H2O DESAL
ELYSATOR Eng. AG™

Operating instructions
H2O DESAL® d-toc 55
for use in the PUROTAP® leader

Installation
Function
Operation
Service





ELYSATOR
engineering water

swiss made

Table of contents

1. Safety instructions 4

2. Function 5

3. Standard delivery 6

4. Specification
   4.1. Device description 7
   4.2. Properties of the H_2O DESAL® d-toc 55 cartridge set 7
   4.3. Dimensions 8
   4.4. Performance data 8

5. Operation
   5.1. H_2O DESAL® d-toc 55 cartridge set 8
   5.2. Connection and commissioning 9
   5.3. Inserting and changing the H_2O DESAL® d-toc 55 cartridge set 11
   5.4. Treating the system water 11

6. Maintenance
   6.1. Changing the H_2O DESAL® d-toc 55 cartridge set 12
   6.2. Draining the water 12

7. Consumables 12

8. Options 13

9. H_2O DESAL® d-toc 55 FAQs 13

10. Disclaimer 13

1. Safety instructions



Not drinking water



Maximum 4 bar up to 20 °C



Maximum 2.5 bar up to 40 °C



Disposal with household waste



Operation under super-
vision



Maximum throughput 10 l/min



Max. volume of water to be treated per cartridge
5000 l at 100 mg/l TOC

2. Function

Heating and cooling systems use water as a heat transfer medium. The water circulates from the place where heat is generated to the consumer and back. Even if the system always reuses the same water, aggressive substances can enter the closed water system due to leaks or errors during filling, which can lead to corrosion, or damage modern components.
One of the ways to determine whether aggressive substances are present in the system is to measure the sum parameter of TOC (total organic carbon) in the circulating water. Clean water has a TOC content of 1-2 mg/l. The SWKI guideline BT 102-01 specifies a target value of < 30 mg/l for TOC in closed systems without antifreeze. There are many possible causes for an increased TOC value, including:

- Use of contaminated hoses/pumps/material during filling
- Refrigerant breakthrough in the heat exchanger
- Antifreeze or brine fluid in the system
- Microbiological processes
- Other unclear causes

The H_2O DESAL® d-toc 55 cartridge set can be used to reduce the TOC content in water for technical applications. This serves as corrosion protection in closed systems.

H_2O DESAL® d-toc 55 works on the basis of adsorption. This means that harmful carbon compounds accumulate on the specially selected filter material and are thereby removed from the water.

The PUROTAP® leader is required to use the H_2O DESAL® d-toc 55 cartridge set. This device is available separately.

In a closed system, the device is connected with the built-in H_2O DESAL® d-toc 55 cartridge set in the bypass flow and operated with a pump at a low flow rate. The system volume should be circulated at least 3 times. Up to 5000 litres of water with a TOC value of up to 100 mg/l can be purified with one cartridge set. For larger system volumes or higher TOC values, multiple cartridge sets must be used.

Due to the risk of transferring contaminants, the cartridge set may only be used once on a system. The cartridge set must be disposed of after a single use.



- Pre-rinsing necessary
- Connect in the bypass flow
- At least 3 system circulations recommended
- For single use

3. Standard delivery

- H_2O DESAL® d-toc 55 cartridge set
- Operating instructions

The set must be used in accordance with the original packaging (marked top, centre, bottom), otherwise the effectiveness may be reduced.

PUROTAP® leader must be used or must be ordered separately.

4. Specification



4.1. Device description

The PUROTAP® leader operating instructions can be found here:

4.2. Properties of the H_2O DESAL® d-toc 55 cartridge set

When the cartridge is first used, both the pH value and the conductivity in the water may change slightly. This is relativised during the course of operation so that the initial values are reached again at the end.

If the system water is too dirty (coarse particles), the cartridge set may become prematurely clogged. If this type of contamination is present, a particle filter (MF-21 magnetic dirt filter) should be installed upstream of the device with the H_2O DESAL® d-toc 55 cartridge set.

The efficiency of the H_2O DESAL® d-toc 55 cartridge set varies depending on the origin and composition of the total organic carbon (TOC) in the water. The following table provides guidance on this:

Origin of the TOC contamination	**Efficiency**
Antifreeze	(+)
Corrosion inhibitor	++
Refrigerant	+
Cleaner with complexing agent	(+)
Microbiological*	+

++ very good reduction
+ good reduction
(+) limited reduction
- no or virtually no reduction
* for a sustainable TOC reduction in the case of microbiological contamination, additional cleaning steps are necessary

4.3. Dimensions

H_2O DESAL® d-toc 55	**Dimension**
Height of the cartridge set	50 cm
Diameter	25 cm
Weight	approx. 10 kg

4.4. Performance data

H_2O DESAL® d-toc 55	**Dimension**
Capacity	up to 5 m^3 system water at 100 mg/l TOC
Max. throughput	10 l/min (the lower the flow rate, the more efficient the cleaning effect)
Operating pressure for max. 24h	maximum 4 bar at 20 °C maximum 2.5 bar at 40 °C

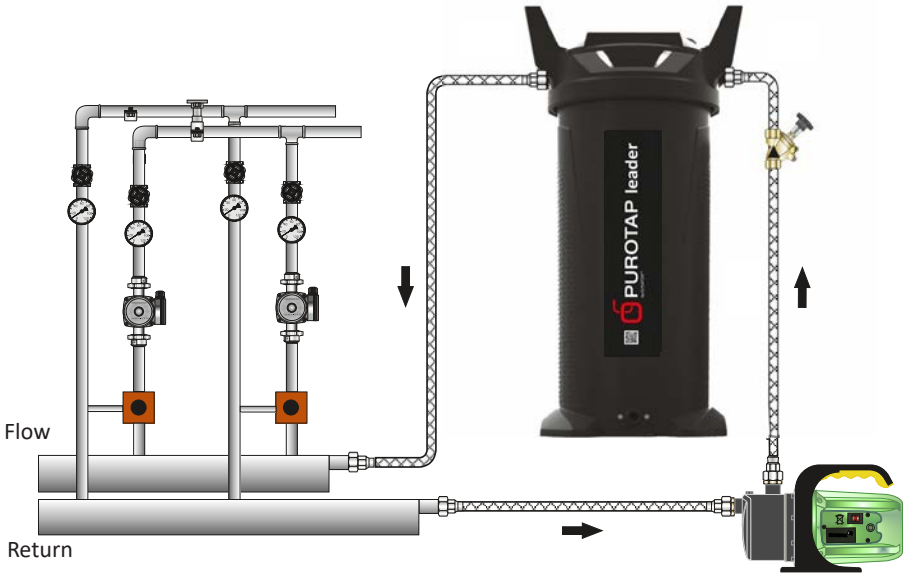
5. Operation

5.1. H_2O DESAL® d-toc 55 cartridge set

The H_2O DESAL® d-toc 55 replaceable cartridge is inserted into the PUROTAP® leader for operation of this device. The complete cartridge set (3 individual cartridges) must be used in order to operate the device.

5.2. Connection and commissioning

The H_2O DESAL® d-toc 55 should only be used in the bypass flow (partial flow process) at the coldest point of the system.



For optimum process control, the differential pressure unit (item no. 102 691) including flow limiter to 10 l/min should also be used. Connect directly to the head of the PUROTAP® leader.

The recommended flow rate for H_2O DESAL® d-toc 55 is a maximum of 10 l/min. In general, the lower the flow rate, the better the result, as adsorption requires a "dwell period".
The device with the H_2O DESAL® d-toc 55 cartridge set is integrated into the bypass flow of the system together with a separate pump (e.g. jet pump, centrifugal pump) and 3 reinforced hoses. The device with the H_2O DESAL® d-toc 55 cartridge set should be connected on the pressure side of the auxiliary pump. It is important that the system's circulation pumps are in operation and that all valves are open and enable thorough mixing of the system water.



The device must be monitored during use and must not be permanently pressurised.
To protect the cartridges from possible contamination, a filter (MF-21 magnetic dirt filter) should be fitted upstream of the inlet of the differential pressure indicator.
In this application, the information unit of the PUROTAP® leader can only be used to set the throughput (l/min) and the total amount of water treated (total litres). All other functions are irrelevant. Any conductivity warning signal that may be issued by the device can be ignored for this application (TOC reduction).
The hoses must be connected correctly as shown above (flow limiter at the outlet).
The equipment includes a non-return valve. If the connection is incorrect/reversed, the system water cannot flow through the device. Note the direction of the arrow on the device head.
Before use, the cartridge must be pre-rinsed with clean water (drinking water or even better, demineralised water) until clear water flows out of the device. This flushes out any loose powder particles from the filter material. The pre-rinse water can be safely discharged into the drain.

5.3. Inserting and replacing the H_2O DESAL® d-toc 55 cartridge set

1. Stop the water supply
2. Release the pressure
3. Detach hoses from the head if necessary
4. Unlock the head with the release lever, open it with a ¼ turn anti-clockwise and remove it
5. Remove spent H_2O DESAL® d-toc 55 cartridges
6. Make sure the lip seal (orange/red) on the tank base is seated properly
7. Insert new H_2O DESAL® d-toc 55 cartridge set
8. If necessary, lubricate O-rings on the cartridges and head with silicone grease
9. Refit the head and close it with a ¼ turn clockwise
10. Connect the inlet hose to the fresh water (or even better, to demineralised water)
11. Route the outlet hose to a drain
12. Pre-rinse the H_2O DESAL® d-toc 55 with clean water until the water runs clear

The spent cartridges can be disposed of as household waste.

5.4. Performing system water treatment

- After pre-rinsing, connect the device with the pump in the bypass flow
- Close the shut-off valve on the device and open the valve upstream of the pump
- Switch on the pump
- Slightly open the shut-off valve on the device, as well as the valve at the system connection, so that a maximum flow rate of 10 l/min is achieved through the H_2O DESAL® d-toc 55 cartridges
- Allow the device to run under supervision until the entire system volume has been circulated at least 3 times
- Switch off the pump
- Close the valves upstream of the pump and downstream of the device
- Drain the device and remove the cartridges
- All components used (e.g. PUROTAP® leader, pump, hoses, etc.) must be rinsed thoroughly with clean water after each use to remove any TOC residues and prevent transfer of contamination.

The PUROTAP® leader does not switch off automatically when the maximum

pressure is reached or exceeded. If the system filling is not monitored continuously, a pressure reducing valve must be connected upstream so that neither the heating or cooling system nor the device itself is damaged by any excess pressure from the pump.

6. Maintenance

6.1. Changing the H_2O DESAL® d-toc 55 cartridge set
See 5.3.

6.2. Draining the water
To reduce the weight for transportation, we recommend draining the water after use.



At colder times of year, it is essential to fully drain the water from the device, as otherwise frost damage could occur.

7. Consumables

Item no.	Designation
102 689	H_2O DESAL® d-toc 55 cartridge set

8. Options

Item no.	Designation
102 691	H_2O DESAL® differential pressure unit incl. flow limiter to 10 l/min
102 310	MF-21 particle filter (magnetic dirt filter)
101 728	PUROTAP® leader, filling device

9. H_2O DESAL® d-toc 55 FAQs

What should I do if the flow rate drops sharply at low differential pressure?
- Clean the prefilter

What should I do if the differential pressure is high?
- Cartridge contaminated with dirt --> Change cartridge, possibly additional pre-filtration (MF-21) before using H_2O DESAL® d-toc 55

10. Disclaimer

All the information in this document is based on current knowledge and does not purport to be complete. No liability claims may be brought in relation to this information.
The process may result in varying degrees of success depending on the origin of the TOC.

All rights reserved. Subject to technical modifications.
The current version can be found at www.elysator.com.