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Powerstar Room Thermostats

Proven to provide fast response and highly accurate temperature control, Powerstar Pneumatic Room Thermostats are designed to control heating and/or cooling by operating a variety of pneumatic devices such as valves or damper actuators.

Powerstar thermostats are factory calibrated to control pneumatic devices over a 3 to 15 psi (103 to 207 kPa) range.

Powerstar pneumatic room thermostats are available for the following applications:

- Single Temperature
- Day/Night
- Day/Night/Vent
- Heating/Cooling
- Free Energy Band
- Free Energy Band with Hesitation

Covers are available with concealed or exposed setpoint adjustment, room temperature indication, and setpoint indicator.



Selection Guide

Air Supply	Applications	Control Outputs	Control Setpoints	Control Actions	Air Output Capacity		Model
					Low (1-pipe)	High (2-pipe)	
15 to 30 psi (103 to 207 kPa)	• Heat or Cool	Single	Single	Direct/Reverse	•	•	192 S
Cool 18 psi (124 kPa) Heat 25 psi (172 kPa)	• Heat and Cool (auto changeover) • Factory calibrated (194 HC) for Honeywell or Johnson retrofit	Single	Dual	Direct/Direct		•	192 HC
				Reverse/Reverse		•	194 HC
				Direct/Reverse		•	
				Reverse/Direct		•	
Day 18 psi (124 kPa) Night 25 psi (172 kPa)	• Day and Night (auto changeover) • Factory calibrated (194 DN) for Honeywell or Johnson retrofit • R2 vent ("0") day, full supply night (DNV only, 3-pipe)	Single	Dual (Day/Night)	Direct/Direct		•	192 DN
				Reverse/Reverse		•	194 DN
Day 18 psi (124 kPa) Night 25 psi (172 kPa)	• Day and Night (auto changeover) • Night override selector switch • Factory calibrated (194 DN for Honeywell or Johnson retrofit) • R2 vent ("0") day, full supply night (DNV only, 3-pipes) • Night override selector switch	Dual	Dual (Day/Night with Vent)	None	•	•	192 DNV 194 DNV
15 to 30 psi (103 to 207 kPa)	• Heat and Cool • Sequence-controlled devices with two control lines (same or different range)	Dual	Dual (Heat/Cool)	Direct/Direct	•	•	193 HC Free Energy Band
				Reverse/Reverse	•	•	
				Direct/Reverse	•	•	
				Reverse/Direct	•	•	
15 to 30 psi (103 to 207 kPa)	• Heat and Cool • Sequence-controlled devices with one control line (different spring ranges)	Single	Dual (Heat/Cool)	Direct/Direct		•	193 HC Free Energy Band (Hesitation)

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Thermostats

Housings with No Logo Option

Our award-winning housing design, plus a variety of energy-saving functions and adaptability options, make Siemens thermostats a welcome addition to any room. Look for the “No Logo” cover option to inconspicuously enhance a room’s aesthetics.

**SIEMENS**

Powerstar Single Setpoint Pneumatic Room Thermostat



192 S Thermostat chassis.



Typical wall plate and screws.

Description

Providing proportional single output, single setpoint, 1-pipe for low air capacity or 2-pipe for high air capacity pneumatic room temperature control, the 192 S Powerstar Single Setpoint Pneumatic Room Thermostat is the most economical model. Refer to the Retroline® Retrostats on page A-15 to replace competitive models.

Features

- Single setpoint dial available in Fahrenheit or Celsius scales
- Available in direct or reverse acting models
- Sensitive bimetal responds to temperature changes
- Integral, field adjustable limit stops
- Wall mounting plate for connection to a variety of rough-in terminal boxes included
- Large volume air capacity relay in 2-pipe models only
- Test port for fast check of output pressure without removing the cover
- Field replaceable thermometer, setpoint dial, restrictor and filters for decreased maintenance cost

Options

- Quick-connect air connections for ease of installation and service
- Fixed limit stops to meet government specifications
- Large, 1/2" setpoint knob for convalescent homes

Applications

Designed for heating and cooling applications for control of pneumatic valves and damper actuators. The 192 S Powerstar Single Setpoint Pneumatic Room Thermostat is excellent for commercial and institutional facilities.

Recommendation

1-pipe: Use when limited output air capacity is required to operate a single valve and/or actuator; requires external restrictor, 20 scim (5.4 ml/s) air supply.

2-pipe: Use for high output capacity for control of multiple valves and actuators, used with or without high/low limiting controls.

Application Drawings

Dotted lines are alternative control schemes.

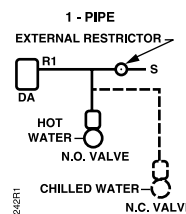


DIAGRAM 1.

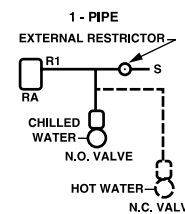


DIAGRAM 2.

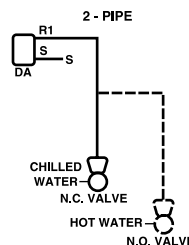


DIAGRAM 3.

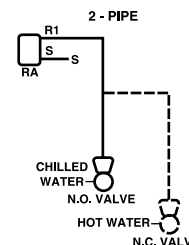


DIAGRAM 4.

192 S Thermostat Specifications



For complete conversion kits, refer to the Retroline® Retrostats starting on page A-15.

Scale; Range
 (mm) Divisions..... 45 to 85°F, 10(2)°F
 (7 to 30°C, 5(1)°C)

Factory Calibration 72°F, 7.5 psi ±0.3
 (22°C, 52 kPa @ 1.8)

Sensitivity Adjustment Range 1 to 4 psi/°F (12 to 50 kPa/°C)

Factory Setting 2.5 psi/°F (31 kPa/°C)

Limit Stop
 Field Adjustment Range 45/85°F (7/30°C)
 Fixed Limit Stop Range 55/75°F (13/24°C)

Temperature
 Storage..... -10 to +140°F (-23 to +60°C)
 Ambient Operating 40 to 140°F (4 to 60°C)

Accuracy at Factory
 Calibration ±2°F (±1.1°C)
 Response 0.1°F (0.06°C)

Supply Air Pressure
 Recommended..... 25 psi (172 kPa)
 Maximum..... 30 psi (207 kPa)

Nominal Air Consumption for Air Compressor Sizing
 1-pipe 25 scim (6.8 ml/s)
 2-pipe 20 scim (5.5 ml/s)

Nominal Air Capacity for Air Main Sizing
 1-pipe 25 scim (6.8 ml/s)
 2-pipe 20 scim (5.5 ml/s)

Nominal Chassis Air Capacity
 1-pipe Supply 25 scim (6.8 ml/s)
 2-pipe Supply 230 scim (63 ml/s)
 1-pipe Exhaust 30 scim (8 ml/s)
 2-pipe Exhaust 150 scim (41 ml/s)

Air Connections 5/32" (4 mm) OD tubing








Dimensions (with cover) 2.16" W x 3.34" H x 1.59" D
 (55 mm W x 85 mm H x 40 mm D)

Shipping Weights (with cover)
 Thermostat Chassis and Wall Plate 0.53 lb. (0.24 kg)
 Plastic Cover/Metal Cover 0.07 lb. (0.04 kg)/0.27 lb. (0.12 kg)

192 S Thermostat Product Ordering

Model #	Thermostat Chassis Type				Thermostat Chassis & Wall Plate	
	Output	Setpoint	Air Output Capacity	Thermometer & Setpoint Scales	Control Action	
					Direct	Reverse
192 S 1-pipe	Single	Single (Heat or Cool)	Low (No Relay)	°F °C	192-200	192-201
					192-220	192-221
192 S 2-pipe	Single	Single (Heat or Cool)	High (Integral Relay)	°F °C	192-202	192-203
					192-222	192-223



Thermostat Covers (Sold Separately)	Plastic Part No.		Metal Part No.
	Desert Beige	White	
 <ul style="list-style-type: none"> Adjustment setpoint concealed Indicator setpoint concealed Chassis thermometer concealed No logo 	192-257	192-257W	192-357
 <ul style="list-style-type: none"> Adjustment setpoint concealed Indicator setpoint concealed Chassis thermometer concealed With logo 	192-256	192-256W	192-356
 <ul style="list-style-type: none"> Adjustment setpoint concealed Indicator setpoint concealed Chassis thermometer exposed 	192-254	192-254W	192-354
 <ul style="list-style-type: none"> Adjustment setpoint key Indicator setpoint exposed Chassis thermometer concealed Use with 1/2" setpoint knob option 	192-265	192-265W	192-365
 <ul style="list-style-type: none"> Adjustment setpoint key Indicator setpoint exposed Chassis thermometer exposed Use with 1/2" setpoint knob option 	192-266	192-266W	192-366
 <ul style="list-style-type: none"> Adjustment setpoint exposed Indicator setpoint exposed Chassis thermometer concealed 	192-250	192-250W	192-350
 <ul style="list-style-type: none"> Adjustment setpoint exposed Indicator setpoint exposed Chassis thermometer concealed 	192-252	192-252W	192-352

Note: • "Exposed features" are indicated in green on corresponding illustration.
 • Universal Cover sold on page A-83. For 194 refer to Powerstar Retroline section.



Powerstar Heating/Cooling Pneumatic Room Thermostats



192 HC Thermostat chassis.



Typical wall plate and screws.



192 HC Thermostat with plastic cover. Chassis wall plate with easy maintenance plug-in adapters shown (optional).



Description

Providing proportional single output, dual setpoint with 2-pipe for high air capacity pneumatic room temperature control, the 192 HC Powerstar Heating/Cooling Pneumatic Room Thermostat provides two thermostats under one cover; one side for heating and the other for cooling. Switchover is accomplished by changing the air pressure to the thermostat.

Features

- Dual setpoint dial available in Fahrenheit or Celsius scales
- Available in direct or reverse acting models
- Sensitive bimetal responds to temperature changes
- Integral, field adjustable limit stops
- Adjustable changeover pressure
- Large volume air capacity relay
- Wall mounting plates provides connection to a variety of rough-in terminal boxes
- Test port for fast check of output pressure without removing the cover
- Field replaceable thermometer, setpoint dials, restrictor and filters

Options

- Fixed limit stops to meet government specifications
- Quick-connect air connections for ease of installation and service
- Large, 1/2" setpoint knob for convalescent homes

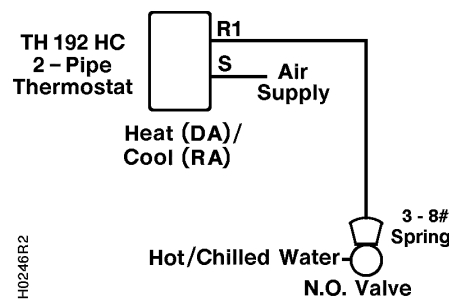
Applications

Designed for temperature control of heating and cooling applications, the 192 HC Powerstar Heating/Cooling Pneumatic Room Thermostat controls valves and damper actuators in cooling equipment. Providing energy management and occupant comfort, the thermostat automatically adjusts to seasonal changes from heating setpoint to cooling setpoint in commercial and institutional facilities.

Recommendation

For control of multiple valves and actuators, use with or without high/low limiting controls.

Application Drawing



192 HC Thermostat Specifications



For complete conversion kits, refer to the Retroline® Retrostats starting on page A-15.

Scale; Range
 (mls) Divisions.....45 to 85°F, 10(2)°F
 (7 to 30°C, 5(1)°C)

Factory Calibration 72°F, 7.5 psi ± 0.3
 (22°C, 52 kPa @ 1.8)

Sensitivity Adjustment Range 1 to 4 psi/°F (12 to 50 kPa/°C)

Factory Setting 2.5 psi/°F (31 kPa/°C)

Limit Stop
 Field Adjustment Range45/85°F (7/30°C)
 Fixed Limit Stop Range.....55/75°F (3/24°C)

Temperature
 Storage.....-10 to +140°F (-23 to +60°C)
 Ambient Operating40 to 140°F (4 to 60°C)

Accuracy at Factory
 Calibration±2°F (±1.1°C)
 Response0.1°F (0.06°C)

Supply Air Pressure
 Two Pressure (Recommended) Cooling/Heating..... 18 psi (124kPa)/
 (124 kPa)/25 psi (172 kPa)

Supply Air Pressure
 Two Pressure (Range)
 Cooling 15 to 19 psi (103 to 131 kPa)
 Heating 23 to 30 psi (159 to 207 kPa)

Two Pressure, Honeywell Competitive Model
 Cooling/Heating 13 psi (90 kPa)/18 psi (124 kPa)

Two Pressure, Johnson Competitive Model¹
 Cooling/Heating 15 psi (103 kPa)/20 psi (138 kPa)

Nominal Air Consum. for Air Compressor Sizing25 scim (6.8 ml/s)

Nominal Air Capacity for Air Main Sizing40 scim (11 ml/s)

Nominal Air Capacity
 Supply/Chassis Exhaust..... 150 scim (41 ml/s)/150 scim (41 ml/s)

Air Connections5/32" (4 mm) OD tube








Dimensions (with cover) 2.16" W x 3.34" H x 1.59" D
 (55 mm W x 85 mm H x 40 mm D)

Shipping Weights
 Thermostat Chassis and Wall Plate 0.53 lb. (0.24 kg)
 Plastic Cover0.07 lb. (0.04 kg)
 Metal Cover (single/dual) 0.27 lb. (0.12 kg)/0.7 lb. (0.3 kg)

1. Some Johnson Controls heat/cool thermostats have a cooling supply pressure of 20 psi (138 kPa) and a heating supply pressure of 15 psi (103 kPa). For this application, the heating and cooling actions must be reversed. If exposed setpoint is required, order special cover, **192-773**.

192 HC Thermostat Product Ordering

Model #	Thermostat Chassis Type				Thermostat Chassis & Wall Plate	
	Output	Setpoint	Air Output Capacity	Thermometer & Setpoint Scales	Control Action	
					Heat Direct	Heat Reverse
192 HC 2-pipe	Single	Dual (Heat and Cool)	High (Integral Relay)	°F	192-207 Cool (DA)	192-209 Cool (DA)
				°F	192-208 Cool (RA)	192-210 Cool (RA)
				°C	192-227 Cool (DA)	192-229 Cool (DA)
				°C	192-228 Cool (RA)	192-230 Cool (RA)

Thermostat Covers (Sold Separately)	Plastic Part No.		Metal Part No.
	Desert Beige	White	
 <ul style="list-style-type: none"> Adjustment setpoint concealed Indicator setpoint concealed Chassis thermometer concealed No logo 	192-257	192-257W	192-357
 <ul style="list-style-type: none"> Adjustment setpoint concealed Indicator setpoint concealed Chassis thermometer concealed With logo 	192-256	192-256W	192-356
 <ul style="list-style-type: none"> Adjustment setpoint concealed Indicator setpoint concealed Chassis thermometer exposed 	192-254	192-254W	192-354
 <ul style="list-style-type: none"> Adjustment setpoint key Indicator setpoint exposed Chassis thermometer concealed 	192-267	192-267W	192-367
 <ul style="list-style-type: none"> Adjustment setpoint key Indicator setpoint exposed Chassis thermometer exposed Use with 1/2" setpoint knob option 	192-268	192-268W	192-368
 <ul style="list-style-type: none"> Adjustment setpoint exposed Indicator setpoint exposed Chassis thermometer concealed Use with 1/2" setpoint knob option 	192-258	192-258W	192-358
 <ul style="list-style-type: none"> Adjustment setpoint exposed Indicator setpoint exposed Chassis thermometer concealed 	192-260	192-260W	192-360

Note: • "Exposed features" are indicated in green on corresponding illustration.
 • Universal Cover sold on page A-83.



Powerstar Day/Night/Vent Pneumatic Room Thermostats



192 DN Thermostat chassis.



Typical wall plate and screws.



192 DN Thermostat with plastic cover. Chassis wall plate with easy maintenance plug-in adapters shown (optional).



Description

Providing proportional dual setpoint, 2-pipe or 3-pipe high air capacity pneumatic room temperature control, the 192 DN or DNV Powerstar Pneumatic Room Thermostat automatically resets the room temperature setpoint during unoccupied hours by changing the air pressure to the thermostat. A manual override feature allows occupants to switch to day mode. The override returns to night mode the following night.

Features

- Dual setpoint dial available in Fahrenheit or Celsius scales
- Available in direct or reverse acting models
- Sensitive bimetal responds to temperature changes
- Manual override selector for off-hour occupant comfort
- Adjustable changeover pressure
- Large volume air capacity relay
- Integral, field adjustable limit stops
- Wall mounting plate for connection to a variety of rough-in terminal boxes included
- Test port for fast check of output pressure without removing the cover
- Field replaceable thermometer, setpoint dial, restrictor and filters

Options

- Fixed limit stops to meet government specifications
- Quick-connect air connections for ease of installation and service
- Large, 1/2" setpoint knob for convalescent homes

Applications

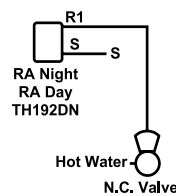
The 192 DN and DNV Powerstar Pneumatic Room Thermostat controls valves and damper actuators in cooling equipment, automatically performing setback changes from day to night. The 192 DNV also performs a purge sequence at night to bring in "vent" outside air to cool the building. A manual override selector switch allows individual room or zone "day" control locally during the night cycle.

During the night control cycle, the 192 DNV models provide a separate output signal (full air supply) allowing ventilation control. Periodic resetting to the "night" control mode during evening or weekend periods using time clocks ensures optimal energy management.

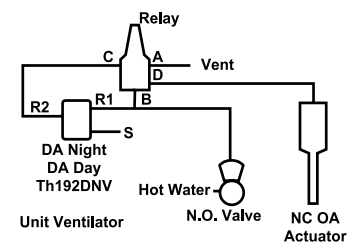
Recommendation

Use 192 DN or DNV for multiple valves and actuators, with or without high/low limiting controls.

Application Drawings



Day/Night.



Day/Night/Vent.

Chassis Port R2 Pressure	Operation Mode (Air Supply)	Switching Relay Connection
Full Air Supply	Night (S=25 psi)	A-D
0 psi	Night Occupied	B-D
0 psi	Day (S=18 psi)	B-D

192 DN/DNV Thermostat Specifications





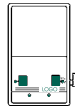


For complete conversion kits, refer to the Retroline® Retrostats starting on page A-15.

- Scale; Range**
Major (minor) Divisions..... 45 to 85°F, 10(2)°F
(7 to 30°C, 5(1)°C)
- Factory Calibration**72°F, 7.5 psi
(22°C, 31 kPa)
- Sensitivity Adjustment Range** 1 to 4 psi/°F (12 to 50 kPa/°C)
- Factory Setting** 2.5 psi/°F (31 kPa/°C)
- Limit Stop**
Field Adjustment Range 45/85°F (7/30°C)
Fixed Limit Stop Range..... 55/75°F (3/24°C)
- Temperature**
Storage..... -10 to +140°F (-23 to +60°C)
Ambient Operating 40 to 140°F (4 to 60°C)
- Accuracy at Factory**
Calibration ±2°F (±1.1°C)
Response 0.1°F (0.06°C)
- Supply Air Pressure**
Two Pressure
Day (recommended)..... 18 psi (124 kPa)
Night (recommended)..... 25 psi (172 kPa)
Vent-Day/Night 0 psi (0 kPa)/25 psi (172 kPa)

- Two Pressure
Day (range)..... 15 to 19 psi (103 to 131 kPa)
Night (range)..... 23 to 30 psi (159 to 207 kPa)
- Two Pressure (Honeywell Competitive Model)
Day/Night..... 13 psi (90 kPa)/18 psi (124 kPa)
- Two Pressure (Johnson Controls Competitive Model)
Day/Night..... 15 psi (103 kPa)/20 psi (138 kPa)
- Nominal Air Consumption for Air Compressor Sizing** 25 scim (6.8 ml/s)
- Nominal Air Capacity for Air Main Sizing** 40 scim (11 ml/s)
- Nominal Chassis Air Capacity**
Supply 230 scim (63 ml/s)
Exhaust 150 scim (41 ml/s)
- Air Connections** 5/32" (4 mm) OD tube
- Dimensions (with cover)**
192 DN 2.16" W x 3.34" H x 1.59" D
(55 mm W x 85 mm H x 40 mm D)
192 DNV 2.5" W x 3.34" H x 1.59" D
(64 mm W x 85 mm H x 40 mm D)
- Shipping Weights**
Thermostat Chassis and Wall Plate0.53 lb. (0.24 kg)
Plastic Cover0.07 lb. (0.04 kg)
Metal Cover (dual).....0.27 lb. (0.12 kg)

192 DN/DNV Thermostat Product Ordering

Model #	Thermostat Chassis Type				Thermostat Chassis & Wall Plate		
	Output	Setpoint	Air Output Capacity	Thermometer & Setpoint Scales	Control Action		
					D (DA) / N (DA)	D (RA) / N (RA)	D (DA) / N (DA) (with Night Vent)
192 DN	Single	Dual (Day and Night)	High (Integral Relay)	°F	192-204	192-205	192-206
192 DNV 3-pipe				°C	192-224	192-225	192-226

Thermostat Covers (Sold Separately)	Plastic Part No.		Metal Part No.
	Desert Beige	White	
 <ul style="list-style-type: none"> • Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed 	192-262	192-262W	192-362
 <ul style="list-style-type: none"> • Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer exposed 	192-264	192-264W	192-364
 <ul style="list-style-type: none"> • Adjustment setpoint key • Indicator setpoint exposed • Chassis thermometer concealed • Use with 1/2" setpoint knob option 	192-269	192-269W	192-369
 <ul style="list-style-type: none"> • Adjustment setpoint key • Indicator setpoint exposed • Chassis thermometer exposed • Use with 1/2" setpoint knob option 	192-270	192-270W	192-370
 <ul style="list-style-type: none"> • Adjustment setpoint key (night) exposed (day) • Indicator setpoint exposed • Chassis thermometer exposed 	192-271	192-271W	192-371

Note:

- DNV 3-pipe model provides full air supply on R2 vent port during night control cycle.
- "Exposed features" are indicated in green on corresponding illustration.
- For 194 refer to Powerstar Retroline section.
- Universal Cover sold on page A-83.

A-10

Thermostats

Powerstar Free Energy Band Heating/Cooling Pneumatic Room Thermostats



193 HC Thermostat chassis.



Typical wall plate and screws.



193 HC Thermostat with plastic cover. Chassis wall plate with easy maintenance plug-in adapters shown (optional).



Description

Providing proportional, dual output, dual setpoint, 2-pipe (dual 1-pipe low air capacity) or 3-pipe (dual 2-pipe high air capacity) pneumatic room temperature control, the 193 HC Powerstar Free Energy Band Pneumatic Room Thermostat creates a deadband so that no heating or cooling occurs during the Free Energy Band.

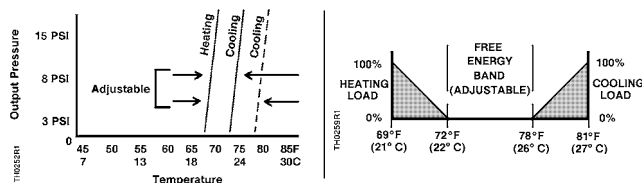
Features

- Dual setpoint dials available in Fahrenheit or Celsius scales
- Integral, field adjustable limit stops
- Sensitive bimetal responds to temperature changes
- Adjustable Free Energy Band
- Test port for fast check of output pressure without removing the cover
- Wall mounting plates for connection to a variety of rough-in terminal boxes included
- Field replaceable thermometer, setpoint dials, restrictors and filters
- Competitive adapter mounting kits available

Options

- Fixed limit stops to meet government specifications
- Quick-connect air connections for ease of installation and service
- Large, 1/2" setpoint knob for convalescent homes

Input/Output Characteristics



Applications

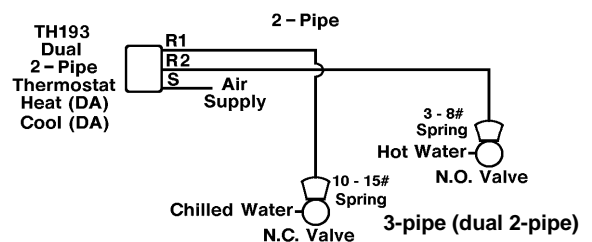
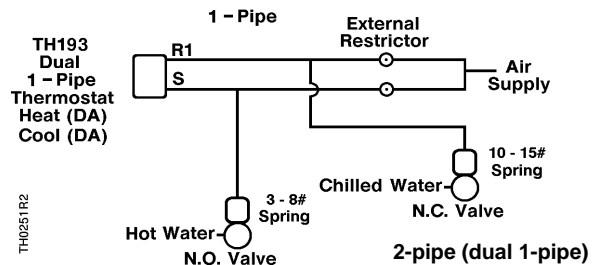
Designed for buildings with early morning heat requirements and mid-morning to afternoon cooling requirements, the Powerstar Free Energy Band Pneumatic Room Thermostat two temperature thermostat controls valves, damper actuators and mechanical heating and cooling equipment. Providing energy management and occupant comfort, the thermostat automatically reduces heating load and increases cooling load.

Recommendation

2-pipe (dual 1-pipe): Use when a limited air capacity is required to operate a single valve and/or actuator.

3-pipe (dual 2-pipe): Use for multiple valves and actuators with or without high/low limiting controls which require higher air capacities.

Application Drawings



193 HC Thermostat Specifications



For complete conversion kits, refer to the Retroline® Retrostats starting on page A-15.

- Scale; Range**
 (mils) Divisions..... 45 to 85°F, 10(2)°F (7 to 30°C, 5(1)°C)
- Factory Calibration** 72°F, 7.5 psi ±0.3
 (22°C, 52 kPa @ 1.8)
- Sensitivity Adjustment Range** 1 to 4 psi/°F (12 to 50 kPa/°C)
- Factory Setting** 2.5 psi/°F (31 kPa/°C)
- Limit Stop**
 Field Adjustment Range 45/85°F (7/30°C)
 Fixed Limit Stop Range 55/75°F (13/24°C)
- Temperature**
 Storage..... -10 to +140°F (-23 to +60°C)
 Ambient Operating 40 to 140°F (4 to 60°C)
- Accuracy at Factory**
 Calibration ±2°F (±1.1°C)
 Response 0.1°F (0.06°C)
- Supply Air Pressure**
 Two Pressure (recommended) 25 psi (172 kPa)
 Maximum..... 30 psi (207 kPa)




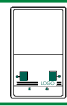

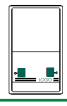

- Nominal Air Consumption for Air Compressor Sizing**
 1-pipe 50 scim (14 ml/s)
 2-pipe 40 scim (11 ml/s)
- Nominal Air Capacity for Air Main Sizing**
 1-pipe 50 scim (14 ml/s)
 2-pipe 40 scim (11 ml/s)
- Nominal Chassis Air Capacity**
 1-pipe Supply 25 scim (6.8 ml/s) per side
 2-pipe Supply 230 scim (63 ml/s) per side
 1-pipe Exhaust 30 scim (8 ml/s) per side
 2-pipe Exhaust 150 scim (41 ml/s) per side
- Air Connections** 5/32" (4 mm) OD tubing
- Dimensions (with cover)** 2.16" W x 3.34" H x 1.59" D
 (55 mm W x 85 mm H x 40 mm D)
- Shipping Weights**
 Thermostat Chassis and Wall Plate 0.53 lb. (0.24 kg)
 Plastic Cover 0.07 lb. (0.04 kg)
 Metal Cover (dual)..... 0.27 lb. (0.12 kg)

193 HC Thermostat Product Ordering

Model #	Thermostat Chassis Type				Thermostat Chassis & Wall Plate	
	Output	Setpoint	Air Output Capacity	Thermometer & Setpoint Scales	Control Action	
					Heat Direct	Heat Reverse
193 HC 1-pipe	Single	Dual (Heat and Cool)	Low (No Relay)	°F	193-211 Cool (DA)	193-213 Cool (DA)
				°F	193-212 Cool (RA)	193-214 Cool (RA)
				°C	193-231 Cool (DA)	193-233 Cool (DA)
				°C	193-232 Cool (RA)	193-234 Cool (RA)
193 HC 2-pipe		Dual (Heat and Cool)	High (Integral Relay)	°F	193-215 Cool (DA)	193-217 Cool (DA)
				°F	193-216 Cool (RA)	193-218 Cool (RA)
				°C	193-235 Cool (DA)	193-237 Cool (DA)
				°C	193-236 Cool (RA)	193-238 Cool (RA)

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Thermostats

Thermostat Covers (Sold Separately)	Plastic Part No.		Metal Part No.
	Desert Beige	White	
 <ul style="list-style-type: none"> • Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed • No logo 	192-257	192-257W	192-357
 <ul style="list-style-type: none"> • Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed • With logo 	192-256	192-256W	192-356
 <ul style="list-style-type: none"> • Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer exposed 	192-254	192-254W	192-354
 <ul style="list-style-type: none"> • Adjustment setpoint key • Indicator setpoint exposed • Chassis thermometer concealed 	192-267	192-267W	192-367
 <ul style="list-style-type: none"> • Adjustment setpoint key • Indicator setpoint exposed • Chassis thermometer exposed • Use with 1/2" setpoint knob option 	192-268	192-268W	192-368
 <ul style="list-style-type: none"> • Adjustment setpoint exposed • Indicator setpoint exposed • Chassis thermometer concealed • Use with 1/2" setpoint knob option 	192-258	192-258W	192-358
 <ul style="list-style-type: none"> • Adjustment setpoint exposed • Indicator setpoint exposed • Chassis thermometer concealed 	192-260	192-260W	192-360

Note: • "Exposed features" are indicated in green on corresponding illustration.
 • Universal Cover sold on page A-83.



Powerstar (Hesitation) Free Energy Band Heating/Cooling Pneumatic Room Thermostats



193 HC Thermostat chassis.



Typical wall plate and screws.



193 HC Thermostat with plastic cover. Chassis wall plate with easy maintenance plug-in adapters shown (optional).

Description

Providing proportional, single output, dual setpoint, 2-pipe pneumatic room temperature control, the 193 HC Powerstar (Hesitation) Free Energy Band Heating/Cooling Pneumatic Room Thermostat is designed to sequence a heating device or a cooling device.

The hesitation feature keeps the output pressure constant through a 6°F (10.8°C) range (typical), causing a deadband.

Features

- Dual setpoint dials available in Fahrenheit or Celsius scales
- Sensitive bimetal responds to temperature changes
- Integral, field adjustable limit stops
- Adjustable Free Energy Band
- Wall mounting plate for connection to a variety of rough-in terminal boxes included
- Test port for fast check of output pressure without removing the cover
- Field replaceable thermometer, setpoint dials, restrictors, and filters

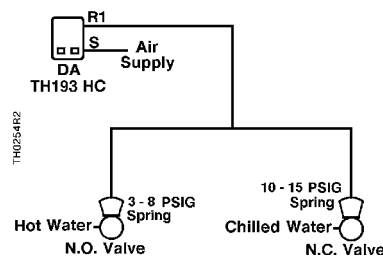
Options

- Fixed limit stops to meet government specifications
- Quick-connect air connections for ease of installation and service
- Large, 1/2" setpoint knob for convalescent homes

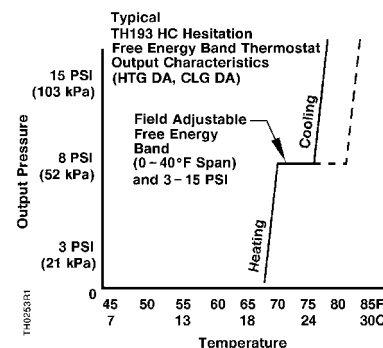
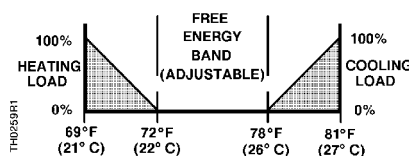
Applications

The 193 HC Powerstar (Hesitation) Free Energy Band Heating/Cooling Pneumatic Room Thermostat is an excellent choice for saving energy by sequencing heating and cooling valves. In most heat/cool pneumatic applications, a 3 to 8 psi (21 to 55 kPa) heating valve and a 10 to 14 psi (69 to 103 kPa) cooling valve is used. By design, this provides a 2 psi (14 kPa) deadband where no heating or cooling is occurring. The hesitation feature allows you to change the deadband range to a 3, 4 or 5 psi (21, 28, or 34 kPa) range to save energy. Refer to the Input/Output chart below for more information.

Application Drawing



Input/Output Characteristics



193 HC Thermostat Specifications

Scale; Range
 (minor) Major Divisions..... 45 to 85°F, 10(2)°F/
 (7 to 30°C, 5(1)°C)

Factory Calibration
 "FEB" Output Pressure..... 7.5 psi (52 kPa)
 Temperature 72°F (22°C)
 Sensitivity 2.5 psi/°F (31 kPa/°C)

Sensitivity Adjustment Range 1 to 4 psi/°F
 (12 to 50 kPa/°C)

Limit Stop, Field Adjustment Range 55/75°F (13/24°C)

Temperature
 Storage..... -10 to +140°F (-23 to +60°C)
 Ambient Operating 40 to 140°F (4 to 60°C)

Accuracy at Factory
 Calibration ±2°F (±1.1°C)
 Response 0.1°F (0.06°C)

Supply Air Pressure
 Recommended..... 25 psi (172 kPa)
 Maximum..... 30 psi (207 kPa)

Free Energy Band
 Output Pressure Adjustment 1 to 15 psi (7 to 103 kPa)
 Range..... 0 to 40°F (0 to 20°C)

Nominal Air Capacity for Compressor Sizing 40 scim (11 ml/s)

Nominal Air Capacity for Air Main Sizing 40 scim (11 ml/s)

Nominal Chassis Air Capacity
 Supply 150 scim (41 ml/s)
 Exhaust 150 scim (41 ml/s)
 Supply/2-pipe Exhaust 150 scim (41 ml/s) per side


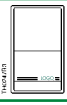



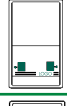

Air Connections 5/32" (4 mm) OD tubing

Dimensions (with cover) 2.16" W x 3.34" H x 1.59" D
 (55 mm W x 85 mm H x 40 mm D)

Shipping Weights
 Thermostat Chassis and Wall Plate 0.53 lb. (0.24 kg)
 Plastic Cover 0.07 lb. (0.04 kg)
 Metal Cover (dual)..... 0.27 lb. (0.12 kg)

193 HC Thermostat Product Ordering

Model #	Thermostat Chassis Type				Thermostat Chassis & Wall Plate	
	Output	Setpoint	Air Output Capacity	Thermometer & Setpoint Scales	Control Action	
					Heat (DA) / Cool (DA)	Heat (RA) / Cool (RA)
193 HC Hesitation	Single	Dual (Heat and Cool)	High (Integral Relay)	°F	193-219	193-220
				°C	193-239	193-240

Thermostat Covers (Sold Separately)	Plastic Part No.		Metal Part No.
	Desert Beige	White	
 <ul style="list-style-type: none"> • Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed • No logo 	192-257	192-257W	192-357
 <ul style="list-style-type: none"> • Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed • With logo 	192-256	192-256W	192-356
 <ul style="list-style-type: none"> • Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer exposed 	192-254	192-254W	192-354
 <ul style="list-style-type: none"> • Adjustment setpoint key • Indicator setpoint exposed • Chassis thermometer concealed 	192-267	192-267W	192-367
 <ul style="list-style-type: none"> • Adjustment setpoint key • Indicator setpoint exposed • Chassis thermometer exposed • Use with 1/2" setpoint knob option 	192-268	192-268W	192-368
 <ul style="list-style-type: none"> • Adjustment setpoint exposed • Indicator setpoint exposed • Chassis thermometer concealed • Use with 1/2" setpoint knob option 	192-258	192-258W	192-358
 <ul style="list-style-type: none"> • Adjustment setpoint exposed • Indicator setpoint exposed • Chassis thermometer concealed 	192-260	192-260W	192-360

Note: • "Exposed features" are indicated in green on corresponding illustration.
 • Universal Cover sold on page A-83.



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Thermostats

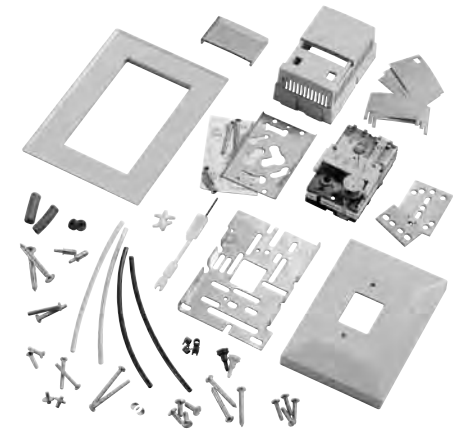


RETROLINE® Powerstar Retrostat Pneumatic Room Thermostats

RETROLINE®

easily replaces:

- Barber-Colman (Siebe)
- Johnson Controls
- Honeywell
- Robertshaw (Siebe)



192/194 Dual Setpoint Pneumatic Room Thermostat Kit.

Description

The Powerstar Retroline Retrostat Pneumatic Room Thermostat converts most existing pneumatic room thermostats to a Powerstar 192/194 direct or reverse acting, 2-pipe, single or dual setpoint unit.

Day/Night or Heat/Cool Retrostat is factory calibrated to match the appropriate changeover pressure of the competitive thermostat.

Features

- Complete kit including Retrostat cover kit with exposed or concealed setpoint adjustment
- Setpoint dials available in Fahrenheit or Celsius scales
- Factory calibrated for accuracy
- All installation hardware and calibration wrench provided.
- Fits into large format wall openings, using included "goof plate."
- Integral, field adjustable limit stops
- Test port for fast check of output pressure without removing the cover
- Field replaceable thermometer, setpoint dial(s), restrictor(s), and filter(s)

Options

- Quick-connect air connections for ease of installation and service
- Large, 1/2" setpoint knob for convalescent homes

Applications

Retroline Retrostat kits are available for most 2-pipe applications in direct and reverse acting models, including:

- Single Temperature
- Day/Night
- Heat/Cool

Refer to the Powerstar products to select the appropriate application.

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Thermostats

192/194 Pneumatic Room Thermostats Specifications

Single Setpoint			
Description	Thermometer & Setpoint Scales	Control Action	
		Direct	Reverse
Single Temperature	°F	192-840	192-841
	°C	192-850	192-851

Kits include covers.

If a different cover is required, refer to the Accessories and Service Kit section.



Dual Setpoint				
Action/Changeover Pressure	Manufacturer	Thermometer & Setpoint Scales	Kit Part No. (Desert Beige)	Kit Part No. (White)
Day/Night				
Day (DA) 13 psi (90 kPa) / Night (DA) 18 psi (124 kPa)	Honeywell	°F	194-3042	194-3042W
Day (DA) 13 psi (90 kPa) / Night (DA) 18 psi (124 kPa)	Honeywell	°C	194-3142	194-3142W
Day (DA) 15 psi (103 kPa) / Night (DA) 20 psi (138 kPa)	Johnson/B-C	°F	194-3043	194-3043W
Day (DA) 15 psi (103 kPa) / Night (DA) 20 psi (138 kPa)	Johnson/B-C	°C	194-3143	194-3143W
Day (DA) 18 psi (124 kPa) / Night (DA) 25 psi (172 kPa)	Siemens	°F	192-3044*	192-3044W
Day (DA) 18 psi (124 kPa) / Night (DA) 25 psi (172 kPa)	Siemens	°C	192-3144*	192-3144W
Day (RA) 13 psi (90 kPa) / Night (RA) 18 psi (124 kPa)	Honeywell	°F	194-3052	194-3052W
Day (RA) 15 psi (103 kPa) / Night (RA) 20 psi (138 kPa)	Johnson/B-C	°F	194-3053	194-3053W
Day (RA) 18 psi (124 kPa) / Night (RA) 25 psi (172 kPa)	Siemens	°F	192-3054*	192-3054W
Day (RA) 18 psi (124 kPa) / Night (RA) 25 psi (172 kPa)	Siemens	°C	192-3154*	192-3154W
Heat/Cool				
Heat (DA) 18 psi (124 kPa) / Cool (RA) 13 psi (90 kPa)	Honeywell	°F	194-3082	194-3082W
Heat (DA) 20 psi (138 kPa) / Cool (RA) 15 psi (103 kPa)	Johnson/B-C	°F	194-3083*	194-3083W
Heat (DA) 25 psi (172 kPa) / Cool (RA) 18 psi (124 kPa)	Siemens	°F	192-3084*	192-3084W
Heat (DA) 25 psi (172 kPa) / Cool (RA) 18 psi (124 kPa)	Siemens	°C	192-3184*	192-3184W

- Note:**
- For detailed specifications on Day/Night, refer to 192 DN or DNV.
 - For detailed specifications on Heat/Cool, refer to 193 HC.
 - The changeover pressures for RobertShaw thermostats are 16 psi Day/25 psi Night.
 - All kits include covers.

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Thermostats



Retroline Powerstar Retrostat Pneumatic Room Thermostat Product Ordering

Manufacturer Part No.	Manufacturer	Control Action/Temperature Scale	Retroline Part No.	
			Kit	Replace. Chassis
T-4002-201 ¹	Johnson Controls	Single Temperature, Direct Acting	192-840	192-202
T-4002-202 ¹	Johnson Controls	Single Temperature, Reverse Acting	192-841	192-203
T-4002-203	Johnson Controls	Single Temperature, Direct Acting	192-840	192-202
T-4002-204	Johnson Controls	Single Temperature, Reverse Acting	192-841	192-203
T-4506-201 ¹	Johnson Controls	Day (DA) 15 psi (103 kPa) changeover / Night (DA) 20 psi (138 kPa)	194-3043	194-2043
T-4506-202	Johnson Controls	Day (DA) 15 psi (103 kPa) changeover / Night (DA) 20 psi (138 kPa)	194-3043	194-2043
T-4506-203 ^{1, 2}	Johnson Controls	Day (DA) 15 psi (103 kPa) changeover / Night (DA) 20 psi (138 kPa)	194-3043	194-2043
T-4506-204 ²	Johnson Controls	Day (DA) 15 psi (103 kPa) changeover / Night (DA) 20 psi (138 kPa)	194-3043	194-2043
T-4506-201 ¹	Johnson Controls	Day (DA) 15 psi (103 kPa) changeover / Night (DA) 20 psi (138 kPa)	194-3043	194-2043
T-4506-202	Johnson Controls	Day (DA) 15 psi (103 kPa) changeover / Night (DA) 20 psi (138 kPa)	194-3043	194-2043
T-4506-203 ^{1, 2}	Johnson Controls	Day (DA) 15 psi (103 kPa) changeover / Night (DA) 20 psi (138 kPa)	194-3043	194-2043
T-4506-204 ²	Johnson Controls	Day (DA) 15 psi (103 kPa) changeover / Night (DA) 20 psi (138 kPa)	194-3043	194-2043
T-4506-209 ¹	Johnson Controls	Day (RA) 15 psi (103 kPa) changeover / Night (RA) 20 psi (138 kPa)	194-3053	194-2053
T-4506-217 ^{1, 2}	Johnson Controls	Day (RA) 15 psi (103 kPa) changeover / Night (RA) 20 psi (138 kPa)	194-3053	194-2053
T-4756-205 ¹	Johnson Controls	Heat (DA) 20 psi (138 kPa) changeover / Cool (RA) 15 psi (103 kPa)	194-3083	194-2083
T-4756-206	Johnson Controls	Heat (DA) 20 psi (138 kPa) changeover / Cool (RA) 15 psi (103 kPa)	194-3083	194-2083
TP970A1002	Honeywell	Single Temperature, Direct Acting	192-840	192-202
TP970A1012	Honeywell	Single Temperature, Direct Acting	192-840	192-202
TP970A1035	Honeywell	Single Temperature, Direct Acting	192-840	192-202
TP970A1038	Honeywell	Single Temperature, Direct Acting	192-840	192-202
TP970A1053	Honeywell	Single Temperature, Direct Acting	192-840	192-202
TP970A1061	Honeywell	Single Temperature, Direct Acting	192-840	192-202
TP970A2004	Honeywell	Single Temperature, Direct Acting	192-840	192-202
TP970A1002	Honeywell	Single Temperature, Reverse Acting	192-841	192-203
TP970B1028	Honeywell	Single Temperature, Reverse Acting	192-841	192-203
TP970B1036	Honeywell	Single Temperature, Reverse Acting	192-841	192-203
TP970B1044	Honeywell	Single Temperature, Reverse Acting	192-841	192-203
TP971A1003	Honeywell	Day (DA) 13 psi (90 kPa) changeover / Night (DA) 18 psi (124 kPa)	194-3042	194-2042
TP971A1029	Honeywell	Day (DA) 13 psi (90 kPa) changeover / Night (DA) 18 psi (124 kPa)	194-3042	194-2042
TP971A1037	Honeywell	Day (DA) 13 psi (90 kPa) changeover / Night (DA) 18 psi (124 kPa)	194-3042	194-2042
TP971A1045	Honeywell	Day (DA) 13 psi (90 kPa) changeover / Night (DA) 18 psi (124 kPa)	194-3042	194-2042
TP971A1086	Honeywell	Day (DA) 13 psi (90 kPa) changeover / Night (DA) 18 psi (124 kPa)	194-3042	194-2042
TP971B1001	Honeywell	Day (RA) 13 psi (90 kPa) changeover / Night (RA) 18 psi (124 kPa)	194-3052	194-2052
TP971B1004	Honeywell	Day (RA) 13 psi (90 kPa) changeover / Night (RA) 18 psi (124 kPa)	194-3052	194-2052
TP972A1002	Honeywell	Heat (DA) 18 psi (124 kPa) changeover / Cool (RA) 13 psi (90 kPa)	194-3082	194-2082
TP972A1028	Honeywell	Heat (DA) 18 psi (124 kPa) changeover / Cool (RA) 13 psi (90 kPa)	194-3082	194-2082
TP972A1036	Honeywell	Heat (DA) 18 psi (124 kPa) changeover / Cool (RA) 13 psi (90 kPa)	194-3082	194-2082
TP972A1101	Honeywell	Heat (DA) 18 psi (124 kPa) changeover / Cool (RA) 13 psi (90 kPa)	194-3082	194-2082

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Thermostats

Ordering Notes

1. Suggested Retrofit Kit converts horizontal thermostat to vertical position.
2. Suggested Retrofit Kit has an additional manual changeover switch, not provided on the original.



Retroline Powerstar Retrostat Pneumatic Room Thermostat Product Ordering

Manufacturer Part No.	Manufacturer	Control Action/Temperature Scale	Retroline Part No.	
			Kit	Replace. Chassis
TK-18	Barber-Colman	Single Temperature, Direct Acting	192-840	192-202
TK-19	Barber-Colman	Single Temperature, Reverse Acting	192-841	192-203
TK-19-1	Barber-Colman	Single Temperature, Reverse Acting	192-841	192-203
TK-19-19	Barber-Colman	Single Temperature, Reverse Acting	192-841	192-203
TK-1001	Barber-Colman	Single Temperature, Direct Acting	192-840	192-202
TK-1101	Barber-Colman	Single Temperature, Reverse Acting	192-841	192-203
TK-1001-116	Barber-Colman	Single Temperature, Direct Acting	192-850	192-222
TK-1002	Barber-Colman	Single Temperature, Direct Acting	192-840	192-202
TK-1002	Barber-Colman	Single Temperature, Reverse Acting	192-841	192-203
TK-5001-116	Barber-Colman	Single Temperature, Direct Acting	192-850	192-222
TKR-18	Barber-Colman	Single Temperature, Direct Acting	192-840	192-202
TKR-18-91	Barber-Colman	Single Temperature, Direct Acting	192-840	192-202
TKR-19	Barber-Colman	Single Temperature, Reverse Acting	192-841	192-203
TKR-1001	Barber-Colman	Single Temperature, Direct Acting	192-840	192-202
TKR-1101	Barber-Colman	Single Temperature, Reverse Acting	192-841	192-203
2212-118	Robertshaw	Single Temperature, Direct Acting	192-840	192-202
2212-119	Robertshaw	Single Temperature, Reverse Acting	192-841	192-203
2212-128	Robertshaw	Single Temperature, Direct Acting	192-840	192-202
2212-129	Robertshaw	Single Temperature, Reverse Acting	192-841	192-203
2212-418	Robertshaw	Single Temperature, Direct Acting	192-840	192-202
2212-419	Robertshaw	Single Temperature, Reverse Acting	192-841	192-203
2212-518	Robertshaw	Single Temperature, Direct Acting	192-840	192-202
2212-519	Robertshaw	Single Temperature, Reverse Acting	192-841	192-203
T15-101	Robertshaw	Single Temperature, Direct Acting	192-840	192-202
T18-101	Robertshaw	Single Temperature, Direct Acting	192-840	192-202
T18-201	Robertshaw	Single Temperature, Direct Acting	192-840	192-202
T18-301	Robertshaw	Single Temperature, Direct Acting	192-840	192-202
T18-3011	Robertshaw	Single Temperature, Direct Acting	192-840	192-202
192-202	Powers	Single Temperature, Direct Acting	192-840	192-202
192-203	Powers	Single Temperature, Reverse Acting	192-841	192-203
192-204	Powers	Day (DA) 18 psi (124 kPa)/Night (DA) 25 psi (172 kPa) changeover	192-3044	192-204
192-205	Powers	Day (RA) 18 psi (124 kPa)/Night (RA) 25 psi (172 kPa) changeover	192-3054	192-205
192-208	Powers	Heat (DA) 25 psi (172 kPa)/Cool (RA) 18 psi (124 kPa) changeover	192-3084	192-208
192-222	Powers	Single Temperature, Direct Acting	192-850	192-222
192-223	Powers	Single Temperature, Reverse Acting	192-851	192-223
192-224	Powers	Day (DA) 18 psi (124 kPa) changeover/Night (DA) 25 psi (172 kPa)	192-3144	192-224
192-225	Powers	Day (RA) 18 psi (124 kPa) changeover/Night (RA) 25 psi (172 kPa)	192-3154	192-225
192-228	Powers	Heat (DA) 25 psi (172 kPa) changeover/Cool (RA) 18 psi (124 kPa)	192-3184	192-228

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Thermostats



Pneumatic Room Thermostats



832 D Pneumatic Room Thermostat and screws.

Description

The single setpoint, direct acting thermostat provides gradual acting pneumatic room temperature control for heating and cooling applications. The 832 D Thermostat is ruggedly constructed for dependable, long-term service.

Features

- All metal construction
- Rapid response to temperature change
- Unique design of supply and exhaust air valves prevents waste
- Quiet operation
- Easy-to-calibrate and service
- Tamper-proof cover screws
- Exposed remote changeover control
- Calibrated thermometer

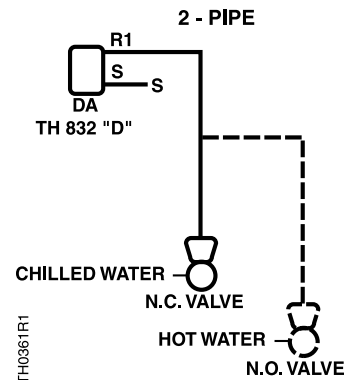
Applications

Designed for controlling rooms heated or cooled by radiation, ventilation, or an air conditioning system, the 832 D Pneumatic Room Thermostat is versatile and responsive for individual room control.

Other applications include room control of radiant panels, finned radiation, and unit ventilators.

Application Drawing

Dotted lines are alternative control schemes.



832 D Pneumatic Room Thermostat Specifications

Control Action	Direct	Maximum Operating Pressure	30 psi (207 kPa)
Operating Range	60 to 85°F (15 to 30°C)	Dimensions	2.88" W x 5.63" H x 2.19" D (73 mm W x 143 mm H x 56 mm D)
Sensitivity Fixed	2.5 psi/°F (31 kPa/°C)	Air Consumption for Compressor Sizing	10 scim (2.7 ml/s)
Temperature Response	0.5°F (0.3°C)	Cover Style	Key or concealed setpoint adjustment
Maximum Ambient Temperature	110°F (43°C)	Cover Finish	Silver; Special order other finishes.
Dial Graduations	2°F (1.1°C)	Shipping Weight	3.0 lb. (1.36 kg)
Normal Air Supply Pressure	18 psi (124 kPa)		

832 D Pneumatic Room Thermostat Product Ordering

Description	Thermostat Part No. ²	Cover Assembly
Concealed Adjustment with Thermometer	832-0120	856-036
Concealed Adjustment without Thermometer	832-0490	856-046 ¹
Exposed Key Adjustment with Thermometer	832-0500	856-044
Exposed Knob Adjustment with Thermometer	832-1260	856-044


Ordering Notes

1. Blind cover, **856-046**, does not include mounting screws, **856-014**, that are required for installation.
2. Does not include adjustment key, **856-055**, that is required for installation.

Thermostat comes complete with cover.

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Thermostats

 Order the Calibration Kit in the Accessories and Service Kits section.

Accessories & Service Kits

A-75

TECH TIP

To calibrate any pneumatic thermostat, perform the following:

1. Remove the cover.
2. Measure the ambient temperature.
3. Set the setpoint dial to the ambient temperature.
4. Measure the controller output pressure (branch pressure).
5. Turn the calibration screw(s) until the branch pressure equals the midpoint of the control span [usually 8 psi (55 kPa)].
6. Replace the cover.

Limitem Rigid Bulb Thermostats



356 Limitem Rigid Bulb Thermostat.

Description

The 356 Limitem Rigid Bulb Thermostat is a pneumatically operated, duct-mounted thermostat, which is available in either direct or reverse acting in a variety of ranges.

Features

- Durable copper motor tube and steel rod temperature sensing element
- Two-valve design reduces air waste
- Duct mounting hardware included
- All metal construction
- 18" (46 cm) sensing tube

Applications

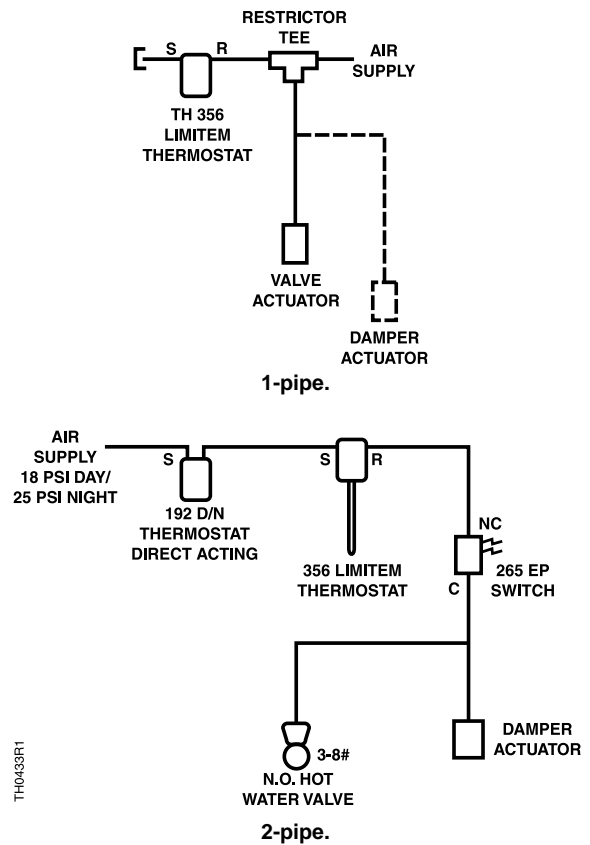
The 356 Limitem Rigid Bulb Thermostat provides primary control for unit ventilators, fan coils and other air handling units. Can also be used as low limit control for air flow to a controlled space.

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Thermostats

Application Drawings

Dotted lines are alternative control schemes.



TH0433R1

356 Limitem Rigid Bulb Thermostat Specifications

Control Action	Direct or Reverse	Nominal Air Supply Pressure	18 to 25 psi (124 to 172 kPa)
Maximum Supply Air Pressure	30 psi (207 kPa)	Maximum External Pressure (on bulb)	250 psi (1722 kPa)
Sensitivity Range (adjustable)	0.25 to 2 psi/°F (3 to 25 kPa/°C)	Mounting	Flange or 3/8" NPT
Factory Sensitivity Setting	1.25 psi/°F (15 kPa/°C)	Air Connections	1/8" NPT
Temperature Response	0.50°F (0.9°C)	Dimensions	
Dial Graduations	5°F (2.7°C)/2°C (3.6°F)	Bulb Length	18" (457 mm)
Maximum Ambient Temperature		Flange OD	2.56" (65 mm)
Case	200°F (93°C)	Case	1.5" Diameter x 3" L (33 mm Diameter x 76 mm L)
Bulb (Direct Acting).....	225°F (107°C)	Shipping Weight	2.0 lb. (0.91 kg)
Bulb (Reverse Acting).....	250°F (121°C)		

356 Limitem Rigid Bulb Thermostat Product Ordering

Control Action	Temperature Operating Range	Part No.
Direct Acting	0 to 100 °F (-18 to +38°C)	356-0012
Direct Acting	30 to 180°F (-1.11 to +82.2°C)	356-0750
Reverse Acting	0 to 100°F (-18 to +38°C)	356-0013
Reverse Acting	30 to 180°F (-1.11 to +82.2°C)	356-1005
Reverse Acting	100 to 250°F (37.8 to 121°C)	356-1006

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Thermostats

Accessories & Service Kits

A-75

TECH TIP

When using the Limitem as a one-pipe device, a 40 scim (11 ml/s) restrictor will limit your output to 80% of supply. A 20 scim (5 ml/s) restrictor will limit your output to 60% of supply.

Example: With a 20 scim (5 ml/s) restrictor and 25 psi (11.3 kPa) supply, your maximum output is 15 psi (6.8 kPa).

Limitem Remote Bulb Thermostats



357 D Limitem Remote Thermostat with an average bulb.

Description

The 357 D Limitem Remote Bulb Thermostat is a pneumatically-operated thermostat that is gradual, direct acting with a remote or averaging bulb.

Features

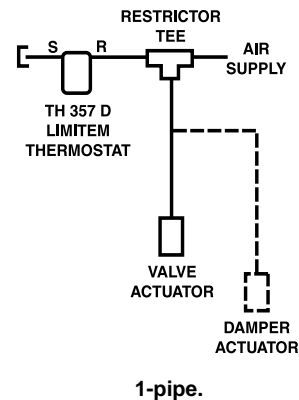
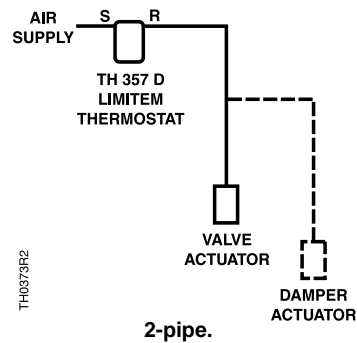
- Direct acting only
- Remote or averaging bulbs for flexibility in installation
- Liquid-filled sensing element for rapid response to temperature changes
- Two-valve design reduces air waste
- Adjustable sensitivity

Applications

The 357 D Limitem Remote Bulb Thermostat provides primary monitoring and control for air handling units or a low limit control.

Application Drawings

Dotted lines are alternative control schemes.



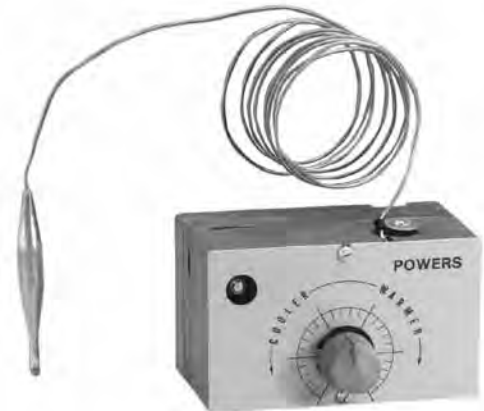
357 D Limitem Remote Bulb Thermostat Specifications

Control Action	Direct	Maximum Ambient Temperature (case)	180°F (82°C)
Maximum Supply Air Pressure	30 psi (207 kPa)	Nominal Air Supply Pressure	18 to 25 psi (124 to 172 kPa)
Sensitivity Range (adjustable)	0.33 to 3.5 psi/°F (4 to 43 kPa/°C)	Mounting	Bracket supplied
Factory Sensitivity Setting	1.25 psi/°F (15 kPa/°C)	Air Connection	1/8" NPT
Bulb	Liquid-filled	Dimensions (Case)	1.75" Diameter x 3.5" H (44.5 mm Diameter x 88.9 mm H)
Temperature Response	0.5°F (0.3°C)	Shipping Weight	2.0 lb. (0.9 kg)
Dial Graduations	5°F (2.7°C), 2°C (3.6°F)		

357 D Limitem Remote Bulb Thermostat Product Ordering

Temperature Operating Range	Sensing Element	Capillary	Bulb	Maximum Ambient Temp.	Part No.
20 to 100°F (-6.7 to +37.8°C)	Remote Bulb	8' (2.4 m)	3/8" x 4' (0.95 mm x 10.2 cm)	201°F (94°C)	357-0003
5 to 145°F (1.7 to 62.8°C)	Averaging Bulb	40' (12.2 m)	3/32" x 15' (0.24 mm x 457 cm)	210°F (99°C)	357-0004
120 to 230°F (48.9 to 110°C)	Remote Bulb	40' (12.2 m)	3/8" x 4" (0.95 mm x 10.2 cm)	261°F (127°C)	357-0005
35 to 145°F (1.7 to 62.8°C)	Averaging Bulb	6" (15 cm)	3/32" x 8' (0.24 mm x 244 cm)	211°F (99.4°C)	357-0001

Unit Mounted Thermostats



188 Unit Mounted Thermostat.

Description

The 188 Unit Mounted Thermostat is a gradual acting thermostat with a remote bulb operating on the force-balance principle, using pneumatic feedback to obtain linearity and maintain selected room temperature by positioning pneumatic devices to control heating or cooling.

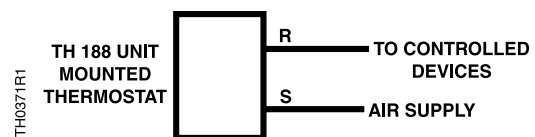
Features

- Liquid-filled thermal system temperature sensing element
- Durable die-cast metal case with rugged setpoint knob
- Adjustable sensitivity
- Universal mounting bracket for easy installation
- Integral adjustable limit stops
- Available as:
 - Direct Acting only (Heating)
 - Reverse Acting only (Cooling)
 - Heat or Cool depending on supply air pressure

Applications

The 188 Unit Mounted Thermostats are designed primarily for use in fan coil induction units and unit ventilators to control the temperature within an occupied space. The thermostat's temperature range is limited to applications at ambient temperatures.

Typical Connections



188 Unit Mounted Thermostat Specifications

Control Action Heating/Cooling, Direct and Reverse;
Direct only; Reverse only

Operating Range 60 to 85°F (15.5 to 29.4°C)

Operating Pressure 30 psi (207 kPa) max.

Adjustment Sensitivity 1 to 5.25 psi/°F (12 to 65 kPa/°C)

Factory Sensitivity Setting 2.25 psi/°F (28 kPa/°C)

Temperature Response 0.2°F (0.1°C)

Maximum Ambient Temperature

Case 135°F (57.2°C)

Bulb 231°F (111°C)

Scale Graduations 1°F (0.55°C)

Nominal Air Supply Pressure

Direct or Reverse Acting..... 25 psi (172 kPa)

Heating/Cooling..... 25 psi (172 kPa)/18 psi (124 kPa)

Average Air Usage

20 scim Restrictor..... 25 scim (6.8 ml/s)

40 scim Restrictor..... 45 scim (12.2 ml/s)

Air Connections 1/4" (6 mm) Brass barbed for polyethylene tubing

Bulb Size 3/8" Diameter x 3-1/2" L
(9.5 mm Diameter x 89 mm L)

Capillary Length 48" (121.9 cm) approx.

Finish Corrosion-resistant Zinc Chromate

Dimensions (case)

Heating/Cooling, Reverse Acting..... 3.1" W x 2.4" H x 2.13" D
(100 mm W x 61 mm H x 54 mm D)

Direct Acting 3.1" W x 2.4" H x 1.38" D
(100 mm W x 61 mm H x 35 mm D)

Shipping Weight 3.0 lb. (1.36 kg)

188 Unit Mounted Thermostat Product Ordering

	Control Action	Changeover Pressure	Average Air Usage	Part No.
Single Setpoint	Direct Acting / 25 psi (172 kPa)	—	40 scim (11 ml/s)	188-0031
Single Setpoint	Reverse Acting (Cooling) 18 psi	—	20 scim (5 ml/s)	188-0024
Heat/Cool	Direct Acting / Reverse Acting (Cooling) 18 psi (124 kPa)	—	40 scim (11 ml/s)	188-0030
Heat/Cool	Retroline Direct Acting/Reverse Acting 18 psi (124 kPa) / 13 psi (90 kPa). Retroline replacement for Honeywell LP916BXXXX .	15 psi (103 kPa)	40 scim (11 ml/s)	188-0033
Heat/Cool	Retroline Direct Acting/Reverse Acting 20 psi (138 kPa) / 15 psi (103 kPa). Retroline replacement for Johnson Controls T-3300-2 .	17 psi (117 kPa)	40 scim (11 ml/s)	188-0034

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Thermostats

Accessories & Service Kits

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Pneumatic High and Low Temperature Detection Thermostats



134 Pneumatic Low Temperature Detection Thermostat.

Description

The 134 High and Low Temperature Detection Pneumatic Thermostats automatically “lockout” at setpoint and require manual reset.

Features

- Snap-acting pneumatic switch
- Sight-set calibrated setpoint scale
- No leakage of air prior to reset of switch
- Easily adjustable settings
- Normally closed air valve; bleeds to less than 2 psi (14 kPa) when supplied through a restrictor
- Barb fitting for push-on connection of 1/4" (6 mm) OD polyethylene tubing
- Holds dead-ended line to approximately 22 psi (152 kPa) air pressure

Applications

The 134 Pneumatic High and Low Temperature Detection Thermostats are used on pneumatic heating and cooling systems in areas protected from the weather.

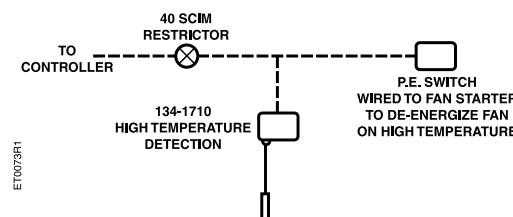
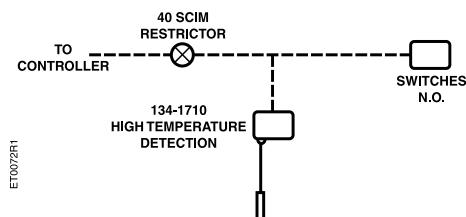
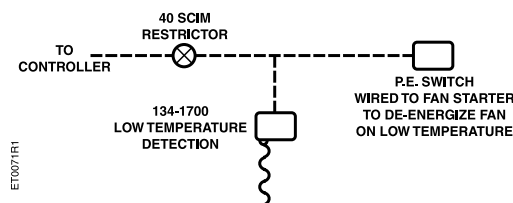
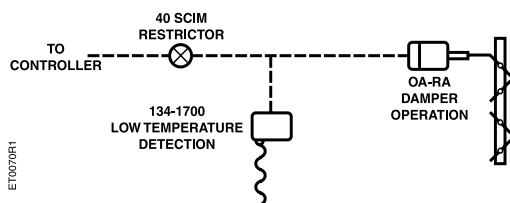
On a typical high limit application, the thermostat shuts down air conditioning or ventilating fans when the duct temperature becomes excessively high. A normally closed switch opens at setpoint.

On a typical low temperature application, the thermostat stops the fan or closes a damper when the temperature drops to the setpoint at any one foot (30.5 cm) or more of the sensing element.

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Thermostats

Application Drawings



134 Pneumatic Thermostat Specifications

Part No. 134-1700

Ambient Temperature RangeGreater than setpoint to 140°F (60°C)

Pneumatic SwitchNC, 0.020" (0.6 mm) diameter bleed

Control Point Low

Temperature ThermostatLowest temperature at any one foot section of the sensing bulb

Case FinishGray Baked Enamel

Shipping Weight2.45 lb. (1.11 kg)

Part No. 134-1710

Ambient Temperature Range-40 to +140°F (-40 to +60°C)

Pneumatic SwitchNC, 0.02" (0.6 mm) diameter bleed

Control Point Low

Temperature ThermostatLowest temperature at any one foot section of the sensing bulb

Case FinishGray Baked Enamel

Shipping Weight2.38 lb. (1.08 kg)

134 Pneumatic Thermostat Product Ordering

Temp.	Temperature Range	Differential	Max. Bulb Temp.	Bulb & Capillary Length	Switch Reclose	Part No.
Low	15 to 55°F (-9 to +12.8°C) with stop at 35°F (1.67°C)	5°F (2.8°C) Non-Adjustable	400°F (204°C)	20' (6 m)	Temperature must increase by 5°F (2.8°C) before pneumatic switch can be reclosed.	134-1700
High	100 to 170°F (38 to 77°C)	10°F (5.6°C) Non-Adjustable	250°F (121°C)	2.7" (69 mm) Dia. x 10" (25.4 cm) L bulb with 6' (183 mm) capillary	Temperature must drop 10°F (5.6°C) before pneumatic switch can be reclosed.	134-1710

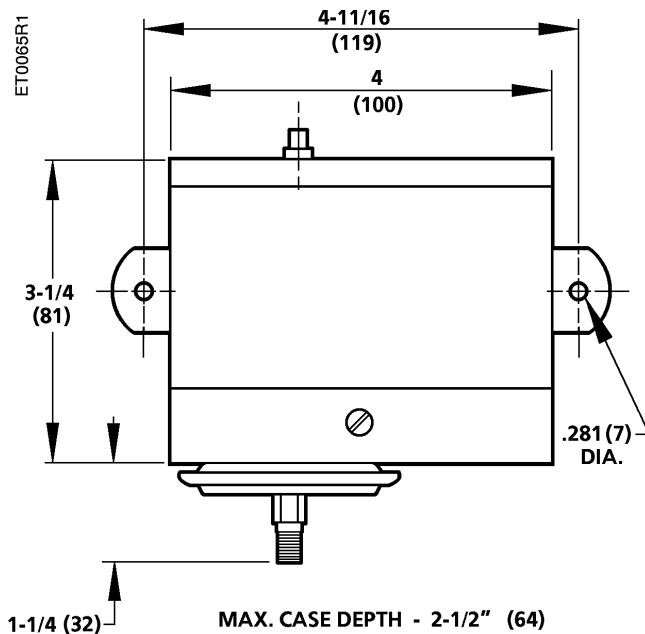
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Thermostats

Accessories & Service Kits

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Dimensions



Dimensions shown in inches (mm).

Electric Line Voltage Remote Bulb Thermostats



141 Electric Line Voltage Remote Bulb Thermostat.

Description

The 141 Electric Line Voltage Remote Bulb Thermostat is a two-position electric line voltage thermostat with remote bulb.

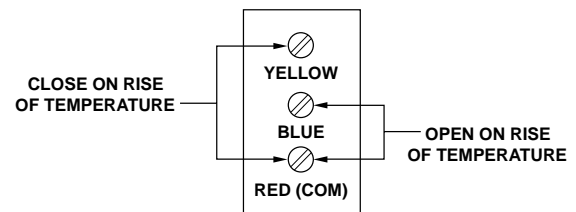
Features

- Temperature sensitive, liquid-filled sensing element
- Single-pole, double-throw snap-acting switches
- Enclosed switches suitable for low or line voltage power switching
- Gray baked enamel case

Applications

The 141 Electric Line Voltage Remote Bulb Thermostat is used for temperature control in heating and cooling application, typically to directly operate two-position damper motor actuators, motor actuated valves, relays and similar equipment. Typical applications includes summer-winter change over and the direct control of liquid or air temperatures where two position (ON-OFF) control is acceptable.

Typical Connections



141 Electric Line Voltage Remote Bulb Thermostat Specifications

Inductive Amps

Full Load Amps

120 Vac7.4

240 Vac3.7

Locked Rotor Amps

120 Vac44.5

240 Vac22.2

Resistive Amps

120 Vac25

240 Vac20

Dimensions 2.5" W x 5.38" H x 2.31" D
(64 mm x (136 mm x 59 mm)

Shipping Weight 1.8 lb. (0.82 kg)

141 Electric Line Voltage Remote Bulb Thermostat Product Ordering

Temperature Scale Range	Max. Bulb Temp.	Bulb Size	Switch Differential	Part No.
0 to 120°F (-7 to +49°C)	130°F (54°C)	.038" Diameter x 4.03" L (9.9 mm Diameter x 102 mm L) Capillary 6' (183 cm)	Adjustable 6 to 30°F (3 to 16°C)	141-0520
100 to 240°F (38 to 110°C)	250°F (121°C)	.029" Diameter x 2.33" L (7.4 mm Diameter x 59.2 mm L) Capillary 6' (183 cm)	Adjustable 7 to 45°F (14 to 25°C)	141-0521



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Accessories & Service Kits

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Thermostats



Electric Line Voltage Room Thermostats Heating/Cooling



134 Electric Line Voltage Room Thermostat—Heating/Cooling.

Description

The 134 Electric Line Voltage Room Thermostat is a line voltage On/Off room thermostat for heating and cooling applications.

Models are available with SPST or SPDT contact action and for standard, nominal 1/4 hp / 10 amps noninductive, or heavy duty, nominal 1 hp / 22 amps noninductive applications.

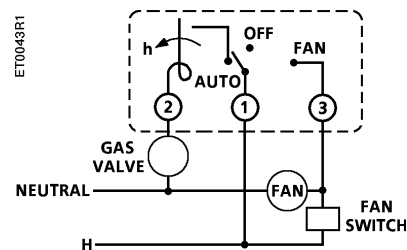
Features

- Single setpoint dial
- Exposed bimetal thermometer
- Temperature range from 50 to 90°F (10 to 30°C)
- High and low limit stops
- Standard or heavy duty models
- Dual Fahrenheit/Celsius scale plate

Applications

The 134 Electric Line Voltage Room Thermostat controls heating and cooling applications or year-round air conditioning units in commercial, industrial, or residential installations.

Typical Connections



134 Electric Line Voltage Room Thermostat Specifications

Part No. 134-1083

Motor Rating
 Vac 120 6.0 A
 240 Vac 3.7 A

Switch Action SPST with "Auto-Off-Fan" switch

Dimensions 2.78" W x 5.19" H x 1.88" D
 (71 mm W x 132 mm H x 48 mm D)

Shipping Weight 1.3 lbs. (0.6 kg)

Part No. 134-1086

Motor Rating
 120 Vac 6.0 A
 240 Vac 3.0 A

Switch Action SPST

Dimensions 3" W x 4.75" H x 1.44" D
 (75 mm W x 120 mm H x 36 mm D)

Shipping Weight 1.3 lb. (0.6 kg)

Part No. 134-1084

Motor Rating
 120 Vac 6.0 A
 240 Vac 3.0 A

Resistive Rating
 120 Vac 10.0 amps
 240 Vac 10.0 amps

Switch Action SPDT

Dimensions 3" W x 4.75" H x 1.44" D
 (75 mm W x 120 mm H x 36 mm D)

Shipping Weight 1.0 lb. (0.6 kg)

Part No. 134-1085

Motor Rating
 120 Vac 16.0 Heating/8.0 Cooling
 240 Vac 8.0 Heating/8.0 Cooling

Resistive Rating
 120 Vac 22.0 Heating
 240 Vac 22.0 Heating

Switch Action SPDT

Dimensions 3" W x 4.75" H x 1.44" D
 (75 mm W x 120 mm H x 36 mm D)

Shipping Weight 1.0 lb. (0.6 kg)

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134 Electric Line Voltage Room Thermostat Product Ordering

Switch Action	Temp. Set Point Range	Temp. Set Point Adjustment	Temperature Difference	Part No.
SPST	40 to 90°F (5 to 30°C)	Concealed	1.8°F (1°C)	134-1083
SPST	40 to 90°F (5 to 30°C)	Concealed	1.8°F (1°C)	134-1086
SPDT	40 to 90°F (5 to 30°C)	Exposed Knob or Concealed ¹	1.8°F (1°C) Heating 2.31°F (1.3°C) Cooling	134-1084
SPDT	40 to 90°F (5 to 30°C)	Exposed Knob or Concealed ¹	3°F (1.7°C) Heating 3.5°F (2°C) Cooling	134-1085

Ordering Note

- Each thermostat is shipped with a blank faceplate for use when concealed adjustment is desired.



Thermostats



Electric Room Thermostats



RAA10C Fan Coil Thermostat
with concealed setpoint knob.



RAA20U Room Thermostat
with exposed setpoint knob.

Description

Designed for simple heating or cooling or heating/cooling applications, RAA... Electric Room Thermostats are an attractive and economical solution that utilize two-wire, gas membrane technology.

RAA... Electric Room Thermostats are available in single scale Fahrenheit or Celsius models, except the RAA10C, with models for dry wall or electrical wall box mounting. Models designed for wall box mounting include wall box plate adapter and screws.

Features

- Two-point control algorithm for on/off control
- 24 to 120, 277 Vac line
- Two mounting styles: electrical wall box or drywall
- Dual Fahrenheit/Celsius scale (RAA20U)

Options

- Tamperproof cover (concealed setpoint knob) noted with a C
- Available with wall plate

Applications

The RAA... Electric Room Thermostats are typically used in public buildings, storage rooms, entrance hallways and maintenance rooms where two-position (On/Off) control is required.

Descriptions of models are as follows:

RAA10C model is a heating or cooling only thermostat that has a concealed setpoint knob for use in areas where setpoint adjustment is limited to authorized personnel. Typical applications are frost and overheat protection and temporary heat for buildings under construction.

RAA20U model is a heating or cooling only thermostat that has an external setpoint knob for occupant adjustment.

Note:

ARG 70 wall plate is required in order to be UL compliant for switching line voltage.

The RAA... Room Thermostats are designed for either simple heating or cooling or for 2-pipe heating and cooling systems where fan control is not required.

RAA Electric Room Thermostat Specifications

Operating Voltage 24 to 120, 277 Vac
Frequency 50 or 60 Hz
Setpoint Adjustment Range 50 to 85°F (10 to 29°C)
Switching Differential ≤ 1.8°F (1°C)
Switch Rating 6A RES, 3.5 A FLA, 12A LRA
Time Constant 14 min.
Switch Action Output SPDT Two-position (On/Off)
Operation-Conditions
 Operating Temperature 32 to 122°F (0 to 50°C)
 Relative Humidity <95% RH

Transportation/Storage Conditions
 Temperature -4 to +122°F (-20 to +50°C)
 Relative Humidity <95% RH
Housing
 Material Plastic
 Color White
 Bellows Environmentally-friendly gas
Wiring Screw terminals for wires of
 2 x 16 AWG or 1 x 14 AWG, 20 AWG max.
Agency Listings Conforms to CE requirements
 UL listed to 873
 cUL listed to Canadian standard C22.2 No. 24-93
Shipping Weight 0.31 lb. (0.14 kg)

RAA Electric Room Thermostat Product Ordering

Description	Electric Wall Box ¹ Part No.	Dry Wall Part No.
Thermostat for heating or cooling only	RAA10CW	RAA10C
Thermostat for heating or cooling only with exposed setpoint knob	RAA20UW	RAA20U

Ordering Note

- Includes wall plate, **ARG70**, to be UL compliant for switching line voltage.

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Thermostats

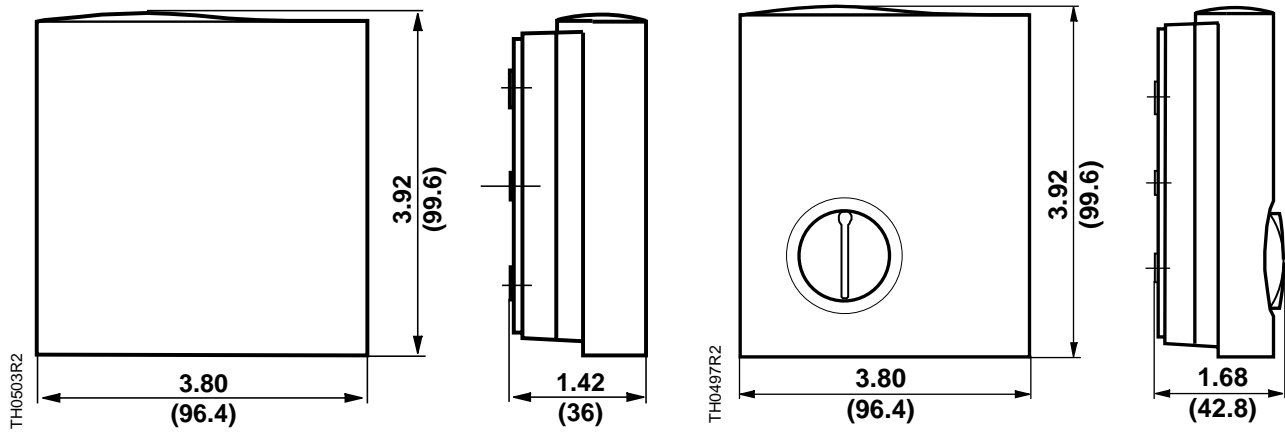
Accessories & Service Kits A-75



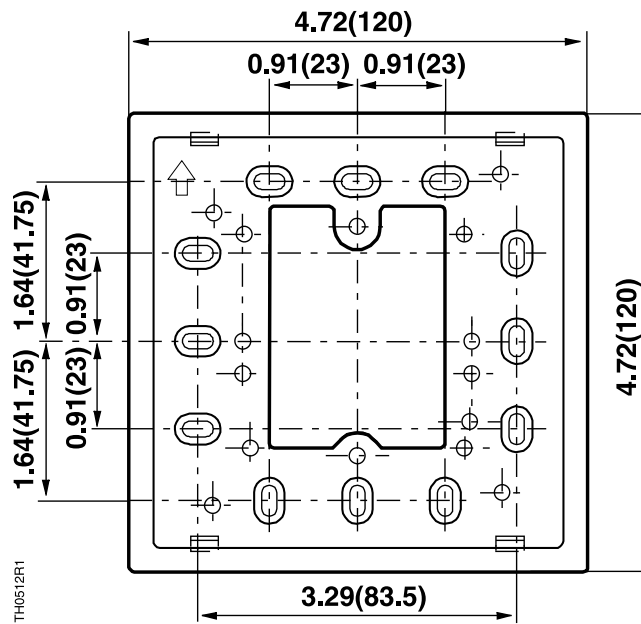
RAA Electric Room Thermostat Dimensions

RAA10C... Thermostat

RAA20U... Thermostat



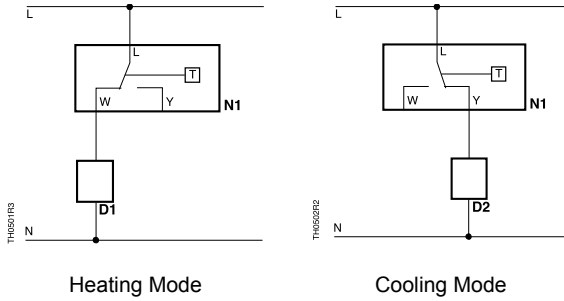
Wall Plate (ARG70) for Mounting (RAA10CW and RAA20UW)



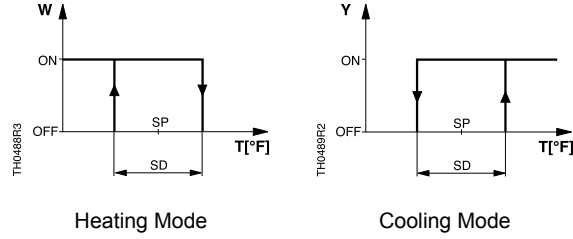
Dimensions shown in inches (mm).

RAA Electric Room Thermostat Engineering Drawings

Wiring Diagrams



Operating Diagrams



RAA10C.../RAA20U...

RAA10C.../RAA20U...

- Key**
- D1 Heating device
 - D2 Cooling device
 - L Operating voltage
 - N Neutral
 - N1 Room thermostat
 - S On/Off switch
 - T Thermostat
 - W Heating control output
 - Y Cooling control output

- Key**
- T Room temperature
 - SD Switching differential
 - SP Room temperature setpoint
 - W Heating output signal
 - Y Cooling output signal

Electric Fan Coil Thermostats



RAB10.1U Thermostat with Manual Changeover.



RAB20.1U Thermostat with Exposed Setpoint Knob and External Changeover.



RAB30.1U Thermostat with Exposed Setpoint Knob and 3-speed Fan Control.

Description

Designed to control 2- or 4-pipe fan coil or unit ventilators, the RAB... Electric Fan Coil Thermostats are an attractive and economical solution that utilize two-wire, gas membrane technology.

Providing On/Off control, the RAB... Electric Fan Coil Thermostats are available with dual scale Fahrenheit/Celsius models with manual or external changeover.

The RAB20.1U requires an aqua sensor to initiate changeover.

Features

- Two-point control algorithm for on/off control
- Line voltage
- 2-pipe or 4-pipe fan coil applications
- 3-speed fan control
- Fan on only models for ventilation
- Manual or external changeover
- Two mounting styles: electrical wall box or drywall
- Adjustable upper/lower limit stops
- Dual Fahrenheit/Celsius scale

Applications

The RAB... Electric Fan Coil Thermostats are recommended for applications in commercial or light industrial buildings in conjunction with zone valves, thermal valves, fans or thermostats.

Note:

ARG70, wall plate, is required for UL compliance in switching line voltage.

RAB Electric Fan Coil Thermostats Specifications

Operating Voltage 24 to 120, 277 Vac
 Frequency 50 or 60 Hz
 Setpoint Setting Range 50 to 85°F (8 to 30 °C)
 Switching Differential (SD) ≤1.8°F (1°C)
 Switch Rating 6 A resistive, 3.5 A inductive,
 3.5 FLA, 12 LRA

Time Constant 14 min.

Operating Conditions

Temperature 14 to 122°F (-10 to +50 °C)
 Relative Humidity <95% RH

Transportation Conditions

Temperature -4 to +122°F (-20 to +50 °C)
 Relative Humidity <95% RH

Safety UL 873
 Wiring Screw Terminals for Wires of
 2 x 16 or 1 x 14 AWG, 20 AWG max.
 Cover Color White
 Shipping Weight 0.08 lb. (0.18 kg)

RAB Electric Fan Coil Thermostats Ordering Chart

Application		Description				Part No.	
		Change-over	Ventilation	3-speed Fan Control	Switch	Electric Wall Box ¹	Dry Wall
2-pipe	Heating/Cooling/Ventilation	Manual	Yes	Yes	Heat/Cool/Vent	RAB10.1UW	RAB10.1U
2-pipe	Heating/Cooling/Ventilation	Auto	Yes	Yes	Heat/Cool/Vent	–	RAB20.1U
4-pipe	Heating/Cooling/Ventilation	Manual	Yes	Yes	Heat/Cool/Vent	RAB30.1UW	RAB30.1U

Ordering Note

- Includes wallplate, ARG70, to be UL compliant for switching line voltage.

Accessories & Service Kits

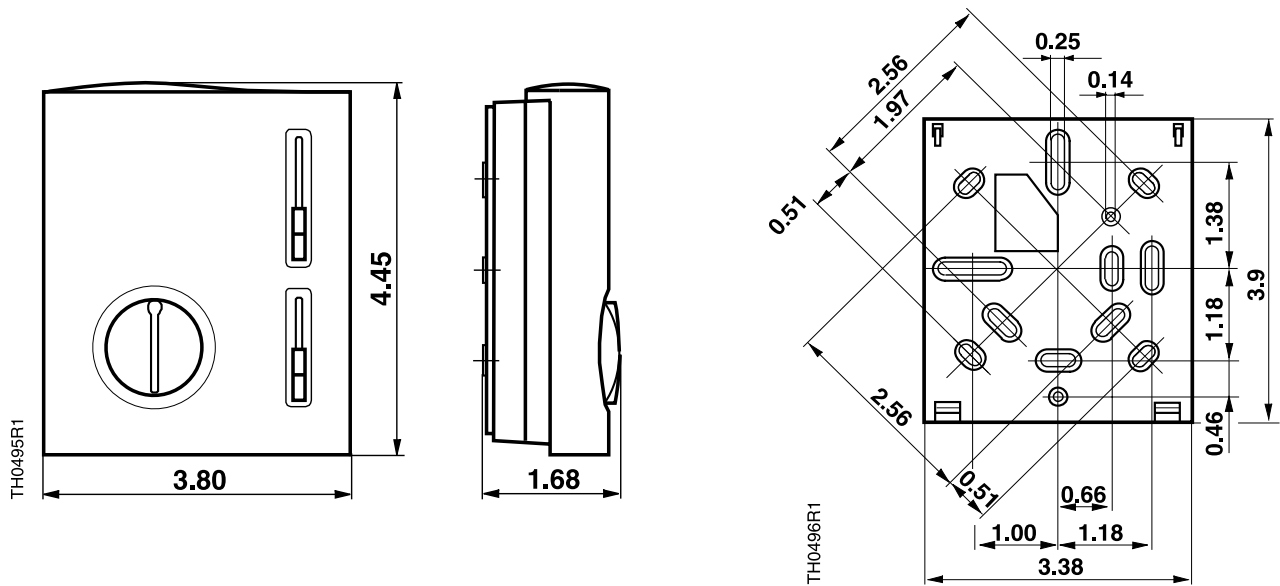
A-75

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Thermostats

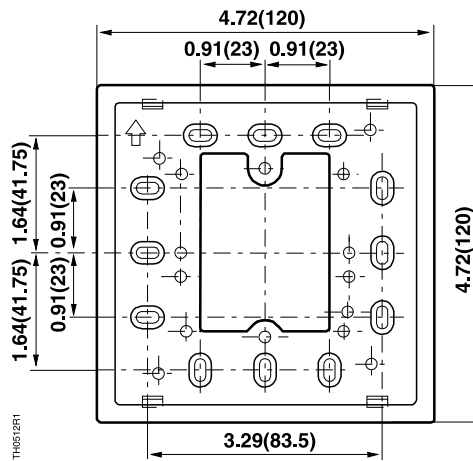
RAB Electric Fan Coil Thermostat Dimensions

RAB Room Thermostat and Wall Plate for Mounting (RAB10.1U, RAB20.1U and RAB30.1U)



A-39

Wall Plate (ARG70) for Mounting

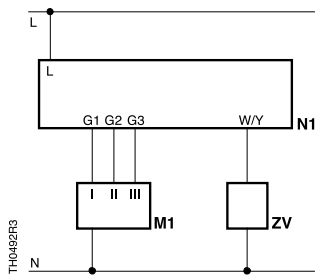


Dimensions shown in inches (mm).

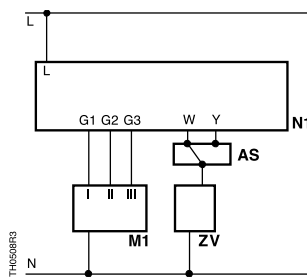
Thermostats

RAB Electric Fan Coil Thermostat Engineering Drawings

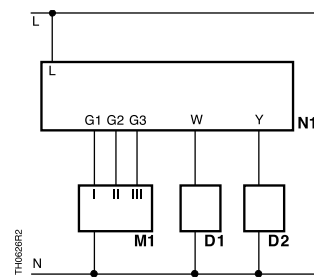
Wiring Diagrams



RAB10.1U...



RAB20.1U...

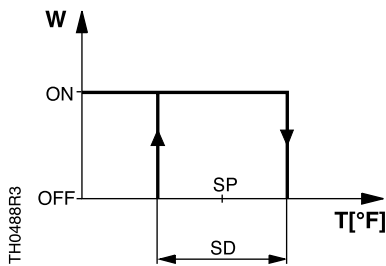


RAB30.1U...

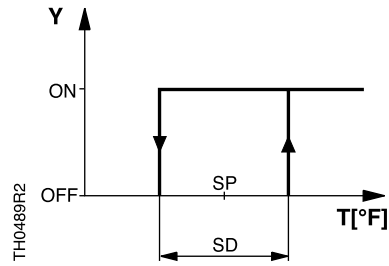
Key

- | | | |
|---------------------|---------------------------------|-----------------------------|
| L Operating Voltage | G1 Control Output Fan Speed I | ZV Zone or Thermal Valve |
| M1 3-speed Fan | G2 Control Output Fan Speed II | W/Y Control Output Actuator |
| N Neutral | G3 Control Output Fan Speed III | AS Aqua Sensor |
| N1 Room Thermostat | | |

Operating Diagrams



Heating Mode



Cooling Mode

Key

- | | |
|------------------------------|-------------------------------|
| T Room Temperature | W Valve Output Signal Heating |
| SD Switching Differential | Y Valve Output Signal Cooling |
| SP Room Temperature Setpoint | |

Room Temperature Controllers for Two-pipe Fan Coil Units



RCC10U Room Temperature Controller.

Description

The RCC... Room Temperature Controllers are room temperature controllers for two-pipe fan coil units.

Features

RCC10U

- Output for on/off valve actuator
- Output for three-speed fan
- Dual setpoint temperature scale
- Control depending on the room or return air temperature
- Automatic Heating/Cooling changeover
- Operating modes: Normal, Energy Saving, Frost Protection and Off
- Operating mode changeover input for remote control
- Selectable control parameters

Applications

The RCC... Series of Room Temperature Controllers are typically used for:

- Controlling Normally Open (NO) 120 Vac, two-position valves
- Controlling room temperature in individual rooms that are heated or cooled with two-pipe fan coil units
- Operating a 3-speed fan

The RCC... Series is suitable for systems with:

- Automatic Heating/Cooling changeover
- Heating only/Cooling only or Heating and Cooling applications

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Thermostats

RCC Specifications

Operating Voltage120 Vac
 Frequency 50/60 Hz
 Power Consumption.....Maximum 4 VA
 Control Outputs (Fan) 11, 10, 9 ... 120 Vac max./3A res./3.5 FLA/7.0 LRA
 Control Output 3 0 to 10 Vdc
 Resolution 39 mV
 Current ±1 mA
 Signal Input 2 for Changeover Sensor QAH11.1, Class 2,
 NTC resistor 3K Ω at 77°F (25°C)
 Permissible Number of Thermostats Ten in Parallel, Signal Input 3
Status Input D1 and GND
 Contact Sensing 6 to 15 Vdc/3 to 6 mA
 Insulation against live voltage 4 kV
 Operating Action Normally Open (NO)
 Permissible Cable Length with Copper
 Cable 16 AWG for Connection to Signal Input 2,
 D1, and GND 262 feet (80m)
 Setpoint Setting Range 50 to 85°F (10 to 30°C)

Setpoint (Energy Saving Mode), Heating 61°F (16°C)
Setpoint (Energy Saving Mode), Cooling 82°F (28°C)
Operation
 Temperature 32 to 122°F (0 to 50°C)
 Humidity <95% RH
Shipping and Storage
 Temperature -13 to +158°F (-25 to +70°C)
 Humidity <95% RH
Agency Approvals UL 873
 cUL
 Certification C22.2 No. 24-93
 Conforms to CE Requirements
Connection Terminals Solid Wires or Prepared Standard Wires
 2 X16 AWG or 1 X14 AWG
 Minimum 20 AWG
Housing Color
 Cover White and gray
 Base Gray
Degree of Housing Protection NEMA 1
Shipping Weight 0.5 lb. (0.23 kg)

RCC Product Ordering

Description	Part No.
Two-pipe fan coil unit controller, on/off output	RCC10U

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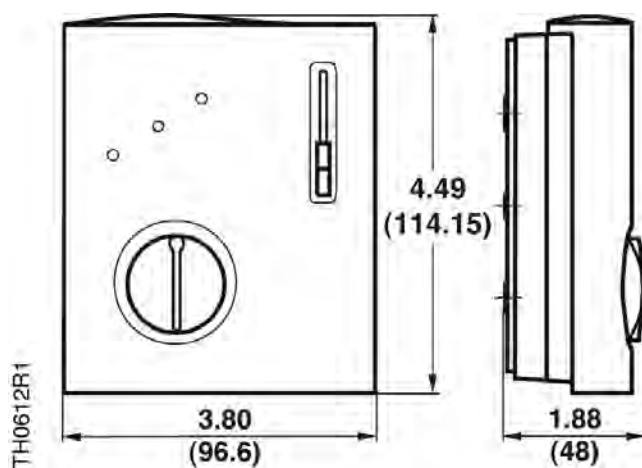
Thermostats

Accessories & Service Kits

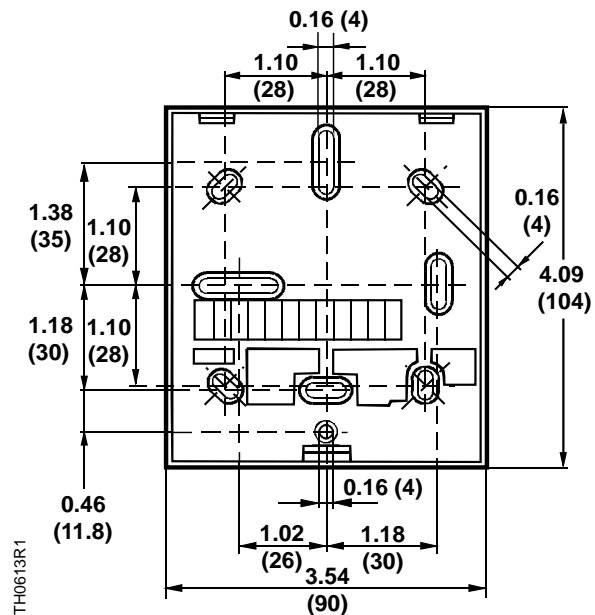
A-75

Dimensions

RCC10U Controller



Baseplate



Dimensions are shown in inches (mm).

Free Energy Band™ Room Temperature Controller for Four-pipe Fan Coil Units



RCC30U Room Temperature Controller.

Description

The RCC... Free Energy Band Room Temperature Controllers are room temperature controls for four-pipe fan coil units.

Features

- Outputs for on/off valve actuators
- Outputs for three-speed fan
- Dual setpoint temperature scale
- Control depending on the room or return air temperature (remote sensing)
- Automatic Heating/Cooling changeover
- Operating modes: Normal, Energy Saving, Freeze Protection and Off
- Operating mode changeover input for remote control
- Selectable control parameters
- Free Energy Band between Heating and Cooling for energy conservation

Applications

The RCC... Series is typically used for the following applications:

- Controlling room temperature in individual rooms that are heated or cooled with four-pipe fan coil units
- Opening or closing a Normally Closed (NC) Heating and a Normally Open (NO) Cooling, 120 Vac, two-position valve
- Switching a three-speed fan

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Thermostats

RCC Free Energy Band Controller Specifications

Operating Voltage 120 Vac +10/-15%
 Frequency 50/60 Hz
 Power Consumption Maximum 10A
 Control Outputs (Fan) 12, 11, 10
 7 and 9 120 Vac max./3A res./
 3.5 FLA/7.0 LRA
 120 Vac max./3A res./3.5 FLA/7.0 LRA
 Control Output 5 (Common) 120 Vac/7A maximum
 Signal Input 1 for Return Air Sensor QAH11.1, Class 2
 NTC resistor 3K @ 77°F (25°C)
 Operating Action Single-pole, Single-throw
 Permissible Cable Length with Copper
 Cable 16 AWG for Connection to
 Terminals 1, D1, and GND 262 feet (80 m)
 Setpoint Setting Range 50 to 85°F (10 to 30°C)
 Maximum Control Deviation at 72°F (22°C) Maximum ±1.5°F (0.7°C)
 Switching Differential in Heating Mode SDH
 (Selectable) 2 or 7°F (1 or 4°C)
 Switching Differential in Cooling Mode SDC 1 or 3.5°F
 (0.5 or 2°C) (selectable)
 Dead Zone in Normal Operation 3.5 or 9°F (2 or 5°C)

Setpoint (Energy Saving mode), Heating 61°F (16°C)
 Setpoint (Energy Saving mode), Cooling 82°F (28°C)
 Setpoint (Freeze Protection) 46°F (8°C)
Operation
 Temperature 32 to 122°F (0 to 50°C)
 Humidity <95% RH
Shipping and Storage
 Temperature -13 to +158°F (-25 to +70°C)
 Humidity <95% RH
Agency Approvals
 UL Listing UL 873
 cUL
 Certification C22.2 No. 24-93
 Conforms to CE requirements
Connection Terminals Solid wires or prepared standard wires
 2 X16 AWG or 1 X14 AWG
 Minimum 20 AWG
Housing Color
 Cover White and gray
 Base Gray
Degree of Housing Protection NEMA 1
Shipping Weight 0.5 lb (0.23 kg)

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RCC Free Energy Band Controller Product Ordering

Description	Part No.
Free Energy Band Four-pipe Fan Coil Controller	RCC30U

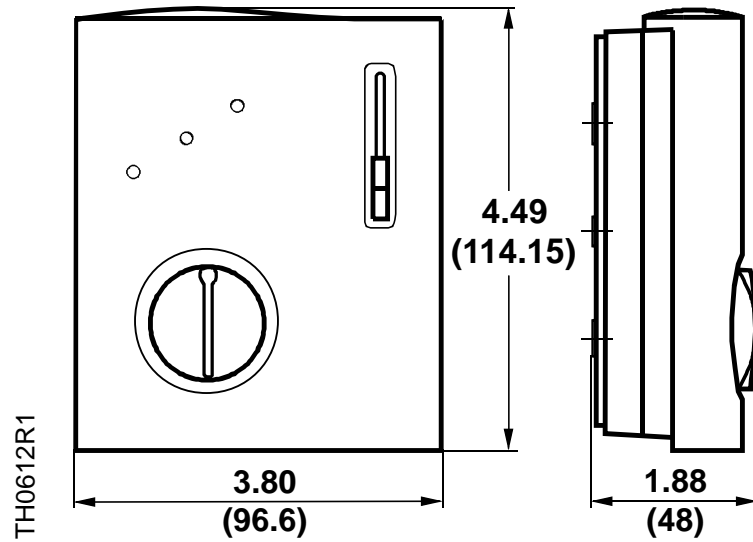
Thermostats

Accessories & Service Kits

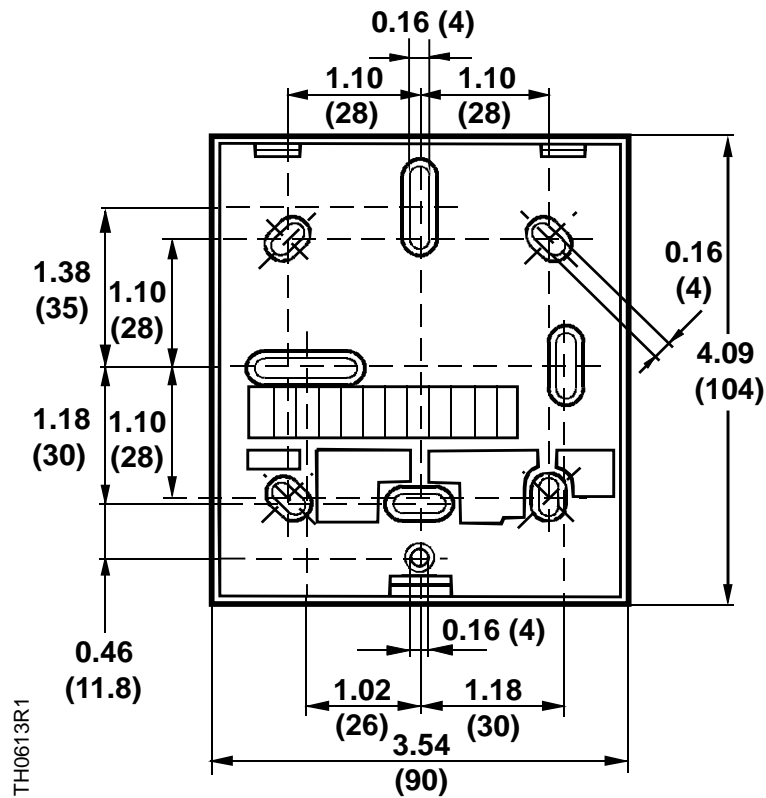
A-75

RCC Free Energy Band Controller Dimensions

RCC30U FEB Controller



Baseplate



Dimensions shown in inches (mm).

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Thermostats

Housings with No Logo Option

Our award-winning housing design, plus a variety of energy-saving functions and adaptability options, make Siemens thermostats a welcome addition to any room. Look for the “No Logo” cover option to inconspicuously enhance a room’s aesthetics.

**SIEMENS**

Room Temperature Controllers for CAV Systems



RCU15U/RCU50U
Room Temperature Controller.



RCU50.2U Room Temperature Sensor with
Manual Heating/Cooling Changeover Switch.

Description

The RCU15/50... Series microprocessor controlled Constant Air Volume (CAV) room controllers are designed for air only, or air and water heating and/or cooling systems. Controllers have two-position, pulse width modulation (PWM), or proportional response.

Features

- 0 to 10 Vdc output for heating or cooling (RCU50U and RCU50.2U)
- ON/OFF or PWM outputs for heating and cooling (RCU15U)
- Control depending on room or return air temperature (RCU15U)
- Automatic heating/cooling changeover (RCU15U and RCU50U)
- Manual heating/cooling changeover (RCU50.2U)
- Operating modes: Normal, Energy Saving, Freeze Protection and Standby (RCU15U and RCU50U)
- Operating modes: Normal and OFF (RCU50.2U)
- Active 0 to 10 Vdc input for setpoint shifting (RCU50U)
- Operating mode changeover input for remote control (RCU50U)
- Adjustable minimum limitation for cooling output (RCU50U)
- Operating voltage 24 Vac

Applications

Controlling individual room temperature in HVAC installations that are heated or cooled.

Controlling these types of equipment:

- Valve actuators
- Air damper actuators

RCU15/50 Specifications

Power Supply

Operating Voltage..... 24 Vac ±20%
 Frequency 50/60 Hz

Setpoint Setting Range 50 to 85°F (10 to 30°C)

P-band in Heating Mode

RCU50U 2 or 7°F (1 or 4°C)
 RCU50.2U (fixed)..... 7°F (4°C)

P-band in Cooling Mode

RCU50..... 1 or 3.5°F (0.5 or 2°C)
 RCU50.2 (fixed)..... 3.5°F (2°C)

Setpoint (Energy Saving Mode), Heating 61°F (16°C)

Setpoint (Energy Saving Mode), Cooling 82°F (28°C)

Setpoint Freeze Protection 46°F (8°C)

Setpoint Shift Temperature @ 72°F (22°C) ±22.5°F (±12.5°C)

Control Action

RCU15U On/Off/PWM
 RCU50U & RCU50.2U Proportional

Control Outputs, Terminals 4 and 5 (RCU 50...)

Voltage 0 to 10 Vdc
 Current ±1 mA

Control Outputs, Terminals 7 and 8 (RCU15U)

Voltage 24 Vac ±20%
 Current 0.02 to 1A
 Cycle time PWM (selectable for terminal 7) 20s or 90s

Status Input D1 (RCU50U)

Contact sensing..... 6 to 15 Vdc/3 to 6 mA
 Insulation against live voltage 4 kV
 Maximum number of contacts connected in a panel.....50

Status Inputs 1 and 2 (RCU50U)

Setpoint shift of ±22.5°F @ 72°F (22°C) 0 to 10 Vdc
 Neutral position (no setpoint shift)..... 5 Vdc

Signal Input Terminals 2 and 3 for Changeover Sensor

..... QAH11.1 safety class 2
 NTC resistor 3KΩ @ 77°F (25°C)

Maximum Copper Cable Length 16 AWG

For Input Signal terminals 1 & 2 (RCU50U) 262 feet (80m)
 For Input Signal D1 (RCU50U)..... 262 feet (80m)

Operation

Temperature 32 to 122°F (0 to 50°C)
 Humidity <95% RH

Shipping and Storage

Temperature -13 to 158°F (-25 to 70°C)
 Humidity <95% RH

Agency Approvals

..... UL listed UL 873
 Conforms to CE requirements
 cUL certified to Canadian Standard C22.2 No. 24-93

Connection Terminals

..... Use Solid Wires or Prepared Stranded Wires
 2 x 16 AWG or 1 x 14 AWG, 20 AWG max.

Housing Color

Cover..... White
 Base Gray

Shipping Weight 0.5 lb (0.23 kg)

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Thermostats

RCU15/50 Product Ordering

Heat/Cool Changeover	Output(s)	Part No.
Automatic	(2) On/Off or PWM	RCU15U
Automatic	(1) 0 to 10 Vdc	RCU50U
Manual	(1) 0 to 10 Vdc	RCU50.2U

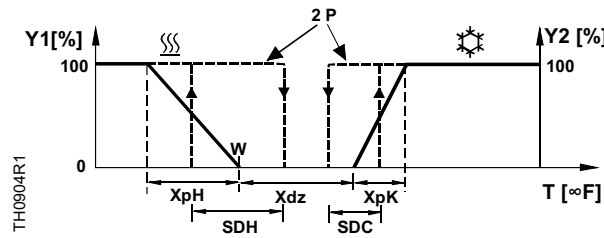
Ordering Note: The temperature sensor, changeover mounting kit, and valve and damper actuators must be ordered separately, see table below.

Device Combinations Product Ordering

Description	Part No.
Remote Cable Temperature/Changeover Sensor	QAH11.1
44 lb-in NSR Air Damper Actuator	GDE16...
88 lb-in NSR Air Damper Actuator	GLB16...
Valve Actuator	SSB61U
Valve Actuator	SSC61U SSC61.5U
Valve Actuator	SQS65U SQS65.5U

RCU15/50 Engineering Drawings

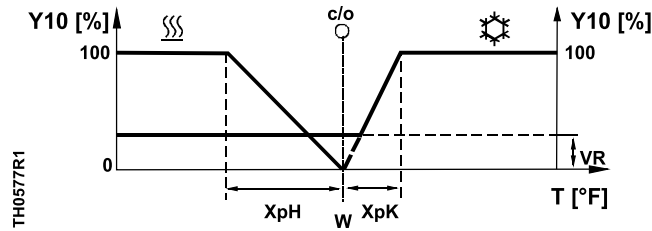
Function Diagrams



RCU15U – Heating-Cooling

Key

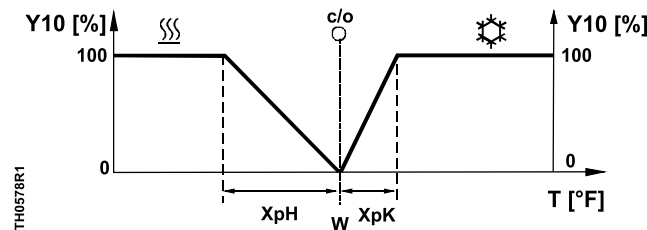
- | | | | |
|--------|---------------------------|------|------------------------------------|
| T | Room temperature | XpK | Proportional band cooling |
| Y1, Y2 | Output percentage | SDH | Switching differential for heating |
| W | Room temperature setpoint | SDC | Switching differential for cooling |
| Xdz | Dead band | 2 P. | 2-position outputs |
| XpH | Proportional band heating | | |



RCU50U – Heating-Cooling with Minimum Limitation Cooling

Key

- | | | | |
|-----|---------------------------|-----|--|
| T | Room temperature | XpK | Proportional band cooling |
| Y10 | Output percentage | VR | 0 to 100% minimum limitation of cooling output |
| W | Room temperature setpoint | c/o | Changeover |
| XpH | Proportional band heating | | |



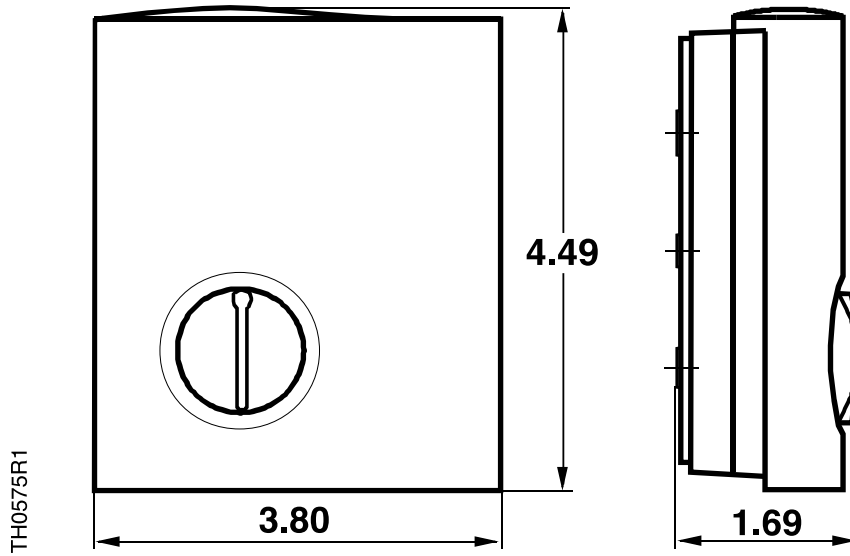
RCU50.2U – Heating-Cooling

Key

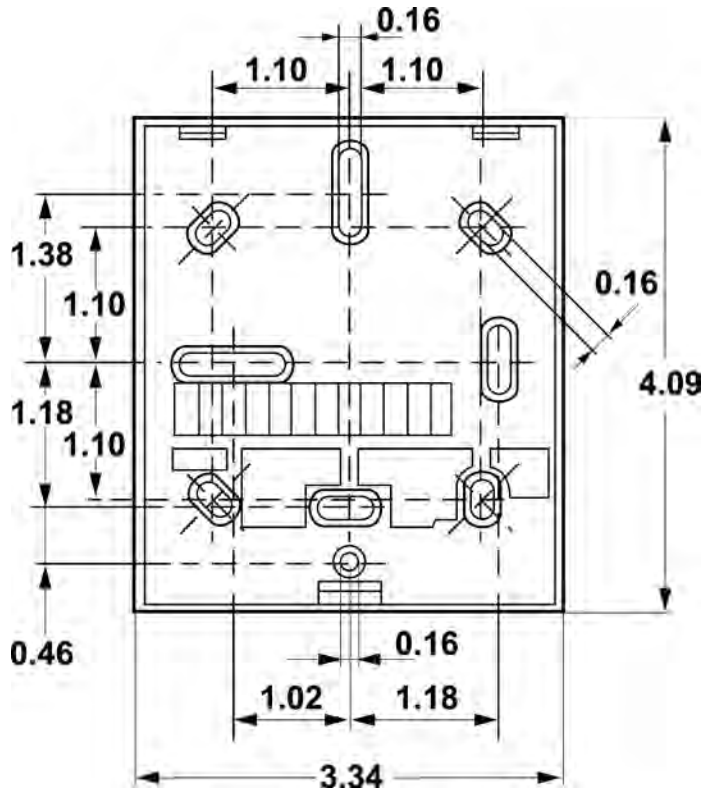
- | | | | |
|-----|---------------------------|-----|---------------------------|
| T | Room temperature | XpH | Proportional band heating |
| Y10 | Output percentage | XpK | Proportional band cooling |
| W | Room temperature setpoint | c/o | Changeover |

RCU15/50 Dimensions

RCU15/50... Controller



RCU15/50... Baseplate



Dimensions shown in inches.

Room Temperature Controllers for CAV and VAV Systems



RCU61U Room Temperature Controller.

Description

The RCU61U Room Temperature Controllers are designed specifically for Constant Air Volume and Variable Air Volume Systems.

Features

- Modulating P-control
- 0 to 10 Vdc output for cooling
- Floating output 24 Vac for heating
- Operating modes: normal, energy saving and standby
- Active 0 to 10 Vdc input for remote setpoint shifting
- Operating mode changeover input for remote control
- Adjustable minimum limitation for cooling output
- Operating voltage 24 Vac
- Ergonomic design
- Dual Fahrenheit/Celsius scale

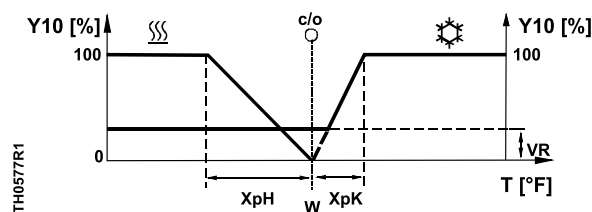
Applications

Controlling individual room temperature in HVAC installations that are heated or cooled, the RCU61U Temperature Controllers are suited for use with VAV systems with auxiliary heating with VAV compact controllers, valve actuators, and air damper actuators.

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Thermostats

Function Diagram



Key	
T	Room Temperature
Y2, Y10	Output Percentage
W	Room Temperature Setpoint
XpH	Proportional Band Heating
XpK	Proportional Band Cooling
VR	0 to 100% Minimum Limitation of Cooling Output

RCU61U Specifications

Power Supply

Operating Voltage..... 24 Vac ±10%
 Frequency 50/60 Hz

Setpoint Setting Range 46 to 86°F (8 to 30°C)

Maximum Control Deviation at 68°F (20°C) ±0.7 K

Switching Differential Heating SDH

or P-band XpH (Selectable) 2 or 7°F (1 or 4°C)

Switching Differential Cooling SDC

or P-band XpC (Selectable) 1 or 3.5°F (0.5 or 2°C)

Setpoint Shift Temperature @ 72°F (22°C) ±22.5°F (±°C)

Control Outputs (Cooling) 4 & 5 0 to 10 Vdc

Voltage 24 Vac

Current ±1 mA

Control Outputs (Heating) 8, 9 & 10 24 Vac ±20%

Motor Timing for Heat Output 150 sec. @ 60 Hz

Status Input D1

Contact Sensing 6 to 15 Vdc /3 to 6 mA

Insulation Against Live Voltage 4 kV

Maximum Number of Contacts per Panel 50

Status Input B1

Setpoint Shift of 36°F (12.5 C) 0 to 10 Vdc

Neutral Position (No Setpoint Shift) 5 Vdc

Signal Input B2 for Changeover Sensor QAH11.1 Safety Class 2

Maximum Copper Cable Length 16 AWG

For Input Signal B1/B2 (RCU61U) 262 ft. (80 m)

For Input Signal D1 (RCU61U) 262 ft. (80 m)

Operation

Temperature 32 to 122°F (0 to 50°C)

Humidity <95% RH

Agency Listings UL Listed 197N; Conforms to CE Requirements

Connection Terminals Use Solid Wires or Prepared Stranded Wires

2x13 AWG or 1x16 AWG

Housing Color

Cover White

Base Gray

Shipping Weight 0.5 lb. (0.02 kg)

RCU61U Product Ordering

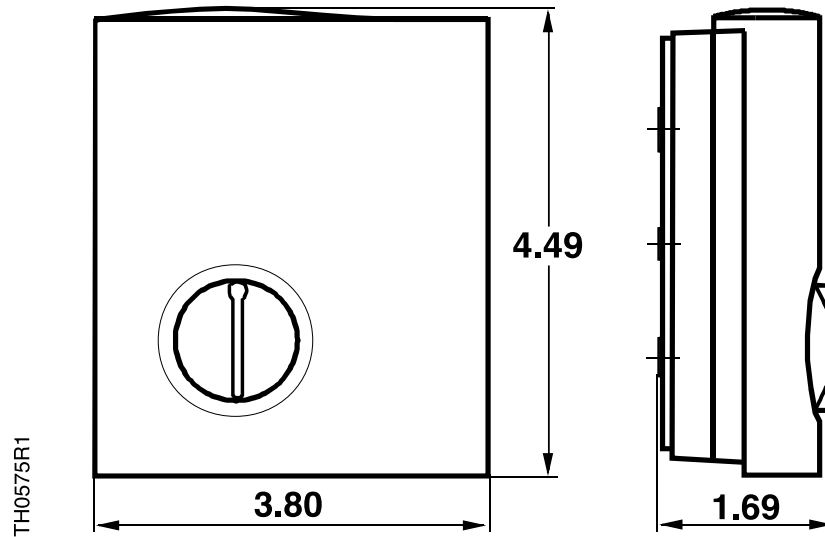
Description	Part No.
Room Temperature Controller	RCU61U

Device Combinations Product Ordering

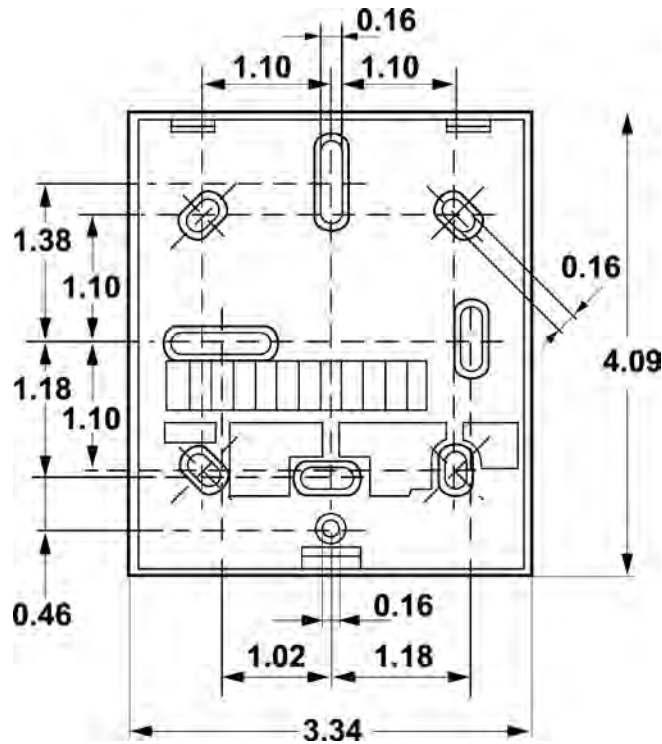
Description	Type Reference
Valve Actuator	SSA81UG
	SSB61U
	SSB81U
	SSC81U
Damper Actuator	GLB16x
	GCA16x
	GBB16x
	GCA16x

RCU61U Dimensions

RCU61U Controller



Baseplate



Dimensions shown in inches.

Room Temperature Controller with Two 0 to 10 Vdc Outputs



RLA162.5U Room Temperature Controller.

Description

Room temperature controller for basic ventilation, air conditioning and heating systems. Compact design with two analog, 0 to 10 Vdc control outputs for heating and/or cooling, and digital output for pump or fan.

Features

- Automatic heat/cool changeover
- Automatic day/night setpoint changeover via external contact
- Room temperature control through modulating control of valve or damper actuators with selectable operating action of control signals for heating only, cooling only, or heating and cooling in sequence
- Relay input for fan, pump or other controls
- Minimum limitation of the supply air temperature
- Outputs are independently selectable direct acting (DA) or reverse acting (RA)
- Adjustable proportional band

Applications

- Single-stage heating
- Single-stage cooling
- Two-stage heating
- Heating and cooling in sequence
- Minimum limitation of supply air

Devices that can be controlled:

- Modulating heating or cooling valve actuators
- Modulating air damper actuators
- Circulating pumps, charging pumps, and boilers

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Thermostats

RLA162.5U Specifications

Power Supply

Operating Voltage..... 24 Vac ±20/-25%
 Frequency 50/60 Hz
 Power Consumption Maximum 2 VA

Setpoint Temperature Differential

Adjustment Range..... 46 to 86°F (8 to 30°C)

Night Setpoint Differential From

Day Setpoint, Adjustable 0 to 18°F (0 to 10 K)

Proportional-band 2 to 90°F (1 to 50 K)

Integral Action Time with PI Control..... 600 Seconds (10 minutes)

Dead Zone with Heating/Cooling in Sequence 1.8°F (1 K)

Relay Input (Fan) 13, 20 24 Vac

Control Outputs 18, 19, Modulating, P or P + I Control Algorithm

Voltage 0 to 10 Vdc, Continuous
 Current Maximum 1 mA

Maximum Cable Length Copper (16 AWG)

For Signal Input 5, 11 262 feet (80 m)

Contact Input (D1-GND) 3 to 6 mA

Operation

Temperature 32 to 122°F (0 to 50°C)
 Humidity <95% RH

Transport

Temperature -13 to 158°F (-25 to 70°C)
 Humidity <95% RH

Regulatory Approvals

Degree of protection NEMA 1
 UL listing..... UL 916
 cUL Canadian Standard C22.2 No. 205-M1983

Connection Terminals for solid wires

or stranded wires..... 2 x 16 AWG or 1 x 14 AWG

Sensor

Sensing Element Siemens-Ni 1000 Ω at 32°F (0°C)

Shipping Weight 1.40 lb (0.64 kg)

RLA162.5U Product Ordering

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Description	Part No.
Room Temperature Control with Minimum Limitation and Automatic Day/Night Changeover	RLA162.5U

Ordering Note: The temperature sensor, kit, and valve and damper actuators must be ordered separately, see table below.

Device Combinations Product Ordering

Actuators and controls must meet the following specifications:

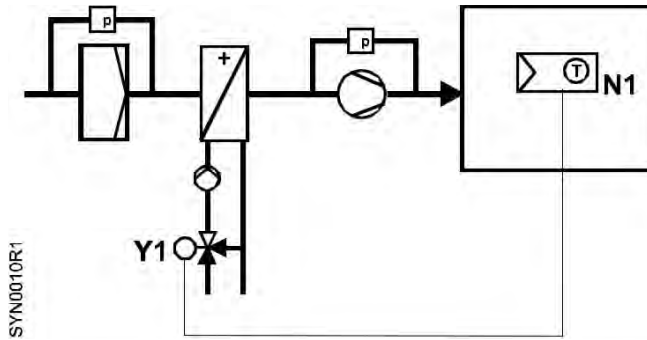
- Operating voltage 24 Vac
- Control input: modulating 0 to 10 Vdc

Description	Part No.
OpenAir™ GDE Series Damper Actuator with 44 lb/in torque	GDE161.1T GDE161.1P
OpenAir™ GLB Series Damper Actuator with 88 lb/in torque	GLB161.1P
OpenAir™ GMA Damper Actuator with 62 lb/in torque	GMA161.1P GMA161.1U
Accessory wall escutcheon	ARG70

Thermostats

RLA162.5U Engineering Drawings

Function Diagrams

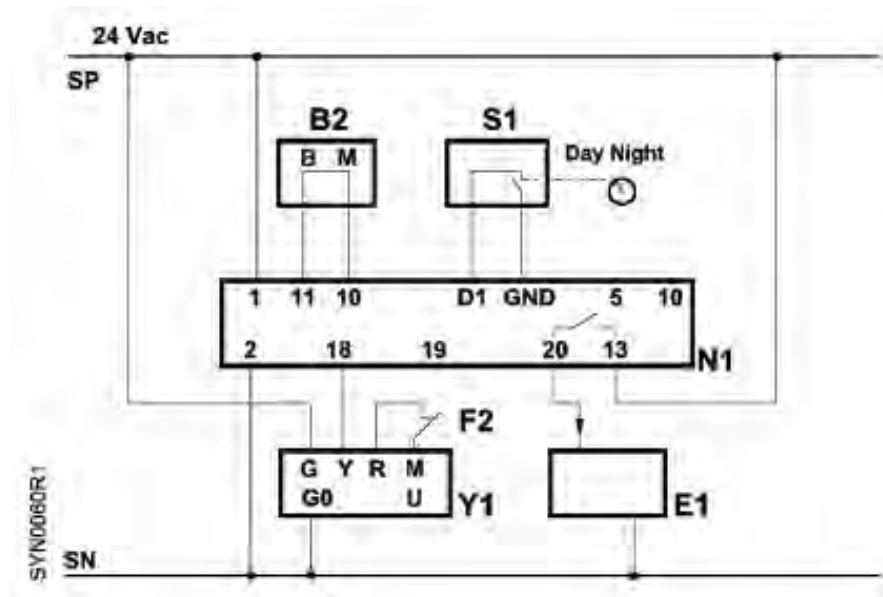


RLA162.5U Room Temperature Controller

Key

- N1 Room Temperature Controller (RLA162.5U)
- Y1 Heating valve

Wiring Diagrams



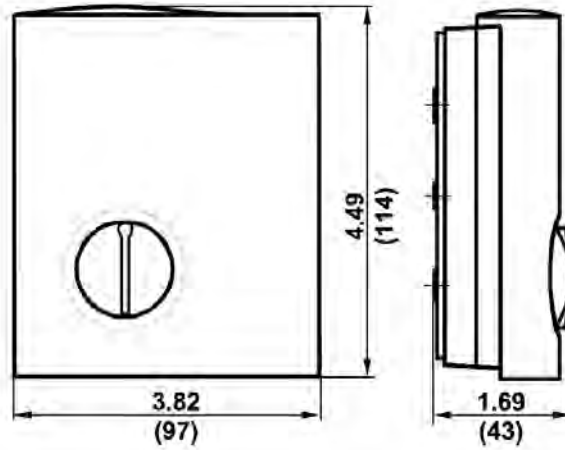
RLA162.5U

Key

- B2 Heat/cool changeover sensor
- E1 Fan or auxiliary unit
- F2 Low temperature detection thermostat
- N1 Room temperature controller (RLA162.5U)
- S1 Time clock or switch for day/night setpoint changeover
- Y1 Heating valve actuator

RLA162.5U Dimensions

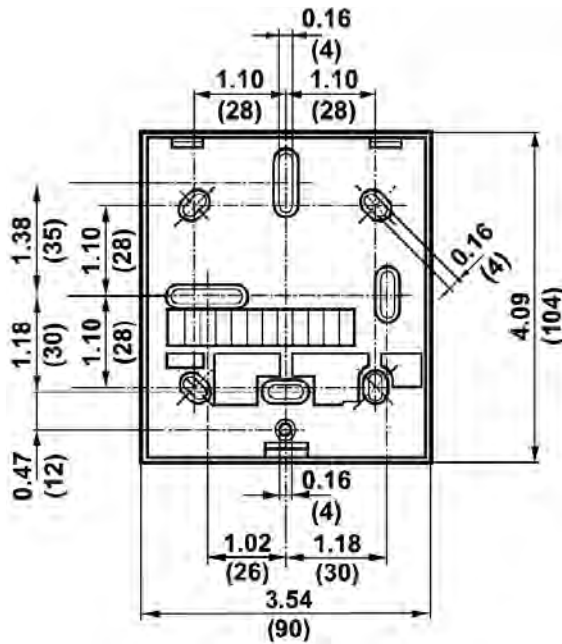
RLA162.5U Controller



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Thermostats

RLA162.5U Baseplate



Dimensions shown in inches (mm).

Room Temperature Controllers with LCD for Heating and Cooling Systems



RDU20U/RDU50U Room
Temperature Controller.



RDU50.2U Room
Temperature Controller.

Description

The RDU Series Room Controller with LCD is designed for 2-pipe heating and cooling systems.

Features

- Liquid Crystal Display (LCD)
- Modulating Proportional + Integral (P+I) control
- Control depending on room or remote air temperature
- Output for a 0 to 10 Vdc actuator (RDU50U and RDU50.2U)
- Output for a floating (floating) or on/off output actuator (RDU20U)
- Adjustable actuator run time (RDU20U)
- Automatic heating/cooling changeover (RDU20U and RDU50U)
- Manual heating/cooling changeover (RDU50.2U)
- Operating modes: Normal, Energy Saving and Off (RDU20U and RDU50U)
- Operating mode changeover input for day/night remote control
- Selectable installation and control parameters
- Adjustable minimum limitation for cooling output (RDU50U)
- Optional selectable Direct Acting or Reverse Acting output (RDU50U and RDU50.2U)
- Selectable display of room temperature or setpoint
- Fahrenheit or Celsius selectable display
- Minimum and maximum setpoint limitation
- Operating voltage, 24 Vac

Applications

The RDU...Series of Room Temperature Controllers are used for individual room temperature control in heating or cooling HVAC applications.

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Thermostats

RDU Specifications

Operating Voltage 24 Vac \pm 20%
Frequency 50/60 Hz
Power Consumption.....Maximum 4 VA
Control Output 1–5 (RDU50U and RDU50.2U) 0 to 10 Vdc
 Resolution 39 mV
 Effective Current.....Maximum \pm 1 mA
Floating Control Output 4–6 (RDU20U)24 Vac
Return air temperature input 4–3..... QAH11.1 Safety Class 2
Changeover temperature input 2–3 (RDU50U)
8–7 (RDU20U)NTC resistor 3K ohm at 77°F (25°C)
Dry Contact D1 and GND
 Contact Sensing..... 6 to 15 Vdc/3 to 6 mA
 Operating Action.....Normally Open (NO)
Maximum Cable Length 16 AWG for Connection to Terminals 4, 2 and D1 262 feet (80 m)
Setpoint Setting Range..... 41 to 95°F (5 to 35°C)
Control Deviation at 77°F (25°C) Maximum \pm 1.6°F (0.9°C)
P-band in Heating Mode, Adjustable in 0.5K Increments (1 Kelvin = 2°F).....0.5K to 4K
 Factory Setting2K
P-band in Cooling Mode, Adjustable in 0.5K Increments (1 Kelvin = 2°F).....0.5K to 4K
 Factory Setting 1K

Integral Action Time, Adjustable 1 to 10 Minutes
 Factory Setting5 Minutes
Setpoint (Energy Saving Mode), Heating..... 41 to 65°F (5 to 18°C)
Setpoint (Energy Saving Mode), Cooling 75 to 95°F (24 to 35°C)
Operation
 Temperature 32 to 122°F (0 to 50°C)
 Humidity <95% RH
Shipping and Storage
 Temperature
 (RDU50U and RDU50.2U) -13 to 158°F (-25 to 70°C)
 (RDU20U)..... -13 to 140°F (-25 to 60°C)
 Humidity <95% RH
Agency ApprovalsConforms to CE Requirements
 NEMA 1
Connection Terminals Use Solid Wires or Prepared Stranded Wires.
 2 x 16 AWG or 1 x 14 AWG
 Maximum 20 AWG
Housing Color
 Cover..... White
 Base Gray
Shipping Weight0.5 lb (0.23 kg)

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Thermostats

RDU Product Ordering

Description	Part No.
Automatic heating/cooling changeover, Floating	RDU20U
Automatic heating/cooling changeover, 0 to 10 Vdc	RDU50U
Manual heating/cooling changeover switch, 0 to 10 Vdc	RDU50.2U

Device Combinations Reference

Description	Type Reference
RDU50U and RDU50.2U	
0 to 10 Vdc Valve Actuators	SSB61U... SSC61U... SQS65U SSC61.5U SQS65.5U
44 lb-in NSR Air Damper Actuators	GDE16...
88 lb-in NSR Air Damper Actuators	GLB16...
RDU20U Only	
Floating Control Valve Actuators	SSB81U...SSC81.5U SSC81U SQS85.53U
44 lb-in NSR Air Damper Actuators	GDE131...
88 lb-in NSR Air Damper Actuators	GLB131...
Valves	
Globe	Powermite Series
Ball	599 Series

Room Temperature Controller with LCD



Energy &
Atmosphere



RDX42.22U Room Temperature Controller with LCD.

Description

The RDX... Room Temperature Controller with LCD is a controller for heat pump systems with reversing valve, or standard heating and cooling with optional electric heater, one- or two-stage heating and one-stage cooling.

Features

- Outputs for one-stage compressor and reversing valve or on/off valve actuators
- Output for auxiliary electric heating
- Output for a one-speed fan
- Room or return air temperature control
- Manual heating/cooling changeover
- Operating modes: Normal (heating, cooling), Energy Saving, Off
- Operating mode changeover input for remote control
- Selectable installation and control parameters
- Operating voltage, 24 Vac
- Liquid Crystal Display (LCD)

Applications

The RDX... Series of Room Temperature Controllers are used for control of the following:

- Heat pump systems with reversing valve, optional electric heater, one- or two-stage heating and one-stage cooling
- Four pipe standard heating and cooling systems
- Room temperature in individual rooms that are heated or cooled with four-pipe fan coil units and optional electric heating
- Opening and closing a valve
- Switching a one-speed fan

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Thermostats

RDX Specifications

Operating Voltage 24 Vac \pm 20%
Frequency 50/60 Hz
Power Consumption Maximum 6 VA
Control Output FAN 24 Vac
 Rating Maximum 5(3)A
Control Outputs Cooling and Heating 24 Vac
 Rating Maximum 5(3)A
Control Output Aux. Heating 24 Vac
 Rating Maximum 5(3)A
Remote Temperature Sensor
Status Input 8-7 QAH11.1 Safety Class II
 NTC resistor 3 k ohm at 77°F (25°C)
Status input D1 and GND
 Operating Action Selectable Normal Open (NO)
 Contact Sensing Normal Closed (NC)
 Insulation Against Line Voltage SELV 6 to 15 Vdc/3 to 6 mA, 4kV
 Reinforced Insulation
Permissible Cable Length with Copper Cable
 2 X16 AWG or 1 X14 AWG for Connection to
 Terminals 8 and D1 262 ft. (80 m)

Setpoint Setting Range 46 to 95°F (8 to 35°C)
Control Deviation at 77°F (25°C) Maximum + 1°F (0.5 K)
Setting Range
 Factory Setting
 Switching Differential in Heating Mode (adj) 3.5°F (2 K)
 Switching Differential in Cooling Mode (adj) 2°F (1 K)
 Setpoint Differential WD (Adjustable) 3.5°F (2 K)
 Setpoint (Energy Saving Mode), Heating 61°F (16°C)
 Setpoint (Energy Saving Mode), Cooling 82.5°F (28°C)
Operation
 Temperature 32 to 122°F (0 to 50°C)
 Humidity <95% RH
Shipping and Storage
 Temperature -13 to +158°F (-25 to +70°C)
 Humidity <95% RH
Agency Approvals Conforms to CE Requirements
 NEMA 1
Connection Terminals Use Solid Wires or
 Prepared Stranded Wires. 22 AWG to 14 AWG
Housing Cover Color White
Shipping Weight 0.5 lb. (0.225 kg)

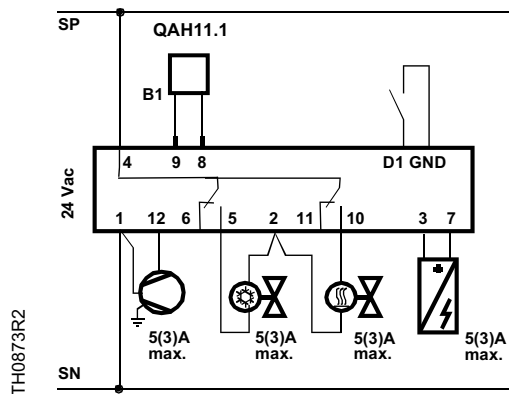
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RDX Product Ordering

Description	Part No.
Room Temperature Controller	RDX42.22U

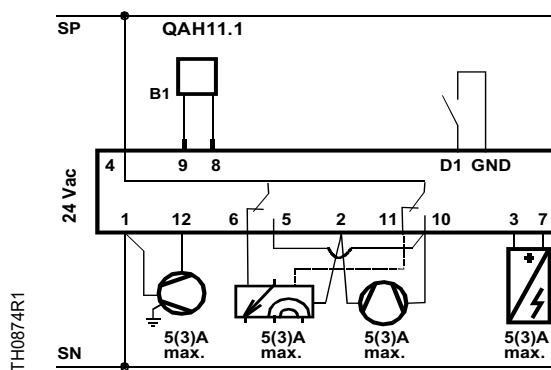
Thermostats

Wiring Diagrams



RDX... Four-pipe System Wiring

- Key**
- 6 Cooling output NC contact
 - 5 Cooling output NO contact
 - 11 Heating output NC contact
 - 9 Heating output NO contact



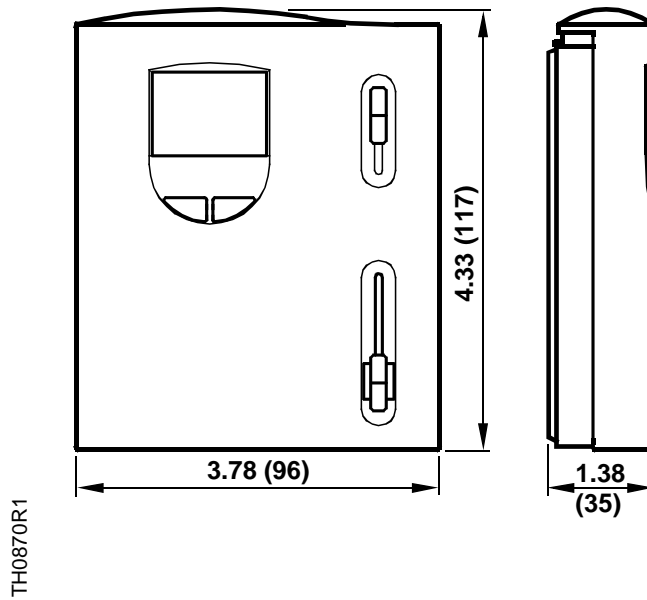
RDX... Heat Pump Wiring

- Key**
- 6 Cooling output NC contact for reversing valve
 - 5 Cooling output NO contact for compressor
 - 11 Heating output NC contact for reversing valve
 - 9 Heating output NO contact for compressor

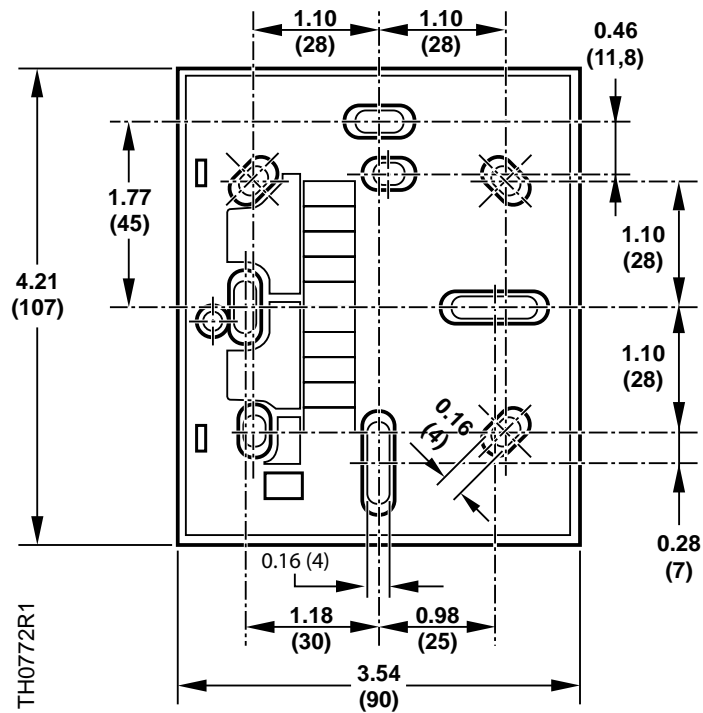
Note:
 Outputs 5 and 10 must be wired together for compressor control

RDX Dimensions

RDX Controller



Baseplate



Dimensions shown in inches (mm).

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Thermostats

Maximize energy-savings. Optimize performance.

Our HVAC products help drive down energy costs and improve indoor air quality. Look for these icons throughout this catalog for products that can help contribute to achieving LEED credits.

Sustainable Sites (SS)

Water Efficiency (WE)

Energy & Atmosphere (EA)

Materials & Resources (MR)

Indoor Environmental Quality (IEQ)

Innovation in Design/Operations (EB)

Regional Priority (RP)

Find more information on LEED beginning on pg. 3



Sustainable Sites



Water Efficiency



Energy & Atmosphere



Materials & Resources



Indoor Environmental Quality



Innovation in Design/Operations



Regional Priority

Room Temperature Controllers with LCD for Two-Pipe Fan Coil Units



RDF20U Room Temperature Controller with LCD for Two-Pipe Fan Coil Units with Electric Heat.

Description

Room temperature controller with LCD for two-pipe fan coil units.

Features

RDF10U

- Output for an on/off valve actuator

RDF20U

- Output for an on/off valve actuator and an electric heater

RDF50.1U

- Modulating PI control
- Output for a 0 to 10 Vdc valve actuator

RDF60.1U

- Modulating PI control
- Output for a floating valve actuator

ALL MODELS

- Outputs for a three-speed fan
- Control depending on the room or the return air temperature
- Automatic heating/cooling changeover
- Continuous heating or cooling mode
- Operating modes: Normal, Economy and Standby
- Operating mode changeover input for remote control (Day/Night)
- Air movement control function for avoiding damage resulting from moisture
- Selectable installation and control parameters
- Display of room temperature or setpoint (selectable)
- Electronic minimum and maximum setpoint limits
- Operating voltage 24 Vac

Applications

Typical use for RDF10U:

- Control of the room temperature in individual rooms that are heated or cooled with two-pipe fan coil units
- Opening or closing a valve and switching a three-speed fan

Typical use for RDF20U:

- Control of the room temperature in individual rooms that are heated or cooled with two-pipe fan coil units equipped with an electric heater
- Opening or closing a valve, switching a three-speed fan, and switching an electric heater

Typical use for RDF50.1U:

- Control of the room temperature in individual rooms that are heated or cooled with two-pipe fan coil units
- For opening and closing a 0 to 10 Vdc valve operating on 24 Vac and for switching a three-speed fan

Typical use for RDF60.1U:

- Control of the room temperature in individual rooms that are heated or cooled with two-pipe fan coil units
- Opening and closing a floating valve operating on 24 Vac and for switching a three-speed fan.

RDF Specifications

Power Supply
 Operating Voltage.....24 Vac, +20/-25%
 Frequency 50/60 Hz

Power Consumption.....6 VA maximum

Fan Control Outputs

RDF10U, RDF20U, RDF60.1U 12, 11, 10-N.....24 Vac
 Rating.....5 (3) A maximum

Valve Control Output 4-2 (NO).....24 Vac
 Rating.....5 (3) A maximum

Valve Control Output 5-2 (NC).....24 Vac
 Rating.....5 (3) A maximum

RDF20U Electric Heating Control Output 6-2 (NO).....24 Vac
 Rating.....5 (3) A maximum

RDF60.1U Valve Control Output 4, 6, 2.....24 Vac
 Rating.....5 (3) A maximum

RDF50.1U Valve Control Output 1-6.....SELV 0 to 10 Vdc
 Resolution 39 mV
 Effective Current.....±1 mA maximum

Return Air Temperature Sensor QAH11.1 safety class II

RDF10U, RDF20U, RDF60.1U
 Status Input 8-9.....NTC resistor 3 kΩ at 77°F (25°C)

RDF50.1U
 Status Input 4-3.....NTC resistor 3 kΩ at 77°F (25°C)

Heat/Cool Changeover..... QAH11.1, safety class II

RDF10U, RDF20U, RDF60.1U
 Status Input 7-8.....NTC resistor 3 kΩ at 77°F (25°C)

RDF50.1U
 Status Input 2-3.....NTC resistor 3 kΩ at 77°F (25°C)

Status Input D1 and GND
 Contact Sensing..... SELV 6 to 15 Vdc/3 to 6 mA
 Insulation Against Live Voltage 4 kV, reinforced insulation
 Operating Action.....Selectable (NO/NC)

Permissible Cable Length With Copper262 ft (80 m) cable
 14 AWG for connection to terminals 7, 8, 9 and D1, GND

Setpoint Setting Range.....41° to 95°F (5° to 35°C)

Control Deviation at 77°F (25°C).....±1°F (0.5 K) maximum

Switching Differential In Heating Mode, Adjustable.....2 K (3.6°F)

Switching Differential In Cooling Mode, Adjustable 1 K (1.8°F)

Setpoint, Economy Mode, Heating, Adjustable 61°F (16°C)

Setpoint, Economy Mode, Cooling, Adjustable 82°F (28°C)

Setpoint, Standby, Heating, Adjustable..... 46°F (8°C)

Setpoint, Standby, Cooling, Adjustable..... OFF

Operation
 Temperature32° to 122°F (0° to 50°C)
 Humidity <95% RH

Transport and Storage
 Temperature-13° to 158°F (-25° to 70°C)
 Humidity <95% RH

UL Listing..... UL 873

Connection Terminals..... Solid wires or prepared stranded wires
 2 x 16 AWG or 1 x 14 AWG

Housing Front Color..... White (RAL 9003)

Weight0.5 lb (0.23 kg)

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Thermostats

RDF Product Ordering

Description	Part No.
Room Temperature Controller with LCD for Two-Pipe Fan Coil Units	RDF10U
Room Temperature Controller with LCD for Two-Pipe Fan Coil Units with Additional Electric Heat	RDF20U
Room Temperature Controller with LCD for Two-Pipe Fan Coil Units with Modulating 0 to 10 Vdc Output	RDF50.1U
Room Temperature Controller with LCD for Two-Pipe Fan Coil Units and Output for Floating Actuator	RDF60.1U

Device Combinations Reference

Description	For Use With Controllers	Type Reference
Temperature Sensor	RDF10U, RDF20U, RDF50.1U, RDF60.1U	QAH11.1
Two-way and Three-way Zone Valves	RDF10U, RDF20U, RDF50.1U, RDF60.1U	599 Series
Zone Valve Actuator	RDF10U, RDF20U	SF Series
Zone Valve Actuator	RDF50.1U, RDF60.1U	SSA61 Series
Zone Valve Actuator	RDF50.1U, RDF60.1U	SSB61U Series

Electric Surface Mounted/High Temperature Limit Control Thermostats



141-0522 Electric Surface Mounted Thermostat.

141-0530 Electric High Temperature Limit Control Thermostat.

Description

The 141 Electric Surface Mounted / High Temperature Limit Control Thermostats are single setpoint electric thermostats for high or low limit control; surface mounted or duct mounted models available.

Features

Electric Surface Mounted Thermostat

- Can be mounted horizontally, vertically or at an angle.
- Visual setpoint indication through cover

Electric High Temperature Limit Control Thermostat

- Liquid-filled, rigid bulb sensing unit
- Adjustable high temperature limit stop
- Manual reset to close contacts

Applications

Surface Mounted Thermostat

The 141 Surface Mounted Thermostat is ideal as a low or high limit control on unit heaters. Also can be used as a convector or fan coil changeover control for automatically selecting the heating or cooling function based on water temperature.

High Temperature Thermostat

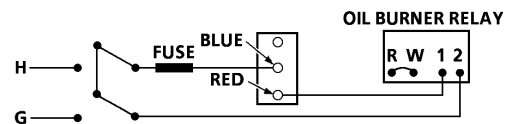
The 141 Electric High Temperature Thermostat is normally located in a duct system and wired to shut down air conditioning or ventilating fans when the air temperature exceeds 125°F (52°C), which would occur during a fire.

This thermostat can also be used as a high limit control for a warm air system when a “lockout” type control is desired or required by code.

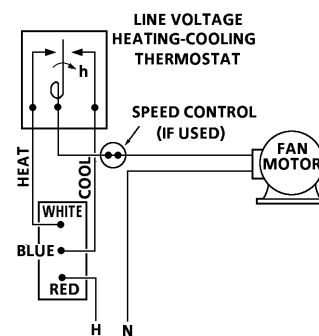
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Thermostats

Typical Connections



Typical High Limit Wiring.



Typical Changeover Wiring.

Electric Low Temperature Detection Thermostats



134 Electric Low Temperature Detection Thermostat.

Description

The 134 Electric Low Temperature Detection Thermostat is a remote bulb instrument with a Single Pole, Double Throw switch. Any one foot of the capillary element actuates the thermostat switch, making this control ideal for the protection of large coils where air stratification could cause localized freezing conditions.

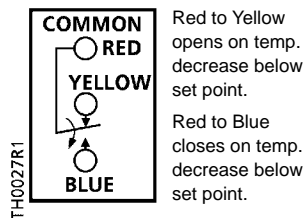
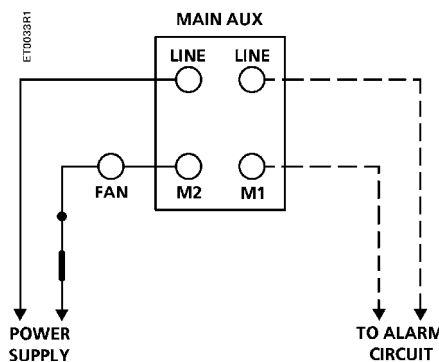
Features

- Compact and durable construction
- Adjustable concealed, low and high range limit stops with a fixed differential
- Available with manual or automatic reset
- Electroplated copper capillary tube for sensitivity and durability
- Switches 120 V or 20 Vac
- Universal mounting bracket included

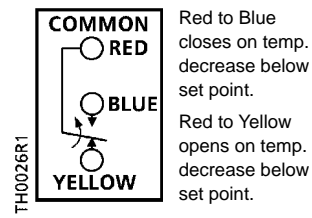
Applications

The 134 Electric Low Temperature Detection Thermostats are ideally suited for detecting potential freeze-up conditions of heating coils, cooling coils, liquid heating pipes, and similar applications.

Typical Connections



OPEN ON RISE



CLOSE ON RISE

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Thermostats

134 Specifications

Part No. 134-1504

Dimensions 4" W x 3.25" H x 2.5" D
(102 mm W x 83 mm H x 65 mm D)

Shipping Weight2.4 lb. (1.1 kg)

Part No. 134-1510

Dimensions 2.31" W x 3.19" H x 2.31" D
(59 mm W x 81 mm H x 59 mm D)

Shipping Weight1.8 lb. (0.8 kg)

Part No. 134-1511

Dimensions 2.31" W x 3.19" H x 2.31" D
(59 mm W x 81 mm H x 59 mm D)

Shipping Weight1.8 lb. (0.8 kg)

134 Product Ordering

Temperature Range	Switch Action	Bulb Size	Reset Action	Part No.
15 to 55°F (-9.4 to +12.8°C)	DPST, 4-wire 2 Circuit	1/8" x 20' (3 mm x 6 m)	Manual	134-1504
35 to 45°F (1.7 to 7.2°C)	SPDT	1/8" x 20' (3 mm x 6 m)	Automatic	134-1510
35 to 45°F (1.7 to 7.2°C)	SPDT	1/8" x 20' (3 mm x 6 m)	Manual	134-1511



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Accessories & Service Kits

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Thermostats



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Thermostats

E-V








Accessories & Service Kits

	Description	Product Group	Quantity	Part No.
All Models				
	Calibration Gauge. <ul style="list-style-type: none"> • 0 to 30 psi (0 to 207 kPa) • Dual scale in psi/kPa • 1% accuracy (ANSI grade 1A) • 2-1/2" (64 mm) dial face • 1/8" NPT bottom connection 	All models	1	142-0455
	Calibration Thermometer. 40 to 140°F (4 to 60°C), 1% accuracy with pocket case and clip.	All models	1	141-0573
	Pneumatic Spring Clamp.	All models	1	531-833
RAA-RDX				
	Mounting Plate.	All models	1	ARG70
	Changeover/Remote Sensor.	RCC, RCU, RDU, and RDX	1	QAH11.1
	Lockable Thermostat Guard.	All models	1	141-570

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Thermostats

Accessories & Service Kits







	Description	Product Group	Quantity	Part No.
Powerstar 192/19X				
	Pressure Gauge. 1-1/2" diameter 0 to 200 kPa back connected 1/8" NPT male.	19X	1	142-0344
	Pressure Gauge. Dual English/Metric scale 0 to 30 psi (0 to 200 kPa) compound gauge back connected 1/8" NPT male.	19X	1	142-0373
	Pressure Gauge. 0 to 30 psi compound gauge, bottom connected 1/8" NPT male. Replacement or for use with 192-633 .	19X	1	142-0426
	Needle Probe. 1-1/2" (38 mm) diameter gauge 0 to 30 psi/0 to 200 kPa and calibration cover wrench.	19X	1	192-633
	Needle Probe. (no gauge)	19X	Pkg of 5	192-759
	Pneumatic Thermostat Calibration Kit. Contains thermometer, gauge squeeze bulb, and fittings for testing room and duct thermostats, pneumatic valve and damper actuators. Includes convenient carrying case. Includes 832-178.	19X	1	832-177
	Calibration Tools. Special tools for calibrating 180, 182, 192 and 832 thermostats. Packed in polyethylene box that fits into carrying case of kit, 832-177.	192	1	832-178
	Test Head Kit. Used for testing 1-pipe transmitters, thermostat air lines for leakage. Packed in polyethylene box that fits into carrying case of kit, 832-177.	192	1	832-179
	Calibration and Cover Screw Wrench with pocket clip.	19X	Pkg of 5	192-632

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Thermostats

8-V






Accessories & Service Kits

	Description	Product Group	Quantity	Part No.
Powerstar 192/19X				
	Aspirator Box. Required for wall box installation in concrete walls.	19X		
	<ul style="list-style-type: none"> • 1- or 2-pipe 		1	192-069
	<ul style="list-style-type: none"> • 3-pipe 		1	192-502
	Wall Box Rough-In. For 2-pipe dual 1/8" (3 mm) OD copper with plaster plate. 8' (2 m) long, belled to 3/16" (5 m) OD with thermostat chassis plug-in adapters for easy maintenance.	19X	1	192-478
	3-pipe dual 1/8" (3 mm) OD copper with plaster plate. 8' (2 m) long, belled to 3/16" (5 m) OD with thermostat chassis plug-in adapters for easy maintenance.	19X	1	192-498
	Wall Box Rough-In. For 1- or 2-pipe dual 1/4" (6 mm) OD polyethylene with plaster plate. 10' (2 m) long. With thermostat chassis plug-in adapters for easy maintenance.	19X	1	192-480
	3-pipe dual 1/4" (6 mm) OD polyethylene with plaster plate. 8' (2.4 m) long. With thermostat chassis plug-in adapters for easy maintenance.	19X	1	192-499
	Stud Mounting Bracket. 6' (2 m) L. Cut to required length.	192	1	141-098
	Stud Mounting Bracket and Dual Copper Tubing, belled to 3/16" (5 mm) OD with plug-in adapters for easy maintenance.	19X	1	192-482
	Metal/Wood Stud Bracket. Drywall rough-in.	19X	Pkg of 5	182-683

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Thermostats

Accessories & Service Kits






	Description	Product Group	Quantity	Part No.
Powerstar 192/19X				
	Aspirator Rough-In and Finish Plate Kit. Installed on new or existing walls to conceal controlling instrument.	192	1	192-070
	Universal Kit. Retrofit thermostats including Honeywell, Johnson Controls, and others. Desert Beige (standard). For White, add W to part number.	19X	1	192-300
	Honeywell Kit. Fits Honeywell and others. Desert Beige (standard). For White, add W to part number.	19X	1	192-483
	Johnson Kit. Retrofit to 19X thermostat. Fits Johnson Controls and others. Desert Beige (standard). For White, add W to part number.	19X	1	192-484
	Aspirator Conversion Kit. For 2-pipe thermostat chassis only. Converts existing 18XAP installed aspirator wall box for use with chassis. Kit includes plate, gasket, hardware, and instruction sheet. Order 19X chassis separately.	18XAP to 19X	1	192-648

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Thermostats

E-V

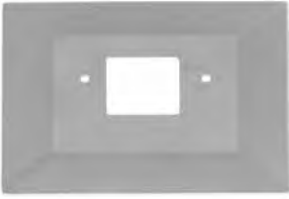



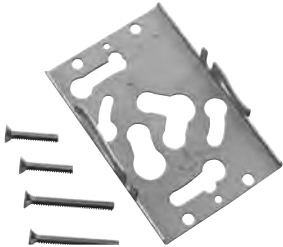
Accessories & Service Kits

	Description	Product Group	Quantity	Part No.
Powerstar 192/19X				
	1- or 2-pipe; split for 3-pipe. Dual 1/4" (6 mm) OD polyethylene with plug-in adapters. 10' (2 m) long.	19X	1	192-600
	1- or 2-pipe. Dual 1/4" (6 mm) OD polyethylene with plug-in adapters. 40' (12 m) long.	19X	1	192-755
	1- or 2-pipe. Dual 5/32" (4 mm) OD polyethylene with plug-in adapters. 40' (12 m) long.	19X	1	192-750
	Preassembled Plastic Tubing Loop. 8" (203 mm) long, with anti-kink spring, plug-in thermostat adapter. Mates to 1/4" (6.4 mm) OD polyethylene tube barbed fitting.	19X	Pkg of 10	192-481
	Preassembled Plastic Tubing Loop. 8" (203 mm) long, with anti-kink spring, thermostat plug-in adapter. Mates to 5/32" (4 mm) OD polyethylene tubing.	19X	Pkg of 10	192-505
	Preassembled Plastic Tubing Loop. 8" (203 mm) long, with anti-kink spring. Cut and attach directly to thermostat chassis. Attach compression rings to prevent air leakage. Mates to 1/4" (6 mm) OD polyethylene tubing.	19X	Pkg of 10	180-896
	20 scim (5 ml/sec) Restrictors. For 1-pipe systems. 1/4" (6 mm) OD polyethylene barb unless noted. Brass coupling, 1/8" NPT.	192 (1-pipe)	1	184-040
	20 scim (5 ml/s) In-line Restrictors.	192	Pkg of 5	184-116
	20 scim (5 ml/s) Restrictor Tee.	192	Pkg of 5	184-113
	External Restrictor Installation Kit. For dual 1-pipe systems. Supply, thermostat and two-controlled devices.	19X	1	184-130

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Accessories & Service Kits





	Description	Product Group	Quantity	Part No.
Powerstar 192/19X				
	Adapter Base. 3.38" W x 5.69" H (86 mm W x 18 mm H).	19X		
	<ul style="list-style-type: none"> Desert Beige (standard) White 		1	192-307
			1	192-307W
	Adapter Frame. 4.38" W x 5.31" H x 0.09" D (111 mm W x 151 mm H x 2 mm D).	19X		
	<ul style="list-style-type: none"> Desert Beige (standard) White 		1	192-308
			1	192-308W
	Multi-Slotted Plate. Use with adapter bases. Not for use with thin profile adapter base.	19X	1	192-301
	Thin Profile Adapter Base. Measures 3.38" x 4.97" H (86 mm x 126 mm).	19X		
	<ul style="list-style-type: none"> Desert Beige (standard) 		Pkg of 5	192-507
	Extra Wall Plate and Mounting Screws. Order only if required for repair or advance mounting prior to factory delivery of chassis (chassis P/N includes wall plate and screws).	19X	1	192-644

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Accessories & Service Kits

	Description	Product Group	Quantity	Part No.
Powerstar 192/19X				
	Mounting Clips, Spacer and Template for finished drywall.	19X	Pkg of 10	182-685
	Terminal Wall Box Cover Kit. Covers abandoned thermostat locations with blank plate. Dimensions 3.13" x 3.25" (54 mm x 84 mm). <ul style="list-style-type: none">• Desert Beige (standard)	19X	1	192-320
	Retrostat Plastic Thermostat Cover Kit. With dial plates that expose or conceal the set point indicator and/or thermometer. Thumb wheel covers to conceal setpoint adjustment. Snap-out tab for Day/Night lever. <ul style="list-style-type: none">• Desert Beige (standard)• White	19X	1	192-868
			1	192-868W
	Gym Guards. <ul style="list-style-type: none">• Desert Beige	19X DN or DNV	1	182-624

Accessories & Service Kits




	Description	Product Group	Quantity	Part No.
Powerstar 192/19X				
	Finish Plate. Mounts on 4" x 4" (102 mm x 102 mm) electrical box. Pneumatic thermostat mounts to finish plate. 1/2" (13 mm) diameter hole provided for electrical switch. Stainless steel finish.	19X	1	192-729
	Finish Plate. Mounts on 4" x 4" electrical box. Pneumatic thermostat mounts to finish plate. 1/2" (13 mm) diameter hole provided for electrical switch. Plastic finish in Desert Beige.	19X	1	192-730
	Finish Plate. 1 gang ¹ , 1 room thermostat. ³	19X	1	192-860
			1	192-861
	Finish Plate. 2 gang ² , 1 room thermostat. ³	19X	1	192-731
			1	192-732
Ordering Notes 1. 1 gang: 3.75" (95 mm) W x 5" (127 mm) H. 2. 2 gang: 5" (127 mm) W x 5" (127 mm) H. 3. For use with pneumatic or automation room sensors and pneumatic or commercial light switches; comes in brushed, stainless steel finish.				

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Accessories & Service Kits

	Description	Product Group	Quantity	Part No.	
Powerstar 192/19X					
 Model 1 and 2	Thermostat Thermometer Kits. <ul style="list-style-type: none"> Scale Range: 45 to 85°F Use with Model 1 and 2 	19X	Pkg of 5	192-775	
	Thermostat Thermometer Kits. <ul style="list-style-type: none"> Scale Range: 10 to 30°C Use with Model 1 and 2 	19X	Pkg of 5	192-776	
 Model 3 and greater	Thermostat Thermometer Kits. <ul style="list-style-type: none"> Scale Range: 45 to 85°F Use with Model 3 and greater 	19X	Pkg of 5	192-786	
	<ul style="list-style-type: none"> Scale Range: 10 to 30°C Use with Model 3 and greater 	19X	Pkg of 5	192-785	
	Setpoint Dials.		19X		
	Fahrenheit of D.A.	Right Side		Pkg of 10	192-779
	Fahrenheit of R.A.	Right Side		Pkg of 10	192-780
	Celsius of D.A.	Right Side		Pkg of 10	192-783
	Celsius of R.A.	Right Side		Pkg of 10	192-784
	Fahrenheit of D.A.	Left Side		Pkg of 10	192-777
Fahrenheit of R.A.	Left Side		Pkg of 10	192-778	

Accessories & Service Kits









	Description	Product Group	Quantity	Part No.
Powerstar 192/19X				
	Replacement Chassis Tube Connector and mounting screws. Also provides access to filters and restrictor plate (10 thermostats).	19X	Material for 10 thermostats	192-525
	Plug-in Adapters For quick thermostat removal. Fits on 5/32" (4 mm) OD polyethylene tubing. Use with compression rings, listed below.	19X	Pkg of 20	192-485
			Pkg of 20	192-486
	Plug-in Adapters (Elbow). <ul style="list-style-type: none"> Blue (provides quick thermostat removal). White (provides quick thermostat removal). 	19X	Pkg of 20	192-487
			Pkg of 20	192-488
	Air Link. Connects adapters for pressure tests.	19X	Pkg of 20	192-501
	Replacement Cover Screws.	19X	Pkg of 20	192-536
	Restrictor Plate Replacement Kit. Contains replacement filters, restrictor plates, and gaskets.	19X	Material for 10 thermostats	192-321

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Thermostats

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Accessories & Service Kits

	Description	Product Group	Quantity	Part No.
832 D/DN				
	Adjustment Key. Opens Powers cover and changes setpoint.	832 D, 832 DN	1	856-055
	Pneumatic Thermostat Calibration Kit. Contains thermometer, gauge squeeze bulb, and fittings for testing room and duct thermostats, pneumatic valve and damper actuators. Includes convenient carrying case. Includes 832-178.	832	1	832-177
	Calibration Tools. Special tools for calibrating 180, 182, 192 and 832 thermostats. Packed in polyethylene box that fits into carrying case of kit, 832-177.	832	1	832-178
	Test Head Kit. Used for testing 1-pipe transmitters, thermostat air lines for leakage. Packed in polyethylene box that fits into carrying case of kit, 832-177.	832	1	832-179
	Wall Box Rough-In. For 2-pipe dual 1/8" (3 mm) OD copper with plaster plate. 8' (2 m) long, belled to 3/16" (5 m) OD with thermostat chassis plug-in adapters for easy maintenance.	832	1	192-478
	"D" Base Kit. For mounting "D" thermostat with exposed tubing. Black base with cutout on top.	832 D, DN	1	832-034
	Gym Guard. No. 1 Silver	832	1	814-018
	"D" Thermostat Friction Knob.	832	1	833-033

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Thermostats

Accessories & Service Kits






	Description	Product Group	Quantity	Part No.
<p>832 D/DN</p> 	<p>"D" Thermostat Replacement Unit. Contains chassis only.</p>	832 D	1	832-040
	<p>Exhaust and Supply Valve Repair Kit. Contains parts for replacement of supply and exhaust valves in one thermostat.</p>	832	1	832-164

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Accessories & Service Kits

	Description	Product Group	Quantity	Part No.
186				
	Wall Box Rough-In. For 2-pipe dual 1/8" (3 mm) OD copper with plaster plate. 8' (2 m) long, belled to 3/16" (5 m) OD with thermostat chassis plug-in adapters for easy maintenance.	186	1	192-478
	3-pipe dual 1/8" (3 mm) OD copper with plaster plate. 8' (2 m) long, belled to 3/16" (5 m) OD with thermostat chassis plug-in adapters for easy maintenance.	186	1	192-498
	Wall Box Rough-In. For 1- or 2-pipe dual 1/4" (6 mm) OD polyethylene with plaster plate. 10' (2 m) long. With thermostat chassis plug-in adapters for easy maintenance.	186	1	192-480
	3-pipe dual 1/4" (6 mm) OD polyethylene with plaster plate. 8' (2.4 m) long. With thermostat chassis plug-in adapters for easy maintenance.	186	1	192-499
	Mounting Clips, Spacer and Template for finished drywall.	186	Pkg of 10	182-685
	Stud Mounting Bracket and Dual Copper Tubing. Belled to 3/16" (5 mm) OD with plug-in adapters for easy maintenance.	186	1	192-482
	Metal/Wood Stud Bracket. Drywall rough-in.	186	Pkg of 5	182-683
	Dual 1/8" (3 mm) OD Copper Tubing with plug-in adapters. For 1- or 2-pipe. Split for 3-pipe.	186	1	192-479
	Plug-in Adapter. With Tee 20 scim restrictor for 1-pipe.	186	Pkg of 10	192-875

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Accessories & Service Kits


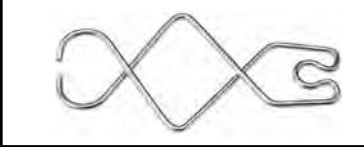







	Description	Product Group	Quantity	Part No.
184/188				
	20 scim (5 ml/sec) Restrictors. For 1-pipe systems. 1/4" (6 mm) OD polyethylene barb unless noted. Brass coupling, 1/8" NPT.	184	1	184-040
	20 scim (5 ml/s) In-line Restrictors.	184	Pkg of 5	184-116
	20 scim (5 ml/s) Restrictor Tee.	184	Pkg of 5	184-113
	Remote Bulb Duct Mounting Kit.	188	1	808-517
	Restrictor Plate Replacement Kit. <ul style="list-style-type: none"> Restrictor plates and gaskets for 20 scim (5.4 ml/s) restriction Restrictor plates and gaskets for 40 scim (11 ml/s) restriction 	188	5 sets of each	188-159

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Accessories & Service Kits

	Description	Product Group	Quantity	Part No.
141				
	Remote Bulb Duct Mounting Kit.	141	1	808-517
	Coil Clip.	141	1	356-115
	Capillary Clip.	141	Box of 100	7421700060
	Well. Copper for 141-0520. 4-15/16" (125 mm)	141	1	141-338
	Well. For 141-0521. 2-3/8" (60 mm)	141	1	141-337
134				
	Remote Bulb Duct Mounting Kit.	134	1	808-517
	Capillary Clip.	134	Box of 100	7421700060
	Electric Thermostat Guard. For electric thermostats no larger than 5 1/4" H x 3/4" W x 2" D. (133 mm H x 19 mm W x 51 mm D). Made of cast aluminum. Allen Key included.	134	1	134-117
	Concealed Adjustment Faceplate.	134	1	134-034

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Accessories & Service Kits

	Description	Product Group	Quantity	Part No.
356/357				
	Pressure Gauge. 0 to 30 psi (0 to 200 kPa) compound gauge back connected 1/8" NPT male.	356	1	142-0373
	Pressure Gauge. 0 to 30 psi compound gauge, bottom connected 1/8" NPT male. Replacement or for use with 192-633 .	356	1	142-0426
	Needle Probe. 1-1/2" (38 mm) diameter gauge 0 to 30 psi (0 to 200 kPa) and calibration cover wrench.	356	1	192-633
	Needle Probe. (no gauge)	356	Pkg of 5	192-759
	Pipe Plug. 1/8"- 27 NPT	356	1	403-007
	Coil Clip.	357	1	356-115
	Capillary Clip.	357	Box of 100	7421700060

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Accessories & Service Kits

	Description	Product Group	Quantity	Part No.
356/357				
	Swivel Flange Mounting Kit.	356	1	356-090
	Flange Kit.	356	1	808-412
	Copper Well. For 357-0003 and 357-0005; Models 1 and 4.	357	1	134-061
	Gauge and Tee. (back)	356/357	1	142-0425
	Allen Wrench Kit. (pack of 5)	356/357	5	192-623
	Lockable Wall Box.	Any Siemens Thermostat	1	141-570

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