

# ORION®

## Reverse Osmosis & CEDI for Pharmaceuticals

Orion® packaged systems are pre-validated, skid-mounted and hot water sanitisable. Developed specifically for the pharmaceutical market, they are compliant with all industry requirements. Orion® systems have over 80 standard configuration options. Orion® is divided into 3 sections:

**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 standardised 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

Highly Purified Water :

- 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 Highly Purified Water

#### 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	m <sup>3</sup> /h	0.5	1	2	4	6
Nominal Feed Flowrate	m <sup>3</sup> /h	0.625 <sup>(1)</sup>   0,560 <sup>(2)</sup>	1.25 <sup>(1)</sup>   1,12 <sup>(2)</sup>	2.5 <sup>(1)</sup>   2,24 <sup>(2)</sup>	5 <sup>(1)</sup>   4,48 <sup>(2)</sup>	7.5 <sup>(1)</sup>   6,72 <sup>(2)</sup>
RO Recovery	%	75 - 90				
Typical Design Flux	l/h/m <sup>2</sup>	21 to 45 (depending on source of water)				
Typical Salt Rejection	%	RO >96%   CEDI >99%				

Model	Unit	9000	12000	15000	20000
Permeate Nominal Flowrate	m <sup>3</sup> /h	9	12	15	20
Nominal Feed Flowrate	m <sup>3</sup> /h	13.5 <sup>(1)</sup>   10 <sup>(2)</sup>	15 <sup>(1)</sup>   13,35 <sup>(2)</sup>	18.75 <sup>(1)</sup>   16,70 <sup>(2)</sup>	25 <sup>(1)</sup>   22,25 <sup>(2)</sup>
RO Recovery	%	75 - 90			
Typical Design Flux	l/h/m <sup>2</sup>	21 to 45 (depending on source of water)			
Typical Salt Rejection	%	RO >96%   CEDI >99%			

<sup>(1)</sup> C Series <sup>(2)</sup> 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 <sup>(3)</sup>

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 <sub>3</sub>	<500 (with softeners) <10 (feed to the RO membranes) <1 (feed to the CDI modules)
Max inlet CO <sub>2</sub>	mg/l	Up to 30 ppm if treated through membrane degasser (option)
Max inlet Silica	mg/l	Up to 20 ppm
Max inlet TOC	mg/l	<1
Max inlet Free Chlorine Cl <sub>2</sub>	mg/l	< 0.25

<sup>(3)</sup> 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