



Potable Water Systems

Installation Guide

Third Version, July 2011

This installation guide is intended for plumbing contractors and building officials and includes general installation guidelines for the HeatLink® Potable Water System.

The HeatLink® Potable Water System

The HeatLink® Potable Water System features PureLink® PEX-a tubing, the EasyFit™ manifold system, and stainless steel press sleeve connection technology.

The unique HeatLink® PEX-a process is based on a method developed during the 1970's and uses organic peroxide to chemically cross-link the polyethylene during the manufacturing process. The PEX-a process produces a higher degree and greater uniformity in crosslinking, resulting in product with significantly improved material properties with respect to temperature, pressure, strength and chemical resistance.

Press sleeve technology has been used for decades worldwide in plumbing applications and has been used extensively for pneumatic and hydraulic applications.

HeatLink's superior potable water system carries all necessary approvals for North American installations, and offers significant advantages and benefits when compared to copper, CPVC, and other PEX plumbing systems in use today.

HeatLink® Potable Water System Advantages

- Clean and non-toxic
- Flexible - easy installations
- Resists scaling and corrosion
- Fewer fittings
- Quiet - no water hammer noise
- Equalized pressure drops, minimize hot or cold surges
- Can easily be repaired if tubing is kinked
- Durable/long life
- Fast installations - no waiting to pressure test
- Labor costs are significantly reduced
- Light weight
- Discreet red/blue identification is an advantage where PEX tubing is exposed (i.e. water closet connections)
- Chlorine resistance
- UV stabilized for up to 12 months exposure to sunlight
- Freeze and chemical resistance
- Low friction losses

PPI PEX Tubing Ratings

Temperature (°F / °C)	Plastics Pipe Institute - recommended HDB (psi)	Hydrostatic Design Stress (psi)	Resultant- pressure Rating (psi)
73.4°F / 23°C*	1,250	630	160
180°F / 82.2°C*	800	400	100
200°F / 93.3°C	630	315	80

* PureLink Plus® PEX tubing is listed in PPI TR-4 for these pressure/temperature ratings.

Plenum Rating

PureLink Plus PEX-a tubing has been tested in accordance with CAN/S102.2, *Standard for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies* and ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*.

CAN/ULC S102.2 (Canada)

Product	Size	Flame Spread	Smoke Development	Spacing Requirements
PureLink Plus	1/2"	15	40	Minimum 8"
PureLink Plus	5/8"-1"	5	25	Minimum 18"

ASTM E84 (United States)

Product	Size	Flame Spread	Smoke Development	Spacing Requirements
PureLink Plus	1/2"	10	25	Minimum 18"
PureLink Plus	3/4"	20	35	Minimum 18"

Product Listings

Notes:

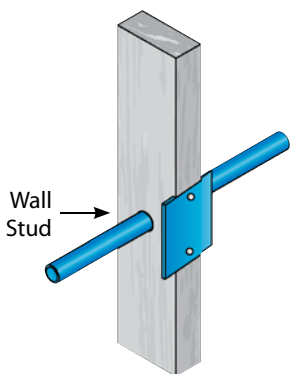
1. It is the sole responsibility of the installer to verify that the product and installation meets local standards.
2. PureLink® PEX-a tubing is approved for use with fittings that are compliant with ASTM F1807/F1960/F2080/F2098/F2159 standards.

Product Line	Standards	Listings
PureLink® Plus PEX-a tubing	ULC S102.2 (1/2"-1") ASTM F876/F877/F2023 CSA B137.5 NSF/ANSI-61 NSF/ANSI-61 Annex G NSF/ANSI-14 ASTM E84 (1/2" & 3/4") AWWA C904	cNSFus-pw ICC-ES IAPMO UPC (1/2") PI TR-4 CSA Potable NSF-6s (1/2" & 3/4") ICC-PMG
PureLink® Reclaim PEX-a tubing	ASTM F876/F877/F2023 CSA B137.5 NSF/ANSI-14	cNSFus-tw CSA Reclaimed Water ICC-PMG
HeatLink® stainless steel press sleeves	ASTM F877 CSA B137.5	cNSFus-pw
HeatLink® brass fittings	NSF/ANSI-61 ASTM F1807 CSA B137.5 ASTM F877	CSA IAPMO UPC
HeatLink® no lead brass fittings	ASTM F1807 CSA B137.5 NSF/ANSI-61 NSF/ANSI-61 Annex G	IAPMO UPC cNSFus-pw
HeatLink® brass ball valves	ASTM F1807 CSA B137.5	CSA IAPMO UPC NSF/ANSI 61/9
HeatLink® no lead brass ball valves	ASTM F1807 CSA B137.5	CSA IAPMO UPC NSF/ANSI 61 Annex G
HeatLink® high performance polymer (HPP) fittings	NSF/ANSI-14 ASTM F2159/F877 CSA B137.5 NSF/ANSI-61 NSF/ANSI-61 Annex G	cNSFus-pw IAPMO UPC CSA
HeatLink® EasyFit™ manifold	CSA B137.5	IAPMO UPC Tested to CSA B137.5 by Warmock Hersey All materials are NSF-61 listed.
HeatLink® copper manifolds	ASTM F1807	CSA IAPMO UPC NSF Warmock Hersey

PureLink® Installation Guidelines

- Minimum bend radius for PEX is 6x the outside diameter at 68°F (20°C).
- PureLink® PEX linear expansion rate is approximately 1" / 10°F (5.5°C) / 100 feet of tubing.
- Use protective sleeves or grommets when penetrating hollow masonry wall or metal studs.
- Drill holes at least 1/4" larger to provide free movement of tube.
- Multiple tube bundles must be protected by heavy gauge protective sheet at the area of abrasion
- Protect tubing with steel plate if it is within 2" of the edges of a stud, plate or nailing surface (see Figure 1).
- Prevent strain on fittings by strapping PEX in position before and after the bend. (see Figure 2).
- Vertical runs need support at every floor level and midpoint between. (see Figure 3).
- Horizontal runs should be supported every 32". (see Figure 4)
- When running PureLink® PEX be sure to install at least 6" away from any gas appliance vent piping, or 12" from any recessed light fixtures. (see Figure 5).
- If PureLink® PEX is notched or cut, section of PEX must be cut out and replaced.
- Use plastic bend supports or copper stub-outs for tight 90° turns when exiting walls (see Figure 6).
- Use 18" long copper connectors on gas fired atmospheric water heater before transitioning to PureLink® on both inlet and outlet. (see Figure 7)
- PEX may be used to connect directly to Power Direct Vent Water Heaters, Electric Water Heaters, or Tankless Water Heaters. (see Figure 8)
- When installing HPP MPT fittings use Teflon tape liberally. (Do not use other sealants.)
- DZR brass fittings are suitable for direct, unprotected burial. All other brass fittings are not suitable for direct, unprotected burial.

Figure 1.



Steel plate must be placed in front of PEX tubing if it is within 2" of surface.

Figure 2.

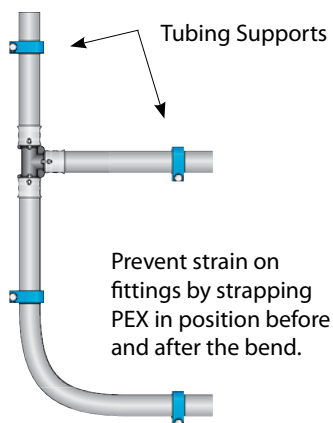


Figure 3.

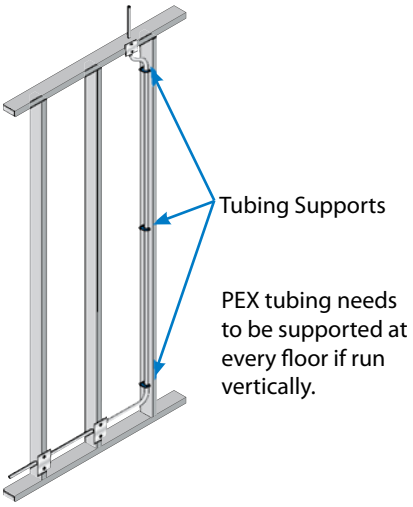


Figure 4.

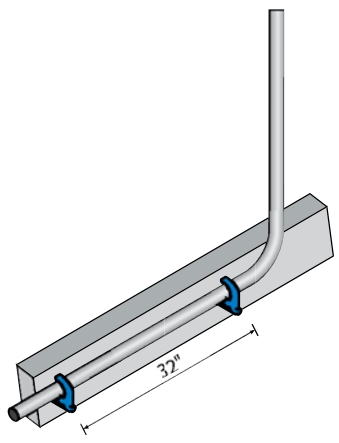


Figure 5.

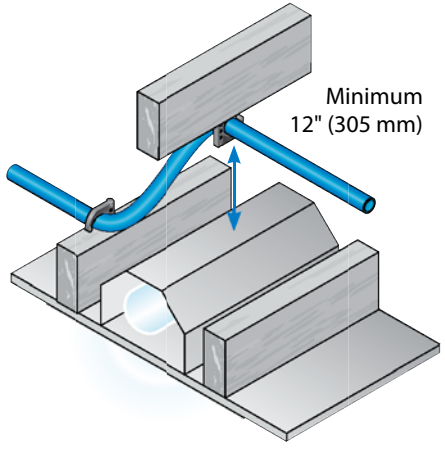


Figure 6.

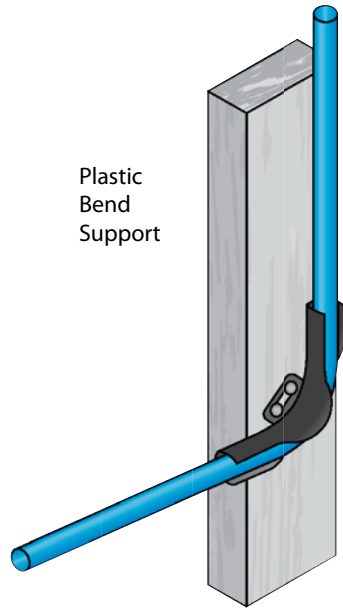
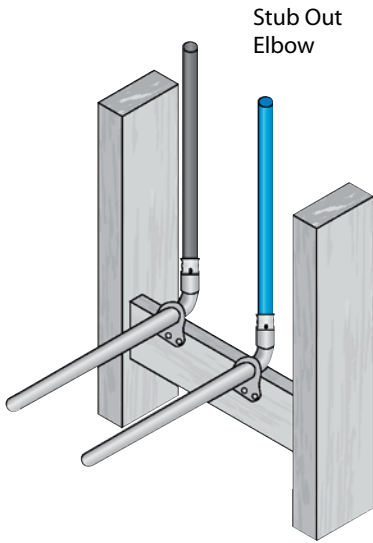


Figure 7.

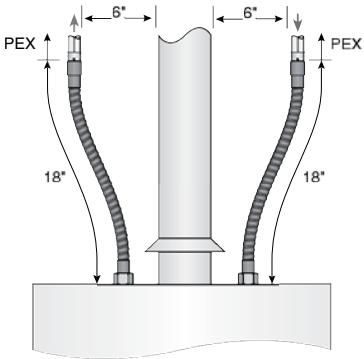
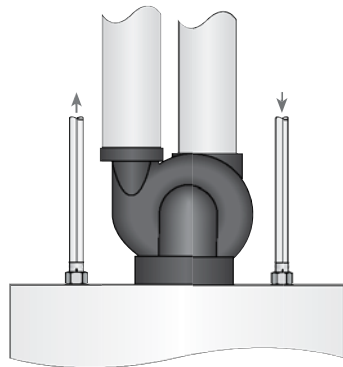


Figure 8.



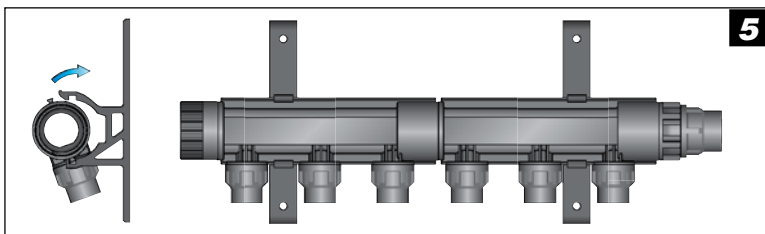
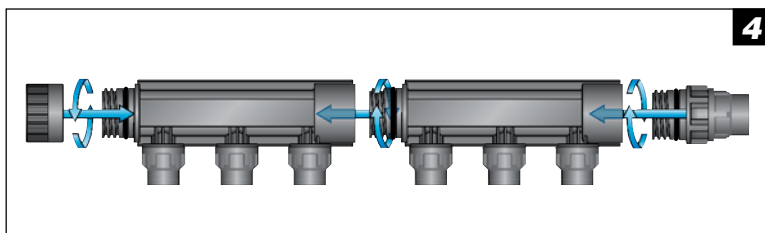
EasyFit™ Manifold Assembly & Installation

Manifold Assembly

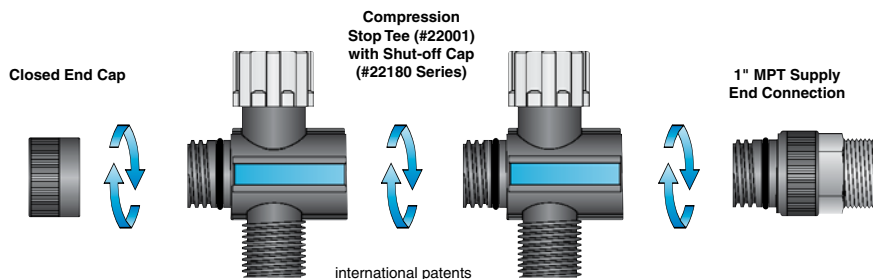
1. Determine number of 1/2" outlet connections required.
2. Determine the number of #22121 mounting brackets required.
Note: Two (2) #22121 brackets are required for every six (6) 1/2" outlet connections.
3. Twist together run/closed end, desired number of two (2) or three (3) port tees, and supply end.
4. Insert manifold mounting ridge/ears into flat side of bracket. Rotate the manifold forward and snap-in to the round side of bracket.

Assembly Precautions

- Inspect all o-rings, confirm they are lubricated and free of dirt.
If o-rings become dirtied they must be cleaned and re-lubricated with non-toxic silicone grease #79951 or #79952.
- Manifold components should be assembled in a clean area free of dirt.
- Inspect manifold assembly.



Assembly with Single Compression Stop Tee Modules

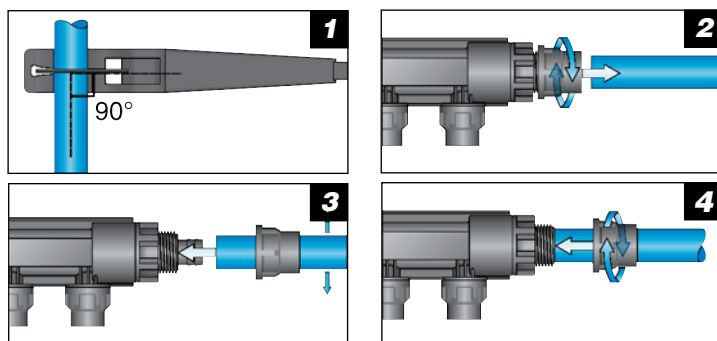


EasyFit™ Manifold Mounting

- Select an accessible manifold location.
- Position manifolds so that water supply connection is easy to make.
- Support using #22121 mounting brackets.
- Mounting brackets can be attached to wood, concrete, masonry, or wall board. *(Mounting hardware not included.)*
- Can be installed either horizontally or vertically.
- If necessary, small positioning adjustments can be made, by sliding the manifold either to right or left.
- Provide adequate protection from freezing.

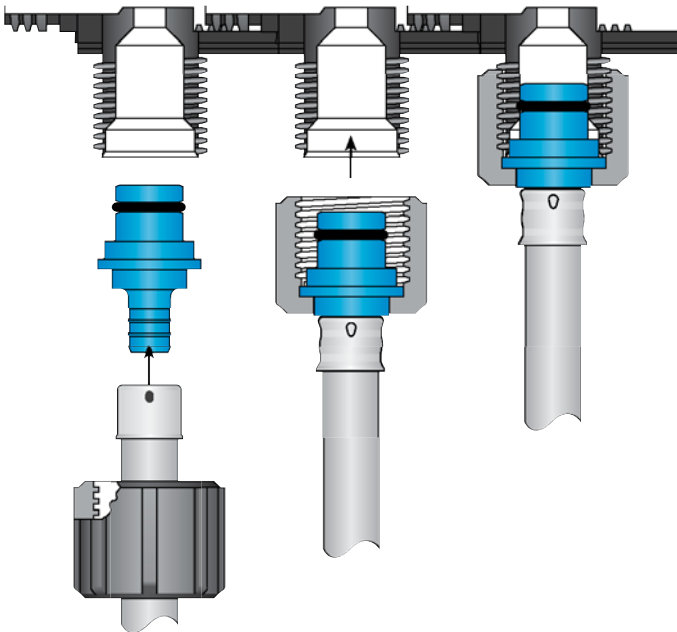
PEX tubing to EasyFit™ Manifold Connections

1. Cut PEX tubing at a 90° angle.
2. Unscrew compression nut and slide it over the PEX tubing.
3. Push PEX tubing over barbed fitting, apply a swaying motion to work PEX tubing flush to fitting shoulder.
4. Tighten on the compression nut with the wrench (Do not over tighten).
5. If extra outlets are not used, install EasyFit™ outlet cap (#23055).
 - *Ensure o-ring on outlet cap is seated properly.*

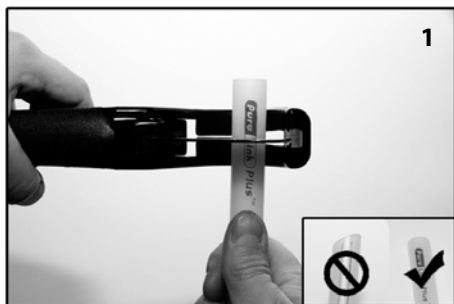


PEX Tubing to Compression Stop Tee Using #23000 Series Connectors

1. Remove Plastic Manifold Nut from Compression Stop Tee.
2. Lubricate the inside of the manifold port with silicone o-ring lubricant (#79952).
3. Cut the PEX tubing at a 90° angle.
4. Place the plastic manifold nut on the PEX tubing.
Note: for a 3/4" connection, place the Plastic Manifold Nut on the PEX to Manifold Connector.
5. The PEX tubing can now be attached to the connectors. (As per installation instructions on page 12.)
6. Push the PEX to Manifold connector (23000 Series) as far as it will go into the Compression Stop Tee.
Ensure the o-ring is clean and take care not to pinch it.
7. Screw the Plastic Nut back on using the multi-purpose wrench. To prevent overtightening, the wrench is designed to slip when the nut is tight.
Note: Avoid sideways motion during pressing to reduce stress on the fitting and manifold.



Pressing Guidelines for Professional Connections



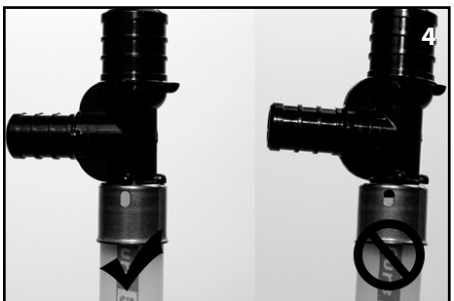
1 Cut the PEX tubing to length squarely (an irregular cut may result in a failed connection).



2 Slide the Stainless Steel Sleeve over the end of the PEX tubing until it bottoms out. Verify proper seating through slot.



3 Insert the fitting into the tubing until it bottoms out on shoulder.



4 After inserting the PEX into the sleeve make sure the tubing is fully visible in the slot.



5 Choose correct size HeatLink® Press Tool: 1/2", 3/4", 1", 1-1/4"



6 Center tool jaws over stainless steel sleeve.



7 Close jaws completely to finalize connection.



8 Inspect the entire connection. To ensure the tubing is seen through the slots on the side of the sleeves AND a 'W' shaped press has been formed onto the sleeves.

Caution: The stainless steel press sleeve MUST be completely pressed only one time: if pressed more than once it is necessary to cut out the connection, and replace both sleeve and fitting and begin at Step 1.

- Notes:
1. Never re-use stainless steel press sleeves.
 2. Lubricate the tool periodically to allow smooth operation.

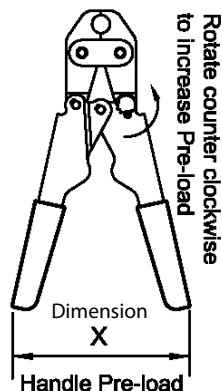


Tool Calibration/Adjustment

HeatLink® Press Tools are pre-calibrated at the manufacturer and an initial adjustment is not normally required. However, HeatLink® recommends bi-monthly installer inspection of the tool calibration to ensure a proper and consistent press is achieved. Extended usage of the tool may cause the tool to move out of calibration and require a simple calibration procedure. See procedure as follows:

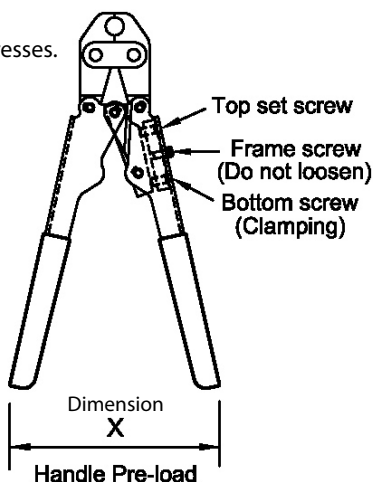
1/2" and 3/4" Adjustment Procedure:

1. Close tool handles until preload is reached (this is the point at which the jaws butt).
2. Measure the distance between the outside of the handles at the end of the handle grips. Ensure dimension X is the correct distance. (see diagram at right.)
3. To increase the preload setting, remove the #6-32 eccentric lock screw and rotate counter clockwise to increase the handle preload and clockwise to decrease handle preload. Re-install the #6-32 lock screw in the appropriate hole which most closely meets the required handle dimension. (dimension X)
4. Lubricate all joints and pivot points.
5. Recheck the set distance after making three presses.



1" and 1-1/4" Adjustment Procedure:

1. Close tool handles until preload is reached (this is the point at which the jaws butt).
2. Measure the distance between the outside of the handles at the end of the handle grips. Ensure dimension X is the correct distance. (see diagram at right.)
3. To increase the preload setting, loosen the bottom set screw slightly by turning counter clockwise. Then tighten the top set screw by turning clockwise until the preload distance is dimension X. Tighten the bottom set screw to clamp the setting.
4. Lubricate all joints and pivot points.
5. Recheck the set distance after making three presses.



Warranty is null and void if the date coded adjustment sticker is removed from the tool.

Stk #	Description	Dimension X
11305	1/2"	7" ± 1/4"
11322	3/4"	7" ± 1/4"
11328	1"	11 1/2" ± 1/4"
11335	1-1/4"	11 1/2" ± 1/4"

Notes:

- 1) Never exceed specified handle distance when adjusting tool or premature wear will result.
- 2) Dimension X on new tools might be 1/4" longer than listed in the table. These tools will come into the proper dimensions after initial use.
- 3) Wear eye protection when working with the HeatLink® press tools and fitting system.

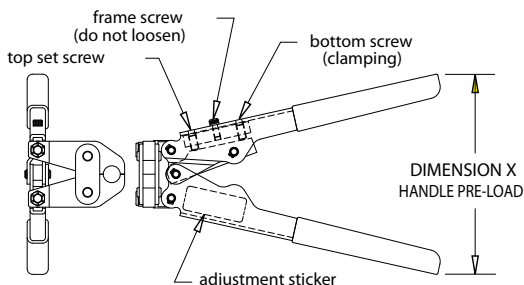
Tool Calibration/Adjustment - Angle Tool

HeatLink® Press Tools are pre-calibrated at the manufacturer and an initial adjustment is not normally required. However, HeatLink® recommends bi-monthly installer inspection of the tool calibration to ensure a proper and consistent press is achieved. Extended usage of the tool may cause the tool to move out of calibration and require a simple calibration procedure. See procedure as follows:

1/2" and 3/4" Adjustment Procedure:

Should the tools, through extended use, require adjustment, wear in the parts may be compensated for as follows:

1. Close tool handles until preload is reached (this is the point at which the jaws butt).
2. Measure the distance between the outside of the handles at the end of the handle grips. Ensure dimension X is the correct distance.
(see diagram at right.)
3. To increase the preload setting, loosen the bottom set screw slightly by turning counter clockwise. Then tighten the top set screw by turning clockwise until the preload distance is Dimension X. Tighten the bottom set screw to clamp the setting.
4. Lubricate all joints and pivot points.
5. Recheck the set distance after making three presses.



Stk #	Description	Dimension X
11405	1/2"	10 1/4" ± 1/4"
11422	3/4"	10 1/4" ± 1/4"

Warranty is null and void if the date coded adjustment sticker is removed from the tool.

Notes:

- 1) Never exceed specified handle distance when adjusting tool or premature wear will result.
- 2) Dimension X on new tools might be 1/4" longer than listed in the table. These tools will come into the proper dimensions after initial use.
- 3) Wear eye protection when working with the HeatLink® press tools and fitting system.

Kinked Tubing Repair

One of the most important features of PureLink® PEX-a crosslinked tubing is its shape memory. As such, a kinked area can be repaired using the following procedure:

- Release system pressure
- Straighten portion of tubing being repaired (do not squeeze with pliers)
- Using a heat gun, heat area to approximately 260°F (125°C), or until tubing appears clear. (**DO NOT use an open flame**)
- Let the tubing cool undisturbed at room temperature
- Repair is now complete

Pressure Testing

- Once the PureLink® rough-in is complete, it must be pressure tested. PureLink® 1/2", 3/4", 1" and 1-1/4" plugs are available.
- An appropriate test kit must be connected to the system including a pressure gauge for monitoring.
- Cold water or air may be used for testing. (If allowed by local codes)
- Test to at least 50 psi above operating pressure.
- Duration of test should be a minimum of 20 minutes.

Test requirements specified in your local building and plumbing codes must always be followed.

Tubing Repair

If tubing is damaged during installation it can be repaired using the appropriate sized coupling. Repairs in concrete require the fitting assembly to be appropriately wrapped to protect assembly from concrete, and only HPP couplings are recommended for concrete repairs.

Thawing Frozen Tubing

PureLink® PEX-a tubing can withstand freeze-thaw cycles better than most other products available for plumbing today. While not freeze proof, PureLink® tubing is resistant to freeze damage.

Should tubing become blocked due to freezing, HeatLink® recommends thawing by using hot water, hot towels or gently heating with a heat gun.

Technical Information

PEX Tubing Pressure Drop Graph

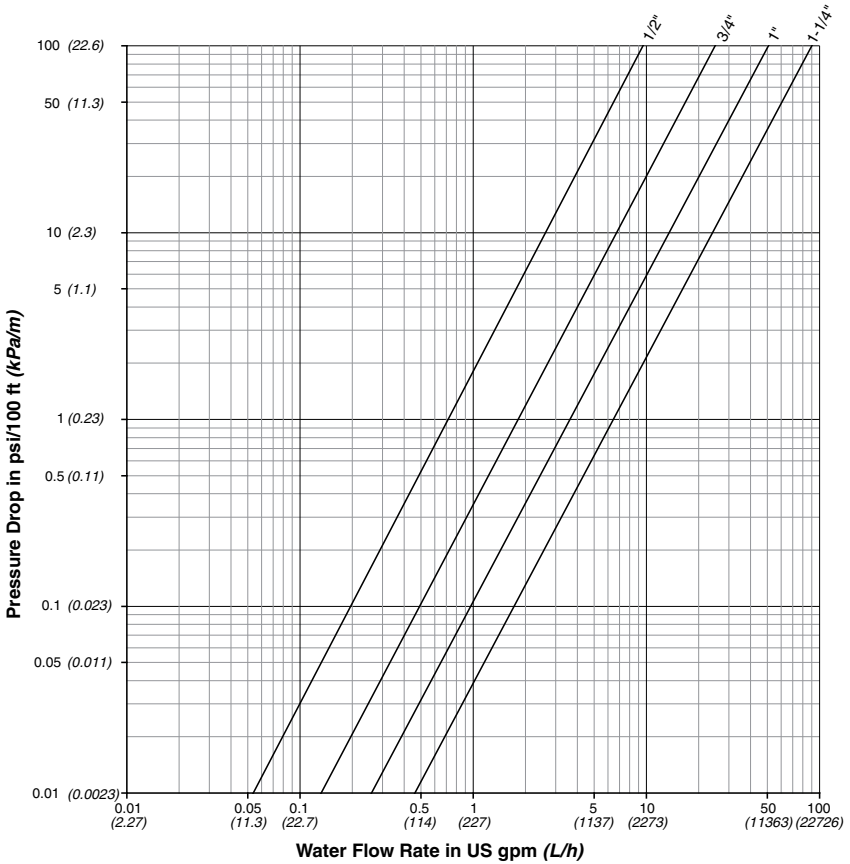
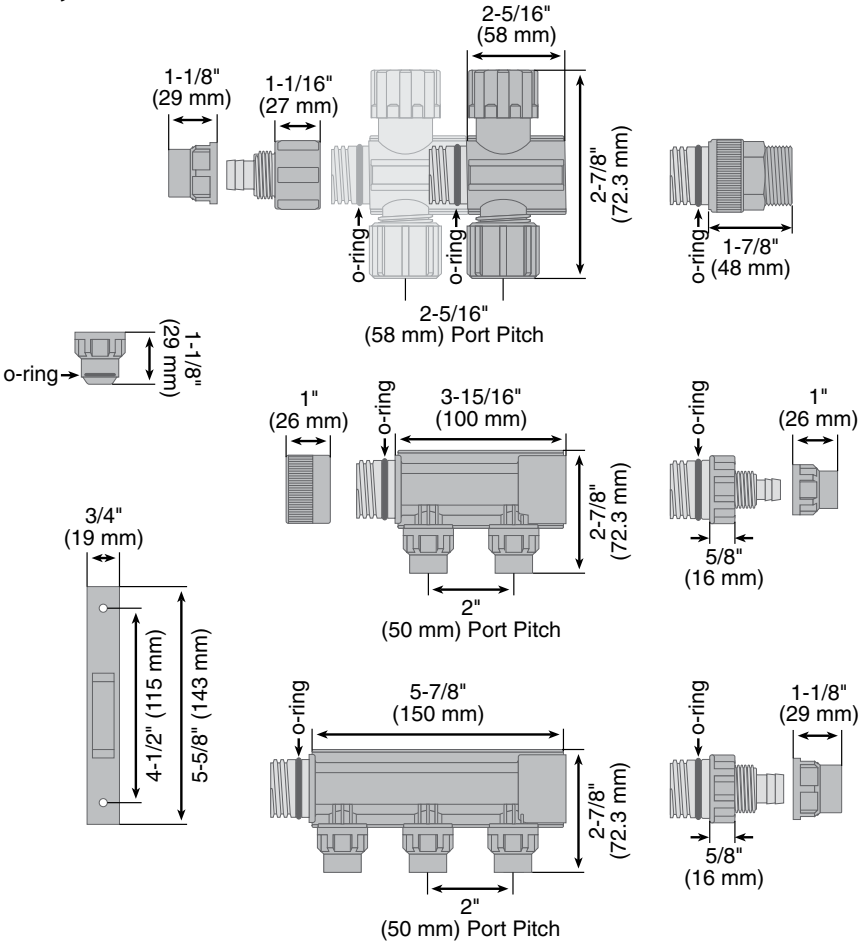


Chart settings at 120°F (49°C)

Note:

- 1 kPa = 10 mbar
- 100 Pa = 1 mbar
- 0.0145 psi = 1 mbar
- 14.5 psi = 1000 mbar
- 1 mbar = 0.033456 ft H₂O
- 1 ft H₂O = 29.89 mbar
- 1 ft H₂O/ft = 97.97 mbar/m
- 1 mbar/m = 0.010207 ft H₂O/ft
- 1 ft H₂O/ft = 0.4331 psi/ft
- 1 mbar/m = 0.004421 psi/ft

EasyFit™ Manifold Dimensions

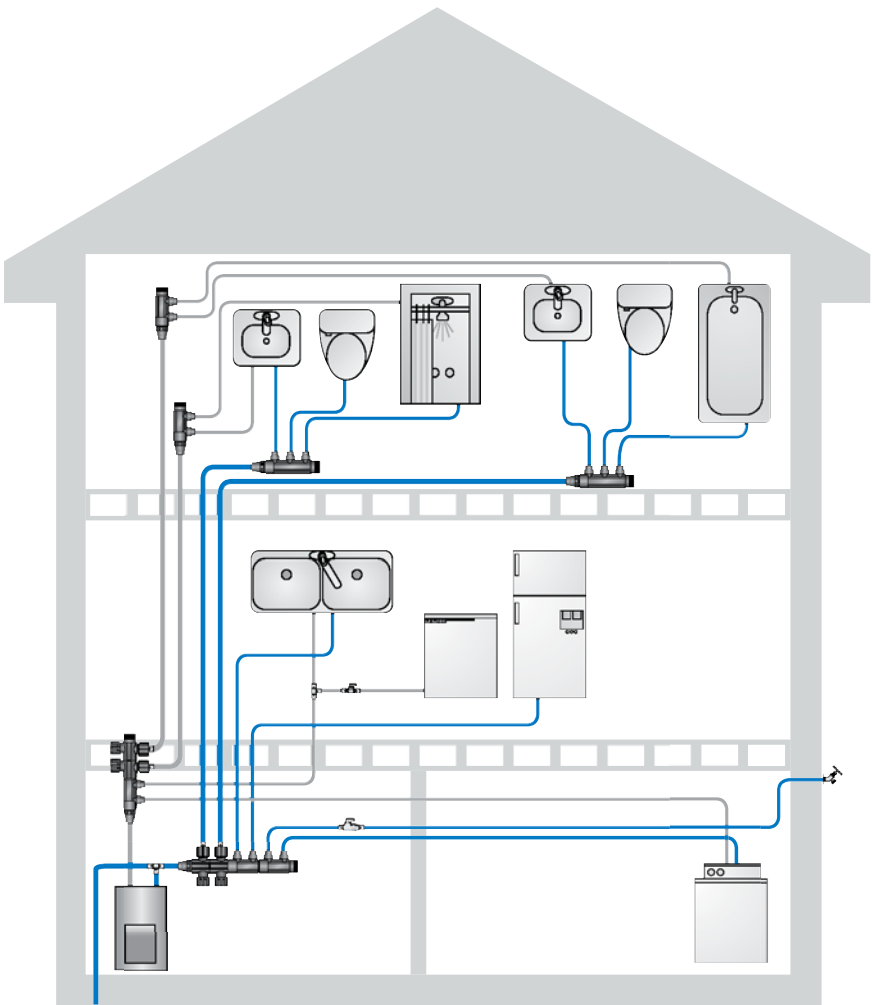


Note: End connections and caps are interchangeable between compression stop tees and 2 or 3 port tees.

EasyFit™ Manifold Specifications

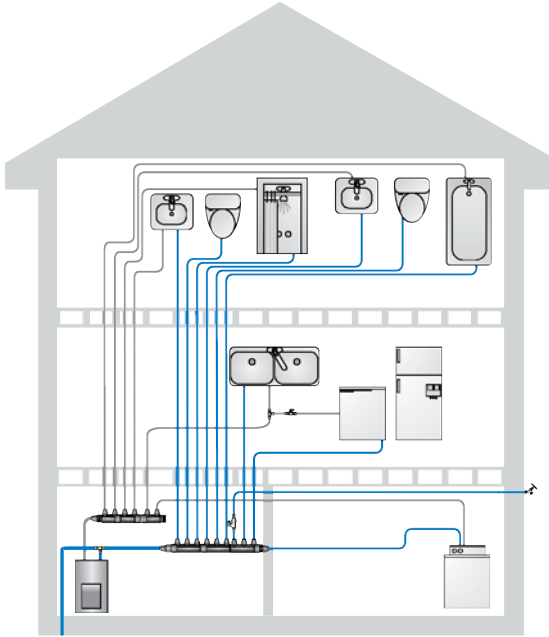
Working Pressure:	6 bar (87 psi)
Tested Pressure:	16 bar (232 psi)
Minimum Temp:	-54 °C (-65 °F)
Maximum Temp:	90 °C (195 °F)
Water Volume:	1.1 m ³ /h @ 0.5 bar (5 US gpm @ 7 psi)

Modified Home Run Piping Method

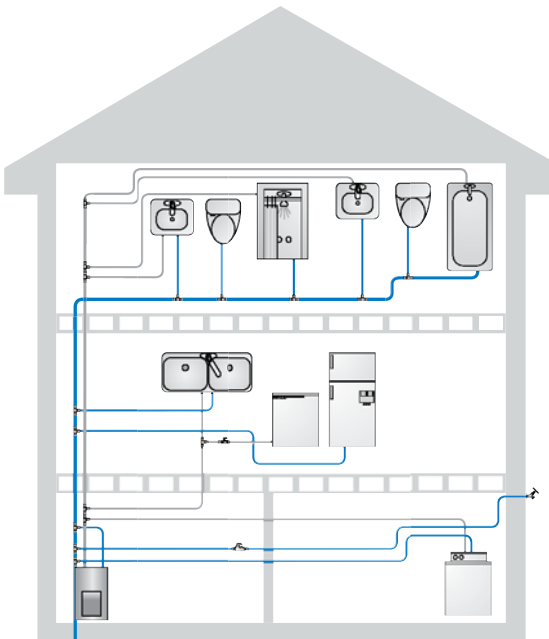


1. Remote headers can be fully accessible.
2. Requires less than half of the connections compared to the branch method.
3. Tremendous saving of blue and red PEX tubing compared to conventional branch method.
4. Mechanical room and basement have much less 1/2" tubing creating cleaner ceilings.

Home Run Piping Method



Branch and Tee Piping Method



Demand Load of Fixtures

Table 1.1 Demand load of fixtures

Fixture	Occupancy	Type of Supply Control	Fixture Units		
			Cold	Hot	Total
WC	Public	Flush valve	10.00		10.00
WC	Public	Flush tank	5.00		5.00
Urinal	Public	1" flush valve	10.00		10.00
Urinal	Public	3/4" flush valve	5.00		5.00
Urinal	Public	Flush tank	3.00		3.00
Lavatory	Public	Faucet	1.50	1.50	2.00
Bath	Public	Faucet	3.00	3.00	4.00
Shower	Public	Mixing valve	3.00	3.00	4.00
Basin	Office	Faucet	2.25	2.25	3.00
Kitchen sink	Hotel, restaurant	Faucet	3.00	3.00	4.00
Drinking fountain	Office	3/8" valve	0.25		0.25
WC	Private	Flush valve	6.00		6.00
WC	Private	Flush tank	3.00		3.00
Basin	Private	Faucet	1.00	1.00	1.50
Bath	Private	Faucet	1.50	1.50	2.00
Shower	Private	Mixing valve	1.50	1.50	2.00
Kitchen sink	Private	Faucet	1.50	1.50	2.00
Laundry tray	Private	Faucet	2.25	2.25	3.00
Dishwasher	Private	Faucet		1.00	1.00
Washing machine 8lbs	Private	Automatic	1.50	1.50	2.00
Washing machine 8lbs	Public or general	Automatic	2.25	2.25	3.00
Washing machine 16lbs	Public or general	Automatic	3.00	3.00	4.00

Definition of Terms

Fixture Unit: The demand imposed by a number of fixtures used intermittently cannot be determined exactly, so each fixture is given a factor known as a fixture unit which corresponds to a demand in GPM. Note: for the purposes of this book the fixture unit is used only to determine the size of distribution pipe required; it is not necessary to know the corresponding GPM.

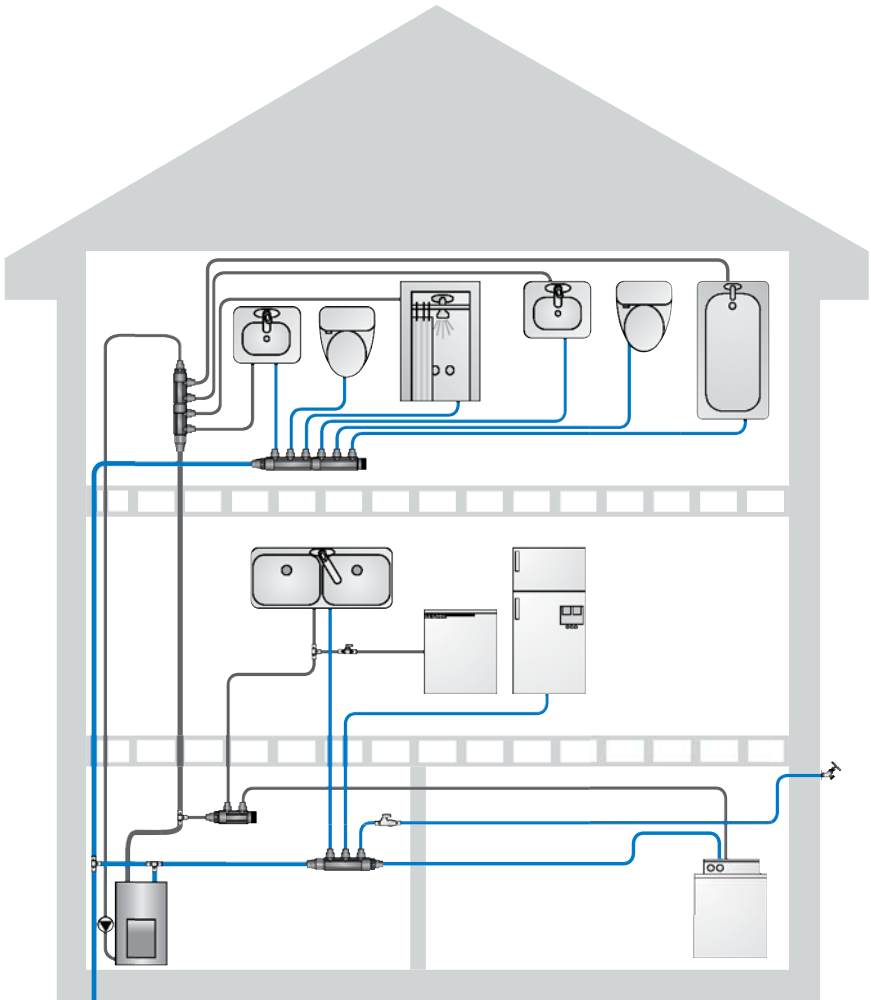
Note: *fixture unit information supplied from general code book info. Please check with your local codes to confirm.*

PEX Tubing Water Volume

Size	Volume (US gallons/ft)
1/2"	0.009
3/4"	0.018
1"	0.030
1-1/4"	0.040

Recirculation

PureLink Plus® PEX tubing is approved for use in timed or on-demand recirculation systems where the temperature does not exceed 140°F with a 50% duty cycle. PureLink Plus® PEX tubing is certified with a PEX designation of 3006. In the interest of energy conservation, HeatLink® recommends recirculation systems that utilize the minimum duty cycle to meet the demand requirements of the system.



Limitations on PureLink® PEX Tubing

- **Should not** be exposed to open flame.
- **Should not** be permanently exposed to UV light.
- **Should not** use glue or any material that affects the basic properties of crosslinked polyethylene.
- **Should not** be used above ratings.
- **Should not** install within 6" of any gas appliance vent piping, or within 12" of any recessed light fixtures.
- **Should not** solder pipe connections within 16" of any PureLink® tubing in the same water line.
- **Do not** come into contact with low molecular weight petroleum products such as fuels or solvents or oil based paints.
- **Should not** be used for LP or natural gas.
- **Cannot** be used for an electrical ground.
- **Do not** allow termiticides or pesticides to come in contact with PEX.
- **Do not** install below florescent lights, unless protected.
- **Do not** install in contaminated soil.
- **Do not** allow pests, insects or rodents to come in contact with PEX tubing.
- **Do not** install between shower valve and tub filler.

Important Notice

HeatLink® products are intended for installation by a licensed plumbing contractor. It is the sole responsibility of the installer to verify that the product meets local codes and standards.

Like most plastic material, crosslinked polyethylene is subject to ultraviolet (UV) deterioration and must not be continuously exposed unprotected to direct or indirect sunlight beyond its stated limits. Storage outside is not recommended but if necessary, the pipe must be covered with a material which will protect it from ultraviolet light. Failure to do so will void the warranty.



www.heatlinkgroup.com

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