

## Coils - Low Limit Diagnostics and Replacement Instructions

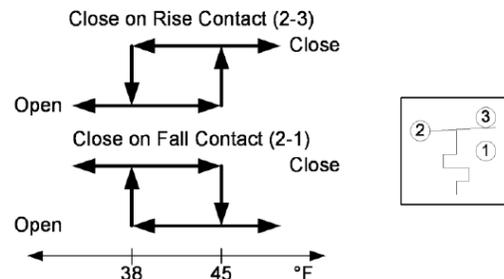
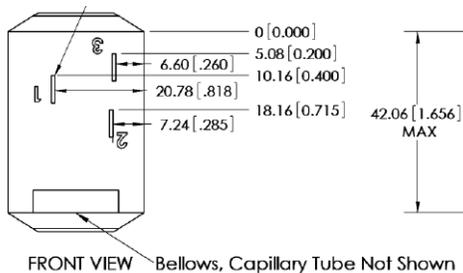
**WARNING!** Lockout and Tag-out all power and cooling/heating supplies to equipment and controls prior to servicing unit. Follow all safety codes.

### TOOLS REQUIRED:

Multimeter	½” socket
5/32” hex (Allen) tool, long handle	safety glasses
¼” nut driver	work gloves
3/8” nut driver	

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

STEP NO.	TOOLS REQUIRED	INSTRUCTIONS	REFERENCE DRAWING
1A	5/32” hex (Allen) tool	Remove front UVF right side panel.	
2A	Multimeter	If the low limit switch is outside of an alarm condition, check for continuity between terminals 2 and 3. These contacts should be closed. Likewise, check continuity between terminals 1 and 2 as these contacts should be open, except during alarm conditions. <b>If the contacts close and open as outlined above, the control scheme should be reviewed for the low limit safety condition settings. See page 2 for details. If contacts do not open and close as expected, skip to page 3 to replace.</b>	



## 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 factory wired into the power circuit of the supply fan, such that a trip stops the fan.
- On DDC ready units, this switch is factory wired to the field terminal strip.
- On factory installed DDC controls, it switches a low level signal and uses the discharge air temperature limit to 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).
- The switch points are  $38^{\circ} \pm 2^{\circ}\text{F}$  and differential  $7 \pm 1.5^{\circ}\text{F}$  at sea level.
- 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  $28^{\circ}\text{F}$  and  $35^{\circ}\text{F}$ . This is mounted on the leaving side of the coil.

## Additional Notes and Diagnostics

- Note: Any 6" span of the capillary tube and is set at 38 degrees F with enough safety margins 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 assistance is requested, please send the following information to [uvsales@magicaire.com](mailto:uvsales@magicaire.com) :
  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.

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 on the portal. NOTE: When installing or packaging, please do not cut or crimp capillary tube.

**For the easiest method of replacement, please find the unit model number on the nameplate. In some configurations, it is easier to access the low limit by removing the blower section. In some configurations, it is easier to access the low limit by removing the coil section.**

If there is only one coil (Model Number 19 = A), follow the blower section removal procedure on page 4.

MODEL:		MAUVF4P1BAB211N0J1AAA2AAA1A		
VOLTS: 115	PHASE: 1	MIN CIRCUIT AMPACITY: 5.9	MOPD	
S/N: W110343941	SO:		MANUFACTURED:	

Or, If the heating coil is in reheat position (Model Number 18 = 2) and the heating low limit needs replaced, follow the blower section removal procedure on page 4.

MODEL:		MAUVF4P1BAB211N0J1AAA2AAA1A		
VOLTS: 115	PHASE: 1	MIN CIRCUIT AMPACITY: 5.9	MOPD	
S/N: W110343941	SO:		MANUFACTURED:	

Or, If the DX low limit needs replaced (Model Number 22 = 2,3,V, or W), follow the blower section removal procedure on page 4.

MODEL:		MAUVF4P1BAB211N0J1AAA2AAA1A		
VOLTS: 115	PHASE: 1	MIN CIRCUIT AMPACITY: 5.9	MOPD	
S/N: W110343941	SO:		MANUFACTURED:	

For All other instances follow the coil section removal procedure on page 6.

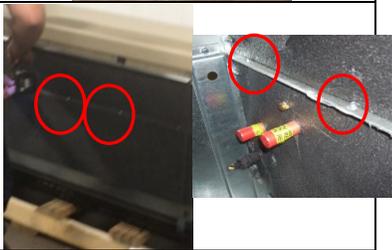
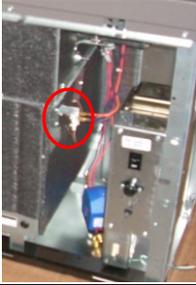
**Blower Section Removal Instructions (Confirm on page 3 whether to remove blower section or coil section):**

1B	5/32" hex (Allen) tool 3/8" nut driver	Remove all remaining front UVF panels. Remove end panels if possible.	
2B	1/4" nut driver	Remove screws along length of unit that secure the unit top to the blower section.	
3B	1/4" nut driver	Remove screws along length of unit that secure coil baffle to blower section. Remove (4) screws that connect the blower section sides to the coil section sides.	
4B	1/4" nut driver	Remove (1) screw from the center of the blower deck that attaches the blower deck to the pipe chase.	
5B	-	Remove the harness connector(s) from the motor.	-
6B	1/4" nut driver	Remove the 1/4" head screw from the green ground wire that connects the motor to the back frame if unit has a PSC motor. ECMs are grounded through the harness.	
7B	1/2" socket	Remove the (2) carriage bolts retaining the front brace to the frame sides.	
8B	1/2" socket	Remove the (4) nuts retaining the blower section to the back	
9B	1/2" socket w/ 12" extension	Remove the (2) nuts retaining the inboard bearing bracket to the pipe chase (UVF5 units only).	-
10B	-	Remove blower section from frame.	-

**Blower Section Reinstallation Instructions:**

11B		Reinstall blower section into frame assembly.	-
12B	½” socket	Tighten the (4) nuts retaining blower section to frame.	-
13B	½” socket	Tighten the (2) nuts retaining the inboard bearing bracket to the pipe chase	-
14B	½” socket	Reinstall (2) carriage bolts that attach the front brace to the frame sides.	
15B	¼” nut driver	Re-attach green ground wire that connects the motor to the frame with screw if unit has a PSC motor. ECMs are grounded through the harness.	
16B	-	Connect harness connector(s) to motor.	-
17B	¼” nut driver	Reinstall (1) screw at center of blower deck attaching blower deck to pipe chase.	
18B	¼” nut driver	Reinstall the (4) screws holding the blower section sides to the coil section sides.	
19B	¼” nut driver	Reinstall screws along length of unit securing coil baffle to the blower section.	
20B	5/16” nut driver	Reinstall Top	
21B	5/32” hex (Allen) tool 3/8” nut driver	Reinstall front and end panels. Ensure that tag on each right front panel matches unit tag. Panels have electrical information specific to each unit.	

**Coil Removal Instructions (Confirm on page 3 whether to remove blower section or coil section):**

1C	5/32" hex (Allen) tool	Remove all remaining front UVF panels. Remove end panels if possible.	
2C	1/4" nut driver	Remove screws along length of unit that secure coil baffle to blower section. Remove (4) screws that connect the blower section sides to the coil section sides.	
3C	1/4" nut driver	Remove screws holding Coil Section front baffle to coil section	
4C	1/4" nut driver	Remove screws attaching OA actuator to damper shaft and remove actuator.	
5C	-	Disconnect low limit thermostat wiring (right end compartment).	
6C	-	Drain water and/or reclaim refrigerant in accordance with all applicable codes. Disconnect piping from coil connections.	-
7C	-	Tag optional electric heat element wire terminations for later reconnection. Disconnect element wires from electric heat control box (remove coil baffle for access).	-
8C	-	Remove the (4) screws retaining the coil section to the frame. Remove coil section from frame.	

**Coil Reinstallation Instructions:**

STEP NO.	TOOLS REQUIRED	INSTRUCTIONS	REFERENCE DRAWING
9C		Replace coil section into frame assembly. **Note: We suggest using the flat edge of a paint scraper on either end of the coil section to create a smooth edge to slide the coil section back into the unit	
10C	½” socket	Tighten the (4) nuts retaining coil section to frame.	-
11C	-	Reconnect electric heat wiring in electric heat control box.	-
12C	-	Reconnect wiring to low limit thermostat.	-
13C	¼” nut driver	Replace screws along length of unit that secure coil baffle to blower section. Replace (4) screws that connect the blower section sides to the coil section sides.	
14C	¼” nut driver	Replace coil baffle using screws	
15C	¼” nut driver	Reinstall outside air actuator	-
16C	-	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.	-
17C	-	Replace coil section side insulation.	-
18C	5/32” hex (Allen) tool 3/8” nut driver	Replace front panels. Replace end panels.	-

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