Technical manual BWT Permo DATA BLUE 16 - 28 & 50 code P0010823EN Rev 4 to 26/03/2014

ORIGINE FRANCE® GARANTIE

BVCert. 6012067

Automatic water softeners

DATA BLUE 16 - 28 & 50

NB:

Read this manual carefully before connecting the unit to the mains supply, filling it with water or operating it. Failure to comply with these instructions will invalidate the BWT PERMO warranty.

afaq ISO 9001 Qualité AFNOR CERTIFICATION

www.bwtpermo.fr

CE

For You and Planet Blue.

BWT BEST WATER TECHNOLOGY

OFFICES

BWT PERMO
SOUTH - WEST OFFICE
Z.A Toussaint Catros - 6 rue Ariane
33185 Le Haillan
Tel.: +33 5 56 13 02 18 - Fax: 05 56 55 94 92
bwtpermo.bordeaux@bwt.fr

BWT PERMO
TOULOUSE AREA OFFICE
SOUTH - WEST Office
Tel.: +33 5 56 13 02 18 - Fax: 05 56 55 94 92
bwtpermo.bordeaux@bwt.fr

BWT PERMO
SOUTH - EAST OFFICE
138, chemin de l'hôpital
06580 Pegomas
Tel.: +33 4 93 40 59 00 - Fax: 04 93 40 59 09
bwtpermo.cannes@bwt.fr

BWT PERMO
DAUPHINÉ - PAYS DE SAVOIE OFFICE
3c, rue Irène Joliot Curie
38320 Eybens-Les-Ruires
Tel.: +33 4 76 14 77 20 - Fax: 04 76 14 77 29
bwtpermo.grenoble@bwt.fr

BWT PERMO
NORTH - PICARDY OFFICE
Z.I. - 15 A, rue du Plouvier
59175 Templemars
Tel.: +33 3 20 16 03 80 - Fax: 03 20 16 03 89
bwtpermo.lille@bwt.fr

BWT PERMO
RHÔNE - ALPES OFFICE
Les Jardins d'Entreprise - 213, rue de Gerland - bt F1
69344 Lyon cedex 07
Tel.: +33 4 78 72 99 17 - Fax: 04 78 72 88 07
bwtpermo.lyon@bwt.fr

BWT PERMO
SOUTH REGION OFFICE
112, Traverse de la Serviane
13012 Marseille
Tel.: +33 4 91 44 87 86 - Fax: 04 91 45 25 62
bwtpermo.marseille@bwt.fr

BWT PERMO
MONTPELLIER AREA OFFICE
SOUTH REGION Office
Tel.: +33 4 91 44 87 86 - Fax: 04 91 45 25 62
bwtpermo.marseille@bwt.fr

BWT PERMO
CENTRE - WEST OFFICE
10, rue des frères Lumière
37170 Chambray-Lès-Tours
Tel.: +33 2 47 74 74 48 - Fax: 02 47 74 74 49
bwtpermo.tours@bwt.fr

BWT PERMO
EAST REGION OFFICE
Technopôle Nancy - Brabois - 2, allée d'Auteuil
54500 Vandoeuvre Lès Nançy
Tel.: +33 3 83 67 61 89 - Fax: 03 83 44 65 81
bwtpermo.nancy@bwt.fr

BWT PERMO
BRITTANY - PAYS DE LOIRE OFFICE
Z.A. des 3 prés - 16, rue de la Plaine
35890 Laillé
Tel.: +33 2 23 61 48 50 - Fax: 02 23 61 48 51
bwtpermo.rennes@bwt.fr

BWT PERMO
CHAMPAGNE - ARDENNES OFFICE
3, rue Saint-Rémi - Lieu-dit Les Vianneries
51370 Les Mesneux
Tel.: +33 3 26 84 00 52 - Fax: 03 26 84 05 04
bwtpermo.reims@bwt.fr

BWT PERMO
NORMANDY OFFICE
Z.A Écoparc 2 - allée de la Fosse Moret
27400 Heudebouville
Tel.: +33 2 32 63 32 32 - Fax: 02 32 63 32 30
bwtpermo.rouen@bwt.fr

BWT PERMO
ILE DE FRANCE OFFICE
191, rue du 1er mai - Hall n° 3
92000 Nanterre
Tel.: +33 1 46 49 01 01 - Fax: 01 46 49 50 69
bwtpermo.idf@bwt.fr

BWT PERMO
EXPORT SERVICE
103, rue Charles Michels
93206 Saint-Denis Cedex
Tel.: +33 1 49 22 46 51 / 48 - Fax: +33 1 49 22 45 30
bwtexport@bwt.fr

BWT PERMO
INDIAN OCEAN OFFICE
ZAC du Portail - 9, rue de l'usine
97424 PITON SAINT LEU
Tel.: +262 262 32 52 77 - Fax: +262 262 22 77 46

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Dear Customer,

Thank you for showing your confidence in **BWT Permo** by choosing an **DATA BLUE** water softener.

We have made every effort to ensure that it gives you complete satisfaction.

This is a technical device: read this manual carefully before installing or operating it, and prior to any work on the unit. Comply with the instructions and operating constraints. The owner of the unit should ensure that any persons having access to it are familiar with this manual and have understood it.

The unit should be installed in a clean, dry location with adequate ventilation that is inaccessible to unauthorised persons.

The unit must be protected from bad weather, sources of heat and chemical vapours.

This appliance is not designed for making drinking water, therefore, in the case of water distribution for human consumption, it must only be connected to a water supply already in compliance with the limits and quality references of the regulations in force.

The electrical junction boxes should only be opened by qualified persons familiar with the danger of electrical current - **RISK OF ELECTROCUTION**.

The operation and maintenance of the unit should be undertaken by a duly qualified person who has the required knowledge for this kind of operation.

The owner of the unit should ensure that persons working on it have the appropriate tools and equipment.

Chemicals may be necessary for certain servicing operations. The user must be fully aware of any risks involved in the use of these chemicals and should employ the appropriate PPE or CPE (personal or collective protective equipment).

The unit must not be modified without the manufacturer's prior written approval.

The unit's surfaces must not be cleaned with alcohol or an alcohol-based product, or with any product containing plastic solvents.

This unit should be maintained by a qualified person who is properly trained for these operations.

Our after-sales service department is at your disposal for any technical assistance you may require.

The CE marking on our **DATA BLUE** water softeners certifies their compliance with the requirements of:

- Directive 2004/108/CEE of 15/12/2004 regarding electromagnetic compatibility.

- Directive 2006/95/CEE of 12/12/2006 regarding electrical equipment intended for use within certain voltage limits.

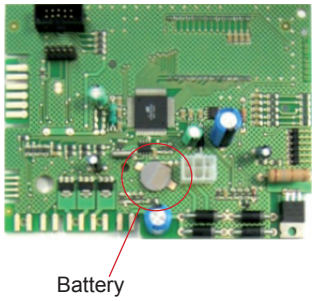
DATA BLUE water softeners are subject to Pressure Equipment Directive 97/23/EC (PED) dated 29/05/97. They fulfil the requirements of article 3 point 3 (design and manufacture within the rules of the art and use) but do not come into categories I to IV and, consequently, are not covered by CE marking for pressure equipment.

ENVIRONMENTAL INFORMATION

French decree n° 2009-1139 dated 22nd September 2009 regarding the sale of batteries and the disposal of used batteries, modifying the French Environment Code.

This appliance contains a 3-volt lithium battery, reference CR 1220. The characteristics of this battery are in compliance with the decree. If it is necessary to replace the battery an identical type of battery must be fitted.

The battery is soldered to the printed circuit board (PCB) at the location shown on the diagram opposite.



To replace it:

- Disconnect the unit from the mains supply
- Open the casing
- Remove the printed circuit board from its support
- Unsolder the old battery taking care not to overheat the surrounding components
- Dispose of the old battery according to the current regulations (WEEE).
- Put the new battery in place taking care to comply with the polarity.
- Resolder the new battery taking care not to overheat the surrounding components

IMPORTANT:
Hydraulic connections must comply with good professional practice and the standards applying where the equipment is installed. It is especially important to fit efficient water-hammer arresters if the water input and output piping is fitted with devices likely to to generate water-hammer effects (for example, solenoid valves).

IMPORTANT:
Moreover, like any electrical device, the control box electronics are subject to electrical or magnetic interference. The control box is fitted with a series of filters to eliminate the most common parasites. However, when the unit is close to power switches, transformers or any other source of interference, shielded cable should be used for connections, and a suitable interference suppressor fitted.

Descriptions are written in clear text. The highlighted areas **WARNING, ATTENTION and REMARK** have the following meaning:

REMARK
Indicates a special feature or important information

WARNING
Risk related to the presence of electrical current

ATTENTION
Risk of incorrect operation

WARNING
Risk of injury or accident

REMARK
Recyclable item

IMPORTANT:
Please take special note of the following points:

Hazards	Recommendations
Electrical hazards: This appliance has electrical supplies.	Disconnect the apparatus electrically and if necessary isolate it before doing any work.
Mechanical hazards: This appliance may have moving parts (e.g. centrifugal pump)	Shut down the unit, isolate it before doing any work as required. Do not remove the protection covers on an appliance in operation. Wear suitable personal protective equipment (PPE).

ATTENTION:
For the safety of the user and that of the appliance, take care to comply with the elementary operating precautions and the following instructions:

- Check that the equipment and its packaging have not been damaged during transport.
- If any damage is visible, do not use the appliance and contact your dealer immediately.

WARNING:
For most electrical appliances, it is advisable to make the connection to a dedicated circuit, meaning a single socket that only supplies the appliance in question and to which no other socket or branch circuit is added.

KEEP THESE INSTRUCTIONS IN A SAFE PLACE

Disposing of your old appliance

1. This symbol, representing a crossed wheeled dustbin, means that the product is covered by European directive 2002/96/EC.
2. The electrical and electronic components must be disposed of separately in containers provided for this.
3. Disposal in accordance with these instructions will help to reduce negative consequences and any risks for the environment and human health.

INSTALLATION INSTRUCTIONS

ATTENTION:
Any electrical work necessary for the installation of this appliance must be done by a qualified electrician or by competent persons. Any plumbing work necessary for the installation of this appliance must be done by a qualified plumber or by competent persons.

WIRING

ATTENTION:
To ensure personal safety, remove the fuse from the electrical circuit or disconnect the circuit breaker before connecting the appliance. Ensure that the electrical socket is not live.

Do not use an extension cord or socket adapter with this appliance. Electrical connections and earth connections must comply with national, regional and/or local electrical standards.

This appliance must be supplied with power at the voltage and frequency specified in this manual. It must be connected to a correctly earthed individual circuit, protected by a circuit breaker or fuse appropriate for the appliance installed.

Hydraulic and electrical connections must comply with good professional practice and standards applying where the equipment is installed.

In addition, as with any electrical equipment, the appliance electronics are subject to electrical or magnetic interference. If the appliance is close to power switches, transformers or any other source of interference, shielded cable should be used for connections, and an interference suppressor may be fitted.

IMPORTANT:
The quality of the softened water depends on the regenerating salt used. In order to obtain all the quality and hygiene guarantees, we recommend you use **"Sanitabs".**

GLOSSARY

Cation: Positively charged ion.

Cycle: (for an ion exchanger): volume of water produced by an ion exchanger between two regenerations.

French degree: Unit of concentration of chemical substances in an aqueous solution. A French degree (1°f) is equivalent to 0.2 milli-equivalents per litre or 10mg/l of CACO3

Fur: A generally hard and adherent deposit, sometimes porous, essentially comprising salts (calcium carbonates, sulphates, silicates, etc.) from hard or calcareous water.

Furring: Formation on the walls of containers or pipes of a layer of fur (a generally hard and adherent deposit, sometime porous) essentially comprising salts (calcium carbonates, sulphates, silicates, etc.) from hard or calcareous water.

Hardness (of water): Calcium and magnesium content, preventing the formation of foam with soap and allowing deposits of insoluble and scaling salts (fur or scale).

Hydrometric degree (TH): Unit of water hardness expressed in French degrees.

Milliequivalent per litre: (meq/l) Unit of concentration of dissolved matter in an aqueous solution: 1 meq/l corresponds to the concentration of a normal solution diluted one thousand times. 1 meq/l is equivalent to 5 French degrees.

Regeneration: Operation performed on a saturated ion exchange resin to return it to its initial condition. Regeneration consists in percolating a high purity salt solution through the resin.

Resin: A partly incorrect term designating the granular materials used in ion exchange (cation exchangers, anion exchangers).

Salt Substance resulting from the action of an acid on a base. Among the salts used in water treatment we can cite: sodium chloride, sodium silicate, ferric chloride, aluminium sulphate. The salt used for regenerating water softeners is very high purity sodium chloride.

Soft water: Water defined as being the opposite of either salt water (when it is water with low dissolved mineral content), or hard water (when it is water with low calcium and magnesium content).

Softening: Treatment for the elimination of water hardness (due to the presence of alkaline earth salts, carbonates, sulphates and calcium and magnesium chlorides). Soft water does not create scale and foams easily with soap. Softening is done by passing water through a cation exchanger (which exchanges calcium ions with sodium ions) regenerated with sodium chloride.

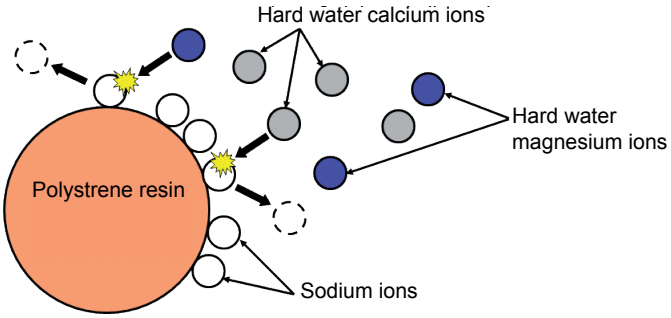
THE ION EXCHANGE PRINCIPLE

Softening is the technique used to remove the TH from water (due to the presence of alkaline-earth salts: calcium and magnesium carbonates, sulphates and chlorides). The softener is an appliance that uses an ion exchange resin and the principle consists of exchanging the calcium and magnesium ions, that constitute the hardness of the water, for sodium ions bound to the softener resin.

When all the sodium ions have been exchanged, the resin is said to be saturated and must be regenerated. The resin is then regenerated using brine (saturated solution of NaCl or sodium chloride). Sodium ions are again positioned on the resin, while the calcium and magnesium ions are discharged to the drain in the form of chlorides. A series of rinses removes the brine.

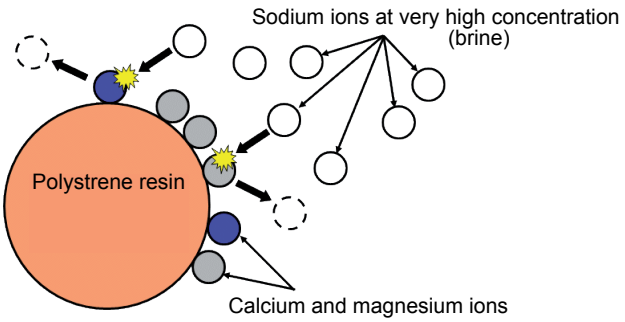
1) – Ion exchange

The calcium and magnesium ions replace the sodium ions on the resin. These are released into the water, which becomes soft.



2) - Regeneration

The sodium ions regain their position on the resin. The expelled calcium and magnesium ions return to the water, which is discharged to the drain.



OPERATION

The BWT residential range is composed of three Permo **DATA BLUE** softeners. All of them work in the anticipated volumetric mode using the bio-system function (fabrication of gaseous chlorine during the brining phase while the ion-exchanging resin is being set to asepsis). In the anticipated mode, the device calculates the water volume flowing through the water softener and determines the average consumption. The water softener outlet turbine is fitted with a flow-rate sensor which sends the data to the electronic control unit. This «smart» operating mode is the main feature of the **BWT** water softener.

TECHNICAL CHARACTERISTICS

Designation	Units	Softners DATA BLUE		
		16	28	50
Exchange capacity	°f.m3	85	155	250
Resin volume	liters	16	28	50
Salt weight per regeneration	kg	2,00	3,50	6,25
Minimum flow	m3/h	0,35	0,35	0,35
First salt load	kg	75	75	75
Packing sizes	cm	50 x 50 x 136	50 x 50 x 150	50 x 50 x 180
Floor load in working order	kg	130	150	300

Some of the data given in the above tables are average values and depend on the settings made.

PACKAGING

The water softener and the relevant accessories are delivered in a box fastened with plastic bands.

After unpacking, you will find:

- this installation and maintenance manual,
- the salt tray and its loading cover,
- the various hoses, connecting accessories and the Permosiphon in two plastic bags,
- the bottle containing the ion-exchanging resin along with the water softener hydraulic and electronic control head,
- the cartridge filter and the associated filtering cartridge are delivered assembled in a blister pack.

All our softeners are fitted with a check-valve located on the utility water inlet on head connecting flange.

LIMIT OF SUPPLIES:

- The inlet / outlet connections of the by-pass (as option), cartridge filter and softener are not supplied by **BWT Permo**.

- Pipes other than the softener inlet / outlet connection hoses (as option), the salt tank overflow and the regeneration water drain are not supplied by **BWT Permo**.

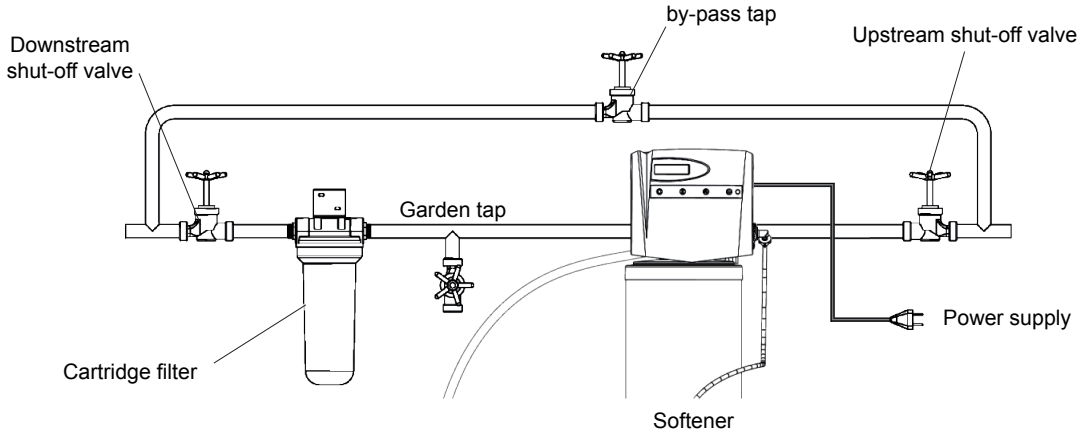
IMPORTANT:

To limit the forces on your appliance in the event of water hammer, we advise you to use flexible connections.

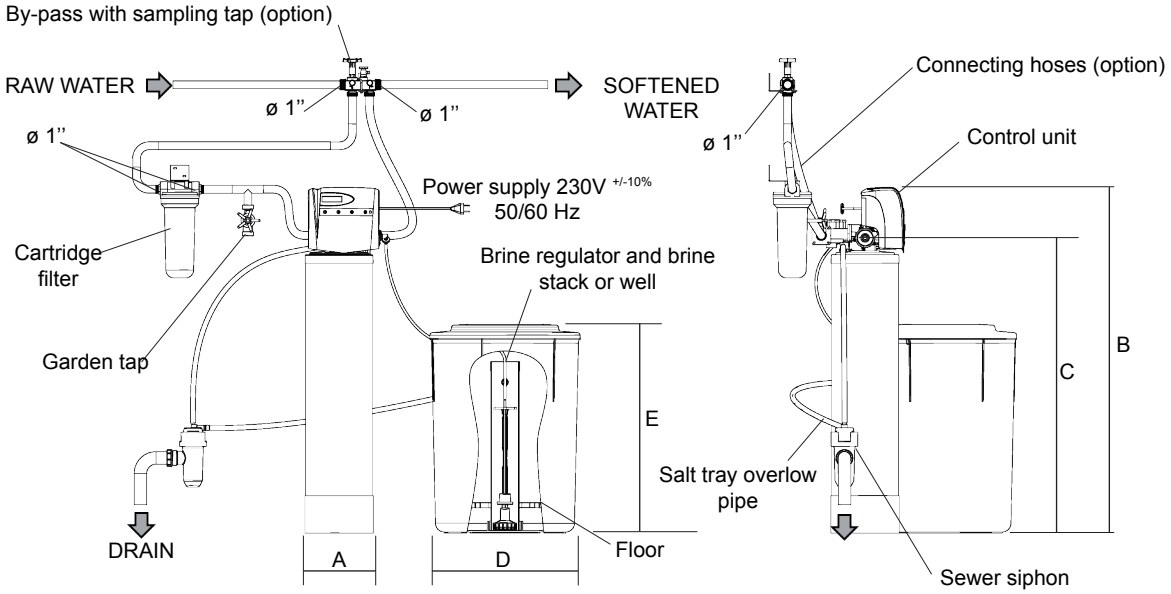
A hose kit and a by-pass kit are available as options, consult your **BWT Permo** dealer or distributor.

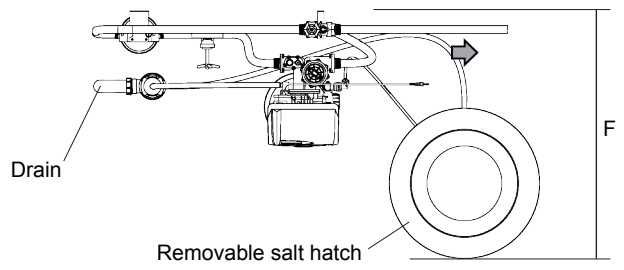
ASSEMBLY - SPECIAL CASE

The check-valve might project off the flange in some extreme operating and installation conditions (see drawing below). To avoid this phenomenon, we recommend to connect the water softener with hoses or to fit the inlet flange with a special adaptor (ring) which will block and prevent the valve from popping out of its housing, code P0072127.



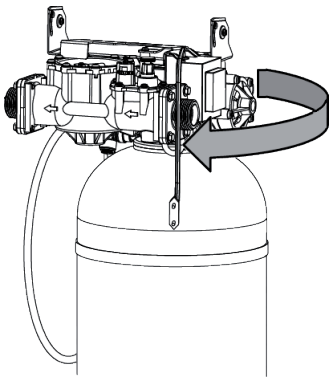
DIAGRAMS AND OVERALL DIMENSIONS





	Softeners DATA BLUE		
	16	28	50
Cote A (in mm)	195	220	260
Cote B (in mm)	1115	1335	1585
Cote C (in mm)	960	1180	1430
Cote D (in mm)	480	480	535
Cote E (in mm)	670	670	775
Cote F (in mm)	env. 820	env. 820	900

INSTALLATION



ATTENTION:
Check that the valve is screwed tightly on the bottle before connecting the appliance to the water supply. To tighten, turn the valve clockwise. Tighten by hand, without using tools or a lever.

Place the softener unit and filter close to the pipes to which it must be connected (water supply, soft water distribution and drain).

Check the pressure of the mains; the appliance operates at a pressure between 0.15 MPa (1.5 bars) in dynamic and 0.7 MPa (7 bars) in static (fit a pressure reducer upstream if the pressure is greater than 0.4 MPa (4 bars)). Provide a supply of unsoftened water for watering the garden, cleaning your car or the sink (see connection diagram).

An electrical socket (single phase 230 volts +/- 10% - 50/60Hz) must be installed less than 1.2 metres from the softener for the permanent electrical supply to the control unit. Earthing is not necessary since the appliance is double insulated. The maximum power consumption of the softener is 25 VA.

IMPORTANT:
For safety reasons the electrical supply cable to the appliance cannot be replaced. If it is damaged, the complete transformer must be discarded and replaced by the transformer sub-assembly, available from your **BWT Permo** agency or dealer.

Choose a dry room, protected from frost, where there is no risk of the temperature exceeding 40°C maximum. The floor must be flat and resist the loads in working order stated in the chapter concerning the appliance technical characteristics.

WATER CONNECTION

1) - Canister filter

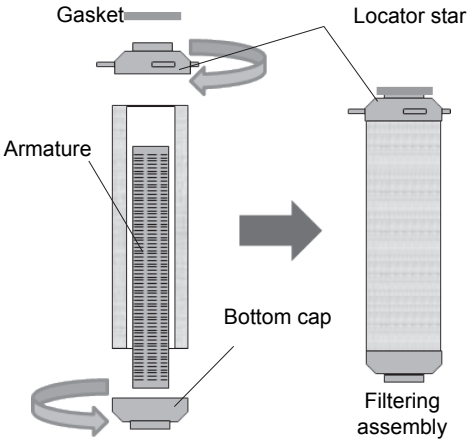
This must be positioned upstream of the softener unit (see connection diagram).

Respect the water flow direction (arrow on the softener head, showing fluid flow direction). Follow the instructions below to ensure that it is correctly fitted.

Mount the filtering element on the plastic armature as shown in the drawing opposite. Manually screw on without forcing the two ends on the armature. Then position the filtering assembly in the filter tank and put the locator (star) at the top. Put the tank and its sealing gasket under the filter head and tighten the filter head by hand. Do not use tools.

After positioning the softener unit, install the angle bracket (supplied with the filter) vertically on a wall. Use suitable fixings for the angle bracket, according to the nature of the support. Then fix the filter head on the bracket using the appropriate screws, without tightening too much, to avoid breaking the plastic head. Check that the elements are firmly mounted.

2) - Cartridge filter maintenance

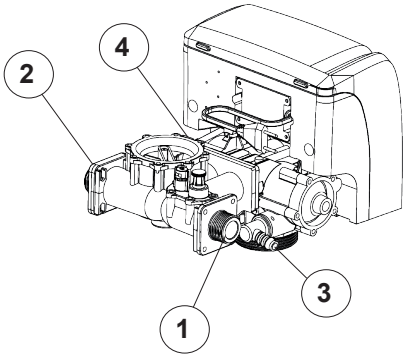


The filtering cartridge should be changed regularly. As the water is more or less clogging according to regions and installations, it is strongly recommended to systematically change the filtering element every 6 months at most.

To do this, isolate the filter by closing the upstream and downstream valves. Unscrew the bleed screw to lower the pressure. Then unscrew the clamp ring and remove the used cartridge. Rinse and clean the tank with water and a soft cloth (do not use detergent).

Replace the filter element the same way, then put the cartridge filter into service.

3) - The softener



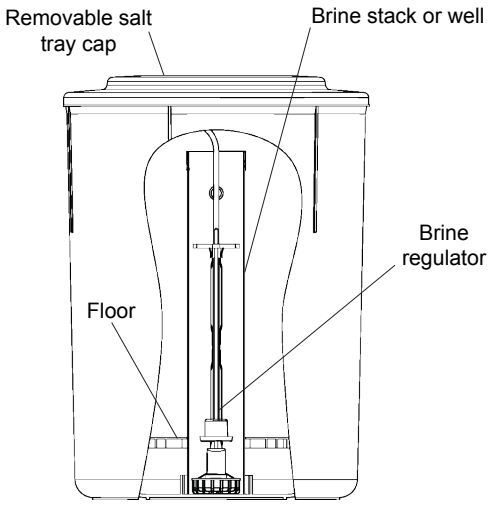
Place the softener unit on its permanent location (see “Dimensions / Connections”).

Check that there is easy access to the control unit for programming and maintenance. Leave enough room for access to the loading hatch for regular additions of regenerating salt.

The softener head has four orifices for connections:

IMPORTANT:
To protect the appliance in the event of excess pressure or water hammer, we recommend flexible assembly.

A hose kit, and a by-pass kit are available as options.



Filtered mains water input (1):
- 1’’ threaded end fitting, located on the left at the rear.

Softened water outlet (2):
- 1’’ threaded end fitting, located on the right at the rear.

Evacuation of regeneration water (3):
- 16 mm dia grooved plastic elbow end fitting (left-angled).

Brine regulator connection (4):
- (see “salt tank” below).

4) - Permo DATA BLUE salt tank

The **DATA BLUE** water softener is equipped with a salt tray mounted apart from the water softener body. It provides for a better installation autonomy thanks to its salt pellet reserve which is larger than a compact softener’s (single-piece salt tray).

4.1 - Connect the softener to the brine regulator with the 6/8 diameter black hose. Check that the ends of the black

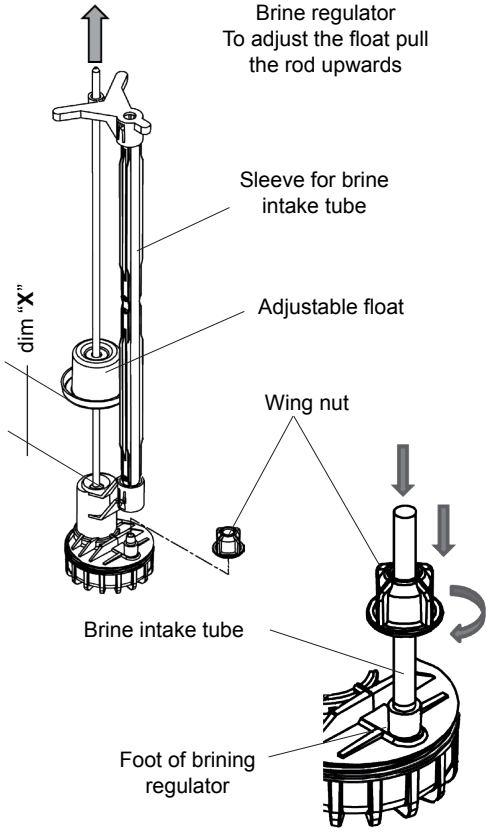
hose are cut cleanly at right angles. Push one of the ends of the 6/8 black hose into the push-fit elbow connector. Connect the other end of the hose to the solenoid valve elbow fitting (4).

4.2 - Adjust the brine regulator float situated in the chimney or brine well inside the one-piece tank. To do this, refer to table “Dimensions X” taking care to pull the float rod upwards.

The “X” dimensions given are the minimum guaranteeing efficient regeneration.

DATA BLUE “X” dimensions		
16	28	50
100 mm	135 mm	160 mm

4.3 - After adjusting the float, replace the brine regulator at the bottom of the chimney or brine well. Finally, reclose the brine well with the red cover taking care not to bend the 6/8 diameter black hose.

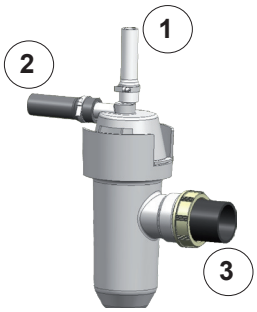


When starting up the unit, add the special softener salt pellets and check that the chimney cover is in place. To use fine powder salt, another salt tank is required. Consult the **BWT Permo** dealer as required.

When preparing the brine, a minimum of one hour is needed to dilute the salt correctly and obtain the brine required.

5) - Drain connection

IMPORTANT:
The drain connection must be made with a regulation pressure break between the regeneration water drain hose and the drain pipe, to avoid any risk of pollution of the ‘drinking water’ circuit by the drain system; use the Permosiphon delivered with the unit.



Connect the 12/16 diameter transparent pipe, item 1 (length supplied 1.5 metre) to the upper grooved orifice, to remove the regeneration water, and refix the ‘Serflex’ collars to both ends.

IMPORTANT:
This flexible hose must not be more than four metres long and must be free of cracks.

If the drain is more than four metres away, use a 40 millimetre diameter rigid PVC pipe between the drain and the Permosiphon. Have a slope of at least 2% for gravity flow on the side orifice (2); connect the 15/21 dia hose to salt tank overflow (see connection diagram) on the self-locking 40 mm dia connector (3); fit a PVC tube as far as the drain (minimum diameter 40 mm).

NOTE: The Permosiphon can placed in a raised position (up to four metres above the floor). In this case, the minimum mains pressure must be greater than 2.5 bars. Provide drainage for the salt tank overflow by any appropriate means.

IMPORTANT:
The salt tank overflow must be under gravity drainage.

6) - Bleeding the installation

It is imperative to take some precautions before definitive water connection of the installation.

Any plumbing work on the pipes upstream of the softener must be subject to correct rinsing before refilling the installation with water. This means that the equipment (by-pass, valves, isolation valves and softener, must be removed and disconnected from the mains to perform this operation.

With the appliance hydraulically and electrically connected, press the ‘Regeneration & Semi-/Auto’ buttons for five seconds, then release (see control unit description).

Then press ‘Mode’ once and the screen displays ‘R’ and ‘1’.

Then, progressively open the upstream isolation valve. If the by-pass is fitted (option), turn the hand-wheel to direct the water to the filter and softener.

Correctly bleed air in the filter tank by the bleed screw located on the head. When the air has been fully bled, close the filter bleed screw.

7) - Bleeding the softener.

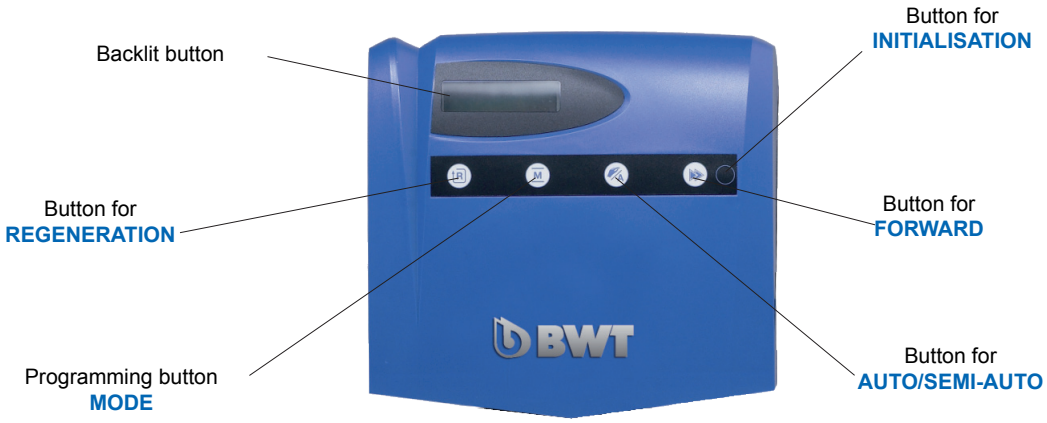
After a few seconds, the water will flow into the drain at a high rate. Wait three to four minutes before stopping the regeneration by pressing the ‘Regeneration’ and ‘Mode’ buttons simultaneously, then release. The water stops flowing to the drain.

If you do not observe any water flow to the drain, restart the procedure.

CONTROL UNIT

1) - Description of control unit

The **DATA BLUE** water softener is fitted with an electronic control unit and a lithium battery so that useful appliance data can be stored for several months in the event of a power cut.

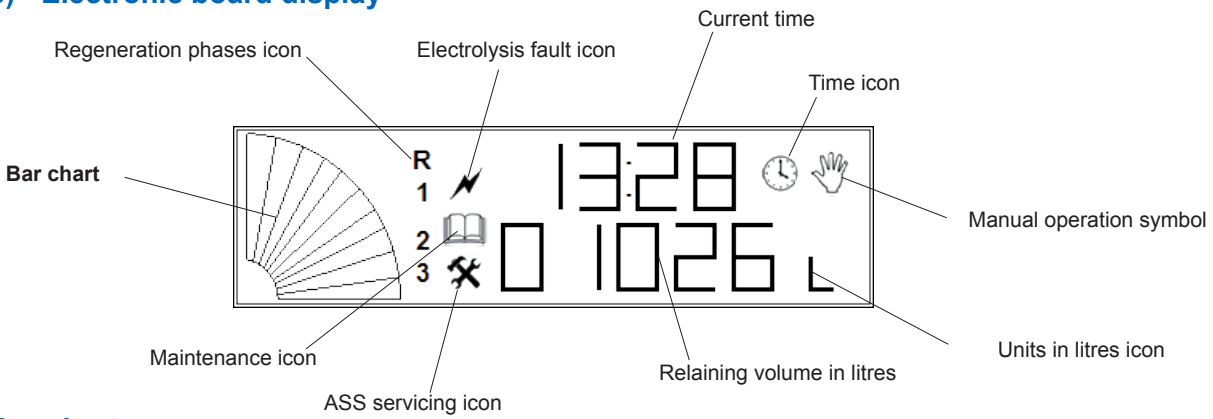


2) - Electrical connection

The softener operates with three 24 volts AC solenoid valves.

The mains cable should be connected to a single-phase outlet 230V +/-10% - 50/60Hz. The integral transformer provides the voltages required for proper unit operation.

3) - Electronic board display



Bar chart

Display of remaining volume (1 dial = 1/10th of the cycle) Display of time elapsed during regeneration

Regeneration

'R' means a bleed, brining preparation is in progress ('R' flashing) or a regeneration is in progress (displayed throughout regeneration).

'1' backwash phase (displayed during the first phase of regeneration)

'2' brine drawing and slow rinsing phase (displayed during the second regeneration phase)

'3' fast rinse phase (displayed during the third regeneration phase)

Brining alarm

Displayed when the electro-chlorination sensor has not detected brine during the second regeneration phase, at the start of brine intake.

Maintenance alarm

Displayed when maintenance is due (e.g. replacement of a filter element). This function is defined by the number of regenerations programmed when the unit is installed. At each regeneration (automatic or by manual start), the internal counter increments and displays the alarm indication on the screen when the figure is equal to the programmed value.

ASS alarm

Displayed when specialised maintenance by our technicians is required. This function is defined by the number of regenerations programmed when the unit is installed. At each regeneration (automatic or by manual start), the internal counter increments and displays the alarm indication on the screen when the figure is equal to the programmed value.

Time (fixed icon)

Manu

Indicates that the operating mode is suspended. Softener regeneration is not possible in automatic or in manual.

Unit

Displays the unit for the displayed volume.

Display

Displays the current time in ‘Service’ and ‘Test’ modes.

Displays the programming step in programming mode.

Remaining volume display (depending on programmed unit and cycle).

Alternating displays of regeneration start and end times when this is in progress.

Display of number of regenerations performed since commissioning.

Display of total volume of water treated since commissioning.

Programming values input. Input of the code for the control unit’s operating mode. Enter the appliance commissioning date.

4) - Programming buttons

‘R’ button

Pressing the button for at least five seconds starts softener regeneration (first phase = brining preparation). The simultaneous combination of buttons ‘R’ and ‘M’ stops the current regeneration.

‘M’ button

Pressing the button for five seconds allows a change to unit programming mode.

The simultaneous combination of buttons ‘R’ and ‘M’ stops the current regeneration.

‘Auto/Semi-auto’ button

Press the button for about five seconds changes the softener into suspended mode, displaying the specific icon (see display detail).

A further five second press returns the softener operation to automatic mode, the icon disappears from the display.

In control unit programming mode, pressing the ‘Auto/Semi-auto’ button briefly allows the selection to be moved to the right. Modifying the value of the flashing digit is possible with the ‘Forward’ button.

The simultaneous combination of the ‘Main/Auto’ and ‘R’ button starts the ‘Test’ mode. Pressing the ‘M’ button next allows all the regeneration phases to be skipped.

‘Forward’ button

In control unit programming mode, pressing the ‘Forward’ button briefly allows the value of the flashing digit to be modified. A sustained press of the ‘Forward’ button runs the value steadily from 0 to 9.

Except when programming, pushing the button for three seconds allows the consumption history to be displayed, meaning the volume of water treated since commissioning. Pressing the ‘Forward’ button briefly displays the number of regenerations performed since commissioning (regeneration started manually be pressing the ‘R’ key for five seconds or automatically).

The simultaneous combination of ‘Forward’ and ‘Initialisation’ buttons deletes the display of the ‘Maintenance’ icon (see display detail), the regeneration counter then goes to zero.

‘Initialisation’ button

The ‘Initialisation’ button must be combined with another button.

The combination of the ‘Initialisation’ button and:

- the ‘M’ button for five seconds allows the generic code that defines the operating mode for your softener to be programmed. When the generic code is programmed, the combination of buttons allows reinitialisation to factory settings.

  the ‘Forward’ key deletes display of the maintenance ‘icon’ and resets the regeneration counter to zero.

PROGRAMMING

1) - Power-up procedure

Connect the appliance to a standard power outlet in compliance with the operating specifications described in this manual.

When the appliance is not used or if it has been disconnected for at least five consecutive days, at power-up the control unit will normally start in the regeneration mode upon the first treated water extraction of at least one liter or so.

- the first line displays a current time to be set later
- the second line alternately displays the regeneration initial time and final time
- the barograph is in low position and the «R» and «1» characters are visible.

To stop regeneration, simply press both «Mode» and «Regeneration» keys simultaneously then release them. The display unit now displays the current time on the upper line and water volume to be treated before the next regeneration process on the lower line.

2) - «Anticipated volume» operating mode

The anticipated volume operating mode triggers regenerations at the programmed time if the available volume is lower than the consumption of the 24 hours to come.

A daily average is calculated every day depending on the corresponding daily consumption of the previous week. This calculation is performed every day at midnight by the control unit.

The following parameters are to be set:

a/ P003 - Current day and time:

- Monday = day 1, Tuesday = 2, etc.
- and the time from 00:00 to 23:59

b/ P080 - regeneration time:

- from 00:00 to 23:59

c/ P050 - regeneration duration:

See the «Setting regeneration duration» Table

d/ P040 - softener cycle:

The softener cycle sets the volume of water produced between two regenerations.

E/ P071 to P077 - consumption averages:

The consumption averages are automatically calculated by the electronic unit according to daily soft water requirements. The meter built into the softener head totals the volume of water produced by the appliance every day of the week (from Monday P071 to Sunday P077).

OPERATING PARAMETERS

To program your softener correctly it is necessary to know the mains water hardness expressed in French degrees. The analysis can be done easily with a water hardness measuring kit available from your distributor or reseller.

The second parameter that also needs to be known is the total regeneration duration. It is programmed according to the equipment type and also as a function of your mains pressure. The “Regeneration duration” table allows this value to be set for your softener.

1) - Generic Code

If the display only shows “00000” on putting into service, the generic code for unit operation should be entered by pressing the ‘Mode’ and ‘Initialisation’ buttons together.

The code to use is **22126** for operation with standby after 96h with no draw off.

The code is confirmed with the “Initialisation” button. The next 2 lines display the current time and the softener cycle programmed by default. After entering the generic code, the programming settings can be entered as explained above. For 60 minutes the additional program-system steps (not hidden) appear which are reserved for qualified personnel:

- P100 for the commissioning date
- P001 and P002 for the current date
- P031, P032 and P033 for the alarms

It is recommended not to change the values of these settings.

ATTENTION:

The operating mode code described above corresponds to a well-defined program in the control unit microprocessor A5X. Any code in error or not corresponding to your softener can cause your unit it to malfunction and may lead to the loss of the **BWT Permo** warranty.

2) - Displaying the operating mode

To display and check the operating mode (five figure generic code), press the “Mode” and “Initialisation” buttons together for five seconds, then release. Check the code displayed (see generic code above), then confirm by pressing the ‘Initialisation’ button twice.

3) - Returning to the factory settings

To reset the programmed operating mode to zero, press the ‘Initialisation and ‘Mode’ buttons simultaneously for five seconds, then release. Then briefly press the ‘Initialisation’ button, the screen shows “ini 0”. Select “1” with the ‘Forward’ button, then press the ‘Initialisation’ button again to confirm the reset.

Then repeat the control unit programming (see ‘programming parameters’ paragraph).

4) - Semi-automatic operation

This operating mode is recommended for intermittent use when regenerations are started manually.

Just press the ‘Auto / Semi-auto’ button for five seconds. The symbol for semi-automatic mode is then displayed alongside the clock symbol. The ‘Regeneration’ button is inactive during this mode.

The softener continues to produce softened water, but automatic regeneration is not started at the end of the cycle.

NOTE:

It is imperative to leave the semi-automatic mode by pressing the 'Auto / Semi-auto' button for five seconds to be able to start a manual or automatic regeneration.

PROGRAMMING PARAMETERS

To simplify the softener parameter setting, certain programming steps are only accessible after a delay of one hour following the entry of the generic code. The steps are then marked by the symbol "#", they must not be changed.

1) - Viewing all the program steps of the unit

To view and check the five figure code, press the 'Mode' and 'Initialisation' buttons together for five seconds, then release. Check and/or modify the displayed code (see "Operating parameters"), then confirm by pressing the 'Initialisation' button twice.

2) - Entering programming parameters

In the steps below, use the following keys to modify the displayed value.

- The 'Forward' button allows the value of the flashing figure to be modified.
- The 'Auto / Semi-auto' button allows the selection cursor to be moved to the right.

3) - Date commissioned

Press the 'Mode' button, for about five seconds.

The display shows program step P100 on the first line and the by default commissioning date in weeks on the second line.

example: 03:08 for week 03 of year 2008.

It is possible to change this value by entering the current week on commissioning.

4) – Current year

Press the 'Mode' button again. The display shows program step P001 on the first line and the by default current year on the second line.

Set the value of the current year.

5) – Current Day and Month

Press the 'Mode' button. The display shows program step P002 on the first line and the by default current day and month on the second line.

example: 01:02 for the 1st February.

Set the current day and month value.

6) - Current Day and Time

Press the 'Mode' button, the display shows program step P003 on the first line and the default current day of the week and time on the second line.

example: 1.01:02 for 01:02 a.m. on Monday.

The first figure corresponds to the day of the week (1 - 7). Monday = 1, Tuesday = 2, Wednesday = 3, etc. Set the 24 hour clock to the current day and time.

7) - Regeneration time

Press the 'Mode' button briefly. The display shows program step P080 and the default regeneration time. This setting allows regeneration to be planned as a function of consumption. The programmed time is the time when backwashing starts.

example: 0.01:00 for 01.00.

Set the regeneration time in the 24 hour clock. The first figure cannot be modified.

8) - Regeneration duration

Press the «Mode» key. The display unit indicates program step P050 and the value corresponding to overall regeneration time in minutes.

Example: 064.

Set regeneration duration value expressed in minutes. To perform this setting, refer to the «Overall regeneration duration» Table in the «Programming control unit operating parameters» section.

Softeners	Network pressure less than 4 bars	Network pressure more than 4 bars
DATA BLUE 16	42 minutes	33 minutes
DATA BLUE 28	62 minutes	53 minutes
DATA BLUE 50	73 minutes	63 minutes

Table «Overall regeneration duration in minutes»

9) - Cycle (volume of water produced between two regenerations)

Press the 'Mode' button again. The display screen shows program step P040.

Example: L.1000 corresponds to a 1000-liter cycle

Set the cycle corresponding to the water volume produced between two regenerations. Refer to the «Overall regeneration duration» Table in the «Programming the A5X unit, operating parameters» section. To calculate your water softener cycle, it is necessary to known the utility water TH in French degrees.

Hardness in °f (TH)	DATA BLUE 16	DATA BLUE 28	DATA BLUE 50
18°f	4700 L	8600 L	13850 L
20°f	4250 L	7750 L	12500 L
22°f	3580 L	7050 L	11350 L
24°f	3550 L	6450 L	10400 L
26°f	3250 L	5950 L	9600 L
28°f	3050 L	5550 L	8900 L
30°f	2850 L	5150 L	8300 L
32°f	2650 L	4850 L	7800 L
34°f	2500 L	4550 L	7350 L
36°f	2350 L	4300 L	6950 L
38°f	2250 L	4100 L	6500 L
40°f	2100 L	3900 L	6250 L
42°f	2000 L	3700 L	5950 L
44°f	1950 L	3500 L	5650 L
46°f	1850 L	3350 L	5400 L
48°f	1750 L	3250 L	5200 L
50°f	1700 L	3100 L	5000 L

Table «Water volume treated between two regenerations»

10) - Daily consumption averages

Press the ‘Mode’ button briefly. The display screen shows program step P071.

This setting determines the volume of water produced per day by your unit. Do not modify the displayed values “00300” that are the averages per day programmed in factory. The microprocesseur of your **Permo DATA BLUE** softener automatically calculates every day and, from powering up, the consumption averages. So the values of program steps “P071” to “P077” are constantly reset.

11) - Alarm activation

Press the ‘Mode’ button again. The display shows program step P031 and the alarms to be selected. See the table below to configure the alarms that will be shown on the display.

“0” = alarm not active
“1” = alarm active

0	0	1	1	1
Pressure switch alarm not used	Low salt alarm not used	Electrochlorination sensor alarm	Maintenance alarm	ASS alarm
		If problem detected by the electronics after 80 seconds delay at the start of the brining phase, alarm activated on the display after regeneration.	Program at step “P032” given as number of regenerations.	Program at step “P033” given as number of regenerations.
				
		Clear the fault by pressing the ‘Mode’ button	Clear the fault by pressing the buttons ‘Forward’ & ‘Initialisation’ together	Fault cleared only by our technicians

12) - Maintenance alarm

Press the ‘Mode’ button again. The display shows program step P032 and the default number of regenerations after which the maintenance alarm is displayed.
As required, set the maintenance alarm parameter from 1 to 999 regenerations. If the alarm is not selected during parameter setting in program step P031, no maintenance alarm can be displayed.

13) - ASS alarm

Press the ‘Mode’ button. The display shows program step P033 and the default number of regenerations after which the after sales service (ASS) alarm is displayed.

As required, set the ASS alarm parameter from 1 to 999 regenerations. If the alarm is not selected during parameter setting in program step P031, no ASS alarm can be displayed.

14) - End of programming

Press the ‘Mode’ button to finish and leave the programming function, the display shows the current time and the initial cycle “01000”.

SETTING RESIDUAL TH

1) - Adjusting the softened water (residual TH)

A TH analysis kit is used to measure the softened water TH.

To take the measurement, draw water from the softener outlet after closing the general by-pass and bleeding the downstream circuit.

Softeners are fitted with a mixer tap at the rear. The mixer allows hard and softened water to be mixed to create the residual hardness desired by the user.

NOTE:

There is no reference value for this setting. The user may choose a value between 0°f and 15°f, the latter value being used in public installations.

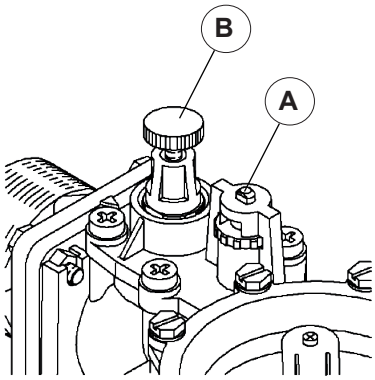
2) - Adjusting the residual TH

a) Fully tighten knob **B**, then unscrew it by 1/2 or 3/4 turn.

b) Slightly open a valve on the installation downstream of the softener, and turn button **A** clockwise to increase the residual TH or anti-clockwise to reduce it.

c) When the adjustment is completed, open the tap or several taps fully for a large flow then tighten knob **B** if the TH too high, and unscrew if it is too low.

d) The check can only be done with an analysis kit.



USE

1) - Sterilising on commissioning, implementing AQA CLEAN (as option)

The softener's ion exchange resins must be cleaned on commissioning and regularly during use.

An **AQA CLEAN** kit **code P0004890** has been especially designed by **BWT Permo** to meet this need (follow the instructions for use supplied with the **AQA CLEAN** kit).

On commissioning (and only then) in the absence of the **AQA CLEAN** kit, a commercial bleach solution can be used (bag or bottle).

Put the bleach dose into the salt tank after charging with salt, according to the table below.

Water softeners	Amount of concentrated bleach (commercial bags at about 36° chlorine) to use in the salt tank	Amount of non-concentrated bleach (commercial bottle at about 9° chlorine) to use in the salt tank
DATA BLUE 16	5 ml	20 ml
DATA BLUE 28	6 ml	24 ml
DATA BLUE 50	7 ml	28 ml

NB:

Do not use perfumed bleach, with detergent or in pellets.

2) - Additional regeneration

To perform an additional regeneration after exceptional water consumption, press the 'Regeneration' button for five seconds and release it.

The regeneration water will flow to the drain. The second line of the display then shows the regeneration start time and end time alternately.

The regeneration phases (described below) will follow each other automatically.

1 = backwash,

2 = brine intake,

3 = slow rinse,

4 = fast rinse,

5 = return to service.

At the end of regeneration, the flow to the drain stops and the display shows the time and the calculated volume of water available between two regenerations.

3) - Electro-chlorination

Electro chlorination is the in situ production of chlorine by the electrolysis of a concentrated solution of sodium chloride. The preparation of this brine requires the use of softened water, to avoid rapid furring of the cathodes of the electrolysis cells (where the OH- ions are produced).

4) - Power cut

Each softener has a lithium battery incorporated in the electronic circuit to protect it against accidental or intentional power cuts. During electricity failures, the display disappears and regeneration cannot be done; however the programming stays in memory.

When the control unit is switched on again, a short wait phase allows the information during the electricity mains failure to be updated. Water consumption is calculated using the averages recorded before the power cut and its duration. If a regeneration occurs during the power cut, it will be re-started automatically when power returns.

INCIDENTS, CAUSES AND REMEDIES

Subject	Incidents	Causes	Remedies
Softener control unit	Additional regeneration impossible	“Semi-automatic” mode initiated	Press the “Auto/Semi-Auto” button for 5 seconds, then release. The icon of the right hand disappears, and the bar chart stops flashing. If the fault continues call After Sales Service.
	Bar chart flashes during service	“Semi-automatic” mode initiated	Press the “Auto/Semi-Auto” button for 5 seconds, then release. The icon of the right hand disappears, and the bar chart stops flashing. If the fault continues call After Sales Service.
		An alarm is activated	Identify the alarm icon displayed and call After Sales service.
	Bar chart flashes during regeneration	Electrochlorination sensor fault	Check the level of salt in the tank. If the fault continues call After Sales Service.
	Incorrect time displayed	After a power cut, the backup battery is U/S.	Reset the clock and call After Sales Service if the fault persists.
	No display	Power cut	Check that the electrical socket is live. If the fault continues call After Sales Service.
	After regeneration the display shows	No detection of good quality of brining intake	Clear the fault by pressing the ‘Mode’ button. Restart regeneration if the TH at the softener outlet is not correct. Check the presence of regenerating salt in the tank.
Abnormal water flow to drain	Abnormal water flow to drain	Solenoid valves, mechanism	Ensure that the unit is not in regeneration phase, otherwise call After Sales Service.
	Abnormal salt tank overflow	Brine regulator not properly closed, leaks.	Remove the brine regulator and check tightness. Check that connections and seals are tight and reassemble. If the fault continues call After Sales Service.
The water produced is not softened	The softener is no longer producing soft water.	Brine solenoid valve, by-pass valve, lack of salt.	Check that the various isolating and by-pass valves are in the correct positions. Check that the appliance is powered-up. Check that there is salt in the salt tank. Check that the filter element is not clogged.
	The TH at the softener outlet is too high.	Residual TH setting.	Check the setting of the residual TH located at the rear of the softener with the hardness test kit. Check the use-by date on your TH kit ans replace it if necessary.

MAINTENANCE & OPERATION

Item	(1)	Action	Frequency	Comment	References of spare parts or consumables
1		Salt recharging	weekly	According to softened water consumption.	See the dealer
2		TH analysis upstream	Monthly	Adjust the setting of the residual TH as required (see “TH setting”).	Analysis kit code P0001561A
3		TH analysis down-stream			
4		Tightness inspection	Quarterly	Visual examination of the installation	
5		Filtering cartridge replacement	Half-yearly	The frequency can be shortened according to the quality of the water to be treated.	Sleeve and support code P0003352 Sleeve alone code P0003351 Set of 3 sleeves code P0003354
6		Utilisation **AQA CLEAN BWT**			Code P0004890
7	C	Regeneration test	Yearly		
8	C	Programming check			
9	C	Internal checks of the valve and cleaning		Requires removal of the valve by a specialist.	
10		Cleaning the salt tank		The frequency can be shortened according to the quality of salt used and the water consumption.	
11	C	Replacing the check valve system and the membrane	Every 2 years	The frequency can be shortened according to the pressure, quality of the water and the number of regenerations.	Code P0012717
12	C	Replacing the brine intake tubing	Every 3 years	The frequency can be shortened if the tubing or the brining regulator have a visual or tightness defect.	Code P0014892 dia 6x8
13	C	Replacing the brining regulator			Code P0014854
14	C	Replacing of the solenoid valves	Every 3 years	The frequency can be shortened according to the pressure, quality of the water and the number of regenerations.	Code P0012711
15	C	BIO sensor and cable (as option)			BIO sensor code P0012006 Cable code P0012723
16	C	Proportional regeneration unit			Code P0070374
17		Replacing the Inlet and Outlet hoses	Visual inspection		Code P0011800

(1) - Service that can be done by **BWT Permo** under a contract.

NOTE: References of parts and consumables on next page.

- “Maintenance” alarm (*)

This alarm is shown by an icon on the display screen

For example, it calls for the replacement of the filter element installed upstream of the softener, or any other event mentioned at the top of the “List of programmed parameters” and completed when the unit was installed.

- “ASS” alarm (*)

This alarm is shown by an icon on the display screen

It means that a technician should be called in for after sales service. This may be related to the replacement of operating and/or wearing parts that ensure the correct operation of your installation. Refer to the top of the “List of programmed parameters” completed when the unit was installed.

(*) - This alarm may not be enabled on the unit.

IMPORTANT:

Have operating and wearing parts checked and replaced as necessary by a person authorised to work on the appliance. Your softener must be correctly and regularly maintained by a professional.

NOTE:

The information shown above is a minimum. It may be necessary to increase maintenance frequency at different periods, depending on the quality of the water to be treated and its change over time, the nature of the location of the unit, and the presence of upstream or downstream processes.

Our regional branches are at your disposal to provide you with a customised technical support contract for your appliance if you require. Go to our website **www.bwtpermo.fr**

WARRANTY

To validate your warranty, you should register your purchase at www.bwtpermo.fr

The following guarantees apply with effect from the date the unit is installed and operated.

- **1 YEAR** for labour and travelling costs in mainland France.
- **3 YEARS** for spare parts **EXCLUDING WEAR PARTS** listed in the manual.
- **10 YEARS** for the softener body, the salt tank and the resin*.

The statutory warranty shall apply in any case, and obliges the professional seller to guarantee the buyer against all possible consequences of latent faults or defects in the goods sold or in the service rendered.

Warranty exclusion:

- Any use other than for drinking water
- Any use which does not comply with the technical specifications supplied with the appliance.
- Any lack of periodical servicing as recommended in the specifications (e.g. not replacing the filtering cartridge).
- Damage caused by frost or by heat exceeding the stated maximum temperature.
- Storms or any other cause of current surges in the mains power supply.
- Cleaning with any product other than water or not recommended by **BWT Permo**.
- Pressure exceeding the maximum pressure stated in the technical specifications.
- Splashing with any liquid.

** The resin is guaranteed for 10 years, unless damaged by an oxidising agent, a metal oxide, frost, use other than with drinking water, or the failure to replace the upstream filter element.*

PARAMETERS OF THE SOFTENER

1) - Summary of technical data for the softener

- Supply voltage: 230 volts +10% -15% 50/60 Hz
- Electricity consumption: 6VA in operation
- Electricity consumption: 25VA in regeneration
- Maximum pressure: 7 bar static
- Minimum dynamic pressure 1.5 bars
- Minimum flow rate: 0.5 m3/h
- Minimum temperatures: water 1°C / frost free ambient
- Maximum temperature: water 35°C / 40°C ambient

2) - List of checks to carry out before commissioning the softener.

- Set current date and time
- Set regeneration time
- Set regeneration duration
- Set softener cycle
- Set “X” dimension of brining regulator

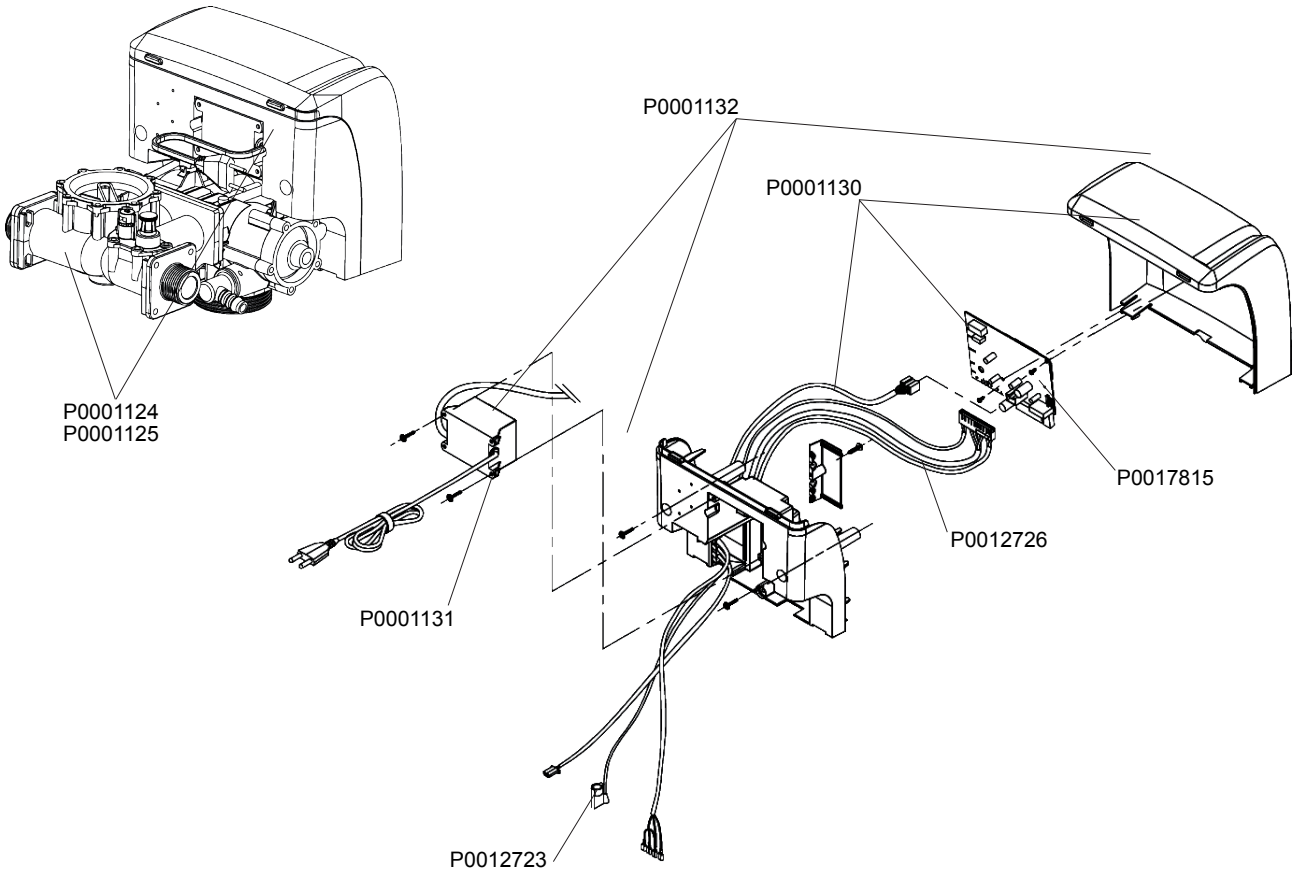
3) - Readings of the installation parameters

- Regeneration time
- “X” dimension setting
- Softener cycle
- Raw water hardness
- Residual hardness

IMPORTANT:

The quality of the softened water depends on the regenerating salt used. To obtain all the quality and hygiene guarantees, we recommend you use “Sanitabs”.

SPARE PARTS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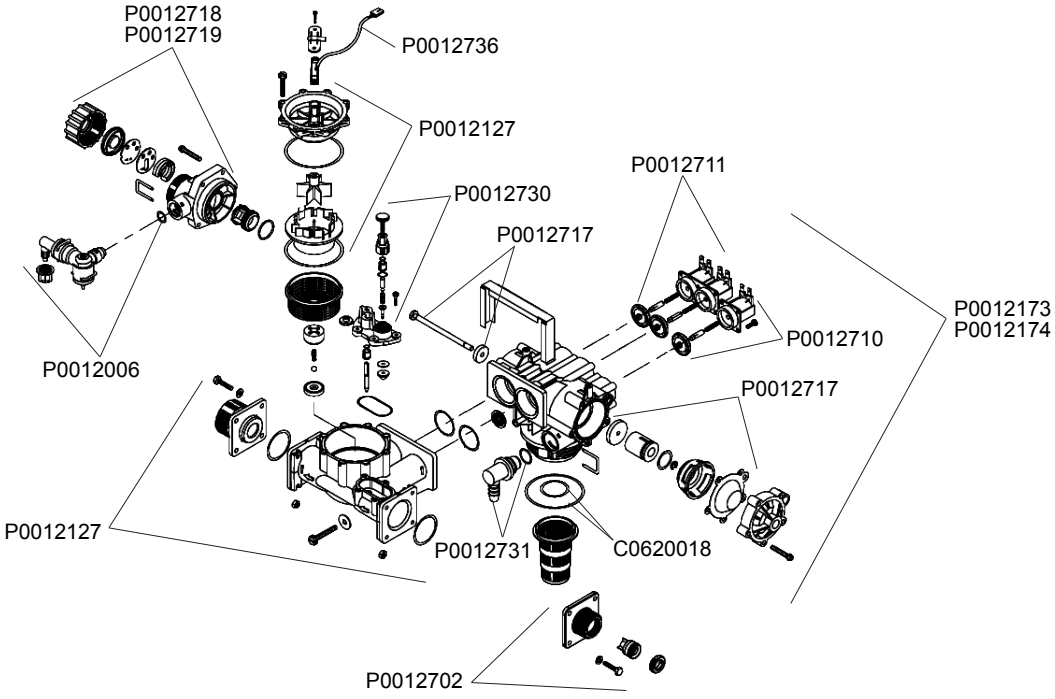
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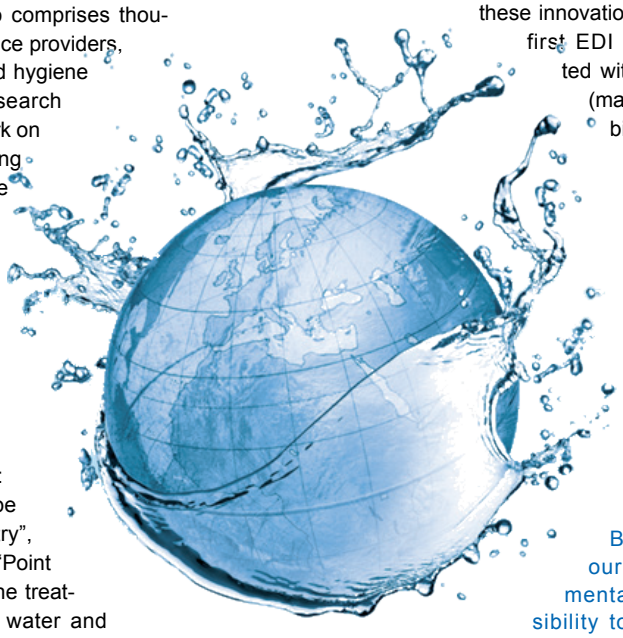
NOTES

NOTES

The BWT Group

Best Water Technology Group was founded in 1990, and is now one of the leading European water technology companies. It has 70 subsidiaries and affiliated companies, with total staff of over 2800, but the BWT network also comprises thousands of partner companies, service providers, installers, planners, architects and hygiene specialists. The staff in the Research and Development department work on new processes and equipment using state of the art techniques with the aim of developing new products that are both environmentally-friendly and cost-effective. BWT is particularly committed to the reduction of energy and CO2 emissions. BWT products are present, and have already more than proved their effectiveness, in almost every field where water is involved: whether at the entry of a water pipe into a building, the “Point of entry”, or where water is drawn off, the “Point of use”. BTW has a product for the treatment of drinking water, mineral water and demineralised water in fields as varied as pharmaceutical applications, swimming pools, heating and process water, boiler and cooling water, or water for air conditioning.



A multitude of innovations which ensure maximum safety, hygiene and health protection for our customers during their daily contacts with water, that precious elixir of life. Noteworthy among all these innovations are the SEPTRON®, the world’s first EDI (electro-deionisation) module fitted with spiral winding, the MDA process (manganese oxide activation), total AQA bipolar technology which offers protection against calcium carbonate without the addition of chemicals, SANISAL, the world’s first regenerating salt for softener units which disinfects at the same time, and the revolutionary new technology Mg2+, which gives filtered water, as well as tea and coffee, a better taste. With its unique high yield membranes for fuel cells and batteries, BWT offers a clean, sustainable energy solution for the 21st century.

BWT – For You and Planet Blue: our mission is to bear the environmental, economic and social responsibility to supply our customers with the best water treatment products, systems, technologies and services, and so contribute to the most effective protection of the global resources of our blue planet.

BWT BEST WATER TECHNOLOGY | For You and Planet Blue.