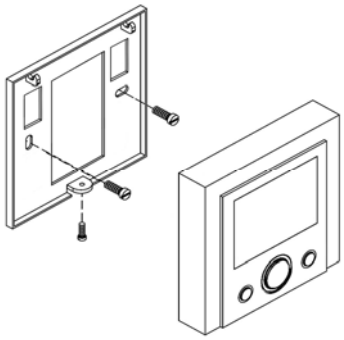
Revision Date June 6, 2012

BACnet MS/TP Networking Room Thermostats with LCD for Fan Coil Units

Installation and Operation Instructions

NCU Mounting Details

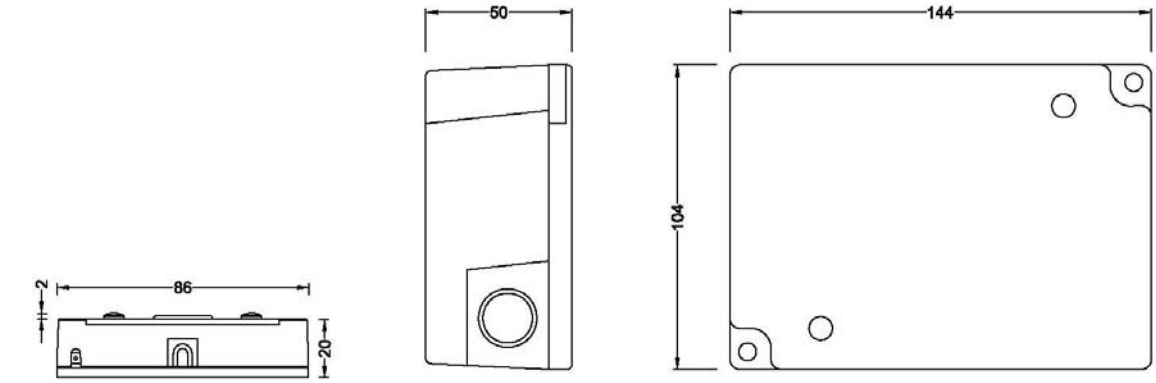


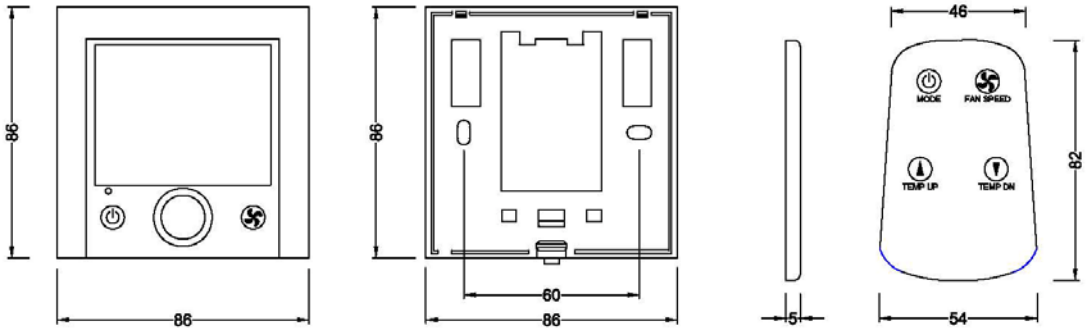
Mounting of Network Control Unit

The network control unit can be surface mounted or secured to a standard European 75 x 75 x 35 mm electrical box. See Fig. 2: Mounting Details. Two M3.5 mounting screws for Network Control Units only are included.

Dimensions in mm

Power Control Unit

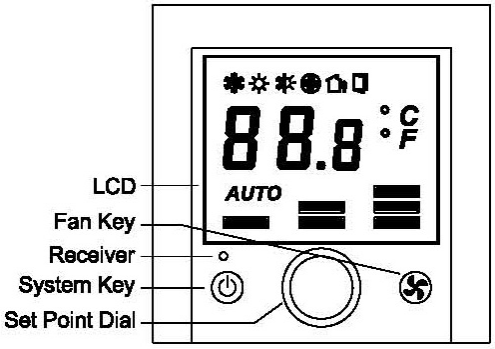


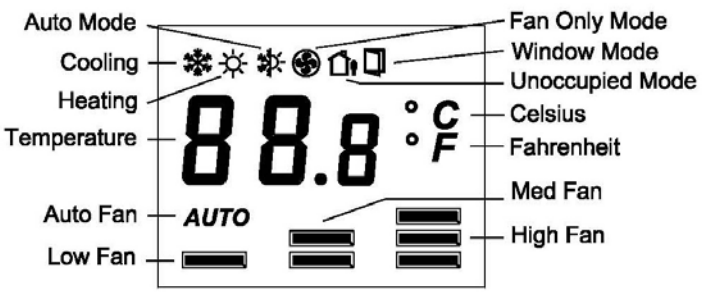


Display Control Unit

Remote Control Unit

Display Control Unit and LCD Layout





Thermostat Errors Reporting

When the following errors are reported on the LED display unit, these errors will prevent the thermostat from normal operation:

E-1 EEPROM read/write error
E-2* Temperature sensor open-circuited
E-3 Temperature sensor short-circuited
E-4 User configuration checksum error

* If jumper JP1 is cut open and external sensor is used, E-2 means the external sensor may have been disconnected from Terminals SR1 and GND. Check the external sensor's connectivity and resistive value. If E-2 error is still reported, return the thermostat to the manufacturer for repair.

When the error E-1, E-3 or E-4 is reported or when the error E-2 is reported without jumper JP1 being cut and external sensor being installed, return the thermostat to the manufacturer for repair.

Trouble Shooting

Before trouble-shooting starts, ensure that the voltage output from Terminals 1 (GND) and 2 (+12 Vdc) on the power supply unit is between 12 Vdc and 15 Vdc and not higher. Higher voltage may damage the internal circuitry and components of the display control unit.

When abnormal power voltages are found, return the thermostat to the manufacturer for repair.

When there is no 12 Vdc power output, check the line voltage power and its 5 A fuse.

Network & Cabling Requirements

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

Item	Description
Cabling	It is recommended to use networking cabling that matches the following specifications: • 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 • Terminating the shield to ground at one end only for each isolated segment will prevent ground loops in the shield and drain RF energy to ground. Grounding at the BACnet router or controller is preferred.
Topology	Ensure the MS/TP network cable is installed as a daisy chain from one device to the next.
Maximum Nodes	The maximum number of devices is 32 per MS/TP network segment and 64 per network trunk with one repeater.
Terminator	A terminator of 120-ohm impedance must be installed at each end of each MS/TP network segment, or two per MS/TP network. Ensure that this requirement is not overlooked in laying out the network architecture and ordering product.
Cable Shielding	Use a shielded, twisted pair cable for communications. Never directly ground wire in more than one point on the shield. Doing so can induce large currents and result in communication problem.
Repeater	A repeater is not necessary unless more than 32 nodes will be installed on a network or the MS/TP network is extended beyond 1,000 m.

Operation Notes

- LCD shows ambient temperature constantly except when set point adjustment is being made.
- Press the switch key 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 ^{o}C for cooling and 16 ^{o}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" 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" and "1FM", while in unoccupied mode, the valve output is never activated.
  For Model "2", 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.
- The thermostat allows authorized service agent to change certain operating parameters in the field.

Wiring Diagram

The networking thermostats consist of two basic units: the Network Control Unit and the Power Supply Unit. While all line-voltage wiring is terminated at the Power Supply Unit, all connections between Network Control Unit and Power Supply Unit are of low-voltage signaling wires.

Wiring and Application Notes

- Cut jumper JP1 if 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.
- 22 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.
- Connecting wires between Network Control Unit and Power Supply Unit must not exceed 15 m.
- Seasonal changeover sensor or switch is only applicable to heat only or cool only 2-pipe model only.
- 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 ºC, the thermostat enters into heating mode.
- Unoccupied contact closure activates energy saving mode.
- Window contact closure locks out all thermostat functions.
- The thermostat outputs are designed for controlling zone valves. If used for controlling electric heaters, external contactors must be used.

Wiring Diagram for Line-Voltage Fan and 0-10 VDC Cooling Valve Output and Line-Voltage 2-Wire On-Off Heating Output

WARNING

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

Piping Notes:

1. Vc must be a 0-10 VDC cooling valve.
2. H must be an electric contactor and connected to line-voltage terminals Vh and N.