BAST-421C – BACnet Communicating Thermostat for Modulating Fan Coil Operation

The BASstat series of BACnet-compliant wired or wireless communicating thermostats ensure effortless integration into BACnet/IP (Wi-Fi) or BACnet MS/TP (EIA-485) networks. These thermostats are suited for modulated heating, cooling, and ventilation with analog output control in 4-pipe applications such as Fan Coil Units (FCU) or Air Handlers. A configurable control algorithm allows adaptability to the specific application. This adaptive algorithm applied to the modulated valve control saves energy and ensures comfort for the occupants. Three sensing options are available: built-in temperature sensor, input for remote temperature sensor, or temperature override network command from Building Automation System. Occupancy status can be set from thermostat buttons, a wired ESI input, or over the BACnet network. Thermostat buttons are optionally lockable to prevent unauthorized control or configuration changes. Digital display with graphical icons is easy to read and understand.

NOTE: This unit is designed for 4-pipe HVAC systems and not recommended for 2-pipe HVAC systems.

Versatile BACnet Communication in Two Distinct Models

- BACnet MS/TP in B2 models with MS/TP baud rates 9.6kbps - 76.8kbps (BTL Listed)
- BACnet/IP in BW2 models with 802.11 b/g/n 2.4GHz Wi-Fi
- Both B2 and BW2 models are BACnet compliant with a B-ASC device profile

Flexible Installation

- 24VAC (+/-10%) power input
- Digital Display with graphical icons of operation, °C or °F display
- Modulating valve control, analog Outputs for Fan Coil Operation
- Suitable for 4-pipe modulating heat/cool control applications with manual or automatic changeover
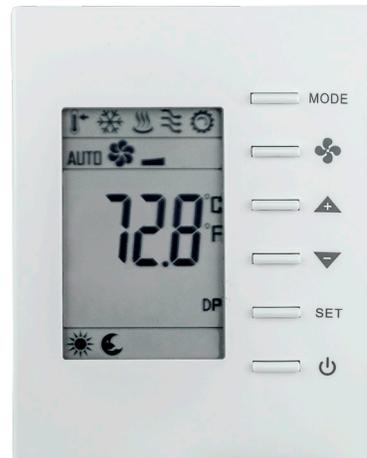
NOTE: 2-pipe heat/cool applications and floating-type valve actuators are not supported by this device

- Occupied/Unoccupied modes with 2 sets of Cool/Heat set points
- Effective run time accumulation for energy consumption calculations
- Built-in temperature sensor
- Remote temperature sensor input (NTC Thermistor 3kΩ)
- Occupancy status can be switched (1) locally by the user, (2) by using a separate occupancy sensor, or (3) by using BACnet network command
- Networked current temperature override from BACnet client (BMS)
- Fully Configurable Algorithm control parameters: Deadband, Proportional Gain, Integral Rate, Stage Trip Points, Stage Widths, Short Cycle Delay, Maximum Cycles Per Hour
- Stand-alone operation with setpoints reset and schedule from BACnet BMS or optional full BACnet BMS control
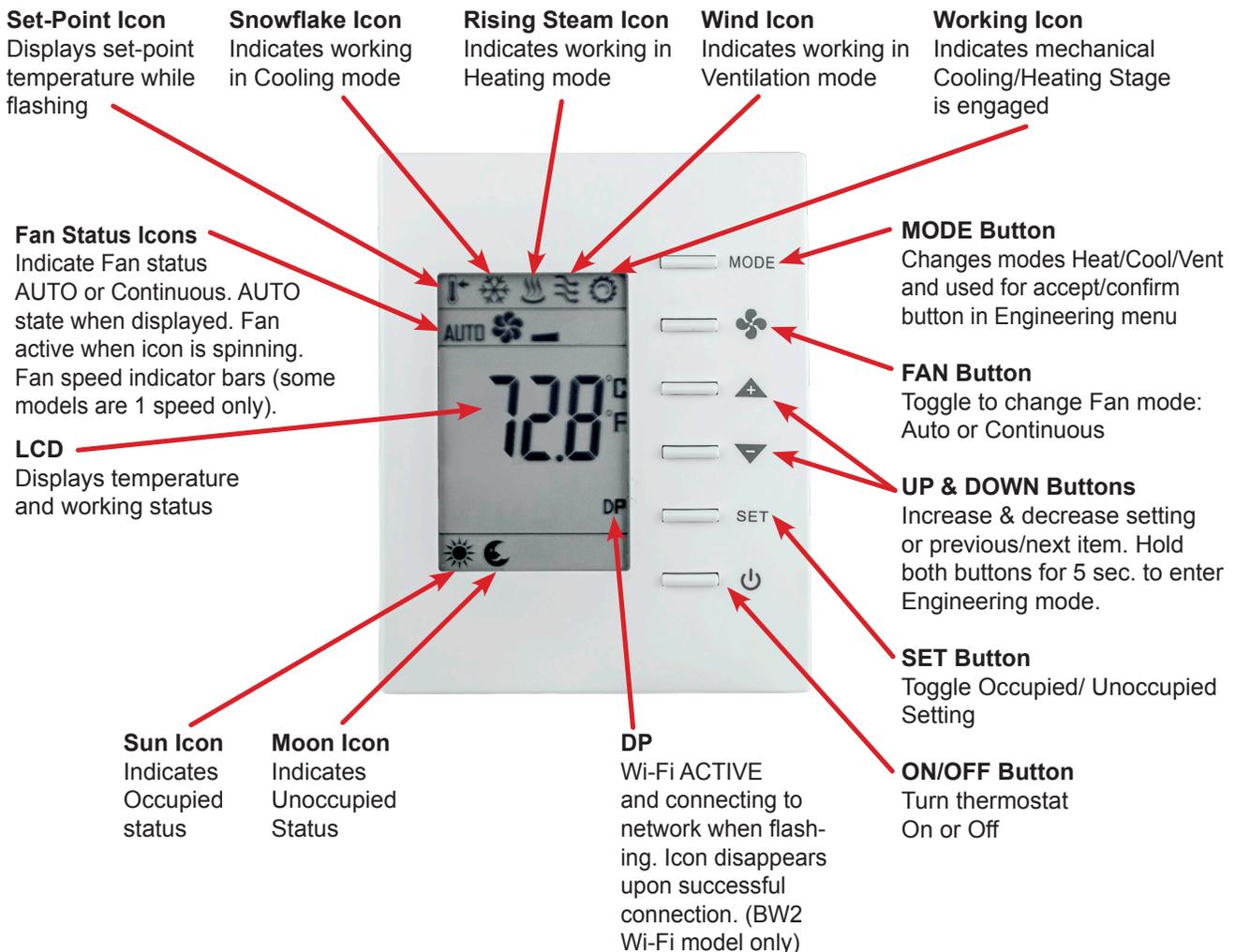
- Non-volatile memory (EEPROM) retains user settings during power loss

- Lockable buttons/user interface

- Operating Environment: 0-50°C, 5-95% RH (non-condensing)

- Wiring: 14 to 22 AWG wires or 1.5mm^2 wires

- Dimensions: 94×118×34 mm (W × H × D)

- Mounts directly onto wall, panel, standard 65×65 mm junction box (hole pitch 60 mm) or standard 2×4 inch vertical junction box (hole pitch 83.5 mm)

BASstat – Overview

The BASstat's white backlit LCD display is large and easy to read, even from a distance. It incorporates graphical icons to aid visual indication of current state of operation. Several icons indicate parameters such as: Active Mode, Cooling stage 1 or 2, Heating stage 1 or 2, Ventilation Only, Fan Active, Occupied/Unoccupied state, and Clock icon to indicate Short Cycle Delay or Max Cycles per hour active waiting state. These icons are very useful in indicating the thermostat's current state of operation.
Six buttons on the BASstat allow users to manipulate temperature set point, change HVAC modes, turn the thermostat ON/OFF, and more. Pressing the Set and Up/Down buttons can manually toggle the thermostat from occupied/unoccupied modes, where BACnet occupancy command is not an option. All 6 of these buttons are lockable in a configurable manner to prevent unauthorized configuration change. Some or all buttons can be locked for application flexibility, making the stat suitable for applications where limited user control is allowed.

Set-Point Icon
Displays set-point temperature while flashing

Snowflake Icon
Indicates working in Cooling mode

Rising Steam Icon
Indicates working in Heating mode

Wind Icon
Indicates working in Ventilation mode

Working Icon
Indicates mechanical Cooling/Heating Stage is engaged

Fan Status Icons
Indicate Fan status AUTO or Continuous. AUTO state when displayed. Fan active when icon is spinning. Fan speed indicator bars (some models are 1 speed only).

LCD
Displays temperature and working status

MODE Button
Changes modes Heat/Cool/Vent and used for accept/confirm button in Engineering menu

FAN Button
Toggle to change Fan mode: Auto or Continuous

UP & DOWN Buttons
Increase & decrease setting or previous/next item. Hold both buttons for 5 sec. to enter Engineering mode.

SET Button
Toggle Occupied/ Unoccupied Setting

ON/OFF Button
Turn thermostat On or Off

Sun Icon
Indicates Occupied status

Moon Icon
Indicates Unoccupied Status

DP
Wi-Fi ACTIVE and connecting to network when flashing. Icon disappears upon successful connection. (BW2 Wi-Fi model only)

Wiring Diagram

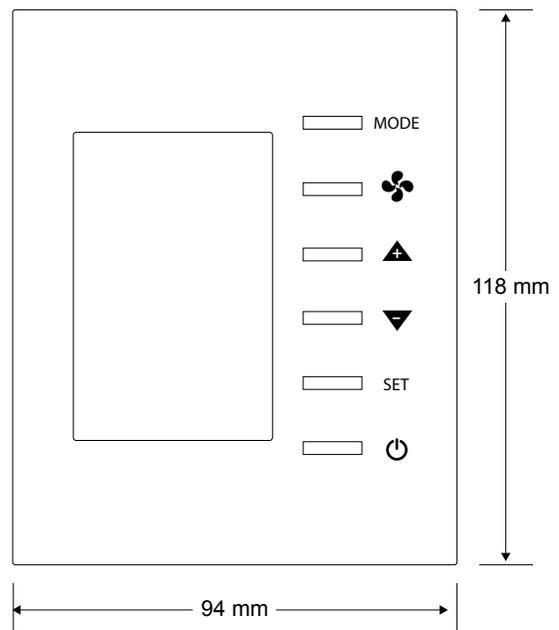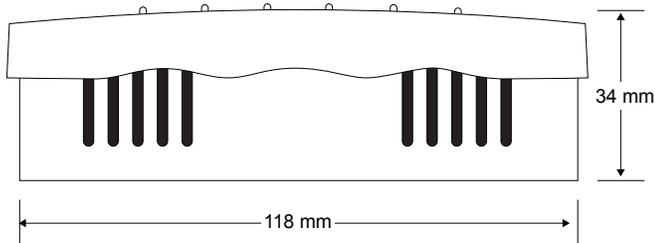Wiring: 14 to 22 AWG wires or 1.5mm^2 wires.

Mounts directly onto wall, panel, standard 65×65mm junction box (hole pitch 60 mm) or standard 2×4-inch vertical junction box (hole pitch 83.5mm).

EIA-485 connection to pins 16(D+) and 17(D-) applicable to B2 - BACnet MS/TP model only. BW2 model uses Wi-Fi connectivity
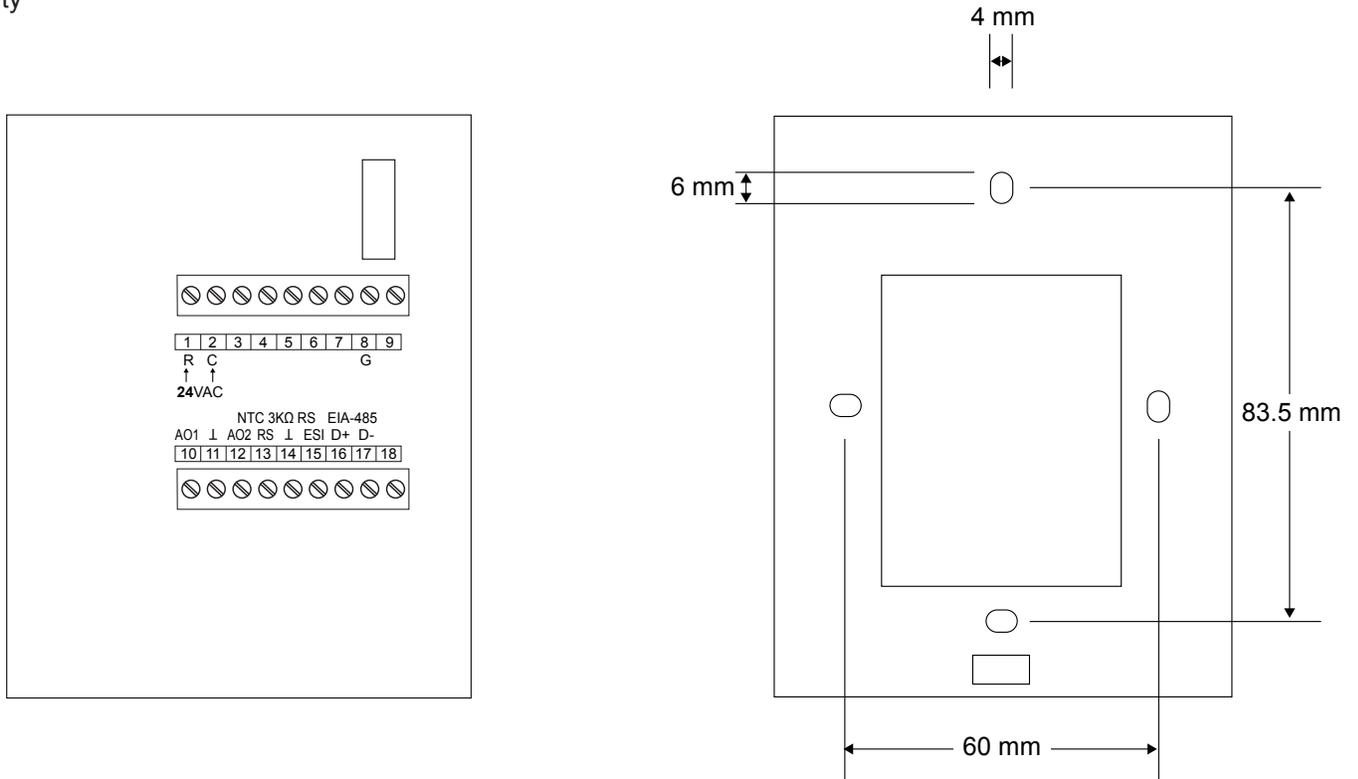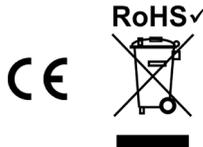
Dimensions (all dimensions are in mm)

Width: 94mm
Height: 118mm
Depth: 34mm

Specifications

Functional	B2 model	BW2 model
Compliance	EIA-485	IEEE 802.11b, 802.11g, 802.11n (single stream) 16.5dBm@11b, 14.5dBm@11g 13.5dBm@11n Frequency range: 2400MHz~2484MHz
Protocols supported	BACnet MS/TP	BACnet/IP
Cable length	4000 ft/1200 m @76.8kbps (max)	N/A
Wi-Fi range	N/A	150ft. as defined by the standard (depending on obstructions) 54Mbps max data rate
Authentication	N/A	WEP, WPA/WPA2 PSK
Maximum Number of Devices	32 MS/TP devices (max)	N/A or depending on Wi-Fi router performance
Temperature Display Range	-30 to 120.0°C (-22 to 248°F) with suitable sensor	-30 to 120.0°C (-22 to 248°F) with suitable sensor
Temperature Display Resolution	0.1°F (0.1°C)	0.1°F (0.1°C)
Temperature Accuracy	±1.8°F (±1.0°C) with all outputs off	±1.8°F (±1.0°C) with all outputs off

Electrical		
Input	AC only	AC only
Voltage (V, ± 10%)	24 VAC	24 VAC
Power	5 VA Frequency 47–63 H	5 VA
Frequency	47–63 Hz	47–63 Hz

Environmental/Mechanical		
Operating temperature	0°C to +50°C (32 to 122°F)	0°C to +50°C (32 to 122°F)
Storage temperature	−10°C to +60°C (14 to 140°F)	−10°C to +60°C (14 to 140°F)
Relative humidity	5–95%, noncondensing	5–95%, noncondensing
Protection	IP30	IP30
Weight	0.44 lbs. (.2 kg)	0.44 lbs. (.2 kg)

Regulatory Compliance

CE Mark; RoHS

RoHS✓

CE

BW2 model Wi-Fi FCCID   P53-EMW3165-P

Electromagnetic Compatibility

The BASstat complies with the following specifications and bears the CE mark in accordance with the provisions of the Electromagnetic Compatibility (EMC) Directive 2004/108/EC based on the following specifications:

Standard	Test Method	Description
EN 61000-6-2	IEC 61000-4-2	Electrostatic Discharge Immunity
EN 61000-6-2	IEC 61000-4-3	Radiated, Radio-Frequency, Electromagnetic Field Immunity
EN 61000-6-2	IEC 61000-4-4	Electrical Fast Transit/Burst Immunity
EN 61000-6-2	IEC 61000-4-5	Voltage Surge Immunity
EN 61000-6-2	IEC 61000-4-6	Immunity to Conducted Disturbances
EN 61000-6-2	IEC 61000-4-8	Power Frequency Magnetic Field Immunity
EN 61000-6-2	IEC 61000-4-11	Voltage Dips and Interruptions
EN 61000-6-3	IEC 61000-3-2	Limits for Harmonic Current Emissions
EN 61000-6-3	IEC 61000-3-3	Limitation of Voltage Fluctuations and Flicker in Low Voltage Supply Systems

Ordering Information

Model	Description
BAST-421C-B2	BACnet MS/TP FCU 4-pipe, single-speed Fan, Wired
BAST-421C-BW2	BACnet/IP FCU 4-pipe, single-speed Fan, Wi-Fi