CORESTAR

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FAN SPEED CONTROLLER

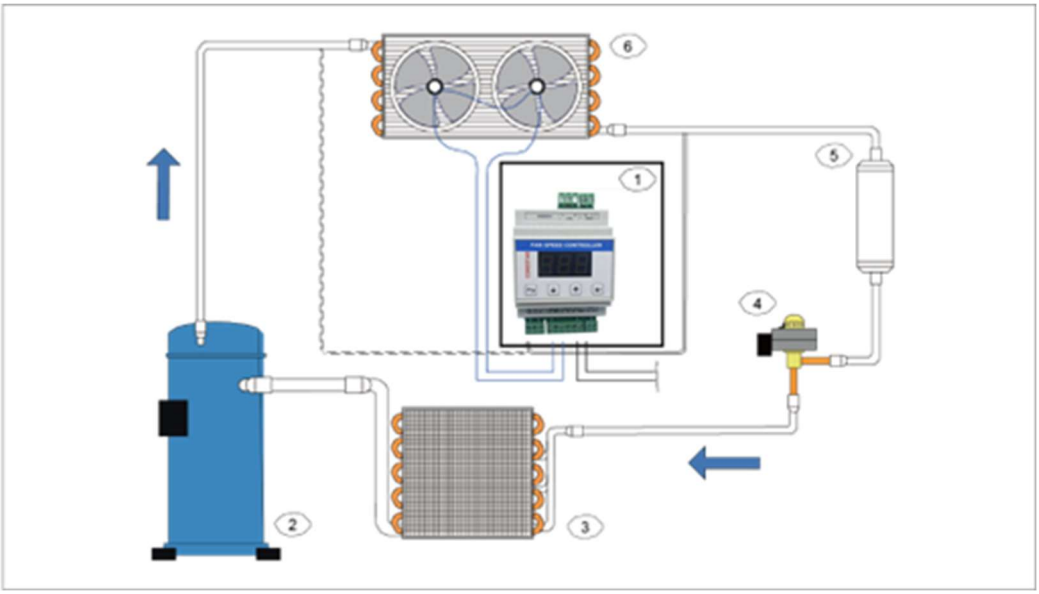
P/N：FCSV05	Suzhou CORESTAR Technology Co., Ltd

Features

Model FCSV05, din rail format, is a speed controller suitable for industrial and refrigeration applications in particular to control the air flow in condensing and evaporating processes. 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 useage.

Typical application

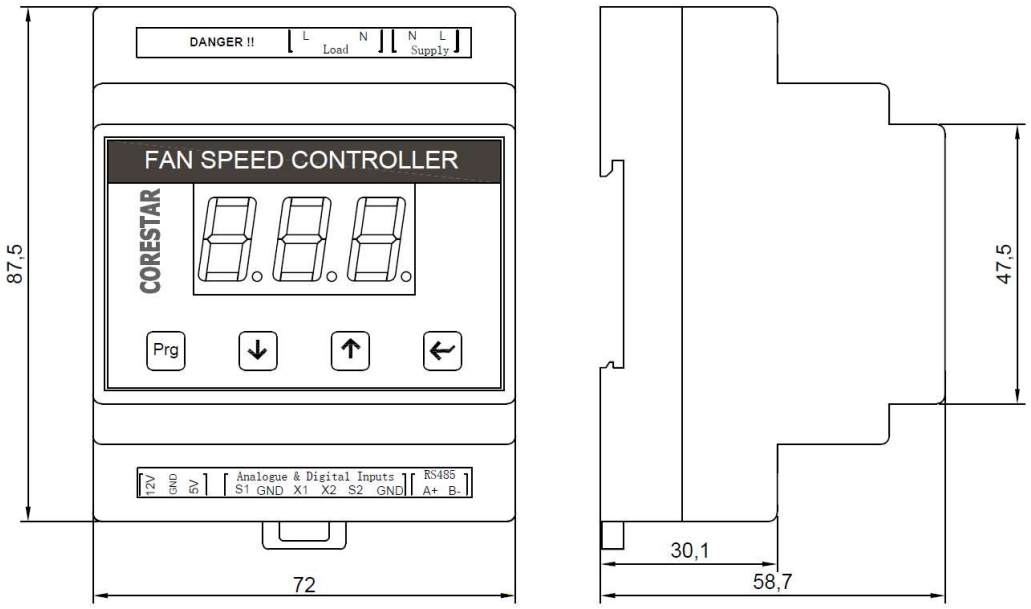
1. FCSV05
2. Compressor
3. Evaporator
4. EEV
5. Receiver
6. Condenser



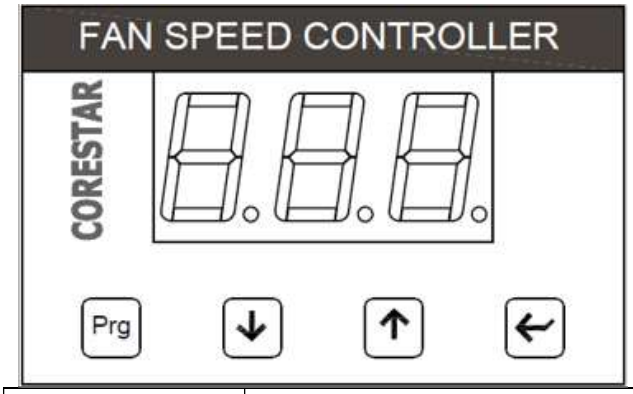
Technical Specifications

Housing: ABS
Mounting: DIN RAIL
Power supply: 230Vac, ± 10% 50Hz.
Power absorption: 3VA max.
Maximum load: 500W.
Inputs: NTC or 4/20mA or 0.5/4.5V and 0/10Vdc.
Range: depending on the probe.
Operating temperature: -25~60 °C.
Storage temperature: -35~85 °C.
Relative humidity: <90% (not condensing).

Dimensions（unit mm）

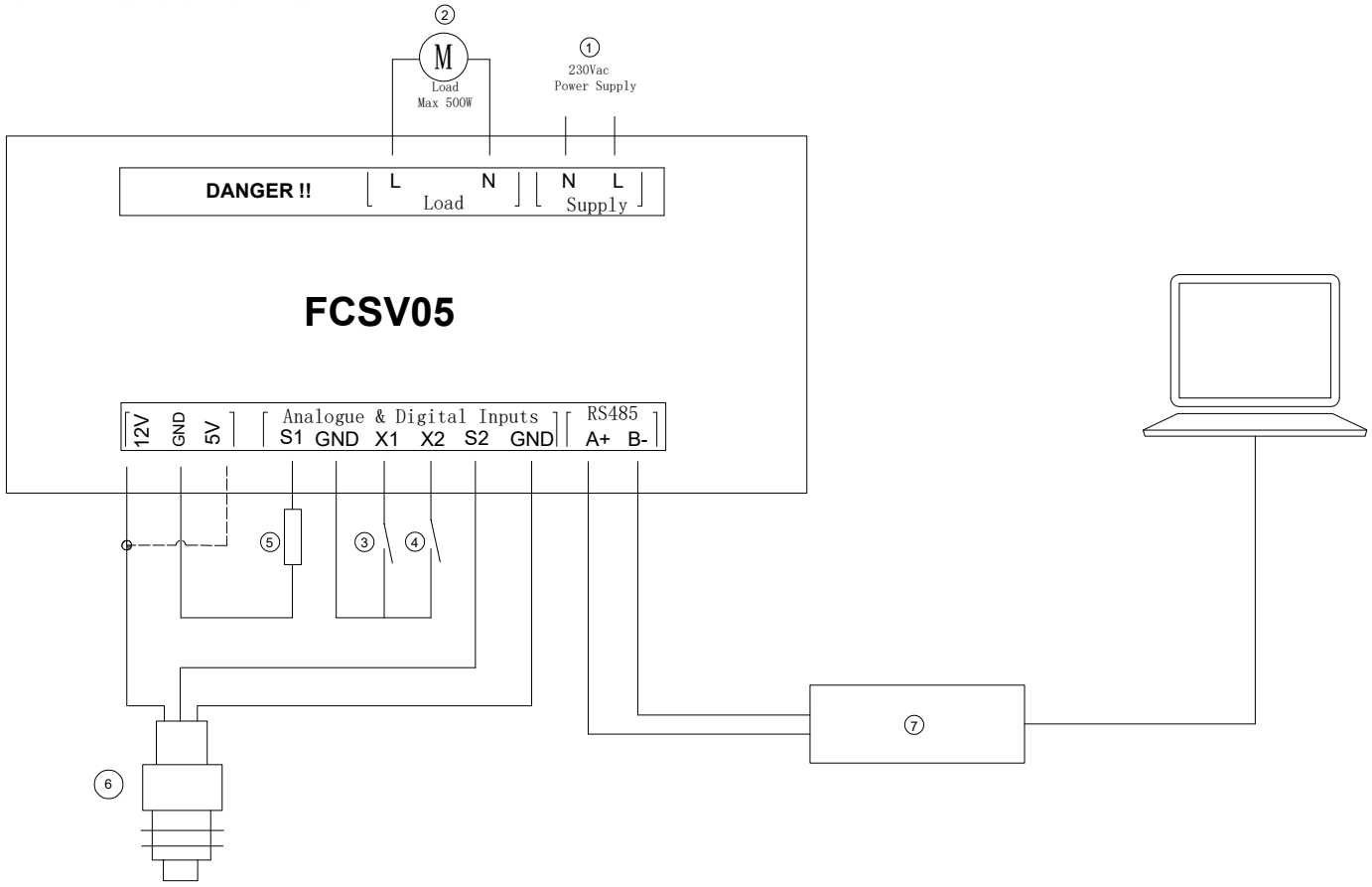


LED display icons and keys definition



Key	Short press	Long(3 seconds) press
Prg	--discard modifications	
Prg + ↵		--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	

Connections



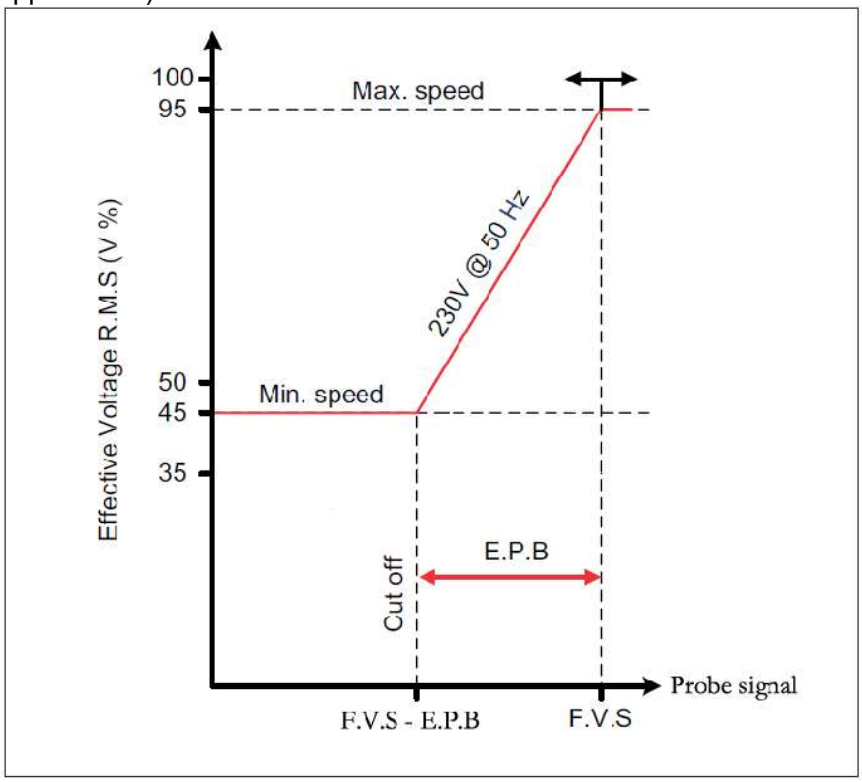
Code and meaning	
1	230Vac power supply
2	load, max 500W
3	remote on/off switch
4	Full speed at startup swtich
5	NTC temperature probe
6	pressure transducer
7	USB-to-RS485 adapter

Control principles

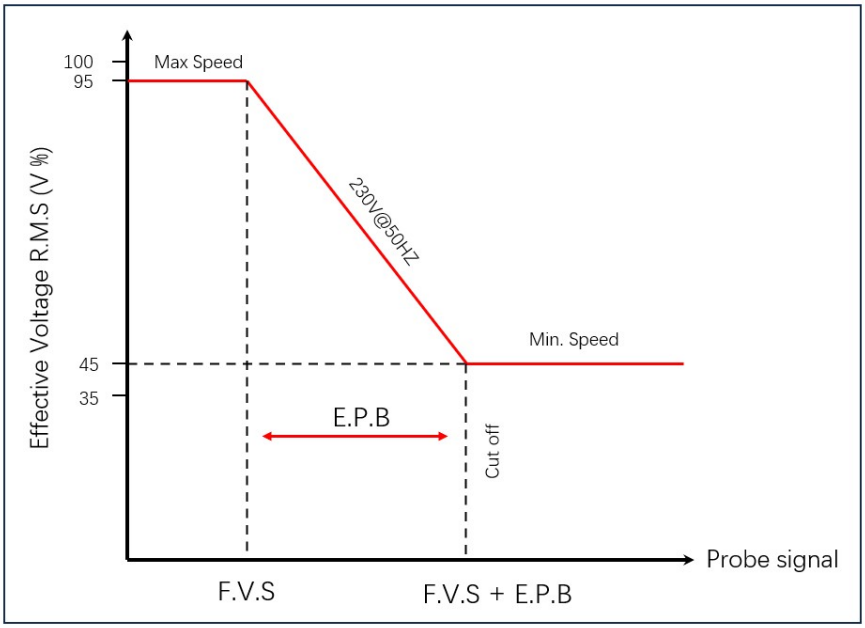
F.V.S = Full Voltage Set Point

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 F11 =1, when the voltage on the load is lower than min speed percentage.

Cut-off function

This function can be enabled if set F11 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 F11 = 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 F06 （fan minimum speed） and F07 （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 F03 to NOT 0 value, the unit is second

Alarms

Code	Why	Reset	Action	Check/Solutions
E01	NTC sensor short or broken	auto	Depends on F08	Check wiring connections
E02	Pressure sensor short or broken	auto	Depends on F08	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 addrress
A	SU	probe signal reading	0	-199	800		R	1
I	SPd	fan speed output percentage	0	0	100	%	R	100
A	Fu	software version					R	9
D	d01	remote on/off switch（OPN=off，CLO= on）	0	0	1		R	1
D	d02	CLO=full speed at startup	0	0	1		R	2
A	FUS	Full Voltage Set Point	20	St0	St1		R/W	5
A	EPb	Effective Proportional Band	4	0.1	20		R/W	6
A	St0	Minimum setpoint	0	0	P04		R/W	7
A	St1	Maximum setpoint	0	P03	P04		R/W	8
I	F01	control source: 0=NTC, 1=4~20mA, 2=0.5-4.5V, 3=0~10V，4=Modbus	0	0	4		R/W	104
I	F02	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	F03	fan safety protection interval	0	0	200	s	R/W	107
I	F04	Action mode：1=direct，2=inverse	1	1	2		R/W	109
I	F05	fan speed adjustment interval= value* 50ms	0	0	200	50ms	R/W	110
I	F06	minimum fan speed	35	0	F07	%	R/W	111
I	F07	Maximum fan speed	95	F06	100	%	R/W	112
I	F08	fault behavior：0= stop, 1~100=keep running speed	0	0	100	%	R/W	113
D	F09	manual operation，0=disable，1=enable	0	0	1		R/W	3

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