

Lucy



Lucy

OPERATING MANUAL

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1. INTRODUCTION

We would like to thank you for acquiring our Lucy water softener. You have made an excellent choice that will allow you to benefit from the highest quality of water in the future.

The Lucy is delivered in a cardboard box together with a by-pass (optional). Please check the softener carefully, in the presence of the delivery man, to ensure you that it was not damaged during transport.

Before starting up your softener, please read this manual carefully. Proper installation guarantees a long service life and high performance of your water softener.

The packaging can be fully recycled, please dispose of it in a suitable place.

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2. PRESENTATION



3. SAFETY INSTRUCTIONS

The installer/user should read the manual in full. The installer must ensure that the manual is available to the user in a legible form. The installer must ensure that all safety measures are followed and maintained.

The following safety and installation instructions are applicable:

- Never install or operate damaged products.
- Only use unaltered and compatible original parts.
- If the equipment is opened improperly, is wrongly installed, commissioned or operated, there is risk of physical injury and material damage.
- The equipment contains parts that can be swallowed.

TRANSPORT

The Lucy softener is delivered in a box. Please inspect carefully your device to be sure it has not been damaged during transportation.

INSTALLATION

Follow all instructions for installation. See chapter 5 'Installation softener'.

PROPER USE

The equipment is to be used on city water. The user is solely responsible for any damage incurred by improper use of the equipment.

EXCLUSION OF LIABILITY

The manufacturer accepts no liability for personal injury or material damage incurred due to misuse or errors caused by improper installation, commissioning or operation.

The safe and fault-free use and the operational safety of the equipment is only guaranteed with proper use according to the specifications of this operating manual.

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4. FUNCTIONING

4.1. GENERAL FUNCTIONING OF A WATER SOFTENER

A water softener provides softened water by removing ions such as Calcium and Magnesium from the incoming water. The incoming water is sent to the valve that directs the water over a vessel filled with special softener resins. These resins will exchange the “hard” Ca- and Mg-ions present in the water for soft “Na”-ions. The softened water coming out of the vessel is then sent via the valve to the different tap-points in the house.

The resins have a certain capacity to remove hard ions from the water. The harder the water or the higher the water consumption, the faster the resins will be exhausted. As the water hardness is known and fixed, the resin bed will be exhausted after a certain amount of water. At this moment, the resins have to be regenerated in order to bring them back to their initial capacity. This regeneration is done by bringing them in contact with brine (dissolved salt (Na-ions)). In order to be able to create the brine, the softener-cabinet is to be filled with salt-tablets. After brining, the resin bed has to be rinsed

and backwashed so that there is no salty taste and the resin bed is in perfect condition to capture again incoming hardness ions (Ca- and Mg-ions).

The heart of the softener is the valve, equipped with a controller that manages the softener in a fully automated way. Water consumption is measured and the valve will trigger at the appropriate moment a regeneration. A regeneration consists out of 4 cycles:

- **Backwash:** water is sent over the resin bed in the opposite way in order to remove possible impurities on top of the bed and to unpack the resin bed.
- **Brining and slow-rinse:** brine is being sent over the resin bed.
- **Fast rinse:** the last traces of brine are removed and the bed is packed again.
- **Refill:** water is sent to the part of the cabinet where the salt is located. This water will dissolve a part of the salt so that the necessary brine will be available to perform the next regeneration.

4.2. FUNCTIONING

The Lucy has the following characteristics:

	Mini	Maxi	Super Maxi
Resin volume	14L	25L	32L
Control System	BNT-850SE BNT-850HE	BNT-850SE BNT-850HE	BNT-850SE BNT-850HE
Regeneration type	Upflow	Upflow	Upflow
Nominal flow	0.6 m ³ /h	1.5 m ³ /h	1.9 m ³ /h
Peak flow	1.2 m ³ /h	1.8 m ³ /h	2.5 m ³ /h
Loading capacity	45 °f x m ³	90 °f x m ³	98 °f x m ³
Water extraction possible during regeneration	Yes, hard water	Yes, hard water	Yes, hard water
Working pressure*	2 - 6 bar	2 - 6 bar	2 - 6 bar
Feedwater temperature range	4 - 43°C	4 - 43°C	4 - 43°C
Connected power supply	220 V AC 50 Hz	220 V AC 50 Hz	220 V AC 50 Hz
Diameter inlet & outlet	3/4" or 1"	3/4" or 1"	3/4" or 1"
Diameter drain	5/8" OD tube	5/8" OD tube	5/8" OD tube
Dimensions mm (H x W x D)	581 x 333 x 467	1091 x 333 x 467	1091 x 333 x 467

(*): it is necessary to put a pressure reducer in case the incoming pressure is higher than 6 bar or is unstable ("Water hammer")

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- The Lucy softener keeps track of the water consumption via an integrated water meter. The amount of water that can be softened depends on the water hardness of the incoming water and is programmed when commissioning the system.
- When the resin bed is exhausted, the Lucy softener will perform a regeneration. This regeneration is programmed by default at 2 a.m. because there is no soft water available during regeneration. If necessary, the regeneration hour can be modified.
- The Lucy softener will optimise the moment of regeneration based on the real water consumption of the user.
- The Lucy softener disposes of a large LCD touch screen (SE timer version) where the functioning of the softener can be monitored and parameters can be set or changed.
- Most of the parameters of the Lucy softener are preprogrammed in the factory so that only a few user-specific parameters have to be set when commissioning the unit.
- Parameters are stored in the memory and will not be lost due to power outage.
- The Lucy softener allows to configure the outgoing hardness by turning the hardness screw.
- The Lucy softener allows to trigger a manual regeneration for special cases where this could be needed.

5. INSTALLATION

5.1. PREPARATION OF THE INSTALLATION

Location

The device is only to be used for interior operation. Install your softener on a flat, firm and clean surface. The unit must be close to a drain line to allow an easy connection. Check if there is an electrical earth grounded plug to power the unit. It is essential to foresee sufficient space for installation, commissioning and easy maintenance. It is also important to ensure good access for filling salt.

Pressure

A minimum incoming pressure of 2 bar (20psi) is needed to allow the valve to perform a proper regeneration.

If the water pressure is higher than 8.6 bar (124psi), use a pressure reducer upstream of your installation.

If there is a risk of sudden pressure surge, a pressure reducer is also to be installed.

Power connection

Be sure that the power cannot be switched off accidentally by a wall switch.

If the power cable is damaged, please ask a skilled electrician to change it.

When the unit is disconnected from the electrical network for a number of days, do not forget to reprogram the clock.

When the unit stays disconnected from the electrical network for a long period of time, please verify if all parameters are still set at the correct values.

Plumbing

The plumbing must be in good state. In case of doubt, please change it.

All plumbing for the water inlet, distribution and drain line should be done correctly and in accordance with the legislation in force at the time of the installation.

Possible soldering should be done before installing the softener. Failing to do so can generate irreversible damages. For any operation, shut down water inlet, unplug your softener and open faucets at the top and at the bottom of your house to drain your installation.

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The connection to the softener must be done using flexible hoses.

The connection to the drain should be done in accordance with legislation. Often an airgap is needed.

In order to adequately compensate the tank elongation the flexible tubes must be installed horizontally. If the flexible piping connection is installed in vertical position, instead of compensating the elongation, it will create additional stresses on the valve & tank assembly.

The flexible piping connection must also be installed stretched, avoiding excessive length. For instance 20 – 40 cm is sufficient. Excessively long and non-stretched flexible piping connection will create stresses on the valve and tank assembly when the system is pressurized, as illustrated in the below picture: on the left the assembly when the system is unpressurised, on the right the flexible piping connection when put under pressure tends to lift up the valve when stretching up.



Filter

A pre-filter is needed upstream of the softener in order to protect the valve from impurities present in the water that might cause damage to the valve or its seals.

Water temperature

The temperature of water should not exceed 43 °C and the installation should not be subjected to freezing conditions (risk of very serious damage).

Do not use the softener on hot water!

Salt

Only use salt tablets for water softening applications (purity should be at least 99.5% - EU standard EN 973). Other types of salt, for example, finely granulated are not permitted.

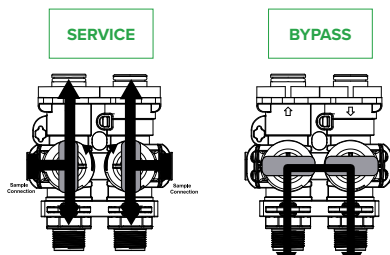
PHYSICAL INSTALLATION

After unpacking the system, please put the power supply, bypass valve and any other accessories apart. When moving the system, pay attention not to hold or move the softener by hoses, valves or other parts not suited for that purpose. In cold weather, it is recommended that

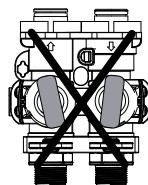
the Lucy is brought up to ambient temperature before proceeding with the installation. The Lucy must be positioned so that it is protected from freezing temperatures. Do not install the unit where it is exposed to direct sunlight or high temperatures (43 °C max).

Installation of the bypass on the softener:

- The installation of a bypass allows you to bypass the water softener when required (maintenance, need for unsoftened water, ...).
- In normal operation the bypass is open with the on/off handles in line with the inlet & outlet piping. To isolate the softener, simply rotate the handles in the BYPASS position. You will be able to use your water related fixtures and appliances as the water supply is bypassing the softener. However, the water you use will still be hard. To resume treated service, open the bypass valve by rotating the handles to SERVICE position.
- Please make sure the bypass handles are completely open otherwise unsoftened water could bypass through the valve.
- The drain connection on the valve must be connected to the drain.
- The overflow connection on the cabinet has to be connected to a drain that is situated below the softener as possible water coming out is unpressurised.
- Connect the softener electrically.



BYPASS NOT ALLOWED POSITION



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6. PROGRAMMING

6.1. DISPLAY

• Menu Icon

Press  to enter the basic setup information required at the time of installation, or back to the previous page.

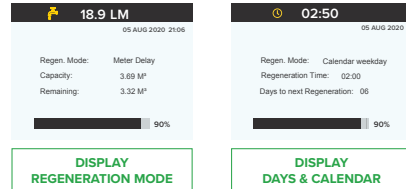
• Set Icon

Press  to validate the selection and advance to the next parameter in the menu.

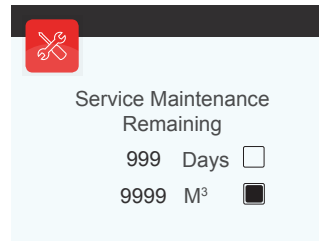
- Press  and  to scroll the icon bar in the menu and to increase or decrease the value of the settings while in the programming mode.
- When the display is locked, it will display “Key Locked”, Press and Hold  for 3 seconds to unlock.



6.1.1 Display during service



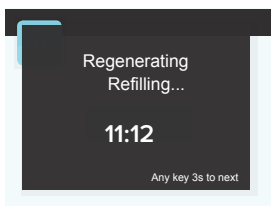
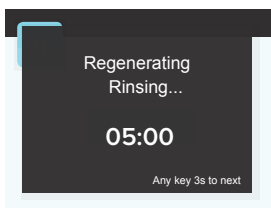
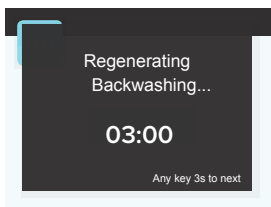
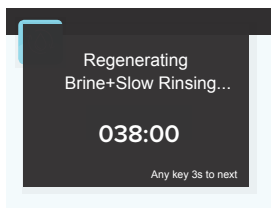
- Press  and  to proceed to the dealer information and system maintenance information if you want to program them upfront.



- The system will return to the main menu if you do not press any buttons for 10 seconds.
- When in standby, press  for 3 seconds to initiate a manual regeneration.

6.1.2 Display during regeneration

- The time of the current cycle counts down automatically and the unit is regenerated cycle by cycle. To skip a regeneration cycle and to proceed to the next one, press any button for 3 seconds.



6.2. BASIC PROGRAMMING

Caution: The programming has to be done only by the installer for the setting of the valve parameters. The modification of one of these parameters could prevent the good functioning of the device.

To enter the programming mode, the valve has to be in service. While in program mode, the valve will continue to operate normally monitoring all information. The programming is stored in a permanent memory with or without line or battery backup power.

6.2.1 System Maintenance Alarm

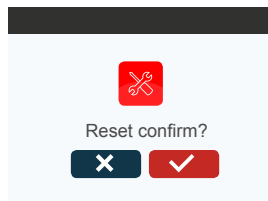
As long as the system maintenance alarm is active, the alarm screen will be displayed on the right side.

Alarm: the backlight flashes & the buzzer beeps

Alarm time: from 6 to 8 AM and from 6 to 8 PM

To dismiss the alarm temporarily, press any button while the screen is unlocked.

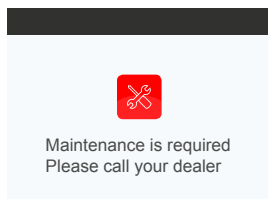
Alarm reset: enter the alarm screen to confirm 'Reset confirm'



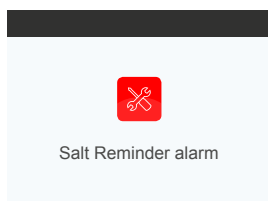
Join our mission.
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Please handle issues before resetting the alarm.

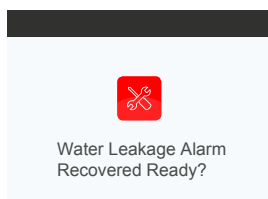
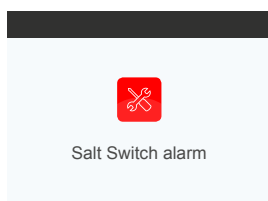
- When the maintenance alarm is active, the screen displays to following



- When the salt reminder is active, the screen displays to following

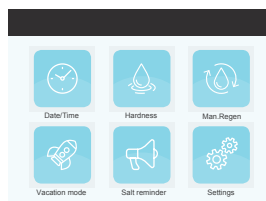


- When the salt switch of leakage sensor is active the screen displays to following



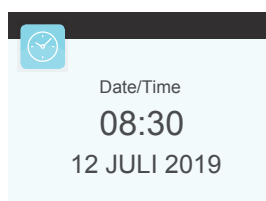
6.2.2 Main menu

- Press to enter the main menu while the screen is unlocked.



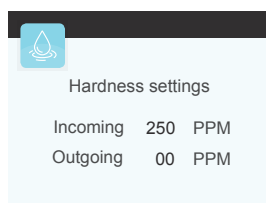
Set Date & Time

Press and use & to change the setting



Set Hardness*

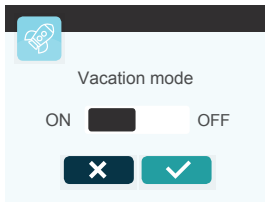
Press and use & to change the setting. The default setting of incoming hardness is 250ppm (range from 1 to 700) and 0ppm for the outgoing hardness. Other units 25°F - 14°dH (range from 0.1 to 70.0)



* Different units (ppm CaCO₃, °F, dH) need to be specified at factory level.

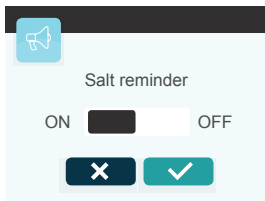
- **Vacation mode**

The vacation mode is only available in MI & MD modes, the default setting is OFF. When set to ON, the system will perform a 3 minute backwash & 3 minute rinse if there is no water flow detected during 7 days. The regeneration will occur at the scheduled regeneration time.



- **Salt reminder**

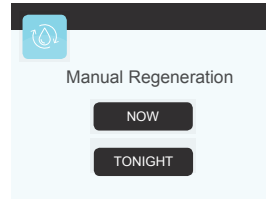
The default setting is OFF



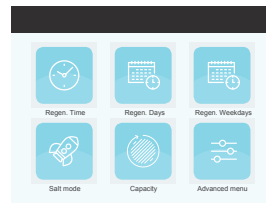
- **Manual regeneration**

When set on 'Tonight' a delayed regeneration will occur at the regeneration time, the screen will display .

Note: 'Now' is the only option in MI mode.



6.2.3 Dealer menu



Put the cursor on the 'Settings icon in the main menu and press  to enter the dealer menu. Some icons might be grey as they cannot be operated in different modes.

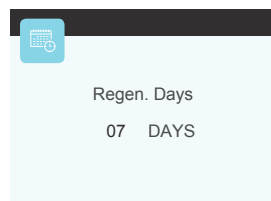
- **Regeneration Time**

This setting determines the time of day to perform a scheduled regeneration. The default setting is 2AM.

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• Regeneration Days

This value is the number of days between regenerations, the default setting is 7 days (range from 1 to 99)

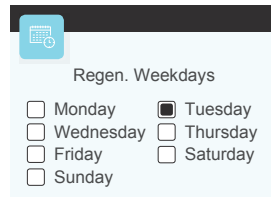


Regen. Days

07 DAYS

• Regeneration Week Days

This setting determines the day to perform a scheduled regeneration, ☒ means it is chosen.



Regen. Weekdays

☐ Monday ☒ Tuesday

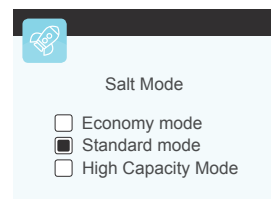
☐ Wednesday ☐ Thursday

☐ Friday ☐ Saturday

☐ Sunday

• Salt mode

This setting will determine the salt dosage and capacity for the system. The Default setting is 'Standard Mode'

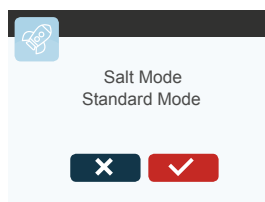


Salt Mode

☐ Economy mode

☒ Standard mode

☐ High Capacity Mode



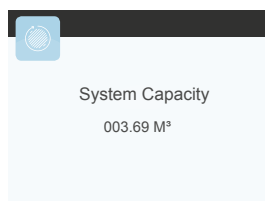
Salt Mode

Standard Mode

X ✓

• Capacity

When the automatic calculation is set to ON, the value cannot be changed. When set to OFF, the value can be changed from 0.01 to 999.99m³.



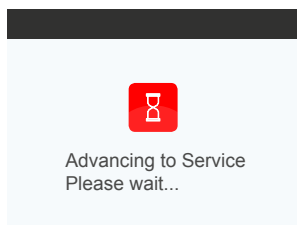
System Capacity

003.69 M³

7. COMMISSIONING

We recommend the following steps for the commissioning of the softener. Wait to put salt in the softener till the end of the commissioning is in line with the guidelines below. You can already add 5 to 7 litres of water in the unit if you want to test the brine suction during the commissioning.

- Plug the power transformer into an approved power source. Connect the power cord to the valve.
- When power is supplied to the controller, the screen will display “Advancing to Service Wait Please”

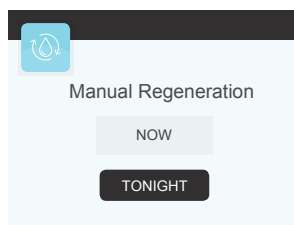


while it finds the service position.

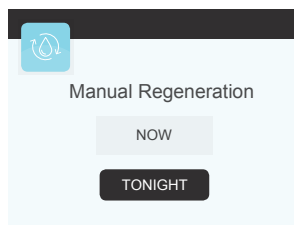
- Go to the BACKWASH position. Follow the instructions below to put the valve in BACKWASH position. As the valve arrives in BACKWASH position, unplug the power and

leave the valve in BACKWASH position.

- Press and hold  for 3 seconds to go to the Manual Regen. menu

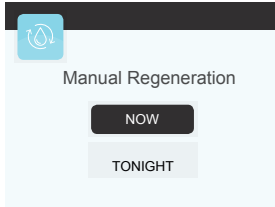


- Press  again, the option will start flashing

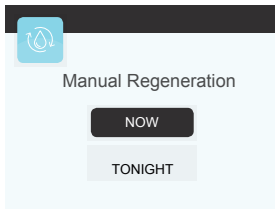


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- Press ▼ to select 'Immediate'



- Press  to confirm and press  to start a manual regeneration



Note: If you select "DELAY" option, the valve will start to regenerate at the closest day's REGEN. TIME (default is 02:00)

- Slowly open the inlet handle on the bypass valve using the supplied bypass tool and let water enter the unit. Allow all air to escape from the unit before turning the bypass fully open. Then let water run to the drain for 3 to 4 minutes until all media fines are washed out of the softener (you will see clear water running down the drain hose). Open a cold water tap nearby and let water run for a few minutes or until the system is free of foreign material resulting from the

plumbing work. Close the water tap when water runs clear.

- Press any button to move on to the BRINE position. Once in brine position, check if the unit is actually brining. There should be suction of the brine from the brine tank. Then press any key to go to the next phase.
- Press any button to go to the RINSE position. Check the drain line flow. Allow the water to run for 3 to 4 minutes until the water is clear.
- Press any button to move on to the REFILL position. Check if the valve is sending water to the brine tank. Allow the valve to continue to fill the tank during the entire time that is displayed on the screen. In this way, you will have a proper brine solution for the next regeneration.
- The valve will automatically go to the SERVICE position. Open the outlet handle on the bypass with the supplied bypass tool. Once the bypass is open, open the nearest treated water faucet and allow the water to run until it is clear.
- Add salt into the cabinet. The unit will automatically fill the water to the correct level when it regenerates.
- Program the unit (see '6. Programming)
- The system is ready and in service.



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8. TROUBLESHOOTING

Problem	Possible Solutions
1. CONDITIONER DELIVERS HARD WATER	
A. Bypass valve is open	A. Close bypass valve
B. No salt in brine tank	B. Add salt to brine tank and maintain salt level above water level
C. Injector or screen plugged	C. Clean injector and screen
D. Insufficient water flowing into brine tank	D. Check brine refill time and clean brine line flow control if plugged
E. Leak at distributor tube	E. Make sure distributor tube is not cracked. Check O ring and tube pilot
F. Internal valve leak	F. Replace seals and spacers and/or piston
G. Flow meter jammed	G. Remove obstruction from flow meter
H. Flow meter cable disconnected or not plugged into meter cap	H. Check meter cable connection to timer and meter cap
I. Improper programming	I. Reprogram the control to the proper regeneration type, inlet water hardness, capacity or flow meter size.
2. CONDITIONER FAILS TO REGENERATE	
A. Electrical service to unit has been interrupted	A. Assure permanent electrical service (check fuse, plug, chain or switch)
B. Timer is not operating properly	B. Replace timer
C. Defective valve drive motor	C. Replace drive motor
D. Improper programming	D. Check programming and reset as needed
3. UNIT USES TOO MUCH SALT	
A. Improper salt setting	A. Check salt usage and salt setting
B. Excessive water in brine tank	B. See#7
C. Improper programming	C. Check programming and reset as needed

Problem	Possible Solutions
4. LOSS OF WATER PRESSURE	
A. Iron build-up in line to water conditioner	A. Clean line to water conditioner
B. Iron build-up in water conditioner	B. Clean control and add resin cleaner to resin bed. Increase frequency of regeneration
C. Plugged controller inlet due to foreign material from pipes caused by recent work done on the plumbing system.	C. Remove piston and clean control
5. LOSS OF RESIN THROUGH DRAIN LINE	
A. Air in water system	A. Assure that well system has proper air eliminator control. Check for dry well condition.
B. Drain line flow control is too large	B. Ensure drain line flow control is sized
C. Broken top distributor	C. Replace the top distributor by a new one
6. IRON IN CONDITIONED WATER	
A. Fouled resin bed	A. Check backwash, brine draw and brine tank fill. Increase frequency of regeneration. Increase backwash time.
B. Iron content exceeds recommended parameters	B. Add iron removal filter system
7. EXCESSIVE WATER IN BRINE TANK	
A. Plugged drain line flow control	A. Clean flow control
B. Brine valve failure	B. Replace brine valve
C. Improper programming	C. Check programming and reset as needed

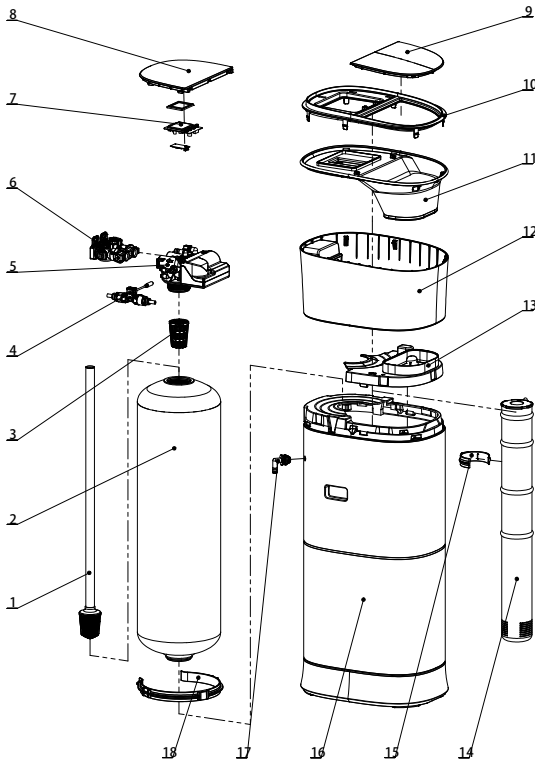
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Problem	Possible Solutions
8. CONDITIONER FAILS TO DRAW BRINE	
A. Drain line flow control is plugged	A. Clean drain line flow control
B. Injector is plugged	B. Clean or replace injectors
C. Injector screen is plugged	C. Replace screen
D. Line pressure is too low	D. Increase line pressure (line pressure must be at least 20 psi at all times)
E. Internal control leak	E. Change seals and spacers and/or piston assembly
F. Improper programming	F. Check programming and reset as needed
G. Timer not operating properly	G. Replace timer
9. CONTROL CYCLES CONTINUOUSLY	
A. Timer not operating properly	A. Replace timer
B. Faulty microswitches and/or harness	B. Replace faulty microswitch or harness
C. Faulty cycle cam operation	C. Replace cycle cam or reinstall
10. DRAIN FLOWS CONTINUOUSLY	
A. Foreign material in control	A. Remove piston assembly and inspect bore. Remove foreign material and check control in various regeneration positions
B. Internal control leak	B. Replace seals and/or piston assembly
C. Control valve jammed in backwash, brine or rinse position	C. Replace piston and seals and spacers
D. Timer motor stopped or jammed teeth	D. Replace timer motor and check all gears for missing teeth
E. Timer not operating properly	E. Replace timer

9. COMPONENT SHEET

No.	Part #	Description	Qty
18	21710110	Pressure Tank Clamp	1
17	02030016	Overflow Assy	1
16	07591035	Softener Cabinet	1
15	07060077	Brine Well Clamp	1
14	02170099	Brine Valve Assy	1
13	22053014	Salt Fog-proof Cover	1
12	50030224	High Cover	1
11	07032134		1
10	07032130		1

No.	Part #	Description	Qty
9	07032131	Softener Salt Lid	1
8	07032132		1
7		Controller PCB	1
6	07032133	Bypass Valve Assy	1
5		Control Valve Assy	1
4	02150001	Chlorine Regenerator	1
3	217101048	Top Cone	1
2	07000285	1035 Pressure Tank	1
1	02170173	Distribution Assy-1035	1

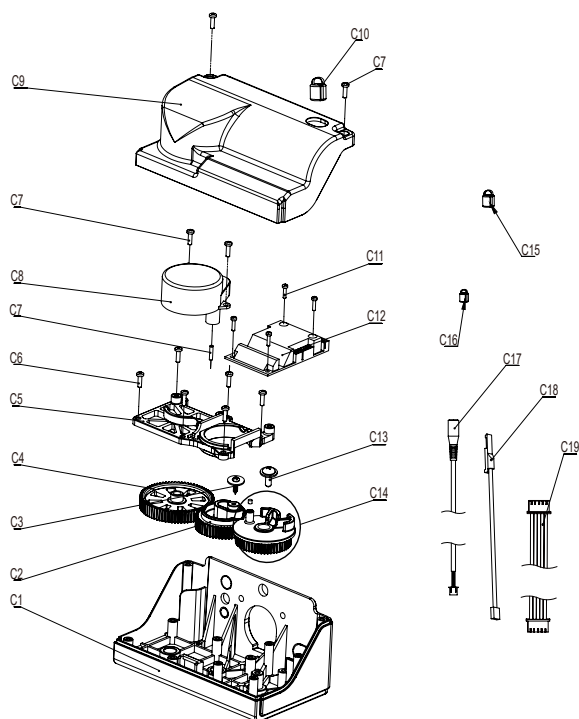


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POWER HEAD PARTS LIST

No.	Part #	Description	Qty
C1	05030005	Bnt85HE Base	1
C2	05031008M	85HE Main Gear	1
C3	13000463	Screw on Main Gear	1
C4	05030009M	Motor Gear	1
C5	05031006	Mounting Plate	1
C6	05056084	Screws on Mounting Plate	10
C7	05056098	Motor Pin	1
C8	05056550	Motor	1
C9	05030024	85HE Cover	1
C10	05056013	Communication Cable Clip	1

No.	Part #	Description	Qty
C11	05010037	Screws on PCB	4
C12	05031041	85HE- PCB(UF)	1
C13	13000462	Screw on Brine Gear	1
C14	05031009N	Brine Gear(C/W magnet)	1
C15	05010046	Meter Cable Clip	1
C16	05010035	Power Cable Clip	1
C17	05010029B	Power Cable	1
C18	05010108B	Meter Cable	1
C19	12100024	Communication Cable	1



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Lucy