



# Fluid Coil Installation, Operation and Maintenance



## FLUID COIL INSTALLATION, OPERATION & MAINTENANCE GUIDELINES

Fluid Coil Installation, Operation and Maintenance Guidelines for the installation, operation and maintenance of Cancoil cooling and heating coils have been provided to help insure the proper performance of the coils. These are *general guidelines* that may have to be tailored to meet the specific requirements of any one product. The installation and maintenance of any coil should be performed by a qualified party or individual. Protective equipment such as safety glasses, steel toe boots, and gloves are highly recommended during the installation and routine maintenance of the coil.

### RECEIVING INSTRUCTIONS

1. All Cancoil coils are factory tested, inspected and carefully packaged.
2. Upon receipt of equipment, inspect for shortages and damage. Any shortage or damage found during initial inspection should be noted on delivery receipt and signed by the driver. This action notifies the freight carrier that you intend to file a claim. Any damaged equipment is the responsibility of the carrier.
3. Do not return to the manufacturer without receiving approval in the form of a Return Material Authorization (RMA) number.
4. For additional assistance, contact your local Cancoil coil representative.

### Installation of Coil

1. Carefully remove the coil from the shipping package to avoid damage to the finned surface area. If a moisture eliminator was purchased, remove it before 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 2 - 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. Standard coils must be mounted level to insure drainability. Refer to Mounting on page 3 for leveling requirements. Coils with intermediate headers and coils with removable box style headers can be pitched 0.125" per foot of coil finned length towards the coil's header/connection end.
4. Proper clearance should be maintained between the coil and other structures such as the fan, filter racks, transition areas, etc..
5. 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 by a licensed mechanical contractor. If the coil itself is found to be leaking, contact your local Cancoil representative.
6. 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.

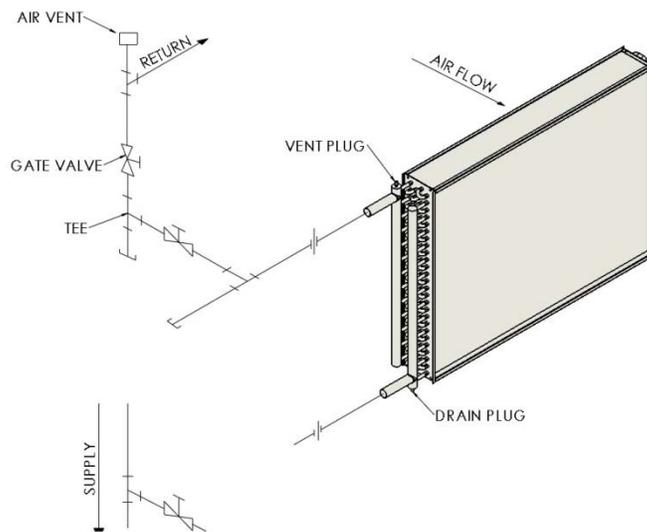
7. All field piping must be self supporting. System piping should be flexible enough to allow for thermal expansion and contraction of the coil.
8. All piping must be in accordance with all local building codes.
9. General piping diagrams can be found in Figure 1 - Horizontal Airflow and Figure 3 - Vertical Airflow.
10. If a moisture eliminator was purchased with the coil installed, place the moisture eliminator into its brackets.
11. Make sure the mesh is aligned with the coil face area (finned area).

### Fin Straightening

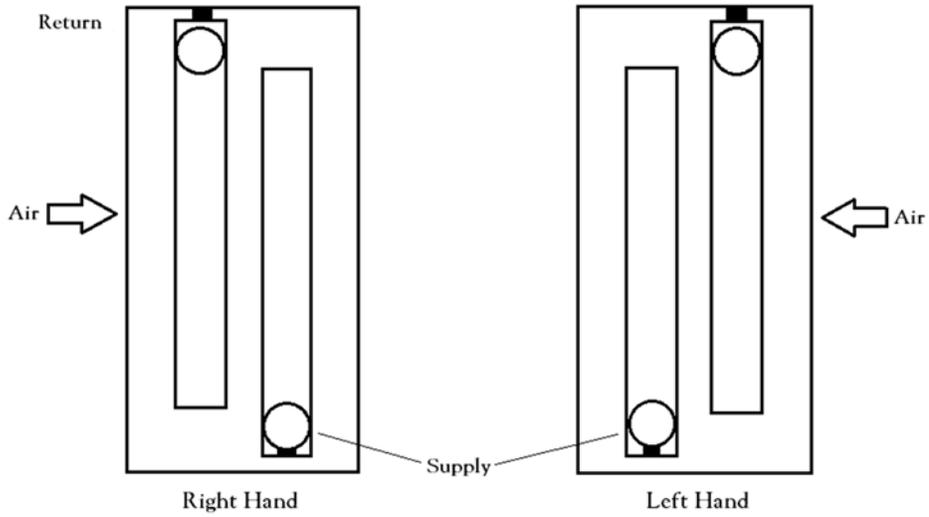
Coil fins may have been bent during shipping or servicing, and should be straightened to maintain maximum heat transfer. Reduction of the effective coil surface will correspondingly reduce coil capacity. Always check fin appearance after any handling of the coil and after any servicing is done near the coils.

Fin combs are sized according to number of fins per inch of the coil. For relatively small bends that require only minor repair, other tools may be used to evenly space the fins. Be careful not to damage the coils.

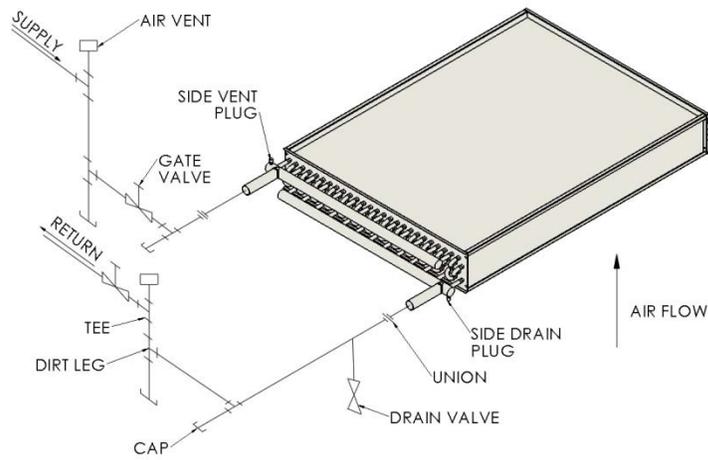
**Figure 1 – Horizontal Airflow Diagram**



**Figure 2 – Connection Diagram**



**Figure 3 – Vertical Airflow Diagram**





## 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.
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 our recommended values.

| Fluid Velocity |            |
|----------------|------------|
| Water          | 1 to 8 fps |
| Gylcol         | 1 to 6 fps |

| Air Velocity  |                            |   |
|---------------|----------------------------|---|
| Cooling Coils | Dry Surface: 200 - 800 fpm | With eliminator<br>Dry Surface: 200 - 800 fpm |
|               | Wet Surface: 200 - 550 fpm | Wet Surface: 200 - 750 fpm                    |
| Heating Coils | 200 - 1500 fpm             |   |

## Maintenance

### General

1. Filters and moisture eliminators should be inspected on a regular basis and changed as needed. Maintaining clean filters and mist eliminators is a cost effective way to help maintain maximum coil performance and service life.
2. Periodic inspection of the coil for signs of corrosion and/or leaks is recommended. Repair and replacement of the coil and the connection of piping, valves, etc., should be performed as needed by a qualified technician.
3. Should the coil surface need cleaning, caution must 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. The circulated fluid must be free of sediment, corrosive products and biological contaminants. Periodic testing of the fluid followed by any necessary corrective measures



along with maintaining proper fluid velocities and 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.

### Low Temperature Maintenance Requirements

Water coils need to be protected against freezing in cold weather. The two predominant protective measures are covered below.

#### Purging 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 1 - Horizontal Airflow and Figure 3 - Vertical Airflow).
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 compressed air supply 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 compressed air supply. The air vent and drain plug are not suitable locations for hooking-up the compressed air supply. Caution should be exercised when installing the compressed air supply. The compressed air supply operator must take precautions to insure that water does not come into contact with any of the electrical components of the compressed air supply. 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 compressed air supply is connected and open the drain valve or cap on the other header.
5. Operate the compressed air supply 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 compressed air supply operation.
7. Leave all plugs out and drains open until the threat of freezing has passed.

#### Flushing Coils

1. Cancoil recommends 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 (F) | Freeze Point (C ) |
|-----------------------------|------------------|-------------------|
| 0                           | 32               | 0                 |
| 10                          | 25               | -3.9              |
| 20                          | 16               | -8.9              |
| 30                          | 3                | -16.1             |
| 40                          | -13              | -25.0             |
| 50                          | -34              | -36.7             |
| 60                          | -55              | -48.3             |

| % Propylene Glycol by Volume | Freeze Point (F) | Freeze Point (C ) |
|------------------------------|------------------|-------------------|
| 0                            | 32               | 0.0               |
| 10                           | 26               | -3.3              |
| 20                           | 19               | -7.2              |
| 30                           | 8                | -13.3             |
| 40                           | -7               | -21.7             |
| 50                           | -28              | -33.3             |
| 60                           | -60              | -51.1             |

\*Freeze points may vary from product to product.

2. Estimate the volume of the coil in gallons.  
 For 0.625" tubes (1.5" face tube spacing)(finned height in inches)x(finned length in inches)x(# of rows)x 0.0011 = gallons  
 For 0.5" 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 and Figure 3 - Vertical 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.
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.



### Flow Equalizer Equipped Coils

Some water coils are equipped with flow equalizer headers and pressure reducing valves. It is important to note that these coils also require draining of all water if the coil will be exposed to ambient temperature below 32o F (0 o C). It is recommended that when a water cooling or water heating coil is pressurized to 350 psi, to ensure that pressure reducing valve opens at this pressure.

At the time of charging the system with water, ensure that there is sufficient water filtering capacity to prevent any debris entering the coil and lodging at the valve inlet.

Connect a properly sized drain line from the valve to the drain pan for proper drainage of water.

**CAUTION**  
**RELIEF VALVE SET AT 300PSIG**  
  
**DO NOT**  
**PRESSURIZE COIL MORE**  
**THAN 250 PSIG**  
  
**DRAIN WATER FROM COIL**  
**IF EXPOSED TO ZERO**  
**DEG. C OR LOWER AIR**  
**TEMPERATURE**

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