

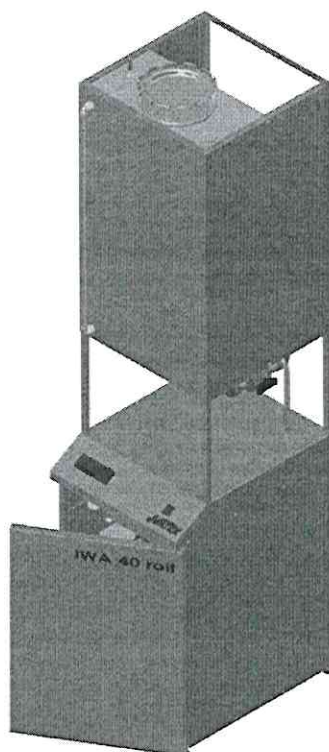


*Ledeč nad Sázavou*

## *OPERATING MANUAL*

# *IWA 40-100 roit*

*device for production of demineralised water*



1  
6/2021



# 1. INTRODUCTION

This service manual states how to operate and service the device correctly. This device is very easy to operate. Nevertheless, we still recommend that you read this manual carefully before you start operating the device. If you follow this advice, you can prevent potential problems arising during operation and you will be able to take full advantage of all functions of this device.

## 2. DESCRIPTION OF THE DEVICE


### 2.1. SCOPE OF APPLICATION

The quality of water produced with the **IWA 40-100 roit** device corresponds to water for analytical purposes, or, alternatively requirements for aqua purificata, with conductivity below  $4.3 \mu\text{S}/\text{cm}$  as per these requirements. The device is designed for medical and pharmaceutical applications or other industrial applications.

### 2.2. DESCRIPTION OF THE DEVICE

The **IWA 40-100 roit** device is a fully automated, microprocessor-controlled device. The device is made of plastic and stainless steel, the frame and casing are from grade-11 steel protected with coating. All main parts of the device are mounted on the frame and casing.

Raw water enters the device under the pressure of 0.25 MPa (2.5 bar) minimum via an electromagnetic valve (**EV1**) into the column of fine mechanical filtration (**F**) and column with an activated carbon cartridge (**AU**). Then it proceeds to the pump (**M1**), which pumps prefiltered water, increases pressure in the system and, at the same time, sustains optimum velocity of flow around the module of reverse osmosis (hereafter referred to as **RO**), which is placed in the housing.

The device is switched on/off to standby mode with a switch placed on the right on the front cover. On the left there is a display of the control system with control keys. The display shows operation parameters of the device. The key  is used to operate the device in the automatic mode. Besides the automatic mode, the user can choose between the following modes:

- **Automatic** (the device operates in the automatic mode and produces demineralised water)
- **Manual** (in this mode, the individual electrical components can be switched on/off)  
This mode is only meant for servicing purposes, no limit values are monitored!
- **Sanitation** (in this mode, the internal piping system including the components and fittings can be sanitised)
- **Rinse** (in this mode, the device can be rinsed before and after sanitation; all water goes to drain)

The device is equipped with a connecting point (**D**) where a sanitising solution can be applied to sanitise the device (valve **V1**).

The device is further equipped with pressure sensors (**P1, P3**), conductivity probes (**G1, G2, G3**), temperature probe (**T3**), and electromagnetic valves (**EV1, EV2, EV3, EV4**), which secure automatic operation of the device. The demineralised water that is produced

goes to an in-built 100-liter tank, which is equipped with a level gauge, microbial filters, and a pump to supply demineralised water under the pressure of 1.5 – 3 bar for further use.

When the tank with demineralised water is full, the IWA device will automatically stop production of demineralised water and will automatically resume operation when the level of water drops. On the contrary, when the level of demineralised water in the tank is low, the IWA device will block the feed pump so that the pump does not run dry. The individual parts of the device are interconnected with PE tubes. The functional diagram in Figure 2 shows the connections and labels of the individual components.

### **2.3. OPERATING CONDITIONS**

The device is meant to be operated under normal conditions according to ČSN 33 2000-5-51.

### **2.4. MATERIALS**

Frame and casing – grade-11 stainless steel protected with coating.

Parts of the device in contact with raw water – PP, PE, PVC, brass, grade-17 stainless steel.

Parts of the device in contact with demineralised water – PVC, PP, PE, grade-17 stainless steel.

## **3. DEVICE DESCRIPTION**

### **Connecting points:**

- A** – water inlet
- B** – product (permeate)
- C** – drain
- D** – suction of regenerating solution
- E** – level gauge connector
- F** – in-built tank connector
- G** – 230V/50Hz power cord connector

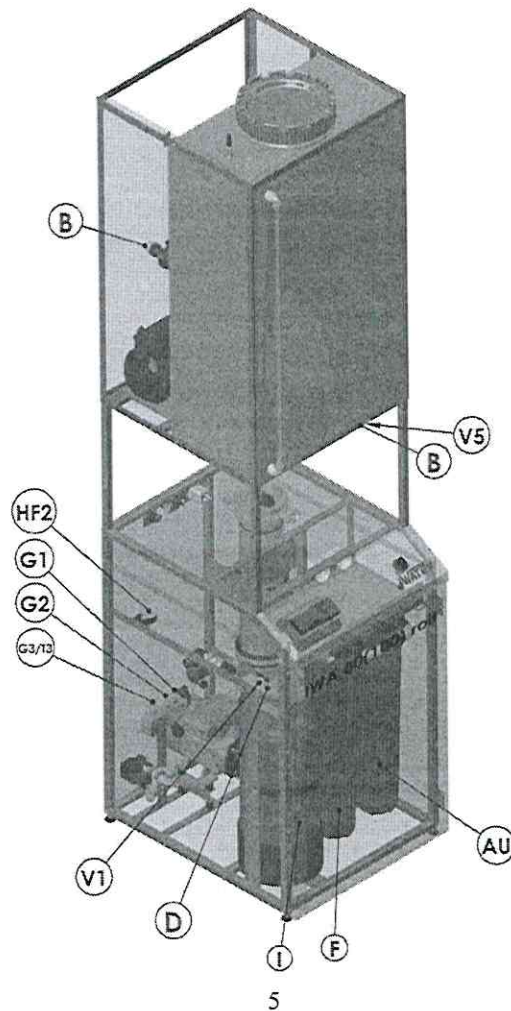
### **Labels of the individual components shown in Figures 1a, 1b, and 2:**

- HF1 – strainer of coarse impurities
- RT – pressure regulator
- EV1 – input solenoid valve
- EV2 – solenoid valve of the RO drain
- EV3 – 3-way solenoid rinse valve
- EV4 – 3- way solenoid rinse valve
- F – filter of fine filtration
- AU – activated carbon filter
- G1 – input conductivity probe
- G2 – probe of permeate conductivity after RO
- G3 – probe of permeate conductivity after ionex cartridge
- T3 – permeate temperature probe
- P1 – pressure switch of feed water pressure



P3 – pressure switch of the RO circuit  
 V1 – sanitising valve  
 V2 – valve to increase pressure in the circuit (factory-set)  
 V3 – valve to cut off supply of demineralised water to M2 pump  
 V4 – valve to cut off demineralised water after M2 pump  
 V5 – valve to draw water from the tank  
 ZK1 – check valve  
 ZK2 – check valve  
 ZK3 – check valve  
 ZK4 – check valve  
 ZK5 – check valve  
 Zk6 – check valve  
 M1 – pump of the RO circulation circuit  
 M2 – feed pump of demineralised water  
 ŘS – control system  
 RO – reverse osmosis  
 R – restrictor  
 HF2 – strainer of coarse impurities  
 I – mix-bed ionex cartridge  
 L – level gauge  
 MF1 – microbial filter  
 MF2 – microbial filter

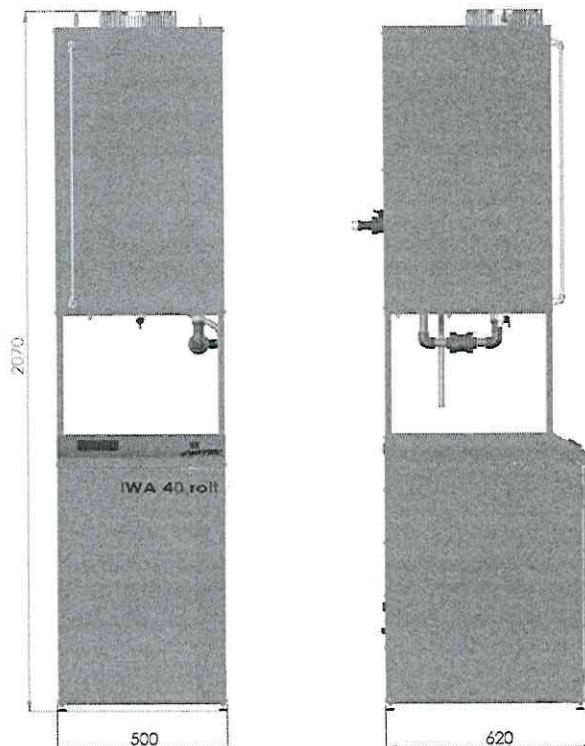
**Fig. 1a – Device description (front view)**



## 4. TECHNICAL DATA

PARAMETER	VALUE
Device output	40 - 100 l/h at 12°C, depending on the type of the device
Minimum required pressure of raw feed water	0.25 MPa
Operating pressure	0.7 ÷ 0.8 MPa
Operating temperature	12 ÷ 25°C
Output conductivity	4.3 µS/cm maximum
Raw water conductivity	2000 µS/cm maximum
Feed	Pre-treated water with parameters according to the supplied analysis
Voltage	230V/50Hz
Installed load	1000 W
Ingress protection	IP44
Protection	ČSN 33 2000-4-41 ed.3, ČSN EN 61140 ed.3, ČSN EN 33 2000-5-54 ed.3
Device dimensions l/w/h	500x620x2070 mm
Volume of tank for demineralised water	100 l
Weight	75 kg
Noise	69.5 dB/A/

*Fig. 3 – IWA 40-100 roit dimensions*



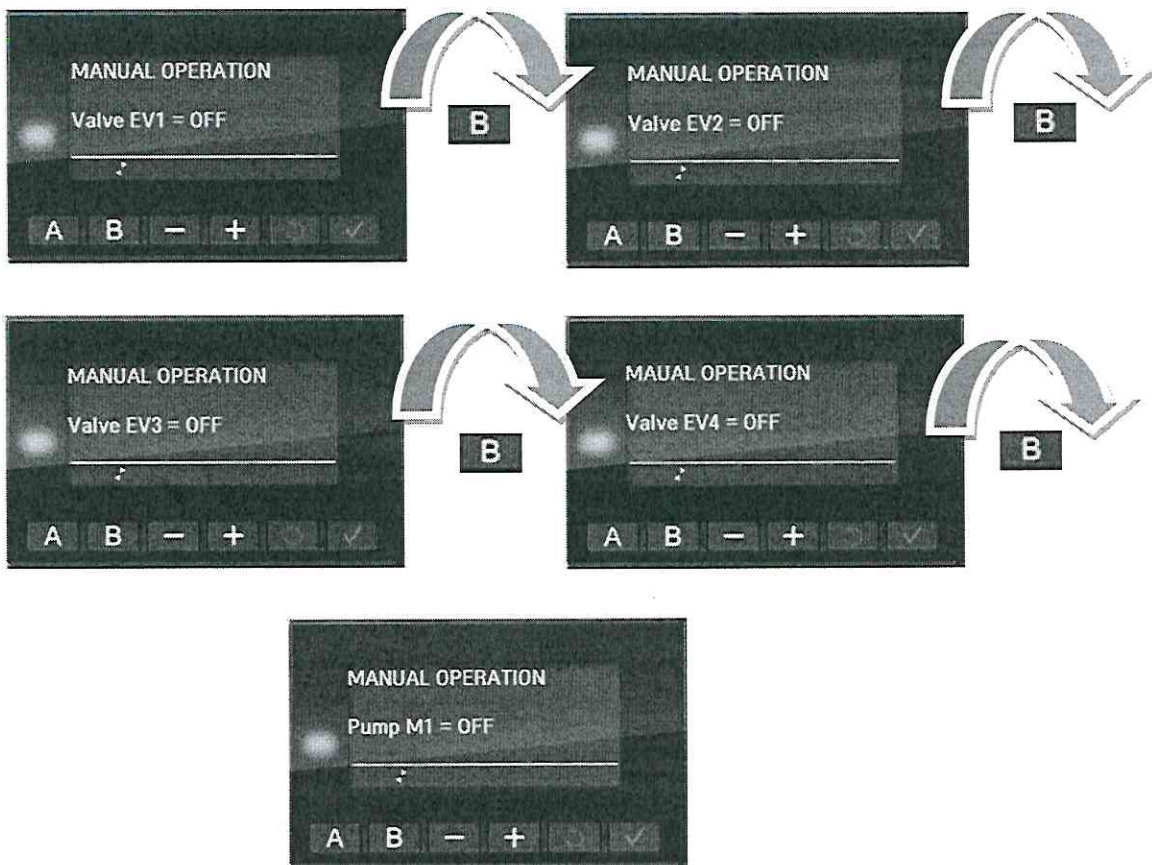
## MANUAL MODE

This mode is functional after entering the safety password (available from the manufacturer upon request).

For servicing purposes and to test fault states the device is equipped with the MANUAL mode. The individual action elements of the device can be switched on individually as needed.

### **WARNING:**

*In this mode there are no active protective functions, therefore it must not be used without detailed knowledge of how the device works! The device must not be left unattended while running in this mode!*




Solenoid valve EV1 (water inlet) = OFF = passage closed

Solenoid valve EV2 (water outlet to drain) = OFF = passage closed

Solenoid valve EV3 (outlet of demineralised water to drain) = OFF = passage closed

Solenoid valve EV4 (outlet of demineralised water to drain) = OFF = passage closed

M1 pump (pump that increases pressure in the system) = OFF = switched off

The individual elements of the device are switched on according to which element is displayed. Press the OK key  to switch it on. Press the OK key again to switch it off or press the ESC key to cancel the manual mode and go back to the initial "AUTOMAT" panel. You can switch between the screens of the individual elements with the "B" key. In the manual mode, you can see the values of measured entities on screens 6 and 7.

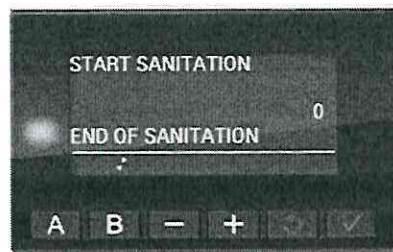


## SANITATION OF THE DEVICE

After setting the “SANITATION” mode and confirming with the “OK” ✓ key, the device will go to the sanitation mode. In the bottom left corner, the remaining time to sanitation completion will be indicated (in seconds).

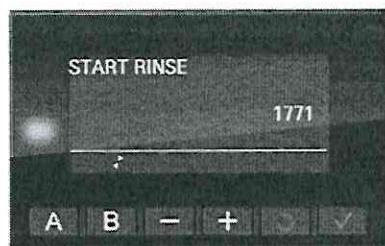


You can interrupt the process of sanitation and quit it with the ○ “ESC” key. If you allow the process of sanitation run to the end of the mode, the device will show a message indicating that sanitation has been completed.



## RINSE

After setting the “RINSE” mode and confirming it with the “OK” ✓ key, the device will go to the “RINSE” mode. In the upper right corner, the remaining time to rinse completion will be indicated.



You can interrupt rinsing and quit the process with the ○ “ESC” key.

## PARAMETER MODE

The mode is functional after a safety password is entered (available upon request from the manufacturer). The purpose of this mode is setting of the device by the manufacturer.

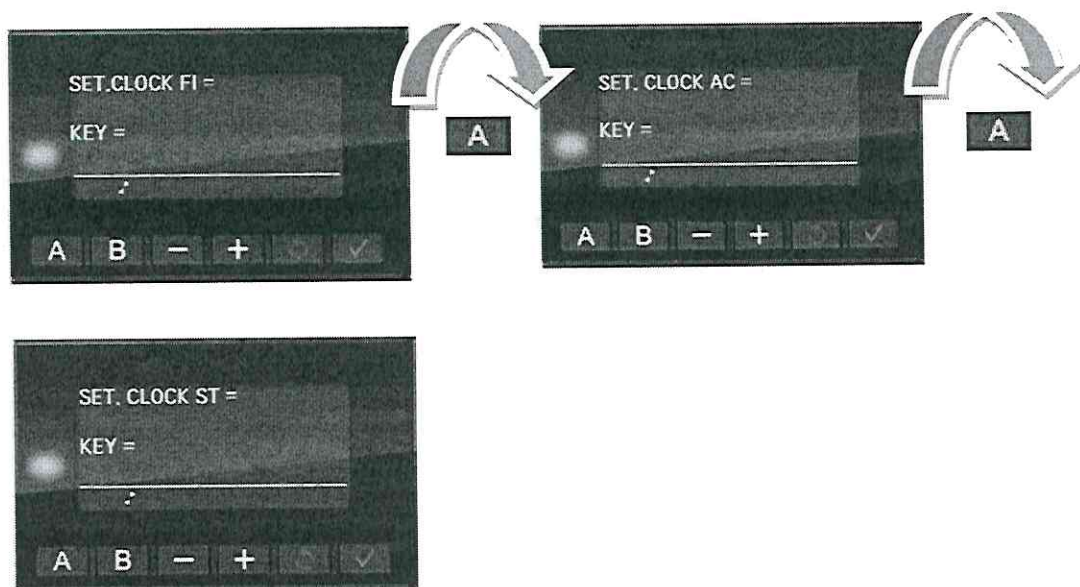
## 6.5. RESETTING THE OPERATING CLOCK OF INLET FILTRATION

Resetting is performed after replacement of the fine filtration cartridge/activated carbon cartridge.

1. Switch the **POWER** main switch to “**I**” position and wait for the message “**AUTOMAT**” to appear. By pressing the “**A**” key, go to the “**SETTING**” mode and confirm with the “**OK**” ✓ key.



2. After selecting the “**SETTING**” mode, choose the filter for which you want to reset time.
3. You can switch between the individual options with the “**A**” key.


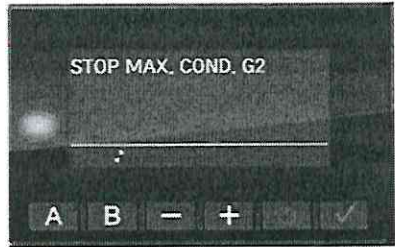

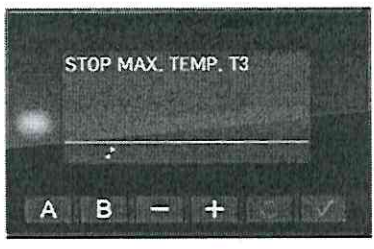


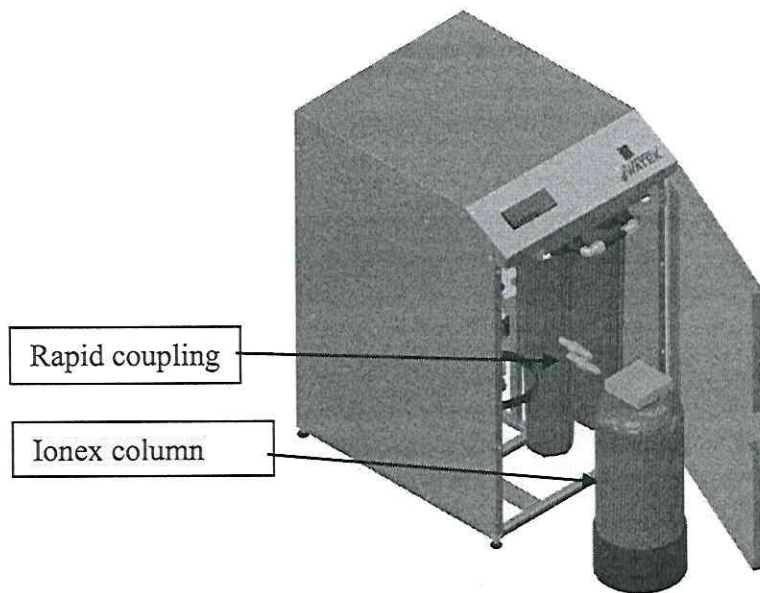
4. Using the “**+**” and “**-**” buttons, enter the safety key (KEY = 79) and press the “**OK**” ✓ button for circa 3 seconds. A message “**SET**” will appear on the display for a few moments. When it disappears, the time is set. Quit the setting by pressing the “**ESC**” ⌫ key and go into the automatic mode (see Chapter 6.3).



## 6.6. ERROR MESSAGES

In the automatic mode, if some monitored value is exceeded, this will be recognised as an error. You can go to the error message with the “A” key on the third screen of measured values. After a time delay, the system will try to switch the device back on in the automatic mode. If the cause of the error lasts, the device will remain switched off after the fifth attempt. The number of attempts at restarting (number of errors) is displayed on the third screen of the automatic mode.

Message	Cause	Troubleshooting
	Set value of maximum conductivity of feed water exceeded	Make sure that feed water has required parameters
	Set value of maximum conductivity after RO exceeded	Check G1 conductivity. If G2 conductivity has risen by more than 100% relative to the initial conductivity of a new RO module (at same set parameters and temperature), replace the RO module.
	Set value of maximum conductivity of water after MIX-BED column exceeded	Replace the cartridge in the MIX-BED column or replace the used-up MIX-BED column with a regenerated MIX-BED column, if you have one.
	High temperature of demineralised water	Check the temperature of feed water



**Note:**

If a spare ionex column has been supplied, only follow steps 1 through 4 during replacement. Unscrew the plug from the spare column and place it on the column with used-up ionex. Send the used-up mixedbed or spare column with used-up mixedbed to the manufacturer for regeneration.

This device makes use of the PUROLITE MB mixedbed ion exchange resin.

After the ionex cartridge has been replaced, it is necessary to rinse it out to ensure the required quality of output demineralised water. Switch the device to the "RINSE" mode. After rinsing is completed, it is possible to go to the automatic mode.

## **RO module replacement**

Longevity of the RO module depends on the quality of feed water and regular replacement of inserts of the filtration block. The expected longevity of the module is 2 years.

The criterium for RO module replacement is a drop in the device output (at the same temperature) of circa 25% or an increase in G2 conductivity after the RO module to more than twice the value of a new RO module that was just put in operation.

RO module replacement is carried out by a service technician authorised by the manufacturer.