Advance Stainless Steel Unvented Hot Water Cylinders for Heat Pump Systems

Installation and Commissioning Manual

PLEASE RETAIN AND ENSURE SERVICE RECORDS ARE KEPT UP TO DATE.

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1. Safety information

Safe operation of this unit can only be guaranteed if it is properly installed and commissioned in compliance with the manufacturer's requirements. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment must also be complied with.

Manufacturer:-
Advance Appliances Ltd
Unit 4
Alma Industrial Estate
Stafford Road
Darlaston
West Midlands
WS10 8SX
Tel: 0121 568 8778

The product is designed and constructed to withstand the conditions encountered during normal use. Use of the product for any other purpose, or failure to install the product in accordance with these Installation and Commissioning Instructions, could damage the product, will invalidate the warranty, and may cause injury or fatality to personnel.

1.1 Access
Ensure safe access before attempting to work on the product. Arrange suitable lifting gear if required.

1.2 Lighting
Ensure adequate lighting, particularly where detailed or intricate work is required.

1.3 Tools and consumables
Before starting work ensure that you have suitable tools and / or consumables available.

1.4 Handling
Manual handling of large and /or heavy products may present a risk of injury. Lifting, pushing, pulling, carrying or supporting a load by bodily force can cause injury particularly to the back. You are advised to assess the risks taking into account the task, the individual, the load and the working environment and use the appropriate handling method depending on the circumstances of the work being done.

1.5 Residual hazards
Many products are not self-draining. Take due care when dismantling or removing the product from an installation.

1.6 Freezing
Provision must be made to protect products which are not self-draining against frost damage in environments where they may be exposed to temperatures below freezing point.

1.7 Disposal/Decommissioning
A life time decommissioning service for this product is available. This is available on a return to base basis (carriage at users' cost).

2. General Product Information

This manual explains how to install and commission an Advance Stainless Steel Unvented Hot Water System with a Kensa Heat Pump.

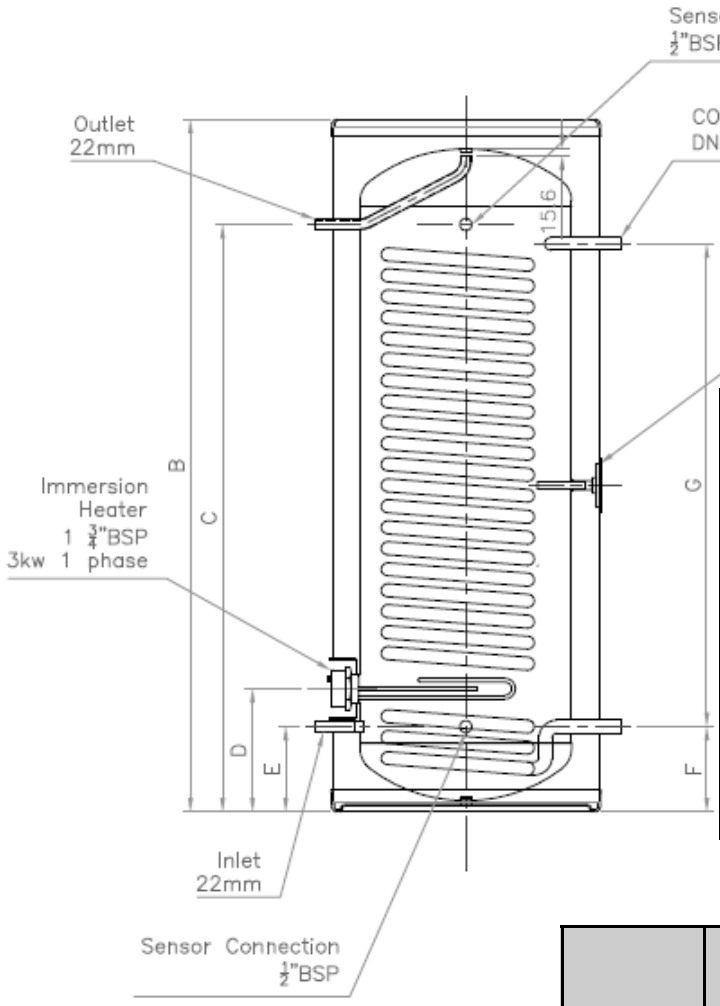
Please note that unvented cylinders supplied with larger coils are outside the scope of the WRAS approvals but are constructed to meet all current Building Regulations.

2.1 Equipment delivery and handling.

Factory shipment
Prior to shipment, the stainless steel unvented hot water storage unit is tested, calibrated and inspected to ensure proper operation.

Receipt of shipment
Each pallet should be inspected at the time of delivery for possible external damage. Any visible damage should be recorded immediately on the carrier's copy of the delivery slip.
Each pallet should be unpacked carefully and its contents checked for damage.
If it is found that some items have been damaged or are missing, notify the manufacturer immediately and provide full details. In addition, damage must be reported to the carrier with a request for their on-site inspection of the damaged item and its shipping pallet.

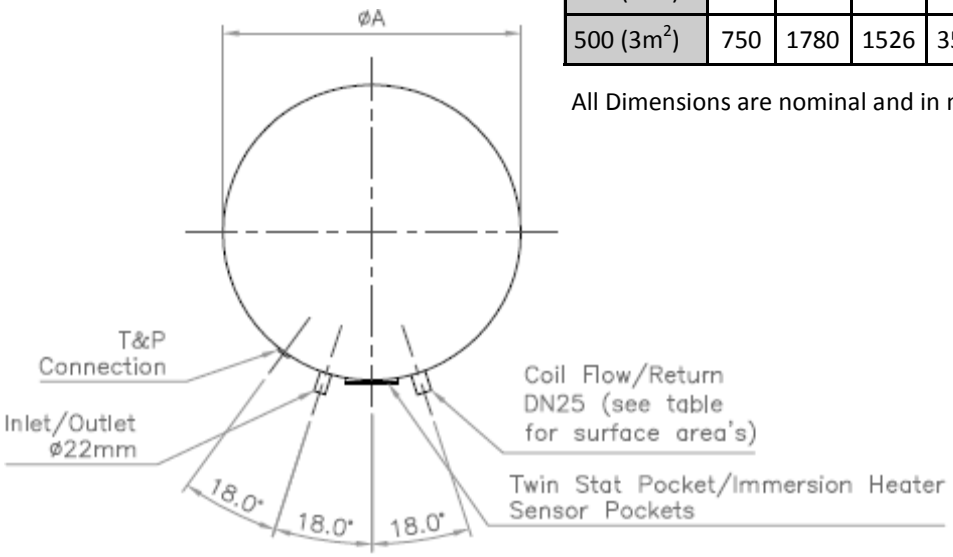
2.2 Single Coil Unvented Hot Water Cylinder (2 and 3m² Heat Pump coil)



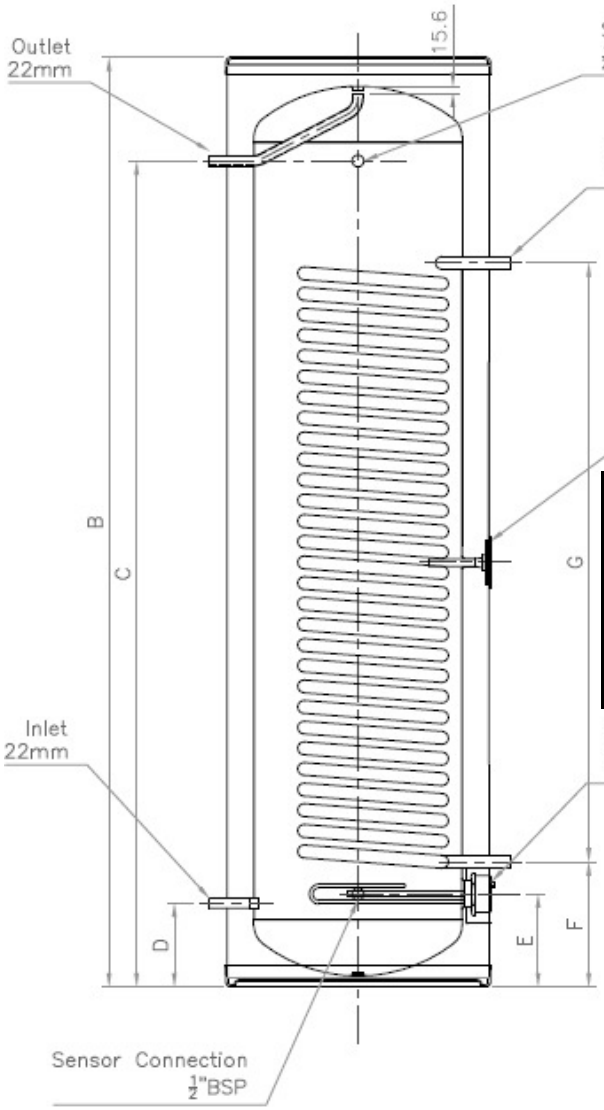
Kensa Model No.	95-060A	95-061A	95-062A	95-063A	95-065A	95-067A
Advance Model No.	HP 150	HP 215	HP 255	HP 305	HP 400	HP 500
Volume (l)	150	215	255	305	400	500
Expansion Vessel capacity (l)	12	12	12	19	35	35
Heat Loss kWh/24hrs @50°C	1.49	1.70	1.80	1.95	2.25	2.60

	A	B	C	D	E	F	G	Weight Full (kg)
150 (2m²)	575	1083	860	264	182	182	675	195
215 (3m²)	575	1485	1259	264	182	182	1035	270
255 (3m²)	575	1750	1527	202	182	272	1035	310
305 (3m²)	575	2023	1800	202	182	272	1035	365
400 (3m²)	750	1630	1376	315	333	405	1035	485
500 (3m²)	750	1780	1526	350	310	405	765	605

All Dimensions are nominal and in mm

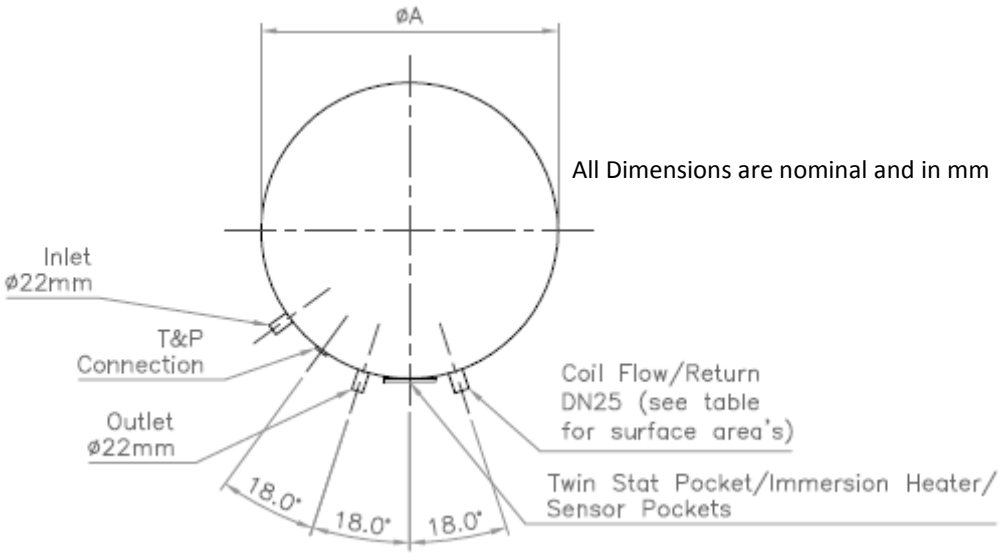


2.3. Single Coil Unvented Hot Water Cylinder (4m^2 Heat Pump coil)



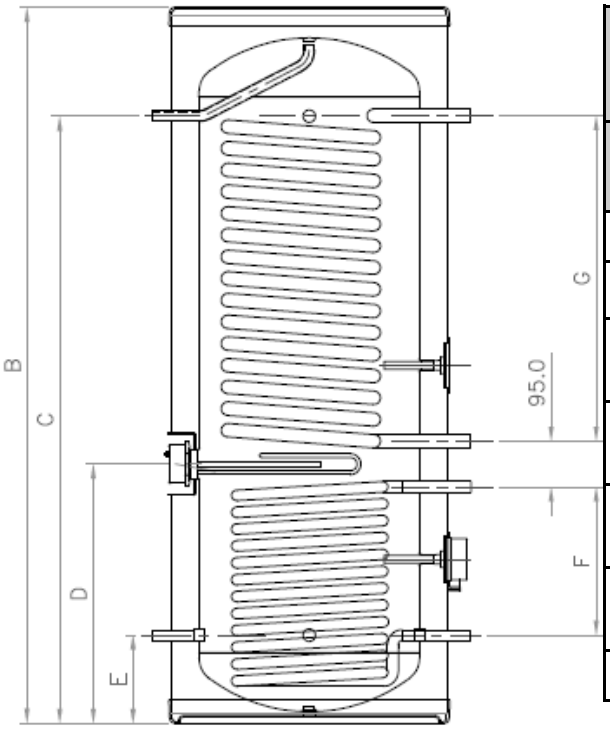
	A	B	C	D	E	F	G	Weight Full (kg)
305 (4m^2)	575	2023	1800	202	182	272	1035	365
400 (4m^2)	750	1630	1376	315	333	405	1035	490
500 (4m^2)	750	1780	1526	315	333	405	765	605

Model	95-064A	95-066A	95-068A
Volume (l)	305	400	500
Heat Pump Coil m^2	4	4	4
Expansion Vessel capacity (l)	19	35	35
Heat Loss kWh/24hrs@50°C	1.95	2.25	2.60



All Dimensions are nominal and in mm

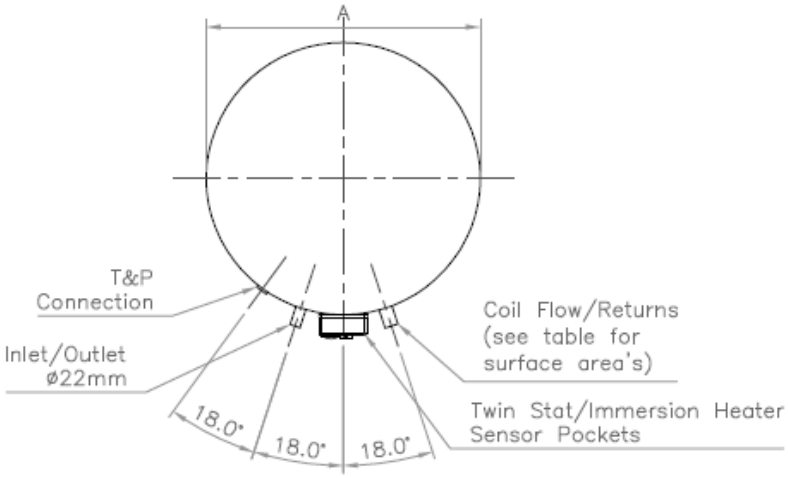
2.4 Twin Coil Unvented Hot Water Cylinder



Kensa Model No.	Advance Model No.	Volume	Heat Pump Coil	Expansion Vessel	Heat Loss
		Litres	m^2	Capacity (litres)	kWh/24hrs @ 50°C
95-080A	HPS215	215	2.0	12	1.70
95-081A	HPS255	255	2.0	12	1.80
95-083A	HPS305-2	305	2.0	12	1.80
95-084A	HPS305-3	305	3.0	19	1.95
95-085A	HPS400-3	400	3.0	35	2.25
95-086A	HPS400-4	400	4.0	35	2.25
95-087A	HPS500	500	4.0	35	2.60

	A	B	C	D	E	F	G	Weight Full (kg)
215 (lower DN20 1.1m^2 & upper DN25 2m^2)	575	1485	1259	538	182.5	270	675	265
255 (lower DN20 1.1m^2 & upper DN25 2m^2)	575	1750	1527	538	182.5	270	675	315
305 (lower DN20 1.1m^2 & upper DN25 2m^2)	575	2023	1800	538	182.5	270	675	370
305 (lower DN20 1.1m^2 & upper DN25 3m^2)	575	2023	1800	538	182.5	270	675	370
400 (lower DN20 1.1m^2 & upper DN25 3m^2)	750	1630	1376	690	310	315	675	500
400 (lower DN20 1.1m^2 & upper DN25 4m^2)	750	1630	1376	690	310	315	675	500
500 (lower DN20 1.1m^2 & upper DN25 4m^2)	750	1780	1526	690	310	315	675	615

All Dimensions are nominal and in mm



Note: the lower coil is used as the solar coil with the upper connected to the heat pump.

Note: The motorised valve supplied is only for use on the lower solar coil.

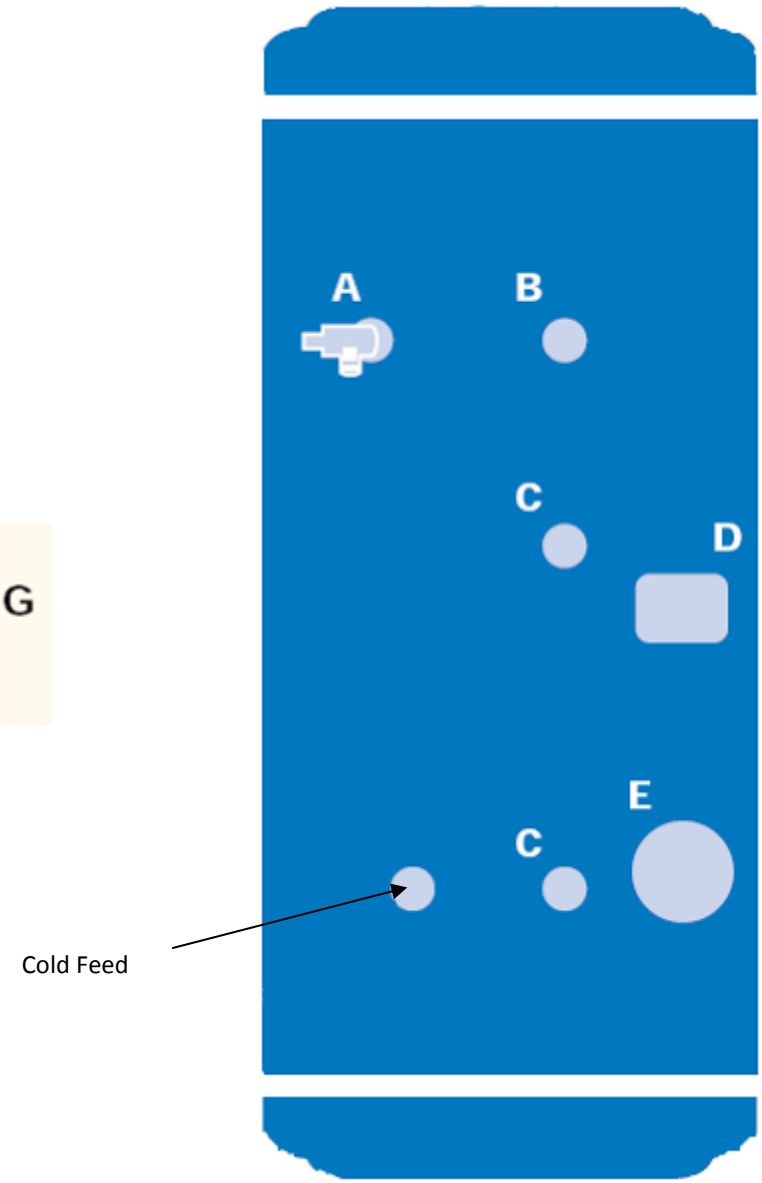
2.6 Components Supplied

Description	Specification
Operating Pressure Tank and Coils	3 bar – 95°C
Pressure Reducing Valve	3.0 bar Control
Safety Relief Valve	6.0 bar
Pressure & Temp Relief Valve	7.0 bar/90°C
Immersion Heater	1 3/4”—240V—3kW
Expansion Vessel up to 170 litre models	3.0 bar charge, 12 litre capacity
Expansion Vessel for 200 & 250 litre models	3.0 bar charge, 18 litre capacity
Expansion Vessel for 300 litre models	3.0 bar charge, 24 litre capacity
Expansion Vessel for 400 and 500 litre models	3.0 bar charge, 35 litre capacity
Flexible Hose for Expansion Vessel	Supplied loose
Mounting Bracket for Expansion Vessel	Supplied loose
Tundish	1/2” x 22mm
Cylinder Twin Thermostat* (for solar coil)	Control & High limit
Motorised Valve* (for solar coil)	240V

* Only supplied with Twin Coil Tanks

2.7 Component ID for Stainless Indirect Unit

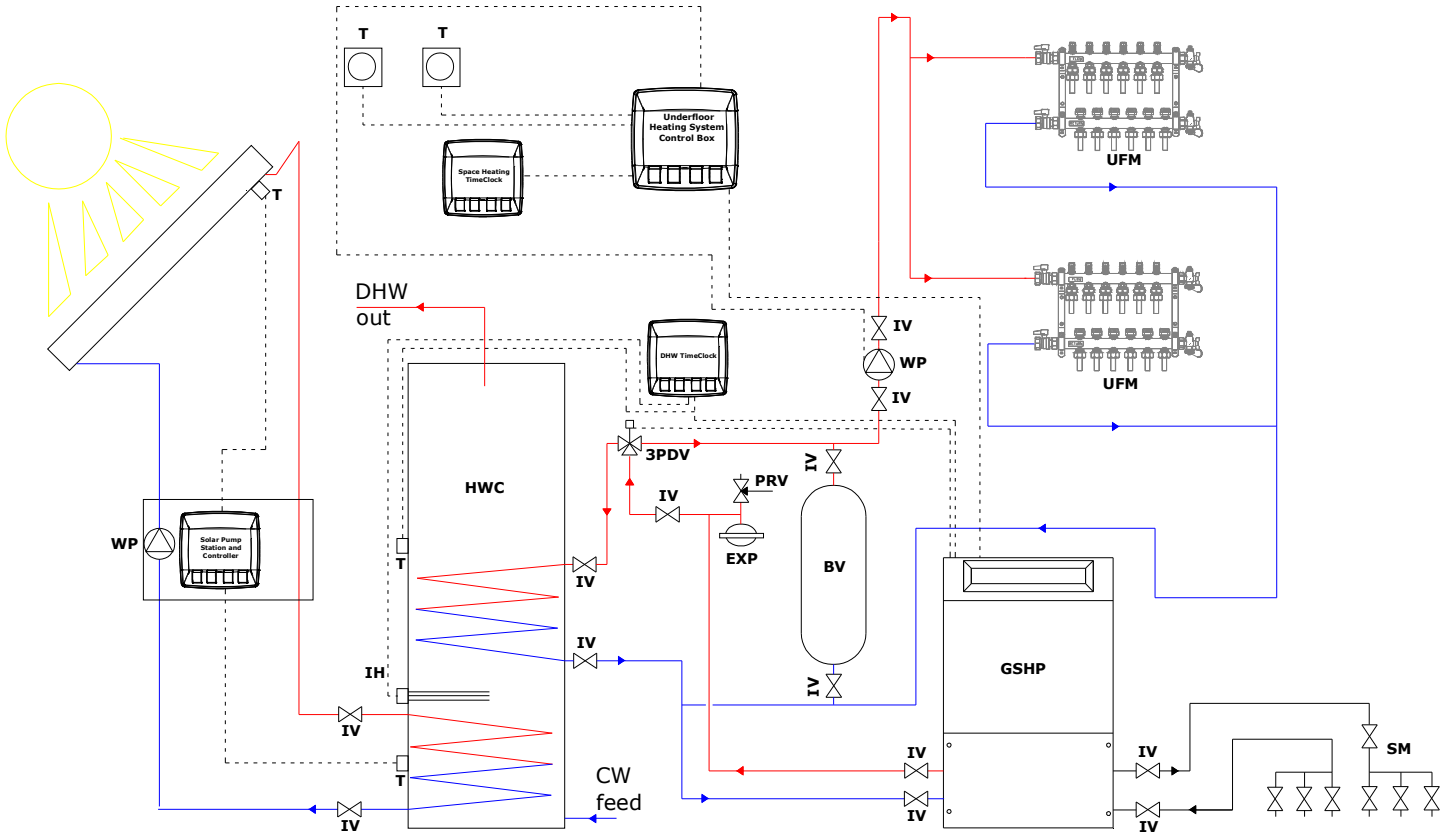
Note: The expansion vessel is designed on the heat pump models to be fitted remotely and has a bracket and hose supplied as standard. There is no bush at the top of the unit to screw the vessel into.



A—Temperature and pressure relief valve
B—Hot draw off to taps
C—Primary connections
D—Immersion thermostat with high limit cut out. (Solar models only)
E—3 kW immersion heater with manual re-set temperature high limit cut-out
F—Group inlet, pressure reducing valve, strainer and expansion relief valve (not shown)
G—Expansion vessel (supplied loose)

3.0. Typical Schematics

3.1 Twin Coil Cylinder with GSHP (Space Heating and DHW Production)



Abbreviations

3PDV - 3 port diverting valve
BV - Buffer Vessel
DHW - Domestic Hot Water
CW - Cold Water
EXP - Expansion vessel
GSHP - Ground source heat pump
IH - Immersion heater
IV - Isolation valve
PRV - Pressure relief valve
SM - Slinky manifold
T - Thermostat
UFM - Underfloor manifold
WP - Water pump

The Buffer Vessel (BV) is an optional item and can be fitted to reduce short cycling of the heat pump and provide close temperature control for all zones. If 25% of the underfloor zones and radiators are left open this is not required.

Please note:- The above drawing is a schematic only and additional valves and fittings maybe required.

Please note:- Running the GSHP to produce DHW with off-peak tariffs might result in the GSHP needing to operate during peak electricity periods for space heating with higher associated running costs.

Principle of Operation

The Kensa compact heat pump is specifically designed to provide space heating and domestic hot water (DHW) at the highest efficiency possible with the simplest installation.

In space heating mode the system provides hot water into the underfloor heating system at generally a flow temperature of 35°C. For underfloor heating in a well insulated building this will provide adequate heating into the building at the heat pump's highest efficiency. If the insulation of the building is below current regulations then this flow temperature might need to be increased reducing the system's efficiency. Insulative floor coverings such as wood or thick carpets can also require higher flow temperatures.

If full zone control is required of all the underfloor areas then a buffer vessel is required to be fitted. The most efficient buffer vessel design for heat pumps is a two connection buffer vessel and fitting this will reduce short cycling while maintaining the highest efficiency of the heat pump.

The underfloor manifolds should ideally be connected using a reverse return system as this will ensure even heat flow through the underfloor zones without the use of balancing valves and the resulting increase in water pump energy.

When the DHW time clock calls for production of DHW, the three-port valve diverts the flow from the heating distribution circuit into the indirect coil within the hot water cylinder. The temperature of the water from the heat pump is raised to approximately 50°C.

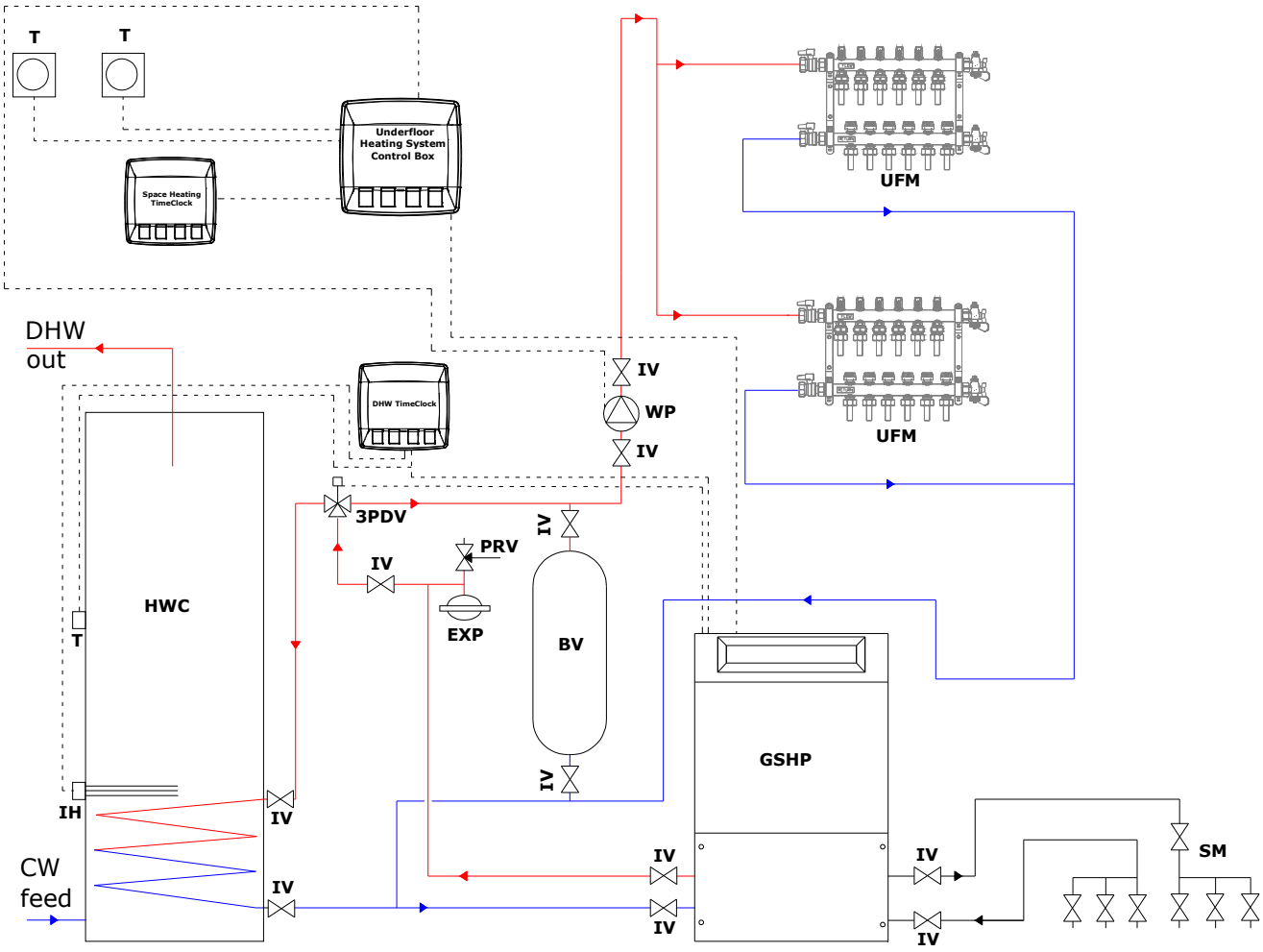
When the DHW production time period ends, the three port valve switches back to the underfloor distribution and the temperature drops back to its space heating design temperature. The heat pump then reverts to space heating mode or switches off if no zones are calling for heat.

The maximum DHW temperature that the heat pump can achieve will be approximately 50-55°C. In summer, it could be higher, due to the warmer ground conditions. If 65°C is required all year round, it is recommended that an immersion heater is linked to a second channel on the DHW timeclock and this is programmed to operate for a period immediately following the DHW production. This means that the majority of the heating load for the DHW is produced using the heat pump, as opposed to using only the direct immersion heater.

If 50°C water is acceptable, then it is recommended that the immersion heater is programmed to raise the temperature to 65°C once a week using the DHW timeclock.

The larger the coil within the tank, the better the heat transfer area and hence the better the DHW performance will be. Ideally the coil should be a minimum of 0.2 sqm per kW output from the heat pump.

3.2 Single Coil Cylinder with GSHP (Space Heating and DHW Production)



Abbreviations

3PDV - 3 port diverting valve
BV - Buffer vessel
DHW - Domestic Hot Water
CW - Cold Water
EXP - Expansion vessel
GSHP - Ground source heat pump
IH - Immersion heater
IV - Isolation valve
PRV - Pressure relief valve
SM - Slinky manifold
UFM - Underfloor manifold
WP - Water pump

Please note:- The above drawing is a schematic only and additional valves and fittings maybe required.

Please note:- Running the GSHP to produce DHW with off-peak tariffs might result in the GSHP needing to operate during peak electricity periods for space heating with higher associated running costs.

The buffer vessel (BV) is fitted to reduce short cycling of the heat pump while still allowing full zone control of the underfloor. If 25% of the underfloor zones are left open then this is not required.

Principle of Operation

The Kensa compact heat pump is specifically designed to provide space heating and domestic hot water (DHW) at the highest efficiency possible with the simplest installation. It is designed to be easily integrated with a twin coil solar domestic hot water cylinder which will provide free DHW during the summer, backed up with the ground source heat pump during the winter.

In space heating mode the system provides hot water into the underfloor heating system at generally a flow temperature of 35°C. If the insulation of the building is below current regulations then this flow temperature might need to be increased reducing the system's efficiency. Insulative floor coverings such as wood or thick carpets can also require higher flow temperatures.

To avoid short cycling of the heat pump it is advised that 25% of the zones on the underfloor manifolds are left hydraulically open to provide a minimum load on the heat pump. These zones are usually the bathrooms and halls. (Alternatively a buffer vessel can be used if control is required over all heating zones). Any mixing valves on manifolds should also be removed to provide maximum heat into the underfloor zones.

The underfloor manifolds should ideally be connected using a reverse return system as this will ensure even heat flow through the underfloor zones without the use of balancing valves and the resulting increase in water pump energy.

During the summer all of the DHW production is provided free by the solar thermal system, however during the winter the heat pump can be used to produce DHW. When the DHW time clock calls for production of DHW, the three-port valve diverts the flow from the heating distribution circuit into the indirect coil within the hot water cylinder. The temperature of the water from the heat pump is raised to approximately 55°C.

When the DHW production time period ends, the three port valve switches back to the underfloor distribution and the temperature drops back to its space heating design temperature. The heat pump then reverts to space heating mode or switches off if no zones are calling for heat.

Warning - when a heat pump is used for heating domestic hot water, it may not get the water hot enough to kill the dangerous Legionella that can breed in hot water cylinders. Alternative arrangements should therefore be made to ensure the cylinder is pasteurised regularly.

The maximum DHW temperature that the heat pump can achieve will be approximately 50-55°C. If 65°C is required all year round, it is recommended that an immersion heater is linked to a second channel on the DHW timeclock and this is programmed to operate for a period immediately following the DHW production. This means that the majority of the heating load for the DHW is produced using the heat pump, as opposed to using only the direct immersion heater.

If 50°C water is acceptable, then it is recommended that the immersion heater is programmed to raise the temperature to 65°C once a week using the DHW timeclock.

4.0 Installation

Please read this leaflet carefully before installation of the product. You should be competent to install the unvented system as defined by the regulations. Please pay special attention to maintenance and service.

Please keep the unit packaged until you are ready to commence installation. The unit should be stored vertically in a dry area, and all safety components kept in the box.

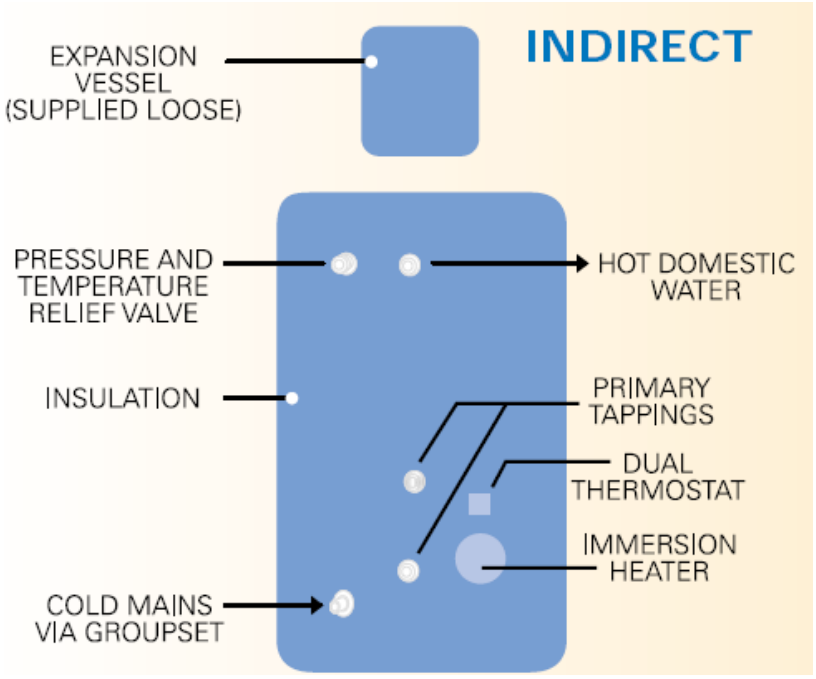
IT IS A REQUIREMENT THAT THIS UNIT IS SERVICED AND MAINTAINED ANNUALLY. THE LOG BOOK MUST BE COMPLETED AND UPDATED. FAILURE TO DO SO WILL INVALIDATE GUARANTEES.

Warning - if a heat pump is used for heating domestic hot water, it may not get the water hot enough to kill the dangerous Legionella that can breed in hot water cylinders. Alternative arrangements should therefore be made to ensure the cylinder is pasteurised regularly.

Install in an area that will be accessible in the future When first fixing take into account that the connections and controls will be front facing to facilitate access.

Mount the unit vertically on a flat even surface.

The expansion vessel is designed on the heat pump models to be fitted remotely and has a bracket and hose supplied as standard. There is no bush at the top of the unit to screw the vessel into.



Check that the floor will support the unit when it is full of water. See page 5-7 for weights.

If using push fit connections i.e. Speedfit, attach a piece of copper pipe initially to the vessel stainless steel connection via means of a compression fitting. The push fit connection then can be attached to this. Failure to do this may well cause any push fit connected directly onto the vessel to leak.

4.1 Cold Feed

Mains pipework should be a minimum of 25mm MDPE or 22mm copper. If 15mm copper or 1/2" lead is the only mains feed then the decision to install rests with the installer or specifier of the product. Flow rates may be compromised, even at appropriate pressures, ensure that you have at least 18 litres per minute at the bath tap. Maximum inlet pressure is 12 bar.

Mains feed may need to be 32mm MDPE or 28mm copper if multiple bath filling or showering is required.

The unit operates at 3 bar but pressures from 2 bar upwards are suitable. Lower pressure will result in a fall in flow rate. Minimum flowrate requirement for single bath applications is 20 litres per minute and must rise proportionately for greater demands.

Please also take into account any fitting that could restrict flow such as water meters, softeners etc.

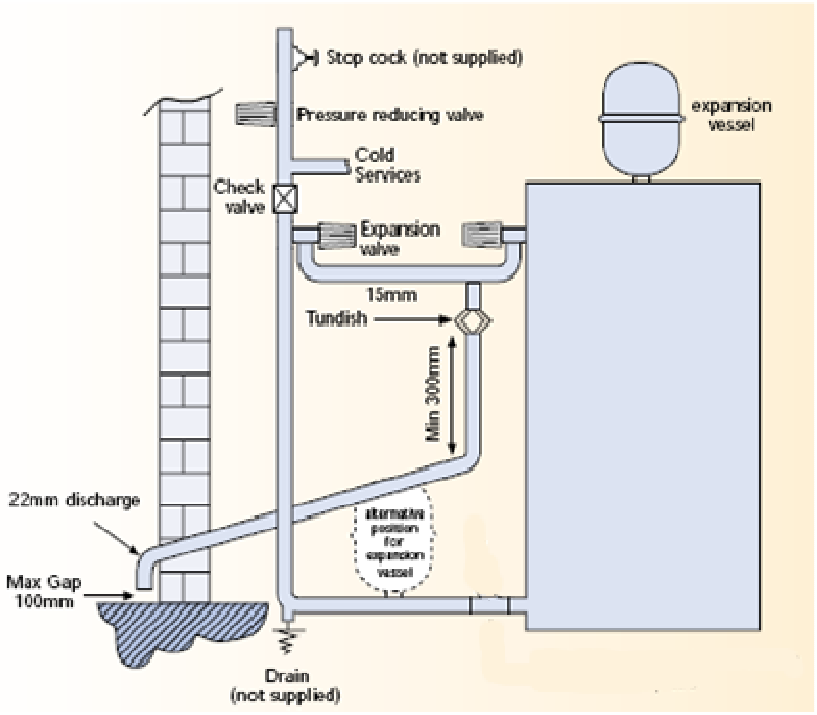
Use 22mm compression fittings for all unit connections. Use gunmetal, DZR or brass fittings, noting local water conditions.

4.2 Cold Mains Component Layout

No valve is to be fitted between the expansion valve and the cylinder, except a drain point. To facilitate servicing it is recommended that a stop cock is fitted to the above. Always install before the pressure reducing valve. Always fit a drain tap in an appropriate position for drain down as low as possible.

DO NOT USE MONOBLOC MIXERS IF THE COLD SERVICE IS UNEQUALISED AS IT WILL BACK PRESSURISE THE UNIT AND RESULT IN DISCHARGE.

4.3 General Arrangement and Discharge



Note: On the heat pump models the expansion vessel is designed to be remote and not screwed on top of the vessel.

Both the pressure and temperature relief valve fitted to the unit and the expansion valve supplied loose must be arranged to comply with G3 regulations and both discharge into an open (visible) tundish.

The tundish must be fitted with a 300mm vertical drop of 22mm diameter pipe.

NB: The tundish and drain must be positioned away from electrical devices.

ALWAYS CONSULT THE REGULATIONS!

IMPORTANT: Discharge arrangements are the responsibility of the installer and reference to current building regulations should always be made. Advance Appliances offers the foregoing as guidelines only.

The discharge pipeworks main purpose is to allow full flow from relief valves to be accumulated and safely routed to a point outside the building at low level.

4.4 General Notes

4.4.1 Tundish Discharge

The unit is supplied with two mechanical safety devices :- An expansion relief valve, supplied loose, and a temperature/pressure relief valve fitted to the unit, both discharging into a tundish (supplied loose).

Discharge pipes must be left open to atmosphere, not blocking the tundish.

The responsibility for supplying and fitting the discharge pipe from the tundish is that of the certified installer. In general, installation practice should be in accordance with the approved document G3 of schedule 1 of the building regulations 1991, VIZ:

3.9 The discharge pipe 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:

i) Be at least one pipe size larger than the nominal 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 larger than the nominal outlet size of the safety device, between 18m and 27m at least 3 sizes larger, and so on. Bends must taken into account in calculating the flow resistance.

See Diagram and table on pages 20 and 22.

ii) Have a vertical section of pipe at least 300mm long, below the tundish before any elbows or bends in the pipework.

iii) Be installed with a continuous fall.

iv) Have discharges visible at both the tundish and the final point of discharge but where this is not possible or practically difficult there should be clear visibility at one or other of these locations.

Examples of acceptance discharge arrangements are:

a) Ideally below a fixed grating and above the water seal in a trapped gully.

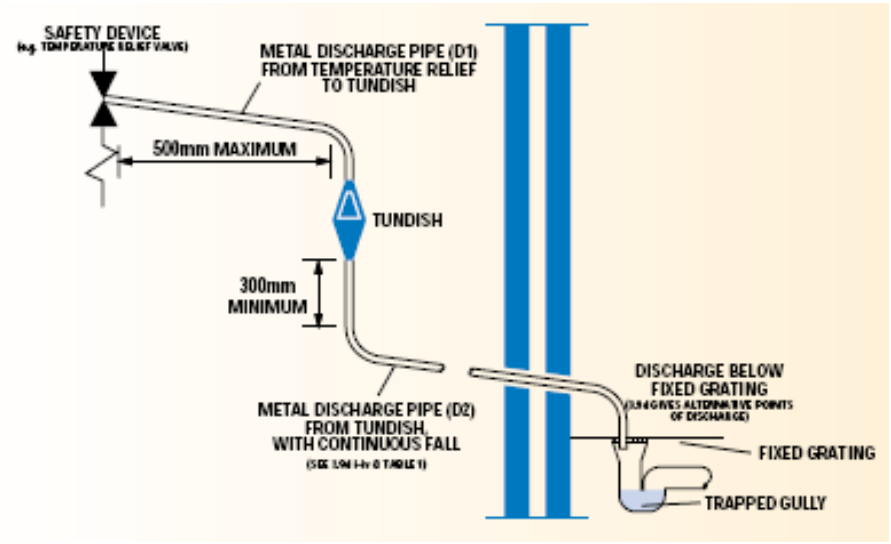
b) Downward discharges at a low level; i.e. up to 100mm above external surfaces such as car parks, hard standings, grassed areas etc. are acceptable providing that where children may play or otherwise come into contact with discharges, a wire cage or similar guard is positioned to prevent contact, whilst maintaining visibility.

c) Discharges at high level; e.g. in to 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 3m from any plastic guttering systems that would collect such discharges (tundish visible).

d) Where a single pipe serves number of discharges, such as in a block of flats, the number served should be limited to not more than 6 systems so that any installation can be traced reasonably easily. The single common discharge pipe should be at least one pipe size larger than the largest individual discharge pipe 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.

NOTE: The discharge will consist of scalding water and steam. Asphalt, roofing felt and non-metallic rainwater goods may be damaged by such discharges.

4.4.2 Typical Arrangement



Worked example:

The example below is for a G1/2 temperature relief valve with a discharge pipe (D2) having 4 No. elbows and length of 7m from the tundish to the point of discharge.

From Table 1

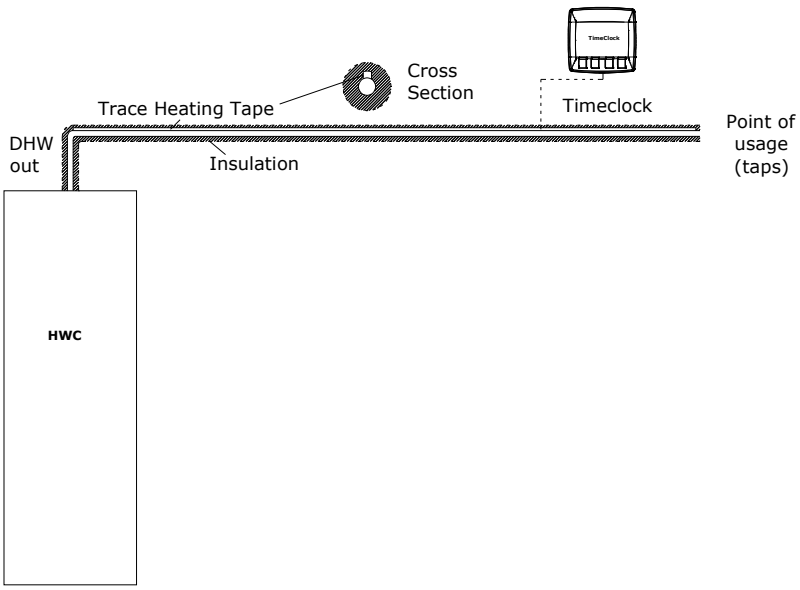
- Maximum resistance allowed for a straight length of 22mm copper discharge pipe (D2) from a G1/2 temperature relief valve is 9.0m.
- Subtract the resistance for 4 No. 22mm elbows at 0.8m each = 3.2m
- Therefore the maximum permitted length equates to 5.8m.
- 5.8m is less than the actual length of 7m therefore calculate the next largest size.
- Maximum resistance allowed for a straight length of 28mm pipe (D2) from a G1/2 temperature relief valve equates to 18m.
- Subtract the resistance for 4 No. 28mm elbows at 1.0m each = 4.0m
- Therefore the maximum permitted length equates to 14m.
- As the actual length is 7m, a 28mm (D2) copper pipe will be satisfactory

Sizing of D2 Copper Discharge Pipe for Common Temperature Relief Valve Outlet Sizes				
Valve Outlet Size	Minimum Size of Discharge Pipe (D1)	Minimum Size of Discharge Pipe (D2) From Tundish	Maximum Resistance Allowed Expressed as a Length of Straight Pipe (i.e No Elbows or Bends)	Resistance Created by Each Elbow or Bend
G1/2	15mm	22mm	Up to 9m	O.8m
		28mm	Up to 18m	1.0m
		35mm	Up to 27m	1.4m
G3/4	22mm	28mm	Up to 9m	1.0m
		35mm	Up to 18m	1.4m
		42mm	Up to 27m	1.7m
G1	28mm	35mm	Up to 9m	1.4m
		42mm	Up to 18m	1.7m
		54mm	Up to 27m	2.3m

Table 1—Sizing of D2 Copper Discharge Pipe for Common Temperature Relief Valve Outlet Sizes

4.4.3 Secondary Returns

In long DHW pipe runs, to avoid excessive water draw off before the water is up to temperature at the point of usage, it is common to install cylinders with a secondary return. This is not recommended for systems using heat pumps as it promotes mixing in the tank and a lower flow temperature off the cylinder.



For long pipe runs, to avoid excessive cold water draw offs it is recommend that trace heating tape is used and the pipe is well insulated. The operation of this tape should be timed to a period/s around the time the most hot water is used, i.e. early morning and evening.

If the water pipe is well insulated and the system is timed, the amount of energy this system will use is minimal.

Using the trace heating tape, removes the additional cost of installation of the secondary return and water pump and the associated running costs of this equipment.

4.4.4 Hot Water Outlets

Dynamic pressure always drops across a system when more than one outlet is opened.

The unit has a working pressure of 3 bar.

Good system design should take this into consideration & pipe sizing should be in line with current good practice.

In hard water areas a reduced operating temperature will help to prevent premature scaling.

4.4.5 Expansion Vessel

The expansion vessel (supplied loose) is fitted remotely and has a bracket and hose supplied as standard. It is sized appropriately and includes some allowance for pipework.

Check the charge is at 3.0 bar before commissioning.

4.4.6 Primary Circuits

- The maximum primary pressure is 3 bar.
- If the primary circuit is sealed, an additional expansion vessel must be fitted.
- If a secondary circuit is connected an additional expansion vessel may be required.

4.4.7 Electrical Connections

For Heat Pump cylinders as the heat input is low (generally below 60oc) the two port valve and overheat thermostat arrangement generally fitted on a boiler can be omitted.

For twin coil cylinders the diverter valve and overheat thermostat arrangement should be employed to provide overheat protection on the solar circuit.

Immersion heaters are rated 3kw at 240v (2.76kw at 230v), incolloy elements, with a thermal energy cut-out, and must be connected via double pole switches with a 3mm contact gap separation. Appropriate wiring for the electrical load must be used.

Do not switch on until the unit is full of water.

Order replacements using reference number on page . Do not fit an immersion heater without a high limit thermostat. Immersion heaters supplied are designed for domestic use only, either utilising low tariff electricity and occasional boost or for switched periods during the day.

- Units must be earth bonded.
- Immersion heaters must meet BS EN 60730-2-1.
- Fuse rating for 6kw loading is 25 amps, for 3kw models fuse rating is 13 amps.

Although not required by Building Regulations, it is generally advised that to provide legionella protection the tank is raised above 60^{o}C at least once a week. To provide this we would recommend that a 3 kW electric immersion heater is fitted with its own dedicated 7- day timeclock. If DHW is required higher than 50^{o}C then it is advisable that the immersion heater is programmed to operate for a period following the heat pump operation period to raise the temperature. This avoids the immersion heater taking all of the load.

5.0 Commissioning

Before filling, check expansion vessel charge is at 3.0 bar.

1. Open all terminal fittings on the domestic hot water circuit. Open the main supply to the unit.
2. Flush the unit through until all air is expelled.
3. Close hot outlets and open all cold outlets connected to the tee after the pressure control valve.
4. Flush through until all air is expelled.
5. The system is now full of water. Check for any leaks on pipework or joints or components such as immersion heaters etc. It is the installers responsibility to check all fittings, including those that are fitted to the unit.
6. Switch on power and heat up via immersion heater, and/or heat pump.
7. Your system should now be ready for use.

6.0 Maintenance

Maintain annually and carry out the following checks:

Clearly up date the Log Book at each service - **GUARANTEES ARE VOID WITHOUT SERVICE RECORDS.**

1. Check incoming pressure is controlled at 3 bar maximum. Expansion vessels must be maintained annually. The charge should be checked with an accurate pressure gauge and maintained at 3.0 bar. If the reading is less than 3.0 bar to recharge the vessel ensure that the unit is decommissioned by turning off the water supply and opening hot tap.
   Open the pressure and temperature relief valve to drain water from the top of the unit then close this valve. Leaving the hot tap open and the main supply off, pump the vessel using a schraeder valve connector via a footpump or motorised pump to 3.0 bar. Remove pump, open mains supply and close hot tap once water is running freely.

   Run a hot tap and close. If the pressure remains over 3 bar, re-calibrate the Pressure Reducing Valve and clean the strainer, replacing if necessary.

2. Open the expansion valve cap to manually discharge water to ensure that it works, making sure that it resets correctly.

3. Open the pressure and temperature relief valve cap to manually discharge water to ensure that it works, making sure that it resets correctly.

4. In both cases ensure that discharge pipework is adequate to safely carry discharged water away. If not, check for blockages etc. and clear.

5. Check that the controls of the hot water temperature do not allow the water to get hotter than 60ºc.

7.0 Warranty

Advance Appliances guarantees the shell of the unit for 25 years. The component parts, including the expansion vessel, are guaranteed for 2 years from date of purchase.

The following information is important – without it your guarantee may be invalid

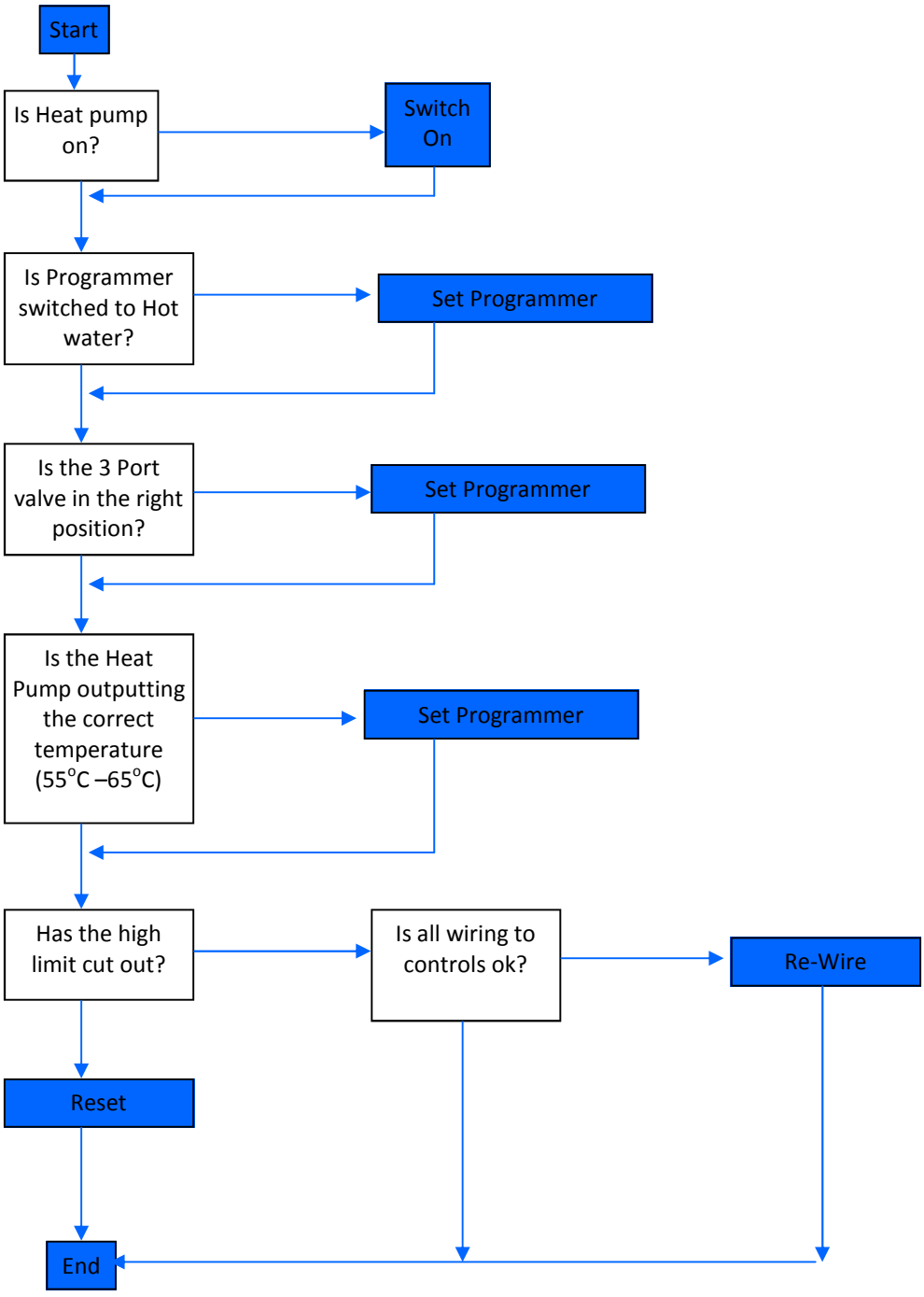
1. Keep proof of purchase
2. Maintain log book on unit
3. Service annually
4. Ensure that installation has been carried out correctly by appropriately approved/competent personnel following relevant Code of Practice.
5. Installation must be in an appropriate location and use is restricted to potable water.

Please note that the extended guarantee is not transferable, and rests with the original householder. The above does not affect your statutory rights.

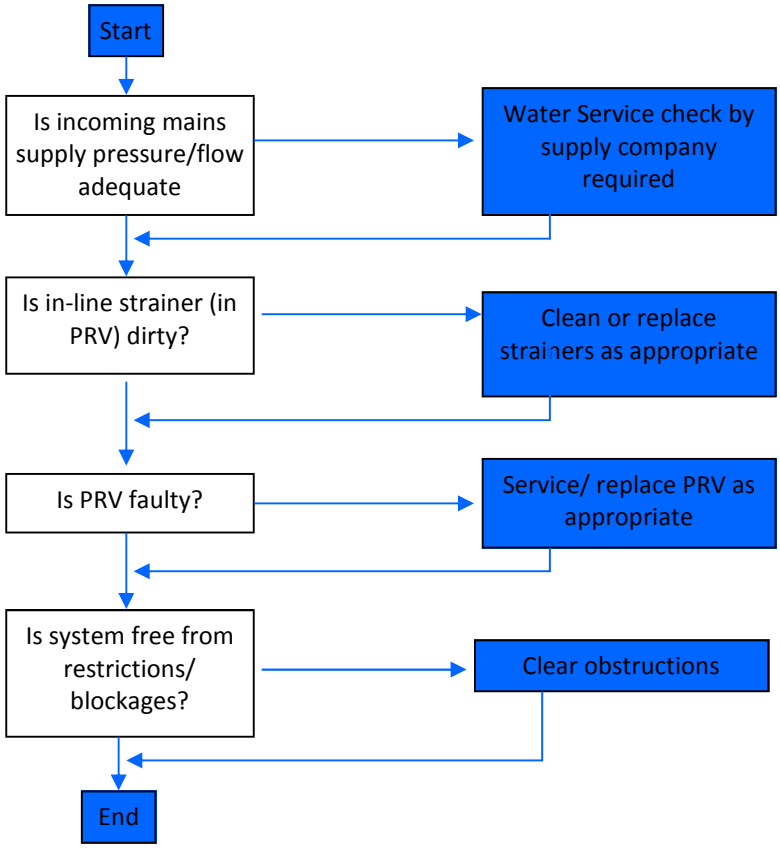
Every effort has been made to ensure that this information is correct. Regulations may change and installers must adopt best current practice.
Advance Appliances/Kensa reserve the right to alter or improve components or specification without notice.

8.0 Troubleshooting

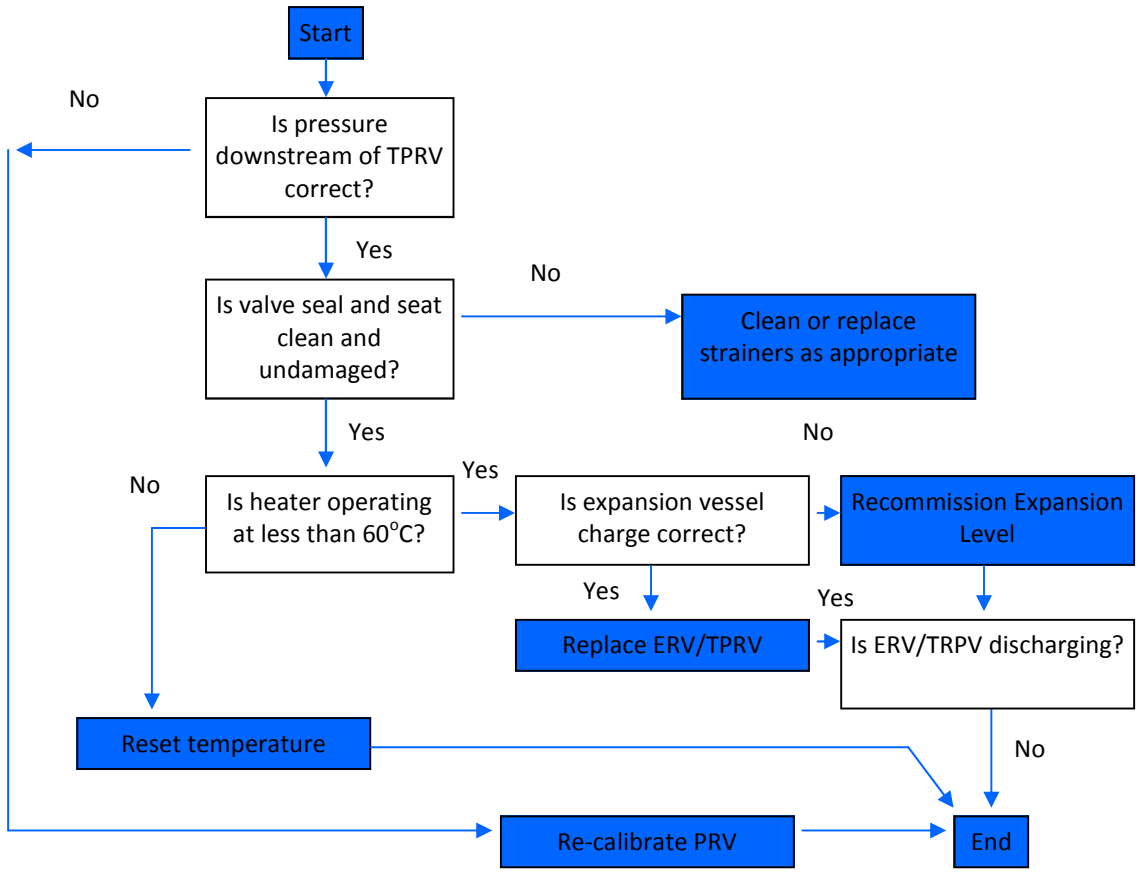
8.1 No Hot Water



8.2 Poor Water Flow at Hot Taps



8.3 Water Discharging into Tundish



9.0 Spares

The following spares for the unvented heat pump cylinders are available :

KENSA CODE	ADVANCE CODE	COMPONENT
95-501A	AA0267	3 BAR CONTROL INLET GROUP
95-502A	AA0272	7BAR/95 DEGREE P&T RELIEF VALVE
95-503A	AA0273	3KW IMMERSION HEATER C/W STAT
95-210A	AA0276	12 LITRE EXPANSION VESSEL 3BAR
95-211A	AA0277	19 LITRE EXPANSION VESSEL 3 BAR
95-506A	AA0279	TUN DISH 22 X 15
95-507A	AA0282	DUAL THERMOSTAT
95-508A	AA0283	2 PORT VALVE 22MM
95-505A	AA0284	6KW IMMERSION HEATER C/W STAT
95-506A	AA0285	3KW IMMERSION THERMOSTAT ONLY