

ECO HOUSE COMFORT



WTRX Water Softener

Installation and User Guide

Product Code EHC-WT01





Introduction	3
The Water Treatment Principle	3
Unit's Soft Water Output Capacity	4
Valve Description and Specifications	5
Device working cycles	8
Keyboard Functions in Settings Mode	12
Control Valve Settings	12
Installation	14



1. Introduction

Dear User,

Thank you for choosing the WTRX water softener - it has been a good choice that will provide you with an efficient and economical treatment of your water supply.

Please read this instruction manual, as it will guide you through a smooth installation process. The manual also provides advices on how to maximize the unit's benefit for a longer time.

The water treatment system functions are managed by a microcomputer controlled valve, which enables the setting of the unit's working parameters based on the local water quality; the correct settings allows users to use the system economically, while the automatic regeneration saves time and money.

The control valve itself utilizes rotating ceramic discs technology. This breakthrough technology guarantees perfect sealing inside the control valve and, implicitly, a long term economical operation.

2. The Water Treatment Principle

Most of the water supplied to the UK households still contains Calcium ions (Ca^{2+}) and Magnesium (Mg^{2+}) ions, even after your Water Provider has treated and filtered it - this is because it is not economically efficient to eliminate these ions. In time, they precipitate out of the hard water as scale, which builds up on the inside of your plumbing, washing machines, water heaters, tea kettles, coffee makers, hot water tanks, etc. Scale reduces the flow through pipes and is a poor conductor of heat. Eventually, pipes can become completely clogged. In addition, the scale also adhere to adjacent surfaces like taps (see picture below), showers and shower cabin doors, etc. and is hard to remove; lots of chemical cleaning products are used to counteract the effect of hard water, leading to increased spending on non-ecological products.

The only efficient way to remove the scale is prevention; this means removing the Ca^{2+} and Mg^{2+} ions **BEFORE** they enter into your house's plumbing. To achieve this, a water softener is used. The principle of the water softener is simple: it substitutes the undesired Ca^{2+} and Mg^{2+} ions with harmless Sodium (Na) ions by using a special cationic resin. This chemical reaction lasts until the resin is

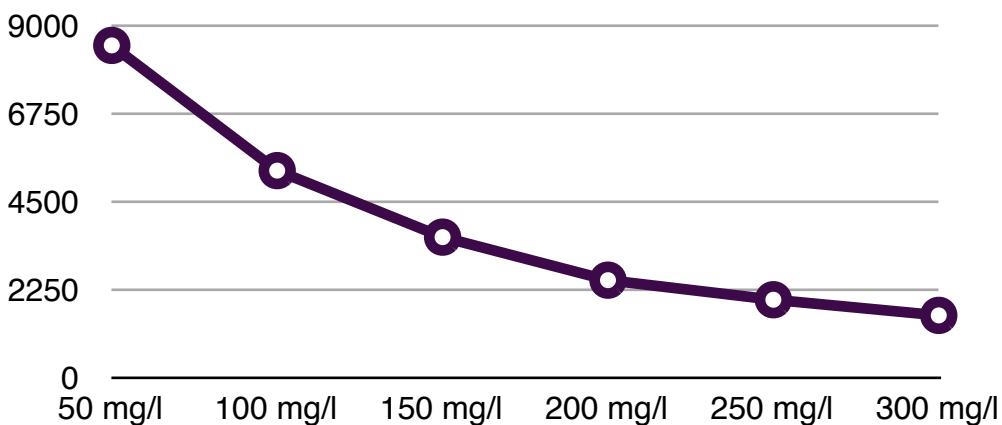


exhausted of its Na ions - the water softener then follows a regeneration cycle in which the resin is washed with a salted solution (NaCl) which releases the Ca²⁺ and Mg²⁺ ions into the solution and takes in the Na instead; the resulting solution (containing the Ca²⁺ and Mg²⁺ ions) is then discarded into the drain and a new softening cycle can begin. The whole cycle is performed by the special valve used; it is automated for maximum efficiency, comfort and peace-of-mind.

3. Unit's Soft Water Output Capacity

The volume of soft water produced by the WTRX unit between two regeneration cycles depends on the water hardness in your area. The water hardness is measured in milligrams per liter (mg/l) and represents the how many milligrams of CaCO₃ (calcium carbonate) are found in a liter of water. The table below shows the hard to soft water classification:

Classification	Hardness in mg/l
Soft	0 - 60
Moderately hard	61 - 120
Hard	121 - 180
Very Hard	≥ 181



So, based on the water hardness in your area, the WTRX unit will produce more or less soft water between two regeneration cycles - see graph, as an estimate...

◆ Soft Water Output (litres) of WTRX unit between two regeneration cycles



4. Valve Description and Specifications

4.1. Icons Description



1	In service / first cycle / water treatment: water flows through the water treatment system.
2	Back wash / second cycle / bed counter flow wash.
3	Regeneration / third cycle / brine draw and slow rinse.
4	Brine refill / fourth cycle / brine tank refill.
5	Fast rinse / fifth cycle / bed concurrent flow washing and structuring
6	Clock – when up, display shows current time.
7	Key – indicates that keyboard is locked; to unlock, simultaneously press and hold down buttons [11] and [12] for 5 seconds. Keyboard is locked automatically after 1 minute of inactivity.
8	Settings mode – when up, settings mode is on. To exit settings mode, press manual regeneration / back [10] button.
13	„D” (day) – display readings in days
14	„m3” – cubic meters – display readings in cubic meters. (1 m3 = 1000 l)
15	„M” – display readings in minutes



4.2. Operating Buttons



9	Enter (enter settings mode, change settings, accept settings)
10	Regeneration / Back <ul style="list-style-type: none"> • In service mode: press to start the regeneration immediately; • In regeneration mode: change the cycle; • In settings mode: press to return to service mode.
11	Down (next option)
12	Up (previous option)
21	Additional manual cycle change handle (allows to carry out regeneration manually when there is no power. turn only clockwise)
22	Additional cycle indicator



4.3. Valve connections



16	Raw water inlets (1 inch connection); one must be closed.
17	Purified water outlets (1 inch connection); one must be closed.
18	Drain outlet (1/2 inch connection).
19	Flow meter sensor connection. NOTE: to remove the sensor, release the clip at the bottom of the sensor.
23	Brine tank connection (3/8 inch connection).
24	By-pass and mixing handle. Positions 1 to 4 are for mixing raw and purified water. The higher the grade, the more raw water is mixed with the purified water.



5. Device working cycles

During cycles 2 to 5, the display shows the symbol of current cycle (described in section 6.1) as well as cycle number (2 to 5) and the remaining time in minutes (to the end of current cycle): for example „2 – 10 M” means that currently the device is in cycle number 2 (back wash) and that there are 10 minutes left to the end of the cycle.

5.1. Cycle 1 - In Service

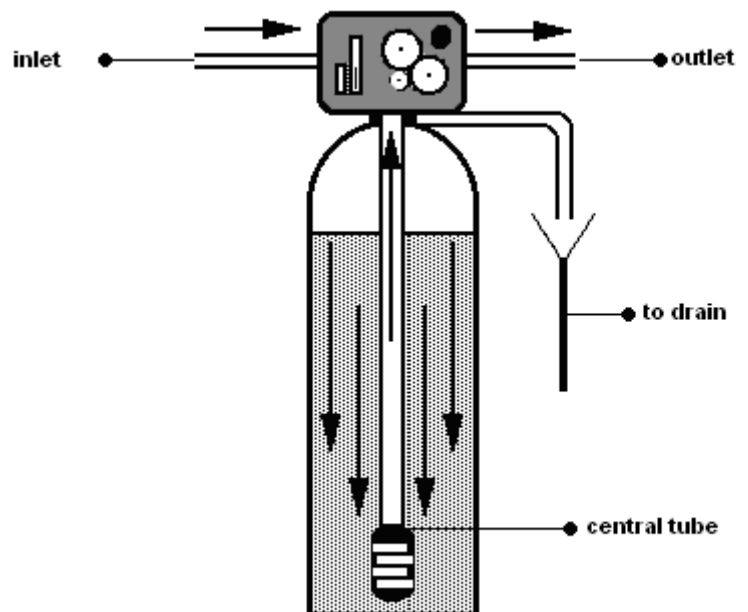
Display: LEDs at the left of the display are flashing and sandglass icon is on. It also displays the following readings:

- the current time,
- the time of the beginning of the regeneration after treating programmed volume of water,
- water volume remaining until regeneration in m³,
- current flow rate m³/h

Status: The device is in the first cycle (water treatment).

Operation: water flows through your water treatment system. Raw water flows through the control valve, goes down the ion - exchange bed, flows up through the central tube to the control valve and out to the water system.

NOTE: the by-pass handle should be in IN SERV or mixing [1, 2, 3, 4] position.



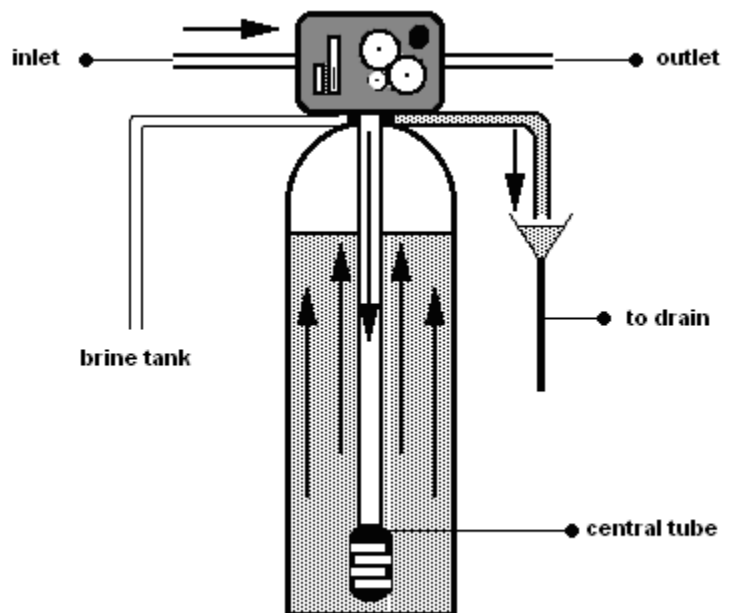


5.2. Cycle 2 - Backwash

Display: Icon number 2 is on.

Status: The unit is in cycle 2 (counter flow bed washing).

Operation: Raw water flows through the control valve and central tube to the bottom of the tank with ion-exchange bed. Water flows through the ion-exchange bed from the bottom to the top and washes and loosens the bed. Then flows through the control valve to drain. During this cycle control valve cuts off water supply into the existing water piping system. In this way it protects the water system from being polluted by wastewater from device regeneration.



5.3. Cycle 3 - Regeneration

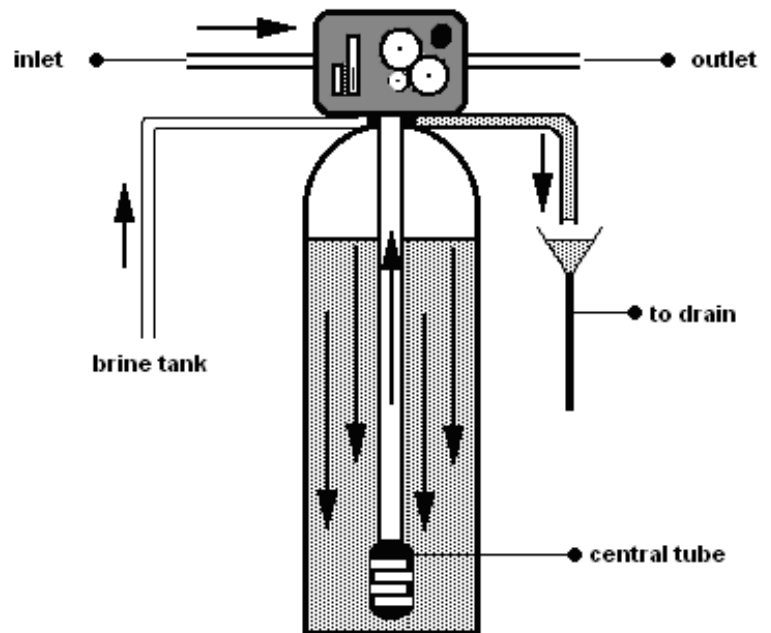
Display: Icon number 3 is on.

Status: The unit is in cycle 3 (brine regeneration and slow rinse).

Operation: Raw water mixed with brine flows through control valve and ion-exchange bed. Water flowing through the bed reactivates its ion exchange capability. Then the water flows through the control valve to drain. When all the



brine is drawn the bed is slowly washed by water. It provides proper conditions for ion-exchange bed regeneration. During this cycle, the control valve cuts off water supply from the existing water piping system. This way, it protects the water system from being spoiled by wastewater from device regeneration.

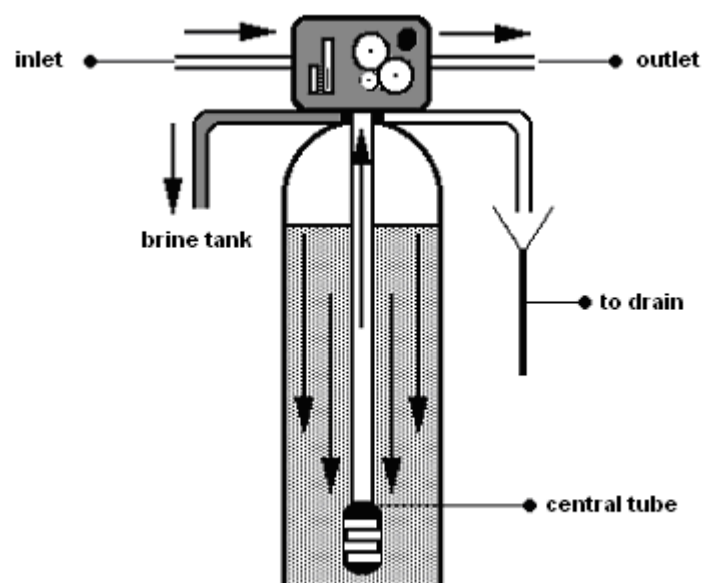


5.4. Cycle 4 - Brine Refill

Display: Icon number 4 is on.

Status: The unit is in cycle 4 (brine tank refill).

Operation: Water is poured into the brine tank in order to prepare brine solution for the next regeneration. Volume of brine can be adjusted by the time of water refill. The longer time the more salt will dissolve in the water and the more brine will be prepared. During this cycle, the control valve cuts off water supply from the existing water piping system. This way, it protects the water system from being spoiled by wastewater from device regeneration.





5.5. Cycle 5 - Fast Rinse

Display: Icon number 5 is on.

Status: The unit is in cycle 5 (ion-exchange bed fast rinse).

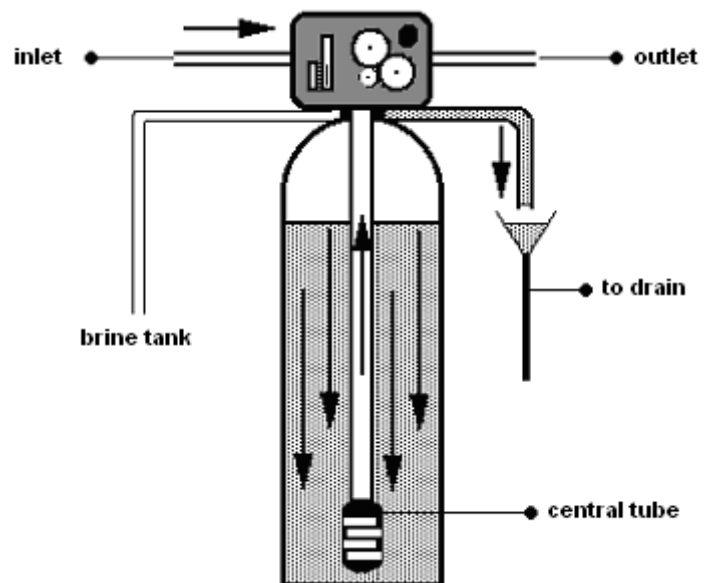
Operation: Water flows through the control valve and ion-exchange bed, washes it from remaining of brine and goes to drain. During this cycle control valve cuts off water supply into the existing water piping system. This way, it protects the water system from being polluted by wastewater from device regeneration.

When regeneration is finished control valve goes automatically into service – water treatment cycle.

While the control valve changes the cycles, the display shows “– 00 –” sign and manual cycle change handle [21] turns and manual cycle indicator [22] changes its position according to digital display readings.

During the whole regeneration cycle, the control valve cuts off water supply from the existing water piping system. This way, it protects the water system from being spoiled by wastewater from device regeneration.

In case of lack of electricity it is possible to perform regeneration manually. Turn the manual regeneration handle in proper time intervals. They can be read in advance from the valve settings. Turn the manual regeneration handle ONLY clockwise.





6. Keyboard Functions in Settings Mode

Press enter button [9] to enter the settings mode. Make sure the keyboard is unlocked. In settings mode, keyboard buttons have the following functions:

Enter [9]: activate the value to be changed and confirm the change. Value to be changed is flashing when activated. Settings mode icon [8] is flashing too. The value can be adjusted when flashing. Enter button [9] confirms the new value. When new value is set the control valve confirms it with a short sound and settings mode icon [8] stops flashing.

Regeneration / back [10]: exit adjusting value mode or exit settings mode.

Down [11]: change to next parameter to be set or decrease active value.

Up [12]: change to previous parameter to be set or increase active value.

NOTE:

The control valve timing for cycles 2-5 is set according to the kind and volume of ion-exchange bed and brine tank size used in the making of the WTRX water softener unit. The volume of treated water had been set on the basis of average values. Please consult a specialist before changing these settings.

In case of lack of power failure, the control valve retains all the settings for 30 days.

7. Control Valve Settings

Press enter button [9] to enter settings mode. If the keyboard is locked and key icon [7] is on, unlock the keyboard by simultaneously pressing and holding the up [11] and down [12] buttons for 5 seconds.

If the settings mode icon [9] is on, settings mode is active. Regeneration / back button [10] exits the settings mode. Settings mode will be closed automatically and the keyboard will be locked after 1 minute of inactivity.

To change the parameter to be set, press the down button [11]. Parameters can be set in the order of their appearance:



- Current time (European 24 hour standard)
- Volume delayed mode (A-01) or volume-immediate mode (A-02). In A-01 mode, when a preset volume of treated water is reached, control valve will postpone regeneration until the start regeneration hour. In A-02 mode when the preset volume of treated water is reached, control valve will start regeneration immediately.
- Start regeneration hour: the time when regeneration will start, after reaching the preset volume of treated water (European 24 hour standard); A-01 mode only.
- Volume of water to be treated between regenerations.
NOTE: this is a crucial parameter for proper operation of your water treatment system. It should be adjusted by a professional according to water analysis results.
- Back Wash (2) – time of back wash, set in minutes.
E.g. 2 – 10M means time of back wash is set to 10 minutes (M in display top right corner – reading in minutes).
- Regeneration (3) – time of brine draw and slow rinse, set in minutes. E.g. 3 – 60M means time of brine draw and slow rinse is set to 60 minutes (M in display top right corner – reading in minutes).
- Brine refill (4) – time of brine tank refill, set in minutes.
E.g. 4 – 05M means time of brine tank refill is set to 5 minutes (M in display top right corner – reading in minutes).
NOTE: long brine refill time might lead to water overflow to drain or outside the brine tank. Adjust at your own risk.
- Fast rinse (5) – time of fast rinse, set in minutes.
E.g. 5 – 10M means time of fast rinse is set to 10 minutes (M in display top right corner – reading in minutes).
- Maximum interval in days between two regenerations. (D in display top right corner – reading in days).

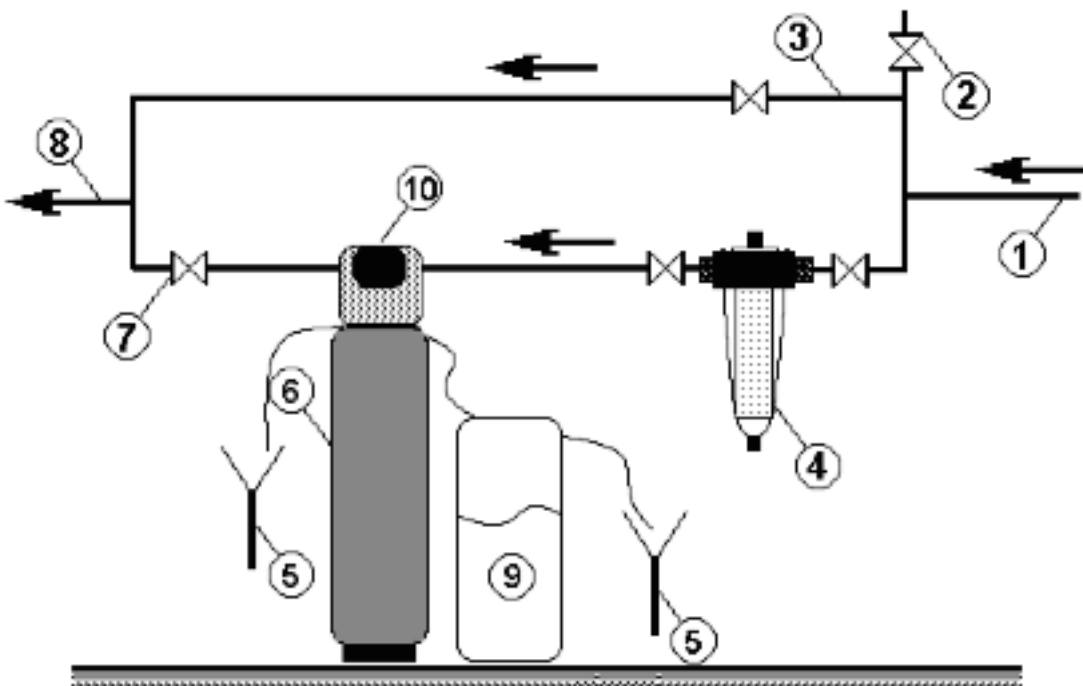


8. Installation

NOTE: We advise that you use a sediment filter of at least 50 microns before the control valve.

Please refer to the diagram below; you can use 1/2 inch flexible garden hose for the control valve to drain connection (see chapter 6, no. 18). Brine tank or cabinet overflow elbow can be connected to the drain in the same way. Drain should be connected below the drain outlet level from water treatment system. Special attention should be paid to the proper connection of the brine tank or cabinet overflow elbow. Excess of water is removed gravitationally.

1. Raw water inlet from water supply system;
2. Raw water output for garden watering;
3. Water treatment system by-pass;
4. Pre-filter with sediment cartridge;
5. Drain outlet;
6. Water softener;
7. Softened water output valve;
8. Treated water output to the existing water piping system;
9. Brine tank (only included in two-frame water softeners);
10. Control valve





The control valve is equipped with a mixing by-pass. The by-pass handle allows to adjust water flow as follows:

IN SERV – water flows through the water treatment system

PASS WAY – water by-passes the water treatment system. Raw water flows directly to the existing water piping system. Device might be disconnected.

CLOSE – water flow to all directions is closed.

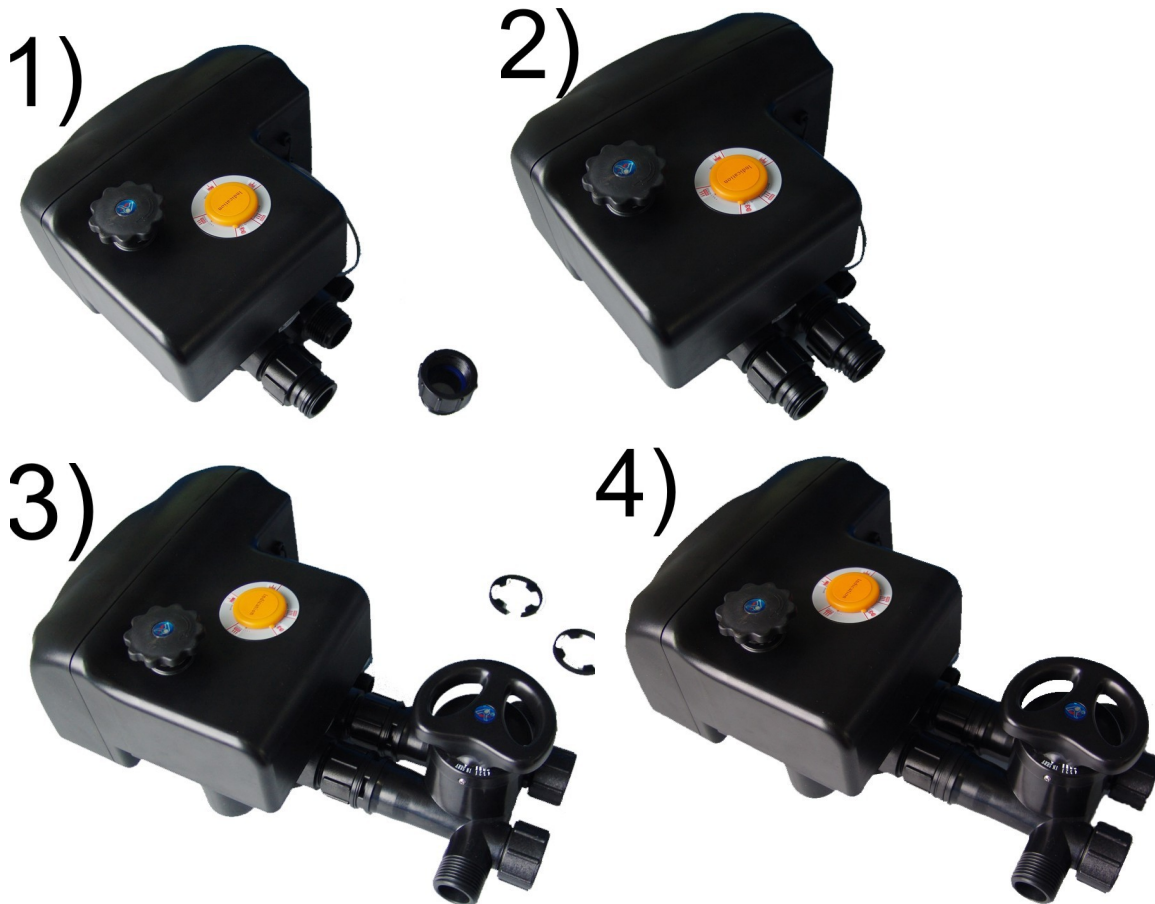
Mixing allows to mix purified water with raw water. In the case of a water softener, it allows to adjust water hardness to the needs of the users, i.e. guarantees the highest comfort of bathing and washing. There are four degrees of mixing [1, 2, 3, 4]: the higher the degree, the more raw water is mixed with the water from water treatment system.

The by-pass has two perpendicular water inlets and two perpendicular water outlets. This allows for an easy connection to existing water systems you should use only one inlet and one outlet, and block the others.



The control valve connections are described on the valve as IN (water inlet) and OUT (water outlet). The by-pass can be assembled directly by screwing it to the control valve with two connectors. Connectors have to be screwed simultaneously and evenly. Alternatively connectors can be disassembled (by releasing safety pins) from by-pass first (picture 1) and screwed separately (picture 2). Then, the by-pass can be inserted into the connectors (picture 3). Remember to secure the connection by assembling safety pins (picture 4).

With the by-pass assembled, adjust the by-pass handle [24] into position „IN SERV”. It is advised to adjust mixing (by-pass positions 1, 2, 3, 4), only when the device is fully working:



To install and use the water softener WTRX, you will require to:

- have proper technical knowledge or use the services of a professional;
- make sure that ground is even and stable, and that it will sustain the weight of a water treatment system filled with water;
- make all the connections in accordance with existing standards and regulations;
- connect the control valve to existing water supply system only with flexible connections;
- use 1/2 inch flexible hose to connect drain. Drain connection should not be more than 6 meters away in level from the control valve;
- use teflon tape for threaded o-ring free connections;
- connect the device only after all water supply system works have been finished;
- control water quality periodically to make sure the device is working properly;
- use only solid salt for water softening (at least 99,5% purity). It is forbidden to use small minced salt;
- use the device indoor, within temperature range 5 – 45°C and avoid high

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humidity;

- use pressure-reducing valve before water inlet if water pressure exceeds 6 bar;
- use only authorized parts from EHC;
- secure the device against access of children.