

TCU-FC4 Intelligent fan coil Controller



Features

- Operating voltage in accordance to type AC 24 V
- Temperature control for 4-pipe fan coil systems.
- Large temperature range from -40 to 140 °C.
- Automatic fan control for three stage fans.
- Energy saving with stand by functionality and adaptation of set points
- Coil control for single stage heating and cooling
- Password protected programmable user and control parameters
 - Set point range limitation
 - Access control for set points, fan speeds and mode change
 - Access control for heat/cool change and time programs
 - Select your display contents
 - Selectable behavior after return from power failure
- Temperature display in Celsius or Fahrenheit
- Clock and time schedule functions (Deluxe Version)
- Backlight for LCD (Deluxe Version)
- Display and operation unit available in various designs and materials.
- Entering or changing of all data via operating buttons on the controller, possible without additional tools
- PC connection for downloading canned applications via the software tool

Application

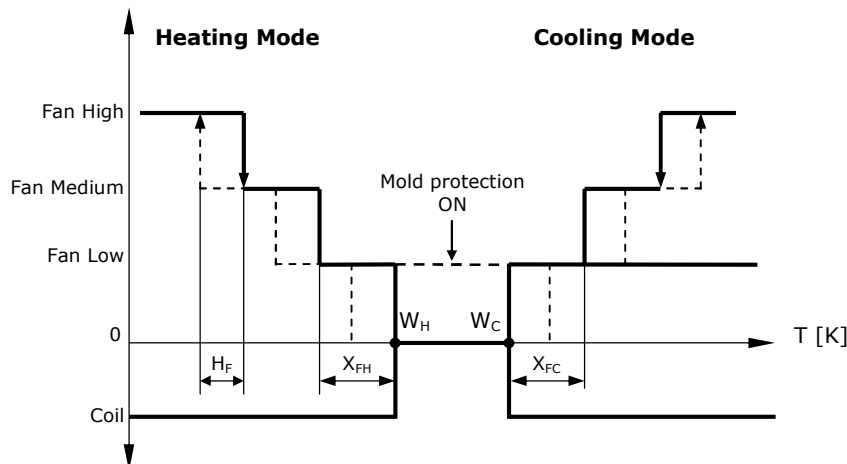
- Air Only Systems: Three stage fans for single duct systems.
- Air/Water Systems: Induction units, fan coil units for 4-pipe systems

Control Functions

The controller is designed to control fan coil systems with up to three fan speeds. The fan speeds may be controlled to run manual or automatic. In automatic mode, the controller will change fan speeds according to the temperature difference of room temperature and setpoint.

Control parameters:

- FC-04, FC-05: The switching span for cooling and heating determines the temperature difference required for the fan speed to increase to the next level.
- FC-06: The hysteresis defines when a fan speed change is reversed. The aim is to avoid unnecessary switching of fan speeds and thus to increase the life span of fan and relays.



T Room Temperature
 X_{FH} Switching Span Heating
 X_{FC} Switching Span Cooling
 W_H Setpoint Heating Mode
 W_C Setpoint Cooling Mode
 H_F Hysteresis

Control Parameters (password 09)

Warning! Only experts should change these settings! The parameters are grouped according to control modules. After completing the logging in, a control module must be selected before accessing the parameters.

pressing the LEFT and POWER button simultaneously for 3 seconds, than enter the parameter configuration, the module parameter is displayed.

Press the LEFT button change the module parameter as UP → FC → 1H → UP

Press the RIGHT button change the subset parameter as UP00 → UP01 → UP02 → → UP00

Change the parameter value by UP and DOWN button, press UP button increase the value and press DOWN button decrease the value, press the ENTER button to save the parameter change value. When change 1H parameter, the UP button change time hours and the DOWN button change time minutes (5 minutes step) .

User Parameters

Parameter	Description	Setting Range	Factory Setting
UP 00	Choose if end user is allowed to change operation modes, OFF = Disabled, ON = Enabled	ON, OFF	ON
UP 01	State after power failure: 0 = Switched OFF, 1 = Switched ON, 2 = state before power failure	0, 1, 2	2
UP 02	Enable standby functionality	ON, OFF	ON
UP 03	Standby temperature shift	0...10K	5 K
UP 04	Calibration value of temperature sensor	-10...10	0
UP 05	Celsius or Fahrenheit,; ON = Fahrenheit, OFF = Celsius	ON, OFF	OFF (Celsius)
UP 06	Modbus Address setting	1 - 64	1
UP 07	11, 12 terminal connections input signal setting: 0 = external temperature input (NTC 10K) 1 = binary input: economic mode when BI = OFF 2 = binary input: OFF mode when BI = OFF	0 - 2	0

Fan coil parameters

Parameter	Description	Range	Standard
FC 00	Define a minimum temperature limit for the set point	10...35 C	16 C
FC 01	Define a maximum temperature limit for the set point	10...35 C	26 C
FC 02	NULL		
FC 03	NULL		
FC 04	Switching Span Heating	0.1...10.0 K	1.5 K

FC 05	Switching Span Cooling	0.1...10.0 K	1.0 K
FC 06	Fan Switching Hysteresis	0.1...10.0 K	0.5 k

Time Schedule 1 parameters (1H)

Parameter	Description	Range	Default
1H 00	Enable the time schedule, oFF = disable , on = Enable	On / oFF	oFF
Pro 1: The time program 1 with 4 switch time points			
1H 01	Enable the time program 1, oFF = disable , on = Enable	On / oFF	oFF
1H 02	Select weekday , 0 = day1-5, 1 = day1, 2 = day2, 3 = day3, 4 = dya4, 5 = dya5, 6 =day6, 7 = day7 , 8 = day 1-7, 9 = day6-7	0 – 9	0
1H 03	Select switch time 1,	00:00 – 23:45	80:00
1H 04	Select action mode (no, ON, Eco, OFF), no = disables this time schedule, On = sets operation mode to On and Comfort, Eco = sets operation mode to On and Standby, OFF = switches unit Off	no,ON,Eco,OFF	no
1H 05	Select switch time 2,	00:00 – 23:45	12:00
1H 06	Select action mode (no, ON, Eco, OFF),	no,ON,Eco,OFF	no
1H 07	Select switch time 3,	00:00 – 23:45	12:00
1H 08	Select action mode (no, ON, Eco, OFF),	no,ON,Eco,OFF	no
1H 09	Select switch time 4,	00:00 – 23:45	12:00
1H 10	Select action mode (no, ON, Eco, OFF),	no,ON,Eco,OFF	no
Pro 2: The time program 2 with 4 switch time points: 1H 11 – 1H 20 , see parameter Pro 1			
Pro 3: The time program 3 with 4 switch time points: 1H 21 – 1H 30 , see parameter Pro 1			
Pro 4: The time program 4 with 4 switch time points: 1H 31 – 1H 40 , see parameter Pro 1			

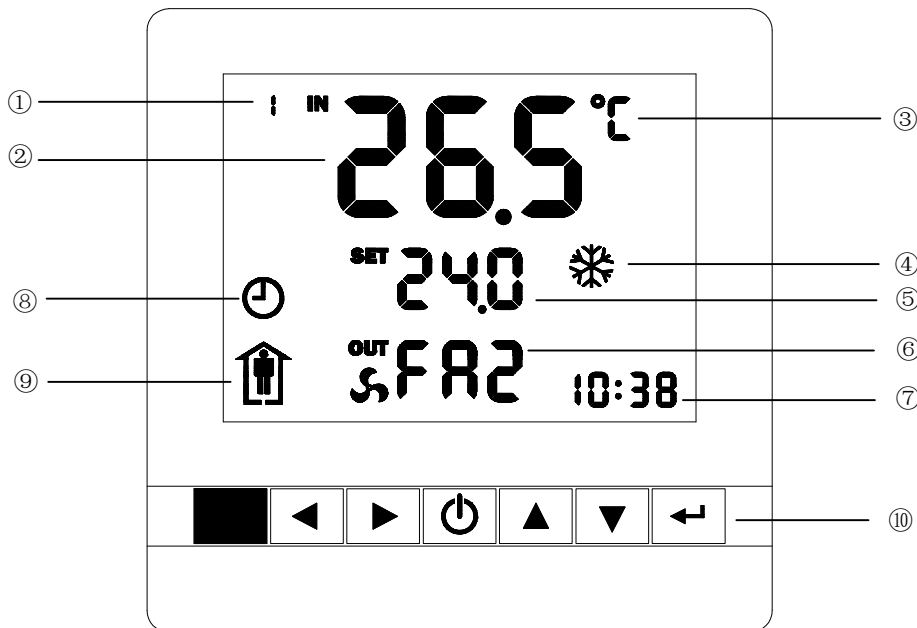
MODBUS communication data

Register	Register address	Modbus variable type	Description
RG 00	100	Read or write coil status	Controller ON / OFF control: 0 = OFF ; 1 = ON
RG 01	null	null	null
RG 02	200	Read only input status	Low fan speed state: 0 = OFF ; 1 = ON
RG 03	201	Read only input status	Mid fan speed state: 0 = OFF ; 1 = ON
RG 04	202	Read only input status	High fan speed state: 0 = OFF ; 1 = ON
RG 05	203	Read only input status	Binary input state: 0 = OFF ; 1 = ON
RG 06	300	Read or write holding register	Set point of temperature: integer 0-500;setpoint 0-50°C; example: integer 220 is set point 22°C.
RG 07	400	Read only input register	Temperature input: integer 0-500;temperature 0-50°C; example: integer 220 is temperature 22°C.
RG 08	401	Read only input register	Low fan speed running time: Integer 0 - 65536;Running time 0 – 65536 hours
RG 09	402	Read only input register	Mid fan speed running time: Integer 0 - 65536;Running time 0 – 65536 hours
RG 10	403	Read only input register	High fan speed running time: Integer 0 - 65536; Running time 0 – 65536 hours
Note: TCU-FC2 only support Modbus communication function code : 01, 02, 03, 04, 05, 06			

Display and Operation

The TCU controller is designed with a modular casing structure. The user has the choice of different colors and coatings. Standard is White RAL 9003.

operation terminal uses an LCD display and six operation buttons.



Legend:

- ① 2-digit display of LCD page number.
- ② 3-digit display of input current value
- ④ Graphical display of PI direction: Heating Active ☀ ; Cooling Active ❄
switch heating/direct or cooling/active , Push UP and Down button more than 5 second .
- ⑤ 3-digit display of set point value
- ⑥ 3-digit display of PI control output : FA1---Low fan speed; FA2---Mid fan speed; FA3 --- High fan speed
- ⑦ 4-digit display of time
- ⑧ Graphical display of time schedule indicate. 🕒
- ⑨ Operation modes: 🏠 Comfort mode, 🏠/ Standby mode, OFF, Energy Hold Off
- ⑩ Buttons for operating the controller

- 🔌 POWER button: comfort mode, Pressing the button less than 5 second; power off, Pressing the button less than 5 second again; standby and comfort mode switch, Pressing the button less than 2 seconds.
- ▲▼ UP and DOWN buttons: change set points or parameters
- ↵ Enter button: Acts as Enter in parameter or value changing menu.
- ◀▶ Left and Right buttons: change the running and operation display page number

Operation Modes

- Comfort: The unit is in full operation mode. All the control functions are operating according to their setpoints. The unit displays occupied mode.
- Standby: The set points are shifted according to parameters. The heating parameter is shifted down and cooling parameter up. The unit displays unoccupied mode.
- Energy Hold Off : The unit is switched off. All outputs are off. Off is displayed.

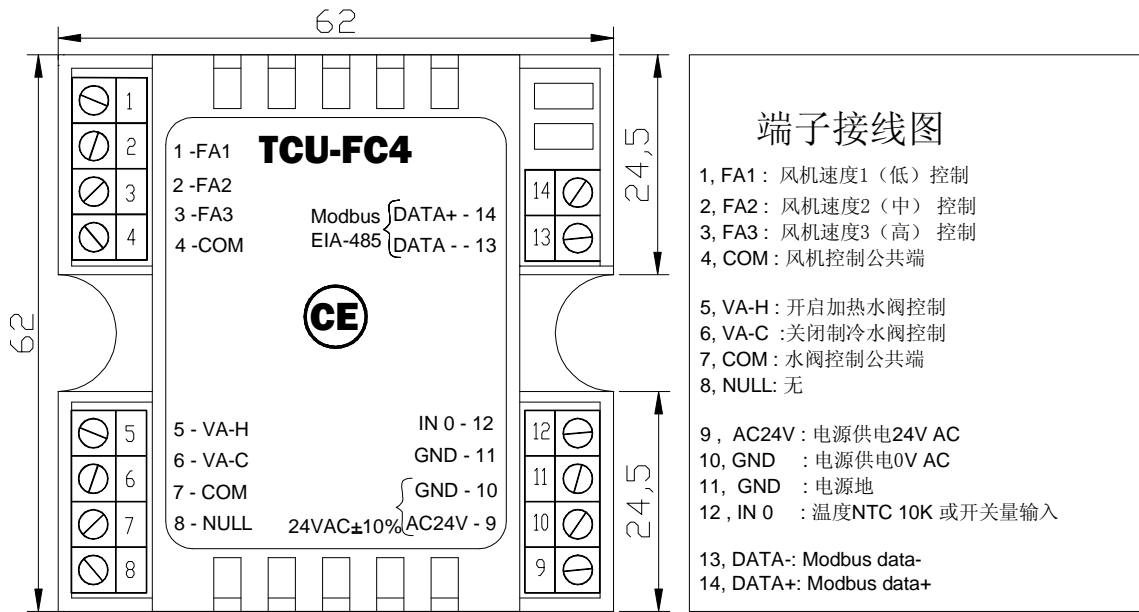
The current time setting

pressing the LEFT and POWER button simultaneously for 3 seconds, when enter time setting state.

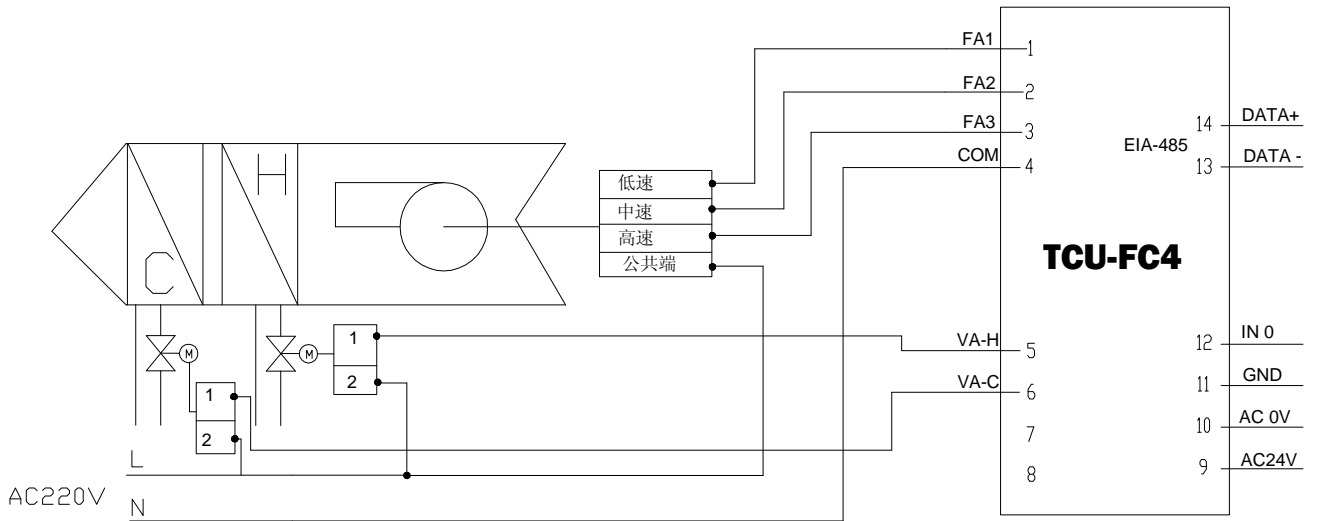
Press the UP button increase time hours and press the DOWN button increase time minutes.

Press the UP and DOWN button simultaneously increase the week date (Monday to Sunday).

Connection terminals



Connection Diagram, half wave rectified



应用:

4管制风机盘管系统: 3 速风机控制 (高、中、低); 电动二通开关阀, 2线控制。