

# Power Regulator Use Manual

# TAISEE

電力調整器  
使用說明書



## ST6 T6-SCR

**AC180~480V Class**

1Ø 28A~800A

3Ø 28A~800A



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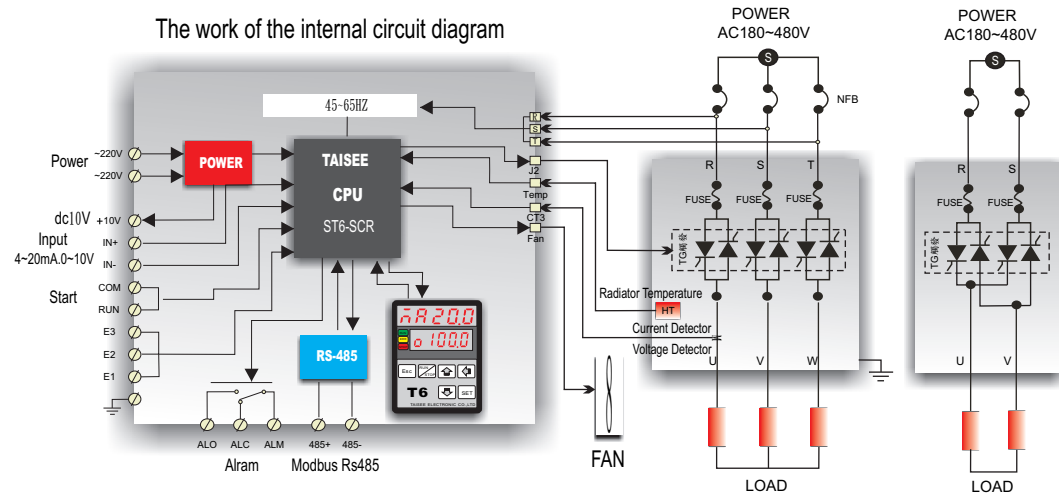
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## Chapter 1: Introduction

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

## Chapter 2: Model Specification

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

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

Mode	Type	Main power	Current	Output mode	Modbus
* ST6	1 * 1-phase phase	2 AC100~200V	028 28A	Z Zero Cycle Control	R RS485
	2 3-phase zero Cycle Control	4 AC220~480V	030 30A	ZP Phase Control	
T6	4 3-phase phase Half-wave	D2 DC100~200V	040 40A	CT Current Limit	
		D4 DC220~480V	050 50A	C Constant current	
	5 * 3-phase phase All-wave		060 60A	V Constant voltage	
			075 75A	AT Detection type	
			080 80A	CD DC output	
			100 100A		
			125 125A		
			150 150A		
			175 175A		
			200 200A		
			225 225A		
			250 250A		
			300 300A		
			400 400A		
			500 500A		
			800 800A		

\* Output mode (cycle / phase-shift) Change settings

ST6 CURRENT--28A~60A  
 ST6-X-X-030-X-X  
 ST6-X-X-040-X-X  
 ST6-X-X-050-X-X  
 ST6-X-X-060-X-X

Load types and characteristics of

- Z Zero-cycle power regulator. For resistance heating wire
- ZP Phase-shift control: application of resistance heating wire far-infrared. Inductive loads. Transformer Load
- CT Automatically limit the current. Silicon carbide load. Graphite load
- C Loads have changed. Automatic constant output current
- V Voltage. Load voltage has changed. Automatic constant output voltage
- AT Random error of the load current detection: load ground (leakage) detection capabilities
- CD DC output

### 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			

## Chapter 3 :Installation Notes

### Storage Precautions

Power Regulator products must be placed in the box prior to installation within. If the machine is temporarily not used. In order to enable the products to meet the scope of the company's warranty and future maintenance. Save important to note

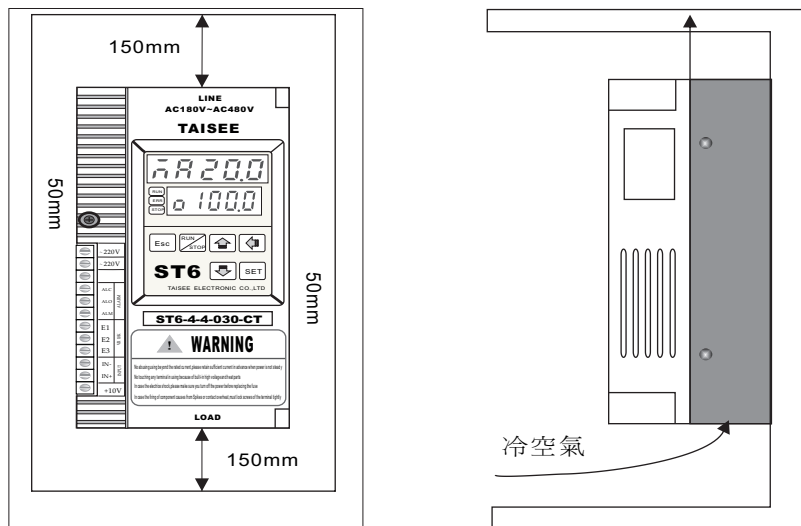
The following matters:

- ★ 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  $0\% \sim 95\%$  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

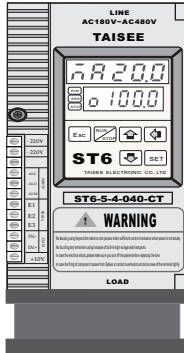


### Installation Environment

- ▲ 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

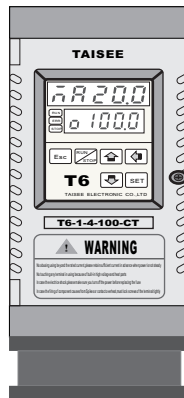
## Chapter 4: appearance and installation dimension

### Compact type (single-phase 28A ~ 60A / three-phase 28A ~ 40A) ST6 Series



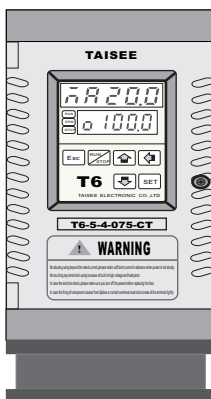
	Mode:	Appearance Dimension(mm)	Installation dimensions
1 ∅	ST6-1-4-028	L=180 W=110 D=110	L=95 W=105
	ST6-1-4-030	L=180 W=110 D=110	L=95 W=105
	ST6-1-4-040	L=180 W=110 D=110	L=95 W=105
	ST6-1-4-050	L=180 W=110 D=110	L=95 W=105
	ST6-1-4-060	L=180 W=110 D=110	L=95 W=105
3 ∅	ST6-4-4-030	L=180 W=110 D=120	L=95 W=105
	ST6-4-4-040	L=180 W=110 D=150	L=95 W=105

### Functional type (single-phase 50A ~ 175A) T6 Series



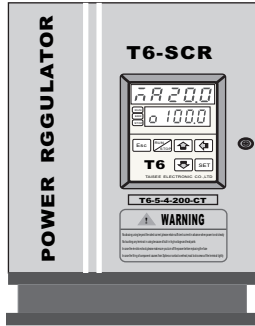
	Mode:	Appearance Dimension(mm)	Installation dimensions
1 ∅	T6-1-4-050	L=210 W=110 D=183	L=170 W=105
	T6-1-4-060	L=210 W=110 D=183	L=170 W=105
	T6-1-4-075	L=210 W=110 D=183	L=170 W=105
	T6-1-4-080	L=210 W=110 D=183	L=170 W=105
	T6-1-4-100	L=240 W=110 D=183	L=170 W=105
	T6-1-4-125	L=240 W=110 D=183	L=170 W=105
	T6-1-4-150	L=240 W=110 D=183	L=170 W=105
	T6-1-4-175	L=240 W=110 D=183	L=170 W=105

### Functional type (single-phase 225A ~ 300A / three-phase 50A ~ 175A) T6 Series



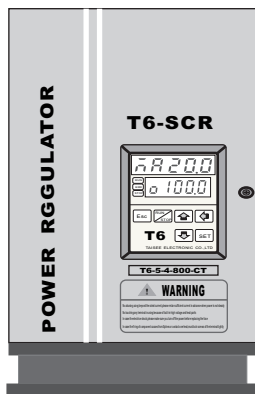
	Mode:	Appearance Dimension(mm)	Installation dimensions
1 ∅	T6-1-4-225	L=250 W=145 D=205	L=170 W=135
	T6-1-4-250	L=300 W=145 D=205	L=170 W=135
	T6-1-4-300	L=300 W=145 D=205	L=170 W=135
3 ∅	T6-4-4-050	L=250 W=145 D=205	L=170 W=135
	T6-4-4-060	L=250 W=145 D=205	L=170 W=135
	T6-4-4-075	L=250 W=145 D=205	L=170 W=135
	T6-4-4-080	L=250 W=145 D=205	L=170 W=135
	T6-4-4-100	L=250 W=145 D=205	L=170 W=135
	T6-4-4-125	L=300 W=145 D=205	L=170 W=135
	T6-4-4-150	L=300 W=145 D=205	L=170 W=135
	T6-4-4-175	L=300 W=145 D=205	L=170 W=135

Functional type (single-phase 400A ~ 500A / phase 200A ~ 300A) T6 Series



Mode:		Appearance Dimension(mm)	Installation dimensions
1 Ø	T6-1-4-400	L=335 W=265 D=235	L=265 W=255
	T6-1-4-500	L=335 W=265 D=235	L=265 W=255
3 Ø	T6-4-4-200	L=335 W=265 D=235	L=265 W=255
	T6-4-4-225	L=335 W=265 D=235	L=265 W=255
	T6-4-4-250	L=335 W=265 D=235	L=265 W=255
	T6-4-4-300	L=335 W=265 D=235	L=265 W=255

Functional type (single-phase 400A ~ 800A / phase 400A ~ 800A) T6 Series



Mode:		Appearance Dimension(mm)	Installation dimensions
1 Ø	T6-1-4-800	L=390 W=265 D=255	L=265 W=255
	T6-4-4-400	L=390 W=265 D=255	L=265 W=255
3 Ø	T6-4-4-500	L=390 W=265 D=255	L=265 W=255
	T6-4-4-800	L=600 W=265 D=255	L=325 W=255

\*(Special Specifications: Voltage / Current) Order

## 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 TAISEE 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

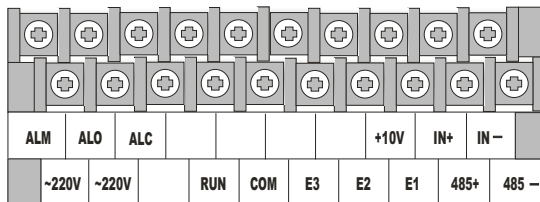
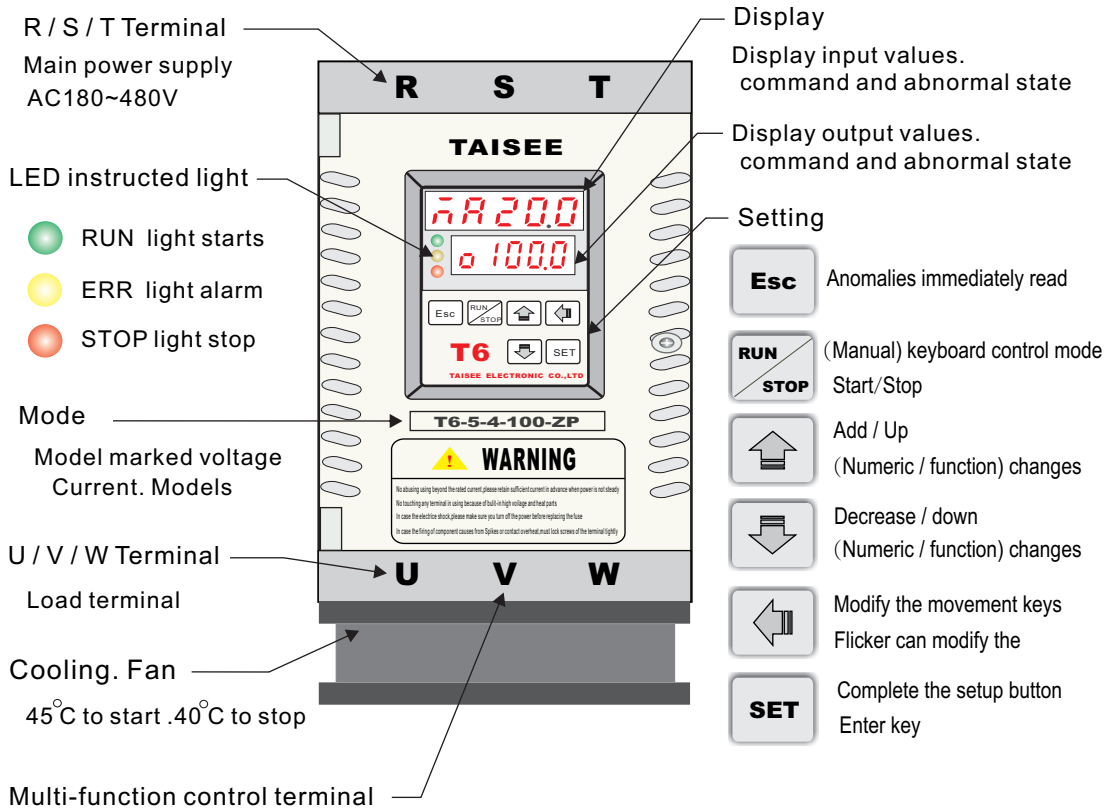
Zero.-Phase models (show output of 0.0 ~ 100%)

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



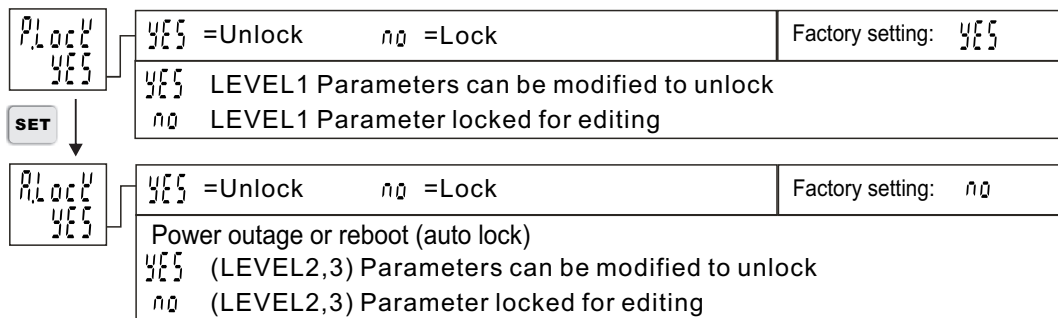
PC board terminal voltage ~ 220V  
Start / stop contacts COM RUN  
Analog input contact IN + IN-  
External maximum output limit E3 E2 E1  
Abnormal alarm output contact ALM ALC ALO  
Modbus RS485 communications contact D + D -

### Command parameter lock function



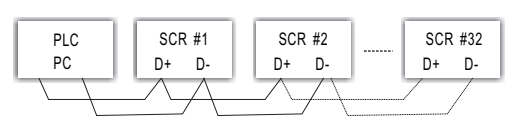
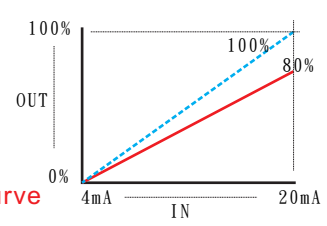
step 1.

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

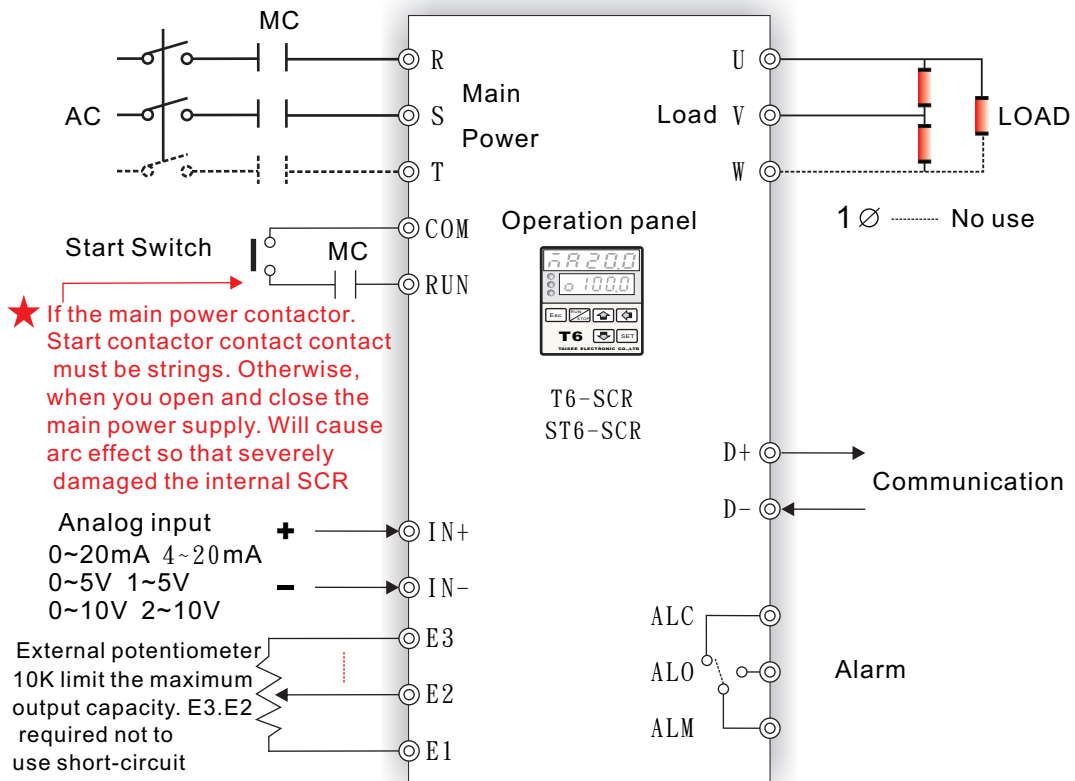


2. A.LOCK. Unlock mode can modify the parameters of LEVEL2.3 (when the SCR reboot A. LOCK will automatically return to lock mode)To change repeat step 1.

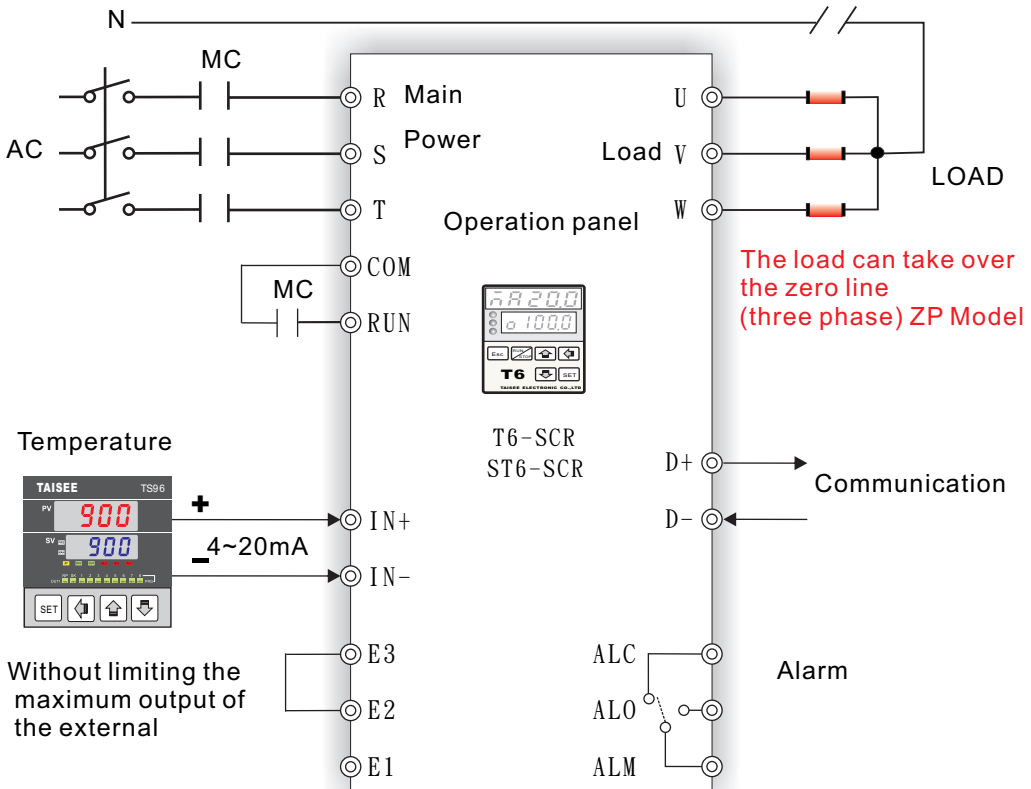
Symbol	Terminal Function Description	
<b>R</b>	Main circuit terminal The main power output: range AC180V ~ 480V 1 ∅ Type: R / S      3 ∅ Type: R / S/T	
<b>S</b>		
<b>T</b>		
<b>U</b>	Main circuit terminal Power regulator output: Next load 1 ∅ Type: U / V      3 ∅ Type: U / V/W	
<b>V</b>		
<b>W</b>		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



Chapter 7: circuit wiring

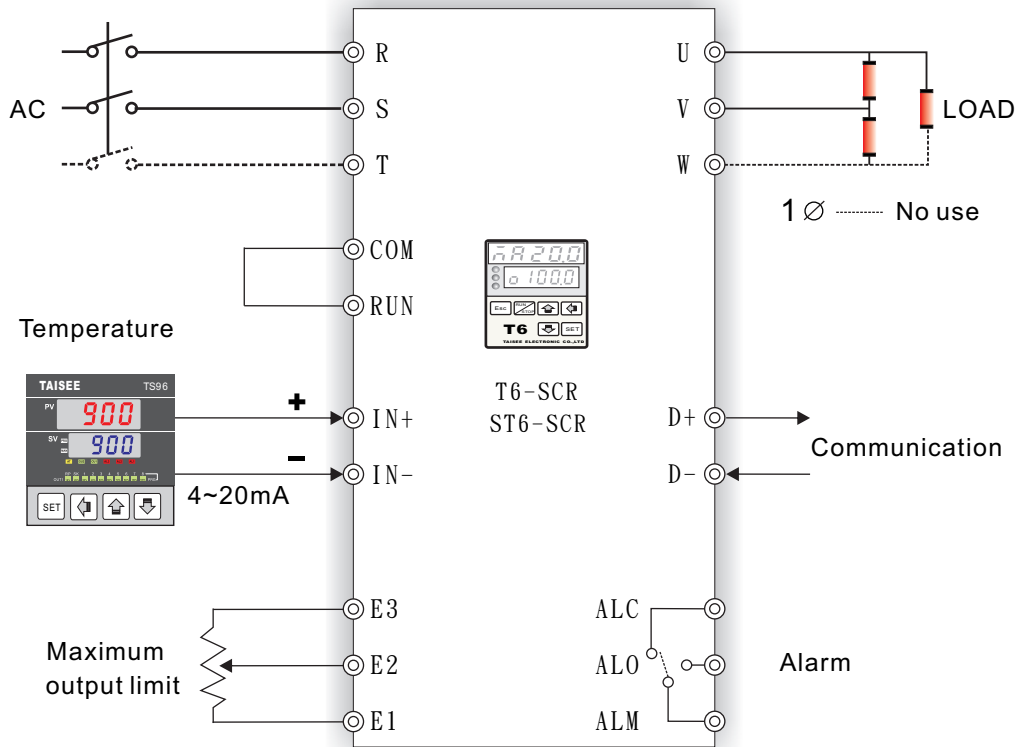


Temperature 4 ~ 20mA current signal - "control the proportion of output (external Without limiting the maximum output volume)

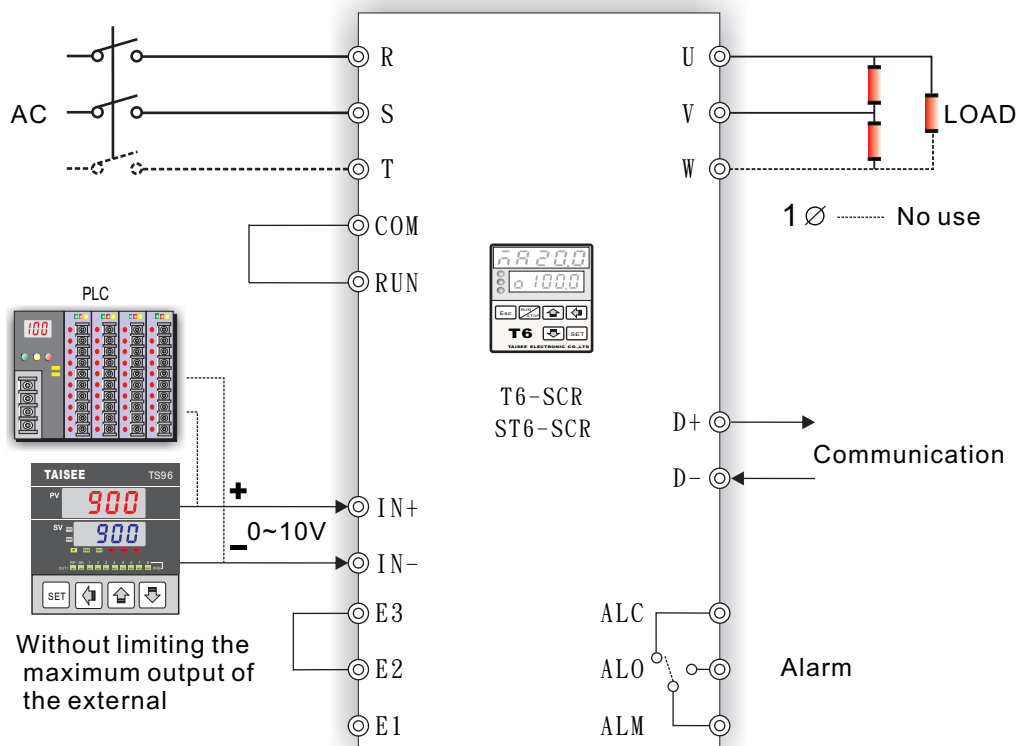


7-2

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

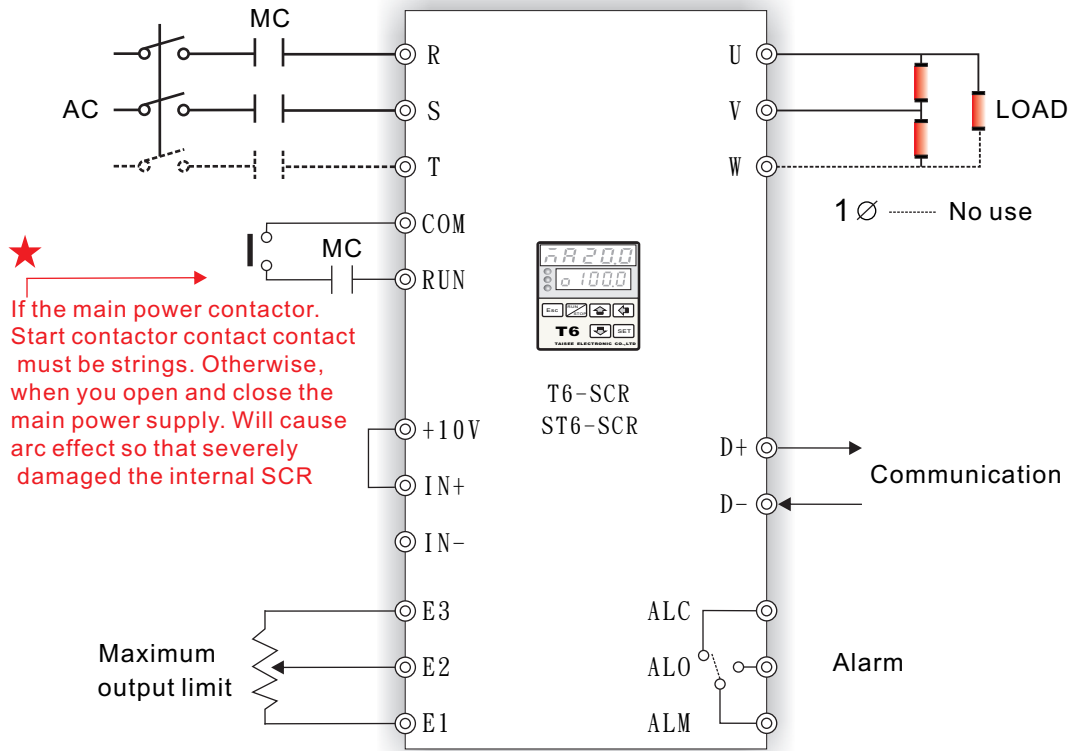


External 0 ~ 10V voltage signal - "control the proportion of output (external Without limiting the maximum output volume)"

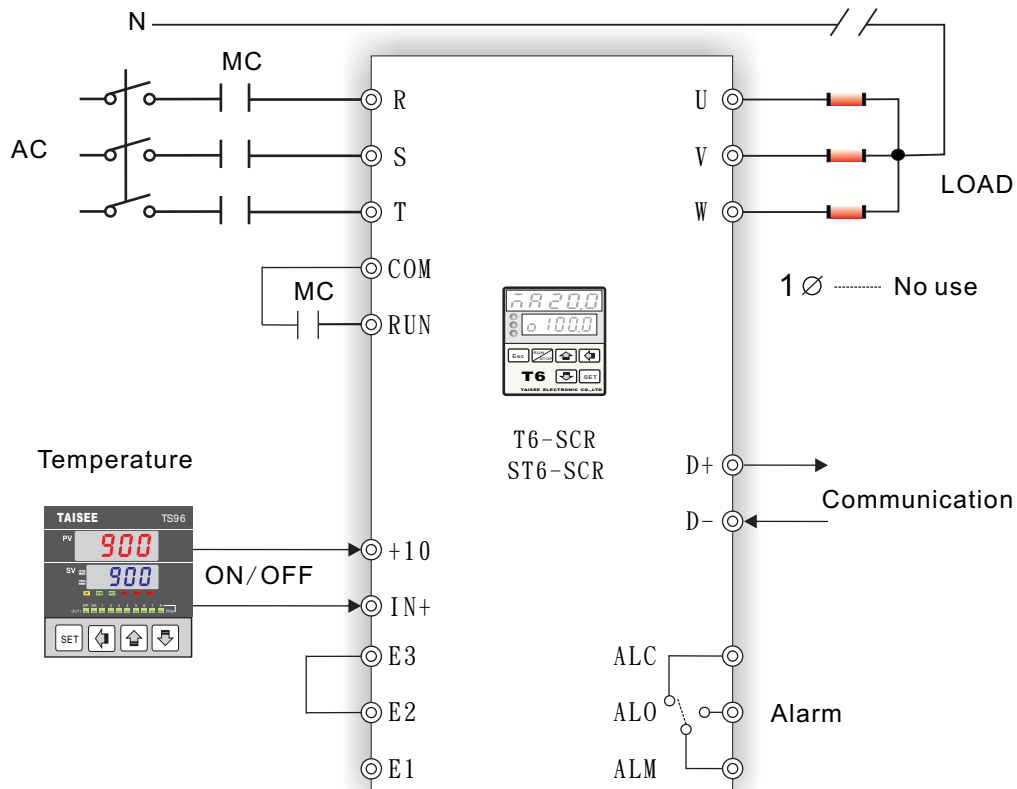


7-3

Manual mode (external VR control output volume)

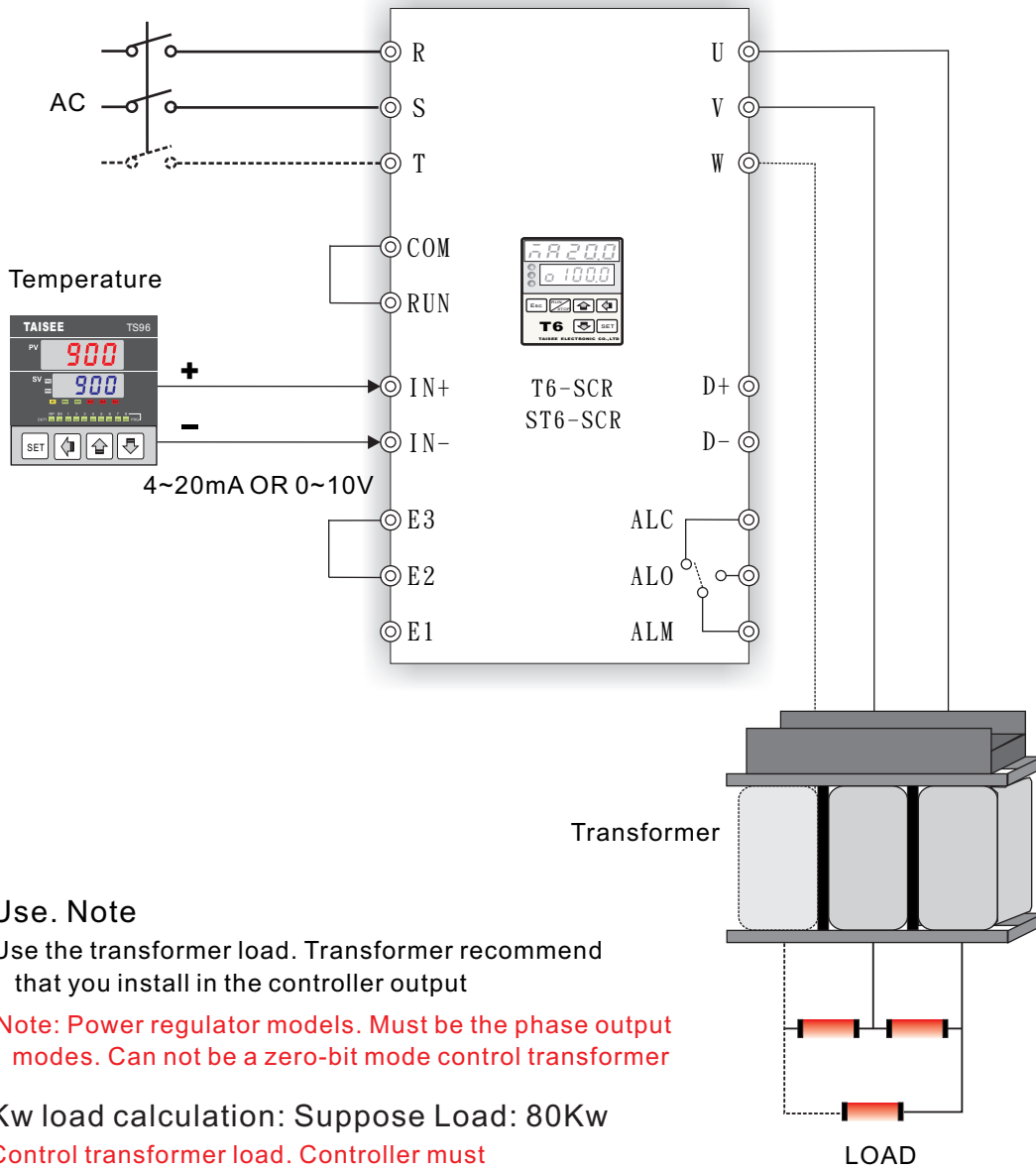


Thermostat ON/OFF-> Relay control output



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

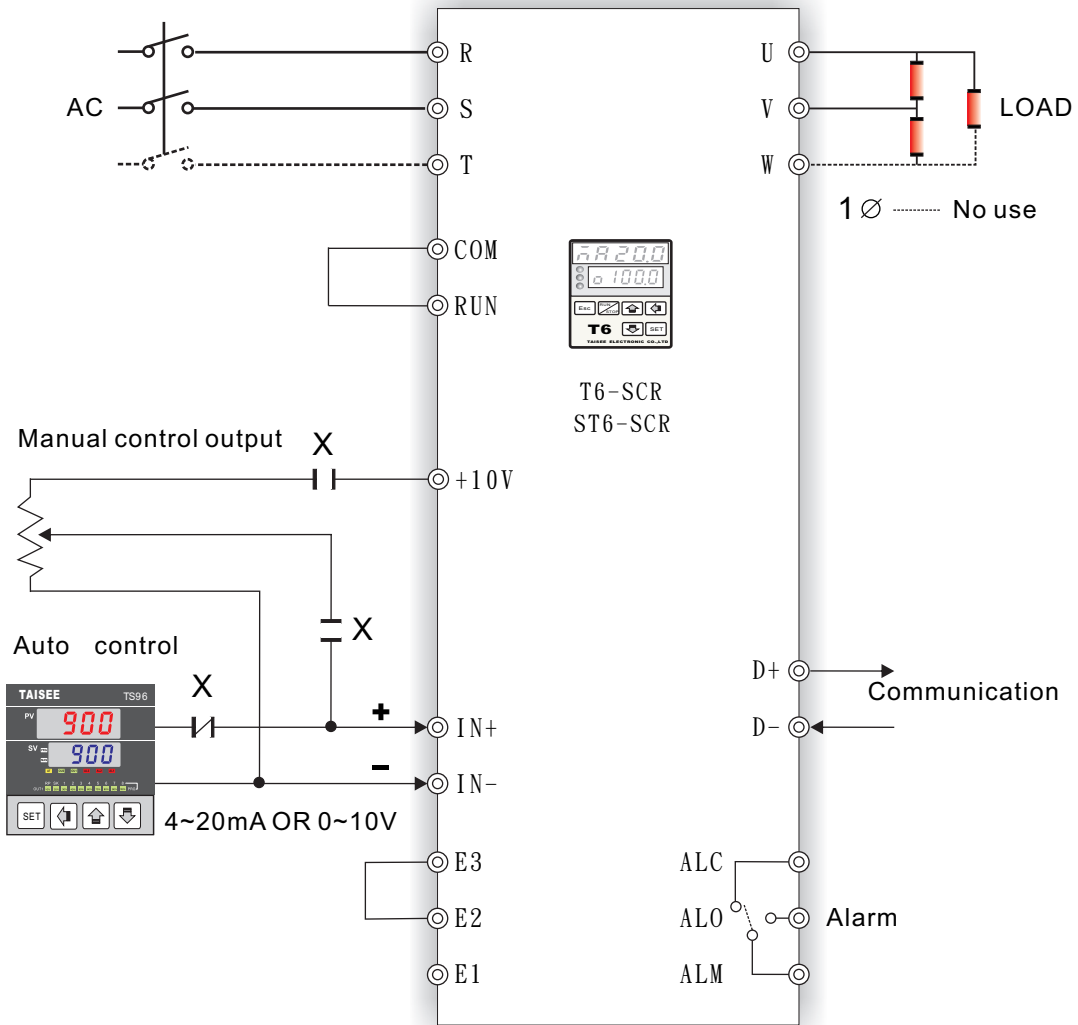
$$3 \varnothing = (80,000/220) * T = 210 / \sqrt{3} = 154A$$

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

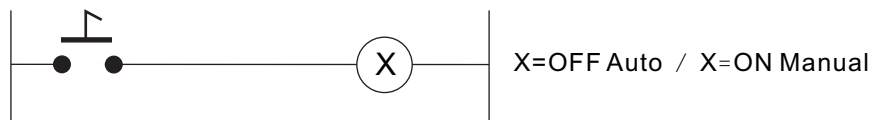
Selected controller amps (154 \* 1.3) = 200A corresponds to Model T6-5-4-200P

7-5

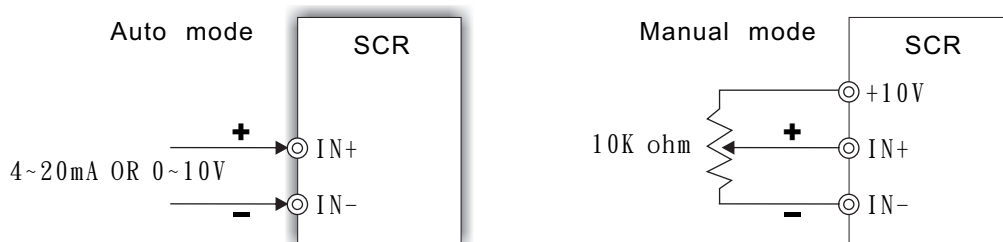
Auto / Manual Switching Control Wiring



Auto / Manual switch control circuit

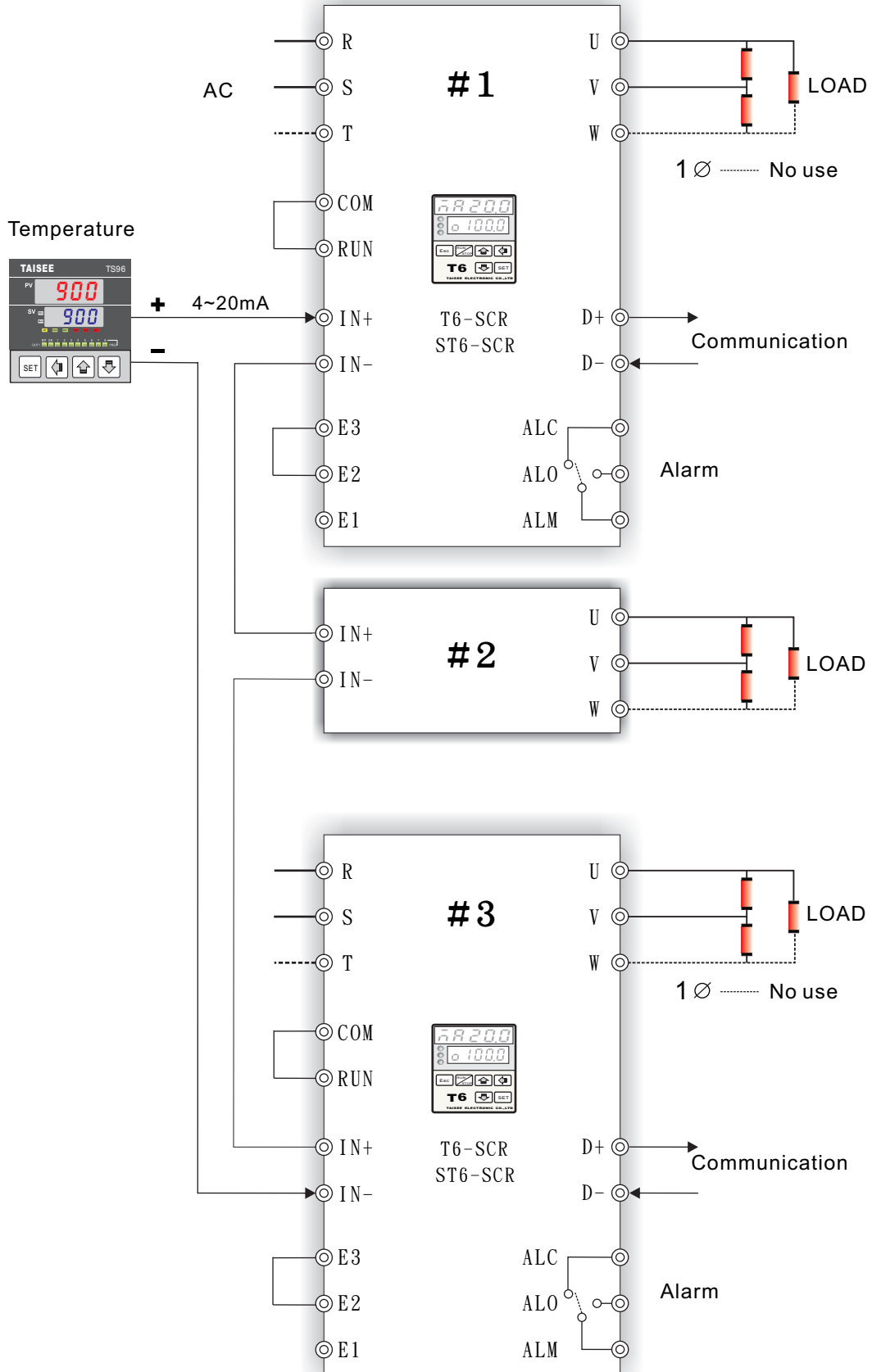


Equivalent circuit



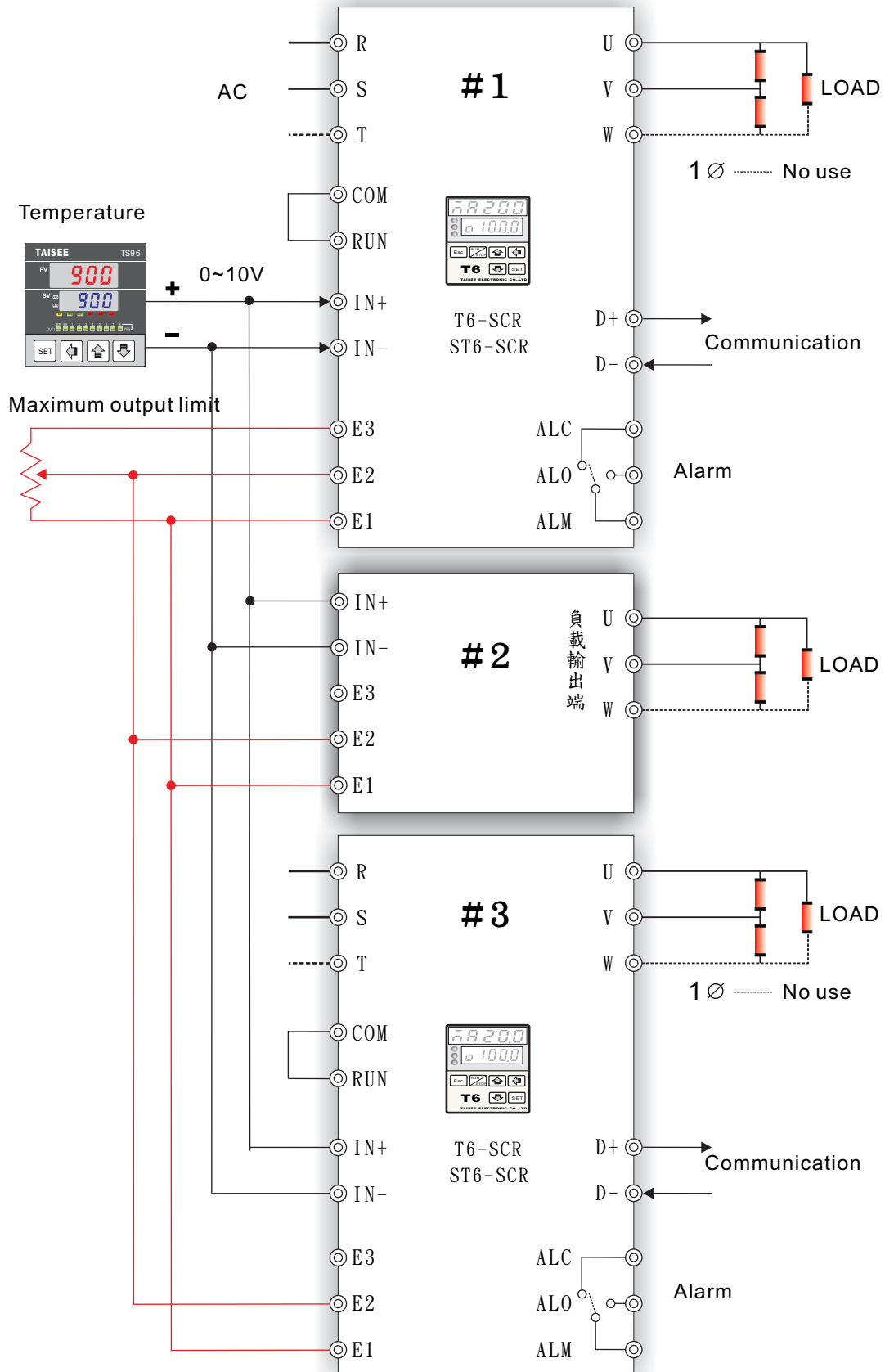
7-6

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



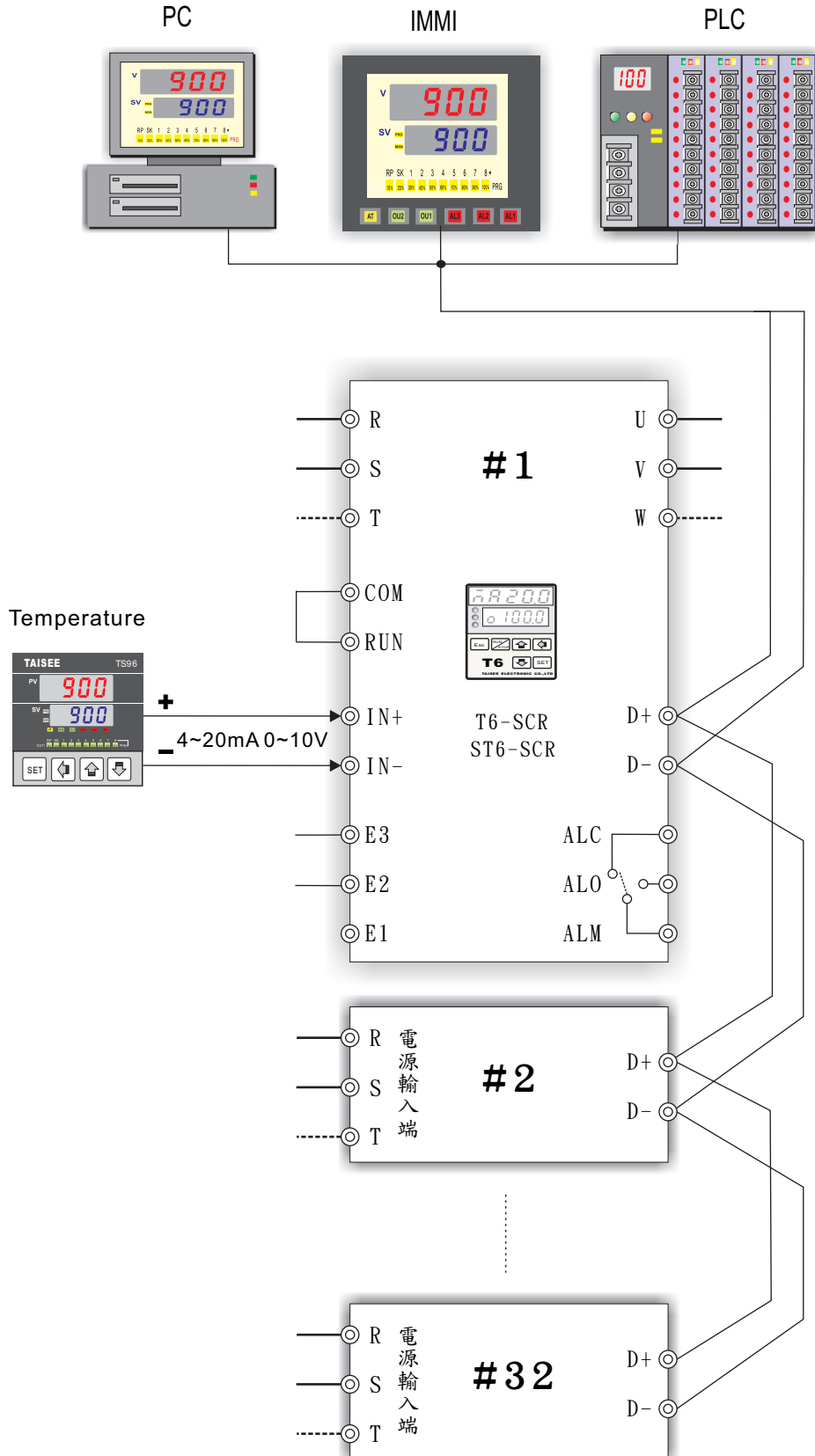
7-7

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



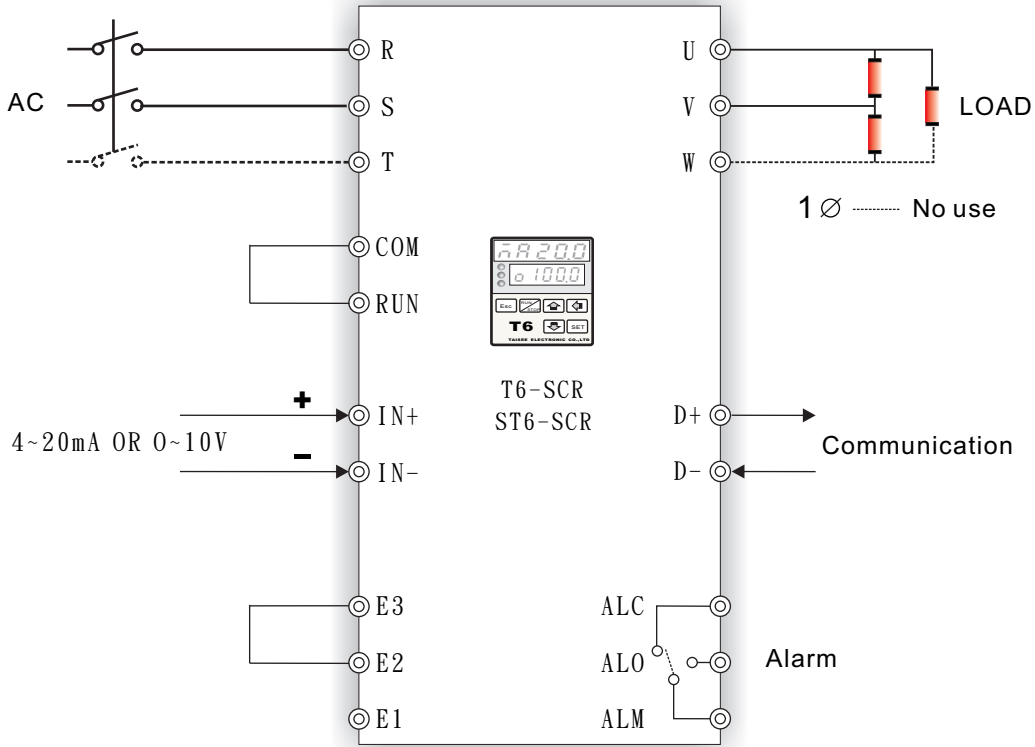
7-8

Modbus RS485 communication connection control. Up to 32 connections  
The longest distance 1200M



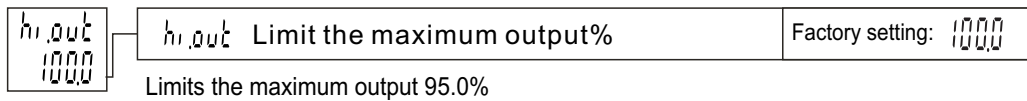
8-1 Chapter 8: special control wiring

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

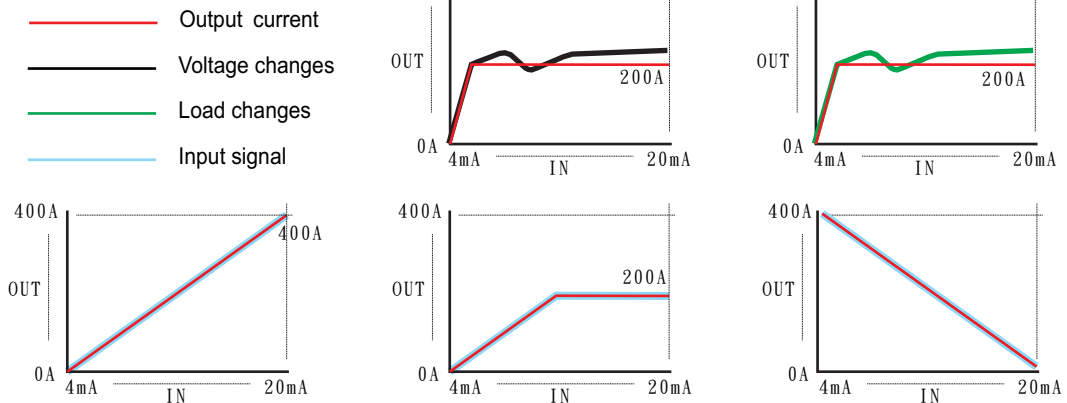


Constant current (set. Note)

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
2. Example: The actual load is 400A: Set manner (class 1) the percentage of the maximum output reduced to 95% so that, (IN + IN-) terminal input DC0 ~ 10V, corresponding to 0 ~ 400A Output% \* (425A \* 0.95 = 403A )

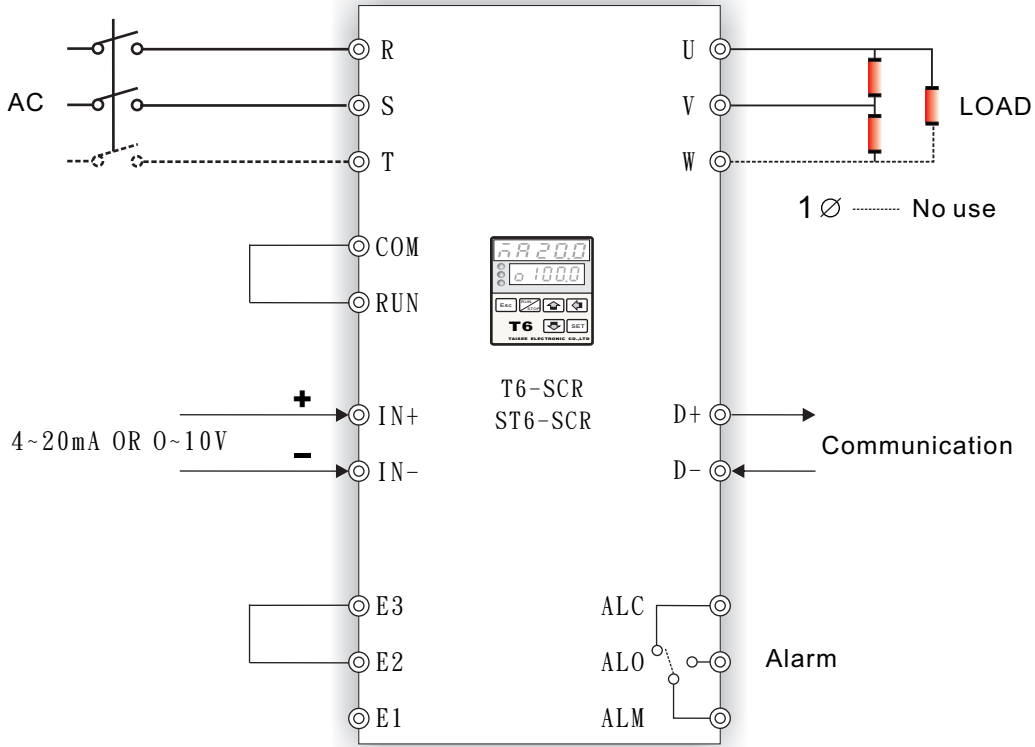


Constant current output waveform



8-2

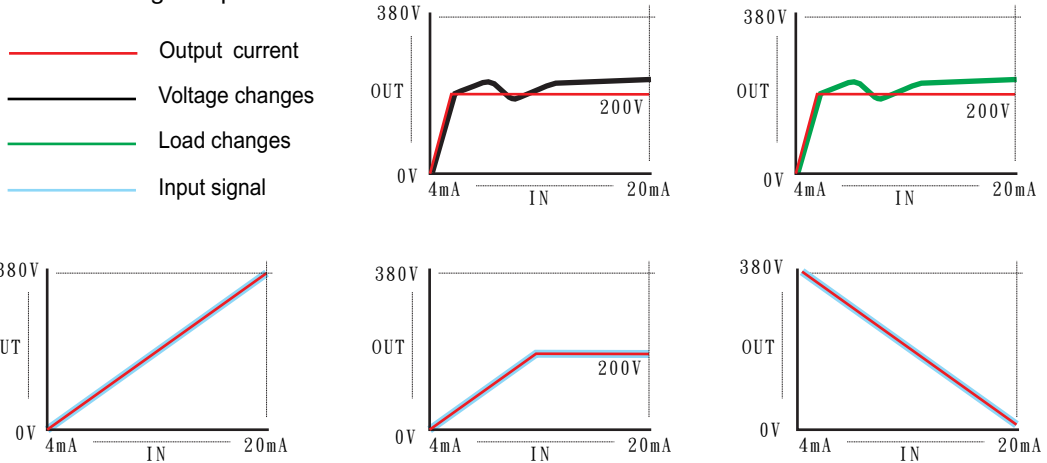
V-type (fixed-voltage models) input analog signal - "control voltage output (automatic constant voltage)



Constant voltage (set. Note)

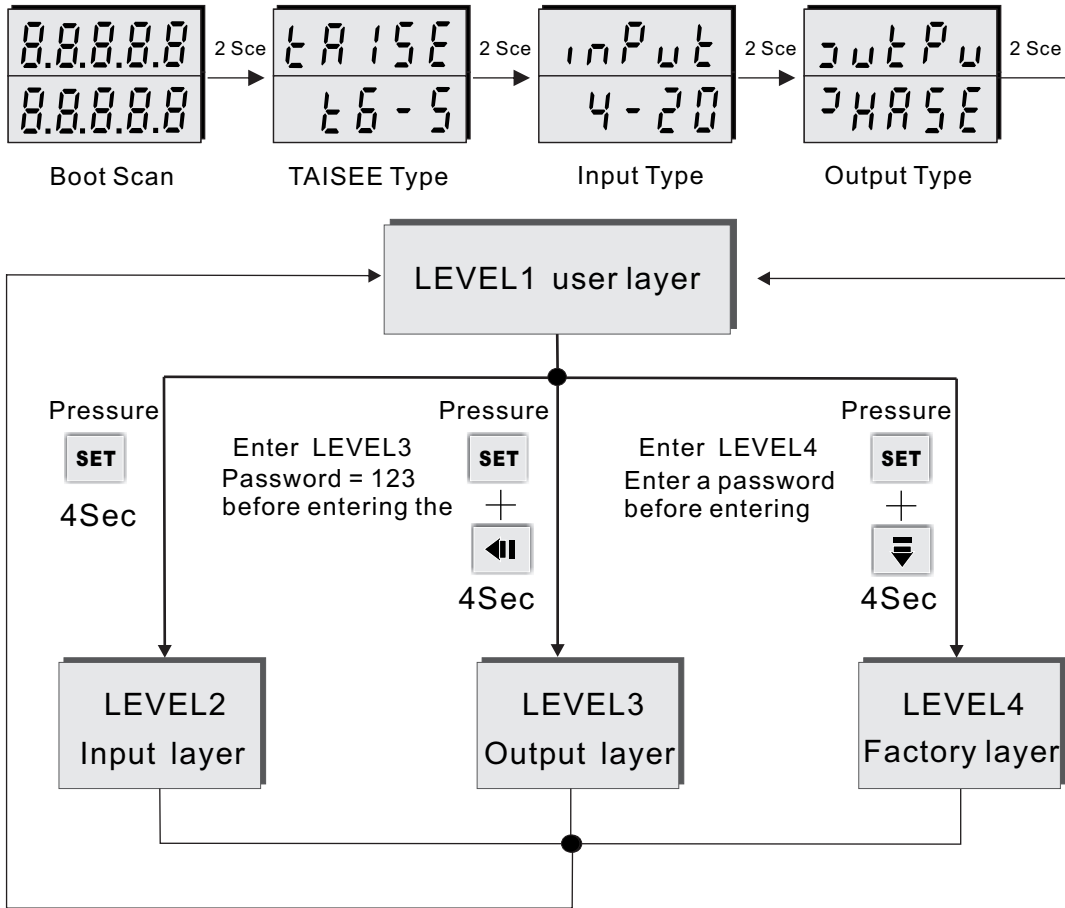
1. Analog input signal terminals (IN + IN-) give as gifts DC0 ~ 10V. Control the output voltage values: cases of the primary analog input voltage is 380V corresponding to (IN + IN-) terminal input DC0 ~ 10V, corresponding to 0 ~ 380V Output

Constant voltage output waveform



## 9-1 Chapter 9: command parameter setting example

### Level Operation Flow



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



Press **←** **⇩** **⇩** **SET** 4 seconds the value of all the command parameters back to factory

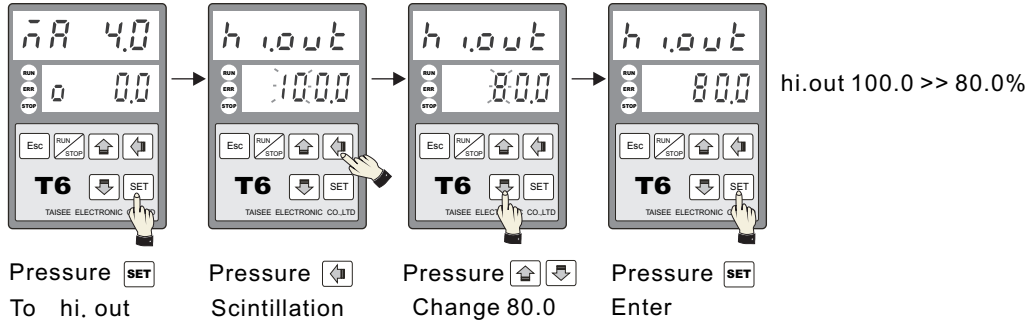
### LEVEL Class Parameters

<b>LEVEL 1</b>	1.Display controller current work status (analog input) and (output %) 2.Set the maximum output%. Current / voltage
<b>LEVEL 2</b>	1.Input setting 0~20mA / 4~20mA / 0~5V / ~5V / 0~10V / 2~10V/KEY 2.Slow start / slow stop. Time settings (load disconnected setting)
<b>LEVEL 3</b>	1.Out-mode change: Zero/phase/constant voltage/current/current limit 2.Parameter lock / unlock. Communication protocol setting
<b>LEVEL 4</b>	Special Features Set: Non-professionals can not enter the

9-2

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

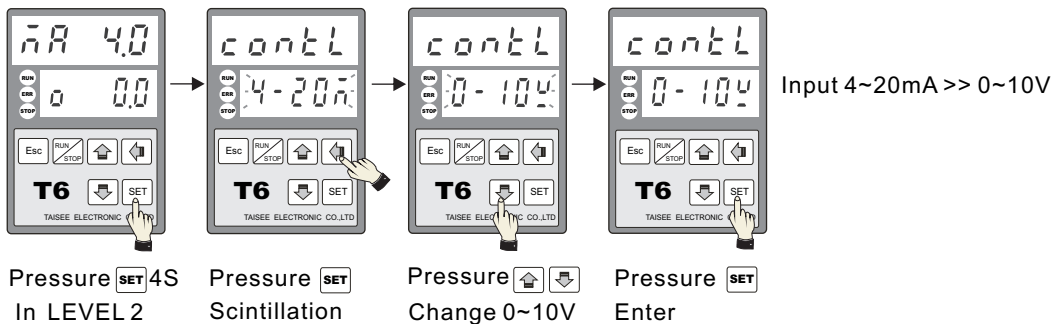
Step 1: Enter Password:

Pressure **SET** 4S In LEVEL 2    Pressure **SET** T0 LOCK    Pressure Scintillation    Pressure Scintillation password:1 2 3    Pressure **SET** Enter

Parameter settings to unlock (LEVEL1 2 may change)

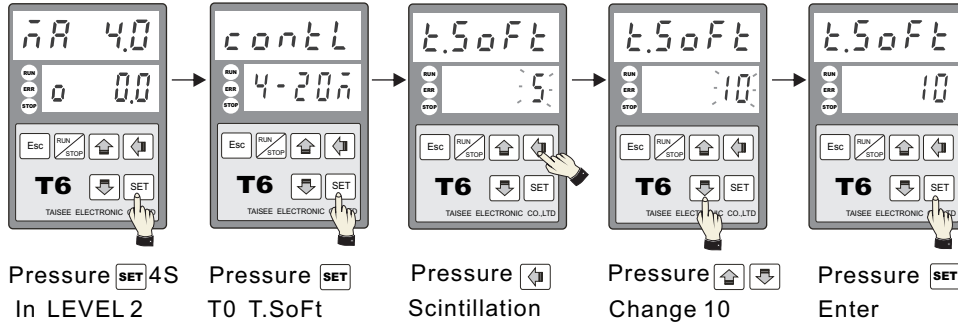
Pressure **SET** 4S In LEVEL 3    Pressure **SET** T0 A.LOCK    Pressure Scintillation    Pressure Scintillation Change yes    Pressure **SET** Enter

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

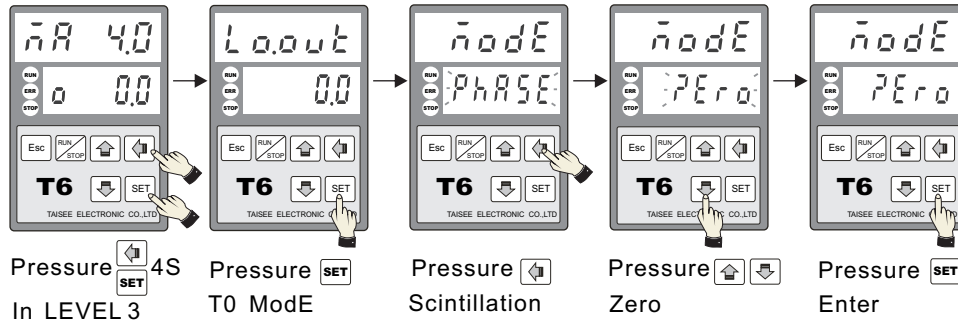


Command parameter operations (Example):

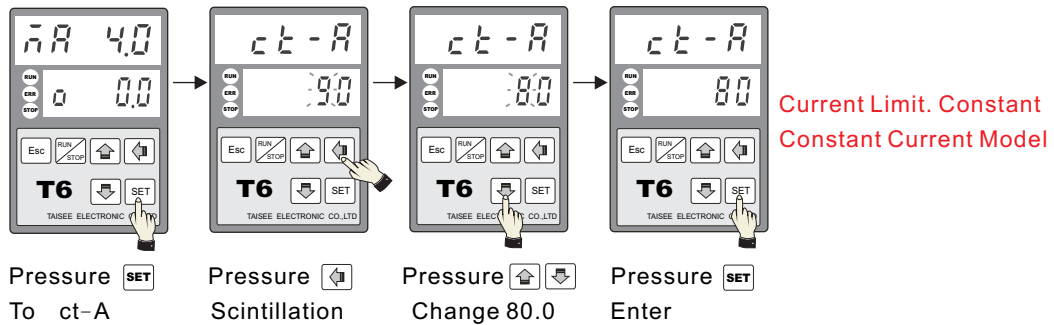
Example 3: slow start-up time changes to 10 seconds  
(confirmation LEVEL 3 instruction (A. LOCK=yes))



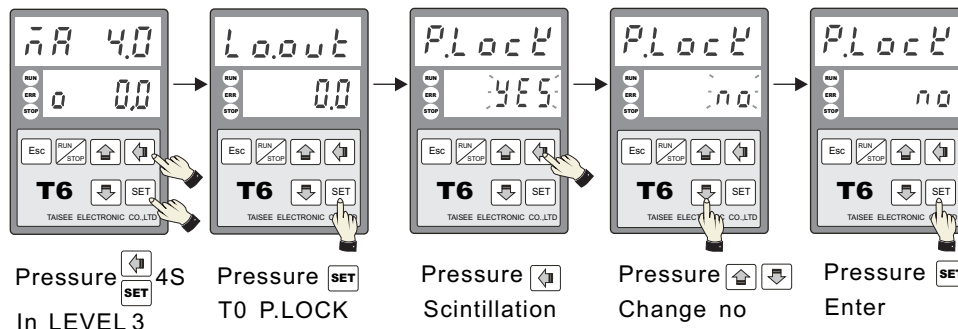
Example 4: Output mode change as follows: zero (distribution-type cycle power regulator)  
(confirmation LEVEL 3 instruction (A. LOCK=yes))



Example 5: The maximum output current is limited to 80A (P. LOCK factory without locking. LEVEL1 brackets parameters can be modified)

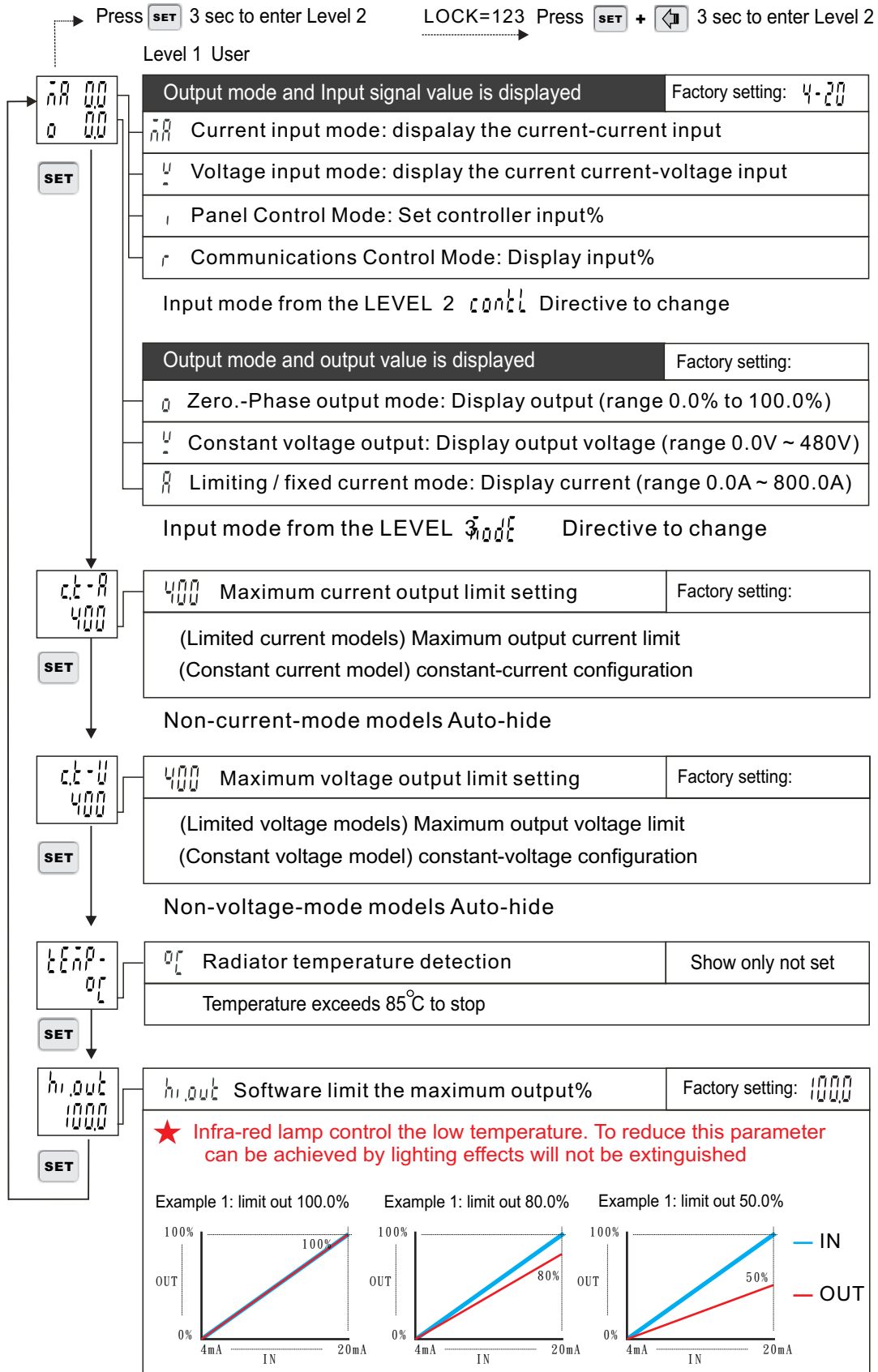


Example 6: All parameters locked (can not change the order parameter)  
(confirmation LEVEL 3 instruction (A. LOCK=yes))



10-1 User-Level

Chapter 10: Instruction Parameter Description



10-1 Input-Level

Level 2 User Press **SET** 3 sec to enter Level 2

contL 4-20mA	Input mode selection (software change)	Factory setting: 4-20																																				
<b>SET</b>	<table border="1"> <tr> <td>KEY</td> <td>Manual mode by the keyboard control output%</td> <td>IN Show</td> <td>1</td> </tr> <tr> <td>diP</td> <td>Standby</td> <td></td> <td></td> </tr> <tr> <td>0-20mA</td> <td>0~20mA current input mode</td> <td>IN Show</td> <td>mA</td> </tr> <tr> <td>4-20mA</td> <td>4~20mA current input mode</td> <td></td> <td></td> </tr> <tr> <td>0-5V</td> <td>0~5V voltage input mode</td> <td></td> <td></td> </tr> <tr> <td>1-5V</td> <td>1~5V voltage input mode</td> <td></td> <td></td> </tr> <tr> <td>0-10V</td> <td>0~10V voltage input mode</td> <td>IN Show</td> <td>V</td> </tr> <tr> <td>2-10V</td> <td>2~10V voltage input mode</td> <td></td> <td></td> </tr> <tr> <td>rS485</td> <td>Rs485 Communications Control Mode</td> <td>IN Show</td> <td>r</td> </tr> </table>	KEY	Manual mode by the keyboard control output%	IN Show	1	diP	Standby			0-20mA	0~20mA current input mode	IN Show	mA	4-20mA	4~20mA current input mode			0-5V	0~5V voltage input mode			1-5V	1~5V voltage input mode			0-10V	0~10V voltage input mode	IN Show	V	2-10V	2~10V voltage input mode			rS485	Rs485 Communications Control Mode	IN Show	r	
KEY	Manual mode by the keyboard control output%	IN Show	1																																			
diP	Standby																																					
0-20mA	0~20mA current input mode	IN Show	mA																																			
4-20mA	4~20mA current input mode																																					
0-5V	0~5V voltage input mode																																					
1-5V	1~5V voltage input mode																																					
0-10V	0~10V voltage input mode	IN Show	V																																			
2-10V	2~10V voltage input mode																																					
rS485	Rs485 Communications Control Mode	IN Show	r																																			
tSoft 50	tSoft Soft start time	Factory setting: 50																																				
<b>SET</b>	<table border="1"> <tr> <td>Setting range</td> <td>0 ~ 199 seconds</td> <td>Example: time=5</td> <td> </td> </tr> </table>	Setting range	0 ~ 199 seconds	Example: time=5																																		
Setting range	0 ~ 199 seconds	Example: time=5																																				
tDown 00	tDown Soft stop time	Factory setting: 00																																				
<b>SET</b>	<table border="1"> <tr> <td>Setting range</td> <td>0 ~ 30 seconds</td> <td>Example: time=5</td> <td> </td> </tr> </table>	Setting range	0 ~ 30 seconds	Example: time=5																																		
Setting range	0 ~ 30 seconds	Example: time=5																																				
tRESP 10	tRESP Reaction time setting range 0 ~ 10.0	Factory setting: 3.0																																				
<b>SET</b>	(Analog input average) number of the more stable the larger the input																																					
Lock 000000	Lock Password (LEVEL parameter lock)	Factory setting: 000000																																				
	Press <b>SET</b> + <b>←</b> 3 sec to enter Level 2																																					
<b>SET</b>	AT Mode: load-break detection (the following example: the load current is less than 85% or less alarm)																																					
currE 1000	currE Full load current setting	Factory setting:																																				
	Example: Load 20Kw. Voltage 380V Calculated values: (20000/380) = 52.6 (Amps) <b>CurrE</b> value is set to: 53																																					
ErrSc 85	ErrSc Set current error%	Factory setting: 85																																				
	Current detection value. With the current set percentage. The ratio of																																					
	Load-break detection settings (50% ~ 100% of the output random test)																																					
	currE = Full load output current																																					
	ErrSc = Load below the% settings. Alarm Output																																					
	Example: Load 20Kw. Voltage 380V Calculated values: (20000/380) = 52.6 (Amps)																																					
	<b>CurrE</b> value is set to: 53 <b>ErrSc</b> value to: 85																																					
	The load current is less than the normal current value of 85% the following warning.																																					
	.Display <b>Error LoAd</b>																																					

10-1 Control-Level

Level 3 User LOCK=123 Press **SET** + **←** 3 sec to enter Level 2

Loout 00	Loout Minimum output setting range 0.0~40.0%	Factory setting: 00																											
<b>SET</b>	<b>Output Mode Selection (software change) Factory setting:</b>																												
mode Phase	<table border="1"> <tr> <td>Phase</td> <td>Phase Output</td> <td>Output waveform </td> <td rowspan="2">1 ∅</td> <td rowspan="2">0</td> </tr> <tr> <td>Zero</td> <td>Zero Output</td> <td>Output waveform </td> </tr> <tr> <td>PZero</td> <td>Phase starts. Zero output</td> <td></td> <td rowspan="2">3 ∅</td> <td rowspan="2">ZP-TYPE</td> </tr> <tr> <td>PPhase</td> <td>Zero starts. Phase output</td> <td></td> </tr> </table>	Phase	Phase Output	Output waveform	1 ∅	0	Zero	Zero Output	Output waveform	PZero	Phase starts. Zero output		3 ∅	ZP-TYPE	PPhase	Zero starts. Phase output													
Phase	Phase Output	Output waveform	1 ∅	0																									
Zero	Zero Output	Output waveform																											
PZero	Phase starts. Zero output		3 ∅	ZP-TYPE																									
PPhase	Zero starts. Phase output																												
<b>SET</b>	<table border="1"> <tr> <td>bcurr</td> <td>Limit current</td> <td>Example: </td> <td rowspan="2">C</td> <td rowspan="2">CT Type</td> <td rowspan="2">A</td> </tr> <tr> <td colspan="2">Applicable to all kinds of loads</td> <td>Restriction 60A</td> </tr> <tr> <td>Acurr</td> <td>Constant current</td> <td>Example: </td> <td rowspan="2">AT</td> <td rowspan="2"></td> <td rowspan="2"></td> </tr> <tr> <td colspan="2">Automatic constant output current</td> <td>Set Current 60A</td> </tr> <tr> <td>Vvoltage</td> <td>Constant voltage</td> <td>Example: </td> <td rowspan="2">V-Type</td> <td rowspan="2"></td> <td rowspan="2">V</td> </tr> <tr> <td colspan="2">Automatic constant output voltage</td> <td>Set Voltage 300V</td> </tr> </table>		bcurr	Limit current	Example:	C	CT Type	A	Applicable to all kinds of loads		Restriction 60A	Acurr	Constant current	Example:	AT			Automatic constant output current		Set Current 60A	Vvoltage	Constant voltage	Example:	V-Type		V	Automatic constant output voltage		Set Voltage 300V
bcurr	Limit current	Example:	C	CT Type	A																								
Applicable to all kinds of loads		Restriction 60A																											
Acurr	Constant current	Example:	AT																										
Automatic constant output current		Set Current 60A																											
Vvoltage	Constant voltage	Example:	V-Type		V																								
Automatic constant output voltage		Set Voltage 300V																											
PLOCK YES	YES =Unlock    NO =Lock	Factory setting: YES																											
<b>SET</b>	YES LEVEL1 Parameters can be modified to unlock NO LEVEL1 Parameter locked for editing																												
ALock YES	YES =Unlock    NO =Lock	Factory setting: NO																											
<b>SET</b>	Power outage or reboot (auto lock) YES (LEVEL2,3) Parameters can be modified to unlock NO (LEVEL2,3) Parameter locked for editing																												
Time 00	Time Auto return to the main screen of time	Factory setting: 25																											
<b>SET</b>	Parameter setting of time did not press any key. Automatically return to the main screen																												
Addr 1	Addr Communication station number setting 1 ~ 32	Factory setting: 1																											
<b>SET</b>																													
bRnd 19200	bRnd Transmission speed	19200																											
<b>SET</b>	setting range: 4800 9600 19200 38400																												
bUS 8-n-2	bUS Communication data format:	Factory setting: 8-n-2																											
<b>SET</b>	RTU 8-N-0 8-N-1 8-N-2																												
cPt 100	cPt (Show current) correction	Factory setting: 100																											
<b>SET</b>	*(CT Current Limit. C constant current) models: setting range of 50 ~ 200% of the formula: (test current) * (corrected set value) / 100																												

11-1

Chapter 11: Directive parameter list

LEVEL3  $\text{P}_{\text{lock}}$  and  $\text{P}_{\text{lock}} = \text{YES}$  The following parameters can be changed

LEVEL1 user layer					
Directive	Explained	Function Description	Setting range & setting mode	Factory	Page
$\bar{n}\bar{r}$	$\bar{n}\bar{r} = \text{mA}$ $\bar{y} = \text{V}$ $\bar{i} = \text{I}$ $\bar{r} = \text{r}$	Input: $\bar{n}\bar{r} - 4\sim 20\text{mA}$ $\bar{y} - 0\sim 10\text{V}$ $\bar{i} - \text{Key}$ $\bar{r} - \text{Modbus}$	Show only. To change the input mode mode. LEVEL2 within <b>contl</b> command from the input mode changes	Show only Model corresponds	22
$\bar{o}$	$\bar{o} = \text{O}$ $\bar{y} = \text{V}$ $\bar{r} = \text{A}$	Output: $\bar{o} - 2\sim 20\text{mA}$ $\bar{y} - 0\sim 10\text{V}$ $\bar{r} - \text{Key}$	Show only. To change the input mode mode. LEVEL3 within <b>modE</b> command from the output mode changes	Show only Model corresponds	22
$\text{c.t.}\bar{r}$	C.tA	Output current limit	imited / constant current models	Model corresponds	22
$\text{tEmP}$	tEmP	Radiator temperature	Temperature exceeds 85°C. Warning	Show only	22
$\text{hi.out}$	hi.out	Limit the output %	Setting range: 40.0 ~ 100.0 %	100.0	22
LEVEL2 input layer					
$\text{contL}$	contL	Input mode selection	Following settings		23
$\text{KEY}$	KEY	Panel to manually set input%	Setting range: 0.0 ~ 100.0 %		23
$0\sim 20\bar{n}$	0~20mA	0~20mA	Corresponds to the proportion of output of 0.0 ~ 100.0 %	Model corresponds	
$4\sim 20\bar{n}$	4~20mA	4~20mA			
$0\sim 5\bar{y}$	0~5V	DC 0~5V			
$1\sim 5\bar{y}$	1~5V	DC 1~5V			
$0\sim 10\bar{y}$	0~10V	DC 0~10V			
$2\sim 10\bar{y}$	2~10V	DC 2~10V			
$\text{r5485}$	r485	Rs485 communication control			
$\text{tsoFt}$	tsoFt	Sdft start-up time	Setting range: 0 ~ 190Sec	5.0	23
$\text{tdwon}$	t.dwon	Soft stop time	Setting range: 0 ~ 30Sec	0.0	23
$\text{tdESP}$	t.dESP	Software Filter Time	The average analog signal detection	3.0	23
$\text{Lock}$	Lock	Password Input	Setting range: 0 ~ 99999	0000	23
$\text{currE}$	currE	Load-full load current setting	AT models: load-break test set		23
$\text{ErrSc}$	Errsc	set the percentage error	(currE)set the percentage error	85	23

11-2

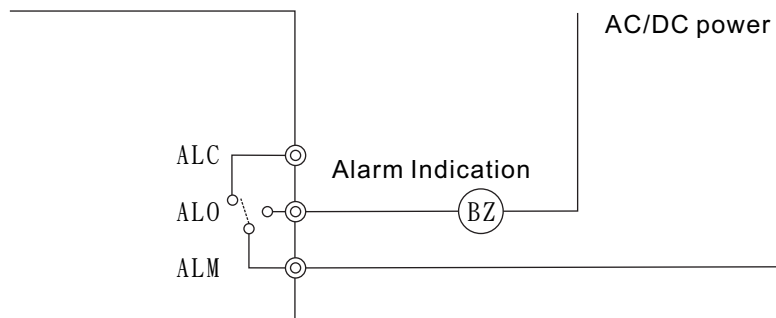
**LEVEL3** *PLock* and *ALock* = YES The following parameters can be changed

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

## Chapter 12: Alarm Descriptions and treatment methods

Abnormal display	Cause of the malfunction	Approach and improvement
<b>ERROR R-OL</b>	R-phase load current exception Error ALP setting	<span>AT models feature</span> Check the R-phase load hot wire. Whether the abnormal current caused by burning
<b>ERROR S-OL</b>	S-phase load current exception Error ALP setting	<span>AT models feature</span> Check the S-phase load hot wire. Whether the abnormal current caused by burning
<b>ERROR T-OL</b>	T-phase load current exception Error ALP setting	<span>AT models feature</span> Check the T-phase load hot wire. Whether the abnormal current caused by burning
<b>ERROR POWER</b>	No main power	1. Check the RST three-phase power supply is normal 2: Check whether the burning fuse within SCR
<b>ERROR R-PH</b>	Main power. R-phase NO power	1. Check whether the lack of R-phase power phase 2: Check the internal R-phase SCR whether the burning fuse
<b>ERROR S-PH</b>	Main power. S-phase NO power	1. Check whether the lack of S-phase power phase 2: Check the internal R-phase SCR whether the burning fuse
<b>ERROR T-PH</b>	Main power. T-phase NO power	1. Check whether the lack of T-phase power phase 2: Check the internal R-phase SCR whether the burning fuse
<b>ERROR TEMP</b>	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
<b>ERROR OE</b>	Load ground (leakage)	<span>AT models feature</span> 1. The load has to touch Case 2: Check whether there is ground heating wire inside the phenomenon of
<b>ERROR OL</b>	(Can not turn off) SCR internal fault	<span>AT models feature</span> 1. Non-full-wave control models. Load caused by the zero line then 2: Check whether there are short-circuit SCR phenomenon of internal modules
<b>ERROR LOAD</b>	(Load disconnected) or the load is less than 0.6A	<span>AT models feature</span> 1. The output load is not received 2: Check the SCR output load is normal
<b>ERROR OC</b>	(Over current) Load Overload	<span>AT models feature</span> 1. Load KW number is greater than the amount of SCR Amp 2: Check whether the SCR output load short-circuit phenomenon
<b>ERROR ERROR</b>	(System exception) SCR internal fault	SCR internal system abnormalities, does not work Please contact the dealer, or returned to the original vendors maintenance

### Abnormal alarm output contacts



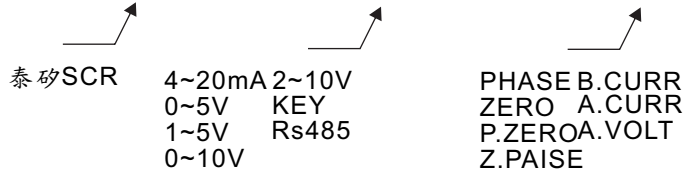
## Chapter 13: Load Test

### 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



Decrease / down



Modify the  
movement keys

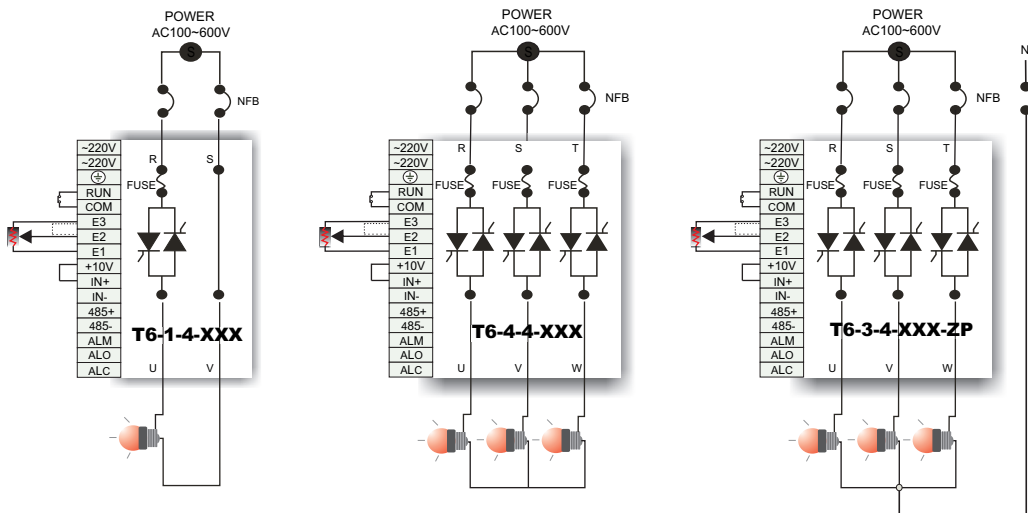


Enter key

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.



## Chapter 14: Communications

### Data Address:

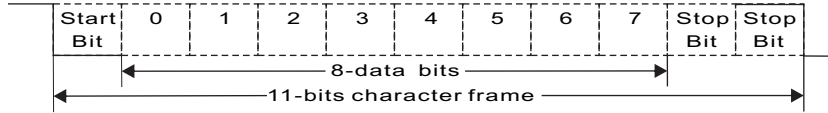
Definition	Parameter Address	R / W	Function Description		
Output value	000H	R/W	Output 0~100%		
Current limit	001H	R/W	limit-Current type		
Current Setting Voltage Setting	002H	R/W	Constant-current type Constant-voltage type		
Output ON / OFF	003H	R/W	Output ON / OFF status		
The above control method 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	Input signal		
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		

## Modbus Format and means of communication

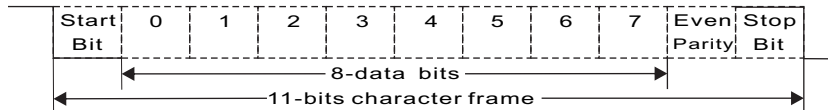
Communication mode: Rs485 Communication speed: 4800/9600/19200/38400 bps

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

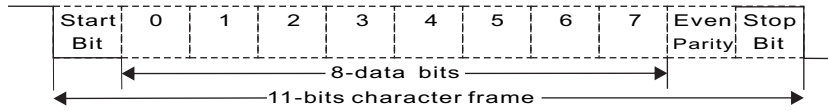
<8: N: 2:> 8-bit data, a single parity bit, 2 stop bit.



<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
2	Data Length	MSB	00H
3	byte	LSB	02H
4	Add Content	MSB	03H
5		LSB	E8H
6		LSB	E4H
7	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

## 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;
Outportb(PORT+MCR,0x08);/*interrupt enable */
Outportb(PORT+IER,0x01);/*interrupt as data in */
Outportb(PORT+LCR,(inportb(PORT+LCR)I0x80));
/* the Baudrata can be access as LCR.B7==1 */
Outportb(PORT+BRDL,12);/*set baudrate =9600, 12=115200/9600*/
Outportb(PORT+BRDH,0x00);
Outportb(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*/
Outportb(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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This manual may be modified when necessary because of improvement of the product, modification or changes in specifications, this manual is subject to change without notice.