Taco®
Comfort Solutions™

CONDENSED CATALOG

The Leader In Hydronic Systems & Components

elbi

FERNOX
MAKES WATER WORK

AXIOM

SCALTROL
The Clear Choice in Water Treatment

Table of Contents

Viridian™ HIGH EFFICIENCY CIRCULATORS by Taco

The Viridian Family of ECM High-Efficiency Wet Rotor Pumps

Built for the job

Whatever the size, Taco Viridian ECM pumps deliver big savings, improved system efficiency, and very happy customers. For residential applications, the VR1816 features infinitely variable fixed speed or 6 pressure presets to fit your job. The VT2218 Delta-T variable speed circulator is the only temperature-sensing pump in its class and can help save hundreds in fuel costs. The VR3452's extended operating range makes it ideal for chilled and hot water applications. The optional communications module adds a host of features for ultimate flexibility and building system integration. The family is capped off by the VR15 to VR30 models which feature built-in web-enabled convenience. As with all Viridians, set-up is simple, quick, and easy.

Built for efficiency

Taco Viridian ECM pumps use up to 85% less electricity than conventional pumps and, depending on the model, feature easy push-button, dial-in or web-enabled setup convenience. High-efficiency Viridian pumps are members of our e-smart® family of products. E-smart is our way of helping you quickly identify our most resource-saving products.

Meet the Viridian Family Video

VR1816 VT2218

VR3452 VR15-VR30

VR1816 (click here for a pdf)

Simple to install and intuitive to set-up the VR1816 is for residential contractors who wish to step up from 3-speeds to ECM efficiency. It features dial-in infinitely variable fixed speed and 6 pressure presets to fit your job

VT2218 (click here for a pdf)

The VT2218 Delta-T Variable Speed circulator is the only temperature sensing circulator in its class, so it's ready to save hundreds in fuel costs right out of the box. Once available, it will replace the HEC-2 Bumble Bee circulator.

VR3452 (click here for a pdf)

The VR3452's extended operating range makes it ideal for a wide range of chilled and hot water applications. The optional communications module adds a host of features for ultimate flexibility and building system integration.

VR15 to VR30 (click here for a pdf)

A convergence of efficiency, simplicity and technology. The Viridian VR15-30 features built-in, web-enabled convenience to make installation, setup and service easy. The multiple operating modes, voltage range and variable speed performance fits a broad range of commercial applications.

Call For Your Local Distributor! 800-493-8432

Infinitely Variable Speed, ECM High-Efficiency Circulator

The Viridian VR1816 circulator is an infinitely variable speed, high-efficiency wet rotor circulator with an ECM permanent magnet motor. Operating modes include infinitely variable fixed speed and self-adjusting constant pressure or proportional pressure variable speed.

To view at VR1816 Installation Video, click here

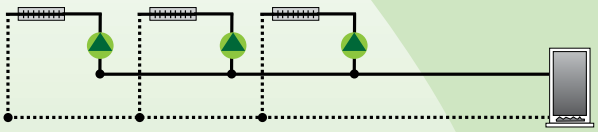
- High-efficiency ECM motor uses up to 85% less electricity
- Infinitely variable speed settings to fine tune flow for any system
- Six pressure presets to fit the job
- *Sure Start* automatic unblocking and air purging mode

e-smart® Resource Saving Products

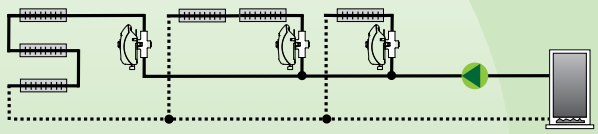
- **18' Shut-off head, 16 gpm max flow**
- **ECM High-efficiency motor**
- **Easy to use dial to set operating speed or pressure control**
- **Operates in 3 different modes:**
  - Infinitely Variable Fixed Speed
  - Constant Pressure — Self-adjusting, Variable Speed
  - Proportional Pressure — Self-adjusting, Variable Speed
- **5 color LED displays:**
  - Operating mode
  - Error code diagnostics
- **Use with a Taco ZVC Zone Valve Control or SR Switching Relay for ON/OFF operation**
- **Integral Flow Check (IFC®) included**
- **Dual electrical knockouts**
- **Whisper quiet operation**
- **BIO Barrier® protects the pump from system contaminants**

Typical Applications

Fixed Speed Mode (Min/Max)
For zoning with circulators

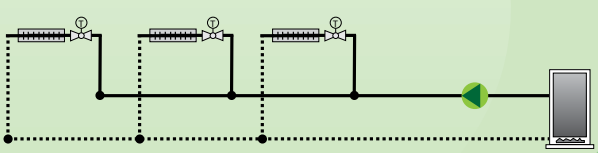


Constant Pressure Mode
Across a series loop system using zone valves



Proportional Pressure Mode
Across multiple panel radiators with thermostatic radiator valves

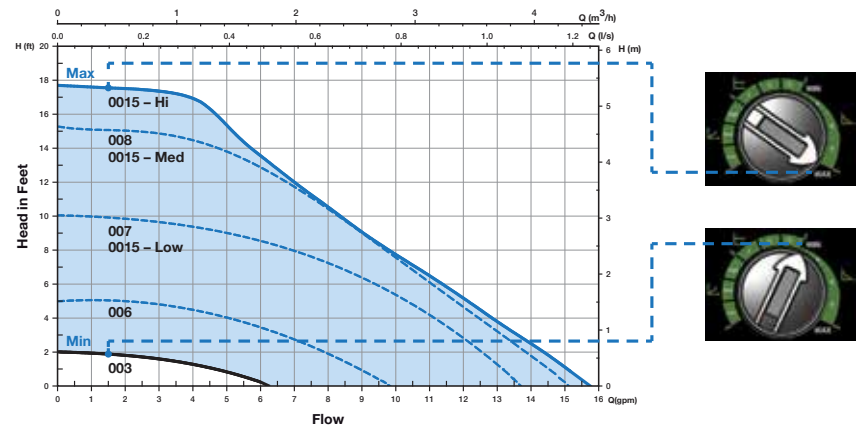
T= thermostatic radiator valve (TRV)



FIXED SPEED MODE	CONSTANT PRESSURE MODE	PROPORTIONAL PRESSURE MODE
min - max Blue LED	C Orange LED	P Green LED

The VR1816 is factory-programmed for **Max Speed Setting**. Simply turn the dial to change speed, operating mode or pressure setting.

Fixed Speed Mode (Min/Max)

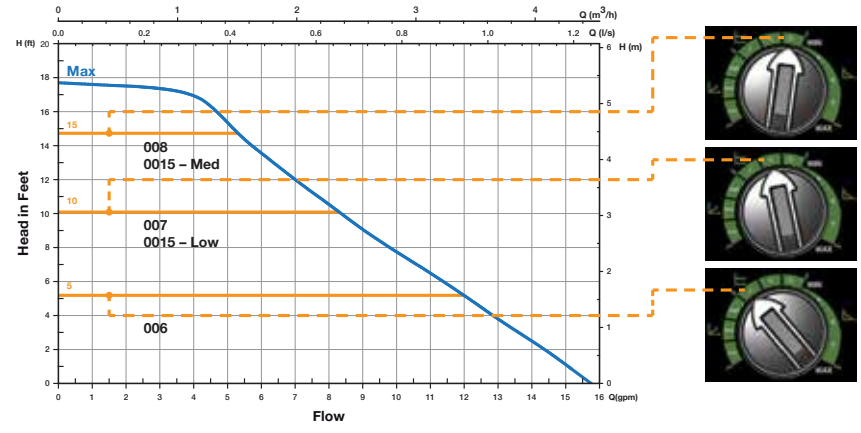


Fixed speed mode allows the installer to fine tune the circulator flow rate to precisely match design load conditions. It is infinitely variable between min/max settings.

Ideal for zoning with circulators.

See chart to the left for equivalent 00® model at each variable speed setting.

Constant Pressure Mode

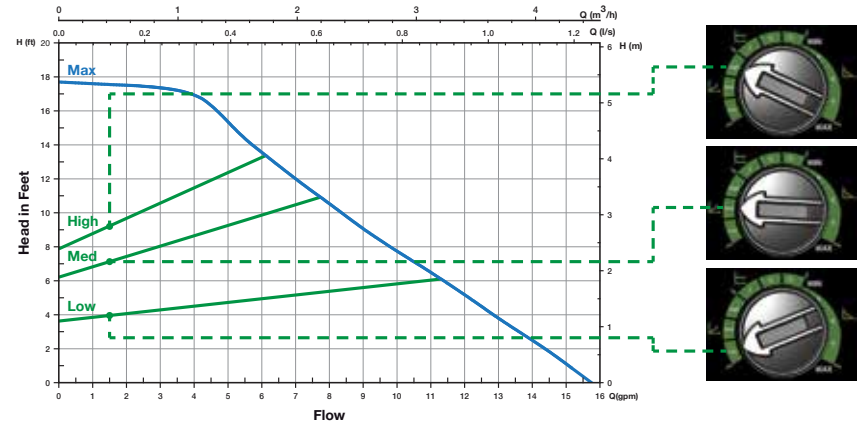


In constant pressure mode, the circulator maintains a constant pressure differential (Δp-c) in the system as heating load increases or decreases. Selection options are 5, 10, or 15 feet of head constant pressure.

Best option for zoning with zone valves.

See chart to the left for equivalent the 00® model at each setting.

Proportional Pressure Mode



In proportional pressure mode, the circulator maintains a proportional pressure differential (Δp-v) in the system as heating load increases or decreases. Flow will change in relationship to the change in pressure differential.

Best option for panel radiators with thermostatic radiator valves (TRV).

Selection options are Low, Medium, or High. If unsure on proper setting, select Medium and adjust as needed.

Specifications

- Maximum Shut-off Head: 18 feet
- Maximum Flow: 16 gpm
- Maximum Operating Pressure: 125 psi (8.6 bar)
- Maximum Water Temp: 230°F (110°C)
- Minimum Water Temp: 36°F (2°C)
- Electrical specifications:

  Voltage: 120V, 60 Hz
  Single phase

  Operating Power: 4W - 44W

  Max. AMP Rating: 0.54
- Equipped with a cast iron casing and should be used for closed loop systems only
- Taco circulator pumps are for indoor use only
- Acceptable for use with water or maximum of 50% water/glycol solution

Materials of Construction:

Casing: ..... Cast Iron
Stator Housing: ..... Composite
Cartridge: ..... Composite
Impeller: ..... Composite
Shaft: ..... Ceramic
Bearings: ..... Carbon
Thrust Bearing: ..... Ceramic
O-Ring & Gaskets: ..... EPDM
Integral Flow Check (IFC®):
Body, Plunger ..... Acetal
O-ring Seal ..... EPDM
Spring ..... Stainless Steel

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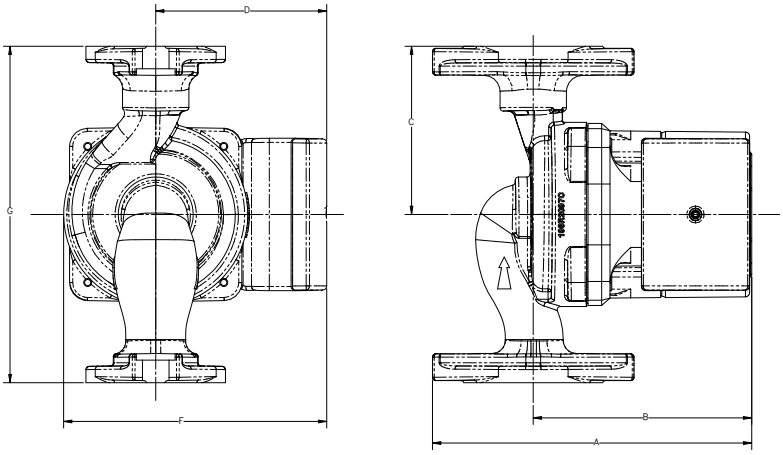
Applications

The Viridian VR1816 circulator is an infinitely variable speed, high-efficiency wet rotor circulator with an ECM permanent magnet motor. Operating modes include infinitely variable fixed speed to fine tune any zone, self-adjusting constant pressure for zone valve applications and self-adjusting proportional pressure for panel radiators with thermostatic radiator valves.



Pump Dimensions & Weights

Model	Flange Code	A		B		C		D		F		G		Ship Wt.	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	Kg
VR1816F	S	6	152	4-1/8	104	3-3/16	80	3-1/4	82	5	126	6-3/8	161	5.8	2.6

Mounting Positions

Flange Orientation

Standard (S)

Electrical Data

Model	Volts	Hz	Ph	Max.Amps	Max. Watts	RPM
VR1816F	120	60	1	.54	44	1590 - 4830
Motor Type	ECM, Permanent Magnet, Thermally Protected					

Viridian® — VT2218

Delta-T Variable Speed, ECM High-Efficiency Circulator

The Viridian VT2218 circulator is a temperature sensing, self-adjusting, variable speed wet rotor circulator with an ECM permanent magnet motor. Operating modes include Delta-T differential temperature, 4 fixed speeds, set point heat, set point cool and boiler protection.

To view at VR2218 Installation Video, click here

- Delta-T operation maximizes system efficiency and comfort
- High-efficiency ECM motor uses up to 85% less electricity
- Can save hundreds in fuel costs
- LCD displays operating mode, temperature or speed setting, watts, supply & return temperatures
- Easy to program and install

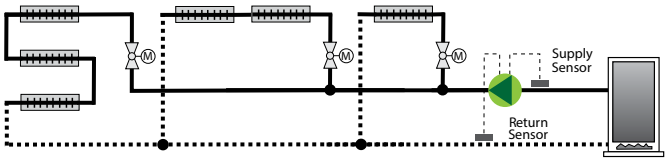
e-smart
Resource Saving Products

The ONLY temperature sensing pump in its class.

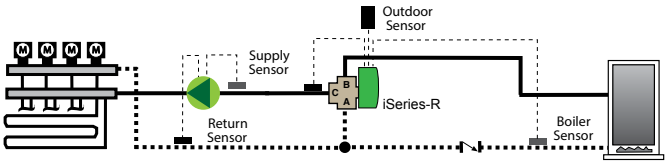
- **22' Shut-off Head, 18 gpm max flow**
- **ECM High-Efficiency Motor**
- **Operates in 5 different modes:**
  - Delta-T (5-50ºF) Variable Speed [factory pre-set : 20˚F ΔT]
  - Multi-Speed (4 fixed speeds)
  - Set Point Heat (50-220˚F) variable speed with boiler protection option
  - Set Point Cool (32-100˚F)
  - Boiler Protection (100-160˚F), protects boiler from low return water temperature
- **Full Speed Over-ride**
  - For system fill and purging
- **Full LCD display showing:**
  - Operating mode, temperature or speed setting, watts, supply & return temperatures
  - Error code diagnostics
  - English or Metric units
- **Use with a Taco ZVC Zone Valve Control or SR Switching Relay for ON/OFF operation.**
- **Sensors and Integral Flow Check (IFC®) included**
- **BIO Barrier® filter protects rotor/bearings from black iron oxide**
- **Whisper quiet operation**

Typical Variable Speed Applications

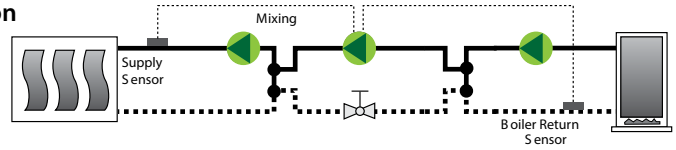
Delta-T
Across a series loop system using zone valves



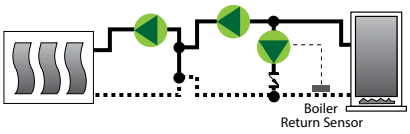
Delta-T
Across multi-zone radiant manifolds with loop actuators



Radiant Injection with boiler protection
Decreases speed to protect boiler from low return water temperature and flue gas condensation



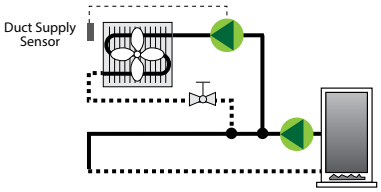
Boiler Protection — by-pass loop
Increases speed to protect boiler from low return water temperature and flue gas condensation



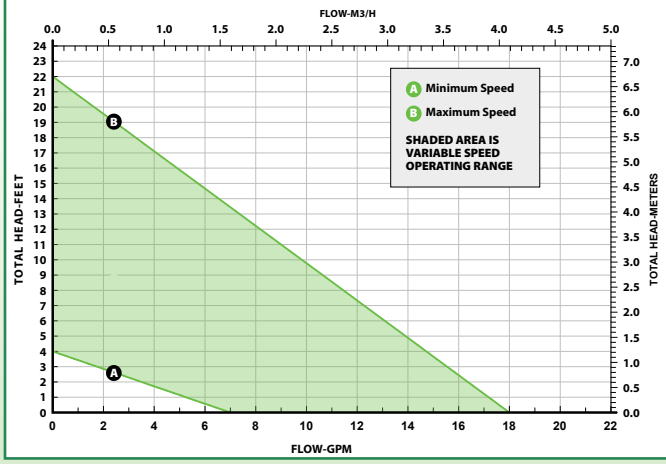
Heating or Chilled Water Cooling
Fan coil fixed water temperature

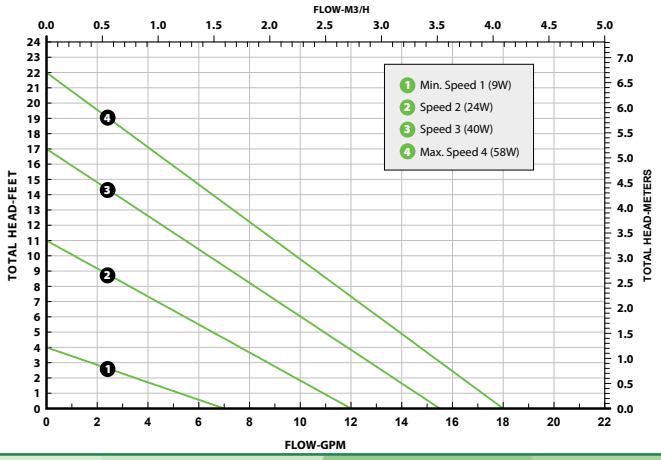
Set Point Heat
Decreases speed on temperature rise

Set Point Cool
Increases speed on temperature rise



Performance Curves for the Viridian® VT2218





Specifications

- Maximum Shutoff Head: 22 feet
- Maximum Flow: 18 gpm
- Maximum Operating Pressure: 125 psi (862 kPa)
- Maximum Water Temp: 230°F (110°C)
- Electrical specifications:

  Voltage: 110-120V, 50/60 Hz, Single phase

  Operating Power Range: 9W to 58W

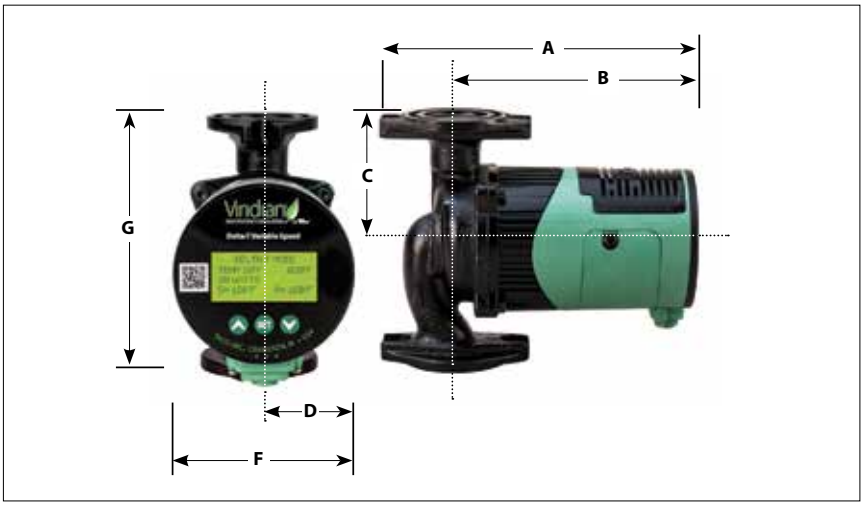
  Maximum AMP Rating: 0.67
- Equipped with a cast iron casing and should be used for closed loop systems only.
- Taco circulator pumps are for indoor use only
- Acceptable for use with water or maximum of 50% water/glycol solution.

Materials of Construction:

Casing: .....Cast Iron
Integral Flow Check (IFC®):
Body, Plunger.....Acetal
O-ring Seal.....EPDM
Spring.....Stainless Steel
Stator Housing:.....Aluminum/Composite
Cartridge:.....Stainless Steel
Impeller:.....Non-Metallic
Shaft:.....Ceramic
Bearings:.....Ceramic
O-Ring & Gaskets:.....EPDM

Applications

The VT2218 is a temperature sensing, variable speed circulator ideal for Delta-T or setpoint temperature applications. Typical uses include hydronic systems zoned with zone valves, radiant loops, injection pumping, snow-melt or hydro-air fan coils. Can also be used in constant speed mode for zoning with circulators, indirect water heaters or primary boiler loops.



Pump Dimensions & Weights

Model	A		B		C		D		F		G		Ship Wt.	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	Kg
VT2218F	8-1/8	207	6	153	3-1/4	82	2	54	4-1/4	107	6-3/8	161	7-3/4	3.52

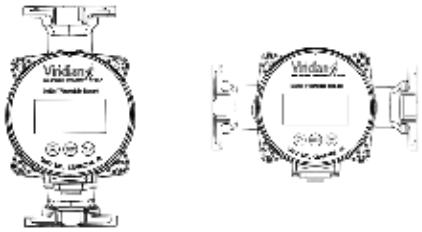
Electrical Data

Model	Volts	Hz	Ph	Max.Amps	RPM
VT2218F	110/120	50/60	1	.67	1650 - 4200
Motor Type	ECM, Permanent Magnet, Electronically Protected				

Maximum Watts

Speed 1	Speed 2	Speed 3	Speed 4
9	24	40	58

Mounting Positions



Flange Orientation

Standard (S)

Viridian™
HIGH EFFICIENCY CIRCULATORS by Taco

The Viridian VR3452 circulator is a self-adjusting, high-efficiency wet rotor circulator for chilled and hot water applications. All settings can be accomplished on the user-friendly interface. The ECM permanent magnet motor saves up to 85% of the electrical energy compared to conventional pumps.

Operating Modes:

- Auto mode (default)
- Proportional pressure control
- Constant pressure control
- Constant speed
- Night setback turndown

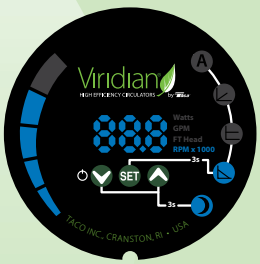
e-smart®
Resource Saving Products

ECM wet rotor circulation pump with integrated electronic regulation.

- **High-efficiency ECM motor uses up to 85% less electricity**
- **LED displays watts, flow & RPM**
- **Compact size for easy handling and installation**
- **Plug & play simplicity**
- **Robust construction for long life**
- **Industry standard flange configuration and lay length**
- **Low noise operation**
- **Cataphoresis coated volute**
- **Communication module (Standard on -FC1A01 models):**
  - Ethernet communication
  - Modbus RTU communication
  - Analog Control input 0 - 10 V
  - 3 analog inputs/outputs
  - 1 relay output
  - Main, Standby, Parallel Pump Operation

Proportional Pressure

Constant Pressure

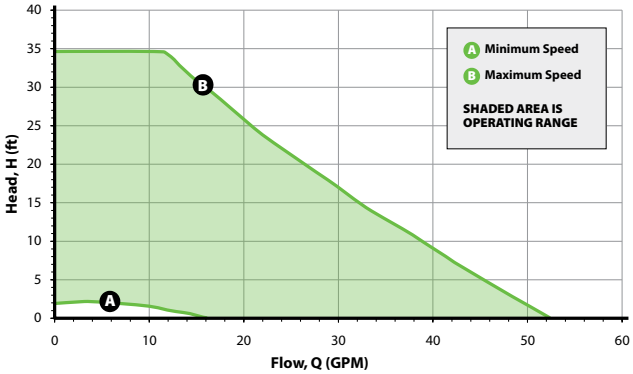


Fixed Speed

NOTE:
Every mode has the ability to function with or without Night Setback Turndown feature.

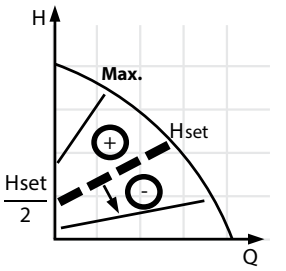
VR3452 with control module

VR3452 without control module



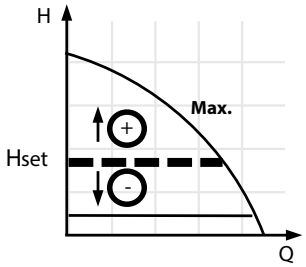
AUTOMATIC MODE (factory setting)

In automatic mode the pump automatically sets the operating pressure, depending on the hydraulic system. By doing so, the pump finds the optimal operating position. *This mode is recommended in most systems.*



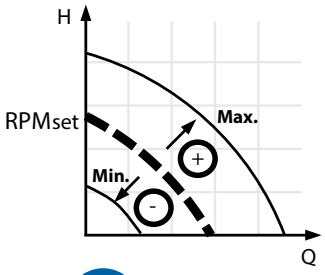
PROPORTIONAL PRESSURE

The pump operates on a pre-programmed inclining performance curve where the differential pressure increases with flow. Hset on the user interface relates to the differential pressure at maximum speed with a corresponding differential pressure at zero flow of half of the Hset value. Hset range from 4.5' to 35' in 0.5' increments. Factory default is 17.5'.



CONSTANT PRESSURE

The pump operates at a constant differential set pressure (Hset on the user interface) from zero flow to maximum speed. Once maximum speed is reached the differential pressure drops as flow increases in a similar manor to a constant speed pump. Hset range from 4.5' to 35' in 0.5' increments. Factory default is 17.5'



FIXED SPEED

The pump operates at its programmed speed between 1100 & 4400 RPM as set by the operator (RPMset on the user interface). Factory default is max speed (4400 RPM).

NIGHT SETBACK TURNDOWN

When the pump operates in night mode, it automatically switches between the selected operating curve in the mode and night curve. The transition to the night mode depends on the media temperature in the system. When the night mode is prepared for operating, its icon illuminates and the pump operates in the selected operating curve of the mode. When the pump identifies the media temperature fall by 59-68F° (approximately during 2 hours), the icon starts to blink and the pump switches to the night curve. When the media temperature rises again, the icon stops blinking and the pump passes over to the operating curve in the selected operating mode. The night mode operates only in combination with the above indicated modes. It is not an independent operating mode.

Specifications

- Maximum Shutoff Head: 34 feet
- Maximum Flow: 52 gpm
- Maximum Operating Pressure: 145 psi (10 bar)
- Maximum Water Temp: 230°F (110°C)
- Minimum Water Temp: 14°F (-10°C)
- Ambient Temp Range: 32°F (0°C) to 104°F (40°C)
- Minimum Inlet Pressure: 112˚F (50˚C) 0.73 psi / 0.05 bar
  176˚F (80˚C) 5.8 psi / 0.4 bar
  230˚F (110˚C) 15.95 psi / 1.1 bar
- Electrical specifications:
  1phase,110-120V, 47-63Hz (VR3452-HY1)
  1phase, 200-240V, 47-63Hz (VR3452-HB1)
- Operating Power: 1/4HP, 10-180W
- Rated Current:
  (1 phase, 115V) 0.1A to 2.5A
  (1 phase, 230V) 0.1A to 1.5A
- Continuous Duty
- Built in start-up circuit
- Equipped with a cast iron casing and should be used for closed loop systems only
- Taco circulator pumps are for indoor use only
- Acceptable for use with water or maximum of 50% water/glycol solution
- Degree of protection: IP 44, Class 2

Materials of Construction:

Casing: ..... Cast Iron
Impeller: ..... Non-Metallic
Shaft: ..... Stainless Steel
Bearings: ..... Graphite
Ventricular wall: ..... Stainless Steel
Rotor Can: ..... Stainless Steel

Certifications & Listings:

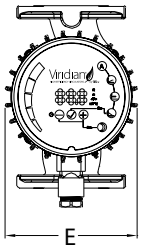
Conforms to UL Standard 778
Certified to CSA Standard 22.2 No 108

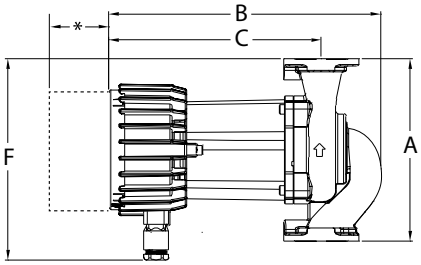
Intertek
4004896

FOR INDOOR USE ONLY

Applications

The VR3452 circulator is used for circulation of water or a mixture of water/glycol in hot water heating systems, air conditioning systems and closed loop circulation systems. Operating modes include self-adjusting auto, proportional pressure, constant pressure, constant speed and night setback.





* Controller Module standard on -FC1A01 models. Adds 1-5/16" to dimensions B and C.

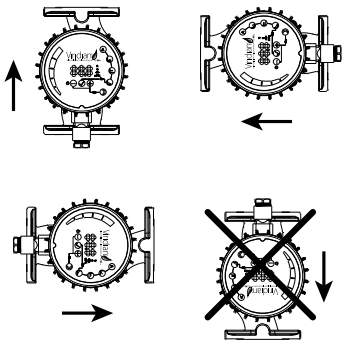
Pump Dimensions & Weights

Model	A		B		C		E		F		Weight	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	Kg
VR3452-FC1A00	6-3/8	162	9-1/2	241	7-7/16	189	4-5/8	117	7-7/16	179	7.8	3.5
VR3452-FC1A01	6-3/8	162	10-3/4	273	8-3/4	222	4-5/8	117	7-7/16	179	7.8	3.5

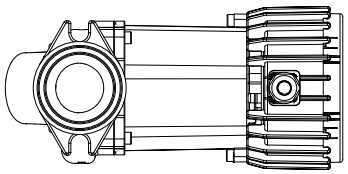
Additional Data

Model	Volts	Class	Flange Size	HP	Hz	Ph	Max. Amps	Max. Watts	RPM
VR3452-HY1	115	Class H	3/4 to 1-1/2	1/100 to 1/4	50/60	1	2.5	180	1100-4400
VR3452-HB1	230	Class F	3/4 to 1-1/2	1/100 to 1/4	50/60	1	1.5	180	1100-4400
Motor Type	ECM, Permanent Magnet, Impedance Protected								

Mounting Positions



Flange Orientation



Companion flanges are .75" to 1.5" (same as used on Taco 00® series). See catalog 100-7.3 and 100-56

Taco® Comfort Solutions™
A Taco Group Company

Viridian™
HIGH EFFICIENCY CIRCULATORS by Taco

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.

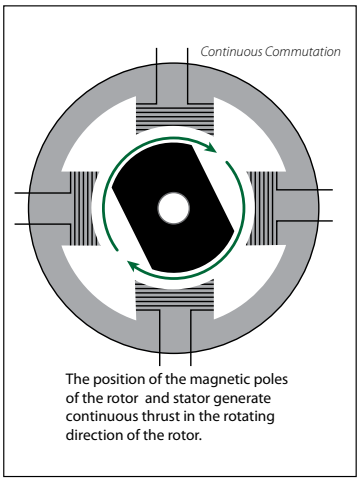
Viridian™ HIGH EFFICIENCY CIRCULATORS by Taco

A convergence of simplicity, efficiency and technology; Taco introduces a new generation of wet rotor circulators

Efficiency as the Basis of Design

The ECM based design combines a brushless electronically commutated synchronous motor with a strong permanent magnet rotor. An ECM motor does not consume any energy in order to magnetize the rotor and the position of the magnetic poles of the rotor and stator generate continuous thrust in the rotating direction of the rotor. The integral electronics precisely drive the rotor as fast as the rotating flux, significantly reducing motor efficiency losses while greatly increasing starting torque.

Up to 80% Electrical Savings



The position of the magnetic poles of the rotor and stator generate continuous thrust in the rotating direction of the rotor.

Full Variable Speed Control Matches System Requirements

The electronics continually change the power adjustment (speed) to match the requirements of the system. Because the electrical motor is being driven by an onboard frequency converter with an integrated PFC filter the supplied electric current is rectified and converted into the appropriate shape to maximize energy efficiency, even when operating at hydraulic partial load conditions. The superior motor efficiency, optimized speed control, and intelligent sensorless variable speed pump control delivers dramatic cost savings over the life of the system.

Flexibility to Fit the Job

The hydraulic characteristics of the pump can be set at will. Pump regulation can be done by pressure, speed, electrical power or a combination of these, so it can be adapted to different hydraulic systems requirement without the need for external regulators or sensors.

Ready-to-go out of the box, the Viridian will automatically adjust its speed based on internally sensed variable differential pressure control, providing optimal energy savings across the industry's largest operating range. Additional modes of control can be selected to provide constant pressure control, proportional pressure control, constant curve duty (uncontrolled pump), RPM regulation or power limitation control.

The Viridian pumps can be operated as single or parallel variable speed pumps. The onboard electronics allows the user to choose to run dual pumps in parallel, standby or alternating modes. The built-in normally open, common and normally closed relay contacts can be used to activate or deactivate a primary or secondary pump contact, actuate a damper for combustion air or switch another piece of equipment. In addition, the Viridian comes standard with 2 external digital inputs and 1 external digital output to be available for additional mechanical room control.

Heating, Air Conditioning or Chilled Water Systems

Taco Viridian pumps are built around exacting specifications to meet the widest range of closed loop hydronic heating and cooling applications. They are suitable for use with fluids at temperatures from 14°-230°F (-10° - 110°C), feature 175psi working pressure and have a stainless steel impeller and shaft. Continuous duty rated with a built-in soft start-up circuit the VR15 and VR20 can accept 110-240 volts and the VR25 and VR30 operate on 230-240 volts supply power.

Lower Installation, Commissioning and TCO Costs

A simple ethernet connection on the pump gives instant remote control, monitoring and adjustment without requiring highly skilled network IT or commissioning personnel. Any Viridian pump can be accessed directly through a common cross-over cable from a connected laptop or through a web enabled computer or smart phone.

The in-line design and standard ANSI class 125 flanges make for a technician friendly installation. The pump and motor form an integral unit without a mechanical seal. The bearings are lubricated by the pumped fluid, ensuring years of quite, maintenance free operation.

To protect your investment in the Viridian it provides overcurrent, line surge and current limit protection, thermal monitoring, heat sink status and over temperature protection.

Given all the advantages stated above, the total cost of ownership (TCO) of a Viridian pump is by far the lowest for its performance range.

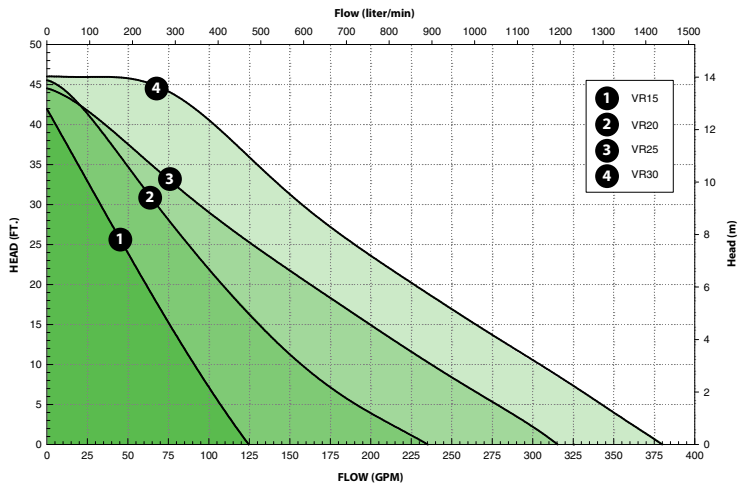
Web Based Simplicity

Simply launch any common browser, like Internet Explorer or Firefox, type in "VIRIDIAN" or the pump's IP address in the browser's address line and you have instant, automatic and full control over the pump(s). The HTTP or FTP protocol ensures a user-friendly, commonly used environment.

The Environment is Always a Consideration

Not only do these pumps use 80% less energy than a standard commercial pump but we also made the choice to use components, processes and manufacturing capabilities which keep the environment in mind. For instance all of the magnets used in the Viridian are time stable, non-toxic ceramic magnets as opposed to the more widely used rare earth Neodium compounds which are sourced only from Chinese mines.

Performance Field



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

Materials of Construction

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

Standards & Protection

Insulation: Class H
Enclosure: Class 2, IP44
Integrated Motor Protection (electronically protected)
Continuous Duty
UL 778, 1004-1, 508C
CAN/CSA C22.2 #108, #100, #107.1
EMC (89/366 EEC): EN 61000
LVD (73/23/EC): EN 60335-1, EN 60335-2-51
Machine Safety (98/37/EC): EN ISO 12100

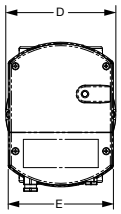
Operating Modes

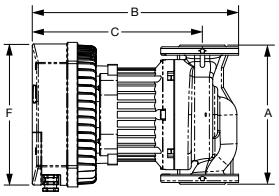
Constant Pressure Control (Δp-c)
Variable Differential Pressure Control (Δp-v) - factory default
Proportional Pressure Control
Constant Curve Duty (uncontrolled pump)
RPM Regulation
Power Limitation (amps or watts)

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

Electrical Specifications

Pump Ratings	1 phase, 110 - 240V, 47 - 63Hz (VR15 & VR20)
	1 phase, 230 - 240V, 47 - 63Hz (VR25 & VR30)
Power Consumption (HP)	VR15 = 0.027 - 0.68 HP
	VR20 = 0.035 - 1.088 HP
	VR25 = 0.054 - 1.496 HP
	VR30 = 0.054 - 2.175 HP
Power Consumption (W)	VR15 = 20 - 500 W
	VR20 = 26 - 800 W
	VR25 = 46 - 1100 W
	VR30 = 40 - 1600 W
Rated Current (1 phase, 230V)	VR15 = 2.2A
	VR20 = 3.5A
	VR25 = 4.5A
	VR30 = 6.9A
Current Limit (Max.)	VR15 & VR20 = 6 A
	VR25 & VR30 = 8 A
24V Supply Output	Max. Current up to 100 mA, Output Voltage of 24V ± 20%, Output Ripple under 1V
Relay Output:	8A, Max. Voltage 250 VAC, 48 VDC Max. Load up to 500 VA
Digital Inputs:	Max. Input Voltage = 32VDC
	2 Inputs & 1 Output
	Logical »1« Voltage > 8V, Logical »0« Voltage < 2V
Ethernet:	Connector = RJ-45
	Services = http server and client, FTP server





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

Fluid Temperatures	VR15 & VR20 (PSI / bar)	VR25 & VR30 (PSI / bar)
112˚F (50˚C)	7.3 / 0.5	4.35 / 0.3
176˚F (80˚C)	11.6 / 0.8	14.5 / 1.0
230˚F (110˚C)	20.3 / 1.4	23.2 / 1.6

Model Number	Flange Size (ANSI)	Power (HP)	A		B		C		D		E		F		Weight	
			in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	Kg
VR15-1	1-1/2"	0.027 - 0.680	9-13/16	250	15-3/16	386	12-5/8	321	7-13/16	198	7-7/16	189	10-1/16	255	57	26
VR20-1	2"	0.035 - 1.088	11	280	16-3/4	425	13-1/4	336	7-15/16	201	7-7/16	189	10-1/16	255	71	32
VR25-1	2-1/2"	0.054 - 1.496	13-3/8	340	17-11/16	449	14-1/2	369	8-11/16	221	7-7/16	189	10-1/16	255	82	37
VR30-1	3"	0.054 - 2.175	14-3/16	360	19-13/16	503	15-7/8	403	9-1/4	235	7-7/16	189	10-1/16	255	99	45

"00" Series Cartridge Circulators

Every Taco "00®" cartridge circulator is designed to make your 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?

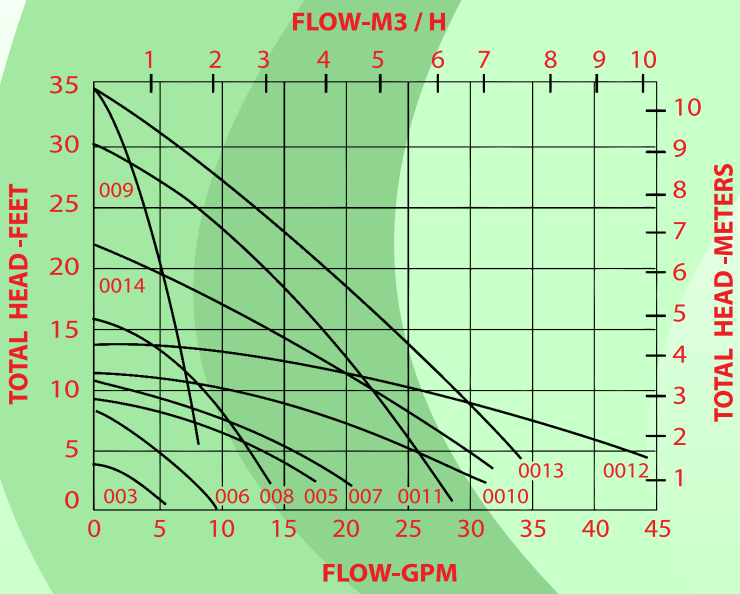
All "00®" Series Taco Circulators are backed by a 3-year limited warranty and are available in standard cast iron or stainless steel.

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)
- Plumb n' Plug-pre-wired timer control

007-SF5 Stainless Steel Circulator

Performance Field



Cast Iron Circulators (Models and Applications)

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

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 00R 3-Speed Radiant pump is a direct replacement for the Grundfos UPS15-58 3-Speed. The 00R 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.

Taco comfort made easy

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

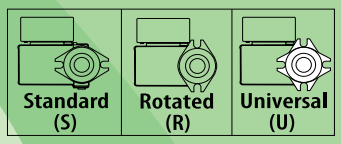
- ***Higher Performance*** – Better flow and head characteristics at all three speeds.
- ***Three Separate Windings*** – A separate winding for each speed for flexibility and maximum starting torque. If one winding burns out, the other speeds will still work.
- ***More Powerful Motor*** – Taco uses a 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.
- ***Sturdier, Stronger Pump*** – The Taco circulator weighs in at 8 pounds, compared to 5 pounds.

Three speeds. One reputation.

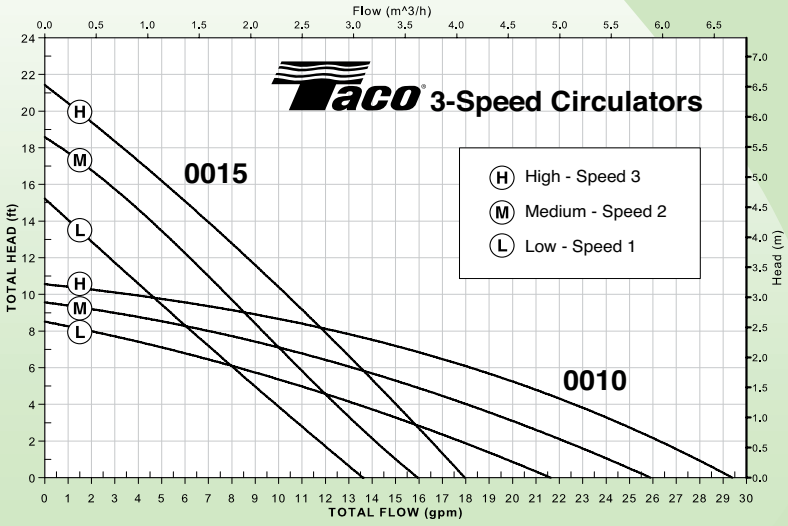
Model #	Flange Code*
0015-MSF1-4 IFC	S
0015-MSF1-1 IFC	R
0010-MSF1 IFC	U

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

***Flange Orientation**



Performance Field - 60Hz



Features

- 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

Taco "00" Wet Rotor Circulator Cross Reference

Taco "00"		Grundfos	Laing	Armstrong	B&G	Wilo
3 SPEED with Integral Flow Check - Closed Systems - Cast Iron Construction						
0015-MSF-IFC 3 spd	Std Flg	UPS15-58FRC 3 speed		Astro 50-3, 230CI, 250CI		Star S21F
	Rotated flg	UPS15-58FC 3 speed		Astro 230CI-R, 250CI-R		
				Astro 30-3		Star S16F
0010-IFC 3 spd	4 way flg	-		Astro 20	NRF-9F/LW	-
					LRF-20BF	
				S-25	100, NRF-22/33	
Single Speed -Closed Systems - Cast Iron Construction						
006F		UP15-10F/R	-	Astro 20	NRF-9F	Star 5F
005F		UPS15-58FC spd 3	-	-	-	-
007F		-	-	-	NRF-22	-
008F		UP15-42F/R, UPS15-58FC spd 2	-	Astro30	NRF-22	Star 16, 21
009F		UP15-100	-	Astro70	-	Star 32
0010F		UPS43-44FC spd 2	-	-	NRF-33	-
0011F		UP26-96F, UPS26-99FC spd 3	-	-	-	Star 30
0012F		UP43-75F,UPS43-44FC spd 3	-	-	-	Star 17
0013F		UP26-99F,UP26-116F	-	-	-	-
0014F		UP26-64F, UP43-64,UPS26-99FC spd 3	-	Astro50	-	-
		UP26-120U Union Conn				
Open Systems- Bronze Construction						
003B		UP15-10B5/7	SM-303	Astro20B	NBF-8S	Star 3B
006B		UP15-18B5/7	SM-909	Astro25B	NBF-8S,9U	Star 5B, 8B
005-BF/SF		UP15-29SF New	-	-	-	Star 11BF
007-BF/SF		UPS15-35SF New	-	-	NBF-12F	Star 11BF
008-BC		UP15-10B7, UP15-42B7	SM-909	-	NBF-10S,18S	-
008-BF/SF		UP15-42SU,SF	-	Astro30B	NBF-22	Star 16BF
009-BF/SF		-	-	Astro70BF	-	Star 32BF
0010-BF/SF		-	-	-	NBF-33	
0011-BF/SF		UP26-96BF	-	-	-	
0012-BF/SF		UP43-75BF	-	-	-	
0013-BF/SF		UP26-99,UP26-116BF	-	-	-	

Taco "00" Wet Rotor Circulator Cross Reference

Taco "00"		Grundfos	Laing	Armstrong	B&G	Wilo
0014-BF/SF		UP25-64SF	-	Astro50B	-	Star 21BF
Open Systems- Stainless Steel Construction						
003-ST						
006-ST						
005-SF		UP15-18SF				
007-SF		UP15-29SF			SSF-12F/LW	
008-SF		UP15-42SF			SSF-22	
009-SF						
0010-SF		UP-15-35SF				
0011-SF						
0012-SF						
0013-SF						
0014-SF		UP25-64SF				
Closed Systems - Cast Iron Construction WITH INTEGRAL FLOW CHECK (IFC)						
006F-IFC		-	-	-	-	
005F-IFC		UP15-42FC, UPS15-58 spd 1	-	-	-	
007F-IFC		UP15-42FC, UPS15-58 spd 1	-	-	-	
008F-IFC		UP15-42FC, UPS15-58FC spd 2	-	-	-	
00R-IFC		UP15-42FC, UPS15-58FC spd 2				
009F-IFC		-	-	-	-	
0010F-IFC		UPS15-58FC sp3	-	-	-	
0011F-IFC		UPS26-99FC spd 2	-	-	-	
0012F-IFC		UPS43-44FC spd 2	-	-	-	
0013F-IFC		UPS26-99FC spd 3	-	-	-	
0014F-IFC		UP43-64FC, UPS26-99FC spd 2	-	-	-	
Open Systems- Stainless Steel Construction WITH INTEGRAL FLOW CHECK (IFC)						
007-SF-IFC		UPS15-35SFC speed 3				
008-SF-IFC						
009-SF-IFC						
0010-SF-IFC						
0011-SF-IFC						
0012-SF-IFC						
0013-SF-IFC						
0014-SF-IFC						

Variable Speed Delta & 00® Circulators

Optimal Pumping Simplified

No matter how good your 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.

Available Models:

- **008-VDTF6-1**
- **0013-VDTF3**

Operational Benefits

- Eliminates velocity noise
- Eliminates need for a pressure by-pass 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

Typical Applications

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

Zoning with Zone Valves or Actuators

Residential radiant floor heating systems often feature several zones on a single manifold, using manifold valve actuators, designed around a 10 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 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.

Perfect Circulator Sizing

Regardless of the challenges of sizing the circulator, whether you are designing your system or inheriting one, you can size your circulator perfectly every time. You simply set the temperature differential (Delta T) you want the circulator to deliver, and you are done.

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 READY *Built-In Transformer and Relay*

controls made **easy**

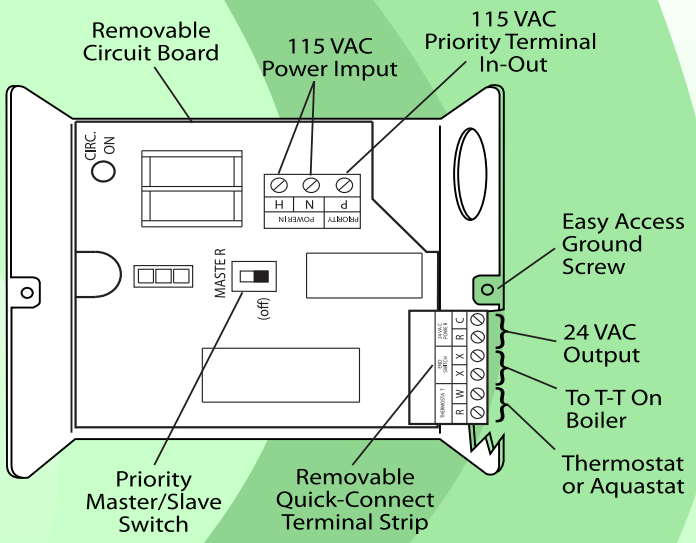
Features

- 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 003 - 0014
- Made in the USA
- Patented design patent# 5,622, 221

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")
0012-ZF4-5	———	S (2")
0013-ZF3	———	R
0014-ZF1-2	0014-ZF1-1IFC	R

PC Board Layout & Electrical Hook-Up



The Taco Variable Speed Solar Control Circulators combine the advanced features of our external speed and solar controls with the reliability and convenience of our 00® Cartridge Circulators. All the wiring for power and sensors is done directly to the circulator while the LED status panel makes it easy to check functionality. Dip switch based user configurable settings makes for a fast set-up, no matter the solar application. The circulator continually adjusts its speed, maximizing the output of the collector, increasing the usable higher temperature water throughout the day, eliminating short cycling and increasing system performance by 20%.

VARIABLE SPEED
Add 20% to Solar System Performance

at the same price as On/Off Circulator+ Separate Control

MULTIPLE FUNCTION SOLAR CONTROL

Features:

- All-in-One Pump and Variable Speed Solar Control
- Variable Speed Benefits
  - Matches Output of Collector
  - No Short Cycling of Circulator
  - +20% Increased Performance
- Available in Several Sizes, 006, 008, 009 and 0011
  - Cast Iron and Non-Ferrous
- User Definable Line Voltage Output, Supports
  - External Heat Exchanger
  - Collector Sink / Dump
  - Storage Tank Supplement
  - Booster Pump Function
- Supports Drain Back Applications
- Freeze Protection for Open Systems
- Holiday Function, Minimizes Collector Stagnation
- Factory Installed Line Cord
- Adjustable Storage Tank Maximum Setting
- LED Status Panel
- Supports 1 or 2 Storage Tank(s)
- External Limit Input
- Exercising of Collector Circulator
- 2 Sensors Included
- Snap-in PC Board
- UL Approved

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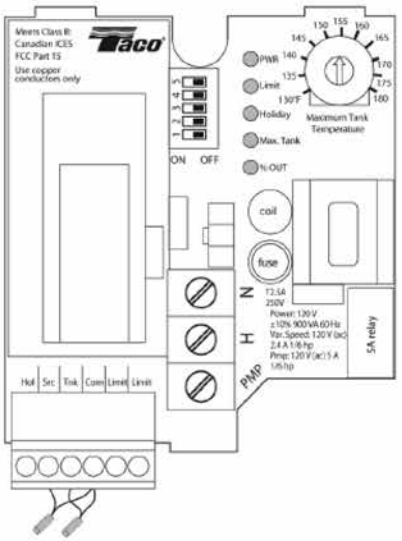
FOR INDOOR USE ONLY

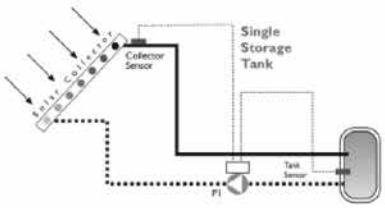
PC Board Layout

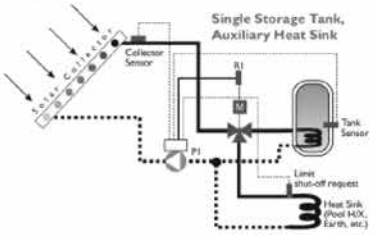


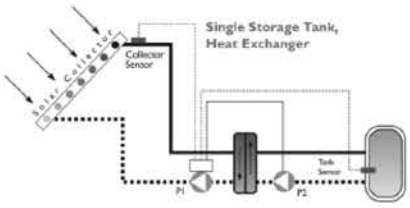
Variable Speed Pays Big Performance Dividend

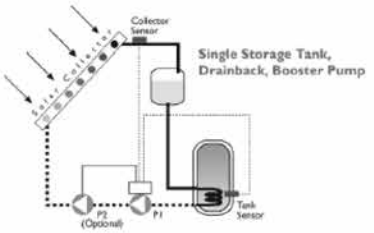
The Solar Variable Speed Circulator (00-VT) continuously optimizes the flow through the collector to achieve maximum energy gain. For example, there is no benefit of pulling 80° water out of the collector when you are trying to maintain 120° in a tank. If a proper delta T is maintained through the collector then higher source temperatures can be achieved over longer periods of time, no matter the weather conditions.

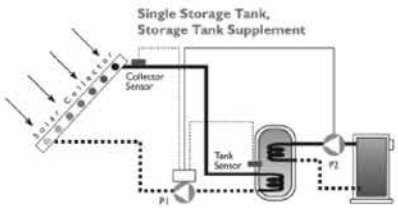
With the flip of a dip switch the Taco all-in-one Solar Circulator can be easily set-up to work in numerous solar applications, some of the most popular are detailed below. For additional application and installation information go to **www.taco-hvac.com**.

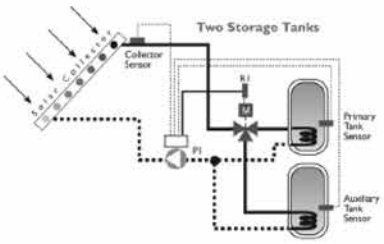




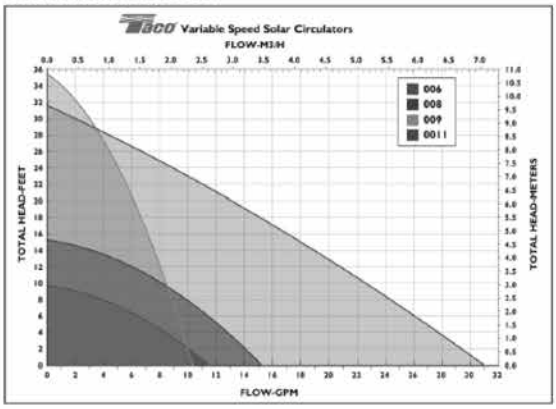






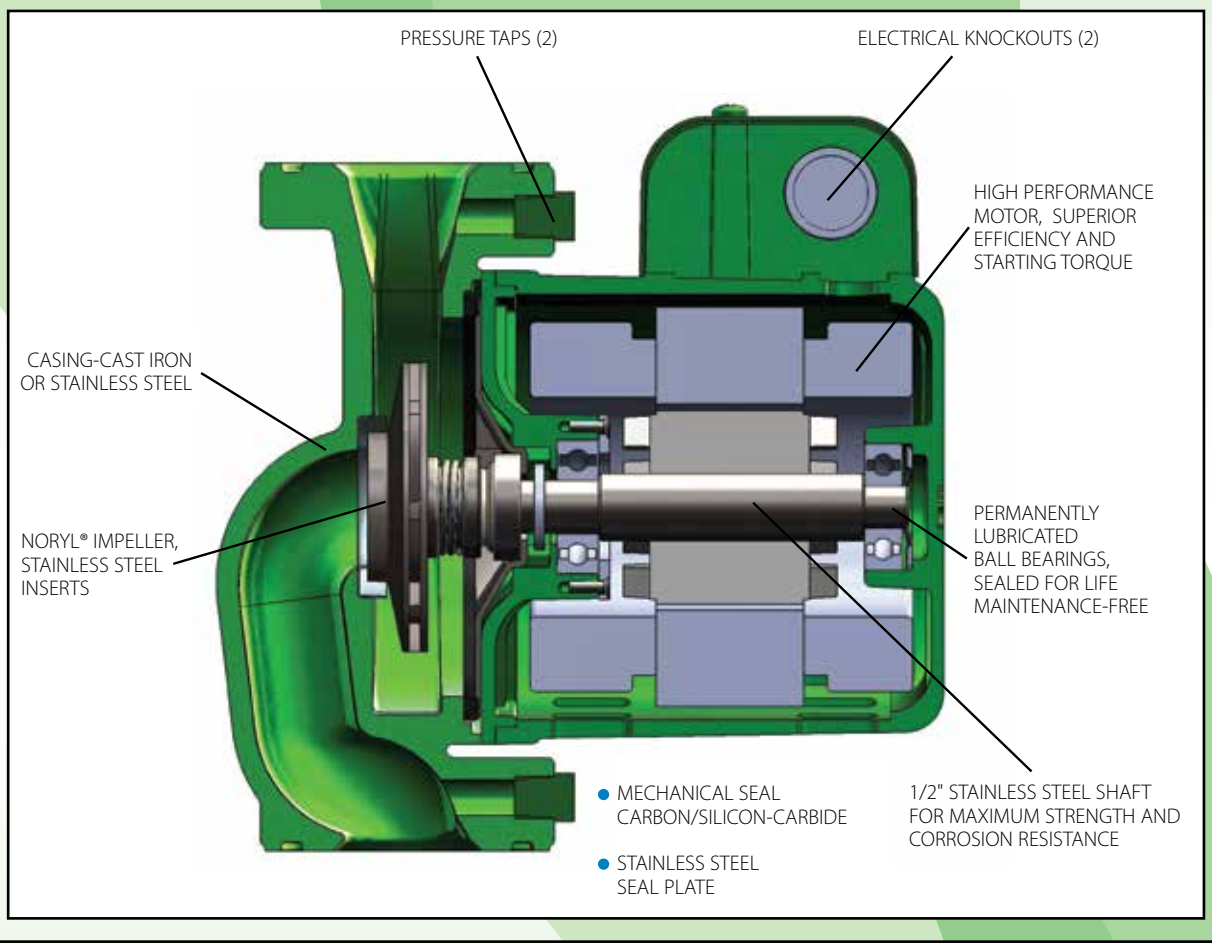


Performance Curves



2400 Series High Capacity Circulators

Taco 2400 Series High Capacity Circulators are specifically designed for quiet, efficient, dependable operation in a wide range of medium to high flow/head hydronic heating, chilled water cooling and hot water recirculation applications. The space saving, close-coupled, maintenance free motor with permanently lubricated, sealed-for-life bearings, Noryl® impeller and durable, carbon/silicon-carbide mechanical seal provide unmatched reliability. Available in Cast Iron or Stainless Steel construction.



Features

- Compact, space saving design
- Powerful close-coupled, maintenance free motor
- Superior efficiency, high starting torque
- Permanently lubricated, sealed for life bearings
- Rugged 1/2" Stainless Steel Shaft
- Carbon/Silicon-Carbide mechanical seal for long life
- Universal flange to flange dimensions — Ideal for retrofits
- Anti-Condensate design for chilled water
- Dual electrical knock-outs
- Dual pressure taps, suction/discharge

Application

The compact 2400 Series High Capacity Circulators are designed for quiet, efficient, maintenance-free operation in a wide range of larger residential and commercial hydronic systems. Typical applications include hydronic heating, in-floor radiant, snow melt, high pressure drop boilers, outdoor wood boilers, chilled water cooling, geothermal heat pumps, primary/secondary loops and hydro air fan coils. The Stainless Steel 2400 Series should be used for open, domestic water recirculation systems. The carbon/silicon-carbide mechanical seal is easy to service in only a few minutes.

2400 Series High Capacity Circulators Cross Reference

Materials of Construction

Casing: Cast Iron or Stainless Steel

Seal Face Plate: Stainless Steel

Motor Housing: Aluminum

Impeller: 30% Glass-filled Noryl®
Impeller Insert: Stainless Steel

Shaft: Stainless Steel

Mechanical Seal (3-piece rotating):
Carbon/Silicon-Carbide

Motor Bearings:
Permanently lubricated ball bearing

O-Ring/Flange Gaskets: EPDM

Model Nomenclature

S — Stainless Steel, Flanged

Y — 230V/60/1 Motor

Performance Data

Maximum Flow: 90 GPM

Maximum Head: 46 Feet

Minimum Fluid Temp: 40°F (4°C)

Maximum Fluid Temp: 225°F (107°C)

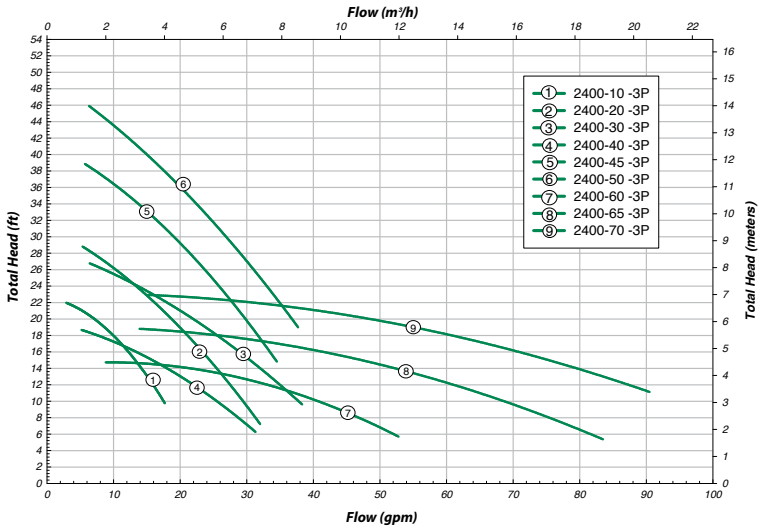
Maximum Working Pressure: 150 psi

c UL us LISTED

FOR INDOOR USE ONLY

NSF Certified to NSF/ANSI 372 Stainless Steel models only

Taco 2400 Series High Capacity Circulators



Pump Dimensions & Weights

All dimensions and weights are approximate.

Cast Iron	Stainless Steel	A		B		C		D		E		F		Ship Wt.	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	Kg
2400-10 -3P	2400-10S -3P	6-3/8	162	4-1/2	114	3-3/16	82	6-7/8	175	5	127	3-3/4	95	11.5	5.3
2400-20 -3P	2400-20S -3P	6-3/8	162	4-1/2	114	3-3/16	82	6-7/8	175	5	127	3-3/4	95	12.0	5.5
2400-30 -3P	2400-30S -3P	8-1/2	216	4-3/4	121	4-1/4	108	8	203	5-1/4	133	3-3/4	95	14.5	6.6
2400-40 -3P	2400-40S -3P	8-1/2	216	4-3/4	121	4-1/4	108	8	203	5-1/4	133	3-3/4	95	14.5	6.6
2400-45 -3P	2400-45S -3P	6-3/8	162	4-5/8	119	3-3/16	82	8-3/4	222	6-7/8	175	3-3/4	95	15.0	6.8
2400-50 -3P	2400-50S -3P	6-3/8	162	4-5/8	119	3-3/16	82	8-3/4	222	6-7/8	175	3-3/4	95	16.0	7.3
2400-50/2 -3P	2400-50S/2 -3P	6-3/8	162	5-1/4	133	3-3/16	82	8-3/4	222	6-7/8	175	3-3/4	95	16.5	7.5
2400-60 -3P	2400-60S -3P	8-1/2	216	5-3/16	132	4-1/4	108	7-7/8	200	5-1/4	133	3-3/4	95	18.0	8.2
2400-65 -3P	2400-65S -3P	8-1/2	216	5-1/2	140	4-1/4	108	9-7/8	251	7-1/4	184	3-3/4	95	22.0	10.0
2400-70 -3P	2400-70S -3P	8-1/2	216	5-1/2	140	4-1/4	108	9-7/8	251	7-1/4	184	3-3/4	95	23.0	10.4
2400-70/3 -3P	2400-70S/3 -3P	8-1/2	216	6-5/8	168	4-1/4	108	10-1/2	267	7-1/4	184	3-3/4	95	29.0	13.2

Electrical Data

Model No.	Hz	Ph	115V Amps	230V Amps	RPM	HP
2400-10 -3P	60	1	1.4	.54	3450	1/10
2400-20 -3P	60	1	1.9	1.0	3450	1/6
2400-30 -3P	60	1	1.9	1.0	3450	1/6
2400-40 -3P	60	1	1.9	1.0	3450	1/6
2400-45 -3P	60	1	3.6	1.7	3450	1/3
2400-50 -3P	60	1	4.9	2.4	3450	1/2
2400-60 -3P	60	1	1.9	1.0	3450	1/6
2400-65 -3P	60	1	3.6	1.7	3450	1/3
2400-70 -3P	60	1	4.9	2.4	3450	1/2
Motor Type	Open Drip Proof, Permanent Split Capacitor, Thermally Ptotected					

Noryl® is a registered trademark of General Electric Co.

2400 Series Companion Flange Sets

Models	Connection	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
2400-10/10S -3P	Iron NPT	110-251F	110-252F	110-253F	110-254F	---	---	---
2400-20/20S -3P	S. Steel NPT	110-251SF	110-252SF	110-253SF	110-254SF	---	---	---
2400-45/45S -3P	Bronze SWT	110-523BSF	110-524BSF	110-525BSF	110-526BSF	---	---	---
2400-50/50S -3P	Shut-Off NPT	SF-075T	SF-100T	SF-125T	SF-150T	---	---	---
	Shut-Off SWT	SF-075S	SF-100S	SF-125S	SF-150S	---	---	---
2400-50/50S/2 -3P	Iron NPT	---	---	---	---	194-2124F	---	---
2", 2 bolt	S. Steel NPT	---	---	---	---	194-2124SF	---	---
2400-30/30S -3P	Iron NPT	---	---	194-1540F	194-1542F	---	---	---
2400-40/40S -3P	S. Steel NPT	---	---	194-1540SF	194-1542SF	---	---	---
	Shut-Off NPT	---	---	SF-125T-0012	SF-150T-0012	---	---	---
	Shut-Off SWT	---	---	SF-125S-0012	SF-150S-0012	---	---	---
2400-60/60S -3P 2400-65/65S -3P 2400-70/70S -3P	Iron NPT	---	---	---	---	185-086C	---	---
	Bronze NPT	---	---	---	---	185-086B	---	---
2400-70/70S/3 -3P	Iron NPT	---	---	---	---	---	185-112C	185-113C
3", 4 bolt	Bronze NPT	---	---	---	---	---	185-112B	185-113B

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
- Available sizes: 1/2" — 1-1/2" NPT and sweat
- Includes nuts and bolts.

Shut-off Flanges for Taco® Circulator Models

Size	Model # NPT	Size	Model # SWEAT	Taco® Circulator Model #'s
1/2"	SF-050T	1/2"	SF-050S	005-0011, 0013, 0014, 00R, 110, 111, 112, 113, 2400-10, 2400-20, 2400-45, 2400-50
3/4"	SF-075T	3/4"	SF-075S	
1"	SF-100T	1"	SF-100S	
1-1/4"	SF-125T	1-1/4"	SF-125S	
1-1/2"	SF-150T	1-1/2"	SF-150S	
1-1/4"	SF-125T-0012	1-1/4"	SF-125S-0012	0012-F4, 2400-30, 2400-40
1-1/2"	SF-150T-0012	1-1/2"	SF-150S-0012	

Freedom Flanges Including Bronze Half-Unions

Taco's flanges fit all 00® circulators, and frees 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.

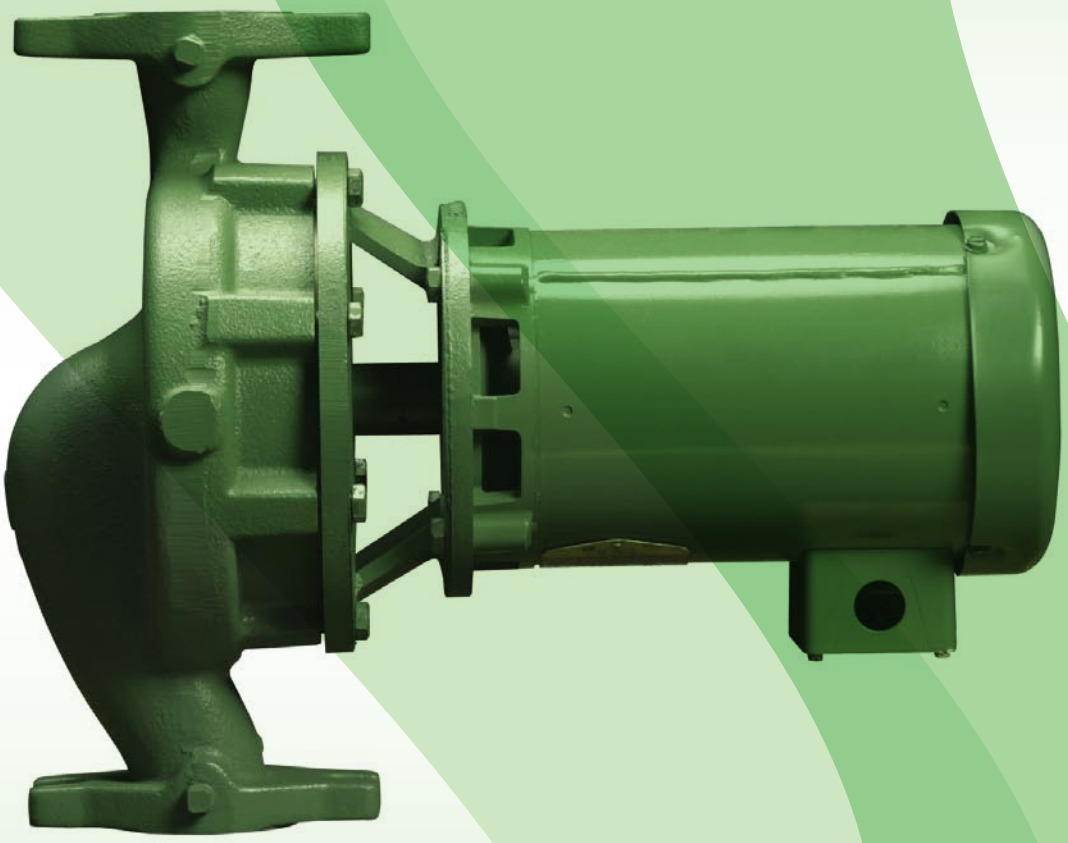
Bronze half-unions and shut-off unions allow for easy installation and service of Taco's 003 & 006 Union Connection models. Available in 1/2" and 3/4", threaded or sweat connections.

Taco systems made easy

1900 Series

Close-Coupled In-Line Pumps

'Fit anywhere' pumps designed for energy efficiency



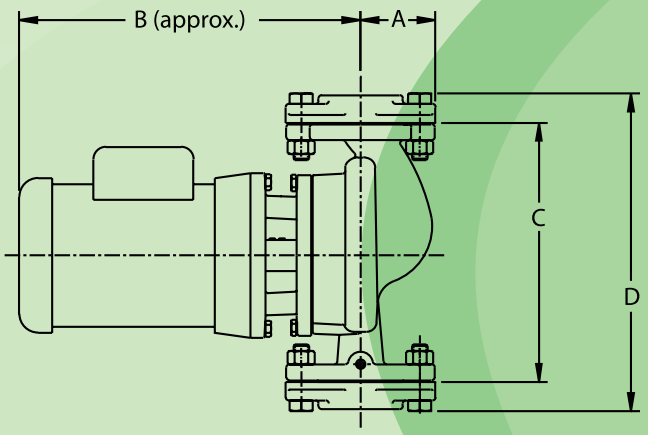
The Taco 1900 Series Close-Coupled In-Line Pumps are designed to be energy efficient and fit anywhere in the piping layout. The 1900 Series is self supported by the piping and can be installed horizontally or vertically. The pump and sealed ball bearing motor a re maintenance free. Rear pull-out design and standard motor simplify servicing and a single seal and shaft sleeve fits all models.

Features	Benefits
Rugged Casing Design	The 1900 Series In-Line pump has a maximum operating pressure of 175psi, and a maximum operating temperature of 300°F. The 1900 Series pump is available in cast iron bronze fitted construction or all bronze construction.
Pressure Tappings	Pressure tappings allow for differential pressure readings to be taken across the pump.
One Piece Enclosed Impeller	Dynamically balanced cast bronze impeller assures long life and higher pump efficiencies.
Cupro-Nickel Shaft Sleeve	Non corrosive shaft sleeve protects the shaft by preventing contact between the shaft and system fluid eliminating the need for more expensive corrosion shaft materials.
Standard Mechanical Seal	"1900" Series In-Line Pumps utilize a revolutionary new "unitized" seal design which facilitates quick and easy replacement. Available in ceramic (standard) or the new "Sealide C" (for more aggressive system fluids) ensures the flexibility to meet a wide range of application requirements. One size seal fits all models.
Motor	NEMA standard 56 frame C face motors*.
Parts Flexibility	Superior parts flexibility one seal, and one shaft extension fits all models.
Factory Tested	All "1900" Series In-Line pumps are factory tested, and are built in accordance with Hydraulic Institute Standards.

**3 HP 1750 rpm motors are TEFC, 5HP and 7 1/2 HP 3450 rpm motors are specially made OEM motors only available through authorized Taco distributors.*

Operating Specifications

Description	Standard	Optional
Pressure	175psi Maximum Operating Pressure (125psi Flanges Standard)	
Temperature Mechanical Seal	250°F	300°F
Motors	NEMA Standard 56 Frame C Face	
Metering Ports	Tapped Suction & Discharge Ports Provided as Standard	
Factory Tested	100% Factory Tested and built in Accordance with Hydraulic Standards	
Pump Flanges	Available with the Pump	



Materials of Construction

Description	Standard	Optional
Casing	Cast Iron	Bronze
Impeller	One Piece Cast Bronze	
Shaft	Alloy Steel	
Shaft Sleeve	Cupro-Nickel	
Bracket	Cast Iron	Cast Iron with S/S Face Plate

Pump Dimensions

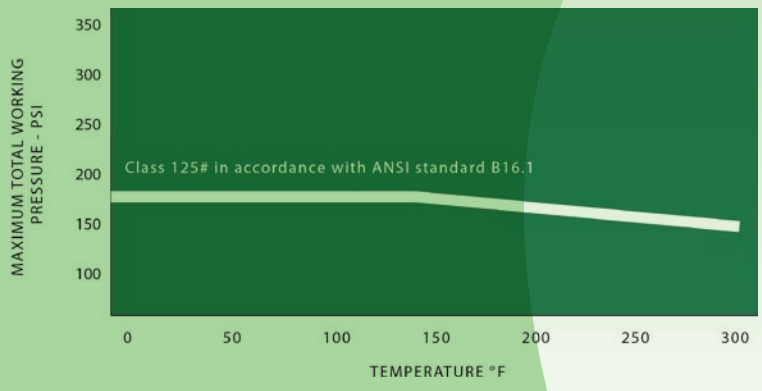
Model No.	Speed	Flange Size	H.P.	Dimensions (inches)			
				A	B	C	D
1911	1760	1 1/2" (38)	1/4* (.19)	3" (75)	14.0 (356)	10 1/4 (260)	12 7/8 (327)
			1/3 (.25)		14.0 (356)		
			1/2 (.37)		14.0 (356)		
			1 (.75)		15.0 (381)		
	3500		1 1/2 (1.1)		15.5 (393)		
			2 (1.5)		15.5 (393)		
			3 (2.25)		15.5 (393)		
			5 (3.75)		16.5 (420)		
1915	1760	1 1/2" (38)	1/3 (.25)	3 1/8" (80)	14.0 (356)	13 1/2 (368)	16 1/8 (410)
			1/2 (.37)		14.0 (356)		
			3/4 (.56)		15.0 (381)		
			1 (.75)		16.0 (406)		
			1 1/2 (1.1)		16.0 (406)		
	3500		2 (1.5)		16.0 (406)		
			3 (2.325)		16.0 (406)		
			5 (3.75)		17.0 (432)		
			7.5 (5.6)		17.0 (432)		
1919	1760	2" (51)	3/4 (.56)	3" (75)	14.75 (375)	14 1/2 (419)	17 3/8 (441)
			1 (.75)		15.75 (483)		
			1 1/2 (1.1)		15.75 (400)		
			2 (1.5)		17.5 (445)		
1935	1760	2" (51)	1/2 (.37)	3 1/2" (89)	13.75 (350)	13 1/2 (343)	16 1/8 (410)
			3/4 (.56)		14.75 (375)		
			1 (.75)		15.75 (483)		
			1 1/2 (1.1)		15.75 (400)		
	3500		2 (1.5)		15.75 (400)		
			3 (2.37)		16.0 (406)		
			5 (3.75)		17.0 (432)		
			7.5 (5.6)		17.0 (432)		
1941	1760	2" (51)	1 1/2 (1.1)	3 5/8" (92)	15.75 (400)	16 1/2 (419)	19 1/2 (495)
			2 (1.5)		17.5 (445)		
			3 (2.37)		24 (610)		

English dimensions are in inches.
Metric dimensions are in milimeters.
Metric data is presented in ( ).
Do not use for construction purposes unless certified.
** 1/4 HP AVAILABLE IN 1 PHASE ONLY.*

Applications

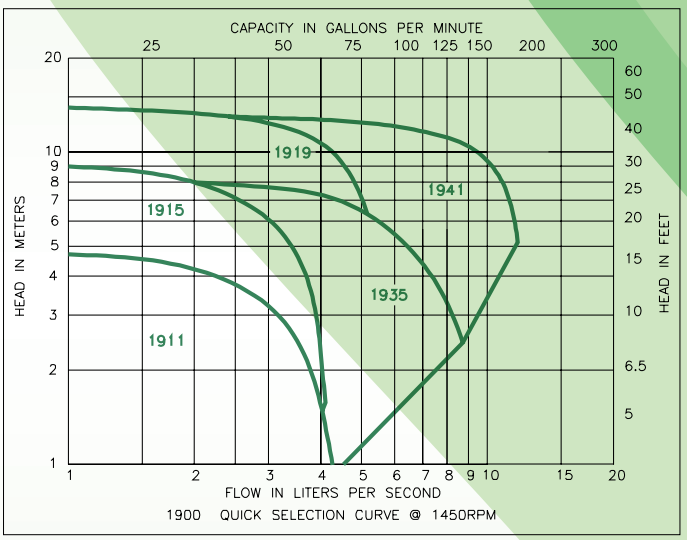
LoadMatch™ Systems	Cooling Towers
Air Conditioning Systems	Golf Courses
Recirculation	Dry Cleaning Plants
Booster Service	Livestock Watering
Heating Systems	Bottle Washers
Laundry Equipment	Lawn Sprinklers

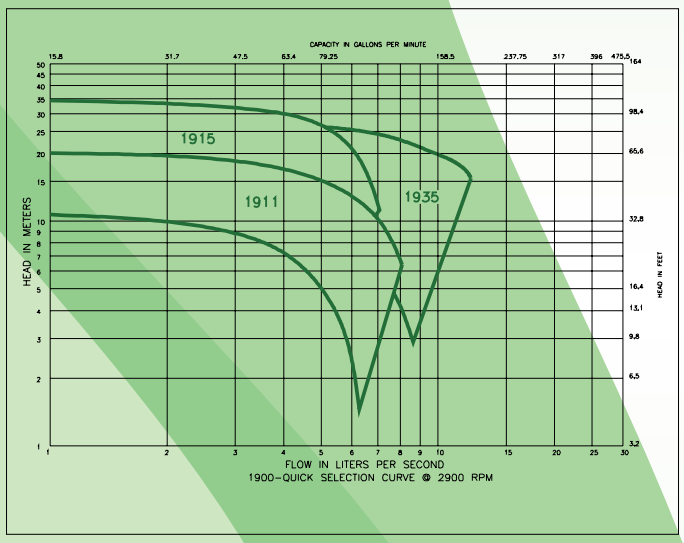
Pressure Temperature Ratings



1900 Series Performance Field 50 Hz

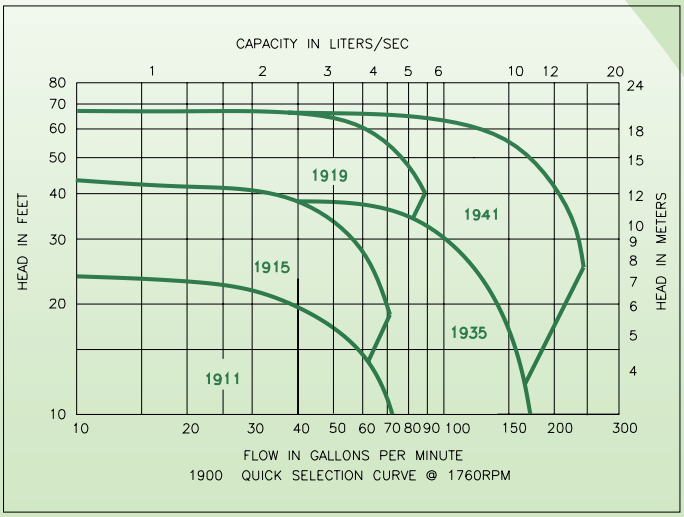
Curves also available on TacoNet.

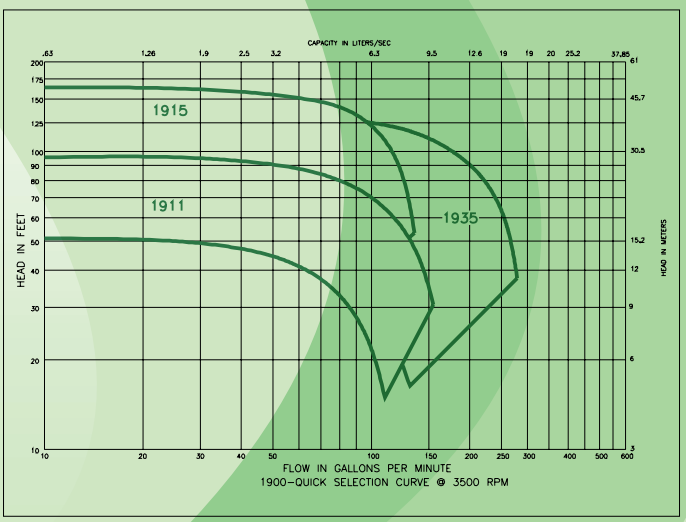




1900 Series Performance Field 60 Hz

Curves also available on TacoNet.





Radiant Mixing Block RMB-1

The Taco Radiant Mixing Block™ is a breakthrough in the design, control and installation of radiant systems. The RMB-1 is a complete injection mixing system, combining a variable speed injection mixing control, injection circulator, system circulator and air elimination all in a single unit. You get unmatched versatility and performance as a result.

- **Use as an outdoor reset control, a setpoint control or a delta T limiting control.**
- **Requires only four pipe connections for complete installation.**
- **Does not require special piping, balancing valve, closely spaced tees, external control or complex wiring.**

To view at RMB Part 1 Video, click here

RMB Part 2 Video, click here

Set RMB Operating Modes Part 1 Video, click here

Set RMB Operating Modes Part 2 Video, click here

Features:

- **Plug-In, Low Voltage Connections**
- **Solid Stage Microprocessor**
- **Replaceable Cartridge Design**
- **Maintenance-Free, Wet-Rotor Circulators**
- **Bronze Casing for Open or Closed Systems**

Features

- All-in-One Injection Piping, Pumping, Air Elimination, & Control Package
- Only 4 Pipe Connections Required
- Plug-in Low Voltage Connections
- Solid State Microprocessor Design
- Greatly Decreases Installation Time
- Substantial Space Savings
- Line Cord Included, Hard Wire Option
- Stainless Steel Casing for Open or Closed Systems
- Replaceable Cartridge Design
- Maintenance Free, Wet-Rotor Circulators
- 2 Operation Modes: Outdoor Reset and Setpoint with or without Delta-T Limiting
- Powered or Unpowered Demand Signal
- Integral Check Valve
- Main System Pump Contact
- 100% Pump Operation / Control Override Switch
- Automatic Pump Exercise
- Adjustable Reset Ratio
- Warm Weather Shutdown
- Boiler Control or Enable Setting
- Boiler Protection
- Large LCD Display
- C° or F°
- Outdoor and 2 Strap-on Sensors included

Performance Data

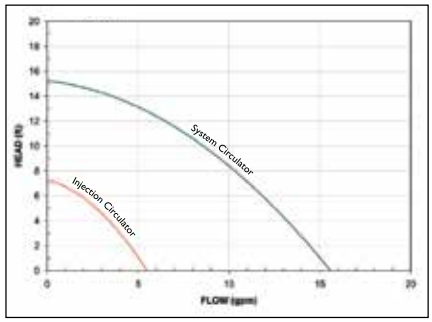
Max. Flow: 15.5 GPM
Max. Head: 15 Feet
Min. Fluid Temperature: 32˚F (0˚C)
Max. Fluid Temperature: 185˚F (85˚C)
Max. Working Pressure: 125 psi
Connection Sizes: 3/4" NPT

Certifications & Listings

c UL us LISTED **FOR INDOOR USE ONLY**

NSF Certified to NSF/ANSI 372 **Low-Lead Compliant**

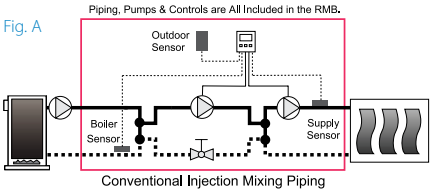
Performance Field

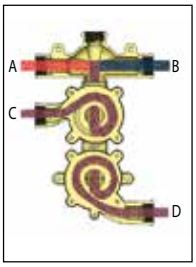


Application

The Taco Radiant Mixing Block® (RMB) is a complete injection mixing system. Integral to the unit is a variable speed injection circulator, constant speed system circulator, air elimination, and the electronics to drive it all. With only four piping connections needed, the RMB greatly reduces the time and space required for installation (see Fig. A). The RMB can be set up to operate as an outdoor reset control or a setpoint control with or without delta T limiting, creating flexibility never seen before in a single unit.

Fig. A



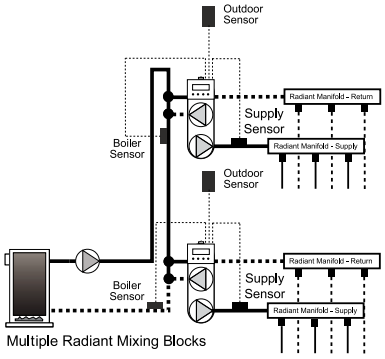


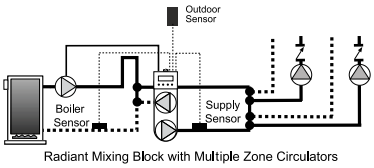
Operation

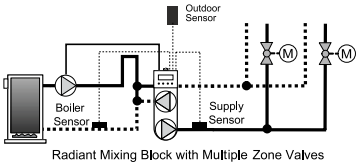
Hot water from the boiler loop enters the RMB at the Boiler Supply port (A). The cooler return water from the radiant loops enters at the System Return port (B). In the middle of these two ports, any air in the system is purged through the integral Taco Hy-Vent®. The injection circulator varies in speed to blend the two temperatures, injecting the excess required temperature back through the Boiler Return port (C). The constant speed system circulator delivers the required blended water temperature to the radiant loop through the Radiant Supply port (D).

Sizing and Piping

The Radiant Mixing Block can handle radiant load demands of up to 120,000 BTU's. Your current method of zoning the radiant loops (manifolds, zone valves, etc.) does not change with the installation of the RMB. Multiple Radiant Mixing Blocks can be used to separate the distinctive temperature requirements between manifolds. No special piping, just 4 connections and your installation is complete.

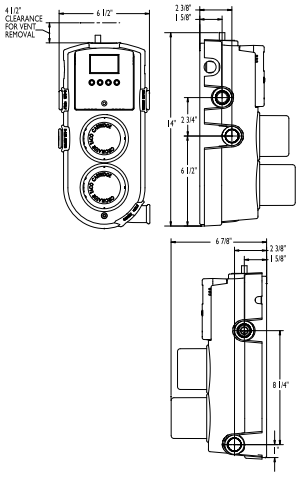






Electrical & Weight Data

Model	Volts	Hz	Ph	Amps	RPM	HP	Ship Wt. lbs.	Ship Wt. Kg
RMB-1	120	60	1	2	3250	1/40 & 1/25	18.5	8.4
Motor Type	Permanent Split Capacitor Impedance Protected							



Taco Comfort Solutions™

Application

The X-Pump Block (XPB) is a complete mixing system with an attached brazed plate, counterflow style heat exchanger for system isolation. Integral to the unit is a variable speed heat source circulator, constant speed system circulator and the electronics to drive it all. The XPB can be set up to operate as an outdoor reset control, a setpoint control or a delta T limiting control. This unparalleled flexibility within a single unit creates a pumping and control package that can be used in systems combining any style heat source (boiler, water heater, etc.) with any style heat delivery method or system condition (radiant tubing, glycol based snowmelt, open system, etc.). With just 4 piping connections needed, the XPB greatly reduces the time and space required for installation.

Features

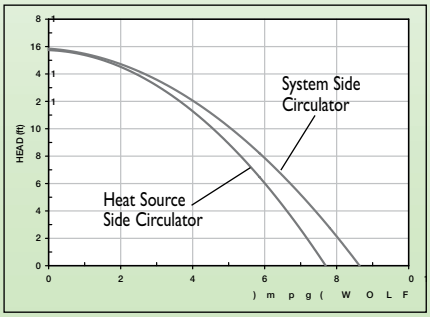
- All-in-One Heat Exchanger, Dual-sided Circulators and Mixing Control Package
- Brazed Plate Heat Exchanger
  - Provides Complete Isolation
  - Stainless Steel
  - Easily Removable
  - Double Wall Optional
- Only 4 Pipe Connections Required
- Plug-in Low Voltage Connections
- Solid State Microprocessor Design
- Greatly Decreases Installation Time
- Substantial Space Savings
- Line Cord Included, Hard Wire Option
- Bronze Casing for Open or Closed Systems
- Replaceable Cartridge Design
- Maintenance Free, Wet-Rotor Circulators
- 2 Operation Modes: Outdoor Reset and Setpoint with or without Delta T Limiting
- Main System Pump Contact
- 100% Pump Operation / Control Override Switch
- Automatic Pump Exercise
- Adjustable Reset Ratio
- Warm Weather Shutdown
- Large LCD Display
- Outdoor and 2 Strap-on Sensors included

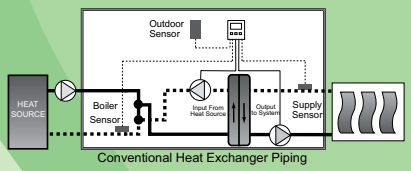
Performance Data

Flow Range: 0 – 7.5 GPM
Head Range: 0 – 15.5 Feet
Minimum Fluid Temperature: 32˚F (0˚C)
Maximum Fluid Temperature: 185˚F (85˚C)
Maximum Working Pressure: 125 psi
Connection Sizes: 3/4" NPT

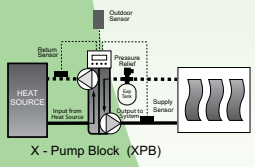
c UL us LISTED **FOR INDOOR USE ONLY**

Performance Field





Conventional Heat Exchanger Piping

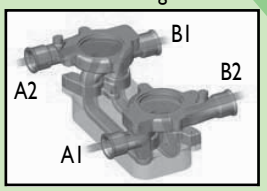


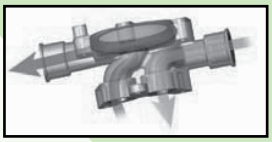
X - Pump Block (XPB)

The features of the X-Pump Block makes it easy and cost effective to include a hydronic based radiant floor warming system in any kitchen and bath remodel project, especially in homes which have an air based heating system. The XPB also makes the perfect companion for basement "radiant ready" packages, jobs where space is at a premium, and small snowmelt areas such as handicap accessible building entrances.

Operation

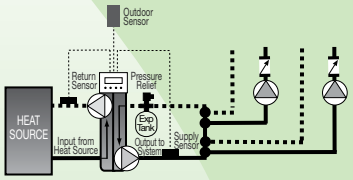
Hot water from the heat source, such as a boiler, enters the X-Pump Block's integral heat exchanger at port (A1) and exists at (A2). The variable speed circulator controls the speed of the water flowing through the A side of the heat exchanger to satisfy the heat transfer requirements between the A side of the heat exchanger and the B (system) side. The heat exchanger is a counterflow style, so system water enters at port (B1) and exits at port (B2). A constant speed circulator moves the water around the B (system) side. In certain applications, such as snowmelt, the system pump motor can be switched with the variable speed motor in order to protect the heat exchanger from freezing up by ensuring constant flow on the heat source side.



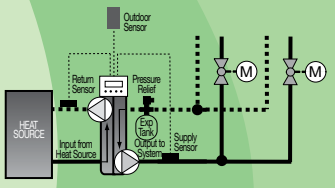


Sizing and Piping

The X-Pump Block can handle transfer loads of up to approximately 50,000 BTU. Your current method of piping virtually remains the same; yet complete system isolation is achieved. The only addition needs to be a separate expansion tank and relief valve on the system side. 1 outdoor sensor, 2 strap-on sensors and a line cord are included for fast plug n' play wiring.



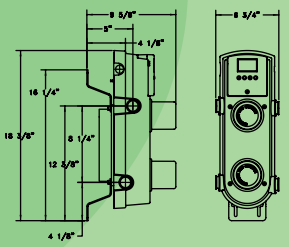
X - Pump Block (XPB), Multiple Zones - Circulators



X - Pump Block (XPB), Multiple Zones - Zone Valves

Electrical & Weight Data

Model	Volts	Hz	Ph	Amps	RPM	HP	Ship Wt.	
XPB-1	120	60	1	2	3250	2 @ 1/25	lbs.	Kg
Motor Type	Permanent Split Capacitor Impedance Protected						26.5	12.0



Features

- All-in-One Pre-insulated and Pre-plumbed Module
- Ball Valves on Supply and Return with:
  - Temperature Gauges
  - Solar Check Valves
- Flow Meter graduated in GPM with Integral Balancing Valve
- Safety Group:
  - Pressure Gauge
  - Pressure Relief Valve
  - Expansion Tank Connection
- Fill and Purge Valves
- Air Eliminator with Manual Vent
- Expansion Tank Bracket and Flex Tubing
- Standard 2-Bolt Flanged Circulator
- Variable Speed Solar Differential Control
  - Matches Output of Collector
  - No Short Cycling of Circulator
  - +20% Increased Performance
- User Definable Line Voltage Output, Supports:
  - External Heat Exchanger
  - Collector Sink / Dump
  - Storage Tank Supplement
  - 1 or 2 Storage Tanks

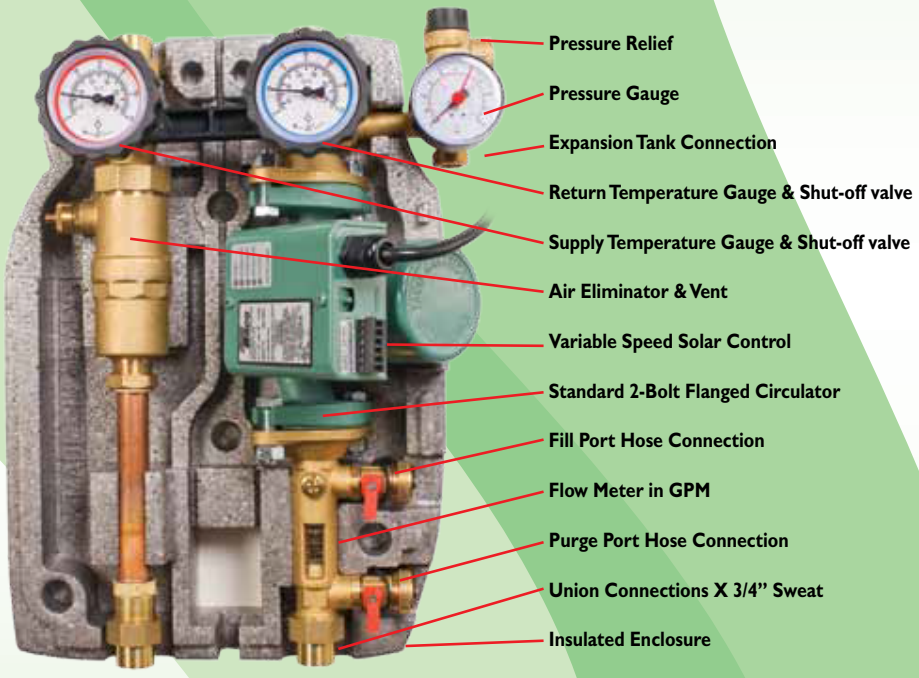
Specifications

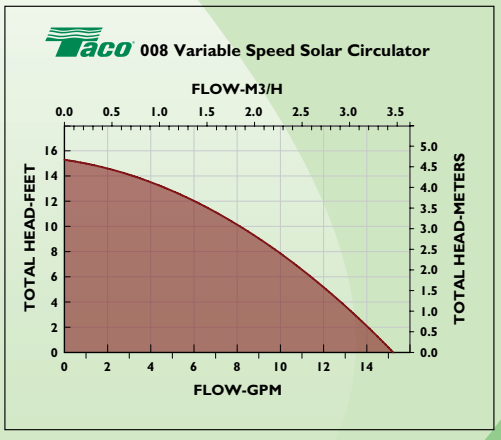
Body Construction	Bronze / Brass
Insulating Enclosure	EPP
Maximum Working Temp. (Excluding Circulating Pump)	250˚F (120˚C)
Short Time	320˚F (160˚C) for 20 Seconds
Pressure Relief Setting	87 PSI (6BAR)
Temperature Gauges	30-250˚F (0-120˚C)
Pressure Gauges	0-145 PSI (0-10BAR)
Flow Meter	0 - 3.25 GPM (0-12 l/min)
Exp. Tank Connections	3/4" BSP or NPT
End Connections	3/4" FM Copper Sweat X 1" Union
Unit Dimensions	12.1" x 17" x 6.6"
Shipping Weight	25 LBS

Variable Speed Pays Big Performance Dividend:

The variable speed circulator in the Solar Pumping Station continuously optimizes the flow through the collector to achieve maximum energy gain. For example, there is no benefit of pulling 80° water out of the collector when you are trying to maintain 120° in a tank. If a proper Delta-T is maintained through the collector then higher source temperatures can be achieved over longer periods of time, no matter the weather conditions.

The Solar Pumping Station truly simplifies your closed loop solar water heating installation. With just a few connections, you install the heart of the system; circulator, solar control and all safety and measurement equipment.





Domestic Hot Water Systems and Plumbing Products

Taco® Comfort Solutions™
A Taco Group Company

Domestic Hot Water Recirculation

Taco Domestic Hot Water Plumbing Products

Since 1920 Taco has designed and manufactured residential plumbing products in the U.S.A. In fact, we invented the side-arm water heater and the hot water tempering valve. Today, Taco is a third generation family owned company who continues to design and manufacture HVAC and plumbing products in the United States. Our highly skilled work force and state-of-the-art facility in Cranston, Rhode Island builds the highest quality products in the industry.

Domestic Hot Water Recirculation (DHWR)

Taco offers the most complete line of DHWR products in the industry. At Taco, we understand that maximizing comfort, convenience and resource savings, with efficient quality products, is critical to establishing and maintaining long-term relationships with your customers. Taco DHWR products are designed with you, and your customer in mind. Our products are built for a variety of domestic hot water systems and customer preferences. They're easy to install and provide years of trouble-free performance.

Stop Wasting & Start Saving

The average family of four can waste 12,000 gallons of water per year waiting for hot water to arrive at taps and faucets. In fact, domestic water heating is typically the second or third largest energy user in residential applications. Since 1970, median home size has increased from 1,600 sq./ft. to 2,400 sq./ft., and the distance from the hot water source to the furthest fixture has increased from 30' to 80'. These significant changes coupled with "low-flow" shower heads and faucets, have dramatically increased the time it takes to deliver hot water. In North America regulations to improve energy efficiency and reduce water consumption are increasing at federal, state, and local levels. Installing a Taco DHW recirculation system will provide your customer's with instant hot water comfort and convenience while conserving our most precious resource.

There's Nothing Standard About Our Standards.

Our commitment to driving high efficiency domestic hot water technology is second to none. All Taco DHWR products are e-smart, NSF compliant and backed by Taco's 3 year warranty. The e-smart tag is your assurance that you're installing a state-of-the-art resource saver. All products included in this catalog carry the e-smart label.

e-smart! Resource Saving Products

NSF Certified to NSF/ANSI 61-G

ALL "00" CIRCULATORS ARE PROTECTED WITH A 3 YEAR FLANGE TO FLANGE WARRANTY

Domestic Hot Water Recirculation

SmartPlus™

Available in Stainless Steel or Bronze
MODELS: 003, 006 & 008

This domestic hot water circulator has a knack for numbers!
SmartPlus™ patented electronics learn and record the family's hot water usage pattern for the first 7 days and repeats that pattern for the next 7 days providing instant hot water only when needed. This process of learn, record and repeat is continuous and never stops. And when the family leaves for vacation, the SmartPlus recognizes it, and stops pumping hot water until the family returns and resumes hot water use. And it's so smart, it never needs programming. Simply install it…plug it in… and the SmartPlus does it all.

Features and Benefits:
- Vacation and exercise function
- Factory installed 6' line cord
- Remote sensor included
- Optional IFC® (Integral Flow Check — 003, 006 models)
- LED indicator lights
  - Green (power), yellow (mode), and red (sensor connection)
- Quiet, efficient operation
- Unique, replaceable cartridge design, field serviceable
- Unmatched reliability, maintenance free

Installation: Dedicated Return Line Piping (Refer to page 6 diagram)

TacoGenie®

SAVE ENERGY • SAVE WATER • SAVE MONEY

Available in Stainless Steel
MODELS: 006, 008 & 0011

Hot water when you want it!
The user-activated TacoGenie® mounts under the most remote kitchen or bath fixture. A great retrofit that uses existing plumbing…..no new piping required! When activated, the TacoGenie quickly sends hot water to fixtures and taps and once the hot water arrives, the internal temperature sensor shuts the pump off to prevent excess hot water from entering the cold water line.

Note: The TacoGenie can also be installed at the water heater for "dedicated return line" piping systems.

Features and Benefits:
- Compact design makes it easy to install
- Runs only when activated by user
- Automatically senses and shuts off when water is hot
- Uses existing plumbing – No dedicated return line needed
- Save up to 12,000 gallons of water per year
- Optional wireless remote push button or hard-wired motion sensor available

Installation: Standard Piping , Dedicated Return Line Piping (Refer to page 6 diagram)

Stainless SmartPlus

Save More Energy

Pulse Mode
When set for Pulse mode, the SmartPlus circulator will run for 150 seconds every 10 minutes to maintain hot water at all fixtures.

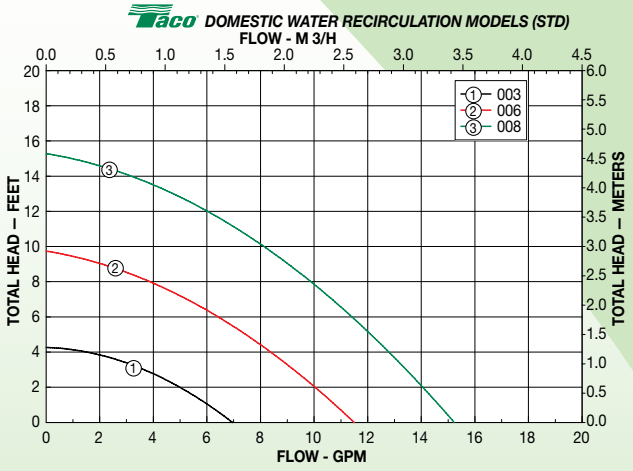
Smart Mode
When set for Smart mode, the circulator will run in Pulse mode as above for the first 7 days. During the first 7 days, the SmartPlus will monitor and record the homes hot water usage pattern. For the next 7 days, the Smart-Plus will use the preceding week's usage pattern to cycle the pump. This process will be repeated every 7 days.

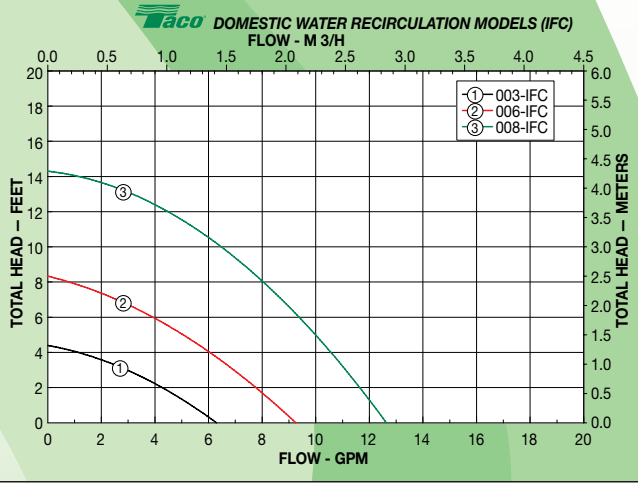
Vacation Function — *After 36 ours of inactivity the pump will automatically TURN OFF and remain off until hot water usage is detected again.*

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
UL Listed
Quiet, Efficient Operation
Remote Sensor Included
Optional IFC® (Integral Flow Check)
Unique Replaceable Cartridge Design-Field Serviceable

Performance Field Information - 60 Hz





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*

Pump Selection Charts

This information is provided as a guide only. Find the table below that best describes the design you plan to use.
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.

TacoGenie™
SAVE ENERGY • SAVE WATER • SAVE MONEY

e-smart

See Taco Catalog *#100-15* and Submittal Datasheet *101-150* for full details.

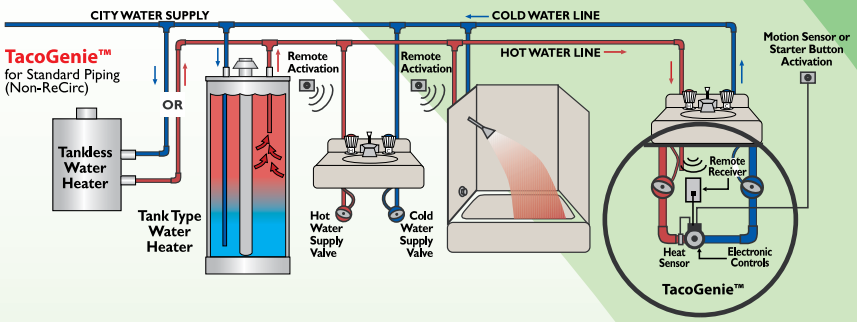
NSF Certified to NSF/ANSI 372

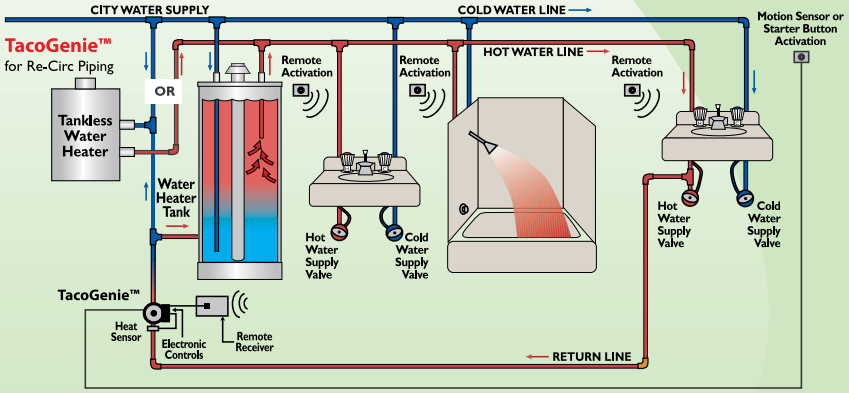
For New or Retrofit Installations

Using the existing cold water line as the return line, TacoGenie™ is ideal for both new and retrofit installations. Typically installed at the furthest fixture from the water heater, TacoGenie fits out of the way, under any bathroom vanity. Connections are made from the hot and cold lines to the suction and discharge side of the pump using adapter tees and stainless flex lines provided. When hot water is needed, the pump is activated by pressing a starter button, runs only long enough to supply hot water to the fixture and then automatically stops. This prevents hot water from entering the cold line. A spring-loaded Integral Flow-Check valve (IFC®) prevents cold water from entering the hot line. Optional wireless RF or motion sensor starters are also available.

Features and Benefits of the TacoGenie™

- Instant Hot Water Comfort
- Maximum Water & Energy Savings
- 24 Hour operation
- Maintenance free circulator - unmatched reliability
- Removable stainless steel cartridge - contains all moving parts
- UL listed
- Integral Flow-Check (IFC®) to prevent thermo-siphoning or gravity flow
- Pre-wired power cord and integral temperature sensor
- Adapter tees & stainless steel flex lines included
- RF wireless remote or motion sensor starter-optional
- Ideal for tankless water heaters





TacoGenie™ includes:

- TacoGenie Circulator
- Hard Wire Push Button
- (2) Copper T's
- (2) Flex Hoses
- RF Wireless Starter Kit (Optional)
- Motion Sensor (Optional)

MATERIALS OF CONSTRUCTION

Circulator:

Casing (Volute).....Stainless Steel
Stator Housing.....Steel
Cartridge.....Stainless Steel
Impeller.....Noryl
Shaft.....Ceramic
Bearings.....Carbon
O-Ring.....EPDM

Integral Flow Check (IFC®):

Body & Plunger.....Acetal
O-Ring.....EPDM

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 = TacoGenie
T = Threaded
F = Flanged
USK = under sink kit

TacoGenie 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

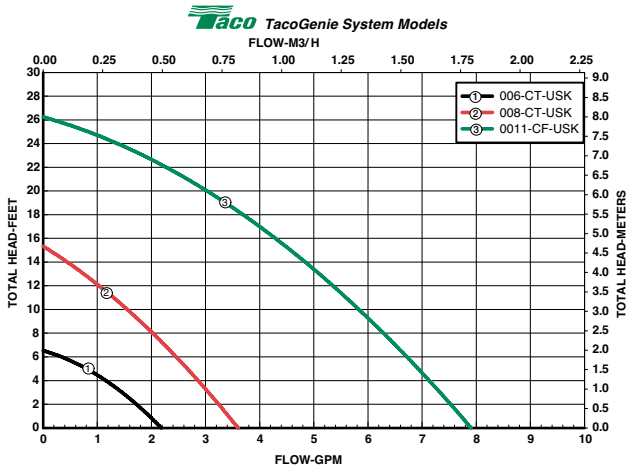
Standard TacoGenie with USK*
(Under Sink Kit) option

RF Wireless Starter Kit
(554-7)

Available in 006, 008 and 0011 circulators

Motion Sensor
(554-4)

Performance Field Information - 60 Hz



Domestic Hot Water Recirculation

HotLink®

NSF Certified to NSF/ANSI 61-G

Retro-fit domestic hot water installation in a snap!
Using existing plumbing, the Hot-Link® Valve is installed under the most remote kitchen or bath fixture and the recirculation pump is installed back at the water heater. The Hot-Link System recirculates "cooled" water back to the water heater so hot lines remain hot. When hot water arrives at the fixture the Hot-Link valve's thermal disc "snaps" shut to prevent excess hot water from entering the cold line. Our exclusive "clean-in-place" under sink valve makes it quick and easy to keep the system clean and operating properly. The Hot-Link circulator is provided with an analog timer that allows the user to set the pump for operation during peak usage hours or to run continuous.

Features and Benefits:
- Clean-in-place valve design
- Creates a DHW system without a 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 the user to set the system to work during peak hours or to work continuously
- Includes Hot-Link Cartridge Circulator; Hot-Link Valve and Stainless Steel Flex Hoses and 1 full union.

Installation: Standard Piping (Refer to page 6 diagram)

HotLinkPlus™

NSF Certified to NSF/ANSI 61-G

Smart, efficient domestic hot water in a snap!
The Taco Hot-LinkPlus features a smart circulator that learns household hot water usage patterns and makes hot water available at the same times the following week. If water usage changes the Hot-LinkPlus circulator adapts for you. It never needs programming!

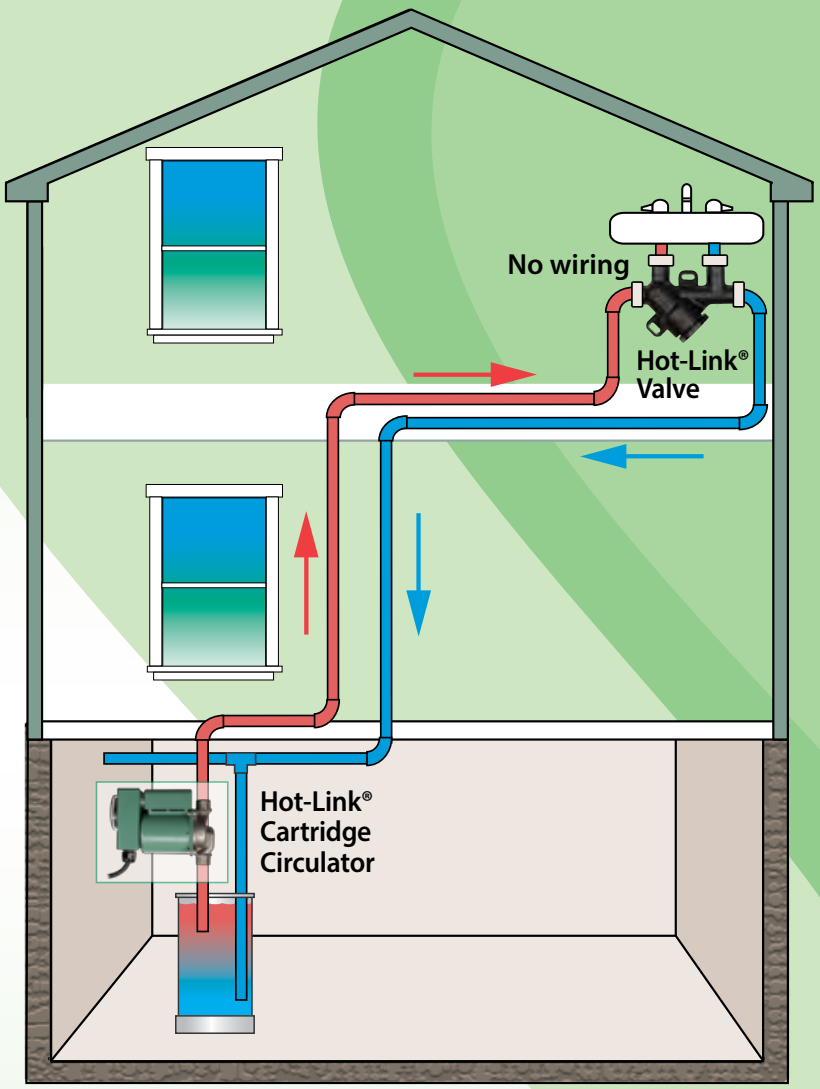
The Hot-Link System recirculates "cooled" water back to the water heater so hot lines remain hot. When hot water arrives at the fixture the Hot-Link valve's thermal disc "snaps" shut to prevent excess hot water from entering the cold line. Our exclusive "clean-in-place" under sink valve makes it quick and easy to keep the system clean and operating properly.

Features of Hot-LinkPlus™ Circulator:
- Up to 94% more energy efficient than standard recirculation circulators.
- Fully automatic. Never needs programming.
- LED Display.
- Vacation Function.
- 3-year warranty.

Features of Hot-Link® Valve:
- Exclusive clean in-place design.
- Saves time, water and energy.
- Easy to install.
- Ideal for home retrofits. No recirculation line necessary.

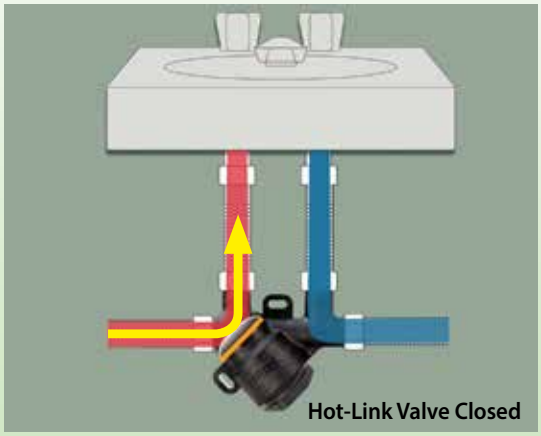
Installation: Standard Piping (Refer to page 6 diagram)

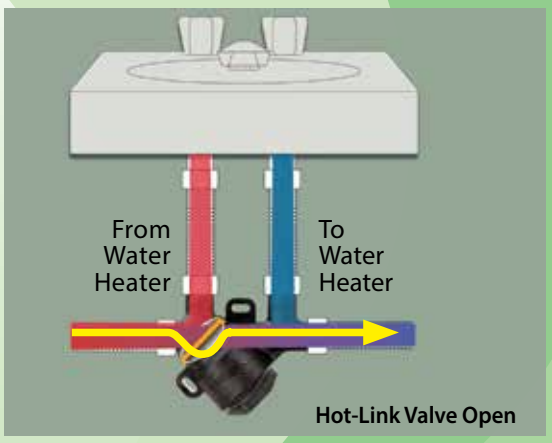
HotLink® delivers instant hot water using existing plumbing system!



Features:

- Exclusive clean in place undersink 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





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

Installation is a snap. Uses existing plumbing.

Save Energy, Water and Time!

Link up to instant hot water comfort!

Hot water without the waste!

The Taco Hot-Link® System for domestic hot water recirculation reduces the time it takes for hot water comfort to reach showers and faucets by recirculating "cooled" water back to the water heater; hot water lines remain hot. **The Hot-Link® System can save an average family up to 12,000 gallons per year** — water that normally goes down the drain while waiting for hot water.

How the Hot-Link System works.

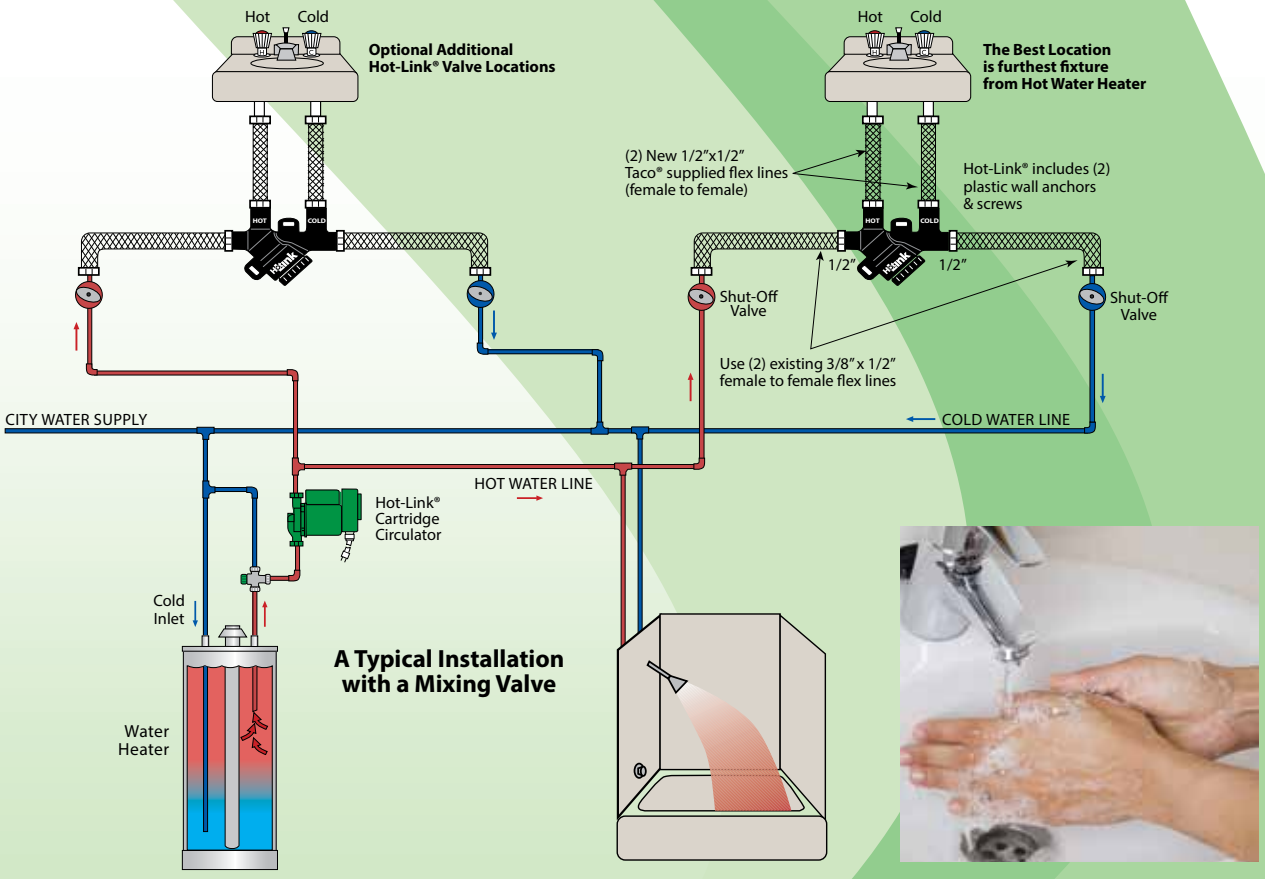
A quiet and efficient Hot-Link circulator is installed at the water heater and a Hot-Link bypass valve is easily installed at the faucet furthest away from the hot water heater. The thermal disk technology tells the Hot-Link bypass valve what to do. No under sink electricity is needed.

Hot-Link System is easy to install.

The Hot-Link System circulator is installed at the water heater. Simply plug the 6' power cord into any standard 120V electrical outlet; no electrician required. Everything needed to install and operate the Hot-Link System is included in the box. Simply set the Hot-Link circulator timer to work during peak hours or to work continuously.

Benefits of the Hot-Link System.

Saves energy, water and time while providing instant hot water comfort. What's more, it's made by Taco, known by plumbing professionals as a world leader in high quality hydronic components since 1920.



Piping schematic is for demonstration only.

Hot-Link System Includes:

- Hot-Link Valve
- Hot-Link Circulator
- (2) Braided Flex Hoses
- 3/4" Bronze Union

Materials of Construction —Pump & Union

Casting (Volute)	Stainless Steel
Stator Housing	Steel
Cartridge	Stainless Steel
Impeller	Noryl
Shaft	Ceramic
Bearings	Carbon
O-Ring	EPDM
Union	Bronze

Materials of Construction —Hot-Link Valve

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

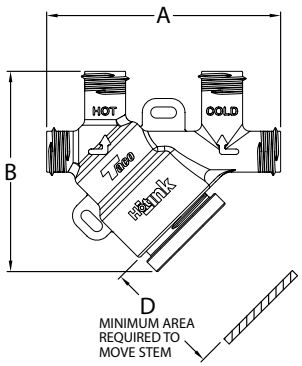
Certifications & Listings

c UL us LISTED FOR INDOOR USE ONLY

NSF Certified to NSF/ANSI 372

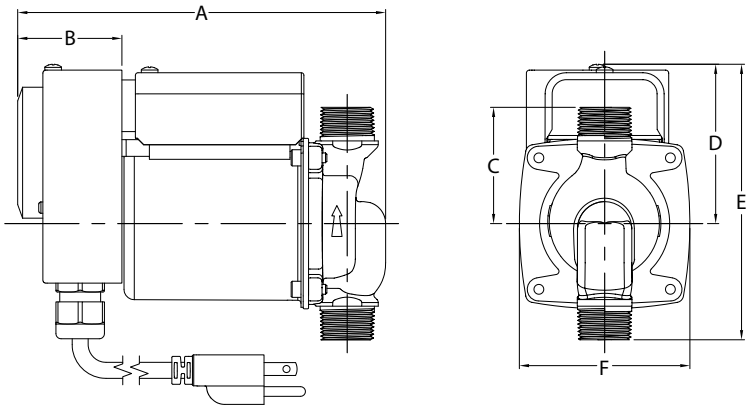
Dimensions & Weights: Hot-Link Valve

Connection	A		B		C		D		Ship Wt.	
	in.	mm	in.	mm	in.	mm	in.	mm	Lbs.	Kg
1/2" MNPT	4	102	4-7/16	87	1-3/4	41	2-1/2	64	0.37	0.17



Hot-Link Circulator

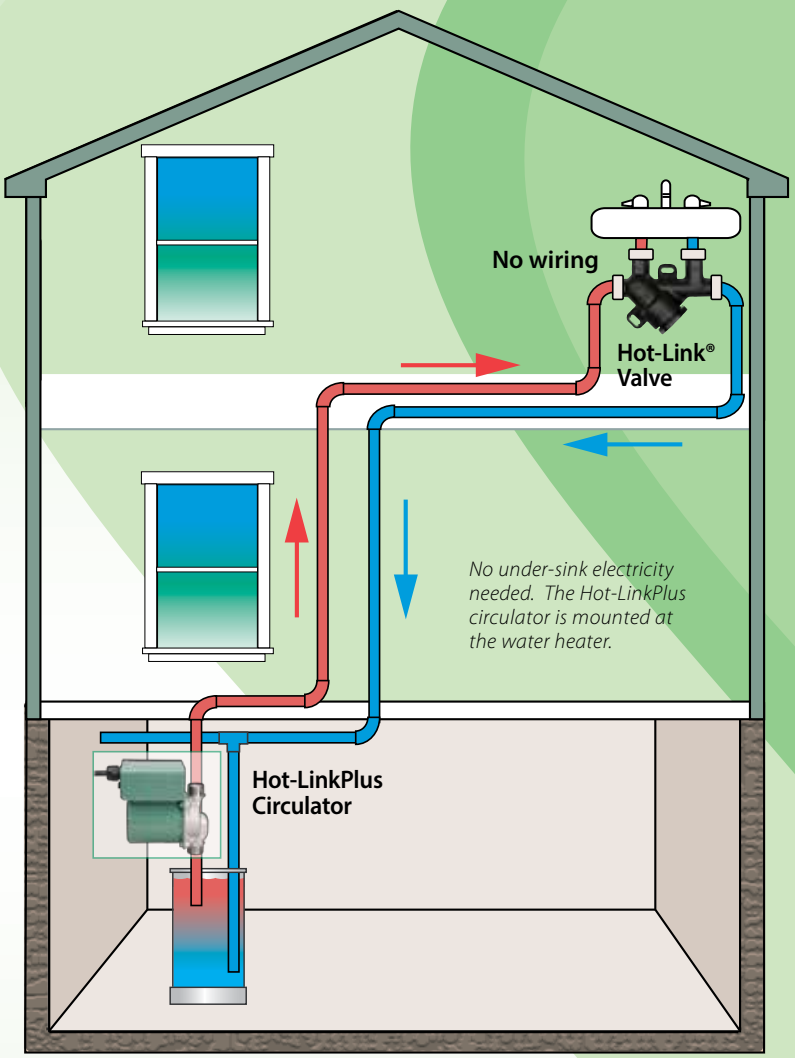
A		B		C		D		E		F		Ship Wt.	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	Lbs.	Kg
7-1/4	184	1-15/16	49	2	51	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2



Electrical Data

Model	Volts	Hz	Ph	Amps	RPM	HP
Hot-Link Circulator	115	60	1	.52	3250	1/40
Motor Type	Permanent Split Capacitor Impedance Protected					

HotLinkPlus™ delivers instant hot water using existing plumbing system!

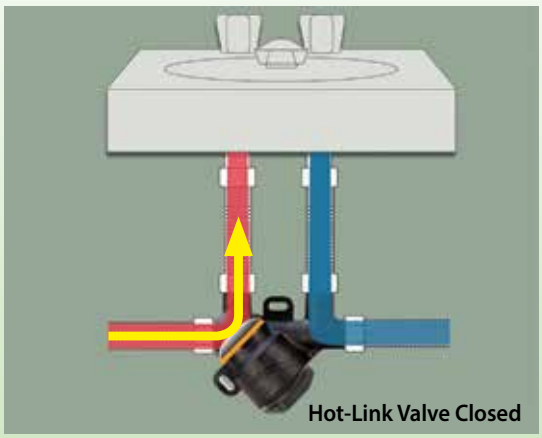


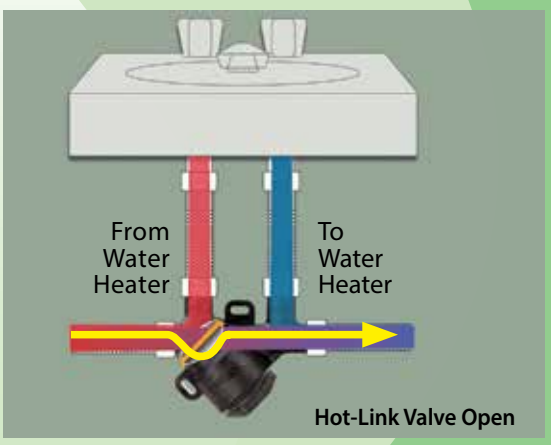
Features of Hot-LinkPlus™ Circulator:

- Up to 94% more energy efficient than standard recirculation circulators.
- Fully automatic. Never needs programming.
- LED Display.
- Vacation Function.
- 3-year warranty.

Features of Hot-Link® Valve:

- Exclusive clean in-place design.
- Saves time, water and energy.
- Easy to install.
- Ideal for home retrofits. No recirculation line necessary.





Save Energy, Water and Time!

Link up to instant hot water comfort!

Hot water without the waste!

The Taco Hot-LinkPlus for domestic hot water recirculation reduces the time it takes for hot water comfort to reach showers and faucets by recirculating "cooled" water back to the water heater; hot water lines remain hot. **The Hot-LinkPlus can save an average family up to 12,000 gallons per year** — water that normally goes down the drain while waiting for hot water. Installation is a snap. Uses existing plumbing.

How the Hot-Link Plus works.

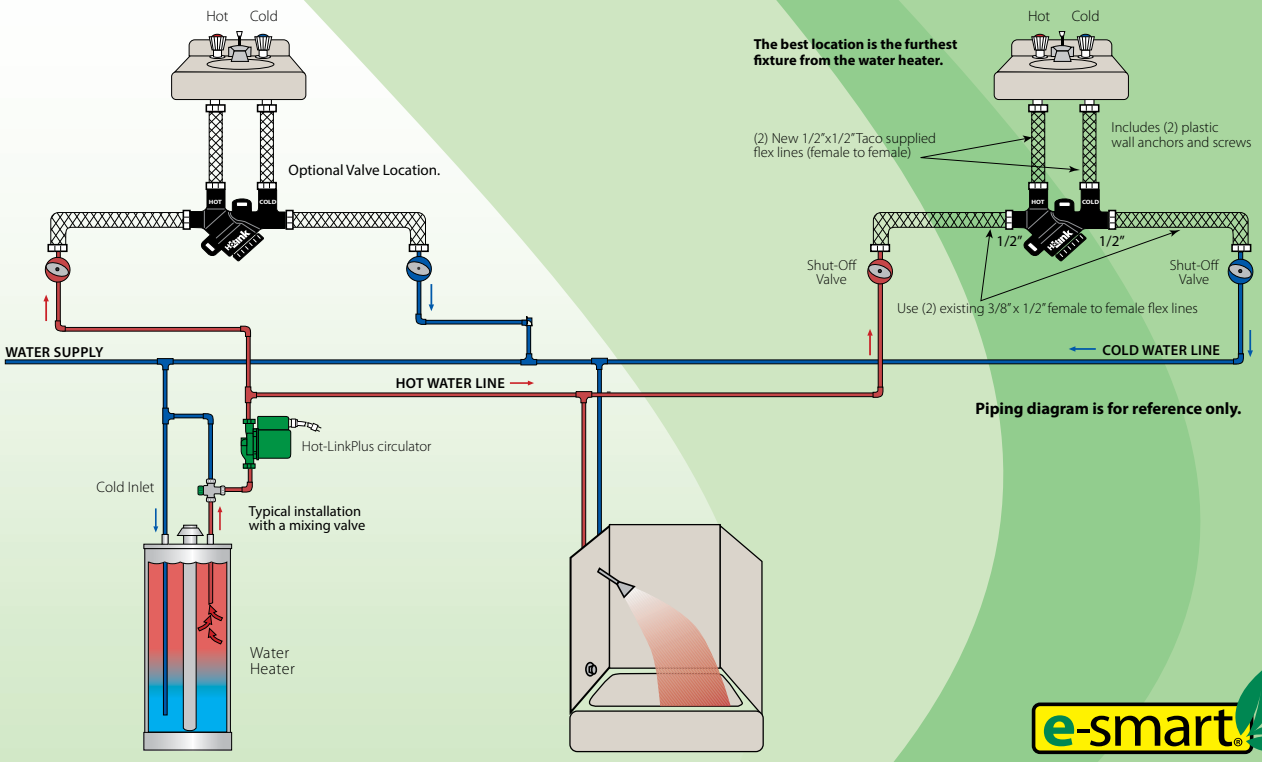
When set to "Smart" mode, the Hot-LinkPlus circulator monitors and records the home's hot water usage pattern and repeats the pattern to cycle the pump, providing instant hot water at all fixtures only when needed. An optional "pulse" mode can be selected which sets the circulator to run for 5 minutes every 10 minutes maintaining hot water at all fixtures. In either mode, an automatic vacation mode activates when 36 hours of hot water inactivity is reached. The Hot-LinkPlus bypass valves unique thermal disk technology sends cooled water back to the water heater so hot water lines remain hot.

Hot-Link Plus is easy to install.

First, install the Hot-LinkPlus bypass valve at the faucet furthest away from the water heater. Then install the Hot-LinkPlus circulator at the water heater. Once installed connect the temperature sensor to the hot water supply pipe and plug the 6' power cord into any standard 120V electrical outlet. Everything needed to install and operate the system is in the box.

Benefits of the Hot-Link System.

Saves energy, water and time while providing instant hot water comfort. What's more, it's made by Taco, known by plumbing professionals as a world leader in high quality hydronic components since 1920.



Hot-LinkPlus Includes:

- Hot-Link Valve
- Hot-LinkPlus Circulator
- (2) Flex Hoses
- (2) Half Unions with Tail Pieces

Materials of Construction —Circulator & Union

Casting (Volute)	Stainless Steel
Stator Housing	Steel
Cartridge	Stainless Steel
Impeller	Noryl
Shaft	Ceramic
Bearings	Carbon
O-Ring	EPDM
Half Unions	Stainless Steel
Tail Pieces	Stainless Steel

Materials of Construction —Hot-Link Valve

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

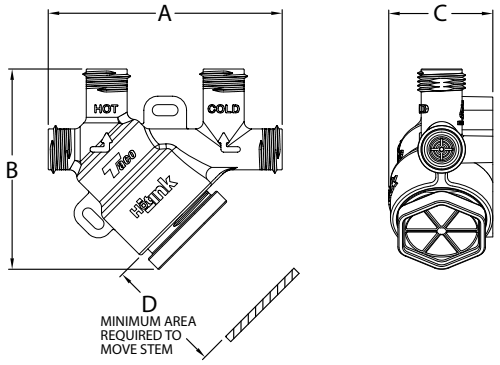
Certifications & Listings

c UL us LISTED FOR INDOOR USE ONLY

NSF Certified to NSF/ANSI 372

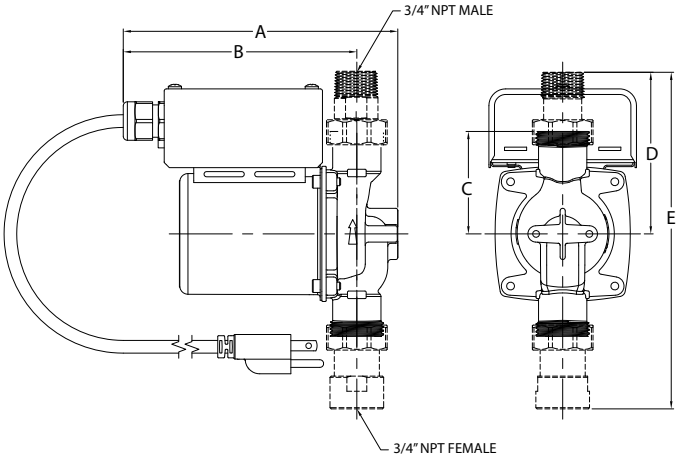
Dimensions & Weights: Hot-Link Valve

Connection	A		B		C		D		Ship Wt.	
	in.	mm	in.	mm	in.	mm	in.	mm	Lbs.	Kg
1/2" MNPT	4	102	4-7/16	87	1-3/4	41	2-1/2	64	0.37	0.17



Hot-LinkPlus Circulator (Model 006-IQST4-2)

A		B		C		D		E		F		Ship Wt.	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	Lbs.	Kg
6-3/4	171	5-3/4	146	2-1/2	64	4	102	8-1/4	210	3-5/16	84	8.0	3.6



Electrical Data

Model	Volts	Hz	Ph	Amps	RPM	HP
Hot-LinkPlus Circulator	115	60	1	.52	3250	1/40
Motor Type	Permanent Split Capacitor Impedance Protected					

Domestic Hot Water Recirculation

Plumb n' Plug®

Available in Stainless Steel or Bronze
MODELS: 003, 006 & 008

NSF Certified to NSF/ANSI 61-G

Simply plumb it in … then plug it in!
Periodically recirculates water through the domestic piping system to decrease the delivery time to outlet fixtures and reduce wasted water. Plumb n' Plug is available with line cord only, analog timer, or digital timer.

Features and Benefits with an Analog Timer:
- Factory installed 6' line cord and 24-hour/15-minute interval analog timer
- Optional 95°F-115°F Aquastat available
- Quiet, efficient operation
- Unique replaceable cartridge design-field serviceable
- Unmatched reliability-maintenance free

Additional Features with a Digital Timer:
- Digital timer, 7-day programmable
- LCD display
- Easy-to-use program buttons
- On/off intervals as short as a minute
- 2,500 hour capacitor backup, saves settings

Installation: Dedicated Return Line Piping (Refer to page 6 diagram)

Domestic Hot Water Accessories

Analog Timer

Digital Timer

Aquastat

Great for retrofits!
The timers and aquastat can be installed on any standard Taco 00® circulator. Adding a timer and aquastat to a Taco domestic hot water recirculation circulator will increase system efficiency and eliminate hot water cycling during "off" hours.

Installation: Taco 00® circulators


Shut-off Swivel Freedom FLANGE®


Bronze Freedom FLANGE®


Stainless Steel Freedom FLANGE®


Half Unions

Features

- Factory Installed 6' Line Cord and 24 Hour/15 Minute Interval Analog Timer
- UL Listed
- Optional 95°F –115°F Aquastat Available
- 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
- Sweat Connections — Bronze
- Union & Threaded Connections — St. Steel
- Flanged — St. Steel

Materials of Construction

Casing (Volute):	Bronze or Stainless Steel
Stator Housing:	Steel
Cartridge:	Stainless Steel
Impeller:	Non-Metallic
Shaft:	Ceramic
Bearings:	Carbon
O-Ring & Gaskets:	EPDM
Integral Flow Check:	Body & Plunger, Acetal, Spring - S/S
O-ring:	EPDM

Model Nomenclature

BC – Bronze, 1/2" Sweat
B – Bronze, 3/4" Sweat
ST – Stainless Steel, 3/4" FNPT
SC – Stainless Steel, Union Connection
PNP – Plumb n' Plug®
SF – Stainless Steel, Flanged

Performance Data

Maximum Flow: 7 GPM (003)
19.5 GPM (005)
11.5 GPM (006)

Maximum Head: 4.5 Feet (003)
8.5 Feet (005)
9.5 Feet (006)

Minimum Fluid Temperature: 40°F (4°C)

Maximum Fluid Temperature: 220°F (104°C)

Maximum Working Pressure: 125 psi

c UL us LISTED

FOR INDOOR USE ONLY

Application

The Taco 003, 005 & 006 Plumb n' Plug® (PNP) periodically re-circulates hot water through the domestic piping system to decrease the delivery time to outlet fixtures and reduce wasted water. Typical timer programming will cycle the Plumb n' Plug during high peak usage periods such as early morning or early evening. An optional aquastat is available for constant circulation applications to maintain temperature between 95°F and 115°F. The Taco 003 PNP is ideal for recirculation loops.
Its design operating condition of 3 gpm at 3 feet of head helps to reduce erosion corrosion and noise in system piping. Use the 003 PNP for systems up to 200 total feet (supply and return) of 3/4" pipe. The Taco 005 & 006 PNP's are designed for systems using 200-400 feet of 3/4" pipe. Installation of isolation valves, pipe insulation and flow checks are recommended.

Pump Dimensions & Weights

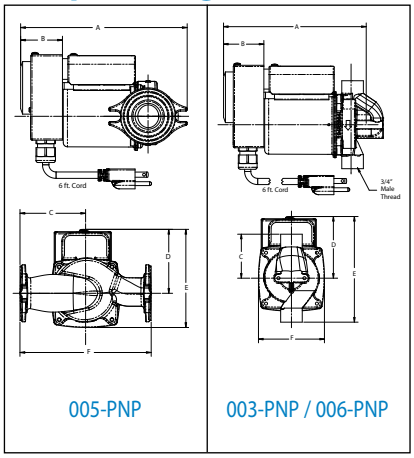
Analog Timer

		A		B		C		D		E		F		Ship Wt.	
Model	Connection	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	Kg
003-BC4-PNP	1/2" Sweat	7-1/4	184	1-15/16	49	2-1/8	54	3-1/16	78.0	5-1/4	134	3-5/16	84	7.0	3.2
003-B4-PNP	3/4" Sweat	7-1/4	184	1-15/16	49	2-3/16	56	3-1/16	78.0	5-1/4	134	3-5/16	84	7.0	3.2
003-ST4-PNP	3/4" FNPT	7-1/4	184	1-15/16	49	2	51	3-1/16	78.0	5-1/4	134	3-5/16	84	7.0	3.2
003-SC4-1PNP	Union	7-1/4	184	1-15/16	49	2-31/32	76	3-1/16	78.0	6	152	3-5/16	84	7.0	3.2
005-SF2-PNP	SS Flanged	8-1/8	205	1-15/16	49	3-5/32	80	3-3/32	78.4	4-3/4	121	6-3/8	162	7.0	3.2
006-BC4-PNP	1/2" Sweat	7-1/4	184	1-15/16	49	2-1/8	54	3-1/16	78.0	5-1/4	134	3-5/16	84	7.0	3.2
006-B4-PNP	3/4" Sweat	7-1/4	184	1-15/16	49	2-3/16	56	3-1/16	78.0	5-1/4	134	3-5/16	84	7.0	3.2
006-ST4-PNP	3/4" FNPT	7-1/4	184	1-15/16	49	2	51	3-1/16	78.0	5-1/4	134	3-5/16	84	7.0	3.2
006-SC4-1PNP	Union	7-1/4	184	1-15/16	49	2-31/32	76	3-1/16	78.0	6	152	3-5/16	84	7.0	3.2

Analog Timer with Integral Flow Check (IFC®)

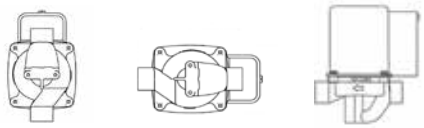
		A		B		C		D		E		F		Ship Wt.	
Model	Connection	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	Kg
003-BC4-3PNP	1/2" Sweat	8-1/8	205	1-15/16	49	2-3/16	56	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2
003-BC4-2PNP	3/4" Sweat	8-1/8	205	1-15/16	49	2-3/16	56	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2
005-SF2-1PNP	SS Flanged	8-1/8	205	1-15/16	49	3-5/32	80	3-3/32	78.4	4-3/4	121	6-3/8	162	7.0	3.2
006-BC7-1PNP	1/2" Sweat	8-1/8	205	1-15/16	49	2-3/16	56	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2
006-BC7-PNP	3/4" Sweat	8-1/8	205	1-15/16	49	2-3/16	56	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2

Pump Drawings



005-PNP | 003-PNP / 006-PNP

Mounting Positions



Standard | Optional | OK if over 20 psi

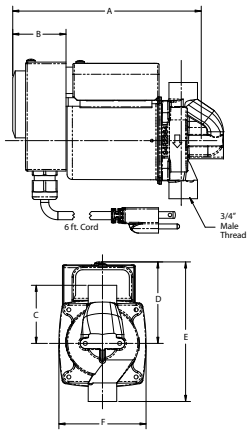
Electrical Data

Model	Volts	Hz	Ph	Amps	RPM	HP
003-PNP	115	60	1	.45	3250	1/40
005-PNP	115	60	1	.54	3250	1/40
006-PNP	115	60	1	.52	3250	1/40
006-PNP (IFC)	115	60	1	.57	3250	1/40

Motor Type Permanent Split Capacitor Impedance Protected

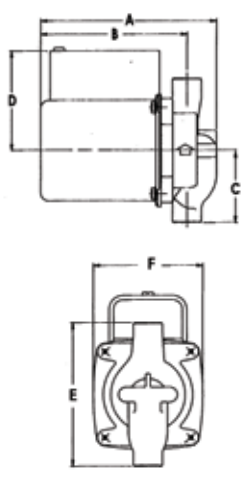
Features

- Digital Timer, 7 day Programmable
- Large LCD Display
- Easy-to-Use Program Buttons
- On/Off Intervals as Short as 1 Minute
- 2,500 hour Capacitor Backup, Saves Settings



Application

For recirculation systems setup for constant circulation or with an optional aquastat control, use Plumb n' Plug® with line cord only. Simply Plumb it in and Plug it in.



Application

The Plumb n' Plug® with Digital Timer allows ON/OFF program settings to fit any homeowners' schedule. Multiple settings allow for different weekday/weekend run times. Run time intervals can be set as short as 1 minute to maximize energy savings. Easy-to-Use clock face and large LCD display make settings a snap. Its on-board capacitor retains settings in memory for up to 2,500 hours, during power outages.

Pump Dimensions & Weights

Digital Timer

		A		B		C		D		E		F		Ship Wt.	
Model	Connection	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	Kg
003-BC4-8PNP	1/2" Sweat	7-1/4	184	1-15/16	49	2-1/8	54	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2
003-B4-2PNP	3/4" Sweat	7-1/4	184	1-15/16	49	2-3/16	56	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2
003-ST4-2PNP	3/4" FNPT	7-1/4	184	1-15/16	49	2	51	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2
003-SC4-3PNP	Union	7-1/4	184	1-15/16	49	2-31/32	76	3-1/16	78	6	152	3-5/16	84	7.0	3.2
006-BC4-4PNP	1/2" Sweat	7-1/4	184	1-15/16	49	2-1/8	54	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2
006-B4-2PNP	3/4" Sweat	7-1/4	184	1-15/16	49	2-3/16	56	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2
006-ST4-2PNP	3/4" FNPT	7-1/4	184	1-15/16	49	2	51	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2
006-SC4-3PNP	Union	7-1/4	184	1-15/16	49	2-31/32	76	3-1/16	78	6	152	3-5/16	84	7.0	3.2

Digital Timer with Integral Flow Check (IFC®)

		A		B		C		D		E		F		Ship Wt.	
Model	Connection	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	Kg
003-BC4-11PNP	1/2" Sweat	8-1/8	205	1-15/16	49	2-3/16	56	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2
003-BC4-10PNP	3/4" Sweat	8-1/8	205	1-15/16	49	2-3/16	56	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2
006-BC7-5PNP	1/2" Sweat	8-1/8	205	1-15/16	49	2-3/16	56	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2
006-BC7-4PNP	3/4" Sweat	8-1/8	205	1-15/16	49	2-3/16	56	3-1/16	78	5-1/4	134	3-5/16	84	7.0	3.2

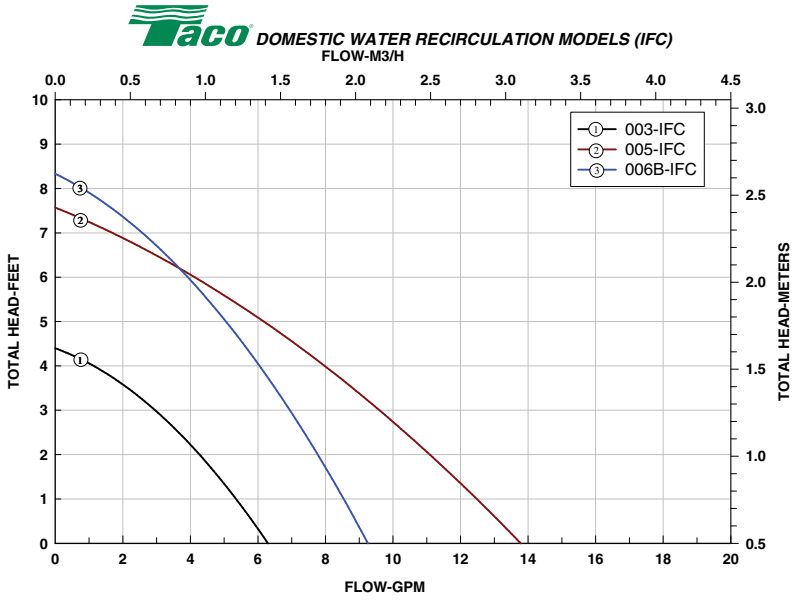
Line Cord Only

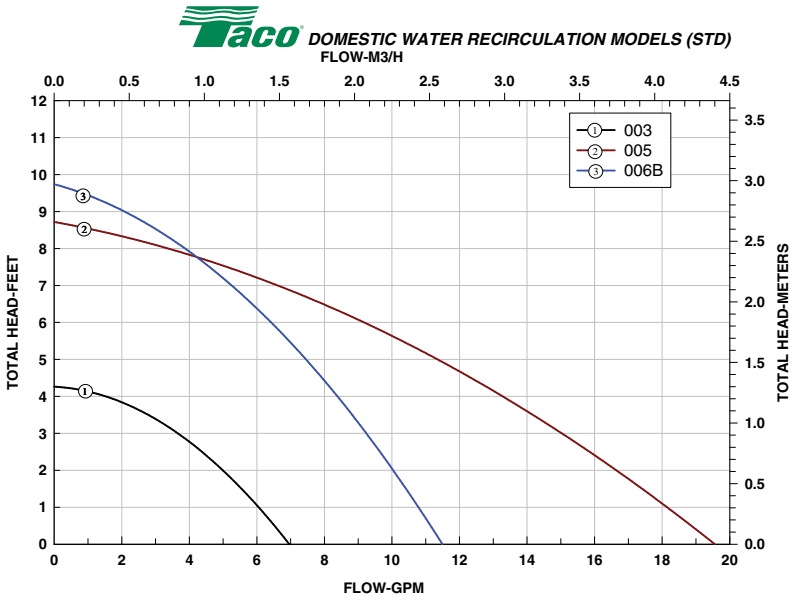
		A		B		C		D		E		F		Ship Wt.	
Model	Connection	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	Kg
003-BC4-4PNP	1/2" Sweat	5-1/8	130	4-1/8	105	2-3/16	56	3-1/16	78	4-13/32	112	3-5/16	84	6.5	2.9
003-B4-1PNP	3/4" Sweat	5-1/8	130	4-1/8	105	2-1/8	54	3-1/16	78	4-1/4	108	3-5/16	84	6.5	2.9
003-ST4-1PNP	3/4" FNPT	5-1/8	143	4-7/8	124	2	51	3-1/16	78	4	102	3-5/16	84	6.5	2.9
003-SC4-2PNP	Union	5-5/32	131	4-11/32	110	2-31/32	76	3-1/16	78	5-15/16	151	3-5/16	84	6.5	2.9
006-BC4-2PNP	1/2" Sweat	5-1/8	130	4-1/8	105	2-3/16	56	3-1/16	78	4-13/32	112	3-5/16	84	6.5	2.9
006-B4-1PNP	3/4" Sweat	5-1/8	130	4-1/8	105	2-1/8	54	3-1/16	78	4-1/4	108	3-5/16	84	6.5	2.9
006-ST4-1PNP	3/4" FNPT	5-5/8	143	4-7/8	124	2	51	3-1/16	78	4	102	3-5/16	84	6.5	2.9
006-SC4-2PNP	Union	5-5/32	131	4-11/32	110	2-31/32	76	3-1/16	78	5-15/16	151	3-5/16	84	6.5	2.9

Line Cord Only with Integral Flow Check (IFC®)

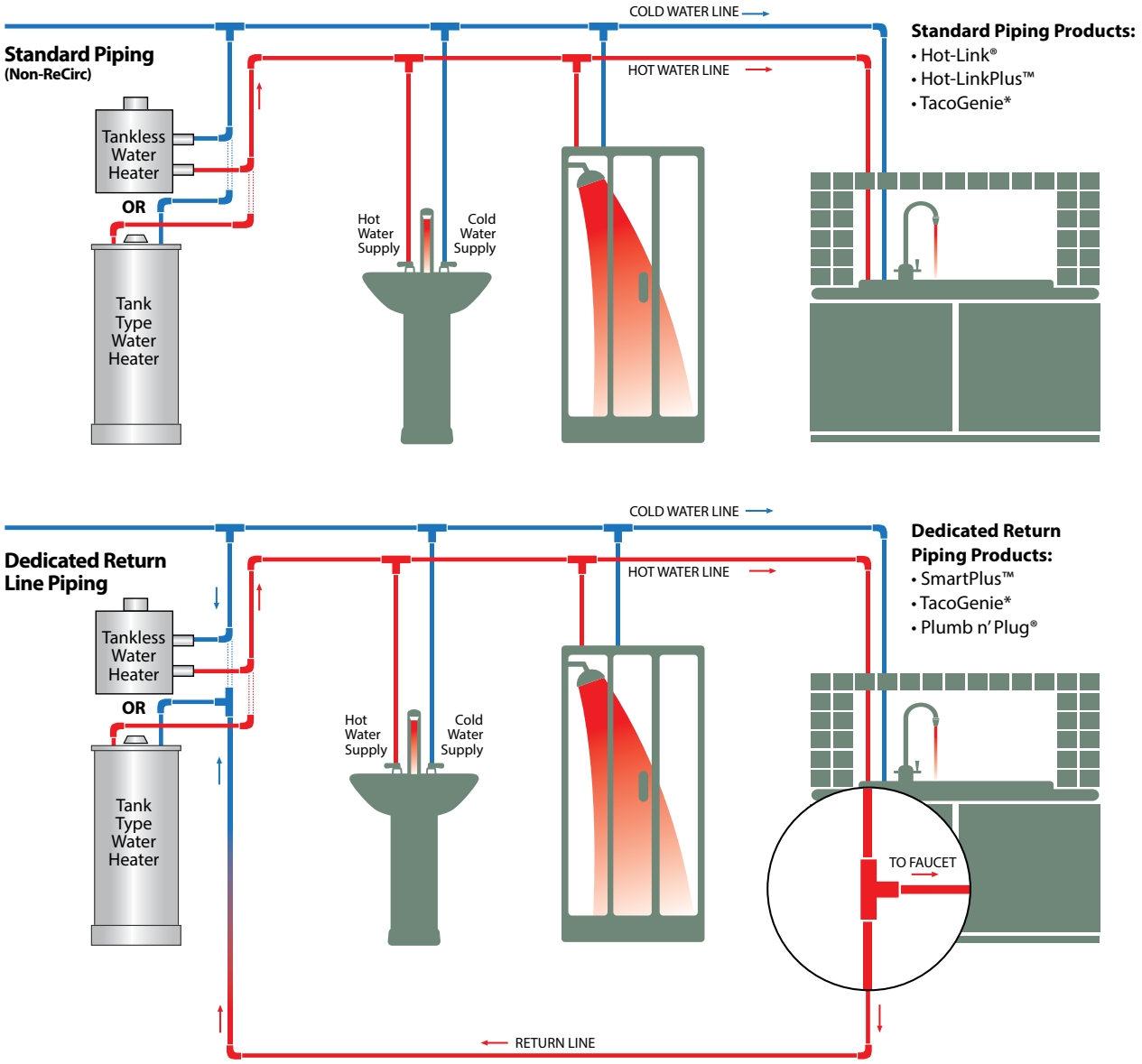
		A		B		C		D		E		F		Ship Wt.	
Model	Connection	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	Kg
003-BC4-7PNP	1/2" Sweat	6	152	4-7/8	124	2-3/16	56	2-15/16	75	4-3/8	111	3-5/16	84	6.5	2.9
003-BC4-6PNP	3/4" Sweat	6	152	4-7/8	124	2-3/16	56	2-15/16	75	4-3/8	111	3-5/16	84	6.5	2.9
006-BC7-3PNP	1/2" Sweat	6	152	4-7/8	124	2-3/16	56	2-15/16	75	4-3/8	111	3-5/16	84	6.5	2.9
006-BC7-2PNP	3/4" Sweat	6	152	4-7/8	124	2-3/16	56	2-15/16	75	4-3/8	111	3-5/16	84	6.5	2.9

60 Hz Performance Field





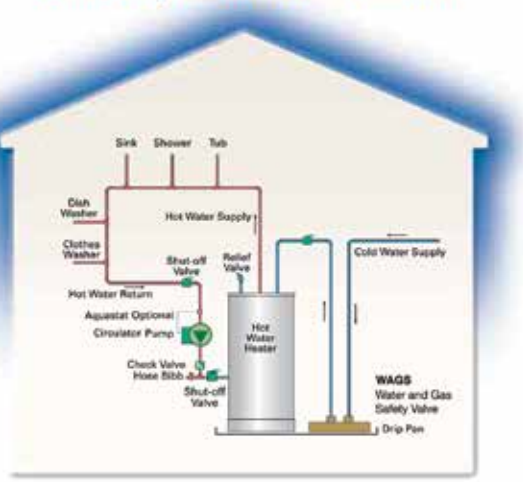
Domestic Hot Water System Piping



DIAGRAMS ARE FOR REFERENCE ONLY

** TacoGenie is the only recirculation system recommended for use with tankless water heaters.*

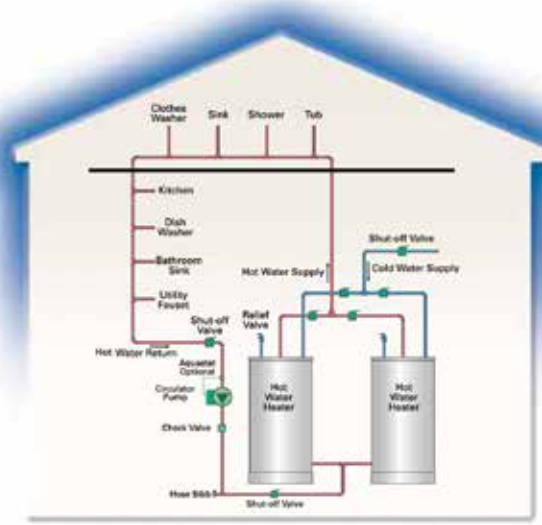
One-Story with 1 Water Heater



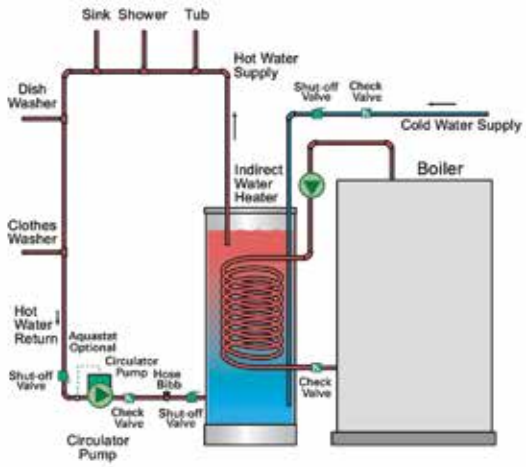
One-Story with 2 Water Heaters

Multi-Story with 1 Water Heater

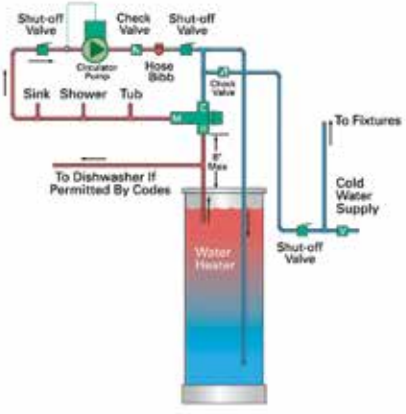
Multi-Story with 2 Water Heaters



Recirculation Piping with Indirect Water Heater



Recirculation Piping with Storage Water Heater & Mixing Valve



Hot Water Recirculation Systems

Water and energy saving products

H2OT Quick Options	Product Name	Item#	Retrofit - No recirculation line needed	Works with Tankless Water Heaters	Need Electrical at Farthest Sink	Push Button, Optional Wireless, or Motion Sensor Activated	Timer Activated	Intelligent Demand Activated	Can Be Used with Dedicated Hot Water Recirc Line	Add To Any Sink Location for Instant Hot Water, requires pump	Good for Intermittent Schedule	Constant Circulation Multi-Family
	Hot Link	HLS-1	✓				✓		✓			
	Hot Link Plus	HLS-2	✓					✓	✓			
	**Hot Link Valve Only**	HLV-1	✓						✓	✓		
	Taco Genie	006-CT-USK	✓		✓	✓			✓		✓	
	Taco Genie	008-CT-USK 0011-CT-USK	✓	✓	✓	✓			✓		✓	
	Smart Plus	006-IQ						✓	✓			
	Plumb n' Plug	006-PNP					✓		✓			
	Taco VDT SF Variable Speed Set Point 110° Return	0013VDTSF							✓		✓	✓

For more info: taco-hvac.com or jtgmuir.com

Multiple sizes available - See product specific website for selection criteria.

	Features & Options								
Taco	**Size**	**System Conn.**	**Line Cord**	**Analog Timer**	**Digital Timer**	**IFC**	**Integral A- stat**	**Grundfos**	**Laing**
006-ST4-PNP	3/4”	FNPT	X	X					
006-SC4-1PNP	-	Union	X	X				UP15-18SU/TLC	
006-BC4-4PNP	1/2”	Sweat	X		X				
006-BC4-2PNP	3/4”	Sweat	X		X				
006-ST4-2PNP	3/4”	FNPT	X		X				
006-SC4-3PNP	-	Union	X		X				
005-SF2-PNP		Flanged	X	X				UP15-29-TL	
Models with Integral Flow Check (IFC)									
003-BC4-1IFC	1/2”	Sweat				X		UP15-10BUC5	
003-BC4-IFC	3/4”	Sweat				X		UP15-10BUC7	
003-SC4-IFC	-	Union				X		UP15-10BUC5	
003-BC4-7PNP	1/2”	Sweat	X			X		UP15-10BUC5/LC	
003-BC4-6PNP	3/4”	Sweat	X			X		UP15-10BUC7/LC	
003-BC4-3PNP	1/2”	Sweat	X	X		X		UP15-10BUC5/TLC	
003-BC4-2PNP	3/4”	Sweat	X	X		X		UP15-10BUC7/TLC	
003-SC4-4PNP	-	Union	X	X		X			
003-BC4-11PNP	1/2”	Sweat	X		X	X		n/a	n/a
003-BC4-10PNP	3/4”	Sweat	X		X	X		n/a	n/a
003-SC4-5PNP	-	Union	X		X	X		n/a	n/a
006-BC7-1IFC	1/2”	Sweat				X		UP15-18BUC5	
006-BC7-IFC	3/4”	Sweat				X		UP15-18BUC7	
006-SC7-IFC	-	Union				X			
006-BC7-3PNP	1/2”	Sweat	X			X			
006-BC7-2PNP	3/4”	Sweat	X			X			
006-BC7-1PNP	1/2”	Sweat	X	X		X			

	Features & Options								
Taco	**Size**	**System Conn.**	**Line Cord**	**Analog Timer**	**Digital Timer**	**IFC**	**Integral A- stat**	**Grundfos**	**Laing**
006-BC7-PNP	3/4”	Sweat	X	X		X			
006-SC7-PNP	-	Union	X	X		X			
006-BC7-5PNP	1/2”	Sweat	X		X	X			
006-BC7-4PNP	3/4”	Sweat	X		X	X			
006-SC7-1PNP	-	Union	X		X	X			
005-SF2-1PNP		Flanged	X	X		X		UP15-29TLC	
		Union	X	X		X		UPS15-35SUC/TLC	
		Union	X	X		X		UPS15-55SUC/TLC	
HLS-1 Hot Link System								**Comfort System Water Recirc Kit**	**Autocirc Water Recirc Kit**
HLS-1								UP15-10SU7PTLC	Autocirc 1
									Autocirc 2 w/x-valve
Taco Genie Systems									
006-DM	1/2”	NPT Male	X			X			
006-DM-PK	1/2”	NPT Male	X			X			
008-DM	1/2”	NPT Male	X			X			
008-DM-PK	1/2”	NPT Male	X			X			
0011-DM	-	Flanged	X			X			
0011-DM-PK	-	Flanged	X			X			

We also provide the 5120 Series, "Low-Lead" Mixing Valves, which which meet the requirements being establish by a number of states.

The 5000 Series Mixing Valve is a dual purpose mixing or diverting valve. It is ASSE 1017 approved, providing shut-off reliability on either a hot or cold water supply failure. The high flow and low headloss characteristics make the 5000 Series ideal for domestic water, radiant applications, installations with large variations in flow rate and supply conditions, and installations requiring tightly controlled water temperature.

Available Models

Model #	Description	Max. Flow Rate (GPM)	Cv
5002-C2	1/2" Sweat Union Connections	18	3.3
5003-C2	3/4" Sweat Union Connections	20	3.5
5004-C2	1" Sweat Union Connections	24	3.8
5002-002RP	Gaskets Set (3) for 5000 Mixing Valves	———	———

Features

- Fail-safe on hot or cold supply failure
- Delivers stable mixed water temperature
- ASSE 1017 certified
- High flow
- Low headloss
- Dual purpose mixing or diverting valve
- Extended mix temperature range of 85 -150 F
- Ideal for domestic water and radiant applications
- Tamper-proof cap
- Available 1/2", 3/4", 1"

Potable Water Valves

Lead Free Mixing Valves

Control hot water temperatures to your domestic system with mixing valves available for point of use (ASSE 1070) and point of distribution (ASSE1017) installations. The expanded line up of 5000 and 5120 Series is the ultimate performer for increasing domestic hot water availability and safety.

Features and Benefits:

- UPC Certified
- Certified to NSF/ANSI 61-G
- Optional dial gauge with adapter
- Mixed outlet temperature strip
- Sweat, NPT, Pex, CPVC union connection types
- Meets 2014 lead requirements for potable water
- Increase amount of useful hot water by up to 50%
- Tamper resistant cap

Assortment of Taco Lead-Free Mixing Valves Include:

- 5000 Series Lead Free (ASSE 1017)
- 5120 Series Lead Free (ASSE 1017 and ASSE 1070)
- High Flow 5120 Series Lead Free (ASSE 1017)
- Direct mount 5123 Series WH-N Lead Free (ASSE 1017 and ASSE 1070)

Potable Water Zone Sentry®

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 in a potable system.

Features and Benefits:

- Uses only 1.44 Watts in the ON position
- Simple push button actuator removal without draining the system
- Multi-function LED assists with troubleshooting
- Bidirectional flow (cannot install the valve backwards)
- Actuator mounts on the valve in either direction
- Manual override button
- Certified to NSF/ANSI 61-G
- 125 PSI shut-off pressure

Domestic Water Safety Products

FloodBreaker®
Whole House Water Shutoff

NSF Certified to NSF/ANSI 61-G

FloodBreaker® is a whole house adjustable leak protection system that monitors several aspects of water usage. It shuts off the water supply once any of the monitored settings are reached. The FloodBreaker is NSF 61 certified and is suitable for potable water installations.

Features and Benefits:

- Certified to NSF/ANSI 61-G
- Programmable leak detection settings
- Programmable vacation mode leak settings
- Operates on batteries and 9V DC power supply
- Mounts in horizontal or vertical pipe
- Protection from property damage
- Push button reset
- Audible alarm
- Floor sensor
- 3/4", 1", and 1 1/4" NPT union connections

WAGS®
Water And Gas Safety and Shutoff Valve

NSF Certified to NSF/ANSI 61-G

WAGS® Valve shuts off the water supply to domestic water heaters (plus gas supply for gas-fired water heaters) when it detects a water leak, preventing disastrous flooding and damage to structures and belongings. Sleep easy at night, knowing that your floors, rug, basements, and property are safe and dry.

Features and Benefits:

- Fully mechanical and requires no external power supply
- Protection from property damage caused by a water heater failure
- Backed by $1,000 lifetime protection policy
- Suitable for most styles of the water heater

FloodBreaker - Protects Against Water Leaks

FloodBreaker®
Whole House Water Shutoff

The Taco FloodBreaker® is a whole house adjustable leak protection system that monitors several aspects of water usage. It shuts off the water supply once any of the monitored settings are reached. The FloodBreaker is NSF 61-G certified.

Features include:
- Programmable Leak Detection Settings
- Programmable Vacation Mode Leak Settings
- Audible Alarm
- Floor Sensor
- Output Contact
- Input Contact
- Operates on Batteries and 9V DC Power Supply
- Reduces Property Damage
- Push Button Reset
- Mounts in Horizontal or Vertical Pipe

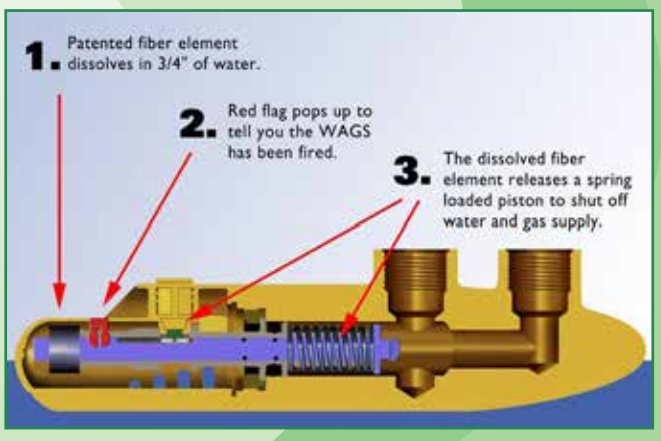
WAGS®
Water And Gas Safety and Shutoff Valve

Designed to protect consumers from flooding and damage caused when a water heater fails

Most water heaters fail within 7 –10 years, some 5 million failures every year. Without a WAGS valve, a leaking water heater keeps refilling—and leaking. The WAGS valve is designed to shut off the water supply (plus gas supply for gas-fired heaters) in the event of a water leak from a hot water heater, thus minimizing water damage and possible gas leakage.

Easily installed on all styles of water heaters, the reliable WAGS Valve is fully mechanical and requires no external power supply. The WAGS Valve sits in a drip pan under the water heater and is activated when leaking water accumulates to a predetermined level in the pan. Once activated, the valve shuts off the water and gas supply, indicated by a red pop-up tab. And it's backed by a $1,000 Lifetime Protection Policy.

Features Include:
- Easily installed on new or existing water heaters
- Dependable, proven technology
- Taco quality and reliability
- $1,000 Lifetime Protection Policy



Submittal Data Information

FloodBreaker® Whole House Water Shut Off

101-161

Effective: December 10, 2014 **Supersedes:** June 1, 2013

Job: _____ Engineer: _____ Contractor: _____ Rep: _____

ITEM NO.	MODEL NO.	

Features

Programmable Leak Detection Settings

Programmable Vacation Mode Leak Settings

Audible Alarm

Floor Sensor

Output Contact

Input Contact

Operates on Batteries and 9V DC Power Supply

Reduces Property Damage

Push Button Reset

Mounts in Horizontal or Vertical Pipe

Performance

Max. Flow: 15.5 gpm (58.7 L/Min)
Caution: Flow should never exceed standards for pipe size.

Max. Water Temperature 86°F (30°C)

Max. Inlet Pressure: 230 psi (15.9 Bar)

Power Supply 9V DC

(4) AA Batteries

Connection Sizes: 3/4", 1", 1-1/4" NPT

Materials

Body: Brass ≤ .25% lead

Internal Components:
Brass ≤ .25% lead
Acetal
Nylon

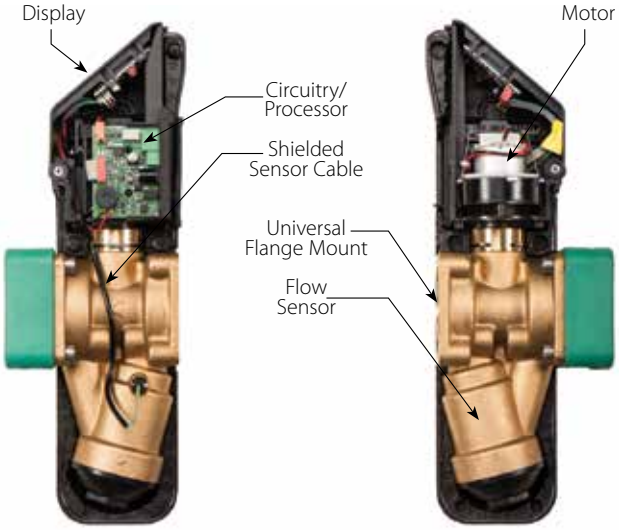
Seals: EPDM

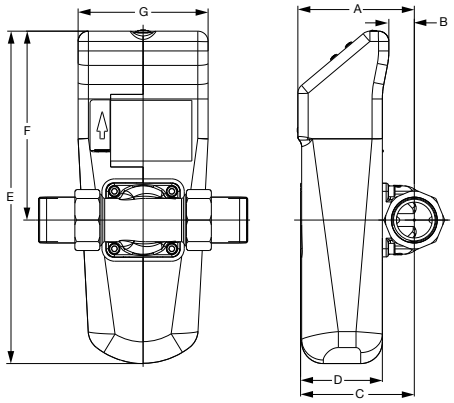
Approvals

NSF Certified to NSF/ANSI 61-G

Application

The Taco FloodBreaker® is a whole house adjustable leak detection system the 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.

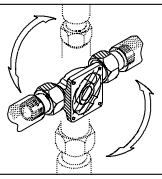




FloodBreaker® Dimensions

DIMENSIONS (For reference only)	In.	mm
A	4-1/4	108
B	15/16	24
C	4-1/8	105
D	3	76
E	12-3/32	307
F	6-55/64	174
G	4-47/64	120

The universal body assembly can be installed into either a vertical or horizontal pipe line as shown



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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 BTUh 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. ***New 3-way iSeries Mixing Valve with Sweat Union connections: Drop-in replacement for any Thermostatic Mixing Valve.***

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

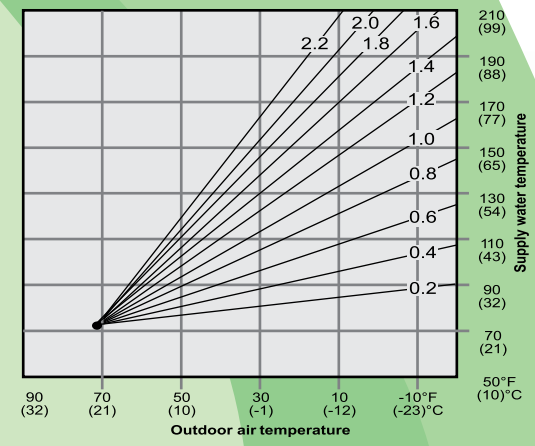
- Selectable maximum supply temperature (110°F, 130°F, 150°F, or off)
- Selectable minimum supply temperature (85°F, when max. supply temp. is set to 150°F or off)
- Adjustable minimum boiler return temperature (120°F, 135°F, or off)
- Warm weather shutdown (70°F or off)
- Adjustable heating curve (0.2-2.2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

Setpoint

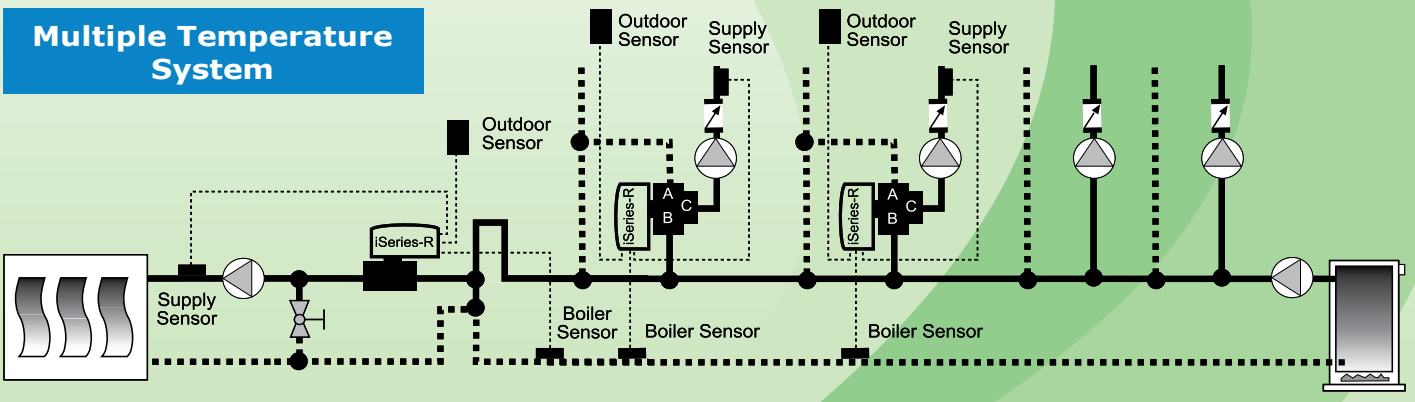
- Adjustable setpoint dial (80°F to 180°F)
- Selectable 15°F setback
- Optional boiler protection (Set at 135°F)

iSeries Electronic Mixing Valves

Model#	Connection Size	Cv
I075C2R-1	Outdoor Reset 3/4" SWT, 2-Way	10.3
I100C2R-1	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-1	Setpoint 3/4" SWT, 2-Way	10.3
I100C2S-1	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



Multiple Temperature System



3450 Combination Boiler Feed Valve & Backflow

The integral design of the Taco 3450 Combi Valve combines a cartridge style backflow preventer with a pressure regulating cartridge style boiler feed valve into a unique one piece body configuration. Taco's 3450 combination dual check backflow with atmospheric vent and boiler feed valve with purge auto-reset, dial in pressure setting and adjustable indicator sets a new standard for performance and serviceability.

Features

- Auto Reset from Fast Fill
- ASSE 1081-2014
- Simple Pressure Adjustment
- Servicable Cartridge for both the Backflow and Feed Valve
- Adjustable 360 View of Pressure Indicator
- Large Adjustment Range
- Serviceable without draining the system
- One Piece Body Construction
- Stainless Steel Strainer

Performance

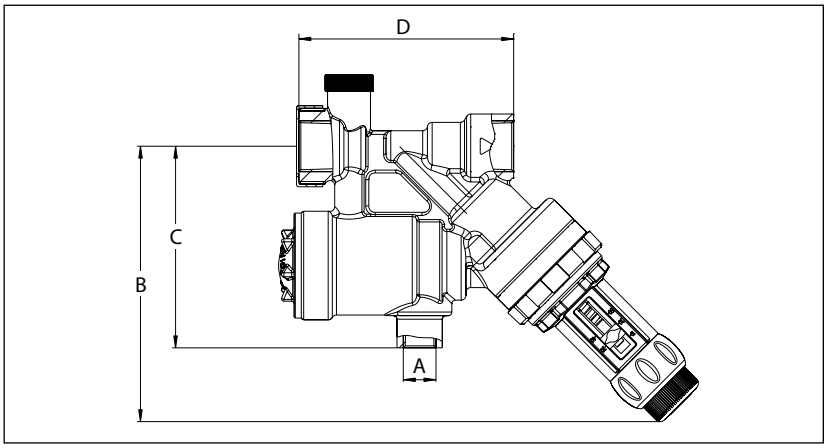
Max. Inlet Pressure:	150 psi (10.3 Bar)
Min. Delta P Inlet to Outlet	15 psi (1 Bar)
Recommended Setting Range:	10-50 psi +/-3 psi (.7-3.4 bar)
Factory Setting:	12psi (.8)
Adjustment Capability:	8.5 - 65 psi (.6-4.5 bar)
Max. Flow Rate:	25 gpm (8 ft / sec) 95 l/m
Max. Temperature:	210˚F (99˚C)

Materials of Construction

Body:	Forged Brass
Cartridge Components:	Brass, EPDM, Hi-Temp Engineered Plastics and Stainless Steel
Gaskets:	EPDM

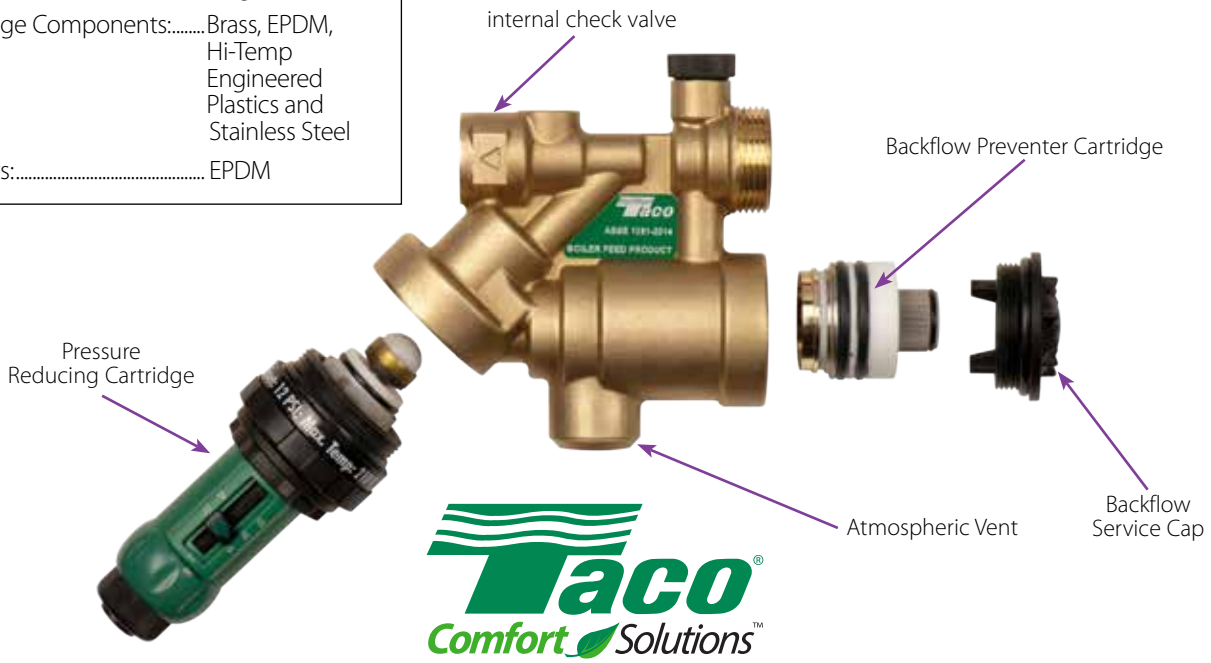
Application:

The integral design of the Taco 3450 Combi Valve combines a cartridge style backflow preventer with a cartridge style feed valve into a unique one piece body configuration. Designed for use in hydronic heating systems the duel check backflow prevents heating system water from flowing back into the supply water piping if the supply pressure falls below the heating system pressure. The boiler feed valve automatically fills or refills (make-up water) the closed heating system to the desired cold fill pressure. Both the back-flow and the feed valve contain cartridges that can be serviced or replaced without draining the entire heating system.



Dimensions: (FOR REFERENCE PURPOSES)

Model Number	Description	A	B		C		D	
		in.	in.	mm	in.	mm	in.	mm
3350	1/2" NPT x 1/2" Union Sweat	1/4 NPT	4-1/2	114.3	3-1/4	82.6	3-1/2	88.9
3350-T	1/2" NPT x 1/2" Union NPT	1/4 NPT	4-1/2	114.3	3-1/4	82.6	3-1/2	88.9



Taco Comfort Solutions™
A Taco Group Company

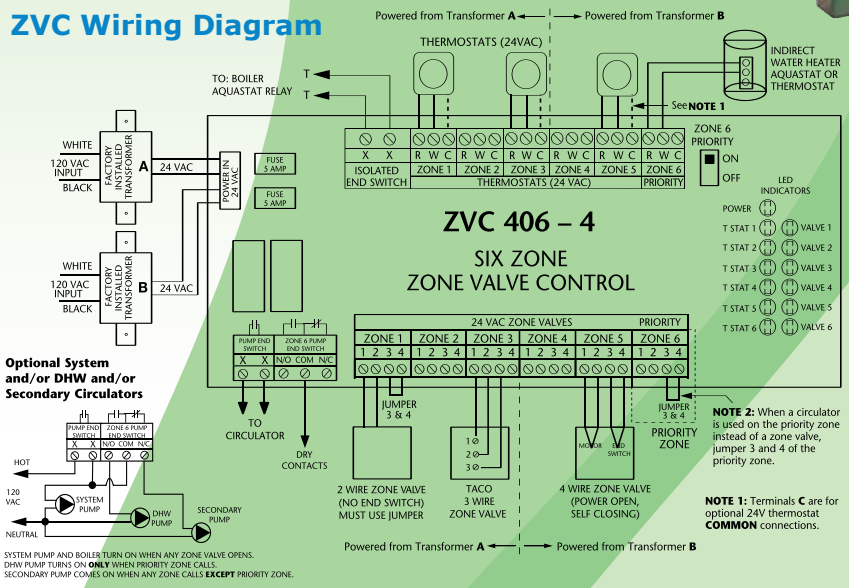
Zone Control Family (Zone Valve Controls)

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



Zone Vale 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 Vale 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

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

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.

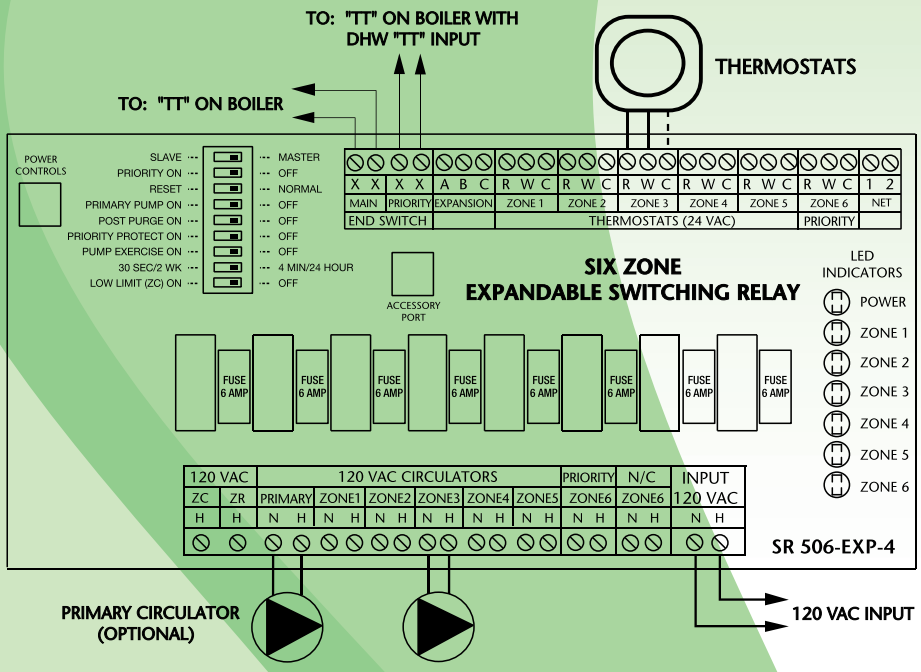
Features

- 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

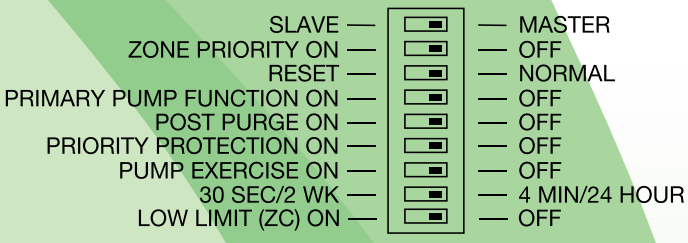
Additional - EXP Features

- 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 Relay Wiring Diagram (Cold Start Boiler)



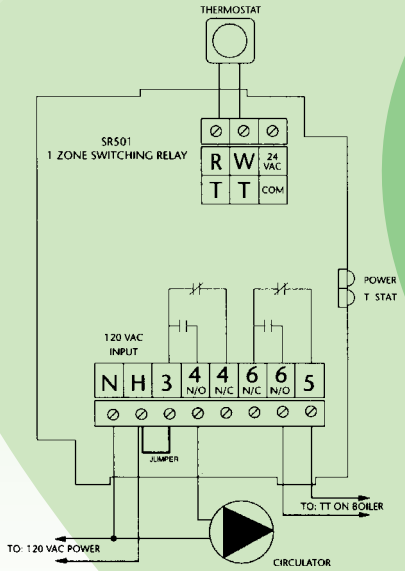
Dip Switch Settings



Switching Relays	
Product #	**Description**
SR501	1– zone switching relay
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

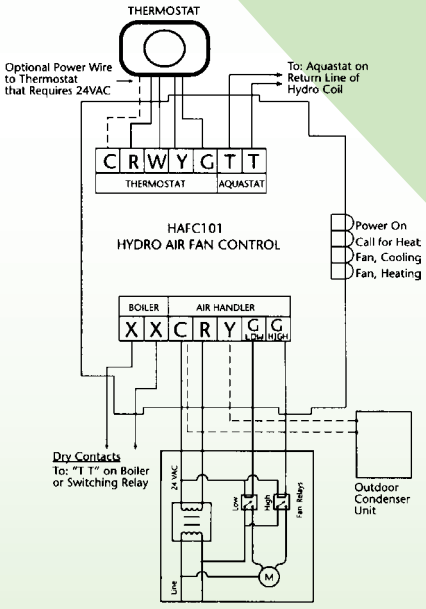
Wiring Diagram for Typical Installation



MODEL	DESCRIPTION
SR501	DPDT Relay Transformer Single Zone, 7.2 amps
SR50845RP	Universal Replacement Board for SR501, & Honeywell Snap in.

Taco SR501 Replacement Cross-Reference

Manufacturer	Model	Connections										
Taco	SR501	H	N	3	4 N/O	4 N/C	5	6 N/O	6 N/C	R/T	W/T	COM
	SR501-845RP	LI	L2	3	4		5	6		R/T	W/T	
Argo	AR821	I	2	3	4		5	6		T	T	
	AR822	LI	L2	3	4 NO	4 NC	5	6 NO	6 NC	R/T	G/T	C
Columbus	MR10	LI	L2	3	4 NO	4 NC	5	6 NO	6 NC	R/T	G/T	C
Erie	SR100	LI	N	3	4 NO	4 NC	5	6 NO	6 NC	R/T	G/T	C
Honeywell	RA89A	I	2	3	4					T	T	
	RA832A	I	2	3	4		X	X		T	T	
	R845A	I	2	3	4		5	6		T	T	
White-Rogers	889-189	I	2	3	4					T	T	
	829-845	I	2	3	4		5	6		T	T	



2 Speed Air Handler*

Taco Hydro Air Fan Control

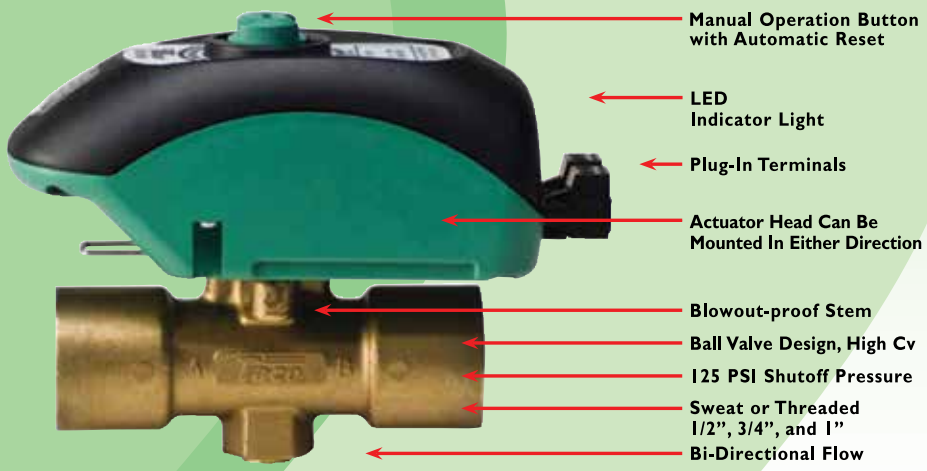
MODEL	DESCRIPTION
SR501-F	DPDT/5 amp 1/6 hp

The Hydro Air Fan Control is an interface between the thermostat and air handler. It also has an isolated end switch to start the boiler and/or pump. When the thermostat calls for heat, the Fan Control energizes the end switch relay and allows the fan to operate at low speed when the water is above the optional aquastat setting. When the thermostat calls for cooling, the Fan Control energizes the condenser and operates on high speed. The HAFC201 also includes three built-in fan time delay options, two selectable pump exercise modes, a secondary aquastat connection for freeze protection and the ability to switch a pump and / or boiler.

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 use on a standard 40VA transformer. The Taco Zone Sentry® zone valves are available in sweat, threaded and 3-way configurations.

Features

- Simple to install in any direction or orientation
- Up to 12 EBV 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



e-smart™ Resource Saving Products

Flow Coefficients & Maximum Close-Off Pressure

Valve Size	Cv (Kv)/Ft. of Pipe Equiv.*	Close-Off PSI (kPa)
1/2"	4.9 (4.3) / 9.5	0-125 psi (0-862 kPa)
3/4"	10.3 (8.9) / 8.4	0-125 psi (0-862 kPa)
1"	8.9 (7.7) / 47.4	0-125 psi (0-862 kPa)

** At 4' per second (max. recommended residential flow rate).*

Quick Order Part Numbers

Part #	Connection Size
Z050C2-1	1/2" SWT / 2-Way
Z0750C2-1	3/4" SWT / 2-Way
Z100C2-1	1" SWT / 2-Way
Z075T2-1	3/4" NPT / 2-Way
Z100T2-1	1" NPT / 2-Way
ZA024Q4A1	Replacement Actuator ALL SIZES (normally closed)
ZB024Q4A1	Replacement Actuator ALL SIZES (normally opened)
Z050C3	1/2" SWT / 3-Way
Z050T3	1/2" NPT / 3-Way
Z075C3	3/4" SWT / 3-Way
Z075T3	3/4" NPT / 3-Way
Z100C3	1" SWT / 3-Way
Z100T3	1" NPT / 3-Way

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
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
Heat Anticipator Setting.....0.5 Amps
End Switch Rating.....1 Amp @ 24 VAC

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 in 3/4" NPT, 3/4" and 1" Sweat connections.

Available Models– Geothermal

Model #	Description
556-G2	3/4" Sweat Zone Valve 2-Way
557-G2	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 in 1/2"–1" Sweat connections.

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 in 1/2"–1-1/4" Sweat connections.

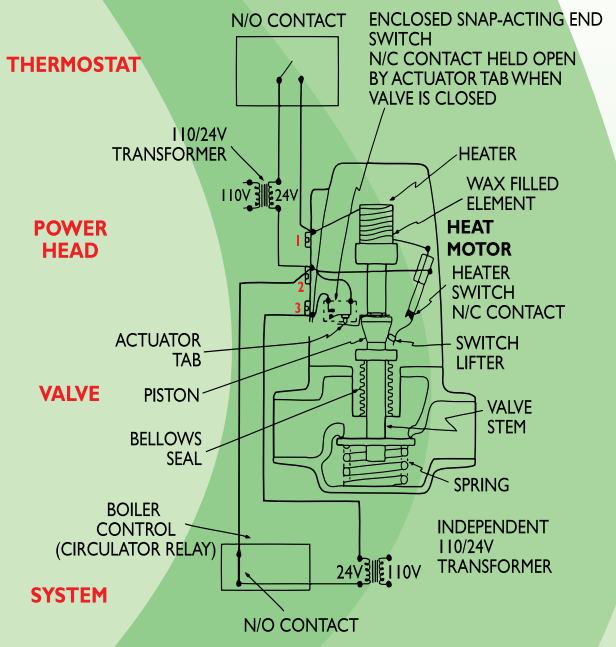
Available Models– 570

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
- 3 year head, 5 year body warranty

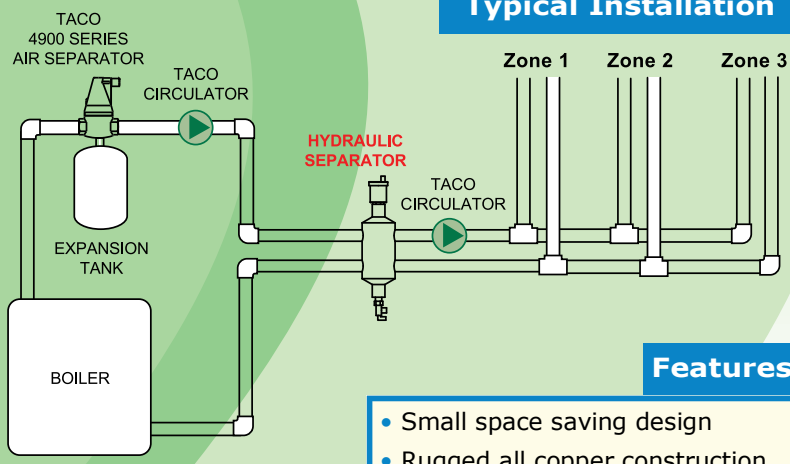
Zone Valve Operation and Wiring



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.

Typical Installation



Specifications

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

Media:
Water or Glycol / Up to 50%

Maximum Pressure:
350 PSIG

Maximum Temperature:
240°F

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.

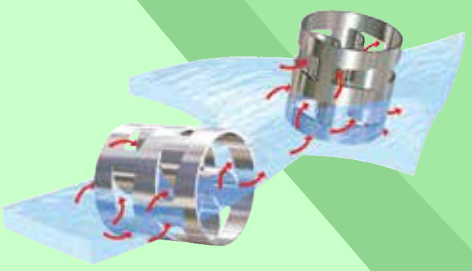
Conical Venting Chamber

The air chamber of the 4900 Series is conical in shape. The advantage of this construction 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.

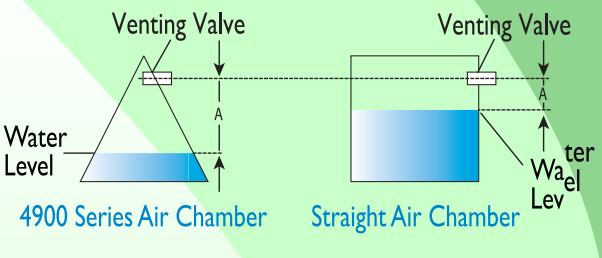
The Coalescence Effect

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.

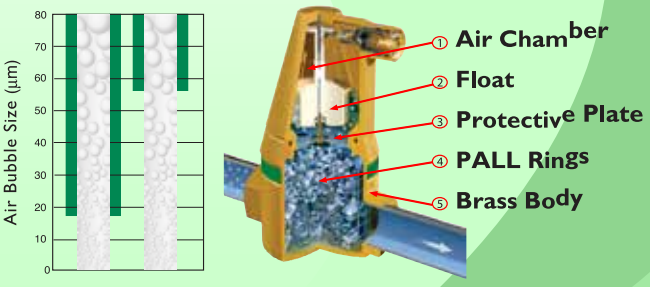
Pall Rings



Water Level



Air Removal



Dimensions

Size	NPT	Sweat
3/4"	49-075T-2	49-075C-2
1"	49-100T-2	49-100C-2
1-1/4"	49-125T-2	49-125C-2
1-1/2"	49-150T-2	49-150C-2
2"	49-200-T-2	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
409-2	**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	———

Differential Bypass Valves

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.

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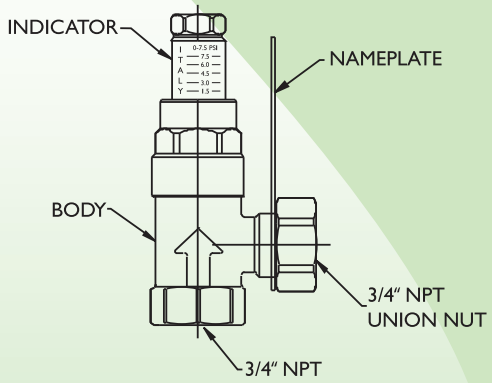
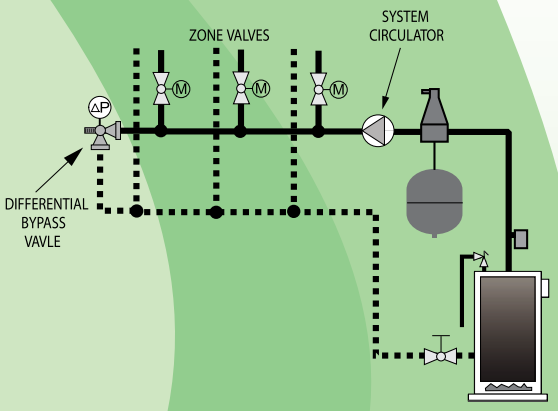


Typical Installation



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

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 line pressure. A one handed fast-fill button 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-T2

Ratings

Fast Fill Mode: 2.1 C_V
Media: Water

Features

- Pressure balanced diaphragm makes the valve self compensating, ensuring incredible output pressure stability even during severe inlet pressure fluctuations
- Stainless steel spindle reduces erosion and corrosion
- Integral stainless steel coaxial strainer prevents system debris
- Fully automated production line incorporates 100% testing and quality control checks on each valve
- Dial-up pressure setting eliminates the need for pressure gauges
- Easy to install and maintain
- Meets or exceeds the most demanding technical standards
- Bubble-tight design maintains constant outlet pressure under flow and no flow conditions
- Unique one-piece cartridge ensures rapid servicing and maintenance under system pressure
- Incredible flow rates and Fast Fill Button
- Patented "comb design" eliminates problems with excessive noise

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: 212ºF (100ºC)

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: 212ºF (100ºC)

Maximum Supply Side Pressure: 100 psi (689kpa)

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

Connection Sizes

Model 329: 1/2" Sweat Union Inlet, 1/2" NPT Outlet
Model 329-T: 1/2" NPT Union Inlet, 1/2" NPT Outlet
Model 335: 3/4" NPT Union Inlet, 3/4" NPT Outlet
Model 334: 1/2" Sweat Union Inlet, 1/2" NPT Outlet Dual Control
Model 334-T: 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

L F _ _ _ _ - 1

- **Low Water Cutoff**
- **Foam Compensating** (Testable)
- **Reset Type**
  - Automatic Reset **A**
  - Manual Reset **H**
- **Input Power**
  - **024** 24 VAC
  - **120** 120 VAC
- **Process Connection**
  - **2** 1/2" NPT
  - **3** 3/4" NPT
- **Probe Styles**
  - **S** Standard (3/4" NPT)
  - **R** Remote Probe with NEMA 4 Enclosure
  - **1** 12" Long Electrode (Remote NEMA 4 Style)
  - **2** 24" Long Electrode (Remote NEMA 4 Style)

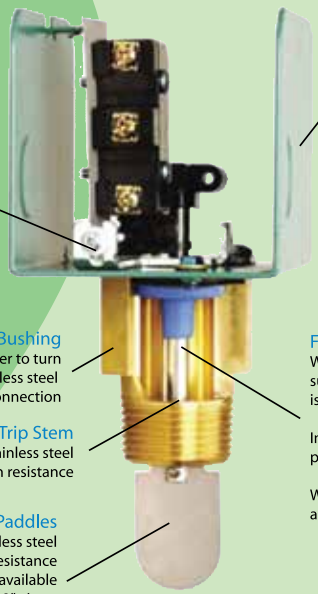
Unlike the competition, the LF won't shut down your boiler on a false low water condition due to a dirty probe, or shut down every 10 minutes to check for proper water level. You can now run your steam boiler flat out for a significant gain in efficiency and operational safety.

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

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.



Enclosures
Sturdier 20 gauge steel covers
16 gauge steel bases ensures robustness

Flow Sensitivity Adjustment
Wide adjustment range

Bushing
Larger wrench flats – Easier to turn
1" NPT brass or stainless steel process connection

Trip Stem
316 stainless steel corrosion resistance

Paddles
316 stainless steel corrosion resistance
rigid paddles available
Paddles for 1" to 8" pipes included with every IFS

Fluorosilicone Seal
Will not harden, crack and subsequently develop a leak as is the case with a Bellows Design

Improves performance in high pressure systems

Withstands 100 PSI more than any other standard flow switch

Better Materials... Better Performance!

IFS Ordering

I F S _ _ _ - 1

Process Connection
F Flexible Paddles
R Rigid Paddles

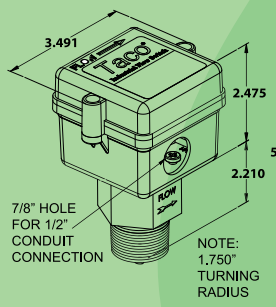
Bushing Material
B Brass
S 316 Stainless Steel

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

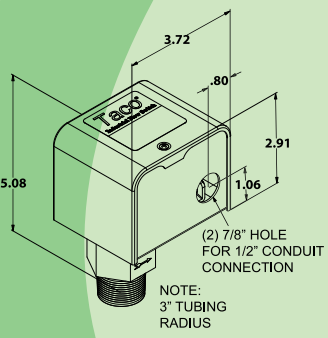
Features

- 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

Models IFS01/02/H1/H2



Models IFSWS



Notes:
1. 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.
2. Typical flow rates for 2" to 8" pipe sizes are averages which may vary approximately ±10% GPM with the use of a 1" weldolet.
(*) Flow rates for these sizes are calculated.

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

"TFP & TMP Series" Brazed Plate Heat Exchangers

TACO . . . "TFP & TMP Series" Brazed Plate Heat Exchangers

Radiant Floor

Connected to Boiler; 180°F Supply, 150°F Return

	Radiant Floor 80˚F return, 100˚F supply			Radiant Floor 100˚F return, 120˚F supply			Radiant Floor 120˚F return, 140˚F supply		
Model	BTUH	Side A Boiler	Side B Radiant Floor GPM	BTUH	Side A Boiler	Side B Radiant Floor GPM	BTUH	Side A Boiler	Side B Radiant Floor GPM
TFP5x12-4 (¾" MPT)	24,000	1.6	2.4	21,000	1.4	2.1	15,000	1.0	1.5
TFP5x12-6 (¾" MPT)	32,000	2.1	3.2	28,000	1.9	2.8	20,000	1.3	2.0
TFP5x12-6 (¾" MPT)	48,000	3.2	4.8	42,000	2.8	4.2	30,000	2.0	3.0
TFP5x12-8 (¾" MPT)	64,000	4.3	6.4	56,000	3.7	5.6	40,000	2.7	4.0
TFP5x12-10 (¾" MPT)	80,000	5.3	8.0	70,000	4.7	7.0	50,000	3.3	5.0
TFP5x12-10 (¾" MPT)	96,000	6.4	9.6	84,000	5.6	8.4	60,000	4.0	6.0
TFP5x12-12 (¾" MPT)	112,000	7.5	11.2	98,000	6.5	9.8	70,000	4.7	7.0
TFP5x12-12 (¾" MPT)	128,000	8.5	12.8	112,000	7.5	11.2	80,000	5.3	8.0
TFP5x12-14 (¾" MPT)	144,000	9.6	14.4	126,000	8.4	12.6	90,000	6.0	9.0
TFP5x12-14 (¾" MPT)	160,000	10.7	16.0	140,000	9.3	14.0	100,000	6.7	10.0
TFP5x12-20 (1" MPT)	200,000	13.3	20.0	175,000	11.7	17.5	125,000	8.3	12.5
TFP5x12-24 (1" MPT)	240,000	16.0	24.0	210,000	14.0	21.0	150,000	10.0	15.0
TFP5x12-30 (1" MPT)	280,000	18.7	28.0	245,000	16.3	24.5	175,000	11.7	17.5
TFP5x12-30 (1¼" MPT)	320,000	21.3	32.0	280,000	18.7	28.0	200,000	13.3	20.0
TFP5x12-36 (1" MPT)	400,000	26.7	40.0	350,000	23.3	35.0	250,000	16.7	25.0
TFP5x12-40 (1¼" MPT)*	440,000	29.3	44.0	385,000	25.7	38.5	275,000	18.3	27.5
TFP5x12-50 (1¼" MPT)*	480,000	32.0	48.0	420,000	28.0	42.0	300,000	20.0	30.0
TFP5x12-50 (1¼" MPT)*	560,000	37.3	56.0	490,000	32.7	49.0	350,000	23.3	35.0
TFP5x12-60 (1¼" MPT)*	640,000	42.7	64.0	560,000	37.3	56.0	400,000	26.7	40.0
TFP5x12-70 (1¼" MPT)*	720,000	48.0	72.0	630,000	42.0	63.0	450,000	30.0	45.0
TFP5x12-80 (1¼" MPT)*	800,000	53.3	80.0	700,000	46.7	70.0	500,000	33.3	50.0
TFP10x20-20 (1½" MPT)	640,000	42.7	64.0	560,000	37.3	56.0	400,000	26.7	40.0
TFP10x20-24 (1½" MPT)	800,000	53.3	80.0	700,000	46.7	70.0	500,000	33.3	50.0
TFP10x20-30 (1½" MPT)	960,000	64.0	96.0	840,000	56.0	84.0	600,000	40.0	60.0
TFP10x20-36 (1½" MPT)	1120,000	74.7	112.0	980,000	65.3	98.0	700,000	46.7	70.0
TFP10x20-40 (1½" MPT)	1280,000	85.3	128.0	1120,000	74.7	112.0	800,000	53.3	80.0
TFP10x20-50 (2" MPT)	1600,000	106.7	160.0	1400,000	93.3	140.0	1000,000	66.7	100.0
TFP10x20-60 (2" MPT)	1920,000	128.0	192.0	1680,000	112.0	168.0	1200,000	80.0	120.0

* Models stocked in 1" MPT. 1¼" available on special order.

Domestic Hot Water

Model	BTUH	Side A Boiler		Side B Water Heater	
		GPM	PD (psi)	GPM	PD (psi)
TFP5x12-4 (¾" MPT)	20,000	0.8	2.1	1.0	0.8
TFP5x12-4 (¾" MPT)	30,000	1.2	4.5	1.5	1.8
TFP5x12-6 (¾" MPT)	40,000	1.6	2.1	2.0	1.4
TFP5x12-6 (¾" MPT)	50,000	2.0	3.2	2.5	2.2
TFP5x12-6 (¾" MPT)	60,000	2.4	4.6	1.3	0.6
TFP5x12-8 (¾" MPT)	70,000	2.9	2.8	1.5	0.5
TFP5x12-8 (¾" MPT)	80,000	3.3	3.6	1.8	0.6
TFP5x12-8 (¾" MPT)	90,000	3.7	4.6	2.0	0.8
TFP5x12-10 (¾" MPT)	100,000	4.1	3.2	2.2	0.6
TFP5x12-10 (¾" MPT)	125,000	5.1	4.9	2.8	1.0
TFP5x12-12 (¾" MPT)	150,000	6.2	4.6	3.3	1.0
TFP5x12-14 (¾" MPT)	175,000	7.2	4.4	3.9	1.0
TFP5x12-16 (¾" MPT)	200,000	8.2	4.2	4.5	1.0
TFP5x12-16 (¾" MPT)	250,000	10.3	6.4	5.6	1.5
TFP5x12-20 (1" MPT)	300,000	12.4	5.7	6.7	1.4
TFP5x12-24 (1" MPT)	350,000	14.5	5.2	7.8	1.4
TFP5x12-24 (1" MPT)	400,000	16.5	6.8	9.0	1.8
TFP5x12-30 (1" MPT)	450,000	18.6	5.4	10.1	1.5
TFP5x12-30 (1" MPT)	500,000	20.7	6.6	11.2	1.8

For Domestic Water Applications 50°F In - 140°F Out
Connected to Boiler; 200°F Supply, 150°F Return

Model	BTUH	Side A Boiler		Side B Water Heater	
		GPM	PD (psi)	GPM	PD (psi)
TFP5x12-30 (1¼" MPT)*	600,000	24.8	9.4	13.5	2.6
TFP5x12-36 (1¼" MPT)*	700,000	29.0	8.9	15.7	2.5
TFP5x12-40 (1¼" MPT)*	800,000	33.1	9.4	18.0	2.7
TFP5x12-50 (1¼" MPT)*	900,000	37.2	7.9	20.3	2.3
TFP5x12-50 (1¼" MPT)*	1,000,000	41.4	9.7	22.5	2.8
TFP5x12-70 (1¼" MPT)*	1,250,000	51.7	8.5	28.2	2.5
TFP10x20-20 (1½" MPT)	500,000	20.7	6.3	11.2	1.6
TFP10x20-20 (1½" MPT)	600,000	24.8	8.9	13.5	2.2
TFP10x20-24 (1½" MPT)	700,000	29.0	8.2	15.7	2.1
TFP10x20-30 (1½" MPT)	800,000	33.1	6.7	18.0	1.8
TFP10x20-30 (1½" MPT)	900,000	37.2	8.4	20.3	2.3
TFP10x20-36 (1½" MPT)	1,000,000	41.4	7.1	22.5	2.0
TFP10x20-40 (1½" MPT)	1,250,000	51.7	8.8	28.2	2.5
TFP10x20-50 (2" MPT)	1,500,000	62.1	8.1	33.8	2.3
TFP10x20-60 (2" MPT)	1,750,000	72.5	7.7	39.4	2.2
TFP10x20-60 (2" MPT)	2,000,000	82.8	9.9	45.1	2.9
TFP10x20-70 (2" MPT)	2,250,000	93.2	9.4	50.7	2.7
TFP10x20-80 (2" MPT)	2,500,000	103.5	9.0	56.4	2.7

Larger models available. Consult your local Taco representative.

For 180°F Boiler Water, multiply product model by 1.1 to select larger required model. (i.e., TFP5x12-14 at 200°F, use TFP5x12-16 at 180°F).

For Steam, 4 psi - 100 psi, use the above chart and substitute TMP Series model numbers for Steam Compatibility. For > 100 psig to 300 psig steam use TMPN Series.

For Snow Melt Application 100°F In - 130°F Out (40% P.G.)
Connected to Boiler; 180°F Supply, 150°F Return

Model	BTUH	Side A Boiler		Side B Snow Melt Circuit	
		GPM	PD (psi)	GPM	PD (psi)
TFP5x12-6 (¾" MPT)	20,000	1.3	1.0	1.3	0.7
TFP5x12-6 (¾" MPT)	30,000	2.0	2.1	2.1	1.4
TFP5x12-8 (¾" MPT)	40,000	2.7	1.7	2.8	1.4
TFP5x12-8 (¾" MPT)	50,000	3.4	2.5	3.6	2.1
TFP5x12-10 (¾" MPT)	60,000	4.1	2.1	4.3	1.9
TFP5x12-10 (¾" MPT)	70,000	4.8	2.8	5.0	2.5
TFP5x12-12 (¾" MPT)	80,000	5.5	2.4	5.7	2.3
TFP5x12-12 (¾" MPT)	90,000	6.2	2.9	6.4	2.9
TFP5x12-14 (¾" MPT)	100,000	6.8	2.6	7.2	2.7
TFP5x12-16 (¾" MPT)	125,000	8.6	2.9	9.0	3.1
TFP5x12-20 (1" MPT)	150,000	10.3	2.6	10.8	2.9
TFP5x12-24 (1" MPT)	175,000	12.0	2.4	12.6	2.8
TFP5x12-24 (1" MPT)	200,000	13.7	3.1	14.4	3.6
TFP5x12-30 (1" MPT)	225,000	15.5	2.5	16.2	3.1
TFP5x12-36 (1" MPT)	250,000	17.2	2.2	18.0	2.7
TFP5x12-36 (1" MPT)	275,000	18.9	2.6	19.8	3.2
TFP5x12-40 (1¼" MPT)*	300,000	20.6	2.6	21.6	3.2
TFP5x12-50 (1¼" MPT)*	350,000	24.1	2.4	25.2	3.0
TFP5x12-50 (1¼" MPT)*	400,000	27.5	3.0	28.8	3.8
TFP5x12-60 (1¼" MPT)*	450,000	31.0	2.9	32.4	3.6
TFP5x12-70 (1¼" MPT)*	500,000	34.4	2.8	36.1	3.6
TFP10x20-30 (1½" MPT)	400,000	27.5	3.1	28.8	3.7
TFP10x20-30 (1½" MPT)	450,000	31.0	3.8	32.4	4.6
TFP10x20-36 (1½" MPT)	500,000	32.8	3.0	35.6	3.9
TFP10x20-40 (1½" MPT)	600,000	41.3	3.7	43.3	4.6
TFP10x20-50 (2" MPT)	700,000	48.2	3.3	50.5	4.2
TFP10x20-60 (2" MPT)	800,000	55.1	3.0	57.7	3.9
TFP10x20-60 (2" MPT)	900,000	62.0	3.8	64.9	4.8
TFP10x20-70 (2" MPT)	1,000,000	68.8	3.5	72.2	4.5

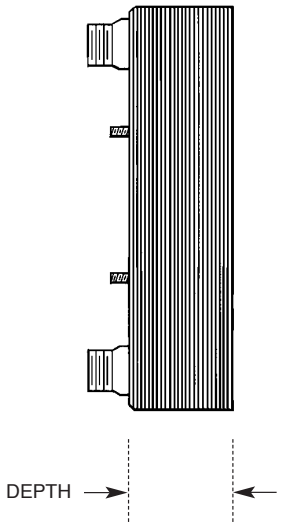
Snow Melt

Larger models available. Contact your local Taco representative.

For 200°F Boiler Water, use the above chart. For 160°F Boiler Water, multiply model number by 1.66.

For Steam, use the above chart and substitute TMP Series model number.

Dimensions & Specifications



Models	Plates	Width	Length	Depth	Connections		Net Wt. (lbs.)
					Hotside-A	Coldside-B	
TFP5x12-4	4	4.9	12.2	0.7	¾" MPT	¾" MPT	4.5
TFP5x12-6	6	4.9	12.2	0.9	¾" MPT	¾" MPT	5.1
TFP5x12-8	8	4.9	12.2	1.1	¾" MPT	¾" MPT	5.8
TFP5x12-10	10	4.9	12.2	1.3	¾" MPT	¾" MPT	6.4
TFP5x12-12	12	4.9	12.2	1.5	¾" MPT	¾" MPT	7.0
TFP5x12-14	14	4.9	12.2	1.7	¾" MPT	¾" MPT	7.7
TFP5x12-16	16	4.9	12.2	1.9	¾" MPT	¾" MPT	8.3
TFP5x12-20	20	4.9	12.2	2.2	1" MPT	1" MPT	9.6
TFP5x12-24	24	4.9	12.2	2.6	1" MPT	1" MPT	10.8
TFP5x12-30	30	4.9	12.2	3.2	1" MPT	1" MPT	12.7
TFP5x12-30 *	30	4.9	12.2	3.2	1¼" MPT*	1¼" MPT	12.7
TFP5x12-36 *	36	4.9	12.2	3.7	1" MPT*	1" MPT	14.6
TFP5x12-40 *	40	4.9	12.2	4.1	1" MPT*	1" MPT	15.9
TFP5x12-40 *	40	4.9	12.2	4.1	1¼" MPT*	1¼" MPT	15.9
TFP5x12-50 *	50	4.9	12.2	5.1	1" MPT*	1" MPT	19.0
TFP5x12-50 *	50	4.9	12.2	5.1	1¼" MPT*	1¼" MPT	19.0
TFP5x12-60	60	4.9	12.2	6.0	1¼" MPT	1¼" MPT	22.2
TFP5x12-70	70	4.9	12.2	6.9	1¼" MPT	1¼" MPT	25.3
TFP5x12-80	80	4.9	12.2	7.9	1¼" MPT	1¼" MPT	28.5
TFP10x20-20	20	9.8	20.3	2.2	1½" MPT	1½" MPT	33.0
TFP10x20-24	24	9.8	20.3	2.6	1½" MPT	1½" MPT	37.0
TFP10x20-30	30	9.8	20.3	3.2	1½" MPT	1½" MPT	44.0
TFP10x20-36	36	9.8	20.3	3.7	1½" MPT	1½" MPT	50.0
TFP10x20-40	40	9.8	20.3	4.1	1½" MPT	1½" MPT	55.0
TFP10x20-50	50	9.8	20.3	5.1	2" MPT	2" MPT	66.0
TFP10x20-60	60	9.8	20.3	6.0	2" MPT	2" MPT	77.0

* Models stocked in 1" MPT. 1¼" available on special order.

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.

Further benefits
The Fernox product range has been proven to improve heating system efficiency and extend system life. The added plus for installers is the time saved by using a suite of products to ensure correct pre-commissioning. This brings added value to customers and enhances the installer's professional reputation.

Liquid Products | 'F' Range Products

26 Gallons

Protector F1
Code: 57880 Carton Qty 10
- Long term protection against corrosion and limescale
- Stops frequent venting of radiators

26 Gallons

Boiler Noise Silencer F2
Code: 57881 Carton Qty 10
- Reduces boiler noise
- Improves heat transfer efficiency

26 Gallons

Cleaner F3
Code: 57882 Carton Qty 10
- Removes sludge, scale and debris
- Restores heating efficiency

26 Gallons

Leak Sealer F4
Code: 57883 Carton Qty 10
- Stops small leaks
- Ideal for reducing pressure loss from sealed system

Aerosols | 'F' Range Products

26 Gallons

Protector F1 Express
Code: 59900 Carton Qty 10
- Long term protection against corrosion and limescale
- Stops frequent venting of radiators

26 Gallons

Boiler Noise Silencer F2 Express
Code: 59901 Carton Qty 10
- Reduces boiler noise
- Improves heat transfer efficiency

26 Gallons

Leak Sealer F4 Express
Code: 59903 Carton Qty 10
- Stops small leaks
- Ideal for reducing pressure loss from sealed system

26 Gallons

Cleaner F5 Express 280ml
Code: 59902 Carton Qty 10
- Removes sludge, flux and debris
- Convenient and simple to use

Cleaners and Limescale | For sludged and blocked systems

DS40 System Cleaner 4.19lbs (1.9Kg)
Code: 62077 Carton Qty 6
- Powerful acid descaler and sludge remover
- Eliminates boiler noise

System Neutralizer 4.4lbs (2Kg)
Code: 62078 Carton Qty 6
- Neutralizes DS40 System cleaner to avoid acid discharge
- Conditions system for application of corrosion inhibitor

Glycol Freeze Protection & Commercial Range

For HVAC commercial systems

Alphi-11 US 5 & 55 Gallons

5 Gallon:155738-0005 Carton Qty 1

55 Gallon:155738-0055 Carton Qty 1

- Combined antifreeze and protector
- Protects against corrosion and lime scale
- Concentrate & designed to be used with regular on-site tap water
- Aluminium safe

HVAC Protector F1 US 2.6 & 55 Gallons

2.6 Gallon: 59700 Carton Qty 1

55 Gallon: 59851 Carton Qty 1

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

HVAC Cleaner F3 US 2.6 & 55 Gallons

2.6 Gallon: 59701 Carton Qty 1

55 Gallon: 59852 Carton Qty 1

- Central heating cleaner for HVAC and commercial systems
- Removes sludge and scale

Equipment and Test Kits

On-site analysis and powerflushing and filters

Express Boiler Commissioning Kit

Code: 62089 Carton Qty 1

- Maintain design specification and energy efficiency of a system
- Express products does a system in seconds

Protector Test Kit

Code: 57879 Carton Qty 1

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

Water Analysis Test Kit

Code: 57878 Carton Qty 1

- Rapid on-site analysis of central heating system water
- Simple colour charts for measuring concentrations

TDS Meter

Code: 57875 Carton Qty 1

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

Refractometer

Code: 55586 Carton Qty 1

- Anti freeze test instrument
- Adjustable eye piece

Powerflow Flushing Pump MKIII

Code: 58973 Carton Qty 1

- Powerful, acid-proof flushing pump
- For effective removal of corrosion debris, sludge and scale

TF1 Total Filter

Code: 1" Sweat 60003 Carton Qty 4

- Removes and contains magnetic and non-magnetic contaminants
- Fast to fit and easy to clean

Powerflushing Filter

Code: 62084 Carton Qty 1

- The fast and easy way to remove contaminants from system water during powerflushing
- Visual aid for home owner confirming the need for a powerflush

Powerflow Pump Head Adapter

Code: 55568 Carton Qty 1

- For easy connection of power flushing machines to central heating systems via the body of circular pump

FERNOX Products

COMMERCIAL / For HVAC Commercial Systems

Alphi-11 6.5 Gallons
Part #: F-57973

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

Protector F1 2.6 Gallons
Part #: F-57572

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

Cleaner F3 2.6 Gallons
Part #: F-57573

- 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

System Neutraliser 4.4 lbs
Part #: F-61009

- Neutralizes system water after using DS-40 System Cleaner
- Free flowing powder for easy use when powerflushing

EQUIPMENT TEST KITS

Boiler Commissioning Kit
Part #: F-59480

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

60 Sec Protector Check Strips
Part #: F-58141

- Simple, quick and accurate on-site dip test to check Fernox Protector levels
- One minute development time – instant, accurate result

Water Analysis Test Kit
Part #: F-57878

- Rapid on-site analysis of central heating system water
- Simple color charts for measuring concentrations

TDS Meter
Part #: F-57975

- 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

Powerflow Flushing Pump MKIII
Part #: F-58973

- Powerful, acid-proof flushing pump
- For effective removal of corrosion debris, sludge and scale

Flush Buddy
Part #: F-55333

- Premium quality, magnetic filter for use during powerflushing
- Connects directly on to any powerflushing machine

Powerflow Pump Head Adaptor
Part #: F-55568

- For easy connection of power flushing machines to central heating systems via the body of circular pump

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.

Further benefits
The Fernox product range has been proven to improve heating system efficiency and extend system life. The added plus for installers is the time saved by using a suite of products to ensure correct pre-commissioning. This brings added value to customers and enhances the installer's professional reputation.

AEROSOLS / For Systems up to 26 Gallons

Protector F1 Express
Part #: F-58229

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

Boiler Noise Silencer F2 Express
Part #: F-58231

- Reduces boiler noise
- Improves heat transfer efficiency

Leak Sealer F4 Express
Part #: F-58232

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

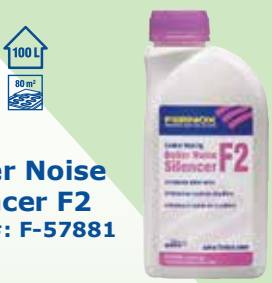
Cleaner F5 Express 280ml
Part #: F-58230

- Removes sludge, flux and debris
- Restores heating efficiency

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

TOTAL FILTER TF1 / Part #: F–61003

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

AXIOM INDUSTRIES LTD.

MODEL MF200 'PRESSURE PAL' MINI SYSTEM FEEDER

The 'PRESSURE PAL' is ideal for feeding and pressurizing closed hydronic systems that do not require cold static fill pressures higher than 170 kPa (25 psig). It is compatible with both water and glycol/water solutions. Perfect for small boiler/chiller systems, snow/ice melt circuits, outside air heating/cooling glycol coils, solar heating systems.

FEATURES and BENEFITS

- *25 liter (6.6 US gallon) tank for storage and mixing*
- *Power supply plugs into any standard 115 VAC outlet*
- *Diaphragm pump can run dry without damage*
- *No direct connection to potable water supply eliminates need for backflow prevention*
- *Make-up fluid stored in the feeder tank can be pre-treated*
- *Diverter valve allows easy purging of air on initial start-up, and manual agitation of solution*
- *Prevents major floods - in the event of system rupture, only the contents of the tank will be pumped into the system*
- *Provides leak detection - dropping fluid level provides immediate notice that the system has developed a leak*
- *Fluid drained for service can easily be put back into the system*
- *Fluid level switch shuts the pump off if the storage tank level gets too low*
- *Auxiliary dry contact included for remote low pressure alarm (alarm optional or by others)*

AXIOM INDUSTRIES LTD.

'PUROPAL' H_2O DEMINERALIZERS

PUROPAL

Optional conductivity and flow meter

The 'PUROPAL' disposable cartridges are ideal for demineralizing fill water for closed loop hydronic systems. The quality of water, especially when mixed with anti-freeze (glycol), can have an impact on system performance. Marginal water quality can lead to scaling, sediment deposits, accumulation of sludge, and increased corrosion rates.

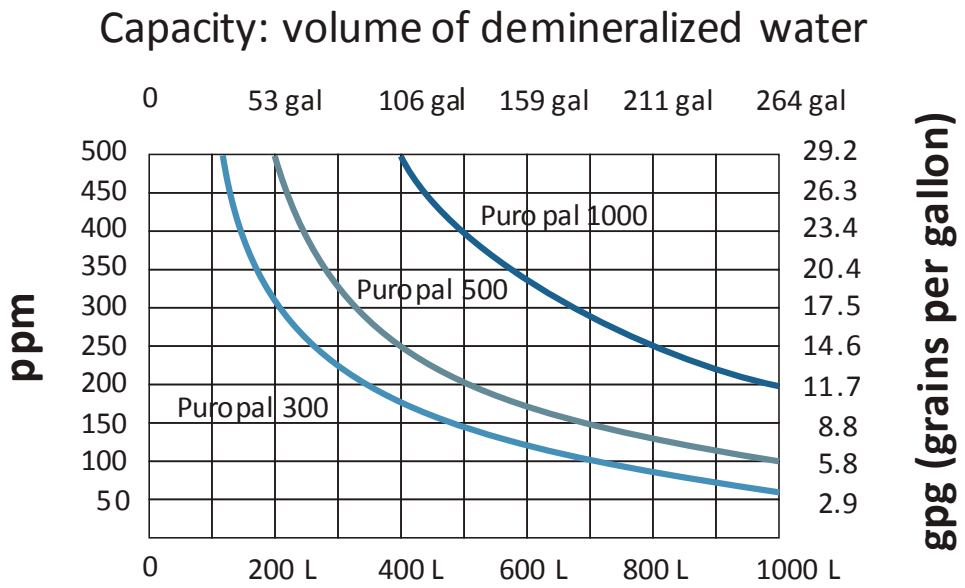
FEATURES and BENEFITS

- *Demineralized water meets the strict water quality requirements from boiler and glycol manufacturers*
- *Removes all the aggressive salts such as chlorides, sulphates, and nitrates which specifically attack metals like stainless steel, copper, and aluminum*
- *Removes scale producing ions like calcium and magnesium that damage components and block heat transfer*
- *Lowers electrical conductivity, which reduces corrosion*
- *The Puropal-300 media changes from blue to beige when spent*
- *An economical and convenient alternative to pre-blended glycol*

PUROPAL H_2O demineralizer TECHNICAL INFORMATION

Application: The closed loop system is filled using local domestic water which has been run through the Puropal cartridge. In doing so the water is demineralized, meeting fill water specifications of glycol and boiler manufacturers. It is also possible to demineralize an existing "water only" system by circulating the system water through a Puropal demineralizing cartridge.
Puropal provides a great advantage because neither meters nor special knowledge are required for water treatment.

Capacity: The graph below shows that the capacity of the demineralizing cartridge depends on the total hardness of the domestic water. Example: With a hardness of 11.7 gpg (200 ppm), the Puropal 300 provides 92 gal (350 L) of completely demineralized water, Puropal 500 provides 132 gal (500 L) and Puropal 1000 provides 264 gal (1000 L).



SPECIFICATION

The H_2O demineralizer shall be AXIOM INDUSTRIES LTD. model PUROPAL-_____. System shall include disposable cartridge with demineralizing ions, and two plastic ¾" female BSP x ¾" male garden hose fittings. Max. pressure 58 psi (400 kPa) at 140 °F (60 °C).

ACCESSORIES

☐ **PUROPAL-Meter** – Flow and conductivity meter

☐ **PUROPAL-Hose Kit**– Hose kit

AXIOM INDUSTRIES LTD.

MODEL NC-1 'NeutraPal' CONDENSATE NEUTRALIZATION KIT

The 'NeutraPal' is ideal for neutralizing condensate from condensing boilers and furnaces operating on natural gas or propane.

The condensate is acidic and has the potential to harm the environment and the sewer system. The NeutraPal will raise the pH of the condensate to a more neutral level before it is discharged to drain.

NeutraPal

FEATURES and BENEFITS

- ***1.6 Gal/hr (6.05l/hr)***
- *NeutraPal prevents acidic condensate from corroding drains and sewer systems*
- *Neutralized condensate is more environmentally friendly*
- *Fast and easy installation*
- *Helps maintain a neutral environment for bacteria in septic systems*
- *Low profile design for appliances with a near floor condensate drain*
- *All corrosion resistant materials*
- *Suitable for use on all types of Natural Gas and Propane appliances*
- *Includes initial charge of neutralizing agent*
- *Can be mounted in horizontal or vertical position (see installation instructions)*

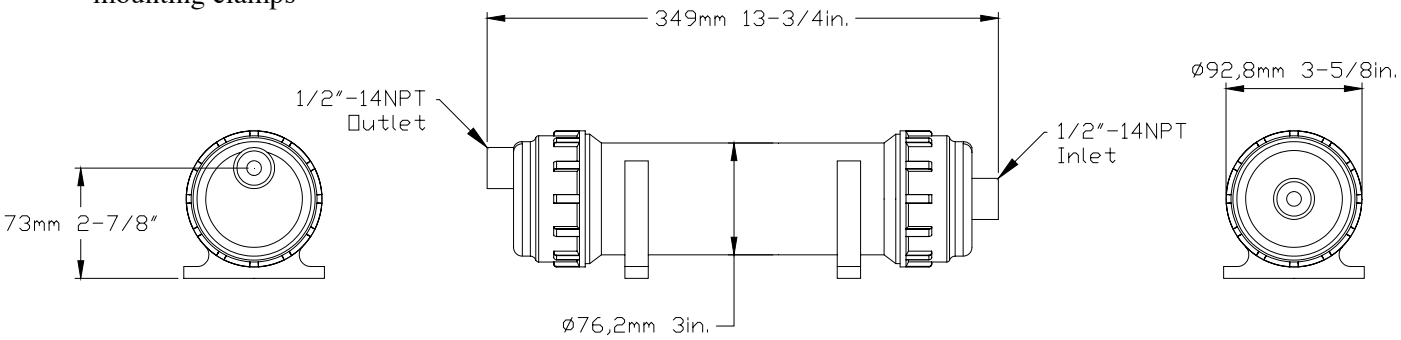
* Check with the appliance manufacturer for condensate flowrate. As a guideline 150,000 BTU/hr at 100% efficiency will produce approximately 1.6 Gal/hr.

NC-1 NEUTRALIZATION CAPSULE TECHNICAL INFORMATION

WEIGHT - 2 kg, 4.4 lbs.

SPECIFICATION

The condensate neutralization capsule shall be AXIOM INDUSTRIES LTD. model NC-1. System shall include 1 litre (0.26 U.S. gallon) capsule made from of corrosion resistant materials with two 3" fill/access openings, ½"-14NPT threaded inlet, ½"-14NPT threaded outlet, three ½" NPT to ½' hose barb fittings, ½" barbed Y fitting, six hose clamps, 10 ft of 1/2" ID vinyl tubing, two base/wall mounting clamps



ACCESSORIES

☐ **GRY-003** – Replacement neutralization media

DXT Series
Thermal Expansion Absorbers

NSF®
Certified to
ANSI-NSF 61

elbi

Elbi's DXT Series Thermal Expansion Absorbers...

The DXT Series diaphragm thermal expansion tank is designed for use in domestic system installations for sanitary hot water applications. The tank is installed in systems equipped with a backflowpreventor or as an add-on to direct or indirect water heaters. The tank's function is to absorb the increased volume of water which results from the heating process, thereby keeping the system's pressure below the relief valve settings.

The tanks are available in sizes from 2 to 13 gallons.

The heavy duty butyl diaphragm is designed to provide a permanent separation of the water from the air cushion. The exclusive TOP-PRO ® internal coating ensures effective protection against corrosion and allows the product to be safely used in sanitary fresh water systems. The installation of a DXT tank in any of the above mentioned systems reduces the system's operating costs and prevents unnecessary relief valve operation.

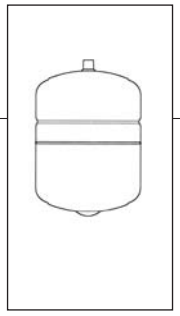
FEATURES AND BENEFITS

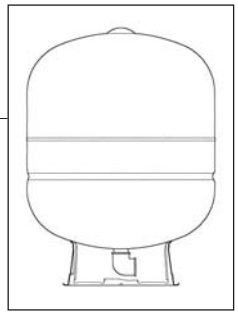
FEATURE	BENEFIT
• **Welded Construction** • **Heavy Duty Butyl Diaphragm**	Adds safety to your installation. Withstands temperatures as high as 200°F. Of solid construction, manufactured in house though an injection molding process. Made of proprietary food quality Butyl compound which will not release taste or odors in the water.
• **Polyester powder white finish**	Provides an attractive, durable appliance like finish obtained though an oven baking process of the polyester paint powder.
• **40 PSI Factory Precharge on All Models**	Suits most common installations. The precharge can be manually adjusted on site.
• **Strong Construction**	Tanks are sturdy and built to last, while at the same time they are lightweight, easy to handle and simple to install.
• **Protection of water inlet**	Plastic insert keeps the diaphragm safe, prevents well water debris from entering the tank and enhances the resistance of water inlet against corrosion.
• **TOP-PRO ® Internal Lining**	The exclusive TOP-PRO ® internal coating provides good protection against water corrosion, yet it does not affect the taste or quality of the water. The TOP-PRO ® coating is also applied at the water connection line to prevent it from premature rusting.* Moreover, the coating does not allow the diaphragm to stick to the tank shell.

* When installed in normal environmental conditions. By normal enviromental conditions it is meant environments which are free of acids, scale or chemical deposits or other factors known to affect paints, coatings and metals.

DIMENSIONAL DATA

	IN-LINE MODELS DXT-8	DXT-18	DXT-24	Non NSF Certified STAND MODEL DXT-50
Capacity (gal.)	2.1	5.0	6.5	13
Acceptance Volume *	1.25	3.0	4.2	8.0
Connector NPTM	3/4"	3/4"	3/4"	1"
Max. Working Pressure (PSIG)	150	150	150	150
Max. Working Temperature (°F)	200°F	200°F	200°F	200°F
Factory Precharge (PSIG)**	40	40	40	40
Diameter (in.)	8	10 1/2	12 3/4	15 3/4
Weight (lbs.)	6.34	11.50	13.72	27.16





*at 40 PSI
** Factory precharge can be affected by variations in environmental conditions (ex. temperature changes) and systems conditions (ex. pressure changes). Product should be carefully inspected upon receipt and all charges should be adjusted to fit your particular system installation.

DXT THERMAL EXPANSION TANKS - QUICK SELECTION TABLE

System Content	Max. Desired press.(PSIG)	ENDING TEMPERATURE 110°F	120°F	130°F	140°F	150° F	160°F	170°F
30	90	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8
	100	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8
	120	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8
40	90	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-18	DXT-18
	100	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-18
	120	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8
50	90	DXT-8	DXT-8	DXT-8	DXT-8	DXT-18	DXT-18	DXT-18
	100	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-18	DXT-18
	120	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-8	DXT-18
75	90	DXT-8	DXT-8	DXT-18	DXT-18	DXT-18	DXT-18	DXT-18
	100	DXT-8	DXT-8	DXT-18	DXT-18	DXT-18	DXT-18	DXT-18
	120	DXT-8	DXT-8	DXT-8	DXT-8	DXT-18	DXT-18	DXT-18
100	90	DXT-8	DXT-18	DXT-18	DXT-18	DXT-18	DXT-24	DXT-24
	100	DXT-8	DXT-18	DXT-18	DXT-18	DXT-18	DXT-18	DXT-24
	120	DXT-8	DXT-8	DXT-18	DXT-18	DXT-18	DXT-18	DXT-18
120	90	DXT-18	DXT-18	DXT-18	DXT-18	DXT-24	DXT-24	DXT-50
	100	DXT-8	DXT-18	DXT-18	DXT-18	DXT-18	DXT-24	DXT-24
	120	DXT-8	DXT-18	DXT-18	DXT-18	DXT-18	DXT-18	DXT-24
250	90	DXT-18	DXT-24	DXT-50	DXT-50	DXT-50	DXT-50	2 x DXT-50
	100	DXT-18	DXT-24	DXT-50	DXT-50	DXT-50	DXT-50	2 x DXT-50
	120	DXT-18	DXT-18	DXT-24	DXT-50	DXT-50	DXT-50	DXT-50

For supplying minimum pressure 45-50 psig - Thermal Expansion Absorber must be precharged to 40 psig - For relief valve setting: 125 psig - use 100 psig minimum pressure, 150 psig - use 120 psig minimum pressure; Initial temperature 60° F

MAINTENANCE

It is recommended that a periodic maintenance inspection of the complete heating system be performed by a professional licensed plumber. The inspection must be done at least once per year and, during such check, the tank's precharge should be tested and adjusted to the correct pressure if necessary. Failure to perform periodic maintenance will void all warranty.

PACKAGING AND SHIPPING DATA

Model Number	Packaging Dimensions (in.)	Volume (cu.ft.)	Quantity* per Pallet
DXT-8	8-5/16 x 8-5/16 x 12-5/8	0.48	162
DXT-18	10-7/8 x 10-7/8 x 16-7/8	1.15	70
DXT-24	10-3/4 x 10-3/4 x 18-3/8	1.40	70
DXT-50	15-7/8 x 15-7/8 x 23-3/8	3.71	33

*Quantity per pallet may vary depending on the size of the pallets and the limitations presented by the means of transportation used when shipping out the product to its final destination. In case there are differences between the quantities per pallet listed here and the actual quantity per pallet loaded, you will be contacted by one of our staff members.

WARRANTY

Elbi's DXT Series tanks are guaranteed to be free of workmanship or material defects for a period of five (5) years from the date of manufacturing. For a complete description of our warranty policy consult the literature which comes with the product or call our offices to request a copy.

Elbi's XT-XTV Series Expansion Tanks...

The XT-XTV Series diaphragm expansion tanks are available in sizes from 2 to 80 gallons in either in-line or stand models (see chart). Designed and manufactured by Elbi since 1975, the XT-XTV Series expansion tanks are solid and have proven reliable in millions of installations worldwide.

The two shell welded construction allows the tank to withstand high pressure ratings and therefore adds safety to your system. The BUTYL diaphragm separates the air from the water and prevents waterlogging while saving space and energy. Product is intended for use in hot water, solar and cooling systems and is compatible with glycol. Call our factory for compatibility and suitability in special applications.

FEATURES AND BENEFITS

FEATURE	BENEFIT
• WELDED STRONG CONSTRUCTION	Steel shells are designed to withstands high pressure loads and add safety to your installation. Tanks are sturdy and built to last while at the same time they are lightweight, easy to handle and simple to install.
• HEAVY DUTY BUTYL DIAPHRAGM	Withstands temperatures as high as 240°F. Of solid construction, manufactured in house through an injection molding process. Made of proprietary food quality compound which will not release taste or odors in the water. Compatible with glycol, solar and cooling systems.
• EPOXY GRAY PAINT FINISH	Provides an attractive, durable appliance like finish obtained through an oven baking process of the epoxy paint powder.
• 12 PSI FACTORY PRECHARGE ON ALL MODELS	Suits most common installations. The precharge can be manually adjusted on site.

DIMENSIONAL DATA

Model Number	Capacity (Gal.)	Acceptance Volume* (Gal.)	Conn. NPTM (in.)	Max. Working Pressure (PSIG)	Factory[1] Precharge (PSIG)	Max. Working Temperature (° F)	Diameter (in.)	Height (in.)	Weight (lbs.)
IN-LINE MODELS									
XT-15	2.1	1.4	1/2"	150	12	210	8	11 3/4	6.34
XT-30	5.0	3.0	1/2"	150	12	210	10 1/2	15	11.50
XT-60	6.5	4.2	1/2"	150	12	210	10 3/4	17	13.72
XT-90	13	8.5	1"	150	12	210	15 3/4	20	24
STAND MODELS									
XTV-30	13	8.5	1"	150	12	210	15 3/4	25	27.16
XTV-40	21	14	1"	90	12	210	15 3/4	32	41.16
XTV-60	27	17	1"	90	12	210	20	29 1/2	48.16
XTV-90	40	26	1"	90	12	210	20	38	63.16
XTV-100	53	36	1"	90	12	210	24	42 1/3	80.16
XTV-110	66	42	1"	90	12	210	26	40 1/2	90.2
XTV-160	80	52	1"	90	12	210	26	45	111.16

* At 60 PSIG; Maximum working pressure allowed in Canada: 30 PSIG
** When installed in normal environmental conditions. By normal enviromental conditions it is meant environments which are free of acids, scale or chemical deposits or other factors known to affect paints, coatings and metals.
1) Factory precharge can be affected by variations in environmental conditions (ex. temperature changes) and systems conditions (ex. pressure changes). Product should be carefully inspected upon receipt and all charges should be adjusted to fit your particular system installation.

XT-XTV EXPANSION TANKS - SELECTION TABLES

TABLE 1 - TYPE OF RADIATION

Boiler Net Output* baseboard	Fin tube baseboard or radiant panels	Convectors or unit heaters	Cast iron radiators	Cast iron baseboard
25	XT-15	XT-15	XT-15	XT-15
50	XT-15	XT-15	XT-30	XT-30
75	XT-30	XT-30	XT-30	XT-60
100	XT-30	XT-30	XT-60	XT-60
125	XT-30	XT-60	XT-60	XT-90
150	XT-30	XT-60	XT-90	XT-90
175	XT-60	XT-60	XT-90	XT-90
200	XT-60	XT-60	XT-90	XT-90
250	XT-60	XT-90	XT-90	XTV-40
300	XT-90	XT-90	XT-90	XTV-40
350	XT-90	XT-90	XTV-40	XTV-60
400	XT-90	XTV-40	XTV-40	XTV-60

* in 1000s BTU/Hour - Fill pressure 12 PSIG/ Relief Pressure 30 PSIG/Average System Temperature 200° F

TABLE 2 - SYSTEM CONTENT

System Content	100°F	110°F	120°F	130°F	140°F	150°F	160°F	170°F	180°F	190°F	200°F	210°F
25	XT-15	XT-15	XT-15	XT- 15	XT-15	XT-15	XT-15	XT-15	XT-15	XT-15	XT-30	XT-30
50	XT-15	XT-15	XT-15	XT-15	XT-15	XT-30	XT-30	XT-30	XT-30	XT-30	XT-30	XT-30
75	XT-15	XT-15	XT-15	XT-30	XT-30	XT-30	XT-30	XT-30	XT-60	XT-60	XT-60	XT-90
100	XT-15	XT-15	XT-30	XT-30	XT-30	XT-30	XT-60	XT-60	XT-90	XT-90	XT-90	XT-90
200	XT-30	XT-30	XT-30	XT-60	XT-90	XT-90	XT-90	XT-90	XTV-40	XTV-40	XTV-40	XTV-40
300	XT-30	XT-60	XT-90	XT-90	XT-90	XT-90	XTV-40	XTV-40	XTV-40	XTV-60	XTV-60	XTV-90
400	XT-60	XT-90	XT-90	XT-90	XTV-40	XTV-40	XTV-40	XTV-60	XTV-90	XTV-90	XTV-90	XTV-90
500	XT-90	XT-90	XT-90	XTV-40	XTV-40	XTV-60	XTV-60	XTV-90	XTV-90	XTV-90	XTV-100	XTV-100
600	XT-90	XT-90	XTV-40	XTV-40	XTV-60	XTV-60	XTV-90	XTV-90	XTV-100	XTV-100	XTV-100	XTV-110
700	XT-90	XT-90	XTV-40	XTV-60	XTV-60	XTV-90	XTV-90	XTV-100	XTV-100	XTV-110	XTV-110	XTV-160
800	XT-90	XTV-40	XTV-40	XTV-60	XTV-90	XTV-90	XTV-100	XTV-100	XTV-110	XTV-110	XTV-160	XTV-160
900	XT-90	XTV-40	XTV-60	XTV-90	XTV-90	XTV-90	XTV-100	XTV-110	XTV-110	XTV-160	XTV-160	2 x XTV-100
1000	XTV-40	XTV-40	XTV-60	XTV-90	XTV-90	XTV-110	XTV-100	XTV-110	XTV-160	XTV-160	2 x XTV-100	2 x XTV-100

Fill pressure: 12 PSIG, Relief pressure: 30 PSIG, System Fill Temperature: 40°F

MAINTENANCE

It is recommended that a periodic maintenance inspection of the complete heating system be performed by a professional licensed plumber. The inspection must be done at least once a year and, during such check, the tank's precharge should be tested and adjusted to the correct pressure if necessary. Failure to perform periodic maintenance will void all warranty.
We strongly recomend the use of dielectric union when connecting dissimilar metals.

PACKAGING AND SHIPPING DATA

Model Number	Packaging Dimensions (in.)	Volume (cu.ft.)	Quantity per Pallet
IN-LINE MODELS			
XT-15	8.43x8.43x12.60	0.35	162
XT-30	10.83x10.83x17.52	1.06	70
XT-60	13.00x13.00x14.76	1.41	70
XT-90	16.14x16.14x21.06	3.08	33
STAND MODELS			
XTV-30	16.14x16.14x24.02	3.52	33
XTV-40	16.14x16.14x33.86	4.96	22
XTV-60	20.08x20.08x32.68	7.40	10
XTV-90	20.08x20.08x40.94	9.27	8
XTV-100	24.02x24.02x41.34	13.40	8
XTV-110	25.98x25.98x47.64	18.07	6
XTV-160	25.98x25.98x50.39	19.11	6

*Quantity per pallet may vary depending on the size of the pallets and the limitations presented by the means of transportation used when shipping out the product to its final destination. In case there are differences between the quantities per pallet listed here and the actual quantity per pallet loaded, you will be contacted by one of our staff members.

WARRANTY

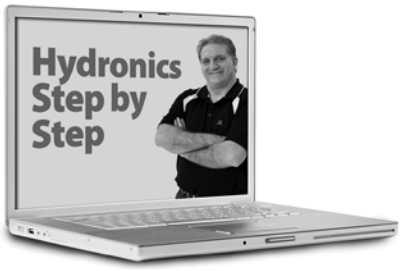
Elbi's XT - XTV Series tanks are guaranteed to be free of workmanship or material defects for a period of five (5) years from the date of manufacturing. For a complete description of our warranty policy consult the literature which comes with the product or call our offices to request a copy.

Join FloPro Today

Free Learning.

Taco turns e-learning into free learning with FloPro® University. Designed for HVAC professionals, FloProU offers an ever-expanding library of video refresher courses to help you grow your HVAC business. It's convenient, fun, and free to all FloPro team members. Visit www.taco-hvac.com/flopro to sign up!

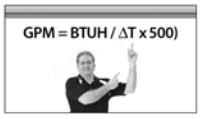
Why attend the FloPro University?



- Training that's convenient, comprehensive, clear and concise.
- Courses designed for you to learn at your own pace.
- View and review lessons as often as you want.
- Self-testing to reinforce what you learned.

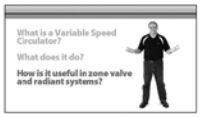
HVAC e-classes

Available online, free to FloPro® Team members. Taught by John Barba.



The Universal Hydronics Formula
It's the hydronic cornerstone, the foundation for heating-heat loss, pipe sizing, circulator selection and troubleshooting, to name a few. To fully understand how hydronic heating systems work, you have to understand the Universal Hydronics Formula.

Hydronics Step By Step
Learn the entire process of building a hydronic heating system, step by step right through start up. Course highlights include how to analyze and calculate heat loss, how to select the right boiler, how to read pump curves, how to choose the right circulator and the ideal location for correctly-sized circulators in your systems.



Variable Speed Pumping
Learn about the many benefits of variable speed pumping and how to use variable speed circulators in the systems you design and install. You'll learn how variable speed circulators respond to heating load changes to deliver greater comfort and energy efficiency.

Anatomy of a Circulator
Go inside a typical wet rotor circulator to learn how it differs from a pump and how it uses centrifugal force to create the flow that is vital to every hydronic system. You'll inspect all the parts of a circulator and learn how each affects the specific performance characteristics of that circulator.

Taco FLOPRO University

www.taco-hvac.com/flopro

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Taco University

Taco Design Software

General Formulas

Horsepower Water = $\frac{\text{GPM x head (ft.) x specific gravity}}{3960}$

Horsepower Brake = $\frac{\text{GPM x head (ft.) x specific gravity}}{3960 \text{ x pump efficiency}}$

Horsepower Brake = $\frac{\text{GPM x PSI x specific gravity}}{1713 \text{ x pump efficiency}}$

Efficiency (pump) = $\frac{\text{GPM x head (ft.) x specific gravity}}{3960 \text{ x pump BHP}}$

Brake horsepower (motor) = $\frac{\text{Watts input x motor efficiency}}{746}$

BTU = Amount heat required to raise (heat or cool) 1 lb of water 1°F

Tank Heating Rate (BTU/hr) (Boiler Capacity Needed) = $\frac{\text{Tank Heating Requirement (BTU)}}{\text{Hrs (hrs desired to bring tank up to temperature}}$

Tank Heat Up Rate (hrs) = $\frac{\text{Tank Heating Requirement (BTU)}}{\text{BTU/hr Heat Source Boiler}}$

Tank Capacity Calculation (gallons) (rectangular) = Length(ft) x Width(ft) x Depth(ft) x 7.481 (gal/cu ft)

Tank Capacity Calculation (gallons) (cylinder) = $\frac{\text{Diameter(ft)}^2 \text{ x 3.14 x Height(ft) x 7.481 (gal/cu ft)}}{4}$

Tank Heating Total Requirement (BTU total) = Tank Temperature Rise x Gallons x 8.346 (plus tank & piping external losses)

Kilowatt (KW) = 3414 BTU/hr

% Efficiency = $\frac{\text{GPH x 8.34 x Temp. Rise x 1.0 (Specific Heat)}}{\text{Btu/Hr. Input}}$

BTU / Output = GPH x 8.34 lbs/Gal. x Temp. Rise x 1.0

BTU / Input = $\frac{\text{GPH x 8.34 x Temp. Rise x 1.0}}{\text{\% Efficiency}}$

GPH = $\frac{\text{BTU/Hr. Input x \% Efficiency}}{\text{Temp. Rise x 8.34}}$

Rise (DF) = $\frac{\text{BTU/Hr. Input x \% Efficiency}}{\text{GPH x 8.34}}$

KW = $\frac{\text{GPH x 8.34 x Temp. Rise x 1.0}}{3413}$

Determine % of hot water portion:

$\frac{MWT - C}{H - C} = \frac{140 - 50}{180 - 50} = \frac{90}{130}$ = 69.2% Hot Water

Determine % of cold water portion:

$\frac{H - MWT}{H - C} = \frac{180 - 140}{180 - 50} = \frac{40}{130}$ = 30.8% Cold Water

MWT = Mixed Water Temperature (°F)
H = Hot Water Temperature (°F)
C = Cold Water Temperature (°F)

BTU/hr (water @ 68°F) = GPM x 500 x ΔT (°F)

BTU/hr (30% E. glycol @ 68°F) = GPM x 445 x ΔT (°F)

BTU/hr (50% E. glycol @ 32°F) = GPM x 395 x ΔT (°F)

Water To Increase Concentration Of Glycol In A Hydronic System

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

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%

$\frac{Vg = 125(45\text{-}25)}{(100\text{-}25)}$ = 33.3 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

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

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

Volts = Amperes X Ohms

AMPERES

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

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

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

OHMS

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

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

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

WATTS

Watts = Volts x Amperes

Watts = Amperes^2 x Ohms

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

GPM = BTUh ÷ (ΔT x 500)
Pipe Head Loss = Supply + Return x 1.5 x .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" Pex Hd Loss = Longest Loop x .035
(based on 1.0 GPM @ 120° water)

Ft Hd. Loss = (Flow / Cv)^2 x 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

JTG MUIR
Manufacturer's Representative

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