

Orion™



Reverse Osmosis & CEDI for Pharmaceuticals

Orion™ packaged systems are pre-validated, skid-mounted and hot water sanitizable. Developed specifically for the pharmaceutical market, they are compliant with all industry requirements. Orion systems have over 80 standard configuration options. Orion is available in 3 series:

C Series - Our classic Orion offers you the core Orion technology within the most economical investment package.

E Series - Our mid-range Orion reduces water during recycle mode. It also conserves energy to meet good environmental practices.

S Series - Our premier Orion meets the ultimate requirements for sustainability. Optimised technologies reduce overall energy and water consumption and offers long term operational savings.



Flow rates
from 500 to
20,000 L/h



Pharma



Cosmetics



FEATURES & BENEFITS

- Regular hot water sanitization at 85 °C; guaranteed microbial compliance
- Designed, manufactured and validated to GAMP
- Fully compliant with latest ISPE, USP and Ph Eur specifications
- Automated PLC control; minimizes operator involvement
- HMI has secure access keys and alarms; prevents accidental or unauthorized usage
- Unique CEDI design; efficiently and reliably ensures water quality
- Skid-mounted, pre-assembled, pre-tested; space saving, short lead times, quick start-up
- Comprehensive and standardized validation pack (FAT, IQ, OQ); reduces validation time

HYDREX® CHEMICALS

Hydrex® 4000 water treatment chemicals from Veolia Water Technologies should be used for optimized plant operation.



APPLICATIONS

Purified Water :

- Ophthalmics
- Antibiotics
- Tablet coating
- Granulation
- Diagnostics
- Veterinary products

Membrane based cold WFI production :

- Nasal/ Ear preparations
- Nebuliser solutions
- Irrigation solutions
- Haemo filtration solutions



OPTIONS

- Standard Option: Meets current USP & Ph Eur requirements for Purified Water
- UF Option: Meets current Ph Eur requirements for membrane based cold WFI production

ASSOCIATED SERVICES

Local after-sales service and support teams offer preventative and corrective maintenance programs to ensure the long-term, efficient operation of installed plant.





System Operating Parameters

Model	Unit	500	1000	2000	4000	6000
Permeate Nominal Flowrate	m³/h	0.5	1	2	4	6
Nominal Feed Flowrate	m³/h	0.625 ⁽¹⁾ 0.560 ⁽²⁾	1.25 ⁽¹⁾ 1.12 ⁽²⁾	2.50 ⁽¹⁾ 2.24 ⁽²⁾	5.00 ⁽¹⁾ 4.48 ⁽²⁾	7.50 ⁽¹⁾ 6.72 ⁽²⁾
RO Recovery	%	75 - 90				
Typical Design Flux	l/h/m²	21 to 45 (depending on source of water)				
Typical Salt Rejection	%	RO >96% CEDI >99%				

Model	Unit	9000	12000	15000	20000
Permeate Nominal Flowrate	m³/h	9	12	15	20
Nominal Feed Flowrate	m³/h	13.50 ⁽¹⁾ 10.00 ⁽²⁾	15.00 ⁽¹⁾ 13.35 ⁽²⁾	18.75 ⁽¹⁾ 16.70 ⁽²⁾	25.00 ⁽¹⁾ 22.25 ⁽²⁾
RO Recovery	%	75 - 90			
Typical Design Flux	l/h/m²	21 to 45 (depending on source of water)			
Typical Salt Rejection	%	RO >96% CEDI >99%			

⁽¹⁾ C Series ⁽²⁾ S Series

System Dimensions

Model	Unit	500	1000	2000	4000	6000
Total Installed Length	m	1.40	1.40	1.40	1.60	1.60
Total Installed Width	m	3.60	3.60	3.60	4.00	4.00
Total Installed Height	m	2.10	2.10	2.10	2.35	2.35
Operating Weight	kg	2100	2300	2600	4700	6000

Model	Unit	9000	12000	15000	20000
Total Installed Length	m	1.80 1.41	1.80 1.49	2.00 1.81	2.00 1.89
Total Installed Width	m	5.00 1.82	5.00 1.98	5.00 2.45	5.00 2.60
Total Installed Height	m	2.30 2.70	2.30 2.75	2.30 2.45	2.30 2.60
Operating Weight	kg	5600 3600	6400 4500	7200 5500	8000 7000

For models 9000 and above: Orion main skid | Softening Skid

Pipes Connections

Model	Unit	500	1000	2000	4000	6000
Feed	in	1	1	1	1½	1½
Treated water	in	¾	¾	1	1½	1½
Instrument Air	mm	8				
Drain	OD	63	63	63	63	63
Cooling Water	in	1 (for E or S Series only)				

Model	Unit	9000	12000	15000	20000
Feed	in	1	1	1	1½
Treated water	in	¾	¾	1	1½
Instrument Air	mm	8			
Drain	OD	75	75	110	110
Cooling Water	in	1 (for E or S Series only)			





Materials of Construction

Softeners	Plastic or Stainless Steel
Soft Water Tank	HDPE / GRP / ABS
Skid	Stainless Steel
Multi-Purpose Tank	Stainless Steel
Control Cabinet	Stainless Steel or Painted Carbon Steel

Feed water Requirements ⁽³⁾

Parameter	Unit	Value
Minimum water temperature	°C	5
Maximum water temperature	°C	30
Minimum supply pressure	barg	4
Maximum supply pressure	barg	6
Max Silt Density Index (SDI)	-	<3
Maximum Inlet Turbidity	NTU	<1
Maximum Inlet TDS	mg/l	Up to 800 ppm
Max inlet Total Hardness	mg/l CaCO ₃	<500 (with softeners) <10 (feed to the RO membranes) <1 (feed to the CDI modules)
Max inlet CO ₂	mg/l	Up to 30 ppm with purification by membrane degasser (optional)
Max inlet Silica	mg/l	Up to 20 ppm
Max inlet TOC	mg/l	<1
Max inlet Free Chlorine Cl ₂	mg/l	< 0.25

⁽³⁾ ORION System Design Program (SDP) must be performed based on specific water analysis and project data.

Typical Treated Water Quality

Parameter	Unit	Value
Average Conductivity	µS/cm	< 0.2
TOC	ppb	<100
Bacteria	cfu/100 ml	< 10
Endotoxins	EU/ml	< 0.125

Environmental Conditions

Parameter	Unit	Value
Minimum ambient temperature	°C	5
Maximum ambient temperature	°C	40
Maximum humidity	%	80

Power Requirements

Parameter	Unit	Value
Voltage	V	380-420
Frequency	Hz	50-60
Phases	-	3