

NT50 RS-485 Networking Room Thermostats with LCD for Fan Coil Units Installation and Operation Instructions

Model Number Selection Guide

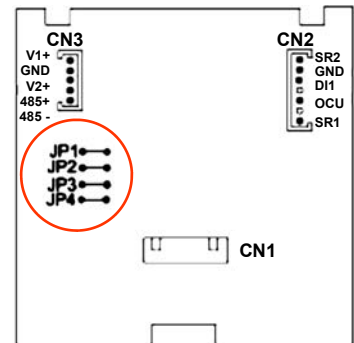
Default Model	Application	Standard Model	Remarks
50-1	Single on-off output, cool only or heat only Single on-off output, manual cool/heat changeover	50-1 50-1M	Factory setting Select via setup menu
50-1A	Single 0-10 VDC output, cool only or heat only Single 0-10 VDC output, manual cool/heat changeover	50-1A 50-1AM	Factory setting Select via setup menu
50-1F	Single 3-wire floating output, cool only or heat only	50-1F	Factory setting
50-2	Dual on-off outputs, manual/auto cool/heat changeover Single 3-wire floating output, cool only or heat only Single 3-wire floating output, manual cool/heat changeover Single on-off output, cool only or heat only Single on-off output, manual cool/heat changeover	50-2 50-1F 50-1FM 50-1 50-1M	Factory setting Cut jumper JP2 Cut jumper JP2 and select via setup menu Cut jumpers JP2 and JP3 Cut jumpers JP2 & JP3 & select via setup menu
50-2A	Dual 0-10 VDC outputs, manual/auto cool/heat changeover Single 0-10 VDC output, cool only or heat only Single 0-10 VDC output, manual cool/heat changeover	50-2A 50-1A 50-1AM	Factory setting Cut jumpers JP2 and JP3 Cut jumpers JP2 & JP3 & select via setup menu

The thermostat 50-2 and 50-2A can be re-configured in the field to various model numbers by a qualified servicing agent, if necessary, by resetting the jumper positions of JP2 and JP3. The locations of these jumpers will be found after removing the thermostat cover from its baseplate.

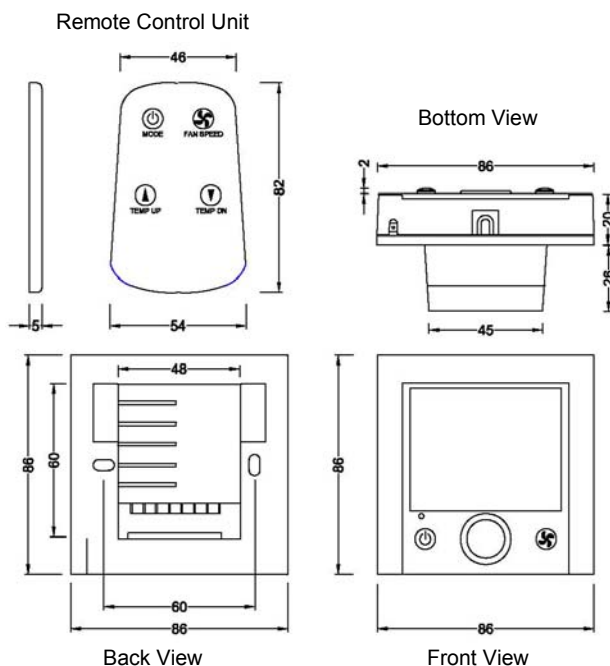
Model Number	Jumper Settings of JP2 and JP3	
	JP2	JP3
50-1	Cut	Cut
50-1M	Cut	Cut
50-2	Uncut	Uncut
50-1F	Cut	Uncut
50-1FM	Cut	Uncut
50-1A	Cut	Cut
50-1AM	Cut	Cut
50-2A	Uncut	Uncut

Jumper Settings of JP1 and JP4		
Jumper	Cut	Uncut
JP1	With External Sensor	With Built-in Sensor
JP4	For 2-10 VDC Output	For 0-10 VDC Output

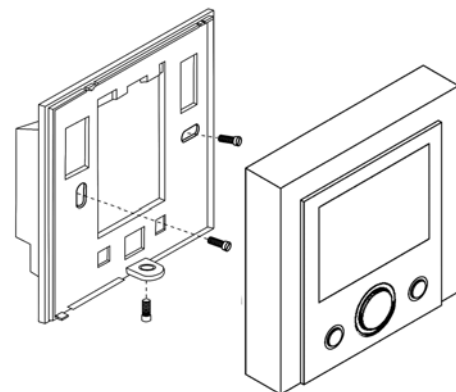
Note: JP4 is available in 0-10 VDC/2-10 VDC output models only. Factory setting is 0-10 VDC.



Dimensions in mm



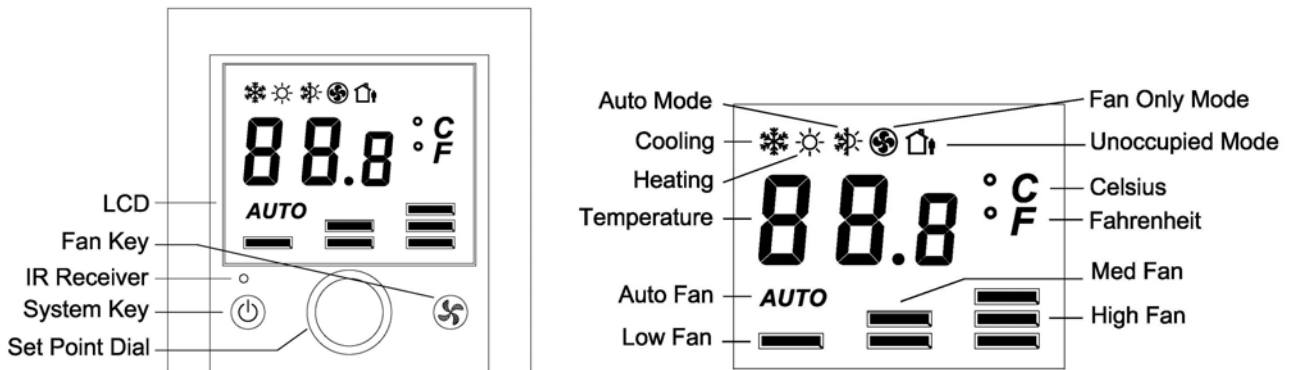
Mounting Details



Mounting

The thermostat can be surface mounted or secured to a standard European 75 x 75 x 35 mm electrical box. Two mounting screws are included.

Display Control Unit and LCD Layout



Operation Notes

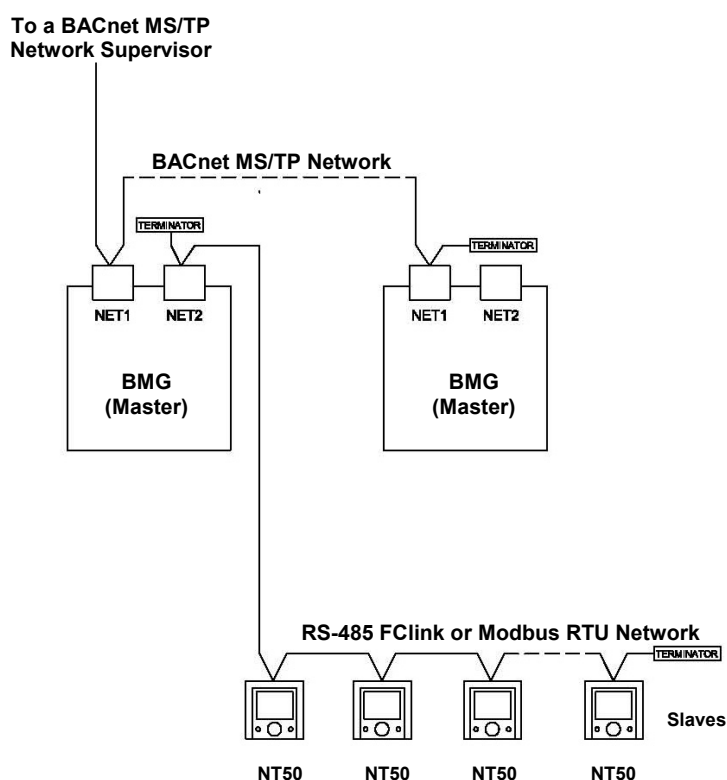
- LCD shows ambient temperature constantly except when set point adjustment is being made.
- Press the system key Φ to enter into the desired operating mode: Cool-Heat-Auto-Fan Only-Off, etc.
- Press the fan key $*$ to change the fan speed mode: High-Med-Low-Auto.
- Increase or decrease temperature set point by rotating the adjustment dial clockwise or counter-clockwise. When the dial is rotated, the LCD shows the existing set point setting.
- In unoccupied mode, the factory temperature set points are 26 °C for cooling and 16 °C for heating and the fan speed is always set at "low".
- Unoccupied mode can be activated in the following manner when the unoccupied contact closes:
 - For Models "1", "1A" and "1F", the unoccupied cooling or heating mode is determined by the status of the SR2 seasonal changeover sensor and the valve output is activated according to the measured temperature.
 - For Models "1M", "1AM" and "1FM", while in unoccupied mode, the valve output is never activated.
 - For Model "2" and "2A", the unoccupied cooling or heating mode is always determined by the measured temperature and valve output is also activated according to the measured temperature.
- Unoccupied mode activation in operating mode only or in both standby and operating mode will be determined by activation setting in setup menu. Low fan will run according to fan action setting in setup menu.
- When unoccupied mode is activated, all keys are locked out and no settings can be entered.
- When "1F" or "1FM" is used for on-off control, its parameter settings must be set as $R 1, b 0$ and $E 3$ and its effective operating temperature differential will be 1 K.
- The thermostat allows authorized service agent to change some operating parameters in the field. Refer to parameter setup manual for details.

Network & Cabling Requirements

To ensure network stability and reliable communications, particularly at high speeds on a Modbus / BACnet MS/TP network for a number of devices, it is imperative that the following network and cabling requirements are adhered to:

Item	Description
Cabling	For BACnet MS/TP, FClink and Modbus RTU networks, it is recommended to use networking cabling that matches the following specifications: <ul style="list-style-type: none"> • Balanced 100 to 120 ohms nominal impedance, 22 or 24 AWG Twisted Shielded Pair (TSP) Cable • Nominal capacitance of 52 pF/m or lower • Nominal velocity of propagation of 66% or higher
Topology	Ensure the MS/TP, FClink or Modbus RTU network cable is installed as a daisy chain from one device to the next.
Maximum Nodes	The maximum number of devices per MS/TP, FClink or Modbus RTU network without any repeaters is 32.
Terminator	A terminator of 120-ohm impedance must be installed at each end of each MS/TP, FClink or Modbus RTU network segment, or two per MS/TP, FClink or Modbus RTU network. Ensure that this requirement is not overlooked in laying out the network architecture and ordering product.
Repeater	A repeater is not necessary unless the MS/TP, FClink or Modbus RTU network is extended beyond 1,000 m.

Figure 8: Network Configuration



BACnet MS/TP Network Notes:

1. Ensure the recommended balanced cable is used.
2. Ensure the cable is installed as a daisy chain from one device to the next (1,000 m maximum) and the shield is grounded at one single point of the network only.
3. Ensure a MS/TP terminator is installed on each end of each MS/TP network.
4. The maximum nodes per MS/TP network is 32 without a repeater.

FLink and Modbus RTU Network Notes:

1. Ensure the recommended balanced cable is used.
2. Ensure the cable is installed as a daisy chain from one device to the next (1,000 m maximum) and the shield is grounded at one single point of the network only.
3. Ensure a terminator is installed on each end of each FLink or Modbus RTU network.
4. The maximum nodes per FLink or Modbus RTU network is 32

Wiring Diagrams and Application Notes

Wiring and Application Notes

- Cut jumper JP1 open if an external sensor is wired to SR1 and GND. Run the wiring away from any electrical motors or power wiring. Failure to do so may result in poor thermostat performance due to electrical noise.
- Cut jumper JP4 open if 2-10 VDC proportional output is required.
- 22 or 24 AWG twisted shielded pair double-insulated cable is recommended as remote sensor wiring and its length must not exceed 25 m.
- Do not bundle and run power wiring and remote sensor wiring in the same conduit.
- The seasonal changeover sensor should be wrapped around the supply water pipe when associated with a water system. When the changeover sensor temperature exceeds 30 °C, the thermostat enters into heating mode.
- External seasonal changeover sensor or switch is applicable to heat only or cool only 2-pipe models only.
- Unoccupied contact closure activates unoccupied mode.
- Hidden-line wiring for Terminal 7 of CN6 and Terminal V2+ of CN3 is applicable to dual-output models only.
- The thermostat on-off outputs are designed for controlling zone valves. If used for controlling electric heaters, external contactors must be used.
- For a 3-wire floating output model, in cooling mode, Terminal 6 of CN6 is wired to open valve on temperature rise and Terminal 7 of CN6 to close valve on temperature drop. The action in heating mode is reversed.

RS-485 Networking Room Thermostat Wiring Diagrams

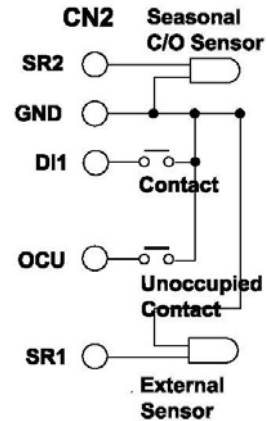
WARNING

Incorrect wiring connection may cause permanent equipment damages to the thermostat.

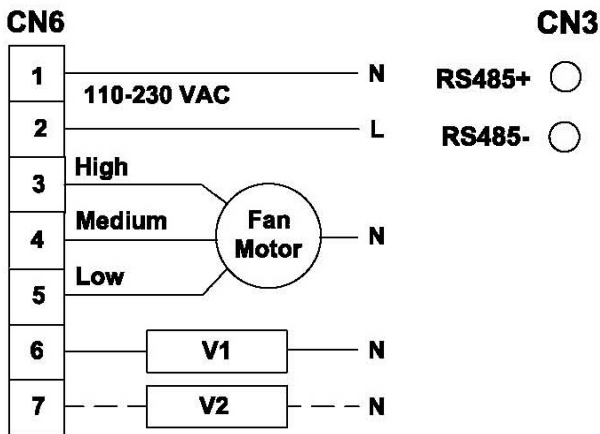
Piping Notes:

1. On a single-output unit, V1 can be either a 2-wire spring-return cooling or heating valve.
2. On a dual-output unit, V1 must be a 2-wire spring-return cooling valve and V2 a 2-wire spring-return heating valve.
3. V3 must be a 3-wire floating valve. In cooling mode, Terminal 6 output opens valve on temperature rise and Terminal 7 output closes valve on temperature drop. The action in heating mode is reversed.
4. On a single-output unit, V4 can be either a 0-10 VDC cooling or heating valve.
5. On a dual-output unit, V4 must be a 0-10 VDC cooling valve and V5 a 0-10 VDC heating valve.

Connections of Sensors and Contacts

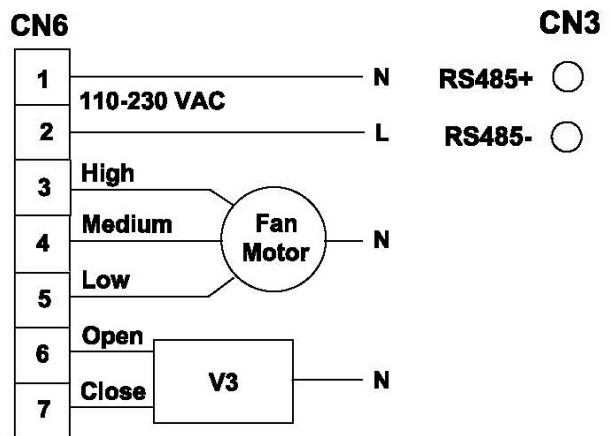


Wiring Diagram NT50-1 and NT50-2



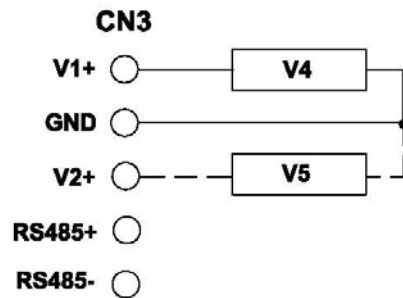
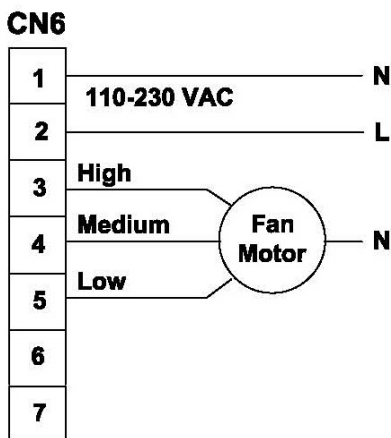
V1 and V2 are 2-wire on-off spring-return valves

Wiring Diagram for NT50-1F



V3 is a 3-wire floating valve

Wiring Diagrams for NT50-1A and NT50-2A



V4 and V5 are 0-10 VDC valves