HYDROLAB®

EN

USER MANUAL FOR HLP SERIE DEMINERALIZER

ENG

Table of contents


H7
HYDROLAB

HLP MODELS

Model	Efficiency l/h	Microfiltration 0,2 µm	Pressure booster pump	UV lamp 254 nm	Standard PN-EN 3696:1999	Catalouge no.
SMART	4	-	-	-	2 class	DH-0004-00

Model	Efficiency l/h	Microfiltration 0,2 µm	Pressure booster pump	UV lamp 254 nm	Standard PN-EN 3696:1999	Catalouge no.
HLP 5	5	-	-	-	2 class	DH-0005-00
HLP 5s	5	+	-	-	1-2 class	DH-0005-0S
HLP 5p	5	-	+	-	2 class	DH-0005-0P
HLP 5sp	5	+	+	-	1-2 class	DH-0005-SP
HLP 5UV	5	+	+	+	1-2 class	DH-0005-UV

Model	Efficiency l/h	Microfiltration 0,2 µm	Pressure booster pump	UV lamp 254 nm	Standard PN-EN 3696:1999	Catalouge no.
HLP 10	10	-	-	-	2 class	DH-0010-00
HLP 10s	10	+	-	-	1-2 class	DH-0010-0S
HLP 10p	10	-	+	-	2 class	DH-0010-0P
HLP 10sp	10	+	+	-	1-2 class	DH-0010-SP
HLP 10UV	10	+	+	+	1-2 class	DH-0010-UV

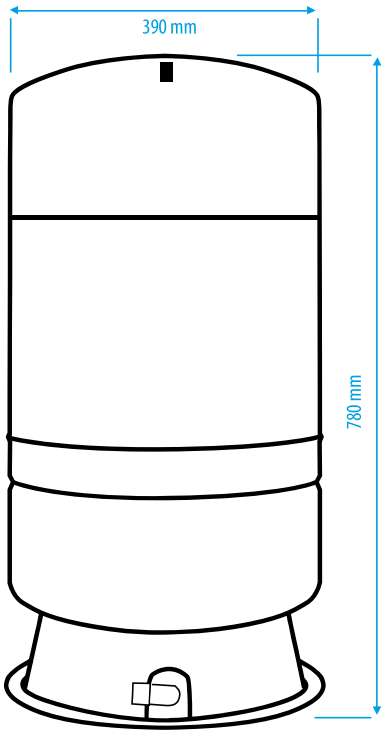
Model	Efficiency l/h	Microfiltration 0,2 µm	Pressure booster pump	UV lamp 254 nm	Standard PN-EN 3696:1999	Catalouge no.
HLP 20s	20	+	+	-	1-2 class	DH-0020-0S
HLP 20p	20	-	+	-	2 class	DH-0020-0P
HLP 20sp	20	+	+	-	1-2 class	DH-0020-SP
HLP 20UV	20	+	+	+	1-2 class	DH-0020-UV

Model	Efficiency l/h	Microfiltration 0,2 µm	Pressure booster pump	UV lamp 254 nm	Standard PN-EN 3696:1999	Catalouge no.
HLP 30s	30	+	+	-	1-2 class	DH-0030-0S
HLP 30p	30	-	+	-	2 class	DH-0030-0P
HLP 30sp	30	+	+	-	1-2 class	DH-0030-SP
HLP 30UV	30	+	+	+	1-2 class	DH-0030-UV

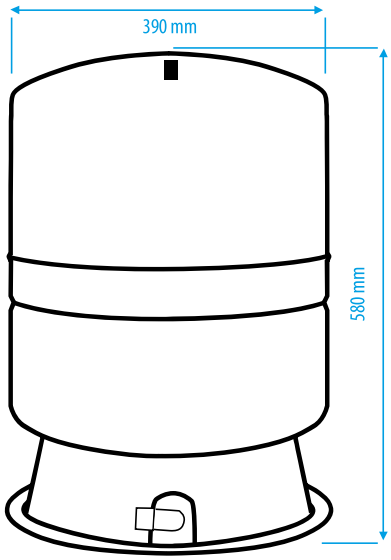
HLP SMART

HLP 5

HLP 10
HLP 20
HLP 30

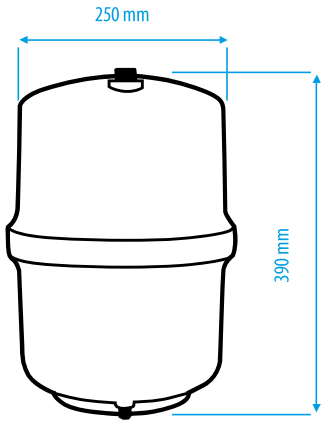


tank 80 l

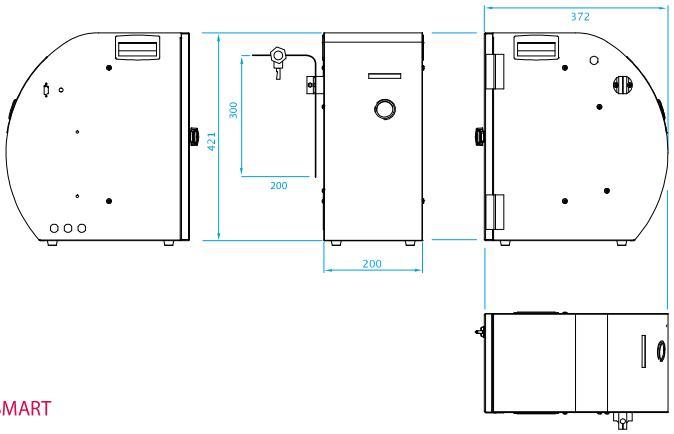


tank 40 l

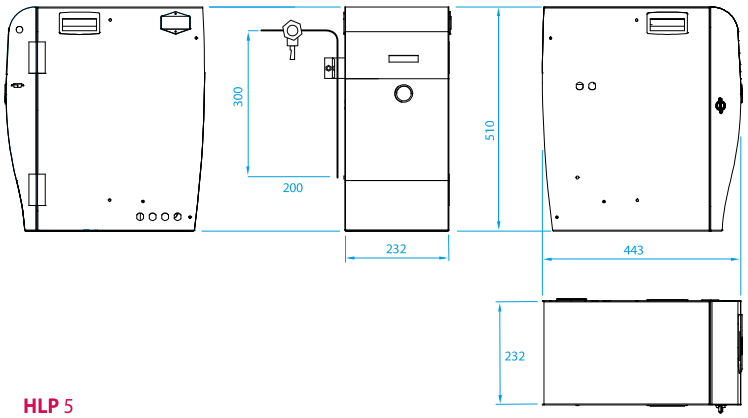
Model	Capacity	Catalogue no.
pressure tank	10 dm^3	ZC-0010
pressure tank	40 dm^3	ZC-0040
pressure tank	80 dm^3	ZC-0080
pressure tank	110 dm^3	ZC-0110
pressure tank	150 dm^3	ZC-0150
pressure tank	230 dm^3	ZC-0230
pressure tank	320 dm^3	ZC-0320
pressure tank	450 dm^3	ZC-0450



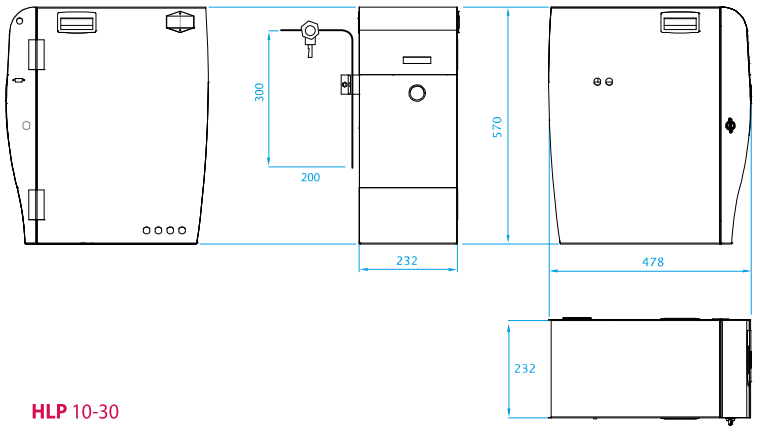
tank 10 l



HLP SMART



HLP 5



HLP 10-30

1.0 INTRODUCTION

1.1 Safety of use

Please carefully read this manual before using. It contains all important information regarding safe installation, usage and maintenance of the device. Please keep this manual so you can use it in the future.

- After delivery please unpack the demineralizer and check if it is not damaged.
  In case of any damage please describe it in the delivery documentation.
- All installation and maintenance work may be done by the user.
- Repairs must be done only by the qualified personnel from an authorized service.
  The user must not attempt to repair the device by himself.
- Do not use the device if the plug, power cord or the device itself is broken or damaged.
- Check if the power cord has not been damaged after relocating the device.
- Caution, the demineralizer is heavy. Be very careful when relocating the device.
- Place the device in a suitable place.
- Perform regular maintenance tasks for a long-time and efficient operation.
- The manufacturer is not responsible for any damage caused by a wrong installation.

1.2 Feed water parameters

Devices are intended to purify tap or pre-cleaned water.

Pressure - from 3.0 bar (minimum) to 6.0 bar (maximum).
A reduction may be used if necessary.
If the pressure is too low, it is recommended to use a pressure pump.

Temperature - the temperature in the room should be between 5°C and 40°C.
The feed water temperature should be between 4°C do 40°C.

Salinity (TDS) - should not exceed 1200 mg/dm^3.

Humidity - the humidity in the room should not exceed przekraczać 80%.

Hardness - should not exceed 250 mg $CaCO_3$/dm^3.

Fe - should not exceed 0,2 mg/dm^3.

If any of these parameter requirements is not satisfied, it is recommended to extend the pre-filtration. Please contact our support.

1.3 Power supply parameters

Before connecting the device please make sure, that the voltage specifie on the device conforms with the voltage of your electrical grid.

- Voltage: 220-240V
- Frequency: 50Hz

2.0 GENERAL INFORMATION

The demineralizer is fed by tap water. It produces water for analytical and instrumental purposes. Obtained water fits the standards of the PN ISO 3696:1999, ASTM. Dependent on the demineralizer type, water may be used for instrumental analyses: AAS, ICP/MS, IC, HPLC, GC. Demineralizers by default are equipped with a microprocessor control and measurement system that supervises the demineralization process (type A automatics).

2.1 How it works

The demineralizer works under the tap water pressure. Purification processes are automated and maintenance-free. These are:

1. **mechanical filtration**
2. **sediment-carbon-softening filtration**
3. **reverse osmosis (RO)**
4. **ion exchange demineralization**
5. **UV lamp 254 nm***
6. **microfiltration capsule***

* depends on the model

2.2 Mechanical-sediment-softening filtration

5 µm pre-filter -prepares water for the reverse osmosis process. It contains a polypropylene string cartridge wrapped around a filtration core located inside the filter. It filters out all kind of mechanical filtration of size > 5 µm.

Module A2 (sediment-carbon-softening):

- **Granulated activated carbon -** prepares water for the reverse osmosis process. It filters out all organical and chlorine-based contamination. Contaminants are sorped on the activated carbon.
- **Softening bed** removes calcium and magnesium ions, that are responsible for water hardness.
- **1 µm sediment filter** - the last element of pre-filtration, protecting the water for re-contamination. It filters out all of the mechanical contamination > 1 µm.

2.3 Reverse osmosis module – RO

The RO membrane holds up to 96-99 % organic and non-organic contamination dissolved in water, heavy metals. Semi-permeable osmotic membrane contains many layers wrapped around a perforated core located inside the module. Contaminated water is pumped under pressure on the membrane surface, where the water particles go through the membrane by diffusion. The contaminants are separated and go into the waste. Purified water flows through the central core and under pressure flows out of the module. This process is critical to the efficiency of the whole system.

2.4 Ion exchange bed demineralization

Ion exchange module - contains mixed beds of ion exchange resins in ion forms H^+/OH^-. Osmotic water is purified on the deionization columns, where the remaining salts are being captured. In the process of ion exchange dissolved ions and particles have an electric charge that is bound by ionites. After this process, water conductivity drops to 0,055 µS/cm.

Ion exchange modules of the TOC are dedicated to researches requiring low amounts of organic carbon.

2.5 UV lamp

The UV lamp is used for water disinfection. It emits radiation of 254 nm wave length causing photochemical reaction that damages the DNA structure of microorganisms. Contains a radiation chamber with a radiator inside. Water flows through the UV lamp between a filter housing and a quartz protection surface.

2.6 Microfiltration capsule 0,2 µm

Microfiltration capsule - ready to use flow filter. Intended for sterilizing water. Contains a 0.45 µm membrane located inside a polypropylene housing. Its working capacity is the number of pores equal to number of bacteria held at a particular area.

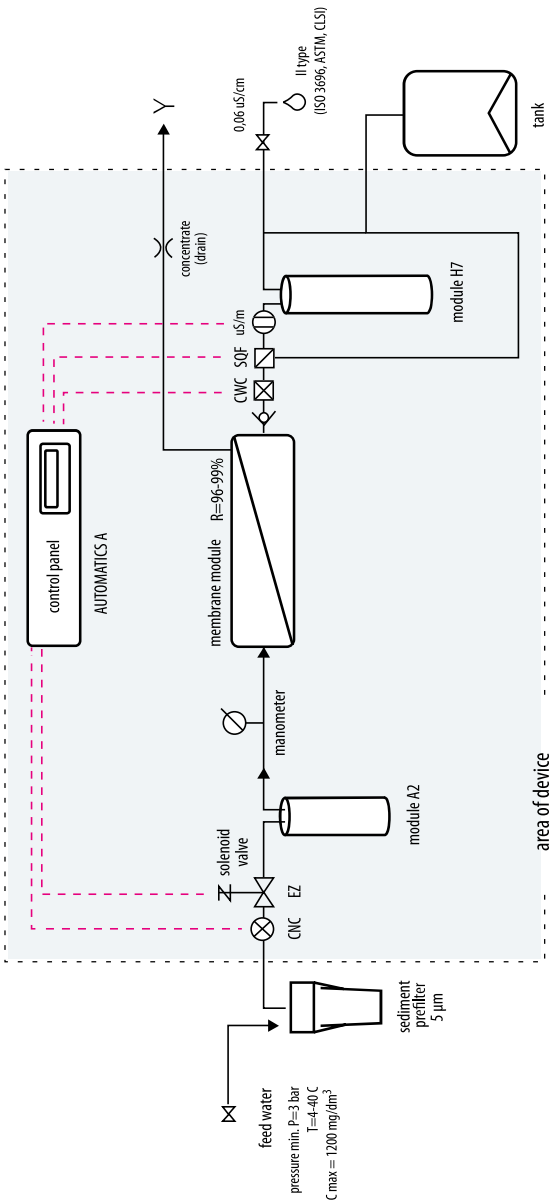
3.0 STRUCTURE

The device is equipped with:

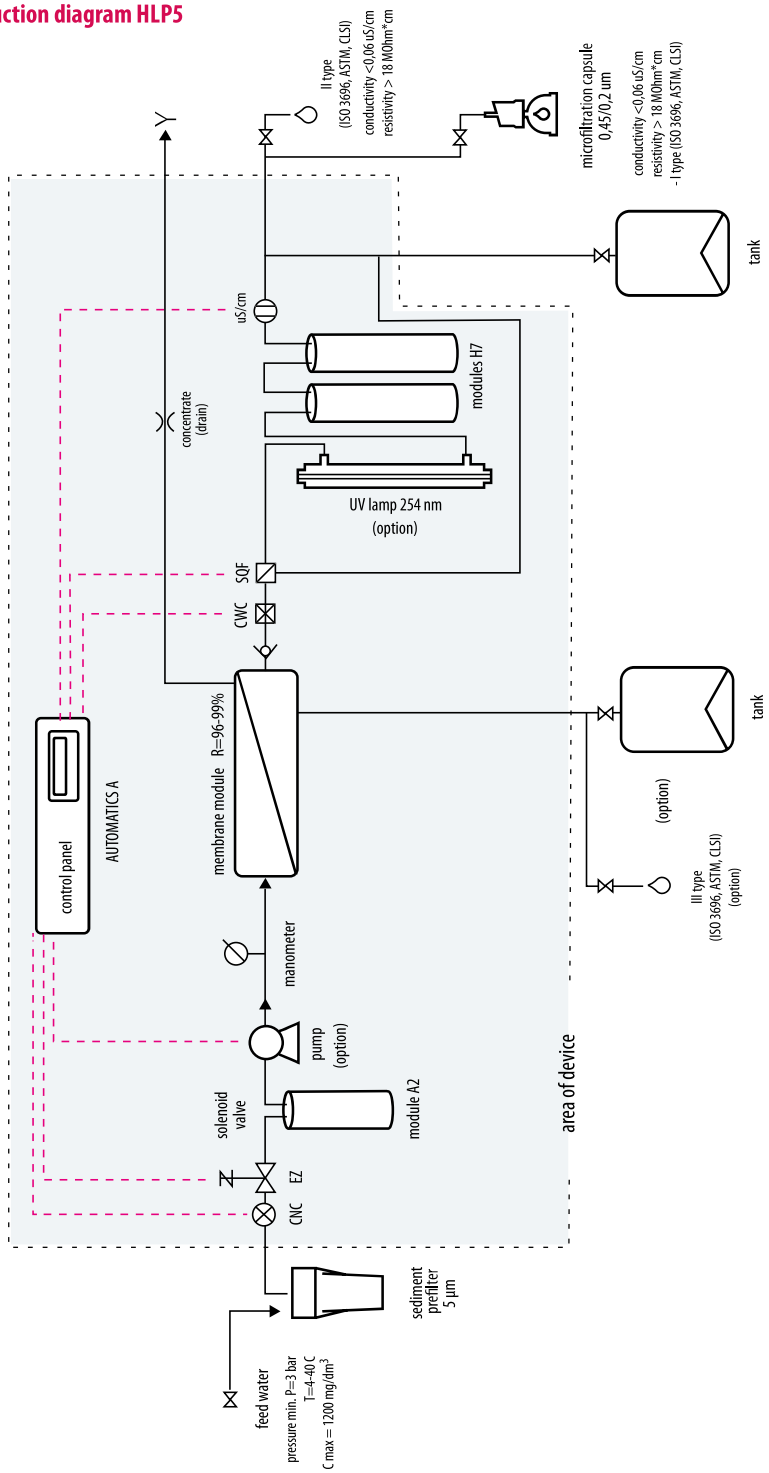
- 5 µm sediment prefilter
- A2 module (sediment-carbon-softening)
- membrane pump*
- membrane module RO
- ion exchange module
- pressure tank for purified water storage
- UV lamp 254 nm*
- conductometer measuring conductivity of purified water with an alarm informing about necessity to change the ion exchange resins
- manometer measuring feed water pressure
- low and high pressure sensors
- electrovalve
- microfiltration capsule*
- washing and feed water cut off valves when idle
- control system

* depending on the model

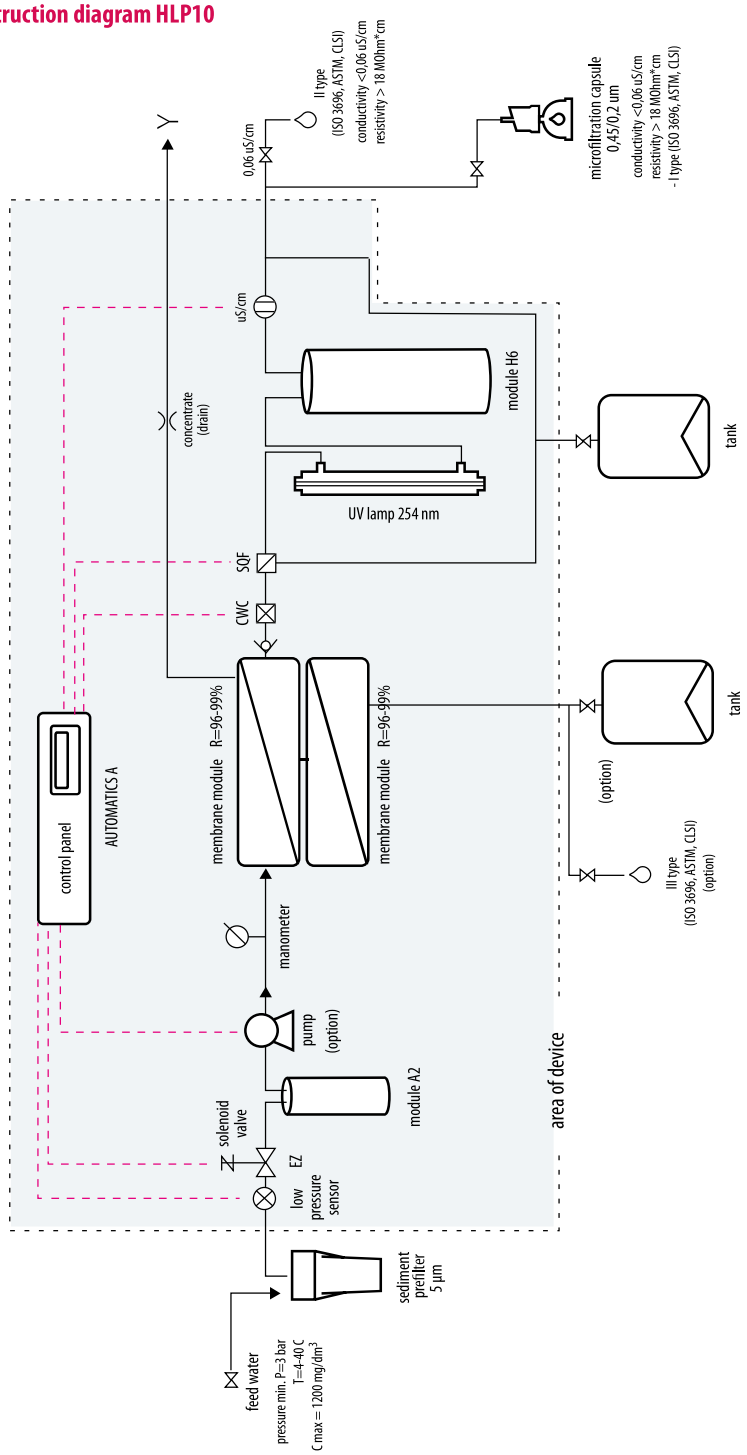
3.1 Construction diagram HLP Smart



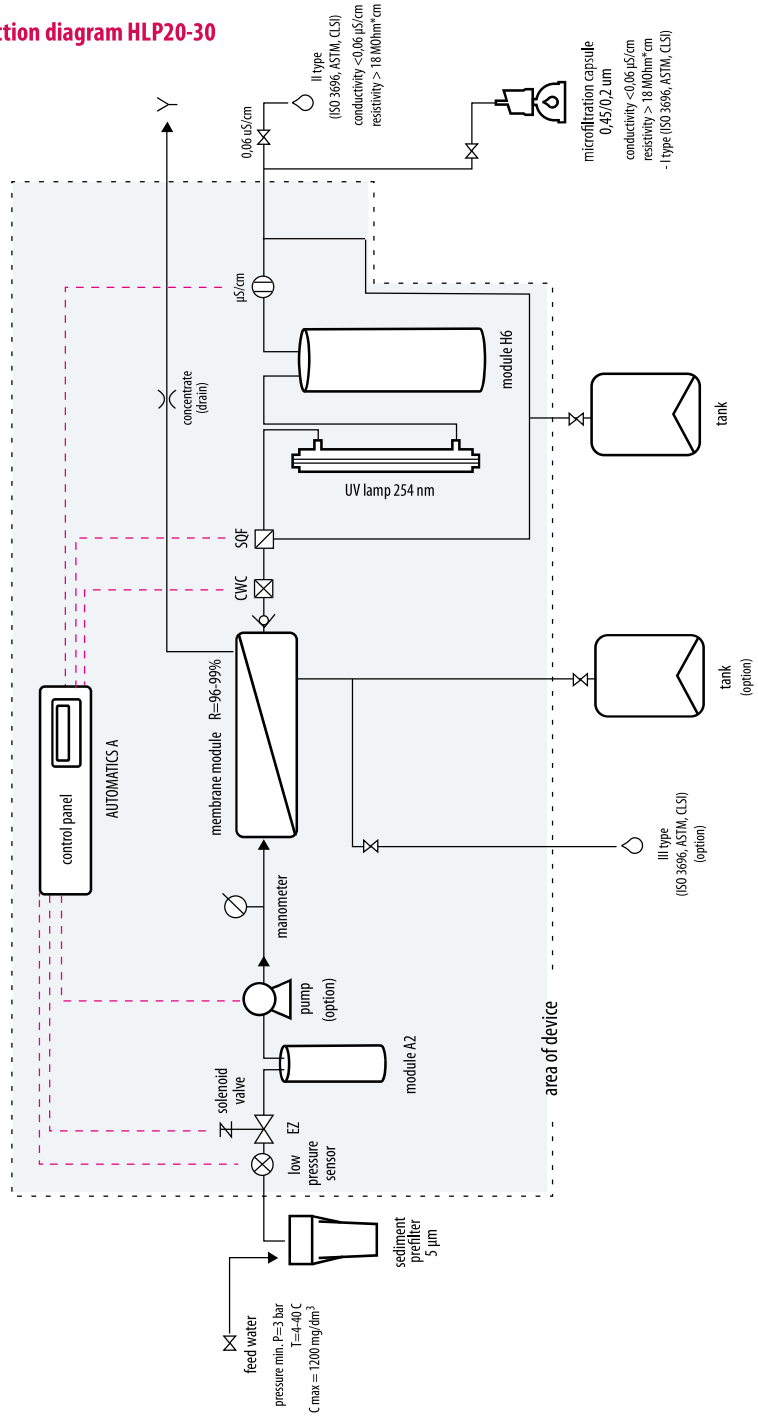
3.1 Construction diagram HLP5



3.1 Construction diagram HLP10



3.1 Construction diagram HLP20-30



3.2 Monitoring functions:

Type A automatics

- 24 V automatics with a microprocessor control and measurement system:
  - LCD display
  - conductometer measuring conductivity and temperature of demineralized water, in units µS/cm or MOhm,
  - temperature compensation,
  - water updates the conductivity measurement
- It is possible to read the conductivity value with linear compensation or without compensation.
- clock displaying date and time,
- system status information,
- graphic and sound alarms:
  - when need to change an A2 module (mechanical-carbon-softening)
  - when need to change a UV lamp (in models containing a UV lamp)
  - alarm informing to replace microfiltration capsule (models with microfiltration capsule)
  - alarm informing to replace ion exchange module
- Service dates view
  - service phone number customization,
  - RS 232 connector for modification of service frequencies and alarm levels
- software on an external data carrier,
- feed water manometer.

4. INSTALLATION

READ BEFORE INSTALLING

- the results are best if feed water is softened,
- feed water must match the requirements listed in 1.2
- doing a quality analysis allows to choose the best pre-filtration system,
- cartridges should be replaced in accordance with frequencies mentioned further in this manual.

Remember to put attached insets into the cords.
In case of quick-connectors just put an evenly cut cord into the socket.

4.1 Device installation

Step 1

Unpack the device and place it in a suitable place.

Step 2

Power supply pipe valve installation.

Due to varying local conditions, the valve provided by the manufacturer contains two reductions: ½" i ¾". Make sure that the tap water is cut off and the water in the feeding pipe is not under pressure. Also make sure that the demineralizer is fed by cold water.

Step3

Connection sockets are located on the right side of the device: **"FEED WATER"**, **"DRAIN"**, **"TANK"**. They are protected by caps. To remove a cap, press the quick-connector ring and pull out the caps. Sockets to connect taps for I, II or III purity classes are located on the left side of the device.

Step 4

Sediment prefilter with a 5 µm filter should be installed between the demineralizer and the tap water connection. Connect the prefilter by putting the cord into "OUT" prefilter socket and **"FEED WATER"** demineralizer socket.

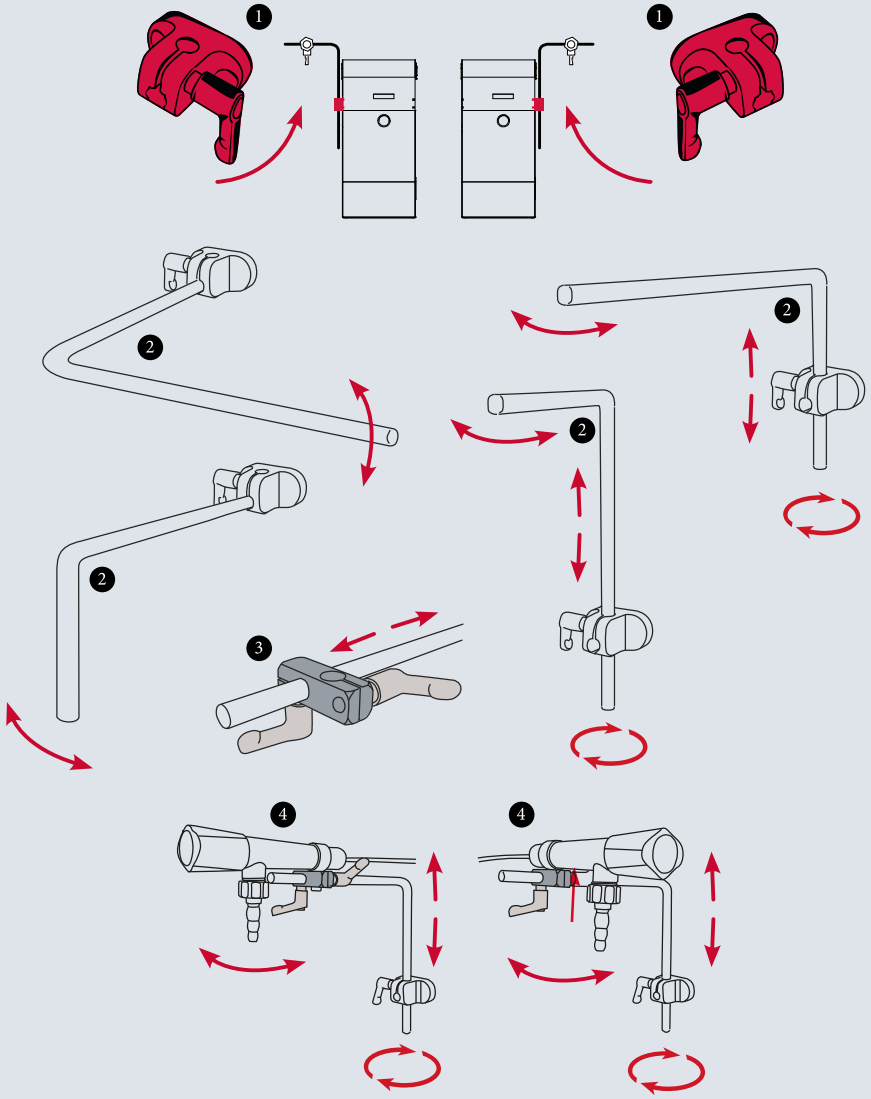
Step 5

Tank installation.

Pick a suitable place for the tank and connect it with the device to **"TANK"** socket.

Krok 6

The INOX arm bracket is included in the set (1), you can screw it to the right and left of the device. Place the arm in the holder (2). This serves to mounting the tap water. You can maneuver it. Mount the tap holder (3) and the tap itself (4).



Step 7

Connect the demi water tap with a proper demieralizer socket "TAP WATER" and install it in the inox arm.

Step 8

In case if the device has a microfiltration capsule, it has an additional tap that should be connected to: „I TYPE 3696" and then installed in the inox arm. Attach the capsule to the tap.

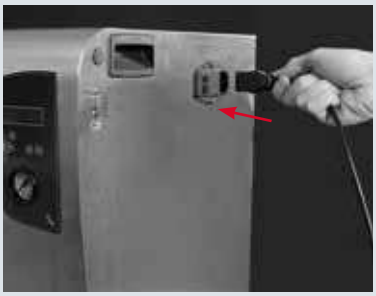
Step 9

Waste connection.

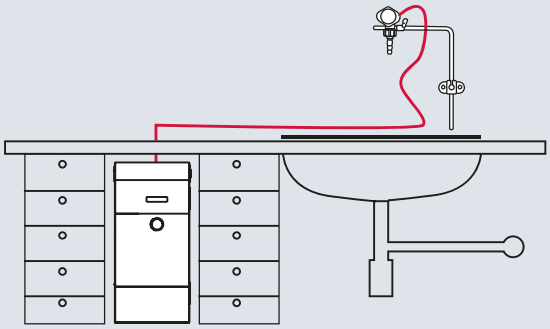
Waste connector provided by the manufacturer assumes that the pipe's diameter is 50 mm. Make a 4-5 mm hole in the pipe. Place a rubber gasket around the clamping ring and install it in the waste pipe where the hole is located. Then connect the clamp with the device in the socket "DRAIN".

Step 10

Connect the power cord to the socket "230 V"
Connect the power cord to the socket "24 V"
(HLP SMART)



Faucet and INOX bracket mounted on the wall above the beaker.



CAUTION:

The demineralizer should be operating daily for at least 15 minutes.

Step 11*

General purpose water collection point.

1. Connecting an additional tank

If the device is equipped with an additional tank for III class water storage, connect it to the socket "III TYPE 3696"

2. Connecting a washer, an autoclave or any other laboratory device.

- Connect the connector to the laboratory device.
- This connection has a built-in reduction on its end.

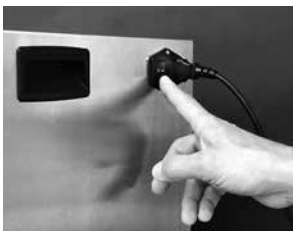
3. Installation of an additional tap

- If the point contains also a tap for water collection install it in the inox arm.
- Connect the tap cord to the socket "III TYPE 3696".

CAUTION:

Amount of purified water stored in a pressure tank depends on a sum of tap water and membrane pump pressure (if equipped). Differences in volume of stored water may be up to 30%.

5. TURNING ON THE DEVICE

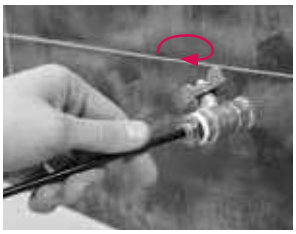


- check all connections,
- turn the power switch to "1".

Pressure leakproofness test:

- open the feed water valve,
- open „TAP WATER". When water appears - close it,
- check if there are no leaks present,
- open the tank valve.

5.1 Turning off the device.



- turn the power switch to "1",
- close the feed water valve,
- close the tank valve.

CAUTION!
If idle for longer periods of time main valve may be closed
and the tank may be emptied.

6. MONITORING FUNCTIONS

Demineralizer has its own control system informing the user of necessity to replace particular cartridges. It also has a keyboard allowing to adjust maintenance procedures frequencies and alarm levels.

A built-in conductometer measures the conductivity and temperature of purified water, and feed water pressure. Pressure value determines the system operation status (if it is operating, the value is equal to the pressure applied on RO module; if it is turned off, it equals zero)

6.1 Control and measurement panel

The device contains an automatics with a microprocessor control and measurement system that has:

LCD display (models with automatics of type A)

CAUTION!

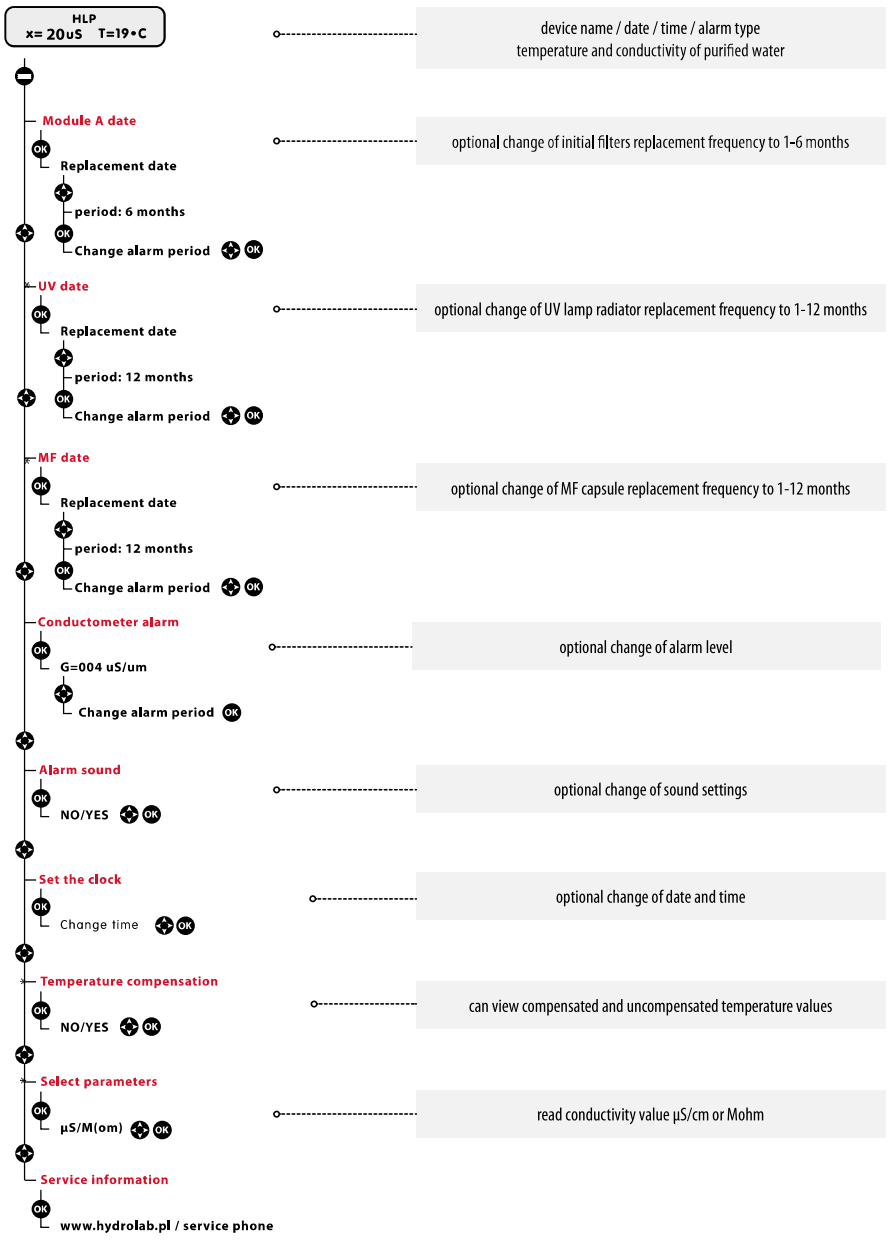
Reading all of the parameters displayed on the panel should take place during system operation (while collecting water - tap open). All alarms should be verified during water collection (tap open) - collect at least 0.5 l of water.

6.2 Protection functions

The demineralizer turns on automatically when the demi water is being collected and is working until it replenishes the tank. Once the tank is full, the device will reach a certain value of pressure and the device will automatically cut off the feed water, and manometer value indication will drop to 0.

Demineralizers from „P", „SP" and „UV" series also contain a membrane pump and low/high pressure sensors. The pump operation and the device itself is maintenance-free. Automatic pump turn off occurs when:

- the feed water pressure is too low,
- the tank is full,
- no feed water is present.



* functions active depending on the device configuration

7. MAINTENANCE

Maintenance procedures consist of replacing the filter cartridges.
These are:

- pre-filters: 5 µm, A2 module (sediment-carbon-softening)
- ion exchange module
- microfiltration capsule 0.45/0.2 µm
- RO module
- UV lamp radiator.

ATTENTION:
Disposable materials for particular models are listed on page 71.

7.1 Pre-filters replacement

Pre-filters are: **PRE-FILTER 5 MM, A2 MODULE**. The frequency of replacement procedures depends on the amount and quality of feed water. Due to hygenic reasons, the replacement should take place at least once every 6 months. This procedure may be performed by the user. The system displays a notification **„REPLACE MODULE A"** and triggers a sound alarm when the module needs to be replaced.

Step 1
Turn off the device and close the feed water valve.

Step 2
5 µm pre-filter cartridge replacement.

- twist off the filter housing using a hand or a key,
- inside the housing there is a rubber gasket - don't lose it,
- take off the cartridge and put in a new one,
- twist in the housing with a new cartridge until a slight resistance, and then until the end.

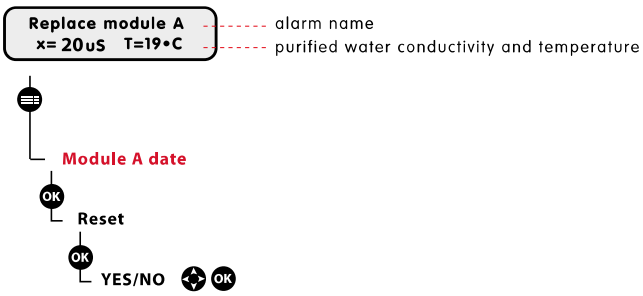
Step 3

Module A replacement

- open the device's front door,
- disconnect the exhausted module A and connect a new one. Mind the flow directions,
- check if none of the tubes is bent,
- close the device's door.

Step 4

- open the feed water valve and check leakproofness,
- reset the alarm for the pre-filters.



7.2 Ion exchange cartridges replacement

Replacement procedure should take place if the conductivity of the purified water exceeds 4 µS/cm. The system displays a notification **"REPLACE MODULE H7 / H6"** and triggers a **SOUND ALARM** when the ion exchange cartridges need to be replaced.

Step 1

- turn off the device and close the feed water valve,
- close the tank valve.

Step 2

Ion exchange module replacement:

- open the front door and disconnect the exhausted ion exchange module.
- connect a new module, mind the flow directions,
- close the front door.

Step 3

- open the main valve and check if there are no leaks.

Step 4

- the message **„REPLACE MODULE H7/H6"** disappears automatically, when water conductivity drops below 4 µS/cm.

CAUTION!

After replacing the ion exchange resin first 10 dm^3 of produced water should be wasted.

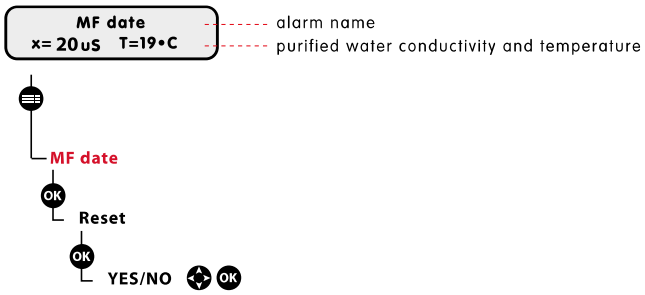
7.3 Microfiltration capsule replacement

The lifetime of a microfiltration capsule is 12 months. The system displays a notification **"REPLACE MF"** and triggers a **SOUND ALARM** when the capsule needs to be replaced. Microfiltration capsule can be regenerated during its operation. It is based on back-flushing and autoclaving the capsule in the max. temperature: 134ºC (duration: 30 mins). This sterilization process is compatible with the ISO 11134 standard. A capsule may be regenerated up to 3 times.

To change the capsule:

- disconnect the exhausted capsule.,
- during the replacement the tap must be closed,
- connect a new capsule.

Reset:



7.4 UV radiator replacement

Step 1

- turn off the device and cut the feed water off,
- close the tank valve,
- open the front door of the device.

Step 2

- cut off the lamp from the power supply,
- twist off the grounding cord,
- take off the radiator joint.
- carefully slide off the radiator from the housing.

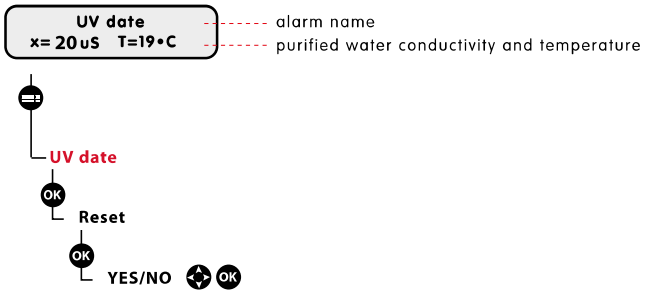
CAUTION!

The radiator is very fragile. Be very careful while handling it.

Step 3

To install a new radiator carefully take it out from the package - do not touch its transparent surface (in case of any dirt - wash it with alcohol). Carefully slide the radiator into the housing, put on the joints, twist in the grounding cord and turn on the device.

Reset:



7.5 RO module replacement

The RO module lifetime is 3-4 years. The lifetime of membrane cartridges may vary due to the flow rate, its characteristics and level/types of feed water contamination.

Symptoms of incorrect membrane functioning:

- lower system efficiency, slower flow rate,
- shorter lifetime of ion exchange columns.

To replace an RO module open the back door of the demineralizer. To do it, twist off four screws on the sides and take the door out. Disconnect the RO module from the tubes and replace it with a new one. Close the door and screw the screws.

CAUTION

We advise the user to contact our authorized service for professional support before changing the RO module.

7.6 Sanitization - we recommend.

Sanitization must be performed when changing ion exchange resins and least every 12 months. When sanitizing follow the instructions for safe use provided in the Sanitation Agent Specification Card.

Sanitation set:

- sanitation chamber,
- sanitation agent: Chloramin T sodium salt,
- connector set and backup tube.

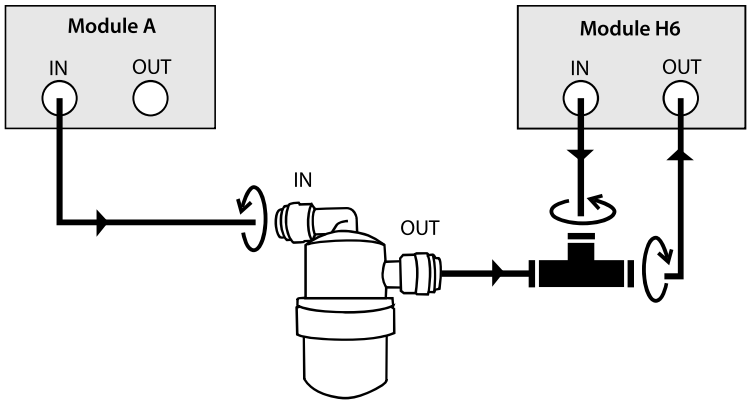
Procedure

- fill sanitation chamber with sanitation agent - 1 pack,
- sanitize with empty tank. Empty the tank first,
- close tank valve,
- disconnect ion exchange module (H6 or H7),
- disconnect module A2,
- connect sanitation chamber (according to schema):
  - tube "IN" from module A2 to sanitation chamber in place "IN",
  - tubes "IN" and "OUT" from H6 module with T-connector in tube "OUT" to sanitation chamber,
- open feed water valve,
- open tank valve,
- leave for 1-2 hours,
- close feed water valve,
- dismount microfiltration capsule,
- after given period empty the tank through H2O tap,
- open feed water valve,
- fill the tank to 100%,
- empty the tank.

CAUTION

Repeat this procedure 2-3 times.

After final tank emptying disconnect the sanitation chamber and connect tubes with connector provided in the sanitation set. Install new A2 and ion exchange modules. After service and sanitization first full volume of the tank should be wasted to clean new ion exchange module, tank and tubes.



CAUTION

We advise to empty the tank after not operating for more than 14 days.

8. BHP

In particular the user should not:

- touch the switches with wet hands,
- touch the tubes with sharp objects.

9. MALFUNCTIONS

Some kinds of damage occur due to not performing simple maintenance tasks or other overlooks and can be fixed without calling the service. Unnecessary service call to fix these kinds of damage will be charged, even during the warranty period.

CAUTION!

The user should not attempt to repair the device by himself.
Repairs done by an unauthorized personnel are hazardous to health and life.

CONSUMABLE **GOODS**

Model	Sediment filter 5 µm	Module A2	Module H7
HLP SMART	+	+	+
lifetime	6 months	6 months	2000 dm^3*
catalogue no.	EO-005-10	EO-MA-12	EJ-2000-0

Model	Sediment filter 5 µm	Module A2	Module H7, H7	Module H7 TOC, H7 TOC	Microfiltration capsule 0,2 µm	UV radiator 254 nm
HLP 5	+	+	+	-	-	-
HLP 5s	+	+	+	-	+	-
HLP 5p	+	+	+	-	-	-
HLP 5sp	+	+	+	-	+	-
HLP 5UV	+	+	-	+	+	+
lifetime	6 months	6 months	2x2000 dm^3*	2x2000 dm^3*	12 months	8500 h
catalogue no.	EO-005-10	EO-MA-12	EJ-2000-0 (x2)	EJ-2000-1 (x2)	EM-SP-20	EUV-254-HLP

Model	Sediment filter 5 µm	Moduł A2	Moduł H6	Moduł H6 TOC	Microfiltration capsule 0,2 µm	UV radiator 254 nm
HLP 10-30	+	+	+	-	-	-
HLP 10-30 s	+	+	+	-	+	-
HLP 10-30 p	+	+	+	-	-	-
HLP 10-30 sp	+	+	+	-	+	-
HLP 10-30 UV	+	+	-	+	+	+
lifetime	6 months	6 months	5000 dm^3*	5000 dm^3*	12 months	8500 h
catalogue no.	EO-005-10	EO-MA-12	EJ-5000-0	EJ-5000-1	EM-SP-20	EUV-254-HLP

CE

HYDROLAB®
SYSTEMY UZDATNIANIA WODY

DECLARATION OF CONFORMITY

Manufacturer: **Hydrolab Sp. z o.o. Sp. K.**
Manufacturer Adress: **ul. Wesoła 1, 83-010 Straszyn**

We hereby declare, that water purification systems (deminalizers) HLP *(models: HLP SMART, HLP 5, HLP 5S, HLP 5P, HLP 5SP, HLP 5UV, HLP 10, HLP 10S, HLP 10P, HLP 10SP, HLP 10UV, HLP 20, HLP 20S, HLP 20P, HLP 20SP, HLP 20UV, HLP30, HLP 30S, HLP 30P, HLP 30SP, HLP 30UV),* conforms requirments of directives:

- Low Voltage Directive (LVD). Nr 73/23/EEC, 93/68/EEC, 2006/95/WE, 2014/35/EU
- Electromagnetic Compability Directive (EMC) Nr 89/336/EEC, 92/31/EEC, 93/68/EEC, 2014/30/EU

The conformity assessment used the following standards:

- PN-EN 61326 Electrical equipment for measurement, control and laboratory use - EMC requirements.
- PN-EN 61010 Safety requirments for electrical equipment for measurement, control and laboratory use.
- PN-EN 62311 Assesment of electronic and electrical equipment related to human exposure restrictions for Electromagnetic Fields (0 Hz - 300 GHz).

The last two digits of the year in which the CE marketing was done: 11.

HYDROLAB
Sp. z o.o Sp. K.
ul. Wesoła 1, 83-010 Straszyn
NIP 604-015-22-97 KRS 0000392441

Printed Name: .....
Przemysław Ganczarek

WARRANTY

1. The Hydrolab company provides a warranty for the demineralizer:

   Model: .....

   Serial no.: .....

   Membrane no. .....

2. Warranty period: 12 months.
3. The warranty is valid only if the user respects the parameters and usage instructions included in the manual.
4. In case of any malfunction it will be removed in:
   - 3 working days after delivery (cost covered by the warrant) to the service to the address: Hydrolab Sp. z o.o., ul. Wesola 1, 83-010 Straszyn, Poland
   - 10 working days on the user's location.

5. The warranty does not cover any mechanical damage and damage occurred due to:
   - wrong usage (ex. no servicing)
   - wrong installation
   - repairs performed by unauthorized people
   - feed water not matching the standards described in the manual

6. The warranty does not cover the disposable materials of lifetime depending on the flow rate, its characteristics, contamination type and level.
7. The warranty period is exceeded by the time the device remains at the warrant's location for repairing.
8. Repairing the device by unauthorized service renders the warranty invalid.
9. When receiving the demineralizer, the user is obliged to pay the costs occurred due to the user's fault.

date, signature and stamp of company

date and buyer's signature