



## Room Temperature Controller with LCD

## RDX42...

For heat pump systems with reversing valve, optional electric heater, 1- or 2-stage heating and 1-stage cooling

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**Outputs for 1-stage compressor and reversing valve or on / off valve actuators**  
**Output for auxiliary electric heating**  
**Output for a 1-speed fan**  
**Control depending on the room or the return air temperature**  
**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 AC 230 V (RDX42.2), or AC 24 V (RDX42.22)**

### Use

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- For control of heat pump systems with reversing valve, optional electric heater, 1- or 2-stage heating and 1-stage cooling
- For control of the room temperature in individual rooms that are heated or cooled with 4-pipe fan coil units and optional electric heating
- For opening and closing a valve
- For switching a 1-speed fan

The controller acquires the room temperature via its integrated sensor or external room temperature sensor QAA32 or – if used – via an external return air temperature sensor QAH11.1 and maintains the setpoint by delivering 2-position control commands. The switching differential is 2 K in heating mode (adjustable) and 1 K in cooling mode (adjustable).

### Fan operation

Fan operation is selected on the controller's front panel, either in "Auto" or "Fan On" mode.

When function "(Auto) – temperature-dependent" is selected, the fan is switched on / off (1-speed) depending on the temperature, that is, together with the control output. When function "Fan On" is selected, the fan will run continuously (1-speed).

The fan is switched off when

- leaving the heating or cooling sequence, provided function "Temperature-dependent fan control" is activated
- manually setting the "Heat-Off-Cool" selector to "Off"
- turning the controller's power supply off

### Fan overrun

When DIP switch 2 is set to "OFF", the auxiliary heater is connected, the controller is in heating mode and the fan overrun function is activated. When the electric heater output (Y3) is switched off by the controller in the heating sequence, fan overrun will start in accordance with the time delay set with parameter P08. Fan overrun has the highest priority and overrides the controller's "Off" position.

### Heating mode

When the operating mode selector on the front of the unit is set to "Heat", the system will switch to heating mode.

#### On

The heating equipment receives the on command via control output Y24 when:

1. The measured room temperature lies by half the switching differential below the setpoint, and
2. The heating output has been off for more than 3 minutes (adjustable)

The auxiliary heating equipment receives the on command via control output Y3 when heating output Y24 is activated and the measured room temperature is below the setpoint differential between heating and auxiliary heating  $W_D$  (adjustable with parameter P12).

#### Off

The heating equipment receives the off command via control output Y24 when:

1. The measured room temperature lies by half the switching differential above the setpoint, and
2. The heating output has been on for more than 1 minute (adjustable)

The auxiliary heating equipment receives the off command via control output Y3 when:

1. The measured room temperature is above the setpoint differential between heating and auxiliary heating ( $W_D$ ) (adjustable with parameters P12), and
2. The auxiliary heating output has been on for more than 1 minute (adjustable)

<b>Cooling mode</b>	When the operating mode selector is set to "Cool", the system will switch to cooling mode.
On	The cooling equipment receives the on command via control output Y14 when: <ol style="list-style-type: none"> <li>1. The measured room temperature lies by half the switching differential above the setpoint, and</li> <li>2. The cooling output has been off for more than 3 minutes (adjustable)</li> </ol>
Off	The cooling equipment receives the off command via control output Y14 when: <ol style="list-style-type: none"> <li>1. The measured room temperature lies by half the switching differential below the setpoint, and</li> <li>2. The cooling output has been on for more than 1 minute (adjustable)</li> </ol>
Return air temperature	The RDX42... provides control either depending on the room temperature or the return air temperature. It detects if a QAH11.1 cable temperature sensor is connected to input B1-M and then operates automatically according to the return air temperature.

## Operating modes

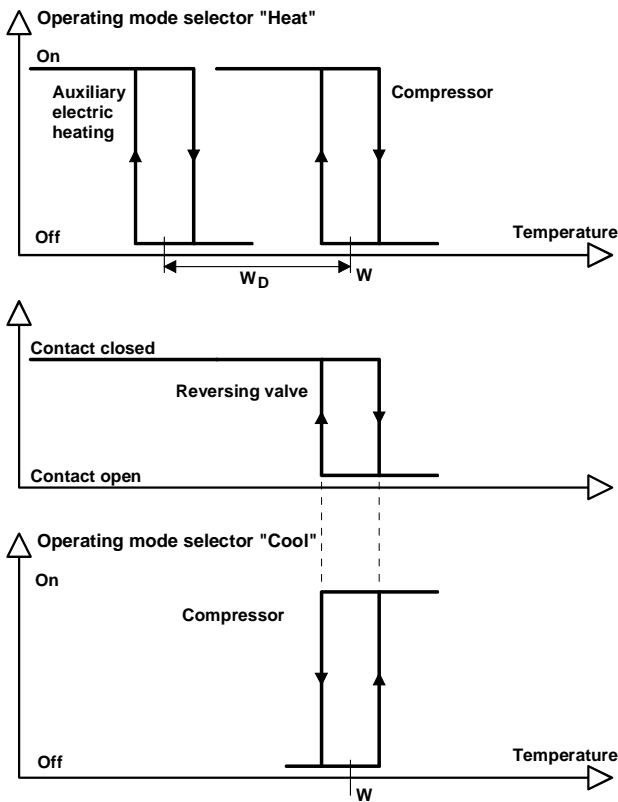
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	The following operating modes are available:
Normal mode	Heating or cooling mode with selected fan operation (auto or continuous on). In normal operation, the controller maintains the adjusted setpoint (see operation diagram below).
Energy saving mode	A changeover switch can be connected to status input D1-GND. When the switch closes (due to an open window, for instance), the operating mode will change from normal operation to energy saving mode. In that case, the relevant setpoints of heating or cooling are maintained (setting of control parameters P01 and P02). The operating action of the switch (N.C. or N.O.) can be selected.
Off mode	When the operating mode selector is set to "Off", the system will switch to off mode. In that mode, the system does not activate any output. The display only shows the room temperature, or normal mode setpoint, according to the DIP switch setting table. After a single press of the "+" or "-" button, the display shows the normal mode setpoint. When the operating mode selector is set to "Off", the system will stay in off mode.

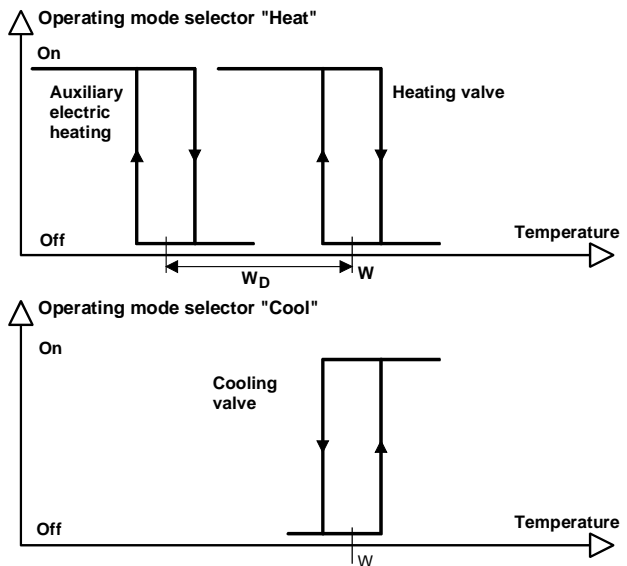
**Operation diagram  
(normal mode)**

**RDX Control Sequences**

**Application with reversing valve:**



**Application with heating and cooling equipment:**



W Room temperature setpoint  
 $W_D$  Setpoint differential between heating and auxiliary heating

For heat pump applications with 1-stage compressor and reversing valve, outputs Y14 and Y24 must be wired together for compressor control. Output Y12 (N.C. cooling contact) or output Y22 (N.C. heating contact) may be connected to a reversing valve depending on the type of valve used.

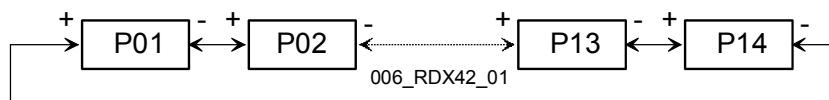
**Setting the control parameters**

A number of control parameters can be set to optimize the control performance. These parameters can also be set during operation without opening the unit. In the event of power failure, all control parameter settings set will be maintained.

**Settings**

The parameters can be changed as follows:

1. Press the + and - buttons simultaneously for 3 seconds. Release them and, within 2 seconds, press the + button again for 3 seconds. Then, the display will show "P01".
2. Select the required parameter by repeatedly pressing the + and - buttons:



3. By pressing the + and - buttons simultaneously, the current value of the selected parameter appears, which can be changed by repeatedly pressing the + and - buttons. To exit from the individual parameter setting mode, press the + and - buttons simultaneously again and the parameter mode setting number

will be displayed "Pxx". You can now choose another parameter mode number setting.

4. By pressing the + and – buttons simultaneously again or 5 seconds after the last press of a button, the last parameter will be displayed again.
5. If you wish to display and change additional parameters, repeat steps 2 through 4.
6. 10 seconds after the last display or setting, all changes are stored and the controller returns to normal operation.

P13 and P14  
(no setting,  
display only)

P13 displays the current value of the temperature sensor connected.

P14 shows the sensor being used by the device to calculate the output.

- 1: Internal sensor
- 2: External sensor

If the position of the operating mode selector or remote ON/OFF switch is changed in this parameter setting mode, the device will abort the setting mode and respond to the new input after 10 seconds. The data changed are saved.

Parameter	Meaning	Setting range	Factory setting
P01	Setpoint of heating in energy saving mode (operating mode changeover switch activated)	OFF, 8...18 °C (in increments of 0.5 K)	16 °C
P02	Setpoint of cooling in energy saving mode (operating mode changeover switch activated)	OFF, 24...35 °C (in increments of 0.5 K)	28 °C
P03	Minimum setpoint in normal mode	8...20 °C (in increments of 1 K)	8 °C
P04	Maximum setpoint in normal mode	21...35 °C (in increments of 1 K)	35 °C
P05	Minimum compressor off-time	1...10 minutes (in increments of 1 min)	3 min
P06	Minimum compressor on-time	1...10 minutes (in increments of 1 min)	1 min
P07	Auxiliary heater minimum hold time	1...10 minutes (in increments of 1 min)	1 min
P08	Fan overrun after auxiliary heater off	30...300 s (in increments of 10 s)	30 s.
P09	Sensor calibration	-3...+3 K (in increments of 0.5 K)	0 K
P10	Switching differential in heating mode	0.5...+4 K (in increments of 0.5 K)	2 K
P11	Switching differential in cooling mode	0.5...+4 K (in increments of 0.5 K)	1 K
P12	Setpoint differential between heating and auxiliary heating $W_D$	0.5...+5 K (in increments of 0.5 K)	2 K
P13	Value of current room temperature	No setting, display only	-
P14	Active temperature sensor (display only, no setting choices)	1: Room temperature sensor active 2: Return temperature sensor active	-

## Equipment combinations

Type of unit	Type reference	Data Sheet
Temperature sensor	<b>QAH11.1</b>	1840
Room temperature sensor	<b>QAA32</b>	1747
Motoric On/Off actuators	<b>SFA...</b>	4863
Thermal valve actuators	<b>STA...</b>	4877
Thermal valve actuators	<b>STP...</b>	4878
Zone valve actuators	<b>SUA...</b>	4830

## Ordering

When ordering, please give name and type reference.

The QAH11.1 temperature sensor (can be used as a return air temperature sensor) and the zone valves are to be ordered as separate items.

## Mechanical design

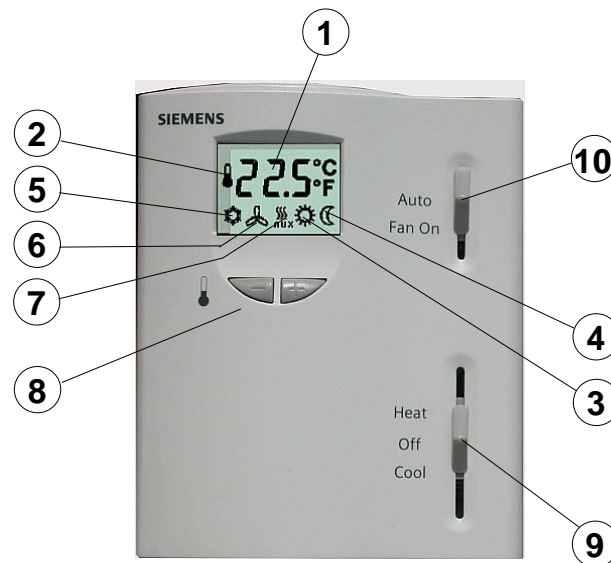
The unit consists of 2 parts:

- The plastic housing which accommodates the electronics, the operating elements and the built-in room temperature sensor
- The baseplate

The housing engages in the baseplate and is secured with 2 screws.



The baseplate carries the screw terminals. The DIP switches are located at the rear of the housing.

## Setting and operating elements



## Legend

1. Display of the room temperature (in degrees Celsius or Fahrenheit), setpoints or control parameters
2. Symbol used when displaying the current room temperature
3. Normal operation
4. Energy saving mode
5. Cooling on
6. Fan on

7.  Heating on
-  Heating and auxiliary heating on  
AUX
8. Buttons for adjusting the setpoints and setting the control parameters
9. Operating mode selector (Heat, Off, Cool)
10. Fan control  
(Auto: Controller switches fan on when heating or cooling output is active)  
(Fan On: Fan is constantly running)

#### DIP switch table

DIP switch	Meaning	Position ON (factory setting)	Position OFF
1	Window contact inactive	Window contact activated when switch is closed (N.O.)	Window contact activated when switch is open (N.C.)
2	Auxiliary heating function	No auxiliary heater connected	Auxiliary heater connected
3	Display of temperature / set-point	Room temperature display	Setpoint display

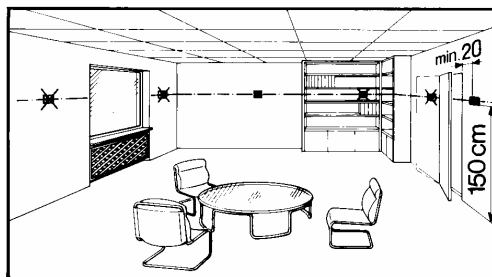
#### Accessories

Description	Type reference
Adapter plate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112x130 mm	ARG70.2

#### Engineering notes

##### Mounting, installation and commissioning notes

Mounting location: On the wall or inside the fan coil unit. Not in niches or bookshelves, not behind curtains, above or near heat sources and not exposed to direct solar radiation. Mounting height is about 1.5 m above the floor. The connecting wires can be run to the controller from a recessed conduit box.



Check the settings of DIP switches 1 through 3 and change them if required. After applying power, the controller makes a reset during which all LCD segments are switched on for 3 seconds, indicating that the reset has been correctly made. Then, the controller is ready to operate.



The cables used must satisfy the insulation requirements with regard to mains potential.



Sensor input B1-M carries mains potential. If sensor cables must be extended, the cables used must be suited for mains voltage.





The controller is supplied with Mounting Instructions.

##### Calibrating the sensor

If the room temperature displayed by the controller is inconsistent with the room temperature effectively measured, the temperature sensor can be recalibrated. In that case, parameter P09 must be changed.

## Technical data

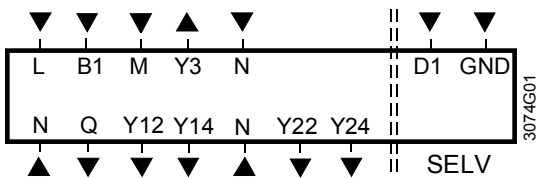
Power supply	Operating voltage	
	RDX42.2	AC 230 V + 10/-15 %
	RDX42.22	AC 24 V +/-20 %
	Frequency	50/60 Hz
	Power consumption	max. 6 VA
	Control output FAN	
	RDX42.2	AC 230 V
	RDX42.22	AC 24 V
	Rating	max. 5(3) A
	Control outputs COOLING and HEATING	
	RDX42.2	AC 230 V
	RDX42.22	AC 24 V
	Rating	max. 5(3) A
	Control output AUX. HEATING	
	RDX42.2	AC 230 V
	RDX42.22	AC 24 V
	Rating	max. 5(3) A
	Remote temperature sensor status input B1 – M	QAH11.1, safety class II NTC resistor 3 kΩ at 25 °C
	Status input D1 and GND	
	Operating action selectable	normally open (N.O.)
	Contact sensing	normally closed (N.C.)
	Insulation against mains	SELV DC 6-15 V / 3-6 mA 4 kV, reinforced insulation
	Perm. cable length with copper cable 1.5 mm <sup>2</sup> for connection to terminals B1 and D1	80 m
	Setpoint setting range	8...35 °C
	Control deviation at 25 °C	max. ±0.5 K
	Switching differential in heating mode (adjustable)	2 K
	Switching differential in cooling mode (adjustable)	1 K
	Setpoint differential w <sub>D</sub> (adjustable)	2 K
	Setpoint « Energy saving mode (C) », heating (adjustable)	16 °C
	Setpoint «Energy saving mode (C) », cooling (adjustable)	28 °C
	Operation	to IEC 721-3-3
	Climatic conditions	class 3 K5
	Temperature	0...+50 °C
	Humidity	<95 % r.h.
	Transport	to IEC 721-3-2
	Climatic conditions	class 2 K3
	Temperature	-25...+70 °C
	Humidity	<95 % r.h.
	Mechanical conditions	class 2M2
	Storage	to IEC 721-3-1
	Climatic conditions	class 1K3
	Temperature	-25...+70 °C
	Humidity	<95 % r.h.
Product standards	 conformity to	
	EMC directive	89/336/EEC
	Low-voltage directive	73/23/EEC
	 N474	
	C-Tick conformity to EMC emission standard	AS/NSZ 4251.1:1994



Automatic electrical controls for household and similar use	
Special requirements for temperature-dependent controls	EN 60 730 – 1 EN 60 730 – 2 – 9
Electromagnetic compatibility	
Emissions	EN 61000-6-3
Immunity	EN 61000-6-1
Devices of safety class	
RDX42.2	II to EN 60 730
RDX42.22	III to EN 60 730
Pollution class	Normal
Degree of protection of housing	IP 30 to EN 60 529
Connection terminals	solid wires or prepared stranded wires 2 x 0.4-1.5 or 1 x 2.5 mm <sup>2</sup>
Weight	0.225 kg
Color of housing front	white, NCS S 0502-G (RAL9003)

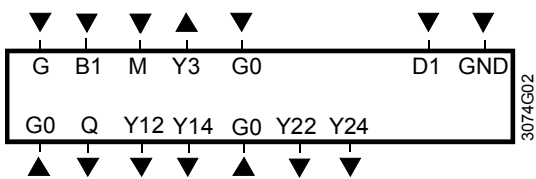
### Connection terminals

RDX42.2



L,N	Operating voltage AC 230 V
B1	Return air temperature sensor QAH11.1 or external room temperature sensor QAA32
M	Measuring neutral
D1,GND	Status input for potential-free operating mode changeover switch or window switch
Q	1-speed fan output
Y12	Cooling output N.C. contact
Y14	Cooling output N.O. contact
Y22	Heating output N.C. contact
Y24	Heating output N.O. contact
Y3	Auxiliary heating output

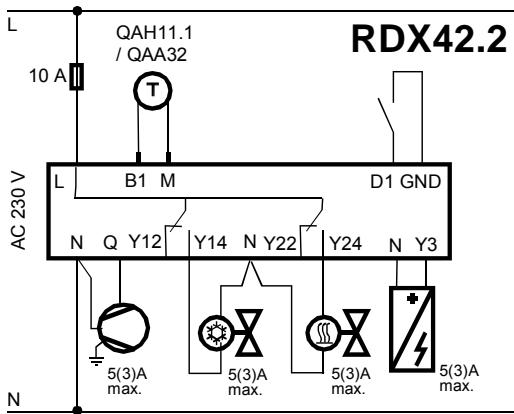
RDX42.22



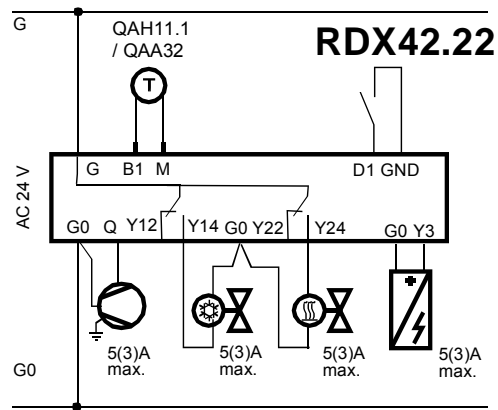
G,G0	Operating voltage AC 24 V
B1	Return air temperature sensor QAH11.1 or external room temperature sensor QAA32
M	Measuring neutral
D1,GND	Status input for potential-free operating mode changeover switch or window switch
Q	1-speed fan output
Y12	Cooling output N.C. contact
Y14	Cooling output N.O. contact
Y22	Heating output N.C. contact
Y24	Heating output N.. contact
Y3	Auxiliary heating output

Connection diagrams

Application: 1- or 2-stage heating and 1-stage cooling

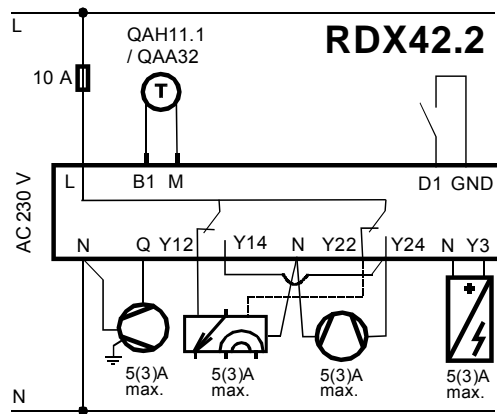


⚠ AC 230 V

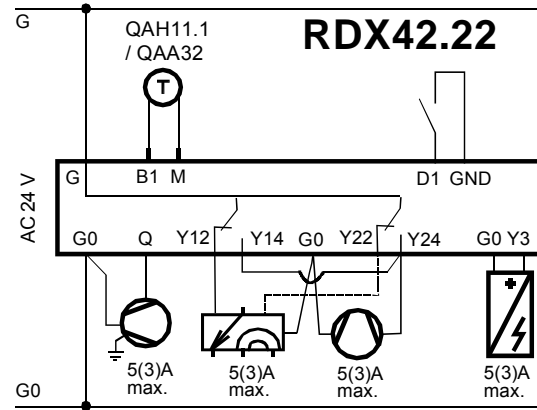


G-G0 AC 24 V

Application: Control of heat pump systems with reversing valve and optional electric heater



⚠ AC 230 V



G-G0 AC 24 V

- L Operating voltage AC 230 V
- N Neutral conductor
- G Operating voltage AC 24 V
- G0 Neutral conductor
- B1 Return air temperature sensor QAH11.1 or external room temperature sensor QAA32
- D1 External operating mode changeover switch or window switch (normal or energy saving mode)
- Q Fan output at 1-speed
- Y3 Auxiliary heating output

- Y12 Cooling output N.C. contact
- Y14 Cooling output N.O. contact
- Y22 Heating output N.C. contact
- Y24 Heating output N.O. contact

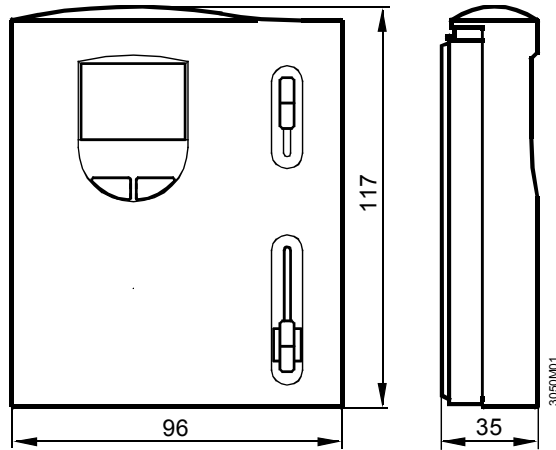
- Y12 Cooling output N.C. contact for reversing valve
- Y14 Cooling output N.O. contact for compressor
- Y22 Heating output N.C. contact for reversing valve
- Y24 Heating output N.O. contact for compressor

Note: Outputs Y14 and Y24 must be wired together for compressor control

## Dimensions

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### Controller



### Baseplate

