

# INDUSTRIAL SEPARATE BED DEIONIZER

## FDI Series Two Bed D.I.

60,000 TO 1,100,000 Grains Capacity



### High Purity Water Industrial Packaged System

### Process Water Treatment

Single and Twin Alternating Systems Available

Twin System with Activated Carbon Filtration Pre-Treatment Shown

## FDI Series Two Bed Deionizer

**Deionization** is the removal or reduction of positive ions called cations and negative ions called anions from the water supply. High purity water from 50 to 1 micro Siemens/cm can be produced from typical water sources. The cation resin is converted to the hydrogen form and exchanges positive ions for hydrogen. The Anion resin is converted to the hydroxyl form and exchanges the negative ions for hydroxyl. This ion exchange process removes the majority of the dissolved minerals and produces deionized water (H<sub>2</sub>O). Separate bed systems utilize one vessel for the cation regeneration and one vessel for the anion regeneration process, and the resins are regenerated in place. This ion exchange process does not reduce the bacterial count of the water, if present. Sediment strainers are standard equipment on the cation and anion outlet and drain piping, and act as resin traps. Standard FDI systems are skid mounted with interconnecting piping and isolation valves.



**Composite Pressure Vessels** are constructed of Industrial grade fiberglass with a polyethylene inner shell. The vessels provide outstanding durability and high corrosion resistance, and weigh about one-third less than steel tanks. ASME code certified vessels are available in sizes over 18 inches. Composite vessels are rated 150 PSI maximum working pressure.

**RESINS** are designed specifically for deionizer applications, and are typically regenerated with 6 lbs. of 100% HCl per Cubic foot of cation resin and 8 lbs. of 100% NaOH per cubic foot of anion resin. Lakeside resins provide high chemical and physical stability, lower pressure drop, and greater resistance to bead breakage. Resins are selected based upon the customers' water quality requirements. Strong Base Type I or II Anion resin is selected based upon the silica residuals required for the specific application.



**Chemical Eductors** are constructed of PVC, and in combination with throttling valves, deliver the correct concentration of chemical to the resin. Standard systems utilize pressure compensating eductors for drawing chemical from chemical carboys or drums. A throttling valve is provided to lower concentration to 5% HCl and 4% NaOH for D.I. regeneration.





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## Water Deionizer Systems for Industrial Solutions



**UNDERDRAIN** The radial hub underdrain uses high quality schedule 80 PVC pipe and fittings, delivering flows uniformly over the entire bed with a minimum pressure drop. The 0.010” PVC slotted laterals provide high flow rates and reliable service.

**Flow Sensors** are designed to interface with the controllers. The sensor sends a pulse signal to the controller that converts into gallons. The programmed K-Factor will ensure the correct batch count and continuous deionized water to service.



**Thermoplastic Diaphragm Valve Nest** design allows each valve to be exactly designed and sized for the required functions, providing a cost effective, efficient, and serviceable system. Backwash and rinse flow rates are controlled with automatic self-regulating flow controllers. Sample valves and pressure gauges for the inlet, outlet and dilute chemical are provided on each vessel. Standard PVC piping configurations include a manual drain valve on each vessel. Optional CPVC piping and other types of control valves are available.

**Rockwell Allen-Bradley® PLC control packages** come standard with a color screen HMI which has user friendly programming. **Lakeside PLC solenoid system features a hold, advance, resume, termination, or close of all valves function, for fast, easy, field service.** Each process valve is controlled by an individual solenoid valve with manual override. Clean, dry, compressed air is required to operate the process valves. The main screen can be designed to display a variety of parameters such as current flow rates, system status and remaining gallons of the system. Custom programming is available.



**Recirculation systems are a standard feature that provides low flow protection and allows the unit to remain in stand-by and maintain optimum water quality.** This eliminates the need for a pre-rinse, which minimizes the in-service delay and saves on raw water use, plus waste water generated. The recirculation system is also used as the last step of the regeneration process to Recirculate to Quality, saving on waste water generated.



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## **FDI Series Two Bed Deionizer**

**Operating Parameters:** Pressure 30-100 PSI. Temperature range 35°F-100°F Electrical: 120VAC/60Hz Electrical enclosures rated NEMA 12/4X Drain piping limits: Max. 10ft. vertical discharged to an atmospheric floor drain sized to handle the backwash rate of the system (Max. proven length is 25ft.). Chemical carboys/drums or day tank locations should be within 10 feet from the unit (not included on standard equipment).

**Deionizer Capacity:** The nominal capacity for a Two Bed Deionizer is 20,000 grains per cubic foot. The actual capacity of a system is determined by the feed water quality and Total Exchangeable Ions, as determined by a detailed water analysis.

### **OPTIONS AVAILABLE:**

- ASME Code vessels are available in sizes over 18” diameter
- Stainless Steel or FRP Skid Material
- Separate Source Regeneration
- Simultaneous Regeneration of Cation and Anion Vessels
- CPVC Face Piping
- Process Valve Position Indicators
- Operating Temperature to 120°F
- Storage Tanks, Level Controls, Re-Pressurization Pumps
- Waste Diversion and Neutralization Systems
- Pumped Chemical Regenerant Systems
- Custom Valves and Instrumentation
- Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>) Regeneration Packages
- Specialty Resin
- Larger Anion Vessels for Greater System Capacity
- Percent Acid and Caustic Meters
- pH or ORP Meters
- Pre-Treatment Systems: Multi-Layer Filters, Activated Carbon Filters, etc.
- Post Treatment Systems: UV Sterilization, Sub-Micron Filtration, etc.
- Custom Controls, Programming, and Special Engineered Systems
- Steel Tank Vessels Supplied with LWTB Series Two Bed Deionizers

## FDI Series Two Bed Deionizer Specifications

Model FDI	Grains Capacity	Resin Qty. Each Tank Cu. Ft.	Flow Cont. GPM	PSID	Flow Peak GPM	PSID	Resin Tank Size DxOAH (Inches)	Service Pipe Size *	Cat BW Flow Rate GPM	Anion BW Flow Rate GPM	Fast Rinse Flow Rate GPM	HCl Usage 6# Dosage (Gals.)	NaOH Usage 8# Dosage (Gals.)
1465-1	60,000	3	6	6	12	17	14 x 65	1"	5	2.5	5	5.2	3.1
1665-1	70,000	3.5	9	10	18	33	16 x 65	1"	6	3	7	7.3	4.4
1865-1	80,000	4	12	16	20	38	18 x 65	1"	7	3.5	8	8.3	5.0
2162-1	110,000	5.5	16	25	23	48	21 x 62	1"	10	5	12	11.5	6.9
2472-1.5	180,000	9	20	8	45	25	24 x 72	1 1/2"	12	7	20	16.7	10.1
3072-2	300,000	15	32	8	75	32	30 x 72	2"	20	10	30	25.0	15.1
3672-2	400,000	20	46	13	80	34	36 x 72	2"	30	15	35	37.5	22.6
3672-3	400,000	20	50	5	110	15	36 x 72	3"	30	15	35	37.5	22.6
4272-2	500,000	25	46	12	80	32	42 x 72	2"	40	20	50	52.1	31.4
4272-3	500,000	25	50	4	110	13	42 x 72	3"	40	20	50	52.1	31.4
4872-2	700,000	35	65	21	100	47	48 x 72	2"	55	28	70	68.8	41.5
4872-3	700,000	35	65	5	125	14	48 x 72	3"	55	28	70	68.8	41.5
6386-3	1,100,000	55	100	9	200	28	63 x 86	3"	90	45	110	114.7	69.1

\*Pipe size up to 3" available, flanged tanks used for 3" piping. HCl Usage is Gallons of 30% Hydrochloric Acid, Technical Grade. NaOH Usage is Gallons of 50% Sodium Hydroxide, Rayon or Mercury Cell Grade. 2020-09

## FDI Series Two Bed Deionizer Dimensions

MODEL NO.	RESIN TANK	OAH (in.)	Width (in.)	Length (in.)	Ship Wt. (Lbs.)	Media Wt. (Lbs.)
FDI-1465	14" X 65"	90	30	90	895	303
FDI-1665	16" X 65"	90	30	90	900	420
FDI-1865	18" X 65"	98	32	94	1010	528
FDI-2162	21" X 62"	95	35	100	1015	694
FDI-2472	24" X 72"	101	36	103	1100	1,026
FDI-3072	30" X 72"	102	42	112	1345	1,564
FDI-3672	36" X 72"	106	50	106	1600	2,646
FDI-4272	42" X 72"	105	56	116	1850	3,425
FDI-4872	48" X 72"	108	66	128	2095	4,601
FDI-6386	63" X 86"	115	81	158	3250	9,335

Dimensions are approximate. OAH for Tripod Base Flanged Tanks.



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