Instruction manual WSU2plus
Version 70 l/h and 120 l/h

Revision: B

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Instruction manual WSU2plus Version 70 l/h and 120 l/h

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1 General

These operating instructions describe the application, use and technical specifications of the WSU2, a Fileder Filter Systems Europe GmbH device.

The operating instructions must be read before the first installation and commissioning!

Fileder Filter Systems Europe GmbH reserves the right to modify parts of this document and parts of the data contained therein.
In case of failure please feel free to always contact our customer support and make use of our service offerings.

Errors and changes excepted.

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2 Declaration of Conformity

CE

The manufacturer Fileder Filter Systems Europe GmbH Aschaffenburg declares that the device WSU2 complies with all relevant requirements of the Low Voltage Directive (2014/35/EU) and the Electromagnetic Compatibility Directive (2014/30/EU).

Other standards applied: EN 61010-1:2010 und EN 61326-1:2013.

3 Warranty

The warranty is valid for one year after delivery. Excluded are wear parts such as couplings, filter cartridges, ball valves and damages caused by improper handling. The guarantee or warranty claim expires in case of non-observance of the operating instructions.

4 Intended Use

The WSU2 device may only be used for the production of ultra-pure water as described in this manual.

All warnings must be observed!

5 Warnings

Warning symbol	Meaning
	DANGER! Imminent danger! Non-observance may lead to death or serious injuries.
	WARNING! Potential danger! Non-observance may lead to serious injuries.
	ATTENTION! Dangerous situation! Non-observance may lead to injuries or property damage.

The following warnings must be observed:

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ATTENTION!
This operating instruction manual contains important operating and safety instructions. Before using this device the operating instructions must be read thoroughly and possible uncertainties regarding its content must be clarified.

DANGER!
Before opening the housing the device must be disconnected from the power supply.
Disconnect the power cable from the socket.

WARNING!
Device of protection class 1:
To avoid an electric shock this device must only be connected to an electrical power supply with a protective ground.

WARNING!
Danger of tipping and toppling hazards! In case of using the WSU2 device in combination with the optional trolley, there is an increased risk of tipping over. Additional weight must not be applied to the device in horizontal direction to the long side.

WARNING!
UV lamp screw cap:
The screw cap of the UV lamp must not be opened during operation.
Caution, risk of electric shock.
The device must be disconnected from the power supply before maintenance or repair.

CAUTION!

Water inlet pressure:
The water inlet pressure must not exceed 6 bar.

System pressure:
WSU2*plus*:
The system pressure of the WSU2*plus* is permanently set to 2 bar at the pressure reducer and should not be changed.

WARNING!
Alarms and information notices on the display must always be observed!
The corrections described in the operating instructions must be followed promptly!

6 Device description

The WSU2plus unit is used for the production of ultrapure water. A Spectrum Pure cartridge with mixed bed resin and a downstream Spectrum UltraPure cartridge with polisher resin are used as ion exchangers. To improve the microbiological quality, a UV lamp and two sterile filters are integrated. A temperature-compensated conductivity measurement is used for monitoring. Furthermore, flow and volume are measured and displayed. All parts in contact with the medium are made of stainless steel or plastic. The unit can be supplied with tap water or demineralised water.
In addition to the ion exchangers, the WSU2plus is equipped with a reverse osmosis module. The reverse osmosis module is connected upstream to the Spectrum Pure Cartridge. This configuration reduces the conductivity of the feed water upstream of the Spectrum Pure Cartridge. Thus the capacity of the Spectrum cartridges is significantly increased (up to a factor of 10). This means that the WSU2plus can also economically supply systems with higher water usage.

The high-pressure pump installed inside the reverse osmosis module moves the medium to the inlet of the membrane module at a pressure of approx. 10 bar. After passing the outlet of the membrane module, the medium, also called permeat, reaches the inlet SPECTRUM Pure Cartridge. The concentrated medium, also called concentrate, is accumulated on the concentrate side of the membrane. The concentrate and also the excess permeate are returned to the pump inlet. Depending on the amount of removed permeate, a part of the concentrate is discharged into the drain (approx. 1l/min).

The high-pressure pump starts automatically and is turned off with a delay when no water is withdrawn. In addition, the high-pressure pump is activated at least once per day in the rinsing cycle to exchange the water in the reverse osmosis module.

Features:
- Reduction of water pressure to 2 bar
- Filtration of tap water
- Deionisation of water
- Measurement of conductivity
- UV sterilisation
- Filtration
- Sampling point
- Emergency supply in case of power and water supply failure
- Web-based interface for real-time data monitoring

6.1 Water storage tank

The WSU2plus device has a 10-litre pressure tank which stores ultrapure water. When the water supply or the power supply fails, the device can still supply up to 10 litres of ultrapure water.
In case of an emergency the required volume is adjustable. The remaining volume which is not needed for the emergency supply is used as extra storage to reduce the switching cycles of the pump.

For setting the volume, see chapter 7.3.5.

Example 1:
Set volume: 5 liters

Example2:
Set volume: 8 liters

6.2 Rinsing

To prevent an increase of conductivity and microbacterial growth during pause times, the system is rinsed at adjustable intervals.

6.3 Leakage monitoring

As soon as the water sensor detects liquid on the floor, the water inlet valve is closed and the leakage alarm activated.

6.4 UV lamp

The device automatically turns off the UV lamp when no liquid is withdrawn over a longer time period.

6.5 Emergency supply

If no ultrapure water supply is possible due to a defect of the electronics, the display or sensors, the ultrapure water supply can be maintained by pressing the "Emergency Supply" button when the system is turned on.
To activate the emergency supply, see section 7.2

WARNING!
The leakage protection is deactivated in the emergency mode!

WARNING!
The emergency mode should only be activated for a short time period.
Should the the device be defective, please contact the responsible service employee to restore the device‘s correct operating condition.

6.6 Sampling for microbiological examination

Water samples can be taken directly from the dead space-free sampling point at the front.
The withdrawn water is the same as the water at the extraction point 2.

The sampling point must be disinfected before sampling (section 12).

7 Operation

7.1 Device components and operating elements

At extraction point 2, water with a very low conductivity can be withdrawn by using the ball valve. This water passes through all filter stages (Spectrum Pure Cartridge, UV lamp, Spectrum UltraPure Cartridge, sterile filter) within the system. Water with a slightly higher conductivity, but a higher output flow, can be taken from the extraction point 1. This water, at sampling point 1, only passes through the Spectrum Pure Cartridge filter stage. A water sample with the same quality level as extraction point 2 can be taken at the sampling point.

7.2 Activating the emergency supply

Turn on the device via the main switch.
After pressing the "Emergency Supply" button, the display is turned off and the "Emergency Button" lights up yellow to indicate the activated emergency supply. The conductivity at output 2, CD2, is monitored continuously. If 1µS/cm is exceeded at output CD2, the red warning light lights up and a buzzer produces an arcoustic warning signal.

To deactivate the emergency mode, the device must be turned off and on again via the main switch.

Emergency supply active. Conductivity is less than 1µS/cm

Buzzer	**OFF**
Red warning light	**OFF**
Illuminated button	**ON**

Emergency supply active. Alarm status, conductivity greater than 1µS/cm

Buzzer

Red warning light **ON**

Illuminated button **ON**

WARNING!
The leakage protection is deactivated in emergency mode!

WARNING!
The emergency mode should only be activated for a short time period.
Should the the device be defective, please contact the responsible service employee to restore the device‘s correct operating condition.

7.3 Display

7.3.1 Operating status display

As soon as the device is turned on at the main switch, it is ready for operation. The operating states are indicated in the display by smileys. The device starts displaying the main screen. If no action takes place on the display within two minutes, the smiley-screen appears.

Display during error-free operation	**Display indicating a warning**	**Display indicating an alarm**
All values within the accepted limits	Possible causes for the warning: - Depleted SPECTRUM Pure Cartridge (>5µS/cm at extraction point 1) - Exceeded filter operating hours - Exceeded UV lamp operating hours - Exceeded membrane operating hours	Possible causes for an alarm: - Polisher resin is depleted (>1µS/cm at output 2) - leakage - UV lamp defective

7.3.2 Menu navigation

Pressing the "i" key takes you to the main screen where you can see more information. Pressing the key in the upper right corner takes you to the service menu or back to the main menu.
If no entry is made for 60 seconds, the smiley screen is automatically displayed.

7.3.3 Main screen

Button	Description	Function
	"mute" button	The sound can be activated by pushing this button, if an error occurs.
	"service menu" button	Pushing this button takes you back to the service menu.

The main screen displays the conductivity at the output 1 (CD1) and the conductivity at the extraction point 2 (CD2).
The operating status line shows the current operating status. In case no extraction takes place, the message "standby" is shown, if liquid is withdrawn, the display shows the message "Consumption".

Since no conductivity measurement is possible in standby mode without extraction flow rates, no conductivity value is shown.
The conductivity value is displayed with a delay of 20 seconds as soon as an extraction of water is detected.

The operating status is displayed in green, if no warnings or alarm is shown, as soon as a warning appears, it changes to yellow, and in case of an alarm, it turns red. In addition, the warning or alarm text is shown in the operating status section.

7.3.4 Service menu

Button	Description	Function
	"Mute" button	The sound can be deactivated by pushing this button, if an error occurs.
	"Home" button	Pushing this button takes you back to the main menu.
	"Reset" button	Pressing the "reset" button sets the corresponding value to 0, for example after a filter change or resin replacement. The button must be pushed for 5 seconds.

7.3.5 Menu Settings

Network settings menu

The WSU2plus can be integrated into an inhouse network. The connection (RJ45 socket) is located beaneath the electronics.

The necessary settings can be adjusted in the settings menu 3.

If "DHCP" is activated, the WSU2plus automatically has a suitable IP address (in case the connected network supports this). Alternatively, a "fixed" IP address can be entered. To do this, "DHCP" must be deactivated by pressing the button.

Changes to the settings only take effect after restarting the device!

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	DHCP active (IP addresses are automatically assigned by the network if it is supported by the network).
	DHCP not active. The IP addresses can be entered manually.

7.3.6 Warning excessive CD1

WARNING!
Alarms and information notices on the display must always be observed!
The corrections described in the operating instructions must be followed promptly!

As soon as the conductivity at the output of the ***Spectrum Pure Cartridge*** exceeds 5µS/cm, the warning message "CD1>5µS/cm" is shown. In addition a demineralizer bottle symbol flashes red in the graphic panel.

An excessive conductivity CD1 indicates a depleted ***Spectrum Pure Cartridge***. As long as the conductivity at the extraction point (CD2) is below 1µS/, liquid can be withdrawn.

The ***Spectrum Pure Cartridge*** should be replaced as soon as possible, as the increased conductivity will deplete the ***Spectrum Pure Cartridge*** faster.

As soon as the ***Spectrum Pure Cartridge*** has been changed and the conductivity CD1 is below 5µS/cm, the warning message is automatically reset.

7.3.7 Warning excessive CD2

WARNING!
Alarms and information notices on the display must always be observed!
The corrections described in the operating instructions must be followed promptly!

As soon as the conductivity CD2 (extraction point2) exceeds the limit value of 1µS/cm, an warning message is shown indicating „CD2>1µS/cm“. In addition a warning sound is activated and the ***Spectrum UltraPure Cartridge*** symbol flashes red. The warning sound can be turned off by pushing the MUTE button.

An excessive conductivity CD2 indicates a depleted ***Spectrum UltraPure Cartridge***. To ensure that the ***Spectrum UltraPure Cartridge*** is exhausted, a few litres should first be rinsed out via the "Rinse Valve" connection. If the conductivity does not drop below 1µS/cm, the ***Spectrum Pure Cartridge*** is exhausted and must be replaced.

Since there is no flow rate via the conductivity measuring cells without an extraction, the measured conductivity will increase with a longer service life. In order to avoid false alarms caused by this behaviour the alarm "CD2 excessive" is delayed for a few seconds and is only shown, if an extraction takes place.

7.3.8 Alarm exceeded filter life

WARNING!
Alarms and information notices on the display must always be observed!
The corrections described in the operating instructions must be followed promptly!

As soon as both sterile filters and the prefilter have reached their maximum operating hours, the "change filter" warning message is shown in the display. Also, the filter symbol flashes red in the graphic panel.

Fluid can be extracted, but the filter should be changed as quickly as possible to maintain the specified microbiological purity.

After the filter change the operating hours have to be reset in the main service menu by pressing the RESET button.

7.3.9 UV lamp alarm after reaching the maximum operating hours

WARNING!
Alarms and information notices on the display must always be observed!
The corrections described in the operating instructions must be followed promptly!

When the UV lamp has reached the maximum operating hours the warning "change UV!" appears in the upper information bar and in addition the UV lamp symbol flashes red in the graphic panel.

Liquid can still be extracted, but the filters should be changed as soon as possible to maintain the specified microbiological purity.

After changing the filters, the filter operating hours counter must be reset in the service menu by pressing the corresponding RESET button.

7.3.10 Alarm exceeded membrane operation hours

WARNING!
Alarms and information notices on the display must always be observed!
The corrections described in the operating instructions must be followed promptly!

When the reverse osmosis membrane has reached its maximum operating time, the warning "change membrane" is displayed. In addition, the osmosis module flashes red in the graphic panel.

The osmosis module must be changed after 365 days (once a year) to maintain the specified water parameters.

7.3.11 Alarm UV lamp in case of UV lamp failure

In case of a complete UV lamp failure the following warning appears in the display:

The message is confirmed by pushing the button.
The main screen shows the warning "UV lamp defect" and in addition the UV lamp symbol flashes red.

WARNING!
Alarms and information notices on the display must always be observed!
The corrections described in the operating instructions must be followed promptly!

The UV lamp is now disfunctional and must be replaced immediately. Fluids can still be extracted without the disinfecting effect of the UV lamp.
As soon as the UV lamp is fully functional again, the message is automatically reset and disappears.

7.3.12 Alarm in case of leakage

WARNING!
Alarms and information notices on the display must always be observed!
The corrections described in the operating instructions must be followed promptly!

In case of a detected leakage the water inlet valve is closed and the following message is shown, a sound warning is activated:

Is the message confirmed, the main service menu appears. The water inlet valve stays closed until the water sensor is dry and the message confirmed. The sound can be deactivated by pushing the MUTE button. After the water sensors have dried, the message is automatically confirmed and the water inlet valve opens.

7.3.13 Warning: Check Cond

At regular intervals the conductivity cells are tested for function. If a defect conductivity measuring cell is detected, the message Check Cond appears. The device should then be inspected by a service technician.

7.4 Network functionality

The WSU2plus offers an integrated web server which can be used to display current operating values on any PC.
The network parameters must be set as described in chapter 7.3.5.
If you have any questions, please contact your system administrator.
To establish a connection, open a web browser (e.g. Microsoft Edge, Internet Explorer, Firefox, ...) and enter the IP address of the WSU2 in the address line. After confirming the address, the web pages shown below will be accessed.

Note:
The PC and the WSU2plus must be within the same network area. The manually set IP address or the automatically generated IP address is displayed in the settings menu (see chapter 7.3.5).

7.4.1 Website „Homepage“

Nach eingeben der IP-Adresse öffnet sich folgende Webseite:

Auf der Ersten Seite sind alle wichtigen Parameter zu sehen

7.4.2 Website „Sensors/Actors“

The website „Sensors/actors“ displays further sensor values.

7.4.3 Website „flow chart“:

The flowchart of the WSU2plus with the current operating values is displayed on the „flow chart“ website. If a component is defective or needs to be replaced, it is depicted red in the flow chart. Error-free components are shown in green. Current operating values are displayed next to the sensor.

7.4.4 Website „Diagrams“

The "Diagrams" website displays the conductivity and water consumption values of the last 24 hours in diagrams. The values are overwritten after 24 hours.
The green bar shows the current time.

8 Installation/Commissioning

8.1 Unpacking

The unit is delivered completely assembled on a pallet. After unpacking the device, it must be commissioned according to chapter 8.3.

The ***Spectrum Cartridges*** are not included in the scope of delivery of the WSU2plus.
The ***Spectrum Cartridges*** are packed individually in cardboard boxes.
1x Spectrum Pure Cartridge and 1x Spectrum UltraPure Cartridge are required for commissioning.

8.2 Installation

WARNING!
Device of protection class 1:
To avoid an electric shock this device must be connected to an electrical power supply with a protective ground.

WARNING!
The mains plug must be easily accessible!

8.2.1 Connecting the *Spectrum Cartridges*

Attention:
The ***Spectrum Quick Connector*** with the black tube must be connected to the ***Spectrum Pure Cartridge***.
The ***Spectrum Quick Connector*** with the red tube must be connected to the ***Spectrum UltraPure Cartridge***.

Tear open the protective film where it is perforated and remove the protective cap from the Spectrum Cartridge.	**Open the locking lever and remove the Spectrum Quick Connector from the bracket.**	***Push the Spectrum Quick Connector onto the Spectrum Cartridge as far as possible.***
Close the locking lever	**Place the Spectrum cartridges on the base plate.** **The rings underneath the cartridges prevent them from slipping.** **Place the Spectrum UltraPure cartridge (red marking) in front of the WSU2plus.** **Place the Spectrum Pure Cartridge (black marking) behind the WSU2.**	

8.2.2 Drain Connection

The WSU2plus has 2 drain hoses. Both hoses must be connected to the correct connection and attached so that it cannot slip out.

The optional available drain funnel can be used to securely fasten the drainage hoses.

8.2.3 Connection to water and power supply

Water is supplied via a ¾" connection on the underside.
The device is delivered with a 2.5 m long hose with a suitable angle connection and a separate connection with hose clamps. This hose can be used to connect the WSU2 to the water connection facing the building.
Make sure that all hose clamps are tightened!

The power is supplied via the mains socket on the back of the unit.

8.3 Commissioning WSU2plus

Install the unit as described in chapter 8.2.

Venting the device:

Open the water tap facing the device. Check that all drain hoses are connected to the drain.
Open the rinse valve completely and turn on the device.

Open the „Rinse Valve“ and turn on the device

A few minutes after the device is turned on for the first time, the high-pressure pump starts. As the pump draws in air bubbles during the rinsing process, the noise level increases slightly compared to normal operation.
After 5 minutes of operation, the ***Spectrum Cartridge*** can be vented (see description below).
During this operating mode, the unit must be rinsed for approx. 15 minutes until no more air bubbles escape the "Rinse Valve" connection.

At the end of the rinsing process, the sterile filters and the pure water tube must be vented and rinsed by opening the ball valves at extraction point 1 and 2 (at the end of the blue hose), allowing approx. 1 litre to flow into a container.
Remove the protective cap at the end of the blue hose.

8.3.1 Venting the Spectrum Cartridge:

To vent both ***Spectrum cartridges***, close all extraction and flushing valves and wait until the pressure is at least 1.5 bar as displayed on the pressure gauge.
Open the locking lever, then press the red venting button until no more air flows out. Close the locking lever again.
If there is still air in the resin container, the procedure should be repeated.

Open the locking lever, then press the red venting button until no more air flows out.	**Close the locking lever again. If there is still air in the resin container, the procedure should be repeated.**

8.3.2 Connecting the ultrapure water output

The water connection of the analysing device is connected to output 2 (on the right side) of the WSU2 plus.

A blue hose and an adapter to 3/4" male threadis included in the scope of supply and should be used for the connection of the device to the analysing device.
To prevent microbacterial growth inside the pipe connecting the WSU2 to the analyser, the following aspects need to be considered:
- The tubing must be as short as possible
- Use as few adapter pieces as possible
- Use the supplied hose, if possible. Otherwise, choose a hose that has a smooth inner surface. If possible, do not use a silicone hose.
- The hose should be replaced regularly
- The width should be as small as possible, as a higher flow rate reduces bacterial growth.

9 Technical data

9.1 Technical data

9.1.1 Dimensions and weight

Dimensions	WSU2plus	
	Height:	1330 mm
	Width:	600 mm
	Depth:	810 mm
	Weight:	ca. 75 kg (filled)

9.1.2 Standard features

Version 70 l/h:

Extraction volume ultrapure water:	1,16l/min (70l/h) water inlet temperature >15°C
Withdrawal volume demineralised water:	1,16l/min (70l/h) water inlet temperature >15°C
Initial conductivity ultrapure water:	<1µS/cm
Initial conductivity of demineralised water:	<5µS/cm
Ion retention:	> 90% for salts (max. conductivity < 1 µS/cm)
Microbiological quality:	<10 CFU/ml (sampling point 2)
Output pressure:	2bar

Version 120 l/h:

Extraction volume ultrapure water:	2l/min (120l/h) water inlet temperature >15°C
Withdrawal volume demineralised water:	2l/min (120l/h) water inlet temperature >15°C
Initial conductivity ultrapure water:	<1µS/cm
Initial conductivity of demineralised water:	<5µS/cm
Ion retention:	> 90% for salts (max. conductivity < 1 µS/cm)
Microbiological quality:	<10 CFU/ml (sampling point 2)
Output pressure:	2bar

9.1.3 Sensors

Conductivity ultrapure water	0-10µS/cm	± 5 % ± 0,2µS
Conductivity demineralized water	0-10µS/cm	± 5 % ± 0,2µS
Temperature measurement	0-100°C	±1% ± 1°C
Flow-volume measurement	0,1-5l/min	± 10 %

9.1.4 Hydraulic connectors

Raw water inlet	3/4" external thread on site for 3/4" union nut on device side
All extraction connections	3/8" connectors / hose nozzles

9.1.5 Power Connection

Power Supply	230 V / 50 Hz +-10%
Power Consumption	max. 300 VA
Protection Class	I
Protection Rating	IP21

9.1.6 Operating Conditions

Operation only inside buildings

Operating temperature	+10°C - +35°C
Air pressure	500 hPa - 1150 hPa
Humidity	up to 80% at 20°C
Installation altitude	up to 2000m
Pollution category	II

Water inlet:

Inlet temperature	+5°C - +35°C
Water inlet pressure	1.5 to 6 bar
Water usage	min. 4l/min
Iron	< 0.1 mg/l
Manganese	<0.05 mg/l
Silicates	< 25 mg/l
Total chlorine	< 0.1 mg/l (ppm)
Conductivity	< 2000 µS/cm
Total salinity	<1500 mg/l
SDI (Fouling Index)	< 3

9.2 Storage & Transportation

Rel. humidity	max. 80%
Ambient temperature	+5°C to + 45°C
Air pressure	500 hPa - 1150 hPa
Do not tilt	
Do not topple	
Do not drop	

9.3 Name plate

Fileder Filter Systems Europe GmbH		
WSU2plus		
Elektrischer Anschluss Power supply	230V/50Hz	Fileder Filter Systems Europe GmbH Frohnradstraße 7-9 D - 63768 Hösbach +49 (0) 6021-373970 Germany
Leistungsaufnahme Power consumption	300VA	
SN	322H0004	
Baujahr / Year of manuf.	2022	
AC-Code / EC-Code	022	
IP21 CE		

Manufacturer's address:
Fileder Filter Systems Europe GmbH
Frohnradstraße 7-9
D – 63768 Hösbach
+49 (0) 6021-373970
Germany

Serial number:

SN

The serial number is a one-time, consecutive number for each device.

10 Maintenance and care

10.1 Rinsing

The WSU2 device must me rinsed every 14 days. At least 10 l water must be extracted from the "Rinse Valve". To do this, connect a hose to the "Rinse Valve" and place it in the drain.
The rinsed quantity is shown in the main service menu via the total volume meter. Afterwards, extract a few liters from output 1 and 2 to vent the complete system.

10.2 Filter change

Before changing the filter the device must be turned off at the main switch. The pressure can be released over the device’s ball valve for rinsing, the "Rinse Valve". The tap of the storage container must be closed so you do not have to empty the entire storage container`s content (10 liters). Follow the description below.

WARNING!
Turn off the device at the main switch to release the pressure before every filter change.

10.2.1 Changing the prefilter

The prefilter insert will clog up with input water particles while using the device. It should be exchanged at least every three months.

1. Turn off the device

2. Close the lever on the storage tank and release the pressure. To do this, open the ball valve for rinsing the system ("Rinse valve").

Open the ball valve

Position of the closed valve

Open the „Rinse Valve“

3. Unscrew the filter housing with the enclosed filter wrench and remove the filter.

- Empty filter housing, remove deposition and rinse.
- After inserting the new filter element, screw the filter housing back on. Make sure that the filter housing seal is properly mounted.
- Open the tap on the storage container again.

Open ball valve again

Position of the open valve

10.2.2 Exchanging both sterile filters

4. Turn off the device

5. Close the lever on the storage tank and release the pressure. To do this, open the ball valve for rinsing the system ("Rinse valve").

Open the ball valve

Position of the closed valve

Open the „Rinse Valve“

6. After turning both locking mechanisms downwards at the filter holder, the filter can be removed upwards and replaced with a new one. When opening, place a tank underneath the opening to collect escaping water. After inserting the new filter, turn the locking mechanisms upwards until they click into place.

   Remove the caps on the new filter!

7. After inserting a new filter the device can be activated again.

8. Open tap of the storage tank once more

Open the ball valve

Position of the closed valve

9. Afterwards the filters must be rinsed.
To do this, open the "Rinse Valve" and rinse for approx. 1 minute.
Then take approx. 1 litre of water each from extraction point 1 and 2 in order to vent the sterile filters.

10.3 Replacing the UV lamp

The UV lamp should be replaced after 3000 operating hours. A warning on the display indicates that the 3000 hours have been reached.

DANGER!
Before any maintenance the device must be turned off at the main switch and disconnected from the power supply by pulling out the mains plug at the power socket.
The UV lamp may only be exchanged by a skilled electrician.

WARNING!
The socket connector at the connecting cable of the UV lamp is "DANGEROUSLY ACTIVE" when the WSU2 is activated. Therefore the UV lamp must only be changed when the device is turned off and disconnected from the power supply.

Turn off the device, pull the plug out of the socket.
Loosen both screws on the side of the lid of the UV lamp and open the cable gland.

Pull out the cable a bit.

Pull out the lid including the UV tube upwards.

Only touch the UV tube with gloves!
Finger prints can affect the life and performance of the UV tube.
Contaminations can be removed with a cloth soaked in alcohol.

Disconnect the plug from the UV tube and replace the tube with a new one. Insert in reverse order.

10.4 Replacing the *Spectrum Cartridge*

Dissolved salt in the inflow depletes the ion exchange resin in the ***Spectrum Cartridge***. The conductivity increases and the required limit values can then no longer be met.
If the display shows warnings of excessive conductivity, the appropriate resin should be changed. After changing the resin tank, the system must be flushed for at least 15 minutes.

Open the locking lever and then release the pressure. Place a receptacle under the ventilation hose.	**Pull the connector off the container.**	**Replace the container with a new one. Tear the protective film where it is perforated and remove the protective cap.**
Push the connection onto the container as far as possible.	**Close the locking lever.**	**Vent and rinse the tank! (siehe Kapitel** Fehler! Verweisquelle konnte nicht gefunden werden. **und 10.4.2)**

10.4.1 Venting

To vent both ***Spectrum cartridges***, close all extraction and flushing valves and wait until the pressure is at least 1.5 bar as displayed on the pressure gauge.
Open the locking lever, then press the red venting button until no more air flows out. Close the locking lever again.
If there is still air in the resin container, the procedure should be repeated.

Open the locking lever, then press the red venting button until no more air flows out.	**Close the locking lever again. If there is still air in the resin container, the procedure should be repeated.**

10.4.2 Rinsing after replacing the *Spectrum Cartridge* :

After replacing the ***Spectrum Cartridge*** it is recommended to rinse the device.
To do this, open the "Rinse Valve" completely for 15 minutes.

After the rinsing process, the "Rinse Valve" must be closed again. The device is now ready for operation again.

10.5 Replacing the membrane module

Switch off the device and disconnect the mains plug.

Release the pressure at the collecting tank. To do this, open the ball valve for rinsing the system ("Rinse Valve").

Close the ball valve

Position of the closed valve

Open the „Rinse Valve“

Place the rear ***Spectrum Pure*** Cartridge next to the rack. Place a tank on the base plate to collect leaking water.

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Unscrew the membrane housing counterclockwise with the supplied spanner.

Pull the membrane housing downwards.

Loosen the membrane module by turning it slightly and pull it out downwards.

Insert the new membrane module by turning it slightly until it stops.

Slide the membrane housing over the membrane module from below.

Screw the membrane housing on clockwise as far as it will go using the spanner supplied.

Rinse after changing the membrane module:

Nach dem Wechsel des Membranmoduls muss die Anlage mindestens 15 Minuten gespült werden.

1. Open the storage tank`s tap

Open ball valve again

Position of the open valve

2. Open the „Rinse Valve“ completely.
3. Plug in the mains plug again and turn on the device at the main switch.

Now the device pumps the air out that came in via the new membrane module.
After flushing for at least 15 minutes, the normal operating status can be restored.
As the pump draws in air bubbles during the rinsing process, the noise level increases slightly compared to normal operation.

10.6 Cleaning the coarse filter at the water inlet valve

There is a coarse filter that retains coarse contaminants at the water inlet valve. This filter should be cleaned at least once a year or when the diagnostic device is not supplied with enough water.

The water connection of the water inlet valve must be removed for cleaning. The coarse filter can be pulled out with pliers and can then be cleaned.

10.7 Care of the device

The WSU2 device can be cleaned if necessary. Use a soft, slightly damp cotton cloth for this purpose.

DANGER!
Before cleaning the surface, turn off the device at the main switch and disconnected from the power supply by pulling out the mains plug at the power socket.

CAUTION!
Do not use aggressive cleaning agents to avoid damaging the smooth surface and labelling.

CAUTION!
Do not use microfibre cloths! Microfibres damage the painted surface and display.

10.8 Replacing the mains cable

The mains connection cable may only be replaced by equivalent or better types:

- H05VV-F 3G1.0mm²

After replacing the mains cable, it is mandatory to carry out a PE conductor measurement.

10.9 Replacing the storage battery

The storage battery may only be replaced by the type: RENATA CR2450N

10.10 Replacing the fuses

DANGER!
Before performing any maintenance work the device must be turned off at the main switch and disconnected from the power supply by pulling out the mains plug at the socket.

The fuses are integrated in the power supply socket. After removing the mains cable, the fuse holder is accessible.

The fuses may only be replaced by the following type:
Fuse link 5x20mm
Rated current: 3.15A
Rated voltage: 250V
Release characteristic: inert
Breaking capacity: high (H)

11 Information Symbols

	Danger of tipping and toppling hazards! In case of using the WSU2 device in combination with the optional trolley, there is an increased risk of tipping over. The device must not be loaded with additional weight laterally.
	General warning sign. In special cases this warning sign is attached to the UV lamp socket. See warning 10.3 UV lamp change.
	Do not push! The device may only be moved to the side for floor cleaning purposes.

	Do not sit on the WSU2 device or its components.
	Read and follow the operating instructions.
	Before opening the hood, the unit must be disconnected from the power supply.
I **O**	Here you turn the WSU2 device on and off. I = on (supply) 0 = off (supply)
2x **T 3,15 AH, 250V**	Fuse link 5x20mm Rated current: 3,15A Rated voltage: 250V Trigger characteristic: inert, sluggish Breaking capacity: high (H) Integrated in the mains connector twice (2x)
	Symbol for the protective conductor connection.
Water Supply	Water inlet connection
Output 1	Output 1
Output 2	Output 2

Output pressure	Output pressure
max. 2 bar	Do not set more than 2 bar as the outlet pressure.
Sampling point	Sampling point (water quality is the same as at output 2)
Rinse valve	Rinse valve
Drain pure water	
Drain RO	

12 Consumables:

Drawing / Picture	Article number	Name
	08452261001	Sterilfilter WSUII 0,2µm
	08452300001	Pre-Filter Activecoal 4 7/8" 05µm ROCHE WSU II
	08452296001	UV-lamp WSU II
	09806415001	RO-membrane WSU II plus, **70l**

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	09808531001	RO-membrane WSU II plus, **120l**
-	09870512001	SPECTRUM ULTRA PURE cartridge filled (ready to use)

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	09870504001	SPECTRUM PURE cartridge filled (ready to use)
	08452326001	sample tacking set (plastic bags)