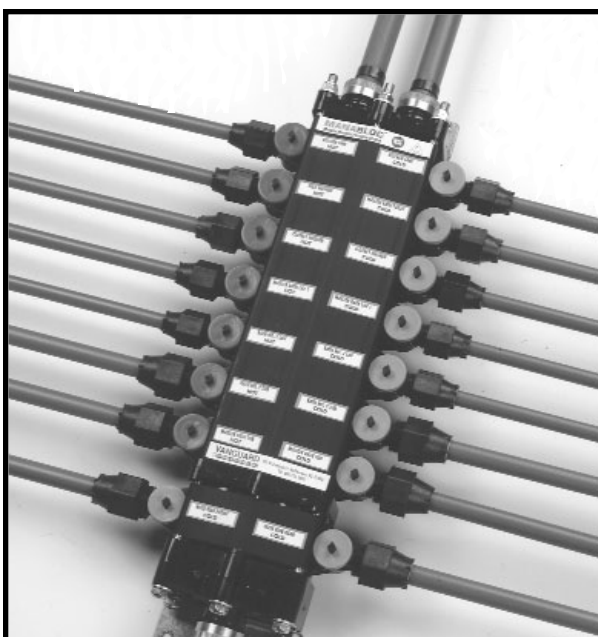




MANABLOC® *Modular Manifold Plumbing System*



**For use with Vanguard VANEX®
SDR9 PEX Cross-Linked Polyethylene Tubing**



Revised June 30, 2003

FAILURE TO FOLLOW THE INSTALLATION GUIDELINES SET FORTH IN THIS PUBLICATION CAN VOID
THE APPLICABLE WARRANTY AND POSSIBLY RESULT IN PLUMBING SYSTEM FAILURE.

IMPORTANT INSTALLATION GUIDELINES

READ THIS FIRST!

These Installation Instructions contain information on the installation of the MANABLOC® hot/cold potable water distribution system with Vanex® cross-linked polyethylene (PEX) tubing.

It is the responsibility of the installer to determine that the selection of the MANABLOC, PEX tubing and other components are the proper ones for the intended application, and that the MANABLOC is installed in accordance with these installation instructions and local plumbing codes.

Nothing in this publication is intended to create any warranty beyond Vanguard's applicable warranty on the MANABLOC manifold plumbing system.

NOTE: These instructions are to be used in the installation of the Vanguard MINIBLOC™. Instructions specific to the MINIBLOC will be covered in an instruction sheet provided with the MINIBLOC.



WARNING!

FAILURE TO FOLLOW THE INSTRUCTIONS AND INSTALLATION GUIDELINES SET FORTH IN THIS PUBLICATION CAN RESULT IN FAILURE OF THE MANABLOC PLUMBING SYSTEM, CAUSING WATER LEAKAGE AND PROPERTY DAMAGE.



DO NOT APPLY CHEMICALS TO THIS MANABLOC PLUMBING SYSTEM



DO NOT Spray or otherwise apply foreign substances onto this MANABLOC or its water distribution lines.

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TEFLON is a registered trademark of the E.I. DuPont Co.

MANABLOC is a U.S. patented product with various foreign patents in force.

- Leave the MANABLOC in the original shipping carton until time of installation. Protect the MANABLOC from debris, wood chips, drywall mud or dust, paint, sand, etc., before, during and after installation. The MANABLOC shall be covered during application of interior finishing materials such as paints, stains and textured coatings.
- The envelope, and its contents, included with the MANABLOC must be left with the MANABLOC for the homeowner. It contains important consumer, warranty and warning information concerning the application of chemicals to this MANABLOC plumbing system.
- DO NOT subject the MANABLOC to impact.
- DO NOT disassemble the MANABLOC.
- DO NOT adjust the tie rod bolts. They are factory preset.
- The Vanguard MANABLOC and Vanex PEX are plastic materials and should not be treated like metal. The MANABLOC and Vanex PEX may melt, crack or distort if exposed to open flame or excessive heat.
- Install the MANABLOC in an accessible location where it will not be exposed to freezing temperatures. See page 4.
- DO NOT allow fluids to freeze in the MANABLOC. See Warnings, page 19.
- DO NOT use pipe dope, thread sealants or Teflon® paste to seal threaded fittings. All of the connections to the MANABLOC are a mechanical compression type, or seal with a rubber gasket and DO NOT REQUIRE OTHER FORMS OF SEALANT AND NONE SHALL BE USED.
- DO NOT allow the MANABLOC to come into contact with CPVC or PVC cements or cleaners, acids such as solder fluxes, strong oxidizing agents, highly alkaline solutions, lubricants, leak check compounds, bug sprays, cleaners, paints, bleaches, or other chemicals which could adversely affect the plastic. Use of solder flux or solvent cements adjacent to the MANABLOC is to be avoided. See page 18.
- DO NOT use standard pipe fittings on the MANABLOC. All distribution line connections shall be made with compression fittings supplied with each MANABLOC or other Vanguard approved connections. See pages 14 and 15. All supply line connections to the MANABLOC shall be made only with MANABLOC swivel fittings available from Vanguard. See pages 17 and 18.
- Distribution lines shall exit the MANABLOC in a straight line perpendicular to the length of the MANABLOC. See pages 10 and 15.
- Supply lines shall enter or exit the MANABLOC in a straight line parallel to the length of the MANABLOC. See page 18.
- The MANABLOC plumbing system relies upon the proper tightening of distribution line compression connections. Failure to complete ALL connections will result in leakage.
- **IN THE EVENT OF CONFLICT OR INCONSISTENCY BETWEEN THESE INSTALLATION GUIDELINES AND LOCAL BUILDING OR PLUMBING CODES, ANY CODES APPLICABLE TO PARALLEL PLUMBING SYSTEMS SHOULD TAKE PRECEDENCE.**

NOTE: Failure to follow the installation instructions will void the Vanguard MANABLOC system warranty. For additional information contact Vanguard Piping Systems, Inc. at 800.775.5039.

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TERMS USED IN THIS GUIDE:

PEX	Vanguard Vanex cross-linked polyethylene tubing
AHJ	Authority Having Jurisdiction
PPM	Parts Per Million
NSF.....	NSF International, Inc. (formerly National Sanitation Foundation)
CAN/CSA	Canadian Standards Association
“shall”	Required; a mandatory procedure
“may” or “should” ..	A suggested optional procedure

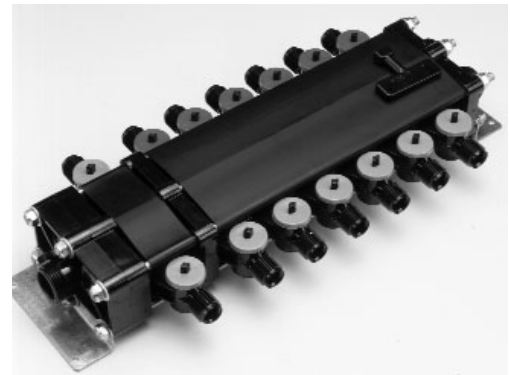
THE SYSTEM



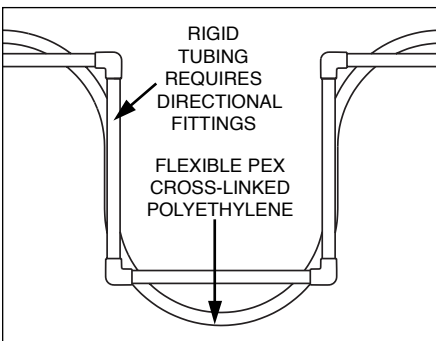
IMPORTANT

The MANABLOC plumbing system is intended for potable water distribution in residential and commercial applications. Installation of a MANABLOC plumbing system for purposes other than potable water distribution may constitute a misapplication of the product and void the warranty. Contact Vanguard Piping Systems, Inc. before applying this system for any use other than potable water distribution.

Components utilized in the MANABLOC plumbing system consist of Vanguard Vanex PEX cross-linked polyethylene tubing, fixture transition fittings, water service swivel connections, compression port connections and the MANABLOC control unit. The MANABLOC and Vanex PEX tubing are manufactured to national and international standards and are listed by recognized third-party agencies.



VANEX PEX TUBING



Vanex PEX tubing is flexible, reducing the need for most directional fittings in the distribution lines of a MANABLOC plumbing system.

Vanguard Vanex PEX cross-linked polyethylene tubing is produced to ASTM F876/F877 and is tested and listed by recognized agencies (such as NSF International) to the requirements of these standards. Vanex PEX tubing has a design pressure rating of 100 psi @ 180°F, and 160 psi @ 73°F. These are maximum-use ratings.

Vanex PEX tubing and the resin used in the manufacture of Vanex tubing have been tested, and listed by NSF to meet the requirements of ANSI/NSF 14/61, and NSF Protocol P171 CL-R/CL-TD, Chlorine Resistance of Plastic Piping Materials.

TUBE SIZE	PRESSURE RATINGS	ASTM SPECIFICATION
VANGUARD VANEX® PEX POTABLE TUBING 1/2" (CTS-OD)	100 PSI @ 180°F / 160 PSI @ 73°F	CL-R/CL-TD ASTM F876 / F877
F2023 (ASTM F1807/F2159) CAN/B137.5 L23707 ICBO ES ER-5287 HUD MR 1276 PEX 1006 SDR9 .070 DATE CODE 996 ft.		

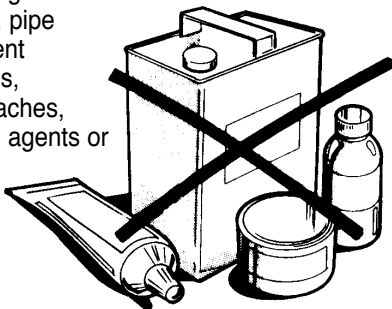
Maximum-use ratings are printed on the tubing.



CAUTION!

Tubing that exhibits damage such as cuts, scratches, gouges, kinks, fading or discoloring, evidence of grease, tar or any chemical exposure shall not be used. PEX tubing must be stored away from direct and indirect sunlight.

A damp rag is all that should be required for cleaning the tubing. If any material (other than those allowed in this publication) has adhered itself to the tubing and cannot be removed in this manner, do not use that section of tubing. NEVER use thinners, fuels, pipe sealants, solvent cements, fluxes, lubricants, bleaches, other oxidizing agents or petroleum based materials to seal or clean PEX tubing.



TOOLS REQUIRED

- Electric Drill
- Pencil or Pen
- Framing Square
- Tape Measure
- Tubing Cutter - Vanguard Part No. HAK6 or HAK67
- MANABLOC Wrench - Vanguard Part No. MW1
- 3/4" and 1 1/4" Wood Drill Bits
- #2 Phillips Head Screwdriver
- Permanent Marking Pen*
- PEX Crimp Tool(s)*

ADDITIONAL MATERIALS

- Wood or Drywall Screws - 1/2" or longer
- 1/2" or 3/4" Plywood - only required when not mounting between studs
- Nylon Ties - Vanguard Part No. HB14120
- PEX Distribution Line Tubing - See page 11
- 3/4" or 1" Supply Line Tubing
- MANABLOC 1" Swivel Supply Fittings
- Fixture Transition Fittings - See Pages 17 & 18 for MANABLOC water supply connections.
- Tubing Clamps and Hangers
- MANAPANEL Access Panel*
- Tubing Uncoiler*
- CLSE23 Tube Turnouts (recommended)

* Optional or may not be required for some installations

THE MANABLOC

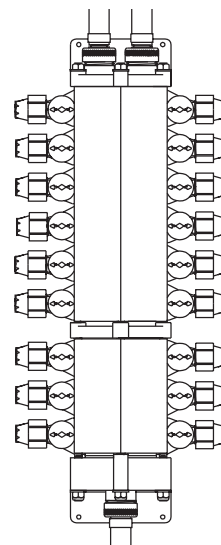
The MANABLOC control unit is tested to requirements of ASTM F877 and certified by NSF International.

The MANABLOC supply inlet connections utilize a special 1" MANABLOC gasketed swivel connection that requires MANABLOC transition fittings (not included in the MANABLOC package, must be purchased separately). Transition fittings available include NPT male thread, brass insert (PEX crimp) and compression.

Connections for the individual PEX distribution lines are a mechanical-type fitting and will not work with standard pipe fittings. Use only fittings supplied with the MANABLOC or other fittings designed for special port transitions available from Vanguard (see pages 14 and 15).

Warranty coverage applies **ONLY** if the MANABLOC is installed with Vanguard tubing and in accordance with the *Installation Instructions for the MANABLOC Modular Manifold Plumbing System*.

Protect the MANABLOC from construction debris, direct exposure to sunlight and inadvertent chemical exposure by storing it in its original shipping carton until installation.



SUPPLY AND DISTRIBUTION LINE SIZING

The general sizing information shown below may be appropriate for many MANABLOC installations. These recommendations are based on flow rates of typical fixtures that require 8 psi residual pressure. For more complete and definitive sizing information for distribution line length limitations, request the *MANABLOC Tube Size Guide* from your local supplier or from Vanguard.

Typical Supply line size:

3/4" up to 2 1/2 baths
1" up to 4 1/2 baths

Typical Distribution line size:

3/8" up to 2 1/2 GPM fixture flow requirement
(lavs, toilets, bidets, bar sinks, kitchen sinks, dishwashers, *some showers (no tub fill) and **some washing machines)
1/2" up to 4 GPM fixture flow requirement
(hose bibbs, tubs, showers, washing machines, whirlpool baths, soaking tubs, etc.)

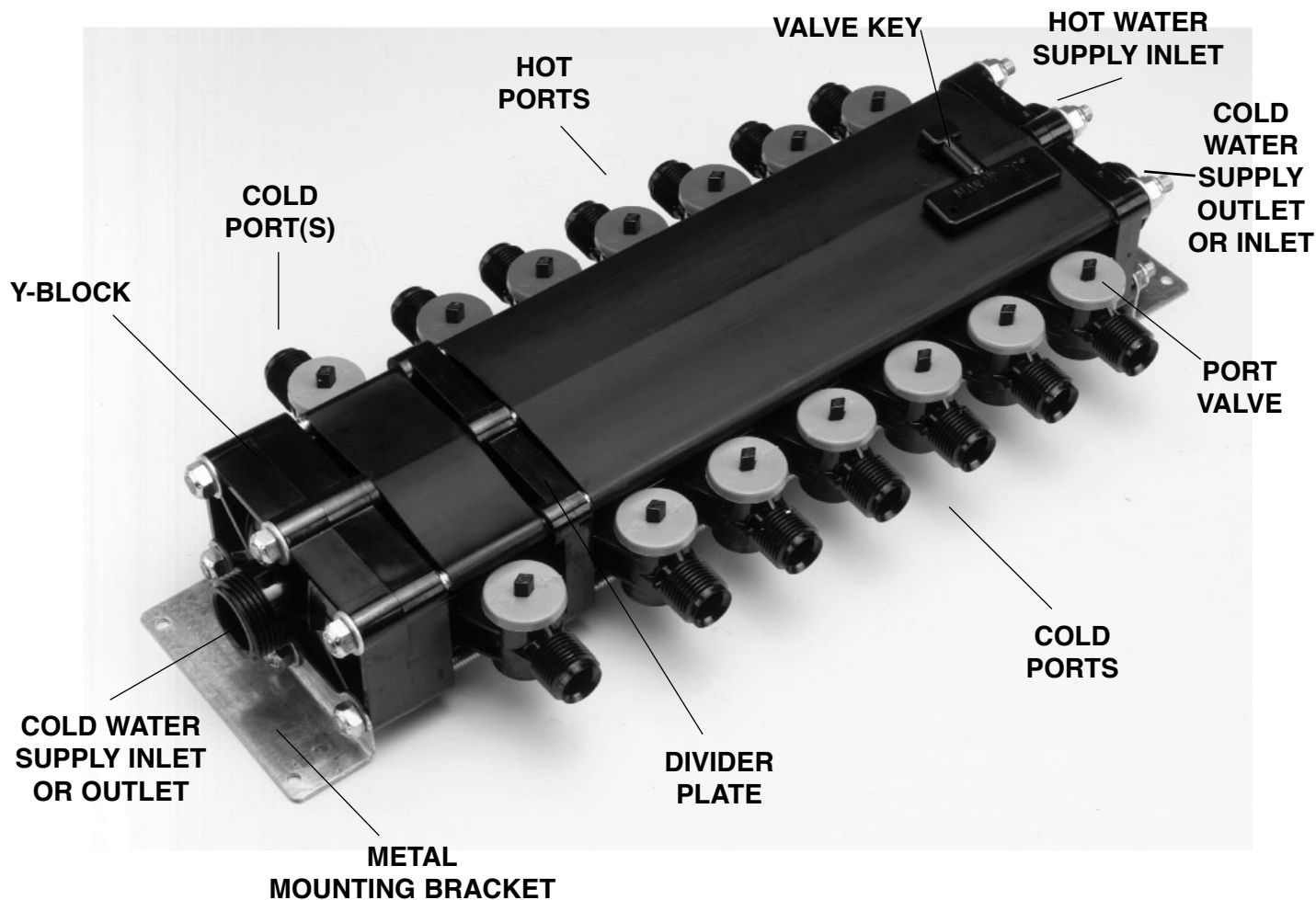
In order to realize the maximum water and energy savings of the MANABLOC system, it is advisable to use the smallest distribution line size that meets the flow and pressure demands of each individual fixture. Using a larger size line than necessary can increase hot water delivery time. Keep in mind that 1/2" PEX contains twice the amount of water that 3/8" PEX does for a given length.

There are times when 3/8" Vanex PEX tubing may not, due to long line lengths or low supply pressure, provide the necessary residual pressure to some fixtures even though the flow requirements are within those stated above. Alternatives such as: increasing line size to 1/2", relocating the MANABLOC to reduce line length(s), installation of a separate MANABLOC close to an outlying group of fixtures, or running the line(s) in a more direct (shorter) path may alleviate a potential problem.

* Due to the many types of shower valves, it is recommended that you consult the valve manufacturer's literature to determine the actual flow rate and required residual pressure demands of the fixture. Use the *MANABLOC Tube Size Guide* to determine distribution line size and length limitations.

** Some washing machines use a timer instead of a water-level sensor to determine when the machine has been filled with the proper amount of water. There are cases in which low supply pressure or excessive distribution line length may cause some machines to fill to a level less than designed. Consult the washing machine manufacturer's literature to determine the actual fill rate and residual pressure requirements for distribution line size.

MANABLOC OVERVIEW & CARTON CONTENTS



MODEL MXBD14-2 SHOWN

The MANABLOC is a manifold water distribution system that operates much like an electrical breaker box. The main water supply lines bring water into the MANABLOC and individual distribution lines move water out to each fixture. MANABLOCs have a built-in valve at each distribution line port which allows you to stop the water flow to any single fixture without shutting down the entire system.

Important Sizing Information

Additional package contents include:

- Valve T-Handle
- Instruction/Warranty Packet - to be left at installation site
- Port Labels
- Port Connection Hardware:**
 - Lock-In Nuts
 - Stainless Steel Insert Stiffeners
 - Lock-In Inserts
 - Plastic Ferrules

A typical residential plumbing system can not be plumbed with all 3/8" distribution lines. It is the decision of the user to choose a combination of both 3/8" and 1/2" lines or to upsize the entire system to 1/2". However, supplying fixtures with 1/2" lines when it is unnecessary for the fixture demand, will increase the wait time for hot water delivery to those fixtures. The best water and energy savings of a MANABLOC system are realized when distribution lines are sized according to the fixture demand and the length of the individual line (see the *MANABLOC Tube Size Guide* for details on sizing a typical system).

A MANABLOC with ports of all the same size, can easily have some of the ports converted to 1/2" with optional crimp adapter MXLSA33 (3/8" port to 1/2" tube). Conversely, 1/2" ports can be converted to 3/8" with optional crimp adapter MXLSA24 (1/2" port to 3/8" tube). See page 15 for detailed installation instructions for the crimp adapters. Note: Each port converted to a larger or smaller size requires one adapter and one crimp ring (crimp ring sold separately).

MANABLOC LOCATION

Before installing the MANABLOC, review the following instructions.

NOTE: The MANABLOC is much like an electrical breaker box. When a fixture is in need of repair, the line to that fixture may be shut off at the MANABLOC, eliminating the need to shut down the water supply for the entire house. This feature requires that the MANABLOC be accessible after installation.

1. Under no circumstances shall the MANABLOC be located in an area that is permanently covered (behind sheetrock, plywood, paneling) or where freezing temperatures may occur. **THE MANABLOC MUST BE ACCESSIBLE** and there shall be sufficient clear area in front of the MANABLOC to provide access.
2. When local code allows, the MANABLOC unit can be mounted in a fire rated wall provided that the access door meets the same rating requirements as the wall and is installed over the access opening.
3. When installing the MANABLOC in a location other than between studs, provisions must be made to support the tubing runs as they exit the MANABLOC. See instructions on page 10 for mounting the MANABLOC without studs for tubing support.
4. Any installed cover panel shall allow access to the MANABLOC and its **mounting screws, the port valves, distribution line connections and supply line connections.**

5. To maximize potential water and energy savings, the MANABLOC should be mounted as close as is practical to the hot water source, taking into consideration the following:

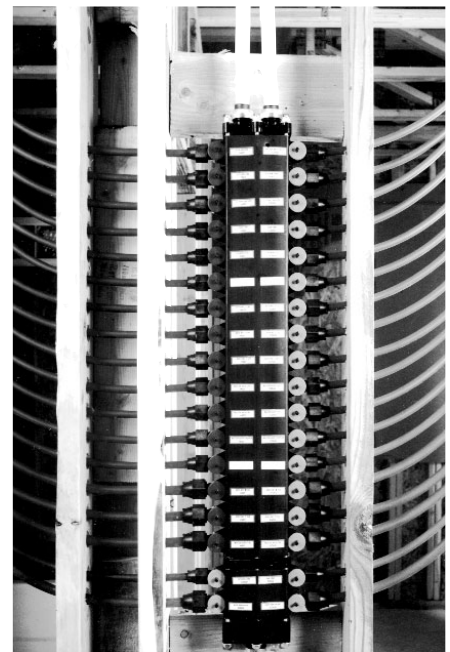
A. When the MANABLOC is mounted above the water heater, there shall be a minimum of 36" of connecting tubing between the water heater and the MANABLOC due to chance of heat stacking;

B. When the MANABLOC is mounted beside the water heater and is connected with tubing incorporating a horizontal flow, it shall be connected with at least 18" of tube length. Mounting the MANABLOC within 8 (eight) feet of developed tube length of the water heater will minimize delivery time of hot water to individual fixtures.

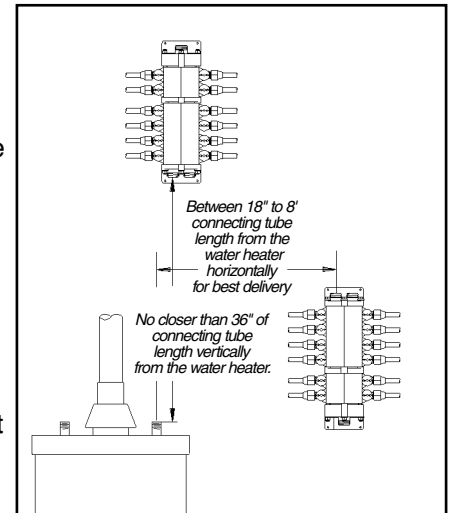
The unit should be installed in an area which is centrally located to the most dense concentration of served fixtures. Some applications will require that the MANABLOC be mounted further than eight (8) feet from the hot water source. See page 5 for suggestions to reduce hot water delivery time in these instances.

6. DO NOT install the MANABLOC within a continuously recirculating hot water plumbing loop. The MANABLOC, however, may be supplied from a recirculating hot water loop. See page 5 for details.

7. Position the MANABLOC so that it can be securely fastened through the holes provided in the mounting brackets. The mounting surface should be as flat as possible so as not to induce any twisting or bending forces on the unit. The MBB2 Mounting Straps simplify mounting between studs on 16" centers. See page 7.

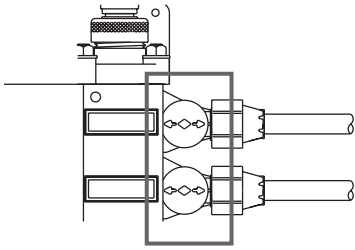


A typical MANABLOC installation with a combination of 3/8" and 1/2" distribution lines.

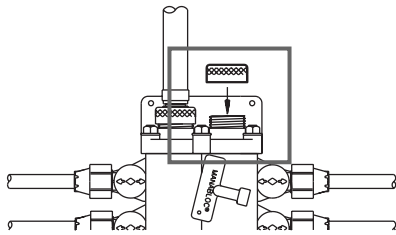


The MANABLOC shall be installed at least 36" away vertically or at least 18" (of connecting tube length) away horizontally from any water heater (DO NOT direct connect flex pipe to MANABLOC inlet.) Mounting the unit as close as practical minimizes hot water delivery time.

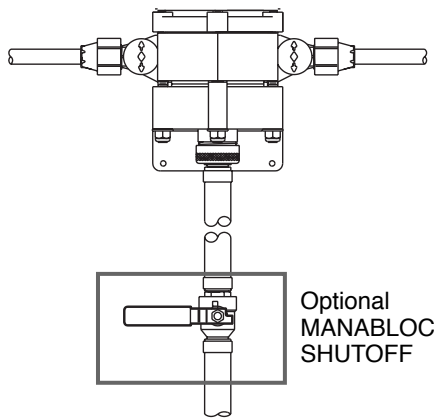
MANABLOC PLUMBING SYSTEM GENERAL DESIGN PRACTICES



A MANABLOC system, which has valves on all of the outlet ports, does not require stop valves at the fixtures. However, the Authority Having Jurisdiction (AHJ) may require stop valves at some fixtures.



If a main inlet/outlet will not be used, it must be capped (use Part No. ECAP1).



The main service line to the MANABLOC shall include a main shut-off valve. Local code may also require the installation of a check valve, PRV (pressure reducing valve), back flow preventer, etc.

To prevent debris and other particles from entering the system, a strainer may be installed in the service line.

Continuously Recirculating Hot Water Plumbing Loops

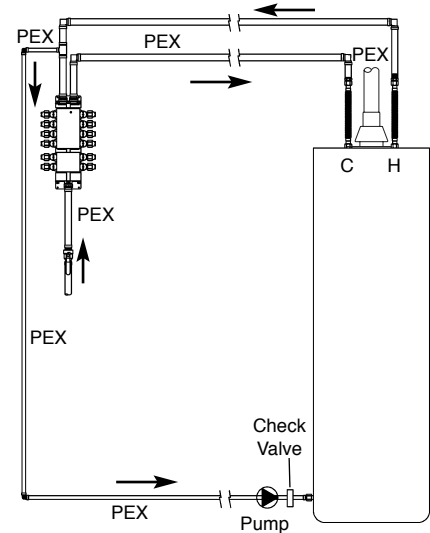
Vanex PEX and the MANABLOC can be used in continuously recirculating domestic hot water plumbing loops, provided:

1. The plumbing loops shall operate with water temperatures of 140°F or lower, as required by most model plumbing codes.

2. The recirculating loop is for supplying hot water more quickly to the MANABLOC, not to circulate through it or the distribution lines. **DO NOT include the MANABLOC within a continuously recirculating loop.**

3. The tubing is marked as rated for "continuous recirculation" as evidenced by the NSF third party certification marking (CL-R). (See the example marking below.)

NOTE: The distribution lines and the MANABLOC are not to be part of the circulating system. The loop is to provide hot water more quickly to the MANABLOC only.



■ If the MANABLOC must be mounted *further* than eight (8) feet from the hot water source, the MANABLOC may be supplied from a recirculating hot water loop.

VANGUARD VANEX® PEX POTABLE TUBING **NSF-pw** **CL-R/CL-TD**

CL - Hot Chlorinated Water

R - Continuous Recirculation Resistance Certification

Multiple MANABLOC Installation

If a home requires multiple MANABLOCs to service the number of fixtures in the home, these guidelines should be followed if the MANABLOCs are closely located.

- Consider dividing high demand fixtures between the units.
- Consider a reasonable division, i.e. upstairs/downstairs, east/west or front/back.

If space permits, the MANABLOC units can be stacked one above the other. Special care must be given to connecting them. (Only specific configurations will work for this type installation. Contact Vanguard for further clarification on this application.)

Locating a Remote MANABLOC

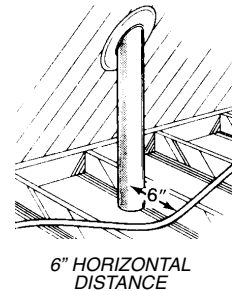
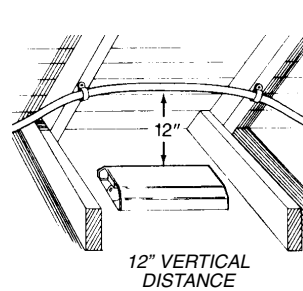
A remote MANABLOC is sometimes recommended to achieve maximum efficiency from your MANABLOC system.

- It can be advantageous when the line lengths are excessive from one centralized MANABLOC unit.
- When the home requires more than one unit due to the number of fixtures or size of the home, you may want to consider locating a remote unit near an outlying group of fixtures.

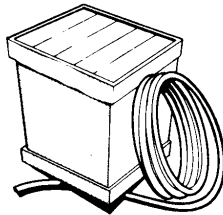
PEX TUBING INSTALLATION PRACTICES

■ Keep the Vanex PEX tubing a **MINIMUM of 12" vertically and 6" horizontally** from sources of high heat such as recessed light fixtures, gas flue vents, heating appliances, or electric motors. Forced air heating ducts are not generally considered sources of high heat. These areas of installation should be rechecked after further construction and other mechanical systems have been installed. PEX can be run in return air plenums.

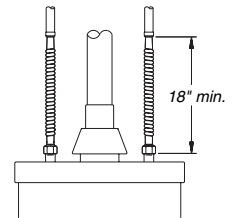
REMEMBER: It is the responsibility of the installer to ensure that further construction, finishing and other mechanical system installations do not compromise the integrity and service life of the Vanex PEX tubing.



■ **DO NOT** drag the tubing over rough terrain, rocks, or any other surface which could abrade, cut, puncture or damage the tube wall in any way. **DO NOT** crush or kink the tubing. **Inspect all tubing** before and after installation. Damaged or kinked sections shall be cut out and replaced. **DO NOT** heat kinked tubing to repair/reform.



■ **Use metallic connectors** to attach PEX to gas water heaters (Vanguard Part No. XLSE4418, XLMSE4418 or similar fabricated metallic assembly). Install a minimum 18" of metallic or other piping between the water heater and PEX. For electric water heaters, it is permissible to connect directly to the inlets and outlets with a brass swivel elbow or straight brass swivel fitting.



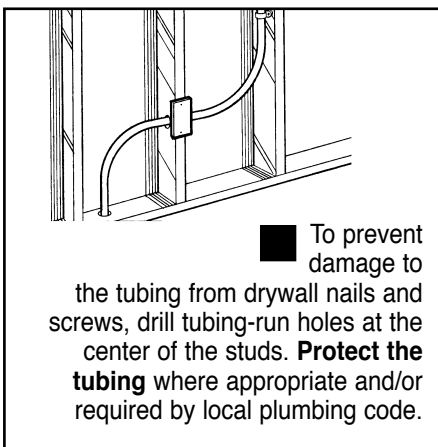
■ Use only continuous lengths of Vanex PEX (no fittings) **in or under a concrete slab**. Any connections shall be outside the slab or in an access box. The proper methods of bedding and backfilling shall follow recommendations of ASTM D2774.

■ Vanex PEX can be used for water heater pressure/temperature relief lines.

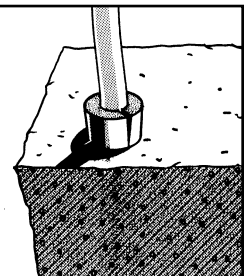
■ **Hose bibbs** shall not be supported by PEX tubing. Well-anchored metallic pipe or drop-ear fittings shall be used to install hose bibbs. See page 16.

■ Vanguard Crimpsert® connections **may be direct buried but not under slab**. These fittings, including crimp rings, shall be wrapped securely with self fusing silicone rubber tape (minimum .020 thickness).

When direct burial of metallic water service fittings are used to connect water service tubing coming into the house, those fittings should be made from ASTM B62 UNS C83600 cast bronze (per AWWA standards) or B140 UNS C31400 "DZR" brass (check with fittings manufacturer). In those areas with aggressive soil, such as desert areas, wrapping as referenced above is recommended.

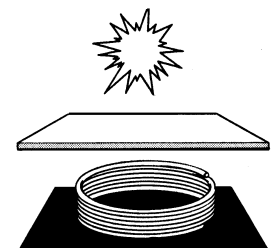


■ Protect the PEX tubing with **non-metallic sleeving material** where it enters and/or exits a slab or at mass penetrations. PEX need not be sleeved its entire length within the slab. However, full-length sleeving is allowed. Penetrations through concrete walls may be sleeved with a larger size metal or plastic tube. Protect the tubing from any sharp edges where it enters and exits larger sleeving material.



■ **Insulating** each PEX tube individually or as a group is not generally necessary if the PEX tubing is installed within the insulation envelope of the structure, i.e. the heated area. For example, the tubing may be installed under the insulation in the attic or within an interior wall of a heated space.

■ **DO NOT INSTALL WHERE EXPOSED TO DIRECT OR INDIRECT SUNLIGHT FOR MORE THAN 60 DAYS.** PEX tubing shall be stored under cover, shielded from direct and indirect sunlight when the material is stored for any length of time. Short exposure times, not exceeding a total accumulated time of 60 days maximum, are permissible.



INSTALLING THE MANABLOC

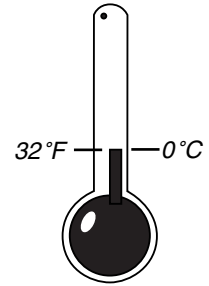
BEFORE INSTALLING THE MANABLOC, MAKE SURE THE LOCATION REQUIREMENTS (PAGE 4) HAVE BEEN MET.



COLD WEATHER CAUTION!

The thermoplastic components of the MANABLOC, like all thermoplastics, have decreased resistance to impact under freezing conditions and could be damaged. Increased care must be exercised when installation is to occur under freezing conditions.

Extra caution should be taken in handling the MANABLOC when temperatures are below freezing.



MOUNTING THE MANABLOC BETWEEN STUDS

Dimensions in these instructions are for 16" stud centers, and must be adjusted for other stud spacing.

Once the general location of the MANABLOC has been determined (see page 4 for guidelines), the MANABLOC may be mounted to a suitable surface between a pair of adjacent studs. For 16" stud spacing, the MBB2 Mounting Straps can simplify installation.

NOTE: The wall in which the MANABLOC is to be mounted must be accessible from both sides during installation to use the MBB2 Mounting Straps.

If the MBB2 Mounting Straps are not being used for installation, go to Step 5.

1. Lay the MANABLOC, metal brackets down, on a suitable flat surface that is large enough to accommodate the full-length of the MANABLOC. Place a MBB2 Mounting Strap under each metal mounting bracket (located at the top and bottom ends of the MANABLOC). Attach the metal mounting bracket at one end of the MANABLOC to the center two holes of a Mounting Strap using the provided self-tapping pan-head screws. The screw heads must be on the accessible side of the mounting strap. Repeat at the other end of the MANABLOC. Tighten screws securely.

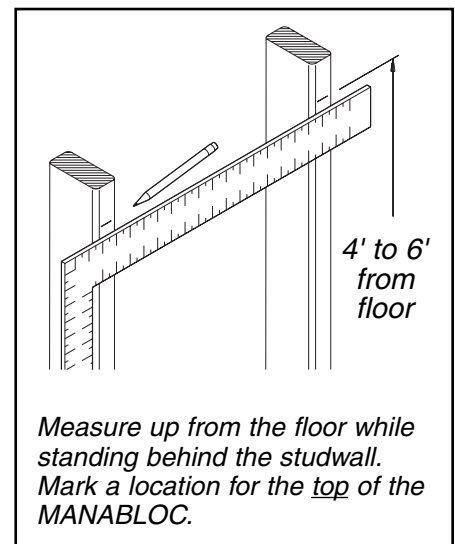
2. Standing behind the studwall, measure up from the floor and make a mark on the back of one of the studs to represent the top of the MANABLOC as shown in the illustration. This mark should be between 4 ft. and 6 ft. from the floor but may be at any height, provided the height will allow all valves on the MANABLOC to be accessible. With a framing square or level, transfer and mark the noted height on the other stud.

NOTE: A residence intended for disabled persons may require that the MANABLOC be mounted lower in the wall to provide access.

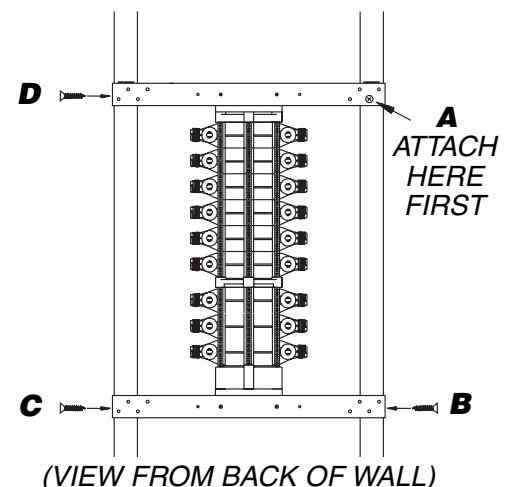
3. Standing behind the stud wall, hold the MANABLOC facing away from you and align the top of the UPPER MBB2 Mounting Strap to the line on the stud that you made in Step 2. Loosely attach this Mounting Strap flush to the back outer edge of one stud using a 3/4" or longer drywall or other suitable wood screw (A). See illustration.

4. Line up the LOWER Mounting Strap with the back outer edge of the stud and attach it in the same manner (B). Attach the remaining strap ends (C & D) to the other stud, and tighten all screws.

GO TO STEP 9.



Measure up from the floor while standing behind the studwall. Mark a location for the top of the MANABLOC.



MOUNTING THE MANABLOC BETWEEN STUDS (con't)

IF NOT USING THE MBB2 MOUNTING STRAPS:

5. Cut two pieces of lumber (1 x 4 - or 3/4" plywood - about 3 1/2" wide) to a length which provides a snug fit BETWEEN two studs.

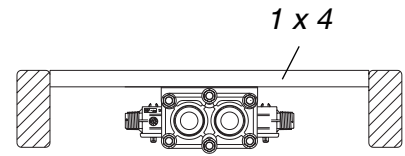
6. The top of the MANABLOC should be between 4 ft. and 6 ft. from the floor (but may be at any height provided that it maintains accessibility to all of the ports on the MANABLOC. See NOTE, step 2). Make a mark near the back of the inside of one stud which would represent the top of the MANABLOC. With a framing square or level, transfer the mark to the inside back of the other stud. See illustration page 7.

7. ATTACHING THE MANABLOC BETWEEN THE STUDS:

- Measure the total length of the MANABLOC, including the metal brackets, and note.
- Attach the first (UPPER) 1 x 4 inside and flush to the back of the studs (see TOP VIEW) at a height where the center of its width is centered on the marks from step 6.
- Attach the remaining (LOWER) 1 x 4 inside and flush to the back of the studs at a distance below the upper 1 x 4 that is equal to the length of the MANABLOC (step 7A) when measured from the top of the upper 1 x 4 to the top of the lower 1 x 4. See FRONT VIEW illustration.

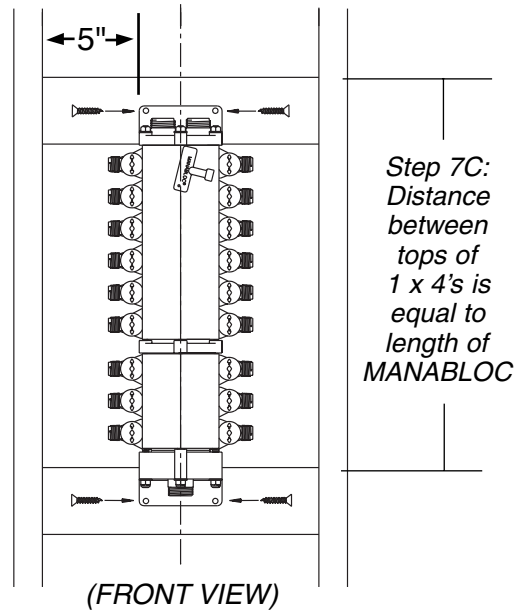
8. CENTER THE MANABLOC IN THE STUD CAVITY:

Center the left and right edges of the metal mounting brackets of the MANABLOC between the studs (5 inches if on 16" stud centers). This measurement may vary with different stud spacing. Attach the MANABLOC to the 1 x 4's with four 1/2" - 3/4" drywall or wood screws through the holes provided in the metal brackets as shown. The screw heads must be on the accessible side of the mounting strap.



(TOP VIEW)

1 x 4's attach at the back, inside the studs, and the MANABLOC is centered between the studs.



(FRONT VIEW)

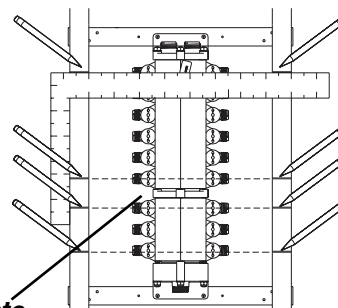
Step 7C:
Distance
between
tops of
1 x 4's is
equal to
length of
MANABLOC

9. Standing in front of the wall, use a framing square or straight edge and mark the center line position of the top and bottom ports onto both studs (see illustration).

When the MANABLOC includes a divider plate, also mark the location of the ports directly above and below the divider plate onto both studs.

10. Detach the MANABLOC from its Mounting Straps (or 1 x 4 brackets) and remove it from the installation area to prevent wood chips or other debris from falling into the unit.

Divider Plate

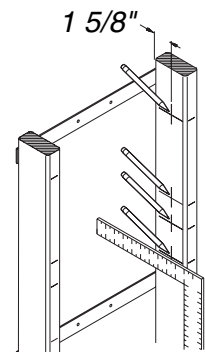


- Mark the centers of the top and bottom MANABLOC ports (A,B) and the ports directly above and below any divider plate (C,D) onto the studs.
-
-
-

LEAVE THE MOUNTING STRAPS ATTACHED TO THE STUDS.

11. Transfer the port-location marks made in step 9 to the insides of the stud cavity using a square and pencil.

12. Measure 1 5/8" from the mounting surface. Draw a vertical line on the studs that passes through each of the horizontal port center-lines marked in step 11 (see illustration). Be sure to mark the inside of both studs.



MOUNTING THE MANABLOC BETWEEN STUDS (con't)

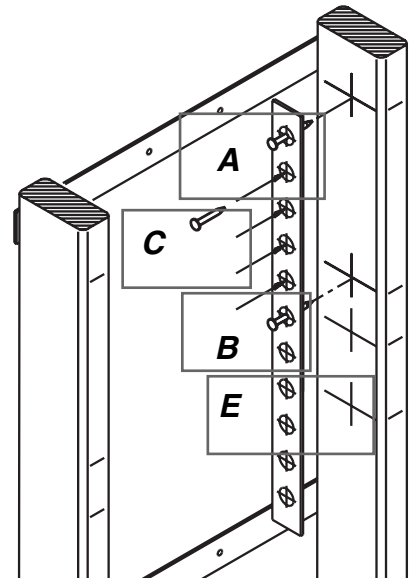
The Drill Guide, included with each MANABLOC, is used to mark locations of distribution line holes to be drilled through the studs. The distribution lines pass through these holes as they are attached to the MANABLOC ports. One Drill Guide will be used to mark both studs.

13. Push a small nail through the printed center-line at one end of the Drill Guide (A). Push the nail into the cross formed where the top port mark intersects with the 1 5/8" mark (from step 12). Tap the nail into the stud to hold the drill guide in place.

14. Push a small nail into the printed center-line on the Drill Guide that corresponds with the center line of the port above the divider plate (B). Tap the nail into the stud to hold the drill guide in place.

If the MANABLOC does not have a divider plate, push the nail into the printed center-line of the bottom-most port (E) and on into the corresponding mark on the stud. Tap the nail into the stud to hold the drill guide in place.

15. Using an awl, nail, or other pointed tool (C), mark the stud by tapping through the Drill Guide at each printed center-line between the two nails. Carefully remove the Drill Guide. If the MANABLOC does not have a divider plate, go to step 17.

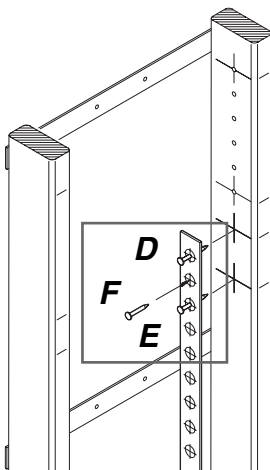


MARKING PORT LOCATIONS BELOW A DIVIDER PLATE:

16. Put the top nail in the Drill Guide (D) on the cross formed by the center-line of the first port below the divider plate and the 1 5/8" measurement from the back of the stud (from step 12). Tap the nail into the stud to hold the drill guide in place.

Push another nail (E) through the center-line on the Drill Guide which corresponds to the bottom port of the MANABLOC. Then place the nail at the point on the stud where the bottom port center-line intersects with the 1 5/8" measurement (from step 12). Tap the nail into the stud to hold the drill guide in place. With a nail or awl (F), tap and mark the stud at each center-line between the two nails.

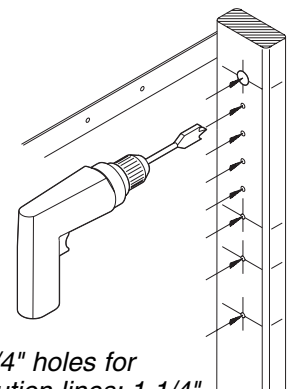
17. Carefully remove the Drill Guide and repeat the marking procedure on the adjacent stud.



18. Drill 3/4" holes through both studs at each marked location. Be sure to hold the drill level and perpendicular to the stud to prevent drilling holes at an angle. Remove any splinters or burrs made during drilling.

19. Mark and drill any holes for main water supply and hot water supply/return lines at this time. A 1 1/4" bit will provide adequate clearance for 3/4" or 1" tubing. The tubing shall enter and/or exit the MANABLOC in a straight line so as not to induce bending stress on the MANABLOC. Necessary elbows, couplings, and tees are allowed in the main water supply lines.

20. Re-attach the MANABLOC to the mounting straps.



Drill 3/4" holes for distribution lines; 1 1/4" holes for supply lines.

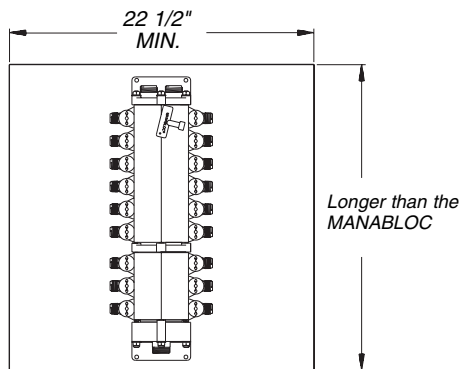
GO TO PAGE 11

NOTE: If the wall where the MANABLOC is installed is to be covered, be sure to cut a hole in the wall covering material to allow access to the MANABLOC. Any installed cover panel shall allow access to the MANABLOC and its mounting screws, the port valves, distribution line connections and supply line connections. Vanguard MANAPANEL access panels are available.

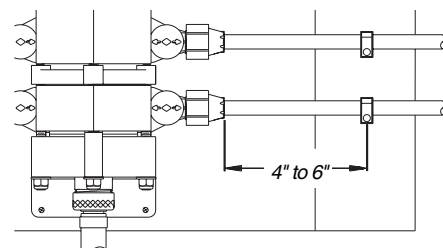
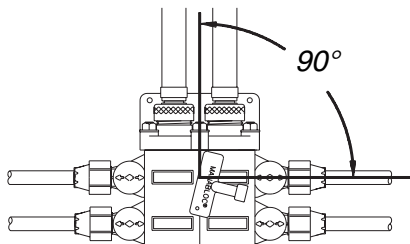
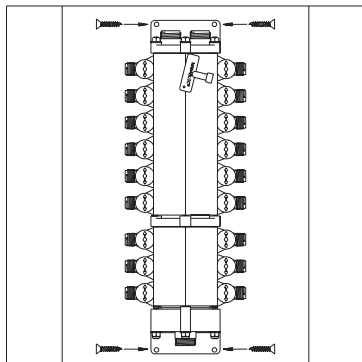


When the MANABLOC is installed prior to wall finishing operations, the unit **MUST** be protected from paint, texture compounds and drywall dust.

MOUNTING THE MANABLOC WITHOUT STUDS

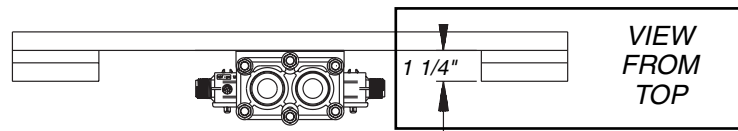


NOTE: A residence intended for disabled persons may require that the MANABLOC be mounted lower in the wall to provide access.



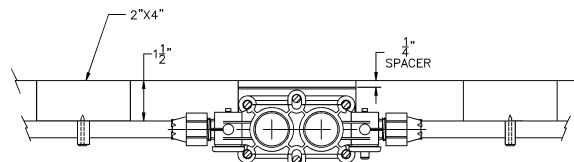
1. A suitable base for the MANABLOC can be constructed from a section of 1/2" or thicker plywood that is a minimum 22 1/2" wide and slightly longer than the overall length of the MANABLOC, including the metal mounting brackets.

2. Securely attach a length of 1 x 4 and 1/2" plywood (for a total thickness of 1 1/4", or other suitable framing material with a thickness of 1 1/4") and about 3 1/2" wide on the left and right sides of the mounting base and running the full-length of the MANABLOC (see illustration, step 5).



These "spacers" will be used to secure the distribution lines at the correct height as they exit the MANABLOC.

Note: The critical measurement is the 1 1/4" from the MANABLOC mounting bracket to the support for the distribution lines. This may be achieved in other ways, for example, a 2 x 4 may be used in place of the 1 x 4 and 1/2" plywood if a 1/4" spacer is placed between the mounting bracket and the mounting base.



3. Attach the mounting base to the structure in a suitable location (see page 4). The base should be mounted so the top of the MANABLOC is between 4 feet and 6 feet from the floor but may be at any height provided that the height maintains accessibility to all the ports on the MANABLOC.

4. The mounting base must be firmly attached to a structure solid enough to support, at a minimum, the weight of the MANABLOC filled with water. The base should be square and level.

5. Center the MANABLOC on the base both vertically and horizontally as shown here.

Attach the MANABLOC to the mounting base with four 1/2" or longer drywall or wood screws through the holes in the metal brackets on the MANABLOC. Tighten the screws securely.

6. As the distribution lines are connected to the MANABLOC (see instructions pages 14 & 15), ensure that the tubes exit the unit at a 90 degree angle to the centerline of the MANABLOC so as not to induce bending stress on the MANABLOC.

7. When attaching the distribution line tubing to the framing spacers, be sure to use appropriately-sized Vanguard tubing clamps (use Part Nos. CLJ2 or CLE2 for 3/8" tubing, CLJ3 or CLE3 for 1/2" tubing). Use one clamp per tube to ensure that the tubing is held securely. Clamps should be positioned NO FURTHER than six (6) inches from the end of the port. DO NOT pull tubing tight. Leave at least 7" of slack per 50' of tubing run. For distribution line connection instructions, see pages 14 & 15.

INSTALLING DISTRIBUTION LINES

Distribution lines should be run continuously in the most direct route (avoiding heat sources, see page 4) from the MANABLOC to the fixtures. A distribution line may contain a coupling or other fitting for purposes such as repairing a damaged section of tubing, handling a change of direction which cannot be made within the minimum bend radius guidelines (see page 12), accommodating a fixture location change which requires a longer line, or to supply a low-demand accessory (i.e., ice maker). However, several pieces of shorter tubing should not be connected with fittings for the purpose of using up left-over lengths of tubing.

NOTE: It is the responsibility of the installer to ensure that further construction, finishing and other mechanical system installations do not compromise the MANABLOC plumbing system as installed according to these instructions.

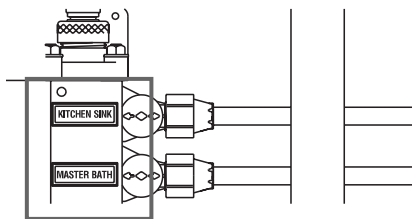
RUNNING THE DISTRIBUTION LINES:

1. The tubing coils are usually placed at the MANABLOC location and tubing is pulled to the fixture through stud cavities, holes drilled overhead in floor joists, etc. Several tubes may be pulled at one time. Vanguard's color coded Vanex tubing (available in 3/8" and 1/2") will help prevent cross-connections.

2. Tubing should not be pulled tightly and some slack (typically, 7" per 50') is necessary to accommodate expansion and contraction. Leave enough excess tubing at the beginning and end of runs to make connections without putting strain on the tubing.

3. Care should be exercised when pulling PEX tubing to prevent cutting or abrading. Care also must be taken to prevent kinking of the coiled tubing. If kinking or cutting should occur, these sections must be cut out and a coupling installed.

4. For the best results, connect the distribution lines to fixtures and the MANABLOC immediately upon installation, and label the end-use fixture on the MANABLOC cover plate next to the port.



Self-adhesive labels are supplied with the MANABLOC. Tubes which are pulled as a bundle, or those that will not be connected immediately, should be marked at both ends with a permanent marker designating the fixture supplied.

5. Since plumbing fixtures are generally located in groups, and there may be several Vanex distribution lines running to approximately the same location, it is easiest to run these distribution lines bundled together. Hot and cold lines may be run in the same bundle. For a neat appearance, bundles can be tied with nylon ties (Vanguard Part No. HB14120) or plastic strapping at regular intervals.

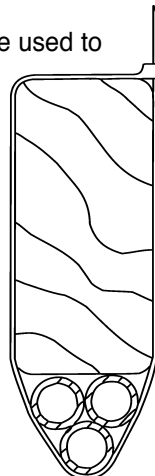
NOTE:
Bundles shall be sufficiently tied for tubing support but SHALL NOT restrict tubing expansion and contraction caused by temperature variations.



CAUTION
DO NOT USE DUCT TAPE FOR BUNDLING.
Duct tape will not permit tubing movement.

6. Bundles may be supported with hangers designed for larger tubing sizes.

7. The HB14120 can be used to support PEX lines directly from wooden framing members. Other plastic cable ties capable of supporting the weight of the tube or bundle when filled with water can also be used.



8. Holes drilled through studs, joists, plates, headers, etc. must be large enough to accommodate tubing bundles without binding, to allow free movement. Several smaller holes (accommodating a few lines each) may be preferable to drilling a bundle-size hole. In no case should the hole size exceed building code guidelines, as this could weaken the structural support members.

9. Distribution lines may be run in return air plenums.

INSTALLATION TIP

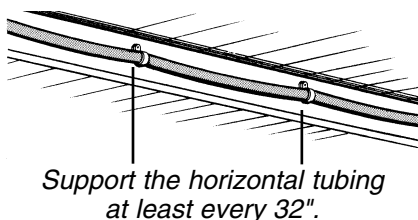


The installation of long tubing runs may be simplified by the use of a MANAPAC tubing kit. Each reel fits inside a standard 16" stud cavity. Also, the Vanguard Tubing Uncoiler, Part No. FHUD-1, holds two 1000' coils of 3/8" or 1/2" Vanex PEX tubing for fast and easy installation.

INSTALLING DISTRIBUTION LINES (con't)

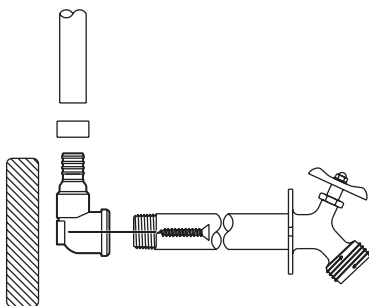
10. Suspended tubes or bundles should be supported at least every 32" horizontally, at each floor level vertically, and at significant changes of direction with clamps, hangers or plastic strapping. Tubes running through holes drilled in joists or studs or laying on top of rafters do not require further support unless the support spacing exceeds 32".

11. Supports may be the same as those commonly used for PEX or other piping systems, keeping in mind bundle size and the weight of the tubing when filled with water.

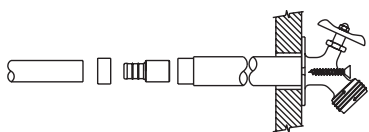


DO NOT use supports that may collapse or cut the tubing. Supports shall NOT have sharp edges which could damage the tubing.

INSTALLATION TIP



Free Standing Hose Bibbs shall not be supported by Vanex PEX. Well-anchored drop-ear fittings or metal pipe shall be used to install hose bibbs.



Hose bibbs supported by the structure can be connected directly.

BENDING THE TUBING:

12. PEX flexibility is a key advantage in the MANABLOC plumbing system. However, care must be exercised in observing the MINIMUM BEND RADIUS of the tubing, particularly when curving the tubing around room corners, stubbing out of walls, and making 90° bends between studs. Drilling holes at shallow angles, rerouting the tubing, or bending the tubing with the natural curve (coils only) are useful solutions to making correctly sized bends. Tubing should appear round and unstrained in a natural bend. Flattening of the tube, however slight, indicates an excessively sharp turn and must be avoided.

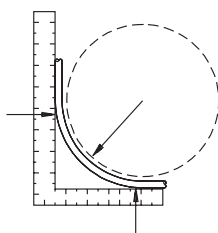


CAUTION

DO NOT BEND 1/2" TUBING 90° WITHIN A 3 1/2" STUD WIDTH when stubbing out.

Use an elbow or stub-out elbow.

DO NOT bend Vanex PEX tubing in a radius smaller than 8 times the outside diameter of the tubing. Flattened tubing is damaged and must be cut out and replaced.



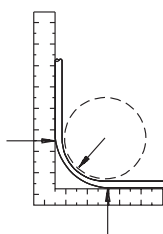
CORRECT:
8 x O.D.

If bending AGAINST the coil, the allowed bending radius is 24 times the outside diameter of the tubing.

Refer to these dimensions for proper radius bends:

BENDING CROSS-LINKED POLYETHYLENE TUBING

TUBING SIZE	NATURAL RADIUS	RADIUS AGAINST COIL
3/8"	4"	12"
1/2"	5"	15"
3/4"	7"	21"
1"	9"	27"

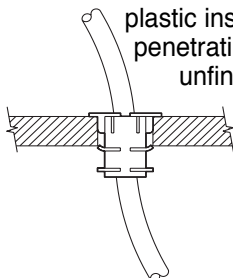


INCORRECT:
FLATTENS
TUBING

13. PEX may be stubbed directly out of the wall with the use of the CLSE23 Turn Out (see page 16). At floor levels above a crawl space, basement, or on upper floors, it may be desirable to run the tubing through the floor directly to the fixture, rather than behind the wall.

Care must be taken to avoid imparting severe bending stresses to the tubing when exiting a wall or floor. At basement or slab levels the bend radius restrictions may force the tubing to exit the wall at an angle. An elbow or stubout ell may be also used for this application (see page 13).

14. Tubing penetrations may require sleeving or the installation of an insulator. When the tubing penetrates at an angle in relation to the hole, it may be subject to a sharp edge, which could damage the pipe. Acceptable sleeving materials include flexible plastic tubing, foam pipe insulation or an approved plastic insulator. It is not generally necessary to sleeve PEX when penetrating wooden framing members or non-metallic finished or unfinished walls. However, if there is a doubt, sleeve the pipe or install an insulator.



SLEEVE all penetrations of metal, metal studs, and masonry or concrete.

INSTALLING DISTRIBUTION LINES (con't)

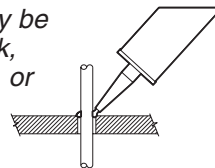
15. When penetrations must be sealed for air infiltration purposes, there are several options available. A good grade of silicone, acrylic, or siliconized acrylic caulking (DO NOT use oil-base caulks), most of the canned expanding foams, and open- or closed-cell pipe insulation are good sealing materials and may be used in direct contact with PEX tubing. Other materials may be used provided they do not cause short or long term damage to the PEX tubing. If there is no information available on the compatibility of the proposed sealing material, wrap the tubing with several layers of aluminum foil in the area of contact and extending a few inches on both sides before applying any sealing material.

FIRE STOP - Most building codes require the use of a fire-stopping compound when tubing penetrates a fire-rated wall. There are a number of fire stopping compounds readily available that have been listed for use with PEX tubing. These compounds come in standard caulking tubes and are identified as water-based, acrylic or latex. Consult the compound manufacturers' instructions for proper application.



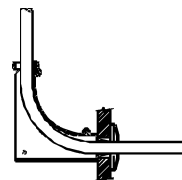
CAUTION DO NOT USE OIL-BASED CAULK FOR SEALING. IF COMPATIBILITY IS IN QUESTION, WRAP THE TUBING WITH ALUMINUM FOIL WHERE IT CONTACTS THE SEALING MATERIAL.

Penetrations may be sealed with caulk, expanding foam, or open- or closed-cell pipe insulation.

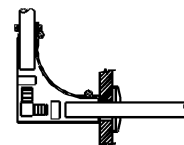


If compatibility is in question, wrap the PEX with aluminum foil at the contact area before sealing. See text for specific information.

INSTALLATION TIP



CLSE23 Turnout provides an acceptable bend radius for 3/8" tubing.



Turnout also accommodates the required elbow for 1/2" tubing.

THAWING PEX TUBING SYSTEMS

PEX tubing systems should not be intentionally subjected to freezing.

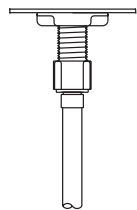
Do not use open torch or excessive heat to thaw PEX tubing. Tubing failure or damage can result.

Heat (DO NOT USE A TORCH) must be applied directly to the frozen tubing section. Temperature on tubing shall not exceed 180°F.

Several suitable methods exist to thaw PEX tubing. They include:

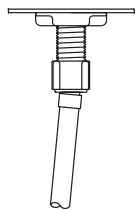
- A commercial system which pumps heated water through a tube to the ice blockage, and returns the cooled water for reheating.
- Wet hot towels
- Hot water
- Hand-held hair dryer
- Low wattage electrical heating tape

CORRECT

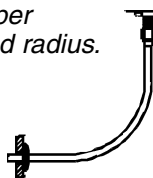


16. When making swivel connections, keep the tubing and fitting aligned and straight while tightening the swivel nut.

INCORRECT

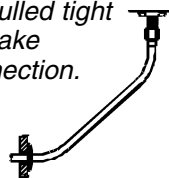


CORRECT:
Allows a proper bend radius.



17. When completing fixture connections, cut the lines carefully and leave sufficient tubing to make the connection without putting undue stress on the tubing, fitting or connection.

INCORRECT:
Tubing shall not be pulled tight to make connection.



NOISE AND WATER HAMMER IN PEX SYSTEMS

As with all plumbing materials under some operating conditions, water hammer can occur in PEX plumbing systems. The inherent flexibility of Vanex PEX drastically reduces the magnitude of pressure surges compared with metallic plumbing materials. Damage to plumbing components in a PEX system due to these pressure surges is highly unlikely, although noise can sometimes result. Fortunately, there are solutions to minimize or eliminate water hammer noise.

• **Install fixtures that are not water hammer prone** - As a general rule, two-handle fixtures are less likely to cause hammer than single-handle fixtures. Single-handle shower valves, which rotate to close and therefore are difficult to close quickly, might be good choices.

• **Clamping or strapping more frequently may help prevent tubing noise.** It is very important that the tubing not be in contact with wallboard, forced air ducts or other high resonance articles. Insufficiently or improperly clamped or strapped tubing may move during fixture operation and hit against these surfaces.

• **Install a water hammer arrester at fixtures where noise is a problem.** A water hammer arrester (Vanguard Part No. XWHA2 or XWHA3 or other size AA) installed as close as possible to the fixture on the cold water side only will eliminate the source of the noise; the pressure wave. It should be noted that even with an arrester, tubing which is clamped or strapped insufficiently may still hit against something as it moves slightly when the water flow is stopped.

• **Avoid operating fixtures in such a way that causes near instantaneous shut off.** Simply closing fixtures in a less abrupt manner can eliminate hammer noise.

CONNECTING DISTRIBUTION LINES TO THE MANABLOC

THE WATER SUPPLY TO THE MANABLOC SHALL BE TURNED OFF WHILE MAKING DISTRIBUTION LINE CONNECTIONS.

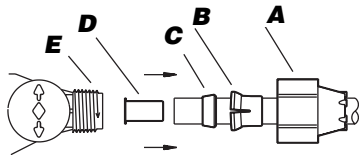
NOTE: The red caps on the MANABLOC designate hot ports, the blue caps designate cold ports. Make sure the distribution lines are being connected to the correct ports (hot or cold). The use of MANABLOC Vanex color coded PEX tubing also reduces the possibility of cross connections.



WARNING

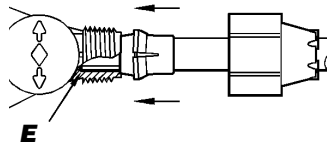
DO NOT use slip-joint pliers to tighten the Lock-In nuts. Use the MW1 MANABLOC Wrench to tighten the port connections.

1. For each distribution line, slide the Lock-In compression nut (A), Lock-In insert (B) and the plastic ferrule (C) onto the tubing in that order. See illustration below.



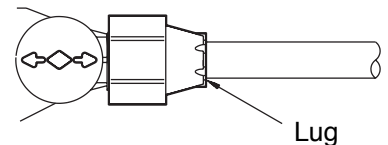
The long taper of a 3/8" ferrule (C) must be TOWARD THE END OF THE TUBE; a 1/2" ferrule is symmetrical and may be installed facing either direction. Then insert the stainless steel stiffener (D) COMPLETELY into the end of the tubing.

2. Push the tubing into the port socket (E) until it bottoms out.



Holding the tube so that it does not back out of the fitting, slide the white Lock-In insert and ferrule snugly against the chamfer inside the port socket. While holding the tube against the bottom of the socket, thread the Lock-In compression nut onto the port and tighten hand-tight.

3. Finish tightening the nut with the MANABLOC Wrench (Vanguard Part No. MW1) until the white Lock-In insert appears between the lugs and becomes flush with the ends of the lugs, plus 1/4 to 1/2 turn.



Wrench-tighten the nut until the white insert is flush with the lugs, plus 1/4 to 1/2 turn.

Complete the connection as soon as each distribution line is connected to the MANABLOC.



WARNING

DO NOT attempt to install the Lock-In insert backwards as breakage may result. ALWAYS insert the long portion of the insert sleeve over the tube first.

DO NOT attempt to use or re-use inserts that are defective, cracked, broken or otherwise damaged, as connection failure will result.



UNDER NO CIRCUMSTANCES

shall any form of thread sealant (Teflon[®] paste, pipe dope) be used on the distribution line connections. The carriers present in these compounds can crack the plastic port connections, resulting in leaks and water damage.



COMPRESSION CONNECTION CAUTION

This plumbing system relies upon the proper tightening of distribution line compression connections. Failure to properly complete ALL connections will result in failure. Incomplete or improper connections can hold pressure during a system test but will fail at a later date, resulting in water damage.

DO NOT OVERTIGHTEN

Compression fittings can be OVER TIGHTENED. Overtightening of the Lock-In compression nuts may cause damage to the tubing, nut, valve or fitting body. DO NOT tighten Lock-In nuts beyond the recommendation of these instructions (Step 3).

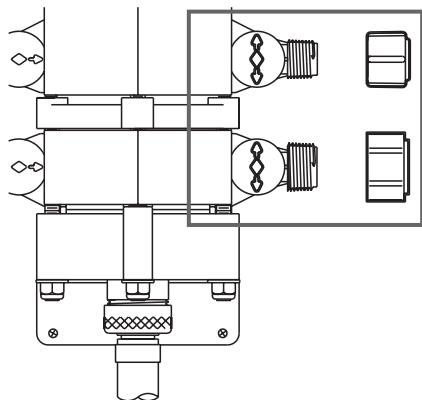
Each valve should be turned to the open position after completing each connection. See valve information on page 19.

4. After all connections are complete, re-check that all of the Lock-In inserts are visible between the lugs and are flush or protruding slightly beyond the lugs.

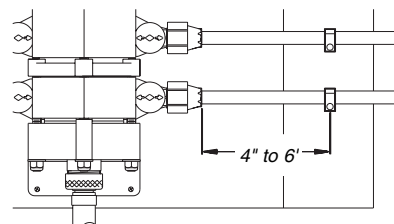
5. As the distribution lines are connected to the MANABLOC, they should immediately be labeled on the cover plate as to which fixture that line supplies. Fixture labels are included with each MANABLOC. Affix the appropriate label to the cover plate next to the port.

CONNECTING DISTRIBUTION LINES TO THE MANABLOC (con't)

6. Any unused outlet(s) shall be capped and the valve(s) turned to the "off" position. Use Vanguard Part No. RXPC3 to cap off 3/8" ports, or No. MBPC4 to cap off 1/2" ports.



7. When the MANABLOC is not mounted between studs (page 10), securely anchor the PEX lines to prevent stressing the MANABLOC connection. Anchoring the tubing 4" to 6" from the connection gives best results. Use Vanguard Part Nos. CLJ2 or CLE2 tubing clamps for 3/8" tubing, and CLJ3 or CLE3 for 1/2" tubing. Failure to secure or anchor the tubing could cause misalignment of the O-ring seals in the MANABLOC, creating the potential for a leak. Refer to page 10 for specific instructions about supporting the tubing when mounting the MANABLOC without studs.



Each distribution line must exit the MANABLOC in a straight line and be supported within 4" to 6" from the MANABLOC.

MXLSA23, MXLSA33, MXLSA24, MXLSA34

OPTIONAL CRIMP ADAPTERS

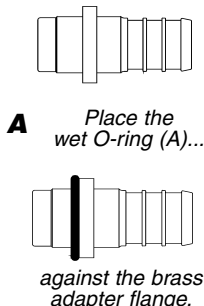
THE WATER SUPPLY TO THE MANABLOC AND THE PORT VALVES SHALL BE TURNED OFF BEFORE ATTEMPTING INSTALLATION OF CRIMP ADAPTERS.



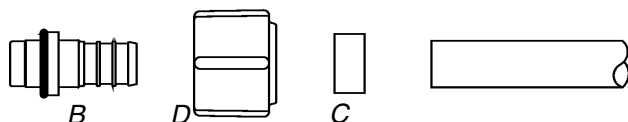
CAUTION

Some O-rings can crack the plastic. Use only O-rings supplied with the adapters.

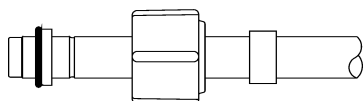
1. Wet the O-ring (A) with tap water or silicone lubricant only. **DO NOT** USE Vaseline®, grease, oil, or any other lubricant. Use of petroleum-based lubricant can cause cracking of the plastic and result in a leak. Place the O-ring against the flange of the brass adapter (B).



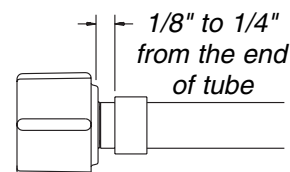
2. Slide a crimp ring (C) - XLCR2 for 3/8" tubing; XLCR3 for 1/2" - and the supplied swivel nut (D) onto the tubing (threads of the nut toward the end of the tubing).



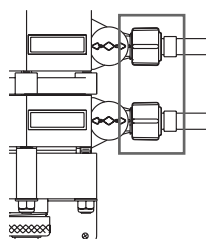
Insert the brass adapter (B) fully into the end of the tubing as shown.



3. Slide the swivel nut (D) back to brass adapter and slide the crimp ring (C) to within 1/8" to 1/4" from the end of tube. Crimp the ring with an appropriately sized full-circle crimp tool. **DO NOT CRIMP TWICE.**



See page 17 for additional crimping information. The publication *Installation Guidelines for the Vanguard Vanex® PEX System with CRIMPSERT® Insert Fittings*, may also be consulted.



4. With the O-ring still in place, thread the nut onto the MANABLOC port and tighten **hand tight plus NO MORE THAN 1/8 turn additional.**

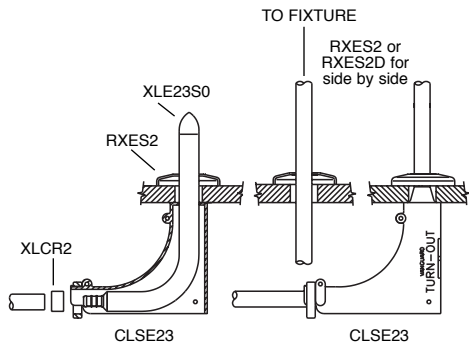
DO NOT OVERTIGHTEN

5. Open the port valve(s) before turning on the main water supply. See valve information, page 19.

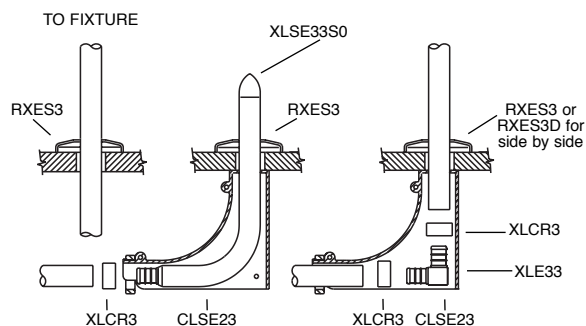
CONNECTING DISTRIBUTION LINES TO FIXTURES

Depending on the fixture being supplied, local code requirements and crimp tool availability, there are several options available to connect PEX distribution lines to fixtures. The following illustrations apply to fittings available from Vanguard Piping Systems, Inc. See the Vanguard Product Catalog for the complete line of transition fittings.

FLOOR STUB-OUT METHODS

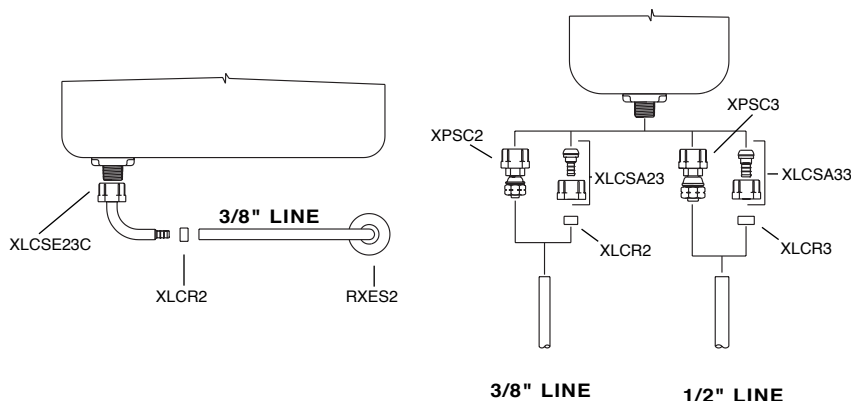


FOR 3/8" DISTRIBUTION LINES



FOR 1/2" DISTRIBUTION LINES

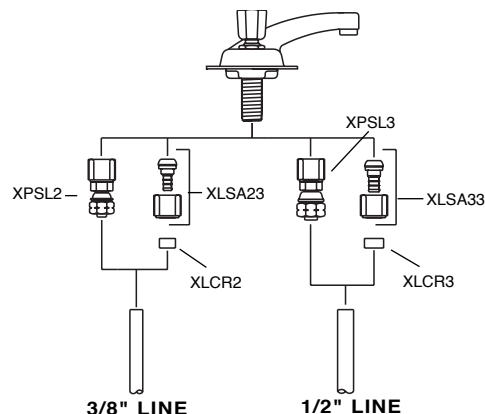
WATER CLOSET CONNECTIONS



3/8" LINE

1/2" LINE

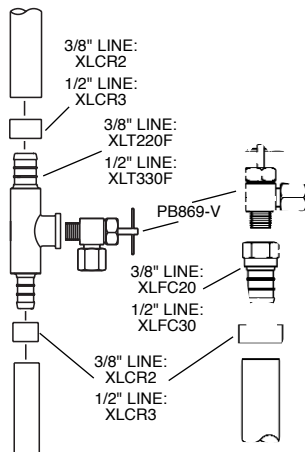
FAUCET CONNECTIONS - LAV or KITCHEN



3/8" LINE

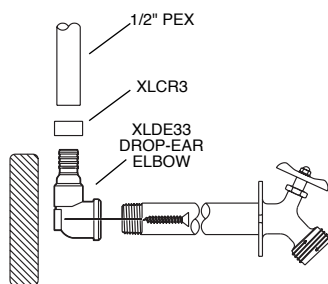
1/2" LINE

ICE MAKER HOOK-UP



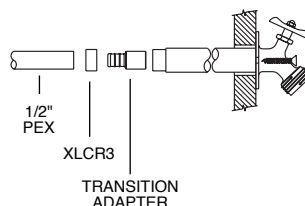
Install from the cold side of the kitchen faucet or other convenient supply.

HOSE BIBB CONNECTION



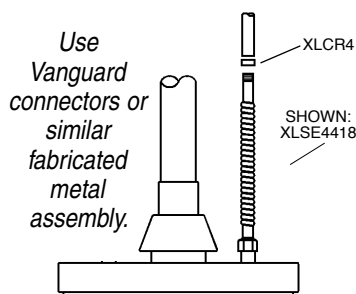
NOTE: FREE STANDING HOSE BIBBS SHALL NOT BE SUPPORTED BY VANEX PEX. Well-anchored drop-ear fittings or metal pipe shall be used to install hose bibbs.

HOSE BIBB CONNECTION



HOSE BIBBS SUPPORTED BY THE STRUCTURE CAN BE CONNECTED DIRECTLY.

WATER HEATER FITTINGS

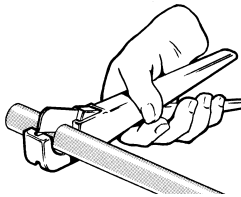


PEX SHALL BE AT LEAST 18" FROM GAS WATER HEATER.

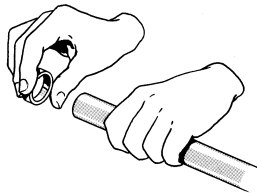
NOTE: Vanex PEX may be connected with standard metallic termination fittings (swivel elbows and straight swivels) to the water heater inlet and outlet nipples on ELECTRIC, tank type water heaters.

CRIMPING INSTRUCTIONS

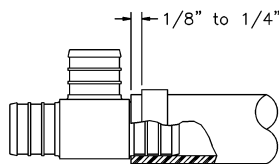
1. Cut the pipe cleanly and squarely.



2. Slide a PEX crimp ring over the end of the pipe.

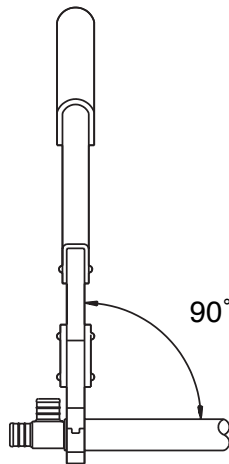


3. FOR CRIMPSERT POLYMER AND CRIMPSERT METALLIC FITTINGS

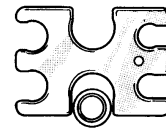


Insert the fitting into the pipe to the shoulder or tube stop. Position the ring 1/8" to 1/4" from the end of the tubing.

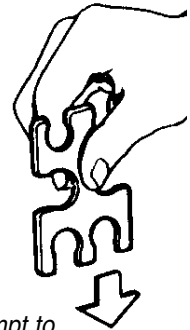
4. The ring must be attached straight. Center the crimping tool jaws exactly over the ring. Keep the tool at 90° and close the handles completely. **DO NOT CRIMP TWICE.**



5. When checking crimped rings with the GO-NO GO gauge,

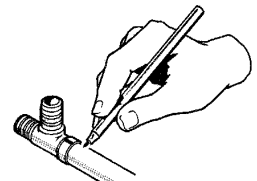


Push the gauge straight down over the crimped ring. **NEVER** slide the gauge in from the side. Do not attempt to gauge the crimp at the jaw overlap area. The overlap area is indicated by a slight removal of the blacking treatment.



6. You have a good crimp if the GO gauge fits the ring and NO-GO does not. Bad crimps must be cut out and replaced.

Good crimps can be identified with a marker.

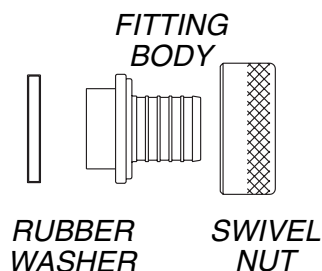


WATER SUPPLY CONNECTIONS

The main water supply shall be turned off before making water supply connections.

The MANABLOC water supply connection uses a special 1" swivel MANABLOC transition fitting which seals with a rubber washer. This connection is used on the cold water supply and the hot water supply/return lines.

This connection to the MANABLOC does not require any form of thread sealant and none shall be used. **DO NOT USE ANY FORM OF THREAD SEALANT TO MAKE THIS CONNECTION.**



NOTE: Water Service connections to adapt to any type of plumbing supply materials are available. Consult the *Vanguard Product Catalog* for a complete listing of available connections.

1. Make all connections to water supply piping before attaching the swivel fitting to the MANABLOC. Excessive force from threaded fittings, or solvents from solvent welding (PVC or CPVC) will cause damage to the MANABLOC. Drill all holes in wood members for water supply/return tubing **BEFORE** mounting the MANABLOC.

2. When using male or female pipe thread transition fittings, use only Teflon® TAPE to seal pipe threads. **DO NOT** use pipe dopes, thread sealers, Teflon® pastes, etc.

3. If copper sweat fittings are used anywhere in the MANABLOC water supply line or water heater feed/return lines, these fittings must be soldered, cooled, and flushed of any flux residue

before these lines are connected to the MANABLOC. Soldering creates a tremendous amount of heat which could melt the MANABLOC, and solder flux contains strong acids and may also contain petroleum products. These compounds can attack the plastic materials from which the MANABLOC is made and cause crazing, cracking and failure of the MANABLOC, resulting in leaks and water damage.

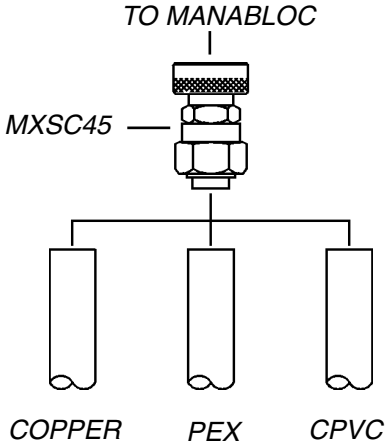
WATER SUPPLY CONNECTIONS (con't)

4. Ensure that the hot/cold supply lines are connected to the correct supply inlet/outlet on the MANABLOC.


Red valve caps designate hot ports, blue valve caps designate cold ports.

5. Supply lines shall enter and/or exit the MANABLOC in a straight line. If bending of the supply lines is required, the tubing must be anchored to a framing member to isolate the bend stress from the MANABLOC or use a directional fitting.


6. After the supply tubing has been connected to the transition fitting, place the rubber washer onto the swivel adapter, remove the plastic protective cap from the MANABLOC fitting and thread the swivel nut onto the threaded male adapter by hand. DO NOT CROSS THREAD.



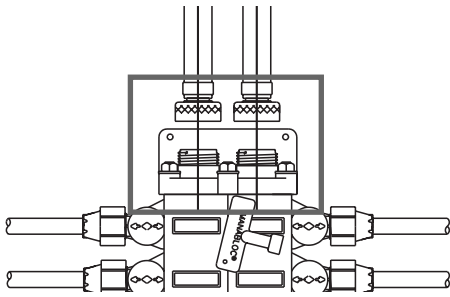
Vanguard Part No. MXSC45 is available to connect 3/4" PEX, copper and CPVC lines to the MANABLOC.



IMPORTANT WARNING!
PVC AND CPVC SOLVENTS CAN CRACK THE MANABLOC. DO NOT SOLVENT WELD NEAR THE MANABLOC. MAKE SURE that all solvent cement welds are COMPLETELY HARDENED before attaching supply tubing to the MANABLOC.



Swivel fittings must be **ALIGNED CORRECTLY** before being attached to the MANABLOC. The piping material must not be allowed to put stress on the MANABLOC, as leaking and damage may result.

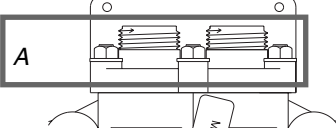


7. TIGHTENING THE SWIVEL CONNECTIONS:

A. On a MANABLOC with two (2) threaded male adapters on one end, tighten the 1" swivel nut hand-tight, then snug with channel locks. DO NOT attempt to stop the male threaded plastic portion of the connector from turning. This connector is designed to turn slightly in the MANABLOC if excess torque is applied to the nut. See illustration.

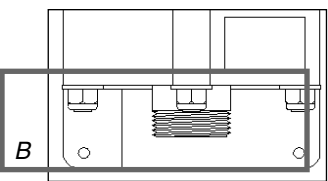
B. On a MANABLOC with only one (1) threaded male adapter on one end (a Y-block turn around assembly), the threaded portion will not turn and could break if excess force is applied. **DO NOT OVERTIGHTEN.**

Repeat for all remaining supply line connections.



A

Two male adapters = designed to turn slightly past "tight" DO NOT OVERTIGHTEN



B

One male adapter = DO NOT OVERTIGHTEN



NOTICE!

Please leave this installation guide for the homeowners reference. Local code may also require additional labeling directly adjacent to the MANABLOC or on the inside of any cover panel.

DO NOT ELECTRICALLY GROUND TO THIS SYSTEM.

FILLING AND TESTING THE MANABLOC SYSTEM

1. Upon completion of the installation, the system should be filled and hydrostatically tested. Use only POTABLE water for testing.



WATER TESTING SHALL BE AVOIDED DURING FREEZING CONDITIONS.

UNDER NO CIRCUMSTANCES SHALL THE SYSTEM BE TESTED AT TEMPERATURES LOWER THAN 10°F (-12°C).

2. Open all connected port valves before filling the system with water or air and pressurizing. If the MANABLOC is filled and pressurized before the port valves have been opened, read the following notice:



NOTICE - VALVE INFORMATION!

Opening a port valve to an empty or unpressurized

distribution line may cause valve damage. To prevent potential valve damage or failure, open the port valves before filling and pressurizing the lines. The force of water rushing to fill an empty line can cause the valve's sealing O-ring to "clip off", resulting in incomplete sealing or complete valve failure.

CARE must be exercised when opening a port valve to an empty or unpressurized line. The fixture to which the line is connected should be in the OFF position and the valve must be opened slowly until water starts to flow into the line.

DO NOT CONTINUE to open the valve until the line is full and pressurized. Open the valve fully only after the line is up to system pressure. The fixture can then be opened to purge the line of air.

Valve stems are replaceable. Order Vanguard Part No. MBR53.

3. Hydrostatic testing of the MANABLOC plumbing system is to be conducted according to local code requirements. Test pressure shall be not less than 100 psi nor greater than 225 psi.

NOTE: Some plumbing fixtures may not withstand test pressures greater than 80 psi. Consult fixture manufacturers instructions for pressure limitations or plug all distribution lines at the fixture end. The system shall, at a minimum, withstand the test pressure, without leaking, for a period of 15 minutes.



WARNING! PRESSURES USED IN TESTING CAN BLOW UNMADE OR INCOMPLETE CONNECTIONS APART WITH TREMENDOUS FORCE!

This force is many times greater when air is used for a test media. To reduce the risk of personal injury, ensure that all connections are completed before testing. Use only the pressure and time required to determine that the system is leak free.

4. Fluid testing the MANABLOC system at temperatures below freezing (less than 32°F, 0°C) may be performed using a solution of water and NON-TOXIC antifreeze such as propylene glycol (typically called RV antifreeze). If such a solution is used, the antifreeze solutions must be sufficiently concentrated to withstand the lowest temperature encountered while the testing fluid is in the system.

Antifreeze solutions should be purged and the system flushed with potable water prior to consumer use.



THE WATER HEATER SHALL BE ISOLATED AND NOT INCLUDED IN THE SYSTEM AIR TEST.

5. Air pressure testing of a MANABLOC is acceptable and preferred to hydrostatic testing in areas where cold weather could freeze the system or where water is not available. Vanguard recommends that the installer pressurize the system with compressed air or another acceptable test medium, such as dry nitrogen, after installing and capping distribution lines. MANABLOC valves shall be in the open position during the test, which shall utilize a pressure of not less than 40 psi and not greater than 100 psi. The system shall be tested for a minimum of 15 minutes but no longer than 1 hour. During the test, system pressure shall drop no more than 8 psi in the one hour period.

If the pressure in the system declines more than 8 psi during the minimum 15 minute period, re-pressurize the system to the original test pressure, and retest.* If the system pressure declines more than 8 psi again during the test period, test the distribution line test caps or any other fittings in the system with the approved leak detection solution. (Any connection found to be in question must be replaced or remade

and the pressure test repeated.) If the solution does not show a leak on any of the caps or fittings, isolate the MANABLOC by turning the valves to the "OFF" position, repressurize if needed, and apply the same solution to the MANABLOC manifold components.

For leak detection, use only a mixture of Original Palmolive Green™ dishwashing soap (#46100-46200) or Palmolive Ultra™ (#356140 or 46128) mixed with potable water at a ratio of 2 ounces of soap to one gallon of water (mix Ultra at a ratio of 1.5 ounces per gallon.)

*During the initial test pressurization period, the system pressure indicated on the gauge may decrease due to the initial deformation of the pipe, followed by slow expansion. The pressure drop is dependent on ambient temperature, system capacity, and test pressure but shall not be more than 8 psi in an hour.



TEST SHALL BE CONDUCTED WHEN SIGNIFICANT CHANGES TO TEMPERATURE AREN'T EXPECTED.

Please note significant changes in ambient temperature also can affect system pressure.

6. Due to the normal contraction of the MANABLOC in extremely cold weather, the tie rods may appear loose. This is normal. DO NOT tighten the tie rod nuts! They are factory pre-set.



DO NOT ALLOW FLUIDS TO FREEZE IN THE MANABLOC SYSTEM! Fluids freezing in the MANABLOC will damage the unit.



WATER (NOT ANTIFREEZE SOLUTION) MUST BE PURGED OR DRAINED FROM THE SYSTEM IF TEMPERATURES ARE EXPECTED TO FALL BELOW FREEZING (32°F, 0°C). Low pressure compressed air can be used for purging.



FOLLOW ANTIFREEZE MANUFACTURERS INSTRUCTIONS FOR CONCENTRATIONS. USE ONLY NON-TOXIC ANTIFREEZE APPROVED FOR USE IN DRINKING WATER SYSTEMS.

SYSTEM DISINFECTION AND DRAINING THE MANABLOC SYSTEM

Local codes may require system disinfection. When no other method is available, follow the time limitations and exposure levels shown below:

	CONCENTRATION	PERIOD	AUTHORITY
1. Use one of the chlorine solutions and exposure durations listed to the right.	200 PPM	3 HOURS	AWWA
	50 PPM	24 HOURS	AWWA

- Mix the disinfection solution thoroughly before adding it to the system.
- The chlorine solution must reach all parts of the system. Open all fixtures (both sides) and flow water until a chlorine smell is present. As an alternative, chlorine tablets can be used to detect chlorine at each fixture. Open all unused ports and flow disinfection solution. A section of Vanex PEX tubing can be temporarily attached to these ports to direct the water to a suitable drain.

- The chlorine source for the solution can be, but is not limited to:

CHLORINE SOURCE	% ACTIVE CHLORINE	AMOUNT PER 100 GAL WATER FOR A 200 PPM SOLUTION
Laundry Bleach	5.25	LIQUID 3 PINTS (24 oz)

- After the solution has been in the system for the time required by the AHJ or the exposure durations listed in step 1 above, the system shall be flushed completely with potable water.
- The system must be purged or drained of all water or protected from freezing.



FAILURE TO FLUSH THE SYSTEM NOTICE!

To prevent reduced service life of system components, disinfection solutions shall not be allowed to stand in the system longer than 24 hours. Flush the system with potable water after disinfection.



DO NOT ALLOW FLUIDS TO FREEZE IN THE MANABLOC SYSTEM

Fluids freezing in the MANABLOC will damage the unit.

DRAINING THE MANABLOC SYSTEM

If the MANABLOC system has been filled with water and there exists the possibility that the ambient temperature will drop close to or below 32° F (0° C), then the MANABLOC unit MUST be drained to prevent irreparable damage.

The process of draining involves loosening and removal of 1 or more supply line connections and 2 distribution lines from the MANABLOC.

Note: Depending on the installation, some of the supply connections may be capped. If that is the case, remove the cap(s) as instructed below.

- Turn off all water supply(s) feeding the MANABLOC. Open both sides of all fixtures served by the manifold and leave the fixtures open during draining. For each port of the MANABLOC where there is a distribution line connected, make sure that the port valve is in the open position.
- Loosen and remove the bottom supply connection(s) (or cap(s)) and both of the distribution line connections directly above the divider plate.

- As the connections are removed, most of the water contained in the MANABLOC main bores and some of the water in the distribution lines should purge from the system.

- Allow to drain until no more water purges.

- Reattach the supply line(s) (or cap(s)) and the distribution lines. Tighten the supply connections according to the instructions on pages 17 – 18 of these guidelines. When reconnecting the distribution lines, DO NOT over-tighten the connections. It should require only about 1/8 turn past hand tight when reinstalling connections that were previously tightened to the specifications outlined in this installation guide.

NOTE: The procedure described above will leave a small amount of water in the MANABLOC unit and, depending on the installation, may leave some or most of the water in the distribution lines. This remaining water should not cause damage to the manifold unit or to the PEX distribution lines in the event of a freeze. However, for complete assurance that freeze damage will not occur, perform the following additional steps.

To completely drain the system:

- Loosen and remove all of the supply line connections (or caps) and all of the distribution lines from the MANABLOC.

- Remove the 4 attachment screws and withdraw the MANABLOC unit from its mounting. Note: Grasp the unit firmly before removing the last attachment screw to prevent the unit from falling and being damaged.

- Completely drain the MANABLOC unit by inverting the unit several times until there is no water coming from any of the supply connections or ports.

- To purge the PEX distribution lines, first make sure that both sides of all of the fixtures are in the open position. Using low pressure air from a tank or compressor, force the water from the lines by connecting the air pressure source to each line one at a time and blow air through the lines until no water flows from the fixtures.

- Reattach the MANABLOC and reconnect the supply and distribution line connections.

NOTE: When reconnecting the distribution lines, DO NOT over-tighten the connections. It should require only about 1/8 turn past hand tight when reinstalling connections that were previously tightened to the specifications outlined in this installation guide.

VANGUARD LIMITED WARRANTY VANEX® PIPE AND TUBING MANABLOC® AND INSERT FITTINGS SYSTEM

Subject to the conditions and limitations in this Limited Warranty, VANGUARD PIPING SYSTEMS, INC. warrants to licensed plumbers, who purchase and properly install in a hot and cold potable water distribution system its VANEX® cross-linked polyethylene pipe and tubing (PEX) in a MANABLOC® or Minibloc manifold plumbing system or with crimp insert fittings sold by Vanguard or meeting the specifications of ASTM 1807 and certified/listed for conformance with ANSI/NSF Standard No. 61, that the VANEX® pipe or tubing, the MANABLOC, Minibloc, and crimp insert fittings sold by Vanguard, under normal conditions of use, will be free from failure caused by manufacturing defect for a period of ten (10) years from date of installation.

Under this warranty, you only have a right to reimbursement if the failure or leak resulted from a manufacturing defect in the products covered by this warranty and occurred during the warranty period. You do not have a remedy or right of reimbursement under this warranty and this warranty does not apply if the failure or any resulting damage is caused by (1) components in the plumbing system other than those manufactured or sold by Vanguard; (2) not designing, installing, inspecting or testing the system in accordance with Vanguard's installation instructions at the time of the installation, applicable code requirements, and good plumbing practices; (3) damage caused to the product prior to, during, or after installation, inadequate freeze protection, exposure to water pressures or temperatures in excess of the limitations on the pipe or tubing, or exposure to unauthorized solvents or chemicals. In addition, for MANABLOC or Minibloc systems, there is no warranty if (1) the MANABLOC or Minibloc manifold has been disassembled or modified after leaving Vanguard; (2) the MANABLOC or Minibloc manifold is installed behind a permanent enclosure and is non-accessible through an access panel or other acceptable enclosure; (3) components or connections to the MANABLOC or Minibloc system are not Vanguard components or connections or crimp insert fittings meeting the specifications of ASTM 1807 and certified/listed for conformance with ANSI/NSF Standard No. 61.

In the event of a leak or other failure in the system, it is the responsibility of the property owner to obtain and pay for the repairs. Only if the warranty applies will Vanguard be responsible for reimbursement under this warranty. The part or parts which you claim failed should be kept and Vanguard contacted by writing to the address below or telephoning 800.775.5039 within thirty days after the leak or other failure and identifying yourself as having a warranty claim. You should be prepared to ship, at your expense, the product which you claim failed due to a manufacturing defect, document the date of installation, and the amount of any claimed bills which you wish reimbursed. Within a reasonable time after notification, Vanguard will investigate the reasons for the failure, which includes the right to inspect the product at Vanguard and reasonable access to the site of the damage in order to determine whether the warranty applies. Vanguard will notify you in writing of the results of its review.

In the event that Vanguard determines that the failure or leak and any resulting damages were the result of a manufacturing defect in the products covered by this warranty, Vanguard will reimburse the property owner for reasonable repair or replacement charges to include drywall and painting or plastering costs, as well as damages to personal property resulting from the failure or leak. VANGUARD SHALL NOT BE LIABLE FOR CONSEQUENTIAL ECONOMIC LOSS DAMAGES UNDER ANY LEGAL THEORY AND WHETHER ASSERTED BY DIRECT ACTION, FOR CONTRIBUTION OR INDEMNITY OR OTHERWISE.

THE ABOVE LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Other than this limited warranty, Vanguard does not authorize any person or firm to create for it any other obligation or liability in connection with its products. Licensed plumbers are authorized to provide this warranty in connection with any warranty extended by them to builders or owners of site built construction.

Some states do not allow the exclusion or limitation of incidental or consequential damages in certain types of transactions, so the above exclusion or limitations may not apply to you. This limited warranty gives you specific legal right and you also may have other rights which vary from state to state.



For further information about the MANABLOC plumbing system,
answers to specific questions or technical support, contact Vanguard:

901 N. Vanguard Street / McPherson, KS 67460

TEL 620.241.6369 or 800.775.5039

FAX 620.241.2123 or 800.775.4068

www.vanguardpipe.com