



**Tempest Stainless Heat Pump with Integral  
Buffer™**  
**Installation Guide & Customer Copy**

## MAINS PRESSURE DOMESTIC HOT WATER APPLIANCE



STORAGE CAPACITY IN LITRES	WEIGHT WHEN FULL IN KGS
90	125
125	165
150	195
170	220
200	250
250	310
300	360
400	448
500	557

Water Supply Pressure	
Max 10 Bar	Min 1.5 Bar
Electric Immersion Heaters	
14"/3kW • 230V AC	
Operating Pressure	
3 BAR	
Expansion Vessel Charge Pressure	
See guide	
Expansion Relief Valve Setting	
6 BAR	
Pressure & Temperature Relief Valve Setting	
7 BAR / 90°C	
Maximum Primary Working Pressure	
2.5 BAR	
Solar	
5.5 BAR	
APPLIANCE SERIAL NO:	
Weight & Litres Capacity	
Litres	Kgs
Direct	Indirect

Tempest Stainless Heat Pump with Integral Buffer  
Mains pressure domestic hot water cylinder

### WARNING TO USER:

- This appliance **MUST** be serviced annually by a competent person.
- Failure to comply with the above will invalidate the manufacturer's warranty.
- Do not remove or adjust any component part of this unvented water heater: Contact the installer.
- If this unvented water heater develops a fault, such as a flow of hot water from the discharge pipe, switch the heater off and contact the installer.

### WARNING TO INSTALLER:

- This installation is subject to building regulation approval, notify Local Authority of intention to install.
- Use only manufacturer's recommended replacement parts.

For term and condition please refer to our website:  
[www.telford-group.com](http://www.telford-group.com)

Installed by:  
Name: .....  
Address: .....  
.....  
Tel. No.: .....  
Completion Date: .....



Technical help line: 01952 257961

Telford Copper Cylinders Limited, Unit 22, Furrows Business Park, Telford TF1 2FE

## The Benchmark Scheme

Telford Copper and Stainless Cylinders is a licensed member of the Benchmark Scheme which aims to improve the standard of installation and commissioning of domestic heating and hot water systems in the UK and to encourage regular servicing to optimise safety, efficiency and performance.

Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturers instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

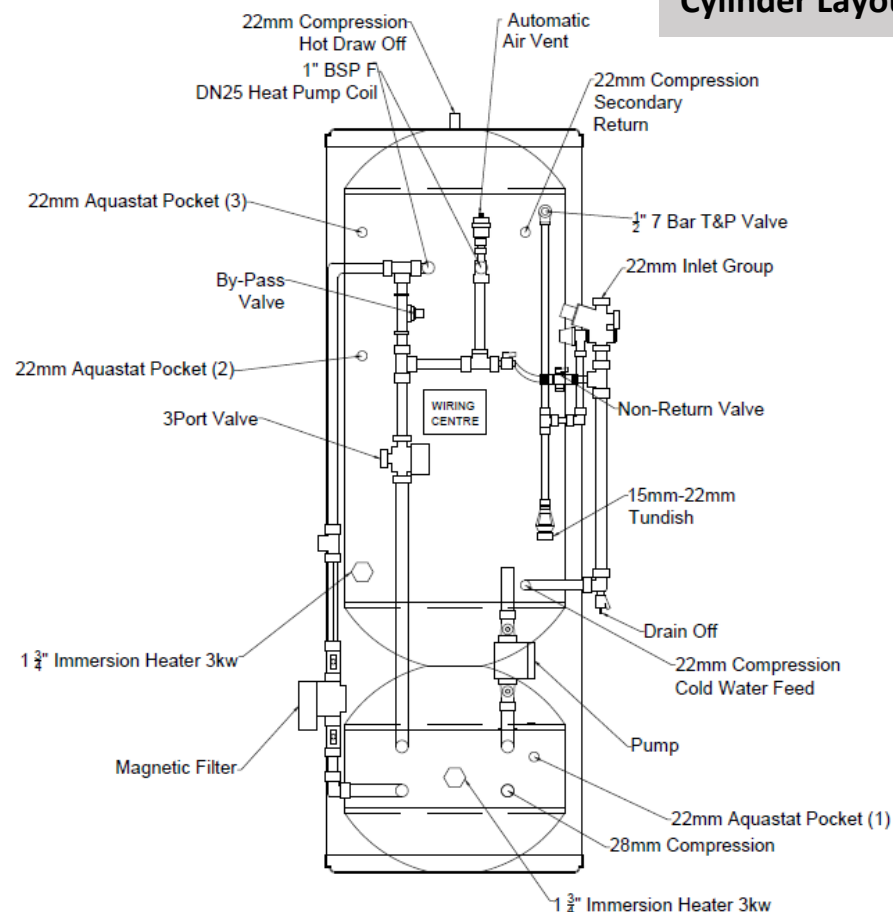
Installers are required to carry out the installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme. Visit [www.centralheating.co.uk](http://www.centralheating.co.uk) for more information.

### The HWA Charter Statement requires that all members adhere to the following:

- To supply fit for purpose products clearly and honestly described
- To supply products that meet, or exceed appropriate standards and building and water regulations
- To provide pre and post sales technical support
- To provide clear and concise warranty details to customers

Visit: [www.hotwater.org.uk](http://www.hotwater.org.uk)

## Cylinder Layout



## STEP 1

Position the unit vertically and make the incoming cold water connection to the fitting labelled “mains water inlet”.

For commissioning and later maintenance purposes it is essential to fit a service valve immediately before the connection to the Inlet Control Group.

### Installing the Inlet Control Group

The mains cold water supply should first pass through the pressure reducing valve, which reduces the pressure to 3.0 bar - this is factory set and cannot be adjusted - and then through the 6.0 bar expansion valve. The Inlet Control Group includes a single check valve and filter.

**\*NB** Upon commissioning the cylinder. The expansion vessel pressure should be adjusted to 0.2 bar less than the incoming water pressure. The vessel needs to be installed in a secure fashion.

Ensure that the Inlet Control Group is fitted adjacent to the cylinder with the arrows on the side pointing in the direction of the flow. It must be no further away than 500mm from the cylinder and have no devices or connections/draw offs between it and the cylinder\*. Balanced supplies for showers and all taps should be taken from the appropriate connection on the Inlet Control Group. Water regulations require that a single check valve should be fitted in the balanced draw off to prevent back flow. The inlet group supplied incorporates a single check within the body of the group.

\*The expansion vessel must be fitted between the inlet control group and the unit.

- A suitable means for draining the unit must be incorporated into the cold feed - Positioning the drain on the cold feed will allow a minimum of 80% of the cylinder to be drained off.

Connect the discharge pipework and tundish to the valve labelled “P&T” The tundish should be connected to the cylinder using 15mm metal pipe.

The tundish (supplied) must be fitted within 600mm of the outlet of the P&T valve and have at least 300mm of straight metal pipe below it before any elbow or bend.

The pipework below the tundish should be fitted in accordance with the current edition of the Building Regulations.

## Step 2

Connect the heat pump flow and return to the labelled connections. Before making the connections ensure that the coil is free from obstructions by blowing through it.

The Energy Cut Out valve is an essential part of the safety requirements for indirect mains pressure cylinders and should be installed on the primary flow to the cylinder with port ‘B’ (embossed on side of valve body) to the cylinder. The valve will open and close on receiving a signal from the cylinder thermostat. No further control is required for the hot water in a two zone valve system. **This valve must also be used in a flow share (Y Plan) system, in conjunction with the mid-position valve, to act as a safety cut out valve.**

The cylinder thermostat controls the temperature of the hot water and also acts as an emergency cut out in the event that the heat pump temperature controls fail. The cylinder thermostat is fitted into the pocket labelled “Store Temp Control” in the cylinder and should be connected to operate the energy cut out valve in accordance with the wiring diagram (S or Y-plan) for the scheme being installed.

Connect hot water draw off to connection labelled “Hot Water Draw Off”.

Make electrical connections to the immersion heaters – see wiring diagram inside cap of immersion heater. **All electrical installations must be to IEE standards.**

The immersion heaters supplied are of a special construction and include both a control thermostat and overheat protection. When fitting, ensure the ‘O’ ring is positioned correctly on the head of the immersion heater and lubricate before fitting. Fit it by hand until almost home then tighten gently as the ‘O’ rings will seal easily. Ensure that the immersion heater control setting is set between 55°C and 65°C for economical operation. **The upper limit thermostat is set to 80°C and must not be tampered with.**

**At the time of commissioning, complete all relevant sections of the Benchmark Checklist located at the back of this manual.**

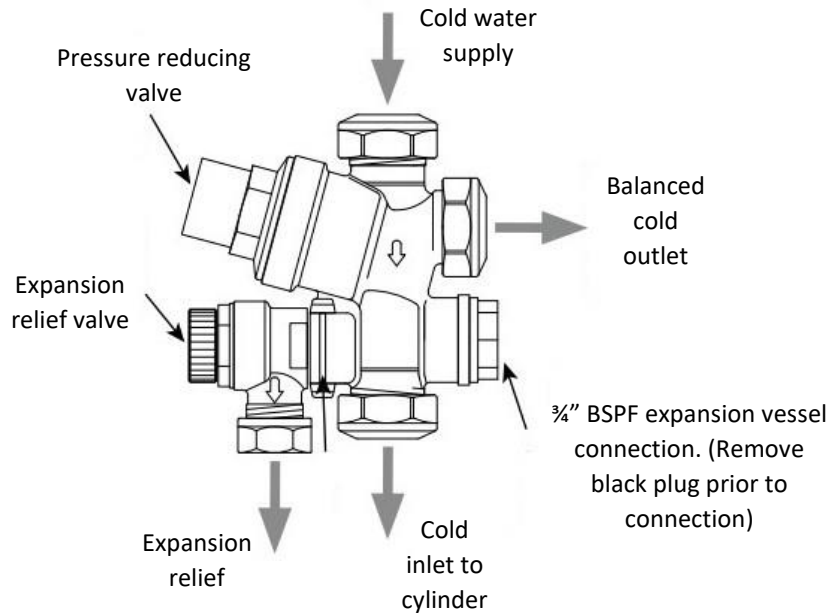
Ensure all connections are fully tightened.

Open all of the hot taps supplied by the cylinder and slowly fill the unit by opening the service valve. Continue to fill the unit until water runs continually from all the open taps. Open the service valve fully and close all the hot taps. Check for leaks.

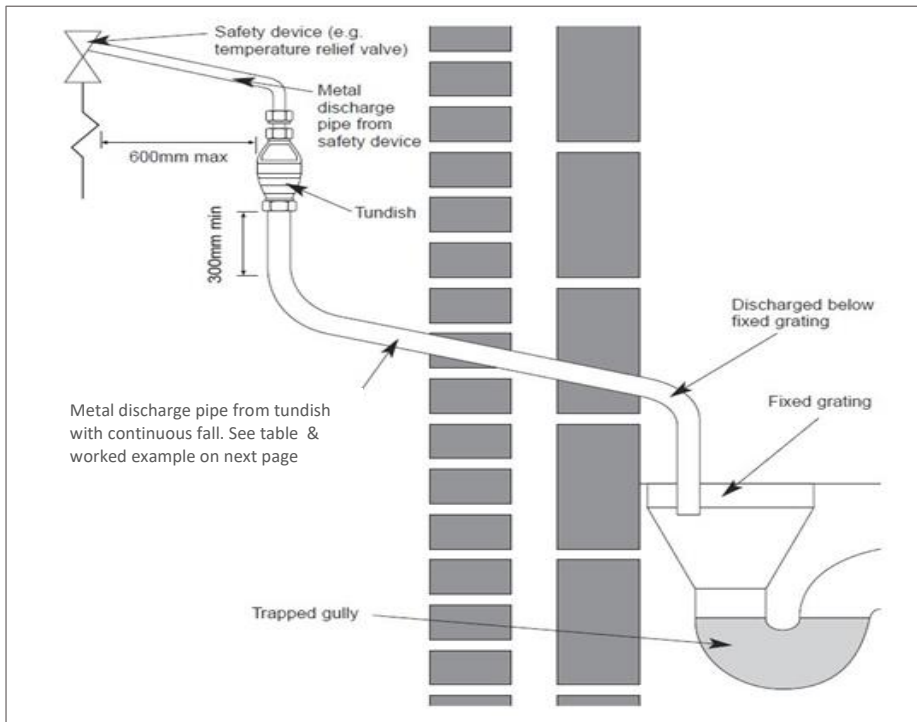
Once the heat pump is commissioned, heat the cylinder up to 60°C. When up to temperature the cylinder should be isolated and drained to flush out any flux/solder introduced during installation. The filter in the inlet control set should be removed, cleaned and re-fitted.

Refill the cylinder and reheat to the desired temperature and recheck for leaks.

## 22mm cold water inlet group



## Discharge – Building Regulations typical discharge pipe arrangement



## Discharge pipe sizing table

Valve outlet size Diameter (inches)	Minimum size of discharge pipe D1 (mm)	Minimum size of discharge pipe D2 from tundish (mm)	Maximum resistance allowed, expressed as a length of straight pipe, i.e. no elbows or bends (m)	Resistance created by each elbow or bend (m)
1/2	15	22	Up to 9	0.8
		28	Up to 18	1.0
		35	Up to 27	1.4
3/4	22	28	Up to 9	1.0
		35	Up to 18	1.4
		42	Up to 27	1.7
1	28	35	Up to 9	1.4
		42	Up to 18	1.7
		54	Up to 27	2.3

### NOTE

The above table is based on copper tube. Plastic pipes may be of a different bore and resistance. Sizes and maximum lengths of plastic pipe should be calculated using data for the type of pipe being used.

Discharge pipes must be installed in accordance with the latest edition of the Building Regulations.

### Worked example:

The example left is for a 1/2" diameter temperature relief valve with a discharge pipe (D2) having 4 x 22mm elbows and a length of 7 m from the tundish to the point of discharge.

From 22mm cold water inlet manifold:

Maximum resistance allowed for a straight length of 22mm copper **discharge pipe (D2) from a 1/2" diameter temperature relief valve** is 9.0m.

Subtract the resistance for quantity of 4 x 22mm elbows at 0.8m each = 3.2m.

Therefore, the maximum permitted length is 9.0 - 3.2 = 5.8m.

5.8m is less than the actual length of 7m; therefore calculate the next largest size.

Maximum resistance allowed for a straight length of 28mm copper **discharge pipe (D2) from a 1/2" diameter temperature relief valve** is 18m.

Subtract the resistance for a quantity of 4 x 28mm elbows at 1.0m each = 4m.

Therefore, the maximum permitted length is 18 - 4 = 14m.

As the actual length is 7m, a 28mm diameter copper pipe will be satisfactory in this case.

## Discharge Pipes

The discharge pipe (D1) from the vessel up to and including the tundish is generally supplied by the manufacturer of the hot water storage system. Where otherwise, the installation should include the discharge pipe(s) (D1) from the safety device(s). In either case the tundish should be vertical, located in the same space as the unvented hot water storage system and be fitted as close as possible and within 600mm of the safety device e.g. the temperature relief valve.

The discharge pipe (D2) from the tundish should terminate in a safe place where there is no risk to persons in the vicinity of the discharge, be of metal and:

- a. be at least one pipe size larger than the normal outlet size of the safety device unless its total equivalent hydraulic resistance exceeds that of a straight pipe 9m long i.e. discharge pipes between 9m and 18m equivalent resistance length should be at least two sizes larger than the nominal outlet size of the safety device, between 18 and 27m at least 3 sizes larger, and so on. Bends must be taken into account in calculating the flow resistance. Refer to Diagram and Table on the previous pages and the worked example on the previous page. An alternative approach for sizing discharge pipes would be to follow BS 6700: 1987 Specification for design installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages, Appendix E, section E2 and table 21.
- b. have a vertical section of pipe at least 300mm long, below the tundish before any elbows or bends in the pipework.
- c. be installed with a continuous fall.
- d. have discharges visible at both the tundish and the final point of discharge but where this is not possible or is practically difficult there should be clear visibility at one or other of these locations. Examples of acceptable discharge arrangements are:
  - i. ideally below a fixed grating and above the water seal in a trapped gully.
  - ii. downward discharges at low level; i.e. up to 100mm above external surfaces such as car parks, hard standings, grassed areas etc. are acceptable providing that where children may play or otherwise come into contact with discharges a wire cage or similar guard is positioned to prevent contact, whilst maintaining visibility.
  - iii. discharges at high level; e.g. into a metal hopper and metal down pipe with the end of the discharge pipe clearly visible (tundish visible or not) or onto a roof capable of withstanding high temperature discharges of water and 3 m from any plastics guttering system that would collect such discharges (tundish visible).

- iv. where a single pipe serves a number of discharges, such as in blocks of flats, the number served should be limited to not more than 6 systems so that any installation discharging can be traced reasonably easily. The single common discharge pipe should be at least one pipe size larger than the largest individual discharge pipe (D2) to be connected. If unvented hot water storage systems are installed where discharges from safety devices may not be apparent; i.e. in dwellings occupied by blind, infirm or disabled people, consideration should be given to the installation of an electronically operated device to warn when discharge takes place.

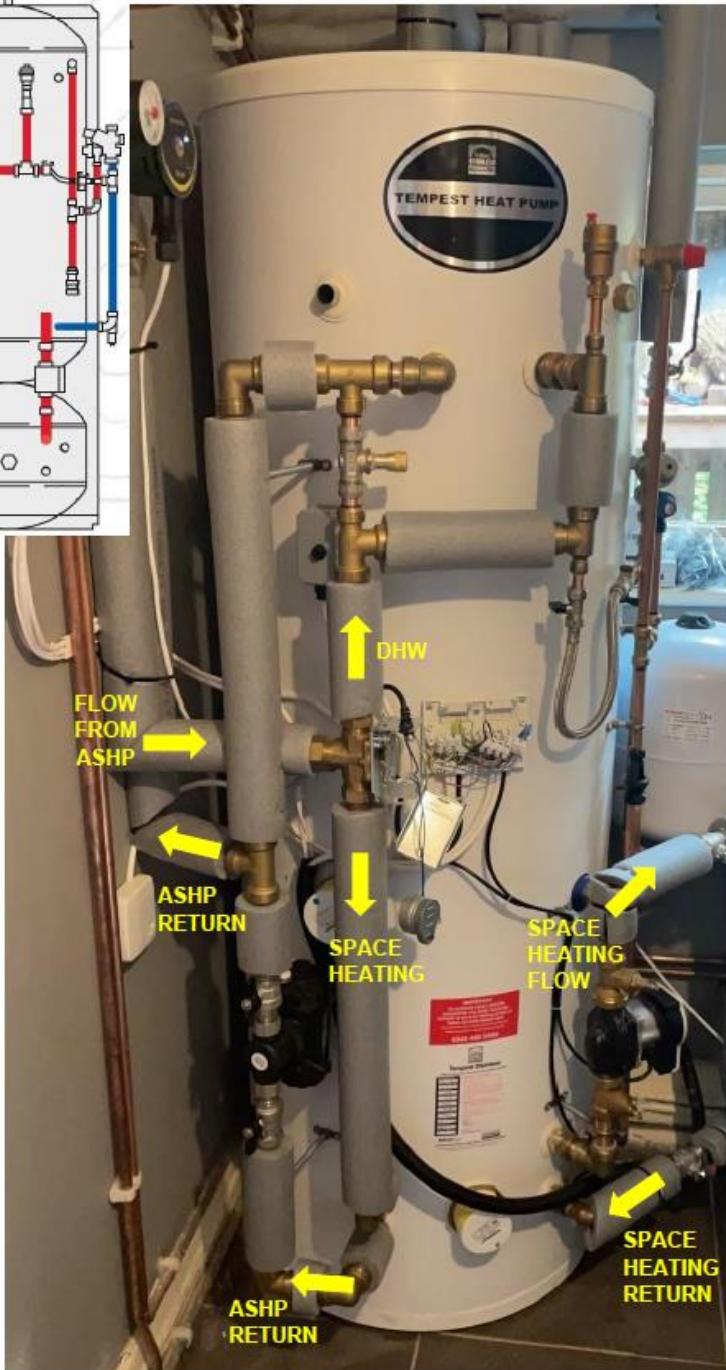
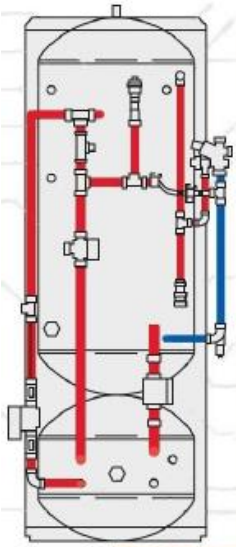
## Immersion Heaters - Further Information

The Tempest Stainless Heat Pump with Integral Buffer Cylinder is supplied with two 3kW immersions. The buffer immersion is manually switched; it is **NOT** controlled by the heat pump system controller. It must be permanently connected to the electrical supply through a double-pole isolator switch or suitable controller with a minimum break capacity of 13 amp and contact separation of at least 3mm.

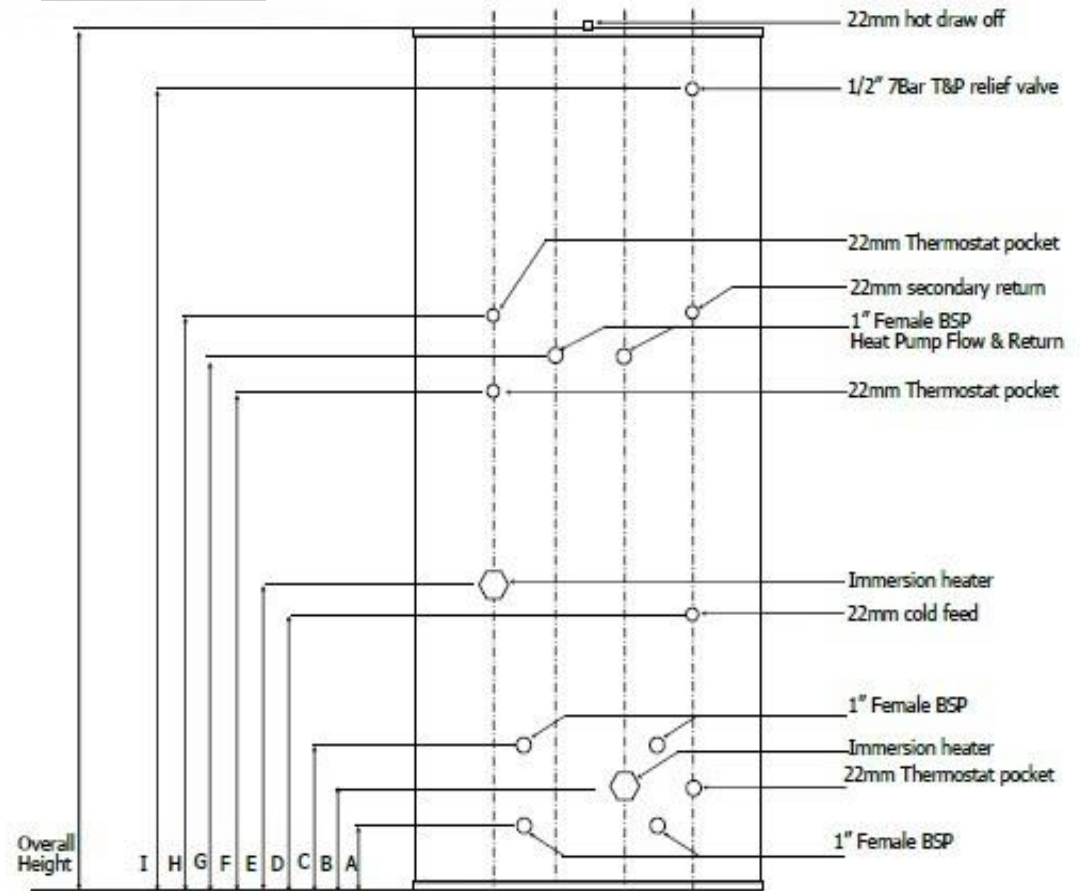




## Flow/return design



## Dimensions



All unvented cylinders come with an unvented component kit to suit.

Cylinder/Buffer Capacity (L)	170/50	200/50	250/50	300/50
Height (mm)	1540	1716	1921	2115
Diameter (mm)	580	580	580	580
A (mm)	193	193	193	193
B (mm)	243	243	243	243
C (mm)	293	293	293	293
D (mm)	675	675	675	675
E (mm)	705	705	705	705
F (mm)	1057	1195	1225	1225
G (mm)	1192	1395	1425	1425
H (mm)	1262	1475	1505	1846
I (mm)	1287	1523	1725	1915

## Lifetime Guarantee

Tempest Stainless Heat Pump with Integral buffer carries a lifetime guarantee against faulty manufacture or materials, provided that:

- The product is used solely for the storage of water from mains public supply.
- The product has not been modified or tampered with.
- The product has been installed and maintained in accordance with these installation instructions.

**You must register your guarantee online within 28 days of installation at [www.telford-group.com](http://www.telford-group.com)**

The immersion heaters, water control valves, circulation pump, magnetic filter, expansion vessel and auto air vent are guaranteed for two years from the date of manufacture on a new build. For new installation/replacement one year.

**The Lifetime guarantee is only available in the United Kingdom of Great Britain and Northern Island.**

Claims made against our Lifetime Guarantee must be supported with evidence of purchase, product serial number along with a copy of the completed Benchmark Commissioning Checklist and Service Record.

Your statutory rights are not affected by this guarantee.

All cylinders are WRAS Approved.

### Exclusions to the guarantee

Any labour charges associated with replacement of the unit or any components

Any consequential losses caused by malfunction or failure of the unit.

The effects of scale build up.

**Failure to carry out the annual safety check on the product will invalidate the guarantee.**

Failure to service the expansion vessel may cause a **serious escape of water**.

This product should be serviced regularly to optimise its safety, efficiency and performance. The service engineer should complete the relevant Service Record attached to the Benchmark Checklist after each service.

## Servicing

### IMPORTANT - DRAIN DOWN PROCEDURE

- 1 Switch off both the heat pump and the immersion heaters
- 2 Open the nearest hot tap and run all hot water until cold, then close it
- 3 Close the incoming cold main at the stop tap
- 4 Hold open the pressure and temperature relief valve until water stops discharging into the tundish and leave it open
- 5 Open the cold taps starting from the highest point and working down to the lowest tap, leaving them open
- 6 When the cold taps have stopped draining, open the hot taps starting from the highest and working down to the lowest tap
- 7 Open the drain cock and ensure the pressure a

Service periods will vary for many reasons. Telford Copper & Stainless recommend a maximum of 12 months to coincide with the heat pump maintenance. Experience of local water conditions may indicate that more frequent maintenance is desirable, eg, when water is particularly hard, scale-forming or where the water supply contains a high proportion of solids, e.g., sand.

Servicing must include the following:

1. Check and clean magnetic filter
2. Manually check the operation of the temperature relief valve.
3. Manually check the operation of the expansion relief valve.
4. Check discharge pipes from temperature and expansion relief valves are free from obstruction and blockage and are not passing any water.
5. Check the condition and if necessary, descale the heat exchangers in hard water areas.
6. Check that water pressure downstream of pressure reducing valve is within the manufacturers limits.
7. Check operation of motorised valves, circulation pump and magnetic filter.
8. Check the pressure on the air side of the expansion vessel. This must be done with the pressure on the water side at zero (gauge pressure).
9. .On completion of the work, fill in the Benchmark Service Record towards the back of this manual.





# SERVICE RECORD

It is recommended that your hot water system is serviced regularly and that the appropriate Service Record is completed.

## Service Provider

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions.

**SERVICE 1** Date \_\_\_\_\_  
Engineer Name \_\_\_\_\_  
Company Name \_\_\_\_\_  
Telephone Number \_\_\_\_\_  
Comments \_\_\_\_\_  
\_\_\_\_\_  
Signature \_\_\_\_\_

**SERVICE 2** Date \_\_\_\_\_  
Engineer Name \_\_\_\_\_  
Company Name \_\_\_\_\_  
Telephone Number \_\_\_\_\_  
Comments \_\_\_\_\_  
\_\_\_\_\_  
Signature \_\_\_\_\_

**SERVICE 3** Date \_\_\_\_\_  
Engineer Name \_\_\_\_\_  
Company Name \_\_\_\_\_  
Telephone Number \_\_\_\_\_  
Comments \_\_\_\_\_  
\_\_\_\_\_  
Signature \_\_\_\_\_

**SERVICE 4** Date \_\_\_\_\_  
Engineer Name \_\_\_\_\_  
Company Name \_\_\_\_\_  
Telephone Number \_\_\_\_\_  
Comments \_\_\_\_\_  
\_\_\_\_\_  
Signature \_\_\_\_\_

**SERVICE 5** Date \_\_\_\_\_  
Engineer Name \_\_\_\_\_  
Company Name \_\_\_\_\_  
Telephone Number \_\_\_\_\_  
Comments \_\_\_\_\_  
\_\_\_\_\_  
Signature \_\_\_\_\_

**SERVICE 6** Date \_\_\_\_\_  
Engineer Name \_\_\_\_\_  
Company Name \_\_\_\_\_  
Telephone Number \_\_\_\_\_  
Comments \_\_\_\_\_  
\_\_\_\_\_  
Signature \_\_\_\_\_

**SERVICE 7** Date \_\_\_\_\_  
Engineer Name \_\_\_\_\_  
Company Name \_\_\_\_\_  
Telephone Number \_\_\_\_\_  
Comments \_\_\_\_\_  
\_\_\_\_\_  
Signature \_\_\_\_\_

**SERVICE 8** Date \_\_\_\_\_  
Engineer Name \_\_\_\_\_  
Company Name \_\_\_\_\_  
Telephone Number \_\_\_\_\_  
Comments \_\_\_\_\_  
\_\_\_\_\_  
Signature \_\_\_\_\_

**SERVICE 9** Date \_\_\_\_\_  
Engineer Name \_\_\_\_\_  
Company Name \_\_\_\_\_  
Telephone Number \_\_\_\_\_  
Comments \_\_\_\_\_  
\_\_\_\_\_  
Signature \_\_\_\_\_

**SERVICE 10** Date \_\_\_\_\_  
Engineer Name \_\_\_\_\_  
Company Name \_\_\_\_\_  
Telephone Number \_\_\_\_\_  
Comments \_\_\_\_\_  
\_\_\_\_\_  
Signature \_\_\_\_\_

**Lifetime Guarantee:** The Stainless steel cylinder carries a lifetime guarantee against faulty manufacture or materials, provided that: The product is used solely for the storage of water from a mains public supply. The product has not been modified or tampered with. The product has been installed and maintained in accordance with the installation instructions. The product has not been subjected to damage caused by frost, or other external influence. The product is registered on the Product Registration section of the TC&SC website within 28 days of installation.





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