

Torrent MultiFuelStore

Open vented thermal store providing heating and mains pressure hot water

S U P P L I E R S T O T H E M E R C H A N T T R A D E F O R O V E R 3 5 Y E A R S



**Mains pressure hot water with
NO DISCHARGE REQUIREMENT**

This product overcomes Part G Building Regulation discharge requirements for unvented cylinders

Torrent Cylinders

The ultimate alternative energy cylinder

Why use a thermal store

Alternative energy fuel sources are typically low grade, inherently unpredictable and are often available in plentiful supply but not when the heat energy is needed! A thermal store provides the means to harness the energy when it is available for later conversion into both hot water AND heating.

Being open vented, they provide a simple and inherently safe way to produce high-performance mains pressure hot water. So the householder can enjoy the comfort and luxury of a mains pressure system produced from alternative energy sources.

The alternative energy feeds into the thermal store which is also the water that circulates around the heating system. This means that the energy available from solar panels or a wood burning stove, for example, can be used to provide energy into the heating circuit to decrease the use of fossil fuel based boilers, and hence reduce household running costs.

It is very problematic and inherently unsafe to connect wood burning stoves or other uncontrolled heat sources to an unvented cylinder, and not easily possible to combine alternative energy heat sources to provide energy to the heating circuit, hence the unique advantages of a thermal store.



The heart of an alternative energy system

The Torrent MultiFuelStore is the ideal product to use as the heart of an alternative energy system as it will take energy input not only from a conventional boiler but also from a wide variety of alternative energy sources, including but not limited to:

- solar panels
- wood burning stoves and other uncontrolled heat sources
- ground or air source heat pumps
- electricity from renewable or low carbon sources

If the system is configured appropriately the heat from the alternative energy source will be available for both hot water AND heating. This is only possible with a thermal store such as the Torrent and is not possible with an unvented cylinder where you will only get an alternative energy contribution to the hot water.

In-built upgrade potential

The Torrent range comes with a full array of tappings as standard so that, for example, a wood burning stove or solar panels can be added as an upgrade to the property at a later stage and the hot water cylinder will be ready to work with it.

Environmental credentials throughout

The Torrent range is insulated to a very high standard with our revolutionary Envirofoam insulation which has an Ozone Depletion potential (ODP) of zero and an industry leading low Global Warming Potential of 0.7. The insulation incorporates Polyol which is derived from Rapeseed oil - a fully renewable resource. The 350 and 450 models are supplied in a blue flexible jacket and currently use Rockwool insulation which is a high performance insulation and also HCFC free.

The Torrent range is manufactured from copper, a fully recyclable resource, and made at one of our nationwide network of super depot manufacturing units local to the customer, meaning we are not shipping a heavy cylinder full of fresh air half way around the country! We think this makes perfect environmental sense and makes the Torrent the lowest carbon-footprint alternative energy cylinder available in the UK. They are also fully recyclable at the end of their



extensive working life. In addition, where a copper cylinder is being replaced as part of the installation of a Torrent we are willing to take it back and provide a credit for the scrap copper which will then be recycled.

Legionella protection by design

Because the Torrent is a thermal store and the domestic hot water is heated via a heat exchanger (no stored domestic hot water) it has the added advantage of not needing any additional heating for legionella protection, which in a conventional or unvented cylinder would have to be provided by carbon-intensive electricity, which undermines the environmental benefits of an alternative energy installation, as well as significantly increasing the running costs!

Simple installation

As each product in the Torrent range is open vented there is no requirement for an unvented pressure and temperature relief discharge and the installer does not need to be specially qualified to fit it.

Building Regulations compliance

The Torrent range is Building Regulations Part L1 compliant for both new build and refurbishment projects. It is also fully compliant with the Hot Water Association (HWA) Performance Specification for Thermal Stores.





Water main requirements

The Torrent is a mains pressure hot water systems, therefore it is important to check and ensure that the performance of the incoming mains cold water supply is adequate before choosing to use it. To achieve the best performance it is recommended that a dynamic pressure of between 2 and 4 bar is available at the appliance although it will work adequately at pressures as low as 1.5 bar. A minimum flow rate of 30 litres/minute is recommended for small properties although in properties with more than 1 bathroom the required flow rate should be calculated using the method set out in British Standard BS6700 or other suitable design guide.

Torrent models are designed to be fed directly from the mains. They fulfil the requirements of Water Regulations and therefore do not require a check valve to be fitted to the supply pipe.

As with any other hot water appliance or combi-boiler the Building Regulation requirements for a suitable scale inhibitor to be fitted on the cold supply to the appliance if the hardness levels exceed 200ppm (mg/l) apply to the Torrent. If the hardness levels exceed 300ppm (mg/l) an optional phosphate type scale inhibitor can be supplied along with the appliance.

Product selection

The model selection guide shown opposite will allow you to choose the model type that is suitable for the heating system and energy sources being used. Once you have done this refer to the section in this brochure dealing with each model type and also the installation manual for typical details including some system arrangement diagrams and the selection guide for the size of appliance you will need for a range of property types.

Although details of the most common energy supply and heating system options are shown there are so many possible combinations that it is not possible to show them all for each model type. If you have any queries we will be pleased to comment on any arrangements you are considering if you forward a detailed diagram outlining your proposals.

Full technical details including typical wiring diagrams are provided in the Torrent Design, Installation and Servicing Instructions. These must be read in conjunction with this guide and all installations must comply fully with their requirements as well as the appropriate Building regulations.

Torrent Model Selection Guide						
	Primary Energy Source	Immersion Heaters ⁵	Solar Thermal System	Solid Fuel	Primary Heating System Source ¹	Secondary / Underfloor Heating System Source
Torrent MultiFuelStore OV	Open vented boiler or immersion heaters	2 or 3	No	Yes	Store and / or boiler	n/a
Torrent MultiFuelStore SP	Sealed primary boiler	1	No	Yes	Boiler only	Store ^{2,4}
Torrent MultiFuelStore SOL	Open vented and / or sealed primary boiler	1	Yes	Yes	Store and / or boiler	n/a
Torrent MultiFuelStore HP	Heat pump	1 or 2	No	Yes	Store and / or heat pump ³	n/a
Torrent MultiFuelStore HP SOL	Heat pump	1 or 2	Yes	Yes	Store and / or heat pump ³	n/a

Please note the F&E tank does not come as standard with the unit, but a 16 litre model (including 10 litre expansion) is available as an optional extra. Please specify the quantity required when placing your order.

Notes:

- 1 The Primary Energy Source must be sized to heat the thermal store and the heating system.
- 2 The Auxiliary Central Heating System Output must be no greater than the Auxiliary Energy Sources Input.
- 3 The Heat Pump supplies the store with water at a lower temperature, therefore the radiators must be sized to account for this. Under-floor heating is the ideal Central Heating System when using a Heat Pump as the primary energy source.
- 4 If the Sealed Primary Coil is used for Under-floor heating, the heat output of the Under-floor heating is limited by the efficiency of the Coil and the Auxiliary Energy Source input, which in addition, must be able to keep the Store hot enough for domestic hot water purposes.
- 5 Immersion heaters on the OV models may be used as the main heat source and will heat the whole cylinder. On all other Torrent models they are back up heat sources or can be used to heat the store if a low-carbon electricity source is available.

General

- All torrent cylinders are Open vented and inherently safe.
- Solid fuel heat sources must be fitted with a suitable heat leak radiator and control system to prevent overheating.
- The Solar Thermal heat exchanger maximum working pressure is 6 bar.
- For full details refer to the relevant Design Installation and Servicing instructions.
- Main central heating can include open vented radiators and Under-floor heating.
- It is very important that the F&E tank is correctly sized to take account of the expansion that will occur in the heating circuit, and also in the volume of water held in the thermal store and boiler circuit.

The complete range of Torrent cylinder options is explained in this brochure:

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Torrent MultiFuelStore OV

Open vented thermal store providing open vented heating and mains pressure hot water

The Torrent MultiFuelStore OV utilises an open vented boiler and / or direct electric immersion heaters as its primary energy source. It comes fitted with tappings for a woodburning or solid fuel boiler as standard, which can be blanked off if not required at the time of installation.

One of the benefits of the open vented boiler configuration is that the whole output of the boiler is available to the thermal store, unlike the indirect Sealed Primary (SP) version where the output from the boiler is limited by the heat exchanger. This will provide an improvement in the operational efficiency of the boiler, reducing the primary energy usage and running costs.

Hot water and heating

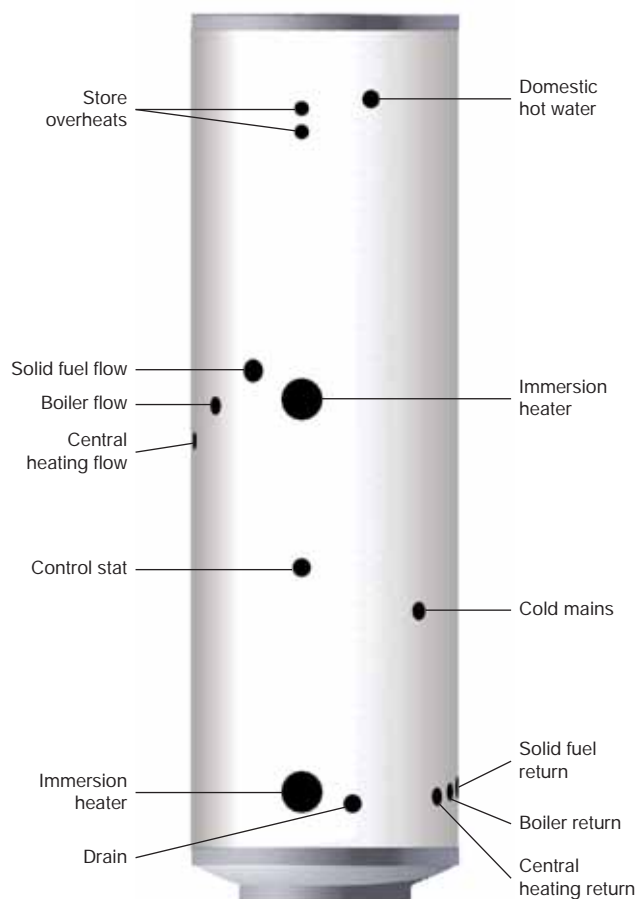
The Torrent MultiFuelStore OV provides high-performance mains pressure hot water. The heat energy provided from the primary heat source and / or solid fuel input is circulated from

the store to the central heating circuit, allowing rapid heat-up of a radiator system.

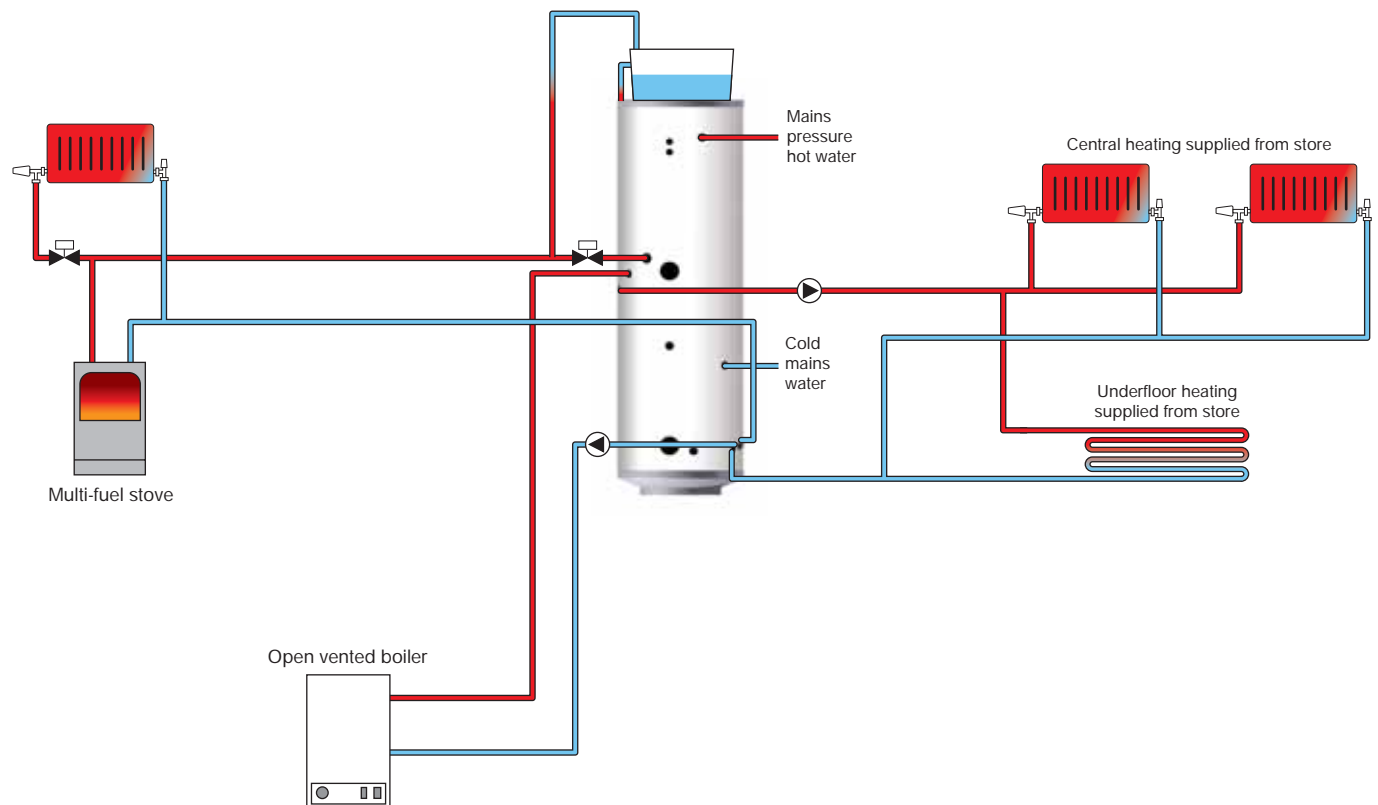
Electric-only option

In situations where no gas or solid fuel source is available the Torrent MultiFuelStore OV can be used exclusively from the two 3kW electric immersion elements which will provide both hot water and heating for the property. The obvious application is apartments where no gas main is available but this could also be appropriate where electricity is available from a renewable or low carbon source.

If connected to the standard grid then the thermal store is the perfect solution to maximise useage of an off peak tariff where arrangements should be made to power the lower immersion element in order to minimise the running costs.



Torrent MultiFuelStore OV showing how the cylinder can utilise numerous heat sources at the same time



Torrent MultiFuelStore OV Technical Specification						
Description		T144-OV	T170-OV	T210-OV	T250-OV	T350-OV
Unit height	mm	1600	1680	1800	1890	1480
Unit diameter	mm	520	520	570	570	720
Total volume (nominal)	litres	166	176	240	266	413
Max. hot water flow rate	litres	15	18	18	25	25
Maximum dwelling type	Bath	1	1	2	2	3
	Shower room	-	1	1	2	2
	Bed	1 - 2	2 - 4	3 - 4	3 - 5	3 - 5

Notes:

- Additional height for F&E tank will need to be allowed if it is to be sited in the same cupboard
- Vent pipes shown through the side of the feed and expansion tank may not be suitable for all systems. Installers must check suitability.
- The standard open vented store relies on an F&E (feed & expansion) tank suitably sited above the highest radiator point to provide sufficient head for the system.
- The feed and expansion tank must be sized to take the water expansion of the whole system (ie. solid fuel boiler, cylinder, open flue boiler and auxiliary heating).

Torrent MultiFuelStore SP

Open vented thermal store providing mains pressure hot water with a sealed heating system

The Torrent MultiFuelStore SP utilises a sealed system boiler as its primary energy source. It comes fitted with tapings for a woodburning or solid fuel boiler as standard, which can be blanked off if not required at the time of installation.

Hot water and heating

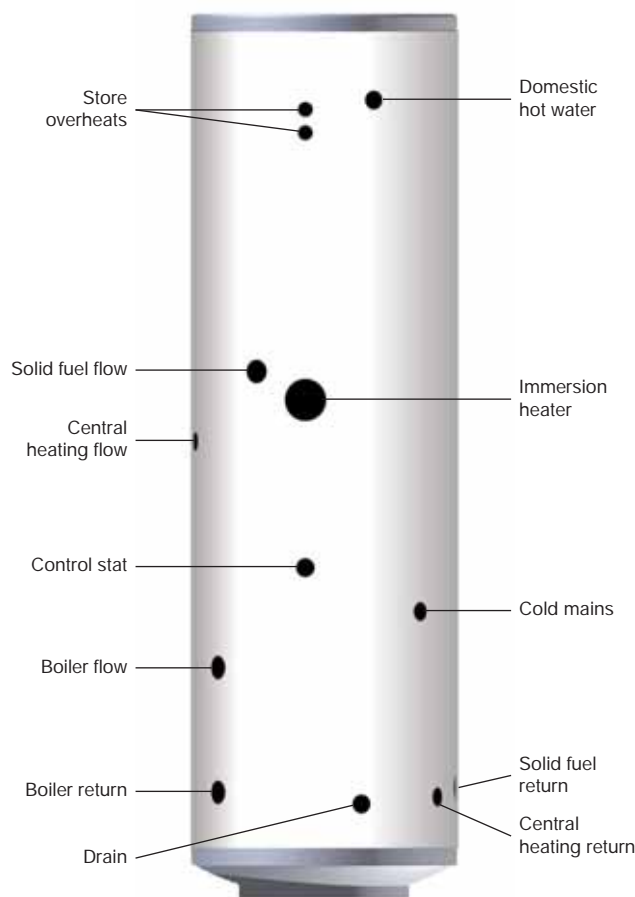
The Torrent MultiFuelStore SP provides high-performance mains pressure hot water.

The central heating circuit is normally supplied directly from the boiler although an auxiliary heating circuit can be connected from the store in which case the solid fuel source will provide energy to the auxiliary heating circuit. Obviously, the energy output that can be provided by the auxiliary heating circuit will be limited to the energy input from the solid fuel appliance.

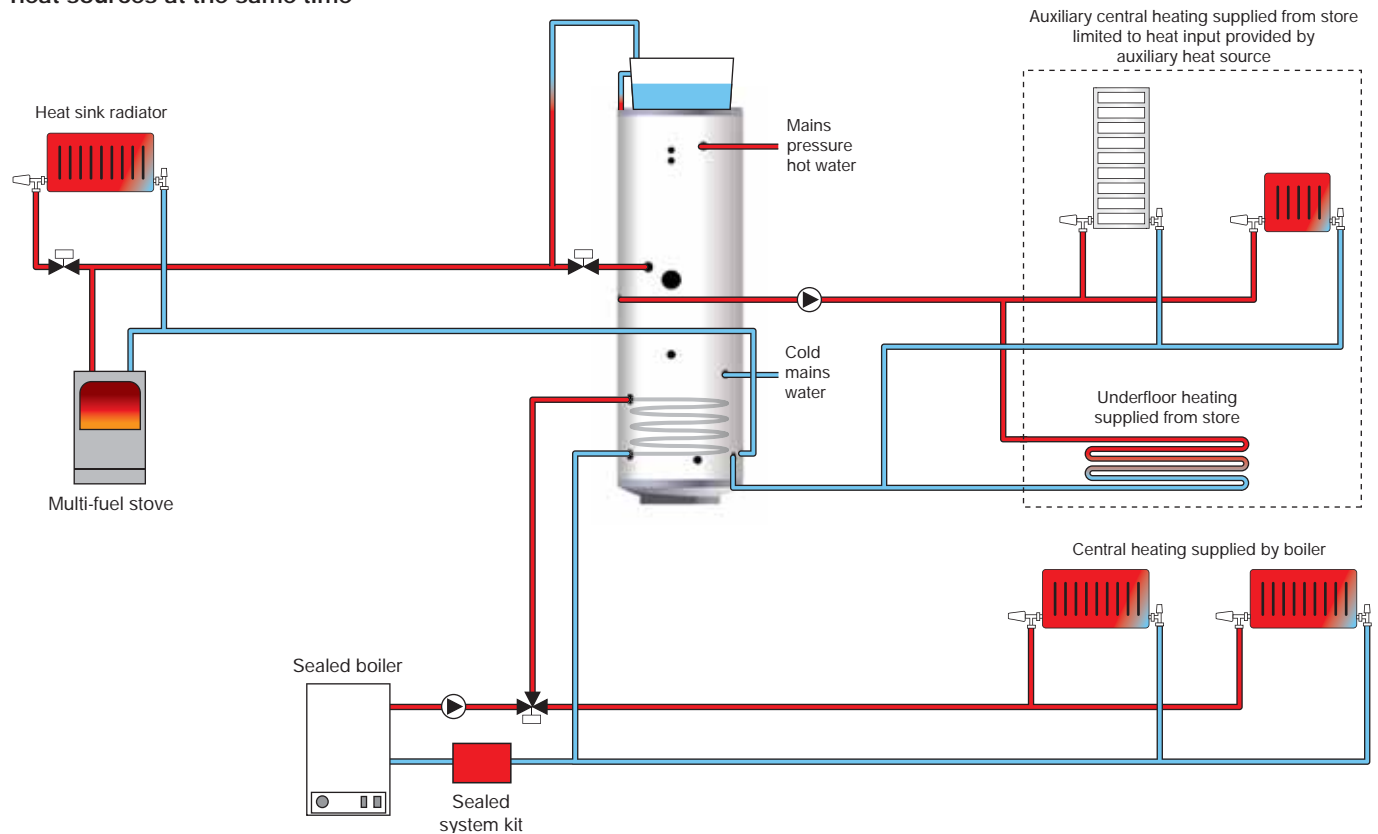
This sealed primary (SP) model permits the use of a smaller feed and expansion tank because the main central heating circuit does not need to be catered for. This can make positioning the F&E tank more straightforward.

Electric back-up

An immersion element is provided and it is normally envisaged that this will be used as an emergency electric back-up for hot water and to provide emergency energy to the auxiliary heating circuit. However, if a low carbon or renewable electricity source is available then this could be connected to the immersion element to provide heat input to the thermal store, decreasing the use of the fossil fuel boiler and hence reducing running costs.



Torrent MultiFuelStore SP showing how the cylinder can utilise numerous heat sources at the same time



Torrent MultiFuelStore SP Technical Specification						
Description		T144-SP	T170-SP	T210-SP	T250-SP	T350-SP
Unit height	mm	1600	1680	1800	1890	1630
Unit diameter	mm	520	520	570	570	720
Total volume (nominal)	litres	165	175	237	252	408
Max. hot water flow rate	litres	15	18	18	25	25
Maximum dwelling type	Bath	1	1	2	2	3
	Shower room	-	1	1	2	2
	Bed	1 - 2	2 - 4	3 - 4	3 - 5	3 - 5

Notes:

- Additional height for F&E tank will need to be allowed if it is to be sited in the same cupboard
- Vent pipes shown through the side of the feed and expansion tank may not be suitable for all systems. Installers must check suitability.
- The feed and expansion tank must be sized to take the water expansion of the whole system (ie. solid fuel boiler, cylinder, open flue boiler and auxiliary heating).

Torrent MultiFuelStore SOL

Solar compatible open vented thermal store providing mains pressure hot water with a sealed heating system

The Torrent MultiFuelStore SOL utilises either a sealed system boiler and / or an open vented boiler as its primary energy source. It also has a high-efficiency solar coil to allow the homeowner to benefit from a wide variety of alternative energy inputs. The cylinder comes fitted with tapings for a woodburning or solid fuel boiler as standard, which can be blanked off if not required at the time of installation.

Hot water and heating

The Torrent MultiFuelStore SOL provides high-performance mains pressure hot water.

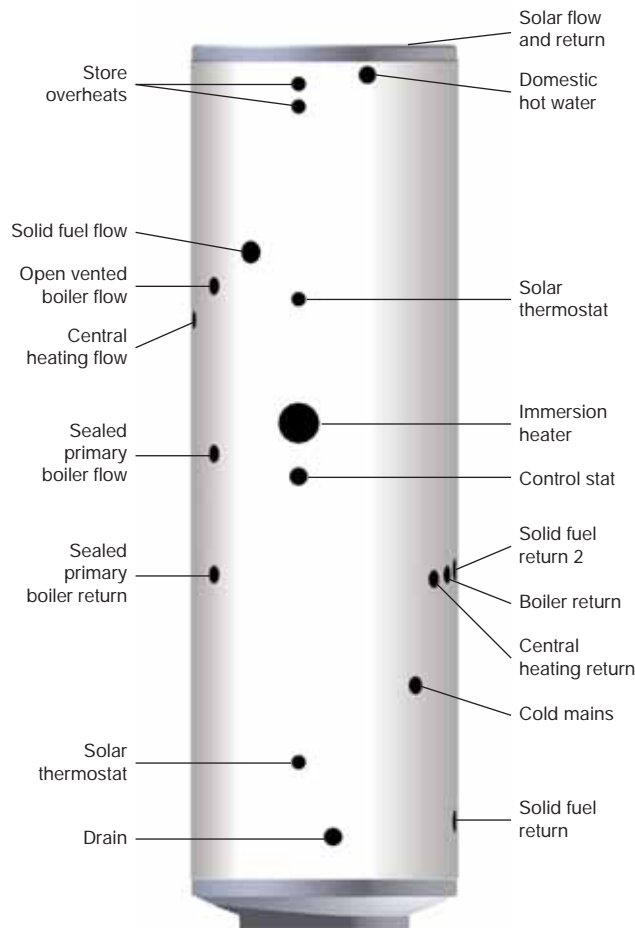
The central heating circuit can be supplied directly from a sealed system boiler although an auxiliary heating circuit can be connected from the store in which case both the solar and solid fuel energy will also provide an input to the auxiliary heating circuit.

Alternatively, an open vented boiler can be used to directly heat the store so that the energy will be available for both hot water and auxiliary central heating circuit.

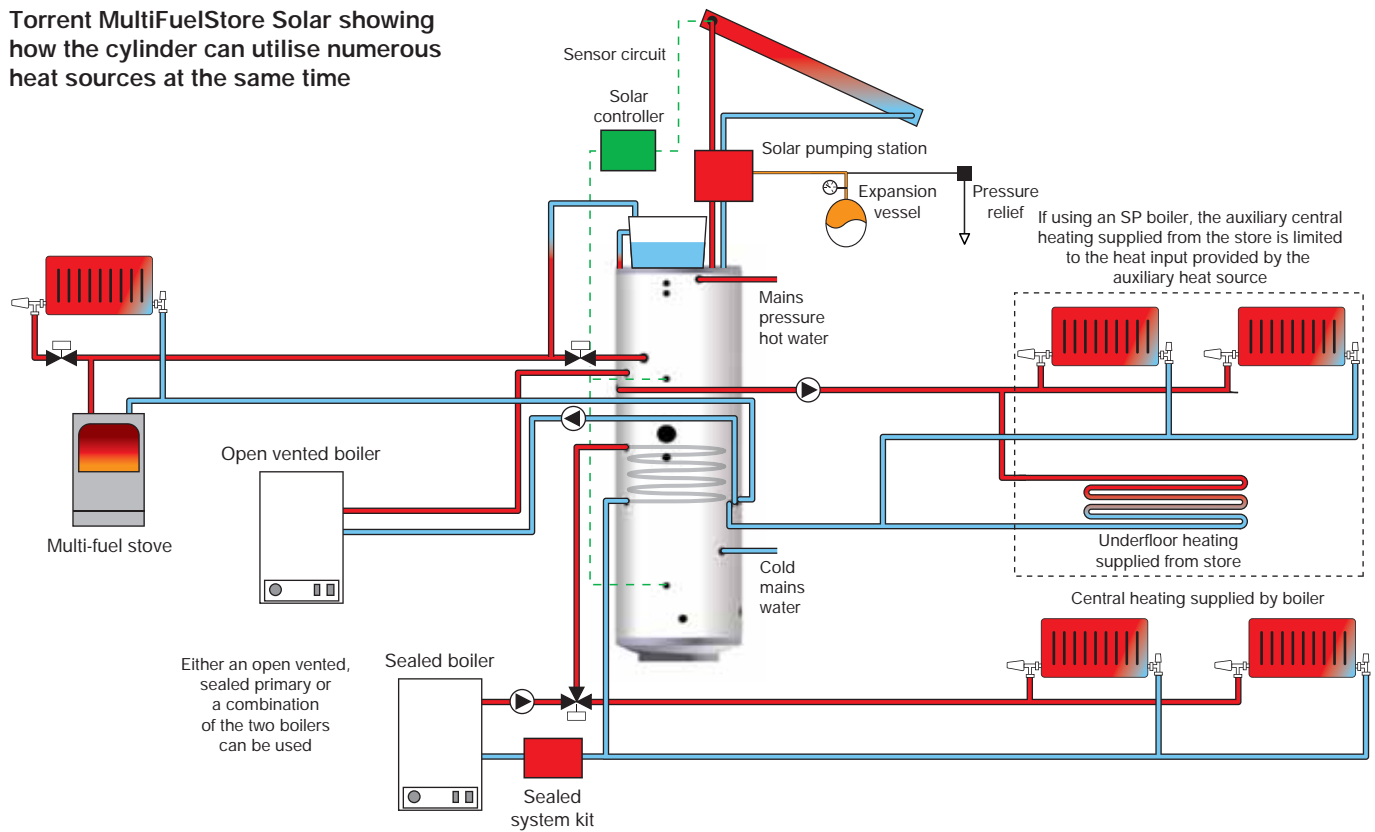
The cylinder comes with two return connections for solid fuel and woodburning stoves to enable the homeowner to have an aga running 24 hours a day but still retaining the dedicated solar volume.

Electric back-up

An immersion element is provided and it is normally envisaged that this will be used as an emergency electric back-up for hot water and to provide emergency energy to the auxiliary heating circuit. However, if a low carbon or renewable electricity source is available then this could be connected to the immersion element to provide heat input to the thermal store, decreasing the use of the fossil fuel boiler and hence reducing running costs.



Torrent MultiFuelStore Solar showing how the cylinder can utilise numerous heat sources at the same time



Torrent MultiFuelStore Solar Technical Specification					
Description		T210-SOL	T250-SOL	T350-SOL	T450-SOL
Unit height	mm	1930	2060	1630	2000
Unit diameter	mm	520	570	720	720
Total volume (nominal)	litres	201	277	409	525
Dedicated solar volume	litres	76	95	125	153
Max. solar collector area ¹	m ²	3.04	3.80	5.00	6.12
Max. hot water flow rate	litres/minute	18	25	25	35
Maximum dwelling type	Bath	1	1	2	3
	Shower room	1	2	2	2
	Bed	2 - 4	2 - 4	3 - 5	4 - 6

Notes:

1 To comply with the Building Regulations ADL1 Domestic Heating Compliance Guide.

- Additional height for F&E tank will need to be allowed if it is to be sited in the same cupboard.
- Vent pipes shown through the side of the feed and expansion tank may not be suitable for all systems. Installers must check suitability.
- The standard open vented store relies on an F&E (feed & expansion) tank suitably sited above the highest radiator point to provide sufficient head for the system. As the domestic hot water is at mains pressure, the Torrent MultiFuelStore Solar itself can be sited anywhere in the property.
- Provision is also made within the design for a sealed heating/boiler circuit with the heat exchanger provided which would then operate as a conventional cylinder. Although this would reduce the potential for utilising the solar energy in the HEATING CIRCUIT, it would mean that both the Torrent and the F&E tank can then be sited anywhere in the property, as the F&E is only being used to fill the store with water.
- The feed and expansion tank must be sized to take the water expansion of the whole system (ie. solid fuel boiler, cylinder, open flue boiler and auxiliary heating).

Torrent MultiFuelStore HP

Thermal store for use with a heat pump to provide heating and mains pressure hot water

Rather than operating with a conventional carbon fuel boiler as the main energy source this appliance has been designed to operate with an air or ground source heat pump. However it still provides mains pressure hot water from an open vented thermal store and enjoys all the other benefits outlined previously for the other Torrent MultiFuelStore appliances.

The main difference when using a heat pump compared to a conventional boiler is the lower temperatures generated by the heat pump. This causes problems in conventional storage/unvented cylinders with low storage temperatures. This can lead to health problems such as Legionella and unacceptable hot water delivery temperatures, which are not helped by the further heat losses that occur due to the need for a primary heat exchanger/coil.

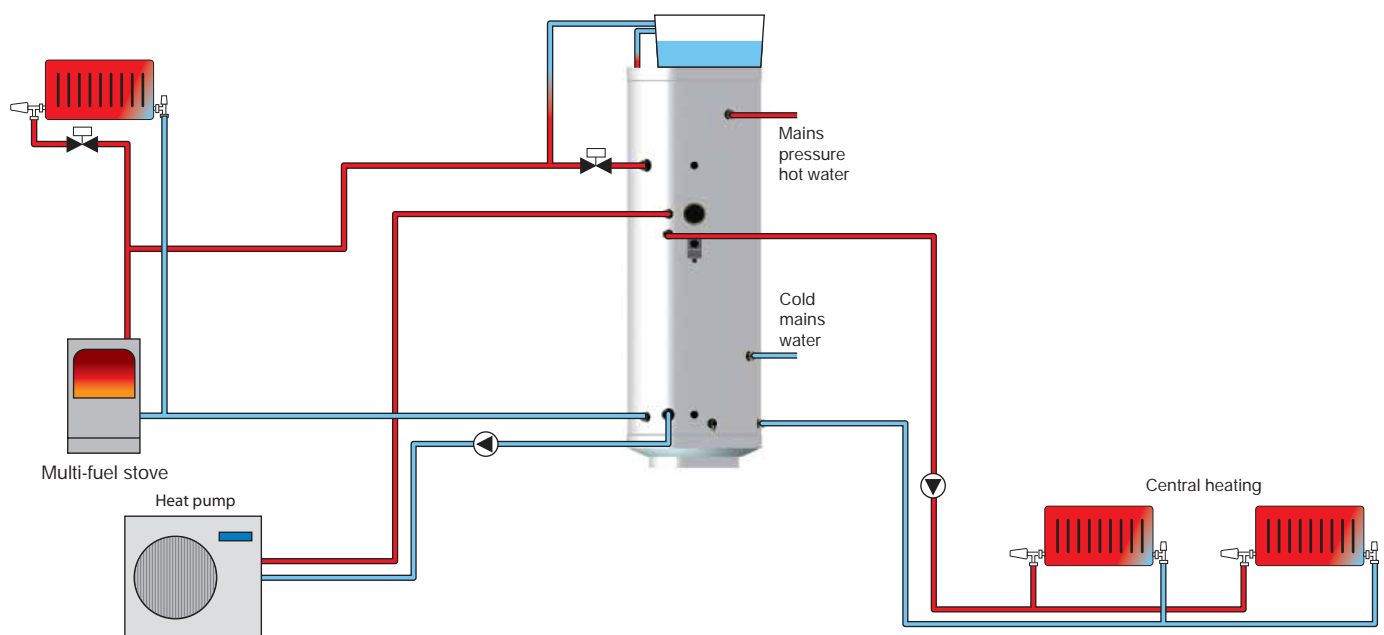
For these reasons it is necessary to constantly boost the hot water temperature using electricity to meet the Regulations regarding the quality and suitability of the hot water being

delivered. With a Torrent MultiFuelStore there are no health issues because the hot water is heated indirectly and the lack of a heat exchanger/coil for the heat pump means that the full output is delivered directly to the thermal store. Both of which ensure that less boost is required to achieve an acceptable hot water temperature at the tap.

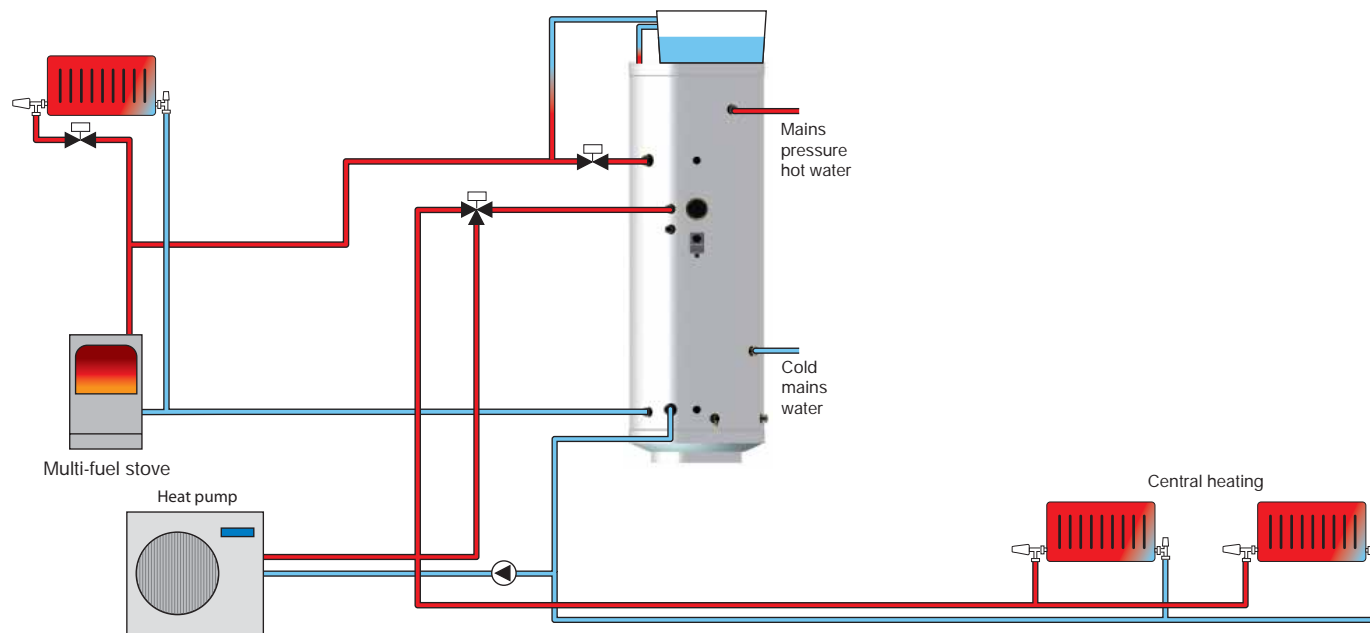
In fact, the ease with which renewable energy systems, such as wood burning stoves, can be connected to a Torrent thermal store means that these are often chosen to provide the boost rather than electricity. Connections for this are provided as standard and can be blanked off if not required at the time of installation.

The low temperatures delivered by the heat pump also mean that the radiators need to be sized to take account of this or an underfloor heating system that operates at the temperatures that can be achieved by the Heat Pump should be used.

Torrent MultiFuelStore HP system configuration with optional wood burning stove and central heating supplied from the thermal store



Torrent MultiFuelStore HP system configuration with optional wood burning stove and central heating supplied directly from the heat pump



Torrent HP Technical Specification						
Description		THP180	THP210	THP250	THP300	THP450
Nominal volume (litres)		191	224	250	300	450
Overall height		1440	1675	1600	1800	1800
Overall diameter		555	555	655	655	855
Approx weight (empty - kg)		54	58	63	67	77
Approx weight (full - kg)		245	282	313	367	527
Heat loss (kWhr/24 hours)		1.82	2.08	2.25	2.41	2.85
Flow rate (litres/min)		15	15	23	23	30
Hot water draw off volume (store temp)	55 °C	90	100	118	136	193
	60 °C	130	140	165	195	275
	65 °C	155	180	210	240	350
Size of heat pump heat exchanger		There is no heat exchanger in a thermal store so there are no restrictions on output				
Dwelling (Bedrooms)		2-3	2-3	3-4	3-4	4-5
Bathrooms		1	1	2	2	3
En-Suite shower		1	2	1	2	2

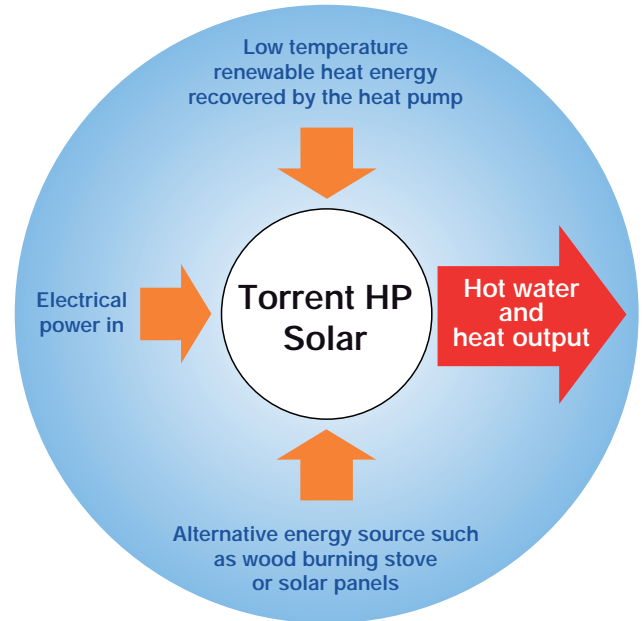
Notes:

- The suggested model sizes in the selection chart are based on a store temperature of 65°C. If the intention is that the heat pump will be used to provide the majority of the hot water with minimum boost from another heat source then consideration should be given to choosing a larger model of Torrent MultiFuelStore HP appliance. See table 1b in the Design Installation and Servicing Instructions for equivalent volumes at different charge temperatures.
- If the immersion heater is to be used as the hot water boost a suitable control system should be installed to ensure that the heat pump has fully charged the appliance before the boost immersion heater is allowed to operate. This will ensure the most efficient and cost effective use of the system.
- Additional height for F&E tank will need to be allowed if it is to be sited in the same cupboard.
- The feed and expansion tank must be sized to take the water expansion of the whole system (ie. solid fuel boiler, cylinder, open flue boiler and auxiliary heating).

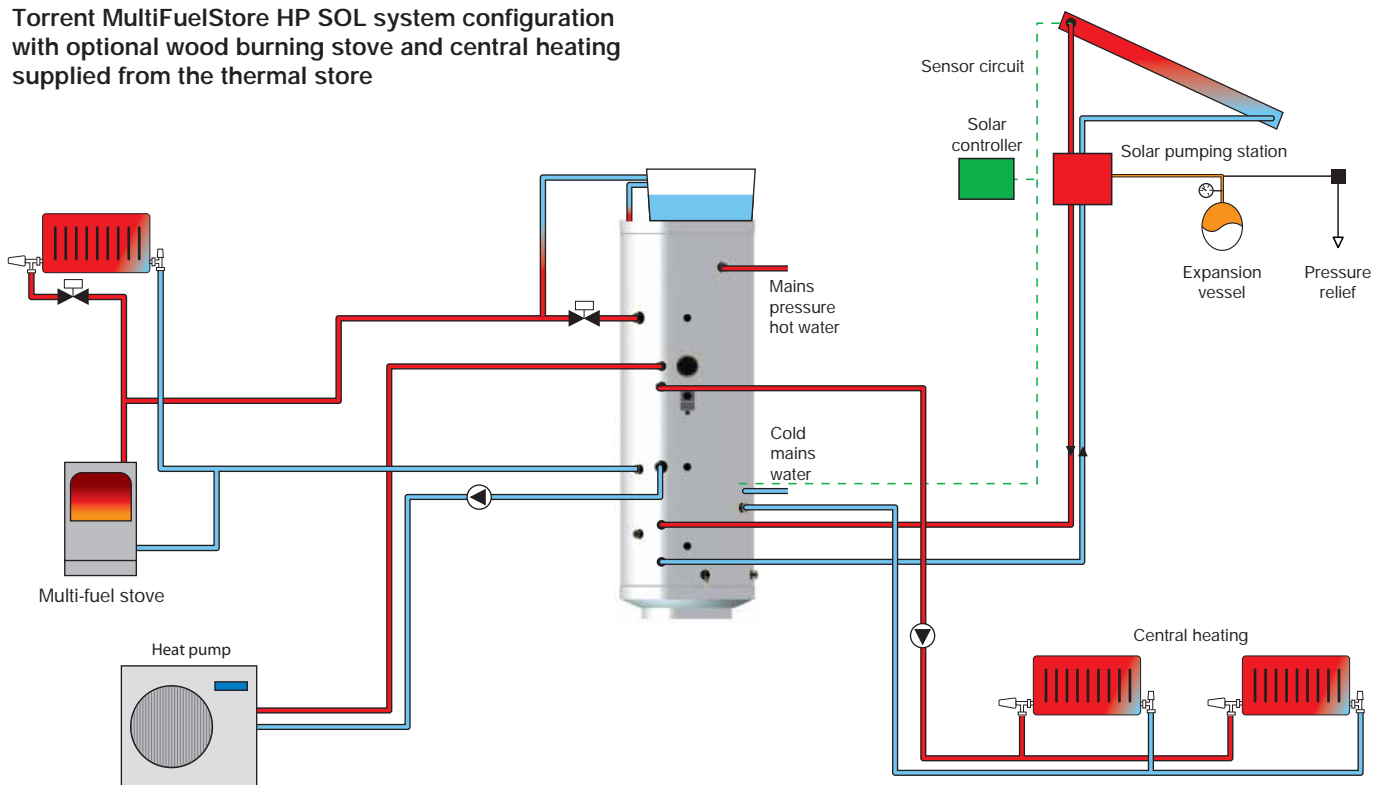
Torrent MultiFuelStore HP SOL

Thermal store for utilising both heat pump and solar technology to provide heating and mains pressure hot water

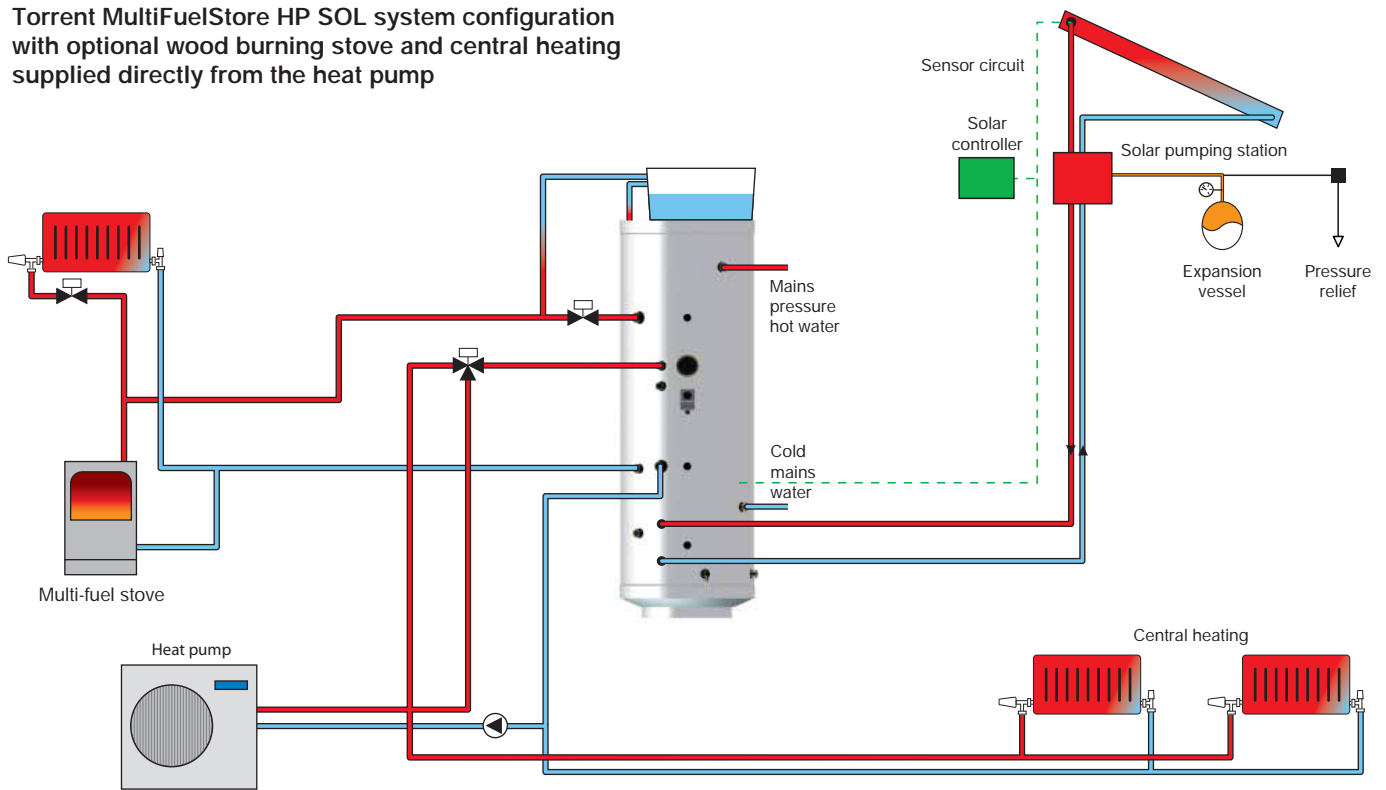
Combining all the benefits of the Torrent MultiFuelStore HP, the Torrent MultiFuelStore HP SOL allows the combination of heat pump, solar energy and wood burning stove in the same system, making what must be the ultimate alternative energy cylinder.



Torrent MultiFuelStore HP SOL system configuration with optional wood burning stove and central heating supplied from the thermal store



Torrent MultiFuelStore HP SOL system configuration with optional wood burning stove and central heating supplied directly from the heat pump



Torrent MultiFuelStore HP SOL Technical Specification					
Description	THP180 SOL	THP210 SOL	THP250 SOL	THP300 SOL	THP450 SOL
Nominal volume (litres)	171	223	250	300	450
Dedicated solar volume	62	72	80	95	140
Overall height	1650	1675	1600	1800	1800
Overall diameter	555	555	655	655	855
Approx weight (empty - kg)	62	63	66	71	81
Approx weight (full - kg)	233	286	316	371	531
Heat loss (kWhr/24 hours)	1.82	2.08	2.25	2.41	2.85
Flow rate (litres/min)	15	15	15	15	23
Hot water draw off volume (store temp)	55 °C	70	90	100	118
	60 °C	100	130	140	165
	65 °C	125	155	180	210
Size of heat pump heat exchanger	There is no heat exchanger in a thermal store so there are no restrictions on output				
Total surface area of solar heat exchanger	1.31	1.31	1.74	1.74	2.18
Max. dwelling floor area (m ²) ¹	49	60	90	105	200
Max. solar collector area (m ²) ¹	2.4	2.9	3.2	3.8	5.6
Dwelling (Bedrooms)	1-2	2-3	2-3	3-4	3-4
Bathrooms	1	1	1	2	2
En-Suite shower	0	1	2	1	2

Notes:

1 To comply with the Building Regulations ADL1 Domestic Heating Compliance Guide

- The suggested model sizes in the selection chart are based on a store temperature of 65°C. If the intention is that the heat pump will be used to provide the majority of the hot water with minimum boost from another heat source then consideration should be given to choosing a larger model of Torrent MultiFuelStore HP SOL appliance. See table 1b in the Design Installation and Servicing Instructions for equivalent volumes at different charge temperatures.
- If the immersion heater is to be used as the hot water boost a suitable control system should be installed to ensure that the heat pump has fully charged the appliance before the boost immersion heater is allowed to operate. This will ensure the most efficient and cost effective use of the system.
- Additional height for F&E tank will need to be allowed if it is to be sited in the same cupboard.
- The feed and expansion tank must be sized to take the water expansion of the whole system (ie. solid fuel boiler, cylinder, open flue boiler and auxiliary heating).

UK Super Depot Infrastructure

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Stainless Steel Manufacturing Site

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Depot Manager: John Parton
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Gledhill Building Products Limited

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Gledhill Building Products produce cylinders for use with a wide range of heat sources including;

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Air source heat pumps
Wood burning stoves

For further information of Gledhill products can be found on the internet at www.gledhill.net



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under an ISO 9001:2008
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by BSI



Due to a programme of continuous improvement Gledhill Building Products reserve the right to modify products without prior notice. It is advisable to check the product technical detail by using the latest design and installation manuals available from our technical support team or on our website.