

Inventory ID	Description	Loc ID	Quantity	Unit
910450	RF-450-1 1/2"-SX w/ERct	1		
100189	36x72 COMPOSITE MINERAL TANK STRUCTURAL P/N: 31217 CONNECTION: 6" FLANGE TOP/BOTTOM HEIGHT W/BASE: 89.0" CAPACITY: 264.0 GAL./ 35.3 CU.FT. COLOR: BLUE	1	1.0000	ea
100053-T	6" - 8 UN THRD ASSY - RF	1	1.0000	EA
703008	1-1/2" MANIFOLD ASSY, HUB, 30" TANK	1	1.0000	EA
479909	RESIN PK 450 36X72 F 15 , 3 RESIN PACKAGE 15 FT3 8% CROSS LINK CATION RESIN 400 POUNDS GRAVEL	1	1.0000	EA
805177	30X50 BRINE TANK ASSY RM/24SP ACCUMATIC BRINE TANK ASSEMBLY DIAMETER: 30 INCHES HEIGHT: 50 INCHES ROTATIONALLY MOLDED HDPE TANK 5" BRINE WELL 1/2" BRINE VALVE 24" HIGH SALT PLATFORM SUPER WEB GRID SUPPORT	1	1.0000	EA
200126-3	BRINE LINE ASSEMBLY 1/2" BV 1/2" BL KIT CONSISTING OF: 1/2" POLY PRO BRINE LINE FITTINGS FOR TM3 AND 1/2" BRINE VALVE	1	1.0000	EA
707150-3DFNT	TM3 ERCT BRN 35 / 1.5 N AM TOP TASK MASTER III 316 STAINLESS STEEL 5 CYCLE WATER SOFTENER VALVE ERct CONTROLLER - TIMED REGENERATION BROWN INJECTOR 35 GPM BACKWASH 1 1/2" TOP MOUNT 110V 60 HZ USA PROGRAM	1	1.0000	EA
400904	4" FUNNEL	1	1.0000	EA

End of Report

SPECIFICATIONS RF Simplex



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Delivering Experience, Quality, and Service since 1934.

RF SX SIMPLEX SINGLE TANK TIME CLOCK INITIATED REGENERATION SPECIFICATIONS

RF. The RF series water softeners have composite (fiberglass tanks with polyethylene liners) with top mounted Task Master III stainless steel valves. These fully automatic softener packages consist of mineral tank(s) with resin (resin pack), Task Master III control valve(s), brine tank(s) using the Accumatic Brine System. They may also include flow meter(s) and shut off kits(s). RF series softeners can have regeneration initiated by time of day with the ERCt controller or by demand (accumulated flow) with the ERCd controller. Model numbers indicate the capacity, operation mode and whether the unit is demand or time clock initiated.

Simplex (-SX). Simplex systems shall have regeneration initiated by time of day or “clock time”. SX systems shall have one brine tank, one Taskmaster III® control valve, one ERCt controller. Simplex systems bypass hard water during regeneration.

Composite Mineral Tank. The mineral tank shall be “polyglass” consisting of an inner shell of virgin polyethylene and an external shell of continuous fiberglass roving. Tanks shall be rated at 150 psi operating pressure, 120°F operating temperature with 4” -8 UN threaded top opening.

Manifold Assembly. The distributor shall be a 2½” Ø single point molded distributor head with 2½” of slotted length and a 1½ inch female socket welded connection. The slots shall be 0.012” - 0.016” wide to retain mineral and the total slot area shall be equal to or larger than the unit pipe size. The distributor pipe shall be 1½” schedule 40 white PVC. For systems using vessels 30” diameter and larger, a hub and lateral distributor is used.

Resin Pack. The resin shall be sodium form polystyrene 8% divinyl benzene cross linked resin with clear spherical beads. Resin beads shall be 16-50 US Standard Mesh with a particle size range of 0.3 to 1.2 mm. The resin shall be clean and packaged in sealed plastic bags weighing 55 lbs or less. The bottom of this mineral tank shall be filled above the distributor with #20 graded washed flint gravel sieved between 1/8” and 1/16”.

Brine Tank. The brine system shall be of the Accumatic™ high grid plate design. The brine tank shall be blow molded or rotationally molded HDPE, including a cover. The system shall include a SCH 80 PVC float operated brine valve to control refill shut-off and refill flow rate. Brine volume is to be repeatedly accurate within 10% and not dependent on salt bed void space for brine volume. Brine draw is to be volumetrically controlled, not timed.

Brine Line Assembly (BLA). The brine tank is connected to the mineral tank with a Polyethylene tubing and Liquid-Tite Tube x NPT connectors. The brine inlet fitting to the valve is ½” MNPT and the connection to the brine tank matches the brine valve fitting.

SPECIFICATIONS RF Simplex

Task Master III (TM3) Control Valve. The main control valve(s) shall be the Task Master III™ with electronic controller to actuate the cycles of backwash, brine, slow rinse, fast rinse, and service for a water softener (or backwash, rinse and service for a filter). The control valve(s) shall be Task Master III™ 5-Cycle, multi-port control valve(s) with machined passivated CF8M Type 316 Stainless Steel body, Type 316 Stainless Steel piston assembly, and EPDM (NSF61 and WRAS Approved) inserts and seals with electronic controller and drive motor assembly in a NEMA 4/IP65 Style Enclosure. The valve shall operate with a single motor driven piston positioned by optical sensors. Valve inlet and outlet shall be 1 ½" FNPT. Backwash drain shall be ¾" or 1 ½" depending on flow. The brine inlet shall be ½". The one-piece brine eductor shall be installed in the valve. The valve shall be equipped with threaded ¼" FNPT ports for the installation of sample taps and pressure gauges. (Taps and gauges are optional.) Hard water by-pass shall be available during all regeneration cycles at 70 gpm or at the peak flow rate of the unit, at a pressure drop less than 25 psi, whichever is less. No hard water bypass option is obtained by adding a shut off kit to the valve. The valve shall be of a single piston design and shall not use multiple plungers or diaphragm valves. Maximum rated power shall be 125 watts with available current options of 115 VAC, 230 VAC, 100 VAC, 200 VAC, in 50 or 60 Hertz.

Ambient operating temperature range shall be 34° F (1° C) to 150° F (65° C). Fluid temperature range shall be 34° F (1° C) to 180° F (82° C). Operating pressure range shall be 20-125 psi (1.38 - 8.6 bar). The valve shall have UL, CSA, TÜV and CE certifications. ANSI/NSF 61 certification is pending.

Electronic Regeneration Controller (ERCt). The ERC controller is a solid state, programmable, electronic controller capable of complete control of meter reading, softener regeneration initiation, and cycle time control. The controller allows independent control of cycle times for backwash, brine draw, slow rinse, and fast rinse over a range of 0 to 250 minutes. The time clock initiated model (ERCt) allows regeneration at preset time intervals to 0.5 days. Regeneration can be performed at a preset time of day with up to a 99 day cycle.

Funnel (4"). A black plastic funnel is provided for adding media to mineral tank.

System Operating Conditions. Maximum temperature shall be 120° F. Maximum Pressure shall be 125 psi. The temperature rating can be raised to 150° F by specifying Viton seals for the shut off kits (-V), vinyl ester resin for the mineral tanks, and 10% DVB cross-linked resin as the media.

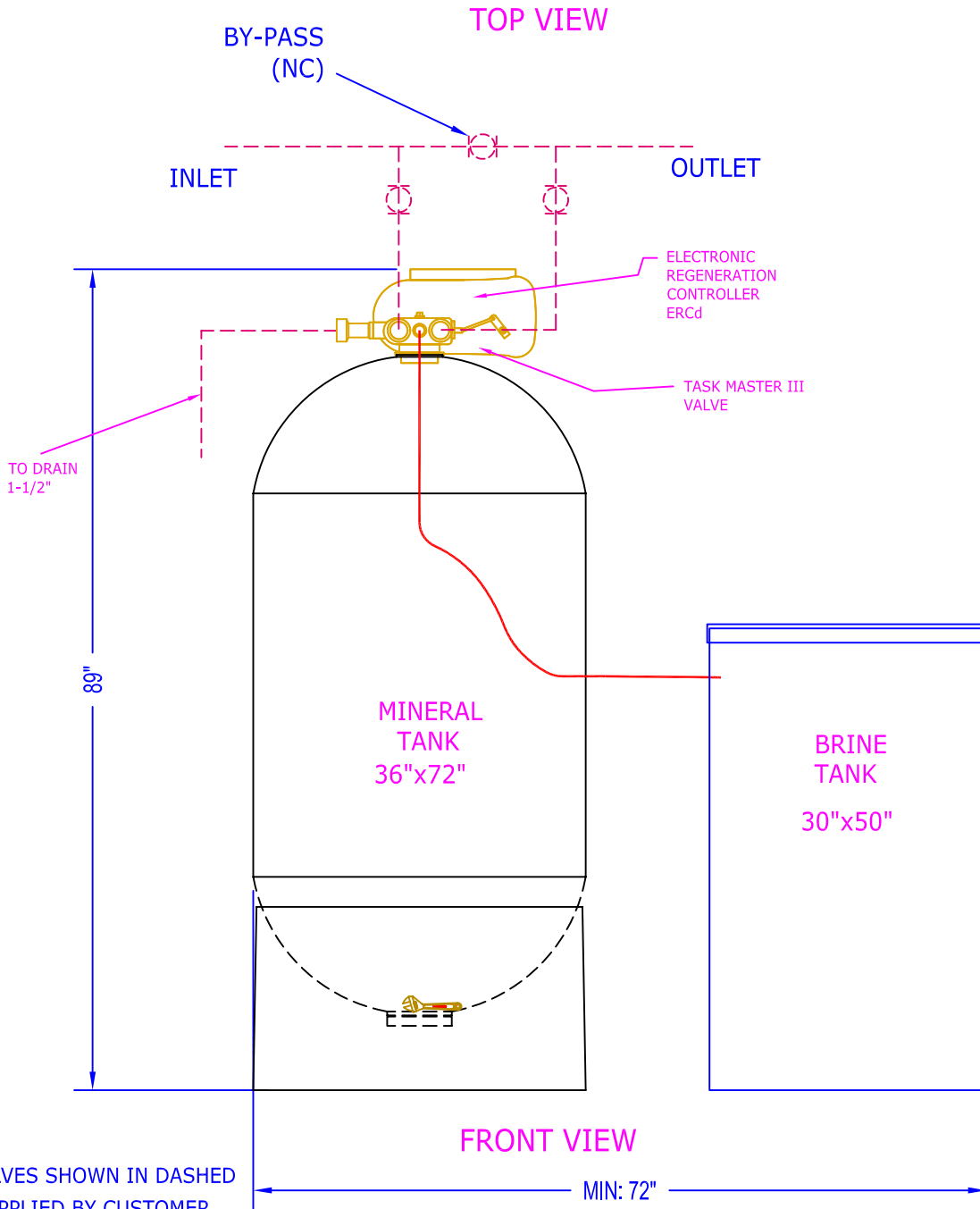
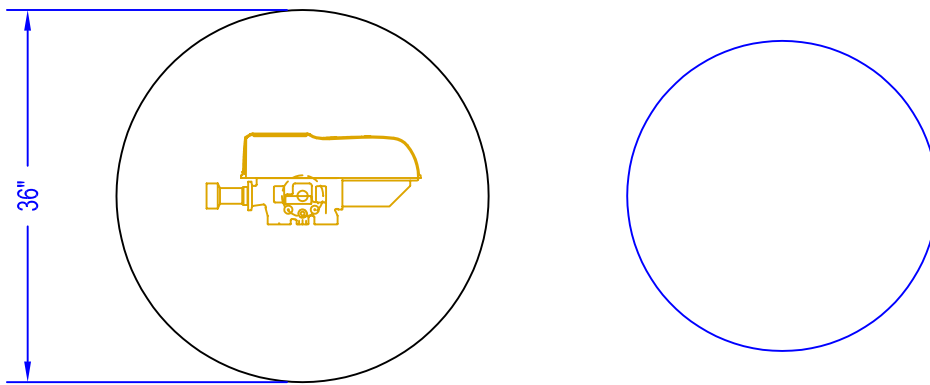
Other items. A standard soft water soap test kit shall be provided. A complete set of instructions, including installation, loading, start-up, adjustments, servicing, and a parts list shall be provided with the equipment.

Qualifications. A company that has continuously manufactured water softeners for at least twenty (20) years shall construct this equipment.

Water Softener Performance		
Part No.:	910450	
Model Number:	RF 450 SX	
Capacity Per Vessel:	432,000	grains at preset brine draw
System Capacity:	432,000	grains
Brine Tank Salt Storage:	900	lbs as NaCl
Preset Brine Draw:	145	lbs per regeneration
Salt Dosage:	10	lb salt / ft3 of resin
Backwash Rate:	35	gpm
Flow vs Headloss (1)		
Head Loss	Flow	
5 psi	32	gpm
10 psi	46	gpm
15 psi	56	gpm - Continuous Flow
20 psi	65	gpm
25 psi	72	gpm - Peak Flow

(1) Simplex Headloss includes losses from Task Master III valve (Cv=15), media and distributor.

Simplex (-SX). Simplex systems shall have regeneration initiated by time of day or "clock time". SX systems shall have one brine tank, one Task Master III control valve, and one ERCt controller. Simplex units bypass hard water during regeneration rather than shutting off the flow of water. Ordering an optional shut off kit will prevent hard water bypass.



PIPING AND VALVES SHOWN IN DASHED LINES TO BE SUPPLIED BY CUSTOMER
 ACTUAL LOCATION & LENGTH MAY VARY

J:\Drawings\catalog\RF450.dwg, 3/15/2011 1:20:07 PM, RaymondRichardson, Water King Inc.

SHIPPING Wt.	1395 Lbs.
OPERATING Wt.	-

REV. NO.	REVISION	DATE	CK'D
1	PRELIMINARY	03/15/2011	



910450 RF-450 SINGLE SOFTENER TYPICAL PIPING ARRANGEMENT		
SCALE @ 24"x36"	DRAWING NUMBER	SHEET
N.T.S.	WKRF450	01 / 0 1
www.waterking.com		

Fiberglass Composite Mineral Vessels

FIBERGLASS COMPOSITE TANKS

Water King RF, MF-FG, VN-FG, and BF Series systems use fiberglass composite vessels with a fiberglass exterior and polyethylene liner.

SPECIFICATIONS

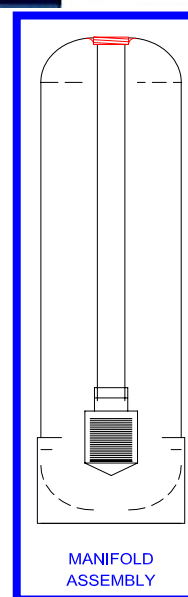
Standard Vessels. Composite tanks shall be 100% non-metallic construction, seamless, molded vessels with no welds or joints. The inner shell shall be constructed of polyethylene and the outside shall be wound with continuous fiberglass, roving to provide superior strength under pressures up to 150 psi. All tanks, vessels, and the materials used in their construction shall be accepted or certified by the Water Quality Association and ANSI/NSF Standard 44. Working pressure rating shall be 100 psi with a design factor of safety of at least 4:1. The tanks have a circular plastic base. Water King's fiberglass composite tanks are covered by a 5-year warranty. Standard color shall be blue.

Note on temperature ratings. Composite polyester tanks with polyethylene lining with threaded fittings shall be rated at 120°F. Composite tanks with flanged fittings shall be rated at 150°F. Vinyl ester FRP tanks, without liners, with threads shall be rated at 150°F.

Commercial Application. The Task Master III™ 1 ½ - inch valve is "top mounted" on a 4-inch diameter threaded opening, which is molded directly into the fiberglass tank. Bayou Series Magnum IT valves are also 4" top mounted.

Residential / Light Commercial Application. The Bayou Series ¾" and 1" plastic valves mount on a 2 ½" threaded top opening.

Bottom Drain. Water King can provide a bottom drain for fiberglass vessels. This is useful if you must drain the softener to prevent freezing or for transportation of rental units. Tanks with bottom openings must be specially ordered.



WK 100 Softener Resin

WK100 IS A MULTIPURPOSE, PREMIUM GRADE, STRONG ACID CATION EXCHANGE RESIN
WK100 IS SUITED FOR SOFTENING, AND CHEMICAL PROCESSING APPLICATIONS.

OPERATING CONDITIONS

Maximum Operating Temp:	250°F (120°C) in H ⁺ form 280°F (140°C) in Na ⁺
Form:	Shipped in Sodium Form
Resin bed Depth:	24"(600 mm) to 36"(900 mm)
Maximum Service Flow:	15 gpm/ft ³ (120M ³ /Hr/M ³)
Backwash Expansion space:	40 to 75%
Backwash flow Rate for 40 to 75% expansion at 77°F (25°C)	4 to 10 gpm/ft ² (9 to 25 M ³ /Hr/M ²)
Regenerant:	NaCl for Na ⁺ form.
Regeneration level:	3.7 to 10.0 lbs NaCl/ft ³ (60-160 g NaCl/l)
Regenerant concentration:	5.0 to 15.0% for NaCl
Regeneration flow rate:	0.25 to 2 gpm/ ft ³ (2 to 16 M ³ /Hr/M ³)
Regeneration time:	20-60 minutes
Fast Rinse:	At service flow rate
Slow Rinse:	At regeneration flow rate
Rinse Volume:	25 to 40 gal/ft ³ (3 to 5 M ³ /M ³)

INFLUENT LIMITATIONS

Free Chlorine:	Not traceable
Turbidity:	Less than 2 N.T.U

WK 100 RESIN CHARACTERISTICS	
Type	Strong acid cation exchange resin
Matrix Structure	Cross linked polystyrene (8%)
Functional group	Sulphonic acid
Physical form	Moist spherical beads
Ionic form	Hydrogen/ Sodium (KW100 is the sodium form)
Particle Size	0.3-1.2mm
Screen Size U.S.S (wet)	16-50
Total Exchange capacity	2.0 meq/ml (Na ⁺) form / 1.8 meq/ml (H ⁺)
Swelling (approx.)	Na ⁺ to H ⁺ 7%
Moisture content (approx.)	52% (H ⁺), 45% (Na ⁺)
Backwash settled density	50 to 52 lbs/ft ³ (800 to 840 g/l) in H ⁺ form 52 to 55 lbs/ft ³ (840 to 880 g/l) in Na ⁺ form
Operating pH range	0-14
Solubility	Insoluble in all common solvents
Shipping weight	0.82 Kg/l (approx.) in H ⁺ form 0.86 Kg/l (approx.) in Na ⁺ form

Accumatic

ACCUMATIC™ BRINE SYSTEM

The Accumatic™ brine system consists of a brine tank and an internal (also called Throat & Nozzle Assembly) or external brine ejector mounted inside (injector) the Task Master III™ or mounted externally (educator) as part of a valve nest. The brine tank consists of a brine valve, a brine well, a salt platform, and an overflow assembly.

The brine system applies a salt solution to the softener to regenerate the cation exchange resin. Saturated brine (26% NaCl by weight) is drawn from the brine tank by the ejector. Each model of softener has a different ejector to generate a different brine flow rate. The corrosion proof ejectors are sized to dilute the saturated brine to 10% NaCl by weight. This brine concentration minimizes salt use during regeneration.

To create the saturated brine, dry salt is added to the brine tank, where it is dissolved in water. Since there is always an excess of salt, the brine solution is saturated. In the high grid plate design, the dry salt is not allowed to fill the bottom of the brine tank.

The saturated brine is drawn from below the grid plate (and below the salt bed) eliminating salt bridging and mushing. The Accumatic™ system controls the amount of brine solution added during regeneration and automatically refills the brine tank with water after regeneration. Because of the high grid plate, brine volume is not dependent upon void space in the salt bed. Brine drawn during regeneration is repeatable and accurate.

Features:

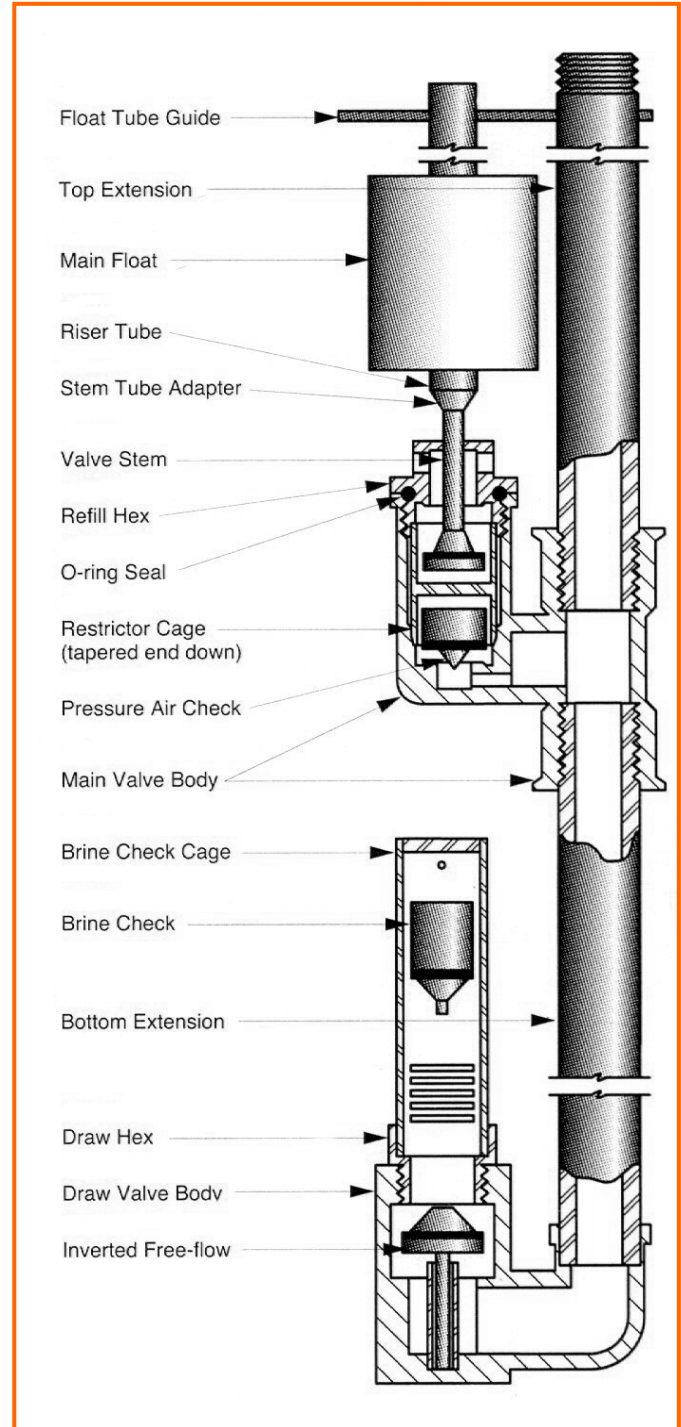
- **Made from Rugged PVC Pipe.** The Accumatic™ brine valve is available in $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1" and 1 $\frac{1}{4}$ " sizes. All sizes are constructed of heavy duty Sch.80 PVC. The sizes are I.D. as in pipe size, not O.D. as in tubing size. Our $\frac{3}{8}$ " ID brine valve is the same size as other $\frac{1}{2}$ " O.D. valves. The Accumatic brine valve is made from pipe, not tubing.
- **Very precise measurement of brine.** The Accumatic™ valve provides accurate volumetric control of brine draw. The same amount is drawn every time. The voids of the salt do not affect the brine draw.
- **Brine check** in brine valve prevents air draw into mineral tank.
- **Positive pressure** is applied to seat the brine valve to prevent brine contamination during the service cycle.
- **Standard systems** have a fixed brine float which is factory preset at a brine draw which works for the system. Brine draw can be adjustable by adding the optional adjustable brine float.



CAT610.2

ACCUMATIC™ BRINE SYSTEM OPERATION

1. The Task Master III™ valve shifts to the brine position. Flow now passes through the brine injector mounted inside the valve body (internal injector). (See part #2 on the exploded view of the Task Master III™.) The injector draws a vacuum on the brine line.
2. This vacuum releases the brine valve seal (originally seated by incoming fill water pressure). The Free-flow valve drops open allowing brine to be drawn from the tank. As water is drawn from the tank, the main float will drop to allow re-fill. At the same time, the vacuum draws the air check valve closed to prevent the drawing of air through the re-fill valve.
3. The unit will continue to draw brine until the water level in the brine riser tube reaches the bottom of the brine riser tube. At this time the brine check will seat. This again prevents air from being drawn into the system. The Task Master III™ valve remains in brine position and water continues to pass through the injector even though it is not drawing brine. This cycle is called Slow Rinse. Slow rinse ends when the cycle timer advances the piston to the Fast Rinse position.
4. In the Fast Rinse position (and all other positions except Brine Draw) the brine line is under positive pressure. This positive pressure lifts the inverted free-flow valve and the air check valve and allows water to begin refilling the brine tank.
5. Refilling continues until the water level in the brine tank reaches the preset level and the float causes the brine valve seat and seal. The continuing positive pressure on the brine line maintains this seal.
6. The fresh water, which entered the brine tank, is now in contact with solid salt. Over the next few hours, the water becomes saturated with salt creating saturated brine.



TASK MASTER III™

1 ½ INCH COMMERCIAL INDUSTRIAL WATER SOFTENER AND FILTER VALVE

- The Task Master III™ is a 316 Stainless Steel 1½ inch, five cycle, water softener or water filter control valve.
- There is only one moving part – the piston.
- The valve body is 316 SS and the piston is stainless steel with EPDM seals and inserts.
- The valve has two different tank adaptors allowing top mount on a fiberglass tank or side mount on the face piping.
 - The housing for the brine ejector is cast into the valve body making it an integral part of the valve.
 - The piston is motor driven and is not dependent on water pressure. It shifts smoothly without water hammer. The drive assembly positions the plunger for each of the five cycles.
 - The valve design assures synchronization of the drive assembly with the electronic timer and optical sensors making certain the plunger is correctly positioned for each of the five cycles of softening.
 - ERCt 99-day electronic timer with ability to independently program each cycle time.
- ERCd demand regeneration timer with variable reserve.
- The electrical enclosure carries a NEMA 4 rating.
- Since brining and process control often must be coordinated with the regeneration cycles of a softener, the valve is designed to provide an on/off signal and dry contacts for external electrical functions.
- Temperature rating is 180°F. Operating pressure is 125 psi.
- 71 gpm backwash rate (at 25 psi head loss)
- Valve coefficient is 15.
- Top Mount and Side Mount tank adaptors =>



ERcT Controller

NEMA 4/IP65 STYLE ENCLOSURE

Intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose-directed water; undamaged by the formation of ice on the enclosure. The enclosure door must be kept tightly closed. Any modifications to this product (i.e. added holes for cable entry/mounting, conduit connections...etc.) may void the intended NEMA4/IP65 rating. NEMA 4/IP65 and UL rated fittings should be used when modifying the enclosure.



POWER LOSS MEMORY RETENTION

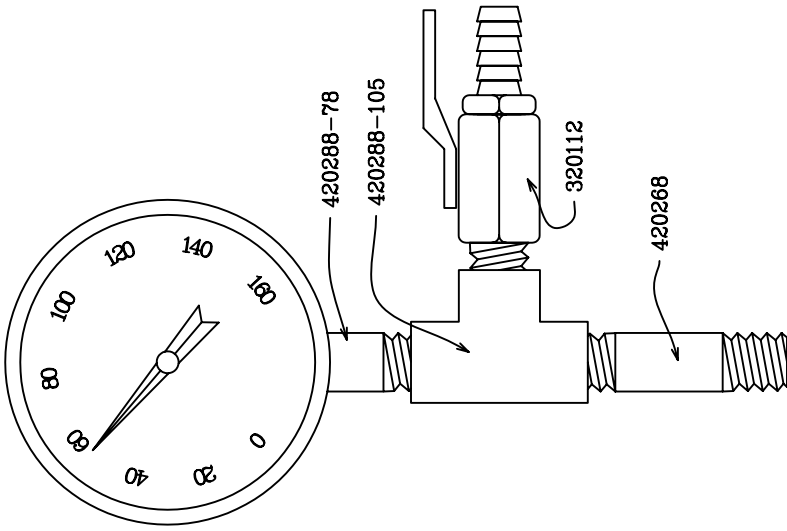
The ERcT Controller features battery-free time and date retention during the loss of power. This is designed to last a minimum of 8 hours depending on the installation. The controller will continue to keep time and day in dynamic memory while there is no AC power.

Information entered or calculated by the controller is stored in two different ways:

1. Static Memory:
 - Media volume
 - Regenerant setting
 - Time of regeneration
 - Days between regeneration
2. Dynamic Memory:
 - Current day of week
 - Running clock

ERcT PARAMETERS

Backwash Cycle	0-250 minutes
Regenerant Draw Cycle	0-250 minutes
Slow Rinse Cycle	0-250 minutes
Fast Rinse Cycle	0-250 minutes
Days between regeneration	0-99 days
Day of the week regeneration	Monday-Sunday
Remote regeneration Switch Delay	3-250 seconds



RF Series- Pressure Gauge & Test Tap Kit # 720075-4

Specifications:

Pressure gauge and test tap kit;
A kit containing two liquid filled, stainless steel pressure gauges with 2 1/2" Ø face, two brass ball valve sample taps with hose barb connections and associated brass connection. Fittings shall be provided for mounting in the 1/4" FNPT pre drilled and tapped ports in the inlet and outlet of the Task Master valve.

Revised by: 310310JEB



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