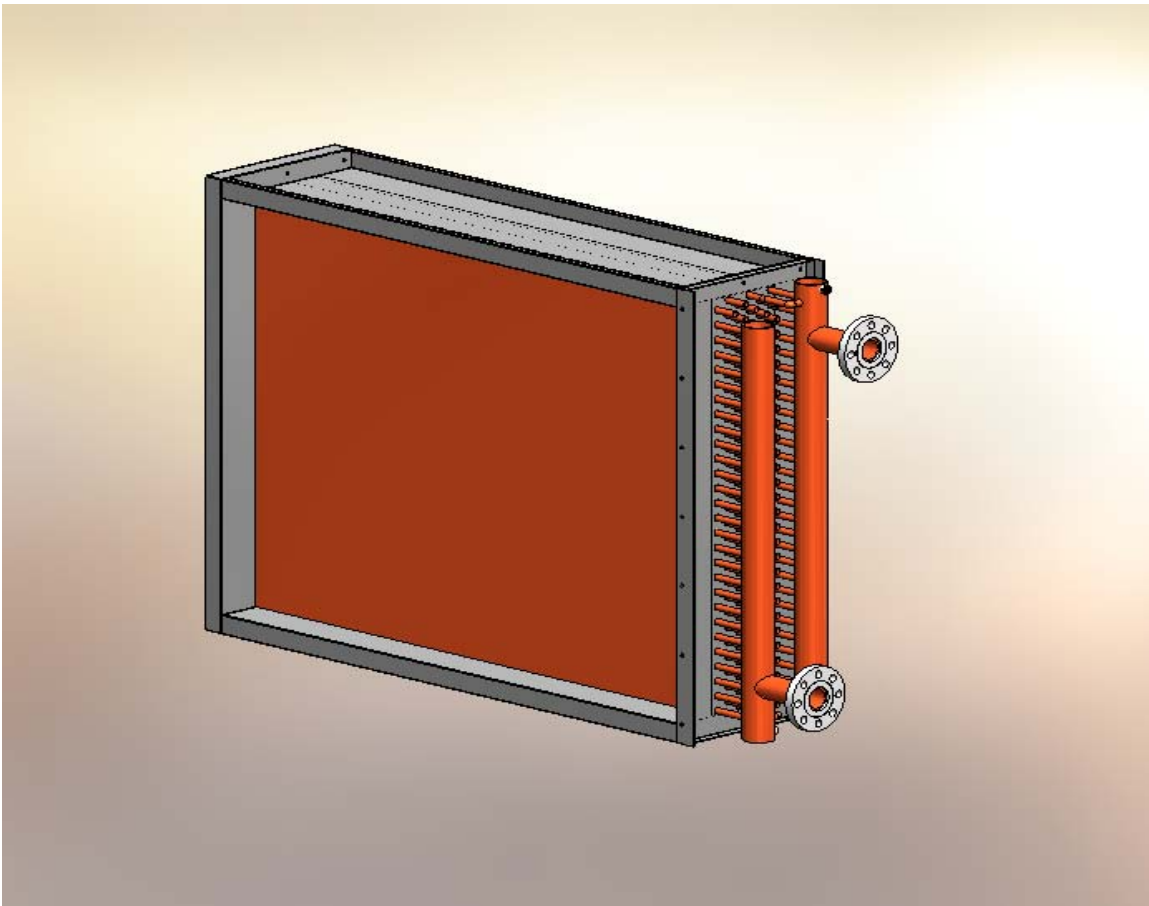




# Water Coils

## Installation, Operation, Maintenance & Service Instructions



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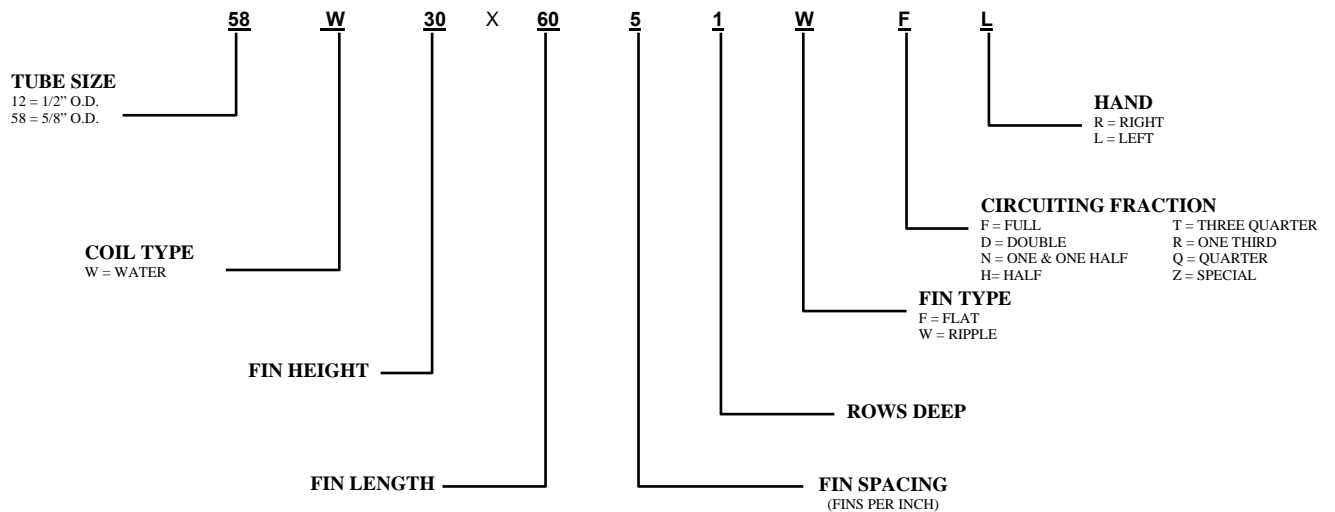
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## Caution

The instructions included in this IOM are provided as guidance to the installer and service provider. All personnel working with the equipment should be qualified to do so and should perform work in accordance with all standard practices. Safety precautions should also be taken. This includes but is not limited to the use of gloves, steel toe boots, hard hats, and safety glasses.

## 2.0 Nomenclature



## 3.0 Receiving

### 3.1 Initial Inspection

Immediately upon receipt, the following should be checked:

1. Bill of Lading / Original Purchase Order
2. Crate
3. Coil

The accuracy of the Bill of Lading must be checked against the physical shipment. Any ship loss parts specified on the bill as separate line items. Any inaccuracies must be documents immediately on the carrier's freight bill and signed by the driver. In addition the Original Purchase Order and Bill of Lading should be equivalent. If any difference is perceived the Factory Sales Representative should be contacted immediately. The above Nomenclature breakdown can be used to clarify any discrepancies between the physical product, the bill of lading, and the original purchase order with regards to the coils geometry.

Crate(s) are designed to protect their contents under reasonable shipping conditions. All coils are shipped in vertical configuration and fully enclosed. Upon arrival packaging should be inspected for broken boards. Broken boards can be an indicator of potential product damage and should be documented.

A visual inspection of the coil(s) appearance should be conducted upon receipt. Even though the packaging is robust, the crating is constructed with wood planks that are gapped. This slating does allow for the potential of foreign objects: chain falls, ratcheting straps, road debris, etc to contact coil surfaces.

### **3.2      *Handling***

When handling coils always wear gloves, the fins and sheet metal edges are very sharp and can seriously injury unprotected hands. All coils should be handled by the casing. Do not attempt to move, support, or lift the coil by the connections headers, tubes, fin face or other non-casing components of the coil.

### **3.3      *Unpacking / Cleaning***

If the coil(s) is to be stored it should be done so in its original packaging. Once the coil is needed, it should be transported to, or as close as possible to the point of use as possible before unpacking. It is recommended to disassembly the top, and sides of the crating before removing its contents. Care should be taken not to damage the coil fins surfaces, however if minor localized minor trauma does occur then fin combs can be purchased from a HVAC supply house to re-orient the fins. If damage is localized, but extends to the refrigeration circuit(s), the integrity of the copper tube(s) must be checked. If damage to the fin surface is extensive the coil's performance will suffer and should be corrected or replaced.

It is standard practice to insert cardboard between the outer finned surface on the coil grouping and the inside crate surface. This helps reduce the potential for air and foreign debris from contacting and embedding itself into the fins, therefore keeping the surfaces cleaner. However, since coil performance is dependant on air flow across the coil fins, it is recommended that all coils are cleaned before installation with a commercially available coil cleaner.

### 3.4 Lifting / Rigging

Rigging and lifting methods may include slings or other suitable devices. All slings, devices, and apparatus should be of a rating suitable for the loads they will be subjected to during the lift. Additionally, the lifting means must ensure that no deformation of the coil casing occurs.

Spreader bars must be used to hold cables or sling straps vertical and away from the coil to prevent damage to coil components.

If the coil is an unbalanced load, use all lifting points and adjust cables / slings and cable / sling lengths for proper balance.

Recommendation: Lifting and rigging attachments are used on a crane or hoist between the hook and the item to be lifted. Lifting and rigging attachments must be properly configured for the weight of the load, the type of crane or hoist and the type of chain, rope, or hook being used to lift the load. A load leveler or end fitting is commonly used as a sling attachment to stabilize the load. A hoist attachment that works between the hook and the load includes a coil lifter, tongs, spreader beams and pallet lifters. Maximum load capacity, maximum lifting volume, and application or uses are important specifications to consider.

RAE assumes no responsibility for lifting apparatus, devices, and methods used by others for rigging and lifting. Do not lift the coil from the headers.

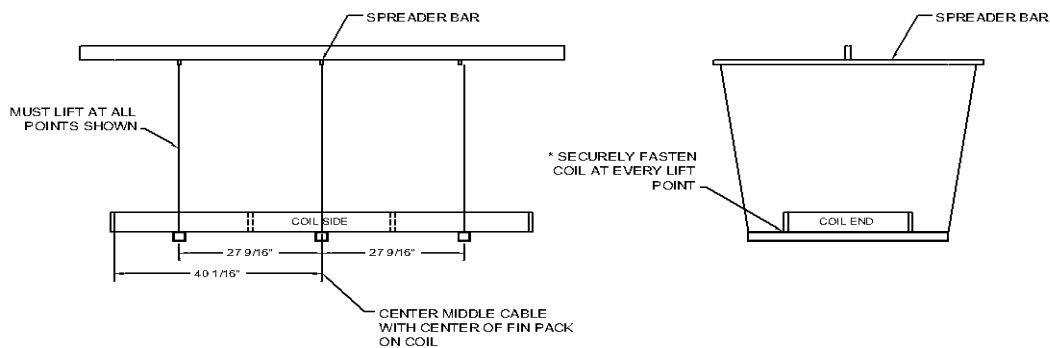


Figure 3.1 – Typical Lifting Apparatus

## 4.0 Installation

### 4.1 Mounting

Install water with tubes horizontal and level. This will allow for the most effective venting and draining of coils on startup and shutdown. Water coils used with hot water/fluid for air heating may be designed for use with either horizontal or vertical airflow provided the coil tubes are level. Installation of water coils with tubes mounted vertically is not recommended. Coils used with chilled water/ fluid should be designed for horizontal airflow with the tubes horizontal and level. Vertical airflow is not recommended for chilled water coils.

#### **4.2 Clearance**

Proper clearance should be maintained between the coil and other structures such as the fan filter racks, transition areas, etc. These clearances are typically application specific and should be based on experience. Proper clearances should result in airflow distribution tolerances listed in this IOM.

## **5.0 Piping**

### **5.1 General Notes:**

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.

All piping must be fully supported at locations other than the coil. The piping should be flexible enough to provide no forces on the coils due to thermal expansion. Do not support piping from coil or headers.

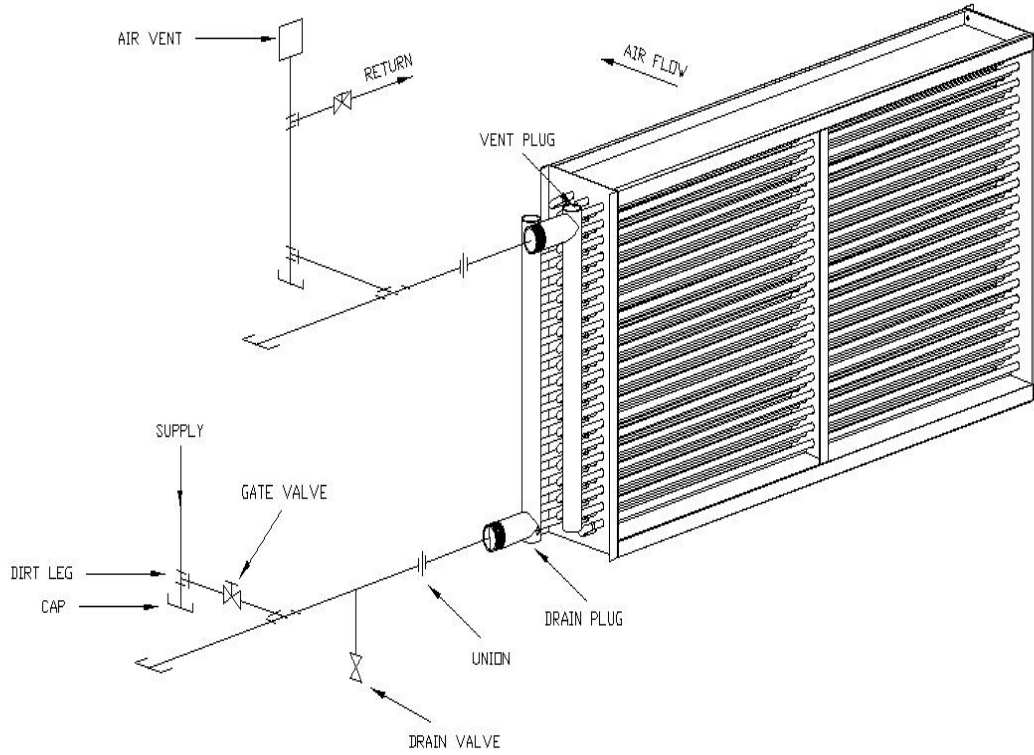
Vent each coil at its highest location to insure the exit of gases and to promote proper drainage.

Piping should be the same size as the inlet and outlet connections.

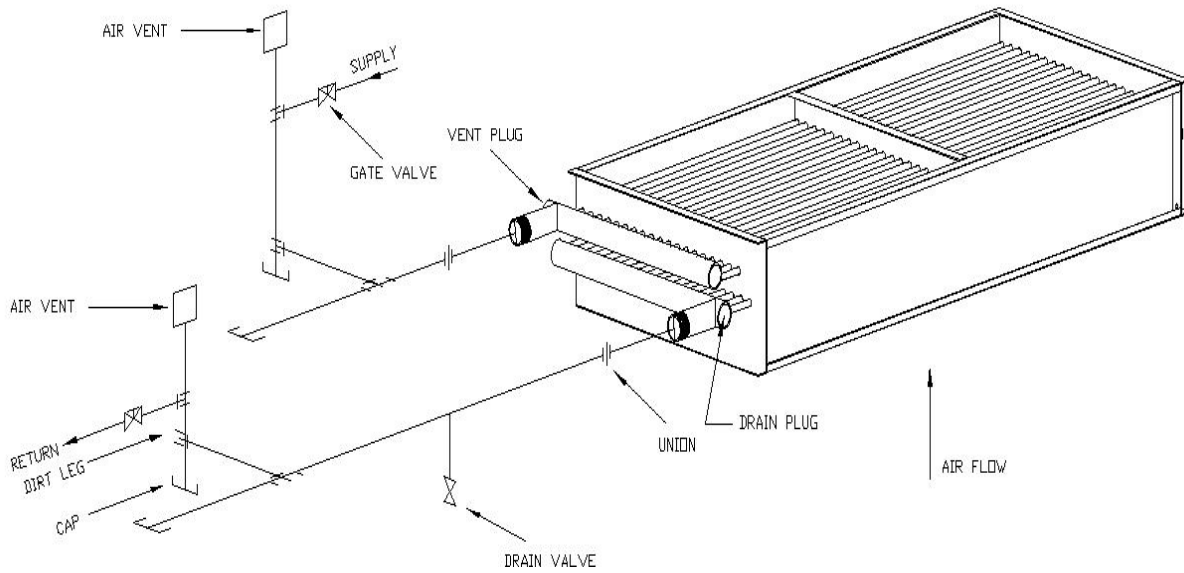
For threaded pipe connections, use only good quality fittings with tapered threads. Use of liquid Teflon type pipe joint compound is recommended. Threaded piping hook-ups should always be made using two wrenches.

Manual service valves should be installed to isolate the coil for servicing.

COIL PIPING  
HORIZONTAL AIR FLOW  
(CHILLED WATER COILS)



COIL PIPING  
VERTICAL AIR FLOW  
(RECOMMENDED FOR HOT WATER/GLYCOL COILS ONLY)



## 5.2 Piping Schematic

- After installation of the coil, it should be pressurized to 100 psig with dry nitrogen. The pressure should be held for at least 10 to 15 minutes to insure that there are no leaks. If the coil itself is found to be leaking, contact your local sales representative for warranty authorization. **Unauthorized repair to the coil will void the warranty.**
- Open air vents, close drains, fill the coil with water and close vents. Perform a hydrostatic leak test on all piping joints to insure there are no leaks. Drain and discard water charge.
- After the coil and piping are leak tested, open all air vents so that air is eliminated from the coil tubes and headers. Verify that all vents and drains discharge a full stream of water and are not blocked.
- Fill the coil with water/fluid then close all vents and drains.
- During initial startup, tighten all bolted connections once the system stabilizes at operating temperature.

## 6.0 OPERATIONS

Proper air distribution is vital to coil performance. Air velocity anywhere on the coil should not vary by more than 20% from the average velocity.

- Hot Water/Fluid air velocities should be maintained between 200 and 1500 feet per minute.
- Dry Chilled Water/Fluid air velocities should be maintained between 200 and 800 feet per minute.
- Wet Chilled Water/Fluid air velocities should be maintained between 200 and 550 feet per minute.

Operating pressures must be at or below the maximum operating pressure for the coil at the fluid temperature. Contact your local sales representative for assistance. Drain coils to prevent corrosion during shutdown. In glycol based systems, always use inhibited glycols. Use of uninhibited glycols can result in corrosion of copper tubes. In chilled water systems, use the following procedure to effectively prevent **freeze** damage to water coils after shutdown during periods of cold weather.

### Freeze Protection

1. Drain water from coil.
2. Blow out remaining water droplets with compressed air.
3. Completely fill coil with antifreeze with proper concentration for the lowest expected temperatures.
4. Drain antifreeze solution and replace drains and vents.

## 7.0 MAINTENANCE

- To continually deliver full heating capacity, both the external and internal heat transfer surfaces must be maintained as clean and corrosion free as possible. The finned surface can be maintained by the use and constant inspection of pre-filters. The filters should be replaced as needed.
- Should the finned surface become fouled, the coil can be cleaned utilizing commercially available coil cleaning fluids. 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. Be sure to carefully read and follow the manufacturer's recommendations before using any cleaning fluid. Clean the coil from the leaving airside so that foreign material will be washed out of the coil rather than pushed further in.
- Keep circulating fluid free of sediment and corrosive elements. The use of fluid filters is recommended.
- Periodic venting of the coil is recommended when automatic vents are not utilized to remove accumulated air. Use caution to avoid injury. Contact with venting high pressure and/or high temperature fluid can cause serious personal injury.
- Inspect and tighten all bolted connections on a regular basis.

## 8.0 STORAGE

If coils are to be stored, they should be drained of any fluid and compressed air or an inert gas should be blown through the headers to assist in drying the coil.

If coils are to be stored, it is preferred that they are stored indoors in a clean, dry location that is level and sturdy. If they are stored outdoors, the coil should be stored off the ground and wrapped fully with a tarp or plastic.

It is recommended that the fin surface be protected by some means to prevent accidental damage.

# WARRANTY

**RAE CORPORATION MAKES NO WARRANTY OF MERCHANTABILITY AND NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, NOR DOES IT MAKE ANY WARRANTY, EXPRESS OR IMPLIED, OF ANY NATURE WHATSOEVER WITH RESPECT TO PRODUCTS SOLD BY RAE CORPORATION OR THE USE THEREOF EXCEPT AS IS SPECIFICALLY SET FORTH ON THE FACE HEREOF, EVEN THOUGH IT MAY HAVE BEEN NEGLIGENT. RAE CORPORATION SHALL IN NO EVENT BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL OR PENAL DAMAGES. RAE CORPORATION MAKES NO WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED TO 'CONSUMERS' AS THAT TERM IS DEFINED IN SEC. 101 OF PUBLIC LAW 93-637, THE MAGNUSON-MOSS WARRANTY-FEDERAL TRADE COMMISSION IMPROVEMENT ACT.**

The RAE Corporation warrants to the original Purchaser-User that Products manufactured by RAE Corporation shall be free from defects in material and workmanship under normal use and service for a period of eighteen months from the date of shipment from RAE Corporation plant or twelve months from date of start-up, whichever period first expires.

The obligation of RAE Corporation under this warranty is limited to RAE Corporation repairing or replacing, free of cost to Purchaser-User, F.O.B. factory, any part or parts that in the judgment of RAE Corporation show evidence of defect provided that upon RAE Corporation authorization the said part or parts be returned to RAE Corporation, transportation prepaid, for inspection and judgment. Under this warranty RAE Corporation assumes no responsibility for the expense of labor or materials necessary to remove a defective part or install repaired or new parts.

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