EC fans speed controller

General description

The REFTECO EC fans speed controller is usually used on remote units such as dry coolers and aircooled condensers.

The controller manages the fan speed rotation based on inputs received through sensors such as temperature probe for dry cooler and pressure probe for condenser.

The standard electronic controller can manage the following power supply:

- 230V / 1ph, frequency 50 or 60Hz
- 400V / 3ph, frequency 50 or 60Hz

In the front panel there are the following main items:

- LCD display
- Control panel for setting parameters and reading information about inputs and outputs.

The controller can provide two control signals which can vary upon work cycles (set point) independent.

PTEC has two ModbusRTU channels transmission to communicate both with a supervision remote device, both for control a slave system of one or more loads.

The PTec electronic controller is normally used to control the speed of EC fans, pumps and centrifugal pumps equipped with inverter. The PTec operates on the basis of the inputs received through the measurements, the settings of the parameters values, the controlling I/O and the control panel. The control panel is used to set the parameters values and read the information about the unit status. The PTec is provided with Modbus connection to dialog with the powered load and with a supervising remote device.

Coding

Position	1	2	3	4	5	6
	PTEC	C	PT	PL	55	XX (coding example)

Pos. 1 : Controller model

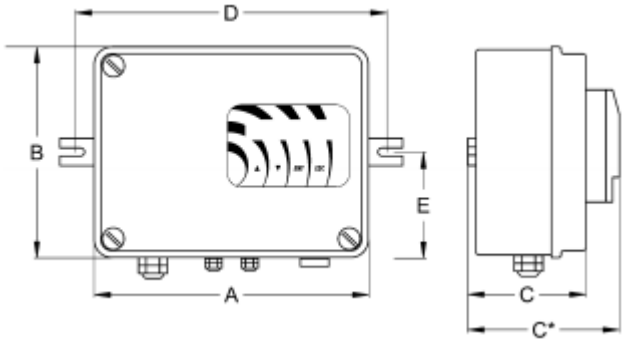
Pos. 2 : Power supply C= 230/400V D= 440/460V 50/60Hz

Pos. 3 : Type of probe/s PT = pressure and temperature

Pos. 4: Container PL = plastic

Pos. 5 : Protection grade 55 = IP55

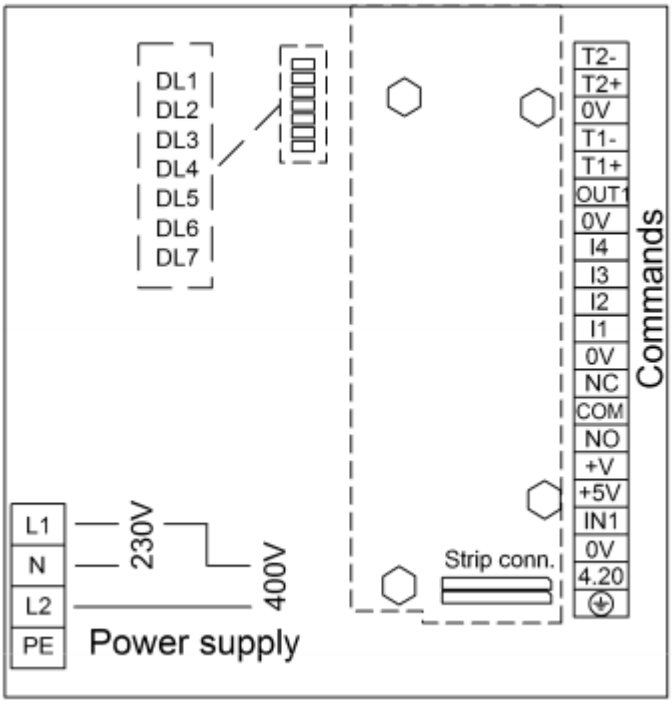
Pos. 6: Variants/additions M = modbus Master transmission, O = weekly clock, C = operable door, D = Oled display

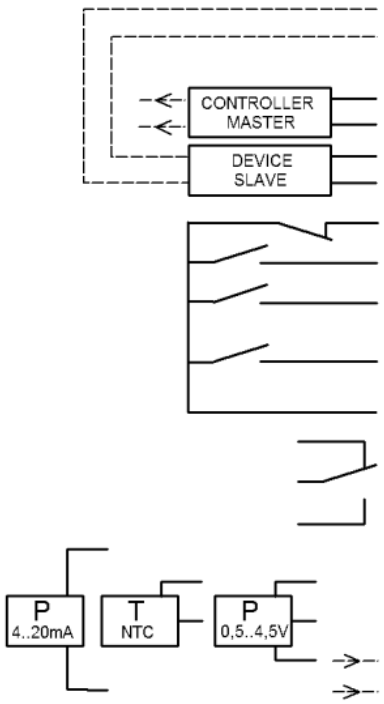


Model	W	Dimensions (mm)				Fix. Screws(mm)			
	(kG)	A	B	C	C*	D	E	F	Ø
PTec	1,1	200	154	86	115	220	77	/	M4

C* = with polycarbonate operable window.

Control terminal board

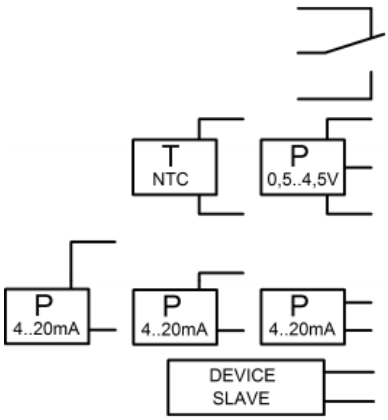




Term.	Description	Application	Page
T2 -	Serial RS485, Modbus RTU - master	Serial connection line to a Slave controlled inverter/device	**24**
T2+	Serial RS485, Modbus RTU - master		
0V	Ground I/O	Mass I/O	
T1 -	Serial RS485, Modbus RTU - slave	Serial connection line from a Master controlling device	**24**
T1+	Serial RS485, Modbus RTU - slave		
OUT1	Analogical output 1, type 0...10V= (max 15mA)	(+) Slave inverter/device controlling signal	
0V	Mass I/O	(-) Mass for Slave inverter/device	
I 4	External emergency input	Open immediately blocks the control. It can be connected to the load temp. protecting device/s	
I 3	Start/Stop input	Programmable Start/Stop input	**22**
I 2	Reduced Speed function input / double speed input	Closed modifies the adjusting modes. It is often used for the night silenced operating	**15**
I 1	Direct/Reverse function input	Open enables the Cool1 cooling mode. Closed enables the Heat or Cool2 heating mode (to be set on basic sett. menu)	**22**
0V	Ground I/O	Mass for the digital inputs	
NC	Relay 1 closed norm. contact output	Programmable output. With standard setting for Defect, the relay is enabled (NO-COM eachother closed) and is disabled by turning to the position represented in the picture in emergency case.	**23**
COM	Relay 1 common contact output (1A-250V~/3A-30V=)		
NO	Relay 1 open norm. contact output		
+V	12V power supply output = (max 30mA)	4..20mA pressure transducer power supply	
+5V	5V power supply output = (max 15mA)	Ratiometric press. transd. and NTC power supply	
IN 1	Analogical input 1, type 0,5...4,5V / ntc (10 kΩ @25°C, β3435), (Ri = 10 kΩ)	Ratiometric pressure transducers and NTC input	**21**
0V	Ground I/O	Mass for analogical input	
4.20	Analogical input 1, type 4...20mA (Ri = 100 Ω)	4..20mA pressure transducers input, command for Slave mode.	**21**

S1 expansion card

The S1 card is an addition card employed to add new I/O to the basic controller.



Term.	Description	Application	Page
OC1*	"Relays 3" outputs, type open collector. Max voltage 24V= / 24V~. Max power 200mA	Settable output. In the default setting OC1-OC2 are in conduct.	
OC2*			
NC	Relay 2 closed norm. contact output	Settable output. In the default setting the relay is enabled (NO-COM closed eachother) and is disabled by moving to the position represented in the picture in emergency case.	
COM	Relay 2 common contact output (1A-250V~/3A-30V=)		
NO	Relay 2 open norm. contact output		
+5V	Power supply output 5V=(max 15mA)	Ratiometric pressure transducer power supply and NTC	
0V	Mass I/O	Mass for analogical input	
IN 2	Analogical input 2, type 0,5...4,5V / ntc (10 kΩ @25°C, β3435), (Ri = 10 kΩ)	Ratiometric pressure transducers input and NTC	
4.20	Analogical input 2, type 4...20mA (Ri = 100 Ω)	Pressure transducers 4..20mA inputs. The higher signal is interpreted as analogical input 2.	
4.20*	Analogical input 3, type 4...20mA (Ri = 100 Ω)		
4.20*	Analogical input 4, type 4...20mA (Ri = 100 Ω)		
+V	Power supply output 12V= (max 100mA)	Pressure transducers 4..20mA power supply	
0V	Mass I/O	(-) Mass for inverter/Slave device	
OUT2	Analogical output 2, tipo 0...10V= (max 15mA)	(+) Control signal for inverter/Slave device	

***Not provided in the version S1-R. PAY ATTENTION: Ensure that the circuit power supply connected to OC1,OC2 must be insulated from +5V, +V, 0V.**

CHILLER

Cooling cycle parameters

CHILLER		
P1	[IC]	
20.0	bar	

Pressure of the voltage/speed V1 point.
Min. 0 bar Max. **P2** Def. 20 bar

CHILLER		
P2	[IC]	
24.0	bar	

Pressure of the voltage/speed V2 point.
Min. **P1** Max. **P_MAX** Def. 24 bar

CHILLER		
P MAX	[IC]	
25.0	bar	

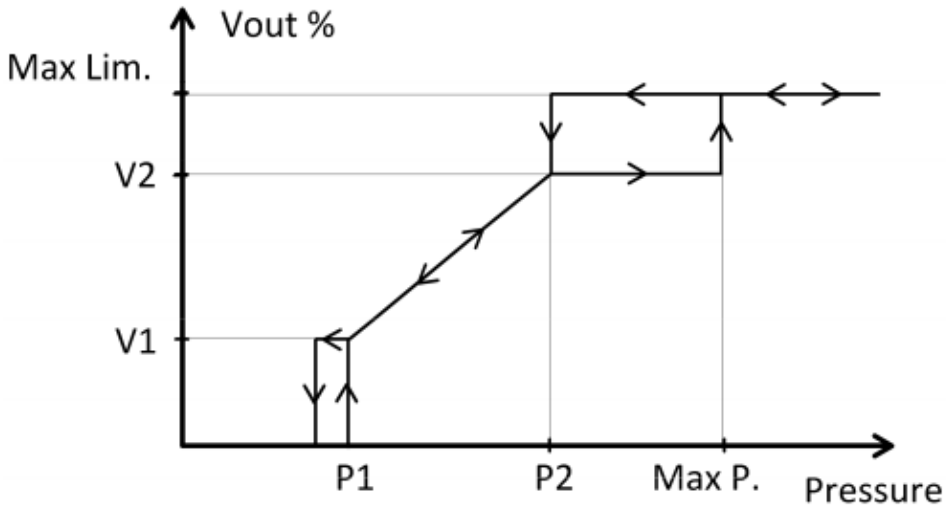
Maximum production pressure, above this the output is at the voltage **MotorMaxLim**.
Min. **P2** Max. **Full Scale** Def. 25 bar

CHILLER		
V1	[IC]	
10	%	

Voltage/speed of the pressure point P1.
Min. **MotorMinLim** Max. **V2** Def. 10%

CHILLER		
V2	[IC]	
90	%	

Voltage/speed of the pressure point P2.
Min. **V1** Max. **MotorMaxLim** Def. 90%



Heating cycle parameters

Caution: The heating cycle can be replaced by a second cooling cycle [CO2] by changing the setting of the parameter *Second Mode* (page 22).

CHILLER		
P1	[IH]	
7.0	bar	

Pressure of the voltage/speed V2 point.
Min. **P_MAX** Max. **P2** Def. 7 bar

CHILLER		
P2	[IH]	
11.0	bar	

Pressure of the voltage/speed V1 point.
Min. **P1** Max. **Full Scale** Def. 11 bar

CHILLER		
P_MAX	[IH]	
5.0	bar	

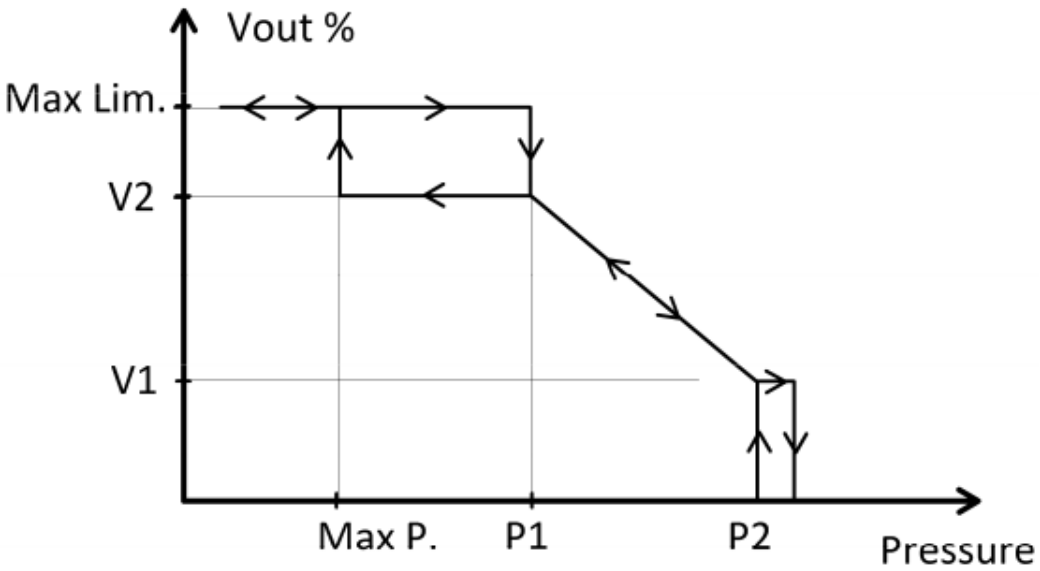
Maximum production pressure, below this the output is at the voltage **MotorMaxLim**.
Min. 0 bar Max. **P1** Def. 5 bar

CHILLER		
V1	[IH]	
10	%	

Voltage/speed of the pressure point P2.
Min. **MotorMinLim** Max. **V2** Def. 10%

CHILLER		
V2	[IH]	
90	%	

Voltage/speed of the pressure point P1.
Min. **V1** Max. **MotorMaxLim** Def. 90%



DRY COOLER

Cooling cycle parameters

DRY COOLER		
T1	[IC]	
22.0	°C	

Temperature of the voltage/V1 speed point.
Min. 0 °C Max. **T2** Def. 22,0 °C

DRY COOLER		
T2	[IC]	
28.0	°C	

Temperature of the voltage/V2 speed point.
Min. **T1** Max. **T_MAX** Def. 28,0 °C

DRY COOLER		
T MAX	[IC]	
29.0	°C	

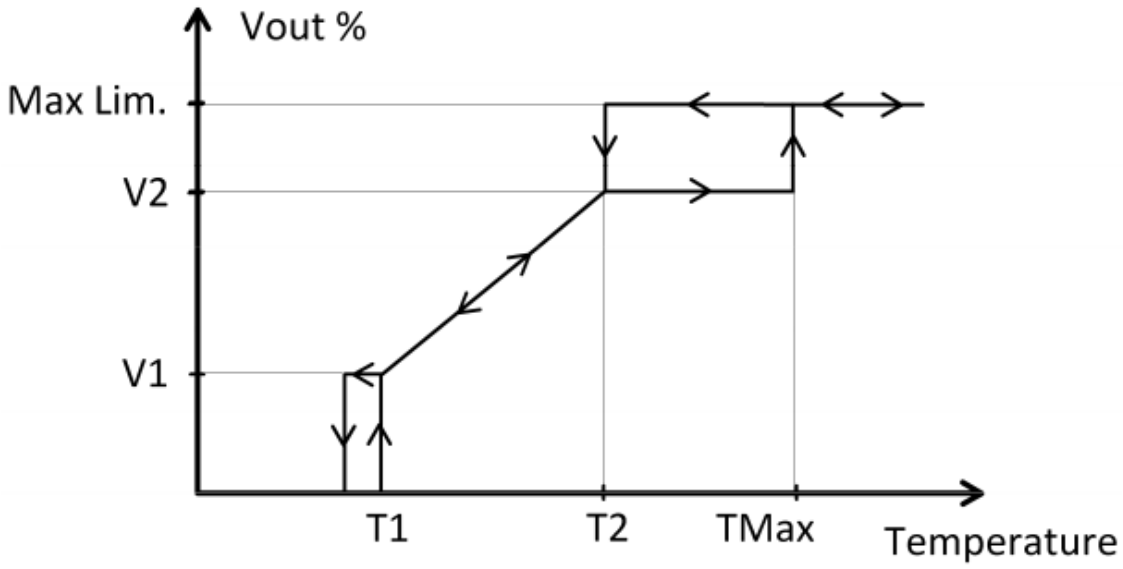
Maximum production temperature, above this the output is at the voltage **MotorMaxLim**.
Min. **T2** Max. 195 °C Def. 29,0 °C

DRY COOLER		
V1	[IC]	
10	%	

Voltage/speed of the temperature point T1.
Min. **MotorMinLim** Max. **V2** Def. 10%

DRY COOLER		
V2	[IC]	
90	%	

Voltage/speed of the temperature point T2.
Min. **V1** Max. **MotorMaxLim** Def. 90%



Heating cycle parameters

DRY COOLER	T1 [IH] 22.0 °C	Temperature of the voltage/V2 speed point. Min. **T_MAX** Max. **T2** Def. 22,0 °C
DRY COOLER	T2 [IH] 24.0 °C	Temperature of the voltage/V1 speed point. Min. **T1** Max. 195 °C Def. 24,0 °C
DRY COOLER	T_MAX [IH] 21.0 °C	Maximum production temperature, over this the output is at the voltage **MotorMaxLim**. Min. 0 °C Max. **T1** Def. 21,0 °C
DRY COOLER	V1 [IH] 10 %	Voltage/speed of the temperature point T2. Min. **MotorMinLim** Max. **V2** Def. 10%
DRY COOLER	V2 [IH] 90 %	Voltage/speed of the temperature point T1. Min. **V1** Max. **MotorMaxLim** Def. 90%