

Life Is On

**Schneider**  
Electric



# Pneumatics Products Catalog

North America  
EcoBuilding | 2018



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Schneider Electric is leading the Digital Transformation of Energy Management and Automation in Homes, Buildings, Data Centers, Infrastructure and Industries.

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# About This Catalog and Online Resources

## Welcome to the 2018 Schneider Electric Pneumatic Products Catalog

Superior engineering, product design patents, ISO9001 certification, and Six Sigma lean manufacturing ensure our products conform to the highest standards of internationally recognized quality to deliver solid performance, unsurpassed value and exceptional reliability.

It is recommended to view this catalog in its electronic PDF version (Acrobat Reader required), from the **Exchange Extranet** or from **iPortal**.

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About this Catalog and Online Resources

## Online Selection Tool for Schneider Electric Valves/Assemblies & Damper Actuators

### [Product Selection Tool](#)

In 2017 Schneider Electric launched an online selection tool for Valves/Assemblies and Damper Actuators. This tool quickly and easily puts a wealth of information at the user's fingertips to ensure specification of the optimum Schneider Electric part to fit their application.

### Features

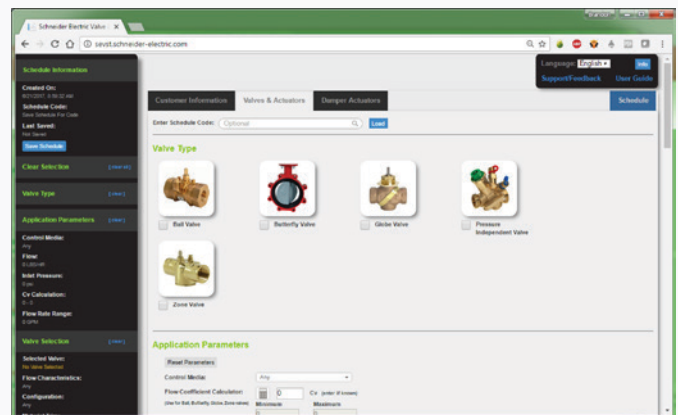
- Part selection based on calculators and drop down menus
- Save and load customer profiles, including customer name, country, contact information, job titles, project names and customer logos.
- Schedule hydronic systems using the Valve Assembly selection feature
- Schedule damper applications using the Damper Actuator selection feature
- View, edit, change and adjust schedules on the Schedule page. Download completed schedules to Excel, pdf, BOM for easy upload to iPortal, or formatted for upload to Schneider Electric's Studio 360 suite.
- Save schedules in progress to be worked on later or for use as a template for future projects.

### Browser Compatibility

- Chrome (preferred), Firefox, Safari, Edge, Internet Explorer 11 or greater.

### Original Valve Selection Tool

- The new online Valve Selection Tool has all the features of the original Valve Selection Tool plus added features.
- The current version of the Tool, V4.3.90 and all earlier versions will not be updated.



### Selection Tool Product Categories

- Ball Valves
- Butterfly Valves
- Damper Actuators
- Globe Valves
- Pressure Independent Balancing Control Valves
- Zone Valves

### Key Functions & Benefits

- Web-based Selection Tool (compatible with wide screen mobile devices)
- Schedule generation
- Sizing and Cv calculator
- List pricing on all products
- Schedule customization
- Quick access to related product documentation
- Favorite Products List Save Feature
- Schedule download to Excel, PDF, BOM
- Easy iPortal upload, Studio 360 File
- User Preferences and Customization
  - Company Information
  - Address & Logo
  - Favorite Parts List

## About This Catalog and Online Resources

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All specifications are nominal and may change as design improvements are introduced. Schneider Electric shall not be liable for damages resulting from misapplication or misuse of its products.

## Pneumatic Damper Actuators

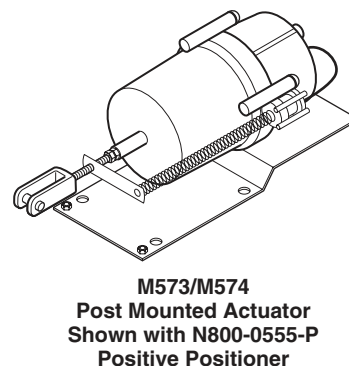
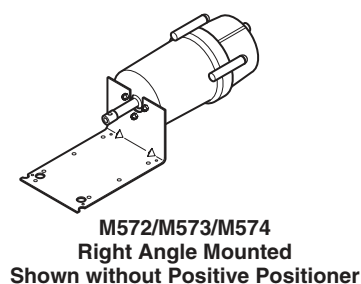
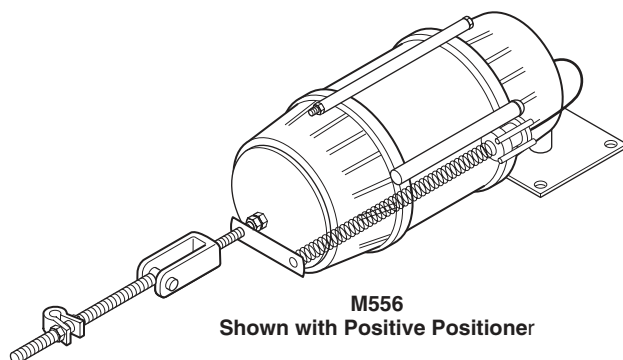
These actuators are designed for use in pneumatic control systems to position air control dampers in response to signals from pneumatic controllers. The M556 is a large swivel-mounted actuator with an adjustable crank arm having a clamp to fit a 1/2 in. O.D. damper shaft.

The M5xx Series damper actuators are used in pneumatic control systems to position automatic air dampers upon receipt of an air pressure signal from a control device. These actuators are equipped with right angle brackets and are adaptable to air conditioning, multi-zone, heating, ventilating, fan coil units, unit ventilators, mixing boxes, and VAV terminal boxes. M573 and M574 are also available as post-mounted actuators.

The M583 is used in classroom type unit ventilators. Special mounting kits are available for adapting the actuator to the various makes and models of classroom type units.

### Features:

- Rigid, corrosion-resistant glass-filled nylon bodies.
- M556, M573 and M574 have 303 stainless steel shafts.
- M556, M573 and M574 available with or without N800-0555-P positive positioner.
- The N800-0555-P positive positioner for M556, M573 and M574 can be purchased separately.



### Model Chart

2 in. (51 mm) Stroke, 3 sq. in. (19.4 cm<sup>2</sup>) Effective Area.

| Model No. | Spring Range |           | Mounting    | Description                                               |
|-----------|--------------|-----------|-------------|-----------------------------------------------------------|
|           | psig         | kPa       |             |                                                           |
| M572-2308 | 3 to 12      | 21 to 83  | Right-angle | Actuator with ball joint to accept 5/16 in. push rod.     |
| M572-2311 |              |           |             | Actuator with complete linkage for 1/2 in. damper shafts. |
| M572-8308 | 4 to 8       | 28 to 55  |             | Actuator with ball joint to accept 5/16 in. push rod.     |
| M572-8311 |              |           |             | Actuator with complete linkage for 1/2 in. damper shafts. |
| M572-3308 | 5 to 10      | 35 to 69  |             | Actuator with ball joint to accept 5/16 in. push rod.     |
| M572-3311 |              |           |             | Actuator with complete linkage for 1/2 in. damper shafts. |
| M572-5308 | 8 to 13      | 55 to 90  |             | Actuator with ball joint to accept 5/16 in. push rod.     |
| M572-5311 |              |           |             | Actuator with complete linkage for 1/2 in. damper shafts. |
| M572-6308 | 10 to 15     | 69 to 104 |             | Actuator with ball joint to accept 5/16 in. push rod.     |
| M572-6311 |              |           |             | Actuator with complete linkage for 1/2 in. damper shafts. |

# M556 Series, M572 Series, M573 Series, M574 Series, M583 Series

## Hesitation Actuator.

| Model No. <sup>a</sup> | Stroke           | Diaphragm Area                     | Spring Range          |                         | Mounting  | Description                                                                                                                    |
|------------------------|------------------|------------------------------------|-----------------------|-------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------|
|                        |                  |                                    | psig                  | kPa                     |           |                                                                                                                                |
| M583-0520              | 2 in.<br>(51 mm) | 7 sq. in.<br>(45 cm <sup>2</sup> ) | 1 to 4 and<br>8 to 12 | 7 to 28 and<br>55 to 83 | Post-mtd. | Actuator with stamped clevis, clevis pin and bracket; for use on air handlers where factory mounting has not been established. |

<sup>a</sup> Total stroke of these hesitation actuators takes place in two stages, from 1 to 4 psig (7 to 28 kPa) and 8 to 12 psig (55 to 83 kPa) or 8 to 13 psig (55 to 90 kPa). No shaft movement from 4 to 8 psig (28 to 55 kPa).

## 3 in. (76 mm) Stroke, 7 sq. in. (45 cm<sup>2</sup>) Effective Area.

| Model No. | Spring Range |           | Mounting    | Description                                               |
|-----------|--------------|-----------|-------------|-----------------------------------------------------------|
|           | psig         | kPa       |             |                                                           |
| M573-2108 | 3 to 12      | 21 to 83  | Right-angle | Actuator with ball joint to accept 5/16 in. push rod.     |
| M573-2111 |              |           | Right-angle | Actuator with complete linkage for 1/2 in. damper shafts. |
| M573-2520 |              |           | Post-mtd.   | Actuator with clevis and pin.                             |
| M573-8108 | 4 to 8       | 28 to 55  | Right-angle | Actuator with ball joint to accept 5/16 in. push rod.     |
| M573-8111 |              |           | Right-angle | Actuator with complete linkage for 1/2 in. damper shafts. |
| M573-8520 |              |           | Post-mtd.   | Actuator with clevis and pin.                             |
| M573-3108 | 5 to 10      | 35 to 69  | Right-angle | Actuator with ball joint to accept 5/16 in. push rod.     |
| M573-3111 |              |           | Right-angle | Actuator with complete linkage for 1/2 in. damper shafts. |
| M573-3520 |              |           | Post-mtd.   | Actuator with clevis and pin.                             |
| M573-1108 | 8 to 13      | 55 to 90  | Right-angle | Actuator with ball joint to accept 5/16 in. push rod.     |
| M573-1111 |              |           | Right-angle | Actuator with complete linkage for 1/2 in. damper shafts. |
| M573-1520 |              |           | Post-mtd.   | Actuator with clevis and pin.                             |
| M573-5108 |              |           | Right-angle | Actuator with ball joint to accept 5/16 in. push rod.     |
| M573-5111 |              |           | Right-angle | Actuator with complete linkage for 1/2 in. damper shafts. |
| M573-5520 |              |           | Post-mtd.   | Actuator with clevis and pin.                             |
| M573-6108 | 10 to 15     | 69 to 104 | Right-angle | Actuator with ball joint to accept 5/16 in. push rod.     |
| M573-6111 |              |           | Right-angle | Actuator with complete linkage for 1/2 in. damper shafts. |
| M573-6520 |              |           | Post-mtd.   | Actuator with clevis and pin.                             |

# M556 Series, M572 Series, M573 Series, M574 Series, M583 Series

## 4 in. ( mm) Stroke, 11 sq. in. (71 cm<sup>2</sup>) Effective Area.

| Model No. | Spring Range |           | Mounting    | Description                                               |
|-----------|--------------|-----------|-------------|-----------------------------------------------------------|
|           | psig         | kPa       |             |                                                           |
| M574-2208 | 3 to 12      | 21 to 83  | Right-angle | Actuator with ball joint to accept 5/16 in. push rod.     |
| M574-2211 |              |           | Right-angle | Actuator with complete linkage for 1/2 in. damper shafts. |
| M574-2520 | 4 to 8       | 28 to 55  | Post-mtd.   | Actuator with clevis and pin.                             |
| M574-8208 |              |           | Right-angle | Actuator with ball joint to accept 5/16 in. push rod.     |
| M574-8211 |              |           | Right-angle | Actuator with 1/2 in. shaft linkage and bracket.          |
| M574-8520 |              |           | Post-mtd.   | Actuator with clevis and pin.                             |
| M574-3208 | 5 to 10      | 35 to 69  | Right-angle | Actuator with ball joint to accept 5/16 in. push rod.     |
| M574-3211 |              |           | Right-angle | Actuator with complete linkage for 1/2 in. damper shafts. |
| M574-3520 |              |           | Post-mtd.   | Actuator with clevis and pin.                             |
| M574-1054 | 8 to 13      | 55 to 90  |             | Actuator for Keystone butterfly valve, w/positioner.      |
| M574-1208 |              |           | Right-angle | Actuator with ball joint to accept 5/16 in. push rod.     |
| M574-1211 |              |           | Right-angle | Actuator with complete linkage for 1/2 in. damper shafts. |
| M574-1520 |              |           | Post-mtd.   | Actuator with clevis and pin.                             |
| M574-5208 |              |           | Right-angle | Actuator with ball joint to accept 5/16 in. push rod.     |
| M574-5211 |              |           | Right-angle | Actuator with 1/2 in. shaft linkage and bracket.          |
| M574-6208 | 10 to 15     | 69 to 104 | Right-angle | Actuator with ball joint to accept 5/16 in. push rod.     |
| M574-6211 |              |           | Right-angle | Actuator with complete linkage for 1/2 in. damper shafts. |
| M574-6520 |              |           | Post-mtd.   | Actuator with clevis and pin.                             |

## 6 in. ( mm) Stroke, 24.8 sq. in. (160 cm<sup>2</sup>) Effective Area.

| Model No. | Spring Range |          | Mounting    | Description                                                                                       |
|-----------|--------------|----------|-------------|---------------------------------------------------------------------------------------------------|
|           | psig         | kPa      |             |                                                                                                   |
| M556-14   | 8 to 13      | 55 to 90 | Swivel-mtd. | 60° to 120° adj. linkage to accept 1/2 in. shafts w/positioner (with 5 psi span feedback spring). |
| M556-51   |              |          |             | 60° to 120° adjustable linkage to accept 1/2 in. shafts.                                          |

# M556 Series, M572 Series, M573 Series, M574 Series, M583 Series

## Specifications

### Construction

|                                            |                                                                         |
|--------------------------------------------|-------------------------------------------------------------------------|
| <b>Housing</b>                             | Glass-filled nylon.                                                     |
| <b>Diaphragm</b>                           | Neoprene, rolling type.                                                 |
| <b>Shaft</b>                               | Stainless Steel on M556, M573, M574. Nickel plated steel on M572, M583. |
| <b>Stroke</b>                              | Refer to Model Chart.                                                   |
| <b>Spring</b>                              | Retract actuator shaft on loss of air pressure.                         |
| <b>Ambient temperature limits</b>          | -20 to 180°F (-29 to 82°C).                                             |
| <b>Supply air pressure</b>                 | Clean, dry, oil free air required (refer to EN-123).                    |
| <b>Nominal</b>                             | 20 psig (138 kPa). [M58x Series nominal 0 to 15 psig (0 to 104 kPa).]   |
| <b>Maximum</b>                             | 30 psig (207 kPa).                                                      |
| <b>Air consumption (positioner models)</b> | 0.017 scfm (0.481 L/m).                                                 |

### Adjustments

|                                      |                                                                            |
|--------------------------------------|----------------------------------------------------------------------------|
| <b>Hesitation stroke start point</b> | 4 psig (28 kPa); stroke adjustable 20% to 70% prior to 4 psig (M583 only). |
| <b>Finish stroke start point</b>     | 8 psig (55 kPa); stroke adjustable 80% to 30% after 8 psig (M583 only).    |

|                    |                                                 |
|--------------------|-------------------------------------------------|
| <b>Connections</b> | Barbed fitting for 1/4 in. O.D. plastic tubing. |
|--------------------|-------------------------------------------------|

### Dimensions

|                    |                                           |
|--------------------|-------------------------------------------|
| <b>M556 Series</b> | 5-3/4 dia. x 17 L in. (146 x 432 mm).     |
| <b>M573 Series</b> | 3-3/4 dia. x 14 L in. (95 x 356 mm).      |
| <b>M574 Series</b> | 4-5/8 dia. x 15-1/8 L in. (117 x 384 mm). |

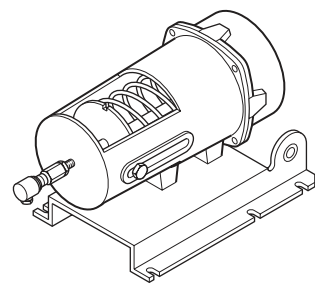
| Part Number | Factory Installed Positive Positioner | Nominal Operating Range (psi) | Starting Pressure Adj. (psi) | Effective Area Sq. In. | Nominal Stroke from Linkage for Nominal Operating Range (Inches) | Power Factor (Area x Stroke) | Nominal Torque Proportional Control     |                                         |
|-------------|---------------------------------------|-------------------------------|------------------------------|------------------------|------------------------------------------------------------------|------------------------------|-----------------------------------------|-----------------------------------------|
|             |                                       |                               |                              |                        |                                                                  |                              | 15 psi Pressure to Actuator (lb. - in.) | 20 psi Pressure to Actuator (lb. - in.) |
| M572-8308   | No                                    | 4 to 8                        | 4, Non-Adj.                  | 3                      | 2                                                                | 6                            | 4.50                                    | 4.50                                    |
| M572-3308   |                                       | 5 to 10                       | 5, Non-Adj.                  |                        |                                                                  |                              |                                         |                                         |
| M572-5308   |                                       | 8 to 13                       | 8, Non-Adj.                  |                        |                                                                  |                              |                                         |                                         |
| M572-2308   |                                       | 3 to 12                       | 3,Non-Adj.                   |                        |                                                                  |                              |                                         |                                         |
| M573-1108   | Yes                                   | 8 to 13                       | 8, Non-Adj.                  | 7                      | 3                                                                | 21                           | 21.00                                   | 68.25                                   |
| M573-1111   | No                                    | 5 to 10                       | 5, Non-Adj.                  |                        |                                                                  |                              | 15.75                                   | 15.75                                   |
| M573-3108   |                                       | 8 to 13                       | 8, Non-Adj.                  |                        |                                                                  |                              |                                         |                                         |
| M573-3111   |                                       |                               |                              |                        |                                                                  |                              |                                         |                                         |
| M573-5108   |                                       |                               |                              |                        |                                                                  |                              |                                         |                                         |
| M573-5111   | Yes                                   | 8 to 13                       | 8, Non-Adj.                  | 11                     | 4                                                                | 44                           | 44.00                                   | 143.00                                  |
| M574-1208   |                                       |                               |                              |                        |                                                                  |                              |                                         |                                         |
| M574-1211   |                                       |                               |                              |                        |                                                                  |                              |                                         |                                         |
| M574-3208   |                                       |                               |                              |                        |                                                                  |                              | No                                      | 5 to 10                                 |
| M574-3211   |                                       |                               |                              |                        |                                                                  |                              |                                         |                                         |
| M574-5208   | 8 to 13                               | 8, Non-Adj.                   |                              |                        |                                                                  |                              |                                         |                                         |
| M574-5211   |                                       |                               |                              |                        |                                                                  |                              |                                         |                                         |
| M566-14     | Yes                                   |                               |                              | 24.8                   | 6                                                                | 148.8                        | 148.80                                  | 483.60                                  |

| Actuators | Accessories       |                                                                                       |
|-----------|-------------------|---------------------------------------------------------------------------------------|
|           | Part Number       | Description                                                                           |
|           | AM-112            | Slotted crank arm for 3/8 in. shaft                                                   |
|           | AM-113            | Slotted crank arm for 1/2 in. shaft.                                                  |
|           | AM-115            | Slotted crank arm for 7/16 in. shaft.                                                 |
|           | AM-122            | Straight connector.                                                                   |
|           | AM-123            | Damper clip.                                                                          |
|           | AM-125            | 5/16 x 20 in. damper rod.                                                             |
|           | AM-125-048        | 5/16 x 48 in. damper rod.                                                             |
|           | AM-132            | Ball joint connector.                                                                 |
|           | N5-75             | 1/2 in. I.D. shaft coupling to extend damper drive shafts (includes four set screws). |
|           | N800-1403         | Slotted crank arm for 3/8 in. shaft.                                                  |
|           | N800-1404         | Slotted crank arm for 1/2 in. shaft.                                                  |
|           | N800-1414         | 3-hole crank arm for 3/8 in. shaft (for 2, 3, 4 in. strokes).                         |
|           | N800-1415         | 3-hole crank arm for 1/2 in. shaft (for 2, 3, 4 in. strokes).                         |
|           | N800-0555-BOX     | Pilot positioner only.                                                                |
|           | N800-0555-P       | Positive positioner kit with feedback arm and springs.                                |
|           | <b>Diaphragms</b> |                                                                                       |
|           | N800-9422         | For M572 (2472) Series.                                                               |
|           | N800-9423         | For M573 (2473) Series.                                                               |
|           | N800-9424         | For M574 (2474) Series.                                                               |
|           | N800-9426         | For M556 (2466) Series.                                                               |

Pneumatic Damper Actuators

Proportional pneumatic actuator with 8 in.<sup>2</sup> (52 cm<sup>2</sup>) effective area used to control dampers, mixing boxes, air valves, etc., in heating, ventilating, and air conditioning systems.

- Features:
- Rugged cast aluminum bodies.
  - Long lasting rolling diaphragm.
  - Provisions for adjustable stroke-stop.



MK-31xx Series

| Model Chart |                         |          |                   |       |                             |                                                |                                            |                                                           |                                                                   |                                                                  |                                                           |                                                                   |
|-------------|-------------------------|----------|-------------------|-------|-----------------------------|------------------------------------------------|--------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------|
| Model No.   | Nominal Operating Range |          | Starting Pressure |       | Nominal Stroke <sup>a</sup> | Maximum Force <sup>b</sup>                     |                                            |                                                           |                                                                   | Nominal Torque <sup>c</sup><br>Proportional Control <sup>b</sup> |                                                           |                                                                   |
|             |                         |          |                   |       |                             | Return Stroke                                  | Power Stroke                               |                                                           |                                                                   |                                                                  |                                                           |                                                                   |
|             |                         |          |                   |       |                             | Based on 1.5 psi (10 kPa) Pressure to Actuator | 15 psi (103 kPa) Supply Dual Press. System | 15 psi (103 kPa) Supply Single Press. System <sup>d</sup> | 20 psi (138 kPa) Supply Single or Dual Press. System <sup>d</sup> | 15 psi (103 kPa) Supply Dual Press. System                       | 15 psi (103 kPa) Supply Single Press. System <sup>d</sup> | 20 psi (138 kPa) Supply Single or Dual Press. System <sup>d</sup> |
|             | psig                    | kPa      | psig              | kPa   | in. (mm)                    | lb (N)                                         | lb (N)                                     | lb (N)                                                    | lb (N)                                                            | lb-in. (N-m)                                                     | lb-in. (N-m)                                              | lb-in. (N-m)                                                      |
| MK-3101     | 3 to 8                  | 21 to 55 | 3 ±1              | 21 ±7 | 3-1/2 (89), adjustable      | 12 (53)                                        | 44 (196)                                   | 56 (249)                                                  | 96 (427)                                                          | 21 (2.37)                                                        | 21 (2.37)                                                 | 21 (2.37)                                                         |
|             |                         |          |                   |       |                             |                                                |                                            |                                                           |                                                                   |                                                                  |                                                           |                                                                   |

<sup>a</sup> Factory setting required for published operating range.

<sup>b</sup> Force and torques based on factory set stroke and starting pressure.

<sup>c</sup> Nominal torque for actuators without positive positioner is based on 1.5 psi pressure change at the actuator.

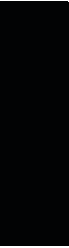
<sup>d</sup> Adjust pressure reducing valve so that listed pressures are available at the actuator.

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Accessories

| Part Number              | Description                                                |
|--------------------------|------------------------------------------------------------|
| AK-42309-500             | Positive positioner and linkage.                           |
| AM-111                   | Crank arm for 5/16 in. diameter damper shaft               |
| AM-161-3                 | Damper linkage kit AM-113 crank arm and AM-132 connector). |
| AM-301                   | 90° mounting bracket for pivot mounting.                   |
| TOOL-095-1               | Pneumatic calibration tool kit.                            |
| <b>Maintenance Parts</b> |                                                            |
| PND-002-1                | Diaphragm.                                                 |
| PND-91                   | High temperature diaphragm.                                |
| PND-045-343*             | Green, 3 to 8 psi spring.                                  |
| PND-045-345*             | Black, 5 to 10 psi spring.                                 |
| PND-045-348*             | Blue, 8 to 13 psi spring.                                  |
| PND-050-343*             | White, 3 to 13 psi spring.                                 |
| PND-504                  | Shaft connector.                                           |

\*2 springs required per actuator.



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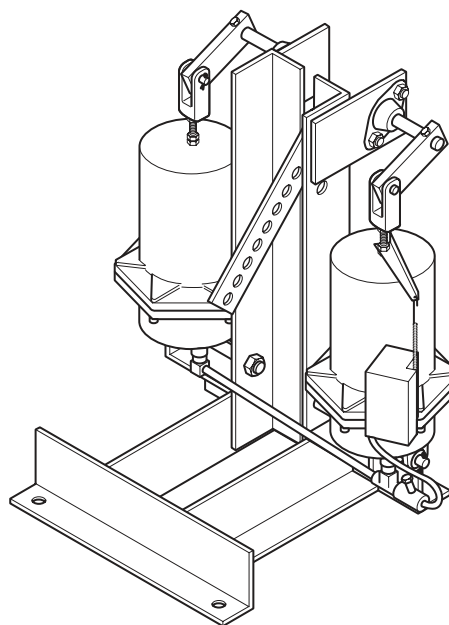
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## Floor Mounted Damper Actuators

For proportional pneumatic actuator used to control inlet vanes on small and medium size fans or large jackshafted dampers.

### Features:

- Dual actuators, operating a single shaft and piloted by a position, provide maximum capacity for heavy loads.
- Lever with multiple holes facilitates stroke adjustment to suit various applications.
- Rigid steel base provides firm actuator support.



MK-7921

### Model Chart

| Model No.      | Diaph. Area (Total) in. <sup>2</sup> (cm <sup>2</sup> ) | Stroke in. (mm)                                         |           |           |           |           |           |           |          |          |          | Max. Torque <sup>b</sup> Power Stroke lb-in. (N-m) | Return Stroke lb-in. (N-m) | Nominal Torque for Proportional Control <sup>a</sup> lb-in. (N-m) |
|----------------|---------------------------------------------------------|---------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|----------------------------------------------------|----------------------------|-------------------------------------------------------------------|
|                |                                                         | 4 (102)                                                 | 5 (127)   | 6 (152)   | 7 (178)   | 8 (203)   | 9 (229)   | 10 (254)  | 11 (279) | 12 (305) | 13 (330) |                                                    |                            |                                                                   |
|                |                                                         | Lb (N) Force Available for Various Strokes <sup>b</sup> |           |           |           |           |           |           |          |          |          |                                                    |                            |                                                                   |
| MK-7821 Single | 20 (129)                                                | 135 (600)                                               | 108 (480) | 90 (400)  | 77 (343)  | 68 (302)  | 60 (267)  | 54 (240)  | 49 (218) | 45 (200) | 42 (187) | 315 (35.5)                                         | 360 (40.6)                 | 67.5 (7.6)                                                        |
| MK-7921 Dual   | 40 (258)                                                | 270 (1201)                                              | 216 (961) | 180 (801) | 154 (685) | 136 (605) | 120 (534) | 109 (465) | 98 (436) | 90 (400) | 84 (374) | 630 (71.0)                                         | 720 (81.2)                 | 135 (15.2)                                                        |

<sup>a</sup> Based on a 1.5 psig (10kPa) pressure change at the actuator.

<sup>b</sup> With 20 psig (138 kPa) main supply.

## Specifications

### Construction

|                                   |                                                                                                                                                                   |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Housing</b>                    | Die cast aluminum.                                                                                                                                                |
| <b>Diaphragm</b>                  | Replaceable beaded molded neoprene.                                                                                                                               |
| <b>Assembly</b>                   | Actuator(s) and positive positioner (AK-42309-500) are factory mounted on a frame of channel and angle iron.                                                      |
| <b>Rotary output</b>              | Provided by a driving lever arm connected to a bearing supported jackshaft.                                                                                       |
| <b>Stroke</b>                     | Rotary output of 60° driving lever arm connecting point adjustable from 4 to 13 in. (102 to 330 mm), in 1 in. (25.4 mm) increments, from centerline of jackshaft. |
| <b>Nominal damper area</b>        | Actuator sizing should be done in accordance with damper manufacturer's specifications.                                                                           |
| <b>Connecting linkage</b>         | AM-394 adjustable 15-3/4 to 24-3/4 in. (400 to 629 mm) is included to link actuator to damper.                                                                    |
| <b>Spring</b>                     | Retracts actuator shaft on loss of air pressure.                                                                                                                  |
| <b>Maximum air pressure</b>       | 30 psig (207 kPa).                                                                                                                                                |
| <b>Ambient temperature limits</b> |                                                                                                                                                                   |
| <b>Shipping</b>                   | -40 to 160°F (-40 to 71°C).                                                                                                                                       |
| <b>Operating</b>                  | -20 to 160°F (-29 to 71°C).                                                                                                                                       |
| <b>Air connections</b>            | Barbed fitting for 1/4 in. plastic tubing.                                                                                                                        |
| <b>Mounting</b>                   | Floor.                                                                                                                                                            |
| <b>Dimensions</b>                 | 30-1/2 H x 16 W x 20 D in. (775 x 406 x 508 mm).                                                                                                                  |

## Accessories

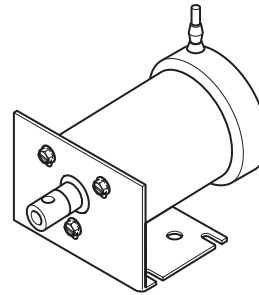
| Model No.                          | Description                 |
|------------------------------------|-----------------------------|
| <b>Linkage</b><br>AM-394           | Actuator Linkage            |
| <b>Maintenance Parts</b><br>PND-90 | High temperature diaphragm. |
| PND-202                            | Diaphragm.                  |
| PND-245-103                        | 2 to 8 psig spring.         |
| PND-245-108                        | 8 to 13 psig spring.        |

## Damper Actuators, Proportional

For proportional pneumatic actuator with 3 in.<sup>2</sup> (19 cm<sup>2</sup>) effective area used to control small dampers and mixing boxes.

### Features:

- Plastic housing.
- Meets UL-465 requirements for air plenum mounting.
- Ideal for VAV terminal unit control.



### Model Chart

| Model No. | Nominal Operating Range | Stroke | Starting Pressure Non-Adjustable | Maximum Force <sup>a</sup> |                                       |                                  |                                                 | Nominal Torque <sup>b</sup> Proportional Control |                                                 |                                                         |
|-----------|-------------------------|--------|----------------------------------|----------------------------|---------------------------------------|----------------------------------|-------------------------------------------------|--------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|
|           |                         |        |                                  | Return Stroke              | Power Stroke                          |                                  |                                                 | 15 psi Supply Dual Press. System                 | 15 psi Supply Single Press. System <sup>c</sup> | 20 psi Supply Single or Dual Press. System <sup>c</sup> |
|           |                         |        |                                  |                            | Based on 1.5 psi Pressure to Actuator | 15 psi Supply Dual Press. System | 15 psi Supply Single Press. System <sup>c</sup> |                                                  |                                                 |                                                         |
|           | psi                     | in.    | psi                              | lb                         | lb                                    | lb                               | lb                                              | lb-in.                                           | lb-in.                                          | lb-in.                                                  |
| MK-12100  | 3 to 8                  | 2      | 3                                | 4.5                        | 16.5                                  | 21                               | 36                                              | 4.5                                              | 4.5                                             | 4.5                                                     |
| MK-12110  | 5 to 10                 |        | 5                                | 10.5                       | 10.5                                  | 15                               | 30                                              |                                                  |                                                 |                                                         |
| MK-12120  | 8 to 13                 |        | 8                                | 19.5                       | 1.5                                   | 6                                | 21                                              | 1.5                                              |                                                 |                                                         |
| MK-12140  | 3 to 13                 |        | 3                                | 4.5                        |                                       |                                  |                                                 |                                                  |                                                 |                                                         |

<sup>a</sup> Force and torques based on factory set stroke, starting pressure, and 90° rotation of driven damper shaft.

<sup>b</sup> Nominal torque for actuators is based on 1.5 psi (10 kPa) pressure change at the actuator.

<sup>c</sup> Adjust pressure reducing valve so that listed pressures are available at the actuator.

### Specifications

#### Construction

|                                   |                                                                                                                  |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------|
| <b>Housing</b>                    | UL-94-5V flame rated plastic material to meet UL-465 requirements for air plenum mounting.                       |
| <b>Diaphragm</b>                  | Beaded molded neoprene.                                                                                          |
| <b>Stroke</b>                     | 2 in. (50.8 mm).                                                                                                 |
| <b>Nominal Damper Area</b>        | Actuator sizing should be done in accordance with damper manufacturer's specifications.                          |
| <b>Spring</b>                     | Retracts actuator shaft on loss of air pressure.                                                                 |
| <b>Maximum air pressure</b>       | 30 psig (207 kPa).                                                                                               |
| <b>Ambient temperature limits</b> |                                                                                                                  |
| <b>Shipping</b>                   | -40 to 180°F (-40 to 82°C).                                                                                      |
| <b>Operating</b>                  | -20 to 150°F (-29 to 66°C).                                                                                      |
| <b>Air connections</b>            | Barbed for 1/4 in. O.D. plastic tubing [for runs up to 20 ft. (6 m)].                                            |
| <b>Mounting</b>                   | In any position. Mounting bracket and ball joint connector for 5/16 in. diameter push rod assembled to actuator. |
| <b>Dimensions</b>                 | 5-5/8 H x 3-9/16 W x 3-5/16 D in. (143 x 90 x 84 mm).                                                            |

Accessories

| Part Number | Description                                                 |
|-------------|-------------------------------------------------------------|
| AM-111      | Crank arm for 5/16 in. diameter damper shaft.               |
| AM-161-3    | Damper linkage kit (AM-113 crank arm and AM-132 connector). |
| TOOL-095-1  | Pneumatic calibration tool kit.                             |

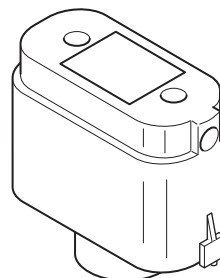
Actuators

## Pneumatic Valve Actuator

For proportional pneumatic control of 1/2 in. to 2 in. VB-7xxx Series valves (subject to close-off ratings) and discontinued 1/2 in. to 1-1/4 in. VB-9xxx valves.

### Features:

- Compact size with 6 in.<sup>2</sup> (39 cm<sup>2</sup>) effective area.
- Rugged die cast aluminum housing.
- Replaceable beaded molded neoprene diaphragm.



| Model Chart |                                                       |          |
|-------------|-------------------------------------------------------|----------|
| Model No.   | Nominal Spring Range <sup>a</sup> (Spring Color Code) |          |
|             | psig                                                  | kPa      |
| MK-2690     | 3 to 7 (Yellow)                                       | 21 to 48 |
|             | 5 to 10 (Black)                                       | 34 to 69 |
|             | 8 to 13 (Blue)                                        | 55 to 90 |

<sup>a</sup> Nominal (no load) condition, spring ranges based on 1/2 in. (13 mm) maximum stroke, provided by AV-7400 or AV-400 linkage (order separately).

| Specifications                    |                                                                                                                                                                 |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Inputs Compatible with</b>     | Proportional pneumatic signal. Refer to Model Chart.                                                                                                            |
| <b>Start point</b>                | Non-adjustable.                                                                                                                                                 |
| <b>Air connections</b>            | 1/8 in. FNPT located on side of housing.                                                                                                                        |
| <b>Mechanical Outputs</b>         |                                                                                                                                                                 |
| <b>Stroke</b>                     | 1/2 in. (12.6 mm) nominal.                                                                                                                                      |
| <b>Environment</b>                |                                                                                                                                                                 |
| <b>Ambient temperature limits</b> | Shipping: -40 to 220°F (-40 to 104°C).<br>Operating: -20 to 220°F (-29 to 104°C).                                                                               |
| <b>Humidity</b>                   | 5 to 95% RH, non-condensing.                                                                                                                                    |
| <b>Maximum air pressure</b>       | 30 psig (207 kPa).                                                                                                                                              |
| <b>Spring</b>                     | Stainless steel spring retracts actuator shaft and raises valve stem on loss of air pressure. Springs provided in AV-400 or AV-7400 linkage (order separately). |
| <b>Dimensions</b>                 | 3-9/16 H x 5 W x 2-1/4 D in. (90 x 127 x 57 mm).                                                                                                                |

| Accessories              |                                                                                              |
|--------------------------|----------------------------------------------------------------------------------------------|
| <b>Model No.</b>         | <b>Description</b>                                                                           |
| AK-42309-500             | Positive positioner and linkage.                                                             |
| AV-400                   | Valve linkage (includes parts for VB-7xxx and discontinued 1/2 to 1-1/4 in. VB-9xxx valves). |
| AV-7400                  | Valve linkage for VB-7xxx valves only.                                                       |
| TOOL-095-1               | Pneumatic calibration tool kit.                                                              |
| <b>Maintenance Parts</b> |                                                                                              |
| PNV-144-043              | Yellow 3 to 7 psig spring.                                                                   |
| PNV-145-045              | Black 5 to 10 psig spring.                                                                   |
| PNV-145-048              | Blue 8 to 13 psig spring.                                                                    |
| PNV-102-1                | Diaphragm.                                                                                   |
| PNV-103-3                | Lower housing.                                                                               |

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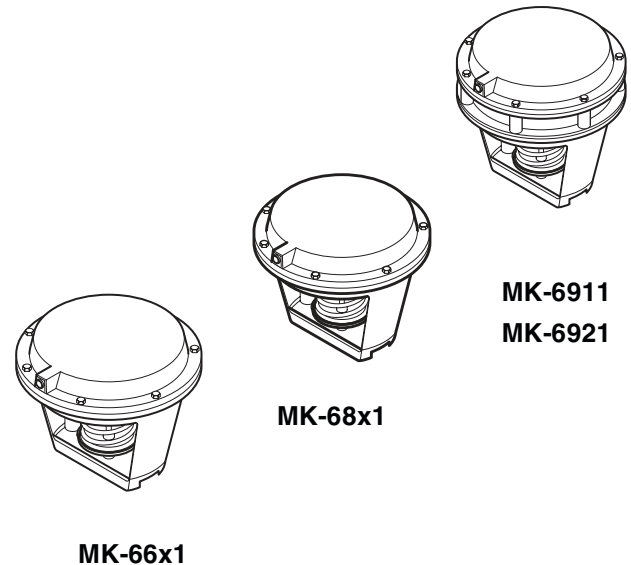
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# Valve Actuators, Proportional

Proportional pneumatic actuator with 50 sq. in. (323 cm<sup>2</sup>) effective diaphragm area used to control  
 1-1/2 in. to 2 in. VB-7xxx series,  
 2-1/2 in. to 6 in. VB-8xxx series,  
 2-1/2 in. to 6 in. VB-9xxx series,

## Features:

- Rugged die cast aluminum construction.
- Rolling diaphragm.
- Three spring ranges for various applications.
- Start point adjustable  $\pm 2$  psi.



## Model Chart

| Model No.             | Nominal Spring Range <sup>a</sup> |          | Nominal Stroke in. (mm) |
|-----------------------|-----------------------------------|----------|-------------------------|
|                       | psig                              | kPa      |                         |
| MK-6601               | 3 to 8                            | 21 to 55 | 1/2 (13.7)              |
| MK-6611               | 5 to 10                           | 34 to 69 | 1/2 (13.7)              |
| MK-6621               | 8 to 13                           | 55 to 90 | 1/2 (13.7)              |
| MK-6801               | 3 to 8                            | 21 to 55 | 1 (25.4)                |
| MK-6811               | 5 to 10                           | 34 to 69 |                         |
| MK-6821               | 8 to 13                           | 55 to 90 |                         |
| MK-6911 <sup>bc</sup> | 5 to 10                           | 34 to 69 | 1-1/2 (33.1)            |
| MK-6921 <sup>b</sup>  | 8 to 13                           | 55 to 90 | 1-1/2 (33.1)            |

<sup>a</sup> Nominal (no load) spring ranges based on maximum 1/2 in. (13.7 mm), 1 in. (25.4 mm) or 1-1/2 in. (33.1 mm) stroke for MK-6911.

<sup>b</sup> MK-6911 is only used on 6 in. VB-8xx3-0-5-16. MK-6911 and MK-6921 were used on discontinued 4 to 6 in. VB-9323-0-5-x.

<sup>c</sup> Recommended for field replacements only where 20 psi air supply pressure is not available and/or required close-off pressure is less than 125 psi.

## Specifications

|                                   |                                                                                     |
|-----------------------------------|-------------------------------------------------------------------------------------|
| <b>Construction</b>               |                                                                                     |
| Housing                           | Die cast aluminum.                                                                  |
| Diaphragm                         | Replaceable beaded molded neoprene (Part number PNV-202).                           |
| Stroke                            | Refer to Model Chart.                                                               |
| Spring                            | Retracts actuator shaft and raises valve stem on loss of air pressure.              |
| Nominal spring range              | Refer to Model Chart.                                                               |
| Starting point                    | Adjustable $\pm 2$ psig ( $\pm 14$ kPa).                                            |
| Maximum air pressure              | 30 psig (207 kPa).                                                                  |
| <b>Ambient temperature limits</b> |                                                                                     |
| Shipping                          | -40 to 220°F (-40 to 104°C).                                                        |
| Operating                         | -20 to 220°F (-29 to 104°C).                                                        |
| Air connections                   | 1/8 in. FNPT.                                                                       |
| Valve linkage                     | Refer to Accessories (order separately).                                            |
| Mounting                          | In any upright position with actuator head above the center line of the valve body. |
| Dimensions                        | 7-3/4 H x 10-1/2 W x 10-1/2 D in. (199 x 267 x 267 mm).                             |

# MK-6xxx Series

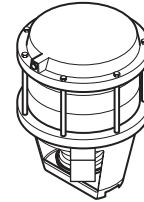
| Actuators | Accessories              |                                         |
|-----------|--------------------------|-----------------------------------------|
|           | <b>Part Number</b>       | <b>Description</b>                      |
|           | AK-42309-500             | Positive positioner and linkage.        |
|           | TOOL-095-1               | Pneumatic calibration tool kit.         |
|           | <b>Linkage</b>           | <b>Valve Body Series</b>                |
|           | AV-430                   | VB-7xx3, 1-1/2 to 2 in.                 |
|           |                          | VB-7xx4, 1-1/2 to 2 in.                 |
|           | AV-495                   | VB-9323, 2-1/2 to 6 in. (discontinued). |
|           |                          | VB-9213, 2-1/2 to 4 in. (discontinued). |
|           |                          | VB-9223, 2-1/2 to 4 in. (discontinued). |
|           |                          | VB-9313, 2-1/2 to 4 in.                 |
|           | AV-497                   | VB-8213, 2-1/2 to 6 in.                 |
|           |                          | VB-8223, 2-1/2 to 6 in.                 |
|           |                          | VB-8303, 2-1/2 to 6 in.                 |
|           | <b>Maintenance Parts</b> |                                         |
|           | PNV-202                  | Diaphragm.                              |
|           | PNV-245-013              | Green, 3 to 8 psi spring.               |
|           | PNV-245-015              | Gray or black, 5 to 10 psi spring.      |
|           | PNV-245-018              | Blue, 8 to 13 psi spring.               |

## Valve Actuators, Proportional

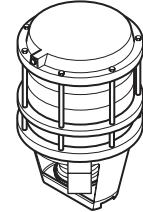
Proportional pneumatic actuator with 100 in.<sup>2</sup> (645 cm<sup>2</sup>) effective area. MK-88xx Series used to control 2-1/2 in. through 4 in. valves requiring 1 in. stroke. MK-89xx Series used to control 5 in. and 6 in. valves requiring 2 in. nominal stroke. Used with VB-931x, and discontinued VB-921x, and VB-922x valves.

### Features:

- Heavy duty aluminum construction.
- Large diaphragm area provides the required force to modulate large valves.
- Valve stroke indicated in 1/8 in. increments.



MK-88xx Series



MK-89xx Series

### Model Chart

| Model No. | Nominal Spring Range <sup>a</sup> |          | Nominal Stroke |      | For Use with Valve Bodies                        |
|-----------|-----------------------------------|----------|----------------|------|--------------------------------------------------|
|           | psig                              | kPa      | in.            | mm   |                                                  |
| MK-8801   | 3 to 8                            | 21 to 55 | 1              | 25.4 | 2-1/2 to 4 in.<br>VB-9213<br>VB-9223<br>VB-9313  |
| MK-8811   | 5 to 10                           | 34 to 69 |                |      |                                                  |
| MK-8821   | 8 to 13                           | 55 to 90 |                |      |                                                  |
| MK-8901   | 3 to 8                            | 21 to 55 | 2              | 50.8 | 5 in. and 6 in.<br>VB-9213<br>VB-9223<br>VB-9313 |
| MK-8911   | 5 to 10                           | 34 to 69 |                |      |                                                  |
| MK-8921   | 8 to 13                           | 55 to 90 |                |      |                                                  |

<sup>a</sup> Nominal (no load) spring ranges are based on maximum 1 in. (25.4 mm) or 2 in. (50.8 mm) stroke.

### Specifications

#### Construction

|                                   |                                                                                            |
|-----------------------------------|--------------------------------------------------------------------------------------------|
| Housing                           | Die cast aluminum.                                                                         |
| Diaphragm                         | Replaceable beaded molded neoprene.                                                        |
| Stroke                            | Refer to Model Chart.                                                                      |
| Spring                            | Retracts actuator shaft and raises valve stem on loss of air pressure.                     |
| Nominal spring range              | Refer to Model Chart.                                                                      |
| Starting point                    | Adjustable $\pm 1$ psi ( $\pm 7$ kPa).                                                     |
| Maximum air pressure              | 30 psig (207 kPa).                                                                         |
| <b>Ambient temperature limits</b> |                                                                                            |
| Shipping                          | -40 to 220°F (-40 to 104°C).                                                               |
| Operating                         | -20 to 220°F (-29 to 104°C).                                                               |
| Air connection                    | 1/8 in. FNPT.                                                                              |
| Valve linkage                     | Order separately AV-496.                                                                   |
| Valve stroke position indication  | 1/8 in. (3 mm) increments.                                                                 |
| Mounting                          | In any upright position with actuator head above 45° of the center line of the valve body. |
| <b>Dimensions</b>                 |                                                                                            |
| MK-88xx Series                    | 11-3/4 H x 10-1/2 W x 10-1/2 D in. (298 x 267 x 267 mm).                                   |
| MK-89xx Series                    | 12-3/4 H x 10-1/2 W x 10-1/2 D in. (342 x 267 x 267 mm).                                   |

# MK-88xx Series, MK-89xx Series

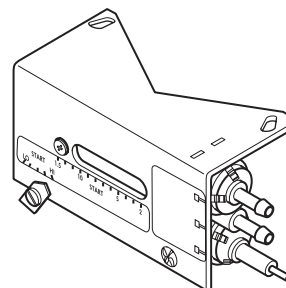
| Actuators | Accessories       |                                   |
|-----------|-------------------|-----------------------------------|
|           | Part Number       | Description                       |
|           | AK-42309-500      | Positive positioner with linkage. |
|           | TOOL-095-1        | Pneumatic calibration tool kit.   |
|           | Linkage           |                                   |
|           | AV-496            | Valve linkage.                    |
|           | Maintenance Parts |                                   |
|           | PNV-202           | Diaphragm (2 required).           |
|           | PNV-312           | Rolling diaphragm.                |

## Positive Positioning Relay

Positive positioner pneumatic relay is used to accurately position an actuator stroke with respect to signal pressure from the controller. It can also be used to change the effective spring range of an actuator and increase the capacity of a controller.

### Features:

For accurate positioning of valve and damper actuators, this positioner utilizes a pilot-operated, relay-type position-sensing mechanism, much more sensitive to actuator position changes than some competitive “force-balance” positioners.



| Model Chart               |                                                   |
|---------------------------|---------------------------------------------------|
| Model No.                 | Description                                       |
| AK-42309-500 <sup>a</sup> | Positive Positioning Relay with Mounting Linkage. |

<sup>a</sup> AK-42309-500 positive positioner cannot be used with M556, M572, M573, M574, and MK-12000 Series actuators. Use N800-0555 positioner with M556, M573, and M574.

| Specifications                                   |                                                                                                                                                                                                                      |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Action</b>                                    | Direct (increase in output pressure to actuator with an increase in pilot pressure from controller).                                                                                                                 |
| <b>Pilot input</b>                               | 0 to main air pressure, psig.                                                                                                                                                                                        |
| <b>Output</b>                                    | 0 to main air pressure, psig.                                                                                                                                                                                        |
| <b>Construction</b>                              |                                                                                                                                                                                                                      |
| <b>Housing</b>                                   | Polysulfone.                                                                                                                                                                                                         |
| <b>Diaphragm</b>                                 | Neoprene.                                                                                                                                                                                                            |
| <b>Start point</b>                               | Adjustable 1 to 12 psig (7 to 83 kPa).                                                                                                                                                                               |
| <b>Span</b>                                      | Adjustable 2 to 13 psi (14 to 90 kPa); factory set at 5 psig.                                                                                                                                                        |
| <b>Stroke</b>                                    | Adjustable 2 to 13 psi (14 to 90 kPa); factory set at 5 psig with feedback spring for 7/16 to 5 in. stroke.                                                                                                          |
| <b>Supply air pressure</b>                       | Clean, oil free, dry air required (refer to EN-123).                                                                                                                                                                 |
| <b>Maximum</b>                                   | 30 psig (207 kPa).                                                                                                                                                                                                   |
| <b>Nominal supply</b>                            | 15 to 20 psig (103 to 138 kPa).                                                                                                                                                                                      |
| <b>Environment</b>                               |                                                                                                                                                                                                                      |
| <b>Ambient temperature limits</b>                | Shipping: -40 to 160°F (-40 to 71°C).<br>Operating: 32 to 140°F (0 to 60°C).                                                                                                                                         |
| <b>Humidity</b>                                  | 5 to 95% R.H., non-condensing.                                                                                                                                                                                       |
| <b>Locations</b>                                 | NEMA Type 1 (IP10).                                                                                                                                                                                                  |
| <b>Air connection code</b>                       | Refer to Figure 1.                                                                                                                                                                                                   |
| <b>Air connections</b>                           |                                                                                                                                                                                                                      |
| <b>“M” and “B”</b>                               | Barbed for 1/4 in. O.D. plastic tubing.                                                                                                                                                                              |
| <b>“P”</b>                                       | Dual-contoured for 1/4 in. O.D. and 5/32 in. O.D. tubing.                                                                                                                                                            |
| <b>Air consumption for sizing air compressor</b> | 19 scim (5.2 mL/s) at 20 psig (138 kPa) supply.                                                                                                                                                                      |
| <b>Air capacity for sizing air mains</b>         | 20 scim (5.5 mL/s).                                                                                                                                                                                                  |
| <b>Flow capacity</b>                             | 860 scim (235 mL/s) at 20 psig (138 kPa) supply.                                                                                                                                                                     |
| <b>Mounting linkage</b>                          | All necessary linkage provided to assemble AK-42309-500 to MK-2690 actuator and the following actuator series; MK-3000, MK-4400, MK-4600, MK-4700, MK-4800, MK-6600, MK-6800, MK-6900, MK-7100, MK-8800 and MK-8900. |
| <b>Dimensions</b>                                | 2-1/2 H x 4-1/2 W x 3 D in. (64 x 114 x 76 mm).                                                                                                                                                                      |

Accessories

| Part Number | Description                                                                |
|-------------|----------------------------------------------------------------------------|
| TOOL-095-1  | Pneumatic calibration tool kit.                                            |
| PKG-1089    | Spring and feedback arm kit for AK-42309-500 (included with AK-42309-500). |

Typical Applications

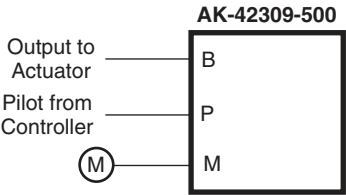


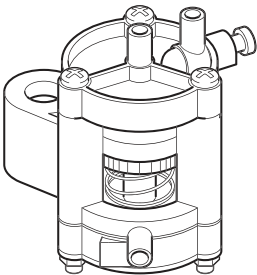
Figure 1 Piping Connections.

# Positive Positioning Relay

The N800-0555 is used with M556 (6 in. stroke), M573 (3 in. stroke), and M574 (4 in. stroke) damper actuators.

The N800-0555 is pilot-operated, providing excellent response to small signal pressure changes from the controller.

Pilot-operation also provides maximum resistance to actuator shaft displacement caused by outside force changes.



Features:

A built-in adjustable needle-valve permits setting the desired rate of actuator movement, helpful in two ways:

- Various size actuators operated by the same control signal can be made to operate at approximately the same rate of movement, since the smaller actuators can be slowed to match the rate of movements of larger actuators. One example: Outdoor, return and relief dampers of Air-Handling-Units, where the return damper is frequently smaller, and has a smaller actuator.
- Some rapidly changing processes are easier to control if the actuator moves slowly. Examples:
  - Duct static-pressure control.
  - Duct air-velocity control.
  - Control of the mixed-air-temperature of air-handling units, where the mixed-air-temperature changes instantly as the dampers change position. Since no sensor responds instantly, more stable control can be attained if the dampers move slowly. This, in turn, may allow use of a narrower controller throttling range.

Actuators may be ordered with positioners mounted. For field-mounting, feedback arm and spring must be ordered separately. Refer to Model Chart.

| Model Chart   |                                                                                                                                                                     |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Model No.     | Description                                                                                                                                                         |
| N800-0555-BOX | Positioner only.                                                                                                                                                    |
| N800-0555-P   | Positioner kit. Includes one positioner, one feedback arm, and 5 and 10 psi feedback springs for M556 (6 in. stroke), M573 (3 in. stroke), and M574 (4 in. stroke). |

| Specifications             |                                                      |
|----------------------------|------------------------------------------------------|
| Environment                |                                                      |
| Ambient Temperature Limits | -20 to 140°F (-29 to 60°C).                          |
| Supply Air Pressure        | Clean, dry, oil-free air required (refer to EN-123). |
| Nominal                    | 20 psig (136 kPa).                                   |
| Maximum                    | 30 psig (207 kPa).                                   |
| Air Consumption            | 30 scim (8 mL/s).                                    |



# Air Switching Devices

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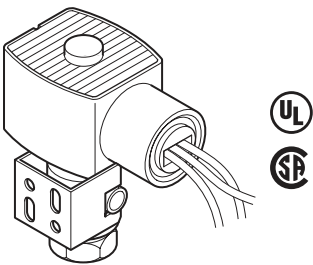
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All specifications are nominal and may change as design improvements are introduced. Schneider Electric shall not be liable for damages resulting from misapplication or misuse of its products.

Solenoid Air Valve

For applications where an electrical circuit is used to control a pneumatically operated device. Used to direct supply air to a pneumatic device when the coil is energized or de-energized depending on the supply and exhaust air connections. May be used for selection or diverting applications.



Air Switching  
Devices

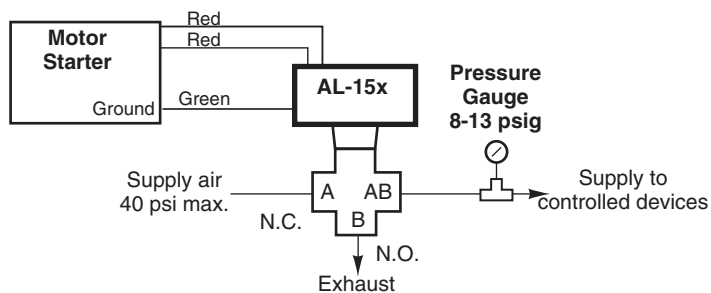
Features:

- High capacity of AL-15x Series allows operation of more devices.
- Brass body receives 1/8 in. male NPT fittings for simple connections to either polyethylene or copper tubing.
- Includes mounting bracket.
- When a 1/8 in. fitting is installed, it secures the body of the valve to the mounting bracket.

| Model Chart |                    |
|-------------|--------------------|
| Model No.   | Voltage (AC 60 Hz) |
| AL-150      | 24                 |
| AL-151      | 120                |

| Specifications             |                                                                                                                      |
|----------------------------|----------------------------------------------------------------------------------------------------------------------|
| Valve inputs               |                                                                                                                      |
| Power input                | 9.1 Watts (energized).                                                                                               |
| Available voltages         | Refer to model chart.                                                                                                |
| Electrical connections     | 18 in. (457 mm) leads on the coil. Threaded hole for 1/2 in. conduit.                                                |
| Maximum inlet air pressure | 40 psig (276 kPa). Clean, dry, oil free air is required (refer to EN-123).                                           |
| Air connections            | 1/8 in. MNPT.<br>N.C.: Normally closed, Port 2.<br>N.O.: Normally open, Port 3.<br>COM: Common, Port 1.              |
| Valve outputs              |                                                                                                                      |
| Flow capacity              | 1988 scim (543 mL/s) at 15 psig (138 kPa) supply with 1 psig (6.9 kPa) drop.                                         |
| Environment                |                                                                                                                      |
| Ambient temperature limits | Shipping: -40 to 150°F (-40 to 65°C).<br>Operating: 32 to 125°F (0 to 52°C).<br>Supply air: 40 to 130°F (4 to 54°C). |
| Humidity                   | 50 to 95% RH, non-condensing.                                                                                        |
| Location                   | NEMA Type 4X (IP56).                                                                                                 |
| Dimensions                 | 3-5/32 H x 2-3/4 W x 2 D in. (80 x 70 x 51 mm).                                                                      |

## Typical Applications



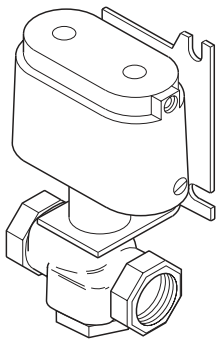
**Figure 1 Typical Application Wiring Diagram.  
(Air-Handling Unit Application)**

Air Switching Valve

Three-way air switching valve is used for central supply air changeover in dual pressure systems.

Features:

- Compact size
- Large air capacity.



Air Switching  
Devices

| Model Chart |                              |             |                                               |             |
|-------------|------------------------------|-------------|-----------------------------------------------|-------------|
| Model No.   | Flow Pattern                 |             |                                               |             |
|             | Stem Up [No Air to Actuator] |             | Stem Down [20 psig (138 kPa) Air to Actuator] |             |
|             | Flow                         | Closed Port | Flow                                          | Closed Port |
| AL-161-4    | B to AB <sup>a</sup>         | A           | A to AB <sup>a</sup>                          | B           |

<sup>a</sup> AB Common.

| Specifications                  |                                                                                           |
|---------------------------------|-------------------------------------------------------------------------------------------|
| Construction                    |                                                                                           |
| Body                            | Bronze.                                                                                   |
| Actuator                        | Die cast aluminum with replaceable neoprene diaphragm.                                    |
| Body rating                     | 250 psig (1724 kPa).                                                                      |
| Maximum air pressure (actuator) | 30 psig (207 kPa).                                                                        |
| Spring range                    | 8 to 13 psig (55 to 90 kPa).                                                              |
| Flow capacity                   | 25,920 scim (7,080 mL/s) at 15 psig (103 kPa) supply with 1 psig (6.9 kPa) drop.          |
| Ambient temperature limits      |                                                                                           |
| Shipping and storage            | -40 to 220°F (-40 to 104°C).                                                              |
| Operating                       | 40 to 130°F (4 to 54°C).                                                                  |
| Supply air                      | 40 to 130°F (4 to 54°C).                                                                  |
| Port code and flow pattern      | Refer to Model Chart.                                                                     |
| Connections                     |                                                                                           |
| Actuator                        | 1/8 in. FNPT.                                                                             |
| Valve body                      | 1/2 in. FNPT.                                                                             |
| Mounting                        | In any position to wall or subpanel of a cabinet with factory assembled mounting bracket. |
| Dimensions                      | 6-1/4 H x 3 W x 2-13/16 D in. (159 x 76 x 71 mm).                                         |

Typical Applications

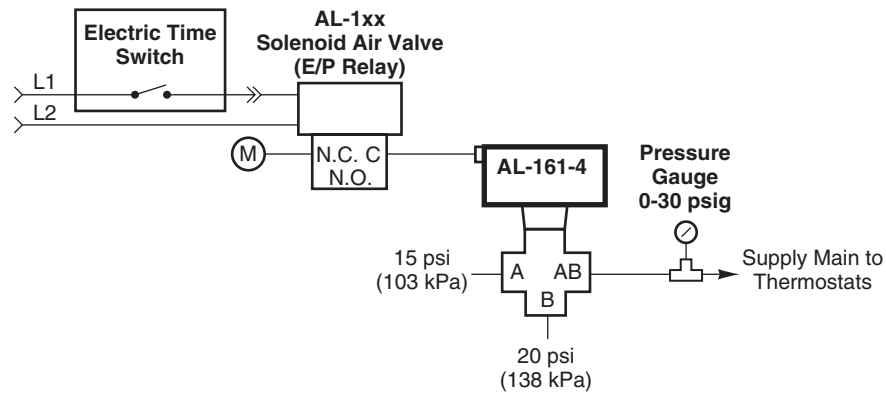


Figure 1 Typical Application.

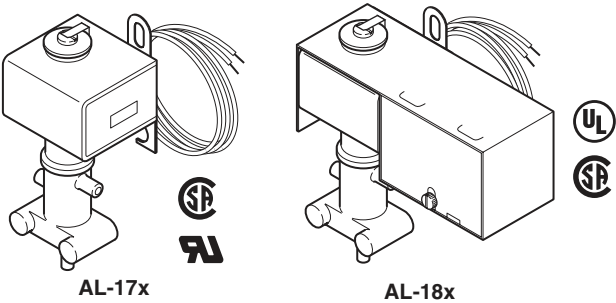
Air Switching  
Devices

Solenoid Air Valves

For applications where an electrical circuit is used to control a pneumatically-operated device. Used to direct supply air to a pneumatic device when the coil is energized or de-energized, depending on the supply and exhaust air connects.

Features:

- Open frame or junction box construction. accommodates a wide variety of NEMA 1 (IP10) mounting locations.
- Available in 24, 120, or, 240 Vac models.
- Supplied with 18 in. electrical leads for ease of installation.
- Corrosion-resistant plastic body.
- Barbed fittings for 1/4 in. O.D. plastic tubing.



| Model Chart |        |                       |
|-------------|--------|-----------------------|
| Model No.   |        | Voltage<br>(AC 60 Hz) |
| Open Frame  | J-Box  |                       |
| AL-170      | AL-180 | 24                    |
| AL-171      | AL-181 | 120                   |
| —           | AL-183 | 240                   |

| Specifications             |                                                                                                                                                            |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Valve inputs               |                                                                                                                                                            |
| Power input                | 5.7 Watts (energized).<br>17.3 VA Inrush.<br>9.2 VA Holding.                                                                                               |
| Voltage                    | For available voltages, refer to Model Chart.                                                                                                              |
| Electrical connections     | 18 in. (457 mm) leads on the coil.                                                                                                                         |
| Maximum inlet air pressure | 30 psig (207 kPa). Clean, dry, oil free air is required (refer to EN-123).                                                                                 |
| Air connections            | Three plastic ferrules included for 1/4 in. O.D. plastic tubing.<br>N.C., Normally closed, Port 1.<br>N.O., Normally open, Port 2.<br>COM, Common, Port 3. |
| Valve outputs              |                                                                                                                                                            |
| Flow capacity              | 519 scim (142 mL/sec) at 15 psig (103 kPa) supply with 1 psig (6.9 kPa) drop.                                                                              |
| Environment                |                                                                                                                                                            |
| Ambient temperature limits | Shipping: -40 to 150°F (-40 to 65°C).<br>Operating: 40 to 130°F (4 to 54°C).<br>Supply air: 40 to 130°F (4 to 54°C).                                       |
| Humidity                   | 50 to 95% RH, non-condensing.                                                                                                                              |
| Location                   | NEMA Type 1 (IP10).                                                                                                                                        |
| Mounting                   | Vertical with solenoid at top (as shown).                                                                                                                  |
| Dimensions                 |                                                                                                                                                            |
| AL-17x                     | 3-5/16 H x 1-9/16 W x 1-7/32 D in. (84 x 40 x 31 mm).                                                                                                      |
| AL-18x                     | 3-3/4 H x 3-13/16 W x 1-3/8 D in. (95 x 97 x 35 mm).                                                                                                       |

## Typical Applications

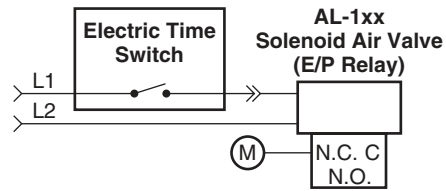


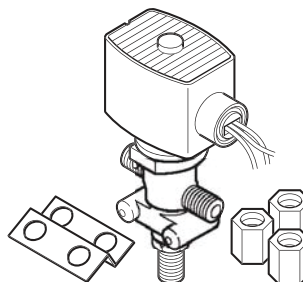
Figure 1 Typical Application Diagram.

## Solenoid Air Valve

For applications where an electrical circuit is used to control a pneumatically operated device. Used to direct supply or control air to pneumatic devices when the coil is either energized or de-energized, depending on the supply and exhaust air connections.

### Features:

- Plastic corrosion-resistant body provides long life.
- Mounting bracket and fittings for 1/4 in. O.D. plastic tubing supplied with valve for simple, quick installation.
- High capacity of AL-19x Series allows more devices to be used with fewer solenoid air valves.



### Model Chart

| Model No. | Voltage (AC 60 Hz) +10/-15% |
|-----------|-----------------------------|
| AL-190    | 24                          |
| AL-191    | 120                         |

### Specifications

#### Valve inputs

|                            |                                                                                                                                                                                                             |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power input                | 9.1 Watts (energized).                                                                                                                                                                                      |
| Available voltages         | Refer to Model Chart.                                                                                                                                                                                       |
| Electrical connections     | 18 in. (457 mm) leads on the coil. Coil leads are red; ground lead is green. Threaded hole for 1/2 in. conduit connector. Accepts 1/2 in. EMT fittings.                                                     |
| Maximum inlet air pressure | 30 psig (345 kPa). Clean, dry, oil free air is required (refer to EN-123).                                                                                                                                  |
| Air connections            | For 1/4 in. compression fittings. Three compression fittings for 1/4 in. plastic tubing supplied with each valve.<br>N.C., Normally closed, Port 2.<br>N.O., Normally open, Port 3.<br>COM, Common, Port 1. |

#### Valve outputs

|               |                                                                                |
|---------------|--------------------------------------------------------------------------------|
| Flow capacity | 1020 scim (278 mL/sec) at 15 psig (103 kPa) supply with 1 psig (6.9 kPa) drop. |
|---------------|--------------------------------------------------------------------------------|

#### Environment

|                            |                                                                                                                      |
|----------------------------|----------------------------------------------------------------------------------------------------------------------|
| Ambient temperature limits | Shipping: -40 to 150°F (-40 to 65°C).<br>Operating: 32 to 130°F (0 to 54°C).<br>Supply air: 40 to 130°F (4 to 54°C). |
| Humidity                   | 5 to 95% RH, non-condensing.                                                                                         |
| Location                   | NEMA Type 4X (IP56).                                                                                                 |
| Dimensions                 | 4-5/16 H x 3-7/16 W x 1-5/8 D in. (110 x 87 x 43 mm).                                                                |

### Typical Applications

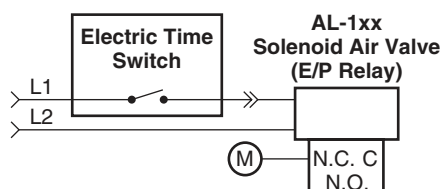


Figure 1 Typical Application Wiring Diagram.  
(Air-Handling Unit Application)

# Control Panel Enclosures and Devices

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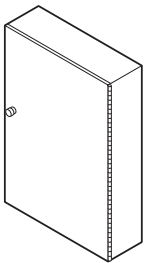
All specifications are nominal and may change as design improvements are introduced. Schneider Electric shall not be liable for damages resulting from misapplication or misuse of its products.

Control Cabinets

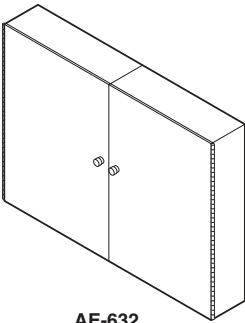
Control cabinets for mounting of electric, electronic, and pneumatic controls.

Features:

- A variety of control cabinets enables selection of the best unit to suit the application.



AE-630  
AE-631



AE-632

Control Panel Enclosures  
and Devices

| Model Chart |                                                                                    |                          |            |                                                        |             |                                          |                                     |
|-------------|------------------------------------------------------------------------------------|--------------------------|------------|--------------------------------------------------------|-------------|------------------------------------------|-------------------------------------|
| Model No.   | Door                                                                               |                          | Steel Gage | Subpanel                                               | Finish      | Knockouts                                | Dimensions<br>W x H x D<br>in. (mm) |
|             | Type                                                                               | Opening                  |            |                                                        |             |                                          |                                     |
| AE-630      | Single,<br>continuously<br>hinged                                                  | Right or<br>left-handed  | 18         | AE-630-101 or<br>obtain locally                        | Beige paint | For 3/4 in. conduit, two on<br>each side | 16 x 24 x 7<br>(406 x 610 x 178)    |
| AE-631      |                                                                                    |                          |            | AE-631-101 or<br>obtain locally                        |             |                                          | 24 x 32 x 7<br>(610 x 813 x 178)    |
| AE-632      | Double,<br>continuously<br>hinged                                                  | Right and<br>left-handed | 16         | Obtain locally, one<br>or two subpanels<br>may be used |             |                                          | 42 x 36 x 7<br>(1067 x 914 x 178)   |
| Subpanel    |                                                                                    |                          |            |                                                        |             |                                          |                                     |
| AE-630-101  | Subpanel for AE-630, 16 gage, perforated for #8 Type A sheet metal screws, flanged |                          |            |                                                        |             |                                          | 14-1/2 x 20<br>(368 x 508)          |
| AE-631-101  | Subpanel for AE-631, 16 gage, perforated for #8 Type A sheet metal screws, flanged |                          |            |                                                        |             |                                          | 22-1/2 x 28<br>(572 x 711)          |

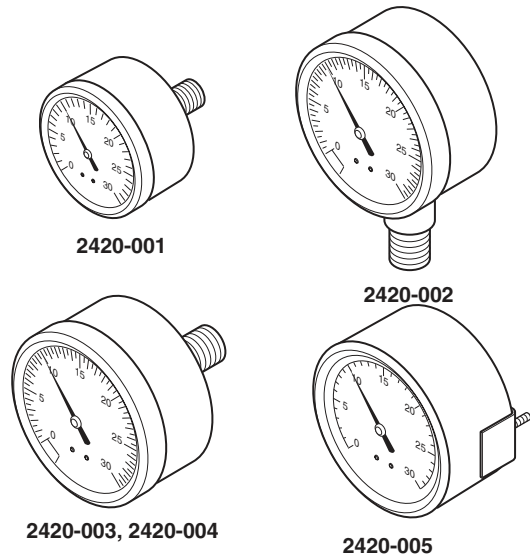
| Specifications |                                                                                                                                                                                        |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction   |                                                                                                                                                                                        |
| Doors          | Locking type, supplied with keys, rigidly supported. The doors are easily removed for protection on job site installation or mounting of components. Refer to Description Model Chart. |
| Steel Gage     | Refer to Description Model Chart.                                                                                                                                                      |
| Knockouts      | Aligned so that a short nipple may be used to couple the panels. Refer to Description Model Chart.                                                                                     |
| Appearance     | Refer to Description Model Chart.                                                                                                                                                      |
| Locations      | NEMA Type 1 (IP10).                                                                                                                                                                    |
| Mounting       | Four extruded mounting holes 1/4 in. (6mm).                                                                                                                                            |
| Dimensions     | Refer to Description Model Chart.                                                                                                                                                      |

# Pressure Gauges

**Pressure gauges for continuous indication of air pressure in pneumatic control systems.**

Features:

- 0 to 30 psig (0 to 200 kPa) models permit readout of main air pressure and/or output pressures of pneumatic control components.
- 0 to 160 psig (0 to 1100 kPa) models permit readout of pressure in air-compressor receivers or high-pressure main air lines.
- Available in flush-mounted, stem-mounted, bottom-mounted or lower-back mounted models.



| Model Chart |                    |                    |                          |          |                          |                                                              |
|-------------|--------------------|--------------------|--------------------------|----------|--------------------------|--------------------------------------------------------------|
| Model No.   | Replaces Model No. | Dial Size in. (mm) | Range psi (kPa)          | Mounting | Air Connection           | Construction and Finish                                      |
| 2420-001    | A201/AL-362        | 1-1/2 (38)         | 0 to 30<br>(0 to 200)    | Stem     | 1/8 in. MNPT center back | ABS plastic case and friction ring                           |
| 2420-002    | A203               |                    |                          |          | 1/8 in. MNPT bottom      |                                                              |
| 2420-003    | A204-3/AL-322      |                    | 1/8 in. MNPT center back |          |                          |                                                              |
| 2420-004    | A204-4/AL-327      |                    |                          |          |                          |                                                              |
| 2420-005    | A205-01            | 2 (51)             | 0 to 30<br>(0 to 200)    | Flush    | 1/4 in. barb back        | Steel case; black enamel case with chrome plated brass rings |
|             |                    |                    | 0 to 30<br>(0 to 200)    |          | 1/8 in. MNPT lower back  |                                                              |

| Specifications              |                                                                |
|-----------------------------|----------------------------------------------------------------|
| <b>Gauge actuation</b>      | Phosphor bronze Bourdon tube through sturdy brass gears.       |
| <b>Flush panel mounting</b> | 2420 Series U-clamp mounting for panels 1/16 to 3/4 in. thick. |
| <b>Dimensions</b>           |                                                                |
| 2420-001                    | 1-42/64 x 1-1/2 in. (34 x 38 mm).                              |
| 2420-002                    | 1-15/32 x 1-3/32 in. (37 x 27 mm).                             |
| 2420-003, 2420-004          | 2-11/64 x 1-55/64 in. (55 x 28 mm).                            |
| 2420-005                    | 2-1/4 x 1-53/64 in. (57 x 46 mm).                              |

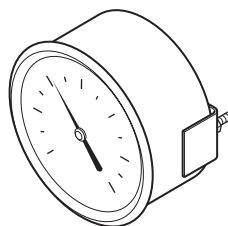
Control Panel Enclosures  
and Devices

## Receiver Gauges

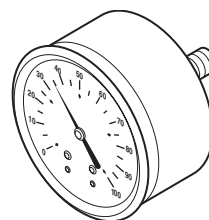
Receiver gauges for continuous indication of temperature, differential static pressure, differential pressure, pressure, enthalpy, or humidity in conjunction with a transmitter-receiver system. Select “donut” type dials listed for required application.

### Features:

- Receiver-gauges receive output signals of pneumatic transmitters and provide readout of measured (and/or controlled) variables at convenient locations.
- Gauge dials available to match each pneumatic transmitter range.
- 2 in. model available for stem mounting.
- 2-1/2 and 3-1/2 in. models available for flush mounting.



2422-001, -002



2422-003

### Model Chart

| Model No.               | Replaces Model No. | Dial Size In. | Pointer    | Mounting                        | Air Connection           | Construction and Finish                             |
|-------------------------|--------------------|---------------|------------|---------------------------------|--------------------------|-----------------------------------------------------|
| 2422-001 <sup>a b</sup> | A251-1             | 2-1/2         | Adjustable | Flush with “U” clamp for panels | 1/8 in. MNPT center back | Black plastic case with chrome plated snap-out ring |
| 2422-002 <sup>a c</sup> | A252               | 3-1/2         |            |                                 |                          |                                                     |
| 2422-003 <sup>a d</sup> | A253-12            | 2             |            | Stem                            |                          | Black plastic case                                  |

<sup>a</sup> Each gauge kit includes a gauge and a gauge overlay kit.

<sup>b</sup> To replace 2-1/2 in. gauge overlays, order overlay kit 2890-002.

<sup>c</sup> To replace 3-1/2 in. gauge overlays, order overlay kit 2890-003.

<sup>d</sup> To replace 2 in. gauge overlays, order overlay kit 2890-001.

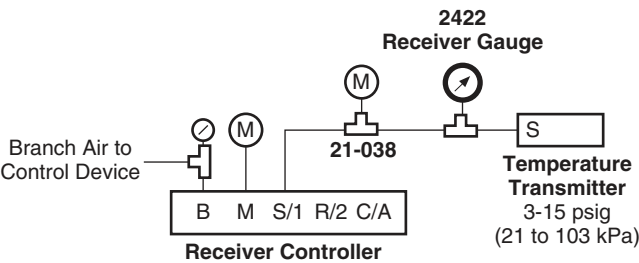
### Gauge Overlay Kits (included with gauge).

| 2890-001                                | 2890-002                                            | 2890-003                                    |
|-----------------------------------------|-----------------------------------------------------|---------------------------------------------|
| Overlay Kit for 2" Dia. 2422-003 Gauges | Overlay Kit for 2-1/2" Dia. 2422-002 Gauges         | Overlay Kit for 3-1/2" Dia. 2422-001 Gauges |
| Blank <sup>a</sup>                      | Blank <sup>a</sup>                                  | Blank <sup>a</sup>                          |
| 0 to 200°F                              | 0 to 200°F                                          | 0 to 200°F                                  |
| 25 to 125°F                             | 25 to 125°F                                         | 25 to 125°F                                 |
| 40 to 100°F                             | 40 to 100°F                                         | 40 to 100°F                                 |
| 3 to 15 psig                            | 3 to 15 psig                                        | 3 to 15 psig                                |
| 40 to 140°F                             | 0 to 100°F                                          | 0 to 100°F                                  |
| 40 to 240°F                             | 40 to 140°F                                         | 40 to 140°F                                 |
| -40 to 160°F                            | 40 to 240°F                                         | 40 to 240°F                                 |
| -25 to 125°F                            | -40 to 160°F                                        | -40 to 160°F                                |
| 50 to 90°F                              | -25 to 125°F                                        | -25 to 125°F                                |
| 62.5 to 92.5°F<br>30% to 80% RH         | 50 to 90°F                                          | 50 to 90°F                                  |
| 0 to 3 in. WC                           | 62.5 to 92.5°F                                      | 62.5 to 92.5°F                              |
| 0 to 10 in. WC                          | 30% to 80% RH                                       | 30% to 80% RH                               |
| 50 to 100°F                             | 0 to 3 in. WC<br>0 to 10 in. WC<br>50 to 100 in. WC | 0 to 3 in. WC                               |
|                                         |                                                     | 0 to 10 in. WC                              |
|                                         |                                                     | 50 to 100°F                                 |

<sup>a</sup> Five majors with nine minors per major can be field customized

| Specifications   |                                                 |
|------------------|-------------------------------------------------|
| Air pressure     | 3 to 15 psig (21 to 103 kPa).                   |
| Construction     |                                                 |
| Case             | Refer to Model Chart.                           |
| Lens             | Clear plastic.                                  |
| Gauge actuation  | Bronze Bourdon tube through sturdy brass gears. |
| Gauge dimensions |                                                 |
| 2422-001         | 2-29/32 (74 mm) dia. x 2-1/2 (64 mm) D in.      |
| 2422-002         | 4 (102 mm) dia. x 2-1/2 (64 mm) D in.           |
| 2422-003         | 2-15/64 (57 mm) dia. x 1-53/64 (46 mm) D in.    |

Typical Applications



Control Panel Enclosures  
and Devices

Figure 1 Typical Application.

Notes:

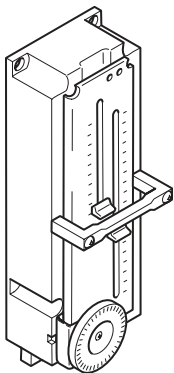
Receiver-Gauges may be connected at any point in the line between the transmitter and the receiver-controller (i.e., on either side of the restrictor-tee). More than one receiver-gauge may be connected to the same line if required.

Pneumatic Receiver Controller

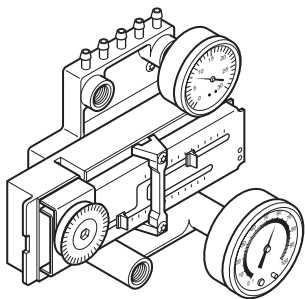
The receiver controllers are used with remote pneumatic transmitters to provide proportional control in pneumatic control systems. They are designed primarily for use with pneumatic transmitters; however, they may be used with any pneumatic device having an output of 3 to 15 psig, such as thermostats or humidistats. Both direct and reverse acting models are available and each device is of the dual-input type, with remote setpoint capability. These devices may be used as single input devices by using only the desired input.

Features:

- Nozzle and flapper relay- type receiver-controller; linear, stable and responsive. Three inputs for primary, reset, and remote control point adjustment (may be used with one or two inputs).
- Slide-type throttling range and authority adjustments are easy to use, require no tools. Easy setpoint calibration.
- Five barbed connections for 1/4 in. O.D. plastic tubing.
- Setpoint dials available to match transmitter ranges.
- Available in direct-acting and reverse-acting models.
- Direct-acting models have a built-in low-limit feature. Reverse-acting models have a built-in high-limit feature.
- Designed for mounting on Socket Kit MCS-S-P; may be mounted as stand-alone controller with P541-BASE.



Receiver-Controller



Receiver-Controller Mounted on Base  
(gauges ordered separately)

| Model Chart |                    |                |                                                                           |
|-------------|--------------------|----------------|---------------------------------------------------------------------------|
| Model No.   | Replaces Model No. | Action         | Description                                                               |
| 2341-501    | P541               | Direct         | Direct Acting Receiver Controller only                                    |
| 2341-502    | P541-RA            | Reverse        | Reverse Acting Receiver Controller only                                   |
| 2341-521    | P541-DA-B          | Direct         | Direct Acting Receiver Controller (2341-501) mounted to a Base P541-BASE  |
| 2341-522    | P541-RA-B          | Reverse        | Reverse Acting Receiver Controller (2341-502) mounted to a Base P541-BASE |
| P541-BASE   | —                  | Not applicable | Mounting Base, Gasket and Mounting Screws                                 |

## Specifications

|                                         |                                                                                                                                                                                                                                            |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Construction</b>                     | Glass-filled nylon.                                                                                                                                                                                                                        |
| <b>Control action</b>                   | Direct acting or reverse acting, determined by model selection.                                                                                                                                                                            |
| <b>Supply air pressure</b>              | Clean, dry, oil free air required (refer to EN-123).                                                                                                                                                                                       |
| <b>Normal</b>                           | 4 to 22 psig (28 to 152 kPa).                                                                                                                                                                                                              |
| <b>Maximum</b>                          | 30 psig (207 kPa).                                                                                                                                                                                                                         |
| <b>Air consumption</b>                  | 36 scim (9.8 mL/s), maximum.                                                                                                                                                                                                               |
| <b>Air flow capacity</b>                | 13824 scim (3774 mL/s).                                                                                                                                                                                                                    |
| <b>Connections</b>                      | Barbed nipples for 1/4 in. O.D. polyethylene tubing-for optional base. 5/32 in. I.D. polyurethane tubing for MCS-S-P socket mounting.                                                                                                      |
| <b>Authority</b>                        | Adjustable; 10 to 300% of primary signal input.                                                                                                                                                                                            |
| <b>Reset action</b>                     | Port R (reset signal) provides reverse reset. To obtain direct reset requires 2341-502 with 60% authority and 40% throttling range to reverse the transmitter's 3 to 15 psi (20.7 to 103.4 kPa) signal to 15 to 3 psi (103.4 to 20.7 kPa). |
| <b>Throttling range</b>                 | Adjustable; 2 to 40%/12 psi.                                                                                                                                                                                                               |
| <b>Setpoint</b>                         | Adjustable; graduated dial with 0.25 psi divisions.                                                                                                                                                                                        |
| <b>CPA (remote setpoint adjustment)</b> | ±10% of primary transmitter span.                                                                                                                                                                                                          |
| <b>Ambient temperature limits</b>       | 40 to 140°F (4 to 60°C).                                                                                                                                                                                                                   |
| <b>Mounting</b>                         | Designed for use on MCS-S manifold socket. These devices can also be surface mounted by using an optional 22-152 mounting bracket or by ordering with base option.                                                                         |
| <b>Dimensions</b>                       |                                                                                                                                                                                                                                            |
| <b>2341-50x</b>                         | 1-63/64 H x 5-25/32 W x 2-1/4 D in. (50 x 147 x 57 mm).                                                                                                                                                                                    |
| <b>2341-52x</b>                         | 3-5/8 H x 5-13/16 W x 3-3/4 (136 x 148 x 95 mm).                                                                                                                                                                                           |

## Accessories

| Part Number | Replaces Model | Description                             |
|-------------|----------------|-----------------------------------------|
| 20-881      | N2-4           | Calibration wrench.                     |
| 21-038      | N100-0010      | Restrictor tee polyethylene tubing.     |
| 21-153      | N100-2501      | In-line restrictor.                     |
| 900-012     | N100-2597      | Calibration kit.                        |
| 2390-501    | S510           | Gradual switch.                         |
| 2390-505    | S511-5         | Minimum switch position (5 psig span).  |
| 2390-510    | S511-10        | Minimum switch position (10 psig span). |

## Typical Applications

### Active Connections.

| Port | Connected to              |
|------|---------------------------|
| B    | Branch output.            |
| M    | Main air.                 |
| S    | Primary signal input.     |
| R    | Reset signal input.       |
| C    | Control point adjustment. |

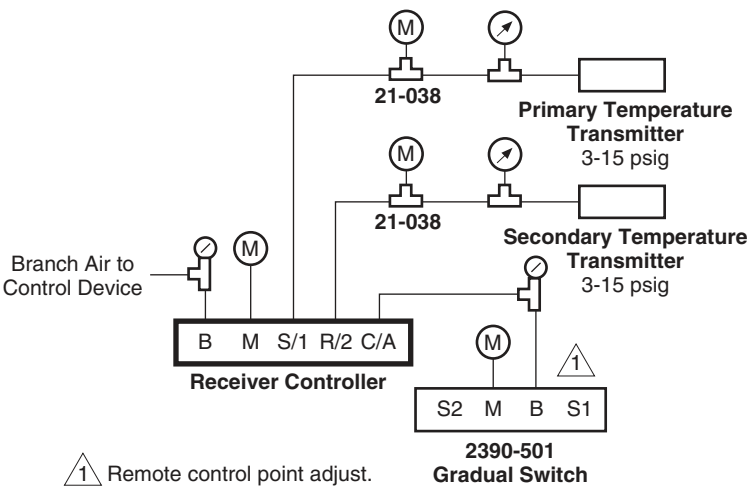
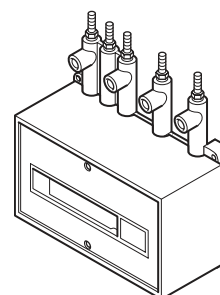


Figure 1 Typical Application.

Control Panel Enclosures  
and Devices

# Single/Dual Transmitter Input Receiver Controllers

For use in conjunction with remote proportional transmitters for proportional control of pneumatic actuated dampers, valves, etc., in air conditioning systems. The transmitter-receiver-controller system may be used to control temperature, humidity, or pressure.



RKSR-4000

## Features:

- Nozzle and flapper relay-type receiver controller.
- Linear, stable and responsive.
- Universal model works with one, two or three inputs.
- Mounting provided for two (1/8 NPT) 1-1/2 in. stem-mounted receiver-gauges and two 1-1/2 in. stem-mounted pressure gauges.
- Barbed fittings for 1/4 in. O.D. plastic tubing.
- Setpoint scales available to match transmitter ranges.
- Rebuildable

## Model Chart

| Model No. | Description                                   | Remote SPA                       | Action <sup>a</sup> | Type     | Authority <sup>b</sup>                                       | Proportional Band                                              |
|-----------|-----------------------------------------------|----------------------------------|---------------------|----------|--------------------------------------------------------------|----------------------------------------------------------------|
| RKSR-4000 | Replacement single or dual input <sup>c</sup> | ±10% of primary transmitter span | D.A./R.A.           | Two Pipe | 10% to 200% of primary (input 1) transmitter span adjustable | 2-1/2% to 40% of primary (input 1) transmitter span adjustable |

<sup>a</sup> D.A. (Direct Acting) factory shipped: increases output pressure on rise in input 1 pressure. Field changeable to R.A.

R.A. (Reverse Acting): decreases output pressure on rise in input 1 pressure.

<sup>b</sup> Primary transmitter connects to input 1.

<sup>c</sup> Input 2 has a reverse acting reset only. For direct acting the output pressure increases as input 2 increases. For reverse acting the output pressure increases as input 2 decreases.

## Specifications

|                                   |                                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Receiver-controller</b>        | Forced balanced pneumatic amplifier.                                                            |
| <b>Setpoint</b>                   | Adjustable, °F, °C, in. water, mm water, % relative humidity labels (included with controller). |
| <b>Proportional band</b>          | Field adjustable.                                                                               |
| <b>Input signals</b>              | 3 to 15 psig (21 to 103 kPa). Maximum input pressure 30 psig (207 kPa).                         |
| <b>Output air signal</b>          | 0.5 psig (3.4 kPa) to supply air pressure -0.5 psig (-3.4 kPa).                                 |
| <b>Action</b>                     | Direct. Field changeable to reverse.                                                            |
| <b>Authority</b>                  |                                                                                                 |
| <b>RKSR-4000</b>                  | Field adjustable.                                                                               |
| <b>Ambient temperature limits</b> |                                                                                                 |
| <b>Shipping and storage</b>       | -40 to 150°F (-40 to 65°C).                                                                     |
| <b>Operating</b>                  | 40 to 150°F (4 to 65°C).                                                                        |
| <b>Humidity</b>                   | 10 to 98% RH, non-condensing.                                                                   |
| <b>Supply air pressure</b>        | Clean, oil free, dry air required (refer to EN-123).                                            |
| <b>Nominal</b>                    | 20 psig (138 kPa).                                                                              |
| <b>Minimum</b>                    | 18 psig (124 kPa).                                                                              |
| <b>Maximum</b>                    | 30 psig (207 kPa).                                                                              |
| <b>Air connections</b>            |                                                                                                 |
| <b>Tubing</b>                     | Barb connectors for 1/4 in. O.D. plastic tubing.                                                |

Specifications (Continued)

|                                           |                                                                                           |
|-------------------------------------------|-------------------------------------------------------------------------------------------|
| Air consumption for sizing air compressor | 13.8 scim (3.8 mL/s) plus 41.5 scim (11.4 mL/s) for each transmitter and remote setpoint. |
| Air capacity for sizing air mains         | 16 scim (4.4 mL/s) plus 36 scim (13.2 mL/s) for each transmitter and remote setpoint.     |
| Cover                                     | Factory supplied.                                                                         |
| Mounting                                  | Upright on surface of wall or panel.                                                      |
| Dimensions                                | 5-23/32 H x 7 W x 4 D in. (145 x 178 x 102 mm).                                           |

Accessories

| Model No.         | Description                                                         |
|-------------------|---------------------------------------------------------------------|
| 20-944            | Restrictor tee, copper tubing.                                      |
| 21-038            | Restrictor tee, polyethylene tubing.                                |
| 21-153            | In-line restrictor.                                                 |
| 2232-053          | Room humidity transmitter.                                          |
| 2220-053          | Room temperature transmitter.                                       |
| 2420-001          | 1-1/2 pressure gauge stem mounted back connected 0 to 30 psi gauge. |
| 2422-003          | 2" receiver gauge, back-mounted 1/8 NPT                             |
| AKS-1100          | Remote setpoint adjustor.                                           |
| AT-539            | Pilot pressure kit for RKSR-4000.                                   |
| TOOL-095-1        | Pneumatic calibration tool kit.                                     |
| Maintenance Parts |                                                                     |
| AT-520-11         | Relay repair kit.                                                   |
| AT-523-20         | Nozzle kit.                                                         |
| AT-523-30         | Input diaphragm kit (parts for 3 inputs).                           |
| AT-524-10         | Input restrictor kit.                                               |
| AT-528            | Pilot restrictor kit.                                               |

Typical Applications

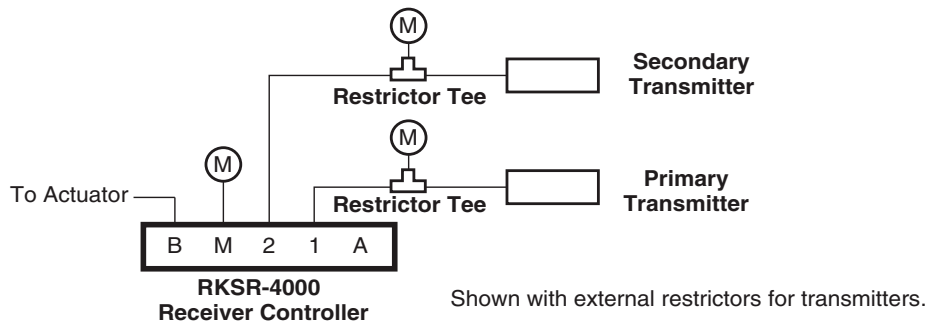


Figure 1 Typical Piping for RKSR-4000 Dual Input Receiver-Controller (External Restrictors for the Transmitters).

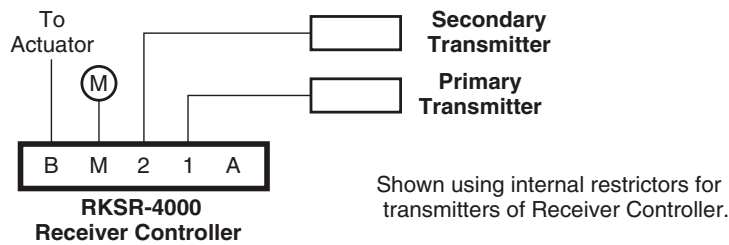


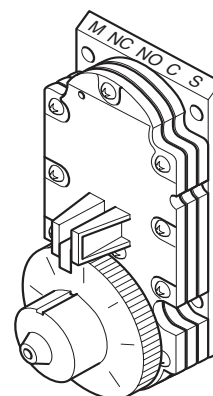
Figure 2 Typical Piping for RKSR-4000 Dual Input Receiver-Controller (Internal Restrictors for the Transmitters).

NOTES:

1. When external restrictors are used, the transmitter must be located within 1000 ft. (305 m) of the receiver-controller, and the restrictor must be located within 200 ft. (61 m) of the transmitter (preferably at the transmitter's location). Remove internal restrictors from receiver-controller and install blocking gaskets.
2. When internal restrictors are used, the transmitter must be located within 200 ft. (61 m) of the receiver-controller.

## Pneumatic Diverting Relays

The 2353-501 and 2353-502 diverting relays are snap-acting devices with adjustable setpoints. They are designed for a variety of switching and interlocking functions in pneumatic control systems where the application requires one or more of the following functions: feeding and exhausting branch lines, diverting a supply line to either one of two branch lines, or diverting one of two supply lines to one branch line. The primary function of these devices is to convert a proportional pneumatic signal, at a predetermined setting, into a positive pneumatic switching action.



**2353-501**  
**2353-502**

### Features:

- All 2353 Series Relays provide positive two-position snap-action, provide SPDT pneumatic switching. Require main air supply.
- 2353-501 and 2353-502 have setpoint dial with PSIG markings.
- 2353-501 has narrow differential; to be piloted by transmitter signals.
- 2353-502 has wide differential; to be piloted by controller signals.
- All ports clearly labeled. Ports align with 22-120 socket terminals.
- Mounts on MCS-S-P Socket Kit or 22-150 Mounting Bracket.

| Model Chart           |                    |      |                            |                                       |                                                                                                                    |                                              |
|-----------------------|--------------------|------|----------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Model No.             | Replaces Model No. | Type | Differential psi (kPa)     | Setpoint Range psig (kPa)             | Switching Action                                                                                                   | Dimensions in. (mm) H x W x D                |
| 2353-501 <sup>a</sup> | R503-1             | SPDT | 0.2 to 0.6<br>(1.4 to 2.8) | 3 <sup>b</sup> to 20<br>(21 to 138)   | Port S at setpoint minus diff.: ports NO and C are connected.<br>Port S at setpoint: ports NC and C are connected. | 4-1/8 x 1-31/32 x 3-9/64<br>(105 x 50 x 80)  |
| 2353-502 <sup>a</sup> | R503-2             |      | 2 to 4<br>(14 to 28)       | 4.5 <sup>b</sup> to 20<br>(31 to 138) |                                                                                                                    | 4-1/2 x 1-31/32 x 2-55/64<br>(114 x 50 x 73) |

<sup>a</sup> Includes two plastic mounting straps and adhesive backed mounting plate.

<sup>b</sup> DO NOT SET below this value.

| Specifications                     |                                                                                                                         |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Control action</b>              | Refer to Model Chart.                                                                                                   |
| <b>Construction</b>                | Glass-filled nylon.                                                                                                     |
| <b>Maximum ambient temperature</b> | 140°F (60°C).                                                                                                           |
| <b>Supply air pressure</b>         | Clean, dry, oil free air required (refer to EN-123).                                                                    |
| <b>Nominal</b>                     | 15 to 25 psig (103 to 172 kPa).                                                                                         |
| <b>Maximum</b>                     | 30 psig (207 kPa).                                                                                                      |
| <b>Connections</b>                 | Barbed nipples for 1/4 in. O.D. tubing.                                                                                 |
| <b>Air consumption</b>             | 29 scim (7.9 mL/s).                                                                                                     |
| <b>Air flow capacity</b>           | 60 scfh (1.7 scmh).                                                                                                     |
| <b>Adjustments</b>                 | Knob operates over two revolutions. A moving pointer slide is provided to indicate both inner and outer scales.         |
| <b>Mounting</b>                    | Designed for use on MCS-S-P Socket Kit. These devices can also be surface mounted by using the 22-150 mounting bracket. |
| <b>Dimensions</b>                  | Refer to Model Chart.                                                                                                   |

2353-5xx Series

Active Connections

| Port | Description      |
|------|------------------|
| M    | Main.            |
| S    | Signal.          |
| C    | Common.          |
| NO   | Normally open.   |
| NC   | Normally closed. |

Accessories

| Part Number | Replaces Model | Description                |
|-------------|----------------|----------------------------|
| 22-150      | K502           | Optional mounting bracket. |
| TOOL-082    | —              | 5/64 in. hex wrench.       |
| 22-120      | —              | Socket.                    |
| MCS-S-P     | —              | Socket kit.                |

Typical Applications

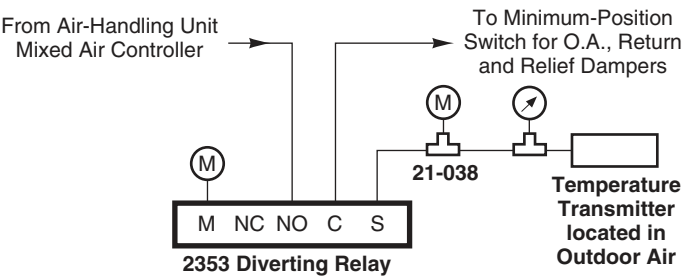


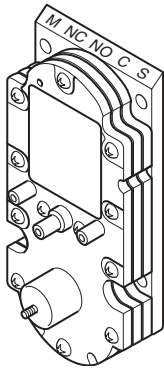
Figure 1 2353-501, 2353-502 Typical Application.

# Pneumatic Diverting Relays

The 2354 Series diverting relays are snap-acting devices designed for a variety of switching and interlocking functions in pneumatic control systems where the applications may require one or more of the following functions: feeding and exhausting branch lines, diverting a supply line to either one of two branch lines or diverting either one of two supply lines to one branch line.

**Features:**

- All 2354 Series Relays provide positive two-position snap-action. No main air connection required.
- Some competitive relays, that are claimed to be snap-acting, are not.
- 2354-501 and 2354-502 are the same relay with different factory settings; provide SPDT pneumatic switching.
- 2354-503 and 2354-504 are the same relay with different factory settings; provide DPDT pneumatic switching (switch two separate pneumatic circuits simultaneously).
- Switching point adjustable with 1/16 in. hex wrench.
- All ports clearly labeled. Ports align with 22-120 socket terminals.
- Mounts on MCS-S-P Socket Kit or 22-150 Mounting Bracket.



Control Panel Enclosures  
and Devices

| Model Chart           |                    |                  |            |                                                                                                                                      |
|-----------------------|--------------------|------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Model No.             | Replaces Model No. | Switching Action | Range psig | Action                                                                                                                               |
| 2354-501 <sup>a</sup> | R504-1             | SPDT             | 4 to 8     | Below 4 psig: NO and C are connected.<br>Above 8 psig: NC and C are connected.                                                       |
| 2354-502 <sup>a</sup> | R504-2             |                  | 18 to 22   | Below 16 psig: NO and C are connected.<br>Above 20 psig: NC and C are connected.                                                     |
| 2354-503 <sup>a</sup> | R504-3             | DPDT             | 4 to 8     | Below 4 psig: NO and C are connected. NO2 and C2 are connected.<br>Above 8 psig: NC and C are connected. NC2 and C2 are connected.   |
| 2354-504 <sup>a</sup> | R504-4             |                  | 18 to 22   | Below 16 psig: NO and C are connected. NO2 and C2 are connected.<br>Above 20 psig: NC and C are connected. NC2 and C2 are connected. |

<sup>a</sup> Includes two plastic mounting straps and adhesive backed mounting plates.

| Specifications                     |                                                                                                                                                               |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Control action</b>              | Refer to Active Connections Table.                                                                                                                            |
| <b>Construction</b>                | Glass-filled nylon.                                                                                                                                           |
| <b>Maximum ambient temperature</b> | 140°F (60°C).                                                                                                                                                 |
| <b>Supply air pressure</b>         | Clean, dry, oil free air required (Refer to EN-123).                                                                                                          |
| <b>Maximum</b>                     | 30 psig (207 kPa).                                                                                                                                            |
| <b>Connections</b>                 | Barbed nipples for 1/4 in. O.D. polyethylene tubing.                                                                                                          |
| <b>Air flow capacity</b>           | 60 scfh (1.7 scmh).                                                                                                                                           |
| <b>Adjustments</b>                 | The differential band (fixed at 4 psig) switch-over point may be adjusted between 4 to 8 psig and 18 to 22 psig respectively by means of 1/16 in. hex wrench. |
| <b>Mounting</b>                    | Designed for use on 22-120 socket. This device can also be surface mounted by using the 22-150 mounting bracket.                                              |
| <b>Dimensions</b>                  | 4-1/8 H x 1-31/32 W x 2-61/64 D in. (105 x 50 x 80 mm).                                                                                                       |

Active Connections

| Port                         | Description            |
|------------------------------|------------------------|
| C                            | Common.                |
| C <sub>2</sub> <sup>a</sup>  | Common no. 2.          |
| NO                           | Normally open.         |
| NO <sub>2</sub> <sup>a</sup> | Normally open no. 2.   |
| NC                           | Normally closed.       |
| NC <sub>2</sub> <sup>a</sup> | Normally closed no. 2. |
| S                            | Input signal.          |

<sup>a</sup> 2354-503 and 2354-504

Accessories

| Part Number | Replaces Model | Description       |
|-------------|----------------|-------------------|
| 22-150      | K502           | Mounting bracket. |
| 22-120      | —              | Socket.           |
| MCS-S-P     | —              | Socket kit.       |

Typical Applications

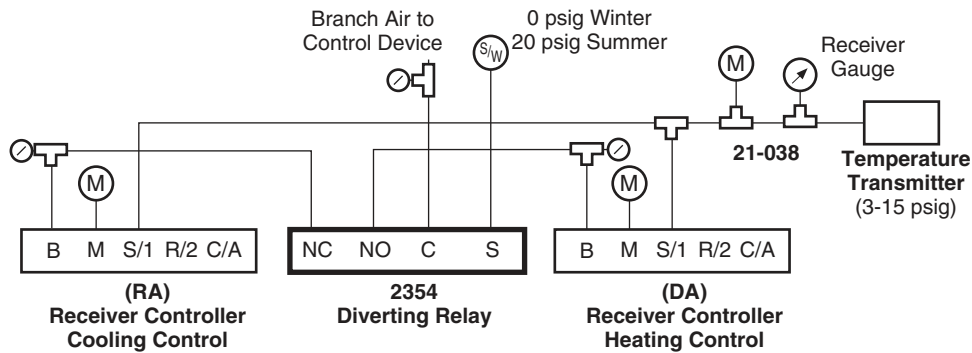
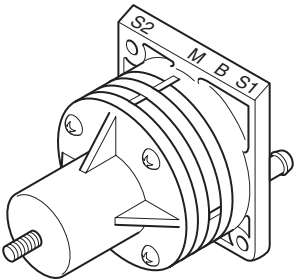


Figure 1 Typical Application.

# Pneumatic Reversing Relay

The reversing relay is a proportional device designed for use in pneumatic control systems where the application requires the reversing of a proportional signal from a controlling device. The 2360-501 branch line pressure decreases in direct proportion to an increase in input signal pressure and also amplifies the volume of air available for the final control device, thereby minimizing system lag.

The unit is factory calibrated to decrease the branch line pressure from 16 psig to 0 psig (110 to 0 kPa) as the signal pressure increases from 0 psig to 16 psig (0 to 110 kPa).



Features:

- Clearly marked connections eliminate the need to memorize port numbers: M (Main), B (Branch), and S1 (Input Signal).
- A bias adjustment is provided which can be used to advance or retard the output signal as required for specific applications (refer to Figure 2).
- The 2360-501 may be used as part of the panel-mounted, modular control system, or individually, using a 22-150 manifold backplate and its barbed tubing connections or MCS-S-P Socket Kit.
- Ports align with 22-120 socket terminals.

| Model Chart           |                    |                  |
|-----------------------|--------------------|------------------|
| Model No.             | Replaces Model No. | Description      |
| 2360-501 <sup>a</sup> | R516               | Reversing Relay. |

<sup>a</sup> Includes plastic mounting strap and adhesive backed mounting plate.

| Specifications              |                                                                                                                                  |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Control action              | Proportional — reverses input signal.                                                                                            |
| Construction                | Glass-filled nylon.                                                                                                              |
| Maximum ambient temperature | 140°F (60°C).                                                                                                                    |
| Supply air pressure         |                                                                                                                                  |
| Nominal                     | 20 psig (138 kPa).                                                                                                               |
| Maximum                     | 30 psig (207 kPa).                                                                                                               |
| Connections                 | Barbed nipples for 1/4 in. O.D. polyethylene tubing.                                                                             |
| Main air consumption        | 29.3 scim (8.01 mL/s).                                                                                                           |
| Air flow capacity           | 230 scim (62.8 mL/s).                                                                                                            |
| Adjustments                 | Crossover point, factory set at 8 psig (55 kPa) (8 psig input = 8 psig output), field adjustable 2 to 15 psig (13.8 to 103 kPa). |
| Mounting                    | Designed for use on 22-120 socket. This device can also be surface mounted by using the 22-150 mounting bracket.                 |
| Dimensions                  | 2-1/16 H x 1-7/8 W x 2-9/64 D (52.4 x 47.6 x 54.4 mm).                                                                           |

Active Connections

| Port Designation           | Connected to   |
|----------------------------|----------------|
| M                          | Main air.      |
| B                          | Branch output. |
| S1                         | Input signal.  |
| Note: S2 port is inactive. |                |

Accessories

| Part Number | Replaces Model | Description          |
|-------------|----------------|----------------------|
| 22-150      | K502           | Mounting bracket.    |
| 22-120      | MCS-S          | Socket.              |
| TOOL-082    | —              | 5/64 in. hex wrench. |
| MCS-S-P     | —              | Socket kit.          |

Typical Applications

Control Panel Enclosures  
and Devices

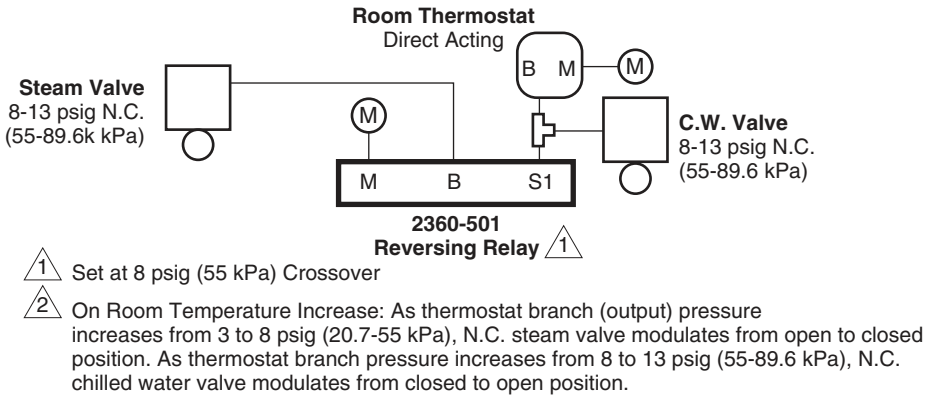
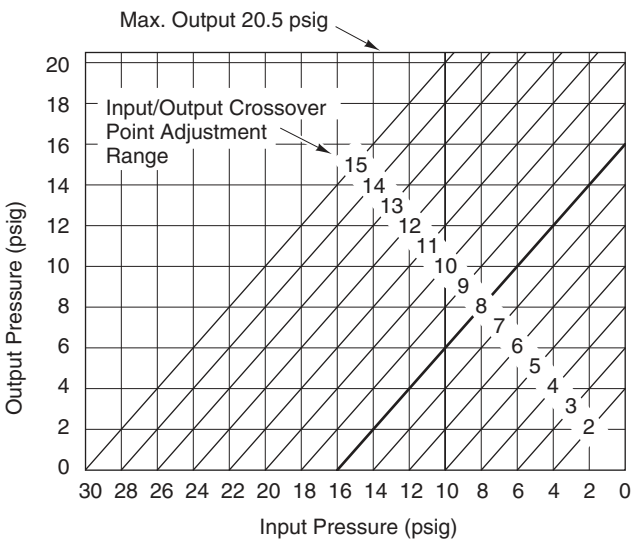


Figure 1 Typical Application.

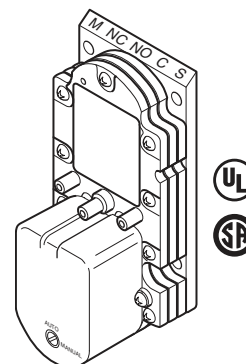


Note: Metric conversion: 6.895 kPa = 1psi

Figure 2 Input vs. Output Pressures.

## Pneumatic Electric-Pneumatic Relays

The electric-pneumatic relays are three-way, two-position, electrically activated air valves for use in pneumatic control systems where the application requires a variety of switching, diverting, or interlocking functions, actuated by an electrical circuit. The 2368-50x Series switches one SPDT pneumatic circuit, while the 2368-52x Series switches two independent SPDT pneumatic circuits simultaneously.



### Features:

- 2368-50x Series provides SPDT pneumatic switching (N.C., N.O., C).
- 2368-52x Series provides DPDT pneumatic switching (N.C., N.O., C), plus (N.C.2, N.O.2, C2). Switches two separate circuits simultaneously.
- Manual/auto switch (permits control system testing without starting and stopping electrical equipment).
- All ports clearly labeled. Ports align with 22-120 socket terminals.
- Must be mounted on 22-120 socket and used with 22-122 electrical connector.

### Model Chart

| Model No. | Replaces Model No. | Coil Voltage | Switch Action |
|-----------|--------------------|--------------|---------------|
| 2368-501  | R527-24            | 24 Vac       | SPDT          |
| 2368-502  | R527-110           | 110 Vac      |               |
| 2368-521  | R528-24            | 24 Vac       | DPDT          |
| 2368-522  | R528-110           | 110 Vac      |               |

### Specifications

|                                      |                                                                                                                                        |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Output</b>                        | 3 to 15 psig.                                                                                                                          |
| <b>Action</b>                        |                                                                                                                                        |
| <b>SPDT models (2368-50x Series)</b> | Coil de-energized, C and NO are connected. Coil energized, C and NC are connected.                                                     |
| <b>DPDT models (2368-52x Series)</b> | Coil de-energized, C and NO are connected, C2 and NO2 are connected. Coil energized, C and NC are connected, C2 and NC2 are connected. |
| <b>Maximum ambient temperature</b>   | 140°F (60°C).                                                                                                                          |
| <b>Supply air pressure</b>           | Clean, dry, oil free air required (refer to EN-123).                                                                                   |
| <b>Nominal</b>                       | 20 to 25 psig (138 to 172 kPa).                                                                                                        |
| <b>Maximum</b>                       | 30 psig (207 kPa).                                                                                                                     |
| <b>Connections</b>                   |                                                                                                                                        |
| <b>Air</b>                           | Barbed fittings for 1/4 in. O.D. polyethylene tubing.                                                                                  |
| <b>Electrical</b>                    | Purchase separately the 22-122 electrical connector with screw terminals and the 22-136 electrical barrier.                            |

Specifications (Continued)

|                   |                                                        |
|-------------------|--------------------------------------------------------|
| Air consumption   | 1728 scim (471.7 mL/s).                                |
| Air flow capacity | 1728 scim (471.7 mL/s).                                |
| Power consumption | 2.2 VA.                                                |
| Adjustments       | Auto, manual switch.                                   |
| Mounting          | Designed for use on 22-120 socket only.                |
| Dimensions        | 4-1/8 H x 1-1/32 W x 2-55/64 D in. (105 x 50 x 63 mm). |

Active Connections

| Port             | Connected to           |
|------------------|------------------------|
| M                | Main air.              |
| C                | Common.                |
| C2 <sup>a</sup>  | Common no. 2.          |
| NO               | Normally open.         |
| NO2 <sup>a</sup> | Normally open no. 2    |
| NC               | Normally closed.       |
| NC2 <sup>a</sup> | Normally closed no. 2. |

<sup>a</sup> DPDT models only.  
NOTE: A loss of main air pressure will have the same effect as de-energizing the coil.

Accessories

| Part Number       | Replaces Model | Description                  |
|-------------------|----------------|------------------------------|
| 22-122            | MCS-EC         | Electrical contact assembly. |
| 22-136            | MCS-EB         | Electrical barrier.          |
| 22-120            | —              | Socket.                      |
| MCS-S-P           | —              | Socket kit.                  |
| Maintenance Parts |                |                              |
| 22-200            | —              | 24 Vac coil.                 |
| 22-201            | —              | 110 Vac coil.                |

Typical Applications

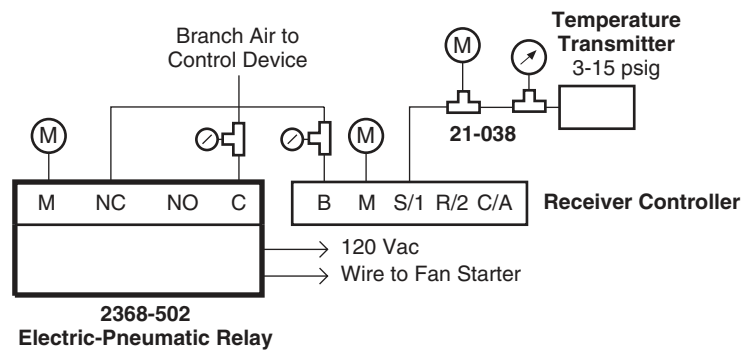
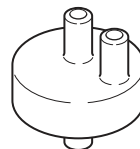


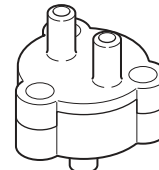
Figure 1 Typical Application.

## High Pressure Selector Relay and Low Pressure Selector or Booster Relay

The pressure selector relays are designed for use in pneumatic control systems where the application requires the comparison, selection, and transmission of the higher or lower of two proportional signals. 2372-351 can also be used as a booster relay.



2372-352  
High Pressure Selector



2372-351  
Low Pressure Selector  
or Booster Relay

### Features:

- Relays are non-adjustable.
- Precise repeatability characteristics.
- Small size and light weight allow these relays to be mounted “in-line”, supported by the pneumatic tubing.
- 2372-351 may be used as Booster Relay or LP Selector.
- 2372-352 HP Selector may be used with “restricted” pneumatic signals down to 0.5 SCFH (14.1 L/h) airflow.

| Model Chart |                    |                                                                            |                                |                  |                                                                |
|-------------|--------------------|----------------------------------------------------------------------------|--------------------------------|------------------|----------------------------------------------------------------|
| Model No.   | Replaces Model No. | Functions                                                                  | Dimensions in. (mm)            | Port Connections |                                                                |
|             |                    |                                                                            |                                | Port             | Connected to                                                   |
| 2372-351    | R432-11            | Selects the lowest of two input signals. Or may be used as volume booster. | 1-3/16 dia. x 1-3/16 (30 x 30) | B                | Branch output                                                  |
|             |                    |                                                                            |                                | S                | Input signal                                                   |
|             |                    |                                                                            |                                | M                | Input signal (piped to main air when used as a volume booster) |
| 2372-352    | R432-2             | Selects the highest of two input signals.                                  | 1-1/8 dia. x 31/32 (29 x 25)   | B                | Branch output                                                  |
|             |                    |                                                                            |                                | S1, S2           | Input signals                                                  |

| Specifications             |                                                      |
|----------------------------|------------------------------------------------------|
| Action                     | Proportional.                                        |
| Construction               | Glass-filled nylon.                                  |
| Ambient temperature limits | 35 to 140°F (2 to 60°C).                             |
| Supply air pressure        | Clean, dry, oil free air required (refer to EN-123). |
| Nominal                    | 20 psig.                                             |
| Maximum                    | 30 psig.                                             |
| Connections                | Fittings for 1/4 in. O.D. plastic tubing.            |
| Air consumption            | When used as a volume booster.                       |
| Main port                  | 29.4 scim (8 mL/s).                                  |
| Signal port                | 0.2 scim (0.1 mL/s).                                 |
| Mounting                   | In-line.                                             |
| Dimensions                 | Refer to Model Chart.                                |

Typical Applications

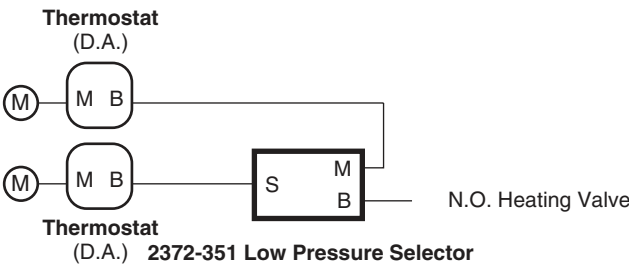


Figure 1 2372-351 Low Pressure Selector Relay.

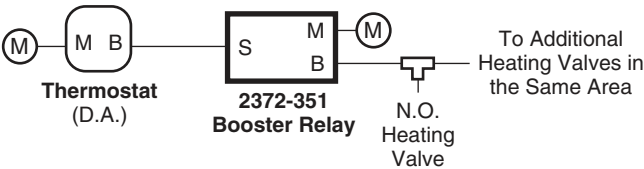


Figure 2 2372-351 Used as Booster Relay.

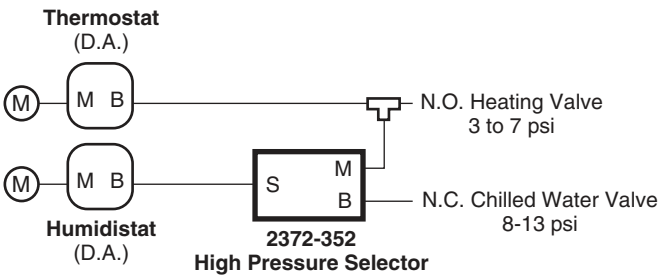


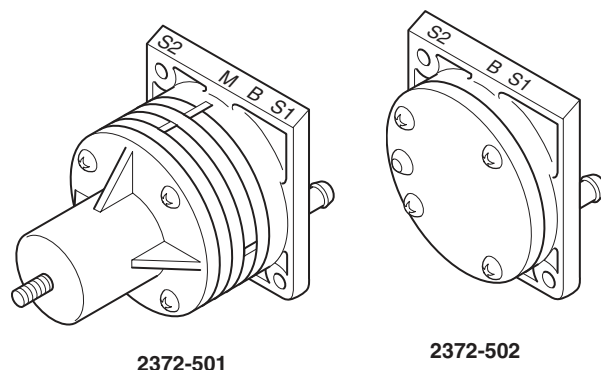
Figure 3 2372-352 High Pressure Selector Relay.

Control Panel Enclosures  
and Devices

## Pneumatic Volume Booster/Pressure Selector Relays

The volume booster relay is a proportional device designed for use in pneumatic control systems where the application requires amplification of control air volume to final control devices. System transmission lag is minimized by using this relay in conjunction with a proportional controller operating several diaphragm valves or damper actuators. This device may also be used as a low pressure selector when the application requires the comparison, selection and transmission of the lower of two proportional input signals.

The high pressure selector relay is a device designed for use in pneumatic control systems where the application requires the comparison, selection, and transmission of the higher of two proportional input signals.



### Features:

#### 2372-502

- Two-input high pressure selector; no adjustments.
- All ports clearly labeled.
- Not for use with “restricted” signals (use 2372-352).
- Mounts on MCS-S-P Socket Kit or 22-150 Mounting Bracket. Due to light weight, may be mounted “in-line”, supported by tubing.

#### 2372-501

- 1:1 booster relay with adjustable bias.
- May be used as low pressure selector (using ports S-1 and M).
- Using S-1 and S-2 inputs (and main air supply at M) may be used as summation (adding) relay.
- All ports clearly labeled. Ports align with 22-120 socket terminals.
- Mounts on MCS-S-P Socket Kit or 22-150 Mounting Bracket.

| Model Chart           |                    |                                         |                  |                                |
|-----------------------|--------------------|-----------------------------------------|------------------|--------------------------------|
| Model No.             | Replaces Model No. | Description                             | Port Connections |                                |
|                       |                    |                                         | Port             | Connected to                   |
| 2372-501 <sup>a</sup> | R532-L             | Volume booster or low pressure selector | M                | Main air or input signal no. 2 |
|                       |                    |                                         | B                | Branch output                  |
|                       |                    |                                         | S <sub>1</sub>   | Input signal no. 1             |
| 2372-502 <sup>a</sup> | R532-H             | High pressure selector <sup>b</sup>     | B                | Output                         |
|                       |                    |                                         | S <sub>1</sub>   | Input signal no. 1             |
|                       |                    |                                         | S <sub>2</sub>   | Input signal no. 2             |

<sup>a</sup> Includes plastic mounting strap and adhesive backed mounting plate.

<sup>b</sup> **Note:** Do not use signals from a low volume signal source such as transmitters, or one pipe thermostats. Use 2372-352 for these applications.

2372-5xx Series

| Specifications              |                                                                               |
|-----------------------------|-------------------------------------------------------------------------------|
| Control action              | Proportional.                                                                 |
| Construction                | Glass-filled nylon.                                                           |
| Maximum ambient temperature | 140°F (60°C).                                                                 |
| Supply air pressure         | Clean, dry, oil free air required (Ref. EN-123).                              |
| Nominal                     | 20 psig (138 kPa).                                                            |
| 2372-501 maximum            | 30 psig (207 kPa).                                                            |
| 2372-502 maximum            | 25 psig (172 kPa).                                                            |
| Connections                 | Barbed nipples for 1/4 in. O.D. polyethylene tubing.                          |
| Main air consumption        | 29.4 scim (8 mL/s) (applies to 2372-501 when used as a volume booster only).  |
| Air flow capacity           | 230 scim (62.8 mL/s).                                                         |
| Adjustments                 |                                                                               |
| 2372-501                    | Output may be advanced or retarded ±5 psi (34.5 kPa).                         |
| 2372-502                    | None.                                                                         |
| Mounting                    | On MCS-S-P Socket Kit. For non-manifold mounting use 22-150 mounting bracket. |
| Dimensions                  |                                                                               |
| 2372-501                    | 2-1/16 H x 1-7/8 W x 2-33/64 D in. (52 x 48 x 64 mm).                         |
| 2372-502                    | 2-1/16 H x 1-7/8 W x 61/64 D in. (52 x 48 x 25 mm).                           |

| Accessories |                |                            |
|-------------|----------------|----------------------------|
| Part Number | Replaces Model | Description                |
| 22-150      | K502           | Optional mounting bracket. |
| TOOL-082    | —              | 5/64 in. hex wrench.       |
| 22-120      | —              | Socket.                    |
| MCS-S-P     | —              | Socket kit.                |

Typical Applications

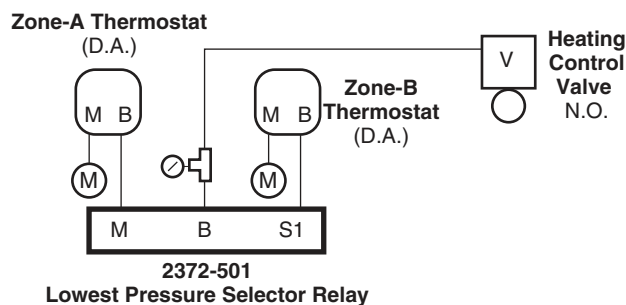


Figure 1 2372-501 Typical Application.

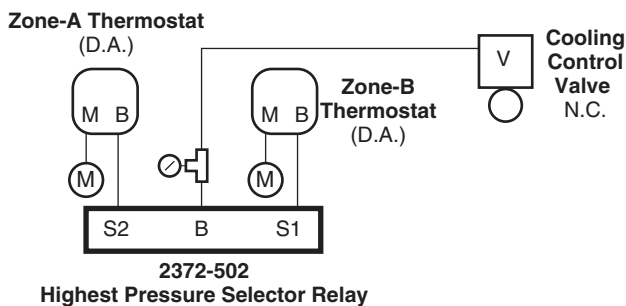


Figure 2 2372-502 Typical Application.

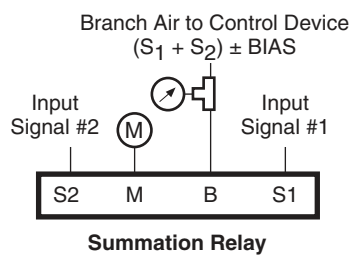


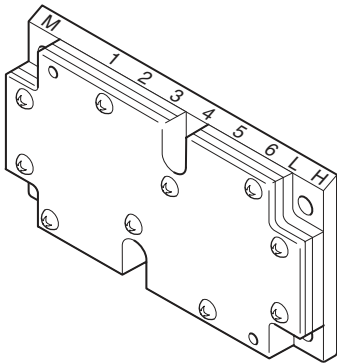
Figure 3 Typical Application.

# Pneumatic Multi-Input High and Low Selector Relay

The selector relay is a device designed for use in pneumatic control systems where the application requires the comparison, selection, and transmission of the highest and/or the lowest of up to six pneumatic input signals. All input ports are “dead-ended” and no signal air passes through the relay to the output ports.

Features:

- Six-input high and low pressure selector. Requires main air connection.
- Highest of 6 inputs is output at Port H.
- Lowest of 6 inputs is output at Port L.
- Inputs numbered 1 through 6.
- All ports clearly labeled. Ports align with 22-120 socket terminals.
- Mounts on two MCS-S-P Socket Kits or on one 22-150 Mounting Bracket.



Control Panel Enclosures  
and Devices

| Model Chart           |                    |                  |                       |
|-----------------------|--------------------|------------------|-----------------------|
| Model No.             | Replaces Model No. | Port Connections |                       |
|                       |                    | Port             | Connected to          |
| 2373-501 <sup>a</sup> | R533               | M                | Main air              |
|                       |                    | L                | Lowest branch output  |
|                       |                    | H                | Highest branch output |
|                       |                    | 1 through 6      | Input signals         |

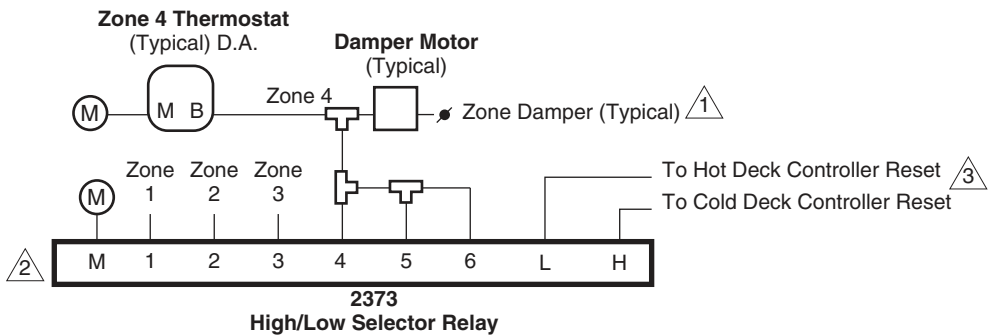
<sup>a</sup> Includes two plastic mounting straps and adhesive backed mounting plates.

| Specifications              |                                                                                                                             |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Action                      | Proportional.                                                                                                               |
| Construction                | Glass-filled nylon.                                                                                                         |
| Maximum ambient temperature | 140°F (60°C).                                                                                                               |
| Supply air pressure         | Clean, dry, oil free air required (refer to EN-123).                                                                        |
| Nominal                     | 20 psig (138 kPa).                                                                                                          |
| Maximum                     | 30 psig (207 kPa).                                                                                                          |
| Connections                 | Barbed fittings for 1/4 in. O.D. polyethylene tubing.                                                                       |
| Air consumption             | 43 scim (11.8 mL/s).                                                                                                        |
| Air flow capacity           |                                                                                                                             |
| HI output port              | 14.4 scim (3.9 mL/s).                                                                                                       |
| LO output port              | 28.8 scim (7.8 mL/s).                                                                                                       |
| Adjustments                 | None.                                                                                                                       |
| Mounting                    | Designed for use on two MCS-S-P Socket Kits. This device can also be mounted by using the optional 22-150 mounting bracket. |
| Dimensions                  | 2 H x 4 W x 1-17/64 D in. (51 x 102 x 32 mm).                                                                               |

Accessories

| Part Number | Replace Model | Description                |
|-------------|---------------|----------------------------|
| 22-150      | K502          | Optional mounting bracket. |
| 22-120      | —             | Socket.                    |
| MCS-S-P     | —             | Socket kit.                |

Typical Applications

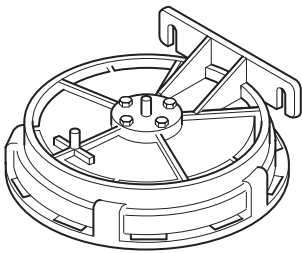


- 1 Hot Deck: N.O.  
Cold Deck: N.C.
- 2 If all 6 inputs are not used, and if the low (L) output is used, connect the last used input to the remaining unused inputs. This keeps the low (L) output from reading "zero".  
If only the high (H) output is used, it is not necessary to connect the unused inputs.
- 3 If either output (L or H) must operate valve or damper actuators, use a 2372-501 volume-booster relay to increase air capacity for that output on a 1:1 basis.

Figure 1 Typical Application.

Air Motion Relay

This relay is used to sense suction and/or discharge pressures across a coil or fan and control pneumatic damper actuators or valves piped downstream from this device. Using sensing lines located at a fan suction and discharge and piped to the low and high ports of this relay, this device is able to detect whether or not a fan is operating. This same operation can also be detected by using one port as a reference port and piping the other port to the fan suction or discharge providing there is a differential pressure of at least 0.15 in. W.C.



Control Panel Enclosures  
and Devices

Features:

- Useful for proving fan-operation pneumatically, without the use of electrical devices.
- Originally designed for use with Unit-Ventilators, the 2374-401 may be used to operate diverting relays (such as the 2354 Series) for Air-Handling Unit Control Systems.

| Model Chart |                    |                   |
|-------------|--------------------|-------------------|
| Model No.   | Replaces Model No. | Description       |
| 2374-401    | R435               | Air Motion Relay. |

| Specifications              |                                                                                |
|-----------------------------|--------------------------------------------------------------------------------|
| Pressure output             | 3 to 15 psig (21 to 103 kPa).                                                  |
| Pressure input              | Minimum 0.15 in. W.C.(373 Pa) differential.                                    |
| Environment                 |                                                                                |
| Maximum ambient temperature | 140°F (60°C).                                                                  |
| Locations                   | Avoid areas with excessive vibration or corrosive materials.                   |
| Supply air pressure         | Clean, dry, oil free air required (refer to EN-123).                           |
| Nominal                     | 20 psig (103 kPa).                                                             |
| Maximum                     | 30 psig (207 kPa).                                                             |
| Connections                 |                                                                                |
| LO/HI Ports                 | 3/8 in. O.D. plastic tubing.                                                   |
| Signal                      | 1/4 in. O.D. plastic tubing.                                                   |
| Maximum static pressure     | 12 in. W.C. (2988 Pa).                                                         |
| Main air consumption        | 27.6 scim (7.5 mL/s).                                                          |
| Air capacity                | 48 scim. (13.1 mL/s).                                                          |
| Mounting                    | Transmitter must be mounted in a horizontal position with the correct side up. |
| Dimensions                  | 5-9/16 H x 5-5/16 W x 2-11/16 D in. (141 x 135 x 69 mm).                       |
| Weight                      | 0.5 lb. (227 g).                                                               |

| Accessories |                |                                            |
|-------------|----------------|--------------------------------------------|
| Part Number | Replaces Model | Description                                |
| AP-302      | —              | Static pressure tip — 1/4 in. O.D. tubing. |

Typical Applications

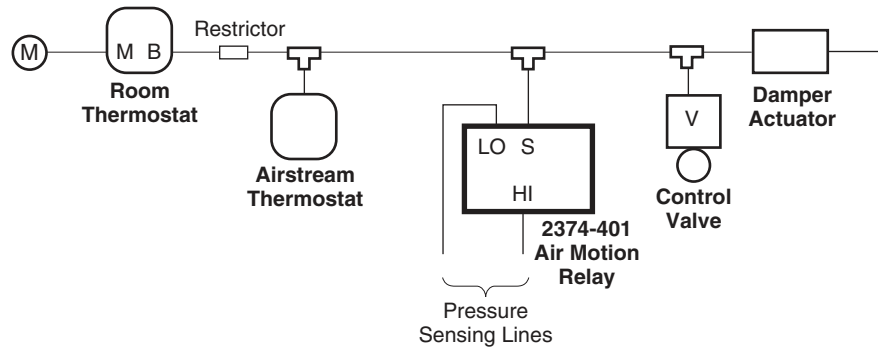


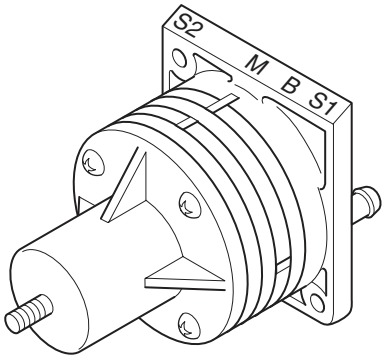
Figure 1 Typical Unit Ventilator Control Application.

# Pneumatic Averaging Relay

The averaging relay is a proportional device designed for use in pneumatic control systems where the application requires operation of a final control device, or some other control action such as resetting a receiver controller, by the average of the signals from two pneumatic devices. The relay also amplifies the volume of air available to the control device, thereby minimizing system lag.

Features:

- Averaging relay (with adjustable bias, factory set to zero). Output equals the sum of the two inputs (S-1 and S-2), divided by two.
- Unlike some competitive bleed-type “averaging relays” (accurate only when the two inputs are equal, and whose accuracy decreases as the square of the signal difference), the 2376-501 is a true averaging relay.
- All ports are clearly labeled. Ports align with 22-120 socket terminals.
- Mounts on MCS-S-P Socket Kit or 22-150 Mounting Bracket.



Control Panel Enclosures  
and Devices

| Model Chart           |                    |                  |                    |
|-----------------------|--------------------|------------------|--------------------|
| Model No.             | Replaces Model No. | Port Connections |                    |
|                       |                    | Port             | Connected to       |
| 2376-501 <sup>a</sup> | R540               | M                | Main air           |
|                       |                    | B                | Branch output      |
|                       |                    | S <sub>1</sub>   | Input signal no. 1 |
|                       |                    | S <sub>2</sub>   | Input signal no. 2 |

<sup>a</sup> Includes plastic mounting strap and adhesive backed mounting plate.

| Specifications              |                                                                                                                        |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------|
| Action                      | Proportional.                                                                                                          |
| Construction                | Glass-filled nylon.                                                                                                    |
| Maximum ambient temperature | 140°F (60°C).                                                                                                          |
| Supply air pressure         | Clean, dry, oil free air required (refer to EN-123).                                                                   |
| Nominal                     | 20 psig (138 kPa).                                                                                                     |
| Maximum                     | 30 psig (207 kPa).                                                                                                     |
| Connections                 | Barbed fittings for 1/4 in. O.D. polyethylene tubing.                                                                  |
| Air consumption             | 28.8 scim (7.9 mL/s).                                                                                                  |
| Air flow capacity           | 230.4 scim (62.9 mL/s).                                                                                                |
| Adjustments                 | Output may be advanced or retarded ±10 psig (69 kPa) by means of TOOL-082 (5/64 in. hexhead wrench).                   |
| Mounting                    | Designed for use on MCS-S-P Socket Kit. This device can also be mounted by using the optional 22-150 mounting bracket. |
| Dimensions                  | 2-1/16 H x 1-7/8 W x 2-33/64 D in. (52 x 48 x 64 mm).                                                                  |

Accessories

| Part Number | Replaces Model | Description              |
|-------------|----------------|--------------------------|
| 22-150      | K502           | Mounting bracket.        |
| TOOL-082    | —              | 5/64 in. hexhead wrench. |
| 22-120      | —              | Socket.                  |
| MCS-S-P     | —              | Socket Kit.              |

Typical Applications

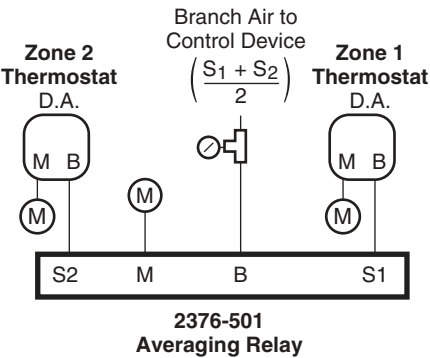


Figure 1 Typical Application.

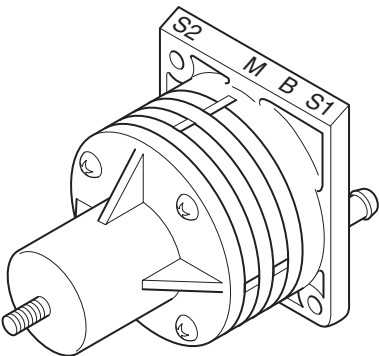
Control Panel Enclosures  
and Devices

# Pneumatic 2:1 Ratio Amplifying Relay

The amplifying relay is a proportional device designed for use in pneumatic control systems where the application requires the amplification of a proportional signal from a controlling device. The relay’s branch line pressure output increases as a 2:1 ratio to the input signal pressure (up to main air pressure) and amplifies the volume of air available to the final control device, thereby minimizing system lag.

Features:

- 2:1 signal amplifying relay, with adjustable bias. Output changes are equal to input changes multiplied by two.
- Ideal for applications such as:
  - Operating two actuators that have the same spring range in sequence (using two 2378-501s and their bias adjustments).
  - Narrowing the throttling range of any pneumatic controller (or portion of an operating sequence) by a factor of two.
  - Factory set for 10 psig (69 kPa) branch pressure at 5 psig (34.5 kPa) input pressure at port S1.
- All ports clearly labeled. Ports align with 22-120 socket terminals.
- Mounts on 22-120 socket or 22-150 mounting bracket.



Control Panel Enclosures  
and Devices

| Model Chart           |                    |                  |               |
|-----------------------|--------------------|------------------|---------------|
| Model No.             | Replaces Model No. | Port Connections |               |
|                       |                    | Port             | Connected to  |
| 2378-501 <sup>a</sup> | R539               | M                | Main air      |
|                       |                    | B                | Branch output |
|                       |                    | S <sub>1</sub>   | Input signal  |

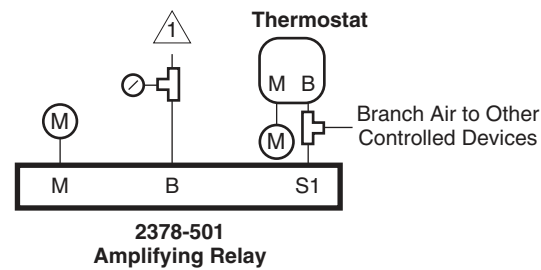
<sup>a</sup> Includes plastic mounting strap and adhesive backed mounting plate.

| Specifications              |                                                                                                                   |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------|
| Action                      | Proportional output at 2:1 ratio.                                                                                 |
| Construction                | Glass-filled nylon.                                                                                               |
| Maximum ambient temperature | 140°F (60°C).                                                                                                     |
| Supply air pressure         | Clean, dry, oil free air required (refer to EN-123).                                                              |
| Nominal                     | 20 psig (138 kPa).                                                                                                |
| Maximum                     | 30 psig (207 kPa).                                                                                                |
| Connections                 | Barbed fittings for 1/4 in. O.D. polyethylene tubing.                                                             |
| Air consumption             | 28.8 scim (7.9 mL/s).                                                                                             |
| Air flow capacity           | 230.4 scim (62.9 mL/s).                                                                                           |
| Adjustments                 | Bias can be manually adjusted from +5 to -13 psig by means of TOOL-082 (5/64 in. hexhead wrench).                 |
| Mounting                    | Designed for use on 22-120 socket. This device can also be mounted by using the optional 22-150 mounting bracket. |
| Dimensions                  | 2-1/16 H x 1-7/8 W x 2-33/64 D in. (52 x 48 x 64 mm).                                                             |

Accessories

| Part Number | Replaces Model | Description              |
|-------------|----------------|--------------------------|
| 22-150      | K502           | Mounting bracket.        |
| TOOL-082    | —              | 5/64 in. hexhead wrench. |
| 22-120      | —              | Socket.                  |
| MCS-S-P     | —              | Socket kit.              |

Typical Applications

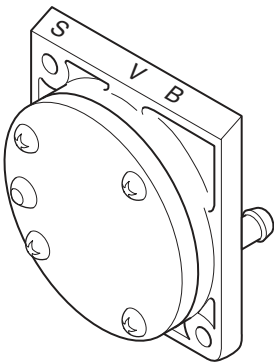


△ 1 Branch (output) air to portion of control system requiring pressure changes at twice the rate of thermostat output pressure change.

Figure 1 Typical Application.

# Pneumatic Signal Repeating Relay

The signal repeating relay is a proportional device for use in pneumatic control systems where it is desirable to repeat a pneumatic signal accurately, such as the output signal from a pneumatic transmitter which must be transmitted to receiver controllers or indicators at multiple locations. In addition to accurately repeating the input signal, use of the relay minimizes transmission lag by increasing the volume of signal air to devices located remotely from transmitter (see Figure 1). This device may also be used as a signal blocking relay and as a signal limiting relay.



Control Panel Enclosures  
and Devices

Features:

- Signal-repeating relay; repeats transmitter signal to multiple pneumatic devices at remote locations. Non-adjustable.
- May be used for signal-blocking applications.
- May be used with two adjustable restrictors as High/Low Signal-Limiting Relay.
- All ports clearly labeled. Ports align with 22-120 socket terminals.
- Mounts on MCS-S-P Socket Kit or 22-150 mounting bracket.

| Model Chart |                    |                  |               |
|-------------|--------------------|------------------|---------------|
| Model No.   | Replaces Model No. | Port Connections |               |
|             |                    | Port             | Connected to  |
| 2379-501    | R534               | S                | Input signal  |
|             |                    | B                | Branch output |
|             |                    | V                | Vent          |

| Specifications               |                                                                                                                              |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Operation                    |                                                                                                                              |
| Signal repeating application | Restricted main air at port B will accurately track the input pressure at port S.                                            |
| Blocking application         | With no air pressure applied at port S, ports V and B are connected. With air pressure at port S, ports V and B are blocked. |
| Construction                 | Glass-filled nylon.                                                                                                          |
| Maximum ambient temperature  | 140°F (60°C).                                                                                                                |
| Supply air pressure          | Clean, dry, oil free air required (refer to EN-123).                                                                         |
| Nominal                      | 20 psig (138 kPa).                                                                                                           |
| Maximum                      | 30 psig (207 kPa).                                                                                                           |
| Connections                  | Barbed fittings for 1/4 in. O.D. polyethylene or 5/32 in. I.D. polyurethane tubing.                                          |
| Air consumption              | 1728 scim (7.9 mL/s).                                                                                                        |
| Air flow capacity            | 1728 scim (7.9 mL/s).                                                                                                        |
| Adjustments                  | Non-adjustable.                                                                                                              |
| Mounting                     | Designed for use on 22-120 socket. This device can also be mounted by using the 22-150 mounting bracket.                     |
| Dimensions                   | 2-1/16 H x 1-7/8 W x 61/64 D in. (52 x 48 x 24 mm).                                                                          |

Accessories

| Part Number | Replaces Model | Description                          |
|-------------|----------------|--------------------------------------|
| 22-150      | K502           | Mounting bracket.                    |
| 21-153      | N100-2501      | 28.8 scim restrictor.                |
| 20-802      | N100-46        | Adjustable restrictor.               |
| 21-038      | N100-0010      | Restrictor tee, polyethylene tubing. |
| 22-120      | —              | Socket.                              |
| MCS-S-P     | —              | Socket kit.                          |

Typical Applications

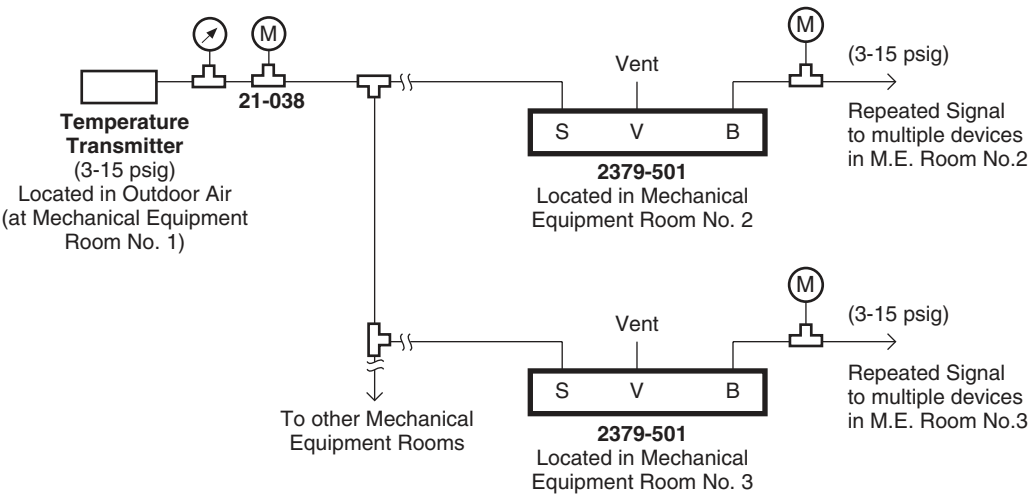
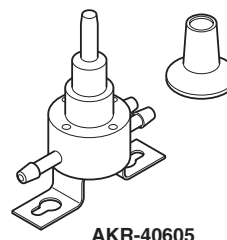


Figure 1 Typical Application.

Control Panel Enclosures  
and Devices

## Limiting, 1:1 Ratio Relay

Pneumatic 1:1 ratio direct acting relay is used to limit minimum or maximum output pressure. The AKR-40605 can also be used as a manual positioner, 1:1 ratio relay, or lowest of two pressures selector. Relay will also increase the capacity of a controller (except when used as maximum output limiter or lowest pressure selector).



### Model Chart

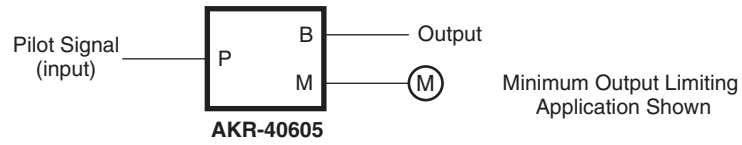
| Model No. | Description              | Output                                                | Air Connection Code |                     |        |
|-----------|--------------------------|-------------------------------------------------------|---------------------|---------------------|--------|
|           |                          |                                                       | Port P              | Port B <sup>a</sup> | Port M |
| AKR-40605 | Minimum output limiting  | Minimum output adjustable 0 to 20 psig (0 to 138 kPa) | Pilot               | Output              | Main   |
|           | Maximum output limiting  | Maximum output adjustable 0 to 20 psig (0 to 138 kPa) | Open to atmosphere  |                     | Input  |
|           | Manual positioner        | Manually selected from 0 to 20 psig (0 to 138 kPa)    |                     |                     |        |
|           | 1:1 Ratio relay          | 0 to 20 psig (0 to 138 kPa)                           | Pilot               |                     | Main   |
|           | Lowest pressure selector | Lowest of two pressures 0 to 20 psig (0 to 138 kPa)   | Input               |                     | Input  |

<sup>a</sup> Output pressure will drop to 0 when main air supply is reduced to 0. The reduced air pressure allows controlled device(s) to return to an ensured safe condition when main air pressure to the AKR-40605 is relieved.

### Specifications

|                                                  |                                                                                                          |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>Action</b>                                    | 1:1 direct.                                                                                              |
| <b>Output</b>                                    | Refer to Model Chart.                                                                                    |
| <b>Construction</b>                              |                                                                                                          |
| <b>Housing</b>                                   | Polysulfone.                                                                                             |
| <b>Diaphragm</b>                                 | Neoprene.                                                                                                |
| <b>Adjustments</b>                               | Refer to Model Chart for outputs.                                                                        |
| <b>Air pressure</b>                              | Clean, oil free, dry air required (refer to EN-123).                                                     |
| <b>Maximum</b>                                   | 30 psig (207 kPa).                                                                                       |
| <b>Nominal supply</b>                            | 15 to 25 psig (103 to 138 kPa).                                                                          |
| <b>Ambient limits</b>                            |                                                                                                          |
| <b>Shipping and storage</b>                      | -40 to 160°F (-40 to 71°C).                                                                              |
| <b>Operating</b>                                 | 32 to 140°F (0 to 60°C).                                                                                 |
| <b>Humidity</b>                                  | 5 to 95% RH, non-condensing.                                                                             |
| <b>Air connection code</b>                       | Refer to Model Chart.                                                                                    |
| <b>Air connections</b>                           | Barbed for 1/4 in. O.D. plastic tubing.                                                                  |
| <b>Air consumption for sizing air compressor</b> | 3.5 scim (0.9 mL/s).                                                                                     |
| <b>Air capacity for sizing air mains</b>         | 16 scim (4.4 mL/s).                                                                                      |
| <b>Mounting</b>                                  | Panel, wall or in-line; mounting plate and two push-in fasteners for perforated metal subpanel provided. |
| <b>Panel space required</b>                      | 4 H x 2-7/16 W x 1-3/4 D in. (102 x 62 x 44 mm).                                                         |

### Typical Applications



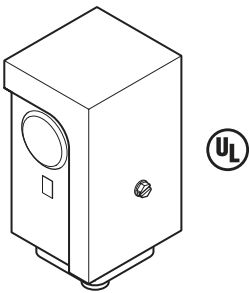
**Figure 1 Piping Connections.**

Pneumatic-Electric Switches

The pneumatic-electric switches are used in control systems requiring conversion of gradual air pressure changes to positive electrical switching actions. The 2364-211 has one SPDT switch for switching a single circuit. The 2364-220 has two SPDT switches for switching two separate circuits simultaneously.

Features:

- Fixed-differential P.E. switches permit two-position electrical switching action from either modulating or two-position pneumatic signals.
- High current rating: 20 amps non-inductive, 120, 240, 480Vac.
- 2364-211 has one SPDT switch.
- 2364-220 has two SPDT switches which operate simultaneously.
- May be wall-mounted or panel-mounted where necessary to keep wiring runs short.



Control Panel Enclosures  
and Devices

Model Chart

| Model No. | Replaces Model No. | Description                                      |
|-----------|--------------------|--------------------------------------------------|
| 2364-211  | R471-1             | Pneumatic-electric relay with (1) SPDT switch.   |
| 2364-220  | R472-1             | Pneumatic-electric relay with (2) SPDT switches. |

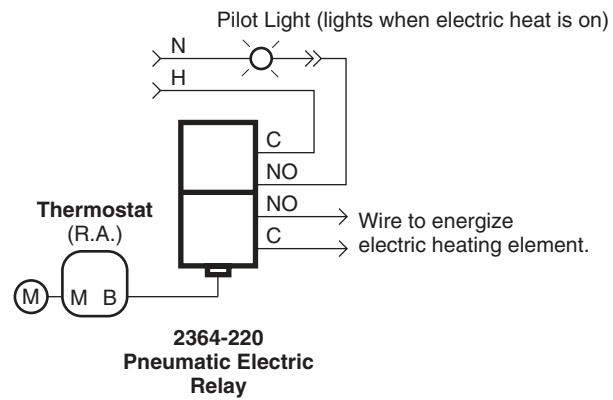
Specifications

|                             |                                                                                                  |
|-----------------------------|--------------------------------------------------------------------------------------------------|
| Environment                 |                                                                                                  |
| Ambient temperature limits  | 32 to 140°F (0 to 60°C).                                                                         |
| Relative humidity limits    | 5 to 95% RH, non-condensing. Avoid areas with excessive vibration or corrosive materials.        |
| Location                    | NEMA 1.                                                                                          |
| Maximum safe pressure       | 30 psig (206.8 kPa). Clean, dry control air only.                                                |
| Connections                 |                                                                                                  |
| Air                         | 3/16 in. (4.76 mm) nipple for 1/4 in. (6.35 mm) O.D. tubing.                                     |
| Wiring                      | Screw terminals. 1/2 in. conduit openings on both sides of housing.                              |
| Setpoint                    |                                                                                                  |
| 2364-211                    | 2 to 25 psig (13.8 to 172.4 kPa). Differential 2.0 psi (13.8 kPa) nominal, fixed.                |
| 2364-220                    | 4 to 20 psig (27.6 to 137.8 kPa). Differential 2.5 to 3.0 psi (17.2 to 20.7 kPa) nominal, fixed. |
| Switch action               | SPDT                                                                                             |
| Switch rating (each switch) | 20 amps non-inductive at 120-240-480 Vac. 1 hp at 125 Vac, 2 hp at 240 Vac.                      |
| Mounting                    | Relay may be mounted in any position.                                                            |
| Dimensions                  | 3-11/16 H x 2-1/2 W x 2-7/16 D in. (94 x 64 x 62 mm).                                            |

Accessories

| Part Number                 | Replaces Model | Description |
|-----------------------------|----------------|-------------|
| Maintenance Parts<br>20-684 | 6-532          | Diaphragm.  |

## Typical Applications

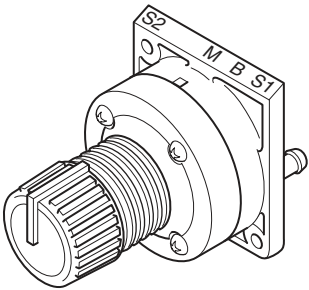


**Figure 1 Typical Application (2364-220 shown).**

Pneumatic Gradual Switches

The 2390 gradual switch is designed to allow manual setting of a desired pressure, up to main air pressure, where the application requires remote positioning of final control devices or remote control point adjustment of a pressure signal is desired.

The 2390-505 and 2390-510 have been designed with an internal high pressure selector relay, primarily for use as a minimum position switch for damper operation when used with actuators having a 5 or 10 psig (34.5 or 69 kPa) span, respectively.



Features:

2390 Gradual and Minimum-Position Switches can easily be mounted any of three ways:

- Flush-mounted on panel face. Dial plate locks onto switch body and is held in place by tightening the mounting nut from the rear. Provides exposed adjustment.
- Mounted with two screws and 22-133 gasket to MCS-S-P Socket Kit. Provides concealed adjustment.
- Mount using the 22-155 mounting bracket.
- All ports clearly labeled. Ports align with 22-120 socket terminals.

| Model Chart |                    |                         |                                    |                    |              |
|-------------|--------------------|-------------------------|------------------------------------|--------------------|--------------|
| Model No.   | Replaces Model No. | Function                | Comments                           | Active Connections |              |
|             |                    |                         |                                    | Port               | Connected to |
| 2390-501    | S510               | Gradual switch          | 0 to 20 psig (0 to 138 kPa) output | M<br>B             | Main Branch  |
| 2390-505    | S511-5             | Minimum position switch | 5 psig (34.5 kPa) span output      |                    |              |
| 2390-510    | S511-10            | Minimum position switch | 10 psig (69 kPa) span output       |                    |              |

| Specifications              |                                                      |
|-----------------------------|------------------------------------------------------|
| Action                      | Proportional.                                        |
| Construction                |                                                      |
| Case                        | Glass-filled nylon.                                  |
| Dial plates                 | Anodized aluminum.                                   |
| Knob                        | Black sunburst plastic.                              |
| Maximum ambient temperature | 140°F (60°C).                                        |
| Supply air pressure         | Clean, dry, oil free air required (refer to EN-123). |
| Nominal                     | 20 to 25 psig (138 to 172 kPa).                      |
| Maximum                     | 30 psig (207 kPa).                                   |

| Specifications (Continued) |                                                                                                                                                                                |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connections                | Barbed fittings for 1/4 in. O.D. polyethylene tubing.                                                                                                                          |
| Air consumption            | 28.8 scim (7.9 mL/s).                                                                                                                                                          |
| Air capacity               | 230.4 scim (62.9 mL/s).                                                                                                                                                        |
| Mounting                   | Designed for use on MCS-S-P Socket Kit. These devices can also be mounted on a panel face or surface mounted by using the appropriate mounting bracket (refer to Accessories). |
| Dimensions                 |                                                                                                                                                                                |
| 2390-501                   | 2-1/16 H x 1-7/8 W x 3-1/4 D in. (52 x 48 x 83 mm).                                                                                                                            |
| 2390-505, 2390-510         | 2-1/16 H x 1-7/8 W x 3-1/2 D in. (52 x 48 x 89 mm).                                                                                                                            |

| Accessories       |                |                          |
|-------------------|----------------|--------------------------|
| Part Number       | Replaces Model | Description              |
| TOOL-082          | —              | 5/64 in. hexhead wrench. |
| 22-155            | K511           | Single switch bracket.   |
| 22-120            | —              | Socket.                  |
| MCS-S-P           | —              | Socket kit.              |
| Maintenance Parts |                |                          |
| 22-173            | —              | Switch knob.             |

Typical Applications

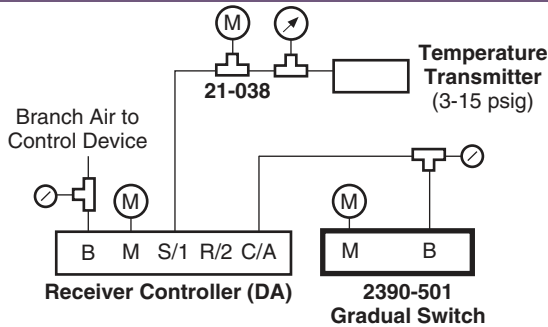


Figure 1 2390-501 Typical Application.

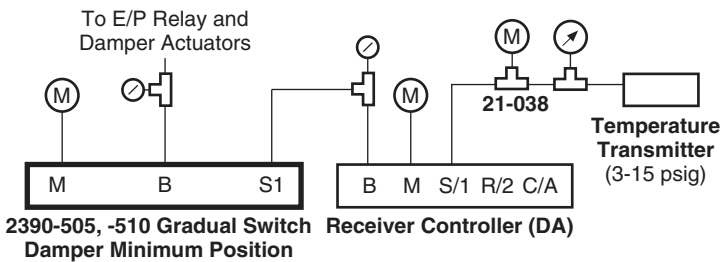


Figure 2 2390-505, -510 Series Typical Application.

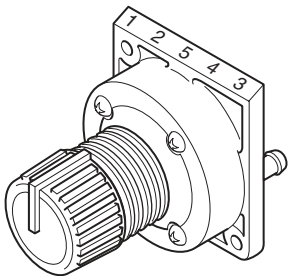
Control Panel Enclosures  
and Devices

# Pneumatic Two- and Three-Position Selector Switches

These switches are manually operated devices adaptable to a wide variety of applications in pneumatic control systems. They are normally used to perform diverting or supply and exhaust functions to operate final control components or index relays in multiple switching systems.

The 2392-504 is a two-position, four-branch switch. The 2392-505 is a two-position five-branch switch that provides one blocked port in each knob position.

The 2393-504 is a three-position, four-branch switch which can be used to supply a signal to any one of three devices or supply any one of three signals to a device. Its unused ports are blocked.



Control Panel Enclosures  
and Devices

Features:

239x-50x Series Selector Switches can easily be mounted any of three ways:

- Flush-mounted on panel face. Dial plate locks onto switch body and is held in place by tightening the mounting nut from the rear. Provides exposed adjustment.
- Mounted with two screws and 22-133 gasket to MCS-S-P Socket Kit. Provides concealed adjustment.
- Mount using the 22-155 bracket.
- All parts clearly labeled. Ports align with 22-120 socket terminals.

| Model Chart           |                    |                                                                     |
|-----------------------|--------------------|---------------------------------------------------------------------|
| Model No.             | Replaces Model No. | Description                                                         |
| 2392-504              | S520               | Two-position, four-branch.                                          |
| 2392-505 <sup>a</sup> | S521               | Two-position, five-branch (one blocked port in each knob position). |
| 2393-505              | S530 and S531      | Three-position, four-branch (unused ports exhausted).               |

<sup>a</sup> If required, unused ports may be plugged

## Specifications

### Construction

|                                    |                                                                                                                                                                                |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Case</b>                        | Glass-filled nylon.                                                                                                                                                            |
| <b>Dial plates</b>                 | Anodized aluminum.                                                                                                                                                             |
| <b>Knob</b>                        | Black sunburst plastic with pointer.                                                                                                                                           |
| <b>Maximum ambient temperature</b> | 140°F (60°C).                                                                                                                                                                  |
| <b>Supply air pressure</b>         | Clean, dry, oil free air required (refer to EN-123).                                                                                                                           |
| <b>Maximum</b>                     | 30 psig (207 kPa).                                                                                                                                                             |
| <b>Connections</b>                 | Barbed fittings for 1/4 in. O.D. polyethylene tubing.                                                                                                                          |
| <b>Air consumption</b>             | None.                                                                                                                                                                          |
| <b>Air flow capacity</b>           | 1,152 scim (314.5 mL/s).                                                                                                                                                       |
| <b>Adjustments</b>                 | Knob.                                                                                                                                                                          |
| <b>Mounting</b>                    | Designed for use on MCS-S-P Socket Kit. These devices can also be mounted on a panel face or surface mounted by using the appropriate mounting bracket (refer to Accessories). |
| <b>Dimensions</b>                  | 2-1/16 H x 1-7/8 W x 2-7/8 D in. (52 x 48 x 73 mm).                                                                                                                            |

## Accessories

| Part Number | Replaces Model | Description            |
|-------------|----------------|------------------------|
| 22-155      | K511           | Single switch bracket. |
| 22-120      | —              | Socket.                |
| MCS-S-P     | —              | Socket kit.            |
| Maintenance | —              | —                      |
| 22-173      | —              | Switch knob.           |

## Typical Applications

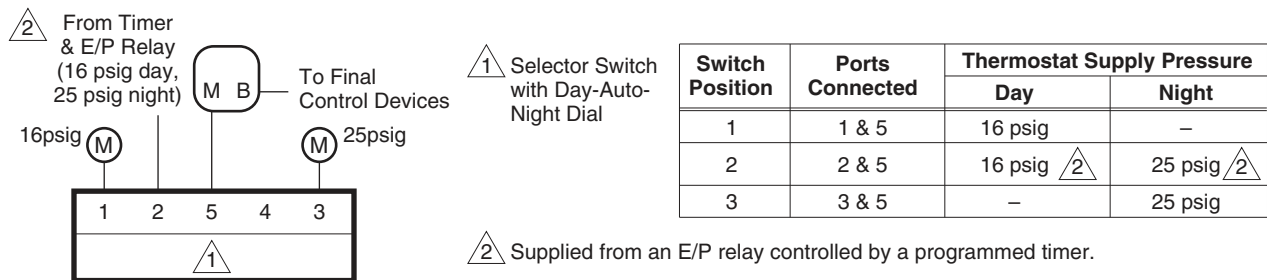


Figure 1 Automatic or Manual Changeover of Day/Night System.

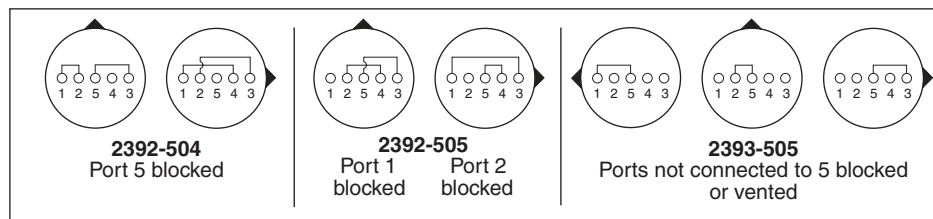
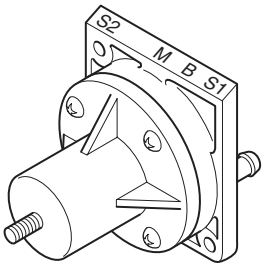


Figure 2 Internal Port Connections.

Pneumatic Pressure Regulator

The 2390-515 pressure regulator allows the manual setting of any desired air pressure, up to main pressure, where the application requires remote positioning of final control devices, remote control point adjustment of receiver controllers, or any other application where manual setting of an output pressure is desired.

- Features:
- Pressure regulator allows any desired pressure (up to main air pressure) to be set with a 5/64 in. hex wrench TOOL-082.
  - Mounts on MCS-S-P Socket Kit or 22-150 Mounting Bracket.
  - All ports clearly labeled. Ports align with 22-120 socket terminals.



| Model Chart |                    |                    |                               |                    |              |
|-------------|--------------------|--------------------|-------------------------------|--------------------|--------------|
| Model No.   | Replaces Model No. | Function           | Comments                      | Active Connections |              |
|             |                    |                    |                               | Port               | Connected to |
| 2390-515    | S515               | Pressure regulator | 0 to main air pressure output | M                  | Main         |
|             |                    |                    |                               | B                  | Branch       |

| Specifications              |                                                                                                                                                                                |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Action                      | Proportional.                                                                                                                                                                  |
| Construction                |                                                                                                                                                                                |
| Case                        | Glass-filled nylon.                                                                                                                                                            |
| Maximum ambient temperature | 140°F (60°C).                                                                                                                                                                  |
| Supply air pressure         | Clean, dry, oil free air required (refer to EN-123).                                                                                                                           |
| Nominal                     | 20 to 25 psig (138 to 172 kPa).                                                                                                                                                |
| Maximum                     | 30 psig (207 kPa).                                                                                                                                                             |
| Connections                 | Barbed fittings for 1/4 in. O.D. polyethylene tubing.                                                                                                                          |
| Air consumption             | 28.8 scim (7.9 mL/s).                                                                                                                                                          |
| Air capacity                | 230.4 scim (62.9 mL/s).                                                                                                                                                        |
| Mounting                    | Designed for use on MCS-S-P Socket Kit. These devices can also be mounted on a panel face or surface mounted by using the appropriate mounting bracket (refer to Accessories). |
| Dimensions                  | 2-1/16 H x 1-7/8 W x 1-61/64 D in. (52 x 48 x 50 mm).                                                                                                                          |

| Accessories       |                |                                         |
|-------------------|----------------|-----------------------------------------|
| Part Number       | Replaces Model | Description                             |
| 21-038            | N100-0010      | Restrictor tee for polyethylene tubing. |
| TOOL-082          | —              | 5/64 in. hexhead wrench.                |
| 22-120            | —              | Socket.                                 |
| MCS-S-P           | —              | Socket kit.                             |
| Mounting Bracket  |                |                                         |
| 22-150            | K502           | Mounting bracket.                       |
| Maintenance Parts |                |                                         |
| 22-173            | —              | Switch knob.                            |

Typical Applications

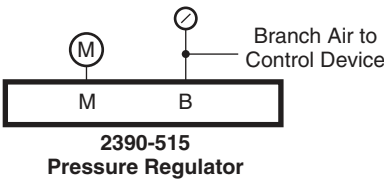
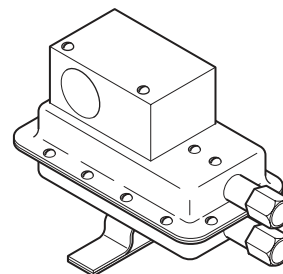


Figure 1 Typical Application.

## Air Differential Pressure Switch

The AFS Series differential pressure switch are sensitive and reliable devices for remotely sensing the operation of fans or blowers associated with ducted ventilating systems, and for sensing static pressure drop across filters. Pressure differentials as small as 0.05 in. WC are sufficient to actuate the SPDT contacts, which in turn operate remote status indicators, alarms, or control circuits of other devices.



AFS-222 Shown

### Features:

- Differential setpoint adjustable from 0.05 to 12 in. WC to suit various applications.
- The AFS-222 and AFS-222-112 are field adjustable over a wide range of pressures, and are relatively insensitive to temperature extremes. They are recommended for any differential pressure application within their operating ranges.

### Model Chart

| Model No.   | Replaces Model No. | Description                                   |
|-------------|--------------------|-----------------------------------------------|
| AFS-222     | R436 and 2374-410  | Air pressure switch with adjustable setpoint. |
| AFS-222-112 | —                  |                                               |
| AFS-262     | —                  |                                               |
| AFS-460     | —                  | Air pressure switch with manual reset.        |

### Specifications

#### Setpoint

|                                |                                                |
|--------------------------------|------------------------------------------------|
| <b>AFS-222 and AFS-222-112</b> | Field adjustable 0.05 $\pm$ 0.02 to 12 in. WC. |
| <b>AFS-262</b>                 | Field adjustable 0.05 $\pm$ 0.02 to 2 in. WC.  |
| <b>AFS-460</b>                 | Field adjustable 0.40 $\pm$ 0.06 to 12 in. WC. |

#### Differential

|                                |                                                                                                                                |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>AFS-222 and AFS-222-112</b> | Progressive, increasing from 0.02 in. $\pm$ 0.01 in. WC at minimum set point to approximately 0.8 in. WC at maximum set point. |
| <b>AFS-262</b>                 | Progressive, increasing from 0.02 in. $\pm$ 0.01 in. WC at minimum set point to approximately 0.1 in. WC at maximum set point. |
| <b>AFS-460</b>                 | Progressive, increasing from 0.06 in. $\pm$ 0.01 in. WC at minimum set point to approximately 0.8 in. WC at maximum set point. |

#### Electrical switch

|                                      |                                                                                 |
|--------------------------------------|---------------------------------------------------------------------------------|
| <b>AFS-222, AFS-222-112, AFS-262</b> | SPDT, 300 VA pilot duty at 115 to 277 Vac; 15A non-inductive to 277 Vac @ 60Hz. |
| <b>AFS-460</b>                       | SPST-NC, 15A 125, 250, or 277 Vac. @ 60 Hz.                                     |

#### Connections

|  |                                   |
|--|-----------------------------------|
|  | Screw terminals with cup washers. |
|--|-----------------------------------|

#### Sampling line connections:

|                                  |                                                            |
|----------------------------------|------------------------------------------------------------|
| <b>AFS-222, AFS-262, AFS-460</b> | Connectors accept 1/4 in. O.D. rigid or semi-rigid tubing. |
| <b>AFS-222-112</b>               | Two barbed 1/4 in. connectors will accept flexible tubing. |

#### Mounting

|  |                     |
|--|---------------------|
|  | Diaphragm vertical. |
|--|---------------------|

#### Conduit opening

|  |                                       |
|--|---------------------------------------|
|  | 7/8 in. diameter for 1/2 in. conduit. |
|--|---------------------------------------|

| Specifications (Continued)    |                                                      |
|-------------------------------|------------------------------------------------------|
| Operating temperature limits  | -40 to 180°F (-40 to 82°C).                          |
| Dimensions                    | 6-1/8 H x 3-7/8 W x 3-1/4 D in. (156 x 98 x 83 mm).  |
| AFS-222, AFS-222-112, AFS-262 | 6-9/64 H x 3-7/8 W x 3-1/4 D in. (156 x 98 x 82 mm). |
| AFS-460                       | 6-9/64 H x 3-1/4 W x 3-9/16 D in. (156 x 82 x 90mm). |
| Locations                     | NEMA 1.                                              |
| Agency Approval               |                                                      |
| AFS-222 and AFS-222-112       | UL, FM, CSA.                                         |
| AFS-262                       | UL, FM, CSA, CE.                                     |
| AFS-460                       | UL, FM, CE.                                          |

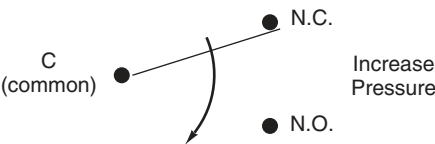


Figure 1 Switch Action and Terminal Identification.

| Accessories |                |                                                      |
|-------------|----------------|------------------------------------------------------|
| Part Number | Replaces Model | Description                                          |
| AP-302      | —              | Static pressure sensing tip for 1/4 in. O.D. tubing. |

Typical Applications

Diaphragm Connections

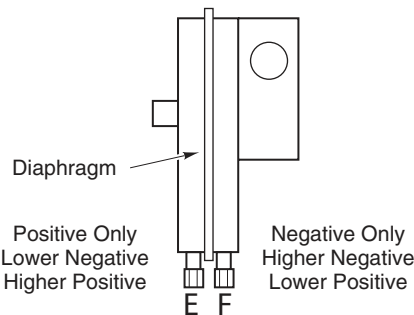
Refer to figure below. For positive pressure only, connect sampling line to port E; port F remains open to atmosphere.

For negative pressure only, connect sample line to port F; port E remains open to the atmosphere.

Two positive samples; connect higher pressure to port E and lower pressure to port F.

Two negative samples; connect more negative sample to port E; less negative to port F.

One positive and one negative; positive to port E; negative to port F.



Electrical

Before any pressure is applied to the diaphragm, the switch contact rests in the N.C. position (see figure below). Upon application of sufficient pressure to actuate the switch, the contact transfers to the N.O. position. Connect control, status, and/or alarm circuits, as shown.

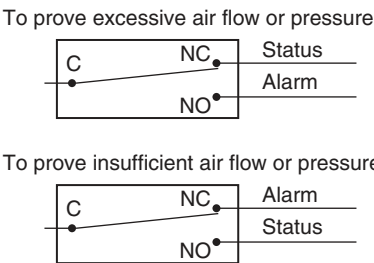


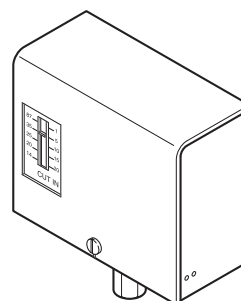
Figure 2 Typical Applications.

## Pneumatic to Electric Pressure Switches, Two-Position

For on-off control of electrical devices such as air compressors, fans, pilot lights, etc., by the use of a predetermined air pressure signal.

### Features:

- A variety of Pressure-to-Electric (P.E.) Switches permits two-position electrical switching from either modulating or two-position pneumatic signals.
- Models are available with either fixed or adjustable differentials and with several different switch actions, permitting selection of the best model for almost any required application.
- May be wall-mounted or panel-mounted where necessary to keep wiring runs short.



PC-110 shown



†PC-110 only CSA certified

### Model Chart

| Model No. | Mounting         | Switch Action                                          | Scale Range<br>psig (kPa) |          | Differential<br>psig (kPa)                              |         | Ambient<br>Temp.<br>Limits<br>°F (°C) | Max.<br>Input<br>psig<br>(kPa) | Dimensions<br>in. (mm)<br>H x W x D      |
|-----------|------------------|--------------------------------------------------------|---------------------------|----------|---------------------------------------------------------|---------|---------------------------------------|--------------------------------|------------------------------------------|
| PC-110    | Surface or track | SPDT makes N.O. contact to common on pressure increase | 1 to 20<br>(7 to 138)     |          | 1 to 5 (7 to 34)<br>adjustable<br>factory set at 2 (14) |         | -40 to 150<br>(-40 to 118)            | 50<br>(345)                    | 3-1/2 x 3-1/8 x 2-1/8<br>(89 x 79 x 54)  |
| PC-151    | Surface          | 3 SPST opens on pressure rise                          | Sw.                       | Open     | Sw.                                                     | Fixed   | 32 to 140<br>(0 to 78)                | 150<br>(1034)                  | 3-1/4 x 5-3/8 x 3-1/2<br>(83 x 137 x 89) |
|           |                  |                                                        | 1                         | 6 (41)   | 1                                                       | 3 (21)  |                                       |                                |                                          |
|           |                  |                                                        | 2 and 3                   | 18 (124) | 2 and 3                                                 | 0.5 (3) |                                       |                                |                                          |

### Specifications

|                    |                                                                       |
|--------------------|-----------------------------------------------------------------------|
| Case               | Metal with 1/2 in. conduit opening.                                   |
| Diaphragm          | Non-metallic, positioned by air pressure changes to actuate switches. |
| Connections        |                                                                       |
| Air                | 1/8 in. FNPT.                                                         |
| Electrical         | Coded screw terminals.                                                |
| Electrical Ratings | Refer to Electrical Ratings Table.                                    |
| Location           | NEMA 1.                                                               |

### Electrical Ratings.

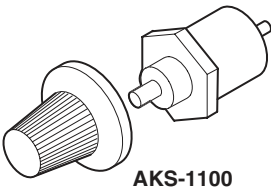
| Model No. | Volts<br>(Vac) | FLA<br>Amps | LRA<br>Amps | Non-Ind.<br>Amps | Pilot<br>Duty VA  |
|-----------|----------------|-------------|-------------|------------------|-------------------|
| PC-110    | 24             | —           | —           | 16               | 100               |
|           | 120            | 13.8        | 82.8        | 16               | 650               |
|           | 208            | 9.6         | 57.6        | 9.6              | 750               |
|           | 240            | 8.3         | 49.8        | 8.3              | 750               |
|           | 277            | —           | —           | 7.2              | —                 |
| PC-151    | 120            | 6           | 36          | 10               | 125 at 24/277 Vac |
|           | 208/240        | 3           | 18          | 8                |                   |
|           | 277            | —           | —           | 7.2              |                   |

Receiver Controller Setpoint Adjuster

Setpoint adjuster used to provide remote setpoint adjustment for receiver-controllers. May also be used to manually pilot pneumatic relays.

Features:

- Allows the setpoint of a pneumatic receiver-controller to be raised or lowered from a location up to 1000 ft. (305 m) from the receiver-controller.
- Able to work with various transmitter ranges.

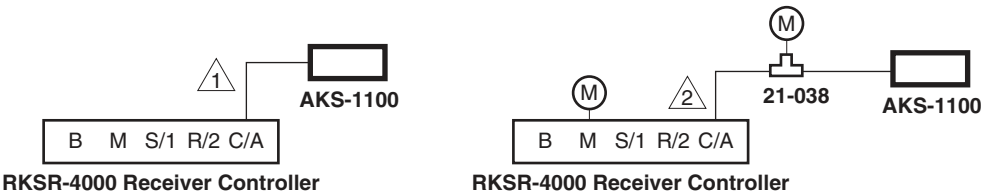


Control Panel Enclosures  
and Devices

| Model Chart |                           |
|-------------|---------------------------|
| Model No.   | Description               |
| AKS-1100    | Remote setpoint adjuster. |

| Specifications                            |                                                                                                   |
|-------------------------------------------|---------------------------------------------------------------------------------------------------|
| Construction                              | Aluminum housing, precision flapper-nozzle assembly.                                              |
| Output                                    | Linear 3 to 15 psig (21 to 102 kPa).                                                              |
| Air pressure                              | Clean, oil free, dry air required (refer to EN-123).                                              |
| Maximum                                   | 30 psig (207 kPa).                                                                                |
| Ambient limits                            |                                                                                                   |
| Shipping temperatures                     | -40 to 150°F (-40 to 65°C).                                                                       |
| Operating temperatures                    | 40 to 120°F (4 to 49°C).                                                                          |
| Humidity                                  | 5 to 95% RH, non-condensing.                                                                      |
| Air connection                            | Barbed connection for 1/4 in. O.D. plastic tubing.                                                |
| Air consumption for sizing air compressor | 41.5 scim (11.3 mL/s).                                                                            |
| Air capacity for sizing air mains         | 48 scim (13.1 mL/s).                                                                              |
| Mounting                                  | Panel or wall box. Panel requires 5/8 in. (16 mm) hole for mounting the remote setpoint adjuster. |
| Panel space required                      | 2-3/8 H x 2-1/4 W x 2-1/2 D in. (60 x 57 x 63 mm).                                                |

Typical Applications



1. When internal restrictor is used, AKS-1100 must be located within 200 ft. (61 m) of receiver-controller.
2. When external restrictor is used, AKS-1100 must be located within 1000 ft. (305 m) of receiver-controller, and the restrictor must be located within 200 ft. (61 m) of the transmitter (preferably at the transmitter’s location). Remove internal restrictor from receiver-controller and install blocking gasket.

Figure 1 Typical Setpoint Adjuster Application.

# Thermostats

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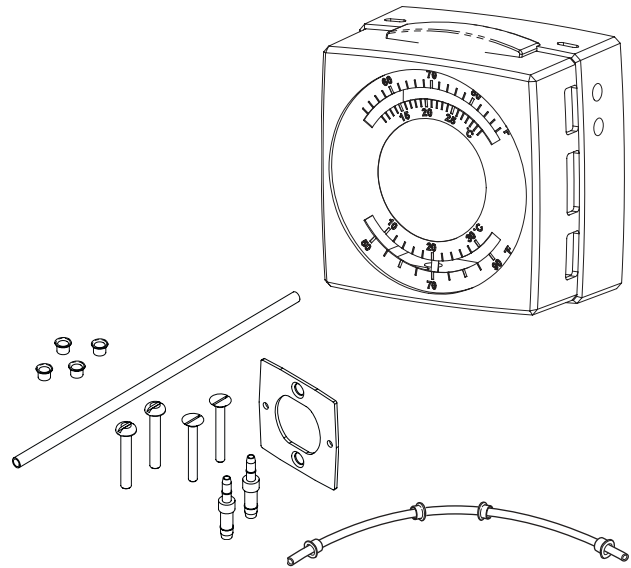
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### Room Thermostats

**These pneumatic room thermostats are designed for proportional temperature control of pneumatic valves and damper actuators to maintain room air temperatures in heating, ventilating, and air conditioning systems.**

#### Features:

- Small size, approximately 2 x 2 in. (51 x 51 mm).
- Factory calibrated. Stainless steel ball-in-seat provides pneumatic feedback for linear, stable operation.
- Easy-to-use throttling range adjustment and recalibration.
- Adjustable bimetal shows actual throttling range in both °F and °C. Adjustable 2 to 12°F (1 to 6.7°C).
- Setpoint (in both °F and °C) shown on thermostat body with cover removed.
- Leakproof, O-ring sealed, spring-loaded self-closing branch gauge tap.
- 2214 and 2216:
  - Separate factory-calibrated night bimetal and setpoint dial, with fixed 4 F° (2 C°) night throttling range for accurate “night” operation.
  - Snap-acting (not gradual) changeover from “day” to “night” operation and vice versa.
- 2216:
  - Third port (R) output with manual reset lever allows full restoration of day operation (typically, of unit ventilator), with either manual or automatic reset to day-night schedule.
- 2218:
  - Snap-acting (not gradual) changeover from direct-action to reverse-action and vice versa.



| Model Chart |                    |                           |                                             |                                                                                                                                                                                                         |  |
|-------------|--------------------|---------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Model No.   | Replaces Model No. | Dial Range °F (°C)        | Air Consumption                             | Description (Refer to Following Pages for More Detail)                                                                                                                                                  |  |
| 2211-012    | T12-301            | 55 to 85 (13 to 29)       | 0.017 scfm at 20 psig (0.48 L/m at 138 kPa) | Single temperature, one-pipe, D.A.                                                                                                                                                                      |  |
| 2211-013    | T13-301            |                           |                                             | Single temperature, one-pipe, R.A.                                                                                                                                                                      |  |
| 2212-118    | T18-301            | 55 to 85 (13 to 29)       | 15.6 scim at 20 psig (4.2 mL/s at 138 kPa)  | Single temperature, two-pipe, D.A., throttling range adjustable 2° to 12°.                                                                                                                              |  |
| 2212-119    | T19-301            |                           |                                             | Single temperature, two-pipe, R.A., throttling range adjustable 2° to 12°.                                                                                                                              |  |
| 2212-618    | —                  |                           |                                             | Single temperature, two-pipe, R.A., throttling range adjustable 2° to 12° (includes 20-023).                                                                                                            |  |
| 2212-619    | —                  |                           |                                             |                                                                                                                                                                                                         |  |
| 2214-121    | T23-301            | Day 55 to 85 (13 to 29)   | 29.4 scim at 16 psig (8.0 mL/s at 110 kPa)  | Day-Night Thermostat, two-pipe, D.A. 16 psig (110 kPa) day, 25 psig (172 kPa) night.                                                                                                                    |  |
|             |                    | Night 50 to 80 (10 to 27) | 43.2 scim at 25 psig (11.8 mL/s at 172 kPa) |                                                                                                                                                                                                         |  |
| 2214-122    | T24-301            | Day 55 to 85 (13 to 29)   | 29.4 scim at 16 psig (8.0 mL/s at 110 kPa)  | Day-Night Thermostat, two-pipe, R.A. 16 psig (110 kPa) day, 25 psig (172 kPa) night.                                                                                                                    |  |
|             |                    | Night 50 to 80 (10 to 27) | 43.2 scim at 25 psig (11.8 mL/s at 172 Kpa) |                                                                                                                                                                                                         |  |
| 2216-126    | T27-301            | Day 55 to 85 (13 to 29)   | 29.4 scim at 16 psig (8.0 mL/s at 110 kPa)  | Day-Night Thermostat, three-pipe, with manual reset lever D.A. 16 psig (110 kPa) day, D.A. 25 psig (172 kPa) night.                                                                                     |  |
|             |                    | Night 50 to 80 (10 to 27) | 43.2 scim at 25 psig (11.8 mL/s at 172 Kpa) |                                                                                                                                                                                                         |  |
| 2218-132    | T32-301            | 55 to 85 (13 to 29)       | 31.1 scim at 16 psig (8.5 mL/s at 110 kPa)  | Summer-Winter, throttling range adjustable 2° to 12°. 16 psig (110 kPa) Main — R.A., Summer. 25 psig (172 kPa) Main — D.A., Winter. (Can be used with 8 psig summer main if recalibrated in the field.) |  |
|             |                    |                           | 43.2 scim at 25 psig (11.8 mL/s at 172 Kpa) |                                                                                                                                                                                                         |  |
| 2218-134    | T32-321            |                           | 22.5 scim at 13 psig (6.1 mL/s at 90 kPa)   | Summer-Winter Thermostat for use with Honeywell 13 to 18 psig Systems. 13 psig (89 kPa) Main — R.A., Summer. 18 psig (124 kPa) Main — D.A., Winter.                                                     |  |
|             |                    |                           | 34.5 scim at 18 psig (9.4 mL/s at 124 kPa)  |                                                                                                                                                                                                         |  |
| 2218-133    | T33-301            |                           | 29.4 scim at 15 psig (8 mL/s at 103 kPa)    | Summer-Winter Thermostat for use with Johnson main air systems. 25 psig (172 kPa) Main — R.A., Summer. 16 psig ( 110 kPa) Main — D.A., Winter.                                                          |  |
|             |                    |                           | 34.5 scim at 20 psig (9.4 mL/s at 138 Kpa)  |                                                                                                                                                                                                         |  |

Note: Includes 1/4" by 3/16" barbed couplings, 20-693 tubing kit, 22-024 standard mounting kit, 20-928 gray plastic cover with F/C listing.

## 2211 through 2218 Series

### Specifications

|                            |                                                                                                                                                    |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Action</b>              | Proportional; refer to Model Chart.                                                                                                                |
| <b>Setpoint range</b>      | 55 to 85°F (13 to 29°C).                                                                                                                           |
| <b>Throttling range</b>    | 2 to 12°F/12 psi (1.1 to 6.7°C/83 kPa) adjustable, factory set 3°F (1.7 °C) [night, 3 to 5°F/12 psi (1.7 to 2.7°C/83 kPa), non-adjustable].        |
| <b>Construction</b>        |                                                                                                                                                    |
| <b>Components</b>          | Die cast aluminum, stainless steel, and glass-filled nylon.                                                                                        |
| <b>Diaphragms</b>          | Fabric-reinforced neoprene.                                                                                                                        |
| <b>Air filter</b>          | Internal.                                                                                                                                          |
| <b>Supply air pressure</b> | Clean, dry, oil free air required (Refer to EN-123).                                                                                               |
| <b>Nominal</b>             | Refer to Model Chart and Typical Applications.                                                                                                     |
| <b>Maximum</b>             | 30 psig (207 kPa).                                                                                                                                 |
| <b>Connections</b>         | For spring-reinforced 3/16 in. O.D. plastic tubing and required fittings.                                                                          |
| <b>Air consumption</b>     | Refer to Model Chart and Typical Applications.                                                                                                     |
| <b>Calibration point</b>   | 9 psig (62 kPa) branch line pressure when ambient temperature equals setpoint (except 2218-3x1 Series and 2218-133, 12 psig branch line pressure). |
| <b>Setpoint adjustment</b> | Serrated thumbwheel, external or concealed.                                                                                                        |
| <b>Mounting</b>            | Upright position on wall.                                                                                                                          |
| <b>Dimensions</b>          | 2-1/32 H x 2-1/32 W x 1-3/8 D in. (52 x 52 x 35 mm).                                                                                               |

### Accessories

| Part Number                                                      | Replaces Model | Description                                                |
|------------------------------------------------------------------|----------------|------------------------------------------------------------|
| <b>Accessories</b>                                               |                |                                                            |
| 20-660                                                           | 6-441          | Cover screw (included with thermostat).                    |
| 20-707                                                           | 10-53          | Metal thermostat guard.                                    |
| 20-715                                                           | 10-62          | Clear thermostat guard.                                    |
| 21-876                                                           | 10-76          | Opaque thermostat guard.                                   |
| 21-928                                                           | —              | Gray plastic cover, blank dial.                            |
| 21-933                                                           | —              | Gray plastic cover, °F/°C dial (included with thermostat). |
| 21-933-1                                                         | —              | Gray plastic cover, Day/Night dial.                        |
| <b>Calibration</b>                                               |                |                                                            |
| 20-881                                                           | N2-4           | Calibration wrench.                                        |
| 22-138                                                           | MCS-GA         | Branch tap gauge adaptor.                                  |
| 900-002                                                          | —              | Thermostat calibration kit.                                |
| <b>Installation</b>                                              |                |                                                            |
| 10-82-SS                                                         | —              | Outlet box mounting plate, stainless steel.                |
| 20-850                                                           | 10-82          | Outlet box mounting plate, black.                          |
| 20-642                                                           | 6-371          | Mounting ring.                                             |
| 21-473                                                           | 10-73          | Snap-in drywall mounting bracket.                          |
| 22-021                                                           | —              | Universal drywall mounting kit.                            |
| 22-022                                                           | N5-95          | Competitor replacement mounting kit.                       |
| 22-024                                                           | —              | Standard mounting kit (included with thermostat).          |
| 22-693                                                           | —              | Tubing kit (included with thermostat).                     |
| <b>Only for 2212-118, 2212-119, 2211-012, 2211-013, 2214-121</b> |                |                                                            |
| 20-712                                                           | 10-59          | Dial stop kit.                                             |
| <b>Only for 2212-61x</b>                                         |                |                                                            |
| 21-930                                                           | —              | White cover.                                               |
| 22-023                                                           | —              | Thermostat conversion kit, white.                          |

For additional information, refer to Accessories on page 124.

Typical Applications

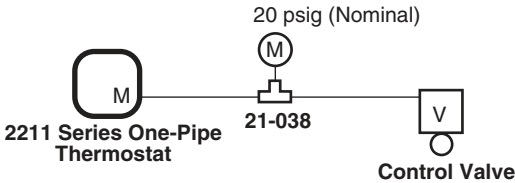


Figure 1 2211 Typical Application.

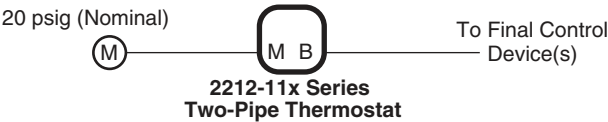


Figure 2 2212-11x Typical Application.

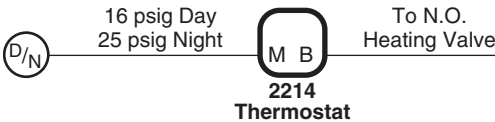


Figure 3 2214 Typical Application.

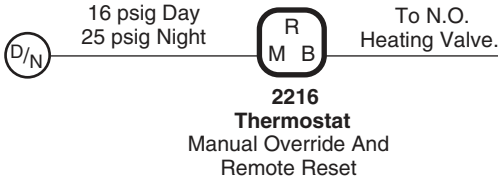


Figure 4 2216 Typical Two Pipe Application.

Thermostats

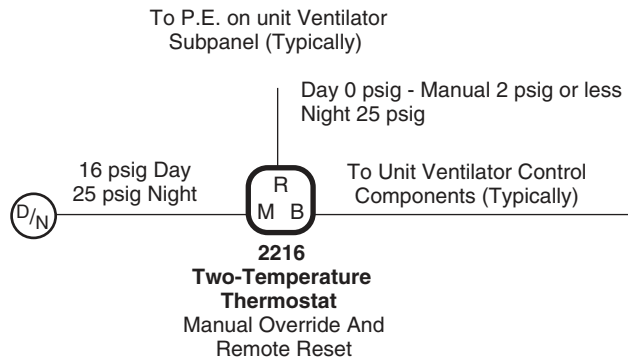


Figure 5 2216 Typical Three Pipe Application.

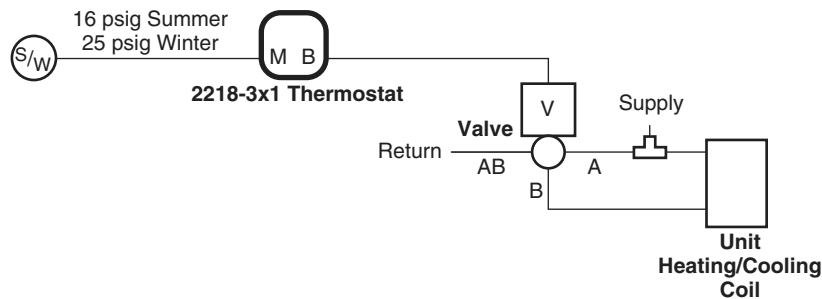


Figure 6 2218-3x1 Typical Application.

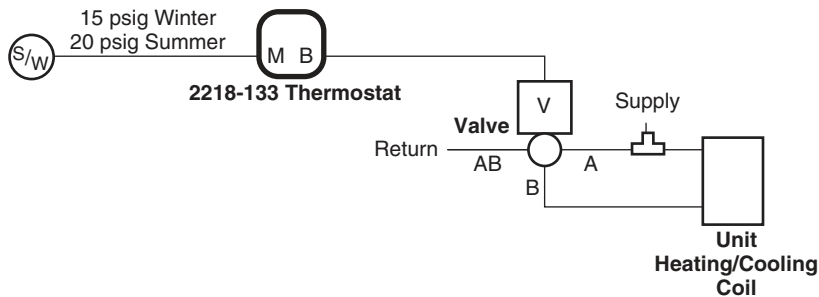


Figure 7 2218-133 Typical Application.

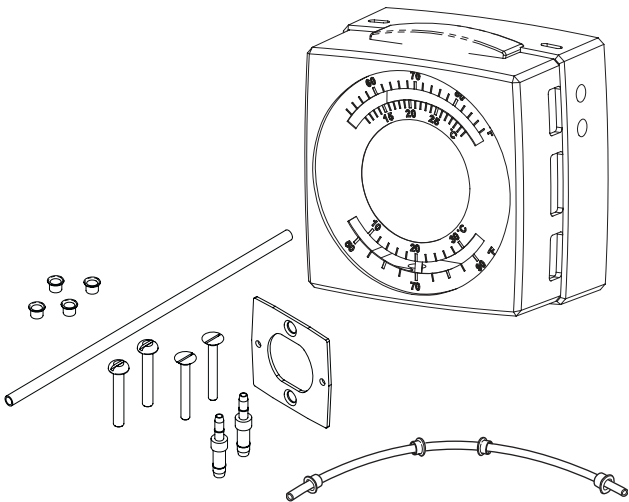
Thermostats

# Dual Setpoint/Deadband Room Thermostat

The dual setpoint/deadband pneumatic room thermostats are designed for the proportional control of pneumatic valves, damper actuators, and other control devices. With this product, the HVAC system uses no energy between pre-selected heating and cooling setpoints.

Features:

- Factory calibrated. Stainless steel ball-in-seat provides pneumatic feedback for linear, stable operation.
- Deadband is set by setting desired heating and cooling setpoints.
- Deadband output pressure factory set at 8 psig (55 kPa); field adjustable.
- Leakproof, O-Ring-sealed, spring-loaded self-closing branch gauge tap.



| Model Chart |                    |                          |
|-------------|--------------------|--------------------------|
| Model No.   | Replaces Model No. | Description              |
| 2212-318    | T35-301            | Refer to Specifications. |
| 2212-319    | T36-301            |                          |

Note: Includes 1/4" by 3/16" barbed couplings, 20-693 tubing kit, 22-024 standard mounting kit, 20-928 gray plastic cover with F/C listing.

| Specifications   |                                                                             |
|------------------|-----------------------------------------------------------------------------|
| Action           | Proportional, with deadband.                                                |
| 2212-318         | Direct.                                                                     |
| 2212-319         | Reverse.                                                                    |
| Setpoint range   |                                                                             |
| Heating          | 57 to 75°F (14 to 24°C).                                                    |
| Cooling          | 65 to 83°F (18 to 28°C).                                                    |
| Throttling range | Approximately 1.5°F/5 psi (0.8°C/0.7 kPa) for each setpoint non-adjustable. |

Thermostats

Specifications (Continued)

|                                                                                              |                                                                                |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Construction                                                                                 |                                                                                |
| Components                                                                                   | Die cast aluminum, stainless steel, and glass-filled nylon.                    |
| Diaphragms                                                                                   | Fabric-reinforced neoprene.                                                    |
| Air filter                                                                                   | Internal.                                                                      |
| Supply air pressure                                                                          |                                                                                |
| Operating                                                                                    | 20 psig (138 kPa).                                                             |
| Maximum                                                                                      | 30 psig (207 kPa).                                                             |
| Connections                                                                                  |                                                                                |
| Air consumption                                                                              | 29.4 scim at 20 psig (8.0 mL/s at 138 kPa) main air pressure.                  |
| Calibration point                                                                            |                                                                                |
| Deadband output                                                                              | Factory set at 8 psig (adjustable).                                            |
| Direct acting 2212-318                                                                       | Heating: 4 psig (28 kPa) at setpoint. Cooling: 10.5 psig (72 kPa) at setpoint. |
| Reverse acting 2212-319                                                                      | Cooling: 4 psig (28 kPa) at setpoint. Heating: 10.5 psig (72 kPa) at setpoint. |
| Setpoint adjustment                                                                          |                                                                                |
| Individual concealed adjustments or heating and cooling by means of 20-881 calibration tool. |                                                                                |
| Mounting                                                                                     |                                                                                |
| Upright position on wall.                                                                    |                                                                                |
| Dimensions                                                                                   |                                                                                |
| 2-1/32 H x 2-1/32 W x 1-3/8 D in. (52 x 52 x 35 mm).                                         |                                                                                |

Accessories

| Part Number  | Replaces Model | Description                                                |
|--------------|----------------|------------------------------------------------------------|
| Accessories  |                |                                                            |
| 20-660       | 6-441          | Cover screw (included with thermostat).                    |
| 20-707       | 10-53          | Metal thermostat guard.                                    |
| 20-715       | 10-62          | Clear thermostat guard.                                    |
| 21-876       | 10-76          | Opaque thermostat guard.                                   |
| 21-928       | —              | Gray plastic cover, blank dial.                            |
| 21-933       | —              | Gray plastic cover, °F/°C dial (included with thermostat). |
| 21-933-1     | —              | Gray plastic cover, Day/Night dial.                        |
| Calibration  |                |                                                            |
| 20-881       | N2-4           | Calibration wrench.                                        |
| 22-138       | MCS-GA         | Branch tap gauge adaptor.                                  |
| 900-002      | —              | Thermostat calibration kit.                                |
| Installation |                |                                                            |
| 10-82-SS     | —              | Outlet box mounting plate, stainless steel.                |
| 20-850       | 10-82          | Outlet box mounting plate, black.                          |
| 20-642       | 6-371          | Mounting ring.                                             |
| 21-473       | 10-73          | Snap-in drywall mounting bracket.                          |
| 21-930       | —              | White cover.                                               |
| 22-021       | —              | Universal drywall mounting kit.                            |
| 22-022       | N5-95          | Competitor replacement mounting kit.                       |
| 22-023       | —              | Thermostat conversion kit, white.                          |
| 22-024       | —              | Standard mounting kit (included with thermostat).          |
| 22-693       | —              | Tubing kit (included with thermostat).                     |

For additional information, refer to Accessories on page 124.

Typical Applications

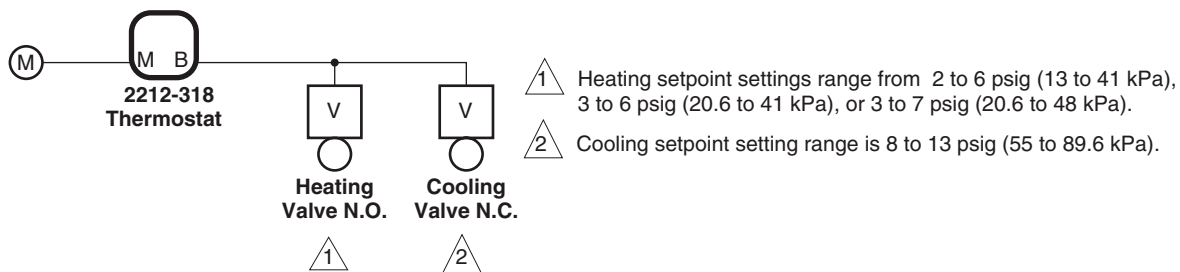


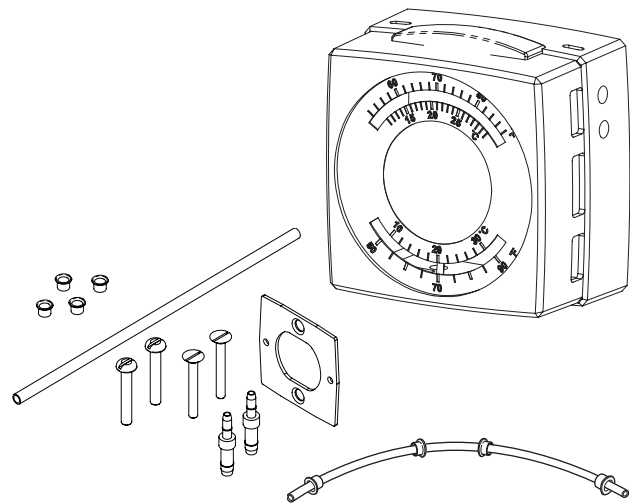
Figure 1 Typical Application.

# Energy Conservation Summer-Winter Room Thermostat

This pneumatic room thermostat is designed for proportional control of pneumatic valves and damper actuators in environmental control systems where a dual pressure air main is utilized for seasonal changeover of heating and cooling functions. Its design incorporates a highly sensitive, bimetal, thermostatic element and a pilot operated relay with pneumatic feedback for accuracy and stability over the entire operating range.

## Features:

- Small size: Approximately 2 x 2 in. (51 x 51 mm).
- Factory calibrated. Stainless steel ball-in-seat provides pneumatic feedback for linear, stable operation.
- Leakproof, O-Ring sealed, spring-loaded self-closing branch gauge tap.
- Separate bimetals (and setpoint scales) for heating and cooling.
- Limited setpoint ranges for energy conservation: 44 to 74°F (7 to 23°C) for winter (heating) and 76 to 85°F (24.5 to 29.5°C) for summer (cooling).
- Snap-acting (not gradual) changeover from direct action to reverse action, and vice versa.
- Concealed or visible adjustment. Image shows concealed adjustment.



## Model Chart

| Model No. | Replaces Model No. | Description              |
|-----------|--------------------|--------------------------|
| 2218-301  | T34-3011           | Refer to Specifications. |

Note: Includes 1/4" by 3/16" barbed couplings, 20-693 tubing kit, 22-024 standard mounting kit, 20-928 gray plastic cover with F/C listing.

| Specifications      |                                                                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Action              | Proportional: R.A. at 15 psig (103 kPa) , D.A at 20 psig (138 kPa).                                                               |
| Setpoint range      | 44 to 74°F (7 to 23°C) winter (internal); 76 to 85°F(24 to 29°C) summer (adjustable by thumbwheel); factory installed dial stops. |
| Throttling range    | 4 F° (2.2 C°) fixed.                                                                                                              |
| Construction        |                                                                                                                                   |
| Components          | Die cast aluminum, stainless steel and glass-filled nylon.                                                                        |
| Diaphragms          | Fabric-reinforced neoprene.                                                                                                       |
| Air filter          | Internal.                                                                                                                         |
| Supply air pressure |                                                                                                                                   |
| Summer              | 16 psig (110 kPa).                                                                                                                |
| Winter              | 25 psig (172 kPa).                                                                                                                |
| Connections         | For spring-reinforced 3/16 in. plastic tubing and required fittings (included).                                                   |
| Air consumption     | 34.6 scim at 16 psig (9.4 mL/s at 110 kPa); 51 scim at 25 psig (14.2 mL/s at 172 kPa).                                            |
| Calibration point   | 9 psig (62 kPa) branch line pressure.                                                                                             |
| Setpoint adjustment | Serrated thumbwheel, visable or concealed.                                                                                        |
| Mounting            | Upright position on wall.                                                                                                         |
| Dimensions          | 2-1/32 H x 2-1/32 W x 1-3/8 D in. (52 x 52 x 35 mm).                                                                              |

| Accessories  |                |                                                            |
|--------------|----------------|------------------------------------------------------------|
| Part Number  | Replaces Model | Description                                                |
| Accessories  |                |                                                            |
| 20-660       | 6-441          | Cover screw (included with thermostat).                    |
| 20-707       | 10-53          | Metal thermostat guard.                                    |
| 20-715       | 10-62          | Clear thermostat guard.                                    |
| 21-876       | 10-76          | Opaque thermostat guard.                                   |
| 21-928       | —              | Gray plastic cover, blank dial.                            |
| 21-933       | —              | Gray plastic cover, °F/°C dial (included with thermostat). |
| 21-933-1     | —              | Gray plastic cover, Day/Night dial.                        |
| Calibration  |                |                                                            |
| 20-881       | N2-4           | Calibration wrench.                                        |
| 22-138       | MCS-GA         | Branch tap gauge adaptor.                                  |
| 900-002      | —              | Thermostat calibration kit.                                |
| Installation |                |                                                            |
| 10-82-SS     | —              | Outlet box mounting plate, stainless steel.                |
| 20-850       | 10-82          | Outlet box mounting plate, black.                          |
| 20-642       | 6-371          | Mounting ring.                                             |
| 21-473       | 10-73          | Snap-in drywall mounting bracket.                          |
| 21-930       | —              | White cover.                                               |
| 22-021       | —              | Universal drywall mounting kit.                            |
| 22-022       | N5-95          | Competitor replacement mounting kit.                       |
| 22-023       | —              | Thermostat conversion kit, white.                          |
| 22-024       | —              | Standard mounting kit (included with thermostat).          |
| 22-693       | —              | Tubing kit (included with thermostat).                     |

For additional information, refer to Accessories on page 124.

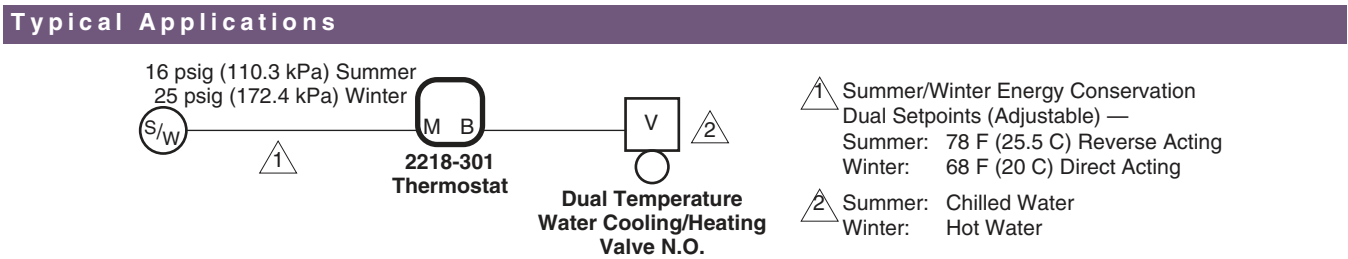


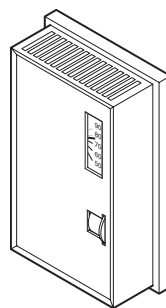
Figure 1 Typical Application.

## Single Setpoint Room Thermostats

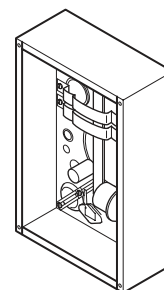
For proportional temperature control of pneumatic valves and damper actuators to maintain room air temperatures in heating, ventilating, and air conditioning systems.

### Features:

- Branch-line to sensing-element pneumatic feedback for linear, stable operation.
- Plastic cover supplied with exposed setpoint and thermometer.
- Cover inserts included for:
  - Exposed setpoint only.
  - Blank face plate with logo.



TK-1xx1



**TK-1xxx-600  
Aspirated Thermostat**  
(Shown in aspirated box without cover)

### Model Chart

| Model No.             | Dial Markings <sup>a</sup> | Control Action <sup>b</sup><br>Supply Pressure  | Type Thermostat                 |
|-----------------------|----------------------------|-------------------------------------------------|---------------------------------|
| TK-1001               | 55 to 85°F                 | Direct Acting                                   | Two pipe                        |
| TK-1001-116           | 13 to 29°C                 |                                                 |                                 |
| TK-1001-600           | 55 to 85°F                 |                                                 |                                 |
| TK-1101               | 55 to 85°F                 | Reverse Acting                                  |                                 |
| TK-1101-116           | 13 to 29°C                 |                                                 |                                 |
| TK-1101-600           | 55 to 85°F                 |                                                 |                                 |
| TK-1201               | 55 to 85°F                 | 15 psig Reverse Acting<br>20 psig Direct Acting |                                 |
| TK-1281               | 55 to 85°F                 | 20 psig ReverseActing<br>15 psig Direct Acting  |                                 |
| TK-1301 <sup>c</sup>  | 55 to 85°F                 | Direct Acting<br>15 psig day – 20 psig night    | Two pipe with manual override   |
| TK-1301-116           | 13 to 29°C                 |                                                 |                                 |
| TK-1381               | 55 to 85°F                 | Reverse Acting<br>15 psig day – 20 psig night   |                                 |
| TK-1601 <sup>cd</sup> | 55 to 85°F                 | Direct Acting<br>15 psig day – 20 psig night    | Three pipe with manual override |
| TK-5001               | 55 to 85°F                 | Direct Acting                                   | Single Pipe                     |
| TK-5001-116           | 13 to 29°C                 |                                                 |                                 |
| TK-5101               | 55 to 85°F                 | Reverse Acting                                  |                                 |
| TK-5101-116           | 13 to 29°C                 |                                                 |                                 |

<sup>a</sup> Dial stop pins included to limit dual range on all units.

<sup>b</sup> Direct Acting (D.A.) increases output pressure on temperature rise. Reverse Acting (R.A.) decreases output pressure on temperature rise.

<sup>c</sup> A manual lever is provided to change the thermostat to "Day" when the system is on "Night". The lever can be used to return to "Night" or the next cycle will return the thermostat to normal operation.

<sup>d</sup> Has second white plastic tube to pass full line pressure (20 psi) at night and 0 psi at day. Used to actuate items such as pressure electric switches.

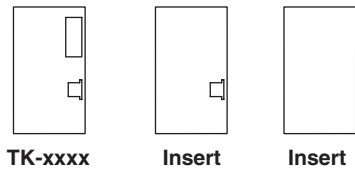


Figure 1 Cover.

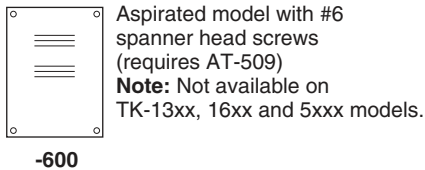


Figure 2 Aspirated Thermostat Cover.

Thermostats

| Specifications                            |                                                                 |
|-------------------------------------------|-----------------------------------------------------------------|
| Thermostat                                | Proportional type.                                              |
| Sensing element                           | Bimetal.                                                        |
| Night setback                             | To 20°F (11°C) below day setpoint for Day/Night heating models. |
| Night setup                               | To 20°F (11°C) above day setpoint for Day/Night cooling models. |
| Control dial range                        | Refer to Model Chart.                                           |
| Throttling Range                          | Adjustable 2 to 10°F/10 psi, factory set at 4°F/10 psi.         |
| Output air signal                         | 0.5 psig to supply air pressure -0.5 psig.                      |
| Action                                    | Refer to Model Chart.                                           |
| Ambient limits                            |                                                                 |
| Shipping                                  | -40 to 150°F (-40 to 65°C). 0 to 98% RH, non-condensing.        |
| Operating                                 | 40 to 150°F (4 to 65°C). 10 to 98% RH, non-condensing.          |
| Supply air pressure                       | Clean, oil free, dry air required (refer to EN-123).            |
| Nominal                                   | Refer to Model Chart.                                           |
| Maximum                                   | 30 psig (207 kPa).                                              |
| Air connections                           |                                                                 |
| Main (black)                              | 5/32 in. dia. spring reinforced plastic tubing.                 |
| Branch (white)                            | 5/32 in. dia. spring reinforced plastic tubing.                 |
| Air consumption for sizing air compressor |                                                                 |
| TK-1001, 1101, 12x1, 13x1                 | 13.8 scim (3.8 mL/s).                                           |
| Air capacity for sizing air mains         |                                                                 |
| TK-1001, 1101, 12x1, 13x1,                | 16 scim (4.4 mL/s).                                             |
| TK-16x1                                   | 32 scim (8.8 mL/s).                                             |
| Cover                                     | Beige plastic.                                                  |
| Mounting                                  | Upright position on wall.                                       |
| Dimensions                                | 4-3/8 H x 2-3/4 W x 1-5/8 D in. (111 x 70 x 43 mm).             |

Accessories

| Part Number              | Description                                                                                                |
|--------------------------|------------------------------------------------------------------------------------------------------------|
| 20-944                   | Restrictor tee, copper tubing.                                                                             |
| 21-038                   | Restrictor tee, polyethylene tubing.                                                                       |
| 21-153                   | In-line restrictor.                                                                                        |
| AT-11-600                | Aspirating conversion kit.                                                                                 |
| AT-11-1                  | Replacement kit fittings.                                                                                  |
| AT-11-500                | Fahrenheit cover kit.                                                                                      |
| AT-11-501                | Celcius cover kit.                                                                                         |
| AT-12-500                | Fahrenheit cover kit for TK-13xx and TK-16xx.                                                              |
| AT-12-501                | Celcius cover kit for TK-13xx and TK-16xx.                                                                 |
| AT-101                   | Lock cover kit.                                                                                            |
| AT-104 <sup>a</sup>      | Dial stop pins.                                                                                            |
| AT-504                   | Plaster hole cover (small).                                                                                |
| AT-505                   | Surface mounting base.                                                                                     |
| AT-506                   | Pneumatic wall box fitting (two tubes for TK-100x and 110x).                                               |
| AT-533-101               | Adaptor 1/4 in. plastic to 5/32 in. plastic.                                                               |
| AT-533-127               | Adaptor 3/16 in. copper or 1/4 in. copper with 1/4 in. solder coupling (not included) to 5/32 in. plastic. |
| AT-536                   | Pneumatic wall thermostat conversion kit.                                                                  |
| AT-546                   | Auxiliary mounting base.                                                                                   |
| TOOL-015                 | Spanner head driver to #6 spanner head screws.                                                             |
| TOOL-095-1               | Pneumatic calibration tool kit.                                                                            |
| <b>Maintenance Parts</b> |                                                                                                            |
| APNT-011-11              | Black tubing 9 inch.                                                                                       |
| APNT-011-21              | White tubing 9 inch.                                                                                       |
| APNT-093-30              | Tubing spring.                                                                                             |
| AT-520-11                | Relay repair kit.                                                                                          |
| AT-512-10                | Replacement auxiliary nozzle kit.                                                                          |
| AT-527                   | Pilot restrictor kit for aspirated (-600) models.                                                          |
| AT-528                   | Pilot restrictor kit for non-aspirated models.                                                             |
| PKG-1019                 | Mounting hardware kit.                                                                                     |

<sup>a</sup> All thermostats are shipped with two dial stop pins.

Typical Applications

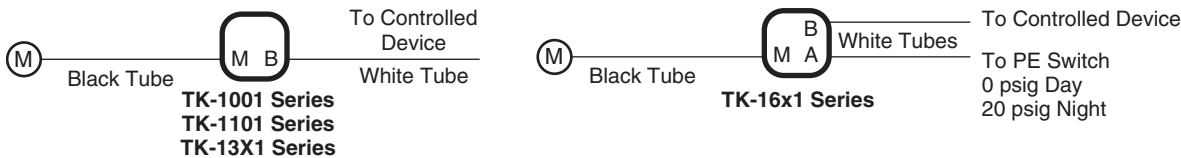


Figure 3 Two Pipe (Relay) Type.

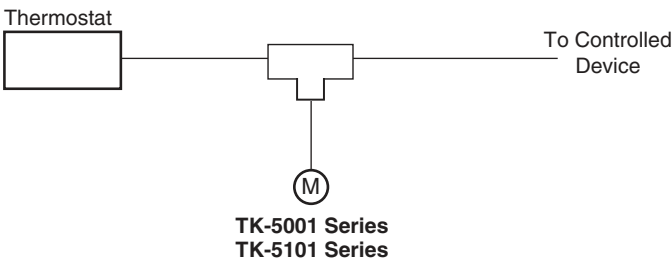


Figure 4 Single Pipe Type.

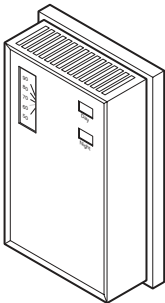
Thermostats

Dual Setpoint, Single Output Room Thermostats

For proportional control of pneumatic-actuated valves and damper actuators to maintain room air temperatures in heating, ventilating, and air conditioning systems.

Features:

- Branch-line to sensing-element pneumatic feedback for linear, stable operation.
- Plastic cover supplied with exposed setpoint and thermometer.
- Cover insert included with a blank face plate with logo.

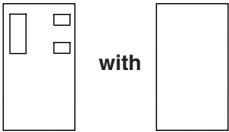


TK-17xx

Model Chart

| Model No.                       | 15 psig Supply Pressure |                             |                           | 20 psig Supply Pressure <sup>a</sup> |                             |              |
|---------------------------------|-------------------------|-----------------------------|---------------------------|--------------------------------------|-----------------------------|--------------|
|                                 | Dial Range <sup>b</sup> | Control Action <sup>c</sup> | Cover Legend <sup>d</sup> | Dial Range <sup>b</sup>              | Control Action <sup>c</sup> | Cover Legend |
| TK-1717                         | 55 to 85°F              | Direct                      | Heat                      | 55 to 85°F                           | Direct                      | Cool         |
| TK-1727                         |                         | Reverse                     |                           |                                      | Reverse                     |              |
| TK-1731                         |                         | Reverse                     |                           |                                      | Direct                      |              |
| TK-1741                         |                         | Direct                      |                           |                                      | Reverse                     |              |
| TK-1711<br>TK-1751 <sup>e</sup> |                         | Direct                      | Day                       |                                      | Direct                      | Night        |
| TK-1721<br>TK-1761              |                         | Reverse                     |                           |                                      | Reverse                     |              |

- <sup>a</sup> 22 psi required if setpoints are more than 20°F apart.
- <sup>b</sup> Control dial is marked in °F on one side and °C on the other side. Units have built-in stops that can limit high and/or low setting of each dial.
- <sup>c</sup> Direct Acting (D.A.) — Increase output pressure on temperature rise.  
Reverse Acting (R.A.) — Decrease output pressure on temperature rise.
- <sup>d</sup> For additional options or to reverse heat/cool legend, order cover replacement kit AT-46-500 Heat/Cool, Cool/Heat or Day/Night.
- <sup>e</sup> Units include a manual override lever for overriding 22 psig (152 kPa) operation and placing control into 15 psig (103 kPa) control mode when unit is supplied with 22 psig (152 kPa). Lever automatically resets when supply pressure is reduced to 15 psig (103 kPa).



Insert

Figure 1 Covers.

## Specifications

|                                                  |                                                                                                                             |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Thermostat</b>                                | Proportional two pipe type. Two pressure Heating/Cooling or Day/Night thermostats switch between two bimetal sensors.       |
| <b>Sensing element</b>                           | Two bimetals.                                                                                                               |
| <b>Control dial range</b>                        | Two independent with stops. Refer to Model Chart.                                                                           |
| <b>Throttling range</b>                          | Independently adjustable for each setpoint dial 2 to 10°F/10 psi change in branch line pressure, factory set at 4°F/10 psi. |
| <b>Output air signal</b>                         | 0.5 psig (3.4 kPa) to supply air -0.5 psig (-3.4 kPa).                                                                      |
| <b>Action</b>                                    | Refer to Model Chart.                                                                                                       |
| <b>Ambient limits</b>                            |                                                                                                                             |
| <b>Shipping</b>                                  | -40 to 150°F (-40 to 65°C). 0 to 98% R.H., non-condensing.                                                                  |
| <b>Operating</b>                                 | 20 to 115°F (-7 to 46°C). 10 to 98% R.H., non-condensing.                                                                   |
| <b>Supply air pressure</b>                       | Clean, oil free, dry air required (refer to EN-123).                                                                        |
| <b>Requires</b>                                  | 15 and 22 psig (103 and 152 kPa) dual pressure. Refer to Model Chart.                                                       |
| <b>Maximum</b>                                   | 30 psig (207 kPa).                                                                                                          |
| <b>Air connections</b>                           |                                                                                                                             |
| <b>Main (black)</b>                              | 5/32 in. dia. spring reinforced plastic tubing.                                                                             |
| <b>Branch (white)</b>                            | 5/32 in. dia. spring reinforced plastic tubing.                                                                             |
| <b>Air consumption for sizing air compressor</b> | 13.8 scim (3.8 mL/s).                                                                                                       |
| <b>Air capacity for sizing air mains</b>         | 80 scim (21.8 mL/s).                                                                                                        |
| <b>Cover</b>                                     | Beige plastic with inserts as standard except aspirated model. Aspirated model has brushed stainless steel covers.          |
| <b>Mounting</b>                                  | Upright position on wall.                                                                                                   |
| <b>Dimensions</b>                                | 4-3/8 H x 2-3/4 W x 1-5/8 D in. (111 x 70 x 43 mm).                                                                         |

## Accessories

| Part Number              | Description                                                                                                |
|--------------------------|------------------------------------------------------------------------------------------------------------|
| 20-944                   | Restrictor tee, copper tubing.                                                                             |
| 21-038                   | Restrictor tee, polyethylene tubing                                                                        |
| 21-153                   | In-line restrictor.                                                                                        |
| AT-11-600                | Aspirating conversion kit.                                                                                 |
| AT-11-1                  | Replacement kit fittings.                                                                                  |
| AT-46-500                | Dual setpoint cover kit with Day/Night, Heat/Cool, Cool/Heat and blank insert with logo.                   |
| AT-47-500                | Dual setpoint cover kit with Day/Night and manual override switch.                                         |
| AT-504                   | Plaster hole cover.                                                                                        |
| AT-505                   | Surface mounting base.                                                                                     |
| AT-506                   | Pneumatic wall box fitting.                                                                                |
| AT-509                   | Wall box required for aspirated thermostats.                                                               |
| AT-536                   | Pneumatic wall thermostat conversion kit.                                                                  |
| AT-546                   | Auxiliary mounting base.                                                                                   |
| AT-533-101               | Adapter 1/4 in. plastic to 5/32 in. plastic.                                                               |
| AT-533-127               | Adapter 3/16 in. copper or 1/4 in. copper with 1/4 in. solder coupling (not included) to 5/32 in. plastic. |
| AT-533-129               | 5/32" x 5/32" barbed brass connector.                                                                      |
| TOOL-015                 | Spanner head driver for #6 spanner head screws.                                                            |
| TOOL-080-1               | Calibration tool.                                                                                          |
| TOOL-095-1               | Pneumatic calibration tool kit.                                                                            |
| <b>Maintenance Parts</b> |                                                                                                            |
| APNT-011-11              | Black tubing 9 inch.                                                                                       |
| APNT-011-21              | White tubing 9 inch.                                                                                       |
| APNT-093-30              | Tubing spring.                                                                                             |
| AT-520-11                | Relay repair kit.                                                                                          |
| AT-512-10                | Replacement auxiliary nozzle kit.                                                                          |
| AT-527                   | Pilot restrictor kit for aspirated (-600) models.                                                          |
| AT-528                   | Pilot restrictor kit for non-aspirated models.                                                             |
| PKG-1019                 | Mounting hardware kit.                                                                                     |

Typical Applications



Figure 2 Typical Application.

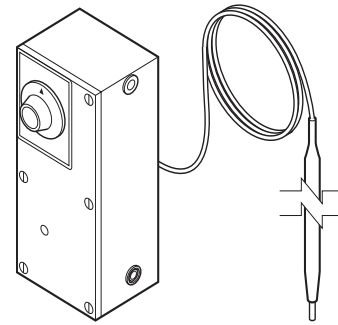
Thermostats

## Unitary Bulb Thermostats

For proportional temperature control of pneumatic valves and actuators to maintain discharge temperature of reheat systems and sampling chamber or return air temperature of terminal units and as a proportional low limit thermostat.

### Features:

- Proportional, two-pipe nozzle and flapper design.
- One-pipe model available for use as low-limit controller.
- Adjustable throttling range.
- Straight, coiled or averaging liquid-filled sensing elements.
- Rugged design.
- Direct Acting or DA/RA models available.



(Shown with straight bulb)

| Model Chart |                                                                                       |                                 |                                       |                                                                 |                                                                                                          |                                                                                |
|-------------|---------------------------------------------------------------------------------------|---------------------------------|---------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Model No.   | Description and Action <sup>a</sup><br>psi (kPa)                                      | Max. Safe Bulb Temp.<br>°F (°C) | Bulb Style Dimensions<br>in. (mm)     | Control Dial Range<br>°F (°C)                                   | Throttling Range                                                                                         | Supply Air Pressure<br>psig (kPa)                                              |
| TK-2001     | Heating<br>D.A. <sup>b</sup>                                                          | 140 (60)                        | Straight<br>1/4 x 11-1/2 (6.35 x 287) | Dial<br>Marked<br>“Cooler-<br>Warmer”<br>60 to 90<br>(15 to 32) | Adjustable<br>2 to 10°F (1 to 6°C)/<br>10 psi (69 kPa)<br>Factory Set<br>4°F (2°C)/<br>10 psi (69 kPa)   | 15 (103)<br>Minimum<br>20 (138)<br>Nominal                                     |
| TK-3001     |                                                                                       |                                 | Coiled<br>1 x 5 (25 x 127)            |                                                                 |                                                                                                          |                                                                                |
| TK-4001     |                                                                                       |                                 | Averaging<br>1/8 x 48 (3 x 1.2 m)     |                                                                 |                                                                                                          |                                                                                |
| TK-2201     | Heating-Cooling<br>20 (138) D.A.<br>15 (103) R.A.                                     |                                 | Straight<br>7/32 x 14 (6 x 356)       |                                                                 |                                                                                                          | 15 (103) R.A. <sup>a</sup><br>Cooling<br>20 (138) D.A. <sup>a</sup><br>Heating |
| TK-3201     |                                                                                       |                                 | Coiled<br>1 x 5 (25 x 127)            |                                                                 |                                                                                                          |                                                                                |
| TK-2012     | Heating<br>D.A. <sup>b</sup>                                                          | 230 (110)                       | Straight<br>3/16 x 11-1/4 (5 x 286)   | Dial<br>Marked<br>“Cooler-<br>Warmer”<br>30 to 90<br>(-1 to 32) | Adjustable<br>5 to 25°F (3 to 14°C)/<br>10 psi (69 kPa)<br>Factory Set<br>10°F (6°C)/<br>10 psi (69 kPa) | 15 (103)<br>Minimum<br>20 (138)<br>Nominal                                     |
| TK-4012     |                                                                                       |                                 | Averaging<br>3/32 x 54 (2 x 1.4 m)    |                                                                 |                                                                                                          |                                                                                |
| TK-4212     | Heating-Cooling<br>20 (138) D.A.<br>15 (103) R.A.                                     |                                 | Averaging<br>3/32 x 54 (2 x 1.4 m)    |                                                                 |                                                                                                          | 15 (103) R.A. <sup>a</sup><br>Cooling<br>20 (138) D.A. <sup>a</sup><br>Heating |
| TK-4212-201 | Heating-Cooling<br>Low Limit <sup>c</sup><br>20 (138) D.A.<br>Full Output<br>15 (103) |                                 | Averaging<br>3/32 x 54 (2 x 1.4 m)    |                                                                 |                                                                                                          | 15 (103)<br>Full Output<br>20 (138) D.A. <sup>a</sup><br>Heating               |

<sup>a</sup> Direct Acting (D.A.) — Increase output pressure on temperature rise.  
Reverse Acting (R.A.) — Decrease output pressure on temperature rise.

<sup>b</sup> Field changeable to reverse acting.

<sup>c</sup> At 20 psi (138 kPa) unit can bleed down a branch line from a controlling thermostat.  
At 15 psi (103 kPa) unit is inoperative, i.e., passes controlling thermostat signal.

| Specifications                            |                                                                                                          |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Thermostat                                | Proportional type using balanced lever system.                                                           |
| Sensing element                           | Liquid-filled copper with 3 ft. (914 mm) capillary.                                                      |
| Control dial range                        | Refer to Model Chart.                                                                                    |
| Throttling range                          | Refer to Model Chart.                                                                                    |
| Output air signal                         | 1 psig (6.9 kPa) to supply air pressure -1.0 psig (-6.9 kPa).                                            |
| Action                                    | Refer to Model Chart.                                                                                    |
| Ambient limits                            |                                                                                                          |
| Shipping                                  | -40 to 140°F (-40 to 60°C). 0 to 98% R.H., non-condensing.                                               |
| Case operating                            | 40 to 140°F (4 to 60°C). 10 to 98% R.H., non-condensing.                                                 |
| Bulb                                      | Refer to Model Chart.                                                                                    |
| Supply air pressure                       | Clean, oil free, dry air required (refer to EN-123).                                                     |
| Nominal                                   | Refer to Model Chart.                                                                                    |
| Minimum                                   | Refer to Model Chart.                                                                                    |
| Maximum                                   | 30 psig (207 kPa).                                                                                       |
| Air connections                           | Post with barb for 1/4 in. O.D. plastic tubing.                                                          |
| Air consumption for sizing air compressor | 27.6 scim (8 mL/s) at 15 psig (103 kPa), 41.5 scim (11 mL/s) at 20 psig (138 kPa).                       |
| Air capacity for sizing air mains         | 40 scim (11.1 mL/s) at 15 psig (103 kPa), 56 scim (15.7 mL/s) at 20 psig (138 kPa).                      |
| Mounting                                  | Directly by means of top mounting holes or with a right angle mounting bracket included with thermostat. |
| Case dimensions                           | 4-5/8 H x 2-1/8 W x 1-5/8 D in. (117 x 54 x 41 mm).                                                      |

| Accessories |                                 |
|-------------|---------------------------------|
| Part Number | Description                     |
| AT-11-600   | Aspirating kit.                 |
| AT-208      | Duct mounting kit.              |
| AT-529      | Restrictor kit.                 |
| TOOL-095-1  | Pneumatic calibration tool kit. |

Typical Applications

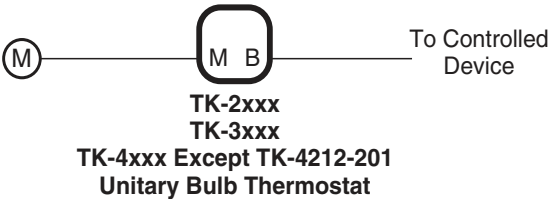
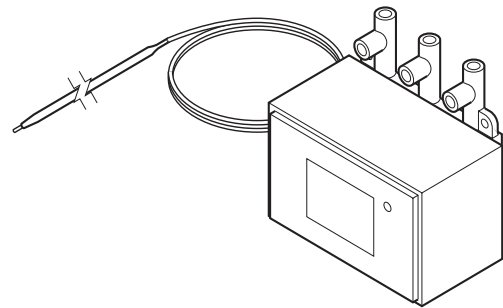


Figure 1 Typical Application.

Thermostats

## Relay Bulb Thermostats

For proportional temperature control of pneumatic valves and actuators to maintain air or liquid temperatures in duct, plenum chambers, liquid lines, tanks, etc. May also be used as a low limit thermostat.



TK-6024 Shown

### Features:

- Two-pipe (Main and Branch) controllers.
- Direct or Reverse Action.
- Liquid-filled sensing elements: Remote-bulb with 6 ft. (1.8 m) capillary, or 8 ft. (2.44 m) averaging element.
- Field-adjustable throttling range.

| Model Chart |                   |           |                                    |
|-------------|-------------------|-----------|------------------------------------|
| Model No.   | Action            | Bulb      |                                    |
|             |                   | Style     | Dimensions                         |
| TK-6024     | D.A. <sup>a</sup> | Straight  | 3/8 x 4-5/8 in. (9.5 x 117 mm).    |
| TK-8024     |                   | Averaging | 3/32 in. x 8 ft. (2.4 mm x 2.4 m). |
| TK-6124     | R.A. <sup>a</sup> | Straight  | 3/8 x 4-5/8 in. (9.5 x 117 mm).    |
| TK-8124     |                   | Averaging | 3/32 in. x 8 ft. (2.4 mm x 2.4 m). |

<sup>a</sup> Direct Acting (D.A.) — Increase output pressure on temperature rise.  
Reverse Acting (R.A.) — Decrease output pressure on temperature rise.

| Specifications                                   |                                                                                            |
|--------------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Thermostat</b>                                | Proportional two pipe type. Thermostats are ambient compensated.                           |
| <b>Sensing element</b>                           | Remote liquid-filled copper.                                                               |
| <b>Control dial range</b>                        | -20 to 240°F (-29 to 115°C). Shipped as -20 to 120°F, reverse side of dial 100 to 240°F.   |
| <b>Throttling range</b>                          | Adjustable 3 to 35°F/10 psi (2 to 19°C/69 kPa) change in output, factory set at 5°F (3°C). |
| <b>Output air signal</b>                         | 0.5 psig (3.4 kPa) to supply air pressure -0.5 psig (-3.4 kPa).                            |
| <b>Action</b>                                    | Refer to Model Chart.                                                                      |
| <b>Ambient limits</b>                            |                                                                                            |
| <b>Shipping</b>                                  | -40 to 150°F (-40 to 65°C). 0 to 98% R.H., non-condensing.                                 |
| <b>Case operating</b>                            | 40 to 150°F (4 to 65°C). 10 to 98% R.H., non-condensing.                                   |
| <b>Bulb</b>                                      | 310°F (154°C) maximum.                                                                     |
| <b>Supply air pressure</b>                       | Clean, oil free, dry air required (refer to EN-123).                                       |
| <b>Nominal</b>                                   | 20 psig (138 kPa).                                                                         |
| <b>Minimum</b>                                   | 15 psig (103 kPa).                                                                         |
| <b>Maximum</b>                                   | 30 psig (207 kPa).                                                                         |
| <b>Air connections</b>                           | 1/8 in. FNPT for main, branches, and AL-362 gages (not included).                          |
| <b>Air consumption for sizing air compressor</b> | 13.8 scim (3.8 mL/s).                                                                      |
| <b>Air capacity for sizing air mains</b>         | 16 scim (4.4 mL/s).                                                                        |
| <b>Mounting</b>                                  | Upright position on a wall or vertical flat surface.                                       |
| <b>Bulb dimensions</b>                           | Refer to Model Chart.                                                                      |
| <b>Capillary length</b>                          | 6 ft. (1.8 m).                                                                             |
| <b>Case dimensions</b>                           | 5-13/16 H x 6-3/16 W x 4 D in. (148 x 157 x 102 mm).                                       |

# TK-6xxx Series, TK-8xxx Series

## Accessories

| Part Number              | Description                                                                  |
|--------------------------|------------------------------------------------------------------------------|
| AL-362                   | Stem mounted back connected 0 to 30 psi gauge.                               |
| AT-201                   | 3/8 x 9-1/2 in. with 3/4 in. MNPT copper bulb well requires AT-209.          |
| AT-203                   | 3/8 x 9-1/2 in. with 3/4 in. MNPT stainless steel bulb well requires AT-209. |
| AT-206                   | 3/8 x 4-1/2 in. with 1/2 in. MNPT copper bulb well.                          |
| AT-208                   | Duct mounting kit.                                                           |
| AT-209                   | Liquid line or tank mounting kit.                                            |
| AT-211                   | Bulb shield.                                                                 |
| AT-539                   | Pilot pressure kit.                                                          |
| TOOL-095-1               | Pneumatic calibration tool kit (required for use as low limit thermostat).   |
| <b>Maintenance Parts</b> |                                                                              |
| AT-520-11                | Relay repair kit                                                             |
| AT-528                   | Pilot restrictor kit.                                                        |

## Typical Applications

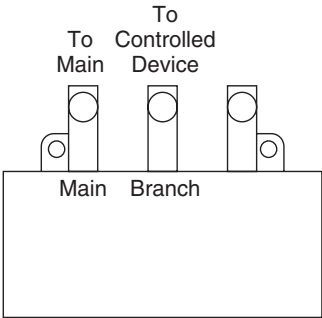


Figure 1 Typical Application.

Thermostats

# Transmitters

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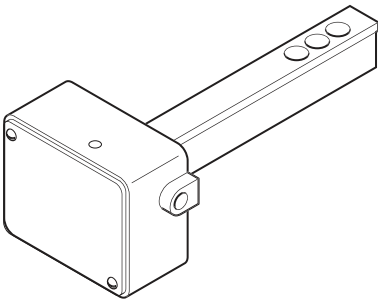
All specifications are nominal and may change as design improvements are introduced. Schneider Electric shall not be liable for damages resulting from misapplication or misuse of its products.

# Duct Relative Humidity Transmitter

The Relative Humidity Transmitter is designed to measure relative humidity in an air duct and transmit a 3 to 15 psig pneumatic signal over its 0 to 100% R.H. span to remote controlling, indicating, and alarm devices such as receiver-controllers, receiver gauges, and sensitive pressure switches.

Features:

- Widest possible (0 to 100%) relative humidity range for 3 to 15 psig (21 to 103 kPa) output.
- Shielded, highly sensitive, temperature-compensated nylon sensing element, designed for duct insertion.
- Force-balanced pneumatic feedback for stable, repeatable operation.



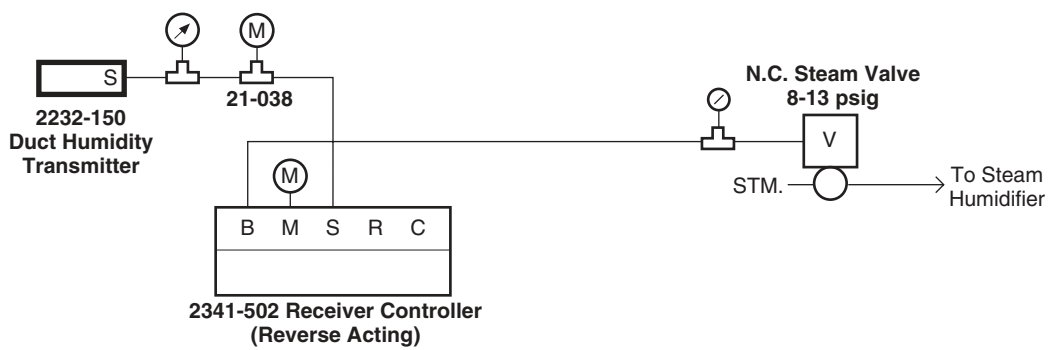
| Model Chart |                |                          |
|-------------|----------------|--------------------------|
| Model No.   | Replaces Model | Description              |
| 2232-150    | H150-100       | Refer to Specifications. |

| Specifications                 |                                                     |
|--------------------------------|-----------------------------------------------------|
| Control action                 | Direct acting, proportional.                        |
| Max. ambient temperature limit | 140°F (60°C).                                       |
| Humidity range                 | 0 to 100% R.H.                                      |
| Air pressure                   |                                                     |
| Operating                      | 20 psig (138 kPa).                                  |
| Maximum                        | 30 psig (207 kPa).                                  |
| Construction                   |                                                     |
| Element                        | Hygroscopic nylon tape sensing element.             |
| Housing                        | Die cast aluminum.                                  |
| Dimensions                     |                                                     |
| Case                           | 2-5/8 H x 2-1/16 W x 1-3/4 D in. (67 x 78 x 44 mm). |
| Element                        | 1-5/16 H x 7/8 W x 5-5/8 D in. (33 x 22 x 143 mm).  |
| Weight                         | 0.9 lb (0.4 kg).                                    |
| Air consumption                | 29 scim (7.9 mL/s).                                 |

| Accessories |                |                                      |
|-------------|----------------|--------------------------------------|
| Part Number | Replaces Model | Description                          |
| 20-944      | N4-32          | Restrictor tee, copper tubing.       |
| 21-038      | N100-0010      | Restrictor tee, polyethylene tubing. |
| 21-153      | N100-2501      | In-line restrictor.                  |

Transmitters

Typical Applications



- 1 2232-150 is usually located in the return (or exhaust) air duct, to measure space relative humidity.
- 2 When the air-handling unit fan motor is de-energized, the E/P relay removes control air from the normally closed steam valve, closing it fully.

Figure 1 Typical Applications.

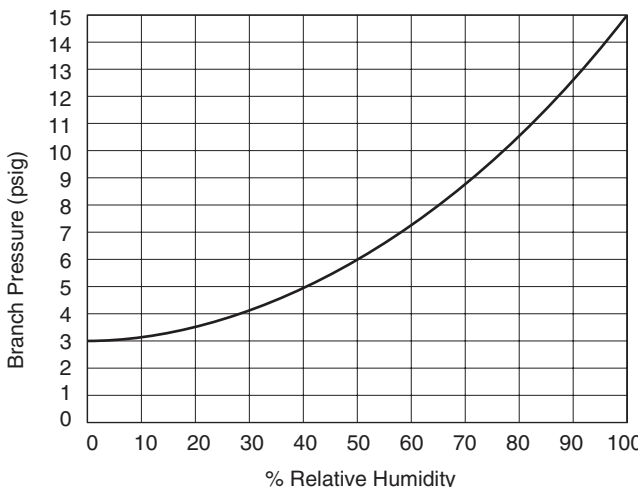


Figure 2 Relative Humidity vs. Branch Pressure.

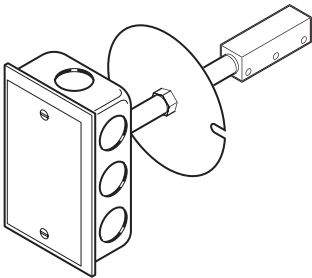
Transmitters

Room/Duct Humidity Transmitters

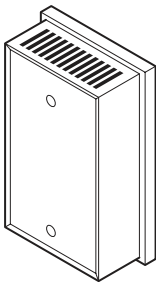
For proportional humidity control used with receiver-controllers. May be used with calibrated gauges for continuous humidity indication at any local or remote position.

Features:

- 10 to 90% relative humidity range for 3 to 15 psig (21 to 103 kPa) output.
- Highly sensitive nylon sensing element.
- Pneumatic feedback for stable, repeatable operation.



HKS-2033



HKS-5033

| Model Chart |                            |
|-------------|----------------------------|
| Model No.   | Description                |
| HKS-2033    | Duct humidity transmitter. |
| HKS-5033    | Room humidity transmitter. |

| Specifications                            |                                                                                                                  |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Sensing element                           | Nylon.                                                                                                           |
| Sensing                                   |                                                                                                                  |
| Span                                      | 80% RH.                                                                                                          |
| Range                                     | 10 to 90% RH (non-adjustable).                                                                                   |
| Output air signal                         | 3 to 15 psig (21 to 103 kPa).                                                                                    |
| Action                                    | Direct.                                                                                                          |
| Ambient limits                            |                                                                                                                  |
| Shipping                                  | -40 to 150°F (-40 to 65°C). 0 to 98% RH, non-condensing.                                                         |
| Operating                                 | -20 to 125°F (-29 to 52°C). 10 to 98% RH, non-condensing. 10 to 2500 fpm (0.05 to 12.7 m/s) sensed air velocity. |
| Supply air pressure                       |                                                                                                                  |
| Nominal                                   | 20 psig (138 kPa) through 0.0075 in. (190 μm) restrictor.                                                        |
| Minimum                                   | 18 psig (124 kPa).                                                                                               |
| Maximum                                   | 30 psig (207 kPa).                                                                                               |
| Air connections                           |                                                                                                                  |
| HKS-2033                                  | Barbed for 1/4 in. O.D. plastic tubing.                                                                          |
| HKS-5033                                  | 5/32 in. diameter spring reinforced plastic tubing.                                                              |
| Air consumption for sizing air compressor | 41.5 scim (11.3 mL/s).                                                                                           |
| Air capacity for sizing air mains         | 48 scim (13.2 mL/s).                                                                                             |

Transmitters

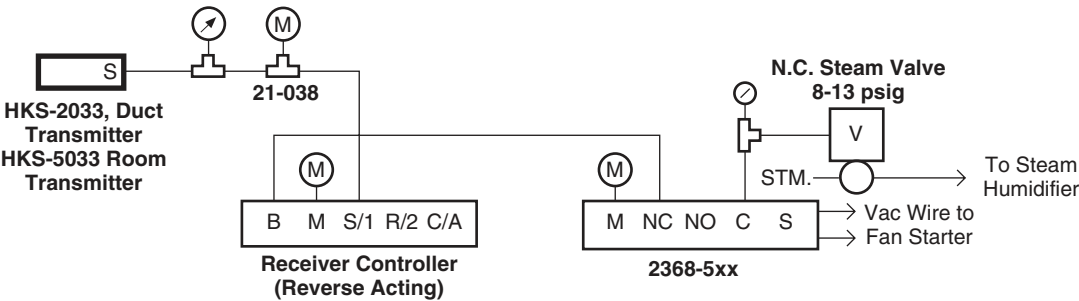
Specifications (Continued)

|            |                                                                                                                                                      |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mounting   |                                                                                                                                                      |
| HKS-2033   | Duct.                                                                                                                                                |
| HKS-5033   | Wall (has beige plastic cover).                                                                                                                      |
| Dimensions |                                                                                                                                                      |
| HKS-2033   | 4-3/16 H x 4 W x 2-1/16 D in. (106 x 102 x 52 mm); tube mounting hole diameter is 1-3/8 in. (35 mm) and tube insertion length is 4-1/4 in. (108 mm). |
| HKS-5033   | 4-3/8 H x 2-3/4 W x 1-5/8 D in. (111 x 70 x 43 mm). Order fittings separately for type of wall construction.                                         |

Accessories

| Part Number | Description                                                                                                |
|-------------|------------------------------------------------------------------------------------------------------------|
| 20-944      | Restrictor tee, copper tubing.                                                                             |
| 21-038      | Restrictor tee, polyethylene tubing.                                                                       |
| 21-153      | In-line restrictor.                                                                                        |
| AT-504      | Plaster hole cover (small).                                                                                |
| AT-505      | Surface mounting base.                                                                                     |
| AT-506      | Pneumatic wall box fitting (two tubes) used for mounting under cover of HKS-5033.                          |
| AT-533-101  | Adaptor 1/4 in. plastic to 5/32 in. plastic.                                                               |
| AT-533-127  | Adaptor 3/16 in. copper or 1/4 in. copper with 1/4 in. solder coupling (not included) to 5/32 in. plastic. |
| AT-533-129  | 5/32" x 5/32" Barbed brass connector.                                                                      |

Typical Applications



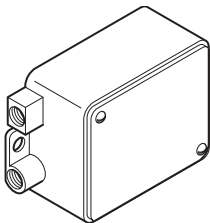
- 1 HKS-2033 is usually located in the return (or exhaust) air duct, to measure space relative humidity.
- 2 HKS-5033 is wall mounted, in the room, to measure area relative humidity.
- 3 When the air-handling unit fan motor is de-energized, the E/P relay removes control air from the normally closed steam valve, closing it fully.

Figure 1 Typical Application.

Transmitters

Pressure Transmitters

The pneumatic pressure transmitters are designed to measure either air or fluid pressures. All models transmit a fixed-span, 3 to 15 psig output signal proportional to input pressure to controlling and indicating devices such as receiver-controllers, receiver gauges, and certain pneumatic relays and alarm devices. These transmitters are available in various pressure ranges to meet most control system application requirements.



Features:

- Single-input pressure transmitter permits remote readout on receiver gauge, and control of air, water, steam or refrigerant pressure from a convenient location.
- Three different ranges permit proper match of transmitter range to application.
- Quality design and construction ensure linearity and responsiveness.
- Factory calibrated.
- Field adjustable “zero”.

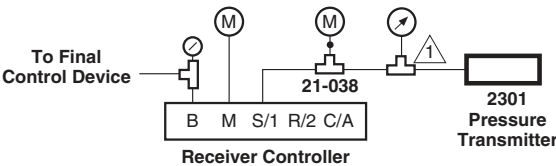
| Model Chart |                    |                             |                              |
|-------------|--------------------|-----------------------------|------------------------------|
| Model No.   | Replaces Model No. | Input Pressure Range (psig) | Maximum Safe Pressure (psig) |
| 2301-040    | P301-040           | -10 to +40 (-69 to 276 kPa) | 65 (448 kPa)                 |
| 2301-150    | P301-150           | 0 to 150 (0 to 1034 kPa)    | 185 (1276 kPa)               |
| 2301-300    | P301-300           | 0 to 300 (0 to 2068 kPa)    | 350 (2413 kPa)               |

| Specifications              |                                                                           |
|-----------------------------|---------------------------------------------------------------------------|
| Output                      | 3 to 15 psig (21 to 103 kPa).                                             |
| Control Action              | Direct, proportional.                                                     |
| Maximum ambient temperature | 140°F (60°C).                                                             |
| Supply air pressure         | Clean, dry, oil free air required (refer to EN-123).                      |
| Nominal                     | 20 psig ±0.5 psig (138 kPa ±3.4).                                         |
| Maximum                     | 30 psig (207 kPa).                                                        |
| Connections                 | Two 1/8 in. FNPT.                                                         |
| Air consumption             | 27.7 scim (7.5 mL/s).                                                     |
| Air capacity                | 48 scim.                                                                  |
| Adjustments                 | Minor “zero” adjustment only.                                             |
| Calibration                 | None; factory calibrated.                                                 |
| Mounting                    | External mounting ears are provided for easy mounting to panels or ducts. |
| Dimensions                  | 2-5/8 H x 3-1/16 W x 1-3/4 D in. (66 x 78 x 45 mm).                       |
| Weight                      | 15 oz.                                                                    |

| Accessories |                |                                              |
|-------------|----------------|----------------------------------------------|
| Part Number | Replaces Model | Description                                  |
| 20-944      | N4-32          | Tee restrictor for copper or plastic tubing. |
| 21-038      | N100-0010      | Tee restrictor for plastic tubing.           |
| 21-153      | N100-2501      | In-line restrictor.                          |
| 2422-001    | —              | 2-1/2" Receiver gauge.                       |
| 2422-002    | —              | 3-1/2" Receiver gauge.                       |
| 2422-003    | —              | 2" Receiver gauge.                           |
| 2890-001    | —              | Overlay kit.                                 |
| 2890-002    | —              | Overlay kit.                                 |
| 2890-003    | —              | Overlay kit.                                 |

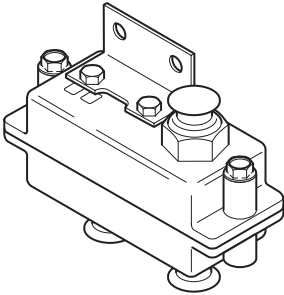
Typical Applications

Figure 1 Typical Piping Diagram.



# Differential Pressure Transmitter

The 2302 series differential pressure transmitters send a fixed span 3 to 15 psig (21 to 103 kPa) pneumatic signal which is proportional to a differential pressure being sensed. The output signal can be used as an input for receiver-controllers or gauges to indicate differential pressure.



**Features:**

- Permits remote readout of differential pressure on receiver-gauge, and control from a convenient location.
- Provides differential pressure readout on a single receiver gauge (eliminates need to read two pressure gauges and subtract one reading from the other).
- Field-adjustable “zero”.

| Model Chart |                    |                                        |                                       |
|-------------|--------------------|----------------------------------------|---------------------------------------|
| Model No.   | Replaces Model No. | Differential Pressure Sensed psi (kPa) | Max. Differential Pressure psig (kPa) |
| 2302-051    | PKSR-9001          | 0 to 50<br>(0 to 345)                  | 85 (586)                              |

| Specifications                                   |                                                                                          |
|--------------------------------------------------|------------------------------------------------------------------------------------------|
| <b>Transmitter</b>                               | Non-relay.                                                                               |
| <b>Construction</b>                              | Zinc diecast case, brass fittings.                                                       |
| <b>Sensed medium</b>                             | Water, air, steam, oil.                                                                  |
| <b>Maximum total pressure (any input)</b>        | 300 psig (2069 kPa).                                                                     |
| <b>Zero adjustment</b>                           | Output to 3 ±1/4 psig (21 ±2 kPa) with input pressures equalized.                        |
| <b>Output air signal</b>                         | 3 to 15 psig (21 to 103 kPa), span fixed.                                                |
| <b>Action</b>                                    | Direct.                                                                                  |
| <b>Environment</b>                               |                                                                                          |
| <b>Ambient temperature limits</b>                | Shipping and storage: -40 to 140°F (-40 to 60°C).<br>Operating: 40 to 120°F (4 to 49°C). |
| <b>Humidity</b>                                  | 5 to 95% RH, non-condensing.                                                             |
| <b>Supply air pressure</b>                       | Clean, oil free, dry air required (refer to EN-123).                                     |
| <b>Nominal</b>                                   | 20 psig (138 kPa).                                                                       |
| <b>Maximum</b>                                   | 30 psig (207 kPa).                                                                       |
| <b>Connections</b>                               | 1/8 in. FNPT.                                                                            |
| <b>Air consumption for sizing air compressor</b> | 27.6 scim (7.5 mL/s) at 20 psig (138 kPa).                                               |
| <b>Air capacity for sizing air mains</b>         | 48 scim (13.1 mL/s) at 20 psig (138 kPa).                                                |
| <b>Mounting</b>                                  | In any position with integral bracket provided.                                          |
| <b>Dimensions</b>                                | 2-11/16 H x 3-3/4 W x 1-19/32 D in. (68 x 95 x 40 mm).                                   |

2302 Series

Accessories

| Part Number | Replaces Model | Description                                              |
|-------------|----------------|----------------------------------------------------------|
| 2422-001    | A251-1         | Receiver gauge 2-1/2 in.                                 |
| 2422-002    | A252           | Receiver gauge 3-1/2 in.                                 |
| 2422-003    | A253-12        | Receiver gauge 2 in.                                     |
| 21-038      | N100-0010      | Restrictor tee for use with 1/4 in. O.D. plastic tubing. |
| 21-153      | N100-2501      | In-line restrictor.                                      |
| 20-944      | N4-32          | Restrictor tee, copper tubing.                           |

| Receiver Gauge Overlays |   | Description            |
|-------------------------|---|------------------------|
| Model No.               |   |                        |
| 2890-001                | — | 2 in. overlay kit.     |
| 2890-002                | — | 2-1/2 in. overlay kit. |
| 2890-003                | — | 3 in. overlay kit.     |

Typical Applications

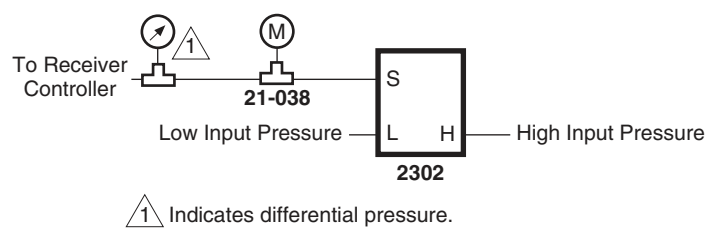


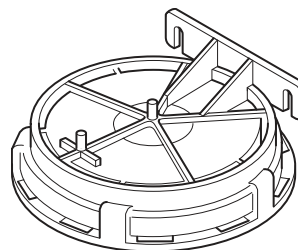
Figure 1 Piping Connections.

Transmitters

## Differential or Static Pressure Transmitters

The 2323-5xx Series differential or static pressure transmitters have been designed to sense differential or static pressure across fans, coils, filters, or between two reference points and to transmit a 3 to 15 psig signal to controlling and indicating devices such as receiver controllers, receiver gages, and sensitive pressure switches.

These devices are one-pipe transmitters which require an external restrictor in the supply line. Their design features pneumatic feedback, which ensures accuracy and stability over the entire operating range. Mounting ears are provided for strain-free mounting on ducts or other flat surfaces.



### Features:

- Permits remote readout and control of differential or static pressure of air.
- Five different ranges permit proper match of transmitter range to various applications.
- Ball-in-seat pneumatic feedback ensures linearity and responsiveness.
- Field-adjustable "zero".

| Model Chart |                    |                                     |
|-------------|--------------------|-------------------------------------|
| Model No.   | Replaces Model No. | Range W.C. (Pa)                     |
| 2323-505    | P323-0025          | -0.05 to +0.20 in. (-12.45 to 49.8) |
| 2323-503    | P323-01            | -0.5 to +0.5 in. (-124.5 to 124.5)  |
| P323-101    | —                  | 0 to 1 in. (0 to 249)               |
| 2323-500    | P323-03            | 0 to 3 in. (0 to 747)               |
| 2323-504    | P323-10            | 0 to 10 in. (0 to 2490)             |

| Specifications              |                                                                                                                     |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------|
| Control action              | Direct, proportional.                                                                                               |
| Pressure output             | 3 to 15 psig (20.7 to 103.5 kPa) for stated span.                                                                   |
| Environment                 |                                                                                                                     |
| Maximum ambient temperature | 140°F (60°C).                                                                                                       |
| Locations                   | Avoid areas with excessive vibration or corrosive materials.                                                        |
| Supply air pressure         |                                                                                                                     |
| Nominal                     | 20 psig (138 kPa).                                                                                                  |
| Maximum                     | 30 psig (207 kPa).                                                                                                  |
| Connections                 | Nipples for 1/4 in. O.D. polyethylene tubing except LO and HI ports which require 3/8 in. O.D. polyethylene tubing. |
| Main air consumption        | 27.7 scim (7.5 mL/s).                                                                                               |

Specifications (Continued)

|              |                                                                                |
|--------------|--------------------------------------------------------------------------------|
| Air capacity | 48 scim.                                                                       |
| Calibration  | Factory set.                                                                   |
| Mounting     | Transmitter must be mounted in a horizontal position with the correct side up. |
| Dimensions   | 5-9/16 H x 5-5/16 W x 2-11/16 D in. (141 x 135 x 69 mm).                       |
| Weight       | 0.5 lb (227 g).                                                                |

Accessories

| Part Number             | Replaces Model | Description                                        |
|-------------------------|----------------|----------------------------------------------------|
| 2422-001                | A251-1         | 2-1/2 in. gauge.                                   |
| 2422-002                | A252           | 3-1/2 in. gauge.                                   |
| 2422-003                | A253-12        | 2 in. gauge.                                       |
| AP-302                  | —              | Static pressure sensing tip — 1/4 in. O.D. tubing. |
| AP-305                  | —              | Static pressure sensing tip, 1/8 in. pipe thread.  |
| 20-944                  | N4-32          | Restrictor tee for copper tubing.                  |
| 21-038                  | N100-0010      | Restrictor tee for polyethylene tubing.            |
| 21-153                  | N100-2501      | In-line restrictor.                                |
| Receiver Gauge Overlays |                |                                                    |
| Model No.               |                | Description                                        |
| 2890-001                | —              | 2 in. overlay kit.                                 |
| 2890-002                | —              | 2-1/2 in. overlay kit.                             |
| 2890-003                | —              | 3-1/2 in. overlay kit.                             |

Typical Applications

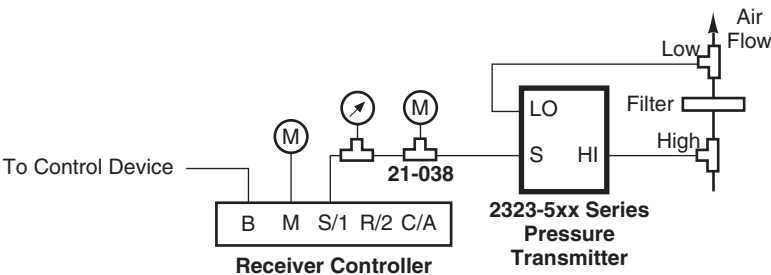


Figure 1 Differential Pressure Transmitter Application.

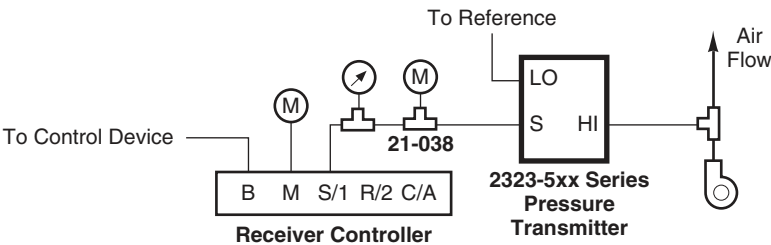


Figure 2 Static Pressure Transmitter Application.

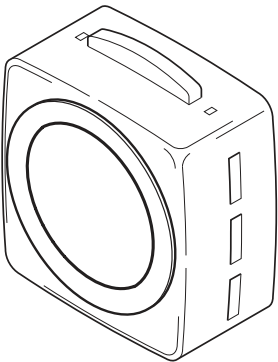
Transmitters

# Room Temperature Transmitter

The temperature transmitter measures room temperature and transmits a proportional pneumatic signal to a calibrated receiver gauge and/or receiver controller. The device is factory set to transmit a 3 to 15 psig (20.7 to 103.4 kPa) signal over a 50 to 90°F range.

Features:

- Permits remote readout and control of room temperature.
- Highly sensitive bimetal sensing element.
- Linear response to room temperature changes.
- Matches appearance of 2 x 2 in. Thermostats, 2230-018 Humidistat, and 2232-053 R.H. Transmitter.
- Field-adjustable “zero” adjustment.



| Model Chart |                    |                          |
|-------------|--------------------|--------------------------|
| Model No.   | Replaces Model No. | Description              |
| 2220-053    | T53-101            | Refer to Specifications. |

Note: Includes 1/4" by 3/16" barbed couplings, 20-693 tubing kit, 22-024 standard mounting kit, 20-928 gray plastic cover with F/C listing.

| Specifications      |                                                                                 |
|---------------------|---------------------------------------------------------------------------------|
| Action              | Direct acting, proportional.                                                    |
| Temperature Range   | 50 to 90°F (10 to 32°C), fixed.                                                 |
| Construction        |                                                                                 |
| Components          | Die cast aluminum, stainless steel, and glass-filled nylon.                     |
| Diaphragms          | Fabric-reinforced neoprene.                                                     |
| Air filter          | Internal.                                                                       |
| Supply air pressure | Clean, dry, oil free air required (Ref. EN-123).                                |
| Nominal             | 20 ±0.5 psig (138 kPa).                                                         |
| Maximum             | 30 psig (207 kPa).                                                              |
| Connections         | For spring-reinforced 3/16 in. plastic tubing and required fittings (included). |
| Calibration point   | Refer to Figure 1.                                                              |
| Mounting            | Upright position on wall.                                                       |
| Dimensions          | 2-1/32 H x 2-1/32 W x 1-3/8 D in. (52 x 52 x 35 mm).                            |

Transmitters

Accessories

| Part Number         | Replaces Model | Description                                                |
|---------------------|----------------|------------------------------------------------------------|
| <b>Accessories</b>  |                |                                                            |
| 20-660              | 6-441          | Cover screw (included with thermostat).                    |
| 20-707              | 10-53          | Metal thermostat guard.                                    |
| 20-715              | 10-62          | Clear thermostat guard.                                    |
| 21-876              | 10-76          | Opaque thermostat guard.                                   |
| 21-928              | —              | Gray plastic cover, blank dial.                            |
| 21-933              | —              | Gray plastic cover, °F/°C dial (included with thermostat). |
| 21-933-1            | —              | Gray plastic cover, Day/Night dial.                        |
| <b>Calibration</b>  |                |                                                            |
| 20-881              | N2-4           | Calibration wrench.                                        |
| 22-138              | MCS-GA         | Branch tap gauge adaptor.                                  |
| 900-002             | —              | Thermostat calibration kit.                                |
| <b>Installation</b> |                |                                                            |
| 10-82-SS            | —              | Outlet box mounting plate, stainless steel.                |
| 20-850              | 10-82          | Outlet box mounting plate, black.                          |
| 20-642              | 6-371          | Mounting ring.                                             |
| 21-473              | 10-73          | Snap-in drywall mounting bracket.                          |
| 22-021              | —              | Universal drywall mounting kit.                            |
| 22-022              | N5-95          | Competitor replacement mounting kit.                       |
| 22-024              | —              | Standard mounting kit (included with thermostat).          |
| 22-693              | —              | Tubing kit (included with thermostat).                     |

Typical Applications

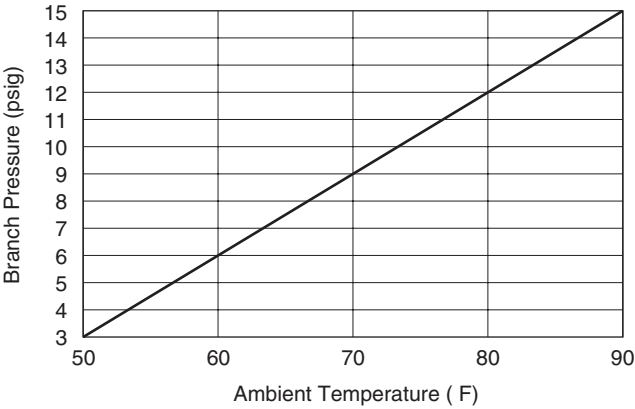


Figure 1 Branch Pressure vs. Ambient Temperature.

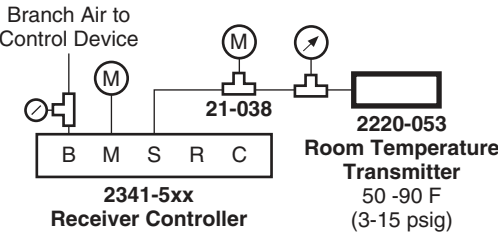


Figure 2 Typical Application.

Transmitters

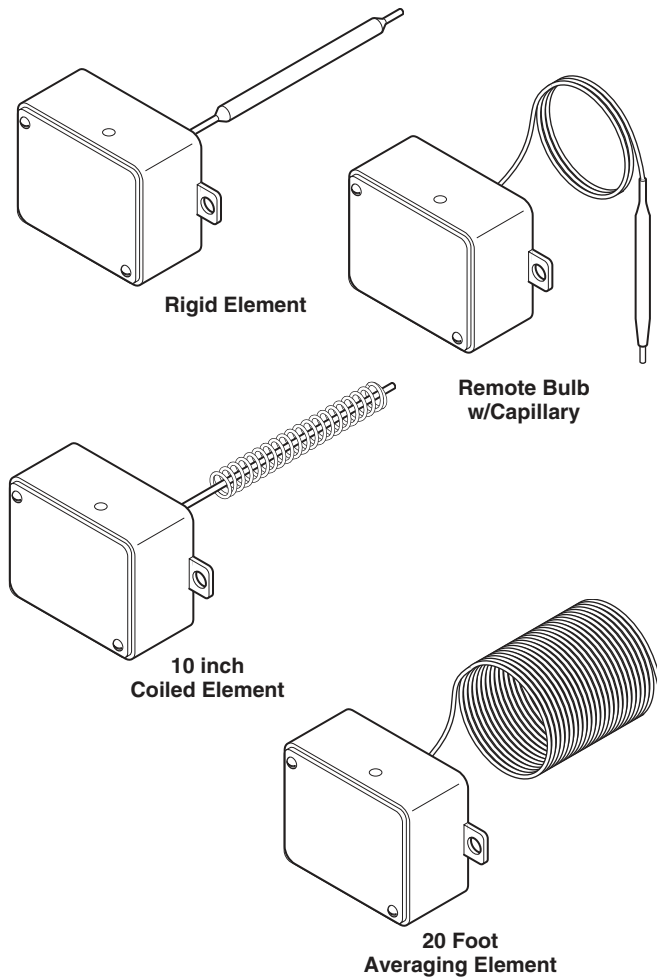
## Duct, Immersion and Outdoor-Air Temperature Transmitters

The 2252 Series pneumatic temperature transmitters are designed to measure air or fluid temperatures in pneumatic control systems and transmit a fixed span, 3 to 15 psig (20 to 103 kPa) signal to controlling and indicating devices such as receiver controllers, receiver gauges, sensitive pressure switches, or snap-acting 2353-501 diverting relays. These transmitters are available with several types of sensing elements.

These transmitters are “one-pipe” devices requiring an externally restricted source of constant pressure control air. Their design features pneumatic feedback to ensure accuracy and stability over their temperature span.

### Features:

- Permits remote readout and/or control of temperatures associated with HVAC systems.
- Eight different ranges permit proper match of transmitter range to applications.
- Quality design and construction, with beryllium copper feedback bellows, provides excellent linearity, response and stability.
- Field-accessible “zero” adjustment.
- Liquid-filled sensing elements in the following styles:
  - 20 ft. (6.1 m) averaging, for air ducts.
  - Rigid, for immersion (in well), or air duct insertion.
  - 10 in. (25.4 cm) rigid coiled, for fast response in air ducts where averaging is not required.
  - Remote-bulb, for various applications.



**Model Chart**

| Model No. | Replaces Model No. | Range (non-adjustable)<br>°F (°C) | Span<br>°F (°C) | Mounting          | Sensing Element Description                                     |
|-----------|--------------------|-----------------------------------|-----------------|-------------------|-----------------------------------------------------------------|
| 2252-510  | T150-1011          | 40 to 140<br>(4 to 60)            | 100<br>(56)     | Duct or immersion | Rigid element, 1/4 x 9-3/8 in. long (6 x 238 mm)                |
| 2252-501  | T150-1012          |                                   |                 | Duct              | Averaging element, 20 ft. long (6 m)                            |
| 2252-502  | T150-1013          |                                   |                 |                   | Rigid (coiled) element, 10 in. long (25.4 cm)                   |
| 2252-250  | T150-1021          | 0 to 100<br>(-18 to 38)           |                 | Duct or immersion | Rigid element, 1/4 x 9-3/8 in. long (6 x 238 mm)                |
| 2252-251  | T150-1022          |                                   |                 | Duct              | Averaging element, 20 ft. long (6 m)                            |
| 2252-252  | T150-1023          |                                   |                 |                   | Rigid (coiled) element, 10 in. long (25.4 cm)                   |
| 2252-610  | T150-1031          | 40 to 240<br>(4 to 115)           | 200<br>(111)    | Duct or immersion | Rigid element, 1/4 x 7-1/16 in. long (6 x 179 mm)               |
| 2252-635  | T150-1035          |                                   |                 | Duct              | 10-1/2 x 1/4 in. (267 x 6 mm) bulb with 9 ft. (2.7 m) capillary |
| 2252-110  | T150-1041          | -40 to 160<br>(-40 to 71)         | 200<br>(111)    | Duct or immersion | Rigid element, 1/4 x 7-1/16 in. long (6 x 179 mm)               |

## 2252 Series

### Model Chart (Continued)

| Model No. | Replaces Model No. | Range (non-adjustable)<br>°F (°C) | Span<br>°F (°C) | Mounting            | Sensing Element Description                                     |
|-----------|--------------------|-----------------------------------|-----------------|---------------------|-----------------------------------------------------------------|
| 2252-703  | T150-1046          | -40 to 160<br>(-40 to 71)         | 200<br>(111)    | Duct or outdoor air | 1/4 x 2.5 in. (6 x 64 mm) bulb with 42 in. (1.1 m) capillary    |
| 2252-151  | T150-1054          | -25 to 125<br>(-32 to 52)         | 150<br>(84)     | Duct or outdoor air | 4 x 1/4 in. (102 x 6 mm) bulb with 3 ft. (0.9 m) capillary      |
| 2252-655  | T150-1055          |                                   |                 |                     | 10-1/2 x 1/4 in. (267 x 6 mm) bulb with 9 ft. (2.7 m) capillary |
| 2252-662  | T150-1062          | 30 to 80<br>(-1 to 27)            | 50<br>(28)      | Duct                | Averaging element, 20 ft. long (6 m)                            |
| 2252-273  | T150-1073          | 50 to 100<br>(10 to 38)           |                 |                     | Rigid (coiled) element, 10 in. long (25.4 cm)                   |
| 2252-701  | T150-1082          | 50 to 150<br>(10 to 66)           | 100<br>(56)     | Duct                | Averaging element, 20 ft. long (6.1 m).                         |
| 2252-702  | T150-1083          |                                   |                 |                     | Rigid (coiled) element, 10 in. long (25.4 cm)                   |

### Specifications

|                                         |                                                                            |
|-----------------------------------------|----------------------------------------------------------------------------|
| <b>Action</b>                           | Direct, proportional.                                                      |
| <b>Adjustments</b>                      | None required, factory calibrated.                                         |
| <b>Supply air pressure</b>              | Clean, dry, oil free air required (Refer to EN-123).                       |
| <b>Nominal</b>                          | 20 psig $\pm 0.5$ psi (138 kPa $\pm 3.4$ kPa) through 1.0 scfh restrictor. |
| <b>Maximum</b>                          | 30 psig (207 kPa).                                                         |
| <b>Output pressure</b>                  | 3 to 15 psig (21 to 103 kPa).                                              |
| <b>Air connection</b>                   | 1/8 in. FNPT.                                                              |
| <b>Maximum case ambient temperature</b> | 140°F (60°C).                                                              |
| <b>Construction</b>                     | Copper element, cast aluminum base, zinc plated steel cover.               |
| <b>Mounting</b>                         | Duct or immersion (refer to Model Chart).                                  |
| <b>Weight</b>                           | 0.9 lb (0.4 kg).                                                           |
| <b>Case dimensions</b>                  | 2-5/8 H x 3-1/16 W x 1-3/4 D in. (67 x 78 x 44 mm).                        |

### Accessories

| Part Number         | Replaces Model | Description                                                                              |
|---------------------|----------------|------------------------------------------------------------------------------------------|
| 20-778 <sup>a</sup> | 100-17         | 3/8 x 7-1/32 in. copper well with 1/2 in. NPT bushing.                                   |
| 20-782              | 100-25         | 3/8 x 10-17/32 in. copper well with 1/2 in. NPT bushing.                                 |
| 20-803 <sup>a</sup> | 100-47         | Neck extension adaptor - converts 7-1/32 in. well to 10-17/32 in. well.                  |
| 20-805              | 100-49         | 3/8 x 7-1/32 in. Stainless steel well with 1/2 in. NPT bushing (includes 20-803).        |
| 22-401              | 100-71         | Adapter, brass, for mounting 2252 Series immersion transmitter in AT-201 or AT-203 well. |
| 20-944              | N4-32          | Restrictor tee, copper tubing.                                                           |
| 21-038              | N100-0010      | Restrictor tee, polyethylene tubing.                                                     |
| 21-153              | N100-2501      | In-line restrictor.                                                                      |
| AT-208              | —              | Duct mounting kit                                                                        |
| AT-211              | —              | Outdoor bulb shield                                                                      |

<sup>a</sup> Use together for copper well with extended neck.

### Typical Applications

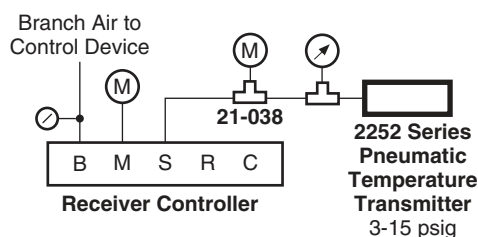


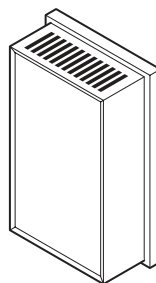
Figure 1 Typical Application.

## Room and Light Troffer Temperature Transmitters

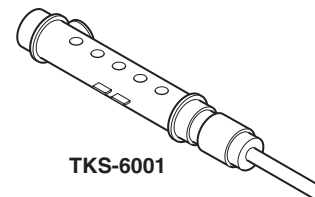
For proportional temperature control used with receiver-controllers. May be used with one or more calibrated gauges for continuous temperature indication at any local or remote position.

### Features:

- Forced balanced pneumatic feedback provides stable operation.
- Highly sensitive bimetal sensing element.



TKS-5001



TKS-6001

### Model Chart

| Model No. | Mounting          | Range<br>(Non-Adj.)<br>°F (°C) | Span<br>°F (°C) | Sensing Element<br>Description | Cover            | Ambient<br>Temperature<br>Limits<br>°F (°C)                                     | Air<br>Connections                                    | Dimensions<br>H x W x D<br>in. (mm)      |
|-----------|-------------------|--------------------------------|-----------------|--------------------------------|------------------|---------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------------|
| TKS-5001  | Wall <sup>a</sup> | 50 to 100<br>(10 to 38)        | 50 (28)         | Bimetal                        | Beige<br>Plastic | Shipping:<br>-40 to 150<br>(-40 to 65)<br>Operating:<br>50 to 100<br>(10 to 38) | 5/32 in. dia.<br>spring<br>reinforced<br>plastic tube | 4-3/8 x 2-3/4 x 1-5/8<br>(111 x 70 x 41) |
| TKS-6001  | Light Troffer     |                                |                 |                                | N.A.             |                                                                                 | 5/32 in. dia.<br>spring<br>reinforced<br>plastic tube | 3/8 x 3/8 x 3<br>(10 x 10 x 76)          |

<sup>a</sup> Order fittings separately for type of wall construction.

### Specifications

|                                                  |                                                           |
|--------------------------------------------------|-----------------------------------------------------------|
| <b>Ambient temperature</b>                       | Refer to Model Chart.                                     |
| <b>Output air signal</b>                         | 3 to 15 psig (21 to 103 kPa).                             |
| <b>Action</b>                                    | Direct.                                                   |
| <b>Supply air pressure</b>                       | Clean, oil free, dry air required (refer to EN-123).      |
| <b>Nominal</b>                                   | 20 psig (138 kPa) through 0.0075 in. (190 µm) restrictor. |
| <b>Minimum</b>                                   | 18 psig (124 kPa).                                        |
| <b>Maximum</b>                                   | 30 psig (207 kPa).                                        |
| <b>Air consumption for sizing air compressor</b> | 41.5 scim (11.3 mL/s).                                    |
| <b>Air capacity for sizing air mains</b>         | 36 scim (13.2 mL/s).                                      |

### Accessories

| Part Number | Description                                                                                                |
|-------------|------------------------------------------------------------------------------------------------------------|
| 20-944      | Restrictor tee, copper tubing.                                                                             |
| 21-038      | Restrictor tee, polyethylene tubing.                                                                       |
| 21-153      | In-line restrictor.                                                                                        |
| AT-201      | Copper bulb well.                                                                                          |
| AT-203      | Stainless steel bulb well.                                                                                 |
| AT-208      | Duct mounting kit for TKS-40xx.                                                                            |
| AT-211      | Bulb shield for wall mounting TKS-2031.                                                                    |
| AT-504      | Plaster hole cover (small).                                                                                |
| AT-506      | Pneumatic wall box fitting (two tubes) used for mtg. AT-532-11-1-01 under cover of TKS-5001.               |
| AT-533-101  | Adaptor 1/4 in. plastic to 5/32 in. plastic.                                                               |
| AT-533-127  | Adaptor 3/16 in. copper or 1/4 in. copper with 1/4 in. solder coupling (not included) to 5/32 in. plastic. |
| AT-533-129  | 5/32 in. x 5/32 in. barbed brass connector.                                                                |

Typical Applications

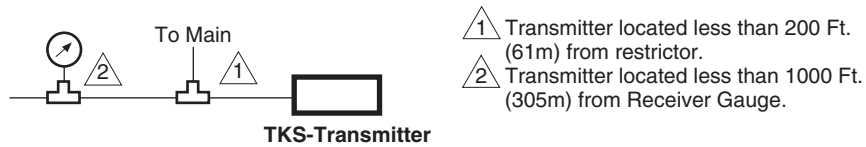


Figure 1 Typical Application.

Transmitters

# Unitary Controllers

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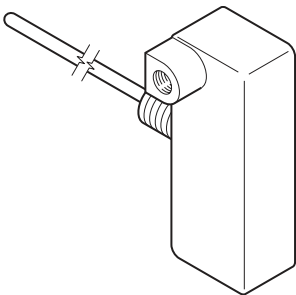
All specifications are nominal and may change as design improvements are introduced. Schneider Electric shall not be liable for damages resulting from misapplication or misuse of its products.

Airstream Temperature Controllers

The 2260 series are one-pipe, non-relay controllers designed primarily for use as low limit thermostats in unit ventilator and central fan system applications.

Features:

- Rigid or averaging liquid-filled sensing elements.
- Field-adjustable throttling range.
- Simple, straightforward one-pipe (nozzle and flapper) operation (direct-acting).
- May be used as primary or low-limit controller.
- Includes gauge-tee and compression restrictor-tee.



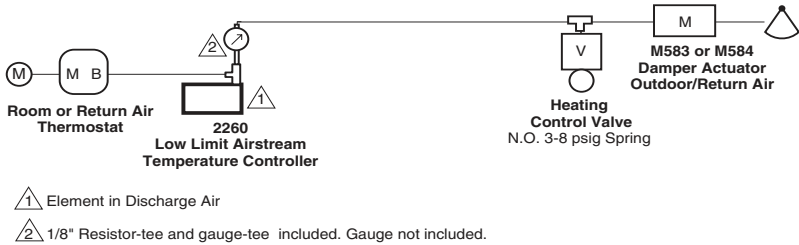
2260-550 Shown

| Model Chart |                    |                                           |
|-------------|--------------------|-------------------------------------------|
| Model No.   | Replaces Model No. | Sensing Element Style Dimensions          |
| 2260-550    | T201-023           | Rigid stem 3/16 x 19-3/8 in. (5 x 492 mm) |
| 2260-551    | T201-024           | Averaging 3/32 in. x 8 ft. (2 mm x 2.4 m) |

| Specifications                            |                                                                           |
|-------------------------------------------|---------------------------------------------------------------------------|
| Thermostat                                | Proportional.                                                             |
| Sensing element                           | Liquid-filled.                                                            |
| Control dial range                        | 40 to 150°F (4 to 65°C), marked Warmer-Cooler with 5F ° (3C°) increments. |
| Throttling range                          | 10 to 50°F (6 to 28°C), field adjustable, marked A through E.             |
| Output air signal                         | 3 to 15 psig (21 to 103 kPa).                                             |
| Control mechanism                         | Mounted in steel enclosure with cover.                                    |
| Restriction                               | External-fixed; furnished for unit ventilator applications.               |
| Construction                              | White molded plastic snap-on cover, iridited aluminum base.               |
| Action                                    | Direct only.                                                              |
| Maximum bulb temperature limit            | 250°F (121°C).                                                            |
| Supply air pressure                       | Clean, dry, oil free air required (Refer to EN-123).                      |
| Nominal                                   | 15 to 17 psig (103 to 117 kPa).                                           |
| Maximum                                   | 30 psig (207 kPa).                                                        |
| Air connections                           | 1/8 in. FNPT.                                                             |
| Air consumption for sizing air compressor | 30 scim (8.2 mL/s).                                                       |
| Mounting                                  | Insertion with two locknuts and washers on 3/8 in. NPSM threaded boss.    |
| Case dimensions                           | 3-31/64 H x 1-1/8 W x 1-7/16 D in. (89 x 29 x 36 mm).                     |
| Weight                                    | Approx. 0.6 lbs. (0.3 kg).                                                |

Typical Applications

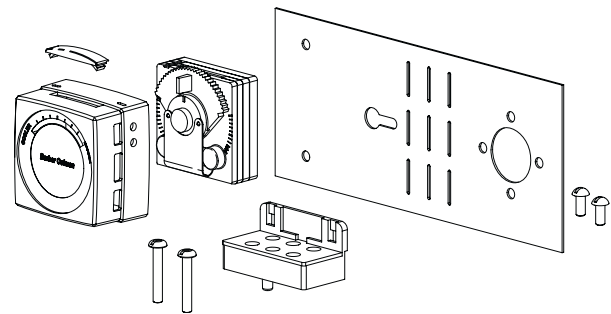
Figure 1 Typical Application (Heating-Only Unit Ventilator).



Unitary  
Controllers

# Unit Temperature Controllers

The Unit Temperature Controllers are designed for the proportional control of pneumatic devices and actuators in environmental control systems. These devices are designed primarily as return air controllers in induction units, fan coil units, and unit ventilators.



**Features:**

- Small size.
- Stable, linear response to room temperature changes.
- Sensor may be mounted up to 200 ft. (61 m) from controller; connects to controller body with 1/4 in. O.D. plastic tubing.
- Summer-winter models have snap-acting changeover from direct action to reverse action and vice versa.

| Model Chart |                    |                                                                         |                                                                          |
|-------------|--------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Model No.   | Replaces Model No. | Action                                                                  | Comments                                                                 |
| 2298-060    | T460-301           | Reverse acting at 16 psig (110 kPa), direct acting at 25 psig (172 kPa) | Includes 20-818 mounting bracket with screws and remote bimetal sensors. |
| 2298-061    | T461-301           | Direct                                                                  |                                                                          |
| 2298-062    | T462-301           | Reverse                                                                 |                                                                          |
| 2298-063    | T463-301           | Direct acting at 16 psig (110 kPa), reverse acting at 25 psig (172 kPa) |                                                                          |

| Specifications              |                                                                                                                                                                                                        |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Setpoint range              | 65 to 85°F.                                                                                                                                                                                            |
| Throttling range            | 4F° fixed.                                                                                                                                                                                             |
| Sensitivity                 | 2.5 psig/F° fixed.                                                                                                                                                                                     |
| Maximum ambient temperature | 140°F (60°C).                                                                                                                                                                                          |
| Main air pressure           | Clean, dry, oil free air required (Refer to EN-123).                                                                                                                                                   |
| Nominal                     | 2298-060: 16 psig (110 kPa) reverse acting, 25 psig (172 kPa) direct acting.<br>2298-061, 2298-062: 20 psig (138 kPa).<br>2298-063: 16 psig (110 kPa) direct acting, 25 psig (172 kPa) reverse acting. |
| Maximum                     | 30 psig (207 kPa)                                                                                                                                                                                      |
| Connections                 | Fittings for 1/4 in. O.D. plastic tubing.                                                                                                                                                              |
| Air consumption             |                                                                                                                                                                                                        |
| 2298-060, 2298-063          | 29.4 scim (8.0 mL/s) at 16 psig, 45 scim (12.3 mL/s) at 25 psig.                                                                                                                                       |
| 2298-061, 2298-062          | 29.4 scim (8.0 mL/s) at 16 psig.                                                                                                                                                                       |
| Adjustments                 | External or concealed.                                                                                                                                                                                 |
| Calibration point           | Factory calibrated at 9 psig (62 kPa) for -061 and -062; 12 psig (82.7 kPa) for -060 and -063.                                                                                                         |
| Mounting                    | Wall mount or mounting bracket.                                                                                                                                                                        |
| Dimensions                  | 2-1/32 H x 2-1/32 W x 1-3/8 D in. (52 x 52 x 35 mm). Does not include mounting plate or remote sensor.                                                                                                 |

Accessories

| Part Number              | Replaces Model | Description                                               |
|--------------------------|----------------|-----------------------------------------------------------|
| <b>Accessories</b>       |                |                                                           |
| 20-660                   | 6-441          | Cover screw.                                              |
| 20-707                   | 10-53          | Metal thermostat guard.                                   |
| 20-715                   | 10-62          | Clear thermostat guard.                                   |
| 21-876                   | 10-76          | Opaque thermostat guard.                                  |
| 21-928                   | —              | Gray plastic cover, blank dial.                           |
| 20-821                   | 100-50         | Remote sensor, reverse acting for 2298-060 and 2298-062.  |
| 20-822                   | 100-51         | Remote sensor, direct acting for 22-98-061 and 22-98-063. |
| <b>Calibration</b>       |                |                                                           |
| 20-881                   | N2-4           | Calibration wrench.                                       |
| 22-138                   | MCS-GA         | Branch tap gauge adaptor.                                 |
| 900-002                  | —              | Thermostat calibration kit warmer/cooler.                 |
| <b>Installation</b>      |                |                                                           |
| 10-82-SS                 | —              | Outlet box mounting plate, stainless steel.               |
| 20-850                   | 10-82          | Outlet box mounting plate, back.                          |
| 20-642                   | —              | Mounting ring.                                            |
| 20-818                   | —              | Mounting bracket.                                         |
| 21-473                   | 10-73          | Snap-in drywall mounting bracket.                         |
| 22-021                   | —              | Universal drywall mounting kit.                           |
| 22-022                   | N5-95          | Competitor replacement mounting kit.                      |
| 22-024                   | —              | Standard mounting kit.                                    |
| <b>Maintenance Parts</b> |                |                                                           |
| 21-929-1                 | —              | Replacement cover.                                        |

Typical Applications

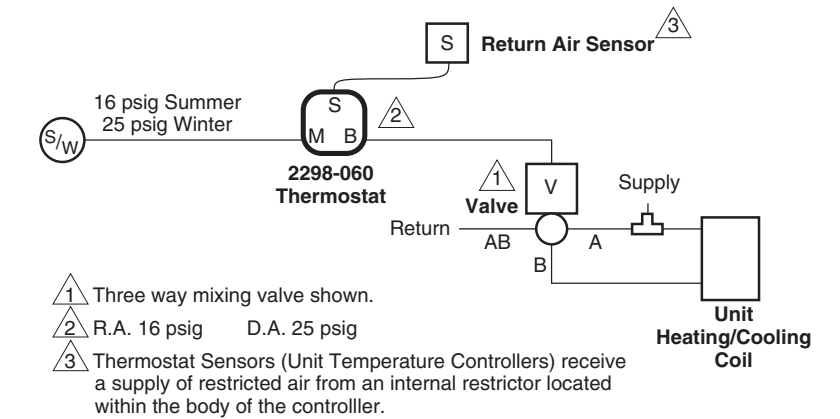


Figure 1 Typical 2298-060 and 2298-063 Summer/Winter Application.

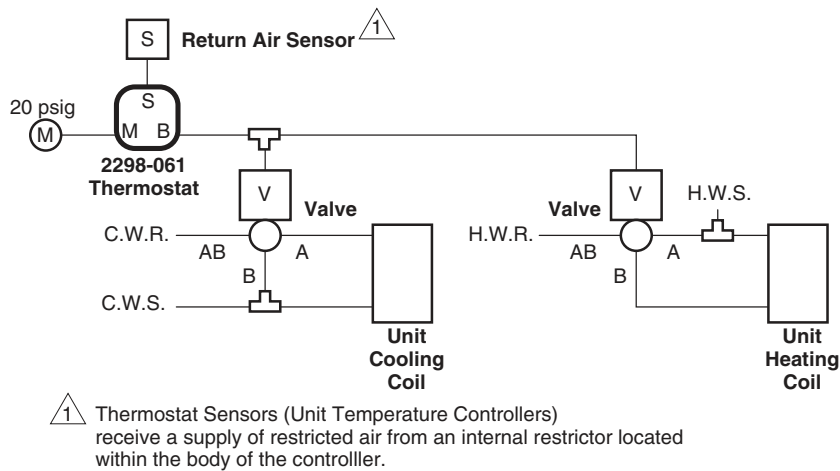


Figure 2 Typical 2298-061 and 2298-062 Heating/Cooling Application.

Unitary  
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All specifications are nominal and may change as design improvements are introduced. Schneider Electric shall not be liable for damages resulting from misapplication or misuse of its products.

## Accessories and Maintenance Parts

### Actuator: Linkages

**Application**

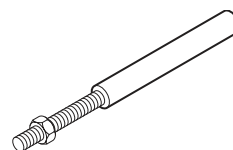
Damper actuator linkage.

**Specifications**

- Construction: Shaft and lock nut 4-3/4 L x 5/8 in. (121 x 16 mm).
- AM-533 for use with actuators:
  - MK-3xxx.
  - MK-71xx-0-0-1 (discontinued).
- AM-543 for use with actuator MK-71x1-0-0-2.

**AM-543**

**Actuator Shaft Extension**

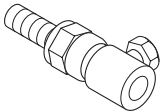
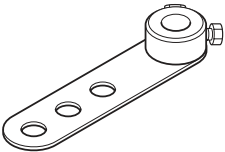


## Accessories and Maintenance Parts

### Actuator: Linkages

# Accessories and Maintenance Parts

## Actuator: Linkages

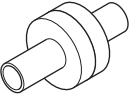
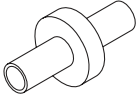
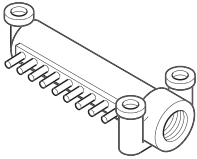
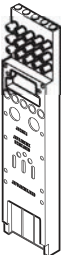
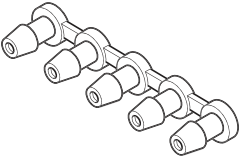
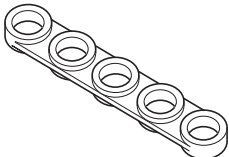
| Damper Actuator Accessories for<br>M556, M572, M574, M583, M584                     |           |                       |                                                                                        |                                     |
|-------------------------------------------------------------------------------------|-----------|-----------------------|----------------------------------------------------------------------------------------|-------------------------------------|
| Illustration                                                                        | Model No. | Replaces<br>Model No. | Description                                                                            | For Use With:                       |
|                                                                                     |           |                       |                                                                                        |                                     |
|    | N800-0803 | —                     | Ball-joint/swivel 1/4-20 male x 5/16 in. dia. female.<br>(Receives 5/16 in. push rod.) | —                                   |
|                                                                                     |           |                       |                                                                                        |                                     |
|  | 21-806    | N800-1415             | Crank arm for 1/2 in. O.D. extended shaft                                              | M556, M572, M573,<br>M574 actuators |
|                                                                                     | N800-1414 | —                     | Crank arm for 3/8 in. O.D. extended shaft                                              |                                     |

## Accessories and Maintenance Parts

### Actuator: Maintenance Parts for Discontinued Actuators

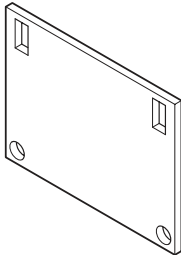
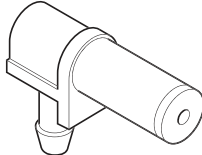
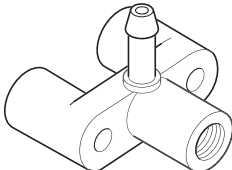
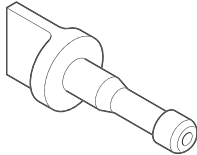
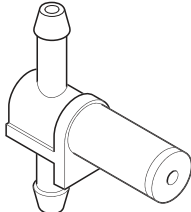
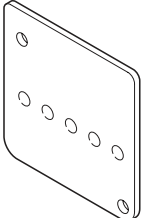
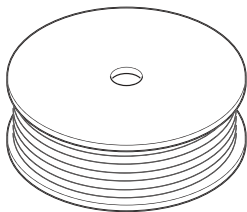
| Model No.   | Replaces Model No.     | Description                               |
|-------------|------------------------|-------------------------------------------|
| 6-501       | 20-695 (10-15)         | Cover Assembly.                           |
| 6-053       | M503                   | Diaphragm.                                |
| 6-054       | M504                   | Diaphragm.                                |
| 6-055       | M505                   | Diaphragm.                                |
| PNV-002     | MK-47x1, MK-48x1       | Diaphragm.                                |
| PNV-251     | MK-47x1, MK-48x1       | High temperature diaphragm.               |
| PND-145-104 | MK-47x1, MK-48x1       | Black spring (3 to 8 psi or 5 to 10 psi). |
| PND-145-107 | MK-47x1, MK-48x1       | Blue spring (8 to 13 psi).                |
| SYZE-13425  | TOOL-100, TOOL-100-500 | Gauge.                                    |

## Accessories and Maintenance Parts Modular Pneumatic Panel Components

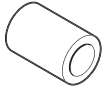
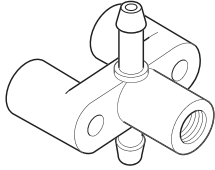
| Illustration                                                                        | Model No. | Replaces Model No. | Description                                                                                                                |
|-------------------------------------------------------------------------------------|-----------|--------------------|----------------------------------------------------------------------------------------------------------------------------|
|    | 21-152    | N100-2500          | In-line check valve will operate on 1/4 psi (2.75 kPa) differential.<br><b>Note:</b> Body is marked IN and OUT.            |
|    | 21-153    | N100-2501          | In-line restrictor, 1 scfh. (28.3 l/h) (0.0063 in. (0.160 mm) Dia. restrictor) for use with 2803-500 or 1/4 in. poly tube. |
|    | 21-721    | N100-2502          | Main air header 3/8 in. FPT input port and nine output ports for 2803-500 tubing.                                          |
|   | 22-120    | MCS-S              | 22-120 includes socket with 22-130 Installed.<br>Package of 20 22-120.<br>Socket assembly                                  |
|                                                                                     | 2890-520  | —                  | Package of 20 22-120.<br>Socket assembly<br><b>Note:</b> Use only 2803-500 on 22-120 tubing connections.                   |
|                                                                                     | MCS-S-P   | —                  | MCS-S-P includes:<br>One 22-130<br>One 22-133<br>Four 22-134<br>Fifteen 22-140                                             |
|  | 22-130    | MCS-PS             | Replacement plug strip for top access holes in 22-120 (has five barbed plugs). (Included as part of 22-120) socket.        |
|  | 22-133    | MCS-G              | Neoprene sealing gasket used when mounting devices on 22-120.                                                              |
|  | 22-134    | MCS-SCREW          | #6-1/2 in. double Plastite® mounting screw; mounts devices to 22-120 socket.                                               |
|  | 22-135    | MCS-MS             | #6-1/4 in. mounting screw for mounting 22-121 to backplate, included with 22-121.                                          |

## Accessories and Maintenance Parts

### Modular Pneumatic Panel Components

| Illustration                                                                        | Model No. | Replaces Model No. | Description                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------|-----------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | 22-136    | MCS-EB             | Electrical barrier. Covers wiring terminals of 22-122.                                                                                                                                                             |
|    | 22-137    | MCS-CV             | Check valve. Mounts on upper end of 22-120 socket.                                                                                                                                                                 |
|    | 22-139    | MCS-GMF            | Drop-eared gauge mounting fitting, receives 1/8 in. NPT stem-mounted gauge. Has one barbed fitting. Used with 22-121.                                                                                              |
|   | 22-140    | MCS-PLUG           | Sealing plug for sealing unused connections of 22-120 socket. (Connections of unused vertical rows need not be plugged).                                                                                           |
|  | 22-143    | MCS-CT             | Check valve tee. Mounts on upper end of 22-120 socket; permits connection to field-mounted devices.                                                                                                                |
|  | 22-144    | MCS-CP             | Cover plate for an unused 22-120 socket.                                                                                                                                                                           |
|  | MCS-TUBE  | —                  | <p>500 ft. roll of 9/32 in (7.1 mm). O.D. polyurethane tubing for use with 22-120</p> <p><b>Note:</b> All connections to TAC 22-120 socket must be made with MCS-TUBE. Do not attempt to use any other tubing.</p> |

## Accessories and Maintenance Parts Modular Pneumatic Panel Components

| Illustration                                                                      | Model No. | Replaces Model No. | Description                                                                          |
|-----------------------------------------------------------------------------------|-----------|--------------------|--------------------------------------------------------------------------------------|
|  | 22-125    | MCS-SC             | Neoprene sealing cap for closing poly-tube air lines. Use with 1/4" barbed coupling. |
|  | N100-2366 | —                  | Drop eared gauge mounting tee.                                                       |

## Accessories and Maintenance Parts

### Thermostats: Guards and Covers

#### Application

2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.

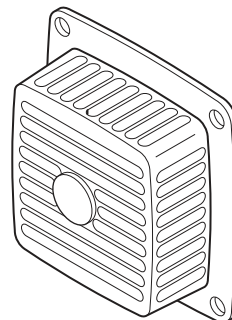
#### Description

5-3/16 in. sq. cast metal guard. Will fit over 2 x 2 in. or 3 x 3 in. units.

**20-707**

**Replaces 10-53**

**Thermostat Guard**



#### Application

2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.

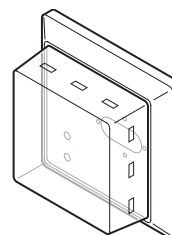
#### Description

Molded Lexan guard for 2 x 2 in. devices. Clear front, satin-chrome enamel base.

**20-715**

**Replaces 10-62**

**Thermostat Guard**



#### Application

2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.

#### Description

Molded ABS guard for 2 x 2 in. devices.

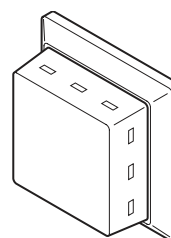
#### Specifications

- Color: opaque gray.

**21-876**

**Replaces 10-76**

**Thermostat Guard**



## Accessories and Maintenance Parts

### Thermostats: Guards and Covers

#### Application

2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.

#### Description

Concealed adjustment cover for use with gray ABS cover.

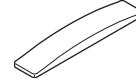
#### Specifications

- Color: gray.

21-964

Replaces 10-80

Adjustment Cover



#### Application

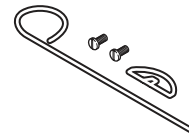
Lock cover screw kit modifies TK Series room thermostats to prevent unauthorized tampering of either the dial setting or the internal mechanism.

#### Specifications

- Two kits are required for duplex type thermostats.
- Used on all TK-1xxx and TK-5xxx except TK-17xx, TK-18xx.

AT-101

Lock Cover Screw Kit



#### Application

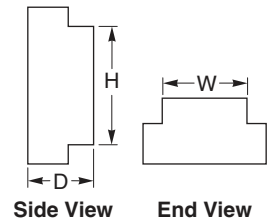
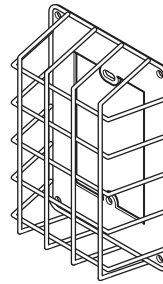
Room thermostat guards protect thermostats from damage and vandalism.

#### Specifications

- Construction: Wire guard with steel base plate.
- Mounting: To standard outlet or directly to the wall.
- Guard/Thermostat combinations:
  - HKS-5033.
  - TK-1xxx.
  - TK-5xxx.
  - TKS-5001.
  - AT-1163 will accept two single thermostats on an AT-546 auxiliary mounting base.
- Dimensions:
  - AT-1103: 4-1/4 H x 2-5/8 W x 1-5/8 D in. (108 x 67 x 41 mm).
  - AT-1163: 6-1/2 H x 6-5/8 W x 3-1/4 D in. (165 x 168 x 83 mm).

AT-1103, AT-1163

Thermostat Guard



#### Application

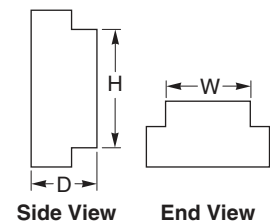
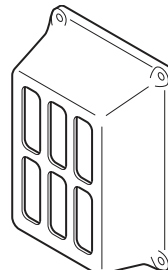
Room thermostat guards protect thermostats from damage and vandalism.

#### Specifications

- Construction: Cast aluminum guard with steel base plate.
- Mounting: To standard outlet or directly to the wall.
- Guard/Thermostat combinations:
  - HKS-5033.
  - TK-1xxx.
  - TK-5xxx.
  - TKS-5001.
- Dimensions: 4-1/4 H x 3-1/8 W x 1-5/8 D in. (108 x 70 x 41 mm).

AT-1104

Thermostat Guard



Accessories  
Tools

## Accessories and Maintenance Parts

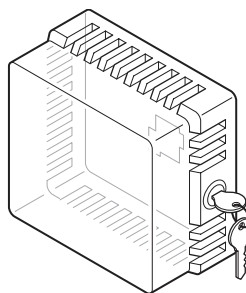
### Thermostats: Guards and Covers

#### Application

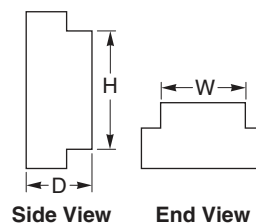
Room thermostat guard protects thermostats from damage and vandalism.

#### Specifications

- Construction: Clear plastic guard with solid base and tumbler type key lock.
- Mounting: To standard outlet or directly to the wall.
- Guard/Thermostat combinations:
  - HKS-5033.
  - TK-1xxx.
  - TK-5xxx.
  - TKS-5001.
  - Any 2 x 2 wall mounted device.
- Dimensions: 3-7/8 H x 3-1/2 W x 2-1/2 D in. (98 x 89 x 63 mm).



**AT-1105**  
**Thermostat Guard**

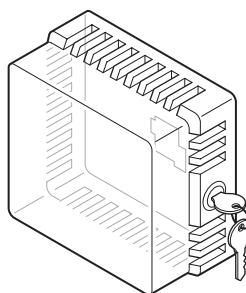


#### Application

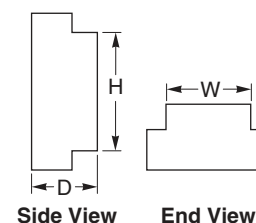
Room thermostat guard protects thermostats from damage and vandalism.

#### Specifications

- Construction: Clear plastic guard with solid and ring base, tumbler type key lock.
- Mounting: To standard outlet or directly to the wall.
- Included: Mounting ring for installation over installed thermostats without their removal from the wall.
- Guard/Thermostat combinations:
  - HKS-5033.
  - TK-1xxx.
  - TK-5xxx.
  - TKS-5001.
  - Any 2 x 2 wall mounted device.
- Dimensions: 5-1/4 H x 4-5/8 W x 3 D in. (133 x 117 x 76 mm).



**AT-1155**  
**Thermostat Guard**

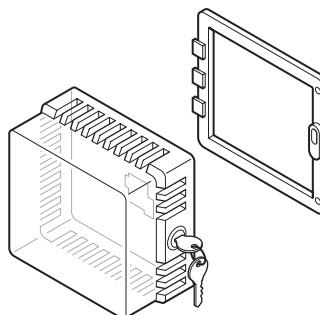


#### Application

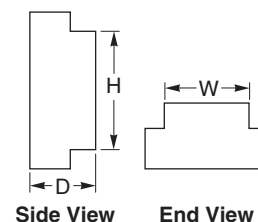
Room thermostat guard protects thermostats from damage and vandalism.

#### Specifications

- Construction: Clear plastic guard with solid and ring base, tumbler type key lock.
- Mounting: To standard outlet or directly to the wall.
- Included: Mounting ring for installation over installed thermostats without their removal from the wall.
- Guard/Thermostat combinations:
  - HKS-5033.
  - TK-1xxx.
  - TK-5xxx.
  - TKS-5001.
  - Any 2 x 2 wall mounted device.
- Dimensions: 8 H x 5-1/2 W x 3-1/2 D in. (203 x 140 x 89 mm).



**AT-1165**  
**Thermostat Guard**



**Accessories and Maintenance Parts**  
**Thermostats: Installation**

**Application**

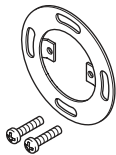
**2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.**

**Description**

Steel mounting ring for mounting thermostat to mounting head.  
Includes two #6 flat head screws.

**20-642**

**Replaces 6-371**  
**Mounting Ring**



**Application**

**2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.**

**Description**

Stop kit for mounting on base of 2 x 2 in. devices only.

**20-712**

**Replaces 10-59**  
**Stop Kit**



**Application**

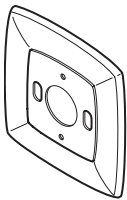
**2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.**

**Description**

10-77: Adaptor plate (molded, black) used to mount 2 x 2 in. devices on 3 x 3 in. hardware. Covers larger hardware so it is not visible.

**20-714**

**Replaces 10-77**  
**Adaptor Plates**



## Accessories and Maintenance Parts

### Thermostats: Installation

#### Application

2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.

#### Description

Thermostat mounting plate provides 2 x 2 in. device mounting to a 2 x 4 in. vertical or horizontal outlet box. Includes two wing bolt screws.

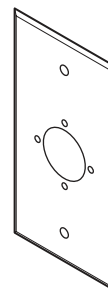
#### Specifications

- 20-850: Black
- 10-82-SS: Color: stainless steel.

**20-850**

**Replaces 10-82 and 10-82-SS**

**Mounting Plates**



#### Application

2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.

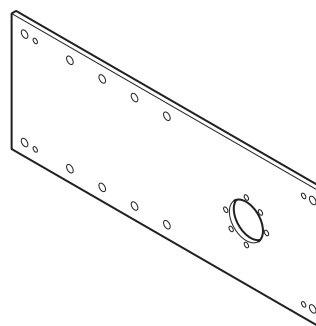
#### Description

Mounting plate for thermostats. Use for dry wall construction. (To be roughed in prior to installation of dry wall.)

**21-069**

**Replaces N5-53**

**Mounting Plate**



#### Application

2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.

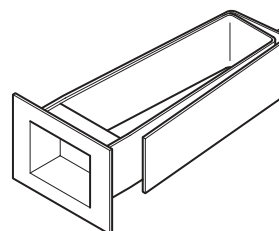
#### Description

Snap-in "labor-saving" fitting for mounting 2 x 2 in. thermostats, humidistats, and transmitters on drywall having at least 3-1/2 in. studs.

**21-473**

**Replaces 10-73**

**Snap-in Fitting**



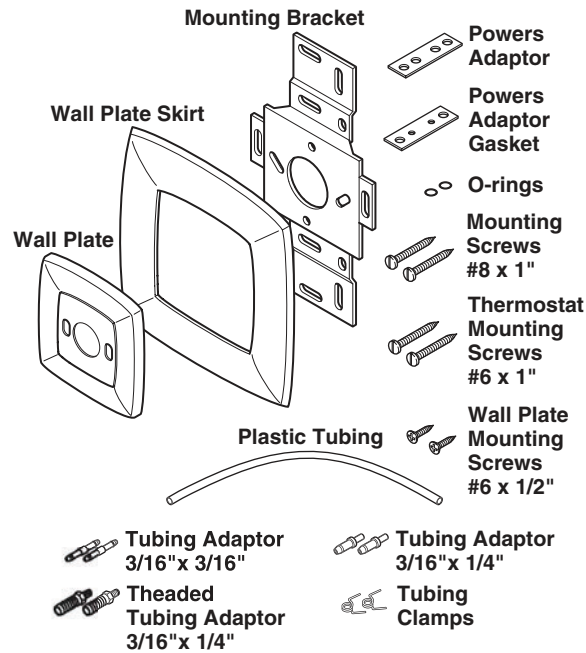
Accessories and Maintenance Parts  
Thermostats: Installation

22-022  
Replaces N5-95  
Thermostat Conversion Kit

This thermostat conversion kit was designed and packaged with the service people in mind. It allows a quick and easy replacement of competitive devices with a new 2211 through 2218 series, 2212-318, 2212-319, 2218-301, and 2220-053 (2 x 2 in.) pneumatic thermostat.

Features:

- Direct replacement of most old or obsolete thermostats.
- Allows replacement without having to remove the old pipe head.
- Wall plate skirt covers marks made by old thermostat.



| Model Chart |              |                                                      |
|-------------|--------------|------------------------------------------------------|
| Model No.   | Kit Contains |                                                      |
|             | Quantity     | Description                                          |
| 22-022      | 1            | Wall plate.                                          |
|             | 1            | Wall plate skirt.                                    |
|             | 1            | Mounting bracket.                                    |
|             | 2            | Tubing adaptor 3/16 x 3/16 in.                       |
|             | 2            | Tubing adaptor 3/16 x 1/4 in.                        |
|             | 2            | 3/16 in. tubing x 1/4 in. threaded adaptor.          |
|             | 2            | O-ring.                                              |
|             | 1            | Adaptor gasket to replace Powers/Siemens/Lands/Gehr. |
|             | 1            | Adaptor to replace Powers/Siemens/Lands/Gehr.        |
|             | 2            | Mounting screw no. 8 x 1 in..                        |
|             | 2            | Wall plate mounting screws no. 6 x 1/2 in.           |
|             | 2            | Thermostat mounting screws no. 6 x 1 in.             |
|             | 2            | Tubing clamps.                                       |
|             | 1            | 1/4 in. O.D. plastic tubing.                         |

## Accessories and Maintenance Parts

### Thermostats: Installation

#### Application

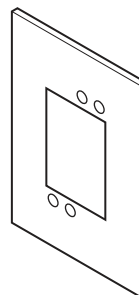
Single room type electric or pneumatic thermostats, sensing elements and electronic controllers or sensing elements. Used to cover a rough plaster hole in the wall. Use with AT-505 sub-base for surface mounting applications.

#### Specifications

- Color: Beige.
- Dimensions: 5-7/16 H x 3-7/8 W x 3/8 D in. (138 x 98 x 16 mm).

**AT-504**

#### Mounting Base Single



#### Application

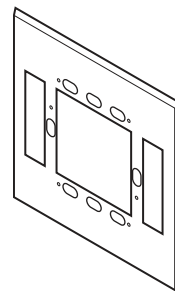
Two single wall type thermostats, controllers or sensing elements for dual function control. Can be installed on a horizontally mounted switch box by mounting an AT-504 on the AT-546.

#### Specifications

- Color: Beige.
- Dimensions: 6-1/4 H x 6-1/4 W x 1/4 D in. (159 x 159 x 6 mm).

**AT-546**

#### Mounting Base Dual



**Accessories and Maintenance Parts**  
**Thermostats: Tools and Calibration**

**Application**

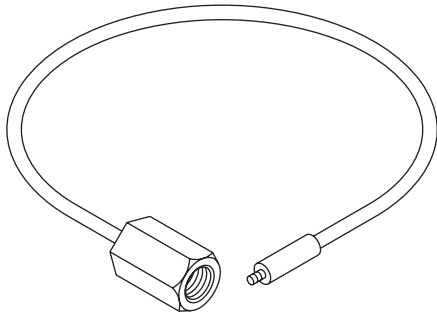
**2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.**

**Description**

Gauge tap adaptor for T15 or T16 only. One end accepts 1/8 in. MPT gauge, other end screws into thermostat body.

**20-706**

**Replaces 10-51**  
**Gauge Adaptor**



**Application**

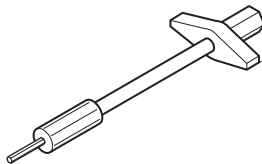
**2 X 2 Thermostat Calibration Tool.**

**Description**

1/16 in. and 1/4 in. hex head thermostat calibration and cover-screw wrench. (Also adjusts 2341 Series Receiver-Controllers.)

**20-881**

**Replaces N2-4**  
**Calibration and Cover-screw Wrench**



**Application**

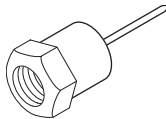
**2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.**

**Description**

Gauge adaptor for 2 x 2 thermostats

**22-138**

**Replaces MCS-GA**  
**Gauge Adaptor**



# Accessories and Maintenance Parts

## Thermostats: Tools and Calibration

Application

Pneumatic thermostat calibration kit for 2 x 2 Thermostats.

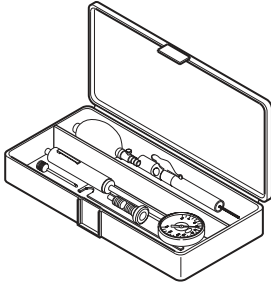
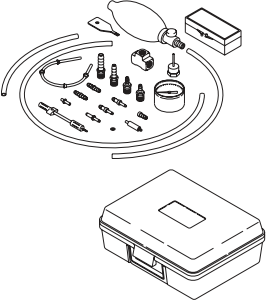
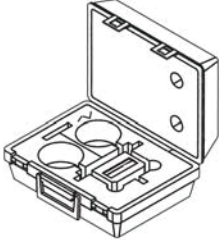
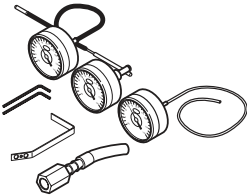
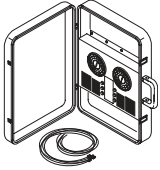
900-002

Calibration Kit

| Illustration | Model No. | Description                                                                                                                                                                                |
|--------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | TOOL-078  | Adaptor for test gauge TOOL-077 to branch test port for HK-1x12, TK-1xxx, T K-6xxx, TK-8xxx, TK-9xxx, and TK-1xxxx type pneumatic thermostat.<br>Also included in TOOL-095-1 and TOOL-096. |
|              | TOOL-082  | Pocket wrench with 5/64 in. Allen wrench for branch test port on TK Series pneumatic thermostats and locking cover screws and 0.048 in. 6-spline wrench for thermostat calibration.        |
|              | TOOL-087  | Needle and adaptor for use with 1/4 in. plastic tubing for TK Series thermostats.                                                                                                          |
|              | TOOL-091  | Branch test adaptor without gauge for Johnson thermostats. Also included in TOOL-090.                                                                                                      |

## Accessories and Maintenance Parts

### Thermostats: Tools and Calibration

| Illustration                                                                        | Model No.    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | TOOL-095-1   | <p>Pneumatic calibration tool kit. Calibrates all TAC pneumatic equipment.</p> <p>Kit includes:</p> <ul style="list-style-type: none"> <li>• 22-138, gauge adaptor.</li> <li>• 20-881, 2 x 2, 1/16 in. hexhead thermostat calibration cover screw wrench.</li> <li>• Female branch tee (1/4 barb x 1/4 barb x 1/8 in. FPT).</li> <li>• TOOL-011: calibration wrench.</li> <li>• TOOL-078: adaptor.</li> <li>• TOOL-080-1: changeover wrench.</li> <li>• TOOL-082: combination wrench.</li> <li>• TOOL-083: thermostat calibration wrench.</li> <li>• TOOL-085: hand pump bulb.</li> <li>• TOOL-087: needle and adaptor.</li> <li>• TOOL-110: 3/32 in. hex wrench.</li> <li>• AL-362: 0 to 30 psi (0 to 206 kPa) gauge.</li> <li>• Air line tubing for barbed fitting.</li> <li>• Air line tubing with compression fitting.</li> <li>• 3/16 x 4 in. blade screwdriver.</li> </ul> |
|   | 900-002      | Pneumatic thermostat calibration kit for 2" x 2" Thermostats.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|  | 900-012      | Pneumatic calibration kit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|  | TOOL-096     | <p>Pneumatic thermostat calibration kit, for TK-Series thermostats.</p> <p>Kit includes:</p> <ul style="list-style-type: none"> <li>• TOOL-076: adaptor.</li> <li>• TOOL-077: adaptor.</li> <li>• TOOL-078: adaptor.</li> <li>• TOOL-080-1: changeover wrench.</li> <li>• TOOL-083: thermostat calibration wrench.</li> <li>• TOOL-111: 5/64 in. Allen wrench.</li> <li>• TOOL-112: 7/64 in. Allen wrench.</li> <li>• Three AL-362, 0 to 30 psi (0 to 206 kPa) gauges</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                 |
|  | TOOL-100-500 | Calibration instrument for pneumatic transmitter/receiver controller systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## Accessories and Maintenance Parts

### Thermostats: Tubing and Fittings

#### Application

2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.

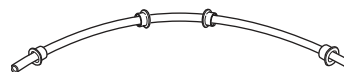
#### Description

3/16 in. tygothane tubing assembly with spring. One tube with four eyelets, but no fittings.

20-693

Replaces 10-11

Tubing



#### Application

2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.

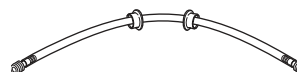
#### Description

3/16 in. tygothane tubing assembly, with spring, two eyelets, and two barbed fittings for 1/4 in. plastic tubing.

20-717

Replaces 10-64

Tubing



#### Application

2 X 2 Thermostat Installation Fittings, Accessories, Adaptors and Tools.

#### Description

Used for transmitters and bleed type units. 1.0 scfh (28.32 l/h) restrictor (1/4 in. O.D. compression) for use on 1/4 in. O.D. copper tubing or can be used on polyethylene with insert.

#### Also Replaces:

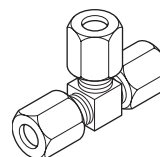
AT-532-098-1-1

AT-532-111-1-03

20-944

Replaces N4-32

Restrictor



#### Application

2 X 2 Thermostat Installation Restrictor, Restrictor Tees, and Thermostat Calibration Kit.

#### Description

1.0 scfh (28.32 l/h) restrictor tee for use with one-pipe thermostats or transmitters (1/4 in. polyethylene or polyurethane tubing). Color: red.

#### Also Replaces:

AT-532-111-1-01

AT-532-111-1-02

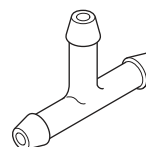
AT-532-222-2-01

Use two 21-038 to replace AT-532-222-2-02

21-038

Replaces N100-0010 (N100-10)

Restrictor Tee



## Accessories and Maintenance Parts

### Thermostats: Tubing and Fittings

#### Application

2 X 2 Thermostat Installation Restrictor, Restrictor Tees, and Thermostat Calibration Kit.

#### Description

0.5 scfh (14.16 l/h) restrictor tee. Color: light green.

**Note:** For use with the 2298 series temperature controllers. This restrictor should be used only (a) when the 100-50 (RA) or 100-51 (DA) temperature sensors are used separately, or (b) for special applications requiring low air flow.

#### Also Replaces:

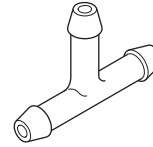
AT-532-098-1-2

AT-532-098-1-3

21-039

Replaces N100-0005 (N100-5)

Restrictor Tee



#### Application

2 X 2 Thermostat Installation Restrictor, Restrictor Tees, and Thermostat Calibration Kit.

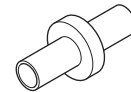
#### Description

Used for transmitters and bleed type units. 1.0 scfh (28.32 l/h) in-line restrictor.

21-153

Replaces N100-2501

In-line Restrictor



#### Application

Optional. 2252 series transmitter accessory.

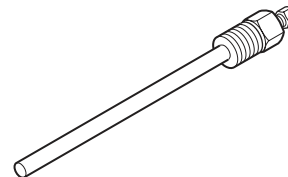
#### Specifications

- 3/8 x 7-1/32 in. copper well with 1/2 in. NPT bushing.
- 2252 series transmitter require 20-803 adapter.
- Assemble using M-500 thermal compound.

20-778

Replaces 100-17

Copper Well



## Accessories and Maintenance Parts

### Transmitters: Wells

#### Application

Standard. 2252 series transmitter accessory.

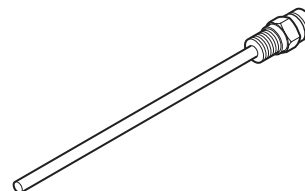
**20-782**

**Replaces 100-25**

**Copper Well**

#### Specifications

- 3/8 x 10-17/32 in. copper well with 1/2 in. NPT bushing.
- Assemble using M-500 thermal compound.



#### Application

Adapts existing female threaded wells (7/16 in. — 24) for T150 set screw mounting. T150 transmitter accessory.

**20-803**

**Replaces 100-47**

**Adaptor**

Neck extension adaptor-converts 7-1/32 in. well to 10-17/32 in. well.



#### Application

2252 series transmitter accessory.

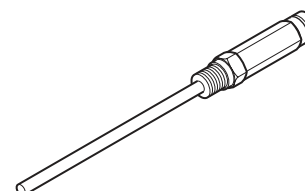
**20-805**

**Replaces 100-49**

**Stainless Steel Well**

#### Specifications

- 3/8 x 7-1/32 in. stainless steel well with 1/2 in. NPT bushing.
- Includes 20-803.
- Assemble using M-500 thermal compound.



#### Application

Adaptor, brass, for mounting T150 Immersion Transmitter in AT-201 or AT-203 well.

**22-401**

**Replaces 100-71**

**Adaptor**



## Accessories and Maintenance Parts

### Transmitters: Wells

#### Application

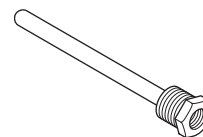
Immersion well for use with 3/8 in. (10 mm) temperature bulbs.

**AT-201, AT-203, AT-206**

**Immersion Well**

#### Specifications

- Ambient temperature limits: -40 to 350°F (-40 to 177°C).
- Assemble using M-500 thermal compound.



| Model No.           | Material        | Dimensions            |                           |                              |             | Application Limitations at 250°F (121°C) Fluid Temp. |                                        | Used With        |
|---------------------|-----------------|-----------------------|---------------------------|------------------------------|-------------|------------------------------------------------------|----------------------------------------|------------------|
|                     |                 | O.D. in. (mm)         | Insertion Length in. (mm) | Overall Well Length in. (mm) | Fitting in. | Max. Recom. Velocity FPS (m/s)                       | Max. Recom. Static Pressure psig (kPa) |                  |
| AT-201 <sup>a</sup> | Copper          | 1/2 (13) <sup>b</sup> | 9-1/2 (241)               | 10-1/4 (260)                 | 3/4 MNPT    | 11 (3.3)                                             | 250 (1728)                             | TK-6024, TK-6124 |
| AT-203 <sup>a</sup> | Stainless Steel | 1/2 (13) <sup>b</sup> | 9-1/2 (241)               | 10-1/2 (267)                 | 3/4 MNPT    | 20 (6.1)                                             | 500 (3448)                             |                  |
| AT-206              | Copper          | 1/2 (13) <sup>b</sup> | 4-1/2 (114)               | 5-13/16 (148)                | 1/2 MNPT    | 11 (3.3)                                             | 250 (1728)                             |                  |

<sup>a</sup> Requires AT-209 for TK-6024, TK-6124.

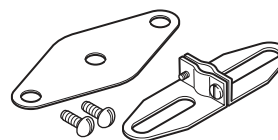
<sup>b</sup> For 3/8 in. (10 mm) diameter bulbs.

#### Application

Duct mounting kit for pneumatic temperature bulbs.

**AT-208**

**Duct Mounting Kit**

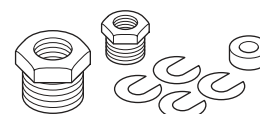


#### Application

3/4 in. MNPT liquid line or tank mounting kit for TK-6024 or TK-6124 Series bulb thermostats. Bulb well is recommended.

**AT-209**

**Liquid Line or Tank Mounting Kit**



Accessories and Maintenance Parts

Transmitters: Miscellaneous

Application

Duct static pressure sensing tips.

Specifications

- Mounting hardware: Provided.

AP-302

Pressure Sensing Tip

| Model No. | Type of Connection                                       | Construction | Mounting Location                                          | Dimensions in. (mm)                                | For Use With                 |
|-----------|----------------------------------------------------------|--------------|------------------------------------------------------------|----------------------------------------------------|------------------------------|
| AP-302    | 1/4 in. compression fitting for plastic or copper tubing | Brass        | Areas with air turbulence caused by filters, dampers, etc. | Insertion length 4 (102); 5 L x 2-1/2 W (127 x 64) | 2323-5xx, 2374-401, 2374-410 |





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