



AVANTech WTModules™ EDM-Series

Electrodeionization System

The EDM-Series electrodeionization elements are called “modules”. These modules polish water with an ROS permeate feed water quality of less than 40 micro S/cm, 1 ppm silica, 0.1 ppm iron, 0.02 ppm total chlorine/chloramine, 1.0 ppm of hardness and 0.5 ppm of dissolved oxygen. The EDM-Series modules are designed to remove dissolved ions and reduce TOC.

EDM Modules

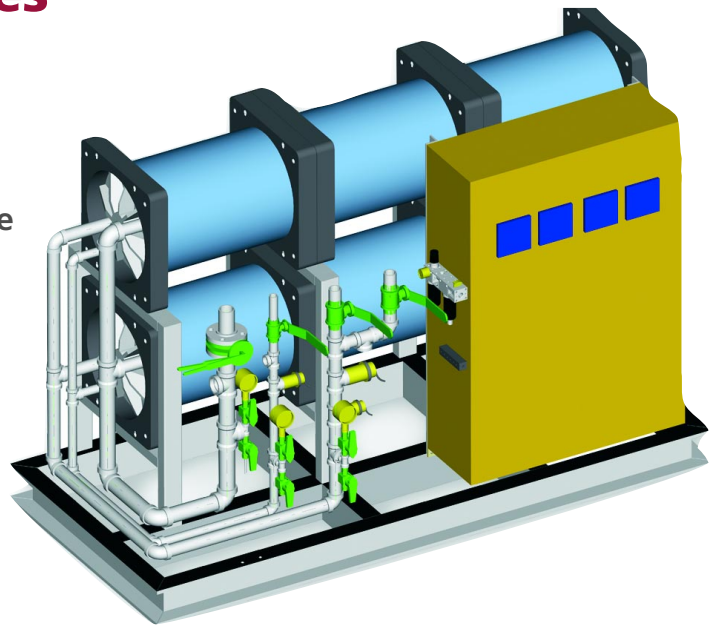
The term “electrodeionization” describes a system consisting of one or more EDM modules. The modules are made up of a series of cation and anion membranes and a mixture of cation and anion resin. The EDM system removes small amounts of dissolved solids from water. It will usually produce water with an effluent quality of greater than 16 megomhos with an inlet feed as presented above.

EDM systems normally run continuously with no periodic shutdowns. An electrical field continuously regenerates the EDM unit. The electric field applied across the module is sufficient to break water molecules into hydrogen and hydroxyl ions (water splitting). The hydrogen ions are adsorbed into the cation resin. Similarly, the hydroxyl ions are adsorbed into the anion resins. The displaced ions are free to migrate to the reject under the influence of the applied electric field. The continuous regeneration process requires minimal operator intervention. At the heart of this system is advancement on conventional ion exchange technology in which the ion exchange resins are continuously regenerated through the use of an imposed electric current making the process chemical-free. Previous versions of this technology required the concentrate flow to recirculate through the module and sometime inject a salt brine solution to increase concentrate conductivity. The latest EDM technology used by AVANTech no longer requires concentrate recirculation or brine injection.

EDM product quality typically approaches 16 to 18 megohm-cm resistivity and as low as 5 ppb of silica. The product quality is not sensitive to inlet feed fluctuations or spikes nor does it fluctuate over time, as in the exhaustion of traditional deionization units. Reduction of ionizable TOC in an EDM system is also achieved.

Piping

The piping is constructed of schedule 80 PVC per ASTM standards D-2464, D-2467, D-1784 and the NSF for plastic pipe. Piping will be rigid with socket-welded fittings except when attached to threaded valves, rotometers, etc. CIP cleaning connections are provided. Units will have pipe supports to prevent damage in normal use.



Valves

Automatic valves 3" and larger are the pneumatically operated butterfly type with stainless steel disc and stem. Automatic valves 2" and smaller are pneumatically operated diaphragm type. Position indicators are provided on all automatic valves. Limit stops are provided for all rate-setting valves. All automatic valves are solenoid operated. All tubing is polypro. Sample valves are provided throughout the system wherever sampling is necessary for operating, troubleshooting, or gathering information.

Controls

EDM-Series electrical instruments are mounted in a NEMA enclosure, which is mounted on the front of the stainless steel frame. A PLC programmable controller is provided with the EDM-Series system. Instrumentation provided includes pressure indication, temperature indication, conductivity/resistivity indication, and flow indication.

EDM Skid

The EDM skid is constructed of 304SS brushed stainless steel. All mechanical and electrical components of the EDM system are mounted, wired, piped, and tubed on a structural stainless steel frame.

Options

- Polypropylene piping and valves
- Clean in place skid
- Automatic recirculation of the permeate flow
- Manual operation
- Permeate rinse to drain

AVANTech WTModules™

EDM-Series

Electrodeionization

WTModules™ are AVANTech's line of pre-engineered water treatment systems designed to provide excellent results at low cost in a variety of water treatment applications. With a long list of options, but without the need for custom engineering, WTModules™ is the cost effective solution for many process requirements.

EDM-Series Electrodeionization

EDM-Series Modules

Model	Permeate Flow (gpm)	Feed Flow (gpm)	Minimum recovery (%)	Reject Flow (gpm)	Max. power consumption (@600V DC)	Height H (in)	Width W (in)	Length L (in)	Shipping weight (lb)	Operating weight (lb)
EDM-001	50	61	90%	6	20 amps	36	36	96	3,145	3,360
EDM-002	100	111	90%	11	40 amps	48	36	96	3,755	4,185
EDM-003	150	161	90%	17	60 amps	48	48	96	4,465	5,010
EDM-004	200	222	90%	22	80 amps	48	48	96	4,975	5,835
EDM-005	250	272	90%	28	100 amps	72	48	96	5,585	5,480
EDM-006	300	333	90%	33	120 amps	72	48	96	6,195	6,660
EDM-007	350	389	90%	39	140 amps	96	48	96	6,805	7,485
EDM-008	400	449	90%	44	160 amps	96	48	96	7,415	8,310
EDM-009	450	525	90%	50	200 amps	108	72	96	8,025	9,960
EDM-010	500	551	90%	56	220 amps	108	72	96	8,635	10,785

Feed Water Specifications

Modules must be fed with RO permeate with a conductivity of less than 40 µs/cm.

Feed water source	RO permeate
Feed water conductivity equi, incl CO ₂	<40µs/cm
Temperature	41 - 113°F (4 - 45°C)
Inlet pressure	20-100psi (1.4-7bar)
Maximum free chlorine (as Cl ₂)	<0.02ppm
Iron (Fe)	<0.01ppm
Manganese (Mn)	<0.01ppm
Sulfide (S-)	<0.01ppm
pH	4-11
Total hardness (as CaCO ₃)	<1.0ppm
Dissolved Organics (TOC as C)	<0.5ppm
Silica (SiO ₂)	<1.0ppm

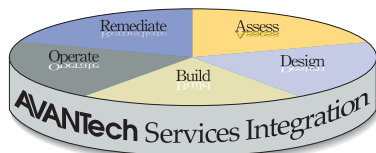
Typical Module Performance

Operating Parameters

Recovery	90-95%
Flow rate	
Minimum	25.0 gpm (5.7 m ³ /hr)
Nominal	50.0 gpm (11.4 m ³ /hr)
Maximum	75.0 gpm (17.0 m ³ /hr)

Product Water Quality

Product Resistivity	>16 megohm-cm
<small>Note: Actual performance may be determined using the IP-Pro projection program</small>	
SiO ₂ removal	90-99% depending on feed conditions



Design/Build/Operate AVANTech's approach to systems integration makes us uniquely qualified to provide turnkey service. Our broad range of services enables us to lend our expertise to an entire project—from planning through commissioning and beyond, including operational and remedial assistance needs. *Call us today for assistance with your project.*

