World-Class Equipment & Process Expertise

HFX Ion Exchange Systems

HFX55D WATER RECYCLING

TANKS

System Feed	
Volume	2,000 gallons
DI Water	
Volume	3,000 gallons

SKID MOUNTED COMPONENTS

Feed Pumps	
Number	Two (2)
Horsepower	7.5 HP
Motor Control (Optional)	Variable H2 Drive
Standard Pre-Treatment**	
System	Hydrus HF230cbOD
Vessel Construction	PE Lined Fiberglass
Media	Granular Activated Carbon
Volume per Vessel	10 ft^3
Bag Filters	
Number	Two (2)
Filter Rating	5-micron
Cation & Anion Exchangers*	
Number	Two (2) of each
Vessel Size	30" x 72"
Construction	PE Lined Fiberglass
Cation Resin	Strong Acid
Anion Resin	Strong Base
Volume per Vessel	22 ft^3
Controls	
Inlet Conductivity	Signet 2850
Outlet Conductivity	Signet 2850
Outlet Flow	Signet 2537
Outlet pH	Signet 2750
Controller	CompactLogix
Touchscreen	10.4" PanelView 6+
Drum Low Level Sensors	One (1) of Each
DI Supply Pumps	
Number	Two (2)
Horsepower	7.5 HP
Motor control (optional)	Variable H2 Drive
UV Sterilization	Tank-size dependent

OPERATING SPECIFICATIONS

Feed Water Quality	
Temperature	55°F-105°F
pH	3-10 SU
TSS	<5 mg/L
TDS	<600 mg/L
Chlorine	<2 mg/L
Product Water Quality	
TDS	<2 mg/L
Conductivity	<5 uS
Silica	<20 µg/L
System Flow	55 gpm

REGENERATION SPECIFICATIONS

Flow Configuration	Alternating Duplex
Regeneration	Countercurrent
Waste Flow	13 gpm
Cycle Time	75 minutes
Cation Exchangers	
HCl per Cycle	29 gallons
Waste per cycle	825 gallons
Grains Capacity	440,000
Anion Exchangers	
NaOH per cycle	16 gallons
Waste per Cycle	1,000 gallons
Grains Capacity	396,000

UTILITIES

Electrical Voltage	208-230/460
Full Load Amps	80/40
Make-up Water	15 gpm
Compressed Air	5 scfm @80-psi

PHYSICAL DATA

Shipping/Operating Wgt	4,500/9,000 lbs
Frame/Coating	304SS/Polyurethane
Piping	Schedule 80 PVC
Available Options	
***HP** - High Purity Duplex Cation	for 3-5 MegOhm
****EP** - Enhanced Pretreatment	for TSS Fitration

Operating Profile - Removes dissolved solids from compatible feed water with TDS <600-mg/l using pre-treatment by back-washable carbon & replaceable bag filtration followed by two-stage, separate-bed cation & anion exchange. Produces a near-continuous supply of deionized water with duplex components with 50% of the resin in reserve or in regeneration. Water quality of less than 5 µS is produced when operated within design parameters

System Feed Tank - Constructed of HDLPE and sized based on system operating capacity. Analog level control provides for automatic water make-up supply, system operation, high level alarm, and to prevent the feed pump from running dry. PVC tank fittings for inlets & outlets pipes including tank isolation valve are included. As applicable, includes required seismic anchoring with PE certification

System Feed Pumps - Skid-mounted in duplex configuration with automatic alternating to share service load to extend operating life. Sized to provide full rated-service flow even during periodic media backwashing. Constructed of 316 SS, Viton® & ceramic wetted-parts. Centrifugal-drive 230/460VAC TEFC motor with optional variable Hz drives for soft-start to optimize operating efficiency. Includes common skid inlet & outlet with pumps isolation & check valves for service

Carbon Filters - Sized for minimum service flow of 8-gpm per ft^2 of bed surface area. Utilizes Hydrus control valves for automatic up-flow backwash to remove accumulated particles. Minimum duplex vessels enabling backwash during service cycle without need to take system off-line. Utilizes filtered water from the vessel(s) remaining on-line. Vessels inlet outlet & drains piped in parallel with isolation valves for service. Backwash is automatically triggered based upon the totalized flow since the previous backwash based on an operator-adjustable set point manually through the HMI

Bag Filters - There are minimum two (2) bag filter housings piped in parallel collectively rated for nominal system flow while allowing one filter to be taken off-line for change-out. The housings are constructed of reinforced polypropylene and are individually valve so one housing can be serviced while the other(s) remains in operation. Filter bags are made of polypropylene and have a nominal rating of 5 microns

Cation & Anion Exchanger – Both are two-vessel units alternating between service & regeneration controlled by air-actuated valves. Service flow as pressurized by the feed pump is down-flow with internal distribution utilizing an upper slotted diffuser and a bottom hub-&-lateral assembly

Regenerations –Initiated in Feed-forward mode based on resin loading as calculated separately for the Cation and Anion in-service vessel by measuring the feed water quality and flow. Feed-back regenerations are triggered based on the outlet water quality and with cation or alternatively anion regeneration triggered based on outlet water pH as an indicator of relative exhaustion.

Deionization Media - Each cation vessel shall utilize high-capacity, strong acid, macroporous cation resin, with an exchange capacity of >20,000 grains per cubic foot when regenerated with 4 pounds of hydrochloric acid per cubic foot of resin. The cation resin will have a minimum of 10% cross-linking. Each Anion vessel shall include high-capacity, weak and strong base anion resins, with an exchange capacity of >18,000 grains per cubic foot when regenerated with 6 pounds of sodium hydroxide per cubic foot of resin. The weak and strong base resin bead sizes are designed to keep the two layers separate. Inert plastic beads shall be used to pack both the Cation and Anion resin vessels while still allowing the resin minimum space for expansion and contraction.

Chemical Draw - The regenerating vessel will draw regeneration chemicals from a customer provided 55-gallon drum or bulk tank. The feed is educted by a pressurized DI water feed with chemical concentration verified with a hydrometer and adjusted with proportional valving to control the flow of chemical regulated from 0-10 lbs/ft^3.

DI Water Storage Tank - Constructed of HDLPE and sized based on a combination of system operating capacity and requirement for regeneration water. Analog level control provides for automatic system operation, high level alarm, and to prevent the feed pump from running dry. PVC tank fittings for inlets & outlets pipes including tank isolation valve are included. As applicable, includes required seismic anchoring with PE certification. DI water is continuously recirculated through an UV Sterilizer at 3-4 tank turn-overs per hour to retard biological growth.

DI Water Supply Pump - Skid-mounted in duplex configuration with automatic alternating to share service load to extend operating life. Sized to provide full rated-service flow even during resin regeneration which utilizes accumulated DI water. Constructed of 316 SS, Viton® & ceramic wetted-parts. Centrifugal-drive 230/460VAC TEFC motor with optional variable Hz drives for soft-start to optimize operating efficiency. Skid outlets to service with a diaphragm valve for flow control and for regeneration with a pressure-regulating valve for consistent supply pressure. The DI water supply loop recirculates to the tank with a pressure-retaining valve to ensure adequate supply pressure

System Skids - Components other than tanks are skid-mounted, pre-piped, & pre-wired limiting installation to interconnect piping & electrical connections. Construction is of 304- SS with sandblasting prior to a polyurethane coating. Skids include feet for securing skids to the floor and lugs for electrical grounding of electrical components.

Piping - Piping is Schedule 80 PVC with both solvent welded and threaded connections.

System Controls – Operation, monitoring, and control of the integrated system utilizes an Allen-Bradley CompactLogix programmable automation controller (PAC) with Human-machine interface (HMI) through a Panelview Plus color touch screen. System operation while highly automated also employs manual control with an intuitive operator-friendly interface. Product water to process is assured with recirculation of “off-spec” water to the feed tank if above an operator-adjustable set point. System operating set points and alarms are set at the touch screen which is password protected to limit access to the operator, supervisor, maintenance, or engineer based on necessity and relative expertise.

Additional Options

***** HP – High Purity Duplex Polishing Cation Exchanger –*** With added duplex polishing-cation skid to produce higher quality DI water in the range of 3-5 MegOhm.

***** EP – Enhanced Pre-treatment –***With added Hydrus Macrolite® multi-media backwashable filters for removal of up to 50 mg/l suspended solids larger in size than 5-microns.