

Electric Fan Coil Thermostats



RAB10.1U Thermostat with manual changeover.



RAB20.1U Thermostat with exposed setpoint knob and external changeover.



RAB30.1U Thermostat with exposed setpoint knob and 3-speed fan control.



RAB90.1U 3-speed fan switch.

Description

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

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

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

Features

- Fan Speed Switch (RAB90.1U) for remote switching location (24 to 120, 277 Vac)
- Two-point control algorithm for on/off control
- Line voltage
- 2-pipe or 4-pipe fan coil applications
- 3-speed fan control
- Fan on only models for ventilation
- Manual or external changeover
- Two mounting styles: electrical wall box or drywall
- Adjustable upper/lower limit stops
- Dual Fahrenheit/Celsius scale

Applications

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

Note:

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

RAB Electric Fan Coil Thermostats Specifications

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

Time Constant 14 min.

Operating Conditions

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

Transportation Conditions

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

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

RAB Electric Fan Coil Thermostats Ordering Chart

Application		Description				Part No.	
		Change-over	Ventilation-	3-speed Fan Control	Switch	Electric Wall Box ¹	Dry Wall
2-pipe	Heating/Cooling/Ventilation	Manual	Yes	Yes	Heat/Cool/Vent	RAB10.1UW	RAB10.1U
2-pipe	Heating/Cooling/Ventilation	Auto	Yes	Yes	Heat/Cool/Vent	RAB20.1UW	RAB20.1U
4-pipe	Heating/Cooling/Ventilation	Manual	Yes	Yes	Heat/Cool/Vent	RAB30.1UW	RAB30.1U
—	3-speed Fan Switch	—	—	Yes	—	—	RAB90.1U

Ordering Note

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

Accessories & Service Kits

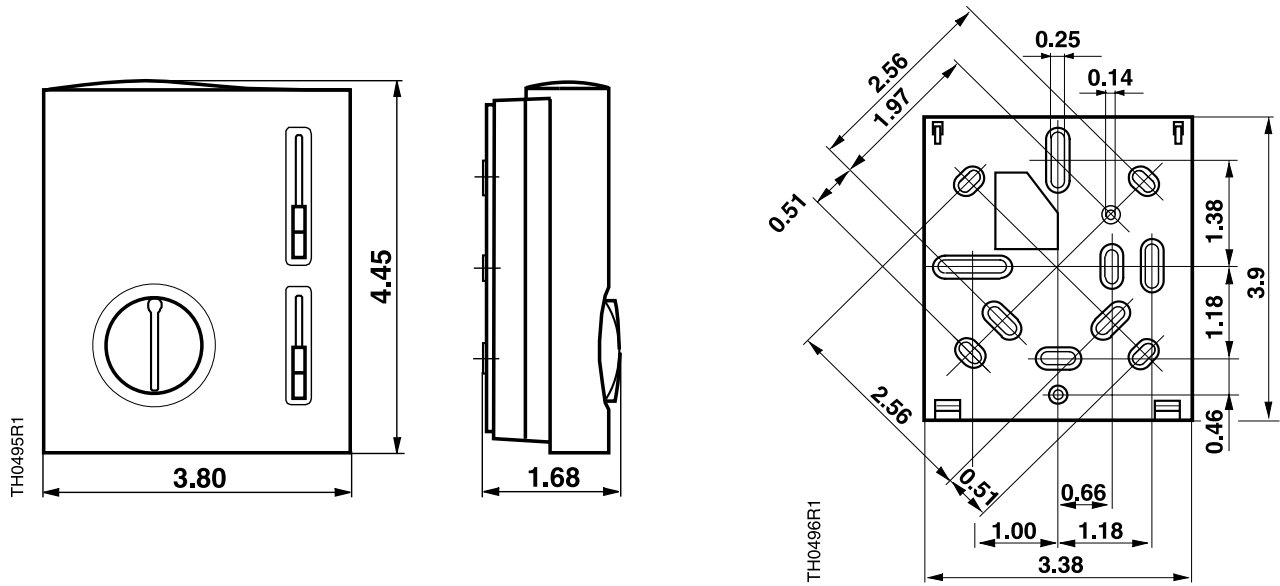
A-75

A-38

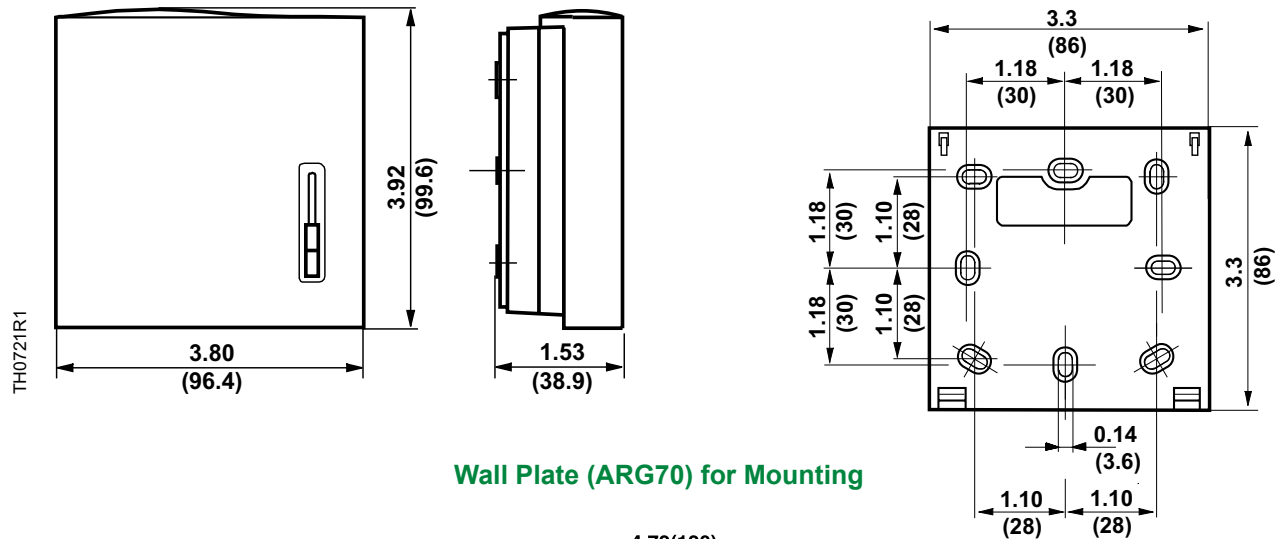
Thermostats

RAB Electric Fan Coil Thermostat Dimensions

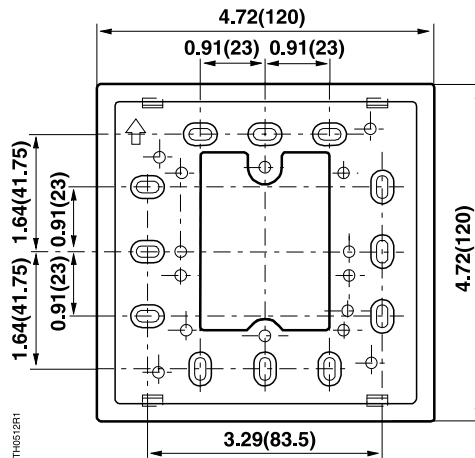
RAB Room Thermostat and Wall Plate for Mounting (RAB10.1U, RAB20.1U and RAB30.1U)



RAB90.1U and Wall Plate for Mounting



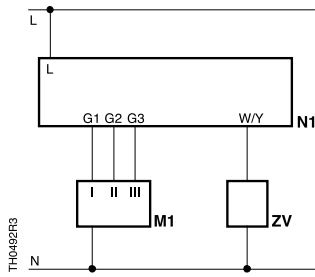
Wall Plate (ARG70) for Mounting



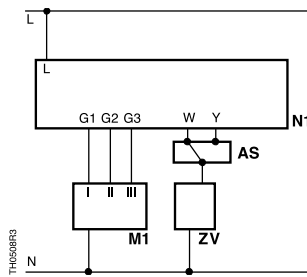
Dimensions shown in inches (mm).

RAB Electric Fan Coil Thermostat Engineering Drawings

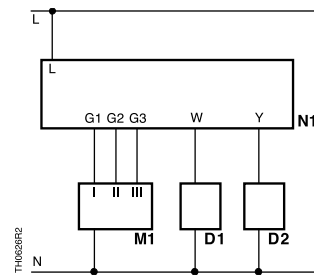
Wiring Diagrams



RAB10.1U...



RAB20.1U...



RAB30.1U...

Key

L Operating Voltage
M1 3-speed Fan
N Neutral
N1 Room Thermostat

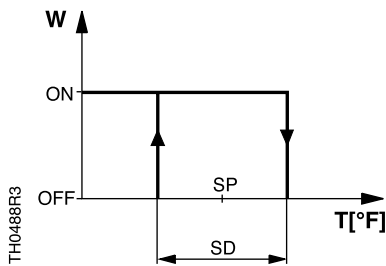
G1 Control Output Fan Speed I
G2 Control Output Fan Speed II
G3 Control Output Fan Speed III

ZV Zone or Thermal Valve
W/Y Control Output Actuator
AS Aqua Sensor

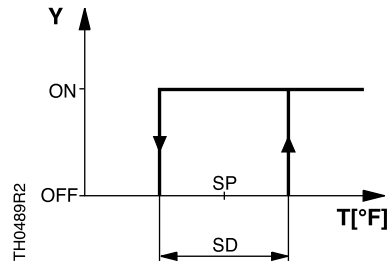
A-40

Thermostats

Operating Diagrams



Heating Mode



Cooling Mode

Key

T Room Temperature
SD Switching Differential
SP Room Temperature Setpoint

W Valve Output Signal Heating
Y Valve Output Signal Cooling

Room Temperature Controllers for Two-pipe Fan Coil Units



RCC10U Room Temperature Controller.



RCC20U Room Temperature Controller.

Description

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

Features

RCC10U

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

RCC20U

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

Applications

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

- Controlling Normally Open (NO) 120 Vac, two-position valves
- Controlling room temperature in individual rooms that are heated or cooled with two-pipe fan coil units
- Switching an electrical heater (RCC20U)
- Operating a 3-speed fan

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

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

RCC Specifications

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

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

RCC Product Ordering

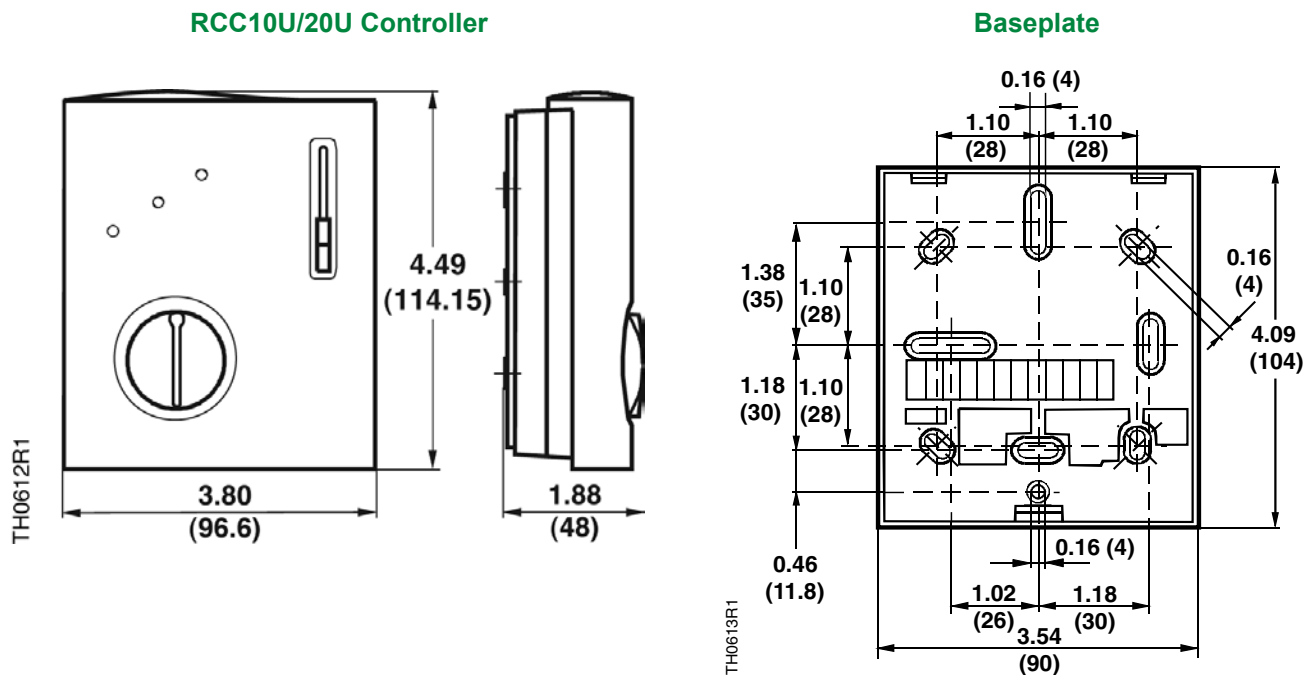
Description	Part No.
Two-pipe fan coil unit controller, on/off output	RCC10U
Two-pipe fan coil unit controller with additional electric heat; on/off output	RCC20U

A-42

Accessories & Service Kits

A-75

Dimensions



Dimensions are shown in inches (mm).

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



RCC30U Room Temperature Controller.

Description

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

Features

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

Applications

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

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

RCC Free Energy Band Controller Specifications

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

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

A-44

RCC Free Energy Band Controller Product Ordering

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

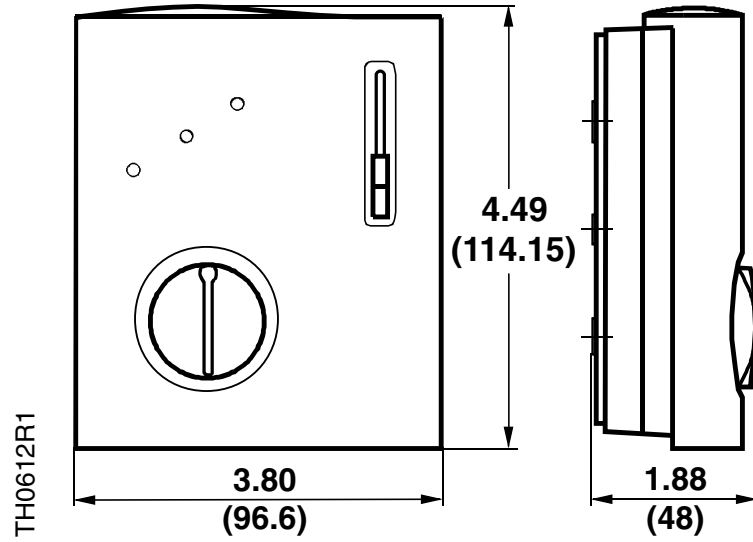
Accessories & Service Kits

A-75

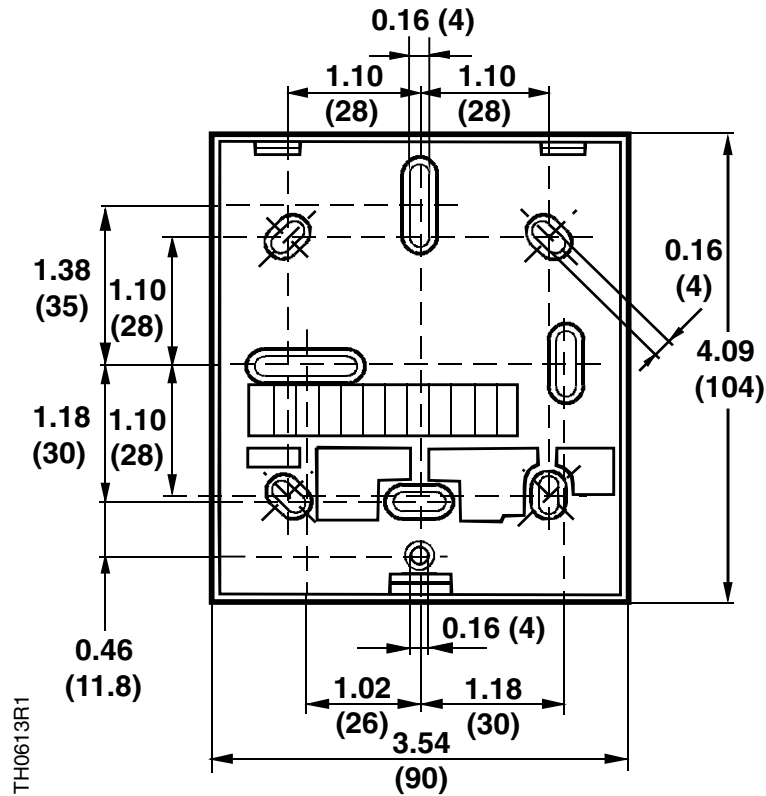
Thermostats

RCC Free Energy Band Controller Dimensions

RCC30U FEB Controller



Baseplate



Dimensions shown in inches (mm).

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.



Room Temperature Controllers for CAV Systems



RCU15U/RCU50U
Room Temperature Controller.



RCU50.2U Room Temperature Sensor with
manual heating/cooling changeover switch.

Description

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

Features

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

Applications

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

Controlling these types of equipment:

- Valve actuators
- Air damper actuators

RCU15/50 Specifications

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

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

P-band in Heating Mode
 RCU50U 2 or 7°F (1 or 4°C)
 RCU50.2U (fixed)..... 7°F (4°C)

P-band in Cooling Mode
 RCU50..... 1 or 3.5°F (0.5 or 2°C)
 RCU50.2 (fixed)..... 3.5°F (2°C)

Setpoint (Energy Saving Mode), Heating 61°F (16°C)
Setpoint (Energy Saving Mode), Cooling 82°F (28°C)
Setpoint Freeze Protection 46°F (8°C)
Setpoint Shift Temperature @ 72°F (22°C) ±22.5°F (±12.5°C)

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

Control Outputs, Terminals 4 and 5 (RCU 50...)
 Voltage 0 to 10 Vdc
 Current ±1 mA

Control Outputs, Terminals 7 and 8 (RCU15U) PWM or ON/OFF
 Voltage 24 Vac ±20%
 Current 0.02 to 1A
 Cycle time PWM (selectable for terminal 7) 20s or 90s

Status Input D1 (RCU50U)
 Contact sensing..... 6 to 15 Vdc/3 to 6 mA
 Insulation against live voltage 4 kV
 Maximum number of contacts connected in a panel.....50

Status Inputs 1 and 2 (RCU50U)
 Setpoint shift of ±22.5°F @ 72°F (22°C) 0 to 10 Vdc
 Neutral position (no setpoint shift)..... 5 Vdc

Signal Input Terminals 2 and 3 for Changeover Sensor..... QAH11.1 safety class 2
 NTC resistor 3KΩ @ 77°F (25°C)

Maximum Copper Cable Length 16 AWG
 For Input Signal terminals 1 & 2 (RCU50U) 262 feet (80m)
 For Input Signal D1 (RCU50U)..... 262 feet (80m)

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

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

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

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

Housing Color
 Cover..... White
 Base Gray

Shipping Weight 0.5 lb (0.23 kg)

A-48

Thermostats

RCU15/50 Product Ordering

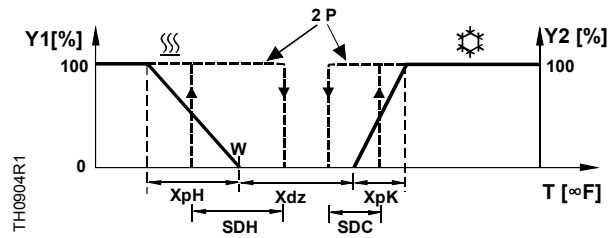
Heat/Cool Changeover	Output(s)	Part No.
Automatic	(2) On/Off or PWM	RCU15U
Automatic	(1) 0 to 10 Vdc	RCU50U
Manual	(1) 0 to 10 Vdc	RCU50.2U

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

Device Combinations Product Ordering

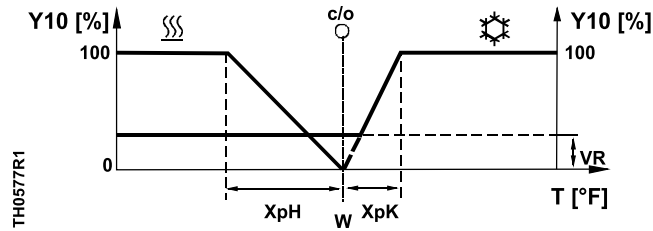
Description	Part No.
Remote Cable Temperature/Changeover Sensor	QAH11.1
44 lb-in NSR Air Damper Actuator	GDE16...
88 lb-in NSR Air Damper Actuator	GLB16...
Valve Actuator	SSB61U
Valve Actuator	SSC61U SSC61.5U
Valve Actuator	SQS65U SQS65.5U

Function Diagrams



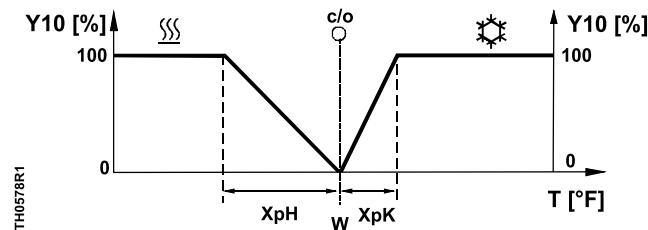
RCU15U – Heating-Cooling

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



RCU50U – Heating-Cooling with Minimum Limitation Cooling

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

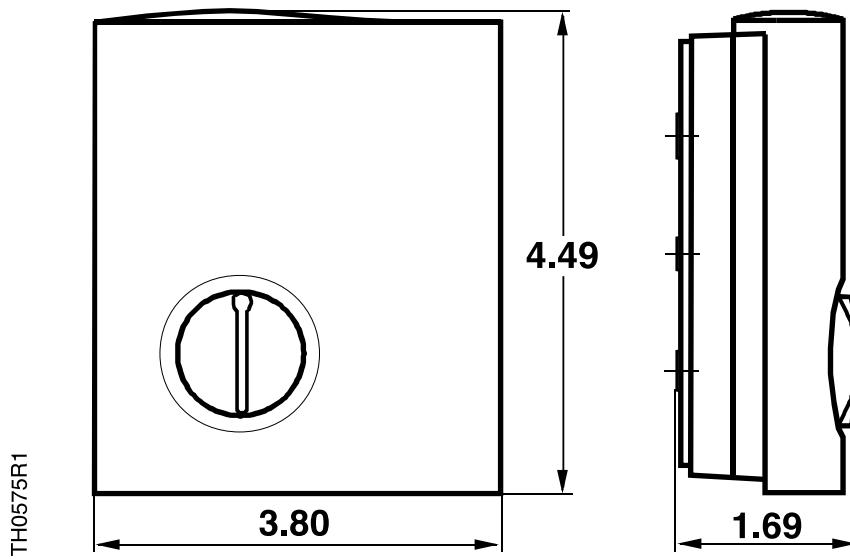


RCU50.2U – Heating-Cooling

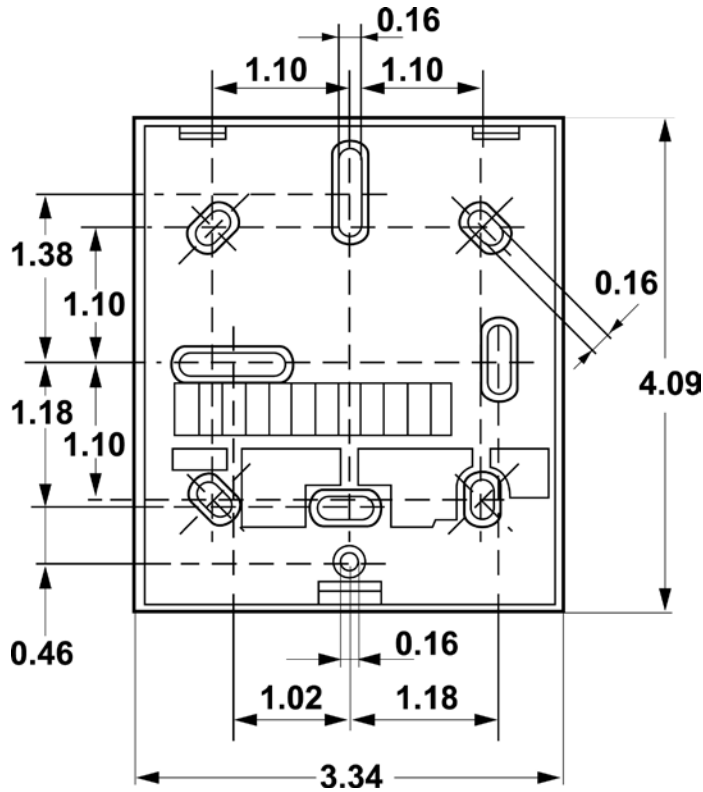
Key	
T	Room temperature
Y10	Output percentage
W	Room temperature setpoint
XpH	Proportional band heating
XpK	Proportional band cooling
c/o	Changeover

RCU15/50 Dimensions

RCU15/50... Controller



RCU15/50... Baseplate



Dimensions shown in inches.

A-50

Thermostats

Room Temperature Controllers for CAV and VAV Systems



RCU61U Room Temperature Controller.

Description

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

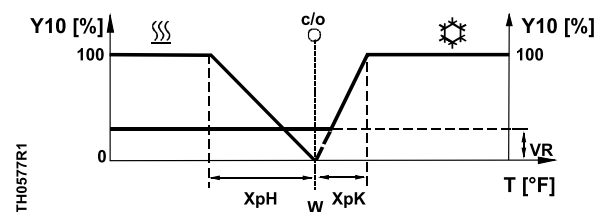
Features

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

Applications

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

Function Diagram



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

RCU61U Specifications

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

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

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

Switching Differential Heating SDH or P-band XpH (Selectable) 2 or 7°F (1 or 4°C)

Switching Differential Cooling SDC or P-band XpC (Selectable) 1 or 3.5°F (0.5 or 2°C)

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

Control Outputs (Cooling) 4 & 5 0 to 10 Vdc
 Voltage 24 Vac
 Current ±1 mA

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

Motor Timing for Heat Output 150 sec. @ 60 Hz

Status Input D1
 Contact Sensing 6 to 15 Vdc /3 to 6 mA
 Insulation Against Live Voltage 4 kV
 Maximum Number of Contacts per Panel 50

Status Input B1
 Setpoint Shift of 36°F (12.5 C) 0 to 10 Vdc
 Neutral Position (No Setpoint Shift) 5 Vdc

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

Maximum Copper Cable Length 16 AWG
 For Input Signal B1/B2 (RCU61U) 262 ft. (80 m)
 For Input Signal D1 (RCU61U) 262 ft. (80 m)

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

Agency Listings UL Listed 197N; Conforms to CE Requirements

Connection Terminals Use Solid Wires or Prepared Stranded Wires
 2x13 AWG or 1x16 AWG

Housing Color
 Cover White
 Base Gray

Shipping Weight 0.5 lb. (0.02 kg)

A-52

RCU61U Product Ordering

Description	Part No.
Room Temperature Controller	RCU61U

Device Combinations Product Ordering

Description	Type Reference
Valve Actuator	SSA81
	SSB61U
	SSB81
	SSC81
Damper Actuator	GLB16x
	GCA16x
	GBB16x
	GCA16x

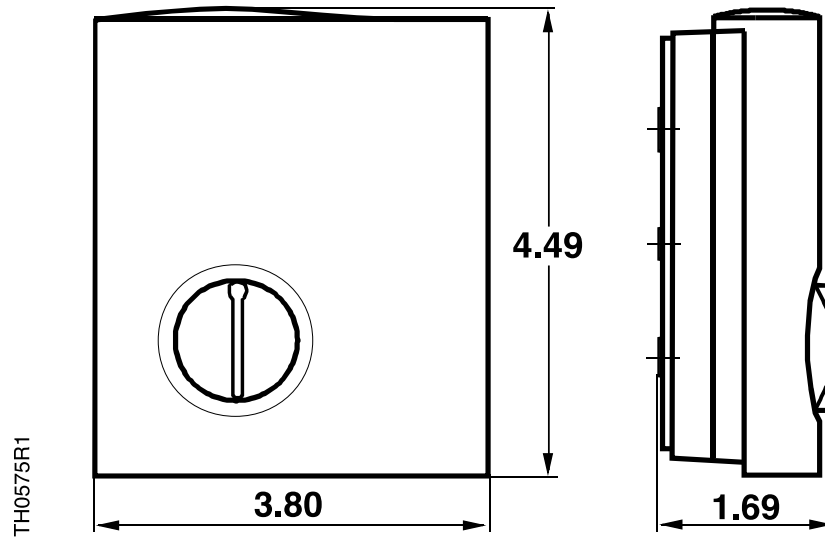
Accessories & Service Kits

A-75

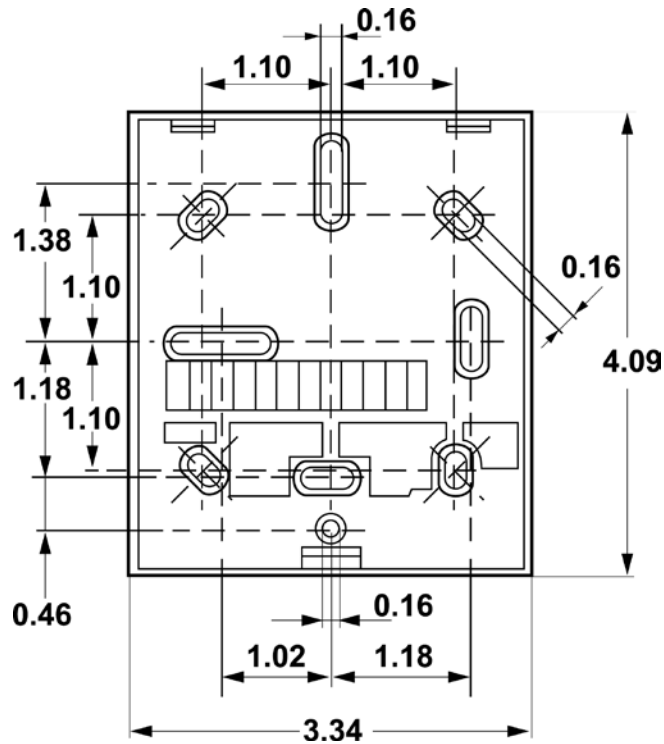
Thermostats

RCU61U Dimensions

RCU61U Controller



Baseplate



Dimensions shown in inches.

Online Order History

This handy online feature stores all your past and current orders online for quick and easy reference. The Order History function lets you access information such as:

- Ordered By
- Order Number
- Shipping Date
- Date Placed
- Products Ordered
- Shipment Tracking

To view your history and order status, register online at www.usa.siemens.com/buildingtechnologiesonlineordering



Room Temperature Controller with Two 0 to 10 Vdc Outputs



RLA162.5U Room Temperature Controller.

Description

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

Features

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

Applications

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

Devices that can be controlled:

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

RLA162.5U Specifications

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

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

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

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

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

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

Relay Input (Fan) 13, 20 24 Vac

Control Outputs 18, 19, Modulating, P or P + I Control Algorithm
 Voltage 0 to 10 Vdc, Continuous
 Current Maximum 1 mA

Maximum Cable Length Copper (16 AWG)
 For Signal Input 5, 11 262 feet (80 m)

Contact Input (D1-GND) 3 to 6 mA

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

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

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

Connection Terminals for solid wires or stranded wires..... 2 x 16 AWG or 1 x 14 AWG

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

Shipping Weight 1.40 lb (0.64 kg)

RLA162.5U Product Ordering

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

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

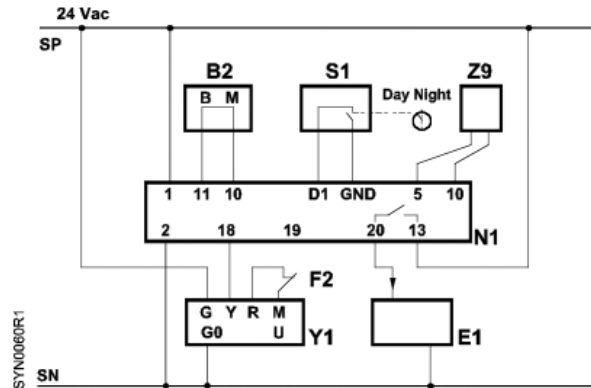
Device Combinations Product Ordering

Actuators and controls must meet the following specifications:

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

Description	Part No.
OpenAir™ GDE Series Damper Actuator with 44 lb/in torque	GDE161.1T GDE161.1P
OpenAir™ GLB Series Damper Actuator with 88 lb/in torque	GLB161.1P
OpenAir™ GMA Damper Actuator with 62 lb/in torque	GMA161.1P GMA161.1U
Accessory wall escutcheon	ARG70
Air duct temperature controller (as a minimum limiter)	RLM162U

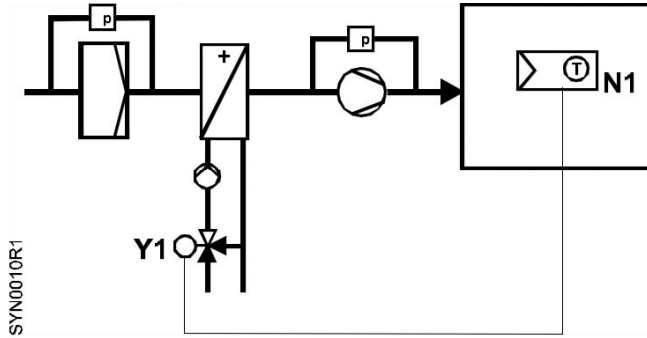
Wiring Diagrams



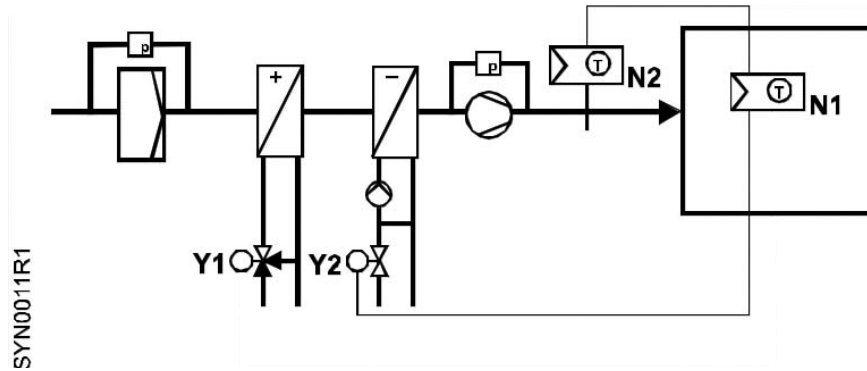
RLA162.5U

- Key**
- B2** Heat/cool changeover sensor
 - E1** Fan or auxiliary unit
 - F2** Low temperature detection thermostat
 - N1** Room temperature controller (RLA162.5U)
 - S1** Time clock or switch for day/night setpoint changeover
 - Y1** Heating valve actuator
 - Z9** Limit controller (RLM162U) as a limiter

Function Diagrams



RLA162.5U Room Temperature Controller

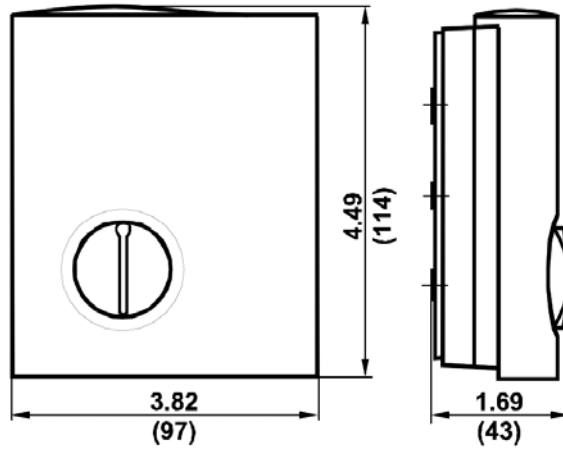


RLA162.5U and RLM162U Room Temperature Controllers

Key

- N1 Room Temperature Controller (RLA162.5U)
- N2 Air Duct Temperature Controller (RLM162U) — controls minimum or maximum limitation of discharge air
- Y1 Heating valve
- Y2 Cooling valve

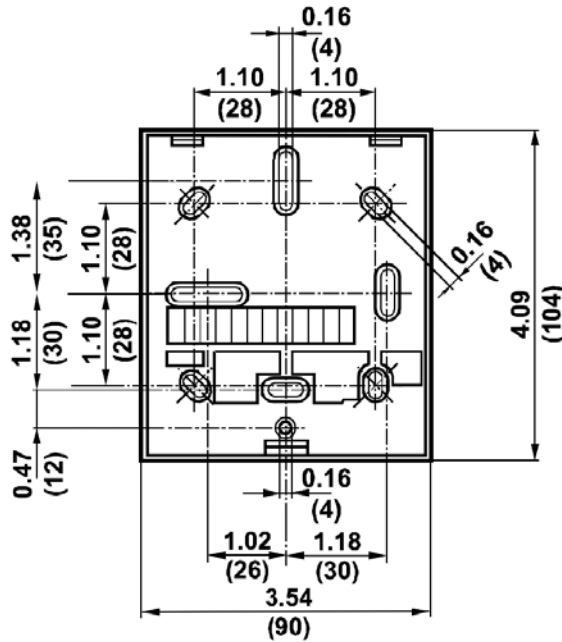
RLA162.5U Controller



A-58

Thermostats

RLA162.5U Baseplate



Dimensions shown in inches (mm).

Room Temperature Controllers with LCD for Heating and Cooling Systems



Energy & Atmosphere



RDU20U/RDU50U Room Temperature Controller.



RDU50.2U Room Temperature Controller.

Description

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

Features

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

Applications

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

A-59

Thermostats

RDU Specifications

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

Integral Action Time, Adjustable 1 to 10 Minutes
 Factory Setting 5 Minutes
Setpoint (Energy Saving Mode), Heating 41 to 65°F (5 to 18°C)
Setpoint (Energy Saving Mode), Cooling 75 to 95°F (24 to 35°C)
Operation
 Temperature 32 to 122°F (0 to 50°C)
 Humidity <95% RH
Shipping and Storage
 Temperature
 (RDU50U and RDU50.2U) -13 to 158°F (-25 to 70°C)
 (RDU20U) -13 to 140°F (-25 to 60°C)
 Humidity <95% RH
Agency Approvals Conforms to CE Requirements
 NEMA 1
Connection Terminals Use Solid Wires or Prepared Stranded Wires.
 2 x 16 AWG or 1 x 14 AWG
 Maximum 20 AWG
Housing Color
 Cover White
 Base Gray
Shipping Weight 0.5 lb (0.23 kg)

A-60

Thermostats

RDU Product Ordering

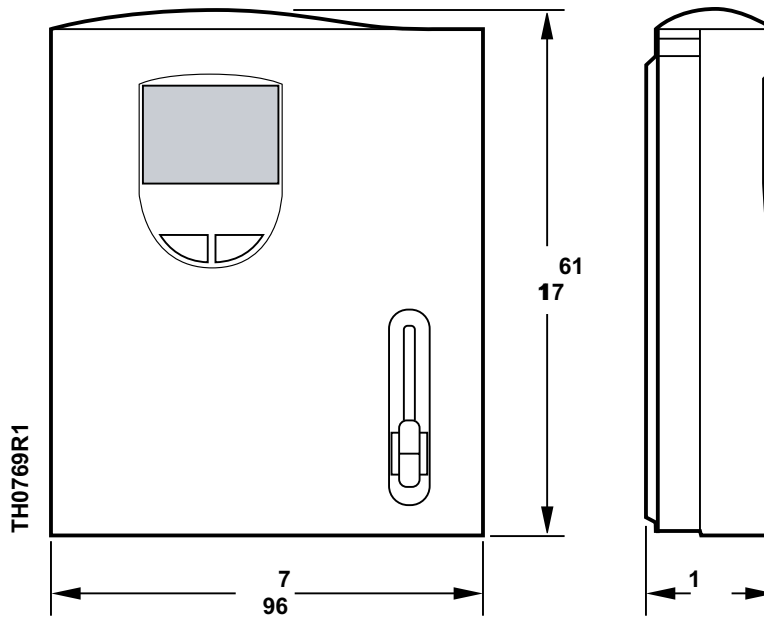
Description	Part No.
Automatic heating/cooling changeover, Floating	RDU20U
Automatic heating/cooling changeover, 0 to 10 Vdc	RDU50U
Manual heating/cooling changeover switch, 0 to 10 Vdc	RDU50.2U

Device Combinations Reference

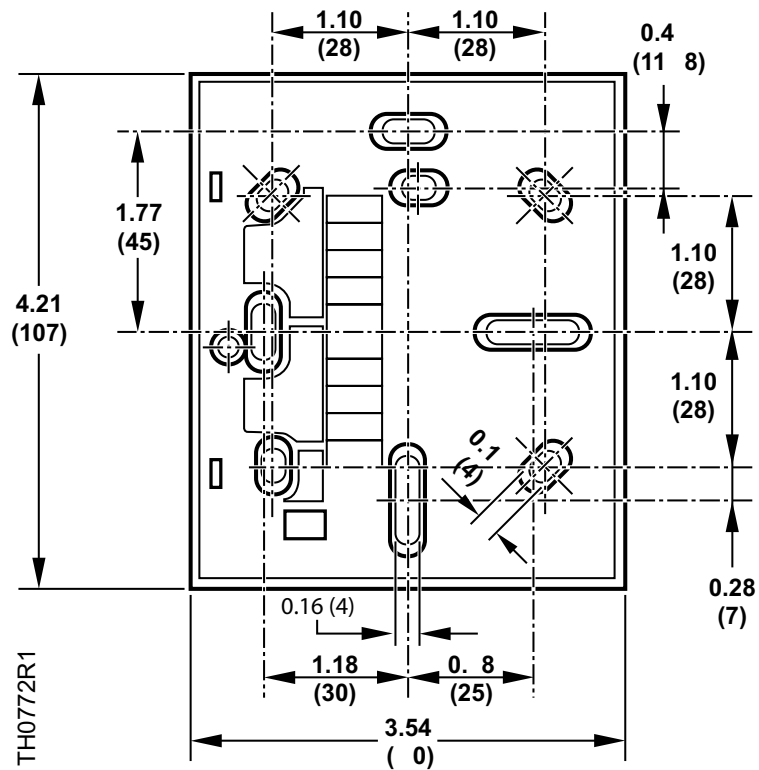
Description	Type Reference
RDU50U and RDU50.2U	
0 to 10 Vdc Valve Actuators	SSB61U... SSC61U... SQS65U SSC61.5U SQS65.5U
44 lb-in NSR Air Damper Actuators	GDE16...
88 lb-in NSR Air Damper Actuators	GLB16...
RDU20U Only	
Floating Control Valve Actuators	SSB81U...SSC81.5U SSC81U SQS85.53U
44 lb-in NSR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

RDU... Dimensions

RDU...Controller



Baseplate



Dimensions shown in inches (mm).

Save trees with paperless invoicing

Once your order has been shipped, an invoice will be sent to you via e-mail, so you can conserve paper while avoiding the hassles of paperwork.



Room Temperature Controller with LCD



Energy &
Atmosphere



RDX42.22U Room Temperature Controller with LCD.

Description

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

Features

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

Applications

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

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

A-63

Thermostats

RDX Specifications

Operating Voltage 24 Vac ±20%
 Frequency 50/60 Hz
 Power Consumption Maximum 6 VA
 Control Output FAN 24 Vac
 Rating Maximum 5(3)A
 Control Outputs Cooling and Heating 24 Vac
 Rating Maximum 5(3)A
 Control Output Aux. Heating 24 Vac
 Rating Maximum 5(3)A

Remote Temperature Sensor
 Status Input 8-7 QAH11.1 Safety Class II
 NTC resistor 3 k ohm at 77°F (25°C)

Status input D1 and GND
 Operating Action Selectable Normal Open (NO)
 Contact Sensing Normal Closed (NC)
 Insulation Against Line Voltage SELV 6 to 15 Vdc/3 to 6 mA, 4kV
 Reinforced Insulation

Permissible Cable Length with Copper Cable
 2 X16 AWG or 1 X14 AWG for Connection to
 Terminals 8 and D1 262 ft. (80 m)

Setpoint Setting Range 46 to 95°F (8 to 35°C)
Control Deviation at 77°F (25°C) Maximum + 1°F (0.5 K)
 Setting Range Factory Setting
Switching Differential in Heating Mode (adj) 1 to 7°F 3.5°F (2 K)
Switching Differential in Cooling Mode (adj) 1 to 7°F 2°F (1 K)
Setpoint Differential WD (Adjustable) 1 to 9°F 3.5°F (2 K)
Setpoint (Energy Saving Mode), Heating 46 to 64°F 61°F (16°C)
Setpoint (Energy Saving Mode), Cooling 75 to 95°F 82.5°F (28°C)

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

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

Agency Approvals Conforms to CE Requirements
 NEMA 1

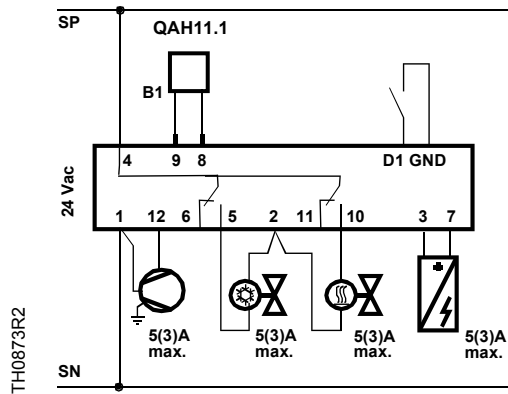
Connection Terminals Use Solid Wires or
 Prepared Stranded Wires. 22 AWG to 14 AWG

Housing Cover Color White
Shipping Weight 0.5 lb. (0.225 kg)

RDX Product Ordering

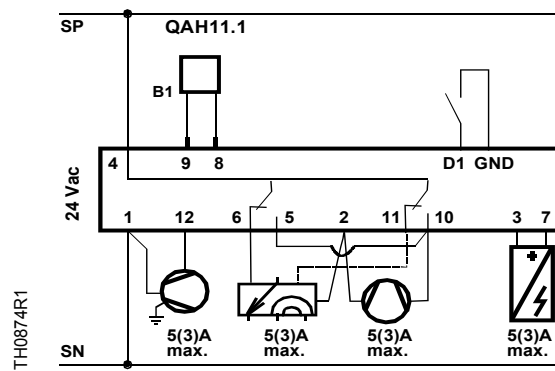
Description	Part No.
Room Temperature Controller	RDX42.22U

Wiring Diagrams



RDX... Four-pipe System Wiring

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



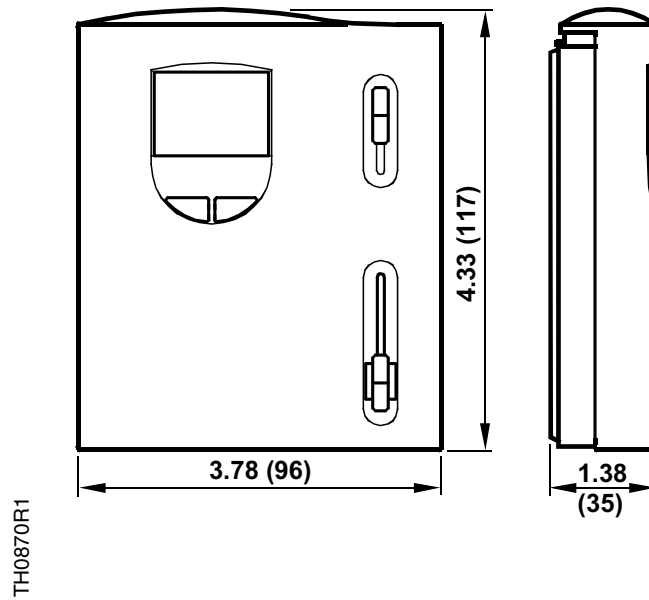
RDX... Heat Pump Wiring

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

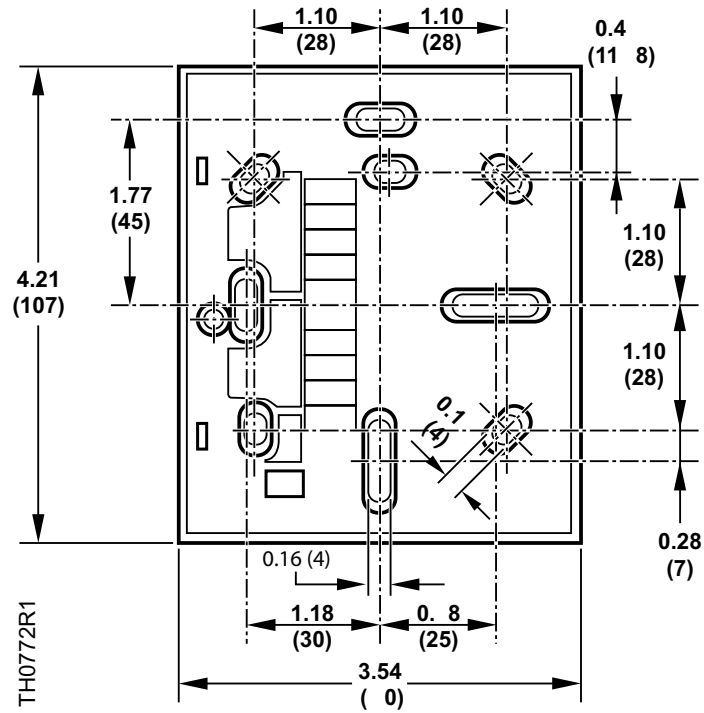
Note:
 Outputs 5 and 10 must be wired together for compressor control

RDX Dimensions

RDX Controller



Baseplate



Dimensions shown in inches (mm).

Get the latest product news!

Join our e-mail list to receive our quarterly newsletter and other offers that will help your business grow and keep your customers happy. We respect your privacy. Your email address will not be shared with others, it's simply our way of keeping you informed!

Send us an email at hvacinquiries.us.sbt@siemens.com to add your name to the list.



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



Energy &
Atmosphere



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

Description

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

Features

RDF10U

- Output for an on/off valve actuator

RDF20U

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

RDF50.1U

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

RDF60.1U

- Modulating PI control
- Output for a floating valve actuator

ALL MODELS

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

Applications

Typical use for RDF10U:

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

Typical use for RDF20U:

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

Typical use for RDF50.1U:

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

Typical use for RDF60.1U:

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

A-67

Thermostats

RDF Specifications

Power Supply

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

Power Consumption.....6 VA maximum

Fan Control Outputs

RDF10U, RDF20U, RDF60.1U 12, 11, 10-N.....24 Vac

Rating.....5 (3) A maximum

Valve Control Output 4-2 (NO).....24 Vac

Rating.....5 (3) A maximum

Valve Control Output 5-2 (NC).....24 Vac

Rating.....5 (3) A maximum

RDF20U Electric Heating Control Output 6-2 (NO).....24 Vac

Rating.....5 (3) A maximum

RDF60.1U Valve Control Output 4, 6, 2.....24 Vac

Rating.....5 (3) A maximum

RDF50.1U Valve Control Output 1-6.....SELV 0 to 10 Vdc

Resolution.....39 mV

Effective Current.....±1 mA maximum

Return Air Temperature Sensor.....QAH11.1 safety class II

RDF10U, RDF20U, RDF60.1U

Status Input 8-9.....NTC resistor 3 kΩ at 77°F (25°C)

RDF50.1U

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

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

RDF10U, RDF20U, RDF60.1U

Status Input 7-8.....NTC resistor 3 kΩ at 77°F (25°C)

RDF50.1U

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

Status Input D1 and GND

Contact Sensing.....SELV 6 to 15 Vdc/3 to 6 mA

Insulation Against Live Voltage.....4 kV, reinforced insulation

Operating Action.....Selectable (NO/NC)

Permissible Cable Length With Copper.....262 ft (80 m) cable
14 AWG for connection to terminals 7, 8, 9 and D1, GND

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

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

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

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

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

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

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

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

Operation

Temperature.....32° to 122°F (0° to 50°C)

Humidity.....<95% RH

Transport and Storage

Temperature.....-13° to 158°F (-25° to 70°C)

Humidity.....<95% RH

UL Listing.....UL 873

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

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

Weight.....0.5 lb (0.23 kg)

A-68

Thermostats

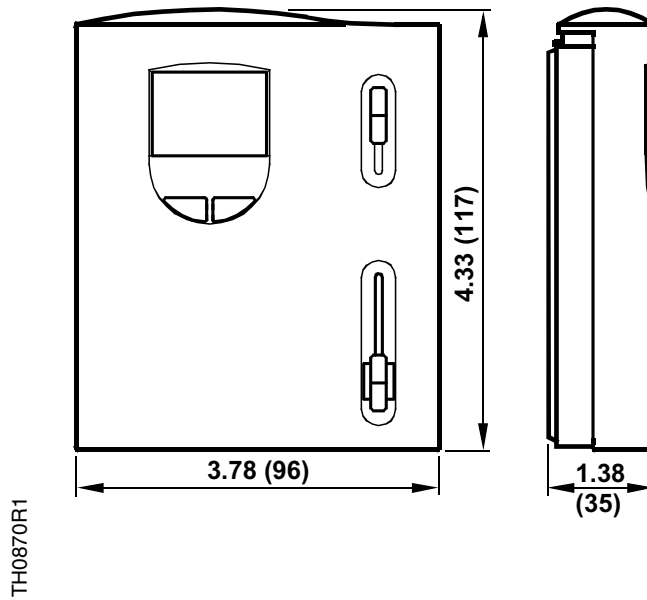
RDF Product Ordering

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

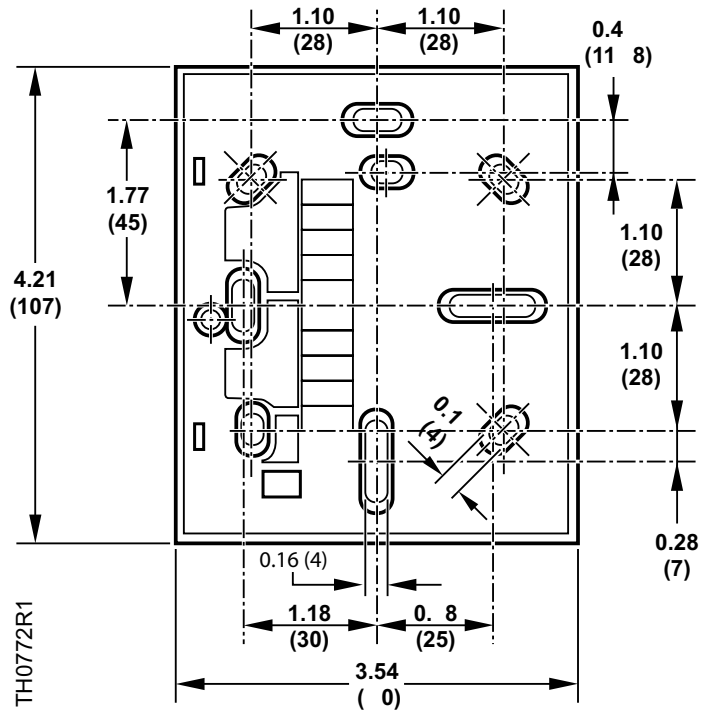
Device Combinations Reference

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

RDF... Controller



Baseplate



Dimensions shown in inches (mm).

FREE Rapid Response Program

Look for this icon on our most critical and commonly ordered products and you'll know it is available for same-day shipping through our Rapid Response program.

How does Rapid Response work?

- Call Customer Support at 1-888-593-7876 by 2:00 p.m. CST
- Specify overnight shipping
- Product ships the same day, at no additional charge

See the inside back cover for more details.

*Only available for continental United States; Not available on online or faxed orders.



Electric Surface Mounted/High Temperature Limit Control Thermostats



141-0522 Electric Surface Mounted Thermostat.

141-0530 Electric High Temperature Limit Control Thermostat.

Description

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

Features

Electric Surface Mounted Thermostat

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

Electric High Temperature Limit Control Thermostat

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

Applications

Surface Mounted Thermostat

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

High Temperature Thermostat

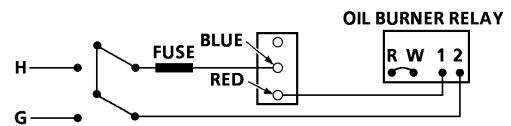
The 141 Electric High Temperature Thermostat is normally located in a duct system and wired to shut down air conditioning or ventilating fans when the air temperature exceeds 125°F (52°C), which would occur during a fire.

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

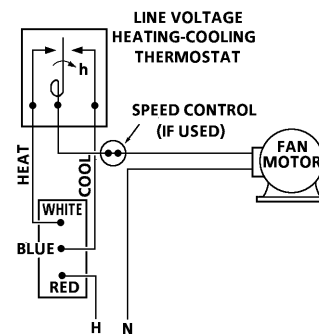
A-71

Thermostats

Typical Connections



Typical High Limit Wiring.



Typical Changeover Wiring.

141 Specifications

Surface Mounted Thermostat

Setpoint Range	50 to 150°F (10 to 65°C)
Maximum Bulb Temperature	240°F (116°C)
Switch Action	SPDT
Electrical Ratings	
Motor Rating	7.4 FLA @ 120 Vac 3.7 FLA @ 240 Vac
Locked Rotor	44.5 A @ 120 Vac 22.2 A @ 240 Vac
Cover Finish	Gray Baked Enamel
Dimensions	2.30" W x 5.38" H x 1.84" D (58 mm W x 173 mm H x 47 mm D)
Shipping Weight	2.0 lb. (0.9 kg)

High Temperature Thermostat

Setpoint Range	25 to 215°F (-4 to +102°C)
Switch Action	SPST, open-on-rise
Factory Temperature Setting	125°F (52°C)
Electrical Ratings	
Motor Rating	10 FLA @ 120 Vac 6 FLA @ 240 Vac
Noninductive Rating	1 A @ 0.3 to 12 Vac 6 A @ 12-50 Vac
Agency Approvals	UL MP3487 CSA LR6246
Cover Finish	Gray Baked Enamel
Dimensions	2.94" W x 5.38 H x 2.5" D (59 mm W x 136 mm H x 64 mm D)
Shipping Weight	1.8 lb. (0.82 kg)

141 Product Ordering

Description	Part No.
Surface Mounted	141-0522
High Temperature Limit Duct Mount	141-0530



Accessories & Service Kits

A-75

A-72

Thermostats



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

SIEMENS

Electric Low Temperature Detection Thermostats



134 Electric Low Temperature Detection Thermostat.

Description

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

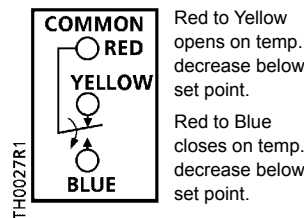
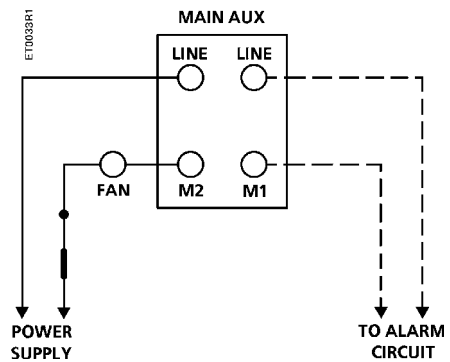
Features

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

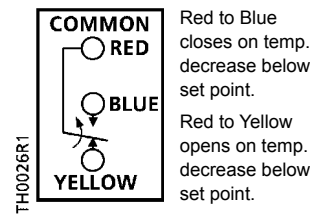
Applications

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

Typical Connections



OPEN ON RISE



CLOSE ON RISE

134 Specifications

Part No. 134-1504

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

Shipping Weight 2.4 lb. (1.1 kg)

Part No. 134-1510

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

Shipping Weight 1.8 lb. (0.8 kg)

Part No. 134-1511

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

Shipping Weight 1.8 lb. (0.8 kg)

134 Product Ordering

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



A-74

Accessories & Service Kits

A-75

Thermostats



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

SIEMENS