ERV Fluid Coil Supplement

ENERGY RECOVERY VENTILATOR

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

This publication contains supplemental installation, operation and maintenance instructions for an ERV-with optional fluid coil.

Carefully read this publication and the installation, operation, and maintenance instruction for standard units of the ERV- Energy Recovery Ventilators publication prior to any installation or maintenance procedure.

Loren Cook catalog, *ERV,* provides additional information describing the equipment, fan performance, available accessories, and specification data.

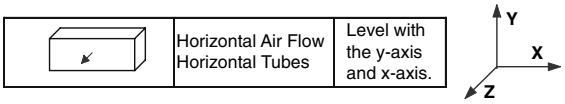
For additional safety information, refer to AMCA Publication 410-96, *Safety Practices for Users and Installers of Industrial and Commercial Fans*.

All of the publications listed above can be obtained from Loren Cook Company by phoning (417)869-6474, extension 166; by FAX at (417)832-9431; or by e-mail at info@lorencook.com.

For information on special equipment, contact Loren Cook Company Customer Service Department at (417)869-6474.

Mounting

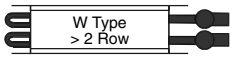
1. All water and glycol coils are designed to be fully drainable when properly mounted.
2. Vertical air-flow is not recommended for dehumidifying coils.

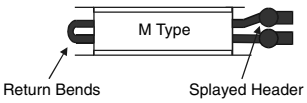


Coil Types

Standard Fluid Coils

Type “M” coils are used for one and two row applications that require same end connections. For type “M” coils the supply and return headers are offset or “splayed”. This orientation allows for the supply and return headers to be placed side by side.





Installation

1. It is recommended that the coils be cleaned with a commercially available coil cleaner prior to installation.

2. Check the coil hand designation to insure that it matches the system. Water and glycol coils are generally plumbed with the supply connection located on the bottom of the leaving air-side of the coil and the return connection at the top of the entering air-side of the coil (Figure 1 - Coil Connection Diagram). This arrangement provides counter flow heat exchange and positive coil drainage. If a universal coil is supplied, cap off the two unused connections.

3. Once installed, the coil should be pressurized to 100 psig with dry nitrogen or other suitable gas. The coil should be left pressurized for a minimum of 10 minutes. If the coil holds the pressure, the hook-up can be considered leak free. If the pressure drops by 5 psig or less re-pressurize the coil and wait another 10 minutes. If the pressure drops again, there is more than likely one or more small leaks which should be located and repaired. Pressure losses greater than 5 psig would indicate a larger leak that should be isolated and repaired. If the coil itself is found to be leaking, contact your local representative. Unauthorized repair to the coil may void the coil’s warranty (see warranty policy on back cover).

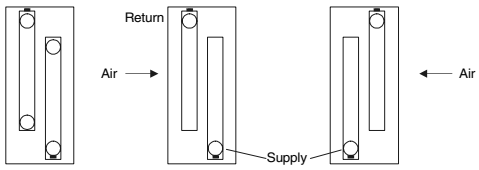


Figure 1 - Coil Connection Diagram

4. All field brazing and welding should be performed using high quality materials and an inert gas purge (such as nitrogen) to reduce oxidation of the internal surface of the coil.

5. All field piping must be self supporting. System piping should be flexible enough to allow for thermal expansion and contraction of the coil.

6. General piping diagrams can be found in Figure 2 - Horizontal Airflow.

Operation

Initial Start-Up

1. Open all air vents so that air is eliminated from within the coil circuitry and headers. Verify that all vents and drains are not obstructed and do discharge a stream of water.

2. Fill the coil with water then close all vents.

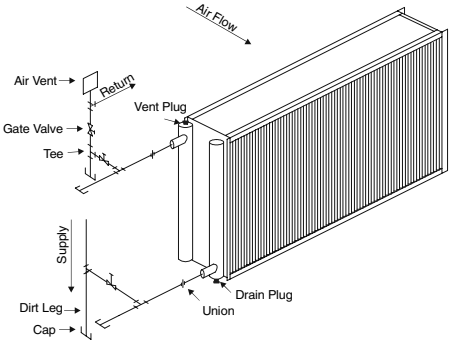


Figure 2 - Horizontal Airflow Diagram

3. Perform an initial hydrostatic leak test of all brazed, threaded or flanged joints, valves and interconnecting piping. Recheck the coil level and correct if necessary. When the setup is found to be leak free, discharge and discard initial water charge. It is important that all grease, oil, flux and sealing compounds present from the installation be removed.

General

1. Proper air distribution is vital to coil performance. Air flow anywhere on the coil face should not vary by more than 20%.

2. The drain pan and associated piping (drain line and trap) should be installed so that there is no standing water in the drain pan and that no blow-through occurs.

3. Fluid and air velocities should be maintained within recommended values.

Fluid Velocity	
Water	1 to 8 fps
Glycol	1 to 6 fps

Air Velocity	
Cooling Coils	Dry Surface: 200-800 fpm Wet Surface: 200-550 fpm
Heating Coils	200-1500 fpm

Maintenance

General

1. Filters should be inspected on a regular basis and changed as needed. Maintaining clean filters is a cost effective way to help maintain maximum coil performance and service life.

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2. Periodic inspection of the coil for signs of corrosion and/or leaks is recommended. Repair and replacement of the coil and the connecting piping, valves, etc., should be performed as needed by a qualified individual(s).

3. Should the coil surface need cleaning, caution should be exercised in selecting the cleaning solution as well as the cleaning equipment. Improper selection can result in damage to the coil and/or health hazards. Clean the coil from the leaving air-side so that foreign material will be washed out of the coil rather than pushed further in. Be sure to carefully read and follow the manufacturer's recommendations before using any cleaning fluid.

4. Maintain the circulated fluid free of sediment, corrosive products and biological contaminants. Periodic testing of the fluid followed by any necessary corrective measures along with maintaining adequate fluid velocities and proper filtering of the fluid will help to satisfy this goal.

5. If automatic air vents are not utilized, periodic venting of the coil is recommended to remove accumulated air. Caution should be exercised to avoid injury. High pressure and/or high temperature fluids can cause serious personal injury.

Freeze Protection

During the winter, chilled water coils need to be protected against freezing. The two predominant protective measures are covered below.

Blowing-Out Coils

1. Isolate the coil from the rest of the system by closing the valves on both the supply and return lines (gate valves in Figure 2 - Horizontal Airflow Diagram).

2. Drain the coil by opening all drain valves and/or the drain plug. Remove the vent plug to aid the draining process.

3. Once the coil has been fully drained, the blower can be hooked-up. Caps installed in the piping on straight runs going to the supply and return connections are ideal points to hook-up the blower. The air vent and drain plug are not suitable locations for hooking up the blower. Caution should be exercised when installing the blower. The blower operator must take precautions to insure that water does not come into contact with any of the electrical components of the blower. Failure to do so may result in damage to the equipment and serious injury.

4. Close the vent or drain plug on the header which the blower is connected and open the drain valve or cap on the other header.

5. Operate the blower for 45 minutes and then check the coil to see if it is dry. A mirror placed in the discharge will become fogged if moisture is present. Repeat this procedure until the coil is dry.

6. Let the coil stand for several minutes then blow it out again. If water comes out, repeat the blowing operation.

7. Leave all plugs out and drains open until the threat of freezing has passed.

Flushing Coils

1. Recommend the use of inhibited glycol designed for HVAC applications for corrosion protection. The use of uninhibited glycol has produced formicary corrosion in copper tubing. The complete filling of water coils with an inhibited glycol solution for freeze protection can be expensive. In some instances, it is more cost effective to flush the coils with an appropriate concentration of inhibited glycol solution. Residual fluid can be left in the coil without the threat of freeze damage provided the correct concentration of inhibited glycol was used. The recovered fluid can then be used to flush other coils. Select an inhibited glycol solution that will protect the coil from the lowest possible temperatures that can occur at the particular coil's locality. The following tables have been provided for your convenience.

% Ethylene Glycol By Volume	Freeze point[1]
0	32° F
10	25° F
20	16° F
30	3° F
40	-13° F
50	-34° F
60	-55° F

% Propylene Glycol By Volume	Freeze point[1]
0	32° F
10	26° F
20	19° F
30	8° F
40	-7° F
50	-28° F
60	-60° F

2. Estimate the volume of the coil in gallons.

For 5/8" tubes (1.5" face tube spacing)

(finned height in inches)x(finned length in inches)x(# of rows)x 0.0011 = gallons

For 1/2" tubes (1.25" face tube spacing)

(finned height in inches)x(finned length in inches)x(# of rows)x 0.00083 = gallons

3. Isolate the coil from the rest of the system by closing the valves on both the supply and return lines (gate valves in Figure 1 - Horizontal Airflow).

4. Drain the coil by opening all drain valves and/or the drain plug. Remove the vent plug to aid the draining process.

5. Close the drain valve(s) and drain plug.

6. Connect the flushing system to the coil. A typical system is shown in Figure 3 - Flushing System Diagram.

7. With the throttling valve closed, start the pump and operate until the air is vented from the coil. Next, close the air vent.

8. Open the throttling valve about half-way and circulate the fluid through the coil for 15 minutes. Check the strength of the fluid. A hydrometer or test kit from the fluid manufacturer is suitable for this application.

9. Adjust the solution strength as needed and circulate the fluid for another 15 minutes.

10. Repeat steps 8 and 9 until the desired concentration is reached.

11. Shut the pump down and drain the inhibited glycol from the coil.

12. The recaptured fluid can be used to flush other coils.

Note: *Be sure to follow the manufactures' recommendations before utilizing any glycol based antifreeze solution. Additional fluid will be required for the pump, connected piping and fluid reservoir. Formulae are for estimation purposes only.*

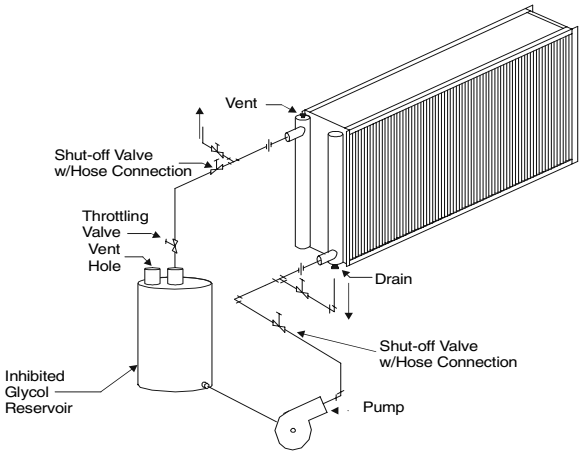

Figure 3 - Flushing System Diagram