T62xx-0 Fan Coil Retrofit Thermostat Controller and R-xxxxx-0 Fan Coil Retrofit Relay Packs

Product Bulletin

T620H-0, T620C-0, T621H-0, T621C-0,
R-HCC40-0, R-HCC44-0, R-MPR20-0, R-MPR24-0, R-SFC40-0

The T62xx-0 Series Retrofit Thermostat Controller and R-xxxxx-0 Series Modular Relay Packs provide control of two-pipe and four-pipe fan coil units. This thermostat and relay pack fan coil control system simplifies the retrofit of existing line voltage fan coil thermostats by integrating all of the relay outputs required for fan switching and valve control into one modular package. In retrofit applications, the installation is further simplified by reusing the existing wires between the old line voltage switching thermostats and the fan coil unit to install the T62x Thermostat controller.

The R-xxxxx-0 Series Modular Relay Packs locally contain all the relay outputs necessary for fan switching and valve control within the fan coil unit. Relay pack models are also available for extra monitoring and controlling inputs for fan coil units. The R-xxxxx-0 Series Modular relay packs operate as slave units under the control of a single master T62xx-0 Series Thermostat controller. One T62xx-0 Series Thermostat controller operates as the master of up to 10 R-xxxxx-0 Series Modular Relay packs. Only one relay pack with remote monitoring inputs can be used under a single T62x Thermostat controller. All other slave units must be relay packs **without** remote inputs.

Figure 1: T620H-0 Thermostat Controller and Fan Coil Retrofit Relay Pack

The non-programmable T62x Series Thermostat Controllers provide the user access to parameters such as system mode, fan mode, and temperature setpoints. Additionally, the T62x Series has over 20 configurable parameters enabling the thermostat controllers to adapt to a variety of fan coil applications.

All T62x Series Thermostat controllers use an intuitive, plain text, menu-driven backlit display that makes setup and operation quick and easy.

Table 1: Features and Benefits (Part 1 of 2)

Features	Benefits
Password Protection Option	Protects against undesired thermostat controller tampering.
Backlit Liquid Crystal Display (LCD)	Offers real-time control status of the environment in easy-to-read, English plain text messages with constant backlight that brightens during user interaction.
Three Speeds of Fan Control	Provide easy **FAN** speed selection, via the interface key, to meet the application requirements.
Single and Dual Setpoint Adjustments	Enable user setpoint options to accommodate the specific application.
Direct Line Switching Control of Valves and Fans	Reduces the number of external components and costs associated with system installation.
Line Powered From 90 to 277 VAC (50 Hz to 60 Hz)	Meets the power supply requirements of most fan coil systems.

Table 1: Features and Benefits (Part 2 of 2)

Features	Benefits
Three Configurable Binary Inputs	Provide additional inputs for advanced functions such as remote night setback, service or filter alarms, motion detector, and window status.
Over 20 Configurable Parameters	Enable the thermostat controller to adapt to any application, allowing installer parameter access without opening the cover.
Color-Coded Relay Pack Wires	Simplify installation for most fan coil units.

Product Overview

The T62x Series Thermostat Controllers are specifically designed for control of two- or four-pipe fan coils using line switching on/off valve control. A number of configurable parameters enable the T62x Series Thermostat Controllers to effectively and efficiently control various types of equipment in nearly any application. Configuration, setup, and operation of the T62x Series Thermostat Controllers is extremely intuitive and is accomplished through a backlit LCD user interface.

> **IMPORTANT:** The T62x Series Thermostat Controllers are intended to provide an input to equipment under normal operating conditions. Where failure or malfunction of the thermostat controller could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the thermostat controller.

Additional Features

The T62x Series Thermostat Controllers offer many other features including:

- **Adjustable Heating/Cooling Deadband**
  Adjusts the minimum heating/cooling deadband from 2.0F°/1.0C° to 5.0F°/2.5C°.

- **Remote Inside Air Temperature Sensing**
  Accommodates remote inside air temperature sensors. Up to three inside air temperature sensors can be averaged.

- **Five Easy-to-Use Interface Keys**
  Allow for easy commissioning of the thermostat controller, and eliminate the need for DIP switches.

- **Six Levels of Keypad Lockout**
  Provide six levels of keypad lockout that can be set up through the Installer Configuration Menu.

- **Accessible Configuration Parameters**
  Allow local access to all configurable parameters while limiting unwanted parameter tampering once the thermostat controller is set up.

- **Three LEDs**
  Provide fan, heating, and cooling status at a glance.

- **Adjustable Heating/Cooling Cycles per Hour (On/Off Control)**
  Configurable for the maximum number of heating and cooling cycles (3 to 8 cycles maximum) in a 1-hour period, balancing temperature control and equipment cycling.

- **Nonvolatile Electrically Erasable Programmable Read-Only Memory (EPROM)**
  Prevents loss of adjusted parameters during a power failure.

- **Modulating Pulsed VDC Output for SSR Electric Reheat Application**
  Allows for 2-pipe fan coil applications that also require electric reheat (R-MPR2x-0 models).

Table 2 describes the T62x Thermostat Controller models. Table 3 describes the Relay Pack models.

Table 2: Thermostat Controller Models

Model	Application
User Interface: Hospitality	
T620H-0	Temperature Only
T621H-0	Temperature and Dehumidification
User Interface: Commercial	
T620C-0	Temperature Only
T621C-0	Temperature and Dehumidification

Table 3: Relay Pack Models

Relay Pack Model / Functionality	R-HCC40-0	R-HCC44-0	R-MPR20-0	R-MPR24-0	R-SFC40-0
Application	2-Pipe FCU 2-Pipe FCU with reheat 4-Pipe FCU	2-Pipe FCU 2-Pipe FCU with reheat 4-Pipe FCU	2-Pipe FCU 2-Pipe FCU with modulating pulsed reheat	2-Pipe FCU 2-Pipe FCU with modulating pulsed reheat	Slave Fan Control Only
Fan Control	Up to 3-Speed	Up to 3-Speed	Up to 3-Speed	Up to 3-Speed	Up to 3-Speed
Monitoring Inputs	None	4 FCU Remote Inputs	None	4 FCU Remote Inputs	None
Control Types	On/Off Line Switched Valve Control 1 Heat/Cool 1 Cool 3 Fan Outputs	On/Off Line Switched Valve Control 1 Heat/Cool 1 Cool 3 Fan Outputs	On/Off Line Switched Valve Control 1 Heat/Cool 1 Modulating Pulsed VDC Output for SSR Electric Heat 3 Fan Outputs	On/Off Line Switched Valve Control 1 Heat/Cool 1 Modulating Pulsed VDC Output for SSR Electric Heat 3 Fan Outputs	Slave Fan Control 3 Fan Outputs

Thermostat Controller User Interface Keys

The T62x Series Thermostat Controller user interface consists of five keys on the front cover (as illustrated in Figure 2). The function of each key is as follows:

- Use the **MODE** key to toggle among the system modes available, as defined by selecting the appropriate operation sequence in the Installer Configuration Menu on T62xH-0 models (for example, Off, Heat, Cool, Auto).

- Use the **FAN** key to toggle among the fan modes available, as defined by selecting the appropriate fan menu options defined in the Installer Configuration Menu on T62xH-0 models (for example, Low, Med, High, Auto).

- Use the **°C/°F or Menu** key to change the temperature scale to either Celsius or Fahrenheit and allow access to the Installer Configuration Menu. (See the *Installer Configuration Menu* section.)

- Use the **UP/DOWN** arrow keys to change the configuration parameters and activate a setpoint adjustment.

Backlit LCD

The T62x Series Thermostat Controllers include a 2-line, 8-character backlit display. Low-level backlighting is present during normal operation, and it brightens when any user interface key is pressed. The backlight returns to low level when the thermostat controller is left unattended for 45 seconds.

LEDs

Three LEDs are included to indicate the fan status, call for heat, or call for cooling:

- The fan LED ✹ is on when the fan is on.

- The heat LED ∭ is on when heating is on.

- The cool LED ❄ is on when cooling is on.

Menu Overview

Two menus are available to view and configure the T62x Series Thermostat Controllers:

- Status Display Menu

- Installer Configuration Menu

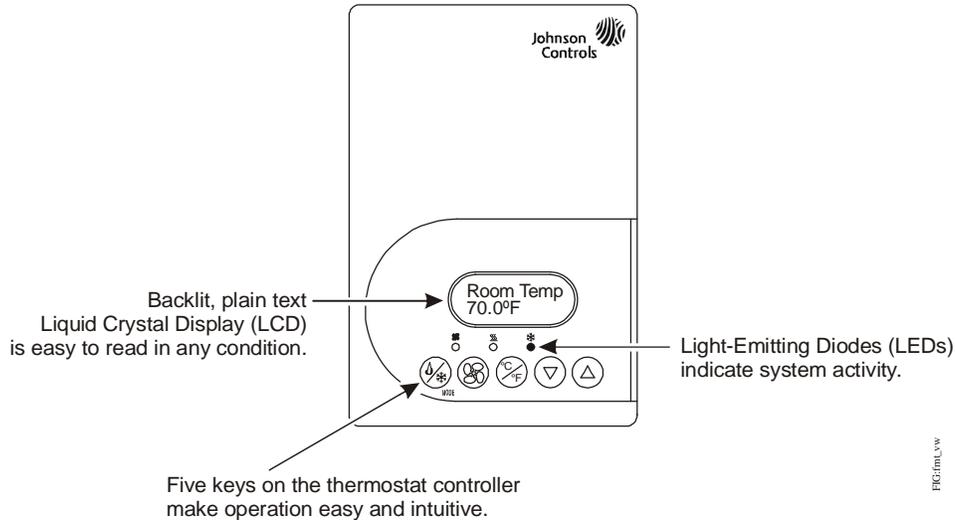The following sections outline the functions and contents of each menu.

Backlit, plain text
Liquid Crystal Display (LCD)
is easy to read in any condition.

Light-Emitting Diodes (LEDs)
indicate system activity.

Room Temp
70.0ºF

Five keys on the thermostat controller
make operation easy and intuitive.

Figure 2: Front Cover of Thermostat Controller (T620H-0 Model)

Status Display Menu

The Status Display Menu is displayed during normal thermostat controller operation. This menu continuously scrolls through the following parameters:

- Room Temperature

Installer Configuration Menu

Use the Installer Configuration Menu to set up the thermostat controller for an application-specific operation. To access the menu, press and hold the **°C/°F** key for approximately 8 seconds.

The Installer Configuration Menu includes the following parameters that are accessed by pressing the same **°C/°F** key:

- Password
- BI1 and BI2 Input Configuration
- RUI1 Input Configuration of Remote Universal Input
- RBI2 Input Configuration of Remote Binary Input
- Menu Scroll
- Auto Mode
- C or F Temperature Display
- % RH Local Display
- Six Keypad Lockout Levels
- Pipe No.
- Pulsed Heat
- Sequence of Operation

- Fan Menu
- Dehumidification Lockout (Dehumidification Models)
- % RH Local Display (Dehumidification Models)
- Dehumidification Hysteresis (Dehumidification Models)
- Maximum Dehumidification Cooling Output (Dehumidification Models)
- Stand-By Heating Setpoint/Stand-By Cooling Setpoint (Dehumidification Models)
- Unoccupied Heating Setpoint/Unoccupied Cooling Setpoint
- Maximum Heating Setpoint/Minimum Cooling Setpoint
- Proportional Band
- Setpoint Type
- Setpoint Function
- Temporary Occupancy Time
- Heating/Cooling Deadband
- Room Air Temperature Calibration
- Auxiliary Configuration
- Auto Fan Mode
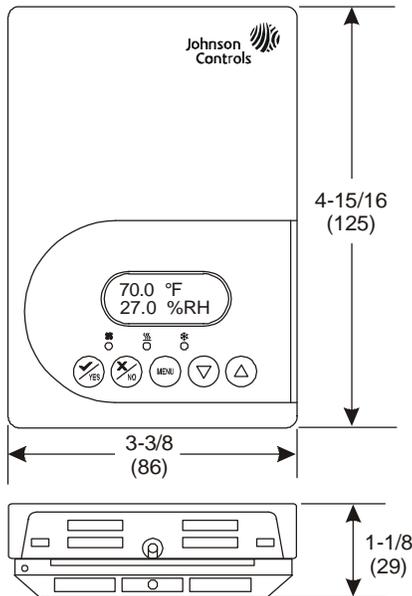- Cycles per Hour (On/Off Models)
- Reheat Time

Dimensions

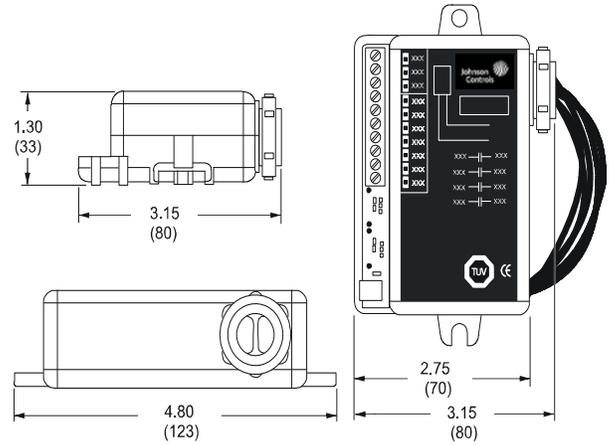**Figure 3: T62xx Thermostat Controller Dimensions, in. (mm)**

Figure 4: Relay Pack Dimensions, in. (mm)

Repair Information

If either the T62x Series Thermostat Controller or Relay Pack fails to operate within its specifications, replace the unit. For a replacement thermostat controller, contact the nearest Johnson Controls® representative.

Technical Specifications

T62xx Series Thermostat Controllers

Power Requirements		7 VDC, 2.4 watts (minimum)
		Terminals 4 (+) and 5 (Com) supplied by first relay pack
Wire Size		18 AWG (1.0 mm Diameter) Maximum, 22 AWG (0.6 mm Diameter) Recommended
Binary Inputs		Voltage-Free Contacts across Terminal Scom to Terminals BI1 or BI2
Temperature Senor Resolution		±0.2F° (±0.1C°)
Temperature Sensor Type		Local 10k ohm NTC Thermistor Sensor
Temperature Range	**Backlit Display**	-40.0°F/-40.0°C to 122.0°F/50.0°C in 0.5° Increments
	Heating Control	40.0°F/4.5°C to 90.0°F/32.0°C
	Cooling Control	54.0°F/12.0°C to 100.0°F/38.0°C
Dehumidification Setpoint Range		30% to 95% RH
Accuracy	**Temperature**	±0.9F°/±0.5C° at 70.0°F/21.0°C Typical Calibrated
	Humidity	±5% RH from 20 to 80% RH at 70.0°F/21.0°C
Minimum Deadband		2F°/1C° between Heating and Cooling
Ambient Conditions	**Operating**	32 to 122°F (0 to 50°C); 95% RH Maximum, Noncondensing
	Storage	-22 to 122°F (-30 to 50°C); 95% RH Maximum, Noncondensing
Compliance CE	**United States**	cTUVus Listed, Tested to UL 873, Temperature Indicating and Regulating Equipment
		FCC Compliant to CFR 47, Part 15, Subpart B, Class A
	Canada	cTUVus Listed, Tested to UL 873, Temperature Indicating and Regulating Equipment
		Industry Canada, ICES-003
	Europe	CE Mark - Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC.
	Australia and New Zealand	C-Tick Mark, Australia/NZ Emissions Compliant
Shipping Weight		0.75 lb (0.34 kg)

Relay Packs

Line Voltage Electrical Connections	
Power Requirements	Black: Hot Wires, White: Neutral Wires 90 to 277 VAC Universal, 50-60 Hz
Fan Relay Output Rating	Brown: High Wires, Blue: Medium Wires, Red: Low Wires
Cooling Valve	Yellow Wire 5 A at 277 VAC Maximum
Heating Valve	Isolated Orange Wires 10 A at 277 VAC Maximum
Low Voltage Electrical Ratings	
Terminal 1: Tx/Rxz	Digital Serial Communications to Thermostat (5 VDC)
Terminal 2: 7 VDC	7 VDC Output, 4 W Maximum, Powers One Thermostat
Terminal 3: Com	Power and Serial Communications Common
Terminal 4: RUI 1	Remote Universal Input: NTC Thermistor, 10K Ohm Type 2 Voltage-Free Dry Contact
Terminal 5: SCom	Signal Common for Terminals
Terminal 6: RBI 2	Remote Binary Input; Voltage-Free Dry Contact
Terminal 7: SS	Supply Air Sensor; NTC Thermistor, 10K Ohm Type 2
Terminal 8: RS	Return Air Sensor; NTC Thermistor, 10K Ohm Type 2
Terminal 9: Heat (-)	Pulsed DC Output, SInking/Open-Drain: Connect to (-) Terminal of Opto-Isolator 10 Second Pulse Width with Variable Duty Cycle (0 to 100% at 1% Increments)
Terminal 10: Heat (+)	Voltage Source Connect to (+) Terminal of Opto-Isolator Tolerance = 6.8 to 7.4 VDC Maximum Allowable Load Current = 45mA (150 Ohm at 6.8 VDC)

Ambient Conditions	**Operating**	32 to 122°F (0 to 50°C); 95% RH Maximum, Noncondensing
	Storage	-22 to 122°F (-30 to 50°C); 95% RH Maximum, Noncondensing
Compliance	**United States**	cTUVus Listed, Tested to UL 873, Temperature Indicating and Regulating Equipment
		FCC Compliant to CFR 47, Part 15, Subpart B, Class A
	Canada	cTUVus Listed, Tested to UL 873, Temperature Indicating and Regulating Equipment
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