

# 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

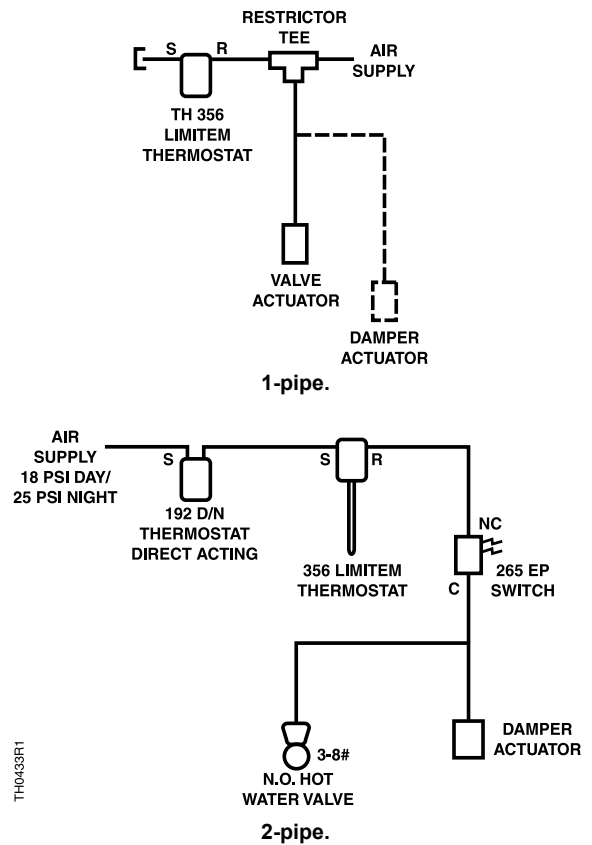
The 356 Limitem Rigid Bulb Thermostat provides primary control for unit ventilators, fan coils and other air handling units. Can also be used as low limit control for air flow to a controlled space.

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### Application Drawings

Dotted lines are alternative control schemes.



TH0433R1

## 356 Limitem Remote Bulb Thermostat Specifications

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

## 356 Limitem Remote Bulb Thermostat Product Ordering

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

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Accessories & Service Kits

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### 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

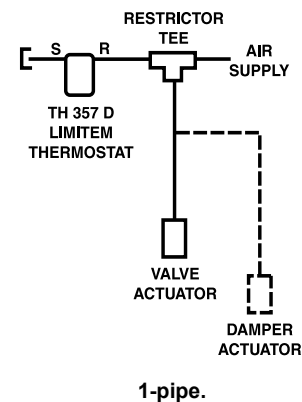
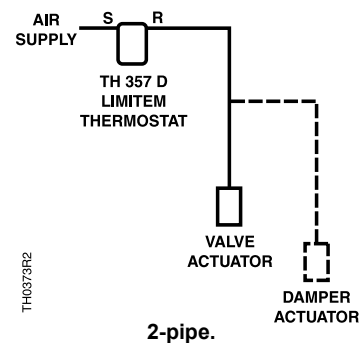
- Direct acting only
- Remote or averaging bulbs for flexibility in installation
- Liquid-filled sensing element for rapid response to temperature changes
- Two-valve design reduces air waste
- Adjustable sensitivity

### 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)	<b>357-0003</b>
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)	<b>357-0004</b>
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)	<b>357-0005</b>
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)	<b>357-0001</b>

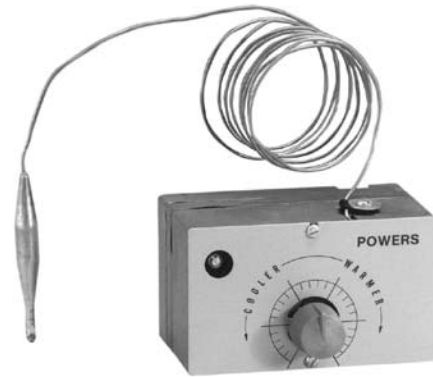
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## Unit Mounted Thermostats



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.

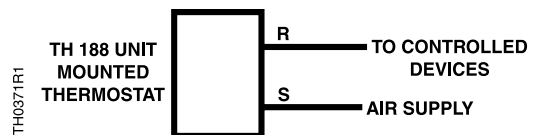
### Features

- 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)	<b>188-0031</b>
Single Setpoint	Reverse Acting (Cooling) 18 psi	—	20 scim (5 ml/s)	<b>188-0024</b>
Heat/Cool	Direct Acting / Reverse Acting (Cooling) 18 psi (124 kPa)	—	40 scim (11 ml/s)	<b>188-0030</b>
Heat/Cool	Retroline Direct Acting/Reverse Acting 18 psi (124 kPa) / 13 psi (90 kPa). Retroline replacement for <b>Honeywell LP916BXXXX</b> .	15 psi (103 kPa)	40 scim (11 ml/s)	<b>188-0033</b>
Heat/Cool	Retroline Direct Acting/Reverse Acting 20 psi (138 kPa) / 15 psi (103 kPa). Retroline replacement for <b>Johnson Controls T-3300-2</b> .	17 psi (117 kPa)	40 scim (11 ml/s)	<b>188-0034</b>

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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.

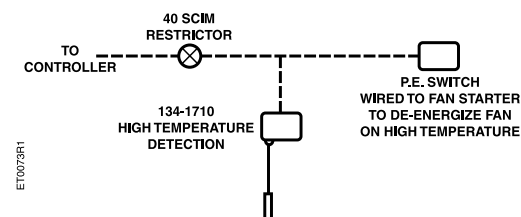
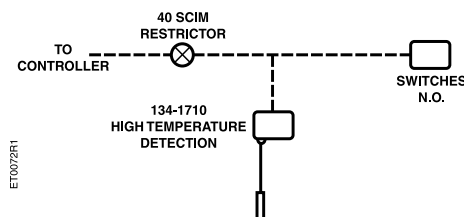
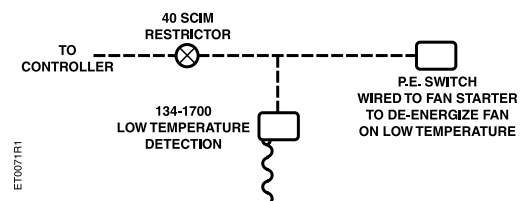
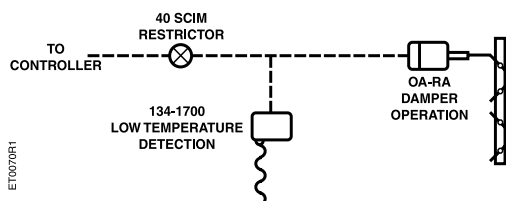
On a typical high limit application, the thermostat shuts down air conditioning or ventilating fans when the duct temperature becomes excessively high. A normally closed switch opens at setpoint.

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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## Application Drawings



## 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

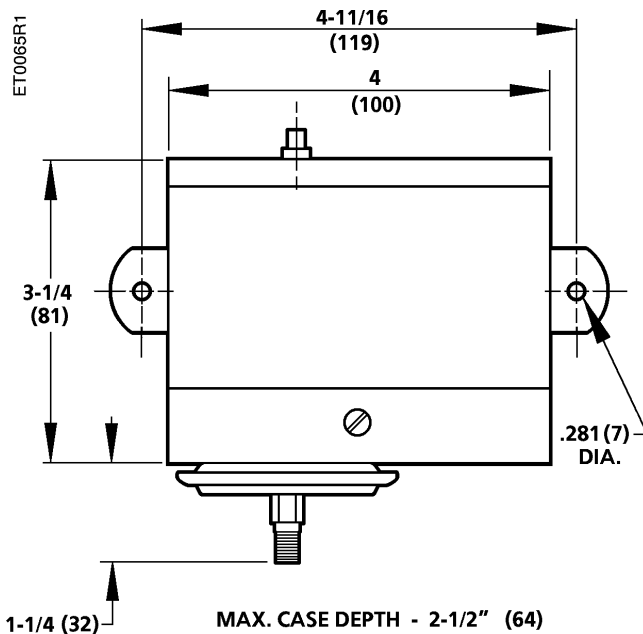
Temp.	Temperature Range	Differential	Max. Bulb Temp.	Bulb & Capillary Length	Switch Reclose	Part No.
Low	15 to 55°F (-9 to +12.8°C) with stop at 35°F (1.67°C)	5°F (2.8°C) Non-Adjustable	400°F (204°C)	20' (6 m)	Temperature must increase by 5°F (2.8°C) before pneumatic switch can be reclosed.	<b>134-1700</b>
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.	<b>134-1710</b>

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### 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.

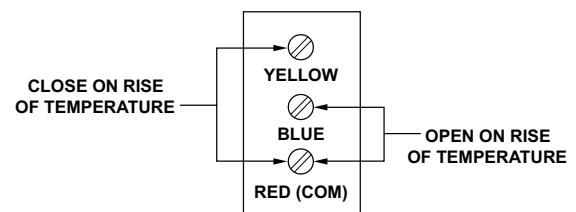
### Features

- 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 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)	<b>141-0520</b>
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)	<b>141-0521</b>



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Thermostats



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

**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.

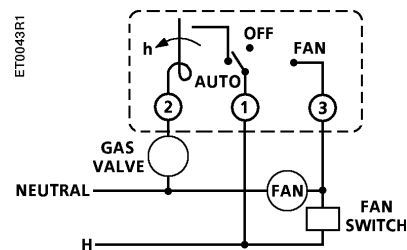
### Features

- 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



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# 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)

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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)	<b>134-1083</b>
SPST	40 to 90°F (5 to 30°C)	Concealed	1.8°F (1°C)	<b>134-1086</b>
SPDT	40 to 90°F (5 to 30°C)	Exposed Knob or Concealed <sup>1</sup>	1.8°F (1°C) Heating 2.31°F (1.3°C) Cooling	<b>134-1084</b>
SPDT	40 to 90°F (5 to 30°C)	Exposed Knob or Concealed <sup>1</sup>	3°F (1.7°C) Heating 3.5°F (2°C) Cooling	<b>134-1085</b>

### Ordering Note

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



## Accessories & Service Kits A-75



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



## 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 <sup>1</sup> Part No.	Dry Wall Part No.
Thermostat for heating or cooling only	<b>RAA10CW</b>	RAA10C
Thermostat for heating or cooling only with exposed setpoint knob	<b>RAA20UW</b>	RAA20U

### Ordering Note

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



## Accessories & Service Kits

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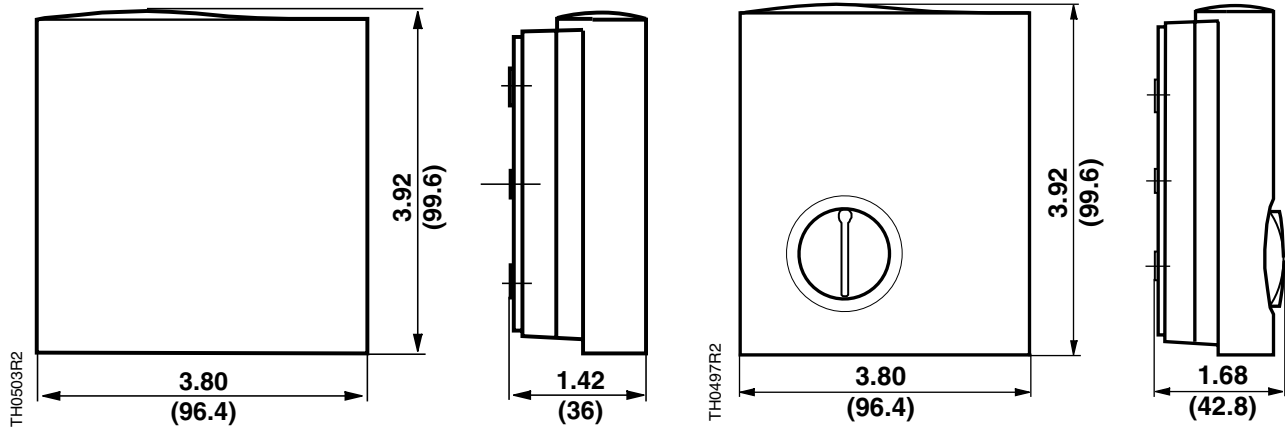
Part No. in black box Ships same day when requested through Rapid Response™ shipping. See inside back cover for details.

**SIEMENS**

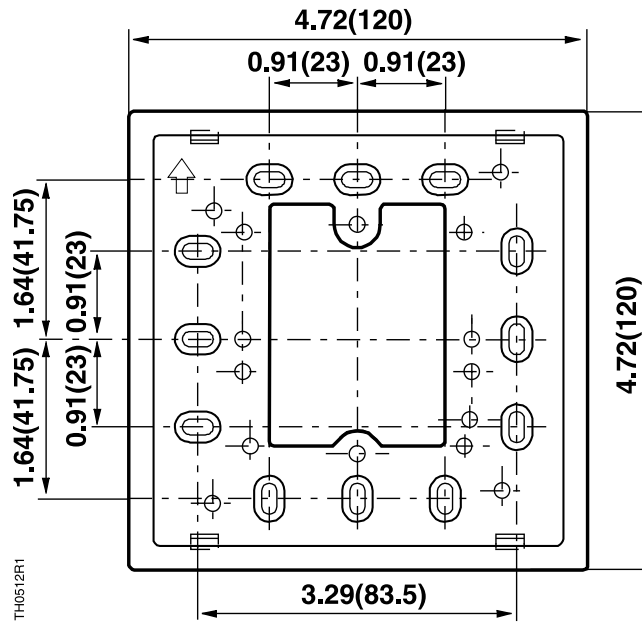
# RAA Electric Room Thermostat Dimensions

RAA10C... Thermostat

RAA20U... Thermostat



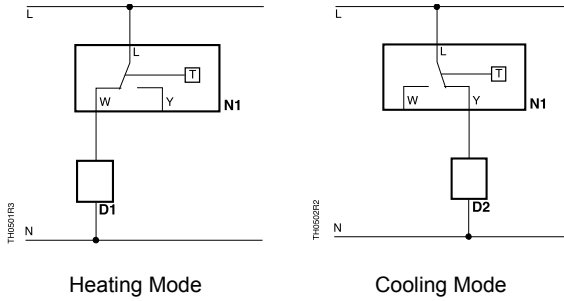
Wall Plate (ARG70) for Mounting (RAA10CW and RAA20UW)



Dimensions shown in inches (mm).

# RAA Electric Room Thermostat Engineering Drawings

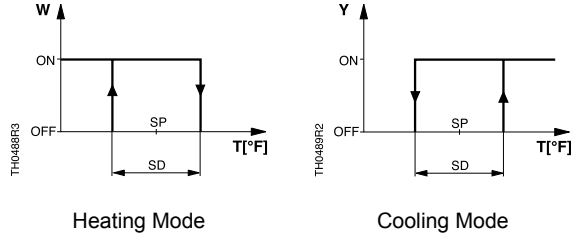
## Wiring Diagrams



### RAA10C.../RAA20U...

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

## Operating Diagrams



### RAA10C.../RAA20U...

<b>Key</b>	
<b>T</b> Room temperature	<b>W</b> Heating output signal
<b>SD</b> Switching differential	<b>Y</b> Cooling output signal
<b>SP</b> Room temperature setpoint	