

VN F 900 to 3000 SOFTENERS



**4" and 6" GRV Piping
42" to 72" diameter vessels**

STANDARD FEATURES

DMB SERIES 230 PSI CAST IRON
POLYETHYLENE LINED DIAPHRAGM VALVES
IN VALVE NEST CONFIGURATION
99-DAY ERCT ELECTRONIC TIMER
MPV1 125 PSI BRASS STAGER
100 PSI EPOXY LINED AND COATED CARBON
STEEL MINERAL TANKS
DOUBLE DRILLED DOUBLE TAPPED PAD
FLANGES ON INLET AND OUTLET
EE SERIES – PVC EXTERNAL BRINE
EJECTOR
FIXED RATE EXTERNAL BACKWASH RATE OF
FLOW CONTROLLERS.
ACCUMATIC™ BRINE SYSTEM.
RESIN POLYSTYRENE 8% DVB CL
MULTIPLE POINT ABS DISTRIBUTOR
PVC HUB AND LATERAL INTERNALS
BRINE DISTRIBUTION HEADER
110V, 60Hz, 1Ø

OPTIONS

ASME CODE TANKS
DEMAND INITIATION WITH ERCd ELECTRONIC
CONTROLLER AND WATER KING'S PW SERIES
FLOW METERS
MULTIPLE TANK CONFIGURATION WITH STAGERS
AND ERC CONTROLLERS
TWIN ALTERNATING WITH EDRd, PW SERIES
METER, AND MPV3 STAGER
PRESSURE GAUGE AND TEST TAP KIT
SKID MOUNTING
220V, 50Hz, 1Ø
Operating Conditions 25 to 100 psi ♦ 100°F

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VN F SERIES SOFTENERS SIZING AND DESIGN INFORMATION						
Model Nº	900	1200	1650	2100	2250	3000
Dia.x Side Shell (in.)	42x72	48x72	54x72	60x72	66x72	72x72
Capacity (Kilograins)	837	1,170	1,609	1,890	2,490	2,700
Salt Applied (lbs)	274	388	559	559	805	805
4" Pipe –Cont Flow Rate ¹ (gpm)	300	381	389	397	405	410
4" Pipe - Peak Flow Rate ² (gpm)	450	509	517	526	534	540
6" Pipe –Cont Flow Rate ¹ (gpm)		400	550	700	835	862
6" Pipe - Peak Flow Rate ² (gpm)		600	825	1,050	1,125	1,155
Backwash ³ (gpm)	50	65	80	100	120	140
Resin (ft ³)	30	40	55	70	85	100
Gravel (ft ³)	5	11	13	16	21	26
Brine Tank-Dia. x Side Shell (in.)	42x60	50x60	60x60	60x60	72x60	72x60
Salt Storage (lbs)	2,370	3,360	4,840	4,840	6,970	6,970
Brine Line Size (in.)	1	1 ½	1 ½	1 ½	1 ½	1 ½

NOTE: SPECIFICATIONS LISTED ARE NOT SKID MOUNTED SYSTEMS. SKID DIMENSIONS ARE GIVEN UPON REQUEST.

NOTES FOR VN F SIZING INFORMATION:

1. Allowable continuous flow is flow at **15 psi** max head loss or **10 gpm/ft³** which ever is less.
2. Allowable peak flow is flow at **25 psi** max head loss or **15 gpm/ft³** which ever is less.
3. Backwash Flow Rate is 5 gpm/ft², which provides 50 to 75% resin bed expansion.
4. 5% reserve capacity at preset salt applied.
5. Six-inch diaphragm valves require Humphrey pilot valves.

VN 900 TO 3000 – 4F AND – 6F SPECIFICATIONS

Mineral Tank (Standard Non Code Vessels). The non-code vessel shall be A36 carbon steel or better rated at 100 psi working pressure designed to a factor of safety of 3.0.

Mineral Tank (Optional Code Vessels). ASME code stamped tanks shall be available. Tank shall be clearly specified as code or non-code with a specified working pressure. Tanks "built to ASME code but not stamped" shall not be acceptable as ASME code. An ASME U1 form shall be provided with each ASME code tank.

Coating and lining. Tanks shall be prepared for internal and external coating with a SPCC 11 near white sand blast. Internal and external coating shall be two 3 - 4 mill coats of white Series 20 Tnemec Epoxy. Paint shall be applied according to manufacturer's recommendations.

Internals. The bottom distributor shall be hub and lateral design with SCH 80 PVC hub and SCH 40 PVC slotted laterals. The slots shall be .012" - .016" wide to retain mineral and the total slot area shall be equal to or larger than the unit pipe size. A four point SCH 80 PVC upper distributor with an opening equal to or larger than the unit pipe size shall be installed in the mineral tank.

Face Piping. For models with a -4F or -6F designation the inlet and outlet connection shall be 4" or 6" flanges and the pipe shall be schedule 40 galvanized grooved fittings. Tanks shall have double drilled double tapped pad flanges on the side shell for inlet and outlet.

Media. 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. Underbedding shall be #20 graded washed flint gravel sieved between 1/8" and 1/16".

Valves. The valves shall be Water King DMB Series cast iron body valves with grooved connections. The valve can be operated by air or water. The diaphragm shall be preformed, nylon fabric reinforced natural rubber. Internal parts shall be stainless steel and brass. Working pressure on the valve is 230 psi with maximum temperature of 175°F.

Stager. Diaphragm valves shall be operated by a rotary pilot valve (stager) with multiple ports through which control fluid is directed, thereby operating the diaphragm valves installed in a process system. Standard units shall use stagers constructed of durable, non-corroding, self-lubricating material for long, maintenance free life. The stager shall function by opening and closing its ports, singly or in combination, in a sequence that accomplishes the five cycles of softening. The stager shall use either water or air for the operating fluid. Process fluid, if pressurized, and not damaging to the internal parts of the stager or diaphragm valve, may be drawn from the main line to the inlet of the stager. Otherwise, an independent source of control fluid is required. The pressure of the control fluid must be equal to or greater than the line pressure of the system. The stager enclosure shall be a 10" x 8" x 6" NEMA 4 fiberglass control box which houses both the stager and the timer. Maximum pressure shall be 100 psi with a maximum temperature rating of 150°F. Ports are 1/8" NPT. Power shall be either 120 VAC/60 Hz or 230 VAC/50 Hz. Flexible tubing (1/4" O.D.) shall connect stager ports to diaphragm valves.

Brine System. The brine system shall be of the Accumatic™ high grid plate design. The brine tank shall be rotationally molded HDPE or fiberglass, 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 volumetrically controlled, not timed.

Brine Distributor. The vessel shall be equipped with a header lateral brine distributor system allowing brine to enter above the bed rather than through the upper distributor.

External Ejectors. Brine shall be drawn directly into brine header using an EE series external ejector. This venturi type device shall be SCH 80 PVC with 1" or 1 1/2" FNPT connections. The venturi shall be chemically bonded to the housing. The venturi shall be precision machined. Maximum temperature shall be 140°F. The external injector shall provide both brine flow and brine dilution.

Operating Conditions. Maximum temperature shall be 100°F. Pressure shall be 25 to 100 psi.

Simplex. Simplex systems shall consist of one mineral tank with attached valve nest and one brine tank. Simplex systems shall be controlled using the ERCt 99-day electronic timer and an MPV1 stager

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both housed in a single NEMA 4 enclosure. Regeneration shall be initiated at preset times of the day. Manual regeneration shall be available at the stager.

Twin. Twin systems shall consist of two mineral tanks with attached valve nest and one brine tank with a brine director. Twin systems shall be controlled using the ERCT 99-day electronic timer and two MPV1 stagers all housed in a single NEMA 4 enclosure. Regeneration shall be initiated at preset times of the day. Softeners run in parallel and are out of service only during regeneration. Simultaneous regeneration is prevented by setting different regeneration times for each unit. Manual regeneration shall be available at the stager.

Twin Alternating Demand Initiation. Twin alternating systems shall consist of two mineral tanks with attached valve nest and one brine tank with a brine director. Twin alternating systems shall be controlled using the ERCd electronic controller and an MPV3 stager housed in a single NEMA 4 enclosure. Regeneration shall be initiated based on the total quantity of water treated by the softener. One softener is in service and one in regeneration or standby. Manual regeneration shall be available at the stager. Twin alternating systems provide a continuous flow of softened water with no bypassing of unsoftened water during regeneration.

Multiple Tank Demand Initiation. Regeneration shall be initiated based on the total quantity of water treated by the softener. For pipe sizes 3" and below, the VN Series uses PW series flow meters with the ERCd controller, and MPV 1 or MPV3 stager. For 4" and 6" and larger piping the VN series uses the PW 400S and 600S saddle mounted flow meters with the WK520-84 controller, stagers and ARC cycle timers. Twin alternating systems provide a continuous flow of softened water with no bypassing of unsoftened water during regeneration.

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 10 years shall construct the equipment.

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 predrilled and tapped ports in the inlet and outlet diaphragm valves.

