



CONDENSED CATALOG

The Leader In Hydronic Systems & Components



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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.



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.

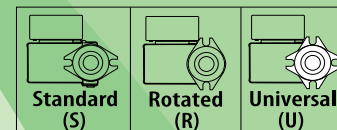


Model #	Flange Code*
0015-MSF1-4 IFC	S
0015-MSF1-1 IFC	R
0010-MSF1 IFC	U

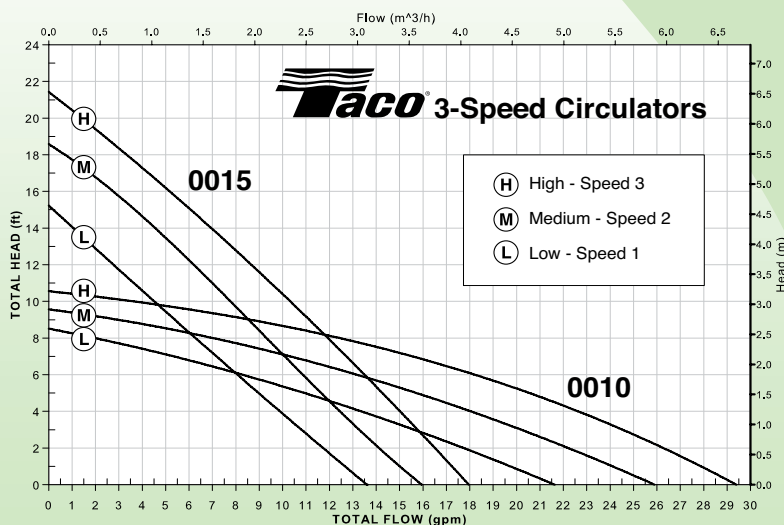
Universal Flange Design on the 0010 version simplifies the change out of any circulator, regardless of style.



***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

"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

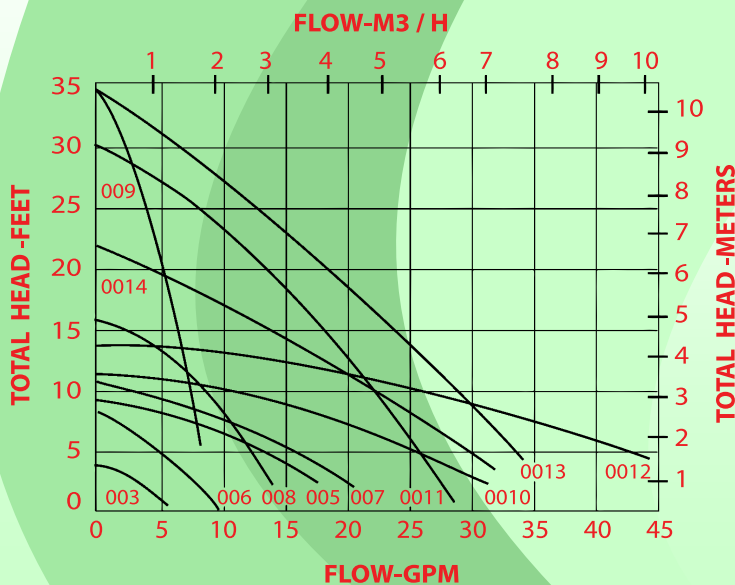
- Standard high capacity output-compact design
- Quiet, efficient operation
- Direct drive-low power consumption
- Unique replaceable cartridge design-field serviceable
- Self lubricating
- No mechanical seal
- Unmatched reliability-maintenance free
- Universal flange-to-flange dimension
- Anti-condensate 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

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 *Built-In*
READY *Transformer and Relay*

controls made **easy**

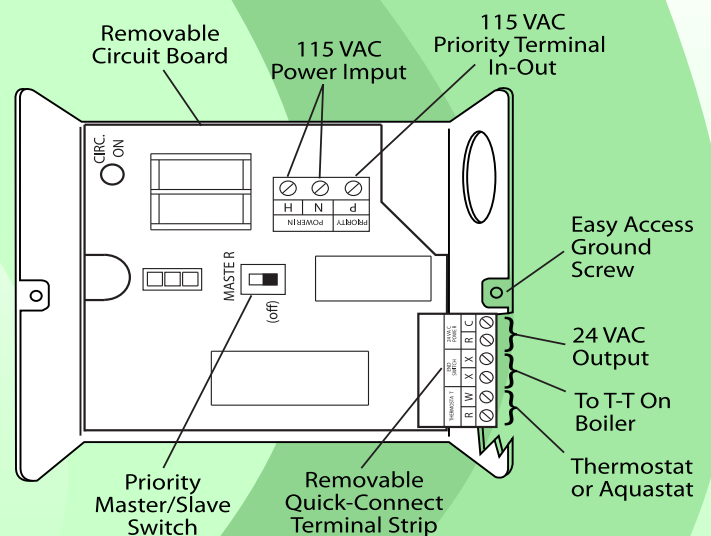
Features

- 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



Circulator with Integral Variable Speed Solar Control

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

VT Solar Series Circulator/Control

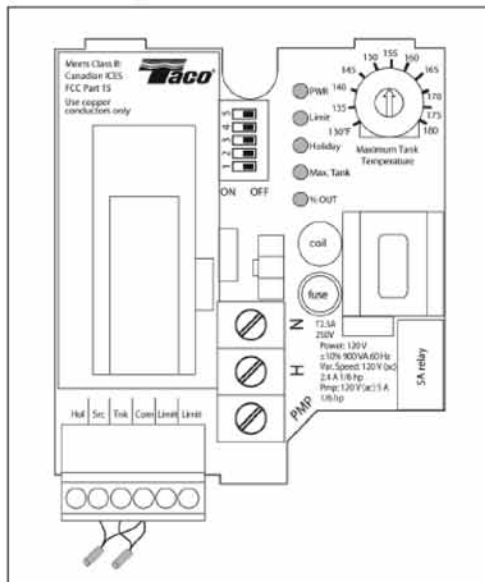
Features:

- 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



FOR INDOOR USE ONLY

PC Board Layout

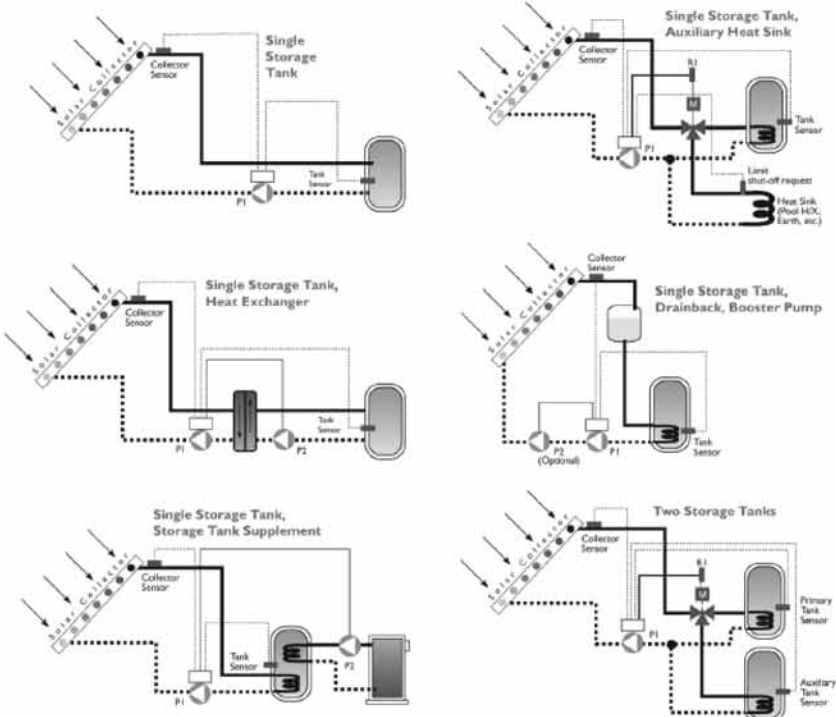


Variable Speed Pays Big Performance Dividend

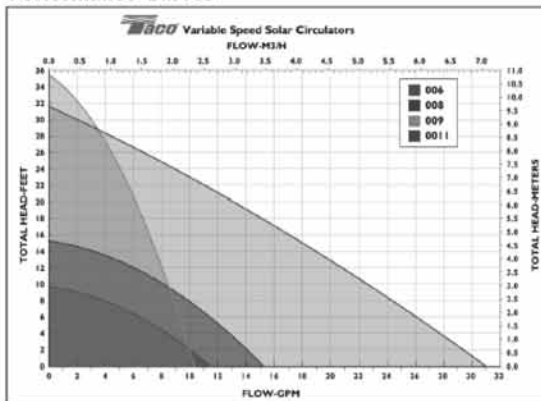
The Solar Variable Speed Circulator (00-VT) continuously optimizes the flow through the collector to achieve maximum energy gain. For example, there is no benefit of pulling 80° water out of the collector when you are trying to maintain 120° in a tank. If a proper delta T is maintained through the collector 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



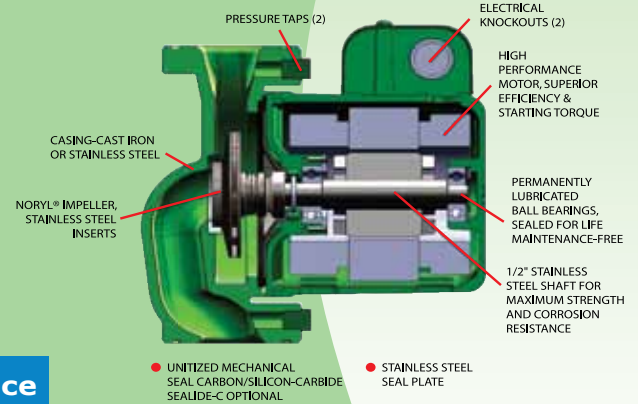
2400 Series High Capacity Circulators

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 unitized, carbon/silicon-carbide mechanical seal is easy to service in only a few minutes..



NOTE:
1-Noryl® is a registered
Trademark of
General Electric Co.

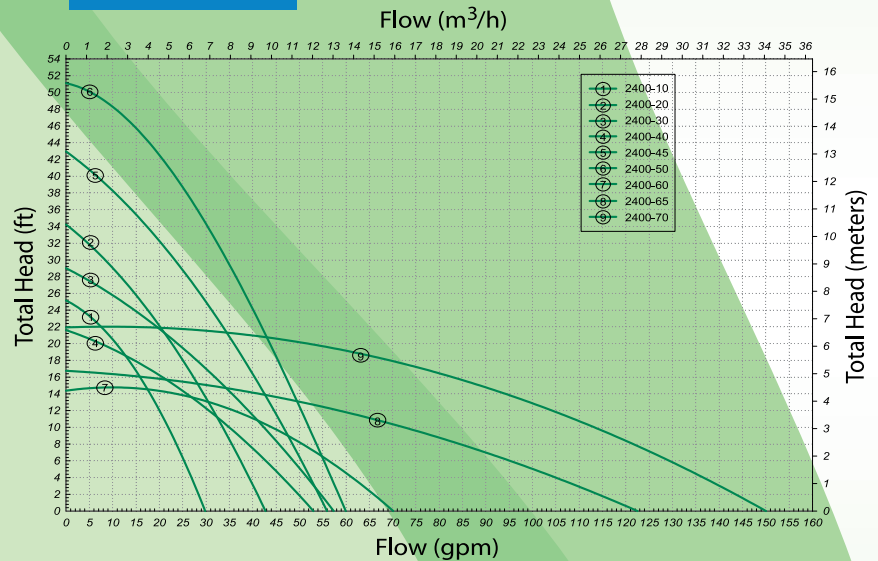
2-Nu-Tride® is a
registered Trademark of
Kolene Corp.



Features

- 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
- Flow range: 0-147 GPM
- Head range: 0-51 feet
- Min. fluid temperature: 40 F (4 C)
- Max. fluid temperature: 225°F (107 C)
- Max. working pressure: 150 psi

Performance Field-60Hz



2400 Series Companion Flange Sets

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

2400 Series High Capacity Circulators Cross Reference

TACO Model	TACO Model	Max Head/Flow	HP	F-F Dim.(in.)	B & G Model	Armstrong Model	Grundfos Model	Equiv to Taco #
	Discontinued							
Cast Iron								
2400-10	1400-10	25/30	1/10	6-3/8	PL-30	E7	UP26-64	0011
2400-20	1400-20	34/43	1/6	6-3/8	PL-36	E8, E9	UP26-99, UP26-116	0013
2400-30	1400-30	29/57	1/6	8-1/2	PL-45	E10, E11	UP43-75	112
2400-40	1400-40	22/53	1/6	8-1/2	PL-50	E13	UP43-75, UPS32-80	0012, 111, 1600
2400-45	1400-45	43/55	1/3	6-3/8	-	E9, E12	UPS32-160	-
2400-50	1400-50	51/55	1/2	6-3/8	PL-55	E12, E14	UPS40-240 Spd 1	-
2400-50/2	1400-50/2	51/55	1/2	6-3/8	-	-	-	-
2400-60	1400-60	15/70	1/6	8-1/2	PL-75	E16	UPS40-80 Spd 1	120, 1600, 1911
2400-65	1400-65	17/120	1/3	8-1/2	-	E28, E29	-	131
2400-70	1400-70	22/150	1/2	8-1/2	PL-130/2"	E30	UPS50-80	1630
2400-70/3	1400-70/3	22/150	1/2	8-1/2	PL-130/3"	E33	-	132
Stainless Steel / Bronze								
2400-10S	1400-10B	25/30	1/10	6-3/8	PL-30B	E7B	UP26-99BF	0011
2400-20S	1400-20B	34/43	1/6	6-3/8	PL-36B	E8B, E9B	UP26-116BF	0013
2400-30S	1400-30B	29/57	1/6	8-1/2	PL-45B	E10B, E11B	UP43-75BF	112
2400-40S	1400-40B	22/53	1/6	8-1/2	PL-50B	E13B	UP43-75BF	0012, 111, 1600
2400-45S	1400-45B	43/55	1/3	6-3/8	-	E9B, E12B	-	-
2400-50S	1400-50B	51/55	1/2	6-3/8	PL-55B	E12B, E14B	UPS40-240B Spd 1	n/a
2400-50S/2	1400-50B/2	51/55	1/2	6-3/8	-	-	-	-
2400-60S	1400-60B	15/70	1/6	8-1/2	PL-75B	E16B	UPS40-80B Spd 1	120, 1600, 1911
2400-65S	1400-65B	17/120	1/3	8-1/2	-	E28B, E29B	-	131
2400-70S	1400-70B	22/150	1/2	8-1/2	PL-130B/2"	E30B	UPS50-80B	1630
2400-70S/3	1400-70B/3	22/150	1/2	8-1/2	PL-130B/3"	E33B	-	132

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.



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.

Operating Data

Maximum WP =
150 psi / 600 WOG

Maximum Operating Temp
240°F (115°C°)

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.



XPump Block

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

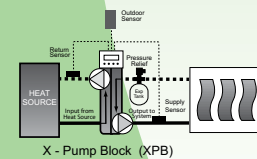
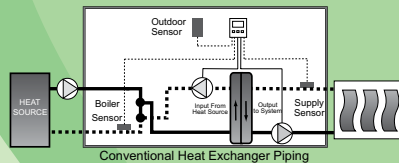
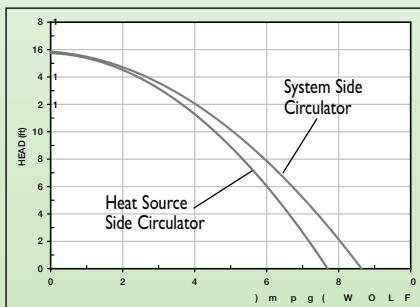
Performance Data

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



FOR INDOOR USE ONLY

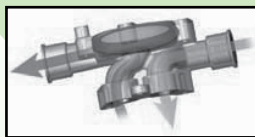
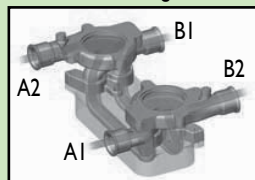
Performance Field



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.

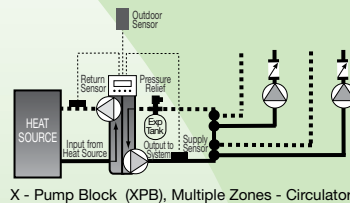
Operation

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.

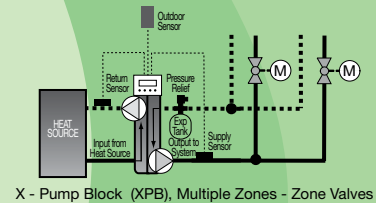


Sizing and Piping

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.



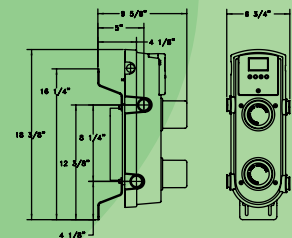
X - Pump Block (XPB), Multiple Zones - Circulators



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

Electrical & Weight Data

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



Solar Pumping Station — SPS-PC

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

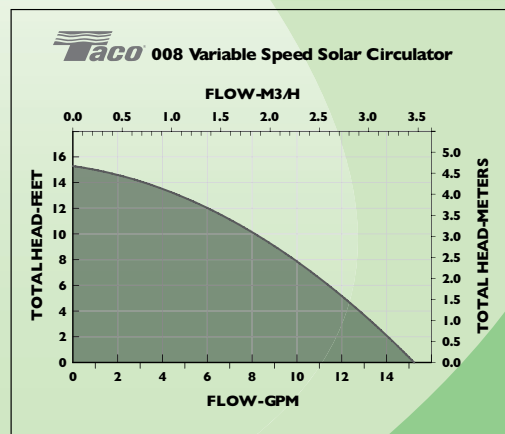
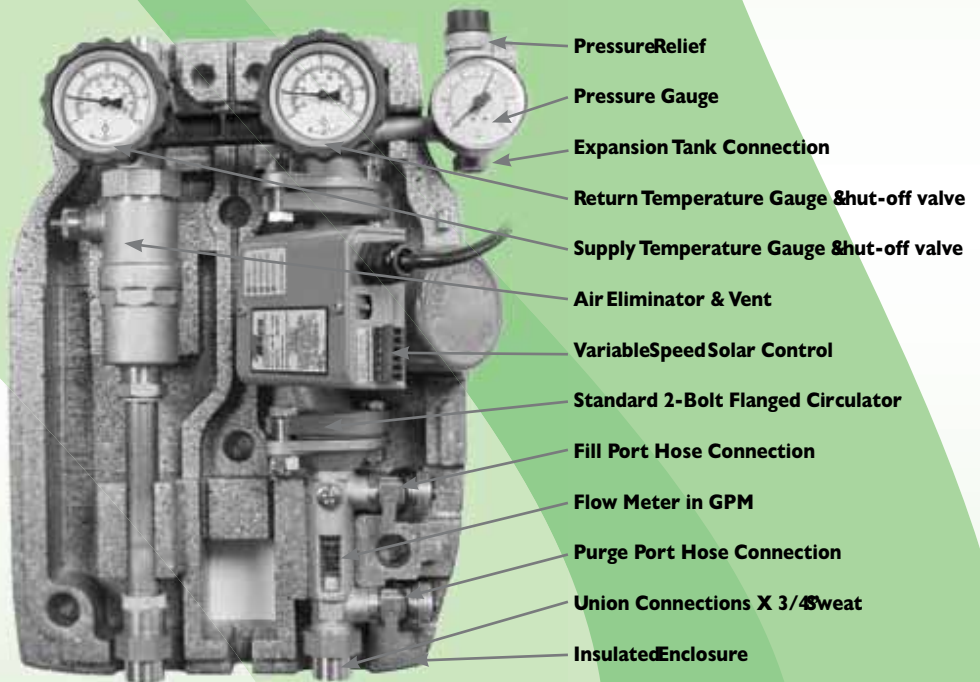
Specifications

- 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.

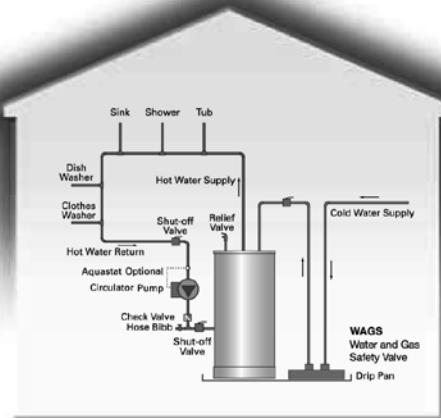
The Solar Pumping Station truly simplifies your closed loop solar water heating installation. With just a few connections, you install the heart of the system; circulator, solar control and all safety and measurement equipment.



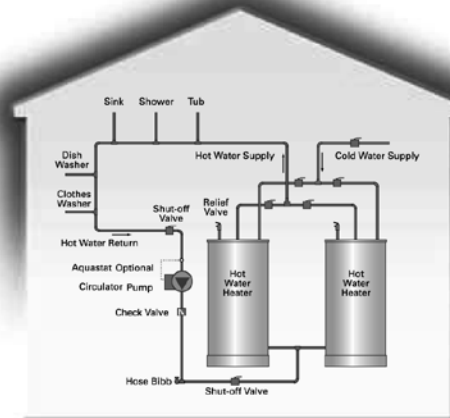
Taco
solar made easy

Typical Installation & Piping

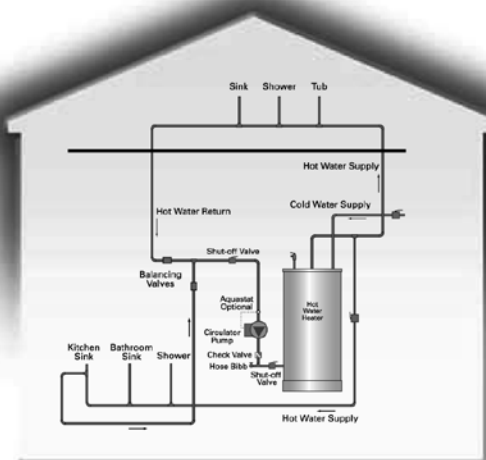
One-Story with 1 Water Heater



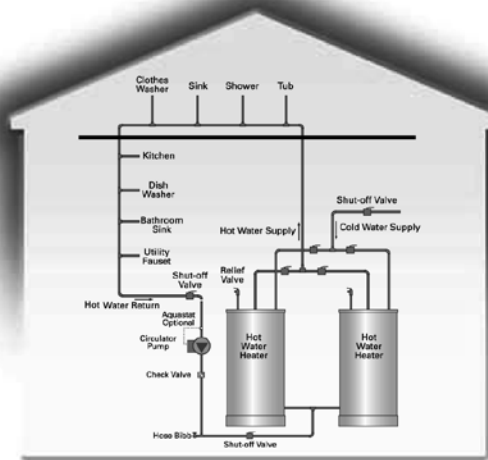
One-Story with 2 Water Heaters



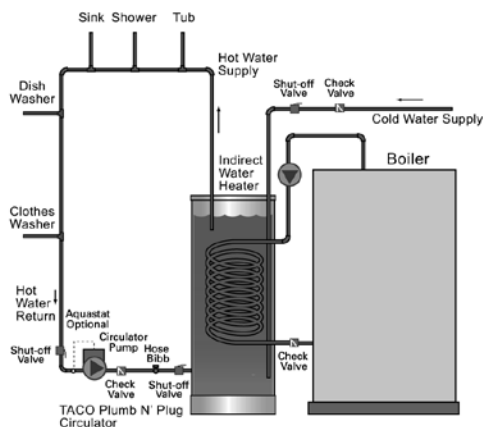
Multi-Story with 1 Water Heater



Multi-Story with 2 Water Heaters



Recirculation Piping with Indirect Water Heater



Recirculation Piping with Storage Water Heater & Mixing Valve

Features & Benefits:

Plumb n' Plug Circulators

- Removable stainless steel cartridge - contains all moving parts
- Patented, removable Integral Flow Check (IFC) option
- Bronze construction
- 1/2" & 3/4" sweat, 3/4" npt, union or flanged connections
- Pre-wired power cord
- Pre-wired 24-hour analog or 7-day programmable timer
- Durable Noryl® impeller
- Ceramic shaft, carbon bearings
- Quiet running, low power consumption
- Low maintenance, unmatched reliability
- UL Listed

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 SmartPlus 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

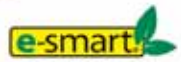
Remote Sensor Included

Optional IFC® (Integral Flow Check)

Unique Replaceable Cartridge
Design-Field Serviceable

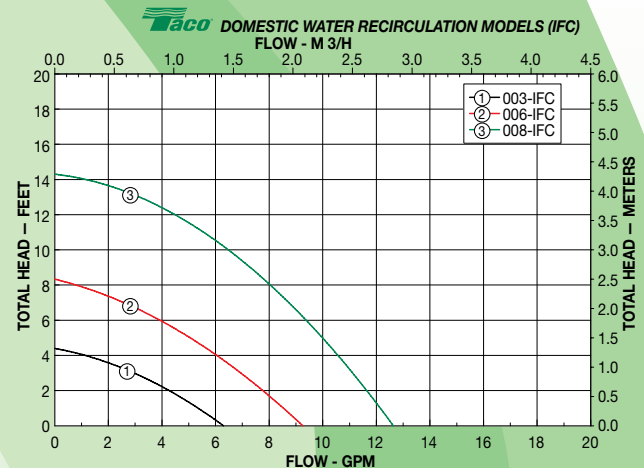
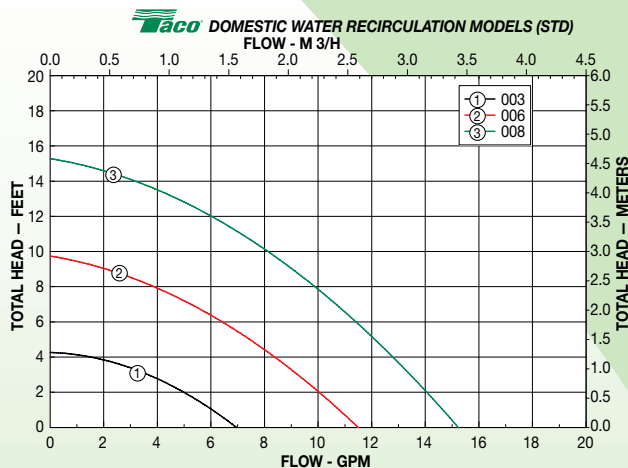
SmartPlus

HOT WATER RECIRCULATION



e-smart™ is our way of helping you quickly identify our most resource-saving products.

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.

Domestic Water Recirculation Product Group

		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			

Domestic Water Recirculation Product Group

		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 D'Mand 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			

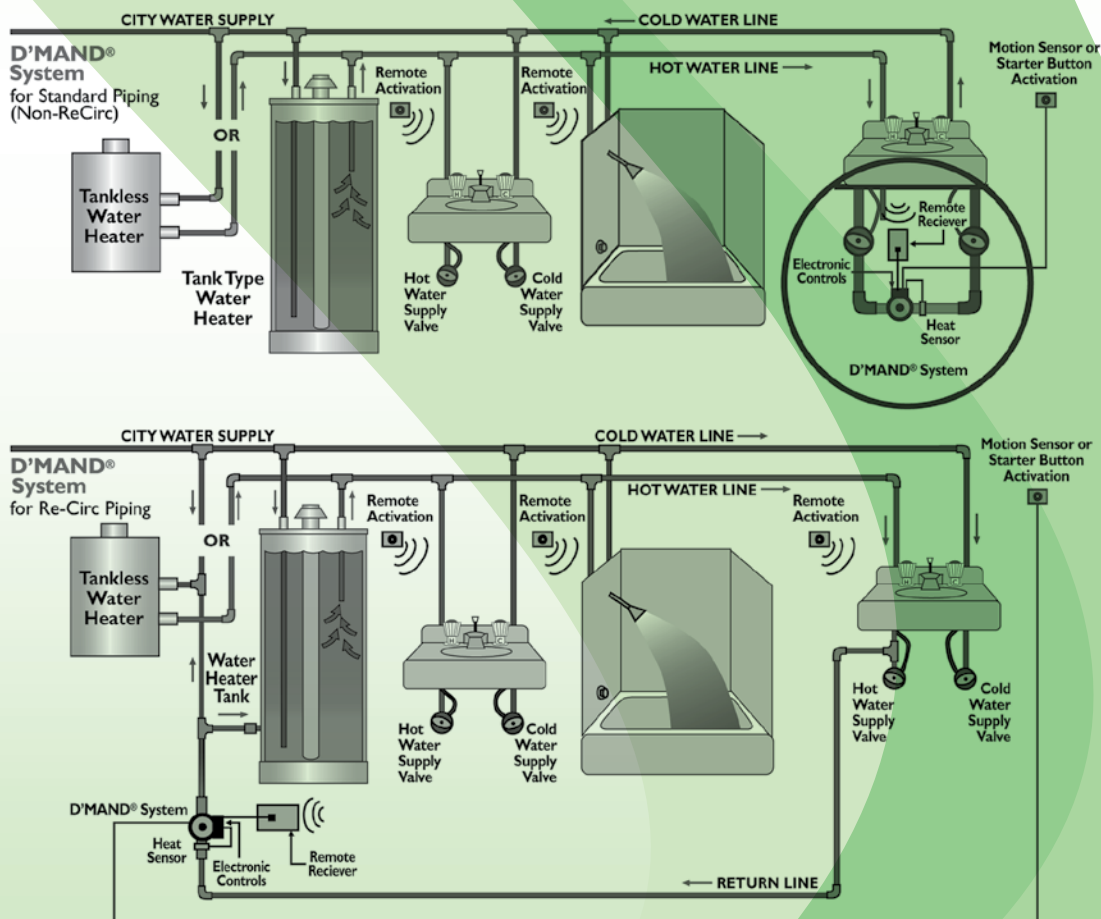


"On-Demand" Systems for New or Retrofit Installations

Using the existing cold water line as the return line, the D'MAND® System is ideal for both new and retrofit installations. Typically installed at the furthest fixture from the water heater, D'MAND® 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.

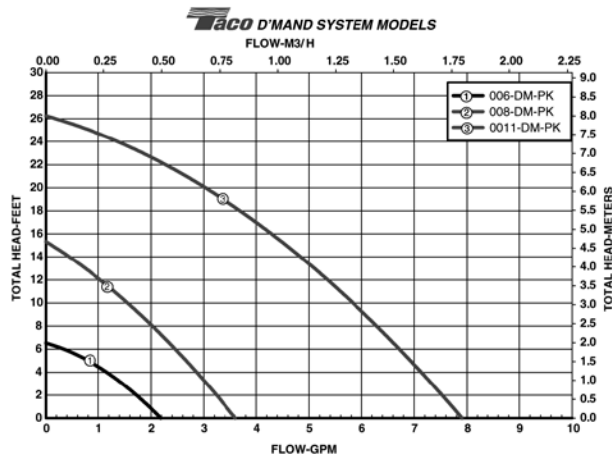
Ideal for Tankless Water Heaters Features and Benefits of the Taco D'MAND® System

- Instant Hot Water Comfort
- Maximum Water & Energy Savings
- 24 Hour "On-Demand" operation
- Maintenance free circulator - unmatched reliability
- Removable stainless steel cartridge - contains all moving parts
- UL, IAPMO listed
- Patented D'MAND® electronics control board
- 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



Recirculation System

Performance Field Information - 60 Hz



Standard Piping: Tank Type Water Heater

Size of Home	Total length of Pipe (ft)	Model
Small	50	006-DM-PK
Medium	100	008-DM-PK
Large/Commerical	Over 100	0011-DM-PK

Tankless Water Heater

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

Recirculation Piping: Tank Type Water Heater

Size of Home	Total Length of Pipe (ft.)	Model
Small	100	006-DM
Medium	200	008-DM
Large/Commerical	200 +	0011-DM

Tankless Water Heater

Size of Home	Sq. Ft.	Model
Small / Medium	<2500	008-DM
Large/Commerical	2500+	0011-DM



D'MAND® System Accessories

Model	Description
554-1	RF Remote Transmitter/Receiver Kit
554-2	RF Individual Remote Transmitter Button
554-3	Hardwired Individual Starter Button Round
554-4	Motion Sensor Kit



RF Wireless
Starter Kit



Motion
Sensor

5000 Series Mixing Valve



We also provide the 5120 Series, "Low-Lead" Mixing Valves, 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.

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"

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	----	----

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 overshings, **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

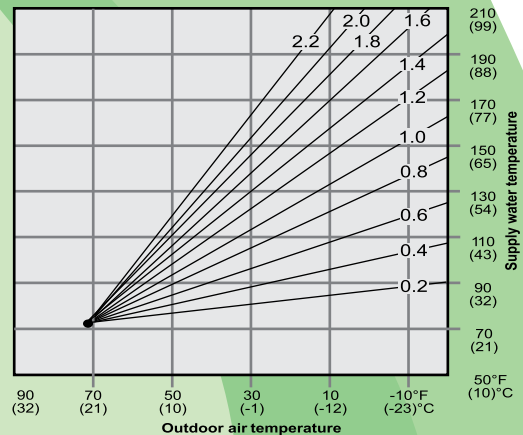
- Selectable maximum supply temperature (110°F, 130°F, 150°F, or off)
- Selectable minimum supply temperature (85°F, when max. supply temp. is set to 150°F or off)
- Adjustable minimum boiler return temperature (120°F, 135°F, or off)
- Warm weather shutdown (70°F or off)
- Adjustable heating curve (0.2-2.2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

Setpoint

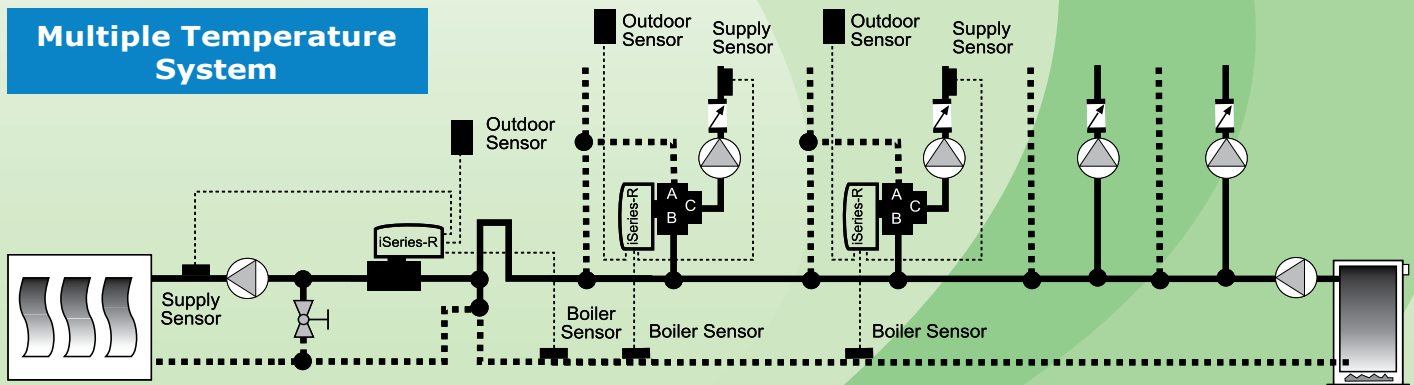
- Adjustable setpoint dial (80°F to 180°F)
- Selectable 15°F setback
- Optional boiler protection (Set at 135°F)

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



Zone Control Family (Zone Valve Controls)

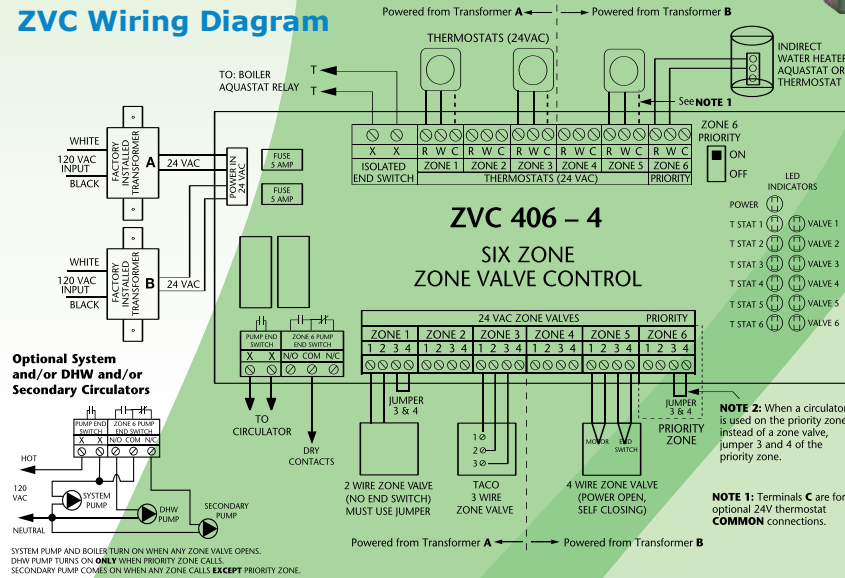
Simplify the wiring nightmare! Taco Zone Valve Controls easy-to follow PC board layout eliminates the problems caused by incorrect wiring, while the external indicator lights provide instant diagnostic feedback. Combined with Taco Zone Valves and Thermostats, the system's performance and dependability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

External Diagnostics

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



ZVC Wiring Diagram



Features

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

Additional - EXP Features

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

Zone Valve Controls

Dimension of Enclosure

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

Expandable Zone Valve Controls

Dimension of Enclosure

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

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

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

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

Zone Control Family (Switching Relays)

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

More Features

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

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

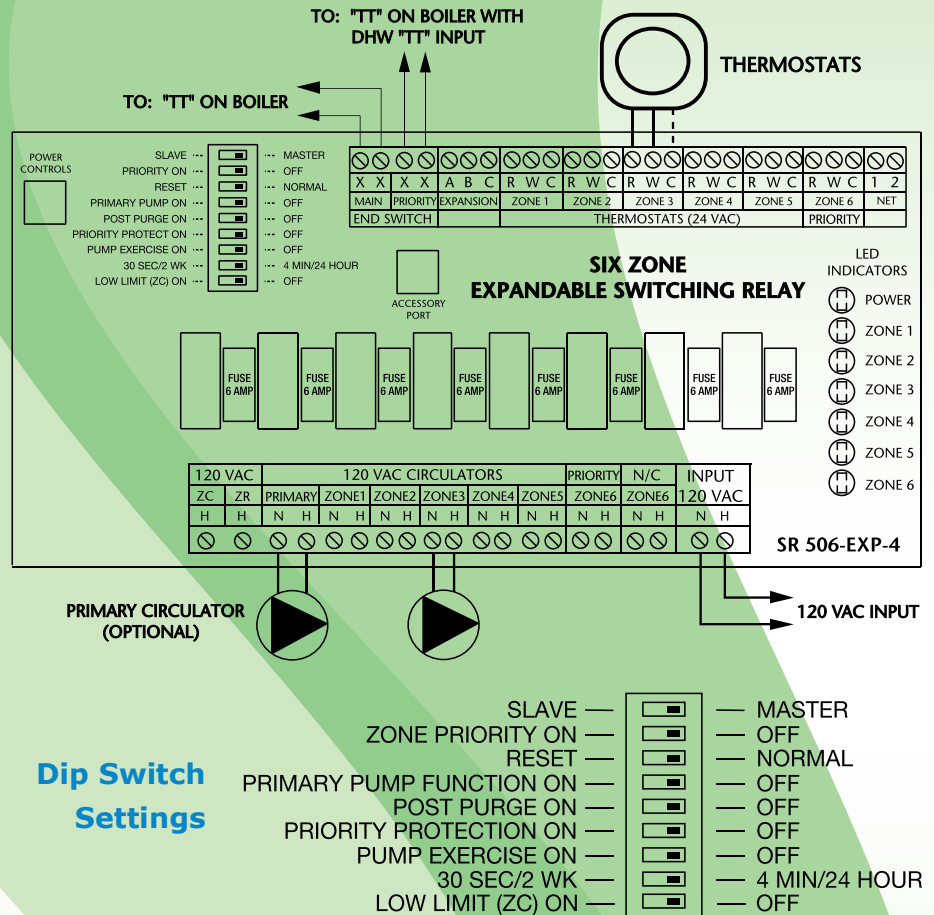
Features

- 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)



Switching Relays

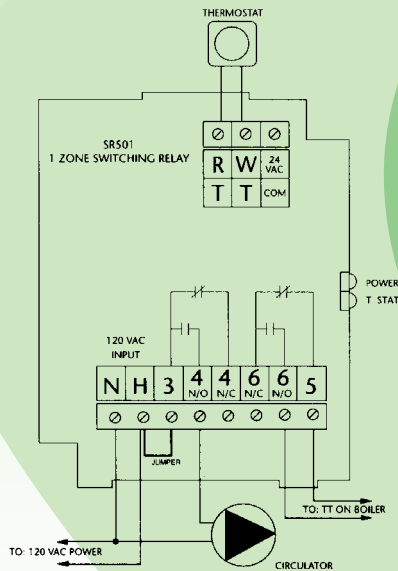
Product #	Description
SR501	1- zone switching relay
SR501-HC	1- zone high current switching
SR502	2- zone switching relay with priority
SR503	3- zone switching relay with priority
SR504	4- zone switching relay with priority
SR506	6- zone switching relay with priority

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

SR-Taco Switching Relay/Transformer

Wiring Diagram for Typical Installation



MODEL

SR501

DESCRIPTION

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	

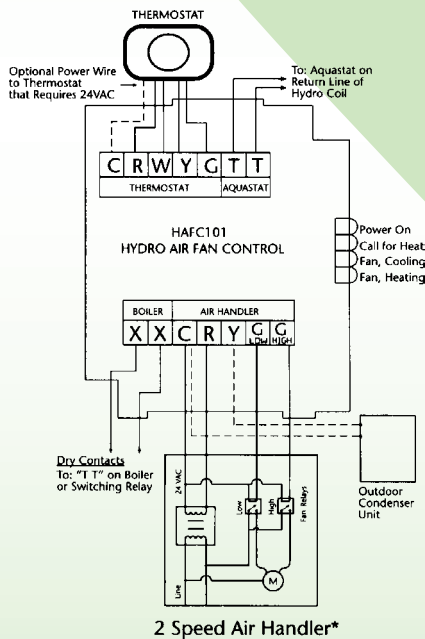
Taco Hydro Air Fan Control

MODEL

SR501-F

DESCRIPTION

DPDT/5 amp
1/6 hp



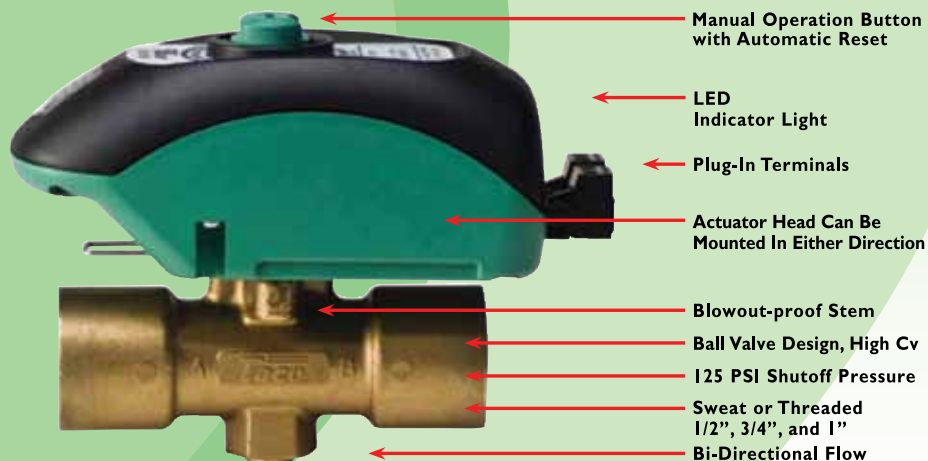
The Hydro Air Fan Control is an interface between the thermostat and air handler. It also has an isolated end switch to start the boiler and/or pump. When the thermostat calls for heat, the Fan Control energizes the end switch relay and allows the fan to operate at low speed when the water is above the 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.

Zone Sentry® Zone Valves

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



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).

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

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

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

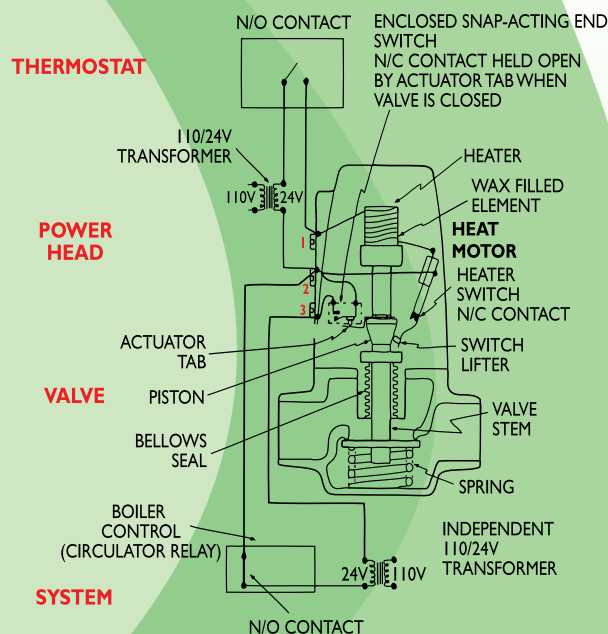
Model #	Description
571-2	3/4" Sweat Zone Valve 2-Way
572-2	1" Sweat Zone Valve 2-Way
573-2	1-1/4" Sweat Zone Valve 2-Way
555-050RP	Power Unit For 570 Series Valves



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.



Specifications

Connections:

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

Media:

Water or Glycol / Up to 50%

Maximum Pressure:

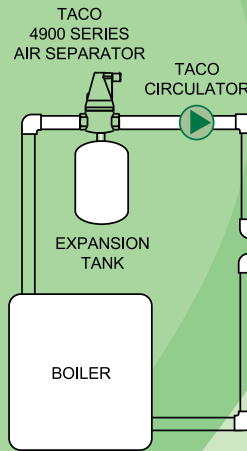
350 PSIG

Maximum Temperature:

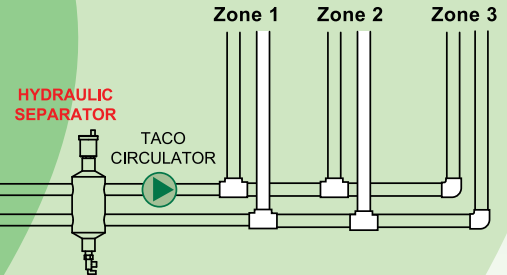
240°F

Hydro-Sep Hydraulic Separators

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



Typical Installation



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.

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.

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.*

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.

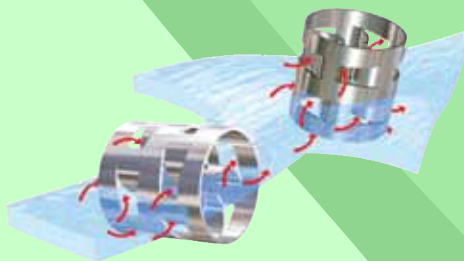
Conical Venting Chamber

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.

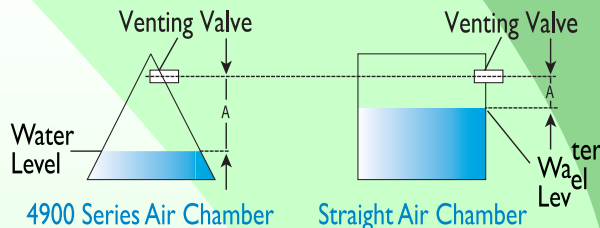
The Coalescence Effect

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.

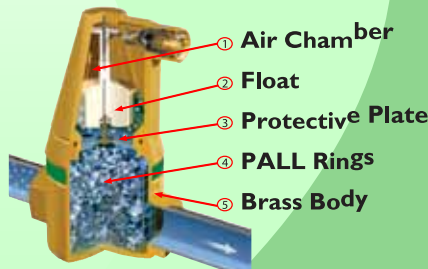
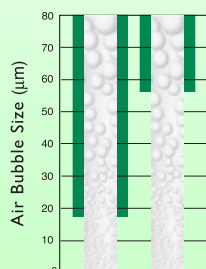
Pall Rings



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

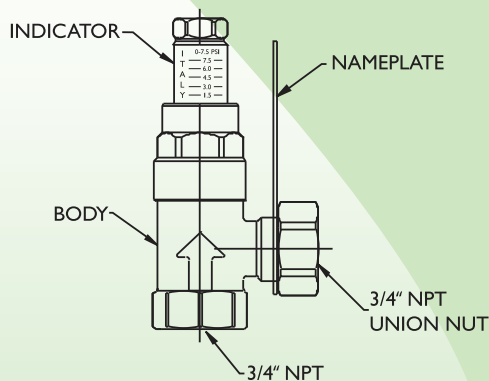
Differential Bypass Valves are used to control excess flow velocities that can be created when there is a reduction in the demand for heat. This reduced heat demand would typically occur as zone thermostats are satisfied and their corresponding zone valves close, causing the system pump to try and force 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.



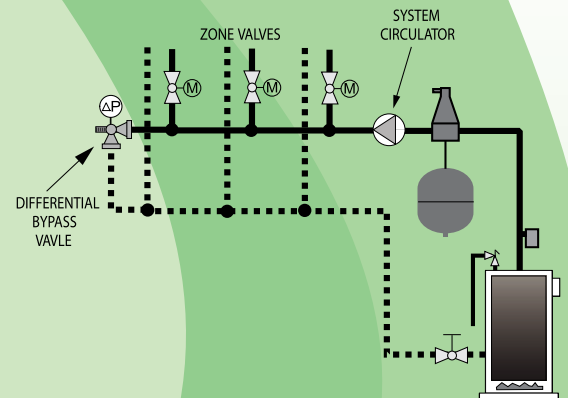
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Operation

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.



Typical Installation



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

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

Ratings

Fast Fill Mode: 2.1 Cv

Media: Water

Boiler Feed Pressure Reducing Valves

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



Features

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

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

Performance Data

PRESSURE REDUCING VALVES

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

Maximum Supply Side Pressure:
100 psi (689kpa)

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

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

DUAL CONTROLS

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

Maximum Supply Side Pressure:
100 psi (689kpa)

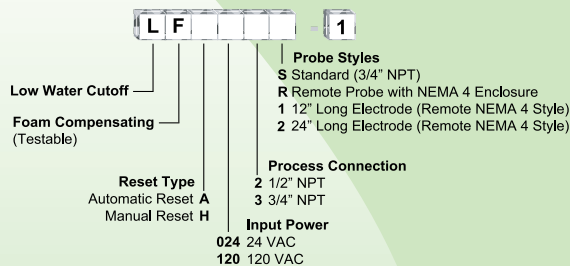
Relief Valve Set to Release at:
30 psi (207kpa)

Low Water Cutoff (LWCO)

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



LF Ordering



Features

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

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

Industrial Flow Switch

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



IFS Ordering



Process Connection

- F Flexible Paddles
- R Rigid Paddles

Bushing Material

- B Brass
- S 316 Stainless Steel

Model

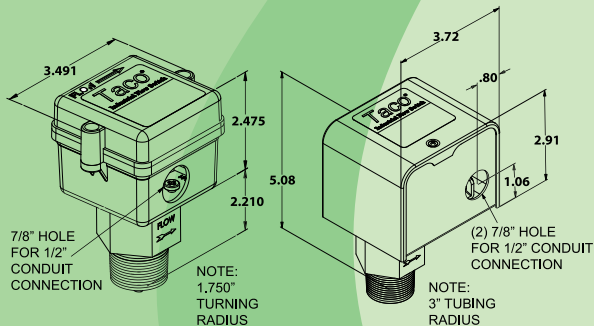
- 01 Single Switch Model
- 02 Double Switch Model
- H1 High Current Single Switch Model
- H2 High Current Double Switch Model
- WS NEMA4, Small Turning Radius
- W2 NEMA4, Double Switch Model

Models

IFS01/02/H1/H2

Models

IFSWS

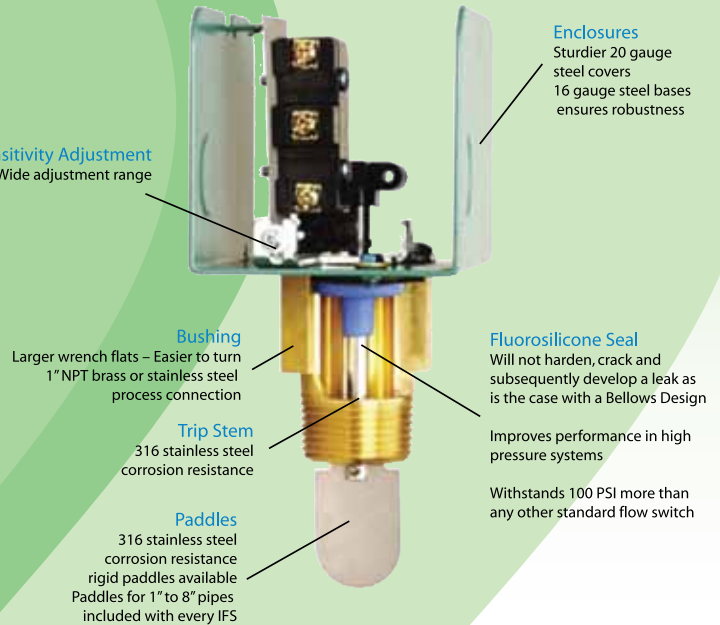


Notes:

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 $\pm 10\%$ GPM with the use of a 1" weldolet.
- (*) Flow rates for these sizes are calculated.

Flow Sensitivity Adjustment

Wide adjustment range



Better Materials... Better Performance!

Features

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

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

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

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 its 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

FERNOX Products

COMMERCIAL / For HVAC Commercial Systems



Alpha-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

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 withstand 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: 50 PSIG

** When installed in normal environmental conditions. By normal environmental 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-30	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-60	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 recommend 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.

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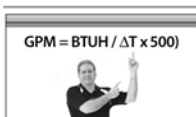
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- Courses designed for you to learn at your own pace.
- View and review lessons as often as you want.
- Self-testing to reinforce what you learned.

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.

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 To help you find practical solutions to the problems you find in the field every day.

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- Courses designed for you to learn at your own pace.
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- Flexibility to view one lesson or the whole course, in one session or as many as you choose, as many times as you want.
- Self-testing so you can be sure you know what you learned.
- Professor John Davis, to lead the way, just as he does in our renowned Taco FloPro Factory Training 2-day courses.

What you won't find here:

- A pile of heavy textbooks
- A tedious course
- Any pressure at all

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Taco Design Software

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NEW FloPro University course

FloPro Designer gets an update
 FloPro Designer, our highly handy system design software, has been updated to make your job even easier. These new enhancements mean more time saving and an easier workflow. Check out the features below or go straight to the download to explore our FloPro Designer. [Download FloPro Designer](#)

Feature updates

- MORE ACCURATE PUMP SELECTIONS:**
 We've changed the default head loss for an expansion, hot and cold water exchanger.
- BALL VALVE RULE:**
 All valves in the Boiler Wizard are now ball valves. The valve menu now highlights ball valves.
- ALLOW PEAK PUMPING:**
 You saved top it!
- ZONE ENTRY:**
 We have changed the EZY valve name to Zone Entry.
- LARGER SERIAL PORT SIZE:**
 Your apps will thank us!
- VARIABLE SPEED DELTA-T OPTION:**
 Variable Speed pumping saves energy and increases efficiency when added the Variable Speed Delta-T calculator to pump selection.
- CALCULATE LENGTH OF RADIATOR AND RADIATOR IMPROVED LOADS: ALLOW OUTPUT RATING TO BE IGNORED:**
 Add the loadboard, run, multiply BTU output and FloPro Designer calculates how many feet of radiator you need. It's that easy. Roundboard is the size and the odd shape of other radiators lost systems.
- ENHANCED BOILER WIZARD:**
 Allow boiler input to be checked. Added option of variable speed delta-T output on the boiler input.

ENHANCED BOILER WIZARD (continued):
 New options added for the length heater.

ALL VALVES ARE NOW BALL VALVES:
 Added new 1/2" and expansion package to the Wizard and the menu.

ADDED TANK WRC2 OPTION:
 It's added now!

IMPROVED AUTOPILOT:
 Automatically fill in the location for all components with the user name. Now you can stay organized!

DETAILS, DETAILS:
 We've added a detailed Load Summary Report for those city inspectors and policy clients.

NEW GEOMETRIC EXPANSION TANK SELECTION:
 For added flexibility, we added expansion tanks in sizes 15, 30, 60 and 90, based on accurate volumes.

ASSIGNED ZONE NAMES:
 Now you can assign zone names to each room or group of rooms and add a zone name to the detailed Load Summary report.

Multiple rooms can now be on the same zone:
 Rooms on the north or south side of the house can be grouped together.

One thermostat controls the temperature in two or more rooms.
 Zoning can now match the piping schematic.

FloPro Designer Support
 Watch the FloPro Designer Basics videos created by Ben Davis. [Get the latest on tips, tricks and talent!](#)

Ra Purtil's BLOG
 Find and make sense the world of FloPro.

Call Ra
 FloPro Designer Contact Support. call 877-376-4485.

Ask Ra Purtil a Question

Formulas and Reference Information

General Formulas

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

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

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

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

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

$$\text{BTU} = \text{Amount heat required to raise (heat or cool) 1 lb of water } 1^{\circ}\text{F}$$

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

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

$$\text{Tank Capacity Calculation (gallons) (rectangular)} = \text{Length(ft)} \times \text{Width(ft)} \times \text{Depth(ft)} \times 7.481 \text{ (gal/cu ft)}$$

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

$$\text{Tank Heating Total Requirement (BTU total)} = \text{Tank Temperature Rise} \times \text{Gallons} \times 8.346 \text{ (plus tank \& piping external losses)}$$

$$\text{Kilowatt (KW)} = 3414 \text{ BTU/hr}$$

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

$$\text{BTU / Output} = \text{GPH} \times 8.34 \text{ lbs/Gal.} \times \text{Temp. Rise} \times 1.0$$

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

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

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

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

Determine % of hot water portion:

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

Determine % of cold water portion:

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

MWT = Mixed Water Temperature (°F)

H = Hot Water Temperature (°F)

C = Cold Water Temperature (°F)

$$\text{BTU/hr (water @ } 68^{\circ}\text{F)} = \text{GPM} \times 500 \times \Delta\text{T (}^{\circ}\text{F)}$$

$$\text{BTU/hr (30\% E. glycol @ } 68^{\circ}\text{F)} = \text{GPM} \times 445 \times \Delta\text{T (}^{\circ}\text{F)}$$

$$\text{BTU/hr (50\% E. glycol @ } 32^{\circ}\text{F)} = \text{GPM} \times 395 \times \Delta\text{T (}^{\circ}\text{F)}$$

Water To Increase Concentration Of Glycol In A Hydronic System

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

Vg = Quantity of glycol, in gallons, to be added

TSV = Total System volume in gallons

PSd = Percent of glycol solution desired

PSt = Percent of system solution by test (initial percent)

Example:

Total system volume (TSV) = 125 gal.

Initial percent of system solution from test (PSt) = 25%

Percent of glycol solution desired (PSd) = 45%

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

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

Ohm's Law

VOLTS

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

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

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

AMPERES

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

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

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

OHMS

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

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

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

WATTS

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

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

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

Formulas and Reference Information

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

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

Hydronic BTUh/Sq Ft	Delta T (ΔT)
Basement20	Residential Radiant10
1st & 2nd Floor25	Commercial Radiant 20
Garage30	Baseboard20

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

(based on 1.0 GPM @ 120° water)

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

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

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

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

* Nominal pipe size

** Maximum 4 ft. / sec.

Spacing Factors (for use with in-floor tubing)

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

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

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

PEX Pressure Drop per/ft of Pipe

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

= Velocity over 4 ft./s



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