Water Softening

fileder
EXPERTS IN FILTRATION

Contents

Welcome to Fileders' newly expanded Water Treatment division, which now includes a comprehensive selection of water softeners.

Increasing our range to include softening capabilities enables customers new, and existing, an even greater selection of products to fulfil their filtration and water treatment needs from one 'easy to deal with', ISO9001 certified supplier.

Browse our new water softening brochure to introduce yourself to the range which includes:

- **Cabinet softeners for light commercial and residential**
- **Industrial water softeners**
- **Duplex water softeners**

Why not contact us to discuss your application and requirement, we are here to help and...

easy to deal with!

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Softening Applications

Capital Equipment
High levels of water hardness build-up, (calcium and magnesium ions) causing machinery to cease working, resulting in increased costs from higher energy consumption, maintenance and capital equipment failure.

Leisure & Office Premises
Buildings such as hotels, restaurants and offices use large volumes of water whether for washing, cleaning, heating or services.
Hard water effects all of these areas, generally causing extra expenditure on maintenance, labour costs and energy consumption.

Cooling Towers
Softened water can have a dramatic effect in reducing the maintenance, chemical feed quality and volume of water required for effective operation.

Residential
60% of homes in the UK have hard water and would benefit from a water softener to protect and prolong the life of equipment such as central heating systems, dishwashers, washing machines and kettles. At the same time soft water significantly reduces the use of detergents and other cleaning products and provides in some cases health benefits for certain skin allergies.

Commercial Laundry
Softened water prevents limescale build-up, which in heavy water-using applications such as a commercial laundry, clogs pipework and damages expensive machinery, shortening the life of equipment. Less energy and detergents are required when soft water is used giving environmental and end product benefit.

Glass Wash
Softened water will ensure a spotless finish for a wide variety of glassware from commercial kitchens to window washing, removing the hard water ions that leave streaks and residue on untreated glassware.

Reverse Osmosis
A softener, placed upfront of reverse osmosis systems, prolongs the life of the membrane preventing scale build-up from altering the membranes water quality and production rate, as well as protecting the system and pipework and minimising energy consumption.

Boiler Feed & Steam Ovens
Scale build-up in ovens significantly increases energy consumption. Just 3mm of scale can increase heating costs by 25%. Softened water protects pipework from furring and clogging, resulting in increased flow and reduced maintenance.

Why Soften?

The majority of water in the UK comes from **groundwater sources.** Rain water permeates layers of soil, clay, sand and rock and in the process picks up a number of minerals along the way.

Hardness is defined by the content of calcium and magnesium that is found in water. The harder the water the more **calcium and magnesium** it contains. Although it is not toxic, hardness can cause a number of problems.

Hard water leaves traces of calcium and magnesium on glassware, surfaces, within pipework and appliances.

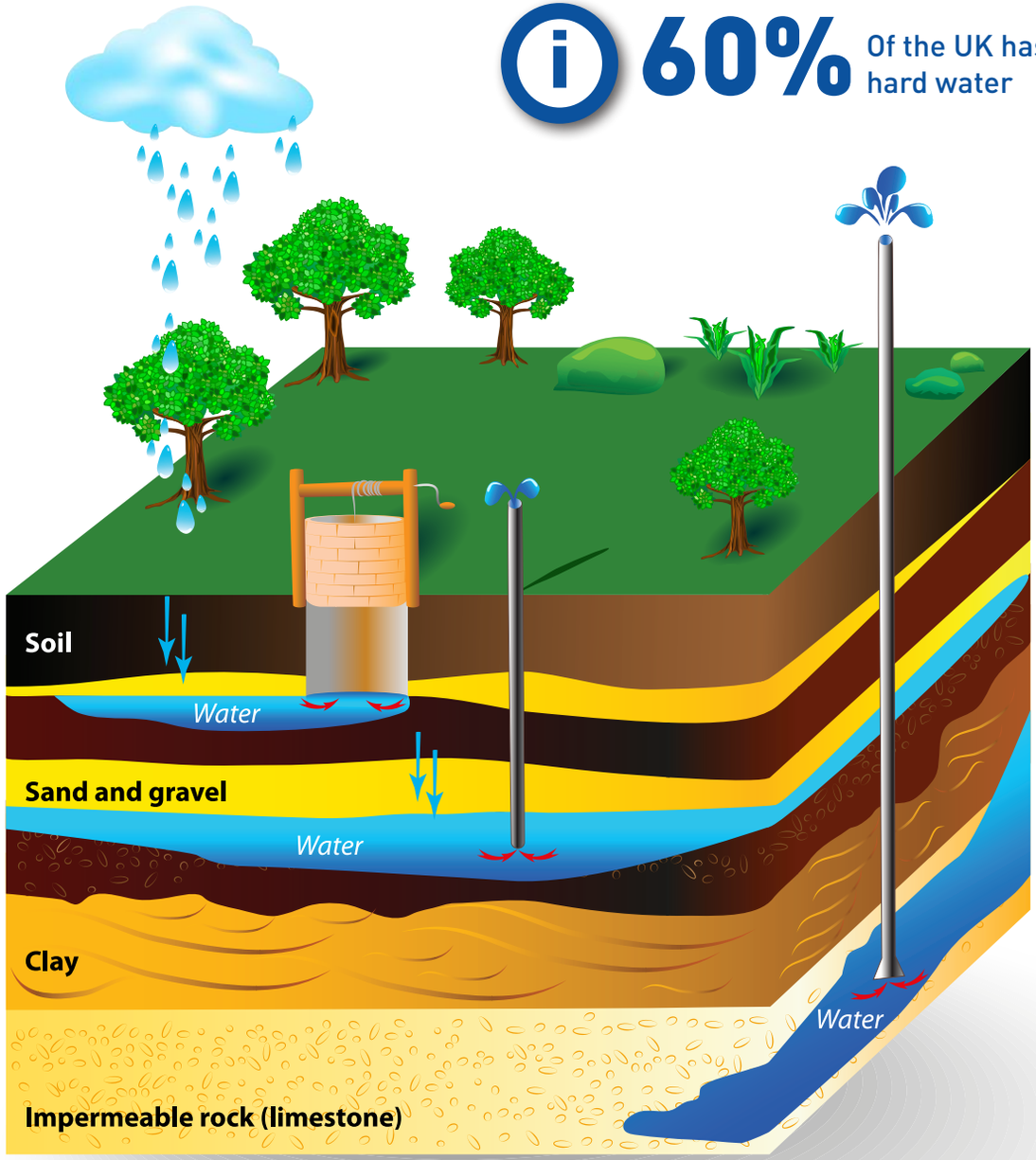
Which causes:

- **Shorter equipment life span**
- **Higher energy costs**
- **Reduced flow rates**
- **Under-performing appliances**

Excess deposits create a drop in efficiency, increased chemical cleaning costs and maintenance schedules and in the worse cases equipment failure.

3mm of scale can increase heating bills by **25%**

60% Of the UK has hard water



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What is a Water Softener?

Softeners come in two types:

1) Cabinet Systems

Most of the components are housed within a cabinet, which doubles up as the brine tank. Where space or aesthetics are key, these are a popular choice.

System shown:
SoftH$_2$O FLO 13 Litre

2) Stand-alone Systems

Usually found in industrial applications, these softener systems are designed to produce several thousand litres of soft water per day. The valve, vessel and brine tank are easily accessible for monitoring and maintenance.

Model shown: WTP-SOFT150 with WTVP-S721 Valve

A water softener is used to remove hardness from water and consists of 4 essential components

1

Valve

Key to making the system produce soft water, the valve is the control centre of the softener and is programmed to ensure the various stages of the softening process occur. As a minimum, a valve will have an inlet, outlet, brine line and drain. SPECTRUM valves have numerous other features that provide the user with operational settings for increased performance and flexibility.

2

Pressure Vessel & Distribution System

Attached to the valve, the vessel contains ion exchange resin, which chemically transforms hard water into soft water.

3

Brine Tank

This can be a stand-alone tank or cabinet containing brine that is integral to a softener system. Created by a mix of salt and water, brine is stored in the tank or cabinet and is injected into the pressure vessel as part of a process called the regeneration cycle. This cycle is essential to ensure the resin is chemically balanced in order to remove hardness. Further explanations are given on page 5.

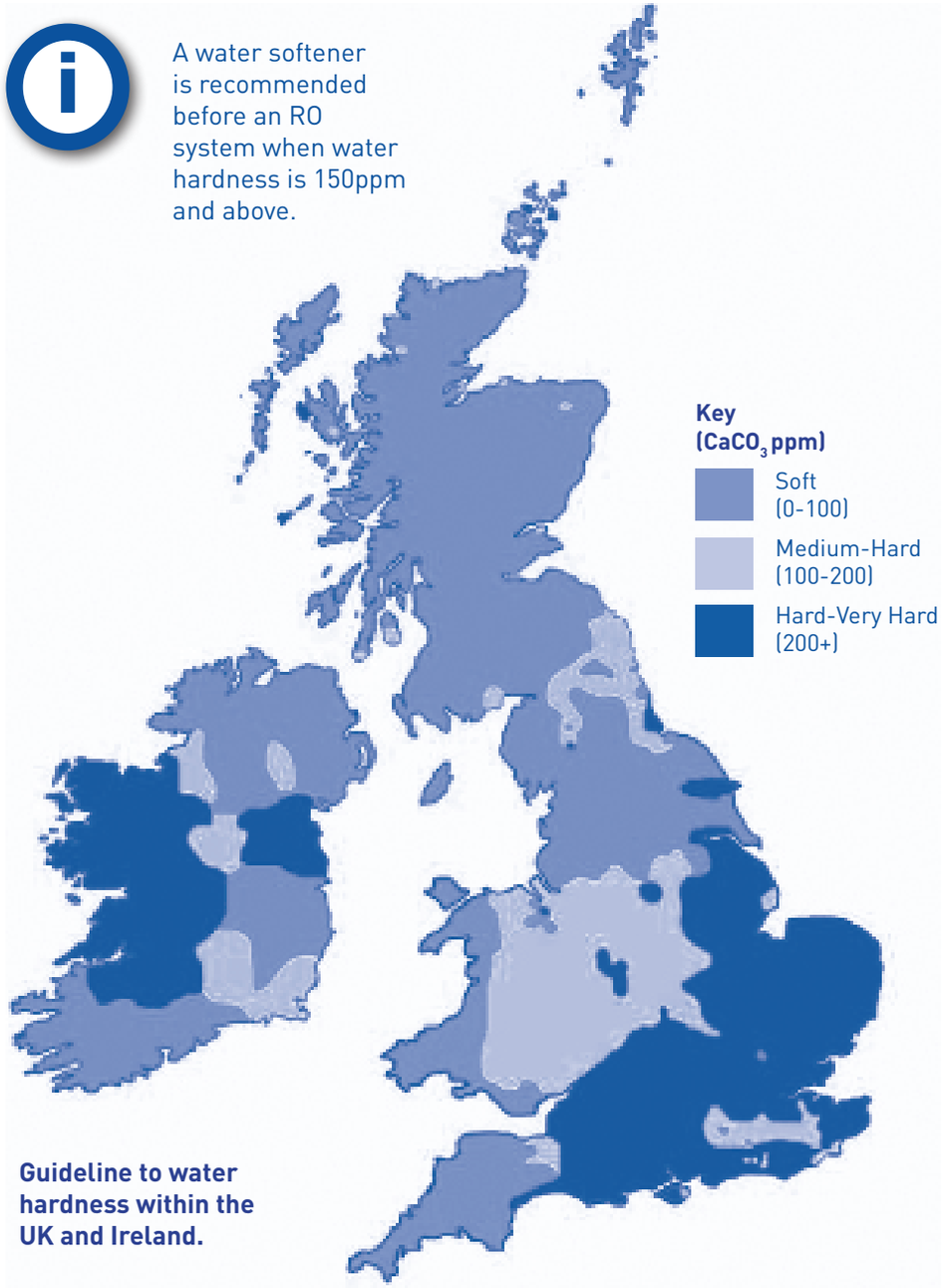
4

Resin

Softening resin is the media used inside the pressure vessel which makes hard water soft by chemically removing calcium and magnesium ions in exchange for sodium ions.

How to Choose a Softener

A water softener is recommended before an RO system when water hardness is 150ppm and above.



Guideline to water hardness within the UK and Ireland.

1 How hard is my water?

The harder the water, the more resin required; which determines the size of the pressure vessel. A rough indication of the water hardness is shown on the **map (left)**, however for greater accuracy and long-term efficiency a water sample should be tested. Should you wish to discuss softener requirements and need assistance with water sampling please contact us to arrange a meeting with one of our specialists.

2 How much softened water will I require each day?

Softeners will have different applications to cater for e.g. a factory may require 8 hours constant demand or a residential application maybe 18 hours intermittent. Therefore, when identifying how much water is required in one day, a full 24 hour period should be considered with allowance for the softener to have an average downtime of one hour a day when the system is regenerating (this is typically every 3-7 days for residential).

3 Identify resin capacity required

Using the water hardness level (ppm) and amount of water required per day the **table (right)** can be used to be give an estimated resin capacity (l).

4 Select an appropriate system using the guideline resin capacity obtained from the table

If continuous 24/7 access to soft water is required, please go to **page 11 for DUO systems.**

5 What is the max flow rate required in any given hour?

If a large amount of softened water is required for a particular period of the day the system must be capable of producing the volume required, this may mean increasing the size of the system to cater for this, information on flow rates can be found on each system page.

Need help sizing a system? Contact us and we'll be happy to help.

How many m³ of soft water will a softener produce per cycle?

Hardness Level (ppm $CaCO_3$)		100	150	200	250 [1]	300	350	400
Resin Capacity (Volume l)	13	6.50	4.33	3.25	2.60	2.17	1.86	1.62
	18	9.00	6.00	4.50	3.60	3.00	2.51	2.25
	25	12.50	8.33	6.25	5.00	4.17	3.57	3.12
	30	15.00	10.00	7.50	6.00	5.00	4.29	3.75
	50	25.00	16.67	12.50	10.00	8.33	7.14	6.25
	75 [3]	37.50	25.00	18.75	15.00 [2]	12.50	10.71	9.37
	100	50.00	33.33	25.00	20.00	16.67	14.29	12.50
	150	75.00	50.00	37.50	30.00	25.00	21.43	18.75
	250	125.00	83.33	62.50	50.00	41.67	35.71	31.25
	350	175.00	116.67	87.50	70.00	58.33	50.00	43.75

1. Using the **chart above**, firstly select the approximate water **hardness level**.
2. Then the **amount of soft water required.**
3. Track back to the left side axis to the relevant **'Resin Capacity'** this indicates which system(s) are most relevant and can be found **highlighted in orange** on each of the **system pages**.

On each system page a maximum and optimal flow rate is stated. Whilst systems are capable of operating at greater flow rates, we make a recommendation as to what each system should flow at for general use.

Flowing systems at the optimal ensures hard water adequate contact time with the resin bed, allowing consistent high quality softened water.

An example can be found to the right.

Technical Information

Resin Volume (l)	13
Optimal Flow Rate (m³/hr)	0.5
Max Flow Rate (m³/hr)	4.5
Cabinet Width (mm)	330
Cabinet Depth (mm)	470
Cabinet Height (mm)	660

How to Improve Performance and Water Quality

Shown: SPECTRUM SFH-PK 10" housing and Tru-Depth 10" spun filter.

Pre-filtration can help to prolong the life of the internal components of a softener, in particular the valve, whilst also helping to maintain maximum system efficiency and remove unwanted particulate from water.

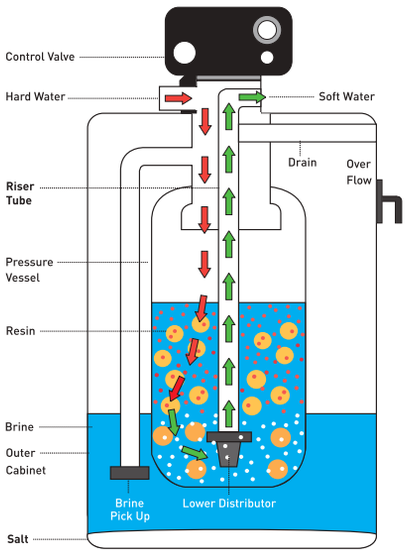
The type of filtration required with a softening system is dependant on flow rate and water quality.

Please **contact us** to discuss your requirements and we'll be happy to help.

How it Works

The Softening Process

Hard water enters the pressure vessel and passes over the softening resin. The resin acts like a magnet attracting the **calcium and magnesium** (hardness) ions, in exchange for sodium ions, creating **softened water** which then exits the system.

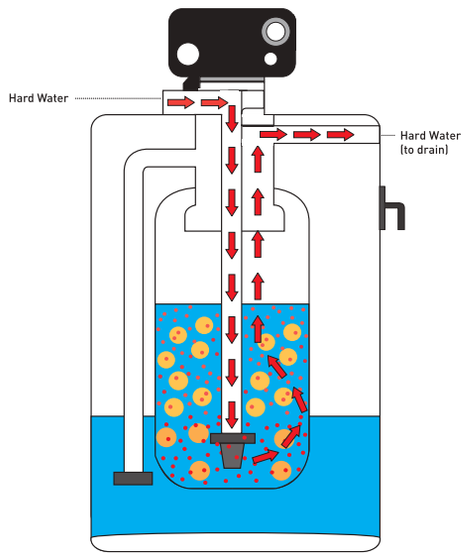


Eventually the resin beads become saturated with calcium and magnesium ions, preventing the production of softened water until the resin is **regenerated**, a process which is triggered and controlled by the valve.

The Regeneration Cycle

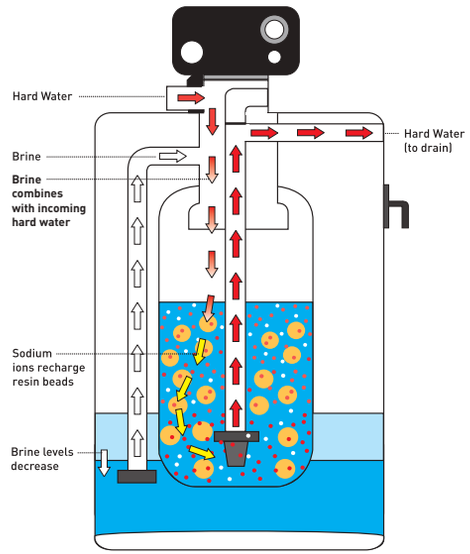
There are 4 parts to regeneration. Depending on the amount of water used/required, regeneration can be programmed according to specific requirements such as; volume of water treated or convenient down-time when softened water isn't required (e.g. overnight). Once completed the softener will be ready to produce softened water again.

1 Backwash



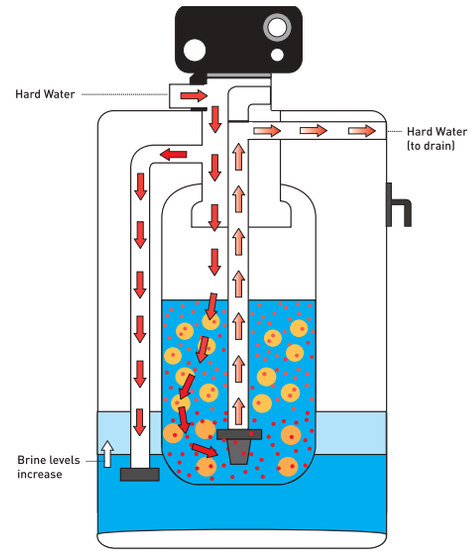
The **backwash** process sends hard water in through the riser tube. The purpose is to lift the resin bed and free impurities that can be trapped. These impurities are then sent to drain.

2 Regeneration



Regeneration involves recharging the resin using brine. The resin takes on sodium again in exchange for the 'hardness' it has obtained during the softening process. The hard water is then sent to drain.

3 Rinse



The **rinse** cycle sends hard water through the pressure vessel to remove the excess brine. This water then goes to the drain.

4 Brine Refill

If required, salt levels must be refilled and water is sent to the brine tank creating brine, once this process is completed the system is ready to start producing soft water again.

Ion Exchange Resin
Calcium and Magnesium Ions
Sodium Ions
Hard Water
Soft Water
Brine
Recharge

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SoftH$_2$O - FLO

SPECTRUM®

Stylish, compact, ready to install units with integral flow meter that saves money on salt and water

System

Uses the unique SPECTRUM 5 Valve
for compact design and complete control

Ready to Install
with integral vessel, resin, brine tank and brine valve system

PED Compliant
pressure vessels are certified for reliability and peace of mind

Volumetric Control (WTS)
precisely measures the volume of soft water produced, optimising salt usage

Chronometric Control (WTE)
time based regeneration mode

Minimal Regenerations
means less wastewater to drain during regeneration process

Valve

LCD Display
clearly shows operational information

Visual Alarm
indicates when salt refill is due

Immediate or Delayed Regeneration
for flexibility and optimal salt usage

Integrated Bypass
allows usage of hard water when soft water is not required

Blending Valve
provides complete control over hardness

Quality Components
meeting PED & CE directives

Product Code	Description	Resin Volume (l)	Optimal Flow Rate (m^3/hr)	Max Flow Rate (m^3/hr)	H (mm)	W (mm)	D (mm)	In / Out (")
WTE-SOFT5	SPECTRUM FLO 5 Litre Softening Cabinet System	5	0.2	4.5	460	200	360	¾ BSPM
WTE-SOFT13	SPECTRUM FLO 13 Litre Softening Cabinet System	13	0.5	4.5	660	333	505	¾ BSPM
WTE-SOFT18	SPECTRUM FLO 18 Litre Softening Cabinet System	18	0.6	4.5	870	333	505	¾ BSPM
WTE-SOFT25	SPECTRUM FLO 25 Litre Softening Cabinet System	25	1	4.5	1100	333	505	¾ BSPM
WTS-SOFT5	SPECTRUM FLO 5 Litre Softening Cabinet System	5	0.2	4.5	460	200	360	¾ BSPM
WTS-SOFT13	SPECTRUM FLO 13 Litre Softening Cabinet System	13	0.5	4.5	660	333	505	¾ BSPM
WTS-SOFT18	SPECTRUM FLO 18 Litre Softening Cabinet System	18	0.6	4.5	870	333	505	¾ BSPM
WTS-SOFT25	SPECTRUM FLO 25 Litre Softening Cabinet System	25	1	4.5	1100	333	505	¾ BSPM

Model shown: WTP-SOFT150 with WTVP-S721 Valve

SoftH$_2$O - PRO

Ultimate flexibility, catering for the most demanding applications

System

PED Compliant
SPECTRUM pressure vessels are tested and certified for reliability and peace of mind

Volumetric Control
precisely measures the volume of soft water produced, optimising salt usage

Minimal Pressure Drop
systems of 150 litres+ incorporate a lateral distribution system that maintains low pressure drop

Added Security
each system incorporates a brine tank, air check and safety valve; minimising the risk of overflow from the brine tank

Easy Salt Filling
350+ litre brine tanks include additional opening to assist with salt filling

High Grade Resin Included
the relevant quantity to the system will be supplied (bags), offering years of trouble free regeneration

Valve

LCD Display
clearly shows operational information

Visual Alarm
indicates when salt refill is due

Immediate or Delayed Regeneration
for flexibility and optimal salt usage

Integrated Bypass
allows usage of hard water when soft water is not required permitting maintenance to be carried out without disrupting water supply

Low Maintenance
valves are designed with minimal parts, which are interchangeable across the range, ensuring a reliable system requiring minimal maintenance cost and downtime

Blending Valve
provides complete control over water hardness

Quality Components
meeting PED & CE directives

Hydrosoft Salt

Hydrosoft salt has been especially designed for use in water softening, delivering constant brining for reliable, easy and long term use.

The granular hydrosoft salt with its rounded salt crystals dissolves easily to avoid clogging internal components.

System Technical Information & Pricing

	Softener											Brine Tank	
Product Code	Resin Volume (l)	Optimal Flow Rate (m^3/hr)	Valve Model*	Maximum Flow Rate (m^3/hr)	Capacity @ 100ppm (m^3)	Capacity @ 200ppm (m^3)	Capacity @ 300ppm (m^3)	Vessel Size	Height (mm)	Width (mm)	Salt Usage (kg/cycle)	Dimensions (mm)	Volume (l)
WTP-SOFT25	25	1	WTVP-S512	4.5	12.5	6.2	4.1	9 x 35	1017	232	3.1	H880 x W332 x D332	70
WTP-SOFT50	50	2	WTVP-S512	4.5	25	12.5	8.3	10 x 54	1500	268	6.5	H880 x W382 x D382	100
WTP-SOFT75	75	3	WTVP-S512	4.5	37	18.5	12.5	13 x 54	1517	349	9.7	H904 x W582 x D362	140
WTP-SOFT100	100	4	WTVP-S716	7	50	25	17	14 x 65	1943	366	13.0		
WTP-SOFT150	150	5.5	WTVP-S721	7	75	37.5	25	16 x 65	1975	411	19.5	H1275 x Ø740	350
WTP-SOFT250	250	8.5	WTVP-S721	7	125	62.5	42	21 x 62	1990	555	32.5	H1335 x Ø840	500
WTP-SOFT350	350	9	WTVP-S1236	12	175	87.5	59	24 x 72	1918	611	45.5		

Bypass included to facilitate valve maintenance or enable a supply of un-softened water

LCD display with visual salt alarm

Volumetric control

Easy programming to adapt settings to your needs

Blending valve can provide a mix of hard and soft water for applications where a specific level of hardness is required

SPECTRUM WTVP S5 Valve

Model shown: WTVP-S512

Backlit LCD displays with history of up to 5 previous regenerations

Constructed from lightweight glass reinforced plastic

Intelligent electronics mean the SPECTRUM valve can be controlled by an external flow meter if already in use

Detachable valve body for simple maintenance without disturbing the distribution system

SPECTRUM WTVP S7 Valve

Model shown: WTVP-S721

SoftH$_2$O - DUO

The perfect solution when a constant supply of soft water is required 24/7

System

2 in 1 Valve
Fleck valve from Pentair controls both pressure vessels, resulting in less parts and maintenance

PED Compliant
pressure vessels are certified for reliability and peace of mind

Added Security
each system incorporates a brine tank air check and safety valve; minimising the risk of overflow from the brine tank

Innovative Tank Adaptor
simplifies connection to second pressure vessel

Increased Valve Lifetime
the regeneration process uses soft water, which allows cleaner operation

High Grade Resin Included
the relevant quantity to the system will be supplied (bags), offering years of trouble free regeneration

Valve

Backlit LCD Display
shows soft water remaining and peak flow

Volumetric Control
for optimal salt usage

Integrated Bypass
allows usage of hard water, e.g. grey water for manufacturing

Visual Alarm
indicates when salt refill is due

Water Saving
valve uses the full capacity of one tank before switching to the other

Product Code	Resin Volume (l)	Optimal Flow Rate (m³/hr)	Valve Model	Maximum Flow Rate (m³/hr)	Capacity @ 100ppm (m³)	Capacity @ 200ppm (m³)	Capacity @ 300ppm (m³)	Vessel Size (") x (qty)
WTP-SOFT30D	30	1.5	Fleck 9100 SXT	4.5	15	7.5	5	10 x 35 (x2)
WTP-SOFT50D	50	2.3	Fleck 9100 SXT	4.5	25	12.5	8.3	10 x 54 (x2)
WTP-SOFT75D	75	3	Fleck 9100 SXT	4.5	37	18.5	12.5	13 x 54 (x2)
WTP-SOFT100D	100	3	Fleck 9100 SXT	4.5	50	25	17	14 x 65 (x2)
WTP-SOFT150D	150	3	Fleck 9100 SXT	4.5	75	37.5	25	16 x 65 (x2)
WTP-SOFT250D	250	6.8	Fleck 9500 SXT	8.6	125	62.5	42	21 x 62 (x2)
WTP-SOFT350D	350	6.8	Fleck 9500 SXT	8.6	175	87.5	59	24 x 72 (x2)

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MixH$_2$O - PRO

SPECTRUM™

Just 1 water treatment system provides treatment for 5 major problems associated with well and borehole water

System

PED Compliant
SPECTRUM pressure vessels are tested and certified for reliability and peace of mind

Minimal Pressure Drop
systems of 150 litres+ incorporate a star type distribution system that maintains low pressure drop

Added Security
each system incorporates a brine tank, air check and safety valve; minimising the risk of overflow from the brine tank

High Grade Resin Included
the relevant quantity to the system will be supplied (bags), offering years of trouble free regeneration

Valve

LCD Display
clearly shows operational information

Visual Alarm
indicates when salt refill is due

Immediate or Delayed Regeneration
for flexibility and optimal salt usage

Low Maintenance
valves are designed with minimal parts, which are interchangeable across the range, ensuring a reliable system requiring minimal maintenance cost and downtime

Quality Components
meeting PED & CE directives

Oxidised Iron
Inert Layer

Iron and Manganese
Sorption media for total removal, regenerable

Organics, tannins, ammonia and colour
Sorption material that uses hydrophobic and electrostatic interactions

Calcium and Magnesium
Ion exchange resin to reduce hardness

Ensures uniform flow
Sized Quartz sand

Product Code	Resin Volume (l)	Optimal Flow Rate (m^3/hr)	Max Flow Rate (m^3/hr)	Vessel Size (") x (qty)
WTP-MIX25	25	1	4.5	09 x 35
WTP-MIX50	50	2	4.5	10 x 54
WTP-MIX75	75	3	4.5	13 x 54
WTP-MIX100	100	4	7	14 x 65
WTP-MIX150	150	5.5	7	16 x 65
WTP-MIX250	250	7	7	21 x 62
WTP-MIX350	350	9	12	24 x 72

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