NIBCO® PEX Piping Systems

HOME
RUN
MANIFOLD®

Installation Manual

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NOTES

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Look to NIBCO for Leadership on PEX Piping Systems

NIBCO is proud to offer NIBCO® PEX, our potable water PEX piping system and radiant heat PEX piping system. With over 100 years of experience, you can trust NIBCO to provide the highest quality PEX product.

NIBCO® PEX tubing is produced through the PEX-c method that uses an electron beam to change the molecular structure of polyethylene, giving it enhanced physical properties over conventional polyethylene. Available in sizes from 3/8" to 1-1/4" copper tube size, NIBCO sets a new standard in PEX plumbing products.

NIBCO® PEX Tubing Offers Significant Advantages:

- NIBCO® PEX contains UV stabilizers that protect it against damage from short-term exposure to sunlight.
- NIBCO® PEX has greater dimensional stability. We hold the outside tubing diameter dimensions of our tubing to strict tolerances. This means a better fit for you with no sliding of copper crimp rings on the tubing.
- NIBCO® PEX is chlorine-resistant. It is a viable solution for aggressive water conditions.
- NIBCO® PEX is non-toxic. Its clean manufacturing process employs no toxic chemicals, unlike other PEX manufacturing methods.
- NIBCO® PEX will not leach taste or odor. It keeps water clear and clean with no odor due to leaching from the tubing.
- NIBCO® PEX is opaque, which limits light from supporting bacteria and algae growth.
- NIBCO® PEX tubing is quiet. It insulates against water hammer and noise in the tubing.
- NIBCO® PEX has better insulating properties than metal piping.
- NIBCO® PEX requires fewer fittings in a typical installation and is easier to install.
- NIBCO® PEX is resistant to abrasion.
- NIBCO® PEX offers superior installation advantages over rigid piping:
  - Pliable, flexible and easily straightened from a coil
  - Lightweight and easy to carry on the job site
  - Installations use longer lengths and require fewer fittings
  - Employs faster connection systems - crimp, clamp and sleeve

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INTRODUCTION

The NIBCO® PEX Home Run Manifold® System was designed to give plumbers a quick, easy, flexible and cost-efficient system to install. Properly installed, the Home Run system will deliver water quickly and efficiently with even flow to all fixtures in the house. All backed by our 25-year limited system warranty when you use the NIBCO® PEX Home Run Manifold with NIBCO® PEX tubing and fittings. In a Home Run system, each faucet or water outlet is fed by a dedicated line directly from the manifold. This installation guide points out some of the do's and don'ts of installing the innovative Home Run manifold.

WHY A HOME RUN MANIFOLD SYSTEM?

A Home Run manifold system is the lowest installed cost PEX plumbing system available. Since more tubing is used via the long runs from the manifold to the fixture, fewer fittings are required and this means less labor and less potential for a leak in the system. Independent studies have confirmed that Home Run manifold systems deliver hot water more quickly to the fixture versus traditional branch and tee installation methods. Since hot water is delivered faster, less water is wasted. Even water pressures are characteristic of Home Run manifold systems meaning less variation in temperature in your shower. In traditional branch and tee systems, a branch with too many fixtures can lead to uneven water pressures from fixture to fixture. Finally, if a Home Run system is used with valves on each port, a fixture leak may be isolated without shutting down water in all parts of the home.

WHY CHOOSE THE NIBCO® PEX HOME RUN MANIFOLD®?

NIBCO tubing and fittings are designed to be used as a complete system. NIBCO cannot guarantee that tubing and/or fittings from other systems are compatible for use with the NIBCO system. Fittings from other systems such as CPVC or copper are not compatible with NIBCO® PEX and will void any warranty. The NIBCO system offers three different connections - crimp, clamp or sleeve. Now, you have a choice.

Applications and Usage

- For use in hot and cold potable water piping systems in single and multi-family residences and in larger units including dormitories, apartments, townhouses, hotels and assisted living quarters.
- Connect NIBCO® PEX tubing, valves and fittings to deliver water to each plumbing fixture.
- Ideal for "Home Run" PEX design applications in residential and commercial applications.
- A cost effective manifold alternative that gives you maximum flexibility.
- Can be used in open radiant heat systems and those employing non-ferrous metal water heaters.

Material

- Manifold is molded from high density polyethylene then cross-linked into PEX for high strength and heat resistance properties.
- This material is the same as NIBCO® PEX tubing and is corrosion-free and resistant to many building construction cements.

Design Innovations

- Outlets are same dimensions as F 876 tubing – compatible with F 1807 fittings and connectors.
  6 and 12-Port Manifolds: Trunk size = 1" CTS, Port size = 1/2" CTS
  8, 16, 24, 32, and 40-Port Manifolds: Trunk size = 1-1/4" CTS, Port size = 1/2" CTS
- Innovative manifold design is simple, durable, light weight and requires fewer connections.
- Unique plug separates hot and cold water flows.
- One-piece design eliminates need for gaskets and potential leak paths.
- One temperature and dual temperature options.

Standards and Approvals

- NSF/ANSI 61
- ASTM F 877
- CSA (on valves)
- Compatible with ICC

Cost Effective

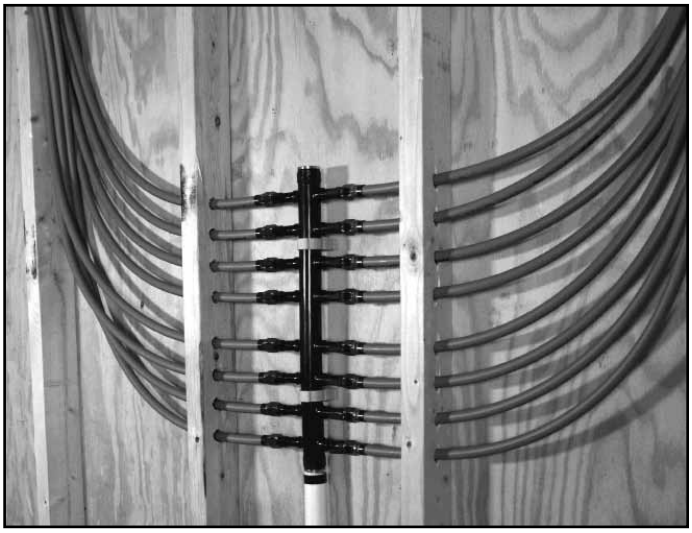
- Economical: Compare to copper, brass, polysulfone & polyphenylsulfone
- Energy efficient: Conserves water and the energy to heat it
- Easy to install
- Low maintenance and easy to service
- Available with or without valves (valves are field installed)

SELECTING THE CORRECT MANIFOLD SIZE

With the Home Run Manifold® System, individual hot and cold water lines are connected directly to each fixture from the manifold. To right size the cold water manifold, begin by counting the number of cold water fixtures in the house. Be sure to include outside outlets such as hose bibbs and frostproof valves. Follow the same procedure for the hot water manifold. Count all hot water fixtures in the house. The Home Run Manifold is available in 6, 8, 16, 24, 32 and 40 outlet port configurations. Select a manifold configuration that has at a minimum as many outlets as either cold or hot water locations in the house. It is a good idea to select a manifold that has a few extra unused outlets. This will allow for future expansion should a wet bar, new hose bibb or bathroom be added to the house at a later date. Ensure that any unused ports are plugged, even if an attached supply stop valve is in a closed position. NIBCO recommends removing the handle from supply stops on any unused ports to prevent accidents and tampering. It is not recommended that two or more fixtures be supplied from a single outlet.

SELECTING THE MANIFOLD LOCATION

The Home Run Manifold should be placed in an easy-to-access location near the water heater. Typically, manifolds are located in utility rooms, garages and basements. Ensure that the manifold is protected from freezing and exposure to sunlight. The manifold should be mounted close to the water heater to minimize hot water delivery time. However, the hot water manifold should be located no closer than 18" horizontally or 36" vertically from the water heater and 6" from vent piping. The cold water manifold may be located in a convenient location, but it is usually located near the water supply. In large installations, with multiple water heaters, use a separate manifold for each water heater. It is important that the Home Run Manifold be in an accessible location. If a leak in the system occurs, one can go to the manifold and shut off the leaking distribution line without shutting off all of the water in the house. Never mount the Home Run Manifold behind drywall or paneling.



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INSTALLING THE NIBCO® PEX HOME RUN MANIFOLD®

The Home Run Manifold gives you many installation options. Each can be stacked end-to-end and installed vertically either between or along a stud or each can be installed horizontally. The Home Run Manifold is available with and without outlet port shut-off valves. Shut-off valves can be placed on the manifold or near the fixture. You should consult you local plumbing code inspector to determine what is approved in your area.

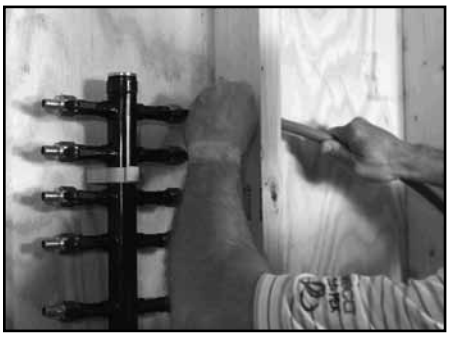
It is preferred that fittings, adapters, outlet stop valves or main shut-off ball valves be attached to the manifold before mounting. Locate a surface where the manifold brackets can be mounted. It is sometimes necessary to attach a plywood panel to the wall for adequate mounting. Position the manifold in the desired location and mark with a pen or pencil the desired location of the brackets. Use the template included with your Home Run Manifold. Attach the mounting brackets with screws. Make sure there is room for all valve handles to operate properly.

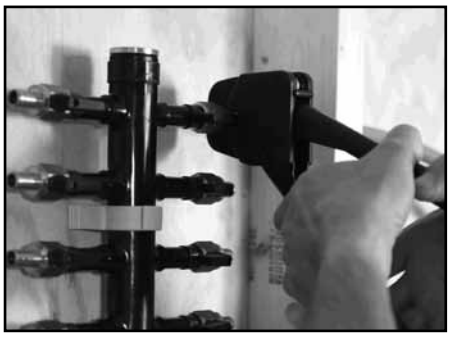
If it is necessary to run PEX tubing through a stud again, use the handy template included with your Home Run Manifold to mark the position of the tubing holes. If 3/8" PEX tubing is being run through the stud, drill 5/8" diameter holes. For 1/2" PEX, drill 3/4" diameter holes.

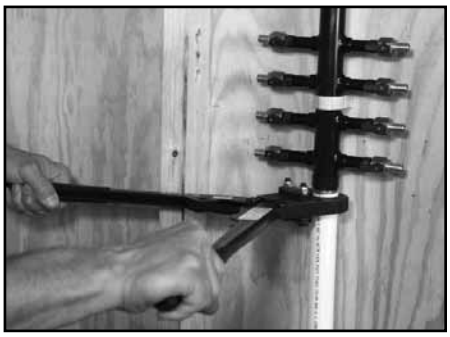
Many installations require the bending of PEX tubing immediately away from the manifold. Care should be taken to ensure that the minimum bending radius requirements of NIBCO® PEX tubing are not exceeded. The minimum bend radius for NIBCO® PEX tubing is eight times the outside diameter of the tube. NIBCO bend supports can be used to hold a tight turn in place. Hangers that do not pierce or damage the tubing wall may also be used to support the system. Whenever possible, bend the tubing with the tube radius.

BENDING RADIUS

Tubing Size	Min. Radius
1/4"	4"
3/8"	5"
1/2"	6"
3/4"	9"
1"	11"
1-1/4"	14"







SELECTING THE PROPER TUBE SIZE

The Home Run Manifold® is designed to be used with 3/8" CTS or 1/2" CTS NIBCO® PEX tubing. The outlets of the Home Run Manifold are 1/2" CTS, the same dimensions as our PEX tubing. If 3/8" tubing is selected, use a 1/2" PEX x 3/8" PEX adapter coupling to make the connection to the 3/8" tubing. If shut-off valves are being installed, select 1/2" PEX x 3/8" PEX shut-off valves. For 1/2" tubing installations, use either 1/2" PEX insert couplings or 1/2" PEX shut-off valves.

Before selecting the tube size, one should determine the local plumbing code requirements. Other factors to consider are water demand of each fixture, the distance from the manifold to each fixture, the change in elevation from manifold to each fixture, and water pressure available to the manifold. Consult the following pressure drop chart for guidance in sizing your system. To get the greatest benefit of the Home Run Manifold in terms of energy and water savings, one is advised to use the smallest tube size that delivers the proper flow and pressure requirement to the fixture.

PRESSURE DROP AT AMBIENT TEMPERATURE (PSI / FT)

GPM	3/8"	1/2"
1	0.071	0.016
2	0.254	0.058
3	0.538	0.122
4	—	0.207
5	—	0.313
6	—	0.439
7	—	0.584

The following table may be consulted to determine minimum water supply lines in a Home Run Manifold system.

Fixture	Minimum Pipe Size (in.)
TUB & SHOWER	1/2"
WHIRLPOOL TUBS	1/2"
SHOWER ONLY	3/8"
BATHROOM LAVATORY	3/8"
WATER CLOSET, RESIDENTIAL	3/8"
WATER CLOSET, COMMERCIAL	1/2"
LAUNDRY WASHING MACHINE	3/8"
UTILITY SINK	3/8"
BAR SINK	3/8"
URINAL, FLUSH TANK	3/8"
URINAL, FLUSH VALVE	1/2"
HOSE BIBB	1/2"

For supply lines, the following guidelines are offered:
- 3/4" tubing for homes with up to 2-1/2 bathrooms
- 1" tubing for homes with up to 4-1/2 bathrooms
- 1-1/4" tubing for homes with 5 or more bathrooms

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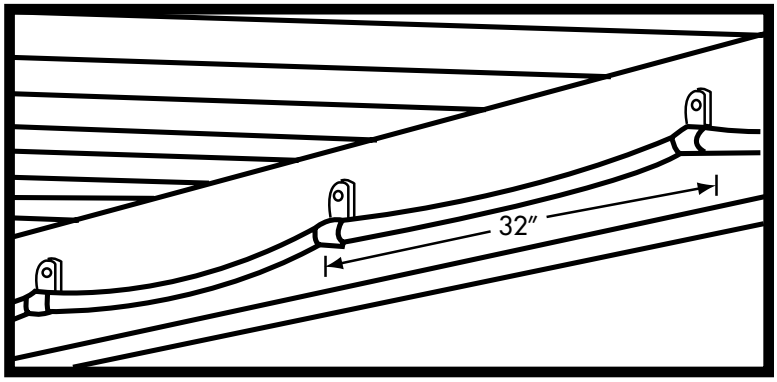
TUBING INSTALLATION GUIDELINES

Always Properly Support NIBCO® PEX Tubing

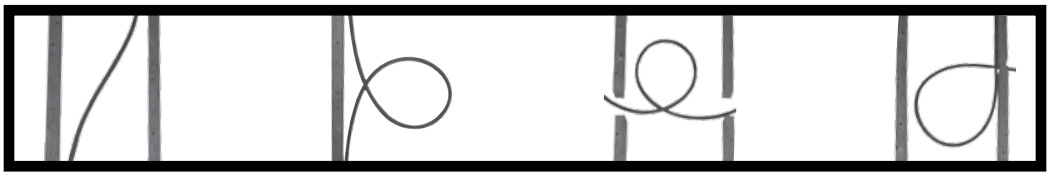
Our cross-linked NIBCO® PEX tubing is tough and durable. Yet, in most applications, it must be properly supported to protect against excessive strain. Please observe the following guidelines. Codes require the use of approved fastening devices. Make sure that supports designed for use with plastic tubing are used whether one is mounting to either wood or steel. Metal supports designed for use with plastic tubing may be used. Never use supports that have sharp edges. For both vertical and horizontal runs, we recommend the tubing be supported every 32" between each support, leaving a little slack (1/8" to 3/16") in the tubing to allow for normal expansion and contraction. Never pull the tubing tight during the installation. Grommets are not required when the tubing passes through wood studs via a hole in the stud. Metal studs require the use of plastic grommets to protect the tubing.



Allow for Expansion and Contraction

Since NIBCO® PEX tubing will expand and contract during temperature changes, please allow slack when stringing the tubing through the building. NIBCO® PEX tubing expands/contracts at a rate of 1.1" per 100 feet of tubing for each 10°F change in temperature. For example, a line at 70°F room temperature will expand 5.5" over a 100' length when 120°F water is run through it. (120°F - 70°F = 50°F; (1.1"/(100ft. x 10°)) x 50°F x 100ft. = 5.5") Conversely, the tubing will shrink 5.5" when it cools down. We recommend that offsets and expansion loops be used as ways to compensate for expansion and contraction in tubing runs. Make sure that the loops have adequate room to expand and contract. Ensure that the loop is not touching any floor joists or wall studs.

Examples of Expansion/Contraction Loop Methods



Remember to Leave Extra Tubing at Both Ends of the Run

Connections to fittings, fixtures and manifolds are made easier by leaving some extra tubing at both ends of the run. Some installers find it easier to run the tubing to the fixtures and leaving an excess amount of tubing near the location where the manifold will be installed. After making the connections to the fixtures, the manifold is then installed and the tubing then connected to the manifold.

Keep Hot and Cold Lines Separate

NIBCO® PEX tubing has superior insulation properties. However, please use caution when bundling tubing. Keep hot and cold lines in separate bundles to avoid heat transfer problems.

Keep NIBCO® PEX Away from High Heat Sources

NIBCO® PEX tubing should be routed around and away from sources for heat such as water heaters / boilers, electric motors, light fixtures and gas appliance vents. Maintain a minimum distance of 12" vertically and 6" horizontally from sources of high heat.

NIBCO® PEX Fixture Connections

- A metal adapter at least 12" long should be used to connect NIBCO® PEX tubing to a gas water heater. The tubing must be at least 6" from the exhaust vent.
- NIBCO® PEX tubing can be connected directly to an electric water heater using metal insert adapters.
- NIBCO® PEX tubing can be connected to PEX insert accessories as long as the barb meets ASTM F 1807 specifications. Such accessories include supply stop valves, ball valves, icemaker boxes, washing machine boxes, copper stub-outs and manifolds, etc.

Fire Proof Caulking

When sealing a penetration for air infiltration purposes, silicone or acrylic caulks, canned expanding foams, and open or closed cell tubing insulation may be put in direct contact with NIBCO® PEX. Do not use any oil-based caulks. If there is no information about the compatibility of a sealing material with NIBCO® PEX, wrap the tubing in several layers of aluminum foil which extends several inches beyond the area of contact before applying the sealant.

Pressure Testing and Inspection of the Completed System

After complete installation, the system should be tested. Local code requirements should be followed for proper testing.

- Test system with water.
- Test pressure shall be at least equal to the expected working pressure (main pressure), but not less then 40 psi and not greater than 225 psi at 73°F.
- Compressed air testing is only recommended when water is not available or when cold weather could freeze the system. Compressed air tests shall include appropriate safety precautions and the test pressure shall not exceed 100 psi. PEX tubing is ductile and will not shatter during a pressure test and release shards of plastic. However, plastic fittings or other system components, or unassembled fittings, may cause a hazard. Check with local codes before using air pressure testing.
- Test duration should not be less than 15 minutes.
- Do not allow water in systems to freeze.

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Final Connections

The outlets of the Home Run Manifold® are ½" CTS. This is the same size dimensionally as PEX tubing. The Home Run Manifold can be installed with outlet port valves or couplings can be used to attach the tubing to each outlet. All three NIBCO® PEX connections - crimp ring, stainless steel clamp or stainless steel sleeve - can be used to connect the tubing to either a PEX barbed coupling or PEX barbed shut-off valve.

Outlet Identification

Mark each outlet with our clip-on outlet marker. Number each outlet and then fill out our identification chart with a description of the destination of each line. A sample of the chart is below:

NIBCO® PEX HOME RUN MANIFOLD®
IDENTIFICATION CHART

COLD		HOT	
Number	Location	Number	Location
1	MASTER LAV - R	1	MASTER LAV - R
2	MASTER LAV - L	2	MASTER LAV - L
3	MASTER CLOSET	3	MASTER SHOWER
4	MASTER SHOWER	4	GUEST LAV - R
5	GUEST LAV - R	5	GUEST LAV - L
6	GUEST LAV - L	6	GUEST SHOWER
7	GUEST CLOSET	7	DISHWASHER
8	GUEST SHOWER	8	KITCHEN SINK
9	KITCHEN SINK	9	WASHER
10	REFRIGERATOR	10	
11	WASHER	11	
12	FROSTPROOF 1	12	
13	FROSTPROOF 2	13	
14	FROSTPROOF 3	14	
15		15	
16		16	

Doors may be used to cover the manifolds. Some installers use access panels that can be mounted flush with the drywall to conceal the manifold but also allow for accessibility.

FEATURING NIBCO® SYSTEMS

NIBCO® PEX Piping Systems • NIBCO® Press System®

FITTINGS

Wrot and cast copper pressure and drainage fittings • Cast copper alloy flanges • Wrot and cast press fittings • ABS and PVC DWV fittings • Schedule 40 PVC pressure fittings • CPVC CTS fittings • CPVC CTS-to-metal transition fittings • Schedule 80 PVC and CPVC systems • CPVC metric piping systems • CPVC BlazeMaster® fire protection fittings • Lead-Free* fittings

BlazeMaster® is a registered trademark of The Lubrizol Corporation.
*Weighted average lead content ≤0.25%

VALVES & ACTUATION

Pressure-rated bronze, iron and alloy-iron gate, globe and check valves • Pressure-rated bronze ball valves • Boiler specialty valves • Commercial and industrial butterfly valves • Circuit balancing valves • Carbon and stainless steel ball valves • ANSI flanged steel ball valves • Pneumatic and electric actuators and controls • Grooved ball and butterfly valves • High performance butterfly valves • UL/FM fire protection valves • MSS specification valves • Bronze specialty valves • Low pressure gate, globe, check and ball valves • Frostproof sillcocks • Quarter–turn supply stops • Quarter-turn low pressure valves • PVC ball valves • CPVC CTS ball valves • Just Right® recirculating valves • Bronze & Iron Y-Strainers • Lead-Free* valves

*Weighted average lead content ≤0.25%

CHEMTROL®

Thermoplastic pipe, valves and fittings in PVC, Corzan® CPVC, polypropylene and PVDF Kynar® • Pneumatic and electric actuation systems

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Pipe hangers • Custom fabricated supports • Strut fittings • Seismic bracing • TOLBrace® Fire seismic bracing software • Markets served include commercial, industrial & fire protection

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Printed in U.S.A.