



# Ultra Clear™ RO and Ultra Clear™ Compact Series Systems

Water Technologies

**SIEMENS**

# Ultra Clear™ Compact Series Systems



The Ultra Clear™ Compact RO DI Series Systems product water quality exceeds ASTM Type II and ISO 3696 Type II.



Compact system - reverse osmosis, deionization and 30l tank combined in one unit. Two flowrates – four choices.

The Ultra Clear™ Compact Series System incorporates RO and RO/DI purification technology, a reservoir, and all needed accessories in one unit. The systems are ready to go because the first set of consumables is included. All units are equipped with a 30 l tank.

The space saving systems can be used wall mounted or on a bench top. With pump, including DI polishing or without, the needed system is easily selected.

With approximately 98% salt reduction in the RO section and a polished water quality < 0,1 µS/cm offers the Compact line water for nearly all laboratory needs.

Flow rates are 7 l/h and 15 l/h for both the RO and the RO/DI range. Optional CO<sub>2</sub> trap/vent filter combinations and UV sanitization units are available to protect the incorporated tank.

The unique design for all Ultra Clear™ Compact Series System cartridges allows an easy and fast replacement.

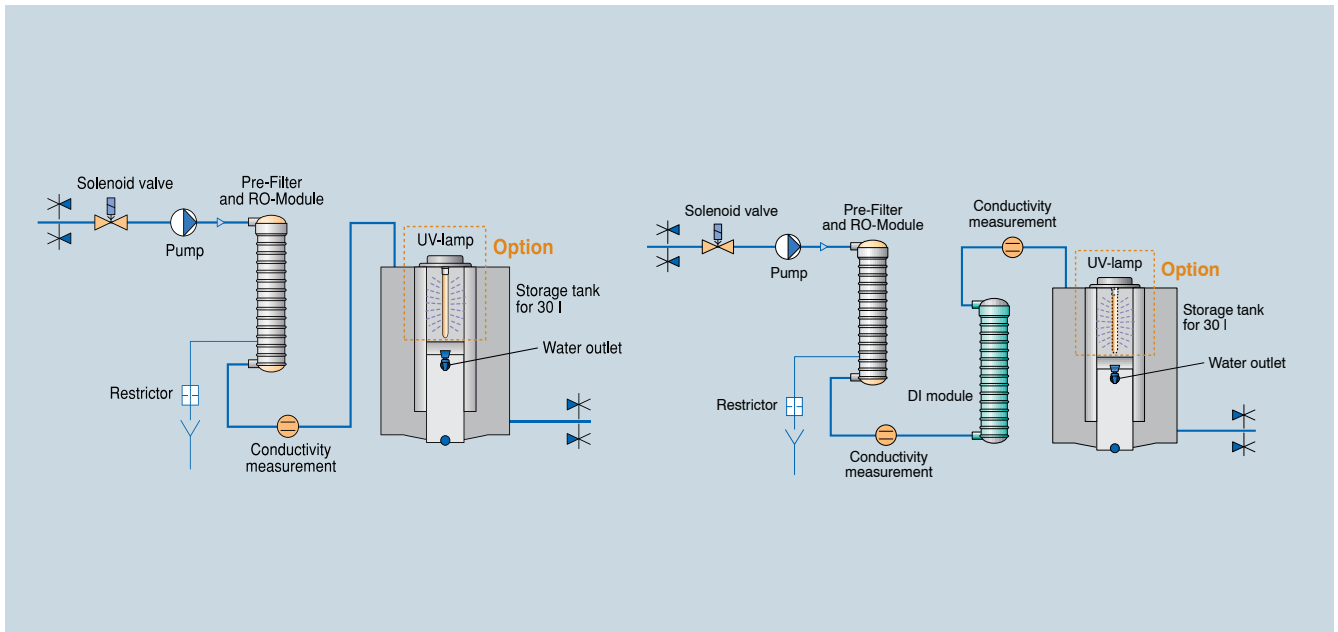
The new product family offers economically priced systems with running costs for each budget.

## Typical applications

**Ultra Clear™ Compact RO Series System:** Feed for laboratory ultrapure water systems, general chemistry, laboratory washing machines, water for autoclaves and environmental chambers, buffer preparation

**Ultra Clear™ Compact RO DI Series System:** Feed for laboratory ultrapure water systems, general chemistry, general chemical analysis, laboratory washing machines including final rinse, water for autoclaves and environmental chambers, buffer preparation, photometry / spectrophotometry, media preparation

Consumables	
Item	Cat. No.
Pre-Filter and RO-Module 7 l/h	2111
Pre-Filter and RO-Module 15 l/h	2112
DI module	2113
CO <sub>2</sub> trap replacement cartridge	3502
Replacement UV Lamp for #2594-1	2594-01



Ultra Clear™ Compact RO Series System (15 LPH) flowsheet

Ultra Clear™ Compact RO DI Series System (15 LPH) flowsheet

Ultra Clear™ Compact Series Systems are the perfect solution for all general laboratory water needs including feed water for ultra pure water systems.

Additional water outlets on the tank can be used to feed dishwashers or autoclaves. The DI version delivers the pure water directly to the faucet on the tank.

**Clear advantages:**

- 30 l tank is integrated
- Space saving
- Easy to use
- Digital display and controller
- One DI cartridge for all DI-systems
- Plug and play
- Quality control of RO permeate in all units
- Reduction rate for particles and bacteria > 99%
- Pure water quality <0,1 µS/cm for all DI units

Ultra Clear™ Compact Series System		RO	RODI
Production rate at 15°C	LPH	7 or 15	7 or 15
Rejection rate	%	> 96	> 96
Purewater quality	µS/cm	–	< 0.1
Dimensions: H/W/D	mm	590 / 405 / 395	
Catalog No.	7 LPH	3802-01	3812-01
	15 LPH	3803-01	3813-01

Please make sure the tap water quality is in the requested range.

Feedwater specification		
Feed water pressure	bar	0.1 – 5
Feed conductivity	µS/cm	< 1400
Colloid Index	SDI	< 3
Free Chlorine and Fe	mg/l	0.1

Options	
Item	Cat. No.
UV-Lamp	2594-1
Wall bracket	3316
CO <sub>2</sub> trap with vent filter	3501-1

# Ultra Clear™ RO Series Systems



Most systems on the market have less than 20% recovery. Automatic, user-friendly maintenance alerts notify the operator when system service is required.

The Ultra Clear™ RO Series System produces high quality water with very low energy consumption. The use of “low energy” membranes provide very efficient and economical operation. High quality material standards guarantee long service life.

The Ultra Clear™ RO Series System uses the newest pump technology, which runs without the traditional e-motor, and operates nearly noiseless (systems 20-100). Due to an integrated automatic membrane rinse cycle, in many cases, the systems can operate on untreated city water.

Recovery rates up to 75% are possible with optional water softening.

Product water recovery is set up to an astounding 50% from the factory, therefore, Ultra Clear™ RO Series Systems also conserve water.

Ultra Clear™ RO Series System		10	20	40	60	100	200
<b>Product water performance</b>							
Production rate at 15°C	LPH	10	20	40	60	100	200
Rejection rate	%	> 96	98 – 99	98 – 99	98 – 99	98 – 99	98 – 99
Rejection rate for bacteria	%	> 99	> 99	> 99	> 99	> 99	> 99
Rejection rate for particles	%	> 99	> 99	> 99	> 99	> 99	> 99
<b>Feed water specification</b>							
Feed water pressure	bar	0.1 - 5	2 – 6	2 – 6	2 – 6	2 – 6	2 – 6
Feed conductivity max.*	µS/cm	< 2000	< 2000	< 2000	< 2000	< 2000	< 2000
Colloid Index	SDI	< 3	< 3	< 3	< 3	< 3	< 3
Free Chlorine and Fe	mg/l	< 0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Shipping weight	kg	26	31	32	33	35	75
Power consumption	kWh	0.05	0.2	0.2	0.2	0.2	0.55
Power supply	V/Hz	110 – 230/50 – 60					
Dimensions: H/W/D	mm	530/340/320	530/340/420				1320/340/420
<b>Catalog Number</b>		<b>3000</b>	<b>3001</b>	<b>3002</b>	<b>3003</b>	<b>3005</b>	<b>3006</b>

\*For feed conductivity up to 3500 µS/cm, 2-pass Ultra Clear RO systems are available on request.



Ultra Clear™ RO Series System



Ultra Clear™ RO Series System

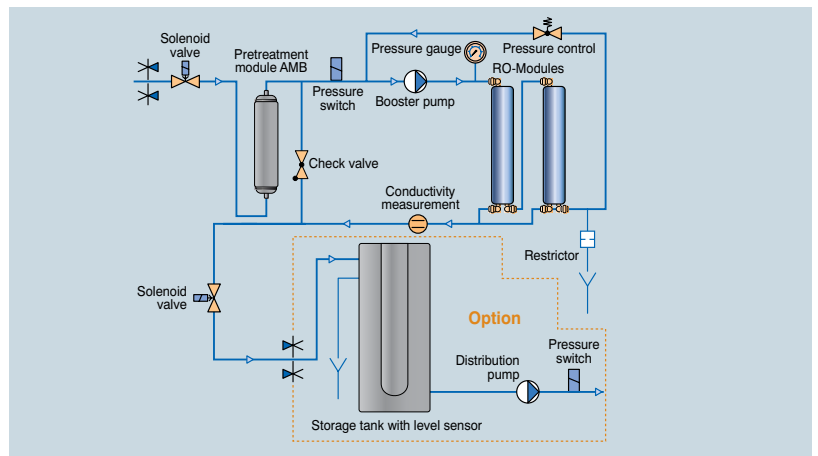


Ultra Clear™ RO Series System

Storage tanks help for the RO systems to provide additional water volume during times of high demand. The storage tank can also be used to supply water for other lab equipment. The storage tank allows higher volumes of water to be used for short periods that would otherwise be limited to the RO system production rate.

A storage tank basically guarantees that water is available when needed. The proper storage tank size and system configuration will be recommended by Siemens Water Technologies based on application and water volume requirements to ensure optimum service from the equipment.

Standard tanks are available in 30, 60 and 80 liter sizes. Optional tanks of up to 3,000 liters are also available. Detailed information about the standard tanks is available in the tank section of this brochure. All systems display inlet and product water quality. The salt reduction rate will be shown in percentage.



Ultra Clear™ RO Series System flowsheet

### Ultra Clear™ RO Series System Consumables

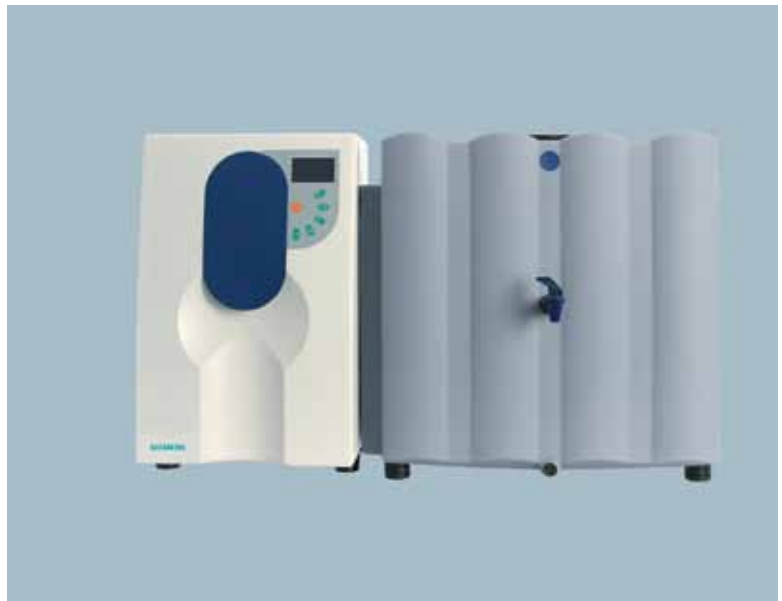
Item	Change frequency	Cat. No.
Pretreatment Module AMB*	6-monthly**	2057
RO-Module for Ultra Clear RO 10, 1 x	2 – 3 years	2083
RO-Module for Ultra Clear RO 20 ... 100***	2 – 3 years	31019
RO-Module for Ultra Clear RO 200, 1 x	3 – 5 years	2076

\* Ultra Clear RO 200: 2 Pretreatment Modules AMB per unit required.

\*\* Cartridge exchange may be more frequent. Subject to feed water quality and consumption.

\*\*\* Number depends on system size.

# Ultra Clear™ RO DI Series Systems



Ultra Clear™ RO DI Series System – final ion exchange polishing Type II water – you select the system size.

The Ultra Clear™ RO DI Series System delivers permeate water with a salt reduction of approximately 98%.

The Ultra Clear™ RO DI Series System will polish the RO permeate to a quality of <math><0.1 \mu\text{S/cm}</math>. At a 98% rejection rate, the RO permeate water that originated

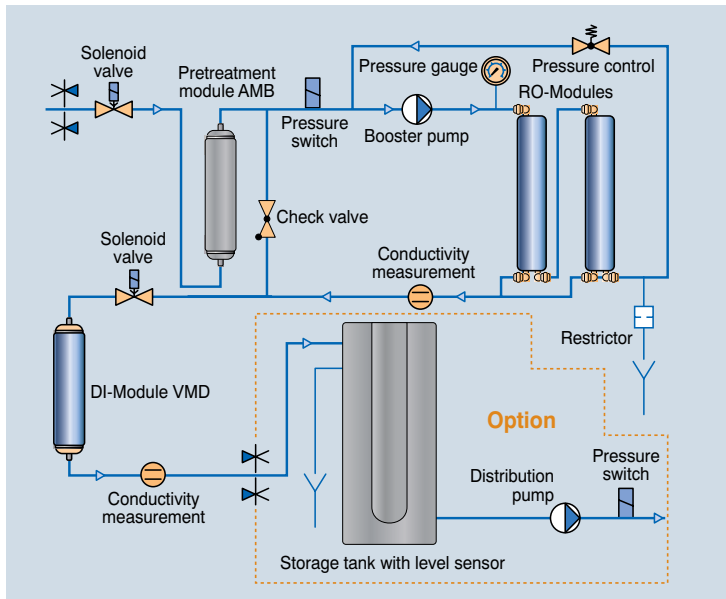
from a  $400 \mu\text{S/cm}$  feed water source would still have a conductivity of about  $8 \mu\text{S/cm}$ . The Ultra Clear™ RO DI Series System polishes this water to  $<0.1 \mu\text{S/cm}$ .

The deionization module is delivered with the Ultra Clear™ RO DI Series System. These modules are directional and will require

replacing at a frequency dependant on feed water quality and water consumption. A changing interval of about 3 months is typical. The DI modules are a lower cost alternative to electro-deionization systems such as our Ultra Clear™ RO EDI Systems.

The high quality resin used in our DI module combines mechanical

Ultra Clear™ RO DI Series System		10	20	40
<b>Product water performance</b>				
Production rate at 15°C	LPH	10	20	40
Rejection rate (RO)	%	98 – 99	98 – 99	98 – 99
Conductivity at 25°C	$\mu\text{S/cm}$	< 0.1	< 0.1	< 0.1
Rejection rate for bacteria	%	> 99	> 99	> 99
Rejection rate for particles	%	> 99	> 99	> 99
<b>Feed water specification</b>				
Feed water pressure	bar	0.1 - 5	2 – 6	2 – 6
Feed conductivity	$\mu\text{S/cm}$	< 2000	< 2000	< 2000
Colloid Index	SDI	< 3	< 3	< 3
Free Chlorine and Fe	mg/l	< 0.5	< 0.1	< 0.1
Shipping weight	kg	28	33	34
Power consumption	kWh	0.05	0.2	0.2
Power supply	V/Hz	110 – 230/50 – 60		
Dimensions H/W/D	mm	530/340/320	530/340/420	
<b>Catalog Number</b>		<b>3000-DI</b>	<b>3001-DI</b>	<b>3002-DI</b>



stability and a low TOC content for low organic applications.

An Ultra Clear RO system with DI module delivers water with a quality that fulfills the needs of most laboratory requirements.

All systems display inlet and product water quality. The salt reduction rate will be shown in percentage.

#### Typical applications

- Feed for laboratory ultrapure water systems
- General chemistry
- Laboratory washing machines including final rinse
- Feed for autoclaves and climate chambers
- Buffer preparation
- Photometry
- Spectrophotometry
- Media preparation

#### Ultra Clear™ RO DI Series System Consumables

Item	Change frequency	Cat. No.
Pretreatment Module AMB	3 – 6-monthly*	2057
RO-Module for Ultra Clear RO 10 DI, 1 x	2 – 3 years	2083
RO-Module for Ultra Clear RO 20 DI, 40 DI**	2 – 3 years	31019
DI-Module VMD	3-monthly*	2050

\* Cartridge exchange may be more frequent. Subject to feed water quality and consumption.

\*\* Number is depending on system size.

Accessories for tanks please see page 17

# Ultra Clear™ RO EDI Series Systems

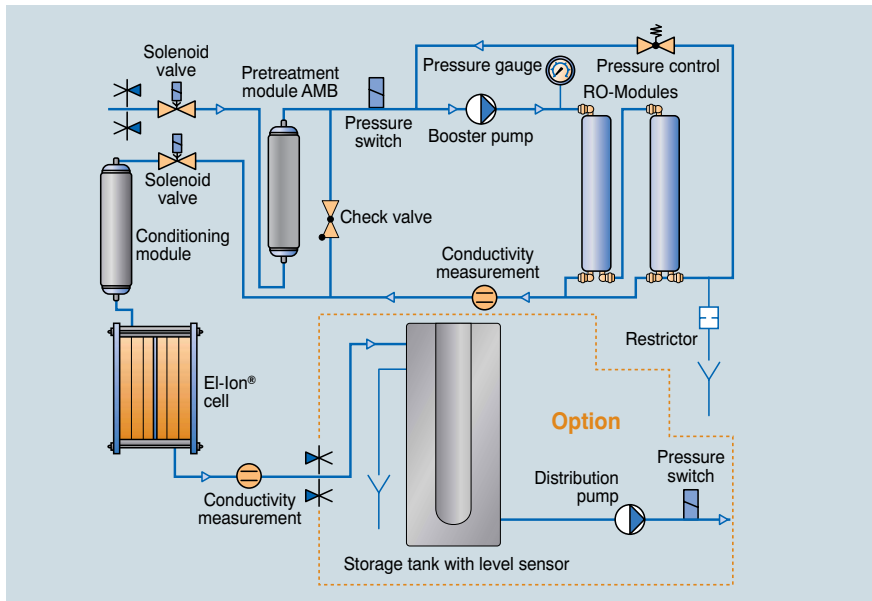


The successful Ultra Clear™ RO EDI Series Systems combines leading edge technology and modern design. The name stands for the high quality purified water produced by the El-Ion® cells combined with proven reverse osmosis technology.

The Ultra Clear™ RO EDI Series Systems is characterized by low energy consumption, high-product water yield, and economical operation. The latest pump technology with an almost silent motor, is another highlight of our Ultra Clear™ RO EDI Series

Systems. As pioneers in the electro-deionization field, we can make your decisions easy. El-Ion® cells do not require regeneration chemicals as do mixed bed ion exchangers. El-Ion® modules also use less rinse water than competitive systems.

Ultra Clear™ RO EDI Series System		10	20	40	55
<b>Product water performance</b>					
Production rate at 15°C	LPH	10	20	40	55
Conductivity at 25°C	µS/cm	0.06 – 0.2	0.06 – 0.2	0.06 – 0.2	0.06 – 0.2
Resistivity at 25°C	MΩ-cm	5 – 17	5 – 17	5 – 17	5 – 17
TOC	ppb	5 – 20	5 – 20	5 – 20	5 – 20
<b>Feed water specification</b>					
Feed water pressure	bar	0.1 - 5	2 – 6	2 – 6	2 – 6
Feed conductivity	µS/cm	< 1400	< 1400	< 1400	< 1400
Hardness	° dH	< 20	0	0	0
Colloid Index	SDI	< 3	< 3	< 3	< 3
Free Chlorine and Fe	mg/l	< 0.5	< 0.1	< 0.1	< 0.1
CO <sub>2</sub> max.	mg/l	< 20	< 20	< 20	< 20
Shipping weight	kg	31	43	44	46
Power consumption	kWh	0.1	0.25	0.25	0.3
Power supply	V/Hz	110 – 230/50 – 60			
Dimensions: H/W/D	mm	530/340/320	530/340/420		
<b>Catalog Number</b>		<b>3402</b>	<b>3403</b>	<b>3404</b>	<b>3406</b>



Ultra Clear RO/EDI with 80 l tank

The results are impressive. Conductivity down to  $< 0.060 \mu\text{S/cm}$ , TOC values down to  $< 10 \text{ ppb}$ , reduction of endotoxins down to  $< 0.02 \text{ EU/ml}$  and significant bacteria reduction, set new standards for electro-deionization.

All systems display inlet and product water quality. The salt reduction rate will be shown in percentage.

#### Typical applications

- Feed for laboratory ultrapure water systems
- General chemistry
- Laboratory washing machines including final rinse
- Feed for autoclaves and environmental chambers
- Buffer preparation
- Photometry
- Spectrophotometry
- General chemical analysis
- Media preparation
- Protein electrophoreses
- Microbiological media preparation,
- Cytology and histology work
- Electrophoreses

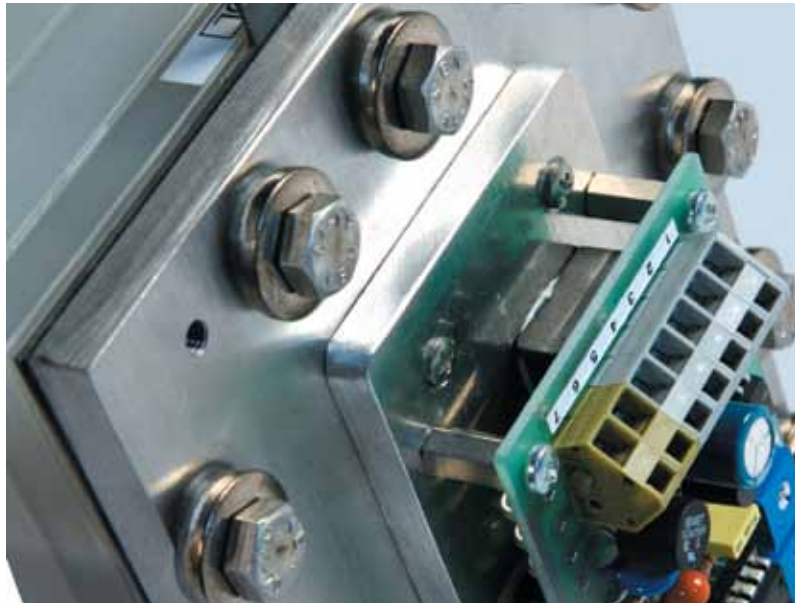
#### Ultra Clear™ RO EDI Series System Consumables

Item	Change frequency	Cat. No.
Pretreatment Module AMB	6-monthly*	2057
Conditioning Module	Change frequency depends on water hardness and amount of used water. Please enter your actual hardness at the controller and the change frequency will be shown automatically.	2062
RO-Module for Ultra Clear RO 10 plus, 1x	2 – 3 years	2083
RO-Module for Ultra Clear RO 20 ... 55 plus**	2 – 3 years	31019

\* Cartridge exchange may be more frequent. Subject to feed water quality and consumption.

\*\* Number is depending on system size.

# Ultra Clear™ RO EDI Series Systems



Leading technology everywhere you look. Constant water quality, no DI cartridge change. Low TOC levels directly from the El-Ion® module.

This electro-deionization process, which makes it possible to greatly improve the quality of the reverse osmosis permeate, was invented and patented at the Jülich research center. As licensees of this technology, we have developed the process to the highest industry standards. Since 1994, the technology has been identified under the El-Ion® brand name. This unique technology has the ability to reduce bacteria, oxidize TOC, and handle higher than normal CO<sub>2</sub>

levels. There is no other product as capable and compact.

### Comparison: Ion exchange and the El-Ion® electro-deionization module

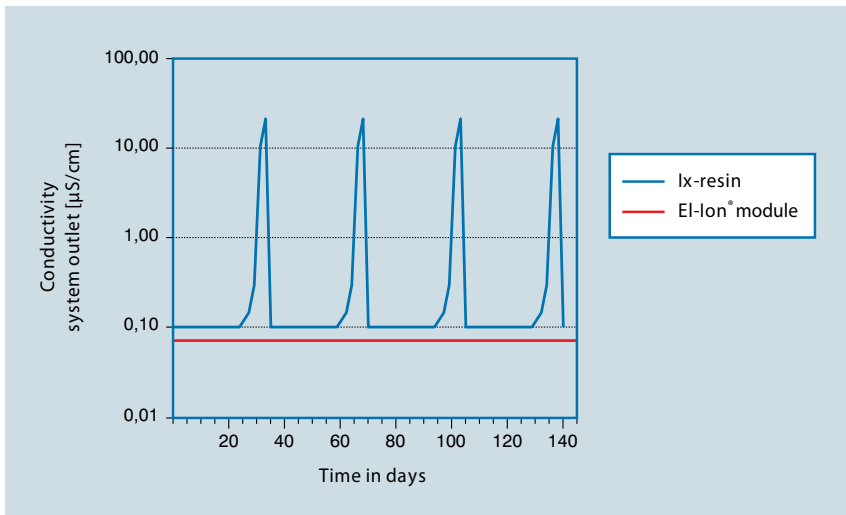
This diagram shows clearly what modern technology can do.

When a mixed bed polishing module is used, the conductivity of the product water increases during normal operation and exhaustion. The resin has to be changed or

regenerated if the maximum acceptable conductivity is reached.

If using the El-Ion® electro-deionization module, the product water quality is constantly at the highest level.

No regeneration, no quality variation. Simply high quality water at any time.

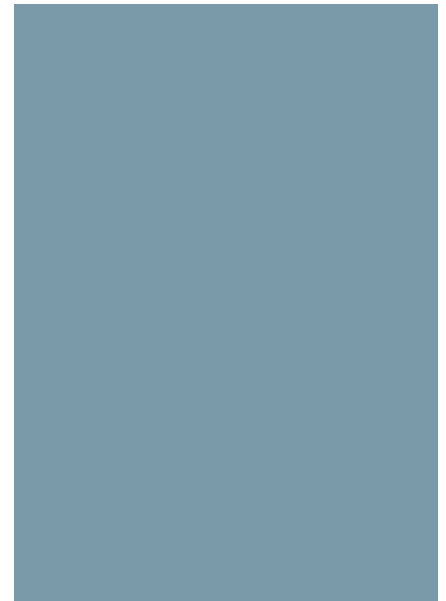




El-Ion® Module, pure water output 10 l/h



El-Ion® Module, pure water output 40 to 55 l/h



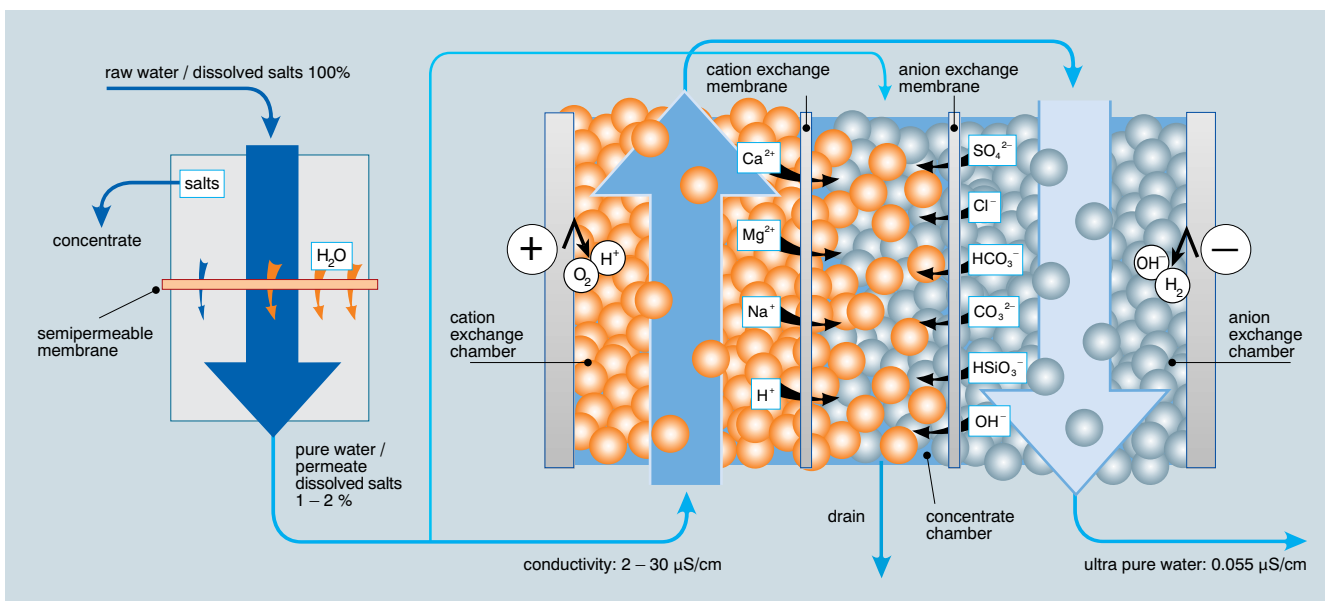
### El-Ion® Module

Our electro-deionization module use resin chambers in a single bed configuration to further deionize the water. Microbiological analysis has proven a remarkable reduction in the number of bacteria with high CFU counts in the feed water. The electrodes that contact the resin

create an electric potential in the water that is unsuitable for bacteria to live in. The intermediate pH shift in the cells creates a positive effect for the removal of  $\text{SiO}_2$  and  $\text{CO}_2$ .

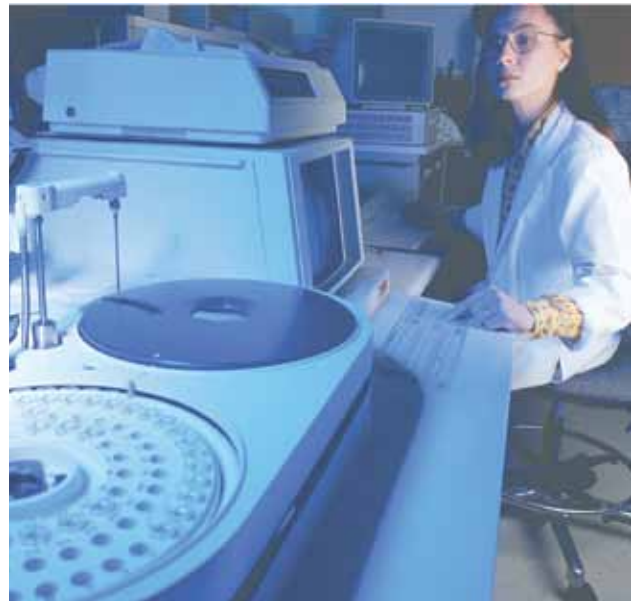
An added advantage of electro-deionization is continuous operation. The resin is continually

regenerated without the use of any acids or alkali. The energy consumption of this process is very low and serves as an advantage for the environment - no chemicals and low power consumption.



The principle of the El-Ion® module

# Ultra Clear™ AFU Series Systems



The specialist when it comes to purified water, water purification systems for clinical analyzers.

Clinical Analyzers can only perform precise and repeatable tests if the feed water supplied to them is of the highest quality. Tap water contains different impurities like salt, organics, particles, silica and bacteria that can interfere with the

analyzer test results. This is why an **analyzer feed unit** is so important for tap water purification.

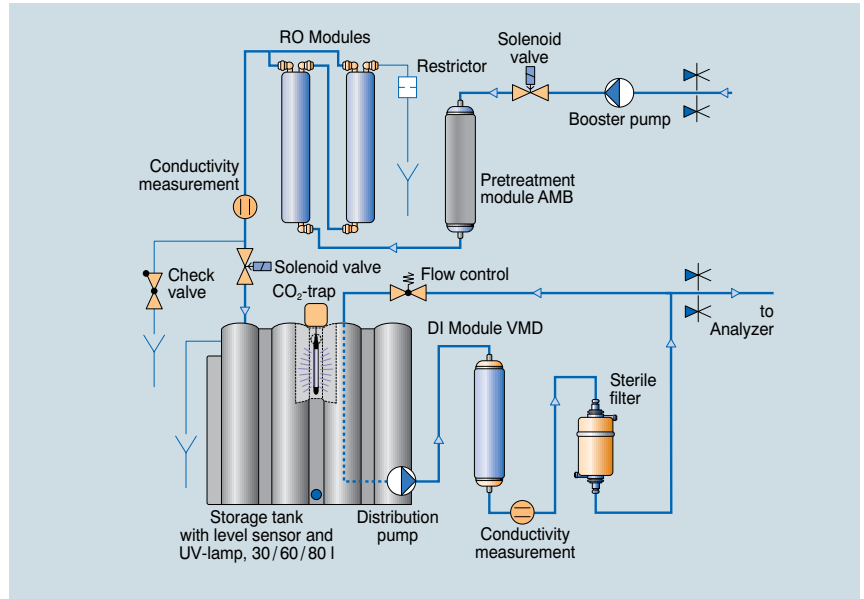
The AFU unit uses multiple technologies to produce consistently pure water at flow

rates of 10 and 20 LPH. All systems combine a pre-purification module, RO membranes, a polishing mixed bed cartridge, a sterile filter and a UV disinfection chamber.

Ultra Clear™ AFU Series System		10 / 30 l	10 / 60 l	10 / 80 l	20 / 30 l	20 / 60 l	20 / 80 l
<b>Product water performance</b>							
Production rate at 15°C	LPH	10	10	10	20	20	20
Pure water performance	l/min	1	1	1	1	1	1
with counter pressure	bar/psig	2/29	2/29	2/29	2/29	2/29	2/29
Conductivity at 25° C	µS/cm	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Resistivity at 25°C	MΩ-cm	> 10	> 10	> 10	> 10	> 10	> 10
Typical TOC-level	ppb	< 30	< 30	< 30	< 30	< 30	< 30
Bacteria	CFU/ml	< 1	< 1	< 1	< 1	< 1	< 1
Particles > 0.2 µm	per ml	< 1	< 1	< 1	< 1	< 1	< 1
<b>Feed water specification</b>							
Feed water pressure	bar	0.1 - 5	0.1 - 5	0.1 - 5	0.1 - 5	0.1 - 5	0.1 - 5
Feed conductivity	µS/cm	< 2000	< 2000	< 2000	< 2000	< 2000	< 2000
Colloid Index	SDI	< 3	< 3	< 3	< 3	< 3	< 3
Free Chlorine and Fe	mg/l	< 0.5	< 0.5	< 0.5	< 0.1	< 0.1	< 0.1
Shipping weight	kg	37	40	62	39	42	63
Power consumption	kWh	0.08	0.08	0.08	0.08	0.08	0.08
Power supply	V/Hz	110 – 230/50 – 60					
Dimensions: H/W/D	mm	530/640/320	530/900/320	1340/340/580	530/640/320	530/900/320	1340/340/580
<b>Catalog Number</b>		<b>3101</b>	<b>3100</b>	<b>3100/80</b>	<b>3103</b>	<b>3102</b>	<b>3102/80</b>



Ultra Clear™ AFU with larger output available on request.



Ultra Clear™ AFU Series System flowsheet

A pump maintains proper circulation of the water to ensure the highest quality water is available for the analyzer. The units are available with 30, 60 and 80 liter tanks constructed of virgin polyethylene. All parts that are in contact with the pure water are made of inert materials to secure the highest water quality.

All systems display inlet and product water quality. The salt reduction rate will be shown in percentage. Water quality meets or exceeds CLSI and ISO 3696 standards. The product water pressure is 2 bar (29psig). All systems include an RS 232 interface.

### Typical applications

Feed for auto analyzers including products from: Abbott, Boehringer, Coulter-Beckman, Hitachi, Olympus, Roche and others.

### Ultra Clear™ AFU Series System Consumables

Item	Change frequency	Cat. No.
Pretreatment Module AMB	6-monthly*	2057
DI-Module VMD	3-monthly*	2050
0.1 µm inline filter 1000 cm <sup>2</sup>	6-monthly	2052
CO <sub>2</sub> Trap CT1 and vent filter (replacement cartridge)	yearly	3502
UV-Replacement bulb	yearly	
– for 30 liter tanks		2595-1
– for 60 liter tanks		2596-1
– for 80 liter tanks	2597-1	
RO Replacement Module**	2 – 3 years	2083

\* Cartridge exchange may be more frequent. Subject to feed water quality and consumption.

\*\* 2 pieces in Ultra Clear 20 AFU.



Vent filter



CO<sub>2</sub> Trap

# Ultra Clear™ AFU EDI Series Systems



Ultra Clear™ AFU EDI with 60 l tank



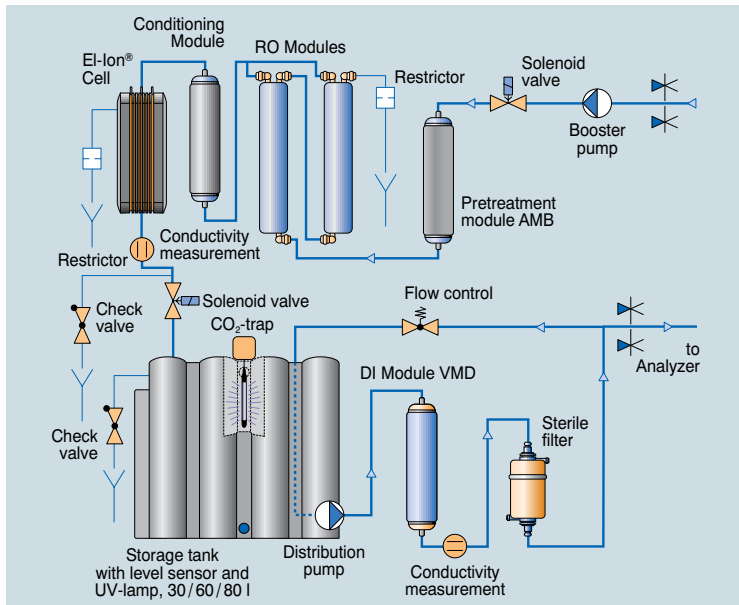
Ultra Clear™ AFU EDI with 80 l tank

In order to ensure precise and accurate data from a Clinical Analyzer, it is essential to have a constant supply of high quality purified water for the instrument. The Analyzer Feed Units (AFU) have been conceptually designed to deliver purified water for years.

You should expect a conductivity range of 0.06–0.2  $\mu\text{S}/\text{cm}$  without the extreme fluctuations in quality typically observed with deionizer cartridges. The Analyzer Feed Units are capable of producing purified water with a TOC value < 30 ppb for the most demanding clinical applications.

To assure continuous water quality, all main purifying components and parts that are in direct contact with the product water are made of high quality plastic, Teflon and stainless steel.

Ultra Clear™ AFU EDI Series System		10	20
<b>Product water performance</b>			
Production rate at 15°C	LPH	10	20
Pure water performance	l/min	1	1
with counter pressure	bar/psig	2/29	2/29
Conductivity at 25°C	$\mu\text{S}/\text{cm}$	0.06 – 0.2	0.06 – 0.2
Resistivity at 25°C	$\text{M}\Omega\text{-cm}$	5 – 16.7	5 – 16.7
Typical TOC-level	ppb	< 30	< 30
Bacteria	cfu/ml	< 1	< 1
Particle > 0.2 $\mu\text{m}$	per ml	< 1	< 1
<b>Feed water specification</b>			
Feed water pressure	bar	0.1 – 5	0.1 – 5
Feed conductivity	$\mu\text{S}/\text{cm}$	< 1400	< 1400
Colloid Index	SDI	< 3	< 3
Free Chlorine and Fe	mg/l	< 0.5	< 0.1
Shipping weight 30 l / 60 l / 80 l	kg	45 / 47 / 58	47 / 49 / 60
Power supply	V/Hz	100 – 240 / 50 – 60	
Dimensions: H/W/D 30 l tank	mm	530 / 640 / 320	
Dimensions: H/W/D 60 l tank	mm	530 / 900 / 320	
Dimensions: H/W/D 80 l tank	mm	1340 / 340 / 580	
<b>Catalog No. 30 l tank</b>		<b>3101-E</b>	<b>3103-E</b>
<b>Catalog No. 60 l tank</b>		<b>3100-E</b>	<b>3102-E</b>
<b>Catalog No. 80 l tank</b>		<b>3100-E/80</b>	<b>3102-E/80</b>



Ultra Clear™ AFU EDI Series System flowsheet



EDI Cells

This reduces or eliminates the potential for contaminants to leach into the water stream from the plumbing. Water is continuously re-circulated within the system to maintain the highest quality on demand.

The integrated booster pump provides up to 2 bar (29 psig) of water delivery pressure. The pure water quality exceeds the CLSI Type 1, ISO 3696 Grade 1, ASTM D1193 Type III standards.

The analyzer feed units come with storage tanks of 30, 60 or 80l capacity and can be directly connected to tap water. The reverse osmosis systems produce 10 or 20l/h. Product water flow rate is 1l/min. All storage tanks are made of FDA grade polyethylene.

A CO<sub>2</sub> trap, sterile filter, UV-disinfector and germ barrier for the over flow are included. These units can either be bench or

wall mounted. Optionally, a wall assembling set for the 30, 60 and 80l storage tank can be delivered.

All systems display inlet and product water quality. The salt reduction rate will be shown in percentage.

### Consumables Ultra Clear AFU

Item	Change frequency	Cat. No.
Pretreatment Module AMB	6-monthly*	2057
DI-Module VMD	3-monthly*	2050
Conditioning Module	Change frequency depends on water hardness and amount of use dwater. Please enter your actual hardness at the controller and the change frequency will be shown automatically.	2062
0.1 µ minline filter 1000 cm <sup>2</sup>	6 monthly	2052
CO <sub>2</sub> Trap CT1 and vent filter (replacement cartridge)	yearly	3502
UV-Replacement bulb	yearly	
– for 30 liter tanks		2595-1
– for 60 liter tanks		2596-1
– for 80 liter tanks		2597-1
RO Replacement Module**	2 – 3 years	2083
El-Ion® Module 10 l/h	2 – 3 years	1804
El-Ion® Module 20 l/h	2 – 3 years	1806

\* Cartridge exchange may be more frequent. Subject to feed water quality and consumption.

\*\* 2 pieces in Ultra Clear™ AFU 20 System.

# Storage Tanks



Storage tank - 80 liter

Storage tank - 30 liter



Storage tank - 60 liter

All PE tanks are 100 % drainable. Accessories like UV lamp, CO<sub>2</sub> traps, sterile filter and TOC reduction pads are available to protect your water your water. Distribution pumps available.

## Storage tanks – 30 liter and 60 liter

These purified water resistant polyethylene tanks match the design of our Ultra Clear reverse osmosis systems. They can operate on a lab bench or can be mounted on a wall. Connections are available for filling an automatic laboratory washing machine. A faucet can be placed at the bottom or middle of the tank for convenient use. The middle position allows a reserve of water for an adjustable laboratory washing machine. Level control sensor is included with two free selectable switch points for automatic on / off of the Ultra Clear reverse osmosis system.

A tank level display is also available. The tank level is indicated by continuous display on the RO panel. The tanks can be equipped with additional accessories including sterile filter or CO<sub>2</sub> traps as shown in the tables. Tanks are 100% drainable.

## Storage tank – 80 liter

The Ultra Clear storage tank is designed in harmony with the Ultra Clear RO system. Both components present an aesthetic and functional unit.

- A high grade steel pump with sufficient performance to provide automatic laboratory rinse units.
- Independent pressure control and protection against dry running of the pump.
- A level sensor provides a continuous display of the tank fill level in percent.
- Sterile air filter for the tank and CO<sub>2</sub> traps are available as options.
- Tank material is purified water resistant polyethylene.
- 100% drainable.

### Storage Tanks for Ultra Clear™ RO, RO DI, RO EDI and AFU Series Systems

Type		30 l	60 l	80 l	80 l
Tank volume	l	app. 30	app. 60	app. 80	app. 80
Power supply	V/Hz/kW	–	–	230/50/0.55	230/50/0.55
Pump performance	l/min	–	–	8	1.2
with counter pressure	bar	–	–	2	2
Level Sensor	mA	4 – 20	4 – 20	4 – 20	4 – 20
Height	mm	555	555	810	810
Width	mm	300	560	340	340
Depth	mm	300	300	520	580
Shipping weight	kg	9	10	15	15
<b>Catalog Number</b>		<b>3315-01</b>	<b>3311-01</b>	<b>3301-01</b>	<b>3301-03</b>

### Accessories for the Ultra Clear™ RO Series System Tanks (initial equipment)

Item	Cat. No.
<b>Vent Filter VF 1 (2")</b> to eliminate airborne contamination	
– for use in 30 and 60 liter tanks	3510
– for use in 80 liter tanks	3512
<b>Vent Filter VF 2 (4")</b> to eliminate airborne contamination. For a maximum flow of 1,5m <sup>3</sup> /h	
	3511
<b>CO<sub>2</sub> Trap CT 1 (2")</b> to eliminate airborne contamination including CO <sub>2</sub> from the incoming air	
– for use in 30 and 60 liter tanks	3501
– for use in 80 liter tanks	3507
<b>CO<sub>2</sub> Trap CT 2 (4")</b> to eliminate airborne contamination including CO <sub>2</sub> from the incoming air. For a maximum flow of 1,5m <sup>3</sup> /h	
	3503
<b>UV-Submersible Lamp</b> to minimize the bacterial growth for 24 VDC	
– for use in 30 liter tanks	2620
– for use in 60 liter tanks	2621
– for use in 80 liter tanks	2622
<b>Bracket ET30</b> for 30 l tank, including screws and plugs	3317
<b>Bracket ET60</b> for 60 l tank, including screws and plugs	3318

### Consumable for the Ultra Clear™ RO Series System Tanks

Item	Cat. No.
Vent Filter VF 1, Replacement Cartridge 2"	80823
Vent Filter VF 2, Replacement Cartridge 4"	80354
CO <sub>2</sub> Trap CT1 + Vent Filter VF 1, Replacement Cartridge 2"	3502
CO <sub>2</sub> Trap CT2 + Vent Filter VF 2, Replacement Cartridge 4"	3504
UV-Replacement bulb (115 V / 230 V)	
– for 2620	2595-1
– for 2621	2596-1
– for 2622	2597-1

# System Components

Potable water or water that is considered safe to drink contains many dissolved or suspended materials that could interfere with laboratory test methods. For reagent grade or ultrapure water, all of these materials would be considered contaminants.

These contaminants include: Total dissolved solids or ions, particles, colloids, organic material, gases and microorganisms. Potable water systems should not contain viable or pathogenic microorganisms. However, due to the ubiquitous nature of microorganisms, there is potential for small amounts of bacteria, viruses, algae, protozoa or fungi to be present.

Remnant body parts or large biochemical components of destroyed bacteria or other microorganisms may also be present in the form of endotoxins, DNA, RNase and DNase. Microorganism contamination may also pose a problem for stored water from pretreatment systems. All these impurities are removed by a combination of different purification technologies.

Only new, specially selected and certified materials are used for the treatment steps in our water systems. Resins and treatment media go through a rigorous R&D stage before approval for use to ensure high quality and zero leachable material that could interfere with water quality.

Carefully selected activated carbon is used in the systems to produce pure water with extremely low organic contaminants. The second application is the removal of free chlorine to protect RO membranes. All wetted parts within the our water systems are specially selected and tested to ensure purity.

## Raw water, its contaminants and the embedded components of the Siemens Water Technologies units



### Pretreatment module AMB

Catalog No.: 2057

Activated carbon / pre-filter combination to protect RO membranes. Granulated carbon and a 1 µm filter.



### Conditioning module

Catalog No.: 2062

Module used for the removal of residual hardness. The special cation deionizer resin prevents "Scaling" in the El-Ion cell.



### Deionization module VMD

Catalog No.: 2050

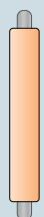
Mixed bed resin module utilized for a reduction of the inlet conductivity. Used for inorganic applications.



### El-Ion® module

Catalog No. dependent on system size

Electro-deionization process module for pure water production < 0.2 µS/cm. No chemicals in use. Constant water quality.



### RO Replacement module

Catalog No.: 2083

Module with high performance TFC (thin-film-composite) membrane with a salt retention rate of up to 98%. Retention rate for dissolved organic compounds, particles and colloids and bacteria can exceed 99%.



### UV-disinfection

Catalog No.: 2620/2621/2622

The 254 nm wavelengths range is used to destroy bacteria that may enter the system. The radiation produced in the 254 to 260 nm range is very effective at destroying bacteria and other microorganisms. The nucleic acids are disrupted resulting in the death of the organism. A properly sized high output UV system will substantially limit the bacterial growth in the system.



### UV-replacement bulb

Catalog No.: 2595-1/2596-1/2597-1  
2594-01

The purification modules are accurately designed to ensure complete wetting of the activated carbon to remove entrained air and purge the systems. The storage of modules is limited and items should be used within one year.

Modules should be stored in a cool, dry location (< 20 °C) away from light. Freshly produced replacement modules can always be obtained.

### Pure water

1. High quality pure water can only be maintained if the produced water is constantly being re-circulated via different purification stages including the sterile filter.

2. A tank for storing pure water should always be equipped with a sterile vent filter, activated carbon unit, a CO<sub>2</sub> trap and a submersible UV lamp. A constant high water quality level can only be maintained by implementation of these components.

3. A regular disinfection procedure diminishes the formation of Biofilms. Disinfection should be done on a regular basis.

4. To prevent the growth of algae: Tanks used for storing water should be made of opaque material or be placed in a cabinet to prevent exposure to light. Avoid direct sun light.

5. Purifying modules should be replaced on a regular basis in order to maintain high quality water and to minimize possible contamination of bacteria.

6. In order to guarantee best water quality and operation of the Siemens Water Technologies' water systems, the systems should undergo a regularly scheduled preventative

maintenance and service procedure. An agreement for this service can be arranged with Siemens Water Technologies.

7. Drainage tubing from any water treatment device should contain an air gap to prevent contamination. Maintain at least a 5-cm gap between the end of the tube and the drain.

### Information about reverse osmosis A natural phenomenon is used for water purification

The natural osmosis process can be reversed and used as an environmentally friendly and safe form of water purification.

How does reverse osmosis work?

A solution with a high salt concentration is separated by a semi permeable membrane from a solution with a low salt concentration. In normal osmosis, the water from the side with less salt will begin permeating the membrane into the more concentrated solution.

In reverse osmosis, pressure is supplied that exceeds the osmotic pressure of the higher concentrated solution to force water in the reverse direction.

Clean water starts to permeate through the membrane. This water contains approximately 98% less salt than the inlet water. This technology will also remove >99% of particles and bacteria. The production rate of an RO system depends on the water temperature. Our specifications are given at a water temperature of 15°C. Each °C of temperature variation creates a water production shift of 3%!

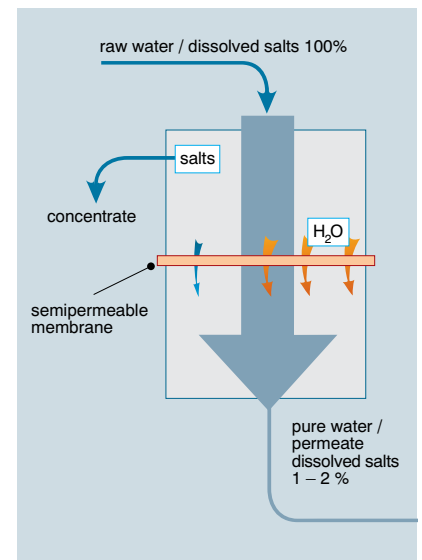


High grade materials are a vital aspect for highest quality. From left to right: Activated carbon, anions, mixed bed and cation exchange resins.



Pre-purification AMB and VMD modules and conditioning module.

### The principle of reverse osmosis



Most manufacturers use 25°C to rate their performance, however, with our systems, you can be assured that your water production is in the right range even if the temperature falls below 25 °C.

For more information contact:

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The information provided in this brochure contains merely general descriptions or characteristics of performance which in actual case of use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.

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The logo for Hyxo Oy, featuring the company name in a stylized, blue, sans-serif font. The 'x' and 'o' are connected, and the 'y' has a unique shape with a horizontal bar.

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