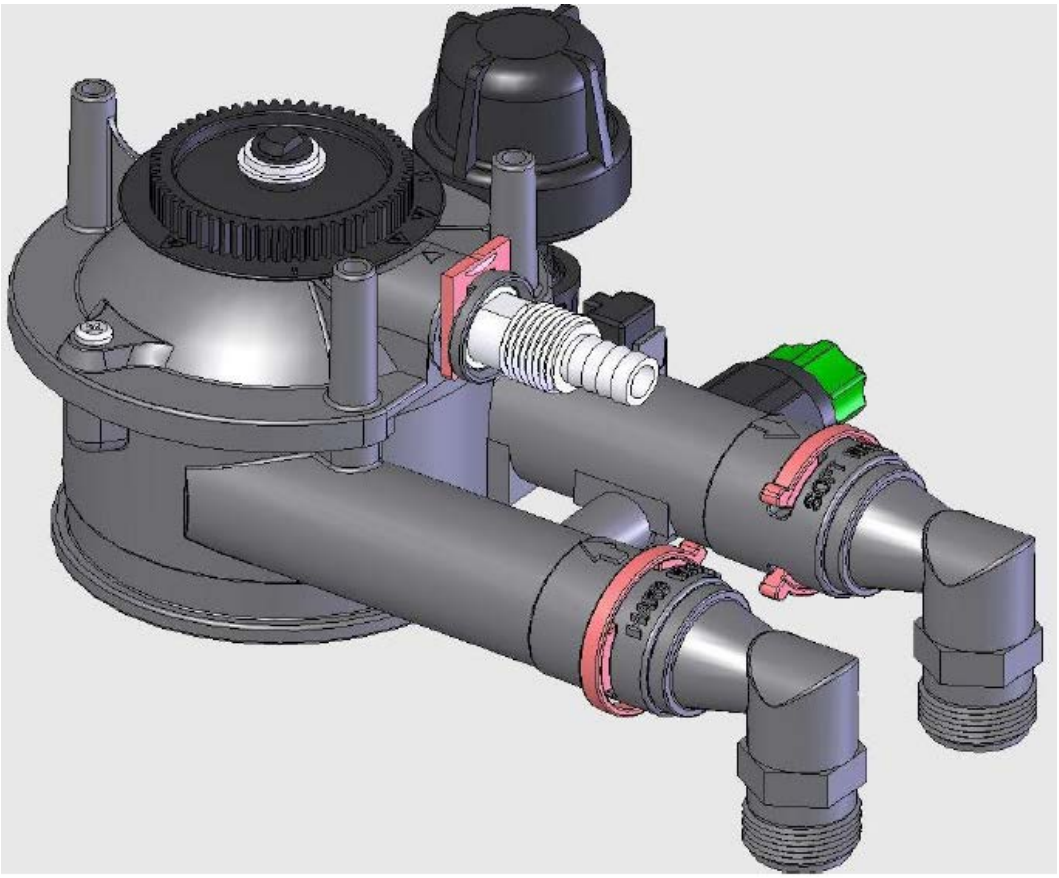
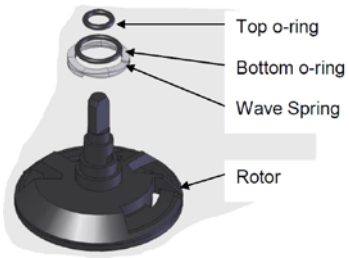
Maintenance –
Service Manual for
KS30E/KS30I
softeners



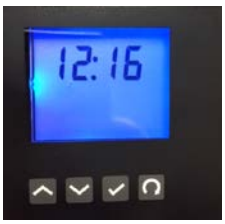
Service, diagnostic and repair instructions for the KS30E/KS30I water softeners with electronic control

Features
At the heart of all KS30E/KS30I water softeners is the valve controlled by the “Advanced Memory Electronic Control System” (AMECS).
AMECS is manufactured and tested to meet the latest EU standards for performance, safety and testing of water softeners

- Rotary valve -> fewer moving parts for greater reliability



- Flow rates suitable for use on all conventional and modern plumbing systems
- Custom backlit -> easy read display



- Low voltage control system
- High capacity resin for generous quantities of softened water between regenerations

1.1 Initial Softener Inspection

1.1.1 Power Supply

Check that the power supply is connected to the softener and switched on. Ensure that the AMECS display is operational and displaying current time. Check that the hardness setting and, where applicable, recharge time and salt type selection are set correctly

1.1.2 Water Pressure

Using a suitable pressure gauge check the water supply pressure is within the softener specification parameters

1.1.3 Softener Connections

Check that the water inlet / outlet and bypass connections are fitted correctly and that the water supply valves are open on both the inlet and outlet, while the bypass is closed.
Ensure that the softener installation meets all local regulations
Ensure that the drain hose connection is fitted correctly and runs to a suitable drain location
Check that the salt tank overflow is connected to a drain line and ensure that this runs downhill from the softener

1.1.4 Salt Level

Ensure that the salt tank contains salt and that there is not a high water level in the tank (approaching the overflow). If excessive salt usage or no salt usage is suspected refer to the fault diagnosis, troubleshooting and repair section of this manual. If a high water level or overflow conditions are found then please refer to the fault diagnosis, troubleshooting and repair section of this manual

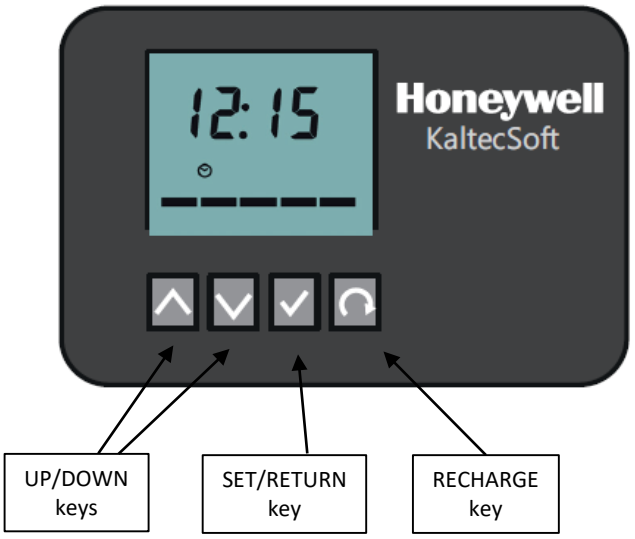
1.2 Initial Softener Setting

1.2.1 Incoming Water Hardness
Test the water hardness

1.2.2 Setting the time of day
On first powering up the softener the digits of the display will flash while the valve rotates to service position, the valve can be heard moving, this can take a few minutes. On locating service position the display will prompt the installer to set the time. Start by pressing the SET/RETURN button, this will make the hour digit to flash, press the UP/DOWN button to adjust to the correct hour, once set, press the SET/RETURN button, this will make the minutes digits flash, use the UP/DOWN button to adjust the minutes. Throughout the settings mode use the UP / DOWN buttons on the softener display to toggle or adjust settings and use the SET / RETURN button to store the setting and move on to the next field in the menu

Initial display on start up

Display when time set



Pressing the SET / RETURN key once the time is set moves the display to set hardness mode

1.2.3 Setting the Water Hardness

The display default is 16°dH. Use the UP / DOWN keys to adjust the setting to match local conditions resp. the measured incoming hardness.
Pressing the SET / RETURN key once enters the hardness and moves the display to set regeneration time mode.

1.2.4 Setting the Recharge Time

The default time for regeneration is 2.00 am. Use the UP / DOWN keys to adjust the time of regeneration to a convenient time when the water supply in the premises is not in use. Pressing the SET / RETURN key once enters the hardness and moves the display to set salt type mode

Display when setting recharge time

1.3 ADDITIONAL INFORMATION

1.3.1 Charge Bar

During Normal operation a charge indicator runs along the bottom of the display.
This charge bar is for indication only and drops in blocks of 20%. The charge bar resets to 100% after regeneration.

1.3.2 Resetting the display during Normal Operation

If the time (or any other user setting) is to be adjusted during normal operation, press any key to illuminate the display. Press the key SET / RETURN once. The display will flash with the current set time. then follow part 1.2.2. to set the time. Continue to press the set button as per the Standard setup on page 4-5.

1.3.3 Power Loss

The AMECS system will maintain the individual programming parameters indefinitely. Should the power cut cause the display to flash 0.00, the control will require the time of day to be reset

1.3.4 Flow Indicator

During normal operation, a flow indicator will flash on the display at a rate of one liter per pulse when water is passing through the softener.

1.3.5 Blending control

All softeners are factory set to produce water that is fully softened. If you require water which has a certain level of hardness, you can adjust the outlet water hardness with the green blending control on the side of the valve. Test the water hardness by running water through the sampling valve on the multiblock in the operation mode. Allow the water to run through the sampling valve for a while and check the hardness of the blended water using a suitable hardness tester. Adjust with the blending valve until the desired value is achieved. Turn anti-clockwise to increase the blend, clockwise to decrease the blend.

2. Manual Regeneration

Manual regeneration of the exchange resin can be carried out at any time during operation, service and maintenance of the softener. To carry out a manual regeneration follow these steps:

2.1 Ensure that the water supply is not in use – if necessary isolate the softener outlet, this will prevent hard water entering the system during regeneration.

2.2 Press the RECHARGE key once to initiate a demand for recharge later within the current 24 hour period (factory set to 2.00am when the water supply is not in use).

2.3 Press and HOLD the RECHARGE key to initiate immediate regeneration. The valve will begin to cycle to the 1st (Fill) position in the regeneration process.

Once fill position has been reached a countdown timer will show the time remaining in that cycle. The valve will then automatically move to the next stage of the process in the following order:

FILL
DWELL
BRINE
BACKWASH
RINSE

At each stage the display will show the current cycle and the countdown time remaining in that cycle.
Once complete the valve will automatically return to the Service position

2.4 Ensure that the water outlet supply is restored if previously isolated

NOTE: The regeneration process can be accelerated to skip individual cycles of the process manually by the service engineer. To do this simply press the SET key once the current cycle has been initiated and the valve has stopped rotating. The valve will skip the current cycle and move to the next position in the cycle in the order stated above. Repeat this process until the required cycle position is achieved.

3. Routine Service and Maintenance

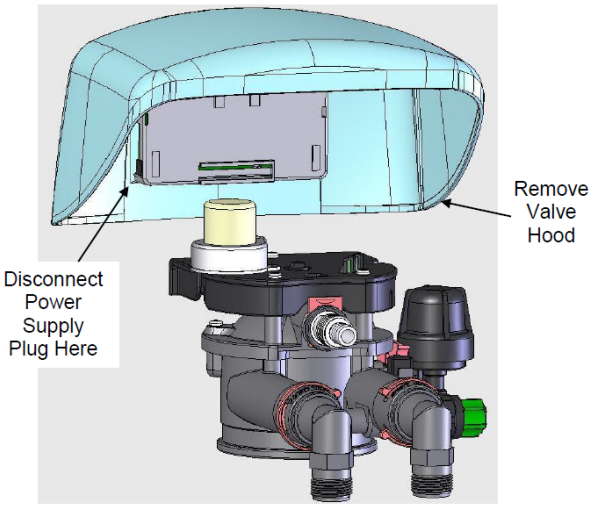
The following section details the method of carrying out a routine scheduled service where the initial inspection and data interrogation have shown no errors or faults and the softener is fully operational

3.1. Isolate the water supply to/from the softener. If necessary switch the water supply to bypass the softener to allow water demand during the softener service

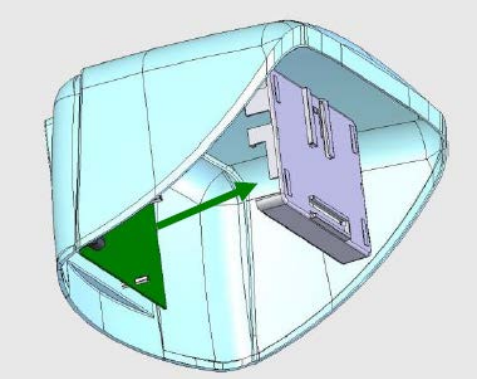
3.2. Depressurize the valve by initiating a manual regeneration. Once the valve has moved from the service position it will depressurize allowing any water inside to flow through the drain line. It is not necessary to wait for the regeneration cycle to complete before continuing with the service process

3.3. Switch off and disconnect the power supply at the mains connection

3.4. Disconnect the power supply connection to the valve PCB by carefully lifting the valve hood and removing the power supply jack plug from the side of the PCB. NOTE: There are ribbon cables running from the PCB to the valve and therefore it is very important to take care when lifting the softener hood to avoid damaging or disconnecting these cables



3.5. Remove the PCB protective control case from the rear of the PCB. This is retained by small locating lugs to the PCB and can be removed simply by pulling it carefully away from the PCB

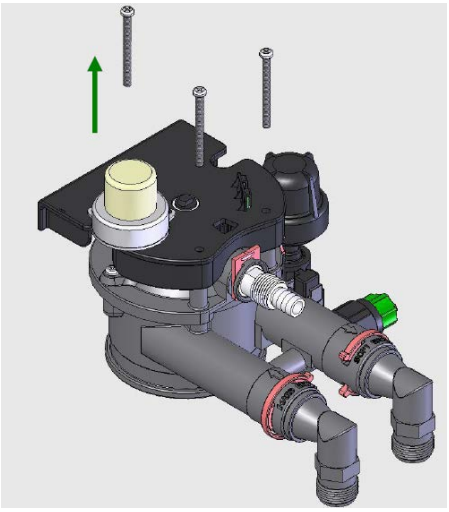


3.6. Disconnect the ribbon cables from the rear of the PCB (and any other connections such the chlorination device if fitted). All cables are attached using discreet pin sockets and can be removed by simply pulling the white connector housing sideways off the pins attached to the PCB

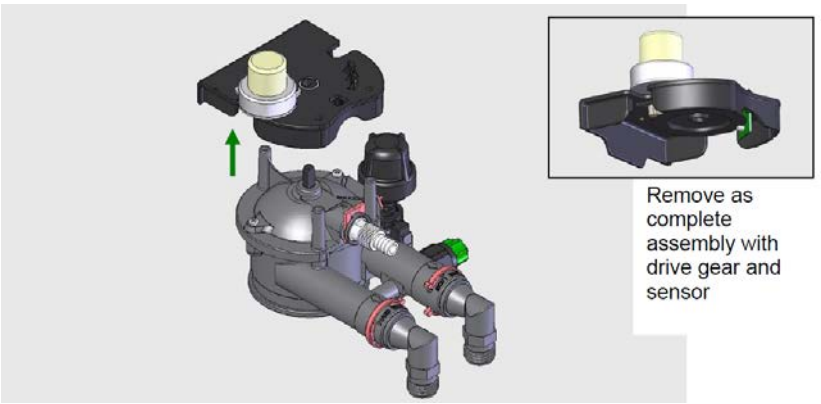
3.7. The softener hood including control PCB can now be removed completely from the softener to allow access to the control valve beneath

3.8. Remove the valve motor.

3.9. Remove the 3 screws from the top of the valve motor plate and loosen the other 2 screws holding the valve top cover – this is important to avoid excessive stress on these two screws.

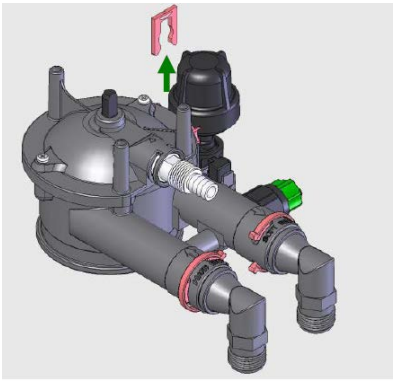


3.10. Lift off the motor plate taking care to ensure that the drive gear sensor is not damaged.
NOTE: The best method to ensure that the sensor is not damaged is to lift off the motor plate, drive gear and drive gear bearing as a complete assembly and thus keep the drive gear sensor in-situ with the drive gear during removal

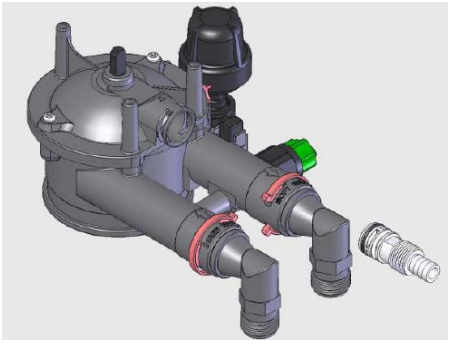


NOTE: It is now preferable to remove the opposite end of the sensor cable from the valve body so that the motor plate can be completely removed

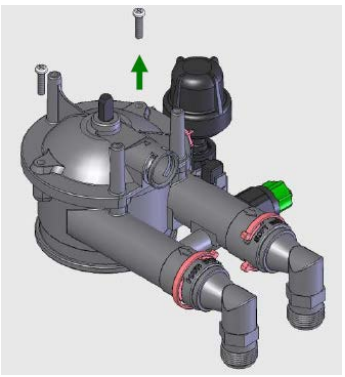
3.11. Remove the drain clip by lifting it using the lugs on the clip



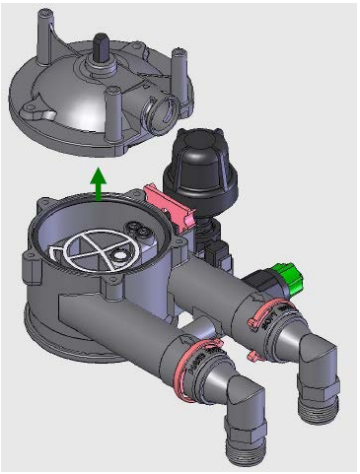
3.12. Pull the drain hose adaptor from the main valve top cover port. Check the condition of the O-ring seal on the adaptor. This seal is not a wear seal and should not require replacing as standard during a routine service but if any damage or degradation is found replace the O-ring as a precaution. Ensure that whenever a seal or O-ring is replaced it is greased with a suitable silicone based lubricant.



3.13. Remove the 2 remaining top cover retaining screws from the top cover

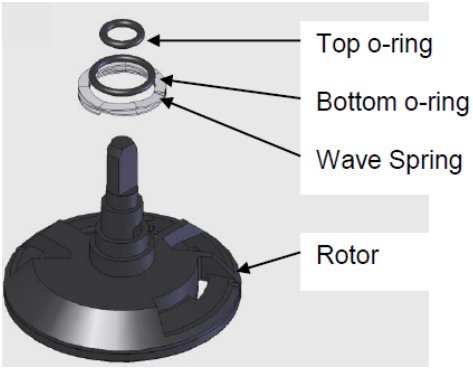


3.14. Lift off the valve top cover. Normally the valve rotor assembly and associated seals and springs will lift out with the top cover



3.15. Remove and replace the following components:

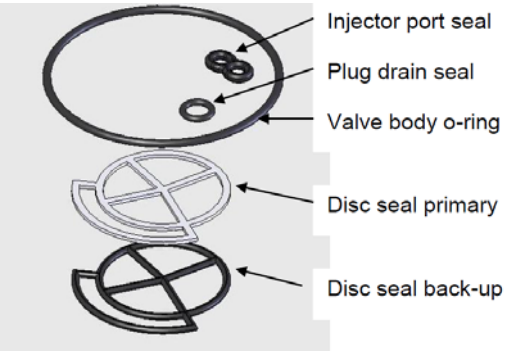
Rotor Assembly
Wave Spring
Top O-ring
Bottom O-ring



Ensure that whenever a seal or O-ring is replaced it is greased with a suitable silicone based lubricant

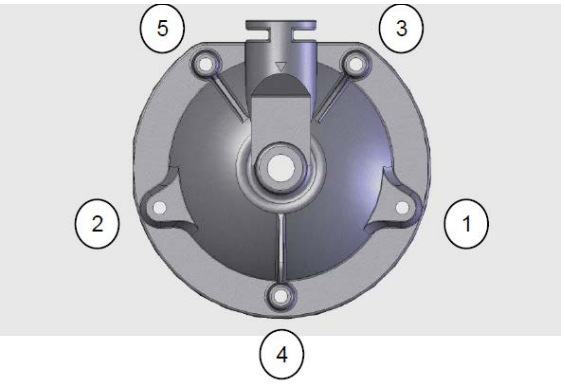
3.16. From the Valve body remove and replace the following components:

Injector Port Seal
O-ring for Plug Drain Seal
Disc Seal Primary
Valve Body O-ring
Disc Seal Back Up



Ensure that whenever a seal or O-ring is replaced it is greased with a suitable silicone based lubricant

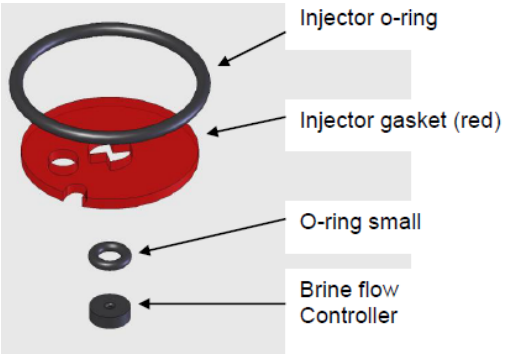
3.17. Re-assemble the valve body in reverse of part 9. to 15. above. NOTE: It is important to re-fit and torque the valve retaining screws in parts 9. and 13. in the correct order shown below. The screws should be tightened to a nominal torque setting of 2Nm and should not exceed 4Nm



3.18. Unscrew and remove Injector Housing Cap by turning the cap counter-clockwise by hand

3.19. Remove and replace the following components:

Injector Gasket Red
O-ring small
Brine line Flow Controller
Injector O-ring



Ensure that whenever a seal or O-ring is replaced it is greased with a suitable silicone based lubricant

3.20. Re-assemble the injector internals in the reverse order of removal and re-fit the Injector Housing Cap by turning the cap clockwise by hand

3.21. Re-assemble all electrical and electronic components in reverse order of parts 3.4. to 3.7.

3.22. Re-connect and switch on the power supply at the mains connection. The softener valve will now begin turning in order to return to service position

3.23. Slowly open the inlet water supply to re-pressurize the softener and check for any leaks. When no leaks are detected slowly open the outlet water supply and disengage any bypass if used at part 3.1.

3.24. Once the softener has achieved service position and is fully operational initiate a manual regeneration following the procedure is section 2. Ensure that all regeneration cycles are fully functional

The routine scheduled service of the softener is now complete

4. Fault Diagnosis, Troubleshooting and Repair

During this section we will provide a guide to the methods of repairing and correcting the most common faults that may occur with the operation of the KS30E/KS30I water softeners with electronic control. We will avoid general water treatment fault diagnosis as this is applicable to all water treatment and control devices and not specific to this product range. In no way is this list exclusive and it is always necessary for the service engineer to inspect, diagnose and repair any faults based on the exact nature of the fault, taking in to account the installation conditions, operation and treatment of the appliance using their experience and knowledge to guide them at all times

The failure modes considered in this section are as follows:

4.1 Error Code “Err1” displays on AMECS controller

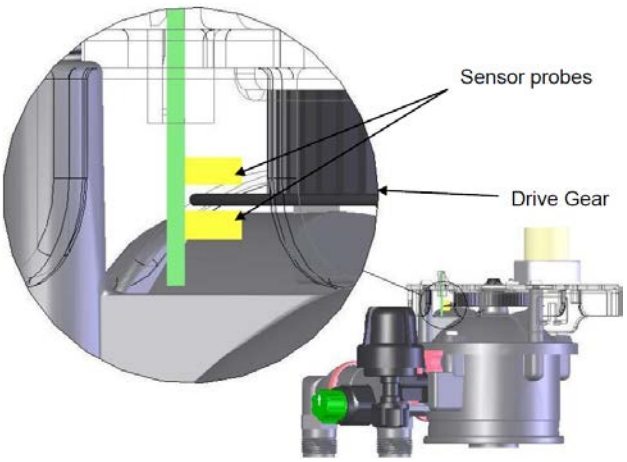
The error code “Err1” displayed on the valve electronic controller display coupled with an audible alarm signifies a valve position sensor fault where the valve sensor has been unable to find the service position on the drive gear within a 10 minute search period. The position sensor senses light through slots placed in the drive gear and can identify service position by the location of 2 slots in the immediate vicinity of each other. In order to work correctly the 2 sensor probes must to be positioned on opposite sides of the drive gear with the gear (and slots) between the sensor probes. Therefore it is very important that whenever work is carried out on the valve this sensor is not damaged and is positioned correctly (see section 3.9., 3.10). It is also essential that the motor and gear assembly is fully operational.

4.1.1. Switch off the power at the mains connection

4.1.2. Check the supply lead to the drive motor is correctly connected to both the motor and the electronic control PCB. Ensure that the motor supply lead is connected to the correct port on the PCB

4.1.3. Switch on the power supply and check that the motor is driving once power is restored. If the motor fails to drive go to part 4.1.10.

4.1.4. If the motor drives successfully but the display continues to show “Err1” check the condition of the valve position sensor and that the ribbon cables and connections are in good condition and connected correctly. Re-connect if disconnected or loose connections are found. Ensure that the 2 sensor probes are positioned on opposite sides of the drive gear with the gear (and slots) between the sensor probes



4.1.5 Switch off the power supply for 10 seconds and then power on to reset

4.1.6. If the motor is operating correctly and the condition of the sensor is OK but the display continues to show “Err1” check the drive gear condition for damage and ensure that the drive gear slots are free from debris

4.1.7. Carry out a valve position sensor check as follows:

- Disconnect the existing valve sensor from the electronic control PCB
- Fit a new/unused spare position sensor to the electronic control PCB
- Switch off the power supply for 10 seconds and then power on to reset
- Holding the sensor use a suitable object (a spare drive gear can be used) to repeatedly break and open the light path between the two sensor probes to simulate operation

4.1.8. If the new spare sensor operates correctly and service position is indicated on the display replace the faulty sensor on the valve with the new spare sensor.

4.1.9. Switch off the power supply for 10 seconds and then power on to reset. If the display continues to show “Err1” replace the faulty PCB and repeat steps 4.1.1. to 4.1.5. as needed

4.1.10. Using an electrical test meter check the 12Vdc supply voltage across the terminals in the motor supply circuit from the control PCB. If 12Vdc is recorded replace the faulty motor. If the 12Vdc is not recorded replace the faulty control PCB (and motor if necessary as a fault in the supply circuit may have disabled the motor by creating a short circuit in the motor windings)

4.1.11. Switch off the power supply for 10 seconds and then power on to reset, If the motor is driving correctly but “Err1” continues to display on the controller go to part 4.1.4.

4.1.12. If the motor drive circuit, motor, PCB and sensor all appear to be working correctly but the “Err1” message persists check that the drive gear is actually turning under load from the motor and the gear assembly. If the drive gear is not functioning correctly check the drive gear tooth condition and motor gearbox condition and replace as needed. If the valve drive gear and rotor still fail to turn carry out a routine service of the valve as detailed in section 7 to ensure that no mechanical resistance exists internally preventing the valve from operating

4.2 Softener brine cabinet overfilling

4.2.1. Check the softener installation conditions to ensure that there is both sufficient flow and pressure in the supply for correct softener operation

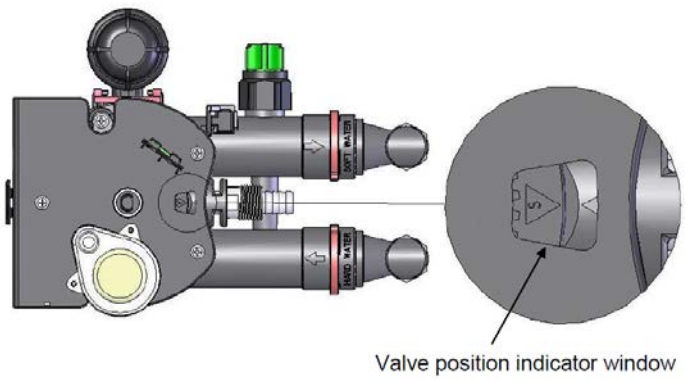
4.2.2. Check for leaks that could be running in to the brine cabinet

4.2.3. Check for constant fill condition by disconnecting the brine line at the injector housing

4.2.4. Check for fluid flow from the injector housing

4.2.5. If fluid is flowing from the injector housing continue to 4.2.6. If no fluid is flowing go to 4.2.9

4.2.6. Check the position of the valve by locating the valve position indicators on the surface of the drive gear through the small viewing window in the motor plate



4.2.7. If the window shows a small arrow labelled “F” or “BR” (to indicate FILL or BRINE position) initiate a manual regeneration following section 2. If the position fails to change and the valve remains in FILL or BRINE position go to section 4.1

4.2.8. If the window does not show a small arrow labelled “F” or “BR” check and replace the Injector Port Seal as needed by following section 3.1. to 3.15. While removing the rotor assembly as section 3.15. check the rotor condition paying particular attention to surface defects on the flat underside of the rotor. If any defects can be seen carry out a full service as detailed in section 3. Please note that internal damage to the rotor assembly cannot be detected visually so if you suspect that an internal bypass within the rotor assembly could be at fault replace the rotor as part of a full service as detailed in section 3

4.2.9. If the softener shows no evidence of being in a constant fill condition and no leaks are present the most likely cause of the cabinet overfilling is a failure to draw sufficient brine from the cabinet in BRINE position following the FILL process during regeneration. Subsequent regenerations will continue to add more fluid to the cabinet and thus lead to an overfill / overflow scenario

4.2.10. To check the brine draw function of the water softener put the valve in to BRINE position by following the process in section 2. Disconnect the brine line at a convenient point and check the brine line for vacuum

4.2.11. If brine vacuum is detected OK from the valve check the brine line throughout its length including components inside the brine cabinet for damage or blockages and replace/ repair as needed

4.2.12. If no brine vacuum is detected check the flow of water from the drain line during FILL position by collecting the drain water in a suitable container. The drain flow should be approximately 1 liter per minute

4.2.13. If flow from the drain is significantly higher than 1 liter/min carry out a routine service as detailed in section 3.

4.2.14. If flow from the drain is excessively low or no flow is present check the drain line and drain port components for blockages or restrictions

4.2.15. Service the injector housing in accordance with section 3.18. to 3.20.

4.2.16. If flow from the drain line during the FILL cycle is still compromised check the resin bed for resin condition and replace the resin as needed. Breakdown of the resin over time can compromise flow through the resin vessel

4.3 Softener constantly running waste water to drain

4.3.1. Check if the softener regeneration is in progress. During regeneration flow of water to drain is normal. If regeneration is in progress allow this to complete and then check the drain for flow

4.3.2. Check the position of the valve by locating the valve position indicators on the surface of the drive gear through the small viewing window in the motor plate – see section 4.2.6.

4.3.3. If the window shows a small arrow labelled “S” (to indicate SERVICE position) then it is possible that there is a leak on an internal seal of the valve allowing service water to run to drain. Check and replace the internal seal components as needed by following section 3.1. to 3.15. While removing the rotor assembly as section 3.15. check the rotor condition paying particular attention to surface defects on the flat underside of the rotor. If any defects can be seen carry out a full service as detailed in section 3. Please note that internal damage to the rotor assembly cannot be detected visually so if you suspect that an internal bypass within the rotor assembly could be at fault replace the rotor as part of a full service as detailed in section 3.

4.3.4. If the window does not show a small arrow labelled “S” (to indicate SERVICE position) the valve may have a position fault and remain in a position other than the correct service position. In this case refer to section 4.1

4.4 Hard water breakthrough in service mode

4.4.1. Test the incoming water hardness Ensure that the softener hardness setting is correct in accordance with section 1.2.3.

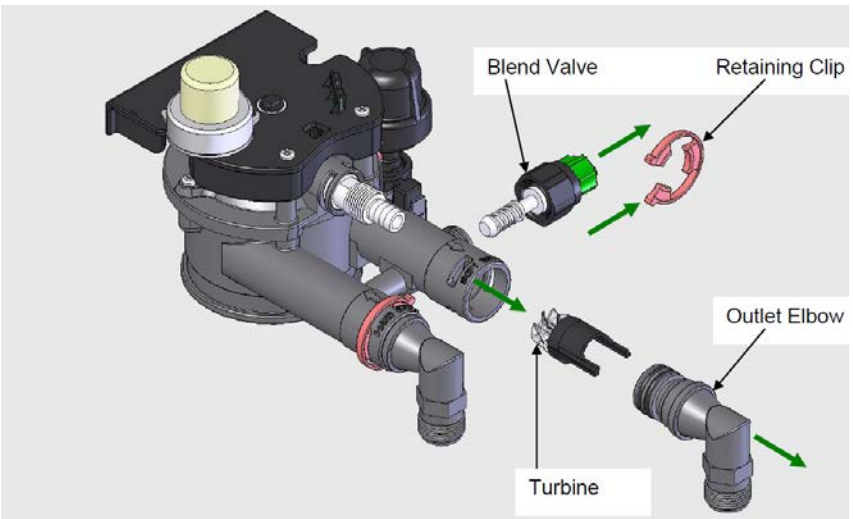
4.4.2. Carry out a static and dynamic pressure test of the water supply in and out of the softener to ensure that the water supply pressure is within the required operating specifications of the softener

4.4.3. Interrogate the softener operating data (refer to section 1.2) to ensure that all control settings are correct. In particular check that the time of day is set correctly and the Recharge Time (section 1.2.4.) is set at a suitable time when the water supply in the system is not being used

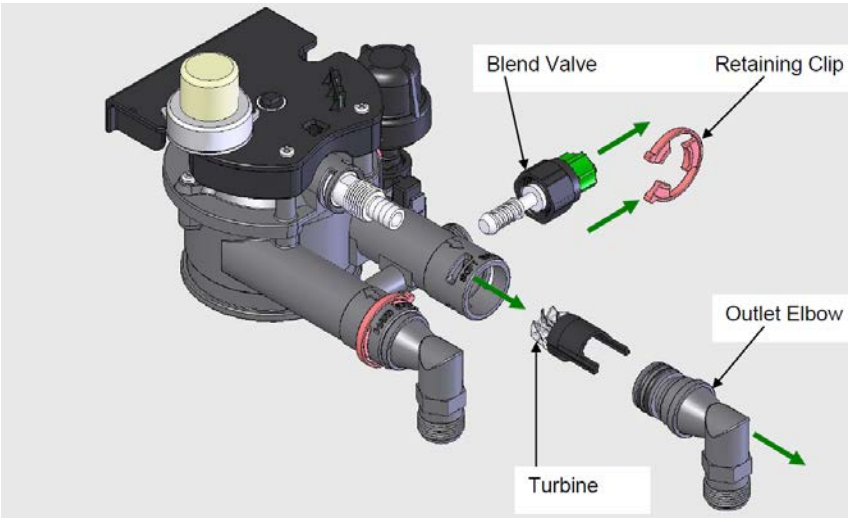
4.4.4. Check that the average daily consumption of treated water in the system is less than the maximum specified capacity of the softener

4.4.5. Check the meter turbine operation using the following method:

- Check the flow indicator on the display operates under water flow conditions (refer to section 1.3.4)
- Check the Current Flow Rate under water flow conditions



4.4.6. If the meter turbine operation is suspect remove the turbine, check rotation and replace as needed. In order to access the meter turbine you will need to remove the blend valve assembly. Then remove the retaining clip on the valve outlet. Remove the outlet elbow by pulling it from the outlet port. The turbine support can then be pulled from the valve outlet. The turbine will remain attached to the support and rotation can be checked by blowing the turbine. Re-assemble in reverse and ensure that the outlet O-rings are greased with a suitable silicone based lubricant before assembly.



4.4.7. Check salt consumption – if there is no salt in the brine cabinet fill as needed. If no salt is being consumed by the softener during routine operation refer to section 4.2

4.4.8. Check the blending valve (see above) setting and operation to ensure that the valve is not set to allow excessive untreated water to bypass the valve. If necessary replace the blend valve assembly

4.4.9. If all operating parameters, settings, turbine function, blend valve operation and salt consumption are fine but hard water breakthrough continues service the valve in accordance with section 3 of this manual to ensure that no internal water leak exists to allow untreated water to bypass the resin vessel in service mode

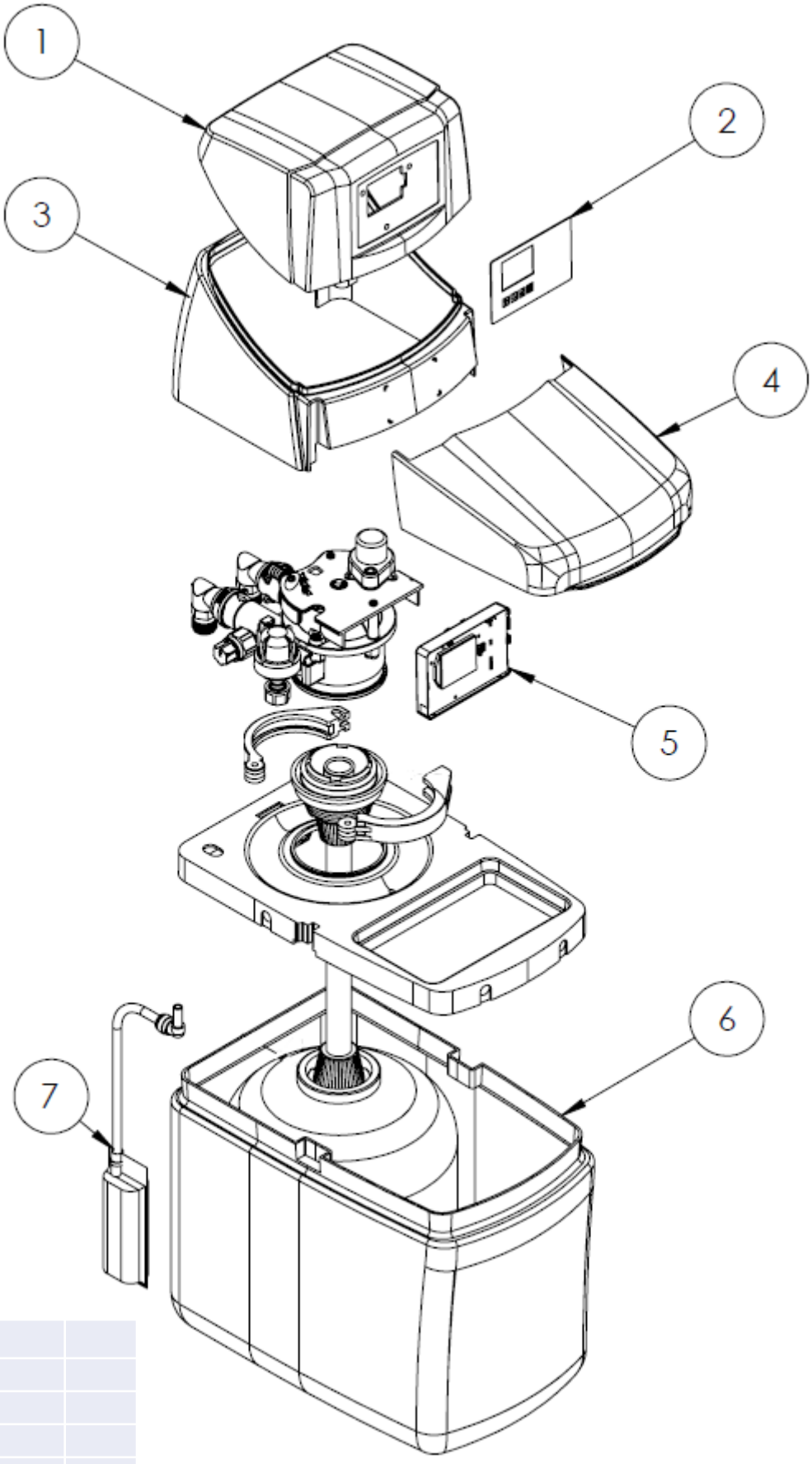
4.4.10. Check the resin and valve riser tube / distributor condition inside the resin vessel. Replace as needed.

5. Spare Part list

#	Resideo ordering number	Description	
1	MK30-A	O-RING SET FOR KS30E/KS30I	
2	VK30-A	VALVE SERVICE KIT	
3	RH30-A	REINFORCED HOSE KS30E/I 1 UNIT	
4	PU30-A	POWER UNIT – TRANSFORMER	
5	RC30-A	RED CLAMP 1 UNITS	
6	MB30-A	MULTIBLOCK 3/4"	
7	DE30I-A	CHLORINE UNIT FOR KS30I	
8	BP30-A	BRINE PUMP SERVICE KIT KS30E/I	
9	MEM30-A	SCREEN MEMBRANE	
10	ECU-E	ELECTRONIC CONTROL UNIT KS30E	
11	MT30-A	MOTOR	
12	MOK30-A	MOTOR CABLE	
13	SCA30-A	SENSOR CABLE	
14	DN30-A	DRAIN NIPPLE	
15	ON30-A	OVERFLOW NIPPLE	
16	TB30-A	TURBINE	
17	AC30-A	ANGLED CONNECTION PIECE 2 UNIT	
18	SC30-30A	SALT CABINET KS30E/I-30	
19	SC30-60A	SALT CABINET KS30E/I-60/80	
20	FL30-306080	FLOATER KS30E/I (BRINE AIRCHECK ASS.)	
21	SL30-A	SALT LID	
22	RTC30-A	TOP REAR COVER	
23	RLC30-A	LOWER REAR COVER	

6. Exploded view

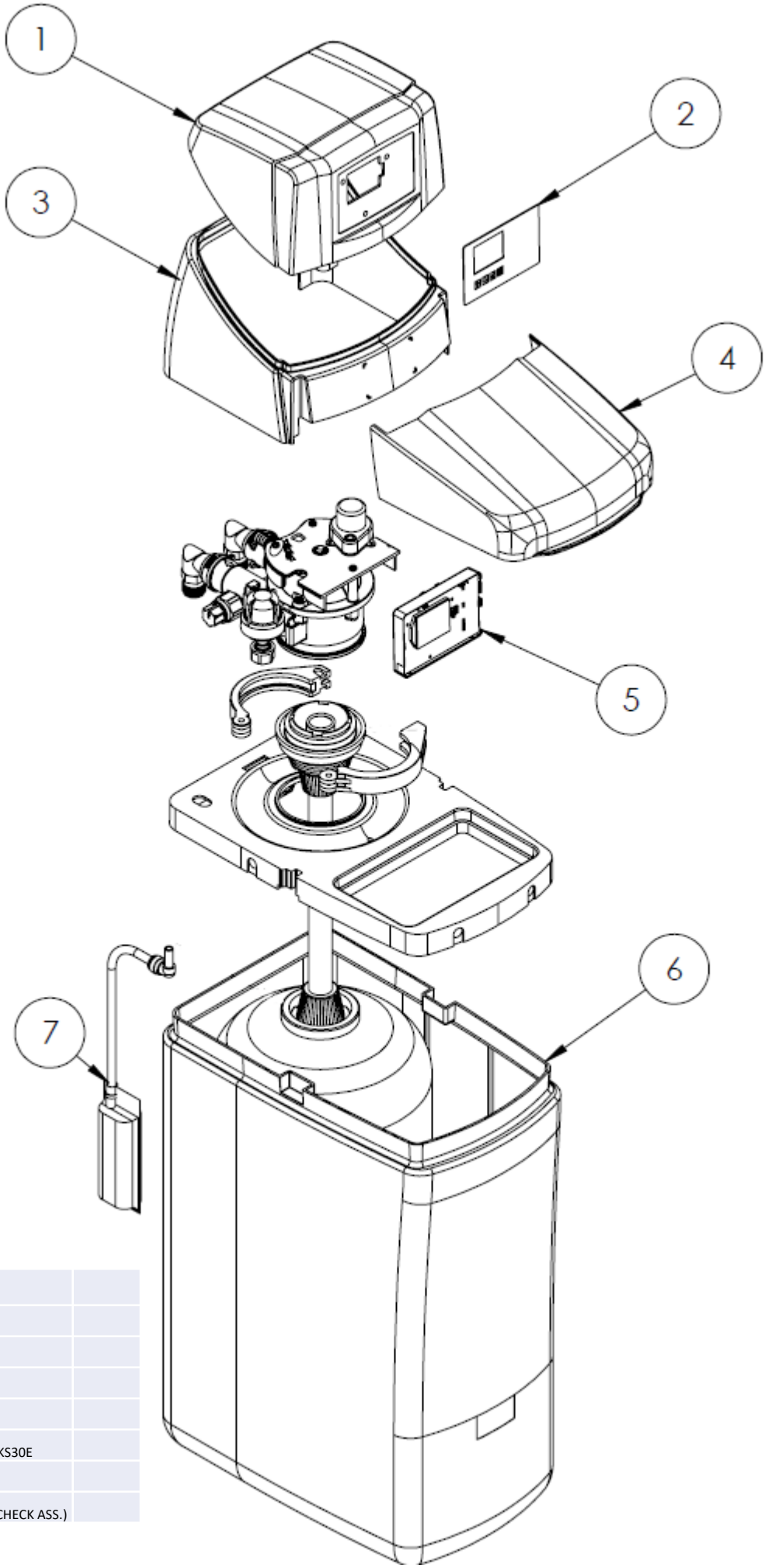
6.1 KS30E/I-30



Item	Resideo OS#	Description	
1	RTC30-A	TOP REAR COVER	
2	MEM30-A	SCREEN MEMBRANE	
3	RLC30-A	LOWER REAR COVER	
4	SL30-A	SALT LID	
5	ECU-E	ELECTRONIC CONTROL UNIT KS30E	
6	SC30-30A	SALT CABINET KS30E/I-30	
7	FL30-306080	FLOATER KS30E/I (BRINE AIRCHECK ASS.)	

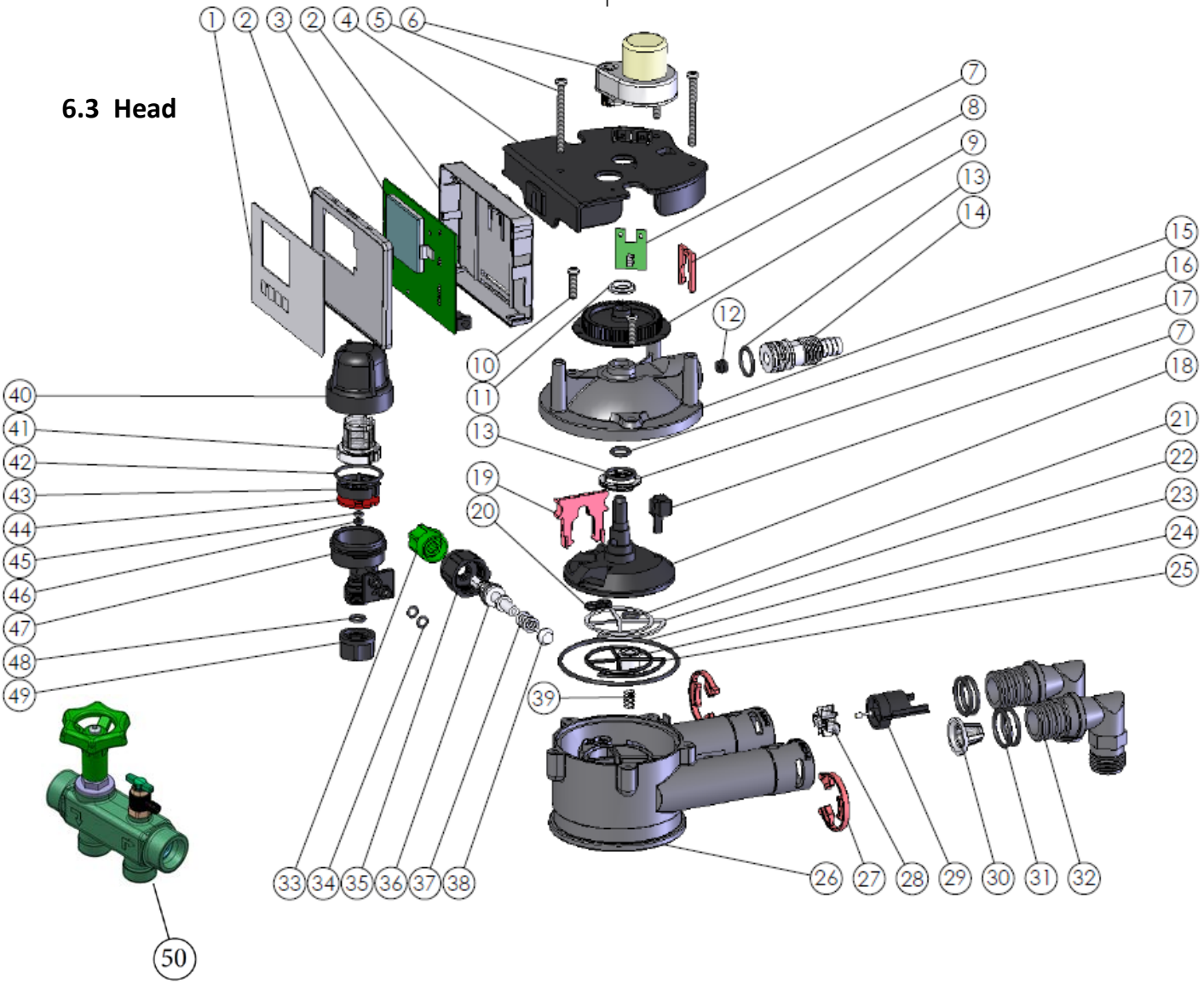
6. Exploded view

6.2 KS30E/I-60/80



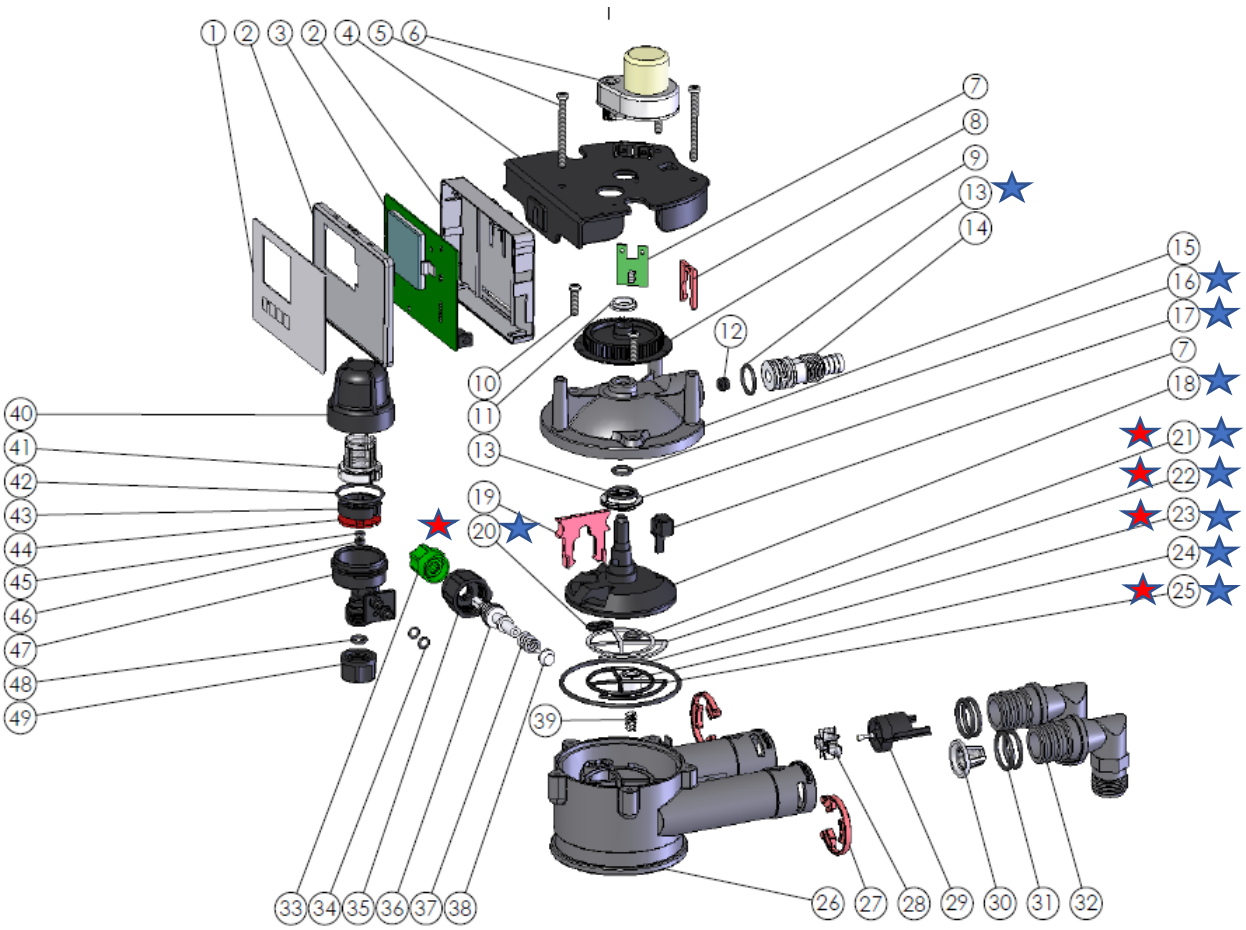
Item	Resideo OS#	Description	
1	RTC30-A	TOP REAR COVER	
2	MEM30-A	SCREEN MEMBRANE	
3	RLC30-A	LOWER REAR COVER	
4	SL30-A	SALT LID	
5	ECU-E	ELECTRONIC CONTROL UNIT KS30E	
6	SC30-60A	SALT CABINET KS30E/I-60/80	
7	FL30-306080	FLOATER KS30E/I (BRINE AIRCHECK ASS.)	

6.3 Head



Resideo OS#	Description	Items
VK30-A	VALVE SERVICE KIT	16
		13
		17
		18
		20
		21
		22
		23
		24
		25
MK30-A	O-RING SET FOR KS30E/KS30I	20
		21
		22
		23
		25
MB30-A	MULTIBLOCK 3/4"	50
RC30-A	RED CLAMPS 2 UNITS	27
BP30-A	BRINE PUMP SERVICE KIT KS30E/I	41
		43
		44
		45
		46
		42
MT30-A	MOTOR	6
DN30-A	DRAIN NIPPLE	14
TB30-A	TURBINE	28
		29
AC30-A	ANGLED CONNECTION PIECE 2 UNIT	32
RH30-A	REINFORCED HOSE KS30E/I 1 UNIT	no fig.avail.
PU30-A	POWER UNIT – TRANSFORMER	no fig.avail.
DE30I-A	CHLORINE UNIT FOR KS30I	no fig.avail.
ON30-A	OVERFLOW NIPPLE (on the tank)	no fig.avail.
MOK30-A	MOTOR CABLE	no fig.avail.
SCA30-A	SENSOR CABLE	no fig.avail.

6.4 Service Kits O-Ring kits for KS30



Resideo OS#	Description	Items
VK30-A	VALVE SERVICE KIT	16
★		13
		17
		18
		20
		21
		22
		23
		24
		25
MK30-A	O-RING SET FOR KS30E/KS30I	20
★		21
		22
		23
		25