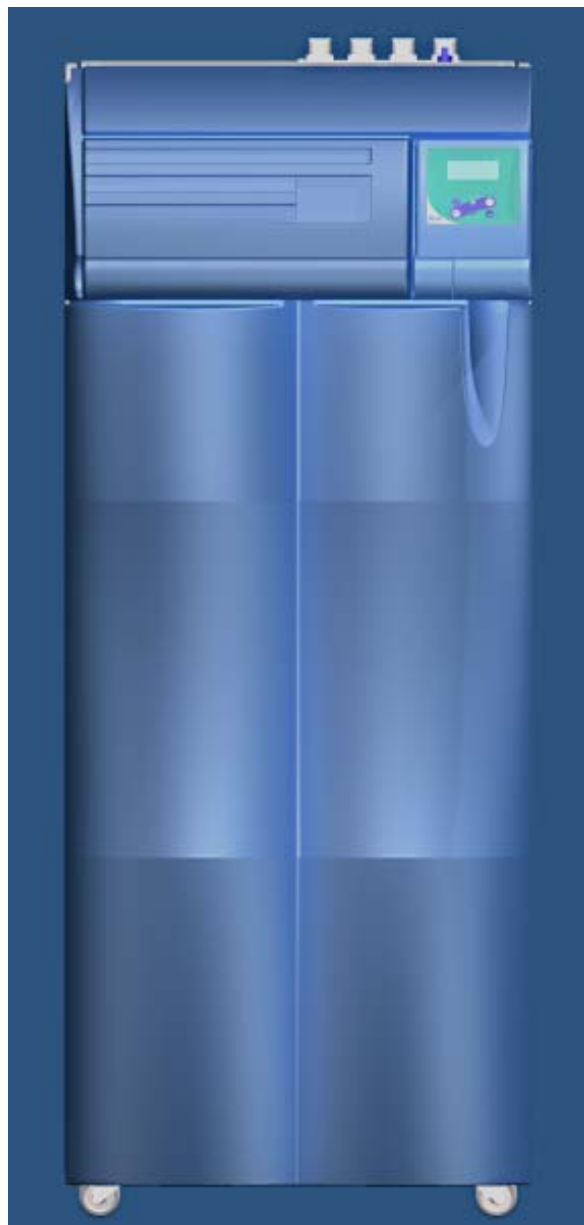


## Operating instructions MediTower 60 – 140-AFT

Art. no.: 05.3060-AFT

Art. no.: 05.3120-AFT

Art. no.: 05.3140-AFT



**These instructions are to be read prior to starting installation and start-up!**

29.0275; Status: 07.12 Rights to technical changes reserved!

## EC-Declaration of Conformity

in accordance with the EEC machine directive 2006/42/EC, appendix II A

We hereby certify that the following described machine in it's conception and form put by us into circulation is in accordance with all the relevant essential health and safety requirements of the EC machinery directive 2006/42/EC as amended and the national laws and regulations adopting this directive.

This declaration is no longer valid if the machine is modified without our consent.

**Manufacturer:** Thermo Electron LED GmbH  
Stockland 3  
D-56412 Niederelbert

### Description of the machine:

function: Pure water system  
type: MediTower 60 – 140-AFT  
article number: 05.3060-AFT, 05.3120-AFT, 05.3140-AFT

**The agreement with further valid guidelines/regulations following for the product is explained:**

EMC Directive (2004/108/EC)

### Reference to the harmonised standards:

DIN EN ISO 12100-1 Safety of machinery, Part 1: Basic terminology  
DIN EN ISO 12100-2 Safety of machinery, Part 2: Technical principles  
DIN EN ISO 14121-1 Safety of machinery, Part 1: Risk assessment  
DIN EN 55014-1, Electromagnetic compatibility - Emission  
DIN EN 55014-2, Electromagnetic compatibility - Immunity  
DIN EN 60204-1, Electrical equipment of machines  
DIN EN 61000-3-2, Electromagnetic compatibility: Limits  
DIN EN 61000-3-3, Electromagnetic compatibility: Limits

### Authorized person for the technical documentation:

Detlef Opp  
Stockland3  
D-56412 Niederelbert

Niederelbert, 1. April 2010

Detlef Opp, Head of Technical documentation

  
Signature

## Preface

Dear Sir or Madam,

With your decision for a pure water system of type **MediTower** you have selected a high-quality product.

Thank you for the confidence you have placed in us.

Before you start to install and operate this pure water system, please carefully read the information on how it is to be properly installed and operated that is given in these operating instructions.

This is particularly important, as we, the manufacturer, cannot accept liability for any damage occurring as a result of improper operation of the system, or from use of it for other than the intended purpose.

Niederelbert, 05.10.2009

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## 2. Notes on the operating instructions



Danger notes are emphasized by a warning triangle.



Important notes are marked with an information sign.

The information provided in these operating instructions is only valid for the system having the serial number\* that is given on the type plate.

It is important that you provide the following details on all inquiries and orders for replacement parts:

- **Serial number**
- **System designation**

\* The serial number is given on the type plate of your pure water system.

### 3. Transport and packaging

MediTower systems are carefully controlled and packed prior to dispatch, but damage could still occur during transport.

#### 3.1 Examination on receipt

- Check the completeness of the goods received against the delivery note.



**Is the packaging damaged?**

- Inspect the system for damage.

#### 3.2 Complaints

If damage has occurred to the system during transport:

- Immediately contact the post, railway or forwarding agent\*.

#### 3.3 Packaging and return shipment

- Pack the system in packing film and protect it against damage from shock.



- \* **The time limit for claims is 6 days (after receipt of the goods).  
The right to claim for damages expires when this time has elapsed.**

## 4. Safety precautions

- Your MediTower system is a state-of-the-art membrane separation technology system and serves exclusively to purify softened or hardness stabilized tap water.
- Please do not start to install and operate the system until you have read through the appropriate information given in these operating instructions.
- Please note that the use of the system for other than the intended purpose or improper operation of it frees the manufacturer from all liability.
- The CE-mark is invalidated when constructional changes are made to the system or foreign products are installed in it.
- Observe all general rules and regulations that are valid at the installation location, including the current relevant accident prevention regulations.
- Protect the system from frost. The temperature at the installation area must be at least + 2°C.
- The maximum operating temperature is 35°C.
- The feedwater pressure must be within the 2 to 6 bar range. Should it be higher, then an additional pressure reducer must be installed.
- According to DIN EN 1717, water purification systems must be equipped with a device that safeguards the tap water system against contamination.
- A suitable electric socket must be available for connection of the system (see “Technical specifications”).
- The installation area must have a drain at floor level with at least DN 50 pipe and which allows free run off. Should no such drain be available, we recommend the installation of a water watcher (article no. 16.0129), otherwise the manufacturer will not accept any liability for water damage.
- The surface the MediTower system is to stand on must have sufficient load bearing capacity (see “Technical specifications” for the weight).
- When installing the system, ensure that there is sufficient working space around it for problem-free usage (e.g. filter change, connectors etc.).
- The system must be subjected to a rinse and, if appropriate, be disinfected after longer standstills. Please refer here to the “Rinsing and disinfecting” section.
- The guarantee is valid for a period of 12 months!

**Observe the above safety precautions for your own safety!**



## 5. Technical specifications

Demands on the feedwater	
Source	Tap water, softened acc. to DIN 2000.
Free chlorine	< 0.10 mg/L
Manganese content	< 0.05 mg/L
Iron content	< 0.05 mg/L
Colloid index	< 3
pH-Range	4 - 11
Temperature	2 - 35 °C
Pressure	2 - 6 bar

Pure water			
	MediTower 60	MediTower 120	MediTower 140
Retention quota, bacteria and particles	Ø 99 %	Ø 99 %	Ø 99 %
RO Operating pressure bar	14	14	14
WCF Rate %	75	75	75
Real output, RO L/h (at10°C)	60	120	140
Pure water performance L/h	60	120	140
Conductivity µS/cm	0.1 – 1.0	0.1 – 1.0	0.1 – 1.0
Resistance MΩxcm at 25°C	10 – 1.0	10 – 1.0	10 – 1.0

Water connectors	
Feedwater inlet	R 3/4" male thread
Concentrate outlet	R 3/4" male thread
Pure water outlets, 2x	R 3/4" male thread

Electrical connections	
Voltage	230 V
Frequency	50/60 Hz
Power consumption	0.3 kW
Serial interface	RS 232

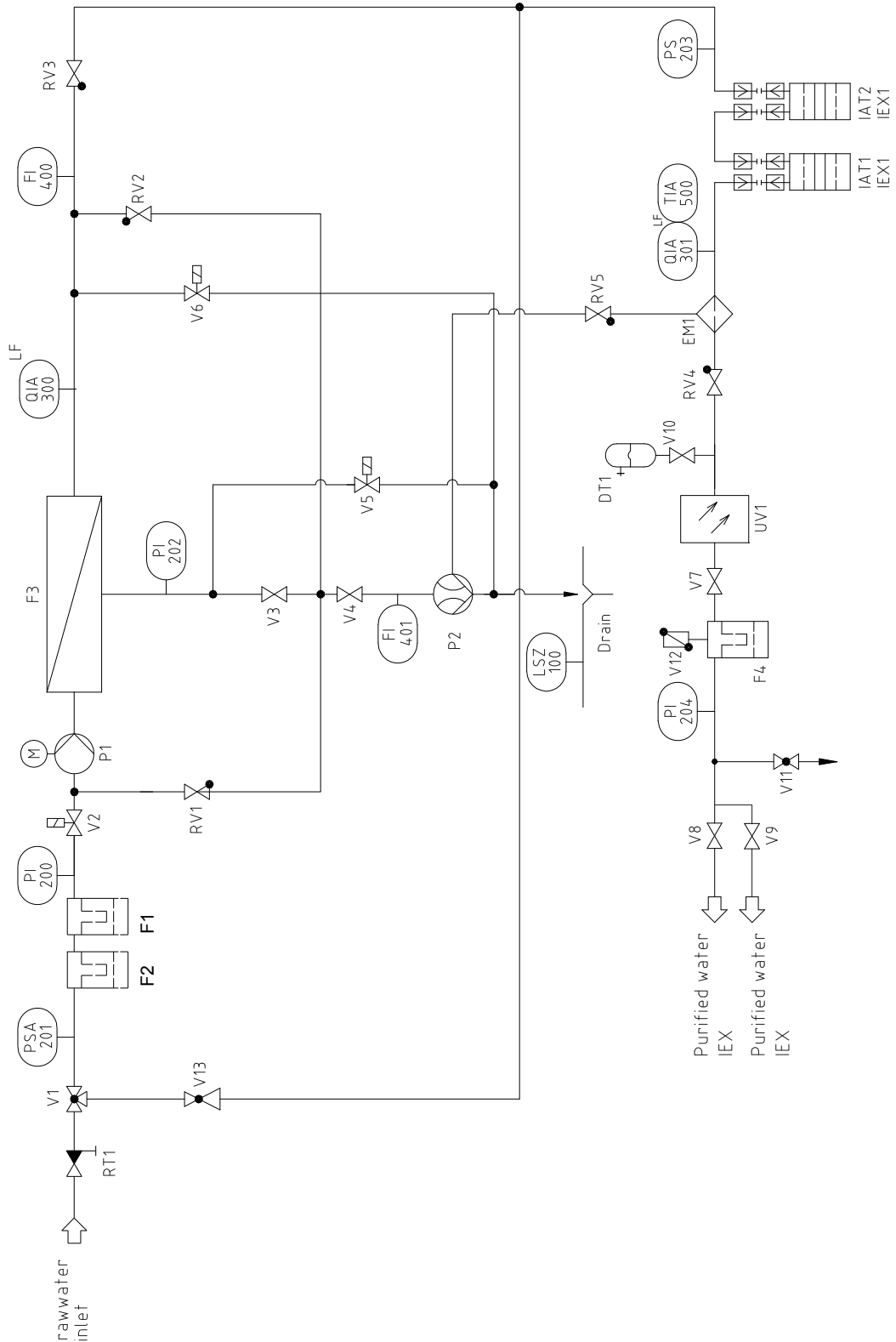
Cell constants of the measuring cells	
Permeate conductivity, QIA 300 (LF 2)	0.16 cm <sup>-1</sup>
Pure water conductivity, QIA 301 (LF 1)	0.01 cm <sup>-1</sup>

Dimensions			
	MediTower 60	MediTower 120	MediTower 140
Height in mm	1380	1380	1380
Width in mm	560	560	560
Depth in mm	660	660	660
Weight empty, kg	147	152	157

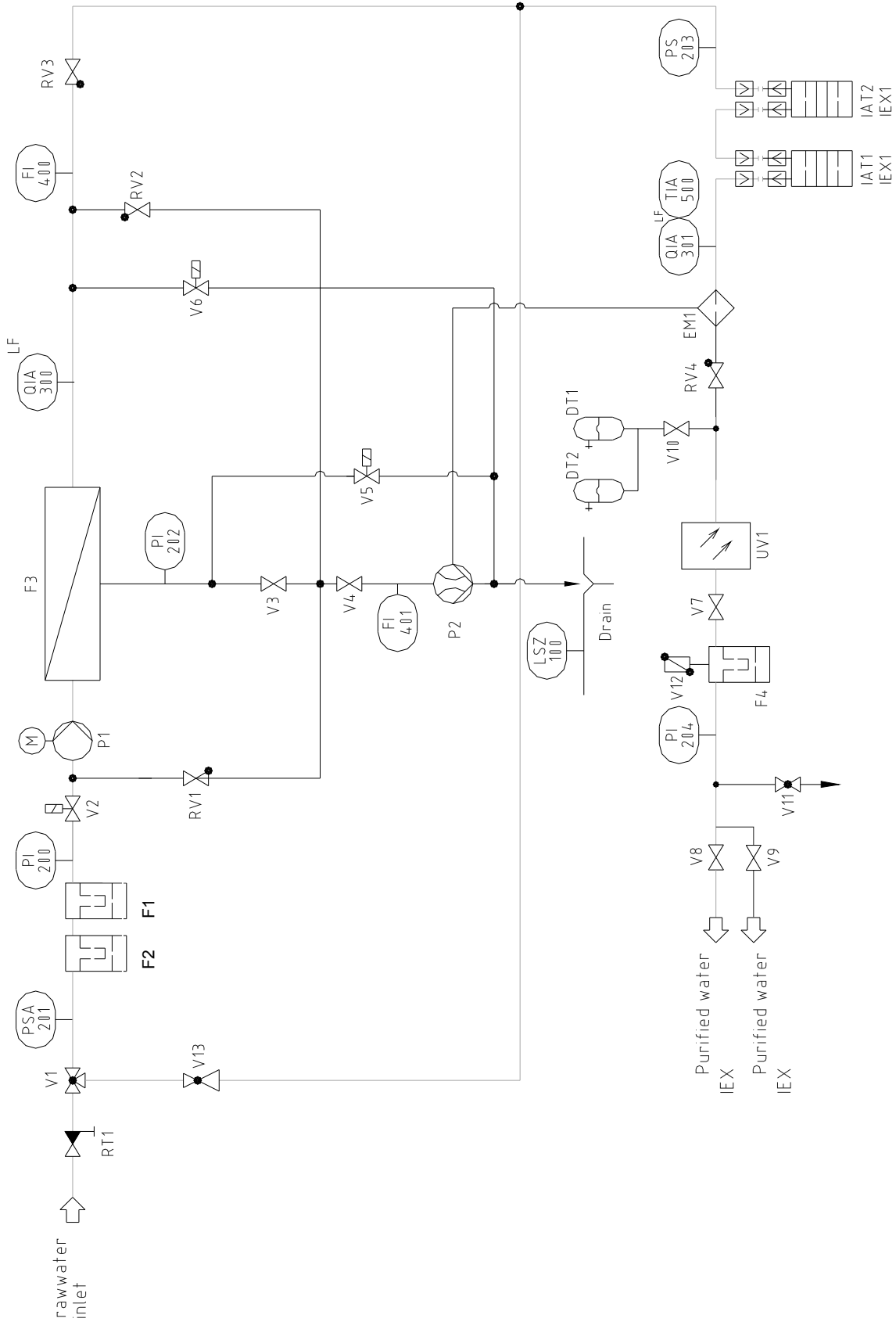
<b>Materials of parts that contact water</b>	
Pump head	Brass/stainless steel
Raw water solenoid valve	Brass
Rinsing solenoid valve	Brass
Pressure hold valve	Brass
Concentrate return valve	Brass
Conductivity measuring cell QIA300	PVC, stainless steel
Conductivity measuring cell QIA 301	GLS, stainless steel
Connectors	POM
Gaskets	EPDM/NBR
RO-Membrane	PA

## 6. Flow chart

### MediTower 60 - 120 AFT



**MediTower 140 AFT**



## Description of MediTower

EM1	Degassing membrane:	Degasses the permeate.
DT1	Pressure tank:	Serves as pressure hold tank for the permeate that is generated.
DT2	Pressure tank: only MediTower 140 AFT	Serves as pressure hold tank for the permeate that is generated.
F1	Combi-cartridge, 5 µm + activated carbon:	Prevents the penetration of particles > 5 µm and too high free chlorine concentrations.
F2	Hardness stabilizer:	Serves for hardness stabilization.
F3	RO Module:	Semipermeable, thin film, composite spiral membrane.
F4	Fine filter, 0.2 µm:	Retains particles > 0.2 µm.
FI400	Permeate flow meter:	Permanently measures the amount of permeate. The measured value of this is required system adjustment.
FI401	Concentrate flow meter:	Permanently measures the amount of concentrate. The measured value can be adjusted using valve V3, keeping the maximum operating pressure in consideration.
IEX1, IEX2	Mixed bed ion exchanger:	Serves to produce pure demineralized water (in series connection).
LSZ100	Leak sensor:	Detects leakage from the system.
P1	Pump aggregate:	Increases the inlet pressure to the max. 14 bar operating pressure that is required the system.
P2	Water jet pump:	Generates the necessary suction for degassing.
PI200	Raw water pressure gauge:	Shows the raw water pressure.
PI202	Operating pressure gauge:	Shows the pump aggregate operating pressure.
PI204	Pressure gauge:	Shows the pure water pressure downstream of the particle filter.
PS203	Pressure switch:	Switches the system off when the permeate pressure reaches 2.5 bar and on again when it drops to 1.5 bar.
PSA201	Raw water pressure switch:	Closes raw water solenoid valve V2 und switches the system off when the pressure fluctuates or there is a lack of raw water (the display shows "Feedwa.pressure").

QIA300	Permeate conductivity measuring cell:	Measurement device for the determination of the conductivity as parameter for the permeate quality.
QIA301	Pure water conductivity measuring cell:	Measurement device for the determination of the conductivity as parameter for the pure water quality.
RT1	Pipe disconnecter:	Serves to prevent foreign substances from entering the tap water supply system.
RV1	Concentrate check valve:	Prevents a backflow of concentrate.
RV2	Permeate check valve:	Prevents a backflow of permeate.
RV3	Permeate check valve:	Prevents a backflow of permeate.
RV4	Pure water check valve:	Prevents a backflow of pure water.
RV5	Vacuum check valve	Prevents a the flow of concentrate
TIA500	Pure water temperature sensor:	Measurement device for the determination of the pure water temperature.
UV1	UV-Disinfection:	Kills bacteria and germs.
V1	Emergency supply valve:	When the MediTower system is subject to a fault, opening of this redirects the municipal tap water straight to the ion exchangers. This emergency supply valve must always be closed when the Medi-Tower system is operating perfectly.
V2	Raw water solenoid valve:	Is closed on a lack of raw water and during stand-stills. It prevents water from entering the system when the MediTower is not operating.
V3	Pressure hold valve:	Serves for adjustment of the operating pressure.
V4	Concentrate return valve:	Valve for adjustment of the amount of concentrate to be fed back into the system. Determination of the WCF-rate (utilization rate).
V5	Rinsing solenoid valve:	Opens for membrane cleaning prior to and after each pure water production and every 24 hours.
V6	Permeate pressure relief solenoid valve:	Serves for permeate discarding and a pressureless start-up and close-down of the system.
V7	Shut-off valve:	For closing the pure water line.
V8	Pure water shut-off valve:	For closing the pure water outlet.
V9	Pure water shut-off valve:	For closing the pure water outlet.
V10	Pure water shut-off-valve	For closing the permeat from pressure tank

V11	Dispensing valve:	Serves to draw off pure water (IEX).
V12	Quick vent valve:	For venting the particle filter.
V13	Pressure reducer:	Regulate the emergency supply pressure

## 7. How the system functions

Tap water that has a maximum pressure of 6 bar flows through prefilter F1 and into the Medi-Tower system. Pressure switch PSA201 checks the water inlet pressure and switches the system off should it go below the minimum pressure of 1 bar.

Raw water inlet solenoid valve V2 is closed when a pressure drop occurs or there is a lack of raw water, in Stand-by mode and during standstills. It prevents water from flowing into the system when the reverse osmosis unit is not in operation and so protects the tank that is installed downstream of the MediTower against overflowing.

Pressure booster pump P1 pumps raw water into RO module F3. The semi-permeable membrane in the module now retains all salts that are dissolved in the water according to their given retention quota. In addition, because of the molecular size of the membrane pores, the specified approx. 99% retention of bacteria and particles is ensured.

The permeate that is produced flows through measuring cell QIA300, where the conductivity is measured. The measured value is shown in the control display.

Water constituents held back by the membrane are led away with the remaining concentrate. 10 to 15 litres of permeate can be stored in the tank according to the setting of pressure switch PS203.

The permeate flows on through 2 mixed bed ion exchangers in series. These produce pure, demineralised product water, which on flows through UV-disinfection, in which bacteria and germs are destroyed. A downstream 0.2 µm filter retains all particles > 0,2 µm.

The quality of the product water that flows from the ion exchangers is measured by measuring cell QIA301 and the measured value is shown in the display: (IEX: --- µS/cm). The limiting value for the ion exchangers can be set in the menu. Should this limiting value be exceeded for longer than 5 minutes, the signal lamp lights up and “Replace IEX” is shown in the display.

Adjustment of the pump aggregate is made via valve V3.



**Valves V3 and V4 are preset at the factory. Changes to these adjustments could result in damage to the reverse osmosis module. Such changes are only to be made by service personnel or after consultation with them. Further information is given in the “Installation and putting into operation” section.**

To increase the economy of the system, concentrate return valve V4 allows adjustment of the amount of concentrate that is fed back into the system and so determines the WCF (utilization rate).

Assuming a maximum operating pressure of 14 bar, as shown by operating pressure gauge PI202, and, for example, a pure water production of 60 litres (as with MediTower 60), then the amount of concentrate is set to approx. 20 litres. This factory setting relates to the operation of the MediTower 60 system with a water softener.

The system is hereby adjusted to a WCF (utilization rate) of 75%. Settings above a WCF of 75% result in a negative change in conductivity that could lead to blockage of the RO module.

Settings below a WCF of 75% lead to a positive change in conductivity.

WCF = 100% raw water supply is converted to 75% permeate and 25% concentrate.

Your MediTower system is equipped with automatic rinsing. The automatic rinse is carried out when the MediTower is switched on, after the end of each production and also every 24 hours, whereby rinsing solenoid valve V5 is opened. The opening of this valve results in a strong flow of water across the reverse osmosis module that sweeps coarse particles and other contaminants away from the membrane surface and carries them with it to drain. This rinsing has a positive effect on the service life of the reverse osmosis module.

An additional advantage of this rinsing is that it prevents a growth of bacteria from occurring in the reverse osmosis module when the system is at a standstill for a long time. For this reason, it is highly advisable to leave your system switched on over weekends and during holiday times, so that the interval rinse can effectively guard against bacterial growth.

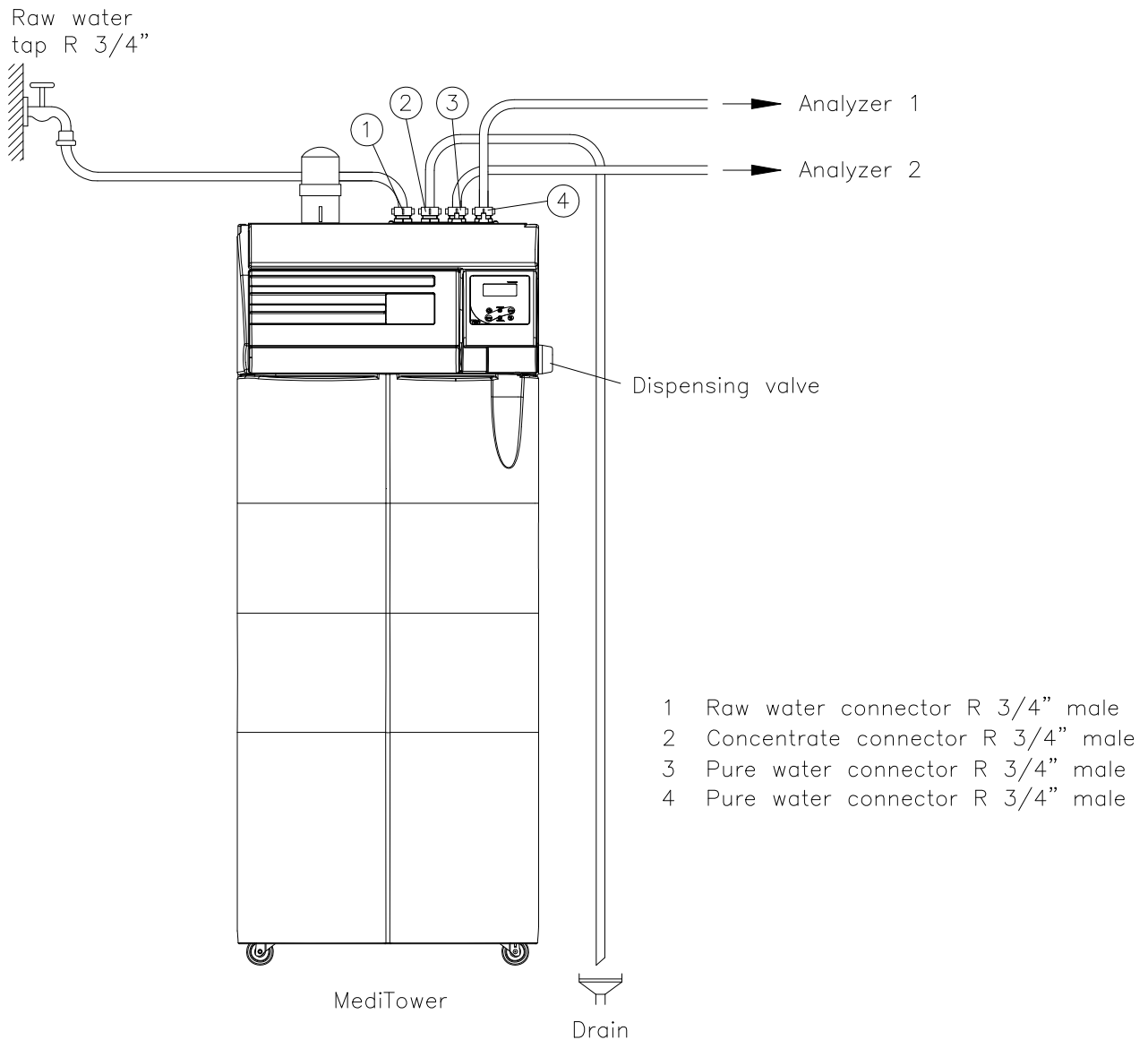
## 8. The installation area

**The following criteria must be taken into account when choosing the installation area:**

- ⇒ The minimum room temperature where the system is located must be +2°C - +35°C.
- ⇒ The surface that the MediTower system is to be stood on must have sufficient load bearing capacity (see "Technical specifications" for the weight of the system).
- ⇒ A floor drain with waste pipe of DN 50 size (38.5 mm id) is required. Should this not be available, then a water watcher (article no.16.0129) must be installed for protection against damage from water flooding!
- ⇒ Unrestricted gravity flow of the concentrate to the floor drain must be ensured.
- ⇒ A socket that matches the voltage that is given on the type plate of the system must be positioned directly alongside the system. The safety fuse must be sufficiently sized for the power required (see "Technical Specifications").
- ⇒ Ensure that there is sufficient working space around the system.
- ⇒ A raw water connector with R 3/4" male thread that can be shut off must be installed directly alongside the system. Easy access to it must be ensured.
- ⇒ Pure water R 3/4" connections and piping must be made of pure water resistant material, such as stainless steel, PVC, PP, PVDF etc. The use of non-ferrous metal in the pure water area leads to leakage.



## 9. Putting into operation



1. Connect the R 3/4" water tap that can be turned off, to the R 3/4" raw water inlet (1) of the MediTower system. This inlet is marked "Raw water".
2. Connect the concentrate outlet (2) to the on-site sewer line. The MediTower connector is marked "Concentrate".



**Pressure surges may occur at the open end of the concentrate outlet hose or pipe during various operating phases of the system. In order to avoid accidents or water damage, this open end must be either securely fastened to the drain by appropriate means, or be firmly fitted to the drain pipe, whereby it is essential to ensure a free gravity flow of concentrate to drain.**

3. Connect the two pure water outlets to the downstream analyzer 1 and analyzer 2. Do not mix up the R 3/4" pure water outlet connectors with any other connectors! They are marked "Pure water".

4. Check the connections to make sure that none of them leak.
5. Check the raw water pressure (must be in the permissible pressure range, see the technical data sheet).
6. Turn on the feed water supply.



**Before you now switch the system on, please read through the „Rinsing and disinfection“ section on the rinsing out procedure for reverse osmosis membranes that are supplied in a preserving agent.**

7. Switch the system on.

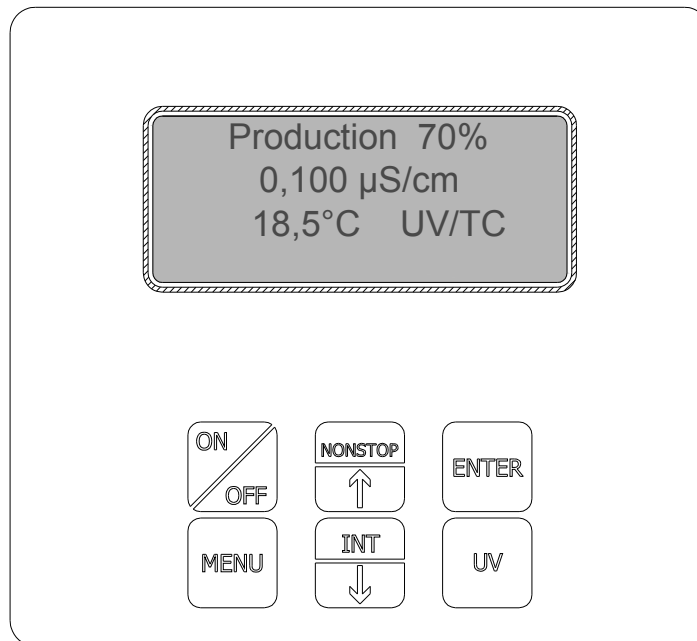


**Louder running noises occur during the brief rinsing phases that are operative following switching on, after each production and every 24 hours. These noises occur because of the pressureless operation of the pump and do not point to a pump defect!**

The MediTower system is now at your availability for the production of pure water.

## 10. System control

### 10.1 Operating the control unit



Switches the system on and off



Calls the menus and switches to the next menu prompt



Increases the numerical value in a menu



Decreases the numerical value in a menu



Confirms a value to be entered in menu prompts



Switches the UV-lamp on and, in menu, serves to select the number to be changed

## 10.2 General information

### 11.2.1 Operating mode after switching on

When the ON/OFF key is pressed, the backlighting of the display is switched on and the system starts to run either in the *Production* operating mode or in the *Stand-by* mode, as governed by the float switch.

Pressing the UV-key switches the outlet for the UV-lamp on or off. When it is switched on, “UV” appears in the display and the intensity and operating time of the UV-lamp are monitored.

The display shows:

Stand by 90% IEX: 0.163 µS/cm 18.5 °C UV/TC Line for fault message
---

### 10.2.2 Production operating mode

As soon as the level switch reports a level below the switching on point and the Rinsing operating mode has been run through, the system is in the production operating mode. Only the inlet solenoid valve and the RO-pump are now switched on.

The potential free output is set when a fault is resident. The fault message is then displayed in line 4 and printed out.

The relay for the operating feedback is operated after the rinsing cycle has been completed. A pressure switch monitors for dry running of the RO-pump. If the inlet pressure is lacking for longer than 5 sec (logical 0), then the RO-pump is switched off and the *Rawwat.faulttime* fault message is shown in the display. The system is now switched off for the settable raw water fault time. Should the raw water pressure increase again during this time, then the system is subjected to a restart. After each unsuccessful attempt to start, the raw water fault time is prolonged by 10 sec.. As soon as the system successfully starts, the raw water fault time returns to the value set in the OEM-menu. The raw water pressure is not monitored in the Stand-by mode. Should a fault message occur, then the potential free output is set and the fault message output switched.

The conductivity LF1 at the downstream ion exchanger is shown in the second line of the display. The measured value is only displayed in the Production operating mode. In the Stand-by operating mode `__` is displayed as measured value. Fault evaluation for the permeate conductivity (LF1) is only made in Production mode.

The display shows:

Production 70% IEX: 0,100 µS/cm 18.5°C UV/TC Line for fault message
--

### 10.2.3 Stand-by operating mode

As soon as the level switch reports that the tank is full and the Rinsing operating mode has been run through, the system switches to the Stand-by operating mode. In Stand-by, all outputs are switched off (logical 0).

The potential free output is set when a fault is resident, the fault message is shown in line 4 of the display.

The measured values of the IEX monitoring point (LF 1) are displayed but a fault evaluation is not made.

The display shows:

Stand-by 100%
IEX: 0.163 $\mu$ S/cm
18,5 °C UV/TC
Line for fault message

### 10.2.4 Rinsing operating mode

The rinsing operating mode is always run through when the operating mode is changed from Stand-by to Production, or from Production to Stand-by.

During this rinsing, and in addition to the inlet solenoid valve and the RO-pump, the rinsing solenoid valve is opened for the rinsing time period that can be set in the OEM-menu. The system subsequently goes to the next operating mode.

The remaining rinsing time is shown in the display

Please note: Rinsing takes place before and after each production, whereas cleaning is independent of the operating mode and is triggered at the end of the cleaning cycle (24h rinse).

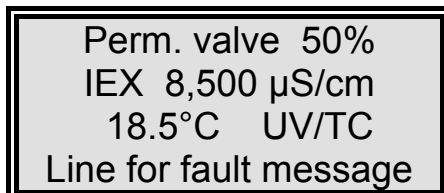
The display shows:

Rinse 50%
IEX: 15 s
18.5°C UV/TC
Line for fault message

### 10.2.5 Permeate discard operating mode

The Permeate discard mode is activated as soon as the Rinsing operating mode that is active between a switch from the Stand-by mode to the Production mode has been completed. The permeate discard solenoid valve is used for pressure relief and has the same switching function as the rinsing solenoid valve.

The display shows:

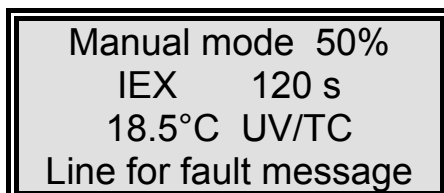


Perm. valve 50%  
IEX 8,500 µS/cm  
18.5°C UV/TC  
Line for fault message

### 10.2.6 Special function, manual operation

To allow the user to manually switch on the RO system during the Stand-by operating mode, a press on the lower arrow-key brings the system to the Production operating mode for 2 minutes. The display then shows “Manual operation” operating mode and the count-down of the time. Manual operation can be stopped before the 2 minutes have elapsed by pressing the Enter-key.

The display shows:



Manual mode 50%  
IEX 120 s  
18.5°C UV/TC  
Line for fault message

### 10.2.7 Operating mode OFF

When the ON/Off-key is pressed a second time, the display darkens, the whole of the text in the display is extinguished and none of the outputs are switched.

## 10.3 User menu

All of the measured values, operating times and limiting values that are relevant for the user can be set and read in this menu.

A press on the menu-key brings you into this menu. Each further press on the menu-key moves you on from one menu prompt to the next.

The system control must be unlocked by means of the code before settings can be made.

Settings can be changed with the arrow keys and must be confirmed by pressing the Enter-key.

To simplify changing settings, a press on the UV-key allows you to select a certain single number in a numerical value that you wish to change. The arrow-keys can then be used to set a number of from 0 to 9 at this selected position.

### 10.3.1 Ion exchanger conductivity

The pre-alarm and the limiting value for the ion exchanger are set in this menu.

The fault message issued and shown in line 4 of the display when the pre-alarm is exceeded is “*IEX*”, that shown when the limiting value is exceeded is “*IEX limit value*”. Should more than one fault occur at any one time, then they are alternately displayed.

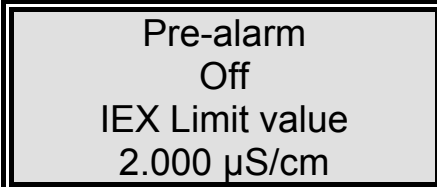
(Limiting value evaluation of monitoring point LF 1).

Measurement range IEX:	0.055- 9.999 $\mu\text{S/cm}$
Pre-alarm:	0.055- 9.999 $\mu\text{S/cm}$
Limiting value setting range:	0.055- 9.999 $\mu\text{S/cm}$
Basic pre-alarm setting:	Off
Basic limiting value setting:	2 $\mu\text{S/cm}$

Both values are set by means of the arrow-keys (see making settings with the arrow keys).

Settings above 9,999  $\mu\text{S/cm}$  cause the limiting value to be switched off. The display then shows the word “*Off*”.

The display shows:



```
Pre-alarm
Off
IEX Limit value
2.000  $\mu\text{S/cm}$ 
```

### 10.3.2 Permeate conductivity

In this menu, the permeate conductivity and the set limiting value of it are shown and can be reset in this menu. If the limiting value is exceeded, the *Permeate limval* message is shown (monitoring point LF 2).

Measurement range, permeate: 0.1- 150.0  $\mu\text{S}/\text{cm}$   
 Limiting value setting range: 0.1- 150.0  $\mu\text{S}/\text{cm}$   
 Basic setting: 50  $\mu\text{S}/\text{cm}$

The limiting value can be adjusted using the arrow-keys (see making settings with the arrow keys).  
 Settings above 150  $\mu\text{S}/\text{cm}$  cause the limiting value to be switched off. The word "Off" is then shown in the display.

The display shows:

Permeate  
5  $\mu\text{S}/\text{cm}$   
Permeate lim. val  
50.0  $\mu\text{S}/\text{cm}$

### 10.3.3 Feedwater conductivity

(not active in this version)

The measured value for the feedwater can be read and the feedwater limiting value be adjusted in this menu. If the limiting value is exceeded, the *Feedwater limval* message is shown (monitoring point LF 3).

Feedwater conductivity 10.1  $\mu\text{S}/\text{cm}$  – 9999  $\mu\text{S}/\text{cm}$   
 Cell constant 0.16  $\text{cm}^{-1}$  (monitoring point LF3)

Limiting value setting range: 10- 9999  $\mu\text{S}/\text{cm}$   
 Basic setting: Off

Adjust the limiting value using the arrow-keys (see making settings with the arrow keys).  
 Settings above 9999  $\mu\text{S}/\text{cm}$  cause the limiting value to be switched off. The word "Off" is then shown in the display.

The display shows:

Feedwater  
500  $\mu\text{S}/\text{cm}$   
Feedw. lim. val  
Off  $\mu\text{S}/\text{cm}$



### 10.3.4 Operating time and intensity of the UV-lamp

The operating time of the UV-Lamp is displayed in this menu. The UV-lamp operating time counter counts the total number of hours that the lamp has been on.

The “*UV-time*” fault message is triggered when the maximum operating time is reached.

The display shows:

e.g.:

UV time
0054 h
UV intensity
90%

### 10.3.6 Flow rates

(not active in this version)

Flow rates are shown in this menu. Flow meters can be used both for an RO-system and for an EDI-system. The limiting values are set in the OEM-menu. The fault message “*Flow rate lim.val.*” is displayed when limiting values are gone below.

The display shows:

e.g.:

Flow rate
Product 300L/H
Concent. 30L/H
Electrolyte 10L/H

### 10.3.5 Operating time

The *Service Interval* and the number of operating hours that the RO pump has been running for are shown in this menu.

For the service interval, a date must be set on which the next servicing should be carried out.

When this date is exceeded, the “*Perform service*” message is shown.

The operating time of the RO pump has not been given a limiting value.

The display shows:

e.g.:

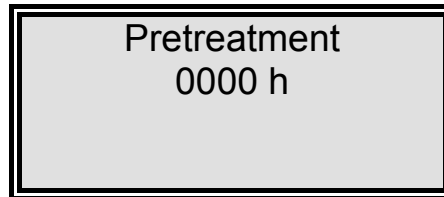
Service-interval
12.08.10
RO operat. time
1200 h

### 10.3.6 Pretreatment operating time

In this menu prompt, the length of time for which the pretreatment cartridge has been in use is displayed.

This operating time has been given a limiting value which is set in the Operating time menu. The fault message that is displayed when the limiting value is exceeded is *Pretreatment*. The operating hours of the pretreatment are counted the whole time that the reverse osmosis pump runs.

The display shows:



Pretreatment  
0000 h

### 10.3.7 Cleaning

In this menu, cleaning can be triggered when required by pressing the Enter-key. The pump then starts to run, the inlet solenoid valve and the rinsing solenoid valve open for the cleaning time set in the OEM-menu.

Cleaning is also automatically activated at the end of the settable cleaning cycle (see the OEM-menu).

During cleaning, neither faults nor measured values are displayed. At the end of the cleaning process, the system is in the last used operating mode (Production or Stand-by). The cleaning time remaining is counted down in the display during cleaning.

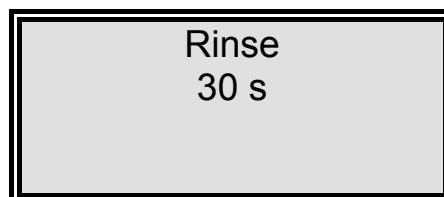
Caution: Rinsing is carried out prior to and after each production. Cleaning is independent of the operating mode and is triggered at the end of the cleaning cycle (24 hour rinse).

The display shows:



Rinse  
Press enter

During cleaning, the display shows:



Rinse  
30 s

### 10.3.8 Disinfection


(not active in this version)

In this menu, disinfection can be triggered when required. Confirmation of the menu-prompt with Enter brings the demand “Disinfection - Cartridge - Install one”. Confirmation of this with Enter initiates disinfection. The pump runs, the inlet solenoid valve and the rinsing solenoid valve open, the permeate solenoid valve is closed.

The “Disinfection - Pinch off - Cartridge” message is shown when disinfection has finished. Confirmation that this has been done with Enter switches the system control to the last operating mode. The disinfection time is set in the OEM-menu.


The count-down of the remaining disinfection time is shown in the display during disinfection.

The display shows:



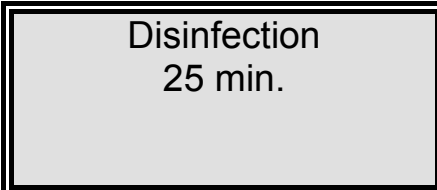
Disinfection  
Press enter

After confirmation with Enter the display shows:



Disinfection  
Install  
Cartridge  
Press enter

During disinfection the display shows:



Disinfection  
25 min.

After disinfection the display shows:



Disinfection  
Cartridge  
Pinch off  
Press enter

### 10.3.9 Fault storage

The contents of the fault storage can be looked through when this menu prompt is confirmed with Enter. Two faults, each with date and time, can be shown at once in the display. Use the arrow-keys to call the next or previous faults to display.

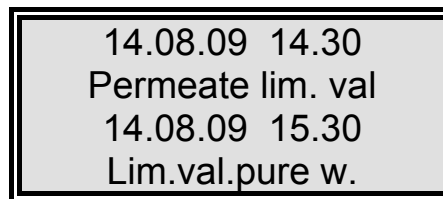
A press on the menu-key or the Enter-key returns system control to the last used operating mode.

The display shows:



Fault storage  
Press enter

The fault storage display shows:



14.08.09 14.30  
Permeate lim. val  
14.08.09 15.30  
Lim.val.pure w.

### 10.3.10 Code lock

To prevent unauthorized access to the settings in the system control, changes to the settings can only be made when a correct code is first entered and confirmed with Enter.

System control can trigger the unlocking at three levels:

At the first level, only the menu is unlocked for changes, at the second level the menu and the OEM-menu are unlocked and at the third level all menus are unlocked.

Code numbers:

No.	Menu	No.	Menu + OEM menu	No.	All levels
1	150	4	450	7	750
2	250	5	550	8	850
3	350	6	650	9	950

Each access via a code number is printed out by the printer (RS 232) with date, time and the code number as assigned in the Table.

The display shows:

Code  
Press enter  
0000

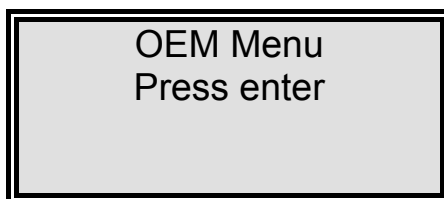
## 10.4 OEM-Menu

Basic settings and limiting values can be changed in this menu.

Calling the OEM-menu:

Simultaneously press the Interval-key and the Nonstop-key to call the OEM-menu. This brings the *OEM-Menu* press *Enter!* request to display. Confirm this request by pressing the Enter-key. The first menu prompt can now be worked on. Make settings with the arrow-keys, selecting the appropriate position with the UV-key. Press the menu-key to pass to the next menu prompt.

When called, the OEM-menu display shows.

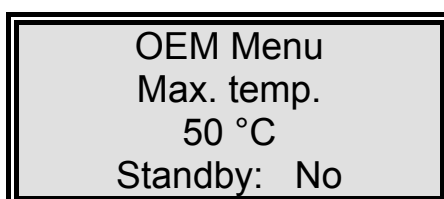


### 10.4.1 Maximum temperature

The maximum permissible temperature which is to be allowed in the system can be set in this menu. The *max. Temperature* fault message is triggered when this limiting value is exceeded. Settings above 50 °C suppress limiting value evaluation and the word "Off" is shown in the fourth line of the display. Evaluation of the temperature fault is only carried out in the "Production" mode. This menu prompt is no longer shown when the calibration factor for the temperature in the calibration-menu has been switched off.

Basic setting:	50 °C
Step width:	1
Setting range:	1 - 50 °C

The display shows:

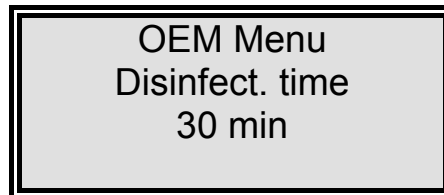


### 10.4.2 Disinfection time

The disinfection time is set in this menu.

Basic setting: 30 min.  
Step width: 1  
Setting range: 15 - 90 min.

The display shows:

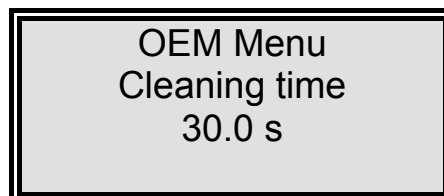


### 10.4.3 Cleaning time

The cleaning time is set in this menu. When a setting below 0.5 sec. is entered, cleaning is switched off and the word „Off“ is shown in the display.

Basic setting: 30 sec.  
Step width: 0.1 - 1  
Setting range: 0.1 – 120 sec.

The display shows:

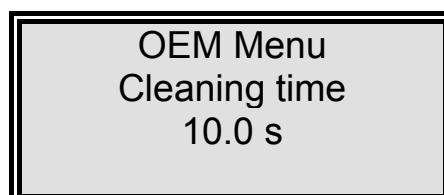


### 10.4.4 Rinsing time

The rinsing time is set in this menu. When a setting below 0,5 sec. is entered, rinsing is switched off and the word „Off“ is shown in the display.

Basic setting: 10 sec.  
Step width: 0.1 - 1  
Setting range: 0.1 – 120 sec.

The display shows:

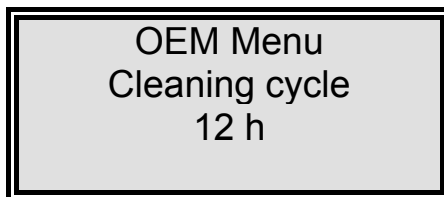


### 10.4.5 Cleaning cycle

The cleaning cycle is set in this menu.

Basic setting: 12 h  
Step width: 1  
Setting range: 1 – 48 h

The display shows:



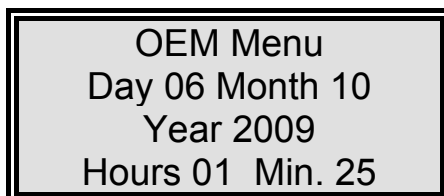
OEM Menu  
Cleaning cycle  
12 h

### 10.4.6 Real-time clock

The real-time clock is set in this menu.

Basic setting: The actual date  
Setting range: 1 - 12 Month, 1 - 31 day, 0 - 24 h, 0 - 60 min.  
Step width: 1

The display shows:



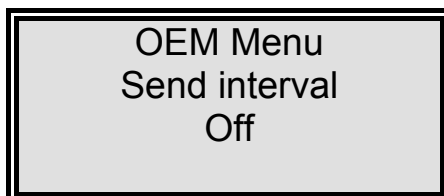
OEM Menu  
Day 06 Month 10  
Year 2009  
Hours 01 Min. 25

### 10.4.7 Sending interval

The sending interval between transmissions of measured values and fault messages to the RS 232 interface can be set in this menu.

Basic setting: Off  
Setting range: 0.5 - 12 hours  
Step width: 0.5

The display shows:



OEM Menu  
Send interval  
Off



### 10.4.8 Language

The language can be set in this menu.

You can choose from three languages: English, German and French.  
Change the setting with the arrow-keys.

Basic setting: English

The display shows:

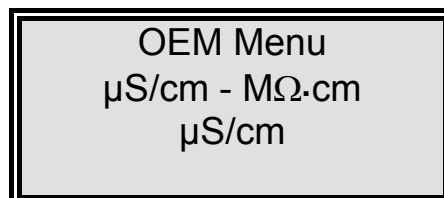


### 10.4.9 Switching units

Here you can choose whether you want the specific electrical resistance or the conductivity to be displayed. When you switch over to resistance from the basic setting, the three conductivities are converted to specific electrical resistances by calculation and the  $M\Omega \cdot cm$  unit is displayed. This is the case for all of the three conductivity monitoring points, but only the measured values are displayed in  $M\Omega \cdot cm$ , all limiting values and other settings are still in  $\mu S/cm$ .

Basic setting: Conductivity

The display shows:

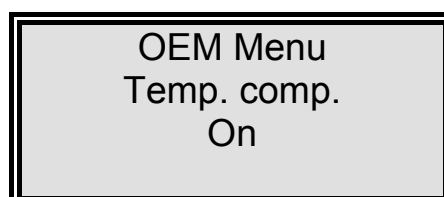


### 10.4.10 Temperature compensation

The TC message appears in the display (see "Operating modes") when temperature compensation is switched on. This menu prompt is no longer shown when the calibration factor for the temperature is switched off in the calibration-menu.

Basic setting: Temperature compensation on

The display shows:



#### 10.4.11 Setting the switching hysteresis of the float switch

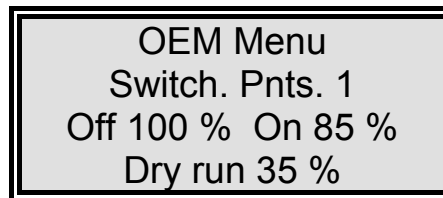
In this menu the setting is made as to whether an analogue or a digital float switch is to be used.

The switching hysteresis of the analogue float switch is also set in this menu. After the number of switching points has been entered, the percentage steps are automatically calculated and shown in the display.

In addition, one of the lower switching points is assigned to dry running of the pump station. When this switching point is gone below, the *Tank level* fault message is given out and both outputs for the external pumps are switched off (see the Pump station menu prompt).

When a setting of less than 5 switching points is entered, the tank level display is switched off. When a digital float switch is set, the dry run function for the pump station is inactivated.

The display shows:



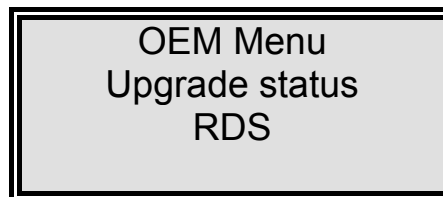
OEM Menu  
Switch. Pnts. 1  
Off 100 % On 85 %  
Dry run 35 %

#### 10.4.12 Programme selection

The programme that is to operate the system control is set in this menu.

Basic setting: RDS

The display shows:



OEM Menu  
Upgrade status  
RDS

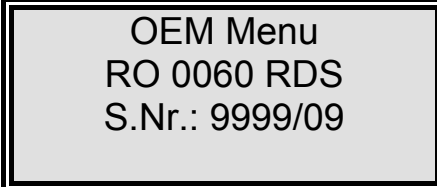
### 10.4.13 Entering the system type and serial number:

When the version and the serial number of the system are entered in this menu prompt, they are both subsequently given as header to every printout. Use the arrow-keys to set these entries. The system version and serial number are briefly visible when the On/Off-key is pressed on booting.

With reverse osmosis systems, the system version always begins with the abbreviation "RO", which is followed by a four digit number and an abbreviation that more exactly describes the system version e.g.: RO 0060 RDS.

The serial number is composed of six characters and a slash and is entered with the arrow-keys just as are all other entries.

The OEM-menu prompt display shows:



OEM Menu  
RO 0060 RDS  
S.Nr.: 9999/09

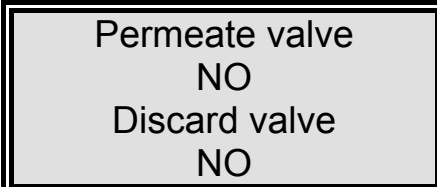
### 10.4.14 How permeate discard functions

The setting that is made in this menu determines whether a currentless open permeate solenoid valve (NO) or a currentless closed valve (NC) is to be used.

When a change of switching function is made in this menu, then the switching condition of the permeate discard output is merely reversed. The permeate solenoid valve is always currentless in the Stand-by operating mode, however.

Basic setting: NO

The display shows:



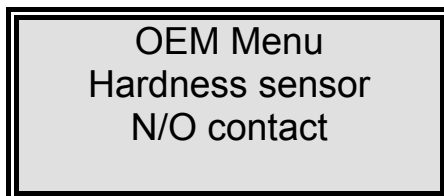
Permeate valve  
NO  
Discard valve  
NO

#### 10.4.15 Hardness sensor input

The setting that is made here determines whether the hardness sensor input is switched with a closer or an opener.

Basic setting: Closer

The display shows:



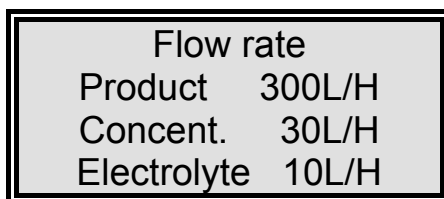
OEM Menu  
Hardness sensor  
N/O contact

#### 10.4.16 Flow rate limiting values for EDI-systems

(not active in this version)

The minimum flow rates for the EDI-cell are set in this menu.

The display shows:



Flow rate  
Product 300L/H  
Concent. 30L/H  
Electrolyte 10L/H

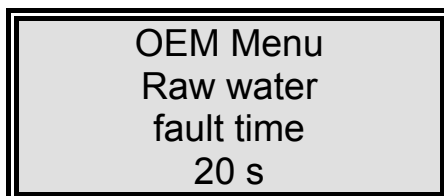
#### 10.4.17 Raw water fault time

The raw water fault time is set in this menu.

Basic setting: 20 sec.

Setting range: 1- 60 sec.

The display shows:



OEM Menu  
Raw water  
fault time  
20 s

**10.4.18 Limiting values for voltage and current**

(not active in this version)

The maximum values for voltage and current are preset in this menu.

The display shows:

OEM Menu	
Voltage	0 V
Current	0,0 A

**10.4.19 Pump station**

(not active in this version)

In this menu, the setting is made as to whether a single or a double pump station is to be used. Make the setting with the arrow-keys and confirm it with Enter. This function must be switched off when no pump station is connected.

The display shows:

OEM Menu
Pump station
No

**10.4.20 Operating feedback**

(not active in this version)

In this menu, the setting is made as to whether the potential-free relay is to signal the operating feedback function or to give out the level signal for a second system (*double system*).

Basic setting: Operating feedback

The display shows:

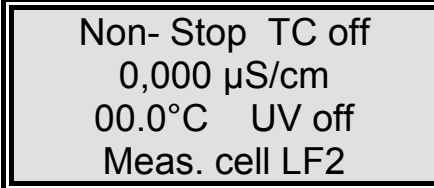
OEM Menu
Oper. feedback



## 10.7 Recognition of measuring cell faults

A minimum and a maximum measured value have been fixed in the programme as limiting values for each of the three conductivity measuring cells and the temperature sensor. If these measured values are gone below or above respectively, one can assume that a cable break has occurred. The fault message *Meas. cell LF1*, *Meas. cell LF2* or *Temp. meas. cell* is displayed in the fourth line of the display.

The display shows:



Non- Stop TC off  
0,000  $\mu$ S/cm  
00.0°C UV off  
Meas. cell LF2

## 11. Maintenance

Your system requires regular, proper and professional maintenance.

We recommend that you close a service contract to ensure that the necessary maintenance work is carried out.

You then have the certainty of a high operational safety and reliability.

The service protocol appended to the service contract serves for certification that maintenance work specified in the contract has been carried out by authorized service company.

When your system is to work reliably for a long time, it must be checked, serviced and cared for at regular time intervals in accordance with these operating instructions!

For this reason, the operating instructions must be readily available to operating and maintenance staff at all times, and be carefully followed!

Please observe that, in accordance with the General Terms and Conditions of Business of the company, which are the basis for both parties, the guarantee becomes invalid when the customer or a third party improperly installs, maintains, repairs, uses or alters the system, or when it is operated in an environment that does not fulfil the installation conditions specified.

Any maintenance work which should become necessary during the validity of the guarantee is only to be carried out by customer service which is expressly authorized to do such work.

The operating-staff assigned is committed to carry out the weekly checks.

During the agreed term of validity of the guarantee, maintenance is to be carried out weekly according to the maintenance record supplied with the operating instructions.

In so far as the maintenance protocol is not kept up-to-date, or is improperly kept, i.e. without the necessary establishment of data, then the system is deemed to be improperly maintained and the guarantee becomes invalid.

Calibration of conductivity displays is only to be carried out and recorded by customer service.

Cleaning and disinfection of storage tanks, piping, filter housings etc. is performed for reasons of hygiene and has no effect on the technical condition of the system. These components must be cleaned and disinfected whenever algae or slime is detected inside them but at least once yearly.

The combi-cartridge 5 µm + activated carbon (article no. 06.5201), the hardness stabilizer (article no. 06.5452) and the sterile filter 0,2 µm (article no. 06.5555) that are installed in the system pretreatment must be replaced at least 2x per year.



Control and maintenance work on electrical systems are only to be carried out when the system has been switched currentless at the mains and the switching off has been secured against inadvertent switching back on. Such work is only to be performed by appropriately trained skilled electricians.



## 11.1 Rinsing and disinfecting membranes

### Rinsing out of preserving agent:

According to the mode of delivery, the system may be supplied filled with a solution containing a preserving agent. When putting the system into operation, it is important to discard permeate that is produced after first switching to production for at least 5-6 hours.

To do this, simply free the permeate hose at the tank and use it to lead the permeate to drain.

### Cleaning membranes:

Automatic rinsing lengthens the service life of your reverse osmosis module. Coarse particles and other contaminants are swept away from the membrane surface during this rinsing process. The rinsing phases so ensure the longest service life and optimal pure water quality.

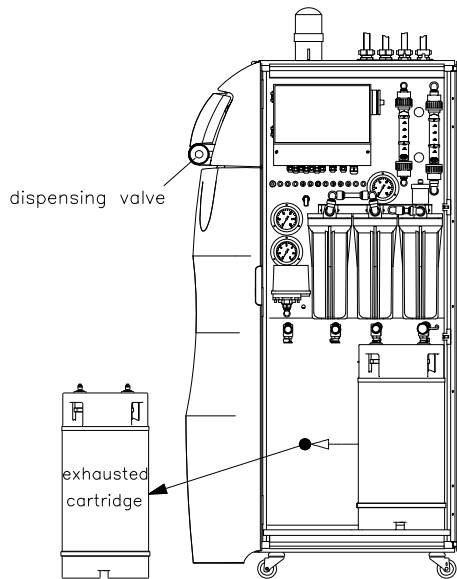


**Leave your reverse osmosis system on over weekends and during holidays. Only then can the 24 hour interval rinse operate and ensure that your reverse osmosis module is also not subject to bacterial growth during system standstills.**

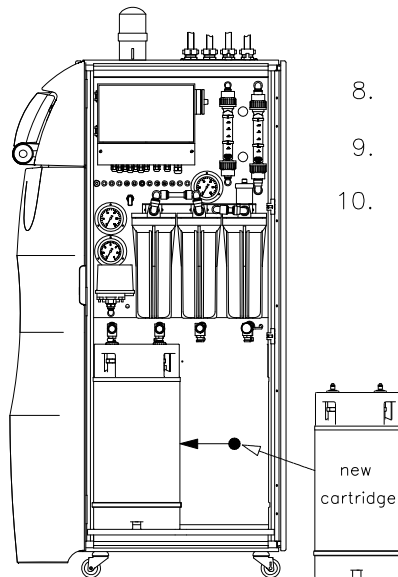
Should the performance of your module lessen because operation of the system without appropriate pretreatment has resulted in blockage of the membrane, it may well be that your module can be reconditioned.

Reconditioning and disinfection of the module is only to be carried out by authorized service personnel on-site or by sending the module to the manufacturer of your system, whereby exposure to frost must be avoided.

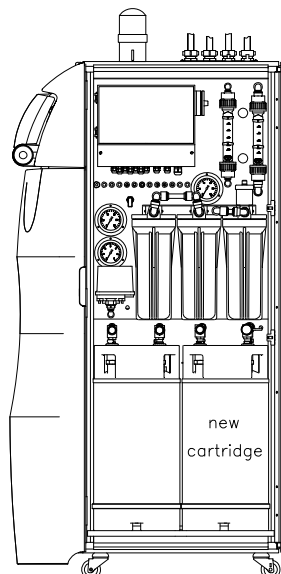
## 12. Replacing and exchanging ion exchanger cartridges



1. Switch the system off (ON/OFF button).
2. Open the door of the system.
3. Close off the water supply.
4. Relieve pressure from the system (via dispensing valve), wait until no more water emerges.
5. Take off the left and right connectors from cartridge on the left.
6. Remove the cartridge.
7. Take off the left and right connectors from cartridge on the right.



8. Move the cartridge on right to empty position on the left.
9. Fit on the left and right connectors as were used for cartridge on the left.
10. Fit the new cartridge in on the right-hand side.

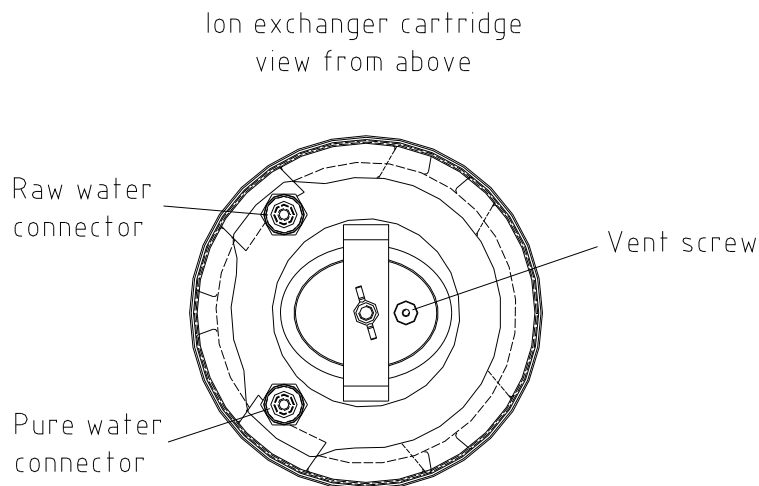


11. Fit on the left and right connectors as were used for cartridge on the right.
12. Close the dispensing valve.
13. Switch the system on (ON/OFF button).
14. Open the water supply.
15. Vent the ion exchangers until water flows out (via vent valve on lids).
16. Close the door of the system

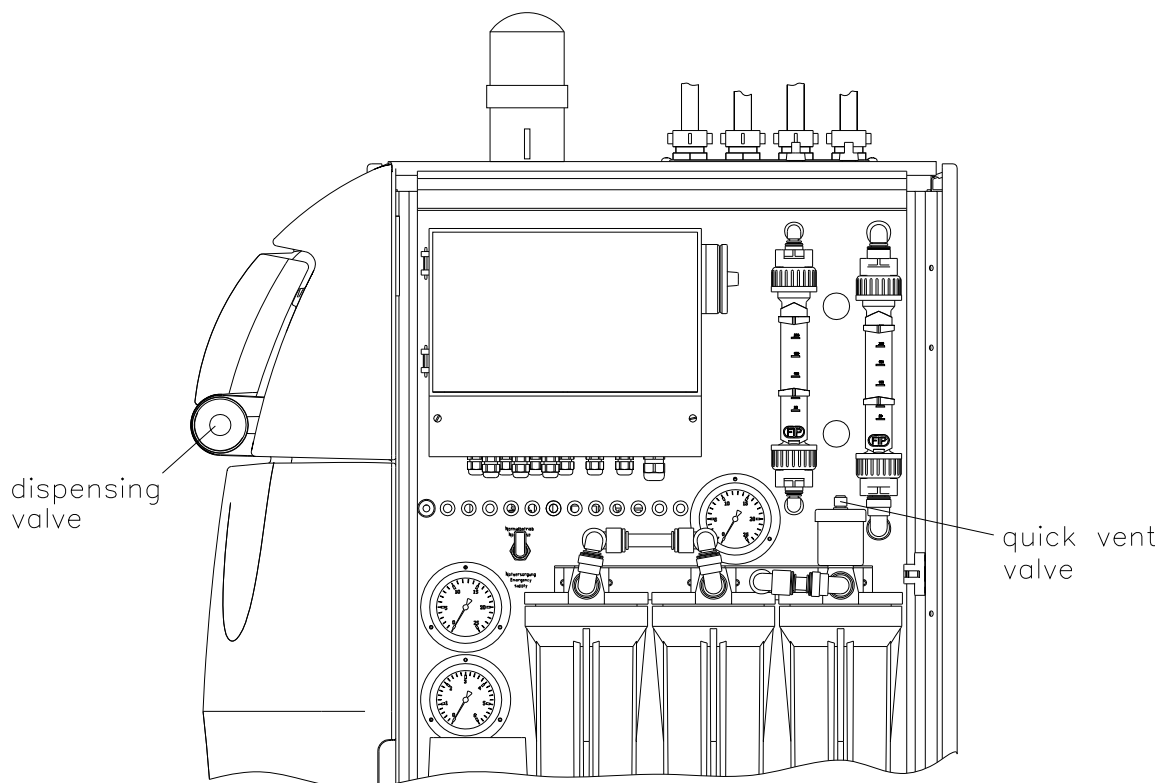
### 13. Air bubbles

Foaming of the pure water is often observed after installation of a new ion exchanger cartridge. The cause of this is finely dispersed air bubbles. During operation, the larger air bubbles that are in the cartridge are dispersed to fine, small air bubbles. The result is a visible foaming effect that is effected by so-called micro-bubbles.

To avoid the passage of the air bubbles to the downstream analyser, the new cartridge must be vented by opening the venting valve on the cartridge lid until water flows out.



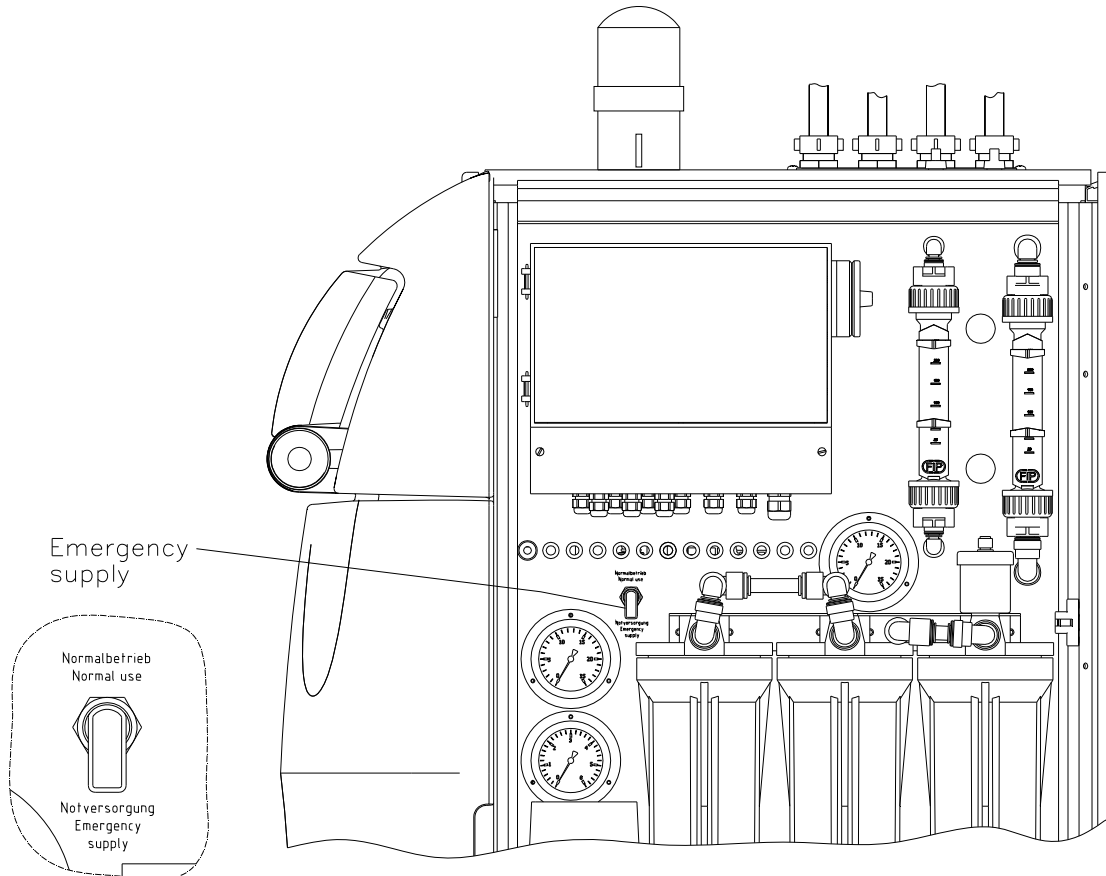
Following this, additionally vent the MediTower system by turning the quick vent on the outlet filter until water emerges.



Finally run off water by opening the dispensing valve of the system until air bubbles are no longer visible.

**Tipp:** The emergency supply can be briefly opened for quicker carrying out of the venting, but then make sure that the emergency supply is closed when venting is finished.

## 14. Emergency supply with demineralized water



The MediTower system is equipped with an emergency supply. During operational disturbance you can take demineralized water from the plant by turning the emergency valve of „Normal use“ to „Emergency supply“. A no-break pure water supply is ensured. The MediTower can be operated now a limited time with the emergency supply, until the ion exchangers are exhausted. If the plant is changed over to emergency supply, the customer service is to be informed immediately.



The valve emergency supply must always be closed when the MediTower System is in working order.

## 15. Trouble shooting

Fault	Cause	Remedy
System does not start	- No supply of electricity	- Connect to the mains
System control no longer reacts	- Improper operation	- Unplug the mains plug for 5 seconds
Water leaks out	- Leak in a pipe connection - Feedwater pressure > 6 bar	- Check the pipe and seal the leak - Install a pressure reducer upstream
Wrong time or date	- Time zones - Summer/Winter time	- Reset time and date
Wrong language	- Wrong language is set	- Correct language setting
Fault message: <i>"Feedwa.pressure"</i>	- Feedwater pressure too low	- Check 5 µm prefilter, replace if necessary - Open the tap water tap
Fault message: <i>"Lim.val.permeate"</i>	- Permeate conductivity is too high - Limiting value set too low	- Check the RO-module - Check and suit the limiting value setting
Fault message: <i>"IEX limit value"</i>	- Ion exchanger resin exhausted - The water has stood too long in the ion exchanger	- Replace ion exchanger and have regenerated - Discard approx. 3 – 4 l water
Fault message: <i>"Max.temp."</i>	- The temperature in the system is too high - Limiting value set too low - Feedwater temperature is too high	- Reduce temperature by running water off - Check and suit the limiting value setting - Reduce the feedwater temperature

Fault message: * "UV time"	- The operating time of the UV-lamp has been exceeded	- Replace the UV-lamp and set operating time counter back to zero
Fault message: * "UV-intensity"	- UV-lamp intensity no longer sufficient - UV-Sensor is dirty - Limiting value set too low	- Replace UV-lamp and measure in the new lamp - Clean the UV-sensor - Check and suit the limiting value setting
Fault message: "Meas. cell LF1"	- Cable break at the measuring cell - System control defect - IEX Conductivity outside of measurement range	- Replace measuring cell - Replace system control - see "IEX limit value"
Fault message: " Meas. cell LF2"	- Cable break at the measuring cell - System control defect - Permeate conductivity outside of measurement range	- Replace measuring cell - Replace system control - see "Permeate limval"
Fault message: * "Service interval"	- Service interval exceeded	- Contact Service
Fault message: * "Pretreatment"	- Operating time of the pre-treatment cartridge exceeded	- Replace with a new pre-treatment cartridge and set operating time counter back to zero
Fault message: * "Tank level"	- The minimum tank level has been gone below	- Wait until sufficient pure water has been produced
Fault message: * "Hardn. breakthru"	- Upstream hardness controller reports fault or lack of salt	- Check the instrument. Fill salt tablets in

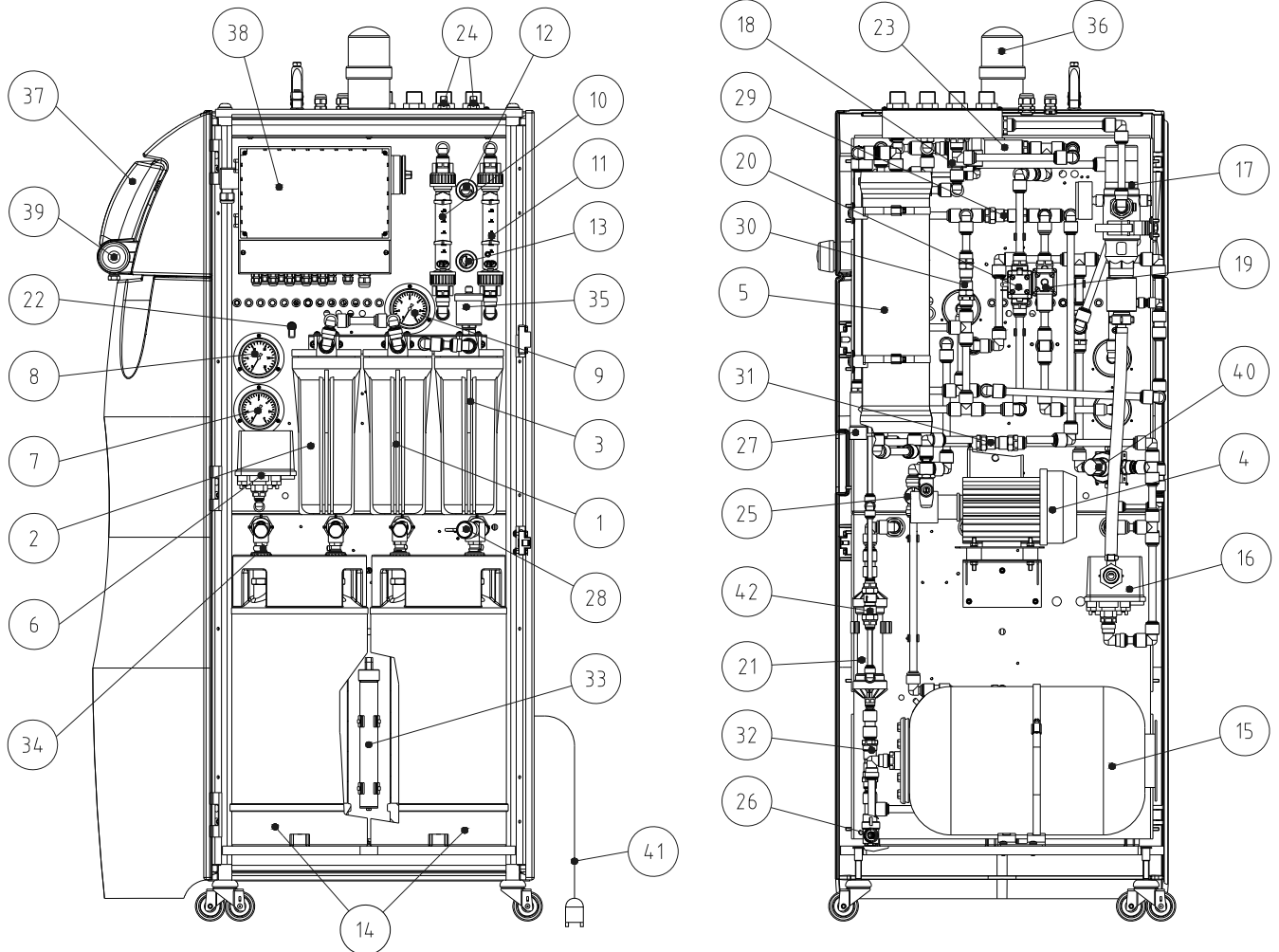
\*optional

The address to contact when service is required:

**Thermo Electron LED GmbH  
Stockland 3  
D-56412 Niederelbert**

**Tel. Nr.: (0 26 02) 1 06 99-0  
Fax. Nr.: (0 26 02) 1 06 99-50  
Internet: [www.tka.de](http://www.tka.de)  
E - Mail: [info@tka.de](mailto:info@tka.de)**

## 16. List of replacement parts



No.	Flow chart no.	Designation	Article no.
1	F1	Hardness stabilisation consisting of: Filter housing 10" Phosphate cartridge 10"	06.5350 06.5452
2	F2	Prefilter consisting of: Filter housing 10" Combi cartridge, 5 µm + Activated carbon, 10"	06.5350 06.5201
3	F4	Fine filter consisting of: Filter housing 10" Sterile filter cartridge, 0.2 µm -10"	06.5350 06.5555
4	P1	Pump aggregate consisting of: Rotary pump Motor, 0.245 KW	19.0021* 19.0019*

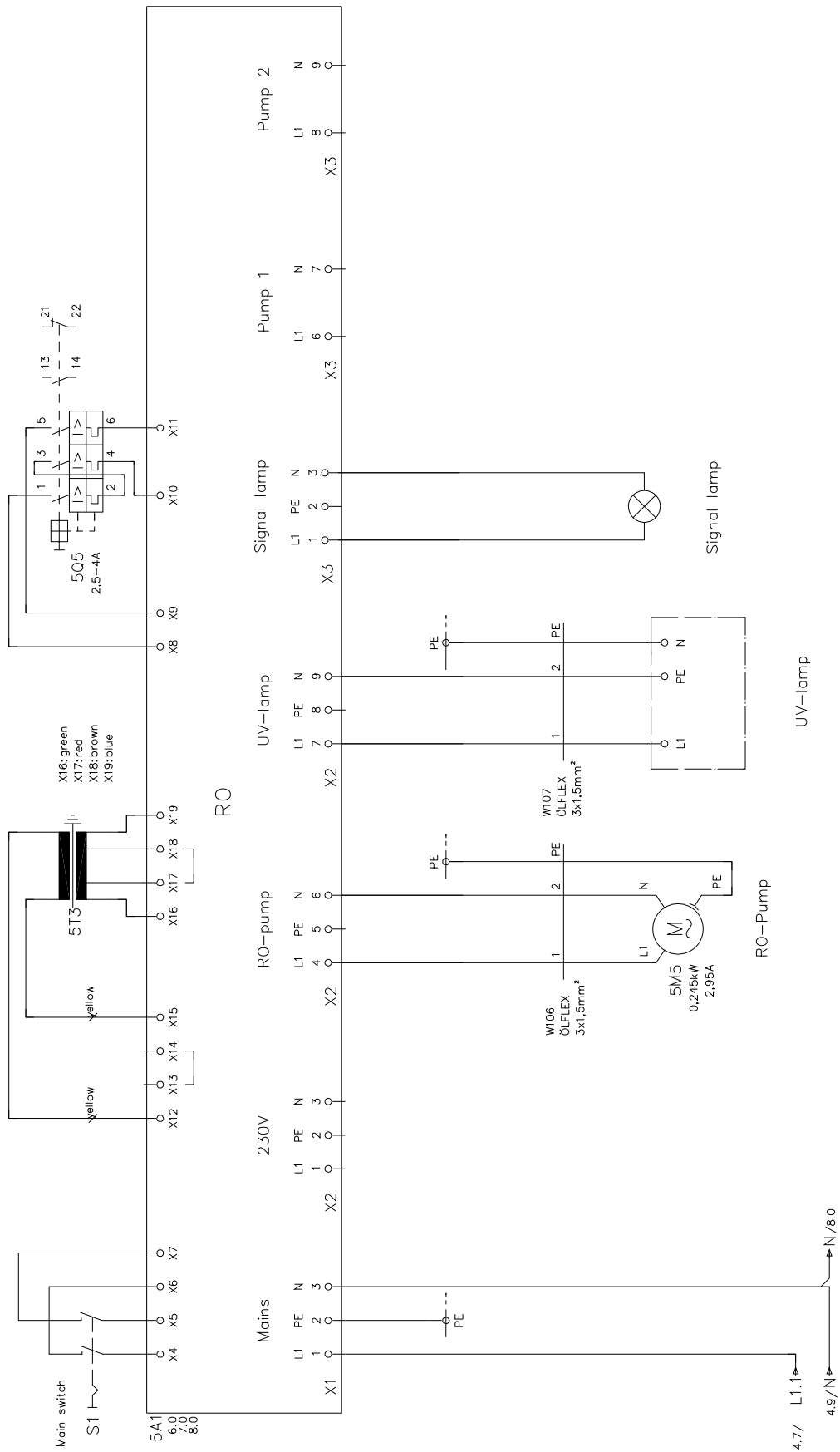


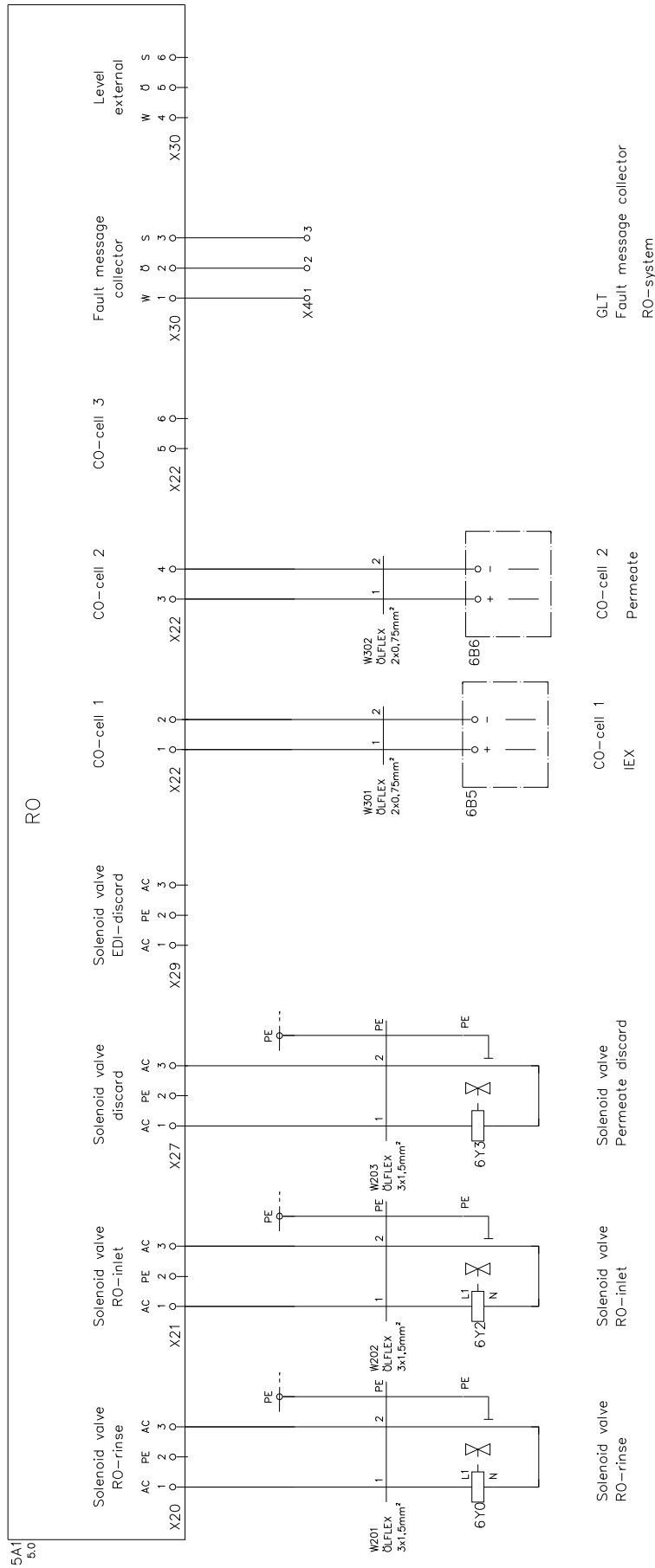
5	F3	Reverse osmosis module consisting of: Pressure tube RO-membrane 4014, at MediTower 60 - 120 RO-membrane 4014 XL, at MediTower 140	25.0047 22.0009* 22.0108*
6	PSA201	Raw water pressure switch	15.0058*
7	PI200	Raw water pressure gauge	15.0030
8	PI202	Operating pressure gauge	15.0031
9	PI204	Pure water outlet pressure gauge	15.0030
10	FI401	Concentrate flow meter	15.0148
11	FI400	Permeate flow meter	15.0148
12	V3	Pressure hold valve	15.0032
13	V4	Concentrate return valve	15.0032
14	IAT1 IAT2	Mixed bed ion exchanger	02.2050- RDS
15	DT1 DT2	Pressure tank Pressure tank (only MediTower 140 AFT)	18.0142
16	PS203	Pressure switch	15.0058*
17	RT1	Pipe separator	15.0079
18	V5	Rinsing solenoid valve	15.0003*
19	V2	Raw water solenoid valve	15.0003*
20	V6	Permeate relief solenoid valve	15.0012*
21	EM1	Degassing membrane	22.0082
22	V1	Emergency supply valve	15.0134
23	P2	Water jet pump	19.0069
24	V8, V9	Shut-off valve	15.0134
25	V7	Shut-off valve	15.0145
26	V10	Shut-off-valve	15.0145
27	QIA300	Permeate measuring cell	16.0126
28	QIA301, TIA500	Pure water measuring cell	26.0047
29	RV1	Concentrate return check valve	15.0009
30	RV2	Permeate discard check valve	15.0019
31	RV3	Permeate check valve	15.0009
32	RV4	Pure water check valve	15.0009
33	UV1	Replacement UV-lamp	09.5002
34		Quick connect coupling	14.0239
35	V11	Quick vent valve	15.0131
36		Light bulb for signal lamp	16.0131
37		System control RO, consisting of: RO Interface board	16.0352
38		RO-CPU Board Protective motor switch	16.0353 16.0020
39	V10	Dispensing valve	25.0068
40	V12	Pressure reducer	15.0072
41	LSZ100	Leak sensor	16.0389
42	RV5	Vacuum check valve	15.0009

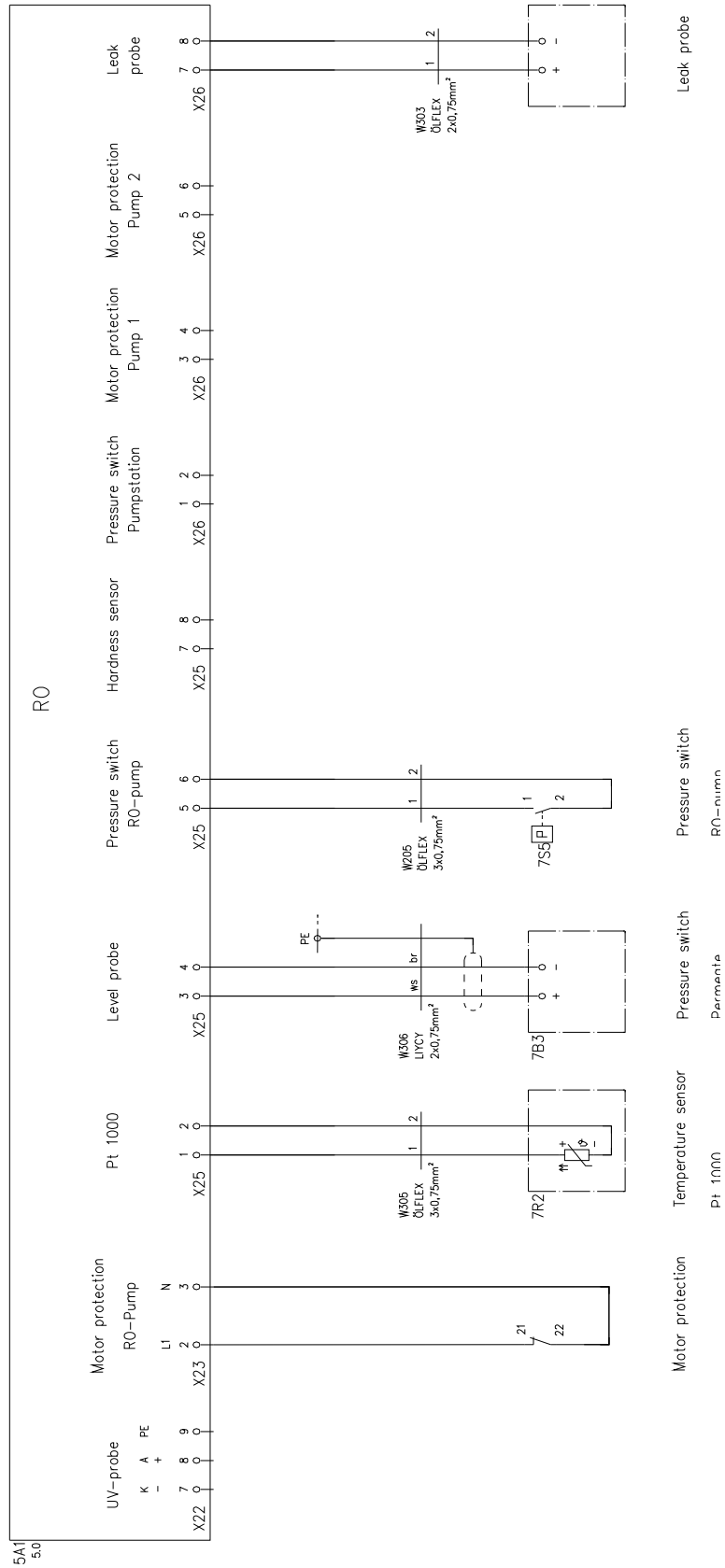
\* Wearing part

We ask for your understanding that the guarantee that we give becomes invalid when replacement parts, accessories or consumables from other manufacturers are used in connection with this system, as we have no influence on their appropriateness or their quality.

## 17. Circuit diagram







## 18. Maintenance record

(Please note that correct keeping of this record is a condition of the guarantee)

**Customer address:** \_\_\_\_\_ **Location:** \_\_\_\_\_

\_\_\_\_\_ **System type:** \_\_\_\_\_

\_\_\_\_\_ **Serial no.:** \_\_\_\_\_

\_\_\_\_\_ **Year made:** \_\_\_\_\_

Date	Raw / Softened water hardness [°dH]	IEX Conductivity [µS/cm]	Permeate flow [L/h]	RO Pressure [bar]	Pure water pressure [bar]	Permeate conductivity [µS/cm]

Temperature [°C]	Concentrate flow [L/h]	Feedwater conductivity [µS/cm]	Pressure tank pre-pressure [bar]	Last change of prefilter	Last change of phosphate

Last cleaning disinfection	Operating hours [h]	Remarks	Signature

Any false entry is considered to be a falsification of documents

**The following measures are to be carried out to maintain the quality of the system:**

- 1x weekly, record measured values
- Every 3 - 6 months\*, replace the hardness stabilizer
- Every 3 - 6 months\*, replace the prefilter
- Every 8 weeks\*\*, replace the ion exchanger
- 

\* According to the feedwater quality! \*\*According to the pure water quality