



# AVANTech WTModules™ TBS-Series

## Steel Tank Two-Bed Demineralizer

The TBS-Series is designed to remove cations and anions (minerals) from water. TBS-Series systems can produce water with an effluent quality of 10 to 20 micromhos-cm, equivalent to a sodium content of 2 to 5 ppm as CaCO<sub>3</sub> and a silica level of 0.1 ppm as CaCO<sub>3</sub>.

### Vessels

TBS-Series vessels are constructed of high quality carbon steel and have a bolt and yoke manway in the top head. This permits the loading of media and inspection of internals without disturbing main piping. A 3" diameter media removal pad flange is provided in the lower side sheet. Vessels include structural legs.

### Distribution

TBS-Series vessels are provided with separate inlet, outlet, and regenerant distributors. The distributors are designed to direct flows uniformly over the entire bed with a minimum pressure drop. TBS-Series distributors are constructed of Sch. 80 PVC.

### Media

The cation/anion resin is high capacity resin designed specifically for demineralization. The cation capacity and attrition loss will not result in demineralizer capacity loss of more than 3% per year for three years if operated under the design conditions specified. The anion capacity and attrition loss will not result in demineralizer capacity loss of more than 25% within two years if operated under the TBS-Series design conditions specified.

A bed of quartz protects the bottom distributor. The quartz media also provides for a means of collecting and distributing the water for service and backwash, respectively. High quality quartz is provided, containing low levels of extractable materials preventing contamination of product water.

### Lining

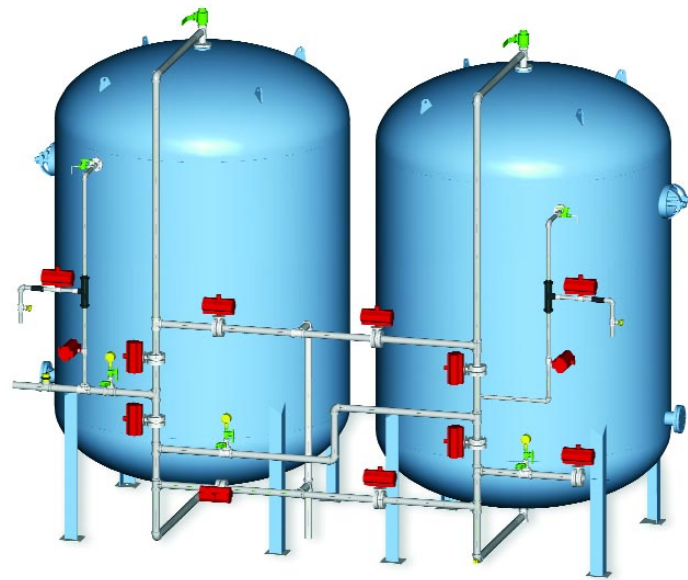
Each tank is lined with 3/16" industrial grade rubber and spark tested for integrity.

### Piping

Standard configuration piping is Schedule 80 PVC with socket welded fittings except where the attachment of threaded valves, rotometers and other devices is needed.

### Valves

Diaphragm valves are provided for 2" piping and smaller; butterfly valves are provided for 3" piping and larger. Backwash and rinse outlet valves are equipped with travel stops to regulate flow rates during backwash and rinse cycles. An air pressure filter/regulator is provided. Clean air at a minimum pressure of 80 psig is required for valve actuation. All tubing is polypro. Individual manual rate set valves are provided on acid and caustic draw lines. Manual vent valves are provided for each vessel. Sample valves for service inlet, service outlet, and dilute chemical sample are provided on each vessel.



### Controls

A PLC controller will be provided, fully wired and programmed. All regeneration times have been programmed into the unit. All automatic valves are solenoid operated, and include manual overrides.

### Regenerant

The unit is designed to draw concentrated chemicals directly from client supplied shipping container (carboy, or drum). The concentrated chemical lines are provided with a PVC wand attached to a flexible hose. Regenerant acid and caustic are introduced to each vessel at the proper flow and concentration by an eductor constructed of non-corrodible material. The flow of concentrated chemicals are regulated by means of a manually adjustable valve on each concentrated chemical line.

### Options

- ASME code tank
- Thermal relief valve
- Backwash sight glass
- Alternate tank lining
- Media trap
- Recirculation pump
- Larger media connection
- Alternate service
- Pressure regulating valve
- Manway and davit
- Flow indicator/totalizer
- Manual operation
- Structural steel skid
- Silica anticipatory probe
- 316 stainless steel distribution
- 316SS piping and valves
- Automatic shut-off
- Separate backwash inlet
- PPL piping and valves
- Automatic rinse control
- ARS Series
- Interconnecting header
- Finish paint
- WNS Series
- CRS Series

# AVANTech WTModules™

## TBS-Series

### Steel Tank Two-Bed Demineralizer

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.

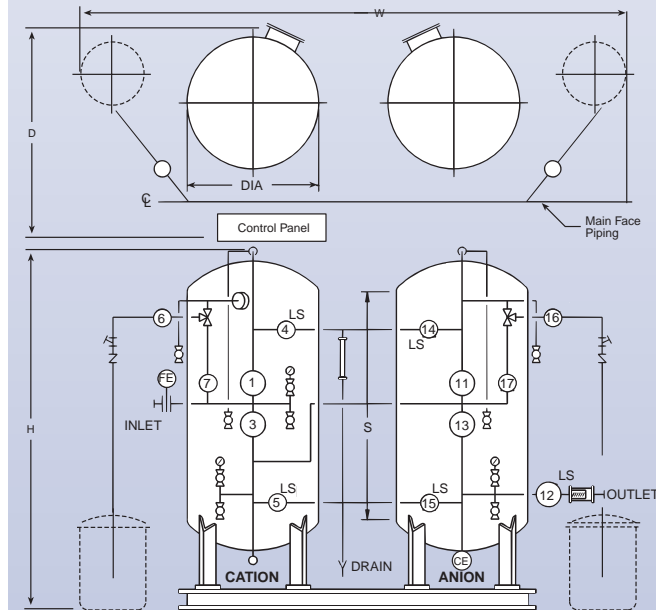
Model	Tank(s) Size (in)	Design Flow (gpm)	Resin Vol. Cation Anion (cf)	Resin Capacity (Kgr)*	Chemicals HCl NaOH (lbs)	Regenerant Volume Water-(gals)	Pipe Size (in)	Overall Height H (ft-in)	Width W (ft-in)	Depth D (ft-in)	Shipping Weight (lb)
TBS-2496	24 x 96	30	14	168	280		1 1/2	10-0	5-6	3-6	5,000
	24 x 96			168	112	2,940					
TBS-3096	30 x 96	50	22	264	440		2	11-6	7-0	4-0	5,600
	30 x 96			264	176	4,620					
TBS-3696	36 x 96	75	32	364	640		2	11-8	7-0	5-0	9,500
	36 x 96			364	256	6,720					
TBS-4296	42 x 96	100	44	528	880		3	11-8	9-0	5-6	12,800
	42 x 96			528	352	9,240					
TBS-4896	48 x 96	130	55	660	1,100		3	12-0	10-0	6-0	18,000
	48 x 96			660	440	11,550					
TBS-5496	54 x 96	160	69	828	1,380		3	12-6	10-6	6-6	19,800
	54 x 96			828	552	14,500					
TBS-6096	60 x 96	200	86	1,032	1,720		3	12-6	12-0	7-7	22,400
	60 x 96			1,032	688	18,060					
TBS-7296	72 x 96	300	115	1,380	2,300		4	12-9	14-0	8-2	30,800
	72 x 96			1,380	920	24,150					
TBS-8496	84 x 96	400	160	1,920	3,200		6	13-9	16-0	9-9	51,400
	84 x 96			1,920	1,280	33,600					
TBS-9696	96 x 96	500	204	2,448	4,080		6	14-0	18-0	10-9	52,600
	96 x 96			2,448	1,632	42,800					

Throughput volume per regeneration = ( ) kgr./ ( ) gpg of the ionic load from the total anions as CaCO<sub>3</sub>.

\* Based on 20lbs/cf of 30% HCl and 8lbs/cf of 100% NaOH.

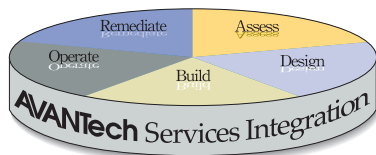
## TBS-Series Two-Bed Demineralizer

### Typical layout (shown with piping)



#### Typical valve sequence

Service	1, 11 & 12
Backwash Cation	3 & 4
Acid Injection	5, 6 & 7
Cation Rinse	5 & 7
Backwash Anion	1, 13 & 14
Caustic Injection	1, 15, 16 & 17
Anion Rinse	1, 15 & 17
Service Rinse	1, 11 & 15



**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.*

