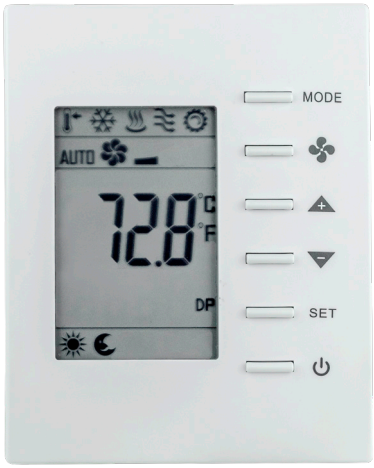

# BAST-321HP – BACnet Communicating Thermostat for Single and Multi-Stage Heat Pump Operation

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.




Wi-Fi

BTL BACnet Testing Laboratories

ASHRAE BACnet™ MS/TP

### Versatile BACnet Communication in Two Distinct Models

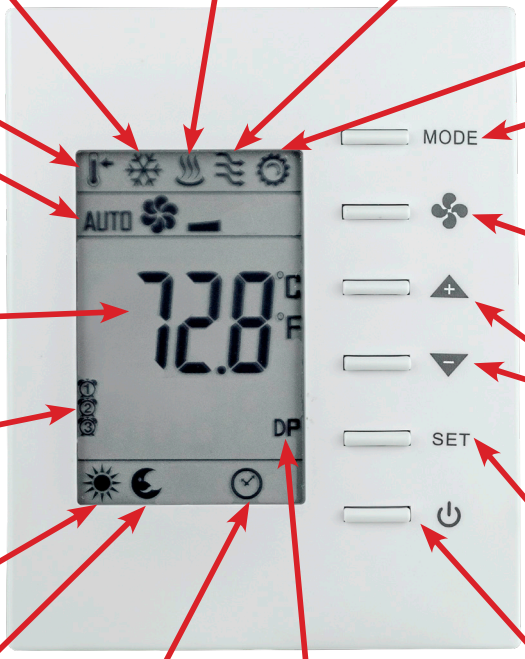
- BACnet MS/TP in B2 models with MS/TP baud rates 9.6kbps - 76.8kbps (BTL Listed)
- BACnet/IP in BW2 models with 802.11 b/g/n 2.4GHz Wi-Fi
- Both B2 and BW2 models are BACnet compliant with a B-ASC device profile

### 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.




**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

**"1" Icon**
**"2" Icon**
**"3" Icon**
Cooling/Heating stage 1 on
Cooling/Heating stage 2 on
Aux Heating stage 3 on

**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

**Clock Icon**
Indicates Short Cycle Delay or Max. Cycles per Hour for mechanical stages

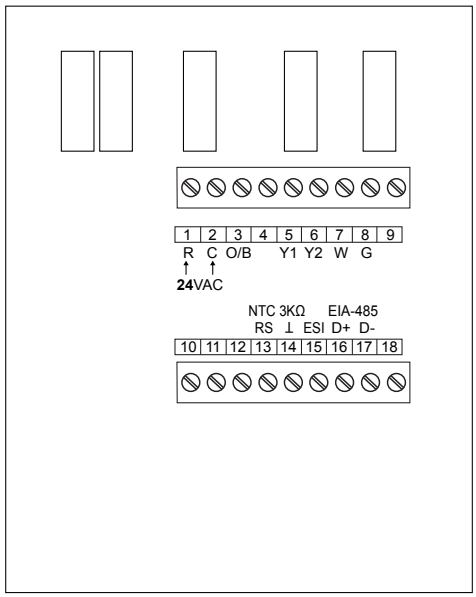
**DP**
Wi-Fi ACTIVE and connecting to network when flashing. Icon disappears upon successful connection. (BW2 Wi-Fi model only)

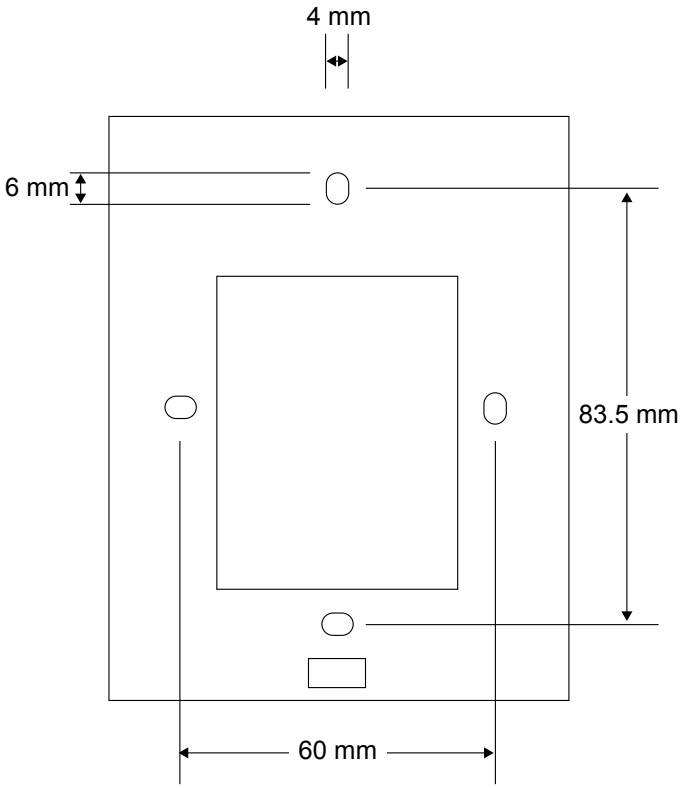
# Wiring Diagram

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).

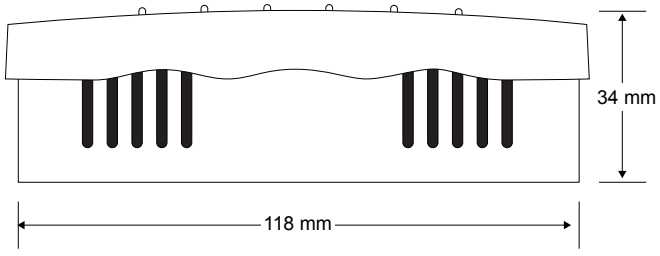
EIA-485 connection to pins 16(D+) and 17(D-) applicable to B2 - BACnet MS/TP model only. BW2 model uses Wi-Fi connectivity

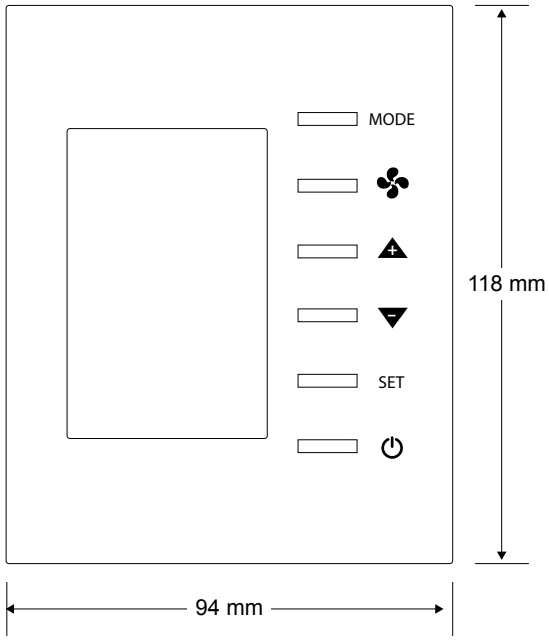


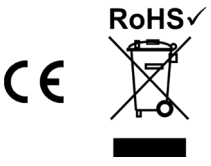

# Dimensions (all dimensions are in mm)

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 | -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

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-321HP-B2 | BACnet MS/TP Heat Pump 2-comp, 1-Aux Heat, 1-Fan, Wired |
| BAST-321HP-BW2 | BACnet/IP Heat Pump 2-comp, 1-Aux Heat, 1-Fan, Wi-Fi |
| TAS-THTRAD01 | 3KΩ Room Temperature Sensor w/Insulated Pad |

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