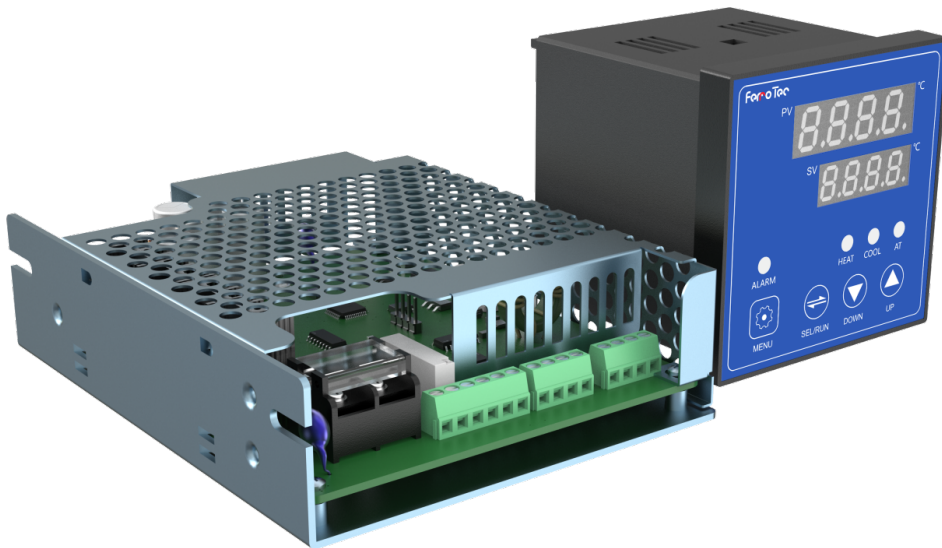


# Product introduction manual

Product name                    TEC temperature controller  
Model number                 FCSE48201- 1A01/4D01



## Product overview

Semiconductor refrigeration thermostat , mainly for the precise control of TEC refrigeration, cooling plates and hot plates systems 。 The user can set the relevant temperature directly on the display panel, or connect to the system host for remote control. This product includes display and control modules, which can be optionally configured on request.

Products comply with the standards IEC60730-1,IEC60730-2-9.

## Application range

This product is mainly applied to temperature control of TEC, and also applicable to cooling systems containing TEC .

## Product options

Model number	Category		Size	Configuration option
FCSE48201-1A01	Control module	FCSE48221-1D01	132*104*34mm	<input type="checkbox"/> Control module
	Display module	FCSE48211-1A01	72*72*75mm	<input type="checkbox"/> Control module+ Display module
FCSE48201-4D01	Control module	FCSE48221-1D01	132*104*34mm	<input type="checkbox"/> Control module
	Display module	FCSE48211-4D02	72*72*75mm	<input type="checkbox"/> Control module+ Display module

## Control module basic technical indicators

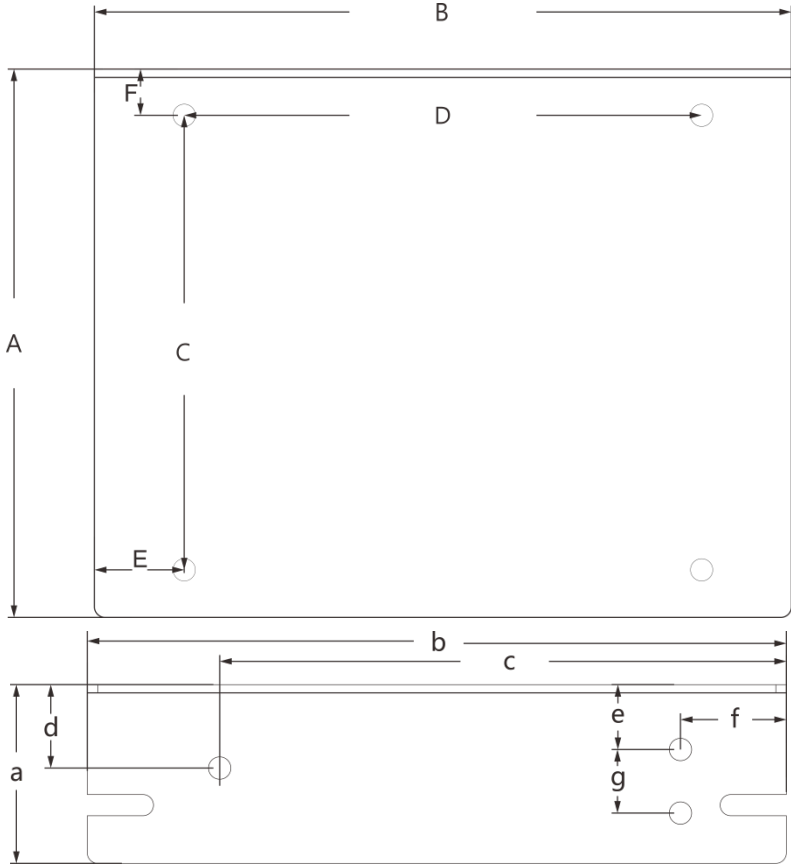
Control module model	FCSE48221-1D01
TEC input/output voltage	12~48V
PCB input voltage	12V
Rated high voltage drive current	0~20A
Temperature sensor	Four-wire PT100
Temperature detection resolution	0.01℃
Temperature stability	±0.02℃

## Control module key functions and parameters

Protection function	Short-circuit protection current 24A
	Overload protection current 20A
	Steady-state abnormal alarm
	Temperature overrun alarm
	Temperature protection switch input I/O
Operation control	PID autotuning + fuzzy control
	8-stage temperature programming
	Temperature compensation
	Power limit

Output I/O and communication interface	External alarm status output I/O
	External communication interface: RS485
Communication protocol	ModBus-RTU
Other	USB-TYPE-C firmware update interface
	Support the upper computer software

# Control module size

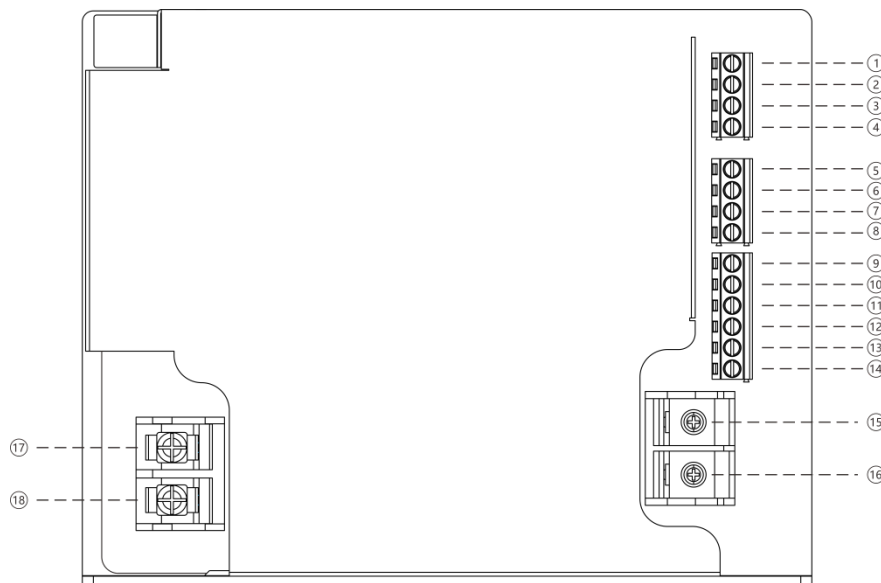


Sign	A	B	C	D	E	F
Size (mm)	104	132	86	98	17	8.7

Sign	a	b	c	d	e	f	g
Size (mm)	34	132	107	15.8	12.3	20	12

To the bottom for reference.

# Control module electrical schematic



Labels correspond to pins

1	PT-	10	A1
2	PT-	11	AL
3	PT+	12	AL
4	PT+	13	TP
5	12V	14	TP
6	0V	15	TEC-
7	B2	16	TEC+
8	A2	17	DC+
9	B1	18	DC-

## Wiring instructions

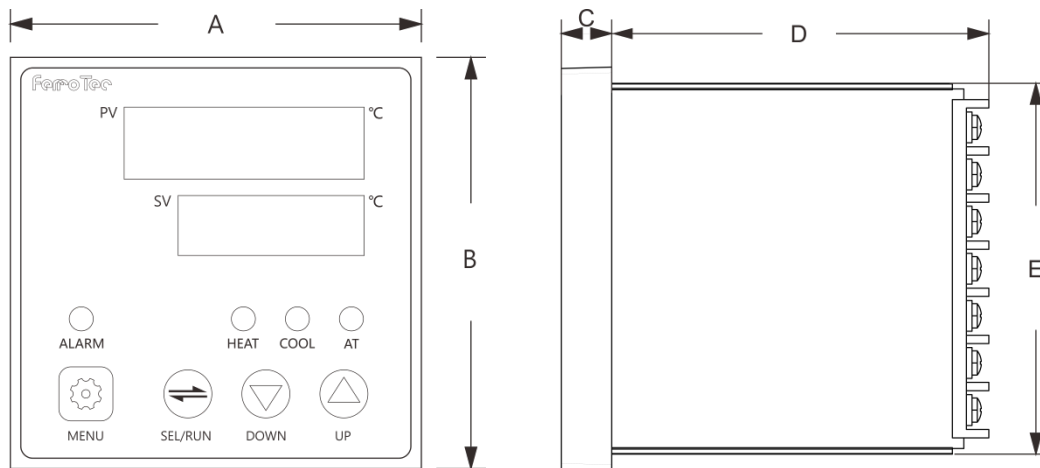
Power line connection	17-18 pins connect DC12~48V power input, pay attention to distinguish positive and negative;
	5-6 pins connect DC12V power input, pay attention to distinguish between positive and negative;
Communication line connection	7-8 pins connect a group of RS485 communication line to the display module, 9-10 pins connect a group of RS485 communication line client host computer, pay attention to distinguish positive and negative;

Alarm output connection	11-12 pins connect alarm output;
PT100 connection	1-4 pins connect PT100, pay attention to distinguish the color;
Temperature protection switch connection	13-14 pins connect temperature protection switch;
TEC connection	15-16 pin connect TEC, pay attention to distinguish positive and negative.

## Display module basic technical parameters

Display module model	FCSE48211-1A01	FCSE48211-4D02
Display digit	4	4
Display range	-1999~9999	-1999~9999
Set range	-1999~9999	-1999~9999
Communication interface	RS485	RS485
Input voltage	100V~240VAC 50/60Hz	18V~72VDC
Output voltage	12V DC	12V DC

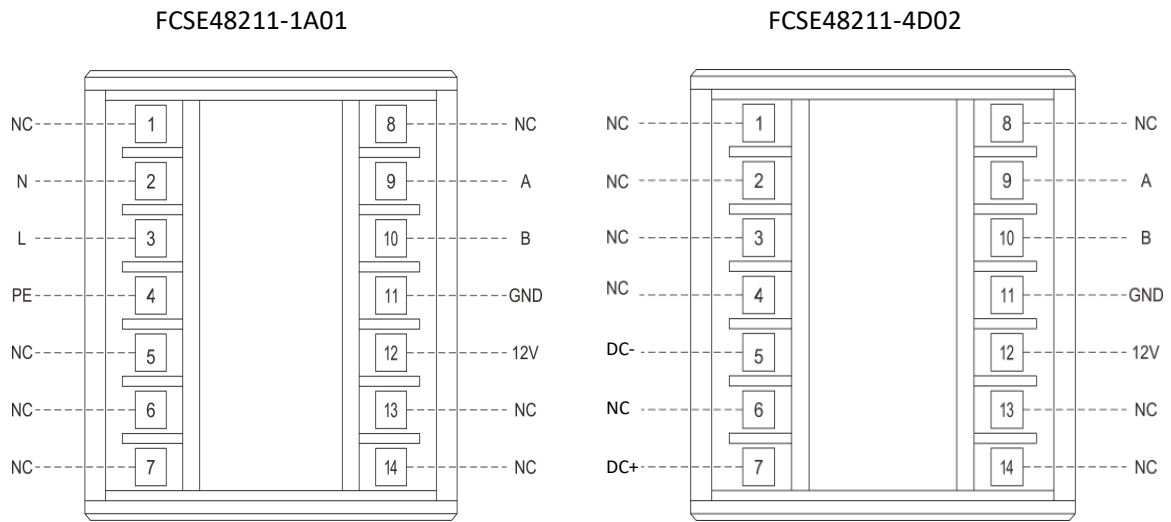
## Display module size



Sign	A	B	C	D	E
Size (mm)	72	72	8.8	65.2	68

Recommended size of installation holes:  $(68_{+0.5}) \times (68_{+0.5})$  mm

# Display module electrical schematic



## Wiring instructions

( FCSE48211-1A01 ) Power line connection	2-4 pins connect AC100~240V input, pay attention to distinguish the zero live wire;
	11-12 pins connect DC12V output, pay attention to distinguish between positive and negative;
( FCSE48211-4D02 ) Power line connection	5/7 pins connect DC18~72V input, pay attention to distinguish between positive and negative;
	11-12 pins connect DC12V output, pay attention to distinguish between positive and negative;
Communication line connection	9-10 pins connect the RS485 communication cable, pay attention to distinguish positive and negative;
Other	Other pins are not connected.