ProRadiant SYSTEMS

Submittal Package

Project:

Engineer:

Contractor:

Submitted by:

VIEGA • *The global leader in plumbing and heating systems.*
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☐ ViegaPEX Barrier	☐ 5/16"	☐ Climate Panels
☐ Pextron	☐ 3/8"	☐ Climate Trak
☐ FostaPEX	☐ 1/2"	☐ Snap Panel
☐ 100% Water	☐ 5/8"	☐ In-Slab
☐ 30% Glycol	☐ 3/4"	☐ Thin-Slab
☐ 40% Glycol	☐ 1"	☐ Snowmelt - Concrete
☐ 50% Glycol	☐ 1-1/4"	☐ Snowmelt - Asphalt
☐ Propylene	☐ 1-1/2"	☐ Snowmelt - Other
☐ Ethylene		

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ViegaPEX™ Barrier Hydronic Radiant Heat Tubing

Scope
This specification designates the requirements for ViegaPEX Barrier cross-linked polyethylene (PEX) tubing for use in hydronic radiant heating systems. ViegaPEX Barrier includes an oxygen barrier layer that helps restrict the passage of oxygen through the wall of the tubing. All ViegaPEX is manufactured and tested to the requirements of ASTM F876 and F877 and is CTS-OD (copper tube size outer dimension controlled) with an SDR - (standard dimension ratio) 9 wall thickness. ViegaPEX Barrier is compatible with both Viega PEX Press fittings and F1807 PEX Crimp fittings. Viega has no control over the quality of other manufacturers, therefore, we do not extend any warranty to those components that are not supplied by Viega.

Materials
ViegaPEX Barrier tubing is produced from cross-linkable, high density polyethylene resin. This cross-linkable resin is produced by grafting organo-silane molecules onto a base polyethylene chain. A catalyst that initiates the cross-linking process is blended with the resin before extrusion. Cross-linking is conducted after extrusion by exposing the tubing to heat and moisture (steam). ViegaPEX Barrier includes 4 layers. The first layer is the cross-linked, high density polyethylene. The second layer is an adhesive for the third layer, the ethylene vinyl alcohol layer (EVOH oxygen barrier). The fourth layer is another very thin layer of polyethylene, put on the outside to protect the EVOH layer from damage. EVOH is highly resistant to the passage of oxygen.

Marking and Certification
Tubing is marked with manufacturer, ViegaPEX Barrier, nominal size, rating, codes and standards, approvals, date, material code and location of production (i.e., 0000FT Viega ViegaPEX Barrier™ 5/16" SDR-9 100 PSI @ 180°F [NSF-pw U.P. Code ASTM F876/F877] ICBO ES ER-5287 PEX1006 Date Code Material Code Made in the USA 0002FT). Tubing is third party tested to the requirements of the stated ASTM standards. Tubing includes incremental footage markings to assist with loop layout. ViegaPEX Barrier is certified to NSF 61 and 14 for use as part of, or connected to a potable water system.

Recommended Uses
ViegaPEX Barrier tubing is recommended for hydronic radiant heating, cooling, and snow melting systems utilizing water or a water/glycol mix as the heat or cold transfer media. Tubing may be installed in concrete, gypsum based lightweight concrete, sand, asphalt (in accordance with special guidelines) in or under wood flooring or behind wallboard or plaster. ViegaPEX Barrier may also be used as transfer lines for baseboard heating systems with a maximum operating temperature of 200°F @ 80 psi.

Handling and Installation
Install ViegaPEX Barrier in accordance with installation manuals provided by manufacturer and applicable code requirements. Water or air can be used to pressure test the system. Please follow manufacturer's requirements on pressure and length of time. ViegaPEX Barrier comes with a 90 day UV protection. For information on the suitability for other applications, contact your Viega representative.

Property	ASTM Test Method	Typical Values	
		English Units	SI Units
Density	D 792	-	0.952 g/cc
Melt Index[1]	D 1238	-	2.0 g/10min
Flexural Modulus[2]	D 638	150,000 psi	1000 MN/m2
Tensile Strength @ Yield (2 in/min)	D 638	3,900 psi	26 MN/m2
Coefficient of Expansion @ 68° F	D 696	8 x 10^{-4}/°F	1.4 x 10^{-4}/°C
Hydrostatic Design Basis @ 73°F (23°C)	D 2837	1,250 PSI	8.6 MPA
Hydrostatic Design Basis @ 180°F (82°C)	D 2837	800 PSI	5.5 MPA
Vicat Softening Point	D 648	255°F	124°C
Thermal Conductivity	C 177	2.7 Btu/hr/ft²/°F	1.1x10 -3 cal/sec/cm/°C

1. Before Crosslinking 2. 73°F

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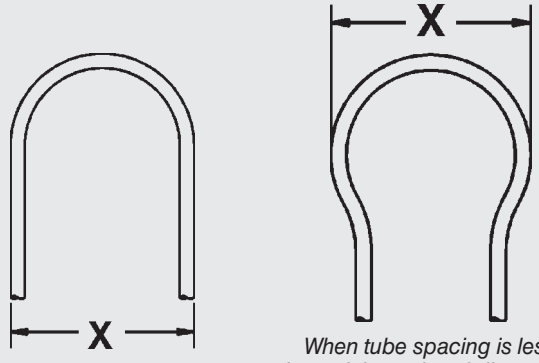
ViegaPEX Barrier

Quality Assurance

ViegaPEX Barrier tubing is manufactured and tested to the requirements of ASTM F876 and F877. The degree of cross-linking of finished tubing is determined by method ASTM D2765.

Certifications

NSF-pw - tested for health effects to ANSI/NSF 61 and performance to ANSI/NSF standard 14.



When tube spacing is less than minimum bend dimension.

When the tube spacing is less than the minimum recommended bending dimension, the loop ends should be swept out to at least the dimensions shown.

Otherwise, if tube spacing is equal or greater than "X", a standard loop may be used.

Dimension X	
Tubing Size	With the Coil
5/16"	7"
3/8"	8"
1/2"	10"
5/8"	12"
3/4"	14"
1"	18"
1-1/4"	22"
1-1/2"	26"

ViegaPEX Barrier Oxygen Permeation: All sizes have less than 0.1 grams/m³/day

Note: ViegaPEX Barrier tubing meets DIN 4726 requirement for oxygen tight pipes.

PRESSURE DROP TABLE

Expressed per/ft.

	SIZE															
	5/16"		3/8"		1/2"		5/8"		3/4"		1"		1-1/4"		1-1/2"	
GPM	PSI	Head Loss	PSI	Head Loss	PSI	Head Loss	PSI	Head Loss	PSI	Head Loss	PSI	Head Loss	PSI	Head Loss	PSI	Head Loss
.1	.002	.005	.001	.001												
.2	.009	.021	.004	.008	.001	.002										
.3	.018	.042	.008	.017	.002	.004	.001	.002								
.4	.031	.072	.013	.030	.003	.007	.001	.002								
.5	.047	.109	.020	.045	.004	.010	.002	.004								
.6	.066	.152	.027	.063	.006	.014	.003	.006	.001	.003						
.7	.088	.203	.036	.084	.008	.019	.003	.008	.002	.004						
.8			.047	.108	.011	.024	.004	.010	.002	.005						
.9			.058	.134	.013	.030	.005	.012	.002	.006						
1			.070	.1626	.016	.037	.007	.015	.003	.007	.001	.002				
1.5					.034	.078	.014	.032	.006	.015	.002	.004				
2					.058	.133	.024	.055	.011	.025	.003	.007				
3							.050	.116	.023	.052	.007	.015				
4							.085	.197	.039	.089	.011	.026				
6							.181	.417	.082	.189	.024	.056				
8									.140	.322	.041	.095				
10									.211	.487	.062	.143	.023	.054		
12									.296	.683	.087	.201	.032	.075		
14													.042	.098		
16													.053	.123	.022	.052
18													.065	.151	.027	.063
20													.078	.182	.033	.077
22													.093	.217	.039	.091
24													.108	.252	.045	.105
26															.052	.121
28															.060	.140
30															.067	.156
32															.075	.175

SDR-9 PEX TUBING

ASTM F876/F877/CTS-OD SDR-9

TUBING SIZE	O.D.	WALL THICKNESS	NOM. I.D.	WEIGHT PER FT	VOLUME (GAL)/ 100 ft
5/16"	.430±.003	.064+.010	0.292	.0340	0.34
3/8"	.500±.003	.070+.010	0.350	.0413	0.50
1/2"	.625±.004	.070+.010	0.475	.0535	0.92
5/8"	.750±.004	.083+.010	0.574	.0752	1.34
3/4"	.875±.004	.097+.010	0.671	.1023	1.82
1"	1.125±.005	.125+.010	0.863	.1689	3.04
1-1/4"	1.375±.005	.153+.015	1.053	.2523	4.52
1-1/2"	1.625±.006	.181+.019	1.243	.3536	6.30

NOTE: Dimensions are in English units. Tolerances shown are ASTM requirements. ViegaPEX Barrier is manufactured to within these specifications.

ViegaPEX Barrier tubing is available in both straight lengths and coils.

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Pextron Tubing Specifications

Tubing Dimensions and Tolerances:
I.D., O.D., and wall thickness according to ASTM Standard F876

Continuous Pipe Dimension Production Testing:
By laser sensors and ultra sound

Standard Thermoplastic Pipe Dimension Ratio:
ASTM F876 - SDR 9

Maximum Operating Temperature and Pressure for Tubing:
200°F at 80 psi
180°F at 100 psi
73.4°F at 160 psi

Base Material:
High density polyethylene

Cross-linking Method:
Electronically cross-linked by means of high energy electron beam

Molecular Leak Detection Test Procedure:
Computerized high vacuum-helium testing

Oxygen Diffusion Standard:
DIN 4726

Listing:
cNSF®us-rfh
ANSI/NSF 14

Chemical Tubing Resistance Chart:
DIN 8075 Standard

UV Resistance:
90 days maximum exposure

Limited Warranty:
25 years covering manufacturer related tubing defects

Technical Specifications:

Degree of Cross-linking	65-70%	ASTM F876 F877, DIN 16892
Long term internal pressure creep strength resistance safety factor after 50 years of service life, taking into account the temperature aging behavior of the piping material	At water temp. of 140°F At water temp. of 200°F	Safety factor: 7.50 Safety factor: 4.75 DIN 16892
Density	58.68 lbs/ft^3	DIN 53479
Tensile Strength	3338 psi	DIN 53455
Percentage of Elongation	400%	DIN 53455
Modulus of Elasticity	87082 psi	DIN 53457
Impact Strength at –40°F	no fracture	DIN 53453
Notch Sensitivity at –4°F	no fracture	DIN 53453
Environmental Stress Cracking Resistance	no cracking	ASTM D 1693
Thermal Conductivity	2.43 Btu*in/h/ft^2/°F	DIN 52612
Thermal Coefficient of Linear Expansion	0.000078 in/in/°F	DIN 52328
Oxygen Diffusion Rate with O_2 Barrier at 104°F	0.0036 mg/l/24h	DIN 4726
Oxygen Diffusion Rate with O_2 Barrier at 203°F	0.0757 mg/l/24h	DIN 4726

Pex Tubing Data Table

Nominal Size (in.)	Outside Diameter (in.)	Inside Diameter (in.)	Water Content (Gal/ft.)
5/16	0.430	0.292	0.004
3/8	0.500	0.350	0.005
1/2	0.625	0.475	0.009
5/8	0.750	0.574	0.014
3/4	0.875	0.671	0.018
1	1.125	0.862	0.030
1-1/4"	1.375	1.055	0.045
1-1/2"	1.625	1.245	0.063

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FostaPEX™ High Density Cross-linked Polyethylene (PEX)

Scope
This material specification designates the requirements for Viega FostaPEX multilayer pressure pipe for hot and cold water distribution tubing and hydronic radiant heating applications. All FostaPEX tubing has a fully dimensioned inner PEX core to the copper tube size dimension (CTS), SDR-9 wall thickness and meets the respective requirements of ASTM Standard F876 and F877.

Materials
The multi-layered construction of the FostaPEX tubing is made from one full dimensional inner PEX core with an aluminum and outer PE layer surrounding it. This construction allows the inner layer alone to meet all temperature and pressure requirements of the system. Using the prep tool to remove the outer layers allows the use of the standard PureFlow PEX Press fitting system.

Marking and Certification
All FostaPEX tubing is marked with the name Viega as the manufacturer, nominal size, plastic tubing material designation code, design pressure and temperature ratings, relevant ASTM standards, manufacturing date and production code, as well as the NSF-pw stamp, indicating third-party certification by NSF International for meeting and exceeding performance and toxicological standards. NSF conducts random on-site inspections of Viega manufacturing facilities and independently tests FostaPEX tubing for compliance with physical and toxicological standards. FostaPEX is also certified to meet the Uniform Plumbing Code, and the ICBO Evaluation Service.

Recommended Uses
FostaPEX tubing is intended and recommended for use in hot and cold potable water distribution systems and hydronic radiant heating and cooling systems. Like ViegaPEX Barrier, which has a barrier layer that resists the passage of oxygen through the wall of the tubing, the aluminum layer in FostaPEX offers even higher resistance to oxygen permeation in radiant heating applications. FostaPEX tubing can also be used in water service applications and is virtually impermeable to any soil contaminents. Design temperature and pressure ratings for FostaPEX are 160 psi @ 73°F, 100 psi @ 180°F, and 80 psi @ 200°F. For information on the suitability for other hot and cold water applications not listed here, consult with your Viega representative.

Handling and Installation
FostaPEX cross-linked polyethylene tubing is tough yet flexible. The aluminum layer allows tubing to be bent into position and remain in position when released. However, use of these materials in hot and cold water distribution systems must be in accordance with good plumbing practices, applicable code requirements, and current installation practices available from Viega. FostaPEX is manufactured to meet written national standards. Contact a Viega representative or the applicable code enforcement bureau for information about approvals for specific applications.

Property	ASTM Test Method	Typical Values	
		English Units	SI Units
Density	D 792	–	0.944 g/cc
Melt Index[1] (190° C/2.16 kg)	D 1238	–	8.5g/10 min
Coefficient of Linear Thermal Expansion @ 68° F	D 696	$1.3x10^{-5}$in/in/°F	$2.4x10^{-5}$mm/mm/°C
Hydrostatic Design Basis @ 73°F (23°C)	D 2837	400 psi	2.8 MPa
Hydrostatic Design Basis @ 180°F (82°C)	D 2837	250 psi	1.7 MPa

1. Before Cross-linking

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FostaPEX™

Quality Assurance

When the product is marked with the ASTM F876 designation, it affirms that the product was manufactured, inspected, sampled and tested in accordance with these specifications and has been found to meet the specified requirements.

Certifications

NSF-pw - Tested for health effects to ANSI/NSF standard 61 and performance to ANSI/NSF standard 14.

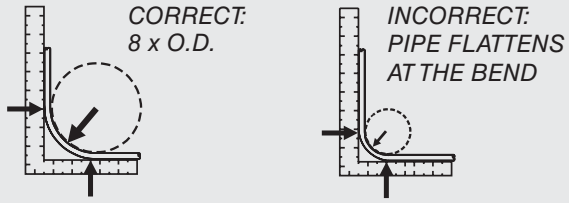
NSF tested according to ASTM Standard F2023, Evaluating the Oxidative Resistance of Cross-linked Polyethylene (PEX) Tubing and Systems to Hot Chlorinated Water.

- **IAPMO Certified**

- **ESR #1837** - listed for plumbing applications.

ICBO ER #5944 - listed for hydronic heating applications.

Minimum Bend Radius



Note: FostaPEX tubing may be bent to a minimum of 3.5 x O.D. with use of a Viega pipe bender.

Minimum Burst Pressure (PSI) Per ASTM F876/F877

SIZE	73°F (23°C)	180°F (82°C)
1/2"	480	215
5/8"	475	200
3/4"	475	210
1"	475	210

Thermal Conductivity

SIZE	BTU/h/ft/°F	W(m.°C)
1/2"	.484	.838
3/4"	.547	.946
1"	.711	1.230

SDR-9 PEX TUBING

ASTM F876/F877/CTS-OD SDR-9

STOCK CODE	TUBING SIZE	O.D.	WALL THICKNESS	NOM. I.D.	WEIGHT PER FT	VOLUME (Gal.) PER 100 FT
35 020	1/2"	0.625±.004	0.070+.010	0.475	.0600	0.92
35 030	5/8"	0.750±.004	0.083+.010	0.574	.0900	1.34
35 040	3/4"	0.875±.004	0.097+.010	0.671	.1200	1.82
35 060	1"	1.125±.005	0.125+.013	0.863	.2000	3.04

NOTE: Dimensions are in English units. Tolerances shown are ASTM requirements. Viega FostaPEX is manufactured within these specifications. (These dimensions do not reflect the outer aluminum and PE layers.)

PRESSURE DROP TABLE

Expressed as PSI/ft. Pressure Drop

GPM	SIZE 1/2"	5/8"	3/4"	1"
1	.016	.007	.003	.001
1.5	.034	.014	.006	.002
2.2	.069	.034	.013	.004
2.5	.087	.043	.016	.005
3	.122	.050	.023	.007
3.5	.162	.080	.030	.009
4	.208*	.100	.039	.011
5	.314	.154	.059	.017
6	.440	.181	.082	.024
7	.586	.287	.109	.032
8		.368	.140	.041
9		.457	.174*	.051
10		.556	.211	.062
11			.252	.074
12			.296	.087
13			.343	.101
14				.116
15				.132*
16				.148
17				.166
18				.184
19				.204
20				.224
21				.245
22				.267

EXAMPLE: To calculate the pressure drop of a 1/2" line, 40 ft. long, with a 3 gpm flow rate, calculate .122 psi x 40 ft. = 4.9 psi pressure drop. Most plumbing codes require 8 psi residual pressure at the fixture. Refer to your local code requirments.

*Indicates 8 fps maximum velocity required by some plumbing codes.

NOTE: Maximum flow for each size based on 12 FPS velocity.

PSI x 2.307 = head loss.

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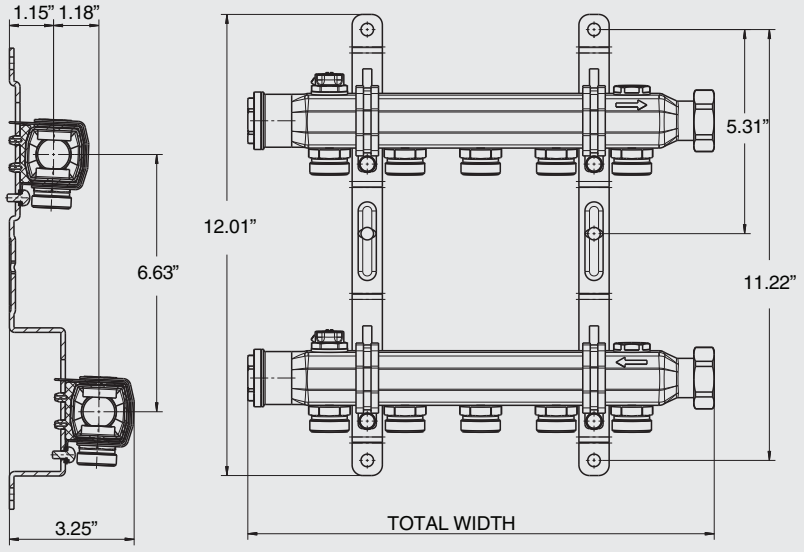
Stainless Manifold Valveless

Product Description

Stainless manifold is to be used in closed loop hydronic heating, cooling and snow melting systems. These preassembled 1-1/4" diameter stainless supply and return manifolds come attached to (2) 6-5/8" spacing brackets for compact remote mounting used with flow rates up to 2 gpm per circuit, maximum 18 gpm per manifold. The air bleeder is connected and factory tested. 1-1/4" Union connection, 1" NPT removable end caps. SVC Circuit connection fittings are sold separately.

Dimensions	
Height*	12"
Depth	3.3"
Manifold	**Total Width**
2 outlets	6.2"
3 outlets	8.2"
4 outlets	10.2"
5 outlets	12.2"
6 outlets	14.1"
7 outlets	16.1
8 outlets	18.1"
9 outlets	20.0"
10 outlets	22.0"
11 outlets	24.0"
12 outlets	26.0"

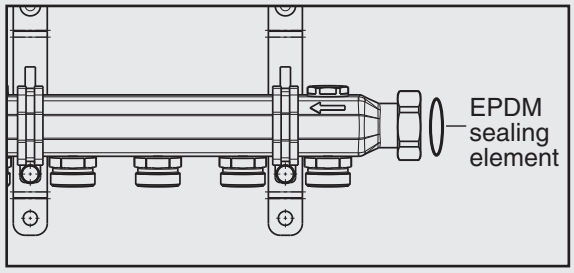


*** When extending the manifold, Viega requires using thread sealant paste on the 1" NPT manifold end connection.**

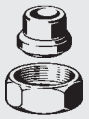
Technical Data

1. 1-1/4" 304 Stainless Header Stock
2. Factory installed air bleeder
3. Mounting Brackets
4. Max. operating temperature: 180°F
   Short periods of 200°F
5. Max. operating pressure: 100 psi

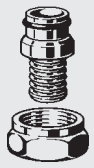
Circuit connection configuration



SVC Compression Pex Adapters attach PEX tubing to manifolds.



SVC Compression Copper Adapters connect 1/2" and 3/4" copper tubing to SVC seat without soldering.



SVC Press Adapters allow the Viega press connection system to be used on manifolds.

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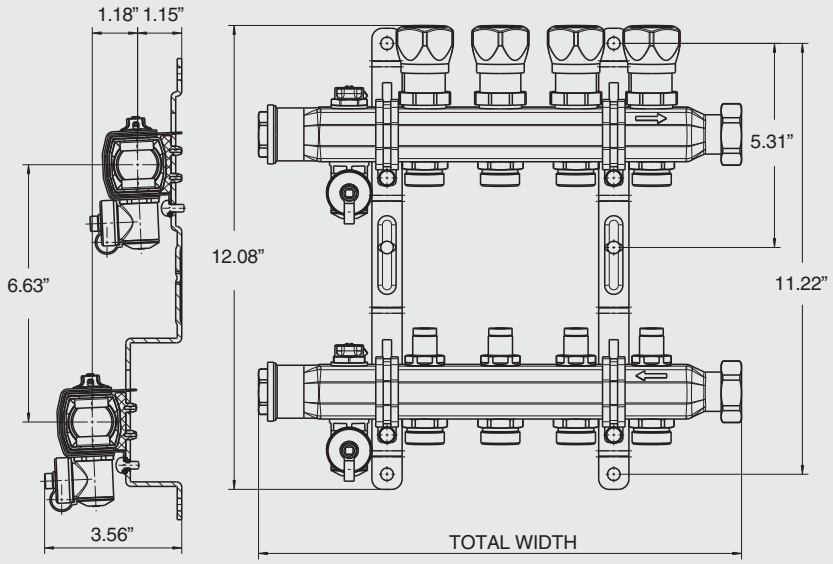
Stainless Manifold Shut Off/Balancing

Product Description

Stainless manifold is to be used in closed loop hydronic heating, cooling and snow melting systems.These preassembled 1-1/4" diameter stainless supply and return manifolds come attached to two 6-5/8" spacing brackets for compact remote mounting. This stainless manifold provides shut off and balancing valves for each circuit. Manifolds used with flow rates up to 2 gpm per circuit, maximum of 18 gpm per manifold. The air bleeder and purge valve are connected and factory tested. 1-1/4" Union connection, 1" NPT removable end caps. SVC Circuit connection fittings are sold separately.

Dimensions	
Height	12.1"
Depth	3.6"
Manifold	**Total Width**
2 outlets	8.21"
3 outlets	10.2"
4 outlets	12.2"
5 outlets	14.1"
6 outlets	16.1"
7 outlets	18.1"
8 outlets	20.0"
9 outlets	22.0"
10 outlets	24.0"
11 outlets	25.9"
12 outlets	27.9"



*** When extending the manifold, Viega requires using thread sealant paste on the 1" NPT manifold end connection.**

Technical Data

1. 1-1/4" 304 Stainless Header Stock
2. Factory installed air bleeder
3. Mounting Brackets
4. Max. operating temperature: 180°F
   Short periods of 200°F
5. Max. operating pressure: 100 psi
6. Return Valve C_V = 2.98
   Supply Valve C_V = 3.35

The return header is fitted with shut off valves which are suitable to receive optional 24V powerheads for control over each circuit via thermostat.

Note: Use new style white cap powerheads with this mainfold (stock code 15 061).

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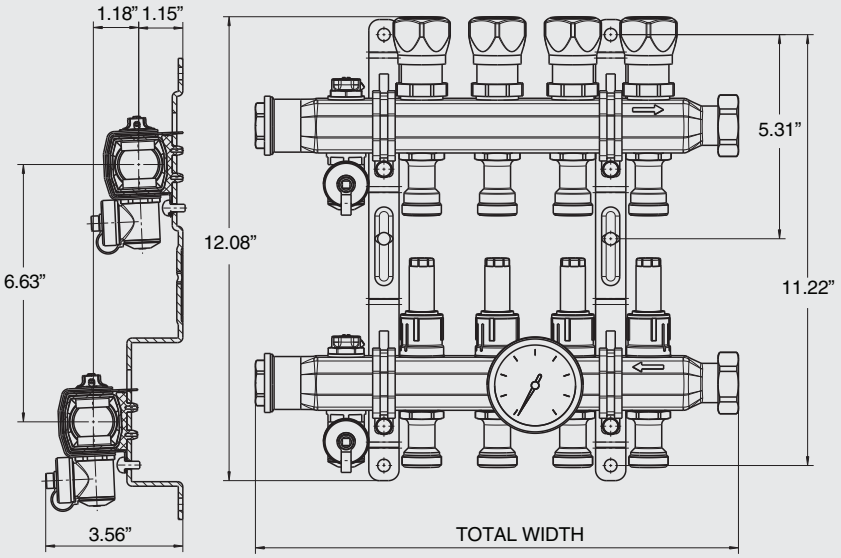
Submittal Package

Stainless Manifold Shut Off/Balancing/Flow Meters

Product Description

Stainless manifold is to be used in closed loop hydronic heating, cooling and snow melting systems. These preassembled 1-1/4" diameter stainless supply and return manifolds come attached to two 6-5/8" spacing brackets for compact remote mounting. This stainless manifold provides shut off and balancing valves with flow meters for each circuit. Each flow meter/balancing valve allows graduated flow setting up to 2 gpm, maximum 18 gpm per manifold. The air bleeder and purge valves are connected and factory tested. 1-1/4" Union connections, 1" NPT removable end caps. SVC Circuit connection fittings are sold separately.

Dimensions	
Height	12.1"
Depth	3.6"
Manifold	**Total Width**
2 outlets	10.2"
3 outlets	10.2"
4 outlets	12.2"
5 outlets	14.1"
6 outlets	16.1"
7 outlets	18.1"
8 outlets	20.0"
9 outlets	22.0"
10 outlets	24.0"
11 outlets	25.9"
12 outlets	27.9"



*** When extending the manifold, Viega requires using thread sealant paste on the 1" NPT manifold end connection.**

Technical Data

1. 1-1/4" 304 Stainless Header Stock
2. Factory installed air bleeder
3. Mounting Brackets
4. Max. operating temperature: 180°F
   Short periods of 200°F
5. Max. operating pressure: 100 psi
6. Return Valve C_V = 2.98
   Supply Valve C_V = 1.30

The return header is fitted with shut off valves which are suitable to receive optional 24V powerheads for control over each circuit via thermostat.

Note: Use new style white cap powerheads with this mainfold (stock code 15 061).

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Submittal Package

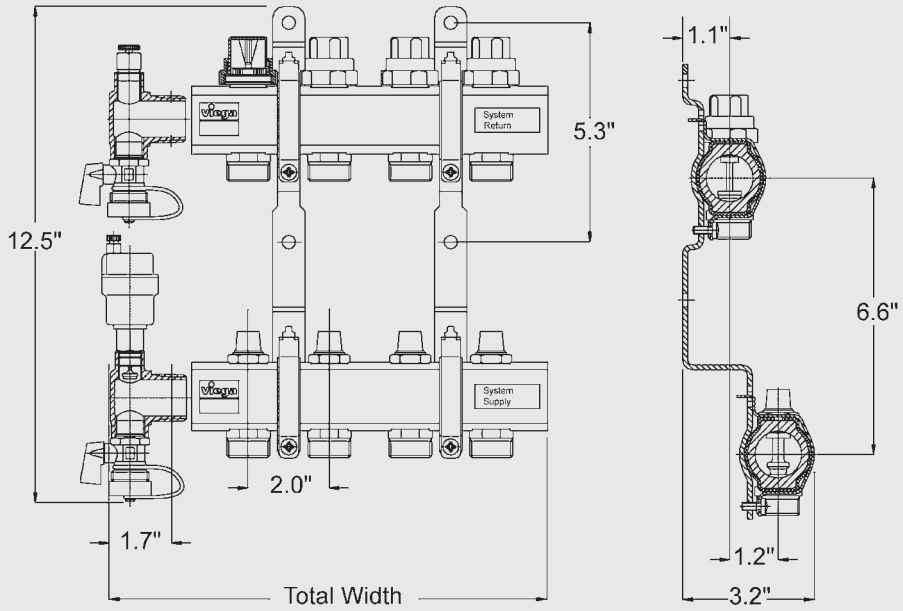
Brass 1 Inch Manifold

Application

The 1 inch brass diameter heating supply and return manifolds come with 6-5/8" spacing brackets for compact remote mounting. The manifold can also be attached easily to the Mixing Station with provided brackets and also an Injection Station (using the 11" spacing bracket included with the Injection Station). Manifold can be used with a 13 GPM max.

Dimensions	
Height*	12.5"
Depth	3.2"
Manifold	**Total Width**
2 outlets	6.5"
3 outlets	8.5"
4 outlets	10.5"
5 outlets	12.5"
6 outlets	14.5"
7 outlets	16.5"
8 outlets	18.5"
9 outlets	20.5"
10 outlets	22.5"
11 outlets	24.5"
12 outlets	26.5"

*Includes height of Accessory Set



Technical Data

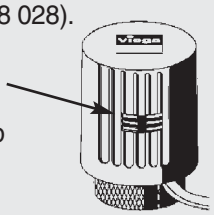
1. 1" Brass header stock
2. Supply Manifold with balancing valves (red caps)
3. Return Manifold with shut off valves (blue caps)
4. Mounting brackets Installation

The supply header is fitted with balancing valves. The return header is fitted with shut off valves which are suitable to receive optional 24V powerheads for thermostatic control (stock code 18 028). The supply and return headers both have outlets which are suitable for all SVC connections. End connections are 1" NPT.

Note: Use grey cap Powerheads with this manifold. (stock code 18 028).

Note indicator window.

*Do NOT use white cap Powerheads with the Brass manifold



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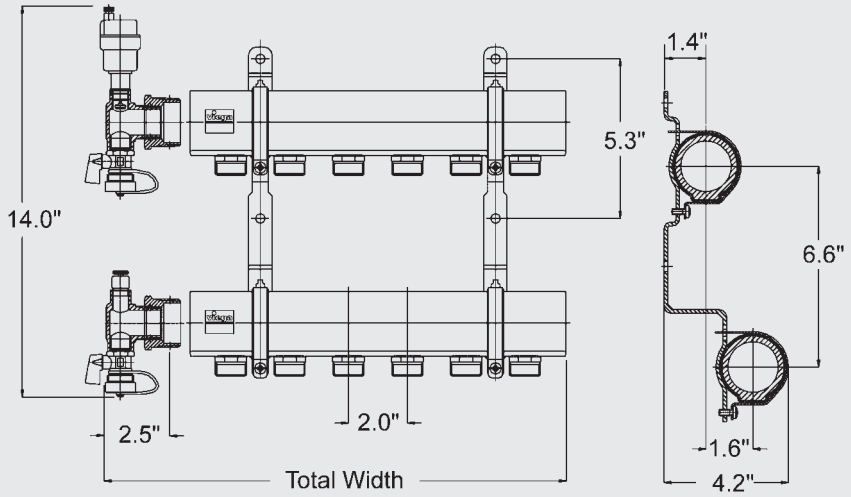
Submittal Package

Brass 1-1/2 Inch Manifold

Applications

The Brass 1-1/2" supply and return manifold is used for high flow rate commercial projects and snow melting applications (up to 35 gpm). Includes two 6-5/8" mounting brackets. When using an odd number of circuits, order a pair of outlet caps (stock code 15 050). In applications where balancing and/or isolation are needed between circuits, SVC Circuit Flow Meters (stock code 15 036) and SVC Circuit Ball Valves (stock code 15 031) are available.



DIMENSIONS	
Height*	14.0"
Depth	4.2"
Manifold	Total Width
4 outlets	11.0"
6 outlets	15.0"
8 outlets	19.0"
10 outlets	23.0"
12 outlets	27.0"

*Includes height of Accessory Set

Installation

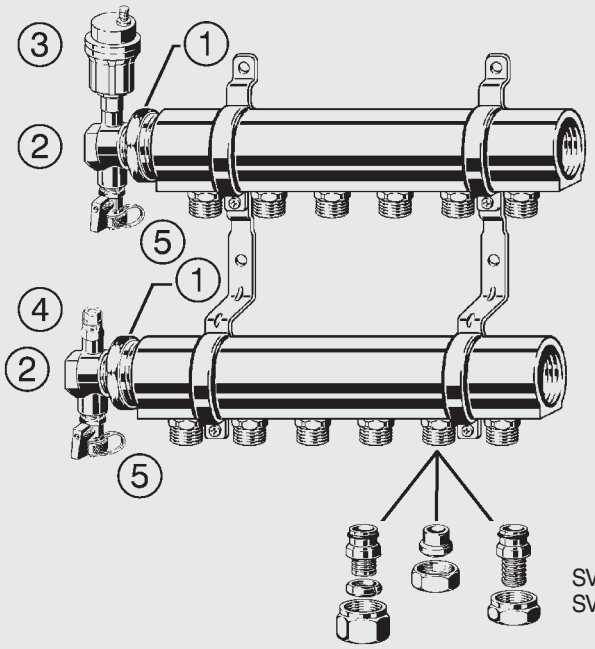
Connect the Manifold Accessory Set (15 023, sold separately) to the manifold using 1-1/2" M NPT x 1" F NPT Reducers (15 043, sold separately) as follows:

1. Connect the 1-1/2" x 1" NPT reducer to the end of the 1-1/2" NPT manifold.
2. Connect the end-piece to the reducer (Note large thread should face bottom).
3. Assemble air vent to supply end-piece.
4. Assemble bleeder to return end-piece.
5. Assemble purge valves to both end-pieces.

Technical Data

- 1-1/2" Brass header stock
- 1-1/2" F NPT thread ends
- Supply Manifold
- Return Manifold
- 6-5/8" Mounting brackets

Note: It is important to use Teflon tape and thread sealant paste on all connections without gaskets.



SVC connections accept all SVC adapters.

ProRadiant SYSTEMS

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Submittal Package

Mixing Station

Applications
The Viega Mixing Station provides temperature control to manifolds in a ready to hang package. Stations can be ordered preassembled with either Brass or Stainless Manifolds.

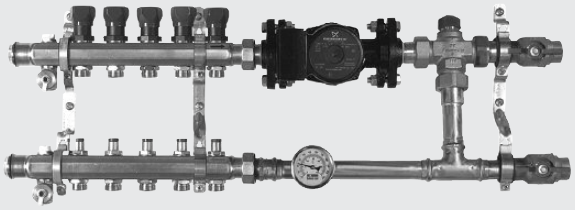
Features
- Low, medium, or high head pump (see page 3 for pump data)
- Diverting valve (see page 5 for setting system high limit)
- Supply temperature gauge
- 1" full port ball valves
- Two 6-5/8" mounting brackets
- 1" M NPT ends for direct connection to 1" Brass Manifolds. Reducer needed for connection to 1-1/4" Stainless Manifolds.

3-way diverting valve accepts the Two or Three Position Actuators (24 V) or the new Proportional Actuator (0-10 V) (stock code 18005, 18003, 18025 respectively) for modulating supply temperature control. To install, remove grey cap from the Mixing Station's valve and screw on Actuator hand tight. Do not use wrench or pliers.

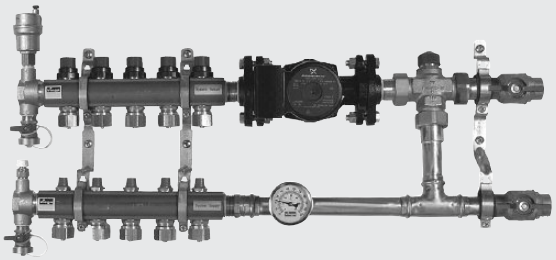
Three Position Actuator

Two Position Actuator

Proportional Actuator (0-10 V)



Assembled Mixing Station with Stainless Steel Manifold



Assembled Mixing Station with Brass Manifold

Assembled Mixing Station With Stainless Manifold Or Brass Manifold

- Stations with Stainless Manifolds include Reducers for direct connection between manifold and station. Station comes preassembled and factory tested. PEX or copper adapters are included (type and size must be specified). Use Powerhead for Stainless Manifold (stock code 15061) when using this manifold.
- Stations with Brass Manifolds include an Accessory Set attached which includes two purge valves, air bleeder, air vent, end caps, and a strap-on temperature gauge. PEX or copper adapters are included (type and size must be specified). Use Powerhead for Brass Manifold (stock code 18028) when using this manifold.

Powerhead for Stainless Manifold (stock code 15061)

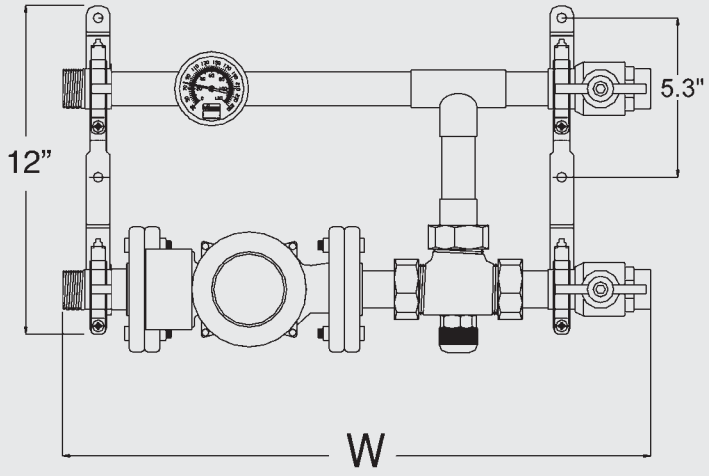
Powerhead for Brass Manifold (stock code 18028)

Consult the ProRadiant Price List/Product Catalog for configurations and ordering details.

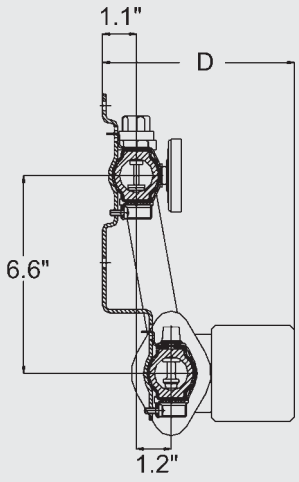
Submittal Package

Mixing Station

Dimensions (W in inches)		
# Outlets	Mixing Station with Brass Manifold Width	Mixing Station with Stainless Manifold Width
0 outlets	18.0"	18.0"
1 outlets	22.5"	N/A
2 outlets	24.5"	26.2"
3 outlets	26.5"	28.2"
4 outlets	28.5"	30.2"
5 outlets	30.5"	32.1"
6 outlets	32.5"	34.1"
7 outlets	34.5"	36.1"
8 outlets	36.5"	38.0"
9 outlets	38.5"	40.0"
10 outlets	40.5"	42.0"
11 outlets	42.5"	43.9"
12 outlets	44.5"	45.9"



Side View Depth (D in inches)	
Low Head Pump	6.13"
Medium Head Pump	7.13"
High Head Pump	7.13"



ProRadiant SYSTEMS

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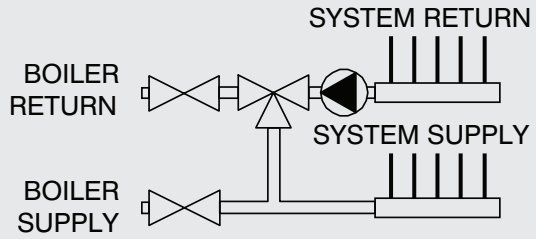
Submittal Package

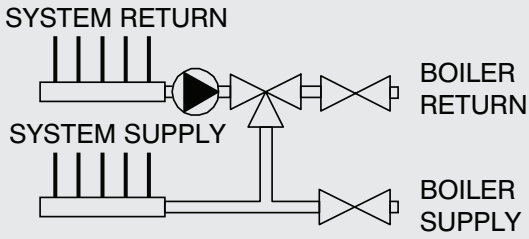
Mixing Station Configurations

Use these diagrams as a guide to determine the proper configuration of your station for ordering.

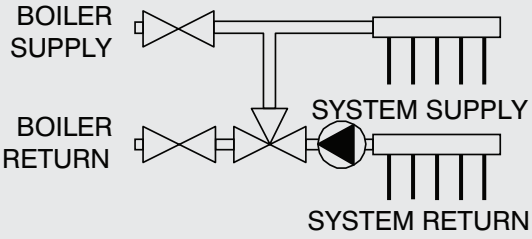
Configuration Top Left



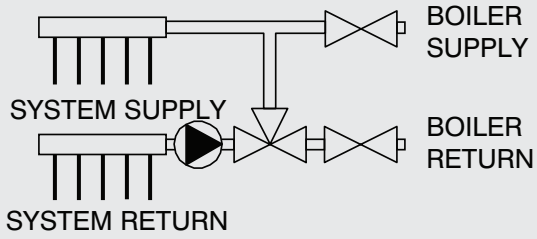
Configuration Top Right



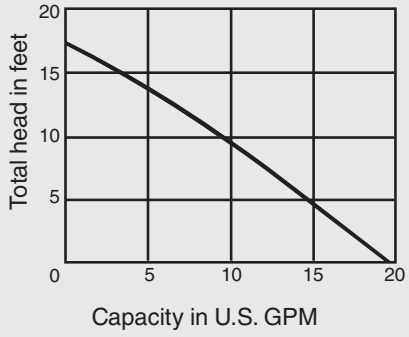
Configuration Bottom Left



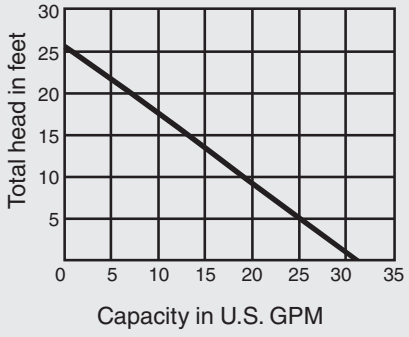
Configuration Bottom Right



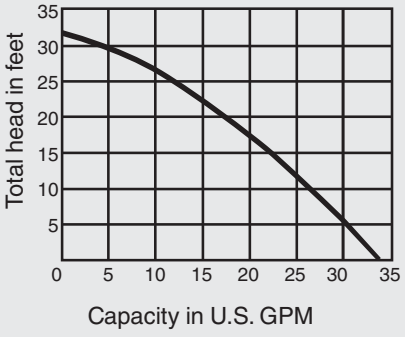
Low head pump curve (UP 15-42)



Medium head pump curve (UP 26-64)



High head pump curve (UP 26-99)



Electrical Data				
Volts	Amp	Watts	HP	Capacitor
115	.74	85	1/25	10μF/180V

Electrical Data				
Volts	Amp	Watts	HP	Capacitor
115	.1.7	185	1/12	8μF/180V

Electrical Data				
Volts	Amp	Watts	HP	Capacitor
115	2.15	245	1/6	10μF/180V

ProRadiant SYSTEMS

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Submittal Package

Injection Station

Applications

The Viega Injection Station provides temperature control to manifolds in a ready to hang package. Stations can be ordered preassembled with either Brass or Stainless Manifolds.

Features:
1. Connection Nipple 1"NPT x 1"G
2. Ball Valve 1"G x 1-1/4"G
3. Outlet Valve
4. Supply Sensor Well
5. Plug
6. Purge Valve
7. Inlet Valve
8. Pump
9. Temperature Gauge
10. 11" Spacing Mounting Brackets (Additional brackets are included for when the manifold is attached directly to the station)

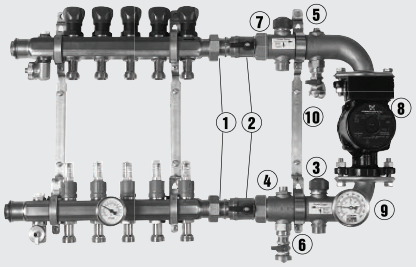
- Available with low, medium and high head pump (see page 3 for pump data)
- Manifold supply is connected to the top end of the Injection station
- Manifold return is connected to the bottom end of the Injection Station

Injection valve accepts the Two or Three Position Actuator (24 V) (stock code 18005, 18003, respectively) for modulating supply temperature control. To install, remove grey cap from the Injection Station's valve and screw on Actuator hand tight. Do not use wrench or pliers.

Two Position Actuator

Three Position Actuator

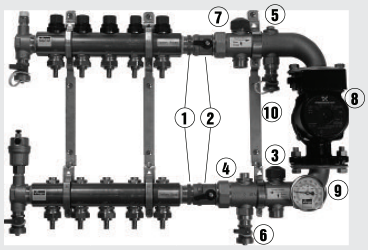
Assembled Injection Station With Stainless Manifold



Powerhead for Stainless Manifold (stock code 15061)

- Stations with Stainless Manifolds include Reducers for direct connection between manifold and station. Station comes preassembled and factory tested. PEX or copper adapters are included (type and size must be specified). Use Powerhead for Stainless Manifold (stock code 15061) when using this manifold.

Assembled Injection Station With Brass Manifold



Powerhead for Brass Manifold (stock code 18028)

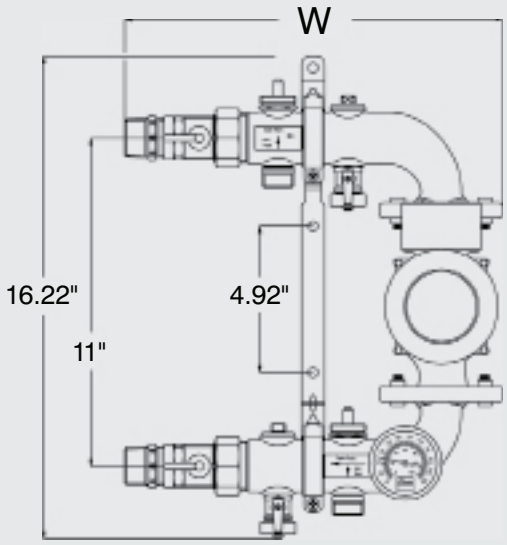
- Stations with Brass Manifold include an Accessory Set attached which includes two purge valves, air bleeder, air vent, end caps, and a strap-on temperature gauge. PEX or copper adapters are included (type and size must be specified). Use Powerhead for Brass Manifold (Stock code 18028) when using this manifold.

Consult the ProRadiant Price List/Product Catalog for configurations and ordering details.

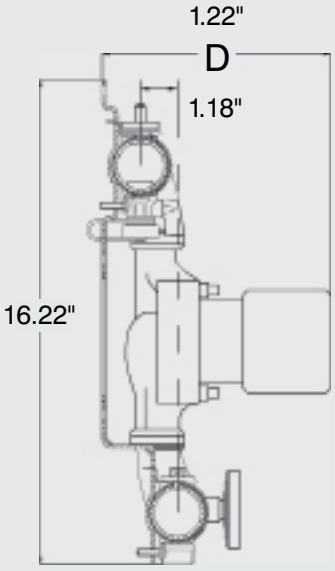
Submittal Package

Injection Station

Dimensions (W in inches)		
#Outlets	Injection Station without Brass Manifold Width	Injection Station without Stainless Manifold Width
0 Outlets	12.8"	12.8"
1 Outlets	17.3"	N/A
2 Outlets	19.3"	21.0"
3 Outlets	21.3"	23.0"
4 Outlets	23.3"	25.0"
5 Outlets	25.3"	26.9"
6 Outlets	27.3"	28.9"
7 Outlets	29.3"	30.9"
8 Outlets	31.3"	32.8"
9 Outlets	33.3"	34.8"
10 Outlets	35.3"	36.8"
11 Outlets	37.3"	38.7"
12 Outlets	39.3"	40.7"



Side View Depth (D in inches)	
Low Head Pump	6.13
Medium Head Pump	7.13
High Head Pump	7.13



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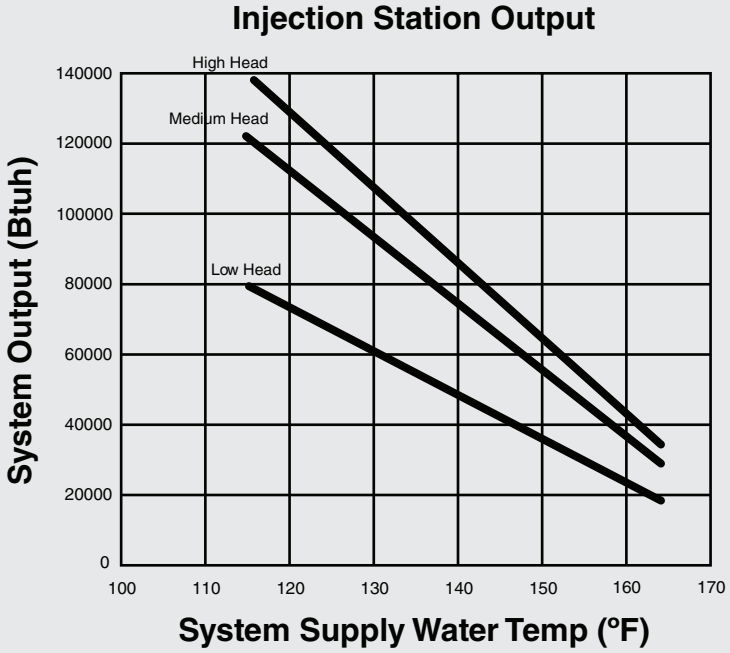
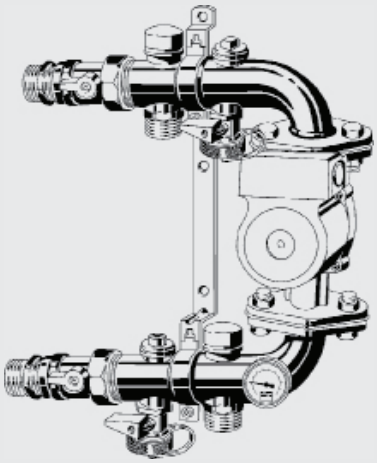
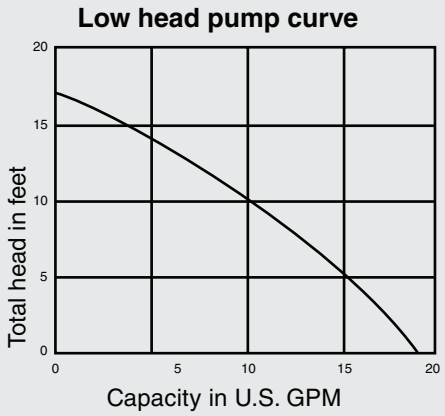
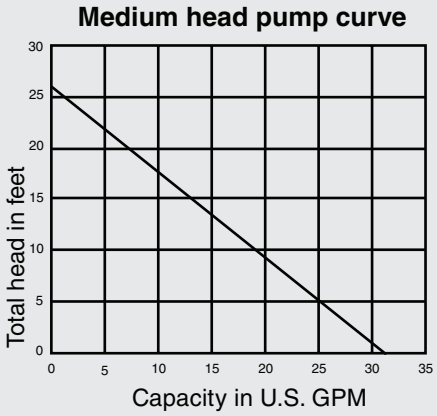
Submittal Package

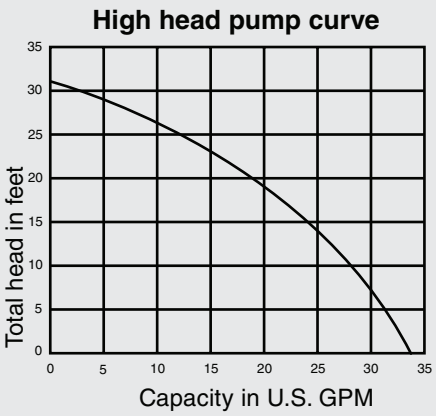




Outputs based upon 180˚F primary loop water temperature.







Electrical Data				
Volts	Amps	Watts	HP	Capacitor
115	.74	85	1/25	10µF/180V

Electrical Data				
Volts	Amps	Watts	HP	Capacitor
115	1.7	185	1/12	8µF/180V

Electrical Data				
Volts	Amps	Watts	HP	Capacitor
115	2.15	245	1/6	10µF/180V

ProRadiant SYSTEMS

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Submittal Package

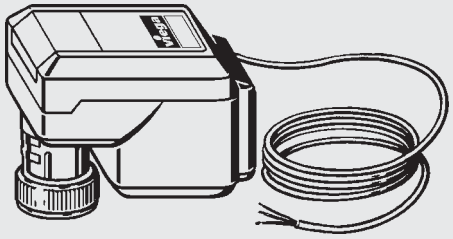
Three Position Actuator for Stations

Applications

The Three Position Actuator for Stations is designed to provide floating action control of Viega Mixing or Injection Stations and diverting valves. The actuator is used in electronic temperature control systems which use hot and/or cold water as the controlled medium in radiant heating systems, snowmelting, or other temperature mixing applications. The actuator is designed for operation by any 24Vfloating signal controller such as theViega Basic Heating (stock code 16015) or Advanced Heating (stock code 16014).

Features

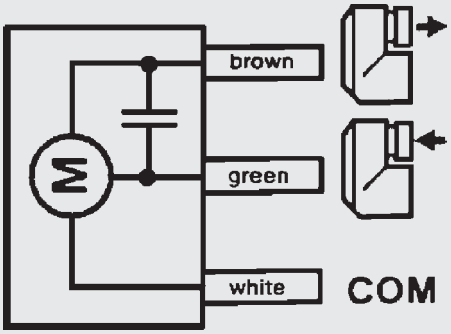
- Small size allows installation where space is limited
- Maintenance free actuator in plastic housing
- Synchronous motor
- Magnetic coupling for torque limitation independent of voltage
- Suitable for 3-position modulating control (floating) without proportional feedback
- No tools required for mounting



Specifications

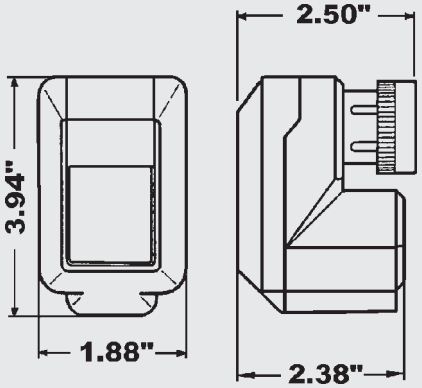
Power supply: 24 VAC, 50/60 Hz
Power consumption: 0.7 VA
Control mode: 3-position (floating)
Stroke: 0.25 inches
Running time: 150 sec at 50 Hz
120 sec at 60 Hz
(70 sec for full valve travel)
Stem force: 40 lbs
Connecting cable: 5 ft
Ambient Temp. Limits: 32 - 140°F
Weight: 0.33 lbs
Mounting thread: M30 x 1.0

Wiring Diagram



Green wire: open valve (warmer water)
Brown wire: close valve (cooler water)
White wire: ground

Dimensions



ProRadiant SYSTEMS

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Submittal Package

Two Position Actuator for Stations

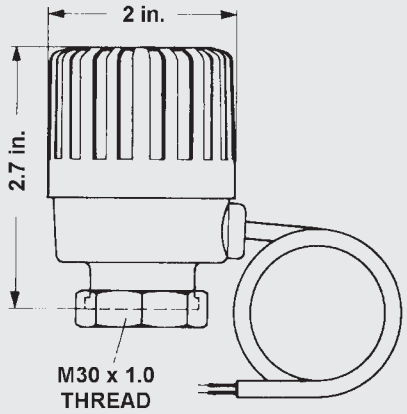
Applications

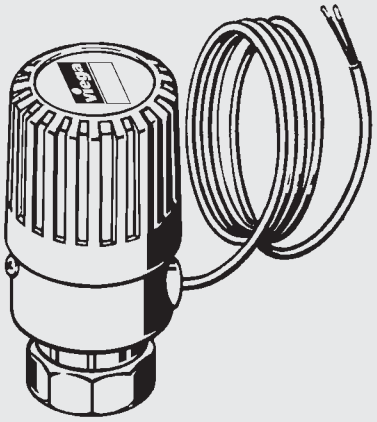
This Two Position Actuator can be mounted on a temperature modulation valve for heating system temperature control. It is suitable for use on Injection Stations and Mixing Stations as well as Viega NA three-way diverting valves.

Features

This Viega NA two-position electrothermal mixing and injection valve actuator is normally closed with current off. The actuator opens when receiving any 24 volt signal (for example, from a Viega NA Thermostat).

Dimensions





Specifications

Working Voltage:	24 V
Starting Current:	0.7 A
Constant Current:	0.125 A
Travel Time:	5 min. max.
Ambient Temp.:	122°F max.
Cable Length:	39 inches

ProRadiant SYSTEMS

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Submittal Package

Proportional Actuator For Mixing Station

Application

The actuator is used in electronic temperature control systems which use hot and/or cold water as the controlled medium in radiant heating systems, snow melting, or other temperature mixing applications.

The actuator is designed for operation by a 0-10 V DC controller such as a DDC system. This actuator will not work with Viega controls such as the Basic or Advanced Heating Control.

Features

- Small size allows installation where space is limited
- Maintenance free actuator in plastic housing
- Suitable for 0-10 V DC control (i.e. DDC systems)
- No tools required for mounting
- Threaded adapter included for attachment to Viega Mixing Station or diverting valves
- Exercising function

Specifications

Power supply:

24 V AC

Power consumption:

2.5 W operating consumption

Control signal:

Proportional 0-10 V DC

Stroke:

0.2 inch

Running time:

75 seconds
(45 seconds for full valve travel)

Stem force:

20 lbs.

Connecting cable:

5 ft.

Weight:

0.5 lbs.

Mounting thread (actuator):

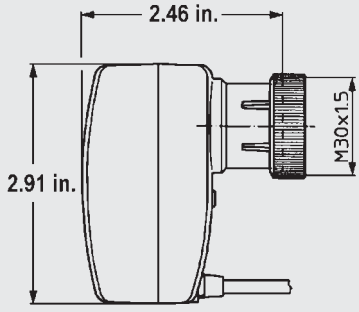
M30 x 1.5

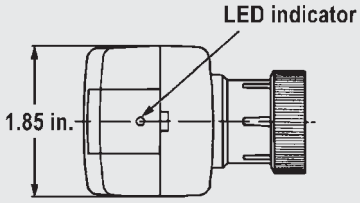
Mounting thread (adapter):

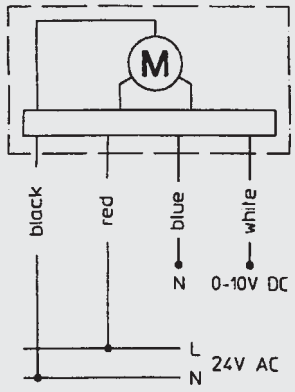
M30 x 1.0

Ambient Temperature Limits:

32°F - 122°F







ProRadiant SYSTEMS

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Submittal Package

PureFlow® Bronze PEX Press Fittings and Stainless Steel Press Sleeves for ViegaPEX™, ViegaPEX™ Ultra, ViegaPEX™ Barrier and FostaPEX™ SDR-9 Cross-linked Polyethylene (PEX)

Scope
This product specification designates the requirements for PureFlow Bronze PEX Press fittings and stainless steel press sleeves to be used as connections for ViegaPEX, ViegaPEX Ultra, ViegaPEX Barrier, and FostaPEX tubing in 3/8", 1/2", 5/8", 3/4", 1", 1-1/4", and 1-1/2" sizes as available. The connections are to be completed with the aid of a PureFlow PEX Press Hand Tool or PureFlow PEX Press Power Tool.

Materials
PureFlow Bronze PEX Press fittings are cast and machined from a solid Bronze alloy. This gives the fitting high corrosion and stress crack resistance. All PureFlow PEX Press fittings are precision made to tight tolerances for a consistent fit with ViegaPEX tubing. All PureFlow PEX Press fittings meet the rigorous requirements of ANSI/NSF-61 for lead extraction.

The stainless steel press sleeves are manufactured from 304 stainless steel that will not corrode, maintaining a clean appearance for the lifetime of the system.

Marking and Certification
PureFlow Bronze PEX Press fittings and stainless steel sleeves are manufactured and certified to the requirements of ASTM F877. PureFlow PEX Press fittings and sleeves are marked with the size, manufacturers mark, and required marking(s) of third party certification organizations. Fittings also meet the requirements of ANSI/NSF-61 for health effects and are suitable for contact with potable water. NSF International and other certification organizations conduct random on-site inspections of manufacturing facilities and independently test PureFlow Bronze PEX Press fittings for compliance with physical, performance, and toxicological standards.

Recommended Uses
PureFlow Bronze PEX Press fittings and stainless steel press sleeves are intended and recommended for use in potable water distribution systems with ViegaPEX, ViegaPEX Ultra, and FostaPEX tubing, and for hydronic heating, snow melt, and cooling systems with ViegaPEX Barrier and FostaPEX tubing meeting the requirements of ASTM F876. Maximum design temperature and pressure ratings are 160 psi @ 73°F, 100 psi @ 180°F and 80 psi @ 200°F. PureFlow Bronze PEX Press fitting system components are only available from Viega and are not interchangeable with components and tubing from other suppliers. For information on other hot and cold applications not listed here, consult with your Viega representative.

Handling and Installation
PureFlow Bronze PEX Press fittings are cast and machined from a solid bronze alloy and precision made to tight tolerances. Use of these materials in hot and cold water distribution systems must be in accordance with good plumbing practices, applicable code requirements, and current installation practices available from Viega. Contact a Viega representative or the applicable code enforcement bureau for information about approvals for specific applications.

ProRadiant SYSTEMS

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Submittal Package

PureFlow® Bronze PEX Press Fittings and Stainless Steel Press Sleeves for ViegaPEX™, ViegaPEX™ Ultra, ViegaPEX™ Barrier and FostaPEX™

Quality Assurance

When the product is marked with the ASTM F877 designation, it affirms that the product was manufactured, inspected, sampled and tested in accordance with these specifications and has been found to meet the specified requirements.

Certifications

NSF-pw - NSF International Performance and Health Effects (Standards 14 & 61)

- **IAPMO Certified**

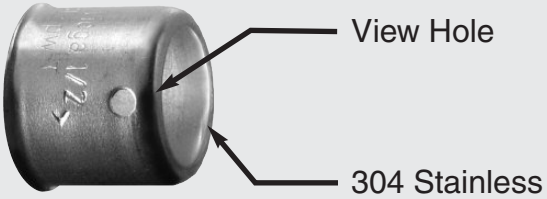
- **NSF certified to CSA B137.5** (Canadian Standards Association)

Friction Loss Table For PureFlow Bronze PEX Press Fittings Expressed in Equivalent Length of Tubing in Feet

SIZE	COUPLING	90° ELBOW	TEE RUN	TEE BRANCH
3/8"	2.9	9.2	2.9	9.4
1/2"	2.0	9.4	2.2	10.4
3/4"	0.6	9.4	1.9	8.9
1"	1.3	10.0	2.3	11.0
1-1/4"	5.5	11.0	4.8	13.0
1-1/2"	6.1	13.0	5.0	16.0

This information is based on tubing nominal flow rate. (@ 8 fps flow velocity)

Stainless Press Sleeve

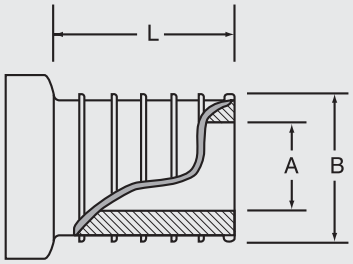


PureFlow Bronze PEX Press Fittings

Typical Fitting Insert Dimensions

SIZE	A	B	L
3/8"	.232	0.355±.003	0.583
1/2"	.354	0.475±.003	0.583
5/8"	.449	0.573±.003	0.583
3/4"	.543	0.668±.003	0.583
1"	.724	0.862±.004	0.740
1-1/4"	.862	1.049±.004	0.933
1-1/2"	1.059	1.238±.004	0.933

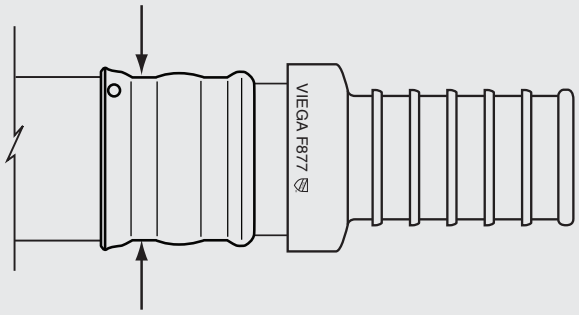
NOTE: Dimensions are in English units. Tolerances shown are Viega requirements. Viega Bronze PEX Press fittings are manufactured within these specifications.



(number of ribs may vary per fitting size)

Pressed Sleeve

A pressed fitting has jaw witness marks indicating the connection has been properly made.



ProRadiant SYSTEMS

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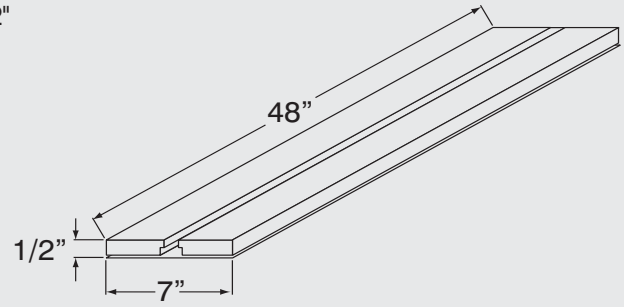
Submittal Package

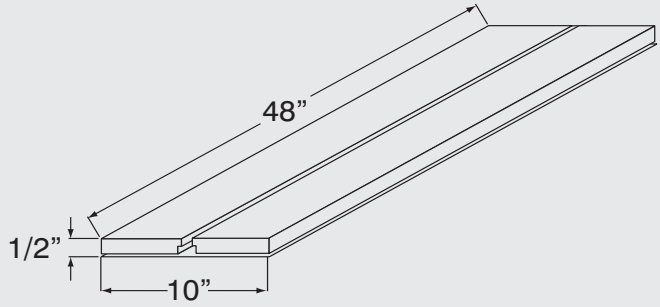
Climate Panel

Application
Climate Panels are used as a fastening system to integrate 5/16" ViegaPEX Barrier tubing into the floor construction.

They are constructed of CCX fir plywood with an aluminum heat transfer sheet underneath for even heat distribution and high performance output. U-Turn strips allow tubing to be turned around at each end of the room to connect with the next row of panels.

Dimensions
Climate Panel Nominal
7"x 48" x1/2"
10"x 48" x1/2"





Specifications

Plywood

Product Designation:
CANPly Exterior/Interior Plywood

Nominal Thickness: 1/2 inch

Manufacturing Standard:
PS1-95 US
CSA 0121-M1978 Canada
CANPly standards and policy

Grade: Sheathing (CCX by PS1-95)

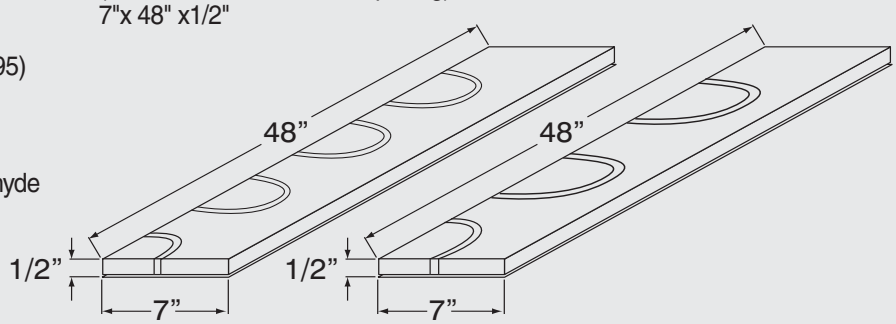
Glue

Bordens 2022 Phenol Formaldehyde Resin
Exterior Bond Type

Aluminum

0.012 inch thick
Dimensions

Dimensions
U-Turn Nominal
(same for both 7" and 10" spacing)
7"x 48" x1/2"



ProRadiant SYSTEMS

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Submittal Package

Groove Tube Silicone

Description
Viega Groove Tube silicone is a single-component, moisture-cured silicone rubber. An acetoxysilicone that reacts with atmospheric moisture to form a strong, durable sealant, Groove Tube silicone is easy to use, solvent-free and remains flexible over a wide temperature range.

Applications
When fully cured, Groove Tube silicone develops excellent adhesion onto most nonporous substrates such as glass, aluminum, ceramic tile, fiberglass and glazed brick.

Standards
Federal Specifications: TT-S-001543A - Non-sag, Class ATT-S-00230C - Type II, Class AUSDA Status. Groove Tube silicone may be used in federally inspected meat and poultry plants provided they are installed in a sanitary manner and the FSIS inspector is notified. FDA Status: When fully cured and washed, Groove Tube silicone contains those ingredients which conform to the FDA requirements as published in the Code of Federal Regulations.

Availability
Groove Tube silicone is available in 10.3 ounce cartridges that fit any standard caulking gun. These cartiridges are available in packages of 24.

Storage and Precautions
Groove Tube silicone has a shelf-life of twelve (12) months from date of manufacture, as indicated by the lot number, when stored in the original, unopened container at or below 75°F. Consult and obey all applicable local, state, and federal regulations for disposal of solvent and silicone waste. For additional information consult product M.S.D.S. Not recommended for surfaces that are to be painted. The acetic acid liberated during cure may react unfavorably with concrete and other masonry materials. Viega believes that the information provided is a true and accurate description of the typical characteristics of the aforementioned product; however, it is the responsibility of the individual user to thoroughly test the product in their specific application to determine performance, efficacy, and safety.

Product Specifications and Properties
The values outlined reflect testing that was conducted on laboratory prepared specimens; actual results may vary. The information provided in the tables below is not intended for use in preparing specifications. Please consult manufacturer for additional information.

Physical Property	Test Method	Performance Range
Appearance		Aluminum, paste
Skin Over Time	3/8" @ 50% RH & 77°F	5-7 minutes
Through Cure	3/8" @ 50% RH & 77°F	7 days

Physical Property	Test Method	Performance Range
Specific Gravity		1.03
Tensile Strength	ASTM D412	200 psi
Elongation	ASTM D412	600%
Tear Resistance	ASTM D624	28
Shore Hardness	ASTM D2240	18
Service Temperature		-62°F to 400°F

ProRadiant SYSTEMS

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Submittal Package

Climate Trak

Application
Climate Traks are used for radiant heating applications in both new construction and retrofit applications. The product is designed to strongly grip the PEX tubing without air gaps or the need for sealant/adhesives, ensuring high heat conduction. Climate Traks are fastened tightly to the underside of subfloor for maximum system performance.

Technical Data
Available for 3/8" or 1/2" nominal diameter ViegaPEX Barrier or Pextron tubing, in 4 foot or 8 foot lengths

Pre-drilled holes for attachment to subfloor (10 holes per 4 foot Trak, 20 holes per 8 foot Trak)

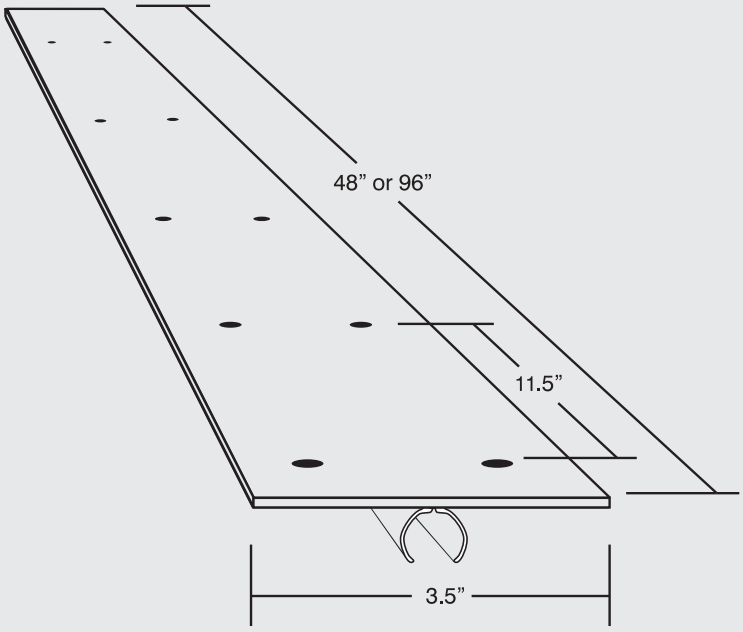
Material
Extruded aluminum

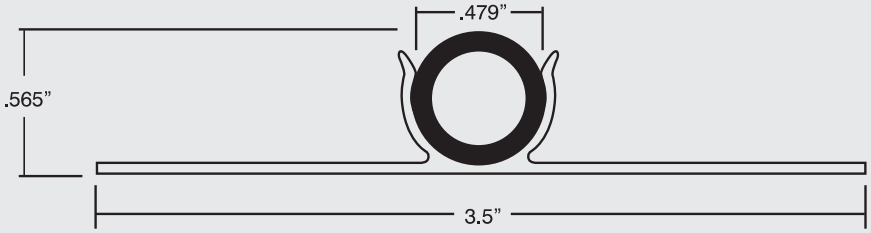
Weight
3/8" plates:
4 foot length 1.07 lbs.
8 foot length 2.14 lbs.

1/2" plates:
4 foot length 1.16 lbs.
8 foot length 2.32 lbs.

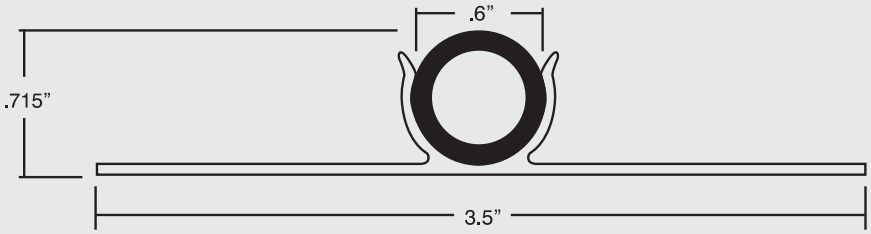
Dimensions
3/8" plates:
3.5" x 48" x 0.515"
3.5" x 96" x 0.515"

1/2" plates:
3.5" x 48" x 0.605"
3.5" x 96" x 0.605"





CLIMATE TRAK 3/8” TUBING



CLIMATE TRAK 1/2” TUBING

ProRadiant SYSTEMS

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Submittal Package

Snap Panel

Snap Panel is a plastic grid fastening system that accepts 1/2" ViegaPEX Barrier tubing for slab and lightweight concrete pour radiant applications. Unique grid pattern allows for tubing to be laid out in both straight and diagonal directions.

Material

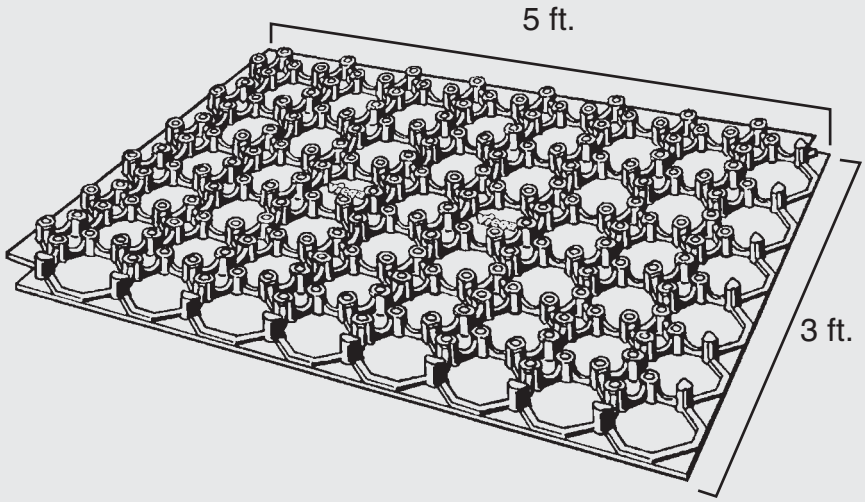
High Density Polystyrene

Compatible Tubing

1/2" ViegaPEX Barrier tubing

Compressive Strength

1,250 psf



Dimensions

3'x 5'x 1"
3" spacing in between fasteners

Packaging

18 panels (240 sq. ft.)
61"x 38"x 8"
61.2 lbs/pkg

- Snap Panels can be used with any type of insulation.
- Snap Panels are considered an oxygen barrier.
- Can be easily cut to size with a utility knife.
- Interlocking capability allows installer to create a sturdy installing surface to work with.
- Can accomodate spacing in multiples of 3" from 6" and up. (6", 9", 12", 15", 18", 21" 24". . .)

ProRadiant SYSTEMS

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Submittal Package

Diverting Valve

Applications
Three-Way Diverting Valves can be used for temperature control in many heating and snowmelting applications.

Features
- Includes solder tailpieces (1-1/4" and 1-1/2" models use same valve body with different tailpieces)
- Pre-installed high limit kit
- Compatible with most Viega actuators (Three Position - 18 003, Two Position - 18 005, and non-electric models - 16 101, 16 102, 16 104, 16 105, 16 115)

Specifications
Materials:
Bronze valve body
Brass and corrosion-resistant steel internal components

EPDM rubber seals

Actuator threads: M30 x 1.0

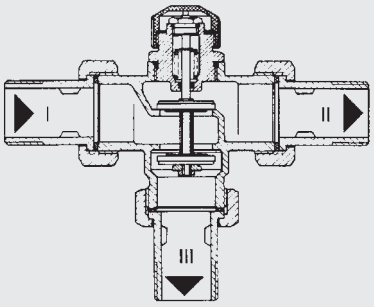
Max working temp.: 242°F (120°C)

Max working pressure: 145 psi 10 bar)

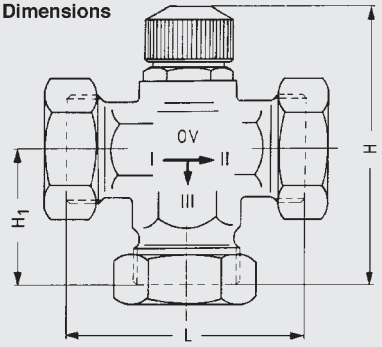
Max differential pressure
(tight shut-off on both end positions of valve discs)
3/4" 10.9 psi (75 kPa)
1" 7.3 psi (50 kPa)
1-1/4" 2.9 psi (20 kPa)
1-1/2" 2.9 psi (20 kPa)

Operations
Diverting Valves have one entry port and two exit ports (see diagram to the right). Depending upon the position of the valve stem, flow is diverted from one exit port to the other.

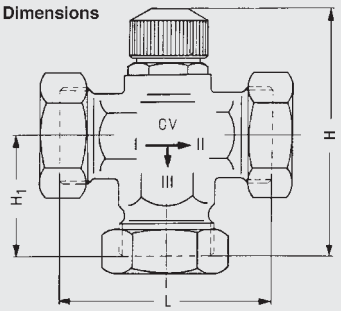
Valve cross section



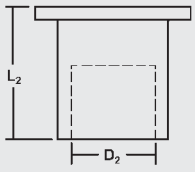
Dimensions



Dimensions



Size	Stock Code	L (in)	H (in)	H_1 (in)
3/4"	20 001	3.15	3.94	1.85
1"	20 002	3.54	4.06	1.97
1-1/4"	20 003	4.53	4.65	2.52
1-1/2"	20 041	4.53	4.65	2.52



Size	D_2 (in)	L_2 (in)
3/4"	0.875	0.91
1"	1.125	1.18
1-1/4"	1.375	1.57
1-1/2"	1.625	1.26

ProRadiant SYSTEMS

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Submittal Package

HX Series Heat Exchangers

Specifications

Plate Material: 316L Stainless Steel
Braze Material: Copper
Max. Working Temp: 350°F
Min. Working Temp: -425°F
Max. Working Pressure: 450 psi
UL Listed

For use in radiant heating, snowmelting, and domestic hot water systems. For pool, spa, and steam applications use MHX Series marine grade exchangers.

Heat exchanger may be installed in vertical or horizontal position (except steam exchangers).

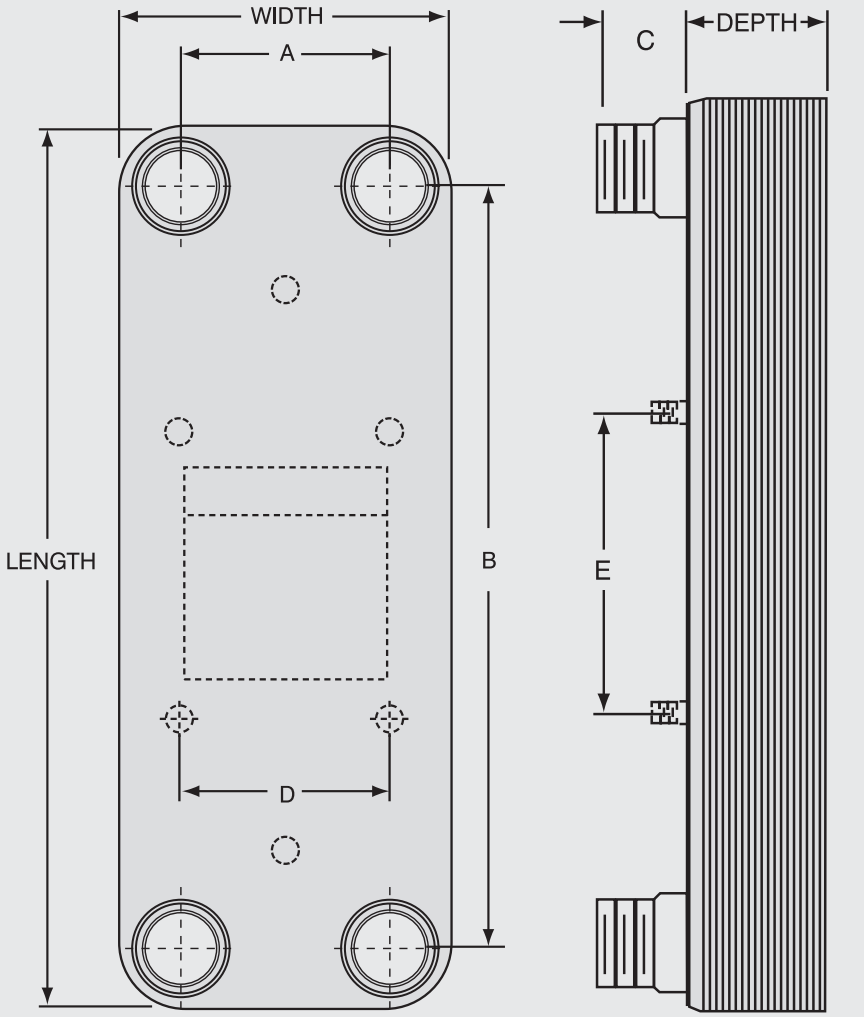
Heat exchanger must be piped in counterflow arrangement.

A water strainer MUST be installed in the water inlet circuit (16-20 mesh minimum, 20-40 mesh recommended).

Water quality should be maintained at a pH of 7.4 (6.5 to 8.0).

Mounting bolts:
3/8-24 x 1" L on standard HX Series
1/2-20 x 1-1/2" L on HX10 Series

Contact Viega NA for larger sizes.



Connections		C
# of Plates	Standard Threaded (MPT)	
HX Series		
4 through 16	3/4"	1.125
20 through 36	1"	1.250
40 through 80	1-1/4"	1.375
HX10 Series		
20 through 40	1-1/2"	1.500
50 through 80	2"	1.750
90 through 200	2-1/2"	2.000

Model	Dimension (inches)							Approximate Weight (lbs.)
	L	W	Depth	A	B	D	E	
HX & HXL Series	12.2	4.9	.09 x # of Plates + .36	2.7	9.9	2.5	3.5	.328 x # of Plates + 3.1
HX10 Series	20.3	9.8	.09 x # of Plates + .36	6.5	17.0	4.0	5.5	1.1 x # of Plates + 10.7