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VEOLIA

CATALOGUE
SOLUTIONS AND PRODUCTS
VEOLIA WATER TECHNOLOGIES SP. Z O.O.

- EDITION 2021

WATER TECHNOLOGIES

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VEOLIA WATER TECHNOLOGIES SP. Z O.O.

**Veolia Water Technologies (VWT) is specialized in design, manufacturing and the logistics for ready made and standard water treatement products/technologies dedicated for industry and municipal sector.
As part of Veolia, our vision it to be a partner of choice commited to our customers succes, recognized for our people and performance, thanks to a constant objective of quality and lead times.
We also have a wide experience and promote a culture of continuous improvement and collaborative approach resulting in customer satisfaction.**

Veolia Water Technologies provides a complete range of capabilities required to design, build, maintain and upgrade water and wastewater treatment facilities for industrial and municipal authorities.

A complete package systems covering a wide range of process and potable water treatment apllication.

STANDARD PRODUCTS

- Plug & play units with state of the art monitoring
- Technical and cost control
- Reliability from quality and flow-rate; products wet-tested in house VEOLIA workshops
- Costs optimisation, services for commercial and technical support
- Industrialised commissioning
- Supply chain management, logistics for off-the-shelf conumables, parts and Hydrex

MODIFIED SYSTEMS

- Based upon core technologies, Veolia manage design and manufacturing of specyfic products/systems projects for itd clients
- Our methods and tools are industrialised which allows us to handle "sepcyfic demands" based upon end-user technical specyfications (different parts, PLC adaprtation etc.)

ADDITIONAL BENEFITS

- Digital and monitoring tools: all new products can be equipped wit Aquavista Digital Services
- Compliance with all leagl and end-user requirements
- Optimisation of risk-based maintenance management Reduction of fresh water use and overall water consumption based on water reuse
- Testig procedures
- Local customer service teams

Clarification

Filtration

UF/MBR

Reverse osmosis

Softening

Deionisation

Multi technology

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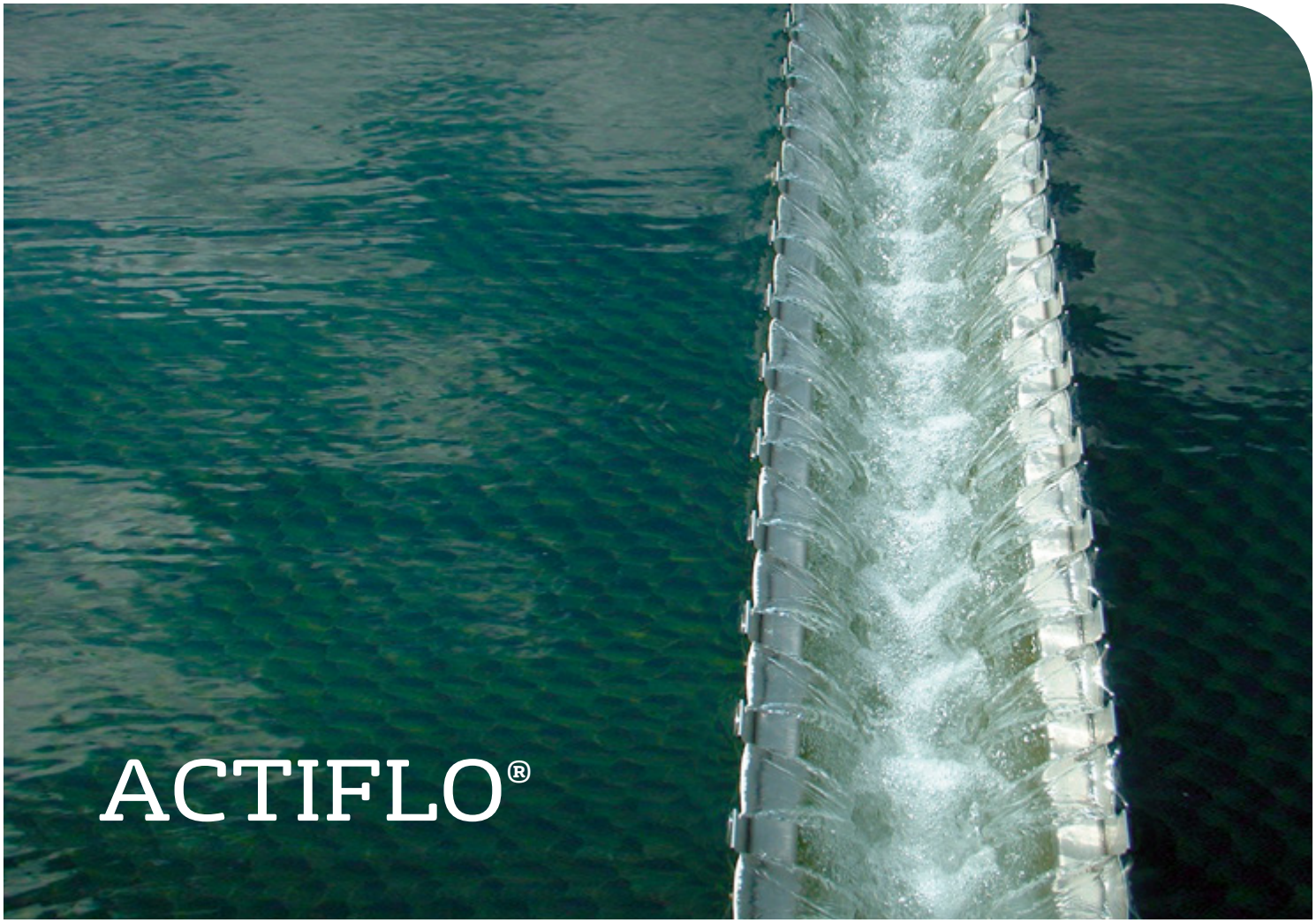


ACTIFLO®

VEOLIA

The ultimate clarifier

WATER TECHNOLOGIES

Coagulation / ballasted flocculation and settling for the production of drinking water, process water and the treatment and reuse of wastewater.

A universal process, always at the forefront of innovation

Actiflo is a compact process for high rate clarification, developed and patented by Veolia Water Technologies.

The specificity of Actiflo resides in the use of microsand, which acts as a ballast for flocculated matter and accelerates its settling.

Actiflo benefits from constant improvements and innovations in order to respond to new environmental requirements from public authorities and industry.

25 years of operational experience and more than 1,000 references around the world make Actiflo the most universal and the highest performing clarification process.

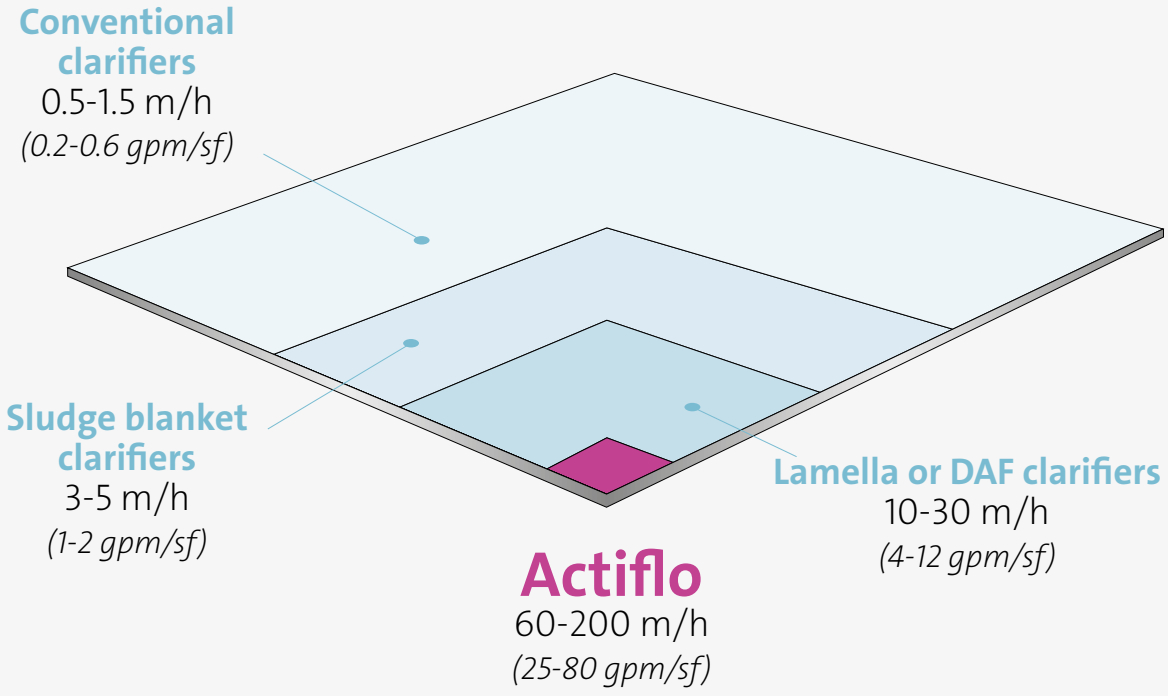
Major advantages

- Exceptional treatment performance, regardless of the field of application.
- Operational stability: no impact on treatment efficiency during sudden flow or raw water quality fluctuations.
- Quick response to treatment adjustments.
- Operational flexibility: possibility of frequent shutdowns and restarts without affecting treated water quality.
- Reduction in construction costs thanks to the compactness of the process.
- Process can be adapted and integrated into all treatment schemes that require a clarification step.
- Full automation and remote monitoring possible.

Compact and ultra-rapid

Actiflo is characterized by:

- Very high settling rates:
  - > Drinking water: 60-80 m/h *(25-35 gpm/sf)*
  - > Municipal wastewater and stormwater: 60-150 m/h *(25-60 gpm/sf)*
  - > Industrial process water and wastewater: 60-200 m/h *(25-80 gpm/sf)*
- Increased compactness: Actiflo is the ideal response where there are space restrictions for rehabilitating existing installations or building new ones. Its footprint is 4 to 8 times smaller than lamella or dissolved air flotation (DAF) clarifiers and up to 50 times smaller than conventional clarification systems.
- Very short residence times resulting in great reactivity and user-friendly operation.



A very wide range of applications

Available in standardized modular solutions (100 to 60,000 m^3/day) or custom designed, Actiflo covers all municipal and industrial treatment applications.

Drinking water and process water

For the production of drinking water and process water, Actiflo treats surface water, ground water, sea water and brackish water. It is particularly effective in eliminating turbidity, natural organic matter, color and algae.

For the specific needs of industry, Actiflo is also suitable for the treatment of cooling tower make-up water and boiler feed pre-treatment.

Municipal and industrial wastewater

Actiflo can be implemented at all stages of the treatment of municipal effluents: primary and secondary clarification, tertiary polishing, and reuse of wastewater.

Real-time treatment of stormwater flows.

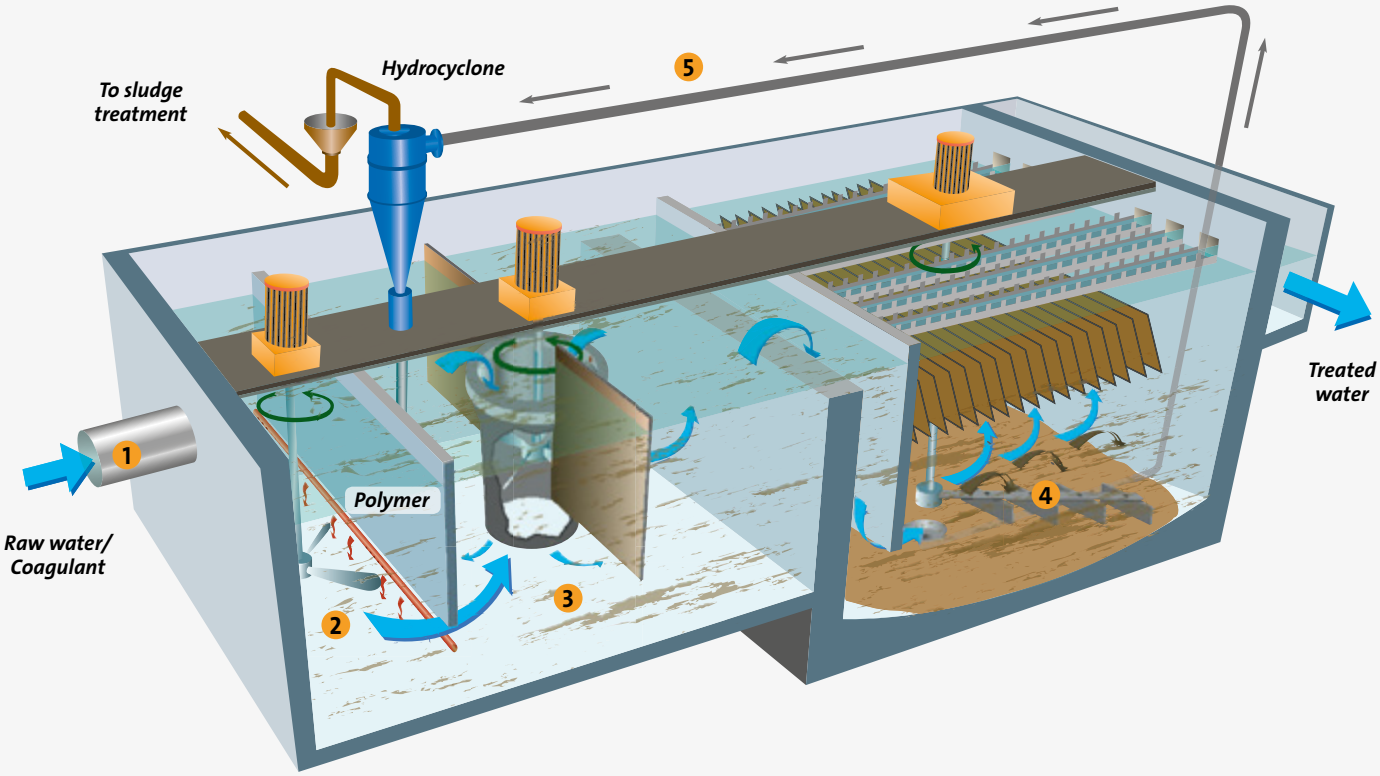
Phosphorus removal: compliant with the strictest standards, with reductions exceeding 95%.

Actiflo can be used for the treatment of most industrial effluents. It is suitable, for example, for the treatment and recycling of cooling towers blowdowns.

It is also particularly suited for eliminating heavy metals, ash and coal fines in power plants or steel mills effluents.

"Actiflo covers all municipal and industrial treatment applications"

State-of-the-art equipment



1 ***Chemicals:*** *a coagulant, such as an iron or aluminium salt, is added to the raw water.*

2 ***Coagulation:*** *hydroxide flocs are formed during the coagulation phase.*

3 ***Turbomix™ flocculation:*** *the flocs formed during the coagulation phase are ballasted with microsand with the help of polymer.*

4 ***Clarification:*** *the ballasted flocs settle quickly thanks to the specific weight of the microsand.*

5 ***Recirculation:*** *the sludge and microsand slurry is pumped to a hydrocyclone where the sludge is separated from the microsand via centrifugal force. The clean microsand is recycled back to the flocculation tank while the sludge is continuously discharged.*

Confi urations

The basic design of Actiflo allows for many configurations that meet the diversity of treatment contexts and needs:

CONFIGURATIONS	MAIN CHARACTERISTICS
ACTIFLO® Duo	Operational flexibility with or without microsand depending on the flow rate.
ACTIFLO® Carb	With Powered Activated Carbon (PAC) addition in order to eliminate non-flocculable organic matter, pesticides and emerging micropollutants.
ACTIFLO® Softening	With lime and/or soda addition for decarbonation and water softening.
ACTIFLO® HCS	For the reduction of the sludge volume and the associated water losses.
BioACTIFLO®	For the online stormwater treatment and the reduction of the soluble BOD.
ACTIFLO® Rad	For the removal of radioactive elements from contaminated water at nuclear sites.
ACTIFLO® Disc	Actiflo followed by Hydrotech discfilters for treated water polishing.
ACTIFLO® Pack	Standardized units for the treatment of any flow rate up to 2,500 m^3/h (11,000 gpm).

ACTIFLO® Green: Actiflo configurations with use of biosourced products

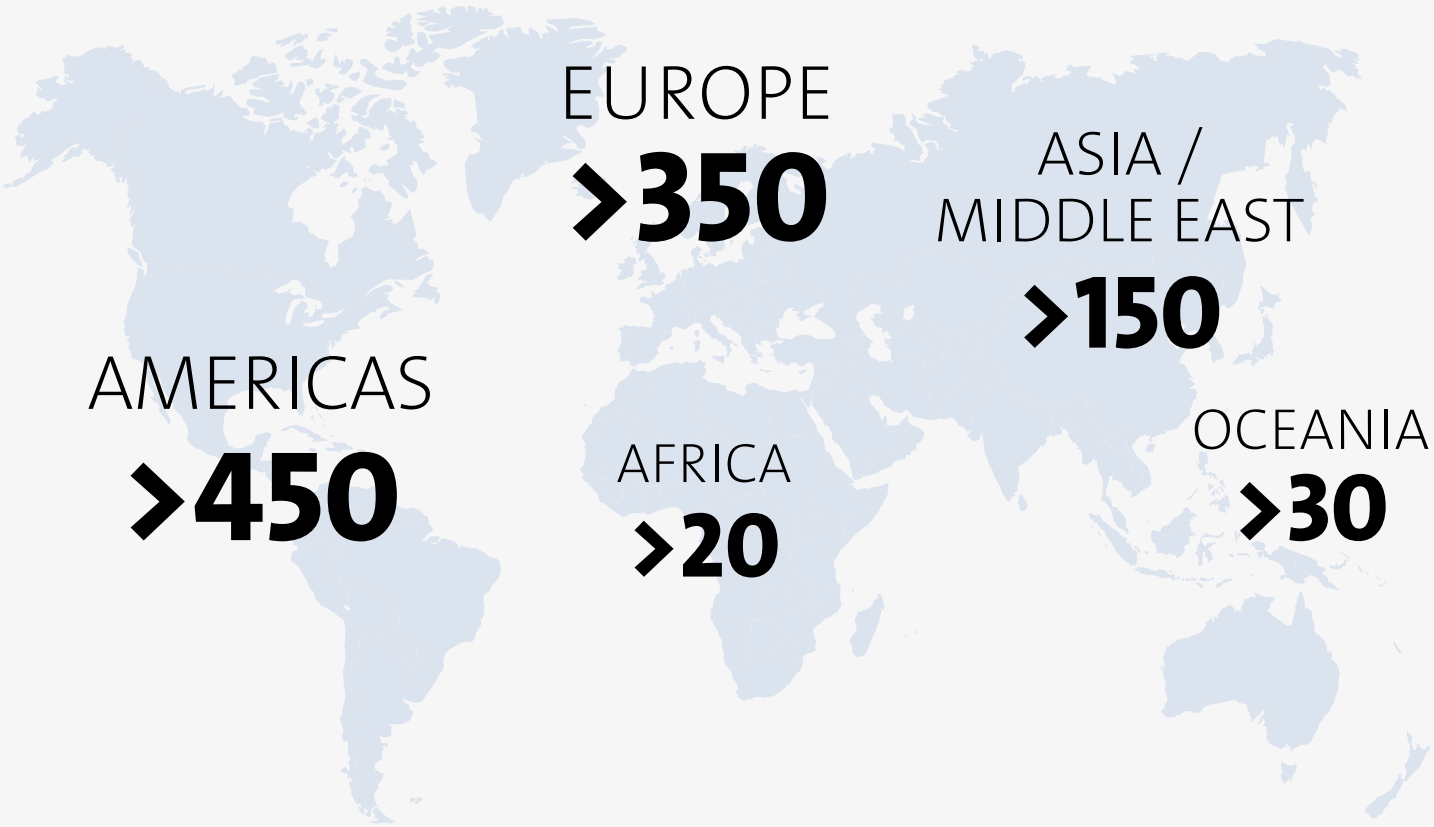
Veolia has developed, through its Hydrex™ water treatment additives brand, a product line based on renewable resources, such as activated starch, to replace traditional polyacrylamide flocculants, as a response to increasing demand from local authorities and industry in this area.

This range of biosourced products is perfectly suited for optimal Actiflo operation and its various configurations.

Actiflo, the ultimate clarifier

References

25 years of operational experience and more than 1,000 references around the world. Actiflo treats more than 50 million m^3 (13 billion gallons) of water every day.



Visit us at:
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ACTIFLO® PACK (MINI series)

The Ultimate Microsand Enhanced Clarifier

The pre-engineered Actiflo® Pack (MINI series) is a very compact standard package plant for drinking water treatment, municipal wastewater treatment as well as industrial process water and wastewater treatment and reuse. The process is a highly efficient and proven clarification technology based on a strong 20+ year operating experience and over 1000 references worldwide. In Actiflo® Pack (MINI series), water is flocculated with microsand and polymer. The microsand enhances the formation of robust flocs and acts as ballast, significantly increasing their settling velocity. The unique characteristics of the resulting microsand ballasted flocs allow for clarifier designs with very short retention times, high rise rates and extremely compact system footprints that are up to 50 times smaller than other clarification processes of similar capacity. A hydrocyclone ensures the microsand continuous cleaning, recovery and reuse in the process.

- **Unit flow rates:**

- Drinking and process water: from 3 to 7 m³/hr

- Wastewater: from 3 to 15 m³/hr

FEATURES & BENEFITS

- High treatment efficiency: Turbidity and TSS removal up to > 99%; treats all water and wastewater sources
- Extremely quick start-up time: Reaches treatment efficiency within few minutes
- Process stability: The microsand buffers the effect of raw water flow or load variations, making the process very user friendly and easy to operate
- Quick optimisation: Short hydraulic retention time makes it feasible for the process to adjust quickly to changing raw water quality
- Efficient use of chemicals: Microsand ballasted flocculation and settling helps to avoid common chemical overdosing to achieve good clarification performance
- Efficient in cold water applications: Suitable for use also in Nordic regions
- Compact design: Can be easily integrated and retrofitted into existing structures
- Modular: Units may be combined to achieve treatment of high flow rates

APPLICATIONS

- Surface and ground water treatment
- Very high or very low turbidity water and wastewater
- Treatment of water with high natural organic matter (colour, TOC)
- Efficient treatment of algae, phosphorus, heavy metals, oil & grease, particle counts, crypto and giardia, coliforms, etc.
- Primary, secondary and tertiary clarification of wastewater
- Treatment of biofilter backwash water and trickling filter effluents
- Stormwater and combined sewer overflow treatment, reverting to effluent polishing during dry weather
- Industrial process water treatment for cooling tower make-up or prior to demin plants
- Pre-treatment to membrane and ion exchange systems
- Industrial wastewater treatment in all market segments, including leachate and run-off water
- Recycling/Reuse of municipal and industrial effluents

HYDREX® CHEMICALS

Hydrex™ 3000 & 6000 water treatment chemicals from Veolia Water Technologies should be used for optimized plant operation.

RELATED SERVICES

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

ACTIFLO® Pack (MINI series)

TECHNICAL PERFORMANCES

Process & Drinking Water Application	3(*) - 7 m^3/H
Industrial & Municipal Wastewater Application	3(*) - 15 m^3/H

Length	3 m
Width	1 m
Height	2.7 m
Operating Weight	3.4 tons

Total Installed Power	max. 4kW
Supply Power (Standard) (**)	380V x 3phase x 50/60 Hz

Recirculation Flowrate	0,4-1m^3/h
Chemical Dosing Pump (Standard) (***)	PAC, Acid, Alkali, Polymer

Monitoring Instrument (Standard) (****)	1 x pH at Coagulation Tank 3 x Flowmeter at Inlet, Recirculation & Sludge Line 1 x Pressure at Hydrocyclone Inlet 2 x Turbidity Meter at Inlet & Outlet

(*) In case of the operation at < 5 m^3/H, the separation of sludge from microsand should be investigated, due to over-mixing in Maturation Tank.
(**) 220V x 3 phase x 50/60Hz is optional.
(***) Additional chemical dosing or different type of chemical should be discussed prior to the order.
(****) Additional monitoring should be discussed prior to the order.

Actiflo® PACK (MINI series) is supplied as a complete functional system, including chemical preparation and dosing equipment as well as integrated PLC & SCADA.
It can be supplied as a stand-alone unit or pre-installed in a 20' container.

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ACTIFLO® Pack ACP2

The Ultimate Microsand enhanced clarifier

The Actiflo® Pack is a very compact and fully standardized clarifier package plant. It can be used for various applications such as drinking water, waste water treatment, re-use or process water.
This product range is based on the Actiflo process developed by Veolia that uses microsand and polymer in the floculation tank to increase settling velocity. Veolia has more than 20 years of design, commissioning and operational experience. Over 1,800 Actiflo units have been installed worlwide by Veolia, including more than 900 package plants.
This package plant is integrating the continuous innovation carried out by Veolia in order to always stay on the cutting edge to meet customer needs and performance excellence

Pharma
Cosmetics
Food
Beverage
Power
General Industry
Drinking Water
Municipal WW

FEATURES & BENEFITS

- High treatment efficiency: turbidity and TSS removal up to > 99%; treats all water and wastewater sources
- Extremely quick start-up time: reaches treatment efficiency within few minutes
- Process stability: the microsand buffers the effect of raw water flow or load variations, making the process very user friendly and easy to operate
- Efficient in cold water applications: suitable for use also in Nordic regions
- Fully standardized design: complete documentation readily available
- Numerous standard options and alternatives to enhance performances and monitoring

APPLICATIONS

- Industrial process water: surface/ground water treatment, pre-treatment to membrane and ion exchange systems
- Municipal and industrial wastewater treatment: primary/secondary/tertiary treatment, biofilter backwash water and trickling filter effluents
- Stormwater and combined sewer overflow treatment, reverting to effluent polishing during dry weather
- Recycling/reuse of municipal and industrial effluents

HYDREX™ CHEMICALS

Hydrex™ 3000, 6000 & 9000 water treatment chemicals from Veolia Water Technologies are recommanded for optimized plant operation.

ASSOCIATED SERVICES

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

System Performances

Model	Unit	ACP2-15	ACP2-30	ACP2-40	ACP2-45	ACP2-55	ACP2-60	ACP2-70	ACP2-75
Min Feed Flowrate(1)	m³/h	21	25	38	50	75	100	156	178
	US gpm	92	110	167	220	330	440	686	783
Max Feed Flowrate	m³/h	104	221	369	414	629	995	1259	1441
	US gpm	458	972	1624	1822	2768	4378	5540	6340

(1) Selection of models must be done according to water characteristics and treatment requirements

System Dimensions

Model	Unit	ACP2-15	ACP2-30	ACP2-40	ACP2-45	ACP2-55	ACP2-60	ACP2-70	ACP2-75
Total Installed Length(2)	m	4.40	6.50	7.70	9.50	11.20	12.50	14.00	15.00
	ft	14.40	21.30	25.30	31.20	36.70	41.00	45.90	49.20
Total Installed Width(2)	m	3.00	3.20	3.50	3.60	4.20	4.90	5.40	5.50
	ft	9.80	10.50	11.50	11.80	13.80	16.10	17.70	18.00
Total Installed Height(2)	m	5.40	5.70	6.10	6.00	7.00	7.00	7.50	7.50
	ft	17.70	18.70	20.00	19.70	23.00	23.00	24.60	24.60
Clearance Height	m	6.40	6.70	7.10	7.00	8.00	8.00	8.50	8.50
	ft	21.00	22.00	23.30	23.00	26.20	26.20	27.90	27.90
Empty Weight	kg	4000	7000	8100	9100	11500	15500	18200	21700
	lb	8800	15400	117820	20020	25300	34100	40040	47740
Operating Weight	kg	26000	37500	53000	64000	90000	122000	180000	200000
	lb	57200	82500	116600	140800	198000	268400	396000	440000

(2) Including recirculation line(s), ladder and embedded control panel.

Feed water requirements

Parameter	Unit	Value
Minimum water temperature	°C	2
	°F	35
Maximum water temperature	°C	40
	°F	104
Maximum Inlet TSS(3)	mg/l	1500
Maximum Inlet Turbidity(3)	NTU	1000
Maximum Inlet particle size	mm	2

(3) For somme applications, max acceptable inlet TSS or Turbidity should be lower in order to warranty performances.

Environmental conditions

Parameter	Unit	Value
Minimum ambient temperature (4)	°C	5
	°F	41
Maximum ambient temperature (4)	°C	35
	°F	95
Maximum humidity(4)	%	90

(4) Standard design can be modified on request to be suitable for other environmental conditions.

Materials

Tank	Coated Carbon Steel
Internal Components	SS304L
Recirculation Pipework	HDPE

(5) Other materials available on request.

Power requirements

Version	ISO Spain	ISO China	ASME US	ASME Canada
Voltage(6)	400 V	400 V	460 V	575 V
Frequency	50 Hz	50 Hz	60 Hz	60 Hz
Phases	3	3	3	3

(6) Other voltages available on request.

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MULTIFLO™ Pack

Compact Lamella Settler

Veolia's MULTIFLO™ technology is a universal and multipurpose clarification process. It can meet various needs of municipal and industrial clients.

The Multiflo pack is a modular design of packaged plant offering all the advantages of the technology in a standardize product range. It can contain 1 to 3 steel tanks in order to cover 2 to 4 treatment steps.

- **6 Models of coagulation tank**
- **5 Models of flocculation/ settling tank**
- **10 Models of Contact tanks**

Flow rate from **13 to 325 m³/h**

FEATURES & BENEFITS

- High flocculation efficiency thanks to patented Turbomix technology
- Higher settling velocity than conventional settlers
- LVE Lamellas installed as a pack inside a metallic or composite structure for easy removal and installation
- Cleaning system of Lamella using air to avoid clogging issues and speed up maintenance
- Possibility to combine tanks to fit to specific treatment requirements

OPTIONS

- 2 different types of lamellas (according to application)
- Access (ladder or stairs) and security platform
- Material of construction suitable for corrosive water
- Thicker coating for corrosive water, installation outside and/or in aggressive environment
- Customization according to enduser needs

APPLICATIONS

- Surface water clarification
- Seawater clarification
- Urban wastewater Primary, secondary and tertiary treatment
- Actiflo's sludge thickening (Actydin)
- Carbonate removal and water softening
- Heavy metals removal
- Storm water treatment
- Biofilter backwash treatment
- Wastewater reuse

HYDREX® CHEMICALS

Hydrex™ 3000 and 6000 water treatment chemicals from Veolia Water Technologies are recommanded for optimized plant operation.

RELATED SERVICES

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

Flocculation/Settling tank operating parameters

Model	Unit	C15351D	C20351D	C25351D	C30351D	C35351D
Mini Inlet flowrate(1)	m³/h	13	25	44	74	110
Maxi inlet flowrate(1)	m³/h	38	83	169	239	325
Flocculation volume	m³	6,3	12,6	21,9	36,8	55,1
Lamella mirror surface	m²	1,28	2,78	5,62	7,98	10,85
Tank external Length(2)	m	4,4	5,8	7,6	9,3	10,9
Tank external Width(2)	m	1,7	2,2	2,7	3,2	3,7
Tank external Height(2)	m	3,7	3,7	3,7	3,7	3,7
Flange size (EN1092) Inlet/outlet	-	DN100	DN150	DN200	DN250	DN300
Flange size (EN1092) sludge outlet	-	DN32	DN40	DN50	DN65	DN80
Empty tank weight(2)	T	3,7	5,3	8,0	11,2	12,6
Weight in operation(2)	T	20,0	36,1	61,6	92,7	126,8
Total power installed	kW	0,92	0,92	0,92	1,47	1,47

Coagulation tank operating parameters

Model	Unit	A1010	A1020	A1415	A1425	A1920	A1935
Coagulation volume	m³	0,7	1,4	2,4	4,0	5,7	10
Tank external max diameter(2)	m	1.2	1.2	1.6	1.6	2.1	2.1
Tank Height(2)	m	3,7	3,7	3,7	3,7	3,7	3,7
Flange size (EN1092) Inlet/outlet	-	DN100	DN150	DN200	DN250	DN250	DN300
Empty tank weight(2)	T	0,7	0,7	1,1	1,1	1,5	1,5
Weight in operation(2)	T	1,4	2,1	3,5	5,1	7,2	11,5
Total power installed	kW	0,55	0,55	1,50	1,50	1,50	1,50

Contact tank operating parameters

Model	Unit	BR1535T1	BR2035T1	BR2535T1	BR3035T1	BR3535T1
Number of mixer	u	1	1	1	1	1
Contact volume	m³	7,9	14,0	21,9	31,5	42,9
Tank external Length(2)	m	1,7	2,2	2,7	3,2	3,7
Tank external Width(2)	m	1,7	2,2	2,7	3,2	3,7
Tank Height(2)	m	3,7	3,7	3,7	3,7	3,7
Flange size (EN1092) Inlet/outlet	-	DN150	DN200	DN300	DN350	DN400
Empty tank weight(2)	T	2,1	2,9	3,8	4,7	5,6
Weight in operation(2)	T	9,9	16,9	25,6	36,2	48,5
Total power installed	kW	0.55	1.5	1.5	1.5	2.2
Model	**Unit**	**BR1535T2**	**BR2035T2**	**BR2535T2**	**BR3035T2**	**BR3535T2**
Number of mixer	u	2	2	2	2	2
Reaction volume	m³	15,8	28,0	43,8	63,0	85,8
Tank external Length(2)	m	3,2	4,2	5,2	6,2	7,2
Tank external Width(2)	m	1,7	2,2	2,7	3,2	3,7
Tank Height(2)	m	3,7	3,7	3,7	3,7	3,7
Empty tank weight(2)	T	4,1	5,7	7,4	9,1	11,0
Flange size (EN1092) Inlet/outlet	-	DN150	DN200	DN300	DN350	DN400
Weight in operation(2)	T	19,8	33,7	51,1	72,1	96,7
Total power installed	kW	1.1	3.0	3.0	3.0	4.4

(1) Selection of models must be done according to inlet water characteristics and treatment requirements.
(2) External Dimension and weight of the unit are defined without access or platform. Height of tank is without motor or support beams.

Feed Water requirements

Parameter	Unit	Value
Min water temperature	°C	2
Max water temperature	°C	40
Max inlet TSS(3)	mg/l	1000

For Actydin applications, Max inlet TSS can be up to 15 g/l.

Typical treated water specifications and performances

Parameter	Unit	Value
TSS Removal efficiency	%	80-90
Typical Sludge concentration	g/l	10-70

For Actydin applications, TSS removal can reach 99% in certain conditions.

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Idraflo ®

Multi DAF Technology

by VEOLIA
Water Technologies

Technology

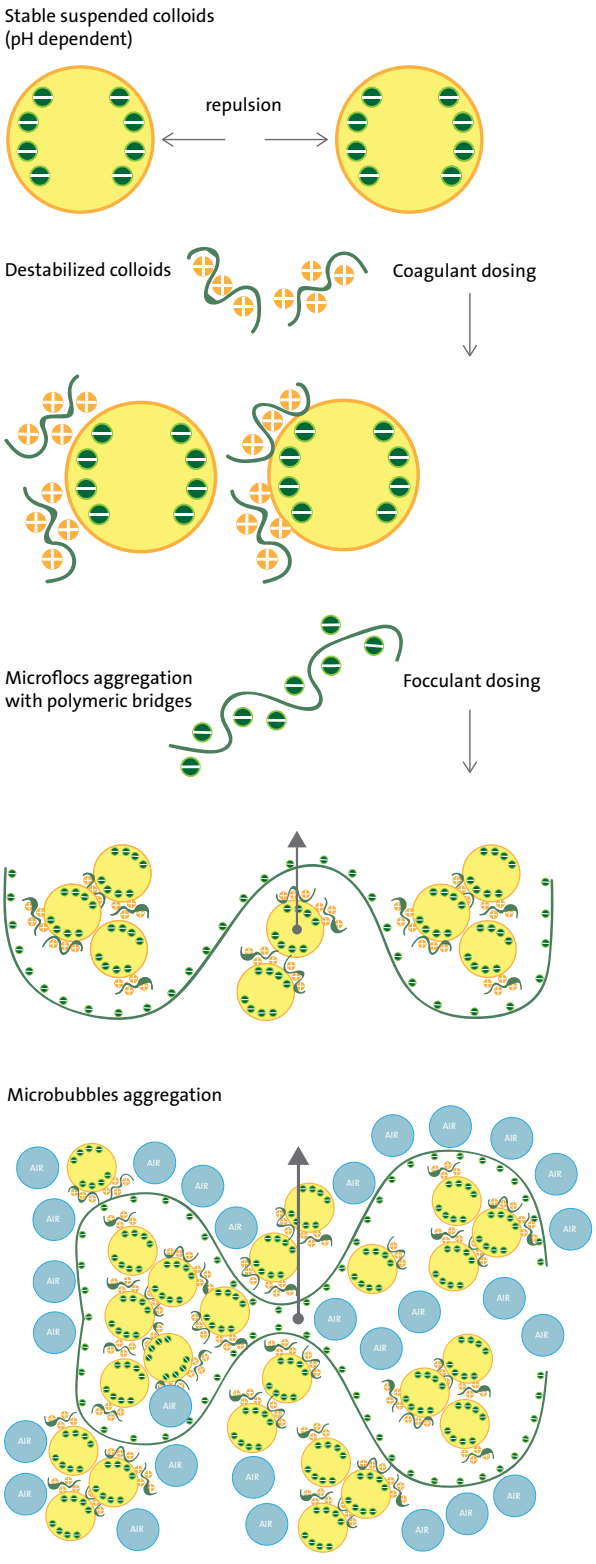
Flotation is a physical process where water is separated from the suspended solids to be reused.

Flotation consists of separating solids from the water phase by attaching the solids to fine air bubbles to decrease the density of the particles which float instead of sinking. The rising solids are called the "float" and are skimmed off the surface and further processed in the sludge train.

Chemicals can be added to improve the separation: first for coagulation and then for flocculation.

The type of flotation used by IDRAFLOT® is the Dissolved Air Flotation (DAF), in which the suspension is saturated with air at high pressure. Bubbles are released to the water and will attach to the suspended solids.

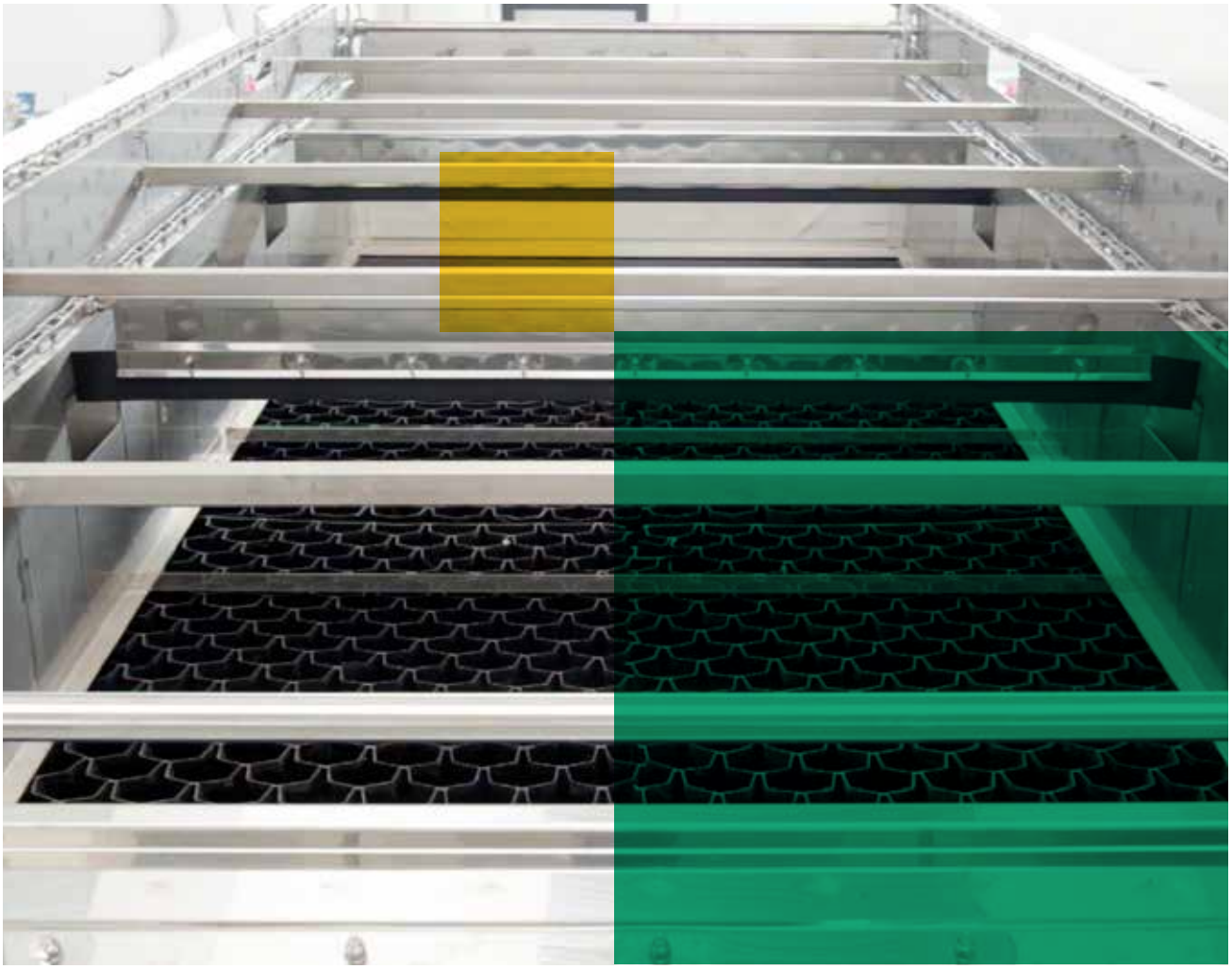
The bubbles from a DAF system are much smaller than in other types of flotation systems and better adhere to the solids. This makes IDRAFLOT® DAFs one of the most efficient flotation options of wastewater treatment.



IDRAFLOT®

Flotation Technology
since 1978

An innovative and effective water mixing device with a modular design.



The new modular design allows for faster delivery, easier implementation and reduced costs.

IDRAFLOT®

An innovative and effective water mixing device

Consistent water mixing that is not achievable with traditional DAF systems.

IDRAFLOT® is not only a compact unit, but also offers many additional advantages.

IDRAFLOT® units allow for enhanced thickening and clarification performance. This creates an increased removal of insoluble COD, suspended solids, and FOG (fats, oils, and grease).

IDRAFLOT® flotation units are protected by three patents. They are intended to assure a perfect mixing of the waste with saturated water and a uniform distribution of the water flow along the entire surface of the unit.

IDRAFLOT® flotation units have mixing volumes intended to optimize the process and the unit's total capacity.

IDRAFLOT® Optimization Benefits Include:

- reduce chemical additive dosing
- reduce the saturated water flow rate (up to 50% less compared to the conventional models)
- avoid hydraulic short circuits
- reduce the unit's operational costs

Technical Data

Units	Modules	Treatment capacity		Dimensions LxDxH (mm)	Dimensions LxDxH (inch)
		(m^3/h)	(gpm)		
IFS 7	-	5-10	22-44	4600 x 1910 x 2260	181 x75 x 89
IFS 15	-	6-25	26-110	5200 x 2040 x 2300	205 x 80 x 91
IFS 40	2	28-80	123-352	7170 x 2640 x 3260	282 x 104 x 128
IFS 60	3	42-120	185-528	8170 x 2640 x 3260	322 x 104 x 128
IFS 80	4	56-160	246-704	9240 x 2640 x 3260	364 x 104 x 128
IFS 100	5	70-200	308-880	10.170 x 2750 x 3260	400 x 108 x 128
IFS 120	6	80-240	352-1057	11.170 x 2750 x 3260	440 x 108 x 128
IFS 140	7	100-280	440-1233	12.220 x 2750 x 3260	481 x 108 x 128
IFS 180	9	126-360	555-1585	14.290 x 2830 x 3260	563 x 111 x 128
IFS 200	10	140-400	616-1761	15.290 x 2830 x 3260	602 x 111 x 128
IFS 240	12	168-480	740-2113	17.290 x 2830 x 3260	681 x 111 x 128

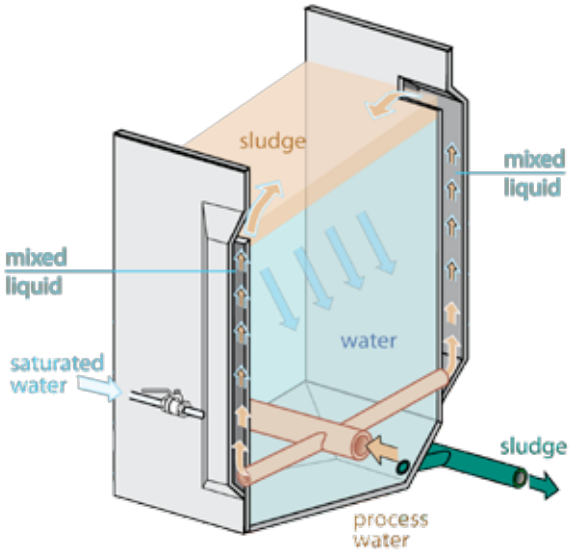
A Unique Modular Design

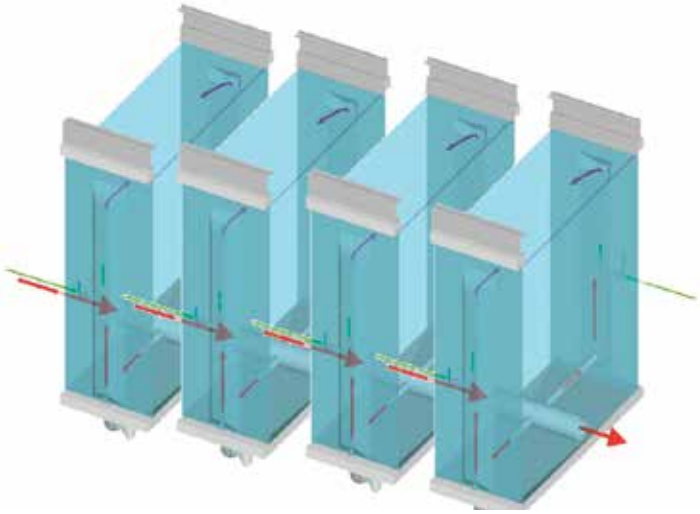
The compact and modular structure creates ease and flexibility when transporting, expanding, and maintaining.

Advanced engineering has made it possible to create a powerful and flexible DAF solution.

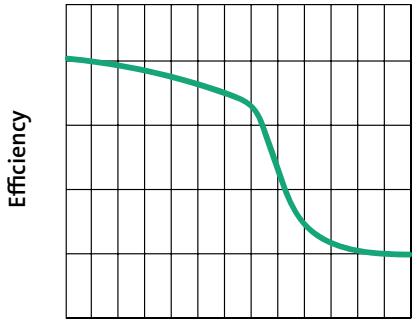
The unit's tank is designed to with a series of modules. This allows for an even distribution of air throughout the unit, when compared to other DAFs that utilize a single tank and distribute the air from a single location. The opportunity to replicate the same module along the whole structure of the unit gives benefits also in terms of consistency and reliability of the treatment process.

A tank designed by modules allowes the distribution of the air not just from one point, as in the traditional systems, but along the whole surface of the unit and from both sides, at different heights based on the specific treatment needs. Each module acts as a double flotation unit.

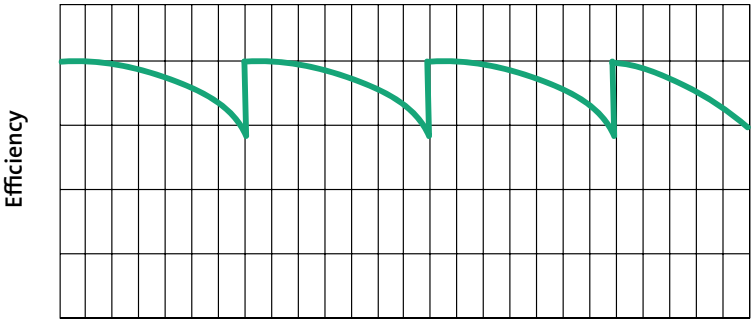




One feeding system



Multiple feeding system



IDRAFLOT®

Industries

IDRAFLOT® is an excellent solution where water clarification and solid separation are required.

- Food & Beverage
- Healthcare (Pharma & Cosmetics)
- Municipal
- Pulp & Paper
- Mining
- Waste disposal centers

Water Impact Index

IDRAFLOT® is a water treatment technological solution designed to face the new sustainability challenges in terms of water management. Learn more on **www.idraflot.com**

Applications

Effective for biological treatment and thickening of activated sludge from biological plants.

- Wastewater Treatment Process Pre-treatment
- Wastewater Treatment Process Tertiary Treatment (P removal)
- Wastewater Treatment Process Sludge Thickening
- MBBR Post Treatment Sludge Separation
- Rain water, floor cleaning
- Pure Water and Wastewater
- Filter Back Wash treatment

Materials

The corrosion resistance is one of the IDRAFLOT® basic characteristics.

That's why all IDRAFLOT® flotation units use AISI 304, 316 and Superduplex (in case of seawater / high salinity applications).

Resourcing the world

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IDRAFLOT Product. February 2019.

IDRAFLOT® SPF

An innovative and effective water mixing device

Consistent water mixing that is not achievable with traditional DAF systems.

IDRAFLOT® is not only a compact unit, but also offers many additional advantages.

IDRAFLOT® SPF is the new generation of compact DAF units boosting water treatment by using a revolutionary patented system which combines nozzles to mixers for the production of whitewater.

This particular device allows to eliminate the traditional saturation tank and brings significant benefits in footprint and costs saving:

- Footprint reduced of 35-40%
- Flotation speed up to 25 m/h
- Fit for container, for an easier and less expensive transport
- Reduction of chemicals up to 20%
- No PED authorization needed

IDRAFLOT® flotation units have mixing volumes intended to optimize the process and the unit's total capacity.

IDRAFLOT® SPF dissolved air flotation units allow for a very effective removal of:

- TSS
- FOG (fats oils and grease)
- COD
- Phosphorus

IDRAFLOT® SPF is equipped with a water level adjustment for an automated different flow rates handling, and it allows also for an automated management of the inlet quality variations, with a specific optional device.

IDRAFLOT® SPF units can be remotely monitored 24/7 thanks to the AQUAVISTA Digital Services, the platform which allows for a smart water treatment.

Technical Data

	Units	SPF 60	SPF 90	SPF 120	SPF 180	SPF 270
Min -Max flowrate	m3/h	30 - 55	45-85	60 - 110	90 - 170	135 - 260
	US gpm	132 - 242	198 - 374	264 - 484	396 - 748	594 - 1145

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BIOSEP™ Pack

Membrane Bio-Reactor for Wastewater and Re-use

Biosep™ Pack is added to a biological aeration tank. The membrane bioreactor replaces the traditional settling system and separates perfectly the purifying biomass from the treated effluent through microfiltration. The microfiltered water is of excellent bacteriological quality and removal of TSS is guaranteed at any time.

Flow rates from **4 to 110 m³/h**

FEATURES & BENEFITS

Standardised systems; short lead times and quick start-up

- Skid-mounted, modular design; low footprint; easily integrated into existing plant, extensible
- Integrated filtration and membrane cleaning system
- Suitable for all types of effluent, easily integrated into a wide variety of biological designs; highly flexible
- Industrial outdoor installation

Compared to conventional activated sludge:

- Compact solution; less equipment and civil engineering, simplified treatment line
- No settler; no risk of sludge loss, sludge index has no impact on performance
- Long biomass retention time; high COD removal, including slowly biodegradable COD Compact solution; less equipment and civil engineering, simplified treatment line

APPLICATIONS

- Small or medium sized industrial or municipal effluent treatment plants (800 to 10,000 PE)
- Temporary solutions during refurbishment or upgrade work
- Re-use for recycling of water or irrigation
- High treated water quality required
- Compact solution for reuse purposes

HYDREX® CHEMICALS

Hydrex™ 4000 & 7000 water treatment chemicals from Veolia Water Technologies should be used for optimized plant operation.

RELATED 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 Performance

Model	Net Flow Rates (m^3/hr)	Membrane Tank					Antifoam skid	Backwash	Membrane Air		Power
		Number of Membrane Modules	Number of Membrane Tanks	Diameter (m)	Total Height (m)*	Net Tank Volume (m^3)	Antifoam Dosin g Pump (l/h) per tank	Dosatron or Backwash Pump Solution (m^3/h)** per tank	Air Blower Power (kW)	Air Blower Flow Rate (Nm^3/h)	Main Control Center Power (kW)
BSP 1 M 5	04 - 12	1	1	2.5	6 - 8	20	0.006 - 6	2	5.5	175	10
BSP 1 M 10	08 - 33	1	1	3	6 - 8	29	0.006 - 6	3 or 4	11	378	17
BSP 1 M 15	12 - 56	1	1	4	6 - 8	52	0.006 - 6	3 or 6	15	522	25
BSP 2 M 20	16 - 66	2	2	3	6 - 8	2x29	0.006 - 6	3 or 4	2x11	2x378	34
BSP 2 M 30	24 - 110	2	2	4	6 - 8	2x52	0.006 - 6	3 or 6	2x15	2x522	50

** Membrane tank height must be selected according to site constraints (aeration basin and discharges levels)*
*** 2 backwash solutions are available, to be chosen depending on potable water availability ($3m^3$/h at 1 bar minimum)*

Treated Water Quality

COD	< 50mg/l*
BOD_5	< 5 mg/l
Suspended Solids	< 3mg/l (threshold)
Total Nitrogen	< 10-15 mg/l
Total Phosphorous	< 0.5 - 2 mg/l
Turbidity	< 1 NTU
E.coli	< 1000/100ml

**COD depends on the non-biodegradable (hard COD) fraction*

Material Specifications

Membrane Tank	Fiber Reinforced Platsic (FRP)
Access Fittings (ladder, platform, guard rails)	Epoxy Coated or 304 L
Skid	PE
Piping	PE / PV C / PVC-C

Feed Water Requirements

Waste water

Environmental Conditions

Outdoor, temperature between 0 and 40° C, Electrical cabinet and other plastic cabinets should be sheltered from sun.

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VEOLIA

MBBR Pack

The modular plug & play wastewater treatment solution

WATER TECHNOLOGIES

MBBR Pack

A complete modular,

The sta es

Local authorities and industries have to deal quickly with rapid increases - or wide swings – in the volumes of wastewater to be treated and the carbon- and nitrogen-based pollutants to be eliminated. Whether they decide to install new sewage treatment plants or to upgrade existing units to meet the standards, a growing number of them are looking for comprehensive, flexible biological treatment options.

They want effective solutions that can be quickly delivered and whose “Plug and Play” installation and commissioning enable them to reduce their infrastructure and civil engineering costs while ensuring continuity of sanitation services for their communities or for industrial production.

In a context of economic pressure, these customers not only expect reliable, proven standardized solutions with a positive impact on production, installation and commissioning costs, but also a high level of service combining training, maintenance, technical support and operations.

To meet all these customers needs, Veolia Water Technologies has developed MBBR Pack, the ideal modular package solution for treating wastewater.

Flexible solution for:

> Industry (Food & Beverage, Pharmaceutical, Pulp & Paper, Mining)

> Compact industrial facilities

> Pilot unit

> Municipal housing development

> Resorts and hotels

> Temporary worker camps

> Remote locations

> Construction sites

> Rehabilitation areas

> Business parks

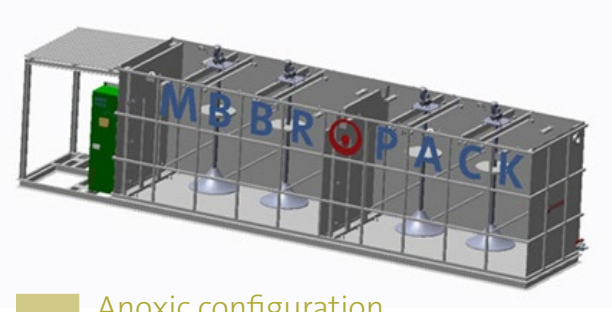
> Offshore installations

standardized wastewater solution

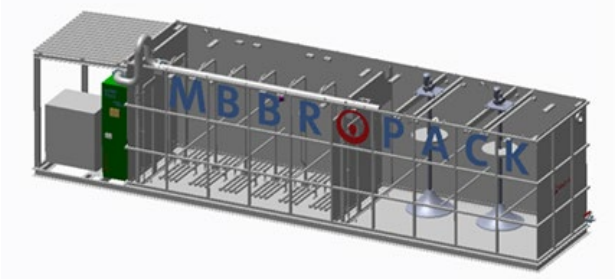
Th ee Packs to suit your needs

The MBBR Pack is available in several configurations, depending on the customer's treatment goals for carbon and/or nitrogen. AnoxKaldnes carriers are a vital component in MBBR Pack.

Aerobic configuration
AEAE



Anoxic configuration
ANAN



Anoxic - Aerobic configuration
ANAE

High Performances Solution

Municipal wastewater

	Flow rate m^3/d	Load PE	BOD kg/d	TN kg/d	Effluent SBOD mg/l	Effluent NH_4 mg/l	Effluent TN mg/l	Temperature °C
AEAE	1,200	3,300	200		< 15			15
AEAE	150	800	50	8	< 5	< 1		15
ANAE + AEAE	300	1,600	100	16	< 5	< 1	< 15	15

Industrial wastewater

Unit/Units	Flow rate m^3/d	COD kg/d	TN kg/d	Efficiency COD %**	Efficiency NH_4 %	Effluent TN %	Temperature °C
AEAE	1,200	400 (300*)		90-95			25
AEAE	150	50	15	95	90-95		25
ANAE + AEAE	100	100	30	95	90-95	80	25

** With fine bubble system.*
*** Soluble biodegradable COD.*

Multiple bundling possibilities

To deal with the problems and quality objectives that each municipal and industrial customer has and to provide them with comprehensive solutions, the MBBR Pack can be combined with many Veolia Water Technologies processes in pre-treatment or in post-treatment.

RELATED SERVICES

- **Hydrex™ 6000** water treatment chemicals from Veolia Water Technologies should be used for optimized plant operation.
- **Local after-sales service and support teams** offer preventative and corrective maintenance programs to ensure the long-term, efficient operation of installed plant.

Pre-treatment	Biological treatment	Post-treatment
IDRASCREEN™ Screen Filter		IDRAFLOT™ DAF
IDRAFLOT™ DAF		ACTIFLO® Clarification
SPIDFLOW® Rapid DAF		HYDROTECH™ DISCFILTER Disc Filtration
		SPIDFLOW® Rapid DAF

MBBR Pack
AnoxKaldnes™ Technology

Technical data

Item	Info
Tank material	Epoxy coated carbon steel or stainless steel AISI304
Piping material	Stainless steel AISI304
Net volume	46 m^3
Media	K5 (45% of the net volume)
Dimensions for transport	11.7 m (L) x 2.4 m (W) x 3 m (H)
Empty weight	9,000 kg
Dimensions in operation	11.85 m(L) x 2.6 m (W) x 3.6 m (H)
Weight in operation	60,000 kg
Water depth	2.3 m
Automation 24/7/365	PLC Siemens/HMI proface
Noise	< 70 [dB (A)]
Marking and standards	CE

Scope of supply

Included in the scope
Tank
Blower
Sieves
Piping
Manual valves
Diffusers
Media
Automation panel
Sensor levels
Oxygen and temperature sensor

standardized wastewater solution

MBBR Pack Solution, all of AnoxKaldnes' experience in a Plug & Play solution

By integrating the Moving Bed Biofilm Reactor, biological treatment technology developed and mastered by Veolia subsidiary AnoxKaldnes over 25 years ago, the MBBR Pack meets the market needs with a packaged solution based on their recognized, proven expertise.

The MBBR Pack provides all the advantages of a conventional MBBR system, in a standard prefabricated package with a Plug & Play function that is easy to install. It is an ideal response for customers who want to be equipped as quickly as possible. By combining the modules with each other, you get a packaged solution that can cover most flows and pollution loads.

High treatment capacity in a very small footprint

MBBR Pack - AnoxKaldnes™ technology is based on the biofilm principle, which uses microorganisms for biological treatment of wastewater.

The microorganisms grow on the surfaces of plastic carriers in the treatment reactor. As the carriers move through wastewater in the reactor, microorganisms utilize contaminants present in the effluent for their biological activity. The proprietary design of the carriers ensures that a high protected surface area is provided for the development of biofilm, enabling high treatment capacity in a very small footprint.

The flexibility of AnoxKaldnes patented technology allows the design of very compact and efficient MBBR solutions for new installations as well as optimal upgrades of existing biological processes.

KEY BENEFITS

Customized biological solution in a standardized package

> **Quick delivery** and easy installation

> **Limited engineering costs**

> Small footprint

> **Limited on-site infrastructure needed**

> Easy transportation

> Robust biological system resistant to:
- Toxic shocks
- Fluctuating flows
- Varying loads

> Automatic operation – userfriendly Human Machine Interface

> **Built-in easy of expansion:**
- Modular units
- Easy carrier addition

> AnoxKaldnes laboratory expertise support

> 25 years of experience and more than 1,000 MBBR references worldwide

Resourcing the world

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ANITA™ Mox

AnoxKaldnes™ MBBR and IFAS

VEOLIA

Solution for High Strength
Ammonia Streams
Anammox Process

WATER TECHNOLOGIES

The Principle of the ANITA™ Mox Process - MBBR

ANITA™ Mox is a single-stage nitrogen removal process based on the MBBR (Moving Bed Biofilm Reactor) technology. The ANITA Mox process is used for treatment of streams highly loaded in ammonia, such as effluents from anaerobic sludge digestion, drying condensates, industrial wastewaters, and landfill leachates.

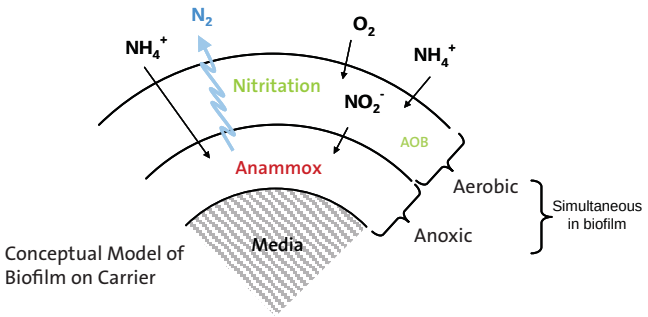
The ANITA Mox process combines aerobic nitritation and anoxic ammonia oxidation (anammox).

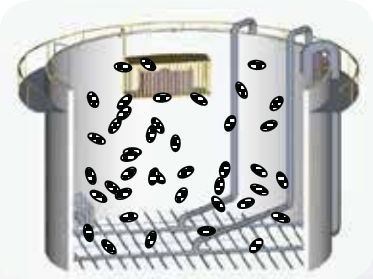
The two steps take place simultaneously in different layers of a biofilm. Nitritation (aerobic) occurs in the outer layer of the biofilm. A portion (55%) of the influent ammonia is oxidized to Nitrite (NO_2-). Anammox (anoxic) activity occurs in the inner layer. In this step, the nitrite produced and the remaining ammonia are utilized by the anammox bacteria and converted to nitrogen gas (N_2) and a small amount of Nitrate (NO_3-).

The aerobic and anoxic reactions occur in a single MBBR reactor equipped with specially designed plastic carriers that support the biofilm, thereby preventing washout of the bacteria from the reactor.

The ANITA Mox process, using a single-stage MBBR with a proven aeration control strategy, achieves ammonia removal up to 90% and total nitrogen removal in the range of 75 to 85% without external carbon addition and with lower energy cost compared to conventional nitrification-denitrification.

Process conditions in the reactor are monitored and maintained to provide the optimal environment for the combination of bacteria.





The ANITA Mox effluent screens provide a positive barrier to loss of anammox bacteria, since they keep the media and biofilm in the reactor.

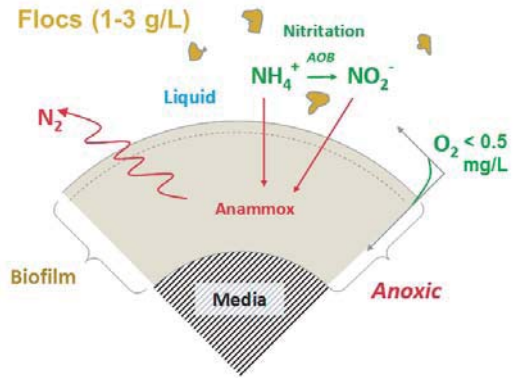
Operating Parameters, Ammonia Removal in Digester Dewatering Stream

Parameter	Conventional Nitrogen Removal	ANITA™ Mox
Oxygen Requirement (lb O_2/lb N)	4.6	1.9
MethanolConsumption (lb /lb N)	3.0	0
Sludge Production (lb VSS /lb N)	0.5 - 1.0	0.1

The IFAS Advantage

IFAS (Integrated Fixed Film Activated Sludge) technology using suspended carriers has been a proven application of the MBBR process for more than 20 years. Applying the same concept to ANITA Mox has shown some significant benefits.

As with any IFAS system, the suspended growth is retained using a clarifier. In IFAS ANITA Mox, the return of biomass to the system shifts much of the nitritation step from the biofilm to the suspended phase, where the conversion of ammonia to nitrite takes place more rapidly. IFAS ANITA Mox can achieve higher volumetric removal rates than any other anammox process, thereby reducing the size of the biological reactor. This results in a tremendous advantage in equipment sizing, reactor footprint, and overall value. Still, the choice between MBBR and IFAS ANITA Mox is site-specific. With IFAS ANITA Mox, our expert team now has two highly efficient ANITA Mox processes to offer in a complete solution.



IFAS Benefits Include:

- Volumetric Nitrogen removal rates have shown to be 2-3 times higher, thereby further reducing the footprint
- The operational DO in IFAS ANITA Mox is lower than in MBBR ANITA Mox which results in energy savings
- IFAS ANITA Mox has been shown to better handle the presence of influent COD and higher polymer doses

A Key Element of the ANITA™ Mox Process: The Carriers

A key element of the MBBR/IFAS technology is the AnoxKaldnes™ carriers, also called media. The very slow growth rate of the anammox bacteria makes their retention a critical objective of the process. Compared with other technologies, the ANITA Mox effluent screens provide a positive barrier to loss of anammox bacteria, since they keep the media and biofilm in the reactor. The media is also designed to provide a large protected surface area for the biofilm and optimal conditions for biological activity.

- Robust
- Compact
- 60% less oxygen requirement
- No external carbon needed
- Reduced sludge production

Highest volumetric loading (up to 3.0 kgN/m³/d)

Energy consumption as low as 1.1 kWh/kgN-rem

Robust, continuous process minimizes operator attention and equipment wear and tear

Resourcing the world

IDRASCREEN®

Idrascreen®

Compact fine screening units

by VEOLIA
Water Technologies

The real self-cleaning screen

IDRASCREEN® represents the range of high capacity self-cleaning screen filters for wastewater pre-treatment and solids separation.

Separating solids from process and drainage water has always been a serious problem in many industrial sectors.

This problem has been faced by using various types of machinery and the results have been partially satisfactory at times and extremely disappointing at others: cylindrical separators cleaned by mechanical or spray system, vibrating sieves, static screen and various other devices have proved not to be able to solve the problem of solids separation.

IDRASCREEN® from 1973 has been introduced in a lot of applications, proving to be **the real self-cleaning screen**, capable of working for long periods with no assistance and little or no maintenance.

For more information visit our website
www.idraflot.com/idrascreen

IDRASCREEN®

High capacity compact screening units for wastewater pre-treatment and solids separation

The battle against the climate changes is a priority for everyone. Veolia Water Technologies Italia has a real commitment to reduce CO_2 emissions: we are working to make sure that our technological offering is ever more enviromentally sustainable.

CO_2 footprint

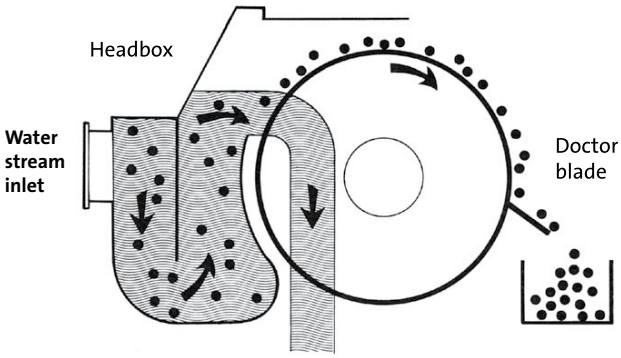
IDRASCREEN®

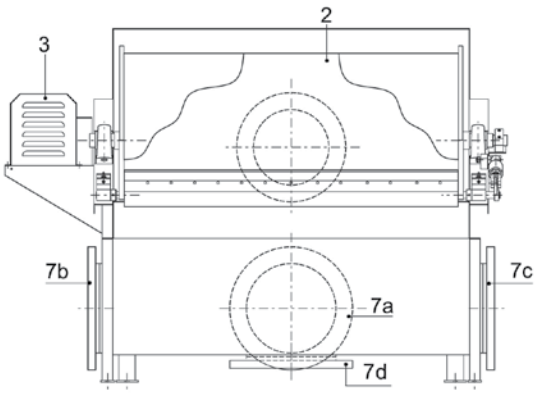
Compact fine screening units

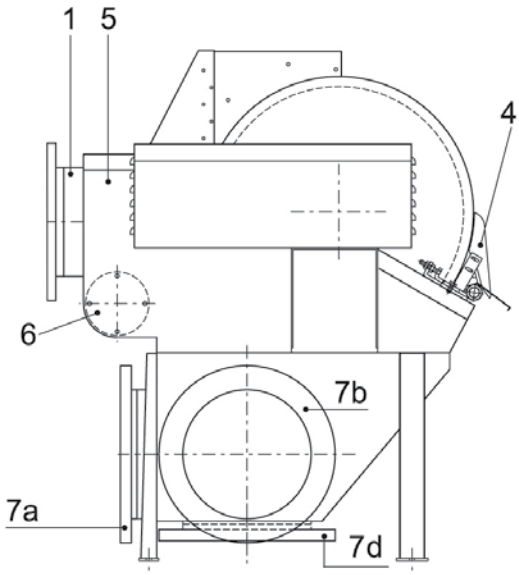
How it works

The inlet water to be screened flows into the headbox which is specially designed to slow down the flow and to distribute it correctly. The inlet overflows a sealed weir into the rotating cylindrical screen. The solids are retained on the outside screen surface and removed by the doctor blade.
The screened effluent passes again through the cylinder and carries on an efficacious backwashing of the screen openings. Thanks to this process, the portion of the cylinder screen is always perfectly clean. Moreover, the backwash avoids any mucilage formations inside the cylindrical screen.
IDRASCREEN® is properly equipped with an inner washing system with low/medium pressure to do the periodical cleaning which allows to avoid clogging phenomena and to reduce the cleaning maintenance and its relevant costs.

IDRASCREEN® also equipped with an overflow system to face unexpected inlet flowrate peaks.







Views

1. Water stream inlet
2. Screen cylinder
3. Drive unit
4. Doctor blade
5. Headbox
6. Bottom emptying

7a. Effluent outlet (standard position)
7b. Effluent outlet (position on request)
7c. Effluent outlet (position on request)
7d. Effluent outlet (position on request)

IDRASCREEN®

Compact fine screening units

Advantages

- Water and/or solids recovery
- Low initial investment and low installation costs
- Low operating costs
- High capacity with very reduced dimensions (from 1/3 to 1/5 of the other screen filters' footprint)
- Long life with little or no maintenance
- Corrosion resistant AISI 304/L or AISI 316/L stainless steel
- Low power consumption
- Reduction of clogging phenomena
- Efficient dry product separation

Applications

Industrial

- Meat and seafood processing
- Fruit and vegetables processing
- Sugar mills
- Animal livestock
- Brewing
- Wine production
- Pharmaceutical industry
- Pulp & paper
- Chemical industry
- Tanneries
- Sludge dewatering
- Textile
- Plastics industry
- Dairy

Municipal

- Fine screening
- Primary clarifiers pre-treatment
- Storm water overflow
- Ocean outfall systems
- Sludge screening

IDRASCREEN®

Compact fine screening units

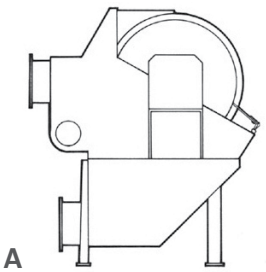
Components

IDRASCREEN® **lateral view (A)**.

Frame, distribution and collecting base are made entirely of AISI 304/L or AISI 316/L stainless steel and sized to guarantee sturdiness and long life. To provide greater flexibility the chassis is divided into three parts: the headbox, the screen section (which can work as an indipendent unit) and the bottom collecting portion.
The unit can be supplied without the collecting base to be fitted directly on canals or pumping stations.
In case the discharged water needs to be piped, the use of a storage tank is advisable.

Optionals & Accessories

- Sliding blade system
- Outlet/inlet flange for canal fitting
- Odour control cover
- Frontal protection mesh
- Level control switch
- Electrovalve on washing system line
- Engine placement on the right
- Solenoid valve for washing
- Outlet flange position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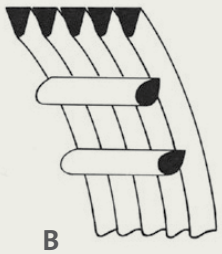
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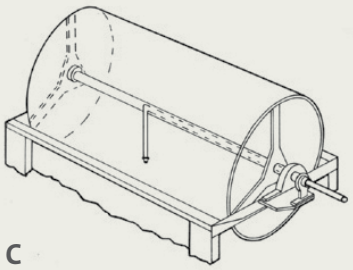
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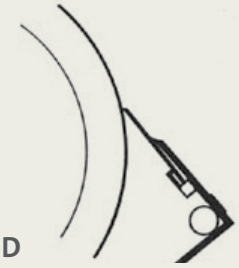
D

The cylinder (B), made entirely of AISI 304/L or 316/L stainless steel, is the heart of the machine and the result of a cutting edge construction technology. Wedge-shaped wire is wrapped around a supporting structure to form a helical coli, leaving free spaces from 0,25 to 2,5 mm (0.01 to 0.1 in) according to the client's requirements.
The wire has a trapezoid shape which has been designed to obtain high specific flow values with a minimum loss of head allowing, at the same time, the self cleaning process of the unit (Venturi effect).

The inner washing system (C) is fed by industrial water at low/medium pressure. It is composed by nozzles and the cleaning is only made periodically not continuously.

The doctor blade (D) has the function to remove the solids trapped on the surface of the screen. It's made of special corrosion-proof material, considerably softer than the material of the cylinder.

Motorization: the standard execution includes fitting of a geared motor.

IDRASCREEN®

Compact fine screening units

Sliding Blade System

The Sliding Blade System is a special equipment of the IDRASCREEN®, outcome of continuous research to solve those difficult cases where the effluents contain a high amount of fibres. These fine particles can become wedged under the doctor blade. The solution to this problem is the sliding blade device.
The continuous and alternative movement of the blade prevents the wedging of the material under its edge. The blade, going up, runs to meet the accumulated screened material. During its descent, it leaves the build up on the cylinder and, crawling on it, it cleans itself.

Materials

Austenitic stainless steel AISI 304/L and 316/L

Austenitic weakly bound structure, non-hardening, non-magnetic.
The low percentage of carbon in this alloy reduces the risk of intergranular corrosion.

Flowrates range *from 10 to 1,900 m3/h (from 44 to 8,365 gpm)*

FLOWRATE	SERIES	DRUM Ø mm. *(in)*	LENGTH mm. *(in)*
LOW	31	310 *(12)*	300-900 *(12 – 35)*
MEDIUM	62	630 *(25)*	300-2,000 *(12 – 79)*
HIGH	90	920 *(36)*	3,000 *(118)*

Resourcing the world

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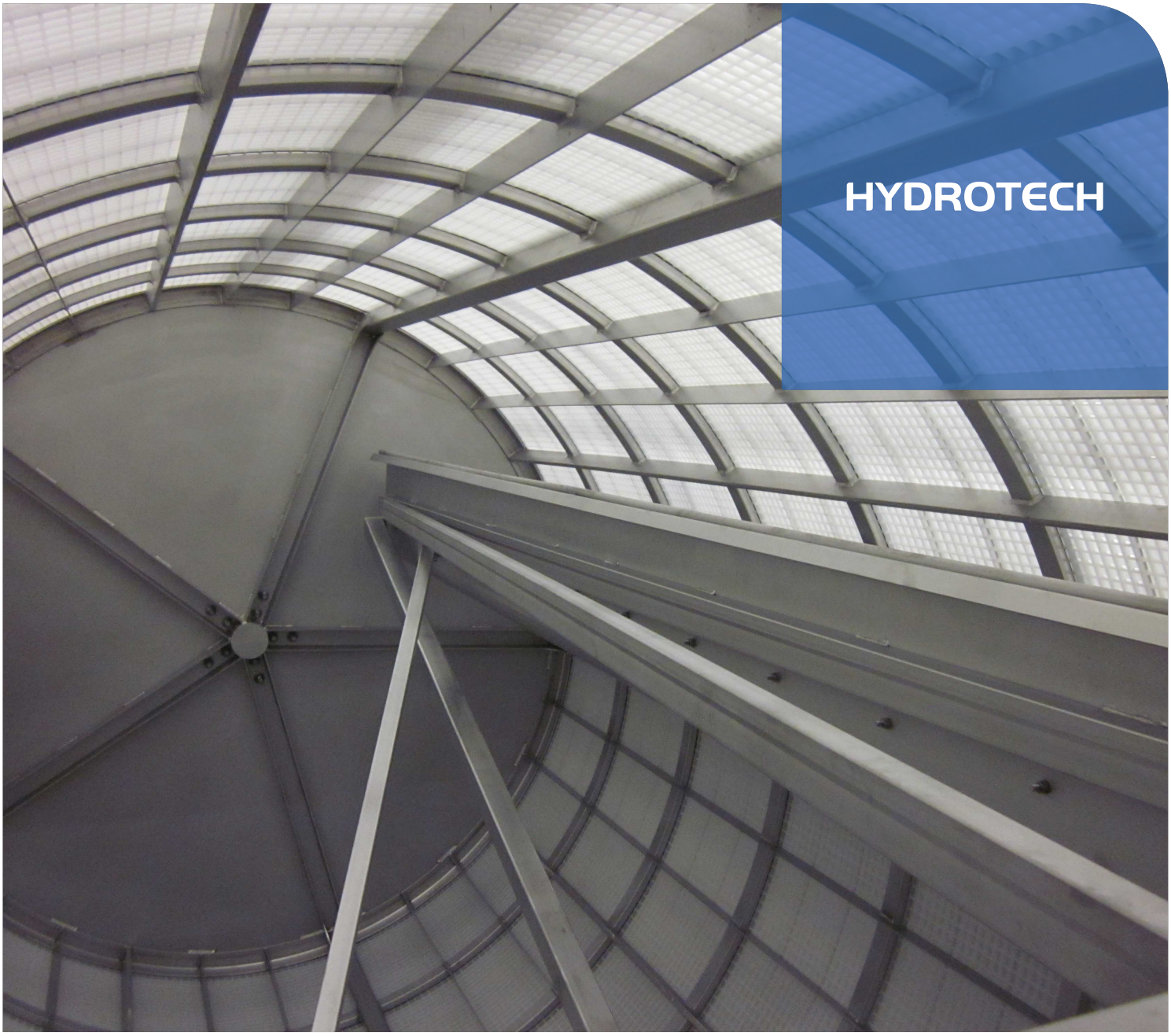
IDRASCREEN Product. February 2019.



HYDROTECH

Hydrotech™ Drumfilters

Market leading microscreen filters

by VEOLIA
Water Technologies

Hydrotech™ Drumfilters

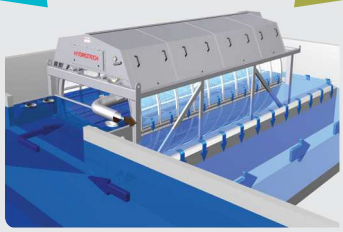
Hydrotech Drumfilters are specially designed for suspended solids removal. The mechanical, self-cleaning filters uses a combination of high quality materials and patented processes, resulting in a product that no other filter on the market can match. Hydrotech Drumfilters are high quality products with over 7000 units sold.

High Quality

- Robust stainless steel construction
- Filter panel life time >10 years
- Extensive quality assurance
- Small footprint
- Patented filter panels

Proven Performance

- Suspended solids removal up to 98%
- Continuous filtration during backwash - no external water source required for backwash



Minimum Maintenance

- Simple wear parts replacement without filter drainage
- Filter panel change while unit is in operation
- All maintenance parts including lubrication points are accessible from walkway
- Only one pump and one drive engine per filter

Best Economic Value

- Self-cleaning backwash nozzles
- Strong woven polyester cloth
- Quick return on investment due to low installation, operation and maintenance costs

Wide range of applications

Hydrotech Drumfilters are ideal in systems where it is essential to prevent particles from fragmenting. The unique design of the filter panels ensures a careful handling of solids, which is essential in achieving the high filtration efficiency required in many applications. By removing fine particles before they are disolved, the filter reduces the risk of harmful bi-products contaminating the water.

Swimming pools

Aquaculture, recirculated systems and open systems for intake and outlet water

Primary treatment

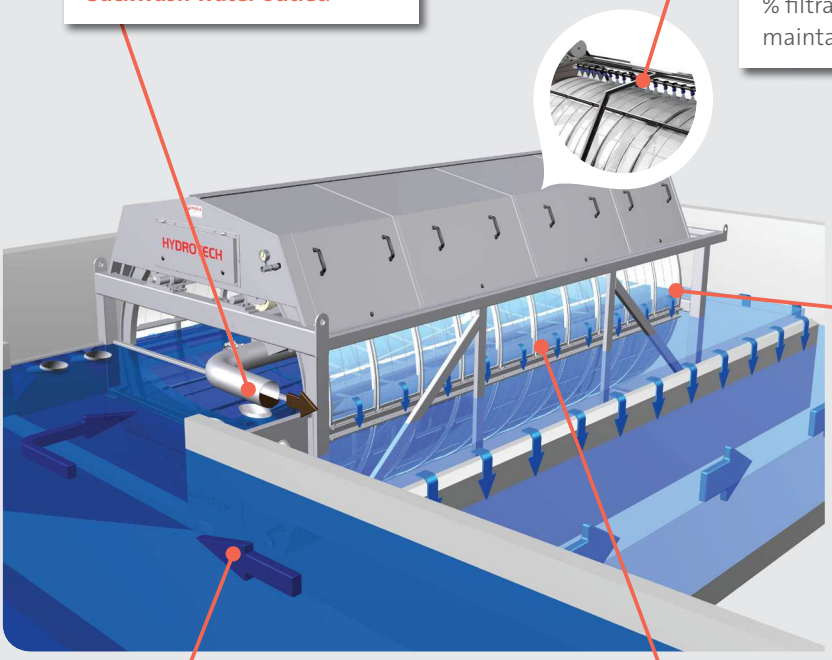
Aquarium life support systems and zoo applications

Clarification and polishing of heavy and light industril wastewater.

Filtering intake water from streams/lakes for municipal or industrial water supply systems

The highest level of filtration efficiency

How it works



5 The solids are collected in the sludge tray and are transported out by gravity through the **sludge/ backwash water outlet**.

4 Using filtered water, the **backwash nozzles** washes the solids off the filter media while the drum rotates. 100 % filtration capacity is continuously maintained, even during backwash.

3 As solids accumulate, the water level rises, triggering a **level sensor** that automatically initiates backwashing.

2 Passing through the **filter media** particles are carefully separated from the water due to the special patented cell structure of the filter panels.

1 **Influent** flows by gravity into the center of the drum.

Minimum maintenance

The superior design of the Hydrotech Drumfilter allows for minimum and simple maintenance. The filter panel's patented design facilitates replacement without the need for specialized service or system downtime. No tools are required for inspection or replacement of the nozzles and there's no need to drain the tank prior to inspection and maintenance.

No special tools required

Superior design allows for individual filter panel replacement.

Simple and efficient

Simple filter panel repair for minor wear.

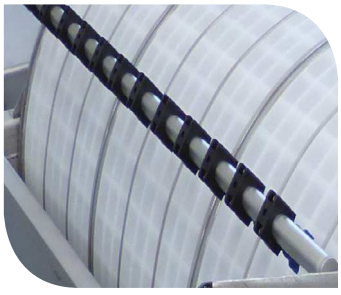
Photo: Krüger Kaldnes

Easy access

All maintenance parts can be replaced with easy access from the walkway.

User friendly

Regular maintenance can safely be performed during operation due to the partially submerged drumfilter.



Optional self-cleaning

For minimum maintenance.

Main product series

HDF800

Filter area
0,9-2,7 m²

Maximun hydraulic capacity

Tank unit	Frame unit
40 l/s	150 l/s

HDF1200

Filter area
1,35-5,4 m²

Maximun hydraulic capacity

Tank unit	Frame unit
70 l/s	350 l/s

HDF1600

Filter area
1,8-18 m²

Maximun hydraulic capacity

Tank unit	Frame unit
190 l/s	1000 l/s

HDF2000

Filter area
11,3-22,5 m²

Maximun hydraulic capacity

Tank unit	Frame unit
540 l/s	1800 l/s

3 configurations

1 Drumfilter with tank

1A Drumfilter with half tank

2 Drumfilter without tank

Superior design and adaptability

Hydrotech's patented filter panels improve the hydraulic capacity and offers better lifting properties. The drum is constructed in sections, each with up to 5 filter panels depending on diameter. This makes it easy to design a solution according to your specific requirements.

The patented Alfaflex™ filter panel is a breakthrough in filter panel design, increasing the capacity of existing drum filters with up to 20%. The secret lies in the angled horizontal walls that offers a number of benefits.

The Alfaflex filter panel is compatible with all Hydrotech Drumfilters and drum filters that are able to fit Hydrotech filter panels. All filter panels are equipped with the filter cloth mesh (available in 10-100 µm) required for your needs.

Enables control over how much water the filter panel should lift into the sludge tray.

Saves up to 95% of the water in the sludge tray compared to traditional filter panels.

Picks up undissolved particles that might be left inside the drum filter.

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VEOLIA

Hydrotech™ Discfilters

Market leading microscreen filters

WATER TECHNOLOGIES

Hydrotech™ Discfilters

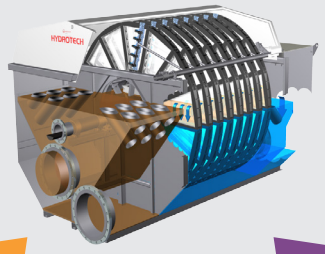
Hydrotech Discfilters are specially designed for suspended solids removal. The mechanical, self-cleaning filters uses a combination of high quality materials and patended processes, resulting in a product that no other filter on the market can match. Hydrotech Discfilters are high quality products with proven performance, minimum maintenance and the best economic value.

High Quality

- Robust stainless steel construction
- Filter panel life time 10-15 years
- Extensive quality assurance
- Small footprint

Proven Performance

- Suspended solids removal capacity with up to 98%
- Filtration continues during the backwash cycle which uses its own filtered water
- Title 22 approved



Minimum Maintenance

- Simple and quick parts replacing procedures
- Filter panel change while unit is in full operation
- All components including filter media accessible from walkway

Best Economic Value

- Self-cleaning backwash nozzles
- A patended moving spray bar lowers the backwash water consumption
- Quick return on investment due to low installation and operational costs and minimum maintenance

Main product series

HSF 2600

Hydrotech takes the lead with the most cost effetive filter that in only 15 m^2 offers you up to 228 m^2 of filtration area.

The HSF2600 with low investment cost and an extreme small foot print, minimizes the construction works and operate automatically with water and energy savings incorporated.

Discs
12-30

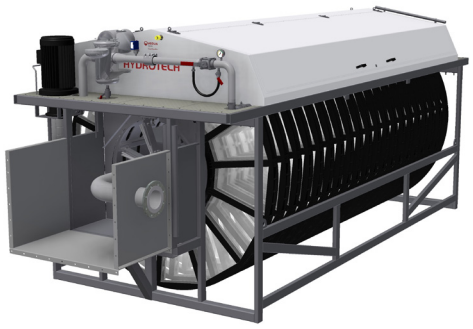
Filtration area (m^2)
91,2-228

Maximum* hydraulic capacity (m^3/h)
3420

HSF 2200 & HSF2200 compact series

The Hydrotech 2200-series plastic disc design brings considerably lower weight and 50% more filter area per footprint compared to the Hydrotech stainless steel Discfilters. In 14 m^2 the HSF 2200 offers you up to 134 m^2 filtration area.

Hydrotech's patented moving backwash spray header fold out feature are also used in the 2200 series as in Hydrotech stainless steel Discfilters.



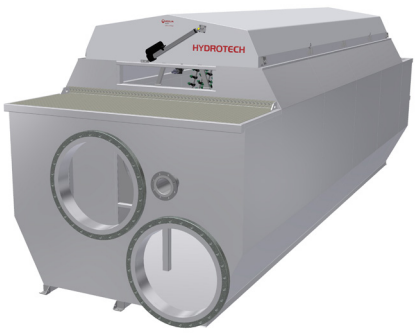
Discs
1-24 (1-12)

Filtration area (m^2)
5,6-134,4 (11,2-33,6)

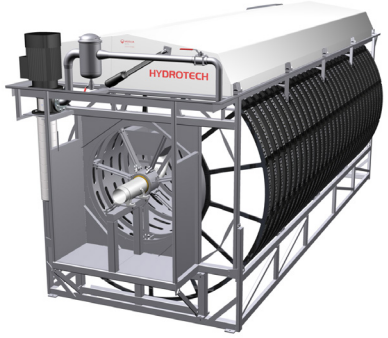
Maximum* hydraulic capacity (m^3/h)
1620 (324-720)

* Maximum hydraulic capacity is based on individual sizing.

1F Discfilter with tank



2F Discfilter without tank

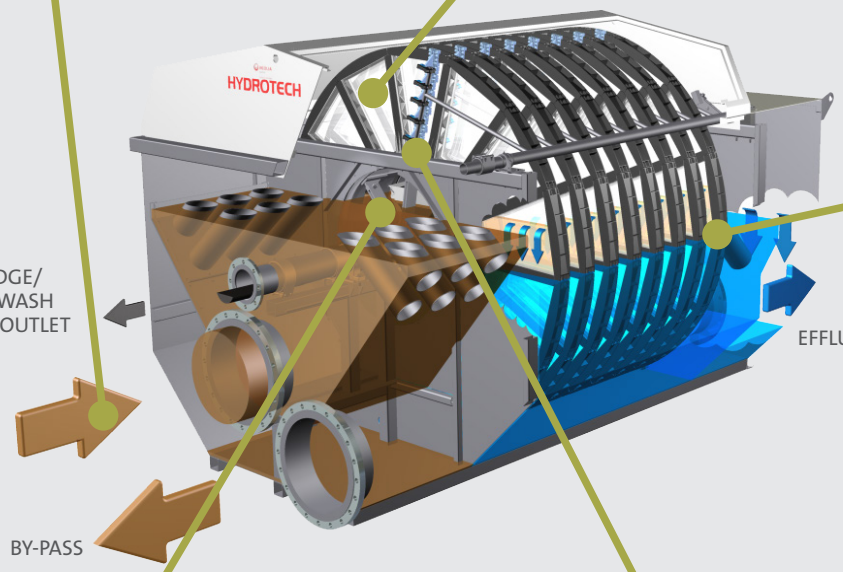


Two configurations

The filters are available in two configurations, with tank for pipe connections and without tank for concrete channels.

The highest level of filtration efficiency

How it works



1 **Influent** flows by gravity into the center drum.

2 Passing through the **filter media** mounted on both sides of the discs, solids are collected on the inside of the media.

3 As solids accumulate, the water level rises, triggering a **level sensor** that automatically initiates backwashing.

4 Using filtered water, the self-cleaning **backwash nozzles** washes the solids off the filter media while the discs rotate. 100 % filtration capacity is continuously maintained, even during backwash.

5 The solids are collected in the **sludge trough** and are transported out by gravity.

Minimum maintenance

The superior design of the Hydrotech Discfilter minimizes the need for maintenance and the maintenance that is needed is easy to perform. The filter panel's patented design facilitates replacement without the need for specialized service or system downtime. No tools are required for inspection or replacement of the nozzles and there's no need to drain the tank prior to inspection and maintenance.

No special tools needed

Only one fastener (two for older models) have to be removed to release each filter panel.

Simple and efficient

The spray headers fold out to facilitate maintenance of the self-cleaning spray nozzles, which can be replaced without any tools.

Easy access

The backwash spray header is retractable for easy access.

User friendly

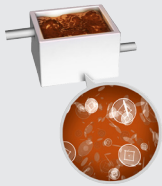
One lid facilitates easy access with both electronic and manual opening choices.

Wide range of applications

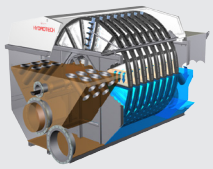
Thanks to innovations and high skilled engineering, Hydrotech filters are the global leader in microscreen filters. The discfilters are used in various applications within both the municipal and industrial markets.

"Hydrotech filters are the most used microscreen filters in the world, with more than 9300 units in over 50 countries and 6 continents"

Bundling for better results



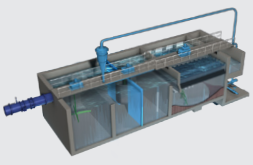
AnoxKaldnes™ HYBAS



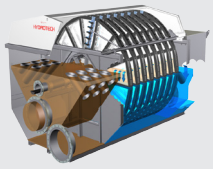
Hydrotech™ Discfilter

Marquette-Lez-Lille WWTP, France

The combination of Hybas with discfilters provides a low Capex and Opex. Upstream Veolia has utilised the Hybas treatment to get a compact biological treatment, a requirement for the rebuild. Following the Hybas are the 8 large discfilters that filter out the remaining SS and Phosporus.



Actiflo©

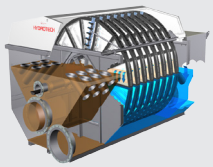


Hydrotech™ Discfilter

Baix Llobregat WWTP, Barcelona, Spain

The combination of Actiflo with discfilters provides a robust and compact plant able to deal with very heavy hydraulic loads and substances. This combination ensures a 80%-reduction of the area required compared to other solutions of similar capacity and load.

SBR



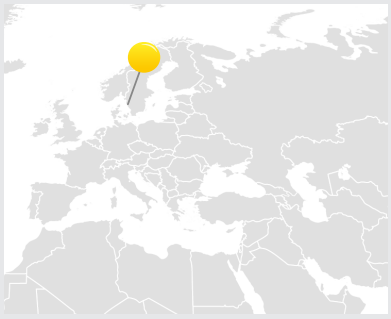
Hydrotech™ Discfilter

South Caboolture WWTP, Australia

Combining the existing SBR reactors with tertiary treatment in form of MBBR reactors for nitrate removal and discfilters for suspended solids removal, allowed the continuous production of a wastewater that can easily be further purified to produce Class A+ recycling water.

RYA WWTP

The world's largest Hydrotech Discfilter installation



The client

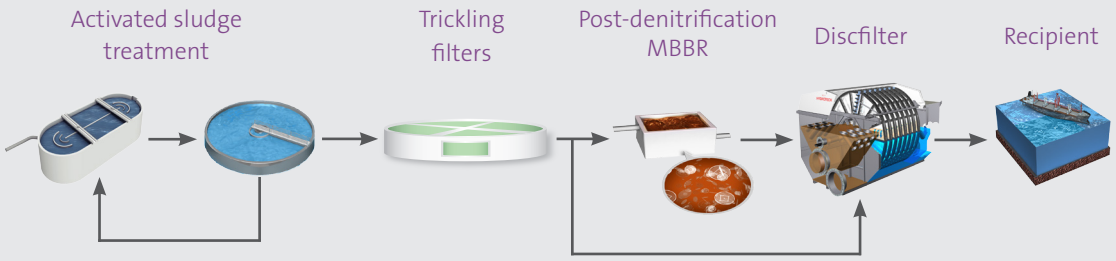
The RYA wastewater treatment plant run by GRYAAB AB is located in Gothenburg, Sweden. The plant serves about 650,000 PE, which makes it one of the largest treatment plants in Scandinavia.

Having to comply with stricter discharge limits but with very limited space, Gryaab selected Hydrotech Discfilters for biomass separation from the new post-denitrifying AnoxKaldnes™ MBBR and for effluent polishing following the existing activated sludge system.

The solution

After screening, grit removal and primary clarification water is treated in the activated sludge plant with possibilities for pre-denitrification and simultaneous precipitation.

Trickling filters are utilized for nitrification and the newly installed AnoxKaldnes™ MBBR for nitrogen removal in a postdenitrification process. Water is finally treated in the Hydrotech Discfilter plant before being released into the recipient.



Design data

Design flow:	8m³/s (900 m³/h per filter)
Pore opening:	15µm
Filter type:	HSF2220-2F
No of filters:	32

Discharge limits

BOD:	< 10 mg/L
TN:	< 10 mg/L
TP:	< 0.3 mg/L

Benefits

With careful process control and efficient tertiary filtration the new discharge limits with <0.3 mg/l in effluent total phosphorous can be achieved without post-precipitation. In practice this means that the effluent Suspended Solids concentration typically is maintained below 5 mg/l.

The Discfilters have been consistently meeting the effluent requirements since their start-up in 2010. During the first year of operation less than 1 ‰ of the filter panels were exchanged.

Resourcing the world

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VEOLIA

THE NEW STANDARD IN DISC FILTRATION

WATER TECHNOLOGIES

Welcome to the world of filtration

Quality has always been the focus at Swedish-based Hydrotech since the start in 1984. As a key technology provider within the woven media filtration for water applications, we have manufactured and delivered more than 11,000 filter units to improve water quality.
Our filters are used in different applications and market sectors. From municipal water treatment facilities, industrial production, fish farms and any other commercial or public facility that needs water. We make sure you get the water quality you need.
Our first invention was the Triangle filter in the mid-eighties. We introduced the Drum filter in the beginning of the 1990s. It is still sold and copied throughout the world. Our first Disc filter was produced in the mid 1990s.
All these products have revolutionized the woven filtration market.

Never compromise on quality

We focus on uncompromised quality in all stages, from design to manufacturing. Our goal is to deliver the best in water filtration.
We are now introducing a new performance filter equipped with the patented PAGUS™ technology – an innovative Particle Guidance System. This technology along with over 50 product improvements sets a new standard in disc filtration.

PAGUS™ Technology

The Hydrotech PAGUS™ Performance Filter series (HPF) is a patented solution for faster particle extraction. The particle guidance system boosts performance and offers a more compact solution.
The combination of increased filtration area per filter and PAGUS™ technology reduces the number of units required and offers a smaller physical footprint.
The Performance Filter series reduces costs and services times, making it a great choice compared to existing Disc filter solutions.

Premium is the new st
Disc filtration techno

Key advantages

- More than twice as much filtration area per filter unit
- Enhanced extraction of solid particles with PAGUS™ Technology
- Increased filtration capacity with PAGUS™ Technology

Drum

The new design allows manufacturing in special corrosion-resistant alloys such as Duplex and Super Duplex steel.

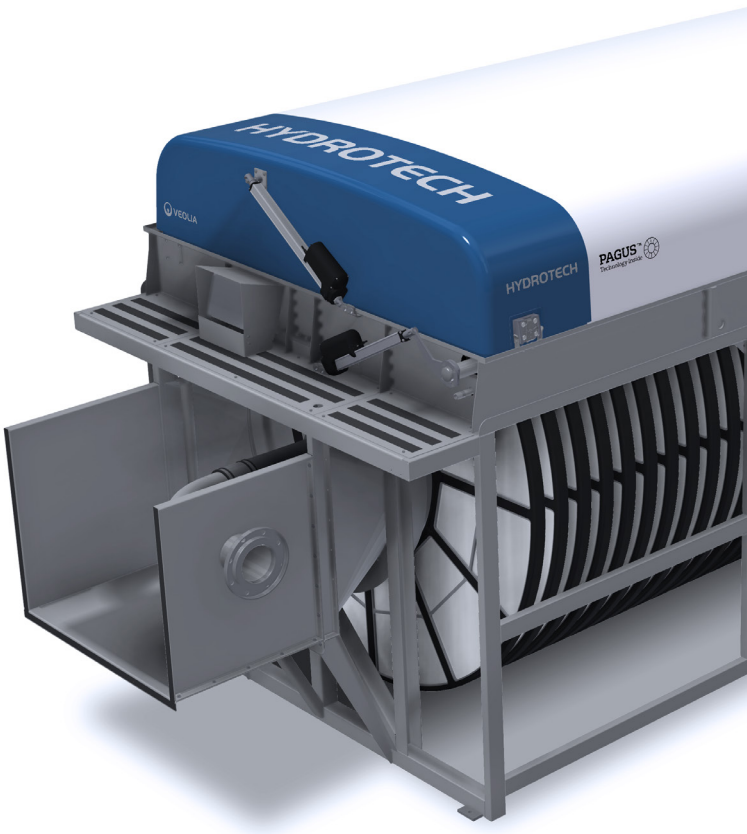
Disc

A total redesign of the disc offers you better results such as:

- Increased filtration area and smaller footprint per disc
- Parts per disc reduced by 75%, cutting down on maintenance time and cost
- Improved hydraulic design to minimize pressure loss.
- Optimized disc design with PAGUS™ Technology for guidance of backwashed particles
- Simplified process to replace filter panels for easier maintenance
- Enhanced water flow communication between disc segments, between drum and disc and between the disc and the solids trough

Hydraulic improvements

To minimize undesirable pressure-loss inside the filter unit, the tank/frame, drum and disc have been hydraulically optimized and redesigned.



PAGUS™
Particle Guidance system

- Optimized disc design for guidance of backwashed particles
- Improved communication between disc segments and drum
- Re-designed and optimized solids trough
- Improved backwash design

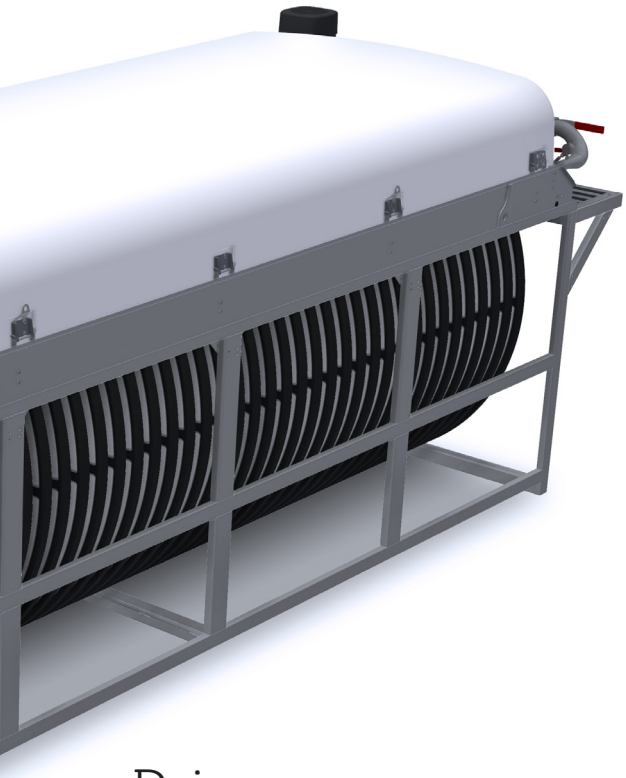
tandard in logy

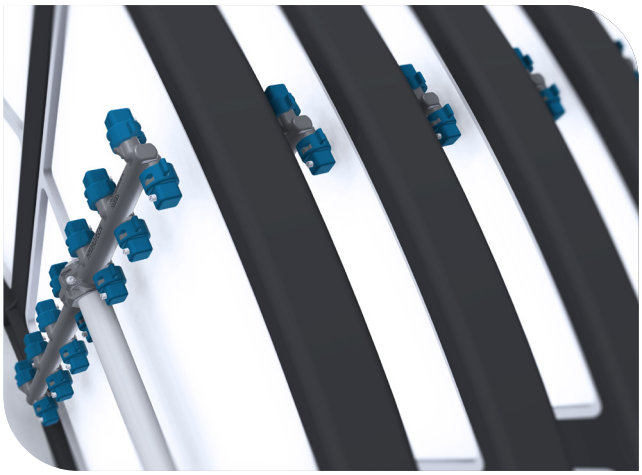
+50 improvements!

Contact your Hydrotech representative to find out more how these new innovations improve your performance.

Cover

The engineered hinge solution improves installation flexibility and enables the cover to be opened in both directions. This assures full maintenance access on both sides of the filter unit. The new cover is electrically opened and closed, has improved sound isolation, a modern visual design and can be operated manually during a power outage. The one-hood cover removes all possible leakage points. Covers for the HPF-model selection are made of non-corrosive GRP material.





Spray bar

The revolutionary redesign of the spray arm includes new benefits:

- Patent pending multiple nozzle holder in lightweight material
- Reduced total spray bar weight
- 50% reduction in the number of parts
- Minimal number of potential leakage points
- Geometrically failsafe design
- Electrically operated spray bar simplifies and minimizes risk during maintenance procedures.
- Manual operation is of course still possible to assure maintenance during a power outage
- Improved cleaning of woven filtration media

Drive

The remodeled drive system optimizes mechanical operating conditions and reduces chain force – increasing product life-time. The new, robust, lightweight plastic chain comes with a non-corrosive plastic chain drive, extending product lifetime.

Chemical spray bar

The new chemical spray bar is manufactured in a Duplex steel pipe to avoid pipe extension due to temperature variations. It provides increased spray coverage to assure the best possible cleaning of filter media.

Solids trough

The new solids trough part of PAGUS™ Technology is specially engineered for enhanced extraction of solids. It is self-supported, has a horizontal top edge and reduced weight. The main part is produced in non-corrosive GRP. Other parts can be made of special corrosion resistant alloys such as Duplex steel.

Other improvements

Level transmitters continuously measure level difference, improving performance in larger installations where several filter units are used.
A new backwash pressure transmitter is included in projects where the Hydrotech PFLC control cabinet is provided to further enhance filter unit performance.

Resourcing the world

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FILTROMAX™ Disc

Disc Filtration

FILTROMAX™ Disc filtration units are stand-alone, all polymeric automatic disc filtration systems. The filters are based on an innovative disc technology capable of removing contaminants such as suspended solids, fibres, grit, sand and algae. Its technology provides micron-precise depth filtration and long-term operation with minimal maintenance .

Flow rates
From 10 to
300 m³/hr

General Industry

Municipal WW

FEATURES & BENEFITS

- Combines surface filtration and depth filtration to ensure high contaminant removal rates;
- Compact, modular & highly scalable design;
- Systems covering high flows (up to 300 m³/h) and choices of filtration grades from 20 to 200 µm;
- Automatic backwashing of individual filters based on pressure differential or time;
- Backwash configurations: with water & air (AAF) or water only (IS);
- Reduced backwash water consumption & constant production flow rates. Air assisted backwashing for 2" AAF only;
- Corrosion resistant polypropylene construction;
- Standard connecting flanges exist in PN and ANSI;
- No consumables; low running costs, minimal

OPTIONS

- Filtromax Controller with associated solenoid valves & pressure switch
- 3x Alternative material configurations: classic (non corrosive), aggressive water and seawater.
- Inlet & Outlet isolation valves

Accessory

- Air Compressor for valves automation and backwash air (AAF only)

APPLICATIONS

- Side & full stream filtration (Cooling tower & Heat exchangers)
- Pre-filtration to softeners, ion exchangers or membrane systems (UF or RO)
- Prevention of corrosion and blockages within pipework, valves, distributors and other equipment
- Re-use & tertiary municipal wastewater
- Feed water for irrigation systems
- Rainwater harvesting post-filtration

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	Rate	Unit	3x2"	5x2"	8x2"	5x3"	8x3"	4x4"	7x4"
Max Feed Flowrate(1)	20 µm	m³/h	N/A	20	40	50	80	80	150
	40 µm		N/A	20	50	50	90	90	180
	55 µm		20	40	70	70	150	120	260
	100 µm		20	40	70	90	180	180	300
	200 µm		20	50	90	120	180	220	>300
Backwash Flowrate		m³/h	11	11	11	22	22	55	55
Maximum Operating Pressure(2)		bar	8						
Maximum Operating Temperature(2)		°C	40						

(1) Maximum recommended flow rate are worked out for a good quality water. Please ask SOLYS for more information.
(2) These values can be increased to either 10 bars or 60° C. Please ask SOLYS for more information.

Dimensions & Pipe Connections

Model - 2"	Unit	2x2"	3x2"	4x2"	5x2"	6x2"	7x2"	8x2"
Total Installed Length(3)	m	1.0 | 0.8	1.3 | 1.0	1.5 | 1.3	1.8 | 1.6	2.2 | 1.8	2.3 | 2.1	2.7 | 2.3
Total Installed Width(3)	m	0.9 | 0.7	0.9 | 0.7	0.9 | 0.7	0.9 | 0.7	0.9 | 0.7	0.9 | 0.7	0.9 | 0.7
Total Installed Height(3)	m	1.2 | 0.8	1.2 | 0.8	1.2 | 0.8	1.2 | 0.8	1.2 | 0.8	1.2 | 0.8	1.2 | 0.8
Feed	in	4	4	4	4	4	4	4
Treated water	in	4	4	4	4	4	4	4
Drain	in	2	2	2	2	2	2	2

(3) AAF | IS

Model - 3"	Unit	5x3"	6x3"	7x3"	8x3"
Total Installed Length	m	1.50	1.80	2.10	2.80
Total Installed Width	m	0.90	0.90	0.90	0.90
Total Installed Height	m	1.30	1.30	1.30	1.40
Feed	in	6	6	6	8
Treated water	in	6	6	6	8
Drain	in	2	2	2	2

Model - 4"	Unit	4x4"	5x4"	6x4"	7x4"	8x4"	10x4"	12x4"
Total Installed Length	m	2.20	2.70	3.30	3.70	2.30	2.80	3.10
Total Installed Width	m	1.00	1.00	1.00	1.00	1.60	1.70	1.70
Total Installed Height	m	1.50	1.50	1.50	1.50	1.60	1.70	1.70
Feed	in	8	8	10	10	10	12	12
Treated water	in	8	8	10	10	10	12	12
Drain	in	2	2	2	2	2	2	2

Filtration Grade & Treated Water Quality

Nominal Filtration Grade	Minimum Inlet Pressure (bar)		Maximum Inlet TSS
	IS	AAF	mg/l
20 µm	5.0	1.0	30
40 µm	5.0	1.0	30
55 µm	5.0	1.0	50
100 µm	3.5	1.0	50
200 µm	3.0	1.0	50

Air & Power Requirements

Parameter	Unit	Value
Backwash Air(4)	L/min	0.270 - 0.311
Compressed Air Pressure(5)	barg	6 to 8
Voltage	V	230 | 110
Frequency	Hz	50 | 60

(4) AAF models only
(5) Air pressure must be above water feed pressure

solys@veolia.com
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FILTRAFLO FPA-D MK1

Media Pressure Filtration

Granular media pressure filter can remove suspended solids, iron, manganese, chlorine, acidity or organics depending on the selected media.

Flow rates from **2 to 12 m³/hr** per filter based on a safe 10m/h linear speed.

FEATURES & BENEFITS

- Cost-effective solution
- Polyamide vessels PN6; corrosion resistant
- Top and bottom distributors with star nozzles
- Air vents
- Simplex configuration
- PVC pipings
- Double or triple layer for filtration optimization
- Automatic diaphragm or butterfly valves with Pneumatic actuators

HIGH QUALITY MEDIA

- Sand: suspended solids removal
- Activated Carbon: chlorine, phenol and organics removal

APPLICATIONS

- Surface and well water filtration and heavy metal precipitation
- Cooling tower water filtration loop
- Pre-treatment prior to membrane and ion exchange technologies
- Organics removal with specific media
- Wastewater filtration for reuse
- Sea water filtration

OPTIONS

- Choice of high quality media
- Control panel for automatic backwashing and rising
- Air compressor for pneumatic valves
- Feeding collectors for duplex configuration

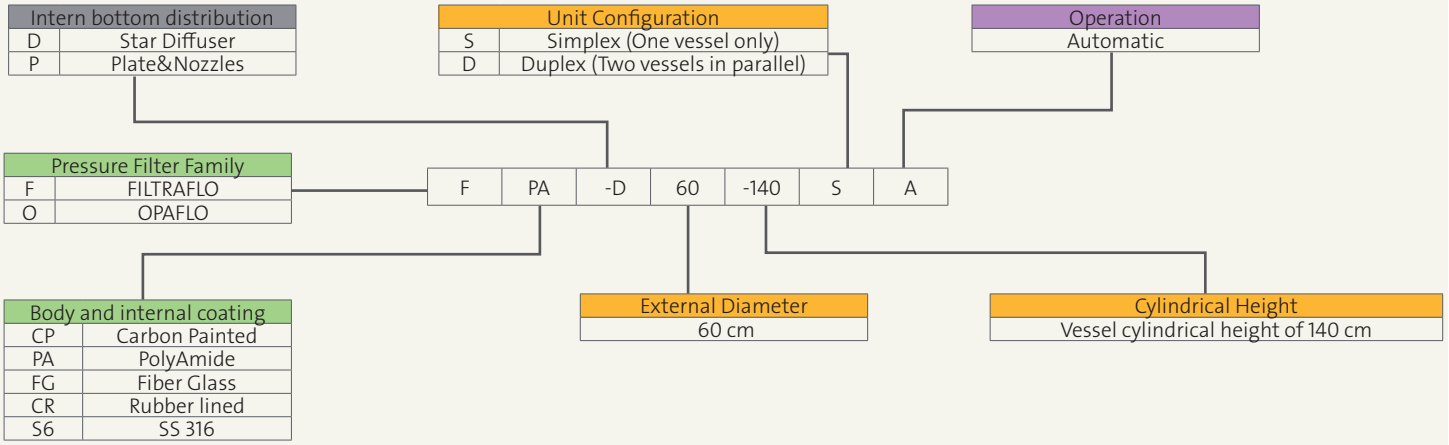
HYDREX® CHEMICALS

Hydrex® 3000 and 6000 water treatment chemicals from Veolia Water Technologies may optionally be used to enhance filtration.

RELATED SERVICES

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

Naming System



System Performance & Dimensions

Model	Flow rates*	Connections	Width	Height	Depth
	m³/h	DN	mm	mm	mm
FPA-D-50-100-SA	1.6-3.1	25	800	1914	650
FPA-D-60-140-SA	2.1-4	25	900	2140	750
FPA-D-70-125-SA	3.4-6.3	40	1050	2140	900
FPA-D-90-110-SA	4.9-9.2	65	1200	2140	1150
FPA-D-120-100-SA	9.6-18	65	1550	2302	1400

**Flow rates as shown above based on linear speed 6m/h (mini) - 15m/h (maxi)*

Note:
1. Flow rates are dependant, on feed water quality and media selection
2. Combined filters (2 filters in series) on specific request

Material Specifications

Piping	PVC
Vessel	Polyamid (6, UV resistant)

Operation

Maximum operating pressure:	6 bar
Maximum operating temperature:	40°C

Location of the skid: indoors

Electrical Supply

Automatic models 230/400V 50Hz

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FILTRAFLO FCP-P MK1

Media Pressure Filtration

Granular media pressure filter can remove suspended solids, iron, manganese, chlorine, acidity or organics depending on the selected media.

Flow rates from **5 to 90 m³/hr** per filter based on a safe 10m/h linear speed.

FEATURES & BENEFITS

- Steel vessels internally coated with epoxy painting; corrosion resistant
- Two manholes; easy access for maintenance
- PVC pipings
- Simplex, Duplex configurations; flexibility
- Air vents
- Blower connection socket; air/water backwashing
- Safety valve

HIGH QUALITY MEDIA

- Sand: suspended solids removal
- Anthracite or Pumice for in depth suspended solids removal
- Manganese, iron and hydrogen sulfide removal
- Activated Carbon: chlorine, phenol and organics removal

APPLICATIONS

- Surface and well water filtration and heavy metal precipitation
- Cooling tower water loop filtration
- Pre-treatment prior to membrane and ion exchange technologies
- Organics removal with specific media
- Industrial markets in general
- Wastewater filtration for reuse

OPTIONS

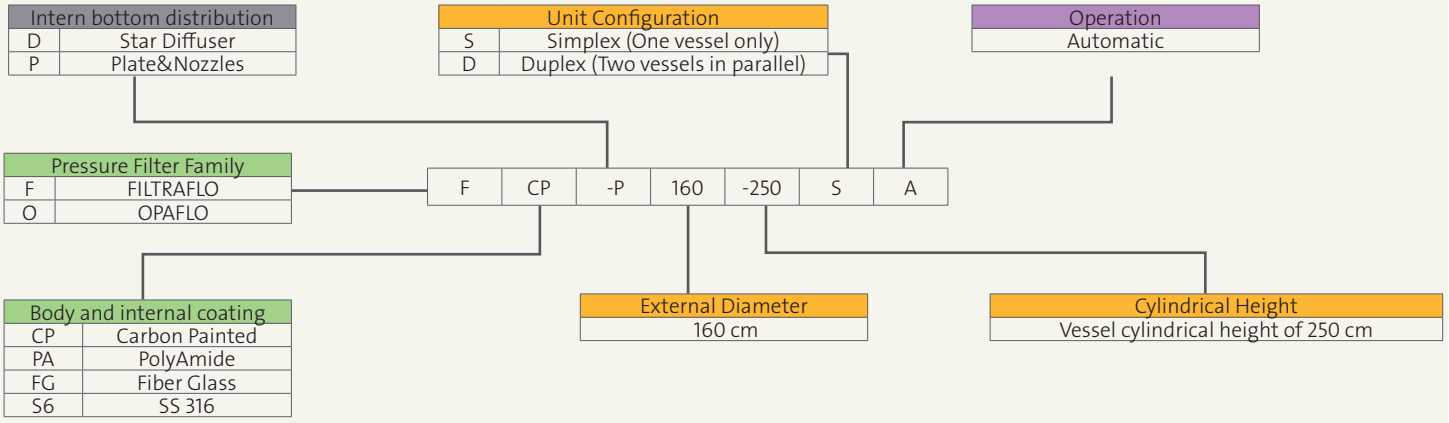
- Choice of high quality media
- Upstream Air mixing system
- Siemens Control Panel
- Backwash packages
- Additional monitoring

HYDREX® CHEMICALS

Hydrex® 3000 and 6000 water treatment chemicals from Veolia Water Technologies may optionally be used to enhance filtration.

RELATED 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 Performance & Dimensions

Model	Flow rate*	Vessel Diameter	Connections	Total Width	Total Height	Depth
	m³/h	mm (Approx)	DN	mm (Approx)	mm (Approx)	mm (Approx)
FCP-P-100-200-S/D A	4 - 11	1000	50	1240	3220	1900
FCP-P-120-200-S/D A	6.8 - 17	1200	65	1420	3310	2100
FCP-P-140-250-S/D A	9 - 23	1400	80	1610	3930	2330
FCP-P-160-250-S/D A	12 - 30	1600	80	1800	4050	2530
FCP-P-180-250-S/D A	15 - 38	1800	100	1980	4240	2870
FCP-P-200-250-S/DA	19 - 47	2000	150	2170	4350	3060

**Flow rates as shown above based on linear speed 6m/h (mini) - 15m/h (maxi)*

Note:
1. Flow rates are dependant, on feed water quality and media selection
2. Our filters can be assembled and delivered for duplex configuration (filters in parallel)

Material Specifications

Pressure Vessels	Carbon Steel, Epoxy
Pipework	PVC
Nozzles	Food Grade Polypropylene Mounted on the bottom welded floor

Operation

Maximum operating pressure:	6 bar
Maximum operating temperature:	40°C

Location of the skid: indoors

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FILTRAFLO FCP-D MK1

Media Pressure Filtration

Granular media pressure filter can remove suspended solids, iron, manganese, chlorine, acidity or organics depending on the selected media.

Flow rates from **12 to 70 m³/h** per filter based on a safe 10m/h linear speed.

FEATURES & BENEFITS

- Steel vessels internally coated with epoxy painting; corrosion resistant
- Two manholes; easy access for maintenance
- PVC pipings
- Simplex Configuration only (combined (note 2) as modified standard)
- Air vents

HIGH QUALITY MEDIA

- Sand: suspended solids removal
- Anthracite or Pumice for in depth suspended solids removal
- Manganese, iron and hydrogen sulfide removal
- Activated Carbon: chlorine, phenol and organics removal

APPLICATIONS

- Surface and well water filtration and heavy metal precipitation
- Cooling tower water filtration loop
- Pre-treatment prior to membrane and ion exchange technologies
- Organics removal with specific media
- Wastewater filtration for reuse
- Sea water filtration

OPTIONS

- Choice of high quality media
- Control panel for automatic backwashing and rinsing
- Air compressor for pneumatic valves
- Feeding collectors for duplex configuration

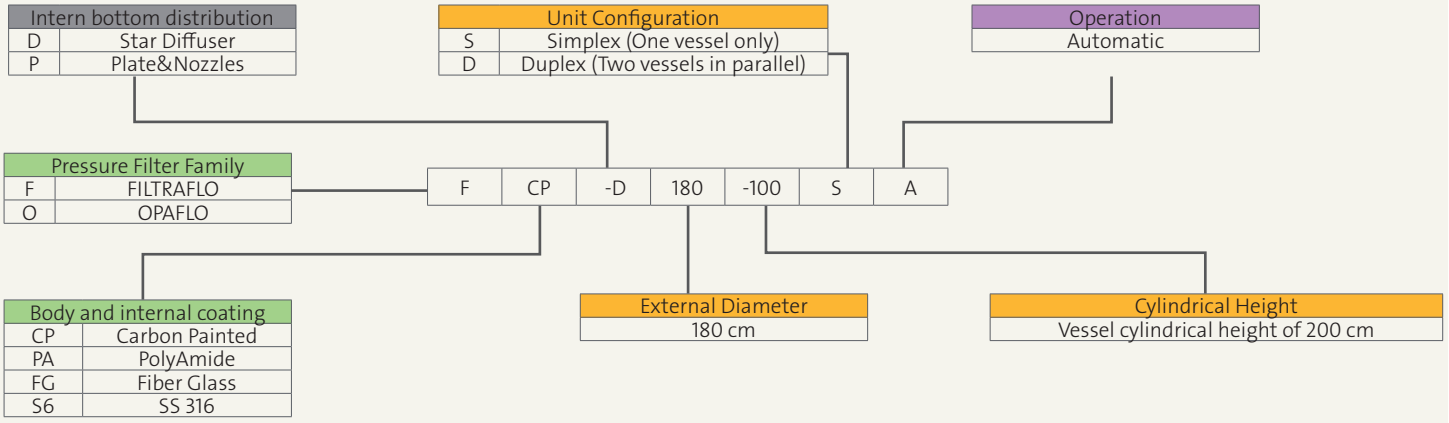
HYDREX® CHEMICALS

Hydrex® 3000 and 6000 water treatment chemicals from Veolia Water Technologies may optionally be used to enhance filtration.

RELATED SERVICES

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

Naming System



System Performance & Dimensions

Model	Flow rate*	Vessel Diameter	Connections	Total Width	Total Height	Depth
	m³/h	mm (Approx)	DN	mm (Approx)	mm (Approx)	mm (Approx)
FCP-D-125-100-SA	7.3 - 18	1250	65	1600	2360	1800
FCP-D-150-100-SA	10.5 - 26	1500	80	1950	2400	2150
FCP-D-180-100-SA	15.2 - 38	1800	100	2200	2700	2400
FCP-D-210-100-SA	20.5 - 52	2100	100	2500	2750	2700
FCP-D-225-100-SA	23.5 - 60	2250	150	2700	2900	2900
FCP-D-250-100-SA	38.9 - 72.9	2500	150	3000	3060	3200
FCP-D-300-100-SA	42 - 106	3000	150	3600	3325	3800

**Flow rates as shown above based on linear speed 6m/h (mini) - 15m/h (maxi)*

Note:
1. Flow rates are dependant, on feed water quality and media selection
2. Combined filters (2 filters in series) on specific request
3. Our filters can be assembled and delivered for duplex/triplex configuration (filters in parallel)

Material Specifications

Pressure Vessels	Carbon Steel. Epoxy painting internal 250µm; epoxy external 170µm
Piping	PVC

Operation

Maximum operating pressure:	6 bar
Maximum operating temperature:	40°C

Location of the skid: indoors

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Beverage Water Solutions

BERKEFELD PurBev® Media Filter

High-Performance Plants Designed for Food and Beverage Applications

BERKEFELD PurBev® Media Filters are pressurized filters with the correct filter material chosen in function of the application. Our range comprises:

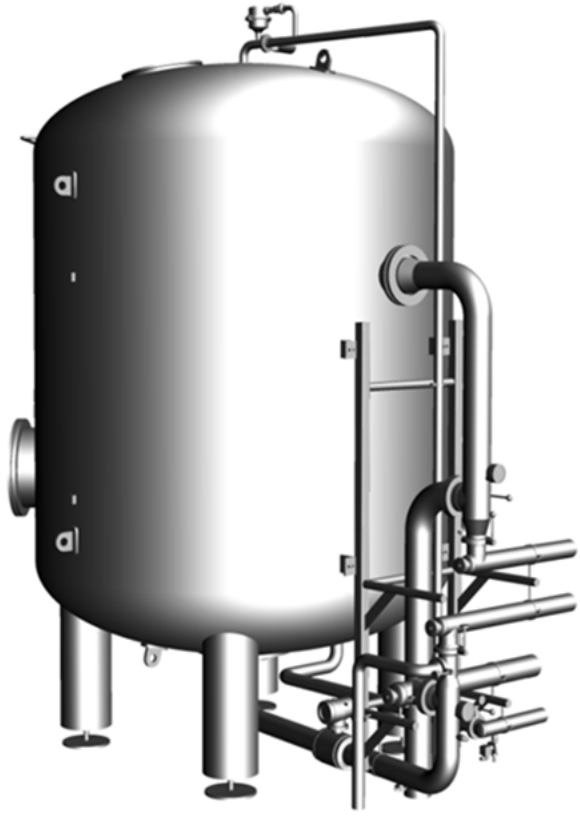
- **Mono-layer sand filters**
- **Multi-layer sand filters**
- **Multi-media filters**

Depending on the application the necessary pretreatment and accessories such as compressors aerators, degasifiers, scavenging air blowers, dosing stations, etc. will be included during the project planning.

Nominal flow rates from 5 – 120 m³/h per unit

Configurations

- Single – Multiple – Lead-lag
- Internal or external backwash
- Manual or automatic operation



BERKEFELD PurBev® – The Hygienic Design Standard

The BERKEFELD PurBev® hygienic standard is based on the expertise of our engineers specializing in beverage water solutions. It takes into account both legal requirements and international standards and directives applicable to beverage water production.

Applications

- Reduction of iron, manganese and aluminum
- Removal of turbidity, suspended solids and undissolved contaminants
- Biological removal of ammonia and nitrates
- Removal of arsenic, fluorine, radium radioactivity, uranium and lead
- De-acidification, CO_2 reduction

Standard Features

- Lean & hygienic front piping in 304/316L DIN 11850-2
- High quality media: Berkosan™, Berkodol™, Berkolit™ CA, Berkosplit™, Berkolit™ FM, Mn & As
- Full de-aeration ensured
- Hot water/steam sanitizable
- EHEDG approved components
- Sterile sample valves Servinox PEMS II
- 60 nozzles/m² according to DIN 19605
- Bed expansion during backwash min 25%

Benefits

- Optimum product quality and safety by minimization of microbial risks
- Reliable cleanability
- Highly-efficient operation minimized water losses during backwash
- Easy dismantling of front piping for convenient maintenance
- Long lifetime due to robust and high quality materials

BERKEFELD PurBev® Media Filter

Standard Configuration

Filter

- 1.4404 / 316L, surfaces “mill finish” or coated steel*
- 4 feet with adjustable heights
- PP GV30S filter nozzles
- Automatic de-aeration valve
- Bottom filter media outlet connection to allow
- easy removal of filter media
- 1 manhole

Piping & Instrumentation

- 304L: < 150 ppm chloride, Cl_2 free
- 316L: < 600 ppm chloride, Cl_2 free or < 200 ppm chloride, < 4 ppm Cl_2
- Aseptic disc valves AWH
- Pressure transmitter make Wika, stainless steel with sanitary threaded connection
- Flanged electromagnetic flowmeter Promag 10 W Endress & Hauser
- Pre-mounted stainless steel solenoid valve cabinet, with Festo pneumatic valves, Profibus

Optional

Filter

- Active venting: two automatic disc valves with level probe (Liquiphant) instead of mechanic vent valve (Mankenberg) with bypass
- Upper media flushing nozzle DN80
- Safety valve for protection against over pressure
- Stainless steel /1.4571 filter nozzles
- Internal surface polished or grinded
- Additional manholes with or without swing device

Piping & Instrumentation

- Leakage valves to prevent contact between product water and backwash water or raw water
- Position indicator switches for selected valves
- Turbidity meter
- Clamp connection instrumentation
- Welded flow meter Promag 10H of Endress &Hauser
- Flow balance valves
- Hard-piped CIP bypass with drain
- Alternative valve manufacturers (Kieselmann, Südmo)

Hot Water or Steam Sanitization Package

Sizes

Ø Filter [mm]	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200
Min. Flow Rate [m³/h][1]	4	6	9	12	16	20	25	30	36	42	49	56.5	64
Max. Flow rate [m³/h]	7.5	11.7	17	23	30	38	47	57	67	80	92	106	120
Backwash Flow [m³/h]	20	31	51	69	90	114	141	171	203	239	277	318	362
Main Connection	DN 50	DN 65	DN 65	DN 80	DN 80	DN 100	DN 100	DN 100	DN 100	DN 100	DN 125		
Cyldr. Vessel Height[2]	2000-3000 mm												

Note [1]: Dependent on feed water quality, application and media selection
Note [2]: Vessel height is dependent on filter capacity in relation to the application

Operational Data

Operating pressure:	0-6 bar
Max. differential pressure inlet-outlet:	0.5 bar
Operating temperature:	1-50°C
Sanitization:	1-110°C
Steam supply:	2-6 bar, max. 160°C
Backwash water:	min. 2 bar

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VWT D 10/2016

Beverage Water Solutions

BERKEFELD PurBev® Activated Carbon Filter

High-Performance Plants Designed for Food and Beverage Applications

The BERKEFELD PurBev® Activated Carbon Filter is designed for water or condensate polishing, de-chlorination and other process applications. It meets our customer's highest performance requirements.

Nominal flow rates from 5 – 150 m³/h per unit

Configurations

- Single – Multiple – Lead-lag
- Hot water or steam sanitization
- Internal or external backwash
- Manual or automatic operation
- Integrated polisher

Standard Features

- Pre-assembled lean & hygienic front piping in 316L DIN 11850-2 with integrated valves and instrumentation
- Full de-aeration ensured
- Hot water/steam sanitizable system
- EHEDG approved components
- Customized EBCT (Empty Bed Contact Time)
- High quality acid-washed coconut shell carbon media (food grade) Berkosorb™ XSa
- Sterile sample valves Servinox PEMS II
- 60 nozzles/m² according to DIN 19605
- Bed expansion during backwash min. 25%

Applications

- Removal of chlorine and reduction of chloramine
- Improvement/removal of odor and color
- Removal of anthropogenic traces (sweeteners, drugs, pesticides, etc.)
- Reduction of THMs and disinfection by-products
- Removal of organic traces.
- Reduction of DOC (i.e. humic acid)

Benefits

- Optimum product quality & safety by minimization of microbial risks
- Reliable cleanability
- Easy dismantling of front piping for convenient maintenance
- Economical & highly efficient operation: minimized water losses during b/w and sanitization
- Long lifetime due to robust and high quality materials

BERKEFELD PurBev® – The Hygienic Design Standard

The BERKEFELD PurBev® hygienic standard is based on the expertise of our engineers specializing in beverage water solutions. It takes into account both legal requirements and international standards & directives applicable to beverage water production.

BERKEFELD PurBev® Activated Carbon Filter

Standard Configuration

Filter

- Filter Vessel
  1.4404 / 316L, surfaces “mill finish”
  4 feet with adjustable heights
- PP GV30S filter nozzles
- Automatic de-aeration valve
- Low filter media outlet connection to allow easy removal of filter media
- Activated carbon with highest purity according to DIN EN 12915, AWWA B604, ANSI NSF61 and a ball-pan hardness of min 98 minimizes carbon dust in filtrate

Piping & Instrumentation

- 316L DIN 11850-2
- Pressure gauges: WIKA, threaded connection, glycerin filled, FDA approved
- Temperature sensor: PT 100 & TR47 Endress & Hauser
- Flanged electromagnetic flowmeter Promag 50P Endress & Hauser
- 15µm or 25µmpolisher, with integrated backwash and sanitization program
- Premounted stainless steel solenoid valve cabinet, Festo CPV10, Profibus
- Aseptic disc valves AWH

Sanitization

- Touch protection safety package
- Hot water sanitization incl. heat exchanger: max. 95°C @ max 4,5 bar
- Steam sanitization: max. 110°C @ max 0,5 bar
- Pre-assembled steam regulation section: valves Gestra, Gemü, Samson

Optional

Filter

- Upper media flushing nozzle DN80
- Active venting: two automatic disc valves with level probe (Liquiphant) instead of mechanic vent valve (Mankenberg) with bypass
- Safety valve for protection against over pressure
- 1.4571 filter nozzles
- Internal surface polished or grinded
- Additional manholes with or without swing device

Piping & Instrumentation

- Leakage valves to prevent contact between product water and backwash water or raw water
- Clamp connection instrumentation
- Welded flow meter
- Pressure transmitters
- Flow balance valves
- Position indicator switches for selected valves
- Alternative valve manufacturers (Kieselmann, Südmo)

Sanitization

- Pipe insulation
- Flashing light during sanitization
- Steam fine filter

Sizes

Ø Filter [mm]	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800
Max Flow Rate [m³/h][1]	15	24	34	46	60	76	94	114	136	159	180
Backwash Flow [m³/h]	13	20	28	38	50	64	79	95	113	133	154
Main Connection	DN 50	DN 65	DN 65	DN 80	DN 80	DN 100	DN 100	DN 100	DN 125	DN 125	DN 125
# Cartridges in Polisher	2	2	2	4	4	4	7	7	10	10	10
Cyldr. Vessel Height[2]	2000-4000 mm										

Note [1]: Flow rates are dependent on feed water quality, application and media selection
Note [2]: Vessel height is dependent on EBCT in relation to the application

Operational Data

Operating pressure: 0-6 bar
Operating temperature: 1-50°C
Sanitization: 1-110°C
Steam supply: 2-6 bar, max 160°C
Backwash water: min 2 bar

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VWT D 10/2016

Beverage Water Solutions

BERKEFELD PurBev® Polisher

Hygienic & Backwashable Particle Filter

The BERKEFELD® PurBev Polisher is designed for removing particles in water treatment systems. The basic version is a stand-alone unit featuring manual backwashing capability.

Available nominal filter fineness: 15 and 25 µm
Nominal flow rates: from 10- 120 m³/h per unit

Options:

- Automatic backwashing
- Pressure transmitters (differential pressure)
- Automatic deaerating (air release) valves
- Integration into frontal piping of Activated Carbon Filters
- Supporting frame in SS 1.4301

BERKEFELD PurBev® – The Hygienic Design Standard

The BERKEFELD PurBev® hygienic standard is based on the expertise of our engineers specializing in beverage water solutions. It takes into account both legal requirements and international standards & directives applying to beverage water production.

Applications

- Sand and/or activated carbon filtrate polishing preventing fine particles from being present in the final beverage product water
- Preventing sand, rust and other solid particles from entering water distribution networks and installations

Features

- Complete stainless steel design
- Robust and backwashable cartridge filter
- Hot water/steam sanitisable system
- Hygienic pipe design, hygienic materials and EHEDG approved components
- Self-draining piping arrangement for reliable cleaning and disinfection

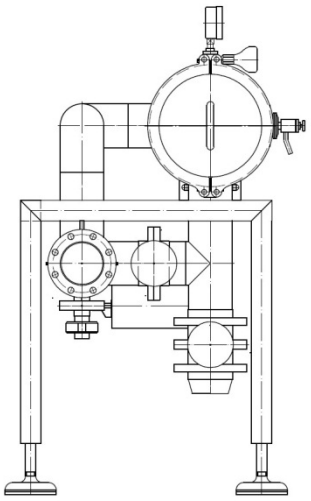
Benefits

- Minimized microbial risk
- Less particles in treated product water
- Cartridges easy to remove and clean externally (compressed air or high pressure washer)
- Easy dismantling for maintenance
- Long cartridge lifetime

BERKEFELD PurBev® Polisher

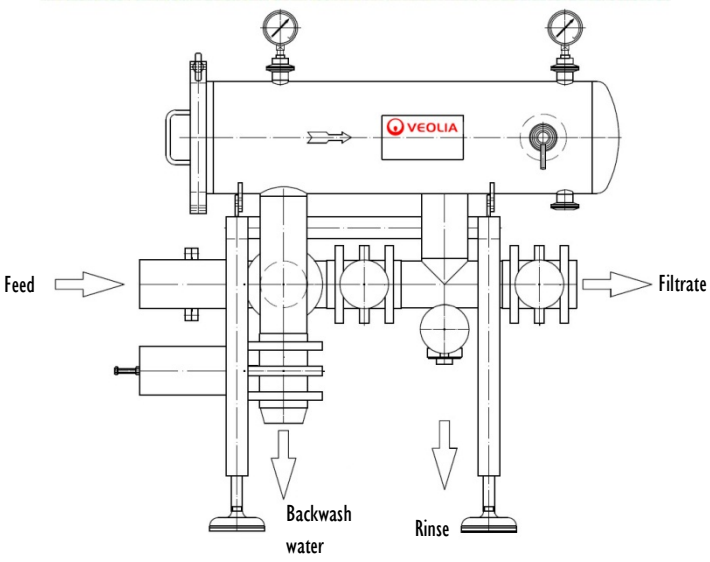
Technical Data

Material	1.4404
Seals	EPDM with FDA approval
Manometer	Clamp connection acc. DIN 32676 DN 25
Cartridge vessel	Clamp connection acc. DIN 32676 for type DN 65 and 80
	Flange connection for type DN 100 & DN 125 with G-ST Gasket
Valves	Aseptic flange connection acc. DIN 11864-2, Form A



Operational data

Normal operation	0-10 bar
Hot Water Sanitization	max 95°C, max 4,5 bar
Steam Sanitization	max 110 °C, max 0,5 bar
Ambient Conditions	+1...45 °C
Max dP across cartridges	4 bar



Cartridges

Nominal fineness
15 µm
25 µm

Types

Description	Nominal flow rate* operation & backwash	Nominal size	Backwash	Rinse	Cartridges	Frame
FE30-65, L/R SA	10-30 m³/h	DN65	DN50	DN25	2	
FE60-80, L/R SA	25-50 m³/h	DN80	DN65	DN25	4	
FE100-100, L/R SA	40-80 m³/h	DN100	DN80	DN40	7	
FE150-125, L/R SA	70-120 m³/h	DN125	DN100	DN40	10	
FE30-65, L/R SAF	10-30 m³/h	DN65	DN50	DN25	2	✓
FE60-80, L/R SAF	25-50 m³/h	DN80	DN65	DN25	4	✓
FE100-100, L/R SAF	40-80 m³/h	DN100	DN80	DN40	7	✓
FE150-125, L/R SAF	70-120 m³/h	DN125	DN100	DN40	10	✓

*Depending on process & quality

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VWT D 10/2016

IONSOFT™ Mini (Berkesoft)

Compact range of softeners

The IONSOFT Mini is a compact softener range based on ion Exchange resins technology that can be used for domestic or industrial applications. It is designed with upflow counter-current regeneration to optimize OPEX.

- **3 sizes**
- **Up to 4 units in parallel**
- **Production flow rate from 0.3 m³/h to 18.7 m³/h (up to 31.2 m³/h with blending 40% of raw water with 60% of softened water).**

FEATURES & BENEFITS

- User-friendly controller with LCD display integrated in the Control valve.
- Regeneration can be triggered manually or automatically.
- Automatic regeneration is based on Volume and time.
- Optimized usage of regeneration salt: upflow counter-current regeneration and proportional regeneration when resins are only partially exhausted.
- Compact designs with integrated brine tanks: space saving and easy installation.
- Up to 4 units running in parallel: continuous production.
- Integrated blending device: can be used when target is not to remove completely hardness.
- Materials in contact with water suitable for drinking water (pending approval with W270 German legislation).

APPLICATIONS

- Drinking water softening
- Glass washing
- Cleaning and rinse water
- Laundry
- Reverse Osmosis feed water pre-treatment (eg. before Sirion)
- Laboratory
- Cooling towers

HYDREX® CHEMICALS

Hydrex™ 7110 water treatment chemicals from Veolia Water Technologies and salt pellets should be used for optimized operation.

RELATED 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 and dimensions

Model single vessel	Unit	Mini 35	Mini 15	Mini 5
Min production flowrate	m^3/h	0.8	0.3	0.3
Max production flowrate	m^3/h	4.7	2.0	0.7
Max production flowrate with blending*	m^3/h	7.8	3.3	1.2
Length	m	0.74	0.74	0.61
Width	m	0.37	0.37	0.34
Height	m	1.09	1.09	0.73
Connections	-	R1" BSPT	R1" BSPT	R1" BSPT
Model 2 vessels in parallel	**Unit**	**Mini 2-35**	**Mini 2-15**	
Min production flowrate	m^3/h	0.8	0.3	
Max production flowrate	m^3/h	9.4	4.0	
Max production flowrate with blending*	m^3/h	15.6	6.6	
Length	m	0.85	0.85	
Width	m	1.1	1.06	
Height	m	1.09	1.09	
Connections	-	Rp2" BSPT	Rp1 ¼ " BSPT	
Model 3 vessels in parallel	**Unit**	**Mini 3-35**	**Mini 3-15**	
Min production flowrate	m^3/h	0.8	0.3	
Max production flowrate	m^3/h	14.0	5.9	
Max production flowrate with blending*	m^3/h	23.4	9.9	
Length	m	0.85	0.85	
Width	m	1.55	1.52	
Height	m	1.09	1.09	
Connections	-	Rp2" BSPT	Rp1 ½ " BSPT	
Model 4 vessels in parallel	**Unit**	**Mini 4-35**	**Mini 4-15**	
Min production flowrate	m^3/h	0.8	0.3	
Max production flowrate	m^3/h	18.7	7.9	
Max production flowrate with blending*	m^3/h	31.2	13.2	
Length	m	0.85	0.85	
Width	m	1.95	2.00	
Height	m	1.09	1.09	
Connections	-	Flange DN65	Rp2" BSPT	
Performance (per vessel) Capacity	$kgCaCO_3$	1.75	0.71	0.23
Water consumption per regeneration	L	172	86	49
Salt consumption per regeneration	kg	4.2	1.8	0.6

** Considering blending of 60% of inlet flow that is softened with 40% of inlet flow that is not softened.*

Feed Water requirements

Parameter	Unit	Value
Min water temperature	°C	5
Max water temperature	°C	25
Min inlet pressure	bar	2.5
Max inlet pressure	bar	6

Feed water must have a quality equivalent to potable water, colorless, free from organic contamination, chlorine, Iron, manganese and suspended solids. Raw water shall not contain hardness stabilizing agents and must not be over-saturated with gas.

Environmental conditions

Parameter	Unit	Value
Min ambient temperature	°C	5
Max ambient temperature	°C	35

Indoor installation in a non-corrosive atmosphere.

Power requirements

Voltage	AC 100-240V
Frequency	50/60 Hz
Phase	1

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IONSOFT™ Midi (Berkesoft)

Cost-efficient softeners

The IONSOFT Midi is a cost efficient softener range based on ion Exchange resins technology that can be used for industrial applications. It is designed with upflow counter-current regeneration to optimize OPEX.

- **5 vessel sizes.**
- **Up to 2 units in Duty/Stand-by.**

Flow rates from **0.2 to 6.4 m³/h**

FEATURES & BENEFITS

- User-friendly controller with LCD display integrated in the Control valve.
- Regeneration can be triggered manually or automatically.
- Automatic regeneration is based on Volume and time.
- Optimized usage of regeneration salt: upflow counter-current regeneration and proportional regeneration when resins are only partially exhausted.
- Possibility to have duty/stand-by configuration with 2 vessels.
- Integrated blending device: can be used when target is not to remove completely hardness.

APPLICATIONS

- Glass washing
- Cleaning and rinse water
- Laundry
- Reverse Osmosis feed water pre-treatment (eg. before Sirion)
- Laboratory
- Cooling towers

HYDREX® CHEMICALS

Hydrex™ 7110 water treatment chemicals from Veolia Water Technologies and salt pellets should be used for optimized operation.

RELATED 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 and dimensions

Model	Unit	Midi 15	Midi 25	Midi 45	Midi 70	Midi 90
Min production flowrate	m^3/h	0.2	0.4	0.5	0.7	0.8
Max production flowrate	m^3/h	2	3.3	5.4	5.9	6.4
Capacity	$kgCaCO_3$	0.71	1.25	2.23	3.66	4.55
Length	m	0.86	0.88	0.89	1.05	1.06
Width	m	0.60	0.60	0.6	0.68	0.68
Height	m	1.09	1.09	1.3	1.42	1.57
Connections	-	R1" BSPT	R1" BSPT	R1" BSPT	R1" BSPT	R1" BSPT
Model Duty/ Stand-by	**Unit**	**Midi 2-15**	**Midi 2-25**	**Midi 2-45**	**Midi 2-70**	**Midi 2-90**
Min production flowrate	m^3/h	0.2	0.4	0.5	0.7	0.8
Max production flowrate*	m^3/h	2	3.3	5.4	5.9	6.4
Capacity	$kgCaCO_3$	1.43	2.50	4.46	7.32	9.10
Length	m	1.49	1.49	1.50	1.71	1.71
Width	m	0.60	0.60	0.6	0.68	0.68
Height	m	1.09	1.09	1.3	1.42	1.57
Connections	-	R1" BSPT	R1" BSPT	R1" BSPT	R1" BSPT	R1" BSPT
Regeneration (per vessel)						
Water consumption per regeneration	L	85	128	216	328	485
Salt consumption per regeneration	kg	1.75	3	5.4	8.4	10.8

Feed Water requirements

Parameter	Unit	Value
Min water temperature	°C	5
Max water temperature	°C	25
Min inlet pressure	bar	2.5
Max inlet pressure	bar	6

Feed water must have a quality equivalent to potable water, colorless, free from organic contamination, chlorine, Iron, manganese and suspended solids. Raw water shall not contain hardness stabilizing agents and must not be over-saturated with gas.

Environmental conditions

Parameter	Unit	Value
Min ambient temperature	°C	5
Max ambient temperature	°C	35

Indoor installation in a non-corrosive atmosphere.

Power requirements

Voltage	AC 100-240V
Frequency	50/60 Hz
Phase	1

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IONSOFT™ Maxi (Berkesoft)

Cost-efficient softeners

The IONSOFT Maxi is a cost efficient softener range based on ion Exchange resins technology that can be used for industrial applications.
It is designed with upflow counter-current regeneration to optimize OPEX.

- **5 vessel sizes.**
- **Up to 4 units in parallel**
- **Up to 2 units in Duty/Stand-by**

Flow rates from **1 to 80 m³/h**

FEATURES & BENEFITS

- User-friendly controller with LCD display integrated in the Control valve
- Regeneration can be triggered manually or automatically
- Automatic regeneration is based on Volume and time
- Optimized usage of regeneration salt: upflow counter-current regeneration and proportional regeneration when resins are only partially exhausted
- Possibility to have duty/stand-by configuration with 2 vessels
- Up to 4 units running in parallel: continuous production

APPLICATIONS

- Glass washing
- Cleaning and rinse water
- Laundry
- Reverse Osmosis feed water pre-treatment (eg. before Sirion)
- Cooling towers

HYDREX® CHEMICALS

Hydrex™ 7110 water treatment chemicals from Veolia Water Technologies and salt pellets should be used for optimized operation.

RELATED 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 and dimensions

Model single vessel	Unit	Maxi 90	Maxi 120	Maxi 140	Maxi 230	Maxi 350
Min production flowrate	m^3/h	1	1	1.2	2.1	2.8
Max production flowrate	m^3/h	9	10.5	11.5	19	20
Capacity	$kgCaCO_3$	4.6	6.0	7.1	11.7	17.5
Length	m	1.40	1.70	1.70	1.80	1.90
Width	m	0.70	1.05	1.05	1.05	1.10
Height	m	1.63	1.93	1.93	2.00	2.25
Connections	-	Rp 2" BSPT	Rp 2" BSPT	Rp 2" BSPT	Rp 2" BSPT	Rp 2" BSPT
Model Duty/ Stand-by	**Unit**	**Maxi 2-90A**	**Maxi 2-120A**	**Maxi 2-140A**	**Maxi 2-230A**	**Maxi 2-350A**
Min production flowrate	m^3/h	1	1	1.2	2.1	2.8
Max production flowrate	m^3/h	9	10.5	11.5	19	20
Capacity	$kgCaCO_3$	9.3	12.0	14.3	23.4	35.0
Length	m	1.93	2.25	2.28	2.45	2.55
Width	m	0.75	1.05	1.05	1.05	1.15
Height	m	1.75	2.05	2.05	2.03	2.28
Connections	-	Rp 2" BSPT	Rp 2" BSPT	Rp 2" BSPT	Rp 2" BSPT	Rp 2" BSPT
Model 2 vessels in parallel	**Unit**	**Maxi 2-90P**	**Maxi 2-120P**	**Maxi 2-140P**	**Maxi 2-230P**	**Maxi 2-350P**
Min production flowrate	m^3/h	2	2	2.4	4.2	5.6
Max production flowrate	m^3/h	18	21	23	38	40
Capacity	$kgCaCO_3$	9.3	12.0	14.3	23.4	35.0
Length	m	2.05	2.60	2.60	2.75	3.10
Width	m	1.20	1.63	1.60	1.75	1.75
Height	m	1.63	1.90	1.93	2.00	2.25
Connections	-	Rp 2" BSPT	Flange DN65	Flange DN65	Flange DN80	Flange DN80
Model 3 vessels in parallel	**Unit**	**Maxi 3-90**	**Maxi 3-120**	**Maxi 3-140**	**Maxi 3-230**	**Maxi 3-350**
Min production flowrate	m^3/h	3	3	3.6	6.2	8.4
Max production flowrate	m^3/h	27	31.5	34.5	57	60
Capacity	$kgCaCO_3$	13.9	18	21.4	35.1	52.5
Length	m	2.58	3.90	3.90	3.95	4.10
Width	m	1.35	1.83	1.83	1.98	2.10
Height	m	1.63	1.90	1.93	2.00	2.25
Connections	-	Flange DN65	Flange DN80	Flange DN80	Flange DN100	Flange DN100
Model 3 vessels in parallel	**Unit**	**Maxi 4-90**	**Maxi 4-120**	**Maxi 4-140**	**Maxi 4-230**	**Maxi 4-350**
Min production flowrate	m^3/h	4	4	4.8	8.4	11.2
Max production flowrate	m^3/h	36	42	46	76	80
Capacity	$kgCaCO_3$	18.4	24	28.4	46.8	70
Length	m	3.25	4.80	4.80	4.80	4.90
Width	m	1.35	1.83	1.83	1.98	2.10
Height	m	1.63	1.90	1.93	2.00	2.25
Connections	-	Flange DN80	Flange DN100	Flange DN100	Flange DN125	Flange DN125
Regeneration (per vessel)						
Water consumption per regeneration	L	500	660	770	1265	1925
Salt consumption per regeneration	kg	11.2	14.4	17.2	28.1	42.0

Feed Water requirements

Parameter	Unit	Value
Min water temperature	°C	5
Max water temperature	°C	25
Min inlet pressure	bar	2.5
Max inlet pressure	bar	6

Feed water must have a quality equivalent to potable water, free from organic contamination and suspended solids.

Feed water must have a quality equivalent to potable water, colorless, free from organic contamination, chlorine, Iron, manganese and suspended solids. Raw water shall not contain hardness stabilizing agents and must not be over-saturated with gas.

Environmental conditions

Parameter	Unit	Value
Min ambient temperature	°C	5
Max ambient temperature	°C	35

Indoor installation in a non-corrosive atmosphere.

Power requirements

Voltage	AC 100-240V / DC 15V
Frequency	50/60 Hz
Phase	1

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IONSOFT™ Mega (Berkoion)

Industrial softeners

The IONSOFT Mega is a softener range based on ion Exchange resins technology that can be used for any industrial application. It is designed with upflow counter-current regeneration to optimize OPEX. It uses multiple individual valves to reduce pressure losses and ease maintenance.

• 4 Models

Flow rates from **3 to 80 m³/h**

FEATURES & BENEFITS

- Proven designs and materials; efficient operation, easy to maintain, reliable.
- Multiple individual valves: reduces pressure loss by almost 50% compared to single valve systems.
- Optimized usage of regeneration salt: upflow counter-current regeneration.
- Advanced controller with LCD display; range of control options, intuitive operation, integrates with centralized control systems.
- Continuous production: duty/ stand-by configuration

APPLICATIONS

- Reverse Osmosis feed water pre-treatment (eg. before Sirion)
- Cooling towers
- Glass washing
- Cleaning and rinse water
- Laundry

HYDREX® CHEMICALS

Hydrex™ 7110 water treatment chemicals from Veolia Water Technologies and salt pellets should be used for optimized operation.

RELATED 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 and dimensions

Model	Unit	AW2-550	AW2-800	AW2-1050	AW2-1400
Min production flowrate	m^3/h	2.7	3.9	5.1	6.8
Max production flowrate	m^3/h	27	39	51	68
Max flowrate (short period)	m^3/h	32	46	60	80
Capacity*	$kgCaCO_3$	27.9	40.6	53.3	71.0
Length	m	3.20	3.95	4.49	4.67
Width	m	1.39	1.70	1.77	1.93
Height	m	2.65	2.74	2.82	2.91
Raw water connection	-	Flange DN80	Flange DN100	Flange DN100	Flange DN100
Soft water connection	-	Flange DN80	Flange DN80	Flange DN80	Flange DN100
Water consumption per regeneration	L	2731	3969	5206	6942
Salt consumption per regeneration*	kg	49.5	72	94.5	126

** the nominal capacity has been referred to economy brine consumption of 90 g NaCl/liter of resin.*

Feed Water requirements

Parameter	Unit	Value
Min water temperature	°C	5
Max water temperature	°C	30
Min inlet pressure	bar	3
Max inlet pressure	bar	8.5

Feed water must have a quality equivalent to potable water, colorless, free from organic contamination, chlorine, Iron, manganese and suspended solids. Raw water shall not contain hardness stabilizing agents and must not be over-saturated with gas.

Environmental conditions

Parameter	Unit	Value
Min ambient temperature	°C	5
Max ambient temperature	°C	35

Indoor installation in a non-corrosive atmosphere.

Materials

Resin vessels	Glass Reinforced Plastic
Brine tanks	PE
Pipework	PVC

Power requirements

Voltage	AC 230V / DC 22V
Frequency	50 Hz (60 Hz on request only)
Phase	1

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VEOLIA

CARIX®

Economical and environmentally-friendly water softening

WATER TECHNOLOGIES

The challenge

Many regions of the world have a problem with high water hardness. Wherever there is hard water, there is lime scale which is caused by calcium, magnesium and hydrogen carbonate dissolved in the water.
Increased concentrations of sulfate and chloride can also have a corrosive effect on concrete and metal, whereas nitrates in higher quantities are harmful to one's health.

That is why many households and businesses frequently rely on decentralized water softening units, which must be regenerated with the aid of environmentally harmful chemicals such as acid, lye or saline solutions.

The solution

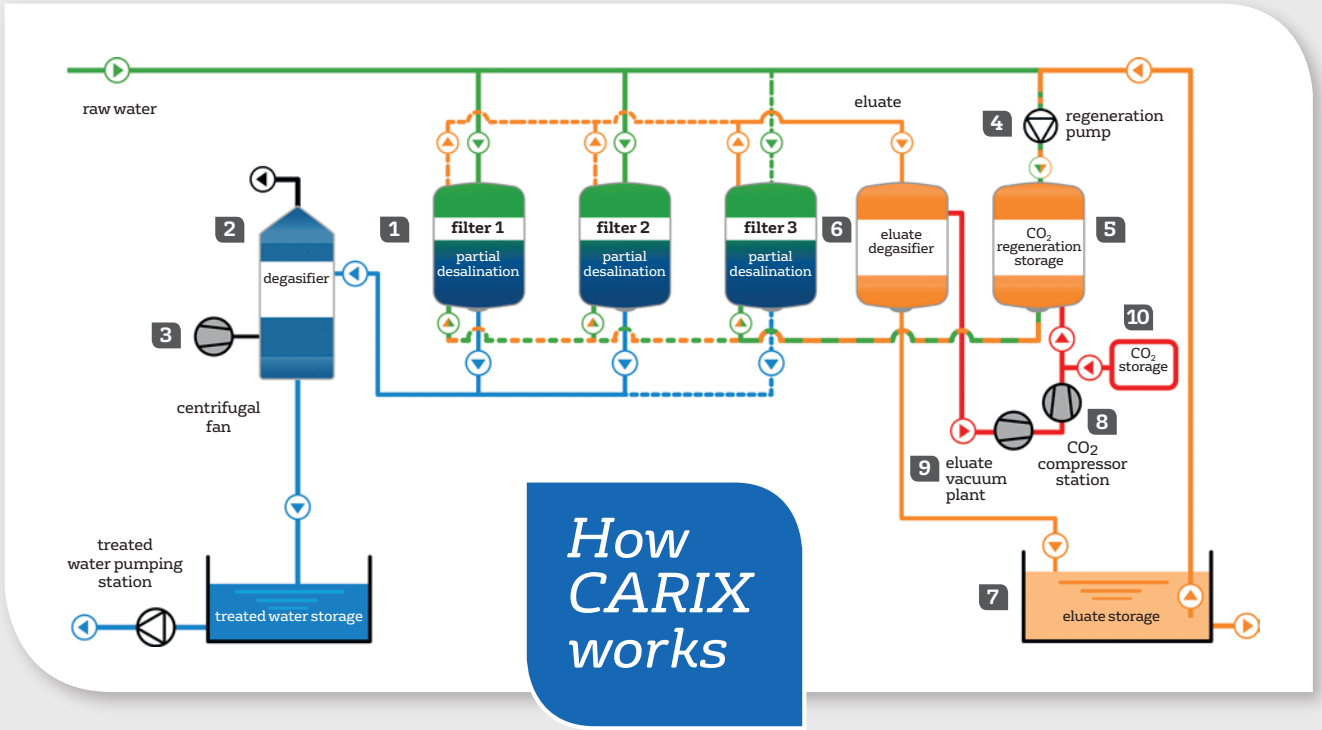
CARIX® (CArbon Dioxide Regenerated Ion EXchanger) allows for a purposeful removal of cations such as calcium and magnesium and anions such as sulfate, nitrate and chloride, and the ion exchange materials can be regenerated with carbonic acid in a very environmentally friendly manner. CARIX® is the only ion exchange process in the world, where the product resulting during the loading process (carbonic acid) is suited for regeneration of the filter material.

Thanks to this type of regeneration, the wastewater contains the right ratio of substances that were absorbed during the softening process. The wastewater is a carbonated "mineral water" of drinking water quality that is free of solids. Contrary to other desalination technologies, CARIX® does not result in an increased salinity in the wastewater due to regeneration chemicals as occurs with conventional ion exchangers or the addition of phosphates when using antiscalants with membrane desalination (nanofitration, reverse osmosis).

Soft water saves money and time!

CARIX soft water protects lines, fittings and equipment against deposits and corrosion, saves energy and increases the service life. For instance, an encrusted heating element in a clothes washer requires up to 20% more energy when it comes to heating, before a premature breakdown makes an expensive replacement necessary. With soft water the cleaning expense is reduced considerably and it is possible to save up to 50% when it comes to detergents, washing and cleaning agents.

The first plant started in 1986 and since then has delivered top-quality drinking water.



How CARIX works

Process description

The untreated water flows through the ion exchange filter 1 from top to bottom. The actual partial desalination takes place here. This reduces calcium, magnesium, carbonate hardness, sulfate, nitrate and chloride, where CO_2 forms as reaction product, which is removed from the water in the downstream degasifier 2.

During regeneration, the exchanger resins are restored to their original state by removing the ions absorbed during the loading process and replacing them with H+ and HCO_3- ions accumulated from the regeneration solution (CO_2) in the water. In this context, the untreated water is pumped by means of a regeneration pump 3 to the regeneration storage tank 4 and enriched with CO_2 from the recovery process 8 and if necessary from a CO_2 tank 9. The regeneration solution (CO_2-enriched water) flows from the regeneration storage tank 4 to the exchanger filter.

In the eluate degasifier 5, approx. 95% of the CO_2 is recovered from the regeneration stream and pumped back to the regeneration storage tank by an oil-free compressor 7 station.

The eluate, which is the wastewater from the regeneration process, flows from the regenerated filter via the eluate degasifier 5 to an eluate storage tank 6. Approx. 40% of the eluate is re-used for the next regeneration cycle.

Key advantages

- Low operating costs and environmentally friendly regeneration of exchanger resins with the aid of a regenerant and its recovery
- Compared to membrane desalination, approx. 60% less wastewater and 50% less energy consumed
- Simultaneous removal of cations and anions without any adverse impact on water quality
- Direct wastewater discharge of solids-free „mineral water“ to the receiving stream without adding salt by means of regeneration chemicals or antiscalants
- Trouble-free operation in the partial load range or during system startup and shutdown
- Easy to use with maximum process automation
- Stable and insensitive to changes in the quality of the untreated water
- Environmentally friendlyconsumption of the greenhouse gas carbon dioxide during regeneration
- Consumers save energy und use less detergents, washing and cleaning agents
- Protection of equipment against failure due to scaling or fouling and corrosion

Installed base: more than 15 plants in operation worldwide

Resourcing the world

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Beverage Water Solutions

BERKEFELD PurBev® Softener

Hygienic Water Softening for Utility Processes

The BERKEFELD PurBev® Softener is designed for water softening applications within the food and beverage industry. The fully automatic unit features flow control for alternate operation, counter-current regeneration and economic brine consumption with the lowest water losses.

Nominal flow rates: from 5-60 m³/h per unit

Features

- Siemens PLC S7 (i.e. CPU 1214C) with operator panel (i.e. KTP1000)
- Magnetic flow meter
- PP brine make up and storage tank, sufficient for several numbers of regeneration
- Regeneration depending on total water flow AND raw water hardness

Options

- Hardness monitoring
- Dilution water booster pump
- Integrated blending to adjust hardness

Applications

- Supply of soft water for utility processes (e.g. cooling, boiler feed, CIP, bottling areas)
- Reduction of hardness/carbonate scaling
- Improvement of product quality in food production processes (spirits, food, etc.)

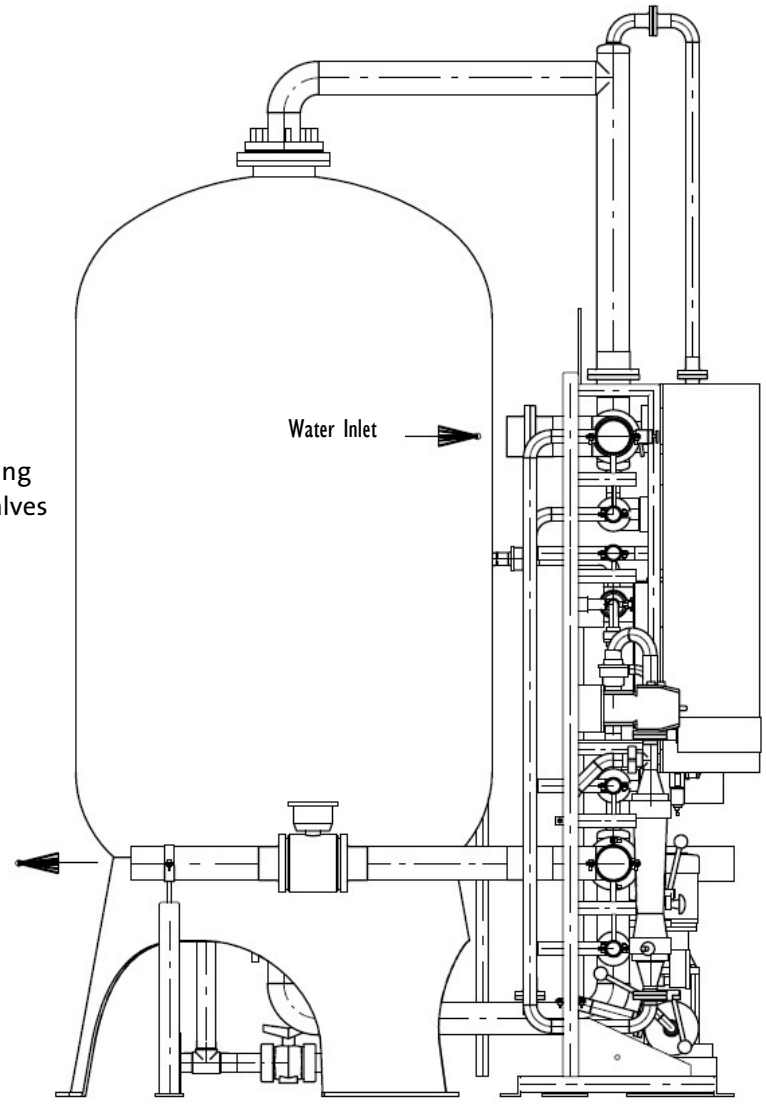
Benefits

- Hygienic frontal piping and sanitary disc valves
- Minimal water demands per regeneration
- Lowest salt and water demand due to counter-current BerCoRe regeneration process
- Safe and reliable operation and regeneration due to a fully automatic control system

BERKEFELD PurBev® Softener

BERKEFELD PurBev® – The Hygienic Design Standard

The BERKEFELD PurBev® hygienic standard is based on the expertise of our engineers specializing in beverage water solutions. It takes into account both legal requirements and international standards & directives applying to beverage water production.



Technical Data

- GRP tank incl. resin charge, with stainless steel piping system and pneumatically-controlled automatic valves
- PP salt dissolving and storage tank, brine piping designed in PP
- Stainless steel frame for installation and support of the pipework, instrumentation and controls
- Switch and control panel – SIEMENS PLC and OP
- Widely pre-mounted, for easy installation and commissioning

Operational data

Max. operating temperature	40 °C
Electrical connection	230 V, 50 Hz
Control air	6 bar
Operating pressure	3.0-8.5 bar

Types

Type	Capacity m³/h	Exchange capacity °d x m³	Salt required per Reg. kg	Water demand per Reg. m^3	Connection	Dimensions W/H/D mm
AW 2-550	2.7 – 27	1,565	49.5	2.8	DN 80/80	3400/2800/1500
AW 2-800	3.9 – 39	2,275	72.0	4.0	DN 100/80	4000/2900/1800
AW 2-1050	5.1 – 51	2,985	94.5	5.3	DN 100/80	4600/3000/1900
AW 2-1400	6.8 – 68	3,980	126.0	7.0	DN 100/100	4800/3100/2000

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VWT D 10/2016

UFLEX™ mk3

Ultrafiltration

UFLEX™ mk3 ultrafiltration systems are skid-mounted, reliable and compact solutions for removing suspended solids, most bacteria and log4 viruses.

• 5.8 to 27.1 m³/h (min. 50 lmh / max. 110 lmh) per skid
• 12 to 54 m³/h with 2 skids in parallel

FEATURES & BENEFITS

- Fully automatic operation with no operator involvement
- Automatic Hydraulic backflush & CEB backwash with connections
- Integrated and simple use controller for easy operation and maintenance
- Module vertical mounting for space saving
- Skid modular and flexible design enabling easy production capacity extension
- One controller to manage up to 2 skids in parallel mode for cost saving

APPLICATIONS

- Industrial process water*
- Swimming pool water
- Water recycling and reuse

Backwash buffer tank to complete the CEB
- City water station above
- Well water
- Surface water*
- Waste water*

* Coagulant dosing unit is necessary before filtration process and/or module recirculation pumps (excluded from our scope)

OPTIONS

- Inlet control valve
- CEB backwash station with dosing pumps
- Backwash buffer tank to complete the CEB station above
- One control cabinet for 2 units

HYDREX™ CHEMICALS

Hydrex™ 4000 water treatment chemicals from Veolia Water Technologies are recommanded for optimized plant operation.

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.

Performance

Model	Unit	64/1-P	128/2-P	192/3-P	256/4-P
Nb of elements per skid	-	1	2	3	4
Membrane Area	m²	64	128	192	256
Operating TMP	bar	0.5 – 1.0	0.5 – 1.0	0.5 – 1.0	0.5 – 1.0
Permeate Nominal Flowrate	m³/h	3.0 - 6.8	6.0 - 13.5	9.0 - 20.3	12.1 - 27.1
Flux ref. min/max	l/h/m²	50 - 110	50 - 110	50 - 110	50 - 110

Multi skids	Unit	2 x 192/3-P	2 x 256/4-P
Nb of skids	-	2	2
Nb of elements per skid	-	3	4
Membrane Area	m²	384	512
Operating TMP	bar	0.5 – 1.0	0.5 – 1.0
Permeate Nominal Flowrate	m³/h	19.2 - 42.4	27.1 - 59.6
Flux ref. min/max	l/h/m²	50 - 110	50 - 110

Dimensions (unit in operation)

Model	Unit	64/1-P	128/2-P	192/3-P	256/4-P
Total Installed Length	m	0.795	0.795	0.795	0.795
Total Installed Width	m	1.648	1.657	2.635	2.655
Total Installed Height	m	2.218 / 2.138*	2.224 / 2.144*	2.141 / 2.151*	2.276 / 2.194*

* with / without legs

Pipes Connections

Model	Unit	64/1-P	128/2-P	192/3-P	256/4-P
Feed	DN	40	50	65	80
Permeate	DN	40	50	65	80
Drain	DN	40	65	65	80
Backwash	DN	40	65	65	80

Feed Water requirements

Parameter	Unit	Value
General	City water/ Well/ surface water or waste water(1)	
Maximum Inlet TSS(2)	mg/l	< 20
Maximum Inlet particle size	mm	< 0.200
Minimum supply pressure	bar	6
Maximum Operating Temperature	°C	40

(1) For waste or surface water, coagulation unit is needed in front

(2) Above 20ppm TSS, to be validated by the Product Manager.

Power Requirements

Parameter	Unit	Value
Voltage	V	380 / 415
Frequency	Hz	50
Phases	-	3

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Beverage Water Solutions

BERKEFELD PurBev® Ultrafiltration

Hygienic Membrane System

The BERKEFELD PurBev® Ultrafiltration system is designed according to the hygienic design engineering standards, and rejects particles, pathogens, high molecular weight species and ultimately lower turbidity.

Customized & Flexible Rack Configurations

- Racks with two or four row modules
- Unilateral or bilateral arrangement
- Membrane surface 40-70 m²
- C4 coated frame profiles

Benefits

- Excellent efficiency by high product output
- Maximum stability – zero fiber breakage
- Robust design with high corrosion and pressure resistance
- Small foot print through space saving design
- High capacity with individual modules
- Simplified assembly by plug & play installation

BERKEFELD PurBev® – The Hygienic Design Standard

The BERKEFELD PurBev® hygienic standard is based on the expertise of our engineers specializing in beverage water solutions. It takes into account both legal requirements and international standards & directives applicable to beverage water production.

Standard Features

- Optimum operation by customized process design according to the water quality
- Intelligent and customized CIP/SIP concept
- Hygienic and EHEDG approved components
- Hygienic pipe design in 316L DIN 11850-2
- Self-draining pipe arrangement
- Energy optimized hydraulic design

Optional Features

- Stainless steel frame
- Advanced instrumentation in feed line
  - Turbidity measurement
  - Flow measurement
  - Temperature measurement
  - Overpressure protection
- Customized process design
  - Expandable with individual modules
  - Prefiltration with Y-Strainer or Berkofin

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SIRION™ Mini

Reverse Osmosis for Process Water

SIRION™ Mini reverse osmosis systems produce high purity water, removing up to 98% of dissolved inorganics and over 99% of large dissolved organics, colloids and particles.

Flow rates from **10 to 90 l/hr**

FEATURES & BENEFITS

- Low energy membranes result in lower operating pressures; cost savings
- Optimised flow:size ratio; space saving and efficient
- 5µm pre-filtration included within the unit; membrane protection
- Digital user interface; simple operation, monitoring of conductivity and temperature
- Dry run monitor; pump protection
- Treated water diverted at startup; ensures water quality
- Timed recirculation rinse; reduces membrane fouling

OPTIONS

- Output to PLC via analogue signal for conductivity monitoring

APPLICATIONS

- Industrial process water
- Boiler feed
- Micro Electronics
- Laboratory
- Hospitals
- Food and beverage industry
- Automotive industry

RELATED 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 Performance

Model		10-15 EP	10-40 EP	10-80 EP
Permeate*	l/hr	10-20	30-45	60-90
Feed*	l/hr	40	90	170
Typical Salt Rejection	%	96-98	96-98	96-98
Pump Motor Size	kW	0.25	0.25	0.25

**Flow rates are dependent on feed water quality, those quoted are typical values based on water at 12°C, 1000 ppm TDS & SDI <3.*

System Dimension

Model		10-15 EP	10-40 EP	10-80 EP
Height	mm	697	697	697
Depth	mm	380	380	380
Width	mm	450	450	450
Weight	kg	53	60	63

Pipe Connections

Model	10-15 EP	10-40 EP	10-80 EP
Feed Water (BSPP Male)	1/2”	1/2”	1/2”
Permeate (push in)	8 mm	8 mm	8 mm
Concentrate (push in)	8 mm	8 mm	8 mm

Feed Water Supply Quality

Potable water free from organic contamination, chlorine and suspended matter. Softening may be required for hard water areas.

Supply Pressure	min. 2 bar	max. 6 bar
temperature	min. 2°C	max. 25°C

Electrical Supply

All models 230V 50Hz standard.

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SIRION™ Midi

Reverse Osmosis for Process Water

SIRION™ Midi reverse osmosis systems produce high purity water, removing up to 98% of dissolved inorganics and over 99% of large dissolved organics, colloids and particles.

Flow rates from **90 to 800 l/hr**

FEATURES & BENEFITS

- Low energy membranes result in lower operating pressures; cost savings
- Optimised flow:size ratio; space saving and efficient
- 1µm pre-filtration included within the unit; membrane protection
- Programmable user interface; simple operation, monitoring and storage (14 days) of flow rate, conductivity and temperature values. (For PLC only).
- Modem & RS232 connections
- Dry run monitor; pump protection
- Treated water diverted at startup; ensures water quality
- Timed recirculation rinse; reduces membrane fouling

OPTIONS

- Output to PLC via analogue signal for conductivity monitoring

APPLICATIONS

- Boiler feed
- Industrial process water
- Cleaning and rinse waters
- Reuse / recycling
- Healthcare
- Pharmaceuticals
- Laboratory

HYDREX® CHEMICALS

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

RELATED 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 Performance

Model		10-100 EP	10-200 EP	10-300 EP	10-500 EP	10-750 EP
Permeate*	l/hr	90-110	180-220	280-330	450-550	650-800
Feed*	l/hr	150	300	450	750	1000
Typical Salt Rejection	%	96-98	96-98	96-98	96-98	96-98
Pump Motor Size	kW	0.56	0.56	0.56	1.5	1.5

**Flow rates are dependent on feed water quality, those quoted are typical values based on water at 12°C, 1000 ppm TDS & SDI <3.*

System Dimension

Model		10-100 EP	10-200 EP	10-300 EP	10-500 EP	10-750 EP
Height	mm	1010	1260	1260	1260	1260
Depth	mm	620	620	620	620	620
Width	mm	600	600	600	600	600
Weight	kg	59	61	68	73	95

Pipe Connections

Model	10-100 EP	10-200 EP	10-300 EP	10-500 EP	10-750 EP
Feed Water (push in)	12 mm	12 mm	12 mm	15 mm	15 mm
Permeate (push in)	12 mm	12 mm	12 mm	15 mm	15 mm
First Permeate (push in)	12 mm	12 mm	12 mm	15 mm	15 mm
Concentrate (push in)	12 mm	12 mm	12 mm	12 mm	12 mm

Feed Water Supply Quality

Potable water free from organic contamination, chlorine and suspended matter. A softened water supply is normally required.

Supply Pressure	min. 2 bar	max. 6 bar
temperature	min. 2°C	max. 25°C

Electrical Supply

10-100EP to 10-300EP models 230V, 1ph, 50 Hz standard
10-500EP & 10-750EP models 400V, 3ph-N-PE, 50 Hz standard

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SIRION™ Maxi

Reverse Osmosis for Process Water

SIRION™ Maxi reverse osmosis systems produce high purity water, removing up to 98% of dissolved inorganics and over 99% of large dissolved organics, colloids and particles.

Flow rates from **450 to 5000 l/hr**

FEATURES & BENEFITS

- Low energy membranes result in lower operating pressures; cost savings
- Optimised flow:size ratio; space saving and efficient
- 1µm pre-filtration included within the unit; membrane protection
- Programmable user interface; simple operation, monitoring and storage (14 days) of flow rate, conductivity and temperature values. (For PLC only).
- Modem & RS232 connections
- Dry run monitor; pump protection
- Treated water diverted at startup; ensures water quality
- Timed recirculation rinse; reduces membrane fouling

OPTIONS

- Output to PLC via analogue signal for conductivity monitoring

APPLICATIONS

- Boiler feed
- Industrial process water
- Cleaning and rinse waters
- Reuse / recycling
- Healthcare
- Pharmaceuticals

HYDREX® CHEMICALS

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

RELATED 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 Performance

Model		14-500 EP	14-750 EP	14-1000 EP	14-1500 EP	14-2000 EP	14-2500 EP	14-3000 EP	14-4000 EP	14-5000 EP
Permeate*	l/hr	450-500	650-800	950-1100	1450-1600	1950-2100	2450-2600	2900-3100	3800-4000	4700-5000
Feed*	l/hr	700	1000	1400	2000	2700	3300	4000	5200	6250
Typical Salt Rejection	%	96-98	96-98	96-98	96-98	96-98	96-98	96-98	96-98	96-98
Pump Motor Size	kW	2.2	2.2	2.2	4.0	4.0	4.0	4.0	4.0	5.5

**Flow rates are dependent on feed water quality, those quoted are typical values based on water at 12°C, 1000 ppm TDS & SDI <3.*

System Dimension

Model		14-500 EP	14-750 EP	14-1000 EP	14-1500 EP	14-2000 EP	14-2500 EP	14-3000 EP	14-4000 EP	14-5000 EP
Height	mm	1630	1630	1630	2358	2358	2358	2358	2950	2950
Depth	mm	1070	1070	1070	1070	1070	1145	1070	1200	1200
Width	mm	636	636	636	636	636	636	636	800	800
Weight	kg	200	220	240	290	330	370	410	300	325

Pipe Connections

Model	14-500 EP	14-750 EP	14-1000 EP	14-1500 EP	14-2000 EP	14-2500 EP	14-3000 EP	14-4000 EP	14-5000 EP
Feed	DN 20	DN 20	DN 20	DN 25	DN 25	DN 32	DN 32	DN 40	DN 40
Concentrate	DN 15	DN 15	DN 15	DN 15	DN 15	DN 25	DN 25	DN 25	DN 25
Permeate	DN 15	DN 15	DN 15	DN 25	DN 25	DN 25	DN 25	DN 32	DN 32
First Permeate	DN 15	DN 15	DN 15	DN 25	DN 25	DN 25	DN 25	DN 32	DN 32

Feed Water Supply Quality

Potable water free from organic contamination, chlorine and suspended matter. A softened water supply is normally required.

Supply Pressure	min. 2 bar	max. 6 bar
temperature	min. 2°C	max. 25°C

Electrical Supply

All models 380/415V, 3 phase, 50 Hz standard

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SIRION™ Advanced & Pro

Reverse Osmosis for Process Water

SIRION™ Advanced & Pro reverse osmosis system produce high purity water, removing up to 98% of dissolved inorganics and over 99% of large dissolved organics, colloids and particles.
Advanced version against Pro equipped with plastic covers granting protection and robust design.
Plug & play unit suitable for transportation into a container. All versions available according to European standards.

Flow rates from 100 to 5,000 l/h

Power

General Industry

FEATURES & BENEFITS

- Low energy Membranes result in lower operating pressure; cost savings.
- Feed salinity up to 1000 mg/l TDS (NaCl).
- 1 µm pre-filtration included within the unit for membrane protection.
- Dry run monitor; pump protection.
- Concentrate throttling valve for flow adjustment and concentrate recirculation.
- Instrument allocated in frontal control block part for comfortable accessibility and workability.
- Skid-mounted, standardized systems; short lead times, quick installation and start-up.
- CIP connections forwards installed.
- HMI Touchscreen 7" modern interface user friendly. Fully configurable and simple operation, monitoring of pressure, flow rate, conductivity and temperature values.
- AQUAVISTA™ compatible
- Data logging
- Comms via Modbus TCP or Aquavista
- OPC Compliant

APPLICATIONS

- Boiler feed
- Industrial process water
- Reuse / recycling
- Healthcare
- Biotechnologies
- Pharmaceuticals
- Hospitals
- Laboratory

OPTIONS

1) VFD for HP pump
2) Conductivity/temperature sensor feed water
3) pH measurement concentrate
4) Acid/caustic dosing station
5) Antiscalant dosing station
6) Raw water automatic / manual blending
7) Additional universal inputs / outputs

(1) AQUAVISTA™ is a cloud based program that allows you to monitor your system performance, day or night, with secure, real-time data available over any internet or cellular connection.
(2) All options available for Advanced model. Pro model compatible with options 1) 3) 6) 8).

HYDREX™ CHEMICALS

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

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

1000 mg/l configuration[1]	Unit	100	200	300	500	750	1000	1500	2000	3000	4000	5000
Inlet Salinity TDS (NaCl)	mg/l	Up to 1000 mg/l										
Typical Design Flux	l/h/m²	23-31										
Permeate Nominal Flowrate	l/h	100	200	300	500	750	1000	1500	2000	3000	4000	5000
Nominal Feed Flowrate	l/h	150	290	430	715	1070	1430	2145	2860	4285	5715	7145
Recovery	%	70-80										
Installed Power	kW	1.5 (Adv.) 0.5 (Pro)	1.5 (Adv.) 0.5 (Pro)	1.5 (Adv.) 0.5 (Pro)	1.5	1.5	2.2	3	3	3	5.5	5.5

Selection of models must be done following RO projections based on project specific inlet water characteristics.
(1) Flow rates and installed power are dependent on feed water quality, those quoted are typical values based on 1000 ppm TDS & SDI <3

Dimensions (unit in operation)

Model	Unit	100	200	300	500	750	1000	1500	2000	3000	4000	5000
Installed Length	m	0.80	0.80	0.80	0.80	0.80	0.96	0.96	0.96	1.11	1.60	1.60
Installed Width	m	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Installed Height	m	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76
Empty Weight	kg	190	195	200	220	230	280	300	320	375	590	600
Operating Weight	kg	199	208	220	242	260	322	359	396	483	765	776

Pipes Connections

Model	Unit	100	200	300	500	750	1000	1500	2000	3000	4000	5000
Feed	-	d22/18	d22/18	d22/18	d22/18	d22/18	DN 32	DN 32	DN 32	DN 32	DN 32	DN 32
Permeate	-	d15/12	d15/12	d15/12	d15/12	d15/12	DN 25	DN 25	DN 25	DN 25	DN 32	DN 32
Concentrate	-	d15/12	d15/12	d15/12	d15/12	d15/12	DN 25	DN 25	DN 25	DN 25	DN 25	DN 25
CIP Feed[2]	-	d15/12	d15/12	d15/12	d15/12	d15/12	1 ¼"	1 ¼"	1 ¼"	1 ¼"	1 ¼"	1 ¼"
CIP Permeate Outlet[2]	-	d15/12	d15/12	d15/12	d15/12	d15/12	1"	1"	1"	1"	1"	1"
CIP Concentrate Outlet	-	d15/12	d15/12	d15/12	DN 15	DN 15	DN 15	DN 15	DN 15	DN15	DN 20	DN 20

(2) BSPT (R/Rp) – British Standard Tapered Pipe, for pipes and tapered thread

Feed water requirements[3]

Well water or surface water

Parameter	Unit	Value
Minimum water temperature	°C	5
Maximum water temperature	°C	25
Minimum supply pressure	bar	2
Maximum supply pressure	bar	6
Max Silt Density Index (SDI)	-	< 3
Maximum Inlet Turbidity	NTU	< 1
Max inlet Iron Fe^{3+}	mg/l	< 0.05
Max inlet Manganese Mn^{2+}	mg/l	< 0.05
Max inlet Aluminium Al^{3+}	mg/l	< 0.05
Max Oil and Grease	mg/l	0
Max inlet Free Chlorine	mg/l	< 0.1

*(3) Non corrosive water. *** To consult Solys.*
Temperature range depending on TDS

Environmental conditions[4]

Parameter	Unit	Value
Minimum ambient temperature	°C	5
Maximum ambient temperature	°C	35
Maximum humidity	%	90

(4) Indoor Design. Non-corrosive atmosphere

Materials

Skid	Epoxy-polyester coated carbon steel
Low pressure Pipework	PP Advanced model PVC-U Pro model POM piping (small ranges)
HIgh pressure Pipework	SS DIN 1.4404 ISO R1127

Power requirements[5]

Voltage	230 V (100-300 model) 380 / 420 V
Frequency	50Hz
Phases	1 (100-300 model) 3

(5) Other voltage or frequency available on request.

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SIRION™ Mega

Reverse Osmosis for Process Water

SIRION Mega reverse osmosis system produce high purity water, removing up to 98% of dissolved inorganics and over 99% of large dissolved organics, colloids and particles.

Plug & play unit suitable for transportation into a container. 7 models available.

All versions available according to European standards.

Flow rates from **5 to 30 m³/h**

FEATURES & BENEFITS

- Low energy membranes result in lower operating pressure; cost savings.
- Feed salinity up to 1000 ppm TDS (NaCl).
- Chemical injections points only (no dosing set).
- 5 µm pre-filtration included within the unit for membrane protection.
- Dry run monitor; pump protection.
- Frequency controlled variable speed pump can save up to 50% of electrical power required by conventional systems.
- Concentrate throttling valve for flow adjustment.
- Concentrate Recirculation.
- Skid-mounted, standardized systems; short lead times, quick installation and start-up.
- CIP connections.
- Programmable user interface; simple operation, monitoring and storage of pressure, flow rate, conductivity and temperature values. (For PLC only.)
- Modem & RS232 connections.
- AQUAVISTA™(1) cloud based integration and reporting.

APPLICATIONS

SIRION Mega produces high purity water, purified water and utility water for:

- Boiler feed
- Industrial process water
- Cooling water
- Reuse / recycling
- Healthcare
- Biotechnologies
- Electronics
- Hospitals
- Chemical industry
- Primary metals

OPTIONS

- Concentrate dump valve
- 1st stage backpressure valve
- 1st stage CIP flush valve
- Permeate divert
- HMI/PLC version

(1) AQUAVISTA™ is a cloud based program that allows you to monitor your system performance, day or night, with secure, real-time data available over any internet or cellular connection.

HYDREX® CHEMICALS

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

RELATED 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

1 000 ppm configuration**	Unit	110x2	110x3	110x4	210x4	211x4	211x5	320x5
Feed water TDS (NaCl)	ppm	Up to 1000 ppm						
Typical design flux	l/m²h	30.5						
Permeate flowrate @ 12°C*	m³/h	5	7.5	10	15	20	25	30
Feed water flowrate @ 12°C*	m³/h	6.3	9.4	12.5	18.8	25	31.3	37.5
Recovery	%	80						
Installed power*	kW	7.5	11	11	15	18.5	22	30

Selection of models must be done following RO projections based on project specific inlet water characteristics.
** Flow rates and installed power are dependent on feed water quality, those quoted are typical values based on 1000 ppm TDS & SDI <3.*

System Dimensions

Model	Unit	110x2	110x3	110x4	210x4	211x4	211x5	320x5
Length	mm	4100	4100	4900	4900	4900	5900	5900
Width	mm	900	900	900	900	900	900	900
Height	mm	1750	1850	1850	1850	2150	2255	2280
Empty weight	kg	980	1100	1150	1200	1350	1700	1700

Pipes Connections

Model	110x2	110x3	110x4	210x4	211x4	211x5	320x5
Feed water	DN40	DN40	DN50	DN50	DN65	DN65	DN80
Permeate outlet (product)	DN40	DN40	DN40	DN50	DN50	DN65	DN65
Concentrate	DN40	DN40	DN40	DN40	DN40	DN40	DN50
CIP inlet / Permeate flush inlet	DN40	DN40	DN50	DN50	DN50	DN50	DN65
CIP outlet	DN40	DN40	DN40	DN50	DN50	DN50	DN65
Permeate outlet (to CIP)	DN40	DN40	DN40	DN50	DN50	DN50	DN50

Feed Water Supply Quality

Well water or surface water.

Parameter	Unit	Value
Min water temperature	°C	2
Max water temperature	°C	30
Min inlet pressure	bar.g	3
Max inlet pressure	bar.g	6
SDI max	-	3
Turbidity max	NTU	1
Iron and heavy metals	-	0
Oil, TSS and colloids	-	0
Free chlorine	Non detectable	

Non corrosive water.

Typical Treated Water Specifications and Performances

Parameter	Unit	Value
Typical salt rejection	%	96 - 98
Product pressure	Bar	Pump feed pressure

Environmental Conditions

Parameter	Unit	Value
Min ambient temperature	°C	5
Max water temperature	°C	35
Max Humidity (non-condensing)	%	90

Indoor Design. Non-corrosive atmosphere.

Materials

Frame	Epoxy coated carbon steel frame
Pipes *Low pressure*	PVC
Pipes *High pressure*	SS 316

Power Requirements

Voltage	380 / 420 V
Frequency	50 Hz
Phases	3

Other voltage or frequency available on request.

Other Specifications

Parameter	Unit	Value
Service air requirement	bar.g	6 (max)
Permeate pressure	bar.g	= Inlet pressure

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SIRION™ Mega HF

High Flow and Low Energy Reverse Osmosis for Process Water

SIRION Mega HF reverse osmosis system produce high purity water, removing up to 98% of dissolved inorganics and over 99% of large dissolved organics, colloids and particles.

Plug & play unit suitable for transportation into a container. Six models available.

Configurable for feed water TDS of 1000 ppm, 3000 ppm or 5000 ppm (NaCl).

All versions available according to European standards.

Flow rates from **32 to 139 m³/h**

FEATURES & BENEFITS

- Low energy membranes result in lower operating pressure; cost savings.
- Frequency controlled variable speed pump (VFD) can save up to 50% on electrical power compared to conventional systems.
- 5 µm pre-filtration included within the unit for membrane protection.
- Dry run monitor; pump protection.
- Raw water rinsing.
- Concentrate throttling valve for flow adjustment.
- Skid-mounted, standardized systems; short lead times, quick installation and start-up.
- CIP manual valves.
- Built-in Ethernet port, touch screen HMI and AQUAVISTA™(1) ready to facilitate local or remote monitoring and operation.
- Permeate pressure bleed valve.
- Chemical injections points only (no dosing set).

(1) AQUAVISTA™ is a cloud based program that allows you to monitor your system performance, day or night, with secure, real-time data available over any internet or cellular connection.

APPLICATIONS

SIRION Mega produces high purity water, purified water and utility water for:

- Boiler feed
- Industrial process water
- Cooling water
- Reuse / recycling
- Healthcare
- Biotechnologies
- Electronics
- Hospitals
- Chemical industry
- Primary metals

OPTIONS

- Feed ORP measurement
- Feed pH measurement
- Feed Conductivity measure
- Concentrate Recirculation
- External CIP skid
- AQUAVISTA™(1) cloud based integration and reporting
- Set of Automatic valves for:
  - > RO flush with permeate (need CIP tank and pump)
  - > Semi-Automatic CIP

HYDREX® CHEMICALS

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

RELATED 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

1 000 ppm configuration**	Unit	420 x 6	420 x 7	840 x 6	840 x 7	1260 x 6	1260 x 7
Feed water TDS (NaCl)	ppm	Up to 1000 ppm					
Typical design flux	l/m²h	27					
Permeate flowrate @ 12°C* (Range)	m³/h	39.7 (32-40)	44 (37-47)	79.5 (64-80)	88 (75-93)	119.3 (96-119)	132 (112-139)
Feed water flowrate @ 12°C* (Range)	m³/h	52.9 (40-53)	53.7 (46-56)	106 (78-106)	107.3 (91-112)	159.1 (117-160)	161 (137-168)
Recovery (Range)	%	75 (70-82)	82 (70-82)	75 (70-82)	82 (70-82)	75 (70-82)	82 (70-82)
Installed power*	kW	37	37	75	75	90	90

Selection of models must be done following RO projections based on project specific inlet water characteristics.
** Flow rates and installed power are dependent on feed water quality, those quoted are typical values based on 1000 ppm TDS & SDI <3.*
*** Up to 5000 ppm TDS upon request.*

System Dimensions

Model	Unit	420 x 6	420 x 7	840 x 6	840 x 7	1260 x 6	1260 x 7
Length	mm	6 875	7 920	6 875	7 920	6 875	7 920
Width	mm	1 300	1 300	1 705	1 705	2 200	2 200
Height	mm	2 800	2 800	2 830	2 830	2 830	2 830
Empty weight	kg	3 200	3 550	5 000	5 400	6 300	6 800
Operating max weight	kg	4 700	5 200	7 800	8 700	10 500	11 800

Pipes Connections

Model	420 x 6	420 x 7	840 x 6	840 x 7	1260 x 6	1260 x 7
Feed water	DN 100	DN 100	DN 150	DN 150	DN 150	DN 150
Permeate outlet (product)	DN 80	DN 80	DN 150	DN 150	DN 150	DN 150
Concentrate	DN 50	DN 50	DN 80	DN 80	DN 100	DN 100
CIP inlet / Permeate flush inlet	DN 65	DN 65	DN 100	DN 100	DN 100	DN 100
CIP outlet	DN 65	DN 65	DN 100	DN 100	DN 100	DN 100
Permeate outlet (to CIP)	DN 65	DN 65	DN 100	DN 100	DN 100	DN 100

Feed Water Supply Quality

Well water or surface water.

Parameter	Unit	Value
Min water temperature	°C	2
Max water temperature	°C	30
Min inlet pressure	bar.g	3
Max inlet pressure	bar.g	6
SDI max	-	3
Turbidity max	NTU	1
Iron and heavy metals	-	0
Oil, TSS and colloids	-	0
Free chlorine	Non detectable	

Non corrosive water.

Typical Treated Water Specifications and Performances

Parameter	Unit	Value
Typical salt rejection	%	96 - 98
Product pressure	Bar	Pump feed pressure

Environmental Conditions

Parameter	Unit	Value
Min ambient temperature	°C	5
Max water temperature	°C	35
Max Humidity (non-condensing)	%	90

Indoor Design. Non-corrosive atmosphere.

Materials

Frame	Epoxy coated carbon steel frame
Pipes *Low pressure*	PVC
Pipes *High pressure*	SS 316

Power Requirements

Voltage	380 / 420 V
Frequency	50 Hz
Phases	3

Other voltage or frequency available on request.

Other Specifications

Parameter	Unit	Value
Service air requirement	bar.g	6 (max)
Permeate pressure	bar.g	= Inlet pressure

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SIRION™ Sea Water

Reverse Osmosis for Process Water

**SIRION™ Sea Water reverse osmosis systems are specifically designed to treat seawater.
They reject over 99% of the salt contained within the feed water.
Flow rates for standard systems range from 1 to 41 m³/hr for feed waters of up to 36 000 ppm (TDS).**

FEATURES & BENEFITS

- Standardised and skid-mounted; short lead times and quick start-up
- Small footprint; easily integrated into existing plant
- Chemical pre-treatment; protects the RO membranes
- High pressure pump with variable frequency drive; efficient and quiet operation
- Energy recovery device for high flow rate models; energy savings of 35-55%
- State-of-the-art RO membranes
- Flushing and chemical cleaning system; removes salt deposits, prevents scaling and maintains system performance
- Touch screen interface for easy operation
- PLC control

APPLICATIONS

- Production of potable water
- Agricultural irrigation
- Industrial process water

HYDREX® CHEMICALS

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

RELATED SERVICES

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

Equipment Performance & Dimensions

Model	Flow @ 20°C		Recovey	Dimensions		Membranes	Pump
	Feed	Permeate		WxDxH	Weight	Quantity	Power
	m^3/hr	m^3/hr	%	m	kg	-	kW
D-25	5.30	1.06	20	3x1.7x2.2	1600	2	18.5
D-50	6.42	2.12	33	3x1.7x2.2	1700	4	22
D-75	7.95	3.18	40	4x1.7x2.2	1800	6	22
D-100	10.60	4.24	40	5x1.7x2.2	1900	8	2x15
D-125	13.25	5.30	40	6x1.7x2.2	2000	10	2x22
D-150	15.88	6.35	40	4x1.7x2.2	2100	12	2x22
D-190-PX	19.88	7.95	40	6.5x1.7x2.2	2200	15	22+2.2
D-230-PX	23.88	9.55	40	8x2x2.2	3100	18	30+2.2
D-270-PX	26.55	11.15	42	8.5x2x2.2	3400	21	2x18.5+3
D-360-PX	35.36	14.85	42	8.5x2x2.2	3700	28	2x22+3
D-450-PX	44.17	18.55	42	9x2x2.2	4025	35	2x30+4
D-530-PX	52.98	22.25	42	10x2x2.2	4325	42	55+5.5
D-620-PX	61.90	26.00	42	10x2.15x2.2	4525	49	55+5.5
D-710-PX	70.48	29.60	42	10x2.15x2.2	4530	56	75+7.5
D-800-PX	79.45	33.37	42	10x2.15x2.2	4535	63	75+7.5
D-890-PX	88.33	37.10	42	10x2.15x2.2	4600	70	90+7.5

Pipe Connections

Low Pressure	
Prefilter Housing	Polyamide (PA)
Filter Element	Polypropylene
Dosing Pumps	PVC head, teflon-coated EPDM diaphragm
Chemical Product Tanks	PE
Flushing and Chemical Cleaning Tank	FRP
Flushing and Chemical Cleaning Pump	Stainless steel
Piping and Accessories	PVC-U / PN-16
High Pressure	
High-Pressure Pump	Stainless Steel AISI 904-L / Super Duplex
	(depending on the model)
Pressure Vessels	FRP
RO Membranes	Link crossed aromatic polyamide (8")
Piping and Accessories	Stainless steel for seawater applications
	AISI 904-L (Standard) ZERON/ 254 SMO (Options)
Skid	Epoxy-painted carbon steel

Feed Water Supply Quality

Raw Water Design Temperature	°C	20
Raw Water Maximum Turbidity	NTU	1
Raw Water Minimum Pressure	bar	3
SDI		<3

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NURION™

Reverse Osmosis Systems for Water Ingredient

NURION™ reverse osmosis systems produce high purity ingredient water for the Food Industry.
Plug & play unit suitable for transportation into a container.
FAT tested unit. Ready for CIP operation (CIP valves included).

Nominal flow rate from **5 to 25 m³/hr**

FEATURES & BENEFITS

- Low energy membranes result in lower operating pressures
- Frequency controlled variable speed pump
- Permeate line deisgn and equipment following EHEDG hygienic design principles
- 1 µm pre-filtration
- Programmable user interface; simple operation, monitoring and storage
- Treated water diverted at start-up; ensures water quality
- All piping, fittings and valves on feed, reject and permeate line in stainless steel
- All non-metallic materials (pressure vessels, membranes, sealings/gaskets) are in accordance to at least one drinking water or FDA/NSF/ACS regulations
- 12" touchscreen panel with TFT widescreen colour display
- PLC with Ethernet connection (Siemens)
- Aquavista™* enabled(1)

APPLICATIONS

- Ingredient water for food production

OPTIONS

- PLC + HMI Allen Bradley
- Inlet pH and ORP measurements
- Control cabinet in SS
- Frame in SS
- Concentrate recirculation line
- Witnessed FAT (with wet tests)

(1)AQUAVISTA™ is a cloud based program that allows you to monitor your system performance, day or night, with secure, real-time data available over any internet or cellular connection.

HYDREX® CHEMICALS

Hydrex™ 4000 water treatment chemicals from Veolia Water Technologies are recommanded for optimized plant operation.

RELATED SERVICES

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

Subscription to Aquavista™ digital services (asset monitoring, benchmarking, improvement and management, digital training).

System Operating Parameters

	Unit	110x2	110x3	110x4	210x4	211x4	211x5
Feed water TDS (NaCl)	ppm	Up to 1000 ppm					
Typical design flux	l/m²h	30.5					
Permeate flowrate @ 12°C*	m³/h	5	7.5	10	15	20	25
Feed water flowrate @ 12°C*	m³/h	6.3	9.4	12.5	18.8	25	31.3
Recovery	%	80					
Installed power*	kW	7.5	11	15	15	22	37

Selection of models must be done following RO projections based on project specific inlet water characteristics.
** Flow rates and installed power are dependent on feed water quality, those quoted are typical values based on 1000 ppm TDS & SDI <3.*

System Dimensions

Model	Unit	110x2	110x3	110x4	210x4	211x4	211x5
Length	mm	4000	4100	4850	4850	4850	5900
Width	mm	860	860	860	900	900	900
Height	mm	1650	1650	1750	1750	1920	1967
Empty weight	kg	990	1120	1240	1375	1625	2195

Pipes Connections

Model	110x2	110x3	110x4	210x4	211x4	211x5
Feed water	DN50	DN50	DN50	DN50	DN65	DN65
Permeate outlet (product)	DN40	DN40	DN40	DN50	DN50	DN65
Concentrate	DN40	DN40	DN40	DN40	DN40	DN40
CIP inlet	DN50	DN50	DN50	DN50	DN50	DN50
CIP outlet	DN40	DN40	DN40	DN50	DN50	DN50
Permeate outlet (to CIP)	DN40	DN40	DN40	DN50	DN50	DN50

Feed Water Supply Quality

Well water or surface water.

Parameter	Unit	Value
Min water temperature	°C	2
Max water temperature	°C	30
Min inlet pressure	bar.g	3
Max inlet pressure	bar.g	6
SDI max	-	3
Turbidity max	NTU	1
Iron and heavy metals	-	0
Oil, TSS and colloids	-	0
Free chlorine	Non detectable	

Non corrosive water.

Typical Treated Water Specifications and Performances

Parameter	Unit	Value
Typical salt rejection	%	96 - 98
Product pressure	Bar	Pump feed pressure

Environmental Conditions

Parameter	Unit	Value
Min ambient temperature	°C	5
Max water temperature	°C	35
Max Humidity (non-condensing)	%	90

Indoor Design. Non-corrosive atmosphere.

Materials

Frame	Epoxy coated carbon steel frame
Pipes	SS 316

Power Requirements

Voltage	380 / 420 V
Frequency	50 Hz
Phases	3

Other voltage or frequency available on request.

Other Specifications

Parameter	Unit	Value
Service air requirement	bar.g	6 (max)
Permeate pressure	bar.g	= Inlet pressure

Other specs on request.

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Beverage Water Solutions

BERKEFELD PurBev® Reverse Osmosis

Hygienic Membrane System

BERKEFELD PurBev® Reverse Osmosis systems remove impurities and particles larger than 10^{-3} µm at efficiencies greater than 99%:

- **Inorganic compounds (i.e. sulfate, nitrate)**
- **Large organic molecules (>100 MW, pesticides)**
- **Organisms like bacteria and viruses**
- **Reaction by-products**
- **Anthropogenic trace elements**

Nominal permeate flow rates: 10-100 m³/h

Configurations:

- Single pass / Double pass / Three Pass
- High recovery up to 96 %
- With Cleaning In Place (CIP) unit
- Integrated blending line for optimal salt composition of product water

Applications

The BERKEFELD PurBev® Reverse Osmosis is designed according to the hygienic engineering design standards and meets the highest performance requirements of our customers in the food and beverage industry:

- Production of bottled water
- Production of soft drinks and juices
- Production of brewing water
- Condensate recovery in the dairy industry
- Process water re-use

BERKEFELD PurBev® – The Hygienic Design Standard

The BERKEFELD PurBev® hygienic standard is based on the expertise of our engineers specializing in beverage water solutions. It takes into account both legal requirements and international standards & directives applicable to beverage water production.

Standard Features

- Optimum operation by customized process design according to the water quality
- Chemical pre-treatment
- Intelligent and customized CIP/SIP concept
- Hygienic and EHEDG approved components
- Hygienic pipe design in 316L DIN 11850-2
- Self-draining pipe arrangement
- Assurance of full de-aeration
- Unique sterile sample valve system on each pressure vessel
- Energy optimized hydraulic design
- Low energy membranes

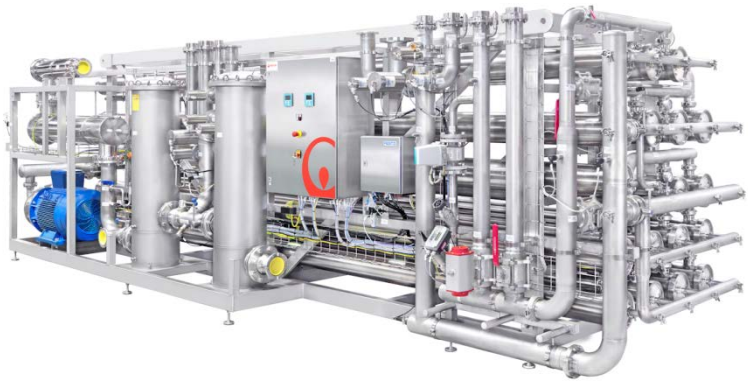
Benefits

- Optimum product quality and safety by minimization of microbial risks
- Customized arrangement of standardized BERKEFELD PurBev® design series components
- Reliable cleanability and disinfection
- Easy dismantling of piping and equipment for convenient maintenance
- Economical & highly efficient operation: minimized water losses and energy savings
- Long lifetime due to robust and high quality materials

BERKEFELD PurBev® Reverse Osmosis

Typical Operational Data

Operating pressure	7-12 bar
Operating temperature	10-35 °C
Max. SDI	3
pH value (operation & CIP)	2-11
Sanitization temperature (optional)	1-80 °C
Max. pressure difference per PV	3.5 bar



Standard Configuration

Reverse Osmosis Unit

- RO skid 1.4301 / 304L
- Pressure vessels (PV)
  - 4-6 membranes per PV
  - Victaulic for side ports & permeate
  - FRP for CIP up to 40°C
- Customized membranes
- Cartridge filter
  - 1-5µm pore size
  - Stainless steel flanged connection
- Dosing stations
  - Antiscalant, Bisulphite
  - Acid/caustic pH correction
- Control Cabinet
  - Stainless steel
  - IP 54
- CIP Station
  - Manual or semi- / automatic
  - Piping and CIP tank in PP

Piping & Valves

- 1.4404 (316L) acc. DIN 11850-2
  - Hygienic design without dead legs
- Automatic pipe de-aeration valves
- EPDM seals with FDA approval
- Valves
  - Aseptic disc valves AWH
  - Welded ends acc. DIN 11864-2
- Permeate Sample Valve
  - Servinox PEMS 2 with clamp connection
- Solenoid Valves
  - Pre-mounted stainless steel cabinet
  - Festo CPV10 including Profibus
- HP Pump
  - KSB Movitec or Grundfos
  - Wetted parts 304 or 316L
- Frequency controlled

Instrumentation

- Manometer
  - Clamp connection acc. DIN 32676 DN25
- Pressure Transmitter
  - WIKA or Endress & Hauser
  - Sanitary threaded connection or clamp
- Flowmeter
  - Endress & Hauser Promag 10 W (welded ends)
- Conductivity
  - Endress & Hauser CLM223 + CLS15
- With clamp connection

Optional System Configuration

Customized Process Design	• Advanvced RO concentrate recovery • Ultraviolet (UV) disinfection prior to RO (integrated in RO skid) • Blending line according to required product quality
Hot Water Sanitation	• Stainless steel CIP tank and piping • Electrical heater and automatic drain CIP tank
Advanced Instrumentation	• Extended measurements in feed line: conductivity, pH, oxidation redox potential (ORP) • Monitoring of water, chemicals and power consumption

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VWT D 10/2016

DUO ECLIPSE™ Deioniser

Deionisation Systems

Duo Eclipse™ two stage deionisers remove up to 98% of total dissolved solids and will typically reduce water with a conductivity of less than 20 µS/ cm.

Flow rates from **0.25 to 4 m³/h**

FEATURES & BENEFITS

- Skid-mounted, standardised systems; short lead-times, quick installation and start-up
- Electronic control panel with indication lamps, conductivity monitoring, manual override; simple to use, operational flexibility
- Automatic regeneration through conductivity control

APPLICATIONS

- Industrial process water
- Boiler feed water

OPTIONS

- Regenerant storage system with low level chemical switches, linked to Duo Eclipse™ control panel; minimizes chemical handling, insufficient chemicals alarm
- Inlet cartridge filter; prevents particulate matter from entering resin beds
- Acid fume system for carbon operation; reduces fumes to atmosphere

RELATED 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 Performance

Model		150	300	400
Flow Rates	m^3/hr	0.25 - 1.5	0.5 - 3.0	1.0 - 4.0
Operating Pressures	bar	4.0 - 6.0	4.0 - 6.0	4.0 - 6.0
Pressure Loss at Max. Flow	bar	1.6	2.8	3.0
Regeneration Time (50 Hz Max.)	hours	2.3	3	3.0
Max. Flow to Drain	m^3/hr	2.0	2.8	4.0
Effluent Volume per Regen. (Approx)	m^3	1.0	1.6	2.0
HCl (28% w/w) Usage per Regen.	l	11	23	41
NaOH (30% w/w) Usage per Regen.	l	10	24	37.5
Output per Regen. (100 mg/l Total Anion Load as $CaCO_3$ Inc. CO_2 & SiO_2)	m^3	25	60	100

System Dimensions, Weights & Connections

Model		150	300	400
Height	mm	1505	1965	2050
Depth	mm	670	670	700
Width (Exc. Regen. Containers)	mm	870	1070	1250
Recommended Headroom	mm	1000	1000	1000
Recommended Rear Access	mm	1000	1000	1000
Approx. Service Weight	kg	480	835	950
Inlet	inches	1	1	1
Outlet	inches	1	1	1
Drain	inches	1	1	1

Treated Water Quality

Model		150	300	400
TDS (Approx)	mg/l	<10	<10	<10
Conductivity	µS /cm	Maximum: <30 Average: <20		

Material Specifications

Pressure Vessels	Composite plastic
Pipework	ABS and uPVC
Skid	Epoxy coated mild steel
Control Valves	Noryl plastic
Control Cabinet	IP54 enclosure

Feed Water Supply Quality

Potable water free from organic contamination, chlorine and suspended solids.
Temperature: min. 5°C max. 35°C

Electrical Supply

240V or 110V single phase, 50/60 Hz.

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RAPIDE STRATA™ MK3

Ion Exchange Deionisation for Process Water

Rapide Strata two-bed or three-bed units produce high purity water for a range of industrial applications. The unique design offers savings of up to 40% on operational and wastewater costs compared to conventional deionisation systems.

Flow rates from **2.5 to 18 m³/h**

FEATURES & BENEFITS

- 2 models available, Rapide Strata and Rapide Strata+ in varying sizes
- Standard regeneration in 35-80 minutes: minimizes down time, enhances bacterial control, improves chemical usage efficiencies
- Control system PLC, Touch Screen HMI, Veolia AQUAVISTA™ Ready: facilitate monitoring and operation
- Duplex operation mode for continuous water production: increased production capacity
- Continuous conductivity monitor with auto service shutoff and alarm: ensures water quality
- Continuous, intermittent or zero recirculation of water when tank reaches high point: operational flexibility
- Skid-mounted, standardised systems: short lead times, quick installation and start-up

APPLICATIONS

- Pharmaceutical
- Beverage
- High and medium pressure boiler feed
- Surface finishing
- General industry

RAPIDE STRATA+ MODEL

- Integrated polishing device (Hipol™)
- Eliminates need for separate post deionisation step
- Produces water exceeding Ph Eur and USP conductivity requirements

EXTENDED REGENERATION OPTION ON STRATA+ MODELS

- Capable of producing water with <20 ppb of reactive silica; suitable for high and medium pressure boiler-feed
- Produces water of <0.1 µS/cm; polishing RO water

RELATED SERVICES

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

Equipment Performance

		Rapide™ Strata			Rapide™ Strata+		
Model		**4**	**10**	**18**	**4+**	**10+**	**18+**
Maximum Gross Flow*	**m^3/hr**	4	10	18	4	10	18
Minimum Flow	**m^3/hr**	2	5	9	2	5	9
Regeneration Time**	**minutes**	35	35	35	35 - 45**	35 - 45**	35 - 45**
Maximum Flow to Drain during Regeneration	**m^3/hr**	2.5	6.5	11.5	2.5	6.5	11.5
Effluent Volume per Regeneration*	**m^3**	0.7	1.5	2.7	0.7	1.5	2.7
Chemical Usage per Regeneration**							
HCl (32%)	**litres**	6.2	15.4	27.8	6.2	15.4	27.8
NaOH (32%)	**litres**	5.8	14.5	26.1	5.8	14.5	26.1
Bulked Effluent	**pH**	6 - 9	6 - 9	6 - 9	6 - 9	6 - 9	6 - 9
Output per Regeneration (100 mg/l Total Anion load as $CaCO_3$ Inc CO_2 & SiO_2)	**m^3**	20.4	51.6	93.6	16.8	42	75.6
Power Consumption - Max.	**kW**	1.5	3	5.5	1.5	3	5.5

** The maximum available flow-rate depends on the TDS of the feed water and the number of regenerations per day. Wastewater volume depends on treated water quality.*

*** Standard regeneration for Rapide Strata+ takes 35 minutes for treated water with a conductivity of < 1uS/cm. For a treated water with a conductivity of <0.1uS/cm and SiO2 <20ppb, regeneration time is 80 minutes. Chemical consumption is calculated for treated water with a conductivity of <2uS/cm.*

Equipment Dimensions

Model		**4**	**10**	**18**	**4+**	**10+**	**18+**
Height	**mm**	2075	2130	2230	2075	2130	2230
Depth	**mm**	900	1100	1300	900	1100	1300
Width	**mm**	1500	2000	2080	1500	2000	2080
Recommended Headroom	**mm**	1000	1000	1000	1000	1000	1000
Approx. Service Weight	**kg**	650	1550	1950	680	1580	2000
Feed Inlet (uPVC Socket Union)		DN40	DN50	DN80	DN40	DN50	DN80
Service Outlet (uPVC Socket Union)		DN32	DN40	DN50	DN32	DN40	DN50
Regeneration Water Inlet (uPVC Socket Union)		DN40	DN50	DN80	DN40	DN50	DN80
Drain (uPVC Socket Union)		DN25	DN32	DN40	DN25	DN32	DN40

Typical Treated Water Quality

	TDS (mg/l)	Conductivity (µS/cm)
Rapide™ Strata	<1	max. 5; average <2
Rapide™ Strata+	<0.2	1-0.1

Material Specifications

Resin Vessels	Composite plastic
Pipework	PVC-U
Pump	316 stainless steel multistage centrifugal
Skid	Epoxy coated mild steel
Control Valves	Air operated diaphragm valves
Control Cabinet	Epoxy coated steel to IP54

Feed Water Requirements

Potable water free from organic contamination, chlorine and suspended solids.

Pressure

Unpressurised via local break tank, or max. 1.2 bar

Temperature

min. 5°C max. 30°C (to 35°C max on request)

TDS max. 500 mg/l

Conductivity max. 700 µS/cm

Electrical Supply Options

380/415V, 3 Phase, 50 HZ standard or adapted to customers requirements on request.

Air Supply

5.5 - 6.0 Bar, Instrument Quality, 5 litres per minute intermittent

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RAPIDE STRATA™ MK4

Short Cycle Regeneration Ion Exchange Deionisation for Process Water

Rapide Strata two-bed or three-bed units produce high purity water for a range of industrial applications. The unique design offers savings of up to 40% on operational and wastewater costs compared to conventional deionisation systems. Versions available according to American and European standards.

Flow rates from **12 to 60 m³/h**

FEATURES & BENEFITS

- 3 models available, Rapide Strata, Rapide Strata+ and Rapide Strata+ Extended Regeneration in varying sizes
- Standard regeneration in 35-80 minutes: minimizes down time, enhances bacterial control, improves chemical usage efficiencies
- Control system PLC, Touch Screen HMI, Veolia AQUAVISTA™ Ready: facilitate monitoring and operation
- Duplex operation mode for continuous water production: increased production capacity
- Continuous conductivity monitor with auto service shut-off and alarm: ensures water quality
- Continuous, intermittent or zero recirculation of water when tank reaches high point: operational flexibility
- Skid-mounted, standardised systems: short lead times, quick installation and start-up
- Variable frequency drive (VFD) on the pump on larger models (23/23+ to 60/60+)

APPLICATIONS

- Pharmaceutical
- Beverage
- High and medium pressure boiler feed
- Surface finishing
- General industry

OPTIONS

- Automatic isolating valves on diluted chemical feed lines
- Pressure gauges in addition to pressure transmitters
- Multipurpose water pump non return valve
- Feed water manual isolating valve
- Resin trap strainer on deionized water outlet

RAPIDE STRATA+ MODEL

- Integrated polishing device (Hipol™)
- Eliminates need for separate post deionisation step
- Produces water exceeding Ph Eur and USP conductivity requirements

EXTENDED REGENERATION OPTION ON STRATA+ MODELS

- Capable of producing water with <20 ppb of reactive silica; suitable for high and medium pressure boiler-feed
- Produces water of <0.1 µS/cm; polishing RO water

RELATED SERVICES

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

Equipment Performance

		Rapide Strata™				Rapide Strata™+			
Model		**23**	**32**	**45**	**60**	**23+**	**32+**	**45+**	**60+**
Maximum Gross Flow*	**m³/hr**	23	32	45	60	23	32	45	60
Minimum Flow	**m³/hr**	12	16	20	30	12	16	20	30
Regeneration Time**	**min**	35-55	35-55	35-55	35-55	35-80	35-80	35-80	35-80
Waste Flow to Drain during Regeneration (Approx.)	**m³/hr**	22	30.5	43	57	22	30.5	43	57
Wastewater Volume per Regeneration***	**m³**	4.5	7	9.5	12.6	4.5	7	9.5	12.6
Bulked wastewater	**pH**	6 - 9	6 - 9	6 - 9	6 - 9	6 - 9	6 - 9	6 - 9	6 - 9
Chemical Usage per Regeneration****									
HCl (32%)	**liters**	41	57	78	100	41	57	78	100
NaOH (32%)	**liters**	38.2	54	64.3	78.2	38.2	54	64.3	78.2
Output per Regeneration (100 mg/l Total Anion load as $CaCO_3$ Inc CO_2 & SiO_2)	**m³**	143	201	240	292	115	162	194	236
Pump motor power	**kW**	7.5	7.5	11	15	7.5	7.5	11	15

** The maximum available flow-rate depends on the TDS of the feed water and the number of regenerations per day.*
*** Standard regeneration for Rapide Strata+ takes 35 minutes for treated water with a conductivity of < 1µS/cm.*
For a treated water with a conductivity of < 0,1 µS/cm and SiO2 <20 ppb, regeneration time is 80 minutes.
**** Wastewater volume depends on treated water quality.*
***** Chemical consumption is calculated for treated water with a conductivity of < 2µS/cm.*

Equipment Dimensions

Model		**23**	**32**	**45**	**60**	**23+**	**32+**	**45+**	**60+**
Height	**mm**	3035	3035	3185	3185	3035	3035	3185	3185
Length	**mm**	3000	3000	3600	3600	3500	3500	4500	4500
Width	**mm**	1900	1900	2100	2100	1900	1900	2100	2100
Recommended Headroom	**mm**	1000	1000	1000	1000	1000	1000	1000	1000
Approx. Service Weight	**kg**	3000	3800	6050	7240	3220	4030	6250	7450
Feed Inlet (uPVC Socket Union/ Flange DN)*	-	DN80	DN100	DN100	DN125	DN80	DN100	DN100	DN125
Service Outlet (uPVC Socket Union/Flange DN)*	-	DN65	DN80	DN100	DN100	DN65	DN80	DN100	DN100
Regeneration Water Inlet (uPVC Socket Union/Flange DN)*	-	DN80	DN100	DN100	DN125	DN80	DN100	DN100	DN125
Drain (uPVC Socket Union/ Flange DN)*	-	DN80	DN80	DN100	DN100	DN80	DN80	DN100	DN100

** Socket unions: for Rapide Strata models 4/4+ to 18/18+. Flanges: for Rapid Strata models 23/23+ to 60/60+.*

Typical Treated Water Quality

	TDS (mg/l)	Conductivity (µS/cm)
Rapide Strata	<1	max. 5; average <2
Rapide Strata+	<0.2	1-0.1

Typical Treated Water Quality

Resin Vessels	Glass Reinforced Plastic
Pipework	uPVC
Pump	316 stainless steel multistage centrifugal
Skid	Epoxy coated carbon steel
Control Valves	Air operated diaphragm valves or butterfly valves
Control Cabinet	Epoxy coated steel - IP54

Feed Water Requirements

Potable water free from organic contamination, chlorine and suspended solids.

Pressure
Unpressurised via local break tank, or max. 1.2 bar

Temperature
min. 5°C max. 30°C (to 40°C max on request)

TDS max. 500 mg/l

Conductivity max. 700 µS/cm

Electrical Supply Options

Rapide Strata 23: 3x220-277V 50/60 HZ IEC

Rapide Strata 32 to 60: 3x380-480V 50/60 HZ IEC

Air Supply

5,5 - 6,0 Bar, Instrument Quality, 10 liters per minute intermittent.

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WAPOL

Continuous Electrodeionisation

Wapol polish reverse osmosis permeate to produce high purity water of up to 18 MΩ.cm.

Flow rates from **1.4 to 40.8 m³/h**

FEATURES & BENEFITS

- Chemical free operation, no regeneration downtime; continuous flow, consistent water quality
- Skid-mounted, standardised systems; short lead-times, quick installation and start-up
- Up to 8 CEDI modules per skid; flexibility, high flow rates

CEDI Modules

- Double o-ring seal; leak-free operation
- Completely filled concentrating compartments; no need for recirculation pump and brine injection
- Plate-and-frame arrangement gives an equal distribution of fluid and current flow; improves performance and module longevity

APPLICATIONS

- Power
- HPI/CPI
- High pressure boiler feed
- Industrial process water
- Food & Beverage industry
- Electronics

IONSOFT™

- When using caustic soda for decarbonation, a softener is needed. Refer to our Ionsoft standard softener product range.

HYDREX® CHEMICALS

Hydrex® 5000 water treatment chemicals from Veolia Water Technologies should be used for optimised operation.

RELATED SERVICES

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

Performance

Model		24-01	30-01	24-02	30-02	30-03	30-04	30-06	30-08
No. of Modules		1	1	2	2	3	4	6	8
Flow Rates	m^3/h	1.4 - 4.2	1.7 - 5.1	2.8 - 8.4	3.4 - 10.2	5.1 - 15.3	6.8 - 20.4	10.2 - 30.6	13.6 - 40.8
Nominal Flow Rate	m^3/h	2.8	3.4	5.6	6.8	10.2	13.6	20.4	27.2
Recovery	%	90-95	90-95	90-95	90-95	90-95	90-95	90-95	90-95
Max. Pressure Drop*	bar	1.7 - 2.4	1.7 - 2.4	1.7 - 2.4	1.7 - 2.4	1.7 - 2.4	1.7 - 2.4	1.7 - 2.4	1.7 - 2.4

**At nominal flow rate*

Dimensions

Model		24-01	30-01	24-02	30-02	30-03	30-04	30-06	30-08
Weight	kg	250	260	500	525	900	1050	1800	2100
Width	mm	600	600	1060	1060	1440	1440	1440	1440
Height	mm	1800	1800	1900	1900	2030	2030	2030	2030
Depth	mm	1300	1300	1300	1300	2550	2550	3400	3400
Connections									
Feed Water Inlet	DN	25	25	40	40	50	50	80	80
Product Outlet	DN	25	25	40	40	50	50	80	80
Reject Outlet	DN	15	15	20	20	25	25	40	40

Material Specifications

Pipework	uPVC*
Skid	Welded structural carbon steel
Sample Valves	¼" PP ball valve

**Other materials upon request: PPH, PVDF, SS*

Feed Water Supply Quality

Feed Water Source		RO Permeate
Conductivity*	µS/cm	<40
Silica	ppm	<1
Iron, Manganese, Hydrogen Sulfide	ppm	<0.01
Total Chlorine	ppm as Cl_2	<0.02
Hardness	ppm as $CaCO_3$	<1
Dissolved Organics (TOC)	ppm as C	<0.5
Operating pH range		4 - 11
Max. Feed Temp.	°C	45
Max. Feed Pressure	bar	7

**Equivalent including CO_2*

Electrical Supply

Models with one module: 230V / 1 / 50Hz standard
Other models: 400V / 3 / 50Hz standard

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TERION™ S

Standard Deionized Water

The TERION™ S standard single-skid unit combines single pass reverse osmosis and continuous electrodeionization to produce high grade deionized water which meets the highest global lab and industrial standards.

- Plug & play unit suitable for transportation into a container.
- 7 models available.
- All versions available according to European standards.

Flow rates from 110 to 4000 L/h

Power

General Industry

FEATURES & BENEFITS

• Designed to produce demineralized water- up to 18 MΩ-cm .
• Salt rejection rate by the high pressure membranes greater than 99.5%.
• Nearly continuous production process, no need to stop production for regeneration.Filter to protect RO from possible solid matter coming from pretreated raw water.
• Ready for manual CIP .
• Proven generation of CEDI to enhance performance.
• AQUAVISTA™ ready Control panel HMI /PLC centralises all operations and data for remote monitoring and control.*
• FAT including wet tests.
• Skid mounted standardized Plug & Play systems suitable for transport in a container, allow for short lead times, quick installation and start-up.

** Available from December 2020.*

APPLICATIONS

• Industrial applications
• Power applications
• Boiler feed
• Turbine injection
• Microeletronics
• Hospitals
• Laboratory

OPTIONS

• Concentrate water pH probe
• $C0_2$ membrane degasser – sweep mode
• $C0_2$ membrane degasser – vacuum mode
• Witnessed FAT

HYDREX™ CHEMICALS

Hydrex® 4000 water treatment chemicals from Veolia Water Technologies should be used for optimized plant operation (anti-scaling and CIP)

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	110	250	500	1000	2000	3000	4000
Permeate Nominal Flowrate	m³/h	0.11	0.25	0.5	1.00	2.00	3.00	4.00
Nominal Feed Flowrate	m³/h	0.15	0.35	0.70	1.40	2.81	4.21	5.61
Typical Design Flux	l/h/m²	28						
Recovery	%	RO 75% - CEDI 95%						
Installed Power	kW	1.80	2.13	2.57	3.00	4.92	7.90	11.10

System Dimensions

Model	Unit	110	250	500	1000	2000	3000	4000
Total Installed Length	m	0.80	0.80	0.80	0.80	0.80	1.00	1.00
Total Installed Width	m	1.05	1.05	1.05	1.30	1.30	1.35	1.35
Total Installed Height	m	1.48	1.48	1.48	2.34	2.34	2.78	2.78
Empty Weight	kg	200	220	250	300	350	550	600

Pipes Connections

Model	Unit	110	250	500	1000	2000	3000	4000
Feed	-	G ¾"	G ¾"	G ¾"	Rp 1¼"	Rp 1¼"	Rp 1½"	Rp 1½"
Permeate	-	G ¾"	G ¾"	G ¾"	Rp ¾"	Rp ¾"	Rp 1"	Rp 1"
Concentrate	-	G ½"	G ½"	G ½"	Rp ½"	Rp ½"	Rp ¾"	Rp ¾"
CEDI Product	-	G ½"	G ½"	G ½"	Rp 1"	Rp 1"	Rp 1¼"	Rp 1¼"
CEDI Product Divert	-	G ½"	G ½"	G ½"	Rp 1"	Rp 1"	Rp 1¼"	Rp 1¼"
CEDI Concentrate	-	G ½"	G ½"	G ½"	Rp ½"	Rp ½"	Rp ½"	Rp ½"

Feed Water requirements

Parameter	Unit	Value
Minimum water temperature	°C	5
Maximum water temperature(1)	°C	25
Minimum supply pressure	barg	1.5
Maximum supply pressure	barg	6
Max Silt Density Index (SDI)	-	<3
Maximum Inlet Turbidity	NTU	1
Maximum Inlet TDS	mg/l	750
Max inlet CO_2(2)	mg/l	< 4
Max inlet Silica	mg/l	10
Max inlet TOC	mg/l	1
Iron and heavy metals, Oil, Suspended solids and colloids	-	Free
Max inlet Total Chlorine	mg/l	0.1

(1) Different temperature range upon request

(2) Without degasser

Typical Treated Water Quality

Parameter	Unit	Value
Average Conductivity	µS/cm	0.1
TOC	ppb	< 1000
Product Pressure	barg	

Environmental conditions

Parameter	Unit	Value
Minimum ambient temperature	°C	5
Maximum ambient temperature(3)	°C	35
Maximum humidity	%	90

Indoor design, non corrosive atmosphere

(3) 30°C in case of CO_2 degasser option

Materials of Construction

Skid	Aluminium
Low pressure Pipework	POM, PA, PE, PP-H
HIgh pressure Pipework	SS316L
Pressure Vessels	SS - FRP

Power Requirements

Parameter	Unit	Value
Voltage(4)	V	400
Frequency	Hz	50
Phases	-	3

(4) 60 Hz upon request

Utilites

Parameter	Unit	Value
Compressed Air Pressure	barg	5.5
Compressed Air Flowrate(5)	Nm³/h	30 - 700

(5) for CO_2 degasser option

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TERION™

Plug & Play integrated RO-CEDI unit for demineralised water production for Power applications

TERION standard indoors single-skid unit combines single pass reverse osmosis and continuous electrodeionization.

> Producing high grade demineralised water adapted to Power market quality specifications

> Low installation and operation costs

> Plug & Play unit offering remote monitoring & control and easy access for maintenance

> High availability unit

> Five models available.

Flow rates from **5.1 to 52.7 m³/h**

FEATURES & BENEFITS

- Designed to produce demineralized water- up to 18 Ω-cm - meeting low levels of conductivity, silica, sodium, TOC and potassium
- Salt rejection rate by the high pressure membranes greater than 99.5%
- Nearly continuous production process, no need to stop for regeneration
- Pre-filter to protect RO
- Two chemical injection points only (no dosing set)
- Frequency controlled variable speed pumps to save up to 50% on electrical power (vs conventional systems)
- Ready for manual CIP
- Proven generation of CEDI to enhance performance
- Individual power supplies for each CEDI module to ensure high reliability
- AQUAVISTA™ enabled(1)
- Control panel HMI /PLC for remote monitoring and control
- FAT including wet tests
- Plug & Play systems suitable for transport in a container, allow for short lead, installation and start-up times

APPLICATIONS

TERION produces demineralised water for:

- Power applications
  - Boiler feed
  - Turbine injection
- Industrial process water
- Industrial utilities for F&B, Microelectronics, P&P, Metals, General Manufacturing, Data centers ...

OPTIONS

- CO_2 membrane degasser. Includes a blower for unit from 25 m³/h to 50 m³/h.
- Feed water pH probe
- Automatic valve for RO flushing with permeate
- Witnessed FAT

(1) AQUAVISTA™ is a cloud based program that allows you to monitor your system performance, day or night, with secure, real-time data available over any internet or cellular connection.

HYDREX® CHEMICALS

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

RELATED SERVICES

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

Subscription to Aquavista™
digital services (asset monitoring, benchmarking, improvement and management, digital training)

System Operating Parameters

Model	Unit	6200	12500	25000	37500	50000
Permeate flowrate @ 12°C*	m³/h	5.1-6.6	10.1-13.2	20.9-26.4	30.1-39.5	45-52.7
Feed water flowrate @ 12°C*	m³/h	7.5-9.2	14.9-18.5	30.9-37	44.5-55.5	66.7-74
Typical Design flux	l/m³/h	Well Water : 28 -Surface Water : 25				
RO Recovery(2)	%	75-80				
CEDI Recovery(2)	%	90-95				
Installed power(2)	kW	21	25	53	77	87

(1): Typical flow rates mentioned here are based on surface water (for the minimum flow) and well water (for the maximum flow).
(2): Flow rates and installed power depend on feed water quality and temperature. RO and CEDI projections to be performed based on project data.

System Dimensions

Model	Unit	6200	12500	25000	37500	50000
Length	mm	5800	7450	7450	7450	7450
Width	mm	1750	1750	2150	2150	2150
Height	mm	2270	2270	2420	2420	2420
Empty weight	kg	2048	2919	4884	6295	7673
Operating Max weight	kg	2781	3608	6160	7725	9434
Configuration RO-CEDI		110X3- VNX28X1	210X4 - VNX55X1	320X5 - VNX55X2	420X6 - VNX55X3	630X6 - VNX55X4

** These dimensions are given for unit in operation. All units are suitable for transportation in a container*

Pipes Connections

Model	6200	12500	25000	37500	50000
Feed water	DN40	DN50	DN80	DN100	DN100
CEDI Product (outlet and divert)	DN32	DN50	DN65	DN80	DN100
Product CEDI reject	DN10	DN15	DN15	DN25	DN25
RO Concentrate	DN32	DN32	DN40	DN40	DN65

Feed Water Specifications

Feed water parameters	Unit	Basic outlet quality	Premium outlet quality
Feed water type	-	Well Water or surface water	
Feed water Temperature	°C	Min: 5- Max: 30	
Feed Water Pressure	bar	Min: 3- Max: 6	
SDI	-	<3	
Turbidity	NTU	<1	
Total Dissolved Salt -TDS	ppm	Up to 800	Up to 500
Maximum hardness (with antiscalant)	ppm $CaCO_3$	178 (indicative value)	
TOC	ppm	< 1 mg O_2/L as oxidizing to the $KMnO_4$	
Silica as SiO_2	ppm	up to 20	
Iron and heavy metals, Oil, Suspended solids and colloids	-	Free	
Free chlorine	-	< 0.1 ppm (Cl_2)	
CO2	mg/l	up to 30 (if treated through membrane degasser (option))	

Outlet Water Expected Quality

Outlet water expected parameters	Unit	Basic outlet quality	Premium outlet quality
Typical conductivity @25°C	µs/cm	<0.1	<0.08
Silica as SiO2	ppb	<10	<5
Sodium + Potassium (Na+K)	ppb	<10	<3
Sodium (Na)	ppb	<10	<3
Chloride as Cl-	ppb	NA	<3
Sulphate as SO42-	ppb	NA	<3
TOC	ppb	200	200
Outlet Pressure	bar.g	with degasser option : 1.5 without degasser option : 2	

**Project specific RO and CEDI projections should be performed to demonstrate that outlet water is in line with expected quality.*

Environmental Conditions

Parameter	Unit	Value
Min ambient temperature	°C	5
Max water temperature	°C	35
Max Humidity (non-condensing)	%	90

Indoor Design. Non-corrosive atmosphere.
**30°C in case of Co2 degasser option (for units > 25 000).*

Materials

Frame	Epoxy coated carbon steel frame
Piping *Low pressure*	PVC
Piping *High pressure*	SS 316

Power Requirements

Voltage	380 / 420 V
Frequency	50/60 Hz
Phases	3

Utilities

Parameter	Unit	Value
Instrument air requirement	bar.g	>5.5
Compressed air requirement *	Nm³/h	40-48

**for CO2 degasser option for units 6200 and 12 500 only (air class 1).*

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IONPRO™ LX

Reverse Osmosis & CEDI

The IONPRO™ LX systems produce high purity water with low bacteria levels.

Flow rates from **500 to 1000 l/hr**

FEATURES & BENEFITS

- I-Button security protection
- HMI: intuitive & simple to use; process information, performance calculations, warnings, alarms displayed on screen
- Stainless steel skid; longevity
- Aesthetically pleasing; moulded covers
- Compact skid; small foot print
- Standardised single-skid design; short lead timesand quick start-up
- Flexible design solutions; easy upgrade, options
- Configurable set points
- Combined drain; simplicity
- Supplied with full Factory Acceptance Test (FAT)
- Integral automatic sanitisation (AutoSan); minimal operator involvement, reliable & repeatable

APPLICATIONS

- Pharmaceutical
- Microelectronics
- Central laboratory (analytical water grade 2)
- General manufacturing

OPTIONS

- Validation pack with schedules, Installation Qualification (IQ) and Operational Qualification (OQ)
- Degasser for performance enhancement

HYDREX® CHEMICALS

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

RELATED 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 Performance & Dimensions

IONPRO® LX MkII Model			2-10	3-10	3-18	4-10	4-18
Nominal Flows* @15°C & 1 bar	Feed	m^3/hr	0.75	1.10	1.10	1.50	1.50
	Product Water	m^3/hr	0.50	0.75	0.75	1.00	1.00
Feed Water, Conductivity & CO_2			High	Medium	High	Medium	High
Nominal Flows are given for indication, more accurate projetions can be obtained using the System Sizing Programme (SSP)*							
Recovery		%	65-75				
Dimensions	Width	mm	800 (950 with optional Degasser)				
	Depth	mm	1100 (1300 with optional Degasser)				
	Height	mm	1570				
	Weight	kg	650	650	660	650	660
Salt Tank	Dia x Height	mm	550 x 850				
Salt Usage per Regeneration		kg	6				
Softener Output per Regeneration (200mg/l Total Hardness as $CaCo_3$)		m^3	10				
Connections	Feed		3/4" BSP (G) Female				
	Product		25mm uPVC Socket Union (option: 1" stainless steel tri-clamp)				
	Return		25mm uPVC Socket Union (option: 1" stainless steel tri-clamp)				
	Drain		40mm uPVC Socket Union				
Electrical Supply (50Hz)			380/400/415V : 3phase : 50Hz : 6.2 kVA				
Electrical Supply (60Hz)			220/380/400/415/480V : 3phase : 60Hz : 7 kVA				
Power Consumption			Depends on operating conditions - See SSP				

Material Specifications

Softeners	Noryl Heads Polyethylene Lined Vessels
Soft Water Tank	High Density Polyethylene
RO Pressure Vessels	PVC and fibreglass epoxy
Pipe Work	cPVC & uPVC
Frame	304 Stainless Steel
RO Pump	304 & 316 Stainless Steel
Power cabinet	Painted Mild Steel
RO Elements	4" x 40" Thin-Film Composite
CEDI Module	Robust Wide Cell Technology

Feed Water Requirements

General	Potable water free from organics, colloids and suspended solids (SDI < 3)
Pressure	3.5 bar minimum, 6 bar maximum
Temperature	5 - 25°C
Total Dissolve Solids (TDS)	< 1000 ppm
Iron	< 0.1 ppm
Manganese	< 0.05 ppm
Free Chlorine	< 0.25 ppm with Activated Carbon Cartridge Filters < 0.02 ppm with Pleated Depth Cartridge Filters
Total Hardness	< 400 ppm as $CaCO_3$

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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 in order to best meet the unique needs of each client.

Flow rates from **500 to 20 000 l/hr**

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

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.

APPLICATIONS

Purified Water

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

Highly Purified Water

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

HYDREX® CHEMICALS

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

RELATED SERVICES

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

Specifications

	C Series	E Series	S Series
Pre-treatment Softener (plastic)	✓	o	-
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	-	o	-
Continuous Electro-Deionisation	✓	✓	✓
Hot Water Sanitisation	✓	✓	✓
Low energy pumps	✓	✓	✓
RO/CDI Recovery Displayed	✓	✓	✓

✓ Standard

- Not Available

o Optional

Orion Performance (Single Pass RO)

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

Orion Dimensions (Single Pass RO)

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.

Feed Water Requirements

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

Typical Treated Water Quality

	Standard Orion	Orion with UF Option
	Meets current USP & 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

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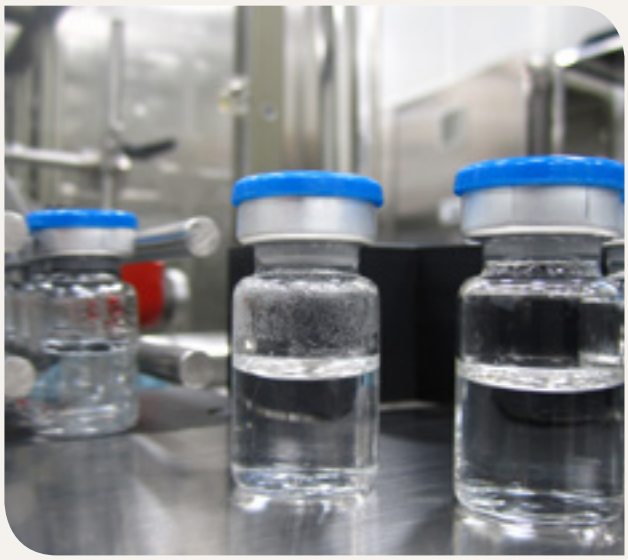
VEOLIA

Polaris MED

Efficient and Effective WFI Solutions

WATER TECHNOLOGIES



Your Wi
The PO

Quantity and quality of water

- Standard units are available from 50 - 15,000 l/hr
- Column geometry, design and efficient droplet separation gives the MED excellent decontamination performance
- Labyrinth baffles reduce steam velocity and optimize droplet separation
- Evaporator columns are dry running, avoiding the risk of bacterial contamination associated with static water
- High running pressures and ease of balancing offers excellent steam and water quality, with low industrial steam and cooling water consumption

Opex - Cost of ownership

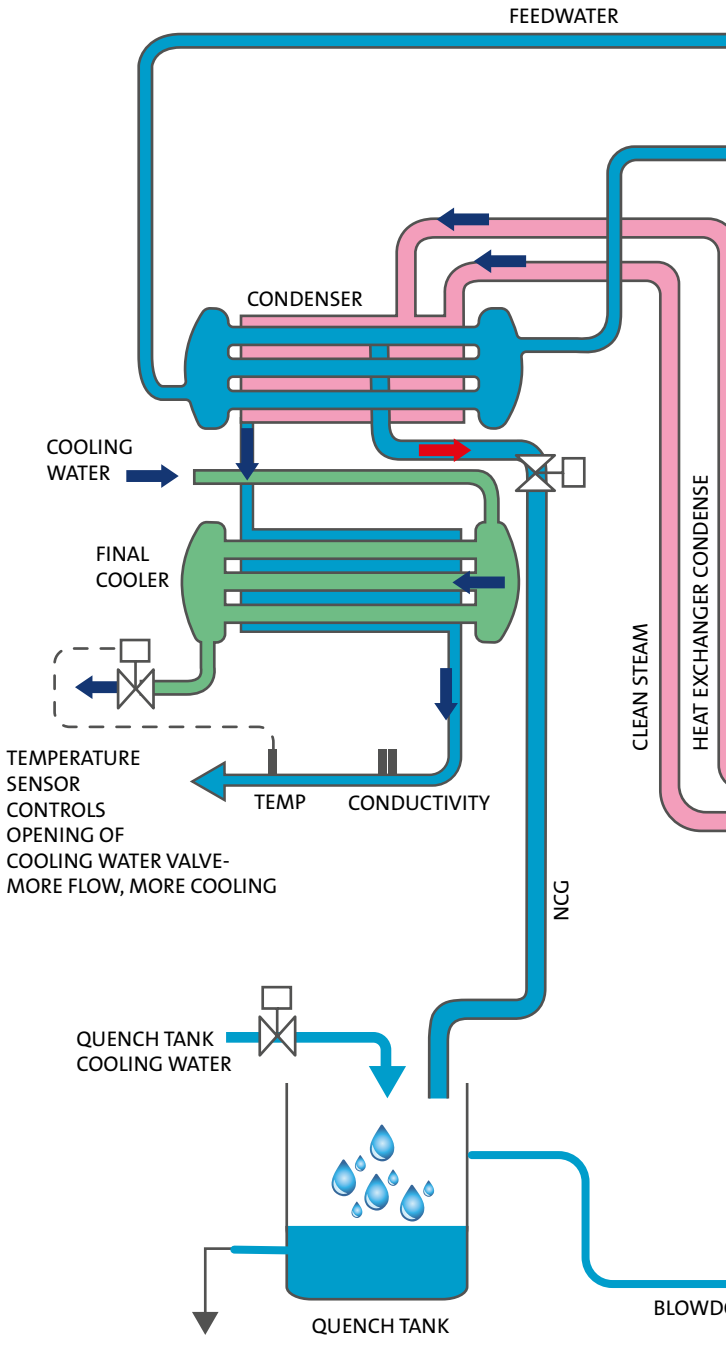
- High efficiency, dry running, falling film evaporator columns
- 3-8 columns
- 10% blowdown offers a small water footprint
- Tall heat exchangers to optimize heat transfer performance
- Super fast startup, minimizing water losses
- Hot standby not required, saving energy, but maintaining fast startup times

Service and Support

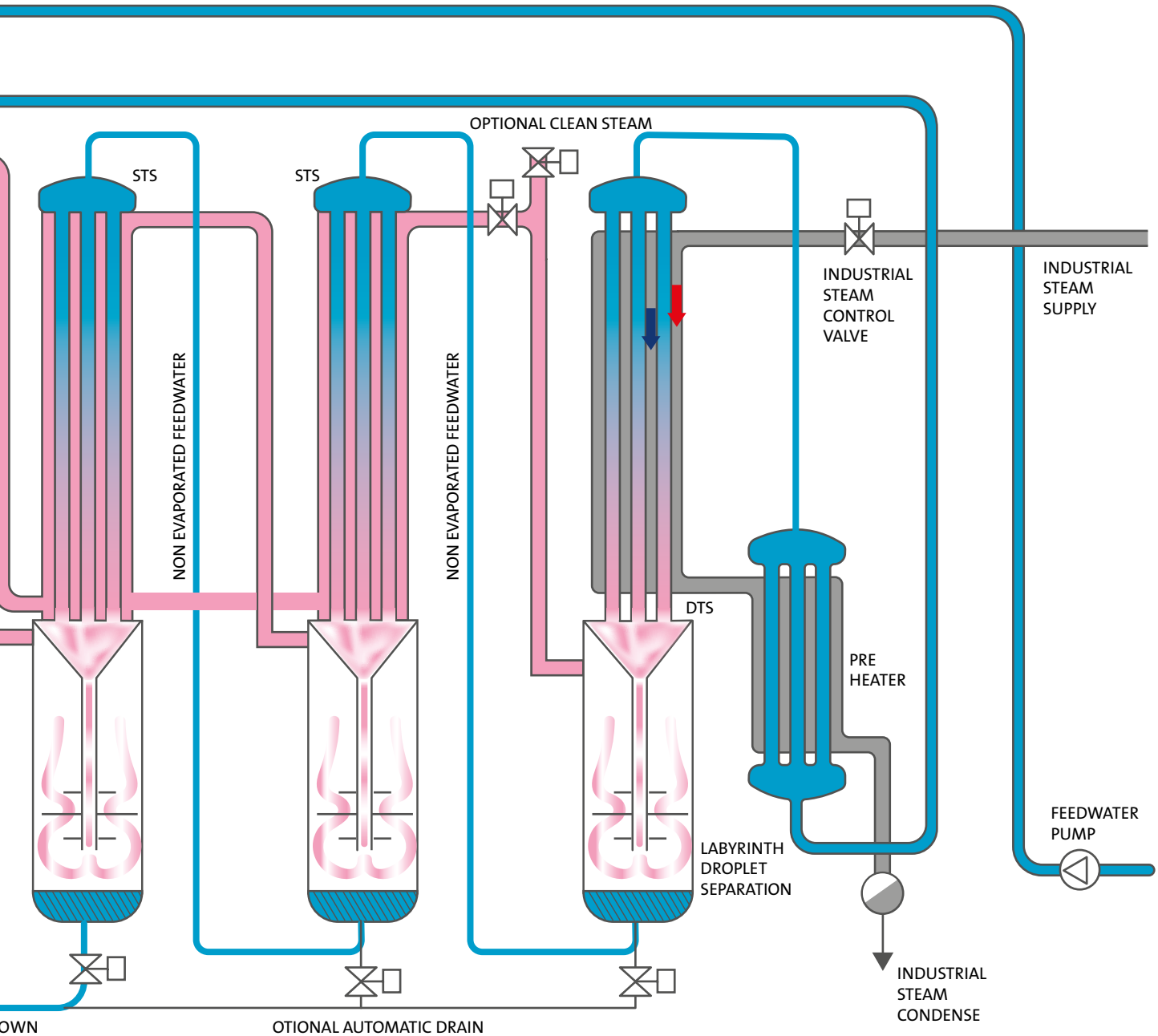
- Local support & service from our global offices
- Yearly service and protection plans

Flexibility & Choice

- Combi units - producing steam and water from the same unit
- Uplift frames & raised cooler / condenser sub assemblies
- Siemens or Allen Bradley PLC, with large touchscreen panel, complete with SCADA option



FI Need...
ARIS Solution



Standard Features

Mechanical

> Sanitary WFI sample point
> Thermal insulation
> Stainless steel frame and control panel IP 54
> Surface finishing Ra<0.6 µm
> Feed water pump
> Drain Cooling System

Functional

> Operation in stop/start or proportional control
> Automatic blow down
> WFI quality switchover system

Controls and Instrumentation

> PLC control + HMI interface
> Non compensated conductivity meter
> Automatic pressure temperature and level controller

Validation and Documentation

> Qualification documentation and operating manual available in multiple languages
> DQ, IQ and OQ Protocols

Optional Features

Mechanical

> Electropolishing Ra<0.4 µm
> Feed water CO2 removal membrane
> Feed water tank
> WFI tank + pressurising transfer pump
> Nitrogen pressurising system

Functional

> Proportional Control – 50% to 100%
> WFI and Pure Steam available as alternative production
> WFI and Pure Steam available as simultaneous production
> Automatic steam sterilization

Controls and Instrumentation

> SCADA supervision system (2 month operating data recording) /HMI in 4 language + printer (only interface required)
> Automatic system drain-down

Validation and Documentation

> GAMP Validation Pack
> PQ Support

POLARIS - Service & Support

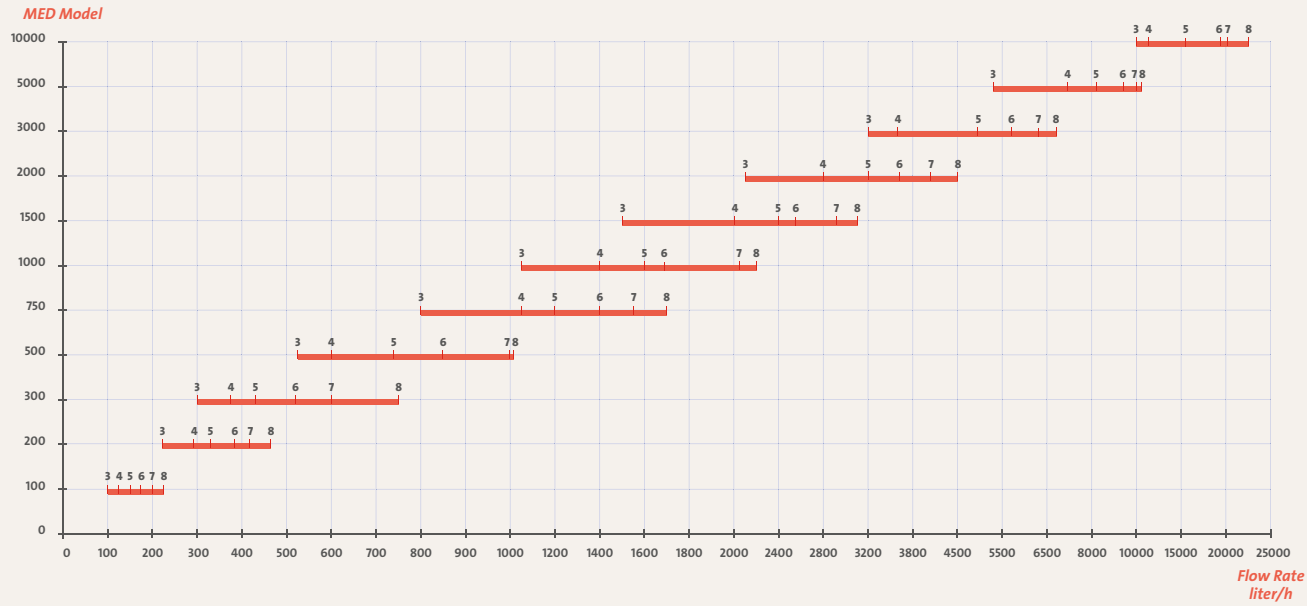
All POLARIS solutions are designed in accordance with GAMP, cGMP, ISPE and FDA guidelines and will meet the product quality specifications of all of the world's major pharmacopeia, including the USP and Ph Eur, giving you peace of mind and compliance assurance, wherever your facility is.

POLARIS systems are backed by a comprehensive range of service maintenance products.

Standardised Performance Qualification Maintenance Contracts (PQMC) are tailored to your system and ensure continuing compliance.

Scheduling service on a pre-planned basis coupled with time-based replacement of specific parts and consumables, significantly reduces the risk of downtime. This approach enables us to guarantee the quality and value of your system for a lifetime.

Polaris MED capability (according to industrial steam pressure)



POLARIS MED Treated Water Quality	
Conductivity	< 1.3 µS/cm @ 25° C
TOC	< 500 ppb
Bacterial Endotoxins	< 0.25 EU
Bacteria	< 10 CFU / 100 ml
Nitrate	< 0.2 ppm
Heavy Metals	< 0.1 ppm

Services Required	
Feed Water Temperature	15-25° C
Feed Water Pressure 1	1 < P < 6 bar
Power Supply	380/480 V; 3 Phase; 50/60 Hz
Compressed Air	6-8 bar
Water Drainage	By gravity
Cooling Water	15° C (if necessary)

Feed Water Requirement (Minimum)	
Potable Water	
Total Hardness	< 0.1° F (1 ppm as $CaCO_3$)
Conductivity	< 5 µS/cm
Silica	< 1 ppm

Material Specification	
Evaporating Columns	Inox 316L ASME BPE
Heat Exchanger (Pre-heater)	Inox 316L (EN 1.4435) ASME BPE
Heat Exchanger (Condenser)	Inox 316L ASME BPE
Feed Pump	Inox 316
Support Frame	Inox 304
Pipeline and Fittings	Inox 316L ASME BPE
Control Panel	Inox 304
Valve	316L/EPDM FDA approved
Sealing and Gaskets	PTFE
Pipe Welding	Orbital

Resourcing the world

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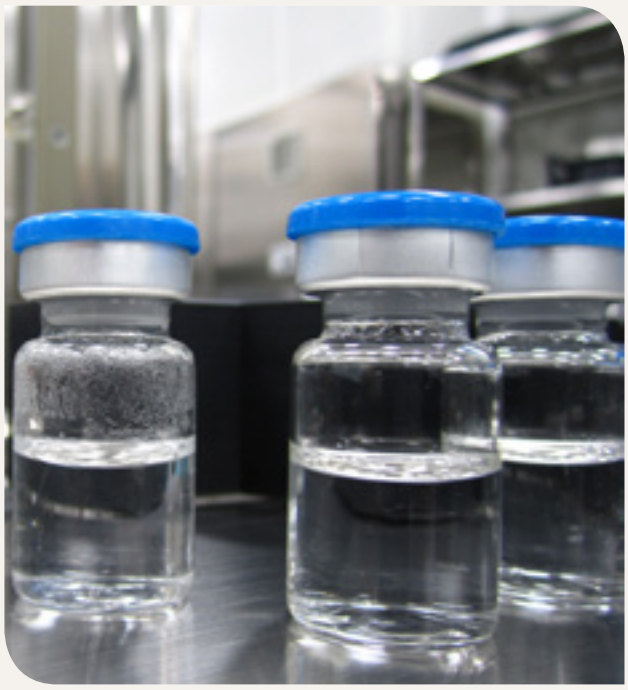
VEOLIA

Polaris VCD

Efficient and Effective WFI Solutions

WATER TECHNOLOGIES



Your Wa
The PO

Quantity and quality of water

- Standard units available between 50-15,000 l/hr
- High decontamination efficiency
- 3 stage NCG removal (feedwater, condenser & degassing tank)
- Low velocity solution for optimizing impurity separation
- Dry running FDA approved compressor seal

Opex - Cost of ownership

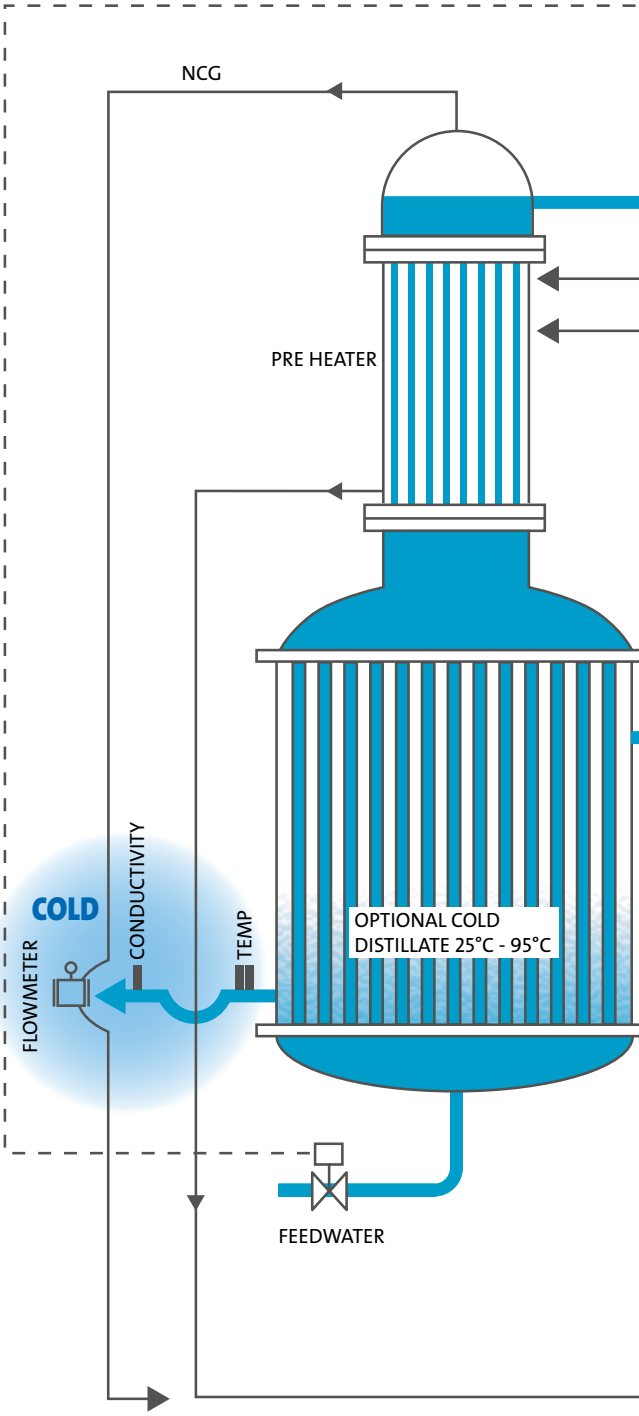
- Low steam consumption
- High efficiency, low power consumption, multi stage blowers
- High thermal efficiency
- NCG used for pre heating
- No cooling water system required

Service and Support

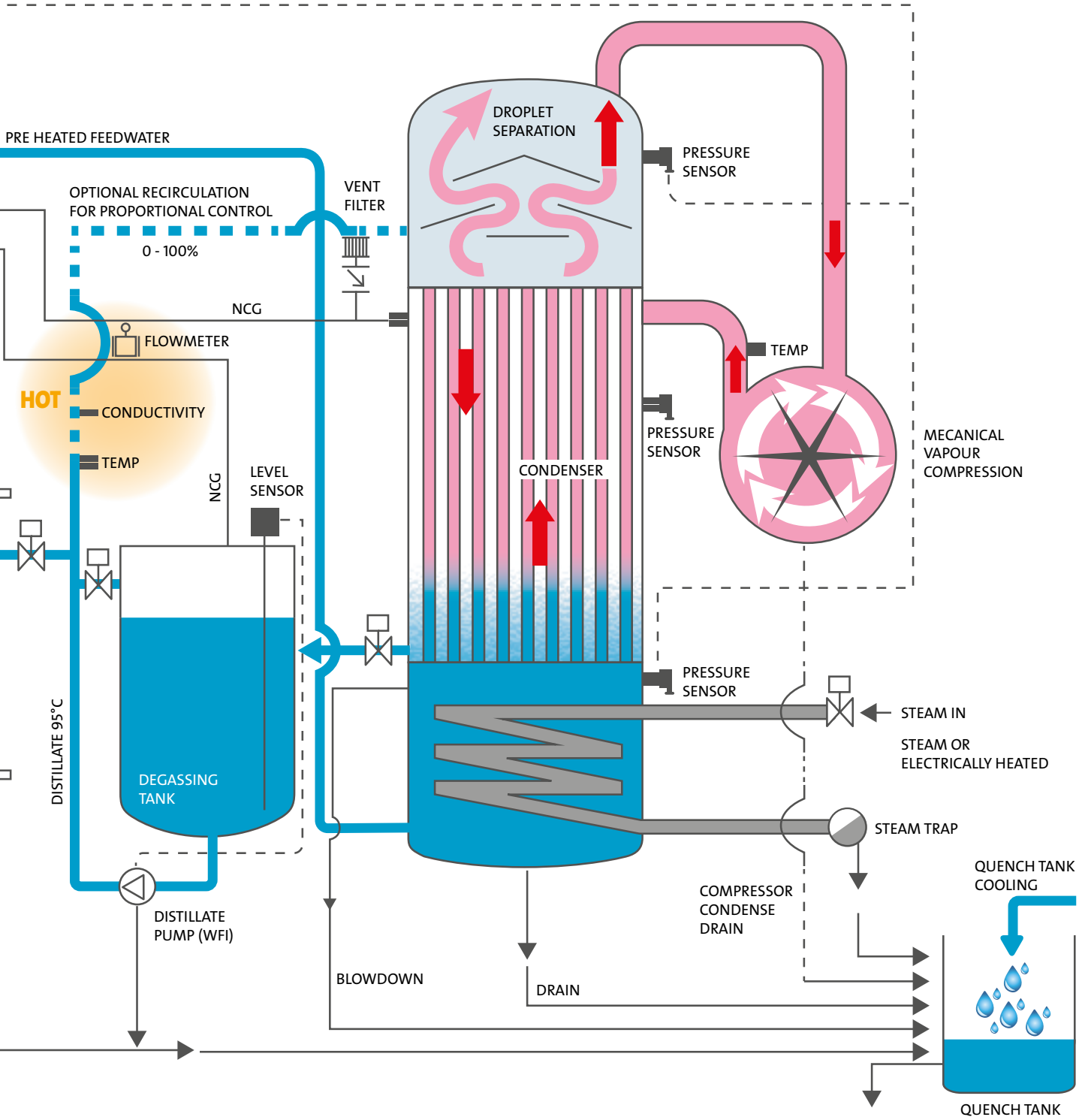
- Local support & service from our global offices
- Yearly service & protection plans

Flexibility & Choice

- Hot & cold water production (25-95°C)
- Low pressure steam supply (3barg)
- Integrated pre treatment, dosing & RO
- Steam production through integrated steam generator
- Siemens or Allen Bradley PLC, with large touch screen panel complete with SCADA option
- Pressurized water discharge



FI Need...
ARIS Solution



Standard Features

Mechanical

> ASME BPE piping
> Sanitary WFI sample point
> Thermal insulation
> Stainless steel frame and control panel IP 54
> Surface finishing Ra<0.6 µm
> Non-condensable gas removal system
> Sight glass inspection point
> Drain cooling system

Functional

> Softened feed water
> Operation in stop/start or proportional control
> Automatic blow down
> WFI quality switchover system

Controls and Instrumentation

> PLC Control complete with 15" panel PC or HMI option
> Non compensated conductivity meter
> Automatic pressure, temperature and level controller

Validation and Documentation

> Qualification documentation and operating manual available in multiple languages
> DQ, IQ and OQ Protocols

Optional Features

Mechanical

> Electropolishing Ra<0.4 µm
> Industrial steam pressure reducing valve
> Electrical heating
> Combined electrical/steam heating

Functional

> Modulated production – 0% to 100%
> WFI temperature production to all temperature from 95 to 20°C
> Automatic steam sanitization

Controls and Instrumentation

> SCADA supervision system (2 month operating data recording) /HMI in 4 languages + printer (interface only required)

Validation and Documentation

> GAMP Validation Pack
> PQ Support

POLARIS - Service & Support

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Standardised Performance Qualification Maintenance Contracts (PQMC) are tailored to your system and ensure continuing compliance.

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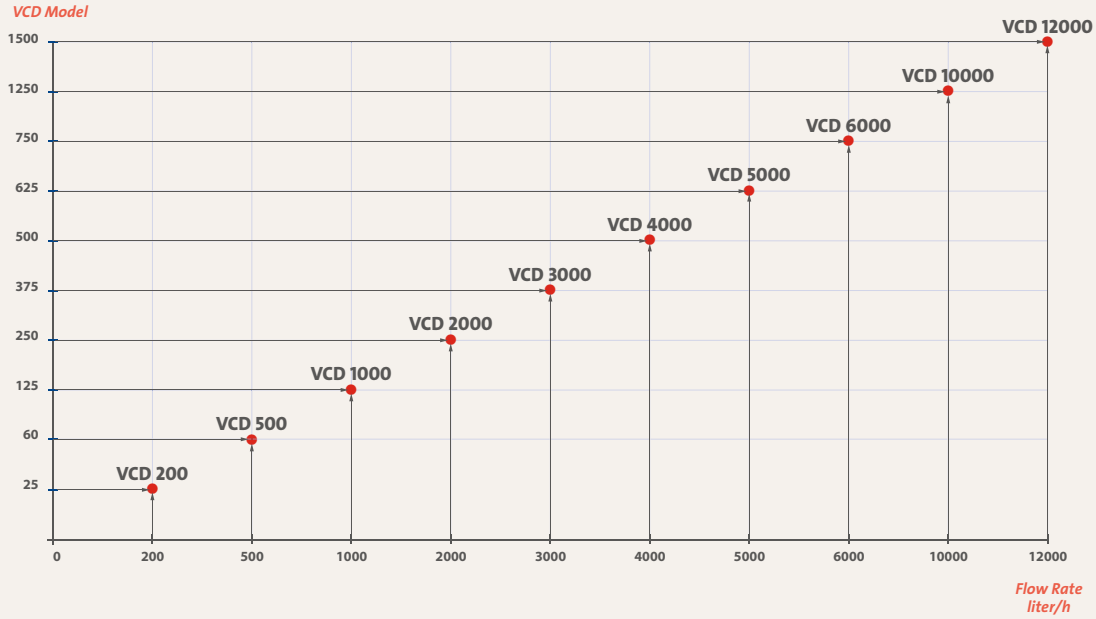
Polaris VCD capability (according to industrial steam pressure)



POLARIS VCD Treated Water Quality	
Conductivity	< 1.3 µS/cm @ 25° C
TOC	< 500 ppb
Bacterial Endotoxins	< 0.25 EU
Bacteria	< 10 CFU / 100 ml
Nitrate	< 0.2 ppm
Heavy Metals	< 0.1 ppm

Services Required	
Feed Water Temperature	15-25° C
Feed Water Pressure 1	1 < P < 6 bar
Power Supply	380/480 V; 3 Phase; 50/60 Hz
Compressed Air	6-8 bar
Water Drainage	By gravity
Cooling Water	15° C (if necessary)

Feed Water Requirement (Minimum)	
Potable Water	Chlorine Free
Total Hardness	< 0.1° F (1 ppm as $CaCO_3$)

Material Specification	
Evaporating Columns	Inox 316L ASME BPE
Heat Exchanger (Pre-heater)	Inox 316L (EN 1.4435) ASME BPE
Heat Exchanger (Condenser)	Inox 316L ASME BPE
Feed Pump	Inox 316
Compressor Body and Impeller	Inox 304
Compressor Seals	Inox 316L ASME BPE
Compressor Impeller's Shaft	Inox 304
Support Frame	316L/EPDM FDA approved
Pipeline and Fittings	Inox 316L (EN 1.4435) ASME BPE
Control Panel	Inox 304
Valve	3 16L/EPDM FDA approved
Sealing and Gaskets	PTFE
Pipe Welding	Orbital

Resourcing the world

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VEOLIA

Polaris CSG

cGMP Clean Steam On Demand

WATER TECHNOLOGIES

Your Cle
The PO

Applications

- Up to 6 barg Clean Steam for autoclave steam supply
- SIP (Sterilization In Place), bio reactors, make up vessels
- Sterile facility HVAC humidification
- Lyophilizer sanitization

Quantity and Quality of steam

- Standard units available between 50 - 10,000 kg/hr
- Rapid response steam production
- Low velocity, droplet free steam production via internal labyrinths
- Integrated thermal degasser for non condensable gases removal, in compliance with HTM 2010, 2031 & EN285 compliance

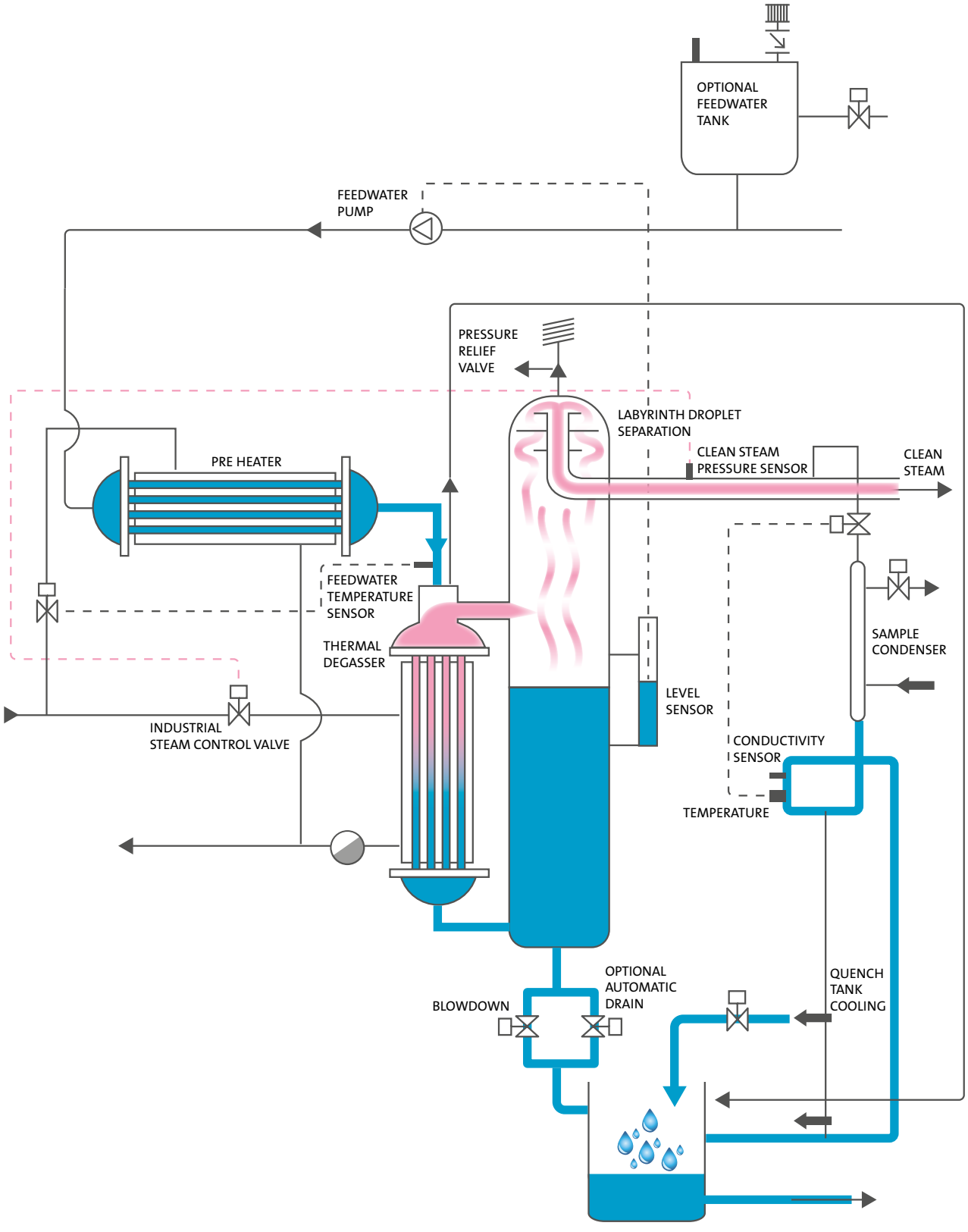
Service & support

- Local support & service from our global offices
- Yearly service & protection plans

Flexibility & choice

- Vertical and horizontal (Kettler) steam generators
- Additional condenser units for small scale, simultaneous steam & WFI production
- Siemens or Allen Bradley PLC, with large touchscreen panel & SCADA option
- Electric or steam heated units, integrated pre-teatment, RO, CEDI & UF for custom build packages

ean Steam Needs...
ARIS Solution



Standard Features

Mechanical

> ASME BPE piping
> Steam sample point EN285 compliance
> Thermal insulation
> Stainless steel frame and control panel IP 54
> Surface finishing Ra<0.6 µm
> Feed water pump
> Drain cooling system

Functional

> PID pressure and flow control
> Automatic blow down
> Clean steam available from 3 to 6 bar

Controls and Instrumentation

> PLC control + HMI interface
> Automatic pressure, temperature and level controller

Validation and Documentation

> Qualification documentation and operating manual available in multiple languages
> DQ, IQ and OQ Protocols

Optional Features

Mechanical

> Electropolishing Ra<0.4 µm
> Feed water tank
> Clean Steam outlet check valve
> Non compensated conductivity meter with automatic sample condensing and cooling system
> Integrated thermal degasser
> Membrane degasser

Controls and Instrumentation

> SCADA supervision system (2 month operating data recording) /HMI in 4 language + printer (only interface required)

Validation and Documentation

> GAMP Validation Pack
> PQ Support

POLARIS - Service & Support

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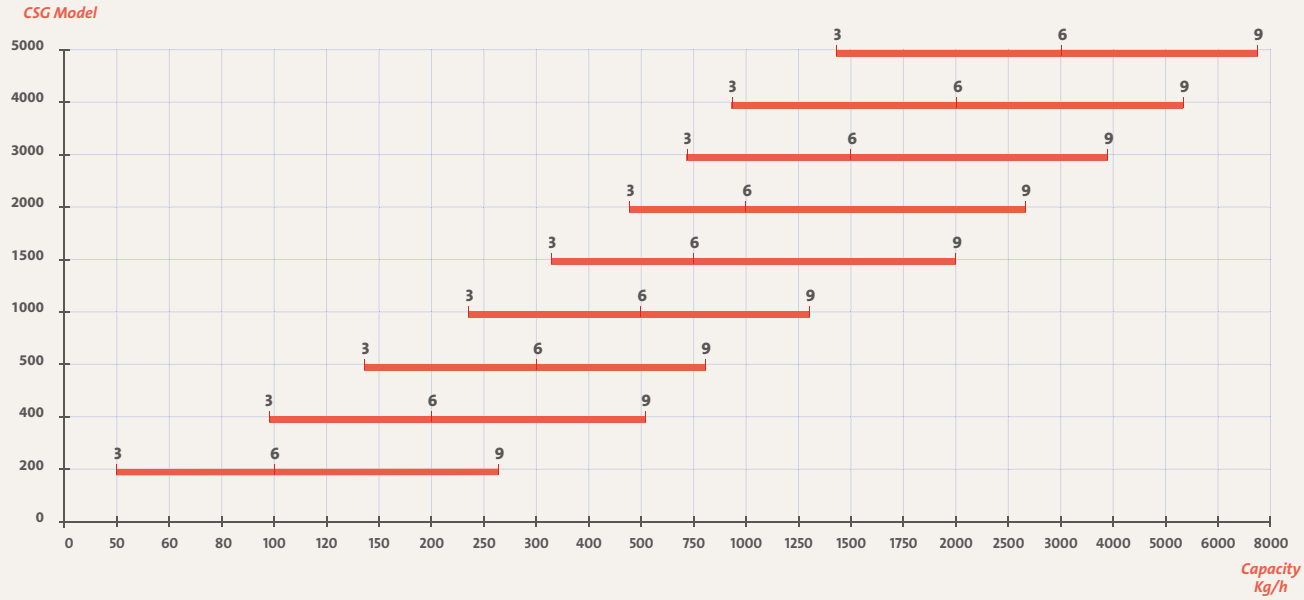
Polaris CSG Capacity @3barg



POLARIS CSG Treated Water Quality	
Conductivity	< 1.3 µS/cm @ 25° C
TOC	< 500 ppb
Bacterial Endotoxins	< 0.25 EU
Bacteria	< 10 CFU / 100 ml
Nitrate	< 0.2 ppm
Heavy Metals	< 0.1 ppm

Services Required	
Feed Water Temperature	15-25° C
Feed Water Pressure 1	1 < P < 6 bar
Power Supply	380/480 V; 3 Phase; 50/60 Hz
Compressed Air	6-8 bar
Water Drainage	By gravity
Cooling Water	15° C (if necessary)

Feed Water Requirement (Minimum)	
Potable Water	
Total Hardness	< 0.1° F (1 ppm as $CaCO_3$)
Conductivity	< 5 µS/cm
Silica	< 1 ppm

Material Specification	
Evaporating Columns	Inox 316L ASME BPE
Heat Exchanger (Pre-heater)	Inox 316L (EN 1.4435) ASME BPE
Heat Exchanger (Condenser)	Inox 316L ASME BPE
Feed Pump	Inox 316
Support Frame	Inox 304
Pipeline and Fittings	Inox 316L (EN 1.4435) ASME BPE
Control Panel	Inox 304
Valve	316L/EPDM FDA approved
Sealing and Gaskets	PTFE
Pipe Welding	Orbital

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VEOLIA

EVALED®

Hot/cold water forced circulation evaporators **AC F**

20
40
60

CO_2 footprint

Low running costs

allow a return on investment often measured in months thanks to the multiple effect.

Waste thermal energy

ideal in case of cogeneration and fumes heat recovery.

Benefits

EVALED AC F is the line of hot/ cold water and forced circulation vacuum evaporators designed to treat liquids with high content of dissolved solids at low temperature, with the minimum fouling and scaling index.

The line is dedicated to water separation and possible reuse.

- Maximum water recovery, minimum quantity of waste to be disposed of
- Useful when thermal energy (steam/hot water) and cold water are available at low cost (cogeneration)
- Suitable for very scaling and fouling liquids
- High quality of recovered water suitable for reuse (with distillate conductivity meter for an indirect measure of quality)
- Skid mounted (small footprint) and ready to use (plug & play unit)
- Fully automatic, continuous operation, minimal manpower
- Constant monitoring by remote control
- User-friendly (intuitive HMI)
- Short delivery time
- Modular and flexible

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www.veoliawatertechnologies.pl

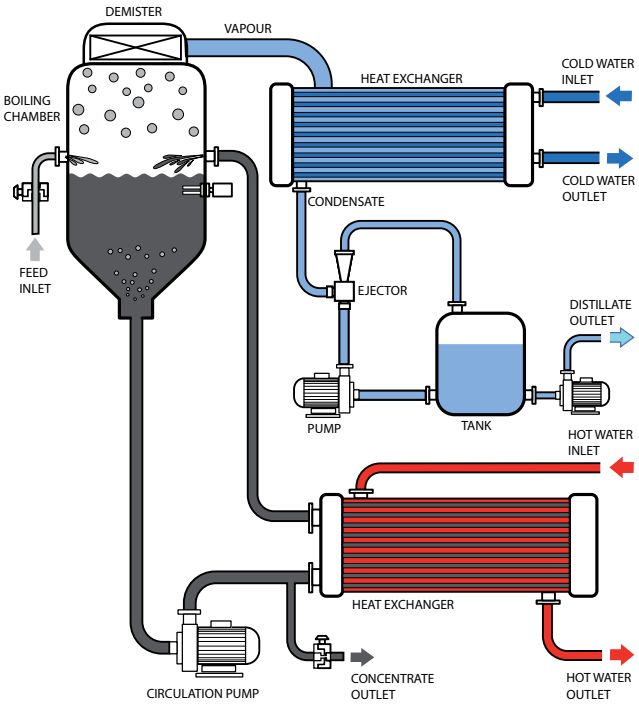
Process diagram

How does EVALED AC F work?

High efficiency forced circulation shell & tube heat exchanger with horizontal tubes and exchanged energy by hot/cold water allows to concentrate wastewater up to the salts solubility limits and to manage scaling and fouling phenomena.

Evaporation at a low boiling point is made possible by the vacuum condition generated by the pump and the ejector. Wastewater is treated in continuous, distilled water and concentrate are separated in continuous. The distillate is discharged through a pump and the concentrate through a valve, according to a pre-set timer, when the desired concentration level is achieved.

Evaporation temperature: 30 - 70 °C (86 - 158 °F)
Min hot water temperature: 80 °C (176 °F)



Available models

Distillate production capacities

AC F 20	15-20 m3/day	2.7 - 3.7 gpm
AC F 40	30-40 m3/day	5.5 - 7.3 gpm
AC F 60	50-60 m3/day	9.2 - 11 gpm

The line is available in different materials to treat liquids containing dissolved salts, organic compounds and even the most aggressive salted wastewaters (chlorides), coming from:

- Waste (Collectors, Incinerators, Landfills)
- Power
- Biogas & Biofuels
- Mechanical & Surface Treatments
- Food & Beverage
- Mining and Primary Metals
- Oil & Gas

Service Optional

EVA life

Your technology. Always powerful.
The program which makes your unit perfectly performing for its entire life.

EVA Clean
Automatic Washing System

EVA Link
Remote Control

EVA Lab
Analysis

Hydrex In case of foaming effluent, Evaled evaporators are designed to be operated with Hydrex antifoams.

VEOLIA

EVALED®

Hot/cold water scraped vacuum evaporators **AC R**

3
6
12

CO_2 footprint

Waste thermal energy

Ideal in case of cogeneration and fumes heat recovery.

Crystallization

High concentration levels and solid separation.

Benefits

EVALED AC R is the hot/cold water scraped vacuum evaporators line designed for low temperature evaporation and to treat liquids with high content of dissolved solids. Able to manage high grade of fouling and scaling phenomena (viscous liquids, sediment presence).

The line is dedicated to water separation and possible reuse and it is aimed at achieving the maximum disposal cost reduction thanks to the high concentration ratio. Also suitable to treat pre-concentrated liquids.

- Maximum water recovery, minimum quantity of waste to be disposed of
- Useful when thermal energy (steam/hot water) and cold water are available at low cost (cogeneration)
- Suitable for very scaling and fouling liquids
- Skid mounted (small footprint) and ready to use (plug & play unit)
- Fully automatic, continuous operation, minimal manpower
- Constant monitoring by remote control
- User-friendly (intuitive HMI)
- Short delivery time
- Modular and flexible

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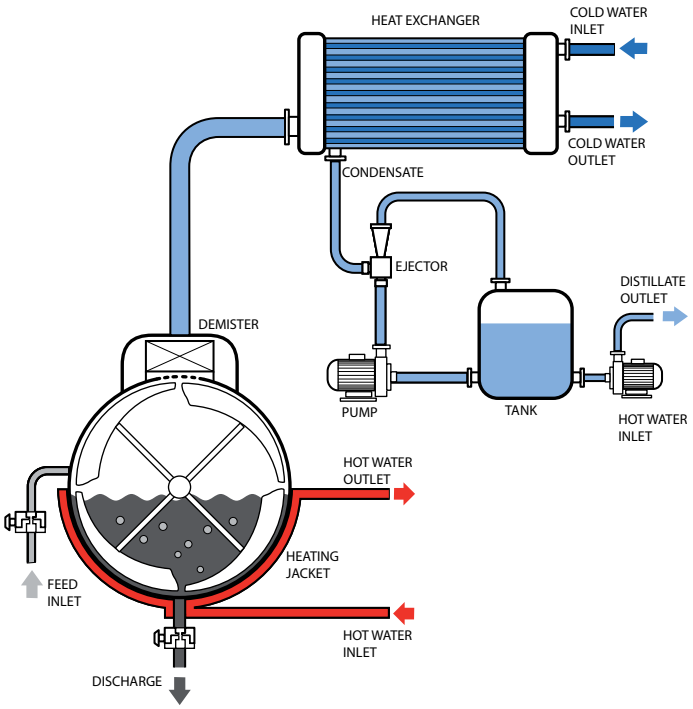
Process diagram
How does EVALED AC R work?

The heat exchange occurs through the surface of the scraped boiling wall. Wastewater, rich in dissolved and suspended solids, is stirred continuously by means of a screw type scraper preventing any fouling of the heat exchanger surface.

Evaporation at a low boiling point is made possible by the vacuum condition generated by the pump and the ejector. The unit operates in batch or continuously depending on the type of concentrate to be obtained: wastewater is treated in continuous, the distillate is separated and simply discharged through a pump, while the concentrate is discharged at the end of concentration cycle.

Evaporation temperature: 30 - 70 °C (86 - 158 °F)
Min. hot water temperature: 80 °C (176 °F)



Available models
Distillate production capacities

AC R 3	2-3 m3/day	0.4 - 0.5 gpm
AC R 6	4-6 m3/day	0.7 - 1.1 gpm
AC R 12	8-12 m3/day	1.5 - 2.2 gpm

The line is manifactured with superduplex steel and it is suitable to treat even the most aggressive liquids. Some typical sectors of application:

Power
Mechanical & Surface Treatments
Waste (Collectors, Incinerators, Landfills)
Microelectronics and Photovoltaics
Chemical
Oil & Gas

Opportunity for heat pump device when hot/cold water are not available on site.

Service Optional

EVA life

Your technology. Always powerful.
The program which makes your unit perfectly performing for its entire life.

EVA Link
Remote Control

EVA Lab
Analysis

Hydrex In case of foaming effluent, Evaled evaporators are designed to be operated with Hydrex antifoams.

VEOLIA

EVALED®

Heat pump forced circulation vacuum evaporators

PC F

- 0.7
- 1.4
- 2.4
- 4
- 6
- 8
- 12
- 24

CO_2 footprint

Low running costs

allow a return on investment often measured in months.

Low boiling temperature

ideal in case of very aggressive salty wastewater. Suitable for temperature sensitive products.

Benefits

EVALED PC F is a line of heat pump vacuum evaporators designed to treat liquids with a high content of dissolved solids while minimizing the fouling and scaling phenomena at low temperature evaporation.

The line is dedicated to water reuse.

- Maximum water recovery, minimum quantity of waste to be disposed of
- High quality of recovered water suitable for reuse
- Low energy consumption
- Suitable for fouling and scaling liquids
- Modular and flexible, short delivery time
- Skid mounted (small footprint) and ready to use (plug & play)
- Fully automatic, minimal manpower
- Constant monitoring by remote control
- User-friendly (intuitive HMI)

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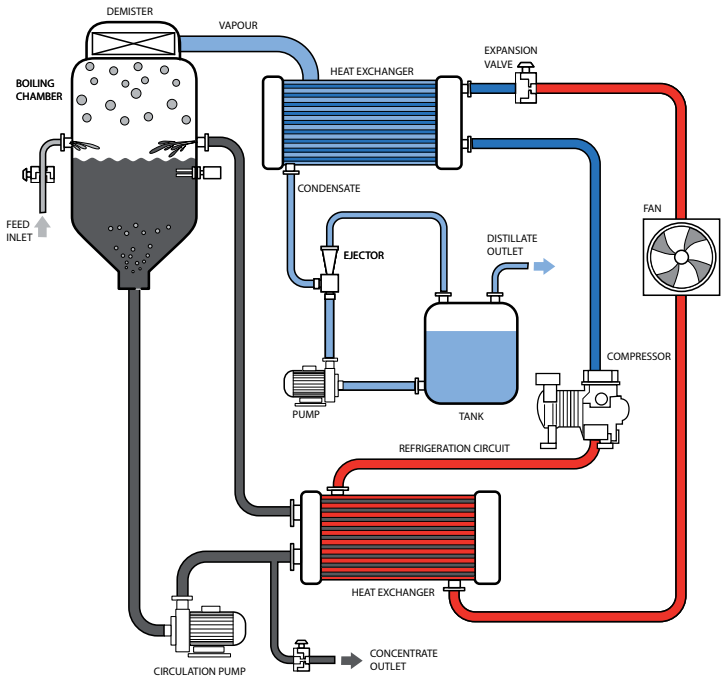
Process diagram
How does EVALED PC F work?

High efficiency forced circulation shell & tube heat exchanger with horizontal tubes and the exchanged energy by the heat pump circuit: it allows that the wastewater concentration is achieved up to the salts solubility limits managing also scaling and fouling phenomena.

Evaporation at a low boiling point is made possible by the vacuum condition generated by the pump and the ejector. Wastewater is constantly treated producing two streams: a distillate and a concentrate. The first is simply discharged through a pump or by overflow. The concentrate is separated and discharged in semi-batch mode through a valve according to a pre-set timer when the desired concentration level is achieved.

Evaporation temperature: 40 °C (104 °F)
Achievable concentration in TS: 25 - 35%



Available models
Distillate production capacities

PC F 0.7	0.5-1 m3/day	0.1 - 0.2 gpm
PC F 1.4	1-2 m3/day	0.2 - 0.3 gpm
PC F 2.4	2-3 m3/day	0.3 - 0.5 gpm
PC F 4	3-5 m3/day	0.5 - 0.9 gpm
PC F 6	5-7 m3/day	0.9 - 1.3 gpm
PC F 8	7-10 m3/day	1.3 - 1.8 gpm
PC F 12	10-15 m3/day	1.8 - 2.7 gpm
PC F 24	20-30 m3/day	3.7 - 5.5 gpm

The line is available in different materials to treat different effluents and even the most aggressive salty wastewater (acid pH, chlorides, heavy metals). Typical industrial sectors of application:

Mechanical & Surface Treatments
Microelectronics and Photovoltaic
Chemical
Healthcare (Pharma and Cosmetics)
Food & Beverage

Service Optional

EVA life

Your technology. Always powerful.
The program which makes your unit perfectly performing for its entire life.

EVA Clean
Automatic Washing System

EVA Link
Remote Control

EVA Lab
Analysis

Hydrex In case of foaming effluent, Evaled evaporators are designed to be operated with Hydrex antifoams.

VEOLIA

EVALED®

Heat pump scraped vacuum evaporators **PC R**

0.1
0.5
1
2

CO_2 footprint

Maximum volume reduction

allow a return on investment often measured in months.

Low boiling temperature

ideal in case of very aggressive salty wastewater. Suitable for temperature sensitive products.

Benefits

EVALED PC R is a range of heat pump vacuum evaporators designed to treat liquids with a high content of dissolved solids at low temperature and able to manage a high level of fouling and scaling phenomena (viscous liquids, sediment presence).

The line is dedicated to water reuse.

- Maximum water recovery, minimum quantity of waste to be disposed of
- High quality of recovered water suitable for reuse
- Low energy consumption
- Suitable for very scaling and fouling liquids
- Modular and flexible, short delivery time
- Skid mounted (small footprint) and ready to use (plug & play unit)
- Fully automatic, minimal manpower
- Constant monitoring by remote control
- User-friendly (intuitive HMI)

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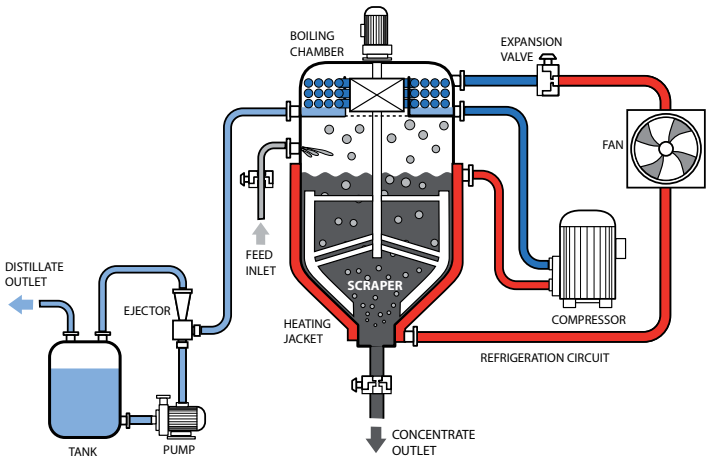
Process diagram

How does EVALED PC R work?

The heat transfer is possible thanks to the heat pump system via a conical jacket at the base of the boiling chamber. The inner heating surface is continuously cleaned by scrapers, which also act to stir the concentrate: this allows a waste concentration achieving the highest viscosity levels also in presence of sediment.

The evaporation at a low boiling point is made possible by the vacuum condition generated by the pump and the ejector. The unit operates in semi batch operation: wastewater is constantly treated, the distillate is continually separated and then discharged through a pump, while the concentrate is discharged at the end of the cycle through a pump as well.

Evaporation temperature: 40 °C (104 °F)
Achievable concentration in TS: 25 - 35%



Available models

Distillate production capacities

PC R 0.1	0.1-0.2 m3/day	0.02 - 0.04 gpm
PC R 0.5	0.3-0.6 m3/day	0.05 - 0.10 gpm
PC R 1	0.6-1.2 m3/day	0.1 - 0.2 gpm
PC R2	1.2-2.2 m3/day	0.2 - 0.4 gpm

The line is available in different materials to treat different effluents and even the most aggressive salted wastewater (acid pH, chlorides, heavy metals), in particular those produced by sectors as:

- Mechanical & Surface Treatments
- Waste (Collectors, Incinerators, Landfills)
- Microelectronics and Photovoltaic
- Chemical
- Healthcare (Pharma and Cosmetics)

Service Optional

EVA life

Your technology. Always powerful.
The program which makes your unit perfectly performing for its entire life.

EVA Link
Remote Control

EVA Lab
Analysis

Hydrex In case of foaming effluent, Evaled evaporators are designed to be operated with Hydrex antifoams.

VEOLIA

EVALED®

Mechanical vapor recompression (MVR) forced circulation evaporators

RV F

- 10
- 15
- 25
- 40
- 60
- 120

CO_2 footprint

Reliability

low maintenance, remote control.

Energy efficiency

very low energy consumption.

Benefits

EVALED RV F is a range of mechanical vapor recompression evaporators designed to achieve the most reliable heat exchange with the minimum fouling and scaling.

The line is dedicated to water separation and possible reuse from high salty wastewater (ZLD).

- Maximum water recovery, minimum quantity of waste to be disposed of
- High quality of recovered water suitable for reuse
- Very low energy consumption
- Suitable for fouling and scaling liquids
- Modular and flexible
- Short delivery time
- User-friendly (intuitive HMI)
- Skid mounted (small footprint) and ready to use (plug & play)
- Fully automatic, minimal manpower
- Constant monitoring by remote control
- Minimum maintenance

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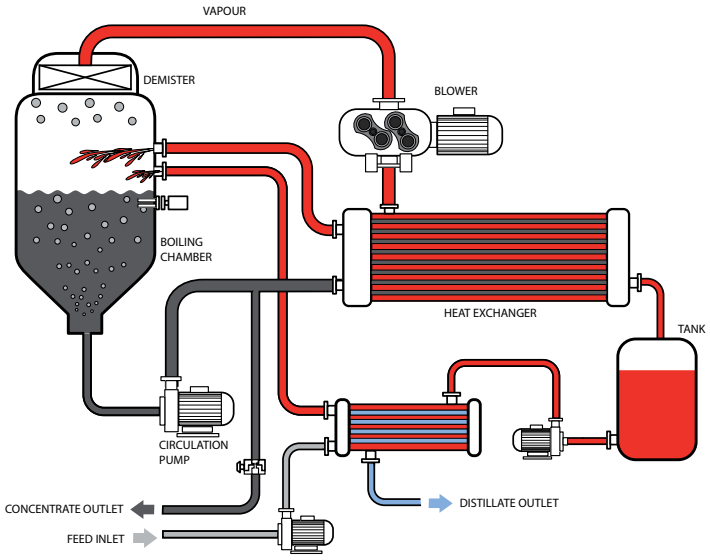
Process diagram

How does EVALED RV F work?

High efficiency forced circulation shell & tube heat exchanger with horizontal tubes allows wastewater concentration up to the salts solubility limits and to manage also suspended crystals.

The MVR is the lowest energy consumption evaporation technology. Wastewater is constantly treated: the distillate and the concentrate are continuously separated and then simply discharged through a pump. Heat is recovered by cooling the two outlet streams using the inlet effluent.

Electrical specific consumption:
45 - 50 kWh/m3 (0.17 - 0.19 kWh/gal)



Available models

Distillate production capacities

RV F 10	8-10 m3/day	1.5 - 1.8 gpm
RV F 15	12-16 m3/day	2.2 - 2.9 gpm
RV F 25	20-25 m3/day	3.7 - 4.6 gpm
RV F 40	30-40 m3/day	5.5 - 7.5 gpm
RV F 60	50-60 m3/day	9.2 - 11 gpm
RV F 120	100-120 m3/day	18.5 - 22 gpm

Available in different materials to treat different effluents containing dissolved salty, organic compounds and even the most aggressive salted wastewater (high chlorides content), produced by various industries:

- Mechanical & Surface Treatments
- Microelectronics and Photovoltaics
- Chemical
- Healthcare (Pharma and Cosmetics)
- Waste (Collectors, Incinerators, Landfills)
- Power
- Mining & Primary Metals
- Food & Beverage

Service Optional

EVA life

Your technology. Always powerful.
The program which makes your unit perfectly performing for its entire life.

EVA Clean
Automatic Washing System

EVA Link
Remote Control

EVA Lab
Analysis

EVA Heart
Maintenance

Hydrex In case of foaming effluent, Evaled evaporators are designed to be operated with Hydrex antifoams.

VEOLIA

EVALED®

Mechanical vapor recompression (MVR) natural circulation evaporators

RV N

3

6

CO_2 footprint

Low running costs

low energy consumption and minimum maintenance.

Treatment of oily effluents

specifically designed to treat oily wastewater.

Benefits

EVALED RV N is a new range of energy efficient MVR natural circulation evaporators dedicated to oily wastewater minimization and water recycling.

Designed for oily wastewater treatment in the mechanical and surface treatments segments, these evaporators can easily separate water from non aggressive wastewater containing oil, heavy metals and dissolved salts.

- High quality of recovered water suitable for reuse
- Very low energy consumption
- Modular and flexible
- Short delivery time
- Skid mounted (small footprint) and ready to use (plug & play)
- Fully automatic
- Minimal manpower
- Constant monitoring by remote control
- User-friendly (intuitive HMI)

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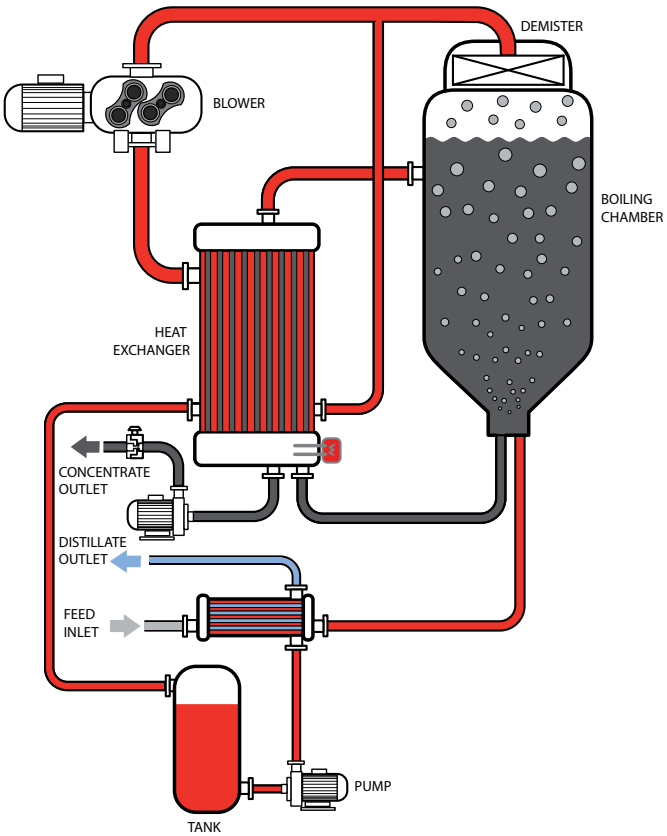
Process diagram
How does EVALED RV N work?

High efficiency heat exchanger with vertical tubes and natural circulation.

Low energy consumption and operating in batch mode: the wastewater is treated in continuous, as well as the distillate is continuously separated and discharged. As soon as the final concentration is achieved, the residue is completely discharged. Wastewater is refilled and a new treatment cycle starts.

Electrical specific consumption:
45 - 50 kWh/m3 (0.17 - 0.19 kWh/gal)



Available models
Distillate production capacities

RV N 3	2-3 m3/day	0.4 - 0.5 gpm
RV N 6	5-6 m3/day	0.9 - 1.1 gpm

This new product is targeted to a specific industry:

Mechanical & Surface Treatments

Automotive, Aviation, Furniture, Appliances, Medical Devices, Micromechanics, Other Mechanical Parts Manufacturing.

Service Optional

EVA life

Your technology. Always powerful.
The program which makes your unit perfectly performing for its entire life.

EVA Clean
Automatic Washing System

EVA Link
Remote Control

EVA Lab
Analysis

EVA Heart
Maintenance

Hydrex In case of foaming effluent, Evaled evaporators are designed to be operated with Hydrex antifoams.

SOLYS WATER QUALITY MONITOR

Chlorine, Hardness, Iron, Phosphate and Sulfite

The WATER QUALITY MONITOR is the ideal system for water quality monitoring.
Several models and parameters: Free chlorine (CLF), Total chlorine (CLT), Hardness (TH), Hardness & Chlorine (THCL), Carbonate hardness (KH), Dissolved Iron (FE), Phosphate (PO_4), Sulfite (SO_3).

FEATURES & BENEFITS

- Menu-driven, programmable functions in clear LCD text display
- Programmable hardness unit in °dH, °f, ppm $CaCO_3$, mmol/l
- Accurate titration via piston-dosing pump
- Low maintenance operation
- Low reagent and water consumption
- Two adjustable limit values with programmable switch functions
- Analysis initiation:
  - Automatic time set intervals (0 - 99 minutes)
  - Dependent on the residual plant capacity
  - Quantity-dependent (water meter)
  - External control
- Output terminal for alarm (fault messages)
- Monitoring of an analysis run and error messages
- Monitoring of the filter capacity
- Analog terminal 0/4-20mA
- Available in 5 languages

APPLICATIONS

- Boiler feed water
- Process water
- Pharmaceuticals
- Food & beverage
- Dialysis
- Swimming pool water
- Drinking water

RELATED SERVICES

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

Models

Model	Measuring parameter	Part Number
Water Quality Monitor TH	Hardness	IEPOHR301088
Water Quality Monitor KH	Carbonate Hardness	IEPOHR301087
Water Quality Monitor CLF	Free Chlorine	IEPOGU301092
Water Quality Monitor CLT	Total Chlorine	IEPOGU301091
Water Quality Monitor DUO	Carbonate Hardness + Hardness	IEPOGU301089
Water Quality Monitor THCL	Hardness + Total Chlorine	IEPOGU301090
Water Quality Monitor FE	Ferrous Iron and Ferric Iron	IEPOGU351971
Water Quality Monitor PO_4	Phosphate	IEPOGU351970
Water Quality Monitor SO_3	Sulfite	IEPOGU351969

Consumables and measuring ranges

Parameter	Reagent type	Reference	°dH	°f	ppm $CaCO_3$	mg/l
Total Chlorine	CLABC	CHKIRT301407				0 - 2.50
Free Chlorine	CLAB	CHKIRT301409				0 - 2.50
Water hardness	TH 2005	CHKIRT301401	0.05-0.50	0.09-0.89	0.89-8.95	
Water hardness	TH 2025	CHKIRT301402	0.25-2.50	0.45-4.48	4.47-44.7	
Water hardness	TH 2100	CHKIRT301403	1.0-10.0	1.79-17.9	17.9-179	
Water hardness	TH 2250	CHKIRT301404	2.5-25.0	4.48-44.8	44.8-448	
Carbonate hardness	TH 2050	CHKIRT301405	0.5-5.0	0.90-8.96	8.9-89.5	
Carbonate hardness	TH 2100	CHKIRT301406	1.0-20.0	1.8-35.8	18-358	
Iron	Fe2500A +Fe2500B	CHKIGU341492 +CHKIGU341493				0-1
Phosphate	KIT PO_4	CHKIGU341491				0-20
Sulfite	SO_3A+SO_3B	CHKIGU341489 +CHKIGU341490				0-50

Specifications

Power supply	230 V or 24 V ±10%; 50 - 60 Hz
Power consumption	max. 30 VA
Degree of protection	IP 65
Protection class	I; CE
Ambient temperature	10 - 45 °C
Water temperature	10 - 40 °C
Operating pressure	0.1 - 8 bar; 104 - 8 x 105 Pa
Dimensions (W x H x D)	380 x 480 x 280 mm
Weight	approx. 10.5 kg

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VEOLIA

Mobile Water Services

Emergency, Planned and Multi-Year Water Treatment

WATER TECHNOLOGIES

As a global leader in mobile water services, Veolia has the resources and expertise to provide high quality, cost-effective solutions for short and medium term water treatment. We provide treated water 24 hours a day, 7 days a week, with flow rates ranging from 1m³/hr to 150m³/hr. Our proven track record for delivering a rapid response, has enabled many companies to maintain continuity of treated water supply to their core operations in unforeseen circumstances.

What are Veolia Mobile Water Services?

Mobile Water Services provide water treatment technologies pre-packaged on a trailer, skid or container for maximum mobility and rapid response. Available as standard or modular systems they are pre-engineered with plug and play connections for ease of use.

A very wide range of water treatment technologies are available on these mobile units including:

• Multimedia Filtration • Ultrafiltration • Clarifiers
• Brackish Water Reverse Osmosis • Electrodeionisation
• Ion Exchange Softening • Ion Exchange Deionisation
• Sea Water Desalination • Membrane Degassing
• DAF • MBR • MBBR • Evaporation

When are mobile water systems suitable?

Mobile water systems are a more cost-effective and efficient alternative to fixed plant in a wide range of industrial situations and circumstances. Furthermore, because they are classed as an operational cost they do not negatively impact the capital investment budget for utilities. They are ideal for:

- Emergency situations where existing plant has failed or where feed/cooling water has become contaminated
- Treating spent process water for re-use or discharge in accordance with environmental standards
- Short or medium term replacement for ageing plant and infrastructure that is becoming unreliable or expensive to operate and maintain
- Providing short term additional water treatment capacity for production expansion, new product trials or an uncertain product lifecycle
- Reducing raw water costs, improving the quality of the treated water and implementing a more sustainable solution

Why choose a mobile water system from Veolia Water Technologies?

- Veolia has unrivalled speed of response and a proven track record within the industry
- The quality and quantity of treated water is guaranteed – 24/7
- Extensive global experience with the widest range of products and technologies available
- Priority access to our emergency fleet through our ReAct service
- Flexible contracts – the treated water volume can be increased or decreased at any time to meet changes in demand
- Fixed price contract with no hidden extras for easy budgeting
- A choice of support packages to suit your operation
  - 'Hands off Maintenance' – full technical and operational support are provided throughout the contract, reducing manpower and inventory management costs
  - 'Hands on Maintenance' – gives you full control over the production using existing resources
- Acquire the very latest technology without substantial investment in new infrastructure
- Zero accidents and full Health & Safety compliance
- A responsible, environmentally friendly and sustainable service

Our markets

Demand for mobile water services is growing year on year. Our customers come from a wide range of markets including:

- Power generation
- Oil and Gas
- Petrochemicals
- Food & Beverage
- Pharma
- Pulp & Paper
- Metals
- Waste water

Short, medium or longer term solutions

Emergency – short term cover for plant failure

Water treatment plant failure is always unexpected and potentially very costly. It is vital that every business has an emergency plan in place to minimise downtime and production losses. By registering with our ReAct Treated Water Security Plan, you can ensure that the appropriate ready to go mobile water treatment resources are deployed within 4 hours of your call. Our Emergency service delivers the quality and quantity of treated water you need as quickly as possible to keep operations running smoothly while your existing plant is repaired. If you are an ISO 22301 registered company our ReAct service will also fulfil your Business Continuity Planning requirement for your water treatment.

Our Emergency service covers a wide range of unforeseen circumstances including:

- Temporary water treatment plant failure
- Unforeseen changes in the raw water supply
- Boiler or condenser leaks
- Need to comply with environmental legislation
- Increase in the demand for treated water

Case Study

Generating electricity from waste

The Veolia Environmental Services Energy Recovery Facility (ERF) at Newhaven, handles 210,000 tonnes per year of municipal solid and street cleansing waste from East Sussex. This waste is incinerated to fuel two 50bar water tube boilers which produce steam to drive a turbine generating 19MW of electricity.

The high pressure boilers operated at 43.7m³/h steam flow and required the water treatment plant to have an operational capability of up to 4.5m³/h of high purity water. Demineralised water was produced on site by an ion exchange plant, but during a two day control system modification the plant was unable to meet normal output quantity and quality.

Within 4 hours of contact, Veolia's Mobile Water Services had despatched two MOFI™ ion exchange units capable of delivering a continuous supply of 70m³/h of high purity water to the site. The mobile solution enabled the turbine to continue running at full capacity while the modifications were carried out.

Planned – covers maintenance downtime

Our Planned service is designed to maintain the continuity of your treated water supply during pre-planned maintenance or refurbishment projects. We provide flexible, cost-effective and adaptable solutions that can be tailored to your particular requirements for as long as you need them – 1 day or 1 year. Our planned service is ideal for:

- Gas turbine inlet cooling
- Two shifting
- Full flow trials
- Feed water changes
- Condensate applications
- Production expansion
- Pipe work commissioning
- Boiler flush and fill
- Hydro testing
- Steam blows

Multi-Year – reliable and cost-effective for long term requirements

Our Multi-Year service offers bespoke or standard water treatment systems for longer contract periods of between 1 and 10 years. It is the ideal way to cover periods of uncertainty over production life cycles or where capital budgets are already stretched.

- Take advantage of the latest products and technology to optimise production and save on operational costs
- Deliver higher volumes of high quality water with maximum uptime
- Achieve a reduction in raw water costs due to higher recovery rates
- Transparent fixed pricing with no unplanned extras – you only pay for what you require for as long as you need it.
- Your treated water needs are always guaranteed with priority access to our emergency fleet if your circumstances change

Case study

Cooling Tower maintenance

INEOS ChlorVinyls is a major manufacturer of industrial chlor-alkali chemicals, a global leader in chlorine derivatives and Europe's largest PVC manufacturer.

The company's wooden cooling towers needed to be replaced, but shutting down the entire cooling system would result in lost production.

The decision was taken to replace the towers one by one. During the process cooling water contaminated with demolition debris, flowed into the sump of the off-line tower. This water had to be treated before discharge to drain or recovery back to the cooling system.

Within days Veolia had provided a temporary water treatment plant with the capacity to process 50m³/h of contaminated water. The bespoke system, consisting of pumps and two stages of filtration, removed and retained the debris and chemicals from the water, enabling the continued operation of the cooling system.

Case study

Keeping the winter lights on

Indian Queens power plant in Cornwall operates at peak demand periods, to supplement electricity supplies from larger power stations. In winter months up to 170m³ per day of deionised water is required to be sprayed into the burner, reducing the flame temperature and suppressing nitrous oxide emissions. Demand for water in summer months drops to just 40m³ per day.

Effluent discharge from water treatment is not allowed on the site and given the seasonal demand for deionised water it was decided that a multi-year mobile water treatment plant for the winter months with a fixed Veolia demineraliser for the low demand summer months would be the most cost-effective solution.

Veolia's Mobile Water Services supplied two separate MODI demineralisation plants. The equipment being capable of providing 30m³/hr of demineralised water at <0.1 µS/cm, <10 ppb Silica – meeting and exceeding the water quality and volume requirements. Discharge of chemicals and effluent was not an issue as regeneration of the ion exchange resins takes place off site at Veolia facilities.

VEOLIA

Resourcing the world

For further information

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Mobile Water Services

Veolia Water Technologies

PRODUCT

VEOLIA

QUALITY

SERVICE

After sales Service

The guarantee of the solution through the time (1)

A RELIABLE SERVICE

Veolia Water Technologies Sp. z o.o. ensures customers to obtain the most from the technological solutions they have been investing in through the time, both they are single units and complete water treatment plants.

The constant efficiency is guaranteed thanks to the high skills on maintenance, spare parts and online service.

SERWICE SKILLS ARE TARGETED TO:

- Standard units for process water (RO, UF, CEDI)
- Standard units for wastewater treatment (evaporators, flotation units, biologic, chemical-phisical, clarification units)
- Chemicals
- Mobile units for wastewater treatment and process water

STANDARD UNITS FOR PROCESS WATER (RO, UF, CDI)

An after-sales service aimed at optimizing both the running costs and the quality of the water produced.

- Ordinary maintenance
- Spare and consumable parts
- Chemical analysis
- Breakdowns management

STANDARD UNITS FOR WASTEWATER TREATMENT

The service for EVALED evaporators, IDRAFLOT DAF units and ACTIFLO clarification units.

- Spare and consumable parts available in stock
- Maintenance:
  - ordinary (scheduled)
  - extra maintenance (scheduled)
  - emergency maintenance (not scheduled)
- Operation of turn-key plants
- Maintenance contracts
- Plants remote control
- Permanent Client's staff training
- Chemical and analitics analysis

CONTACT

info.poland@veolia.com

PRODUCT

QUALITY

SERVICE

After sales Service

The guarantee of the solution through the time (2)

HYDREX™ CHEMICALS

Our systems are designed to work with Hydrex chemicals:

- Antifoam products for evaporation processes
- Maintenance chemicals (cleaners, antiscalants and anticorrosives)
- Polyelectrolyte and coagulants for chemical-phisycal processes and flotation

HYDREX SERIES

- 1 000 series: total boiler water treatment chemicals
- 2000 series: closed and open cooling system treatment programs (cooling towers, air coolers)
- 3000 series: drinking water production
- 4000 series: effective antiscalants and cleaners
- 5000 series: industrial maintenance chemicals (corrosion inhibitors)
- 6000 series: state-of-the-art clarification and wastewater chemistry and application experience
- 7000 series: bioacides with a board spectrum of activity and legionella control
- 8000 series: estabilished process and speciality chemicals
- 9000 series: wide range of other applications

RELATED SERVICES

- Technical support on standard product portfolio
- Product customization
- Product commissioning
- Local operators training

Our service department offers the possibility to prepare a customized after-sales service package tailored to the specific / specific requirements of water treatment facilities.

FULL SERVICE

The possibility of choosing a full and complete package including all after-sales activities.

CUSTOMIZED FULL SERVICE

The possibility of choosing a full and complete package including all after-sales activities:

- Recommended spare parts and consumables:
- Description of spare parts and consumables that must be available in stock to facilitate repair and maintenance operations. Increased reliability and availability for faster maintenance
- Routine maintenance
- Planned and preventive maintenance
- Management of intervention in crisis situations
- Turnkey unit management
- Long-term maintenance contracts/offers
- Remote control of the installation
- Training sessions for customer personnel
- Chemical analysis and analytical tests
- Self-cleaning kit for heat exchanger

CONTACT

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PRODUCT

QUALITY

SERVICE

HUBGRADE/ AQUAVISTA™ - digital services

The all-in-one water digital service.

AQUAVISTA™ is a comprehensive digital solutions package dedicated to support, control and archiving the operation of water and wastewater equipment and systems.
Fully flexible, the AQUAVISTA™ digital solutions can be implemented for a single technology, a range of equipment, standard products as well as for existing or new industrial and municipal water treatment plants for all applications including drinking, waste and process water.

A new and better way to manage your water treatment systems.

AQUAVISTA™ delivers remote monitoring of your water treatment system and can be accessed via the AQUAVISTA™ portal.

AQUAVISTA™ is composed of 4 complementary components:

- AQUAVISTA™ Portal: A customer portal for remote monitoring and reporting with a complete overview of all your data;
- AQUAVISTA™Insight: A data driven performance optimization tool with notifications regarding the general status and operational conditions of your plant;
- AQUAVISTA™ Plant: An online real-time, smart and automated optimization system;
- AQUAVISTA™ Assist: An access to Veolia's Process Experts for easily accessible assistance.

New vision for your water treatment

Main benefits include:

- Remote monitoring from whwrever you are - supporting you to make the most of performance and equipment status data
- Managed service 24/7 - full alarm management, pre-emptive maintenance and emergency support, ensuring your business runs smoothly.
- Instant insights - access trend and alarm reports that give you real insights into equipment performance.

AQUAVISTA™ Plant is installed at over 100 water treatment plants and installations worldwide.
Recorded impacts up to:

- 40% higher biological capacity
- 100% increase in hydraulic capacity
- 25% energy reduction for aeration
- 75% energy reduction for grit chamber aeration
- 75% reduction in energy use for internal nitrate recirculation
- 100% reduction in chemical use
- 20-50% in overall cost savings

CONTACT
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PRODUCT

QUALITY

SERVICE

Factory Acceptance Test (FAT)

At VEOLIA, we conduct Factory Acceptance Tests of all the products manufactured in our workshops for:

- **Evaluating the manufactured product during and after the assembly process**
- **Ensuring that the components and controls are working properly according to the functionality of the equipment itself**

Testing procedures includes from procurement, goods reception, assembly and to the dispatch of the finished product:

- Goods inspection
- Mechanical test
- Electrical test
- FAT report
- Continuous improvement

FEATURES & BENEFITS

- Delivery of plug & play units: All units are tested and validated in our factory, ready for shipment and installation
- Qualified quality control teams and testing programmes for meeting our customers' expectations
- Feedwater quality: drinking water, or RO permeate for testing demineralisation units
- Performance records and traceability
- Documentation compliance including operator's manuals, instructions, drawings, P&IDs

OPTIONS

- Customised tests agreed at design stage can be conducted at FAT with end user
- Witnessed FAT with end-user: final acceptance tests of the fully pre-tested product can be organized in our workshops with the presence of the end-user

*Test of SIRION **in** Spain*

Test of ORION in UK

Test bench for large units, Spain

CONTACT

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PRODUCT

QUALITY

SERVICE

Commissioning support

VEOLIA can provide support during your VEOLIA product commissioning phase having a VEOLIA qualified engineer on site will ensure that the site installation of the unit is perfectly done that the unit control is integrated into the client control system (external signals connection) and that the requested performances we readed (Instalation and Operational Qualified IQ/OQ).

Having the same VEOLIA engineer for factory internal tests, witnessed tests and on-site commissioning, guarantees the longtest lend of quality to our customers.

FEATURES & BENEFITS

- Technical support on VEOLIA standard product portfolio
- Check of the unit installation
- Start-up and run the unit
- Validation knowledge for completion of IQ/OQ
- Local training to operators

OPTIONS

- Functional training for the local site operators on the standard unit
- Troubleshooting assistance for standard products

RELATED PRODUCTS

- ACTIFLO
- FILTRAFLO Pack
- ORION
- NURION
- OPAMEM
- RAPIDE STRATA
- SIRION Mega HF
- SIRION Seawater

CONTACT

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PRODUCT

QUALITY

SERVICE

Consumables and spare parts

At VEOLIA, offer a wide range of consumables and spare parts to ensure the optimal running of our customers's water treatment facilities in industrial or municipal market applications.

To ensure the best quality for our clients rents units and efficiency, VEOLIA proposes a complete portfolio of consumables and spares focus on your equipments.

VRO™ Veolia reverse osmosis membranes

FEATURES & BENEFITS

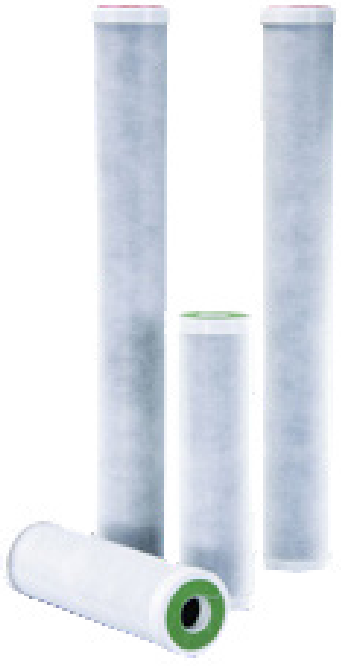
- Veolia high-quality and competitive product
- Quick lead-time
- Documented installation kits, maintenance equipment
- Worldwide delivery

PRODUCTS

- Filtration: cartridge filters, filtration false floor, nozzles
- Clarification, settling: lamella plates and blocks, Turbomix™, Hydrocyclone
- UF/NF/RO: VRO™ reverse osmosis membranes, UF module, repair and control units
- Media: sand, microsand, gravel, resin, biodagen, mangagran, pumice
- Monitoring & Flow Control, pressure gauges, water quality monitoring, syphons •

Dosing pumps

- HYDREX™ water treatment chemicals, protection of membranes



Cartridge filters

CONTACT

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PRODUCT

QUALITY

SERVICE

Best in class Logistics services

We can propose different levels of logistics services, from the simple ExW delivery to the whole supply chain outsourcing.

To ensure the best quality for your units and his efficiency, VEOLIA has several logistics sites in Europe and Asia.

Wissous

FEATURES & BENEFITS

- VEOLIA logistics warehouses located in Europe and Asia
- 150000 items dispatched Worldwide per year
- We reduce logistic cost, thanks to our transport partnership
- Barcoding System for goods in & goods out, for supply chain efficiency, increased stock accuracy & traceability

Spain

OPTIONS

- Emergency delivery
- Logistics Cost reducing with the INCOTERM delivery on demand
- DDP available on demand if you want VEOLIA team to handle the whole supply chain and final delivery on site
- CIF delivery to ease the transportation of your goods up to the closest location needed
- FCA delivery on demand

We offer different incoterms (FCA,DDP,CIF) to case the transportator of your goods and to match as close as we can with your projects expectations.

CONTACT

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Resourcing the world

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