Lucy

Lucy HE

OPERATING MANUAL

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ENGLISH

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.

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.

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
Resin volume	14L	25L
Control System	BNT-850HE	BNT-850HE
Regeneration type	Upflow	Upflow
Nominal flow	0.6 m^3/h	1.5 m^3/h
Peak flow	1.2 m^3/h	1.8 m^3/h
Loading capacity	45 °f x m^3	90 °f x m^3
Water extraction possible during regeneration	Yes, hard water	Yes, hard water
Working pressure*	2 - 6 bar	2 - 6 bar
Feedwater temperature range	4 - 43°C	4 - 43°C
Connected power supply	220 V AC 50 Hz	220 V AC 50 Hz
Diameter inlet & outlet	3/4" or 1"	3/4" or 1"
Diameter drain	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

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

- 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.

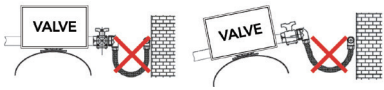
Possible soldering should be done before installing the softener. Failing to do so can generate irreversible damages. For any operation, shut down water inlet, unplug your softener and open faucets at the top and at the bottom of your house to drain your installation.

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

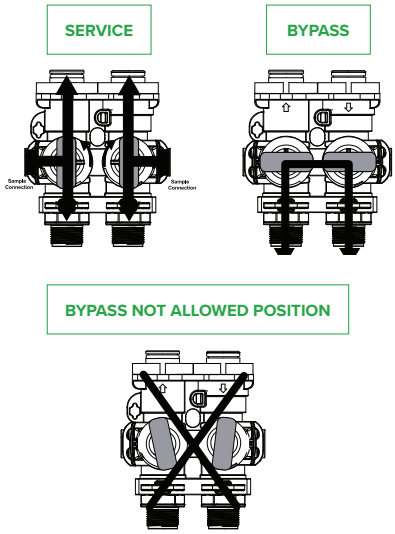
Only use salt tablets for water softening applications (purity should be at least 99.5% - EU standard EN 973). Other types of salt, for example, finely granulated are not permitted.

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).

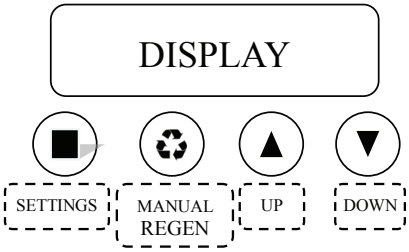
Installation of the bypass on the softener:

- 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 un-softened 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.



6. PROGRAMMING

6.1. KEY PAD CONFIGURATION



- **Setting Menu**
  This function is to enter the basic set up information required at the time of installation.
- **Manual Regen**
  This function is to initiate an immediate or delayed manual regeneration.
- **Up and Down key**
  These buttons are used to increase or decrease the value of the settings while in the programming mode.

Program will go back to standby status if no key was not operated during 1 minute.

The keys will automatically be locked if there is no operation during 3 minutes.

6.2. PROGRAMMING LEVELS

There are 4 levels to the valve program. Master options and Factory options are typically adjusted at the factory. These options link the PCB function with the type of control valve and should not be tampered with. Advanced options are used to configure the unit when the valve is assembled to the tank so that it can function as the proper size and intended system operation. Settings are the final options chosen when the unit is installed to a specific location.

Program level	User access
Master	These settings are programmed by the factory. The settings are important for the operation of the valve and should only be changed by a qualified person.
Factory	These settings are programmed by the factory and should be adjusted when the valve is assembled into a unit or system. It contains important settings so the valve will operate properly for the type of system it is intended for. The settings should only be changed by qualified person.
Advanced	These settings are programmed when the unit is assembled. The settings should only be adjusted by a qualified person.
Settings	These settings are programmed when the unit is installed. The settings should only be adjusted by a qualified person.

6.3. MAIN DISPLAY OPTIONS

The main display page will pause on the Date and Time page for 5 seconds. Then it will continually scroll through all of the system diagnostic display pages. Depending on the Valve Type some pages will not be displayed.

To manually scroll through the diagnostics, press the down or up key. To reset the TOTAL REGENERATIONS, TOTAL LITERS OVER RUN, TOTAL or PEAK flow rates, press and hold the MENU until the value changes to zero.

Parameter	Description
July/17/2012 8:30 pm	Month, Day, Year, Time
Total 4 days remain 3 days	The number of days remaining before regeneration. This option is only in filter mode.

Total 1,500 L remain 1,200 L	The total amount is the system capacity when fully regenerated. The remaining is the capacity left in the system.
People 2 reserve 150 L	Number of people in the household and the calculated reserve capacity. When remaining reaches reserve capacity a regeneration will be scheduled.
Est. Days to next regen 06 days	The estimated number of days until the next regeneration will occur.
Last regen 9/24/12	The date of the last regeneration.
Total regens 10	The total number of regenerations.
Total liters 001590 L	The total amount of liters treated by the system.
Over run total 0500 L	The total amount of water that has exceeded the system capacity over the last 4 regenerations. When remaining goes to zero, the liters used will be added to over run total.
Current 1.5 lpm peak 6.5 lpm	The current flow rate and the peak flow rate since the last regeneration.
Delayed regen off	Advises whether a delayed regeneration has been scheduled manually or automatically.
Refill time 3:00 min	The current calculated refill time.
Regen time 2:00 am	The current setting for regeneration time.
Valve mode softener uf	The current setting of the valve mode.

6.4. MANUAL REGENERATION

Delayed regeneration

Press and release the MANUAL REGEN Button to set a delayed regeneration that will occur at the regeneration time. To cancel the delayed regeneration, press and release the MANUAL REGEN button.

Immediate regeneration

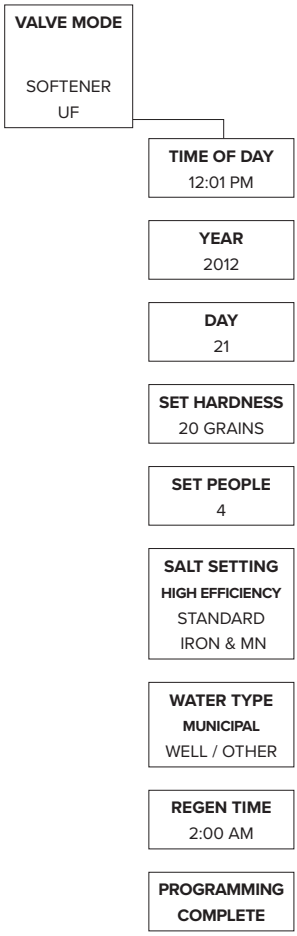
To start an immediate regeneration (or step valve through each position), press and hold the MANUAL REGEN Button for 3 seconds (until beeps). The valve will start an immediate regeneration. Press any key to skip to the next cycle.

6.5. SETTINGS

Settings

Press SETINGS key (3 SECONDS / BEEP)

CAUTION: The values in this page are for illustration purpose and can be changed by the factory without notice. Please contact Customer Service to confirm proper settings.



Time of day, year, month, day,
Time of day is used for the normal operation of the system and the scheduling of the regeneration time. The date is used in a diagnostic function to track the last time the system regenerated.

Set hardness
This value is the maximum compensated water hardness of the raw water supply. It is used to calculate the system capacity.

Set people
This value is the number of people living in the home. It is used to calculate the amount of water needed for daily use and the reserve capacity of the system.

Salt setting
There are 3 settings to choose in the MENU SETTINGS. High Efficiency, Standard Capacity, and IRON & MN. These settings will determine the salt dosage and capacity for the system.

Water type
This setting will determine if the BACKWASH OVERIDE function will be on or off. Select MUNICIPAL if the water source is clean (<1NTU turbidity) and the system will skip the back wash cycle based on the setting in BACKWASH OVERIDE.

Regen time
This setting determines the time of day to perform a scheduled regeneration.

Regen days
This value is the number of days between regenerations.

Liter
Default value is OFF. Adjust the liters to set the capacity. This will cause the unit to regenerate either when the liters remaining goes to zero or the days between regeneration is zero. Which ever occurs first.

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.
- 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 the MANUAL REGEN Button for 3 seconds to start an immediate regeneration. Insert manual regen icon from page 13.
- 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 B. No salt in brine tank C. Injector or screen plugged D. Insufficient water flowing into brine tank E. Leak at distributor tube F. Internal valve leak G. Flow meter jammed H. Flow meter cable disconnected or not plugged into meter cap I. Improper programming	A. Close bypass valve B. Add salt to brine tank and maintain salt level above water level C. Clean injector and screen D. Check brine refill time and clean brine line flow control if plugged E. Make sure distributor tube is not cracked. Check O ring and tube pilot F. Replace seals and spacers and/or piston G. Remove obstruction from flow meter H. Check meter cable connection to timer and meter cap 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 B. Timer is not operating properly C. Defective valve drive motor D. Improper programming	A. Assure permanent electrical service (check fuse, plug, chain or switch) B. Replace timer C. Replace drive motor D. Check programming and reset as needed
3. UNIT USES TOO MUCH SALT	
A. Improper salt setting B. Excessive water in brine tank C. Improper programming	A. Check salt usage and salt setting B. See#7 C. Check programming and reset as needed

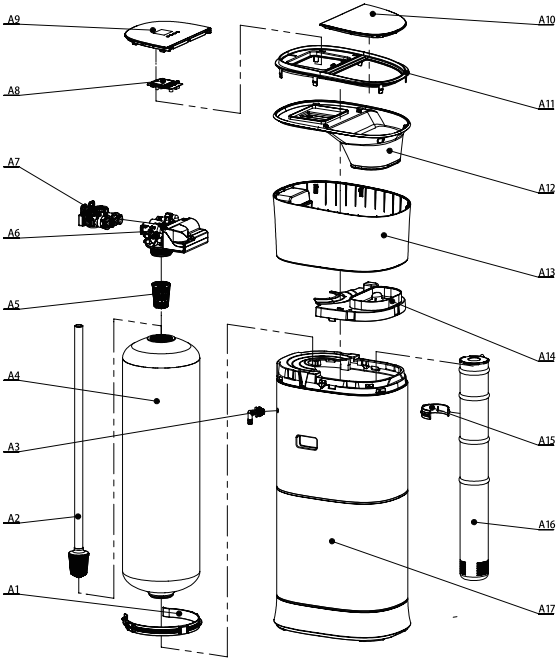
Problem	Possible Solutions
4. LOSS OF WATER PRESSURE	
A. Iron build-up in line to water conditioner B. Iron build-up in water conditioner C. Plugged controller inlet due to foreign material from pipes caused by recent work done on the plumbing system.	A. Clean line to water conditioner B. Clean control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

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

9. COMPONENT SHEET

No.	Part #	Description	Qty
A1	21700110	Pressure Tank Clamp	1
A2	02030031	Distribution Assy-1015	1
	02030016	Distribution Assy-1035	1
A3	02170173	Overflow Assy	1
A4	07501015	1015 Pressure Tank	1
	07591035	1035 Pressure Tank	1
A5	07060077	Top Cone	1
A6	22018816	Control Valve Assy	1
A7	22053014	Bypass Valve Assy	1
A8	05030028G	Controller PCB	1

A9	07032130	Controller Cover	1
A10	07032134	Softener Salt Lid	1
A11	07032130	Softener Top Cover	1
A12	07032131	Softener Middle Cover	1
A13	07032132	Softener High Cover	1
A14	07032133	Salt Fog-proof Cover	1
A15	21710104B	Brine Well Clamp	1
A16	02150027	0415 Brine Valve Assy	1
	02150001	0435 Brine Valve Assy	1
A17	07000284	Softener Cabinet 1015	1
	07000285	Softener Cabinet 1035	1



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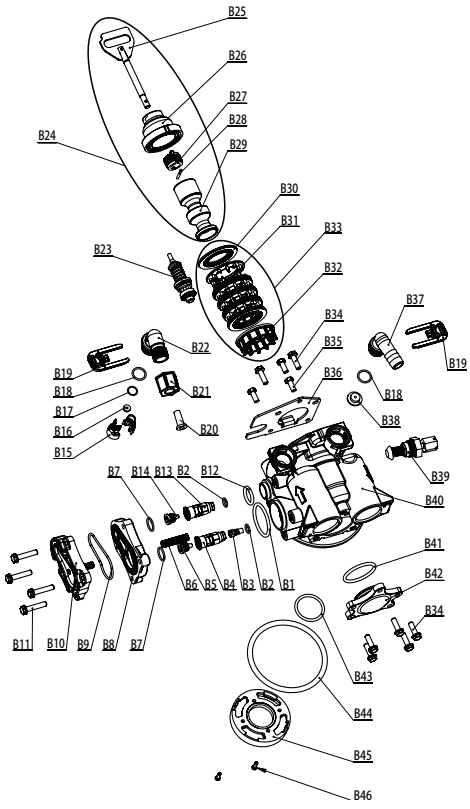
VALVE BODY PARTS LIST



No.	Part #	Description	Qty
B1	05031022	Big O-ring of Injector Cover	1
B2	05031020	Small O-ring of Injector Holder	2
B3	#1	White Injector Throat(Optional)	1
B4	05031012M	Injector Holder	1
B5	#1	White Injector Nozzle(Optional)	1
B6	05056103	Screen	1
B7	05031019	Big O-ring of Injector Holder	2
B8	05031003M	85HE Injector Cover	1
B9	05031018	O-ring on Injector Cover	1
B10	05031004M	85HE Injector Cover Cap	1
B11	05031027	Screws on Injector Cover Cap	4
B12	05031021	Small O-ring of Injector Cover	1
B13	05031013M	Injector Holder Plug	1
B14	05056156	Injector Nozzle Plug	1
B15	05031010M	BLFC Holder	2
B16	BLFC	(0.3GPM)(Optional)	1
B17	05031033	O-ring of BLFC Holder	1
B18	05056134	O-ring of Brine Line Elbow	2
B19	05056172N	Secure Clip-S	1
B20	30110004M	Tube Insert	1
B21	21389033M	Brine Line Elbow Nut	1
B22	30020013M	Brine Line Elbow	1
B23	05056180M	Brine Valve Injector Stem Assy	1
B24	02170101	Piston Assembly-85HE Valve(UF)	1
B25	05031032	Piston Rod-85HE Valve	1
B26	02170233	End Plug-85HE Valve	1
B27	05031014	Piston Retainer-85HE Valve	1
B28	05056097	Piston Pin	1
B29	05057002	UP Flow Piston-85HE Valve	1
B30	05056073	Seal-85HE Valve	1
B31	05056204M	Spacer-85HE Valve	8
B32	05031005	Bottom Spacer-85HE Valve	1
B33	02170102	Seals and Spacers Assembly	1
B34	05056508	Valve Body Connect Screws	7
B35	05056087	End Plug Retainer Screws	3
B36	05056047	End Plug Retainer	1
B37	05010082M	Drain Elbow	1
B38	05056187	DLFC(2.4GPM)(Optional)	1
B39	02170013M	Mixing Valve Assy	1
B40	05031002B	85HE Valve Body	1
B41	05030013	O-ring on 85HE Side Cover	1
B42	05030004	85HE Side Cover	1
B43	26010103	Distributor O-ring	1
B44	05056063	Tank Mouth O-ring	1
B45	07060007	Valve Button Connector	1

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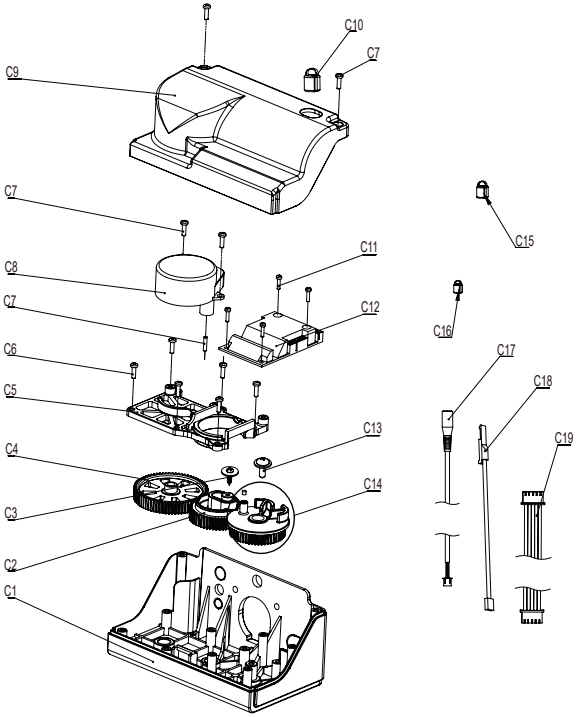
POWER HEAD PARTS LIST

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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