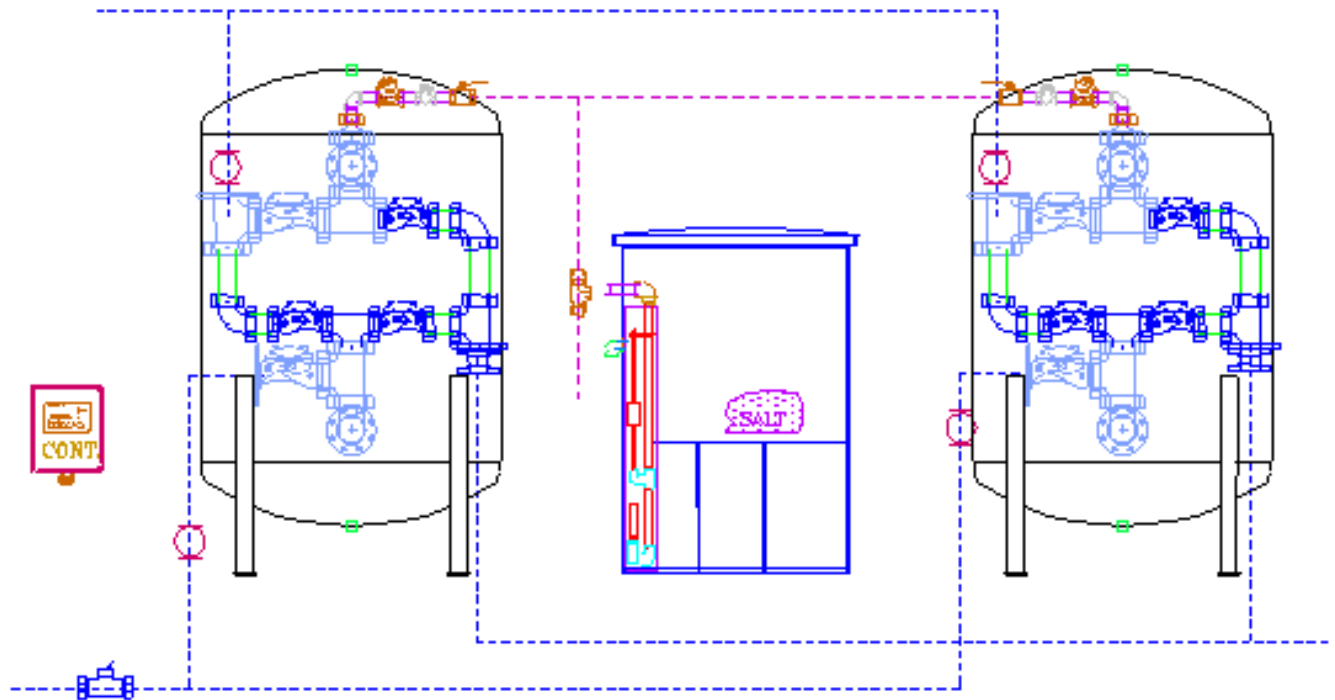


# VN F 900 to 3000 SOFTENERS



## STANDARD FEATURES

DM series 230 psi ductile iron diaphragm valves in valve nest configuration  
 6-day timer  
 100 psi epoxy lined and coated carbon steel vessels  
 EE series – PVC external brine ejector  
 Fixed rate external backwash rate of flow controllers.  
 Accumatic™ Brine System.  
 Resin - Polystyrene 8% DVB CL  
 PVC hub and lateral internals  
 Brine distribution header  
 110V, 60Hz, 1Ø

## OPTIONS

ASME code tanks  
 7-day timer  
 Demand initiation  
 Twin configuration with stagers and timers  
 Twin Alternating with WK520, PWS series meter, stagers and ARC timers  
 Pressure gauge and test tap kit  
 Skid mounting  
 220V, 50Hz, 1Ø

## OPERATING CONDITIONS

25 to 100 psi ♦ 100°F

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<b>VN F SERIES SOFTENERS SIZING AND DESIGN INFORMATION</b>						
Model Nº	900	1200	1650	2100	2250	3000
Dia.x Side Shell (in.)	42x72	48x72	54x72	60x72	66x72	72x72
Capacity (Kilograings)	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 <sup>1</sup> (gpm)	300	381	389	397	405	410
4" Pipe - Peak Flow Rate <sup>2</sup> (gpm)	450	509	517	526	534	540
6" Pipe –Cont Flow Rate <sup>1</sup> (gpm)		400	550	700	835	862
6" Pipe - Peak Flow Rate <sup>2</sup> (gpm)		600	825	1,050	1,125	1,155
Backwash <sup>3</sup> (gpm)	50	65	80	100	120	140
Resin (ft <sup>3</sup> )	30	40	55	70	85	100
Gravel (ft <sup>3</sup> )	500	1,100	1,300	1,600	2,100	2,600
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/ft<sup>3</sup>** which ever is less.
2. Allowable peak flow is flow at **25 psi** max head loss or **15 gpm/ft<sup>3</sup>** which ever is less.
3. Backwash Flow Rate is 5 gpm/ft<sup>2</sup>, which provides 50 to 75% resin bed expansion.
4. Brining efficiency at 0.26 Kgr/lb of salt applied. Assumes 90% utilization of capacity.
5. Brining efficiency at 0.47 Kgr/lb of salt applied. Assumes 90% utilization of capacity.
6. 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

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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.** Standard single unit (simplex) shall be controlled by an electromechanical system using a 6-day timer and a stager. The timer shall be housed in the NEMA 4 control box with the stager and initiates regeneration at certain, preset times. Manual regeneration shall be available at the stager. To increase the closure speed, Humphrey pilot valves shall be installed on all six-inch valves.

**Twin.** Twin systems shall consist of two mineral tanks with attached control valves and one brine tank with a brine director. Regeneration initiation shall be by a single 6 or 7-day timer controlling a stager on each unit.

**Demand Initiation.** Regeneration shall be initiated based on the total quantity of water treated by the softener. VN F series uses the PW 400S and 600S saddle mounted flow meters with the WK520-84 controller, staggers 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.