

AQUAPHOR
PROFESSIONAL

APRO-120 LPH



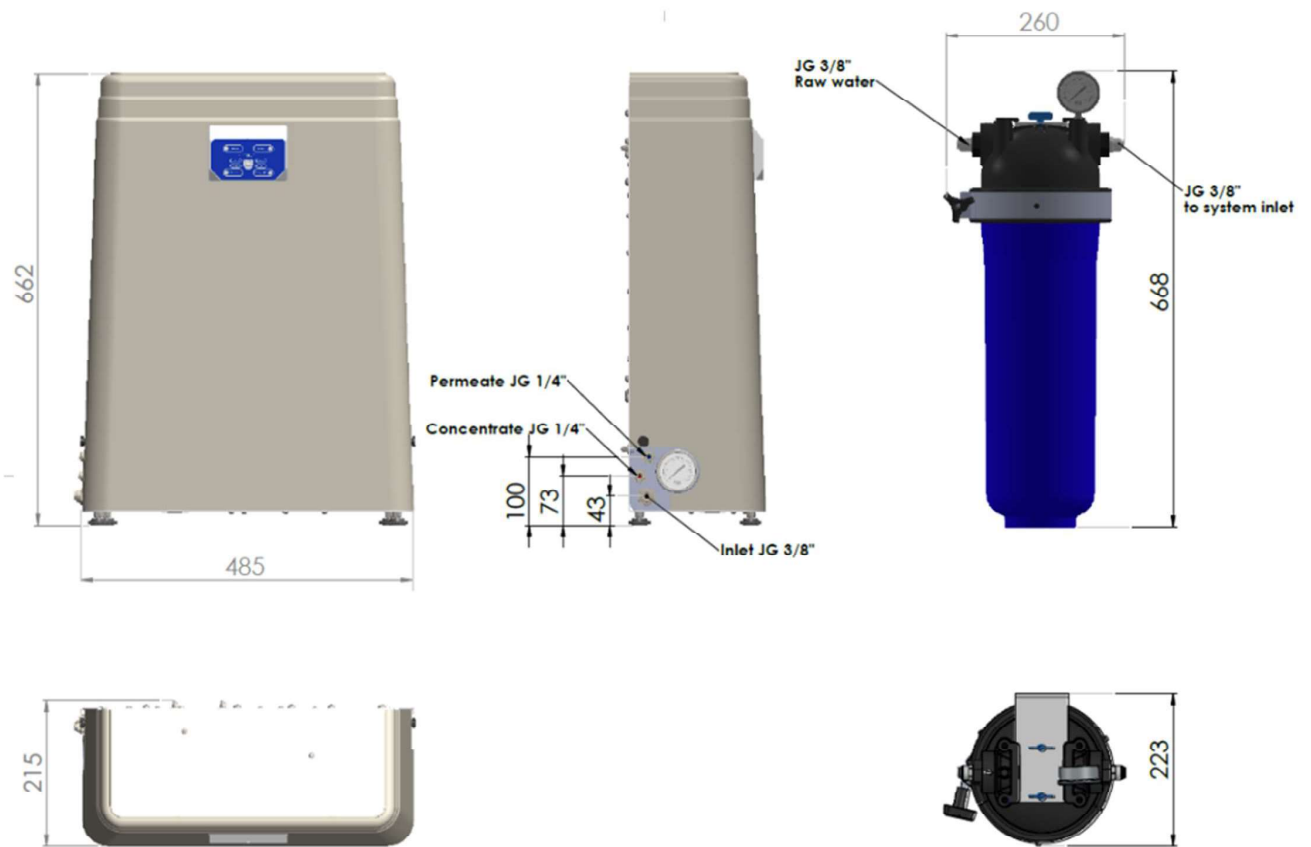
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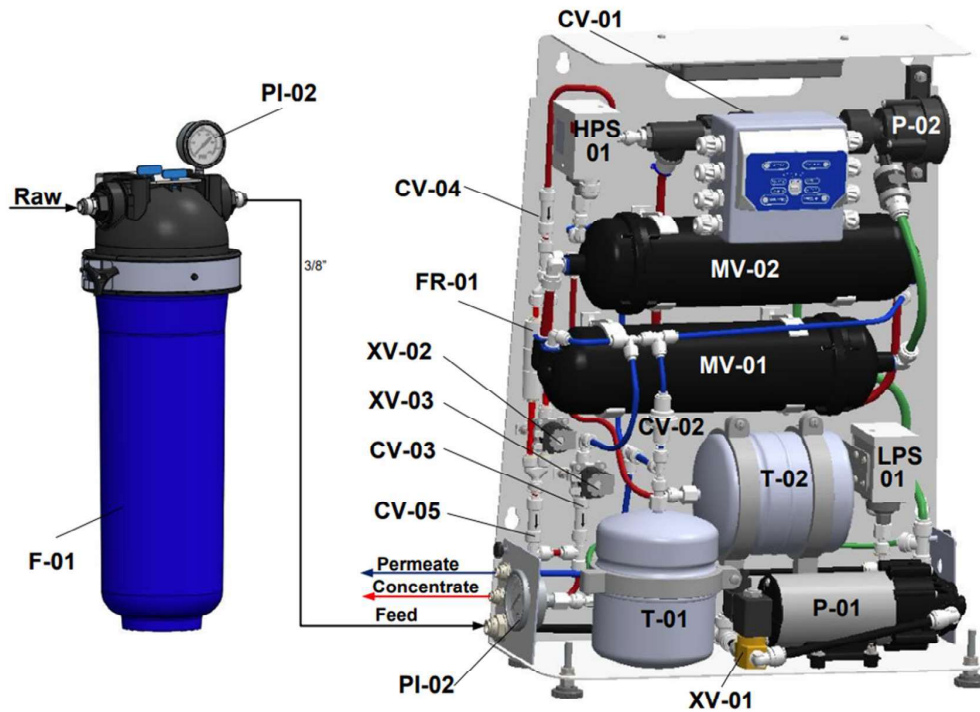
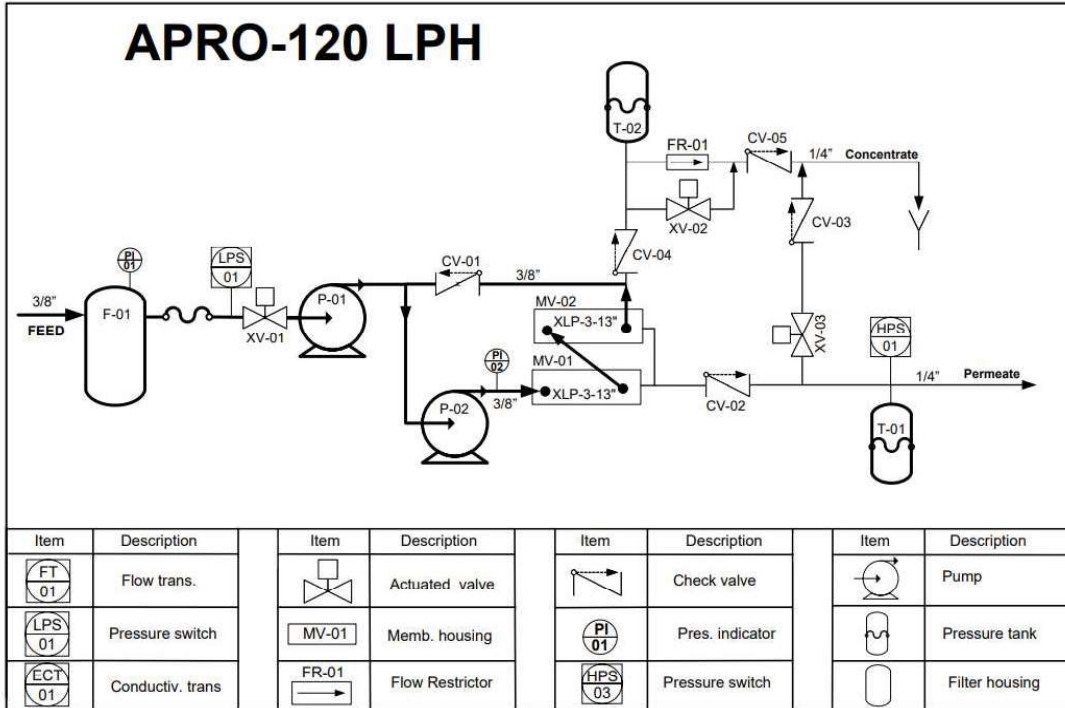
1. System Overview

1.1. System's dimensions

Net weight of the system: 27 kg.

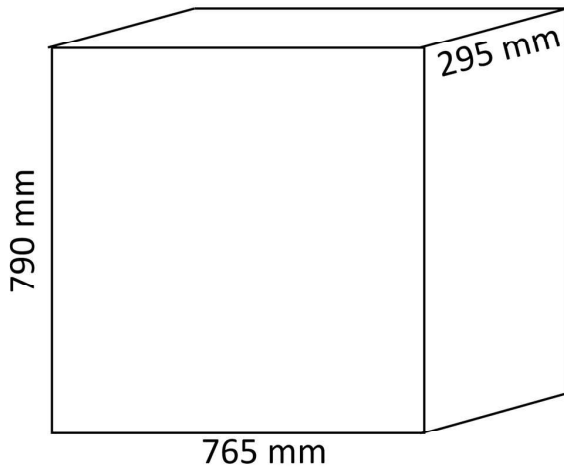
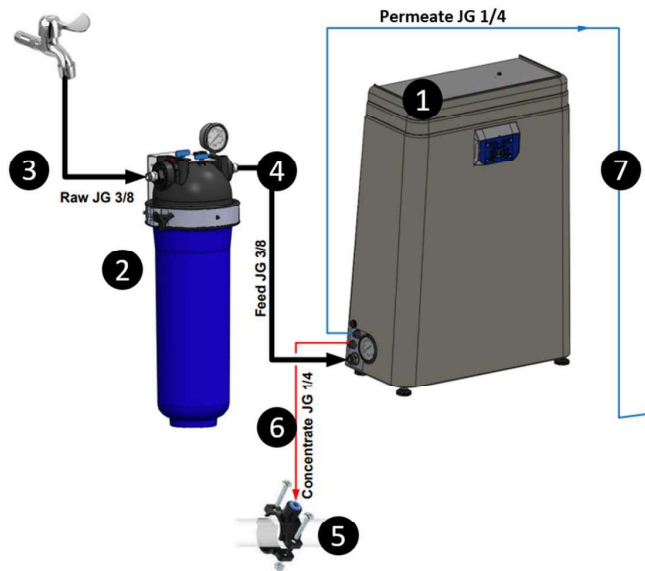


1.2. APRO-120 system equipment



Tag	Name	Function
F-01	Cartridge Filter Housing	Feed water filtration cartridge.
LPS-01	Low pressure switch	Low-pressure sensor in the supply line. Protects the system from dry running in case of interruption of the water supply.
XV-01	Feed valve	The valve for supplying feed water to the reverse osmosis system.
XV-02	Concentrate valve	Concentrate drainage valve.
XV-03	Drainage valve	First permeate drainage.
P-01	Pressure pump	Builds up pressure and supply water to reverse osmosis membranes.
P-02	Recirculation pump	Concentrate recirculation pump. Serves to recirculate concentrate through the osmotic membranes.
PI-01	Pressure Indicator	Feed water pressure.
PI-02	Pressure Indicator	Pump pressure.
MV-01/02	Membrane housing	
T-01	Permeate tank	Serves for the accumulation of permeate.
T-02	Concentrate tank	Serves for the accumulation of concentrate.
HPS-01	Permeate pressure switch	The pressure sensor stops the system when the T-01 tank is filled with permeate.
CV-01	Check valve	Concentrate recirculation check valve.
CV-02	Check valve	Permeate check valve.
CV-03	Check valve	Permeate drainage check valve.
CV-04	Check valve	Concentrate check valve.
CV-05	Check valve	Concentrate drainage check valve.
FR-01	Flow restrictor	

1.3. Standard package equipment



The net weight of the system is 27 kg.
The weight of the package is ~ 30 kg.

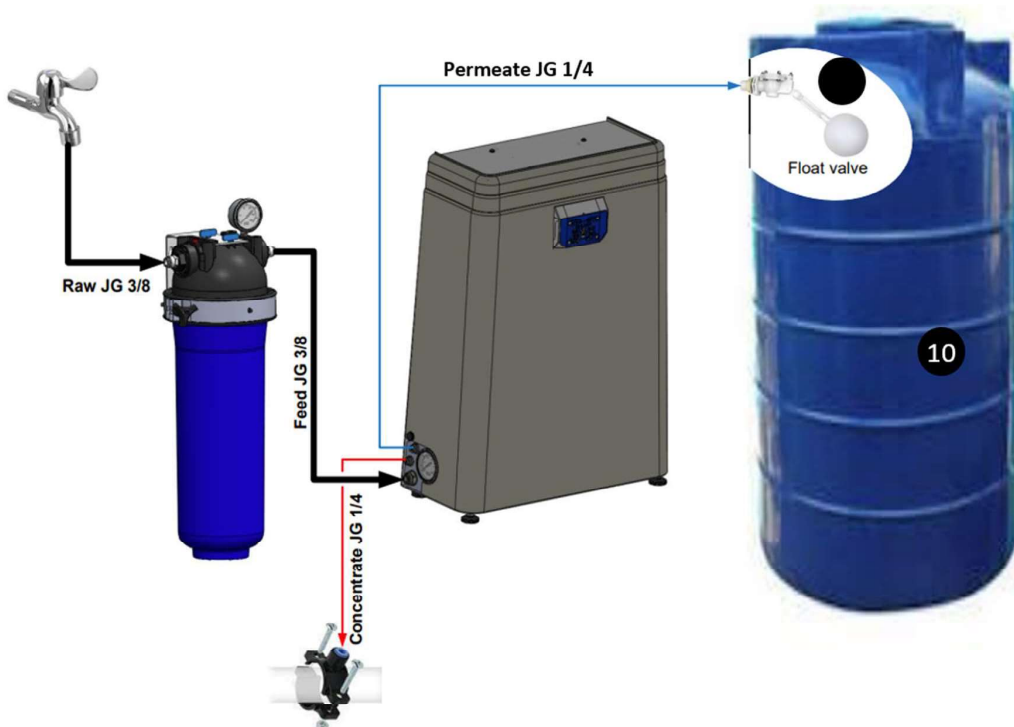
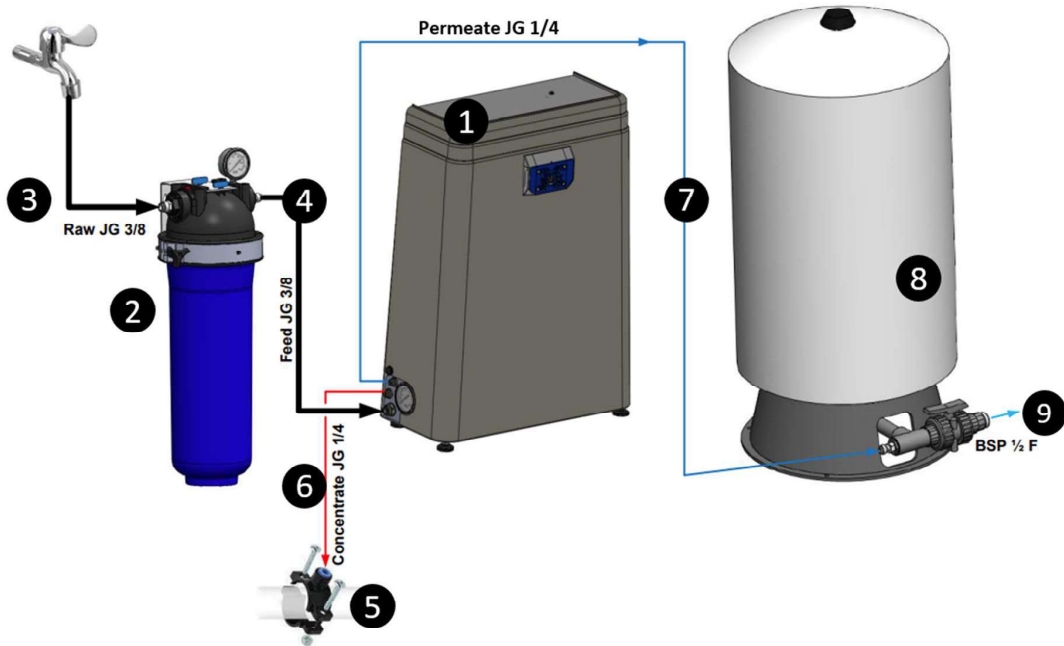
The standard equipment:

1. APRO 120 LPH system
2. Prefiltration unit (Viking)
3. Feed pipe
4. Supply pipe
5. Concentrate drainage clamp
6. Concentrate drainage pipe
7. Permeate supply pipe

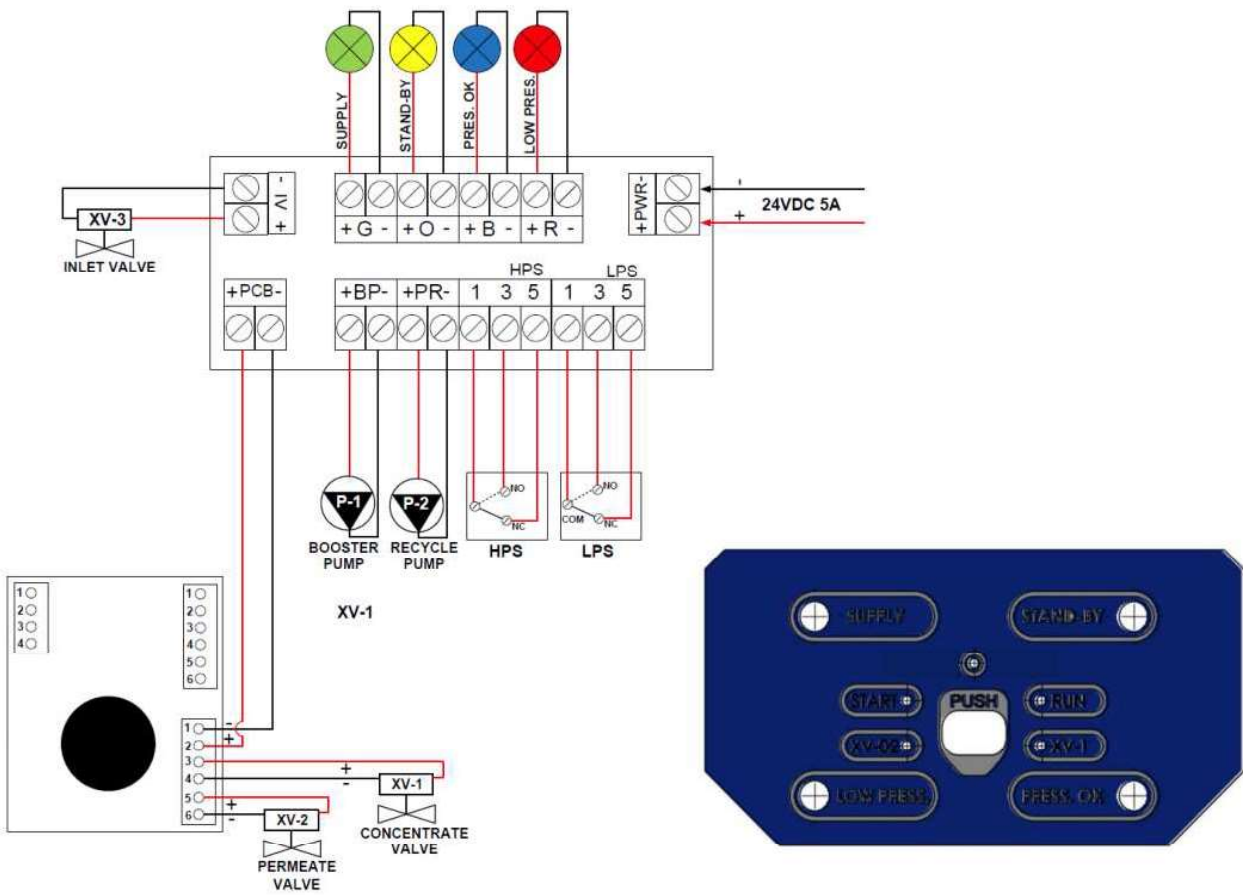
1.4. Optional equipment connection

Optional equipment:

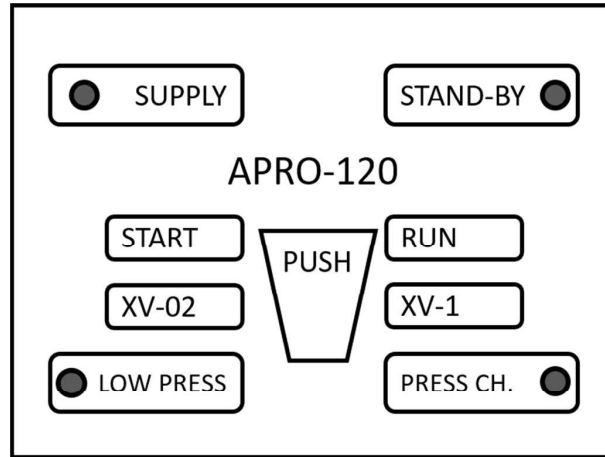
- 8. Pressure tank
- 9. Permeate water supply
- 10. Atmospheric accumulation tank



2. Electric circuit



3. Controller



Name	Type	Function
SUPPLY	Indicator	ON – RO water supply mode
STAND-BY	Indicator	ON – system is in stand-by mode
PUSH	Button	Enables valve testing mode: turns on valves for testing.
START	Indicator	System is in start-up mode
RUN	Indicator	System runs
XV-02	Indicator	XV-02 (Concentrate drainage valve) is open
XV-01	Indicator	XV-1 (Feed water supply valve) is open
LOW PRESS.	Indicator	Low feed pressure
PRESS OK	Indicator	Pressure is OK

4. Technical Data Description

4.1. Water Quality Requirements

Designation	Unit	Value
Water supply for the reverse osmosis system		
Temperature	°C	5 - 30
Turbidity factor	NTU	<1
Blocking factor (sludge / index of sedimentation density)	SDI	<3
Feed pressure	bar	2.5 - 6
Salinity	ppm	<1500
Total hardness	°dH	0 - 15
pH under constant operation	-	6.5 - 9
Short term for the rinse	-	1 - 12
Odour	-	odourless
Oil	mg/l	0
Free chlorine	mg/l	<0.2
Iron	mg/l	<0.1
Manganese	mg/l	<0.1
Sewage		according to local regulations

4.2. Installation Rooms Requirements

Designation	Unit	Value
Temperature	°C	5 to 40
Lighting	lx	at least 150
Source of fresh air	-	aerate and deaerate sufficiently

4.3. Reverse Osmosis Data

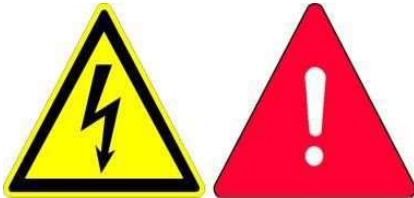
Designation	Unit	Value
Permeate		
With 20 °C	l/h	120
With 10 °C	l/h	84
Operating pressure max.	bar	6-9
Power		24WDC 5A
Control	W	1
Connections		
Raw water	NW	3/8''
Concentrate	NW	1/4''
Permeate	NW	1/4''
Pressure fluctuations max.	bar	± 1
RO salt retention rate max.	%	80 - 95
Operating temperature	°C	30 - 40
Surrounding temperature	°C	4 - 40
Electric connection		EU plug
Connection	-	1/N/PE
Voltage	V	230
Frequency	Hz	50

4.4. Viking Data

Application	Cold water pretreatment	Drinking water purification	
Filtered contaminants	Mechanical impurities, colloidal iron, residual active chlorine, organic substances (phenol, benzene), heavy metal ions (lead, cadmium)	Mechanical impurities, μm	>1
		Colloidal iron, %	>80
		Residual active chlorine, %	>90
		Organic substances (phenol, benzene), %	>90
		Heavy metal ions (lead, cadmium), %	>90
Replacement Cartridge	B520 PRO, B520 PRO H		
Cartridge life*	150 000 L, but not more than 6 months		
Filtered particle size	5 μm or more		

5. Installation

5.1. Safety Points



DANGER: Danger for life, Electric shock

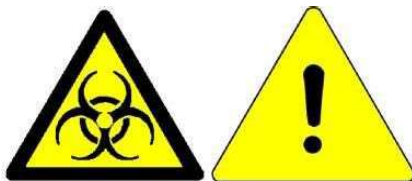
- Turn OFF the main switch and avoid its reactivation.
- Let only the competent staff carry out the electric work.
- Ensure the absence of power before starting to work.
- Consider the national regulations, the safety ones, and if available, the factory prescriptions.

WARNING: Dangerous tasks



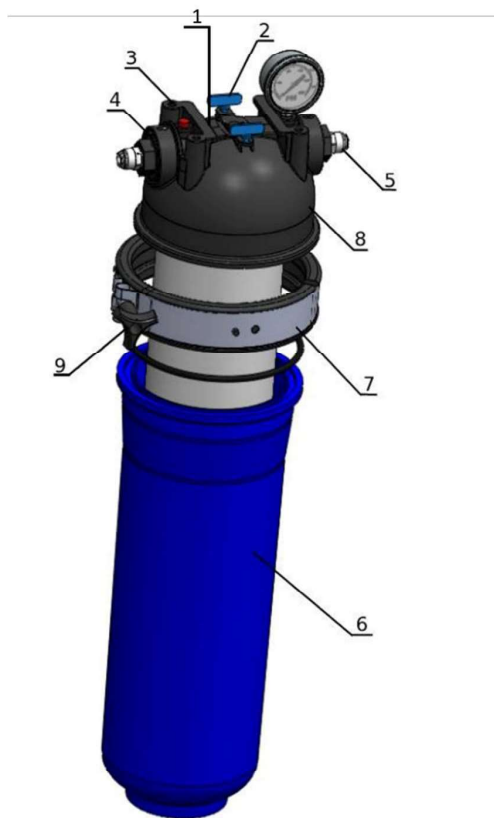
- Ensure that only specially trained personnel carries out the tasks.
- Ensure that the laws, regulations, and directives applicable to the site of use are fulfilled
- Before beginning the tasks, ensure that the air and water systems are pressureless.
- Ensure that the tasks are carried out with suitable tools only.
- Ensure the use of adequate climbing aids and protective measures before working at height to prevent a fall.
- Ensure that the safety data sheets of the auxiliary and operating materials used are fulfilled.
- Ensure the use of personal protective equipment (helmet, non-skid safety shoes, safety goggles, ear protectors, gloves, etc.)
- Consider stumbling and spraining areas.
- Avoid slip hazard.
- Provide sufficient lighting.
- Provide sufficient aeration.
- In case of danger, actuate the emergency-stop switching device.

CAUTION : Possible contamination of the washing water / air; Infections and diarrhea



- Wear personal protective equipment (waterproof clothing, boots, gloves and breathing protection (e.g. particle filtering half-mask)).
- Avoid any contact with washing water and spray mist.
- Provide sufficient aeration.

5.2. Prefiltration module (Viking) installation



The pre-filter needs no specific servicing during its service life, except the timely replacement of the filtration module. It is recommended to change the filtration module once every 3 months (*Maintenance 7.3*).

1. Shut off the water supply and relieve excess pressure before starting installation.
2. Determine the location on the wall for the pre-filtration unit installation (1). Keep in mind to leave some space for the pre-filter's housing when replacing the filter cartridge. At least 40 mm of free space should be left under the water.
3. Drill holes in the wall so that they match the holes in the bracket (1).
4. Fasten the bracket to the wall using all the mounting holes with suitable fasteners (depending on the wall material).
5. Install the replacement filter cartridge into the water purifier housing, then assemble the water purifier (*Maintenance 7.3*).



CAUTION: It is important not to mix up the entry and exit holes of the water purifier. The arrows on the cover designate the direction of the water flow.

6. Insert the housing holder (1) into the L-shaped guide rails on the top cover (8) until the holes on top and on the bracket are aligned. Secure the structure with a retainer (2).
7. Connect the water purifier

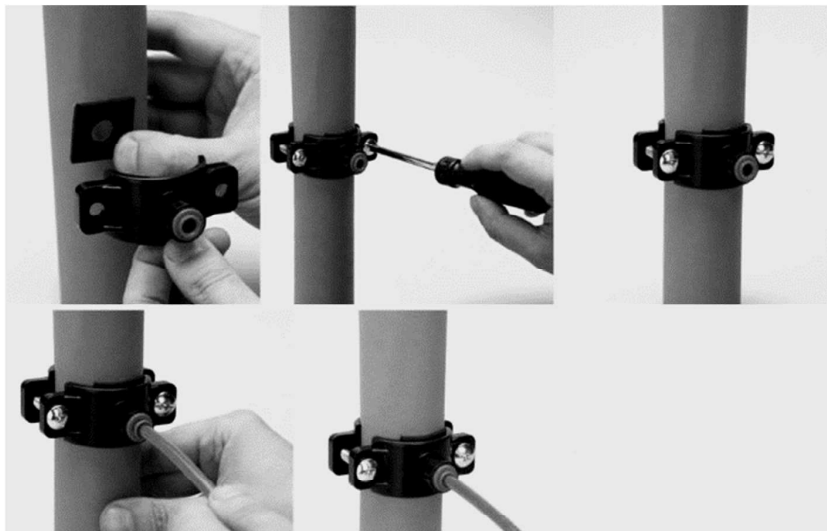
Replace the filter cartridge in the proper time!

5.3. System Installation

The system should be stored in a dry place at a temperature between +5 °C and +45 °C.

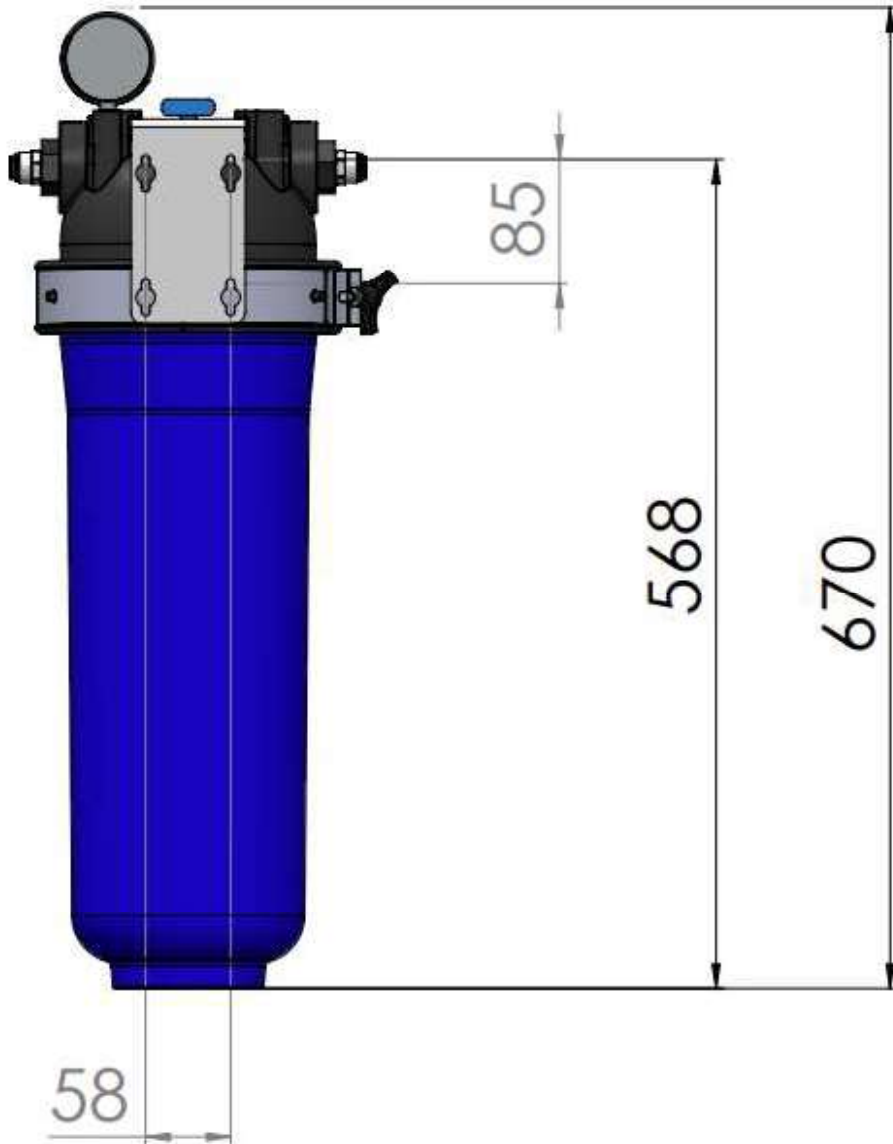
It can be installed on the floor or hung on a wall (*Installation 5.4*).

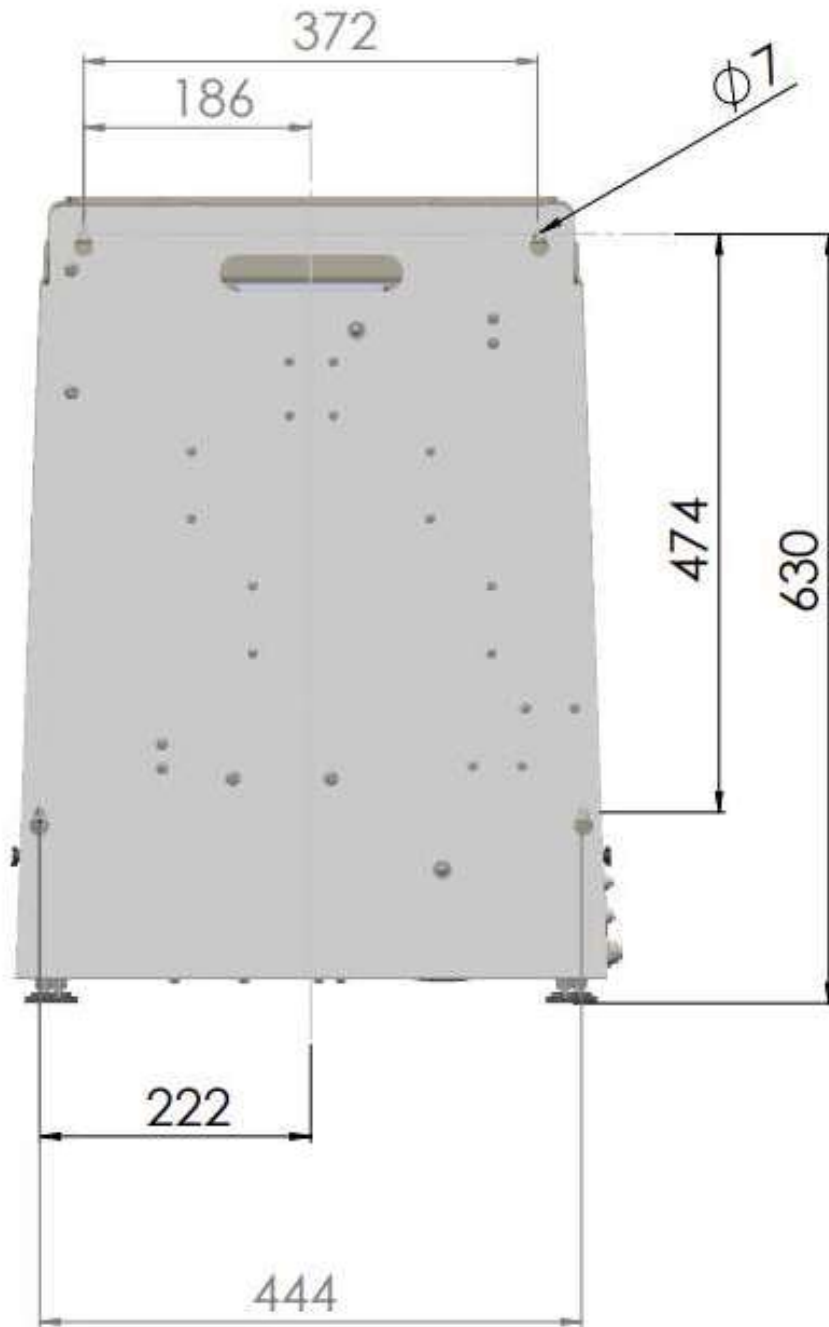
1. Unpack the system and place it to the permanent place of work.
2. A prefiltration unit should be installed on the floor with a stand fixed on a wall.
3. A prefiltration unit should be hung on a wall of the house (via a fixed stand). It is recommended that the unit is standing on the floor with a fixed stand to the wall (*Installation 5.2*).
4. Check if there is a cartridge inside the prefiltration unit. (*Installation 5.2, Maintenance 7.3*)
5. Pipe connection. Connect the water supply to the pre-filter inlet with a flexible pipe. From the pre-filter outlet, connect the pipe to the system's feed input. Concentrate pipe should be connected to drainage according to the picture below. Permeate pipe goes to water user with pressure tank or accumulation tank. Float valve the level of water in atmospheric accumulation tank.

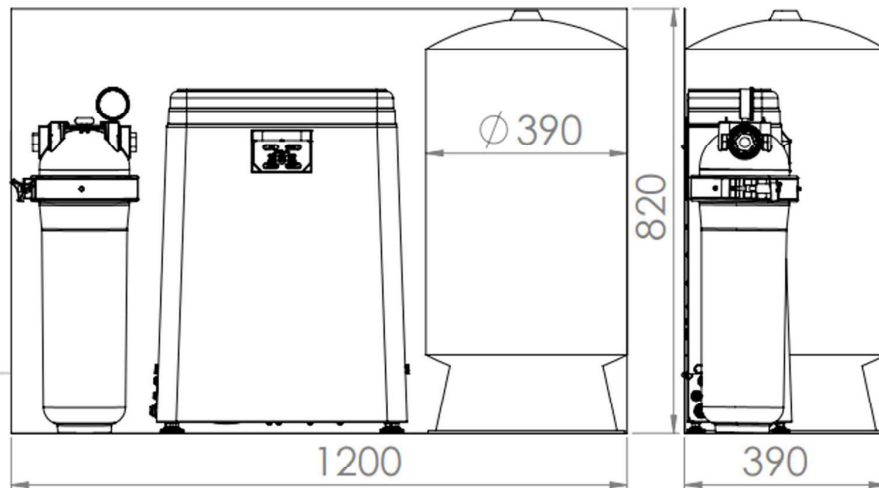
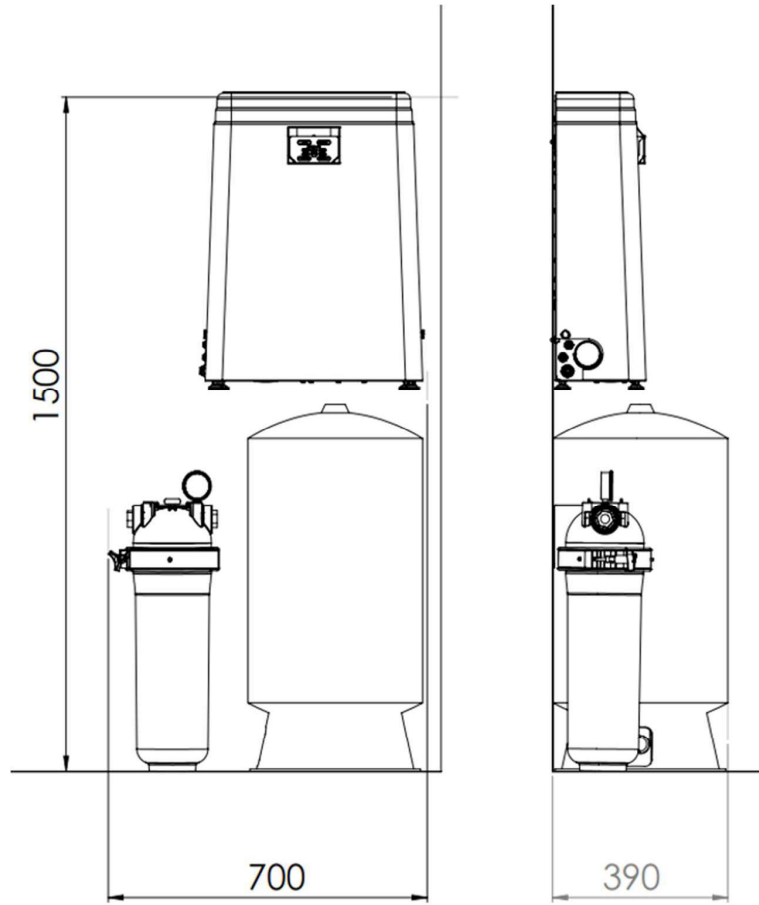


6. Take off the cover of the system
7. and apply pressure to the pre-filter. Push the air release (red) button on top of the pre-filter to release the air. After the air is released, check the pressure indicator (PI-2), the pressure should be at least 2 bar but no greater than 6 bar.
8. Make sure there are no leaks. Connect the electricity plug to the power supply. The system should automatically start, a run indicator should turn ON.
9. Put the cover back on.
10. Squeeze the permeate supply tube for 5 minutes and make sure the system stops, a Stand-by indicator should turn ON. Release (unclench) the permeate tube and continually drain the 1st permeate for 20 minutes.
11. System is ready to use

5.4. Wall mounting and installation dimensions







6. Troubleshooting

6.1. Low Feed Pressure

If **Low Press.** (Low Feed Pressure) indicator is ON:

- a. Check on P-01 pressure. If the pressure is less than 2 bar, check feed water supply line.
- b. If **Low Feed Pressure** indicator is ON after restarting the system, or the system turns ON and OFF repeatedly, check:
 - The pressure supply line
 - Cartridge condition
 - LPS-01 condition

6.2. STANBY indicator is ON while permeate tank is empty

STAND-BY indicator is ON, while permeate tank is empty:

- Check the permeate supply line
- Check HPS-01 condition

6.3. STANBY indicator is ON, system turns on and off repeatedly

STAND-BY indicator is ON, and the system turns on and off repeatedly.

- Check the air pressure in T-01 (permeate tank). Make sure it is less than 0.8 bar.
- Check HPS-01 setup and condition

If the error remains, please, change T-01 and HPS-01.

6.4. RUN indicator is ON, no permeate produced

If RUN indicator is on, but the system do not produce permeate, check PI-02 pressure. It should be 5 to 10 bar.

- If PI-02 pressure is less or equals P-01 pressure, it means the pump P-01 has malfunction and it should be changed.
- If P-02 has no pressure at all, XV-01 (feed valve) has malfunction and it should be changed.

7. Maintenance

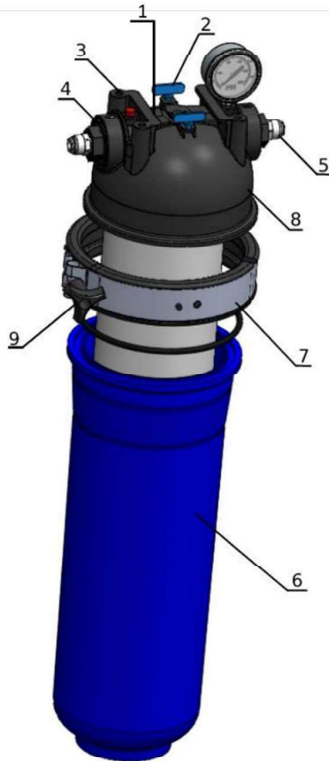
7.1. General Recommendations

1. It is recommended to replace the pre-filter cartridge (*Maintenance 7.3*) once every 3 months, or if the pressure is too low.
2. The RO membranes (MV-01/MV-02) and pressure pump (P-01) are recommended to be replaced once a year. Check the air pressure in both permeate and concentrate tanks (T-01/T-02). This pressure shall not be less than 1 bar and more than 1.2 bar*.
3. Permeate and concentrate tanks (T-01/T-02) are recommended to be replaced once every 3 years.

7.2. Tank Air Pressure Regulation

1. Empty the tank before pumping air to get an accurate pressure reading. To empty the tank, shut off the feed water to the system and turn on the outlet of the tank to drain water.
2. To check the tank's pressure, unscrew the air valve cover on the tank body. Use a low-pressure gauge to check the pressure reading. We recommend 1 - 1.2 bar for common use on our standard RO tanks.
3. If the pressure is below 1 bar, use a hand pump, electrical pump, or compressor to add air. Any remaining water will flow out from the outlet of the tank.
4. Once the recommended pressure is reached, reinstall the air valve cover, shut off the outlet of the tank, and turn on the feed water valve. The RO tank is successfully pressurized.

7.3. Prefiltration Cartridge Installation & Replacement



1. Shut off the water supply to the prefiltration unit.
2. Disconnect the quick-release couplings by unscrewing the union nuts.
Remove the water purifier from the housing (1), drain any excess water from it; place the wing nut (9), and remove the fixing collar (7) from the housing.
3. Remove the manifold and disconnect the filter cartridge by pulling it off the central fitting.
4. When replacing the cartridge, wash the inner surfaces of the manifold, bowl and rubber ring with water.
5. Install a new filter cartridge.
6. Assemble the water purifier, connect the manifold and the bowl with a clamp, and tighten the wing nut (9) until it stops.
7. Put the assembled water purifier into the housing (1). Make sure the water flow direction matches the direction of the arrow on the manifold.
8. After the filter cartridge is installed, turn on the water supply and make sure that the connections between the pipe and the prefiltration unit are tight.
9. Make sure there are no leaks.
10. The filter cartridge is successfully replaced.

System Equipment List

Tag	Name	Material	Connection size	Code
F-01	Cartridge Filter Housing	PP	1"	513990
LPS-01	Low pressure switch	Brass	1/4"	218001
XV-01	Feed valve	Brass	3/8"	217932
XV-02	Concentrate valve		1/4"	217923
XV-03	Drainage valve		1/4"	217923
P-01	Pressure pump		3/8"	208724
P-02	Recirculation pump		1/2"	217261
PI-01	Pressure Indicator		1/4"	217312
PI-02	Pressure Indicator		1/4"	217313
MV-01/02	Membrane housing	PP	3/8"	514771
T-01	Permeate tank	SS	1/4"	211823
T-02	Concentrate tank	SS	1/4"	211823
HPS-01	Permeate pressure switch	Brass	1/4"	217996
CV-01	Check valve	PVC	20 mm	217497
CV-02	Check valve		1/4"	212128
CV-03	Check valve		1/4"	201614
CV-04	Check valve		1/4"	201614
CV-05	Check valve		1/4"	201614
FR-01	Flow restrictor		1/4"	205069