

SpaceLogic Thermostat

TC900 Series for Digital Fan Coil Applications

TC903-3A2L, TC903-3A4LA, TC903-3A4LMA, TC903-3A4DLSA, TC903-3A4DLMSA, TC903-4FMSA, TC907-3A2L, TC907-3A4LA, TC907-3A4LMA, TC907-3A4DLSA, TC907-3A4DLMSA, TC907-4FMSA



Product Description

The TC900 Series fan coil thermostats are optimized for office building, hotel, hospital and residential applications.

The TC900 Series can be used for 2-pipe or 4-pipe applications.

Available in two housing finishes: optimum (black glass display with capacitive buttons on a white base) or medium (white glass display with mechanical buttons on a white base).

The TC900 Series is both easy to operate and install. The devices feature microprocessor-based control and large backlit LCD screens which display operation status (cooling, heating, and ventilation), fan speed, room temperature and set-point.

Specifications

Built-in sensing element	100 kΩ NTC, type 3
Accuracy	±1 °C
Set-point range	5 to 35 °C
Display range	0 to 50 °C (shown in 0.5 °C increments)
Operating temp.	0 to 50 °C
Operating humidity	5 to 95 %RH (non-condensing)
Power consumption	< 1.7 W
Power supply	90 to 240 Vac, 50/60Hz 24 Vac (models with suffix '-24')
Relay & load	Relay rating 5A Load rating 2A resistive, 1A inductive
Protection class	IP20
Housing	Flame-retardant PC
Dimensions	86 x 86 x 14.5 mm (3.40" x 3.40" x 0.57")
Wall box	BS wall box, min. 35 mm depth
Hole pitch	60 mm (standard)
Control pollution degree	Pollution Degree 2
Operation type	Type 1.B
Terminal sizing	Max: 2 x 1.5 mm² or 1 x 2.5 mm² conductors
Pollution degree	2
Agency approvals	European conformance CE: IEC/EN 60730-1 IEC/EN 60730-2-9

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Precautions

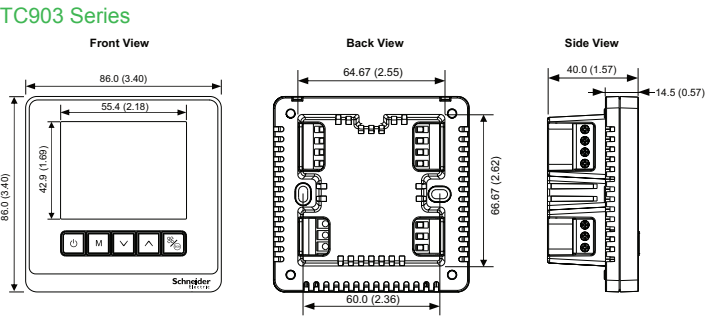
DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

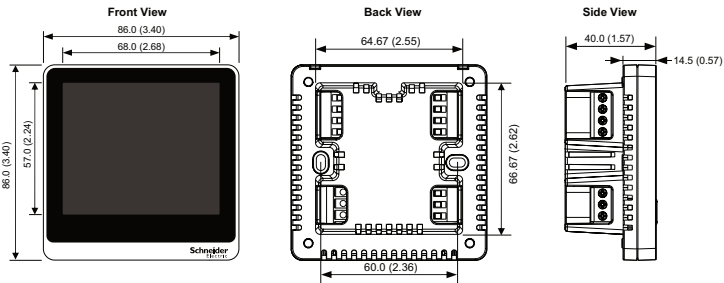
- Follow safe electrical work practices. See NFPA 70E in the USA, CSA Z462 in Canada, or applicable local codes.
- Read and understand the instructions before installing the product. Follow the instructions during installation.
- Installation, wiring, testing or service must be performed only by qualified persons in accordance with all applicable codes and regulations.
- Do not use the product for life or safety applications.
- Do not install the product in hazardous or classified locations.
- Do not exceed the product's ratings or maximum limits.
- The product may use multiple voltage/power sources.
- Turn off ALL power supplying equipment before working on or inside the equipment.
- Use a properly rated voltage sensing device to confirm that all power is off.
- Do NOT depend on the product for voltage indication.
- Products rated only for basic insulation must be installed on insulated conductors.
- Current transformer secondaries (current mode) must be shorted or connected to a burden at all times.
- Remove all wire scraps and tools, replace all doors, covers and protective devices before powering the equipment.

Failure to follow these instructions will result in death or serious injury.

Dimensions mm (in.)



TC907 Series



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Functions

Set-point Adjustment

The set-point buttons allow users to adjust the set-point (in 0.5 °C increments) for the space.

Fan Speed

Users can select a fan speed (High, Medium, Low or Automatic) by a short press of the FAN/ECO button (TC903) or the FAN button (TC907).

Mode Control

Users can switch operating modes (Heating, Cooling, or Ventilation) by pressing the Mode button.

Eco Mode

To begin Eco mode, do a short press of the FAN/ECO button (TC903) or the ECO button (TC907) until the ECO icon flashes in the lower right corner of the LCD display. In Cooling mode, the set-point is automatically adjusted to 26°C and the fan speed is set to Low. In Heating mode, the set-point is automatically adjusted to 18 °C and the fan speed is set to Low. To exit Eco mode, do a short press of the FAN/ECO button (TC903) to choose any other fan speed, as desired, or do a short press of the ECO button (TC907) to cancel Eco mode.

Button Lockout Function

This function allows the buttons to be deactivated to prevent thermostat operation by others.

Low Temperature Protection

If the room temperature drops below 5 °C, Heating mode will start automatically and the fan speed will be set to High. Once the temperature reaches 7 °C, the thermostat will switch off the output.

Alert

In the event of an operating exception, the thermostat will attempt to command the valve to close and place the device in an inoperative state. The display will indicate the current status with one of five diagnostic messages:

- EEPROM: 'EE'
- Temperature sensor short-circuit: 'E1'
- Temperature sensor open-circuit: 'E2'
- Ambient temperature is higher than 50°C: 'HI'
- Ambient temperature is lower than 0°C: 'LO'

Installation Guidelines

- Install the thermostat about 1.5 m (59") above the floor
- Make sure the device is powered off prior to installation/service
- Do not install in locations that can be affected by radiant heat or in places with high levels of sunlight
- Do not install thermostats behind doors or in corners
- Protect from water/debris to avoid damaging the thermostat

Operation Instructions

Power On/Off

A short press of the ON/OFF button will turn the power on. Another short press of the ON/OFF button will turn off the power, fan coil and motorized valve. If no buttons are pressed for 10 seconds, the thermostat backlight turns off. Press any button to turn the backlight back on.

Temperature Setting

With the power on, press to decrease the temperature setting and to increase temperature in steps of 0.5°C. The will appear on the display. If no buttons are pressed for six seconds, is displayed, indicating the setpoint is confirmed.

Mode Selection

With the power on, press M to switch the operation mode. The display indicates cooling with , heating with and ventilation with . Auto mode can be selected in the parameter settings and is indicated on the display with .

Fan Speed Selection

With the power on, press on TC903 or on TC907 to select a fan wind/air speed of high , medium , low or automatic . In automatic mode, the fan speed changes automatically. For a difference of 1 °C, the fan will automatically switch to low fan speed. For a difference of 2 °C, the fan will automatically switch to medium fan speed. For a difference of 3 °C or more, the fan will automatically switch to high wind speed.

Motorized Valve Control (2-Pipe Models)

In cooling (or heating) mode, the motorized valve will be switched on when the room temperature is higher than (or lower than) the temperature setting by 1 °C . It will switch off when the room temperature reaches the temperature setting.

Motorized Valve Control (4-Pipe Models)

In Cooling mode, the cold water valve will be opened when the room temperature is 1 °C higher than the temperature setting or closed when the room temperature drops to the setting. The hot water valve will remain closed.

In Heating mode, the hot water valve will open when the room temperature is 1 °C lower than the temperature setting and will close when the room temperature rises to the setting. The cold water valve will remain closed.

Energy Saving Functions

Eco Mode

Press the FAN/ECO button on TC903 or the ECO button on TC907 to turn on Eco mode. The display will show the and icons. If the thermostat is in Cooling mode, the temperature is automatically set to 26 °C with the fan running at low speed. If the thermostat is in Heating mode, the temperature is automatically set to 18 °C with the fan running at low speed. To turn Eco mode off, press the up or down buttons to change the temperature setting or press the FAN/ECO or ECO buttons.

Unoccupied Energy Saving Mode

Unoccupied Energy Saving mode can be entered via a hotel room key card or bioprobe. Example: after a hotel room key card is removed from the reader and are displayed. If the thermostat is in cooling mode, the temperature is automatically set to 28 °C with the fan running at low speed. If the thermostat is in heating mode, the temperature is automatically set to 16 °C with the fan running at low speed. When the key card is returned to the reader, the indoor display and ECO icon turn off and the thermostat returns to the previously set mode.

Sleep Energy Saving Mode

At 12:00 a.m., Sleep Energy Saving mode turns on and **[Override]** displays at 1:00 a.m. The temperature setpoint increases or decreases automatically every hour by 1 °C until 3:00 a.m. Example: if the thermostat is in cooling mode, the setpoint will increase 1 °C per hour until 3:00 a.m. then decreases 1 °C per hour until the original setpoint is reached at 7:00 a.m. and **[Override]** turns off. If the thermostat is in heating mode, the setpoint will decrease 1°C per hour until 3:00 a.m. and then increases 1°C per hour until the original setpoint is reached at 7:00 a.m. and **[Override]** turns off. The

A qualified person is one who has skills and knowledge related to the construction and operation of this electrical equipment and installations, and has received safety training to recognize and avoid the hazards involved.

If this product is used in a manner not specified by the manufacturer, the protection provided by the product may be impaired. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

External housing may be cleaned with a damp cloth if it becomes dirty. Do not use any cleaning agent, especially alcohol.

cooling setpoint will not rise above 26°C and the heating setpoint will not drop below 18°C in Sleep Energy Saving mode.

Time Setting Function

During power-on, press and hold M for six seconds to enter the Time Setting mode. Press the mode M button again to select the hour, minute and week. Press the up and down buttons to adjust this parameter. Time Setting mode is exited automatically if no button is pushed for six seconds.

Button Lockout Function

Press and hold the up and down buttons at the same time for six seconds to activate the keypad lockup function to prevent thermostat operation by others. While lockout is active, the lock icon will be displayed on the screen. To deactivate the lockout function, press and hold the up and down buttons at the same time for six seconds to unlock the system.

Low Temperature Protection Function

If the thermostat is switched off and the room temperature drops below 5 °C, the thermostat will start automatically for heating and display the symbol. The fan will run at high speed automatically and the motorized valve will be opened (hot water valve will be opened for 4-pipe models). When the room temperature rises to 7 °C, the low temperature protection function is canceled and the thermostat will stop automatically, returning to its previously switched off state.

Alert Function

In the event of an operating exception with the temperature sensor (either built-in or external, depending on which is selected), the thermostat will attempt to command the fan and valve to close, place the device in an inoperative state and display the icon and an 'E1' or 'E2' alert.

- E1: Sensor short-circuit alert
- E2: Sensor open-circuit alert

'HI' will be displayed if the temperature is higher than 50 °C. 'Lo' will be displayed if the temperature is lower than 0 °C.

Parameter Settings

During power off, press and hold the mode button M for six seconds to enter the display screen. Press the mode button M or Fan button to move forward or backward between the parameters shown in the table below. Press the up and down buttons to adjust these parameters.

Parameter Settings Table

Number	Parameter	Default	Description
01	Low temperature protection	On	OF: Disabled, On: Enabled
02	Fan operation status after temperature setting is reached	DA	Db: Fan off, DA: Fan on
03	Power-on state	00	00: Power-down memory, 01: power-down do not remember, 02: power-up power-on
04	Differential	1°C	1~3°C
05	ECO mode differential	2°C	1~5°C
06	Heating set-point upper limit	35°C	5 to 35°C
07	Cooling set-point lower limit	5°C	5 to 35°C
08	Auto deadband	1°C	1 to 3°C (only for 4-pipe Auto mode)
09	Mode button selection (2-pipe)	02	00: Heating only (heating, ventilation), 01: Cooling only (cooling, ventilation), 02: Heating and cooling (heating, cooling, ventilation)
	Mode button selection (4-pipe)	02	00: Heating only (heating, ventilation), 01: Cooling only (cooling, ventilation), 02: Heating and cooling (heating, cooling, ventilation), 03: Auto, 04: 2-pipe mode
10	Auto fan setting	On	OF: Fan Auto disabled - Fan mode setting can be High, Medium or Low, On: Fan Auto enabled - Fan mode setting can be High, Medium, Low or Auto. No Fan Auto in Ventilation mode.
11	Show temperature selection	00	00: Room temperature, 01: Set-point
12	Modbus connection	On	OF: Disabled, On: Enabled
13	Modbus address setting	01	01 to 64
14	Modbus baud rate	01	00: 4800 bps, 01: 9600 bps, 02: 19200 bps, 03: 38400 bps
15	Modbus parity check	00	00: Odd check, 01: Even check, 02: No check
16	Clock display	On	OF: Disabled, On: Enabled
17	12/24 hour clock	24	12: 12-hour clock, 24: 24-hour clock
18	Sleep Energy Saving mode	On	OF: Disabled, On: Enabled
19	Cooling temperature, Unoccupied Energy Saving mode	28°C	22 to 32°C
20	Heating temperature, Unoccupied Energy Saving mode	16°C	10 to 21°C
21	Fan speed, Unoccupied Energy Saving mode	02	00: High speed, 01: Medium speed, 02: Low speed
22	Temperature sensor selection	00	00: Built-in, 01: External
23	Low-speed fan output voltage	3.3V	Range: 0V to medium-speed setting
24	Medium-speed fan output voltage	6.6V	Range: Low-speed setting to high-speed setting
25	High-speed fan output voltage	10V	Range: Medium-speed setting to 10V

Notes:
Parameters 01 to 11 apply to all models.
Parameters 12 to 15 only apply to models with 'M' in the part number (Modbus connection).
Parameters 16 to 22 only apply to models with 'S' in the part number (real-time clock and external sensors connection).
Parameters 23 to 25 only apply to models with 'F' in the part number (DC brushless fan).

For models without one of the specific functions mentioned above, skip the parameters entirely.

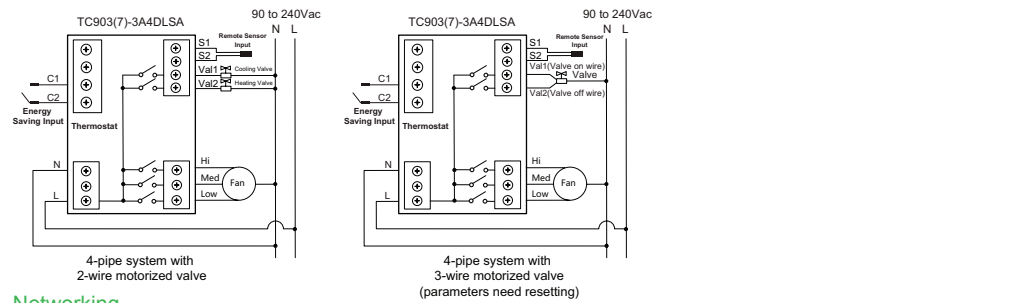
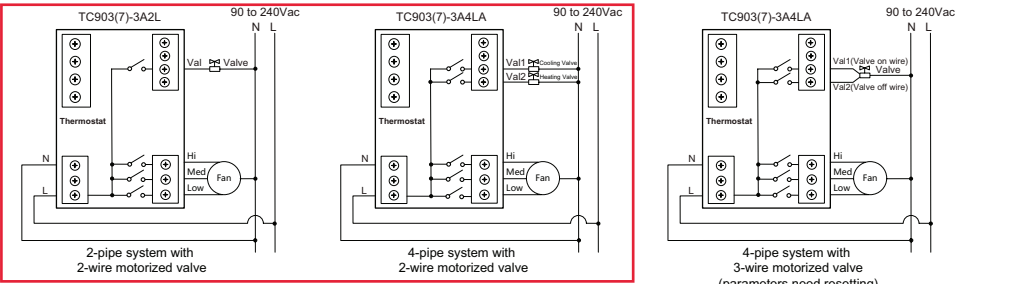
This parameter table must be set by specialized installation personnel authorized by Schneider Electric. Any inconvenience or damage caused by unauthorized operation will not be covered by warranty.

Wiring

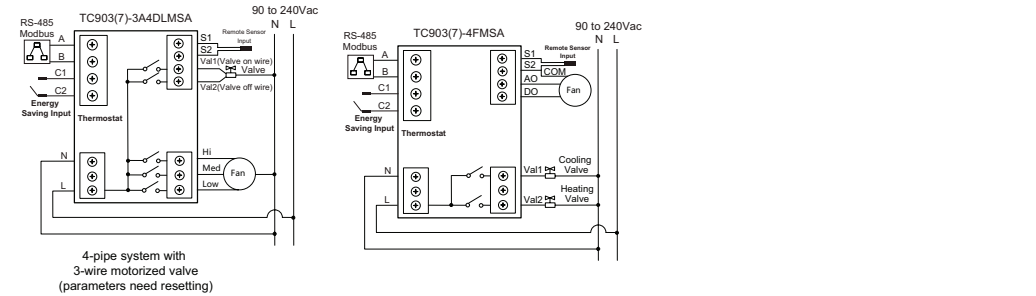
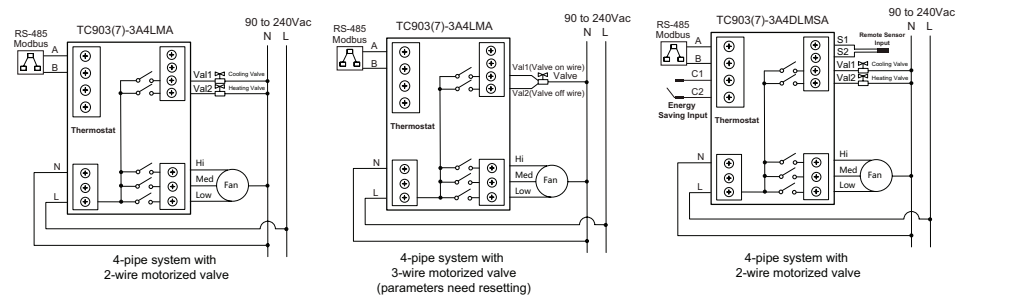
Provide an approved disconnecting means and overcurrent protection to supply conductors. The disconnecting device(s) shall meet the relevant

requirements of IEC 60947-1 and IEC 60947-3 and shall be suitable for the application. Locate and mark per local requirements.

Standlone

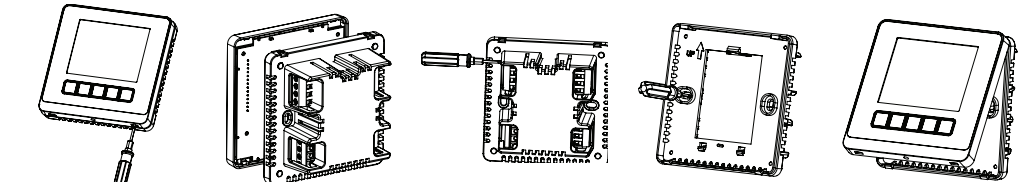


Networking

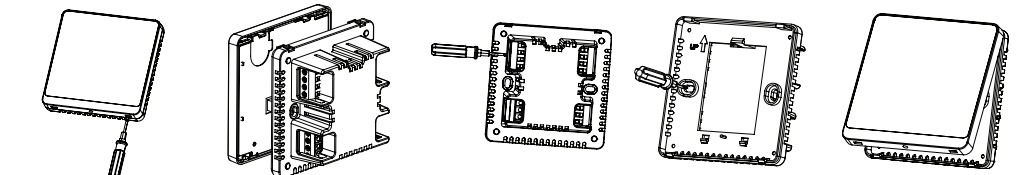


Mounting

TC903 Series



TC907 Series



1. Insert a 3.5 mm flat head screwdriver along the bevel into the slot. Pry upwards with appropriate force to release the two hooks.
2. Remove the display from the base module. Carefully remove the Pry upwards with appropriate force to release the two hooks.
3. Connect the wires according to the appropriate wiring diagram shown above. Ensure the polarity of the mains supply is correct.
4. Mount the base module onto the wall box using the two screws supplied.
5. Fit the display module onto the base module. Align upper hooks between the two modules. Carefully replace the wiring connection if it has been removed. Click display module onto base module using the two lower hooks.

Modbus Transport Protocols

The TC900 Series thermostats come with the option of Modbus communication. Modbus is an open, widespread and well established serial communication protocol used in building automation. The support of Modbus communication allows simple integration of the TC900 Series thermostats with a building management system using standard Modbus serial communication. The following models provide support for Modbus connectivity: TC903-4FMSA, TC903-3A4LMA, TC903-3A4DLSMA, TC907-4FMSA, TC907-3A4LMA, TC907-3A4DLSMA

The TC900 Series thermostats communicate as a Modbus RTU slave device over a serial RS-485 connection, allowing for the transfer of real-time data. The RS-485 communication parameters can be adjusted as follows:

- Baud Rate: 4800, 9600, 19200 and 38400 bps
- Parity check: Odd, Even and None
- Device Modbus Address: 01 to 64

These parameters are defined for each thermostat in the Parameter Settings Table. If required, adjust the settings to disable the Modbus connection. All of these settings can be completed under menu items 12 to 15. Connection to the RS-485 network

is made via dedicated terminals on the back of the thermostat and marked A (+) and B (-). The following Modbus register types and formats are supported:

Code	Register Type	Data	Format
01	Read coils	Boolean	Binary/digital
02	Read discrete inputs	Boolean	Binary/digital
03	Read holding registers	Word	16-bit unsigned integer
04	Read input registers	Word	16-bit unsigned integer
06	Write single register	Word	16-bit unsigned integer

Function Code 01

Reg.	Description	Definition
0	Cooling valve (4-pipe)	0 = Off, 1 = On
4	Fan speed status high	0 = Off, 1 = On
5	Fan speed status medium	0 = Off, 1 = On
6	Fan speed status low	0 = Off, 1 = On
7	Heating valve (4-pipe)	0 = Off, 1 = On

Function Code 02

Reg.	Description	Definition
2	Temp sensor, short circuit	0 = OK, 1 = Fault
3	Temp sensor, open circuit	0 = OK, 1 = Fault

Modbus Transport Protocols (cont.)

Function Code 03/06

Reg.	Description	Definition
2	Thermostat mode	0 = Off, 1 = On, 02=Frost protection*
3	Operation mode	1 = Cool, 2 = Heat, 3 = Ventilation, 4 = Auto
4	Set-point	5 to 35 °C
5	Fan mode	00 = High, 01 = Medium, 02 = Low, 03 = Auto
6	Heating set-point, upper limit	5 to 35°C
7	Cooling set-point, lower limit	5 to 35°C
8	ECO mode	0 = Disable 1 = Enable
9	ECO mode, cooling set-point	22 to 32°C
10	ECO mode, heating set-point	10 to 21°C
11	Temperature compensation	-5 to 5°C
12	Setpoint, upper limit	2 to 49.5°C
13	Setpoint, lower limit	0 to 47.5°C
14	Sleep mode	0 = Disable 1 = Enable
15	Low temperature protection	0 = Disable 1 = Enable
16	Fan operation after setting temperature is reached	0 = Fan off 1 = Fan on
17	Power-on state	00 = Power-down memory 01 = No power-down memory 02 = Display on when powered
18	Differential	1 to 3°C
19	ECO mode differential	1 to 5°C
20	Auto deadband	1 to 3°C
21	Operation mode configuration	0 = Heat only (heat & vent) 1 = Cool only (cool & vent) 2 = Heat and cool (heat, cool & vent) 3 = Auto 4 = 2-pipe mode
22	Auto fan	0 = Disable 1 = Enable
23	Display temperature	00 = Room temp. 01 = Set-point
24	Temperature sensor	00 = Built-in sensor 01 = External sensor
25	Modbus connection	0 - Disable 1 - Enable
26	Modbus address setting	1 to 64
27	Modbus baud rate	00 = 4800 bps 01 = 9600 bps 02 = 19200 bps 03 = 38400 bps

Reg.	Description	Definition
28	Modbus parity check	00 = Odd check 01 = Even check 02 = None
29	RTC clock display	0 = Disable 1 = Enable
30	12/24-hour clock	12 = 12-hour clock 24 = 24-hour clock
31	Auxiliary input close/open	00 = Occupied when short-circuit, unoccupied when open-circuit 01 = Unoccupied when short-circuit, occupied when open-circuit
32	Unoccupied mode, cooling setpoint	22 to 32°C
33	Unoccupied mode, heating setpoint	10 to 21°C
34	Unoccupied mode, fan speed	00 = High 01 = Medium 02 = Low
35	Temp. value from connection	00 = Local device 01 = Modbus connection
36	Temp. input	
37	Heating mode KP	1 to 99 s
38	Cooling mode KP	1 to 99 s
39	PID sampling time	1 to 99 s
40	KI	0 to 99 s
41	Span	1 to 99 s
42	Heating valve 2, output voltage	10x voltage (e.g., if voltage is 5.7V, '57' is displayed)
43	Cooling valve 1, output voltage	10x voltage (e.g., if voltage is 5.7V, '57' is displayed)
44	Low-speed fan output voltage	Range: 0V to medium-speed setting
45	Medium-speed fan output voltage	Range: Low-speed setting to high-speed setting
46	High-speed fan output voltage	Range: Medium-speed setting to 10V

*Read only.

Function Code 04

Register	Description	Value Definition
0	Actual room temperature	0 to 50°C