



Household Softener
DAYTON
**Owner's Manual, Installation
and Maintenance**



MAIN SPECIFICATIONS



Electronic timer

Allows to control all parameters



Regenerations

Delayed or immediate / programming



Mixing valve

Allows to regulate the residual hardness



Integrated by-pass

Allows to isolate the system from the installation



Transformer

External transformer



Easy salt refill

Easy tank refilling with special salt for softeners



Multilingual programmer

English / French / Spanish



Certified

Official product



KEEP THIS MANUAL THAT INCLUDES THE SERVICE BOOK AND THE GUARANTEE SECTION. IT WILL PROVIDE YOU A BETTER AFTER-SALES SERVICE.

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1. PRESENTATION



The water treatment equipment that you have bought is a softener of latest generation with one of the most advanced control valves on the market.

DAYTON Water Softeners have quickly positioned themselves as an international model in terms of household water softening systems, both for its proven quality and smart design and for its easy and intuitive operation.

This is a system with an efficient water and salt consumption, thus contributing both to the protection of our environment and to the household economy.

Your DAYTON softener will provide you and your family with the following advantages.

Reduces the hardness present in the water, the cause of encrustations.

ENERGETIC SAVING: Avoiding future encrustations in the pipes and connections.

Great wellness sensation in the shower.

Soft and smooth skin.

Increases the life time of the household appliances and heating systems.

ECONOMIC SAVING: Reduces the consumption of the soaps, softeners and chemical products.

Lowers maintenance costs.

Automatic function, your only concern is to add salt to the tank storage from time to time.

! It is important that you keep and read this manual carefully before the installation and starting up of this equipment. If you have any doubt about the installation, use or maintenance of this equipment, please contact with the technical assistance service (T.A.S.) of your distributor.

1.1 Softener safety



Your safety and other's safety are very important. We have included safety messages in this manual and on your appliance. This is the safety alert symbol.

! This symbol alerts you to the potential hazards that can be risky for you and others.

All safety messages will follow the safety alert symbol or either the word "DANGER" or "WARNING".

APPLICATION IN THIS MANUAL



"DANGER"

You can be killed or seriously injured if you do not carefully follow instructions.



"WARNING"

All safety messages will inform you about potential hazards, how to reduce the chance of injury, and what can happen if the instructions are not followed.

1.2 Before starting



See 'Section 5' before installing the water softener. Carefully follow the instructions for the installation. (Warranty may be considered void, should the installation be faulty).

Before starting the installation, read this entire manual. Afterwards, obtain all the necessary materials and tools for the installation.

Check the local plumbing and electrical regulations.

All installations must be done according to the law in force in each region or country.

Be careful when handling the softener. Do not turn it upside down, drop it, or set it on sharp/cutting objects.

Do not install it outdoors. Keep it away from direct sunlight and from other adverse weather conditions.

2. INTRODUCTION



The DAYTON softeners prevents all kinds of problems caused by the hardness in water and will reduce the maintenance requested by your electrical devices, giving them a longer life.

These systems come with a residual hardness regulator as standard, which allows selecting the appropriate hardness for your home.

Its user-friendly electronic programmer will allow you to put the system into operation in an easy and fast manner.

2.1 What is hardness?



By hardness we understand the quantity of the encrusted salts present in the water, formed mainly by salts of low solubility in calcium and magnesium. Salts causing the hardness are mainly:

Calcium bicarbonate:	$\text{Ca}(\text{CO}_3\text{H})^2$
Calcium chloride:	CaCl^2
Calcium sulfate:	CaSO^4
Magnesium bicarbonate:	$\text{Mg}(\text{CO}_3\text{H})^2$
Magnesium chloride:	MgCl^2
Magnesium sulfate:	MgSO^4

These salts, because of their chemical features, tend to precipitate in pipes and blocking them because of accumulation. At the same time the hardness has a high tendency to be encrusted in the electrical resistances of heaters and to precipitate inside the heaters because of high temperature. The combination of tough minerals and soap produces a soap curd or cutted soap. This soap curd reduces the cleaning action of the soap. The mineral precipitation of tough minerals form a crust on cooking utensils, connections and plumbing fixtures. They can even affect the taste of the food.

MAINLY PROBLEMS

- Clogging in pipes, accessories and equipments.
- Clogging on electrical resistances, cause an increase of energetic consumption.
- Increased use of soap and chemical products.
- Reduction in the life time of the household appliances and increased need of maintenance.

All these problems are solved when using a softener of the DAYTON range, because the water after being treated with the system is absolutely free of encrusted salts.

In most parts of Europe, the hardness is expressed in hydrometric French grades, but other measurement units exist depending on other locations. Please see below the most common equivalents.

UNITS	ppm of CaCO_3	° French
1 ppm of Calcium	2,5	0,25
1 ppm of Magnesium	4,13	0,413
1 ppm de CaCO_3	1	0,1
1° French (°HF)	10	1
1° German (°d)	17,8	1,78
1° English (°e)	14,3	1,43
1 mmol/L	100	10
1 mval/L=eq/L	50	5

2.2 How does your system work



The water softening process in your system is achieved with a process of ionic exchange. To do this we use ionic exchange resins that have the chemical capacity to capture the Calcium ions (Ca) and Magnesium (Mg), removing them from the water.

At the same, the ions of calcium and magnesium are captured by the resin liberating Sodium ions (Na), and with their chemical features, create sales with a much higher solubility, avoiding the problems related to hardness.

Moreover, when we soften the water we increase the sodium level of the same. You can find a wider explanation of this aspect in point 2.8.

IONIC EXCHANGE RESINS:

These are synthetic components, normally spheric and they have the capacity to capture the chemical particles present in the water, exchanging them with others. In the case of softening, we use hard cationic resins, made of styrene copolymers and divinylbenzene in sulfonated basis.

The exchange resin charge is located inside the vessel of the softener, contributing an important part of volume of the same (between 60 and 75% depending on the model). It is important that one part of the vessel remains free to allow a correct regeneration of the resin bed.

2. Introduction

During the treatment process the water goes through the multiway valve by the entrance connection, flows to the upper part of the softener through the distributor producing an ionic exchange inside the resin bed.

The treated water is collected by the distributor and driven through the inner tube, through the vessel, and later through the multiway valve. It is sent through the out connection towards the main water pipe for consumption. In this point the system has a meter to measure the water.

2.3 Regeneration of your system



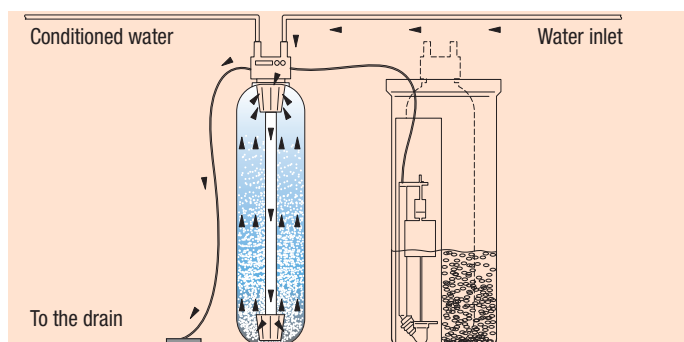
The quantity of calcium and magnesium ions that the resin may retain is limited; therefore, the water volume a water softener can treat is limited as well. The system must periodically carry out a process known as regeneration, which allows the resin to recharge with sodium ions, so it can continue softening water.

In DAYTON systems, the regeneration process starts automatically when the systems detects that the exchange capacity is about to finish, the timer incorporated in the system allows to configure the starting of the regeneration, please see section 6.3 in order to get more information about how this programme works.

The regeneration of a softener system is made of different processes, each one with a specific purpose.

BACKWASHING:

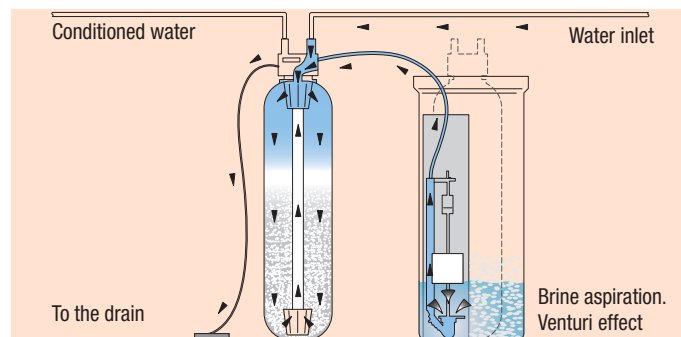
The water goes into the vessel through the inferior collector, washing the resin bed and allowing, this way, the following regeneration process.



BRINE ASPIRATION:

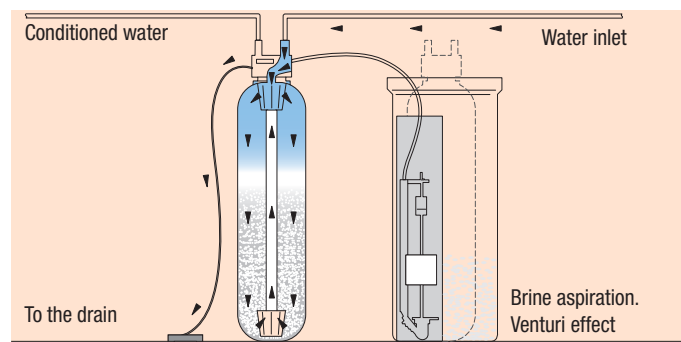
Through an aspiration process by the Venturi effect, the system suctions the brine liquid solution previously prepared in the regenerating tank. This salt solution is introduced into the softening vessel combining with the ionic exchange resin and

starting the regeneration.



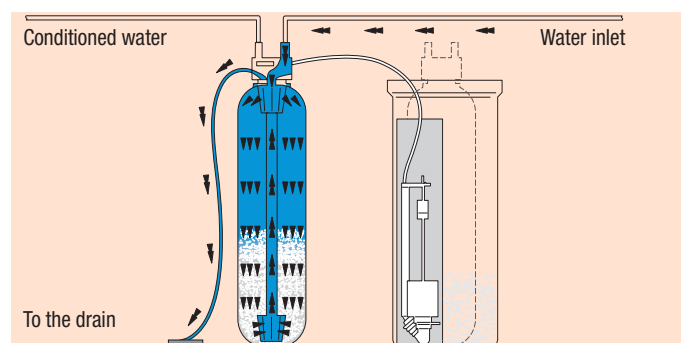
SLOW RINSE:

It refers to the movement of water in the resin bed of the salt solution, this way the contact of the salt with the resin is higher and the regeneration of the same is optimized.



FAST RINSE:

The water flows through the resin bed making a final wash of the same and ensuring the total removal of the salt remaining inside the vessel.



REFILLING THE BRINE TANK:

The water goes automatically into the brine tank in order to prepare the necessary brine to be consumed in the next regeneration. This process is automatic, so normally it is not necessary to put more water into the brine tank (except during the starting up as shown in section 7).

NOTE: During the regeneration process the systems allows continuous flow of non treated water in order to ensure the disponibility of water to be consumed.

2.4 Regeneration grade and capacity

The exchange capacity is the quantity of hardness that a particular resin volume can keep before saturation. This value is expressed in °HFxm³/liter of resin.

The higher the resin volume the higher hardness can be kept in this resin before becoming saturated. This way it will be able to treat a higher quantity of water before starting a regeneration. It is important to choose a system that better suits the particular needs of each installation.

Depending on the quantity of sodium chloride used to regenerate each liter of resin, the capacity of exchange rate can differ. Normally the DAYTON systems are provided of a programming with a regenerating grade of, 250grNaCl/resin liter and an exchange capacity of 6,5°HFxm³/resin liter.

DAYTON systems have three different regeneration capacities, depending on the conditions under which the system must operate, which are shown below:

Capacity	Salt/Regen.	Capacity	Max. Hardness
Small	1,8 Kg	115°HFxm ³	35°HF
Medium	3,6 Kg	170°HFxm ³	70°HF
Large	7,5 Kg	210°HFxm ³	100°HF

2.5 Work volume



The softeners with ionic exchange should respect the suitable contact times between the water to be treated and the resin in order to ensure that the softening process is correctly carried out. For DAYTON systems you should respect the following flow process:

Minimum volume (liters/hour): Resin volume x 4

Maximum volume (liters/hour): Resin volume x 40

If the flow volumes are out side the recommended ranges this can affect the correct working of the system (too high charge loss, hardness leak...)

You can find more information about the minimum and maximum volumes for each type in the general characteristic table.

2.6 Hardness leak

HIGHER SODIUM CONCENTRATION IN THE TREATED WATER

The ionic exchange process on which the softening water is based can be affected by different parameters that can reduce its efficacy creating hardness leak.

EXCESSIVE VOLUME

Can affect the exchange process

REGENERATION GRADE

If there is not enough time, part of the hardness cannot absorbed by the resin

2.7 Residual hardness

Depending on the application of the treated water it can be necessary to have it completely softened or sometimes it is better to have a certain amount of residual hardness. These systems have been designed to supply fully softened water, but the integrated control valve contains a residual hardness mixer, which allows for the regulation of the desired hardness degree in treated water (see 'Section 7').

NOTE: For drinking water it is recommended a residual hardness between 5 and 10°HF with copper tubes and between 8 and 10°HF with iron tubes (in this last case it is recommended the installation of a polyphosphate filter).

2.8 Sodium increase

The majority of the sodium that we consume daily comes with the food we eat and also in the preserved/canned foods because salt is an excellent preservative and it is used commonly as an additive for prepared food products.

The ingestion of sodium in drinking water is low compared with the quantity that we are getting in our food.

However, it is important to bear in mind, as we have said before, that the softener increase the sodium cocentration existing in the treated water (compared to the concentration of the same at the initial moment of water treatment).

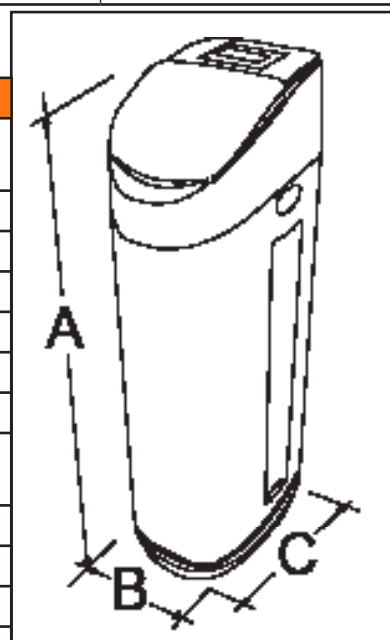
ATTENTION: The recommended limit of sodium in water for human consumption is of 200 ppm. Depending on the sodium concentration and the hardness of the water to be treated, the softened water can present sodium concentrations higher than recommended. If this happens or in the case of people on low sodium diets, we recommend the installation of a reverse osmosis equipment for drinking water.

3. Technical specifications

Model	Dayton Slim Blue 7	Dayton Slim Blue 12	Dayton Slim Blue 18
Code	15000106-37	15000106-02	15000106-38
Resin volume	7 liters	12 liters	18 liters
Bottle	8x15	8x24	8x35
Working flow	0,3 m3/hour	0,5 m3/hour	0,8 m3/hour
Maximum flow	0,4 m3/hour	0,7 m3/hour	1,2 m3/hour
Low capacity configuration (S) Salt / Regeneration Exchange capacity	0,4 Kg 10 mc/°F	0,72 Kg 40 mc/°F	1,1 Kg 57 mc/°F
Medium capacity configuration (M) Salt / Regeneration Exchange capacity	0,6 Kg 22 mc/°F	0,96 Kg 49 mc/°F	2,2 Kg 97 mc/°F
High capacity configuration (A) Salt / Regeneration Exchange capacity	0,8 Kg 27 mc/°F	1,44 Kg 60 mc/°F	4,5 Kg 117 mc/°F
Dimensions Height A Width B Depth C	606 mm 240 mm 420 mm	835 mm 240 mm 420 mm	1120 mm 1120 mm 1120 mm

Volume of treated water according to inlet hardness (m3)

	Dayton Slim 7 liters	Dayton Slim 12 liters	Dayton Slim 18 liters
Hardness	Low Capacity 16 mc/°F	Low Capacity 40 mc/°F	Low Capacity 57 mc/°F
15°F	1,09 m3	2,67 m3	3,80 m3
25°F	0,65 m3	1,60 m3	2,28 m3
30°F	* 0,54 m3	1,33 m3	1,90 m3
35°F	* 0,47 m3	1,14 m3	1,63 m3
45°F	* 0,31 m3	0,89 m3	1,27 m3
55°F	* 0,30 m3	0,73 m3	1,04 m3
Hardness	Medium Capacity 22 mc/°F	Medium Capacity 49 mc/°F	Medium Capacity 97 mc/°F
15°F	1,48 m3	3,27 m3	6,47 m3
25°F	0,89 m3	1,96 m3	3,88 m3
30°F	0,74 m3	1,63 m3	3,23 m3
35°F	0,63 m3	1,40 m3	2,77 m3
45°F	* 0,49 m3	1,09 m3	2,16 m3
55°F	* 0,40 m3	0,89 m3	1,76 m3
Hardness	Hight Capacity 27 mc/°F	Hight Capacity 60 mc/°F	Hight Capacity 117 mc/°F
15°F	1,79 m3	4,00 m3	7,80 m3
25°F	1,07 m3	2,40 m3	4,68 m3
30°F	0,89 m3	2,00 m3	3,90 m3
35°F	0,77 m3	1,71 m3	3,34 m3
45°F	0,60 m3	1,33 m3	2,60 m3
55°F	* 0,49 m3	1,09 m3	2,13 m3



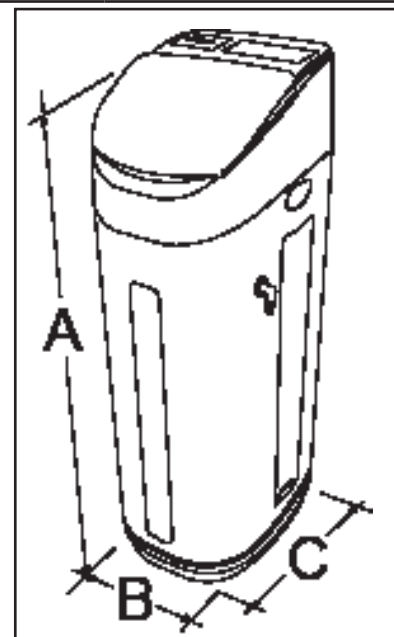
* Capacity not recommended

Model	Dayton 12,5	Dayton 18	Dayton 30
Code	15000106-03	15000106-05	15000106-06
Resin volume	12,5 liters	18 liters	30 liters
Bottle	10x17	10x22	10x35
Working flow	0,50 m3/hour	0,72 m3/hour	1,20 m3/hour
Maximum flow	0,75 m3/hour	1,08 m3/hour	1,80 m3/hour
Low capacity configuration (S) Salt / Regeneration Exchange capacity	0,75 Kg 40 mc/°F	1,08 Kg 57 mc/°F	1,80 Kg 115 mc/°F
Medium capacity configuration (M) Salt / Regeneration Exchange capacity	1,00 Kg 49 mc/°F	2,16 Kg 97 mc/°F	3,60 Kg 170 mc/°F
High capacity configuration (A) Salt / Regeneration Exchange capacity	1,50 Kg 60 mc/°F	4,50 Kg 119 mc/°F	7,50 Kg 210 mc/°F
Dimensions Height A Width B Depth C	575 mm 333 mm 505 mm	1034 mm 333 mm 505 mm	1034 mm 333 mm 505 mm

Volume of treated water according to inlet hardness (m3)

	Dayton 12,5 liters	Dayton 18 liters	Dayton 30 liters
Hardness	Low Capacity 40 mc/°F	Low Capacity 57 mc/°F	Low Capacity 115 mc/°F
15°F	2,67 m3	3,80 m3	7,67 m3
25°F	1,60 m3	2,28 m3	4,60 m3
30°F	1,33 m3	1,90 m3	3,83 m3
35°F	1,14 m3	1,63 m3	3,29 m3
45°F	0,89 m3	1,27 m3	2,56 m3
55°F	0,73 m3	1,04 m3	2,09 m3
Hardness	Medium Capacity 49 mc/°F	Medium Capacity 97 mc/°F	Medium Capacity 170 mc/°F
15°F	3,27 m3	6,47 m3	11,33 m3
25°F	1,96 m3	3,88 m3	6,80 m3
30°F	1,63 m3	3,23 m3	5,67 m3
35°F	1,40 m3	2,77 m3	4,86 m3
45°F	1,09 m3	2,16 m3	3,78 m3
55°F	0,89 m3	1,76 m3	3,09 m3
Hardness	Hight Capacity 60 mc/°F	Hight Capacity 119 mc/°F	Hight Capacity 210 mc/°F
15°F	4,00 m3	7,93 m3	14,00 m3
25°F	2,40 m3	4,76 m3	8,40 m3
30°F	2,00 m3	3,97 m3	7,00 m3
35°F	1,71 m3	3,40 m3	6,00 m3
45°F	1,33 m3	2,64 m3	4,67 m3
55°F	1,09 m3	2,16 m3	3,82 m3

* Capacity not recommended



4. UNPACKAGING AND CONTENTS VERIFICATION

It is important that before installing and starting the system that you check the box and conditions of the material received, in order to ensure that the system has not been damaged during the transport

Any claim for damages during transport must be detailed together with the delivery note or invoice to the distributor, mentioning the name of the carrier within a maximum period of 24 hours after the goods reception.

The DAYTON softeners are provided completely assembled and have the following parts:

- Volumetric DAYTON valve 850: Automatic valve made of Noryl. With an isolating by-pass and mixing screw of residual hardness.
- Vessel containing the resins, made of polyester reinforced with glass fibre.
- Resin for the ionic exchange, cationic type, special for softening, provided inside the vessel.
- System DAYTON, made of plastic, with salt capacity for multiple regenerations.
- Brine system aspiration protected with a plastic funnel.
- Packaging and protection, including a pressurized air balloon to avoid damage in transport.

Please read carefully this manual before starting installation.

! The air balloon must be removed before installing the system.

The packaging material can be recycled and must be thrown away in the suitable recycling bins or to be delivered to the specific centre for the collection of waste material.

The system that you have bought has been designed and manufactured with high quality materials and components that can be recycled and re-used. This product cannot be thrown away into the usual urban rubbish system. It must be taken to a specific local centre for the recycling of materials, indicating that it has circuits, electrical and electronic components and also resin of ionic exchange. In order to obtain more information about how to dispose of your electrical and

electronic systems once they have fulfilled their use, contact the local authorities for the management of urban waste or the shop where you bought the system.

The proper collection and treatment of the machines that can no longer be used contributes to the preservation of natural resources and also avoids the potential public health risks.

5. WARNINGS



! The DAYTON water treatment equipments are not intended to be used to produce POTABLE WATER. Their function is to eliminate the hardness of the water obtaining a treated softened water that will avoid all problems related to hard water.

! If the treated water does not come from a public source or if it is from an unknown source it will be necessary to carry out a physical- chemical and bacteriological test in order to ensure the correct potabilization (BEFORE the system is INSTALLED). Please contact you distributor and he will recommend to you the most suitable treatment according to your needs.

5.1 Requirements for the proper working of the system



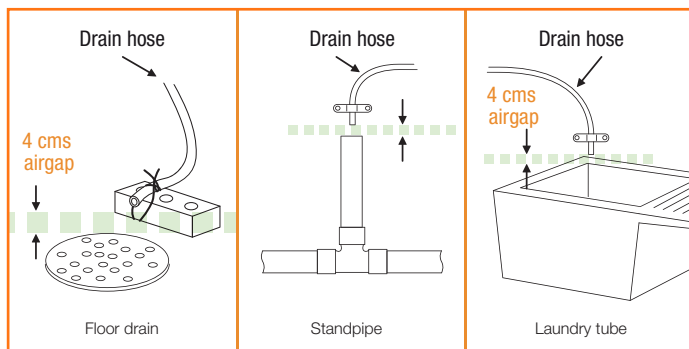
- Do not connect hot water ($T > 36^{\circ}\text{C}$) to the system.
- The temperature must be between 4°C and 45°C .
- If possible the system must be installed in a dry environment, free of acid vapors. At the same time proper ventilation must be insured.
- The minimum pressure should be of 2,5 bars, and if this is not possible you should install a pressurization system that ensures the proper pressure.
- If the inlet pressure is higher than 5,5 bars you should install a pressure regulator
- Water to be treated must be properly filtered, therefore, it is recommended to install a pre-filter to guarantee the removal of suspended particles, which may be swept along by inlet water. It is recommended to use the self-cleaning filters of the FILTERMAX series, which include all necessary components.

If a suitable filter is not installed, suspended particles could block the holes and the inner injectors of the system and could affect the proper working of the same.

5.2 Installation



- To condition all the water at the home, install the water softener close to the water supply inlet, and before all other plumbing connections. Outside faucets should remain on hard water to avoid wasting conditioned water and salt. In any case and considering the sodium increase in softened water, it is not recommended to use for watering because it can damage the growth of plants and vegetables.
- In case of having to prepare the place for the installation of the system you should follow the national laws in force regarding electric and hydraulic installations.
- A drain is needed for the regeneration discharge water. The drain connection should be suitable for this function. The diameter of this connection should be at least 1". The maximum distance between the softener and the floor drain should be no more than 6 meters. A nearby drain is needed to carry away the regeneration discharge water. A floor drain, close to the water softener, is preferred.



- The location for the installation must have enough space for the system itself, its accessories, connections, and to carry out a proper maintenance.
- The system should not be installed next to a heat source or where it receives a direct flow of hot air.
- In no case should you install the system in the open air.
- Do not locate the water softener where hot temperatures occur or near to a warm supply.
- The environment where the system is installed should have all the proper hygienic and sanitary conditions.
- Any leaks over the system should be avoided: plumbings, drain...

- In case of softened water supplying a hot water or steam device, it will be necessary to install a checking valve between the softener and the water heater in order to avoid the return of hot water that could damage the system.
- If there are quick closing valves in your installation it is recommended to use a non ram device.
- The softener works only on 12 V - 50 Hz electrical power supplied by a direct plug-in transformer included. Please use the transformer and connect it to 220 - 240 V, 50Hz. At the same time you should make sure that the home electrical installation is properly protected with a device like a switch or or a fuse.
- If the daily pressure is over 5.5 bar, nighttime pressure may exceed the maximum. Please install a reducing valve if needed (a pressure reducing valve may reduce the flow). If your home is equipped with a back flow preventer, you should install an expansion tank in accordance with local legislation.
- It is also recommended to install a silicophosphate filter at after the system, this way you will protect the installation from the corrosive tendency of softened water.

5.3 Starting up and maintenance



- The system must be periodically sanitized. For more information see section 8.
- The system maintenance has to be carried out by qualified technical people and following suitable hygienic conditions. For more information please contact the technical service of your distributor.

6. INSTALLATION



The DAYTON installation process must be carried out by qualified technical people. Please follow the recommendations of section 5 and warnings in this manual.

Taking into account that the system that you are going to install will improve the quality of the water that it is going to be consumed and that this is considered like food, all tools used for the assembling and installation should be clean and in no case can be contaminated nor impregnated with grease, oils or oxides. The job should be carried out with the proper attitude and hygienic conditions considering all necessary precautions with everything related to the materials that are going to be in contact with the treated/to be consumed water (please contact your distributor for more information).

6.1 Tools and parts needed

Before starting the installation, please make sure you have all necessary tools. Read and follow the instructions included in 'Section 6.2'.

Screwdriver

Pliers

Tape measure

Flexible hose of 1/2".

If using soldered copper pipe

Tubbing cutter

Propane torch

Misc.copper pipe fittings

Lead-free solder and flux

Emery cloth

Sandpaper or steel wool

If using threaded pipe

Pipe cutter or hacksaw

Threading tool

Pipe joint compound

Misc.threaded pipe fittings

If using CPVC plastic

Pipe cutter

Hacksaw

Adjustable wrench

Glue for CPVC

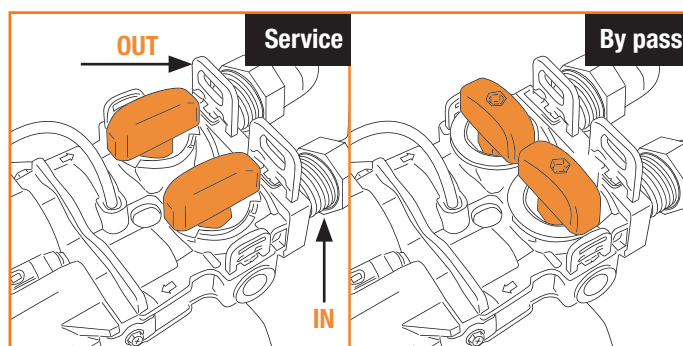
Misc.CPVC pipe fittings

If using other

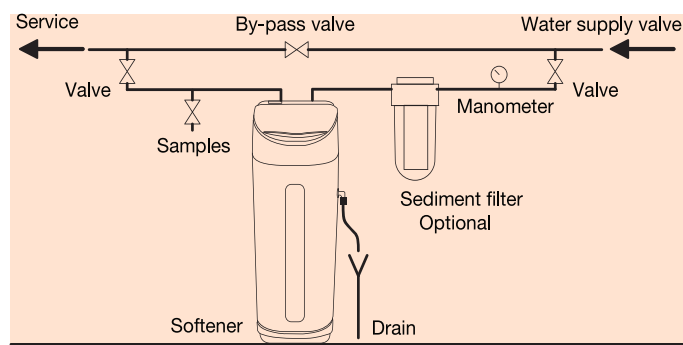
Other pipes and fittings suitable for potable water supply as required by manufacturer or local legislation.

6.2 Installation step by step

1. The system should be always installed with the by-pass valve supplied. If desired, it can also be installed a by-pass with 3 valves. The bypass of DAYTON systems has several positions.



RECOMMENDED INSTALLATION



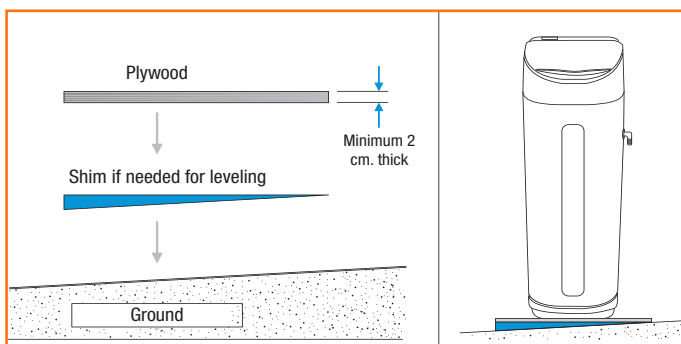
2. Close the main water supply valve, near the well pump or water meter.

3. Open all faucets to drain all water from the house pipes.

NOTE: Be sure not to drain water from the water heater because it can be damaged.

! **"DANGER"** Excessive weight hazard. At least two people are required to move and lift salt bags. Failure to do so can result in injury to back or other body parts.

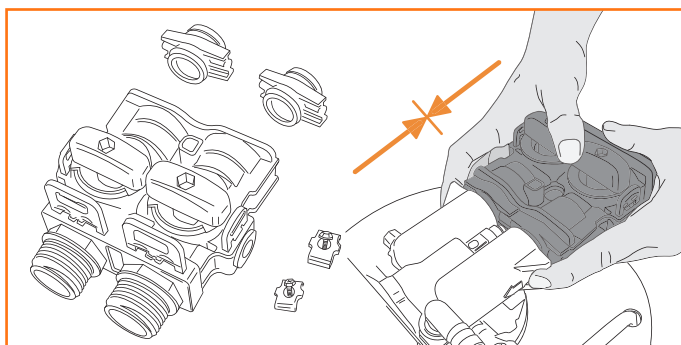
4. Move the water softener into the installation position. Set it on a level surface. If needed, place the water softener on a section of plywood, a minimum of 2 cm thick. Then, shim under the plywood to level the water softener. Please see picture below:



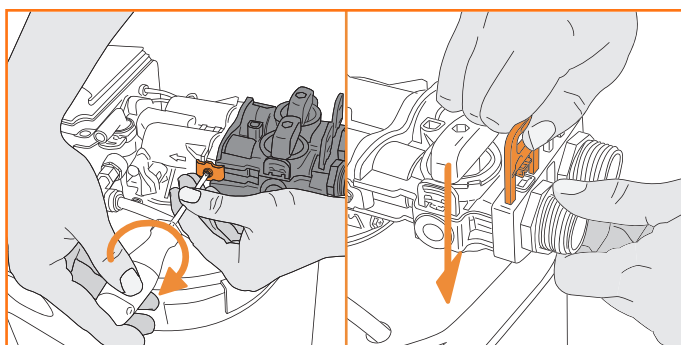
IMPORTANT: Do not place shims directly under the salt storage tank. The weight of the tank, when full of water and salt, may cause the tank to fracture at the shim.

5. Visually check and remove any debris from the water softener's valve inlet and outlet ports

6. Set up the bypass into the softener valve and before you install put a light coating of silicone grease on the bypass valve o-rings.



7. You will be supplied with an in and out noryl set of connections male 1". Be sure that the clips snap firmly into place so that the bypass will not pull out.



8. You should measure, cut, and loosely assemble pipes and fittings from the main water pipe to the inlet and outlet ports of the water softener valve. Be sure to keep fittings fully together, and pipes squared and straight. Check that hard water supply goes to the water softener valve inlet side.

NOTE: Inlet and outlet are marked on the valve. Trace the water flow direction to be sure.

IMPORTANT: Be sure to fit, align and support all pipes to prevent putting stress on the softener valve inlet and outlet. Undue stress from misaligned or unsupported plumbing may cause damage to the valve.

SOLDERED COPPER

1. Thoroughly clean and apply solder flux to all joints.
2. Make all solder connections.

NOTE: Do not solder the installation tubes whilst still attached to single valve bypass. Soldering heat will damage the valve.

IMPORTANT: When installing the copper tubes and ground clamp assembly to the single valve bypass, the ground clamp must be secured in place. If necessary tighten the screw.

THREADED PIPE

1. Apply pipe joint compound or Teflon tape to all male pipe threads.
2. Tighten all threaded joints and complete all solder connections.

CPVC PLASTIC PIPE

1. Clean, prime and cement all joints, following the manufacturer's instructions.

NOTE: Do not solder the installation tubes attached to single valve bypass. Soldering heat will damage the valve.

OTHER

Follow the piping system manufacturer's instructions when using other pipe approved for potable water.

INSTALLING DRAIN HOSE

Measure, cut to required length and connect the 1/2" drain line to the water softener valve drain fitting. Use a hose clamp to hold the hose in place.

NOTE: Run the green drain hose or copper tubing to the floor drain. Secure drain hose. This will prevent "whipping" during regenerations.

INSTALLATION OF SALT STORAGE TANK OVERFLOW ELBOW

Connect the storage tank overflow elbow installed in the sys-

tem to a near floor drain point. This point should be no higher than the drain fitting on the salt storage tank.

NOTE: The drain hose should be installed in a proper way so that the water overflows and flows through the drain hose.

6.3 PROGRAMMING DAYTON



TIMER DESCRIPTION

DAYTON softeners are equipped with an advanced electronic timer that can easily control the workings of the system. This timer is installed in the upper part of the cabinet.

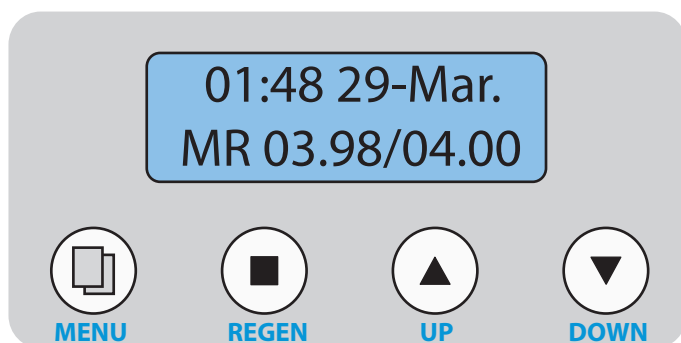
DAYTON timers supply a lot of information about the operation of the system. Moreover it allows the adjustment of all the internal parameters of the system.

MAIN PERFORMANCES:

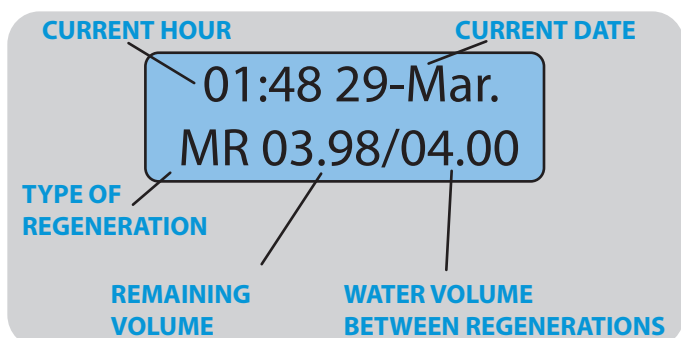
Digital display.

You can choose between different types of regeneration: immediate, automatic, delayed or mixed

FRONT PART OF THE TIMER:



LCD DISPLAY: It supplies information about the softener. Depending on the stage in which the system is in the timer will supply different types of information: **Service:** Information about softener working



Regeneration: Current stage is shown in the lcd display

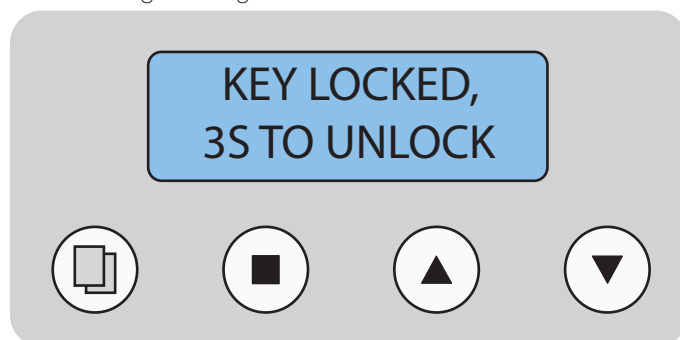
Programming: The display shows all the internal parameters and allows you to modify them.

"MENU" KEY: Allows entering inside the internal programming and confirms the amended parameters in any stage of programming .

"UP" AND "DOWN" KEYS: Allows to navigate among the different parameters. In programming it, allows to modify the selected parameters.

"REGEN" KEY: Is used to start automatic regenerations.

PROGRAMMING BLOCKAGE: After some seconds without pressing any key, the timer will be blocked automatically for safety. The following message will be showed:



To unlock the timer, please press "MENU" key for 3 seconds.

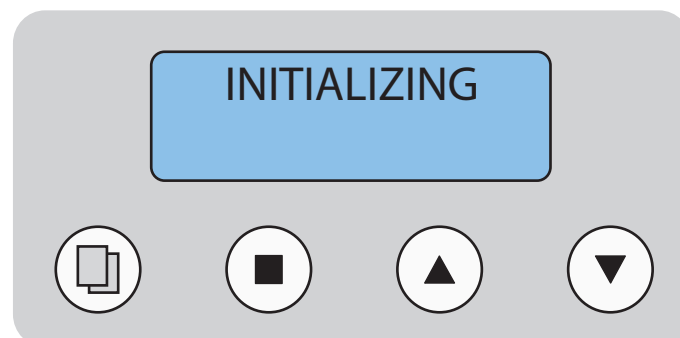
6.4 System programming

DAYTON softeners are configured to work with delayed regenerations (02.00 am).

PROGRAMMING:

1. Connect the provided transformer to the electrical connector at the back of the system. The timer will show service position.

IMPORTANT: After connecting the system can show the following message:



This message indicates that the system is placing itself in the service position. If after two minutes this message is still shown on the display, please contact your distributor.

2. Press "MENU" key for three seconds to enter into the internal programming. By pressing the "UP" y "DOWN" keys, the different parameters can be selected, and pressing REGEN key we can access to modify it (selected parameter flashes). With the "UP" y "DOWN" keys we can modify the selected parameter and pressing REGEN key one final time, the parameter will be confirmed the parameters that you can modify are as follows:

HOUR OF DAY: Format 0:00-24:00.

LANGUAGE: Spanish or English

UNITS : Metric system or US units

TYPE OF REGENERATION: The types of regenerations are as follows:

Time initiated (--) Delayed regenerations according to a selected frequency (Ex: Regenerates every 3 days at 02:00 am).

Meter immediate: (MI) Regenerations are started as per treated volume of water. When the remaining volume is 0, it commences a regeneration.

Delayed regenerations: (MD) Regenerations are delayed according to volume. When the remaining volume is finished, the system starts the regeneration on the same day at the programmed hour.

Mixed regeneration (MR) Similar to delayed regeneration but it allows to program a maximum period of time between regenerations.

NOTE: *Mixed regenerations are recommended. If you want to select another type of regeneration, please contact your distributor.*

SYSTEM CAPACITY: It is necessary to program the volume of the water that can be treated by the system. To calculate it please follow the indications as stated below:

$$\text{Volume(m}^3\text{)} = \frac{\text{Exchange capacity (}^\circ\text{ HFxm}^3\text{)}}{\text{Hardness (}^\circ\text{ HF)}}$$

Where:

EXCHANGE CAPACITY:

It is the amount of hardness that can be retained by the system. See the table below.

HARDNESS:

Hardness of inlet water in French degrees °HF.

VOLUME:

Amount of water that can be treated by the system.

THIS IS THE PARAMETER THAT SHOULD BE PROGRAMMED INTO THE SYSTEM.

Example: A softener of 30 liters of resin with a hardness of 30°HF.

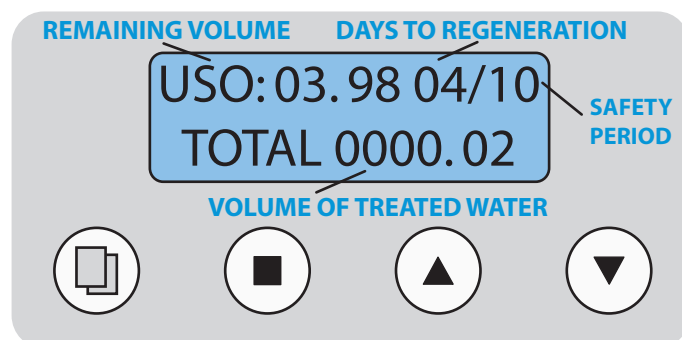
$$\text{Volume (m}^3\text{)} = \frac{115 (^\circ\text{ HFxm}^3)}{30 (^\circ\text{ HF})} = 3,8 \text{ m}^3$$

3,8 m³ must be programmed inside capacity parameter.

In the case of adjusting the residual hardness of treated water with a mixing screw the initial hardness should be compensated with the residual value.

CHECKING MENU:

By pressing "UP" y "DOWN" keys simultaneously when the system is working the display shows additional information of the softener.



REGENERATIONS:

To start an immediate regeneration, you only need to press the REGEN key for three seconds.

REGENERATION STAGE:

Once the regeneration is started, it can be cancelled by pressing any key. However the stage can only be cancelled when the motor of the valve stops (the display will be flashing).

7. START-UP

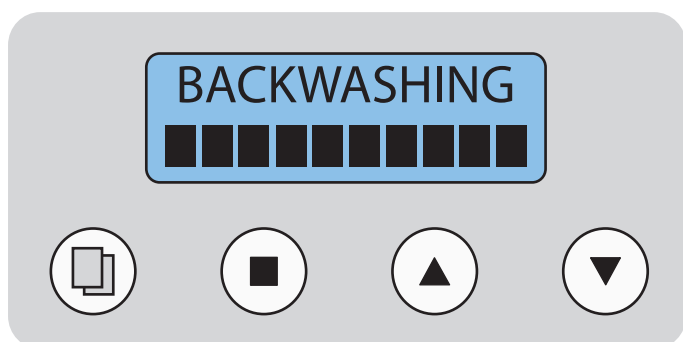


7.1 Hydraulic start-up

Prior to initiate the start-up of the system make sure that all previous steps regarding installation. The assembling have been completed and programming have been correctly carried out and according to the instructions of this manual and according to local regulations. To start up follow the following steps:

! Do not put salt inside the system until the end of the start-up process. In order to avoid air pressure upon the softener and the plumbing system, follow the instructions in order.

1. Put the bypass valve in "bypass" position.
2. Fully open two or more cold and treated water faucets located near the water softener.
3. Open completely the inlet valve. Let the water flow until you get a continuous flow from the faucets, without air bubbles.
4. Plug the programmer into the power supply using the transformer included in the system.
5. The program should be in service, otherwise please check 'Section 6.3'.
6. Press the 'REGEN' button for 3 seconds to start a regeneration. After some minutes, the system will move to the Backwash stage.



7. Slowly open the water inlet valve to allow the entrance of water inside the system. At this point, the inlet flow must be rather low, since in this position water will flow into the bottom of the bottle and flow upwards to the drain.

8. When water starts flowing continuously through the drain, fully open the water inlet of the system. At this point, the bottle will be full of water and so a higher flow will not produce any damage. Water going out to the drain may be a bit yellowish or brown. This is completely normal, since it is due to the preservatives of the resin.

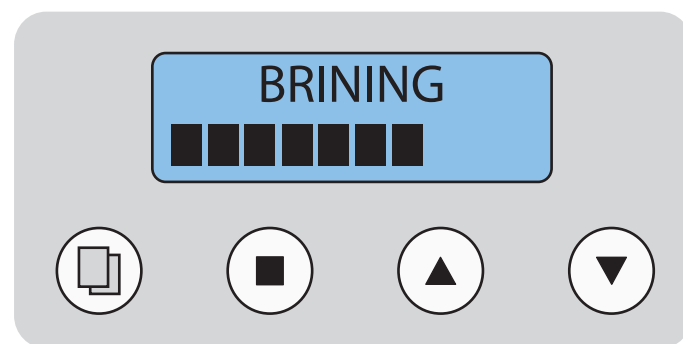
9. Please maintain this position (water flowing through the drain) until the coloration disappears.

10. Close inlet valve for five minutes and all the air trapped with the resin will float to the upper part of the vessel.

11. Open inlet valve one more time for some minutes to ensure that all the air inside the vessel has been removed.

12. Cancel the current stage of the regeneration until the refill stage. The brining tank will start refilling by itself. At this moment the system will end the regeneration started in point 6.

13. Start another regeneration. Wait until the system is placed in backwashing position nbr.6 and cancel this stage by pressing any key.



14. The softener will start to suction water from the tank (brining position). Check that the softener suctions water from the tank.

15. Cancel the remaining stages of the regeneration.

16. Put the by-pass into the service position and check that the treated water has been correctly softened (see Section 7.3).

17. Fill the tank with salt.

18. The system is ready to work. The start-up process is finished.

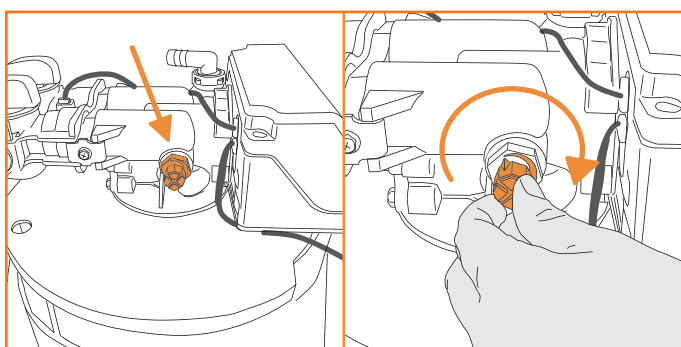
! **"WARNING"** Excessive weight hazard. At least two people are required to move and lift salt bags. Failure to do so can result in injury to back or other body parts.

7.2 Regulation of residual hardness setting

As stated in section 2.7. it is recommended not to supply completely softened water to household installations.

DAYTON systems have a residual hardness regulator that allows you to adjust the hardness quantity in the treated water. This works by mixing a small quantity of non treated water with completely softened water.

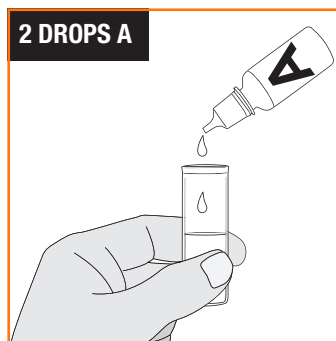
In order to modify the residual hardness, lightly open the regulating valve, as indicated in the images below.



Now you can test the hardness of the outlet water and check that it is according to the desired values. If it is not adjust the regulator and check it again.

ATTENTION: The hardness regulator is supplied completely closed, so if you do not regulate it the softener will provide totally softened water.

2. Add two drops of indicator reactive A



3. Shake it.
4. If the water becomes blue it means that it is completely softened, if it is red, it means that there is present some kind of hardness.
5. Add some drops of B reactive until the water becomes blue.



7.3 Hardness testing



In order to check the hardness of the water with the tester (code 271800), you should follow following steps:

1. Prepare the water to be analyzed



8. Maintenance / Sanitizing

The quantity of drops used, will be the quantity of hardness in °HF found in the tested water.

8. MAINTENANCE / SANITIZING ANUAL

The DAYTON softeners, being automatic, do not require a complex maintenance.

In order to ensure the correct working of the system, it is enough to make the following checks from time to time as shown in the table below:

TESTING	PERIOD
Check the quantity of salt inside the tank:	Monthly
Check the feed hardness:	Monthly
Check the hardness of the treated water:	Monthly
Sanitizing:	Every 12 months
Encrustation level:	Every 12 months
Salt tank cleaning:	Yearly
Technical service revision:	Yearly

! It is important not to make the sanitizing and the descaling treatment at the same time, because the chemical products can react in a dangerous way. You should alternate both processes as per indicated frequency.

SALT FILLING

Please revise the level of the salt inside the tank. It should be at a minimum of: 1/3 of the tank. If the system runs out of salt before refilling, the softener will produce hard water. When finishing the checks, please make sure that the cover is correctly closed.

NOTE: In humid areas it is best to keep the salt storage level lower and refill the tank more often.

RECOMMENDED SALT: Coarse salt tablets or pellets with less than 1% of impurities.

NOT RECOMMENDED SALT: Rock salt with impurities, block, granulated, ice melting, or for kitchen use.

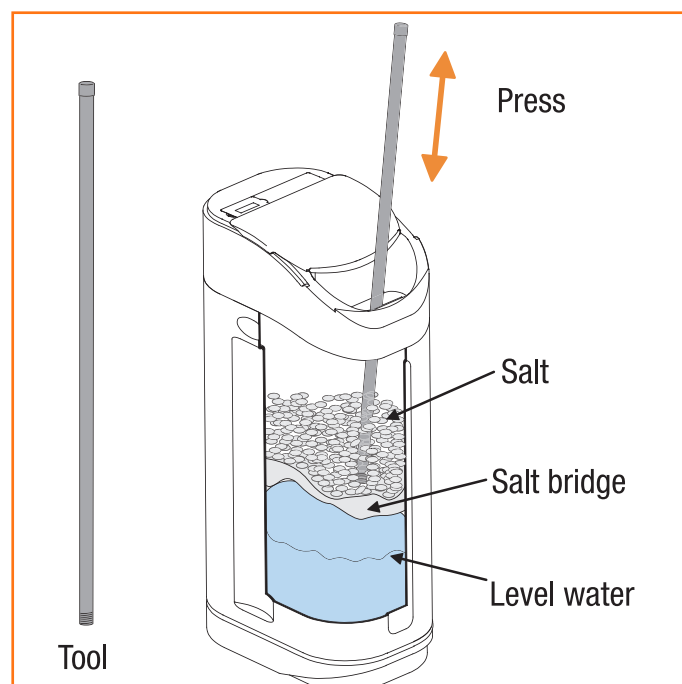
BREAKING A SALT BRIDGE

Sometimes, a hard crust or salt bridge is formed in the brine tank. It is usually caused by high humidity or the wrong kind of salt. When there is a salt bridge, an empty space forms between the water and the salt. The salt will not be dissolved in the water to make brine and without brine, the resin bed does not regenerate and you will get hard water.

If the storage tank is full of salt, it is hard to tell if you have a salt bridge because salt is loose on top but the bridge could be under it.

Take a tool or a broom handle, for instance, and hold it next to the water softener, measure the distance from the floor to the rim of the water softener. Then push the broom handle straight down into the salt. If you find a hard object, it is most likely a salt bridge. Carefully push into the bridge in several places to break it.

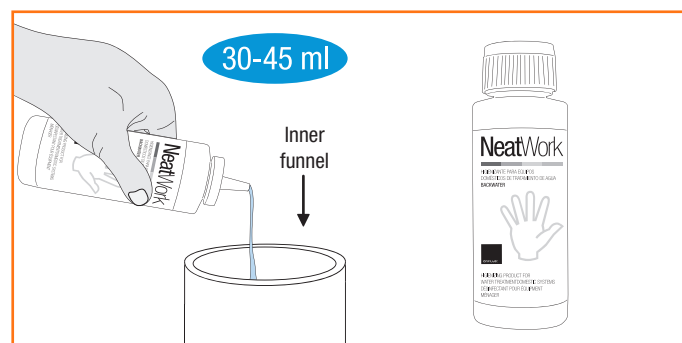
! **“WARNING”** Do not use any sharp or pointed objects as you may puncture the brine tank



SANITIZING:

Every year it is recommended to complete a sanitizing process as follows:

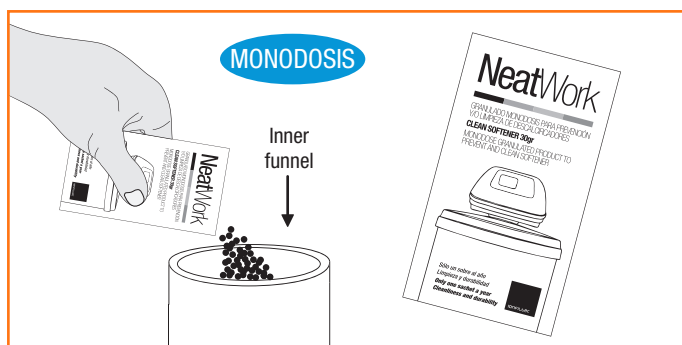
1. Open the covers of the salt tank and put inside about 20 a 30 ml (2 or 3 caps) of Bacwater (652100) inside the funnel. Close again.



2. Make sure that the bypass valves are working.
3. The disinfection process will be done when the regeneration finishes and the disinfection solution has been eliminated from the softener to the drain.

REMOVING ENCRUSTATION:

Once a year it is recommended to clean the system with Clean Softener (611000), a product specially designed for the cleaning of your softening system. This product, because of its special formulation, will clean the resin eliminating all iron and other remaining metals and at the same time it will remove all possible encrustations in the inner passages of the valve.



NOTE: Follow carefully the instructions in the use of the product.

The maintenance and sanitizing of the system should be carried out by a specialized technician, qualified in hygienic conditions and following the specific indications of each product.

9. IDENTIFICATION GUIDE AND PROBLEMS RESOLUTION

PROBLEM	SOLUTION	
1. The timer doesn't work	1. The transformer is not connected.	1. Plug in the transformer (power supply).
	2. Electric cable defective.	2. Replace the cable.
	3. No power.	3. Revise the installation.
	4. Defective transformer	4. Replace the transformer.
2. The system regenerates at incorrect hours	Power cuts can affect the timer programming.	Please use the manual to adjust the clock of the system.
3. Water leaks	Bad connections.	Revise/tight all connections.
4. Annoying noises / White water	Air inside the system.	Put in backwash to eliminate the air
5. Excessive hardness of the water treated	1. Increase of hardness in inlet water.	1. Check the hardness and revise timer.
	2. Incorrect regeneration.	2. Revise the timer.
	3. Damaged resin.	3. Replace the resin.
	4. Lack of salt inside tank /salt bridge.	4. Fill the storage with salt /break the salt bridge
6. There is no brine aspiration	1. Not enough feed pressure.	1. The minimum feed pressure should be of 2,5bar.
	2. Brine line blocked.	2. Clean the brine line.
	3. Blocked injectors.	3. Clean or replace the injector and the filter.
	4. Water interior leaks.	4. Revise piston, threads and separators.
7. The brine tank is overflowing	1. Incorrect timing	1. Please contact the distributor.
	2. Incorrect aspiration.	2. Revise aspiration.
	3. Flow to high.	3. Revise filling flow.
8. The hardness of the water is not going away	1. Failure of regeneration.	1. Check for loss of power and correct.
	2. Not enough brine.	2. Keep the brine tank full of salt.
	3. Incorrect aspiration.	3. Revise aspiration.
9. Backwashing flow too high or too low	1. Incorrect backwashing regulator.	1. .Put a proper regulator
	2. Blocked backwashing regulator.	2. Wash the backwashing regulator.
10. Non treated Water leaking during working	1. Incorrect regeneration.	1. Make a regeneration checking that the salt amount is correct
	2. Leak in by-pass valve .	2. Check the by-pass valve.
	3. Tube o-ring damaged.	3. Replace the o-ring.
	4. Incorrect regeneration cycle.	4. Reset the regeneration cycle
11. Resin escape from the system	1. Inner difusors damaged.	1. Substitute damaged difusors
	2. Damaged resin	2. Replace resin and revise installation
12. During working, water is leaking to the drain	1. O-ring and separators damaged.	1. Replace o-rings and separators.
	2. Damaged piston.	2. Replace piston
	3. Not in position piston.	3. Start the system again, repeat the process and if it does not work please contact your distributor.

10. SERVICE BOOK AND MAINTENANCE

NAME, SIGNATURE AND STAMP OF AUTHORISED TECHNICIAN INSTALLER				
/	/	<input type="checkbox"/> SETTING UP	TECHNICIAN	<input type="checkbox"/> ORDINARY <input type="checkbox"/> EXTRAORDINARY <input type="checkbox"/> GUARANTEE
/	/	<input type="checkbox"/> FULL MAINTENANCE	STAMP	
/	/	<input type="checkbox"/> REPAIR		
/	/	<input type="checkbox"/> SANITIZATION		
/	/	<input type="checkbox"/> OTHERS		
/	/	<input type="checkbox"/> FULL MAINTENANCE	TECHNICIAN	<input type="checkbox"/> ORDINARY <input type="checkbox"/> EXTRAORDINARY <input type="checkbox"/> GUARANTEE
/	/	<input type="checkbox"/> REPAIR	STAMP	
/	/	<input type="checkbox"/> SANITIZATION		
/	/	<input type="checkbox"/> OTHERS		
/	/	<input type="checkbox"/> FULL MAINTENANCE		
/	/	<input type="checkbox"/> REPAIR	STAMP	
/	/	<input type="checkbox"/> SANITIZATION		
/	/	<input type="checkbox"/> OTHERS		
/	/	<input type="checkbox"/> FULL MAINTENANCE		TECHNICIAN
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/	/	<input type="checkbox"/> SANITIZATION		
/	/	<input type="checkbox"/> OTHERS		
/	/	<input type="checkbox"/> FULL MAINTENANCE		TECHNICIAN
/	/	<input type="checkbox"/> REPAIR	STAMP	
/	/	<input type="checkbox"/> SANITIZATION		
/	/	<input type="checkbox"/> OTHERS		

NAME, SIGNATURE AND STAMP OF AUTHORISED TECHNICIAN / INSTALLER				
/ /	<input type="checkbox"/>	SETTING UP	TECHNICIAN	<input type="checkbox"/> ORDINARY <input type="checkbox"/> EXTRAORDINARY <input type="checkbox"/> GUARANTEE
/ /	<input type="checkbox"/>	FULL MAINTENANCE	STAMP	
/ /	<input type="checkbox"/>	REPAIR		
/ /	<input type="checkbox"/>	SANITIZATION		
/ /	<input type="checkbox"/>	OTHERS		
/ /	<input type="checkbox"/>	FULL MAINTENANCE	TECHNICIAN	<input type="checkbox"/> ORDINARY <input type="checkbox"/> EXTRAORDINARY <input type="checkbox"/> GUARANTEE
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/ /	<input type="checkbox"/>	FULL MAINTENANCE		TECHNICIAN
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/ /	<input type="checkbox"/>	SANITIZATION		
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