



BASstat221C – BACnet Communicating Thermostat for Multi-Stage Heating/Cooling

The BASstat series of BACnet-compliant wired or wireless communicating thermostats are BTL listed to ensure effortless integration into BACnet/IP (Wi-Fi) or BACnet MS/TP (EIA-485) networks. These thermostats are suited for single or multi-stage heating, cooling and ventilation binary output control applications such as RTU or AHU. Configurable control algorithm parameters allow adaptability to the specific application. Adaptive control algorithm applied to multi-stage on/off control saves energy and ensures seamless comfort for the occupants. Built in temperature sensor, input for remote temperature sensor, or temperature override network command from Building Automation System. A built-in relative humidity sensor (in 221CH models) allows the thermostat to display relative humidity on the screen as well as serve it as a BACnet object, dew point calculation is also served as a BACnet object (no control action is taken based on humidity). Occupancy status can be set from thermostat buttons or over the BACnet network. Thermostat buttons are optionally lockable to prevent unauthorized control. Digital display with graphical icons is easy to read and understand.



Versatile Communication in Two Distinct Models

- Both models are BTL listed with B-ASC device profile
- BACnet MS/TP in B2 model MS/TP baud rates 9.6kbps - 76.8kbps
- BACnet/IP in BW2 model 802.11 b/g/n 2.4GHz Wi-Fi

Flexible Installation

- 24VAC (+/-10%) power input
- Digital Display with graphical icons of operation, °C or °F display
- Single or Multistage, Binary Outputs for RTU or AHU applications
- Manual or Auto-changeover modes

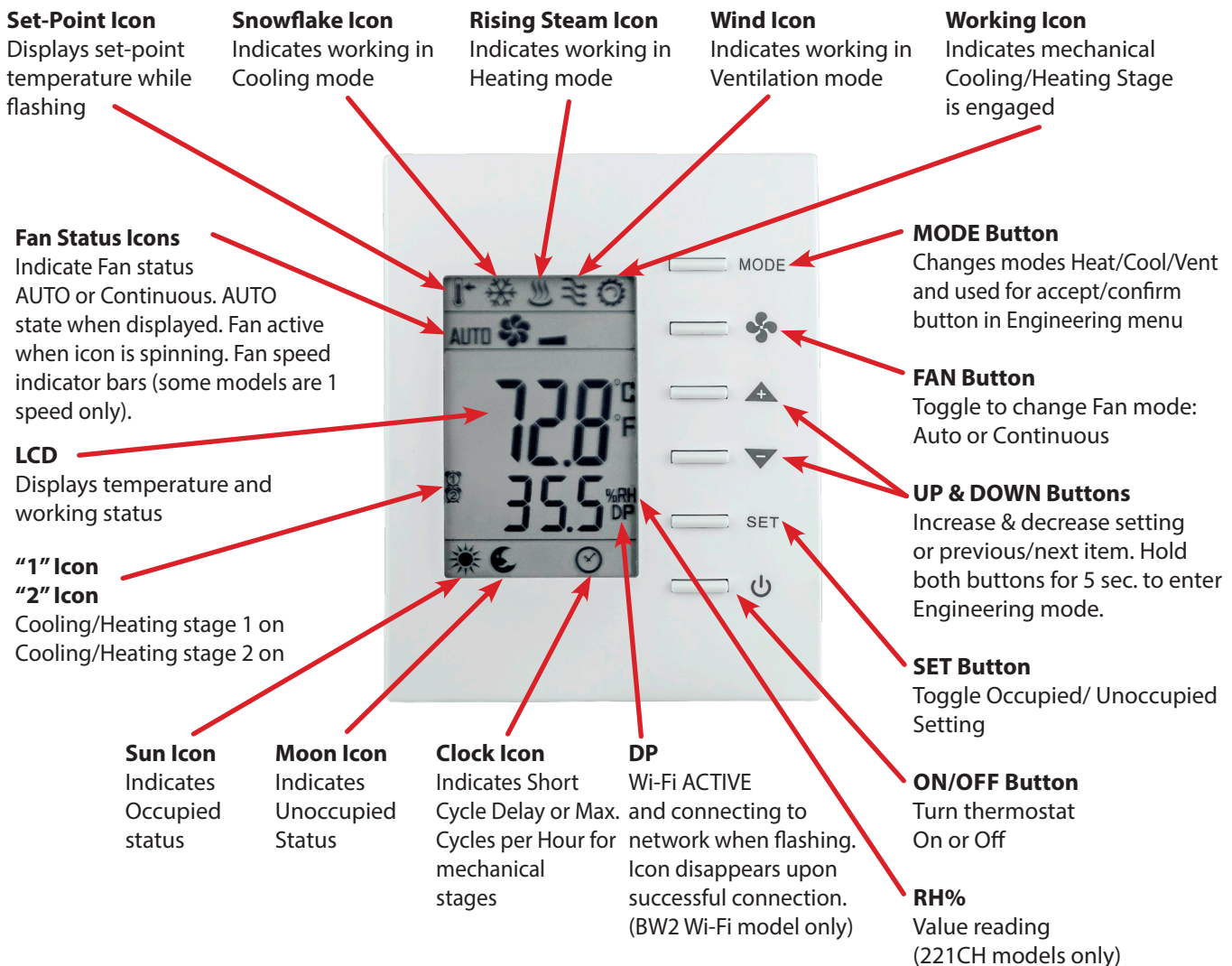
- Occupied / Unoccupied modes with 2 sets of Cool/Heat set points
- Effective run time accumulation for energy consumption calculations
- Built-in temperature sensor
- Built-in relative humidity sensor and dew point calculation value (in 221CH models)
- Remote temperature sensor input (NTC Thermistor 3kΩ)
- 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 up to 1.5mm² 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.

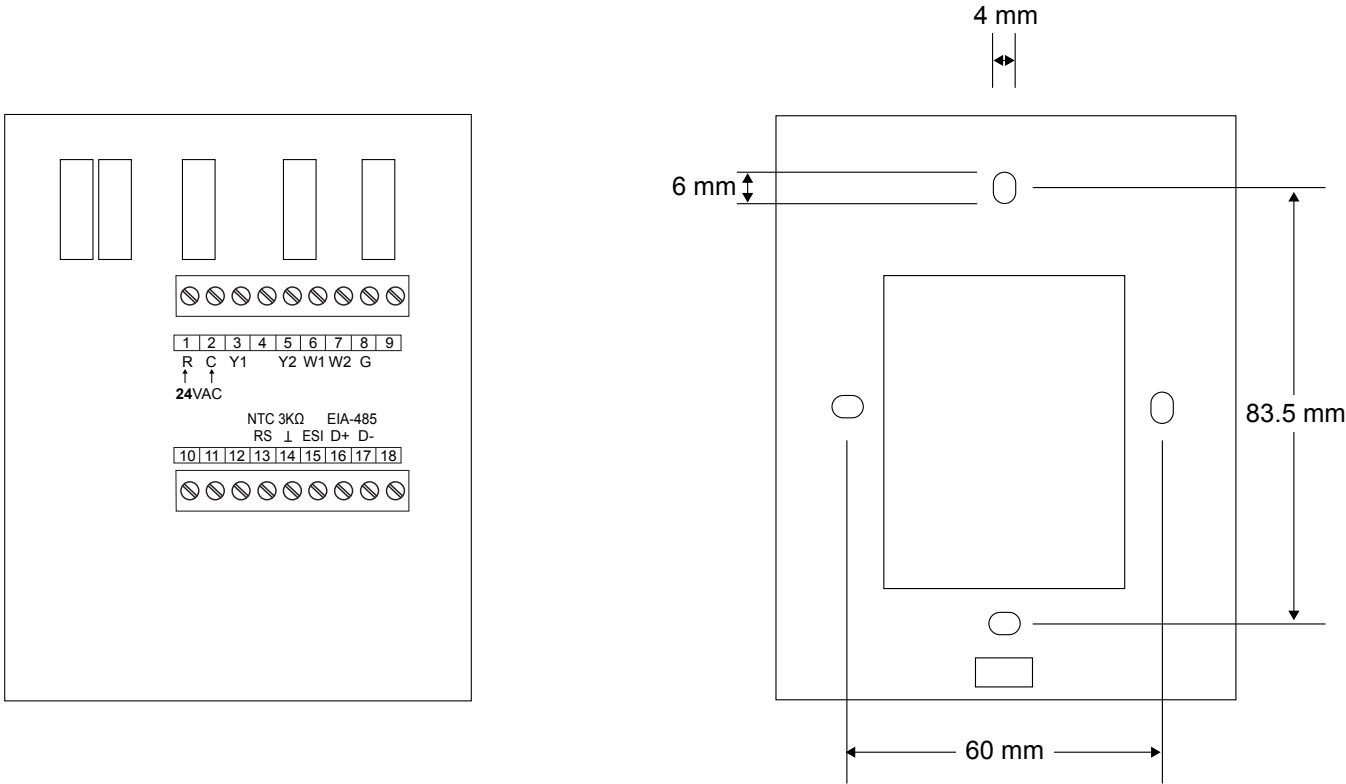


Wiring Diagram

Wiring: 14 to 22 AWG wires or up to 1.5mm² 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 83.5 mm)

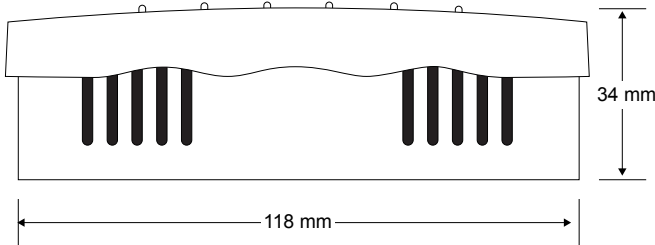
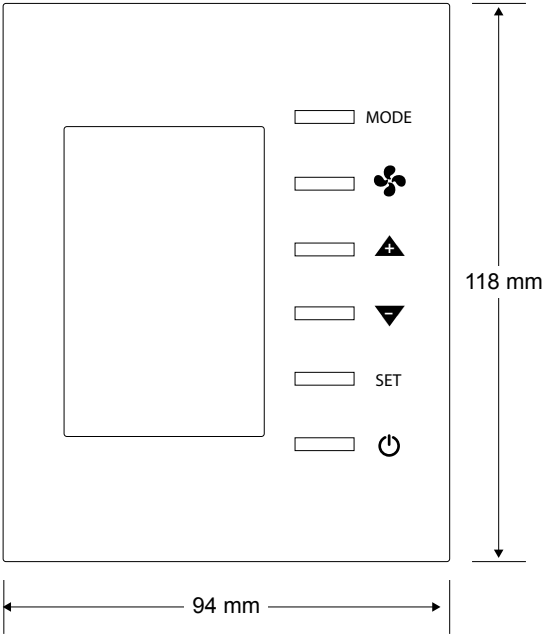
EIA-485 connection to pins 16(+) and 17(-) applicable to B2 - BACnet MS/TP model only. BW2 model uses Wi-Fi connectivity



Dimensions (all dimensions are in mm)

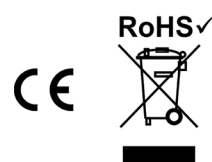
Dimensions:
Width: 94mm
Height: 118mm
Depth: 34mm

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



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	14 to 140°F (-10 to 60°C)	14 to 140°F (-10 to 60°C)
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
Humidity Display Range (221CH models)	0 to 100 %RH	0 to 100 %RH
Humidity Display Resolution (221CH models)	0.1 %RH	0.1 %RH
Humidity Accuracy (221CH models)	± 2.0 %RH	± 2.0 %RH
Long-term Humidity Sense Drift (221CH models)	<0.25 %RH/year	<0.25 %RH/year
Electrical		
Input	AC only	AC only
Voltage (V, ± 10%)	24	24
Power	5 VA	5 VA
Frequency	47–63 Hz	47–63 Hz
Environmental/Mechanical		
Operating temperature	0°C to +50°C	0°C to +50°C
Storage temperature	-10 to +60°C	-10 to +60°C
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		
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-221C-B2	BACnet MS/TP Thermostat 2-Heat, 2-Cool, 1-Fan, Wired
BAST-221C-BW2	BACnet/IP Thermostat 2-Heat, 2-Cool, 1-Fan, Wi-Fi
BAST-221CH-B2	BACnet MS/TP Thermostat 2-Heat, 2-Cool, 1-Fan, RH, Wired
BAST-221CH-BW2	BACnet/IP Thermostat 2-Heat, 2-Cool, 1-Fan, RH, Wi-Fi

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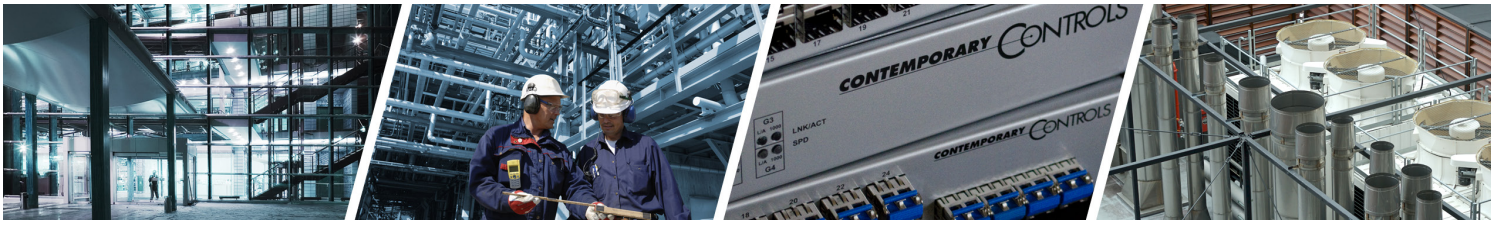
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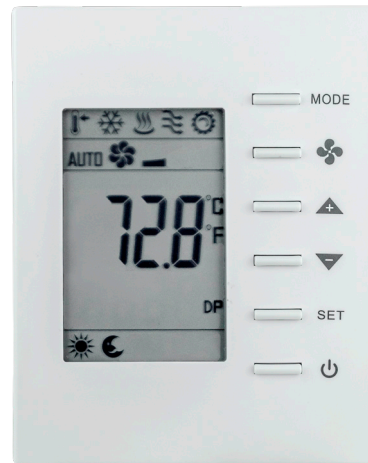
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BAST-321HP – BACnet Communicating Thermostat for Single and Multi-Stage Heat Pump Operation

The BASstat series of BACnet-compliant wired or wireless communicating thermostats ensure easy integration into BACnet/IP (Wi-Fi) or BACnet MS/TP (EIA-485) networks. The BAST-321HP is suited for heating, cooling, and ventilation with binary output control for single and multi-stage heat pumps with or without 3rd stage auxiliary heat. An adaptive control algorithm saves energy and ensures comfort for the occupants. Three sensing options are available: built-in temperature sensor, input for a remote temperature sensor, or temperature network command from a Building Automation System (BMS). Reversing valve (O/B) logic is configurable. Occupancy status can be set from thermostat buttons, a wired ESI input, or over the BACnet network. Thermostat buttons are optionally lockable to prevent tampering. Digital display with graphic icons is easy to read and understand.



ASHRAE **BACnet™ MS/TP**

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 graphic icons of operation, °C or °F display
- Single or Multi-stage, low voltage binary outputs for heat pump applications
- Configurable O/B reversing valve control (N.O/N.C.)
- Manual or Auto-changeover modes
- Effective run time accumulation for energy consumption calculations

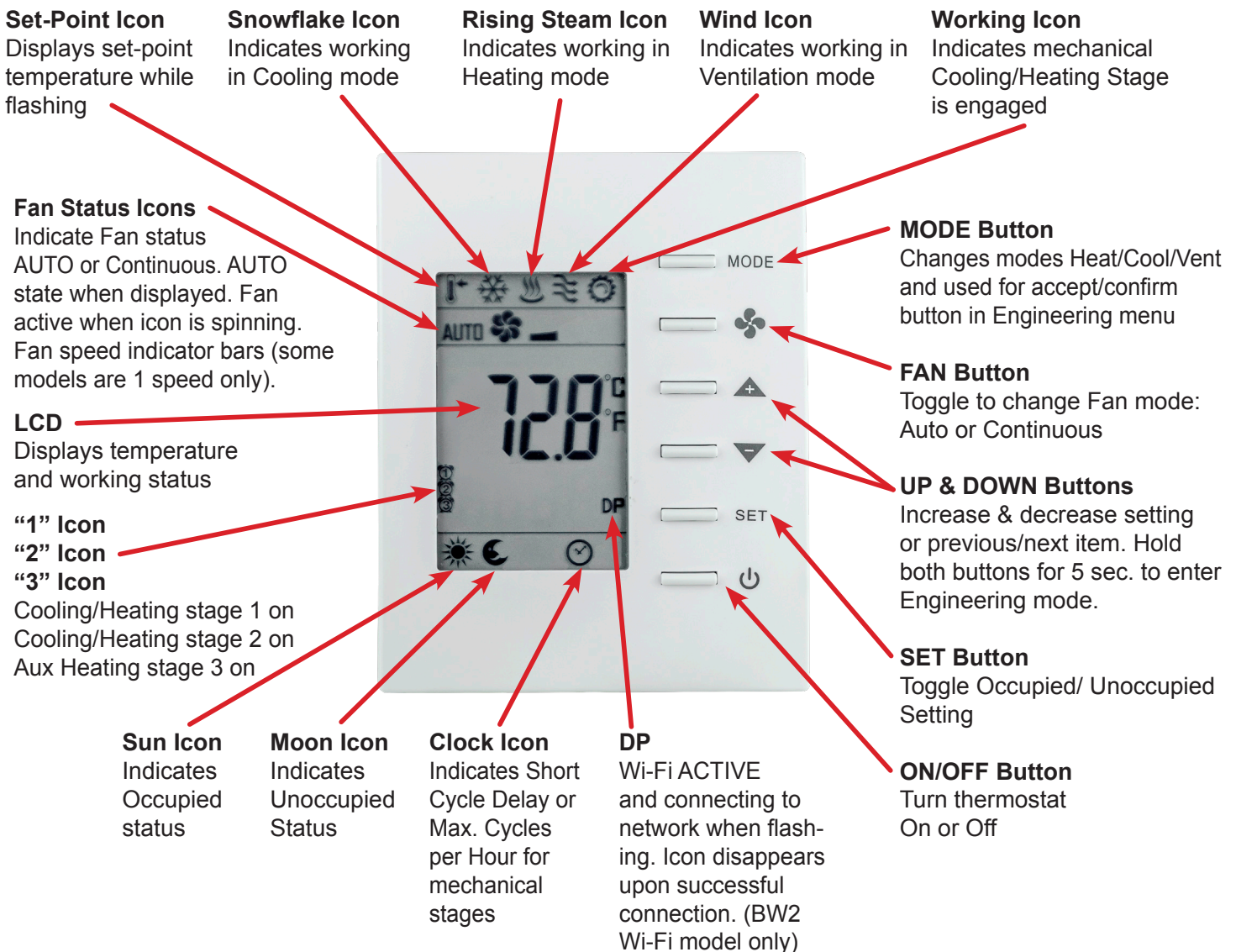
- Selectable built-in temperature sensor or remote temperature sensor input (NTC Thermistor 3kΩ)
- Occupied / Unoccupied mode can be switched locally by the user, by using a separate occupancy sensor, or remotely by the BMS headend
- Configurable PID Algorithm parameters: Proportional Gain, Integral Rate, Stage Widths, Deadband
- Configurable Max Heat & Min Cool temperatures, Short Cycle Delay, Maximum Cycles Per Hour
- Stand-alone operation with BACnet setpoint and schedule supervision or optional full BMS control
- Non-volatile memory retains user settings during power loss
- Lockable user interface
- Operating Environment: 0-50°C, 5-95% RH (non-condensing)
- 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 backlit LCD display is large and easy to read. It incorporates graphic icons to indicate current state of operation: Active Mode, Cooling stage 1 or 2, Heating stage 1, 2, or 3, Ventilation Only, Fan Active, Occupancy Status, and Clock icon to indicate Short Cycle Delay or Max Cycles per hour active waiting state.

Six buttons on the BASstat allow users to adjust temperature set points, 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. Front panel buttons are lockable to prevent user tampering. These buttons can also be locked individually, making the BASstat suitable for applications where limited user control is desired. For greater operational flexibility, an optional remote space temperature sensor is available. Featuring an NTC type 3kΩ thermistor, the temperature sensor is directly compatible with any BASstat model.

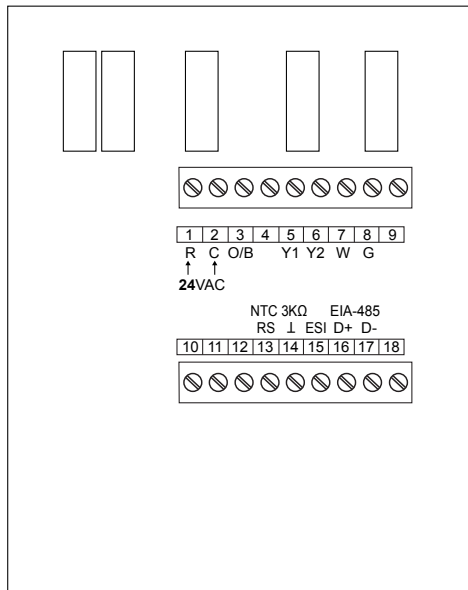
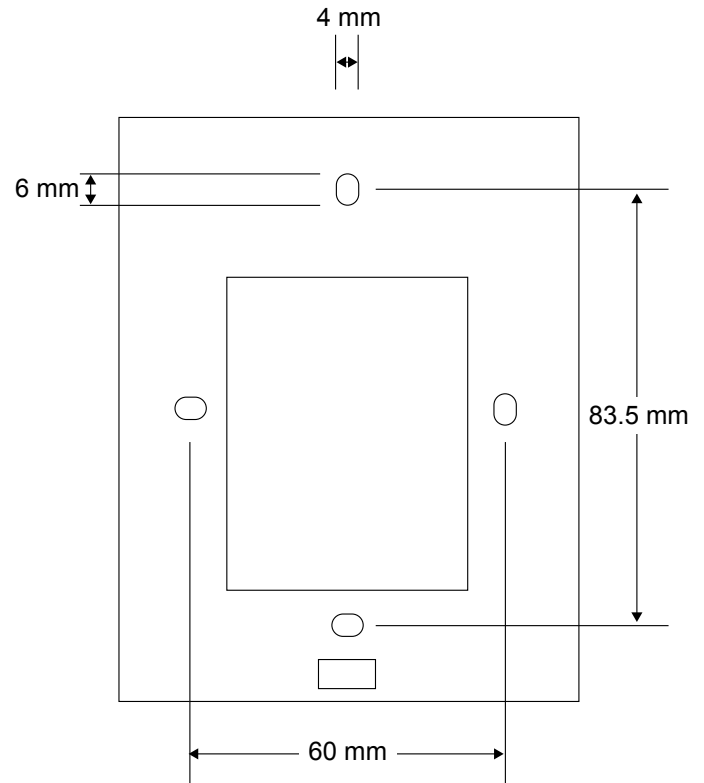


Wiring Diagram

Wiring: 14 to 22 AWG wires or 1.5mm² wires.

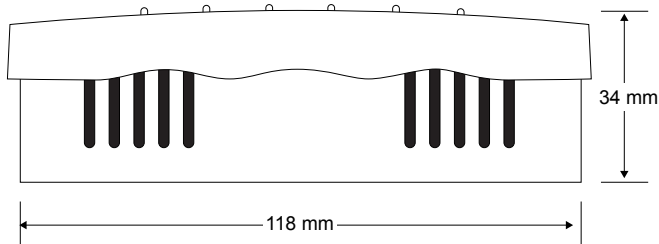
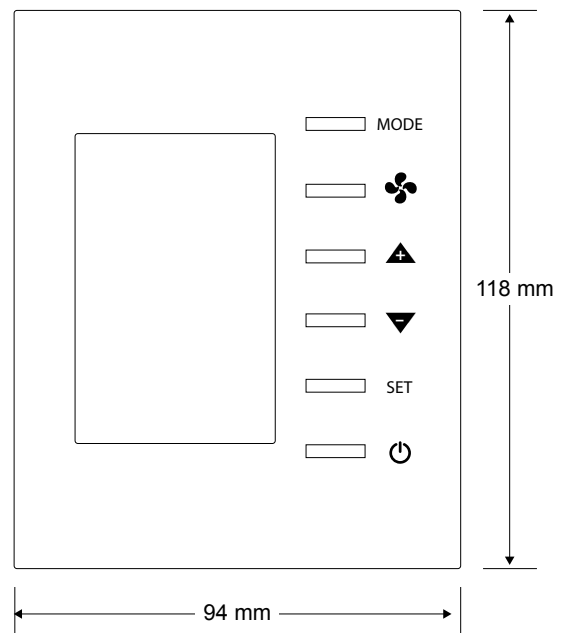
Mounts directly onto wall, panel, standard 65×65mm junction box (hole pitch 60 mm) or standard 2×4-inch vertical junction box (hole pitch 83.5mm).

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

Compliance

B2 model

EIA-485

BW2 model

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

-10 to +60°C (14 to 140°F)

-10 to +60°C (14 to 140°F)

Temperature Display Resolution

0.1°F (0.1°C)

0.1°F (0.1°C)

Temperature Accuracy

±1.0°C (±1.8°F) with
all outputs off

±1.0°C (±1.8°F) with
all outputs off

Electrical

Input

AC only

AC only

Voltage (V, ± 10%)

24 VAC

24 VAC

Power

5 VA

5 VA

Frequency

47–63 Hz

47–63 Hz

Environmental/Mechanical

Operating temperature

0°C to 50°C

0°C to 50°C

Storage temperature

-10°C to +60°C

-10°C to +60°C

Relative humidity

5–95%, noncondensing

5–95%, noncondensing

Protection

IP30

IP30

Weight

0.44 lbs. (.2 kg)

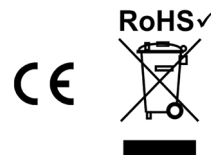
0.44 lbs. (.2 kg)

Regulatory Compliance

CE Mark; RoHS

BW2 model Wi-Fi FCCID

P53-EMW3165-P



Electromagnetic Compatibility

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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

BAST-321HP-B2
BAST-321HP-BW2
TAS-THTRAD01

Description

BACnet MS/TP Heat Pump 2-comp, 1-Aux Heat, 1-Fan, Wired
BACnet/IP Heat Pump 2-comp, 1-Aux Heat, 1-Fan, Wi-Fi
3KΩ Room Temperature Sensor w/Insulated Pad

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