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FACTORY SHOALS PARK

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22-0000 Plumbing O&M



Date Sent: 07/16/2026

OPERATIONS AND MAINTENANCE MANUAL

NEWTON COUNTY FACTORY SHOALS SOUTH PARK

Customer

KINGS PLUMBING COMPANY
1360 DANIELSVILLE RD
ATHENS, GA 30601

Branch Location

Ferguson
11600 Wills Rd
Alpharetta, GA 30009
(407) 856-5161

Table of Contents

Tab		Spec/Vendor	Page #
1	P-1		
	A3461001020 - CCY 1.1/1.6 GPF EB *MADERA WHIT ADA	AMERICAN STANDARD	4
	ZZER6000PLHETCPM - EZ FLUSH BATRY EXP FV 1.28 GPF	ZURN INDUSTRIES INC	6
	PFTSCOF2000WH - EB CLST SEAT COMM OFLC WHIT	PROFLO	12
	PFWR - STD WAX RING	PROFLO	13
2	P-2		
	A0355012020 - @ 20X18 VC 4 WM LAV *LUCERN WHIT	AMERICAN STANDARD	15
	ZZ86100XLCP4 - CCY LF 0.25 1 MTR SGL BASIN LAV CP	ZURN INDUSTRIES LLC	17
	PF203WH - P TRAP SPLY & OS TLPC CVR ONLY WHT	PROFLO	22
3	P-4		
	ZZ843M1RC - *NP 2HDL CRS ADA SERV SINK FCT RC	ZURN INDUSTRIES INC	24
4	P-7		
	EEZWESEDFPBM117K - LFA EZH2O INTG- EDFPBM117	ELKAY MANUFACTURING	27
5	P-8		
	SC-96-300-B30-V-X - CCN 2.5 COMM H/SHWR SYS *TEMPTR CP	SYMMONS INDUSTRIES INC	36
6	WH-1		
	ADEN12020R022J52R - 119G 12.2KW 240V 3PH WHTR ALUM	AO SMITH CORP	43
7	PRV		
	WLF223SBK - LF 2 WTR PRES RED VLV & STRN	WATTS REGULATOR COMPANY	68

Spec Section:

O&M Name

P-1

INSTALLATION INSTRUCTIONS

American Standard

MADERA 16-1/2" HEIGHT FLUSH VALVE FLOOR MOUNTED TOILETS

Model 3461, 3462, 3463, 3464, 3465, 3466



Meets the American Disabilities Act Guidelines and ANSI A117.1 Requirements for the Physically Challenged



3461001020

Thank you for selecting American Standard – the benchmark of fine quality for over 100 years. To ensure this product is installed properly, please read these instructions carefully before you begin. (Certain installations may require professional help.) Also be sure your installation conforms to local codes.

⚠ CAUTION: PRODUCT IS FRAGILE. TWO PEOPLE ARE RECOMMENDED FOR HANDLING TO AVOID BREAKAGE AND POSSIBLE INJURY!

NOTE: For proper operation product requires a minimum of 30 psi working line pressure

RECOMMENDED TOOLS AND MATERIALS

Putty Knife

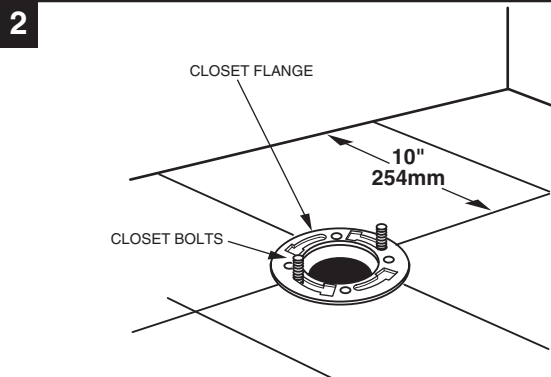
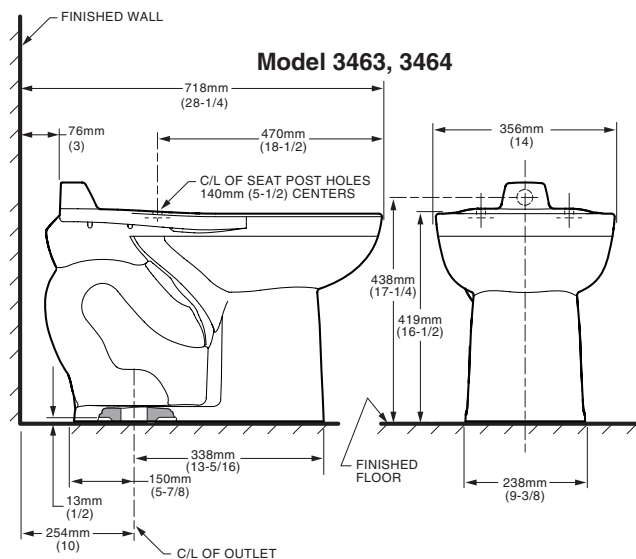
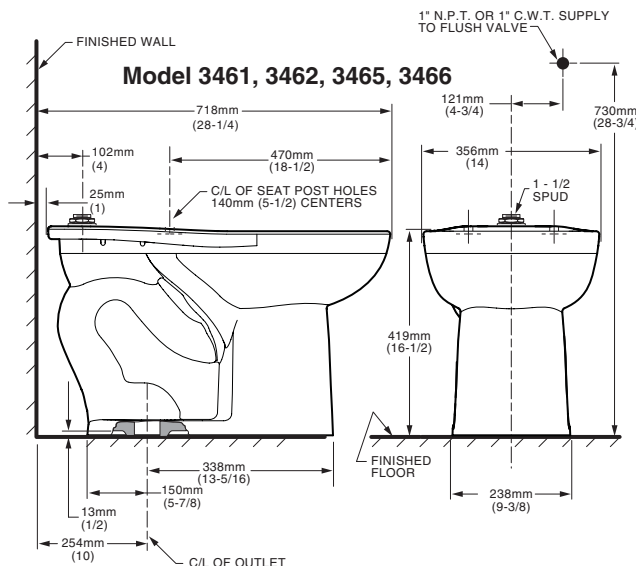
Regular Screwdriver
Adjustable Wrench

Sealant
Tape Measure

Carpenters Level
Flush Valve

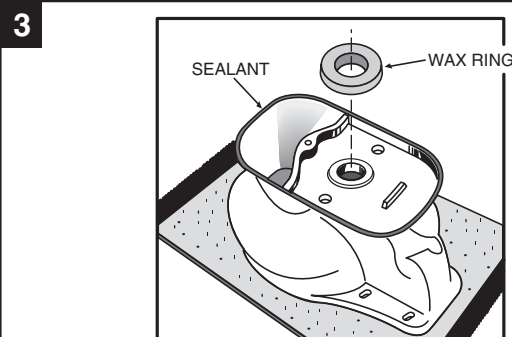
USE FOR FUTURE SAVE

1 Pictures may not exactly define contour of china



INSTALL CLOSET BOLTS

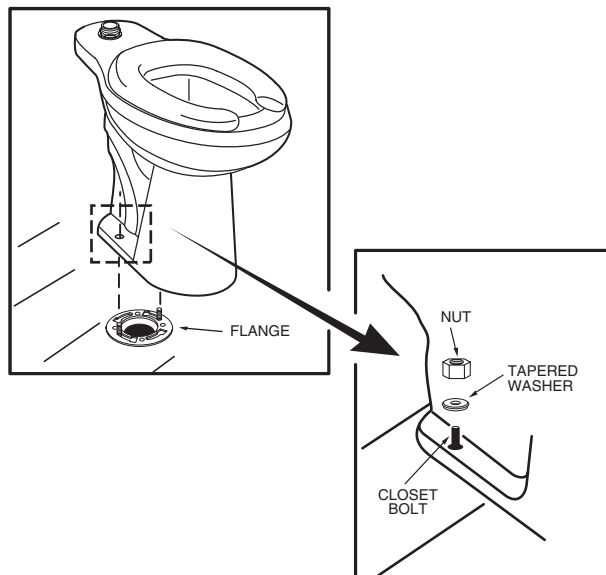
Install closet bolts in flange channel, turn 90°, and slide into place 6" (152 mm) apart and parallel to wall.



INSTALL WAX SEAL

Invert toilet on floor (cushion to prevent damage), and install wax ring evenly around waste flange (horn), with tapered end of ring facing toilet. Apply a thin bead of sealant around toilet base.

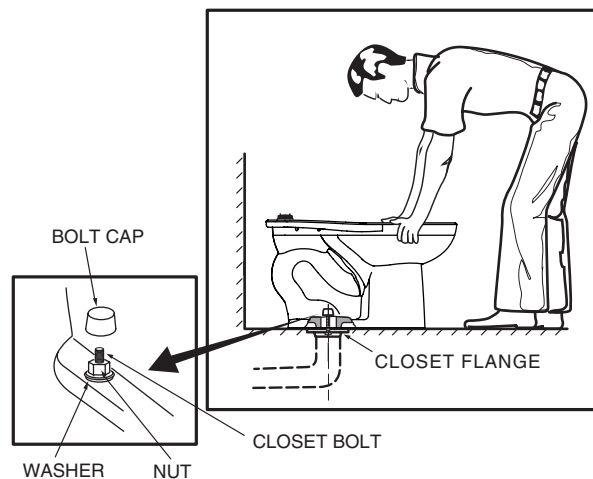
4



POSITION TOILET ON FLANGE

- Unplug floor waste opening and install toilet on closet flange so bolts project through mounting holes.
- Loosely install retainer washers and nuts. Side of washers marked "THIS SIDE UP" *must* face up!

5



INSTALL TOILET

- Position toilet squarely to wall and, with a rocking motion, press bowl down fully on wax ring and flange. Alternately tighten nuts until toilet is firmly seated on floor.



CAUTION:
DO NOT OVERTIGHTEN NUTS
OR BASE MAY BE DAMAGED!

- Install caps on washers. (If necessary, cut bolt height to size before installing caps.)
- Smooth off the bead of sealant around base. Remove excess sealant.

AMERICAN-STANDARD ONE-YEAR LIMITED WARRANTY

If inspection of this American-Standard plumbing product, within one year after its initial installation, confirms that it is defective in materials or workmanship, American-Standard will repair or, at its option, exchange the product for a similar model.

This warranty **does not apply** to local building code compliance. Since local building codes vary considerably, the purchaser of this product should check with a local building or plumbing contractor to insure local code compliance before installation.

This warranty **shall be void** if the product has been moved from its initial place of installation; if it has been subjected to faulty maintenance, abuse, misuse, accident or other damage; if it was not installed in accordance with American-Standard's instructions; or if it has been modified in a manner inconsistent with the product as shipped by American-Standard.

American-Standard's option to repair or exchange the product under this warranty does not cover any labor or other costs of removal or installation, **nor shall American-Standard be responsible for any other incidental or consequential damages attributable to a product defect or to the repair or exchange of a defective product, all of which are expressly excluded from this warranty.** (Some states or provinces do not allow the exclusion or limitation of implied warranties, so this exclusion may not apply to you.)

This warranty gives you specific legal rights. You may have other statutory rights that vary from state to state or from province to province, in which case this warranty does not affect such statutory rights.

For service under this warranty, it is suggested that a claim be made through the contractor or dealer from or through whom the product was purchased, or that a service request (including a description of the product model and of the defect) be sent to the following address:

In the United States:

American Standard Inc.
P.O. Box 6820
Piscataway, New Jersey 08855
Attention: Director of Consumer Affairs

For residents of the United States, warranty information may also be obtained by calling the following toll free number: (800) 442-1902
www.americanstandard-us.com

In Canada:

American-Standard
2480 Stanfield Road
Mississauga, Ontario
Canada L4Y 1S2

Toll Free: (800) 387-0369
www.americanstandard.ca

In Mexico:

Customer Service Manager
Ideal Standard, S.A. de C.V.
Via Morelos #330
Col. Santa Clara
Ecatepec 55540 Edo. Mexico
www.americanstandard.com.mx



AquaSense® AV ZER Series

Automatic Sensor-Operated,
Battery-Powered Flushometer

Installation, Operation, Maintenance,
and Parts Manual

Patented and Patents Pending



✓ ZER6000AV-CP
ZER6000AV-CPM

**Sensor-Operated, Battery-Powered
Closet/Urinal Systems**

ZER6000AV-CPM
ZER6000AV-WS1-CPM
ZER6001AV-CPM
ZER6001AV-WS1-CPM
ZER6003AV-CPM
ZER6003AV-WS1-CPM



ZER6003AV-CP
ZER6003AV-CPM

LIMITED WARRANTY

All goods sold hereunder are warranted to be free from defects in material and factory workmanship for a period of three years from the date of purchase. Decorative finishes warranted for one year. We will replace at no costs goods that prove defective provided we are notified in writing of such defect and the goods are returned to us prepaid at Sanford, NC, with evidence that they have been properly maintained and used in accordance with instructions. We shall not be responsible for any labor charges or any loss, injury or damages whatsoever, including incidental or consequential damages. The sole and exclusive remedy shall be limited to the replacement of the defective goods. Before installation and use, the purchaser shall determine the suitability of the product for his intended use and the purchaser assumes all risk and liability whatever in connection therewith. Where permitted by law, the implied warranty of merchantability is expressly excluded. If the products sold hereunder are "consumer products," the implied warranty of merchantability is limited to a period of three years and shall be limited solely to the replacement of the defective goods. All weights stated in our catalogs and lists are approximate and are not guaranteed.

PRIOR TO INSTALLATION

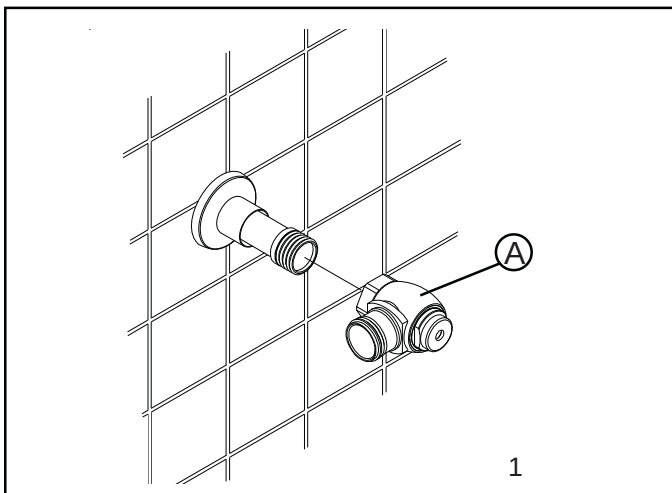
Prior to installing the ZER Flushometer, install the items listed below:

- Closet or urinal fixture
- Drain line
- Water supply line

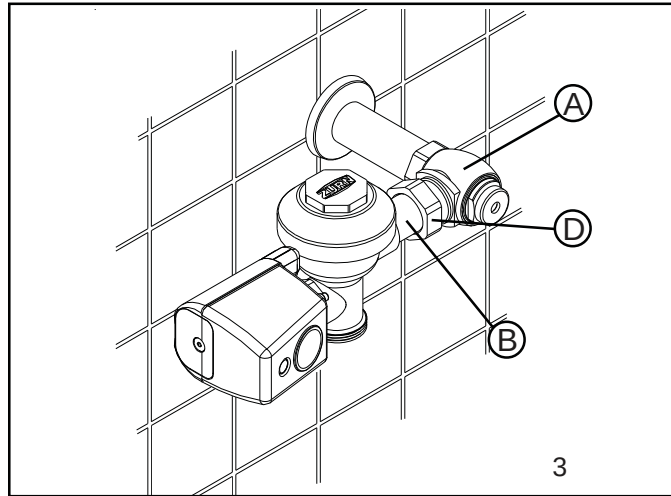
The ZER is designed to operate with 20 to 80 psi (138 to 552 kPa) of water pressure. THE MINIMUM PRESSURE REQUIRED TO THE VALVE IS DETERMINED BY THE TYPE OF FIXTURE SELECTED. Consult fixture manufacturer for pressure requirements. Protect the chrome or special finish of this flushometer. DO NOT USE TOOTHED TOOLS TO INSTALL OR SERVICE THE VALVE.

IMPORTANT:

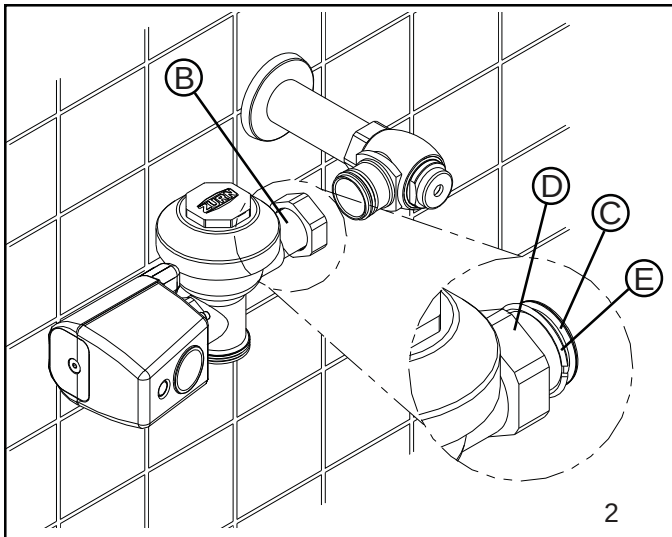
- ALL PLUMBING IS TO BE INSTALLED IN ACCORDANCE WITH APPLICABLE CODES AND REGULATIONS.
- WATER SUPPLY LINES MUST BE SIZED TO PROVIDE AN ADEQUATE VOLUME OF WATER FOR EACH FIXTURE.
- FLUSH ALL WATER LINES PRIOR TO OPERATION (See Step 9).
- DIRT AND DEBRIS CAN CAUSE FLUSH VALVE TO RUN CONTINUOUSLY.



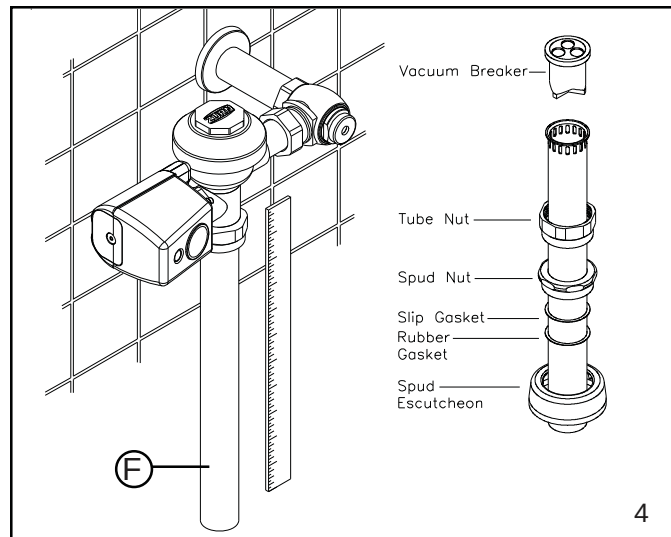
1.) Install stop valve assembly (A) using proper size supply escutcheon and sweat solder adapter kit if applicable. Thread sealing compounds should be used on male NPT threads only.



3.) Insert the flush valve tailpiece (B) into the stop valve (A) and hand tighten the lock nut (D) to the stop valve. Plumb the entire unit.



2.) Prior to inserting the flush valve tailpiece (B) into stop valve, be certain that the O-ring seal (C) is located in O-ring seal groove at the end of the tailpiece and the locking nut (D) and locking snap ring (E) are located as shown. Care should be taken not to damage the O-ring when inserting the tailpiece into the stop valve. If lubrication is needed, wetting the O-ring with water will be sufficient.



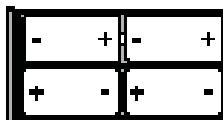
4.) Determine the length of vacuum breaker tube (F) required to join the flush valve and fixture spud. Cut the vacuum breaker tube, if required, to this length. Assemble the vacuum breaker tube assembly and spud nut assembly to the flush valve and fixture spud.

5.) Hand tighten spud nut and vacuum breaker tube nut to fixture and flush valve. Adjust the valve assembly for plumb. Tighten fixture spud nut, vacuum breaker tube nut and lock nut with a wrench. **Do not turn water on until batteries are inserted – see 6.**

6.) ACTIVATION

Using supplied battery compartment wrench, remove battery compartment from the E-Z Flush™ unit.

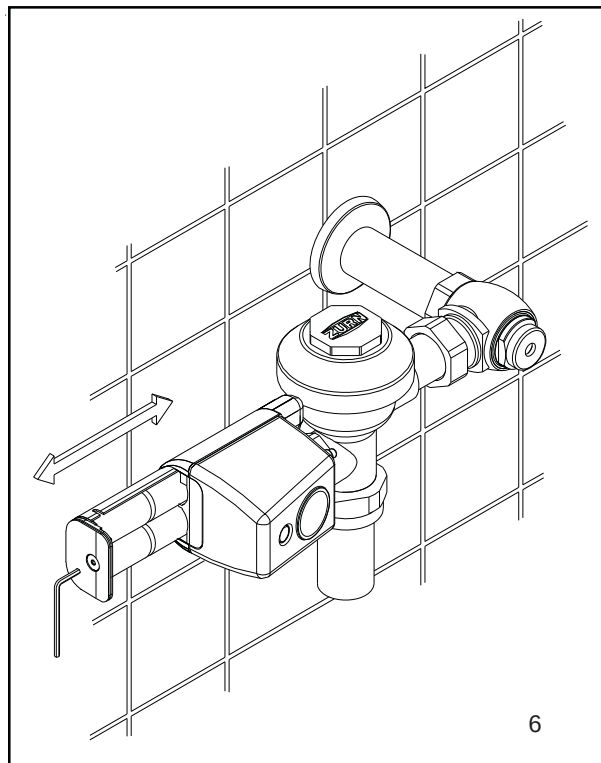
Load batteries into compartment tray (note position of batteries in tray), and reinstall battery tray into the E-Z Flush unit.



Secure tray with battery compartment wrench. The last three turns of the wrench will activate the E-Z Flush unit. The E-Z Flush System is now operational.

Your E-Z Flush unit comes preset from the factory. If special circumstances require adjustment of the activation distance, see Appendix A – Adjusting Your E-Z Flush.

The E-Z Flush unit has a 10-minute start-up sequence in which the Object Lock Sensor will flash the User-In-View **yellow L.E.D.** continuously as long as a user is in view. After the start-up sequence is completed and when the Object Lock Sensor has a user in view, the User-In-View **yellow L.E.D.** will flash only 3 times after a 5-second delay. This delay prevents needless flushes when someone walks by. Sensor units should not be located across from each other or in close proximity to highly reflective surfaces.



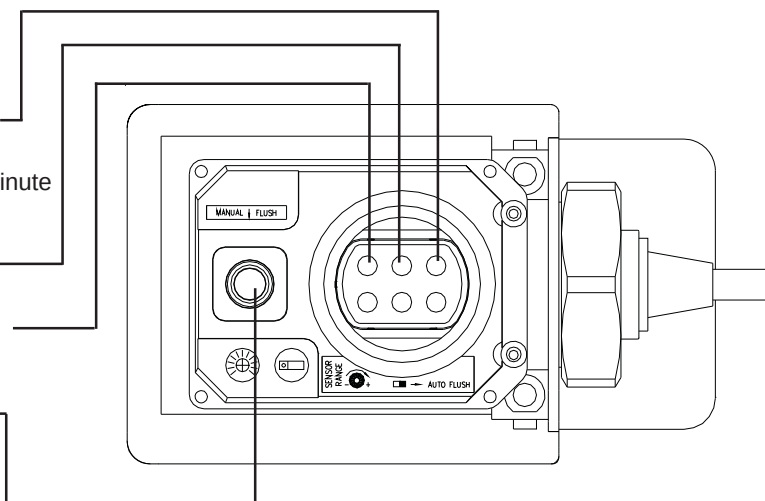
7.) VISUAL INDICATOR GUIDE

USER-IN-VIEW L.E.D. Yellow light flashes 3 times – after 5-second delay – when a user is in view. The yellow light flashes constantly when a user is in view during the 10-minute start-up sequence.

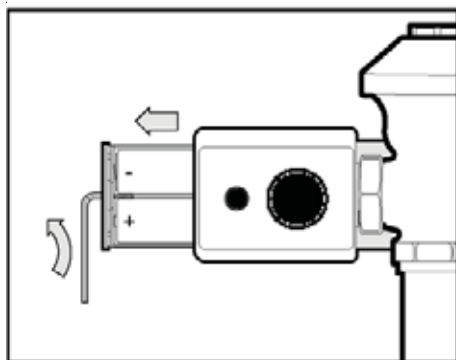
OBJECT LOCK SENSOR

BATTERY L.E.D. Red light flashes indicating it is time to replace batteries with 4 new “C” batteries.

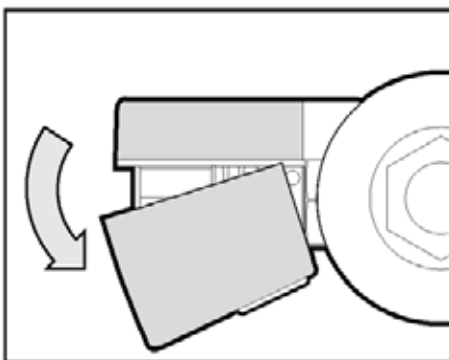
COURTESY MANUAL FLUSH BUTTON Allows manual activation of flush when needed.



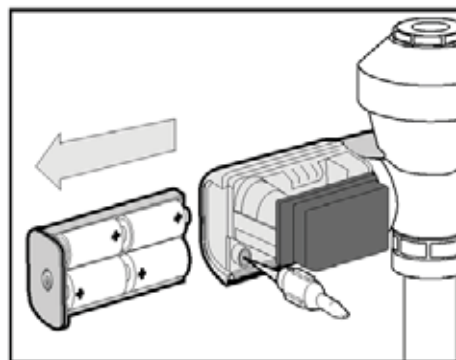
8.) ADJUSTING YOUR E-Z FLUSH



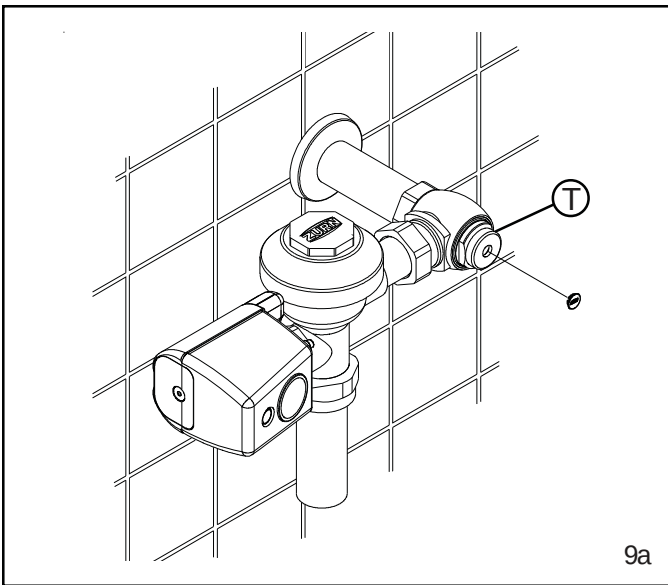
STEP A Use battery compartment wrench to remove battery compartment tray.



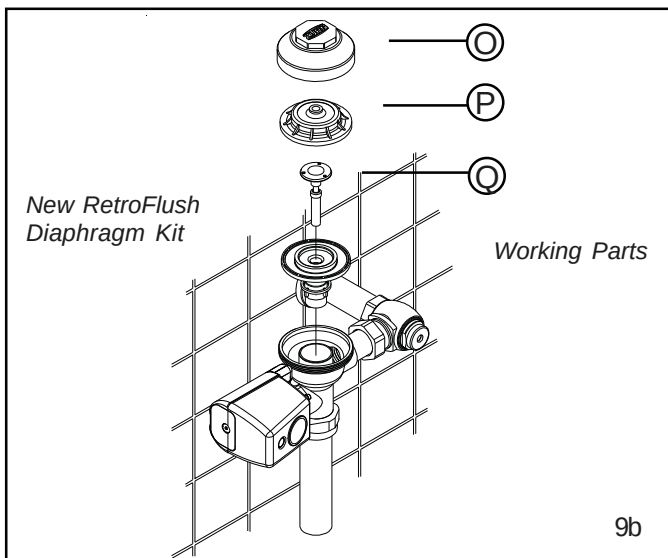
STEP B Pull cover off by rotating battery side forward and out.



STEP C Sensor Adjustor Tool comes in a built-in storage pocket. Replace after use.



Before the supply water is turned on, be sure all stop valves to the flush valves are closed off tight. The stop valves can be opened and closed by using the adjusting screw located at the center of the stop valve cap (T) , behind the adjusting screw cover if already installed. Stop valve adjustments can only be made by using the adjusting screw. **It is not necessary to remove the stop valve cap when making adjustments. If for any reason it becomes necessary to remove the stop valve cap, be certain the water is shut off at the main supply valve.**

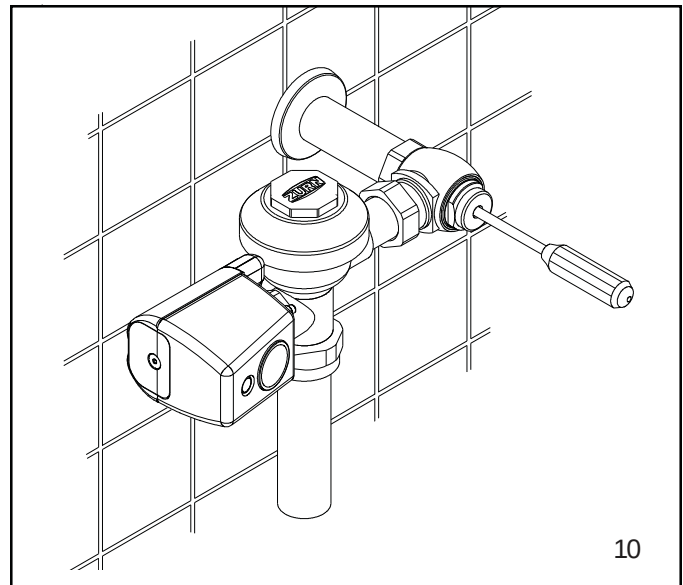


9.) When all flush valves are connected to the fixtures and water pressure is available, it is recommended that the supply piping be flushed to remove dirt, pipe chips, etc., from system.

Use the following procedure to flush out the supply piping:

- A. Remove the main valve body cover (O)
- B. Remove the working parts from the flush valve (P) and (Q) (shown in 9b).
- C. Replace the plastic cover (P) and main body cover (O) without reinstalling the working parts.
- D. Open the stop valve by using the stop adjusting screw and flush out all debris from pipe and connections.
- E. Shut stop, open cover, reinstall the working parts, replace both covers and tighten.

This procedure should also be repeated when the system is drained for seasonal use, as occurs in athletic fields, recreation parks, etc.



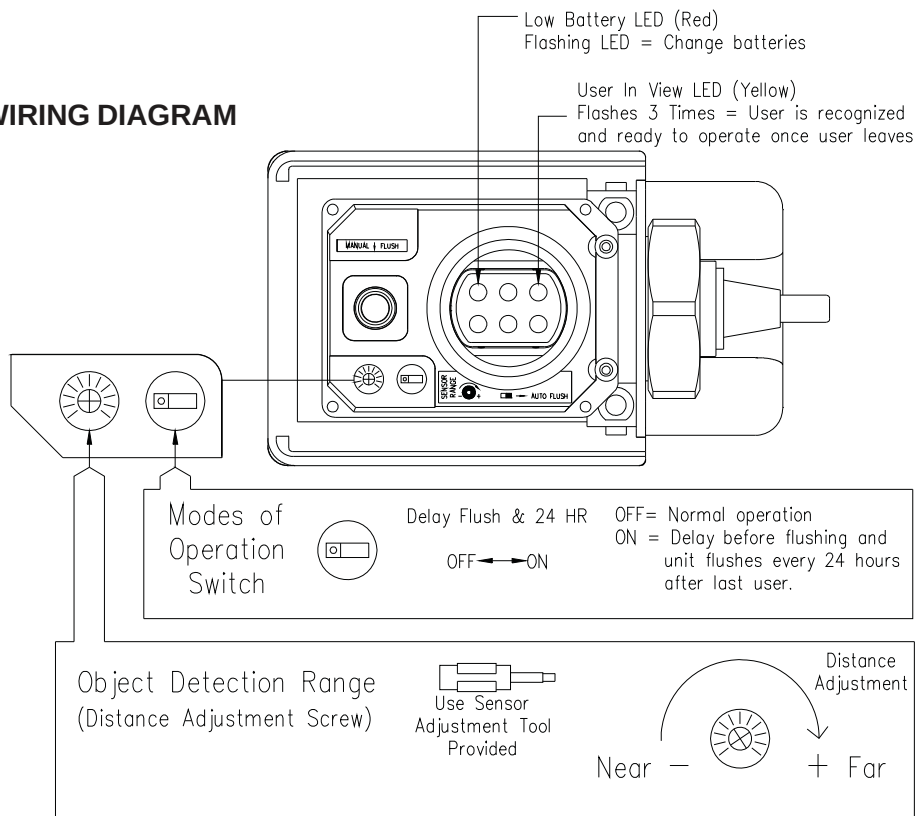
10.) The ZER flush valves are preset for fixture volume as marked on the valve cartons. The valve does not require regulation for variation in water pressure within its operating range. To set the flush valve for proper operation, gradually adjust the stop valve open, using the adjusting screw, while actuating the valve until the rate of water flow into the fixture is not excessive, yet is sufficient to adequately evacuate the waste. The final setting for urinals should be such that the fixture will not overflow when the valve is actuated in succession. The stop cap screw cover should be replaced after final adjustments have been made.

APPENDIX A

TO CHANGE ACTIVATION DISTANCE FOR THE OBJECT LOCK SENSOR

1. Remove battery compartment tray as shown in Step 6.
2. Remove cover and sensor adjustor tool as shown in Step 6.
3. Replace battery compartment in E-Z Flush to activate unit.
4. Press sensor range reset button (the yellow L.E.D. will flash continuously when it has an object in view for the 10-minute reset period).
5. Stand at desired activation distance.
6. Use sensor adjustor tool and turn **Distance Adjustment Screw** all the way down and then turn slowly up until **yellow L.E.D.** begins to flash.
7. Ensure Object Lock Sensor is not detecting stall door or wall by closing door, stepping out of sensor path and making sure **yellow L.E.D.** is not flashing. If sensor locks onto door or wall, unit will not flush properly. Shorten activation distance.
8. Remove battery compartment, replace sensor adjustor tool and cover. Replace battery compartment tray to reactivate E-Z Flush unit.
9. After 10-minute start-up sequence, the **yellow L.E.D.** will flash only 3 times when a user is in view (after a 5-second delay).

WIRING DIAGRAM



Delay Flush = User must leave the sensor range for 3 seconds before a flush is generated.
 24 Hour Flush = Unit will automatically flush 24 hours after the last use.

TROUBLE SHOOTING GUIDE

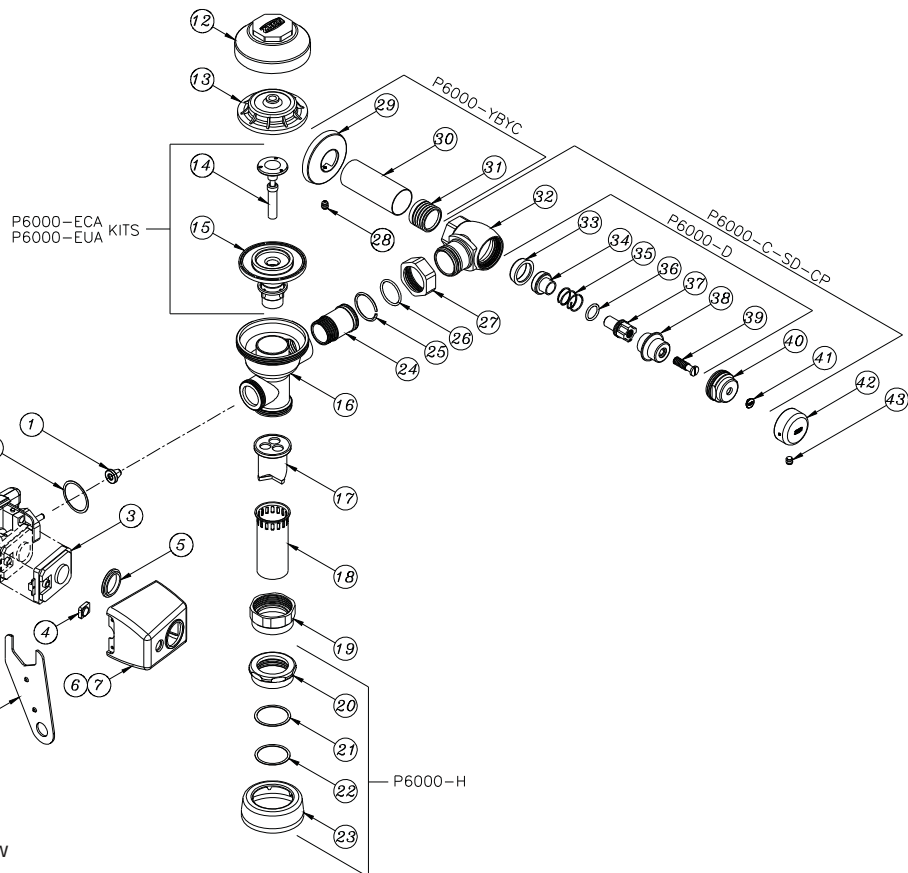
PROBLEM	CAUSE	SOLUTION
Yellow L.E.D. light flashes 3 times when there are no users.	Front of Object Lock Sensor is covered or Object Lock Sensor is set too far out, registering the opposite wall or door as a user.	Remove item covering sensor or adjust Object Lock Sensor activation distance. (See Appendix B – Adjusting the E-Z Flush.)
Yellow L.E.D. light flashes continuously when Object Lock Sensor is activated by a user.	E-Z Flush unit is in 10-minute start-up mode (when first activated), or Sensor Range Reset Button has been depressed.	Yellow L.E.D. light will flash only 3 times, acknowledging a user is in view after the 10-minute start-up mode.
Red L.E.D. light flashes.	Batteries need replacing.	Replace batteries.
Not enough water to fixture or too much water to fixture.	Diaphragm damaged or valve control stop improperly adjusted.	Replace diaphragm and/or adjust valve control stop.
Valve will not operate.	Object Lock Sensor range set too close to E-Z Flush, batteries are dead, or water supply is turned off.	Adjust Object Lock Sensor, replace batteries, or turn water on. If the E-Z Flush does not begin to function, call Customer Service at 1-800-997-3876.
Valve does not shut off.	Dirt or debris preventing diaphragm from functioning properly.	Remove dirt or debris, check by-pass hole in diaphragm.
Valve does not flush even after Object Lock Sensor has been adjusted.	Batteries are dead.	Replace batteries. If the E-Z Flush does not begin to function, call Customer Service at 1-800-997-3876.



AquaVantage® Exposed E-Z Flush Repair Kits

Part Identification

1. Seal
2. Collar Gasket
3. Sensor Module
4. Manual Override Push Button
5. Replacement Sensor Lens
6. Chrome Plastic Cover
7. Chrome Metal Cover
8. Battery Drawer
9. O-Ring
10. Allen Wrench
11. Handle Nut Wrench
12. Valve Body Cover
13. Plastic Cover
14. Trip Mechanism
15. Diaphragm Repair Kit
16. Valve Body
17. Vacuum Breaker Duckbill
18. Vacuum Breaker Tube
19. Vacuum Breaker Tube Nut
20. Spud Nut
21. Spud Friction Washer
22. Spud Sleeve
23. Spud Escutcheon
24. Tailpiece
25. Snap Ring
26. Tailpiece O-Ring
27. Locking Nut
28. Setscrew for Cast Wall Flange
29. Cast Wall Escutcheon
30. Supply Cover Tube
31. Sweat Solder Adapter
32. Stop Body
33. Piston Seal
34. Piston
35. Stop Spring
36. Guide O-Ring
37. Piston Guide
38. Guide Holder
39. Adjusting Screw
40. Stop Cap
41. Snap Cap Screw Cover
42. Vandal - Resistant Control Stop Cover
43. Setscrew for Control Stop Cover



Covers and Repair Kits	Product No.
Outside Cover - CP - Item 10	P6000-LL-CP
Inside Cover - Item 11	P6000-L
Low Consumption Closet Kit - 1.28 gal. flush	P6000-ECA-HET
Low Consumption Closet Kit - 1.6 gal. flush	P6000-ECA-WS1
Water Saving Closet Kit - 3.5 gal. flush	P6000-ECA-WS
Full Flow Closet Kit - 4.5 gal. flush	P6000-ECA-FF
Ultra Low Flush Urinal Kit - 0.125 gal. flush	P6000-EUA-ULF
Extra Water Saver Urinal Kit - 0.5 gal. flush	P6000-EUA-EWS
Low Consumption Urinal Kit - 1.0 gal. flush	P6000-EUA-WS1
Water Saving Urinal Kit - 1.5 gal. flush	P6000-EUA-WS
Full Flush Urinal Kit - 3.0 gal. flush	P6000-EUA-FF

Repair Parts - Inside Parts	Product No.
Urinal Relief Valve - Item 12	P6000-EU13
Closet Relief Valve - Item 12	P6000-EC13

Flush Connections and Spud Coupling Kits	Product No.
Flush Tube Assembly for Flush Valves Includes Items 15-19, Specify Diameter and Length	P6000-A
Vacuum Breaker Repair Kit, Item 17	P6000-B
Spud Coupling Assembly Includes Items 20-23 Specify Size.	P6000-H

Control Stop Repair Kit and Parts	Product No.
Control Stop Repair Kit for 1" and 3/4", Includes Items 33-39	P6000-D-SD
Seal Seat for 1" and 3/4", Includes Item 33	P6000-D42
VP Control Stop Repair Kit for 1" and 3/4", Includes Items 33-39	P6000-D-VP
Sweat Solder Connection with Cast Wall Flange, Includes Items 29-31	P6000-YBYC

Adjustable Tailpieces	Product No.
Adjustable Tailpiece for Standard Flush Valve Includes Items 24-26	P6000-J1
Tailpiece Coupling Assembly Includes Items 25-27	P6000-K
Tailpiece Locking Ring Includes Item 25	P6000-C30
Tailpiece O-Ring Includes Items 26	P6000-C31
Coupling Nut Includes Item 27	P6000-C32

Handle Assembly and Repair Kits	Product No.
Chrome Plastic Cover, Item 6	PERK6000-L-CPCR
Chrome Metal Cover, Item 7	PERK6000-L-CPMCR
Replacement Sensor Lens Item 5	PERK6000-SCR
Battery Drawer, Item 8	PERK6000-BD
Repair Kit Includes Items 1, 2, 4, and 9	PERK6000-RK
Repair Kit Includes Items 1, 2, Retainer and Cup Seal	PERK6000-MRK
Sensor Module	PERK6000-SR

ZURN INDUSTRIES, LLC. ♦ COMMERCIAL BRASS OPERATION ♦ 5900 ELWIN BUCHANAN DRIVE ♦ SANFORD NC 27330

PHONE: 1-800-997-3876 ♦ FAX: 919-775-3541 ♦ WORLD WIDE WEB: WWW.ZURN.COM

IN CANADA: ZURN INDUSTRIES LIMITED ♦ 3544 NASHUA DRIVE ♦ MISSISSAUGA, ONTARIO L4V1L2 ♦ PHONE: 905-405-8272 FAX: 905-405-1292

Toilet Seat



Easy Installation

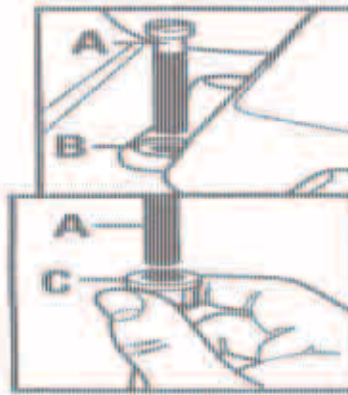
1. Carefully remove old seat
 2. Place new toilet seat on toilet bowl
 3. Make sure that the hinge bolts (A) are inserted through or connected to the seat hinge (B).
 4. Insert hinge bolts (A) through the holes in the rear of the toilet bowl.
 5. Place nuts (C) on the hinge bolts (A) and tighten until the nut is firmly seated
- Important: Do not over tighten the nuts as this could crack the toilet bowl.

Fácil Instalación

1. Retire cuidadosamente el asiento viejo
 2. Coloque el nuevo asiento de inodoro sobre la taza del inodoro.
 3. Asegúrese de que los pernos de la bisagra (A) penetren o se acoplen a la bisagra del asiento (B).
 4. Introduzca los pernos de la bisagra (A) a través de los orificios en la parte posterior de la taza del inodoro.
 5. Coloque las tuercas (C) en los pernos de la bisagra (A) y apriételas hasta que asienten firmemente.
- Importante: No apriete excesivamente las tuercas ya que al hacerlo podría romper la taza del inodoro.

Installation facile

1. Retirez soigneusement le vieux siège.
 2. Placez le nouveau siège sur la toilette.
 3. Les boulons d'articulation (A) doivent traverser la charnière du siège (B).
 4. Insérez les boulons d'articulation (A) dans les trous situés à l'arrière du siège.
 5. Insérez les écrous (C) sur les boulons d'articulation (A) et resserrez-les fermement.
- Important :** Ne resserrez pas trop les écrous car ils risqueraient de faire craquer la toilette.



Cleaning Instructions

Please refer to these important instructions for maintaining and protecting your toilet seat. When cleaning your toilet seat, wash it only with mild, soapy water. Rinse the seat thoroughly with clean water and dry with a soft cloth. This will help keep your seat looking new for years to come.

Never use abrasive powders or detergents, disinfectants or cleaning products in aerosol cans as they can damage your seats lustrous finish. In addition, some bathroom chemicals and cosmetic products may damage the seat's finish so use proper caution.

Instrucciones De Limpieza

Instrucciones Importantes para el mantenimiento del acabado y la protección de su asiento de inodoro.

Al limpiar su asiento, lávelo únicamente con agua y jabón suave. Enjuague el asiento completamente con agua limpia y séquelo con un paño suave. Esto le ayudara a mantener su asiento luciendo como nuevo durante mucho tiempo.

Nunca use polvos abrasivos de limpieza, desinfectantes o productos de limpieza en latas de aerosol, ya que estos pueden dañar el acabado

brillante de su asiento. Además, algunos productos químicos para limpieza de baños y cosméticos pueden dañar el acabado del asiento, así que recomendamos tener precaución.

Consignes de nettoyage

Consultez ces consignes pour entretenir et protéger votre siège de toilette. Nettoyez le siège uniquement avec de l'eau légèrement savonneuse. Rincez-le à fond avec de l'eau claire et essuyez-le avec un chiffon doux. Vous préserverez ainsi l'apparence de votre nouveau siège.

N'utilisez jamais de produits de nettoyage abrasifs ou de détergents, désinfectants ou aérosols car ils risquent d'endommager le fini lustré du siège. De plus, comme certains produits chimiques et cosmétiques peuvent aussi endommager le fini du siège, nous vous conseillons de les utiliser prudemment.

PFWR

Heavy Duty Wax Bowl Ring



Product Features

- 100% pure petroleum wax gasket for setting any floor type closet bowl
- Wax Bowl Ring fits all floor-type toilet bowls with 3" or 4" waste lines
- 48 per pack
- 25 lbs. carton weight

✓ Physical/Chemical Properties

Specific Gravity	0.82 – 0.86
Appearance	Golden Wax
Shelf Life	1 year from manufacture
Melting Point	150° F – 160° F

✓ Directions for Use

Wax Ring works best at room temperature to ensure proper flow of wax. All surfaces must be dry and free of putty, scale or other contaminated wax. Remove debris by scraping with putty knife or wire brush. Dust and dry all surfaces before installing gasket. Remove wax ring from wrapping. Place wax firmly over the horn of the outlet on the toilet bowl and set into place over closet bolts, using body weight to compress gasket. Gently twist bowl to spread wax. Tighten flange bolts carefully to prevent cracking or chipping the toilet bowl.

✓ Precautions

Read all cautions and directions carefully before using this product. Make sure water supply is shut off before beginning installation. For use on floor closet bowls only. **DO NOT INSTALL ON WET SURFACES.** Keep away from direct sunlight to prevent darkening. Do not store near extreme heat. **KEEP OUT OF REACH OF CHILDREN.**



PFWR

✓ Common Applications

PROFLO Heavy Duty Wax Bowl Ring provides a permanent, sanitary, gas and watertight seal on most types of water closets. Wax Bowl Ring will not dry out, harden or deteriorate.

✓ Ingredients

Petrolatum (Non-Hazardous)
When used for the intended end use application, this product is considered an "article" as defined in OSHA 29 CFR 1910.1200(c).

✓ Approvals and Listings

Meets Federal Specification TT-P-1536A.

Spec Section:

O&M Name

P-2

INSTALLATION INSTRUCTIONS CARE AND MAINTENANCE

American
Standard

WALL HUNG SINK

NOTE: For installation of models using concealed or exposed arms, follow instruction provided by arms manufacturer.

Thank you for selecting American Standard - the benchmark of fine quality for over 100 years. To ensure this product is installed properly, please read these instructions carefully before you begin. (Certain installations may require professional help.) Also be sure your installation conforms to local codes.

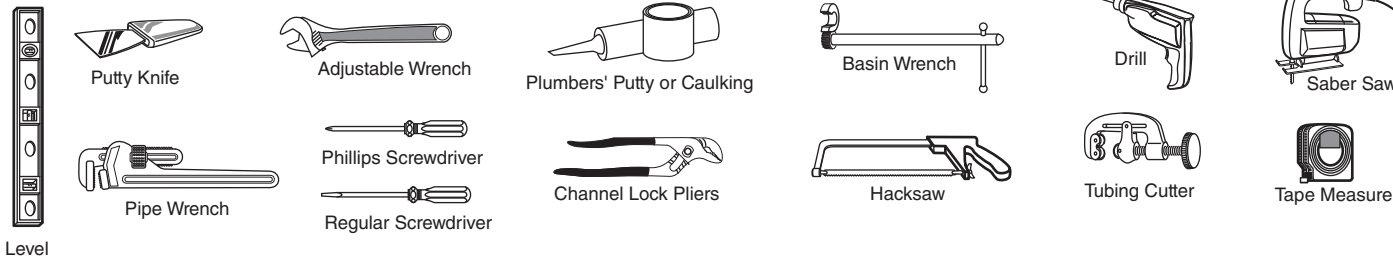
⚠ CAUTION: PRODUCT IS FRAGILE. TO AVOID BREAKAGE AND POSSIBLE INJURY HANDLE WITH CARE!

NOTE: Pictures may not exactly define contour of china and components.

OBSERVE LOCAL PLUMBING AND BUILDING CODES

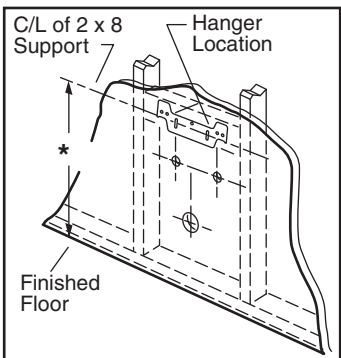
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Recommended Tools & Materials



1 Provide suitable reinforcement behind finished wall for lavatory hanger mounting screws. *Determine horizontal center line location of support from the table listed in Step 2. (Make sure support bottom extends to lavatory back wall bottom.)

NOTE: If replacing an existing sink be certain to shut off water supply before removing old sink.



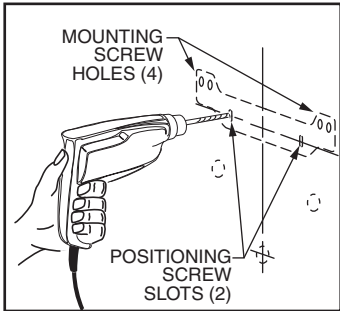
2 Determine the desired rim height (for example 32") then select from the Table at right the height of the hanger mounting bolts centerline

EXAMPLE:
For Comrade:
 $32" - 2-1/2" = 29-1/2"$

TABLE		
Part #	Model	Distance "A"
0124	Comrade	- 2-1/2" (64mm)
0321	Declyn	- 2-3/4" (70mm)
0355/0356	Lucerne	- 1" (25mm)
0372/0373	Penlyn	- 1/8" (3mm)
4867/4869	Regalyn	+ 2-3/4" (70mm)
9024	Decorum 18-1/4" x 20-1/16"	- 3-11/16" (93mm)
9134	Decorum 20-1/2" x 21-1/4"	- 3-11/16" (93mm)

3 Position hanger according to Step 2, making sure its center is aligned with the waste hole centerline. Mark the hanger screw locations through its mounting holes.

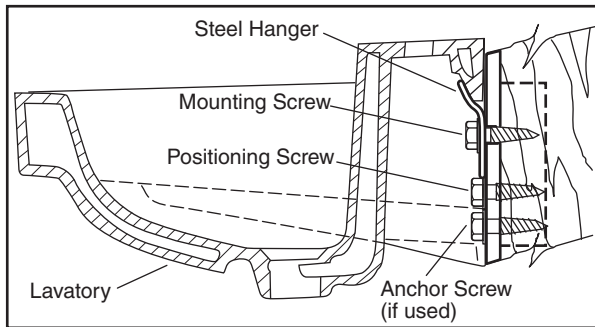
4 Drill pilot holes in positioning screw slots of hanger. **Note:** Some models are supplied with anchor screws, or steel hangers for lavatory installations. Other models are not provided with mounting hardware which can be purchased at local hardware outlets. Lavatories with bottom anchor screw holes should be secured with anchor screws in addition to hangers.



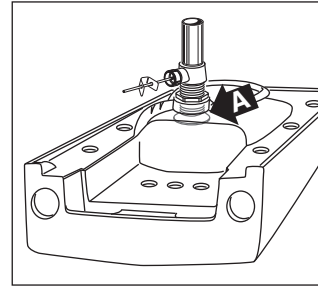
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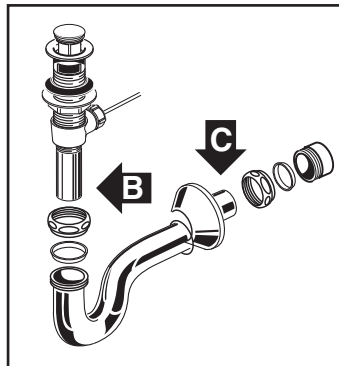
- 5** Affix hanger to wall (hand tighten only). Mount lavatory for positioning, level the deck, and mark bottom anchor screw holes (if applicable). Remove lavatory, tighten the hanger positioning screws and drill pilot holes for anchor screws and 4 mounting screws. Install and tighten the mounting screws.



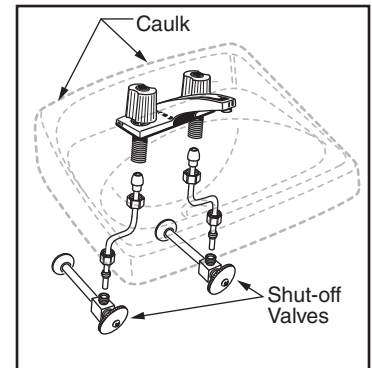
- 6** Following manufacturers instructions, install faucet and drain assembly. (Not included). Be certain to apply a bead of sealing putty on the underside of the drain (Part "A") in order to ensure a watertight seal between the lavatory and drain. Remove excess putty after installing drain on lavatory.



- 7** Return the fitted lavatory to the installed position. Connect trap to drain assembly hand tight to check alignment. It may be necessary to cut off part of the tailpiece (area "B") or part of the horizontal leg of the trap (area "C").

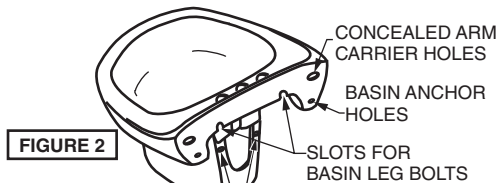


- 8** Secure lavatory on hanger as shown in 5. Insert and tighten anchor screws if applicable. Connect hot and cold supply lines to the shut-off valves. Tighten trap joints for watertight assembly. Apply a bead of caulk around the edge which contacts the wall as shown.

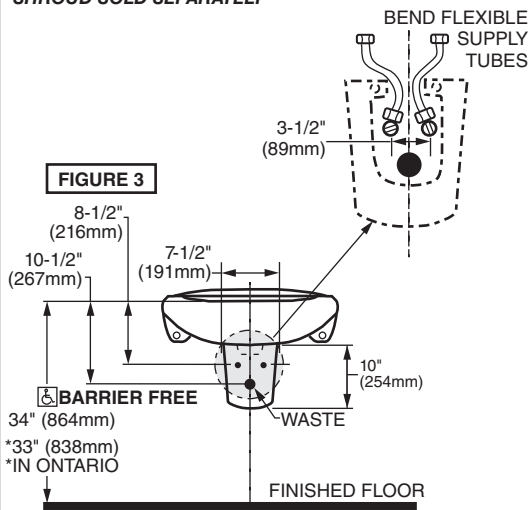


9 Installing Optional Shroud

Position semi-pedestal/shroud under basin and secure to wall using 2" (51mm) screws.



SEMI-PEDESTAL/SHROUD*
ANCHOR HOLES
*SHROUD SOLD SEPARATELY



AS AMERICA, INC. ONE YEAR LIMITED WARRANTY

If inspection of this AS America, Inc. ("American Standard") plumbing product, within one year after its initial purchase, confirms that it is defective in materials or workmanship, American Standard will repair or, at its option, exchange the product for a same or similar model.

This limited warranty applies only to the original purchaser and installation of these products. In the event of a limited warranty claim, proof of purchase will be required—save sales receipts.

This limited warranty does not apply to local building code compliance. Since local building codes vary considerably, the purchaser of this product should check with a local building or plumbing contractor to ensure local code compliance before installation.

This limited warranty will be void if the product has been moved from its initial place of installation; if it has been subjected to faulty maintenance, abuse, misuse, accident or other damage; if it was not installed in accordance with American Standard's instructions; or if it has been modified in a manner inconsistent with the product as shipped by American Standard.

American Standard's option to repair or exchange the product under this limited warranty does not cover any labor or other costs of removal or installation including any costs of any surrounding material such as tile or marble. American Standard is not responsible for any other incidental or consequential damages attributed to a product defect or to the repair or exchange of a defective product, all of which are expressly excluded from the warranty. This limited warranty does not cover the extension beyond the duration of this limited warranty of any implied limited warranties, including those of merchantability or fitness for an intended purpose. (Some states or provinces do not allow the exclusion or limitation of implied warranties, so this exclusion may not apply to you.)

This limited warranty gives you specific legal rights. You may have other statutory rights that vary from state to state or from province to province, in which case this limited warranty does not affect such statutory rights.

For service under this warranty, it is suggested that a claim be made through the contractor or dealer from or through whom the product was purchased, or that a service request (including a description of the product model and of the defect) be sent to the following address:

In the United States:

American Standard Brands,
1 Centennial Ave
Piscataway, New Jersey 08854
Attention: Director of Consumer Affairs
For residents of the United States, warranty
information may also be obtained by calling
the following toll free number: (800) 442-1902
www.americanstandard.com

In Canada:

LIXIL Canada ULC
5900 Avebury Road
Mississauga, Ontario
Canada L5R 3M3
Toll Free: (800) 387-0369
www.americanstandard.ca

In Mexico:

Customer Service Manager
AS Maquila, S.A. de C.V.
Via Morelos #330
Col. Santa Clara
Ecatepec 55540 Edo. Mexico
www.americanstandard.com.mx

**THIS WARRANTY IS NOT TRANSFERABLE
FROM ORIGINAL CONSUMER PURCHASER.**

AQUASPEC[®] FAUCETS

MODEL - Z86100-XL SERIES
SINGLE BASIN METERING



TECHNICAL INFORMATION

FLOW: 0.25 GPC MAXIMUM; PRESET AT FACTORY TO 10 TO 15 SECONDS @ 80 PSI ADJUSTABLE

MAXIMUM PRESSURE: 80 PSI

MAXIMUM TEMPERATURE: 140° F

- CAN USE QUARTER TURN CERAMIC DISK CARTRIDGE

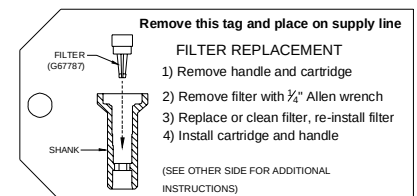
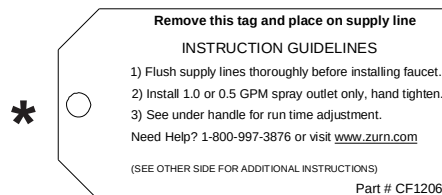
Z86100XLC P4

IMPORTANT THE WATER SUPPLY LINES MUST BE THOROUGHLY FLUSHED BEFORE INSTALLATION TO PREVENT FOREIGN MATTER AND DEBRIS FROM CLOGGING AND/OR DAMAGING INTERNAL COMPONENTS

IMPORTANT THE FAUCET HAS AN INTEGRAL SHANK FILTER ASSEMBLY INSTALLED IN THE BODY UNDER THE METERING CARTRIDGE TO PREVENT FOREIGN MATTER AND DEBRIS FROM DAMAGING THE FAUCET. THE INTEGRAL FILTER MAY BE REMOVED TO BE BACK-FLUSHED AND CLEANED IF INSUFFICIENT FLOW IS DETECTED. THE INTEGRAL SHANK FILTER ASSEMBLY MUST BE RE-INSTALLED AFTER SERVICING TO ENSURE PROPER FUNCTIONING OF THE METERING CARTRIDGE.

* INSTALLATION INSTRUCTIONS

1. THE WATER SUPPLY LINE MUST BE THOROUGHLY FLUSHED BEFORE FAUCET INSTALLATION.
2. REMOVE FAUCET BODY FROM CARTON AND PLACE GASKET (#7A) ON SHANK.
3. PLACE FAUCET ON SINK, MOUNT LOCKWASHER (#7B) AND MOUNTING NUT (#7C) ONTO SHANK FROM UNDER SINK.
4. HAND TIGHTEN MOUNTING NUT (#7C). MAKE SURE FAUCET IS CENTERED PROPERLY. DO NOT OVER TIGHTEN, YOU COULD DAMAGE THE FIXTURE.
5. ATTACH LAVATORY SUPPLY TO THE FAUCET WITH RISER NUT (#7D).
6. REMOVE MAINTENANCE TAG FROM SPOUT END AND ATTACH TO SHANK OF FAUCET UNDER SINK FOR FUTURE REFERENCE * .
7. OPTIONAL GRID STRAINER (-G)/HANDICAP OFFSET GRID DRAIN (-GH):
INSTALL GRID STRAINER IN SINK OUTLET AND PLUMB WASTE CONNECTION.
8. TURN SUPPLY WATER ON AND OPERATE THE FAUCET WHILE CHECKING FOR LEAKS
9. INSTALL SPRAY OUTLET (#6) INTO FAUCET AND HAND TIGHTEN.
10. METERING CARTRIDGE IS FACTORY PRESET FOR A 10 TO 15 SECOND CYCLE AT 80 PSI, IF ADJUSTMENT IS NECESSARY, SEE "ADJUSTING THE CYCLE TIME" SECTION (PAGE 2).



ZURN INDUSTRIES, LLC ♦ COMMERCIAL BRASS OPERATION ♦ 2640 SOUTH WORK STREET ♦ FALCONER NY 14733

Phone: 1-800-997-3876 ♦ Fax: 1-919-775-3541 ♦ www.zurn.com

In Canada: ZURN INDUSTRIES LIMITED ♦ 3544 Nashua Drive ♦ Mississauga, Ontario L4V1L2 ♦ Phone: 905/405-8272 Fax: 905/405-1292

MAINTENANCE

1. YOUR ZURN AQUASPEC FAUCET HAS A HIGHLY POLISHED NICKEL CHROME PLATED FINISH. CLEAN WITH SOAP AND WATER OR A MILD CLEANER WHICH IS SAFE FOR CHROME PLATING. DO NOT USE ACIDS OR TOILET BOWL CLEANER AS THEY WILL DAMAGE THE FINISH.
 2. METERING CARTRIDGE (#3) REMOVAL AND REPLACEMENT (SEE SERVICE VIDEO AT WWW.ZURN.COM/OPERATIONS/AQUASPEC/PAGES/SERVICEVIDEOMENU.ASP)
 - 2.1. REMOVE COLORED INDEX BUTTON (#1C) FROM HANDLE (#1A)
 - 2.2. LOOSEN SET SCREW (#1B) IN HANDLE WITH 3/32" ALLEN WRENCH
 - 2.3. PULL UP ON HANDLE TO REMOVE FROM STEM (#2C) OF HANDLE NUT ASSEMBLY (#2)
 - 2.4. REMOVE HANDLE NUT ASSEMBLY (#2) USING 1-1/8" HEX 6-POINT SOCKET
 - 2.5. REMOVE METERING CARTRIDGE (#3) BY LIFTING OUT OF FAUCET BODY (#5). IT MAY BE NECESSARY TO OPEN THE SUPPLY STOP SLIGHTLY TO ALLOW WATER PRESSURE TO PUSH THE METERING CARTRIDGE UPWARD.
 - 2.6. INSPECT METERING CARTRIDGE (#3) FOR WORN PARTS, DAMAGED PARTS AND ANY CONTAMINATION THAT MAY BE PREVENTING THE METERING CARTRIDGE FROM MOVING FREELY OR SEATING. OTHER THAN CLEANING ANY TRAPPED DEBRIS, THERE ARE NO SERVICEABLE PARTS IN THE METERING CARTRIDGE. CONTAMINATED OR DAMAGED METERING CARTRIDGE ASSEMBLIES SHOULD BE REPLACED.
 - 2.7. REVERSE STEPS 2.1 THROUGH 2.5 FOR RE-ASSEMBLY. TIGHTEN CAP (#2F) WITH 1-1/8" HEX 6-POINT SOCKET UNTIL NO WATER IS LEAKING FROM UNDER THE HANDLE NUT ASSEMBLY WHEN THE FAUCET IS RUNNING. HOLD DOWN HANDLE (#1) WHILE TIGHTENING SET SCREW (#1B) TO ENSURE PROPER SEATING
 3. IT MAY BE NECESSARY TO REPLACE OR BACK FLUSH THE INTEGRAL SHANK FILTER CARTRIDGE AND AERATOR PERIODICALLY TO REMOVE COLLECTED SEDIMENT AND DEBRIS
 - 3.1 THE INTEGRAL SHANK FILTER (#4) MAY BE REMOVED BY USING A 1/4" ALLEN WRENCH. CLEAN OR REPLACE AS REQUIRED.
-

ADJUSTING THE CYCLE TIME ON ZURN METERING FAUCET

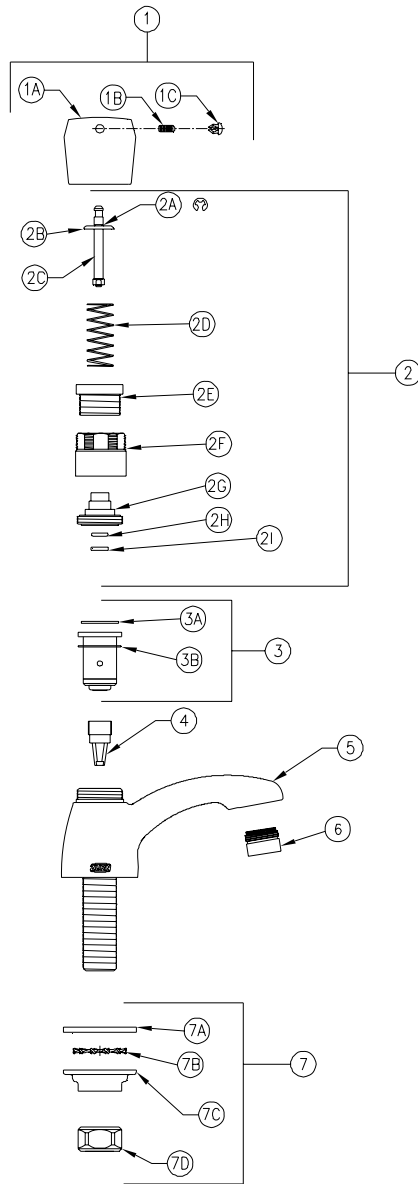
(SEE SERVICE VIDEO AT WWW.ZURN.COM/OPERATIONS/AQUASPEC/PAGES/SERVICEVIDEOMENU.ASP)

1. METERING FAUCETS ARE FACTORY PRESET FOR A 10 SEC. CYCLE AT 80 PSI.
2. ACTUATE FAUCET 3 TO 5 TIMES TO REMOVE ANY TRAPPED AIR IN THE SUPPLY LINE OR FAUCET
3. REMOVE HANDLE (#1) PER INSTRUCTIONS IN MAINTENANCE SECTION 2.1 THROUGH 2.3 TO EXPOSE ADJUSTMENT NUT (#2E)
4. INCREASE CYCLE TIME BY TIGHTENING ADJUSTMENT NUT (#2E) 1/2 TURN CLOCKWISE. DECREASE CYCLE TIME BY LOOSENING ADJUSTMENT NUT 1/2 TURN COUNTERCLOCKWISE. CHECK FOR DESIRED CYCLE TIME BY ACTUATING FAUCET WITH HANDLE (#1) IN PLACE ON STEM (#2C)

REPLACEMENT PARTS

HANDLE NUT ASSEMBLY	G60561
METERING CARTRIDGE ASSEMBLY	G61754
HANDLE ASSEMBLY	G60522
INTEGRAL SHANK FILTER ASSEMBLY	G67787

✱ Installation Instructions are revised frequently.
Please access website for the latest revision.



Z86100-XL PICTURED

ITEM	PART#	DESCRIPTION	QTY	ITEM	PART#	DESCRIPTION	QTY
1	G60522	METERING HANDLE ASSEMBLY	1	2H	62499107	O-RING	1
1A	60601003	COLD METERING HANDLE	1	2I	60458001	O-RING RETAINER	1
1B	62705001	SET SCREW	1	3	G61754	METERING CARTRIDGE ASS'Y	1
1C	G60558	METERING INDEX BUTTONS-H,C,T	1	3A	58155020	O-RING	1
	60460001	HOT INDEX	1	3B	81241001	WASHER	1
	60460002	COLD INDEX	1	4	G67787	INTEGRAL SHANK FILTER	1
	60460003	TEMPERED INDEX	1	5	92285004	SINGLE BASIN BODY	1
2	G60561	HANDLE NUT ASSEMBLY	1	6	G63561	13/16\"-27 MALE SPRAY OUTLET	1
2A	60465001	E RING	1	7	G63367	MOUNTING HARDWARE	1
2B	60450001	SPRING SEAT	2	7A	60549001	GASKET	1
2C	60451003	STEM	1	7B	61613019	LOCKWASHER	1
2D	60447001	SPRING	1	7C	59530002	MOUNTING NUT	1
2E	60446001	ADJUSTMENT NUT	1	7D	59532001	1/2\" NPSM RISER NUT	1
2F	60452001	CAP	1				
2G	60456001	STEM HOUSING	1				

METERING FAUCET TROUBLE SHOOTING GUIDE

<u>PROBLEM</u>	<u>CAUSE</u>	<u>SOLUTION</u>
No water dispensing from faucet.	Supply stops not open.	Open supply stops.
	Spray outlet (item 6) contaminated.	Remove spray outlet (item 6) to clean and/or replace.
	Filter assembly (item 4) contaminated.	Shut off water supply. Remove filter assembly to clean and/or replace. Filter located internally within faucet body under metering cartridge.
Faucet is shutting off too quickly	Timing nut (item 2E) requires adjustment.	Remove handle (item 1) using 3/32" Allen wrench. Rotate timing nut (item 2E) down (CW) to lengthen handle stroke and increase cycle time.
	Metering cartridge (item 3) is damaged.	Replace metering cartridge (item 3) G61754 per Installation and Maintenance guide, page 2
Faucet is running too long or will not shut off	Timing nut (item 2E) requires adjustment.	Remove handle (item 1) using 3/32" Allen wrench. Rotate timing nut (item 2E) up (CCW) to shorten handle stroke and decrease cycle time.
	Metering cartridge (item 3) is overly contaminated or damaged.	Replace metering cartridge (item 3) G61754 per Installation and Maintenance guide, page 2
	Spray outlet (item 6) is not installed <u>or</u> incorrect spray outlet (item 6) installed.	Install 1.0 GPM or 0.5 GPM spray outlet (item 6). Facuet may not shut off with flow rate > 1.0 GPM.
	Handle nut (item 2) is not adequately tightened	Tighten handle nut (item 2) using 1-1/8" hex 6 point socket to create seal and seat metering cartridge. Do not over tighten.



AquaSpec® Commercial Faucets Terms and Conditions

Price and Terms of Payment

Terms are net, payable 30 days from date of invoice. All pricing is in U.S. currency. The Buyer shall pay all sales, consumers, or other applicable taxes. A 1-1/2% per month service charge will be added to all past due invoices. Annual rate 18% of the outstanding balance due.

Minimum invoice \$100.00. Zurn reserves the right to apply a minimum order charge to equal \$100.00. All orders are subject to credit approval by the Zurn Credit Department prior to the acceptance of an order. Orders may be refused, delivery may be withheld, or shipment stopped in transit without any liability on Zurn's part if in its sole opinion, the Buyer's ability to pay for the merchandise or the terms and conditions herein are in doubt. The Credit Department of Zurn must be notified of potential pricing errors within 30 days of invoice date.

Freight

All sales are F.O.B. Zurn's plant. Zurn will allow full freight allowance only on Zurn AquaSpec® Commercial Faucet orders of \$3,000 or more. This full freight allowance is when the shipment is within the continental United States and has a destiny of a Buyer's standard address of job location. Routing of shipment shall be determined at the sole discretion of Zurn. Multi product line orders totaling \$7,500 can be combined to meet FFA guidelines. Shipping dates are estimates and time of delivery is not the essence of this sale of the contract therefore. Under no circumstances will Zurn have any responsibility on account of any delays in manufacture, transportation, or otherwise.

Limited Warranty

All goods sold hereunder are warranted to be free from defects in material and factory workmanship for a period of three years from the date of purchase. Zurn will replace goods at no cost that prove defective provided Zurn is notified in writing of such defect and the goods are returned to Zurn prepaid at Falconer, New York, with evidence that they have been properly maintained and used in accordance with instructions. ZURN SHALL NOT BE RESPONSIBLE FOR ANY LABOR CHARGES OR ANY LOSS, INJURY, OR DAMAGES WHATSOEVER, INCLUDING, BUT NOT LIMITED TO, INCIDENTAL OR CONSEQUENTIAL DAMAGES. The sole and exclusive remedy shall be limited to the replacement of the defective goods. Before installation and use, the purchaser shall determine the suitability of the product for his intended use and the purchaser assumes all risk and liability whatever in the connection therewith. Where permitted by law, THE IMPLIED WARRANTY OF MERCHANTABILITY IS LIMITED TO A PERIOD OF THREE YEARS AND SHALL BE LIMITED SOLELY TO THE REPLACEMENT OF THE DEFECTIVE GOODS. All weights stated in Zurn catalogs and lists are approximate and are not guaranteed.

Illustrations of Typical Installations

The typical installations for various products found in each product section are intended to illustrate the products and potential options for the use of these products. Under no circumstances are they to be construed as recommended installation procedures. Consult local codes and project specifications for proper installation instructions.

Returned Goods

Standard cataloged material may be returned only with written permission of Zurn. Returned goods are subject to a 25% restocking charge of total saleable material returned, plus cost of reconditioning, if necessary, to make material sellable. Transportation charges are the responsibility of the Buyer. Credit allowance will be in the form of merchandise credit only – not cash credit. The value of a return must total at least \$100.00 to qualify for credit allowance. No credit will be allowed for parts unless originally ordered and invoiced as parts. No credit will be allowed for discontinued or made-to-order items. Items that have been specially made are not subject to return or cancellation except by special negotiation. Material must be returned within two years of invoice date for credit to be issued.

Shortage/Damage Claims

Notification of material shortages or incorrect filling of orders must be made to Zurn within 10 days of receipt. No claims over three months old will be honored. Buyer agrees to make all complaints for damage in transit or "short count" directly to the carrier; before the contents are unloaded have the carrier agent's acknowledgement of such damage noted on the bill of lading and to present to the carrier its agent's acknowledgement of such damaged material with formal claim covering said damage.

General

Zurn reserves the right to make changes in design or equipment of any item or product without incurring any obligation on previously sold items, and to discontinue items at any time, without notice. Possession of this Catalog or other sales literature is not to be construed as an offer to sell. All orders are subject to acceptance by the general office of Zurn in Falconer, New York.

Catalog printed in U.S.A.

PF200 Series

Trap Covers



Product Features

- ADA & UFAS Compliant
- No tools required contractor friendly Tear-To-Fit feature makes trimming fast
- Universal design fits virtually all lavatory applications
- Smooth, flush SnapClip™ fasteners firmly secure piping covers in place and are nonabrasive and reusable
- Antimicrobial vinyl maintain sanitary conditions
- Lock Lid™ on valve stops tampering and allows service
- Cleanout nut cap allows service on trap without disassembly
- Internal ribs enhance K valve and soften impact cushioning
- Fire retardant

Model Numbers

PF200WH PF201WH PF202WH PF203WH PF205WH PF209WH PFEXT200WH

Material	Soft, resilient molded vinyl
Nominal Wall	1/8" constant with internal ribs
Durometer	70-80 – Shore A
UV Protection	Will not fade or discolor
Durability	Virtually indestructible
Trimming	E-Z Tear-To-Fit trim feature (no tools needed)
Fasteners	Internal E-Z Grip fasteners, reusable
Color	China white
Compatibility	Fits all 1-1/4" or 1-1/2" cast brass or tubular P-trap assemblies and 3/8" or 1/2" angle stop assemblies
Paintability	Apply latex paint
Burning Characteristics ASTM D-635	Self extinguished 0 sec (ATB) mm (AEB)
Bacterial/Fungus Resistance	ASTM G21 and G22 – Result: 0 growth
Maintenance	Wipe clean using common detergents

New E-Z Tear-To-Fit feature and E-Z Grip built-in fasteners make installation fast and easy!

1. Tear-To-Fit on internal, dimensioned tear lines for quick, clean, accurate trimming to fit virtually any piping configuration. Covers flex to install over pipes.
2. Press seams together at finger recesses to engage E-Z Grip internal fasteners for a secure, safe, tamper-resistant installation. To remove cover, firmly pull seam apart using a strong grip. To reinstall, press seams back together.

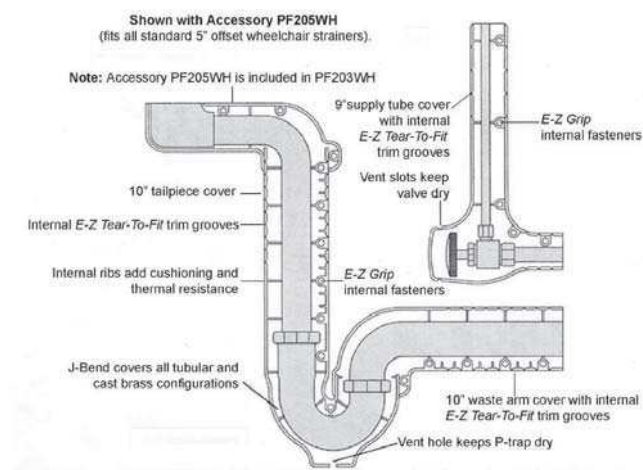
Warranty and Codes

This PROFLO product carries a 1-year limited warranty. This product meets ADA article 4.19.4; CABO/ANSI 4.20.4; UFAS 4.19.4; California Title 24; UPC/IAPMO ICC; Canada Barrier-Free Code. Made in USA.



Product Specifications

PF201WH



PF200WH	one P-trap cover
PF201WH	one P-trap cover, one angle valve and supply cover
PF202WH	one P-trap cover, two angle valves and supply covers
PF203WH	one P-trap cover, two angle valves and supply covers, one 5" offset tailpiece wheelchair strainer cover
PF209WH	one angle valve and supply cover
ACCESSORIES	
PF205WH	one 5" offset tailpiece wheelchair strainer assembly
EXTENSIONS	
PFEXT200WH	one 16" extension for drain waste or tailpiece



Spec Section:

O&M Name

P-4

AQUASPEC[®] FAUCETS

MODEL - Z84300 SERIES
SINK FAUCET



TECHNICAL INFORMATION

MAXIMUM PRESSURE: 125 PSI

MAXIMUM TEMPERATURE: 180° F

HANDLE NUT TORQUE: 15-20 FT - LBS.

CARTRIDGE STYLE: QUARTER TURN CERAMIC DISK

INSTALLATION INSTRUCTIONS

1. 1/2" IP NIPPLE SHOULD PROTRUDE 3/8" FROM THE FINISHED WALL ON 8" CENTERS. SUPPLY PIPES SHOULD BE SECURED TO SUPPORT THE FAUCET.
2. APPLY PIPE SEALANT TO 1/2" THREADS OF SUPPLY PIPE AND SCREW SUPPLY ARM ASSEMBLY (ITEM #5) ONTO PIPE. POSITION SUPPLIES SO THAT THE BODY CONNECTIONS END UP AT 8" CENTERS ON A HORIZONTAL PLANE.
3. INSERT SINK FAUCET BODY (ITEM #4) TO SUPPLY ARMS PLACING GASKET (ITEM #5A) BETWEEN BODY AND SUPPLY ARM.
4. ASSEMBLE SPOUT TO BODY USING HARDWARE.
5. INSTALL WALL BRACE BY SCREWING THE SUPPORT ROD INTO THE THREADED SPOUT CONNECTION. ADJUST THE SUPPORT ROD TO DESIRED LENGTH AND SECURE TO FINISHED WALL USING THE TWO WOOD SCREWS PROVIDED.

NOTE: SUPPORT FOR FINISHED WALL IS RECOMMENDED WHERE WALL BRACE MOUNTS FOR MAXIMUM SUPPORT.

6. TURN WATER SUPPLY ON AND OPERATE FAUCET CHECKING FOR LEAKS.
 7. IT MAY BE NECESSARY TO SHUT WATER OFF AND REMOVE CARTRIDGES TO CLEAN SUPPLY LINES. CARTRIDGES CAN BE REMOVED BY FIRST REMOVING THE HANDLES. COLOR INDEXES CAN BE REMOVED BY INSERTING A PIN INTO THE HOLE ON THE UNDERSIDE OF THE HANDLE. AFTER THE HANDLES HAVE BEEN REMOVED UNSCREW THE HANDLE NUTS AND PULL OUT ON THE CARTRIDGE. ZURN WILL SUPPLY HANDLE PORT PLUGS (ZURN PART #61094001) AT YOUR REQUEST.
 8. REPLACE CARTRIDGES IN BODY AND HAND TIGHTEN HANDLE NUTS. PLACE HANDLES ON THE CARTRIDGE STEM AND LOCATE THEM AS DESIRED. TIGHTEN HANDLE NUTS.
 9. REPLACE HANDLE SCREWS AND COLOR INDEX BUTTON.
 10. IF NECESSARY, INSTALL AERATOR INTO SPOUT AND HAND TIGHTEN. IT MAY BE NECESSARY TO UNSCREW AND CLEAN AERATOR AT START-UP.
-

CAUTION-FOR INSTALLATION WITH ATMOSPHERIC VACUUM BREAKERS (AVB'S). THIS DEVICE SHOULD NEVER BE USED IN INSTALLATIONS THAT ARE UNDER CONTINUOUS PRESSURE WHEN INSTALLED WITH SPOUTS HAVING ATMOSPHERIC VACUUM BREAKERS (AVB'S). THEREFORE, NEVER PLACE A SELF-CLOSING, SHUT-OFF VALVE DOWN-STREAM OF AN AVB.

SERVICE INSTRUCTIONS

1. YOUR ZURNAQUASPEC FAUCET IS FURNISHED WITH INTEGRAL SUPPLY STOPS (ITEM #4B) TO PROVIDE A COMPLETE SHUT OFF OF THE WATER SUPPLY. TURN SCREW STOPS INTO BODY USING 5/16" HEX KEY WRENCH UNTIL WATER SHUTS OFF COMPLETELY. TURN STOP NO MORE THAN THREE (3) COMPLETE TURNS TO ACTIVATE WATER FLOW.

MAINTENANCE

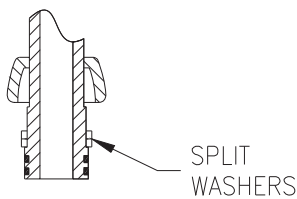
1. YOUR ZURN AQUASPEC FAUCET HAS A HIGHLY POLISHED NICKEL CHROME PLATED FINISH. CLEAN WITH SOAP AND WATER OR A MILD CLEANER WHICH IS SAFE FOR CHROME PLATING. DO NOT USE ACIDS OR TOILET BOWL CLEANER AS THEY WILL DAMAGE THE FINISH.
2. AQUASPEC FAUCETS CONTAIN CERAMIC DISK CARTRIDGES WHICH REQUIRE NO MAINTENANCE. TO REMOVE THE CARTRIDGE, SHUT THE WATER OFF, LOOSEN THE HANDLE NUTS AND PULL UP ON THE CARTRIDGE.

REPLACEMENT PARTS

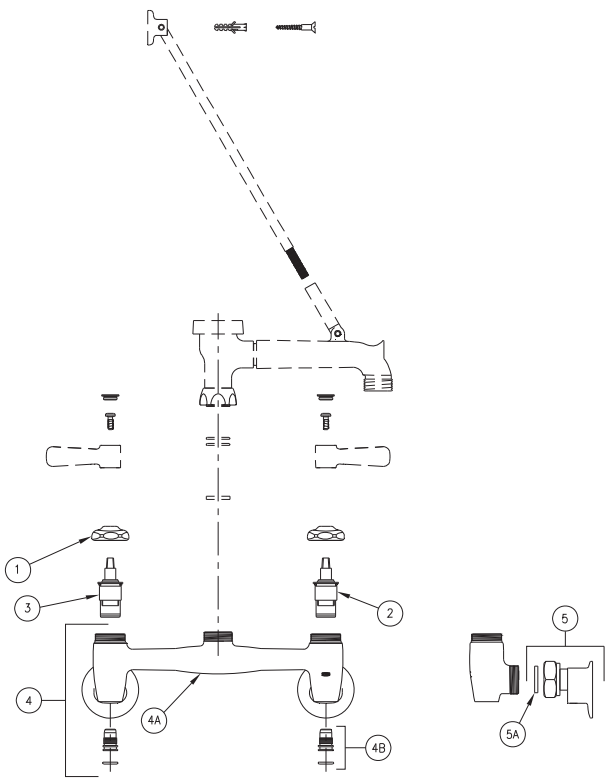
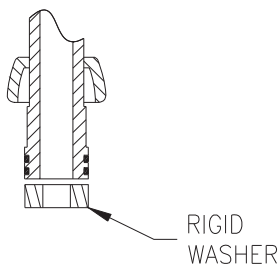
COLD WATER CARTRIDGE	59517001
HOT WATER CARTRIDGE	59517002
INDEX BUTTONS	G60500
STOP PLUG ASSEMBLY	G67807

Z843M1 PICTURED

SWING SPOUT CONFIGURATION



RIGID SPOUT CONFIGURATION



Z84300 PARTS LIST

ITEM				ITEM			
QTY				QTY			
1	59440001	HANDLE NUT	2	4B	G67807	STOP PLUG ASSEMBLY	2
2	59517001	SHORT COLD CARTRIDGE	1		59536002	STOP PLUG	1
3	59517002	SHORT HOT CARTRIDGE	1		58155013	O-RING	1
4	66168001	SINK BODY ASSEMBLY	1	5	G65336	SHORT SUPPLY ARM ASS'Y.	2
4A	66156001	SINK BODY	1	5A	59748001	GASKET	2

Spec Section:

O&M Name

P-7

ELKAY® With FLEXI-GUARD®

INSTALLATION & USE MANUAL

SWIRLFLO® Fountains with FLEXI-GUARD® and ezH2O® Bottle Filler



EZWS-EDFPBM117K



LZWS-EDFPBM117K

INSTALLER



CAUTION:

Review these instructions before beginning installation. Be sure that installation conforms to all plumbing, electrical and other applicable codes.



WARNING:

When installation is complete, ensure these instructions are left in the plastic bag provided inside the installed unit for future reference.



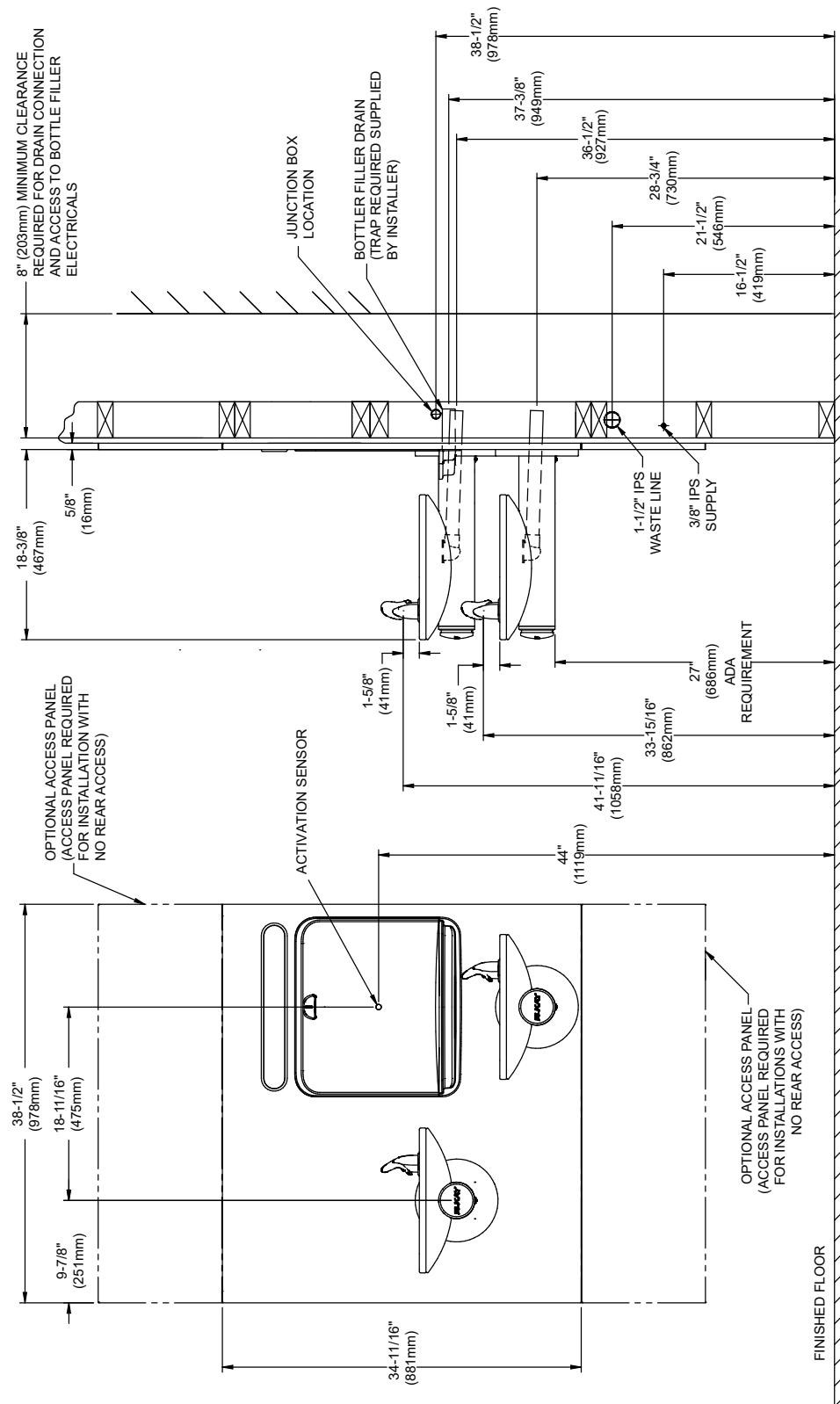
WARNING:

Service to be performed by authorized service personnel only.

NOTE: It is common practice to ground electrical hardware such as telephones, computers and other devices to available water lines. This can, however, cause electrical feedback in the plumbing circuit, which results in an "electrolysis" effect occurring in the fountain. This may result in water which has a metallic taste to it or has a noticeable increase in the metallic content of the water.

When inspecting plumbing circuit, remember the line may be grounded some distance from the installation, and may occur outside the building or area in which the unit is being installed.

This condition can be avoided (in most cases) by using recommended materials during installation. Any drain fittings provided by the installer should be made of **plastic** which will electronically isolate the fountain from the remainder of the building's plumbing circuits.



MAXIMUM WATER SUPPLY PRESSURE: 105 PSI (0.73MPa).
****NEW INSTALLATIONS MUST USE GROUND FAULT CIRCUIT INTERRUPTER *GFCI)**

REQUIRED TOOLS AND MATERIALS

These tables show special tools and/or additional materials (not provided) which are necessary to complete installation of these units:

Special Tools		
Item	Description	Quantity
	NONE	

Additional Materials Not Included		
Item	Description	Quantity
1	Unplated copper inlet pipe	1
2	Service Stop/Shut-off Valve	1
3	90° 1-1/4" Drain Line	1
4	1-1/4" Tee Drain Line	1

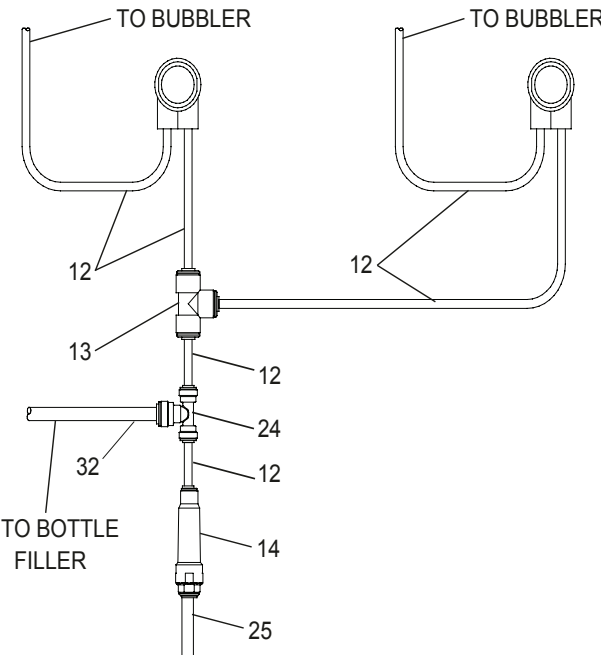


Figure 2 - EZWS-EDFPBM117K Tube Routing

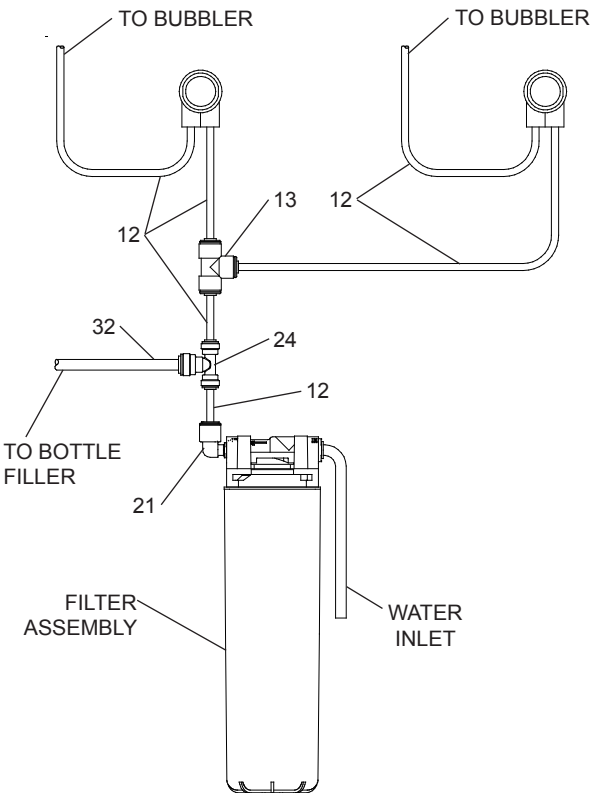


Figure 3 - LZWS-EDFPBM117K Tube Routing

1. **Make** water supply connections (Fig. 11). Install a shut-off valve and union connection to building water supply (valve and union not provided). Turn on water supply and flush the line thoroughly.

Caution: DO NOT SOLDER tubes inserted into the strainer or filter head as damage to the o-rings may result.

2. **Install** mounting frame (instructions supplied with mounting frame).
3. **(For LZWS-EDFPBM117K)** Install the filter head to the bracket, then install filter bracket on mounting frame (Fig. 10), plumb from the filter outlet to the chiller inlet with ¼" elbow, poly tubing and ¼ x ¼ union, install filter.
- 3a. **(For EZWS-EDFPBM117K)** Install strainer on the input tube to the chiller (Fig. 2).
4. **Install** ¼ x ¼ x 3/8 Tee on building water supply tube. Install supplied 4" poly tubing and armaflex to the outlet of the previously installed tee. Connect supplied ¼ x ¼ x ¼ tee to the 4" poly tubing. With the back panel standing close to the frame, connect 3/8" poly tube to the bottle filler.
5. **Hang** main panel on mounting frame hanger. Make sure the power cord, reset switch wire & poly tube do not get pinched between the panel & mounting frame. Ensure the panel engages at the top. Align fountain holes with mounting frame holes.
6. **Remove** protective coating from main panel.
7. **Install** reset switch for bottle filler (Fig. 5). Snap the switch into position after locating wires through slot. Wrap up the excess cord.

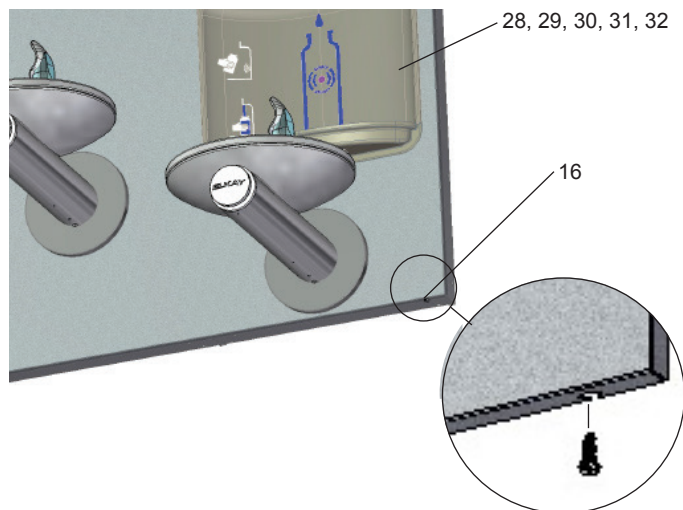


Figure 4 - Upper Panel Installation

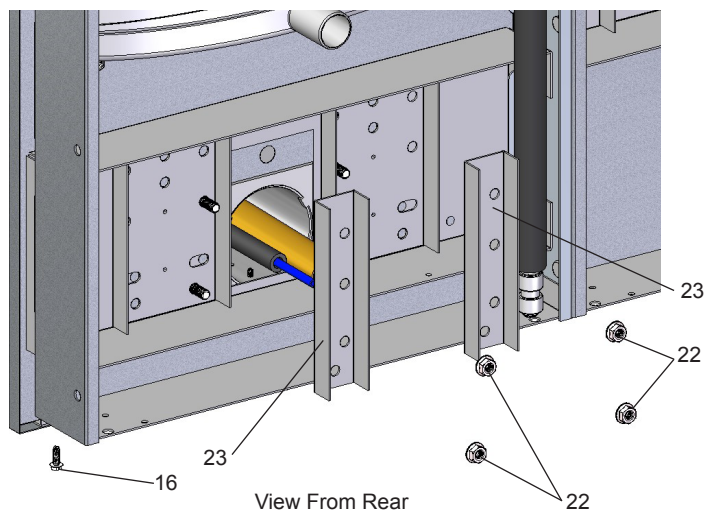
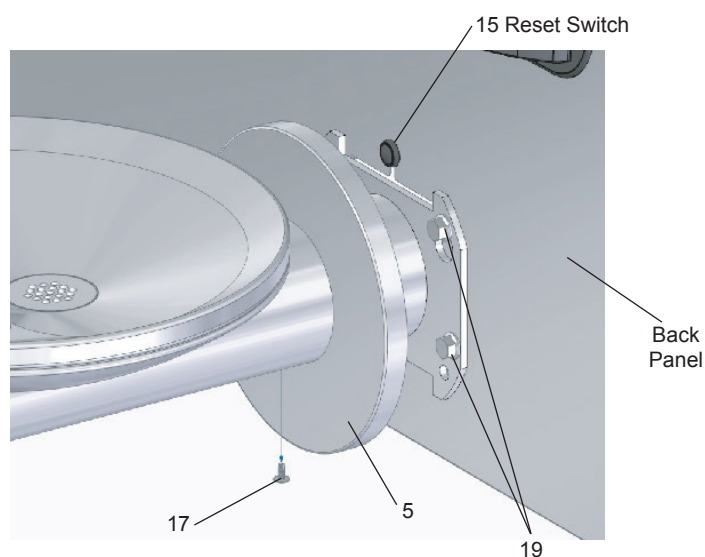


Figure 5 - Fountain Installation

8. **Install** fountains with (8) 5/16-18 HHMS & (8) 5/16-18 nuts (provided) (Fig. 5). Connect the 1/4" water lines from each fountain to the remaining openings on the tee at the remote chiller (cut lines to fit as needed).

9. **Attach** waste tubes (1-1/4" O.D.) to 1-1/4" O.D. slip trap. Trap on the bottle filler side must be 1-1/2" O.D. (provided by others).

10. **Make** final water supply connections.

11. **These** products are designed to operate on 20-105 PSI supply line pressure. If inlet pressure is above 105 PSI, a pressure regulator must be installed in the supply line.

Caution: Any damage caused by connecting these products to a supply line with pressure lower than 20 PSI or higher than 105 PSI IS NOT covered under warranty.

12. **Make** electrical connections to the bottle filler and remote chiller. The LCD Bottle counter should illuminate.

13. **Verify** proper dispensing from the bottle filler by placing a cup, hand or any opaque object in front of sensor area and verify water dispenses. Note: the first initial dispenses might have air in the line which may cause a sputter. This will be eliminated once all air is purged from the line. A steady stream of water assures all air is removed. The sensor has a 20 second maximum ON time. It may be necessary to step away from the beam a few times to purge all air. Check for leaks.

14. **Check** stream height from bubbler. Stream height is factory set for 35 PSI supply. If supply pressure varies greatly from this, remove push button (Item 7 - Fig. 9) and adjust the screw on the regulator (Item 8 - Fig. 9). To remove push button, remove setscrew from bottom of sleeve (Item 6). Insert a small punch in screw hole and push up while grasping the push button and pull forward removing the push button. Clockwise adjustment will raise stream height and counterclockwise movement will lower stream height. For best adjustment stream should hit basin approximately 6-1/2" from the bubbler. Reassemble the push button by pushing in on button until the push button catches in the sleeve. Reinstall the setscrew (Item 20) in the sleeve (Item 6).

15. **Install** the cover plates.

16. **Install** the bottom panel, tighten screws (Fig. 4).

17. **Optional:** Mount optional panels. Slide tongue of panel under edge of already installed panel. Tighten screws.

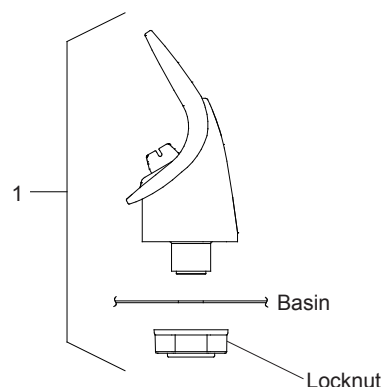


Figure 6 - Bubbler Details

NOTE:

When installing replacement bubbler and pedestal, tighten locknut only to hold parts snug in position. **Do Not overtighten.**

WATERSENTRY® PLUS FILTER PARTS LIST (See Fig. 7)		
ITEM NO.	PART NO.	DESCRIPTION
1	51300C	Filter Assy-30000 Gal.
2	51469C	Assy-Filter & Brkt includes Fltr Head/ Mtg Brkt/John Guest Fittings/Screws



Scan for troubleshooting information and to subscribe to automatic filter replacements at a discount.

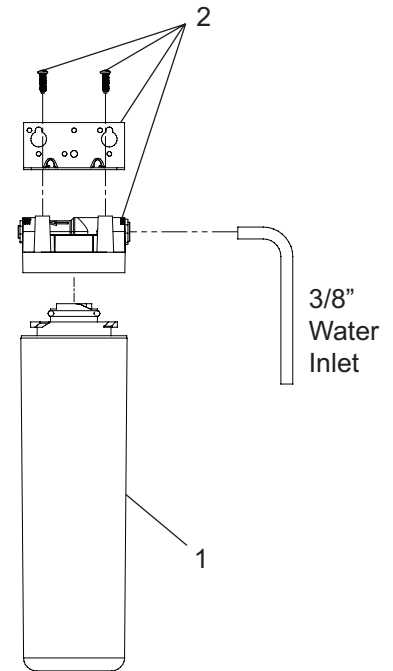


Figure 7

Filter Head Assembly
used after 01/01/2021

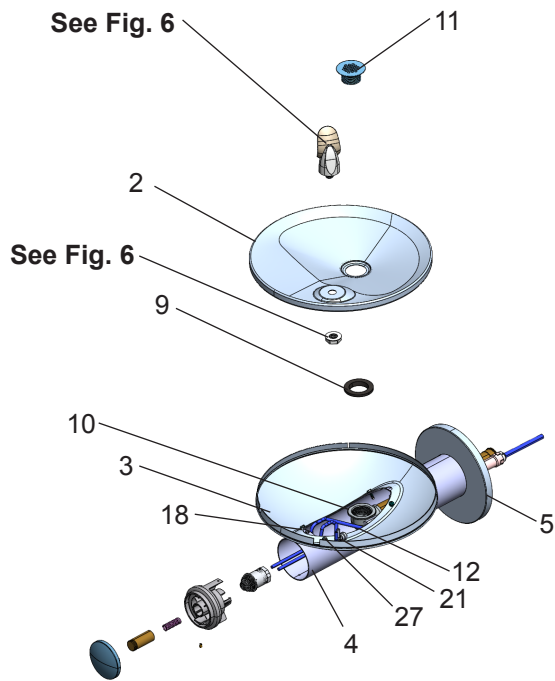


Figure 8 - Fountain Body Assembly

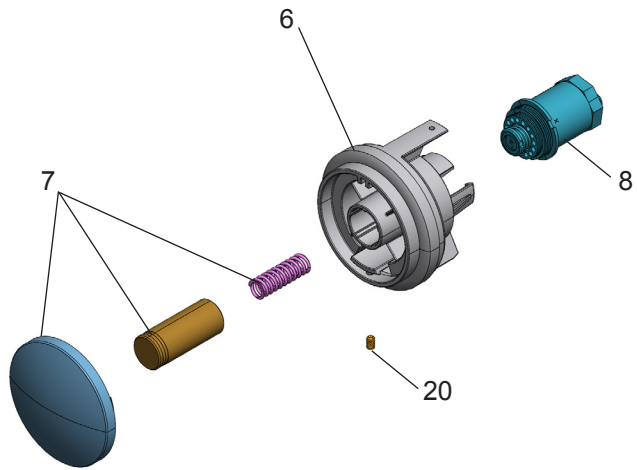


Figure 9 - Push Button Assembly

BF11 - BF12 PROGRAM SETTING THE CONTROL BOARD

VERIFY CONTROL BOARD SOFTWARE

- 1) To verify the software program of the control board the unit will need to be shut down and restarted. The chiller (if present) does not need to be shut down and restarted.
- 2) Shut down the unit by unplugging the power cord from the wall outlet or switching off the circuit breaker to the unit.
- 3) Restart the unit by plugging the power cord back into the wall outlet or by switching on the circuit breaker to the unit.
- 4) Upon start up, the bottle count display will show the software designation of BF11 or BF12.

ACCESSING THE PROGRAMMING BUTTON

- 1) To access the program button, remove #8-32 screw, pull back cover plate on lower fountain arm (Fig. 5). Reset button is located above fountain arm.

RESET THE FILTER MONITOR

- 1) Instructions apply to filtered units only.
- 2) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Monitor
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 3) When the display changes to "RST FLTR", depress the button again. The display will change to show "FLTR =". Depress the button again and the display will show "FLTR =0"
- 4) The Green LED should be illuminated indicating that the visual filter monitor has been reset.

SETTING RANGE OF THE IR SENSOR WHERE APPLICABLE

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 2) When the display changes to "SETTINGS", depress the button again. The display will change to show
"RNG SET" - Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-RFRG)
"FLT SIZE" - Select filter capacity
"RST BCNT" - Reset bottle count
- 3) When display shows "RNG SET" push program button once the display will show current value (can be 1 – 10) e.g. "RNG = 3".
- 4) Once display shows current value push the program button to scroll through value of 1 – 10. Select the desired range setting, "1" being closest to sensor and "10" being farthest away.
- 5) Once range is selected allow approximately 4 seconds to pass and then the display will go back to bottle counter and be in run mode.
- 6) Test bottle filler by placing bottle or hand in front of sensor to make sure water is dispensed.

SETTING UNIT TYPE

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 2) When the display changes to "SETTINGS", depress the button again.
The display will change to show
"RNG SET" - Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-RFRG)
"FLT SIZE" - Select filter capacity
"RST BCNT" - Reset bottle count

Continued from below:

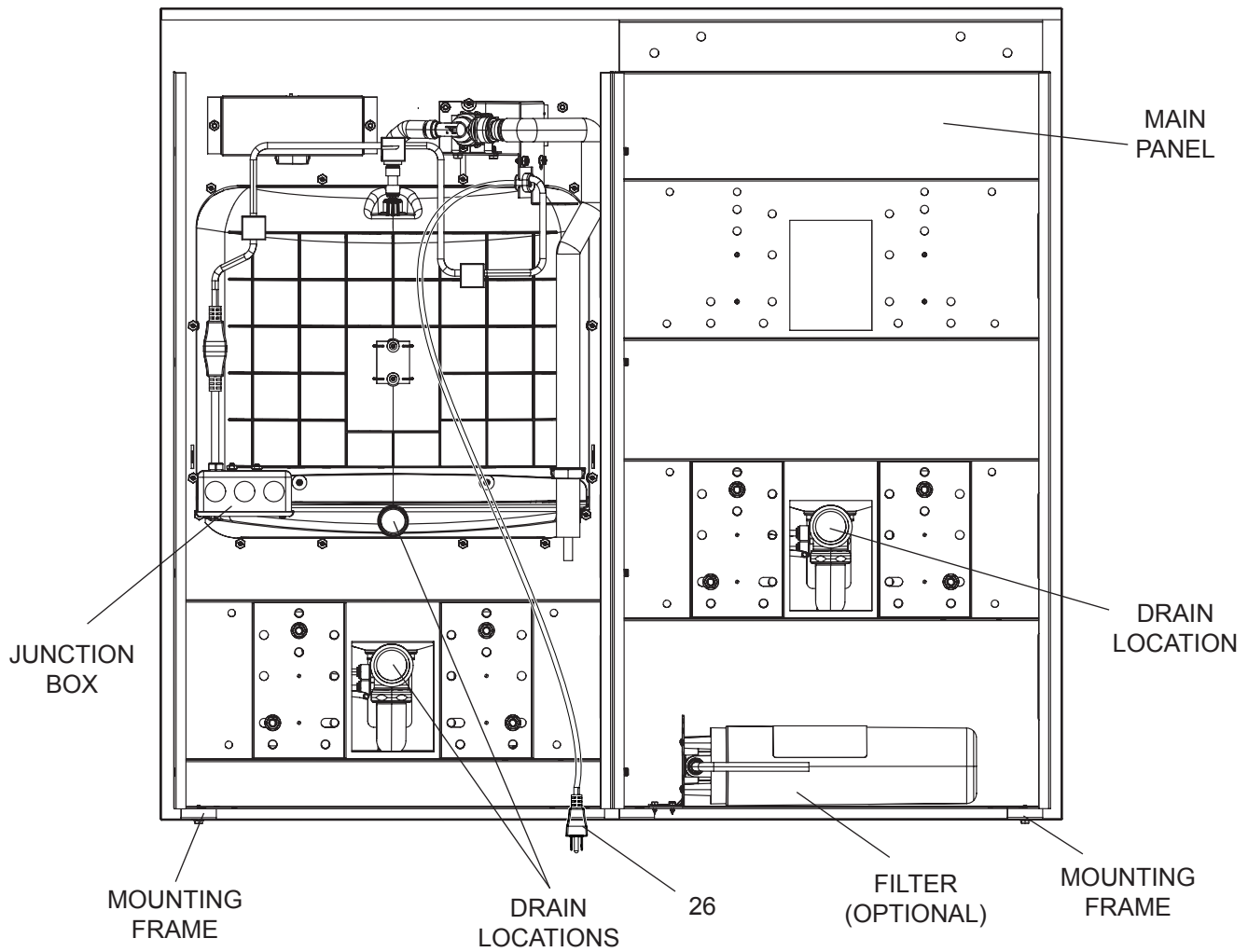
- 3) When display shows "UNIT TYPE" push program button once the display will show current value. Can be REFRIG or NON-RFRG
- 4) Push button once to change value. Once value is selected the display will show the new value. (Can be REFRIG or NON-RFRG)
"REFRIG" - stands for refrigerated product. In this setting the flow rate is estimated at 1.0 gallon per minute.
"NON-RFRG" - stands for nonrefrigerated product. In this setting the flow rate is estimated at 1.5 gallons per minute. Both "REFRIG" and "NON-RFRG" simulate 1 bottle equal to 20 oz.
- 5) Allow approximately 4 seconds to pass and the display will return to bottle counter and be in run mode.

RESETTING BOTTLE COUNT

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 2) When the display changes to "SETTINGS", depress the button again. The display will change to show:
"RNG SET" - Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-RFRG)
"FLT SIZE" - Select filter capacity
"RST BCNT" - Reset bottle count
If the button is not pushed again the display will scroll through the four messages above for three cycles and return to run mode.
- 3) When display shows "RST BCNT" push program button once the display will show current value, e.g. "0033183".
- 4) Once display shows current value push the program button once more to reset back to 0. The display will show BTLCT = 0 for approximately 2 seconds and then return to run mode showing 00000000 bottles.
NOTE: Once the bottle count is reset to zero there is no way to return to the previous bottle count.
- 5) Testing the bottle counter:
REFRIG units: Place bottle or hand in front of sensor for approximately 9 seconds to see bottle counter count 00000001,
(This is based on filling a 20 oz. bottle).
NON-RFRG units: Place bottle or hand in front of sensor for approximately 6 seconds to see bottle counter count 00000001,
(This is based on filling a 20 oz bottle).

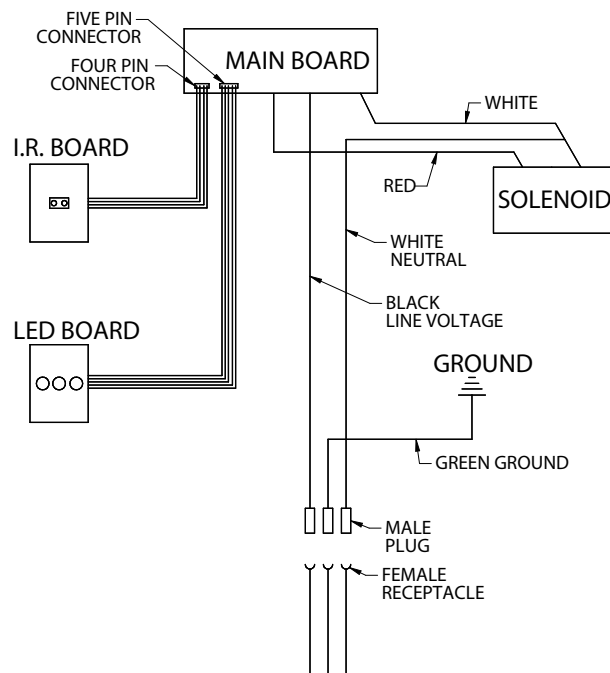
SETTING FILTER CAPACITY

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 2) When the display changes to "SETTINGS", depress the button again. The display will change to show:
"RNG SET" - Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-RFRG)
"FLT SIZE" - Select filter capacity
"RST BCNT" - Reset bottle count
If the button is not pushed again the display will scroll through the four messages above for three cycles and return to run mode.
- 3) When display shows "FLT SIZE" push program button once. The display will show current value. Can be 3000GAL or 6000GAL.
- 4) Push program button again to display the desired "FLT SIZE".
- 5) Allow approximately 4 seconds to pass and the display will return to bottle counter and be in run mode.



NOTE: Bottle filler back cover removed from the view for clarity

Figure 10



Electrical Diagram

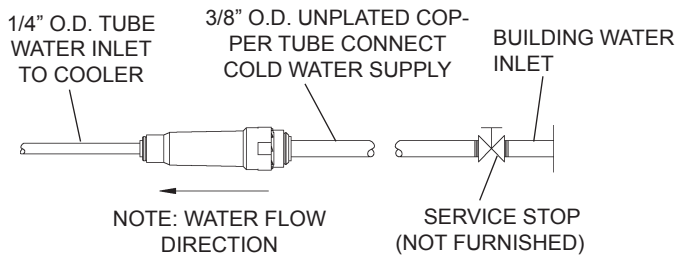


Figure 11 – Water Supply Connections

PARTS LIST		
ITEM NO.	PART NO.	DESCRIPTION
1	56073C	Kit - Bubbler Assy
2	28708C	Basin - Swirlflow
3	28473C	Lower Shell
4	45767C	Fountain Body
5	28343C	Cover Plate
6	45781C	Sleeve
7	98871C	Kit - Swirlflo Pushbutton/Spring
8	2000002461	Kit - Regulator Swirlflo
9	56163C	Gasket - Drain
10	0000000930	Assy - Drain/Tailpipe
11	45768C	Drain - Plug 1-1/2"
12	56092C	Poly Tubing (Cut To Length)
13	1000001994	Kit - Tee 1/4 (3 Pack)
14	55996C	Strainer
15	99003C	Reset Switch Assy
16	111008343890	Screw - #10-24 x .62 HHSM
17	70432C	Screw - #8-32 x .38 THSM
18	38417001	Screw - #8-18 x .37 HHSM
19	75560C	Screw - 5/16-18 x 1.00 HHMS
20	75632C	Setscrew - #10-32 x .38
21	1000001772	Kit - 70817C Elbow 1/4x1/4 (3 Pack)
22	111577343890	Nut - Hex 5/16-18
23	28395C	Bracket - Support
24	1000002062	Kit - Tee 1/4 x 1/4 x 3/8 (3 Pack)
25	62223C	Copper Tube - 3/8" Cut to Length
26	1000005855	Power Cord
27	70288C	Screw - #10X.37 HHSM

BOTTLE FILLER REPLACEMENT PART KITS		
ITEM NO.	PART NO.	DESCRIPTION
28	98543C	Kit - Electrical Package
29	98544C	Kit - EE Sensor
30	2000000503	Kit - Bottle Filler Solenoid Valve 115V
31	98546C	Kit - Aerator Replacement
32	98549C	Kit - Hardware & Waterway Parts

Installation Package

The components for installation are packed in two separate boxes, regardless of the type of unit being installed. The boxes contain the following:

Box No. 1: Wall Frame(s)

Box No. 2: Fountain(s), Arm(s) and Panels

Additional materials, as noted in the Parts List, are also shipped in these boxes.

TROUBLESHOOTING & MAINTENANCE

Orifice Assembly: Mineral deposits on orifice can cause water flow to spurt or not regulate. Mineral deposits may be removed from the orifice by poking with a small round file not over 1/8" diameter, or using a small diameter wire.



CAUTION: DO NOT file or cut orifice material

Stream Regulator: If orifice is clean, regulate flow as in Step 14 of the installation instructions. If replacement is necessary, see parts list for correct regulator part number.

Actuation of Quick Connect Water Fittings: Cooler is provided with lead-free connectors which utilize an o-ring water seal. To remove tubing from the fitting, relieve water pressure, push in on the gray collar while pulling on the tubing. (See Fig. 12) To insert tubing, push tube straight into fitting until it reaches a positive stop (approximately 3/4").

OPERATION OF QUICK CONNECT FITTINGS

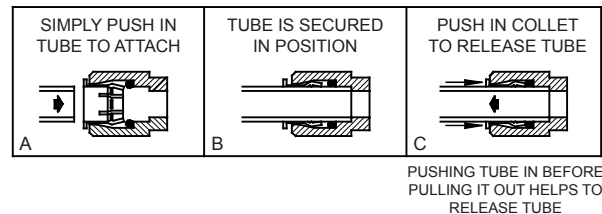


Figure 12 – Quick Connect Fittings



2000000495

Patent zurnelkay.com/patents

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REPAIR SERVICE INFORMATION TOLL FREE NUMBER 1.800.260.6640

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Spec Section:

O&M Name

P-8



SYMMONS® Temptrol® II

BP and 2000 Series Pressure-Balancing Mixing Valve for Shower or Tub/Shower Application

INSTALLATION, OPERATION & SERVICE INSTRUCTIONS

Symmons valves and shower heads comply to all known standards, codes and specifications: CSA B-125, ANSI A112.18.1M, ASSE 1016, EPA '92 etc.

Symmons shower heads are equipped with a 2.5 GPM (9.5 L/min) water and energy saving flow restrictor.

LIFETIME LIMITED WARRANTY

Symmons warrants to the original consumer purchaser that any TEMPTROL® series* or SYMMETRIX® product will be free of defects in material and workmanship during normal domestic use for the life of your home. All other products and purchasers including industrial, commercial or business use are warranted for a period of 5 years from the date of purchase. At our option, we will either have you send the defective part or product prepaid to us for inspection, or we may elect to send you the replacement part or product without investigation. A replacement for any defective part will be supplied FREE OF CHARGE for installation by the purchaser. Defect or damage caused by the use of replacement parts other than Symmons Genuine Replacement Parts will void this warranty. This warranty excludes product damage due to installation error, product abuse, or product misuse whether performed by a contractor, service company or yourself. Symmons further warrants that any TEMPTROL or SYMMETRIX product will be leak free and drip free during normal domestic use for the life of your home. If the product should develop a leak or drip, Symmons will provide FREE OF CHARGE the parts necessary to return it to good working condition. Proof of purchase (original sales receipt) and a copy of the warranty registration card from the original consumer purchaser must accompany all warranty claims. This warranty is applicable only to Symmons TEMPTROL or SYMMETRIX products purchased after July 1, 1998 and shall be effective from the date of purchase as shown on the purchaser's receipt. Damage to the chrome and/or other decorative finishes on Symmons products may be a result of improper handling or abusive treatment. Finishes should only be cleaned with a soft, damp cloth or sponge. Use of polish, abrasive cleaners, solvents, or acid cleaners will damage the finish and void this warranty. There are no other express warranties on this product and ALL WARRANTIES OF MERCHANTABILITY AND OTHER IMPLIED WARRANTIES ARE LIMITED IN ACCORDANCE WITH APPLICABLE LAW. SYMMONS INDUSTRIES, INC., EXPRESSLY DISCLAIMS CONTINGENT LIABILITY AND CONSEQUENTIAL DAMAGE OF EVERY KIND. Since some states do not allow limitations on how long an implied warranty lasts or an exclusion or limitation of incidental or consequential damages the above limitation or exclusion may not be applicable. This warranty gives specific legal rights. Other rights may vary from state to state. To obtain warranty service, write to Symmons Industries, Inc., 31 Brooks Drive, Braintree, MA 02184-3804 or call our Customer Service Department at 1-800-SYMMONS. If writing to us, please include proof of purchase, the model number of the product with a brief description of the problem, your name, address and phone number.

*Temptrol series includes Allura®, Olde Braintree Brass®, Temptrol, Temptrol Deluxe and Temptrol II shower and tub/shower systems.

IMPORTANT: After completion of installation step 4, follow these instructions to set the Temptrol II Limit Stop Screw. This valve is equipped with a limit stop screw to be used to limit valve handle from being turned to excessively hot water discharge temperatures. To adjust, remove dome cover, open valve to maximum desired temperature and turn in limit stop screw until it seats.

WARNING: FAILURE TO ADJUST THE LIMIT STOP SCREW PROPERLY MAY RESULT IN SERIOUS SCALDING.

WARNING: THIS SHOWER SYSTEM MAY NOT PROTECT THE USER FROM SCALDING WHEN THERE IS A FAILURE OF OTHER TEMPERATURE CONTROLLING DEVICES ELSEWHERE IN THE PLUMBING SYSTEM.



For ADA compliance (Americans with Disabilities Act) consult ADAAG or your state regulations for proper product choice and mounting locations.

PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE STARTING INSTALLATION. SAVE THIS MANUAL FOR FUTURE REFERENCE.

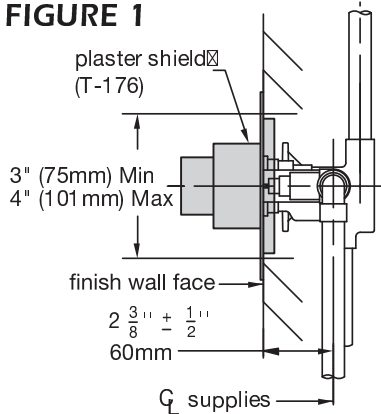


INSTALLATION OF: SHOWER SYSTEMS AND TUB/SHOWER SYSTEMS

Tools required for installation of this product are: Phillips screw driver, tubing cutter, teflon tape, soldering equipment, adjustable wrench and channelHock pliers.

1. Install piping and fittings with valve body as shown in Figure 2 or 3. **IMPORTANT: Valve rough-in is 2-3/8" +/- 1/2" from CENTERLINE OF SUPPLIES TO FACE OF FINISH WALL.** Install so that line indicated on rough-in plaster shield (T-176) on valve is flush with finish wall as shown in Figure 1 (See Figure 5 for fiberglass wall installation).

FIGURE 1



Tub/Shower System (Figure 2) Model BP-56-2, 25-2

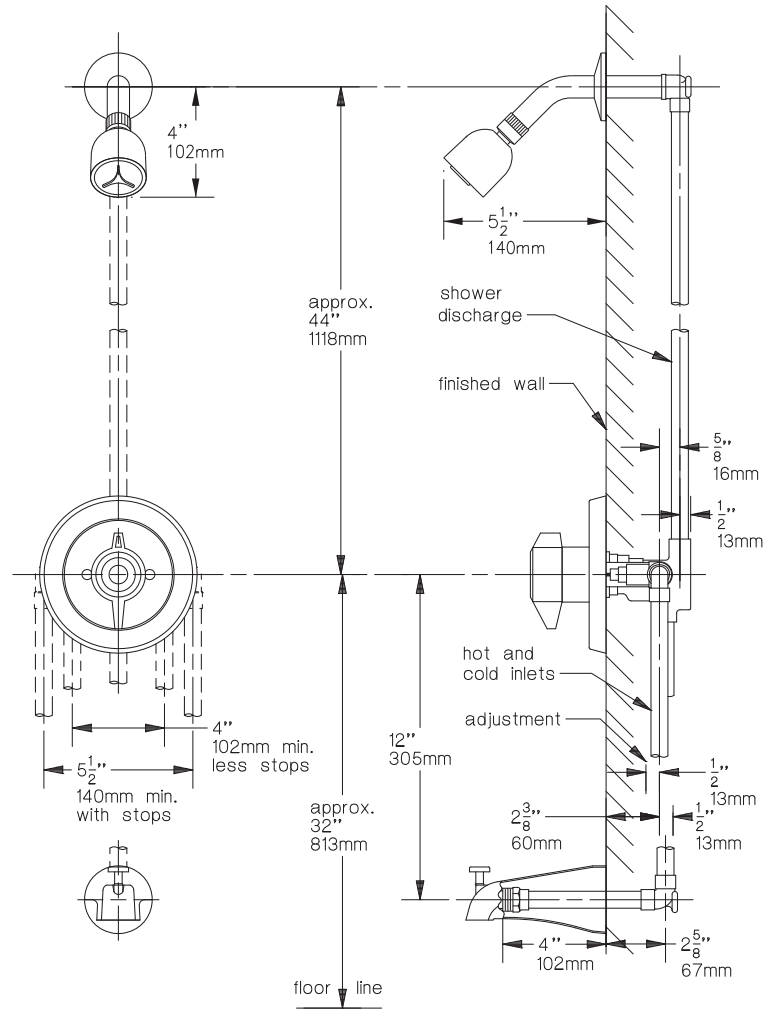
Pipe shower head from outlet marked "S" and to tub spout from outlet marked "T". The valve in this system has a built-in choke for use with a diverter spout. The built-in choke is designed so that it cannot be subject to any back pressure, other than is imposed by the spout supplied with this package. **DO NOT SUBSTITUTE OTHER OUTLET ACCESSORIES FOR THE TUB SPOUT (SUCH AS HOSE AND SPRAY, SHOWER HEAD, BODY SPRAY, LEDGE SPOUTS, ETC.) OR ANY PIPE ADAPTER OR ADDITIONAL FITTINGS (SUCH AS PEX, ETC.) THAT CAN CAUSE BACK PRESSURE THROUGH THE VALVE.** Install HOT on left and COLD on right according to valve markings.

Tub or Shower System (Figure 3) Model BP-56-1, 25-1

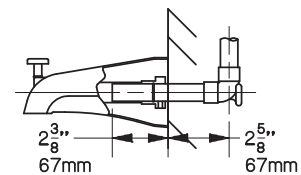
Shower System: Pipe shower head from outlet marked "S". Install either the included copper sweat or 1/2"-1 4 NPT plug (pipe sealer required) into the outlet marked "T" (see figure 3A).

Tub only System: Pipe tub spout from outlet marked "T". Install either the included copper sweat or 1/2"-1 4 NPT plug (pipe sealer required) into the outlet marked "S" (figure 3A).

FIGURE 2
Model A: Tub/Shower System (BP-56-2 Shown)

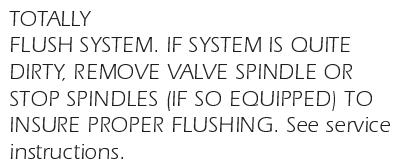


Suffix SS: Slip-on type spout



2. When finishing tile wall PULL OFF ENTIRE PROTECTIVE PLASTER SHIELD (T-176). If finish wall obstructs removal of plaster shield, break off outer edge along perforations (if necessary, carefully use sharp blade to facilitate removal). After plaster shield is removed FILL AREA AROUND VALVE BODY WITH GROUT OR PLASTER
3. TURN ON HOT AND COLD SUPPLIES, valve will not operate unless both hot and cold water are turned on.
4. Unscrew dome cover (T-19/20) and tighten packing nut (T-17) for positive frictional resistance to handle turn
5. SET LIMIT STOP SCREW AS DIRECTED AFTER "IMPORTANT" IN BOLD TYPE ON PAGE ONE. Reattach dome cover back onto packing nut.
6. Mount gasket (T-27B), T3-27B onto back of escutcheon with opening at bottom as shown in Figure 4. The use of this gasket should not preclude sealing valve body in wall as directed in installation instruction step #2.
7. ALLOW VALVE TO RUN IN WARM

POSITION FOR A FEW MINUTES TO



- Push escutcheon (T-27) with dial plate (T-29CT2) against wall and secure to valve with two escutcheon screws (T-28).

Push escutcheon(T3-27) against wall and secure to valve with two escutcheon screws(T3-28). Snap dial emblem assembly(T3-29) onto escutcheon by engaging tabs on dial into the mating recesses in escutcheon.

Mount temperature control handle on valve spindle spline as shown in figure 9. Install shower arm, flange and shower head. See Figures 2 and 3.

9. Do not install positive shut-off devices on the outlet of this valve or devices that do not allow the valve to flow at least 1 GPM at 50 psi inlet pressure. EXCEPTION: If a self-closing or slow-closing valve is installed on the outlet, the supplies of the valve must be equipped with checks to eliminate hot to cold by-pass in the event the valve's handle is not turned to off after use. Contact your factory representative or Symmons directly for information on available checks.

When installing Temptrol® II series valves in fiberglass or panel walls and it is desired to sandwich wall between valve body and escutcheon, cut hole in wall as shown in Figure 5 and mount valve with T-177 wall mounting flange from rear. **Note: It is always recommended to secure valve piping to rough construction and not depend on fiberglass wall for valve mounting security.** On panel walls over 1" thick, install in conventional manner.

[illegible]

T-177 Wall Mounting Flange
 For $\frac{13}{16}$ " 21mm to 1" 25mm
 thick wall order part no. T-193

THICK WALL

$\frac{1}{16}$ " 2mm to $\frac{3}{4}$ " 19mm

HOLE SIZE
 3" (75mm) Min
 4" (101mm) Max

BACK TO BACK INSTALLATION

To simplify piping on back to back installations use one standard valve (hot on left, cold on right) and one with reverse coring (hot on right, cold on left) as shown in Figure 6 and 7. Order reverse core valve **by adding the suffix REV-X** after the plate number. (e.g. BP-56-2-REV-X Temptrol® II tub and shower unit with reverse coring.)

FIGURE 6

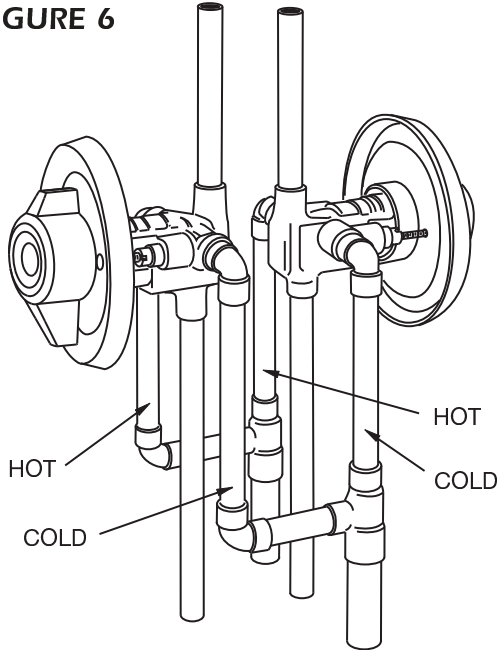
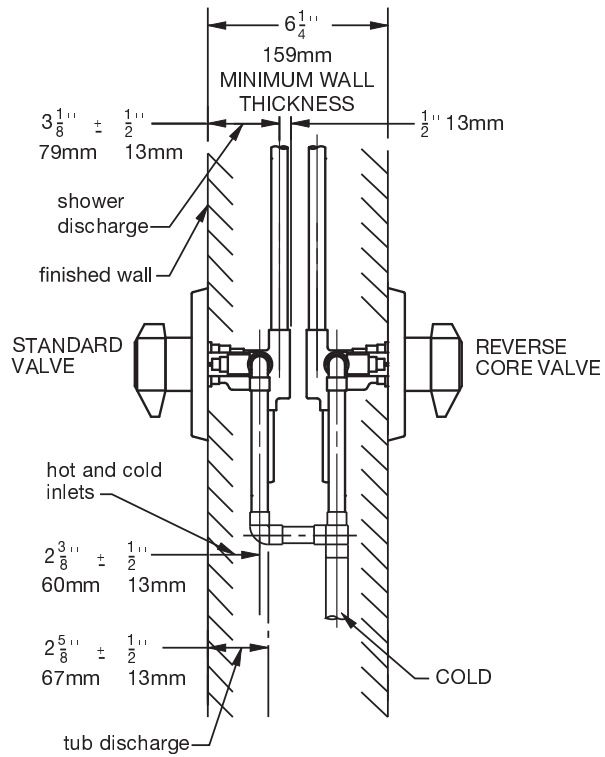


FIGURE 7
Back to Back Installation



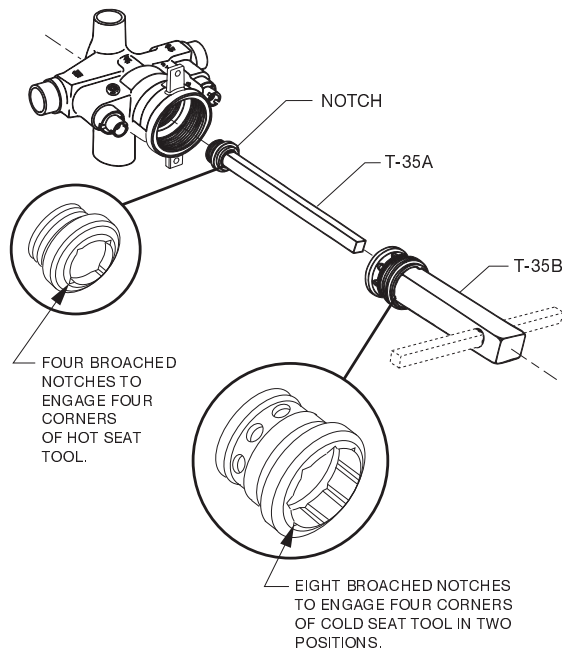
OPERATION OF VALVE

The main handle of a Temptrol® II series valve is for control of temperature only. From the OFF position, the handle is turned counter-clockwise through a minimum cold position, through a warm and hot position for a maximum turn of approximately one revolution. This allows for wide range of temperature adjustments to suit the requirements of any user.

CARE AND CLEANING

The lustrous finish on your Temptrol II series valve should be treated with care. It can be readily damaged by improper handling or abusive treatment. To clean the finish wipe gently with a soft damp cloth and blot dry with a soft towel. Use only a mild soap solution if required. **DO NOT USE ABRASIVE CLEANERS. USE OF POLISH, ABRASIVE CLEANERS, SOLVENTS OR ACID CLEANERS WILL DAMAGE THE FINISH AND VOID THE SYMMONS WARRANTY.**

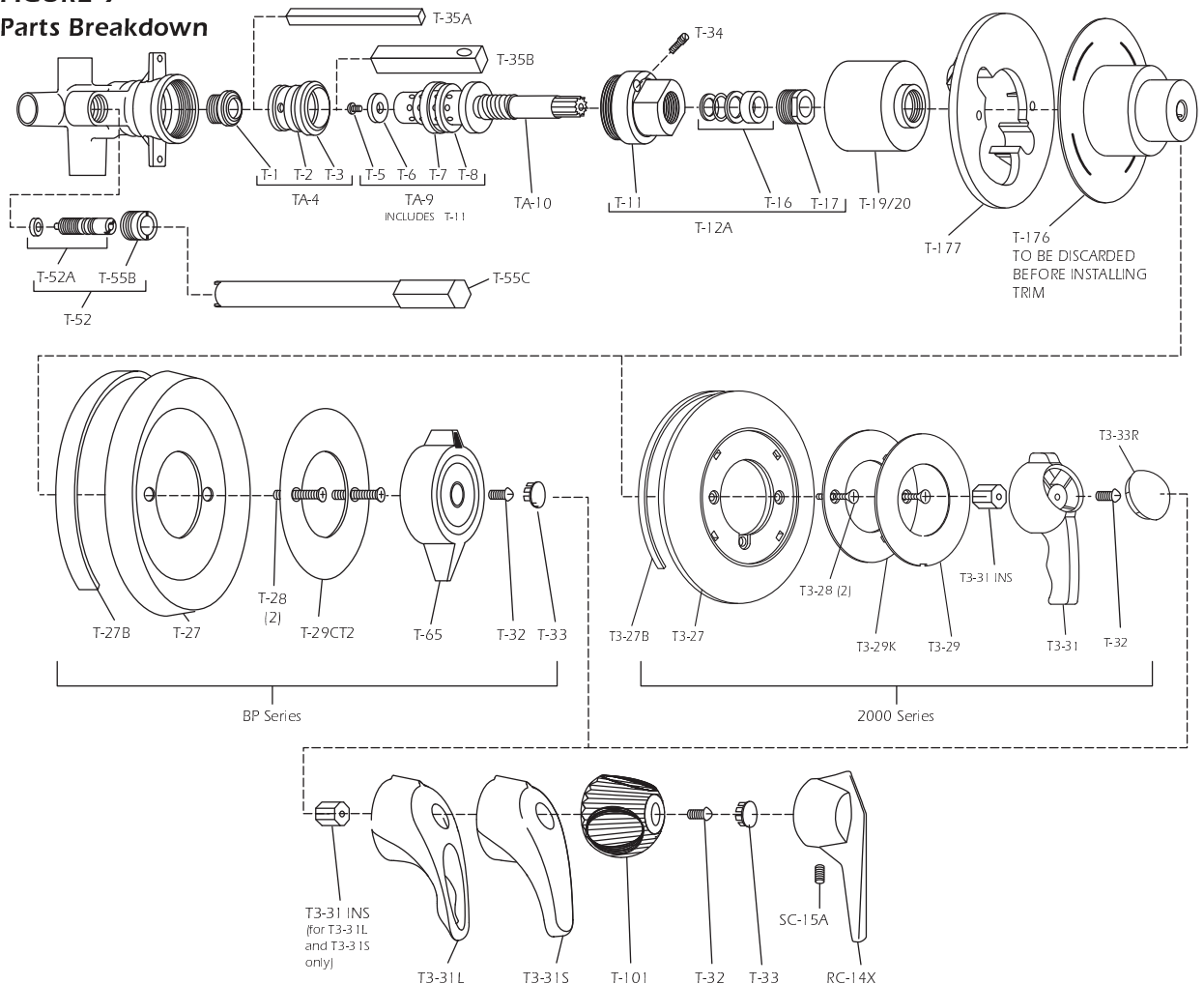
FIGURE 8
Seat Removal Tools



INDIVIDUAL PARTS		INDIVIDUAL PARTS		COMPOSITE PARTS	
T-1	Hot renewable seat	T-55C	Stop plaster shield removal tool	TA-4	Hot seat (T-1) Cold seat (T-3)
T-2	Cold seat O-ring	T-176	Plaster shield	TA-9	Cold seat O-ring (T-2) Hot washer screw (T-5)
T-3	Cold renewable seat	T-177	Wall mounting flange		Hot washer (T-6)
T-5	Hot washer screw	T3-27	Escutcheon (Model C) (2000 Series)		Cold washer retainer (T-7)
T-6	Hot washer	T3-27B	Escutcheon gasket (2000 Series)		Cold washer (T-8)
T-7	Cold washer retainer	T3-28	Escutcheon screw (2000 Series)	TA-10	Cap gasket (T-11)
T-8	Cold washer	T3-29	Dial/emblem assembly (2000 Series)		Spindle assembly
TA-10	Flow control spindle	T3-29K	Dial	T3-31	Temperature control handle: Insert (T3-31 INS)
T-11	Cap gasket	T3-31 INS	Handle insert		Handle screw (T-32)
T-12A	Cap assembly	COMPOSITE PARTS			Plug button (T3-33R)
T-16	Packing, O-ring and washers	T-52	Stop spindle assembly/ escutcheon screw retainer (T-52A)	T3-31 L	Loop style lever handle: Insert (T3-31 INS)
T-17	Packing nut		Stop plaster shield (T-55B)		Handle screw (T-32)
T-19/20	Dome cover and lock nut	T-65	Temperature control handle	T3-31 S	Solid style lever handle: Insert (T3-31 INS)
T-27	Escutcheon (BP series)		Handle screw (T-32)		Handle screw (T-32)
T-27B	Gasket (BP series)		Plug button (T-33)		Plug button (T-33)
T-28	Escutcheon screws (BP series)	T-101	Acrylic handle: Handle screw (T-32)	RC-14X	Single blade lever handle: Handle screw (T-32)
T-29CT2	Dial (BP series)		Plug button (T-33)		Plug button (T-33)
T-32	Handle screw with lock washer				Set screw (SC-15A)
T-33	Plug button				
T-34	Limit stop with O-ring				
T-35A	Hot seat removal tool				
T-35B	Cold seat removal tool				
T-52A	Stop spindle assembly/ escutcheon screw retainer				
T-55B	Stop plaster shield				

FIGURE 9

Parts Breakdown



SERVICE

1. Shut off water supply to valve.
2. Remove handle plug button and handle (see figure 9).
3. **BP Series** Remove dial (T-29CT2) and escutcheon (T-27) by removing escutcheon screws (T-28). Remove all remaining trim.
2000 Series Remove dial (T3-29) by prying up from the slot located at 6 o'clock and then pry up around the clock until dial is loose. Remove escutcheon T3-27(D) by removing escutcheon screws (T3-28). Remove all remaining trim.
4. Open valve to about warm position and unscrew cap (T-1 2A). Warning: Failure to do this will damage cap and spindle. Spindle assembly (TA-10) will be removed with cap. Leave packing nut (T-1 7) in place while unscrewing cap to avoid distortion.
5. Ordinary service to eliminate dripping or not shutting off requires only the replacement of parts supplied in washer and gasket kit (TA-9).
Hold spindle with handle while removing hot washer screw and cold washer retainer (remove retainer with channel lock pliers).
6. Inspect top surfaces of hot and cold seats and replace if necessary. Important: When replacing hot and cold seats, always replace both seats. Even if only one seat appears worn, both seats must be replaced. Use part No. (TA-4). After long years of service, if spindle is very loose in cold seat, replace with part no. (TA-4). Use seat removal tool [T-35(A,B)] for removal and replacement of (TA-4). If seats are difficult to remove and tool shifts damaging notches, relocate tool in second position of notches. Tighten both seats to 15 foot pounds of torque.
7. The perforated end of the (TA-10) spindle assembly houses the balancing piston which is the heart of this pressure balancing valve. The piston should be free to move back and forth and should click when the spindle assembly is shaken. If deposits block this action, tap the handle end of the spindle against a solid object to free the piston. Soaking in household vinegar will help free foreign matter. If this does not free piston, replace (TA-10) spindle assembly. **Do not tamper with perforated cylinder on the spindle assembly or attempt removal of the piston.**
8. Reassemble, reversing above procedure, be sure spindle assembly is drawn close to the cap before screwing cap back into valve. Warning: Failure to do this will damage cap and spindle.
9. Use only Symmons Genuine Repair Parts. Failure to do so will void all warranties AND IMPAIR PROPER OPERATION OF YOUR VALVE.

TROUBLE SHOOTING CHART

Problem	Cause	Solution (Follow service instructions)
Valve will not pass water.	Hot and cold water not turned on.	Turn on both supplies. Valve will not operate unless both HOT and COLD water pressure is turned on.
Valve leaks when shut off.	Hot and cold washers are worn, or foreign matter (solder, chips, etc.) are between washers and seat surfaces	Replace Hot and Cold washers, inspect top surface on hot and cold seats and replace if necessary.
Temperature control handle is turned from cold to hot (or hot back to cold) and volume from spout or head is not constant.	Pressure balancing piston housed in spindle assembly is blocked from free movement by foreign matter.	With valve open half way, remove handle and tap spindle with plastic hammer. If problem not solved, remove spindle assembly completely and tap handle against solid object to free piston. Soaking in household vinegar will help free foreign matter.
Valve delivers sufficient quantity of cold, but little hot, or the reverse of this.	Same as above	Same as above
Temperature varies without moving handle.	Same as above	Same as above
Valve delivery temperature reduces gradually during use; must be turned on to hotter positions to maintain constant temperature.	Overdraw on hot water supply, i.e., running out of hot water.	Reduce maximum flow by using volume control adjustment on valve or shower head. This will allow longer period of use before overdrawing hot water supply.
Valve delivers hot water when initially opened and water turns colder when the handle is rotated in a counter-clockwise direction.	Valve is piped incorrectly, i.e., the hot supply is piped to the cold inlet to the valve and the cold supply is piped to the hot inlet of the valve.	If piping is accessible, correct piping connections to the valve. If piping is not accessible, contact factory to order a reverse seat and tool (T-108 KIT). Older installations may require replacement of the hot seat (T-1) as well

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Spec Section:

O&M Name

WH-1

COMMERCIAL ELECTRIC WATER HEATERS



500 Tennessee Waltz Parkway
Ashland City, TN 37015



Low Lead Content



Thank you for buying this energy efficient water heater.
We appreciate your confidence in our products.

**MODELS DEL-6/10/15/20 Series 102
DEL-30/40/50 Series 110
& DEN-30/40/52/66/80/120 Series 110**

**INSTALLATION - OPERATION - SERVICE
- MAINTENANCE - LIMITED WARRANTY**



⚠ WARNING

Read and understand this instruction manual and the safety messages herein before installing, operating, or servicing this water heater.

Failure to follow these instructions and safety messages could result in death or serious injury.

This manual must remain with the water heater.

⚠ WARNING

If the water heater becomes immersed in water up to or above the level of the bottom of the element doors, the heater should be examined by a qualified service agency before it is placed in operation, see Page 2.

PLACE THESE INSTRUCTIONS ADJACENT TO HEATER AND NOTIFY OWNER TO KEEP FOR FUTURE REFERENCE.

SAFE INSTALLATION, USE, AND SERVICE

The proper installation, use and servicing of this water heater is extremely important to your safety and the safety of others.

Many safety-related messages and instructions have been provided in this manual and on your own water heater to warn you and others of a potential injury hazard. Read and obey all safety messages and instructions throughout this manual. It is very important that the meaning of each safety message is understood by you and others who install, use, or service this water heater.

	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or injury.
	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or injury.
	CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
	CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, could result in property damage.

All safety messages will generally tell you about the type of hazard, what can happen if you do not follow the safety message, and how to avoid the risk of injury.

The California Safe Drinking Water and Toxic Enforcement Act requires the Governor of California to publish a list of substances known to the State of California to cause cancer, birth defects, or other reproductive harm, and requires businesses to warn of potential exposure to such substances.

This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. This appliance can cause low level exposure to some of the substances listed in the Act.

IMPORTANT DEFINITIONS

- **Qualified Installer or Service Agency:**

Installation and service of this water heater requires ability equivalent to that of a Qualified Agency (as defined by ANSI below) in the field involved. Installation skills such as plumbing, electrical supply are required in addition to electrical testing skills when performing service.

- **ANSI Z223.1 2006 Sec. 3.3.83:**

"Qualified Agency" - "Any individual, firm, corporation or company that either in person or through a representative is engaged in and is responsible for (a) the installation, testing or replacement of gas piping or (b) the connection, installation, testing, repair or servicing of appliances and equipment; that is experienced in such work; that is familiar with all precautions required; and that has complied with all the requirements of the authority having jurisdiction."

GENERAL SAFETY INFORMATION

PRECAUTIONS

DO NOT USE THIS WATER HEATER IF ANY PART HAS BEEN EXPOSED TO FLOODING OR WATER DAMAGE. Immediately call a qualified service technician to inspect the water heater and to replace any part of the control system which has been under water.

If the unit is exposed to the following, do not operate heater until all corrective steps have been made by a qualified service technician.

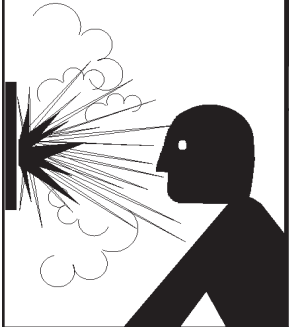
1. External fire.
2. Damage.
3. Firing without water.

GROUNDING INSTRUCTIONS

This water heater must be grounded in accordance with the National Electrical Code and/or local codes. These must be followed in all cases. Failure to ground this water heater properly may also cause erratic control system operation on ELECTRONIC CONTROL models.

This water heater must be connected to a grounded metal, permanent wiring system; or an equipment grounding conductor must be run with the circuit conductors and connected to the equipment grounding terminal or lead on the water heater.

HYDROGEN GAS (FLAMMABLE)



⚠ WARNING

Explosion Hazard

- Flammable hydrogen gases may be present.
- Keep all ignition sources away from faucet when turning on hot water.

Hydrogen gas can be produced in a hot water system served by this heater that has not been used for a long period of time (generally two weeks or more). Hydrogen gas is extremely flammable. To reduce the risk of injury under these conditions, it is recommended that the hot water faucet be opened for several minutes at the kitchen sink before using any electrical appliance connected to the hot water system. If hydrogen is present there will probably be an unusual sound such as air escaping through the pipe as the water begins to flow. THERE SHOULD BE NO SMOKING OR OPEN FLAME NEAR THE FAUCET AT THE TIME IT IS OPEN.

When servicing this unit, verify the power to the unit is turned off prior to opening the control cabinet door.



⚠ WARNING

Read and understand this instruction manual and the safety messages herein before installing, operating, or servicing this water heater.

Failure to follow these instructions and safety messages could result in death or serious injury.

This manual must remain with the water heater.



⚠ WARNING

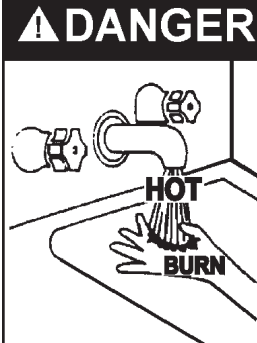
- Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned "OFF."
- Failure to do this could result in death, serious bodily injury, or property damage.

CAUTION

Improper installation, use and service may result in property damage.

- Do not operate water heater if any part has been exposed to flooding or water damage.
- Inspect anode rods regularly, replace when significantly depleted.
- Install in location with drainage.
- Fill tank with water before operation.
- Properly sized thermal expansion tanks are required on all closed water systems.

Refer to this manual for installation and service.



⚠ DANGER

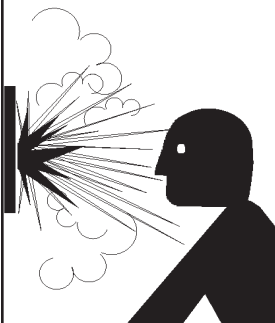
Water temperature over 125°F (52°C) can cause severe burns resulting in severe injury or death.

Children, the elderly, and the physically or mentally disabled are at highest risk for scald injury.

Feel water before bathing or showering.

Temperature limiting valves are available.

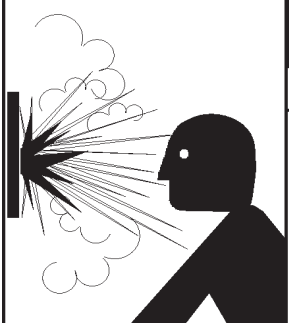
Read instruction manual for safe temperature setting.



⚠ WARNING

Explosion Hazard

- Flammable hydrogen gases may be present.
- Keep all ignition sources away from faucet when turning on hot water.



⚠ WARNING

Explosion Hazard

- Overheated water can cause water tank explosion.
- Properly sized temperature and pressure relief valve must be installed in opening provided.

TABLE OF CONTENTS

SAFE INSTALLATION, USE, AND SERVICE.....	2	Thermal Expansion	10
GENERAL SAFETY INFORMATION.....	3	ELECTRICAL	11
Precautions	3	General.....	11
Hydrogen Gas (Flammable).....	3	Branch Circuit.....	11
INTRODUCTION	4	Calculating Amperage/Overcurrent Protection	11
Preparing for the Installation	4	WIRING DIAGRAMS	12
DIMENSIONS AND CAPACITIES DATA	5	OPERATION.....	13
APPROVALS	6	General.....	13
MODEL AND RATING	6	Filling the Water Heater.....	13
FEATURES AND COMPONENTS	7	Initial Start Up.....	13
Electronic Control Models	7	Draining the Water Heater.....	13
LOCATING THE NEW WATER HEATER.....	8	TEMPERATURE REGULATION	14
Facts to Consider About the Location	8	Temperature Adjustment	14
Clearances	8	MAINTENANCE	15
INSTALLATION	9	General.....	15
Required Ability	9	Anode Rod Inspection.....	15
General.....	9	TROUBLESHOOTING CHECKLIST	16
Contaminated Water.....	9	Checklist.....	16
Circulating Pump.....	9	Leakage Checkpoints.....	17
Insulation Blankets	9	WARRANTY	18
Temperature-Pressure Relief Valve.....	9	NOTES	19
Closed Water Systems.....	10	Repair Parts List.....	20

INTRODUCTION

Thank You for purchasing this water heater. Properly installed and maintained, it should give you years of trouble free service.

Abbreviations Found In This Instruction Manual:

- ANSI - American National Standards Institute
- AHRI - Air-Conditioning, Heating and Refrigeration Institute
- NEC - National Electrical Code
- NFPA - National Fire Protection Association
- UL - Underwriters Laboratory

PREPARING FOR THE INSTALLATION



⚠ WARNING

- Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned “OFF.”
- Failure to do this could result in death, serious bodily injury, or property damage.

1. Read the “General Safety Information” section of this manual first and then the entire manual carefully. If you don’t follow the safety rules, the water heater may not operate safely. It could cause DEATH, SERIOUS BODILY INJURY AND/OR PROPERTY DAMAGE.

This manual contains instructions for the installation, operation, and maintenance of the electric water heater. It also contains warnings throughout the manual that you must read and be aware of. All warnings and all instructions are essential to the proper operation of the water heater and your safety. **READ THE ENTIRE MANUAL BEFORE ATTEMPTING TO INSTALL OR OPERATE THE WATER HEATER.**

Be sure to turn off power when working on or near the electrical system of the heater. Never touch electrical components with wet hands or when standing in water. When replacing fuses always use the correct size for the circuit. see page 12.

The model and rating plates on page 6 interprets certain markings into useful information. Both of these references should be used to identify the heater, its components and optional equipment.

2. The installation must conform with these instructions and the local code authority having jurisdiction and the requirements of the power company. In the absence of local codes, the installation must comply with the latest editions of the National Electrical Code, NFPA 70 or the Canadian Electrical Code CSA C22.1. The National Electrical Code may be ordered from: National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269. The Canadian Electrical Code is available from the Canadian Standards Association, 8501 East Pleasant Valley Road, Cleveland, OH 44131.
3. If after reading this manual you have any questions or do not understand any portion of the instructions, call the toll free number listed on the back cover of this manual for technical assistance.

A sample rating plate is shown on page 6 of this manual. In order to expedite your request, please have full model and serial number available for the technician.

4. Carefully plan your intended placement of the water heater. Examine the location to ensure the water heater complies with the “Locating the New Water Heater” section in this manual.

Installation and service of this water heater requires ability equivalent to that of a licensed tradesman or qualified agency (page 2) in the field involved. Plumbing and electrical work are required.

DIMENSIONS AND CAPACITIES DATA

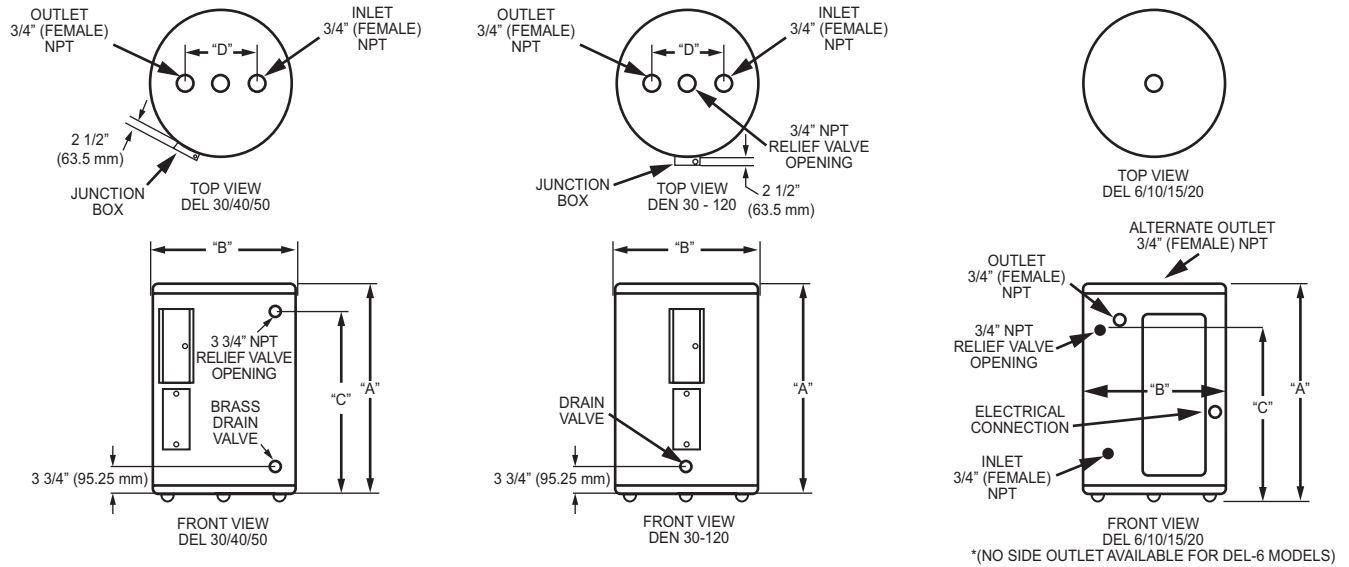


FIGURE 1

TABLE 1 - ROUGH-IN DIMENSIONS

Models Dimensions	No. of Elements	Tank Capacity		A		B		C		D		Approx. Shipping Weight	
		US Gals.	Litres	inches	mm	inches	mm	inches	mm	inches	mm	Lbs.	Kg.
DEL-6	1	6	23	15 1/2	394	14 1/4	362	11	279	-	-	35	15.9
DEL-10	1	10	38	18 1/4	464	18	457	12 1/2	318	-	-	54	24.5
DEL-15	1	15	57	26	660	18	457	20 1/2	521	-	-	58	26.3
DEL-20	1	20	76	22 1/4	565	21 3/4	552	15 3/8	391	-	-	73	33.1
DEL-30	2	30	114	30 7/8	784	21 3/4	552	24 1/8	613	8	203	100	45.4
DEL-40	2	40	151	32 1/4	819	24	610	25 9/16	649	8	203	125	56.7
DEL-50	2	50	189	32 1/4	819	26 1/2	673	25 1/8	638	8	203	166	75.3
DEN-30	2	30	114	34 1/2	876	20 1/2	521	-	-	8	203	98	44.5
DEN-40	2	40	151	45 1/8	1146	20 1/2	521	-	-	8	203	113	51.3
DEN-52	2	50	189	54 7/8	1394	20 1/2	521	-	-	8	203	131	59.4
DEN-66	2	66	250	60 3/4	1543	21 3/4	552	-	-	8	203	176	79.8
DEN-80	2	80	303	59 3/8	1508	24	610	-	-	8	203	211	95.7
DEN-120	2	119	450	62 7/16	1586	29 3/8	746	-	-	8	203	326	147.9

TABLE 2 - RECOVERY CAPACITIES

Element Wattage (Upper/Lower)	INPUT KW	U.S. Gallons/Hr and Litres/Hr at TEMPERATURE RISE INDICATED											
		F°	36F°	40F°	54F°	60F°	72F°	80F°	90F°	100F°	108F°	120F°	126F°
		C°	20C°	22.2C°	30C°	33.3C°	40C°	44.4C°	50C°	55.5C°	60C°	66.6C°	70C°
NON-SIMULTANEOUS													
/1500		GPH	17	15	11	10	8	8	7	6	6	5	5
	1.5	LPH	64	58	43	38	32	29	26	23	21	19	18
/2000		GPH	23	20	15	14	11	10	9	8	8	7	6
	2.0	LPH	85	77	57	51	43	38	34	31	28	26	24
/2500		GPH	28	25	19	17	14	13	11	10	9	8	8
	2.5	LPH	107	96	71	64	53	48	43	38	36	32	30
3000/3000		GPH	34	30	23	20	17	15	14	12	11	10	10
	3.0	LPH	128	115	85	77	64	58	51	46	43	38	37
4000/4000		GPH	45	41	30	27	23	20	18	16	15	14	13
	4.0	LPH	170	153	114	102	85	77	68	61	57	51	49
4500/4500		GPH	51	46	34	30	25	23	20	18	17	15	14
	4.5	LPH	192	173	128	115	96	86	77	69	64	58	55
5000/5000		GPH	56	51	38	34	28	25	23	20	19	17	16
	5.0	LPH	213	192	142	128	107	96	85	77	71	64	61
6000/6000		GPH	68	61	45	41	34	30	27	24	23	20	19
	6.0	LPH	256	230	170	153	128	115	102	92	85	77	73
SIMULTANEOUS OPERATION													
3000/3000		GPH	68	61	45	41	34	30	27	24	23	20	19
	6	LPH	256	230	170	153	128	115	102	92	85	77	73
4000/4000		GPH	90	81	60	54	45	41	36	32	30	27	26
	8	LPH	341	307	227	205	170	153	136	123	114	102	97
4500/4500		GPH	101	91	68	61	51	46	41	36	34	30	29
	9	LPH	384	345	256	230	192	173	153	138	128	115	110
5000/5000		GPH	113	101	75	68	56	51	45	41	38	34	32
	10	LPH	426	384	284	256	213	192	170	153	142	128	122
6000/6000		GPH	135	122	90	81	68	61	54	49	45	41	39
	12	LPH	511	460	341	307	256	230	205	184	170	153	146

Recovery capacities at 100° F rise equal: for non-simultaneous element operation = 4.1 gal. x KW of one element; for simultaneous element operation = 4.1 gal. x 2/3 KW of both elements. For other rises multiply element KW as previously explained by 410 and divide by temperature rise. Full load current for single phase = total watts : voltage.

APPROVALS

All models are listed by
Underwriters Laboratories Inc.



Low Lead Content



MODEL AND RATING

		COMMERCIAL STORAGE TANK WATER HEATER						LISTED 22U1	
LLC		MODEL NUMBER		SERIAL NUMBER		ITEM ID / PART NUMBER			
VOLTS - AC	PHASE	WATTS UPPER	WATTS LOWER	CIRCUIT	CAPACITY US GAL.	MAX WORKING PRESSURE			
TOTAL WATTS CONNECTED INTERLOCK SIMULTANEOUS 1 PH / 3PH 1 PH 3 PH									

DEL-30/40/50 & DEN-30/40/52/66/80/120

		ELECTRIC STORAGE TANK WATER HEATER						LISTED 932N	
LLC		MODEL NUMBER		SERIAL NUMBER		ITEM ID / PART NUMBER			
VOLTS - AC	PHASE	WATTS UPPER	WATTS LOWER	TOTAL WATTS CONNECTED	CAPACITY US GAL.	MAX WORKING PRESSURE			
ALTERNATE RATINGS									
VOLTS - AC	WATTS UPPER	WATTS LOWER	TOTAL WATTS CONNECTED		CIRCUIT				

DEL-6/10/15/20

FEATURES AND COMPONENTS

ELECTRONIC CONTROL MODELS

This page shows typical water heater installations by model designations.

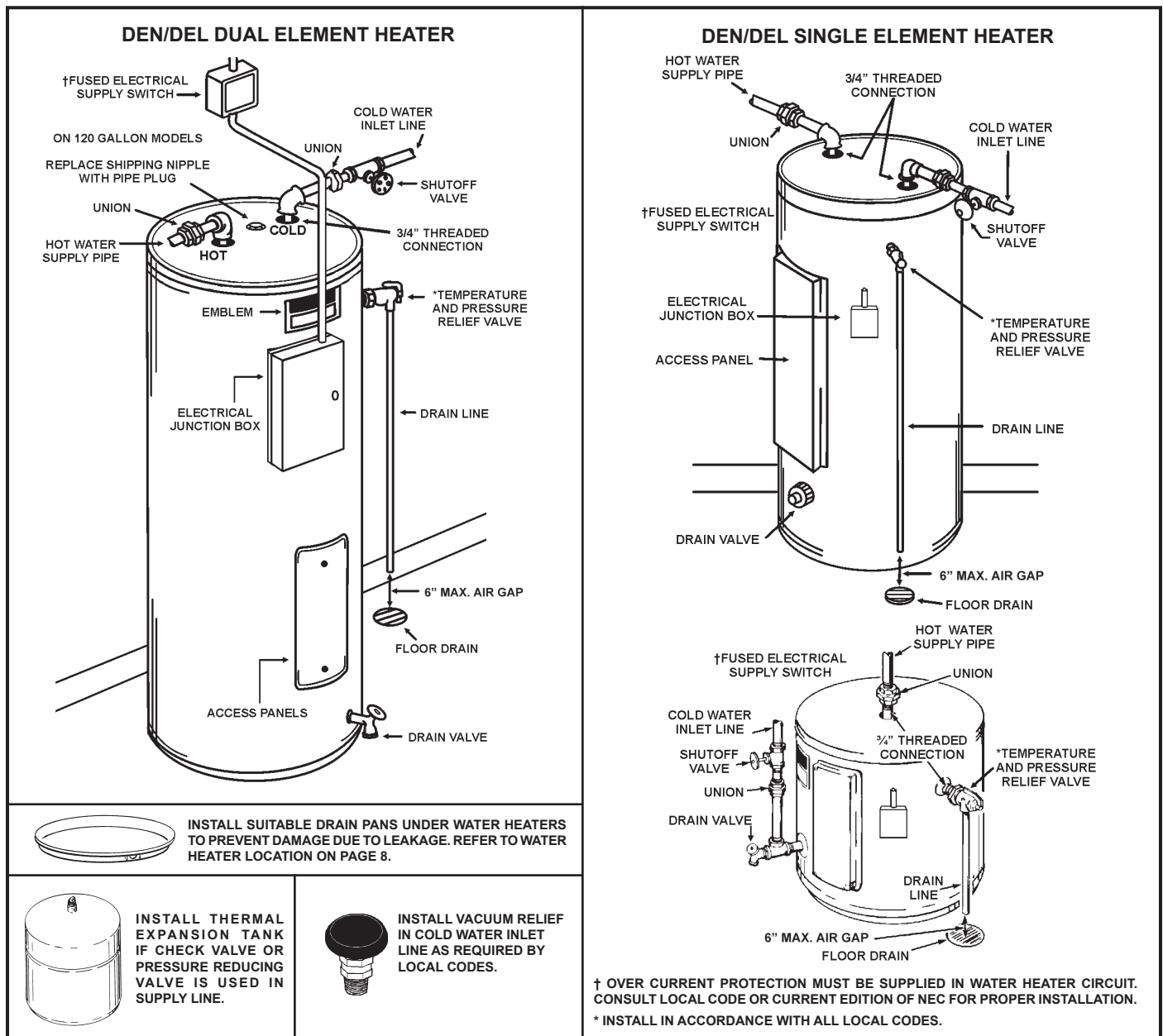


FIGURE 2

LOCATING THE NEW WATER HEATER

FACTS TO CONSIDER ABOUT THE LOCATION

CAUTION

Property Damage Hazard

- All water heaters eventually leak
- Do not install without adequate drainage.

The water heater should be located as close as possible to/or centralized to the water piping system. The water heater should be located in an area not subject to freezing temperatures.

The water heater should be located in an area where leakage of the tank or connections will not result in damage to the area adjacent to the heater or to lower floors of the structure.

When such locations cannot be avoided, a suitable drain pan should be installed under the heater.

Such pans should be at least two inches deep, have a minimum length and width of at least two inches greater than the diameter of the heater and should be piped to an adequate drain.

Drain pans suitable for these water heaters are available from your distributor or A.O. Smith Water Heater Parts Fulfillment, 125 Southeast Parkway, Franklin, TN 37068.

Water heater life depends upon water quality, water pressure and the environment in which the water heater is installed. Water heaters are sometimes installed in locations where leakage may result in property damage, even with the use of a drain pan piped to a drain. However, unanticipated damage can be reduced or prevented by a leak detector or water shut-off device used in conjunction with a piped drain pan. These devices are available from some plumbing supply wholesalers and retailers, and detect and react to leakage in various ways:

- Sensors mounted in the drain pan that trigger an alarm or turn off the incoming water to the water heater when leakage is detected.
- Sensors mounted in the drain pan that turn off the water supply to the entire home when water is detected in the drain pan.
- Water supply shut-off devices that activate based on the water pressure differential between the cold water and how water pipes connected to the water heater.
- Devices that will turn off the gas supply to a gas water heater while at the same time shutting off its water supply.

CLEARANCES

A minimum clearance of 4" must be allowed for access to replaceable parts such as thermostats, drain valve and relief valve.

Adequate clearance for servicing this water heater should be considered before installation, such as changing the anodes, etc.

INSTALLATION

REQUIRED ABILITY

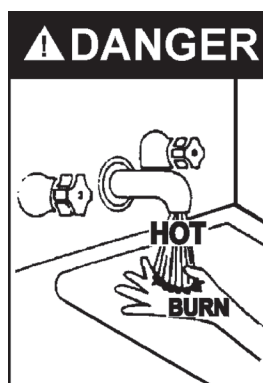
Installation and service of this water heater requires ability equivalent to that of a qualified installer or service agency (page 2) in the field involved. Plumbing and electrical work is required.

GENERAL

The installation must conform with these instructions and the local code authority having jurisdiction and the requirements of the power company. In the absence of local codes, the installation must comply with the latest editions of the National Electrical Code, NFPA 70 or the Canadian Electrical Code CSA C22.1. The National Electrical Code may be ordered from: National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269. The Canadian Electrical Code is available from the Canadian Standards Association, 8501 East Pleasant Valley Road, Cleveland, OH 44131.

Do **NOT** test electrical system before heater is filled with water, follow the START UP procedure in the OPERATION section of this manual.

The principal components of the heater are identified in the Features and Components illustrations on page 7.

	⚠ DANGER Water temperature over 125°F (52°C) can cause severe burns resulting in severe injury or death. Children, the elderly, and the physically or mentally disabled are at highest risk for scald injury. Feel water before bathing or showering. Temperature limiting valves are available. Read instruction manual for safe temperature setting.
--	--

MIXING VALVE USAGE:

Water heaters are intended to produce hot water. Water heated to a temperature which will satisfy space heating, clothes washing, dish washing, cleaning and other sanitizing needs can scald and permanently injure you upon contact. Some people are more likely to be permanently injured by hot water than others. These include the elderly, children, the infirm, or physically/developmentally disabled. If anyone using hot water in your home fits into one of these groups or if there is a local code or state law requiring a maximum water temperature at the hot water tap, then you must take special precautions. In addition to using the lowest possible temperature setting that satisfies your hot water needs, a means such as a **MIXING VALVE**, should be used at the hot water taps used by these people or at the water heater.

MIXING VALVES for reducing point of use temperature are available and are to be set at a maximum of 125 degree F. Consult a qualified installer or service agency. Follow all manufacturer's Instructions for installation of these valves. Before changing the factory setting on the thermostat, read the "Temperature Regulation" section in this manual.

⚠ WARNING Toxic Chemical Hazard • Do not connect to non-potable water system.

CONTAMINATED WATER

This water heater shall not be connected to any heating system(s) or component(s) used with a non-potable water heating appliance.

Toxic chemicals, such as those used for boiler treatment shall not be introduced into this system.

CIRCULATING PUMP

Field installed circulating pumps should be of all bronze construction.

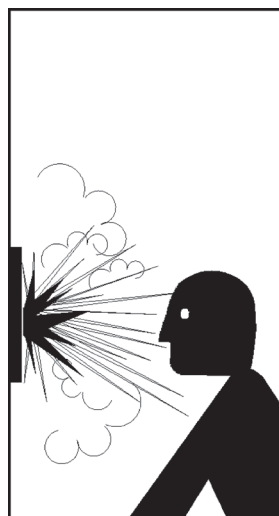
INSULATION BLANKETS

Insulation blankets are available to the general public for external use on electric water heaters but are not necessary with this product. The purpose of an insulation blanket is to reduce the standby heat loss encountered with storage tank heaters. Your water heater meets or exceeds the EPACT and ASHRAE/IES 90.1 standards with respect to insulation and standby loss requirements, making an insulation blanket unnecessary.

Should you choose to apply an insulation blanket to this heater, you should follow these instructions below. Failure to follow these instructions can result in fire, serious personal injury, or death.

- Do not cover the temperature and pressure relief (T & P) valve with an insulation blanket.
- Do not cover the instruction manual. Keep it on the side of the water heater or nearby for future reference.
- Do obtain new warning and instruction labels for placement on the blanket directly over the existing labels.

TEMPERATURE-PRESSURE RELIEF VALVE

	⚠ WARNING Explosion Hazard • Temperature-pressure relief valve must comply with ANSI Z21.22 and ASME code. • Properly sized temperature-relief valve must be installed in opening provided. • Failure to install relief valve can result in overheating and excessive tank pressure. • Failure to follow these instructions can cause serious injury or death.
--	--

This water heater is provided with a properly rated/sized and certified combination temperature - pressure relief valve by the manufacturer. The valve is certified by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment of materials as meeting the requirements for Relief Valves for Hot Water Supply Systems, ANSI Z21.22 • CSA 4.4, and the code requirements of ASME.

If replaced, the new valve must meet the requirements of local codes, but not less than a combination temperature and pressure relief valve rated/sized and certified as indicated in the above

paragraph. The new valve must be marked with a maximum set pressure not to exceed the marked hydrostatic working pressure of the water heater (150 psi = 1,035 kPa) and a discharge capacity not less than the water heater Btu/hr or KW input rate as shown on the water heater's model rating plate.

For safe operation of the water heater, the temperature and pressure relief valve must not be removed from its designated opening nor plugged. The temperature-pressure relief valve must be installed directly into the fitting of the water heater designed for the relief valve. Install discharge piping so that any discharge will exit only within 6 inches (15.2 cm) above, or at any distance below the structural floor. Be certain that no contact is made with any live electrical part. The discharge opening must not be blocked or reduced in size under any circumstances. Excessive length, over 30 feet (9.14 m), or use of more than four elbows can cause restriction and reduce the discharge capacity of the valve.

No valve or other obstruction is to be placed between the relief valve and the tank. Do not connect discharge piping directly to the drain unless a 6" (15.2 cm) air gap is provided. To prevent bodily injury, hazard to life, or property damage, the relief valve must be allowed to discharge water in adequate quantities should circumstances demand. If the discharge pipe is not connected to a drain or other suitable means, the water flow may cause property damage.

CAUTION

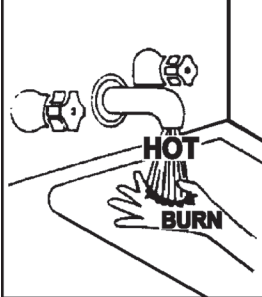
Water Damage Hazard

- Temperature-pressure relief valve discharge pipe must terminate at adequate drain.

The Discharge Pipe:

- Shall not be smaller in size than the outlet pipe size of the valve, or have any reducing couplings or other restrictions.
- Shall not be plugged or blocked.
- Shall be of material listed for hot water distribution.
- Shall be installed so as to allow complete drainage of both the temperature-pressure relief valve and the discharge pipe.
- Must terminate a maximum of six inches above a floor drain or external to the building. In cold climates, it is recommended that the discharge pipe be terminated at an adequate drain inside the building.
- Shall not have any valve or other obstruction between the relief valve and the drain.

⚠ DANGER



Water temperature over 125°F (52°C) can cause severe burns resulting in severe injury or death.

Children, the elderly, and the physically or mentally disabled are at highest risk for scald injury.

Feel water before bathing or showering.

Temperature limiting valves are available.

Read instruction manual for safe temperature setting.

The temperature-pressure relief valve must be manually operated at least once a year. Caution should be taken to ensure that (1) no one is in front of or around the outlet of the temperature-pressure relief valve discharge line, and (2) the water manually discharged can cause bodily injury or property damage because the water may be extremely hot. If after manually operating the valve, it fails to completely reset and continues to release water, immediately close the cold water inlet to the water heater, follow the draining instructions in this manual, and replace the temperature-pressure relief valve with a properly rated/sized new one.

If you do not understand these instructions or have any questions regarding the temperature-pressure relief valve call the toll free number listed on the back cover of this manual for technical assistance.

CLOSED WATER SYSTEMS

Water supply systems may, because of code requirements or such conditions as high line pressure, among others, have installed devices such as pressure reducing valves, check valves, and back flow preventers. Devices such as these cause the water system to be a closed system.

THERMAL EXPANSION

As water is heated, it expands (thermal expansion). In a closed system the volume of water will grow when it is heated. As the volume of water grows there will be a corresponding increase in water pressure due to thermal expansion. Thermal expansion can cause premature tank failure (leakage). This type of failure is not covered under the limited warranty. Thermal expansion can also cause intermittent temperature-pressure relief valve operation: water discharged from the valve due to excessive pressure build up. This condition is not covered under the limited warranty. The temperature-pressure relief valve is not intended for the constant relief of thermal expansion.

A properly sized thermal expansion tank should be installed on all closed systems to control the harmful effects of thermal expansion. Contact a local plumbing service agency to have a thermal expansion tank installed.

ELECTRICAL



⚠ WARNING

- Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned "OFF."
- Failure to do this could result in death, serious bodily injury, or property damage.

GENERAL

The installation must conform with these instructions and the local code authority having jurisdiction and the requirements of the power company. In the absence of local codes, the installation must comply with the current editions of the National Electrical Code, NFPA 70 or the Canadian Electrical Code CSA C22.1.

An electrical ground is required to reduce risk of electrical shock or possible electrocution. The water heater should be connected to a separate grounded branch circuit with over-current protection and disconnect switch. The water heater should be grounded in accordance with national and local codes.

Voltage applied to the heater should not vary more than +5% to -10% of the model and rating plate marking for satisfactory operation.

DO NOT ENERGIZE THE BRANCH CIRCUIT FOR ANY REASON BEFORE THE HEATER TANK IS FILLED WITH WATER. DOING SO WILL CAUSE THE HEATING ELEMENTS TO BURN OUT AND VOID WARRANTY.

The factory wiring is attached to a terminal block within the external junction box unit. The branch circuit is connected to the terminal block within this junction box. The water heater should be connected to a separate, grounded, branch circuit with overcurrent protection and disconnect switch. The water heater should be grounded in accordance with national and local codes.

BRANCH CIRCUIT

The branch circuit wire size should be established through reference to the current edition of NFPA-70, the National Electrical Code or other locally approved source in conjunction with the heater amperage rating. For convenience, portions of the wire size tables from the Code are reproduced here. The branch circuit should be sized at 125 percent of the heater rating and further increase wire size as necessary to compensate for voltage drop in long runs.

CALCULATING AMPERAGE/OVERCURRENT PROTECTION

The heaters come from the factory in two configurations:

1. Two wire C-2 circuit for single element heater equipped with a high limit control, single phase power input.
2. Four wire A-8 circuit for dual element heater equipped with two high limit controls, single phase or three phase power input.

The heater with dual elements is factory wired for connection to a three wire, three-phase delta branch circuit, non-simultaneous operation. In addition a ground conductor is required.

Element connection is for non-simultaneous operation. This means only one element at a time operates. The wiring diagram, on page 12, shows the heater may be field converted to simultaneous element operation by moving the red wire on "J" terminal to L1. It is then possible for both elements to operate at once as determined by the thermostats. Regardless of element connection the heater operates in an "unbalanced" fashion.

The heater may be field converted to single-phase operation by moving the wire on L3 of the terminal block to L2. L3 is not used, see page 12.

The heater, now in single-phase non-simultaneous operation, may be field-converted to single phase simultaneous operation by moving the red wire on terminal "J" to L1, see page 12.

This is an example of calculating heater amperage for both types of element operation. From this, the branch circuit conductor and overcurrent protection sizing can be established.

The example is of a three-phase 240 volt unit with two, 6 kw elements. The notations are for units field converted to single-phase. Check the heater model and rating plate for actual specifications and substitute those values in the following.

TABLE 3

Non-simultaneous: (as factory wired)	Simultaneous: (Field conversion)
3000 : 240 = 12.5 amps*	3000 : 240 = 12.5 amps* 12.5 x 1.73 = 21.6 amps
*NOTE: as a single-phase non-simultaneous unit.	*NOTE: as a single-phase simultaneous unit the total is: 12.5 x 2 = 25 amps

The rating of the overcurrent protection should be computed on the basis of 125 percent of the total connected load amperage. Where the standard ratings and settings do not correspond with this computation, the next higher standard rating or setting should be selected.

Portion of Table 310-16 (NFPA-70) follows:

Allowable Ampacities of Insulated Copper Conductors. Not more than three conductors in Raceway or Cable or Direct Burial (Based on Ambient Temperature of 30° C, 86° F).

These ampacities relate only to conductors described in Table 310-13 in Code.

For ambient temperatures over 30° C (86° F), see Correction Factors, Note 13 in Code.

For ambient temperatures over 30° C (86° F), see Correction Factors, Note 13 in Code.

TABLE 4

Size	Temperature Rating of Conductor See Table 310-13 in Code	
	60°C (140°F)	75°C (167°F)
AMG MCM		
	Types: RUW, (14-2), T, TW, UF	Types: RH, RHW, RUH, (14-2), THW, THWN, XHHW, USE
18	---	---
16	---	---
14	15	15
12	20	20
10	30	30
8	40	45
6	55	65
4	70	85
3	80	100

Portion of Table 310-18 follows:

Allowable Ampacities of Insulated Aluminum and Copper -Clad Aluminum Conductors.

Not more than three conductors in Raceway or Cable or Direct Burial (Based on Ambient Temperature of 30° C, 86° F. These ampacities relate only to conductors described in Table 310-13 in Code.

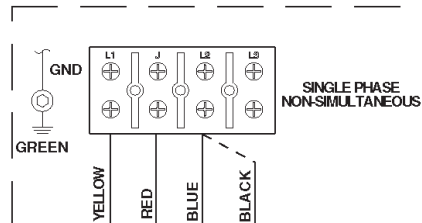
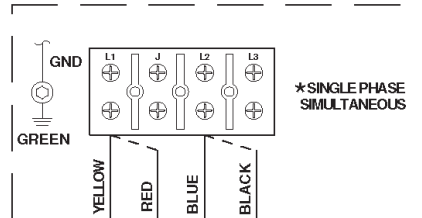
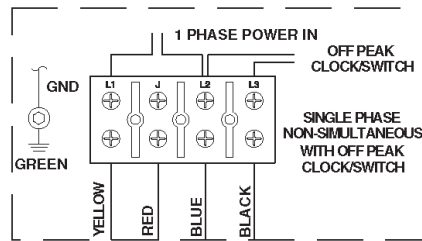
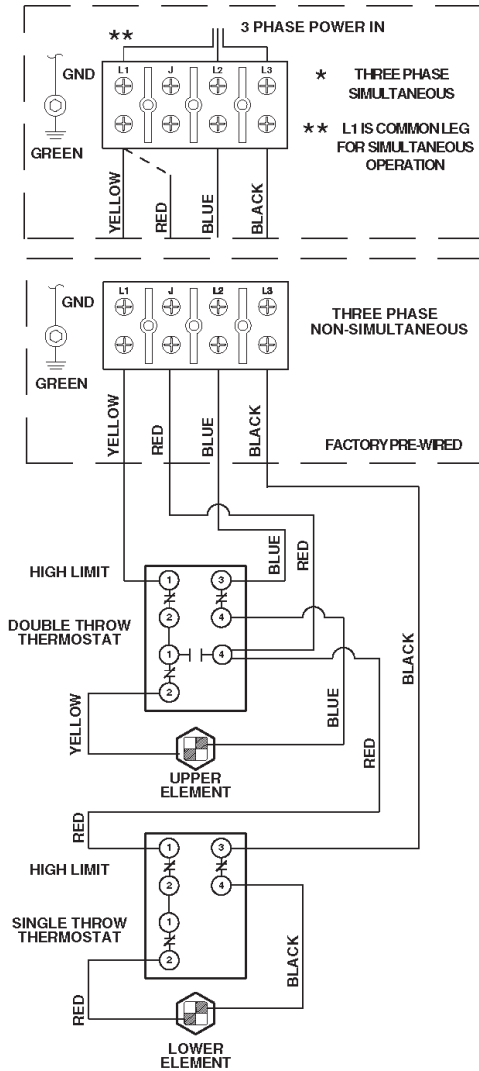
For ambient temperatures over 30° C (86° F), see Correction Factors, Note 13 in Code.

TABLE 5

Size	Temperature Rating of Conductor See Table 310-13 in Code	
	60°C (140°F)	75°C (167°F)
AMG MCM		
	Types: RUW, (12-2), T, TW, UF	Types: RH, RHW, RUH, (12-2), THW, THWN, XHHW, USE
12	15	15
10	25	25
8	30	40
6	40	50
4	55	65
3	65	75
2	75	90
1	85	100

WIRING DIAGRAMS

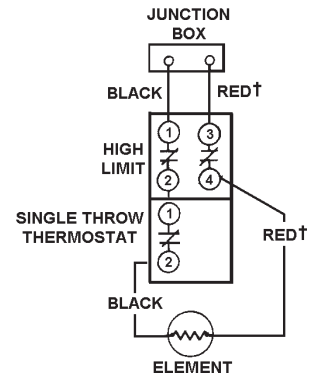
A-8 CIRCUIT FOR DUAL ELEMENT HEATER



*** NOTE:**
MUST NOT BE CONVERTED TO
SIMULTANEOUS OPERATION IF
TOTAL CURRENT DRAW EXCEEDS
48 AMPS.

--- :FIELD CONVERSION

C-2 CIRCUIT FOR SINGLE ELEMENT HEATERS EQUIPPED WITH HIGH LIMIT CONTROL



— FACTORY WIRED
--- FIELD WIRING
† WHITE FOR 120V & 277V

FIGURE 3

OPERATION

GENERAL

Refer to the Features and Components section of this manual (page 7) for the location of components mentioned in the instructions that follow.

NEVER turn on power to the water heater without being certain the water heater is filled with water and a temperature and pressure relief valve is installed in the relief valve opening.

DO NOT TEST ELECTRICAL SYSTEM BEFORE HEATER IS FILLED WITH WATER. FOLLOW FILLING AND START-UP INSTRUCTIONS IN OPERATION SECTION.



⚠ DANGER

Full power is present whenever the cabinet door is opened even with the pilot switch turned off.

FILLING THE WATER HEATER

CAUTION

Property Damage Hazard

In order to avoid water heater damage, fill tank with water before operating.

1. Turn off the electrical disconnect switch.
2. Close the water heater drain valve.
3. Open a nearby hot water faucet to permit the air in the system to escape.
4. Fully open the cold water inlet pipe valve allowing the heater and piping to be filled.
5. Close the hot water faucet as water starts to flow. The heater is now ready for STARTUP and TEMPERATURE REGULATION.

INITIAL START UP

The following checks should be made by the installer when the heater is placed into operation for the first time.

1. Turn off the electrical disconnect switch.
2. Open the front panel or top access cover, check all water and electrical connections for tightness. Also check connections on top and or sides of heater. Repair water leaks and tighten electrical connections as necessary.
3. Depress the red manual reset button on each Thermostat/ECO combination control. (See Figure 5, Figure 6, Figure 7, or Figure 8)
4. Turn on the electrical disconnect switch.
5. Observe the operation of the electrical components during the first heating cycle. Use care as the electrical circuits are energized.
6. Close the front panel or top access cover.

Temperature control and contactor operation should be checked by allowing heater to come up to temperature and shut off automatically. Use care as the electrical circuits are energized.

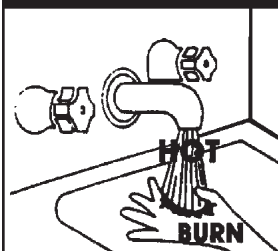
DRAINING THE WATER HEATER

The water heater must be drained if it is to be shut down and exposed to freezing temperatures. Maintenance and service procedures may also require draining the heater.

1. Turn off the electrical disconnect switch.
2. Open a hot water valve until the water is cool, then close the supply water inlet valve to heater.
3. Attach hose to outlet opening of drain valve and direct end to drain.
4. Open a nearby hot water faucet and the heater drain valve.
5. If the heater is being drained for an extended shutdown, it is suggested the drain valve be left open during this period. The hose may be removed.

Follow FILLING instructions when restoring hot water service.

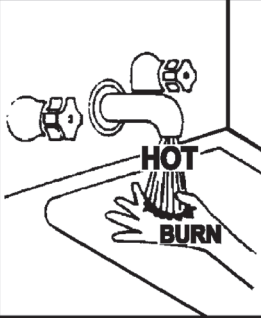
⚠ DANGER



- Burn hazard
- Hot water discharge.
- Keep clear of drain valve outlet.

TEMPERATURE REGULATION

⚠ DANGER



Water temperature over 125°F (52°C) can cause severe burns resulting in severe injury or death.

Children, the elderly, and the physically or mentally disabled are at highest risk for scald injury.

Feel water before bathing or showering.

Temperature limiting valves are available.

Read instruction manual for safe temperature setting.

THE WATER HEATER IS EQUIPPED WITH AN ADJUSTABLE THERMOSTAT TO CONTROL WATER TEMPERATURE. HOT WATER AT TEMPERATURES DESIRED FOR AUTOMATIC DISHWASHER AND LAUNDRY USE CAN CAUSE SCALDS RESULTING IN SERIOUS PERSONAL INJURY AND/OR DEATH. THE TEMPERATURE AT WHICH INJURY OCCURS VARIES WITH THE PERSON'S AGE AND TIME OF EXPOSURE. THE SLOWER RESPONSE TIME OF CHILDREN, AGED OR DISABLED PERSONS INCREASES THE HAZARD TO THEM. NEVER ALLOW SMALL CHILDREN TO USE A HOT WATER TAP, OR TO DRAW THEIR OWN BATH WATER. NEVER LEAVE A CHILD OR DISABLED PERSON UNATTENDED IN A BATHTUB OR SHOWER.

It is recommended that lower water temperatures be used to avoid the risk of scalding. It is further recommended, in all cases, that the water temperature thermostats (See Figure 4) be set for the lowest temperature which satisfies your hot water needs. This will also provide the most energy efficient operation of the water heater.

Figure 4 shows the approximate time-to-burn relationship for normal adult skin. The thermostats on your water heater have a linear relationship between degrees of angular rotation and the corresponding change in temperature. Thus rotating the temperature adjustment indicator 30 angular degrees will result in a 10 degree Fahrenheit change in water temperature.

Water Temperature °F (°C)	Time for 1st Degree Burn (Less Severe Burns)	Time for Permanent Burns 2nd & 3rd Degree (Most Severe Burns)
110 (43)	(normal shower temp.)	
116 (47)	(pain threshold)	
116 (47)	35 minutes	45 minutes
122 (50)	1 minute	5 minutes
131 (55)	5 seconds	25 seconds
140 (60)	2 seconds	5 seconds
149 (65)	1 second	2 seconds
154 (68)	instantaneous	1 second

(U.S. Government Memorandum, C.P.S.C., Peter L. Armstrong, Sept. 15, 1978)

FIGURE 4

TEMPERATURE ADJUSTMENT

The water heater is supplied with thermostats that may come from different manufactures and have different temperature indications as described below.

APCOM THERMOSTATS

A-8 Circuit thermostats have three designated set points; LO, MED and HI. (See Figure 5). The approximate equivalent temperatures for these three settings are: LO = 140°F (60°C), MED = 160°F (71°C) and HI = 181°F (83°C). These thermostats are set from the factory at the LO 140°F (60°C) setting. The over temperature device (ECO high limit) attached to each thermostat has a manual reset. The C-2 circuit thermostat is adjustable from approximately 130°F (54°C) to 170°F (77°C) (See Figure 6). These thermostats are set from the factory at

approximately the 140°F (60°C) setting. The over temperature device (ECO high limit) attached to each thermostat has a manual reset.

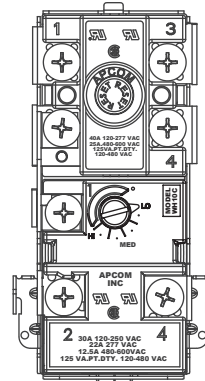


FIGURE 5

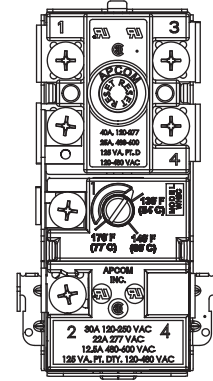


FIGURE 6

THERMODISC THERMOSTATS

A-8 circuit thermostats are adjustable from approximately 120°F (49°C) (lowest setting) to 181°F (83°C) (highest setting) (See Figure 7). The C-2 circuit thermostat is adjustable from approximately 110°F (43°C) to 170°F (77°C) (See Figure 8). These thermostats are set from the factory at approximately the 140°F (60°C) setting. The over temperature device (ECO high limit) attached to each thermostat has a manual reset.

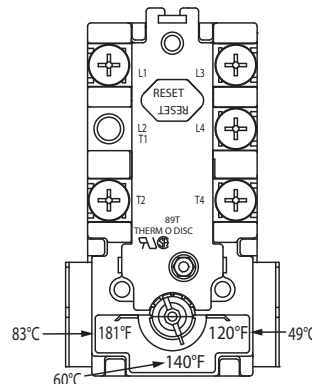


FIGURE 7

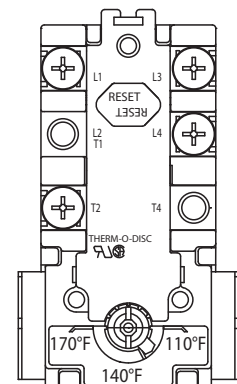


FIGURE 8

NOTE: It is not necessary to adjust the upper thermostat for a dual element unit. However, if it is adjusted above the factory set point 140°F (60°C) it is recommended that it not be set higher than the lower thermostat setting.

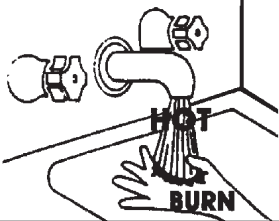
To change the temperature setting:

1. **DANGER:** Turn off the heater electrical supply. Do not attempt to adjust thermostat with power on.
2. Open the junction box door (for upper thermostat of dual element water heater only) and/or remove the (lower) thermostat access panel. Do not remove the plastic personnel protectors covering the thermostats. The thermostat is factory pre-set at 140°F (60°C).
3. Using a flat tip screwdriver, rotate the adjusting knob to the desired temperature setting.
4. Replace the covers and access panels, and turn on heater electrical supply.

MAINTENANCE

GENERAL

⚠ DANGER



- Burn hazard
- Hot water discharge.
- Keep clear of relief valve discharge outlet.

Periodically the drain valve should be opened and the water allowed to run until it flows clean. This will help to prevent sediment buildup in the tank bottom.

Periodically check the temperature and pressure relief valve to ensure that it is in operating condition. Lift the lever at the top of the valve several times until the valve seats properly and operates freely.

Water heater maintenance includes periodic tank flushing and cleaning, and removal of lime scale from the heating element.

The heater tank is equipped with an anode rod to aid in corrosion control.

ANODE ROD INSPECTION

CAUTION

Property Damage Hazard

- Avoid water heater damage.
- Inspection and replacement of anode rod required.

The anode rod is used to protect the tank from corrosion. Most hot water tanks are equipped with an anode rod. The submerged rod sacrifices itself to protect the tank. Instead of corroding tank, water ions attack and eat away the anode rod. This does not affect water's taste or color. The rod must be maintained to keep tank in operating condition.

Anode deterioration depends on water conductivity, not necessarily water condition. A corroded or pitted anode rod indicates high water conductivity and should be checked and/or replaced more often than an anode rod that appears to be intact. Replacement of a depleted anode rod can extend the life of your water heater. Inspection should be conducted by a qualified technician, and at a minimum should be checked annually after the warranty period.

Artificially softened water is exceedingly corrosive because the process substitutes sodium ions for magnesium and calcium ions.

The use of a water softener may decrease the life of the water heater tank.

The anode rod should be inspected after a maximum of three years and annually thereafter until the condition of the anode rod dictates its replacement.

NOTE: Artificially softened water requires the anode rod to be inspected annually.

TROUBLESHOOTING CHECKLIST

CHECKLIST

Before calling for service, check the following points to see if the cause of trouble can be identified and corrected.

Reviewing this checklist may eliminate the need of a service call and quickly restore hot water service. See Figure 2 on page 7 in this manual to identify and locate water heater components.

	⚠ WARNING • Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned "OFF." • Failure to do this could result in death, serious bodily injury, or property damage.
--	--

NOT ENOUGH OR NO HOT WATER

1. Be certain the electrical disconnect switch serving the water heater is in the ON position.
2. Check the fuses.
 - The electrical disconnect switch usually contains fuses.
3. If the water was excessively hot, and is now cold, the high limit switch may have activated.
 - See the Temperature Regulation section of this manual for more information on how to reset the ECO high limit controls.
4. The capacity of the heater may have been exceeded by a large demand for hot water.
 - Large demands require a recovery period to restore water temperature.
5. Cooler incoming water temperature will lengthen the time required to heat water to the desired temperature.
6. Look for hot water leakage.
7. Sediment or pipe scale may be affecting water heater operation.

ABNORMAL SOUNDS

1. Sediment or lime scale accumulations on the elements causes sizzling and hissing noises when the heater is operating.
 - The sounds are normal, however, the tank bottom and elements should be cleaned. See the Maintenance section of this manual.

WATER LEAKAGE IS SUSPECTED

Refer to Leakage Checkpoint on the following page 17.

1. Check to see if the heater drain valve is tightly closed.
2. If the outlet of the relief valve is leaking it may represent:
 - Excessive water temperature.
 - Faulty relief valve.
 - Excessive water pressure.
3. Excessive water pressure is the most common cause of relief valve leakage. It is often caused by a "closed system". See "Closed Water Systems" and "Thermal Expansion" in the Installation section of this manual for more information.
4. Examine the area around the element for gasket leakage.
 - Tighten the elements or, if necessary, follow the WATER AND LIME SCALE REMOVAL procedure to replace the gaskets.

IF YOU CANNOT IDENTIFY OR CORRECT THE SOURCE OF MALFUNCTION

1. Turn the power supply to the water heater off.
2. Close the supply water inlet valve to the heater.
3. Contact a Qualified Service Agency in your area. Call the toll free phone number on the back cover of this Instruction Manual for assistance in locating a service agency in your area.

REPLACEMENT PARTS

Call the toll free phone number on the back cover of this Instruction Manual for assistance in locating replacement parts.. When ordering parts, specify complete model no., serial no., (see rating plate), quantity and name of part desired. Standard hardware items should be purchased locally.

LEAKAGE CHECKPOINTS

Instructions: Use this illustration as a guide when checking for sources of water leakage. You or your dealer may be able to correct what appears to be a problem. **NOTE:** Cover and Insulation shown removed to reveal tank top.

Where possible remove or lift top cover to examine threads of fittings installed into tank for evidence of leakage. Correct fitting leaks as necessary.

Water leaks at the elements may be due to:

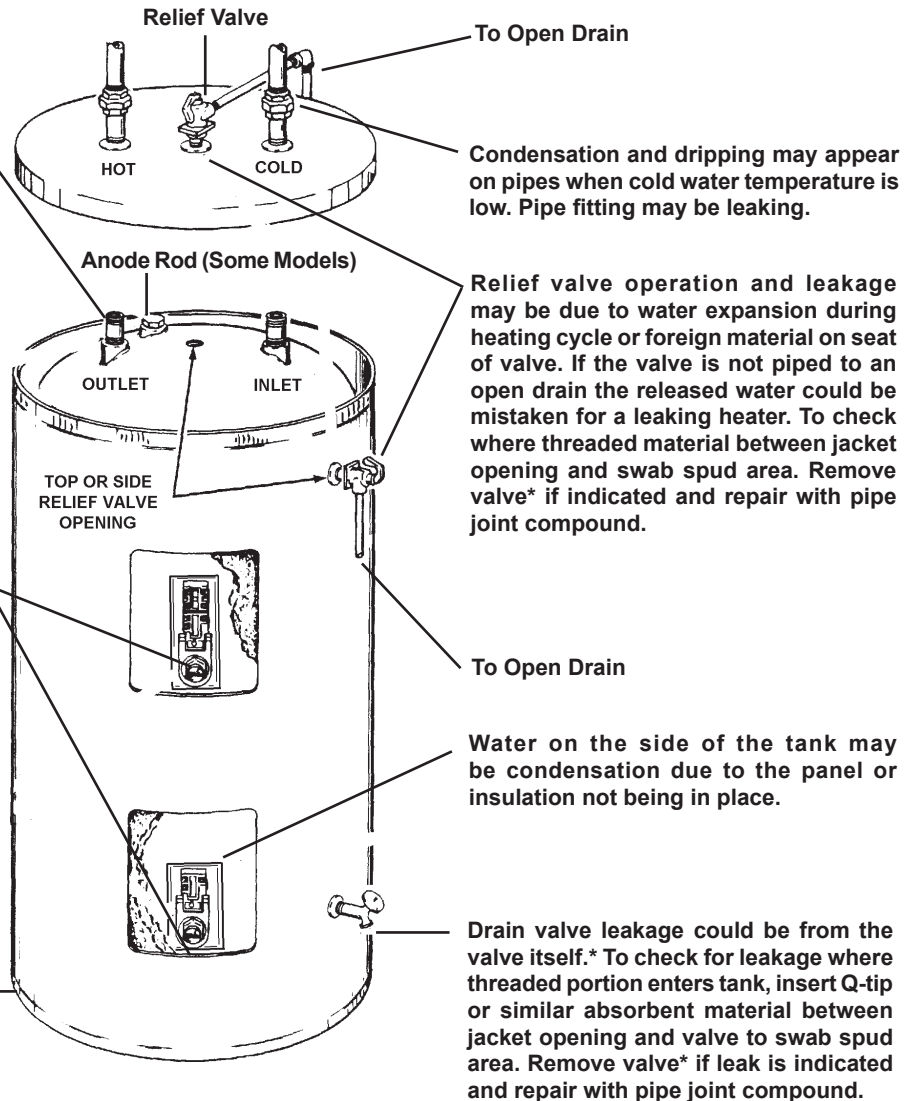
1. Defective element which leaks at terminals or thru flange. Replace element*.

2. Loose element/gasket leak:

(a) Screw-in type: tighten with 1-1/2" socket wrench. If leak continues, remove element*, discard gasket and clean thread areas. Apply nonhardening Permatex Number 2 to thread areas, install new gasket and screw element into fitting until it seats. Tighten 1/2 to 3/4 turn with wrench.

(b) Flange type: tighten screw with wrench. If leak continues remove element* and discard gasket. Clean gasket seating areas and re-install element with new gasket. A new element may be required where threads have become rusted or damaged, preventing tightening.

All water which appears at the water heater bottom or on the surrounding floor may be caused by condensation, loose connections or relief valve operation and leakage. Do not replace the water heater until full inspection of all potential leak points is made and corrective steps taken to stop the leak. Leakage from other appliances, water lines or ground (see page 16) should also be suspected until proven otherwise.



*Contact your dealer as it is necessary to shut off electricity and drain tank to perform procedure.

FIGURE 9

COMMERCIAL WATER HEATER LIMITED WARRANTY



EFFECTIVE

For 3 Years, in the event of a tank leak, we will repair or, at our discretion, replace the defective water heater.

For 1 Year, in the event of part failure, we will repair or, at our discretion, replace the defective part.

We warrant this product against defects in materials or workmanship as described in this document if installed within the United States or Canada and provided the product remains at its original place of installation.

Warranty coverage begins the date of installation OR the date of manufacture if installation cannot be verified.

WHAT'S COVERED

Subject to these terms, in the event of defect in materials and/or workmanship resulting in a **tank leak** during the **first three years**, we will:

- Replace the water heater should the tank leak.

Subject to these terms, in the event of a defect in materials and/or workmanship appearing during the **first year**, we will:

- Repair or, at our discretion, replace any part of the water heater covered under this limited warranty excluding parts subject to normal maintenance (Example: non-electronic anode rod, filter, etc)

Service/labor, shipping, delivery, installation, handling or any other costs are not covered at any time under this warranty.

Any replacement part or product will be warranted only for the unexpired portion of the original water heater's limited warranty period.

If an identical model is no longer available due to a change in law, regulation, or standard, we will replace the product with one having comparable capacity and input. In these instances, the owner will have the option of paying the difference between what was paid for the original model and the new model with the additional features, or receiving a refund of the portion of the purchase price, on a pro-rata basis allocable to the unexpired portion of the warranty.

WHAT'S NOT COVERED

- Problems caused by improper: gas supply line sizing, gas type, venting, connections, combustion air, voltage, wiring, or fusing
- Failure to follow applicable codes
- Failure to follow printed instructions
- Abuse, misuse, accident, fire, flood, Acts of God
- Improper installation, sizing, delivery, or maintenance
- Claims related to rust, noise, smell, or taste of water
- Failure to conduct authorized factory start up if required
- Alterations to the water heater
- Non-outdoor heaters installed outdoors
- Damages due to a failure to allow for thermal expansion
- Heat exchanger failure due to lack of adequate / proper supply of water
- Heaters moved from their original location
- Service trips to explain proper installation, use, or maintenance of the product/unit or to describe compliance requirements under applicable codes and regulations
- Charges related to accessing your heater including but not limited to door/wall removal, equipment rental, etc.
- Replacement parts after expiration of this warranty

LIMITATIONS

NOTWITHSTANDING ANYTHING ELSE TO THE CONTRARY, THIS IS YOUR SOLE AND EXCLUSIVE WARRANTY. ALL OTHER WARRANTIES INCLUDING A WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. SELLER SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, PUNITIVE OR OTHER INDIRECT DAMAGES. TOTAL LIABILITY ARISING AT ANY TIME SHALL NOT EXCEED THE PURCHASE PRICE PAID WHETHER BASED ON CONTRACT, TORT, STRICT LIABILITY OR ANY OTHER LEGAL THEORY.

SERVICE INQUIRIES:

For service inquiries call the telephone number listed below. Be prepared to provide the following information: name, address, and telephone number; the model and serial number of the water heater; proof of installation; and a clear description of the problem.

For your records, fill in the product:

Serial: _____

Model: _____

U.S. Customers:

A. O. Smith Corporation
500 Tennessee Waltz Parkway
Ashland City, Tennessee 37015
800-527-1953
www.hotwater.com

Canadian Customers:

P. O. Box 310 – 768 Erie Street
Stratford (Ontario) N5A 6T3
800-265-8520

NOTES

REPAIR PARTS LIST

Now that you have purchased this water heater, should a need ever exist for repair parts or service, simply contact the company it was purchased from or direct from the manufacturer listed on the rating plate on the water heater.

Selling prices will be furnished on request or parts will be shipped at prevailing prices and you will be billed accordingly.

The model number of your Water Heater will be found on the rating plate located above the lower access panel.

Be sure to provide all pertinent facts when you call or visit.

WHEN ORDERING REPAIR PARTS, ALWAYS GIVE THE FOLLOWING INFORMATION:

- MODEL NUMBER
- VOLTAGE AND ELEMENT WATTAGE
- SERIAL NUMBER
- PART DESCRIPTION

Del 6, 10, 15, 20 Series 102 (refer to repair parts table).

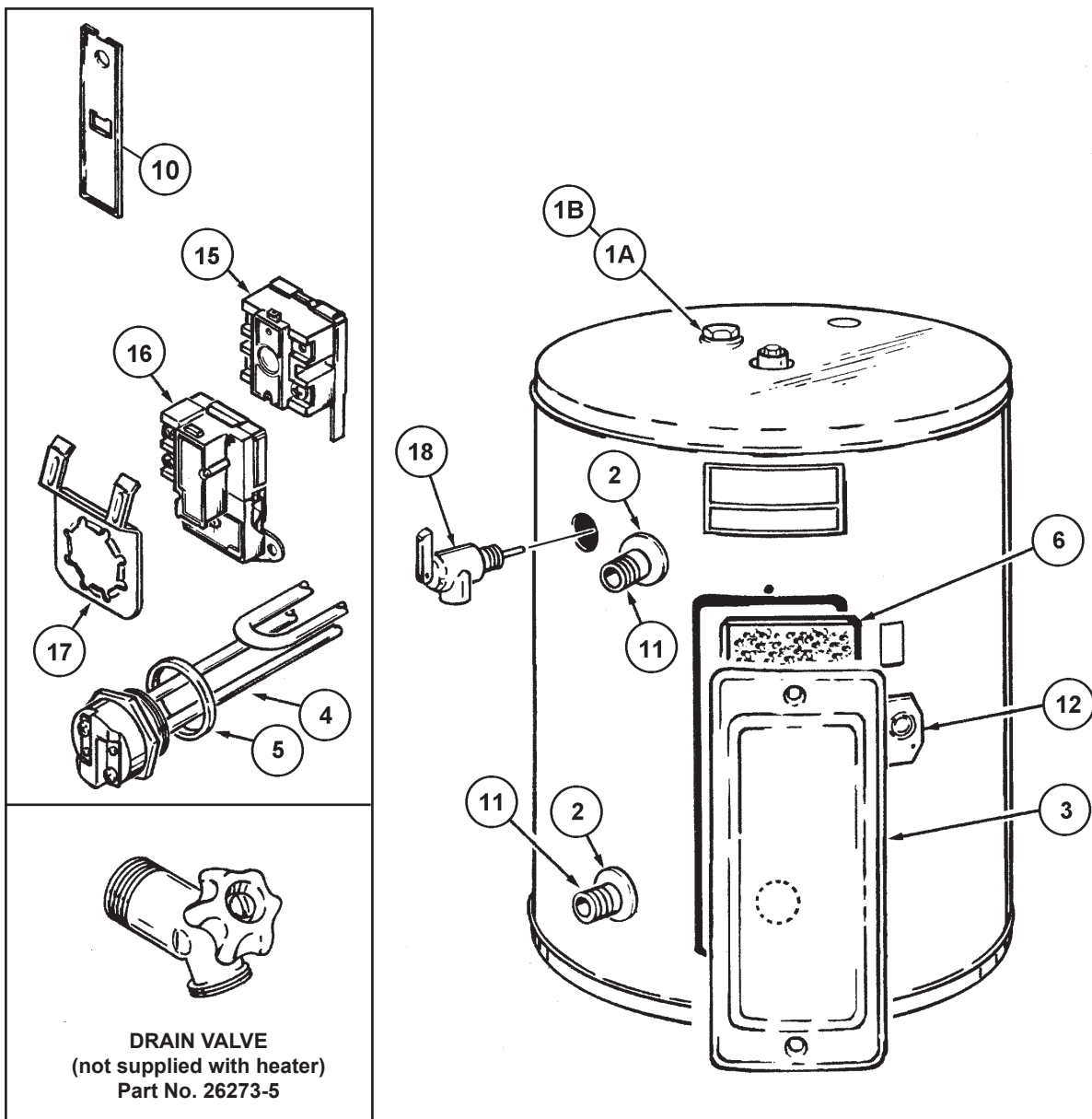


FIGURE 10

Item	Description	DEL-6 Series 102	DEL-10 Series 102	DEL-15 Series 102	DEL-20 Series 102
1A	Anode, Alum.....	9003942005.....	9003942005.....	9003942005.....	9003944005
1B	Anode, Mag. (SMR P72 and S19).....	9001909005.....	9001909005.....	9001909005.....	9003721005
2	Collar, Pipe.....	9004610115.....	9004610115.....	9004610115.....	9004610115
3	Cover, Front.....	9003900005.....	9003900005.....	9003900005.....	9003900005
4	ELEMENT, HEATING.....	SEE ELEMENT CHART ON PAGE 23.....			
5	Gasket, Element.....	9000308005.....	9000308005.....	9000308005.....	9000308005
6	Opening Insulation.....	043307-000.....	043307-000.....	043307-000.....	043307-000
7	*Instruction Manual.....	322055-0.....	322055-0.....	322055-0.....	322055-0
10	Personnel Protector.....	9003914015.....	9003914015.....	9003914015.....	9003914015
11	Pipe Nipple.....	194130.....	194130-3.....	194130-3.....	194130-3
12	Plate, Knockout.....	43293-1.....	43293-1.....	43293-1.....	43293-1
	PLUG				
15/16	Thermostat with High Limit Switch.....	9006586015.....	9006586015.....	9006586015.....	9006586015
17	Bracket, Thermostat.....	9003898015.....	9003898015.....	9003898015.....	9003898015
18	Valve, Relief.....	9003484005.....	9003741005.....	9003741005.....	9003741005

*Not Illustrated.
Standard Hardware Items May Be Purchased Locally. Underlined Parts Are Recommended For Emergency Replacement.

DEN 30, 40, 52, 66, 80 & 120, Series 110
(Refer to Repair Parts Table on page 22)

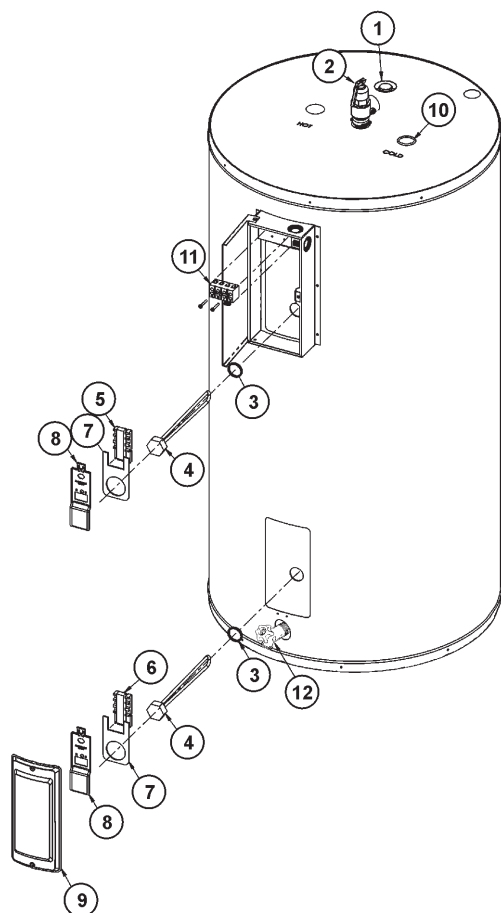


FIGURE 11

DEL 30, 40 & 50, Series 110
(Refer to Repair Parts Table on page 22)

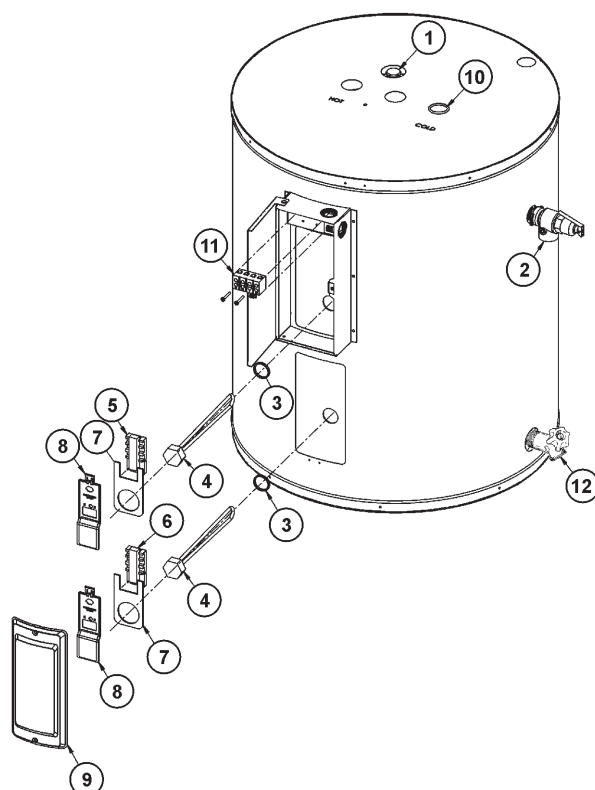


FIGURE 12

Item	Description	DEL-30 Series 110	DEL-40 Series 110	DEL-50 Series 110	DEN-30 Series 110	DEN-40 Series 110	DEN-52 Series 110	DEN-66 Series 110	DEN-80 Series 110	DEN-120 Series 110
1A.....	Anode, Alum.	9003944005.....	9003944005 ...	9003944005.....	9003944005 ...	9003944005 ...	9003944005...	9000029005....	9003892005....	9003892005
1B.....	Anode, Mag.(SMR P72).....	9003721005.....	9003721005 ...	9003721005.....	9003721005 ...	9003721005 ...	9003721005...	9003721005....	9001829005....	9001829005
2	T&P Relief Valve.....	9003741005.....	9003741005 ...	9003741005.....	9000071005 ...	9000071005 ...	9000071005...	9000071005....	9000071005....	9000071005
3	Gasket, Element.....	9000308045.....	9000308045 ...	9000308045.....	9000308045 ...	9000308045 ...	9000308045...	9000308045....	9000308045....	9000308045
4	ELEMENT, each..... (SEE ELEMENT & WATTAGE CHART page 23)									
5	Upper Thermostat w/Hi Limit	<u>9002856015</u>	<u>9002856015</u> ...	<u>9002856015</u>	<u>9002856015</u> ...	9002856015 ...	9002856015...	9002856015....	9002856015....	9002856015
6	Lower Thermostat w/Hi Limit	<u>9002857015</u>	<u>9002857015</u> ...	<u>9002857015</u>	<u>9002857015</u> ...	<u>9002857015</u> ...	<u>9002857015</u> ...	<u>9002857015</u>	<u>9002857015</u>	<u>9002857015</u>
7	Thermostat Bracket, each.....	9003898215.....	9003898215 ...	9003898215.....	9003898215 ...	9003898215 ...	9003898215...	9003898215....	9003898215....	9003898215
8	Personal Protector.....	9003914015.....	9003914015 ...	9003914015.....	9003914015 ...	9003914015 ...	9003914015...	9003914015....	9003914015....	9003914015
9	Lower Access Panel.....	9003900005.....	9003900005 ...	9003900005.....	9003900005 ...	9003900005 ...	9003900005...	9003900005....	9003900005....	9003900005
10	Dip Tube.....	9003902005.....	9003902005 ...	9003902005.....	9003902005 ...	9003903005 ...	9003904005...	9003905005....	9003905005....	9005709205
11	Power Terminal.....	9005719215.....	9005719215 ...	9005719215.....	9005719215 ...	9005719215 ...	9005719215...	9005719215....	9005719215....	9005719215
12	Drain Valve	9003906015.....	9003906015 ...	9003906015.....	9003906015 ...	9003906015 ...	9003906015...	9003906015....	9003906015....	9003906015
15*.....	Junction Box Assembly	195171	195171.....	195171	195171.....	195171	195171	195171	195171	195171
16*.....	Manual	322055-0	322055-0.....	322055-0	322055-0.....	322055-0.....	322055-0	322055-0	322055-0	322055-0

*Not Illustrated.

Standard Hardware Items May Be Purchased Locally.

Underlined Parts Are Recommended For Emergency Replacement.

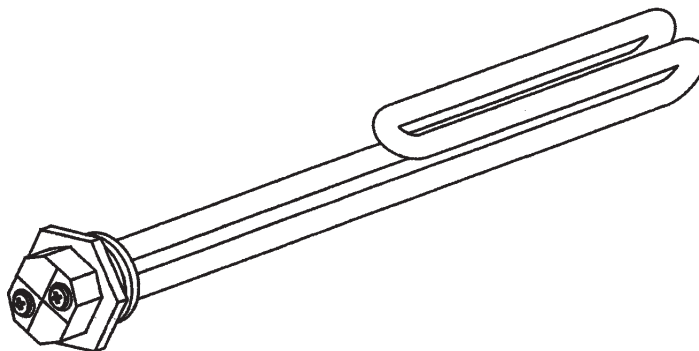


FIGURE 13

TABLE 6 - COPPER SHEATH ELEMENT AND WATTAGE CHART

K.W.	ELEMENT WATTAGE	120V	208V	240V	277V	480V
		PART NO.	PART NO.	PART NO.	PART NO.	PART NO.
1.0	1000W	---	9002863115	90001431005	---	---
1.5	1500W	9002963005	9000145005	9002864005	9001225115	---
2.0	2000W	9003947005	9002858005	9000145005	9004709115	---
2.5	2500W	9002859005	9004712105	9002860005	9002890005	9002861005
3.0	3000W	9002862005	9002868005	9003959005	9003958005	9003961005
3.5	3500W	---	9003950005	9004712105	---	---
MAX 3.5KW INPUT FOR 6 GALLON UNITS, ELEMENTS BELOW DOTTED LINE CANNOT BE USED ON 6 GALLON UNITS						
4.0	4000W	---	9002867005	9002868005	9001229005	9002869005
4.5	4500W	---	9003952005	9003950100	9003960005	9001225005
5.0	5000W	---	9001224005	9003957005	9001231005	9001236005
5.5	5500W	---	9002871005	9002867005	---	9002872005
6.0	6000W	---	9003953005	9003952005	9002874005	9002875005

TABLE 7 - INCOLOY SHEATH ELEMENT AND WATTAGE CHART (FOR SMR P72)

K.W.	ELEMENT WATTAGE	120 V	208 V	240 V	277 V	480 V
		PART NO.	PART NO.	PART NO.	PART NO.	PART NO.
1.5	1500 W	9004279005	9004283005	9004290005	9004736105	Not Available
2.0	2000 W	9004280005	9004284005	9004283005	9004290005	9004298005
2.5	2500 W	9004281005	9004285005	9004291005	9004295005	9004299005
INCOLOY ELEMENTS BELOW THIS LINE CANNOT BE USED ON 6 GALLON UNITS BECAUSE OF ELEMENT LENGTH						
3.0	3000 W	9004282005	9004751115	9000664005	9004296005	9004300005
3.5	3500 W	Not Available	9003210005	9004292005	Not Available	Not Available
4.0	4000 W	Not Available	9004294005	9004751115	9000664005	Not Available
4.5	4500 W	Not Available	9004287005	9003210005	9004297005	9004301005
5.0	5000 W	Not Available	9004753105	9004293005	Not Available	Not Available
5.5	5500 W	Not Available	9004288005	9004294005	Not Available	Not Available
6.0	6000 W	Not Available	9004289005	9004287005	Not Available	Not Available



www.hotwater.com

500 Tennessee Waltz Parkway, Ashland City, TN 37015

Tech Support: 800-527-1953

Parts: 800-433-2545

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Spec Section:

O&M Name

PRV

⚠️ ADVERTENCIA

Lea este manual ANTES de utilizar este equipo.

El no leer y seguir todas las medidas de seguridad y usar la información puede causar la muerte, lesiones personales graves, daños materiales o daños en el equipo.

Guarda este manual para referencia futura.

Instrucciones de instalación

- Esta válvula debe instalarse en un lugar accesible con suficiente espacio para la limpieza, el servicio o el ajuste.
- Enjuague la tierra y el sarm de la tubería de suministro.
- Puede instalar el regulador de forma vertical u horizontal, pero debe instalarlo con la flecha en la dirección del flujo.
- El regulador está configurado a 345 kPa (50 psi). Para ajustar, afloje la tuerca de seguridad y gire el tornillo de ajuste en el sentido de las agujas del reloj para aumentar la presión, en el sentido contrario para disminuirla.
- El LF223 tienen una válvula de derivación de expansión térmica incorporada. Si usa el modelo LF223 cuando la presión de entrada es mayor que la configuración de descarga de la válvula T&P (temperatura y presión) del calentador de agua (comúnmente 10.3 bar, 150 psi) o cuando existe una válvula de retención o válvula de contraluz de agua instalada en la línea, debe hacer provisiones para la protección de la liberación de la presión a fin de proteger su sistema de tuberías y sus componentes. Lo sugerimos el uso de un tanque de expansión modelo DET, la válvula de flotador y la válvula de liberación de la expansión térmica Governor 80 de Watts o una válvula de liberación de presión calibrada 530C. (Solicite la carpeta F-RV, S-Therm Expansion, o consulte a un plomero profesional).

⚠️ PRECAUCIÓN

Siempre que ajuste una válvula reductora, se recomienda el uso de un medidor de presión para verificar la configuración correcta de la presión. No quise el tornillo de ajuste hacia atrás en el compartimiento del resorte.

Línea principal de servicio

Instale en serie con un regulador más pequeño para mejorar el rendimiento del sistema y extender la vida útil de la válvula.

Conduite principale

Installez en tandem avec un régulateur plus petit afin d'améliorer la performance du système et de prolonger la durée de vie de la soupape.

Instructions d'entretien

- Pour nettoyer ou remplacer des pièces, couper l'alimentation, desserrer le contre-écrou et déloger la vis de réglage.
- Déposer la cage à ressort, le ressort et la rondelle. Enlever le bouchon inférieur.
- Démontez le module. Utilisez une clé pour desserrer le carter de manœuvre et enlever la rondelle d'obturation et la plaque de la membrane. Enlever la fourche en desserrant le support de disque à l'aide d'un tournevis.
- Lors de la remise en place du support de disque, appliquer une goutte d'enduit fran pour filer à faible résistance. Ne pas trop serrer.

AVIS

Lorsque le dispositif est équipé d'un filtre, le purger régulièrement.

Trousses de réparation

La trousses pour le modèle n° LF223 comporte les pièces illustrées

N° de commande	N° de trousses	Souape de série	Taille
0125123	LFKIT-C-RK		1/2, 3/4
0125124	LFKIT-D-RK		1, 1 1/4
0125125	LFKIT-E-RK	LF223	1 1/2, 2
0125369	1 1/2 RK LF223N		2, 2 1/2
0125370	2 RK LF223N		2 1/2, 3
0125371	2 1/2 RK LF223N		2 1/2, 3
0009009	2 1/2 LHK-223	LFN223B	65, 80
0125372	2 1/2 RK LFN223M2	LFN223BM1	65

AVIS

Pour commander, indiquer le numéro de code de commande, le numéro de trousses et la taille de la soupape.

⚠️ AVERTISSEMENT

Effectuer une inspection complète de la soupape afin de détecter les fuites exister après l'installation « finale » du régulateur.

Instrucciones de mantenimiento

- Para limpiar o cambiar piezas; cierre el suministro, afloje la contratuercas y retire el tornillo de ajuste.
- Quite el compartimento del resorte, el resorte, la arandela. Quite el tapón de la parte inferior.
- Desarme el módulo. Use la llave para aflojar la tuerca de vástago y quitar la arandela de trabajo y la placa del diafragma. Quite el yugo aflojando el soporte del disco usando un destornillador.
- Cuando cambie un soporte de disco, aplique una gota de selladores de rosca de baja resistencia. No apriete demasiado.

AVISO

cuando se proporcione con un filtro, enjuague periódicamente.

⚠️ ADVERTENCIA

realice una inspección minuciosa de la válvula para verificar que no presenta pérdidas externas luego de la instalación "final" del regulador.

FRENCH INSTRUCTIONS

⚠️ AVERTISSEMENT

Lisez attentivement ce manuel avant d'utiliser cet équipement.

Négliger de lire et de suivre toutes les consignes de sécurité et d'utilisation de l'information peut entraîner la mort, des blessures graves ou des dégâts matériels, ou endommager l'équipement.

Veuillez conserver ce manuel pour toute référence ultérieure.

Instructions d'installation

- Ce robinet doit être installé dans un endroit accessible avec un dégagement suffisant pour le nettoyage, l'entretien ou le réglage.
- Purger les saletés et le terre présents dans la conduite d'alimentation.
- Le régulateur peut être installé verticalement ou horizontalement, en autant que la flèche soit orientée dans la direction du débit.
- Le régulateur est pré-réglé à 345 kPa (50 psi). Pour le régler, desserrer le contre-écrou et tourner la vis de réglage dans le sens horaire pour augmenter la pression, ou dans le sens antihoraire pour la diminuer.
- Le modèle LF223 comporte une dérivation thermostatique intégrée. Pour le modèle LF223, lorsque la pression d'entrée est supérieure au réglage de l'évacuation de la soupape T&P du chauffe-eau (habituellement 10.3 bars/150 psi), ou lorsqu'une soupape à clapet ou un dispositif anti-refoulement est installé sur la conduite, prévoir l'installation d'un limiteur pour protéger la plomberie et ses composants. Il est suggère d'utiliser un réservoir de dilatation modèle DET, le robinet à flotteur Governor 80 de Watts et une soupape de sécurité thermostatique ou une soupape de décharge étalonnée 530C. (Demander le dossier F-RV, S-Therm Expansion, ou consulter un plombier professionnel).

⚠️ ATTENTION

Chaque fois qu'un robinet est ajusté, il est recommandé d'utiliser un manomètre pour vérifier le réglage de la pression. Ne pas dévisser complètement la vis de réglage de la cage à ressort.

69 of 69