

## RETROLINE®

### Retrostat Kits for Johnson Controls D/N or H/C Thermostats

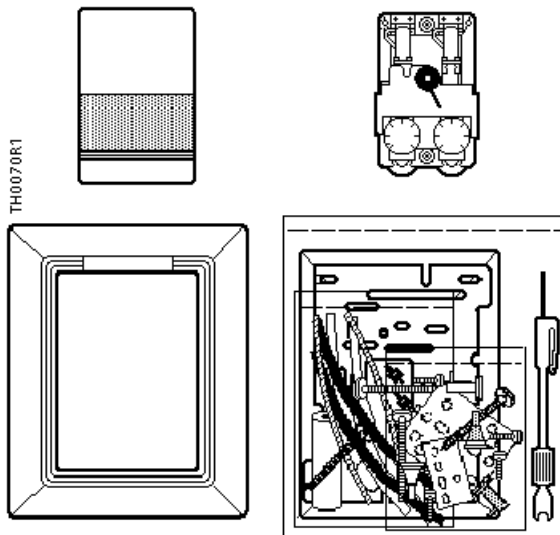
#### Product Description

The Retrostat Kits convert a Johnson Controls day/night or heating/cooling pneumatic thermostat to a Powers™ Controls direct or reverse acting, two-pipe, dual temperature pneumatic device.

#### Contents

Part	Quantity
Retrostat Cover Kit	1
Thermostat *	1
Adapter frame	1
Bag assembly with installation hardware	1
Optional 1/2-inch Large, Exposed Set Point Knob	1

\* Includes thermostat installation instructions.



#### Product Number

Retrostat Kit (See Notes 1 and 2)	Johnson Controls Product		
	Number	Type	Action
194-3043	T-4506-201 T-4506-202 T-4506-203 T-4506-204	Day/ Night	Direct/ Direct
194-3143	Same as above with Celsius scale		
194-3083	T-4576-217 T-4752-205 T-4752-206 T-4756-205 T-4756-206	Heating/ Cooling	Direct @ 20psig, Reverse @ 15 psig

#### NOTES:

1. For Retrostat Kits with white cover, order standard kit with "W" suffix.
2. For Retrostat Kits with optional 1/2-inch large, exposed set point adjustment knob, order standard kit with "K" suffix.

#### Expected Installation Time

1 hour

## Prerequisites

- Review all these instructions before you begin installation.
- Check job drawings for any site-specific information.
- Verify the existing thermostat installation has its supply and return air lines connected properly.

**NOTE:** *Supply* is the Powers term for main air and *Return* is the term for branch air.

- Obtain the installation instructions provided with the thermostat in this Retrostat Kit. The document provides instructions for calibrating the thermostat.
- Make certain a supply of wall anchors and plastic ties are available.

## Specifications

Operating range	45 to 85°F (7 to 30°C)
Air supply pressure	
Day/Cooling	
Minimum	10 psi (69 kPa)
Maximum	15 psi (103 kPa)
Night/Heating	
Minimum	20 psi (138 kPa)
Maximum	30 psi (207 kPa)
Sensitivity adjustment	
	1 to 4 psi/°F (12 to 50 kPa/°C)
Temperature response	0.1°F (0.06°C)
Storage temperature	-10 to 140°F (-23 to 60°C)
Dial graduations	2°F (1°C)
Factory settings (adjustable)	
Temperature	72°F (22°C)
Sensitivity	2.5 psi/°F (31 kPa/°C)
Limit stops	45 and 85°F (7 and 30°C)

## Required Tools

- Calibration and cover screw wrench (192-632) or 1/16" Allen wrench and 1/8" open-end wrench
- Medium flat blade screwdriver
- Small level
- Accurate thermometer
- Needle nose pliers

## Installation

### Removing Existing Thermostat

1. Remove the existing thermostat from the wall.
2. Plug the supply (main) air line.
3. Place a piece of tape on the supply air line to identify it.
4. Remove the terminal head and the gasket from the fitting.
5. Clean the surface of the fitting, if required.

### Installing New Thermostat

See *Figure 1* for a typical thermostat installation.

1. The following table lists the figures that correspond to a particular thermostat application. See the appropriate figure to identify the mounting parts.

Johnson Controls Thermostat Type	Type of Terminal	Figure Number
H & T 4000, 5000	Flush Box	2
	Surface Fitting	3
T400, 401, 403, 432, 460, 465, H101, 102, 103, 105	Flush Fitting Old Round Head	4
Terminal Head Removed	1/8-inch O.D. Copper Tubing	5
	3/16-inch O.D. Copper Tubing	6

2. Complete the required air line connections as necessary. Secure all connections and install the plug-in adapters into the 5/32-inch (4 mm) plastic tube. Use the blue adapter for the supply air line. See *Figure 1*.

**NOTE:** Either polyethylene (hard, black) or polyurethane (soft, clear) tubing is recommended. The appropriate tubing depends on which is most compatible for the application.

3. Place the multi-slotted metal plate into the adapter frame, if required. Attach the multi-slotted plate to the terminal head or the wall using screws and slots shown in *Figures 2* through *6*.
4. Loosely screw adapter base to the multi-slotted plate.

5. Draw plastic tubing through the multi-slotted plate and the adapter base. Install the plug-in adapters on the wall plate.
6. Using mounting screws supplied with the thermostat chassis, install the wall plate on the adapter base as follows:
  - a. Guide screws through the slotted key holes on the wall plate and partially insert them into the adapter base.
  - b. Orient the wall plate so that it is square and level.
  - c. Tighten the mounting screws to secure the wall plate in place.
7. Moisten the thermostat supply and return ports to lubricate them. Carefully insert the thermostat ports into the terminal adapter "O" rings on the wall plate.
8. Configure the cover per installation instructions provided and mount the cover over the thermostat.

**NOTE:** For applications that use the 1/2-inch large set point adjustment knob, align the key hole in the cover over the shaft protruding from the thermostat when mounting the cover (see *Figure 1*).

Use either the hex key end of the calibration and cover screw wrench or a 1/16" Allen wrench to tighten the two screws that secure the cover in place.

9. Place the optional 1/2-inch large set point adjustment knob on the shaft protruding through the cover. Use either the hex key end of the calibration and cover screw wrench or a 1/16" Allen wrench to tighten the set screw on the knob.

## NOTES:

1. In applications with a 1/2-inch large set point adjustment knob, whenever you remove the thermostat cover, *first* remove the adjustment knob by loosening its set screw with either the hex key end of the calibration and cover screw wrench or a 1/16" Allen wrench.
2. To remove the thermostat from the wall plate, hold the thermostat firmly at the top and bottom and start to pull the thermostat from the wall plate. At the same time, use a screwdriver to pry the wall plate latch arms away from the thermostat chassis and pull the thermostat away from the wall plate.

Frequent removal and installation of the thermostat can bend the latch arms beyond their operating positions. If this occurs, bend the latch arms back to their operating positions before mounting the thermostat.

The installation is complete.

## Calibration, Adjustment, and Troubleshooting

See the installation instructions provided with the thermostat in this retrostat kit for the following procedures:

- Thermometer Calibration
- Changeover Point Adjustment
- Limit Stop Adjustment
- Sensitivity Adjustment
- Thermostat Cooling/Heating Calibration
- Troubleshooting

## Reference

Technical Bulletin	Document Number
TB 214 TH 192 Adapter Kits	155-231

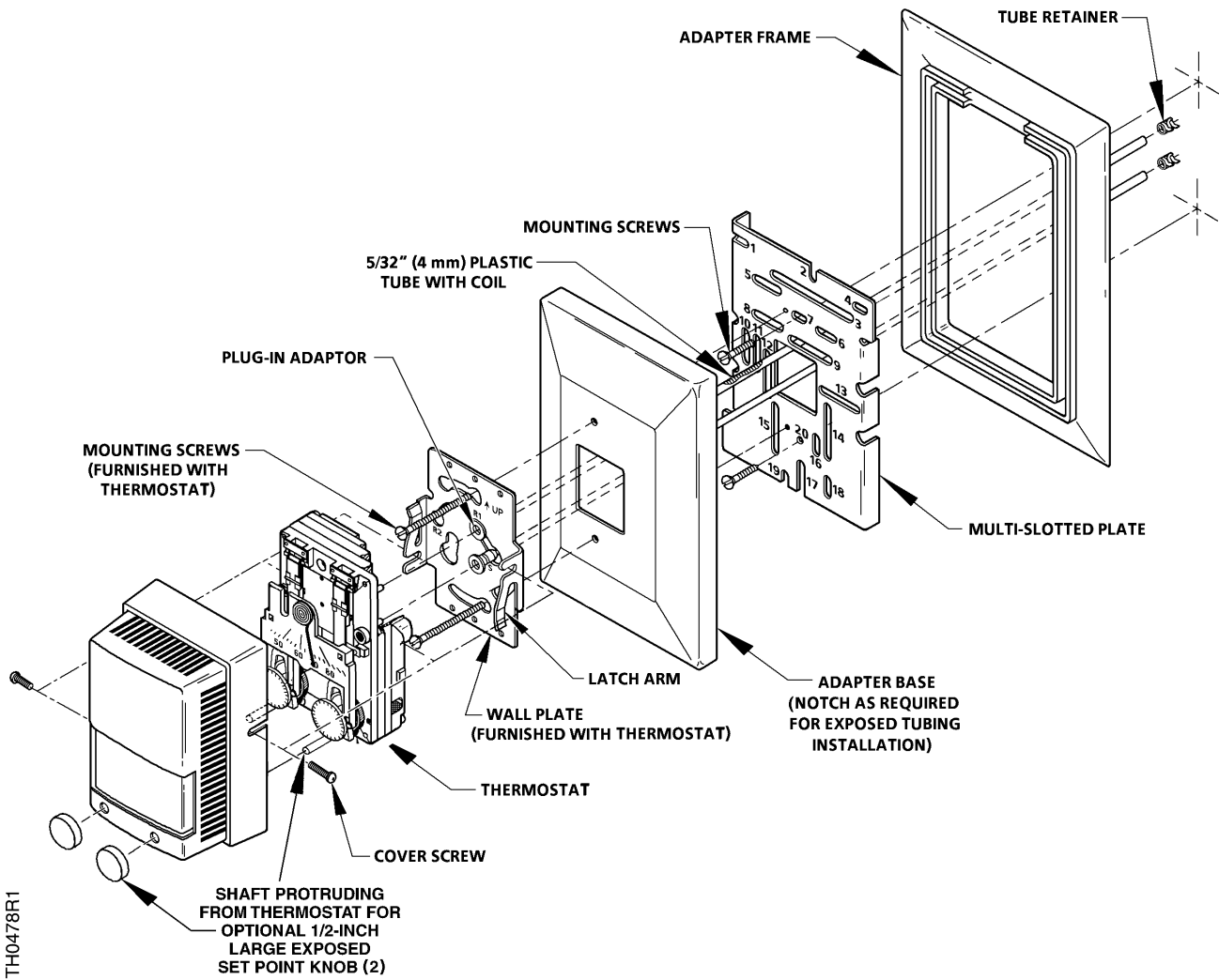
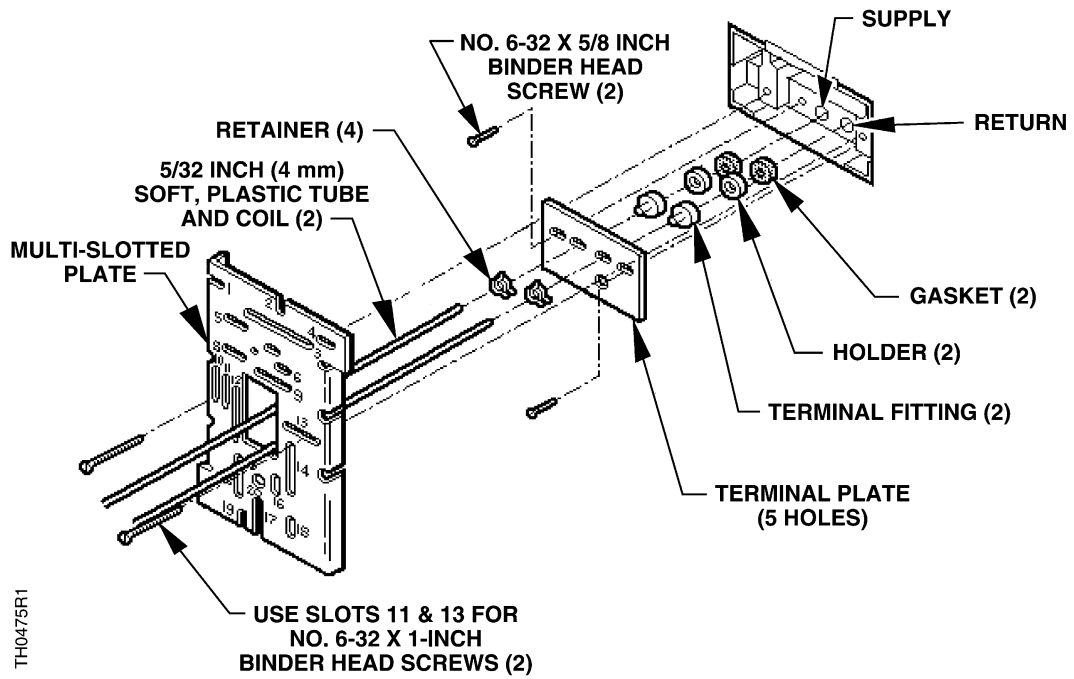
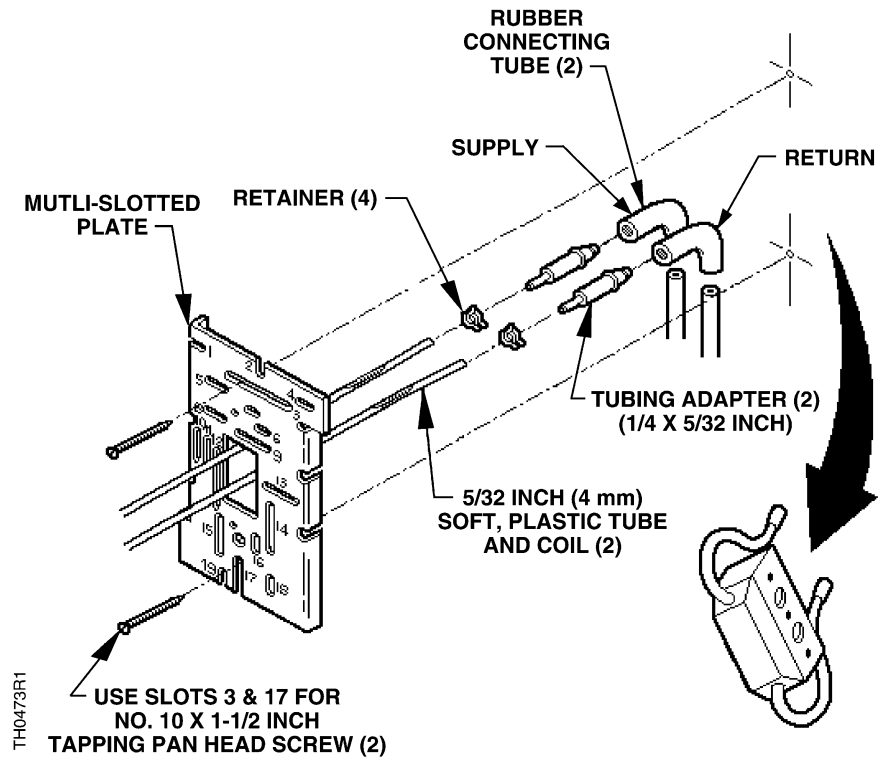


Figure 1. Typical Thermostat Installation.



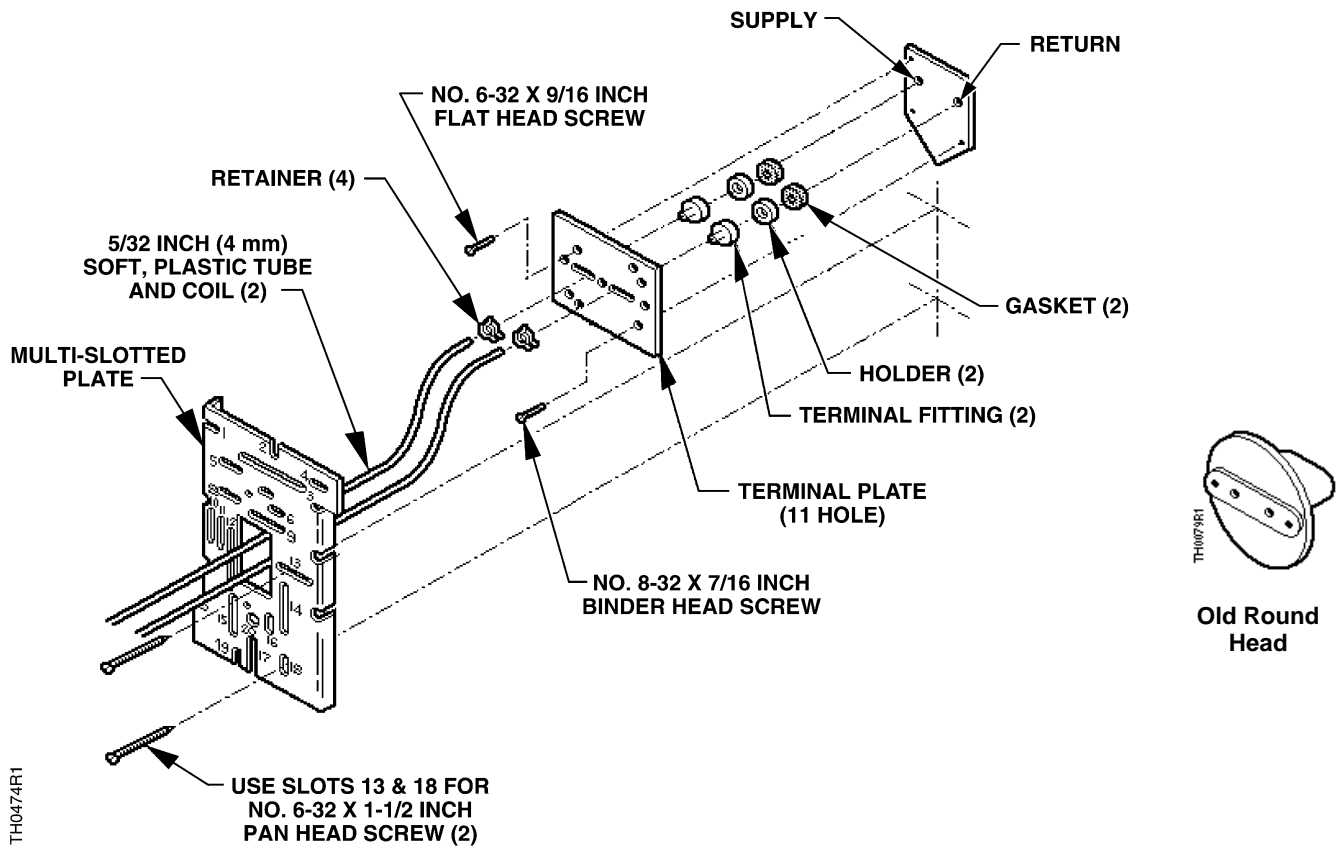
**NOTE:** Adapter Base and Plug-in Adapter (2) not shown. See *Figure 1* for proper installation.

**Figure 2. H & T 4000, 5000 Flush Box.**



**NOTE:** Adapter Base and Plug-in Adapter (2) not shown. See *Figure 1* for proper installation.

**Figure 3. H & T 4000, 5000 Surface Fitting.**



**NOTE:** Adapter Frame, Adapter Base, and Plug-in Adapter (2) not shown. See *Figure 1* for proper installation.

**Figure 4.** T400, 401, 403, 432, 460, 465, H101, 102, 103, 105 Flush Fitting.

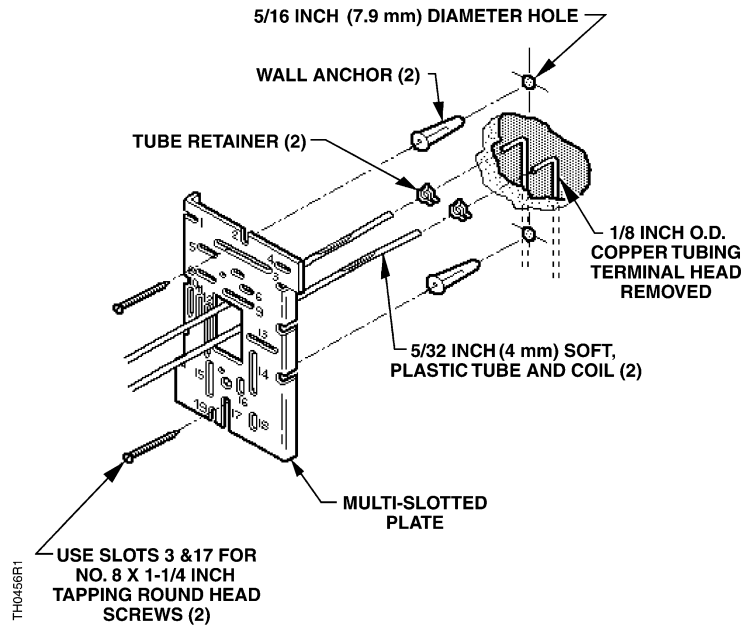


Figure 5. Terminal Head Removed with 1/8-inch O.D. Copper Tubing.

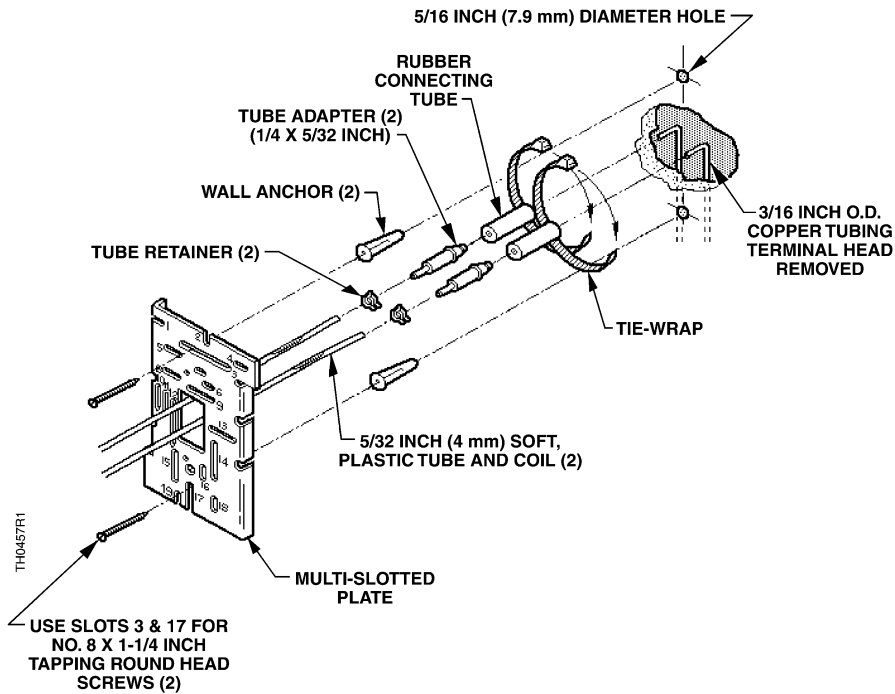


Figure 6. Terminal Head Removed with 3/16-inch O.D. Copper Tubing.

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