

# Product introduction manual

Product name                   TEC temperature controller  
Model number                   FCSE48131-4D01



## 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

Category		Size (mm)	Configuration option
Control module	FCSE48131-4D01	72*72*75	<input type="checkbox"/>
Extended executive module	FCSE482E1-4D01 (20A)	100.7*71.2*48.2	<input type="checkbox"/>
	FCSE482E1-4D02 (40A)	100.7*92.2*39.2	<input type="checkbox"/>
	FCSE482E1-4D01 (40A , with fan)	138.1*120*101	<input type="checkbox"/>
	FCSE486E1-4D01 (60A , with fan)	168.1*120*101	<input type="checkbox"/>

## Control module basic technical indicators

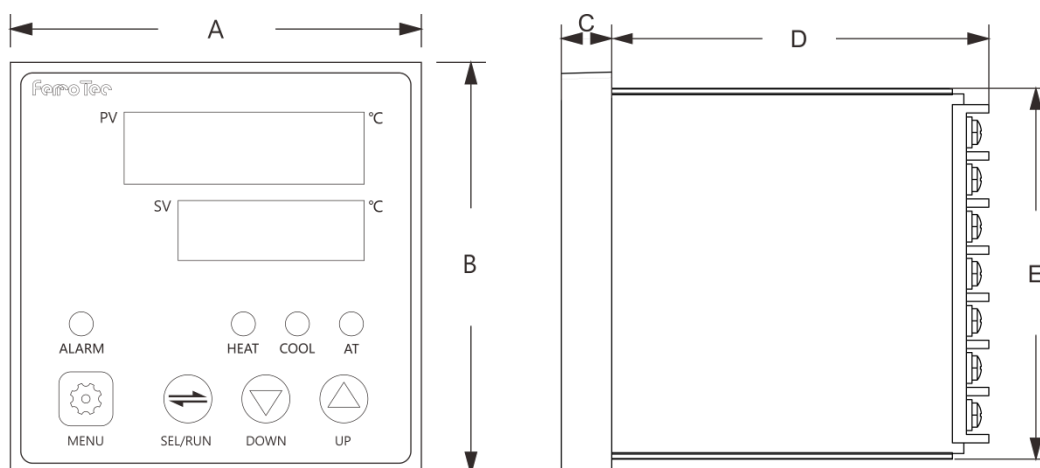
Control module model	FCSE48131-4D01
Display digit	4
Display range	-1999~9999 (-199.9~999.9)
Set range	-100~200 (-100.0~200.0)
Communication interface	RS485
Temperature sensor	NTC/TC/RTD
Temperature detection resolution	0.1°C
Temperature stability	±0.5°C
Input/output voltage	12~48V
Rated high voltage drive current	0~10A ※1

※1: The drive current can be increased to 20A or higher by expanding the execution module.

## Control module key functions and parameters

Protection function	Short-circuit protection current 15A
	Overload protection current 10A
	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	Alarm status output I/O
	External communication interface: RS485
Communication protocol	ModBus-RTU
Other	Support the upper computer software

## Control module size

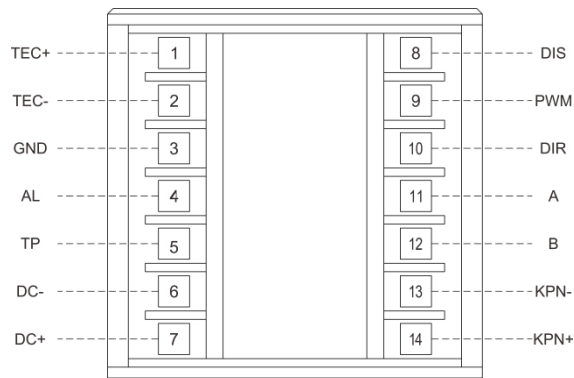


Sign	A	B	C	D	E
Size (mm)	72	72	8.8	65.2	68

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

# Control module electrical schematic

FCSE48131-4D01



## Wiring instructions

Power line connection	6-7 pins connect DC12~48V input, pay attention to distinguish between positive and negative;
TEC line connection	1-2 pins connect TEC, pay attention to distinguish between positive and negative;
Alarm output connection	3-4 pins connect alarm output, disconnect from GND when alarm occurs;
Temperature protection switch connection	3, 5 pin connect temperature protection switch, when not in use, need to short connect with GND;
Expand execution module connection	3, 8, 9, 10 pin connect the expansion executive module, and need to be increased when the current exceeds 10A;
Communication line connection	11-12 pins connect the RS485 communication cable, pay attention to distinguish positive and negative;
Temperature sensor connection	13-14 pins connect temperature sensor.

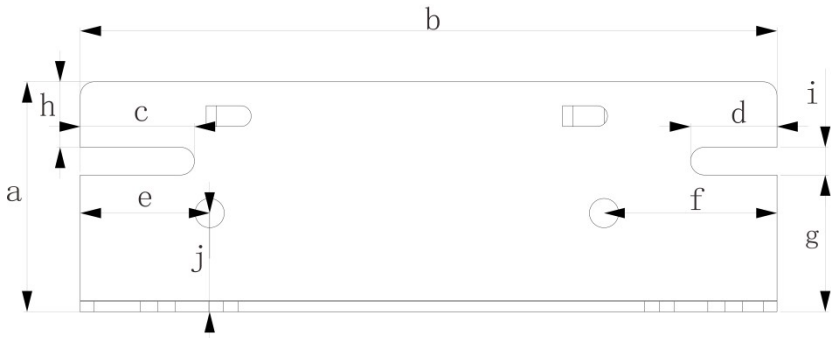
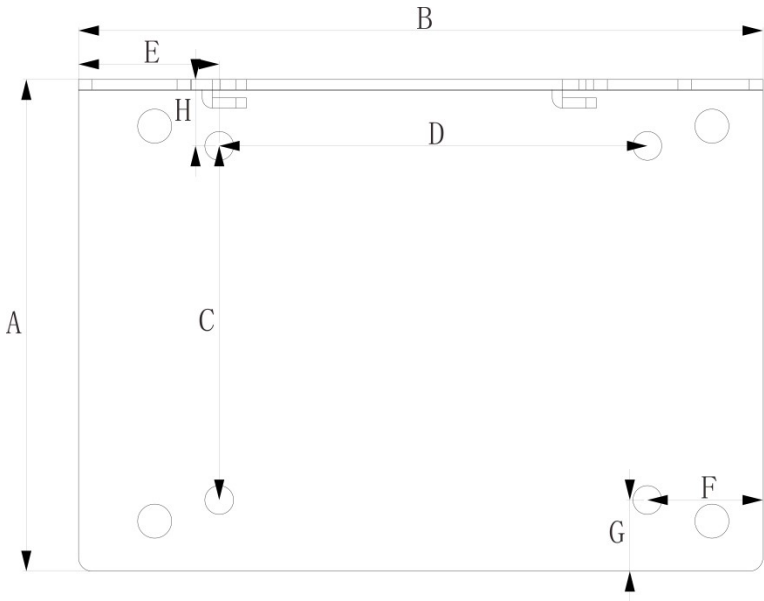
## Extended executive module basic technical parameters

Model	FCSE482E1-4D01	FCSE484E1-4D01 FCSE484E1-4D02	FCSE486E1-4D01
TEC input/output voltage	12~48V	12~48V	12~48V
TEC drive current	0~20A ※2	0~40A	0~60A

※2: When the current requirement is less than 10A, the control module can be used separately. When the current requirement is more than 10A, the control module + extended executive module can be used separately.

# Extended executive module size

FCSE482E1-4D01

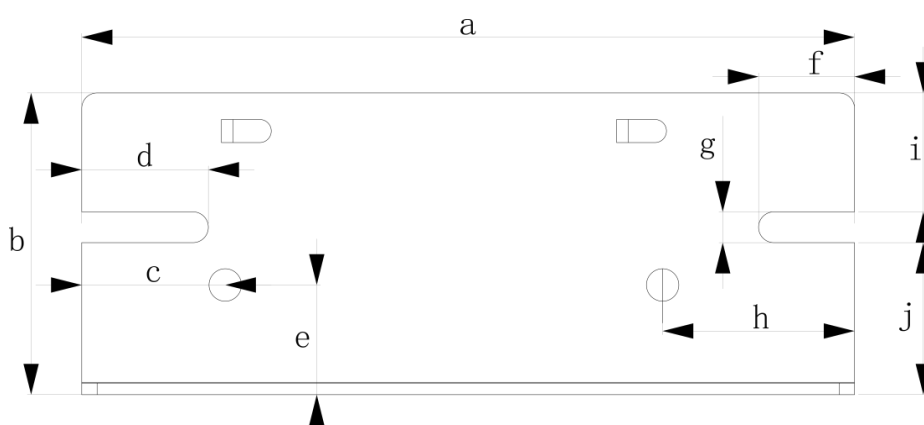
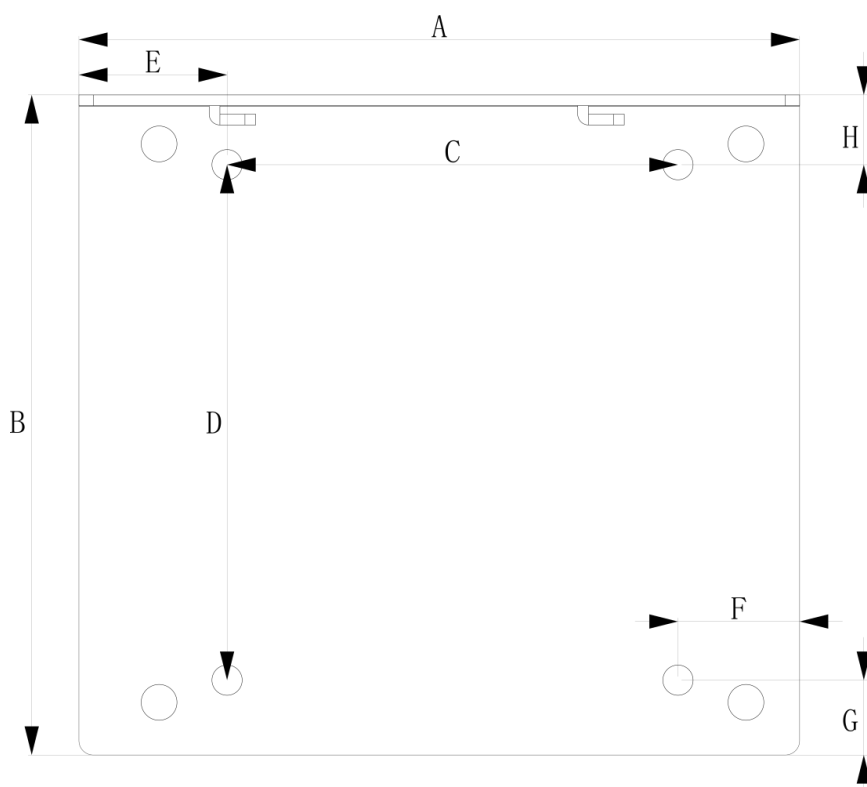


Sign	A	B	C	D	E	F	G	H
Size (mm)	72.2	100.7	52	63	20.7	17	10.45	9.75

Sign	a	b	c	d	e	f	g	h	i	j
Size (mm)	33.2	100.7	16.5	12.5	18.7	25	19.75	9.45	4	14.25

To the bottom for reference.

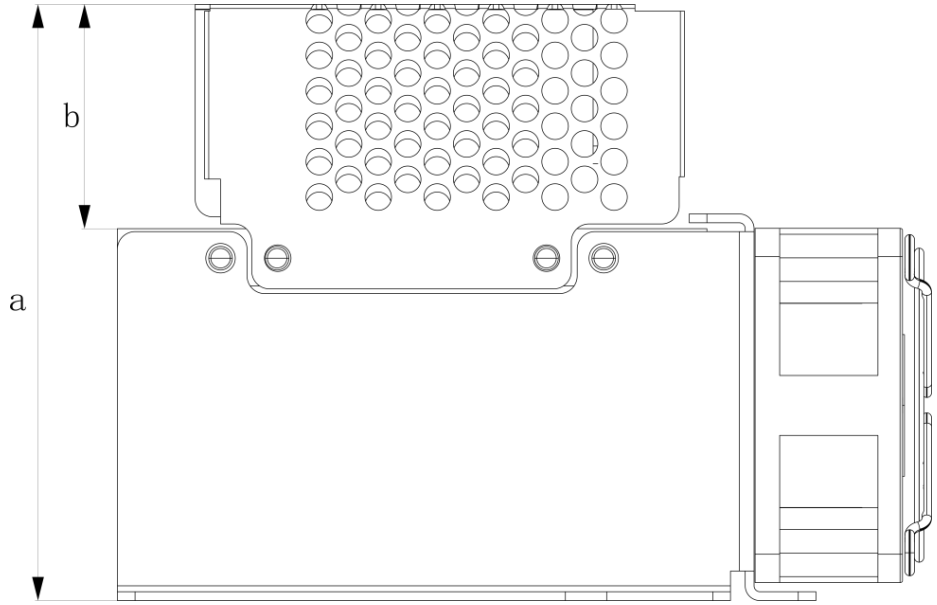
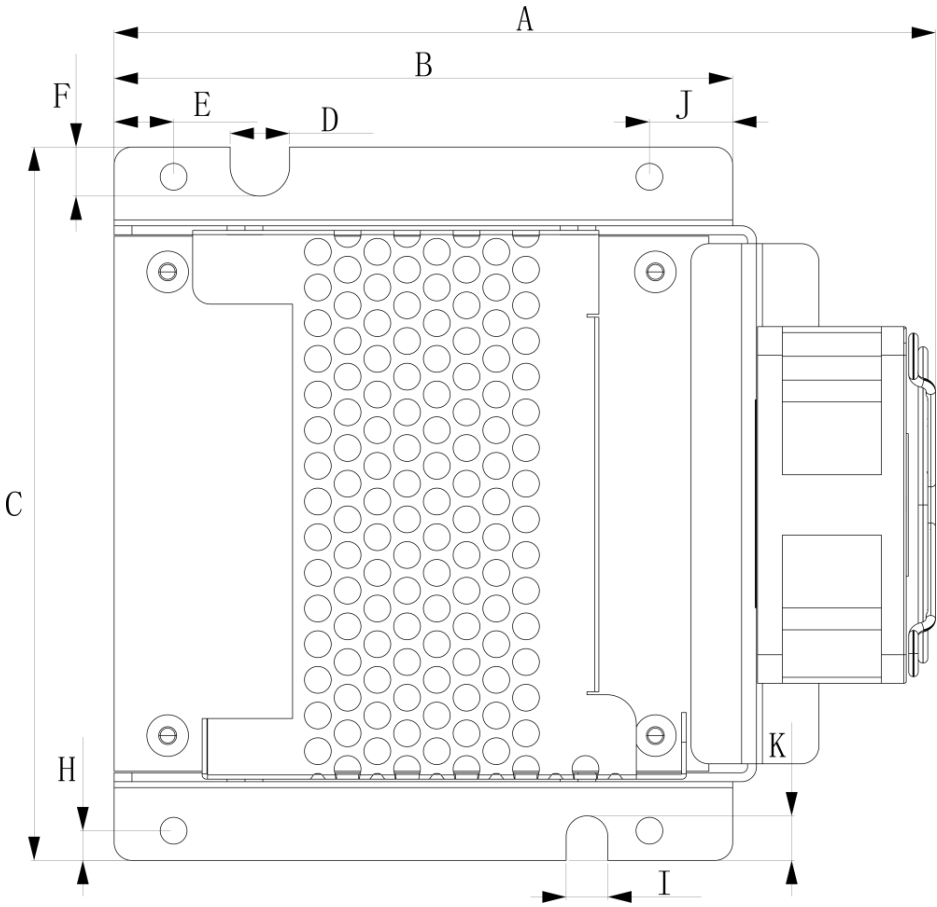
**FCSE484E1-4D02**

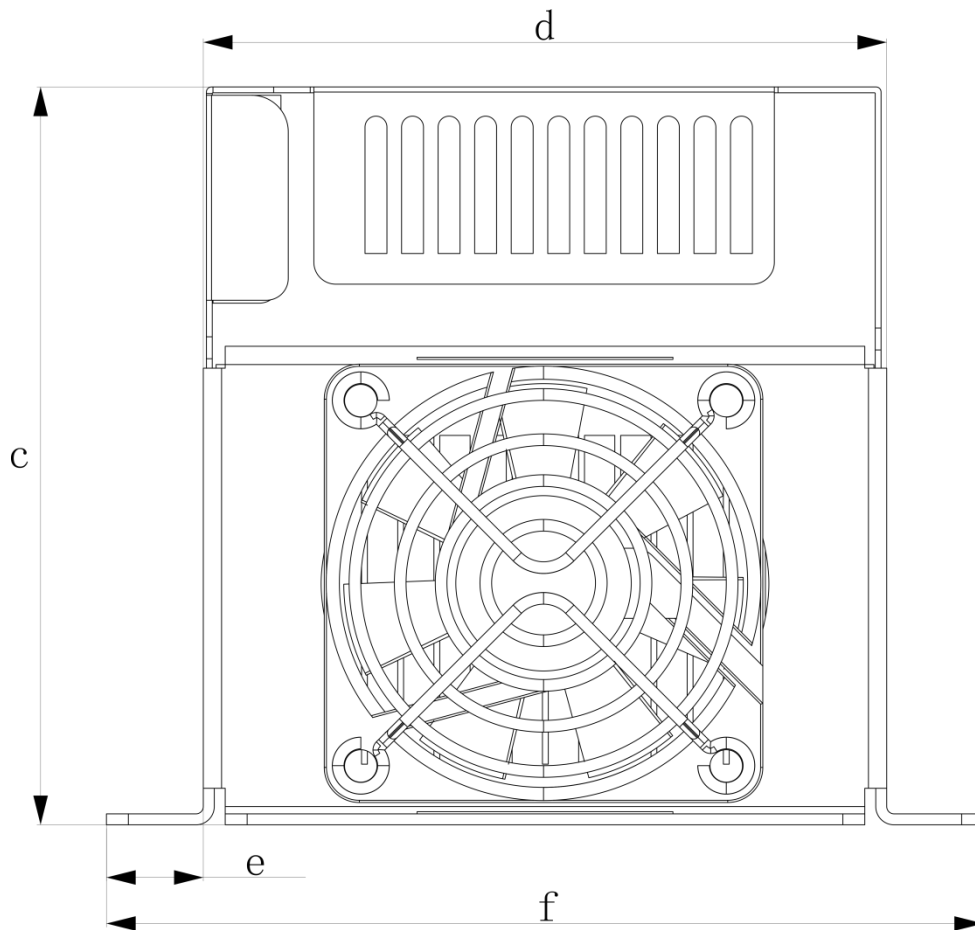


Sign	A	B	C	D	E	F	G	H
Size (mm)	100.7	92.2	63	72	20.7	17	10.45	9.75

Sign	a	b	c	d	e	f	g	h	i	j
Size (mm)	100.7	39.2	18.7	16.5	14.25	12.5	4	25	15.45	19.75

**FCSE484E1-4D01 Heat dissipation with fan**

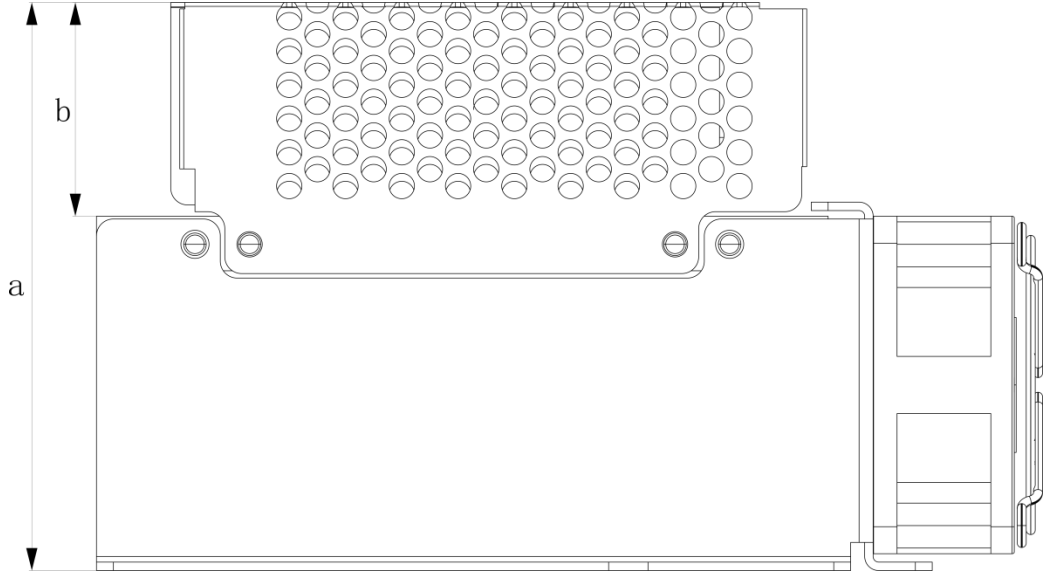
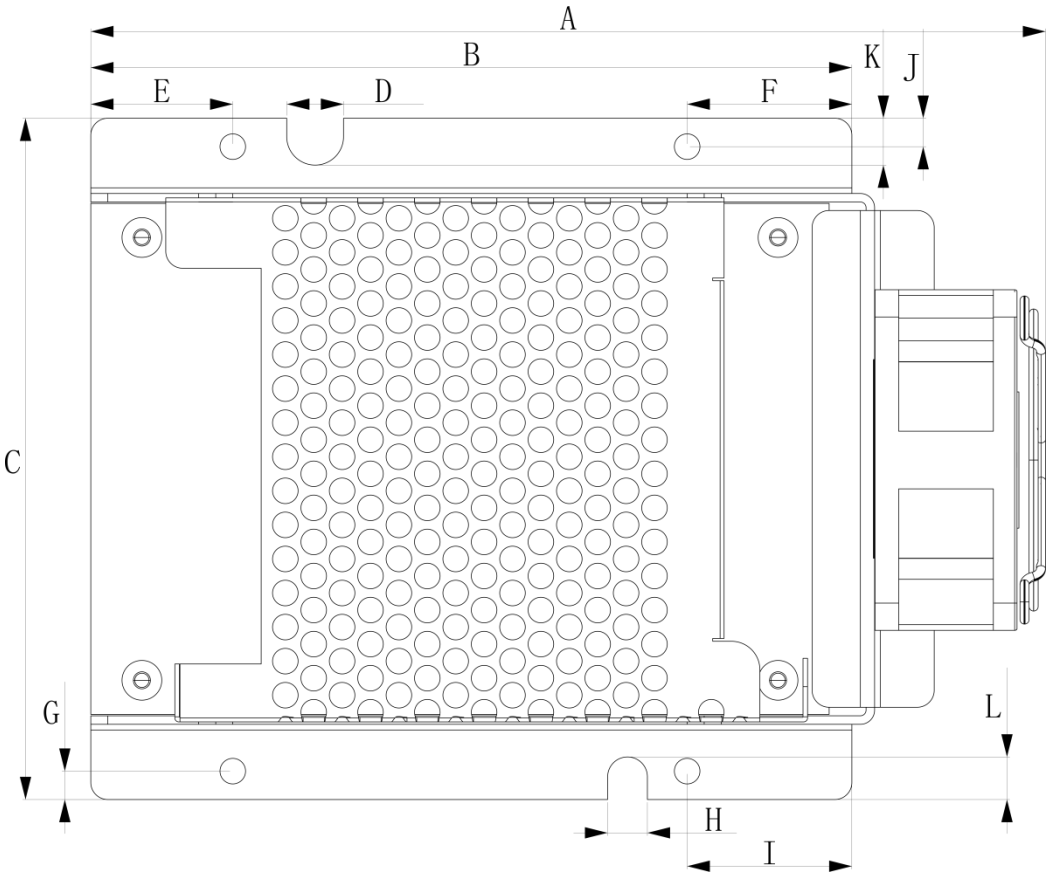


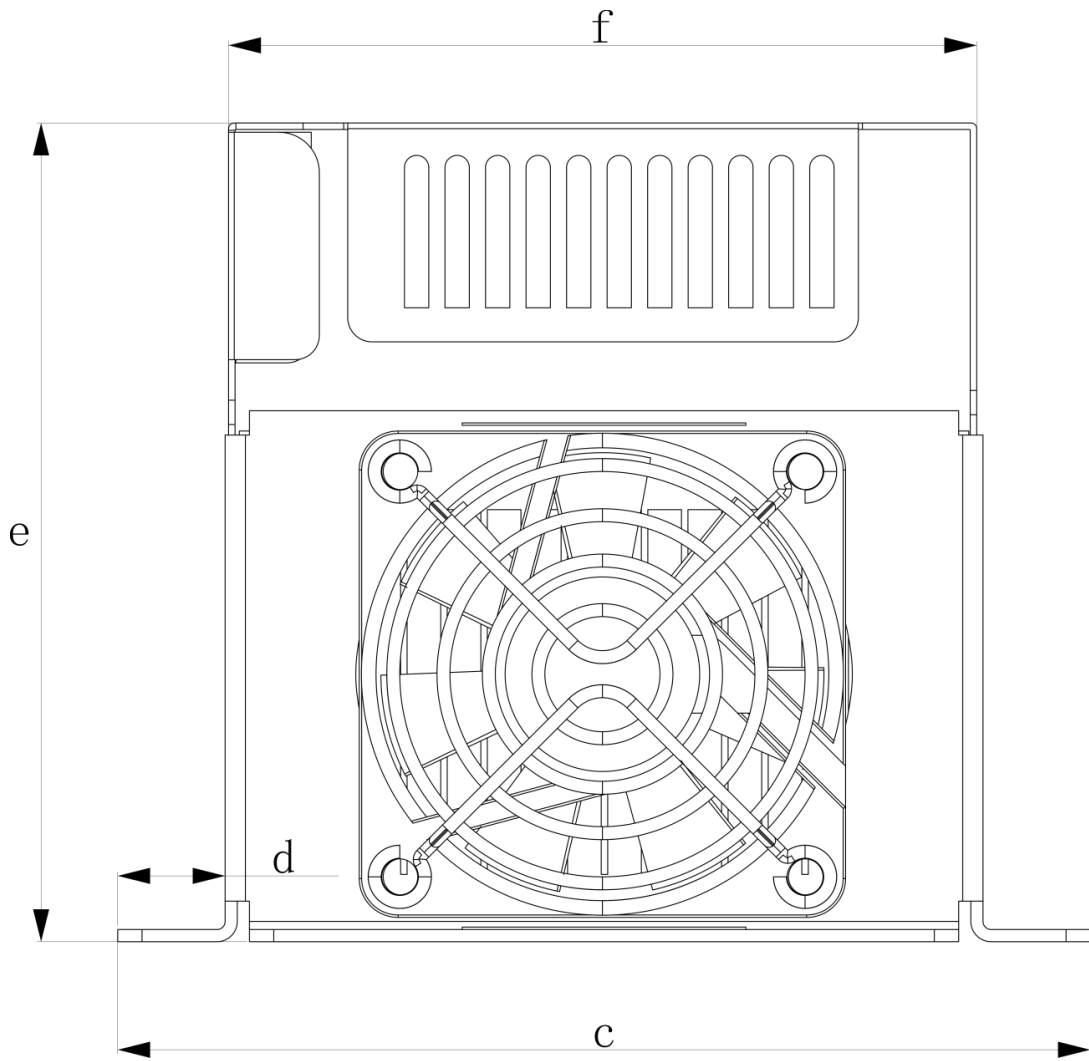


Sign	A	B	C	D	E	F	H	I	J	K
Size (mm)	138.1	104	120	10	10	8.25	5	7	14	7

Sign	a	b	c	d	e	f
Size (mm)	101	38	101	93.5	13.25	120

**FCSE486E1-4D01 Heat dissipation with fan**

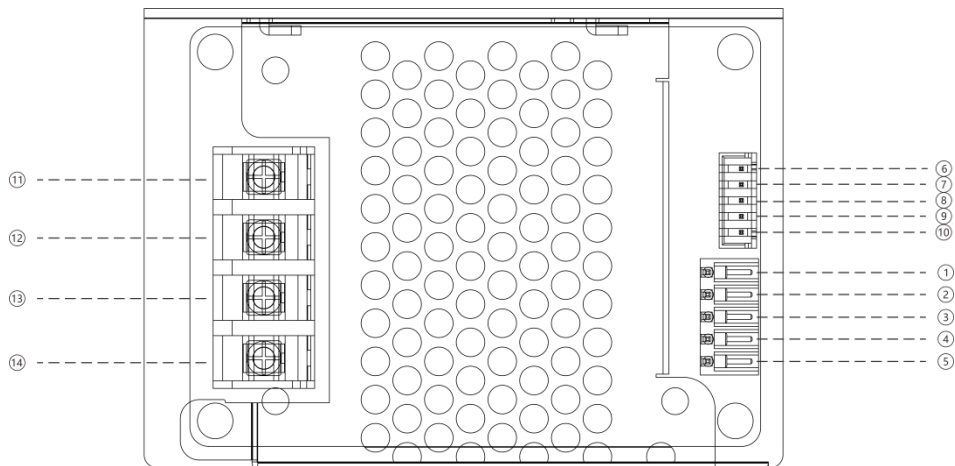




Sign	A	B	C	D	E	F	G	H	I	J	K	L
Size (mm)	168.1	134	120	10	25	29	5	7	29	5	8.25	7.5

Sign	a	b	c	d	e	f
Size (mm)	101	38	120	13.25	101	92.3

# Extended executive module electrical schematic



Labels correspond to pins

1/10	DIR	11	TEC-
2/9	PWM	12	TEC+
3/8	DIS	13	DC-
4/7	GND	14	DC+
5/6	DC+		

Wiring instructions

Power line connection	13-14 pins connect DC12~48V power input, pay attention to distinguish positive and negative;
Control line connection	1-5 or 6-10 pins connect control module;
TEC connection	11-12 pin connect TEC, pay attention to distinguish positive and negative.