Z U R N P E X ®

Residential Fire Protection Systems Installation Guide

ZURN PEX

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Zurn PEX® Residential Fire Protection Addendum To Plumbing Installation Guide

Note: This manual is an addendum to the Zurn PEX® Plumbing Installation Guide and Zurn PEX® Commercial Plumbing Manual. Its purpose is to provide customers with additional information relevant to Residential Fire Protection Systems.

Section I

System Overview

Zurn PEX offers multipurpose fire protection systems as described by the National Fire Protection Association 13D standard (NFPA 13D). A multipurpose system is often referred to as a combination system because the tubing serves the needs of both the cold domestic water distribution and fire protection system. These types of systems provide an array of benefits including:

- Lower cost than traditional “stand-alone” fire protection systems
- Provides confirmation that the system is working each time cold domestic water is used
- No stagnant water eliminates need for backflow preventers
- Both domestic water and fire systems can be installed by same contractor
- Utilizes flexible PEX tubing that provides fewer connections
- Zurn PEX systems resistant to freeze damage

Intended Purpose

Zurn PEX Fire Protection Systems are intended to be used in product combinations tested by NSF International to UL 1821. To our knowledge, Zurn PEX products have only been tested with other Zurn PEX products and are not intended to be used with any other manufacturer’s products.

Zurn PEX Fire Protection Systems are UL 1821 listed to be installed when protected by any of the constructions referenced below:

1. 3/8" [9.5 mm] thick or thicker gypsum wallboard; or
2. A suspended membrane ceiling with lay-in panels or tiles having a weight of not less than 0.35 lb/ft^2 [1.76 kg/m^2] when installed with metallic support grids; or
3. One layer of 1/2" [12.7 mm] plywood or plywood soffits.

The tubing and fittings are intended for use in multipurpose systems without a fire department connection.

The tubing and fittings are intended to be used in areas where the ambient temperature does not exceed 120°F.

Standards, Ratings, and Certifications

Zurn PEX tubing, fittings, copper crimp ring, and QickClamp™ systems are UL 1821 listed for use in multipurpose systems as described in NFPA 13D.

Zurn PEX products are manufactured in accordance with ASTM F876, ASTM F877, ASTM F1807, ASTM F2159, and CSA B137.5 standards and are listed by NSF International as such.

Zurn PEX products are listed to NSF International Standards 14 and 61.

Zurn PEX systems carry the following pressure and temperature ratings:

160 psi at 73°F
130 psi at 120°F (Fire Protection Rating)
100 psi at 180°F
80 psi at 200°F

Types of Multipurpose Fire Protection Systems

There are three types of multipurpose systems as described in NFPA 13D-Standard for the Installation of Sprinkler Systems in One and Two Family Dwellings and Manufactured Homes. A multipurpose fire protection system can be installed in accordance with any of these three systems or a combination of each in accordance with NFPA 13D.

Gridded

This system is set up as a grid and is the preferred system type of Zurn PEX because it is the simplest design and provides some of the best hydraulic characteristics. A sprinkler is supplied with water from both sides, while other branch lines help transfer water.

Looped

In this system, the outer sprinklers on the perimeter of the floor level are connected in a loop so they are supplied with water from both sides. Sprinklers within the loop are supplied with branch tee connections off the loop.

Straight

In this system, the sprinkler is supplied with water in only one direction. The hydraulic calculations are not very good; therefore, this is not a very popular design method.

System Design

Design of a residential fire protection system shall be in accordance with all requirements of the NFPA 13D standard. Prior to installation, construction plans including the sprinkler head locations and piping layout, as well as the hydraulic demand data, should be submitted to the local authority having jurisdiction for approval. Any deviations or changes in the plans after approval shall have permission by the same authority.

Section II

Product Descriptions

Sprinklers

Only sprinklers listed in accordance with NSF 61 can be used in Zurn PEX multi-purpose systems. In addition, the sprinkler must meet the requirements of NFPA 13D, specifically UL 1626 – Residential Sprinklers for Fire Protection Service.

Residential sprinklers operate under various temperatures ranging from 150°F to 175°F. In addition, all sprinklers vary in their specific K-value, wetting density capability, flow volume, and operating pressure at a specified design coverage area. There are sprinklers available for all types of situations and it is up to the designer to specify the appropriate sprinkler and its operating conditions.

Do not store sprinklers, sprinkler cover plates, or sprinkler accessories in areas that may experience excessive heat over 100°F.

Concealed Sprinklers

These sprinklers are flush against the ceiling and are covered with a special cover plate. In operation, the plate falls off at approximately 135°F and as the heat increases the sprinkler operates. It is important to **never** paint over the special cap. It may interfere with the operation of the sprinkler.

Recessed Pendent Sprinklers

These sprinklers are visible on the ceiling and do not have a cover plate. In operation, high heat in the range of 150°F to 175°F will cause the sprinkler to operate.

Recessed Horizontal Sidewall Sprinklers

These sprinklers are visible on the wall and do not have a cover plate. In operation, high heat in the range of 150°F to 175°F will cause the sprinkler to operate.

Tubing

UV Resistance – 6 months, please see precautions below.

Chlorine Resistance – 5006 designation, generally a continuously circulating hot water plumbing loop.

Sizes up to and including 1" meet the 25/50 flame spread/smoke developed requirement in general accordance with UL733/ASTM E84 and is suitable for use in plenums.

Sizes greater than 1" meet the 25/50 flame spread/smoke developed requirement in general accordance with UL733/ASTM E84 when wrapped with 1/2" thick fiberglass insulation that is ASTM E84 listed and is suitable for use in plenums.

Zurn PEX Tubing Installation Precautions

- Zurn PEX tubing should not be exposed to or stored in direct UV light. When possible, protect the tubing with an opaque covering.
- Zurn PEX tubing should not be exposed to a direct flame. Braze, solder, or weld and allow to cool prior to connecting Zurn PEX to metal pipe.
- Zurn PEX should never be used for electrical grounding. Consult the NEC for recommended grounding methods when PEX is used.
- Do not install Zurn PEX tubing within 24 inches of air return grills or other opening in the ceiling.
- Zurn PEX should not be installed in conditions near extreme heat.
- Painting Zurn PEX is unnecessary. Water-based latex or acrylic paints will not affect Zurn PEX tubing; however, oil-based paints or lacquers should never be applied to Zurn PEX tubing.
- Zurn PEX should only be installed in operating conditions that are consistent with pressure and temperature ratings that appear on the tubing and applicable standards.
- Zurn PEX should not be subjected to prolonged exposure to free chlorine concentrations greater than 4 ppm.
- Zurn PEX tubing that has been crushed or scratched should be removed from the system and replaced.
- Zurn PEX should never come into contact with any chemicals, pipe thread compounds, putty, mineral, or linseed oil products.

Zurn PEX CR

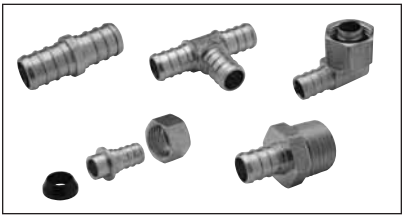
Zurn PEX CR plastic fittings are molded from a blend of highly engineered polymers. The inherent qualities of the polymers make Zurn PEX CR fittings highly resistant to chlorine and other chemicals present in potable water.

Zurn PEX CR Installation Precautions

- Zurn PEX CR fittings should only be used in operating conditions that are consistent with the temperature and pressure ratings of the tube as well as applicable standards.
- Zurn PEX CR fittings should not be painted.
- Zurn PEX CR fittings should not be exposed to direct UV light. When possible, protect fittings with an opaque covering.
- Zurn PEX CR male pipe threads must only use PTFE tape as a thread sealant.
- Zurn PEX CR fittings should not be exposed to cleaners, chemicals, solvents, sealants, or glues as they could be damaged from contact.
- Zurn PEX CR fittings should always be stored in clean bins or containers, preferably in the original packaging.

Zurn PEX XL

Zurn PEX XL brass fittings have a 30-year track record of reliability. With over 230 million fittings in service nationwide, the Zurn PEX XL fitting system is the most widely used system in the industry.



Zurn PEX XL Installation Precautions

- Zurn PEX XL fittings should only be used in operating conditions that are consistent with the temperature and pressure ratings of the tube as well as applicable standards.
- Zurn PEX XL fittings should not be used in reverse osmosis systems.
- Zurn PEX XL fittings should not be used in areas with known localized aggressive water chemistries.

Section III

Making Crimp Connections

Cold Weather Installation Connections

Crimps are intended to be made in general working temperatures above 32°F. However, in extreme temperatures down to 0°F, we recommend more frequent gauging to ensure in specification crimps are being made.

Zurn PEX offers two different clamp fitting systems for the installation of multipurpose fire protection systems: the QickClamp™ and Copper Crimp Ring. To choose the clamp system most appropriate for your installation, consider factors relative to your jobsite priorities.

QickClamp™ System

- Patent-pending technology
- One tool system
- Available in 3/8", 1/2", 3/4", and 1" sizes
- Go Gauge
- 25-year system warranty

Listings

By NSF International as meeting the following standards:

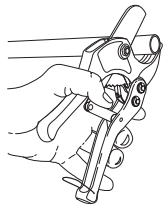
ASTM F877
CAN/CSA B137.5
NSF Standard 14

Important: The QickClamp™ cannot be used with Zurn PEX transitional fittings which are used to transition from polybutylene to PEX.

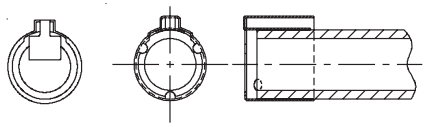
Making The Connection With The Medium QickClamp™ Tool

Important: Using this tool for anything other than its intended purpose voids the warranty.

1) Measure and cut the tube. Be sure you have a square, burr-free cut. An uneven or jagged cut may cause an improper connection.

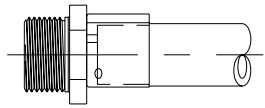


2) Push tubing into the QickClamp until the tubing stops at locating fingers. **Do not force the tubing to bottom out in the QickClamp.** Some tubing should be visible in the sight hole. **Be sure that the tab inside the QickClamp stays on the outside of the tubing.**

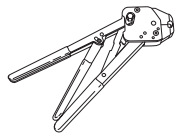


Incorrect Assembly **Correct Assembly**

3) Push fitting into the tubing until the fitting shoulder touches the locating fingers on the QickClamp.

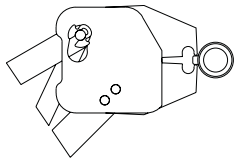


4) Open the QickClamp Medium Crimp Tool* and pull the middle handle down. Hold the tool in one hand with your thumb over the middle handle and your fingers around the bottom handle. Place the jaws completely over the QickClamp pinch ear.

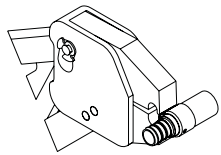


Important: Be sure the tool jaws cover the entire ear of the QickClamp before crimping; failure to do so will result in an improper crimp and may void the warranty.

5) With the tool at a 90º angle to the tube, close the middle handle until it contacts the bottom handle. The ratchet will lock the handles in place. Complete the crimp by removing your thumb from the middle and squeezing the upper and lower handles together. The ratchet will allow the handle to open once the crimp is completed.

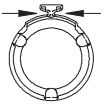


6) Open the QickClamp Medium Crimp Tool and remove it from the QickClamp. If the entire ear didn't crimp, **do not recrimp**. The crimp ring must be cut out and replaced.

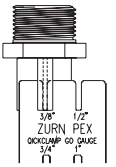


Crimp Systems, continued

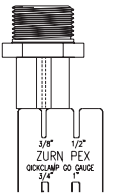
7) Check a completed connection with the appropriate sized section of the QickClamp Go gauge. Using the appropriate slot on the gauge for the fitting size, slide the gauge onto the crimped pinch ear. If the QickClamp pinch ear does not go into the Go gauge, the fitting should be cut out, the tool adjusted, and the fitting replaced. For tool adjustment, see instructions supplied with tool.



Gauging Area



Good Crimp

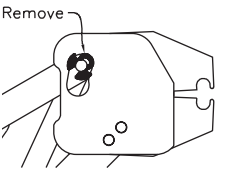


Bad Crimp, Adjust Tool and Replace Fitting

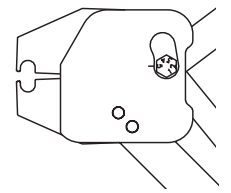
Adjusting The Medium QickClamp™ Crimp Tool

The Zurn Medium QickClamp Crimp Tool is factory set to provide proper crimps. This should be checked before use by making a test crimp connection and checking it with the QickClamp Go Gauge. As long as the finished crimp connection gauges properly, there is no need to adjust the tool. **We recommend checking finished crimp connections frequently with the Zurn QickClamp Go Gauge. As more crimp connections are made, the QickClamp Tool will require adjustment. This can be detected by the crimp diameter increasing and the completed crimp does not gauge properly.**

1) With the tool in the open position, remove the E-clip using a screwdriver.

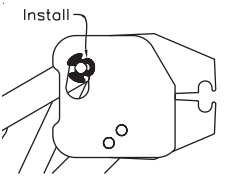


2) Slide the Adjustment Pin back about 1/4". **Warning: The Adjustment Pin must not be pulled or pushed completely out.** Rotate the Adjustment Pin until the line on the the tool head points to the next higher number on the pin. For example, to tighten the crimp when tool is set to zero (0), adjust the pin to the one (1) position. There are five total adjustments.



3) Push Adjustment Pin back in and reinstall the E-clip.

4) Apply light oil to the tool pivot points each time the tool is adjusted. Failure to lubricate the tool will shorten the tool's life.



Crimp Systems, continued

Copper Crimp Ring System

- Proven system for over 30 years
- Available in 3/8", 1/2", 5/8", 3/4", 1", and 1-1/4"
- Go/No-Go Gauge
- 25-year system warranty

Listings

By NSF International as meeting the following standards:

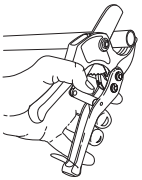
ASTM F877
ASTM F1807
CAN/CSA B137.5
NSF Standard 14

Making The Connection With The Medium Crimp Tool

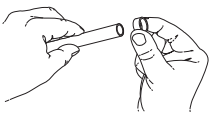
Note: *Use the crimp tool only to install PEX tube/fitting systems meeting ASTM F1807 for brass or copper insert fittings and F2159 for plastic insert fittings.*

Important: Always refer to the tube manufacturer's product assembly instructions when using the crimp tool.

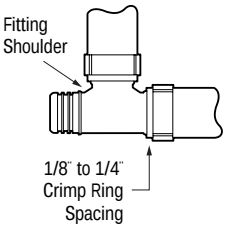
1) Measure and cut the tube. Be sure you have a square burr-free cut. An uneven or jagged cut may cause an improper connection.



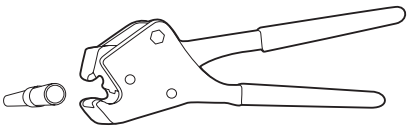
2) Next, slip a copper crimp ring onto the tube. Do not use hose clamps!



3) Now insert the fitting into the tube up to the fitting shoulder. Position the crimp ring 1/8 inch to 1/4 inch from the end of the tube. An improperly positioned ring may produce a weak connection. Ring may be squeezed to hold it in place until step 4 is completed.



4) Position jaws squarely around the ring. Release upper handle to close jaws on the ring. Squeeze handles together to complete the crimp.



Crimp Systems, continued

5) Pull back on moving handle to release jaws from crimped ring.

6) Measure the crimped ring with Zurn "Go/No-Go" gauge. See table below. Do not measure bumps on ring where jaws met. If "Go" on gauge does not fit, or if "No-Go" does fit, then cut out connection, replace fitting and ring, adjust and calibrate the tool, and recrimp.

   The following dimensions are the ASTM maximum and minimum crimped ring diameters for crosslinked polyethylene (PEX) pipe installations.

Standard Tube Size >	3/8"	1/2"	5/8"	3/4"
Minimum Diameter	0.580"	0.700"	0.815"	0.945"
Maximum Diameter	0.595"	0.715"	0.830"	0.960"

Variation in ring diameter (out-of-round) should not exceed 0.006".

Making The Connection With The Large Crimp Tool

Note: *Use the crimp tool only to install PEX tube/fitting systems meeting ASTM F1807 for brass or copper insert fittings and F2159 for plastic insert fittings.*

Important: Always refer to the tube manufacturer's product assembly instructions when using the crimp tool.

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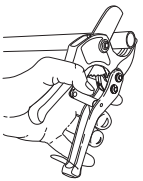
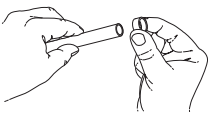
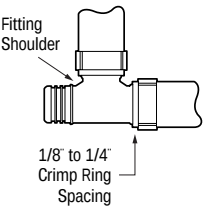


2) Next, slip a copper crimp ring onto the tube. Do not use hose clamps!

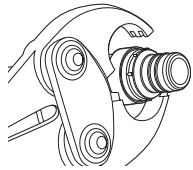


3) Now insert the fitting into the tube up to the fitting shoulder. Position the crimp ring 1/8 inch to 1/4 inch from the end of the tube. An improperly positioned ring may produce a weak connection. Ring may be squeezed to hold it in place until step 4 is completed.



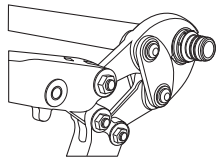
Crimp Systems, continued

4) Position the tool so the crimp ring is completely covered by the tool jaws. Keep the tool at a 90° angle to the fitting and close it completely. Squeeze handles together to complete the crimp.



5) Open the tool handles to release jaws from the crimped fitting.

6) Measure the crimped ring with Zurn "Go/No-Go" gauge. **See table below.** Do not measure bumps on ring where jaws met. If "Go" on gauge does not fit, or if "No-Go" does fit, then cut out connection, replace fitting and ring, adjust and calibrate the tool, and recrimp.



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Standard Tube Size >	3/8"	1/2"	5/8"	3/4"	1"
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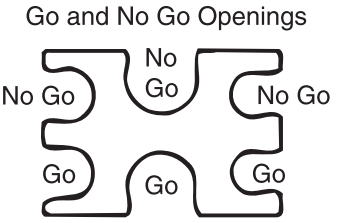
Maximum Diameter	0.595"	0.715"	0.830"	0.960"	1.190"

Variation in ring diameter (out-of-round) should not exceed 0.006".

Crimp Systems, continued

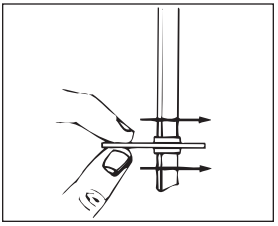
Using The Zurn Go/No-Go Gauge



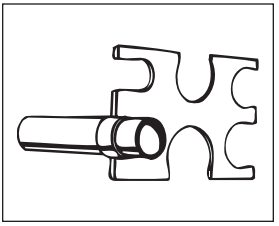
After making a crimp connection, use the appropriate opening of this flat "Go/No-Go" Gauge to check your finished crimp. The "Go" opening should go freely across a crimped ring anywhere on its diameter with the possible exception of the upset area on the ring surface caused by the tool jaws closing. Do not force the gauge across the ring. The "No-Go" opening should not go across a crimped ring anywhere. If the crimp fails either test, cut out the fitting and replace.

DO:

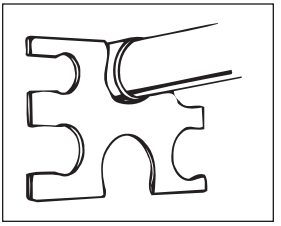
Always place the gauge opening on the crimp ring at a 90° angle for an accurate check.



Be certain to use the gauge opening sized for the diameter of your tube.

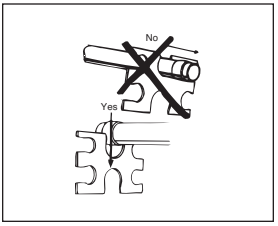


We recommend you check every finished crimp with this gauge.

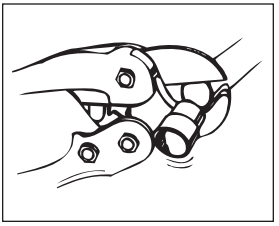


DO NOT:

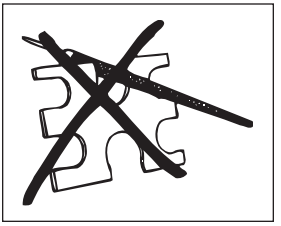
Do not slide the gauge onto the connection. Push it directly onto the crimp ring.



Do not try to save time by recrimping a crimp that does not gauge properly. The fitting must be cut out and replaced.



Do not modify the gauge opening for any reason. They have been carefully manufactured to .002-inch tolerance.

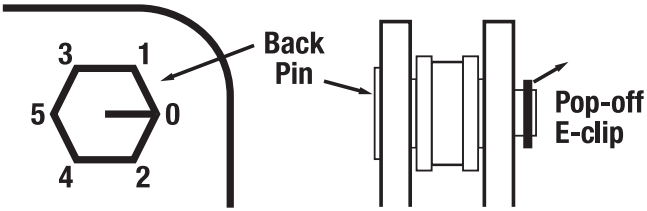


Crimp Systems, continued

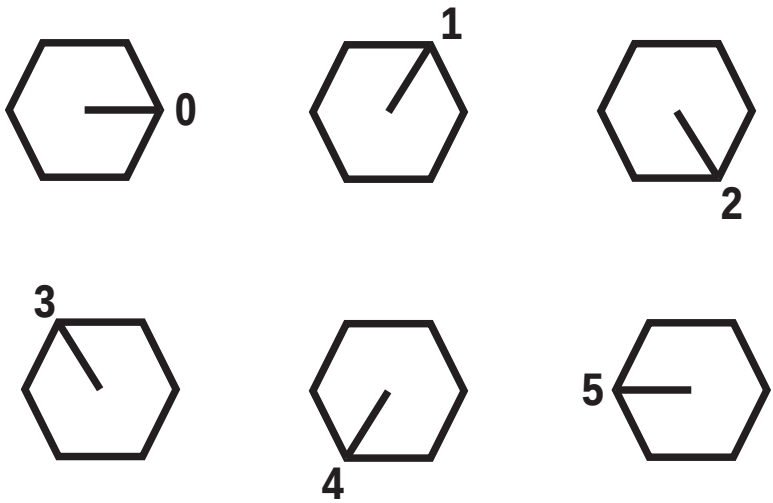
Adjusting The Medium Crimp Tool

Note: Zurn Crimp Tools are factory set to provide proper crimps. This should be checked before use by making a test crimp connection and checking it with the crimp gauge. As long as the finished crimp connection gauges properly, there is no need to adjust the tool.

All crimp tools wear, which increases the crimp diameter after many crimps. When the crimps start to approach the maximum ring diameter, adjust the back pin. To adjust for a tighter crimp, remove the E-clip (for example, pop it off with a screwdriver) and slide the back pin head out about 1/4 inch. **Warning: The Adjustment Pin must not be pulled or pushed completely out.** Rotate the back pin until the line on the hex head points to the next highest number on the tool body, push the pin back in, and refit the E-clip. Five adjustments are available.



For a tighter crimp, turn mark on pin to the next number:



Maintenance

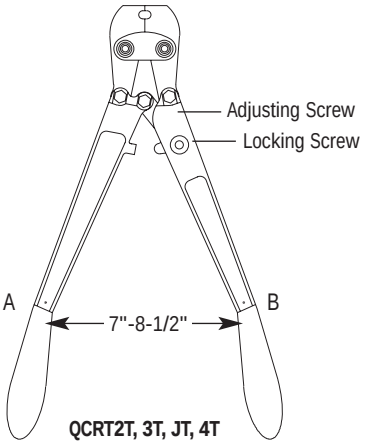
For easier, better crimps and longer tool life, keep tool clean and rust-free inside and out. Lubricate all moving parts frequently with light oil.

Crimp Systems, continued

Adjusting The Large Crimp Tool

Zurn Crimp Tools are factory set to provide proper crimps. This should be checked before use by making a test crimp connection and checking it with the crimp gauge. As long as the finished crimp connection gauges properly, there is no need to adjust the tool.

1) Loosen the bottom Locking Setscrew two turns using the hex wrench provided with the tool.
2) Close the tool until the jaws just touch and increased resistance is felt. This is the pre-load point.
3) Turn the top Adjusting Setscrew until the distance between the raised "+" marks on the handles is between 7 and 8-1/2 inches for QCRT2T, 3T, JT, and 4T. The distance for QCRT5T should be 13 inches. Tighten the bottom Locking Setscrew. **See Warning for QCRT2T, 3T, JT, 4T, and QCRT5T tool.**
4) Make a test crimp connection and check it with the "Go" and "No-Go" openings of the gauge. If the "No-Go" opening goes over the crimped ring, the tool is too tight. The distance between the "+" marks should be decreased. If the "Go" opening does not go over the crimped ring, the tool is too loose and the distance between the "+" marks should be increased.
5) Apply a light oil to the pivot points each time the tool is adjusted. **Failure to lubricate the tool will shorten its life.**



QCRT2T, 3T, JT, 4T

WARNING:

Increasing the pre-load distance beyond 9 inches for the QCRT2T, 3T, JT, 4T or 13 inches for the QCRT5T will make the tool hard to use and shorten tool life because of excessive stress.

Section IV

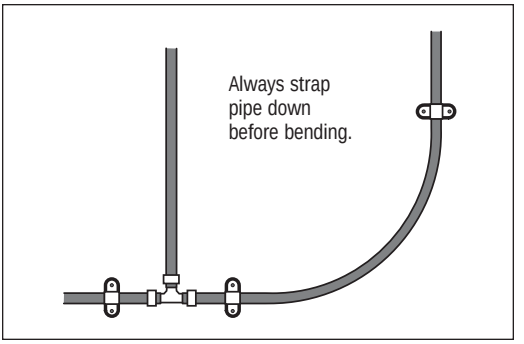
Tubing Supports and Fitting

- Do not use supports that have sharp edges which could damage the tubing. Tube supports should allow free tubing movement.
- Do not install Zurn PEX within 6 inches of any gas appliance single wall vent. The exception is when double walled B-vent is used, which has a minimum clearance of 1 inch.
- It is acceptable to run Zurn PEX tube next to normal HVAC ductwork, provided the tubing cannot be cut or abraded by sharp edges of the duct work.
- It is acceptable to install Zurn PEX tubing within 12 inches of recessed light fixtures only when insulation has been installed with the specific purpose of protecting the tubing from excessive heat.
- When Zurn PEX tubing is free to uniformly expand, it is resistant to freeze damage in an accidental freeze. However, if Zurn PEX tubing is to be installed in an area subject to regular freezing conditions, we recommend that the tubing be insulated or otherwise protected as required by local code.
- Zurn PEX tubing is approved for water distribution only and should not be used for distribution of petroleum based products such as liquid petroleum (LP) or natural gas.

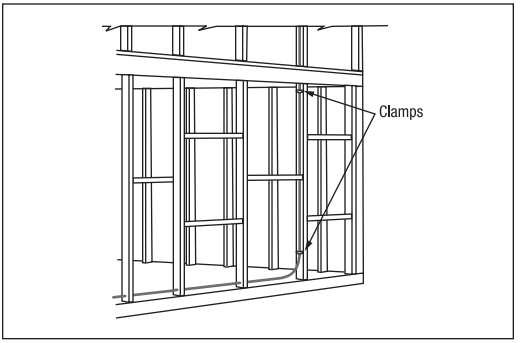
Uncoiling Zurn PEX Tubing

For ease of installation Zurn recommends using the Zurn PEX dual coil uncoiler, QDISP; the Zurn PEX pipe dispenser, QHD; or the Zurn PEX portable uncoiler.

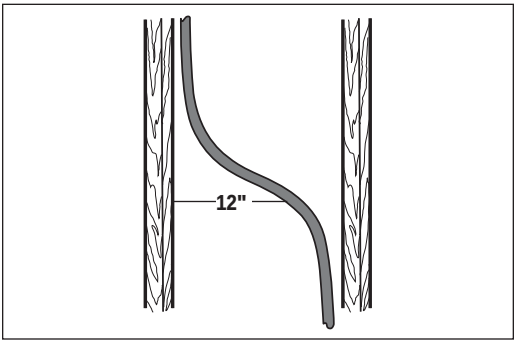
Zurn PEX straps and hangers hold pipe in position and prevent strain on fittings when the pipe is bent.



Vertical runs need support at every floor level.



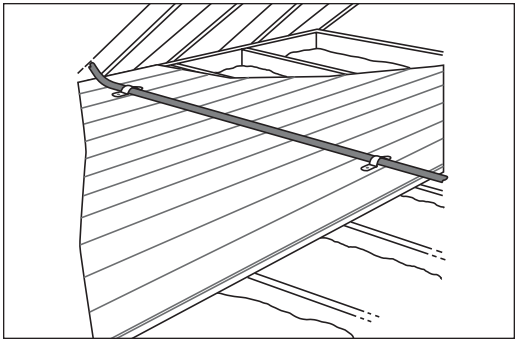
Since Zurn PEX tubing expands or contracts one inch for every 100 feet of pipe for every 10° of temperature change, you must allow for expansion and contraction in long runs with a 12-inch horizontal offset.



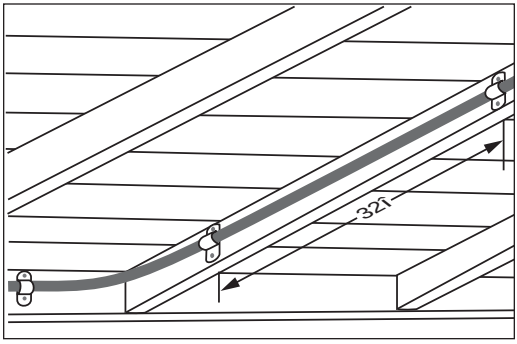
Supporting Zurn PEX Distribution Lines

Note: Zurn PEX should be supported or strapped every 32" when hung from floor joists or running across rafters. When supporting tube bundles, use a strap to support the entire bundle.

Straps can be as far as 6 feet apart if the pipe is continuously supported.

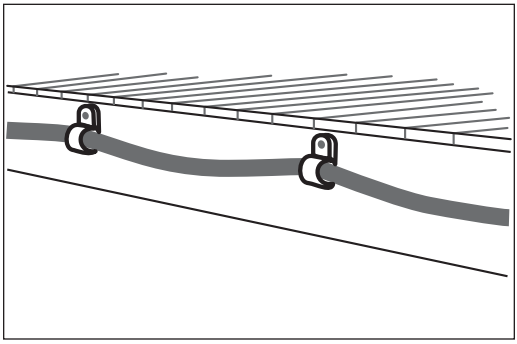


Horizontal runs should be supported every 32 inches.



Always cut the pipe longer than necessary to allow some slack for any contraction in the pipe. 1/8" per foot of length is usually enough.

Strapping support should be firm but loose enough to allow the pipe to move back and forth as it expands and contracts.



Important: When running Zurn PEX tubing, be sure to keep it away from potential sources of heat. Maintain a minimum of 12 inches between Zurn PEX and any recessed light fixture and a minimum of 6 inches between Zurn PEX and any gas appliance vent.

The use of zip ties to attach Zurn PEX to DWV piping is acceptable so long as the ties leave enough room for free movement of the tubing.

Note: When installing runs of Zurn PEX, it is sometimes necessary to pull one tube past another. Care should be taken to make sure that the friction of the moving tube does not burn or wear a notch in the stationary tube. If this occurs, the notched section of the tube must be cut out and replaced.

Tubing Expansion

Zurn PEX tubing should not be pulled tight during installation. Adequate slack should be determined in order to prevent the tubing from exerting tensile loads on the connections to the fittings.

Allow 1/8" per foot of tube length as slack. This should cover installations from 35°F - 160°F.

Bending Zurn PEX Tubing

The minimum bend radius for Zurn PEX is 6 times the outside diameter of the tubing, when bending it with the natural curvature of the coil.

Tubing Size	Outer Diameter	Minimum Bend Radius
3/8"	.500"	3.00"
1/2"	.625"	3.75"
3/4"	.875"	5.25"
1"	1.125"	6.75"
1-1/4"	1.375"	8.25"
1-1/2"	1.625"	9.75"
2"	2.125"	12.75"

Note: If you must bend against the natural curvature of the coil, these minimums must be multiplied by 3.

Metal Studs

Protective sleeves or bushings should be used on Zurn PEX tubing when penetrating metal studs. Sleeves and bushings are not required when penetrating ordinary wood or particle board if the holes are at least 1/8" larger than the tube size and tube movement is not restricted.

Insulating Tubing

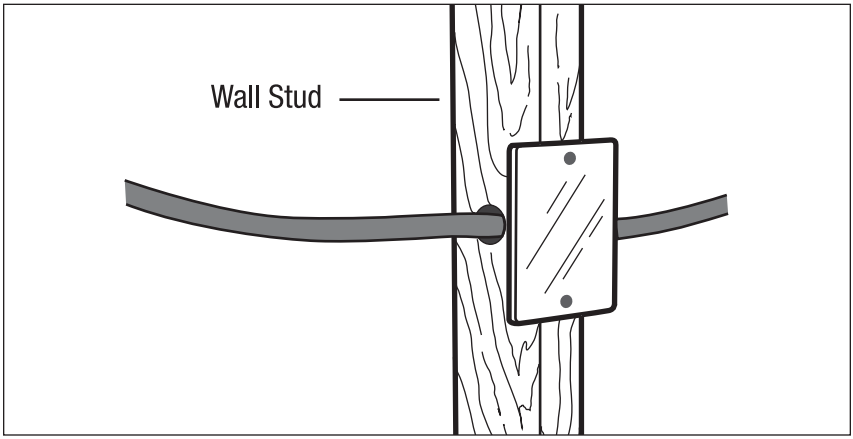
Zurn PEX is resistant to freeze damage; however, installation specific variables can affect the performance of the system if it is allowed to freeze up. In general, plumbing codes specify that tubing run through attics and exterior walls should be insulated. As such, Zurn PEX tubing should be insulated according to code requirements. Insulation that is typically used in copper and CPVC installations would provide equivalent protection for Zurn PEX tubing.

Note: When using expanding foam to insulate tubing, please contact Zurn for recommendations. While many expanding foams have been tested and have shown no adverse effects to PEX tubing, we cannot guarantee all foams are the same.

Nailing Plates

Nailing plates should be used when Zurn PEX tubing is passing through a stud within 2" of a nailing surface. Using a nailing plate minimizes the possibility of damage to the tube from nails or drywall screws.

Note: Best results are achieved by using clamps, pipe insulators, and strapping designed for plastic plumbing systems.



Section V

Sprinkler Adapter Fittings

Zurn PEX offers sprinkler adapter fittings for the installation of its multipurpose fire protection systems. All adapter fittings are designed for side mounting onto a ceiling or wall joist. The choice of adapter fitting, sprinkler, and placement shall be in accordance with the approved system design and NFPA 13D requirements.

1. Use the design layout to determine the type of sprinkler and adapter fitting required in a specific location. Sprinkler, sprinkler placement, and spacing are dictated by the design.
2. The design may call for a general area for sprinkler placement, for example within a 2 foot radius of a specific location. This is intended to leave the installer with the discretion to avoid any obstructions that may interfere with sprinkler discharge such as fans, surface mounted lights, beams, and slopes. Please refer to the applicable sections of NFPA 13D for more specific requirements.
3. Attach the sprinkler adapter to the structure using #10 x 1-1/4" deck screws. The height at which the adapter fitting is mounted will vary based on sprinkler type chosen. Please refer to sprinkler manufacturer's technical data sheet for guidance. The slotted screw-hole design will allow for slight modification as necessary. It is recommended that the sprinkler adapter fittings be installed prior to installing the tubing.
4. Use the procedures from the preceding sections when making a crimp to the sprinkler adapter fitting.
5. Install the sprinkler with protective cap using the appropriate sprinkler wrench.

Section VI

Testing

Installation is not complete until testing of the installed system confirms both its proper design and installation. Testing takes part in two forms; pressure testing and flow testing. Both MUST be performed and recorded to complete installation. It may also be necessary for the authority having jurisdiction to be present for flow and pressure testing. It is recommended that the local inspector is notified prior to testing.

Pressure Testing

Each completed installation must be pressure tested in accordance with NFPA 13D which calls for testing at normal operating pressure. If local code requirements are more stringent, they should prevail.

Flow Testing

To ensure a properly designed Zurn PEX Fire Protection System has been installed, a flow verification test of the two most hydraulically remote sprinkler heads is necessary. All information must be recorded and filed accordingly. This is the installer's responsibility.

1. With the water turned off and drained, carefully unscrew the most hydraulically remote sprinkler head(s) using the appropriate sprinkler head tool.
2. Install Zurn PEX flow test kit by threading 1/2" male adapter fitting(s) into sprinkler adapter fitting using thread seal tape to make a water tight connection.
3. Assemble the remaining kit including the properly size orifice and be sure valve on kit is closed.
4. Open main shut off valve and purge out the air in the system using the valve on the flow kit. Once all air is purged the system should be pressurized to its working pressure.
5. Record static pressure readings at the manifold and at the test kit.
6. Ensure large 30 gallon bucket is properly placed and open valve(s) on flow kit.
7. Allow to run until the flow meter stabilizes and the flow rate can be recorded. In addition, record the residual pressure of the flow kit.
8. Compare results to designed values.
9. Fax completed Flow Test Data Sheets to Zurn PEX at 903-886-2583.

Appendix

Table 1 Pressure Drop for Zurn PEX Tube - psi/foot

	1"		1.25"		1.5"		2"	
GPM	Pressure Drop	Velocity (ft/sec)	Pressure Drop	Velocity (ft/sec)	Pressure Drop	Velocity (ft/sec)	Pressure Drop	Velocity (ft/sec)
5	0.017	2.7	0.006	1.8	0.003	1.3	0.001	0.8
8	0.041	4.4	0.015	2.9	0.007	2.1	0.002	1.2
10	0.062	5.5	0.023	3.7	0.010	2.6	0.003	1.5
11	0.074	6.0	0.028	4.0	0.012	2.9	0.003	1.7
12	0.087	6.6	0.033	4.4	0.015	3.2	0.004	1.8
13	0.101	7.1	0.038	4.8	0.017	3.4	0.005	2.0
14	0.116	7.7	0.044	5.1	0.020	3.7	0.005	2.2
15	0.132	8.2	0.049	5.5	0.022	4.0	0.006	2.3
16	0.148	8.8	0.056	5.9	0.025	4.2	0.007	2.5
17	0.166	9.3	0.062	6.3	0.028	4.5	0.007	2.6
18	0.184	9.9	0.069	6.6	0.031	4.8	0.008	2.8
19	0.204	10.4	0.077	7.0	0.034	5.0	0.009	2.9
20	0.224	11.0	0.084	7.4	0.038	5.3	0.010	3.1
21	0.245	11.5	0.092	7.7	0.041	5.5	0.011	3.2
22	0.267	12.1	0.100	8.1	0.045	5.8	0.012	3.4
23	0.290	12.6	0.109	8.5	0.049	6.1	0.013	3.5
24	0.314	13.2	0.118	8.8	0.053	6.3	0.014	3.7
25	0.338	13.7	0.127	9.2	0.057	6.6	0.015	3.8
26	0.364	14.3	0.137	9.6	0.061	6.9	0.016	4.0
27	0.390	14.8	0.147	9.9	0.066	7.1	0.018	4.2
28	0.417	15.4	0.157	10.3	0.070	7.4	0.019	4.3
29	0.445	15.9	0.167	10.7	0.075	7.7	0.020	4.5
30	0.474	16.5	0.178	11.0	0.080	7.9	0.021	4.6
31	0.504	17.0	0.189	11.4	0.085	8.2	0.023	4.8
32	0.534	17.6	0.201	11.8	0.090	8.4	0.024	4.9
33	0.565	18.1	0.213	12.1	0.095	8.7	0.026	5.1
34			0.225	12.5	0.101	9.0	0.027	5.2
35			0.237	12.9	0.106	9.2	0.028	5.4
40			0.303	14.7	0.136	10.6	0.036	6.2
45			0.377	16.5	0.169	11.9	0.045	6.9
50					0.206	13.2	0.055	7.7
55					0.245	14.5	0.066	8.5
60					0.288	15.8	0.077	9.2
65					0.334	17.2	0.090	10.0
70					0.383	18.5	0.103	10.8
75							0.117	11.5
80							0.132	12.3
90							0.164	13.9
100							0.199	15.4
110							0.237	16.9
120							0.278	18.5

Appendix

Table 2 Fitting Equivalent Length - Feet of Tube

Fitting	Size				
	1" XL Brass	1" CR Plastic	1-1/4" XL Brass	1-1/2" XL Brass	2" XL Brass
Tee Run	1.65	6.93	2.95	3.11	3.32
Tee Branch	10.76	24.55	13.12	15.74	21.14
Elbow	9.98	23.61	13.17	14.44	20.85
Coupling	1.45	6.79	1.90	2.09	2.29
FST - Run*	1.84	N/A			
FST - Branch*	20.23				

*FST - Fire Sprinkler Tee

How Fitting Equivalent Length Is Calculated

Zurn PEX fire protection fittings are flow tested according to the requirements laid out in UL 1821 and ANSI/ISA-S75.02 - 1996. Fitting and tube samples were subjected to five different flow velocities between 10 and 18 ft/second. The measured pressure loss across each fitting was divided by the pressure loss of 1 foot of tube tested at the same flow velocity to calculate the equivalent length. The equivalent lengths of the five flow velocities were averaged to determine the fitting equivalent length.

Notes

Notes

Zurn Pex, Inc.
Highway 11 East
Commerce, TX, U.S.A. 75428
Phone: 903/886-2580
Fax: 903/886-2583
www.zurnpex.com

In Canada:
Zurn Industries Limited
3544 Nashua Drive
Mississauga, Ontario, Canada L4V 1L2
Phone: 905/405-8272
Fax: 905/405-1292

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