

## FAN SPEED CONTROLLER

**P/N: FCXV12**

Suzhou CORESTAR Technology Co., Ltd

### Features

Model FCXV12, with plastic cover, is a speed controller suitable for industrial and refrigeration applications in particular to control the air flow in condensing process. By closing an external jumper, it is possible start the fan at the maximum speed for 10 seconds. The input signal can be configured as temperature probe NTC, 4/20mA or 0.5/4.5Vdc and 0/10Vdc signals.

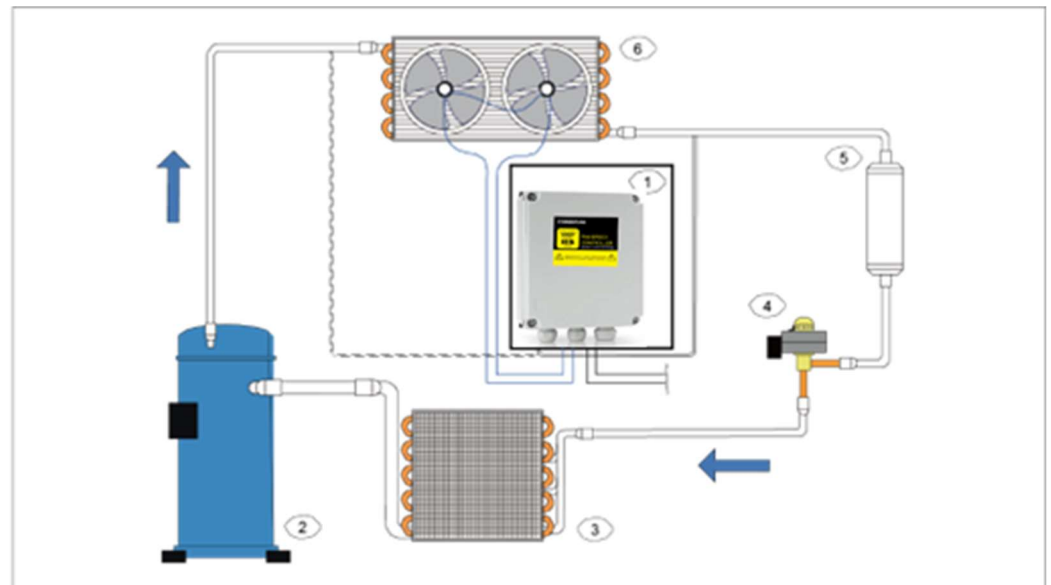
Thanks for build-in LED display and keypads, it is easy to configure the controller's running parameters.

It supports Modbus RTU too for more advanced usage.



### Typical application

1. FCXV12
2. Compressor
3. Evaporator
4. EEV
5. Receiver
6. Condenser



### Technical Specifications

**Housing:** ABS

**Protection degree:** IP 55

**Power supply:** 400Vac,  $\pm 10\%$  50Hz.

**Power absorption:** 5VA max.

**Nominal current:** 12A.

Maximum current: 25A(10S)

**Inputs:** NTC or 4/20mA or 0.5/4.5V and 0/10Vdc.

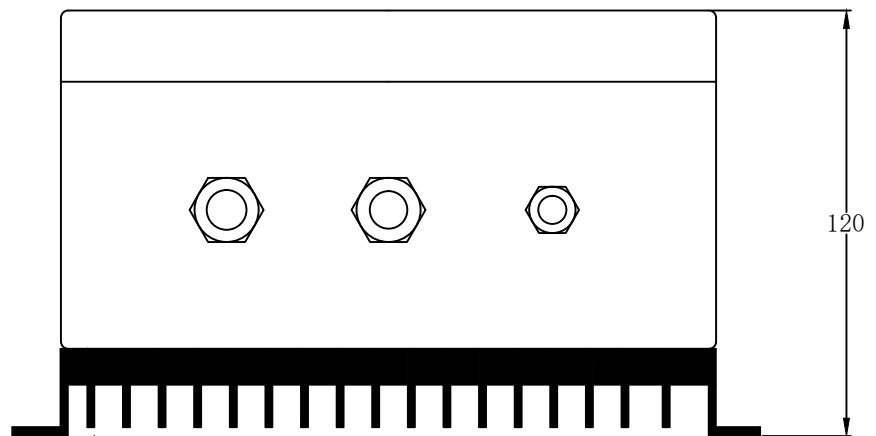
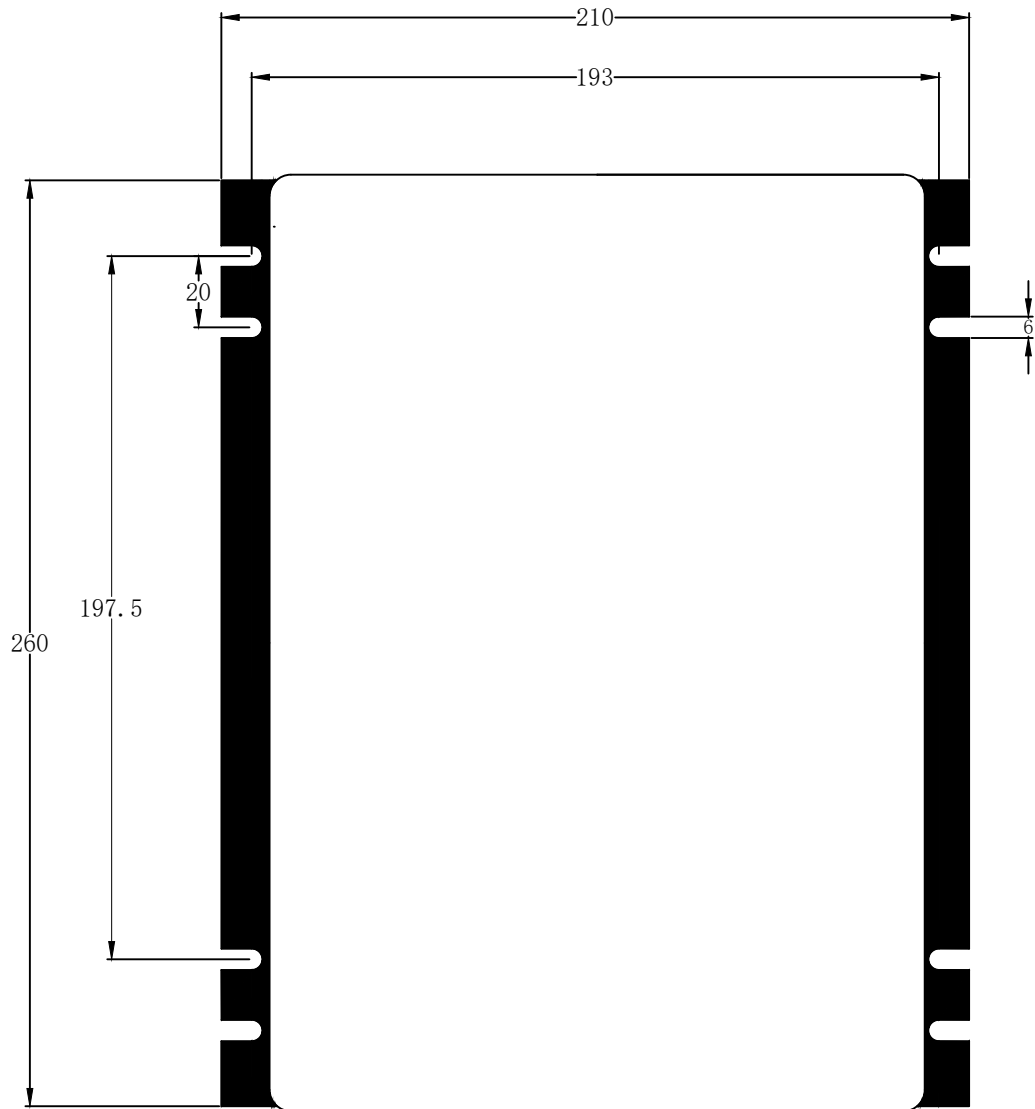
**Range:** depending on the probe.

**Operating temperature:** -20~50 °C.

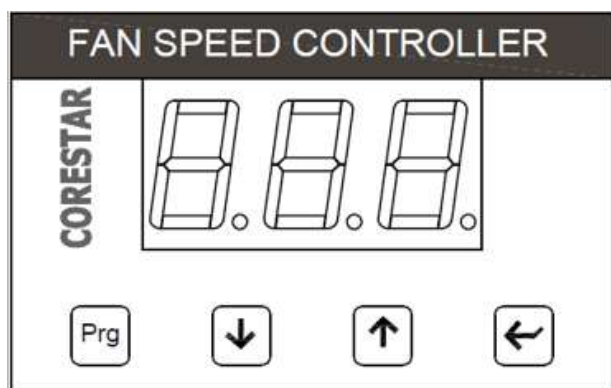
**Storage temperature:** -30~70 °C.

**Relative humidity:** <90% (not condensing).

Dimensions (unit: mm)

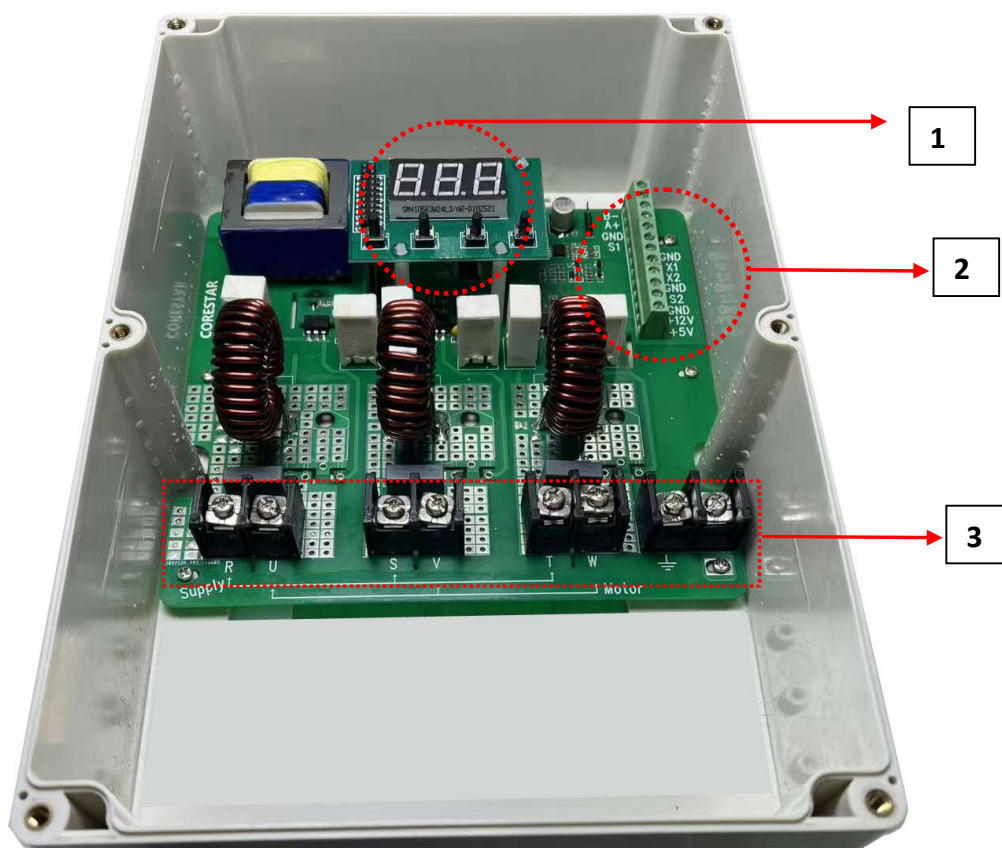


## LED display icons and keys definition



Key	Short press	Long(3 seconds) press
	--discard modifications	
+		--Enter parameters settings (if not in edit mode) --exit parameters settings menu and save modifications (if in edit mode)
	-- Menu down -- Value decrease	--Value fast decrease
	--Menu up --Value increase	--Value fast increase
	--Save changes to RAM, will lose if reboot --show value --back to parameters' code	

## Functions explanation



### 1. Please refer to LED display icons and keys definition

### 2. Analogue and digital inputs

+5V	Power supply for Ratiometric type pressure sensor
+15V	Power supply for Current type pressure sensor
GND	Signal grounding
S1	NTC temperature probe(10K@25°C, B=3435)
S2	Pressure sensor or 0-10V or 4-20mA
X1	ON/OFF switch
X2	Full speed at startup switch
A+	RS-485 A+
B-	RS-485 B-

### 3. Power supply and load connections

Power supply	Motor
R	U
S	V
T	W

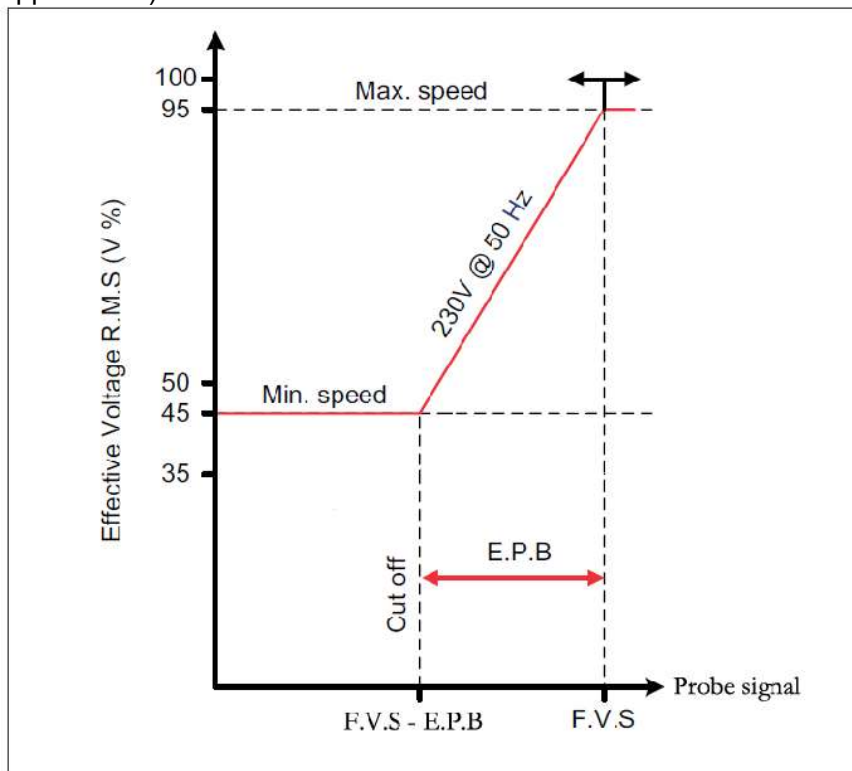
**NOTE:** please make sure connection is correct, if reversed the power supply input and motor output, will damage the controller

## Control principles

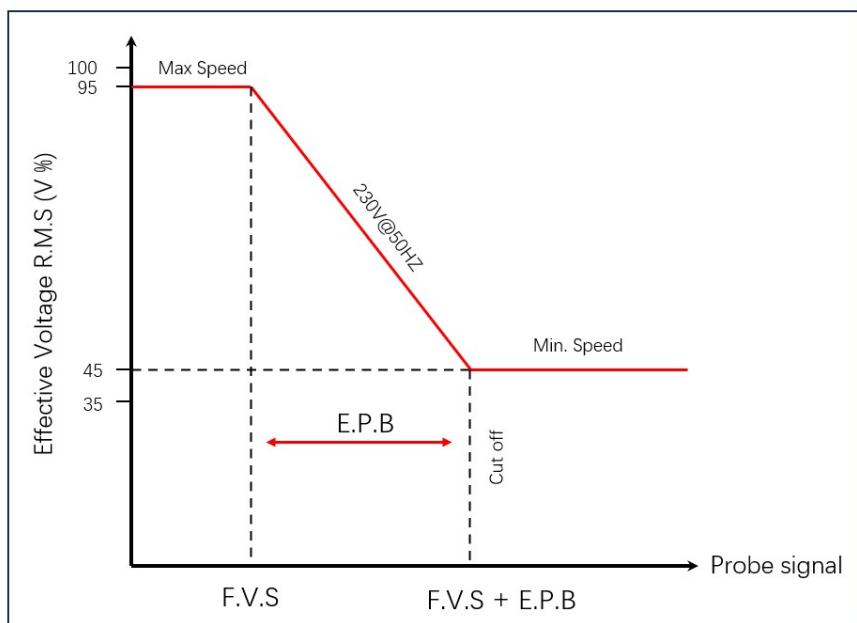
F.V.S = Full Voltage Set Point

E.P.B = Effective Proportional Band

**Direct action:** if the input signal increases, the voltage output proportionally increases (condensing or cooling applications).



**Inverse action:** if the input signal increases, the voltage output proportionally decreases (evaporating or heating applications).



## Minimum fan speed

To avoid that the fan can be damaged with low voltage output, it is suggested to set a minimum voltage (minimum speed). The range is selectable from 0 to 50% of the power supply

Fan can continuously run in minimum speed if set  $F_{11} = 1$ , when the voltage on the load is lower than min speed percentage.

## Cut-off function

This function can be enabled if set  $F_{11}$  to 0, The Cut-off function drastically reduces the output to 0V, when the voltage on the load is lower than min speed percentage.

Example: if min. speed set to 45% and  $F_{11} = 0$ , when the voltage on the load is lower than 45% of 230V, the fan immediately stopped.

## Remote on/off control

It is possible to start/stop the fan remotely by closing or opening the external jumper at terminals X1 and GND,

fore sure, you have to enable this function firstly by set  $dE = 1$

NOTE: X1 only support passive signal

## MAXIMUM FAN SPEED AT START UP

By closing the external jumper at terminals X2 and GND, each time the fan restarts, for 10 seconds it will run at maximum speed.

NOTE: X2 only support passive signal

## Fan Speed limitation

By configure  $F_{05}$  (fan minimum speed) and  $F_{07}$  (fan maximum speed), final user can limit the regulation speed

## Fan safety protection

To avoid that the fan can be damaged with frequently on/off, final user can set the  $F_{03}$  to NOT 0 value, the unit is second

## Alarms

Code	Why	Reset	Action	Check/Solutions
E01	NTC sensor short or broken	auto	Depends on $F_{08}$	Check wiring connections
E02	Pressure sensor short or broken	auto	Depends on $F_{08}$	Check wiring connections
E08	EEPROM machine parameters error	auto	Stop	Contact with Corestar
E09	EEPROM user parameters error	auto	Stop	Contact with Corestar

## Parameters list

Type	Code	Description	default	Min	Max	unit	R/W	modbus address
A	<i>SU</i>	probe signal reading	0	-199	800		R	1
I	<i>SPd</i>	fan speed output percentage	0	0	100	%	R	100
A	<i>Fv</i>	software version					R	9
D	<i>DO1</i>	remote on/off switch (OPN=off, CLO= on)	0	0	1		R	1
D	<i>DO2</i>	CLO=full speed at startup	0	0	1		R	2
A	<i>FUS</i>	Full Voltage Set Point	20	St0	St1		R/W	5
A	<i>EPb</i>	Effective Proportional Band	4	0.1	20		R/W	6
A	<i>St0</i>	Minimum setpoint	0	0	P04		R/W	7
A	<i>St1</i>	Maximum setpoint	0	P03	P04		R/W	8
I	<i>FO1</i>	control source: 0=NTC, 1=4~20mA, 2=0.5-4.5V, 3=0~10V, 4=Modbus	0	0	4		R/W	104
I	<i>FO2</i>	display index: 0=Fan speed output, 1=control source, 2=Din1, 3=Din2, 4=FVS, 5=software version	0	0	5		R/W	106
I	<i>FO3</i>	fan safety protection interval	0	0	200	s	R/W	107
I	<i>FO4</i>	Action mode: 1=direct, 2=inverse	1	1	2		R/W	109
I	<i>FO5</i>	fan speed adjustment interval= value* 50ms	0	0	200	50ms	R/W	110
I	<i>FO6</i>	minimum fan speed	35	0	F07	%	R/W	111
I	<i>FO7</i>	Maximum fan speed	95	F06	100	%	R/W	112
I	<i>FO8</i>	fault behavior: 0= stop, 1~100=keep running speed	0	0	100	%	R/W	113
D	<i>FO9</i>	manual operation, 0=disable, 1=enable	0	0	1		R/W	3

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I	F10	manual speed set	0	0	100	%	RW	102
D	F11	low speed behavior, 0=cut off, 1= running at minimum speed	0	0	1		RW	4
I	C01	Modbus address	1	1	207		RW	105
I	C02	modbus parameters, see below note	4	0	17		RW	114
I	C03	fan speed set by Modbus Rtu	0	0	100	%	RW	101
A	P01	Probe calibration	0	-20	20		RW	2
I	PSd	password	22	0	200		RW	103
A	P03	pressure transducer range minimum	0	-199	P04	bar	RW	3
A	P04	pressure transducer range maximum	100	P03	800	bar	RW	4
I	P05	probe signal filter strength, the bigger, the stronger	4	1	15		RW	108
D	dE	remote on/off switch, 0=disable, 1=enable	0	0	1		RW	5

## NOTE:

1. A=analogue data, real value = (read value)/10.0,  
I=integer data, real value = read value  
D=digital data, real value = read value
2. modbus Rtu configure parameters see table 2

Table 2

index	baud rate	stop bit	parity
0	4800	2	None
1	9600	2	None
2	19200	2	None
3	4800	1	None
4	9600	1	None
5	19200	1	None
6	4800	2	Even
7	9600	2	Even
8	19200	2	Even
9	4800	1	Even
10	9600	1	Even
11	19200	1	Even
12	4800	2	Odd
13	9600	2	Odd
14	19200	2	Odd
15	4800	1	Odd
16	9600	1	Odd
17	19200	1	Odd

Default communication parameters:

baud rate: 9600, Parity: None, data bit: 8, stop bit: 1