Operation Manual

Reverse Osmosis (RO) System
NW-RO50-D1/RO400-E2/RO50-NP35/RO50-A1/RO50-C01-1/RO50-C01/PR305/RO400-B3LS3

50808, 50809, 50915, 51078, 51079, 51080–51082, 51084, 51085, 51110, 51783

Illustration similar, may vary depending on model

Read and follow the operating instructions and safety information before using for the first time.

Technical changes reserved!
Due to further developments, illustrations, functioning steps, and technical data can differ insignificantly.

Updating the documentation
If you have suggestions for improvement or have found any irregularities, please contact us.

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Introduction

Thank you for purchasing this quality product. **To minimise the risk of injury we urge that our clients take some basic safety precautions when using this device. Please read the operation instructions carefully and make sure you have understood its content.**
Keep these operation instructions safe.

General instructions

- This manual describes the Usage of all our RO systems.
- Note that some parts of this manual are intended for certain systems. Usually, the arrangement of the filter stages is always the same. The number of filter stages depends on the model that you have bought, between 1 and 6.
- For RO-Systems without pump: If you use a pressure tank, the input water pressure should be higher than 5.8 bar (85 psi).

Operation principle

The RO system adopts U. S. high-tech reverse osmosis technology. This automatic reverse osmosis system is composed of five to seven filtration stages:

- The ***first stage:*** The PPF cartridge removes suspended substance and other substances up to 5 µ in raw water.
- The ***second stage:*** granular activated carbon cartridge.
- The ***third stage:*** filter block of activated carbon.
- The ***fourth stage*** is the actual reverse osmosis membrane. The pre-cleaned water passes through the RO membrane, the pores of which are so small that organic contaminants (pesticides, insecticides, medicine, hormones, etc.), bacteria, and viruses are retained. The water flowing out of the membrane is stored in a pressure tank. When the gooseneck tap is opened, the pure water passes through the ***fifth stage,*** the highly active activated carbon cartridge "Gourmet," which gives the water a pleasant taste.
- If necessary, you can install a ***sixth*** and ***seventh stage,*** i.e., a mineral enrichment cartridge "Santé," which adds the desired minerals to the water. It is also possible to use a UV lamp that kills bacteria and viruses.
- The system controls the water purification process automatically. If the water pressure is too low or the water tank is full, the system stops automatically. When the water pressure returns to normal, the system switches on automatically.

The different filter stages

To maintain the pure-water quality, the filters must be replaced regularly depending on the quality of the raw water. With a daily consumption of 10 ℓ pure water and the use of public tap water, the following idle times can be expected:

Filter	Materials	Functions	Material life in average
1st stage	PP	Un-dissolved contaminants removal, i.e., sand, silt, rust, etc., with a diameter of < 5 µ	10 months
2nd stage	Granulated activated carbon	Adsorbs odour and taste intensive substances, chlorine, and chlorinated compounds.	10 months
3rd stage	Block activated carbon	Adsorbs odour and taste intensive substances, chlorine, and chlorinated compounds.	10 months

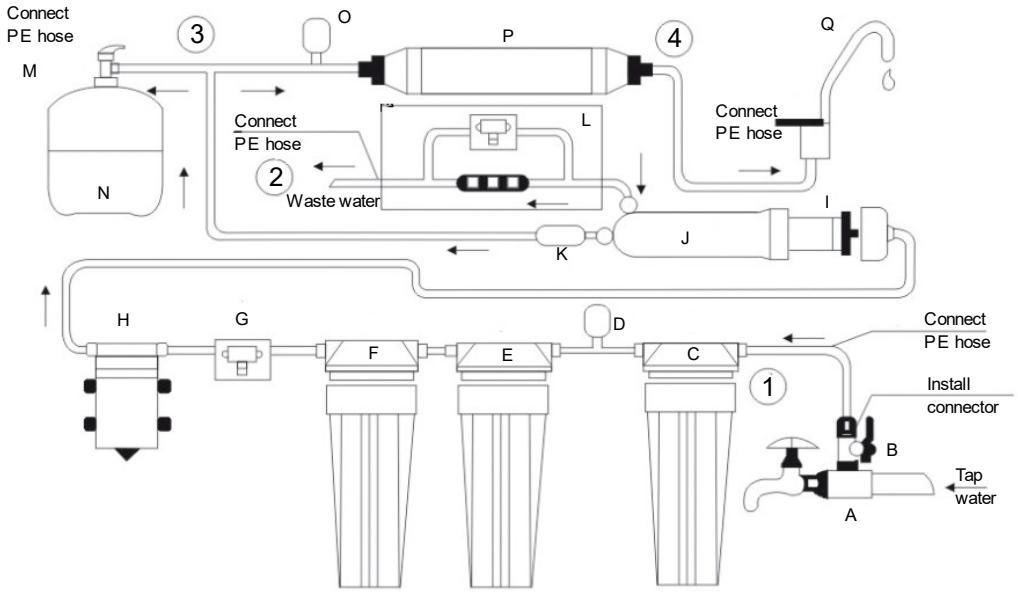
4th stage	RO membrane	Filters dissolved substances, bacteria, and viruses from the raw water.	2 years
5th stage	PI activated carbon filter “Gourmet”	Adsorbs odour	1 year
6th Stage	UV light	Disinfects the water	1 year
7th stage	Minerals	Puts minerals into the water	1 year

Technical flow process

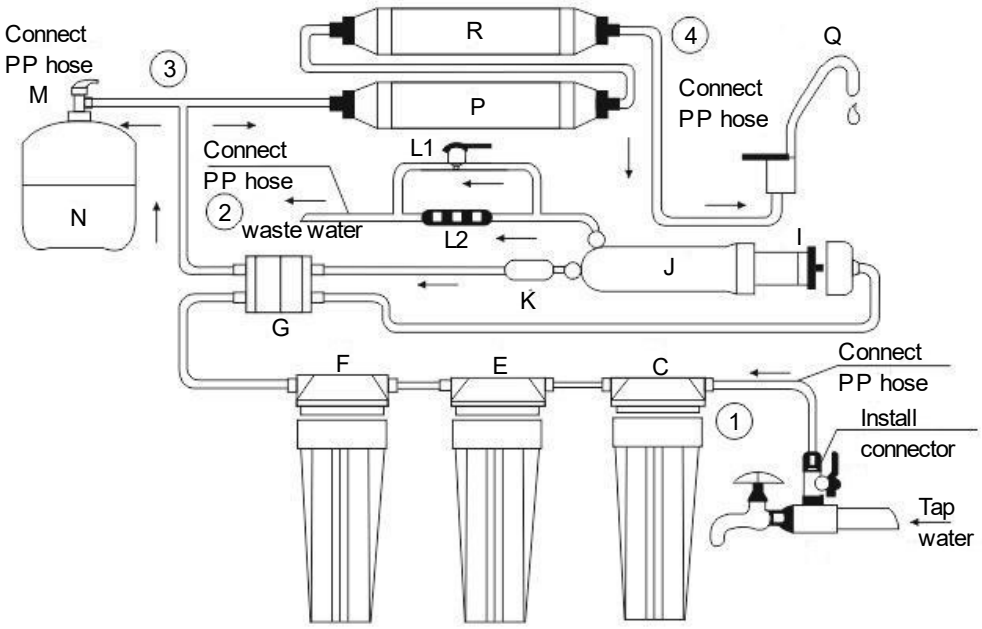
Tap water ⇘

- ➔ PPF filter
- ➔ Low-pressure switch
- ➔ Granular activated carbon
- ➔ Block of activated carbon
- ➔ Booster pump
- ➔ 4-way valve
- ➔ RO system
  → Waste water outlet
- ➔ High-pressure switch
- ➔ Activated carbon filter “Gourmet”
- ➔ Sixth filter stage (if present)
- ➔ Purified water
- ➔ Flow out from goose-neck water-tap
  → Pressure tank

RO system structure



Letter	Name	Letter/№	Name
A	3-way feed water connector	**B**	Ball valve
C	PP sediment cartridge	**D**	Low pressure switch
E	Activated carbon	**F**	Activated carbon block
G	Flow-in valve	**H**	Booster pump
I	RO membrane	**J**	Membrane housing
K	Check valve	**L**	Drain restrictor and flush valve
M	Tank valve	**N**	Pressure tank
O	High pressure switch	**P**	Gourmet filter
Q	Goose neck water-tap	**1, 2, 3, 4**	Connect plastic hose



Letter	Name	Letter/№	Name
A	3-way feed water connector	**B**	Ball valve
C	PP sediment cartridge	**E**	Activated carbon
F	Activated carbon block	**G**	4-way valve
	Booster pump*	**I**	RO membrane
J	Membrane housing	**K**	Check valve
L1	Drain valve	**L2**	Drain restrictor
M	Tank valve	**N**	Pressure tank
P	PI activated carbon filter “Gourmet”	**Q**	Goose-neck water-tap
R	Mineral ball / UV light**	**1, 2, 3, 4**	Connect plastic hose

* In this drawing, the booster pump is not illustrated. Usually, it is between the third filter stage and the RO membrane, like it is in the technical drawing on the page before.
** Please note that availability of a sixth filter stage is depending on the type of system.

Connection of the water hoses

- Red: to water inlet
- Blue: to faucet or pure water
- Yellow: to pressure tank
- Black: to drain

Technical data

	RO-50-XX / RO-BX-XX	RO-400-XX
Purified water output (ℓ/day)	190 (500 gpd with 25 °C)	1500 (400 gpd with 25 °C)
Tank capacity (ℓ)	11.35 (3 gallons)	
Raw water temperature (°C)	4–42	
Raw water pressure (bar)	1–3.5 (0.1–0.35 MPa)	
Clean water content relative to raw water (%)	15–20	
Water supply	Tap water or ground water TDS 1000 ppm less	

Installation

The system installation method should be determined in accordance with the layout of your kitchen. Refer to the following installation maps. If the RO unit is to be suspended on the wall, it should be fixed with two M6 swelling screws.

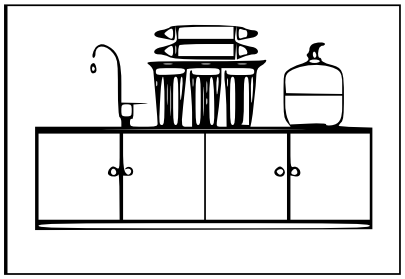


Fig. 6: On countertop

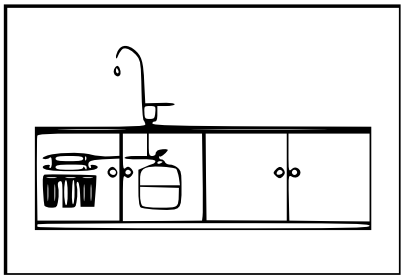


Fig. 7: Under countertop

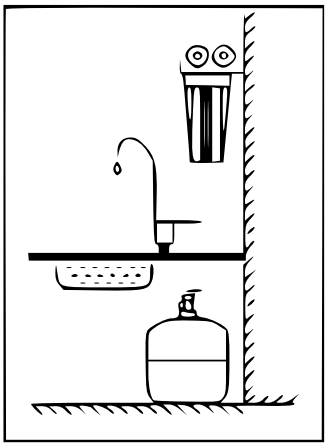


Fig. 8: Wall mounting

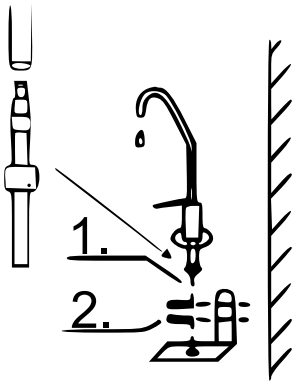


Fig. 9: Faucet on the wall

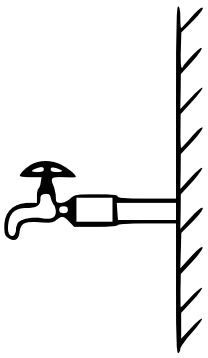


Fig. 10: 3-way connector

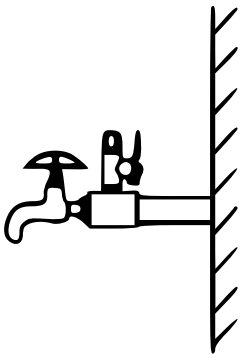


Fig. 11: ball valve

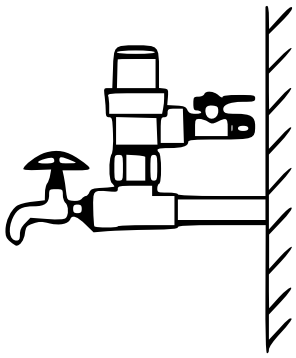


Fig. 12: Reduce valve

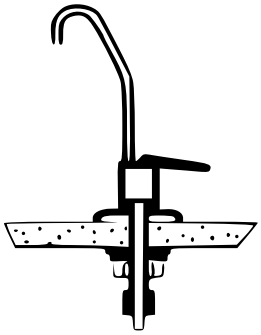


Fig. 13: Faucet on countertop

Fig. 14: Quick fitting connect PE hose

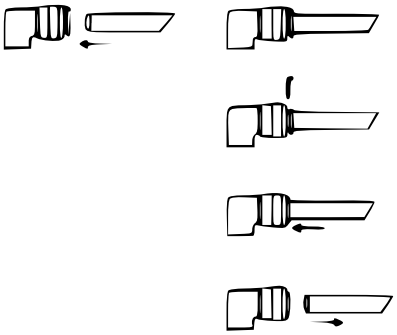


Fig. 15: Quick fitting disconnect PE hose

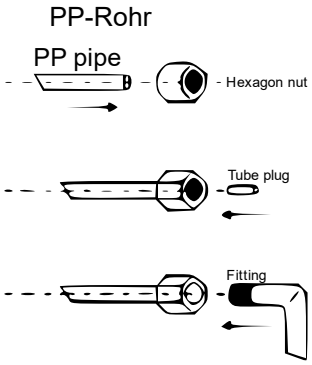
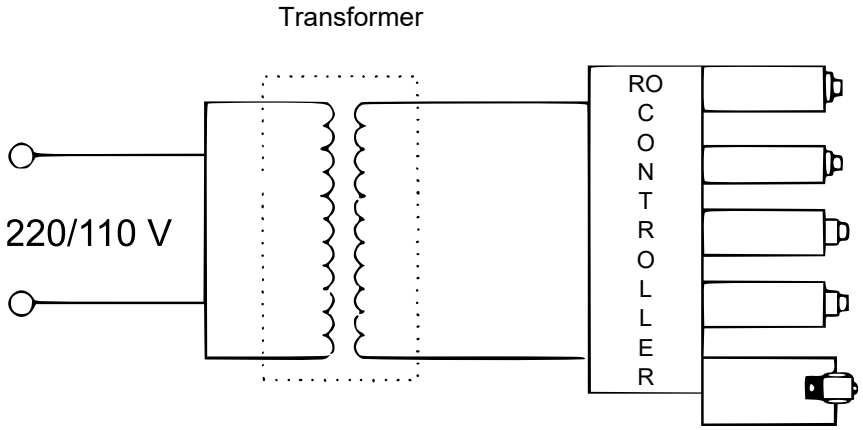
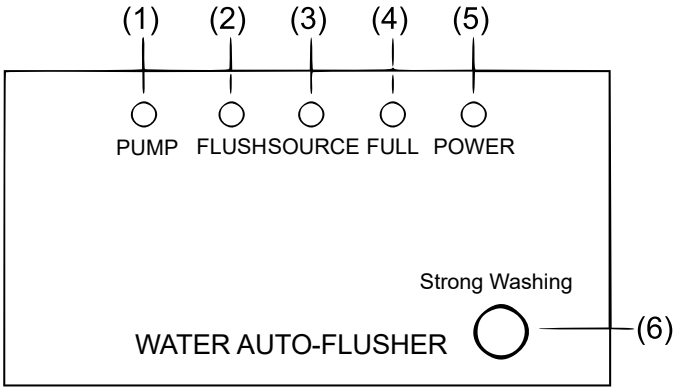


Fig. 16: Quick fitting connect PE hose

1. To install the ball valve, fit a three-way feed water connector **(A)** and place the ball valve **(B)** on the three-way feed water connector **(A),** then connect the water-tap with the three-way feed water connector (Fig. 10 and 11). If a pressure reducing valve is used, connect it (Fig. 12).
2. To install the RO membrane, screw off the cap of the RO housing **(J),** put the one end with two sealing rings of RO membrane **(I)** first into the RO housing, then screw on the cap tight.
3. The goose-neck water-tap **(Q)** should be positioned for good aesthetics, function, and convenience; it connects to the outlet fitting of the activated carbon filter **(P)** by means of a white plastic hose.
4. Install the plastic hose at following positions according to technological process. There are marks numbered 1, 2, 3, 4, on the Reverse osmosis system layout and components chart.
   - **Mark 1:** between water tap and PPF filter **(C)** with white plastic hose.
   - **Mark 2:** installing a drain tubing white plastic hose linking to the outlet of drain restrictor and flush valve. Connect the drain tubing to sewer or connect with a container where you can collect water which can be used for washing or for the toilet.
   - **Mark 3:** between the valve outlet **(M)** on water storage tank **(N)** and the Tee in front of activated carbon filter **(P)** with white plastic hose.
   - **Mark 4:** Between the goose-neck water-tap **(Q)** and the activated carbon filter **(P)** or mineral ball filter if available.
5. a) Method of connecting plastic hose with fittings
   - Cut a plastic tube according to measurement.
   - Insert the plastic tube into the hexagon nut (Fig. 16).
   - Place the white hose connector in the end piece of the white plastic hose, press the hose connector into the plastic hose by hand or with a tool (Fig. 16).
   - Place the plastic hose in the connector (Fig. 16).
   - Tighten the hexagon nut.
5. b) Method of connecting plastic hose with quick fittings (Pic. 14)
   - Cut a plastic hose after measuring.
   - Insert plastic hose deep into the quick fitting
5. c) Method of disconnecting the plastic hose from the quick fittings (Pic. 15)
   - Remove the small part.
   - Press the round part until it touches the main body of the quick fitting.
   - Remove the plastic hose.
6. Power cord: This system is equipped with a transformer which uses single-phase power supply of 220–240 V (see transformer voltage). To use it, plug the power cord of the transformer into the power supply socket.

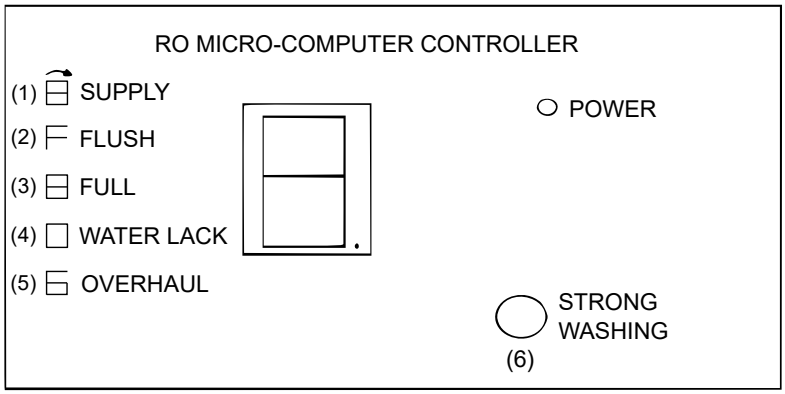
Functional principle





1	Pump
2	Flush
3	Source
4	Full
5	Power
6	Auto-flusher

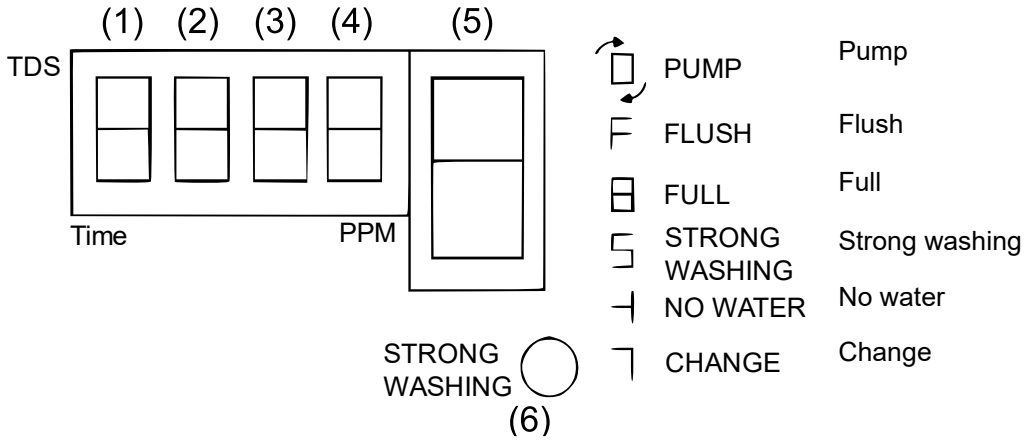
- Once the system is turned on, it will flush for 30 s.
- After 2 h of cleaning the water, it flushes again for 30 s.
- After 5 s, the system responds to the low-pressure switch.
- If the high-pressure switch operates, the system stops after 20 s.
- If the key **(6)** “Strong Washing” is pressed, the system flushes for 20 s.
- The LEDs **(1), (3), (5)** switched on mean that the system produces pure water.
- The LEDs **(3), (4), (5)** switched on mean that the pressure tank is full.
- The LEDs **(2), (3), (5)** switched on mean that the system is flushed.



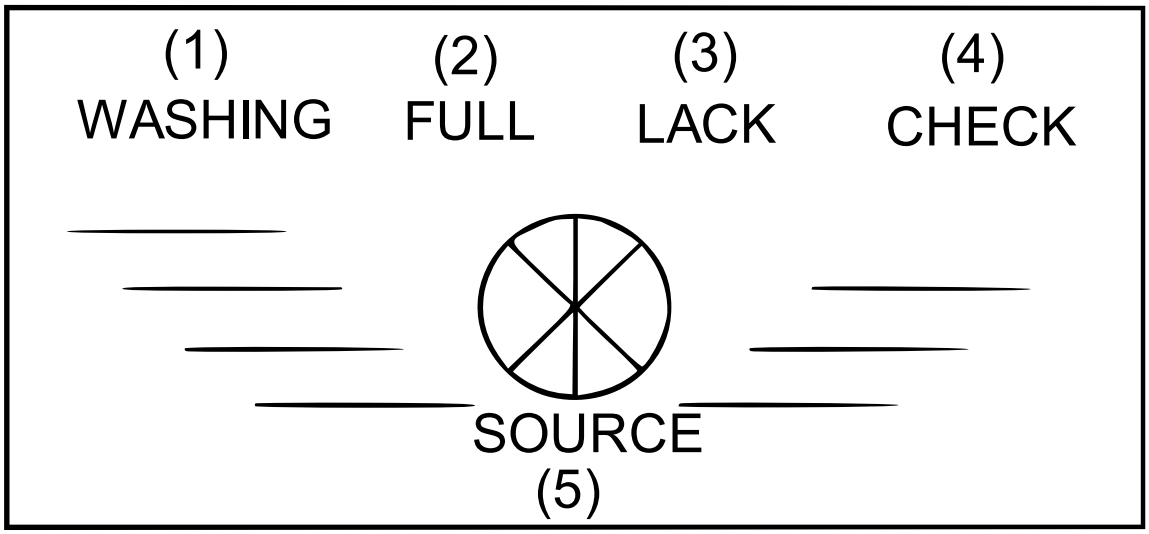
1	Supply
2	Flush
3	Full
4	Water lack
5	Overhaul
6	Strong washing

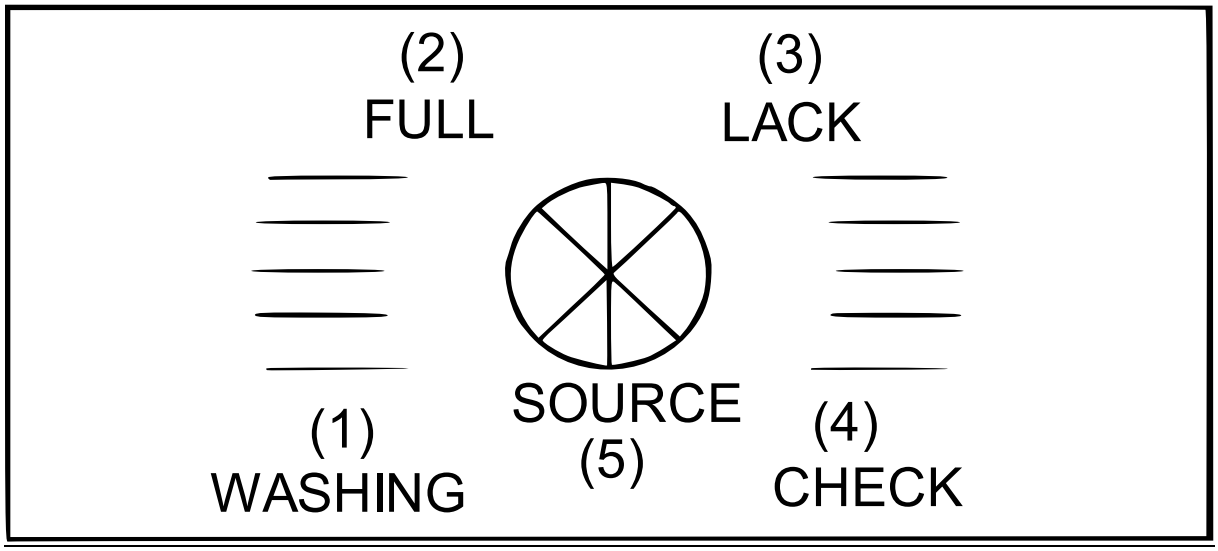
- If the system is turned on, it flushes for 30 s, the display being as **(2).**
- After having been rinsed, pure water is produced, the display being as **(1).**
- When the pressure tank is full, the system stops, the display being as **(3).**
- A warning buzzer will be shown if the water supply lacks or the water supply pressure is too low, the display being as **(4).**
- After 2 h of pure water production, there is again a 30 s rinse.
- In the event of the system working for an unusually long time, it is automatically switched off, in which case a warning buzzer is activated, the display being as **(5).**
- If you press the button **(6)** for strong flushing (“Strong Washing”), the system is rinsed for 30 s.

RO control box

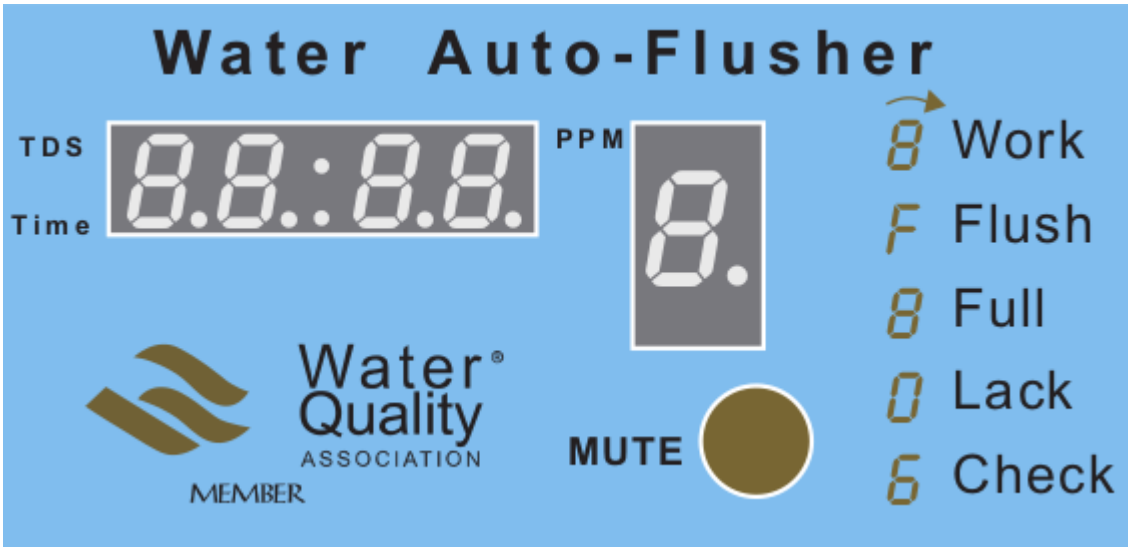


1. Digit diode **(1):** two indicator options: “E” = control beeps, “P” = control is silent. The function can be changed by pressing for 2 s the “STRONG WASHING” button **(6).**
2. The digit diodes **(2), (3), (4)** show the TDS value. If the system flushes, the digit diodes **(3), (4)** show the remaining seconds for rinsing
3. The digit diode **(5)** shows the system operating state. The explanation can be found on the right controller side.
4. Press the button **(6)** to flush the system.





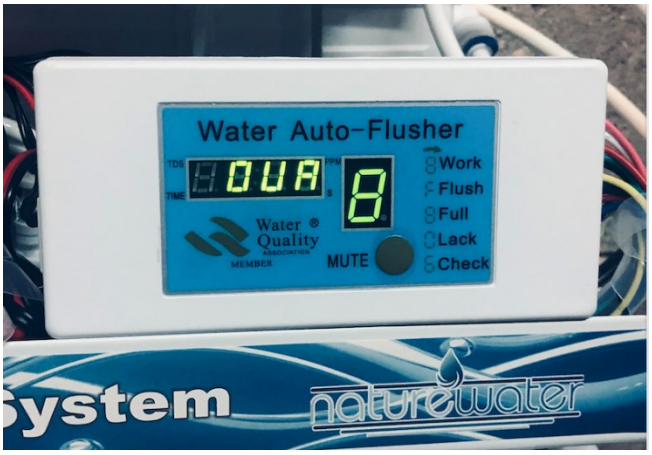
- The system, after having been turned on, is rinsed for 30 s, the display being as **(1).**
- After having been flushed, the system starts to produce pure water, the display being as **(5).**
- Once the pressure tank is full, the system stops, the display being as **(2).**
- A buzzer indicates if feed water lacks or the water supply pressure is too low, the display being as **(3).**
- After two hours of pure water preparation, the system is rinsed for 30 s, the display being as **(1).**
- When the system has worked for an unusually long time, it is automatically stopped and at the same time there is a warning buzz, the display being as **(4).**



Work	1. When the high-pressure switch determines that the water pressure inside the tank is lower than the pre-set value, the system starts operating. 2. The two last digits show the actual TDS value. The TDS value upper limit is 100 ppm. If the value exceeds 100 ppm, the symbols “100” and “TDS” flash one after another. 3. If the TDS value is higher than 50 and if the buzzer mode (“E”) is activated, a buzzer sounds. 4. The first digit shows “E” for the buzzer mode and “P” for the mute mode, the last of which can be activated by pressing the “MUTE” button. 5. Both the probe and the control unit regulate possible deviations in the measuring range; do **not** combine the system with other devices. 6. The TDS measurement can easily be perturbed. Ensure that the probe has been introduced to as sufficient depth inside the pipe to guarantee accurate measuring results. 7. The presence of air bubbles inside the tubing system can influence on the accuracy of the TDS measurement. Purge the pipes before using the system. (The high-pressure pump works, the inlet valve opens, the outlet valve closes.)
Flush	1. The system is activated and is rinsed for 30 s. 2. Cumulative water production for 6 h; do not rinse the system during that time, it will afterwards be rinsed automatically for 30 s. 3. Automatic rinsing for 30 s after the lack of water programme having been finished. 4. The last two digits show the remaining back-flushing time, the clock symbols flushes once per second. 5. The first digit shows “E” for the buzzer mode and “P” for the mute mode, the last of which can be activated by pressing the “MUTE” button. 6. Rinse the system for 5 s before the water production and the water tank filling. (The high-pressure pump works, the inlet valve opens, the outlet valve closes.)
Full	1. When the high-pressure switch determines that the water pressure inside the water tank has reached to pre-set value, the water production is stopped. 2. Shows the last measured TDS value during the water production or rinsing. When the system does not produce any water, there is no TDS

	measuring. (The high-pressure pump works, the inlet valve opens, the outlet valve closes.)
0 Lack	1. When the low-pressure switch determines that the raw water pressure is beneath the pre-set value, the water filtering system changes to the lack of water programme, and a buzzer sounds. 2. Neither the TDS value is measured nor it is indicated. (The high-pressure pump works, the inlet valve opens, the outlet valve closes.)
6 Check	1. If after 12 successive hours there is not any water inside the system tank yet, the system changes to the maintenance mode. In that case, contact an expert. 2. Neither the TDS value is measured nor it is indicated. (The high-pressure pump works, the inlet valve opens, the outlet valve closes.)

Error message



- This error message means that the TDS value is higher than 100 ppm. The controller setting limit is at 100 ppm precisely. If the value is beyond this limit, the controller cannot determine the value any longer, and the OVA message is showed.
- The normal value is between 10 and 20 ppm.
- There are several alternatives that lead to this error:
  1. When the system is reinstalled, water contaminations can cause a high TDS value to be indicated. We recommend to thoroughly rinse the osmosis system. The TDS value should normalise by rinsing the system.
  2. Check if the RO membrane has been correctly installed. It may lack or have been incorrectly set into the housing. Thus, the water cannot be purified, and this leads to a high TDS value.
  3. If the RO membrane is newly set in, you must repeat the rinsing for otherwise the TDS value can become too high.
  4. The TDS controller may be dirty. Check the controller condition and clean it if necessary.

Commissioning

After the installation, wash the filters of each stage before using the system for the first time. The steps are as follows: turn on the water-tap tubing ball valve **(B)**, turn off the tank valve **(M)** of the water tank **(N),** turn on the goose-neck water-tap **(Q),** open the flush valve **(L1).** Now plug the power cord into the power supply socket, and the high-pressure pump **(H)** starts up automatically, the dirt water outlet begins to drain, filters of each stage are washed automatically.

After having washed the tank, turn on the tank valve **(M)** of the water tank **(N),** turn off the goose-neck water-tap **(Q),** turn off the drain valve **(L1).** The reverse osmosis filter then begins to purify the water. When you use this system for the first time, let the purified water flow out from the full water tank twice, then the purified water is suitable for drinking.

The concentrated waste water produces during pure water filtering cannot be used as drinking water. Re-check the system for tightness.

Operation

After the installation and the adjustment, the system begins to automatically produce purified water. Usually, turn off the goose-neck water-tap **(Q),** turn on the tank valve **(M)** of water storage tank, let the purified water flow into the tank. When the water storage tank is full of purified water, the system automatically stops. Turn on the goose-neck water-tap **(Q)** to use the purified water. If using the system for the first time, let the water twice flow out of the tank; it is after that that the purified water can be drunk.

Notes:

A) When you use the system for the first time, turn on the goose-neck water-tap to drain the water (black water flowing out from water-tap caused by activated carbon filter).
B) When you use the system for the first time, TDS test data may be a bit high; continue washing until the TDS test data normalises.
C) When you use the system for the first time, the purified water is not drinkable until steps A and B are done. The concentrated dirt water used for the water purifying process cannot be used for drinking.

Maintenance

- It is highly recommended to replace filters periodically to keep the high water quality. This helps to take full advantage of the filters and guarantee the water quality standard. If one takes care of the filters and replaces them periodically, the water purifier system could have a longer life-time. The period of filter replacement depends on the raw water quality and its impurity quantity. Based on empirical statistics a family of four persons usually consumes 10 ℓ (10 kg) of purified water each day. If a mineral filter is installed into the system, this filter should be replaced after 6–12 months.
- By regularly replacing the filters, you will ensure the drinking water quality and long service life of the system.

Rinsing the RO membrane

When the RO membrane purifies the water, there is impurity and bacteria left on the surface of the membrane, which may affect the quality and volume of the purified water. Thus, the RO membrane must be cleaned periodically. In our system, the RO membrane is automatically washed. One may manually wash the membrane by turning on the flush valve **(L1)** for 2–3 min once a week.

Note: To guarantee the efficient work of your system, please use the specified filters, provided by the same vendor of the osmosis system.

Warning!

- Do not drink the water of first two tank contents.
- Clean the remaining contaminants and sediment inside the unit.
- Check if the unit works normally and without water leakage.
- Do not take apart the parts of system.
- Do not apply the system to purify hot water or to filter hot water.
- Do not place air valve discharged on the pressure tank.
- To ensure the quality of purified water, replace the first and the second filters after 10 months.
- Check the power supply and make sure that it has a suitable voltage.
- When the system is not used for a long time, turn off the power and shut off the ball valve.
- Do not
- Keep the RO unit away from sunshine.

Trouble-shooting table

Problem	Solution
No operation of the pump to generate purified water	Check if the water supply pressure is high enough to work. The RO controller box does not start the pump under low pressure.
	Check if either high-pressure switch or flush valve works.
	Check if the fuse on transformer is burned; if so, then check if post in-line carbon filter (T33) or PP cartridges is blocked, it may cause the pump to be overloaded.
No operation at all	Check if power supply is normal.
	Check if the water supply ball valve has been turned on (check if water pressure is normal).
	Check if the water storage tank is full of water.
No automatic operation	Check if there is any wrong operation.
	Check if the high- and low-pressure valve is normal.
Pump head leakage	Check if post in-line carbon filter (T33) or PP cartridges are blocked, which may cause the leaking. Sometimes the leakage may be caused by the increased water pressure inside the pump head that cannot be released. If so, replace all the carbon cartridges and send the pump for repair.
	Either a weakened membrane or the blocked scale could cause the leaking as well.
	The water cannot flow out due to the blocked RO membrane, which is caused by a blocked flow restrictor. This causes the pump head to be filled with high pressure water that can cause a leak. Improve the relevant components.
No water purifying with pump normally working	Maybe the RO membrane is blocked or the pump is out of pressure. If the RO membrane is blocked, replace it. If the pump has no pressure, check if it is due to either the pump having operated for too long or the filtering materials being blocked and the adequate maintenance not having been done, which may cause the pump structure to weaken. Send in the pump for repairing.
Lack of purified water outlet with filled tank	The cause may be a lack of air inside the tank. Please recharge the air (7 psi) and check if tank has air leakage. If it does, please replace the tank.
	If the post in-line carbon filter is blocked, replace the filter.
Continued dirt water discharging with the tap closed	Check if flush valve is operating normally; otherwise, replace it.
	The input water valve was damaged.
No complete stop or restart of RO system with filled tank	High-pressure switch is out of work. Please repair or replace it.
	Check if valve is releasing pressure and is not stuck. Please replace it.
Too little purified water volume	Check if the filters are dirty or have served for too long. If the RO membrane is dirty or has not regularly been flushed, replace it.
	Check if the water is too cold.
Water supply pressure quality beneath that of the new system	Replace the pump.

Disposal regulations

EU guidelines regarding the disposal of scrap electric appliances (WEEE, 2012/19/EU) were implemented in the law related to electrical and electronic equipment and appliances.

All WilTec electric devices that fall under the WEEE regulations are labelled with the crossed-out wheeled waste bin logo. This logo indicates that this electric equipment must not be disposed with the domestic waste.

The company WilTec Technik GmbH has been registered in the German registry EAR under the WEEE-registration number DE45283704.

Disposal of used electrical and electronic appliances (intended for use in the countries of the European Union and other European countries with a separate collection system for these appliances).
The logo on the article or on its packaging points out that this article must not be treated as normal household waste but must be disposed to a recycling collection point for electronic and electrical waste equipment. By contributing to the correct disposal of this article you protect the environment and the health of your fellow men. Environment and health are threatened by inappropriate disposal.

Material recycling helps reduce the consumption of raw materials.

Additional information on recycling this article can be provided by your local community, municipal waste disposal facilities, or the store where you purchased the article.

Address:
WilTec Wildanger Technik GmbH
Königsbenden 12 / 28
D-52249 Eschweiler

Important notice: