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Standard Shipping within 3 to 5 days Products ordered through the Rapid Response™ program can ship same day. Expect longer lead times for large quantities and unique parts. See inside back cover for details on Rapid Response™ shipping.

A-1

Thermostats

Table of Contents *(Continued)*

Thermostats

SIEMENS

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 Low (1-pipe)	High (2-pipe)	Model
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) • Night override selector switch	Single	Dual (Day/Night)	Direct/Direct		•	**192 DN 194 DN**
				Reverse/Reverse		•	
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-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)**

SIEMENS

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
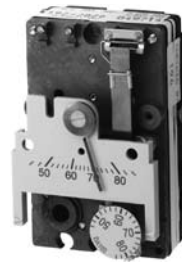
192 S Thermostat chassis.

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.

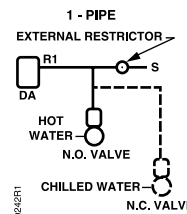### Application Drawings
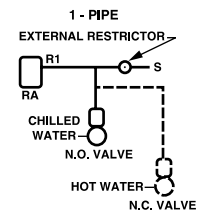
Dotted lines are alternative control schemes.

1 - PIPE — DIAGRAM 1.

1 - PIPE — DIAGRAM 2.

2 - PIPE — DIAGRAM 3.

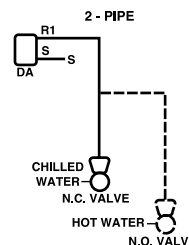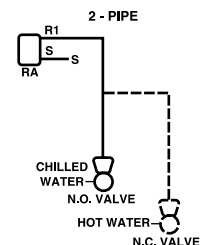2 - PIPE — DIAGRAM 4.

192 S 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 ±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	**192-200**	**192-201**
				°C	**192-220**	**192-221**
192 S 2-pipe	Single	Single (Heat or Cool)	High (Integral Relay)	°F	**192-202**	**192-203**
				°C	**192-222**	**192-223**

Chassis Options: Chassis with 1/2" (13 mm) diameter setpoint adjustment knob for convalescent facilities. Available in Desert Beige only. Add a "K" to the end of the Part No., for example **192-200K**.

| Thermostat Covers *(Sold Separately)* | Plastic Part No. | | Metal Part No. |
	Desert Beige	White	
• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed • No logo	**192-257**	**192-257W**	**192-357**
• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed • With logo	**192-256**	**192-256W**	**192-356**
• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer exposed	**192-254**	**192-254W**	**192-354**
• Adjustment setpoint key • Indicator setpoint exposed • Chassis thermometer concealed • Use with 1/2" setpoint knob option	**192-265**	**192-265W**	**192-365**
• Adjustment setpoint key • Indicator setpoint exposed • Chassis thermometer exposed • Use with 1/2" setpoint knob option	**192-266**	**192-266W**	**192-366**
• Adjustment setpoint exposed • Indicator setpoint exposed • Chassis thermometer concealed	**192-250**	**192-250W**	**192-350**
• 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.

Part No. in black box Ships same day when requested through Rapid Response™ shipping. See inside back cover for details.

SIEMENS

Powerstar Heating/Cooling Pneumatic Room Thermostats
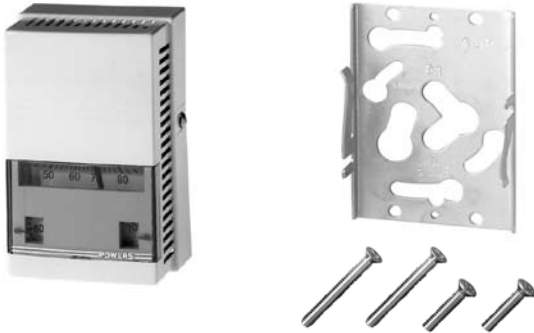
192 HC Thermostat chassis.

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

TH 192 HC 2 – Pipe Thermostat

R1

S — Air Supply

Heat (DA)/ Cool (RA)

3 - 8# Spring

Hot/Chilled Water

N.O. Valve

TH0246R2

SIEMENS

192 HC Thermostat Specifications

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 ± 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 (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 (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 (124 kPa)
Two Pressure, Johnson Competitive Model[1]
Cooling/Heating........................... 15 psi (103 kPa)/20 psi (138 kPa)
Nominal Air Consum. for Air Compressor Sizing ....25 scim (6.8 ml/s)
Nominal Air Capacity for Air Main Sizing ....40 scim (11 ml/s)
Nominal Air Capacity
Supply/Chassis Exhaust............... 150 scim (41 ml/s)/150 scim (41 ml/s)
Air Connections ....5/32" (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 Cover ....0.07 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

A-8

Thermostats

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)

Chassis Options: Chassis with 1/2" (13 mm) diameter setpoint adjustment knob for convalescent facilities.
Available in Desert Beige only. Add a "K" to the end of the Part No., for example **192-207K**.

Thermostat Covers *(Sold Separately)*		Plastic Part No.		Metal Part No.
		Desert Beige	White	
	• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed • No logo	**192-257**	**192-257W**	192-357
	• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed • With logo	**192-256**	**192-256W**	192-356
	• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer exposed	192-254	192-254W	192-354
	• Adjustment setpoint key • Indicator setpoint exposed • Chassis thermometer concealed	192-267	192-267W	192-367
	•Adjustment setpoint key •Indicator setpoint exposed •Chassis thermometer exposed •Use with 1/2" setpoint knob option	192-268	192-268W	192-368
	• Adjustment setpoint exposed • Indicator setpoint exposed • Chassis thermometer concealed • Use with 1/2" setpoint knob option	192-258	192-258W	192-358
	• 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**.

Part No. in black box Ships same day when requested through Rapid Response™ shipping. See inside back cover for details.

SIEMENS

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).
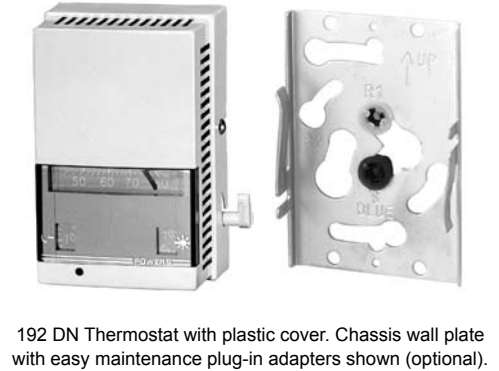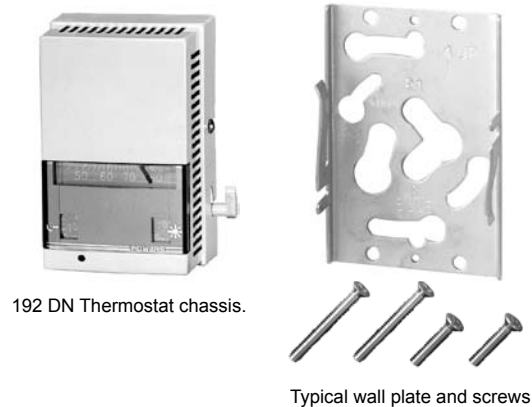
Description

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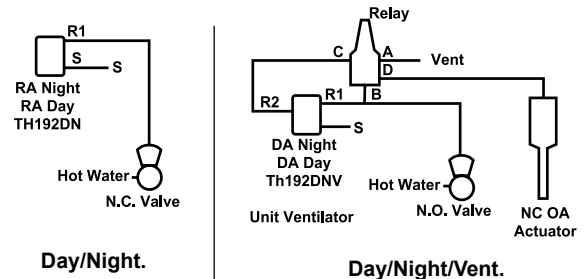
Chassis Port R2 Pressure	Operation Mode (Air Supply)	Switching Relay Connection
Full Air Supply	Night (S=25 psi)	A-D
0 psi	Night Occupied	B-D
0 psi	Day (S=18 psi)	B-D

SIEMENS

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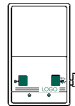
Scale; Range
Major (minor) Divisions...45 to 85°F, 10(2)°F
(7 to 30°C, 5(1)°C)

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 Plate ....0.53 lb. (0.24 kg)
Plastic Cover ....0.07 lb. (0.04 kg)
Metal Cover (dual)...0.27 lb. (0.12 kg)

192 DN/DNV Thermostat Product Ordering

A-10

Thermostats

Model #	Thermostat Chassis Type				Thermostat Chassis & Wall Plate		
					Control Action		
	Output	**Setpoint**	**Air Output Capacity**	**Thermometer & Setpoint Scales**	**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**

Chassis Options: Chassis with 1/2" (13 mm) diameter setpoint adjustment knob for convalescent facilities.
Available in Desert Beige only. Add a "K" to the end of the Part No., for example **192-204K**.

Thermostat Covers *(Sold Separately)*		Plastic Part No.		Metal Part No.
		Desert Beige	**White**	
	• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed	**192-262**	**192-262W**	**192-362**
	• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer exposed	**192-264**	**192-264W**	**192-364**
	• Adjustment setpoint key • Indicator setpoint exposed • Chassis thermometer concealed • Use with 1/2" setpoint knob option	**192-269**	**192-269W**	**192-369**
	• Adjustment setpoint key • Indicator setpoint exposed • Chassis thermometer exposed • Use with 1/2" setpoint knob option	**192-270**	**192-270W**	**192-370**
	• 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**.

SIEMENS

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).

Thermostats

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
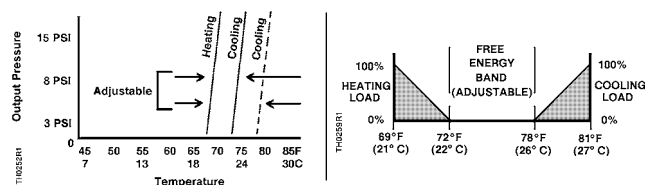
Applications

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

2-pipe (dual 1-pipe)

3-pipe (dual 2-pipe)

Input/Output Characteristics

193 HC Thermostat Specifications

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 ±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)

Chassis Options: Chassis with 1/2" (13 mm) diameter setpoint adjustment knob for convalescent facilities.
Available in Desert Beige only. Add a "K" to the end of the Part No., for example **193-211K**.

Thermostat Covers *(Sold Separately)*		Plastic Part No.		Metal Part No.
		Desert Beige	White	
	• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed • No logo	**192-257**	**192-257W**	192-357
	• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed • With logo	**192-256**	**192-256W**	192-356
	• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer exposed	192-254	192-254W	192-354
	• Adjustment setpoint key • Indicator setpoint exposed • Chassis thermometer concealed	192-267	192-267W	192-367
	•Adjustment setpoint key •Indicator setpoint exposed •Chassis thermometer exposed •Use with 1/2" setpoint knob option	192-268	192-268W	192-368
	• Adjustment setpoint exposed • Indicator setpoint exposed • Chassis thermometer concealed • Use with 1/2" setpoint knob option	192-258	192-258W	192-358
	• 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**.

RAPID RESPONSE **Part No. in black box** Ships same day when requested through Rapid Response™ shipping. See inside back cover for details.

A-12

Thermostats

SIEMENS

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
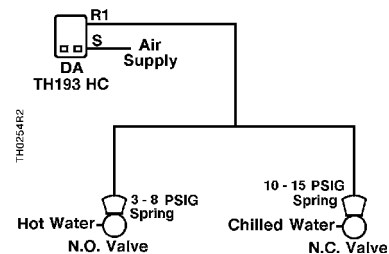
Input/Output Characteristics
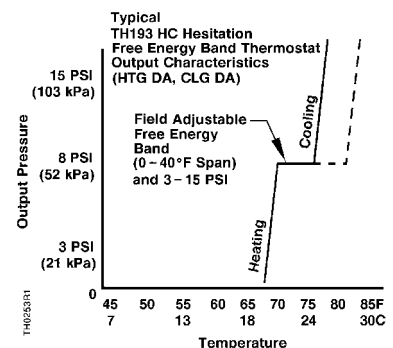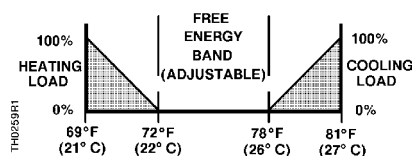
193 HC Thermostat Specifications

Scale; Range
Major (minor) 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

Chassis Options: Chassis with 1/2" (13 mm) diameter setpoint adjustment knob for convalescent facilities.
Available in Desert Beige only. Add a "K" to the end of the Part No., for example **193-219K**.

| Thermostat Covers *(Sold Separately)* | | Plastic Part No. | | Metal Part No. |
		Desert Beige	White	
	• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed • No logo	192-257	192-257W	192-357
	• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer concealed • With logo	192-256	192-256W	192-356
	• Adjustment setpoint concealed • Indicator setpoint concealed • Chassis thermometer exposed	192-254	192-254W	192-354
	• Adjustment setpoint key • Indicator setpoint exposed • Chassis thermometer concealed	192-267	192-267W	192-367
	•Adjustment setpoint key •Indicator setpoint exposed •Chassis thermometer exposed •Use with 1/2" setpoint knob option	192-268	192-268W	192-368
	• Adjustment setpoint exposed • Indicator setpoint exposed • Chassis thermometer concealed • Use with 1/2" setpoint knob option	192-258	192-258W	192-358
	• 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**.

Part No. in black box Ships same day when requested through Rapid Response™ shipping. See inside back cover for details.

SIEMENS

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.

A-15

Thermostats

SIEMENS

192/194 Pneumatic Room Thermostats Specifications

Single Setpoint		Control Action	
Description	**Thermometer & Setpoint Scales**	**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.

Chassis Options: Chassis with 1/2" (13 mm) diameter setpoint adjustment knob for convalescent facilities.
Available in Desert Beige only. Add a "K" to the end of the Part No., for example **192-207K**.
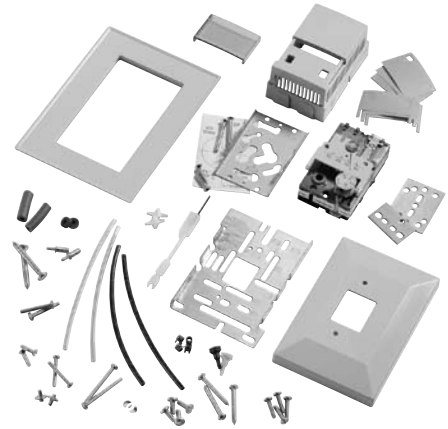
Thermostats

Part No. in black box Ships same day when requested through Rapid Response™ shipping. See inside back cover for details.

SIEMENS

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

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.

Part No. in black box — Ships same day when requested through Rapid Response™ shipping. See inside back cover for details.

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

A-18

Thermostats

SIEMENS

Pneumatic Room Thermostats

832 D Pneumatic Room Thermostat
and screws.

Thermostats

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.
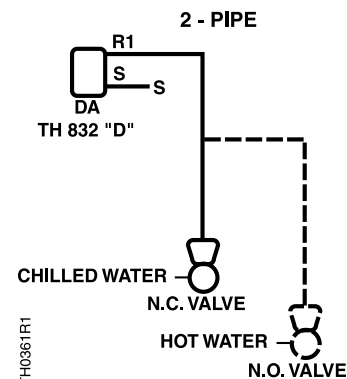
832 D Pneumatic Room Thermostat Specifications

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

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.

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

Accessories & Service Kits	**A-75**

A-20

Thermostats

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.

SIEMENS

Limitem Rigid Bulb Thermostats

356 Limitem Rigid Bulb Thermostat.

Thermostats

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.

Application Drawings
Dotted lines are alternative control schemes.

RESTRICTOR TEE

AIR SUPPLY

S   R

TH 356 LIMITEM THERMOSTAT

VALVE ACTUATOR

DAMPER ACTUATOR

1-pipe.

AIR SUPPLY 18 PSI DAY/ 25 PSI NIGHT

S

192 D/N THERMOSTAT DIRECT ACTING

S   R

356 LIMITEM THERMOSTAT

NC

C

265 EP SWITCH

3-8#

N.O. HOT WATER VALVE

DAMPER ACTUATOR

2-pipe.

TH0433R1

SIEMENS

www.usa.siemens.com/hvac
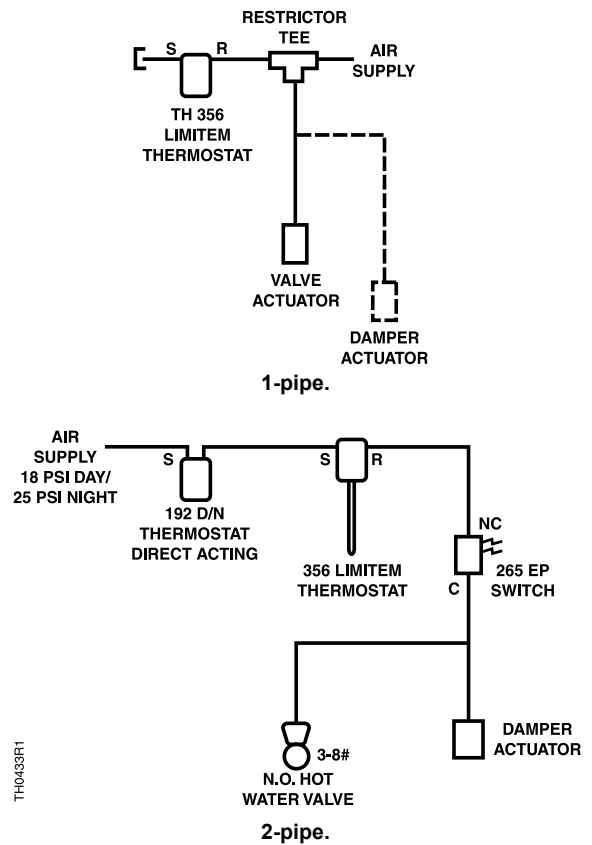
356 Limitem Remote Bulb Thermostat Specifications

Control Action ....Direct or Reverse

Maximum Supply Air Pressure .... 30 psi (207 kPa)

Sensitivity Range (adjustable) ....0.25 to 2 psi/°F (3 to 25 kPa/°C)

Factory Sensitivity Setting ....1.25 psi/°F (15 kPa/°C)

Temperature Response .... 0.50°F (0.9°C)

Dial Graduations .... 5°F (2.7°C)/2°C (3.6°F)

Maximum Ambient Temperature
  Case .... 200°F (93°C)
  Bulb (Direct Acting).. 225°F (107°C)
  Bulb (Reverse Acting)... 250°F (121°C)

Nominal Air Supply Pressure .... 18 to 25 psi (124 to 172 kPa)

Maximum External Pressure (on bulb) .... 250 psi (1722 kPa)

Mounting ....Flange or 3/8" NPT

Air Connections .... 1/8" NPT

Dimensions
  Bulb Length ....18" (457 mm)
  Flange OD ....2.56" (65 mm)
  Case ....1.5" Diameter x 3" L
  (33 mm Diameter x 76 mm L)

Shipping Weight ....2.0 lb. (0.91 kg)

356 Limitem Remote 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**

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).

SIEMENS

Thermostats

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.
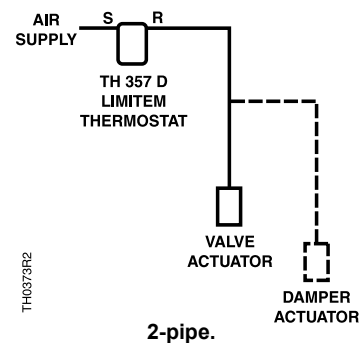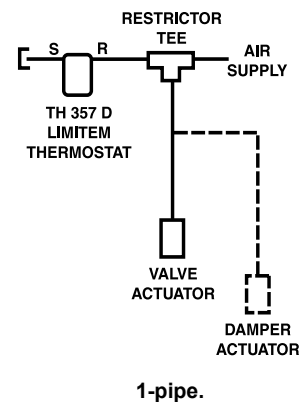
2-pipe.

1-pipe.

Thermostats

SIEMENS

www.usa.siemens.com/hvac

357 D Limitem Remote Bulb Thermostat Specifications

Control Action ....Direct
Maximum Supply Air Pressure ....30 psi (207 kPa)
Sensitivity Range (adjustable) .... 0.33 to 3.5 psi/°F (4 to 43 kPa/°C)
Factory Sensitivity Setting .... 1.25 psi/°F (15 kPa/°C)
Bulb .... Liquid-filled
Temperature Response .... 0.5°F (0.3°C)
Dial Graduations .... 5°F (2.7°C), 2°C (3.6°F)

Maximum Ambient Temperature (case) .... 180°F (82°C)
Nominal Air Supply Pressure .... 18 to 25 psi (124 to 172 kPa)
Mounting ....Bracket supplied
Air Connection ....1/8" NPT
Dimensions (Case) ....1.75" Diameter x 3.5" H
(44.5 mm Diameter x 88.9 mm H)
Shipping Weight .... 2.0 lb. (0.9 kg)

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**

Accessories & Service Kits A-75

Thermostats

SIEMENS

Unit Mounted Thermostats
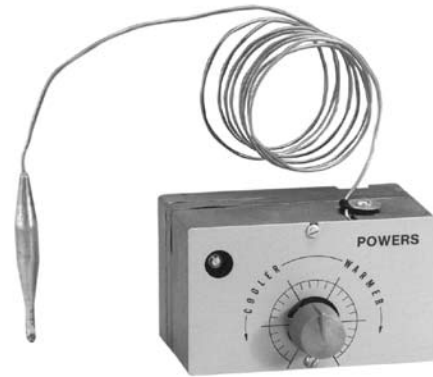
188 Unit Mounted Thermostat.

Thermostats

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

TH 188 UNIT
MOUNTED
THERMOSTAT

TH0371R1

R — TO CONTROLLED DEVICES

S — AIR SUPPLY

SIEMENS

www.usa.siemens.com/hvac
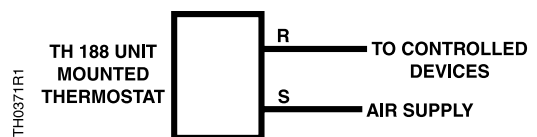
188 Unit Mounted Thermostat Specifications

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**

Accessories & Service Kits   **A-75**

Thermostats

SIEMENS

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.

Thermostats

Application Drawings

40 SCIM RESTRICTOR

TO CONTROLLER

134-1700 LOW TEMPERATURE DETECTION

OA-RA DAMPER OPERATION

ET0070R1

40 SCIM RESTRICTOR

TO CONTROLLER

134-1700 LOW TEMPERATURE DETECTION

P.E. SWITCH WIRED TO FAN STARTER TO DE-ENERGIZE FAN ON LOW TEMPERATURE

ET0071R1

40 SCIM RESTRICTOR

TO CONTROLLER

134-1710 HIGH TEMPERATURE DETECTION

SWITCHES N.O.

ET0072R1

40 SCIM RESTRICTOR

TO CONTROLLER

134-1710 HIGH TEMPERATURE DETECTION

P.E. SWITCH WIRED TO FAN STARTER TO DE-ENERGIZE FAN ON HIGH TEMPERATURE

ET0073R1

SIEMENS

134 Pneumatic Thermostat Specifications

Part No. 134-1700

Ambient Temperature Range ....Greater than setpoint to 140°F (60°C)

Pneumatic Switch ....NC, 0.020" (0.6 mm) diameter bleed

**Control Point Low
Temperature Thermostat** ....Lowest temperature at any one foot section of the sensing bulb

Case Finish .... Gray Baked Enamel

Shipping Weight ....2.45 lb. (1.11 kg)

Part No. 134-1710

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

Pneumatic Switch ....NC, 0.02" (0.6 mm) diameter bleed

**Control Point Low
Temperature Thermostat** ....Lowest temperature at any one foot section of the sensing bulb

Case Finish .... Gray Baked Enamel

Shipping Weight ....2.38 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**

Dimensions

ET0065R1

4-11/16 (119)

4 (100)

3-1/4 (81)

.281 (7) DIA.

1-1/4 (32)

MAX. CASE DEPTH - 2-1/2" (64)

Dimensions shown in inches (mm).

SIEMENS

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

Thermostats

SIEMENS
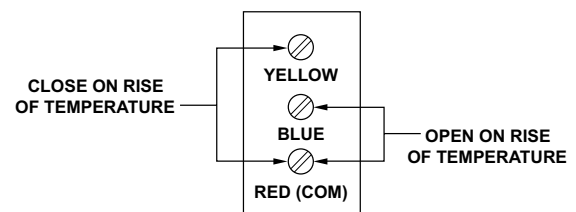
141 Electric Line Voltage Remote Bulb Thermostat Specifications

Inductive Amps
   Full Load Amps
      120 Vac...7.4
      240 Vac...3.7
   Locked Rotor Amps
      120 Vac...44.5
      240 Vac...22.2

Resistive Amps
   120 Vac 25
   240 Vac 20

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

A-30

Thermostats

Accessories & Service Kits   **A-75**

SIEMENS

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
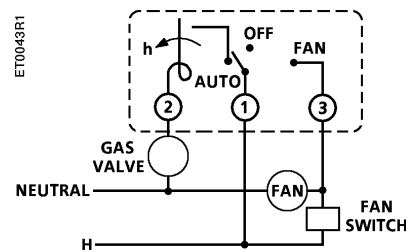
ET0043R1

Thermostats

134 Electric Line Voltage Room Thermostat Specifications

Part No. 134-1083

Motor Rating
120 Vac ....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)

Thermostats

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

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

Accessories & Service Kits   **A-75**

Electric Room Thermostats

RAA10C Fan Coil Thermostat with concealed setpoint knob.

RAA20U Room Thermostat with exposed setpoint knob.

Thermostats

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.

SIEMENS

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

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

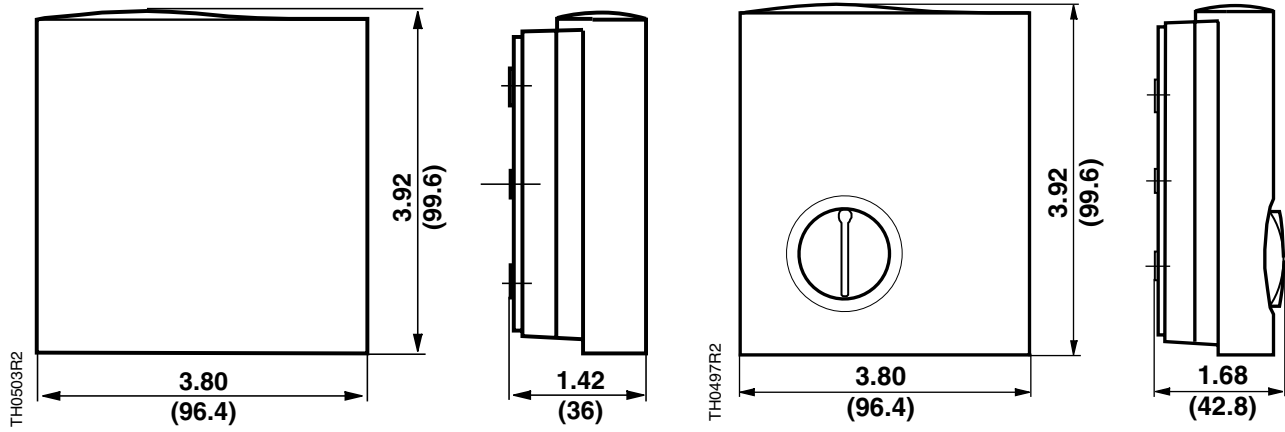**Accessories & Service Kits**   **A-75**

Thermostats

SIEMENS

RAA Electric Room Thermostat Dimensions

RAA10C... Thermostat

3.92 (99.6)

3.80 (96.4)

1.42 (36)

TH0503R2

RAA20U... Thermostat

3.92 (99.6)

3.80 (96.4)

1.68 (42.8)

TH0497R2

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

4.72(120)

0.91(23) 0.91(23)

1.64(41.75)

0.91(23)

1.64(41.75)

0.91(23)

1.64(41.75)

4.72(120)

3.29(83.5)

TH0512R1

Dimensions shown in inches (mm).

Thermostats

SIEMENS
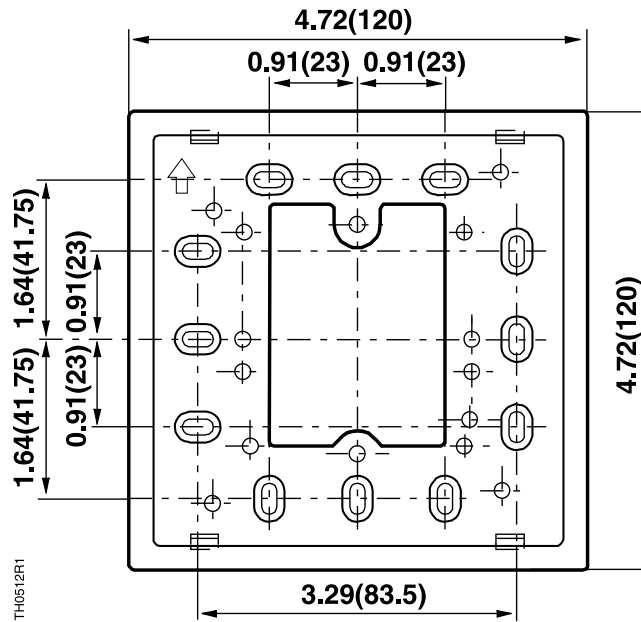
RAA Electric Room Thermostat Engineering Drawings

Wiring Diagrams

Heating Mode

Cooling Mode
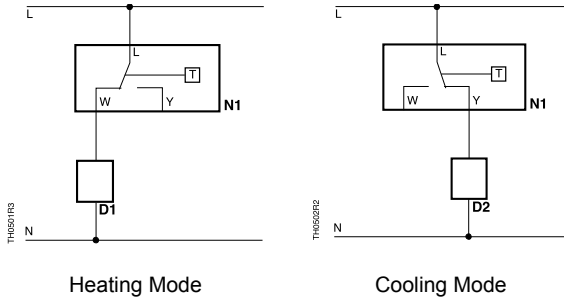
RAA10C…/RAA20U…

Key

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

Operating Diagrams

Heating Mode

Cooling Mode
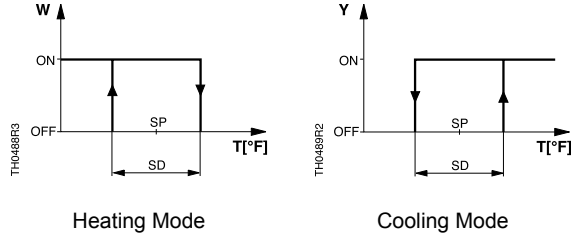
RAA10C…/RAA20U…

Key

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

A-36

Thermostats

SIEMENS