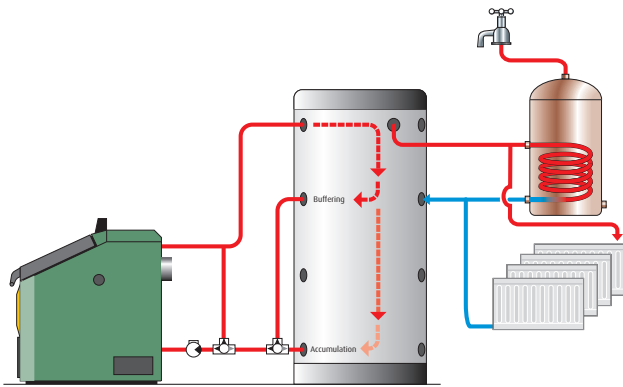


Buffer, Accumulators and Thermal stores

Design and specifications



Buffers, accumulators and thermal stores explained

The biomass industry has several name conventions for process of storing heat energy in water. At Euroheat the following system descriptions are used to define the type of heat storage, buffer, accumulator or thermal store, and assist with the system design and project requirements.

A biomass boiler burning wood pellets, logs or wood chip needs time to operate. It needs time to introduce fuel and ignite it, time for the fire to establish before producing its full output and time to burn the remaining wood in the fuel chamber at the end of its cycle. This differs from fossil fuel boilers which can quickly achieve their full output and switch off, biomass boilers need time to react and respond.

Older generations of wood boilers do not have the ability to switch on, and off, because they were designed to be used in parts of the world where there are sustained periods of very cold weather. In such places having only full and partial load is possible because there is always a heat demand. In the UK where outside temperatures and weather conditions can change quickly boilers need to be able to adapt to different heating demands.

All automatic HDG boilers constantly monitor the amount of heat being stored in the buffer, ignite only when there is a need to produce heat and stop when the demand is met. This greatly increases the overall annual efficiency, reduces fuel consumption, reduces environmental emissions, servicing costs and extends the boilers life.

Manually fed log boilers require greatly increased human input because the fuel needs to be loaded by hand, even though the actual ignition can now be automatic. Poorly conceived installations can result in many trips to reload the boiler on colder days. A correctly sized log boiler and accumulator will allow the user, in most cases, to provide enough heat by lighting and loading the boiler once each day.

Accumulator

As the name suggests its main purpose is to accumulate energy. In this case the energy is heat energy from a log wood boiler.

The function of the log boiler is to convert the energy stored in wood log to heated water. To be able to do this cleanly and efficiently the combustion needs to be able to proceed in a controlled and steady fashion. A correctly sized accumulator will ensure that the boiler will be able to maintain a high temperature without needing to choke the fire causing smoke and tar, reducing the efficiency and life of the boiler.

The accumulated heat is then used on demand from the accumulator. In very cold weather the property may use this energy in a matter of hours, most of the winter over the course of 24 hours, and in the summer, because the accumulators are highly insulated, the heat will be available for heating domestic water for a number of days.

Accumulator designs come with stratification columns, and snorkels as standard for log boilers. Also available are additional stratification plates, solar coils and electric heating elements. Sizes range from 1500 litres to 10,000 litres and multiple accumulators can be connected in parallel.

Buffer

As the name suggests the vessel is used as a buffer of energy between the heat source and the heating system.

Because automatic biomass boilers take more time to respond to a heating demand than a fossil fuel boiler, a buffer is used between the boiler and the heating system, when there is a demand the heat being drawn from the buffer signals the biomass boiler to ignite and produce heat.

The buffer also ensures that when the automatic biomass boiler is started it runs for an optimum length of time irrespective of the amount of heat being used by the building.

The boiler then stops when the buffer is fully charged and waits for the heating system to use the energy produced, when it then repeats the cycle. This is done by sensing the water temperature, and because the buffer is highly insulated, during periods of light load it may not be required to fire again for a day or more. As a method of preventing the boiler starting and stopping more often than necessary the buffer has a huge impact on the boiler efficiency, a reduction in wear and tear, reduced emissions and fuel consumption.

Buffer sizing is based on the output of the biomass boiler, but may be over-sized when being connected to large district heating systems to accommodate the volume of water in the system. Buffers are generally much smaller than the accumulators used with log boilers, and are of a similar construction with stratification columns, and snorkels as standard. Buffers are also available with additional stratification plates, domestic hot water coils, solar coils and electric heating elements. Sizes range from 1500 litres to 10,000 litres and multiple accumulators can be connected in parallel.

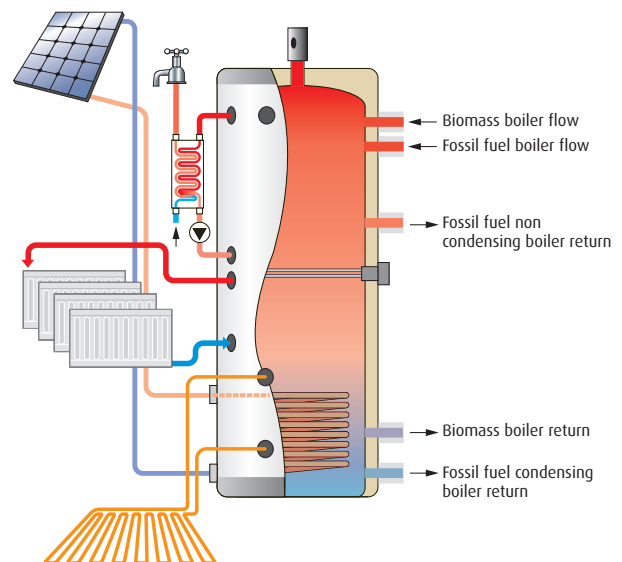
Probably the most poorly explained and confusing term is for a buffer/accumulator. These are generally best described as a small buffer undertaking many functions. These include some buffering and some accumulation, although their ability to do both is limited because they are generally small in size, normally 200 litres to 500 litres.

They are used on small heating demands and to produce domestic hot water with either an internal coil or external heat exchanger. They are also used to integrate multiple primary sources such as wood stoves, fossil fuel boilers, heatpumps, solar thermal, and electric heating.

Although smaller they are of a similar construction to buffers and accumulators with options of domestic hot water coils, solar coils and electric heating elements.

Hydraulic system design

Whether the biomass heating system is using a buffer, accumulator or thermal store, in order for the system to work it is imperative that the system side pumps and controls are designed and installed correctly. A correctly designed system can achieve temperature differences of up to 20°C and this can be maintained using flow management control.



Stratification

This term describes the natural tendency for water to settle with the hotter, less dense, water at the top of the vessel, and cooler, more dense, water at the bottom. This property is used in both accumulators and buffers to maintain high flow temperatures for longer while using the heat from the accumulator, and increasing the temperature rise across the boiler when loading the accumulator with energy.

De-stratification, or stirring, can be seen when the movement of the water inside the vessel is too great for the strata, or layers of water at different temperatures to form. The most common reason for this is the velocity of the water entering and leaving the accumulator or buffer on either the boiler side or the system side.

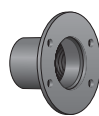
There are a number of devices, and practices which can greatly reduce, and almost eliminate de-stratification leading to a much more efficient and economical heating system.

Connection size and snorkels

The velocity of the water entering and leaving the accumulator or buffer is dictated by the amount of water being pumped, and the diameter of the opening where the pumped water meets the water in the vessel. As a guide the velocity at this point should be around 0.5m/s, and should not exceed 0.7m/s, where often distribution pipework can be 2m/s.

The size of the connections on the accumulator should be large enough to connect 1m pipe, which has a diameter that will reduce the velocity of the water to around 0.5m/s. Alternatively on accumulators and buffers over 500 litres snorkels can be used which protrude into the vessel and slow down the entering water in the same way. This enables the connection at the accumulator or buffer to be line size, saving space and money on fittings and tube.

All standard automatic boiler buffers and log boiler accumulators are supplied with snorkels.



Connection size



H₂O Store-Plus

Stratification column

This is a perforated column within the accumulator into which the system return flows, and from which the boiler return originates. The lower snorkels link the stratification column to the boiler and system return connections outside the accumulator or buffer.

Return water that has already slowed to approximately 0.5m/s in the snorkel enters the column, and slows down further. Quite often the temperature of the system return water is higher than the water at the base of the accumulator. Inside the column the return water will either float up to the level at which its temperature matches the surrounding water, or it will be drawn into the boiler return without entering the main body of the accumulator or buffer.

All standard automatic boiler buffers and log boiler accumulators are supplied with stratification columns.

Solar thermal

Most accumulators or buffers can include at least one solar thermal coil, some models can accommodate two coils. The HDG control will manage solar thermal system and loading the accumulator with solar energy. Where two coils are used the HDG control will prioritize the upper coil before diverting the solar heat to the lower coil to make the best use of the solar heat when available. The use of solar thermal coils can greatly reduce the amount of wood fuel used through the summer when there is only a domestic hot water demand, and including solar thermal coils for future development of the system is worth considering.

Domestic hot water coils (potable water)

Buffers and thermal stores can be used to produce instantaneous mains pressure hot water. A stainless steel coil running through the heating water inside the vessel carries mains cold water which increases in temperature before exiting the coil as hot water. It is essential that the mains cold water kit, expansion vessel, and hot water mixing kits are used to prevent scolding at the taps.

Instantaneous hot water is only recommended for use with automatic boilers and buffers, not for use with log boilers and accumulators.

Electric elements (immersion heaters)

There are two main reasons for using electric elements in buffers and accumulators:

1. Where hot water is produced from the accumulator and the main heating source is not in use.
2. Where photovoltaic solar is in use, and the excess electrical power is used to heat water.

The electric elements are available as 3kW single phase and 9kW three phase.



H₂O Flow-Plus

Accumulator with domestic hot water production

H₂O Accumulator & hot water accumulators

Purpose built or bespoke accumulators

Euroheat range of accumulators explained

The aim of any accumulator or buffer is to remain stratified. This means hotter water at the top and cooler water at the bottom. Water returning to the accumulator from a heating system is cooler than the water at the top of the accumulator. If the return water enters the accumulator slowly it will sink to the bottom. If however it returns to the accumulator at high velocity it will stir the water in the accumulator and the temperature will become the almost the same top to bottom.

H₂O Plus accumulator

The H₂O Store-Plus range of accumulators are produced as standard with stratification tubes and column to suit boiler and system size. Versions R1 have an internal coil for thermal solar or other applications. The H₂O Store-Plus range feature side top connection for boiler and system flow connections to reduce room height requirements.

The H₂O plus range come in two ranges. One for wood log boilers and one for automatic boilers.

H₂O Flow domestic hot water

The H₂O Flow are designed as accumulator/buffer or accumulator/buffer with domestic hot water production for smaller boilers.

The H₂O Flow allows for the common connection of different input and output requirements. These include heat sources from wood burning stoves, fossil fuel boilers (oil & gas) automatic wood fuel boilers such as HDG K Series.

The domestic hot water is produced instantly through a copper finned tube heat exchanger. The large surface area of the heat exchanger 4.54m² ensure good hot water flow rates. In addition, the choice of the R1 model includes a coil which can be used for other heat input appliances or thermal solar.

H₂O Flow-Maxi commercial hot water

The H₂O Flow-Maxi is a combined instantaneous domestic hot water cylinder combined with an accumulator/buffer for central heating. The hot water production coil is manufactured from stainless steel 32 x 16mm connected in parallel and mounted through the top on a flanged ring. This allows the possibility of its removal at any time in the future. The hot water production is mounted in the top of the cylinder and protects against legionella, due to its location. The design of the hot water heat exchanger allows for excellent flow rates even with lower than normal water temperatures.

Standard insulation is 125mm.

H₂O Store bespoke accumulator

The accumulators of series "H₂O Store bespoke" can be produced to almost any requirement. Produced from high quality steel, with versions R1 and R2 have internal coil/s for connecting to solar systems or other heating sources.

Options include

Multiple flow and return connections for multiple boiler and heating system connections.

To prevent this occurring, either the speed at which the water enters the accumulator is reduced by increasing the connection size based on the system kW demand, or the return water is introduced into a neutral area, a stratification tube of the correct size to suit the flow rate. The Euroheat range of accumulators has been specially designed to suit UK heating system designs. We offer four different options to suit requirements.

H₂O Store-Plus accumulator insulation

Insulation is very important as an accumulator is generally heated 24 hours a day. Heat loss unless well insulated can be very large over a period of time.

Our standard insulation is 100mm on tanks up to 2000 litres and 125mm on tanks 2500 litres and above.

Insulation is Polyester fiber 9000 g/m². Reaction to fire class B1, external finish grey PVC.

H₂O Store-Plus accumulator insulation

Insulation is very important as an accumulator is generally heated 24 hours a day. Heat loss unless well insulated can be very large over a period of time.

The H₂O flow is fitted with hard shell insulation and external cover. Thermal conductivity coefficient 0.025 W/mk.

Our standard insulation is 100mm on tanks up to 2000 litres and 125mm on tanks 2500 litres and above.

Insulation is Polyester fiber 9000 g/m². Reaction to fire class B1, external finish grey PVC.

When installing the H₂O Flow-Maxi it is essential the mains cold water supply is connected via a check valve, pressure reducing valve (3bar), and an expansion vessel. There must also be a thermostatic mixing valve (TMV2) installed in the domestic hot water flow with the cold input also pressure reduced to 3 bar.

Multiple flow and return connections for multiple boiler and heating system connections.

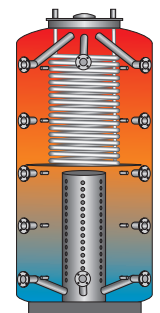
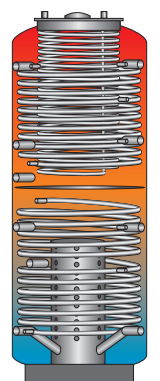
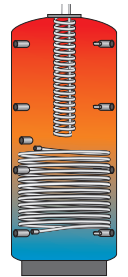
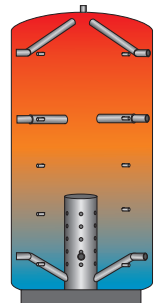
Internal stratification tubes in sizes 65mm-150mm.

Stratification columns up to 400kW heating circuits.

External connections from DN40-DN150.

Hot water production up to 60 litres per minute.

Insulation options 100mm or 150mm thermal conductivity coefficient 0.039 W/mk. Elastic efficiency 44%. Free from HCFC.



Accumulator sizing & accessories

Log, pellet and chip boilers and accumulator accessories

Accumulator and sizing

Depending on HDG boiler type and fuel, a minimum accumulator size will be required. The size of the accumulator should be adapted to the boiler type, the wood type, the heat requirements of the building, district heating circuit and/or any direct hot water production.

Log Boilers	Softwood minimum accumulator size		Hardwood minimum accumulator size	
HDG R 15kW	1,000		1,250	
HDG R 20, 25, 30kW	1,500		2,000	
HDG F Series 20, 25, 30kW	2,000		2,500	
HDG F Series 40kW	2,500		3,000	
HDG F Series 45, 50kW	3,000		4,000	
HDG Euro 30, 40kW model	3,000		4,000	
HDG Euro 45, 50kW model	3,000		4,000	
HDG Turobotec 50	4,000		5,000	
HDG Turobotec 60	4,000		5,000	
SHT Thermodual HV 25	2,500		3,000	
SHT Thermodual HV 30	2,500		3,000	
SHT Thermodual HV 35	2,500		3,000	
SHT Thermodual HV 40	2,500		3,000	
Dual fuel boilers	Softwood minimum accumulator size		Hardwood minimum accumulator size	
SHT TDA Thermodual 15	2,000		2,500	
SHT TDA Thermodual 25	2,000		2,500	
SHT TDA Thermodual 30	2,500		3,000	
SHT TDA Thermodual 40	2,500		3,000	
Domestic / small commercial automatic boilers	Minimum	Minimum with hot water	Recommended	Recommended with hot water
SHT Evo Aqua 9	400	500	500	600
SHT Evo Aqua 15	500	600	600	700
SHT PNA Thermocomfort 15	300	400	400	500
SHT PNA Thermocomfort 20	300	400	400	500
SHT PNA Thermocomfort 25	400	500	500	600
SHT PNA Thermocomfort 30	400	500	500	600
HDG K10	200	300	300	400
HDG K15	300	400	400	500
HDG K21	400	500	500	600
HDG K26	500	600	600	800
HDG Compact 25/35	1,000	1,250	1,250	1,500
HDG Compact 45/50	1,250	1,500	1,500	2,000
Commercial automatic boilers	Minimum		Recommended	
HDG Compact 65	1,500		2,500	
HDG Compact 80	2,000		2,500	
HDG Compact 99/100	2,000		3,000	
HDG Compact 115	2,500		3,000	
HDG Compact 150	3,000		4,000	
HDG Compact 200	4,000		5,000	
Industrial automatic boilers	Minimum		Recommended	
HDG M 300/350/400	6,000/7,000/8,000		7,000/8,000/9,000	



H₂O Plus log boiler accumulator

Accumulator details and prices

The H₂O Plus range of accumulators are produced specially for our log boiler range. They feature stratification tubes and a stratification column for optimum water stratification both in buffering and accumulation mode.

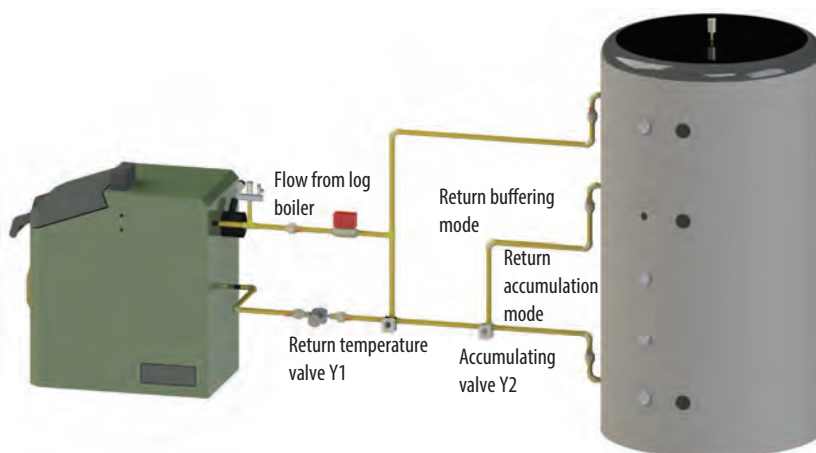
Accumulator insulation

Insulation is very important. The H₂O range have very high levels of insulation.

Standard insulation is 100mm on tanks up to 2000 litres, and 125mm on tanks 2500 litres and above.

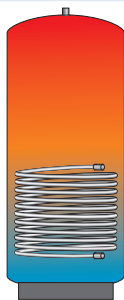
Soft polyurethane 18kg/m³ density. Thermal conductivity coefficient 0.039 W/mk.

Elastic efficiency 44%. Free from HCFC.

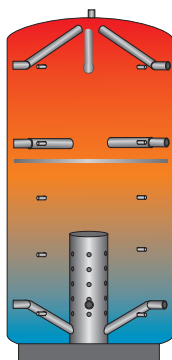


H₂O Plus for log boilers

R1 single solar coil fitted to standard H₂O Plus



Standby boiler connection kit with Standard H₂O Plus

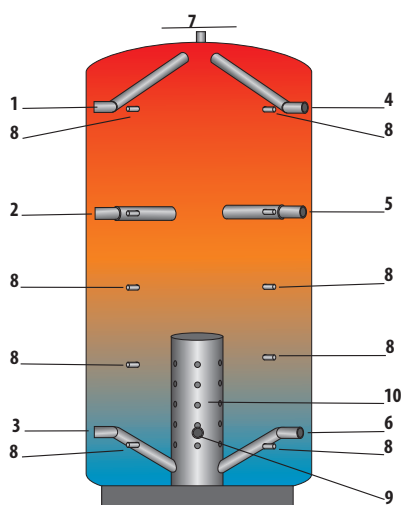


Model Type	Profile	Insulation thickness	Type	Order code
H ₂ 1000	tall/thin	100mm	Standard	TS4855
			R1	TS4855R1
H ₂ 12500	tall/thin	100mm	Standard	TS4856
			R1	TS4856R1
H ₂ 1500	tall/thin	100mm	Standard	TS4801
			R1	TS4801R1
H ₂ 2000	tall/thin	100mm	Standard	TS4802
			R1	TS4802R1
H ₂ 2500	tall/thin	125mm	Standard	TS4803
			R1	TS4803R1
H ₂ 2550	short/wide	125mm	Standard	TS4804
			R1	TS4804R1
H ₂ 3000	tall/thin	125mm	Standard	TS4805
			R1	TS4805R1
H ₂ 3050	short/wide	125mm	Standard	TS4806
			R1	TS4806R1
H ₂ 4000	tall/thin	125mm	Standard	TS4807
			R1	TS4807R1
H ₂ 4050	short/wide	125mm	Standard	TS4808
			R1	TS4808R1
H ₂ 5000	tall/thin	125mm	Standard	TS4809
			R1	TS4809R1

Standby boiler connection kit	Order code	£ ex VAT
1 x top mounted DN40 1 x DN65 stratification tube 1 x stratification plate	To order add B to the end of H ₂ O Plus Order code	82.00

H₂O Plus log boiler accumulator

Technical and dimensions



Connection options		
1	Flow from log boiler or flow to heating or flow from backup boiler	DN40
2	Return to log boiler accumulator buffering or return to backup boiler	DN40
3	Return to log boiler in accumulating mode or return from heating	DN40
4	Flow from log boiler or flow to heating or flow from backup boiler	DN40
5	Return to log boiler accumulator buffering/ return to backup boiler	DN40
6	Return to log boiler in accumulating mode or return from heating	DN40
7	Auto vent or top exit	DN40
8	Temperature gauge or sensor pocket	DN15
9	Expansion vessel connection	DN40
10	Return stratification column	

Features of the H₂O log boiler accumulator

These purpose designed accumulators feature special additions to improve the stratification of heated water. Stratification is extremely important. If returning water from the heating system is allowed to enter the accumulator at the incorrect speed or location, stirring of the accumulated water will occur. This stirring will mix the hot and colder water together resulting in a mean temperature from top to bottom of the accumulator. This contradicts the concept of having a high flow temperature and a lower return temperature to the heating system reducing comfort and efficiency. The H₂O accumulators are installed as standard with special stratification tubes and columns. These slow the speed of the returning water reducing the stirring effect. In addition the HDG

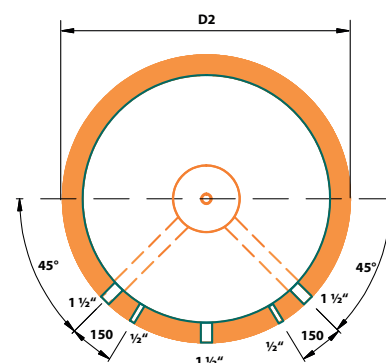
log boilers include a special accumulator loading system which first loads the upper third of the accumulator (buffering) and then accumulates heated water in the lower two thirds if the heated water is not required.

The specially designed stratification column also allows the returning system water to continue directly to the log boiler bypassing the accumulator if heat production is occurring. This greatly improves the speed at which the heated water passes to the heating system.

Multiple sensor pockets allow the installation of HDG Lambda 1 Plus which can calculate the required amount of fuel needed for heating and if fitted ignite the log boiler (F Series & Euro models) when heating is required.

H₂O Accumulator design and special features

- High level of insulation 0.039W/mk
- Insulation jacket can be fitted after placement to reduce access requirements
- Specially designed for HDG Log boilers
- Includes stratification tubes as standard
- Includes stratification columns as standard
- Includes buffering level connections
- Stratification column allows accumulator by pass with heavy heating demands
- Flow in and out stratification tubes are snorkelled to the top to reduce room height installation
- Connections allow installation on the left or right of the accumulator

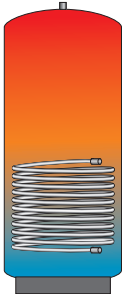
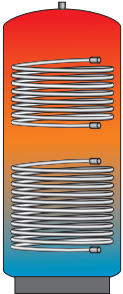
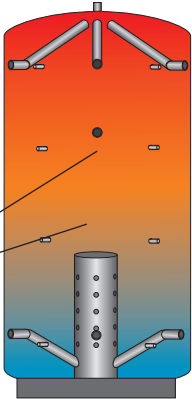
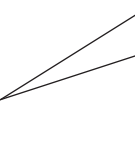



Model type	Connections	Stratification tube	Stratification column	ØD1 Diameter without insulation	ØD2 Diameter with insulation	Tank height without insulation	Tilt height without insulation	Height with insulation	Weight (kg) H ₂ O Store Plus/R1	Capacity litres	Maximum operating pressure	Maximum operating temperature	Solar coil R1 m ²	Solar maximum operating pressure
1000	DN40	DN65	<80kW	790	990	2041	2090	2109	114/156	915	3 bar	95°C	3.0	10 bar
1250	DN40	DN65	<80kW	950	1150	2017	2090	2085	146/189	1284			3.0	
1500	DN40	DN65	<80kW	1000	1200	2152	2220	2212	162/210	1515			3.6	
2000	DN40	DN65	<80kW	1100	1300	2377	2450	2437	225/278	2055			4.2	
2500	DN40	DN65	<80kW	1200	1450	2443	2515	2528	252/308	2590			4.2	
2550	DN40	DN65	<80kW	1400	1650	2070	2220	2155	270/326	2660			4.2	
3000	DN40	DN65	<80kW	1250	1500	2644	2705	2729	280/343	2959			5.4	
3050	DN40	DN65	<80kW	1400	1850	2318	2490	2403	290/353	3050			5.4	
4000	DN40	DN65	<80kW	1400	1650	2818	2910	2883	431/498	3820			6.0	
4050	DN40	DN65	<80kW	1600	1850	2380	2575	2465	441/508	4050			6.0	
5000	DN40	DN65	<80kW	1600	1850	2917	3010	3002	504/585	5055	7.2			

H₂O Plus automatic boiler accumulator

Accumulator details and prices

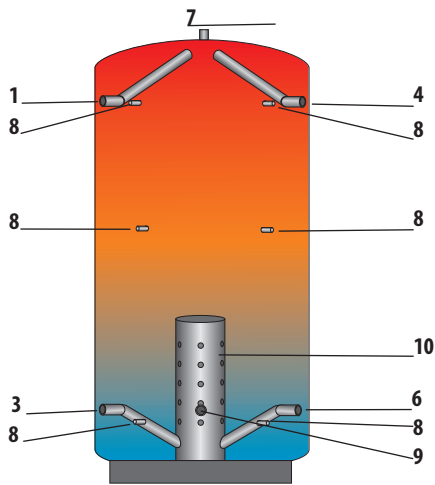
The H₂O Plus range of accumulators are produced specifically for automatic boiler range and feature stratification tubes and stratification column for water stratification.

H ₂ O Plus for Automatic boilers		Model Type	Profile	Insulation thickness	Type	Order code
R1 single solar coil fitted to standard H ₂ O Plus		600	tall/thin	100mm	Standard	TS4847
					R1	TS4847R1
		800	tall/thin	100mm	Standard	TS4849
					R1	TS4849R1
R2 single solar coil fitted to standard H ₂ O Plus		1000	tall/thin	100mm	Standard	TS4810
					R1	TS4810R1
		1250	tall/thin	100mm	Standard	TS4811
					R1	TS4811R1
Standby boiler connection kit with Standard H ₂ O Plus		1500	tall/thin	100mm	Standard	TS4812
					R1	TS4812R1
		2000	tall/thin	100mm	Standard	TS4813
					R1	TS4813R1
		2500	tall/thin	125mm	Standard	TS4822
					R1	TS4822R1
		2550	short/wide	125mm	Standard	TS4823
					R1	TS4823R1
		3000	tall/thin	125mm	Standard	TS4814
					R1	TS4814R1
		3050	short/wide	125mm	Standard	TS4815
					R1	TS4815R1
Standby boiler additional connections Flow Return		4000	tall/thin	125mm	Standard	TS4816
					R1	TS4816R1
		4050	short/wide	125mm	Standard	TS4817
					R1	TS4817R1
		5000	tall/thin	125mm	Standard	TS4818
					R1	TS4818R1
6000			tall/thin	125mm	Standard	TS4819
					R1	TS4819R1

Standby boiler connection kit, 2 external, 2 internal stratification tubes		Order code	£ ex VAT
600-2,000	2 x DN40 threaded 2 x DN65 stratification tube	To order add B to the end of H ₂ O automatic order code	164.00
2,500-5,000	2 x DN65 flange 2 x DN100 stratification tube		238.00

H₂O Plus automatic boiler accumulator

Technical and dimensions



Connection options		Size
1	Flow from automatic boiler or flow to heating	Dependant on accumulator size
3	Return to automatic boiler or return from heating	
4	Flow from automatic boiler or flow to heating	
6	Return to automatic boiler or return from heating	
7	Auto vent	DN40
8	Temperature or sensor	DN15
9	Expansion vessel connection	DN40
10	Return stratification column	

Accumulator insulation

Insulation is very important. The H₂O range have very high levels of insulation. Standard insulation is 100mm on tanks up to 2000 litres and 125mm on tanks 2500 litres and above. Soft polyurethane 18 kg/m³ density. Thermal conductivity coefficient 0.039 W/mk. Elastic efficiency 44%. Free from HCFC.

Features of the H₂O Automatic boiler accumulator

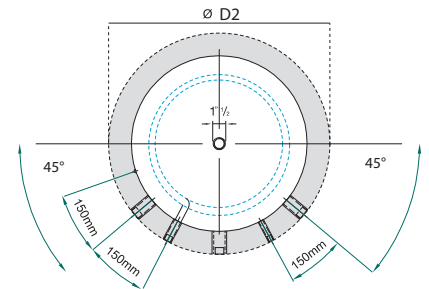
These purpose designed accumulators feature special additions to improve the stratification of heated water. Stratification is extremely important. If returning water from the heating system is allowed to enter the accumulator at the incorrect speed or location, stirring of the accumulated water will occur. This stirring will mix the hot and colder water together resulting in a mean temperature from top to bottom of the accumulator.

This contradicts the concept of having a high flow temperature and a lower return temperature to the heating system reducing comfort and efficiency.

The H₂O accumulators are installed as standard with special stratification tubes and columns. These slow the speed of the returning water reducing turbulence. The specially designed stratification column also allows the returning system water to continue directly to the automatic boiler bypassing the accumulator if heat production is occurring. This greatly improves the speed at which the heated water passes to the heating system.

H₂O Accumulator Design and Special Features

- High level of insulation 0.039W/mk
- Insulation jacket can be fitted after placement to reduce access requirements
- Specially designed for automatic boilers
- Includes stratification tubes as standard
- Includes stratification columns as standard
- Stratification column allows accumulator by pass with heavy heating demands
- Flow in and out stratification tubes are snorkelled to the top to reduce room height installation
- Connections allow installation on the left or right of the accumulator



Model type	Connections T=Threaded F=Flange	Stratification tube	Stratification column	ØD1 Diameter without insulation	ØD2 Diameter with insulation	Tank height	Height with insulation	Tilt height without insulation	Maximum operating temperature (°C)	Weight (Kg) H ₂ O Store Plus/R1	Capacity litres	Maximum operating pressure	Maximum operating temperature	Solar coil R1 m ²	Solar maximum operating pressure
600	DN40 T	DN65	<80kW	700	900	1644	1704	1690	95	84/109	572	3 bar	95°C	1.8	10 bar
800	DN40 T	DN65	<80kW	790	990	1686	1746	1740		97/130	792			2.4	
1000	DN40 T	DN65	<80kW	790	990	2041	2101	2090		114/156	915			3.0	
1250	DN40 T	DN65	<80kW	950	1150	2017	2077	2090		146/189	1285			3.0	
1500	DN40 T	DN65	<80kW	1000	1200	2152	2212	2220		162/210	1516			3.6	
2000	DN50 T	DN100	<200kW	1100	1300	2377	2437	2450		225/278	2055			4.2	
2500	DN65 F	DN100	<200kW	1200	1450	2443	2528	2515		252/308	2590			4.2	
2550	DN65 F	DN100	<200kW	1400	1650	2070	2155	2220		252/308	2660			4.2	
3000	DN65 F	DN100	<200kW	1250	1500	2644	2729	2705		280/343	2959			5.0	
3050	DN65 F	DN100	<200kW	1400	1650	2318	2403	2490		290/353	3050			5.0	
4000	DN65 F	DN100	<200kW	1400	1650	2818	2903	2910		431/498	3820			6.0	
4050	DN65 F	DN100	<200kW	1600	1850	2380	2465	2575		441/508	4050			6.0	
5000	DN65 F	DN100	<200kW	1600	1850	2917	3002	3010		504/585	5056			7.2	
6000	DN80 F	DN150	<400kW	1600	1850	3367	3517	3500		605/TBC	6060			TBC	

H₂O Flow domestic hot water

Accumulator/buffer/thermal store details and prices

The H₂O Flow is designed for accumulation or accumulation and domestic hot water storage. The H₂O Flow allows for the common connection of different input and output requirements. These include heat sources from wood burning stoves, fossil fuel boilers (oil and gas) automatic wood fuel boilers such as HDG K Series.

The domestic hot water is produced instantly through a copper finned tube heat exchanger. The large surface area of the heat exchanger 4.54m² ensures good hot water flow rates. In addition, the choice of the R1 model which includes a coil which can be used for other heat input appliances or thermal solar.

Four versions available

H₂O Flow = this model is suitable only as accumulator/buffer.

H₂O Flow M = this model provides domestic hot water and provision as accumulator/buffer.

H₂O Flow R1 = this model includes an additional coil for energy input by an alternative source hydraulically separated, such as thermal solar or open vented equipment.

H₂O Flow R1 M = all the above combined in one accumulator/buffer.

Small in size and weight, requires minimum space for installation.

Big in functionality, myriad of heating sources can be connected.

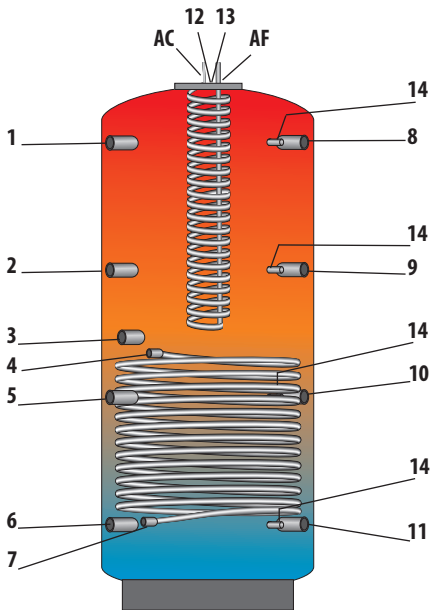


H ₂ O Flow	H ₂ O Flow M, domestic hot water	Model type	Description	Order code
		200	H ₂ O Flow	TS4701
			H ₂ O Flow M, Hot water	TS4709
		300	H ₂ O Flow	TS4702
			H ₂ O Flow M, Hot water	TS4710
		400	H ₂ O Flow	TS4703
			H ₂ O Flow M, Hot water	TS4711
		500	H ₂ O Flow	TS4704
			H ₂ O Flow M, Hot water	TS4712
All H ₂ O Flow tanks require mains cold starter kit (EV4718) and hot water mixing kit (EV4720), and 8 litre potable expansion vessel (EV4716)				
H ₂ O Flow R1	H ₂ O Flow M R1 coil and hot water	Model type	Description	Order code
		200	H ₂ O Flow R1	TS4705
			H ₂ O Flow ..M..R1, Hot water	TS4713
		300	H ₂ O Flow ..R1	TS4706
			H ₂ O Flow ..M..R1, Hot water	TS4714
		400	H ₂ O Flow ..R1	TS4707
			H ₂ O Flow ..M..R1, Hot water	TS4715
		500	H ₂ O Flow ..R1	TS4708
			H ₂ O Flow ..M..R1, Hot water	TS4716
All H ₂ O Flow tanks require mains cold starter kit (EV4718) and hot water mixing kit (EV4720), and 8 litre potable expansion vessel (EV4716)				

H ₂ O options	Order code
	EV4716
	EV4717
	EV4718
	EV4723
	TSH101

H₂O Flow domestic hot water

Technical and dimensions



Connection options

Option	Description	DN	Port	Description	DN
1	Flow from wood boiler or alternative heat source or 8	DN40	9	Primary Flow to heating system for H ₂ O M hot water model or 2	DN40
2	Primary Flow to heating system for H ₂ O M hot water model or 9	DN40	10	Return to wood boiler with coil (solar) system	DN40
3	Electric immersion option	DN40	11	Return to wood boiler with no coil (solar) system	DN40
4	Flow from solar or alternative heat source with hydraulic coil separation	DN40	12	Primary flow to heating system with no hot water. H ₂ O flow & R1	DN40
5	Return to wood boiler with coil (solar) system	DN15	13	Auto vent location for hot water models H ₂ O M	DN15
6	Return to wood boiler with no coil (solar) system	DN40	14	Temperature or sensor	DN15
7	Return to solar or alternative heat source with hydraulic coil separation	DN15	AF	Mains cold inlet	3/4"
8	Flow from wood boiler or alternative heat source or 1. Alternative system flow to 12, when no hot water production. H ₂ O flow & H ₂ O flow R1	DN40	AC	Mains hot outlet	3/4"

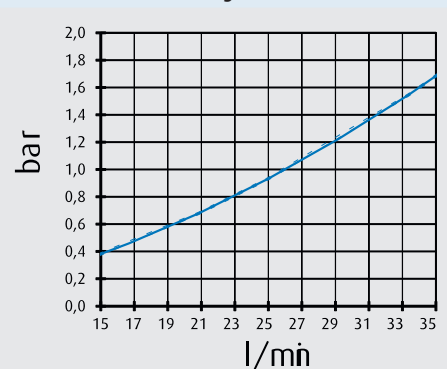
H₂O Flow performance information - one off withdrawal

Withdrawal of hot domestic water 10 - 45°C		Type	200	300	400	500
Withdrawal of hot domestic water	Store temperature 70°C	Flow -l/m	15	15	15	15
Duration of flow		Time - min	6.7	9.8	12.3	15.4
Total withdrawal		Quantity - litres	100	147	184	231

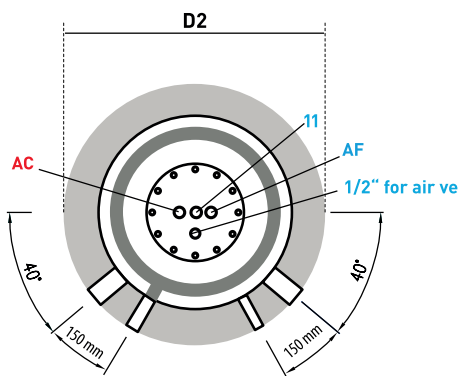
H₂O Flow performance information - Continuous withdrawal with boiler input

Boiler input		Boiler flow temperature 70°C	kW	10	15	20	25
Continuous withdrawal 10-45°C			l/min	4.1	6.2	8.3	10.3

Pressure loss DHW exchanger & technical



Material	Copper
Surface area	4.54m ²
Water capacity	4.2L
Connection (AS and FS)	3/4"
Maximum operating pressure	10 bar



H₂O Flow, H₂O Flow M & H₂O Flow M R1 Information

Model Type	3 electric immersion	RS1 H ₂ O Flow M R1	AS1 H ₂ O Flow M R1	L = length of immersion heater	D2 diameter with insulation	Height	Minimum installation height	Tilt height	Maximum operating pressure (Bar)	Maximum operating temperature (°C)	Solar coils				
											Lower Coil m ²	Lower Coil capacity (L)	Maximum operating pressure (Bar)	Weight (Kg) H ₂ O Flow M	Weight (Kg) H ₂ O Flow M R1
200	595	205	543	350	600	1210	1410	1230	3	95	3.0	19.8	10	72	84
300	720	210	660	450	650	1342	1542	1385	3	95	3.0	19.8	10	80	96
400	707	211	656	550	750	1371	1571	1425	3	95	3.0	19.8	10	92	117
500	811	211	751	550	750	1621	1821	1670	3	95	3.6	23.7	10	102	126

H₂O Flow-Maxi commercial hot water

Hot water / accumulator details and prices

The H₂O Flow-Maxi is a combined instantaneous domestic hot water cylinder combined with an accumulator/buffer for central heating. The hot water production coil is manufactured from stainless steel 32 x 16mm connected in parallel and mounted through the top on a flanged ring. This allows the possibility of its removal at any time in the future. The hot water production coil is mounted in the top of the cylinder and protects against legionella, due to its location. The design of the hot water heat exchanger allows for excellent flow rates even with lower than normal water temperatures.

The insulation jacket is made from soft polyurethane and CFC. This is delivered separately and can be simply fitted on site.

This greatly helps with access and location.

When installing the H₂O Flow-Maxi it is essential the mains cold water supply is connected via a check valve, pressure reducing valve (3bar), and an expansion vessel.

There must also be a thermostatic mixing valve (TMV2) installed in the domestic hot water flow with the cold input also pressure reduced to 3 bar. See equipment options below.

Standard insulation is 125mm can be ordered as an option. Soft polyurethane 18kg/m³ density.

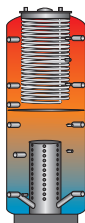
Thermal conductivity coefficient 0.039 W/mk. Elastic efficiency 44%. Free from HCFC.

Suitable for heating systems up to 45kW with the stratification tube.

For systems above this level use H₂O bespoke version.



H₂O Flow-Maxi



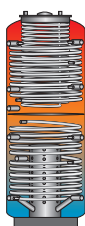
Capacity litre	Insulation mm	Order code
600	125	TS4739
800	125	TS4740
1000	125	TS4741
1250	125	TS4742
1500	125	TS4743
2000	125	TS4744

H₂O Flow-Maxi R1 with single coil



Capacity litre	Insulation mm	Order code
600	125	TS4745
800	125	TS4746
1000	125	TS4747
1250	125	TS4748
1500	125	TS4749
2000	125	TS4750

H₂O Flow-Maxi R2 with dual coils



Capacity litre	Insulation mm	Order code
600	125	TS4751
800	125	TS4752
1000	125	TS4753
1250	125	TS4754
1500	125	TS4755
2000	125	TS4756

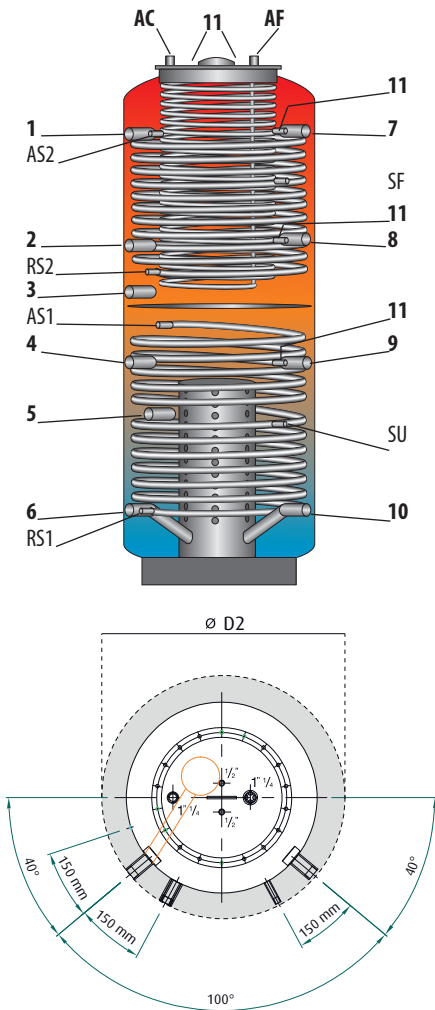
Hot water control equipment



Capacity litre	Insulation mm	Order code
Expansion vessel with fixed membrane 8 litre		EV4716
Mounting kit for expansion vessel		EV4717
Mains cold starter kit		EV4718
Hot water mixing kit		EV4723

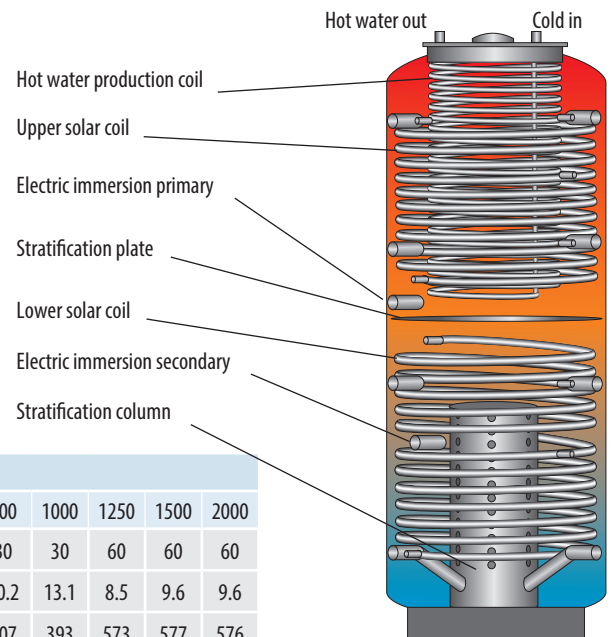
H₂O Flow-Maxi commercial hot water

Technical and dimensions



Connection options

Option	Description	DN	Port	Component	DN
1	Flow from wood boiler or alternative heating source	DN40	11	Sensor or temperature gauge	DN15
2	Flow from alternative heating source	DN40	12	Auto vent x 2	DN15
3	Electric immersion	DN40	AS	Flow from solar	DN40
4	Return to wood boiler or alternative heating source lower solar coil installed	DN40	RS	Return to solar or (RS1) DN15 sensor connection if no solar coil	DN40
5	Electric immersion secondary	DN40	D1	Diameter without insulation	
6	Primary return from heating system or return to boiler	DN40	D2	Diameter with insulation	
7	Flow from wood boiler or alternative heating source	DN40	SF	Upper solar coil temperature sensor position	DN15
8	Flow to heating system	DN40	SU	Lower solar coil temperature sensor position	DN15
9	Secondary return from heating system or alternative boiler return	DN40	AF	Potable (mains cold) water inlet	1 1/4"
10	Primary return from heating system or return to boiler	DN40	AC	Potable (hot) water outlet	1 1/4"



H₂O Flow Plus performance information - one off withdrawal

Withdrawal of hot domestic water 10 - 45°C		Type	600	800	1000	1250	1500	2000
Withdrawal of hot domestic water	Store temperature 70°C	Flow - l/min	30	30	30	60	60	60
Duration of flow		Time - min	8.5	10.2	13.1	8.5	9.6	9.6
Total withdrawal		Quantity - litres	255	307	393	573	577	576

H₂O Flow Plus performance information - continuous withdrawal with boiler input

Boiler input		Boiler flow temperature 70°C	kW	15	20	25	30	35	50
Continuous withdrawal 10-45°C			l/min	6.2	8.2	10.2	12.3	14.3	20.5

H₂O Flow-Maxi commercial hot water

Model Type	H ₂ O Flow-Maxi commercial hot water											Solar coils												
	1 & 7	2 & 8	3	4 & 9	5	6 & 10	RS1	AS1	RS2	AS2	ØD1 Diameter without insulation	ØD2 Diameter with standard insulation	Tank height	Height standard insulation	Max pressure (Bar)	Max temperature (°C)	Lower Coil m ²	Lower Coil capacity (L)	Upper Coil m ²	Upper Coil capacity (L)	Maximum pressure (Bar)	Weight (Kg)	Weight (Kg) H ₂ O Flow-MaxiR1	Weight (Kg) H ₂ O Flow-MaxiR2
600	1394	994	804	594	490	224	224	724	994	1344	700	950	1661	1695	3	95	1.8	11.9	1.2	7.9	10	172	196	213
800	1426	1026	866	626	547	256	256	8001	1026	1386	790	1040	1708	1745	3	95	2.4	15.9	1.8	11.9	10	185	227	253
1000	1720	1249	1040	844	635	300	300	970	1180	1720	790	1040	2063	2095	3	95	3.0	19.8	2.4	15.9	10	228	271	309
1250	1700	1239	1085	784	632	300	300	970	1160	1700	950	1200	2048	2095	3	95	3.0	19.8	2.4	15.9	10	257	299	334
1500	1750	1285	1128	900	740	325	325	1000	1240	1750	1000	1250	2176	2205	3	95	3.6	19.8	2.4	15.9	10	270	320	360
2000	2025	1489	1214	959	730	325	325	1105	1475	2025	1100	1350	2413	2445	3	95	4.2	23.7	2.8	19.8	10	357	403	444

H₂O Store bespoke accumulator

H₂O Store bespoke accumulator details and prices


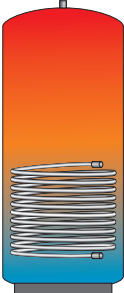
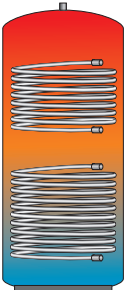
The accumulators of series H₂O Store bespoke can be manufactured to almost any requirement. Produced from high quality steel, R1 and R2 have internal coil/s for connecting to solar systems or other heating sources.

Options include:

- Multiple flow and return connections for multiple boiler and heating system connections
- Multiple flow and return connections for multiple heating system connections, i.e. act as a low loss header
- Internal stratification tubes in sizes 65mm-150mm up to 400kW
- Stratification columns up to 400kW heating circuits.
- External connections from DN40-DN150
- Hot water production up to 60 litres per minute
- Insulation options 100mm or 150mm thermal conductivity coefficient 0.039 W/mk. Elastic efficiency 44%. Free from HCFC



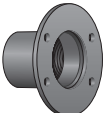

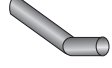
Step 1 - Select your basic accumulator

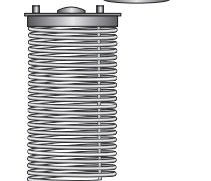
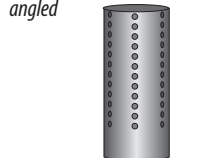
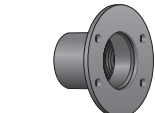
Store bespoke	Model Type	Order code 100mm insulation	£ ex VAT	Order code 125mm insulation
	600	TS4901	896.00	TS4938
	800	TS4902	958.00	TS4939
	1000	TS4903	1,076.00	TS4940
	1250	TS4904	1,153.00	TS4941
	1500	TS4905	1,202.00	TS4942
	2000	TS4906	1,454.00	TS4943
	2500	TS4907	2,066.00	TS4944
	3000	TS4908	2,516.00	TS4945
	3050	TS4909	2,719.00	TS4946
	4000	TS4910	3,099.00	TS4947
	4050	TS4911	3,358.00	TS4948
	5000	TS4912	3,614.00	TS4949
	6000	TS4913	5,423.00	TS4950
	8000	TS4914	7,398.00	TS4951
	10000	TS4915	9,248.00	TS4952
H₂O Store bespoke - R1 with single coil				
	600	TS4916	1,017.00	TS4953
	800	TS4917	1,105.00	TS4954
	1000	TS4918	1,259.00	TS4955
	1250	TS4919	1,350.00	TS4956
	1500	TS4920	1,426.00	TS4957
	2000	TS4921	1,713.00	TS4958
	2500	TS4922	2,375.00	TS4959
	3000	TS4923	2,775.00	TS4960
	3050	TS4924	2,978.00	TS4961
	4000	TS4925	3,407.00	TS4962
	4050	TS4926	3,666.00	TS4963
	5000	TS4927	3,984.00	TS4964
H₂O Store bespoke - R2 with dual coil				
	600	TS4928	1,073.00	TS4965
	800	TS4929	1,176.00	TS4966
	1000	TS4930	1,379.00	TS4967
	1250	TS4931	1,470.00	TS4968
	1500	TS4932	1,556.00	TS4969
	2000	TS4933	1,853.00	TS4970
	2500	TS4934	2,555.00	TS4971
	3000	TS4935	2,925.00	TS4972
	4000	TS4936	3,597.00	TS4973
	5000	TS4937	4,213.00	TS4974

H₂O Store bespoke accumulator

Option prices, technical and dimensions

Step 2 - Select connections type, stratification column, stratification tube, plate or hot water production you require

Accessories H ₂ O Store Bespoke		Order code	
	DN15 connection for temperature or Sensor location	TSS15	
	Flange connection 50mm. Accumulator supplied with PN6 flange fitted	TSF50	
	Flange connection 65mm. Accumulator supplied with PN6 flange fitted	TSF65	
	Flange connection 80mm. Accumulator supplied with PN6 flange fitted	TSF80	
	Flange connection 100mm. Accumulator supplied with PN6 flange fitted	TSF100	
	Flange connection 125mm. Accumulator supplied with PN6 flange fitted	TSF125	
	Flange connection 150mm. Accumulator supplied with PN6 flange fitted	TSF150	
		Straight connector 40mm	TSS40
		Straight connector 50mm	TSS50
		Straight connector 65mm	TSS65
Straight connector 80mm		TSS80	
Straight connector 100mm		TSS100	
		Flow and return stratification tube 65mm, up to 80kW	TSN65
		Flow and return stratification tube 100mm, up to 200kW	TSN100
		Flow and return stratification tube 150mm, up to 400kW	TSN150
		Stratification column suitable up to 80kW	TSC340
		Stratification column suitable up to 200kW	TSC500
	Stratification column suitable up to 400kW	TSC750	
	Stratification plate 600-2,500 litre, stratification split between top and bottom of accumulator	TSP500	
	Stratification plate 3,000-10,000 litre, stratification split between top and bottom of accumulator	TSP750	
	Hot water production coil, flanged top mounted 9.98m ²	TSW500	
	Hot water production coil, flanged top mounted 11.5m ²	TSW750	



For hot water production coil capacity information see H₂O Flow Maxi accumulator

Step 3 - Few rules of selection. All stratification tubes must be the same size. Up to 4 stratification tubes can be fitted at the top and/or bottom. Models 4050 and above can have 6 fitted

H ₂ O Bespoke accumulator information						Additional coil information								
Model Type	ØD1 Diameter without insulation	ØD2 Diameter with standard insulation	Tank height	Height with standard insulation	Maximum operating pressure	Maximum operating temperature (°C)	Lower Coil m ²	Lower Coil capacity (L)	Upper Coil m ²	Upper Coil capacity (L)	Maximum operating pressure	Weight (Kg) H ₂ O Store	Weight (Kg) H ₂ O Store R1	Weight (Kg) H ₂ O Store R2
1000	790	990	2041	2090	3 bar	95	3.0	19.8	2.4	15.9	10 bar	114	121	156
1250	950	1150	2017	2060		95	3.0	19.8	2.4	15.9		146	153	189
1500	1000	1200	2152	2200		95	3.0	19.8	2.4	15.9		162	169	210
2000	1100	1300	2377	2420		95	3.6	23.7	3.0	19.8		225	232	278
2500	1200	1400	2443	2500		95	3.6	23.7	3.0	19.8		252	349	308
3000	1250	1450	2635	2700		95	4.2	27.7	3.0	19.8		280	287	343
3050	1400	1600	2318	2378		95	5.0	33.0	n/a	n/a		290	n/a	353
4000	1400	1600	2818	2880		95	5.0	33.0	3.0	19.8		431	538	498
4050	1600	1800	2380	2440		95	6.0	39.6	n/a	n/a		441		508
5000	1600	1800	2880	2950		95	6.0	39.6	3.6	23.7		504	511	585
6000	1600	1800	3117	3177	95					605				
8000	1600	1800	4117	3177	95									
10000	1800	2000	4504	4550	95									

Larger models and additional technical data available on request

