



Orion[®]

Reliable and proven purified water technology with
intelligent innovation in the age of sustainability

The next generation of innovative purified water treatment systems for the pharmaceuticals, generics, healthcare and biotechnology markets.

The Orion is a premier, fully validated standard system:

Meeting the quality standards of current USP and Ph Eur purified water and Ph Eur highly purified water.

Fully compliant with FDA, cGMP and GAMP requirements.

Manufactured and designed in accordance with the ISPE guidelines for water and steam.

Delivering critical high performance in a sustainable manner is key for this high technology product. Energy and water-saving technology, combined with operator-friendly HMI information is displayed to allow cumulative key operational parameters to be measured. Our new and improved skid, with easy to identify operational modes, brings health and safety for users to the next level.

Multi-technology unit

The Orion comes as a skid-mounted system:

- Comprising softening, reverse osmosis and continuous electrodeionisation as its core technologies, which may be fully or partially hot water sanitised
- A diverse range of options is available including pre and post UV, UF, filtration and degassing
- All systems follow our stringent sustainability manufacturing guidelines and are FAT tested prior to delivery.

Validation

Our validation package covers everything you require for your system to meet the manufacturing criteria such as GAMP and be in accordance with ISPE guidelines, as well as inspection bodies, including the FDA and MCA. The documentation follows the regimes, protocols and guidelines laid out by the regulatory authorities for a smooth progression from Design Qualification (DQ) right through to successful completion of the Performance Qualification (PQ).

This new range truly is a differentiated modular system. It offers the broadest flexibility by providing enhanced features and options to complement each model. The Orion can meet a diverse range of manufacturing requirements, along with evolving sustainability requirements.



Connecting a World of
Pharmaceutical Knowledge

Environmental excellence and product efficiency

Embracing sustainable innovation

The Orion development helps to address today's environmental challenges by helping our customers to reduce their water and energy usage. All products and materials have been selected for optimum recyclability.



Carbon footprint up to

30%

reduction of CO₂ released during operation

Water footprint up to

40%

recovered

Environmental footprint

99%

of materials used with recyclable potential

Chemical footprint

minimal

chemicals used during operation

Sustainability features

- Health and safety operational status lights
- Blueflux electrical motors
- Low energy full fit membranes
- 99% recyclable materials
- End-of-life components recycle guide
- Increased water efficiency process enhancements
- Reduced energy process enhancements
- Manufactured within environmental ISO 14001
- Chemical-free sanitisation
- Reduced water discharge during recycle
- Reduced product flow during recycle
- Integral recovery RO and concentrate recycle

Reliable and proven purified water intelligent innovation in the age of



Our commitment to sustainability is at the heart of everything we do. This is reflected in our efforts to embed environmental and socially responsible business practices. We take opportunities to adapt and improve our products and services to meet the needs of our customers who want to achieve a sustainable future. Being the benchmark for sustainable development, we strive to help and support our customers to achieve their own sustainability goals, the driving force behind the new Orion.

Controls and instruments features

15" widescreen TFT HMI

Allen Bradley or Siemens PLC

Storage and distribution software

Sustainability display for:

- CO₂
- Energy
- Water

Operational coloured status lights for improved health and safety

Energy saving 'standby mode'

Panel rating IP55

Thornton M800 (conductivity, pH, TOC) meter

Integrated SMART module sensors

Multi-level service access button

Chart recorder for 21CFR Part II

Output on HMI for remote PC mirroring

High and low voltage segregation

Ethernet communication card

Multi-language

'Vision' digital intelligent portal and remote monitoring



technology with sustainability



Process and mechanical features

High voltage, low level electrical distribution

Low voltage and controls high level distribution

Safety service light

Stainless steel or painted mild steel panel

Enhanced hygienic design for multi-purpose storage vessel

Increased range up to 20m³/hr

Pre UV

Post UV

Post UF

5 micron or carbon prefilter

Hot water sanitisation (>80°C)

Electrical hot water sanitisation heating with option for steam heating

Twin pass RO option (E Series)

Fill and recycle lines fill the purified water tank simultaneously

Sanitary sample valves

TOC monitor connection point

20% standard endoscopy on all welds, 100% upon request

ASME BPE pipework

Specifications

	C Series	E Series	S Series
Pre-Treatment Softener (Plastic)	✓	○	-
Pre-Treatment Softener (Stainless)	-	✓	✓
Water Saved Blue Display	✓	✓	✓
Energy Saved Blue Display	-	✓	✓
Reduced Water Discharge	-	✓	✓
Reduced Product Flow During Recycle	-	✓	✓
Integral Recovery RO	-	-	✓
Reject Recycle Pump	-	-	✓
Single Pass RO	✓	✓	✓
Twin Pass RO	-	○	-
Continuous Electro-Deionisation	✓	✓	✓
Hot Water Sanitisation	✓	✓	✓
Low Energy Pumps	✓	✓	✓
RO/CDI Recovery Displayed	✓	✓	✓

Feed Water Requirements

General	Potable water free from organics, colloids and suspended matter, SDI <1
Free Chlorine	<0.25 ppm
Temperature	5 - 30°C
Pressure	4 - 6 bar

Typical Treated Water Quality	Standard Orion	Orion with UF Option
	Meets current USP and Ph Eur requirements for Purified Water	Meets current Ph Eur requirements for Highly Purified Water
Conductivity	<0.2 µS/cm	<0.2 µS/cm
TOC	<250 ppb	<250 ppb
Bacteria	<10 cfu/ml	<10 cfu/100ml
Endotoxins	N/A	<0.125 EU/ml

Orion Performance (Single Pass RO)

Model		500	1000	2000	4000	6000	9000	12000	15000	20000
Product (nominal)	l/h	500	1000	2000	4000	6000	9000	12000	15000	20000
Feed C Series (nominal)	l/h	625	1250	2500	5000	7500	13500	15000	18750	25000
Feed S Series (nominal)	l/h	560	1120	2240	4480	6720	10000	13350	16700	22250
Recovery (range)	%	75 - 90								

Orion Dimensions (Single Pass RO)

Model		500	1000	2000	4000	6000	9000	12000
Height	mm	2100			2420		2010	
Width	mm	3600			4000		5000	
Depth	mm	1400			1600		1800	
Weight (operational)	kg	2100	2300	2600	4700	6000	5600	6400

Dimensions are approximate and vary with options selected.
 Dimensions exclude the salt/brine tanks and dosing tanks.
 Dimensions for 9000 and above exclude the softeners which are not mounted on the Orion skid.

✓ Standard - Not Available ○ Optional

Pre-treatment	C Series	E Series	S Series
Plastic Front End (Cold Softener)	✓	○	-
Stainless Steel Front End (HWS Softener)	-	✓	✓
Carbosoft	○	○	○
5 Micron Filter	✓	✓	✓
Carbon Cartridge Filter (In Place of 5 Micron Filter)	○	○	○
Caustic Dosing & Ph Monitor	○	○	○
Bisulphite Dosing & ORP Monitor	○	○	○
Cl Monitoring (ORP)	○	○	○
Hardness Monitor	○	○	○
Pre UV & Monitor	○	○	○

Main Treatment	C Series	E Series	S Series
Multi-Purpose Tank	✓	✓	✓
Electrical Heater	✓	✓	✓
Steam Heating	-	○	○
Single Pass RO	✓	✓	✓
Conc Recycle Pump	-	-	✓
Integral Recovery RO	-	-	✓
Twin Pass RO	-	○	-
Degasser	○	○	○
Cedi Unit	✓	✓	✓

Post Treatment	C Series	E Series	S Series
Post UV & Monitor	○	○	○
Post UF	○	○	○

Controls	C Series	E Series	S Series
Siemens PLC and HMI	✓	✓	✓
Allen Bradley PLC and HMI	○	○	○
Painted Steel Control Panel	✓	○	○
Stainless Steel Control Panel	○	✓	✓
21 CFR PT 11	○	○	○
Paperless Chart Recorder	○	○	○
Remote Monitoring by Vision	○	○	○
Control of Distribution System	○	○	○

Pipe	C Series	E Series	S Series
ASME BPE Product Pipework RO Onwards	✓	✓	✓
TOC Sample Point	○	○	○
Purified Water Tank Valve(s)	✓	✓	✓

Sustainability

is at the core of the Orion. Energy and water efficiencies are displayed on all models and all materials of construction have been selected for optimum reuse and recycle at the end-of-life.

Available in three models with an expanded range of flow rates from

0.5 to 20 m³/hr

the Orion is an evolution in modular water treatment.

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.



E Series

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



C Series

Our classic Orion, offers you the core Orion technology within the most economical investment package.



Orion Series

Orion combines its pedigree of providing compendial purified water through tried and tested process excellence with sustainability features at its core. The result is an unrivalled water technology package.



A sustainable product

'Vision' – the value of connected intelligence

You can enhance your level of service and support by adding in our exclusive secure cloud-based application that enables you to access your system remotely from anywhere.

Providing a world-class service and support to your organisation, 'Vision' is available to enable you to have a seamless experience with Veolia via the connection of our secure web-based portal.

You have the capability to store and access your complete individual or multi-site product and service information. There is also the option to connect your equipment to enable remote monitoring or critical performance parameters combined with alert and alarm management.

'Vision' improves the reliability of your purified water system. It gives you control over costs, minimises response times and improves service levels in the most sustainable way.



A private, secure web platform and a single point of reference for all information regarding the Orion products and services.

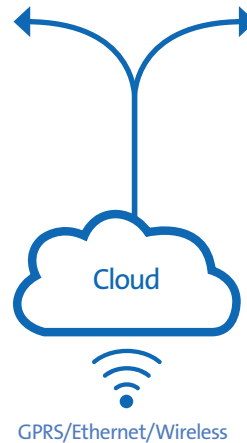
Simplified multi-stage management of all documents, service contracts, manuals, invoices and general reports in one place, sent digitally from a proprietary connected device.



A remote monitoring platform to access real-time encrypted performance data including alarms and equipment status.

A secure and proven cloud-based application that simplifies Machine 2 Machine operations, it allows users to monitor single or multiple systems remotely utilising the latest cloud API technology. This gives you the capability to access up to five years' worth of data storage.

'Vision air' improves efficiencies through remote monitoring. Easy and automatic creation of trend and alarm reports and instant notifications enhance business efficiencies and reduce administration costs.



'Vision' is our high-value service utilising the latest Machine 2 Machine technology

Service and maintenance

We offer a variety of service and maintenance contracts to ensure continual compliance and the assurance that your Orion delivers the optimum performance.

Safeguard critical processes which rely on continuous supply of purified water

Minimise equipment failures and downtime

Ensure regulatory compliance

Maximise availability

Meet water quality and quantity

Optimise operating costs ensuring environmental efficiency

Extend equipment life

Health and safety is our number one priority

We specialise in delivering unrivalled service and maintenance for your process water requirements through operational excellence



Resourcing the world

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