

# Installation Guide

## M-8300E/EV

### ECONOMY STAINLESS STEEL MANIFOLD SERIES



The M-8300EV Stainless™ Manifolds are designed for use in hydronic heating and cooling applications that do not require individual circuit flow control and are available in various sizes up to 12 circuits. Projects using these manifolds must be self balancing or have other means to balance the individual loops.

### Assembly

A complete manifold consists of both a **Supply** and **Return Header**, each with an **End Plug**, **MNPT x Manifold Adapter**, two **Manifold Mounting Brackets** and one **Circuit Isolation Valve** (M-8300EV models) for each circuit to be mounted on the Supply Header.

**a) MNPT x Manifold Adapter.** It is recommended that the installer add isolation valves to the inlet side of both the supply and return manifolds. To do so, add thread sealant to the 1" MNPT threads of the **MNPT x Manifold Adapter** and thread into a ball valve. Once it has been tightened by hand, use a wrench (or vise) to hold the ball valve and a second wrench to tighten the **Manifold Adapter** into the ball valve. After it is fully tightened, thread the end with the EPDM gasket into the manifold header. Using a crescent wrench turn the adapter into the header until tight<sup>1</sup> and the ball valve handle is in a good position to operate it. Repeat this step for the other header.

**b) End Plug:** Thread in and use a crescent wrench turn the **End Plug** into each header until tight<sup>1</sup>. 8300EV models only.

M-8300EV Models Only:

**c) Circuit Isolation Valve:** Thread on a **Circuit Isolation Valve** to each of the tube connector ports on the bottom of the Supply Header. Once each one is attached to the header align the valve handle to the front so that it can be easily operated and use a crescent wrench and turn until tight<sup>1</sup>. If full loop isolation is required, additional circuit isolation valve can be purchased and installed on the return header.

### Mount the Manifold

The manifold should be located near the area (radiant panel) where the tubing is to be installed in order to avoid long circuit tails. The manifold may be mounted in any orientation: vertical, horizontal, or even inverted. The best orientation for installation access and later maintenance and/or troubleshooting is in a vertical position on a wall. The steel brackets are provided for secure mounting, proper alignment and isolation of vibration and noise. Do not install the manifold without these brackets.

<sup>1</sup>**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. **Caution: Do Not use thread sealant tape or paste on these threads.**

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#### Connect the Radiant Tubing

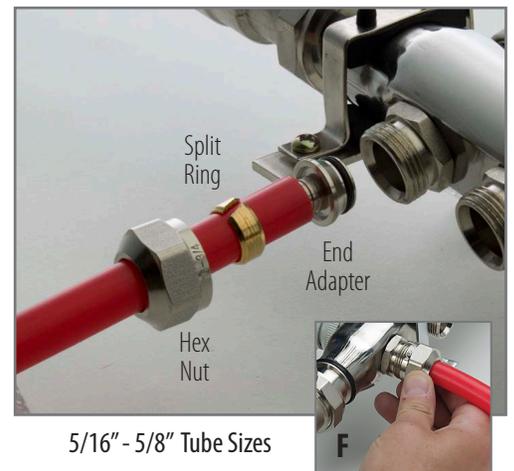
Slide the end of the tubing through the appropriately sized Tube Bend Support (800-305 for 3/8" & 1/2" tubing or 800-304 for 5/8" & 3/4" tubing) before attaching the manifold connector. Position the 90° bend support on the tubing as it turns out of the floor, up into the manifold, typically 3 to 4 feet below the mounted manifold. At this approximate location, 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.

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.

**Note:** For a complete list of tube connector sizes and tubing options, contact your local Legend Hydronics supplier or visit [www.legendhydronics.com](http://www.legendhydronics.com)

#### For 5/16", 3/8", 1/2" & 5/8" radiant tubing (Tube & Composite Tube Connectors) connections.

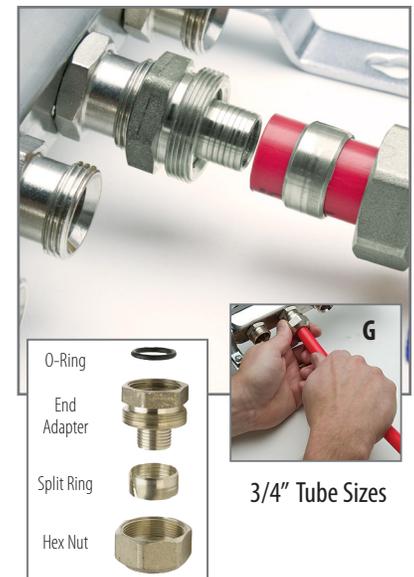
- Ensure that the tubing is cut squarely using a proper tube cutter.
- Slide the **hex nut** (with the threads towards the manifold) onto the tubing.
- Slide the **split ring washer** onto the tubing.
- Insert the **barbed end adapter** into the tubing until flush with the end of the tubing.
- Place the end adapter into the selected port ensuring that the o-ring is seated properly into the manifold port.
- 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.
- Once the hex nut is hand tight, use a 1-1/8" (29 mm) wrench and turn it no more than 1/2 turn.



5/16" - 5/8" Tube Sizes

#### For 3/4" radiant tubing (Tube & Composite Tube Connectors) connections:

- Ensure that the tubing is cut squarely using a proper tube cutter.
- Install the **o-ring** in the 3/4" **end 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 adaptor onto the port by hand until it stops, and then no more than 1/2 turn with a wrench.
- Slide the **hex nut** (with the threads towards the manifold) onto the tubing.
- Slide the **split ring washer** onto the tubing.
- Insert the barbed end adapter into the tubing until flush with the end of the tubing.
- Place the hex nut onto the end adapter.
- 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.
- Once the hex nut is hand tight, use a 1-1/2" (38 mm) wrench and turn it no more than 1/2 turn. Do not over tighten, as this may destroy the integral o-ring.



3/4" Tube Sizes

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

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#### Pressure Test

After the radiant tubing has been installed, but before it is covered, a pressure test should be performed on the manifold with all Circuit Isolation Valves open so that the tubing and manifold connections can be checked for leaks. This pressure test can be performed with either air or water<sup>2</sup> 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.

- a) Thread the male end (1" NPT threads) of the Air Pressure Tester (T-820; sold separately) into the female end of one of the installed ball valves. The use of thread sealant (Teflon tape or paste) will help ensure that this connection is air tight. Make sure this ball valve is open and that the other ball valve is closed so that the manifold and radiant tubing system is sealed closed.
- b) Fill the system with air through the Schrader valve on the Air Pressure Tester (T-820) to the required test pressure
- c) 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.
- d) 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.
- e) 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.
- f) If a leak is present as determined by any step above (C through E), 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.

<sup>2</sup>**CAUTION:** When pressure testing with water, ensure that all precautions are taken to prevent the water from freezing or pipe damage may result.

#### Fill & Purge the System

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. 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. In smaller system the manifolds and radiant tubing can be filled and purged with the distribution piping from the mechanical room.

Larger systems, especially those with zones on upper levels, require that the manifold and radiant tubing is filled and purged at the manifold one loop at a time. Use the Circuit Isolation Valves, as provided as part of the M-8300 EV manifold, to assist in this process by closing off all the circuits except for the one that is being purged. Once the selected circuit is purged, open another isolation valve and close the proceeding one. Repeat this process until all the circuit are purged.