

## VRx Water For Injection (WFI) System

### GENERAL INFORMATION

The VRx WFI System is a Hot Water Sanitizable (HWS) system built on a standardized platform for the generation of Water for Injection (WFI) in accordance with USP, EP, and JP monographs.

Designed for minimization of microbial growth, the VRx WFI System employs the use of all stainless steel tubing and chlorine injection at the front of the skid. The VRx WFI System is engineered with the industry leading CDI-LX® module. We also offer our patented S3 capabilities as an option for maximum efficiency and ease of use.

The VRx WFI System has configurable options to match each unique application, process preferences and challenging feed water sources. This evolutionary and robust standardized design eliminates engineering delays and is offered with competitive lead times.

### VRx WFI SYSTEM FEATURES

- Standardized pharmaceutical system with five flow rate options
- Comprehensive GAMP compliant validation documentation package and protocols including detailed engineering/design documents and certifications
- High quality 316 L stainless steel tubing throughout the system
- Chlorinated break tank to minimize bacterial growth
- Modular programming with premium PLC/HMI
- Fully operational wet FAT performed on all systems for ease of installation and fast start-up
- Single point electrical and pneumatic connections, simplifying field install requirements
- High recovery options available on large capacity units
- 24/7 remote monitoring available through our Water One® Services program with access to production, water quality and system performance data



### VRx WFI SYSTEM BENEFITS

- Provides high quality water to meet your needs
- Ease of operation and maintenance
- Minimizes bacterial growth
- Easily integrates with plant wide automation system
- Supports sustainability goals with efficient water and power consumption
- Unsurpassed local service support with industry expertise



The VRx WFI System features a sophisticated design that includes intricate stainless steel tubing throughout the skid to ensure quality.

# Process Components

## PROCESS WATER EQUIPMENT

Chlorinated Break Tank with Spray Ball	Water entry point for the VRx system is a stainless steel break tank which is chlorinated by a metering pump and solution tank on either feed or recirculated water
Booster Pump	Stainless steel vertical multi-staged centrifugal VFD controlled pump
Steam or Electric Heat Exchanger	Stainless steel shell and tube heat exchanger or stainless immersion heater for hot water sanitization and water tempering
Dechlorination	3 options available
Pre-Filter	Stainless steel housing with 5.0 micron filter
1 <sup>st</sup> Pass RO Pump	Stainless steel vertical multi-staged centrifugal VFD controlled pump
1 <sup>st</sup> Pass Pressure Vessels	Stainless Steel or FRP pressure vessels, rated for 450 psig
RO Membranes	Full fit thin film composite, hot water sanitizable membranes
CEDI Modules	CDI-LX® hot water sanitizable modules
Terminal Ultrafilter	6,000 or 10,000 Dalton MWCO hollow fiber UF, or 0.05 UF in 316SS housing
Controls Panel	IP65 rated controls enclosure
Power Panel	IP54 rated fan cooled enclosure
Process Piping	Stainless steel tube sanitary, <20 Ra interior finish

## OPTIONAL PROCESS WATER COMPONENTS

Cooling Exchanger	Stainless steel shell and tube heat exchanger for water tempering
Activated Carbon Filter	Stainless steel vessel, 100 psig with optional chlorine analyzer
Bisulfite Chemical Injection	Feed forward design, metering pump, solution tank and mixer, low level switch and 2 chlorine analyzers with automatic rate controlled by the PLC
Carbon Block Filter	5.0 micron hot water sanitizable carbon cartridge placed in the pre-filter if this option is selected
Pre RO-Ultra Violet Lamp	Stainless steel chamber with 254 nm lamp (minimum 30 mJ/cm <sup>2</sup> )
2 <sup>nd</sup> Pass RO Pump	Stainless steel vertical multi-staged centrifugal VFD controlled pump
2 <sup>nd</sup> Pass Pressure Vessels	Stainless Steel or FRP pressure vessels, rated for 450 psig
Membrane Degasifiers	Stainless steel housing X50 hot water sanitizable membranes
Caustic Chemical Injection	pH adjustment unit including metering pump, solution tank and pH monitor with automatic rate control by system control
Final UV Unit	Stainless steel chamber with 254 nm lamp (minimum 30 mJ/cm <sup>2</sup> )
PLC/HMI	Allen-Bradley or Siemens with 15" touch screen

## GENERAL SPECIFICATIONS

Description	Model 4	Model 8	Model 18	Model 25	Model 45
Nominal Product gpm (m <sup>3</sup> /hr)	4 gpm (0.91 m <sup>3</sup> /hr)	8 gpm (1.82 m <sup>3</sup> /hr)	18 gpm (4.09 m <sup>3</sup> /hr)	25 gpm (5.68 m <sup>3</sup> /hr)	45 gpm (10.2 m <sup>3</sup> /hr)
Nominal Recovery %	75% (2 <sup>nd</sup> pass 82.5%)				
Inlet Pressure	20-100 psig (1.3-6.8 Bar)				
Inlet Feed Water Temperature	40°F-77°F (4.5°C-25°C)				
Nominal Product Pressure	20 psig (1.3 bar)				
Frame Construction	Carbon steel or 304 stainless steel—box tube and channel				
Electrical and Power Panels	Carbon steel or stainless steel (will align with frame material choice)				



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