TB7300 Series Communicating Fan Coil Thermostats

24 VAC/FOR COMMERCIAL AND LODGING HVAC APPLICATIONS

INSTALLATION INSTRUCTIONS

APPLICATION

The TB7300 PI thermostat family is specifically designed for fan coil control. The TB7300 Series are communicating thermostats with models available in BACnet® MS/TP protocol and can be easily integrated into a WEBs-AX building automation system based on the NiagaraAX® platform.

Thermostats equipped with an occupancy sensor cover provide advanced active occupancy logic, which will automatically switch occupancy levels from Occupied to Stand-By and 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.

TB7300 Series Commercial Thermostat

TB7300 Series Hotel Thermostat with Occupancy Sensor

FEATURES

- Available in BACnet MS/TP protocol

- Backlit LCD display with dedicated function menu keys for simple operation

- Fully integrated advanced occupancy functionality with a PIR cover provides energy savings opportunity on select models; all other models are PIR ready and can have an optional occupancy sensor cover added

- Configurable sequences of operation

- Configurable fan button allows thermostat to meet more applications with a single model

- Password protection to minimize parameter tampering

- Six levels of keypad lockout to limit access to change user parameters such as setpoints, system mode, etc.

- Auto Fan speed mode increases occupant comfort in cooling mode by reducing humidity and reduces fan noise

- Available for 24 Vac on/off, floating or analog control meets advanced applications requirements

- Three inputs for monitoring and other advanced functions

- SPST auxiliary output that can be used for lighting or auxiliary reheat

- All wiring connections are made to removable terminal blocks simplifying installation

TB7300 Series Model Selection

Product Number	Description	Outputs	Occupancy Sensor[1]
BACnet Models			
TB7300A5014B	Commercial Fan Coil Unit	2 digital + 1 Aux	Ready
TB7300A5514B	Commercial Fan Coil Unit	2 digital + 1 Aux	Yes
TB7300C5014B	Commercial Fan Coil Unit	2 floating + 1 Aux	Ready
TB7300C5514B	Commercial Fan Coil Unit	2 floating + 1 Aux	Yes
TB7300F5014B	Commercial Fan Coil Unit	2 analog + 1 Aux	Ready
TB7300F5514B	Commercial Fan Coil Unit	2 analog + 1 Aux	Yes
TB7305A5014B	Hotel Fan Coil Unit	2 digital + 1 Aux	Ready
TB7305A5514B	Hotel Fan Coil Unit	2 digital + 1 Aux	Yes
TB7305C5014B	Hotel Fan Coil Unit	2 floating + 1 Aux	Ready
TB7305C5514B	Hotel Fan Coil Unit	2 floating + 1 Aux	Yes
TB7305F5014B	Hotel Fan Coil Unit	2 analog + 1 Aux	Ready
TB7305F5514B	Hotel Fan Coil Unit	2 analog + 1 Aux	Yes
Accessories			
TB-PIR-FCU	FCU Occupancy Sensor Cover		
TB-WALL-1014	Room Sensor 10K NTC Type 2		
TB-WALLOVR-1014	Room Sensor with Override 10K NTC Type 2		

[1] Thermostats ordered without an occupancy sensor cover can be retrofitted with an occupancy sensor cover later if needed.

More Information

We recommend downloading the appropriate integration reference document (BACnet) and if installing thermostats with occupancy sensor covers, then also downloading the PIR Application Guide before you begin installation. All documentation is available on http://customer.honeywell.com.
— BACnet Integration Manual for TB7200 and TB7300 Series Thermostats (Form No. 63-4524)
— PIR Application Guide for TB7200 and TB7300 Series Thermostats (Form No. 63-4526)
— Sensors Product Overview Brochure (Form 63-9285) provides a complete listing of 10K NTC Type II sensors.

INSTALLATION AND WIRING

Mounting Locations

- Do not install on an outside wall.
- Must be installed away from any heat source.
- Should not be installed near an air discharge grill.
- Should not be mounted in direct sun radiation.
- Nothing must restrain vertical air circulation to the thermostat.
- Wall surface must be flat and clean.

IMPORTANT
- *If replacing an old thermostat, label the wires before removal of the old thermostat.*

⚠ CAUTION
- *Electronic controls are static sensitive devices. Discharge yourself properly before manipulation and installing the thermostat.*
- *Short circuit or wrong wiring may permanently damage the thermostat or the equipment.*
- *Anti-short cycling can be set to 0 minutes for equipment that has an anti-cycling timer. Do not set to 0 unless the equipment has internal anti-cycling timer or damage to equipment can occur.*
- *All TB7300 Series thermostats are to be used only as operating controls. Whenever a control failure could lead to personal injury and/or loss of property, it becomes the responsibility of the user to add safety devices and/or alarm system to protect against such catastrophic failures.*

Thermostat Installation

1. Open up by pulling on the bottom side of thermostat. (Fig. 1)

2. Remove wiring terminals.

3. Open the thermostat PCB to the left by pressing the PCB retaining tabs. (Fig. 2).

4. Pull cables 6 inches out of the wall.

**5.** Thread cable through the central hole of the base.
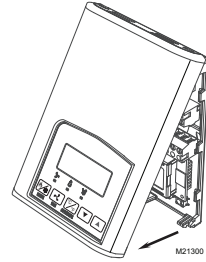
Fig. 1. Remove cover of thermostat

6. Align the base and mark the location of the two mounting holes on the wall. Install proper side of base up.

7. Install anchors in the wall.

8. Insert screws through the mounting holes on each side of the base and mount base on wall. (Fig. 2).

9. Gently swing back the circuit board back to the base and push on it until the tabs lock it in place.

10. Strip each wire 1/4 inch.
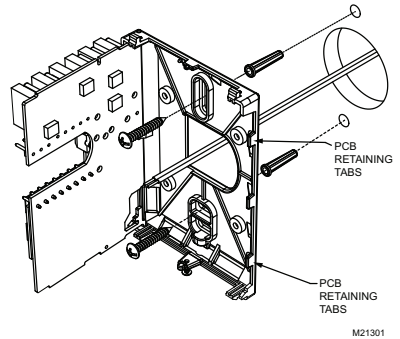
Fig. 2. Location of PCB retaining tabs and mounting screws

11. Wire the terminals for the desired application. See Table 1 for terminal descriptions and wiring diagrams.

12. Gently push back excess cable into hole.

13. Install wiring terminals in correct location (Fig. 3).

14. Reinstall the cover (top first).

15. Install security screw.
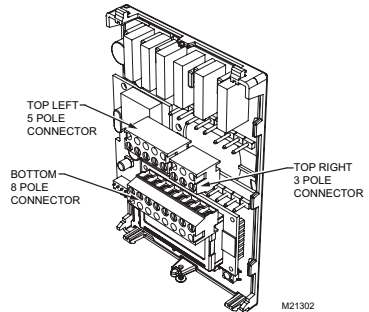
Fig. 3. Re-install terminal blocks

Thermostat Terminals

Table 1. Terminal identification

Terminal Description	TB73xxA5x14(x) 2 and 4 Pipe on/off	TB73xxC5x14(x) 2 and 4 Pipe floating 2 and 4 Pipe on/off	Terminal Description	TB73xxF5x14(x) 2 and 4 Pipe analog
Internal Temperature	X	X	Internal Temperature	X
1- High Fan Speed	Fan-H	Fan-H	1- High Fan Speed	Fan-H
2- Medium Fan Speed	Fan-M	Fan-M	2- Medium Fan Speed	Fan-M
3- Low Fan Speed	Fan-L	Fan-L	3- Low Fan Speed	Fan-L
4- 24 V~ Hot	24 V~ Hot	24 V~ Hot	4- 24 V~ Hot	24 V~ Hot
5- 24 V~ Com	24 V~ Com	24 V~ Com	5- 24 V~ Com	24 V~ Com
6- Aux BO 5	BO 5-Aux	BO 5-Aux	6- Aux BO 5	BO 5-Aux
7- Aux BO 5	BO 5-Aux	BO 5-Aux	7- Aux BO 5	BO 5-Aux
8- BO 3 Open Heat	BO 3	BO 3		Blank
9- BO 4 Close Heat		BO 4	9- AO 2 Heat	AO 2
10- BO 1 Open Cool		BO 1	10- AO 1 Cool	AO 1
11- BO 2 Close Cool	BO 2	BO 2	Not used Blank	Blank
12- BI #1	BI 1	BI 1	12- BI #1	BI 1
13- RS	RS	RS	13- RS	RS
14- Scom	Scom	Scom	14- Scom	Scom
15- BI #2	BI 2	BI 2	15- BI #2	BI 2
16- UI #3 COS/COC/SS	UI 3	UI 3	16- UI #3 COS/COC/SS	UI 3

For information on configuration options for the binary inputs (B1 and B2) and the universal input (U3) see Table 11. Configuration Parameters.

Sensor Wiring for all Thermostat Models

Remote sensors

Remote mount temperature sensors use 10K type 2 NTC thermistors. See Remote Inputs wiring diagram below for wiring information.
- Each sensor can be configured for various averaging combinations
- Optional occupancy led
- Optional override key
- Remote mount temperature sensors use 10K type 2 NTC thermistors.

Table 2. Temperature vs Resistance for 10 Kohm NTC thermistor ($R_{25°C}$ = 10KW±3%, $B_{25/85°C}$ = 3975K±1.5%)

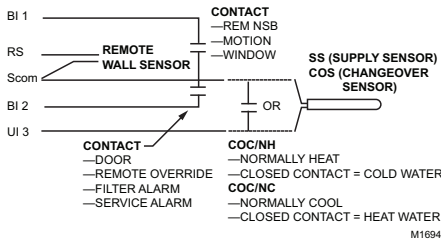| °F	°C	Kohm	°F	°C	Kohm	°F	°C	Kohm	°F	°C	Kohm	°F	°C	Kohm
-40	-40	324.3197	-4	-20	94.5149	32	0	32.1910	68	20	12.4601	104	40	5.3467
-31	-35	234.4009	5	-15	71.2430	41	5	25.1119	77	25	10.0000	113	45	4.3881
-22	-30	171.3474	14	-10	54.1988	50	10	19.7390	86	30	8.0694	122	50	3.6202
-13	-25	126.6109	23	-5	41.5956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

Fig. 4. Remote input

If LED indicator is desired at the TB-WALL-OVR-1014:

1. Set the Aux Cont installer parameter (which controls BO5) to option 2, Auxiliary NC.
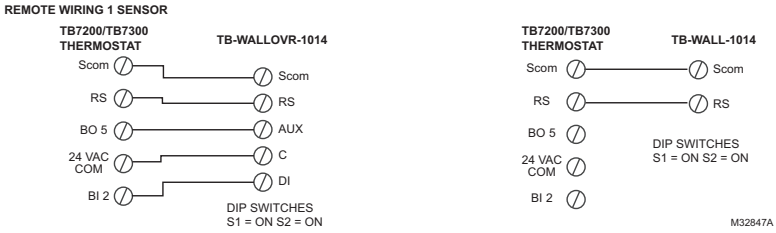2. Install a jumper across the BO5 terminal and 24 Vac Hot.

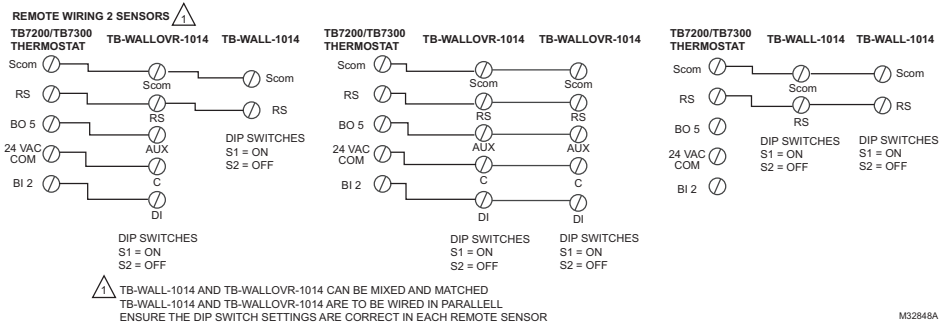**Fig. 5. Wiring example of single remote wall mounted room sensor**

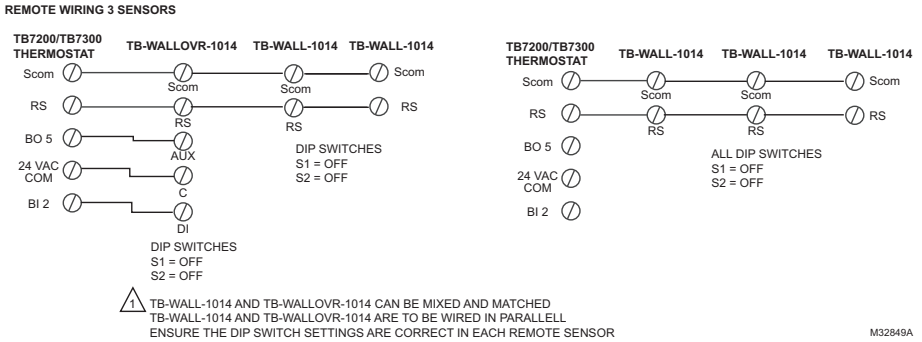**Fig. 6. Wiring examples of two remote wall mounted room sensors for averaging applications**

Fig. 7. Wiring examples of three remote wall mounted room sensors for averaging applications

Fan and Auxiliary Output Wiring
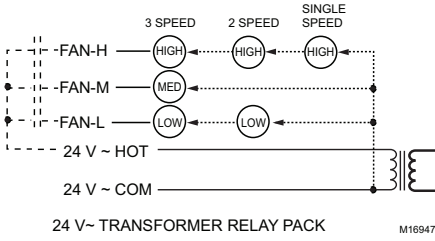
Fig. 8. Power fan
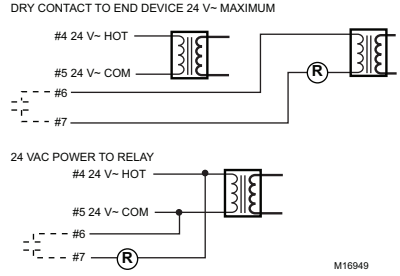
Fig. 9. Auxiliary output
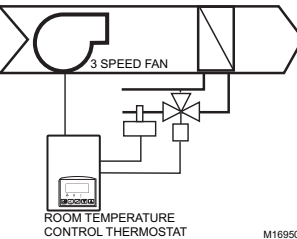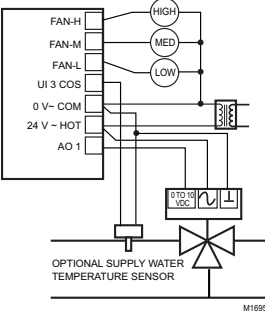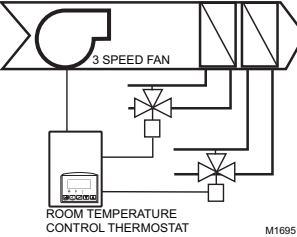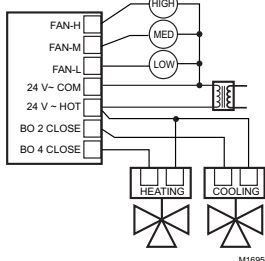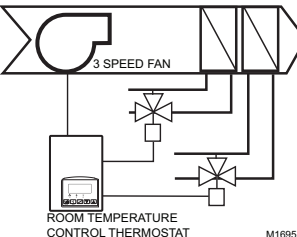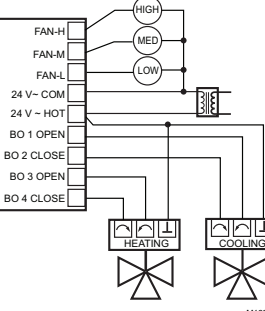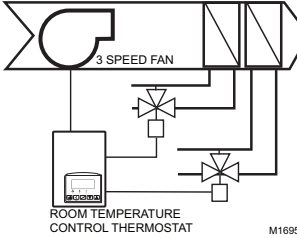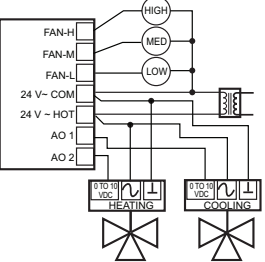
Main outputs wiring

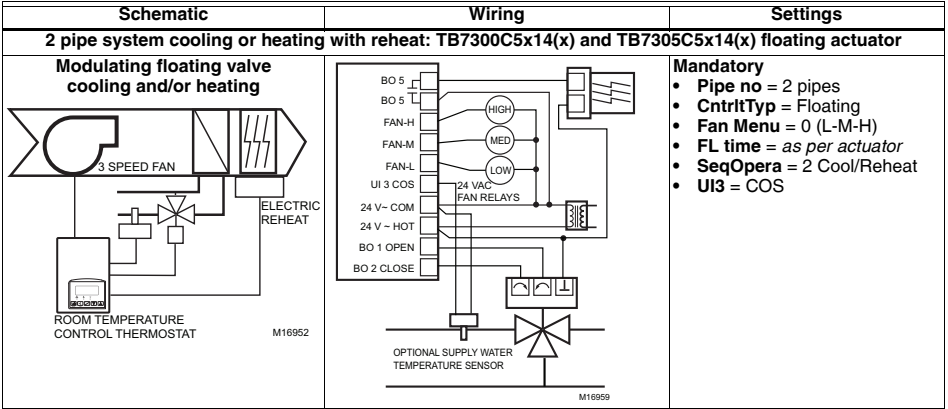| 2 Pipe applications	4 Pipe applications
On/Off control	
TB7300A5x14(x) and TB7305AC5x14(x)	
On/Off control	
TB7300C5x14(x) and TB7305C5x14(x)	
Floating control	
TB7300C5x14(x) and TB7305C5x14(x)	

2 Pipe applications	4 Pipe applications
Analog control	
TB7300F5x14(x) and TB7305F5x14(x)	
M16926	M16919

Typical applications

Schematic	Wiring	Settings
2 pipe system cooling and/or heating: TB7300A5x14(x), TB7300C5x14(x) and TB7305C5x14(x) on/off N.C. actuator		
Normally closed on/off valve cooling and/or heating ROOM TEMPERATURE CONTROL THERMOSTAT M16950	OPTIONAL SUPPLY WATER TEMPERATURE SENSOR M16953	**Mandatory** • **Pipe no** = 2 pipes • **CntrltTyp** = On/Off • **Fan Menu** = 0 (L-M-H) • **FL time** = *as per actuator* If **cooling only** set: • **SeqOpera** = 0 Cooling only If **heating only** set: • **SeqOpera** = 1 Heating only If **heat/cool auto-changeover** with a local water temperature sensor set: • **SeqOpera** = 0 Cooling only • **UI3** = COS
2 pipe system cooling and/or heating: TB7300C5x14(x) and TB7305C5x14(x) floating actuator		
Modulating floating valve cooling and/or heating ROOM TEMPERATURE CONTROL THERMOSTAT M16950	OPTIONAL SUPPLY WATER TEMPERATURE SENSOR M16954	**Mandatory** • **Pipe no** = 2 pipes • **CntrltTyp** = Floating • **Fan Menu** = 0 (L-M-H) • **FL time** = *as per actuator* If **cooling only** set: • **SeqOpera** = 0 Cooling only If **heating only** set: • **SeqOpera** = 1 Heating only If **heat/cool auto-changeover** with a local water temperature sensor set: • **SeqOpera** = 0 Cooling only • **UI3** = COS

Schematic	Wiring	Settings
2 pipe system cooling and/or heating: TB7300F5x14(x) and TB7305F5x14(x) analog actuator		

Modulating analog valve cooling and/or heating

3 SPEED FAN

ROOM TEMPERATURE CONTROL THERMOSTAT
M16950

24 VAC FAN RELAYS

FAN-H — HIGH
FAN-M — MED
FAN-L — LOW
UI 3 COS
0 V~ COM
24 V ~ HOT
AO 1

0 TO 10 VDC

OPTIONAL SUPPLY WATER TEMPERATURE SENSOR
M16955

Mandatory
- **Pipe no** = 2 pipes
- **Fan Menu** = 0 (L-M-H)
- **RA/DA** = *as per actuator*

If **cooling only** set:
- **SeqOpera** = 0 Cooling only

If **heating only** set:
- **SeqOpera** = 1 Heating only

If **heat/cool auto-changeover** with a local water temperature sensor set:
- **SeqOpera** = 0 Cooling only
- **UI3** = COS

| **4 pipe system cooling and heating: TB7300C5x14(x) and TB7305C5x14(x) on/off N.C. actuators** | | |

Normally closed on/off valve cooling and heating

3 SPEED FAN

ROOM TEMPERATURE CONTROL THERMOSTAT
M16951

24 VAC FAN RELAYS

FAN-H — HIGH
FAN-M — MED
FAN-L — LOW
24 V~ COM
24 V ~ HOT
BO 2 CLOSE
BO 4 CLOSE

HEATING   COOLING
M16956

Mandatory
- **Pipe no** = 4 pipes
- **CntrltTyp** = On/Off
- **Fan Menu** = 0 (L-M-H)
- **FL time** = *as per actuator*
- **SeqOpera** = 4 Cool/Heat

| **4 pipe system cooling and heating: TB7300C5x14(x) and TB7305C5x14(x) floating actuators** | | |

Modulating floating valve cooling and heating

3 SPEED FAN

ROOM TEMPERATURE CONTROL THERMOSTAT
M16951

24 VAC FAN RELAYS

FAN-H — HIGH
FAN-M — MED
FAN-L — LOW
24 V~ COM
24 V ~ HOT
BO 1 OPEN
BO 2 CLOSE
BO 3 OPEN
BO 4 CLOSE

HEATING   COOLING
M16957

Mandatory
- **Pipe no** = 4 pipes
- **CntrltTyp** = Floating
- **Fan Menu** = 0 (L-M-H)
- **FL time** = *as per actuator*
- **SeqOpera** = 4 Cool/Heat

| **4 pipe system cooling and heating: TB7300F5x14(x) and TB7305F5x14(x) analog actuators** | | |

Modulating analog valve cooling and heating

3 SPEED FAN

ROOM TEMPERATURE CONTROL THERMOSTAT
M16951

24 VAC FAN RELAYS

FAN-H — HIGH
FAN-M — MED
FAN-L — LOW
24 V~ COM
24 V ~ HOT
AO 1
AO 2

0 TO 10 VDC HEATING   0 TO 10 VDC COOLING
M16958

Mandatory
- **Pipe no** = 4 pipes
- **Fan Menu** = 0 (L-M-H)
- **RA/DA** = *as per actuator*
- **SeqOpera** = 4 Cool/Heat

Schematic	Wiring	Settings
2 pipe system cooling or heating with reheat: TB7300C5x14(x) and TB7305C5x14(x) floating actuator		
Modulating floating valve cooling and/or heating		**Mandatory** • **Pipe no** = 2 pipes • **CntrltTyp** = Floating • **Fan Menu** = 0 (L-M-H) • **FL time** = *as per actuator* • **SeqOpera** = 2 Cool/Reheat • **UI3** = COS

THERMOSTAT USER INTERFACE

The thermostat features a two-line, eight-character display. There is a low level backlight level that is always active and can only be seen at night. To turn on the back light to high level, press any key on the front panel. The back lit display will return to low level when the thermostat is left unattended for 45 seconds

When left unattended, the thermostat has an auto scrolling display that shows the actual status of the system. Use the **MenuScro** in the configuration menu to lockout the scrolling display and to only present the room temperature and conditional outdoor temperature to the user. With this option enabled, no local status is given on the system mode or occupancy.

Each item is scrolled one by one with the back lighting in low level mode. Pressing any key will cause the back light to come on to high level. When left unattended for 10 seconds after changes are made, the display will resume automatic status display scrolling.

Table 3. Sequence and possible display options for the auto-scroll display

Room Temp >	System mode >	Schedule status >	Outdoor Temp* >	Alarms
x.x °C or °F	Sys mode auto	Occupied	Outdoor x.x °C or°F	Service
RoomTemp x.x °C or °F	Sys mode cool	Stand-By		Filter
	Sys mode heat	Unoccup		Window
	Sys mode off	Override		

* Network value only

OUTDOOR AIR TEMPERATURE
• Display is only enabled when outdoor air temperature network variable is received.

OCCUPANCY STATUS
• Occupied, Stand-By, Unoccupied and Override status are displayed on the scrolling display.

ALARMS
• If alarms are detected, they will automatically be displayed at the end of the status display scroll.
• During an alarm message display, the backlit screen will light up at the same time as the message and shut off during the rest of the status display.
• Two alarms maximum can appear at any given time. The priority for the alarms is as follows:

Service	Indicates that there is a service alarm as per one of the programmable binary input (BI2)
Filter	Indicates that the filters are dirty as per one of the programmable binary input (BI2)
Window	Indicates that the outside window or door is opened and that the thermostat has cancelled any cooling or heating action (BI1)

STATUS LED'S
The three LEDs on the thermostat cover are used to indicate the status of the fan (any speed), a call for heat, or a call for cooling.
• When any of the fan speeds are ON, the FAN LED will illuminate.

- When heating and reheat is ON, the HEAT LED will illuminate.
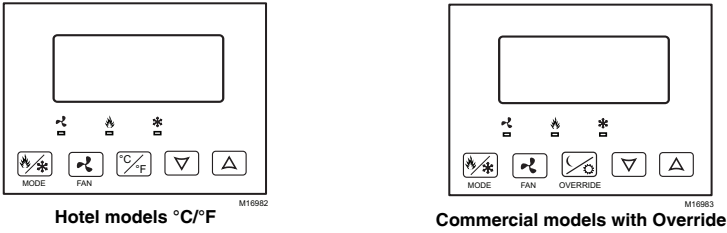- When cooling is ON, the COOL LED will illuminate.

Hotel models °C/°F

Commercial models with Override

Fig. 10. Fan coil thermostat buttons and display

User Control Options

Unoccupied mode Override

An Override can be made on commercial models during an Unoccupied period. If the Override option is enabled in the **Lockout** parameter, pressing the middle override button will resume occupied setpoints for a time specified by parameter **TOccTime**

Table 4. Keypad interface

System	Is used to toggle between the different system modes available as per sequence and menu selected. Pressing repetitively the button will toggle between all the available modes. Available menus are dependent on selected sequence of operation.
Fan	Is used to toggle between the different fan modes available per sequence and menu selected. Pressing repetitively the button will toggle between all the available modes. Available menus are dependent on selected sequence of operation and menu selected for Fan.
°C/°F **Override**	Middle key is • °C/°F for Hotel models. • Override for commercial models.
Down	Adjust the setpoints down • In cooling mode only the cooling setpoint is displayed. • In heating mode only the heating setpoint is displayed. • In auto mode (see below).
Up	Adjust the setpoints up • In cooling mode only the cooling setpoint is displayed. • In heating mode only the heating setpoint is displayed. • In auto mode (see below).

Any setpoint change can be permanent or temporary based on parameter **Set Type** (setpoint type).
Any setpoint written through the network, will be permanent and cancel any active temporary setpoints.
Lockouts of access to certain functions is made with parameter (**Lockout**).

LOCAL SETPOINT ADJUSTMENT WHEN "STP FUNC" = DUAL STP
(DUAL OCCUPIED SETPOINTS ADJUSTMENT)

Table 5. Occupied setpoint adjustments

Cooling mode	Heating mode	Off mode	**Auto Mode** • Setpoint presented to user is the setpoint from the last action taken by the thermostat or the one currently in use. • If the other setpoint is the one desired, then the MODE button is used to toggle between the current displayed one and the other.
Cool XX.X °F or °C	**Heat XX.X °F or °C**	No access to setpoint	**Cool XX.X °F or °C or Heat XX.X °F or °C** Toggle to (Heat or Cool) with MODE button

Heat/Cool setpoint toggle with MODE button is active only in AUTO mode.
If cooling, heating or off mode are active, this function is disabled

LOCAL SETPOINT ADJUSTMENT WHEN "STP FUNC" = *ATTCHSTP*
(SINGLE OCCUPIED SETPOINT ADJUSTMENT)

Table 6. Occupied setpoint adjustments

Cooling mode	Heating mode	Off mode	Auto Mode
			• Setpoint presented to user is the setpoint from the last action taken by the thermostat or the one currently in use. • Both heating and cooling setpoints are changed simultaneously while respecting the minimum configured deadband. • If the other setpoint is the one desired, then the MODE button is used to toggle between the current displayed one and the other.
Cool XX.X °F or °C	Heat XX.X °F or °C	No access to setpoint	Cool XX.X °F or °C and Heat XX.X °F or °C Both heating and cooling setpoints are change simultaneously. Toggle to (Heat or Cool) with MODE button.

Unoccupied and Stand-By setpoints adjustments

Setting the stand-by and unoccupied setpoints is done through the network or through configuration setup only.

Mode button menu sequence.

- Modes presented to the user are dependent on sequence of operation selected.
- **Default mode** is in **bold** when sequence of operation parameter is changed.

Table 7. Auto Mode set to On = Auto system mode active.

Sequence selected	Mode Menu
0 = Cooling only	Off - **Cool**
1 = Heating only	Off - **Heat**
2 = Cooling With Reheat	Off – **Auto** – Heat – Cool
3 = Heating With Reheat	Off - Heat
4 = Cooling/Heating 4 pipes	Off – **Auto** – Heat – Cool
5 = Cooling/Heating 4 pipes with Reheat	Off – **Auto** – Heat – Cool

Table 8. Auto Mode set to Off = Auto system mode NOT active.

Sequence selected	Mode Menu
0 = Cooling only	Off - **Cool**
1 = Heating only	Off - **Heat**
2 = Cooling With Reheat	Off – **Heat** – Cool
3 = Heating With Reheat	Off - **Heat**
4 = Cooling/Heating 4 pipes	Off – **Heat** – Cool
5 = Cooling/Heating 4 pipes with Reheat	Off – **Heat** – Cool

Fan button menu sequences

Table 9. Available fan button menu sequences.

Fan button menu configuration	Menu presented are dependent on model used and sequence of operation selected	Default value when sequence toggled
0 Low-Med-High	**3** Speed configuration using 3 fan relays (L-M-H)	High
1 Low-High	**2** Speed configuration using 2 fan relays (L-H)	High
2 Low-Med-High-Auto	**3** Speed configuration with **Auto** fan speed mode using 3 fan relays (L-M-H)	High
3 Low-High-Auto	**2** Speed configuration with **Auto** fan speed mode using 2 fan relays (L-H)	High
4 On-Auto	**Single** Speed configuration. Auto is for Fan on demand/On is On all the time	Auto

Auto speed fan mode is also offered in heating mode applications; it will not however have any effect on dehumidification. It will be strictly for noise comfort issues

Auto Speed Fan Mode operation for sequences 2 and 3 is dependent on Auto Fan parameter. When Auto Fan is set to:
- AS (Default) = **Auto Speed** during occupied periods. Fan is always on during occupied periods. Low, medium and high speeds operate on temperature offset from setpoint.
- AS AD = **Auto Speed/Auto Demand** during occupied periods.
  - — Medium and high speeds operate on temperature offset from setpoint.
  - — Low speed operates on demand and will shut down when no demand is present

INSTALLER CONFIGURATION PARAMETER MENU

This section describes the parameters available for TB7300 Series thermostat configuration. The TB7300 Series can be programmed at the thermostat or through WEBStation-AX, with the following exception: Wireless models must have the **Com Addr**, **PAN ID**, and **Channel** set at the thermostat before adding to the wireless network or doing any programming in WEBStation-AX.

To program the thermostat through WEBStation-AX, refer to the BACnet Integration Reference Guide for BACnet models (Form No. 63-4524).

Local configuration:
1. To enter configuration, press and hold the middle button (°C/°F or Override) for 8 seconds
2. If a password lockout is active, "Password" is prompted. Enter password value using the "up" and "down" arrows and press the middle button again to gain access to all configuration properties of the thermostat. A wrong password entered will prevent local access to the configuration menu.
3. Press the same middle button repetitively to scroll between all the available parameters
4. Use the up and down key to change the parameter to the desired value.
5. To acknowledge and save the new value, press the middle button again.
6. The next listed parameter is now displayed.

Table 10. Configuration interface

Fan	Re-starts the configuration parameter list at the beginning.
°C/°F Override	Enters the configuration mode. Press and hold for 8 seconds. Pressing repetitively will scroll all available parameters one by one.
Down	Adjust parameter value down.
Up	Adjust parameter value up.

Table 11. Configuration parameters.

Configuration parameters	Default value	Significance and adjustments
PswrdSet	Configuration parameters menu access password Default value = **0** Range is: 0 to 1000	This parameter sets a protective access password to prevent unauthorized access to the configuration menu parameters. A default value of "0" will not prompt a password or lock the access to the configuration menu. Range is: 0 to 1000
Com Addr	Thermostat networking address Default value = **254** Range is: 0 to 254	If the thermostat is installed as a stand-alone unit, this parameter will not be used or displayed For BACnet models valid range to use is from 0 to 127. Default value of 254 disables BACnet communication for the thermostat.
BI1	Binary input no.1 configuration Default value = **None**	**(None):** No function will be associated with the input **(Rem NSB):** remote NSB timer clock input. The scheduling will now be set as per the binary input. It provides low cost setback operation via a dry contact • Contact opened = Occupied • Contact closed = Unoccupied **(Motion NO) or (Motion NC):** Advanced PIR occupancy functions using a Normally Open (NO) or Normally Closed (NC) remote PIR motion sensor. Occupancy mode is now set as per applied PIR function and configuration. Application information is available in the PIR Application Guide for TB7300 Series Thermostats (Form No. 63-4526). This document provides installers and system designers with detailed examples on applications, parameter configuration, sequence of operations, troubleshooting and diagnostic help required for proper use of occupancy sensor models. **(Window)** EMS: Forces the system to disable any current heating or cooling action by the thermostat. The mode stays the same and the current setpoints are the same Occupied setpoints. Only the outputs are disabled. There is a Door/Window alarm displayed on the thermostat to indicate to the local tenant that the door/window needs to be closed for cooling or heating to resume. **NOTE: These settings will disable the local override function on the thermostat.**

Table 11. Configuration parameters. (Continued)

Configuration parameters	Default value	Significance and adjustments
BI2	Binary input no.2 configuration Default value = **None**	**None):** No function will be associated with the input **(Door Dry) Door contact and Motion detector**: This configuration is only functional if binary input #1 is set to **Motion N.O.** or **Motion N.C.** or a **PIR accessory cover** is used. With this sequence enabled, the occupancy is now dictated through those 2 inputs. Any motion detected will set the zone to occupied status. The zone will remain permanently in occupied mode until the door contact switch opens momentarily. The thermostat will then go in stand-by mode. If more movements are detected, the occupied mode will resume. While the door is opened, any movements detected by the remote PIR sensor or the PIR accessory cover will be ignored. Use a Normally Closed contact switching device. • Contact opened = Door opened • Contact closed = Door closed **(RemOVR):** temporary occupancy remote override contact. This function disables the central button override function on the thermostat. The override function is now controlled by a manual remote momentarily closed contact. When configured in this mode, the input operates in a toggle mode. It is now possible to toggle between unoccupied and occupied setpoints for the amount of time set by parameter (**TOccTime**) temporary occupancy time. **(Filter):** a backlit flashing Filter alarm will be displayed on the thermostat LCD screen when the input is energized. It can be tied to a differential pressure switch that monitor filters • Contact opened = No alarm • Contact closed = Alarm displayed **(Service)**: a backlit flashing **Service** alarm will be displayed on the thermostat LCD screen when the input is energized. It can be tied in to the AC unit control card, which provides an alarm in case of malfunction. • Contact opened = No alarm • Contact closed = Alarm displayed
UI3	Universal input no.3 configuration Default value = **None**	**(None):** No function will be associated with the input **(COC/NH) Change over dry contact. Normally Heat**: Used when both heating and cooling are controlled from the same thermostat output. Contact closes when cold air/water is present. Only used and valid if system parameter (**Out1Conf**) is set at 2.0 **(COC/NC) Change over dry contact. Normally Cool:** Used when both heating and cooling are controlled from the same thermostat output. Contact closes when hot air/water is present. Only used and valid if system parameter (**Out1Conf**) is set at 2.0 **(COS) Change over analog sensor**: Used where heating and cooling are controlled from the same output. Temperature in duct/pipe determines control mode (heat/cool). Only used and valid if system parameter (**Out1Conf**) is set at 2.0 **(SS) Supply air sensor monitoring**: Used for supply air temperature monitoring. Only used for network reporting of the supply air temperature. Has no internal function in the thermostat
MenuScro	Menu scroll Default value = **On** = Scroll active	Removes the scrolling display and only presents the room temperature to the user. With this option enabled, no status is given of mode, schedule and outdoor temperature. Outdoor temperature only displays if a network variable is received. **On = Scroll active** **Off = Scroll not active**
AutoMode	Enables **Auto** menu for Mode button Default value = **On**	Enables Auto function for the mode button For sequences 2, 4 and 5 only **On = Auto active** (Off-Cool-Heat-Auto) **Off = auto not active** (Off-Cool-Heat)
C or F	Sets scale of the thermostat Default value = °**F**	°**F** for Fahrenheit scale °**C** for Celsius scale On hotel models, this sets the default value when the thermostat powers up

Table 11. Configuration parameters. (Continued)

Configuration parameters	Default value	Significance and adjustments
Lockout	Keypad lockout levels Default value = **0 No lock**	See Table 12 for **Lockout** level details

Table 12. Keypad Lockout Levels

Level	Occupied temperature setpoints	System mode setting	Fan mode setting	Unoccupied Override
0	Yes access	Yes access	Yes access	Yes access
1	Yes access	Yes access	Yes access	No access
2	Yes access	No access	No access	Yes access
3	Yes access	No access	No access	No access
4	No access	No access	No access	Yes access
5	No access	No access	No access	No access

Configuration parameters	Default value	Significance and adjustments
Pipe No	System type installation Number of pipes Default value = **4.0 Pipes**	Defines the type of system installed **2.0** Pipes, will limit the number of sequences of operation available from 0 to 3. Will enable heat/cool operation from the same output (refer to wiring diagram) **4.0** Pipes, can access all the sequences of operation from 0 to 5. Will enable heat/cool operation from different output (refer to wiring diagram)
SeqOpera	Sequence of operation Default value = **Sequence #1**	(see table below)

Default value = Sequence #1	System = 2 Pipes	System = 4 Pipes
0 = Cooling Only	Yes access	Yes access
1 = Heating only	Yes access	Yes access
2 = Cooling With Reheat	Yes access	Yes access
3 = Heating With Reheat	Yes access	Yes access
4 = Cooling/Heating 4 pipes	No access	Yes access
5 = Cooling/Heating 4 pipes with Reheat	No access	Yes access

For single output applications, the system access is also limited if UI3 is configured for local changeover COS, COC/NC or COC/NC. The current water temperature detected by the UI3 then limits the system mode available for the local configuration or network write.

Configuration parameters	Default value	Significance and adjustments
Fan Menu	Mode button menu configuration Default value = **Menu #4**	Menu presented is dependent on model used and sequence of operation selected Auto Mode operation for sequences 2 and 3 is dependent on Auto Fan parameter

0 = Low-Med-High	**3** Speed configuration using 3 fan relays (L-M-H)
1 = Low-High	**2** Speed configuration using 2 fan relays (L-H)
2 = Low-Med-High-Auto	**3** Speed configuration with Auto fan speed mode using 3 fan relays (L-M-H)
3 = Low-High-Auto	**2** Speed configuration with Auto fan speed mode using 2 fan relays (L-H)
4 = On-Auto	**Single** Speed configuration. Auto is for Fan on demand/On is On all the time

Configuration parameters	Default value	Significance and adjustments
St-By TM	Stand-by Timer value Default value = **0.5 hours**	Time delay between the moment where the PIR cover detected the last movement in the area and the time which the thermostat stand-by mode and setpoints become active. Range is: **0.5 to 24.0 hours** in 0.5 hr increments

Table 11. Configuration parameters. (Continued)

Configuration parameters	Default value	Significance and adjustments
Unocc TM	Unoccupied Timer value Default value = **0.0 hours**	Time delay between the moment where the thermostat toggles to stand-by mode and the time which the thermostat unoccupied mode and setpoints become active. The factory value or **0.0 hours:** Setting this parameter to its default value of 0.0 hours disables the unoccupied timer. This prevents the thermostat to drift from stand-by mode to unoccupied mode when PIR functions are used Range is: **0.0 to 24.0 hours** in 0.5 hr increments
St-By HT	Stand-by heating setpoint Default value = **69 F**	The value of this parameter should reside between the occupied and unoccupied heating setpoints and make sure that the difference between the stand-by and occupied value can be recovered in a timely fashion when movement is detected in the zone. Stand-by heating setpoint range is: **40 to 90 F (4.5 to 32.0 C)**
St-By CL	Stand-by cooling setpoint limit Default value = **78 F**	The value of this parameter should reside between the occupied and unoccupied cooling setpoints and make sure that the difference between the stand-by and occupied value can be recovered in a timely fashion when movement is detected in the zone. Stand-by cooling setpoint range is: **54 to 100 F (12.0 to 37.5 C)**
Unocc HT	Unoccupied heating setpoint Default value = **62 F**	Unoccupied heating setpoint range is: **40 to 90 F (4.5 to 32.0 C)**
Unocc CL	Unoccupied cooling setpoint limit Default value = **80 F**	Unoccupied cooling setpoint limit range is: **54 to 100 F (12.0 to 37.5 C)**
Heat max	Maximum heating setpoint limit Default value = **90 F (32 C)**	Maximum occupied and unoccupied heating setpoint adjustment. Heating setpoint range is: **40 to 90 F (4.5 to 32.0 C)**
Cool min	Minimum cooling setpoint limit Default value = **54 F (12 C)**	Minimum occupied and unoccupied cooling setpoint adjustment. Cooling setpoint range is: **54 to 100 F (12.0 to 37.5 C)**
Pband	Proportional band setting Default value = **3**	Adjust the proportional band used by the thermostat PI control loop. ⚠ **CAUTION** Note that the default value of 3.0 F (1.2 C) gives satisfactory operation in most normal installation cases. The use of a superior proportional band different than the factory one is normally warranted in applications where the thermostat location is problematic and leads to unwanted cycling of the unit. A typical example is a wall mounted unit where the thermostat is installed between the return and supply air feeds and is directly influenced by the supply air stream of the unit. | Value	F scale Pband	C scale Pband
3	3 F	1.7 C
4	4 F	2.2 C
5	5 F	2.8 C
6	6 F	3.3 C
7	7 F	3.9 C
8	8 F	4.4 C
9	9 F	5.0 C
10	10 F	5.6 C	

Table 11. Configuration parameters. (Continued)

Configuration parameters	Default value	Significance and adjustments
Set Type	Temporary setpoint enable Default value = **Permnent** Enables temporary setpoints feature to any change of occupied or unoccupied setpoint.	**Temporar**: (temporary) Local changes to the heating or cooling setpoints by the user are temporary. They will remain effective for the duration specified by **ToccTime**. Setpoints will revert back to their default value after internal timer **ToccTime** expires. To change setpoints permanently, revert to **No** this variable or write setpoints through the network. Any setpoints written through the network will be permanent ones and saved to EEPROM. **Permnent**: (permanent) Any change of occupied or unoccupied setpoints through the keypad by the user are permanent and saved to and EEPROM.
Spt Func	Local setpoint settings Default value = **Dual Spt**	Set the local setpoint interface for the user. **Dual Spt** (Dual Occupied Setpoints Adjustment) **Attch Spt** (Single Occupied Setpoint Adjustment)
TOccTime	Temporary occupancy time Default value = **2 hours**	Temporary occupancy time with occupied mode setpoints when override function is enabled. When the thermostat is in unoccupied mode, function is enabled with either the menu or UI2 configured as remote override input. Range is: **0,1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and up to 24 hours**
Deadband	Minimum deadband Default value = **2.0 F (1.0 C)**	Minimum deadband value between the heating and cooling setpoints. If modified, it will be applied only when any of the setpoints are modified. Range is: **2, 3, 4 or 5 F, 1.0 F increments (1.0 to 2.5 C, 0.5 C increments)**
Cal RS	Room temperature sensor calibration Default value = **0.0 F or C**	Offset that can be added/subtracted to actual displayed room temperature . Range is: **± 5.0 F, 1.0 F increments (± 2.5 C, 0.5 C increments)**
Aux cont	Auxiliary contact function and configuration Default value = **0** Not Used	**0 Aux contact function used for reheat.** *IF SEQUENCE IS SET TO REHEAT THROUGH NETWORK OR LOCAL*, Ignore this parameter. **The output will directly follow the occupancy of the thermostat** **1 Auxiliary NO**, Occ or St-By = Contact Closed/Unoccupied = Contact Opened **2 Auxiliary NC**, Occ or St-By = Contact Opened/Unoccupied = Contact Closed **Output to follow directly main occupancy and Fan on command** Typically used for 2 position fresh air damper applications. **3 Auxiliary NO**, Occ or St-By and Fan On = Contact Closed/ Unoccupied and Fan On or Off = Contact Opened **4 Auxiliary NC**, Occ or St-By and Fan On = Contact Opened/ Unoccupied and Fan On or Off = Contact Closed **Output to follow secondary network occupancy command** **5 Auxiliary on/off control** through auxiliary network command. The output can be commanded through the network for any required auxiliary functions through a separate and dedicated network variable.
Auto Fan	Auto Fan Function Default value = **AS**	Auto Speed Fan Mode operation for Fan Sequences 2 and 3. **AS = Auto Speed** during occupied periods. Fan is always on during occupied periods. **AS AD = Auto Speed/Auto Demand** during occupied periods.
FL time	Floating actuator timing Default value = **1.5 minutes**	**For floating models TB73xxC5x14(x) only** Maximum stroke time of floating valve actuator. Range is: **0.5 to 9.0 minutes** in 0.5 minutes increment
cph	On/Off devices cycles per hour Default value = **4 cph**	**For on/off models and sequences TB73xxC5x14(x) only** Will set the maximum number cycles per hour under normal control operation. It represents the maximum number of cycles that the equipment will turn ON and OFF in one hour. Note that a higher cph will represent a higher accuracy of control at the expense of wearing mechanical components faster. Range is: **3, 4, 5, 6,7 and 8 cph**

Table 11. Configuration parameters. (Continued)

Configuration parameters	Default value	Significance and adjustments
RA/DA	Reverse acting or Direct acting signal Default value = **DA signal**	**For analog models TB73xxF5x14(x) only** Reverse acting or Direct acting signal for analog output signals **DA** = Direct acting, 0 to 100% = 0 to 10 Vdc **RA** = Reverse acting, 0 to 100% = 10 to 0 Vdc
Reheat	Sets the reheat output time base Default value = **0 = 15 minute**	Valid only if reheat sequences are enabled **0 =** 15 minutes **1 =** 10 seconds for Solid state relays
UI3 dis	Display UI3 value.	Used as diagnostic/service help to troubleshoot and diagnose sensor operation. Supply or change over temperature when UI3 is configured as an analog input . **(SS or COS)**

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

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 Class 2

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

Temperature sensor: 10 K NTC thermistor on board

Temperate sensor resolution: ± 0.2 F (± 0.1 C)

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

Occ. Stand-By and Unocc cooling setpoint range: 54 to 100 F (12.0 to 37.5 C)

Occ. Stand-By and Unocc heating setpoint range: 40 F to 90 F (4.5 C to 32 C)

Room and outdoor air temperature display range -40 F to 122 F (-40 C to 50 C)

Proportional band for room temperature control: Cooling and Heating: 3.2 F (1.8 C)

Binary inputs: Dry contact across terminal BI1, BI2 and UI3 to Scom

Contact output rating:
Fan relay output: 30 Vac, 1 Amp. Maximum, 3 Amp. in-rush
Valve triac output: 30 Vac, 1 Amp. Maximum, 3 Amp. in-rush
Valve analog: 0 to 10 Vdc into 2KW resistance min.

Wire gauge 18 gauge maximum, 22 gauge recommended

Dimensions: See Fig. 11

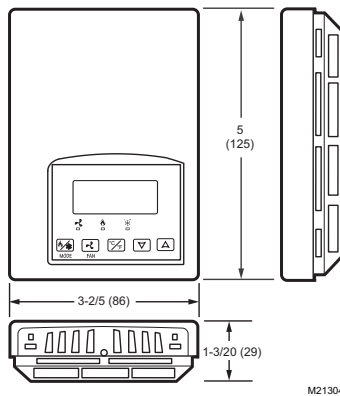**Approximate shipping weight:** 0.75 lb (0.34 kg)

Fig. 11. Thermostat dimensions in inches (mm)

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

Agency Approvals all models
FCC: Compliant to CFR 47, Part 15, Subpart B, Class A (US)
CE: EMC Directive 89/336/EEC (Europe Union)

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 TB7300 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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