

# TM4810O34 Temperature Controlling System Instruction Manual

[PRODUCT MODEL ]

## Amendment

Date	Revision Version	Change Contents	Modified By
2016-01-30	00	Initial release	
2016-03-03	01	1. The set range of refrigerate opening(stopping) point 2. The set range of heating opening(stopping) point The set range of dehydrogenating period	

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## 1 Overview

“TM4810034 temperature control system” temperature control panel is designed for the semiconductor cooler to adjust the environment temperature, it can control the semiconductor when it works under the condition of cooling or heating. The temperature control panel can not only adjust the environment temperature, but also monitor the inner and external fan, temperature sensor, the situation of over pressure or under pressure and so on. If there is any abnormal, it will report alarm message through relay dry contacts. Real-time monitor toward the working mode of semiconductor is implemented by RS485 serial port, upper machine software and connection of communication port for temperature control panel.

## 2 Technical Specifications

### 2.1 Technical Parameter:

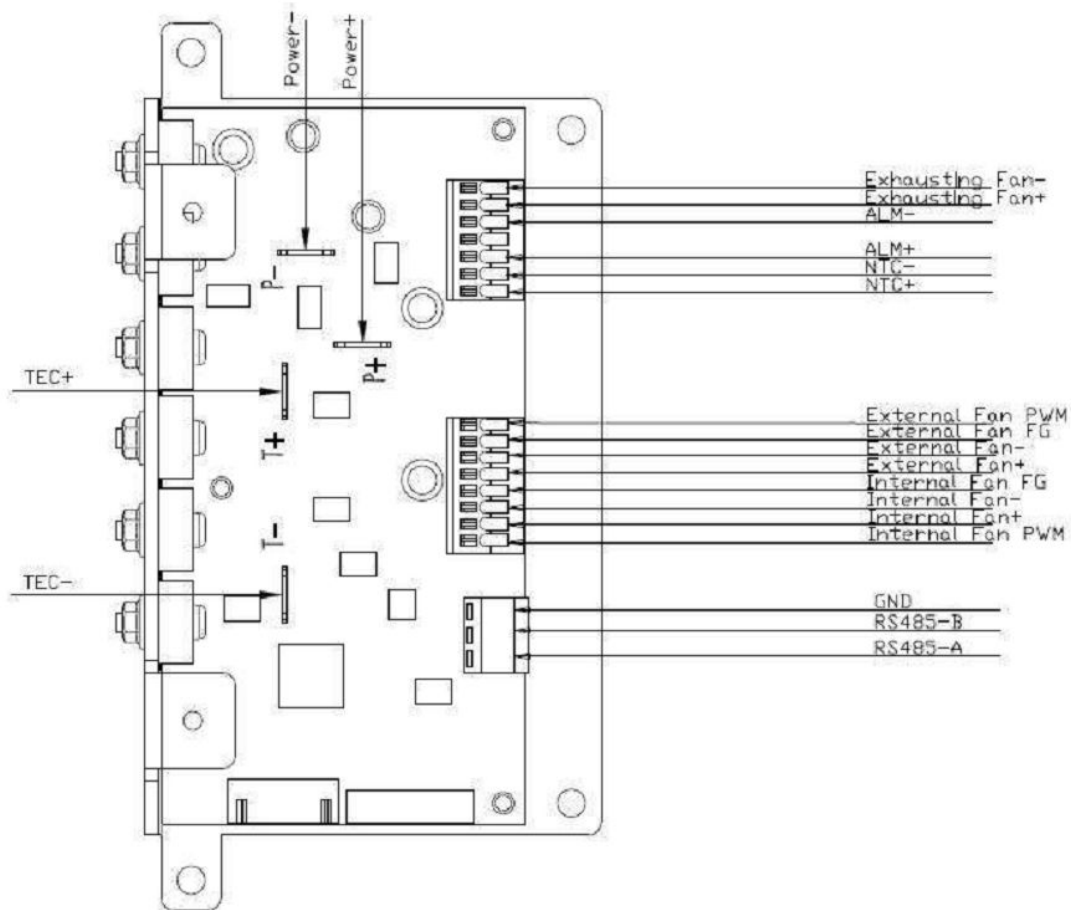
Technical Term	Unit	Parameter
➤Max Voltage	VDC	60
➤Rated Voltage	VDC	48
➤Rated Current	A	10
➤Measuring Range	°C	-40~110
➤Temperature Measurement Accuracy	°C	±0.1
➤Dehydrogenating Fan	VDC/A(VAC/A)	30/5(250/5)
➤Internal Recycle Fan	VDC/A	48/2
➤Extrinsic Cycle Fan	VDC/A	48/2

### 2.2 Interface Spec.:

- 1)Power input DC48V.
- 2)NTC temperature sensor interface
- 3)TEC working power supply DC48V.
- 4)Dehydrogenating Fan out put interface
- 5)Internal recycle fan interface: power supply+, PWM signal output, fan speed signal feedback, power supply-.
- 6)Extrinsic cycle fan interface: power supply+, PWM signal output, fan speed signal feedback, power supply-.
- 7)Alarm relay normally open/Normally closed dry contact output
- 8)485 communication interface GND(can be left open), 485B(T/R-), 485A(T/R+)
- 9)DIF(reserved)

### 3 Temperature Control System Connection

#### 3.1 The Schematic Diagram of Electrical Connection



#### 3.2 The Physical Map of Electrical Connection

Please refer to 《TM4810034 temperature control system connection》

### 4 Product Function

#### 4.1 Self Test

When power on, the temperature controlling panel starts to self test: temperature sensor- internal recycle fan- extrinsic cycle fan- TEC refrigerate. When self testing, the green light is blinking. If hardware failure, the red light will blink. When self testing finish: a. No failure warning, the controlling panel works normally. b. If there is a alarming, the green light will be off and the red one will be blinking.

## 4.2 refrigerate

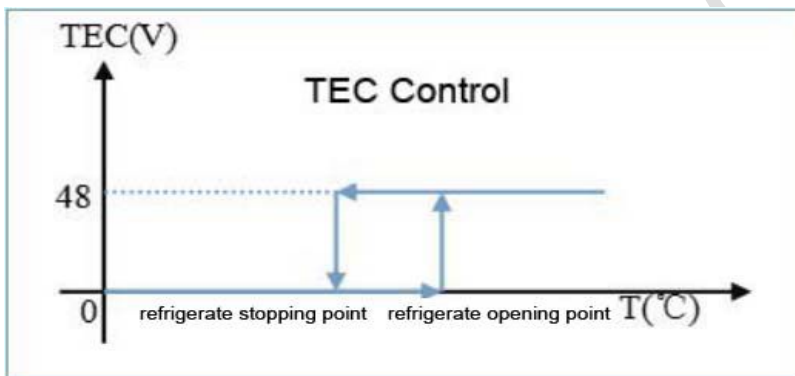
When temperature inside cabinet higher than the opening point of refrigeration, the refrigeration operation starts to run; when temperature lower than opening point, it stops.

When setting the point, the stopping point should be lower than the opening one

### refrigeration technical parameter

Parameter	Default Value	Set Range	Description	Set Point Description
Refrigeration opening point	30	[15~55]	°C	The temperature point is set when the refrigeration operation starts to run
Refrigeration stop point	25	(10~55)	°C	The temperature point is set when the refrigeration operation stops to run

refrigerate running chart:



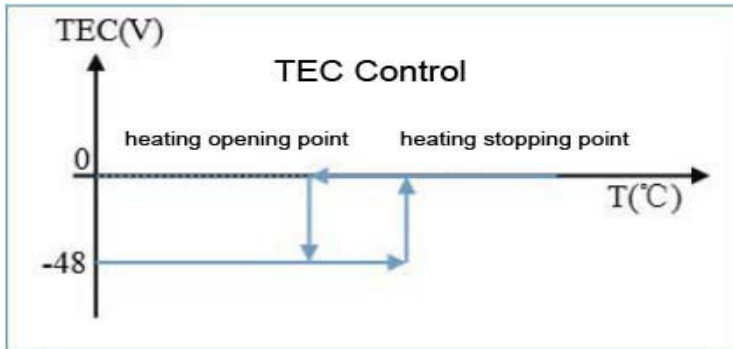
## 4.3 Heating

When temperature inside cabinet lower than the opening point of heating, the heating operation starts to run; when temperature higher than stopping point of refrigeration, it stops the refrigeration operate. When setting the point, the stopping point should be higher than the opening one.

### Heating operation parameter

Parameter	Default Vaule	Set Range	Description	Set Point Description
Heating opening point	5	[-10~20]	°C	The temperature point is set when the heating operation starts to run
Heating stop point	15	(-10~30)	°C	The temperature point is set when the heating operation stops to run

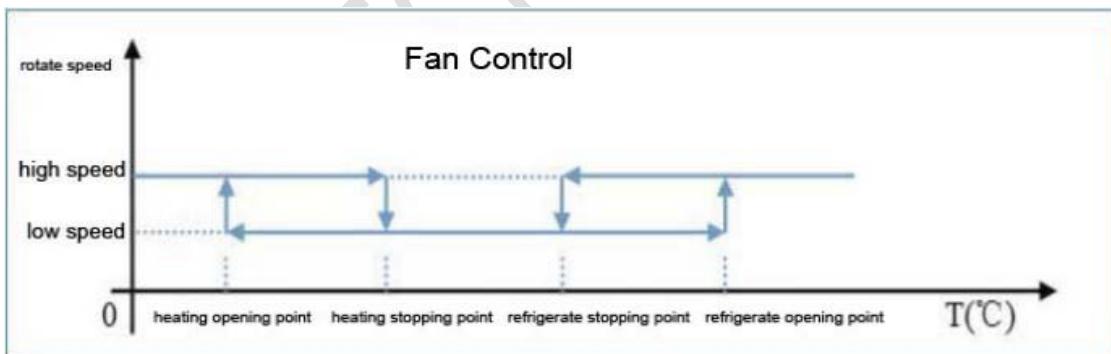
Heating running chart:



#### 4.4 Internal Recycle Fan Control

In the range of refrigerate point and heating point, the internal recycle fan runs in a low speed. When the temperature reach refrigerate point or heating point, TEC start to work, the internal recycle fan runs in high speed.

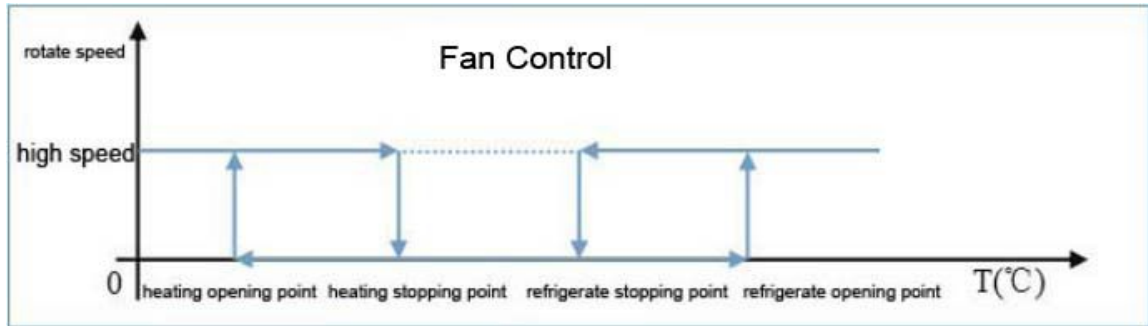
Internal recycle fan control chart:



#### 4.5 Extrinsic Cycle Fan Control

When the temperature reach refrigerate point or heating point, TEC start to work, the extrinsic cycle fan runs in high speed.

Extrinsic cycle fan control chart:



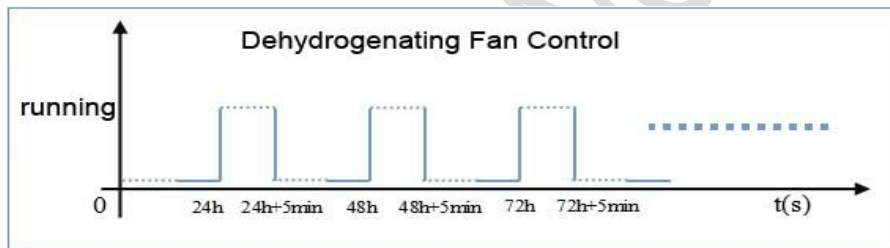
#### 4.6 Dehydrogenating Fan Controlling

The dehydrogenating fan output can be with DC exhaust fan. The time for dehydrogenating is 5minute, time interval is adjustable within 24 hours.

dehydrogenating parameter setting

Parameter	Default Value	Set Range	Description	Set Point Description
dehydrogenating period	24	[1-24]	hours	dehydrogenating period of start-up
dehydrogenating working time	5	[1-30]	minutes	dehydrogenating opening time

dehydrogenating fan working control chart



#### 4.7 Fault Alarm

The temperature control system has the function of fault detection and fault alarm. Below is the condition and phenomenon for alarm:

Parameter	Default Value	Set Range	Unit	Description	External Fan	The Reaction of TE When Alarming
high temperature alarm	55	[30 -55]	°C	trigger point of high temperature alarm	Keeping working	Keeping working
low temperature alarm	0	[-40 -10]	°C	trigger point of low temperature alarm	Keeping working	Keeping working
Internal recycle fan default alarm	--	--	--	/	Stop working	Stop working
Extrinsic cycle fan default alarm	--	--	--	/	Stop working	Stop working
TE module default alarm	--	--	--	/	Stop working	Stop working
Over voltage default alarm	58	--	--	Voltage input ≥ 58VDC	Keeping working	Keeping working



<b>Under voltage default alarm</b>	39	--	--	Voltage input $\leq 39VDC$	Keeping working	Keeping working
<b>NTC sensor alarm</b>	--	--	--	Sensor fault	Keeping working	Keeping cooling

⚠️ If any of the above condition appears, the indicator light of alarm turn red.

Warning output: Divided into “relay dry contacts output” and “LED indicator light output”.

⚠️ Relay dry contacts please see the chapter of <temperature control system interface>.

⚠️ LED indicator light output please see the chapter of <LED indicator light>.

## 4.8 Remote Monitoring

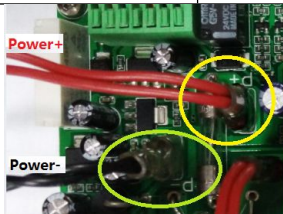
Temperature control system has the function of RS485 and remote monitoring, it can monitor the condition of temperature control system in real time through remote monitor software.

## 5 Temperature Control System Interface

### 5.1 Power Interface

The chart below, you can find the definition of power interface, and also please consult the picture below.

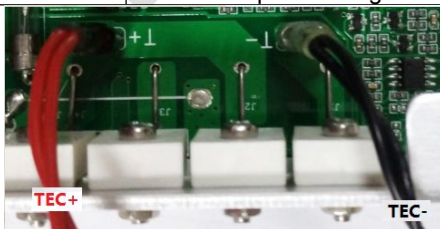
Interface Name	Interface Function	Wire Specification	Remarks
Power+	The DC Power input into positive plate	18AWG Red	
Power-	The DC Power input into negative plate	18AWG Black	



### 5.2 TEC Interface

According to the chart below, you can find the definition of TEC interface, and also please consult the picture below.

Interface name	Interface function	Wire specification	Remark
TEC+	TEC input into positive electrode	18AWG Red	
TEC-	TEC input into negative electrode	18AWG Black	



### 5.3 Fan Interface

According to the chart below, you can find the definition of Fan interface, and also please consult the picture below.

Interface Name	Interface Function	Wire Specification	Remark
Internal Fan+	The fan interface input into positive electrode	RED	Internal Circulation(Third from right)
Internal Fan PWM	Fan speed-transfer	BLUE	Internal Circulation(First from right)
Internal Fan FG	Fan speed test	YELLOW	Internal Circulation(Fourth from right)
Internal Fan-	The fan interface input into negative electrode	BLACK	Internal Circulation(Third from right)
External Fan+	The fan interface input into positive plate	RED	Extrinsic cycle(Fourth from left)
External Fan PWM	Fan speed-transfer	BLUE	Extrinsic cycle(First from left)
External Fan FG	Fan speed test	YELLOW	Extrinsic cycle(Second from left)
External Fan-	The fan interface input into negative plate	BLACK	Extrinsic cycle(Third from left)





#### 5.4 Other Interfaces


Other interfaces including NTC, default dry contacts, hydrogen discharging interface. According to the chart below, you can find the definition, and also please consult the picture below.

Interface name	Interface function	Wire specification	Remark
Exhausting Fan-	dehydrogenating fan input into negative electrode	BLACK	First from left
Exhausting Fan+	dehydrogenating fan input into positive electrode	RED	Second from left
ALM-	Alarming dry contact	BLUE	
	/		
ALM+	Alarming dry contact	RED	
NTC-	NTC Sensor Interface	BLACK	
NTC+	NTC Sensor Interface	BLACK	



 To refrigerated cabinet without storage battery, the dehydrogenating fan interface can be ignore.

 Without connecting to the alarm interface, it has no effect on the function of temperature system.

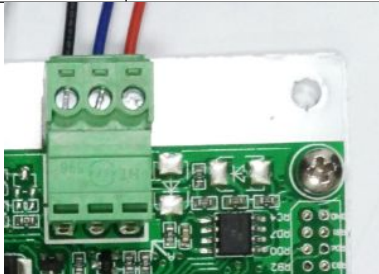
 Dry contact refers to passive output. Just relay switching. The mode of connection please see “TM 4810034 Temperature control system connection diagram”

#### 5.5 Remote Control Interface

According to the chart below, you can find the definition of remote control interface, and also

please consult the picture below.

Interface Name	Interface Function	Wire Specification	Remark
A	RS485 differential positive electrode	RED	
B	RS485 differential negative electrode	BLUE	
GND	Ground Wire	BLACK	can be left open



## 6 LED Indicator Light

There are two kinds of color on the control panel, below is the definition:

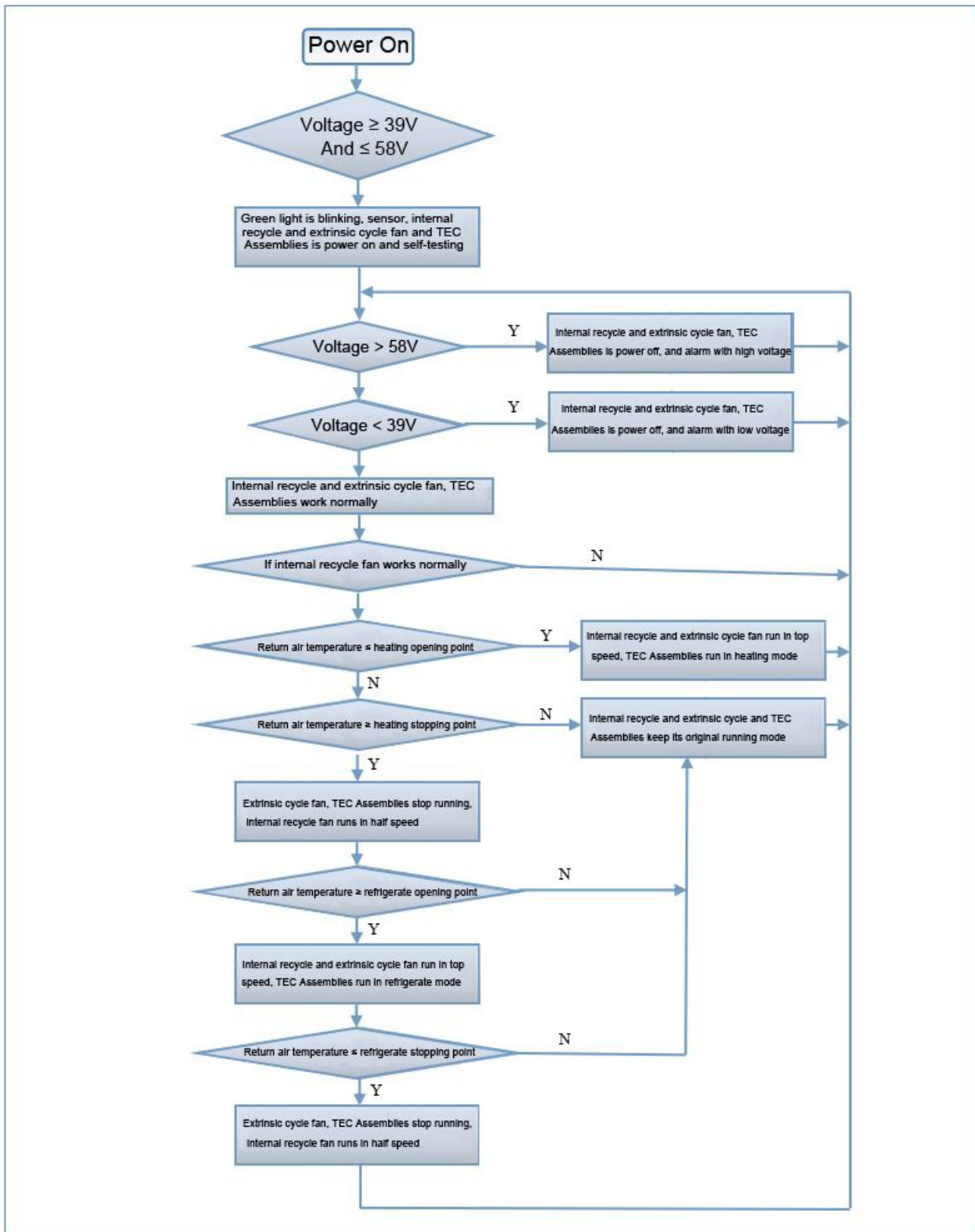
LED	Statements	Colors	Indicator status	Definition
Power indicator light	Normal operation	Green	Flashing	Self test/Normal operation
			OFF	Power-down/default
Alarm indicator light	Alarm	Red	Flashing	Default
			OFF	Power-down/without alarming

## 7 Product Usage

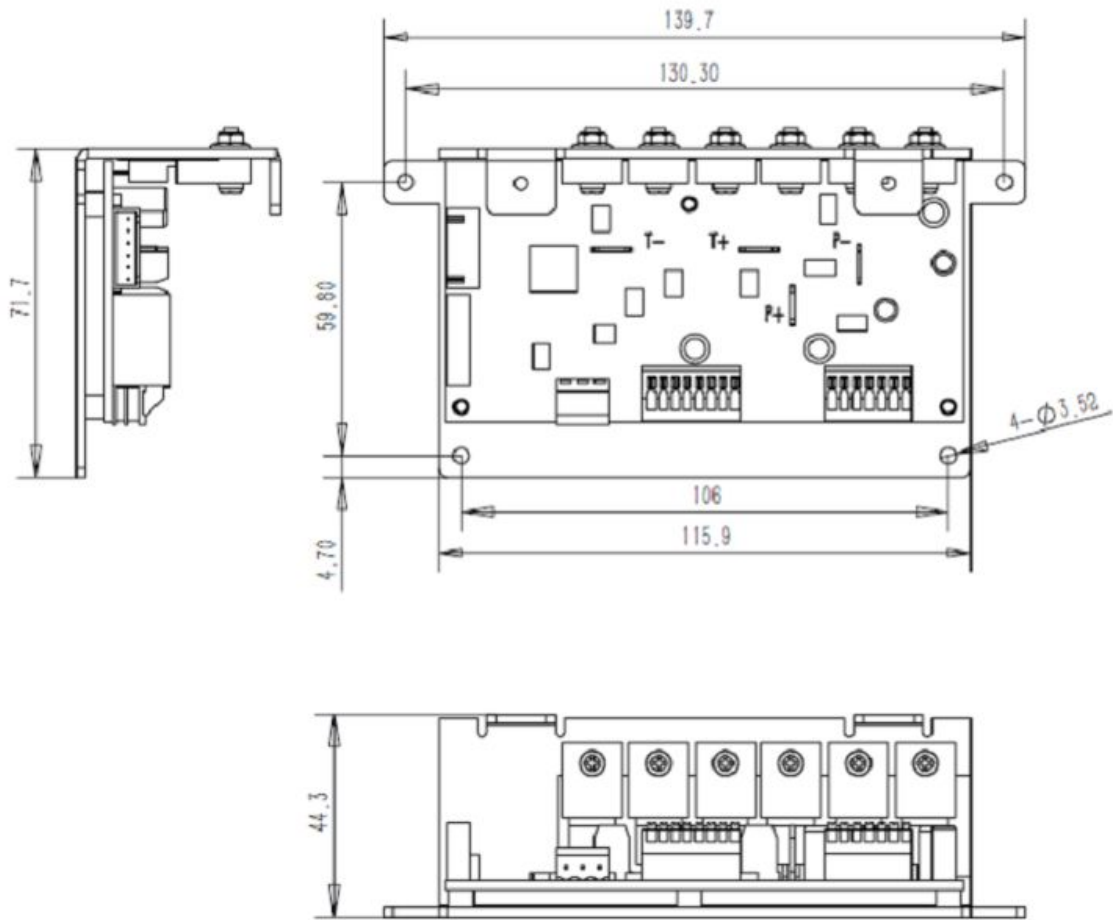
- 1、Interface Operation(Reserved)
- 2、Remote Control Operation

Refer to “TM temperature controlling system instruction manual”

## 8 Operation Flow Chart



## 9 Dimension Size Chart



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