



CONDENSED CATALOG

The Leader In Hydronic Systems & Components



Maxifold



iWorX[®]

by Taco Electronic Solutions



Mondale & Associates now offers iWorX, a web-based building management system by Taco Electronic Systems.

PLEASE NOTE:

This catalog contains only a fraction of all the Taco products and parts available. For more information about, or to order other Residential and Commercial Taco products, please contact Mondale and Associates, Inc.

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How To Select a Circulator...

▶ Step 1: Establish the "Target Flow Rate" for the system.

Calculate the amount of heat the fluid will need to carry and the temperature drop across the heat load or circuit. Determine this by performing a heat loss calculation on the zone that the circulator is serving. Once the heat loss is determined, enter the Btu/hr heat loss load and the desired temperature drop into the following formula.

$$\text{Flow (GPM)} = \text{Btu's} \div (500 \times \Delta T)$$

***Note:** 500 is the constant for 100% water. Use 479 for 30% glycol & 450 for 50% glycol.

***Note:** If unsure which ΔT to use then try 20°F for hydronic systems, 20°F for non-condensing boiler pump, 30°F for condensing boiler pump and 30° for snowmelt.

▶ Step 2: Establish the resistance in the system that the circulator will need to overcome.

Determine the resistance or pressure drop in the piping, heat source, valves, fittings and any other devices in the system. This resistance is measured in either psi or ft of head.

***Note:** To convert psi to ft of head just multiply the psi x 2.31 OR divide ft of head by 2.31 to convert to psi

Let's break this down by the major components...

Heat Source: This could be a boiler, water heater or heat exchanger. Consult the manufacturer for these pressure drops.

Piping: All pipe presents resistance to the fluid flowing through it. The faster the water flows, the greater the resistance. Add the various lengths of pipe runs in the circuit served by the circulator. In the case of parallel circuits, like a radiant floor manifold, use the loop with the greatest resistance, typically the longest length.

Fittings and Valves: Don't forget to add fittings and valves into the calculations. It is accepted practice to add up the fittings and valves in the piping circuit then consult a fitting equivalent length chart to assign the appropriate pipe length to the number of fittings or valves used. "Rule of Thumb": multiply the total footage of pipe times 1.5.

Miscellaneous Devices: Includes items like mixing valves, air separators, filters, wye-strainers, flow meters, heat exchangers, coils or anything else the fluid flows through. Some items will have a pressure drop chart to refer to, others will publish a Cv rating. Cv is short for coefficient of velocity (gpm that flows through the valve to produce 1 psi of pressure drop). For example, a mixing valve with a Cv rating of 3.5 has a 1 psi pressure drop at 3.5 gpm of flow. If the flow is different than the stated Cv rating, then use this formula to find the pressure drop that corresponds to the actual flow.

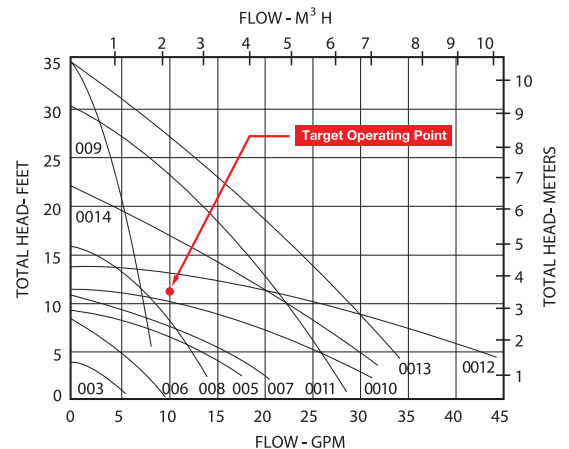
▶ Step 3: Add it all up.

Now that all the pressure drops through the various piping and components are known, the pump can be sized. To do this, consult the pump curves provided in this catalog or use the sizing wizard on Taco's website:

www.taco-hvac.com/wizard_pumps.html#. For a quick search, enter your flow and head into the web sizing program and click search.

Example

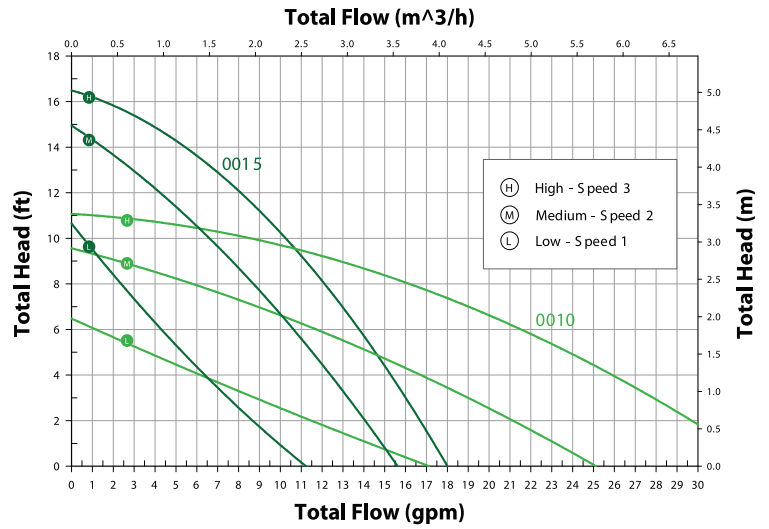
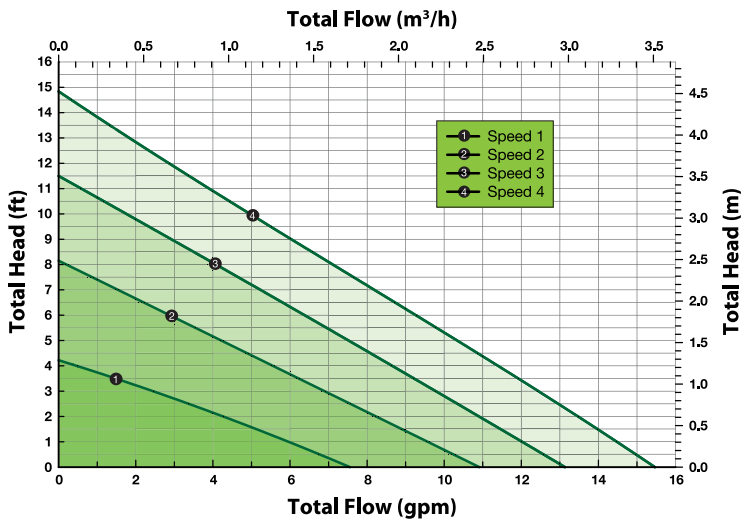
System parameters are 10 gpm @ 11.3 ft of head. To select the ideal curve, draw a line starting at 0 through the selection parameters. Chose the curve that intersects somewhere in the middle of the third curve. In this scenario, the pumps that satisfy the requirements include 0011, 0012, 0013 or 0014.



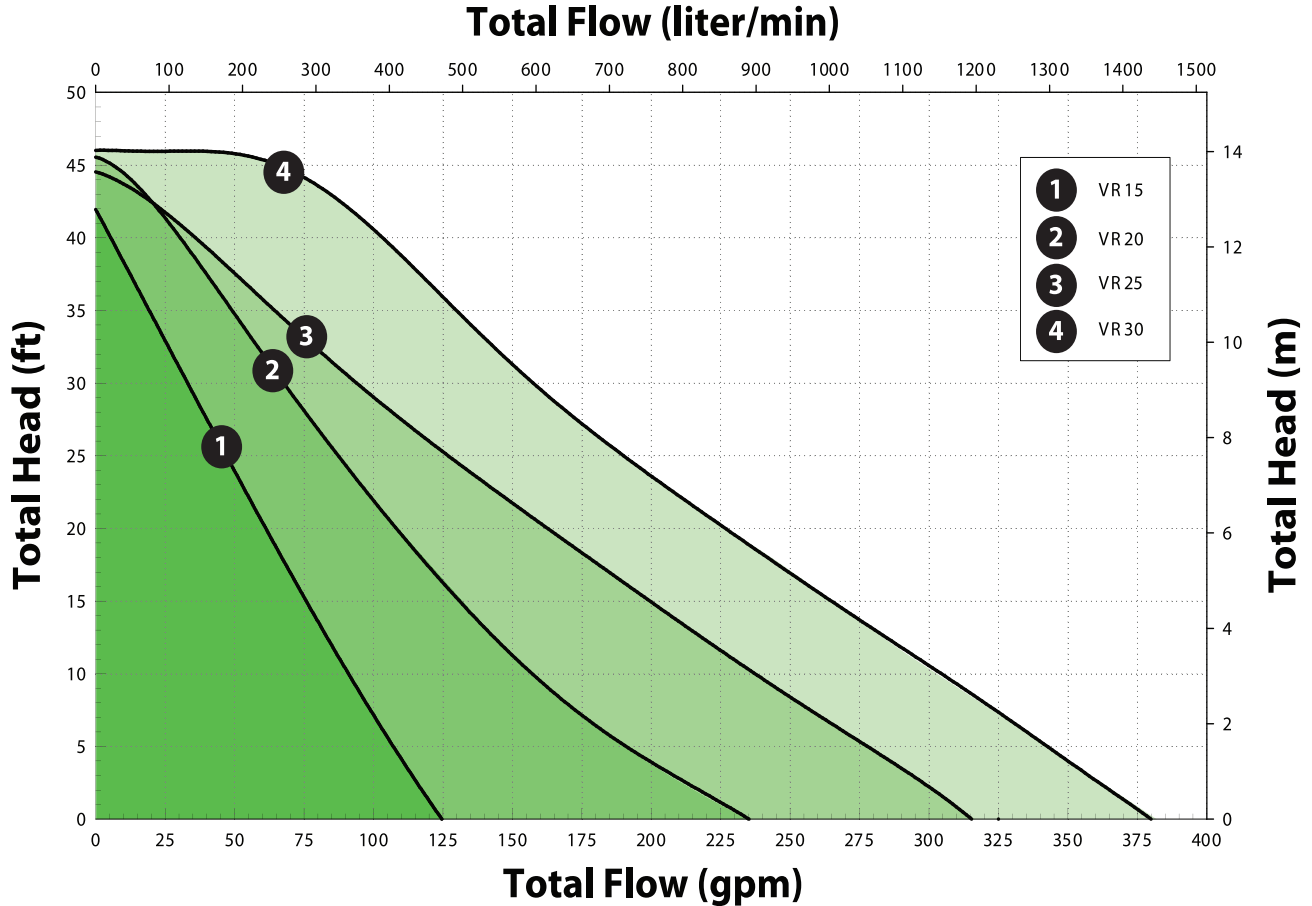
Circulator Selector Guide- (Pump Curves)

The HEC-2 Bumble Bee Constant Power (Fixed Speed)

The 00-3 Speed Multi-Speed Circulators

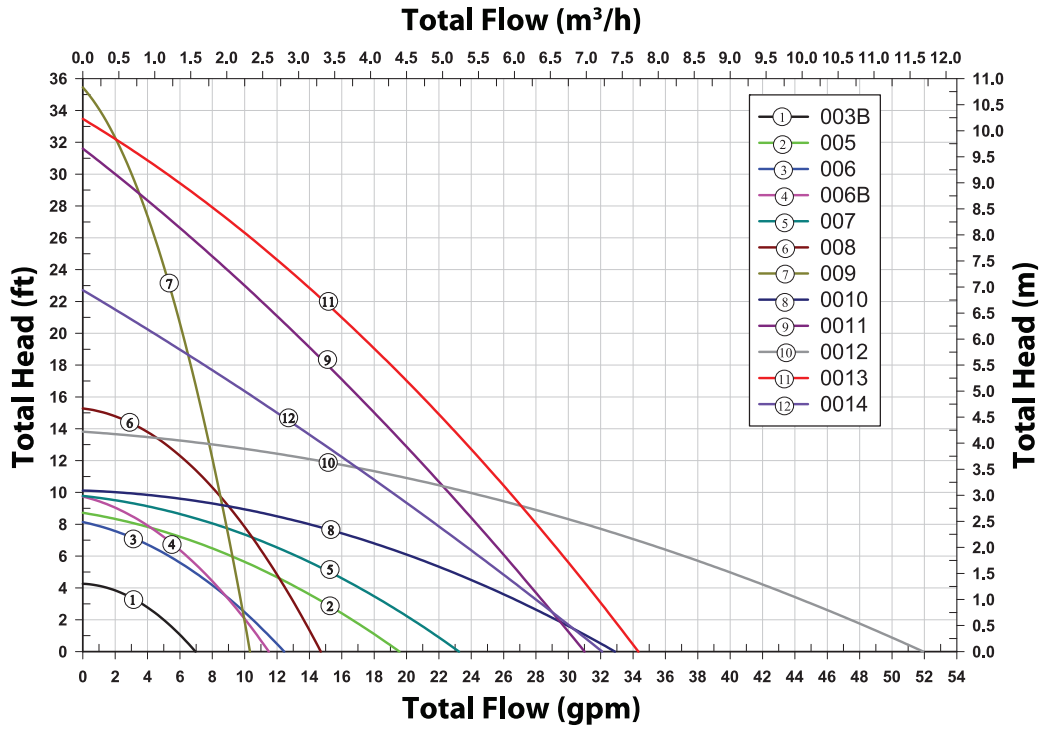


The Viridian Performance Field

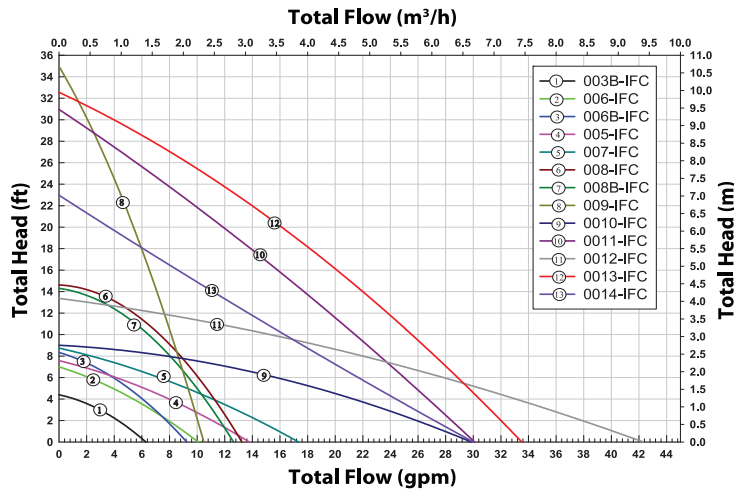


Circulator Selector Guide—(Pump Curves)

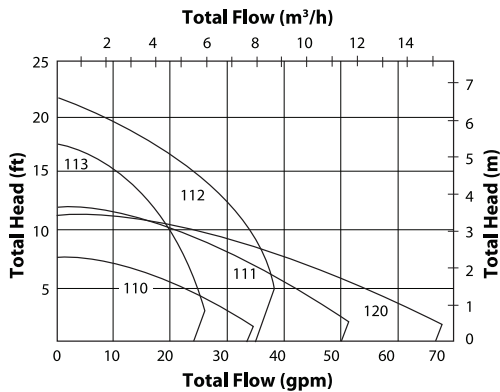
OO- Series Circulators / Performance Field



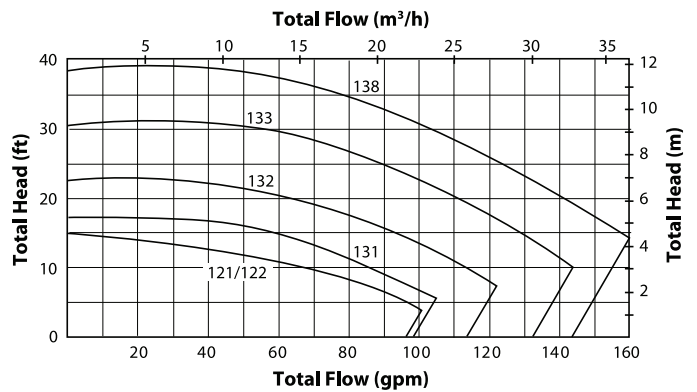
Integral Flowcheck (IFC) Models / 60 Hz Performance Field



In-Line Circulator Models (110, 111, 112, 113 & 120)

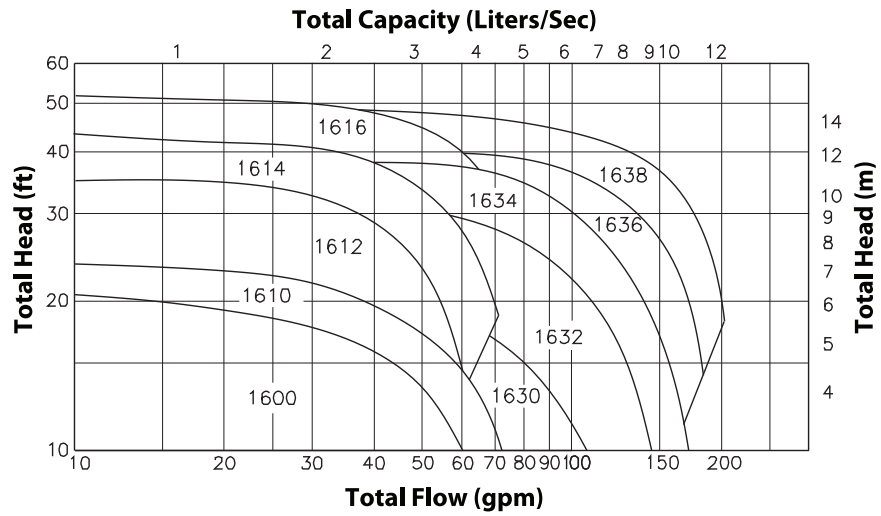


In-Line Circulator Models (121-138)

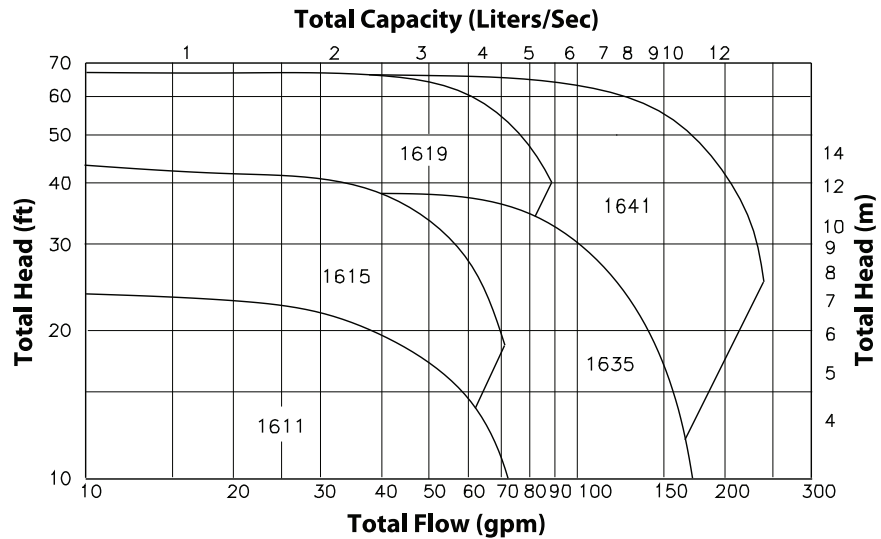


Circulator Selector Guide—(Pump Curves)

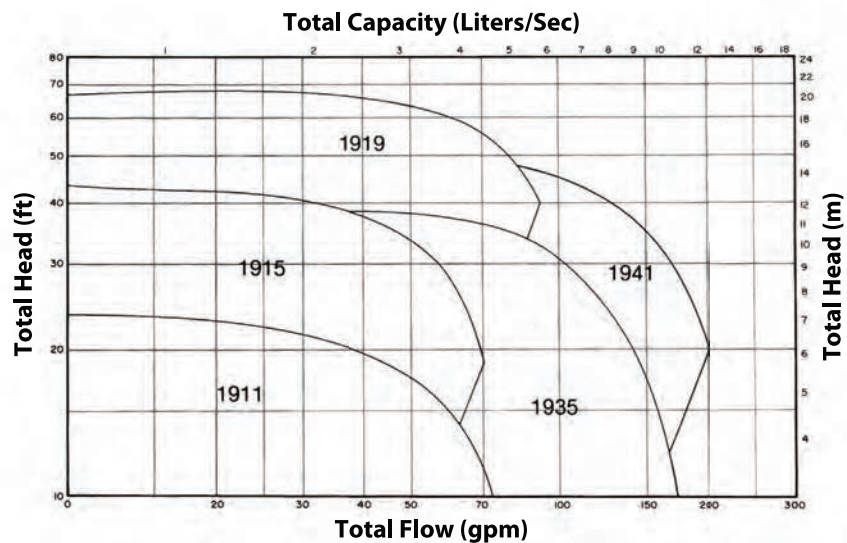
1600- Series STOCK Unit Quick Selection Curves (1750 RPM)



1600- Series CUSTOM Unit Quick Selection Curves (1750 RPM)



1900- Series Selection Curves (1750 RPM)



Hot-Link® System

The Taco Hot-Link® System (HLS-1) for domestic hot water recirculation reduces the time it takes for hot water comfort to reach showers and faucets. The Hot-Link System can save an average family up to 12,000 gallons of water per year and it's easy to retrofit to an existing plumbing system.

Features

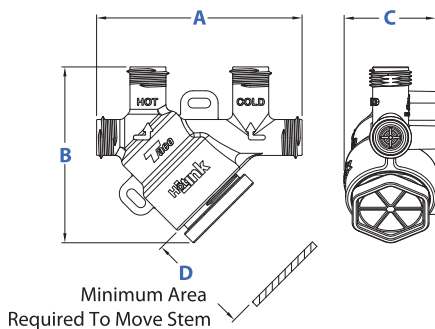
- Exclusive clean in place under sink valve design
 - Extends valve life
 - Reduces customer calls to replace "plugged" valves
- Creates a domestic hot water recirculation system without dedicated return loop piping
- Easy to retrofit to existing plumbing system
- Conserves water by greatly reducing the time it takes to get hot water
- Analog pump timer allows you to set the system to work during peak hours or to work continuously
- Includes Hot-Link® System Cartridge Circulator, a Hot-Link® bypass valve and flex hoses
- 3 Year Warranty

Materials of Construction

- Body.....Nylon
- Thermal Disk Actuator.....Bi-Metal
- O-Ring Seals.....EPDM
- Integral Flow Check (IFC®):
 - Body, Plunger.....Acetal
 - O-Rings.....EPDM
- Screen.....304 SS
- Stem.....Nylon
- Actuator Cartridge.....Stainless Steel
- Braided Flex Hoses.....Stainless Steel

Hot-Link Valve Dimensions

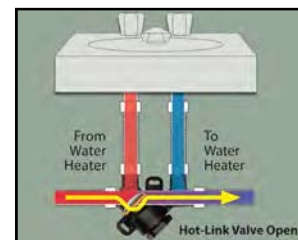
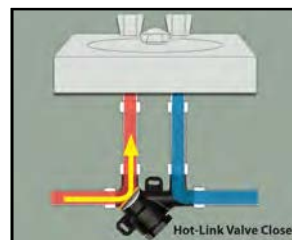
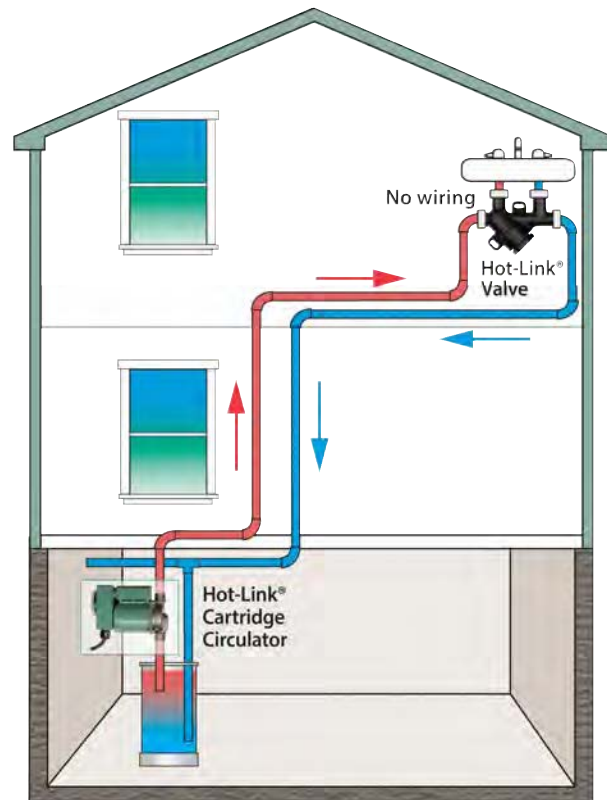
Connection	A	B	C	D
	in.	in.	in.	in.
1/2" MNPT	4	4-7/16	1-3/4	2-1/2



Hot-Link® Domestic Hot Water Recirculation System



Hot-Link® delivers instant hot water using existing plumbing system!



* No under-sink electricity is needed. The Hot-Link Pump is mounted at the water heater.

On Command - Hot Water Recirculation

Hot water without the waste! Activate On Command™ only when you need it. It's easy to install- no new piping required. The On Command™ Recirculator operates 24 hours a day, saving water, energy and money.

ON COMMAND™

HOT WATER RECIRCULATION



Included with USK*
*
Std. On Command with USK* (Under Sink Kit) option



Available in 006, 008 and 0011 circulators



Motion Sensor (554-4)



RF Wireless Starter Kit (554-7)

Standard Piping:

Tank Type Water Heater

Size of Home	Total length of Pipe (ft)	Model
Small	50	006-CT-USK
Medium	100	008-CT-USK
Large/Commerical	Over100	0011-CF-USK

Tankless Water Heater

Size of Home	Total length of Pipe (ft)	Model
Small / Medium	<60	008-CT-USK
Large/Commerical	60+	0011-CF-USK

Recirculation Piping:

Tank Type Water Heater

Size of Home	Total length of Pipe (ft)	Model
Small	100	006-CT
Medium	200	008-CT
Large/Commerical	200+	0011-CF

Tankless Water Heater

Size of Home	Total length of Pipe (ft)	Model
Small / Medium	<2500	008-CT
Large/Commerical	2500+	0011-CF

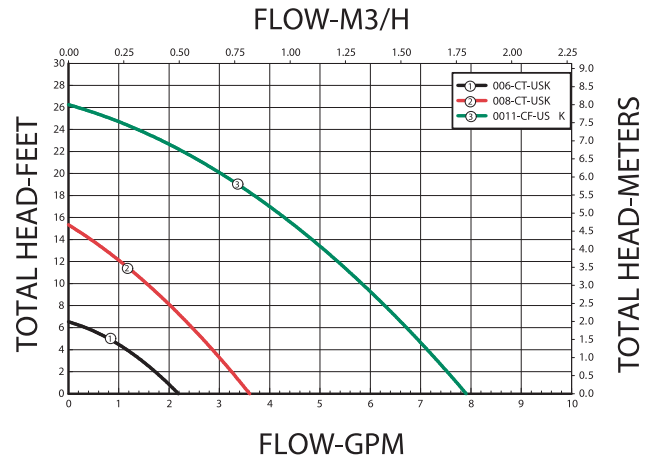
C = On Command
T = Threaded
F = Flanged
USK = under sink kit

On Command™ System Accessories

Model	Description
554-7	RF Remote Transmitter/Reciever Kit
554-8	RF Individual Remote Transmitter Button
554-3	Hardwired Individual Starter Button Round
554-4	Motion Sensor Kit



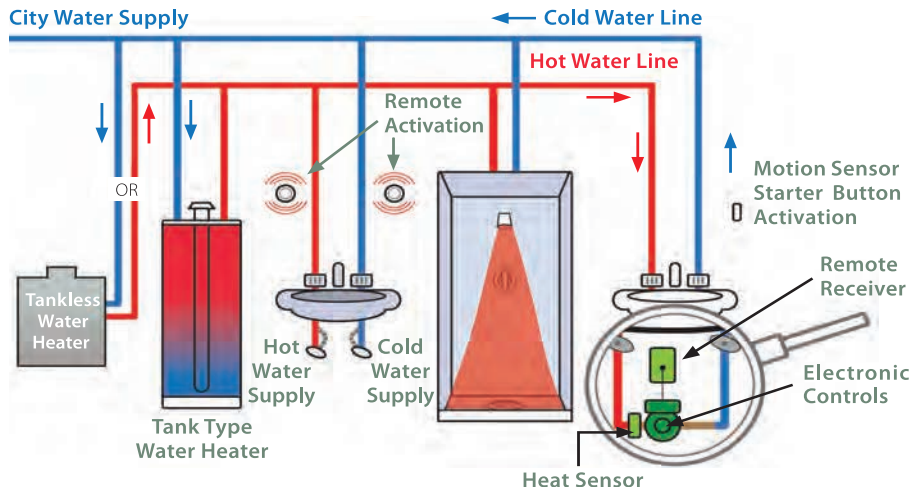
Performance Field Information - 60 Hz



Activate On Command™ only when you need it.

On Command™ only runs when you tell it to, and it's smart enough to know when the water currently in the line is hot enough. On Command™ can be activated with the push of a button, or with an optional wireless remote transmitter/ receiver or optional hard-wired motion sensor.

For standard piping (non-ReCirc).



SmartPlus Circulation Pumps

The Taco SmartPlus circulator is designed to deliver instant hot water comfort and convenience while conserving water and energy. By recirculating "cooled" hot water back to the water heater, the wait for hot water is decreased to seconds. The SmartPlus is designed for use with dedicated return line systems.

The SmartPlus recirculation pumps can work in one of two modes. The "Smart" mode learns the home's hot water usage patterns and has hot water ready to go when you need it. Pulse mode runs the circulator 150 seconds every 60 minutes to maintain hot water.



SmartPlus

HOT WATER RECIRCULATION



The smart way to instant **hot** water comfort and resource conservation

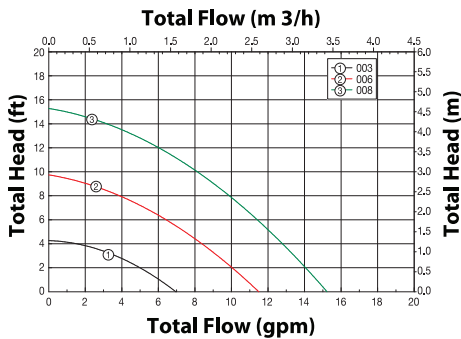


Features and Benefits

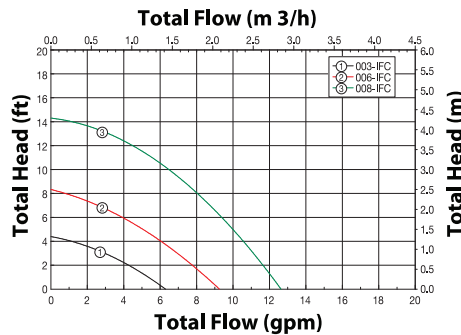
- **Vacation Function** — After 36 hours of inactivity the pump will automatically TURN OFF and remain off until hot water usage is detected again.
- **Exercise Function** — While in vacation mode the pump will cycle on once every 7 days and run for 10 seconds to prevent any corrosion or scale buildup.
- **Factory installed 6' line cord**
- **Remote Sensor Included**
- **Optional IFC® (Integral Flow Check)**
- **Quiet, Efficient Operation**
- **Unique Replaceable Cartridge Design-Field Serviceable**
- **Self-Lubricating / No Mechanical Seal**
- **Unmatched Reliability-Maintenance Free**
- **Water Conservation** — The average residence can save up to 12,000 gallons of water per year-water that normally goes down the drain while waiting for hot water.
- **Comfort and Convenience** — Once the pump is set to the desired operating mode it never needs to be set again. Hot water is always available in seconds.
- **Efficiency** — Smart/Pulse operation maximizes hot water comfort and energy savings
- **Reliability** — The SmartPlus provides quiet operation and industry leading electronics with Taco's 00® circulator proven performance and dependability.

Performance Field Information- 60 Hz

Standard Domestic Models



IFC Domestic Models



Pump Selection Charts Below

The following information is provided as a guide only. Select the circulator based on the supply and return pipe size, pipe line length, and circulator model. Do not oversize the pump or high velocity noise and erosion corrosion of the system piping may result.

1/2" Supply and Return Lines

Model Number	Supply Pipe Maximum Length (ft.)	Total Maximum Pipe Length (ft.)
003	50	100
006	100	250
008	250	450
003-IFC*	25	100
006-IFC*	100	250
008-IFC*	250	450

* With Optional Integral Flow Check

3/4" Supply and Return Lines

Model Number	Supply Pipe Maximum Length (ft.)	Total Maximum Pipe Length (ft.)
003	50	200
006	150	300
008	300	600
003-IFC*	50	200
006-IFC*	150	300
008-IFC*	300	600

* With Optional Integral Flow Check

Bronze w/Smart-Pulse Control

Model #	Connection Type	HP
003-IQBC4	1/2" Sweat	1/40
003-IQB4	3/4" Sweat	1/40
006-IQBC4	1/2" Sweat	1/40
006-IQB4	3/4" Sweat	1/40

Stainless Steel w/Smart-Pulse Control

Model #	Connection Type	HP
006-IQST4	3/4" FNPT	1/40

Domestic Hot Water Circulators

The Plumb n' Plug® Cartridge Circulators are designed to conserve water, increase comfort and reduce the delivery time of hot water to outlet fixtures by periodically re-circulating hot water through the system. An average residence can save up to 25 gallons of wasted water per day. Factory pre-wired 6 foot line cord with optional 24 hour analog or 7 day digital programmable clock timers allow for easy installation. Simply Plumb it in, then Plug it in. Available in Bronze Construction with Sweat, Threaded or Union connections and optional Integral Flow Check (IFC®).

Plumb n' Plug® Accesories	Model #
Analog Timer Kit	265-1
Digital Timer Kit	265-3
Aquastat	563-2



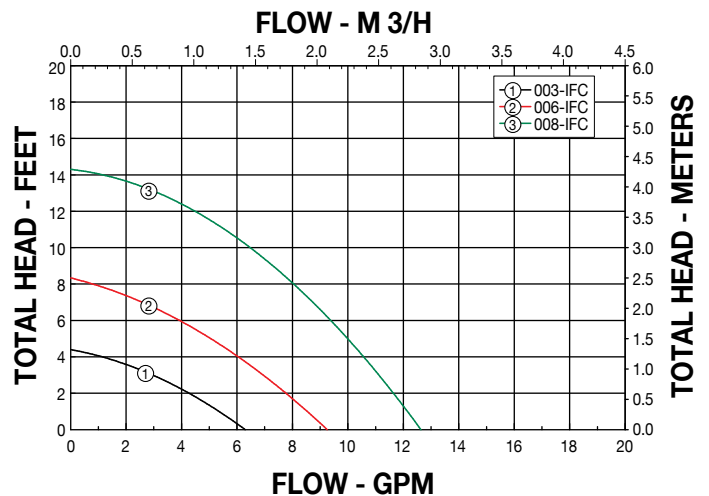
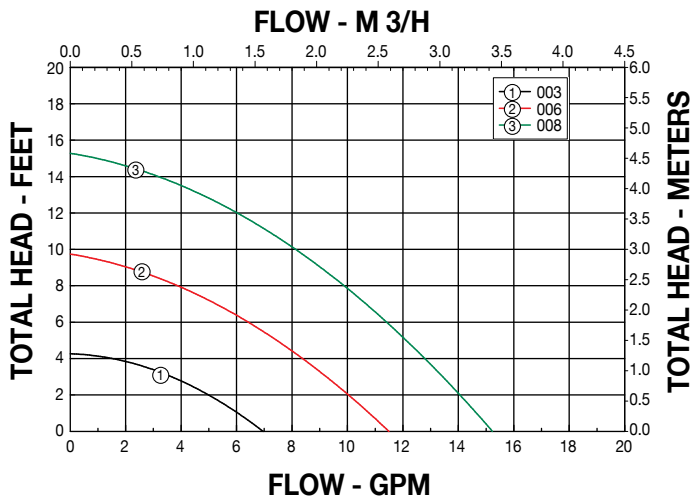
Plumb n' Plug® (PNP) Pre-Wired Models

Standard Model #	System Connection	24 Hr. Analog Timer	7 Day Digital Timer	Line Cord Only	HP	Voltage	Amps
003-BC4	1/2" Sweat	003-BC4-PNP	003-BC4-8PNP	003-BC4-4PNP	1/40	115/60/1	0.43
003-B4	3/4" Sweat	003-B4-PNP	003-B4-2PNP	003-B4-1PNP	1/40	115/60/1	0.43
003-BT4	3/4" NPT	003-BT4-PNP	003-BT4-2PNP	003-BT4-1PNP	1/40	115/60/1	0.43
003-BC4-1	Union	003-BC4-1PNP	003-BC4-9PNP	003-BC4-5PNP	1/40	115/60/1	0.43
006-BC4	1/2" Sweat	006-BC4-PNP	006-BC4-4PNP	006-BC4-2PNP	1/40	115/60/1	0.52
006-B4	3/4" Sweat	006-B4-PNP	006-B4-2PNP	006-B4-1PNP	1/40	115/60/1	0.52
006-BT4	3/4" NPT	006-BT4-PNP	006-BT4-2PNP	006-BT4-3PNP	1/40	115/60/1	0.52
006-BC4-1	Union	006-BC4-1PNP	006-BC4-5PNP	006-BC4-3PNP	1/40	115/60/1	0.52
008-BC6	3/4" Sweat	----	----	----	1/25	115/60/1	0.84
008-SF6	Flanged	----	----	----	1/25	115/60/1	0.84

Performance Field Information (60-Hz)

(STD) Models

(IFC) Models



3-Speed, 00-Series Circulators

The 0015, 3-Speed Radiant Pump is specifically designed for the flow and head requirements of today's radiant heating systems. The 0015, 3-Speed Radiant pump is a direct replacement for the Grundfos UPS15-58, 3-Speed. The 0015 delivers the highest starting torque in its class and a removable, high-flow Integral Flow Check (IFC®) that prevents gravity flow, reduces installation costs and improves pump performance.

The 0010, 3-Speed Service Pump is designed as an ideal replacement circulator for service contractors to use on any emergency "no-heat" call. Simply install it and set the speed to match the original pump performance. This pump features the Universal Flange Design.



How is the 0015, 3-Speed better than the Grundfos UPS15-58FC?

- **Higher Performance** – Better flow and head characteristics at all three speeds.
- **Three Separate Windings** – A separate winding for each speed for flexibility and maximum starting torque. If one winding burns out, the other speeds will still work.
- **More Powerful Motor** – Taco uses a 1/20hp motor instead of a 1/25hp motor. Combined with separate windings, this circulator provides 60% more starting torque.
- **Thermally Protected Motor** – Better than impedance protection.
- **Electrical Box** – Larger, all-steel electrical box with two knockouts and more room inside the electrical box for the wire nuts, etc.

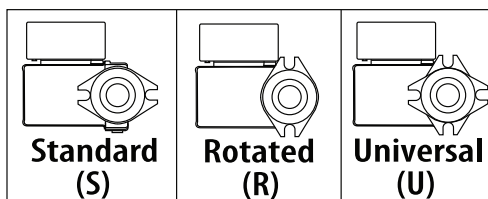
Three speeds. One reputation.



NSF® ≤ .25% Lead

Stainless Steel Model Meets California AB 1953 and Vermont Act 193

*Flange Orientation



Universal Flange Design on the 0010 version simplifies the change out of any circulator, regardless of style.

Model #	Flange Code*
0015-MSF3-IFC	S
0015-MSF3-1 IFC	R
0010-MSF2-IFC	U

Features

- Sturdy 3-speed switch
- Fine tune to system requirements
- Highest performance & starting torque in class
- Heavy duty construction for longer life
- Universal flange (0010 only)
- Removable high-flow Integral Flow Check (IFC®)
 - Prevents gravity flow
 - Reduces installation costs
 - Improves pump performance
- Replaceable cartridge design
- Quiet, efficient operation
- Self lubricating, no mechanical seal
- Wide range of applications
- Cast iron, flanged construction

Priority Zoning Circulators

The Taco Priority Zoning Circulator combines the reliability of the "00" circulator with the convenience and efficiency of a PC board mounted switching relay package. Each zoning circulator has low and high voltage terminal strips for ease of electrical hookup, as well as a built-in priority switch. The priority switch allows the installer to choose the zone that requires the most attention and, when activated, runs only that circulator. It is ideal for indirect hot water heaters, adding another zone, zoning with circulators, and for prioritizing undersized zones.



Thermostat BUILT-IN READY *Built-In Transformer and Relay*

controls made easy

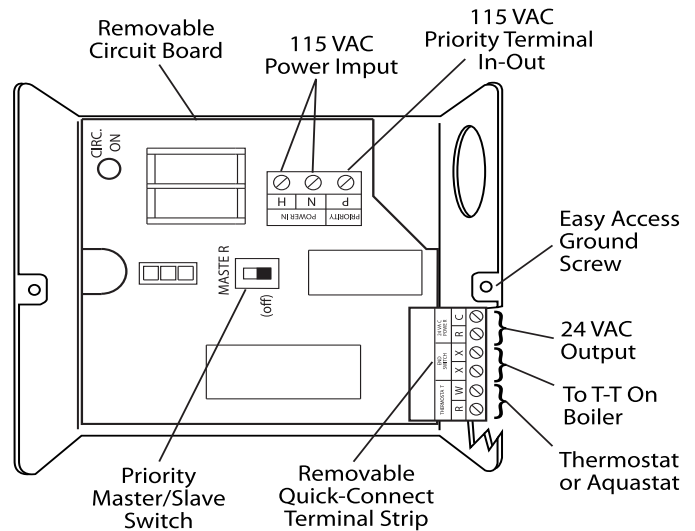
Features

- 00[®] reliability
- Snap-in PC board
- Removable, quick-connect low voltage terminal strip
- Integral Flow Check (IFC[®]) (optional)
- UL listed
- Simplified wiring
- LED power light
- 100% factory tested
- Works with other circulators or zone valves
- Universal thermostat compatibility
- Available in sizes 005 - 0014
- Made in the USA

Priority Zoning Circulators

Without Check Valve	With Check Valve	Flange Configuration
005-ZF2-6	005-ZF2-2IFC	S
007-ZF5-9	007-ZF5-3IFC	S
007-ZF5-10	----	R
008-ZF6-6	----	S
----	008-ZF6-2IFC	R
009-ZF5-2	009-ZF5-1IFC	R
0010-ZF3-2	0010-ZF3-1IFC	S
0011-ZF4-2	0011-ZF4-IFC	R
0012-ZF4-4	0012-ZF4-IFC	S (1-1/2") Incl.
0012-ZF4-5	----	S (2") Incl.
0013-ZF3	----	R
0014-ZF1-2	0014-ZF1-1IFC	R

PC Board Layout & Electrical Hook-Up



Certified to NSF/ANSI 372

All Bronze or Stainless Steel "00" Circulators Meet California AB 1953 and Vermont Act 193

Variable Speed Delta T 00® Circulators

Optimal Pumping Simplified

No matter how good the original system design and heat loss calculations were, they included estimates and rules of thumb. What are the design conditions for those systems you "inherited" or have to service? Have a zone valve system or multi-zone radiant manifolds running off a common circulator? Your system needs a circulator that automatically adjusts to deliver the optimal heat transfer based on the actual operation of the system, every day, under all load conditions – even when those conditions change.

With the Taco Variable Speed Delta T 00® Circulators you simply dial in your desired temperature drop across the system or zone (5-50 degrees Fahrenheit), attach a supply and return sensor directly to the pump and it will automatically vary its performance to deliver optimal heat, efficiency and comfort.



Operational Benefits

- Eliminates velocity noise
- Eliminates need for a pressure valve
- Conserves energy
- Pump always runs at minimum required speed
- Increases system performance
- Achieves system design goals, even when installed system varies from original design
- Pump automatically adjusts to current system conditions
- Spend less time figuring out pressure drop (for proper pump sizing) when servicing existing systems
- Pump exercise
- Delivers ideal BTU/hr heat transfer for all styles of emitters



Available Models

Cast Iron	Stainless Steel	HP
008-VDTF6-1	008-VDTSF6-1	1/25
0011-VDTF4	0011-VDTSF	1/8
0013-VDTF3	0013-VDTSF	1/6

There are two applications that can benefit greatly from the use of a Taco Variable Speed Delta T Circulator:

Residential radiant floor heating systems often feature several zones on a single manifold, using manifold valve actuators, designed around a 10 or 20 degree Delta T. The circulator is sized to provide enough flow and head pressure to satisfy all zones calling at the same time. The same is true with circulators feeding multiple zones using zone valves. When using a regular circulator and not all zones call, you get too much flow through the zone calling and can get velocity noise and poor system performance. The Variable Speed Delta T Circulators automatically compensate by adjusting flow to make your system perform optimally.

Bumble Bee High-Efficiency Variable Speed Circulator

The Bumble Bee (model HEC-2) represents the very latest in variable speed wet rotor circulator technology. Its high efficiency ECM motor uses up to 85% less electricity than a standard circulator, and its out-of-the-box settings and 360° swivel flange makes it a breeze to install. Most importantly, the Bumble Bee's Delta-T variable speed technology maximizes the overall efficiency of your heating system. The Bumble Bee is engineered for energy savings, ease of installation, versatility in the field and ultimate comfort.

Features

- High efficiency ECM Motor reduces power consumption by up to 85%
- Fully programmable with 3 operating modes
- Plug-in remote temperature sensors included
- LED displays real-time mode, watt usage and GPM flow
- 360° swivel flange for mounting flexibility
- Nut capture feature on flanges
- Integral Flow Check (IFC®) included in carton
- Sensor kit with supply and return sensors and tie wraps



360° Swivel Flange for universal fit-up

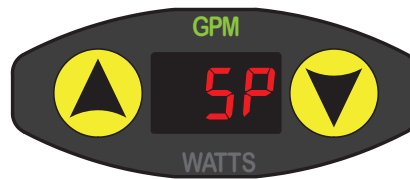


The Bumble Bee Operates in 3-Modes

Factory Pre-Set for Delta-T mode @ 20°F ΔT



CP - Constant Power (Fixed Speed) mode allows for 4 fixed circulator speeds.



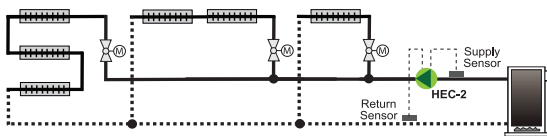
SP - Setpoint (Variable Speed) mode allows for a fixed supply temperature from 65°F to 220°F.



dE-Delta-T, Differential Temperature (Variable Speed) mode allows for a fixed system temperature differential (ΔT) from 5°F to 50°F.

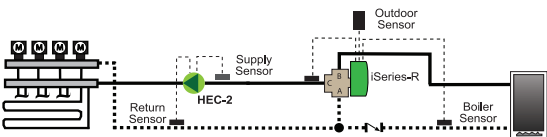
Delta-T

Across a series loop system using zone valves



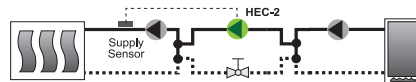
Delta-T

Across multi-zone radiant manifolds with loop actuators



Setpoint

Radiant injection mixing



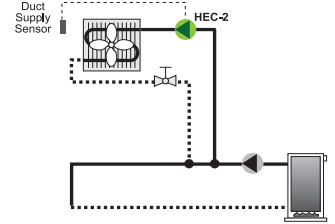
Setpoint

Boiler protection by-pass



Setpoint

Fan coil fixed temperature



"00" Series Cartridge Circulators

Every Taco "00"® cartridge circulator is designed to make the job easier. With no mechanical seal, the self-lubricating design provides unmatched reliability. **Every "00"® features a field-replaceable cartridge** that contains all the moving parts. Replacing the cartridge rebuilds the circulator! Our IFC® Cartridge Circulators feature an Integral Flow Check, eliminating additional installation costs associated with separate in-line flow checks. What could be better than lower cost and better performance?

Features

- Standard high capacity output-compact design
- Quiet, efficient operation
- Direct drive-low power consumption
- Unique replaceable cartridge design-field serviceable
- Self lubricating
- No mechanical seal
- Unmatched reliability-maintenance free
- Universal flange-to-flange dimension
- Anti-condensate baffle (ACB) to protect motor windings (0011, 0012, 0013)
- Integral Flow Check (IFC)™ (optional)
- Priority zoning relay (optional)
- Most available in 230 volt



All Bronze or Stainless Steel "00" Circulators Meet California AB 1953 and Vermont Act 193



007-SF5 Stainless Steel Circulator



00-Series Circulators (Models and Applications)

Stainless Steel	Cast Iron Without Check Valve	Cast Iron With Check Valve	Flange Orientation	Application
005-SF2	005-F2	005-F2-2IFC	S	Small Residential
----	006-F4	006-F6-IFC	R	DHW Recirculation / Air Handlers
007-SF5	007-F7	007-F7-IFC	S	Residential
----	007-F5-5	007-F5-8IFC	R	Residential
008-SF6	008-F6	----	S	Radiant
008-SF6-2	----	00R-F6-1IFC	R	Radiant
009-SF5	009-F5	009-F5-IFC	R	High Head Pressure
0010-SF3	0010-F3	0010-F3-1IFC	S	Light Commercial
0011-SF4	0011-F4	0011-F4-2IFC	R	High Velocity / Head Pressure
0012-SF4	0012-F4	----	S	High Velocity
0012-SF4-1	0012-F4-1	----	S	High Velocity
0013-SF3	0013-F3	0013-F3-1IFC	R	High Velocity / Head Pressure
0014-SF1	0014-F1	0014-F1-1IFC	R	Medium Velocity

*** Replacement Gaskets: Part #007-007RP for all models except 0012. For 0012 models, use 0012-020RP.**

In-Line Circulator Series

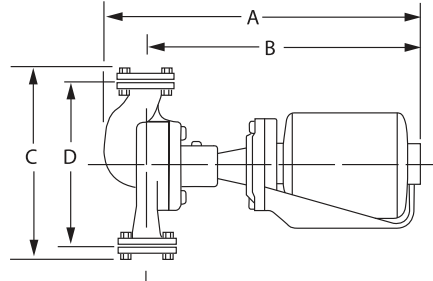
Taco In-Line Circulators are designed to efficiently circulate heated or chilled water in residential or light commercial Hydronic Systems. These circulators may also be used for zoning large installations and are available in bronze or stainless steel construction for domestic hot water applications. In-Line Circulators demonstrate proven performance, dependability, quiet operation and long lasting performance.

110 Series



NSF₆ ≤ .25% Lead

Stainless Steel Models
Meet California AB 1953
and Vermont Act 193



Features 110 Red Baron Series (110, 111, 112, 113, 120)

Rugged Motor Built to Last

- Resilient mounted, split phase motor with built-in overload protector
- Equipped with sleeve bearings for quiet operation

Proven Pump Construction

- One piece non-ferrous impeller
- Stainless steel shaft
- Rugged bronze sleeve bearing
- Two piece carbon/ceramic seal assembly
- Durable one piece spring coupling

(1) When specifying all bronze construction, add letter "B" after model number (i.e. 110B).
When specifying Stainless Steel construction, add letter "S" after model number (i.e. 110-24S).
(2) 240° Intermittent; 200° Continuous.

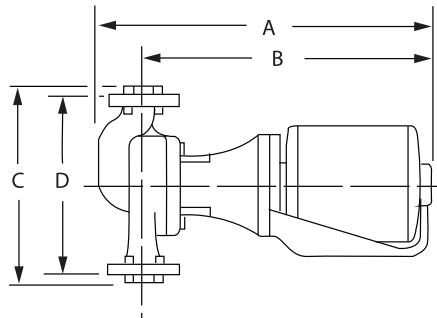
MODEL NUMBER ⁽¹⁾	FIANGE SIZE	MOTOR ⁽²⁾		MAXIMUM TEMP. ⁽³⁾	PRESSURE RATING	DIMENSIONS				APPROX. SHIPPING WEIGHT LBS.	FLANGES ---
		115V 60C 1 Ph	RPM			A IN.	B IN.	C IN.	D IN.		
110	3/4", 1", 1-1/4", 1-1/2"	1/12	1725	240° F	125 psi	14-5/8	12-5/8	7-7/8	6-5/16	21	Not Incl'd
111	3/4", 1", 1-1/4", 1-1/2"	1/8	1725	240° F ⁽³⁾	125 psi	16-1/4	13-7/8	10-1/4	8-3/4	26	Not Incl'd
112	3/4", 1", 1-1/4", 1-1/2"	1/3	3450	240° F	125 psi	16-1/2	14-1/2	7-7/8	6-3/8	28	Not Incl'd
113	3/4", 1", 1-1/4", 1-1/2"	1/8	1725	240° F ⁽³⁾	125 psi	16-1/4	14	10-1/8	8-1/2	27	Not Incl'd
120	2	1/6	1725	240° F ⁽³⁾	125 psi	16-7/8	14-1/4	13-1/2	11	46	Incl'd



121-138 Series

NSF₆ ≤ .25% Lead

Stainless Steel Models
Meet California AB 1953
and Vermont Act 193



Features 121-138 Series

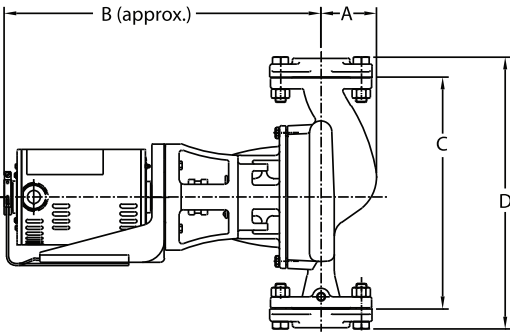
- Bearing Cartridge Design
- Alloy steel shaft
- Cupro-Nickel shaft sleeve
- Two piece carbon/ceramic mechanical seal is standard
- Sealide-C/viton seal available for high temperature and aggressive water applications
- Companion flanges provided in 2-1/2" or 3"
- Impeller is dynamically and hydraulically balanced
- Rugged flexible rubber drive coupling construction absorbs angular and parallel misalignment
- **Rugged motor** is available in single an three phase, and all standard voltages. Open drip proof enclosure
- Equipped with sleeve bearings for quiet operation
- Resilient mounted
- Built-in overload protector on single phase models
- One cartridge bearing assembly fits all models – replace cartridge only, not bracket
- One mechanical seal fits all models

(1) When specifying all bronze construction, add letter "B" after model number (i.e. 132B).
When specifying bronze fitted construction, add letter "C" after model number (i.e. 132C).

MODEL NUMBER ⁽¹⁾	FIANGE SIZE	MOTOR ⁽³⁾		DIMENSIONS				APPROX. SHIPPING WEIGHT LBS.	FLANGES ---
		60C/AC 1 PH	RPM	A IN.	B IN.	C IN.	D IN.		
121	2-1/2"	1/4 HP, 115V	1725	18-1/8	15-7/8	14-1/4	11-1/8	72	Incl'd
122	3"	1/4 HP, 115V	1725	18-1/8	15-7/8	13-5/8	11-1/8	72	Incl'd
131	3"	1/3 HP, 115V	1725	19-1/4	15-3/4	16	13-5/8	95	Incl'd
132	3"	1/2HP, 115/230V or 230/460/60/3 or 200/60/3	1725	21-1/2	18	16	13-5/8	108	Incl'd
133	3"	3/4 HP, 115/230V or 230/460/60/3 or 200/60/3	1725	22-1/8	18-5/8	16	13-5/8	113	Incl'd
138	3"	1 HP, 115/230V or 230/460/60/3 or 200/60/3	1725	22-5/8	19-1/8	16	13-5/8	118	Incl'd

1600 Series In-line Pump

Taco "1600" Series In-Line Pumps combine the ultimate in reliability with ease of installation and maintenance, for heating, air conditioning, pressure boosting, cooling water transfer and water supply applications. Quiet, dependable and proven performance makes the "1600" Series Pump the right choice.



NOTE: Replacement parts and motors for the 1600 pumps are available through Mondale & Associates. Please contact us for more information and pricing.

Features

- Available in cast iron bronze fitted construction or all bronze construction
- Replaceable "cooler running" bearing cartridge extends bearing life
- Designed with permanently sealed greased lubricated ball bearings, making it virtually maintenance free
- Cupro-nickel shaft sleeve
- Standard mechanical seal
- Maximum opening pressure of 175 psi and maximum operating temperature of 300° F.
- One piece enclosed impeller
- Superior parts flexibility
- Flanges included

Pump Dimensions

Model No.		Flange Size	Power			Dimensions			
Custom	Stock		60Hz HP(KW)	1-PH	3-PH	A	B	C	D
1611	1600	1-1/2	1/4*	X		3	16-1/2	10-1/4	12-7/8
	1610		1/3	X	X	3	16-1/2		
			1/2	X	X	3	17.00		
1615	1612	1-1/2	1/3	X	X	3-1/8	18	13-1/2	16-1/8
			1/2	X	X	3-1/8	18-1/2		
	3/4		X	X	3-1/8	19			
	1		X	X	3-1/8	19-1/2			
1619	1616	2	3/4	X	X	3	18-1/2	14-1/2	17-3/8
			1	X	X	3	19		
			1-1/2	X	X	3	21		
			2	X	X	3	23		
1635	1630	2	1/2	X	X	3-1/2	18	13-1/2	16-1/8
	1632		3/4	X	X	3-1/2	18-1/2		
	1634		1	X	X	3-1/2	19		
			1-1/2	X	X	3-1/2	21		
1641	1636	2	1-1/2	X	X	3-5/8	21	16-1/2	19-1/2
	1638		2	X	X	3-5/8	23		
			3		X	3-5/8	24		

- English dimensions are in inches.
- Do not use for construction purposes unless certified.

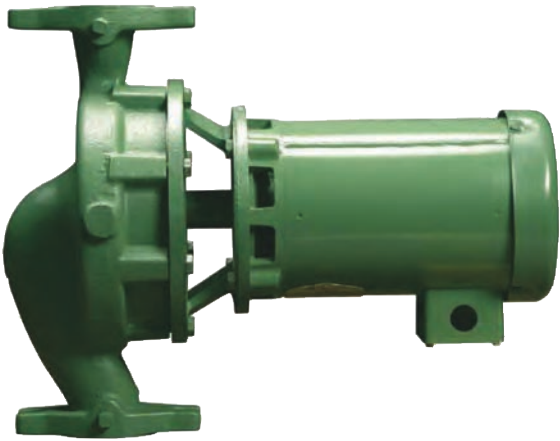
* 1/4 HP Available In 1 Phase Only.

Motor Chart

MOTOR NO.	HP	VOLTAGE	REPLACES
121-151	1/4	115/60/1	---
131-143	1/3	115/60/1	---
132-096	1/2	115/230/60/1	---
1661-022	1/2	200-230/460/60/3	132-097, 230/460/60/3
			132-066, 200-60/3
133-119	3/4	115/230/60/1	---
1661-023	3/4	200-230/460/60/3	133-134, 230/460/60/3
			133-140, 200/60/3
138-119	1	115/230/60/1	---
1661-024	1	200-230/460/60/3	138-142, 230/460/60/3
			138-148, 200/60/3
1636-013	1-1/2	115/230/60/1	---
1661-025	1-1/2	200-230/460/60/3	1636-010, 230/460/60/3
			1636-019, 200/60/3
1638-012	2	115/230/60/1	---
1661-026	2	200-230/460/60/3	1638-010, 230/460/60/3
			1638-015, 200/60/3
1661-027	3	200-230/460/60/3	1640-010, 230/460/60/3
			1640-013, 200/60/3

1900 Series In-Line Pumps

Taco 1900 Series In-Line pumps are compact, energy efficient and can be installed anywhere in the piping layout. The 1900 is designed to be self-supported by the system piping (no additional strapping or external support required) and can be mounted horizontally or vertically. Permanently sealed grease lubricated ball bearings in the motor make it virtually maintenance free. 1900 Series pumps are available with VFD's for variable speed operation.



Features and Benefits

- Cast Iron Bronze Fitted Or All Bronze Construction
- Max Operating Pressure of 175 PSI And Max Operating Temperature of 300°
- Superior Parts Flexibility. One Seal And One Shaft Extension Fits All Models.
- Cupronickel Shaft Sleeve
- "Unitized" Seal Design For Quick & Easy Replacement
- NEMA Standard 56 frame "C" motors
- Flanges Included
- Pressure Tappings Included In Flange Casting For Differential Pressure Readings.

Model #	Speed	Flange Size	H.P.	1-PH	3-PH
1911	1760	1-1/2" (2" OPT)	1/4	X	X
			1/3	X	X
			1/2	X	X
			1	X	X
	3500		1-1/2	X	X
			2	X	X
			3	X	X
			5	X	X
1915	1760	1-1/2" (2" OPT)	1/3	X	X
			1/2	X	X
			3/4	X	X
			1	X	X
			1-1/2	X	X
	3500		2	X	X
			3	X	X
			5	X	X
			7.5	X	X
1919	1760	2"	3/4	X	X
			1	X	X
			1-1/2	X	X
			2	N/A	X
1935	1760	2"	1/2	X	X
			3/4	X	X
			1	X	X
			1-1/2	X	X
			2	X	X
	3500		3	X	X
			5	X	X
			7.5	X	X
1941	1760	2"	1-1/2	X	X
			2	N/A	X
			3	N/A	X

Motor Assembly

Model #	HP	Voltage
121-199RP	1/4	115/208/230/60/1
121-200RP	1/4	200/60/3
121-201RP	1/4	208/230/460/60/3
131-192RP	1/3	115/208/230/60/1
131-193RP	1/3	200/60/3
131-194RP	1/3	208/230/460/60/3
132-169RP	1/2	115/208/230/60/1
132-170RP	1/2	200/60/3
132-171RP	1/2	208/230/460/60/3
132-189RP	1/2	575/60/3*
133-175RP	3/4	115/208/230/60/1
133-176RP	3/4	200/60/3
133-177RP	3/4	208/230/460/60/3
133-191RP	3/4	575/60/3*
138-166RP	1	115/208/230/60/1
138-167RP	1	200/60/3
138-168RP	1	208/230/460/60/3
138-195RP	1	575/60/3*
138-169RP	1-1/2	115/208/230/60/1
138-170RP	1-1/2	200/60/3
138-171RP	1-1/2	208/230/460/60/3
138-196RP	1-1/2	575/60/3*
138-173RP	2	200/60/3
138-174RP	2	208/230/460/60/3
138-187RP	2	575/60/3*

***NOTE: All 575/60/3 motors available as TEFC only.**

The Viridian High Efficiency Circulators

The Taco Viridian is a web-enabled, high efficiency, wet rotor, variable speed commercial pump product line for chilled and hot water applications. All settings and pump access can be done over an internet connection making installation, setup and service easy. The ECM motor saves up to 80% of the electrical energy compared with conventional pumps and its multiple operating modes fit most applications.



Viridian web connections are a snap!



Pump Specifications

- Max. Operating Pressure: 175 PSI (12 bar)
- Water Temperature Range: 14° - 230°F (-10° - 104°C)
- Ambient Operation Temperature Range: 32° - 104°F (0° - 40°C)
- Designed for closed loop heating and cooling systems pumping water or a water/glycol mixture (Wet rotor design)
- Utilizes standard ANSI class 125 flanges
- Over-current protection

Materials of Construction

- Casing.....Cast Iron
- Impeller....Stainless Steel
- Shaft.....Stainless Steel
- Bearing....Metal Impregnated Carbon

Operating Modes

- Constant Pressure Control ($\Delta p-c$)
- Variable Differential Pressure Control ($\Delta p-v$) - factory default
- Proportional Pressure Control
- Constant Curve Duty (uncontrolled pump)
- RPM Regulation
- Power Limitation (amps or watts)

NOTE: The sensorless pump control doesn't need or accept a remote reference signal to operate in any of the modes.

Connecting with crossover cable

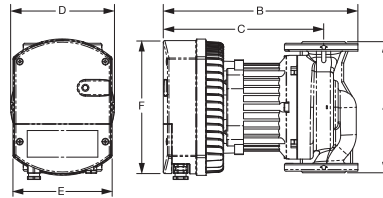


Connecting with LAN cable



Minimum static inlet pressure
A pump suction port
(PSI / bar) to avoid cavitation
at fluid temperatures

Fluid Temperatures	VR15 & VR20 (PSI)	VR25 & VR30 (PSI)
112°F (50°C)	7.3	4.35
176°F (80°C)	11.6	14.5
230°F (110°C)	20.3	23.2



Model Number	Flange Size (ANSI)	Voltage Pump Ratings	Power (HP)	Power Consumption (W)	A	B	C	D	E	F	Weight lbs.
					in.	in.	in.	in.	in.	in.	
VR15	1-1/2"	115-240/1	0.027 - 0.680	20-500 W	9-13/16	15-3/16	12-5/8	7-13/16	7-7/16	10-1/16	57
VR20	2"	115-240/1	0.035 - 1.088	26-800 W	11	16-3/4	13-1/4	7-15/16	7-7/16	10-1/16	71
VR25	2-1/2"	208-240/1	0.054 - 1.496	46-1100 W	13-3/8	17-11/16	14-1/2	8-11/16	7-7/16	10-1/16	82
VR30	3"	208-240/1	0.054 - 2.175	40-1600 W	14-3/16	19-13/16	15-7/8	9-1/4	7-7/16	10-1/16	99

Shut-Off Freedom Swivel Flanges

Taco's Shut-Off Freedom Swivel Flange combines a full-port, ball valve and companion flange to isolate system circulators for easy removal and service, without draining the system. Solid brass uni-body construction, available in 1/2" - 1-1/2" NPT or Sweat connections. The Swivel Flange provides easier installation and positioning of the pump and lever handle in the most convenient locations.



Operating Data

Maximum WP =
150 psi / 600 WOG

Maximum Operating Temp
240°F (115C°)

Features

- Easy 1/4-turn open/close operation
- Positive shut-off, leak free design
- Swivel flange allows 360° rotation
- Solid brass construction
- Chrome/brass valve ball
- High quality Teflon® seats
- Full port ball valve for unrestricted flow
- 150# working pressure
- Includes nuts and bolts

Freedom Flanges Including Bronze Half-Unions



Taco's flanges fit all 00® circulators, and free you from scraped knuckles and jury-rigged tools of yesteryear! Their Easy-On / Easy-Off and sweat designs make quick work of pump installation and maintenance. Now available in Cast Iron, Stainless Steel or Bronze.

Bronze half-unions and shut-off unions allow for easy installation and service of Taco's 003 & 006 Union Connection models. Available in 1/2" and 3/4", threaded or sweat connections.

Size	# of Bolts	Standard or High Velocity	Bronze NPT	Bronze SWT	Stainless NPT	Ductile Cast Iron NPT	SWT Isolation Flange	NPT Isolation Flange	Pumps Covered
1/2"	2	Standard	----	110-522BSF	----	----	SF-050S	SF-050T	005,007-0011,0013-0015,110-113,2400-10,20,45,50
3/4"	2	Standard	----	110-523BSF	110-251SF	110-251F	SF-075S	SF-075T	005,007-0011,0013-0015,110-113,2400-10,20,45,50
1"	2	Standard	----	110-524BSF	110-252SF	110-252F	SF-100S	SF-100T	005,007-0011,0013-0015,110-113,2400-10,20,45,50
1-1/4"	2	Standard	----	110-525BSF	110-253SF	110-253F	SF-125S	SF-125T	005,007-0011,0013-0015,110-113,2400-10,20,45,50
1-1/4"	2	HV	----		194-1540SF	194-1540F	SF-125S-0012	SF-125T-0012	0012,2400-30,40
1-1/2"	2	Standard	----	110-526BSF	110-254SF	110-254F	SF-150S	SF-150T	005,007-0011,0013-0015,110-113,2400-10,20,45,50
1-1/2"	2	HV	----	----	194-1542SF	194-1542F	SF-150S-0012	SF-150T-0012	0012,2400-30,40
2"	2	HV	----	----	----	194-2124F	----	----	0012,2400-30,40
2"	4	HV	185-086B	----	----	185-086C	----	----	2400-60,65,70
2 1/2"	4	HV	185-112B	----	----	185-112C	----	----	2400-70/3
3"	4	HV	185-113B	----	----	185-113C	----	----	2400-70/3

iSeries Electronic Mixing Valve

Taco iSeries Mixing Valves are a breakthrough in precision, cost-effective temperature control for heating systems. The iSeries valves are available in two versions, providing either outdoor reset control or fixed water supply temperature by modulating the position of a 2-way, 3-way or 4-way valve. Additionally, the iSeries valves protect the boiler against flue gas condensation.

Outdoor reset doesn't end at the boiler control! The most comfortable system is one with the lowest possible water temperatures running through the system all the time to match the BTU_h needed by the structure. This keeps your system warm and eliminates overheating and the associated temperature overswings, **delivering the comfort and efficiency your customers expect!** A microprocessor-based outdoor reset control is built right into the valve actuator. All-in-one iSeries Mixing Valves deliver optimum zone-by-zone temperature control. **The 3-way iSeries Mixing Valve with Sweat Union connections is a drop-in replacement for any Thermostatic Mixing Valve.**



iSeries Electronic Mixing Valves

Model#	Connection Size	Cv
I075C2R-2	Outdoor Reset 3/4" SWT, 2-Way	10.3
I100C2R-2	Outdoor Reset 1" SWT, 2-Way	8.9
I075C3R-1	Outdoor Reset 3/4" SWT 3-Way	4.5
I100C3R-1	Outdoor Reset 1" SWT, 3-Way	4.5
I075U3R-1	Outdoor Reset 3/4" SWT Union, 3-Way	3.5
I100U3R-1	Outdoor Reset 1" SWT Union, 3-Way	4.0
I075T4R-1	Outdoor Reset 3/4" NPT, 4-Way	7.0
I100T4R-1	Outdoor Reset 1" NPT, 4-Way	9.3
I125T4R-1	Outdoor Reset 1-1/4" NPT, 4-Way	17.5
I075C2S-2	Setpoint 3/4" SWT, 2-Way	10.3
I100C2S-2	Setpoint 1" SWT, 2-Way	8.9
I075C3S-1	Setpoint 3/4" SWT, 3-Way	4.5
I100C3S-1	Setpoint 1" SWT, 3-Way	4.5
I075U3S-1	Setpoint 3/4" SWT Union, 3-Way	3.5
I100U3S-1	Setpoint 1" SWT Union, 3-Way	4.0

Features

iSeries

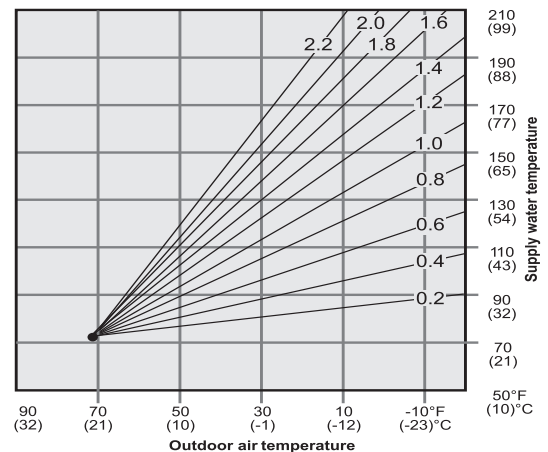
- 2-way injection, 3-way or 4-way mixing
- Operates off constant power or relay end switch
- Ball valve design, high Cv
- Manual operation button
- Solid state microprocessor design
- Compact design
- Easy, one-handed actuator removal
- 125 PSI shut-off pressure
- Plug-in low voltage connections
- Multi-status LED indicator light
- Fail safe mode
- Sensors included

Outdoor Reset

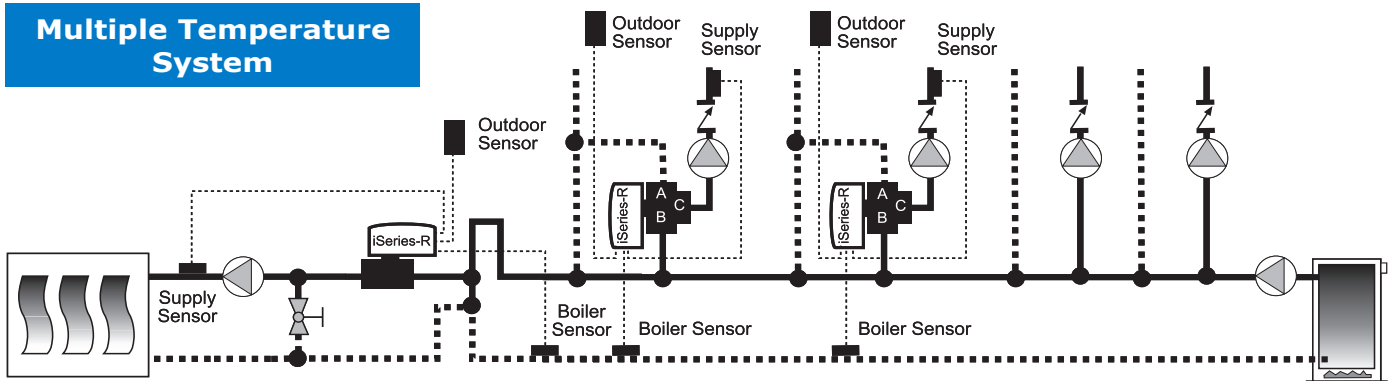
- Selectable maximum supply temperature (110°F, 130°F, 150°F, or off)
- Selectable minimum supply temperature (85°F, when max. supply temp. is set to 150°F or off)
- Adjustable minimum boiler return temperature (120°F, 135°F, or off)
- Warm weather shutdown (70°F or off)
- Adjustable heating curve (0.2-2.2 reset ratio)

Setpoint

- Adjustable setpoint dial (80°F to 180°F)
- Selectable 15°F setback
- Optional boiler protection (Set at 135°F)



Multiple Temperature System



5000 Series Mixing Valve

Taco now offers a variety of mixing valves from heating only to domestic hot water applications. Both "high flow" options and direct mount valves are available. Most models include a built-in check valve and all have the option of adding a temperature gauge. **Additional versions and sizes also available!**

5123-WH-N Series (Direct Mount)



5120 High Flow Series



5000 Heating Only Series

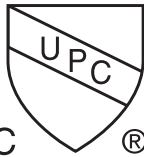


5120 Low Flow Series



NSF® ≤ .25% Lead

Meets California AB 1953 and Vermont Act 193



All union models are available with a stainless steel temperature gauge as shown here.

Thermostatic Mixing Valve

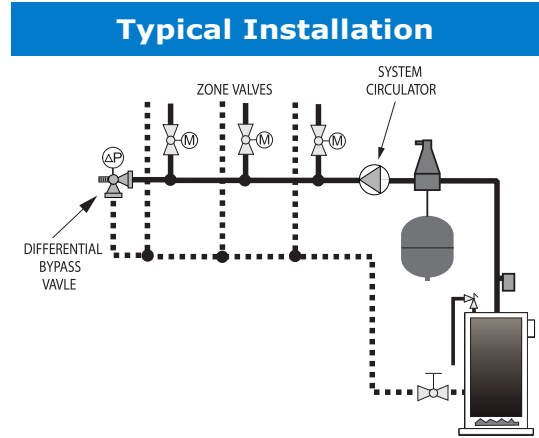
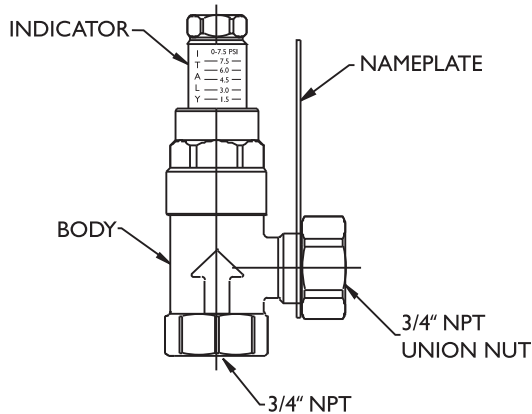
Model	Description	Cv
MIXING VALVES (ASSE 1017) Adjustment 85-176F - All Union Valves Include Built In Check Valves		
5002-C3	Thermostatic Mixing / Tempering Valve, 1/2" Union Sweat	2.3
5003-C3	Thermostatic Mixing / Tempering Valve, 3/4" Union Sweat	2.3
5004-C3	Thermostatic Mixing / Tempering Valve, 1" Union Sweat	2.3
5002-002RP	Gasket set (3) for 5000 Mixing Valves	
5003-C3-G	Thermostatic Mixing / Tempering Valve, 3/4" Union Sweat w/Temp Gauge	2.3
5004-C3-G	Thermostatic Mixing / Tempering Valve, 1" Union Sweat w/Temp Gauge	2.3
MIXING VALVES (Dual ASSE 1070 & ASSE 1017) Adjustment 85-120F - All Union Valves Include Built In Check Valves		
5122-C2	Thermostatic Mixing / Tempering Valve, 1/2" Union Sweat	2.12
5123-C2	Thermostatic Mixing / Tempering Valve, 3/4" Union Sweat	1.63
5124-C2	Thermostatic Mixing / Tempering Valve, 1" Union Sweat	1.37
5123-C2-G	Thermostatic Mixing / Tempering Valve, 3/4" Union Sweat w/Temp Gauge	1.63
5124-C2-G	Thermostatic Mixing / Tempering Valve, 1" Union Sweat w/Temp Gauge	1.37
MIXING VALVES Heating Only (No ASSE) Adjustments 85-176F - All Union Valves Include Built In Check Valves		
5002-HX-C3	Thermostatic Mixing / Tempering Valve, 1/2" Union Sweat	2.3
5003-HX-C3	Thermostatic Mixing / Tempering Valve, 3/4" Union Sweat	2.3
5004-HX-C3	Thermostatic Mixing / Tempering Valve, 1" Union Sweat	2.3
5003-HX-C3-G	Thermostatic Mixing / Tempering Valve, 3/4" Union Sweat w/Temp Gauge	2.3
5004-HX-C3-G	Thermostatic Mixing / Tempering Valve, 1" Union Sweat w/Temp Gauge	2.3
MIXING VALVES HIGH FLOW (ASSE 1017) Adjustments 85-176F - Includes Built In Check Valves		
5124-HF-C1	Thermostatic Mixing / Tempering Valve, 1" Union Sweat, High Flow	4.1
5125-HF-C1	Thermostatic Mixing / Tempering Valve, 1-1/4" Union Sweat, High Flow	4.1
MIXING VALVES DIRECT MOUNT (ASSE 1070 & 1017) Adjustments 90-130F - Includes Built In Check Valves And Recirc connections		
5123-WH-N1	Direct Mount Thermostatic Mixing / Tempering Valve, 3/4" Union NPT	1.2
5120G-1	Outlet Adapter, Union and Temperature Gauge	

Differential Bypass Valve

Differential Bypass Valves are used to control excess flow velocities that can be created when there is a reduction in the demand for heat. This reduced heat demand would typically occur as zone thermostats are satisfied and their corresponding zone valves close, causing the system pump to try and force more water through the remaining zones. By installing a Taco Differential Bypass Valve between the discharge of the system pump and somewhere before the inlet of the pump, usually on the system return, an automatically regulated flow path is created. This regulated flow path will prevent unacceptable velocities from being pumped through the zones that remain open during reduced demand periods. Differential Bypass Valves should also be used to prevent dead heading of the circulator in systems where parallel piped heat emitters are controlled by thermostatic radiator valves.



3196-1



Operation

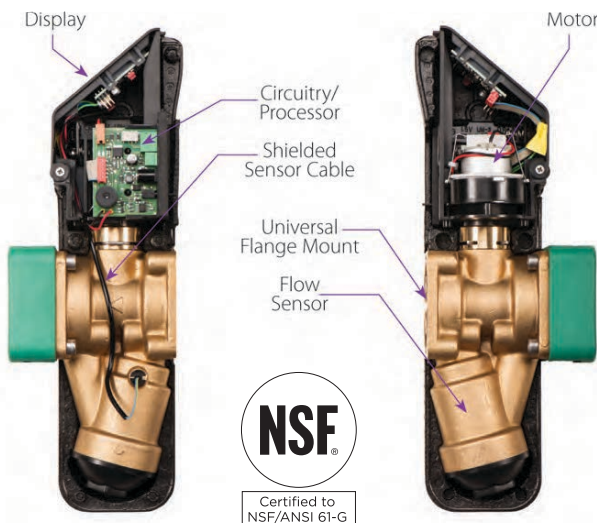
The Bypass Valve uses an adjustable spring loaded seat that opens and closes to allow flow through the valve. This opening and closing is based on the system pressure applied to the valve seat and the set point of the valve.

Ratings

- Maximum Pressure:** 200 PSI
- Maximum Temperature:** 200°F
- Adjustment Range:** 0 to 7.5 PSI

FloodBreaker™ Whole House Water Shut-Off

The Taco FloodBreaker™ is a whole house adjustable leak detection system that monitors several aspects of water usage. It shuts off the water supply once any of the monitored settings are reached. Use FloodBreaker™ to protect homes from water damage, eliminate waste and protect unoccupied or vacation properties. Not only can it protect against a large catastrophic leak but is capable of protecting against the small unnoticed leak that could go on for weeks, months or even indefinitely.



Features

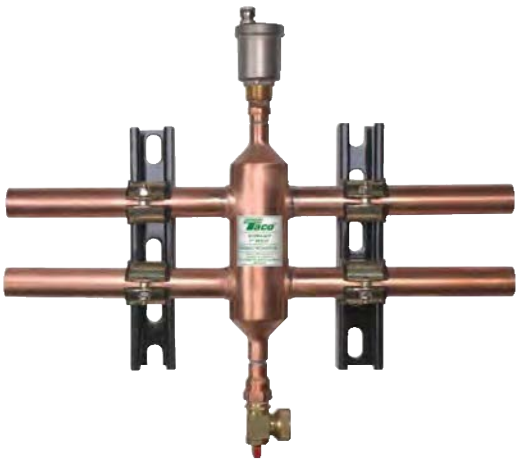
- Programmable leak detection settings
- Programmable vacation mode leak settings
- Audible alarm
- Floor sensor
- Output / Input contact
- Operates on batteries and 9V DC power supply
- Reduces property damage
- Push button reset
- Mounts in horizontal or vertical pipe

FloodBreaker Models

Model #	Description
FB075-1	FloodBreaker, 3/4" Union NPT
FB100-1	FloodBreaker, 1" Union NPT
FB125-1	FloodBreaker, 1-1/4" Union NPT

Hydraulic Separator

Taco's Hydro-Sep™ Hydraulic Separators are compact economical units that allow fast and efficient installation of primary/secondary piping for many different boilers. Installing this unique Hydraulic Separator offers the additional advantages of assisting in the removal of unwanted air and dirt particles, preventing their damaging affects on system components. It is especially suitable for today's smaller boilers that tend to have a much higher flow resistance.



Specifications

Connections:

1" and 1-1/4" / Copper Sweat

Media:

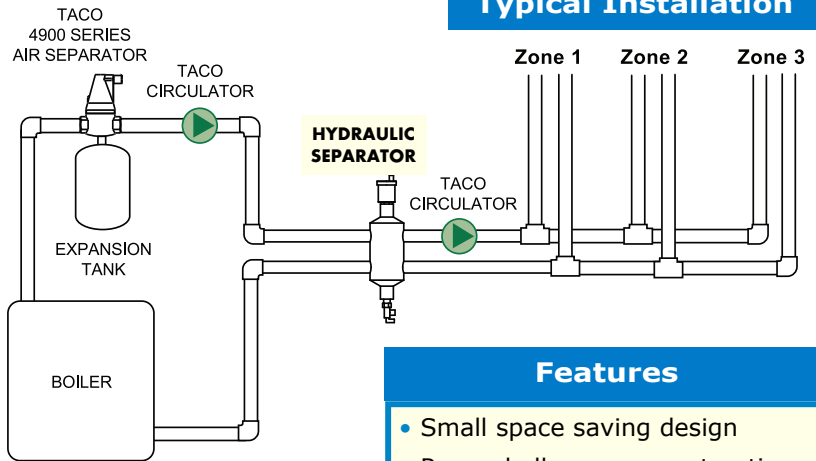
Water or Glycol / Up to 50%

Maximum Pressure:

350 PSIG

Maximum Temperature:

240°F



Typical Installation

Hydro-Sep Hydraulic Separators

Part #	Connection Size	Max Flow (GPM)
HSEP100-1	1" Copper Sweat	11
HSEP125-1	1-1/4" Copper Sweat	15

Features

- Small space saving design
- Rugged all copper construction
- Suitable for use with oxygenated water heating systems
- Blow down port for sediment removal
- High quality, industry standard automatic Taco Hy-Vent®
- Wall mounting brackets

Air Scoop

Taco Air Scoop's enlarged design with internal baffles slows the water velocity in order to separate the air from solution. The air scoop also provides an economic and noiseless way to integrate air elimination with the connection of either a plain steel or diaphragm expansion tank.



Size & Connections

Taco Air Scoops are available in 1" through 3" cast iron threaded and 4" flanged cast iron. Each Air Scoop has an vent connection on top for the installation of a 1/8" Taco 400-3 or 416-1 Hy-Vent, and a 1/2" bottom tapping for a diaphragm expansion tank. The 1-1/2" through 4" Air Scoops also have an additional top tapping for the connection of a plain steel expansion tank.

Dimensions

Model #	Size	Cv
431-6	1"	31
432-6	1-1/4"	54
433-5	1-1/2"	61
434-5	2"	107
435-5	2-1/2"	140
436-5	3"	276
*437-1	4"	600

*This size has 125 lb. flanged ends.

Ratings

Maximum Operating Pressure: 125 PSI (862 kPa)

Maximum Operating Temperature: 300°F (135°C)

Media: Water or Water / Glycol

Recommended Flow Rate: 4 Ft. / Sec.

Maximum Flow Rate: 8 Ft. / Sec.

Features

- One piece cast iron construction
- Never requires any servicing
- Engineered baffle separates air from water

4900 Series Air Separator

The Taco 4900 Series Air Separators are designed for the complete elimination of air from closed loop heating and cooling systems up to a maximum temperature of 240°F and a maximum pressure of 150 psi. The principle on which the Taco 4900 Series Air Separator is based is a patented and proven method of removing gases from water: the PALL ring process. **This is the most effective residential air separator on the market!**



4900 Air Separators Were Proved To Be Better!

Tests carried out at the Delft Technical University have unequivocally proved that 4900 Air Separators remove all micro-bubbles from 15-20 microns and up. This is three times better than comparable high performance Air Separators!

Features

- Patented PALL Ring design
- Eliminates air induced system noise
- Minimal pressure loss
- Vent can be closed
- Large surface contact area
- Protective vent plate
- Rugged dependability
- Maximum air removal
- Convenient expansion tank connection tapping
- No minimum run of pipe requirement
- Bi-directional flow

How It Works

Stainless Steel Pall Rings

An optimum coalescence effect is achieved by the 4900 Series' use of the patented pall ring process. The PALL Ring chamber is engineered to optimize the collision of the flowing system water with the PALL Rings. As a result of this collision, all of the gas containing water particles are brought into contact with the entire pall ring surface area. Even the smallest micro-bubble present in the water will adhere to the surface of a pall ring, allowing coalescence to occur and air to be removed.

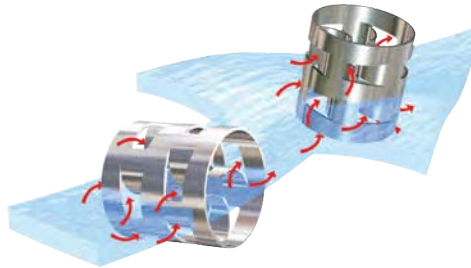
Conical Venting Chamber

The advantage of the conical venting shape is that the distance between the water level and the venting valve is greater than that of a straight air chamber, due to the effects of pressure. Thus any dirt or impurities floating on the fluid within the air separator will remain well clear of the venting mechanism during normal operating conditions. This means that fouling of the gearing and venting valve is reduced to a minimum.

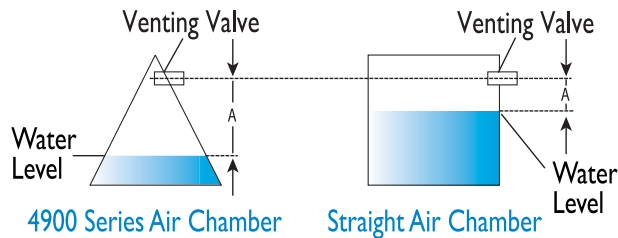
The Coalescence Effect

Both small air bubbles and micro-bubbles will adhere to a surface and join together to form larger air bubbles. These combined bubbles then traverse up through the water and into the air chamber to be released by the vent.

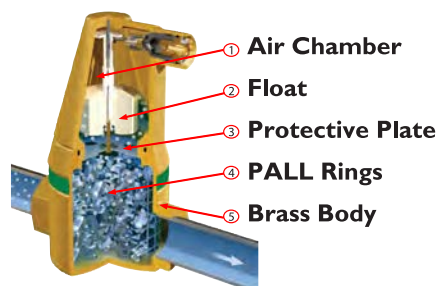
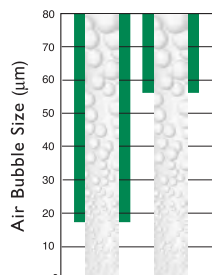
Pall Rings



Water Level



Air Removal



Available Models

Size	NPT	Sweat
3/4"	49-075T	49-075C
1"	49-100T	49-100C
1-1/4"	49-125T	49-125C
1-1/2"	49-150T	49-150C
2"	49-200T	N/A

Ratings

Maximum Operating Pressure: 150 psi

Maximum Operating Temperature: 240°F

Minimum Operating Temperature: 25°F

Media:

Water or Water/Glycol

Maximum Velocity: 5 feet/sec

Automatic Air Vents



Taco automatic air vents have been the industry standard for over 30 years. No matter the application, Taco has the size and style vent to provide unmatched reliable service. Attached to the boiler or used throughout the system, Taco vents automatically purge unwanted air from any hydronic installation, allowing the system to run more efficiently.

***Suitable for use in low pressure steam systems.**
****Outlet connection fits 3/4" ID Flex tubing.**

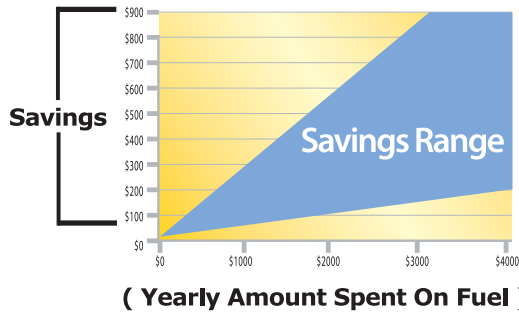
Dimensions

Product Number	Description	A	Bubble Breaker	Max. System Conditions	Max. Venting Pressure
417-3	Taco-Vent® Coin Vent	1/8" NPT	No	*125 psi, 240°F	125 psi
400-4	Hy-Vent®	1/8" NPT	Yes	150 psi, 240°F	50 psi
416-2	Slim-Line Hy-Vent®	1/8" NPT	Yes	150 psi, 240°F	115 psi
426-3	Hy-Vent®	1/4" NPT	Yes	150 psi, 240°F	50 psi
418-4	Hy-Vent®	1/2 x 3/4" NPT	No	150 psi, 240°F	50 psi
419-1	High Pressure Hy-Vent®	1/2 x 3/4" NPT	No	250 psi, 240°F	150 psi
409-3	**Commercially Rated Brass Vent	3/4" NPT	No	150 psi, 240°F	150 psi
414-1	Waste Connector	1/4" NPT	---	150 psi, 240°F	---

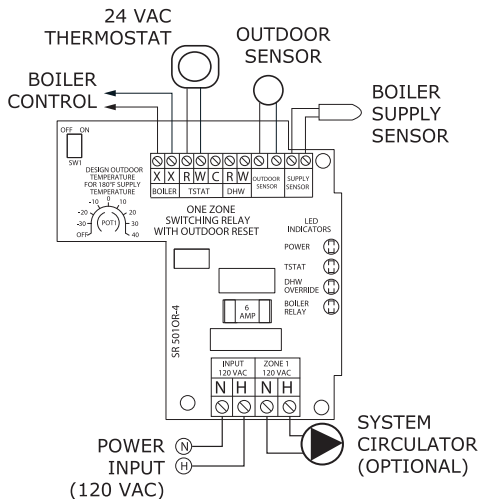
Fuel Miser

The FuelMizer™ (SR501-OR) is a microprocessor-based control designed to regulate the supply water temperature of a single boiler, based on the outdoor temperature. The FuelMizer is a boiler reset control and switching relay in one unit; it is ideal for retrofit application, but may also be used in new installations as well.

Savings from 5% to 30%



FUEL Mizer Outdoor Reset Switching Relay



Features

- Full outdoor boiler reset control
- Can control system or zone valve circulator
- Over-ride of outdoor reset when DHW tank is calling
- Easy to install and set; will not affect boiler's warranty
- Front mounted LED lights for full diagnostic information
- Ideal for retrofit applications of just about any cast iron boiler
- Typical energy savings is about 14% with some customers experiencing up to 30%

Zone Control Family (Switching Relays)

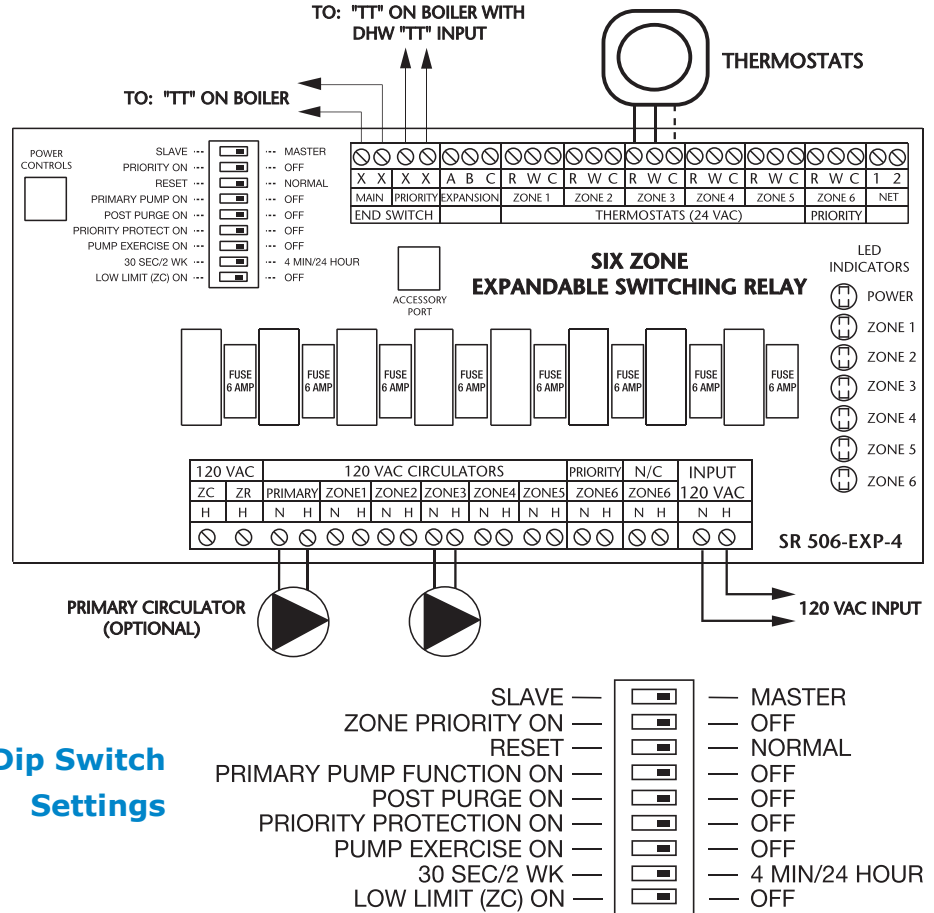
The Taco Switching Relay is the best choice for all your zoning needs, with advanced timer and boiler functions, external diagnostic lights, switchable priority and contractor friendly PC board layouts. Combined with the time proven reliability of the 00[®] family of circulators and thermostats, total system integration is achieved.

More Features

External indicator lights provide instant diagnostic feedback, making a snap of service calls or new installation start-ups. All switching relays are UL listed, and are compatible with conventional and programmable thermostats.

For those larger jobs, the EXP Switching Relays can be expanded up to 120 zones (20 zoning panels) with priority. Taco Switching Relays are available in one, two, three, four and six zones.

Switching Relay Wiring Diagram (Cold Start Boiler)



Features

- Front diagnostic lights
- Simplified wiring
- Premium sealed relays
- Compact design
- Fuse protected (with spare)
- 100% factory tested
- Isolated end switch
- Contractor friendly PC board layout
- Universal thermostat compatibility
- 24 volt power output for hard-wired thermostats
- Field replaceable transformer
- UL approved
- Extended 3-year warranty
- Made in the USA

Additional - EXP Features

- Add-on power control plug
- Built-in; post purge and pump exercise functions
- Switchable primary circulator output
- Two boiler contacts, utilizes full functionality of Mod-Con boilers
- Expandable to 20 zoning panels (120 zones if all are 6 zone panels)
- Interface with-EXP zone valve controls
- Common contact for simplified powered thermostat wiring

Switching Relays

Product #	Description
SR501	1- zone switching relay
SR501-OR	1- zone switching relay with outdoor reset (Fuel Miser)
SR501-HC	1- zone high current switching
SR502	2- zone switching relay with priority
SR503	3- zone switching relay with priority
SR504	4- zone switching relay with priority
SR506	6- zone switching relay with priority

Expandable Switching Relays

Product #	Description
SR501-EXP	1- zone switching relay
SR503-EXP	3- zone switching relay with priority
SR504-EXP	4- zone switching relay with priority
SR506-EXP	6- zone switching relay with priority

Zone Control Family (Zone Valve Controls)

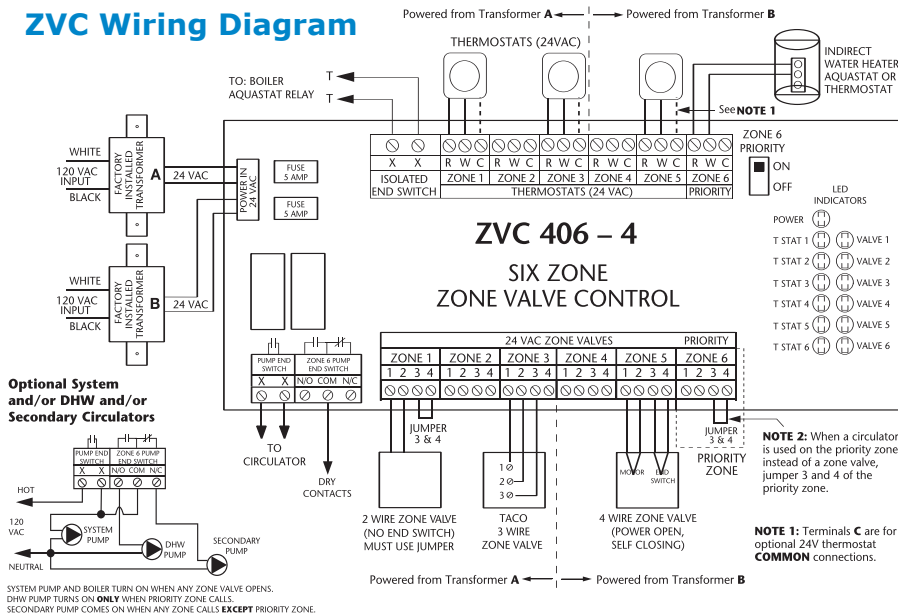
Simplify the wiring nightmare! Taco Zone Valve Controls easy-to follow PC board layout eliminates the problems caused by incorrect wiring, while the external indicator lights provide instant diagnostic feedback. Combined with Taco Zone Valves and Thermostats, the system's performance and dependability is maximized.

External Diagnostics

It's no longer necessary to remove the box cover to troubleshoot the system. External visible indicator lights show full functionality of all products wired to the zone valve controls. When the thermostat calls for heat, both the appropriate zone valve and yellow indicator lights are energized. When the zone valve is fully opened, the end switch relay and red indicator light is then energized.



ZVC Wiring Diagram



Features

- Front diagnostic lights
- Switchable priority
- Built-in priority protection
- Simplified wiring
- Works with 2, 3, or 4-wire Zone Valves
- Compact design
- Fuse protected
- 100% factory tested
- Two pump end switches can control up to 3 pumps; system, secondary and DHW
- Contractor friendly PC board layout
- Universal thermostat compatibility
- 24 volt power output for hard-wired thermostats
- Field replaceable transformer
- UL approved
- Extended 3-year warranty
- Made in the USA

Additional - EXP Features

- Add-on power control plug
- Built-in; post purge and pump exercise functions
- Two boiler contacts, utilizes full functionality of Mod-Con boilers
- Expandable to 20 zoning panels (120 zones if all are 6 zone panels)
- Interface with-EXP switching relays

Zone Valve Controls

Dimension of Enclosure						
Product Number	Number of Zones	Transformer Rating	Transformer Voltage	Width	Height	Depth
ZVC403	3-zone w/priority	40 VA	120 VAC input	10-1/4"	7"	2-3/4"
ZVC404	4-zone w/priority	40 VA	120 VAC input	10-1/4"	7"	2-3/4"
ZVC405	5-zone w/priority	80 VA	120 VAC input	12-1/4"	8"	3"
ZVC406	6-zone w/priority	80 VA	120 VAC input	12-1/4"	8"	3"

Expandable Zone Valve Controls

Dimension of Enclosure						
Product Number	Number of Zones	Transformer Rating	Transformer Voltage	Width	Height	Depth
ZVC404-EXP	4-zone w/priority	80 VA	120 VAC input	12-1/4"	8"	3"
ZVC406-EXP	6-zone w/priority	80 VA	120 VAC input	12-1/4"	8"	3"

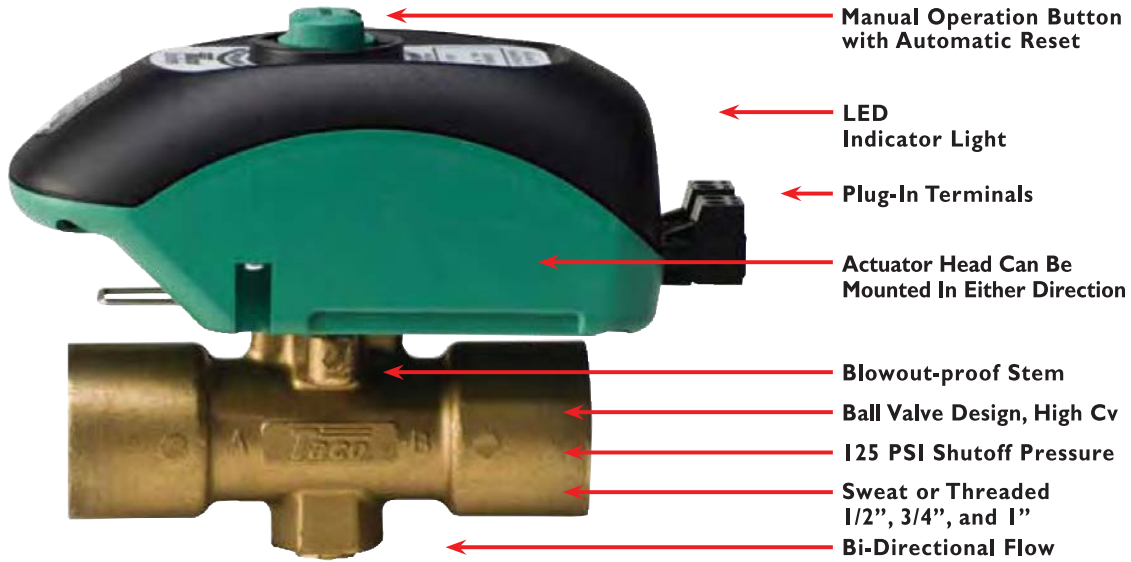
* The pump end switches are rated 1/6 hp, 5 amps at 120 VAC. The main and priority end switch connections are rated 24 VAC, 1 amp. All thermostat and zone valve connections supply a 24 VAC class 2 output.

Add-On Power Controls (For use with all EXP Controls)

Product #	Description
PC700	Boiler Reset Control
PC702	2-Line Stage Boiler Reset Control
PC705	Variable Speed Pump Injection Mixing Control

Zone Sentry® Zone Valves

The Taco Zone Sentry® Zone Valve enhances the overall performance of any zone valve system. The unique patented technology in the Zone Sentry® utilizes a microcircuit based logic to control a gear driven electronic actuator which drives a ball valve based body design. All this adds up to a zone valve that leads the industry in energy efficiency, flow capacity (Cv), shutoff pressure rating, ease of installation, diagnostic capability and the number of valves (12) that can be used on a standard 40VA transformer. The Taco Zone Sentry® zone valves are available in sweat, threaded and 3-way configurations.



Zone Sentry Zone Valves			
Model	Description	Cv	Size
ZONE VALVE			
Z050C2	Zone Valve - 2 Way	4.9	1/2" SWT
Z075C2	Zone Valve - 2 Way	10.3	3/4" SWT
Z100C2	Zone Valve - 2 Way	8.9	1" SWT
Z050T2	Zone Valve - 2 Way	4.9	1/2" NPT
Z075T2	Zone Valve - 2 Way	10.3	3/4" NPT
Z100T2	Zone Valve - 2 Way	8.9	1" NPT
Z050C3	Zone Valve - 3 Way	1.5	1/2" SWT
Z075C3	Zone Valve - 3 Way	3.3	3/4" SWT
Z100C3	Zone Valve - 3 Way	3	1" SWT
Z050T3	Zone Valve - 3 Way	1.5	1/2" NPT
Z075T3	Zone Valve - 3 Way	3.3	3/4" NPT
Z100T3	Zone Valve - 3 Way	3	1" NPT
ZA024Q4A1	Zone Actuator Head (normally closed)	----	ALL SIZES
ZB024Q4A1	Zone Actuator Head (normally open)	----	ALL SIZES

Specifications

- Maximum Operating Pressure**.....300 PSI (2,100 kPa)
- Maximum Shutoff Pressure**.....125 PSI (875 kPa)
- Fluid Temperature Range**.....20° to 240°F, (-7° to 115°C) @135°F
- Heat Anticipator Setting**.....0.5 Amps
- End Switch Rating**.....1 Amp @ 24 VAC

Features

- Simple to install in any direction or orientation
- Up to 12 zone valves per 40 VA transformer
- Uses only 1.44 watts while power is on
- High flow, low headloss characteristics
- Universal compatibility
- Push-button engage and disengage design eliminates gear and spring damage
- Plug-in screw terminals for easy installation and operation
- External LED status light
- Fewer moving parts for extended product life
- **Service**... Water or Water / Glycol up to 50% Glycol
- **Electrical Rating**... 24 VAC, 60 Hz, 0.48 Amps
- **Power Consumption, Charging**... 11.4 Watts, 0.48 Amps Max
- **Power Consumption, Power On**... 1.44 Watts, 0.06 Amps

Potable Water Zone Sentry® Zone Valve

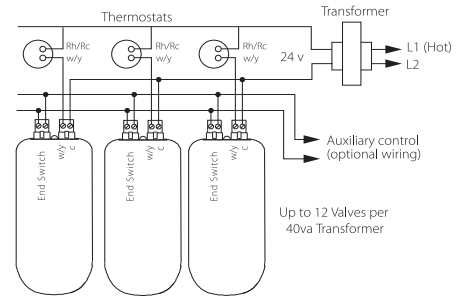
The Taco Potable Water Zone Sentry® Valve is available in a 2-way sweat configuration with either a normally open or normally closed actuator. Some typical installations would include a combination domestic water and hydronic heating system, culinary installation or water shut off to a potable system.



≤.25% Lead



Typical Potable Water Zone Sentry® Zone Valve



Available Zone Valve Sizes

Model #	Description	CV	Size
V050CD2ZA024AQ4A1	Potable Zone Valve / 2-Way (Closed)	4.9	1/2" SWT
V075CD2ZA024AQ4A1	Potable Zone Valve / 2-Way (Closed)	10.3	3/4" SWT
V050CD2ZB024AQ4A1	Potable Zone Valve / 2-Way (Open)	4.9	1/2" SWT
Z075CD2ZB024AQ4A1	Potable Zone Valve / 2-Way (Open)	10.3	3/4" SWT

Geo-Sentry® Zone Valve

The Geo-Sentry® Zone Valve provides on off, normally open or normally closed control and is especially suited for use in either open or closed loop geothermal systems with water source heat pumps.



Geo-Sentry Zone Valves

Model	Description	Cv	Size
GEO-SENTRY ZONE VALVE			
	Normally Open (B)		Normally Closed (A)
V075C2G2ZA024Q4A1	Geo-Sentry Zone Valve - 2 Way	10.3	3/4" SWT
V100C2G2ZA024Q4A1	Geo-Sentry Zone Valve - 2 Way	8.9	1" SWT
V075T2G2ZA024Q4A1	Geo-Sentry Zone Valve - 2 Way	10.3	3/4" NPT
V100T2G2ZA024Q4A1	Geo-Sentry Zone Valve - 2 Way	8.9	1" NPT
V075C3G1ZA024Q4A1	Geo-Sentry Zone Valve - 3 Way	3.3	3/4" SWT
V100C3G1ZA024Q4A1	Geo-Sentry Zone Valve - 3 Way	3	1" SWT
V075T3G1ZA024Q4A1	Geo-Sentry Zone Valve - 3 Way	3.3	3/4" NPT
V100T3G1ZA024Q4A1	Geo-Sentry Zone Valve - 3 Way	3	1" NPT

* Also available in 1/2" sizes.



The "NEW" Geo-Sentry® utilizes a microcircuit based logic to control a gear driven electronic actuator.

Heat Motor Zone Valves

Taco Heat Motor Zone Valves provide a convenient way to create individual zones or equipment isolation in a hydronic heating system. Utilizing one pump along with multiple zone valves, flow can be started, stopped, or diverted through the system to provide individual room or area comfort control and energy savings. Taco offers many versions and sizes of the Heat Motor Zone Valve to meet all your zone valve needs.

Choosing The Right Valve...

Geothermal Valves (Models 5101G, 556G, 557G)

Designed for high head, open system zone control. The unique end switch design permits control of the heat pump by the valve. This allows movement of cold water into the coil before the heat pump actually starts.



Available Models– Geothermal

Model #	Description
556-G3	3/4" Sweat Zone Valve 2-Way
557-G3	1" Sweat Zone Valve 2-Way
5101-G2	3/4" NPT Zone Valve 2-Way
555-173RP	Power Unit For Geothermal Valves

560 Series (560, 561, 562)

A 3-Way bypass version of the 570 Gold Series. This valve is used to control the flow to a fan coil or terminal heating unit.



Available Models– 560

Model #	Description
561-5	3/4" Sweat Zone Valve 3-Way
562-5	1" Sweat Zone Valve 3-Way
555-154RP	Power Unit For 560 Zone Valves (-4 & -5)
555-151RP	Power Unit For 560 Zone Valves (-2 & -3)

570 Gold Series (570, 571, 572, 572)

The Gold Series is the industry standard for hydronic heating applications. The quiet and dependable operation has made this valve an industry leader for decades. The manual open lever and twist off head makes installation and service easy.

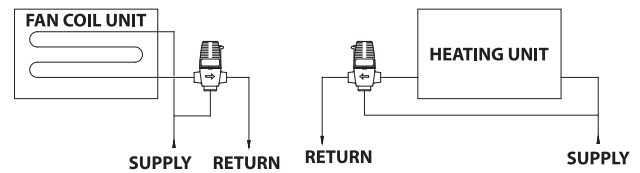


Available Models– 570

Model #	Description
571-2	3/4" Sweat Zone Valve 2-Way
572-2	1" Sweat Zone Valve 2-Way
573-2	1-1/4" Sweat Zone Valve 2-Way
555-050RP	Power Unit For 570 Series Valves

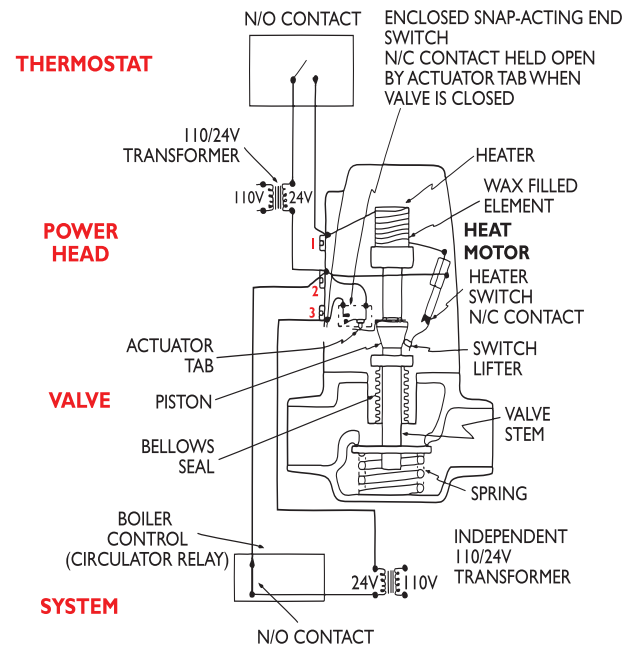
Features

- Proven performance – millions in use
Taco Zone Valves are the industry's top choice for consistent performance
- Rugged dependability
- Silent operation
- Twist off head
- Bellows or Globe Valve Construction ensures positive shut-off and leak proof operation
- Patented construction
- Easy to install
- Manual open (bypass) lever
- 24 VAC powered with isolated end switch
- 100% factory tested
- Made in the USA



560 Series (3-Way Valve Piping)

Zone Valve Operation and Wiring



Flo-Chek Valves

Taco Flo-Cheks are used in a forced hot water heating system to prevent “gravity” circulation during periods when the boiler is hot but the space heating zone is not wanted. This makes it possible for the use of the heating boiler to maintain domestic hot water year round. In systems with multiple circulator zones, Flo-Cheks allow heat to flow only into the zones that are calling for heat. Also, the thumb screw can be manually opened for gravity feed applications if the main circulator stops operating.



Size & Connections

Available in 3/4” and 1” bronze sweat in-line design or 3/4” - 2” cast iron universal threaded body design. The Taco MPV can be used for sizes above 2”.

Size and Body Construction

Product Number	Size	Body
219-4	3/4”	Bronze
241-4	1”	Bronze
218-3	3/4”	C.I.
220-6	1”	C.I.
221-6	1-1/4”	C.I.
222-6	1-1/2”	C.I.
223-5	2”	C.I.

Specifications

Maximum Operating Pressure: 125 PSI (862 kPa)

Maximum Operating Temperature: 277°F (136°C)

Media: Water or Water / Glycol

Cartridge Style Pressure Reducing Valve

Taco’s 3350-T Cartridge Style Pressure Reducing Valve sets a new standard for performance and serviceability. All the parts are contained in a one piece cartridge which can be easily removed and serviced without reducing the system pressure. A fast-fill mode that automatically returns to the normal mode when the set pressure is reached and delivers increased flow to speed system fill times while its unique dial-in pressure setting allows for easy adjustment throughout the 10-50 psi range, without the need for an external gauge. The cartridge will automatically feed water to a system whenever pressure in the system drops below the pressure setting of the valve.



3350-T3



Convenient One-Piece Cartridge

Features

- Automatic pressure reset from fast fill
- Easy external dial-up pressure setting
- Set pressure indicator
- Simple serviceability with the unique one piece cartridge
- Internal check allows the cartridge to be replaced without draining the system
- Integral strainer
- ASSE 1003

Specifications

Max. Inlet Pressure: 250 psi

Adjustment Range: 10-50 psi

Max. Temp: 210° F

Factory Setting: 12 psi

Media: Water

Boiler Feed Pressure Reducing Valves

Taco Boiler Feed Valves have set the standards for dependable service. Each valve is adjustable from 10 to 25 psi, has a built-in check to prevent the emptying of the system if incoming pressure fails, and the easy to use fast fill lever is lockable. The Dual Control combines the Boiler Feed with an in-line Pressure Relief Valve. The valve automatically feeds water to a system whenever pressure in the system drops below the pressure setting of the valve. The Dual Control combines the Boiler Feed Valve with an in-line Pressure Relief Valve connected at the outlet end.



Features

- Fast Fill rate on all models
- Exclusive Fast Fill Lever Lock
- Built-In check to prevent emptying the system if incoming pressure fails
- Adjustable set pressure of 10 to 25 psi
- Pressure setting adjustment separated from Fast Fill Lever for easy, fast adjustment

Performance Data

PRESSURE REDUCING VALVES

Maximum Fluid Temperature:
212°F (100°C)

Maximum Supply Side Pressure:
100 psi (689kpa)

Set Pressure Range:
10-25 psi (69-172kpa)

Factory Setting of System Side:
12 psi (83kpa)

DUAL CONTROLS

Maximum Fluid Temperature:
212°F (100°C)

Maximum Supply Side Pressure:
100 psi (689kpa)

Relief Valve Set to Release at:
30 psi (207kpa)

Connection Sizes

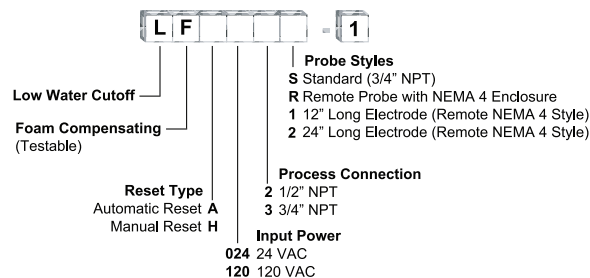
Model #	Description
329-4	1/2" Sweat Union Inlet, 1/2" NPT Outlet
329-T4	1/2" NPT Union Inlet, 1/2" NPT Outlet
335	3/4" NPT Union Inlet, 3/4" NPT Outlet
334-3	1/2" Sweat Union Inlet, 1/2" NPT Outlet Dual Control
334-T3	1/2" NPT Union Inlet, 1/2" NPT Outlet Dual Control

Low Water Cutoff (LWCO)

For accurate and dependable boiler protection, our Low Water Cutoff (LWCO) is a probe style, microprocessor based control that detects the fluid level in hot water and steam boilers. The LF uses Taco's patented DualVision™ technology to know the difference between foam, water, and even probe buildup. It's patented signal processing technology, external LEDs and simplified wiring make installation and testing a snap. It features the simplicity, reliability and unmatched quality you've come to expect from Taco Electronic Controls.



LF Ordering



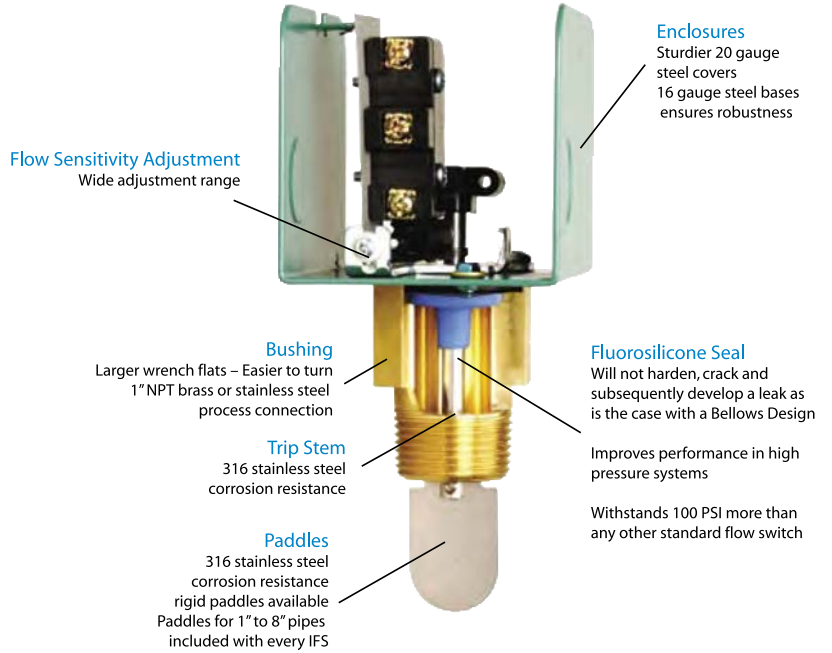
Features

- 120 and 24 VAC models
- Automatic and manual reset
- 1/2" and 3/4" NPT connection sizes
- Foam compensating
- Automatic delay on make (DOM)
- Automatic delay on break (DOB)
- Direct probe to control connection
- NEMA 4 remote probe
- Extended length remote probes
- External LEDs
- Test button
- Service LED
- Tri-barrier terminal blocks
- Listings and approvals
- Probe connections
- Electrical knock-outs
- Made in the USA

Unlike the competition, the LF won't shut down your boiler on a false low water condition due to a dirty probe, or shut down every 10 minutes to check for proper water level. You can now run your steam boiler flat out for a significant gain in efficiency and operational safety.

Industrial Flow Switch

The Taco Industrial Flow Switch (IFS) starts or stops electronically operated equipment when a flow or no flow condition occurs. The IFS can be used in 1" to 8" liquid flow lines, carrying water or any nonhazardous fluid not harmful to brass, stainless steel or fluorosilicone. It is used in a wide variety of applications including heating systems, domestic water boosters, process work, water systems, chillers and on low mass boilers.

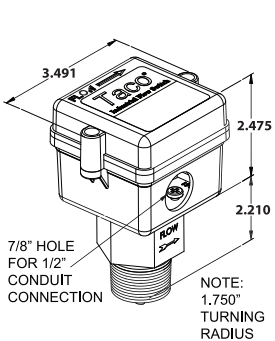


IFS Ordering

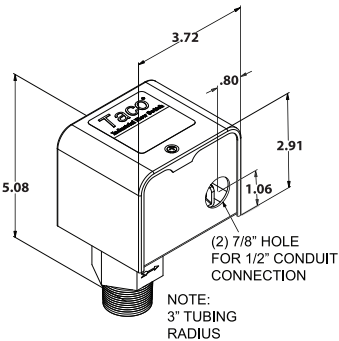


- Process Connection**
F Flexible Paddles
R Rigid Paddles
- Bushing Material**
B Brass
S 316 Stainless Steel
- Model**
01 Single Switch Model
02 Double Switch Model
H1 High Current Single Switch Model
H2 High Current Double Switch Model
WS NEMA4, Small Turning Radius
W2 NEMA4, Double Switch Model

Models IFS01/02/H1/H2



Models IFSWS



Notes:

- Typical flow rates for 1" to 1-1/2" pipe sizes are averages which may vary approximately ± 1 GPM with the use of a bronze reducing tee.
 - Typical flow rates for 2" to 8" pipe sizes are averages which may vary approximately $\pm 10\%$ GPM with the use of a 1" weldolet.
- (*) Flow rates for these sizes are calculated.

Better Materials... Better Performance!

Features

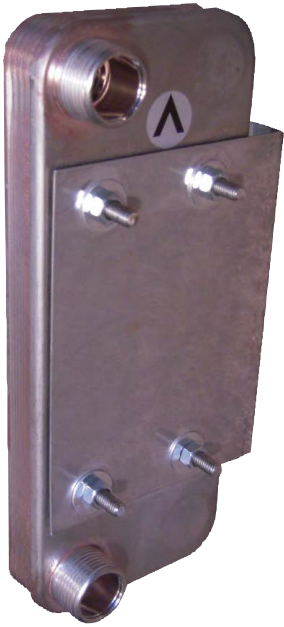
- 3 year warranty
- Fluorosilicone seal superior to competitor's mechanical bellows
- Little mechanical wear or fatigue
- Greater flow sensitivity and wider adjustment range
- Higher pressures, 250 psi standard
- 250°F temperature rating
- Stainless steel paddles and trip rods
- NEMA 1 and NEMA 4 models
- Single or double switch models
- High current models available
- For use on 1" to 8" diameter pipe
- UL, CSA, CE approved

Typical Flow Rates-GPM Required to Actuate Switch (For Vertical Pipe Installations)

Pipe Size		1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	5" *	6"	8" *
Minimum Adjustment	Flow Increase	4.5	4.5	6.0	7.5	13.5	18	35	50	70	210
Minimum Adjustment	Flow Decrease	3.5	3.5	5.0	5.5	9.5	13	25	40	60	190
Maximum Adjustment	Flow Increase	9.5	10	13.5	20.0	29	50	70	120	180	410
Maximum Adjustment	Flow Decrease	7.0	8.5	10.5	18.5	26	45	65	105	160	380

Compact Brazed Plate Heat Exchangers

Experience more efficient heat transfer solutions in your heating application! The list of applications that operate more efficiently with Compact Brazed Plate Heat Exchangers, is a long one: boilers, steam, solar panels, floor heating, snow melting and so on...

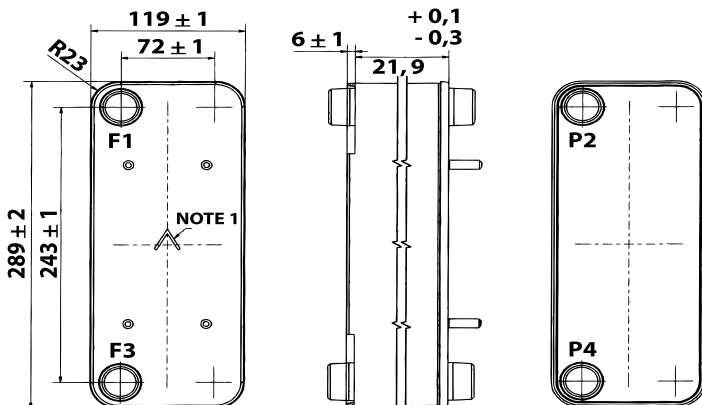
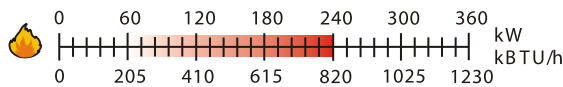


A **DOVER** COMPANY



***Mondale stocks several sizes of B10 (roughly 5"x12") single-wall models with the "Front and Back" connections and some sizes of B16 double-wall models. SWEP also manufactures many other types of brazed plate heat exchangers. Up to 3 + million BTUs. Please call us for sizing, pricing and availability. Dimensions for our B10T models are provided below.**

Port diameter		Max flow rate		Max heat transfer area	
mm	inch	m ³ /h	usg/min	m ²	ft ²
24	1"	12	53	4.3	41



NOTE 1 Alternate Marking: Sticker or Stamp

Features

- Made from stainless steel and manufactured with the highest of quality
- Delivered with full traceability and verified functionality
- Approved by leading independent international bodies such as PED, UL, KHK, CSA
- Manufactured in the USA and Sweden

Brazed Plate Heat Exchangers (Single Wall)

Part #	Description	BTU/h
B10TH-BKT	Wall Mount Bracket for Front and Back Connections	---
B10THX-8FB	B10TH x 8/1P-SC-S 2 x 1" PTF / 2 x 1" PTF	65,000
B10THX-10FB	B10TH x 10/1P-SC-S 2 x 1" PTF / 2 x 1" PTF	90,000
B10THX-12FB	B10TH x 12/1P-SC-S 2 x 1" PTF / 2 x 1" PTF	110,000
B10THX-16FB	B10TH x 16/1P-SC-S 2 x 1" PTF / 2 x 1" PTF	150,000
B10THX-20FB	B10TH x 20/1P-SC-S 2 x 1" PTF / 2 x 1" PTF	185,000
B10THX-24FB	B10TH x 24/1P-SC-S 2 x 1" PTF / 2 x 1" PTF	220,000
B10THX-30FB	B10TH x 30/1P-SC-S 2 x 1" PTF / 2 x 1" PTF	270,000
B10THX-36FB	B10TH x 36/1P-SC-S 2 x 1" PTF / 2 x 1" PTF	320,000
B10THX-40FB	B10TH x 40/1P-SC-S 2 x 1" PTF / 2 x 1" PTF	345,000
B10THX-50FB	B10TH x 50/1P-SC-S 2 x 1" PTF / 2 x 1" PTF	405,000
B10THX-60FB	B10TH x 60/1P-SC-S 2 x 1" PTF / 2 x 1" PTF	455,000
B35HX30	B35 Model (9.5" x 15.4") 1-1/2" NPT	610,000
B35HX50	B35 Model (9.5" x 15.4") 1-1/2" NPT	920,000

(Double Wall)

Part #	Description	BTU/h
B16DW x 10	B16DW x 10 / 1P-SC-S4* 1" NPT	60,000
B16DW x 30	B16DW x 30 / 1P-SC-S4* 1" NPT	205,000
B16DW x 50	B16DW x 50 / 1P-SC-S4* 1" NPT	350,000
B16DW x 70	B16DW x 70 / 1P-SC-S4* 1" NPT	480,000

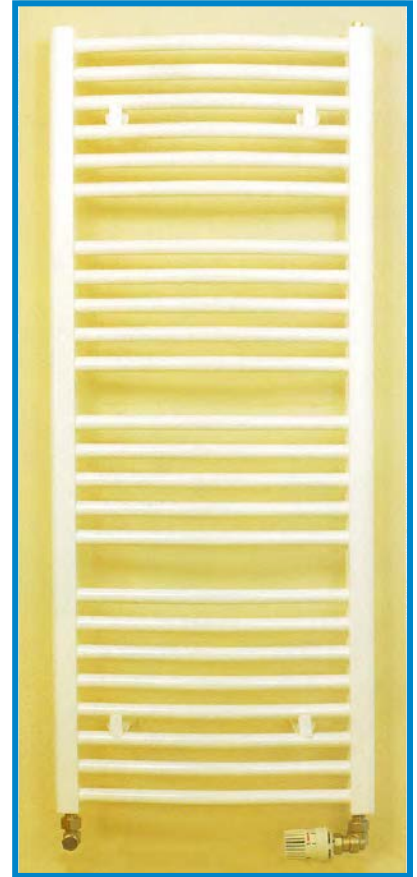
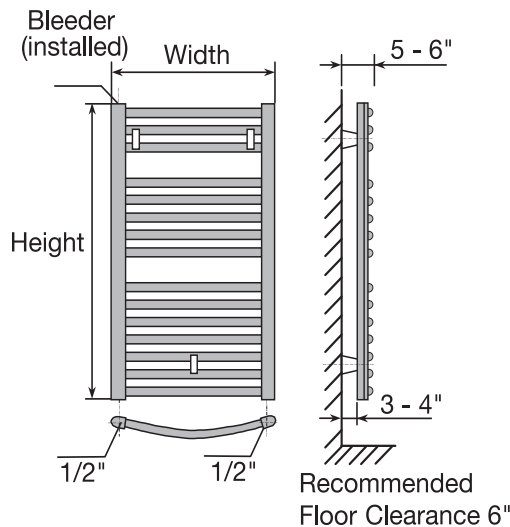
*** Delivered Outputs At Design Conditions Are: Side A (Water) - 180 Supply/150 Return**

"Noblesse NB" Towel Warmers

Built in Germany to the highest design and quality standards, DiaNorm's "Noblesse NB" Towel Warmers provide affordable comfort and elegance, plus individual room temperature control. "Noblesse NB" Towel Warmers are made of precision round 1"x 1mm steel tubes. The horizontal bars are slightly bent forward, the vertical tubes are "D"- shaped and straight (1-1/2" x 1.5 mm).

Features

- **5-Year Limited Warranty**
- Designed for hot water (no steam) and operating pressures of up to 120 psi and temperatures of up to 220° F
- Supply and return water tapplings (1/2" fem) located at bottom of vertical tubes and reversible
- Standard 1/8" air bleeder installed at top of right hand vertical tube
- Mounting brackets included
- Standard finish is white epoxy powder coating to RAL 9016 which can be easily painted any color



Specifications

Part #	Height x Length	BTU Outputs @ 180° F
DN43224	32" x 24"	1,760
DN44824	48" x 24"	2,640
DN47124	71" x 24"	3,960

Panel Radiator and Towel Warmer (Valves & Accessories)

Part #	Product Description
H-1082	Return Angle Valve 1/2" (For towel warmers)
H-1365	Thermostat (WHITE)
H-5813	1/2" 2-Pipe Isolation Valve (STRAIGHT)
H-5814	1/2" 2-Pipe Isolation Valve (ANGLED)
H-5933	1/2" 2-Pipe Diverter Valve (STRAIGHT)
H-5934	1/2" 2-Pipe Diverter Valve (ANGLED)
H-6062	1/2" Double Angle Valve LH (For towel warmers)
H-6063	1/2" Double Angle Valve RH (For towel warmers)
H-6864	1/2" Copper Compression Fittings (Pair)
H-F6674	Dual Floor Escutcheon
H-WKL	Tubing Cover

Panel Radiators

More comfort, less wall space! Built in Germany to the highest design and quality standards, DiaNorm's panel radiation products combine comfortable radiant heat with individual room temperature control. DiaNorm radiators take up to **75% less wall space** and generate comfortable heat at lower water temperatures than baseboard heating products.

DiaNorm radiators are built to the highest quality standards and carry quality seals such as **DIN, TÜV, EN, RAL, NF** etc. The factory has been one of the first to receive **ISO 9002 Certification**. If properly installed, DiaNorm radiators come with a **5-year Limited Warranty**.



Features

- Made of high quality 1.25mm FePO1 steel
- Epoxy powder coating, white finish to RAL 9010
- Water connections are not exposed but located at bottom
- Can utilize thermostatic radiator valve for non-wire zoning
- Can be piped with plastic "PEX" Tubing, making it much easier to install than copper

Stocked

Specifications (Type 22, 3-3/4")

Part #	Height x Length	BTU Outputs @ 180° F
DN20848	8" x 48"	3757
DN20864	8" x 64"	5005
DN20872	8" x 72"	5633
DN21224	12" x 24"	2317
DN21236	12" x 36"	3477
DN21248	12" x 48"	4637
DN21616	16" x 16"	1931
DN21624	16" x 24"	2900
DN21636	16" x 36"	4347
DN21648	16" x 48"	5797
DN22016	20" x 16"	2368
DN22024	20" x 24"	3555
DN22036	20" x 36"	5330
DN22048	20" x 48"	7107
DN22416	24" x 16"	2757
DN22424	24" x 24"	4135
DN22436	24" x 36"	6203
DN22448	24" x 48"	8271
DN22472	24" x 72"	12409
DN23616	36" x 16"	3862
DN23636	36" x 36"	8690

Non-Stocked

Specifications (Type 22, 3-3/4")

Part #	Height x Length	BTU Outputs @ 180° F
DN21264	12" x 64"	6183
DN21272	12" x 72"	6954
DN21664	16" x 64"	7728
DN21672	16" x 72"	8697
DN22064	20" x 64"	9475
DN22072	20" x 72"	10663
DN22464	24" x 64"	11031
DN23672	36" x 72"	17381

Specifications (Type 11, 2-1/2")

Part #	Height x Length	BTU Outputs @ 180° F
DN11616	16" x 16"	1143
DN11624	16" x 24"	1713
DN11636	16" x 36"	2569
DN11648	16" x 48"	3426
DN11664	16" x 64"	4569
DN11672	16" x 72"	5142
DN12016	20" x 16"	1396
DN12024	20" x 24"	2092
DN12036	20" x 36"	3139
DN12048	20" x 48"	4187
DN12064	20" x 64"	5582
DN12072	20" x 72"	6278
DN12416	24" x 16"	1638
DN12424	24" x 24"	2457
DN12436	24" x 36"	3685
DN12448	24" x 48"	4913
DN12464	24" x 64"	6551
DN12472	24" x 72"	7370

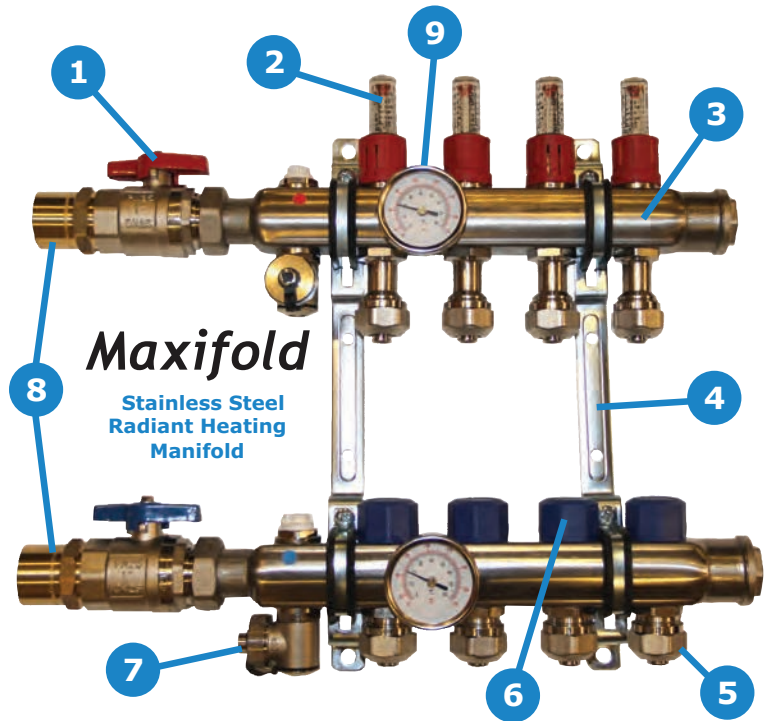


Maxifold Radiant Heating Manifold

The stainless steel Maxifold manifold provides quality craftsmanship and maximum comfort in radiant heating for your home. It's a wise choice as part of your overall hydronic heating system.

Features

- 1** Full-Port Ball Valves (optional)
- 2** Adjustable flowmeters allow flow to be set at up to 2 gallons per minute per loop
- 3** High-quality 1-1/2" stainless steel manifold. The slim profile fits conveniently in joist space
- 4** Mounting brackets included
- 5** Compression fittings available for 5/16", 3/8", 1/2", 5/8" and 3/4" Pex tubing. These fittings can be used with most brands of Pex tubing.
- 6** Actuator Zone Valves (optional)
- 7** Fill valve swivels to allow piping from either direction. The fill valve cap also serves as the tool to open the fill and bleeder valves
- 8** 1" Sweat Manifold Transitions (Included)
- 9** Well for optional thermometers



Extension Valves



Extension Flow Meter

Stainless Steel Radiant Manifold

Product #	Description
H - 4172	For 2 Branches
H - 4173	For 3 Branches
H - 4174	For 4 Branches
H - 4175	For 5 Branches
H - 4176	For 6 Branches
H - 4177	For 7 Branches
H - 4178	For 8 Branches

Extension Kit

Product #	Description
H - 4172 EXT	For 2 Additional Branches
H - 4173 EXT	For 3 Additional Branches
H - 4174 EXT	For 4 Additional Branches
H - 4175 EXT	For 5 Additional Branches
H - 4176 EXT	For 6 Additional Branches

Accessories

Product #	Description
H - 2496	Electrothermal Actuator (4 Wire)
H - 4004	Caps For Unused Loops (Pair)
H - 4008	Sweat Tails (Pair)
H - 4700	Full-Port Ball Valves (Pair)
H - 6815	Gasket for 1" Manifold Tail Piece (Pair)
H - 4900	Thermometers

Electrothermal Actuators (LH)

Product #	Description
H - 2496	Normally Closed w/End Switch 4-Wire

Compression Fittings (EK-20 Size)

Product #	Description
H - 6848	5/16" Pex Compression Fittings (Pair)
H - 6849	3/8" PEX
H - 6850	1/2" PEX
H - 6851	5/8" PEX
H - 6852	3/4" PEX
H - 6864	1/2" Copper Compression Fittings
H - 6950	1/2" Pex-Al-Pex

FERNOX Products

Fernox has developed a reliable and trusted product portfolio covering everything from water treatment cleaners and inhibitors to solders and fluxes. These products have been used successfully in Europe for many years and are approved for use by most boiler manufacturers. There's specialist equipment such as powerflushing machines and scale reducers, plus renewable technologies including heat transfer fluids and underfloor corrosion inhibitors. Fernox also produces some quick-fix products for emergency repairs.

Environmentally responsible

All of Fernox's products are formulated and packaged in a way that aligns with the company's corporate and social responsibility policy. Each product is designed to contribute to maximizing energy efficiency, reducing both fuel consumption and the carbon footprint of it's business, industrial and domestic customers.

Express Cans (Pressurized) / For Systems up to 26 Gallons (265 ml Sizes)



Protector F1 Express
Part #: F-59900

- Long term protection against corrosion and limescale
- Multi-metal safe




Boiler Noise Silencer F2 Express
Part #: F-59901

- Reduces boiler noise
- Improves heat transfer efficiency




Leak Sealer F4 Express
Part #: F-59903

- Stops small leaks
- Ideal for reducing pressure loss from sealed system




Cleaner F5 Express
280ml
Part #: F-59902

- Removes sludge, flux and debris
- Restores heating efficiency



TOTAL FILTER TF1 Part #: F-60003



- Hydrocyclonic and magnetic in-line filter
- Unique action, removes magnetic and non-magnetic contaminants
- Fits vertical and horizontal pipe work
- Dosing point for Fernox liquid products
- Cleaned in seconds without removal or disassembly
- Will not block or restrict flow
- All valves and fittings including purge valves

LIQUID PRODUCTS For Systems up to 26 Gallons (1-Pint Sizes)



Protector F1
Part #: F-57880

- Long term protection against corrosion and limescale
- Multi-metal safe




Boiler Noise Silencer F2
Part #: F-57881

- Reduces boiler noise
- Improves heat transfer efficiency




Cleaner F3
Part #: F-57882

- Removes sludge, scale and debris
- Restores heating efficiency




Leak Sealer F4
Part #: F-57883

- Stops small leaks
- Ideal for reducing pressure loss from sealed systems



FERNOX Products

COMMERCIAL / For HVAC Commercial Systems



Alpha-11
5 Gallons
 Part #: 155738-005
55 Gallons
 Part #: F155738-055

- Combined anti-freeze and protector
- Protects against corrosion and limescale



Protector F1
2.6 Gallons
 Part #: F-59700

- Central heating protector for commercial and cooling systems
- Maintains efficiency of system



Cleaner F3
2.6 Gallons
 Part #: F-59701

- Central heating cleaner for commercial and cooling systems
- Remove sludge and scale

CLEANERS AND LIMESCALE REMOVER / For Sludged and Blocked Systems



DS-40 System Cleaner
4.2 lbs
 Part #: F-61102

- Powerful acid descaler and sludge remover
- Eliminates boiler noise

EQUIPMENT TEST KITS



Express Boiler Commissioning Kit
 Part #: F-62089

- Maintain the design specification and energy efficiency
- Comprised of Cleaners, Protectors and Check Strips



TDS Meter
 Part #: F-57875

- For easy on-site measurement of total dissolved solids
- Ideal for use when powerflushing



Protector Test Kit
 Part #: F-57879

- Gives rapid on-site analysis of the concentration of all Fernox protectors
- Kit includes sufficient reagent for 25 system checks

The Flexconsole :: dutchtech::usa™

The Flexconsole is the only easy and professional way to install your thermal expansion tank. Unlike the way most expansion tanks are installed, the Flexconsole provides a solid mounting point and eliminates all stress on the water lines. Flexconsole installations look more professional and service is a breeze with both hands free to make repairs! When properly mounted on solid walls, or on a stud behind drywall, the Flexconsole is designed to hold a steel thermal expansion tank with a volume of up to 6.6 US gallons.

flexconsole :: usa standard

For use on closed hydronic systems

flexconsole :: usa stainless

For use with potable water thermal expansion tanks



(Standard)
 FC-97975



(Stainless)
 FC-97976



Flexconsole Models

Model #	Description	Type
FC-97975	Flexconsole Expansion Tank Mount, 1/2" NPT x 1/2" NPT	Standard
FC-97976	Flexconsole Expansion Tank Mount, 3/4" NPT x 1/2" NPT	Stainless Steel

General Formulas

<p>Horsepower Water = $\frac{\text{GPM} \times \text{head (ft.)} \times \text{specific gravity}}{3960}$</p> <p>Horsepower Brake = $\frac{\text{GPM} \times \text{head (ft.)} \times \text{specific gravity}}{3960 \times \text{pump efficiency}}$</p> <p>Horsepower Brake = $\frac{\text{GPM} \times \text{PSI} \times \text{specific gravity}}{1713 \times \text{pump efficiency}}$</p> <p>Efficiency (pump) = $\frac{\text{GPM} \times \text{head (ft.)} \times \text{specific gravity}}{3960 \times \text{pump BHP}}$</p> <p>Brake horsepower (motor) = $\frac{\text{Watts input} \times \text{motor efficiency}}{746}$</p> <p>BTU = Amount heat required to raise (heat or cool) 1 lb of water 1°F</p> <p>Tank Heating Rate (BTU/hr) (Boiler Capacity Needed) = $\frac{\text{Tank Heating Requirement (BTU)}}{\text{Hrs (hrs desired to bring tank up to temperature)}}$</p> <p>Tank Heat Up Rate (hrs) = $\frac{\text{Tank Heating Requirement (BTU)}}{\text{BTU/hr Heat Source Boiler}}$</p> <p>Tank Capacity Calculation (gallons) (rectangular) = Length(ft) x Width(ft) x Depth(ft) x 7.481 (gal/cu ft)</p> <p>Tank Capacity Calculation (gallons) (cylinder) = $\frac{\text{Diameter(ft)}^2 \times 3.14 \times \text{Height(ft)} \times 7.481 \text{ (gal/cu ft)}}{4}$</p> <p>Tank Heating Total Requirement (BTU total) = Tank Temperature Rise x Gallons x 8.346 (plus tank & piping external losses)</p> <p>Kilowatt (KW) = 3414 BTU/hr</p>	<p>% Efficiency = $\frac{\text{GPH} \times 8.34 \times \text{Temp. Rise} \times 1.0 \text{ (Specific Heat)}}{\text{Btu/Hr. Input}}$</p> <p>BTU / Output = GPH x 8.34 lbs/Gal. x Temp. Rise x 1.0</p> <p>BTU / Input = $\frac{\text{GPH} \times 8.34 \times \text{Temp. Rise} \times 1.0}{\% \text{ Efficiency}}$</p> <p>GPH = $\frac{\text{BTU/Hr. Input} \times \% \text{ Efficiency}}{\text{Temp. Rise} \times 8.34}$</p> <p>Rise (DF) = $\frac{\text{BTU/Hr. Input} \times \% \text{ Efficiency}}{\text{GPH} \times 8.34}$</p> <p>KW = $\frac{\text{GPH} \times 8.34 \times \text{Temp. Rise} \times 1.0}{3413}$</p> <p>Determine % of hot water portion: $\frac{\text{MWT} - \text{C}}{\text{H} - \text{C}} = \frac{140 - 50}{180 - 50} = \frac{90}{130} = 69.2\% \text{ Hot Water}$</p> <p>Determine % of cold water portion: $\frac{\text{H} - \text{MWT}}{\text{H} - \text{C}} = \frac{180 - 140}{180 - 50} = \frac{40}{130} = 30.8\% \text{ Cold Water}$</p> <p>MWT = Mixed Water Temperature (°F) H = Hot Water Temperature (°F) C = Cold Water Temperature (°F)</p> <p>BTU/hr (water @ 68°F) = GPM x 500 x ΔT (°F)</p> <p>BTU/hr (30% E. glycol @ 68°F) = GPM x 445 x ΔT (°F)</p> <p>BTU/hr (50% E. glycol @ 32°F) = GPM x 395 x ΔT (°F)</p>
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Water To Increase Concentration Of Glycol In A Hydronic System

$$Vg = \frac{\text{TSV} (\text{PSd} - \text{PSt})}{(100 - \text{PSt})}$$

Vg = Quantity of glycol, in gallons, to be added
 TSV = Total System volume in gallons
 PSd = Percent of glycol solution desired
 PSt = Percent of system solution by test (initial percent)

Example:

Total system volume (TSV) = 125 gal.
 Initial percent of system solution from test (PSt) = 25%
 Percent of glycol solution desired (PSd) = 45%

$$\frac{Vg = 125(45-25)}{(100-25)} = 33.3 \text{ gallons of glycol concentrate required}$$

Drain 33.3 gallons from the system and then refill the system with 33.3 gallons of glycol concentrate.

Ohm's Law

VOLTS

$$\text{Volts} = \sqrt{\text{Watts} \times \text{Ohms}}$$

$$\text{Volts} = \frac{\text{Watts}}{\text{Amperes}}$$

$$\text{Volts} = \text{Amperes} \times \text{Ohms}$$

AMPERES

$$\text{Amperes} = \frac{\text{Volts}}{\text{Ohms}}$$

$$\text{Amperes} = \frac{\text{Watts}}{\text{Volts}}$$

$$\text{Amperes} = \sqrt{\frac{\text{Watts}}{\text{Ohms}}}$$

OHMS

$$\text{Ohms} = \frac{\text{Volts}}{\text{Amperes}}$$

$$\text{Ohms} = \frac{\text{Watts}}{\text{Amperes}^2}$$

$$\text{Ohms} = \frac{\text{Volts}^2}{\text{Watts}}$$

WATTS

$$\text{Watts} = \text{Volts} \times \text{Amperes}$$

$$\text{Watts} = \text{Amperes}^2 \times \text{Ohms}$$

$$\text{Watts} = \frac{\text{Volts}^2}{\text{Ohms}}$$

Formulas and Reference Information

$$\text{GPM} = \text{BTUh} \div (\Delta T \times 500)$$

$$\text{Pipe Head Loss} = \text{Supply} + \text{Return} \times 1.5 \times .04$$

Hydronic BTUh/Sq Ft		Delta T (ΔT)	
Basement	20	Residential Radiant	10
1st & 2nd Floor	25	Commercial Radiant	20
Garage	30	Baseboard	20

$$1/2'' \text{ Pex Hd Loss} = \text{Longest Loop} \times .035$$

(based on 1.0 GPM @ 120° water)

$$\text{Ft Hd. Loss} = (\text{Flow} / \text{Cv})^2 \times 2.31$$

* NOTE: For Estimating Purposes Only. All sizes should be confirmed by proper design methods.

Maximum Tubing Flow Rates and BTUhr Loads (at 20°F ΔT)

Pipe Size (Copper)*	Maximum Flow Rate (GPM)**	Heat Carrying Capacity (BTUhr)
1/2"	3.2	32,000
3/4"	6.5	65,000
1"	10.9	109,000
1-1/4"	16.3	163,000
1-1/2"	22.9	229,000
2"	39.6	396,000

* Nominal pipe size

** Maximum 4 ft. / sec.

Spacing Factors (for use with in-floor tubing)

Spacing	Feet of Tube Per Square Foot of Floor Space
4" O.C.	3.10
6" O.C.	2.10
8" O.C.	1.60
9" O.C.	1.38
12" O.C.	1.05
15" O.C.	0.83
18" O.C.	0.70
24" O.C.	0.55
36" O.C.	0.37
48" O.C.	0.28

$$\text{Pressure (PSI)} = \frac{\text{Head (ft.)} \times \text{Specific Gravity}}{2.31}$$

$$\text{Head (Ft.)} = \frac{\text{Head (PSI)} \times 2.31}{\text{Specific Gravity}}$$

PEX Pressure Drop per/ft of Pipe

GPM	3/8"	1/2"	5/8"	3/4"	1"
8.0	11.31	2.48	0.93	0.44	0.12
7.8	10.61	2.32	0.87	0.41	0.12
7.5	9.94	2.18	0.81	0.39	0.11
7.3	9.29	2.03	0.76	0.36	0.10
7.0	8.66	1.90	0.71	0.34	0.09
6.8	8.05	1.76	0.66	0.31	0.09
6.5	7.46	1.63	0.61	0.29	0.08
6.3	6.90	1.51	0.57	0.27	0.08
6.0	6.36	1.39	0.52	0.25	0.07
5.8	5.84	1.28	0.48	0.23	0.06
5.5	5.34	1.17	0.44	0.21	0.06
5.3	4.87	1.07	0.40	0.19	0.05
5.0	4.42	0.97	0.36	0.17	0.05
4.8	3.99	0.87	0.33	0.15	0.04
4.5	3.58	0.78	0.29	0.14	0.04
4.3	3.19	0.70	0.26	0.12	0.03
4.0	2.83	0.62	0.23	0.11	0.03
3.8	2.55	0.56	0.21	0.10	0.03
3.6	2.29	0.50	0.19	0.09	0.03
3.4	2.04	0.45	0.17	0.08	0.02
3.2	1.81	0.40	0.15	0.07	0.02
3.0	1.59	0.35	0.13	0.06	0.02
2.8	1.39	0.30	0.11	0.05	0.02
2.6	1.19	0.26	0.10	0.05	0.01
2.4	1.02	0.22	0.08	0.04	0.01
2.2	0.86	0.19	0.07	0.03	0.01
2.0	0.71	0.15	0.06	0.03	0.01
1.8	0.57	0.13	0.05	0.02	0.01
1.6	0.45	0.10	0.04	0.02	
1.4	0.35	0.08	0.03	0.01	
1.2	0.25	0.06	0.02	0.01	
1.0	0.18	0.04	0.01	0.01	
0.8	0.11	0.02	0.01		
0.6	0.06	0.01	0.01		
0.4	0.03	0.01			
0.2	0.01				
0.0					

= Velocity over 4 ft./s



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