VWR Puranity PU 20

INSTRUCTION MANUAL

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CE

Legal Address of manufacture

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Puranity PU 20

Preface

Dear Sir or Madam

You have selected a high quality product designed to give long and reliable service.

Before you start to install and commission your Puranity PU 20 system, please carefully read through the information given in this operating instructions manual on installation and operation.

This is important as we cannot be held liable for any damage occurring as a result of incorrect operation of it, or use of it for other than the intended purpose.

Thank you for the confidence you have placed in us by deciding to purchase a Puranity PU 20 ultrapure water system.

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1. Symbols & conventions

EU Mark of Conformity

This symbol indicates the presence of high voltage and warns the user to proceed with caution.

Important operating and/or maintenance instructions! Read the operating instructions with due care.

Risk of electric shock! Electrical work on the system is only to be carried out by qualified personnel.

General information! Particularly important notes are marked with this information sign.

Protective conductor connection

Connect the power supply to an electrical socket with a protective connection.

The information provided in these operating instructions is only valid for the system which has the serial number which is to be entered on the front page.

Please enter the serial number* of your Puranity PU 20 system in the space provided on the front page.

* Read the serial number of your ultra pure water system from the type plate.

For quick and correct service, please include the following information on all inquiries and replacement parts orders which relate to your system:

- The serial number

- The article number

2. Package contents

Ultrapure water systems are carefully controlled and packed, but despite this damage could occur during transport.

2.1 Examination on receipt

- Check complete delivery by comparing the parts supplied with those listed in the delivery note.

Is the packaging visibly damaged?

- Inspect the equipment supplied for damage.

2.2 Complaints

Should damage have occurred during transport:

- Immediately* contact the postal, railway, shipping or air freight agent.
- Save the complete packaging (outer carton and packaging materials) for possible inspection or return delivery.

2.3 Packing for return

Whenever possible, use the original carton and packaging material.

Should these no longer be available, or be unfit for use:

- Pack the equipment in suitable sheets or bags in a strong cardboard box so that all parts are protected against shock.

*** The time limit for claims is 6 days after the date of delivery.**
All rights to claim for damages cease when this time limit has elapsed.

3. Safety informations

For your own safety, please observe the above safety precautions!

- Your Puranity PU 20 system is an advanced system that has been designed exclusively for the production of ultrapure water from potable water that has been pretreated by reverse osmosis, ion exchange or distillation.
- Do not start to install or operate the system until you have heeded the corresponding information contained in these Operating Instructions.
- Lifting and carrying the ultrapure water system, e.g. to the installation location, should be carried out by two people. To lift it, each takes hold of it under the base plate at two corners.
- Do not make changes to the system. Please note that the manufacturer's liability does not cover damages resulting from improper operation or from use other than for the intended purpose.
- The CE-mark is invalidated when constructional changes are made to the system or foreign products are installed in it.
- Protect the system from frost. The temperature at the installation area must not go below +2°C.
- Follow all general regulations and requirements that must be observed at the installation location, including the valid accident prevention regulations.
- A feedwater pressure of min. 0.1 bar and max. 6 bar is required. Install an additional pressure reducer should the feedwater pressure be higher.
- DIN EN 1717(for german and europe) requires that water purification systems be equipped with a safety device that protects the drinking water system from contamination.
- A grounded 100-240V, 50/60Hz socket must be available.
- A gravity drain with at least DN (Nominal diameter) 50 pipe (38.5 mm internal diameter) must be available at the installation area.(specifically for Europe)
- When the system is to be wall-mounted, check the statics of the wall for sufficient load-bearing capacity (see Technical Data for the weight of your system).
  The ultrapure water system only be mounted on a concrete wall or a solid masonry.
- Positioning the system so that operation of the power separation unit is not made difficult.
- The maximum operating temperature is +40°C.

- When the system will be at a standstill for a longer period (e.g.long holidays), proceed as follows:
  → **Switch the system off.**
  → **Close the supply of feedwater to the ultrapure water system.**
  Damage to the pump will occur should the supply of feedwater be turned off with the system still on. The manufacturer does not accept liability should such damage occur. When you restarting your system, please open the feedwater to the ultrapure system and follow our sanitization instructions to put your system into operation.

- When planning the installation of the system, ensure that there will be sufficient working room for convenient operation of the system and for maintenance such as changing the Filter cartridge and opening, breaking and checking connections.

- The warranty is valid for a period of 2 yaers.

- Never look directly at a switched-on UV-lamp, because UV light endangers eyesight! Never switch the UV-lamp on when is has been taken out of the metal cylinder!

3.1 Warning

- Installing the appliance incorrectly, making incorrect settings on it or modifying it can lead to damage, injury or even death.
- Do not put your fingers in socket of electrical connector because a electrical shock you can have.
- Do not swap any electrical parts of the unit when it is on and works, because there is a danger of electrical shock exist.

4. Use

4.1 Intended use

Increasingly sophisticated technologies, continually lower detection limits in laboratory analysis, and the requirement for biologically-pure water in research correspondingly require the water used to be of ever higher quality. The novel Puranity PU 20 line of water purification systems has been developed to produce such ultrapure water, as well as to fill the needs for user-friendly systems and complete solutions

Puranity PU 20 ultrapure water systems produce salt-free, organically-pure particle-free and sterile filtered ultrapure water.

To make full use of the long and economical service life of the high-quality purification media, the feedwater for Puranity PU 20 systems must be pretreated by an appropriate purification step (reverse osmosis, ion exchange or distillation.

Application areas

- Analytical methods:

- HPLC (**H**igh **P**erformance **L**iquid **C**hromatography)
- IC (**I**on **C**hromatography)
- ICP (**I**nductive **C**oupled Argon **P**lasma)
- AAS (**A**tomic **A**bsorptions **S**pectrophotometry)
- TOC-measurements (**T**otal **O**rganic **C**arbon)
- DNA research
- etc.

- Preparation of reagents and solutions:

- Cell culture media
- Tissue culture media
- Make-up water for reagents for online analyzers

- Ultraclean washing and rinsing processes in laboratories

4.2 Unintended use

It must be stated according to standard din en iso 12100.

5. Accessories & spares

The following Puranity PU 20 versions are available:

Puranity PU 20	(Standard system)
Puranity PU 20 UV	(Standard system + UV-photooxidation)
Puranity PU 20 UV/UF	(Standard system + UV-photooxidation + Ultrafiltration module)

(Please check that the version you have received corresponds to that stated on the delivery note.)

Art.-No. 171-1172 consists of:

Puranity PU 20 Standard basic unit
Material for wall-mounting

Connecting hose, 1.5 m, straight/angle	(Article-No. 171-1103)
Sterile filter capsule, 0.2 µm	(Article-No. 171-1105)
Filter cartridge for ultrapure water systems	(Article-No. 171-1175)
PE hose, 8 mm OD, 2 m	(Article-No. 171-1128)
Connecting cord (rubber connector to nema plug connector)	(Article-No. 171-1131)
Connecting cord (rubber connector to british ST plug connector)	(Article-No. 171-1132)
Connecting cord (rubber connector to euro plug connector)	(Article-No. 171-1133)
Tabletop power pack	(Article-No. 171-1121)
Universal adapter	(Article-No. 171-1129)
Universal holder	(Article-No. 171-1130)

Art.-No. 171-1173 consists of:

Puranity PU 20 UV/UF basic unit
Material for wall-mounting

Connecting hose, 1.5 m, straight/angle	(Article-No. 171-1103)
Sterile filter capsule, 0.2 µm	(Article-No. 171-1105)
Filter cartridge for ultrapure water systems	(Article-No. 171-1175)
PE hose, 8 mm OD, 2 m	(Article-No. 171-1128)
Connecting cord (rubber connector to nema plug connector)	(Article-No. 171-1131)
Connecting cord (rubber connector to british ST plug connector)	(Article-No. 171-1132)
Connecting cord (rubber connector to euro plug connector)	(Article-No. 171-1133)
Tabletop power pack	(Article-No. 171-1121)
Universal adapter	(Article-No. 171-1129)
Universal holder	(Article-No. 171-1130)

Art.-No. 171-1174 consists of:

Puranity PU 20 UV basic unit
Material for wall-mounting

Connecting hose, 1.5 m, straight/angle	(Article-No. 171-1103)
Sterile filter capsule, 0.2 µm	(Article-No. 171-1105)
Filter cartridge for ultrapure water systems	(Article-No. 171-1175)
PE hose, 8 mm OD, 2 m	(Article-No. 171-1128)
Connecting cord (rubber connector to nema plug connector)	(Article-No. 171-1131)
Connecting cord (rubber connector to british ST plug connector)	(Article-No. 171-1132)
Connecting cord (rubber connector to euro plug connector)	(Article-No. 171-1133)
Tabletop power pack	(Article-No. 171-1121)
Universal adapter	(Article-No. 171-1129)
Universal holder	(Article-No. 171-1130)

5.1 Spares

Designation	Article- No.
Pressure boosting pump	171-1107
Ultrafiltration module (optional)	171-1184
Filter cartridge	171-1175
Replacement UV-lamp	171-1176
Rinsing solenoid valve	171-1115
Pressure reducer	171-1112
Feedwater conductivity measuring cell	171-1109
Ultrapure water conductivity measuring cell	171-1111
Check valve 1 bar	171-1113
Microprocessor system control	171-1116
Sterile filter capsule, 0.2 µm, for dispensed water	171-1105
Dispensing valve	171-1114
Fuse holder for glas tube fuse 5 x 20mm Glas tube fuse 5 x 20mm, 3,15 A, slow fuse	171-1118 171-1119
Tabletop power pack, 24V DC	171-1121

5.2 Accessories

Designation	Article- No.
Disinfection cartridge	171-1182
Disinfection agent, MICRO-Chlor (pack of 12 cans, Europe only)	171-1123
Cleaning Solution, 1 syringe (US-market only)	171-1124
Volume control for water dispensing	171-1179
Printer	171-1160

6. Specifications

Required quality of the feedwater	
Source and treatment	Potable water that has been pretreated by reverse osmosis, ion exchange or distillation.
Colloid index (SDI)	max. 1 for all versions. Additional upstream 1 µm membrane filtration is recommended for feedwater that has not been pretreated by reverse osmosis.
Feedwater resistance	> 0.5 MΩxcm
Free chlorine	max. 0.05 ppm
TOC	max. 50 ppb
Bacteria	< 100 CFU/ml
Turbidity	< 1.0 NTU
Carbon dioxide (CO_2)	max. 30 ppm
Silicate	max. 2 ppm
Particles	Filtration to 0.2 µm is recommended to protect internal media and filters from fine particles.
Temperature	2 - 35 °C
Pressure	0.1 - 6 bar

Product water quality				
		Standard	**UV**	**UV/UF**
Resistance (Reference temperature 25°C)	MΩxcm at 25°C	18.2	18.2	18.2
TOC	ppb	5 - 10	1 - 5	1 - 5
RNase DNase	ng/ml pg/ul	--	--	<0.003 <0.4
Bacteria	CFU/ml	< 1	< 1	< 1
Bacterial Endotoxines	EU/ml	--	--	< 0.001*
Particles	> 0.2 µm	< 1/ml	< 1/ml	< 1/ml
Flow rate	L/min**	up to 2	up to 2	up to1.7
Flow rate with volume control	L/min	1.2	1.2	1.2

* Depending on feedwater and appropriate disinfection
** Depending on feedwater pressure

Dimensions and weight	
Height	615 mm
Width	372 mm
Depth	330 mm
Weight:	
Puranity PU 20	22 kg
Puranity PU 20 UV	24 kg
Puranity PU 20 UV/UF	24 kg

Cell constants of the measuring cells	
Feedwater conductivity	0.16 cm^{-1}
Conductivity after UV-oxidation	0.01 cm^{-1}
Ultrapure water conductivity	0.01 cm^{-1}

Connectors for water	
Feedwater	R 3/4"
Rinse water	8 mm OD hose
Ultrapure water	R 1/4"
Sterile filter outlet	8 - 10 mm OD hose

Electrical connections / external switched mode power supply	
Input voltage	AC 100 – 240 V, 50 – 60 Hz, 5 – 3.8 A
Output voltage	DC 24 V, 3.8 A
System connection	DC 24 V, 80 W
Serial interface	RS 232
Protection Class	Class II (external SMPS certified as Class I)

Airborne sound emission	
Sound-pressure level	49 db(A)

Ambient conditions (DIN EN 61010-1 (VDE 0411-1):2011-02)	
Usage	Indoor rooms
Height	Up to 2000 m
Temperature range	From 5° C to 40° C
Relative humidity	Maximum relative humidity 80 % at temperatures of up to 31° C, linearly decreasing to 50 % relative humidity at 40° C
Line-voltage variation	Not more than ± 10 % of the line voltage
Transient overvoltages	As usually occur in the supply network (overvoltage category II acc. to IEC 60364-4-44). Note: The rated level of transient overvoltage is the withstand impulse voltage acc. to overvoltage category II of IEC 60364-4-44
Ventilation requirements	There are no special requirements with regard to ventilation.
Degree of pollution	2

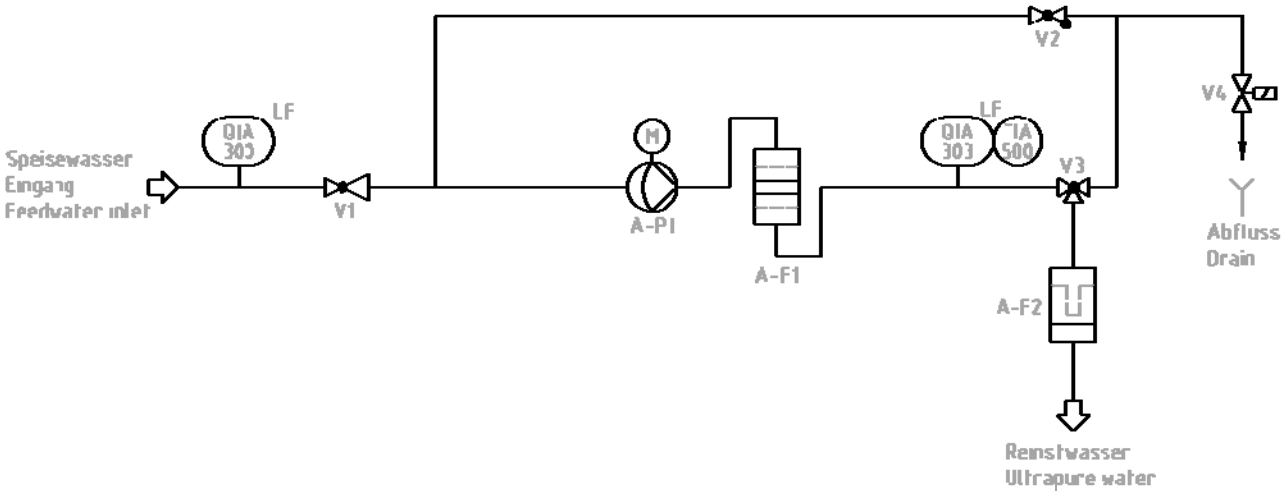
Materials of parts that contact water	
Pressure reducer	NBR
Pump head	Nylon with glass fibre
UV-Lamp	Ultrapure quartz
UV-Housing	Stainless steel
Ion exchanger	PP
UF-Housing	Polycarbonate
Rinsing solenoid valve	PA
Dispensing valve	PVDF
Conductivity measuring cell	POM, stainless steel
Distributor block	POM
Connectors	POM
Hoses	PE
Gaskets	EPDM

7. Description of how the systems function

Puranity PU 20 Standard, UV, and UV/UF versions

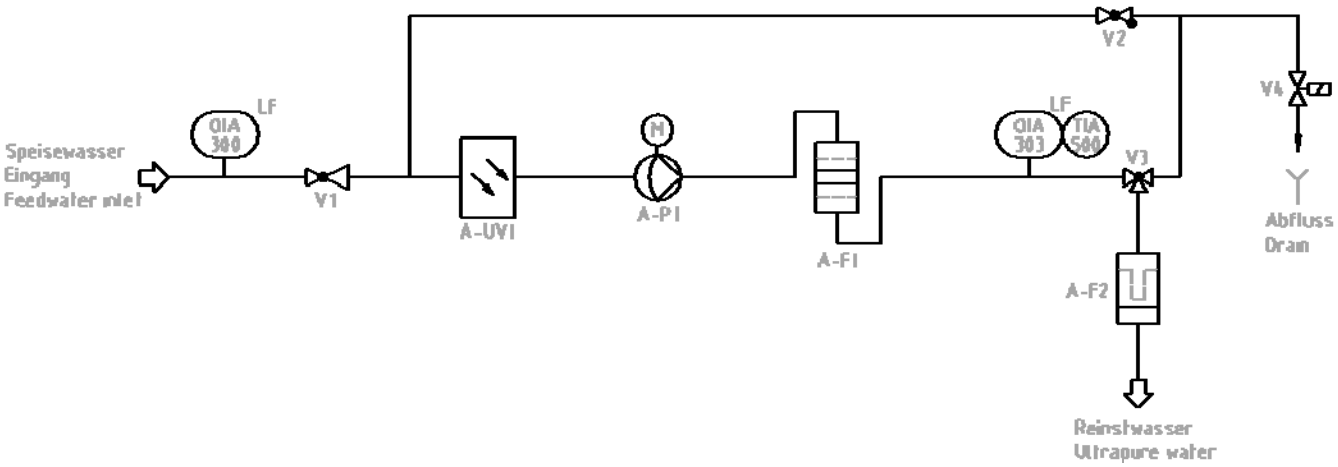
Potable water is pretreated by a downstream reverse osmosis, ion exchange system or distillation, then fed through a pressure reducer into the Puranity PU 20 ultrapure water system, where the conductivity of it is measured. A pump forces this feedwater through a UV-photooxidation (only with Puranity PU 20 UV and Puranity PU 20 UV/UF) and a Filter cartridge, then through an ultrafiltration module. (only with Puranity PU 20 UF and Puranity PU 20 UV/UF), following which the conductivity is permanently measured by a special measuring cell (with temperature compensation). When the dispensing valve is opened, the ultrapure water is subjected to filtration by a sterile filter immediately prior to flowing out of the ultrapure water outlet. When the system is in stand-by mode (the Interval operating state), the water in the system is recirculated through the internal circuit at regular intervals.

7.1 Flow chart for Puranity PU 20 Standard



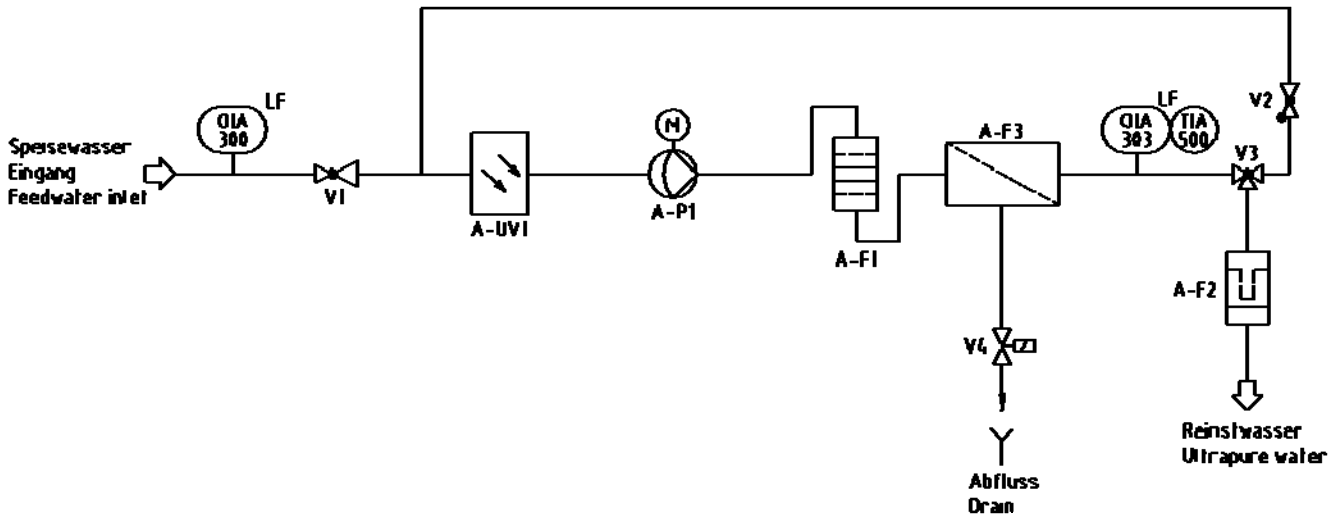
A-F1	Filter cartridge
A-F2	Sterile filter
A-P1	Circulation pump
QIA 300	Feedwater conductivity measuring cell
QIA 303	Ultrapure water conductivity measuring cell
TIA 500	Temperature sensor
V1	Pressure reducer
V2	Check valve
V3	Dispensing valve
V4	Rinsing solenoid valve

7.2 Flow chart for Puranity PU 20 UV



A-F1	Filter cartridge
A-F2	Sterile filter
A-P1	Circulation pump
A-UV1	UV-photooxidation
QIA 300	Feedwater conductivity measuring cell
QIA 303	Ultrapure water conductivity measuring cell
TIA 500	Temperature sensor
V1	Pressure reducer
V2	Check valve
V3	Dispensing valve
V4	Rinsing solenoid valve

7.3 Flow chart for Puranity PU 20 UV/UF



A-F1	Filter cartridge
A-F2	Sterile filter
A-F3	Ultrafiltration module
A-P1	Circulation pump
A-UV1	UV-photooxidation
QIA 300	Feedwater conductivity measuring cell
QIA 303	Ultrapure water conductivity measuring cell
TIA 500	Temperature sensor
V1	Pressure reducer
V2	Check valve
V3	Dispensing valve
V4	Rinsing solenoid valve

8. Installation

8.1 The installation area

The following criteria must be considered when the installation area is selected:

- Feedwater pressure at least 0.1 bar, at most 6 bar.

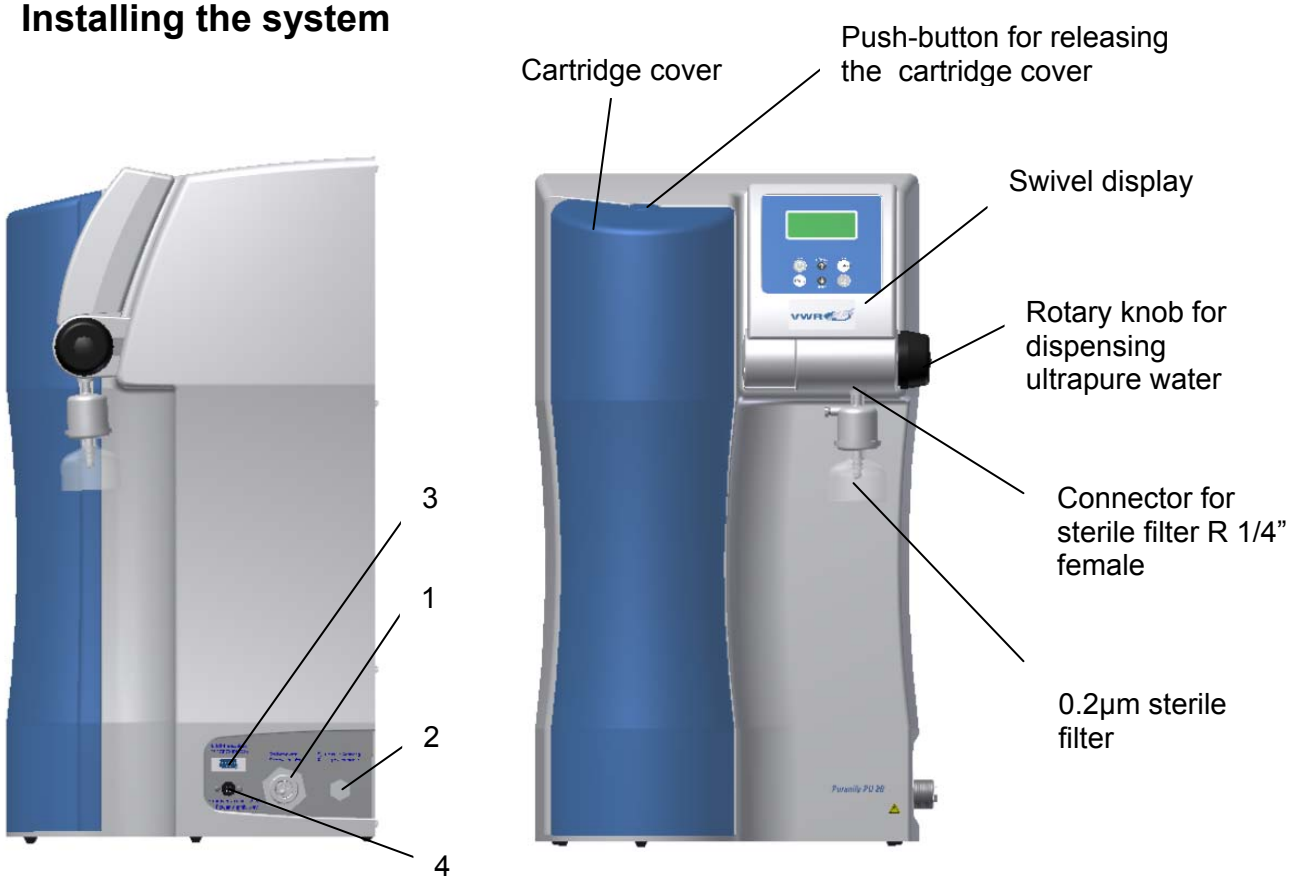
The feedwater pressure must not exceed 6 bar. With higher pressures, a pressure reducer must be installed.

- Minimum temperature +2°C
- Level standing surface
- The standing surface or the wall where the system is to be stood or mounted must have sufficient weight-bearing capacity (see Technical specifications for weight).
- The ultrapure water system only be mounted on a concrete wall or a solid masonry.
- DN(Nominal diameter) 50 floor drain
- A gravity drain with a DN(nominal diameter) 50 size (id 38.5 mm) waste pipe is required.
  When no such floor drain is available, install a water watcher (article no.: 171-1126) to guard against water damage! (specifically for Europe)

A free flow-off must be ensured!

- Grounded 100-240 V, 50/60 Hz socket
- Positioning the system so that operation of the power separation unit is not made difficult.
- Sufficient working room around the Puranity PU 20 system (for Filter cartridge change, etc.)
- The system must be positioned for easy operation and control
- R 3/4" pre-treated-water connection

8.2 Installing the system

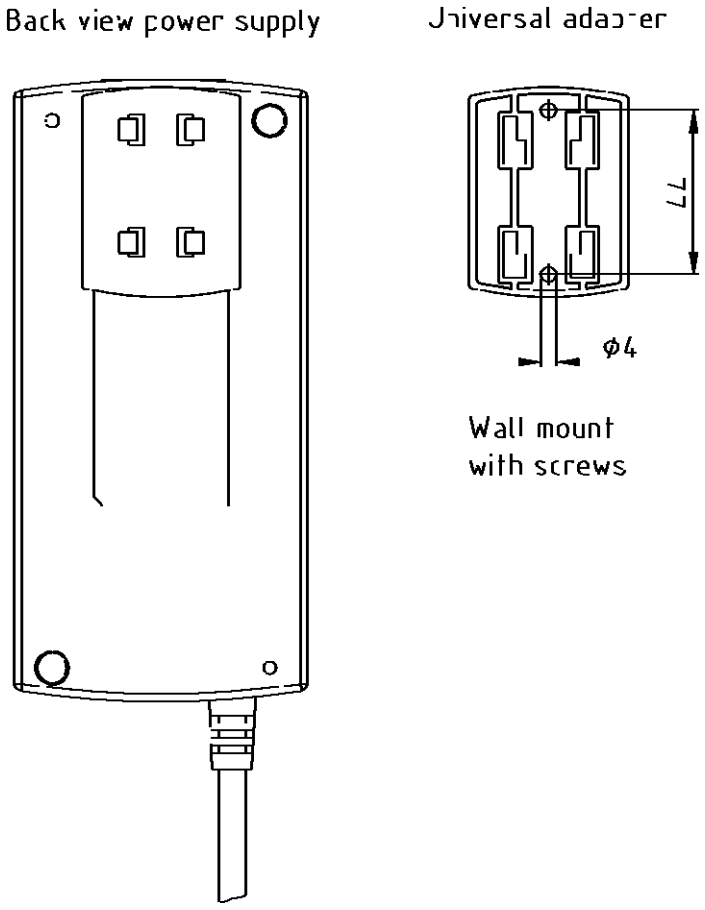


1) Feedwater inlet connector, R 3/4" male thread
2) Rinsing water outlet connector, 8 mm OD
3) Connector for an optional printer
4) Connection power supply

Proceed as follows to prepare your Puranity PU 20 ultrapure water system for operation:

- Stand the Puranity PU 20 system on the selected surface or hang it on the wall using the hooks supplied.
- Remove the cartridge cover from the Puranity PU 20 system (push-button on the top).
- Remove the closing caps from the Filter cartridge and save them for later use.
- Push the Filter cartridge in (guide in the recess), fit the quick-connect couplings on and put the cover back on.
- Fit the connecting hose to the Puranity PU 20 system (connector 1) and to the feedwater connector (see the following Installation examples at chapter 8.4)
- Use the 8 mm OD hose to connect the Puranity PU 20 system (connector 2) to the floor drain, ensuring free gravity fall to drain. The drain to the sewer must be max. Are 1m above the rinsing water connector of the Unit. (specifically for europe)
- If not already fitted, screw the sterile filter provided into the R 1/4" female thread of the dispensing valve outlet.
- Plug the line cord into an earthed 100-240, 50/60 Hz socket.
- Open the feedwater tap.

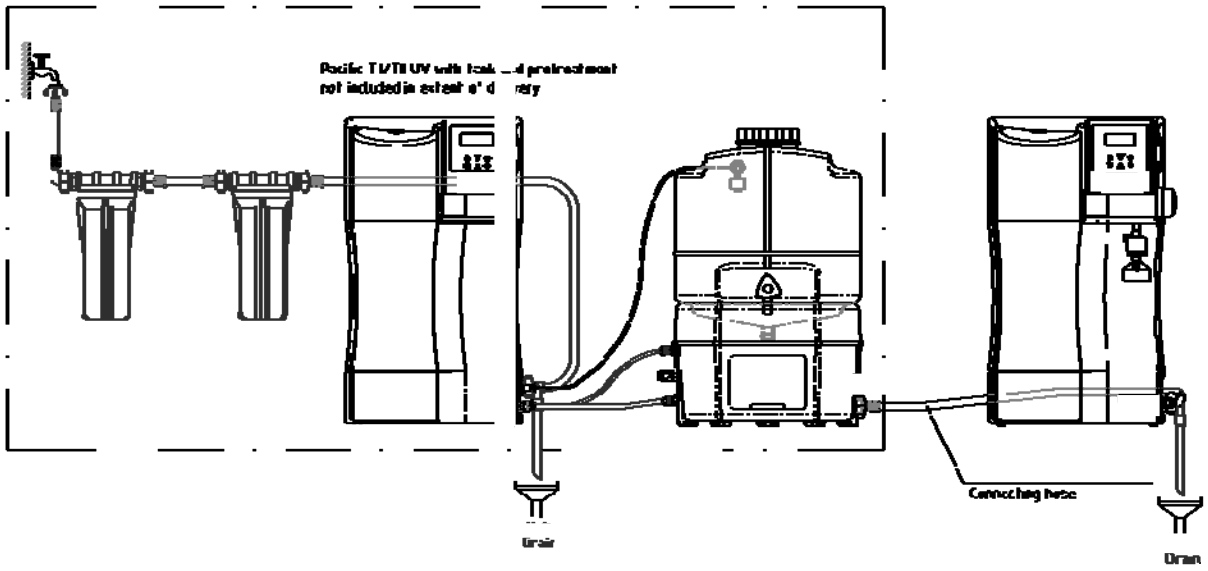
8.3 Mounting the power pack (voltage supply)



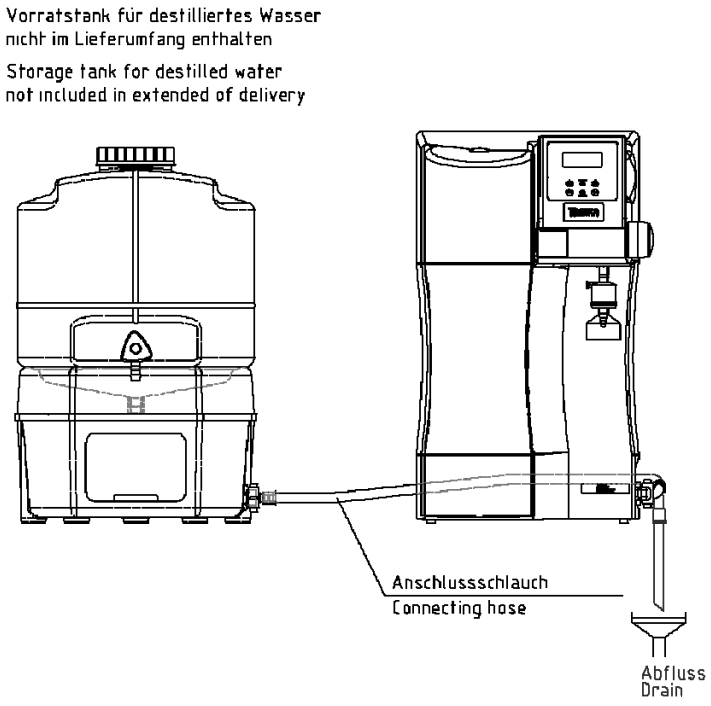
- Whenever possible, mount the power pack on the wall to the left or right of the ultra pure water system where it is freely accessible.
- Stick the universal holder which is supplied in the assembly kit to the back of the power pack as shown in the above Figure.
- Stick the universal adapter to a smooth wall surface or screw it to the wall using the dowels and screws supplied in the assembly kit.
- When the universal holder and universal adapter have been fitted, hang the power pack in.
- Plug the connecting cable (appliance cable) in the power pack socket.
- Connect the power pack to the ultra pure water system (4-pin power supply connector,).
- The system is now ready for use.

8.4 Installation examples

Connection to a Pacific TII/TII UV system with a storage tank

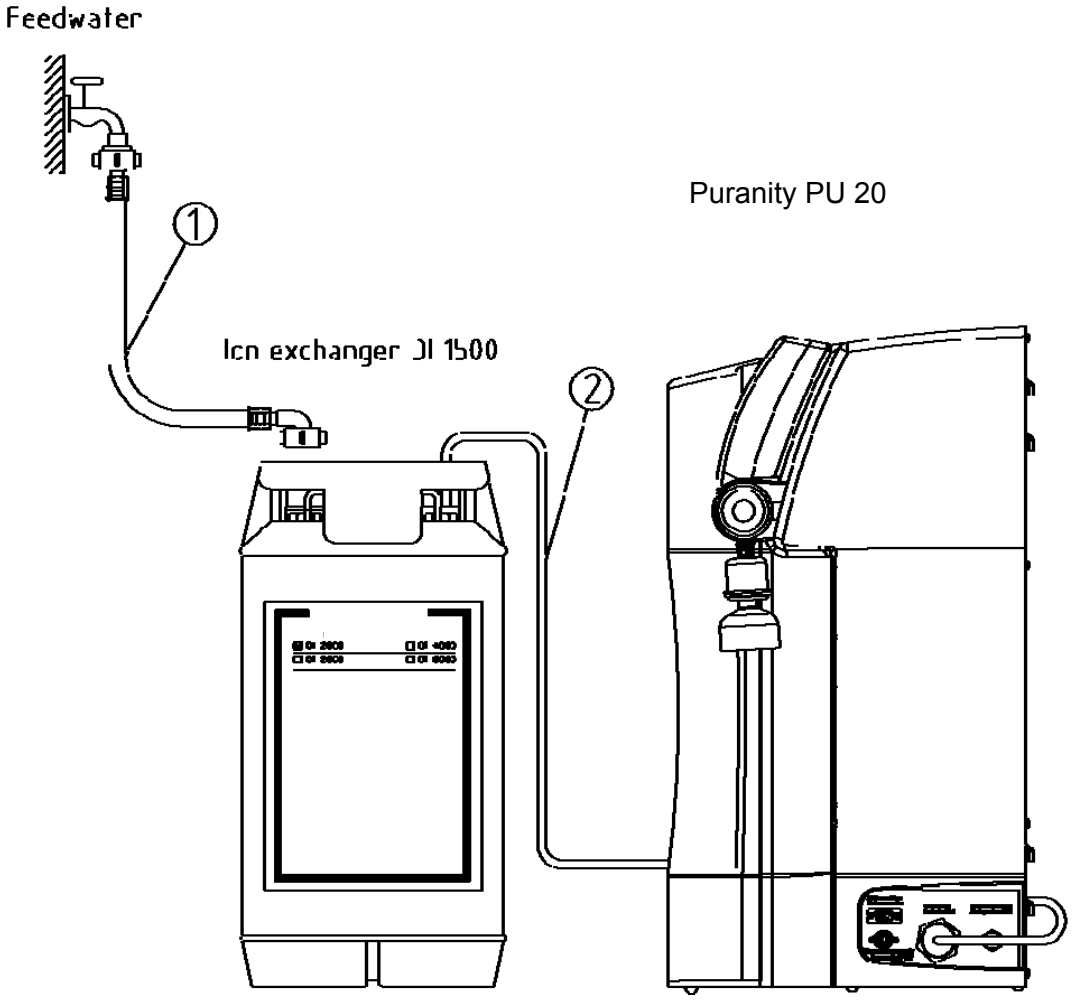


Connection to a storage tank:



Caution: When connected to a storage tank, the Puranity PU 20 system must be switched to "Nonstop" operation when ultrapure water is to be dispensed.

8.5 Mounting examble Puranity PU 20 with Ion exchanger DI 1500 (option)

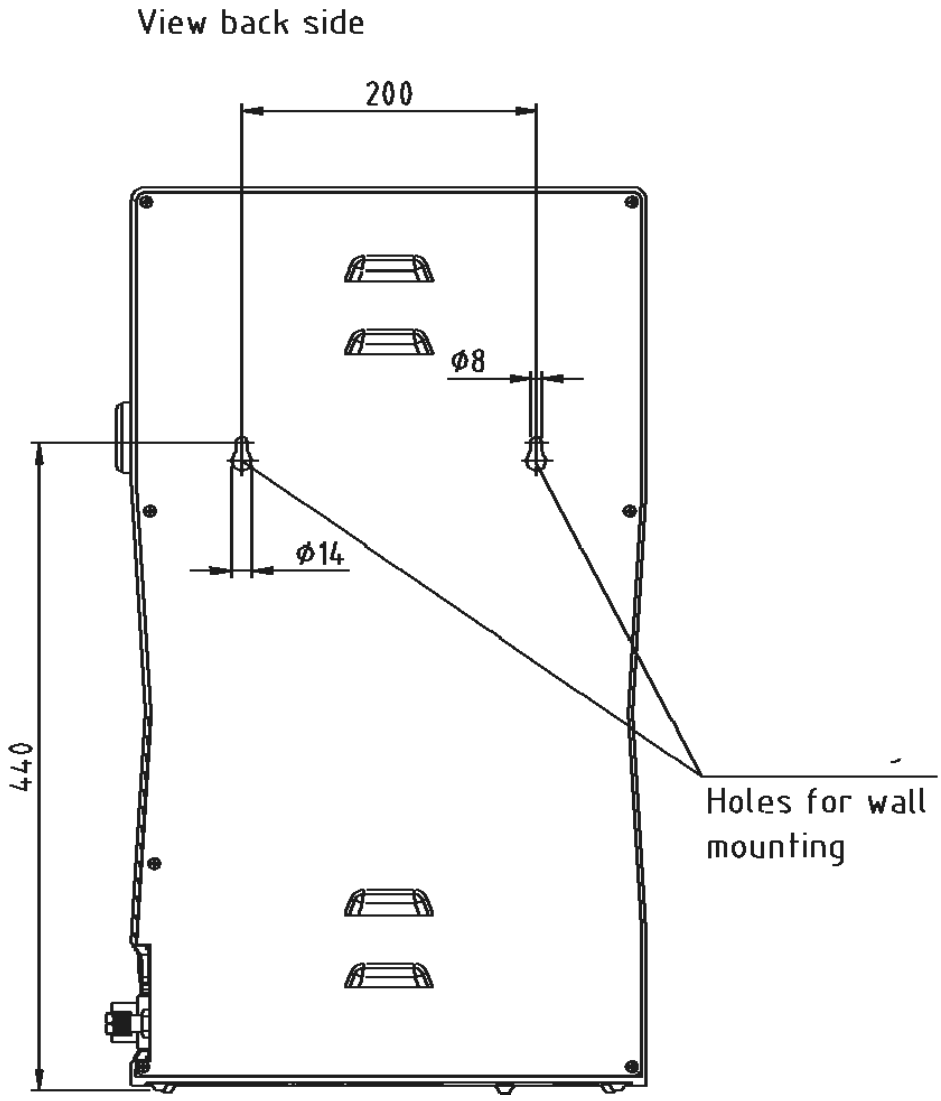


Proceed as follows to connect an ion exchanger to the upstream side of the Puranity PU 20 system:

1) Connect the hose wich has a R3/4 union nut (1) from the raw water tap to the R3/4” input of the ion exchanger.

2) Make connection from the R3/4 output of the ion exchanger to the feedwater Connector of the Puranity PU 20 system by using the feedwater connector kit (2) that is contained in the assembly kit.

8.6 Wall mounting



Proceed as follows to mount your Puranity PU 20 system to a wall:

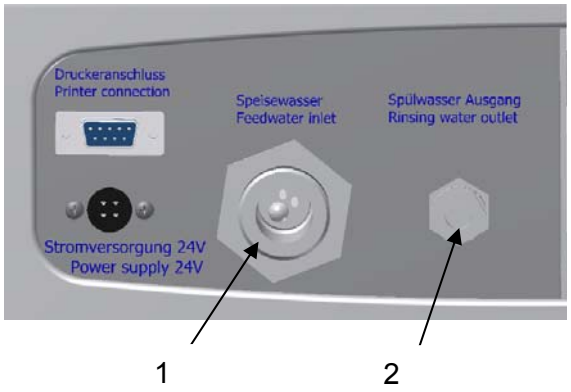
- Use a twist drill (8 mm diameter or 5/16 inch) to make the two holes in the wall that are required as shown in the diagram above.
- Plug the nylon S8 dowel that are supplied in the assembly kit in the holes. Screw the 5.2 x 50 mm screw hooks that are also supplied in the assembly kit in the dowels.
- Lift the Puranity PU 20 system (2 people are required for this) and hang the back side of it on the screw hooks.

9. Putting the system into operation

Allow the system to warm up to, or to cool down to, room temperature before starting it up for the first time.

Check that all hose connections have been made as specified in the "Setting up the system" section.

1) Feedwater inlet connector, R 3/4" male thread
2) Rinsing water outlet connector, 8 mm OD



Switch the system on by pressing this button. After a compulsory rinse the system switches to the last operating mode.

To vent air from the system, switch the system 3 times successively to "Rinsing" in the menu and collect and discard approx. 5 litres of water each time. The ultra pure water limiting value can be gone below during this procedure.

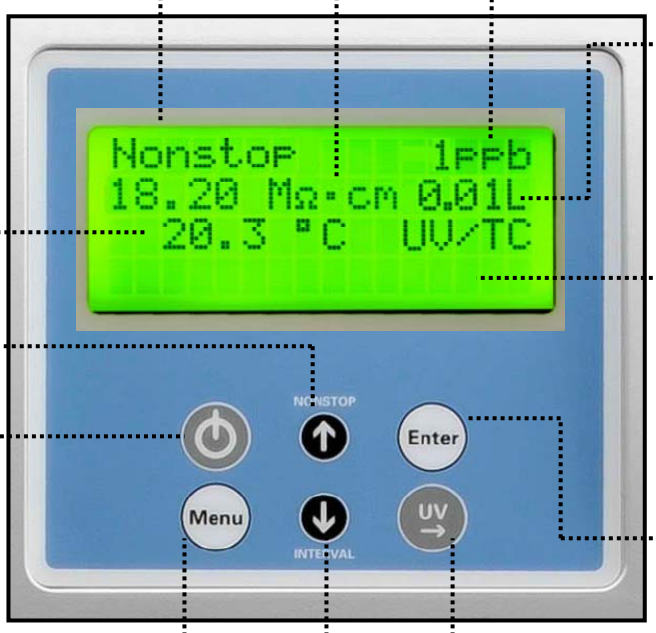
NONSTOP

Use this “NONSTOP“-key to switch the system to the “Nonstop“ operating mode.

INTERVAL

You can set the system back to “Interval“ operation when the system has brought the ultra pure water to the quality you require.

10. Instructions for use



Shows actual operating mode of the system.

Display of the ultra pure water resistance

Shows the TOC content in systems equipped with TOC monitoring.

Shows the volume of ultra pure water that would be dispensed while it is being set.

Temperature measurement

Switches to Nonstop mode for dispensing. Increases numerical values in the menu.

Shows the ON/OFF status of the UV-lamp operating mode and of the temperature compensation.

ON/OFF Switch

Confirms prompts and selections.

The menu key brings you to the following system parameters:

- Setting for the feedwater resistance
- Setting for the ultra pure water resistance
- UV-Lamp intensity and operating time
- Cartridge number and maintenance interval
- Rinsing
- Disinfection
- System faults display
- System faults print-out
- Unlocking the factory setting with your password

Switches to the Interval mode. Decreases numerical values in the menu.

UV Key for manual operation of the UV-lamp. Also enables values to be changed in the menu mode.

11. The system control

General information

A single press on the ON/OFF-key brings the system to the *Interval* operating state (see Interval operation). In this stand-by mode, recirculation within the system is automatically started every half hour, and lasts for the time set. This measure assures maintenance of the ultrapure water quality.
The text message *"UV"* indicates that the UV-lamp is switched on. The text message *"TC"* indicates that temperature compensation is switched on. In addition, the measured value of the ultrapure water and the temperature are displayed.
Should a fault occur, the corresponding fault message is transmitted via the potential-free output and is shown in clear text in the 4th line of the display. In the case of several faults occurring at one time, they are alternately shown in the display.

A press on the NONSTOP-key switches the system to *Nonstop* operation. The pump runs and the rinsing solenoid valve opens for the duration of the *Rinse interval* that has been set. A press on the INTERVAL-key stops *Nonstop* operation and switches the system to *Interval* operation. After 2 hours, the system switches itself automatically to *Interval* operation

When the UV-key is pressed, *"UV"* is shown in the display, but the UV-lamp is only actuated when the system is in the *Nonstop* operation state. It is automatically switched off when *Nonstop* operation is stopped after 2 h. When *Nonstop* operation is manually stopped by pressing the INTERVAL-key, the UV-lamp is not switched off until it has been burning for a minimum of 0.5 hours.
The intensity of the UV-light is monitored when the UV-lamp is actuated, and the measured value is shown in the display. The TOC-value is additionally shown.

The User-menu

All measured values, operating times and limiting values that are relevant for the user can be set and read here.
A press on the menu-key brings you into this menu. Each further press on the menu-key moves you from one menu point to the next.
Settings can be changed by pressing on the arrow-keys and be confirmed by pressing the enter-key, which also takes you to the next menu point. Settings can only be changed when the system control has been previously unlocked (see 12.1.8).

To simplify changing a value, a press on the UV-key allows you to select the position in a number which you wish to change, and then use the arrow keys to replace the digit there by any digit from 0 - 9.

Minimum and maximum measured values have been entered as limiting values in the fixed programme for each of the conductivity and temperature measuring cells. Should these measured values be gone below or exceeded, it can be assumed that a break in a cable has occurred. The fault message *"Meas.cell LF1"*, *"Meas. cell LF2"*, *"Meas. cell LF3"* or *"Temp. Meas. cell"* is shown in the 4th line of the display.

11.1 The User-menu

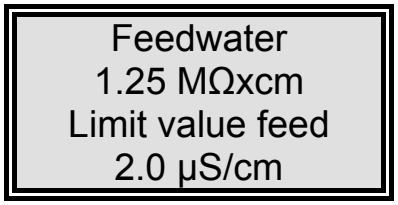
11.1.1 Feedwater conductivity:

A single press on the menu-key allows the feedwater conductivity to be read or the limiting value of it to be changed. The fault message „*Limit value feed*“ flashes in the 4th line of the display when the limiting conductivity value is exceeded.

Feedwater measuring range: 10 – 0.01 MΩxcm
Limiting value setting range: 0.1- 50.0 µS/cm
Basic setting: 0.5 MΩxcm

When a setting above 50 µS/cm/ 0.02 MΩxcm is entered for the limiting value, the limiting value is switched off and the word „*Off*“ appears in the display.

The display shows:



11.1.2. Ultrapure water limiting value:

Two presses on the menu-key in this menu allow the fault display for the pure water limiting value and the pure water limiting value to be set. As soon as the fault display is switched on, the fault will be displayed both in Stand-by mode and in Production mode. When the fault display is switched off, the fault is only displayed in Production mode. The “Lim. val.pure w.” message is displayed when the limiting value is exceeded.

Ultrapure water measuring range: 0.1 MΩxcm
Limiting value setting range: 0.055- 5.000 µS/cm
Basic setting: 10 MΩxcm
Basic setting, fault suppression: On

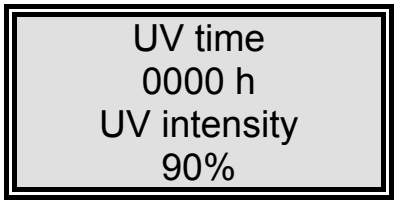
When a setting above 5.0 µS/cm is entered for the limiting value, the limiting value is switched off and the word „*Off*“ appears in the display.

The display shows:

11.1.3. UV-Lamp operating time and intensity:

In this menu the operation hours of the UV-lamp are indicated and the evaluation of UV-sensor input into the display under "*UV time*".
The fault message *"UV duration"* is displayed when the maximum operating time has been reached.
The UV-sensor measures the intensity of the UV-light, and this is displayed as a percentage value of the maximum value.

The display shows:



11.1.4. Filter cartridge operating hours counter:

After fourth press on the menu-key the operating hours counter for the filter cartridge is set by input of a valid serial number.

The display shows:

11.1.5. Rinsing procedure

A fifth press on the menu-key calls the question asking if rinsing is to be carried out. A press on the enter-key confirms this and triggers the rinsing procedure. The pump starts and the rinsing solenoid valve opens for the rinsing time set in the OEM-menu.
The remaining rinsing time is shown in the display during rinsing
Neither fault messages nor measured values are displayed during rinsing.
When the rinsing procedure is finished, the system returns to the last operating state (Interval or Nonstop).

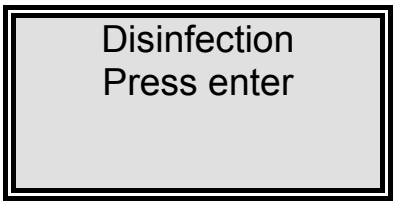
The display shows:

The display during rinsing:

11.1.6. Disinfection procedure

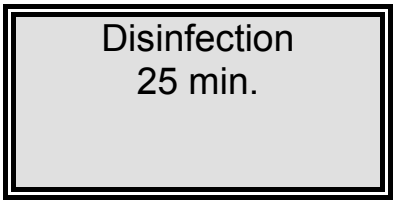
A sixth press on the menu-key calls the question asking if a disinfection is to be carried out. A press on the enter-key confirms this, following which the demand "*Disinfection cartridge must be fitted*" is shown. When this has been fitted, a confirming press on the enter-key triggers the disinfection procedure. The pump starts for the full time set in the OEM-menu and, when the half of this time has elapsed, the rinsing solenoid valve opens and stays open until the disinfection procedure has finished. The demand *"New Filterset must be fitted"* is then displayed. When this has fitted, confirmation with the enter-key causes the system to return to the last operating state.
During disinfection the remaining disinfection time is shown in the display.

The display shows:



The display after confirmation with the enter-key:

The display during the disinfection procedure:



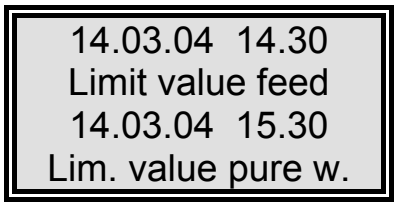
The display when disinfection has been completed:

11.1.7 Fault storage display:

A seventh press on the menu-key calls the fault storage, and the contents of this can be examined by pressing the Enter-key.
Up to two faults are shown in the display, each with the date and time at which they occurred. Pressing the appropriate arrow key allows any fault messages before or after those shown to be called.
A press on the menu-key or on the Enter-key returns the system to the last operating state.

The display shows:

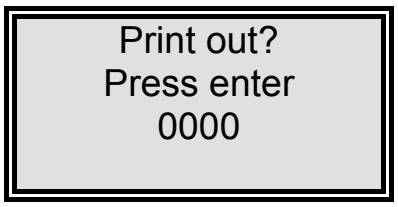
The fault storage display:



11.1.8 Print-out

A eight press on the menu-key bring you to a menu in which you can hand-request a print-out.

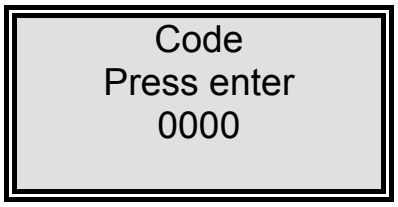
The display shows:



11.1.9 Unlocking the system

A nine press on the menu-key calls the menu „Code".
To prevent unauthorized access to the settings, changes to settings can only be made when a correct code number from the following Table is entered and confirmed with Enter. The unlocking is then active for a 5 minute period.
Each access via the code is printed out by the printer (RS 232) complete with date, time and shortened code number. ("Code 150" = Code 0001, "Code 250" = Code 0002 etc.)

The display shows:



You can assign the permissible code numbers listed in the Table on the following page to appropriate members of the staff etc.
When names have been entered, tear the page out and file it where it is safe from unauthorized viewing.

Table for assigning permissible code numbers for unlocking the system

Code-No.	printed out	Person
150	0001	
250	0002	
350	0003	
450	0004	
550	0005	
650	0006	
750	0007	
850	0008	
950	0009	

11.2 The OEM-Menu:

Basic settings and limiting values can be changed in this menu.
To make such changes in the OEM-menu, the system must first be unlocked (see 12.1.7).

Calling the OEM-menu:
Simultaneous presses on the INTERVAL-key and the NONSTOP-key call the OEM-menu. The display shows *"OEM-Menu Press enter!*". On confirming this by pressing the enter-key, the first menu point is called to be worked on. To simplify making changes, a press on the UV-key allows the position that is to be changed in a number to be selected, so that the arrow keys can be used to replace it with any digit from 0 – 9.
A press on the menu-key takes you to the next menu point.

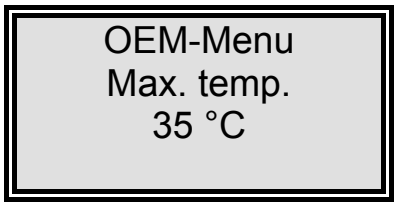
The display shows:

11.2.1 Set the limiting value for temperature:

The maximum operating temperature limit for the system iss et here. Should this temperature be exceeded, the fault message *„Max. temperature"* is triggered. This is shown in the 4th line of the display.

Basic setting: **50 °C**
Setting range: **1 - 50 °C**

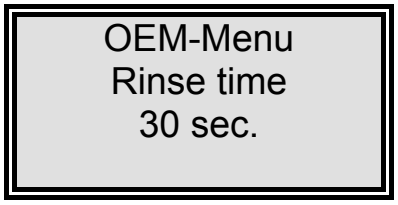
The display shows:



11.2.2 Set the rinsing time:

Basic setting: **30 sec.**
Setting range: **10 - 60 sec.**

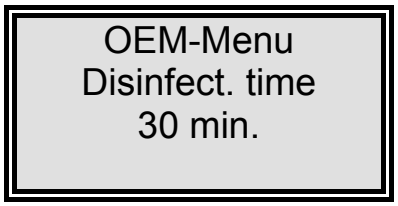
The display shows:



11.2.3 Change the disinfection time:

Basic setting: **30 min.**
Setting range: **15 - 90 min.**

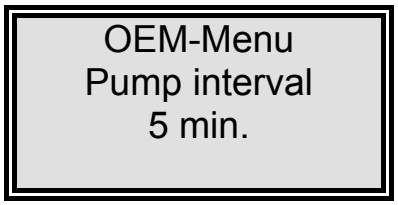
The display shows:



11.2.4 Set the pump interval time:

Basic setting: **5 min.**
Setting range: **1 - 30 min.**

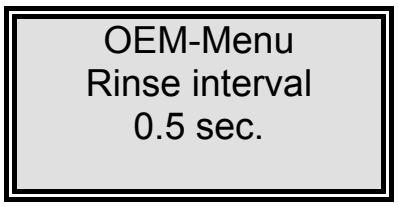
The display shows:



11.2.5 Set the rinse interval time:

Basic setting: **0.5 sec.**
Setting range: **0.1 - 2 sec.**

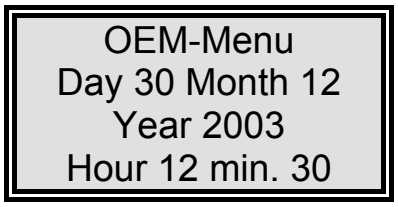
The display shows:



11.2.6 Adjust the real time clock:

Basic setting: **The actual date**
Setting range: **Month 1 - 12, Day 1 - 31, Hour 0 - 24, Minutes 0 - 60.**

The display shows:

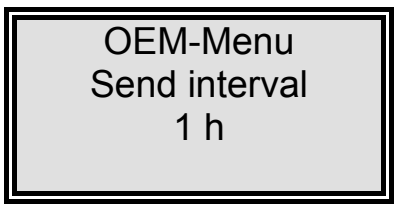


11.2.6 Set the sending interval:

The sending interval at which measured values and fault messages are transmitted via the RS 232 interface can be set here.

Basic setting: **1 hour**
Setting range: **0.5 - 12 hours**

The display shows:



11.2.7 Select the language:

Basic setting: **German**
Setting range: **German, English, French**

The display shows:

11.2.8 Switch units, conductivity/resistance:

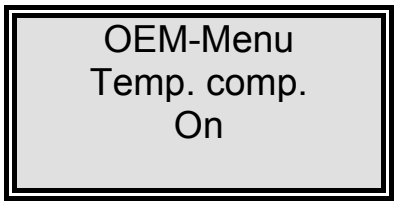
Basic setting: **Resistance MΩxcm**
Setting range: **Resistance MΩxcm, specific electrical resistance MΩ cm**

The display shows:

11.2.9 Switch temperature compensation on/off:

Basic setting: **On**
Setting range: **On, Off**

The display shows:



11.3 Using volume control for water dispensing

Puranity PU 20 systems that are equipped with the option of volume control allow volume-controlled dispensing to be carried out.

As soon as the Nonstop operating mode is selected, the number of litres that were last required appears as set value in line 2 of the display.

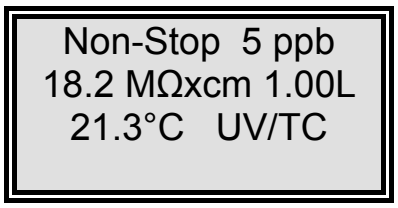
Press once on the Enter-key if you wish to use the arrow keys to change this set value within the permissible range of 0.01 to 60 litres. You can use the UV-key to position the cursor at the position where you want to change the number.

Press twice on the Enter-key if you wish to have the displayed water volume dispensed. During dispensing, the number shows the actual volume dispensed. Dispensing is stopped as soon as the set value has been reached.

Dispensing can be stopped at any time by a further press on the Enter-key.

To carry out manual dispensing of volumes smaller than the set value, first press the Enter-key twice, then press it once again when the required volume has been dispensed.

The Display shows:



11.4 Printer output

By means of the printer different parameters are documented. It is differentiated between three messages.

- **Standard message**
- **Code message**
- **Error message**

11.4.1 Standard message

Here in dependence of the transmit interval of all measured values are printed out. Within the NONSTOP-operation a complete data record is printed out.

Printout:

e. g.:

```
   27.02.07  15:15
GenPure  Standard
  S.No.    3988/07
Interv.  TC  on  UV  off
LF1=  18.2 MΩxcm
LF2=  10.0 MΩxcm
LF3=  0.000 MΩxcm
Temp.=  16.8 °C
TOC=  0  ppb
UV Intens.=     0%
```

Standard protocol contains all measured values. With devices without TOC measurement and UV-intensity are spent the measured values with 0!

11.4.2 Code message

If a code number is entered into the system control and confirmed with the enter key, then the code input is printed out immediately. Code identification (see „tables of classification for authority codes for unlocking the system“).

Printout:

e. g.:

```
   27.02.07  15:17
GenPure  Standard
  S.No.    3988/07
    Code  0002
```

11.4.3 Error message

If an error message in the display, e.g. the high-purity water limit value is indicated, the error message is printed out after the transmit interval.

Printout:

e. g.:

```
   27.02.07  17:09
GenPure  Standard
  S.No.    3988/07
 Reinst.grenzwert
```

12. General maintenance

Regular maintenance maintains the value of your system. We recommend that you select a service contract with representative authorized to service your area. You then have the certainty that your system is kept at a high level of operational safety and reliability.

NOTE!

To ensure your system will work reliably for a long time, it must be controlled, maintained and cared for at regular intervals in accordance with the information given in these operating instructions.
These operating instructions must therefore be kept readily available to operating and maintenance staff at all times, and the staff must carefully follow them!

Any maintenance work that is necessary during the period of the guarantee is only to be carried out by a customer service company expressly authorized to do this.

It is the duty of the operating staff to carry out the weekly controlling of the system.
During the period agreed upon for the guarantee, maintenance is to be carried out weekly according to the maintenance record provided in this operating instruction manual.

IMPORTANT!

Sanitization of the system by the performance of rinsing and disinfection is carried out for reasons of hygiene and has no effect on the technical condition of the system.
The system need only be rinsed and disinfected when algae or bacteria is determined in it, when the cartridge is changed, otherwise at least once per year.

Prior to carrying out control or maintenance work on electrical equipment, the mains power supply must be switched off and protected against being unwantedly switched on again. Such work is only to be performed by assigned skilled technicians.

12.1 Maintenance intervals

Consumable materials are to be replaced at the intervals given in the following Table or when there is a drop in performance:

Material	Flow chart no.	Article no.	Average*
Filter cartridge	F1	171-1175	12 Months[1]
0.2 µm sterile filter	F2	171-1105	3 Months[2]
Ultrafiltration membrane	F3	171-1106	24 Months[1]
UV lamp	A-UV1	171-1176	24 Months[3]

*Please keep in mind that the life of your consumables is directly dependent on the quality of the feed water and the amount of water used daily. The interval is contingent on the feedwater quality so that a shorter one may be necessary.

[1] Or when the ultrapure water limiting value is exceeded, wich ever is shorter. Longer usage can be result in bacterial growth on the resin.

[2] Or flow rate is noticeably slow.

[3]Or unless system indicates the lamp needs to be replaced.

12.2 Change the Filter cartridge

The filter cartridge must be replaced as soon as the maximum limiting value set for the ultrapure water is exceeded or when the "Change cartridge" message is shown in the display.

Proceed as follows to replace the Filter cartridge:

Please note that you sanitize the system each time when the filter is replaced.

1. Switch the system off.
2. Shut off the supply of feedwater.
3. Open the dispensing valve until the flow of water stops, then re-close it.
4. Remove the cartridge cover.
5. Disconnect the quick-connects on the feedwater inlet and purified water outlet of the cartridge, then close the inlet and outlet with the stoppers which you have kept for later usage.
6. Draw the used Filter cartridge out from the guide and insert the new Filter cartridge.
7. Remove the stoppers from the new Filter cartridge and store them for later use.
8. Plug the quick-connects correctly onto the new Filter cartridge.
9. Replace the cartridge cover.

10. Open the supply of feedwater.

11. Switch the system on again.

12. Run off and discard at least 5 litres of water.

13. To return the operating time meter to zero, enter the serial number that is given on the cartridge as described in the “Filter cartridge operating hours counter” section.

Important: To do this, the system must first be unlocked via the code function, refer here to the "Unlocking the system" section.

To air-vent the system, switch it to the „Rinse“ state.

12.3 Disinfection procedure

Disinfection should be regularly carried out, at the latest when the Filter cartridge is replaced.

A disinfection cartridge (article no.: 171-1182) is required for disinfection of the system.

Use cleaning solutions as follows:
MICRO-Chlor Granulate, 1 box, article no. 171-1123 (Europe only)
Cleaning Solution, 1 syringe, article no. 171-1124(US-market only).

Please observe the information given in the safety data sheet supplied with Micro-Chlor disinfectant to avoid possible health hazards!

Proceed as follows to sanitize your system:

1. Switch the Puranity PU 20 system off.
2. Shut off the supply of feedwater to the system and open the dispensing valve so that pressure in the system is completely released.
3. Remove the filter cartridge (as under "Changing the filter cartridge" in the Operating Instructions for the system).
4. Unscrew the stopper from the disinfectant cartridge, fill the cartridge with water then empty the contents of a box respectively a syringe of the cleaning solution into the water.
   Important! **For effective disinfection the cartridge must be completely filled with water.**
5. Screw the stopper back on the disinfectant cartridge and connect the cartridge in the system (as under "Changing the filter cartridge" in the Operating Instructions for the system).
6. Re-open the feedwater supply.
7. Switch the system on and select the "Disinfection" prompt in the menu. The disinfection programme is finished after approx. 30 minutes.
8. Switch the system off.
9. Shut off the supply of feedwater to the system.

10. Remove the disinfectant cartridge (as under "Changing the filter cartridge" in the Operating Instructions for the system).

11. Connect the new filter cartridge in the system (as under "Changing the filter cartridge" in the Operating Instructions for the system).

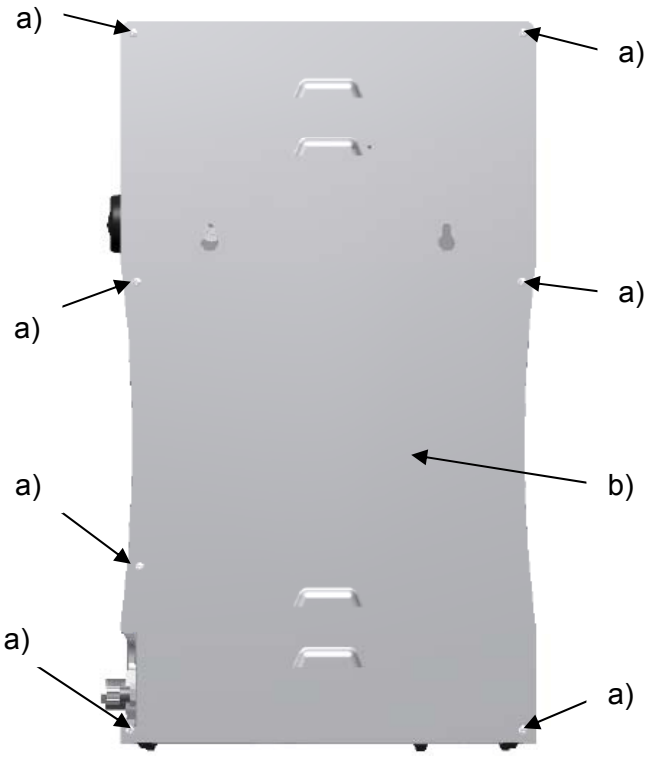
Before dispensing water from the system, let water run out for approx. 15 minutes. The system is then ready for use.

12.4 Change the ultrafilter

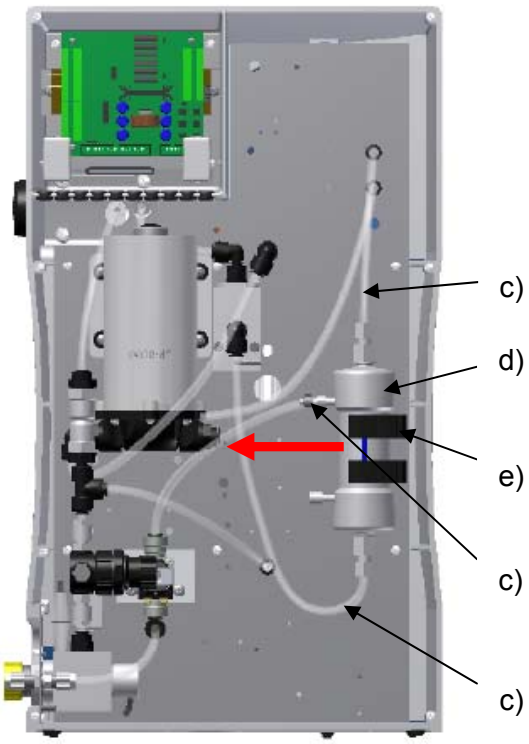
Proceed as follows to change the ultra filter

1. Switch the Puranity PU 20 system off.
2. Shut off the supply of feedwater to the system and open the dispensing valve so that pressure in the system is completely released.
3. Remove the back panel (b) by removing the screws (a) (Pic.I) and pull out the hoses(c) from the ultra filter (d). After this procedure change the ultra filter (d) in which you are draw it out of the mounting clamps (Pic.II)
4. Build the back panel back and switches the sytem on.

Pic.I



Pic.II



a) Screws
b) Back panel
c) Hose 8mm
d) Ultra filter
e) mounting claps

12.5 Change the UV lamp

Proceed as follows to change the UV-lamp

1. Switch the Puranity PU 20 system off.
2. Shut off the supply of feedwater to the system and open the dispensing valve so that pressure in the system is completely released.
3. Remove the cartridge cover (not showns) and take off the filter cartridge (a)(Pic.I).Then unscrew the bracket (b) from the mounting plate and take it up over the UV-lamp cable.
4. Draw the UV-lamp housing (c) slightly towards the front and take the plug off of the UV-lamp (Pic.II).
5. Now carefully draw the UV-lamp upwards while lightly turning it clockwise (Pic.III). During the replacement of a UV-lamp, great care must be taken to avoid touching the glass of the UV-lamp with fingers, to avoid dirtying of the lamp which would impair the functioning of it. We therefore recommend that clean gloves be worn.
6. Carefully introduce the new UV-lamp under a slight turning motion as before but in the anticlockwise direction. Plug the plug on the lamp and push it back in to the unit.
7. Build the filter cartridge (a) and the cartridge cover (not showns) back and switches the sytem on.

a) Filter cartridge
b) Bracket
c) UV lamp housing

Pic.I

Pic.II

Pic.III

13. Equipment disposal

This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste.
Instead it's your responsibility to correctly dispose of your equipment at lifecycle -end by handling it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment.
For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.

By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

Thank you

14. Troubleshooting

Fault	Cause	Remedy
System does not start	- No power	- Connect to power supply
No water can be dispensed	- Feedwater tap is closed - Feedwater and rinse water connections are the wrong way round - The feedwater pressure is < 0.1 bar	- Open the feedwater tap - Re-connect them properly - Increase feedwater pressure
Resistance < 18.2 MΩxcm	- Ion exchange capacity is exhauste	- Replace the Filter cartridge
Control no longer reacts	- Control error	- Unplug the line plug for 5 seconds
Water leaks out	- Hose connections not watertight - Feedwater pressure > 6 bar	- Check connections and make them leaktight - Install a downstream pressure reducer
Ultrapure water flow rate too low	- UF-Module is clogged - Too low a pre-pressure - Internal pressure too low	- Replace the UF-module - Increase the pre-pressure - Re-adjust the pressure reducer
Wrong time or date	- Time difference - Time change	- Reset the clock and the date
Wrong language	- wrong language setting	- Correct the language setting
Fault message: *"Limit value feed"*	- Feedwater has too high a conductivity - Limiting value set too low	- Check the preatreatment system - Check the limiting value setting and correct it

Fault message: *„Limit val. Pure w."*	- Filter cartridge is exhausted - Limiting value set too low	- Replace it with a new one (Art. No.: 171-1141) - Check the limiting value and re-adjust it
Fault message: *"UV duration"*	- The maximum operating hours of the UV-lamp have been exceeded	- Replace the UV-lamp with a new one (Art. No. 171-1176) and re-set the operating hours counter to zero
Fault message: *"UV-Intensity"*	- Intensity to the UV-lamp is no longer sufficient - UV-Sensor is dirtied - Limiting value set too low	- Replace the UV-lamp and measure maximum value - Clean the UV-sensor - Check and readjust the limiting value setting
Fault message: *"Max.temp."*	- The temperature in the system is too high - Pump interval time too long - Limiting value set too low - Feedwater temperature too high	- Reduce the temperature by dispensing water - Reduce pump interval time - Check and readjust the limiting value setting - Reduce the feedwater temperature
Fault message: *"Meas cell LF1"*	- A break in the measuring cell cable - System control defect - Ultrapure water conductivity outside the measurement range	- Replace the measuring cell - Replace the system control - see "Resistance <18.2 MΩxcm"
Fault message: *"Meas. cell LF2"*	- A break in the measuring cell cable - System control defect - Feedwater conductivity outside the measurement range	- Replace the measuring cell - Replace the system control - see Feedwater limiting value
Fault message: *"Meas. cell LF3"*	- A break in the measuring cell cable - System control defect	- Replace the measuring cell - Replace the system control

Fault message: *"Temp. meas. cell."*	- A break in the measuring cell cable - System control defect	- Replace the measuring cell - Replace the system control
Fault message: *„change cartridge"*	- Operating hours of the filter cartridge has expired	- Replace it with a new one (Art. No.: 09.2005)

15. Technical service

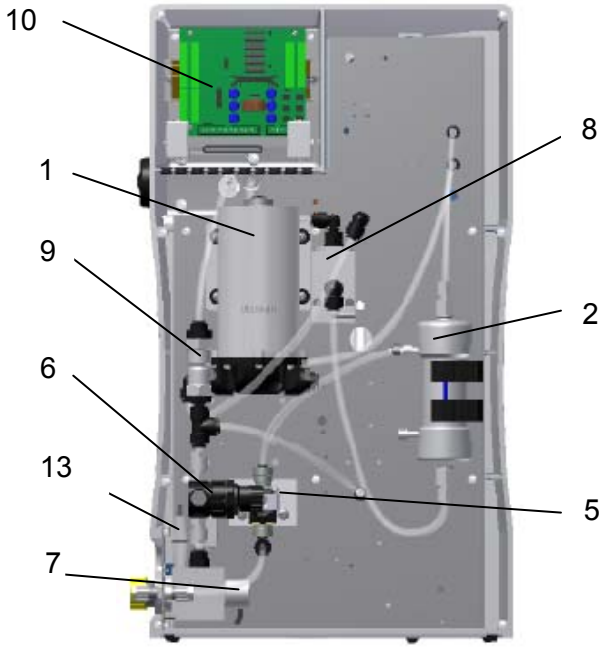
Visit the VWR's website at **www.vwr.com** for:

• Complete technical service contact information

• Access to VWR's Online Catalogue, and information about accessories and related products

• Additional product information and special offers

Contact us For information or technical assistance contact your local VWR representative or visit. www.vwr.com.



No.	Designation
1	Pressure boosting pump
2	Ultrafiltration module (optional)
3	Filter cartridge
4	Replacement UV-lamp
5	Rinsing solenoid valve
6	Pressure reducer
7	Feedwater conductivity measuring cell
8	Ultrapure water conductivity measuring cell
9	Check valve 1 bar
10	Microprocessor system control
11	Sterile filter capsule, 0.2 µm, for dispensed water
12	Dispensing valve
13	Fuse holder for glas tube fuse 5 x 20mm Glas tube fuse 5 x 20mm, 3,15 A, slow fuse

16. Warranty

VWR International warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of delivery. If a defect is present, VWR will, at its option and cost, repair, replace, or refund the purchase price of this product to the customer, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid, except to the extent, the defect of the product is not due to such non-performance.

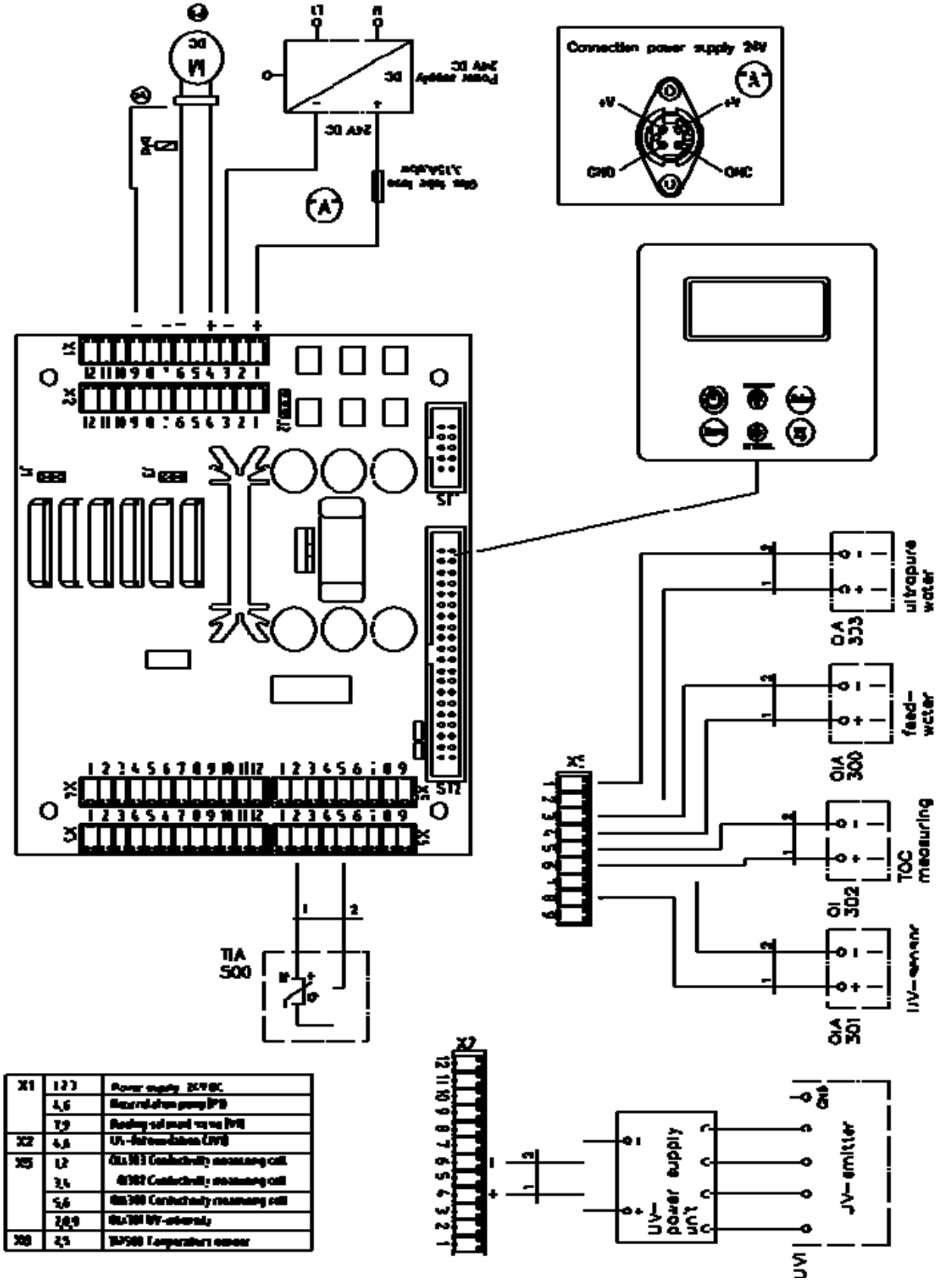
Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

16.1 Compliance with local laws and regulations

The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorisations necessary to run or use the Product in its local environment. VWR will not be held liable for any related omission or for not obtaining the required approval or authorisation, unless any refusal is due to a defect of the product.

17. Appendix

17.1 Terminal assignment



X1	1 2 3	Power supply 24 VDC
	4,6	Measured value pump (P1)
	7,9	Reading solenoid valve (V1)
X2	4,6	UV-Intensity (UV1)
X5	1,2	OIA 303 Conductivity measuring cell
	3,4	OI 302 Conductivity measuring cell
	5,6	OIA 300 Conductivity measuring cell
	7,8,9	OIA 301 UV-intensity
X8	2,5	TIA 500 Temperature sensor

17.2. Maintenance record

(Please carefully keep this record, as complete and correct entries are a requirement for the validity of the guarantee)

Customer address: **Location:**

		Type of system:	
		Serial number:	
		Year made:	

Date	Feedwater resistance [MΩxcm]	Ultrapure water resistance [MΩxcm]	Ultrapure water flow rate [L/h]	Tempe rature [°C]	TOC-value [ppb]	UV-Intensity [%]	UV-Lamp operating hours [h]

Last change of Filter cartridge	Last cleaning / disinfection	Last change of pretreatment	Remarks	Signature

Any false entry is a falsification of documents.

The following points are to be observed to ensure maintenance of the quality of the system:

- **1**x/ Weekly – record measured values

For the optimal ultrapure water to be produced, the feedwater pre-treatment must be checked and subject to maintenance at regular intervals.

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