Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
P.O. Box 16620
Little Rock, AR 72231
Phone 501-834-3320
Fax 501-834-5416

Date: 2/4/2025
Return Request: 2/14/2025
Project: City Of Sherwood Public Works (Maintenance Building)
Supplier: Falk
Manufacturer: Various
Submittal: Plumbing Equipment
Submittal Number: 22 30 00-01
Drawing # and Installation: Plumbing Drawings

ARCHITECT
Cromwell
1300 East 6th Street
Little Rock, AR 72202
501-372-2900

ENGINEER
Cromwell
1300 East 6th Street
Little Rock, AR 72202
501-372-2900

GENERAL CONTRACTOR
Baldwin & Shell
1000 W. Capitol Ave.
Little Rock, AR 72201
501-374-8677

MECHANICAL SUBCONTRACTOR
Comfort Systems USA (Arkansas), Inc.
9924 Landers Rd.
N. Little Rock, AR 72117
501-834-3320

Notes:

CSUSA PROJECT NO.
24-6084
sean@comfortar.com

DWH-1

COMMERCIAL-GRADE

RESIDENTIAL / COMMERCIAL GAS WATER HEATERS

TANKLESS CONDENSING HIGH EFFICIENCY

Ultra-Low NOx gas tankless water heaters with condensing technology featuring up to 0.95 Uniform Energy Factor (UEF) which lowers operating costs and is environmentally friendly.

FEATURES:

ULTRA-LOW NOX CONDENSING TECHNOLOGY PROVIDES UP TO 0.95 UNIFORM ENERGY FACTOR

DURABLE HEAT EXCHANGER

- Primary Heat Exchanger is constructed of Commercial-Grade Copper that is more resilient to erosion and is 25x better at heat transfer than stainless steel thus stabilizing outgoing water temperatures quicker
- Secondary Heat Exchanger is made of Type 316L Stainless Steel to protect against corrosion

CONTINUOUS MAXIMUM FLOW RATES UP TO 10.0 GPM

ENERGY STAR® QUALIFIED+

AVAILABLE IN NATURAL GAS OR PROPANE (LP)

INDOOR MODEL - INCLUDES INTEGRATED TEMPERATURE CONTROLLER AND ADVANCED DIAGNOSTICS TO SIMPLIFY TROUBLESHOOTING

OUTDOOR MODEL - INCLUDES A WALL MOUNT TEMPERATURE REMOTE CONTROLLER AND ADVANCED DIAGNOSTICS TO SIMPLIFY TROUBLESHOOTING

FACTORY-INSTALLED POWER CORD INCLUDED FOR INDOOR MODELS

GTS-540 MODELS

- Can be used in residential and commercial applications
- Easy-link up to 4 heaters
- Multi-link up to 20 heaters

COMMON VENT UP TO 8 UNITS

COMPLIES WITH LEAD FREE STANDARDS

SAFETY FEATURES:

- Air-Fuel Ratio (AFR) Sensor
- Exhaust & Water Temperature Safety Control
- Overheat Cut-Off Fuse

INTERNAL FREEZE PROTECTION SYSTEM

POWER DIRECT VENT DESIGN

- Exhaust, 3" PVC Venting up to 70 feet or 4" PVC Venting up to 100 feet
- Provides flexible venting with PVC, CPVC, or ABS Pipe for Intake and Exhaust (solid core only). Canadian Installations Require ULCS636 Listed PVC or CPVC Pipe for Venting.
- Category III or IV venting can be used

ACCESSORIES

- Pipe Cover
- Neutralizer Kit
- Isolation Valve Kits
- Concentric Termination

WARRANTY

- 15-year limited warranty on heat exchanger in residential applications
- 5-year limited warranty on heat exchanger in commercial applications
- 5-year limited warranty on all parts

+Select models

INDOOR MODELS
GTS-240, GTS-340, GTS-540

OUTDOOR MODELS
GTS-240, GTS-340, GTS-540

Meets: SCAQMD Rule 1146.2 California and Texas

DESIGN CERTIFIED

ENERGY STAR

NSF 540 models only

LOW-LEAD IAPMO R&T

AHRI CERTIFIED® www.ahridirectory.org

ANSI Z21.10.3 CSA 4.3

SOLID. STATE.

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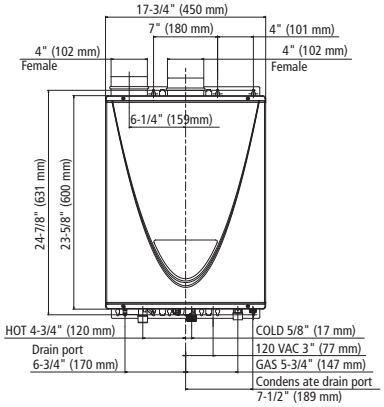
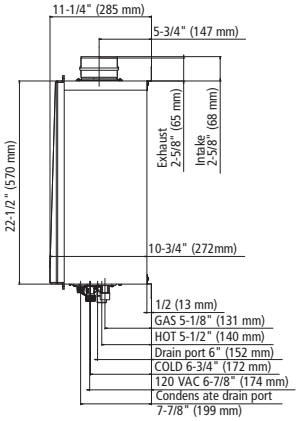
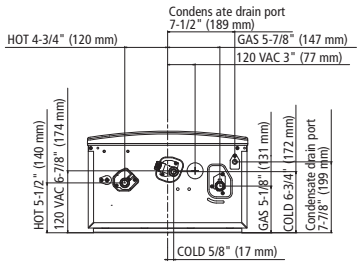
Model Number	Type	Gas Consumption Input		Inlet Gas Pressure		UEF	Maximum GPM*	Hot/Cold Connections	Gas Connection	Dimensions in Inches			Approx Shipping Weight (lbs)
		Minimum BTU/H	Maximum BTU/H	Minimum in. W.C.	Maximum in. W.C.					Height	Width	Depth	
Indoor Models													
GTS-240-NIH	Natural	15,000	160,000	4.0	10.5	0.94	6.6	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4	71
GTS-240-PIH	Propane	13,000	160,000	8.0	14.0	0.94	6.6	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4	71
GTS-340-NIH+	Natural	15,000	180,000	4.0	10.5	0.95	8	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4	71
GTS-340-PIH+	Propane	13,000	180,000	8.0	14.0	0.95	8	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4	71
GTS-540-NIH	Natural	15,000	199,000	4.0	10.5	0.93	10	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4	71
GTS-540-PIH	Propane	13,000	199,000	8.0	14.0	0.93	10	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4	71
Outdoor Models													
GTS-240-NEH+	Natural	15,000	160,000	4.0	10.5	0.95	6.6	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4	69
GTS-240-PEH+	Propane	13,000	160,000	8.0	14.0	0.95	6.6	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4	69
GTS-340-NEH	Natural	15,000	180,000	4.0	10.5	0.94	8	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4	69
GTS-340-PEH	Propane	13,000	180,000	8.0	14.0	0.94	8	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4	69
GTS-540-NEH+	Natural	15,000	199,000	4.0	10.5	0.95	10	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4	69
GTS-540-PEH+	Propane	13,000	199,000	8.0	14.0	0.95	10	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4	69

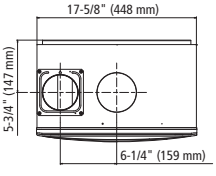
All dimensions are in inches.
15-150 psi Water Pressure. 40 psi or above is recommended for maximum flow.
*Current numbers based on factory testing; 0.4 GPM required for continuous fire after initial ignition.
Indoor models are certified from sea level to 10,100 ft. elevations.
Outdoor models are certified from sea level to 6,000 ft. elevation.
The manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligation.
+ENERGY STAR® Qualified

INDOOR MODELS

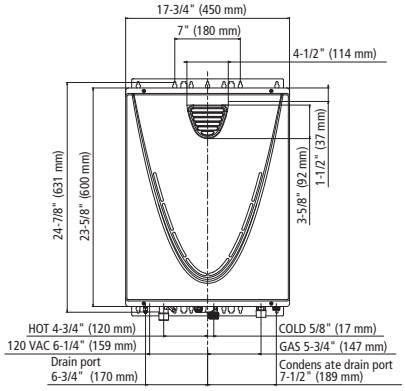


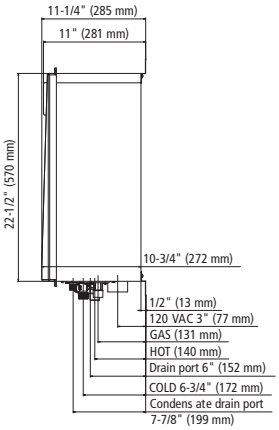


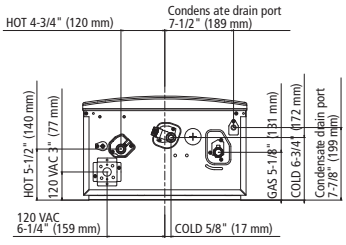


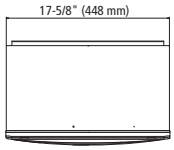


OUTDOOR MODELS

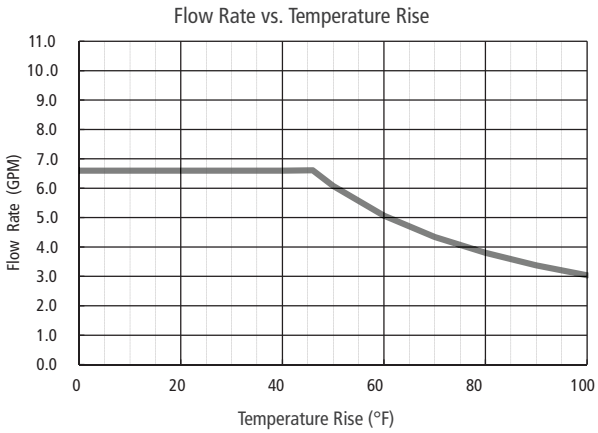


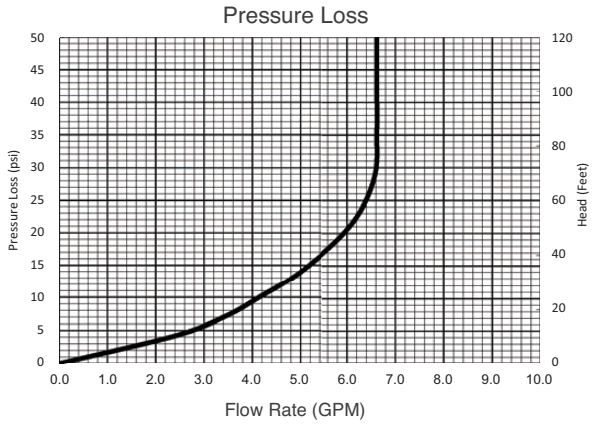




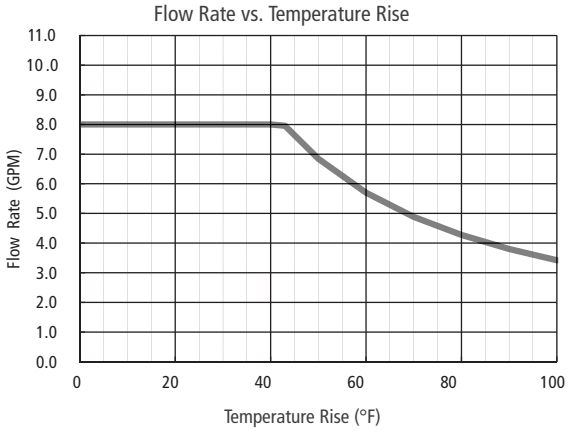


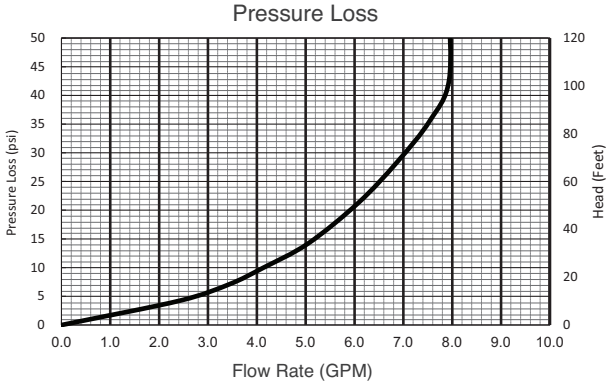
240 MODEL



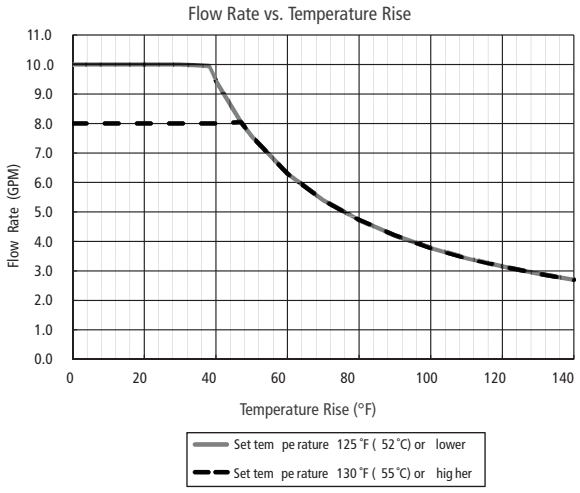


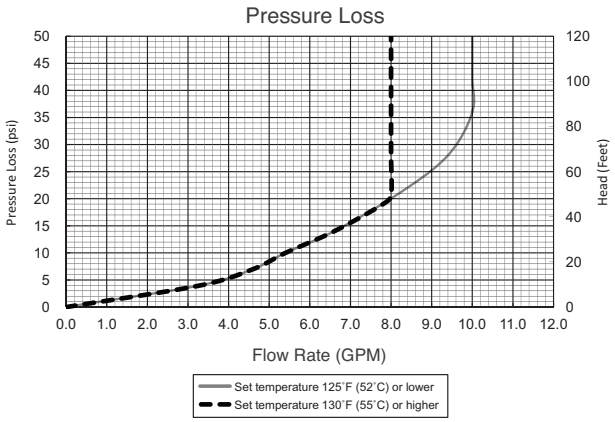
340 MODEL





540 MODEL





TANKLESS CONDENSING HIGH EFFICIENCY SPECIFICATIONS

The fully modulating, on-demand, condensing gas fired tankless water heater(s) shall be State model GTS540, having a maximum input rating of 199,000 Btu/h and available in NG or LP. The heater shall have ¾ in. male NPT water and gas connections. The inlet gas supply pressures shall be 4.0 in. WC (min.) up to 10.5 in. WC (max) for NG and 8.0 in. WC (min.) up to 14 in. WC (max.) for LP. The indoor heater(s) shall incorporate an integrated temperature controller that will provide diagnostic information, fault history, and heater set temperature. The outdoor heater(s) shall be factory supplied with a temperature remote, 100209924, that can be installed up to 400 ft. from the heater using 18 gauge (minimum) control wire. The temperature remote shall provide diagnostic information, fault history, and heater set temperature. The heater(s) shall operate using 120 V / 60 Hz power source. The indoor heater(s) will incorporate a factory installed power cord.

The indoor heater(s) shall be vented with 3" or 4" diameter schedule 40 PVC, CPVC, ABS, or Category IV vent pipe with a length not to exceed 70 ft. (equivalent) for 3" vent or 100 ft. (equivalent) for 4" vent, terminating horizontally or vertically. The intake pipe may use material such as PVC, ABS, aluminum, or Category IV pipe and cannot exceed 70 ft. (equivalent) for 3" vent or 100 ft. (equivalent) for 4" vent. The outdoor heater(s) shall be constructed with an integral exhaust vent on the front of the heater.

The water heater(s) shall use a commercial-grade copper, fin tube primary heat exchanger with quick release brass or bronze waterways. The secondary heat exchanger shall be constructed from stainless steel 316L. The heater(s) shall be controlled by an on-board solid-state printed circuit board which uses the following factory installed components: thermistors to monitor water temperature and exhaust temperature; a flow sensor to measure flow rate; a flame sensor to monitor combustion; an Air-Fuel Ratio Rod to measure and adjust air input in order to maintain optimal combustion efficiency. The heater also consists of in-line fusing and surge absorbers for electrical surge protection, an electronic spark igniter, aluminized stainless steel burners, hi-limit temperature switches to monitor water and exhaust temperatures, modulating gas valve, dual freeze protection that will automatically fire the heater (indoor model only) and use heating blocks to protect the heat exchanger, and an overheat cutoff fuse.

The heater(s) can manifold to Easy-Link up to 4 heaters to provide additional capacity. The Easy-Link controls shall be built onto the on-board solid-state printed circuit board and does not require external controls. The linking control wire shall be supplied with the heater. The heater(s) can use a Multi-Unit controller, 100112691, to manifold 5-20 heaters. The Easy-Link and Multi-Unit Controller shall modulate the system for the most efficient performance. The Easy-Link and Multi-Unit Controller shall rotate the priority heater every 12 hours of operation time or 100 starts for balanced duty/cycle operation.

The heater(s) shall be CSA approved for sale in the United States and Canada, has a minimum uniform energy factor of 0.93, meets the energy efficiency requirements of the U. S. Department of Energy and ASHRAE 90.1-2007, complies with Ultra-Low NOx emissions of 14 ng/J or 20 ppm, and shall be certified to NSF 5 Standards.

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For Residential and Commercial Applications

Product Submittal Form

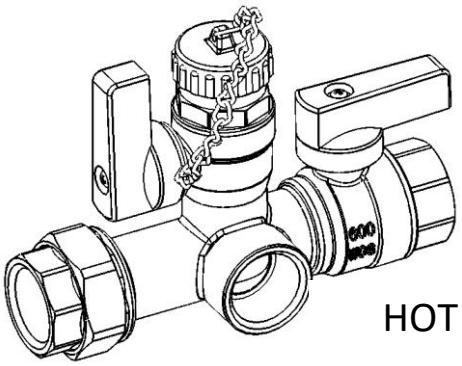
Job Name:	Engineer/Architect:
Job Location:	Wholesaler:
Submittal Date:	Contractor:

TWV30X/TWV3SX/TWVR3 Tankless Water Heater Hot/Cold Service Valves

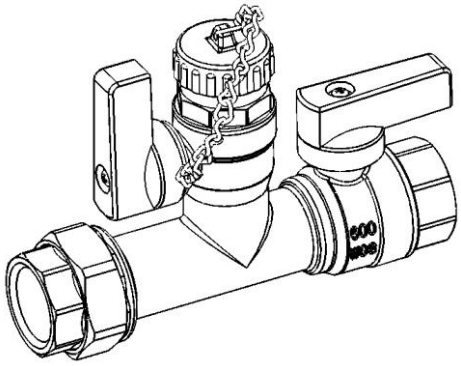
Use: For use in potable water distribution systems for water flow control. Valves connect directly to cold water inlet and hot water outlet of the tankless water heater. Use for appliance maintenance and emergency shut-off.

Design Features:

- **Compact design** ideal for recessed and cover box installations.
- **Captive coupling nut and washer** reduces the opportunity for component loss making installation easier.
- **Captive washer** won't kink or tear during installation.
- **Forged, one-piece construction** reduces the potential for pinhole leaks.
- **Integrated drain valve** with independent, quarter-turn operation allows for quick system diagnostic testing and maintenance.
- **Built-in side port** for the pressure relief valve reduces the number of connections and simplifies the installation.
- **Color-coded handles** for immediate system identification.
- **Right-sized** for tight installations.
- **No-lead brass material** meeting compliance for safe drinking.



HOT



COLD/RECIRCULATION

Operating Specifications:

Temperature: 40° - 180° F

Pressure: 125 PSI maximum

VALVE MATERIAL SPECIFICATIONS	
Body	*Forged brass*
Stem	*Brass*
Handle	*Aluminum, coated*
Handle Screw	*Steel, zinc plated*
Flat Seal	*Rubber*
Coupling Nut	*Forged brass*
Drain Cap	*Forged brass*
Cap Gasket	*Rubber*
Seat	*PTFE*
Ball	*Brass, chrome plated*

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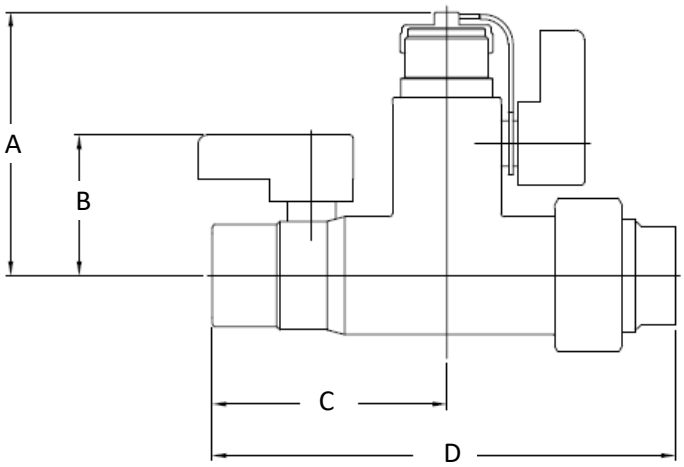
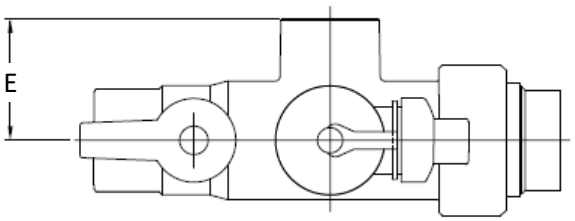
Product Submittal Form

TWV30X/TWV3SX/TWVR3 Tankless Water Heater Hot/Cold Service Valves

Part Listing:

☐	TWV30X	3/4" IPS x 3/4" IPS Hot/Cold Service Valves Only
☐	TWV30RX	3/4" IPS x 3/4" IPS Hot/Cold Service Valve Kit with 200K Pressure Relief Valve
☐	TWV3SX	3/4" Sweat x 3/4" IPS Hot/Cold Service Valves Only
☐	TWV3SRX	3/4" Sweat x 3/4" IPS Hot/Cold Service Valve Kit with 200K Pressure Relief Valve
☐	TWVR30RX	3/4" IPS x 3/4" IPS Hot/Cold/Recirculation Service Valve Kit with 200K Pressure Relief Valve
☐	TWVR3SRX	3/4" Sweat x 3/4" IPS Hot/Cold/Recirculation Service Valve Kit with 200K Pressure Relief Valve





PART SPECIFICATIONS *(Inches)*					
Model	***DIM. A***	***DIM. B***	***DIM. C***	***DIM. D***	***DIM. E****
TWV30X/TWV30RX/TWVR30RX	3"	1-3/4"	2-5/8"	5-1/8"	1-1/8"
TWV3SX/TWV3SRX/TWVR3SRX	3"	1-3/4"	2-5/8"	5-1/8"	1-1/8"

*Dimension for hot valve with pressure relief valve port

Listings and Certifications:

- IAPMO listed to IAPMO/ANSI Z1157 including NSF/ANSI 14

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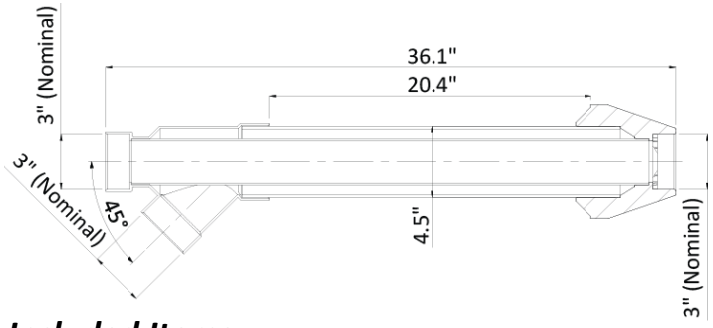
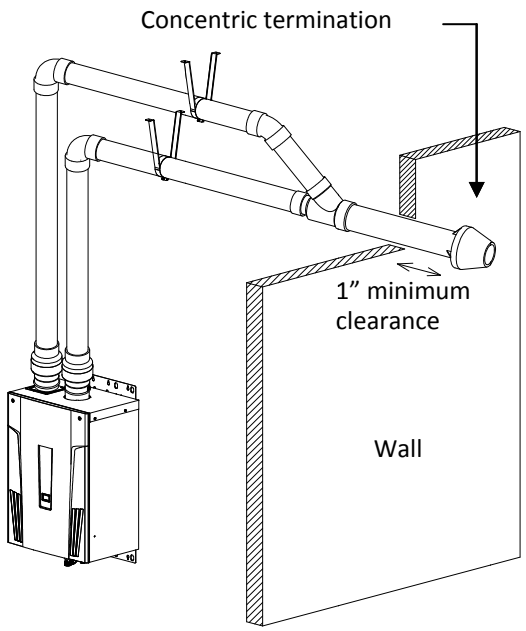
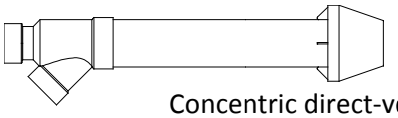
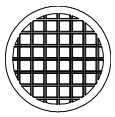
TH-CVPVC33

3” Sidewall Direct-Vent Concentric Termination Kit





Included Items

 Concentric direct-vent termination (Qty.1)
 Bird screen (Qty.1)
 Installation Instructions (Qty.1)
Stainless steel screw & nut set (Qty.1)

GENERAL

WARNING

Improper installation can cause nausea or asphyxiation, severe injury or death from carbon monoxide and flue gas poisoning. Improper installation will void product warranty.

When installing the vent system, all applicable national and local codes must be followed. If you install thimbles, fire stops or other protective devices and they penetrate any combustible or noncombustible construction, be sure to follow all applicable national and local codes.

The TH-CVPVC33 termination kit is only to be used with the Takagi T-H2-DV model and is only to be used as a sidewall termination (horizontal). The TH-CVPVC33 is not to be used as a roof termination (vertical). Doing so will void the warranty of the Takagi water heater. **Please follow all instructions in the T-H2-DV Installation Manual for proper venting.**

The T-H2-DV must be vented in accordance with the section “Venting of Equipment" of the latest edition of the Natural Fuel Gas Code: ANSI Z223.1/NFPA 54 and/or Section 7 of the CAN/CSA B149.1 Natural Gas and Propane Installation Code in Canada, as well as all applicable local building codes.

Vent installations in Canada which utilize plastic venting must use vent systems that comply with ULC S636. The TH-CVPVC33 concentric vent termination kit is certified to ULC S636 for use with IPEX PVC vent system. Please follow the procedures outlined in the IPEX System 636 Installation Guide on the use of solvents and cements, available at www.ipexinc.com.

Takagi Industrial Co.USA, Inc
5 Whatney, Irvine, CA 92618 Tel: 949.770-7171 Fax: 949.770.3171
www.takagi.com

Concentric vent kit assembly

1. Once the proper location has been determined, cut a hole in the wall large enough to accommodate the outer pipe.
2. Solvent cement the inner pipe to the concentric Y-fitting.
3. Solvent cement the outer pipe to the concentric Y-fitting.
4. Slide the assembly through the wall penetration.
5. To permanently affix the termination cap, it should be solvent cemented to the inner pipe. For installations where removal of the cap may be required for service or cleaning, it can be fastened mechanically with the supplied screw & nut set. For either installation method, the outer pipe is only a friction fit with the cap.
6. Once the cap is installed, and the kit is secured as outlined below, the kit can be connected to the venting system.

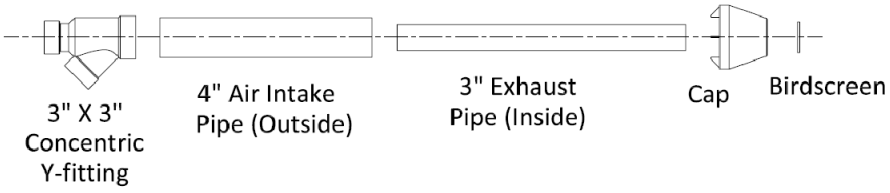
Installation / support procedures

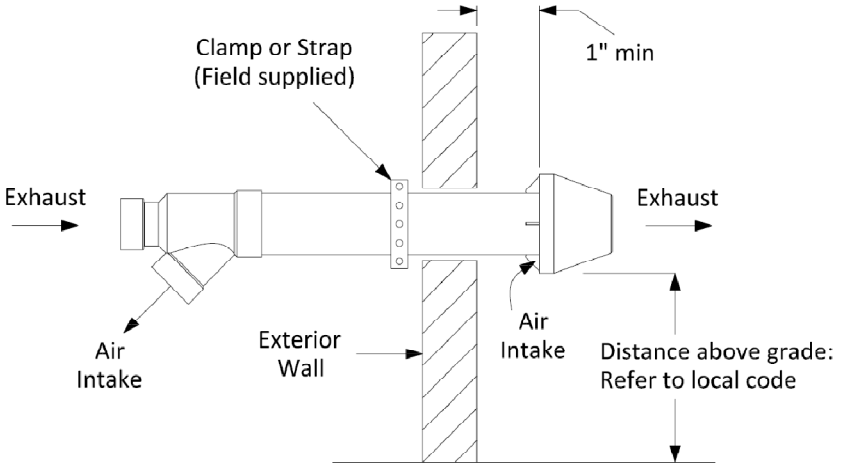
1. Kits must be securely fastened to structure, to ensure dimensions shown below are maintained.
2. Straps are field supplied. Use straps, clamps, or equivalent that will not score or damage the pipe. Expansion and contraction should be addressed between appliance and termination point.
3. All penetrations must be sealed according to local codes. Caulking for sidewall terminations is typical. Use only PVC/CPVC compatible sealing material.
4. The weight of the concentric kits must be supported by the clamps/straps and not by the vent system it connects to.

Mechanically fastened termination cap

If the cap is to be mechanically fastened, please follow the instructions below:

1. Locate the drill location dimple on the outside of the cap.
2. At this location, drill a 3/16” hole through the cap and the inner pipe wall. Ensure that the path of the hole is perpendicular to the inner pipe, NOT the outside of the cap.
3. Insert the screw and tighten the bolt. Do not over tighten.





AXIOM INDUSTRIES LTD.

MODEL NC-1 'NeutraPal' CONDENSATE NEUTRALIZATION KIT

NeutraPal™

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

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

FEATURES and BENEFITS

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

* Check with the appliance manufacturer for condensate flowrate. As a guideline 400,000 BTU/hr at 93% efficiency will produce approximately 1.6 Gal/hr.

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AXIOM INDUSTRIES LIMITED 2615 WENTZ AVENUE SASKATOON, SK S7K 5J1
TOLL FREE : (877) 651-1815 **PHONE :** (306) 651-1815 **FAX :** (306) 242-3373

www.axiomind.com

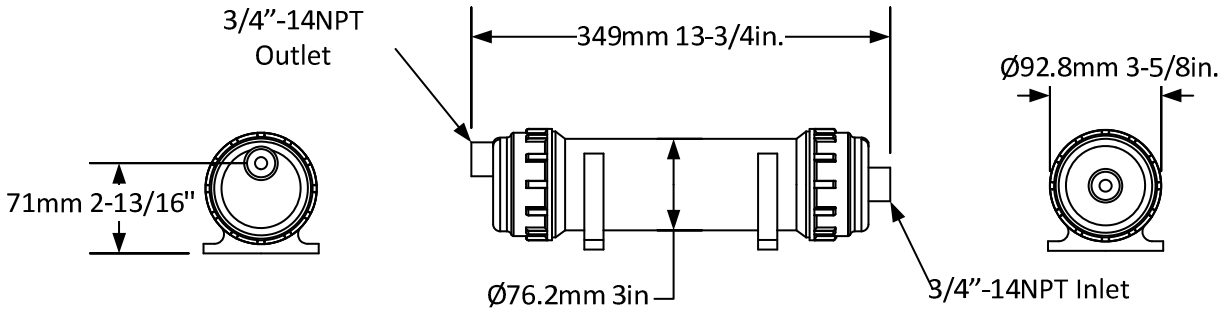
AXIOM INDUSTRIES LIMITED

NC-1 NEUTRALIZATION CAPSULE
TECHNICAL INFORMATION

WEIGHT - 2 kg, 4.4 lbs.

SPECIFICATION

The condensate neutralization capsule shall be AXIOM INDUSTRIES LTD. model NC-1. System shall include 1 litre (0.26 U.S. gallon) transparent capsule made from corrosion resistant materials with two 3" fill/access openings, 3" inlet and outlet screen, 3/4"-14NPT threaded inlet, 3/4"-14NPT threaded outlet, two ¾" MNPT x ¾" FNPT unions, three 3/4" NPT to ½" hose barb fittings, ½" barbed Y fitting, six hose clamps, 10 ft of 1/2" ID vinyl tubing, two base/wall mounting clamps.



ACCESSORIES

☐ **NM-1** – Replacement Li*p*Hter neutralization media

LipHter™

Project _____ Location _____

Consultant _____ Contractor _____

Unit Tag _____ Sales Agent _____

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DWH-2

Eemax® HomeAdvantage II®

Provide Endless Hot Water in a Durable, Space-Saving Design

Tankless Electric Water Heaters

POINT-OF-USE

HA008240, HA011240, HA013240 are are designed for one or two applications and are installed at the point-of-use. The durable, compact design allows installation in tight spaces. Perfect for a low flow faucet or bathroom faucet. In warmer climates, these models can accommodate a shower. To select a unit that meets electrical and hot water gallons per minute (GPM) requirements, please use the sizing guide.

HA008240
HA011240
HA013240

PERFORMANCE FEATURES

- **Saves Space** – up to 93% smaller than a standard electric water heater
- **Saves Energy** – zero standby heat loss when installed near point-of-use
- **More Hot Water** – up to 4 times the hot water delivery of a standard electric tank (per hour)
- **High Efficiency** – UEF up to .96 and advanced self-modulating technology only consumes the power needed to satisfy hot water demand
- Copper immersion heating elements improve the thermal performance providing better temperature control and faster recovery of hot water
- Stainless steel heat exchanger transfers heat fast and resists corrosion
- Durable powder-coated shell with an engineered polymer backplate
- Brass ½ compression fittings (CF) located on the side for the inlet and outlet water connections provide strength and durability
- Designed to be mounted in an upright position with the inlet and outlet water connections on the side of the unit
- Venting is not required to operate, simplifying the installation process compared to a gas tankless water heater
- Digital thermostatic temperature controls in 1-degree increments ranging from 80°F - 140°F (26°C - 60°C)

WARRANTY

- Limited Warranty – 5 Years - Leaks, 1 Year - Parts

See Use and Care Manual for complete information.

These products meet a stringent set of our company's internally defined sustainability standards

Tested and certified by the Water Quality Association against NSF/ANSI 372 for lead free compliance.

TANKLESS ELECTRIC SPECIFICATIONS & MINIMUM REQUIREMENTS

Model #	HA008240	HA011240	HA013240
Power (kW)	**8**	**11**	**13**
Voltage	**240**	**240**	**240**
Total Unit Amperage (AMPS)	**33**	**46**	**54**
Required Number of Dedicated Circuit Breakers	**1 x 40 A Double Pole**	**1 x 50 A Double Pole**	**1 x 60 A Double Pole**
Household Electrical Service Panel Recommendations	**100 AMPS**	**100 AMPS**	**100 AMPS**
Phase	1	1	1
Uniform Energy Factor (UEF)	0.96	0.92	0.92
Required Wire	8 AWG*	6 AWG*	6 AWG*
Water Connections	½" CF	½" CF	½" CF
Element	1	2	2
Dimensions	11.4" H x 7.9" W x 3.7" D	11.4" H x 7.9" W x 3.7" D	11.4" H x 7.9" W x 3.7" D
Weight	4.75 lbs.	6.5 lbs.	6.5 lbs.
Heat Exchanger	Stainless Steel	Stainless Steel	Stainless Steel
Operating Pressure	Minimum: 25 PSI l Maximum: 150 PSI		
Flow Activation Rate (GPM)	0.3 GPM		

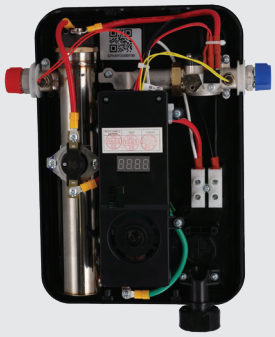
NOTE: *When converting from an electric tank to an electric tankless water heater, household electric service panel upgrades are often required. Please see the electric service panel recommendations above.*

**AWG - American Wire Gauge*

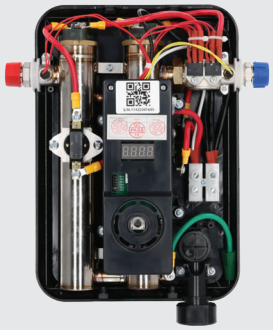
Eemax® evolving hot water

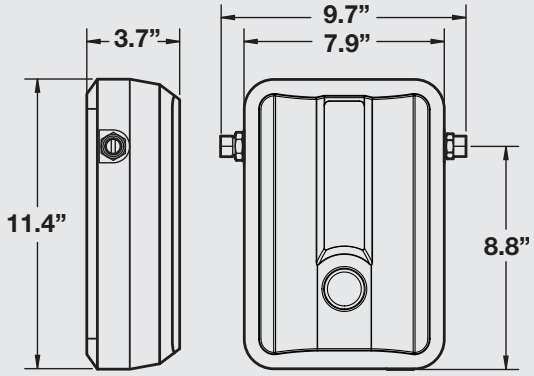
eemax.com

HA008240



HA011240, HA013240





SIZING A TANKLESS ELECTRIC WATER HEATER

IMPORTANT – Verify that your home meets the electrical requirements. See specifications and minimum requirements. (front side)

1. Estimate your total household gallons per minute (GPM) needs by adding up the average flow rates by fixture (faucets, showers) **that run at the same time**.

   Ex. 1 bathroom faucet and 1 low flow faucet running at the same time adds up to 1.5 GPM (1 + 0.5 = 1.5 GPM)

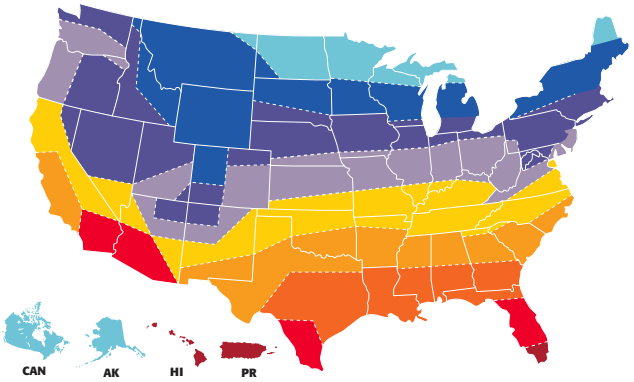
AVERAGE FLOW RATES (GPM) BY FIXTURE

Low Flow Faucet	0.5
Bathroom Faucet	1
Kitchen Faucet	1.5
Low Flow Shower	1.5
Shower	2

Flow rates may vary.

2. Locate your zone on the map.

U.S. AVERAGE GROUND WATER TEMPERATURE ZONE MAP



3. Select the model that can supply you with the estimated total household gallons per minute (Step 1) with the ground water temperature in your zone.

FLOW RATE CAPACITY TABLE BY ZONE (GALLONS PER MINUTE - GPM)

Model #	Zone 1 37°F/ 3°C	Zone 2 42°F/ 5°C	Zone 3 47°F/ 8°C	Zone 4 52°F/ 11°C	Zone 5 57°F/ 14°C	Zone 6 62°F/ 17°C	Zone 7 67°F/ 20°C	Zone 8 72°F/ 22°C	Zone 9 77°F/ 28°C
HA008240	0.8	0.9	0.9	1.0	1.1	1.3	1.4	1.7	2.0
HA011240	1.1	1.2	1.3	1.4	1.6	1.7	2.0	2.3	2.7
HA013240	1.3	1.4	1.5	1.7	1.9	2.1	2.3	2.7	3.2

Flow rates are calculated to a set point of 105°F. Ground water temperature varies seasonally.

OPTIONAL – Flow Regulator Sizing Table by Zone (Gallons Per Minute – GPM)
The flow regulator fitting threads onto the outlet water connection and limits the outlet flow to the GPM specified in the table. Select the appropriate GPM insert for your model based on your zone. This is an optional part to ensure accurate temperature output.

Model #	kW	Connection Size	Part #	Zone 1 37°F/ 3°C	Zone 2/3 42-47°F/ 5-8°C	Zone 4/5 52-57°F/ 11-14°C	Zone 6/7 62-67°F/ 17-20°C	Zone 8/9 72-77°F/ 22-28°C
HA008240	8	½” NPT	IFR 1-2	–	–	1.0	1.0	1.5
HA011240	11	½” NPT	IFR 1-2	1.0	1.0	1.0	1.5	2.0
HA013240	13	½” NPT	IFR 1-2	1.0	1.0	1.5	2.0	2.0

NOTE: (–) indicates flow regulator insert is not recommended in this zone.

Eemax® evolving hot water

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Waterbury, CT 06705
eemax.support@eemax.com

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04/2024-HA 8-11

TMV-1

For Commercial Applications

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

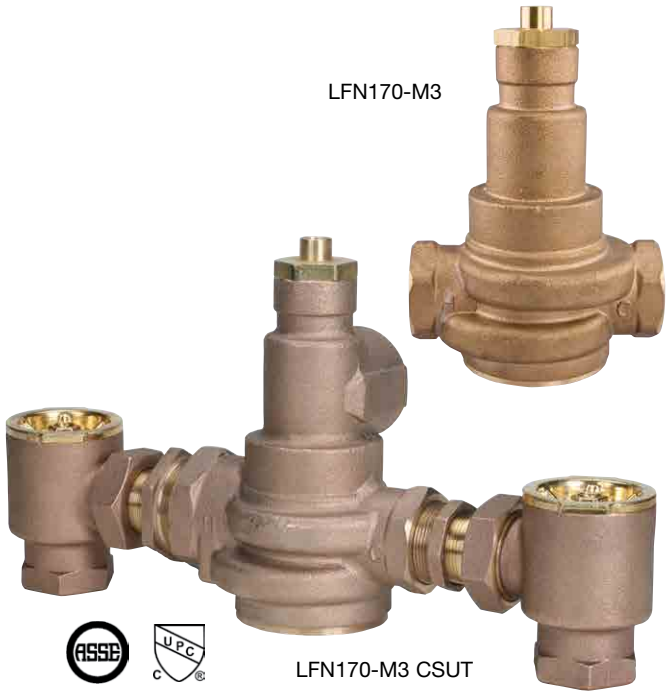
Approval _____ Representative _____

LEAD FREE*

Series LFN170

Hot Water Master Tempering Valves

Watts Series LFN170 hot water master tempering valves are especially designed for use on larger hot water supply systems for mixing hot and cold water for a variety of applications to extend the hot water supply. This series uses paraffin-based thermostat to sense and adjust outlet temperature. The LFN170s feature Lead Free* construction to comply with Lead Free* installation requirements.



Features

- Lead Free* brass body construction
- ASSE 1017 and IAPMO cUPC Listed
- LFN170-M3 uses paraffin-based thermostat to sense and adjust outlet temperature
- Dirt and lime resistant poppet and seat design
- Virtual shutoff if supply pressure fails
- Vandal-resistant locking mechanism to secure temperature setting
- Factory tested

Specifications

Maximum Operating Pressure	125psig (861 kPa)
Maximum Hot Water Temperature	200°F (93°C)
Minimum Hot Water Supply Temperature	5°F (3°C) Above Set Point**
Temperature Adjustment Range***	90 - 180°F (32 - 82°C)
Hot Water Inlet Temperature Range	120 - 180°F (42 - 82°C)
Cold Water Inlet Temperature Range	40 - 80°F (4 - 27°C)
Listing	ASSE 1017, IAPMO CUPC
Approval Standards	ASSE 1017, CSA B125.3

⚠ WARNING

Watts Hot Water Master Tempering Valves cannot be used for tempering water temperature at fixtures. Severe bodily injury (i.e., scalding or chilling) and/or death may result depending upon system water pressure changes and/or supply water temperature changes. ASSE standard 1016, 1069 or 1070 listed devices such as Watts Series LFMMV, LFUSG, or LFL111 valves should be used at fixtures to prevent possible injury.

The Watts Hot Water Tempering Valves are designed to be installed at or near the boiler or water heater. They are not designed to compensate for system pressure fluctuations and should not be used where ASSE standard 1016, 1069 or 1070 devices are required. These Watts valves should never be used to provide "anti-scald" or "anti-chill" service.

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

NOTICE

Inquire with governing authorities for local installation requirements

*** The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

**** With Equal Pressure**

***** Low Limit cannot be less than the cold water temperature. For best operation, hot water should be at least 5°F (3°C) above desired set point.**

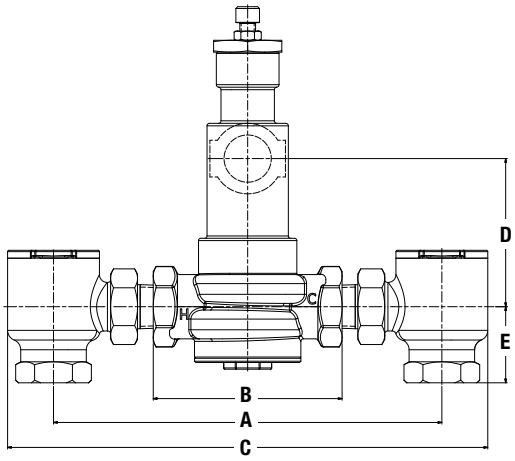
Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

WATTS®

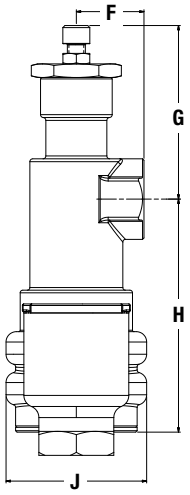
Capacity

Flow Capacity at 50-50 mixed Less Checkstops									
				Pressure Drop Across Valve					
Model	Inlet / Outlet (NPT)	Min. Flow to ASSE 1017	C_v	5psi (34 kPa)	10psi (69 kPa)	20psi (138 kPa)	30psi (207 kPa)	45psi (310 kPa)	60psi (414 kPa)
3/4" LFN170-M3	3/4 x 3/4"	3 gpm 11 lpm	6.70	15 gpm 57 lpm	21 gpm 79 lpm	30 gpm 114 lpm	37 gpm 140 lpm	45 gpm 170 lpm	52 gpm 197 lpm
1" LFN170-M3	1 x 1"	4 gpm 15 lpm	10.13	23 gpm 87 lpm	32 gpm 121 lpm	45 gpm 170 lpm	56 gpm 212 lpm	68 gpm 257 lpm	79 gpm 299 lpm
1 1/4" LFN170-M3	1 1/4 x 1 1/4"	4 gpm 15 lpm	14.16	32 gpm 121 lpm	45 gpm 170 lpm	63 gpm 238 lpm	76 gpm 288 lpm	95 gpm 360 lpm	110 gpm 416 lpm
1 1/2" LFN170-M3	1 1/2 x 1 1/2"	5 gpm 19 lpm	15.65	35 gpm 134 lpm	49 gpm 185 lpm	70 gpm 265 lpm	86 gpm 326 lpm	105 gpm 397 lpm	121 gpm 458 lpm
2" LFN170-M3	2 x 1 1/2 x 2"	7 gpm 26 lpm	18.63	42 gpm 159 lpm	59 gpm 223 lpm	83 gpm 314 lpm	102 gpm 386 lpm	125 gpm 473 lpm	144 gpm 545 lpm

Dimensions



Flow Capacity at 50-50 mixed with Checkstops									
				Pressure Drop Across Valve					
Model	Inlet / Outlet (NPT)	Min. Flow to ASSE 1017	C_v	5psi (34 kPa)	10psi (69 kPa)	20psi (138 kPa)	30psi (207 kPa)	45psi (310 kPa)	60psi (414 kPa)
3/4" LFN170-M3 CSUT	3/4 x 3/4"	3 gpm 11 lpm	6.26	14 gpm 53 lpm	20 gpm 76 lpm	28 gpm 106 lpm	34 gpm 129 lpm	42 gpm 159 lpm	48 gpm 182 lpm
1" LFN170-M3 CSUT	3/4 x 1"	4 gpm 15 lpm	9.54	21 gpm 79 lpm	30 gpm 114 lpm	43 gpm 163 lpm	52 gpm 197 lpm	64 gpm 242 lpm	74 gpm 280 lpm
1 1/4" LFN170-M3 CSUT	1 1/4 x 1 1/4"	4 gpm 15 lpm	13.42	30 gpm 114 lpm	42 gpm 159 lpm	60 gpm 227 lpm	74 gpm 280 lpm	90 gpm 341 lpm	104 gpm 394 lpm
1 1/2" LFN170-M3 CSUT	1 1/4 x 1 1/2"	5 gpm 19 lpm	14.90	33 gpm 125 lpm	47 gpm 128 lpm	67 gpm 254 lpm	82 gpm 310 lpm	100 gpm 379 lpm	115 gpm 435 lpm
2" LFN170-M3 CSUT	1 1/4 x 2"	7 gpm 26 lpm	17.89	40 gpm 151 lpm	57 gpm 216 lpm	80 gpm 303 lpm	98 gpm 371 lpm	120 gpm 454 lpm	139 gpm 526 lpm



MODEL	BODY INLETS NPT	CHECK STOP INLETS NPT	BODY OUTLET NPT	DIMENSIONS A in.	A mm	B in.	B mm	C in.	C mm	D in.	D mm	E in.	E mm	F in.	F mm	G in.	G mm	H in.	H mm	J in.	J mm	WEIGHT lbs.	WEIGHT kgs
3/4 LFN170-M3	3/4	N/A	3/4	N/A		4 1/2	114	N/A		3 1/2	89	N/A		1 7/16	36	3 5/8	92	4 7/8	124	2 15/16	75	4.8	2.2
3/4 LFN170-M3 CSUT	N/A	3/4	3/4	9 1/4	235	4 1/2	114	11 7/16	291	3 1/2	89	1 13/16	46	1 7/16	36	3 5/8	92	4 7/8	124	2 15/16	75	9.8	4.5
1 LFN170-M3	1	N/A	1	N/A		4 9/16	116	N/A		3 1/2	89	N/A		1 7/16	36	3 5/8	92	4 7/8	124	2 15/16	75	4.8	2.2
1 LFN170-M3 CSUT	N/A	3/4	1	10 1/8	264	4 9/16	116	12 9/16	319	3 1/2	89	1 13/16	46	1 7/16	36	3 5/8	92	4 7/8	124	2 15/16	75	10.3	4.9
1 1/4 LFN170-M3	1 1/4	N/A	1 1/4	N/A		6 1/16	154	N/A		3 7/16	87	N/A		1 3/4	44	3 11 1/16	94	5 1/4	133	4 1/2	114	9.4	4.3
1 1/4 LFN170-M3 CSUT	N/A	1 1/4	1 1/4	12 1/16	306	6 1/16	154	15 1/16	383	3 7/16	87	2 1/2	64	1 3/4	44	3 11 1/16	94	5 1/4	133	4 1/2	114	19.3	8.8
1 1/2 LFN170-M3	1 1/2	N/A	1 1/2	N/A		6 1/16	154	N/A		3 7/16	87	N/A		1 3/4	44	3 11 1/16	94	5 1/4	133	4 1/2	114	9.1	4.1
1 1/2 LFN170-M3 CSUT	N/A	1 1/4	1 1/2	13 1/4	337	6 1/16	154	16 1/4	413	3 7/16	87	2 1/2	64	1 3/4	44	3 11 1/16	94	5 1/4	133	4 1/2	114	19.8	9.0
2 LFN170-M3	2 (Hot) 1 1/2 (Cold)	N/A	2	N/A		6 7/16	164	N/A		3 3/16	81	N/A		2 1/16	52	3 7/8	98	5 3/8	137	4 1/2	114	10.4	4.7
2 LFN170-M3 CSUT	N/A	1 1/4	2	13 3/4	349	6 7/16	164	16 3/4	425	3 3/16	81	2 1/2	64	2 1/16	52	3 7/8	98	5 3/8	137	4 1/2	114	21.3	9.7

Typical Specification

Master mixing valve shall feature paraffin-based, thermal actuation technology for precise temperature control. Valve shall be listed to ASSE 1017 and cUPC and shall be approved to ASSE 1017 & CSA B125.3 standards. Master mixing valve shall have an approach temperature of 5°F (3°C). Valve shall have an outlet temperature range from 90 – 180°F (32 to 82°C) with a lockable temperature-setting feature. Valve shall be manufactured of corrosion resistant materials and feature a single-seat design for positive shutoff. It shall have a Lead Free* brass body. Body shall be constructed using Lead Free* brass. Lead Free* master mixing valves shall comply with state codes and standards, where applicable, requiring reduced lead content. Minimum flows to ASSE 1017 shall be 3/4 LFN170-M3 (3.0 gpm, 11 lpm), 1 LFN170-M3 (4.0 gpm, 15 lpm), 1 1/4 LFN170-M3 (4.0 gpm, 15 lpm), 1 1/2 LFN170-M3 (5.0 gpm, 19 lpm), 2 LFN170-M3 (7.0 gpm, 26 lpm).

Master mixing valves shall be of Watts Series LFN170-M3. Any alternate must have a written approval prior to bidding.

WATTS®

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Canada: T: (905) 332-4090 • F: (905) 332-7068 • Watts.ca
Latin America: T: (52) 81-1001-8600 • Watts.com

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HWRP-1

Submittal Data Information

101-192

0034e

ECM High-Efficiency Circulator

Effective: March 10,2020

Supersedes: New

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

ITEM NO.	MODEL NO.	

Specifications

- Maximum Shut-off Head: 34 feet
- Maximum Flow: 50 gpm
- Maximum Operating Pressure: 150 psi (10.3 bar)
- Maximum Water Temp: 230°F (110°C)
- Minimum Water Temp: 14°F (-10°C)
- Electrical specifications:
  - Voltage: 115V/208/230, 50/60 Hz Single phase
  - Operating Power Range: 10 - 170W
  - Max. AMP Rating: 1.48 (115V) - 0.70 (230V)
- Equipped with a Cast Iron or Stainless Steel casing
- Suitable for chilled water systems
- Stainless Steel model suitable for open loop potable water systems
- Taco circulators are for indoor use only
- Acceptable for use with water or maximum of 50% water/glycol solution

Materials of Construction:

Casing:	Cast Iron or Stainless Steel
Stator Housing:	Composite
Control Base:	Composite
Control Cover:	Composite
Cartridge:	Composite
Impeller:	Composite
Shaft:	Ceramic
Rotor:	Neodymium
Bearings:	Ceramic
Thrust Bearing:	Carbon
O-Ring & Gaskets:	EPDM

Certified to NSF/ANSI 61 & 372

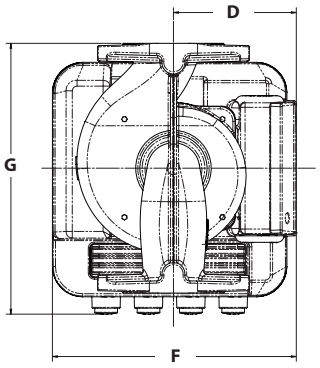
Stainless Steel Model

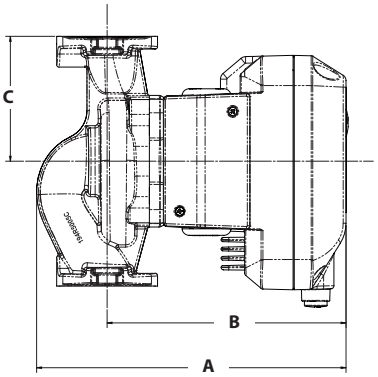
Applications

Cast Iron Model: Closed loop, pressurized heating and chilled water HVAC systems

Stainless Steel Model: Open loop, potable water systems

The 0034e is a high-performance, variable speed, wet-rotor circulator with high-efficiency ECM permanent magnet technology. With 5 easy settings, its variable speed performance curves are equivalent to the Taco 009, 0010, 0011, 0012, 0012 3-Speed, 0013, 0013 3-Speed & 0014. Ideal for large residential and light commercial hydronic heating, chilled water cooling and domestic hot water systems. The 0034e reduces power consumption by up to 85% compared to equivalent AC permanent split capacitor circulators.





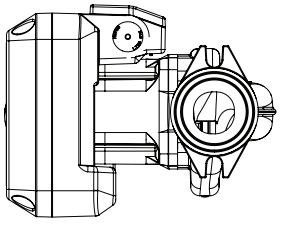
Pump Dimensions & Weights

Model Number Part Number	Casing	Flange Type	A	B	C	D	F	G	Wt.lbs. [kg]
			Inches [mm]						
0034e-F2 VM3450-HY1-FC2A00	Cast Iron	R	8.05" [205]	6.22" [158]	3.25" [83]	3.20" [81]	6.22" [158]	7.05" [179]	10.5 [4.8]
0034e-SF2 VM3450-HY1-FS2A00	Stainless Steel								

Electrical Data

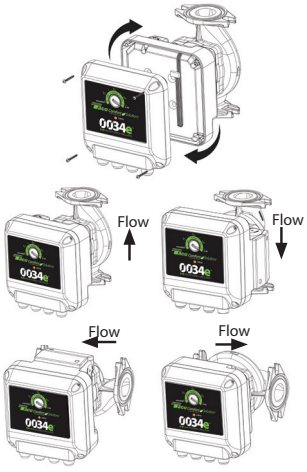
Model	Volts	Hz	Ph	Max Amps	Watts	RPM
All Models	115/208/230	50/60	1	1.48	10 - 170	830 - 4300
Motor Type	ECM, Permanent Magnet, Electronically Protected					

Flange Orientation

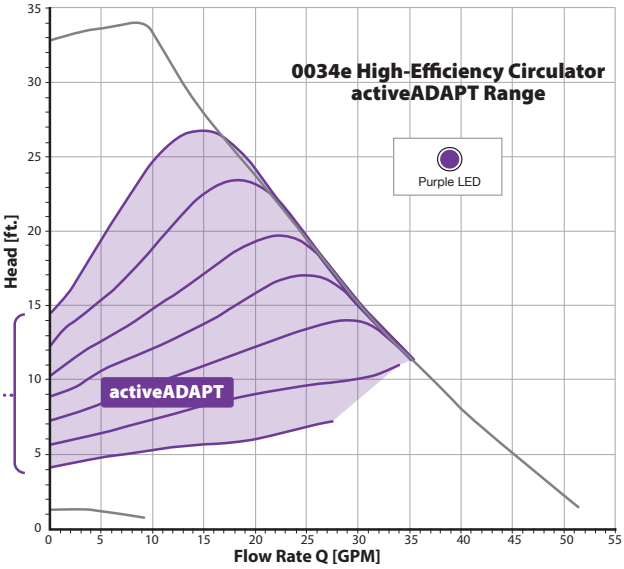


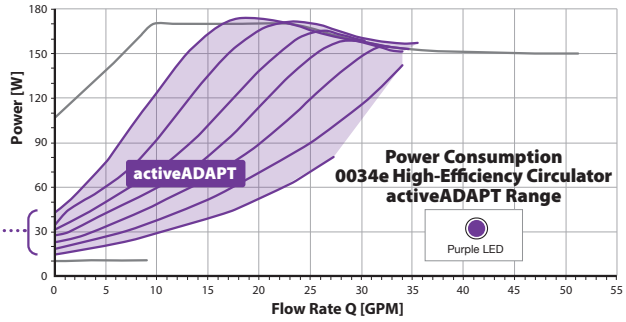
Rotated (R)

Rotatable Control Cover to allow mounting in any orientation

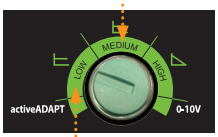


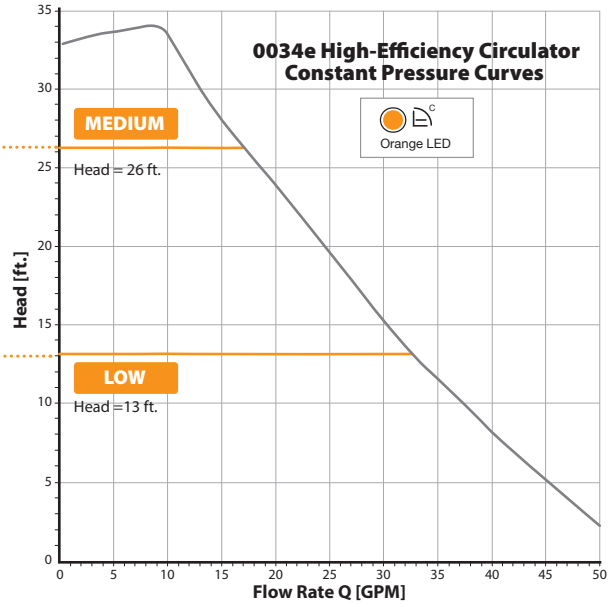
activeADAPT™ Mode:
activeADAPT is an operating mode designed for constant circulation systems. On this setting, the circulator will sense changes in system flow and head conditions and adjust the operating curve automatically.

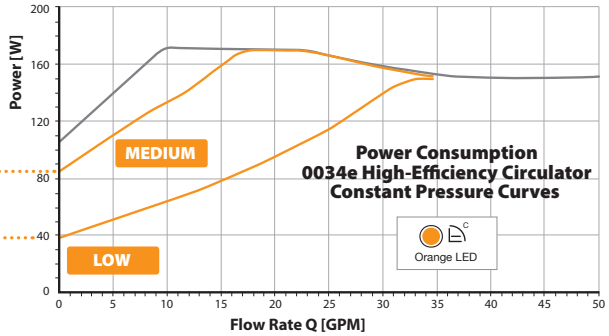




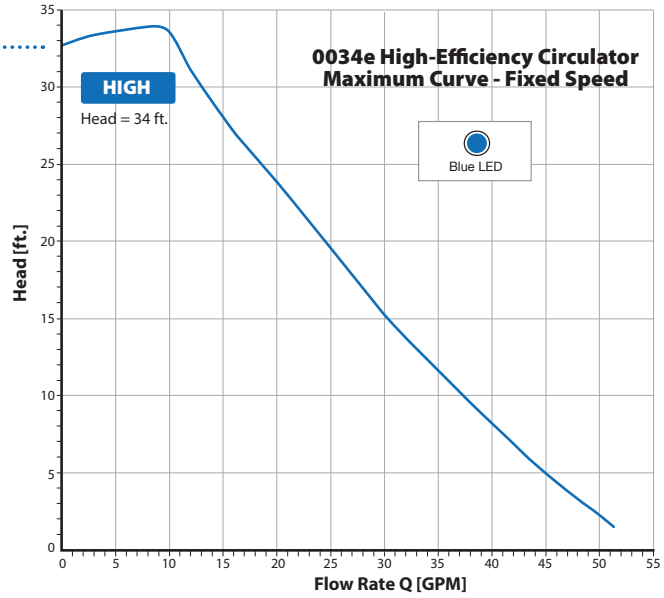
Constant Pressure Mode:
At Low setting the circulator will vary speed to maintain 13 feet of head constant pressure. At Medium setting the circulator will vary speed to maintain 26 feet of head constant pressure.

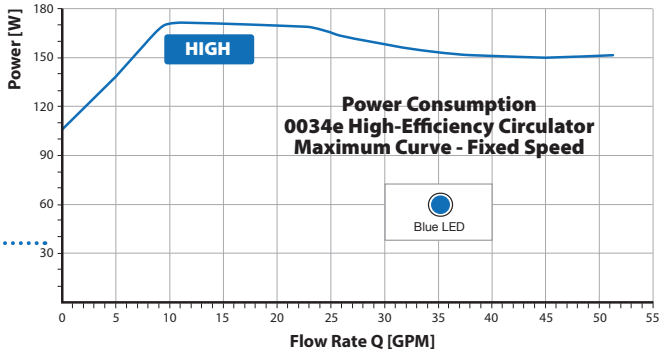






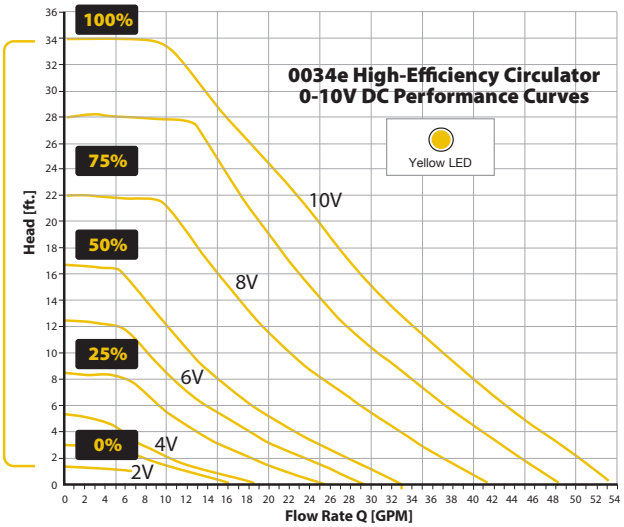
Fixed Speed Mode:
At High setting the circulator always operates at full speed.

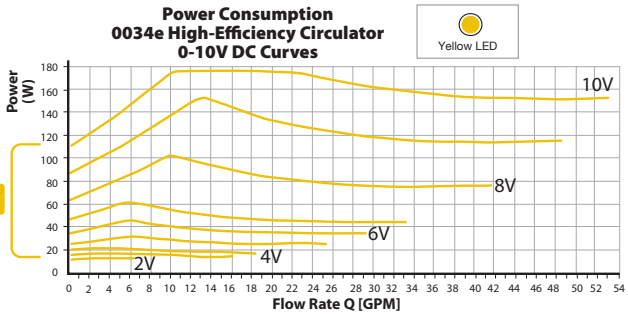




0-10V DC or PWM External Input:
The circulator will vary its speed and performance based on a 0-10V DC analog or PWM digital signal external input.

PWM (Pulse Width Modulation)





RPZA-1

Engineering Specification

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

LEAD FREE*

Series LF009

Reduced Pressure Zone Assemblies

¼" – 3"

Series LF009 Reduced Pressure Zone assemblies are designed to protect potable water supplies in accordance with national plumbing codes and water authority requirements. These series are used in a variety of installations, including the prevention of health hazard cross-connections in piping systems or for containment at the service line entrance. They are also used in irrigation systems, boiler feed, water lines, and other installations requiring maximum protection. The body construction is fused with ArmorTek™ coating technology to resist corrosion due to microbial induced corrosion (MIC) or exposed metal substrate.* The series also features Lead Free* construction to comply with Lead Free* installation requirements.

The series features two in-line, independent check valves, captured springs, and replaceable check seats with an intermediate relief valve. Its compact modular design facilitates maintenance and assembly access. Sizes ¼" to 1" shutoffs have tee handles.

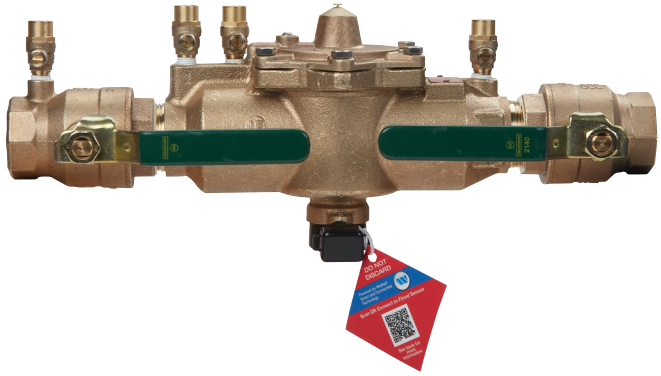
Series LF009 assemblies of sizes ½" to 3" include a flood sensor to detect excessive water discharges from the relief valve. The sensor is installed on the assembly exterior and does not alter assembly functions or certifications. The sensor relays a signal that triggers notification to facility personnel who can take corrective action, thus avoiding the possibility of ruinous flooding and costly damage.

NOTICE

An add-on connection kit is required to activate the flood sensor. Without the connection kit, the sensor is a passive component that has no communication with any other device. (For more information, download RP/IS-009.)

Features

- Single access cover and modular check construction for ease of maintenance
- Top entry to all internals for immediate accessibility
- Captured springs for safe maintenance
- Internal relief valve for reduced installation clearances
- Replaceable seats for economical repair
- ArmorTek™ coating technology to resist internal corrosion†



LF009M2-QT-FS

- Lead Free* cast copper silicon alloy body construction (¼" – 2")
- Fused epoxy coated cast iron body (2½" – 3")
- Ball valve test cocks — screwdriver slotted (¼" – 2")
- Large body passages provides low pressure drop
- Compact, space saving design
- No special tools required for servicing
- Sensor on the relief valve for flood detection (½" – 3")
- Flood alerts feature activated with add-on sensor connection kit, compatible with BMS and cellular communication

NOTICE

Use of the flood sensor does not replicate the need to comply with all required instructions, codes, and regulations related to installation, operation, and maintenance of this product, including

Watts® is not responsible for the failure of alerts due to connectivity or power issues.

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

Inquire with governing authorities for local installation requirements.

*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.

†Amortek coating applied to the 2½" and 3" models only.

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

WATTS®

Specification

A Reduced Pressure Zone Assembly shall be installed at each potential health hazard location to prevent backflow due to backsiphonage and/or backpressure. The assembly shall consist of an internal pressure differential relief valve located in a zone between two positive seating check modules with captured springs and silicone seat discs. Seats and seat discs shall be replaceable in both check modules and the relief valve. There shall be no threads or screws in the waterway exposed to line fluids. Service of all internal components shall be through a single access cover secured with stainless steel bolts. Body and shutoffs shall be constructed using Lead Free* cast copper silicon alloy materials. Lead Free* reduced pressure zone assembly shall comply with state codes and standards, where applicable, requiring reduced lead content.

The assembly shall also include two resilient seated isolation valves, four resilient seated test cocks, and an air gap drain fitting. The valve body shall utilize a coating system with built-in electrochemical corrosion inhibitor and microbial inhibitor.† The assembly shall meet the requirements of USC; ASSE Std. 1013; AWWA Std. C511; CSA B64.4. Shall be a Watts Series LF009, and shall include a sensor on the relief valve for flood detection on sizes ½" to 3".

Materials

¼" – 2"

Lead Free* cast copper silicon alloy body construction, silicone rubber disc material in the first and second check plus the relief valve. Replaceable polymer check seats for first and second checks. Removable relief valve seats. Stainless steel cover bolts.

Standardly furnished with NPT body connections. Model LF009QT furnished with quarter-turn, full port, resilient seated, Lead Free* cast copper silicon alloy body ball valve shutoffs.

2½" – 3"

- FDA-approved epoxy-coated cast iron unibody with plastic seats
- Relief valve with stainless steel seat and trim
- Lead Free* cast copper silicon alloy body ball valve test cocks

Model/Option

¼" – 2"

Prefix:

U – Union connections

Suffix:

FS – Flood detection sensor (½" – 2")
LF – Without shutoff valves
PC – Internal polymer coating
Press** – Press inlet x press outlet (½" – 2")
QT – Quarter-turn ball valves
S – Strainer

2½" – 3"

Suffix:

FS – Flood detection sensor
LF – Without shutoff valves
NRS – Non-rising stem resilient seated gate valves
OSY – UL Classified and FM Approved outside stem and yoke resilient seated gate valves
S-FDA – FDA epoxy coated strainer

NOTE: The installation of a drain line is recommended. When installing a drain line, an air gap is necessary. (For more information download ES-AG/EL/TC at watts.com.)

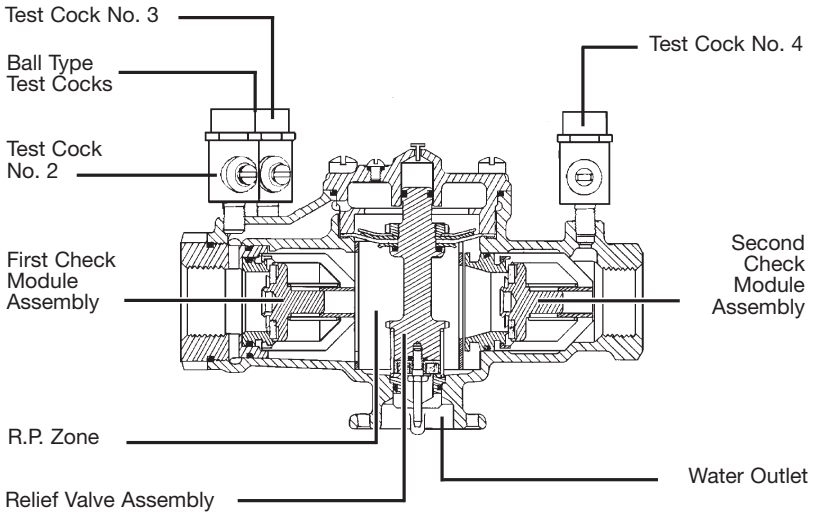
Pressure – Temperature

¼" – 2"

Suitable for supply pressure up to 175 psi (12.1 bar)
Water temperature: 33°F – 180°F (0.5° – 82°C)

2½" – 3"

Suitable for supply pressures up to 175 psi (12.1 bar)
Water temperature: 110°F (43°C) continuous; 140°F (60°C) intermittent



** Viega ProPress® connections are optional factory-installed fitting on each end of the approved/certified assembly.

Standards

USC
ASSE No. 1013
AWWA C511
CSA B64.4
IAPMO File No. 1563

Approvals

USC-FCCCHR

ASSE, AWWA, CSA, IAPMO

Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California

Approval models NRS, OSY, PC, QT

UL Classified
2½" – 3" with OSY gate valves

¾" – 2" without shutoff valves (-LF), except LF009M3LF

Insulated Enclosure

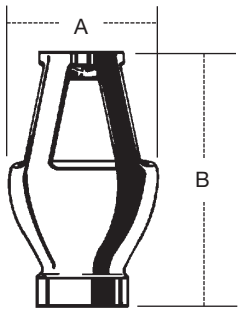
The WattsBox insulated enclosure is available for Series LF009.
For more information download ES-WB at watts.com.

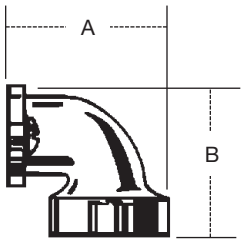
Air Gaps and Elbows

Call customer service if you need assistance with technical details.

MODEL		DRAIN OUTLET		DIMENSIONS				WEIGHT	
				A		B			
	For 909, 009, and 993 sizes	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lb*	*kg*
909AGA	¼"–½" 009, ¾" 009M2/M3	½	13	2⅜	60	3⅛	79	0.625	0.28
909AGC	¾"–1" 009/909, 1"–1½" 009M2	1	25	3¼	83	4⅞	124	1.5	0.68
909AGF	1¼"–2" 009M1, 1¼"–3" 009/909, 2" 009M2, 4"–6" 993	2	51	4⅜	111	6¾	171	3.25	1.47
909AGK	4"–6" 909, 8"–10" 909M1	3	76	6⅜	162	9⅝	244	6.25	2.83
909AGM	8"–10" 909	4	102	7⅜	187	11¼	286	15.5	7.03
909ELA	¼"–½" 009, ¾" 009M2/M3	–	–	–	–	–	–	–	–
909ELC	¾"–1" 009/909	–	–	2⅜	60	2⅜	60	0.38	0.17
909ELF*	1¼"-2" 009M1, 1¼"–2" 009/909, 2" 009M2, 4"–6" 993	–	–	3⅝	92	3⅝	92	2	0.91
909ELH* Vertical	2½"–3" 009/909	–	–	–	–	–	–	–	–

*Epoxy coated

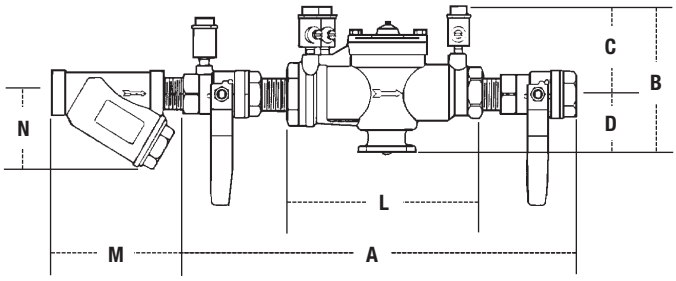




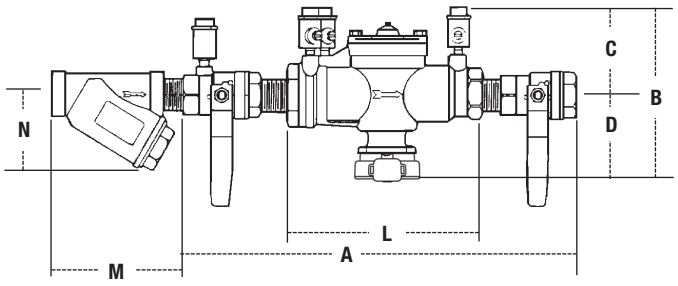
Dimensions – Weight

Call customer service if you need assistance with technical details.

¼" – ⅜"

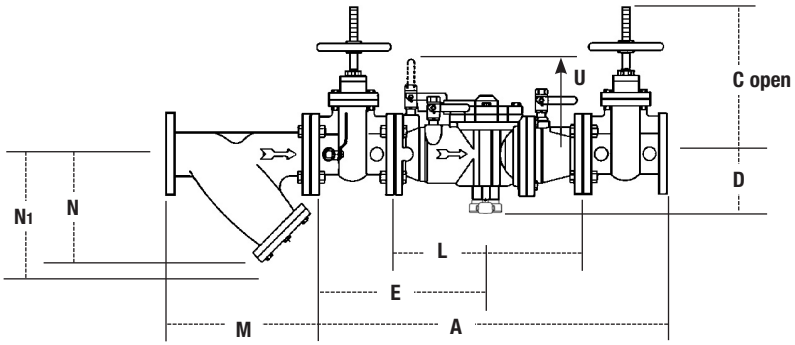


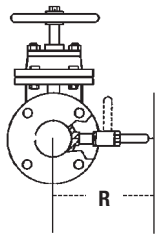
½" – 2"

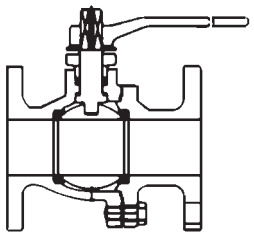


SIZE	DIMENSIONS (APPROX.)														WEIGHT	
	A		B		C		D		L		M		N			
in.	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in*	*mm*	*in*	*mm*	*lb*	*kg*
¼	10	250	4⅝	117	3⅜	86	1¼	32	5½	140	2⅜	60	2½	64	5	2
⅜	10	250	4⅝	117	3⅜	86	1¼	32	5½	140	2⅜	60	2½	64	5	2
½	10	250	5⅞	149	3⅜	86	2½	64	5½	140	2¾	70	2¼	57	5	2
¾	10¾	273	6¼	159	3½	89	2¾	70	6¾	171	3 3/16	81	2¾	70	6	3
1	14½	368	6¼	159	3	76	3¼	83	9½	241	3¾	95	3	76	12	5
1¼	17⅜	441	6¾	169	3½	89	3¼	83	11⅜	289	4 7/16	113	3½	89	15	6
1½	17⅞	454	6¾	169	3½	89	3¼	83	11⅛	283	4⅞	124	4	102	16	7
2	21⅜	543	8¾	222	4½	114	4¼	108	13½	343	5 5/16	151	5	127	30	13

2½" – 3"







Watts G-4000 Series
QT – Ball Valves

STRAINER SIZE		DIMENSIONS (APPROX.)						WEIGHT	
		M		N		N1†			
in.	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lb*	*kg*
2½	65	10	254	6½	165	9¾	248	28	12.7
3	80	10⅛	257	7	178	10	254	34	15.4

†Clearance for servicing

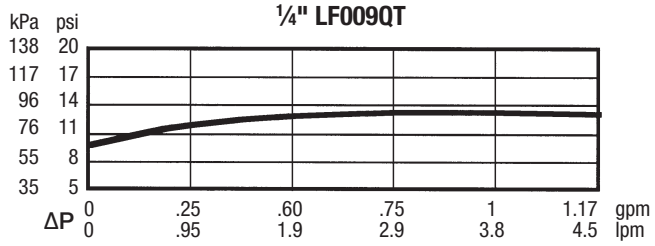
MODEL	SIZE	DIMENSIONS (APPROX.)														WEIGHT	
		A		C		D		E		L		R		U			
	in.	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lb*	*kg*
LF009LF	2½	—	—	—	—	5⅝	143	—	—	18⅛	460	—	—	10⅝	270	76	34.5
LF0090SY	2½	33¼	845	15⅞	403	5⅝	143	16⅜	416	18⅛	460	7¾	197	10⅝	270	166	75.3
LF009NRS	2½	33¼	845	11⅜	289	5⅝	143	16⅜	416	18⅛	460	7¾	197	10⅝	270	161	73.0
LF009LF	3	—	—	—	—	5⅝	143	—	—	18⅛	460	—	—	10⅝	270	76	34.5
LF0090SY	3	34¼	870	18½	470	5⅝	143	16⅝	422	18⅛	460	8¾	222	10⅝	270	198	89.8
LF009NRS	3	34¼	870	12¾	324	5⅝	143	16⅝	422	18⅛	460	8¾	222	10⅝	270	191	86.6

Capacity

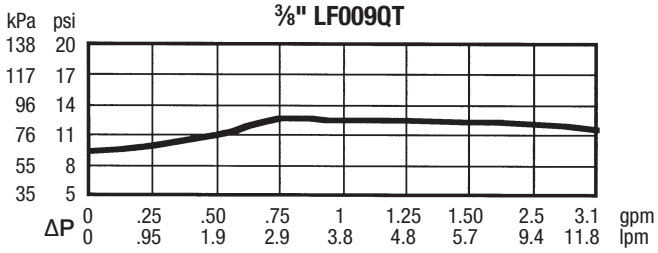
Performance as established by an independent testing laboratory.

The asterisk (*) indicates the typical maximum system flow rate (7.5 ft/s, 2.3 m/s).

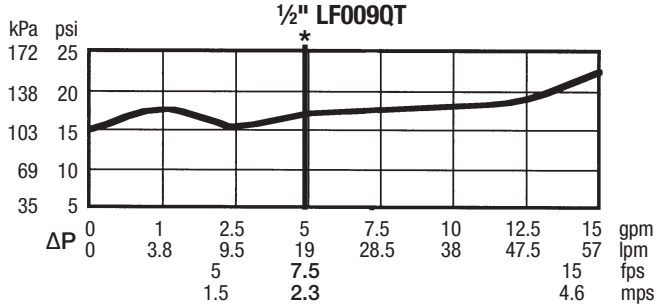
¼" LF009QT



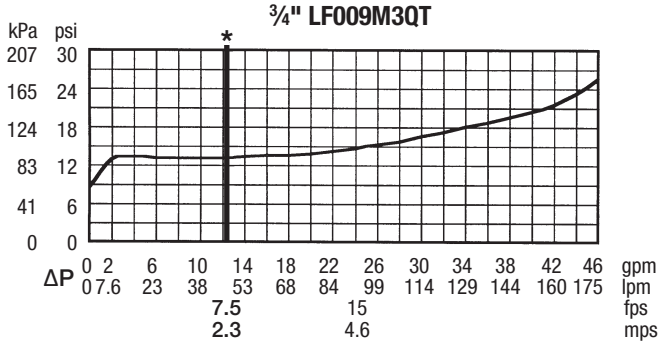
⅜" LF009QT



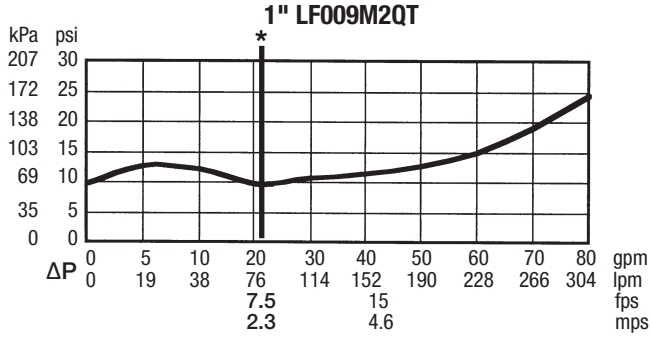
½" LF009QT



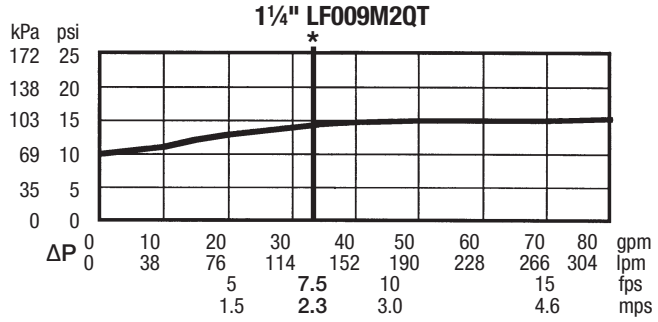
¾" LF009M3QT



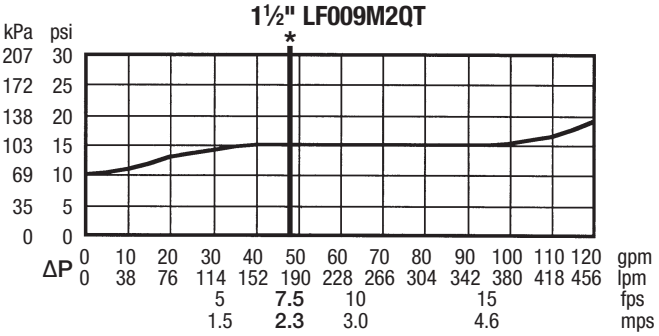
1" LF009M2QT



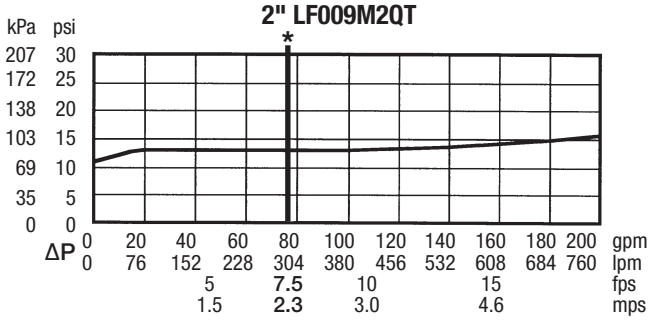
1¼" LF009M2QT



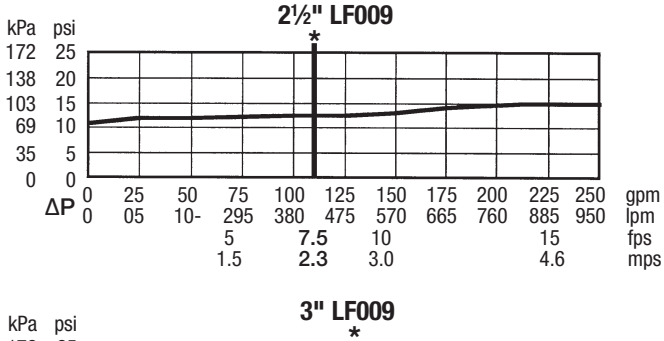
1½" LF009M2QT



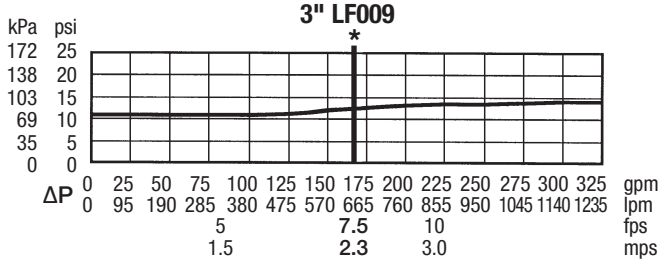
2" LF009M2QT



2½" LF009



3" LF009



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Canada: T: (888) 208-8927 • Watts.ca
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For Liquid and Steam Service

Job Name _____ Contractor _____

Job Location _____ Approval _____

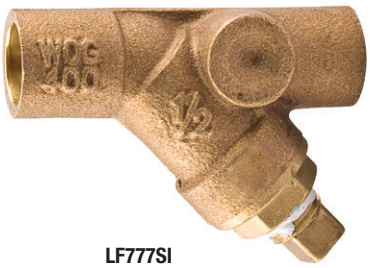
Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

LEAD FREE*

Series LF777SI, LFS777SI

Wye-Pattern, Lead Free Cast Strainers



LF777SI

Sizes: ⅜" – 3"

Series LF777SI, LFS777SI Wye-Pattern, Lead Free* cast strainers are designed to protect plumbing system components from dirt, rust and other damaging debris. The Series LF777SI and LFS777SI feature Lead Free* construction to comply with Lead Free* installation requirements.

Features

- Lead Free* cast copper silicon alloy body and cap
- Wye-pattern
- Tapped retainer cap
- Closure plug
- Special flared screen opening on upstream end to provide unrestricted flow through the strainer

Models

LF777SI – ⅜" – 3" threaded connections

LFS777SI –½" – 2" solder connections†

Specifications

A wye-pattern, Lead Free* cast strainer to be installed as indicated on the plans. The strainer must have a tapped retainer cap and closure plug. Strainer shall be rated to 400psi (27.6 bar) WOG; 125psi (8.6 bar) WSP for sizes ⅜"-2" and 300psi (20.7 bar) @ 210ºF (99ºC); 125psi (8.6 bar) WSP @ 353ºF (178ºC) for sizes 2½"-3". The strainer shall be constructed using Lead Free* cast copper silicon alloy. Lead Free* strainers shall comply with state codes and standards, where applicable, requiring reduced lead content. Strainer shall be a Watts Series LF777SI (threaded ends) or LFS777SI (solder ends).

Materials

Body:	Lead Free* cast copper silicon alloy
Retainer Cap:	Lead Free* cast copper silicon alloy
Plug	Lead Free* brass
Gasket:	EPDM
Standard Screen:	#20 mesh, 304 stainless steel

Pressure – Temperature

Maximum Working Pressure:

⅜"–2"

400psi (27.6 bar) WOG @ 210ºF (99ºC)

125psi (8.6 bar) WSP @ 353ºF (178ºC)

2½"–3"

300psi (20.7 bar) WOG @ 210ºF (99ºC)

125psi (8.6 bar) WSP @ 353ºF (178ºC)

Approvals

NSF Certified to NSF/ANSI/CAN 61-G

NOTICE

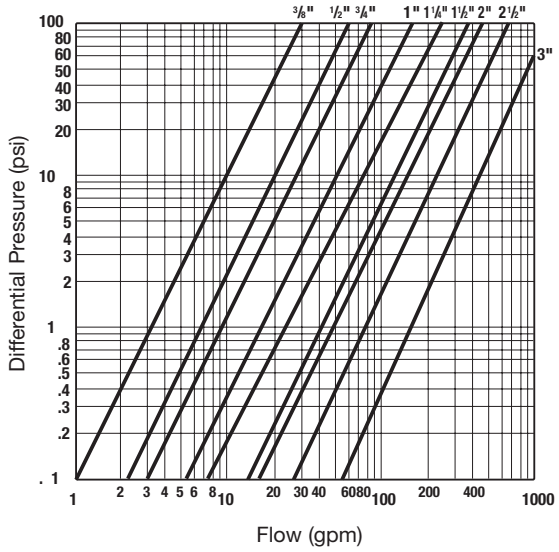
The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

WATTS®

Performance Data

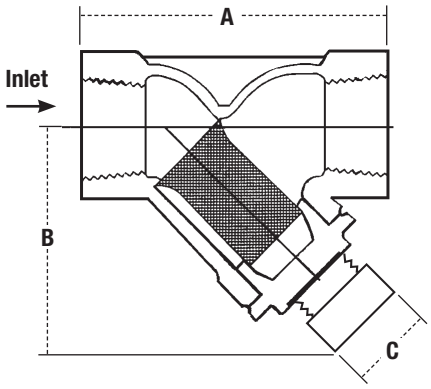


Flow curves show flows (gpm) and pressure drop (psig) through Watts Series 777SI, S777SI using standard 20 mesh screen.

Dimensions — Weights

LF777SI

SIZE	DIMENSIONS						WEIGHT	
	A		B		C			
in.	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lbs.*	*kgs.*
3/8	2 3/8	60	15/16	33	1/4	6	0.4	0.18
1/2	2 3/4	70	1 3/8	35	1/4	6	0.5	0.23
3/4	3 3/16	81	1 5/8	42	1/4	6	0.6	0.27
1	3 3/4	95	2 1/8	54	1/2	13	1.1	0.50
1 1/4	4 7/16	113	2 1/2	64	1/2	13	1.9	0.86
1 1/2	4 7/8	124	3	76	3/4	19	2.4	1.09
2	5 15/16	151	3 9/16	91	1	25	4.4	2.00
2 1/2	9 1/16	230	5 7/8	149	1/2	13	9.8	4.44
3	10 3/16	259	6 1/4	159	1/2	13	13.2	5.99



LFS777SI

SIZE	DIMENSIONS						WEIGHT	
	A		B		C			
in.	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lbs.*	*kgs.*
1/2	2 3/4	70	1 3/8	35	1/4	6	0.4	0.18
3/4	3 3/8	86	1 5/8	42	1/4	6	0.6	0.27
1	3 3/4	95	2 1/8	54	1/2	13	0.9	0.41
1 1/4	4 9/16	116	2 1/2	64	1/2	13	1.5	0.68
1 1/2	5 5/16	135	3	76	3/4	19	1.9	0.86
2	6 1/8	156	3 9/16	91	1	25	3.3	1.50

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ET-1

Engineering Specification

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

LEAD FREE*

Series PLT

Potable Water Expansion Tanks

Series PLT Potable Water Expansion Tanks are designed to absorb the increased volume of water created by thermal expansion and to maintain balanced pressure throughout the potable water supply system.

Heated water expands, and in a domestic hot water system, the system may be closed when the potable water system is isolated from the public water supply by a one-way valve such as pressure reducing valve, backflow preventer or check valve. Provisions must be made for this expansion.

Series PLT expansion tanks absorb the increased volume of water created when the hot water storage tank is heated and keeps the system pressure below the relief setting of the T&P relief valve.

It is a pre-pressurized steel tank with an expansion membrane that prevents contact of the water with the air in the tank. This prevents loss of air to the water and insures long and trouble-free life for the system. These tanks may be used with all types of Direct Fired Hot Water Heaters (gas, oil or electric) and hot water storage tanks.

Features

- Rugged flexible butyl diaphragm
- Field adjustable pre-charge
- In-line and free standing models
- Can be used with most standard hot water heaters and storage tanks

Models

PLT-5-M1	¾" male connection, tank volume 2.1 gal.
PLT-12-M1	¾" male connection, tank volume 4.5 gal.
PLT-20-M1	¾" male connection, tank volume 8.5 gal.
PLT-35-M1	1" female connection, tank volume 14.00 gal.

Specifications

The potable water expansion tank shall be of drawn steel construction. It shall have a Butyl diaphragm separating the air chamber from the water containing chamber. Inlet connector shall be Stainless Steel. Materials of manufacture for the diaphragm shall be FDA approved.

The potable water expansion tank shall be a Watts Model PLT.

Standards

Models PLT-5, PLT-12 and PLT-20 are Listed by IAPMO.
Certified to ANSI/NSF 61
Model PLT-35
Certified to ANSI/NSF 61

(73˚F/23˚C)

Note: The potable water expansion tank shall be installed in the cold water service pipe line on the supply side of the water heater (or water storage tank). A pressure relief valve sized and installed in accordance with local codes must be incorporated in the system.
In those systems requiring a combined temperature and pressure safety relief valve, the temperature and pressure relief valve should be sized and installed in accordance with local codes. Adequate drainage provisions should be provided where water flow will cause damage.

See chart on back

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

NOTICE

Inquire with governing authorities for local installation requirements

***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

Selection

This Quick Reference Selection Guide may be used as an alternative to using a formula to determine the correct expansion tank for the system. This table is based upon a relief valve setting of 150psi (10.3 bar), and a maximum of 50°F temperature rise.

To select the correct model PLT series tank, simply go the supply pressure equal to the system supply pressure (for pressures between those shown use next highest supply pressure shown), read across the chart to the correct tank as indicated by the water heater capacity (for capacities between those shown, use next highest capacity).

To accommodate the thermal expansion required for higher temperature and/or higher pressure systems, multiple tanks may be used. Please contact the factory for sizing information.

Materials

Diaphragm: Butyl rubber

Inlet Connection: Stainless Steel

Technical Information

DESCRIPTION	PLT-5	PLT-12	PLT-20	PLT-35
Max. Pressure - PSI	150	150	150	150
Max. Temp. - °F	200	200	200	200
Tank Volume - Gal.	2.1	4.5	8.5	14.00
Air Pre-charge - PSI	20	20	20	20
Connections Size - Inches	¾ Male	¾ Male	¾ Male	1 Female
Diameter - Inches	8	10.5	12.5	16.0
Length - Inches	11	13.5	19.2	21.7
Weight - Lbs.	5.5	10	15	32

Acceptance Volume

AIR SIDE PRE-PRESSURE (PSI)	WATER SIDE VOLUME AT 150PSI (GALLONS) PLT-5	PLT-12	PLT-20	PLT-35
20	1.48	3.42	7.102	10.69
40	1.26	2.88	5.882	9.17
60	1.0	2.49	4.705	7.59
80	.8	1.85	4.009	6.07

SUPPLY PRESSURE (PSIG)	WATER HEATER (GALLONS) 20	30	40	50	80	100	120
40							
50							
55							
60							
70							
80							
90							
100							
110							
120							

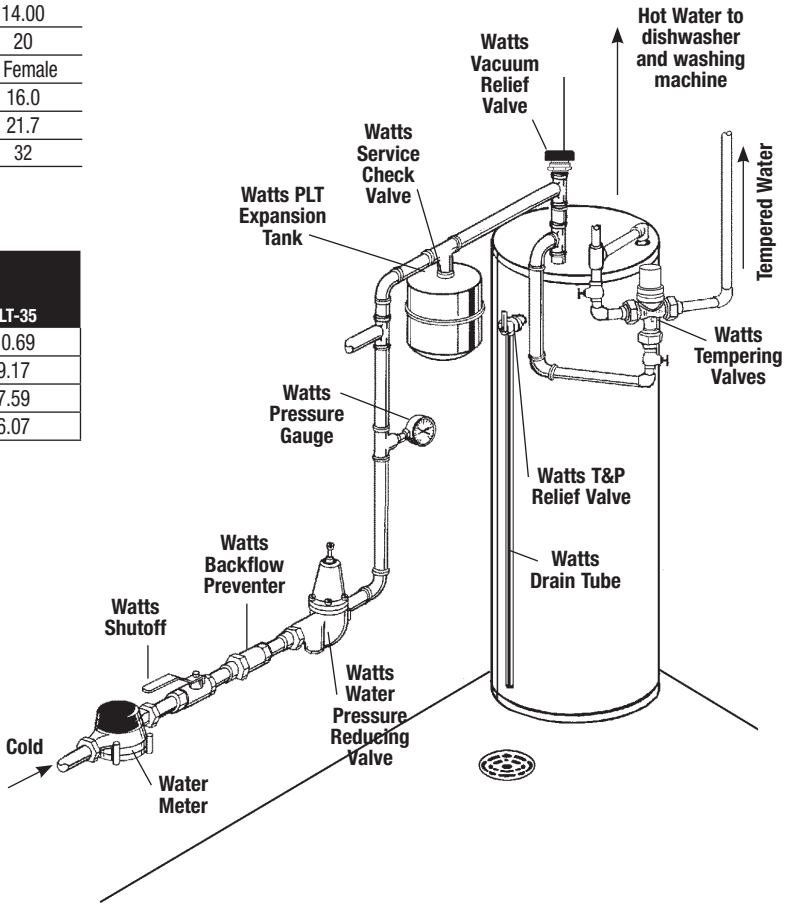
PLT-5 ←

PLT-12

PLT-20

PLT-35

Multiple tanks required - consult factory



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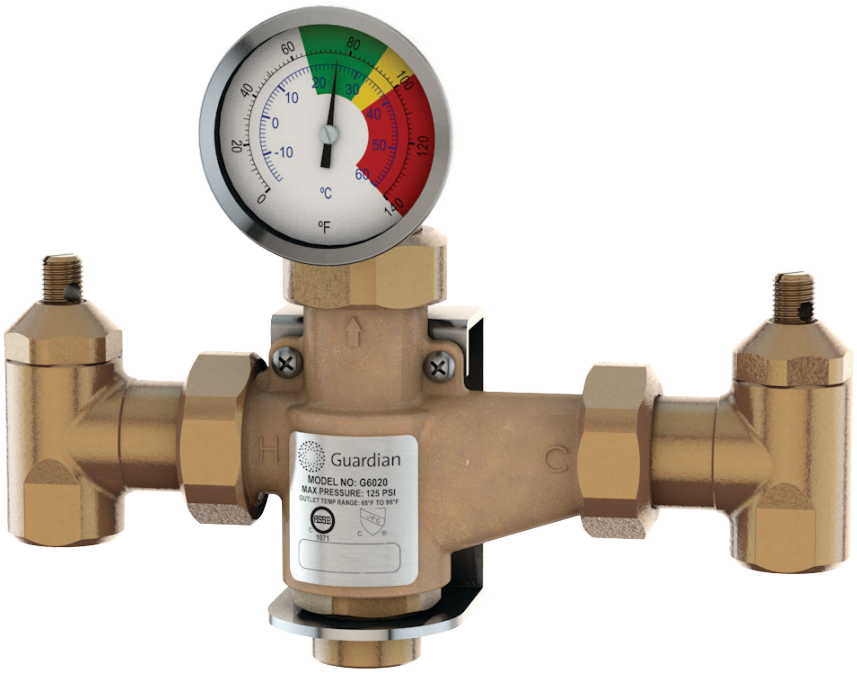
TMV-2

G6020 Thermostatic Mixing Valve, 13 Gallon/49 Liter Capacity



Application: Thermostatic mixing valve to blend hot and cold water to deliver tepid water. Valve has flow capacity of 13 gallons (49 liters) per minute at 30 PSI (2.1 bar) pressure drop. Valve can be used to supply emergency eyewash, eye/face wash or drench hose unit. Depending on water supply size and pressure, valve can supply multiple units.

Mounting: Valve inlets can be positioned on top, back or bottom of valve. Outlet can be on top or bottom. Valve can be configured in the field for any mounting position. Furnished with heavy duty stainless steel mounting bracket.

Temperature Control: Valve has precision thermal actuator that senses incoming water temperature and automatically blends water to preset temperature. Valve is factory set to deliver 85°F (29°C) water. Temperature of tepid water can be adjusted as required and then locked. Furnished with dial temperature gauge as standard to monitor temperature of tepid water.

Cold Water Bypass: If the supply of hot water is restricted or interrupted, an internal bypass allows the valve to deliver cold water only. In bypass mode, the valve delivers 9 GPM (34 L/min) at 30 PSI (2.1 bar) pressure drop.

Hot Water Shutoff: Valve has internal PTFE valve seat. If the supply of cold water is interrupted, the valve will close completely and *not deliver any water at all*, eliminating any possibility of scalding.

Flow Capacity: Refer to table below for flow capacity of valve at specified pressure drops.

Checkstops/Filters: Each inlet has a lockable shutoff valve for maintenance, internal check valve to prevent backflow and stainless steel basket filter to remove debris from the water flow.

Construction: Valve meets the requirements of the U.S. Safe Drinking Water Act as lead-free.

Inlet/Outlet: 1/2" NPT female inlets and outlet as standard.

Quality Assurance: Valve is ASSE certified under ANSI/ASSE 1071. Valve is fully assembled and factory tested prior to shipment.

Water Pressure/Temperature Requirements

Supply Pressure: Maximum incoming water pressure is 125 PSI (8.6 bar). Pressure of hot and cold water supplies can vary up to 25% and still deliver the flow and temperature required by ANSI/ASSE 1071.

Hot Water Supply Temperature: Incoming hot water temperature range is 120° - 180°F (49° - 82°C). Guardian recommends that the hot water temperature not exceed 140°F (60°C).

Cold Water Supply Temperature: Incoming cold water temperature range is 40° - 70°F (4° - 21°C). Cold water temperature must be at least 10°F (5.6°C) less than the temperature of the delivered tepid water.

Tepid Water Temperature: Temperature of tepid water is adjustable within a range of 65° - 95°F (18° - 35°C) and then locks in position. High temperature limit stop is set at 90°F (32°C) to prevent misadjustment.

G6020 Thermostatic Mixing Valve, 13 Gallon/49 Liter Capacity

Pressure Drop (PSI)	1	5	10	15	20	25	30	35	40
Flow Rate (GPM)	3	5	7	8	10	11	13	13	14
Bypass Flow Rate (GPM)	3	4	5	6	7	8	9	9	10

Pressure Drop (Bar)	0.1	0.3	0.7	1.0	1.4	1.7	2.1	2.4	2.8
Flow Rate (L/min)	11	19	26	30	38	42	49	49	53
Bypass Flow Rate (L/min)	11	15	19	23	26	30	34	34	38

Ordering Information

Models

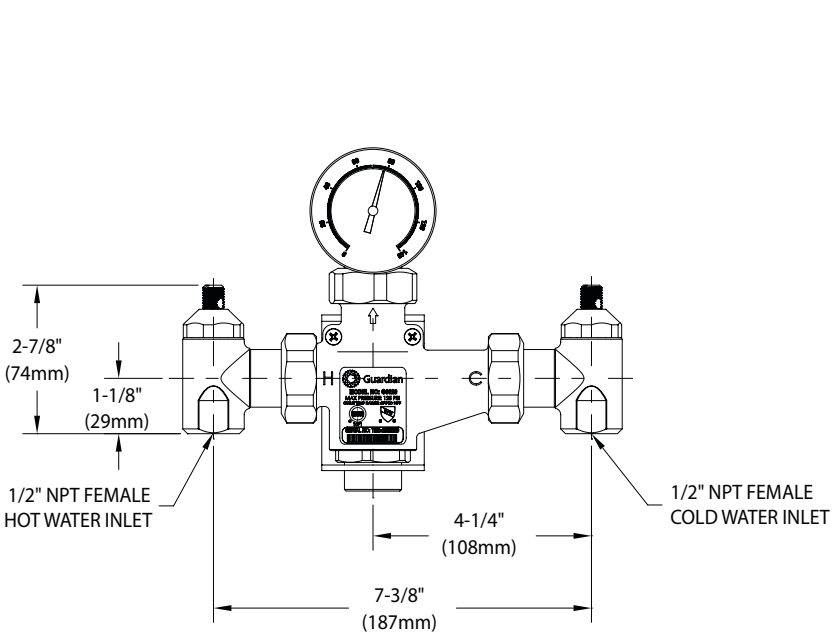
☐	G6020	Thermostatic Mixing Valve, 13 Gallon/49 Liter Capacity
☐	G6021-XXX	G6020 valve installed in surface mounted powder coated steel cabinet
☐	G6022-XXX	G6020 valve installed in surface mounted stainless steel cabinet
☐	G6023-XXX	G6020 valve installed in recess mounted powder coated steel cabinet
☐	G6024-XXX	G6020 valve installed in recess mounted stainless steel cabinet

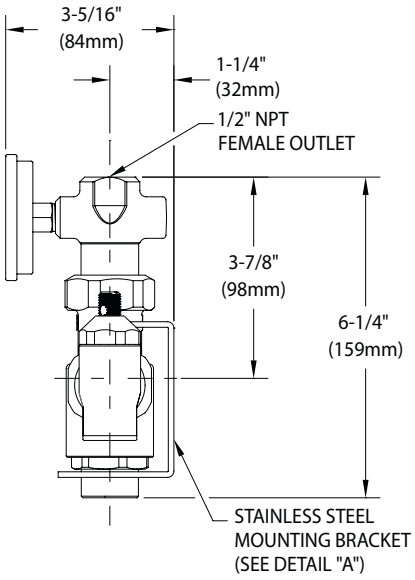
Available Options

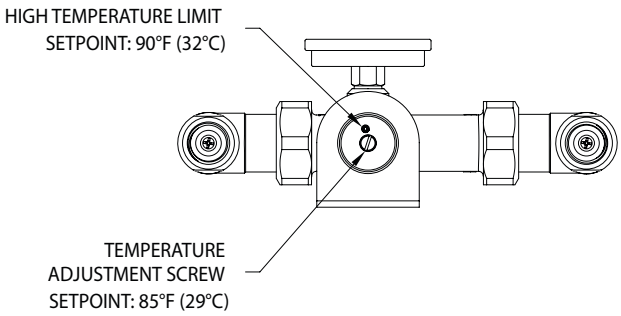
☐	Finish	Chrome plated finish in place of raw brass (add suffix “CP”)
☐	Inlet/Outlet Threads	G1/2 female thread on inlets and outlet (add suffix “G”)
☐	Temperature Gauges	Temperature gauges on hot and cold water inlets (add suffix “IT”)
☐	Pressure Gauges	Pressure gauges on hot and cold water inlets (add suffix “IP”)
☐	Temperature/Pressure Gauges	Temperature and pressure gauges on hot and cold water inlets (add suffix “ITP”)

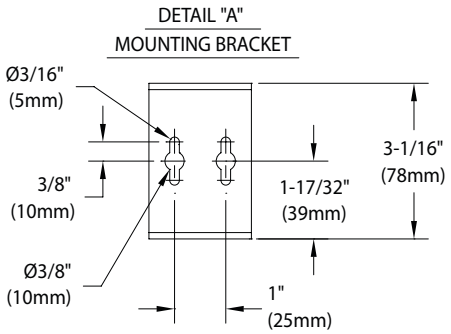
Note: *Installation of temperature and/or pressure gauges will change rough-in dimensions of valve. Contact factory for catalog drawing.*

G6020 Thermostatic Mixing Valve, 13 Gallon/49 Liter Capacity









Notes:

1. ANSI Z358.1-2014 states that the water temperature delivered by emergency equipment should be “tepid”. Tepid is defined as 60°F - 100°F (16°C - 38°C). However, in circumstances where a chemical reaction can be accelerated by water temperature, a medical professional should be consulted to determine the optimum water temperature for the application.
2. For thermostatic mixing valves to deliver the required water temperature and volume, the water system must be sized correctly. Please refer to the flow capacity, pressure and temperature requirements herein when designing the tepid water system.
3. Valve is factory set to deliver 85°F (29°C) tepid water. Depending on pressure and temperature of the incoming water supplies, this setting may require adjustment in the field. The adjustment screw is locked in position after adjusting.
4. Thermostatic mixing valves, like all emergency equipment, must be installed in accordance with the manufacturer’s instructions and maintained on a regular basis. Per ANSI Z358.1-2014, all emergency equipment should be activated weekly and inspected at least annually. Thermostatic mixing valves should be treated the same.
5. Per ANSI Z358.1-2014, plumbed emergency equipment must be connected to a potable water supply. This valve meets the requirements of the U.S. Safe Drinking Water Act as lead-free and is safe for use with potable water.
6. This valve is supplied with shutoff valves. Per ANSI Z358.1-2014, if shutoff valves are installed on the water supply to emergency equipment, the valves must be lockable to prevent unauthorized shutoff. Accordingly, each shutoff valve stem on this valve has a hole for installing a lock to secure the stem in the open position.

THIS SPACE FOR ARCHITECT/ENGINEER APPROVAL

Due to continuing product improvement, the information contained in this document is subject to change without notice. All dimensions are ± 1/4” (6mm). Rev. 022420