# INSTALLATION GUIDE

## M-8330HC STAINLESS STEEL MANIFOLD

## WARNING

Read this Installation Manual PRIOR to installing this device. Noncompliance with safety and use information can result in serious personal injury, property damage, or damage to the device and may void the warranty. Keep this IOM for future reference.

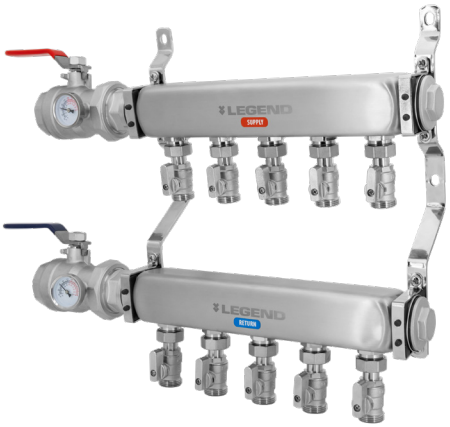
Individuals performing removal and disassembly should be provided with suitable protection from possibly hazardous liquids.

## INTRODUCTION

The M-8330HC Stainless™ Manifolds are designed for use in high flow hydronic applications like Snow and Ice Melting. They have a 1-1/2" header and are available in sizes from 3 port, up to 15 port. Consult your local Representative for project specific requirements. The 8330HC manifolds do not have balance valves, so it is important to us a self-balancing loop design. This means that all of the loops should be within 5% of each other in length on the manifold. Additionally, the supply and return piping should be installed in a Reverse-Return configuration to allow for self-balancing across the manifolds.

The manifold components are packaged in multiple boxes and must be assembled before attaching the radiant tubing or performing system start-up procedures. Therefore, we are recommending the following sequence for complete installation of the manifold.

1. Assemble the Manifold Components
2. Mount Manifold
3. Connect the Radiant Tubing
4. Pressure Test
5. Fill & Purge the System




**Pictured:**
**M-8330HC**
SS Manifold

## MANIFOLD COMPONENTS

1. The components for the M-8330HC manifold consist of: Base unit, header isolation valves, end plugs and header union(s).
2. A base unit box should contain both a Supply and Return Header, Circuit Isolation Valves on all the ports, and be mounted on brackets.
3. Depending on how many ports the manifold has, a complete manifold will have one, two or three base units and possibly one or two manifold unions.
4. Determine the overall size of the manifold to be installed and verify that installation area is large enough.

# DETERMINE THE LOCATION OF THE MANIFOLD

1. The manifold location is normally determined during project design prior to installation. If the location was not previously selected or the selected location is no longer suitable due to project changes; a new location can be chosen based upon the following criteria: It should be located near the area (radiant panel) where the tubing is to be installed in order to avoid long circuit tails. It should be located so that it is accessible during and after project construction for initial start up procedures and periodic system maintenance and/or troubleshooting.
2. The manifold should be installed using appropriate fasteners for the mounting surface and sized to fit the mounting holes in the steel brackets. The manifold should be mounted in its permanent location prior to installing the radiant tubing; adjustments after the tubing is connected, concrete is poured or floor coverings are installed, are very difficult. A temporary support may be built if the walls are not yet in place. Ensure that the manifold is level and has adequate clearance on the sides for the distribution piping connections to/from the mechanical room. The minimum clearance is 20" (40 cm) between the bottom of the manifold and the top of the finished floor (right). Ideally, the manifold will be mounted with the upper (supply) header 40" (1.0m) above the floor.
3. The manifold should never be mounted without the proper steel brackets. The M-8330HC Stainless Manifolds are sold with the brackets. The steel brackets are provided for secure mounting, proper alignment and isolation of vibration and noise. Do not install the manifold without these brackets.

# ASSEMBLE THE MANIFOLD

## 3 to 5 Circuit Manifold

1. For a single base unit manifold (3-5 circuits), fully assemble the manifold before mounting it.
2. Remove the base manifold from the box and set it on a solid surface, like a table.
3. **Manifold Isolation Valves.** Disassemble the union nut on each of the main valves for easier assembly into the header.
    a. Determine what side of the manifold the main isolation valves will be located on and hand-tighten the **Tail Piece Nipple** into the header **(Note 1)**. Repeat for the second header.
    b. The red-handle valve is for the supply manifold header and the blue-handle valve is for the return manifold header; both are installed the same way. Make sure that the flat EPDM gasket is inside the union nut, then thread the union nut onto the tailpiece. Before hand-tightening the nut, position the valve so that the handle and thermometer are in the desired position.
    c. Using two adjustable wrenches, one on the end of the valve and one on the union nut, tighten the union nut.
4. **End Plugs.** Thread the male end of the End Plug until tight[2], into the end of the manifold header opposite the Manifold Isolation Valve. Repeat for both the supply (upper) and return (lower) manifold.
5. Once complete, proceed to the section titled "Mount the Manifold."

# ASSEMBLE THE MANIFOLD (CONT.)

## 6 to 15 Circuit Manifold

1. For a manifold containing 6-15 circuits, it will consist of 2 or 3 base units and 1 or 2 manifold unions. Due to the size of the manifold, it is recommended that it is assembled in sections as it is mounted on the wall.
2. Remove the first base manifold from the box and set it on a solid surface, like a table.
3. **Manifold Isolation Valves.** Disassemble the union nut on each of the main valves for easier assembly into the header.
   a. Determine what side of the manifold the main isolation valves will be located on and hand-tighten the Tail Piece Nipple into the header. (Note 1) Repeat for the second header.
   b. The red-handle valve is for the supply manifold header and the blue-handle valve is for the return manifold header; both are installed the same way. Make sure that the flat EPDM gasket is inside the union nut, then thread the union nut onto the tailpiece. Before hand-tightening the nut, position the valve so that the handle and thermometer are in the desired position.
4. **Using Manifold Unions.** Disassemble two manifold unions.
   a. Thread one half on the first union onto the supply header, thread the same half of the second union into the return header, and hand tighten both of them.
   b. Remove the second base manifold from the box and set it on a solid surface.
   c. Install the remaining halves of the two manifold unions into the opposite side of the second base manifold, and tighten both of them in place.
5. If you are building a manifold with three base manifolds (11 to 15 circuits), repeat steps 4 through 6 on the remaining part of the second base manifold, and the third manifold.
6. **End Plugs.** Install the two end plugs into the other end of the last base manifold.

[1]**Note:** These components seal together and to the manifold with an EPDM gasket (o-ring). One quarter (1/4) turn beyond "hand-tight" is normally sufficient to seal properly. If turning beyond 1/4 turn is required to align gauges and handles then do so, up to one (1) full turn beyond "hand-tight". **Caution: Do not use thread sealant tape or paste on these threads.**

# MOUNT THE MANIFOLD

1. With the assistance of a helper, position and mount the manifold with the main isolation valves onto the wall. Make sure that the manifold is level and securely mounted.
2. If there are additional base manifolds to be connected, verify that the flat gasket is installed into the union nut portion of union.
3. With the help of an assistant, line the manifold up next to the portion that is already mounted and attach the two manifold union nuts together.
4. While still supporting the newly connected portion of the manifold, make sure it is level and securely attach it to the wall.
5. If there is a third section to connect, repeat steps 3 & 4.
6. Once the manifold is mounted, cycle the valve handles to make sure that they turn without any interference. If there is interference when the handles are rotated, try to reposition the valves. If needed, the valve handles can be removed and orientated so that they operate in a different direction.

# CONNECT THE RADIANT TUBE

1. Slide the end of the tubing through the appropriately sized Tube Bend Support (800-305 for 3/8" & 1/2" tubing or 800-304 for 5/8" & 3/4" tubing) before attaching the manifold connector. Position the 90° bend support on the tubing as it turns out of the floor, up into the manifold. The bend support should extend several inches vertically above the finished floor height. Tubing Bend Supports protect the tubing as it transitions to and from the thermal mass (radiant floor) and help align the convergence of several tubing loop ends at the manifold location for a neat, professional appearance.
2. Manifold tube connectors are **not** included with the manifold; they are sold separately. Use the appropriate tube connectors for the type and size (below a through g/h) of radiant tubing. Tube Connectors (830-143, -144, -145) are for PEX or PE-RT tubing manufactured in compliance with ASTM F 876 (PEX) or ASTM F 2623 (PE-RT). Composite Tube Connectors (830-143C, -144C, -145C) are for PEX-AL-PEX tubing manufactured in compliance with ASTM F1281.
3. After the manifold is securely mounted in its final position, begin to connect the radiant tubing. The tubing should be connected to the manifold as it is being installed. For the best results, start each loop by attaching the tubing to the upper (supply) header.
4. Try to avoid crossing loops by attaching the end of the loop to the header port on the side (end) of the manifold closest to the area to be covered by that loop. It is also recommended to attach both ends of each loop to corresponding supply and return header ports on the manifold. For example, port 1 (to the far left as facing the manifold) on both the supply and return header should have attached the beginning and end of the same loop.
5. Each loop on the manifold should be marked with length of the connected loop. The length should also be recorded on the project documentation.

**Note:** The Legend, M-8000 Modular Brass or M-8200 Precision Brass series tube connectors (and all other manufacturers' tube connectors) are not compatible with the M-8330HC Stainless Steel Manifold series manifolds.

**CAUTION: Do not use thread sealant tape or paste on these threads. These are parallel threads; sealing is achieved by the tapered brass threading and integral o-rings.**

## For 1/2" & 5/8" Radiant Tubing (Tube & Composite Tube Connectors) Connections:

a. Ensure that the tubing is cut squarely using a proper tube cutter.

b. Slide the **hex nut** (with the threads towards the manifold) onto the tubing.

c. Slide the **split ring washer** onto the tubing.

d. Insert the **barbed end adapter** into the tubing until flush with the end of the tubing.

e. Place the end adapter into the selected port ensuring that the o-ring is seated properly into the manifold port.

f. Hand-tighten the hex nut onto the male threads of the manifold port while supporting the tube and keeping the end adapter square in the port. It should turn on smoothly as the fitting is aligned.

g. Once the hex nut is hand tight, use a 1-1/8" (29mm) wrench and turn it no more than 1/2 turn. Do not over tighten, as this may destroy the integral o-ring.

# CONNECT THE RADIANT TUBE (CONT.)

## For 3/4" Radiant Tubing (Tube & Composite Tube Connectors) Connections:

a. Ensure that the tubing is cut squarely using a proper tube cutter.

b. Install the o-ring in the 3/4" adapter. Attach the 3/4" adapter to the selected manifold port (the hex end of the bushing closest to the header) ensuring that the o-ring is seated properly into the manifold port. Thread the adapter onto the port by hand until it stops, and then no more than 1/2 turn with a wrench.

c. Slide the hex nut (with the threads towards the manifold) onto the tubing.

d. Slide the split ring washer onto the tubing.

e. Insert the barbed end adapter into the tubing until flush with the end of the tubing.

f. Place the end adapter into the manifold bushing.

g. Hand-tighten the hex nut onto the male threads of the manifold bushing while supporting the tube and keeping the end adapter square in the manifold bushing. It should turn on smoothly as the fitting is aligned.

h. Once the hex nut is hand-tight, use a 1-1/2" (38mm) wrench and turn it no more than 1/2 turn. Do not over-tighten, as this may destroy the integral o-ring.

**Note:** The Legend, M-8000 Modular Brass or M-8200 Precision Brass series tube connectors (and all other manufacturers' tube connectors) are not compatible with the M-8330HC Stainless Steel Manifold series manifolds.

**CAUTION: Do not use thread sealant tape or paste on these threads. These are parallel threads; sealing is achieved by the tapered brass threading and integral o-rings.**

# PRESSURE TESTING

After the radiant tubing has been installed, but before it is covered, a pressure test should be performed on the manifold with all Circuit Valves (both supply and return header) open so that the tubing and manifold connections can be checked for leaks. This pressure test can be performed with either air or water depending upon availability and/or local code requirements and is typically done prior to connecting the system supply/return distribution piping to/from the mechanical room.

## Air Pressure Test

1. Thread in the Air Pressure Tester (T-820; sold separately) into the female end of the installed supply Manifold Isolation Valve (red handle) (right). The use of thread sealant (Teflon tape or paste) will help ensure that this connection is air tight. Make sure the supply Manifold Isolation Valve is open and the return Manifold Isolation Valve is closed so that the manifold and radiant tubing system is sealed closed.
2. Fill the system with air through the Schrader valve on the Air Pressure Tester (T-820) to the required test pressure (continue to step 3 below for recommended test pressures).

# PRESSURE TESTING (CONT.)

## Water Pressure Test[2]

1. Follow steps 2 through 5 in the "Fill & Purge the System" section of these instructions to purge the air out of the system.
2. Once all of the air has been purged, fill the system with water to the required test pressure (continue to step 2 below for recommended test pressures).
3. Initially fill the system to a pressure the greater of 1.5 times the maximum operating pressure or 100 psi for 30 minutes. Check for leaks, especially at the connections. As the radiant tubing expands, restore pressure, first at 10 minutes into the test and again at 20 minutes. At the end of 30 minutes, a pressure drop of more than 7 psi indicates there is a leak in the system.
4. After 30 minutes, restore the system to test pressure (if necessary), and then maintain pressure for a minimum of 2 hours. At the end of 2 hours, a pressure drop of more than 5 psi indicates there is a leak in the system.
5. After 2 hours, reduce the system pressure to 30 – 40 psi, and then maintain this pressure during the remainder of building construction up to the time at which the system is filled. The system should be monitored during installation of the thermal mass, floor coverings and/or any time where floor penetrations may be necessary.
6. If a leak is present as determined by any step above (3 through 5), visually inspect the system to identify the location and then perform the necessary repairs. A soap and water mix solution can be poured onto the outside of the tubing and connections at potential leak areas to help identify leaks in systems under air pressure test. Upon completion of repairs, repeat the pressure test procedures from the beginning.

**[2]CAUTION: When pressure testing with water, ensure that all precaution is taken to prevent the water from freezing or pipe damage may result.**

# FILL & PURGE THE SYSTEM

1. Before the system is ready for operation it must be filled with the proper fluid media and purged of air. The proper fluid is determined during design of the system, typically clean, de-ionized water or a water and glycol mixture depending upon the required level of freeze protection and/or corrosion inhibitors. If using a water/glycol solution, mix the glycol into the water thoroughly prior to filling the system. Follow the glycol manufacturer's instructions for proper usage and installation.
2. A complete system fill/purge procedure normally starts in the mechanical room with the boiler and near boiler piping, followed by the distribution (zone) piping to/from the radiant manifolds and then through the manifolds and tubing.
3. To aid in the purging process (air removal) of the circuits, close a majority of the Circuit Isolation Valves on supply header. This will force a higher flow rate through the open circuits, allowing the system fluid to capture the air and move it back towards the mechanical room.
4. Once the flow is quiet and there is no more air visible through the tubing, open a few more circuit isolation valves, and close the previous ones. Continue this process until are the circuits are done.
5. If there is more than one manifold, repeat steps 3 & 4 on all of the manifolds.