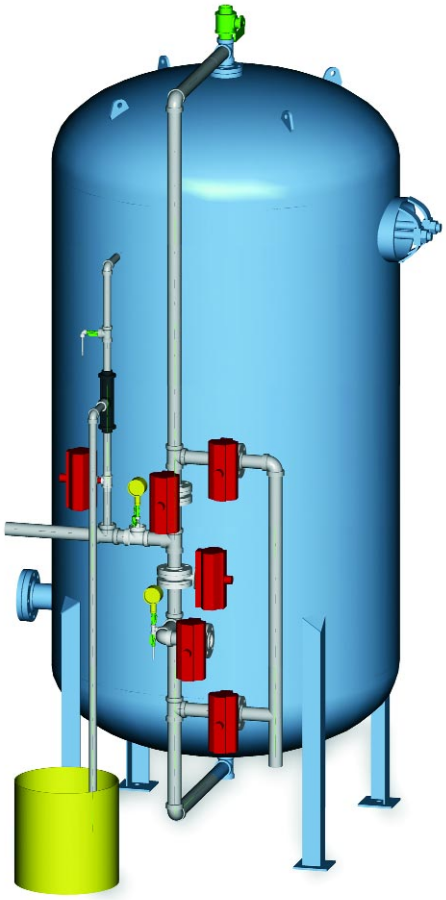
Industrial Water Treatment

AVANTech WTModules™ IRS-Series

Steel Tank Iron Reduction

The IRS-Series is designed to remove iron and manganese. A manganese greensand iron reduction unit operates by oxidizing iron and manganese to insoluble ferric oxide ($Fe2O_3$) and manganese dioxide (MnO_2) and then filtering the resultant oxides out of the water. The media is regenerated with potassium permanganate when it becomes exhausted.



Vessels

IRS-Series vessels are constructed of high quality carbon steel with flanged and dished heads. The 24" and smaller vessels have two 6" handholes to permit loading of media and inspection of internals without disturbing main piping. The 30" and larger vessels have a bolt and yoke manway in the top head to permit loading of media and inspection of internals without disturbing main piping and a 3" diameter media removal pad flange in the lower side sheet. All IRS-Series vessels include structural legs.

Distribution

IRS-Series 24" and smaller vessels are provided with an inlet/regenerant, and outlet distributor. The 30" and larger 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. IRS-Series distributors are constructed of Schedule 80 PVC.

Media

All filters have a 36" or 60" total bed depth when the height of the straight side of the tank is 60" or 96", respectively. Manganese greensand is made from greensand zeolite by alternately treating it with manganese sulfate and potassium permanganate.

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 to prevent contamination of product water.

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.

Automatic 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.

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

Potassium permanganate is transferred from a day tank to each iron reduction unit and diluted to proper concentration by means of a hydraulic eductor. Additionally, a manual valve is provided for flow control.

Options

- **ASME code tank**
- **Tank lining**
- **Larger media connection**
- **Manway and davit**
- **3" x 12" sight glass**
- **Structural steel skid**
- **316SS piping and valves**
- **PPL piping and valves**
- **Interconnecting header**
- **Thermal relief valve**
- **D/P switch**
- **Flow indicator**
- **Media options**
- **Alternating service**
- **Alternate controllers**
- **Air scour**
- **Sanitation**
- **Media trap**
- **Backwash sight glass**
- **Finish paint**
- **Manual operation**
- **316 stainless steel distribution**
- **Pump regeneration system**
- **Continuous potassium permanganate feed system**

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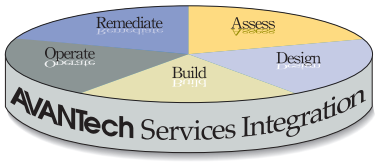
AVANTech WTModules™
IRS-Series
Steel Tank Iron Reduction

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.

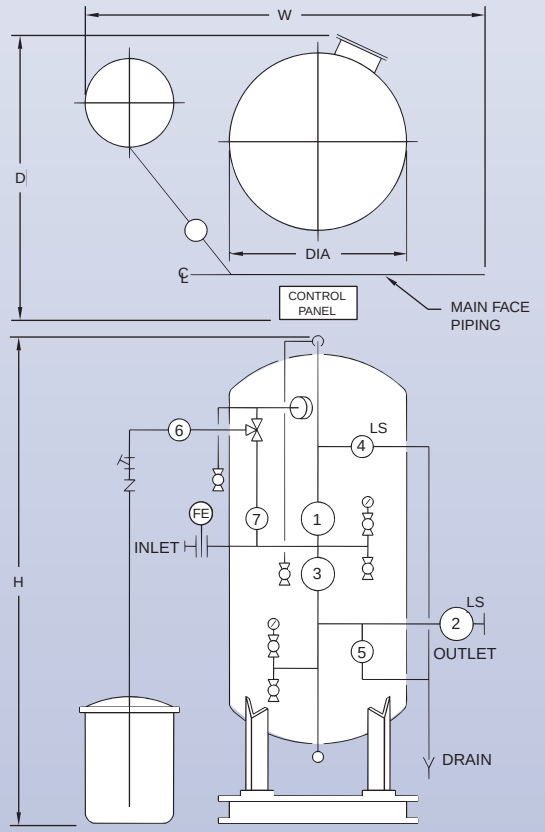
Model	Tank Size (in)	Design Flow (gpm)	Greensand Volume (cf)	Capacity (2 oz/cf) (Kgr)	Day Tank (in)	Pipe Size (in)	Overall Height H (in)	Width W (in)	Depth D (in)	Shipping Weight (lb)	Operating Weight (lb)
IRS-2060	20 x 60	11	7	5.25	11 x 14	1	97	43	36	1,200	1,500
IRS-2096	20 x 96	14	11	8.25	11 x 14	1 1/2	133	43	36	1,700	2,000
IRS-2460	24 x 60	16	9	6.75	14 x 27	1 1/2	98	50	40	1,625	3,050
IRS-2496	24 x 96	20	16	12.00	14 x 27	1 1/2	134	50	40	2,425	3,800
IRS-3060	30 x 60	25	14	10.50	14 x 27	1 1/2	100	56	45	2,150	3,100
IRS-3096	30 x 96	31	24	18.00	14 x 27	1 1/2	136	56	45	3,150	4,300
IRS-3660	36 x 60	35	21	15.75	14 x 27	1 1/2	102	62	51	3,200	4,600
IRS-3696	36 x 96	44	36	27.00	14 x 27	1 1/2	138	62	51	5,000	6,400
IRS-4260	42 x 60	50	28	21.00	14 x 27	2	104	68	57	4,300	6,000
IRS-4296	42 x 96	63	48	36.00	14 x 27	2	140	68	57	6,700	8,400
IRS-4860	48 x 60	65	37	27.75	18 x 29	3	106	78	69	5,600	7,900
IRS-4896	48 x 96	81	62	46.50	18 x 29	3	142	78	69	8,700	11,600
IRS-5460	54 x 60	80	47	35.25	22 x 36	3	107	88	75	7,200	10,200
IRS-5496	54 x 96	100	80	60.00	22 x 36	3	143	88	75	11,200	14,200
IRS-6060	60 x 60	100	58	43.50	22 x 36	3	109	94	81	8,700	12,500
IRS-6096	60 x 96	125	96	72.00	22 x 36	3	145	94	81	13,500	17,300
IRS-7260	72 x 60	140	84	63.00	22 x 36	3	112	116	93	12,500	17,800
IRS-7296	72 x 96	175	140	105.00	22 x 36	3	148	116	93	19,500	24,800
IRS-8460	84 x 60	190	114	85.50	22 x 36	4	126	118	114	16,200	23,800
IRS-8496	84 x 96	237	190	142.50	22 x 36	4	166	118	114	25,700	33,300
IRS-9660	96 x 60	250	149	111.75	24 x 48	4	132	136	120	20,900	30,500
IRS-9696	96 x 96	313	248	186.00	24 x 48	4	168	136	120	33,300	41,900
IRS-10860	108 x 60	315	188	141.00	24 x 48	6	135	152	135	29,500	41,400
IRS-10896	108 x 96	393	314	235.50	24 x 48	6	171	152	135	45,500	57,400
IRS-12060	120 x 60	390	232	174.00	32 x 48	6	142	164	150	35,500	50,500
IRS-12096	120 x 96	488	387	290.25	32 x 48	6	178	164	150	41,450	69,500
IRS-13260	132 x 60	470	281	210.75	32 x 48	6	160	176	160	42,200	60,500
IRS-13296	132 x 96	588	468	351.00	32 x 48	8	196	176	160	53,250	83,500
IRS-14460	144 x 60	560	336	252.00	38 x 42	6	171	194	170	50,500	71,600
IRS-14496	144 x 96	700	560	420.00	38 x 42	8	207	194	170	67,750	99,600

Throughput volume per regeneration = ( ) kgr.x 17,120/ (( ) ppm Fe + 2 x ( ) ppm Mn) as $CaCO_3$.



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.***

IRS Series
Iron Reduction
Typical layout
(shown with piping)



Typical valve sequence

Service	1 & 2
Backwash	3 & 4
Chemical Injection	5, 6 & 7
Rinse	1 & 5

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