

BWT Household Softener

Design and Operation



2019

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For You and Planet Blue.



Softener Design

For You and Planet Blue.



Design Philosophy

The BWT Household Softener Goals

1. Cost effective

Competitive in the intensely price sensitive marketplace

2. High quality

Quality assurance through design, validation and inspection

3. Simple and reliable

Limit moving parts and wear components

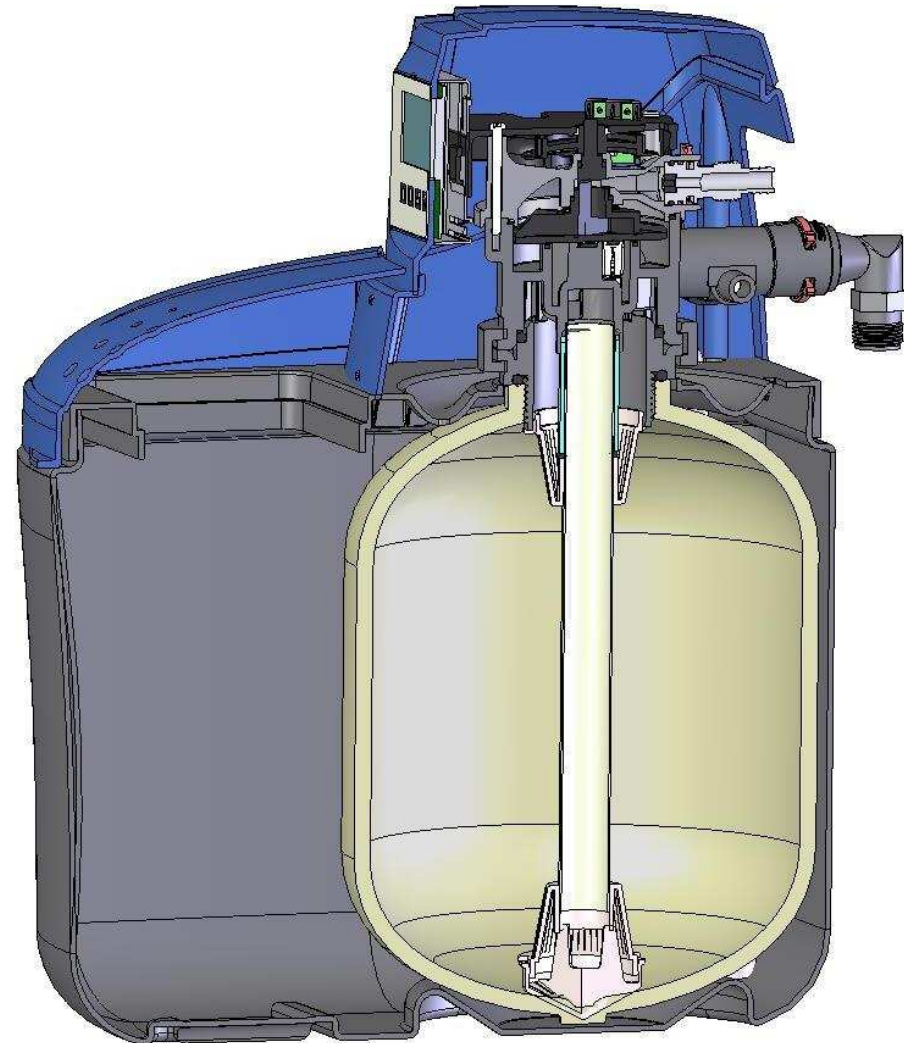
4. Effective performance

Meet EU regulations for performance, safety and testing



Standard Design

- **BWT Millennium Rotary Valve**
Unique BWT design
- **AMECS Electronic Controller**
Patented electronic program and algorithms
- **ION Exchange Resin Vessel**
High quality composite pressure vessel
- **Brine Cabinet**
Unique BWT family design



BWT UK Quality Assurance



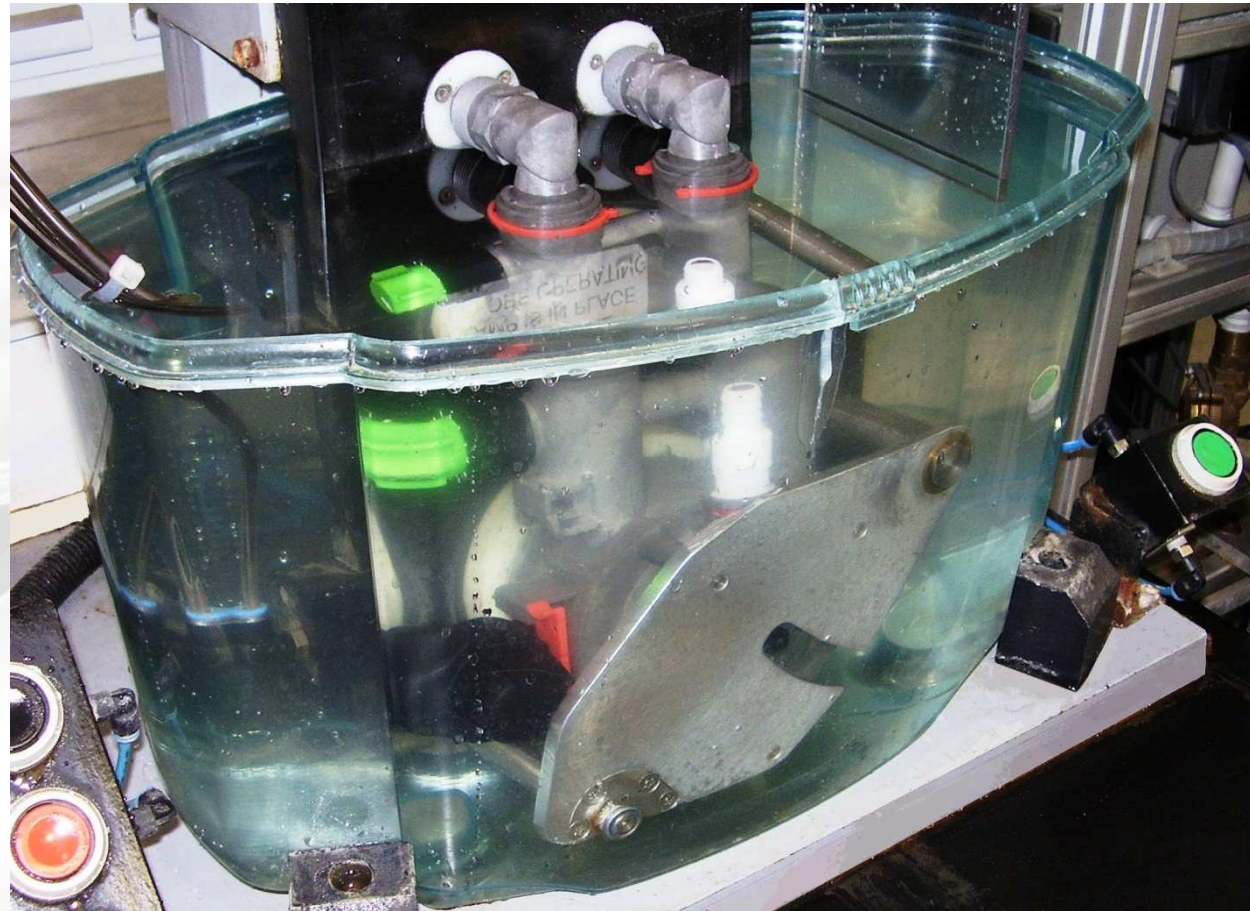
Quality Assurance

All household water softeners assembled by BWT are subject to the following QA inspection and testing

1. Immersion pressure integrity testing of the valve
 2. Valve automated cycle testing for 5 cycle operation and integrity validation
 3. Electronic cycle testing and validation of PCB operation and interface
 4. Softener decay pressure integrity testing
- All softener models are subject to testing and validation in accordance with EN 14743 The European Standard for Water Softener Performance, Testing and Safety
 - A random sample of all assembled softeners are subject to operational water testing prior to shipment

Valve Immersion Pressure Testing

- Manual air pressure integrity test for leaks
- 100% inspection of all valves on assembly line
- Leak test in 2 cycle positions to test valve body and injector housing



Valve Automated Cycle Testing

- 100% Function Testing
- Industrial PC control
 - Tests Include
 - Pressure Test (Leak Test)
 - Turbine flow test
 - Brine fill test
 - Brine draw test
 - Backwash / Rinse test
 - Sensor positioning test
- Valve serial number issue



BWT Softener Operation

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Simple Intuitive Controller

- Only 4 simple control keys
- Set the time of day
- Set the water hardness
- Softener will operate correctly with just these 2 parameters set

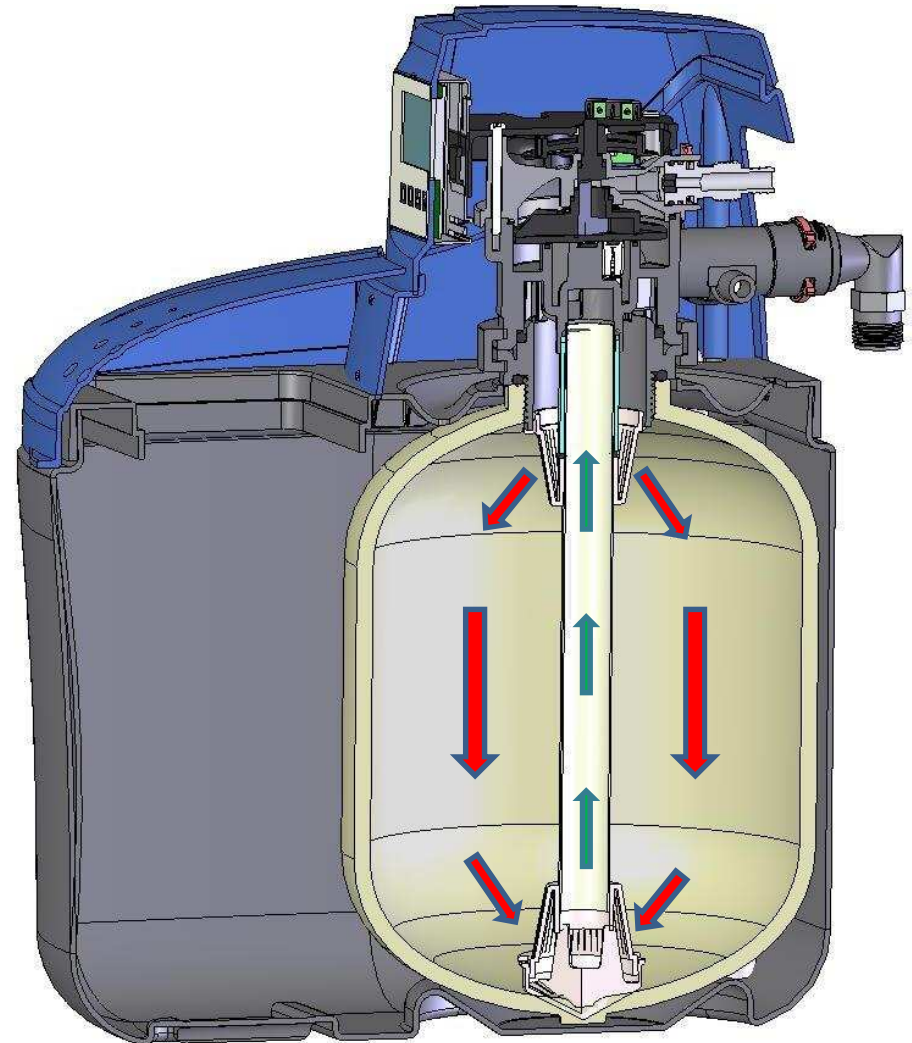


Service

Supply water is passed down-flow through the resin vessel

The volume of water used is metered using a turbine on the outlet port of the valve

Upon achieving a desired volume of treated water (defined by the PCB programme and the hardness of the water set by the operator on installation) the electronic control will initiate demand for a recharge (or regeneration) of the exchange resin

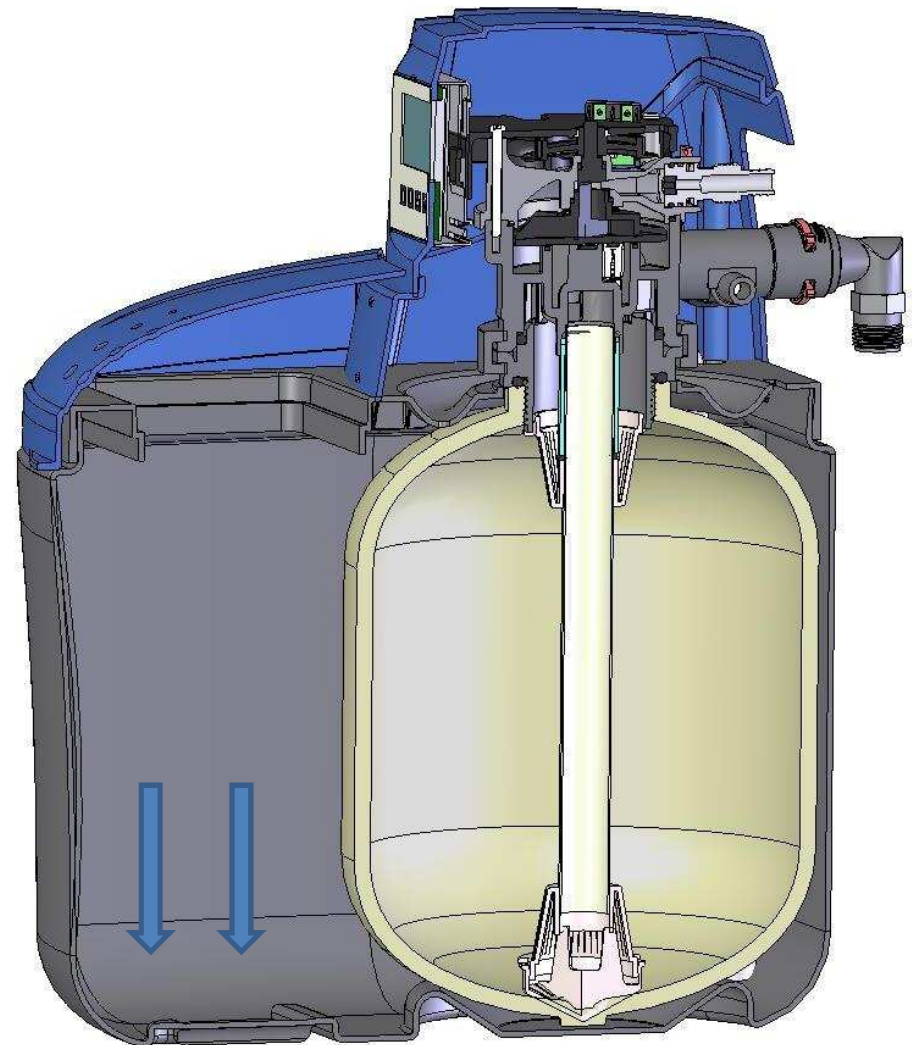


Brine Fill

The first stage of the recharge process is to fill the brine cabinet with a calculated amount of water to produce brine by dissolving the salt already placed in the cabinet by the user

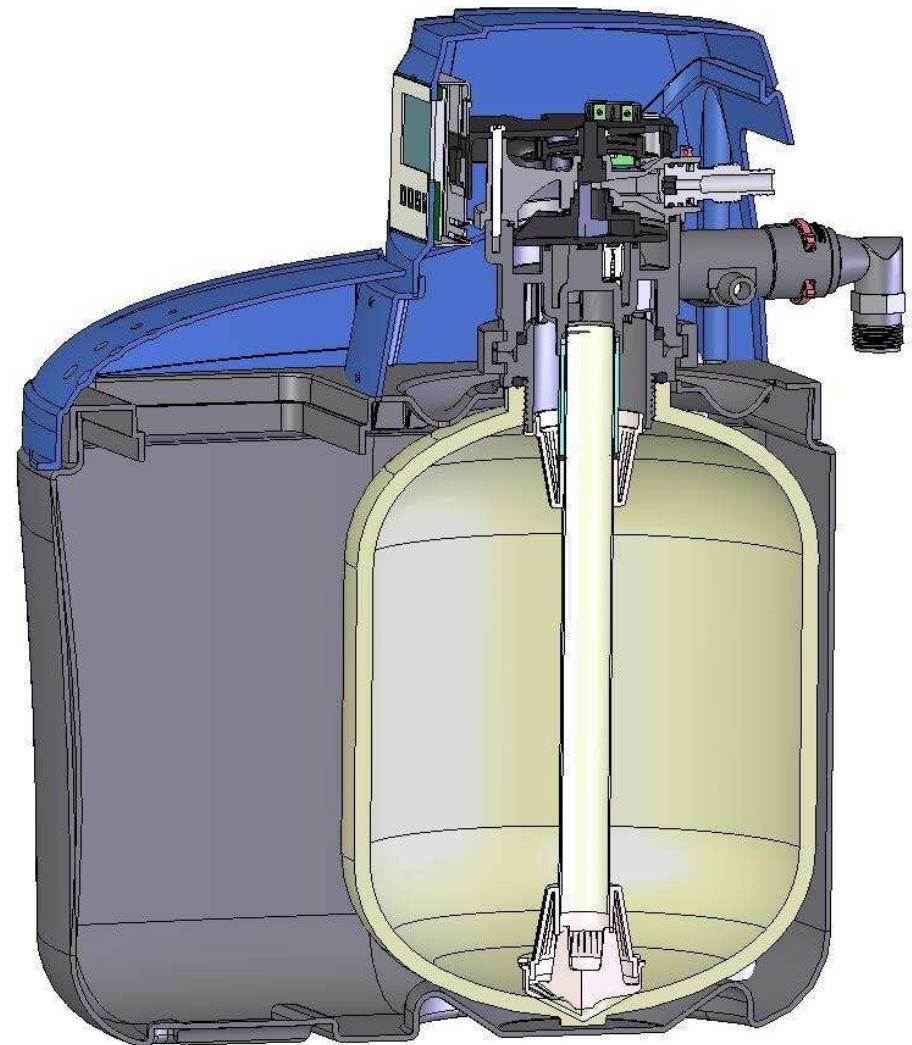
The amount of water is calculated based on the volume of treated water metered in the previous service run to ensure that only the necessary amount of brine is produced (proportional brining)

This minimises waste water and salt



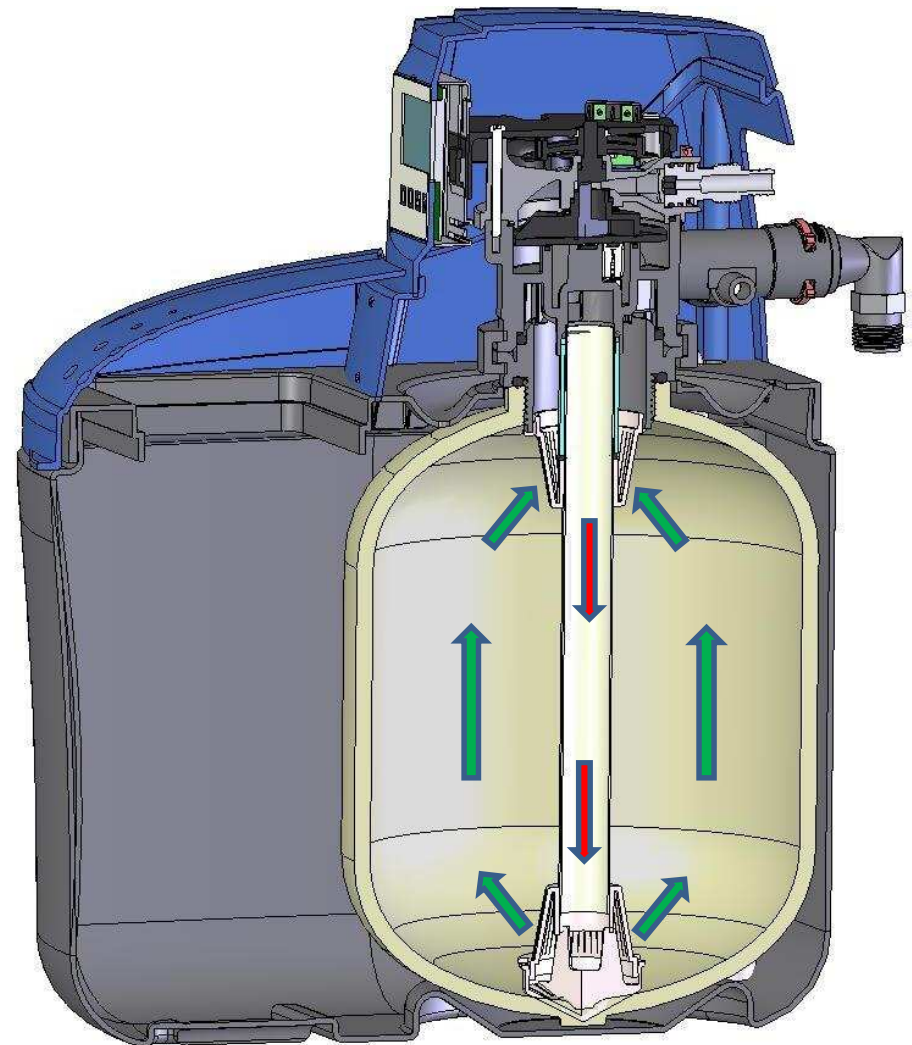
Dwell

A predefined period of hold to allow the salt to fully dissolve and form full strength brine solution.



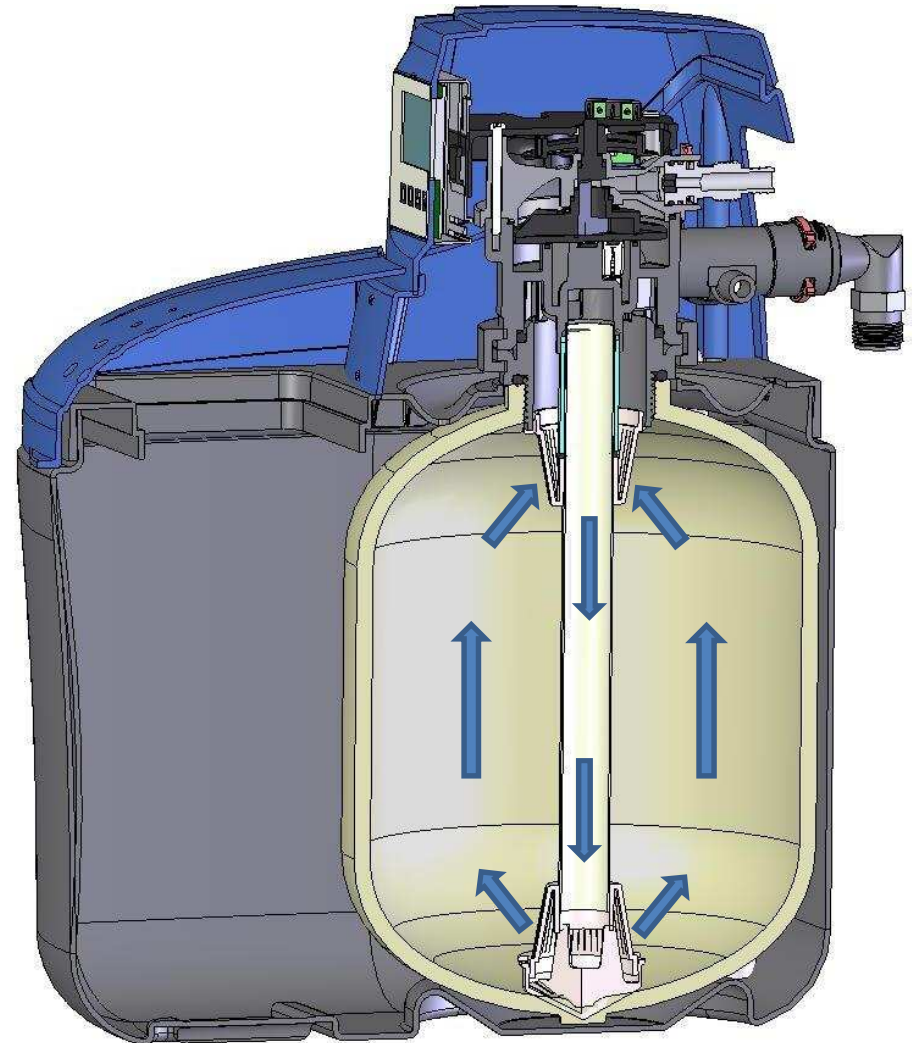
Brine Draw

The softener will then draw the entire volume of brine up-flow in to the resin vessel to recharge the resin using the salt.



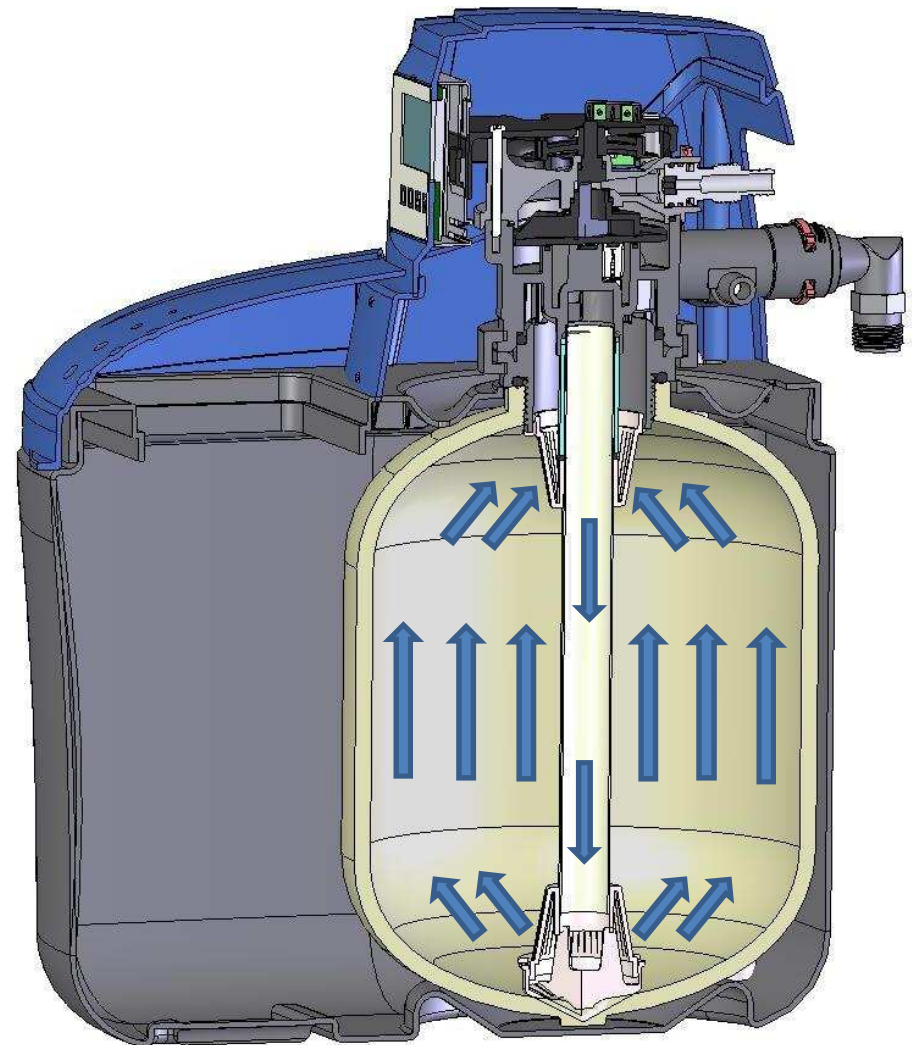
Slow Rinse

Immediately after brining the softener will perform a slow up-flow rinse to circulate and remove the brine solution from the resin vessel using supply water



Back Wash

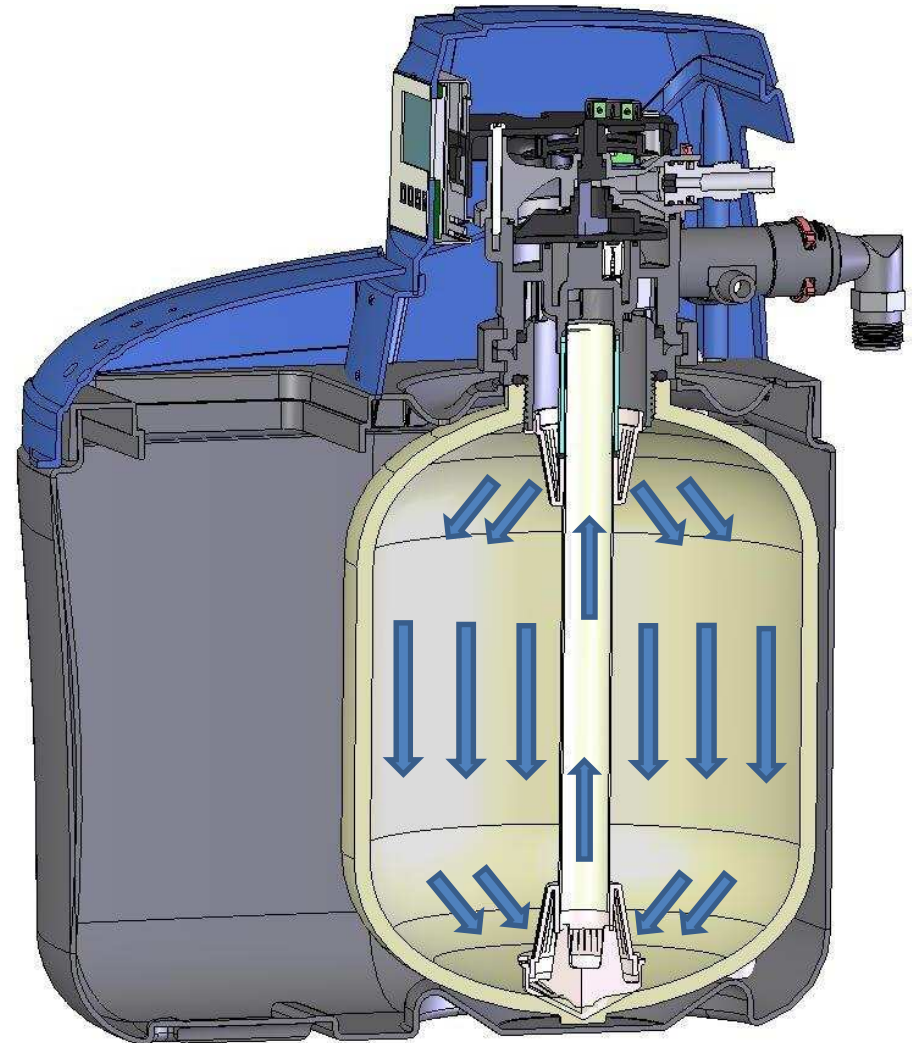
The softener will then perform a short fast up-flow rinse to further remove the brine



Fast Rinse

A short fast down down-flow rinse is then performed to remove the last of the brine and settle the resin bed

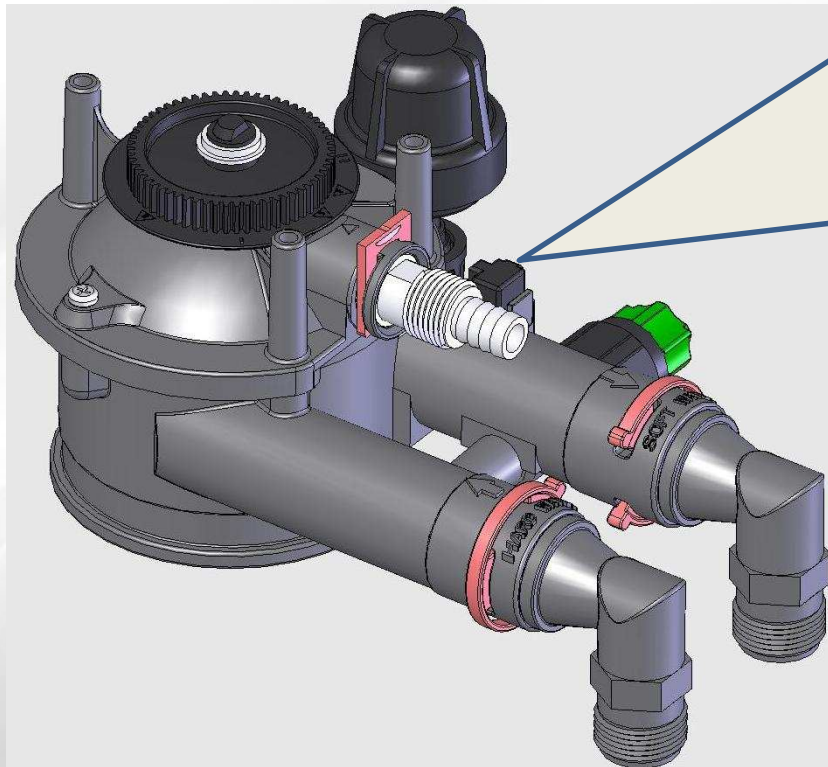
The softener will then return to its service position



BWT Softener Electronic Control



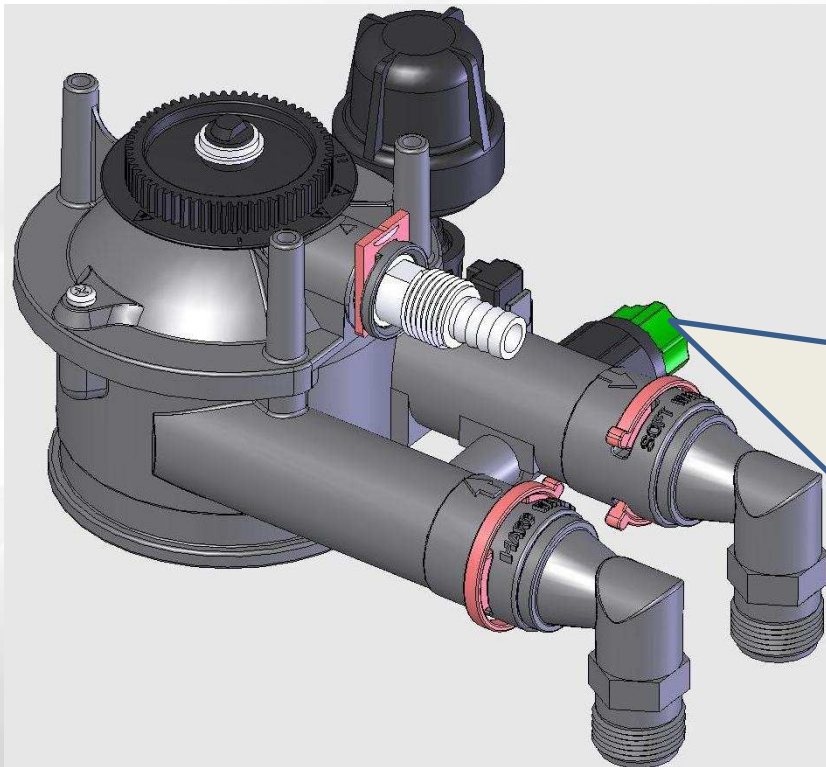
Water Softener Programming and Control



To meter the treated water we use a turbine in the outlet port

The turbine has 2 small magnets on the blades and a proximity sensor uses these magnets to measure turbine revolutions and calculate water volume

Water Softener Programming and Control



A spring loaded blend valve placed internally in the valve allows a controlled amount of untreated water to bypass the softener

This can be used to produce a controlled blend of partially softened water as desired

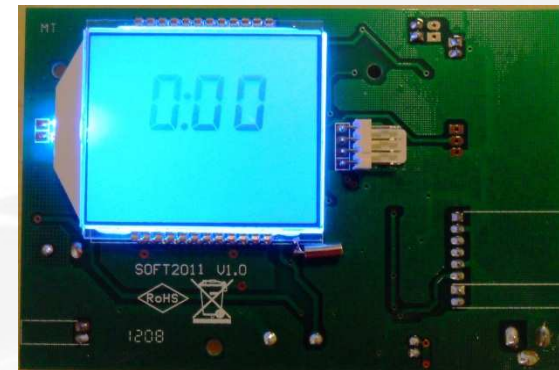
AMECS Electronic Control

The AMECS PCB Programmable control board allows us to control the functionality of the softener in many ways

The AMECS programme uses a memory chip to store usage data on the operation of the softener. This data is used not only to diagnose the softener operation but also to determine a water usage pattern for the user. Based on metered water usage the controller creates a water usage pattern for each day of the week so that it can anticipate increased water usage on given days. The pattern is created using a rolling average for each day over a 14 day period so for a softener installed on a Monday the volumes will be averaged as follows:

M T W T F S S M T W T F S S
V1 V2 V3 V4 V5 V6 V7 V8 V9 V10 V11 V12 V13 V14

The controller uses these patterns combined with the softening capacity of the resin and the hardness of the water to predict when the softener resin is likely to be exhausted and initiates a recharge in advance in order to ensure that the user has a constant supply of treated soft water



Supply and Specifications



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Scope of Supply

- Softeners available in 4 sizes:
 - 10 Litre
 - 15 Litre
 - 20 Litre
 - 25 Litre
- All softeners supplied fully packaged with:
 - Instruction manual
 - Water hardness test kit
 - Connection drain hose
- Installation kits are available as an optional extra



Specifications

Model	10 Litre	15 Litre	20 Litre	25 Litre
Maximum peak flow rate (l/min)	30	50	60	70
Maximum continuous flow rate (l/min)	25	35	45	55
Nominal flow rate [@ 1 bar pressure loss] (l/min)	24	26	28	28
Minimum flow rate (l/min)	10	10	10	10
Salt usage per regeneration (kg)	1.5	2	2.5	3
Maximum pressure (bar)	8	8	8	8
Minimum pressure (bar)	1	1	1	1
Maximum water temperature (°C)	30	30	30	30
Minimum water temperature (°C)	5	5	5	5
Primary transformer voltage (Vac)	230	230	230	230
Secondary transformer voltage (Vdc)	12	12	12	12
Inlet / outlet connection (BSP)	3/4"	3/4"	3/4"	3/4"
Drain connection	1/2"	1/2"	1/2"	1/2"

Hardness Conversion Table

Measure your local water hardness and adjust the settings of the softener to its actual values!

Attention!
The softener requires values given in ppm!

Softener Model:			10 litres	15 litres	20 litres	25 litres
M3/°F			50	75	100	125
German °H	French °H	PPM (mg/l)	Capacity	Capacity	Capacity	Capacity
5.6	10.0	100	5000	7500	10000	12500
6.2	11.0	110	4545	6818	9091	11364
6.7	12.0	120	4167	6250	8333	10417
7.3	13.0	130	3846	5769	7692	9615
8.4	15.0	150	3333	5000	6667	8333
10.1	18.0	180	2778	4167	5556	6944
11.2	20.0	200	2500	3750	5000	6250
12.3	22.0	220	2273	3409	4545	5682
13.4	24.0	240	2083	3125	4167	5208
14.6	26.0	260	1923	2885	3846	4808
15.7	28.0	280	1786	2679	3571	4464
16.8	30.0	300	1667	2500	3333	4167
17.9	32.0	320	1563	2344	3125	3906
19.0	34.0	340	1471	2206	2941	3676
20.2	36.0	360	1389	2083	2778	3472
21.3	38.0	380	1316	1974	2632	3289
22.4	40.0	400	1250	1875	2500	3125
23.5	42.0	420	1190	1786	2381	2976
24.6	44.0	440	1136	1705	2273	2841
25.8	46.0	460	1087	1630	2174	2717
26.9	48.0	480	1042	1563	2083	2604
28.0	50.0	500	1000	1500	2000	2500
29.1	52.0	520	962	1442	1923	2404
30.3	54.0	540	926	1389	1852	2315
31.4	56.0	560	893	1339	1786	2232
32.5	58.0	580	862	1293	1724	2155
33.6	60.0	600	833	1250	1667	2083

Water Softener Video



Questions

If you have any questions please
don't hesitate to ask



Thank you for attending our training!

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