

**Installation and user manual
of
Technical 100**



1. Usage safety

Before connecting and launching the device we advise to read carefully this manual, which includes all important information about safe installation, usage and maintenance of the demineralizer. This manual should be kept in case of any issues that might appear during the running process.

1.1 Installation and service

- Every installation and service should be performed by an authorized technician. Installation or service performed by a person without qualifications can may lead to incorrect system running or be dangerous for the user.
- Before launching, the demineralizer should be unpacked and checked if it is damaged. In case of any damage noticed, it should be described in the delivery documentation.
- Service should be performed only by an authorized technician. It is forbidden to perform a service by the user himself.
- Before plugging in the device you should close the main valve.
- Water supplying the demineralizer should fit the requirements described in point 1.3. You shouldn't use water that does not fit the bacteriological requirements or of unknown quality.
- Before plugging in the device make sure, that tension is compatible with the electric network.
- It is forbidden to run the device when the plug, supplying cable or the device itself is damaged.
- While moving the device, watch out for the supplying cable, as it might break or be damaged.
- Warning, the demineralizer is heavy. Be careful while moving it.
- The device and tank should be located in a place with easy access.
- To keep a good lifetime and long-term efficient work, the maintenance should be performed regularly.
- The producer is not responsible for any damages incurred from improprie device installation.

1.2 Supplying water parameters

- Demineralizer devices are intended for purifying tap water.
- **Pressure** – demineralizer can be supplied by water with 3,5 bar (min.) pressure up to 6.0 (max.) bar. If it is necessary, you should use the reduction valve.
- **Temperature** – demineralizer should not be situated in locations of high or low temperature. Supplying water temperature should fit between 4°C and 38°C. Supplying the demineralizer water of temperature higher than 38°C may damage the device.
- **Salinity (TDS)** – amount of salts dissolved in supplying water should not excess 900mg/dm³.
- **Humidity** – relative humidity in the room should not be greater than 80%.
- **Water hardness** – Water hardness should not be greater than 280 mg CaCO₃/dm³.
- **Iron** – should not be greater than 0,2 mg/dm³.

If any of this parameters is higher than recommended, better preliminary filtration is highly advised. In that case, you should contact with our service.

1.3 Power supply voltage

- Rated voltage: 220-240V
- Frequency: 50 Hz
- Maximum consumption of power: 4A

2.General information

TECHNICAL demineralizers are devices perfect for washers, analyzers, autoclaves, environmental chambers, water baths, as well as, through developing a proper network, supplying several laboratory rooms and floors. They are fully-automated and maintenance-free.

Allows obtaining third class water, according to PN-EN ISO 3696:1999.



2.1 Operating method

TECHNICAL demineralizer works under the tap water pressure. The purification process is fully-automated and maintenance-free. It consists of following steps:

- 1/ mechanical filtration
- 2/ carbon filtration
- 3/ reverse osmosis (RO)
- 5/ UV lamp 254 nm



Prefilter

2.2.1 Mechanical filtration and carbon filter

(5 µm) 10" - Residual filter is intended for preliminary filtration, preparing tap water for reverse osmosis. It consists of a string cartridge made of polypropylene fiber, coiled on the filtration core, which is situated in the transparent filter housing. It keeps all the mechanical particles with a size up to 5 µm.

Carbon filter 10" – is intended for preliminary filtration, preparing water for reverse osmosis. A filling of the carbon filter is made of block active carbon put into the housing. Contaminants are sorpted by the active carbon.

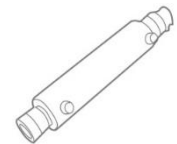
2.2.2 Reverse osmosis

RO membrane holds up to 96-99% organic and non-organic contaminants dissolved, as well as heavy metals and radioactive elements (with a size up to 0,01 micron). Water conduction oscillates around 8-20 µS/cm.

Semipermeable membrane consists of many layers coiled on a perforated pin situated inside the membrane. Polluted water is pressed on the membrane's surface, where water particles by diffusion penetrate the membrane. Contaminants are thrown out to the waste-pipe. Purified water gets through holes to the central pin, and under the pressure, it flows out of the membrane.

2.2.3 UV lamp (option)

UV lamp is used for disinfection. This device emits radiation with 254 nm or 185/254 nm wave length, which reacts with DNA of bacteria existing in water. UV lamp consists of a expose chamber containing UV radiator, protected by a removable quartz sheath, mounted inside. In the device water flows alongside with the lamp, between the housing and the sheath.



3. Technical specification

Dimensions: 1000x700x1500mm
Maximum feed water pressure: 0,6 MPa
Minimum demineralized water pressure: 0,35 MPa
Feed water temperature: 4 – 38°C
Device efficiency: 100 dm³/h +/- 10%
Power supply voltage: 230 V + 10%
Frequency: 50 Hz
Maximum operating pressure: 1,3 MPa



This device is equipped with:

- sediment filter 5µm 10",
- carbon filter 10",
- production pump,
- membrane module 4040,
- UV lamp 254 nm or 185/254 nm*,
- conductometer measuring feed and after reverse osmosis conductivity,
- with an alarm informing about necessity to replace disposable materials
- manometer measuring feed water pressure,
- storage tank for purified water*,
- automatic membrane rinsing,
- thermal protection of the membrane module,



- microprocessor control system - "touch panel"
*option
- valve no. 1 - tap water connection
- valve no. 2 - demineralized water collection point (third class PN 3696)
- valve no. 4 - drain waste point (must not be closed, must always be unobstructed!!!)



valve no. 1



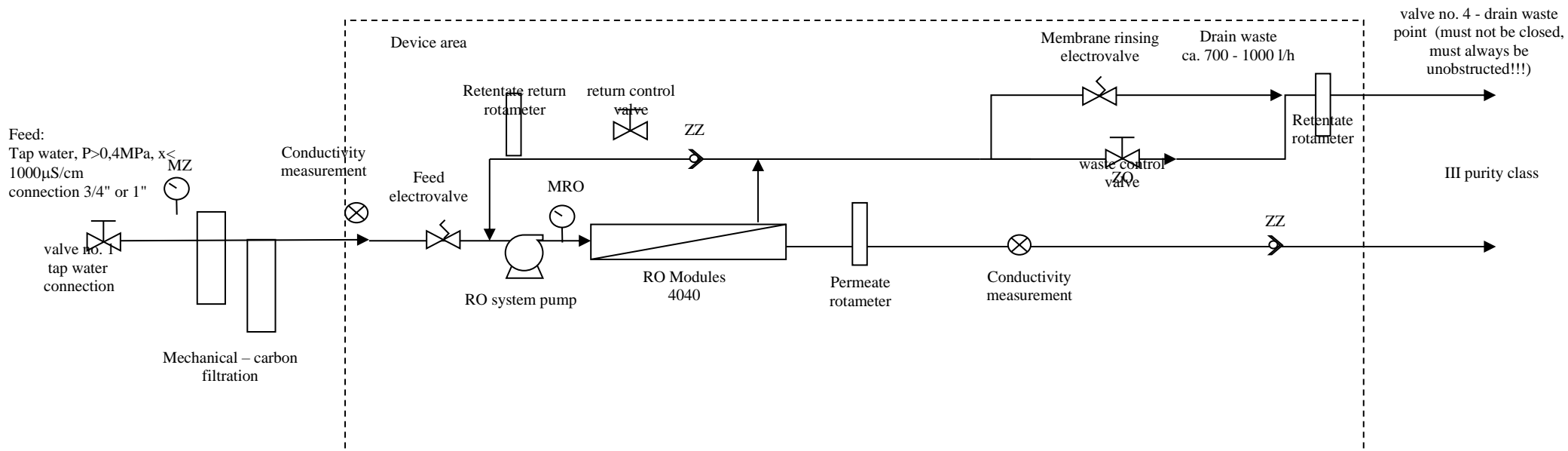
valve no. 2



valve no. 4



3.2 Technical 100 hydraulic schema



Legend:
 MZ – tap water manometer
 MRO – RO module manometer
 ZZ – return valve
 ZO – drain valve



3.1. Materials

All materials used are inert. The most important for the quality of water are materials used after the second step of the purification process, all the wires are made of polyurethane, connectors and fittings – polyethylene or PVC, distributors and filtration nozzles – polyethylene, conductivity sensor – polyethylene and stainless steel



4. Mounting

- Best results are gained when soft water is used to feed the Spring demineralizer.
- Feed water should fit the requirements listed in 1.3
- Doing the feed water quality analysis allows to choose a proper preliminary purification method
- Cartridge replacement should be performed with a frequency recommended in this manual

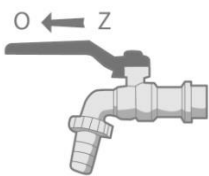
WARNING: It recommended to run the demineralizer for at least 15 minutes each day.

4.1 Technical demineralizer installation

It should be remembered to put attached plugs into the wires (which are connected by caps). In case of quick connectors, just put the flat-cut wire to the connector.

Step 1

Put the device in a suitable place.



Step 2

Supply valve installation.

Because of different local conditions, supplying valve has two reductions: $\frac{1}{2}$ " i $\frac{3}{4}$ ".

You should make sure, that the main tap water valve is turned off and water in the feeding pipe is not under pressure.

You should make sure, that the Technical demineralizer is fed by cold water.

• Step 3

- connect cold water feed to the valve no. 1
- connect the retentate pipe to the drainage



- connect the computer cable to 230V power supply

5. Launching the demineralizer



Step 1

Check the correctness of every device.

Step 2

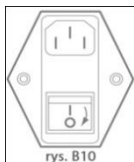
Pressure test for checking the leakproofness.

Turn on the supplying valve.

Turn on the "Tap H₂O", when water appears – turn off.

Check the demineralizer leakproofness.

5.1 Turning off the demineralizer.



Follow the steps below:

Turn off the power.

Turn off the feed water valve.

Turn off the demineralized water tank valve.

5.2 Operation



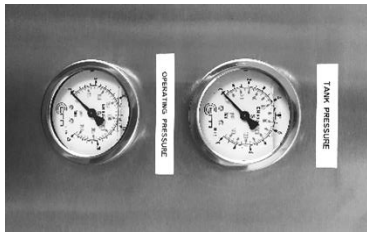
Starting the system

- Open the "waste control valve"
- Close the "return control valve"
- Open the feed water valve
- Turn on the power supply 230V
- A production pump and automatic membrane rinsing will begin to operate



- After the automatic membrane rinsing shuts down (estimated 20 seconds), gradually close the "waste control valve" until you reach a flow rates between permeate rotameter to retentate rotameter 1:1,5 – 1:2 such that the "operating pressure" stabilizes between 10-12 bar level.





- Now keep opening the "return control valve" until reaching the "retentate return" flow rate 4-8 LPM, keeping the "operating pressure" no lower than 8-10 bar.

6. Monitoring functions

TECHNICAL demineralizer has a built-in control system informing about the necessity to replace the filtration cartridges. It is possible to connect it with a computer, allowing for an individual set of alarm levels and service frequency. The device is also equipped with a conductometer measuring conduction and temperature of the reverse osmosis water.

The device also has a manometer measuring feed water pressure. Feed water pressure value indicates whether the device is working (value equals to the network pressure) or if the tank is full and the device has been automatically turned off (value equals 0).

6.1 Measuring and controlling panel

Alarms informing the user about necessity to perform maintenance procedures:

- „change prefilter" and a sound signal – informs the user about necessity to replace the sediment-carbon filters, alarm time is set to 6 months
- „change UV" and a sound signal - informs the user about necessity to replace the UV radiator, alarm time is set to 12 months - option

6.2 „Touch panel" usage



Turning on/off the panel

Touch the Hydrolab logo to display the main window

Basic mode contains information listed below:

- demineralizer model
- current date and time (top right corner)
- reverse osmosis water parameters
- tank fill level
- active alarms icons
- icons of particular system functions
- sound alarm icon - „speaker"

WATER PARAMETERS



Touch this icon to display the feed water parameters:

- conductivity (in units: $\mu\text{S}/\text{cm}$ or $\text{M}\Omega\text{m}$)
- temperature (in $^{\circ}\text{C}$)
- tank fill level





Touch this icon to display the water processed by reverse osmosis parameters:

- conductivity (in units: $\mu\text{S}/\text{cm}$ or $\text{M}\Omega\text{m}$)
- temperature (in $^{\circ}\text{C}$)
- retention level
- tank fill level

There are three independent levels of conductivity and temperature values of feed, processed by reverse osmosis, and ultrapure water:

I. **blue color** – correct value

II. **yellow color** – warning; values are too high

In case of an alarm occurrence the user should:

- turn on the automatic membrane rinsing – in case of an exceeded conductivity value of water processed by reverse osmosis

If, despite the performed procedures, alarms are still present, the user should contact the service.

III. **red color** – alarm; value too high

In case of an alarm, the user should:

- turn on the automatic membrane rinsing – in case of an exceeded conductivity value of water processed by reverse osmosis

If, despite the performed procedures, alarms are still present, the user should contact the service.



AUTHORIZED SERVICE



Touch this icon to view the contact data to an authorized Hydrolab service

DOSING (OPTION)



Touch this icon to collect water

The user can input to the system memory 3 values of dosed water volume:
To set the volumes (separately for 1, 2, and 3) touch the icon „key”.
Touch „start” – measure the water volume, and press „stop”.

INFORMATION



Touch this icon to view the maintenance deadlines of particular disposables:

- integrated module
- UV lamp radiator (option)

ALARMS



Touch this icon to get information about active alarms:

The user is also informed about:
- too low (<4°C), or too high (>40°C) water temperature
- current system status, for instance „filling the tank”

MEMBRANE RINSING



Touch this icon to perform the membrane rinsing

TURNING ON/OFF THE SOUND SIGNALS

To toggle the sound signal of active alarms, touch the „speaker” icon

6.3 Functions protecting the operation process

Demineralizer automatically turns on when the demineralized water is provided, and works until a full replenishment. When the tank reaches a proper pressure, the device is automatically turned off. Technical demineralizer is equipped with a membrane pump, and low/high pressure sensors. It allows operating without necessity to constant maintenance of the device. The demineralizer is automatically turned off when:

- the pressure is too low
- the tank is full
- there is no water feeding the device

7. Maintenance

This system uses disposable materials listed below:

- sediment filter 5µm 10",
- carbon filter 10",
- UV lamp 254 nm *,
*option



7.1 Preliminary filter replacement

Preliminary filters: 5 µm, carbon filter 10"

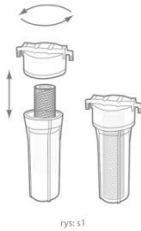
Frequency of replacement depends on amount and quality of water. For the hygienic purposes, the control should be performed at least once per 6 months. This can be performed by a user himself.

About necessity to replace the preliminary filters a user is informed by the control system on the display screen. Information appears on the screen ("change prefilters") and there is a sound signal.



Step 1

Turn off the device (5.1) and close the feed water valve.



Step 2

Replacement of a 5 µm pre-filter (s1):

- Twist off the filter body using a hand or a key
- There is a rubber seal in the body – don't lose it
- Remove the filtration cartridge and put in a new one
- Tighten up the head to the body until a delicate resistance, and then a bit more.

Step 3

Replacement a block carbon:

- Open the device's back
- Remove the filtration cartridge and put in a new one
- Close the back



Step 4

- Open the feed water valve
- Check the leakproofness
- Press the "reset" button

7.4 UV radiator replacement*

WARNING: the radiator is very fragile!

Step 1

- Turn off the device
- Close the tank Valve

Step 2

Disconnect the lamp from the power supply.

Take out the rubber cover and carefully slide out the radiator. Disconnect the power supply cable from the radiator and remove the radiator from the housing.

Step 3



To mount a new radiator, take it carefully from the box – don't touch the transparent surface (in case of dirt – clean it with alcohol). Slide it in carefully into the quartz sheath (1), connect the power supply cable and pull it into the rubber cover on the aluminum sealing cap (2). Secure the cap. (3.1 – 3.2) Check the grounding – green wire should be connected with a bolt located on the side of the device.

Step 4

- Open the feed water valve.
- Check the leakproofness.
- Open the tank valve.

Step 5

Connect the lamp to the power socket.

7.5 Replacing the RO module

RO module works for 4-5 years (assumption – it depends on the quality of feed water).

The membrane cartridge lifetime may differ, depending on the flow, its character and type of contaminants.

Symptoms of imperfect membrane module work:

- slower flow,
- lower efficiency.

A replacement of the RO module is performed by an authorized service of Hydrolab.

7. Work safety regulations

Conditions of the location and other issues concerning the device may be regulated by certain law acts and bills.

You particullary should not:

- touch the switches with wet hands,
- touch the pressure wires with sharp tools

8. Malfunctions in the device operation

Some of them may occur because of not performing simple maintenance or oversights and may be easily fixed by a user himself without necessity to call the service. Unnecessary service call is chargeable, even during the warranty.

WARNING: don't try to fix the device by yourself. Repairs performed by unqualified individuals may cause a serious damage to the device and be dangerous to user's safety.

10. Service

Date	Service	Subject	Signature	Comments
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