

Group: **WSHP**Supercedes: **LIA204-4**Date: **May 2007**

## Auto-changeover Electronic Thermostat

2 Heat/2 Cool, Auto or Manual Changeover, Hardwired

Part No. 668375401



- Configurable
- Two Stage Heat / 2 Stage Cool Systems
- Backlit Display
- Field Temperature Calibration
- Status Indicator Light
- Relay Outputs (minimum voltage drop in thermostat)
- Night Set-Back Override
- Reset

**McQuay**  
Air Conditioning

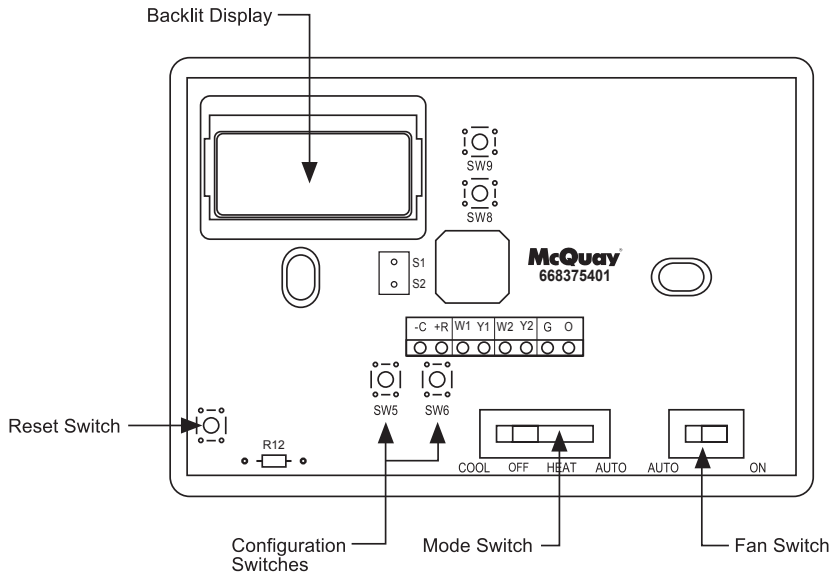
For replacement parts call 1-800-377-2787

©2008 McQuay International • www.mcquay.com • 800-432-1342

# Table of Contents

Parts Diagram .....	1
Specifications .....	2
Important Safety Information .....	2
Package Contents/Tools Required.....	2
To Remove Existing Thermostat .....	3
To Install Thermostat.....	3
Remote Sensor Installation (Optional) .....	5
Terminal Designator Descriptions.....	6
Wiring Diagrams.....	6
Configuration Mode.....	8
Testing the Thermostat .....	11
Mode of Operation .....	12
Operating Modes .....	13
Troubleshooting .....	14
Factory Default Settings.....	15

# Parts Diagram



## Specifications

**Electrical rating:** • 24 VAC/VDC (18-30 VAC/VDC) • 4 amp maximum total load

- 1 amp maximum per terminal

**Temperature control range:** 45°F to 90°F (7°C to 32°C) **Accuracy:**  $\pm 1^{\circ}\text{F}$  ( $\pm 0.5^{\circ}\text{C}$ )

**System configurations:** 2-stage heat, 2-stage cool

**Timing:** *Backlight Operation:* 13 seconds after mode change or button press

**Terminations:** -C, +R, W1, Y1, W2, Y2, G, O, S1, S2

## Important Safety Information

**WARNING!** *Always turn off power at the main power supply before installing, cleaning, or removing thermostat.*

- This thermostat is for 24 VAC/VDC applications only; do not use on voltages over 30 VAC/VDC
- Do not short across terminals of system control to test operation; this will damage your thermostat and void your warranty
- All wiring must conform to local and national electrical and building codes
- Use this thermostat only as described in this manual

## Package Contents/Tools Required

**Package includes:** Thermostat on base, thermostat cover, wiring labels, screws and wall anchors, Installation, Operation and Application Guide

**Tools required for installation:** Drill with 3/16" bit, hammer, screwdriver

## To Remove Existing Thermostat



**ELECTRICAL SHOCK HAZARD** – Turn off power at the main service panel by removing the fuse or switching the appropriate circuit breaker to the OFF position before removing the existing thermostat.

1. Turn off power to the heating and cooling system by removing the fuse or switching the appropriate circuit breaker off.
2. Remove cover of old thermostat. This should expose the wires.
3. Label the existing wires with the enclosed wire labels before removing wires.
4. After labeling wires, remove wires from wire terminals.
5. Remove existing thermostat base from wall.
6. Refer to the following section for instructions on how to install this thermostat.

## To Install Thermostat



**ELECTRICAL SHOCK HAZARD** – Turn off power at the main service panel by removing the fuse or switching the appropriate circuit breaker to the OFF position before removing the existing thermostat.

**IMPORTANT:** Thermostat installation must conform to local and national building and electrical codes and ordinances.

**\*\* Note:** Mount the thermostat about five feet above the floor. Do not mount the thermostat on an outside wall, in direct sunlight, behind a door, or in an area affected by a vent or duct.

1. Turn off power to the heating and cooling system by removing the fuse or switching the appropriate circuit breaker off.

## To Install Thermostat (continued)

2. To remove cover, insert and twist a coin or screwdriver in the slots on the sides of the thermostat.
3. Put thermostat base against the wall where you plan to mount it (Be sure wires will feed through the wire opening in the base of the thermostat).
4. Mark the placement of the mounting holes.
5. Set thermostat base and cover away from working area.
6. Using a 3/16" drill bit, drill holes in the places you have marked for mounting.
7. Use a hammer to tap supplied anchors in mounting holes.
8. Align thermostat base with mounting holes and feed the control wires through wire opening.
9. Use supplied screws to mount thermostat base to wall.
10. Insert stripped, labeled wires in matching wire terminals. See "Wiring Diagrams" section of this manual (Pages 6-7).

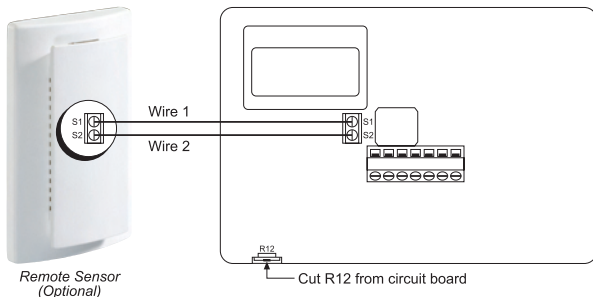
**CAUTION!:** *Be sure exposed portion of wires does not touch other wires.*

11. Tighten screws on terminal block. Gently tug wire to be sure of proper connection. Double check that each wire is connected to the proper terminal.
12. Seal hole for wires behind thermostat with non-flammable insulation or putty.
13. Replace cover on thermostat by snapping it in place.
14. Turn on power to the system at the main service panel.
15. Test thermostat operation as described in "Testing the Thermostat" (Page 11).

# Remote Sensor Installation (Optional)

Requires McQuay Remote Sensor Part Number 667720401

1. Remove cover from remote sensor housing.
2. Select an appropriate location for mounting the remote sensor.
3. Mount remote sensor unit using hardware provided.
4. Install two strand shielded wire between remote sensor and thermostat. Shielded wire must be used. Do not run remote sensor wire in conduit with other wires.
  - **Wire 1** should run between the S1 terminal on the thermostat and the S1 terminal on the remote sensor
  - **Wire 2** should run between the S2 terminal on the thermostat and the S2 terminal on the remote sensor
  - Connect the shielding of the wire to the S2 terminal on the thermostat
5. Disable the main sensor (R12) on the thermostat by cutting it from the circuit board.

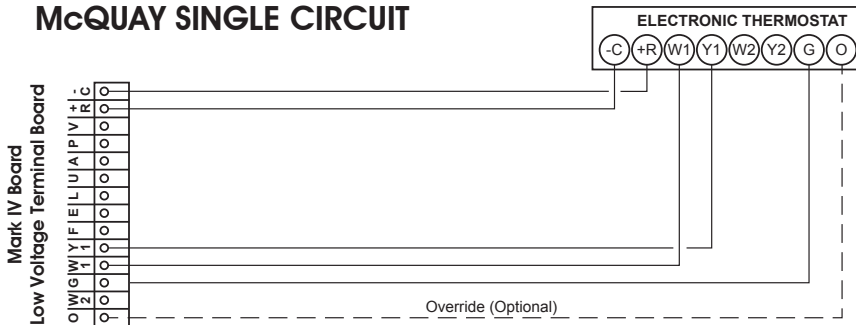


# Terminal Designator Descriptions

- C – 24 VAC/VDC common
- +R – 24 VAC/VDC hot
- W1 – 1st stage heat
- Y1 – 1st stage cool
- W2 – 2nd stage heat
- Y2 – 2nd stage cooling
- G – Fan
- O – Override

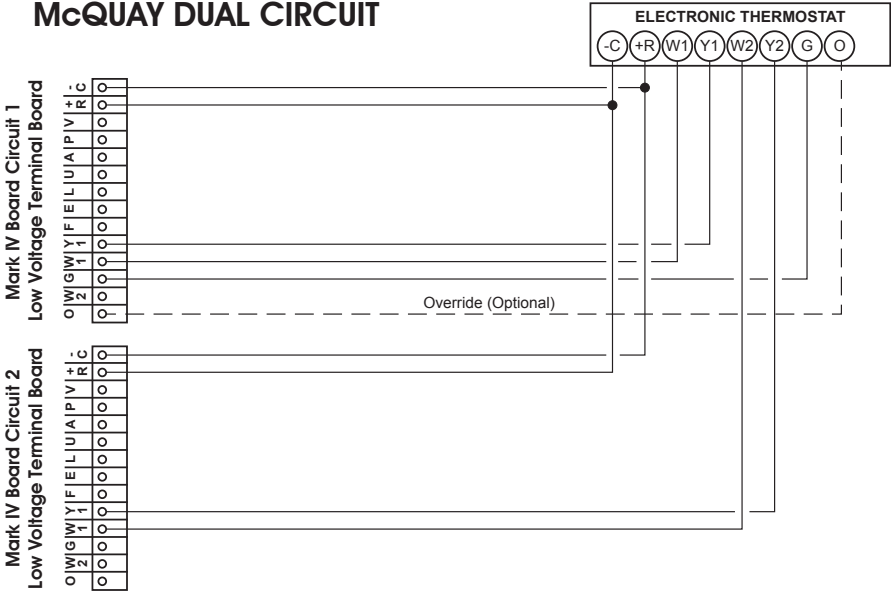
## Wiring Diagrams

### McQUAY SINGLE CIRCUIT





# McQUAY DUAL CIRCUIT



# Configuration Mode

The configuration mode is used to set the McQuay Auto-changeover Electronic Thermostat to match your heating/cooling system. To configure the McQuay Auto-changeover Electronic Thermostat, perform the following steps:

1. Remove the cover of the thermostat by gently pulling on one of the corners.
2. Simultaneously hold the **SW5** and **SW6** buttons in for 5 seconds while the McQuay Auto-changeover Electronic Thermostat is in **OFF** mode.
3. Press the  $\nabla$  or  $\wedge$  button to change settings within each screen.
4. Press the **SW6** button to advance to the next screen.  
\*\* **Note:** The **SW5** button will return you to the previous screen.
5. To exit configuration mode, slide the **Mode** switch to **Heat** or **Cool**.

## Configuration Mode Settings

The setup screens for Configuration Mode are as follows:

1. **Heat Pump and Non Heat Pump** – Press the  $\nabla$  or  $\wedge$  button to configure as heat pump, or non-heat pump system. Set to "0" for all McQuay WSHR, PTAC, PTHP and UV units.  
Press the **SW6** button to advance to the next screen.
2. **Heat Source** – Set to "g".  
Press the  $\nabla$  or  $\wedge$  button to set to "g".  
Press the **SW6** button to advance to the next screen.
3. **Temperature Scale (F or C)** – Choose Fahrenheit or Celsius.  
Press the  $\nabla$  or  $\wedge$  button to select.  
Press the **SW6** button to advance to the next screen.



4. **1<sup>st</sup> Stage Temperature Differential** (1°F to 3°F) (0.5°C to 1.5°C)  
Set the number of degrees between your “setpoint” temperature and your “turn on” temperature.

Press the  $\nabla$  or  $\wedge$  button to set differential value.

Press the **SW6** button to advance to the next screen.



5. **2<sup>nd</sup> Stage Temperature Differential** (1°F to 6°F) (0.5°C to 3.0°C)  
Set the number of degrees between when stage 1 turns on and when stage 2 turns on.

Press the  $\nabla$  or  $\wedge$  button to set differential value.

Press the **SW6** button to advance to the next screen.



6. **Minimum Deadband** (2°F to 9°F) (1.0°C to 4.5°C)  
Set the minimum separation between heat setpoint and cool setpoint in **Auto Changeover** Mode.

Press the  $\nabla$  or  $\wedge$  button to set deadband.

Press the **SW6** button to advance to the next screen.



7. **Staged Off Outputs**

Select whether the outputs for heating and cooling are staged off independently or are satisfied simultaneously.

1 = outputs staged off independently

0 = outputs off simultaneously

Press the  $\nabla$  or  $\wedge$  button to set deadband.

Press the **SW6** button to advance to the next screen.



8. **Minimum Cool Setpoint** (45°F to 75°F) (7°C to 24.0°C)  
Adjust to control the minimum Cool set temperature allowed.  
Press the  $\nabla$  or  $\wedge$  button to select.  
Press the **SW6** button to advance to the next screen.



9. **Maximum Heat Setpoint** (55°F to 90°F) (13°C to 32°C)

Adjust to control the maximum Heat set temperature allowed.

Press the  $\nabla$  or  $\wedge$  button to select.

Press the **SW6** button to advance to the next screen.



10. **Room temperature offset** (+9°F to -9°F) (+4.5°C to -4.5°C)

Adjust to calibrate displayed room temperature to match actual room temperature.

\*\* **Note:** When not set to 0, **ROOM** will display

Press the  $\nabla$  or  $\wedge$  button to select.

Press the **SW6** button to advance to the next screen.



11. **Maximum compressor cycles allowed per hour** (-, 2-6)

- = as many as needed, and 2-6 = maximum cycles/hour

Press the  $\nabla$  or  $\wedge$  button to select.

Press the **SW6** button to advance to the next screen.



12. **Status Indicator Light** (Lt 0, 1, 2)

0 = Status indicator never on

1 = Status indicator on with first stage

2 = Status indicator on with second stage

Press the  $\nabla$  or  $\wedge$  button to select.

\*\* **Note:** Red light indicates heating cycle and green light indicates cooling cycle.

Slide the **Mode** switch to **Heat** or **Cool** to exit configuration.



# Testing the Thermostat

Once the thermostat is installed, it should be thoroughly tested.

**CAUTION!:** *Do not energize the air conditioning system when the outdoor temperature is below 50 degrees. It can result in equipment damage or personal injury.*

## Cool Test

1. Slide **Mode** switch to **Cool** mode.
2. Adjust set temperature so it is 5 degrees below room temperature.
3. Air conditioning should come on within a few seconds. Status indicator may come on.
4. Adjust the set temperature 2 degrees above the room temperature and the A/C should turn off. There may be a fan delay on your system.



Cool Off Heat Auto

## Heat Test

1. Slide **Mode** switch to **Heat** mode.
2. Adjust the set temperature so it is 5 degrees above the room temperature.
3. Heat should come on within a few seconds. Status indicator may come on.
4. Adjust the set temperature so it is 2 degrees below the room temperature and the heat should turn off. There may be a fan delay on your system.



Cool Off Heat Auto

## Fan Test

1. Slide **Fan** switch to **On** position.
2. Indoor fan turns on.



Auto  On

3. Slide **Fan** switch to **Auto** position.
4. Indoor fan turns off.



Auto  On

## Mode of Operation

The McQuay Auto-changeover Electronic Thermostat is a two-stage heat, two-stage cool thermostat.

The thermostat activates the first stage of heating when the room temperature is below the heat set temperature (by the differential temperature). The second stage of heating will be activated if the room temperature continues to drop. The heat outputs are staged off (configurable, setting 7, Page 9) as the room temperature increases.

When the room temperature is greater than the cool set temperature (by the differential temperature), the cooling device is activated. The second stage of cooling will be activated if the room temperature continues to rise. The cool outputs are staged off (configurable, setting 7, Page 9) as the room temperature drops.

The thermostat has the following operating modes: **OFF**, **Heat**, **Cool** and **Auto**. In **OFF** mode, the thermostat will not turn on heating or cooling devices. In the **Heat** mode, the thermostat controls the heating system. In the **Cool** mode, the thermostat controls the cooling system. In the **Auto** mode, the thermostat operates as an auto-changeover thermostat. It will turn on heating or cooling as required. The indoor fan can be turned on in all operating modes using the **Fan** switch.

Pressing the  $\vee$  and  $\wedge$  buttons simultaneously for 2 seconds causes the thermostat to output from the "O" terminal for 5 seconds. "r" will show on the display. This will result in the unit going into a night set-back override.

Pressing the  $\vee$  and  $\wedge$  buttons simultaneously for 10 seconds causes the thermostat to output from the "O" terminal for 15 seconds. "r5" will show on the display. This will result in the unit being reset.

# Operating Modes

These are the possible operating modes of the McQuay Auto-changeover Electronic Thermostat.

## Off Mode

In off mode, the thermostat will not turn on the heating or cooling appliances.

**Note 1:** The indoor fan can be activated in every mode by sliding the Auto/On fan switch to the On position.

**Note 2:** Off mode is used to enter the configuration setup (by pressing SW5 and SW6 simultaneously for 5 seconds).

## Cool Mode

In cool mode, the thermostat controls the cooling system.

## Heat Mode

In heat mode, the thermostat controls the heating system.

## Auto-changeover Mode

In this mode the thermostat will automatically change from heat mode to cool mode, or vice versa.

Pressing the  $\vee$  or  $\wedge$  button in **Auto** mode causes the thermostat to display the heat set temperature then the cool set temperature. The set temperature that is displayed can be changed using the  $\vee$  or  $\wedge$  buttons.

## Override

Press  $\vee$  and  $\wedge$  buttons simultaneously for 2 seconds to override night setback. When override is activated, "0r" will be displayed.

## Reset

Press  $\vee$  and  $\wedge$  buttons simultaneously for 10 seconds to reset the control board. "r5" will be displayed.

# Troubleshooting

Symptom	Remedy
No display	Check for 24 VAC/VDC at thermostat; display is blank when 24 VAC/VDC is not present
System fan does not come on properly	Verify wiring is correct Check configuration (see "Configuration Mode," Setting 2, Page 8) See "Fan Test" (Page 11)
Thermostat turns on and off too frequently	Adjust temperature differential (see "Temperature Differential," "Configuration Mode," Settings 4 and 5, Page 9)
Fan runs continuously	Check fan On/Auto switch, ON position runs indoor fan continuously
Room temperature is not correct	Verify wall hole is plugged with putty or insulation; calibrate thermostat (see "Configuration Mode," Setting 10, Page 10)
<u>ROOM</u> displays	Room temperature offset is not zero (see "Configuration Mode," Setting 10, Page 10)
Status indicator	Green light – Cooling operation Red light – Heating operating Status indicator option ON (see "Configuration Mode," Setting 12, Page 10)
Er displays	Sensor error – check S1 & S2 connections, check remote sensor wire and connections, use shielded wire for remote sensor
Problem not listed above	Press the Reset button once; display will be refreshed and anti-short cycle timing will be reset to zero



# McQuay Auto-changeover Electronic Thermostat

## Factory Default Settings

<b>** Note:</b>		
Following are the factory default settings for the McQuay 2811 thermostat:		
1.	Heat pump	0
2.	HS gE	9
3.	FC	F
4.	Differential 01	1
5.	Differential 02	2
6.	db	4
7.	Staged outputs	1
8.	LO	45
9.	UP	90
10.	Calibration	0
11.	Maximum compressor cycles per hour	-
12.	Lt	1

This page left intentionally blank.

This page left intentionally blank.

### **McQuay Training and Development**

Now that you have made an investment in modern, efficient McQuay equipment, its care should be a high priority.

For training information on all McQuay HVAC products, please visit us at [www.mcquay.com](http://www.mcquay.com) and click on training, or call 540-248-9646 and ask for the Training Department.

### **Warranty**

All McQuay equipment is sold pursuant to its standard terms and conditions of sale, including Limited Product Warranty. Consult your local McQuay Representative for warranty details. Refer to Form 933-43285Y. To find your local McQuay Representative, go to [www.mcquay.com](http://www.mcquay.com).

This document contains the most current product information as of this printing. For the most up-to-date product information, please go to **[www.mcquay.com](http://www.mcquay.com)**.



For replacement parts call 1-800-377-2787

©2008 McQuay International (800) 432-1342 [www.mcquay.com](http://www.mcquay.com)

LIA266 / Version A: 5-18-07