HydroION

Base Exchange Water Softener

Type: VAD 200CS1.5B

The HydroION

Our WRAS approved **HydroION** base exchange softener removes hardness from the water via ion exchange. Hard water passes though a bed of high efficiency ion exchange resin where the hardness ions, calcium and magnesium, are exchanged with sodium ions.
The resin bed will become “exhausted” and will be full of calcium and magnesium with no sodium left to produce soft water, the resin will then need “recharging/regenerating. During this multi- stage process the hardness minerals are washed away and a prepared brine solution is flushed through the resin bed replacing the lost sodium ions, the excess brine is flushed away and the softener is put back in to service with a full production capacity.

HydroION VAD CS Duplex Water Softener

The Design

The **HydroION VAD** consists of two resin filled pressure vessels, brine tank, control valve and controller.

The control valve facilitates the stages of operation. The valve is simple to maintain and operate as it comprises minimal moving components.

The proprietary HC controller provides extensive usage data and unparalleled levels of functionality

The **HydroION** is supplied with BSP threaded connections

The softener may also be supplied with an inline or bypass valve to achieve specific water hardness’

Key Benefits

- Full Product WRAS Approval
- BSEN 14743 Performance Validation
- 80g/l Brining Rate
- High Water Efficiency
- VFC for Low Salt as Standard
- Electro-chlorinator as Standard
- Water Refresh Mode

Links to Additional Information

- Verified EPD
- BIM Model (2019)
- WRAS Directory Listing

sales@hydrotec.co.uk
www.hydrotec.co.uk
Last change 2/24. Subject to technical modification.

HYDROTEC

HydroION

Base Exchange Water Softener

Type: VAD 200 CS1.5B

The Design(Continued)

The **HydroION VAD** is a duplex softener operating in duty/standby, this means that when one vessel is exhausted the other comes into service ensuring zero interruption to soft water production.

The **HydroION** benefits from an electro-chlorinator, to ensure the hygiene of the resin bed is maintained a small current is applied to drawn brine which generates small amounts of low concentration chlorine which is used to disinfect the resin bed

HydroION Vessel and Brine Tank

Water Softening and Wholesomeness

The Water Supply (Water Quality) Regulations provide a maximum prescribed concentration value of 200mgNa/l for sodium.

If after softening and when factoring in the local incoming sodium the final concentrations are <200mgNa/l the water is classified as wholesome and as such suitable for drinking, cooking and food preparation

Example

Thames Water Water Supply Zone 0350
Incoming Hardness – 277ppm
Target Hardness – 80ppm
Max. Incoming Sodium – 42.4mgNa/l

Resultant Sodium = 133.02mgNa/l

Calculation
277-80 = 197ppm (hardness to be removed)
197*0.46 = 90.62 sodium exchanged for 197 calcium and magnesium (0.46 ex. rate)
90.63+42.4 = 133.02mgNa/l

Installation Notes

- Only Tablet Salt is to be used
- Device will need a bypass and/or ability to be isolated for service and maintenance purpose
- Sample point upstream and down stream the softener are advised
- A local drain point is required
- A single phase 240V mains connection should be provided to the unit controller
- Access should be available for commissioning and servicing
- Technical data and technical guidelines should be followed per the O&M manual and local regulations.

sales@hydrotec.co.uk
www.hydrotec.co.uk
Last change 2/24. Subject to technical modification.

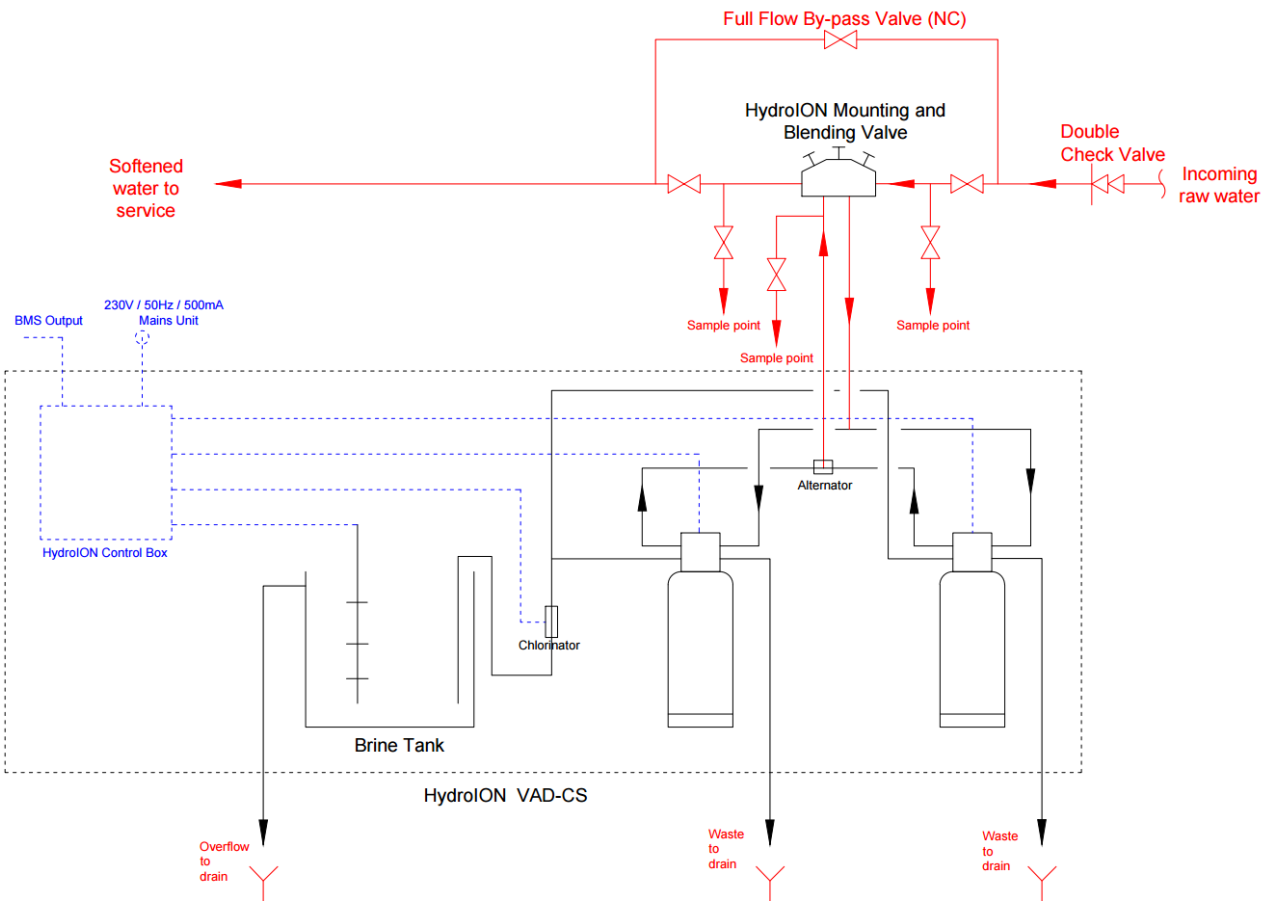
HYDROTEC

HydroION

Base Exchange Water Softener

Type: VAD 200 CS1.5B

Typical Installation Diagram with Inline Blending Valve



sales@hydrotec.co.uk
www.hydrotec.co.uk
Last change 2/24. Subject to technical modification.

HYDROTEC

HydroION

Base Exchange Water Softener

Type: VAD 200 CS1.5B

	Unit	VAD 200-CS1.5B
Approval		WRAS
Performance Validation		BSEN 14743
Method of Operation		Duplex (Duty/Standby)
Peak Flow Rate Through Softener	l/s	2.92
Peak Flow Rate (Total Services Demand @ 300 - 60ppm)	l/s	3.65
Softener Production Capacity @ 300ppm	m^3	31.6
Volume Between Regenerations @ 300 to 60ppm	m^3	37.92
Brining Rate	g/l	80
Pressure loss at Peak Flow	bar	1.39
Min. flow rate at 8 BV/h	l/s	0.44
Peak flow rate to drain	l/min	37.8
Waste Water Per Regeneration	m^3	0.75
Water Efficiency @ 300-<10ppm		97.63%
Water Efficiency @ 300-60ppm		98.02%
Salt consumption/ regen	kg	16
Recommended Regeneration salt stock	kg	300
Maximum Regeneration salt stock	kg	425
Inlet/ outlet connections		40 (1 ½")
Drain line		50 (2")
Operating pressure	bar	2.0 - 8.0
Water temperature	°C	5 - 30
Ambient temperature	°C	5 - 40
Block Dimensions		
Height (min.)	mm	2165
Width(min.)	mm	2400
Depth(min.)	mm	850
Operational weight - (complete unit) max.	kg	1200

sales@hydrotec.co.uk
www.hydrotec.co.uk
Last change 2/24. Subject to technical modification.

HYDROTEC

HydroION

Base Exchange Water Softener

Type: VAD 200 CS1.5B

ENVIRONMENTAL DATA SUMMARY	
EPD Reference	EPD_Hydrotec_(UK)_Ltd_DN40_200_litre_Base_Exchange_Water_Softener_HUB-0796_2023-10-30
Declared unit	Average of two units of water softening equipment
Declared unit mass	427.44 kg
GWP-fossil, A1-A3 (kgCO2e)	1.81E+03
GWP-total, A1-A3 (kgCO2e)	1.78E+03
Secondary material, inputs (%)	1.08
Secondary material, outputs (%)	22
Total energy use, A1-A3 (kWh)	6960
Total water use, A1-A3 (m^3)	2.34E+01
Variation in GWP-fossil for A1-A3 (%)	27.24
PRODUCT RAW MATERIAL MAIN COMPOSITION	
Metals Amount, mass- %	0.11
Minerals Amount, mass- %	0.28
Fossil materials Amount, mass- %	99.61
Bio-based materials Amount, mass- %	-
BIOGENIC CARBON CONTENT	
Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	9.76
FUNCTIONAL UNIT AND SERVICE LIFE	
Declared unit	Average of two units of water softening equipment
Mass per declared unit	427.44 kg
Functional unit	Average of two units of water softening equipment operating at 0.012 kW for 24 hours and 365 days a year.
Reference service life	15
SUBSTANCES, REACH - VERY HIGH CONCERN	The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

sales@hydrotec.co.uk
www.hydrotec.co.uk
Last change 2/24. Subject to technical modification.

HYDROTEC

HydroION

Base Exchange Water Softener

Type: VAD 200 CS1.5B

Specification Clause

HydroION VAD 200-CS1.5B Ion Exchange Water Softening

To protect the proposed domestic hot and cold-water pipework and respective appliances from the damaging effects of hardwater and limescale the Mechanical Contractor shall supply and install a WRAS approved fully automatic Duplex ion exchange water softener.

This design is based on the HydroION VAD200 CS 1.5B as manufactured by Hydrotec (contact sales@hydrotec.co.uk).

The system shall generally be in accordance with the following schedule:-

- Peak operating flow rate (l/s): 2.92
- Peak operating flow rate when blending from 300-60ppm (l/s): 3.65
- Production capacity at 300ppm (m3): 31.6
- Target outgoing hardness (ppm): 60
- Salt Consumption Per Regen (kg): 16
- Water Efficiency (%): 98
- Salt Stock (kg): 425
- Operating Pressure (bar): 2.0 - 8.0

The water softening equipment shall comprise two vertical resin vessels, brine tank with weighted brine sensor rods, electronic control head with integrated water meter and a digital display indicating operational and fault status, volt-free connections for BMS compatibility shall be provided.

The softener shall employ a high efficiency strong cation exchange resin of mono-spherical grade to ensure optimum performance at an 80g/l Brining Rate.

The internal resin bed shall be automatically chlorinated at every regeneration cycle via integral electronic chlorinator facility in accordance with current HSE, L8 ACoP guidances and legislations.

A blending valve shall be included to achieve the target water hardness of 60 ppm

The unit shall be installed in strict accordance with the manufacturer's technical literature.

To minimise energy use and associated operational carbon the power consumption of the softener shall not exceed 12W.

To keep water loss to a minimum the softener shall employ measures to ensure that the volume of wastewater production shall be less than 2% of the total softened water demand between regenerations, where feed water quality requirements and local water chemistry may make this challenging the wastewater production volume shall not exceed 4% of the total softened water demand between regenerations.

For the accurate monitoring of environmental impact, it is preferred that the manufacturer is able to provide a Verified EPD or alternatively a mid-level LCA in accordance with the TM65 Embodied Carbon Calculation Methodology.

Features Spec / Notes:-

- High quality GRP pressure resin vessels.
- 1 No. brine tank c/w weighted ‘low brine’ sensor rods.
- High water and salt efficiency.
- Digital control display with operational and fault status indicator – BMS integration.
- Strong cation exchange resin of high-quality mono-spherical grade.
- Integrated electronic chlorination facility – Resin bed disinfection at every regeneration.
- Independently tested to both BS EN 14743:2005 + A1:2007 and DIN 19636-100:2008-02.
- Unit should possess full product WRAS approval.

The recommended specification clauses above are intended to cover a wide variety of applications. We recommend speaking to a Hydrotec representative to produce project-specific tailored specifications.