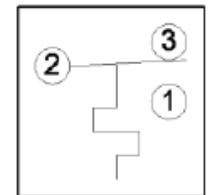
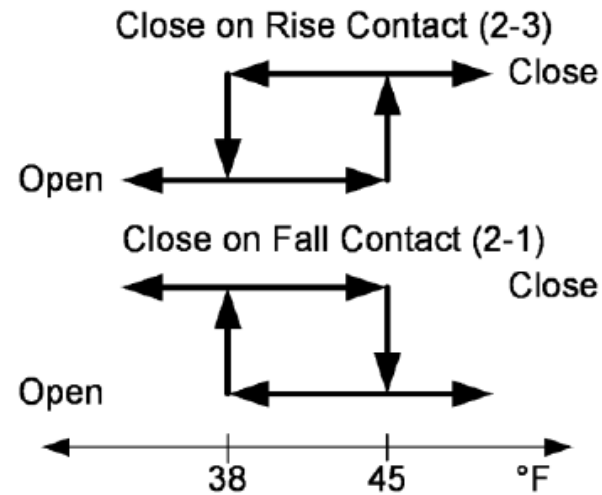
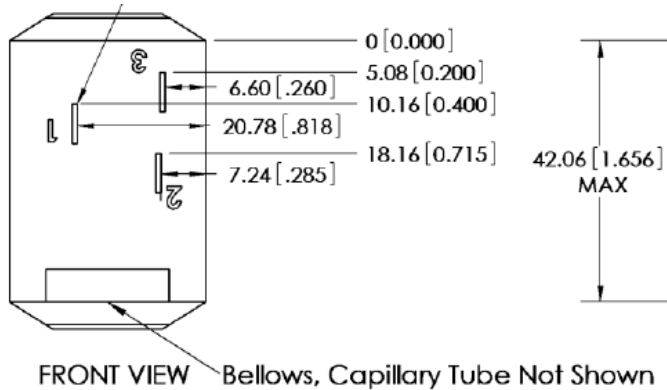




Coils - Low Limit Diagnostics and Replacement Instructions

Before replacing a coil low limit, the following steps can save time and money. Please complete the following check:

1. If the low limit switch is outside of an alarm condition, check for continuity between terminals 2 and 3. These contacts should be closed
2. Likewise, check continuity between terminals 1 and 2 as these contacts should be open, except during alarm conditions
3. If the contacts close and open as outlined above, the control scheme should be reviewed for the low limit safety condition settings





Additional Notes and Diagnostics

- Note: Any 6” span of the capillary tube and is set at 38 degrees F with enough safety margin to detect below freezing air temperatures.
- Note: The purpose of the limit switch is to signal the controller when the air temperature reaches a point below 38F. It is up to the controller to initiate the appropriate actions within the control system to prevent coil freeze-up. Such actions would typically include closing the outdoor air damper and also opening the coil water valve to ensure there is adequate water flow in the coil to prevent freezing.
- If Factory assistance is requested, please send the following to our customer service group , uvsales@magicaire.com , with a designated time for a conference call:
 1. Please explain how the low limit thermostats are failing: do they fail open or closed?
 2. Do the low limits cause nuisance tripping or cycling?
 3. How are the low limits wired into the field supplied and installed control system? Please provide wiring diagram of control system if possible.
 4. Are there any noted physical defects with these failed low limit thermostats? If so, please send back intact samples of failed parts for analysis using the RGA procedure outlined at:
<http://www.magicaire.com/support/RGA%20Request/>
NOTE: When installing or packaging, please do not cut or crimp capillary tube.



Part Specification

The low limit switch is a single-pole, double-throw device that closes contacts to indicate a near freezing condition. This does not necessarily switch 24 VAC.

- On "field installed controls" units, this switch is wired into the power circuit of the supply fan, such that a trip stops the fan.
- On DDC ready units, this switch is wired to the field terminal strip.
- On Magic Aire controls, we switch a low level signal AND use the discharge air temperature limit to try and prevent cycling on the mechanical switch.

For ALL units:

- All units with Hydronic Coils include an automatic reset, single-pole, double-throw low limit switch (LLT) that **changes state** at 38°F and 42°F. This is mounted on the leaving side of the coil (heating coil for 4-pipe).
- All units with DX coils include an automatic reset, single-pole, double-throw low limit switch (LLR) that **changes state** at 28°F and 35°F. This is mounted on the leaving side of the coil.

Magic Aire Controls -

Safeties - Low Limit Conditions (Damper Control)

If the low limit thermostat trips, the unit enters low limit mode. This shall drive the outdoor air damper closed. In heating mode, this shall force the face & bypass damper into full face position (open) and the optional EOC valve shall open. In cooling mode, this shall force the face & bypass damper into full bypass position and the optional EOC valve shall close.

Normal unit operation shall resume when the low limit thermostat opens.

Safeties - Low Limit Conditions (Valve Control)

If the low limit thermostat trips, the unit enters low limit mode. This shall drive the outdoor air damper closed. In heating mode, this shall drive the control valve open. In cooling mode, this shall drive the control valve closed.

Normal unit operation shall resume when the low limit thermostat opens.

DX applications:

If the heating coil low limit thermostat closes OR the optional refrigerant low limit switch closes, this shall immediately disengage the compressor regardless of the minimum on timer status. The compressor shall not be allowed to operate until the discharge air temperature exceeds 52°F AND the heating coil low limit thermostat is open AND the optional refrigerant low limit switch is open AND the minimum off time has elapsed.



Replacement Procedure

WARNING! Lockout and Tag-out all power and cooling/heating supplies to equipment and controls prior to servicing unit. Follow all safety codes.

 **WARNING**

Lock out and tag all power supplies to equipment and controls prior to servicing unit. Follow all safety codes. Failure to do so could result in personal injury.

TOOLS REQUIRED:

- 5/32" hex (Allen) tool, long handle
- 1/4" nut driver
- 3/8" nut driver
- 1/2" socket
- Safety glasses
- Work gloves



STEP NO.	TOOLS REQUIRED	INSTRUCTIONS	REFERENCE DRAWING
1	5/32" hex (Allen) tool 3/8" nut driver	Remove all front UVF panels. Remove end panels	-
2	1/4" nut driver	Remove 1/4" head screws (#72) along length of unit that secure coil baffle to blower section.	FIGURE 1
3	1/4" nut driver	Remove (4) 1/4" head screws (#70) that connect the blower section sides to the coil section sides.	FIGURE 1
4	1/4" nut driver	Remove 1/4" head screws (#76) attaching OA actuator to damper shaft OR locking quadrant assembly to damper shaft. Remove OA actuator or locking quadrant assembly.	FIGURE 1
5	-	Tag low limit thermostat wiring and terminals. Disconnect low limit thermostat wiring (right end compartment).	-
6	-	Drain water and/or reclaim refrigerant in accordance with all applicable codes. Disconnect piping from coil connections.	-
7	-	Tag optional electric heat element wire terminations for later reconnection. Disconnect element wires from electric heat control box (remove coil baffle for access). If applicable.	-
8	1/2" socket	Remove the (4) 5/16" nuts (#75) retaining the coil section to the frame.	-
9	-	Remove coil section from frame.	FIGURE 1

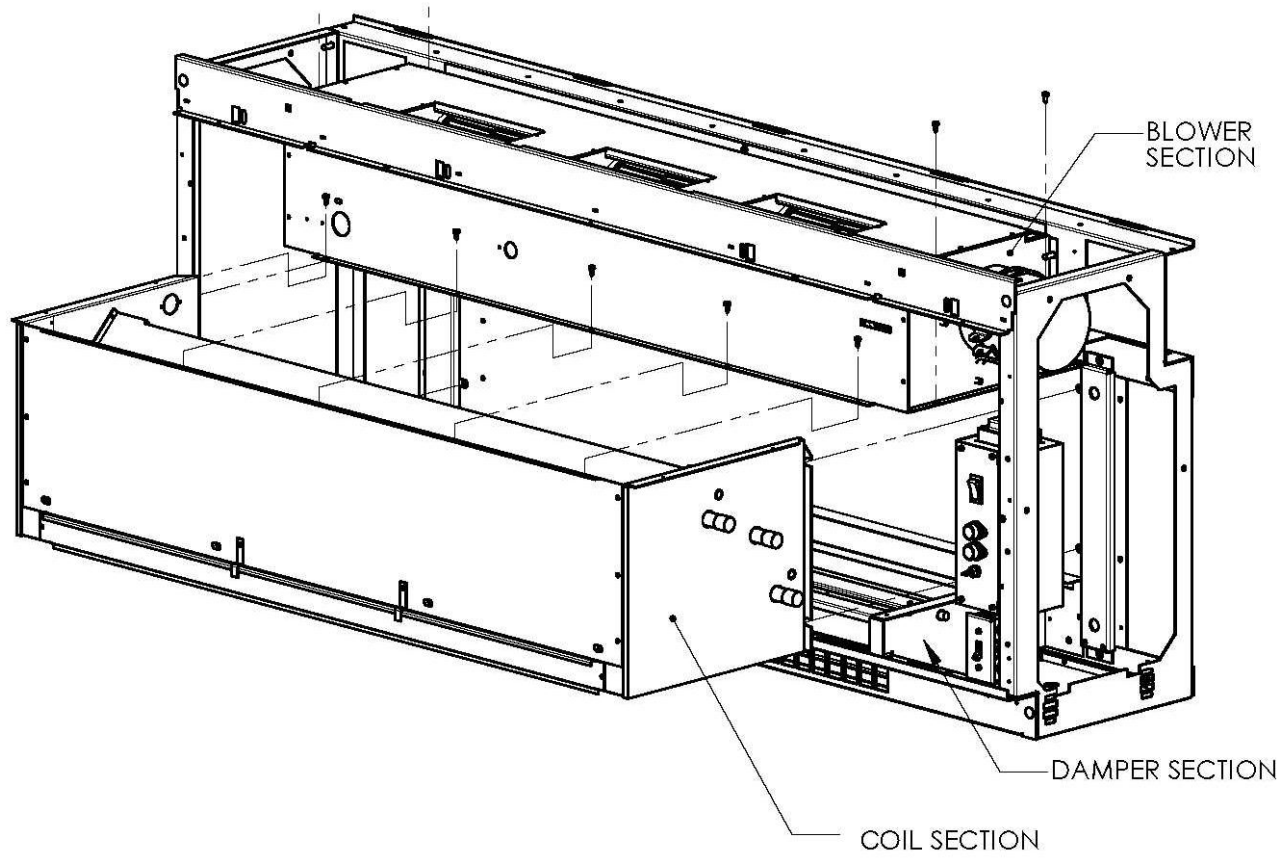
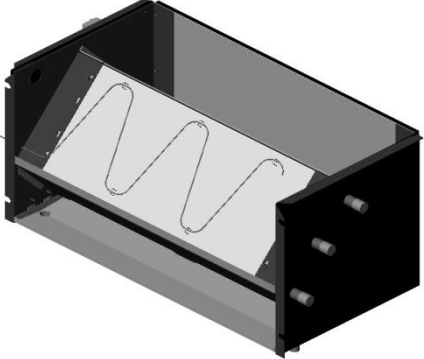


Figure 1



10	<p>Route the low limit, If needed, per the drawing. The exposed capillary tubing needs to be as minimal as possible without causing a kink in the tube. The excess tubing can be run parallel to the coil. Use the retaining clips at every bend.</p> <p>Using a voltmeter (continuity test) check the low limit.</p> 	<p>Quality Alert-Do not bend the tubing sharply it can break.</p> <p>Quality Alert-Test the low limit for continuity after installation.</p>
11	<p>If electric heat units, Use the voltmeter to check for a short from all electric heat modules. Perform this test by connecting one test lead from the voltmeter to a quick-connect lead from the electric heat and connecting the other lead from the voltmeter to any exposed metal on the unit. If there is continuity between the electric heat module and the unit, the electric heat module is defective and must be replaced. Perform this test on each electric heat module that is installed on a unit.</p>	<p>SAFETY TEST – This is to check if the electric heat module is shorting to the unit. NOTE: This test must be performed on all electric heat units to prevent electrocution!</p>



STEP NO.	TOOLS REQUIRED	INSTRUCTIONS	REFERENCE DRAWING
12	1/2" socket	Tighten the (4) 5/16" nuts (#75) retaining coil section to frame.	-
13	-	Reconnect electric heat wiring in electric heat control box. If applicable.	-
14	-	Reconnect wiring to low limit thermostat.	-
15	1/4" nut driver	Replace the (4) 1/4" head screws holding the blower deck to coil section (2 per side).	FIGURE 1
16	1/4" nut driver	Replace coil baffle using 1/4" head screws (#72)	FIGURE 1
17	1/4" nut driver	Reinstall outside air actuator or locking quadrant handle using 1/4" head screws (#76)	-
18	-	Reconnect piping to coils. If water coil, purge air from coils and perform hydrostatic test to check for leaks. If DX coil perform leak test using nitrogen, evacuate and charge per recommended HVAC procedures and all applicable codes.	-
19	-	Replace coil section side insulation.	-
20	5/32" hex (Allen) tool 3/8" nut driver	Replace front panels. Replace end panels.	-

Be careful with all components during removal and installation. Any excessive force applied to these components can cause unintended damage and void your warranty.