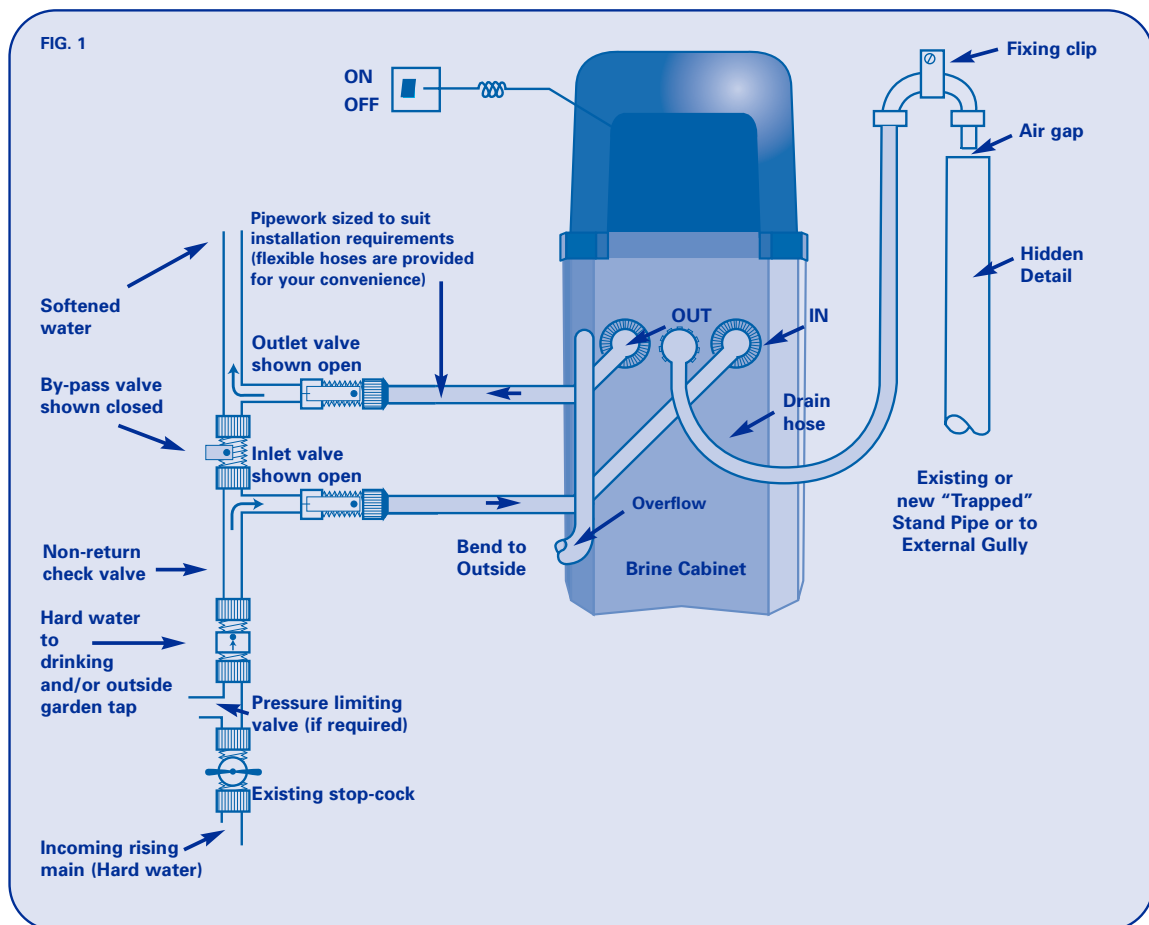


# Installation, Commissioning, Programming & User Information For Water Softener Models: SF 10 Litre Timed & SF 12 Litre Metered

These instructions are designed to give you the customer a complete understanding of how to locate, install, programme and obtain trouble-free running of your water softener.

Whether you intend to install the unit yourself or obtain the services of a tradesman, please spend a few minutes reading through this booklet and the other enclosed details. It will give you a complete understanding of the "SOFT WATER WORLD" that you are about to enter. **PLEASE RETAIN FOR FUTURE REFERENCE.**



## LOCATION

The water softener should be located as close as practicable to the incoming cold rising main supply. Very often (but not always) this main is in the kitchen or utility room. Sometimes the main rises in a downstairs cloakroom, under the stairs, or in the garage. In most cases the softener can be sited in any of these locations as well as outside (with a suitable frost protection cabinet) or even in the loft space.

If you are planning to install the water softener above ground level, e.g. in the loft, the following instructions should be strictly adhered to. The water softener should be installed within a container of not less than 113.65 Litres (25 gallons) capacity, to which there shall be connected an overflow pipe not less than 19mm (3/4 inch) in diameter. The overflow shall be connected not less than 152.4 mm (six inches) below the height of any electrical components mounted on the softener. Where necessary the water softener and any additional pipework should be adequately lagged to prevent damage by freezing.

## Requirements for Installation of the Water Softener.

- Mains Water Supply 25-70 p.s.i. (1.75-5 Bar) pressure. ● Optimum pressure is 60 p.s.i. (4 Bar).
- A waste and overflow connection. ● An electrical point. ● Access for salt filling and service.

# PRE-INSTALLATION

Your water softener comes complete with a basic 10mm flexible trade installation kit (see detail sheet with kit). Alternatively you can disregard the hoses and “hard plumb” the connections in 15mm or 22mm copper tube.

Unvented/direct mains fed plumbing and hot water systems: For maximum flow rates disregard the inlet and outlet hoses, valves and non-return check valve. “Hard plumb” using 22mm copper tube and fittings. A 22mm non-return check valve will also be required. It must be UK Water Fittings Byelaw Scheme (W.F.B.S.) listed.

The following are available from BWT or your retailer:

1. 22mm non-return valve.
2. Pressure limiting valve 3.5 Bar (50 p.s.i.) for high pressure areas.
3. Hardness measuring kit: For accurate testing.
4. Drinking water tap: For hard water drinking point.
5. Drinking water filter kits.
6. 12.5mm inlet/outlet hoses.

## LOW-HEIGHT – RESTRICTIONS (under low sinks etc)

If you are in a situation where height is a problem, it is possible to mark out the shape of the water softener cabinet and cut out the wooden plinth. Allow the “Cut-Out” to fall through the hole to act as a smooth base for the water softener to sit on. The gap between the water softener and the cut out can be filled with a plastic edging strip.

# INSTALLATION

## 1. STARTING THE INSTALLATION – ALL MODELS

Before commencing the installation, ascertain that the water pressure is not too low or high. Optimum operating pressure is 1.75 to 4 Bar (25 to 60 p.s.i.). If daytime pressure exceeds 4 Bar (60 p.s.i.), then a pressure limiting valve should be installed. These are available from your supplier and should be located as shown in Fig. 1. Pressure can be determined by applying a gauge to an outside tap or single pillar tap or by contacting your local Water Board. If water splashes out over the sink when the cold tap is turned fully on, it is a good indication of high pressure.

## 2. DRAIN THE RISING MAIN

Turn off the existing cold mains supply stopcock and drain down any water in the pipe via the “drain off cock” or kitchen cold tap. To allow air to enter the main via the ballvalve in the loft tank, run a small amount of water from the cold tap in the bathroom. If all your cold supply connections are off the rising main, open a tap at the highest point.

## 3. INSTALLING THE BY-PASS SET

Cut the rising main and install the inlet, outlet and by-pass valves as shown in Fig.1. Install the non return check valve and connect hard water supply to kitchen drinking tap and/or outside garden supply (if required). Fit the pressure limiting valve (if applicable) prior to the hard water inlet to the water softener.

Turn the inlet and outlet valves to closed (handle pointing across water flow). Turn the by-pass valve to open (handle pointing with the water flow).

Ensure the “drain off cock” is closed and turn back on the existing stopcock. This will allow hard water to again enter the system.

## 4. CONNECTING INLET/OUTLET HOSES

### MODEL SF 10 Litre Timed

Fit the two 3/4” nylon nipples into “▲” inlet and “▼” outlet sockets. Use a suitable thread sealer such as PTFE tape.

### All MODELS

From the inlet valve connect a hose to the inlet port marked “▲” on the water softener control valve (Fig. 1). Check that the rubber washers (Fig. 2) are in place and hand tighten nut plus half turn with a spanner. Connect outlet hose from outlet valve to water softener in the same manner.

FIG. 2



# INSTALLATION (cont)

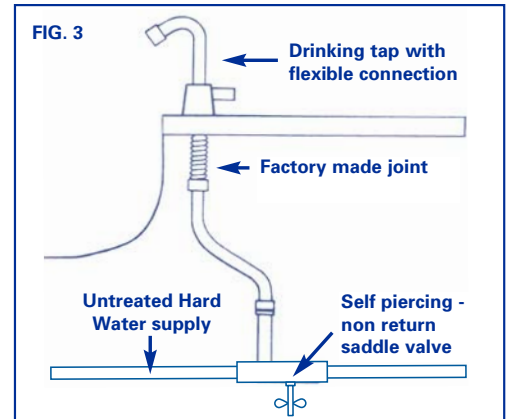
## 5. CONNECTING THE HARD WATER DRINKING TAP

The cold supply to the kitchen sink can be left on hard water or alternatively a separate hard water tap kit can be installed as Fig. 3. Hardwater tap kits are available from either BWT or your supplier.

Note

### IMPORTANT!

*Softening water increases the sodium content of raw water. Anybody on a sodium free or low sodium diet should not drink softened water. Do not use softened water in artificial baby feeds as they will already contain the correct level of sodium.*



## 6. PLUMBING THE DRAIN CONNECTION

### MODEL SF 10 Litre Timed

Fit the 1/2" x 1/2" nylon nipple into the drain socket. Use a suitable thread sealer such as PTFE tape.

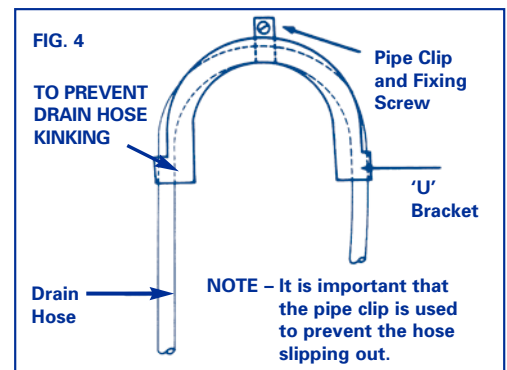
### ALL MODELS

The drain outlet for the water softener is located between the inlet and outlet port. See Fig. 1. The drain operates under mains pressure during regeneration. The drain hose may be run into an existing or new "stand-pipe" (as in a washing machine installation) or directly into an external gully. If the drain hose is exposed to the outside, the part outside should be insulated to prevent freezing.

The drain can be connected to a soil stack via a deep-seal trapped connection and "stand-pipe".

As the drain is under pressure, it may be elevated up to 2 meters above the top of the water softener, as in cellar or under stair type installations. Provided you have an incoming mains pressure above 40 psi.

When discharging into a stand-pipe always leave an air gap between water level and hose outlet. Secure the hose at stand pipe to prevent "kinking" and accidental removal or "blow out" of the hose. Using the plastic 'U' bracket and the pipe clip supplied in the kit. See Fig 4.



## 7. OVERFLOW CONNECTION

The overflow connection is located at the rear of the water softener. It is not under pressure and cannot be elevated. The overflow pipe must run downhill and terminate either outside the building or into an internal stand-pipe. This is to allow any excess water to run away.

### ALL MODELS

Use 20mm rigid plastic overflow pipe in conjunction with the elbow prefitted to the rear of the water softener cabinet.

The 20mm rigid plastic overflow pipe can be obtained from your supplier.

Note

*Always try to have a vertical drop as shown. (see fig 1.)*

## 8. ELECTRICAL CONNECTION

The low voltage adaptor should be plugged into a 13 amp socket. The electrical connection is simply plugged in at the timer end. *If in doubt, please contact a qualified electrician.*

### POWER FAILURES

In the event of an electrical power failure it will be necessary to reset the time displayed - see section 10 for water softener model "SF 10 Litre Timed", for model "SF 12 Litre Metered" see section 13.

# COMMISSIONING THE WATER SOFTENER

9. For Model "SF Timed", follow Sections 9,10 and 11. For other models, go straight to Sections 12.

## COMMISSIONING THE WATER SOFTENER – ALL MODELS

It will be necessary to ascertain the hardness of your water. This information is available from your local water supply company. Alternatively hardness testing kits are available from BWT or your supplier.

1. Remove control valve cover.
2. Depress and turn pointer knob 'H' (Fig 5) on the control, anticlockwise using broad headed screwdriver, to the backwash position. Assist this movement by simultaneously turning the camshaft with your other hand.
3. Close the by-pass valve as Fig. 1. Open inlet valve partially by turning. The blue (resin) vessel should now be heard to fill with water. Air in the resin vessel and valve will be evacuated out of the drain pipe.
4. When water starts running from the drain hose, open the inlet valve fully and allow to run for three minutes.
5. Depress and turn pointer knob 'H' anticlockwise to a point just before the brine re-fill and purge position.
6. Switch on power supply. Check that the clock motor can be heard running.
7. Allow clock to run pointer knob anticlockwise to softened water position. Allow approximately 15 minutes.
8. Fill brine storage tank with salt to a level not exceeding 75mm below top of the tank. Granular or tablet salt is suitable. The salt will be dissolved and gradually used by the machine. A visual check should be carried out on a 3 to 6 weekly interval (depending on usage). Top up as necessary. Always insure a minimum salt level of 125mm exists above the base of the cabinet.
9. Fully open outlet valve and check the by-pass valve is closed. Fig. 1. You now have softened water.
10. Set clock and regeneration days required (see Adjustment of Timer).

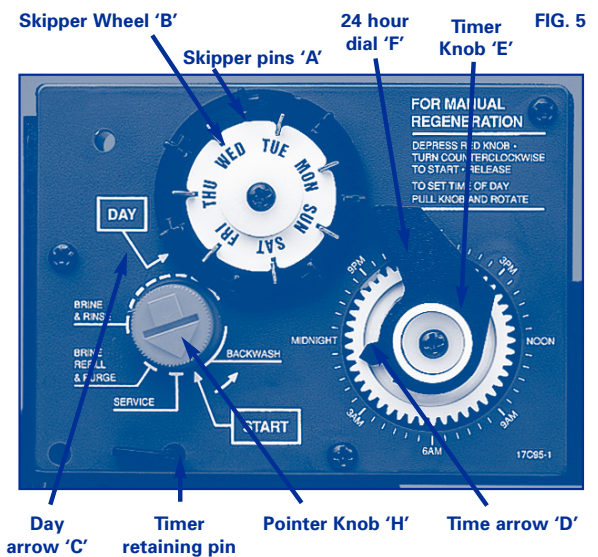
## 10. ADJUSTMENT OF TIMER (Model SF Timed)

1. Set time arrow 'D' (Fig 5) to correct time of day by grasping timer knob 'E', pulling outwards and rotating in either direction until the actual time of day on the 24hr. time dial lines up with time arrow 'D'. Release timer knob 'E' and ensure that cogs relocate.
2. Rotate skipper wheel 'B' until the day of the week faces the day arrow 'C'.
3. From the "regeneration chart" (on following page) decide how often you wish to regenerate. Your local water supply company will give you the hardness of your water in p.p.m. (parts per million as Calcium Carbonate (CaCO<sub>3</sub>) or milligrams per litre (mg/l)). These are the same. SF Timed Example: Hardness 300 p.p.m. 3 people. Regenerate every 3 days, on skipper wheel 'B' pull all skipper pins 'A' out and push in Friday pin and Monday pin. This will allow a 3 and 4 day regeneration at 3 a.m.
4. For regeneration 1 day per week, push in Friday pin.

If regeneration is required every two days push in Friday pin, Sunday pin, Tuesday pin. This always leaves Wednesday, Thursday, Saturday and Monday as non regeneration days.

Manual Regeneration. If you need an extra amount of softened water at any time, a manual regeneration can be started by:

Pushing in the pointer knob 'H' and turning anticlock-wise to start. A regeneration will take 90 minutes on the Timed Model.



NB Any water used during the regeneration will be replaced with hard water in the plumbing system.

## 11. DECIDING WHEN TO REGENERATE THE TIMED SOFTENER

The regeneration chart is a guide to capacities and usage based on the industry standard 160 litres of water per person per day. Naturally everyone's usage will vary and regeneration can be altered to suit. If towards the end of the interval between regenerations the water starts to get hard, re-programme the water softener to regenerate more frequently. Capacities are shown in p.p.m. (parts per million) as CaCO<sub>3</sub> equivalent. One degree (Clark or English) = 14.29 p.p.m.

EXAMPLE: 21° (300 p.p.m.) hardness, 4 people in family, machine regeneration every 3-4 days or 2 times per week.

REGENERATION CHART – TIMED SOFTENER								
Hardness in Degrees	Hardness in p.p.m.	Litres per regeneration	Persons in household					
			2	3	4	5	6	7
10°	150	4570	7	7	7	3-4	3-4	3-4
14°	200	3430	7	7	3-4	3-4	3-4	3-4
17°	250	2740	7	3-4	3-4	3-4	2	2
20°	286	2395	7	3-4	3-4	2	2	2
21°	300	2285	7	3-4	3-4	2	2	2
24°	350	1960	3-4	3-4	3-4	2	2	1
28°	400	1715	3-4	3-4	2	2	1	1
30°	430	1595	3-4	3-4	2	1	1	1
DAYS BETWEEN REGENERATION								

One degree (Clark or English) = 14.29 p.p.m.

# INSTALLATION (cont)

## 12. DECIDING WHEN TO REGENERATE THE SF METERED SOFTENER

Because the Softener works on a metering device, this allows it to decide the frequency of regeneration that best suits your needs. Simply program the incoming mains hardness and the softener will do the rest!

## COMMISSIONING THE SF METERED SOFTENER

### SET THE PROGRAMMER

Obtain your water hardness from your local water authority, or alternatively purchase a Test Kit from your supplying retailer. To set the programmer refer to instructions on facial panel.

1. Carefully remove the control valve cover by lifting gently under the front edge.
2. Depress and turn black pointer knob 'H' (Fig. 6) on the control, anticlockwise using broad headed screwdriver, to the backwash position. Assist this movement by simultaneously turning the camshaft with your other hand.
3. Close the by-pass valve as Fig. 1. Open inlet valve partially by turning. The blue resin vessel should now be heard to fill with water. Air in the resin vessel and valve will be evacuated out of the drain pipe.
4. When water starts running from the drain, open the inlet valve fully and allow to run for three minutes.
5. Turn pointer knob 'H' anticlockwise to a point just before the FAST RINSE REFILL position.
6. Switch on power supply. Check that clock motor can be heard running.
7. Allow motor to run pointer knob anticlockwise to SOFTENED WATER position. Allow approximately 10 minutes.
8. Fill brine storage tank with salt to a level not exceeding 75mm below the bottom of the salt lid opening. Granular or tablet salt is suitable. The salt will be dissolved and gradually used by the machine. A visual check should be carried out on a 3 to 6 weekly interval (depending on usage). Top up as necessary. Always ensure a minimum salt level of 125mm exists above the base of the cabinet.
9. Fully open outlet valve as Fig. 1. You now have softened water.
10. Set the time of day (see Adjustment of Timer).

## 13. ADJUSTMENT OF TIMER (METERED VERSION)

1. Open the access door 'D' (see Fig. 6).

**Note** *The hardness and capacity have been set at the factory. Unless you need to alter the hardness for your area (it is set to 17 GPG (Grains Per Gallon) or 290 p.p.m.), no further adjustment should be made.*

If for any reason you should wish to alter the time or hardness proceed as follows.

**Note** *The use of a pair of small needle nose pliers or tweezers will aid in moving the jumper.*

2. With the "jumper" on the top 2 pins next to the word "TIME" (Fig. 7/2), set the time-of-day to the closest hour by depressing the black TIME SET BUTTON 'E'.
3. If you need to adjust the hardness, pull the jumper off the top 2 pins and place it on the next set of pins next to the word HARDNESS (Fig. 7/1). Depress the black TIME SET BUTTON 'E' until the correct hardness is displayed. The hardness range is from 1 to 99 grains per gallon.

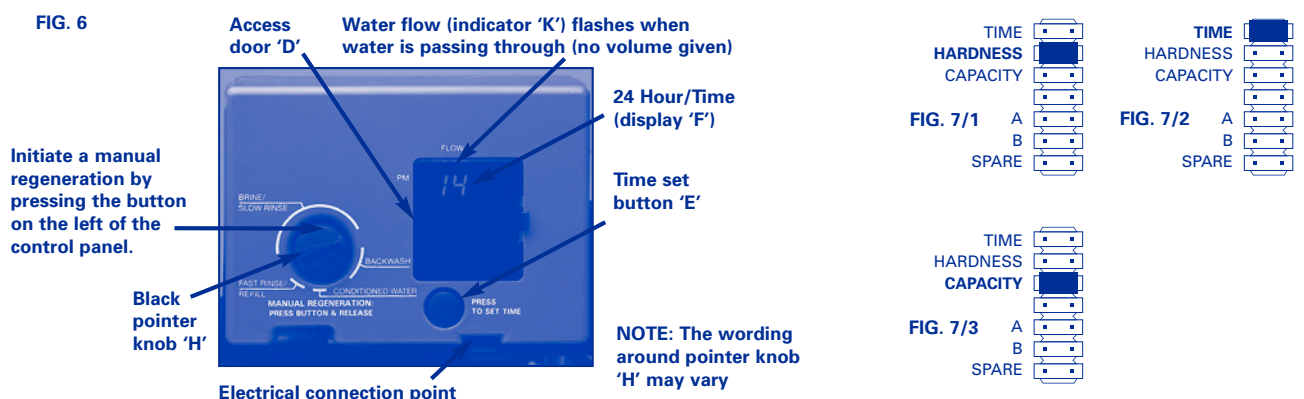
To change the water hardness from parts per million or mg/l to grains per gallon as displayed use this formula:

Divide the p.p.m. by 17.1 to get the G.P.G.

4. Capacity is pre-set - do not alter. (Fig. 7/3)
5. Return the jumper to the top set of pins next to the word "TIME" and close the access door. The bottom 3 sets of pins are used for factory testing and are not used in normal operation. The jumper must NOT be left on any pins other than the top pair next to the word "TIME". Failure to do this will cause the unit not to operate.

In the event that the hardness or capacity setting must be changed, simply follow steps 1 through 6. The new information will be entered when the jumper is returned to the top 2 pins next to the word "TIME".

6. Manual Regeneration. Push in black pointer knob 'H', Fig. 6, until click is heard. This will start a regeneration. It takes approximately 90 minutes to complete a full regeneration.



# PRODUCT INFORMATION

## 14. ELECTRICAL CONNECTION

The softeners must be connected to an electrical supply. The consumption is only three watts which is used to drive the power unit. All other cycles on the valve are operated by water pressure. The Timer and Metered Softeners are low voltage for safety and is supplied with a plug in transformer.

Connect the transformer to a 13 amp socket. The supply must be continuous. A 5 metre extension lead is available from BWT or your supplier. The transformer lead should be plugged into the processor socket .

## 15. POWER FAILURE

If a substantial quantity of water has been used during power stoppage include an additional manual regeneration by depressing the “Regen” button. Any water used during the regeneration will be replaced with hard water in the plumbing system.

## 16. GUARANTEE (UK ONLY)

All BWT automatic domestic water softeners are covered by the BWT one year parts and labour guarantee against faulty materials or workmanship.

BWT have full service back-up covering the United Kingdom. For help, advice or service please telephone the BWT Service Department on: 01376 334 200.

## 17. THE CULLIGAN SOFTENER SERVICE PLAN

Like any large household appliance, your water softener will benefit from regular checks and service to ensure optimum performance and low running costs. That is why we offer a range of unique service programmes carried out by the manufacturers own national service team. Telephone for details on: 01376 334 200.

## 18. SALT

Salt is essential to make the water softener work. It is dissolved in water to make a concentrated brine solution, which is washed over the resin to recharge it. This brine solution never enters the household water as it is washed away to an outside drain.

**You should only use granular salt specially made for water softeners.** Product quality does vary from one manufacturer to another, with some products containing damaging impurities or being liable to fall apart (mush). That is why **we recommend Care Crystals**, which are made to the highest quality standards. Care Crystals are available in 10kg & 25kg bags. If you need any assistance in finding your local supplier, telephone BWT on 01376 334 200.

For filling instructions see Section 9, Paragraph 8 or Section 12, Paragraph 8.

Softened water has a higher sodium content than mains water and the Department of Health currently recommend that it should not be used for drinking and cooking. In fact the level of sodium in softened water is typically less than one quarter of that in milk. After installation of your water softener you will still have an unsoftened mains tap. **It is particularly important that this unsoftened water is used for mixing powdered feed for babies, as the powdered feed will already contain the correct level of sodium.**



# TROUBLESHOOTING

Before contacting your supplier or our service department, please complete the check list below. A service visit can very often be avoided by studying the information below or alternatively discussing the problem over the telephone. Always check your salt level at a regular (at least monthly) interval and top up as necessary.

The technology upon which BWT Water Softeners are based is well established and proven in service over many years. However, should a problem or question arise regarding the operation of the system, please call us on our helpline.

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. No illuminated display on processor (Metered Version).	No power to softener.	Check power outlet. Check power supply.
2. No soft water.	No salt in brine tank. By-pass valve open.	Add salt to brine tank and manually regenerate softener. Close by-pass valve.
3. Softener brine tank overfilling or overflowing.		Close inlet and outlet valves. Open by-pass valve - contact the BWT Service Department.
4. Other Malfunction.		Contact the BWT Service Department.

## USEFUL NOTES

1. For manual regeneration see "Adjustment of timer" section 10.4 or 13.6.
2. For minimum and maximum salt levels see section 9 paragraph 8 or section 12 paragraph 8.

Serial No. \_\_\_\_\_

Model:      SF 10 Ltr Timed               SF 12 Ltr Metered

Date Installed \_\_\_\_\_

Regeneration Set Every \_\_\_\_\_ Days

Purchased From \_\_\_\_\_

\_\_\_\_\_

BWT UK Limited  
BWT House  
Coronation Road  
High Wycombe  
Buckinghamshire. HP12 3SU

*As part of the BWT policy of continuous improvement all specifications  
are subject to change without prior notice*



**Please retain this manual**