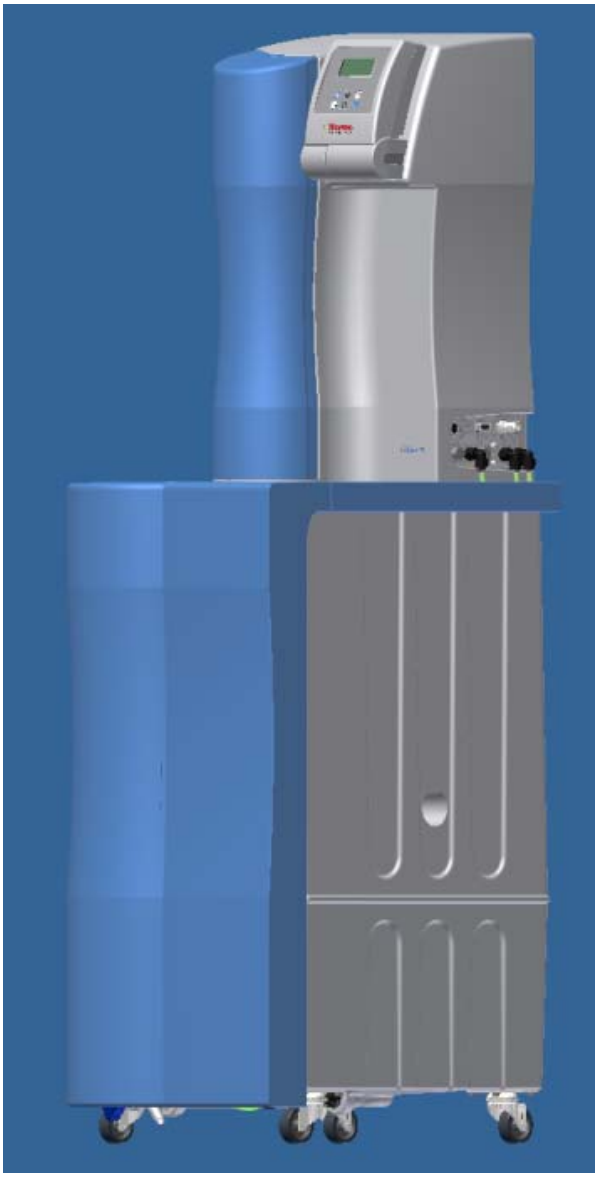
Thermo SCIENTIFIC

Operating Instructions
Thermo Scientific Barnstead LabTower RO Water Purification System

[ ] **Art. no.: 50132390 RO 20** [ ] **Art. no.: 50132391 RO 40**



Serial-no.: .....

These Operating Instructions must be read prior to installing and starting the system!

50132744, Stand: 10.12

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 its 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This declaration is no longer valid if the machine is modified without our consent.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: LabTower RO

article number: 50132390, 50132391

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 61326-1

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,

In deciding to purchase a pure water system of type **LabTower RO** you have selected a high-quality product.

Thank you for the confidence you have placed in us.

Before you start to install and operate your pure water system, please carefully read the information given in these Operating Instructions on how to properly carry out installation and operation.

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

Niederelbert, 01.04.2010

1. Contents

2. Explanatory notes on the operating instructions

EU Mark of Conformity

CSA - admission

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

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 LabTower RO system in the space provided on the front page.

* Read the serial number of your 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

3. Transport and packaging

Pure water systems are carefully checked and packed prior to shipment but despite this there is always a possibility that damage could occur to them during shipment.

3.1 Examination on receipt

- Check the completeness of the delivery against the shipping papers.

Is the packaging damaged ?

- Check the system for damage.

3.2 Complaints

Should the system have been damaged during transport:

- Immediately contact the post office, railway or forwarding agent*.
- Keep the packaging, including the outer cardboard box, for a possible inspection and/or return shipment.

3.3 Packaging and return shipment

Whenever possible use the original packaging and packing materials.

Should these no longer be available:

- Pack the system in packing film and then in a strong cardboard box so that it is held shock-proof.

*** Complaints are only valid for 6 days (after receipt of the goods). After this time, the right to claim for damages expires.**

4. Safety precautions

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

- The LabTower RO system is a modularly constructed pure water system which is intended to be used solely for further purifying tap water.
- Do not start or operate the system until you until you have read through the corresponding information that is given in these Operating Instructions.
- Lifting and carrying the pure 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.
- Note that the manufacturer is freed from all liability for damages that result from improper operation of the system, or from use of it for other than the intended purpose.
- The CE-Mark becomes invalidated when constructional changes are made to the system or products of other manufacturers are installed in it.
- Protect the system from frost. The temperature in the room where it is installed must be at least +2°C and at most +40°C.
- Observe all regulations and requirements that are in force at the area in which the system is installed and the statics of the flooring (see “Technical specifications” for the weight) as well as the valid accident regulations.
- The feedwater pressure must be at least 2 bar and at most 6 bar. An additional pressure pressure must be installed should the feedwater pressure be higher.
- DIN EN 1717 requires that water purification systems be equipped with a safety device that protects the drinking water system from contamination.
- A grounded 100-250V, 50/60Hz socket must be available.
- The installation area must have a drain at floor level with at least DN 50 pipe, otherwise the manufacturer will not accept any liability for water damage.
  A water watcher (240V only) (article no. 16.0129) must be installed should no such drain be available.
- Gravity fall to the waste drain must be ensured.
- After long standstill periods (e.g. company holidays), the system must be subjected to cleaning and, if appropriate, disinfection. Refer to the “Cleaning and disinfection” section for details.
- When selecting the installation area and installing the system, make sure that there is sufficient working area around the system for convenient operation of it.
- Never look directly into a switched-on UV-lamp, as UV-light is dangerous to eyesight. The UV-lamp is only to be replaced by authorized person to do this.
- The guarantee is valid for a period of 12 months.

5. Intended use

The LabTower RO pure water system is a reaction to the continually increasing requirements that water of pure quality must fulfil, the increasingly strict demands resulting from technological advances and the need for user-friendly systems and complete solutions.

LabTower RO systems have been solely and specifically designed to excel in the intended use, which is to produce sterile filtered pure water free of particles, salts and organic compounds.

To benefit from the long possible service lives of the high-quality purification media, feed the pure water system with water which has been subjected to an upstream pre-treatment step (reverse osmosis, ion exchange or distillation),

- Analytical techniques in laboratories:

- 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**bsorption **S**pectrophotometry)
- TOC Analysis (**T**otal **O**rganic **C**arbon)
- DNA Research
- etc.

- Reagent and solution preparation:

- Cell culture media
- Tissue culture media
- Make-up water for reagents for on-line analytical systems

- Water for high-purity rinse processes on a laboratory scale

6. Extent of delivery

The LabTower RO pure water system consists of:

1 x	LabTower RO 20 - 40	Article no.: 5013xxx
1 x	Assembly kit (RO 20) or Assembly kit (RO 40) consists of:	Article no.: 50132753 Article no.: 50134369
1 x	Prefilter cartridge 5µm + hardness stabilizer 10“	Article no.: 06.5204
1 x	Fine filter 1µm-10”	Article no.: 06.5101
1 x	Connecting kit consists of:	Article no.: 25.0085
3 x	Connecting hose, PE, Ø8/Ø6 x 3m	Article no.: 18.0036
2 x	POM Insert	Article no.: 14.0189
2 x	Gasket, 3/4”	Article no.: 21.5008
2 x	Union nut, R 3/4”	Article no.: 14.0003
2 x	Screw-in connector, Ø8-1/4”	Article no.: 14.0075
1 x	Operating Instructions	Article no.: 50132744
1x	Connecting cord (rubber connector to nema plug connector)	Article no.: 50132200
1x	Connecting cord (rubber connector to british ST plug connector)	Article no.: 50132203
1x	Connecting cord (rubber connector to euro plug connector)	Article no.: 50132215
1x	Table power unit 24V	Article no.: 50134196
1x	Table power unit 48V DC (only RO 40)	Article no.: 50134184
1x	Universal adapter	Articel no.: 21.1006
1x	Universal holder	Articel no.: 21.1007

Please check the parts delivered against this list.
Contact the manufacturer should a part be missing.

7. Technical specifications

Demands on the feedwater	
Source	Potable tap water that has been softened or hardness stabilized.
Silt density index (SDI)	< 5. With higher values a pretreatment (article no. 09.4000) must be installed upstream of the system.
Resistance	> 0.001 MΩxcm
Prefiltration	5µm + hardness stabilization
Free chlorine	< 0.1 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 quality	
	LabTower RO
Salt retention quota	Ø 98 %
Retention quota for bacteria and particles	99 %
Performance	20 – 40 L/h, according to the version

Dimensions	
Height	1500 mm
Width	450 mm
Depth	580 mm
Weight empty	39 kg
Weight in operation (with full tank)	139 kg

Cell constants of the measuring cells	
Conductivity, feedwater	0.16 cm^{-1}
Conductivity, permeate	0.16 cm^{-1}

Water connectors	
Raw water inlet	Hose, 8 mm o.d.
Concentrate outlet	Hose, 8 mm o.d.
Pure water outlet	Hose, 8 mm o.d.

Electrical connections / external switched mode power supply RO 20	
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

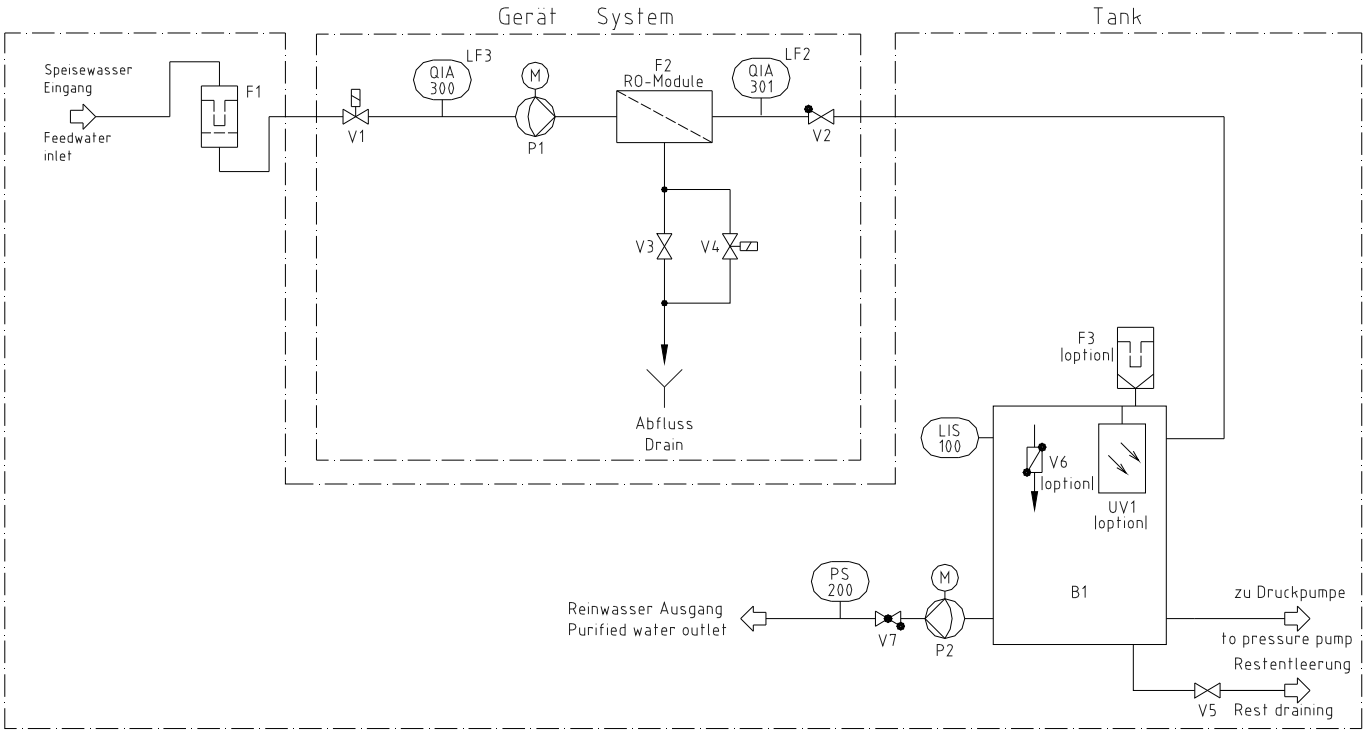
Electrical connections / external switched mode power supply RO 40	
Input voltage	AC 100 – 250 V, 50 – 60 Hz, 4 – 2.5 A
Output voltage	DC 48 V, 2.5 A
System connection	DC 48 V, 120 W
Serial interface	RS 232

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 60364-4-443). Note: The rated level of transient overvoltage is the withstand impulse voltage acc. To overvoltage category II of IEC 60364-4-443
Ventilation requirements	There are no special requirements with regard to ventilation.
Degree of pollution	2

Materials of parts that contact water	
Pump head	Nylon with glass fibre
Filter cartridge	PP
Rinsing solenoid valve	PA
Conductivity measuring cell	POM, stainless steel
Distribution block	POM
Connectors	POM
Hoses	PE
Gaskets	EPDM

8. Flow chart



B1 Storage tank:	Stores the pure water that is produced.
F1 Prefilter 5µm + hardness stabilization:	Prevents the penetration of particles > 5µm, stabilizes calcium and magnesium.
F2 RO-Module:	Semipermeable thin film composite spiral wound membrane.
F3 Sterile vent filter (optional)	Prevents the penetration of bacteria and particles > 0.2 µm from the ambient air.
LIS100 Float switch:	Determines the filling level in the storage tank.
P1 Pressure booster pump:	Raises the input pressure to the required operating pressure.
P2 Pressure pump:	Pumps pure water to the user when required.
PS200 Pressure switch:	Switches pressure pump (P2) on when pure water is to be taken from storage tank (B1) and off when the user is closed.
QIA300 Measuring cell, feedwater:	Measuring device for determining the feedwater conductivity as feedwater quality parameter.
QIA301 Measuring cell, pure water:	Measuring device for determining the conductivity downstream of the RO as pure water quality parameter.
UV1 UV-Disinfection: (optional)	Serves to hinder bacterial growth and the formation of a biofilms on the inside surfaces of the storage tank.

V1 Feedwater solenoid valve:	Is closed during stand-by and standstills. It prevents water from flowing into the system when it is not in operation.
V2 Check valve:	Prevents measuring cell (QIA301) running dry.
V3 Pressure hold valve:	Serves to set the operating pressure and the WCF rate.
V4 Rinsing solenoid valve:	Opens for membrane cleaning, prior to and after pure water production and at least every 12 hours.
V5 Residual drainage	Allows complete drainage of storage tank (B1).
V6 Sterile overflow: (optional)	Prevents the penetration of bacteria and particles.
V7 Check valve:	Prevents water from backflowing into storage tank (B1).

8.1 How the system functions

After switching on at the ON/OFF-key, the system starts either in the production mode or stand-by mode, according to the filling level in the storage tank.
Feedwater flows into the system under a maximum pressure of at least 2 bar or at most 6 bar.

Feedwater solenoid valve (V1) is closed in the stand-by mode and during standstills. It prevents feedwater from flowing into the system when the system is not in operation and so protects against overflowing of the storage tank (B1).

From feedwater solenoid valve (V1), the feedwater flows across feedwater measuring probe (QIA 300) and on through pressure booster pump (P1) to the RO membranes in RO-module (F2).

Here the semi-permeable membranes (F2) retain 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, an average 99% retention of bacteria, pyrogens and particles is also ensured.

The pure water now flows across pure water measuring probe (QIA 301) into storage tank (B1).
The measured value can be read from the display.
The constituents removed from the water are led away in the remaining concentrate.

The value measured by measurement probe (QIA 300) can be called in the microprocessor control menu.

Pressure pump (P2) pumps the pure water that is in storage tank (B1) to the pure water outlet / user via check valve (V7).

Valve V3 has been pre-adjusted in the factory. A change in the adjustment of this valve could result in damage to the reverse osmosis module. Because of fluctuations in the feedwater temperature and pressure, the setting of this pressure hold valve and the concentrate flow that it governs must be checked and, if necessary, re-adjusted, when the system is put into operation and at regular intervals thereafter. The measured values must be entered in the maintenance record.

Concentrate flows for LabTower RO
Check and possibly readjust at least once monthly

System	Permeate flow [L/h]	Concentrate flow [L/h]	adjustable up to [%]
LabTower RO 20	20	60	40
LabTower RO 40	40	60	40

Your pure water system is equipped with automatic flushing, i.e. flushing which is automatically carried out when the system is switched on, at the end of each production, and also every 12 hours. For this flushing, rinsing solenoid valve (V4) is opened and the strong flow of water across reverse osmosis module (F2) sweeps coarse particles and other contaminants away from the surface of the membranes and carries them with it to drain.

The automatic flushing has a positive effect on the service life of the reverse osmosis module.

An additional advantage of automatic flushing is that it prevents bacterial growth from occurring in the reverse osmosis module when the system is at a standstill for a long time. For this reason, we expressly recommend that you leave the system switched on over the weekend and during holiday times, so that the 12 hour flush can effectively guard against bacterial growth.

9. The installation area for the pure water system

The following criteria must be taken into consideration when choosing the installation area.

⇒ Minimum temperature in the installation area: +2°C - +40°C.

⇒ The surface that your pure water system is to be stood on must be strong enough to support it (for weight, see “Technical specifications”).

⇒ A floor drain with waste pipe of DN 50 size (38.5 mm i.d.) is required.
Should this not be available, then a water watcher (240V only) (article no.: 16.0129) must be

installed to protect against damage from flooding!

⇒ An unrestricted gravity flow of concentrate to the floor drain is obligatory.

⇒ An electrical socket appropriate to the voltage given on the type plate of the system must be available directly alongside the system. The safety fuse must be appropriate for the power required by the system (see “Technical specifications”).

⇒ There must be sufficient working room around the system.

⇒ An R ¾“R male thread tap water connection which can be shut off must be installed in the direct vicinity of the system.

10. Installation

- Before the pure water system can be put into operation, it must be to move to the back of designated wall with screws.

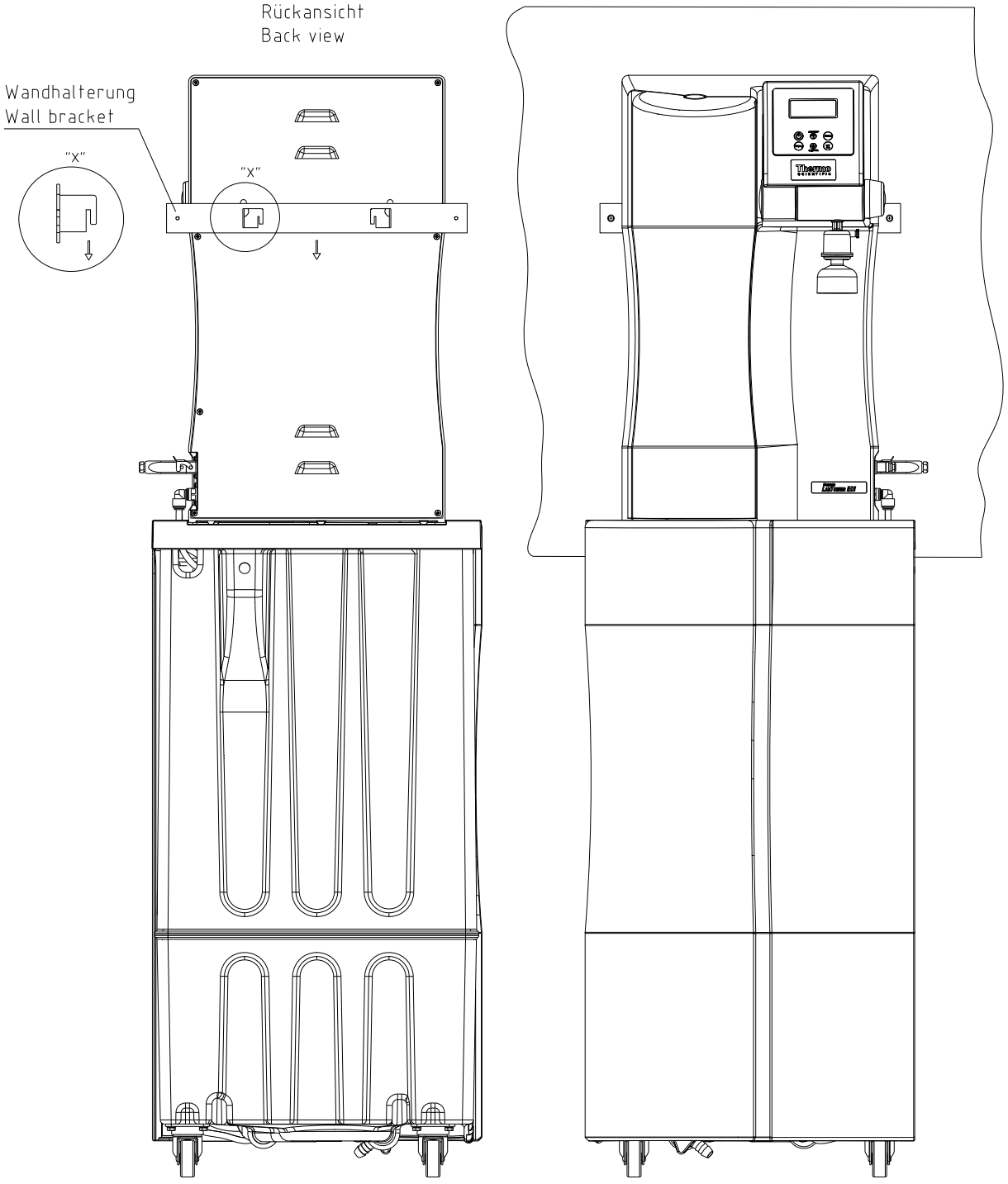
  Note: The distance from the pure water system to the wall is 20 mm.

- Use the assembling kit available in wall bracket, the 2 screws 4x40 mm and the 2 dowels (Ø 6 mm)

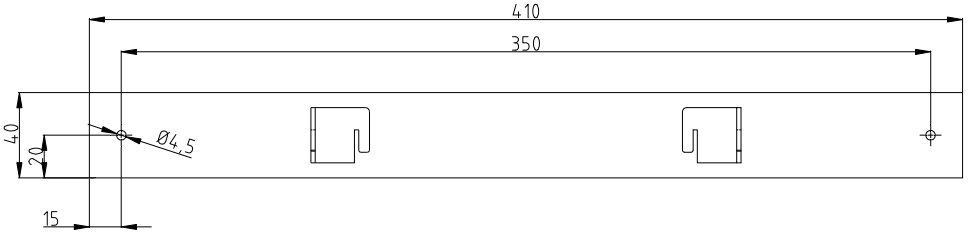
- Plug the wall bracket into the backside of the pure water attachment, as shown graphically on the following page.

  The wall bracket must shown with the notches (see position “X”) down.

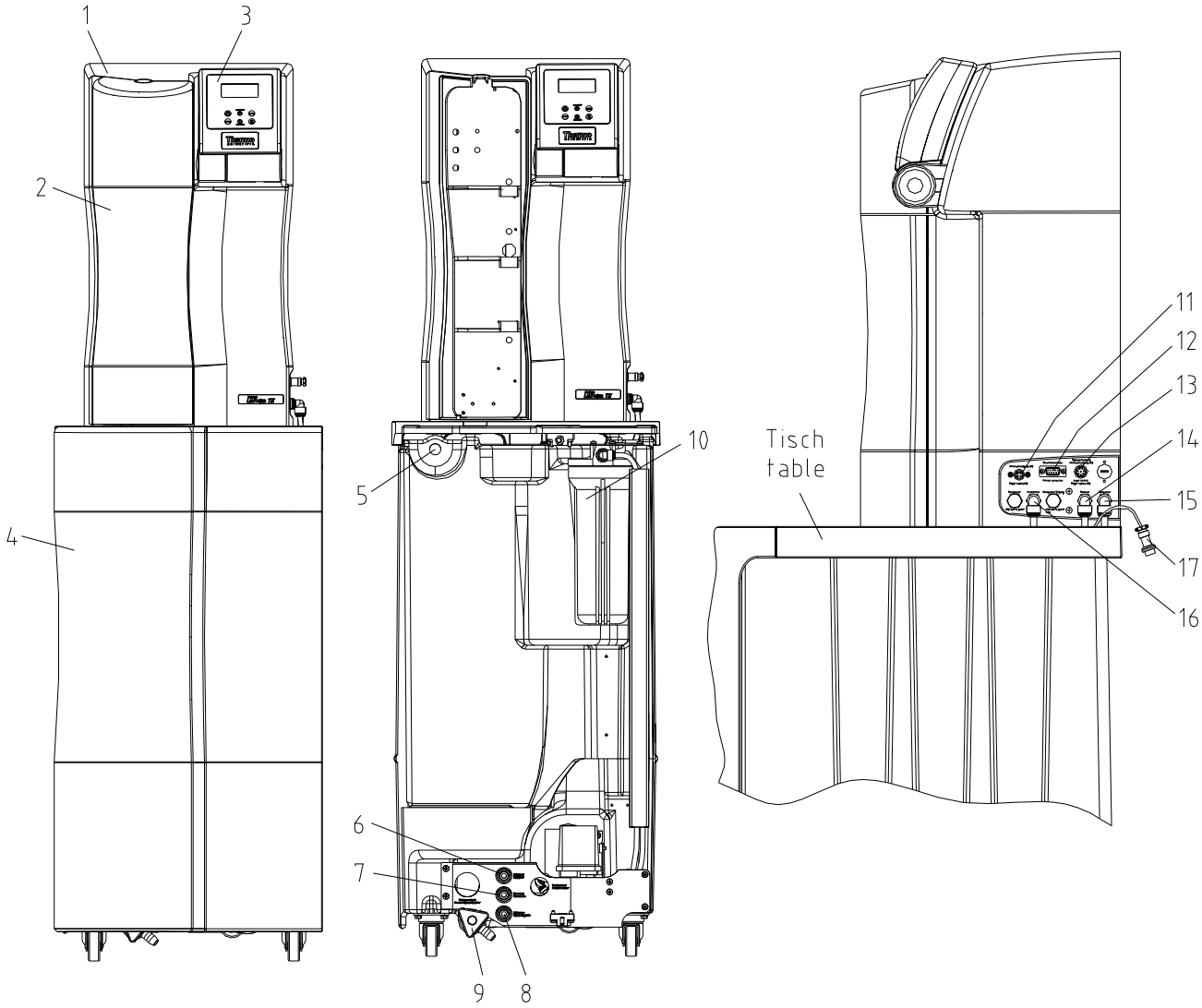
- Now position the pure water system at the proposed wall and attach it with the dowels and screws.



Wandhalterung / Maße
Wall bracket / dimensions



11. Putting the system into operation



1) LabTower RO pure water system
2) Front cover, removable
3) Operating unit
4) Front cover, storage tank
5) Sterile vent filter (option)
6) Feedwater inlet
7) Concentrate outlet
8) Pure water outlet
9) Residual drainage
10) Pretreatment
11) Power supply, 24/48V DC
12) Printer connector
13) Socket for level control, power supply pressure booster pump / storage tank
14) Connector, permeate
15) Connector, feedwater
16) Connector, concentrate
17) Plug for level control, power supply pressure booster pump / storage tank

1. Place the pure water system on the storage tank table. Connect the hoses positioned on
the table to the appropriate system connectors (14-16) using the angled connectors.

2. Take off front cover (4) from the storage tank.

3. Turn pretreatment filter housing (10) to take it off. Insert the pretreatment unit (prefilter and hardness stabilization) which is provided in the assembly kit in the pretreatment filter housing and screw this tightly back on (see the “Replacing the pretreatment“ section).

4. Use the Ø8 – ¾“ i.d. hose that is provided to make connection between the storage tank feedwater inlet (6) and to a water tap that can be turned off. The connector on the storage tank is marked “Raw water“.

5. Connect the 8 mm diameter hose supplied to concentrate outlet (7) on the storage tank and lead it to the on-site drain. The connector is marked “Concentrate“. The drain to the stewer must be max. Are 1 m above the rinsing water connector of the unit.

   Important! The concentrate must be able to flow to drain under free gravity fall!

6. Connect 4-pin plug (17) for the level control (storage tank) and voltage supply (pressure pump) to the 4-pin socket (13) of the pure water system and screw the milled nut of the plug tight.

7. Screw the (optional) sterile vent filter (5) onto the storage tank.

8. Now fit the (optional) 8 mm diameter sterile overflow hose to the overflow at the back of the tank and connect it to the drain.

The sterile overflow will only function perfectly when the tank lid is tightly closed.

9. Check that the residual drainage (9) is closed.

10. Check the feedwater pressure; it must be within the permissible pressure range (see “Technical specifications”.

11. Turn on the feedwater supply.

12. Plug the mains plug in.

Before you now switch the system on, read through the rinsing out procedure for reverse osmosis membranes that are supplied in preserving agent in the “Rinsing membranes” section!

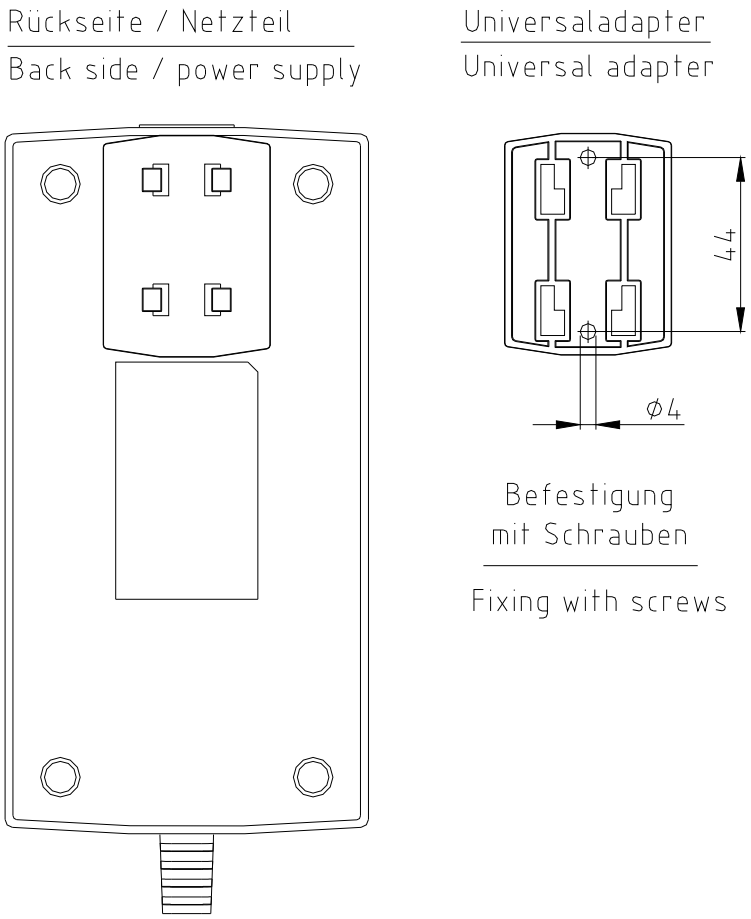
13. Use the on/off key of operating unit (3) to switch the pure water system on.

14. Check that all connections are leak-tight.

15. Fit front cover (4) back on the storage tank.

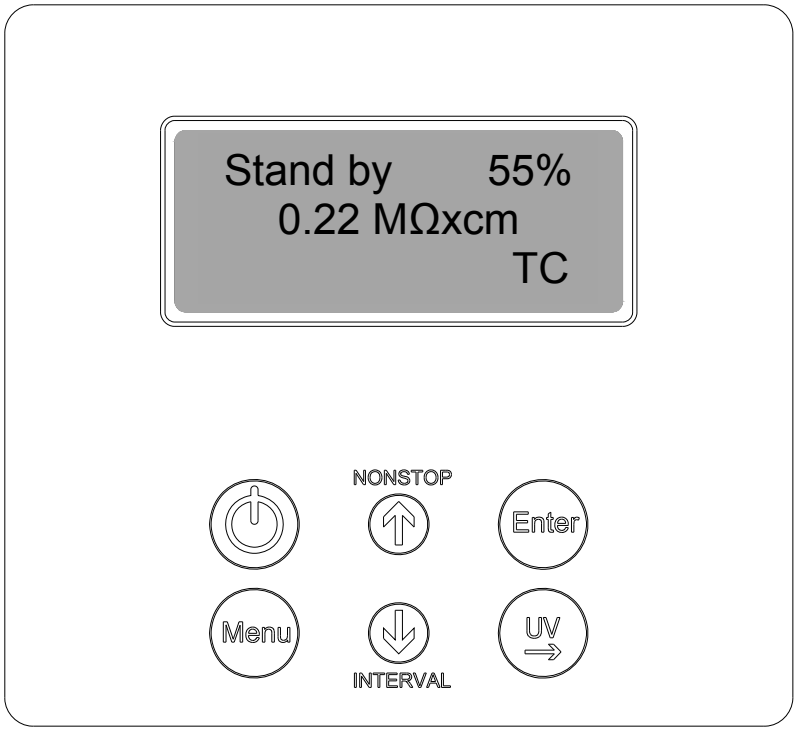
The system is now ready to operate.

11.1 Mounting the power pack (voltage supply)



- Whenever possible, mount the power pack on the wall to the left or right of the 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 pure water system (24/48V DC 4-pin power supply connector, pos. 11).
- The system is now ready for use.

12. Operating elements



	Switches the system on or off
	Increases a value on display
	Confirms the value shown in a menu point
	Switches the menu to the next menu point
	Decreases a value on display
	Switches the UV-lamp on or, in the menu, allows you to select the position in a number that you wish to change

13. System control

General information

When the ON/OFF key is pressed, the pure water system starts running either in the operating mode or in the stand-by mode, as governed by the float switch.
The operating mode and the volume contained in the tank are shown in line 1 of the display and the measured value for the permeate is shown in line 2.
Should a fault exist, then a fault message is given out across the potential-free output and is shown in line 4 of the display. Should several faults occur simultaneously, then they are alternately displayed.

13.1 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.
Settings can be changed with the arrow keys and, when the appropriate value has been set, be confirmed by pressing the Enter-key, which also takes you to the next menu prompt.

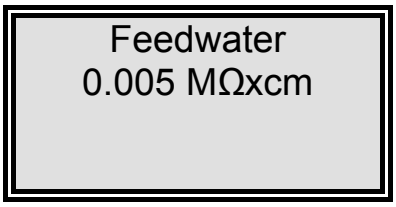
To simplify changing settings, a press on the UV-key allows you to select a certain number in the numerical value that you wish to change. The arrow-keys can then be used to enter the wanted number from 0 to 9 at the selected position.

13.1.1 Feedwater conductivity:

A single press on the menu-key enables the feedwater conductivity (measuring point LF3) to be read.
There is no limiting value evaluation here.

The display shows:

e.g.:



13.1.2 Permeate limiting value:

A second press on the menu-key allows the limiting value for the permeate conductivity to be set. Should this limiting value be exceeded, then the *"Lim.val.permeate"* fault message is displayed (measuring point LF 2)

Limiting value setting range: 1.0 – 99.0 µS/cm
Basic setting: 0.020 MΩxcm

Use the arrow keys to set the limiting value (see 11.1). Settings above 99.0 µS/cm result in the limiting value being switched off. The word "*Off*" appears in the display.

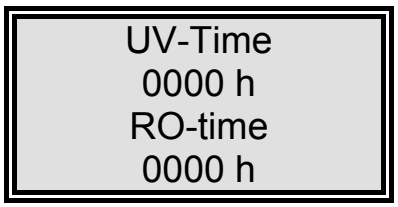
The display shows:

e.g.:

13.1.3 Operating hours:
(is not active in this system version)

A third press on the menu-key in this menu brings the operating hours of the UV-lamp and the RO pump to display. The operating hours counter for the UV-lamp registers the time that the lamp has been in operation. When the maximum operating time is reached, then the fault message "*UV-Time"* is triggered. The limiting value of this is set in the OEM menu. The operating time of the RO pump has no limiting value.

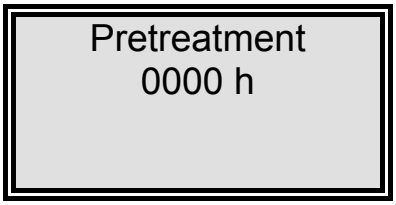
The display shows:



13.1.4 Operating hours, pretreatment:

A fourth press on the menu-key in this menu brings the operating hours of the pretreatment cartridge to display.
This operating time has a limiting value, which can be set in the UV menu. The fault message that is displayed when the limiting value is exceeded is *"Pretreatment"*.
The operating hours of the pretreatment are counted whenever the reverse osmosis pump is running.

The display shows:



13.1.5 Cleaning:

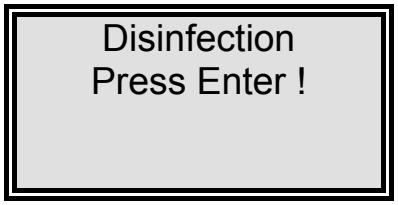
A fifth press on the menu key in this menu allows cleaning to be triggered if necessary. Triggering is made by confirming the requirement with a press on the Enter-key. The pump is started and the inlet solenoid valve and the rinsing solenoid valve open for a 60 second period.
During cleaning, no fault messages or measured values are shown; when cleaning is finished, the system is in the last operating mode (operation or stand-by). During cleaning, the remaining cleaning time is displayed.

The display shows:

During cleaning, the display shows:

13.1.6 Disinfection:
(is not active in this system version)

The display shows:

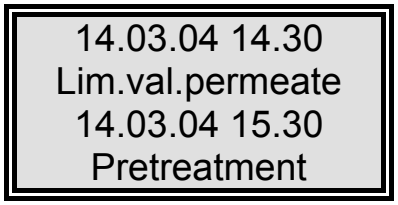


13.1.7 Fault storage:

A seventh press on the menu-key in this menu calls the fault storage prompt. Confirmation of this with the Enter-key allows the fault storage to be looked through. The display can show two faults at once, each with time and date. Pressing an arrow key allows previous or following faults to be displayed.
Pressing the menu-key or the Enter-key returns the system to the last operating mode.

The display shows:

Display of the contents of the fault storage:



13.1.8 Unlocking the system:

An eighth press on the menu-key in this menu brings you to the “Code” menu. To prevent unauthorized access to the settings in the system control, changes to the settings can only be carried out when a correct code from the Assignment Table that follows is entered and confirmed with the Enter-key. The unlocking remains active for 5 minutes. Each access via the code is typed out by the printer (RS 232) complete with date, time and abbreviated code number (“Code 0001” corresponds to code 150, “Code 0002” to code 250 etc.).

The menu prompt F display shows:

Code numbers can be assigned to individual persons according to the Assignment Table that follows on page 25.
Please remove this page from the Operating Instructions and store it where it is safe from unauthorized viewing.

Assignment Table for code numbers that allow the system to be unlocked

Code no.	Printer output	Person
150	0001	
250	0002	
350	0003	
450	0004	
550	0005	
650	0006	
750	0007	
850	0008	
950	0009	

13.2 OEM Menu

Basic settings and limiting values can be changed in this menu.
To make changes in the OEM menu, the system control must previously be unlocked (see 11.1.8 “Unlocking the system”).

Calling the OEM menu:
Simultaneous pressing of the Interval-key and the Nonstop-key calls the OEM menu. Following this, the prompt *“OEM menu Press enter”* appears. When this is confirmed with the Enter-key, the first menu prompt can be worked on. To simplify changing settings, press the UV-key to select the number in a numerical value which you want to change. Now use the arrow keys to enter the wanted number from 0 to 9 at the selected position.
A press on the menu-key takes you to the next menu prompt.

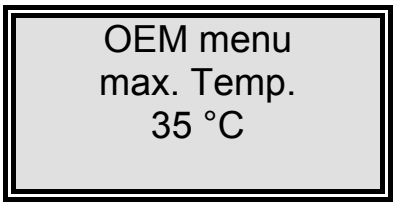
The OEM menu call display shows:

13.2.1 Maximum Temperatur:
A single press on the menu-key:

The maximum temperature which the system can be allowed to reach can be set in this menu. When this temperature is exceeded, the *“max. Temp.”* Fault message is triggered. Settings above 50 °C cause the limiting value to be suppressed and the word *„off“* appears in the 4th line of the display.

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

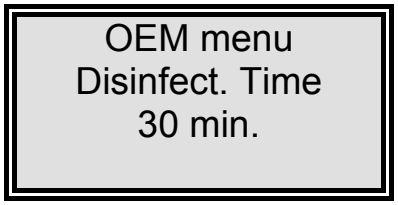
The display shows:



13.2.2 Disinfection time:

A second press on the menu-key:
(not active in this system version)

The display shows:



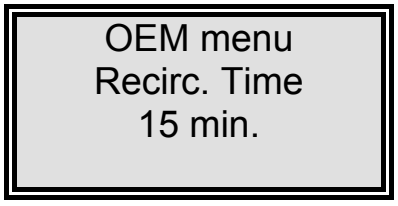
13.2.3 Recirculation time:

A third press on the menu-key:

The recirculation time is set in this menu.

Basic setting: **15 min.**
Setting range: **1 – 30 min.**

The display shows:



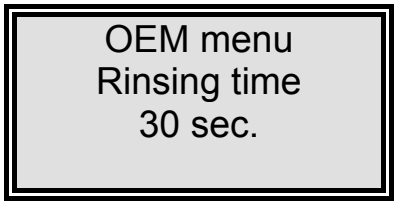
13.2.4 Rinsing time:

A fourth press on the menu-key:

The rinsing time is set in this menu.

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

The display shows:

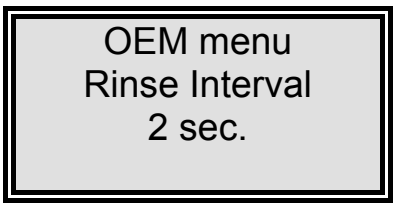


13.2.5 Interval rinse time:
A fifth press on the menu-key:

The interval rinse time can be set in this menu. Rinsing is then carried out for this time period when the operating mode is changed, between stand-by and operation and every 12 hours.

Basic setting: **2 sec.**
Setting range: **1 – 30 sec.**

The display shows:

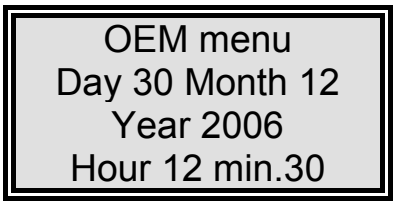


13.2.6 Real-time clock:
A sixth press on the menu-key:

The real-time clock is set in this menu.

Basic setting: **The actual date and time**
Setting range: **Month 1 – 12. Day 1 – 31. Hour 0 – 24. Minute 0 – 60**

The display shows:

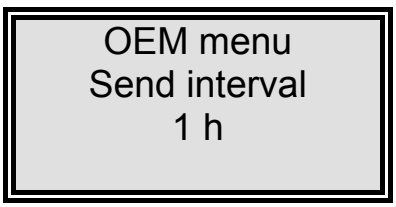


13.2 7 Sending interval:
A seventh press on the menu-key:

In this menu, the sending interval for transmissions of measured values and fault messages to the RS 232 interface can be set.

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

The display shows:



13.2.8 Language:

An eighth press on the menu-key:

The language in which the texts are displayed is set in this menu.
The choice is of English, German or French.

Basic setting: **English**

The display shows:

13.2.9 Switching units:

A ninth press on the menu-key:

In this menu, a choice can be made as to which unit is to be displayed, specific electric resistance or conductivity.

Basic setting: **Resistance MΩxcm**
Setting range: **Resistance MΩxcm,**
Specific electric resistance MΩxcm

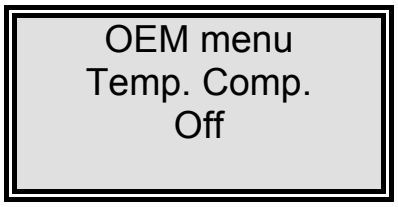
The display shows:

13.2.10 Switch off temperature compensation:

A tenth press on the menu-key:

Basic setting: **off**
Setting range: **on, off**

The display shows:



13.2.11 Adjusting the float switch circuit hysteresis:

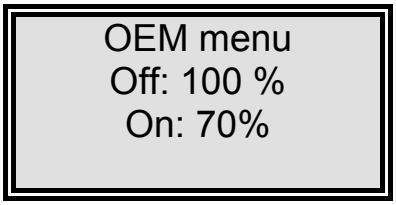
An eleventh press on the menu-key:

Basic setting: **Off: 100 %**
On: 70 %

Setting range: **Off: 25 – 100 %**
On: 0 - 70 %

With a setting of above 100 % for the upper switching point, the display of the tank level is switched off, so that this setting shows whether an analogue or a digital float switch is installed.

The display shows:



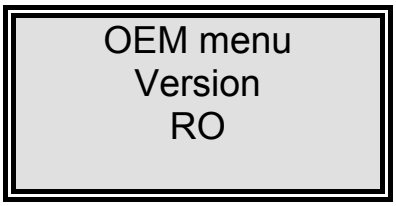
13.2.12 Programme choice TII UV/RO:

A twelfth press on the menu-key:

The equipping grade of the system can be set in this menu so that a differentiation can be made between TII UV and RO versions.

Basic setting: RO

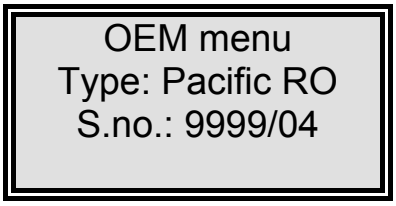
The display shows:



13.2.13 Entering the system type and serial number:

The system type and serial number can be entered in this menu. They are both then printed as headline on every print-out. The following types of system can be entered:
Pacific RO / Pacific TII / Pacific TII UV / Pacific AFT

The display shows:



13.3 Printer output

Various parameters can be recorded by means of a printer. A distinction is made between three types of messages:

- **Standard messages**
- **Code messages**
- **Fault messages**

13.3.1 Standard messages:

A record of all measured values is printed out here in dependence on the sender interval.

Print-out:

e.g.:

```
31.10.07  09:39
 Pacific  RO
 S.No.    9999/07
TC  off  UV  off
LF2=      0.220 MΩxcm
LF3=      0.005 MΩxcm
Temp.=  off
```

13.3.2 Code messages:

Whenever a code number is entered in the system control and confirmed with the Enter-key, then the code input is immediately printed out.
For code identification refer to the „Assignment Table for code numbers that allow the system to be unlocked”.

Print-out:

e.g.:

```
31.10.07  10:17
 Pacific  RO
 S.No.    9999/07
   Code  0001
```

13.3.3 Fault messages:

Should a fault message be shown in the display, e.g. for the permeate limiting value, then this fault message is printed out after the sending interval.

Print-out:

e.g.:

```
31.10.07  16:15
 Pacific  RO
 S.No.    9999/07
Lim.val.permeate
```

14. Maintenance

Your system requires regular, proper and professional maintenance.

We recommend that you secure 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.

To ensure your system will 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!

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

The operating-staff assigned is committed to carry out daily/weekly checks.
During the term of validity of the guarantee agreed upon, maintenance is to be carried out weekly according to the maintenance record sheet supplied with the Operating Instructions.

The calibration of the conductivity is only to be carried out and recorded by customer service.

Cleaning and disinfection of supply 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 are detected inside them or at least once yearly.

Checks or maintenance work on electrical equipment are only to be carried out after the system has been completely separated from the electrical supply by unplugging the mains plug and ensuring that it will not be inadvertently plugged back in. Such work is only to be carried out by qualified electricians.

14.1 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.	Interval*
Pretreatment 09.4001 Prefilter/Hardness stabilization	F1	 06.5204	 6 Months
Pretreatment 09.4000 Prefilter Hardness stabilization	F1	 06.5201 06.5452	 6 Months 6 Months
Filter cartridge	F3	09.4011/09.4012	12 Months

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

14.2 Rinsing RO-membranes

Rinsing out preservative solution:

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 the permeate produced for at least 3 – 4 hours after switching to production.

To do this, after each filling of the tank, open the permeate outlet and empty the tank by allowing the permeate to run to drain.

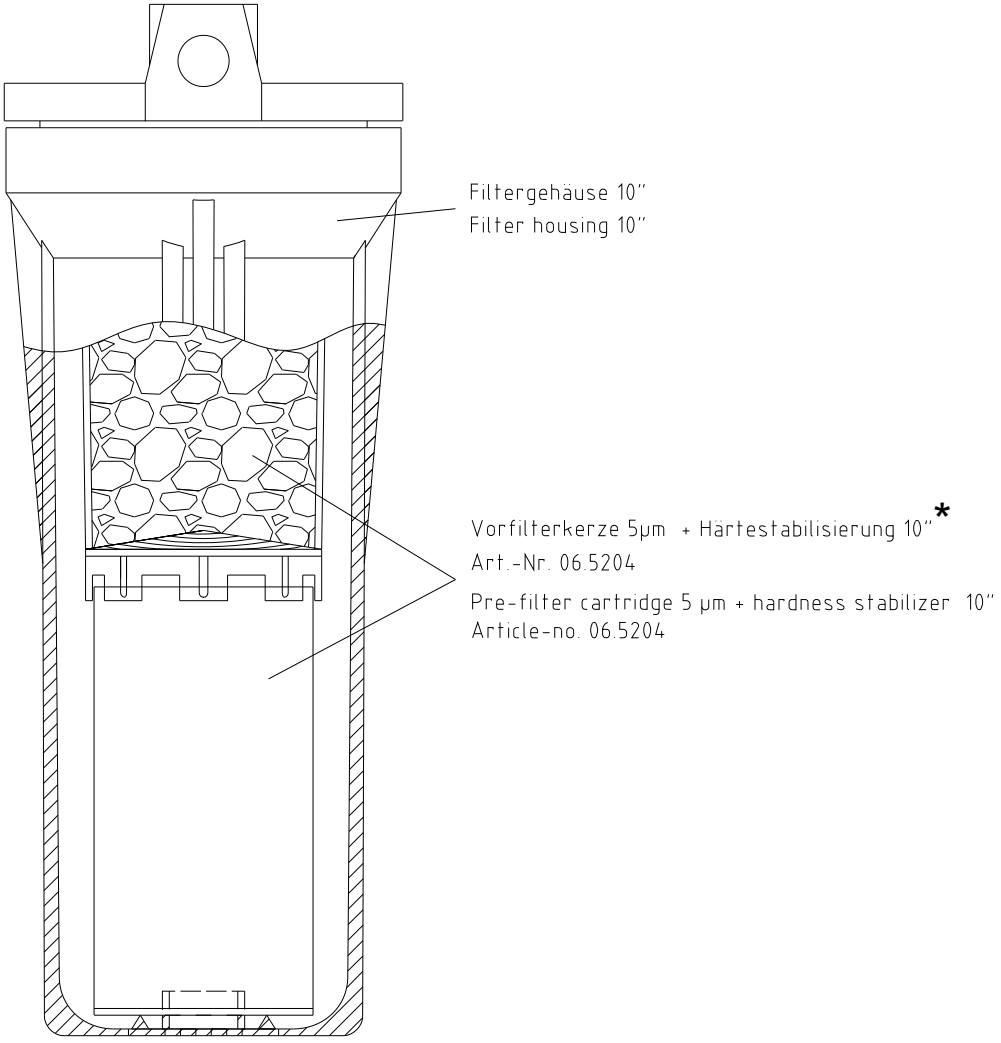
Cleaning membranes:

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 purified water quality.

Leave your pure water system on over the weekend and during holiday times. Only then can the 12-hourly rinse operate and ensure that your reverse osmosis module is not subject to bacterial growth during standstill periods.

Should the performance of your module drop because the system has been operated without appropriate pretreatment and blockage of the membrane has resulted from this, 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 of the module to frost must be avoided.

14.3 Replacing the pretreatment



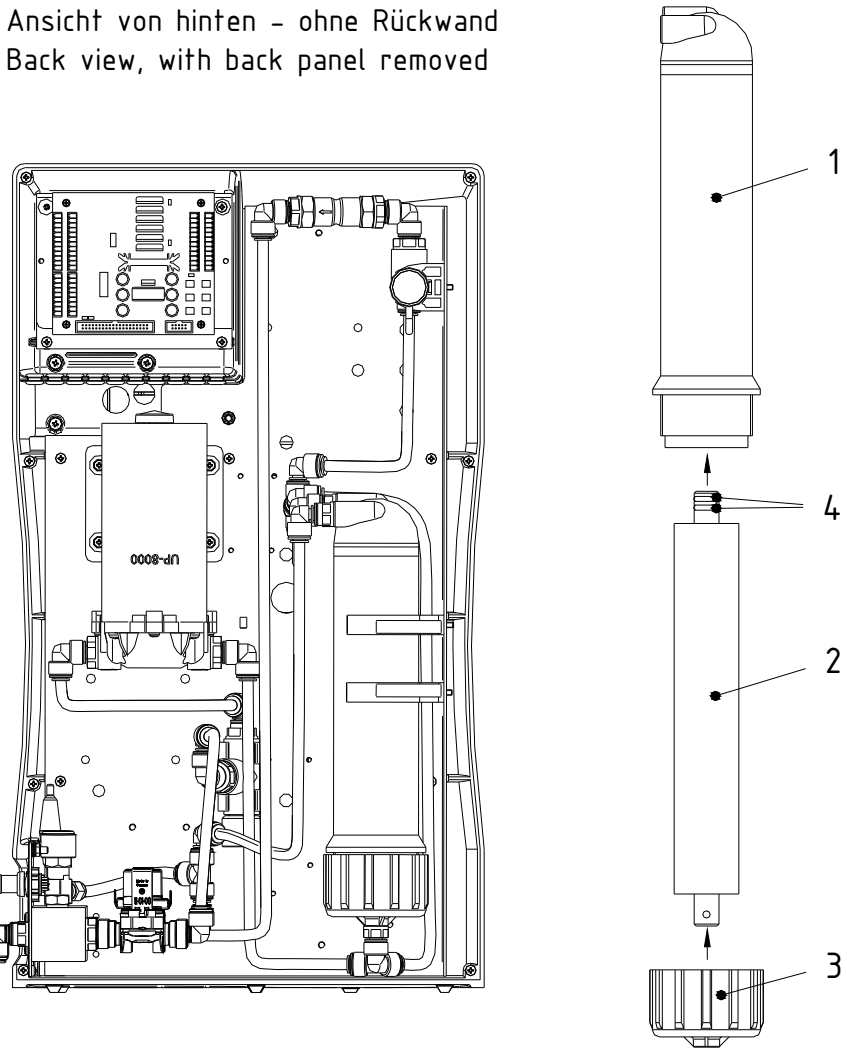
1. Remove the covering hood from the storage tank.
2. Open the residual drainage of the storage tank until the pure water system starts to operate.
3. Shut off the supply of feedwater to the pure water system.
4. Switch the system off.
5. Turn the residual drainage to close it again.
6. Screw the pretreatment filter housing off.
   Caution! The filter housing is still full of water.
7. Change the spent pretreatment unit.

8. Screw the filter housing back on.
9. Open the supply of feedwater to the system.
10. Check that the filter housing does not leak.
11. Switch the pure water system back on.
12. Replace the covering hood on the storage tank.

Your pure water system is now again ready for use.

14.4 Replacing RO-membranes

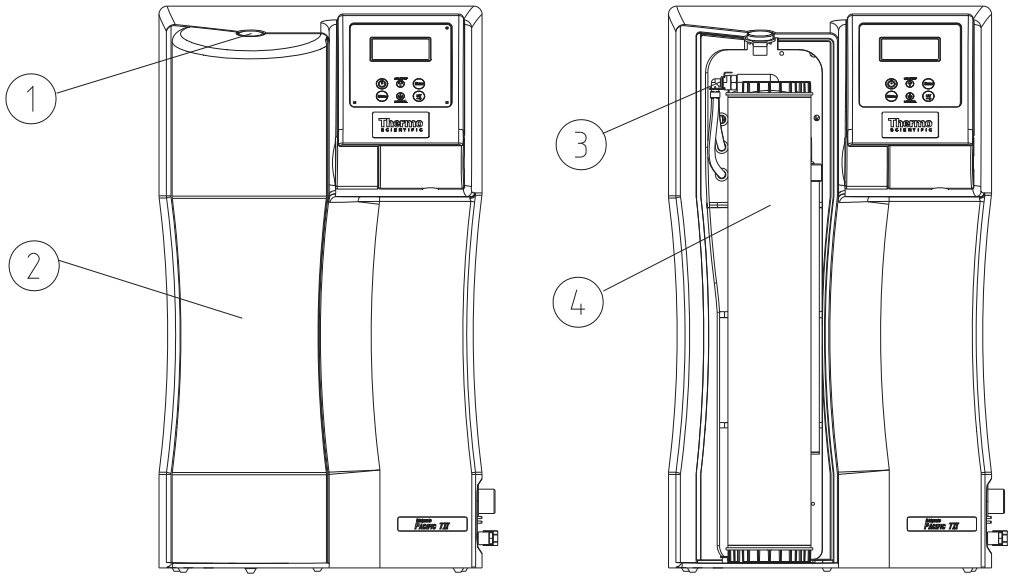
LabTower 20 – 40 RO: 2 RO-Membranes



- Unplug the mains plug.
- Remove the back panel.
- Release all hose connections to the pressure tube (1) of the RO-module.
- Take the pressure tube out of the holding sleeves.
- Open the pressure tube cap nut (3) and remove the membrane (2).
- Insert the new membrane with the two O-rings (4) on the permeate tube in the direction of the arrow pointing to the pressure tube.

Insertion of RO-membrane the wrong way round would lead to certain destruction of them!

14.5 Changing the filter cartridge



For changing the filter cartridge,proceed as follows:

1. Switch off your device and turn off the feedwater supply.
2. Press pressure knob (1) to unlock and remove cover (2).
3. Release filter cartridge (4)quick connect coupling (3).
4. Remove exhausted filter cartridge (4) and replace it with a new one.
5. Fit the quick connect coupling (3) back onto the new filter cartridge (4).
6. Replace the cover (2) and listen to ensure it clicks on pressure knob (1).
7. Turn on the feedwater supply and switch your device on again.
8. Your device is now ready for operation

14.6 Disinfection

Disinfection of storage tank

Your system should be cleaned and disinfected at least once a year to eliminate any bacteria that are possibly in the system. We recommend that you carry out cleaning and disinfection shortly before the time that the filter cartridge must to be replaced.

Use cleaning solutions as follows:
MICRO-Chlor Granulate, 1 box, article no. 09.2202 (Europe only)
Cleaning Solution, 1 syringe, article no. CMX 25 (US-market only).

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

1. The pure water system must be in the “Stand by” operating mode.
   The storage tank must be filled.
2. Switch the system off and unplug the power supply from the pure water system.
3. Turn off the feedwater supply to the system.
4. Open the dispensing valve to bleed the pure water system completely and then close it again.
5. Remove the covering hood from the storage tank.
6. Remove the four connectors from the pure water system to the storage tank and pull the 8 pin connector (float switch, pressure pump, (see Chapter 11. Putting the system into operation).
7. Lift the system from the storage tank and put it aside.
8. Remove the table by removing the 3 screws.
9. Open the lid of the storage tank, pour the contents of a box respectively a syringe of then cleaning solution in the water-filled tank and then close the lid.
10. Leave the disinfectant for 1 hour in the storage tank..

Do not take any water from the dispensing valve or the storage tank during disinfection.

11. Now open the residual drainage of the storage tank and discard all of the water. Close the residual drainage.

12. Screw the table back to the storage tank.

13. Replace the pure water system back to the storage tank and connect the four connectors for power supply and the 8 pin connector (float switch, pressure pump) to the storage tank.

14. Open the feedwater supply to the system.

15. Switch the pure water system on.

16. Fill the storage tank until the “Stand by” operating mode has been reached and empty the tank as in 11. Repeat this process a second time.

17. Finally replace the covering hood on the storage tank.

18. The pure water system is now again at your availability to produce pure water.

15. Waste disposal

When the packaging is no longer needed it can be disposed of as household waste.

Systems are in conformity with EEC Guideline 2002/95/EC

The system is not to be thrown away as household waste but must be properly disposed of. It can be returned to the manufacturer for safe disposal according to EEC Guideline 2002/96/EC. We therefore request our customers in Germany and other member States in the European Economic Area to contact our local service centre or our headquarters:

Thermo Electron LED GmbH
Stockland 3
D-56412 Niederelbert, Germany

WEEE-Reg.-no.: DE 12471402

In countries outside of the European Economic Area, please contact your local authorities or waste disposal company.

16. Trouble shooting

Fault	Cause	Remedy
The system does not start	- No supply of power	- Supply power
No dispensing possible	- Feedwater tap is closed - Feedwater and rinse water connections mixed up - Feedwater pressure < 1.5 bar	- Open the feedwater tap - Switch connections - Increase feedwater pressure
System control no longer reacts	- Improper operation	- Unplug the mains plug for 5 seconds
Water leaks out	- Leaky hose connection - Feedwater pressure > 6 bar	- Check hose connection, find and stop leak - Install an upstream pressure reducer
Permeate flow too low (-15%)	- Blocked membrane - Pre-pressure too low - Feedwater temperature fluctuates	- Clean the membrane - Increase the pre-pressure
Wrong time or date	- Time zone - Summer/Winter time	- Set to correct time or date
Wrong language	- Wrong language set	- Correct the language setting
Fault message: *"Lim.val.permeate"*	- The permeate conductivity is too high - Limiting value is set too low - Membrane blocked	- Check the pretreatment - Check and adjust the limiting value setting - Replace membrane

Fault message: *"Measuring cell LF2"*	- Break in the measuring cell cable - System control defect - Permeate conductivity outside the measuring range	- Replace the measuring cell - Replace the system control - See permeate limiting value
Fault message: *"Measuring cell LF3"*	- Break in the measuring cell cable - System control defect	- Replace the measuring cell - Replace the system control

The address to contact when service is required:

Overview of Thermo Scientific International Sales Organization
Postal address USA:
Thermo Scientific
275 Aiken Road
Asheville, NC 28804
USA

Enquiries from USA/Canada
Sales: +1 866 984 3766
Service: +1 800 438 4851

Enquiries from Latin America
Sales: +1 866 984 3766
Service: +1 866 984 3766

Enquiries from Asia
China
Sales: +86 10 8419 3588
Service: Toll free 8008105118
Support Mobile 4006505118 or +86 10 8419 3588

India
Sales: +91 22 6716 2200
Service: Toll free 1 800 22 8374 or +91 22 6716 2200

Japan
Sales: +81 45 453 9220
Service: +81 45 453 9224

Enquiries from the Rest of Asia/Australia/New Zealand
Sales: +852 2885 4613
Service: +65 6872 9720

Enquiries from Countries not listed / Rest of EMEA
Sales: +49 6184 90 6940 or +33 2 2803 2000
Service: +49 6184 90 6940

Enquiries from Europe:
Austria
Sales: +43 1 801 40 0
Service: +43 1 801 40 0

Belgium
Sales: +32 53 73 4241
Service: +32 53 73 4241

Finland / Nordic / Baltic countries
Sales: +358 9 329 100
Service: +358 9 329 100

France
Sales: +33 2 2803 2180
Service: +33 825 800 119

Germany:
Postal Address Germany:
Thermo Electron LED GmbH
Robert-Bosch-Straße 1
D – 63505 Langenselbold

Phone
Sales: Toll free 0800 1 536 376
or +49 6184 90 6940
Service: Toll free 0800 1 112110
or +49 6184 90 6940
E-Mail: info.labequipment.de@thermoftsher.com

Italy
Sales: +39 02 95059 341
Service: +39 02 95059 250

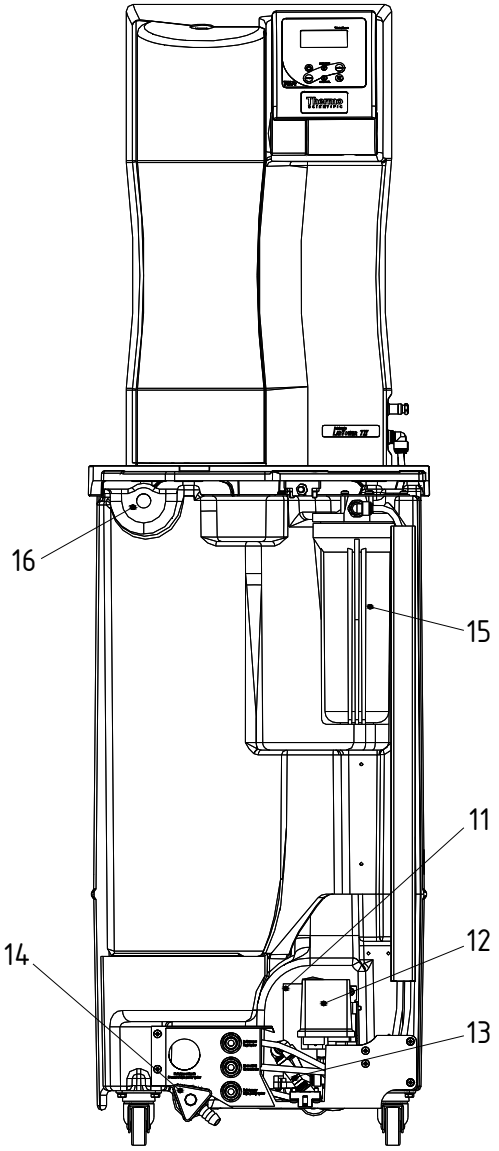
Netherlands
Sales: +31 76 579 5555
Service: +31 76 579 5639

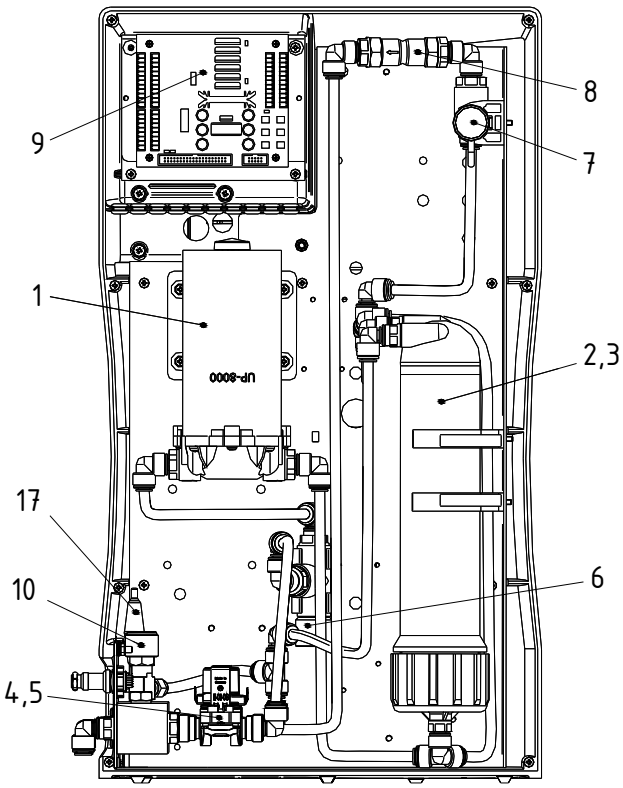
Russa / CIS
Sales: +7 812 703 4215
Service: +7 812 703 4215

Spain / Portugal
Sales: +34 93 223 0918
Service: +34 93 223 0918
Switzerland
Sales: +41 44 454 1212
Service: +41 44 454 1212

UK / Ireland
Service: +44 870 609 9203
Sales: +44 870 609 9203

17. List of replacement parts





Pos.	R+I No.	Designation	Article no.
1	P1	Pressure booster pump RO (LabTower RO 20 – 40)	19.0050*
2,3	F2	RO-Module, consists of:	
		Reverse osmosis membrane (LabTower RO 20)	22.0046*
		(LabTower RO 40)	22.0087*
		Pressure tube	50133990

4	V1	Inlet solenoid valve	50131190*
5	V4	Rinsing solenoid valve	50131190*
6	QIA300	Measuring cell, feedwater	16.0126
7	QIA301	Measuring cell, pure water	16.0126
8	V2	Check valve	15.0009
9		Microprocessor system control, complete	50132019
10	V3	Pressure hold valve	15.0060
11	P2	Pressure booster pump	19.0046*
12	PS200	Pressure switch	15.0058*
13	V7	Check valve	14.0441
14	V5	Dispensing valve, residual drainage	14.0250
15	F1	Prefilter, consisting of: Prefilter cartridge 5 µm + Hardness stabilization, 10”	 06.5204
16	F3	Sterile vent filter, 0.2 µm (optional)	50135142
17		Fuseholder for glas tube fuse, 5 x 20mm Glas tube fuse, 5 x 20mm, 3,15 A, slow Glas tube fuse, 5 x 20mm, 2 A, nimble (only RO 40)	50133979 50131758 50134191
		Table power unit 24V DC (not shows)	50134196
		Table power unit 48V DC (not shows, only RO 40)	50134184

* 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, as we have no influence on their appropriateness or quality.

19. Accessories

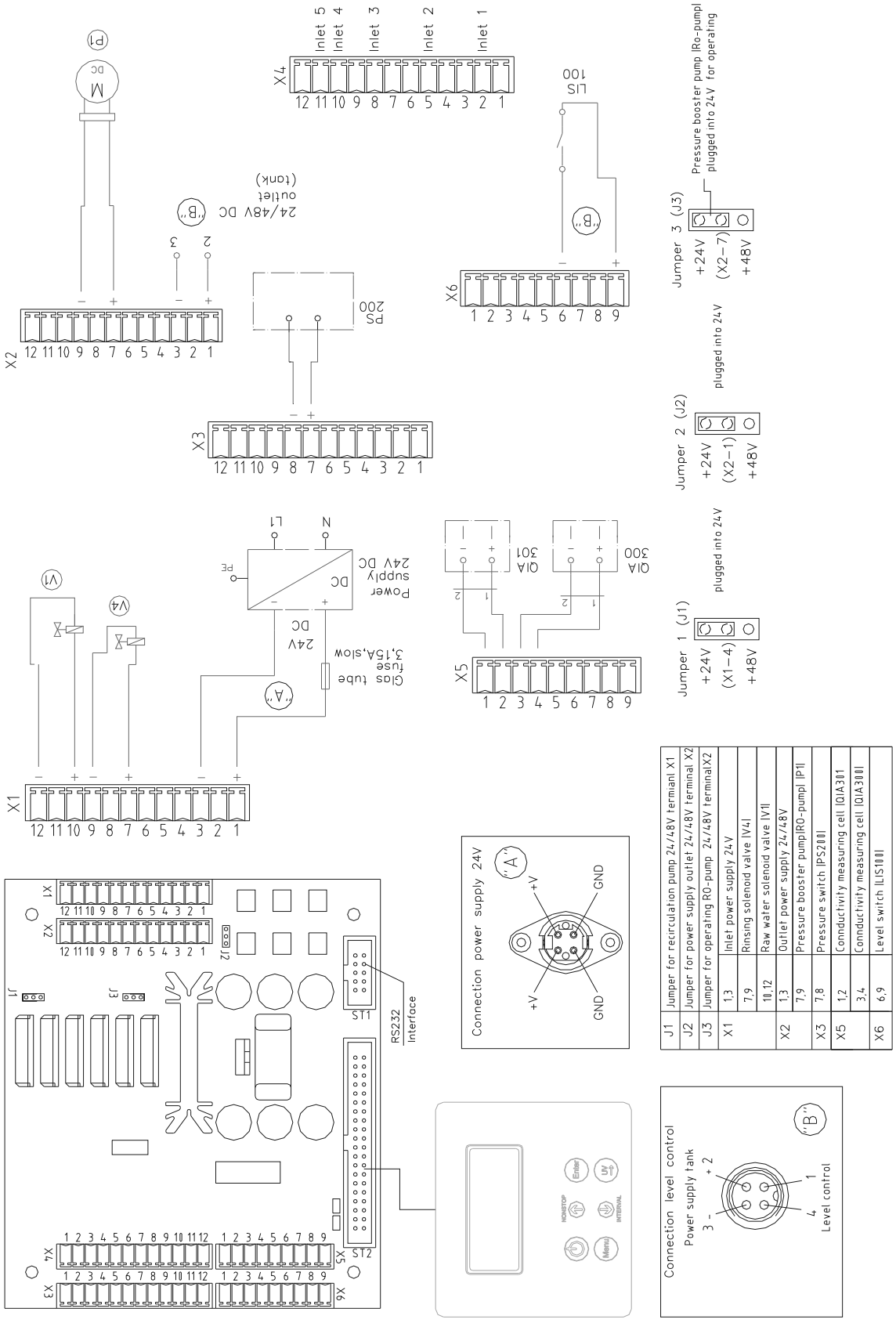
Article designation	Article no.
UV-Emitter (in the storage tank)	06.5006
Sterile vent filter	50135142
Sterile overflow	50132714
Pretreatment, consisting of: 1x activated carbon combi cartridge 5µm, 5” 1x hardness stabilizing cartridge 5”	09.4001
Pretreatment, consisting of: 1x activated carbon combi cartridge 5µm, 10” 1x hardness stabilizing cartridge 10”	09.4000
Disinfection agent, MICRO-Chlor (pack of 12 cans, Europe only)	09.2202
Cleaning Solution, 1 syringe (US-market only)	CMX25
Pressure pump MQ3 – 35, 110V	50135134
Pressure pump MQ3 – 45, 110V	50135135

20. Consumables

Article designation	Article no.
Pretreatment: Prefilter cartridge 5µm + hardness stabilization, 10“	 06.5204
Reverse osmosis membrane (LabTower RO 20) (LabTower RO 40)	22.0046 22.0087
Sterile venting filter	50135142
Fine filter 1µm-10”	06.5101
UV-lamp in the storage tank: Replacement UV-lamp Immersion tube	 22.0095 22.0096

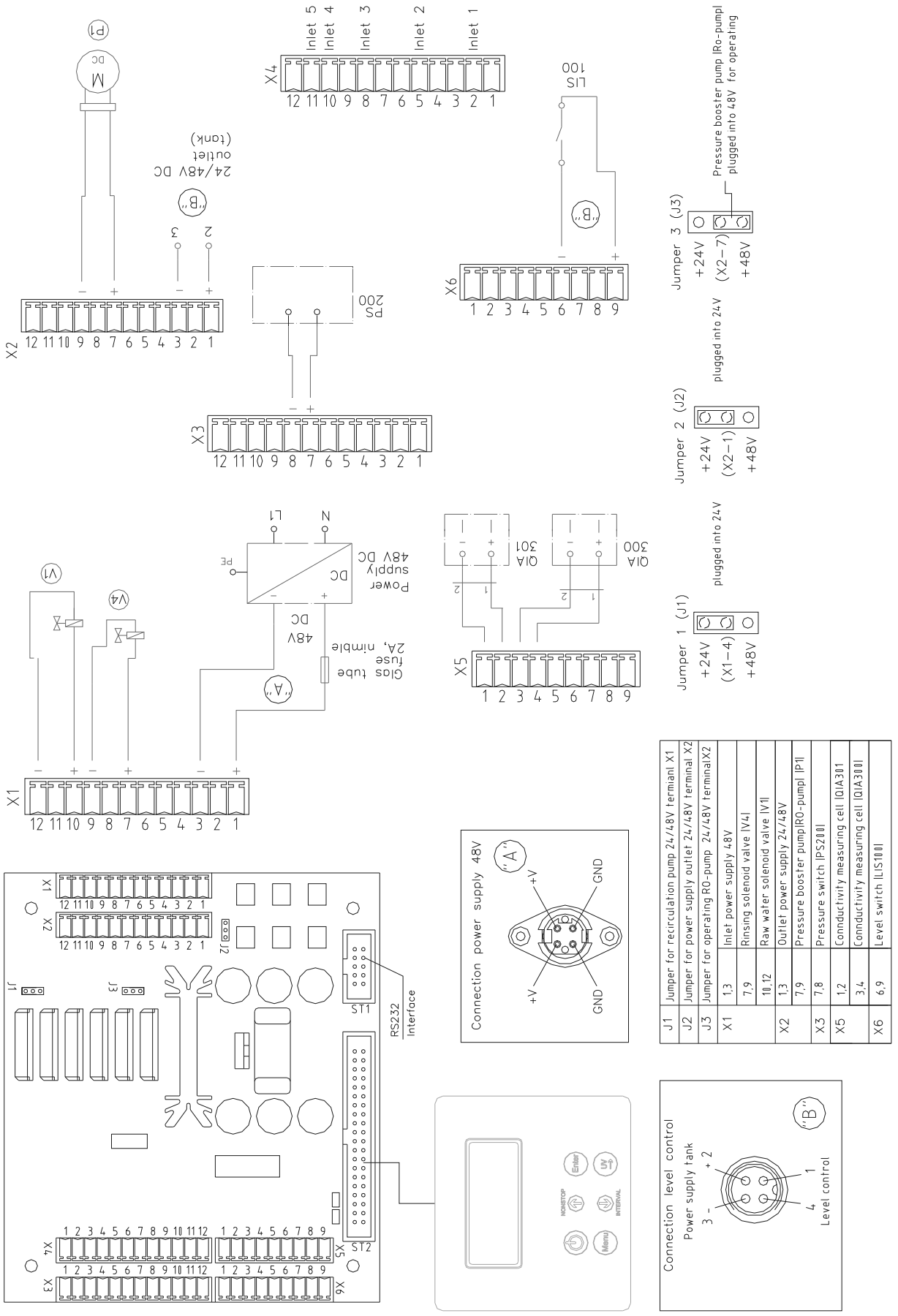
20. Terminal assignment

20.1 LabTower RO 20 (24V DC)



J1	Jumper for recirculation pump 24/48V terminal X1		
J2	Jumper for power supply outlet 24/48V terminal X2		
J3	Jumper for operating RO-pump 24/48V terminalX2		
X1	1.3	Inlet power supply 24V	
	7.9	Rinsing solenoid valve IV4I	
	10.12	Raw water solenoid valve IV1I	
X2	1.3	Outlet power supply 24/48V	
	7.9	Pressure booster pumpIRO-pumpl IP1I	
X3	7.8	Pressure switch IPS200I	
X5	1.2	Conductivity measuring cell IQIA301	
	3.4	Conductivity measuring cell IQIA300I	
X6	6.9	Level switch ILIS100I	

20.2 LabTower RO 40 (48V DC)



J1	Jumper for recirculation pump 24/48V terminal X1		
J2	Jumper for power supply outlet 24/48V terminal X2		
J3	Jumper for operating RO-pump 24/48V terminalX2		
X1	1,3	Inlet power supply 48V	
	7,9	Rinsing solenoid valve IV4I	
	10,12	Raw water solenoid valve IV1I	
X2	1,3	Outlet power supply 24/48V	
	7,9	Pressure booster pumpIRO-pumpI IP1I	
X3	7,8	Pressure switch IPS200I	
X5	1,2	Conductivity measuring cell IQIA301	
	3,4	Conductivity measuring cell IQIA300I	
X6	6,9	Level switch ILIS100I	

21. Maintenance record

(Please keep carefully up-to-date as this is one of the conditions of the guarantee)

Customer address: **Installation location:**

		System type:	
		Serial no.:	
		Year made:	

Date	Feedwater resistance [MΩxcm]	Permeat resistance [MΩxcm]	Prefilter replaced yes/no	Hardness stabilization replaced yes/no	Signature

Any false entry is considered to be a falsification of documents.

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

- **1** x weekly, record measured values.

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