

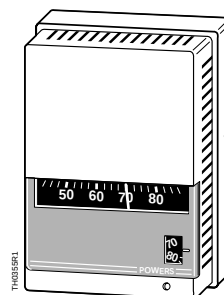
# SIEMENS



**Technical Instruction**  
**Document No. 155-065P25**  
**TH 192-1**  
Rev. 1, July, 1999

## Powers<sup>TM</sup> Controls

### TH 192 S Single Temperature Room Thermostat



#### Description

The TH 192 S thermostats are proportional single output, single set point, 1-pipe (low air capacity) or 2-pipe (high air capacity) sensor controllers. Each thermostat includes a wall mounting plate for installation in a variety of rough-in terminal boxes. A sensitive bimetal responds to temperature change to modulate control air through a flapper nozzle. One set point dial is provided. Air connections are made with 5/32" (4 mm) OD plastic tubing, directly to the thermostat chassis for retrofit applications or with plug-in adapters (provided with the TH 192 rough-in terminal box or optional accessories) which slide into the wall mounting plate.

#### Features

- Direct and reverse acting models for one and two-pipe
- Fahrenheit or Celsius set point dials
- Highly sensitive bimetal thermostatic element
- Field adjustable sensitivity with graduated scale
- Integral field adjustable limit stops
- Control pressure test port accessible without removing cover
- Easily replaceable thermometer, set point dial, filters, and restrictor plate
- Covers available for concealed or exposed thermometers and for either concealed, key, or exposed knob adjustment and set point indication
- Standard plastic thermostat covers provide desert beige or white finish

#### Optional Design Features

- Fixed temperature limit stops meet government specifications
- Competitor adapter mounting kits available
- Metal covers available in standard configurations with a variety of finishes
- All thermostat chassis available with optional 1/2" large set point adjustment knobs

Application

TH 192 S thermostats are temperature sensing devices that control pneumatic valve and damper actuators in heating and cooling applications such as air conditioners, space heaters, unit ventilators, and air volume controllers. The thermostats maintain energy management (maximum economy) and occupant comfort. TH 192 S thermostats are available with covers that conceal or expose the set point adjustment dial.

Use TH 192 S 1-pipe thermostats with an external restrictor (20 scim, 5.4 ml/sec) where a limited air capacity operates a single valve and/or actuator. Use TH 192 S 2-pipe thermostats where multiple valves and actuators, used with or without high/low limiting controls, require higher air capacities.

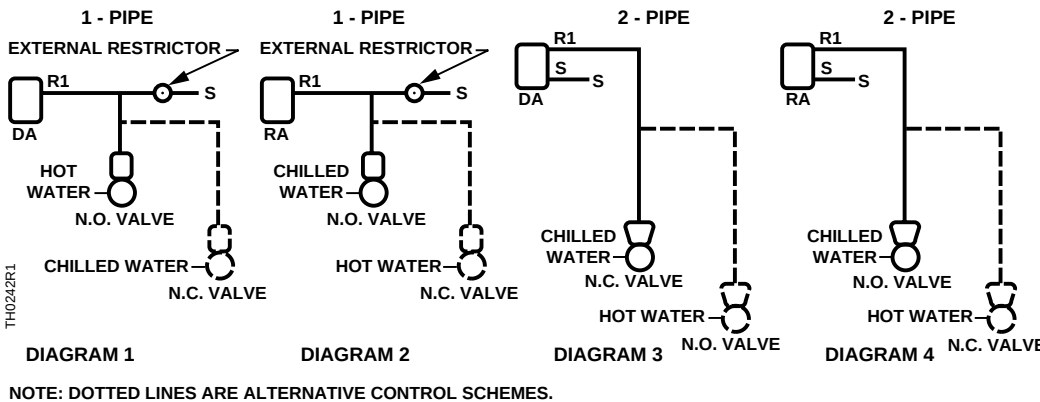


Figure 1. Typical TH 192 S Thermostat Applications.

Piping

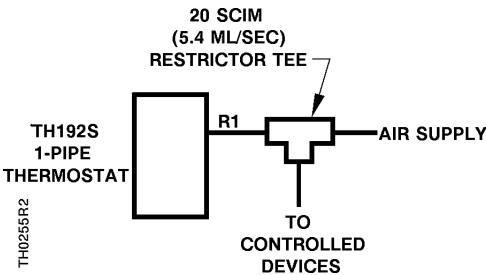


Figure 2. TH 192 S One-Pipe Thermostat Connections.

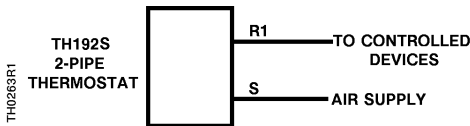


Figure 3. TH 192 S Two-Pipe Thermostat Connections.

## Product Numbers and Ordering Information

### Chassis

See Table 1 for product number and ordering information on TH 192 S thermostat chassis.

1. Is a one-pipe (low air capacity) or two-pipe (high air capacity) connection required for application?
2. Is a Fahrenheit or Celsius scale required?
3. Is the control action direct or reverse acting?
  - a. Direct acting: An increase in temperature increases the control air pressure.
  - b. Reverse acting: An increase in temperature decreases the control air pressure.
4. Where is set point adjustment knob located?
  - a. Adjustment knob located at bottom of chassis.
  - b. Adjustment knob on front with 1/2" large exposed knob.

**Table 1. TH 192 S Thermostat Chassis Part Numbers.**

| Chassis with Wall Plate      |                     |               |                |               |                |
|------------------------------|---------------------|---------------|----------------|---------------|----------------|
| Set Point Adjustment         | Connection Type     | Fahrenheit    |                | Celsius       |                |
|                              |                     | Direct Acting | Reverse Action | Direct Acting | Reverse Acting |
| Exposed at Bottom of Cover   | Two-pipe, relay     | 192-202       | 192-203        | 192-222       | 192-223        |
|                              | One-pipe, non-relay | 192-200       | 192-201        | 192-220       | 192-221        |
| Exposed 1/2" Knob on Cover * | Two-pipe, relay     | 192-202K      | 192-203K       | 192-222K      | 192-223K       |
|                              | One-pipe, non-relay | 192-200K      | 192-201K       | 192-220K      | 192-221K       |

\* This feature requires a key set point adjustment cover (or key type cover). See Table 2.

## Covers

See Table 2 for product number and ordering information on TH 192 S thermostat covers.

1. Is the set point adjustment exposed for customer adjustment or concealed to prevent alteration of setting?
2. Is the thermometer exposed or concealed?
3. Is the set point indication exposed or concealed behind cover?
4. Is a plastic or zinc cast metal cover required?
  - a. Plastic covers order 192-2XX.
  - b. Metal covers order 192-3XX.
5. Is finish of cover standard or optional?
  - a. Standard cover is plastic, desert beige color.  
For white plastic cover option, add "W" suffix code to cover part number (e.g., 192-256W).
  - b. Optional covers are plastic or metal and available in a variety of colors per Table 3.

**Table 2. TH 192 S Thermostat Cover Part Numbers.**

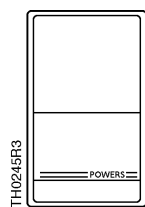
| Set Point Adjustment | Cover Configuration |                     | Cover Part Number<br>(See Note 2) |                      |
|----------------------|---------------------|---------------------|-----------------------------------|----------------------|
|                      | Thermometer         | Set Point Indicator | Standard Plastic Cover            | Standard Metal Cover |
| Concealed            | Concealed           | Concealed           | 192-256                           | 192-356              |
|                      | Exposed             |                     | 192-254                           | 192-354              |
| Key<br>(See Note 1)  | Concealed           | Exposed             | 192-265                           | 192-365              |
|                      | Exposed             |                     | 192-266                           | 192-366              |
| Exposed              | Concealed           |                     | 192-250                           | 192-350              |
|                      | Exposed             |                     | 192-252                           | 192-352              |

1. Key set point adjustment cover required for all thermostat chassis with optional 1/2" large set point adjustment knobs.
2. To order an optional thermostat cover finish, add the appropriate suffix letter listed in Table 3 to the end of the part number listed in Table 2.

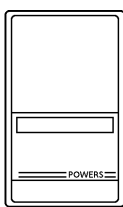
**Table 3. TH 192 S Thermostat  
Suffix Letters for Optional Cover Part Numbers.**

**NOTE:** For color samples, order color reference guide 152-178P10.

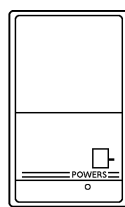
| Part Number Suffix Letter | Cover Material     | Cover Finish             | Part Number Suffix Letter | Cover Material   | Cover Finish                        |
|---------------------------|--------------------|--------------------------|---------------------------|------------------|-------------------------------------|
| None                      | Plastic (standard) | Desert Beige             | D                         | Metal (optional) | #10 Special Bronze                  |
| W                         | Plastic (optional) | White                    | E                         |                  | Brushed Electro-plated Satin Chrome |
| None                      | Metal (standard)   | Desert Beige             | F                         |                  | Sierra Gold                         |
| A                         | Metal (optional)   | #1 Silver                | G                         |                  | Brushed Aluminum                    |
| B                         |                    | #5 Satin Chrome          | H                         |                  | White                               |
| C                         |                    | #7 Light Statuary Bronze |                           |                  |                                     |



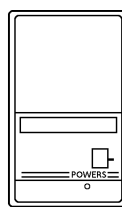
**192-256  
192-256W**



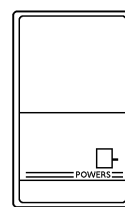
**192-254  
192-254W**



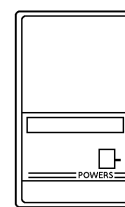
**192-265  
192-265W**



**192-266  
192-266W**



**192-250  
192-250W**



**192-252  
192-252W**

## Specifications

|                               |                                 |
|-------------------------------|---------------------------------|
| Control action                | See Table 1.                    |
| Operating range               | 45 to 85°F (7 to 30°C)          |
| Supply air pressure, maximum  | 30 psi (207 kPa)                |
| Normal air supply pressure    | 18 to 25 psi (124 to 172 kPa)   |
| Sensitivity adjustment        | 1 to 4 psi/°F (12 to 50 kPa/°C) |
| Nominal air consumption       |                                 |
| One pipe                      | 25 scim (6.8 ml/sec)            |
| Two pipe                      | 20 scim (5.5 ml/sec)            |
| Temperature                   |                                 |
| Storage temperature           | -10 to 140°F (-23 to 60°C)      |
| Ambient operating temperature | 40 to 140°F (4 to 60°C)         |
| Temperature response          | 0.1°F (0.06°C)                  |
| Dial graduations              | 2°F (1°C)                       |

Specifications  
(Continued)

|                           |                          |
|---------------------------|--------------------------|
| Factory settings          |                          |
| Calibration @ 72°F (22°C) | 7.5 psi (52 kPa)         |
| Sensitivity               | 2.5 psi/°F (31 kPa/°C)   |
| Limit stop adjustment     | 45 and 85°F (7 and 30°C) |
| Standard cover            | Cyclac, desert beige     |
| Shipping weight           | 0.7 lbs. (0.3 kg)        |
| Dimensions                | See Figure 4.            |

Accessories

See the following Technical Bulletins for information on accessories.

| Technical Bulletin            | Document Number |
|-------------------------------|-----------------|
| TB 237 Terminal Kits          | 155-244         |
| TB 213 Aspirator Wall Box Kit | 155-245         |
| TB 214 Adapter Kits           | 155-231         |
| TB 193 Guard Kit              | 155-222         |
| TB 241 Test Head Kit          | 155-255         |
| TB 167 Restrictors            | 155-213         |

Dimensions

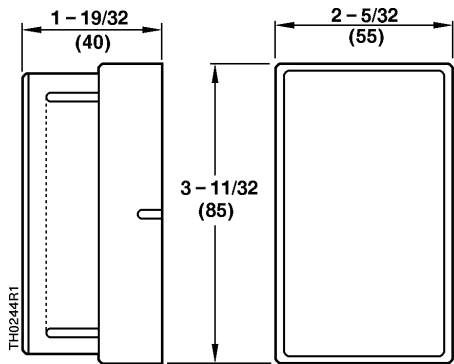


Figure 4. TH 192 S Dimensions in Inches (Millimeters).

Operation

In the TH 192 S direct acting thermostat, an increase in temperature increases the control air pressure and a decrease in temperature decreases the control pressure.

In the TH 192 S reverse acting thermostat, an increase in temperature decreases the control air pressure and a decrease in temperature increases the control pressure.

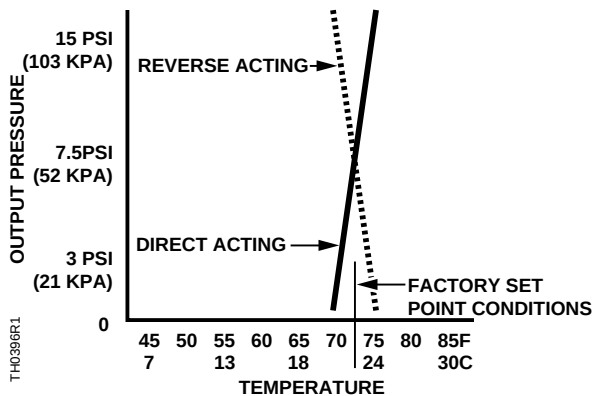
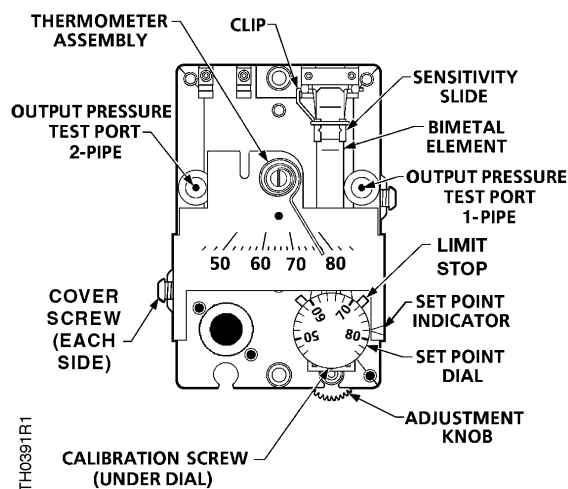


Figure 5. TH 192 S Input/Output Characteristics.

## TH 192 S Thermostat Details



**Figure 6. TH 192 S Thermostat Details.**

### Thermometer Calibration

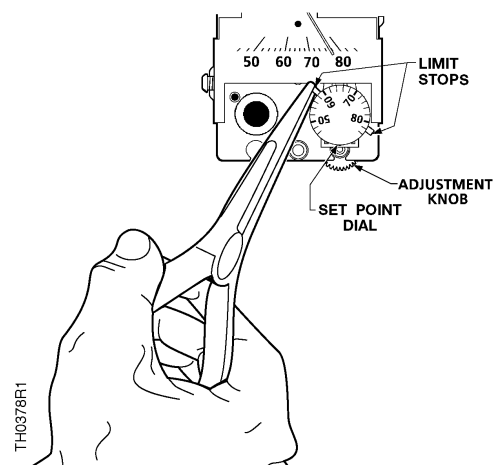
1. Use a test thermometer to read the current room temperature.
2. Place a screwdriver in the center of the thermometer assembly (Figure 6). Carefully rotate thermometer assembly until pointer tip indicates the correct room temperature.

**NOTE:** Avoid breathing on or touching the bimetal spiral since this affects the temperature reading.

### Limit Stop Adjustment

Thermostat limit stops define the minimum and maximum thermostat set points. The limit stops engage in the set point cam gear teeth and cause interference between the set point cam gear and the adjustment knob gear.

To change limit stop settings, use needle nose pliers to pull limit stop between the set point cam gear teeth. Rotate limit stop to its new position. Do not pull limit stop any more than necessary to clear the gear teeth. Changing the limit stop position one gear tooth changes the limit stop setting by 1-1/3°F (0.7°C).



**Figure 7. TH 192 S Limit Stop Adjustments.**

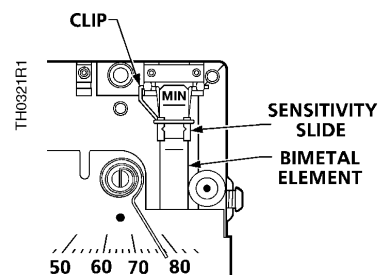
## Sensitivity Adjustment

To change thermostat sensitivity, use a flat blade screwdriver to carefully move the sensitivity slide to the desired position as follows:

Graduation closest to the rigid end of the bimetal element  
4 psi/°F  
(50 kPa/°C)



Graduation closest to the minimum (MIN) end of the bimetal element  
1 psi/°F  
(12 kPa/°C)

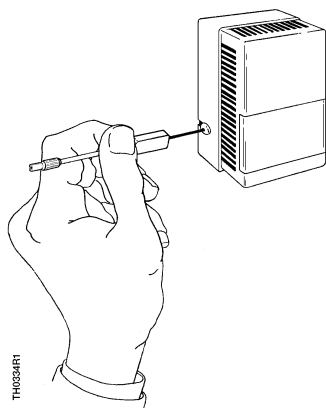


**Figure 8. TH 192 S Sensitivity Adjustment.**

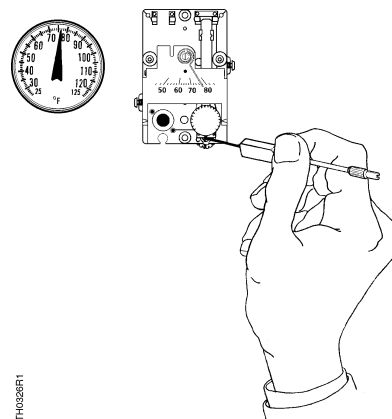
**NOTE:** If the thermostat sensitivity is adjusted, the thermostat must be recalibrated.

## Thermostat Calibration

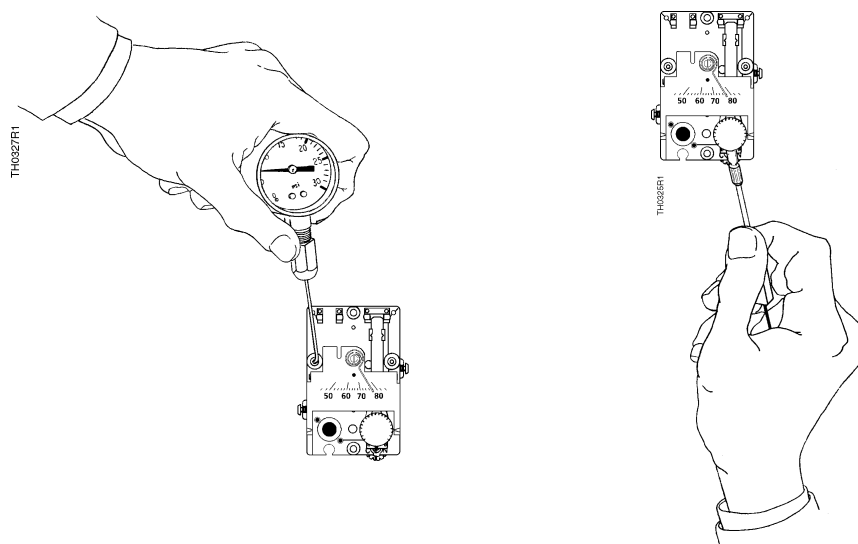
The thermostat is factory calibrated to a control pressure of 7.5 psi (52 kPa) when the set point and the ambient temperature are both at 72°F (22°C). The factory sensitivity setting is approximately 2.5 psi/°F (31 kPa/°C). No adjustments are required if these settings are appropriate for the application. If the thermostat has been tampered, the sensitivity changed, or is out of adjustment, use the following steps to re-calibrate the instrument.



**Step 1 —**  
Remove cover using 192-632 calibration tool. Verify room temperature is between 70 and 80°F (21 and 27°C).



**Step 2 —**  
Verify that supply pressure is 18 psi (124 kPa). Set dial to room temperature by turning the exposed adjustment knob or using a hex key as shown. Allow thermostat to stand for about five minutes to adjust to the new setting.

**Step 3 —**

Moisten needle and insert 192-633 test gauge and needle adapter in a test port. Read control pressure.

**Step 4 —**

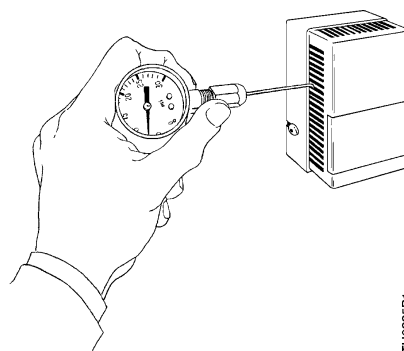
If control pressure does not read 7 to 8 psi (48 to 55 kPa), turn calibration screw using 192-632 calibration tool or 1/8" (3.2 mm) wrench until pressure is 7 to 8 psi (48 to 55 kPa). The sensing element is now in calibration and the set point can be changed to the desired room temperature.

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**Troubleshooting**

Before troubleshooting thermostat per Table 4, make certain there is clean dry supply air at 18 psi (124 kPa) minimum. Use test probe gauge and needle adapter to measure control pressure at thermostat test port.

The output pressure test port is accessible without removing the thermostat cover through the 8th opening from the top. For one-pipe thermostats, the port is on the right side. For two-pipe thermostats, the port is on the left side.



**Figure 9. Accessing Output Pressure Test Port.**

**Table 4. Troubleshooting Guide.**

| Problem                                                            | Check                             | Cause                                                           | Action                                                               |
|--------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------|
| Control pressure stays at approximately zero                       | Air supply                        | Low supply pressure                                             | As required                                                          |
|                                                                    | Nozzle or flapper                 | Dirt on nozzle or flapper                                       | Clean nozzle or replace thermostat                                   |
|                                                                    | Restrictor                        | Clogged restrictor                                              | Replace restrictor                                                   |
|                                                                    | Calibration                       | Out of calibration                                              | Recalibrate                                                          |
| Control pressure stays at approximately supply pressure            | Nozzle                            | Clogged nozzle                                                  | Clean nozzle or replace thermostat                                   |
|                                                                    | Calibration                       | Dirt on either supply or exhaust valve seat                     | Alternately close and open nozzle by gently pushing down the bimetal |
| Excessive air leakage from exhaust port on left side of thermostat | Supply and return line connection | Connections are interchanged or connection to port is incorrect | As required                                                          |

## Chassis Tube Connector and Restrictor Plate Replacement

1. Remove thermostat chassis from wall. Terminal does not have a ball check valve.

**NOTE:** You must close off the supply air. For example, use a connector with the supply air terminal plugged.

2. Remove two Phillips head screws from connector on back of thermostat chassis. Pull connector out of recess. If necessary, pry connector loose with a screw driver, but be careful not to damage restrictor plate and gasket.
3. Remove gasket from under connector. Remove restrictor. Remove second gasket from under restrictor.
4. Use restrictor replacement kit 192-321 to replace gasket, restrictor, and second gasket.

**NOTE:** The restrictor plate is keyed to ensure proper orientation during installation.

5. Remove filters from existing connector and insert in new connector. Or, if filters are dirty, use restrictor replacement kit 192-321 to replace filters.
6. Use chassis tube connector replacement kit 192-525 to replace connector and mounting screws.

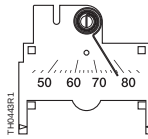
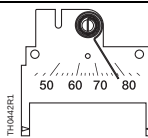
**Service Parts**

The following chart lists accessory parts and tools available for thermostat service.

| Description                                                                                                       | Part Number |
|-------------------------------------------------------------------------------------------------------------------|-------------|
| Dial thermometer (-40 to 140°F, -40 to 60°C) with pocket case                                                     | 141-0573    |
| Basic pneumatic calibration kit with thermometer, gauge, squeeze bulb, fittings, and case                         | 832-177     |
| Test head kit                                                                                                     | 832-179     |
| Calibration tools                                                                                                 | 832-178     |
| Test probe to check pressure with cover on                                                                        |             |
| Needle probe with 1-1/2" diameter gauge 0-30 psig (0-200 kPa) and calibration/cover wrench                        | 192-633     |
| Needle probe, no gauge (package of five)                                                                          | 192-759     |
| 1-1/2" diameter gauge, 0-200 kPa, back connected 1/8" NPT male                                                    | 142-0344    |
| 1-1/2" diameter compound gauge, 0-30 psig/0-200 kPa, back connected 1/8" NPT male                                 | 142-0373    |
| 1-1/2" diameter compound gauge, 0-30 psig/0-200 kPa, bottom connected 1/8" NPT male.                              | 142-0426    |
| Replacement for use with 192-633                                                                                  |             |
| Chassis tube connector replacement kit with mounting screws (material for 10 thermostats included)                | 192-525     |
| Restrictor plate replacement kit with filters and gasket (material for 10 thermostats included)                   | 192-321     |
| Plug-in adapters for quick thermostat removal                                                                     |             |
| Straight, blue (package of 20)                                                                                    | 192-485     |
| Straight, white (package of 20)                                                                                   | 192-486     |
| Air link connects adapters for pressure tests (package of 20)                                                     | 192-501     |
| Compression ring (package of 100)                                                                                 | 141-388     |
| Elbow (provides quick return for wall surface mounting), blue (package of 20)                                     | 192-487     |
| Elbow (provides quick return for wall surface mounting), white (package of 20)                                    | 192-488     |
| 20 scim (5.4 ml/sec) restrictors for 1-pipe systems (package of 5). (1/4", 6.4 mm, OD plastic barb unless noted.) |             |
| Brass coupling, 1/8" NPT (1 only).                                                                                | 184-040     |
| Coupling                                                                                                          | 184-116     |
| Tee                                                                                                               | 184-113     |
| Pre-piped dual tee for dual 1-pipe systems                                                                        | 184-130     |

## Service Parts

(Continued)

| Description                                         |                                                                                                      | Part Number |                                                                                       |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------|
| Replacement thermometer kits, brown (packages of 5) |                                                                                                      | 192-775     |                                                                                       |
| Scale Range                                         | Thermostat Model                                                                                     |             |                                                                                       |
| 45° to 85°F                                         | <br>Model 3 and Up |             |                                                                                       |
| 10° to 30°C                                         |                                                                                                      |             |                                                                                       |
| 45° to 85°F                                         | <br>Models 1 and 2 |             |                                                                                       |
| 10° to 30°C                                         |                                                                                                      |             |                                                                                       |
| Replacement set point dials (packages of 10)        |                                                                                                      | 192-779     |                                                                                       |
| °F, Direct Acting                                   | Right Side                                                                                           |             |   |
| °F, Reverse Acting                                  |                                                                                                      |             |                                                                                       |
| °C, Direct Acting                                   |                                                                                                      |             |                                                                                       |
| °C, Reverse Acting                                  |                                                                                                      |             |                                                                                       |
| °F, Direct Acting                                   | Left Side                                                                                            |             |  |
| °F, Reverse Acting                                  |                                                                                                      |             |                                                                                       |
| °C, Direct Acting                                   |                                                                                                      |             |                                                                                       |
| °C, Reverse Acting                                  |                                                                                                      |             |                                                                                       |

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