

Operating instructions
PUROTAP® expert

Installation
Function
Operation
Service



ELYSATOR 
engineering water

swiss made 

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1. Safety instructions



Not drinking water



Maximum 45 °C



Maximum inlet pressure 9 bar (not constantly)



Permeate output up to 10 l/min without pump



Permeate output up to 20 l/min with pump



Membrane:

Disposal with household waste



Device:

100 % recyclable



Operation under supervision

2. Function

The PUROTAP® expert treats water for technical applications in closed systems according to the latest standards (VDI 2035, SWKI BT 102-01, Ö H5195). The PUROTAP® expert works on the basis of reverse osmosis (RO). The flow pattern of the water inside the intricately designed tank is controlled in a way that enables the system to achieve incomparably high filtration velocities. With its integrated high pressure pump, the PUROTAP® expert achieves a throughput of 20 litres per minute or 1200 litres per hour.

The PUROTAP® expert pushes raw water at pressures of up to 18 bar through a special filter membrane with a gauge width of less than one nanometre – this equates to one millionth of a millimetre. This holds back all dissolved solids and only pure water molecules pass through the membrane. The hyper filtered water is particularly suitable for technical applications since dissolved minerals and salts, heavy metals and pesticides, as well as bacteria and organic matter, are removed from the water. The pH value is only slightly affected. The membrane can be replaced when it is spent or if it no longer allows sufficient throughput. The old membrane can be disposed of as household waste.

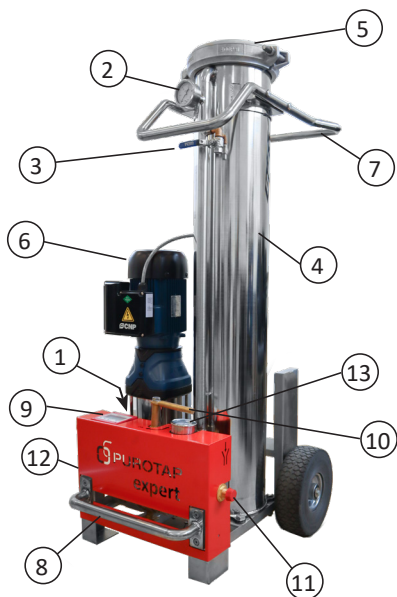
3. Standard delivery

- PUROTAP® expert device
- Label "demineralised"
- Spacer ring, grey
- Operating instructions

The PUROTAP® E90 membrane must be ordered separately

4. Specification

4.1. Device description

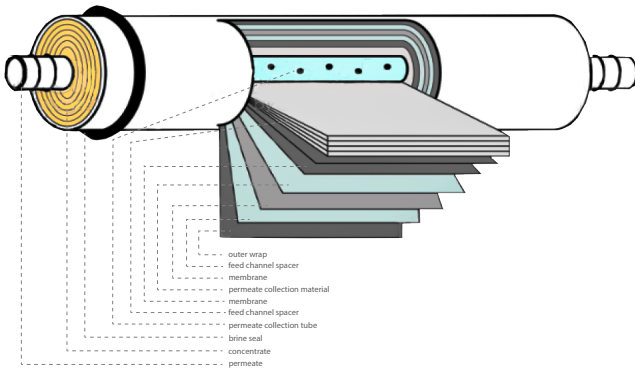


1. Inlet $\frac{3}{4}$ " male thread (at the bottom on the pump)
2. Pressure gauge for dynamic pressure filter membrane
3. Aeration tap
4. Filter casing
5. Filter casing cover
6. Pressure booster pump
7. Handle, top
8. Handle, bottom
9. Combined meter
10. Single lever fitting assembly
11. Outlet/waste water concentrate $\frac{3}{4}$ " male
12. Outlet/permeate pure water $\frac{3}{4}$ " male, fully desalinated
13. Pressure gauge for pure water output

Properties of the PUROTAP® E90 membrane

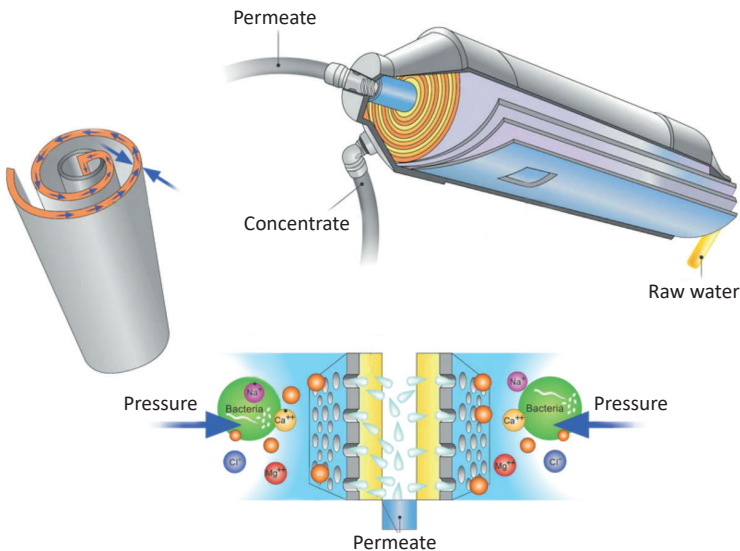
- The membrane has very little effect on the pH value: pH value before treatment ~ pH value after treatment. The demineralised water remains approximately neutral (the pH value is usually slightly lower after treatment).
- The membrane technology is not compatible with system flushing.
- Once the membrane has been inserted, it is "used". If the membrane does not remain in use, it may become unusable due to bacterial, fungal or algal growth.
- The first 20-50 litres must always be discarded, because TOCs may be released due to the membrane manufacturing process.
- The first few litres after each use must also be discarded (due to fungal and algal growth, etc...)

- Osmosis systems require a "breaking-in" period for the membrane to reach peak performance. The membrane does not perform optimally/constantly



from the 1st litre.

- The membrane cannot filter out carbon dioxide (CO_2).
- In addition, the CO_2 affects the pH value.



- Chlorine and chlorinated water must be avoided, because the membrane is made of polyamide, which can disintegrate at concentrations of > 0.25 ppm.
- If the raw water has a high level of conductivity, so will the permeate.

Membranes have a linear effect.

- Salt retention rate: 93-96 %
- Ratio (for a new membrane): Permeate to concentrate = 60:40
- At higher water temperatures, membranes are more efficient. The optimum operating temperature is between +20 °C and +35 °C.

With every degree less, performance drops significantly.

For example, if the water inlet temperature is +10 °C, the output can drop by 40 % or more.

Storing the membrane

- Version a) The best way to preserve the membrane for storage is to sterilise it with sulphite solution or a 3 % hydrogen peroxide solution. Store the still damp membrane in an airtight container in a cool, dark place.
- Version b) Leave the membrane in the device, with the device filled with water (risk of frost!)
- Version c) Remove the membrane, seal it airtight in a plastic bag, and store it in a cool, dark place

The used membrane must never be allowed to dry out.



4.2. Dimensions

Dimension	PUROTAP® expert
Height	133 cm
Width	64 cm
Depth	60 cm
Weight	100 kg

4.3. Performance data

	PUROTAP® expert
Min. inlet pipe throughput	30 l/min
Pmax. inlet pipe	9 bar
Max. operating pressure with pump	18 bar
Desalination capacity without pump	up to 10 l/min #
Desalination capacity with pump	up to 20 l/min #
Tmax	45 °C *
pH range	3-10
Pump connection	230 V AC, 16 A
Filter membrane service life	approx. 100,000 l **

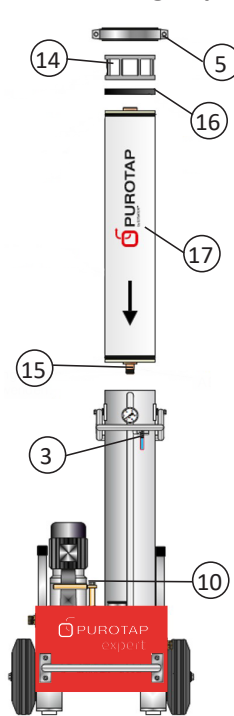
- # The desalination capacity depends on the salt content of the raw water. The higher the salt content, the lower the throughput. The inlet pressure and the inflow rate also have a significant impact. The permeate output will gradually decrease over the service life. The higher the system backpressure, the lower the output.
- * The inlet temperature of the raw water has a significant impact on the desalination capacity of the device. (ideal T = +25 °C). If the water has an inlet temperature +10 °C, the output can drop by 40 % or more.
- ** The service life of the filter membrane depends on the contamination level of the raw water. Contaminants shorten the service life of the filter membrane. Storage of the membrane also has an impact on its service life.

5. Operation

5.1. PUROTAP® E90 membrane

To operate the PUROTAP® expert, a PUROTAP® E90 membrane is required (see 5.2. for insertion instructions)

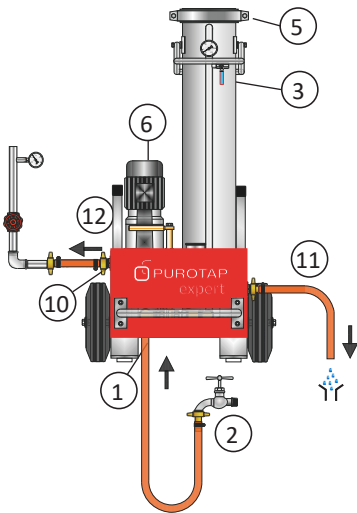
5.2. Installing/replacing the filter membrane

- 
1. Disconnect the pump from the power supply
 2. Disconnect the device from the water supply and the system to be filled
 3. Release the pressure
 4. Open the single lever fitting (10) (lever pointing forwards)
 5. Open the aeration tap (3)
 6. Open the cover (5) on the filter casing
 7. Remove the spacer ring (14)
 8. Remove the prefilter (16)
 9. Remove the filter membrane (17) (tilt PUROTAP® expert if required)
 10. Unpack the new filter membrane. Please note: Open the plastic bag close to the weld seam. The plastic bag is reused for storing the membrane!
 11. Lubricate the connector (15) with silicone grease
 12. Insert the new filter membrane (17) with connector (15) pointing down
 13. Insert a new fine filter (16)
 14. Insert the spacer ring (14)
 15. Close the cover (5)



The filter casing cover must be closed properly!

5.3. Connection



Connect the device to the raw water (2) at the inlet (1) using an adequately sized tube.

Connect the permeate outlet (12) to the system to be filled, also using a tube. Use a tube to route the waste water/concentrate outlet (11) to a drain.



- The water supply (2) must exhibit a flow rate of at least 30 l/min and a pressure of between 2 and 9 bar.
- Where DIN EN 1717 is applicable, a pipe separator must also be installed upstream of the filling station. Observe the water supply utilities' regulations.
- PUROTAP® expert does not contain any mechanism for automatic shut-off when the required pressure is reached. If system filling is not continuously monitored, a pressure reducing valve must be connected upstream to prevent damage to the heating system due to overpressure.
- Always use sufficiently pressure and temperature resistant hoses (e.g. reinforced hoses).
- PUROTAP® expert may only be pressurised for the duration of the filling process. Permanent connection under pressure is not permitted.

5.4. Commissioning

1. Turn the single lever fitting (10) in the direction of flow = close
2. Close the aeration tap (3)
3. Open the water supply (2)
4. Open the single lever fitting (10) and aeration tap (3) and vent the casing
5. Close when no more air is escaping from the aeration tap (3)
6. If required, plug the pump (6) into the power supply to commission it
7. Observe the pressure at the pure water outlet (12)



The pump can be used to build up a pressure of 18 bar at the device outlet/permeate (12) in operation. It is therefore essential to install a pressure reducing valve!

5.5. Decommissioning

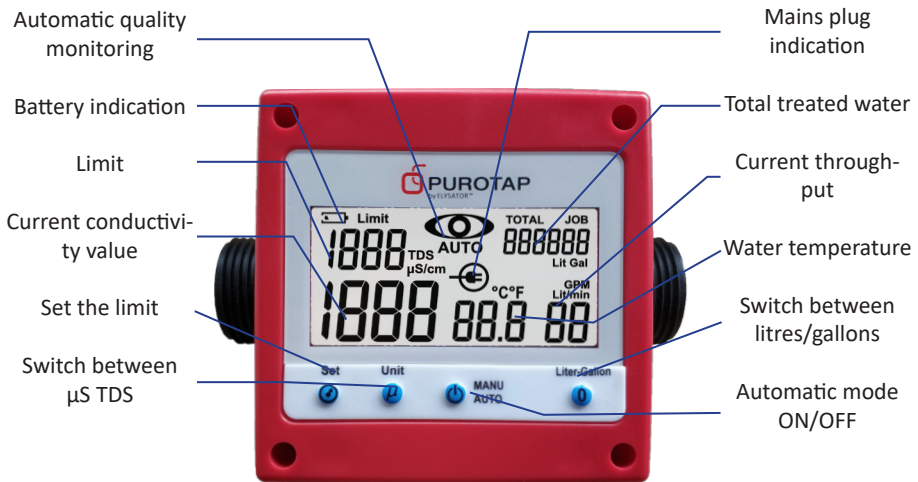
Close the single lever fitting (10), disconnect all hoses, open the aeration tap (3) and the single lever fitting (1) and drain the casing. Store the membrane (17) correctly.

5.6. Combined meter

The combined meter measures the pure water / permeate quality and the throughput (l/min and total throughput).



For detailed information about the combined meter, see the PUROTAP® LFM-20 product page on our website.



Set key

Each time the set key is pressed, the limit is increased by 10 $\mu\text{S}/\text{cm}$ or 6 TDS. Hold the key for 3 seconds to reset the limit to zero. Programming the limit ensures that a warning is issued when the filter membrane is spent. If the set limit is exceeded, the backlight flashes red and an acoustic alarm sounds. In addition, the floating contact is switched over (only when using the optional power supply unit).

Unit key

Use this key at any time to switch between electrical conductivity ($\mu\text{S}/\text{cm}$) and TDS (total dissolved solids) as well as between $^{\circ}\text{C}$ and $^{\circ}\text{F}$. The first two are units of measurement for the amount of minerals dissolved in the water. Most European component manufacturers use the unit of measurement $\mu\text{S}/\text{cm}$ (microsiemens per centimetre). Water hardness at the output of the refill device can be determined using the following rule of thumb: 1 $^{\circ}\text{fH}$ corresponds to approx. 20 $\mu\text{S}/\text{cm}$, while 1 $^{\circ}\text{dH}$ corresponds to approx. 35 $\mu\text{S}/\text{cm}$. Sequence of units: $\mu\text{S}/\text{cm}$ -- $^{\circ}\text{C}$ | $\mu\text{S}/\text{cm}$ -- $^{\circ}\text{F}$ | TDS -- $^{\circ}\text{C}$ | TDS -- $^{\circ}\text{F}$

ON/OFF key (MANU/AUTO)

Press the  key once to switch on the combined meter. The water quality is measured for 10 seconds and compared to the set limit. During measuring, the screen backlighting is blue and the conductivity value is displayed. If the measured value is below the set limit, everything is OK. If the measured value exceeds the limit, the display flashes red, an alarm signal sounds and the floating contact switches over (only when using the optional power supply unit). The current throughput and the water temperature, as well as the total water throughput, are continuously displayed. Press the key for approx. 3 seconds to switch off the device. If the combined meter is switched on and measures no throughput for about one hour, it automatically switches off. During operation with the optional power supply unit, the combined meter does not automatically switch off and cannot be switched off manually. If the combined meter has switched off automatically, it will automatically restart once the throughput (> 2 l/min) resumes. If the combined meter is switched off using the ON/OFF key, it will not restart automatically.

Auto mode

Press the  key twice in quick succession to start automatic monitoring by the combined meter. The  symbol is shown to indicate that monitoring has been enabled. In auto mode, the meter only takes measurements when water is actually passing over it. If the throughput is interrupted, the meter continues to show the last captured value. When a throughput is present, the meter takes a new reading of the conductivity value after every 10 litres and displays it. If the limit is exceeded in two successive measurements, the display continuously flashes red and an acoustic alarm sounds. In addition, the floating contact is switched over. If the  key is pressed for a third time, the meter exits auto mode.

Litre-gallon key

Briefly press this key once to select the throughput indication in litres per minute (l/min) or gallons per minute (GPM). Press the key for approx. 3 seconds to reset the total throughput volume ("JOB") to 0. We recommend setting "JOB" to 0 after every filter change. Press the key for 8 seconds to reset the "TOTAL" litres value to 0.



With reverse osmosis, the conductivity does not increase as the PUROTAP® E90 membrane is used. The conductivity slowly decreases to zero when the permeate output (12) drops below roughly 5 l/min.

5.7. Troubleshooting

Water conductivity is too high after filtration:

- Has the membrane been installed correctly (tap at the bottom, prefilter, spacer ring, cover)?
- Has the cover been fitted correctly (polished surface on the outside)?
- Is there carbon dioxide in the water? This is not filtered out and increases conductivity.

Throughput is too low:

- Is the minimum throughput of 30 l/min present at the inlet?
- Is the prefilter clogged?

6. Maintenance

6.1. Battery replacement

If the battery symbol () is displayed, the batteries must be replaced.

Undo the 4 screws on the red cover, lift off the cover and insert 3 new AAA (LR03) 1.5 V batteries. Make sure the cover seal is seated properly. Refit the cover and secure with the screws. Check the device is working correctly.



For detailed information about the combined meter, see the PUROTAP® LFM-20 product page on our website.

6.2. Draining

To reduce the weight of the device for transportation and avoid frost damage in winter, the water must be drained after use. Draining is carried out by opening the aeration tap (3) and single lever fitting (10).



To avoid frost damage, the device must be drained if temperatures are below freezing point!

6.3. Storing the membrane

See 4.1. Properties of the PUROTAP® E90 membrane.

7. Spare parts

Item no.	Designation
102 358	PUROTAP® expert, cover seal
102 220	PUROTAP® expert, pump
102 278	PUROTAP® LFM-20, combined meter
101 172	PUROTAP® expert, prefilter
102 359	PUROTAP® expert, spacer ring
102 360	PUROTAP® expert, tank cover clamp, complete
102 361	PUROTAP® expert, tank cover

8. Consumables

Item no.	Designation
101 221	PUROTAP® E90, membrane
100 750	PUROTAP® label, heating system demineralised
100 280	PUROTAP® LFM-20, device batteries (3×)

9. FAQ PUROTAP® expert

Water is not filtered (measured conductivity value is too high)

- Does the membrane appear to be in good condition?
- Are either of the O-rings on the connector damaged or brittle?
- Does the spacer ring sit correctly on top of the membrane?
- Is the filter casing cover fitted correctly?
- Is the device sealed correctly?
- Is the membrane spent? Poss. contaminated? Poss. clogged up?
- Depending on the raw water properties, I am checking the conductivity values of other substances (elements).
- The membrane cannot filter out carbon dioxide (CO₂). In addition, the CO₂ affects the pH value.

Throughput is too low

- Is there a filter in the inlet line? If so, is the throughput after the filter satisfactory?
- Is the throughput volume sufficient? Target: At least 30 l/min!
- Is the water being filtered heavily contaminated? Is there visible residue on the membrane?
- Is there back pressure on the permeate (pure water) side (e.g. system almost full, etc.)?
- Is the membrane spent?
- How was the membrane stored?
 - o Without packaging, exposed to dust = poss. clogged up
 - o Humidity in packaging = poss. contaminated

- o Dry membrane = is membrane torn (due to drying out)?
- Is the water inlet temperature too low? For example, if it is +10 °C, the output can drop by 40 % or more.