20130 Valley Forge Circle
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www.cooneycoil.com

Installation and Maintenance of Cooney Freeze Block Coils

Receiving a shipment

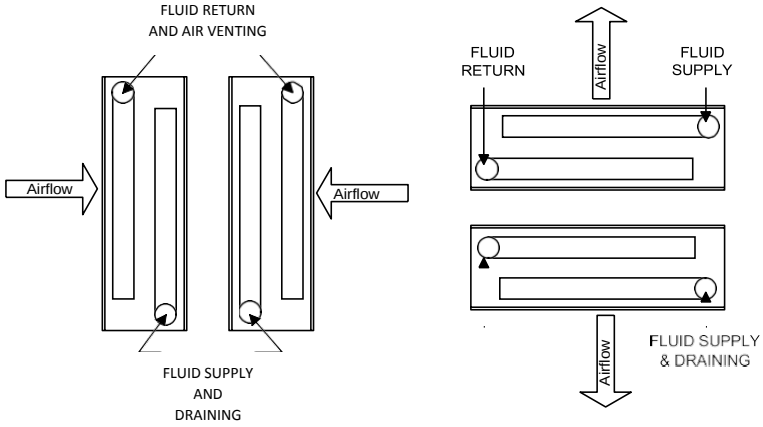
All coils, unless otherwise pre-arranged with CES, are shipped FOB plant requiring all received crates and coils be inspected for any signs of possible freight damage. CES makes every effort to protect the coils from shipping damage but if suspect upon arrival, check the coil while the carrier is still present. If there is damage file a claim with the carrier.

Installation

Coil Mounting Orientation -

A Freeze Block coil is designed to be mounted in one particular orientation. Proper coil orientation ensures proper valve deployment given a freeze event, maximum heat transfer, automatic purging of air in the tubes and complete draining of the liquid by gravity. If the coil is improperly installed or has not been built to fit the orientation required at the job site, coil performance may be diminished.

The sketch shows the proper fluid connections and horizontal air flow direction of a coil built for a "Right" or for a "Left" hand installation. Also shown are the proper fluid connections to a coil built for a vertical air flow orientation.



Coil and Pipe Support -

Fluid coil tubes must be horizontal and level with the ground for maximum draining, and the sheet metal coil casing firmly attached to the duct work or supporting structure. Any movement or vibration in the coil and / or connected piping during operation must be minimized as this could put excessive bending force on the headers. Piping at the coil should be supported so the weight of the piping and fluid in the piping are not supported by the coil headers. Also see the "Precautions" section.

Piping Connection -

The coil connections are usually copper or brass. They are softer than steel connections and can easily be cross-threaded and damaged by over tightening. Coils with small headers with a few tubes can be twisted out of shape, especially if a long handled wrench is used.

It is recommended that a second wrench be attached to the integral hex nut on the coil connection, (if provided) and held firmly to prevent the twisting of the coil connection as force is applied by the tightening wrench.

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Freeze Block Valve Drainage -

All Freeze Block valves should have access to an open drain. Attaching a hose to direct drain flow is optional. Any hose attachment to direct drainage should flow downward ensuring proper flush. Traps should not be employed as significant damage could occur when the valves are deployed during a freeze event. Any coil installed or operated with a drainage restriction will not be covered under the Freeze Block Warranty.

Access Panels -

All new air handling units designed and manufactured with the Cooney Freeze Block technology must be equipped with access doors at all relief valve connections. These access doors must be large enough to perform any and all necessary maintenance to the relief valve section of the coil.

Avoiding Tube / Fin Damage -

When cutting or drilling near the coil, observe and check the location of the nearest tubes and header to avoid puncturing them. If the coil fins get bent they can be combed out by utilizing and fin comb, (this needs to match the coil's fins per inch) and can be procured from a local HVAC supply house.

Insulation -

All Fluid Cooney Freeze Block Coils will come with pre-insulated return bends and expansion relief headers on the front and back of the coil. This insulation must be left in place for the life of the coil. The supply and return piping and fittings to and from the coil connections must be fully insulated and or heat traced to be protected against freezing in the event that the piping is exposed to freezing conditions

Note -

Any coil installed or operated without this insulation will not be covered under the Freeze Block Warranty.

Initial Operation

Startup -

During initial startup, the fluid flow should be gradually increased until the system has been vented of all entrapped air. If the coil is mounted properly and vented (with mechanical air vent or manually) it will purge itself of air. Trapped air in the system can lower the efficiency of the system, cause excessive corrosion and erosion, and create water hammer along with vibration. This air needs to be removed, ideally at the highest point of the coil or in the return line of the system.

Leak Check -

It is suggested that the coil be checked for leaks several days after initial startup when the system is operating at full fluid flow and temperature levels.

Note -

Rain water, cleaning, loose connections and condensation dripping off piping, coil surfaces or headers may look like a coil leak. Investigate these thoroughly to avoid downtime and expense prior to leak testing the coil.

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Performance

Thermal -
Optimum heat transfer of a coil can be maintained if the fin surface and inside of the tubes are kept clean, along with a tight bond between the fins and tubes. Should a coil not meet thermal expectations the problem may reside elsewhere in the system.
The coil is the final component in a series with other heating and cooling components. It relies on these prior components working properly to supply the correct fluid flow rates at designated temperatures. The coil is the easiest component to measure how well the entire heating / cooling system is operating and usually the first to be suspect when the root cause may lie elsewhere.

Durability -
Similarly the durability of a coil can be affected by distant issues in the system. Water hammer, pressure and / or temperature spikes, vibration, water treatment incompatibility and other factors may first show up at the coil as a leak. This may be a result of an issue somewhere else in the system. These factors need to be investigated if there is a deficiency in the coil's thermal performance or durability. Once eliminated, a more thorough evaluation can be done. Refer to the "Initial Operation" and "Precautions" sections.

Cleaning

Valves-
It is extremely rare that a Freeze Block Valve would clog but it can occur if a system experiences repeat freeze and thaw cycles along with an excessive amount of sludge or deposits moving through the valves. It is recommended that strainers and / or filters be installed according to industry standards throughout the chilled water and hot water systems to prevent such situations.

Fins -
The fin surface can be cleaned in several ways. For light dust or dirt that does not aggressively adhere to the fins, blowing low pressure, (oil free) compressed air across the fins or use of a mild soapy detergent that is "free" rinsing, (leaving no residue behind) should be sufficient. Any such cleaning solution needs to be compatible with the coil material and must not be applied to a hot coil so as to allow time for the cleaning solution to work and not burn solvents into the airstream and / or coil materials. Be sure to rinse the seams and crevices thoroughly, especially brazed and welded joints along with where the coil tubes come through the coil casing. After rinsing, the coil needs to be dried as quickly as possible. Ideally use low pressure, (oil free) compressed air to minimize any corrosion.
For more aggressive contaminates a stronger solution or solvent and / or cleaning procedure may be required. Contact CES for more in-depth details.

Steam Cleaning -
The coil can be steam cleaned but the steam pressure needs to be low and the steam parallel to the fins, otherwise the force of the steam could bend the fins over. Also if the fins are severely corroded at the point of contact with the tube, steam cleaning could further deteriorate this critical fin-to-tube bond.

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Cleaning Position -

The ideal cleaning position for a coil is with it flat because contaminates travel the shortest distance before being forced out. Cleaning the finned surface in the upright position allows contaminates to collect at the bottom of the coil making it difficult to get debris out.

Seasonal Shutdown

Short Term -

Short term shutdowns do not require draining the coil if the temperature surrounding the coil is above the freeze point and below the boiling point of the fluid and the fluid is relatively free of oxidizing dissolved air.

Winterization -

For winterization of chilled water Freeze Block coils, draining is required. Undrained fluids are likely to cause internal tube corrosion, fowling along with possible exposure to repeated freezing and thawing. These issues may cause tube damage and premature failure

All Cooney Freeze Block coils are manufactured with threaded drain connections at the bottom of the supply header along with each of the expansion relief headers. A threaded vent connection is located at the high point of the outlet header. Each of these connections require a ball valve, (not included) to be installed prior to the coil installation and operational for use during draining and winterization. When draining, the coil should be isolated from the fluid system. Open the vent ball valve at the top of the coil along with all ball valves at the bottom. If the coil has been installed properly, (see "Installation") the fluid will drain out by gravity. All vent and drain ball valves should be left open throughout the entire heating season to properly winterize the coil. Coil failures related to lack of proper winterization by customer shall not be covered under the Freeze Block warranty.

Precautions

System issues, or a coil not designed for the rigors of the particular application, as mentioned in the "Performance" sections could cause premature coil failure. The possibility of replacing the coil should be considered in the initial site design or at the time of installation especially if it is a crucial component in the process. Another consideration should be what affect any leaking fluid would have on the surroundings.

Repairs

Do not attempt to repair a Freeze Block coil without Cooney Engineered Solutions factory authorization. Doing so voids the warranty and destroys any evidence of what caused the leak so it is not possible to be evaluated. If the coil is damaged beyond repair it must be replaced. Also refer to the "Performance" and the "Precautions" sections.