Operating Instructions
Thermo Scientific Barnstead Pacific RO Water Purification System

[ ] **Art. no.: 50132385 RO 3**
[ ] **Art. no.: 50132386 RO 7**
[ ] **Art. no.: 50132387 RO 12**
[ ] **Art. no.: 50132388 RO 20**
[ ] **Art. no.: 50132389 RO 40**

Serial no.: .....

Read these Operating Instructions prior to system installation and start-up!

50132707, State 11.12

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This declaration is no longer valid if the machine is modified without our consent.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
Robert-Bosch-Straße 1
D-63505 Langenselbold
Germany

Description of the machine:

function: Pure water system

type: Pacific RO

article number: 50132385, 50132386, 50132387, 50132388, 50132389

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 **Pacific 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 installation and operation are to be properly carried out.

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

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

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

Please enter the serial number* of your Pacific 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 there is nevertheless 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!

- Your Pacific RO system is a modularly constructed, pure water system that serves exclusively for the purification of tap water.
- Do not put the system into operation until you have taken notice of all of the appropriate 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 of 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 should constructional changes be made to the system or products of other manufacturers be installed in it.
- Protect the system from frost. The temperature in the area in which the system is installed must be at least +2°C and must not exceed +40°C.
- Observe all regulations and requirements, including current accident regulations, that are applicable and appropriate at the installation area, including those for the statics of the flooring (see weight under „Technical specifications).
- The raw water pressure must be at least 2 bar and at most 6 bar, should it be higher, then an additional pressure reducer must be installed.
- DIN EN 1717 requires that water purification systems be equipped with a safety device that protects against contamination of the drinking water piping.
- 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.
- Gravity fall to the waste drain must be ensured.
- After long standstill periods (e.g. long holidays), the system must be subjected to rinsing and, if appropriate, disinfection. Refer to the section on ”Cleaning and disinfection“ for de tails.
- 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 Pacific 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.

Pacific 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 Pacific RO pure water system consists of:

1 x	Pacific RO	Article no.: 5013xxx__
1 x	Assembly kit (RO 3-20) or Assembly kit (RO 40)	Article no.: 50132708 Article no.: 50134364
	consisting of:	
	2 x PVC connecting hose, 1.5 m, straight/angled	Article no.: 18.0042
	1 x Pure water hose, 8mm o.d., 2 m	Article no.: 18.0036
	2 x Screw hook with dowel	Article no.: 21.0057, 21,0035
	1 x Operating Instructions	Article no.: 50132707
	1 x Connecting cord (rubber connector to nema plug connector)	Article no.:50132200
	1 x Connecting cord (rubber connector to british ST plug connector)	Article no.:50132203
	1 x Connecting cord (rubber connector to euro plug connector)	Article no.:50132215
	1 x Table power unit 24V DC	Article no.:50134196
	1 x Table power unit 48V DC (only RO 40)	Article no.:50134184
	1 x Universal adapter	Article no.:21.1006
	1 x Universal holder	Article 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 + activated carbon
Free chlorine	< 0.1 mg/litre
Manganese content	< 0.05 mg/litre
Iron content	< 0.05 mg/litre
Colloid index	< 3
pH-Range	4 - 11
Temperature	2 - 35 °C
Pressure	1.5 - 6 bar

Pure water quality						
	Pacific	**RO 3**	**RO 7**	**RO 12**	**RO 20**	**RO 40**
Salt retention quota	%	Ø 98	Ø 98	Ø 98	Ø 98	Ø 98
Retention quota for bacteria and particles	%	99	99	99	99	99
Performance	L/h	3	7	12	20	40

Dimensions	
Height	603 mm
Width	372 mm
Depth	330 mm
Weight:	
Pacific RO 3	21 kg
Pacific RO 7	21 kg
Pacific RO 12	21 kg
Pacific RO 20	21 kg
Pacific RO 40	22 kg

Cell constants of the measuring cells	
Feedwater conductivity	0.16 cm^{-1}
Permeate conductivity	0.16 cm^{-1}

Water connections	
Raw water inlet	R 3/4"
Concentrate outlet	R 3/4"
Pure water outlet	Hose, 8 mm o.d.

Electrical connections / external switched mode power supply RO 3-20	
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

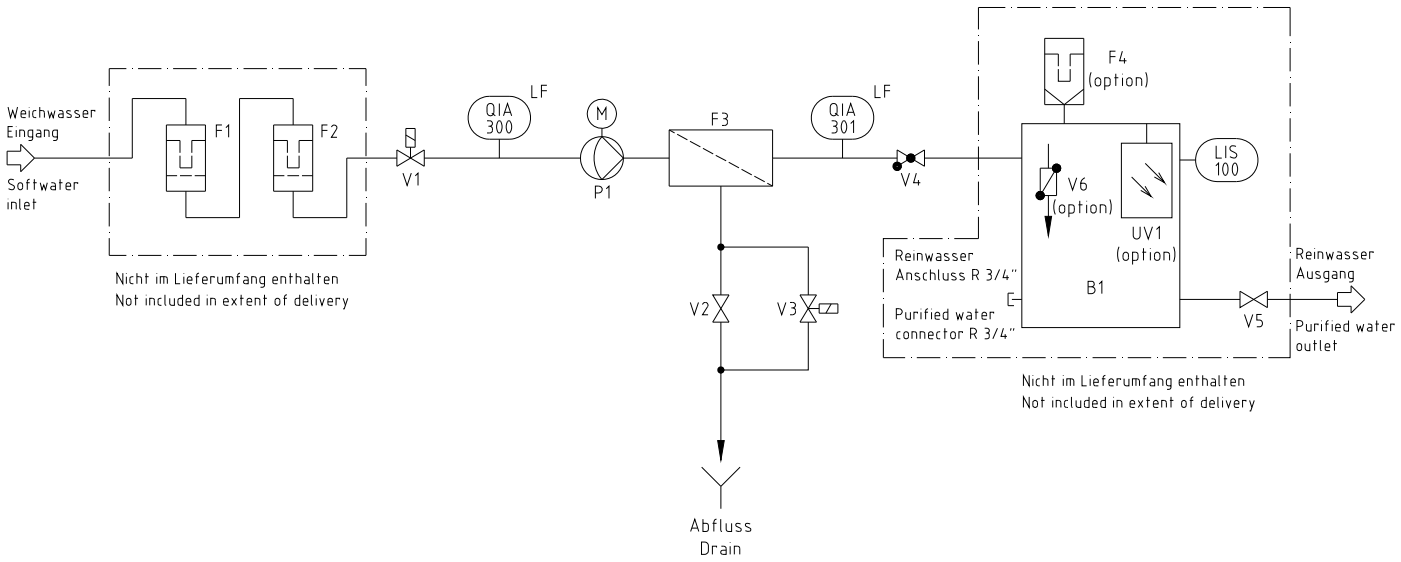
Airborne sound emission	
Sound-pressure level	49 db(A)

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

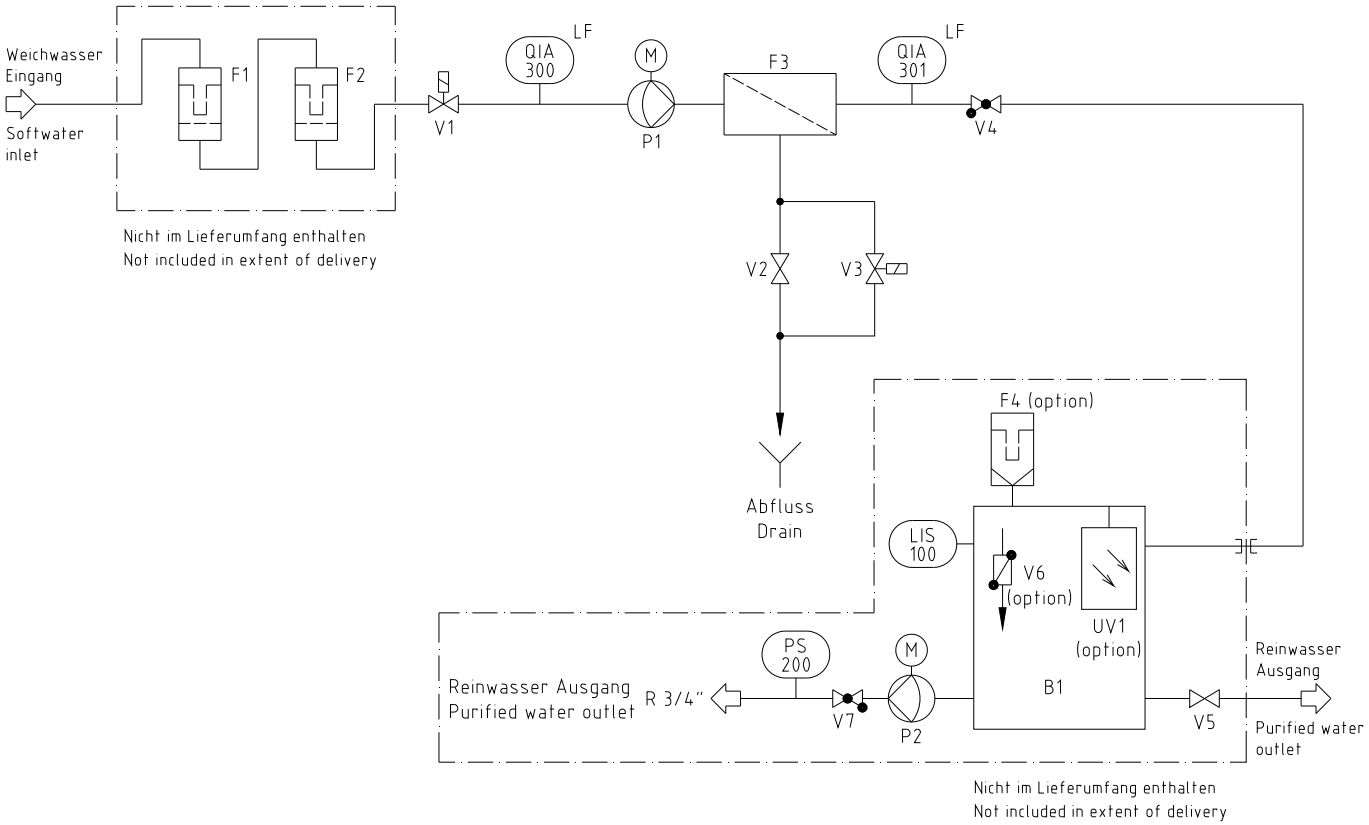
Materials of parts that contact water	
Pump head	Nylon with glass fibre
Filter cartridge	PP
Rinsing solenoid valve	PA
Conductivity measuring cell	POM, stainless steel
Distribution block	POM
Connectors	POM
Hoses	PE
Gaskets	EPDM

8. Flow chart

8.1 Flow chart, tank without pump



8.2 Flow chart, tank with pump



B1 Storage tank:	Stores the pure water that is produced.
F1 5µm Prefilter + activated carbon	Prevents the entry of particles > 5µm and guards against too high free chlorine concentrations.
F2 Hardnes stabilization	Binds calcium and so prevents precipitation of it.
F3 RO Module:	Semi-permeable thin-film composite spiral wound membrane.
F4 Sterile vent filter (option)	Prevents the entry of bacteria and particles > 0.2 µm with drawn-in air.
LIS100 Float switch:	Detects the filling level in the storage tank.
P1 Pressure booster pump:	Increases the inlet pressure to the required working pressure.
P2 Pressure pump:	Pumps water through the pressure switch to the user.
PS 200 Pressure switch::	Switches the pressure pump off when no water is being drawn from the tank.
QIA300 Conductivity measuring cell, raw water:	Measuring device for determination of the conductivity as a parameter that indicates the raw water quality.
QIA301 Conductivity measuring cell, pure water:	Measuring device for determination of the conductivity (after RO) as a parameter that indicates the pure water quality
UV1 UV-Disinfection: (option)	Reduces the bacterial content in the water and serves to prevent bacterial growth and biofilm formation on the inside surfaces of the storage tank.
V1 Raw water solenoid valve:	Is closed during stand-by and during standstills. It prevents water flowing into the system when the system is not in operation.
V2 Pressure hold valve:	Serves to adjust the working pressure and the WCF rate.
V3 Rinsing solenoid valve:	Opens for the cleaning of the membrane, before pure water production, after pure water production and at least every 12 hours.
V4 Check valve:	Prevents running dry of the measuring cell (QIA301).
V5 Dispensing valve	For withdrawal of pure water from the storage tank (B1).
V6 Sterile overflow: (option)	Prevents the entry of bacteria and germs.
V7 Check valve:	Prevents water backflow into the tank.

8.3 How the system functions

After switching the ON/OFF-key to on, 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 6 bar.

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

Downstream of the raw water solenoid valve (V1), the raw water flows past the raw water measuring probe (QIA 300) and on through the pressure booster pump (P1) to the membrane (F3).

The semi-permeable membranes (F3) 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 effected.

The pure water now flows past the pure water measuring probe (QIA 301) and into the storage tank. The measured values can be seen in the display.
The feedwater constituents that were retained are led off in the remaining concentrate.

The measuring probe (QIA300) values can be called in the microprocessor control menu.

Pure water is pumped to the user by a downstream tank with pressure pump P2. Float switch LIS 100 senses the filling level in the tank.

Valve V2 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 the 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 Pacific RO
Check and/or re-adjust every 6 months

System	Permeate flow	Concentrate values		Adjustable to max.
	[L/h]	[L/h]	≙ WCF-Rate [%]	WCF-rate [%]
Pacific RO 3	3	40		33
Pacific RO 7	7	40	13	33
Pacific RO 12	12	60	17	33
Pacific RO 20	20	60	25	40
Pacific RO 40	40	100	28	40

Your pure water system is equipped with automatic flushing. Flushing is carried out when the system is switched on, at the end of each production, and also every 12 hours. For this, rinsing solenoid valve (V3) 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.

This 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 highly 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

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 (article no.: 16.0129) must be installed to protect against damage from flooding!

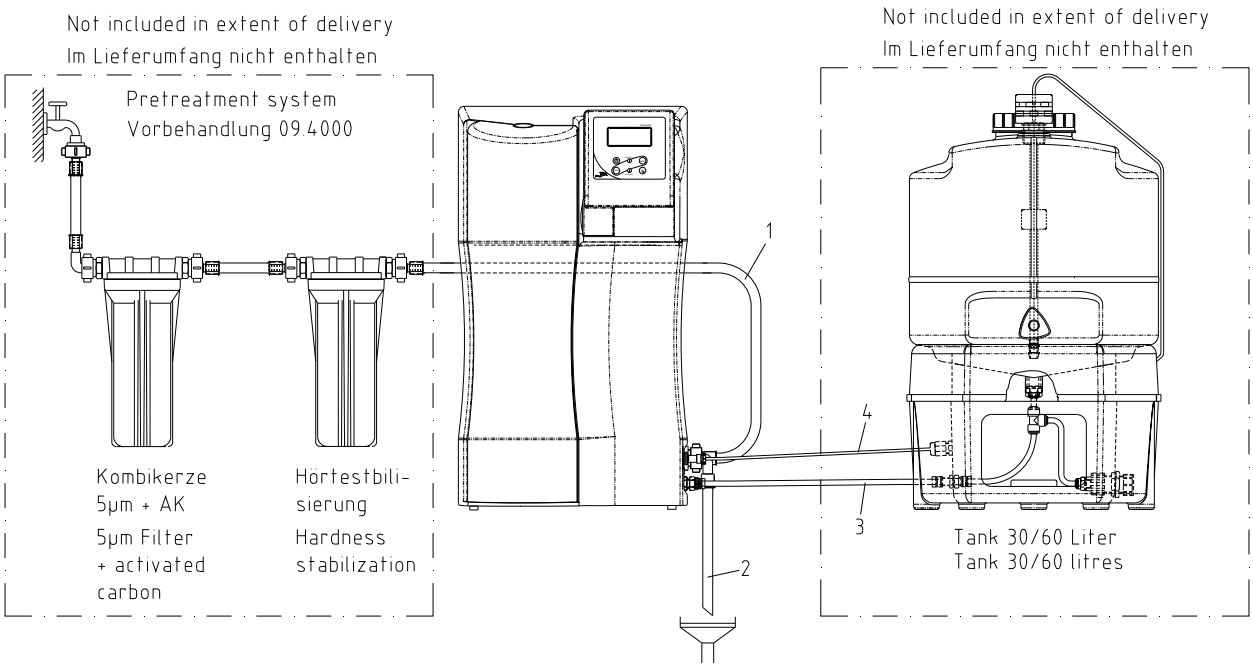
⇒ An unrestricted gravity flow of concentrate to the floor drain is obligatory.

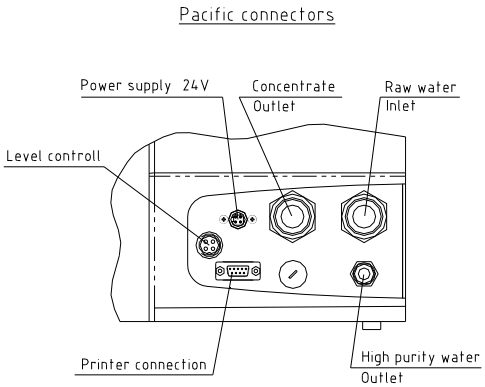
⇒ An electrical socket appropriate to the voltage given on the type plate of the system must be positioned directly alongside the system. The safety fuse must be appropriate for the power required (see "Technical specifications").

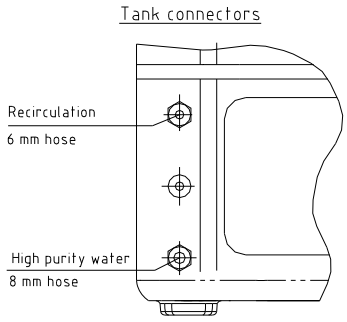
⇒ There must be sufficient working room around the system.

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

10. Putting the system into operation







1. Connect the raw water inlet of your pure water system to the pretreatment and this to a water tap that can be shut off. The connector (R ¾“) of the pure water system is marked „Raw water“.

2. Connect the concentrate outlet to the on-site drain. The connector (R ¾“) of the pure water system is marked “Concentrate“. The drain to the stewer must be max. Are 1 m above the rinsing water connector of the unit.
TAKE CARE! The concentrate must be able to pass to drain under free gravity fall!

3. Pacific-RO with external tank (optional):
Use the Ø 8 mm hose provided to connect the pure water outlet of the system to the pure water inlet of the tank.

4. Connect the cable of the level switch to the 4-pin plug on the system.

Optional: Sterile overflow (accessory).
Plug the hose for the sterile overflow, Ø 8 mm, in the overflow at the back of the tank and connect this to drain.

Note: The tank lid must be tightly closed for the sterile overflow to function properly.

6. Check the connections for perfect leakproof connection.

7. Check the raw water pressure. It must be within the permissible pressure range (see the Technical Specifications).

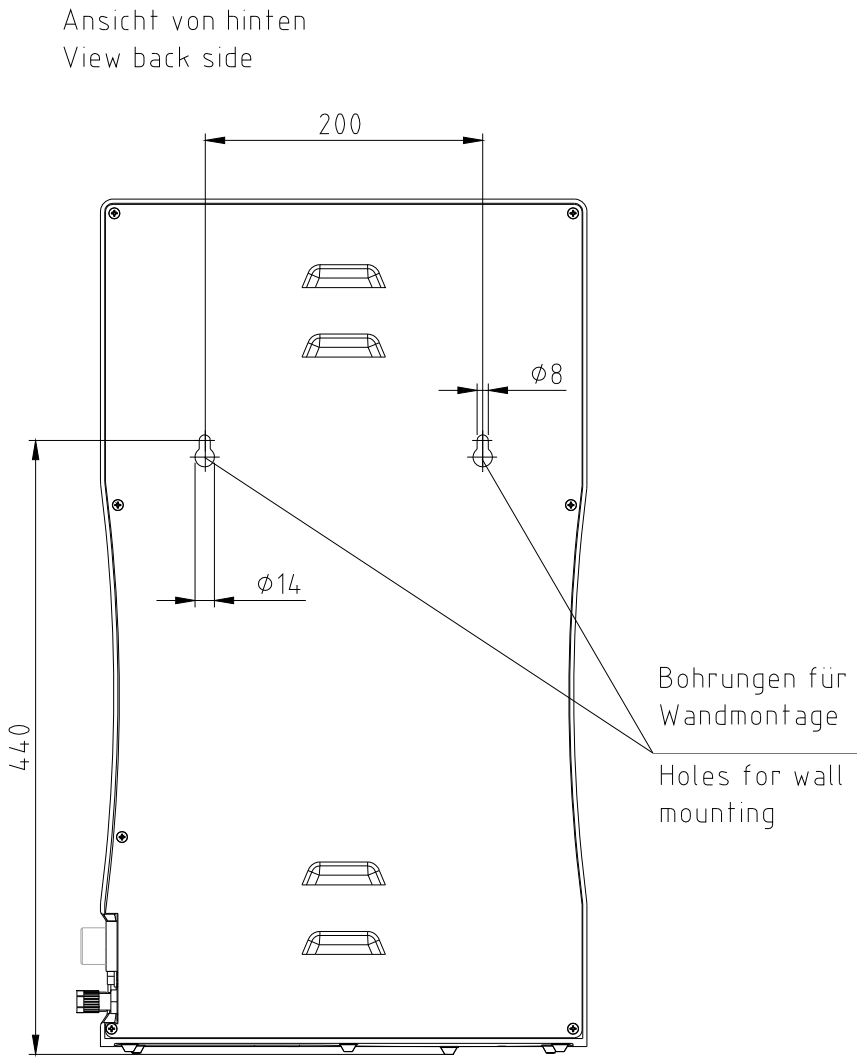
8. Open the raw water tap.

Before you now switch the system on, please read through the rinsing procedure for removing preservative solution from reverse osmosis membranes supplied filled with it in the „Cleaning and disinfecting“ section!

9. Plug the mains plug in and switch the system on at the on/off key of the operating unit.

After a brief rinsing phase, your system is ready to produce pure water into the tank.

10.1 Wall mounting



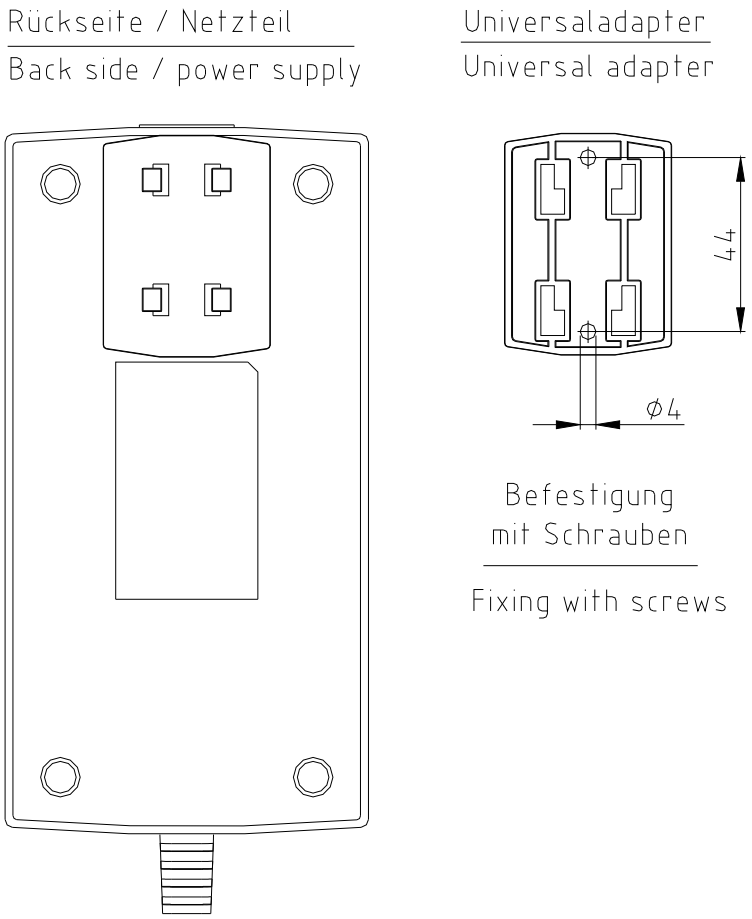
Proceed as follows to mount your Pacific RO system to a wall:

1) Use a twist drill (8mm or 5/16 inch) to make the two holes in the wall that are required as shown in the diagram above.

2) Plug the nylon S8 dowels that are supplied in the assembly kit in the holes. Screw the 5.2 x 50 mm screw hooks that are also supplied in the assembly kit in the dowels.

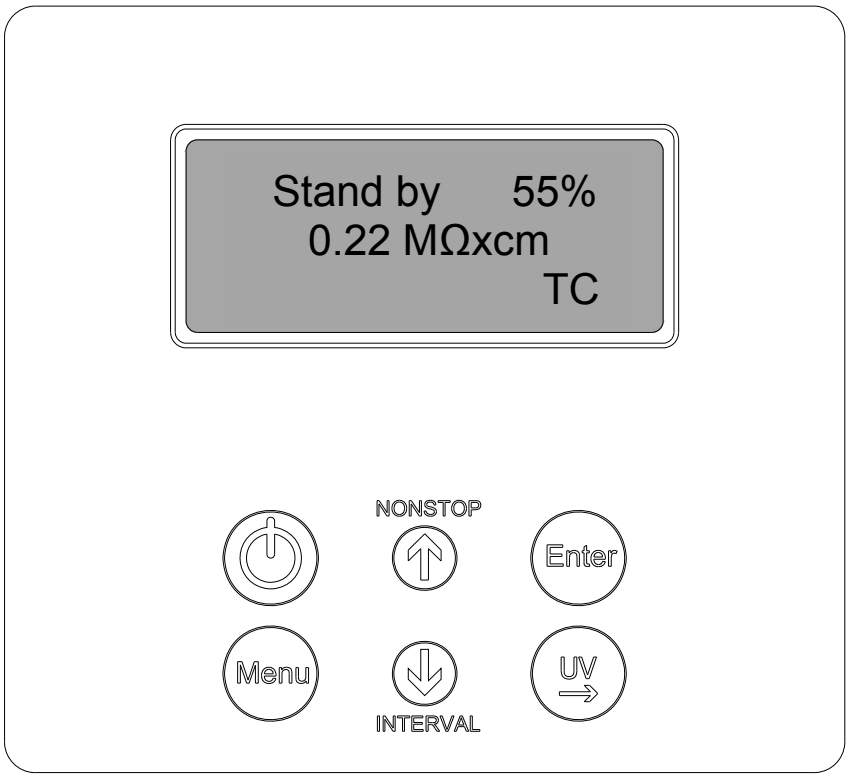
3) Lift the Pacific RO system (2 people are required for this) and hang the back side of it on the scew hooks.

10.2 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
  (Power supply 24/48V, 4-pin power supply connector)
- The system is now ready for use.

11. Operating elements



	Schaltet das System an und aus
NONSTOP	Erhöht im Menu die Zahlenwerte
Enter	Bestätigt in den Menüpunkten den Eingabewert
Menu	Ruft die Menüs auf und schaltet in nächsten Menüpunkt
INTERVAL	Verringert im Menu die Zahlenwerte
UV	Schaltet den UV-Strahler ein, dient im Menu zur Auswahl der zu ändernden Zahl

12. 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.

12.1 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.

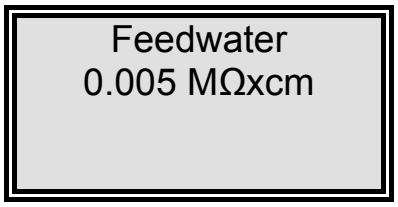
To simplify changing settings, a press on the UV-key allows you to select a certain number in the numerical value that you wish to change. The arrow-keys can then be used to enter a number from 0 to 9 at the selected position.

12.1.1 Feedwater conductivity:

A single press on the menu-key allows the feed water conductivity (measuring position LF3) to be read.
An evaluation of the limiting value is not carried out.

The display shows:

e. g:



12.1.2 Permeate limiting value:

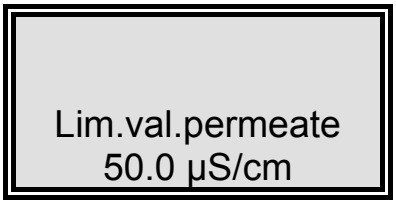
A second press on the menu-key allows the permeate limiting value to be set. Should this limiting value be exceeded, then the *Lim.val.permeate* message is shown (measuring position LF 2).

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 Setting with the arrow keys).
Settings above 99.0 µS/cm result in the limiting value being switched off. The word "*Off*".appears in the display.

The display shows:

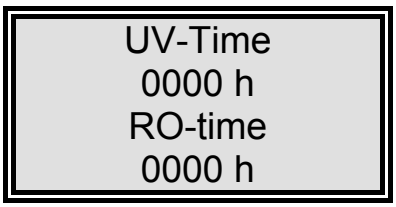
e.g.:



12.1.3 Operating hours:
(UV-operating hours is not active in this 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 trigged. The limiting value of this is set in the OEM menu. The operating time of the RO pump has no limiting value.

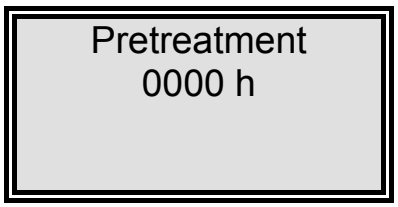
The display shows:



12.1.4 Pretreatment operating hours:

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 is 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 over the whole time that the reverse osmosis pump is running.

The display shows:



12.1.5 Cleaning:

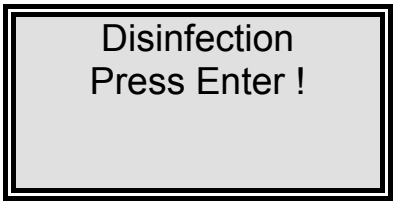
A fifth press on the menu key in this menu allows cleaning to be triggered if necessary. Triggering is made by confirming the requirement with a press on the Enter-key. The pump is started and the inlet solenoid valve and the rinsing solenoid valve open for a 60 second period.
During cleaning, no fault 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 rinsing, the display shows:

12.1.6 Disinfection:
(Is not active in this version)

The display shows:



12.1.7 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 fault storage:

12.1.8 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 display shows:

Code numbers can be assigned to individual persons according to the Assignment Table that follows on page 25.
Remove that 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	

12.2 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).

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 value which you want to change. Now use the arrow keys to enter a 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 prompt display shows:

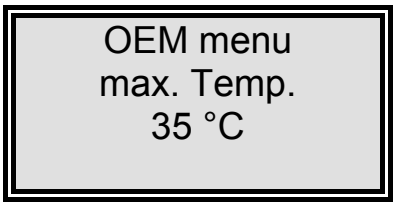
12.2.1 Maximum temperature:

A single press on the menu-key:
(this is not active in this version)

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:



12.2.2 Disinfection time:

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

The display shows:

OEM menu Disinfect. time 30 min.

12.2.3 Recirculation time:

A third press on the menu-key:
(this is not active in this version)

The recirculation time is set in this menu.

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

The display shows:

OEM menu Recirc. time 15 min.

12.2.4 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:

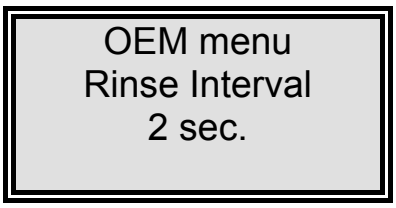
OEM menu Rinsing time 30 sec.

12.2.5 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:

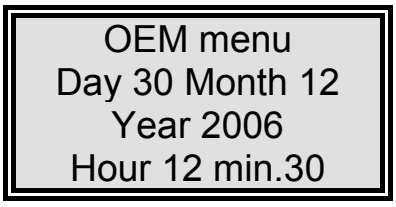


12.2.6 Real-time clock:
A sixth press on the menu-key:

The real-time clock is set in this menu.

Basic setting: **The actual time**
Setting range: **1 - 12 month, 1 - 31 day, 0 - 24 h, 0 - 60 min.**

The display shows:

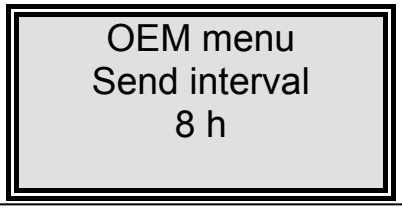


12.2 7 Sending interval:
A seventh press on the menu-key

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

Basic setting: **8 hours**
Setting range: **0.5 - 12 hours**

The display shows:



12.2.8 Languages:
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:

12.2.9 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.

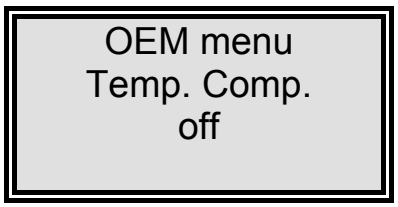
Basic setting: **Resistance MΩxcm**
Setting range: **Resistance MΩxcm,**
Specific electric resistance MΩ cm

The display shows:

12.2.10 Switch off temperature compensation:
A tenth press on the menu-key

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

The display shows:



12.2.11 Adjusting the float switch circuit hysteresis:

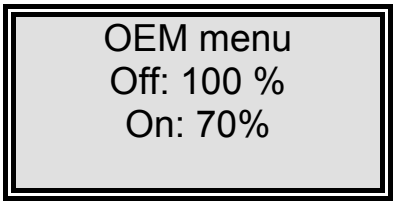
An eleventh press on the menu-key:

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

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

With a setting over 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:



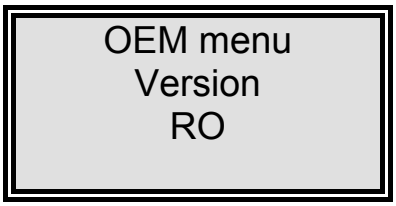
12.2.12 Programme choiceTII UV / RO:

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

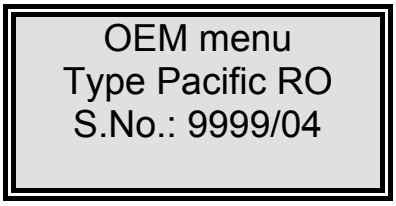
The display shows:



12.2.13 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 AFS

The display shows:



12.3 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**

12.3.1 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
```

12.3.2 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
```

12.3.3 Fault messages:

Should a fault message be shown in the display, e.g. for the pure water 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
```

13. 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 should be committed to carry out daily/weekly checks.
During the agreed term of validity of the guarantee, maintenance is to be carried out weekly according to the maintenance record sheet supplied with the Operating Instructions.

The calibration of the conductivity display 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.

13.1 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 water used daily. The interval is contingent on the feedwater quality so that a shorter one may be necessary.

13.2 Rinsing the membrane

Rinsing out preservative solution:

According to the mode of delivery, the system may be supplied filled with a solution containing a preservative. 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 the membrane:

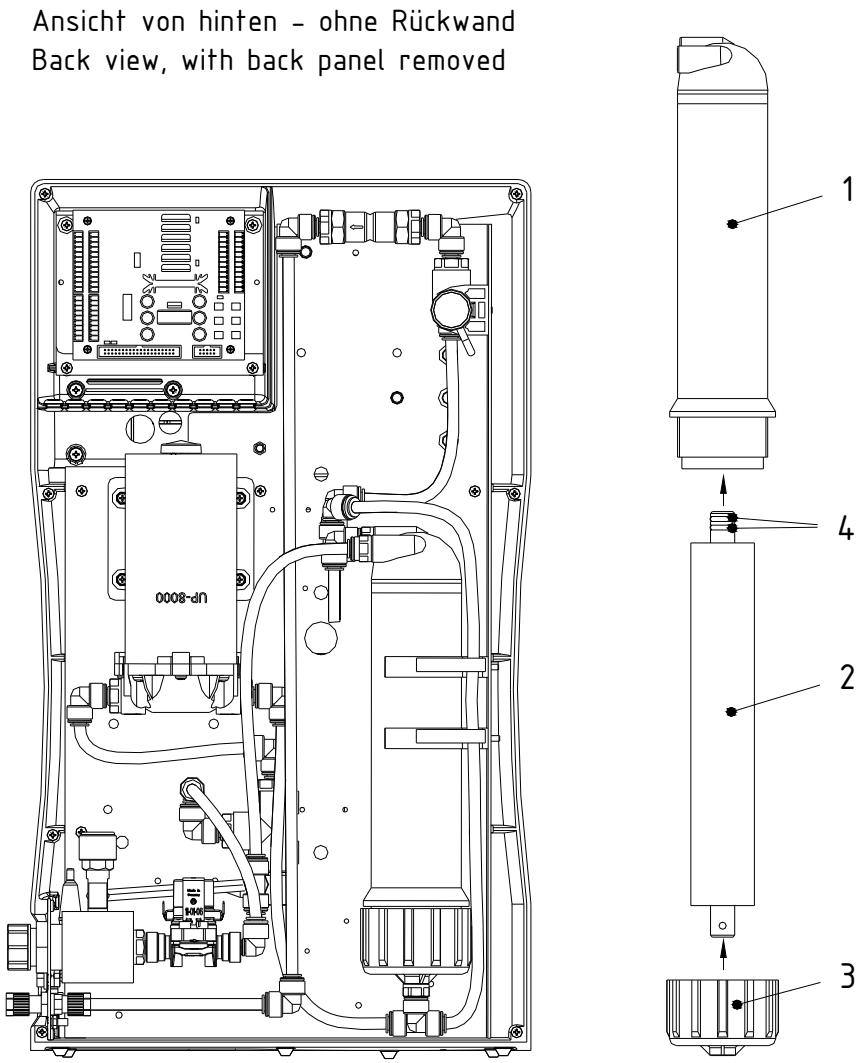
Automatic rinsing lengthens the service life of your reverse osmosis module. Coarse particles and other contaminants are swept away from the membrane surface during this rinsing process. The rinsing phases so ensure the longest service life and optimal purified water quality.

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 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.

13.3 Replacing the RO membrane

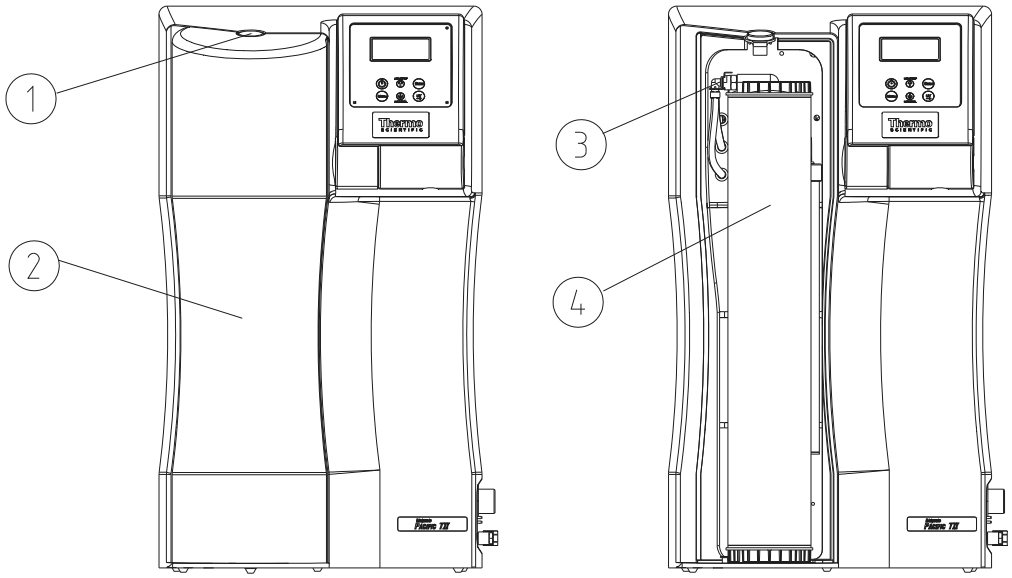
Pacific RO 3 – 12: 1 RO membrane
Pacific RO 20 – 40: 2 RO membranes



- 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 unit (2).
- Insert the new membrane unit with the two O-rings (4) on the permeate tube in the direction of the arrow pointing to the pressure tube.

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

13.4 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

13.5 Disinfection

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!

Disinfect the reverse-osmosis or the tank/ recirculation with the used filter cartridge. Replacement these after the disinfection against a new filter cartridge.

Disinfection of the reverse-osmosis

1. Switch the Pacific system off.
2. Shut off the supply of feedwater to the system and release pressure from the feed line.
3. Open the housings of the pre-treatment, take the filter cartridges out and pour the contents of a box respectively a syringe of the cleaning solution into it. Tightly screw-close the housings again.
4. Re-open the feedwater supply.
5. Switch the system on and let it run for 1 hour in normal operation.
6. Switch the system off and empty the tank to drain.
7. Shut off the supply of feedwater to the system and release pressure from the feed line.
8. Open the housings of the pre-treatment, put the new filter cartridges into the empty housings of pre-treatment and screw down the housings.
9. Now change the filter cartridge as described in the Operating Instructions for the system and, if necessary, the reverse osmosis membrane.
10. Open the supply of feedwater.
11. Switch the system on, produce two complete tank fillings of water and discard the water that is produced.

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

Disinfection of the tank/ recirculation

1. Switch the Pacific system off.
2. Shut off the supply of feedwater to the system and release pressure from the feed line.
3. Half empty the tank belonging to the system, screw the lid off and pour the contents of a box respectively a syringe of the cleaning solution into it. Close the lid again.
4. Re-open the feedwater supply.
5. Switch the system on and let it run for 1 hour in normal operation.
6. Switch the system off and empty the tank to drain.
7. Produce two complete tank fillings of water and discard the water that is produced.
8. Now change the filter cartridge as described in the Operating Instructions for the system and, if necessary, the reverse osmosis membrane.
9. Replace the filter elements in the pre-treatment (if not already with the „Disinfection of the reverse-osmosis" happen).
10. Fill the tank completely once and discard the water produced from this tank filling.

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

Use after disinfecting the reverse-osmosis and the tank/ recirculation always new filter elements in the pre-treatment.

Replacement parts:

Filter cartridge, article no.: 09.4011
RO-membrane, article no.: 22.0046

14. 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.

15. 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 - Make correct 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 the leak - Install a pressure reducer
Permeate flow is too low (-15%)	- Clogged membrane - Too low a pre-pressure - Feedwater temperature fluctuates	- Clean the membrane - Increase pre-pressure
Time or date is wrong	- Time zone - Summer/winter time	- Set to correct time and date
Wrong language	- Wrong language is set	- Set to correct language setting
Fault message: *"Lim.val.permeate"*	- The permeate conductivity is too high - Limiting value is set too low - The membrane is clogged	- Check the pretreatment - Check and re-adjust the limiting value setting - Replace the membrane

Fault message: *"Measuring cell LF2"*	- Break in the measuring cell cable - System control is defect - Permeate conductivity is 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 is defect	- Replace the measuring cell - Replace the system control

The address to contact when your system requires service:

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

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Sales Toll free 0800 1 536 376
or +49 6184 90 6940
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Italy
Sales +39 02 95059 341
Service +39 02 95059 250

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

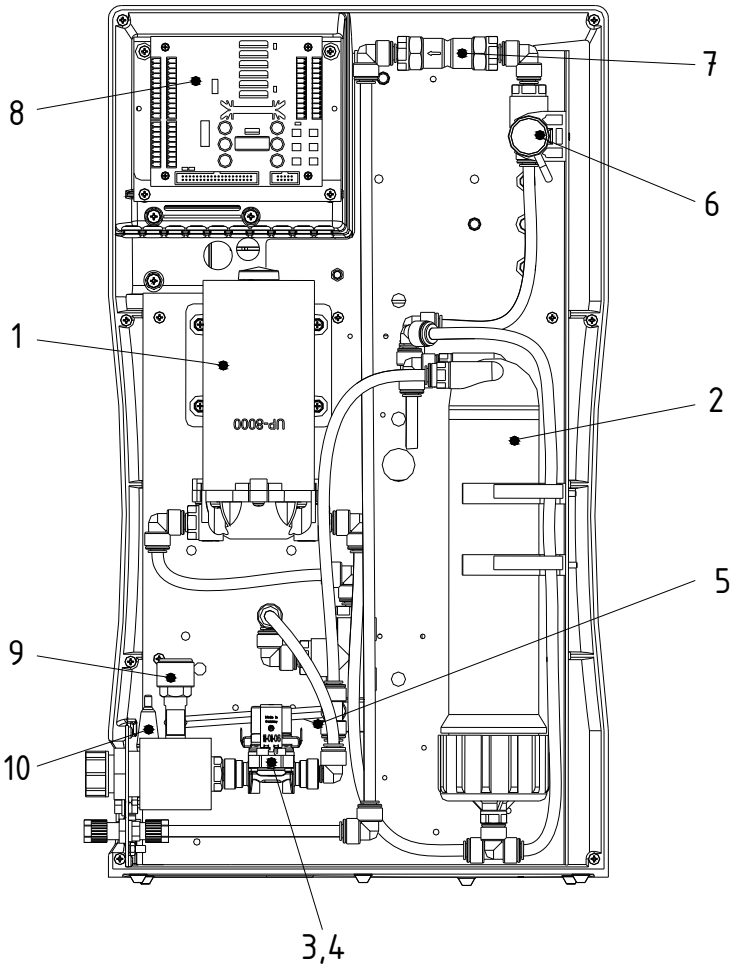
Russa / CIS
Sales +7 812 703 4215
Service +7 812 703 4215

Spain / Portugal
Sales +34 93 223 0918
Service +34 93 223 0918

Switzerland +41 44 454 1212
Service +41 44 454 1212

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

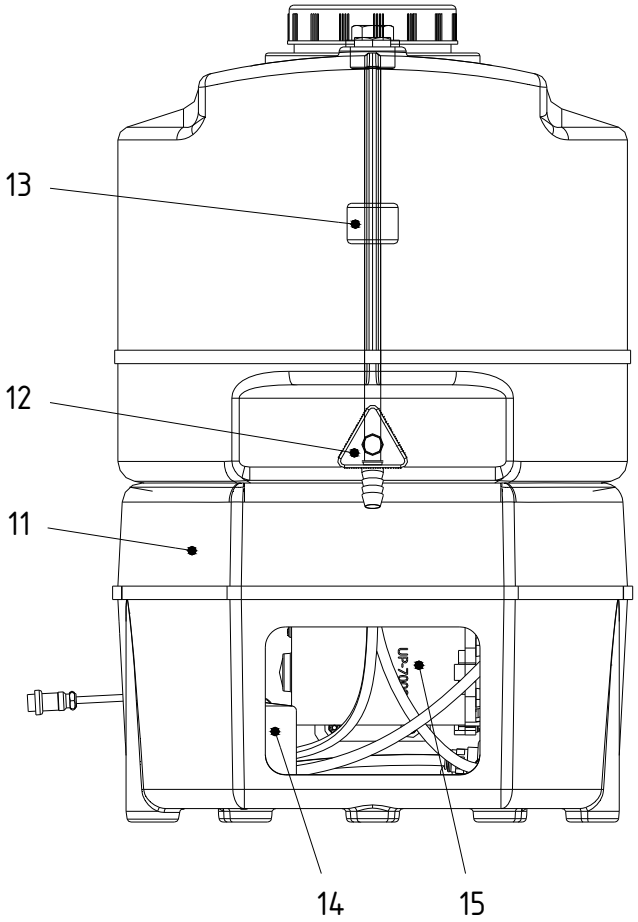
16. Replacement parts Pacific RO 3 – 40



Pos.	R+I no.	Article designation	Article no.
1	P1	Pressure booster pump, RO (Pacific RO 3 – 40)	19.0050*
2	F3	RO Module, consisting of: Reverse osmosis membrane (Pacific RO 3 – 12) 1x (Pacific RO 20) 2x (Pacific RO 40) 2x Pressure tube	 22.0046* 22.0046* 22.0087* 50133990
3	V1	Inlet solenoid valve	50131190*
4	V3	Rinsing solenoid valve	50131190*
5	QIA300	Measuring cell, raw water	16.0126
6	QIA301	Measuring cell, pure water	16.0126
7	V4	Check valve	15.0009
8		Microprocessor control, complete	50132019
9	V2	Pressure hold valve	15.0060
10		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 for RO 40)	50133979 50131785 50134191
		Table power unit 24V DC (not shows)	50134196
		Table power unit 48V DC (not shows, only for RO 40)	50134184

* Wearing part

17. Replacement parts tank (optinal)



Pos.	R+I no.	Article designation	Article no.
11	B1	Pure water tank, 30 litre Pure water tank, 60 litre	18.0114 18.0115
12	V5	Dispensing valve	14.0250
13	LIS 100	Float switch for 30 litre tank for 60 litre tank	16.0303 16.0304
14		Pressure switch	15.0058
15	PS200	Pressure pump tank	19.0066*
16	F4	Sterile vent filter, 0.2µm (optional, not shown)	06.5003
17	V6	Sterile overflow (optional, not shown)	06.5001
18	UV1	UV-Disinfection in tank (optional, not shown)	06.5006

* Wearing part

We ask for your understanding that the guarantee 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.

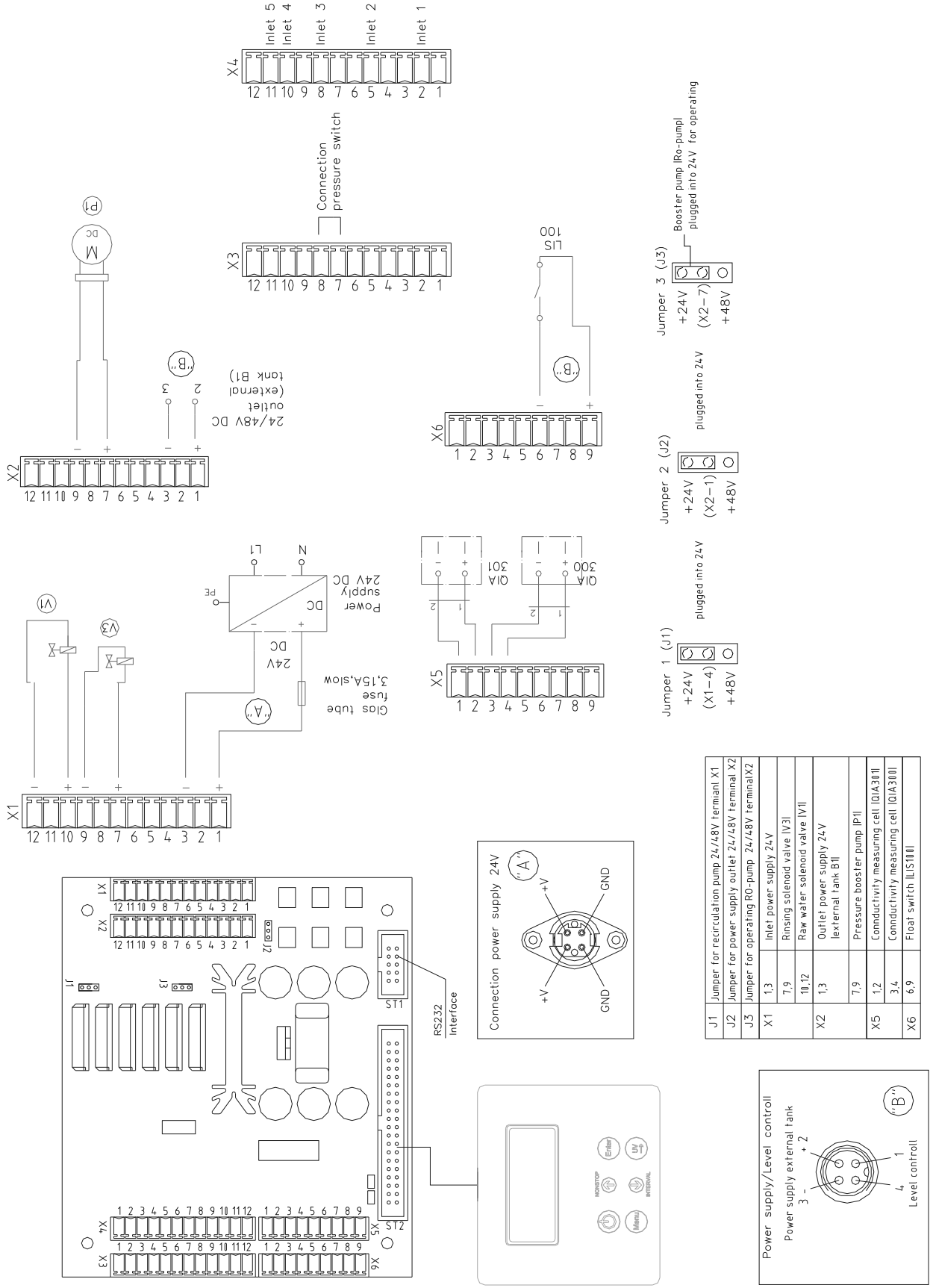
18. Consumable materials and accessories

Pacific RO	
Article no.	**Article designation**
09.4000	Pretreatment for RO Complete, incl. 2 x 10“ housings, hardness stabilization and Activated carbon combi-cartridge
06.5201	Combi-cartridge with activated carbon, 10“ for pretreatment
06.5452	Hardness stabilization, 10“ for pretreatment
22.0046	Reverse osmosis membrane for Pacific RO 3 – 20
22.0087	Reverse osmosis membrane for Pacific RO 40

Tank (optional)	
Article no.	**Article designation**
06.5033	Pure water tank, 30 litre incl. float switch
06.5063	Pure water tank, 60 litre incl. float switch
Accessories	
Article no.	**Article designation**
06.5001	Sterile overflow
06.5002	CO2 adsorber + sterile vent filter
06.5003	Sterile vent filter
06.5006	UV-Immersion lamp complete for tank
22.0095	Replacement UV-lamp
09.4003	Pretreatment
09.2202	Disinfection agent MICRO-Chlor (packs of 12 cans,Europe only)
CMX25	Cleaning Solution, 1 syringe (US-market only)

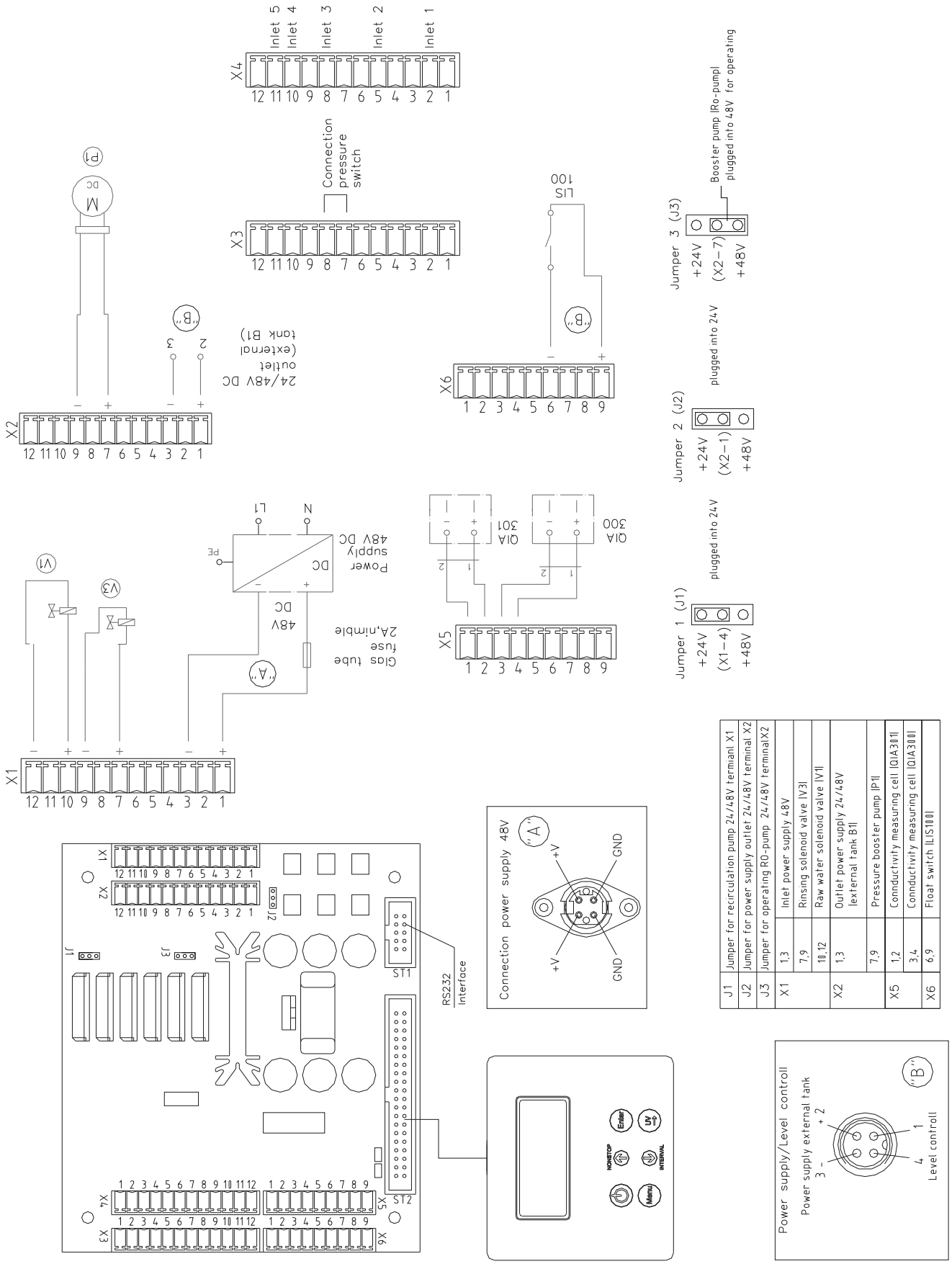
19. Terminal assignment

19.1 Pacific RO 3-20 (24V)



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 [V3]	
	10,12	Raw water solenoid valve [V1]	
X2	1,3	Outlet power supply 24V lexternal tank B1]	
	7,9	Pressure booster pump [P1]	
X5	1,2	Conductivity measuring cell [QIA301]	
	3,4	Conductivity measuring cell [QIA300]	
X6	6,9	Float switch [LS100]	

19.2 Pacific RO 40 (48V)



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 (V3)	
	10,12	Raw water solenoid valve (V1)	
X2	1,3	Outlet power supply 24/48V (external tank B1)	
	7,9	Pressure booster pump (P1)	
X5	1,2	Conductivity measuring cell (QIA301)	
	3,4	Conductivity measuring cell (QIA300)	
X6	6,9	Float switch (LIS100)	

20. 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	Resistance, feedwater [MΩxcm]	Resistance, permeate [MΩxcm]	Prefilter replaced Yes/no	Hardness stabilizer 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:

- Record measured values **1x/ week**.

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