | 01H |
| 1 | CMD           |     | 06H |
| 2 |               | MSB | 00H |
| 3 | Data Address  | LSB | 00H |
| 4 |               | MSB | 02H |
| 5 | Data length   | LSB | BCH |
| 6 |               | LSB | 89H |
| 7 | CRC checksums | MSB | 1BH |

## 14-3

## CRC checksums

## CRC checksums

RTU mode with CRC (Cyclical Redundancy Check) error detection,  
CRC debug calculated by the following steps:

Step 1: Load a content FFFFH of the 16-bit register  
(called CRC send register)

Step 2: The first byte instruction message and send 16-BIT CRC registers  
low yuan to Exclusive OR operation, and the results stored back  
in CRC register

Step 3: The CRC register content to the right 1bit, populate the left-most 0  
check the CRC registers the lowest value of

Step 4: If the CRC registers the lowest value of 0, then repeat step 3;  
otherwise CRC register A001H for Exclusive Or operation

Step 5: repeat Step 3 and Step 4; until the CRC register contents have  
been shifted to the left of the 8-bit, the byte has completed  
processing

Step 6: The one-byte instruction messages can repeat steps 2 through 5;  
until all bytes of all the processing is completed. CRC register is  
the CRC value of the contents of that, passing instruction must  
be high or low byte CRC exchange order, which is a low-bytes  
of the first to be transmitted

Calculated CRC value Example: (using the C language of the CRC  
calculation example)

Namely, the function requires two parameters:

Unsigned char \* data; the pointer to point to the message buffer

Unsigned char lenght; the number of bytes in the message buffer

The function will return Unsigned integer; types of CRC values

Unsigned integer CRC\_check(unsigned char\* data,unsigned char lenght)

```

{
  Int x;
  Unsigned int reg_crc=0XFFFF
  While(lenght--)
  {
    reg_crc^=*data++;
    fox(x=0;<8;x++)
    {
      If(reg_crc&0x01) //LSB(b0)=1
      {reg_crc=(reg_crc>>1)^0xa001;}
      else
      {reg_crc=reg_crc>>1; }
    }
  }
  return reg_crc;
}

```

## Communications Test Program

PC communications program example: (The following is a simple simple communications program, PC with SCR communication with C language example)

Modbus RTU communication of program

```
#include<stdio.h>
#include<dos.h>
#include<conio.h>
#include<process.h>
#define THR 0X0000
#define RDR 0X0000
#define BRDL 0X0000
#define IER 0X0001
#define BRDH 0X0001
#define LCR 0X0003
#define MCR 0X0004
#define LSR 0X0005
#define MSR 0X0006
Unsigned read_data[100];
Unsigned read_data[10]={0x01,0x03,0x00,0x0B,0x00,0x01,0xF5,0xC8};
{
    int i;
    Outputb(PORT+MCR,0x08);/*interrupt enable */
    Outputb(PORT+IER,0x01);/*interrupt as data in */
    Outputb(PORT+LCR,(inportb(PORT+LCR))0x80));
        /* the Baudrata can be access as LCR.B7==1 */
    Outputb(PORT+BRDL,12);/*set baudrate =9600, 12=115200/9600*/
    Outputb(PORT+BRDH,0x00);
    Outputb(PORT+LCR,0x07);/*<8,N,2>=0x07,<8,E,1>=0x1B,<8,0,1>=0x0B*/
    for(i=0;i<8;i++)
    {
        While(!inportb(PORT+LSR)&0x20);/*wait until THR empty*/
        Outputb(PORT+THR,send_data[i]); /*send data to THR*/
    }
    i=0
    While(!kbhit())
    {
        If(inportb(PORT+LSR)&0x01) /*b0==1,read data ready*/
        {
            read_data[i++]=inportb(PORT+RDR);read data form RDR*/
        }
    }
}
```

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