

TB7600 Series Communicating RTU/Heat Pump Thermostats

FOR COMMERCIAL HVAC APPLICATIONS

SPECIFICATION DATA



**TB7600 Series
Thermostat**



**TB7600 Series
Thermostat with
Occupancy Sensor**

APPLICATION

The TB7600 Series PI thermostat family is specifically designed for single stage and multi-stage control of heating/cooling equipment such as rooftop and self-contained units. The TB7600 Series are communicating thermostats with models available in BACnet® MS/TP and ZigBee® wireless mesh protocols and can be easily integrated into a WEBS-AX building automation system based on the NiagaraAX® platform. The product features an intuitive, menu-driven, backlit LCD display, which walks users through the programming steps, making the process extremely simple. Accurate temperature control is achieved due to the product's PI time proportional control algorithm, which virtually eliminates temperature offset associated with traditional, differential-based thermostats.

Depending on the model, up to three remote sensor inputs are available. All models contain a SPST auxiliary switch, which can be used to control lighting or disable the economizer function and a discharge air sensor input. For more advanced applications, economizer control logic has been integrated into the thermostat for use with proportional damper economizer actuators.

Thermostats equipped with an occupancy sensor cover provide advanced active occupancy logic, which will automatically switch occupancy levels from Occupied to Unoccupied as required by local activity being present or not. This advanced occupancy functionality provides

advantageous energy savings during occupied hours without sacrificing occupant comfort. All thermostats are PIR ready and can be ordered with or without Honeywell occupancy sensor. The occupancy sensor cover is available to order separately if a PIR is needed at a later time.

FEATURES

- Available in BACnet MS/TP and ZigBee wireless protocols
- Backlit LCD display with dedicated function menu keys for simple operation
- Built in default profile set-up for easier start up and commissioning
- Fully integrated advanced occupancy functionality with a PIR accessory cover on some models
- Non-volatile EEPROM memory prevents loss of parameters during power outage
- Programmable smart fan operation can provide energy savings during night mode
- Password protection to minimize parameter tampering
- Three levels of keypad lockout to limit access to change user parameters such as setpoints, system mode, etc.
- Gas/oil or electric system compatibility for all type of applications
- SPST auxiliary output can be used for lighting and/or economizer override
- 0 to 10 Vdc economizer output for more retrofit opportunities
 - Built in dry bulb economizer logic using outdoor temperature sensor
 - Input for supply/mixed air temperature sensor
- Support single and two stages heat pump with one auxiliary heat stage
- Remote indoor averaging sensing with 2, 3, 4, 9 or 16 sensors
- Remote discharge air sensor input
- Automatic frost protection to prevents costly freeze damage
- Anti short cycle and minimum on/off run time protection to reduce wear and maximizes life span of mechanical equipment



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- Two programmable digital inputs for added flexibility can be used to monitor filter status, activate a remote temporary occupancy switch, and/or used as a general purpose service indicator
 - 7 day programmable models, 2 or 4 events for use in non-networked applications*
 - Six hour reserve prevents the need to reprogram day/time on programmable models after a power outage on programmable models
 - Compressor/auxiliary interlock adds flexibility by locking out heat pump operation during auxiliary heating to prevent high pressure trip when the coil is downstream of the auxiliary heat source
- * Use programmable models only when installing as stand-alone thermostats that may eventually be added to a WEBs-AX network. When a programmable thermostat is added to a network, schedules should be applied through the WEBStation-AX.

Heat Pump Model Specific Features

- Selectable single or dual stage compressor stages
- High balance point locks out auxiliary heating when outside air temperature is above set value, low balance point locks out heat pump compressor operation when outside air temperature is below the set value
- Comfort/economy mode maximizes heat pump use before turning on auxiliary heating

More Information

To learn about additional products in this family visit <http://customer.honeywell.com>.

- TB7600 Series Communicating Thermostats with Humidity Control Specification Data (Form No. 63-2707)
- TB7300 Series Communicating Fan Coil Unit Thermostats Specification Data (Form No. 63-2709).
- TB7200 Communicating Zoning Thermostats Specification Data (Form No. 63-2708).
- Sensors Product Overview Brochure (Form No. 63-9285) for a complete listing of compatible sensors.

TB7600 Series Model Selection

Product Number	Description	Outputs	Scheduling ¹	Occupancy Sensor ²
BACnet Models				
TB7600A5014B	Single Stage RTU	1H/1C	No	
TB7600A5514B	Single Stage RTU	1H/1C	No	X
TB7600B5014B	Multi-stage RTU	2H/2C	No	
TB7600B5514B	Multi-stage RTU	2H/2C	No	X
TB7600H5014B	Heat Pump	3H/2C	No	
TB7600H5514B	Heat Pump	3H/2C	No	X
TB7605B5014B	Economizer RTU	2H/2C	No	
TB7605B5514B	Economizer RTU	2H/2C	No	X
TB7652A5014B	Single Stage RTU	1H/1C	Yes	
TB7652A5514B	Single Stage RTU	1H/1C	Yes	X
TB7652B5014B	Multi-stage RTU	2H/2C	Yes	
TB7652B5514B	Multi-stage RTU	2H/2C	Yes	X
TB7652H5014B	Heat Pump	3H/2C	Yes	
TB7652H5514B	Heat Pump	3H/2C	Yes	X
TB7656B5014B	Economizer RTU	2H/2C	Yes	
TB7656B5514B	Economizer RTU	2H/2C	Yes	X
Wireless Models				
TB7600A5014W	Single Stage RTU	1H/1C	No	
TB7600A5514W	Single Stage RTU	1H/1C	No	X
TB7600B5014W	Multi-stage RTU	2H/2C	No	
TB7600B5514W	Multi-stage RTU	2H/2C	No	X
TB7600H5014W	Heat Pump	3H/2C	No	
TB7600H5514W	Heat Pump	3H/2C	No	X
TB7605B5014W	Economizer RTU	2H/2C	No	
TB7605B5514W	Economizer RTU	2H/2C	No	X
TB7652A5014W	Single Stage RTU	1H/1C	Yes	
TB7652A5514W	Single Stage RTU	1H/1C	Yes	X

Product Number	Description	Outputs	Scheduling ¹	Occupancy Sensor ²
TB7652B5014W	Multi-stage RTU	2H/2C	Yes	
TB7652B5514W	Multi-stage RTU	2H/2C	Yes	X
TB7652H5014W	Heat Pump	3H/2C	Yes	
TB7652H5514W	Heat Pump	3H/2C	Yes	X
TB7656B5014W	Economizer RTU	2H/2C	Yes	
TB7656B5514W	Economizer RTU	2H/2C	Yes	X
Accessories				
TB-PIR-RTU	RTU Occupancy Sensor Cover			
TB-RA-1014	Wireless Remote Antenna Base			
TB-RP5000W	Wireless Repeater for TB7XXX Series Wireless Thermostats			
TB-VWG-APP-1014	TB7XXX Series Wireless Communication Card			
TBST-5014W	ZigBee Wireless Survey Toolkit			
TB-WALL-1014	Room Sensor 10K NTC Type 2			
TB-WALLOVR-1014	Room Sensor with Override 10K NTC Type 2			

- 1 Use programmable models only when installing as standalone thermostats that may eventually be added to a WEBS-AX network. When a programmable thermostat is added to a network, schedules should be applied through the WEBStation-AX.
- 2 Thermostats ordered without an occupancy sensor cover can be retrofitted with an occupancy sensor cover later if needed.

Remote sensor accessories

Remote mount outdoor temperature sensors must be 10 Kohm NTC @ 77°F.

Remote sensors can be used for:

- Various averaging combinations (3 thermistors with 2 dip switches are provided with each sensor)
- Optional occupancy led
- Optional override key

Table 1. Temperature vs. Resistance for 10 Kohm NTC thermistor (R_{25°C} = 10KW±3%, B_{25/85°C} = 3975K±1.5%)

°F	°C	Kohm	°F	°C	Kohm	°F	°C	Kohm	°F	°C	Kohm	°F	°C	Kohm
-40	-40	324.3197	-4	-20	94.5149	32	0	32.1910	68	20	12.4601	104	40	5.3467
-31	-35	234.4009	5	-15	71.2430	41	5	25.1119	77	25	10.0000	113	45	4.3881
-22	-30	171.3474	14	-10	54.1988	50	10	19.7390	86	30	8.0694	122	50	3.6202
-13	-25	126.6109	23	-5	41.5956	59	15	15.6286	95	35	6.5499	131	55	3.0016

Theory of Operation

The TB7600 uses a proprietary adaptive logic algorithm to control the space temperature. This algorithm controls the heating/air conditioning system to minimize overshoot while still providing comfort. It provides exceptional accuracy due to its unique PI time proportioning control algorithm, which virtually eliminates temperature offset associated with traditional, differential-based on/off thermostats.

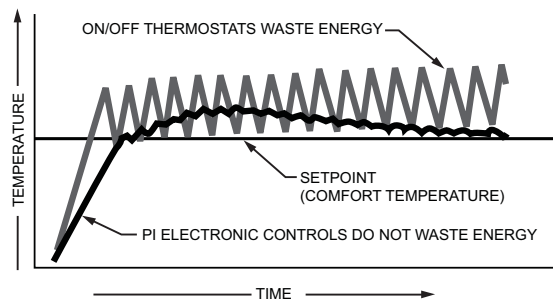


Fig. 1. On/Off mechanical control vs. PI electronic control.

SPECIFICATIONS

Network Protocol: Models available in BACnet MS/TP or ZigBee wireless mesh

WEBs-AX Controllers: Compatible with WEB-2xx, WEB-6xx, and WEB-7xx

Thermostats Per Controller

BACnet: 126 thermostats (BACnet allows 128 but 1 node is used by the controller, and when more than 64 devices are on the network a repeater is required so 1 node used by the repeater).

Wireless: WEB-2xx: 30
WEB-6xx & WEB-7xx: 50

Platform:

WEB-2xx and WEB-6xx - WEBStation-AX 3.0 or later
WEB-7xx - WEBStation-AX 3.5 or later

Thermostat power requirements:

19-30 Vac 50 or 60 Hz; 2 VA (RC and C) Class 2
RC to RH jumper 2.0 Amps 48 VA maximum

Operating conditions:

32 F to 122 F (0 C to 50 C)
0% to 95% R.H. non-condensing

Storage conditions:

-22 F to 122 F (-30 C to 50 C)
0% to 95% R.H. non-condensing

Sensor: 10 K NTC thermistor onboard

Resolution: ± 0.2 F (± 0.1 C)

Control accuracy: ± 0.9 F (± 0.5 C) @ 70 F (21 C) typical calibrated

Occupied and unoccupied setpoint range cooling:

54 to 100 F (12.0 to 37.5 C)

Occupied and unoccupied setpoint range heating:

40 F to 90 F (4.5 C to 32 C)

Room and outdoor air temperature range:

-40 F to 122 F (-40 C to 50 C)

Proportional band for room temperature control:

Factory set, heating and cooling at 2.0 F (1.1 C)

Digital inputs: Relay dry contact only across C terminal to DI1 or DI2

Contact output rating:

Each relay output: (Y1, Y2, G, W1, W2 and AU)
30 Vac, 1 Amp maximum
30 Vac, 3 Amp in-rush

Economizer analog output rating: 0 to 10 Vdc into 2KΩ resistance min.

Economizer analog output accuracy: ± 3% typical

Wire gauge: 18 gauge maximum, 22 gauge recommended

Dimensions: see Fig. 2.

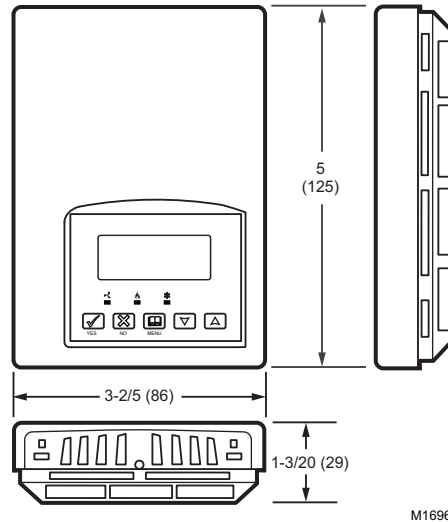


Fig. 2. Thermostat dimensions in inches (mm)

Approximate shipping weight: 0.75 lb (0.34 kg)

Agency Approvals all models:

UL: UL 873 (US) and CSA C22.2 No. 24 (Canada), File E27734 with CCN XAPX (US) and XAPX7 (Canada)

Industry Canada: ICES-003 (Canada)

FCC: Compliant to CFR 47, Part 15, Subpart B, Class A (US)

CE: EMC Directive 89/336/EEC (Europe Union)

C-Tick: EN55022:2006, IEC 61326-1:2005

Agency Approvals wireless models

FCC: Compliant to: Part 15, Subpart C

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Agency Approvals BACnet models

BTL

IMPORTANT

All TB7600 series controls are for use as operating controls only and are not safety devices. These instruments have undergone rigorous tests and verifications prior to shipment to ensure proper and reliable operation in the field. Whenever a control failure could lead to personal injury and/or loss of property, it becomes the responsibility of the user/installer/electrical system designer to incorporate safety devices (such as relays, flow switch, thermal protections, etc.) and/or alarm system to protect the entire system against such catastrophic failures. Tampering of the devices or miss application of the device will void warranty.

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