



# AVANTech WTModules™ EDS-Series

## Electrodionization

The EDS-Series elements are known as “stacks”. These stacks are designed to remove cations and anions (minerals) from pretreated water with less than 40 microS/cm, 1ppm silica, .01 ppm iron, .02 ppm total chlorine/chloramine, 1.0 ppm of hardness and .05 ppm of dissolved oxygen. The EDS-Series modules are designed to remove ions, and reduce TOC.

## EDS Stacks

The term “electrodionization” describes a system consisting of an EDS membrane stack. An EDS stack consists of multiple beds of ion-exchange material sandwiched between charged membrane walls and open channels between two electrodes.

There are two types of membranes within an EDS stack: anion membranes and cation membranes. The anion membranes allow only negatively charged anions to permeate, and the cation membranes allow only positively charged cations to permeate.

The basic EDS process uses a plate and frame arrangement of cell pairs. There are three types of chambers in the cell pair; the dilute chambers, the concentrate chambers, and the electrolyte chambers. The membranes become the walls that separate the chambers with spacers to allow for water flow.

Electrodionization (EDS) is a continuous demineralization process with a recovery rate of 90% or more. EDS exchanges cations and anions in the feedwater for hydrogen and hydroxyl ions in the ion exchange resin which produces demineralized water. EDS uses ion exchange resin, which is regenerated continuously, while with conventional ion exchange, chemical regeneration is performed periodically. *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 EDS technology used by AVANTech no longer requires concentrate recirculation or brine injection.*

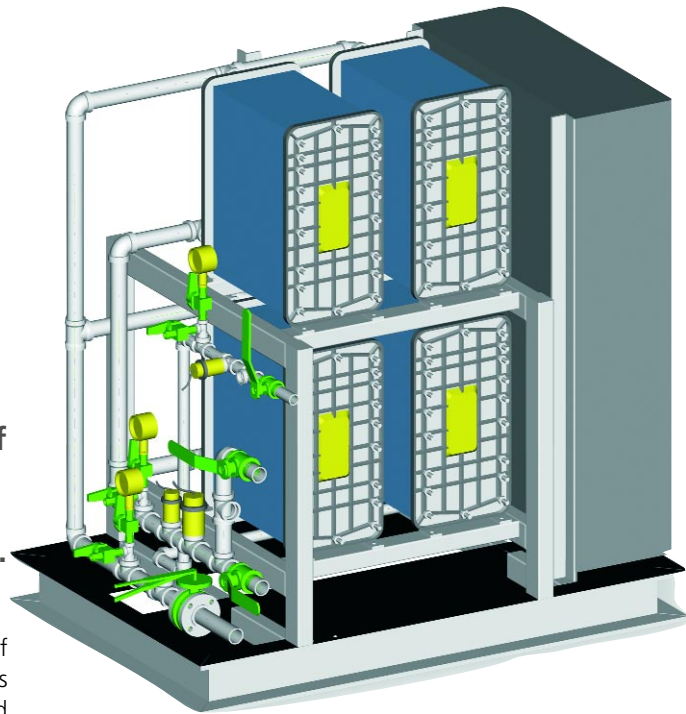
EDS-Series product quality typically approaches 16 to 18 megohms-cm resistivity and as low as 5 ppb of silica. The product quality is not sensitive to inlet feed fluctuations or spikes nor does it fluctuate over time, as in the exhaustion of traditional deionization units. Reduction of ionizable TOC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

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

## EDS Skid

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

## Options

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

# AVANTech WTModules™

## EDS-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.

## EDS-Series Electrodeionization

### EDS-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)
EDS-0020	30	33	90%	3	9 amps	84	46	53	1,725	1,780
EDS-0040	60	66	90%	5	18 amps	84	74	53	2,560	2,630
EDS-0060	90	99	90%	8	27 amps	84	102	53	3,750	3,890
EDS-0080	120	132	90%	10	36 amps	84	102	53	3,975	4,130
EDS-0100	150	165	90%	13	45 amps	84	130	53	5,125	5,480
EDS-0120	180	198	90%	15	54 amps	120	130	53	5,430	3,775
EDS-0140	210	231	90%	18	63 amps	130	102	84	6,600	7,130
EDS-0160	240	264	90%	20	72 amps	130	102	84	6,900	7,430
EDS-0200	300	330	90%	25	92 amps	130	120	96	9,380	10,450
EDS-0240	360	396	90%	30	108 amps	130	120	96	9,830	10,680

### Feed Water Specifications

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

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

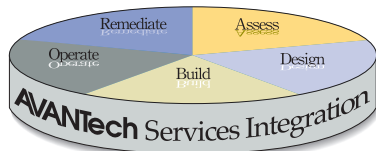
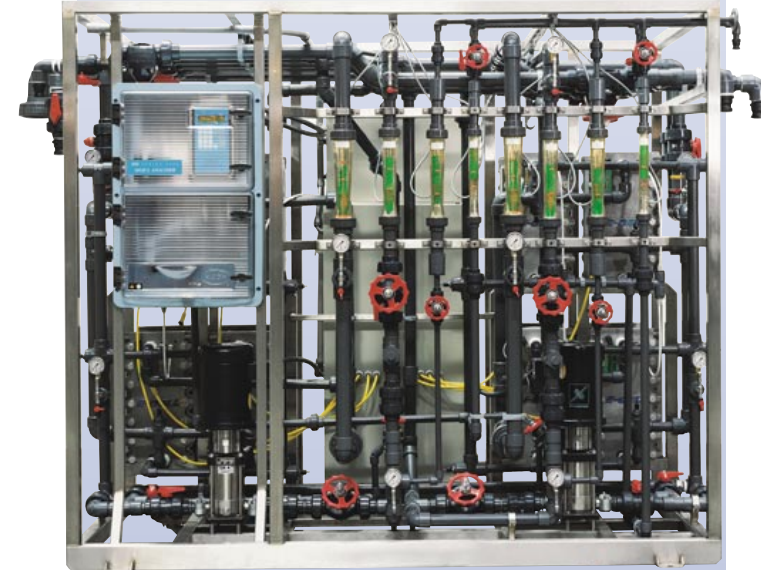
### Typical Module Performance

#### Operating Parameters

Recovery	90-95%
Flow rate	
Minimum	7.5 gpm (1.65 m <sup>3</sup> /hr)
Nominal	15.0 gpm (3.3 m <sup>3</sup> /hr)
Maximum	33.0 gpm (5.11 m <sup>3</sup> /hr)

#### Product Water Quality

Product Resistivity	>16 megohm-cm
<small>Note: Actual performance may be determined using the IP-Pro projection program</small>	
SiO <sub>2</sub> 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.*

