Dimplex EC

Heat Pump Cylinders
Up to 300L

EC-Eau Cylinder Range

Installation and User Instructions

Important - This manual must be left with the user after Installation!

Dimplex is a licensed member of the Benchmark Scheme which aims to improve the standards 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 manufacturer's 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 installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hot Water Industry Council who manage and promote the Scheme. Visit www.centralheating.co.uk for more information.

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

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

For further information on the HWA Charter Membership, please refer to the HWA website www.hotwater.org.uk'

0 Overall View

Reference	Description
01	Cold Water Inlet
02	Hot Water Outlet
03	T & P Valve
04	Bottom Immersion
05	Heat Pump Flow
06	Heat Pump Return
07	Bottom Thermostat
08	Secondary Return (larger than 150L only)
09	Technical Data Label

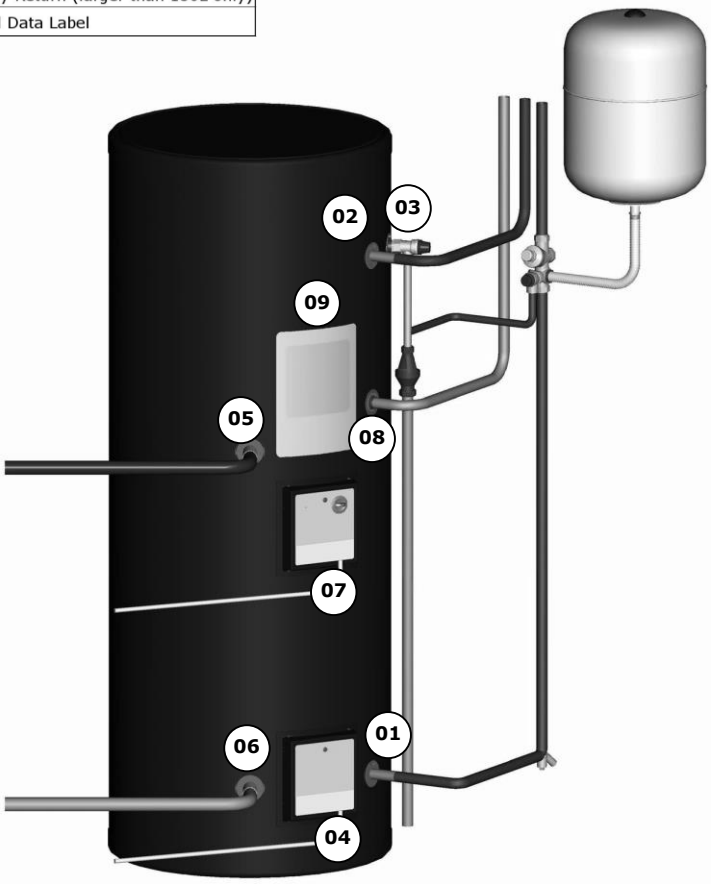


*Figure 1: Overall view of **Heat Pump** Cylinder installation process*

Reference	Description
01	Cold Water Inlet
02	Hot Water Outlet
03	T & P Valve
04	Bottom Immersion
05	Top Immersion
06	Heat Pump Flow
07	Heat Pump Return
08	Heat Pump Buffer from HP
09	Heat Pump Buffer to System
10	Bottom Thermostat
11	Secondary Return (larger than 150L only)
12	Buffer air vent point
13	Technical Data Label

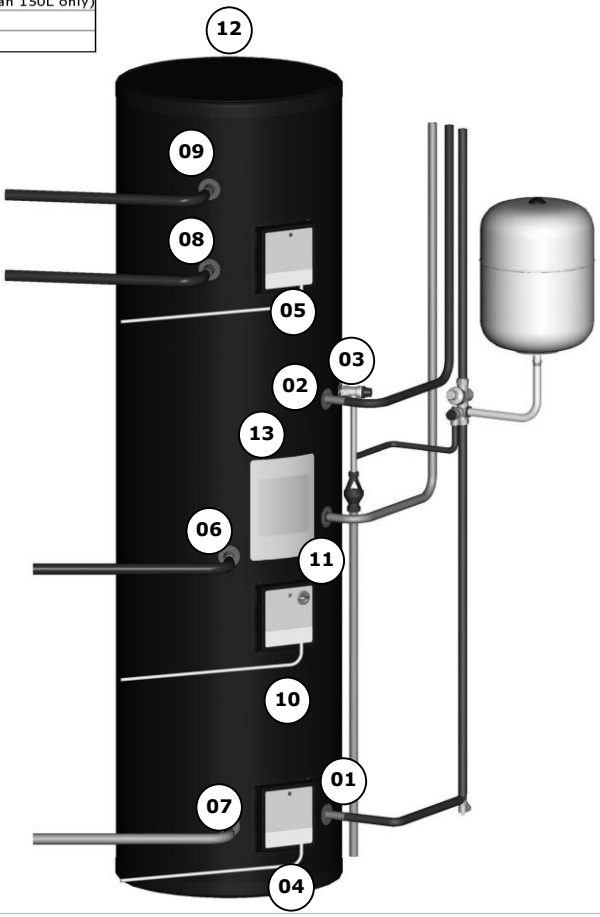


*Figure 2: Overall view of **Heat Pump and Buffer** Cylinder installation Process*

Overall View

1 Contents

Precaution: *"This appliance can be used by children aged from 8 years and above and persons with reduced physical sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understanding the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision."*

Note: Between the inlet group and the cold water inlet on the cylinder NO isolating device may be fitted, as by doing so important safety devices could be isolated!

It is important to check the pre-charge pressure of the expansion vessel membrane before filling the cylinder. This has been factory set to 3 bar. The pre-charge should be greater than or equal to 3 bar.

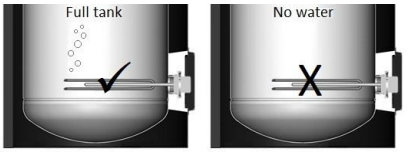
It is important that the tundish is positioned away from any electrical components.

Note: Means for electrical disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

Before removing the cover from the immersion heater isolate appliance using isolating switch! Danger of electrical shock! Only use suitable electrically insulated equipment

when working inside immersion housing.

Note: The cylinder must be filled with water before switching on the immersion heater. Failure to do so will damage the element and void any guarantee on the product.



Never operate cylinder without water or element can burn out

The maintenance of this appliance must be carried out by a suitably qualified person only. It is recommended to maintain the unit on an annual basis. Isolate all electrical supplies from the unit before commencing work. Danger of electrical shock!

CLEANING INSTRUCTIONS:
Clean outer cladding of cylinder with a soft cloth dampened with warm water only. Do not use abrasive or aggressive cleaning materials, such as alcohol or petroleum based solvents, as this may damage the surface of the product.

Temperature setting: A high level cutout is fitted to the product for each heat source. This should never activate under normal operation. The maximum possible cylinder temperature attainable by the heat pump is 65°C as set on the User Interface. The back-up immersion heater can produce up to 72°C at its maximum setting, i.e 5. For

convenience the immersion heater is preset to produce 60°C.

If an electronic copy of this manual should be required, please contact the manufacturer at the address at the back of this manual.

Note: This appliance is intended to be permanently connected to the water mains and not connected by a hose-set.

2 Introduction

Thank you for choosing a Dimplex product. The EC-Eau heat pump cylinders are specified with large, high surface area heat exchangers, specifically sized to match the requirements of Dimplex heat pumps. They boast 60mm of low GWP insulation foam, together with 100% recyclable stainless steel inner components and a sleek black, hard wearing outer shell manufactured from completely recycled materials. For more detailed information on product features, please see the Technical Data section in this manual.

3 Scope of delivery

Please ensure you check the scope of delivery below before signing any delivery documentation. Claims for missing or damaged parts after signing for the delivery will not be accepted.

Scope of delivery				
Cylinder nominal volume		**125 l and 150 l**	**175 l and 210 l**	**250 l and 300 l**
Cylinder with one 3kW immersion *		✓	✓	✓
T+P valve *		1/2", 7bar/90°C	1/2", 7bar/90°C	1/2", 7bar/90°C
Inlet control group consisting of:-		✓	✓	✓
- in line strainer				
- 3 bar PRV				
- 6 bar ERV				
- non-return valve				
- balanced cold water supply port				
- 22mm connection for expansion vessel				
28mm motorised two port valve **		✓	✓	✓
Expansion vessel with fixing kit and connection hose		12 l	18 l	24 l
Tundish		15mm/22mm	15mm/22mm	15mm/22mm
Installation & User Instructions x 1		✓	✓	✓
Terms and conditions x 1		✓	✓	✓

*Table 1: Scope of Delivery for **Heat Pump** Cylinders*

* These items are supplied factory fitted
** Only part of the scope of delivery when not supplied as a Dimplex Heat Pump package

Scope of delivery			
Cylinder nominal volume		**125/75 l and 150/75 l**	**180/75 l and 210/75**
Cylinder with one 3kW immersion *		✓	✓
75l Buffer vessel with one 3kW immersion *		✓	✓
T+P valve *		1/2", 7bar/90°C	1/2", 7bar/90°C
Inlet control group consisting of:-		✓	✓
- in line strainer			
- 3 bar PRV			
- 6 bar ERV			
- non-return valve			
- balanced cold water supply port			
- 22mm connection for expansion vessel			
28mm motorised two port valve **		✓	✓
Expansion vessel with fixing kit and connection hose		12 l	18 l
Tundish		15mm/22mm	15mm/22mm
Installation & User Instructions x 1		✓	✓
Terms and conditions x 1		✓	✓

*Table 2: Scope of Delivery for **Heat Pump with Buffer** Cylinders*

* These items are supplied factory fitted

** Only part of the scope of delivery when not supplied as a Dimplex Heat Pump package

4 Pre-Installation Advice

Please read the following section carefully before commencing installation. If in any doubt, please call the appropriate help desk. Disregarding the instructions given in this manual in its entirety and any relevant regulations, standards and codes of practice will void the guarantee of this product.

Handling – depending on the size of the unit and access to its installation location, consideration must be given to the handling of the unit. Please note that handling, installation and use of this product is subject to the Health and Safety at Work Act.
If the unit is not installed immediately, it should remain in its protective packaging with all pipe protectors/end caps applied to prevent damage and dirt deposit inside the cylinder and the coils.

Pipe work – the pipe runs should be executed as short as possible, unused pipe work should be removed and all remaining pipe work should be lagged in accordance with regulatory requirements to prevent heat loss and the formation of condensation.

Taps and fittings – all taps and fittings incorporated in the unvented system should have a rated operating pressure of 0.6 MPa (6 bar) or above.

4.1 Risk assessment

The compilation of a risk assessment is strongly recommended before installing the product. The following areas require particular consideration in addition to the information required by the Health and Safety at Work Act.

- scalding: where appropriate or required by law a thermostatic mixing valve is to be fitted to the hot water outlet of the cylinder (see also water borne organisms).

- explosion: the unit is fully equipped with all relevant safety equipment to comply with current regulations. The correct design and function has been verified by independent third party testing. The correct application thereof is the responsibility of the competent installer.

- water borne organisms (i.e. Legionella): if applicable a risk assessment should be carried out following the recommendations outlined in the Approved Code of Practice L8.

- the user preference must be considered when commissioning the system, in particular when adjusting the solar and auxiliary system temperature and timer settings.

4.2 Siting considerations

When choosing a suitable location for the cylinder the following aspects should be considered:

- structural integrity

- access for installation, operation, maintenance and replacement

- routing of discharge pipe work

- access to water mains supply, hot and cold water distribution pipe work

- access to suitable electricity supply

- location in relation to remaining system components such as auxiliary and solar heating system

- frost protection

The heat pump cylinder range is designed to be floor standing, vertically mounted, indoors and in a frost free environment. The cylinder may be located on any flat and level surface, provided it is sufficiently robust to support the weight of the cylinder when full of water (please see technical data) and suitably accessible for replacement/maintenance without specialist tools or lifting equipment as this will void the warranty conditions.

The position and orientation of the cylinder should be such that easy access is provided for servicing the controls. A minimum distance of 400mm in front of the immersion is recommended, to allow the replacement of the immersion heater should the need arise. When installing the cylinder all labels should be clearly visible and ensure that no pipework hinders any work to be carried out on the various cylinder components.

Particular care must be taken when placing the cylinder in a garage or outbuilding. All exposed pipe work must be correctly insulated to avoid frost damage.

CLEANING INSTRUCTIONS: Clean outer cladding of cylinder with a soft cloth dampened with warm water only. Do not use abrasive or aggressive cleaning materials, such as alcohol or petroleum based solvents, as this may damage the surface of the product.

4.3 Cold water supply

For satisfactory and safe performance of the unvented cylinder the water supply must meet the following criteria:

Minimum dynamic pressure	150 kPa (1.5 bar)
Maximum inlet supply pressure	1200 kPa (12 bar)
Minimum flow rate	15 l/min
Max. chlorine content	250mg/L
Max. water hardness	200mg/L

The following instructions have to be followed when installing the cold water mains supply to the cylinder:

- The cold water supply to the cylinder must come directly from the cold water mains after the mains stop valve to the property.

- The cold water inlet pipe work should have at least an inside diameter of 19mm and should meet the requirements of the water regulations for the supply of wholesome water.

Dimplex recommend an annual maintenance inspection is carried out on the domestic hot water cylinder. In hard water areas this should include inspection of the heat exchanger and immersion heater, [above 120ppm or 120mg/l]. A local water treatment company should be able to offer free water quality testing. The heating elements may require periodic de-scaling. The installer should do this as part of a maintenance agreement.

If required, precautions can be taken to minimise effects of water hardness, i.e. installation of water conditioner or water softener. These devices should be installed in hard water areas where high water storage temperatures are required, i.e. greater than 60°C storage temperatures, particularly when water hardness exceeds 200ppm. Should the water cylinder require de-scaling, this must be performed by a qualified technician.

4.4 Building regulation G3 Discharge requirements

As part of the requirements of Building Regulation G3 any discharge from an unvented system should be conveyed to where it is visible, but will not cause danger to persons in or about the building. The tundish and the discharge pipes should be fitted in accordance with the requirements of Building Regulation approved document G3, (England and Wales), Part P of Northern Ireland and Standard 4.9 of Scotland.

4.4.1 Discharge pipe D2

The discharge pipe (D2) from the Tundish should:

- *"have a vertical section of pipe at least 300mm long below the tundish before any elbows or bends in the pipework and be installed with a continuous fall of at least 1 in 200 thereafter."*

The discharge pipe (D2) should be made of:

- *"metal; or other material that has been demonstrated to be capable of safely withstanding temperatures of the water discharged and is clearly and permanently marked to identify the product and performance standard"*

Dimplex strongly recommends the use of metal pipework only and Dimplex does not take responsibility for any damage caused from discharges.

The discharge pipe D2 should 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. for discharge pipes between 9m and 18m the 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. See Figure 3, Table 3 and the worked example.

Note: An alternative approach for sizing discharge pipes would be to follow Annex D, section D.2 of BS 6700:2006 + A1:2009).

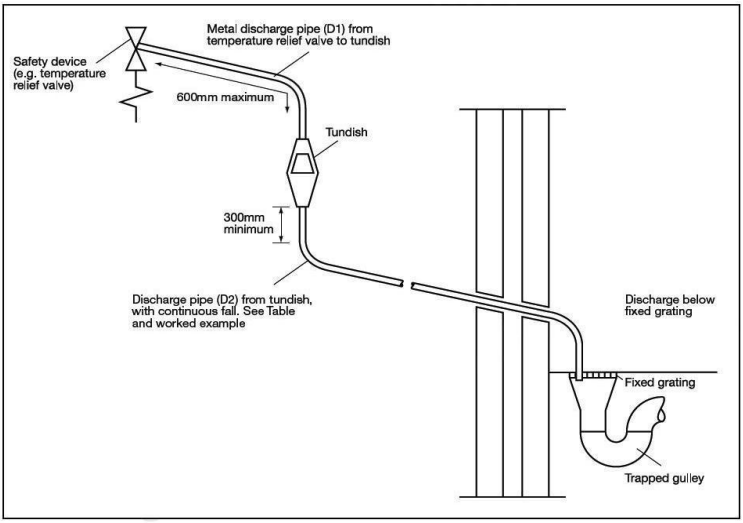


Figure 3: Typical discharge pipe arrangement

Valve outlet size [-]	Minimum size of discharge pipe before tundish [mm]	Minimum size of discharge pipe after tundish [mm]	Maximum allowed length of pipe after tundish [m]	Length to be substracted for each elbow or bend [m]
G1/2	15	22	9	0.8
		28	18	1.0
		35	27	1.4
G3/4	22	28	9	1.0
		35	18	1.4
		42	27	1.7
G1	28	35	9	1.4
		42	18	1.7
		54	27	2.3

Table 3: Sizing of copper discharge pipe "D2" for common temperature relief valve outlet sizes

4.4.2 Worked example

This example is for a G½ temperature relief valve with a discharge pipe (D2) (as fitted on 125 to 300L cylinders) having 4 No. 22mm elbows and length of 7m from the tundish to the point of discharge.

From Table 3*, the maximum resistance allowed for a straight length of 22mm copper discharge pipe*

(D2) from a G½ 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, which 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 G½ temperature relief valve is: 18m

Subtract the resistance for 4 No. 28mm elbows at 1.0m each = 4m

Therefore the maximum permitted length equates to 14m.

As the actual length is 7m, a 28mm (D2) copper pipe will be satisfactory.

- Where a single common discharge pipe serves more than one system, it should be at least one pipe size larger than the largest individual discharge pipe (D2) to be connected.

- The discharge pipe should not be connected to a soil discharge stack unless the soil discharge stack is capable of safely withstanding temperatures of the water discharged, in which case, it should:

  - contain a mechanical seal, which allows water into the branch pipe without allowing foul air from the drain to be ventilated through the tundish.

  - there should be a separate branch pipe with no sanitary appliances connected to it.

  - if plastic pipes are used as branch pipes carrying discharge from a safety device, they should be either polybutalene (PB) or cross-linked polyethylene (PE-X) complying with national standards.

  - be continuously marked with a warning that no sanitary appliances should be connected to the pipe.

4.4.3 Termination of discharge pipe

- *"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."*

- Examples of acceptable discharge arrangements are:

- "to a trapped gully with the end of the pipe below a fixed grating and above the water seal;

- 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 a wire cage or similar guard is positioned to prevent contact, whilst maintaining visibility; and ,

- discharges at high level: e.g. into a metal hopper and metal downpipe with the end of the discharge pipe clearly visible or onto a roof capable of withstanding high temperature discharges of water and 3m from any plastic guttering system that would collect such discharges."

Note: As the discharge would consist of high temperature water and steam, asphalt, roofing felt and non-metallic rainwater goods may be damaged by such discharges.

4.5 Limitations

- The heat pump must be specified correctly, to ensure it is compatible with the model of cylinder installed. This is to prevent the heat pump malfunctioning when preparing domestic hot water.

- The heat exchangers in this range of cylinders have been specifically designed for heat pump applications. Great care must be taken if using these cylinders with other heat sources, due to the heat exchange capacity of the product.

5 Installation

5.1 Cold Water Inlet with Inlet Control Group

5.1.1 Correctly site the cylinder

Install the cylinder in an appropriate location, ensuring all of the recommendations have been considered (see chapter 4.2).

5.1.2 Install the inlet group

The inlet group regulates the pressure of the incoming mains water supply to the cylinder and removes any debris that might be water borne.

Note: Between the inlet group and the cold water inlet on the cylinder NO isolating device may be fitted, as by doing so important safety devices could be isolated!

5.1.3 Expansion vessel

The expansion vessel is mandatory on all EC-Eau cylinders and can be connected directly to the cold water inlet group, utilising the flexible hose supplied with the vessel. The expansion vessel should always be fitted in accordance with the manufacturer's instructions. No isolating device should be fitted between the water cylinder and the cold water inlet group.

Furthermore, it is recommended to mount the vessel higher than the cylinder to avoid having to drain the cylinder when maintaining and replacing the expansion vessel.

Figure 4: Connection of the expansion vessel to the inlet group

It is important to check the pre-charge pressure of the expansion vessel membrane before filling the cylinder. The pre-charge should be greater than or equal to 3bar.

Note: The expansion vessel must be installed to the side of the expansion relief valve on the inlet group. To do this the blanking plug must be removed and the expansion vessel connected, as shown in Figure 5.

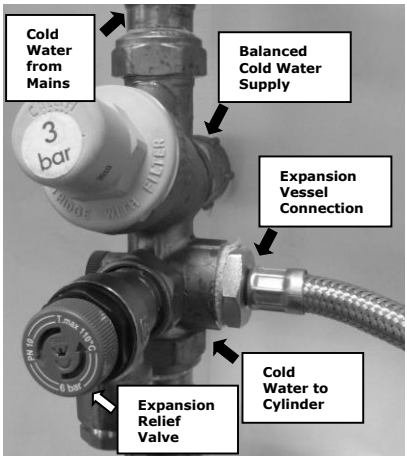


Figure 5: Detail showing the connection of the expansion vessel to the inlet group

5.1.4 Balanced cold water supply

If balanced cold water supply is required a connection can be taken from the bottom of the inlet group.

5.1.5 Drain valve

It is also recommended to install a drain valve (not supplied) in the lowest point of the cold water feed to the cylinder. This allows the cylinder to be drained in a controlled manner should this become necessary.

5.2 Hot Water Outlet

The hot water pipe work is to be directly connected to the hot water outlet connection on the cylinder, see Figure 1.

5.2.1 Thermostatic mixing valve

A thermostatic mixing valve may be required to limit the outlet temperature. In this case, the valve should be installed following the manufacturer's instructions, ensuring none of the safety equipment has been isolated, (i.e. make sure the connection to the thermostatic mixing valve is taken after the safety equipment of the inlet group).

5.2.2 Pipe insulation

It is recommended to insulate the hot water pipe work from the cylinder to the outlets, to reduce the energy requirements for providing hot water. It is also recommended to insulate all other exposed pipework, such as the T&P to the tundish, the coil flow and return and the cold water inlet pipes.

5.3 Discharge pipes from safety devices

5.3.1 Discharge pipe D1

- The temperature and pressure relief valve must be discharged directly or by way of a manifold via a short length of metal pipe (D1) into a tundish; and the discharge pipe must be installed in a continuously downward direction and in a frost free environment. Water may drip from the discharge pipe of the pressure relief device and this pipe must be left open to the atmosphere.

- The diameter of discharge pipe (D1) should not be less than the nominal outlet size of the safety device, e.g. temperature relief valve.

- Where a manifold is used it should be sized to accept and discharge the

total discharge from all the D1 discharge pipes connected to it.

- The discharge pipe work from the expansion relief valve must be installed constantly falling to an open point of discharge. It is recommended to combine it with the discharge of the temperature and pressure relief valve.

Note: The T&P valve is pre-sealed and if moved the seal will be broken, should this occur, it will need to be resealed with an appropriate sealant (Dimplex part number R00836-1).

5.3.2 Discharge pipe D2

For a detailed description of the discharge pipework D2 see chapter 4.4.1.

5.3.3 Tundish

- The tundish should be vertical, located in the same space as the unvented hot water storage system and be fitted as close as possible to, and lower than, the safety device, with no more than 600mm of pipe between the valve outlet and the tundish (see Figure 3).

- Discharge should be visible at the tundish, where discharges may not be apparent, e.g. in dwellings occupied by people with impaired vision or mobility, consideration should be given to the installation of a suitable safety device to warn when discharge takes place, e.g. electronically operated.

Note: To comply with the Water Supply (Water Fittings) Regulations, the tundish should incorporate a suitable air gap.

It is important that the tundish is positioned away from any electrical components.

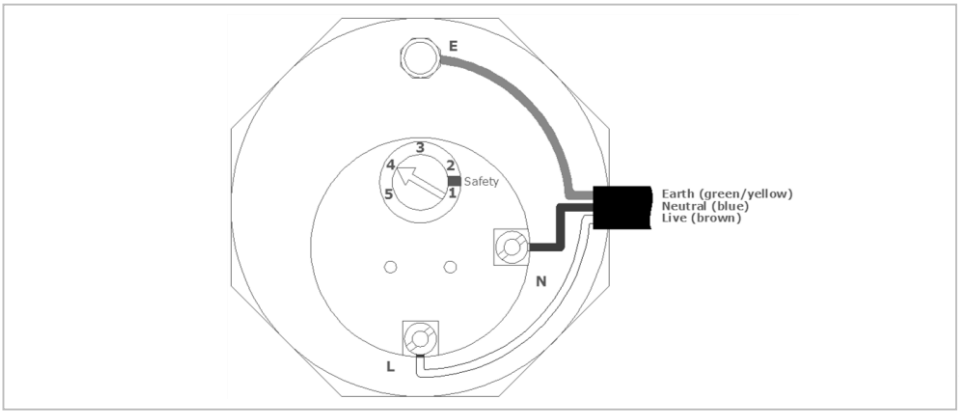


Figure 6: Wiring diagram for Immersion Heater

5.4 Immersion heater

The immersion heater has to be connected in accordance with IEE Wiring Regulations and the installer carrying out the work has to be suitably qualified. It must be connected through a double pole isolating switch or suitable controller which must have a contact separation of at least 3mm in all poles. The wiring diagram can be seen in Figure 6. For further details please see instructions provided with the immersion heater.
The immersion heater incorporates an independent non-self resetting over temperature cut-out. Should the over temperature cut-out operate, the reset pin will be pushed upwards, and become level or slightly proud of the cover at the position marked "Safety". Use a suitable sized implement to reset the pin by pushing it hard into its original position.

The immersion heater typically cannot be directly switched by the heat pump controller, but instead requires a relay.

Note: Should it be necessary to remove the thermostat from the immersion element, ensure that the contacts are re-fitted correctly into the positions on the element. Failure to do so carries the risk of overheating the contacts and thus damaging the appliance.

A torque of 40 Nm is recommended when tightening up the immersion after it has been removed and refitted. The immersion heater thermostat must not be opened under any circumstances.

Note: The cylinder must be filled with water before switching on the immersion heater. Failure to do so will damage the element and void any guarantee on the product.

5.5 Coil flow connections

If the flow connection is the highest point in the heat pump loop and if the system was not commissioned using a flush and fill pump, an adequate device for de-aeration must be installed.

5.6 Coil return connections

Equally, if the return connection is the lowest point in the heat pump loop, a suitable drain device should be installed. For location of connections see Figure 1.

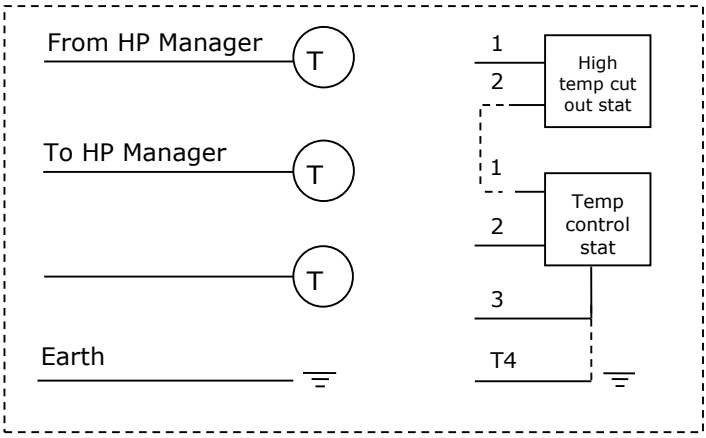
It is recommended that the fittings used to connect to the cylinder are suitable for stainless steel, the flow and return should use 28mm compression fittings. Not all push fit fittings can be used – please check with your supplier. When using compression fittings, ensure that the connection is not over-tightened.

5.7 Thermostat connection and installation of the heat pump DHW temperature sensor

The heat pump can be wired to the cylinder in various ways as described by the chosen supplier.

To conform to building regulations, it is imperative that the hot water circulating pump is installed through the twin thermostat.

If a non Dimplex heat pump is used in combination with this cylinder or another heat source, a two port valve has to be wired after the thermostat, ensuring compliance with building regulations.



NOTE: T1 and T2 must be connected to the heat pump control panel, see heat pump installation manual. T3 can replace T2 only when a normally open configuration is required.

Figure 7: Heat Pump Loop Wiring

5.7.1 Heat Pump and Buffer Cylinder Schematic

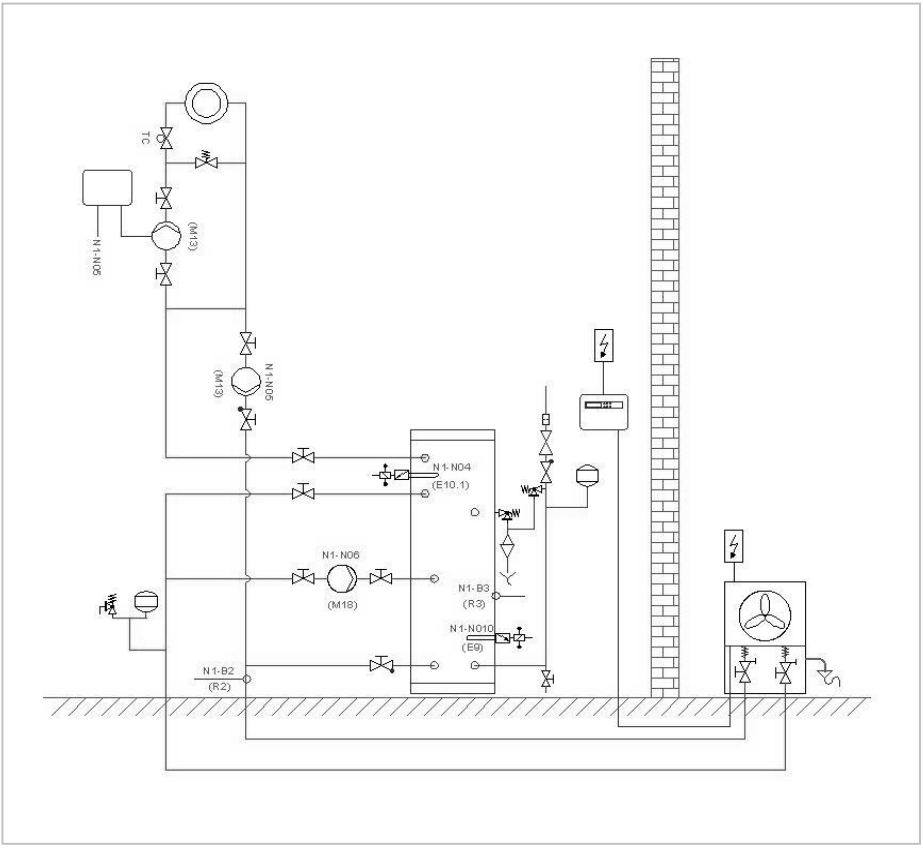
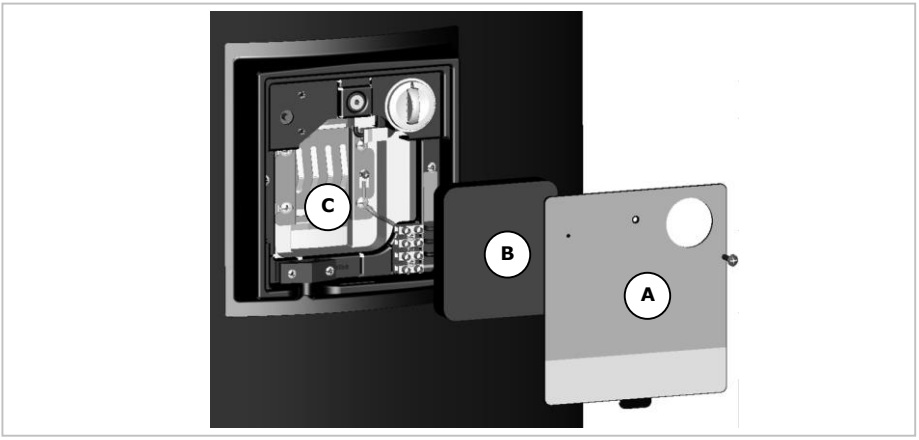
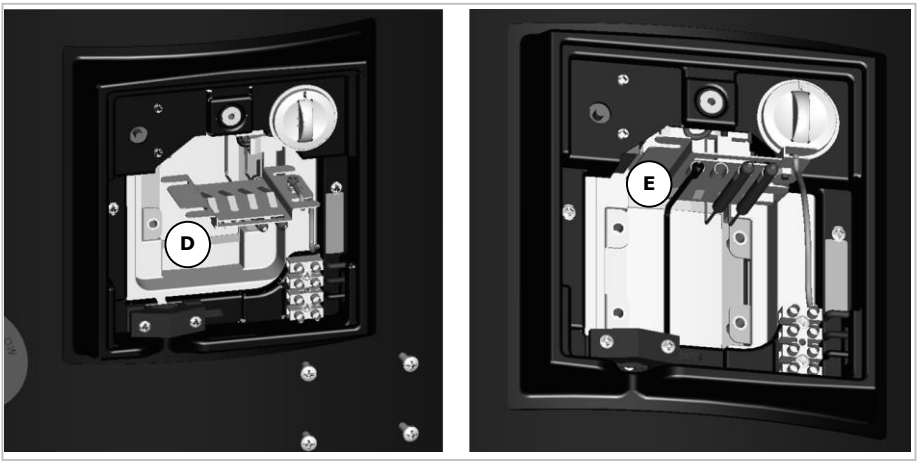


Figure 8: Heat Pump and Buffer Cylinder Schematic

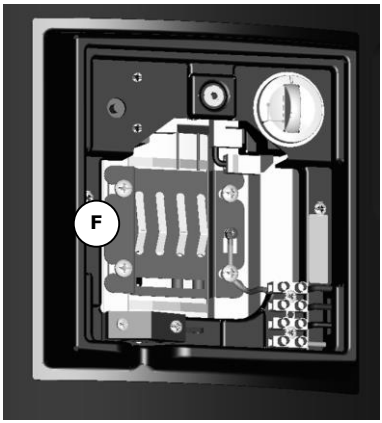
5.7.2 Connection of the sensor



Step 1: Access the sensor mounting plate. To do this remove the Dual Cut Out cover plate (A) by removing the fixing screw and insulation foam (B) to access the sensor mounting plate (C). Remove the M5 fixing screws in the four corners of the plate.

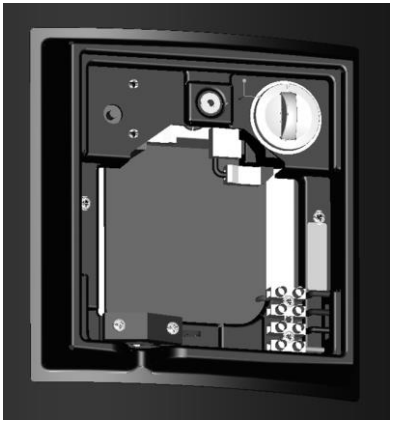


Step 2: Orientate the sensor mounting plate to allow access to the phials (*four clips in the centre of the sensor mounting plate*). Be careful not to kink the capillaries that connect the thermostat bulbs. The sensor mounting plate will have two vacant slots for additional sensors (D). Slide the solar sensor into place as shown (E).

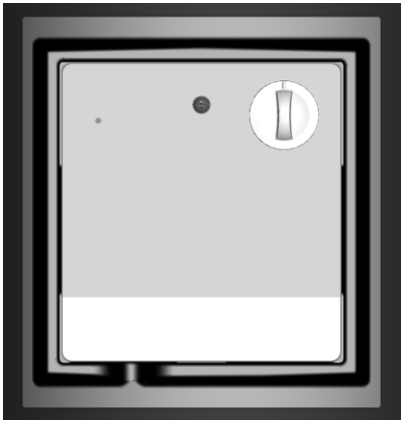


Step 3: Move the sensor mounting plate back into its fixing position. Be careful not to kink the capillaries that connect the thermostat bulbs. Fit the four M5 fixing screws into the cylinder bracket (F). Tighten the screws until the thermostat bulbs and heat pump sensor are held firmly against the wall of the inner cylinder.

Note: there should be no movement in the phials that are used to hold the bulbs and sensor. Care should be taken not to overtighten the screws.



Step 4: Replace the insulating foam over the sensor mounting plate.



Step 5: Refit the Dual Cut Out cover plate. Enter the fixing tab into the slot provided at the base of the enclosure and fit the fixing screw.

5.8 Connection of Secondary Return

A secondary return port is installed on the 210, 250 and 300L cylinders. For cylinders that do not have a dedicated secondary return connection, it is possible to install a secondary return by connecting a swept - T to the cold water inlet of the cylinder (see Figure 9).

The secondary return pipe should incorporate a check valve and a WRAS approved circulation pump; timer and thermostat to be provided separately. Where secondary return circuits are used, then an additional expansion vessel may be required.

The secondary return loop must avoid:

- stagnant water in long pipe runs
- long waiting times at draw off point for hot water
- undue water wastage

To minimise the energy consumption of the secondary return circuit and to ensure reliable operation it is important to consider:

- the control of the circulation pump to be time and temperature controlled
- the secondary return circuit pipe work to be insulated
- the secondary return pump to be of suitable material and specification

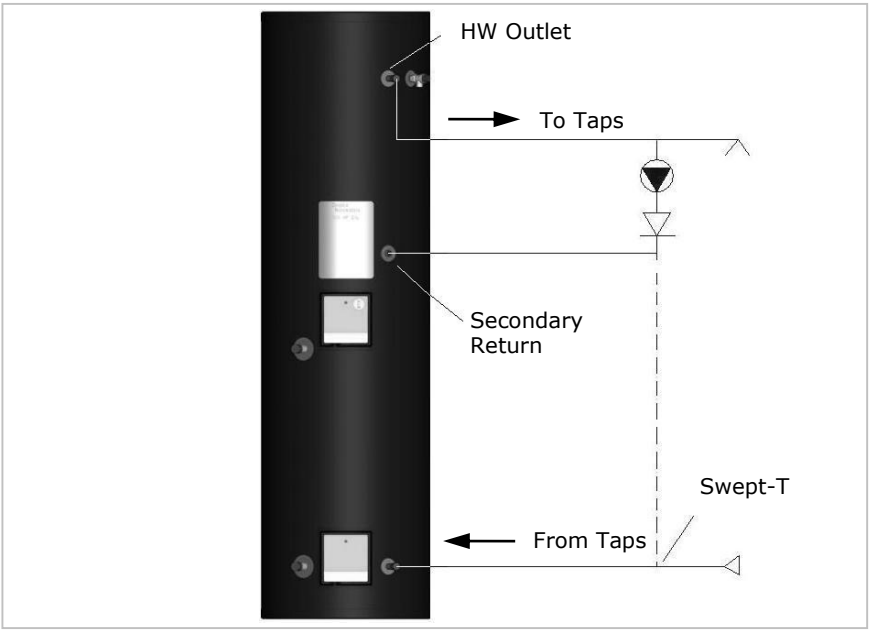


Figure 9: Secondary return loop

6 Commissioning

At the time of commissioning, complete all relevant sections of the Benchmark Checklist located on the inside back pages of this document.

The following commissioning procedures only detail the required steps to be taken for the potable water loop and not for the heat pump loop:

1) Before making any mains connections to the inlet control group, flush the mains pipework out to ensure all debris has been removed so as not to damage the strainer within the combination valve.

2) Make final mains connection on combination valve and check all connections and joints to ensure they have been tightened and secured correctly.

3) Before turning on the mains supply to the cylinder a hot water tap should be opened, preferably on the same floor or the floor below where the cylinder is located.

4) Check the pre-charge in the expansion vessel and ensure it is at least 3 bar. Note actual pressure on label on expansion vessel.

5) Turn on the supply to the cylinder and fill until water runs from the open hot water tap. Continue to flush the system until all debris has been removed.

6) Close the hot water tap.

7) Check all joints for leaks, even those not having been altered especially when replacing a vented cylinder.

8) Open temperature and pressure relief valve to ensure proper discharge and check after closing that valve is not dripping.

9) Open expansion relief valve to ensure proper discharge and check after closing that valve is not dripping.

10) Check all shower outlets, toilet cisterns and other draw off points for leaks or dripping (especially when replacing a vented unit). Open all water outlets to purge air from pipe work and ensure proper operation.

11) Adjust timer programmer and cylinder thermostat settings in accordance with client requirements.

12) Instruct user in the operation of the unit and hand over this manual advising the owner of annual service requirements.

13) Complete the technical data label on the cylinder with legible and permanent writing.

7 Maintenance

After servicing, complete the relevant Service Record section of the Benchmark Checklist located on the inside back pages of this document. To meet with warranty requirements the cylinder must be serviced annually.

The maintenance of this appliance must be carried out by a suitably qualified person only. It is recommended to maintain the unit on an annual basis. Isolate all electrical supplies from the unit before commencing work. Danger of electrical shock!

1) Draw some water from cold water tap and retain in container.

2) Isolate cold water mains supply from cylinder.

3) Briefly open temperature and pressure relief valve, assure safe discharge and check that valve is not dripping when closed.

4) Briefly open expansion relief valve, assure safe discharge and check that valve is not dripping when closed. The expansion relief valve should be operated regularly to remove lime deposits and to verify that it is not blocked.

5) Open hot water tap and release remaining pressure from unit.

6) If the system is drained completely for an internal inspection, ensure the hot water tap remains open, connect a hose to the drain valve and ensure a safe discharge.

7) Note the set pressure of the pressure reducing valve. Remove cartridge and clean strainer in water provided in container. Re-assemble pressure reducing valve ensuring the correct pressure is set.

8) Periodically the immersion heaters should be removed cleaned and the unit flushed out. Check the O-ring seal for damage and replace if necessary. A torque of 40 Nm is recommended when tightening up the immersion after it has been removed and refitted.

9) Check electrical wiring connections and the condition of the cable of the immersion heater and the thermostat.

10) The immersion heater boss can also be used for access to view the internal components of the cylinder.

11) Re-commission unit (see chapter 6).

Note: Air vent located on top of buffer vessel; to access remove end cap.

If the cylinder is not in use for excess of 1 month, it must be drained down by a competent person and recommissioned before use. Note: The immersion must be switched off at the mains before draining the cylinder.

If replacement parts are required, please see Figure 10 for part descriptions and part numbers.

CLEANING INSTRUCTIONS: Clean outer cladding of cylinder with a soft cloth dampened with warm water only. Do not use abrasive or aggressive cleaning materials, such as alcohol or petroleum based solvents, as this may damage the surface of the product.

8 Spare Parts

Description		Part No	Heat Pump	Heat Pump & Buffer
22mm x 3bar Inlet control group		R00041-1	✓	✓
Inlet control group PRV cartridge		R00009-1	✓	✓
Inlet control group ERV		R01447-1	✓	✓
12 litre expansion vessel		R00044-2	✓	✓
19 litre expansion vessel		R00045-2	✓	✓
24 litre expansion vessel		R00046-2	✓	×
Expansion vessel fixing kit		R00094-1	✓	✓
DN16 3/4" BSP x 1000 flex pipe		R00095-1	✓	✓
1/2" BSP T&P valve		R00020-1	✓	✓
15 x 22 straight PE tundish		R00047-1	✓	✓
1 3/4" 3kW Imm htr CW rodstat		R00019-2	✓	✓
Immersion heater element		R00089-1	✓	✓
Imm heater rodstat		R00090-1	✓	✓
3kW Titanium Imm htr CW rodstat		R01284-2	✓	✓
22mm/24l d/dST/HP CYL Safety Kit		R00829-1	✓	✓
Renewable Integrated Dual Cut Out Enclosure		R01941-1	✓	✓
Renewable Dual Cut Out Cover Plate Complete with Label		R01944-1	✓	✓
Renewable immersion enclosure		R01951-1	✓	✓
Renewable Immersion Cover Plate Complete with Label		R01948-1	✓	✓
28mm motorised two port valve		R01439-2	✓	✓
1/2" Manual bleed valve		R01370-1	×	✓
Thread sealant		R00836-1	✓	✓
Heat Pump Cylinders Installation and User Instructions manual		R00918-7	✓	✓
Terms and conditions		R01020-3	✓	✓

Figure 10: Replacement part numbers for Heat Pump range of cylinders

9 Technical data

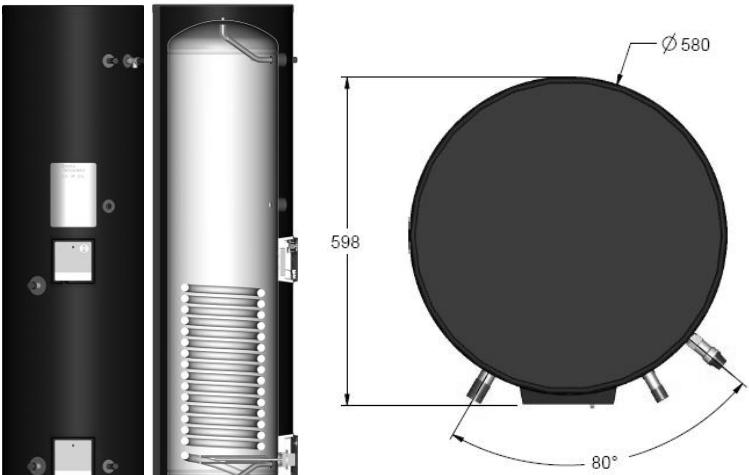


Figure 11: Heat Pump Cylinder and Cross-section (for reference only)

Heat Pump Cylinder Range						
Reference	**125**	**150**	**175**	**210**	**250**	**300**
Weight [kg]	30	35	38	42	47	53
Reheat time [mins]*	7	7	11	12	17	20
Average draw off temperature	61	60	63	62	63	62
Hot water draw off capacity (l)*	97	120	142	180	238	267
/ draw off flow rate (l/s)	0.25	0.25	0.25	0.25	0.25	0.50
Heat loss [kWh]*	0.95	1.10	1.12	1.41	1.51	1.96
Height [mm]	945	1115	1265	1490	1765	2065
Outer Diameter [mm]	580	580	580	580	580	580
HW Outlet [mm]	720	890	1040	1265	1540	1840
T&P Valve [mm]	720	890	1040	1265	1540	1840
Secondary Return [mm]	-	-	-	957	1095	1245
CW Inlet [mm]	180	180	180	180	180	180
Bottom Immersion [mm]	200	200	200	200	200	200
HP Return [mm]	180	180	180	180	180	180
HP Flow [mm]	700	835	835	885	885	920
Bottom Thermostat [mm]	450	535	610	722	860	1010

Table 4: Heat Pump Cylinder Dimensions

Note: All measurements are taken from the base of the cylinder to the mid-point on the item.

* Determined in accordance with EN12897 at 80°C flow temperature and 0.42l/s flow rate.

Heat Pump Cylinder Range						
Reference	**125**	**150**	**175**	**210**	**250**	**300**
Actual capacity [L]	120	145	175	210	250	300
Materials						
- inner cylinder	Duplex stainless steel LDX2101					
- outer cylinder	HIPS					
- inlet/outlet	Stainless steel					
- coils	Stainless steel					
- insulation	60mm PU foam (GWP=1, ODP=0)					
Maximum operating conditions						
- potable water temperature	70°C					
- heating water temperature	95°C					
- operating pressure	3 bar					
Cold water supply						
- minimum dynamic pressure	1.5 bar					
- maximum pressure	12 bar					
- minimum flow rate	15 l/min					
Connections						
- cold water inlet	22mm stainless steel					
- hot water outlet	22mm stainless steel					
- coil flow and return	28mm stainless steel					
Coil specification						
- heat pump coil surface area [m²]	2.2	2.8	2.8	3.0	3.0	3.2
- HX performance heat pump coil [kW]	45	51	43	47	47	43
- max. working pres. [Bar]	3					
Immersion heater	1 ¾ F BSP 3kW @ 240 V					
Thermostatic control						
- direct input	integral immersion heater thermostat and cut out					
- indirect input	integral twin thermostat (10 to 70°C) and cut out (~85°C)					
Safety components						
- pressure reducing valve and strainer	3 bar					
- expansion relief valve	6 bar					
- temperature and pressure relief valve	½" 7 bar/90°C					
- factory pressure test	12 bar					
Other features	Over 60% in volume from recycled materials#					
	Surface mounted sensor devices for compatibility and ease of maintenance					
Approvals	KIWA approval number:- 1112705					
Guarantee						
- inner cylinder	25 yrs					
- immersion heaters	2 yrs - excluding the effects of lime scale or other water borne contaminants					
- other components	2 yrs - excluding expansion vessel membrane pressure					

Table 5: Heat Pump Product features

Not including insulation

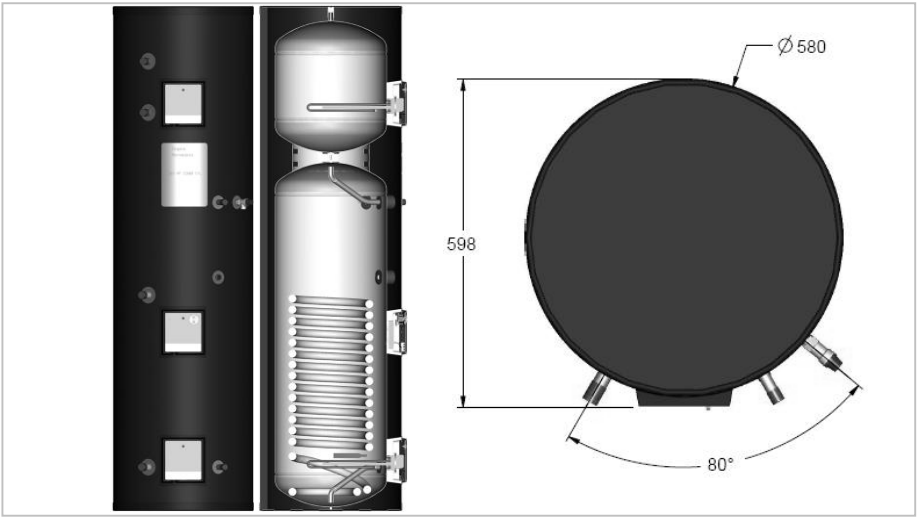


Figure 12: Heat Pump with Buffer Cylinder and Cross-section (for reference only)

Heat Pump with Buffer Cylinder Range				
Reference	**125/75**	**150/75**	**180/75**	**210/75**
Weight [kg]	45	49	63	57
Reheat time [mins]*	7	7	11	12
Average draw off temperature [°C]*	61	60	63	62
Hot water draw off capacity (l)* / draw off flow rate (l/s)	97 0.25	120 0.25	142 0.25	180 0.25
Heat loss [kWh/24h]*	0.95	1.10	1.12	1.41
Height [mm]	1520	1690	1840	2065
Outer Diameter [mm]	580	580	580	580
HW Outlet [mm]	720	890	1040	1265
T&P Valve [mm]	720	890	1040	1265
Secondary Return [mm]	-	-		957
CW Inlet [mm]	180	180	180	180
Bottom Immersion [mm]	200	200	200	200
Top Immersion [mm]	1112	1282	1432	1657
HP Return [mm]	180	180	180	180
HP Flow [mm]	700	835	835	885
HP Buffer Return [mm]	1087	1257	1407	1632
HP Buffer Flow [mm]	1297	1467	1617	1842
Bottom Thermostat [mm]	450	535	610	722

Table 6: Heat Pump with Buffer Cylinder Dimensions

Note: All measurements are taken from the base of the cylinder to the mid-point on the item.

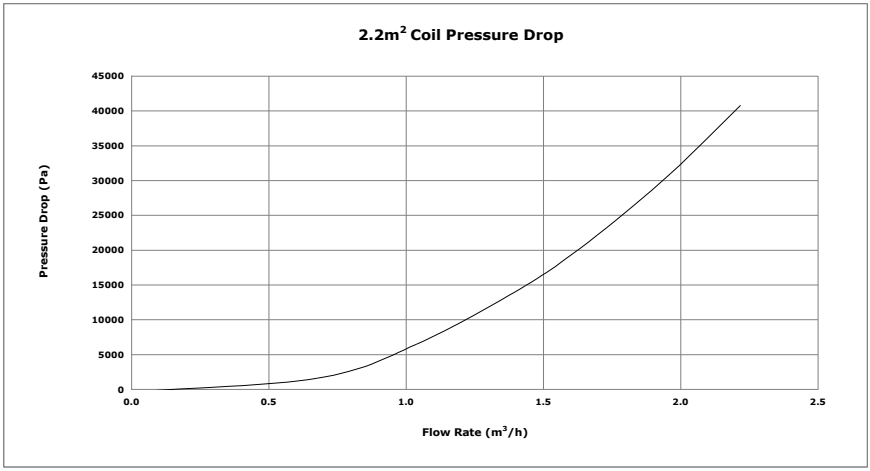
* Determined in accordance with EN12897 at 80°C flow temperature and 0.42l/s flow rate.

Heat Pump with Buffer Cylinder Range				
Reference	**125/75**	**150/75**	**180/75**	**210/75**
Actual capacity [L]	120	145	175	210
Materials				
- inner cylinder	Duplex stainless steel LDX2101			
- outer cylinder	HIPS			
- inlet/outlet	Stainless steel			
- coils	Stainless steel			
- insulation	60mm PU foam (GWP=1, ODP=0)			
Maximum operating conditions cylinder / buffer				
- potable water temperature	70°C / N/A			
- heating water temperature	95°C / 95°C			
- operating pressure	3 bar / 3 bar (max)			
Cold water supply				
- minimum dynamic pressure	1.5 bar			
- maximum pressure	12 bar			
- minimum flow rate	15 l/min			
Connections				
- cold water inlet	22mm stainless steel			
- hot water outlet	22mm stainless steel			
- coil flow and return	28mm stainless steel			
- buffer in and out	28mm stainless steel			
Coil specification				
- heat pump surface area [m²]	2.2	2.8	2.8	3.0
- HX performance heat pump coil [kW]	45	51	43	47
- max. working pres. [Bar]	3			
Immersion heater	1 ¾ F BSP 3kW @ 240 V			
Thermostatic control				
- direct input	integral immersion heater thermostat and cut out			
- indirect input	integral twin thermostat (10 to 70°C) and cut out (~85°C)			
Safety components (cylinder)				
- pressure reducing valve and strainer	3 bar			
- expansion relief valve	6 bar			
- temperature and pressure relief valve	½" 7 bar/90°C			
- factory pressure test	12 bar			
Other features	Over 60% in volume from recycled materials# Surface mounted sensor devices for compatibility and ease of maintenance			
Approvals	KIWA approval number:- 1112705			
Guarantee				
- inner cylinder	25 yrs			
- immersion heaters	2 yrs - excluding the effects of lime scale or other water borne contaminants			
- other components	2 yrs - excluding expansion vessel membrane pressure			

Table 7: Heat Pump with Buffer Product Features

Not including insulation

9.1 Cylinder heat exchanger pressure drop



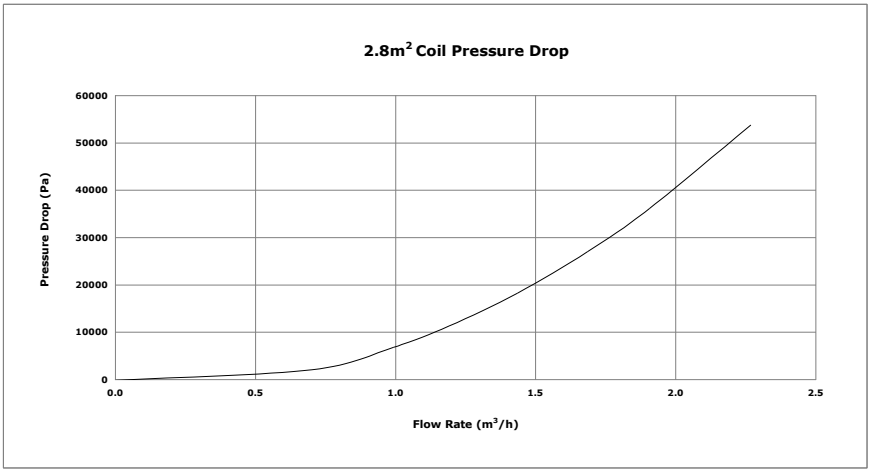


Figure 13: Heat exchanger pressure drops for 2.2m² and 2.8m² coils

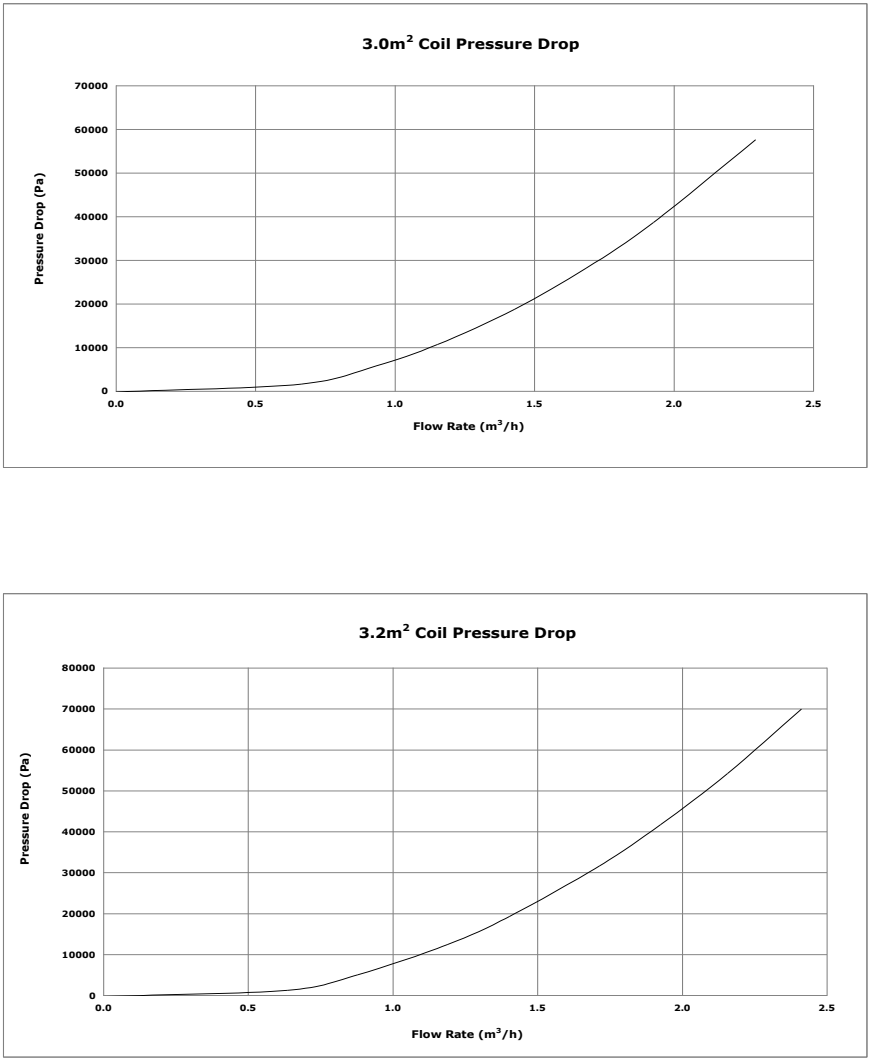


Figure 14: Heat exchanger pressure drop for 3.0m² and 3.2m² coils

9.2 Cylinder attainable temperature curves

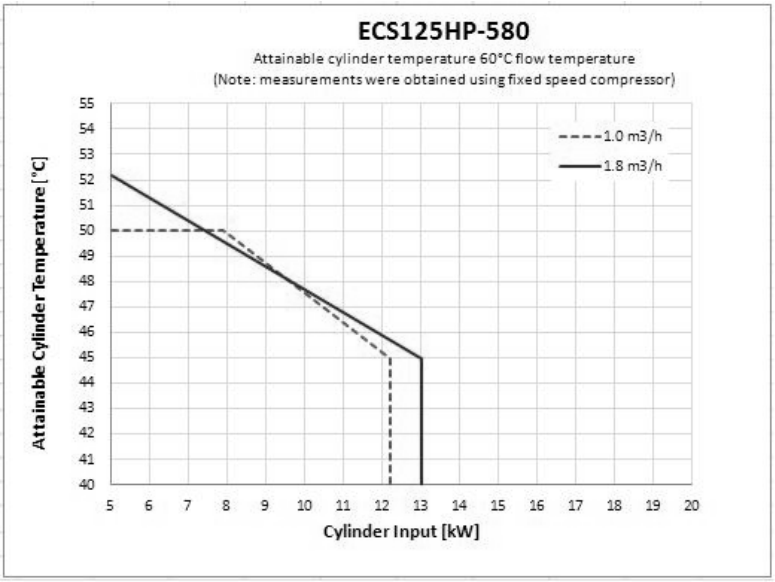


Figure 15: Cylinder attainable temperature curves for ECS125HP-580 and ECS150HP-580

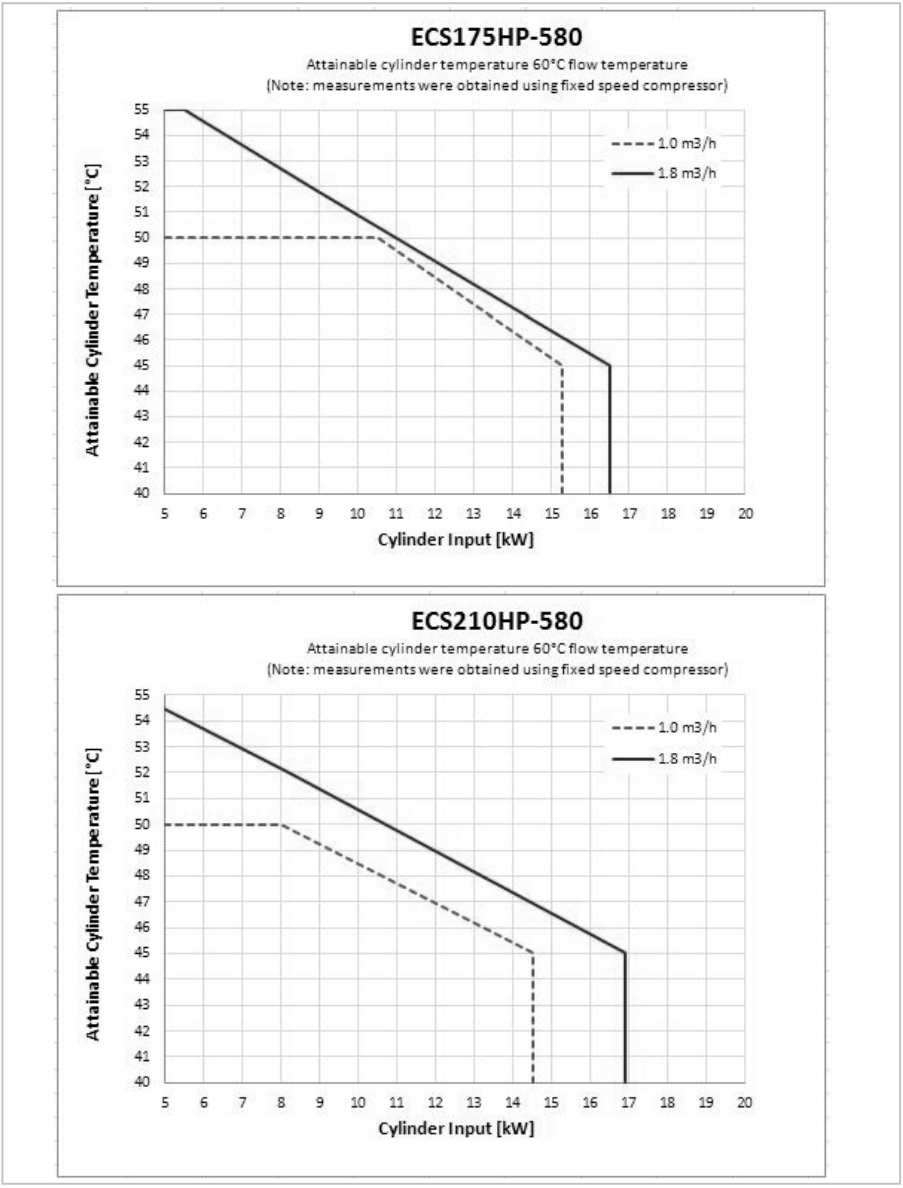


Figure 16: Cylinder attainable temperature curves for ECS175HP-580 and ECS210HP-580

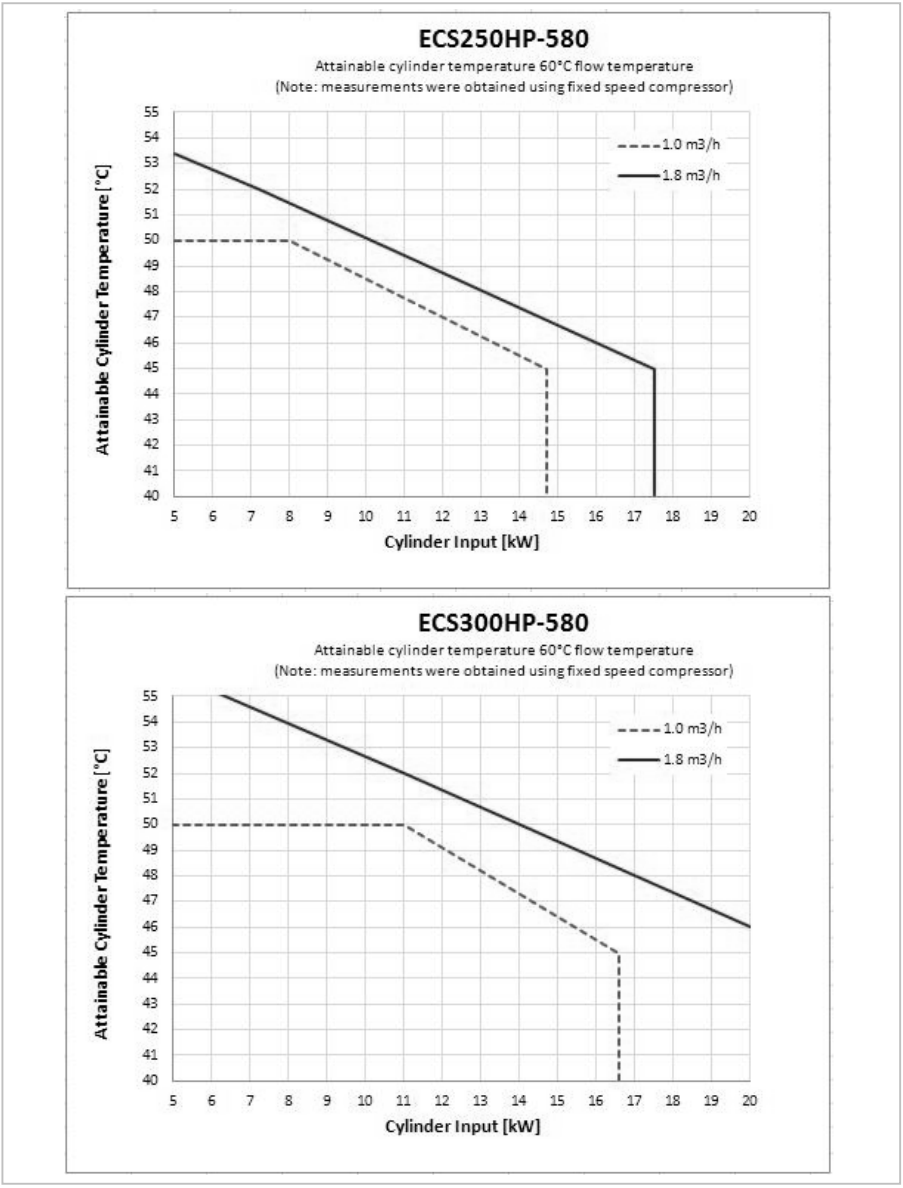


Figure 17: Cylinder attainable temperature curves for ECS250HP-580 and ECS300HP-580

10 User Instructions

10.1 General

"*This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the appliance by person responsible for their safety.*"
"*Children should be supervised to ensure they do not play with this appliance.*"

Please read the following statements carefully as it affects your warranty:

Please ensure that the installer has fully completed the Benchmark Checklist on the inside back pages of this document and that you have signed it to say that you have received a full and clear explanation of its operation. The installer is legally required to complete a commissioning checklist as a means of complying with the appropriate Building Regulations Part G3 (England and Wales), Part P of Northern Ireland and Section 6 of Scotland.

All installations must be notified to Local Area Building Control either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer who should, on receipt, write the Notification Number on the Benchmark Checklist.

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

The Benchmark Checklist will be required in the event of any warranty work.

10.2 Operation

Once the system has been fully commissioned, no user intervention should be required to fully enjoy the comfort and benefits of the unvented hot water cylinder.

The hot water temperature can be set to various requirements. For operation with a heat pump it is recommended to set the hot water temperature to between 45°C and 55°C (this is between 2 and 3 on the dial, please refer to Figure 19 for approximate settings). Higher temperatures can cause tripping of the high limit thermostat, introduce more heat loss from the unit and increase the risk of scalding significantly.

When turning on a hot tap for the first time after a heat up period there might be a short surge of water. This is normal in unvented systems and does not constitute a fault. Sometimes the water may appear milky – this is due to very fine air bubbles in the water which will clear quickly.

10.2.1 Water temperature direct electric heating

Before removing the cover from the immersion heater isolate appliance using isolating switch! Danger of electrical shock! Only use suitable electrically insulated equipment when working inside immersion housing.

The hot water temperature achieved by the direct electric heating element can be adjusted by removing the cover from the immersion heater and adjusting the dial up or down as indicated in Figure 18.

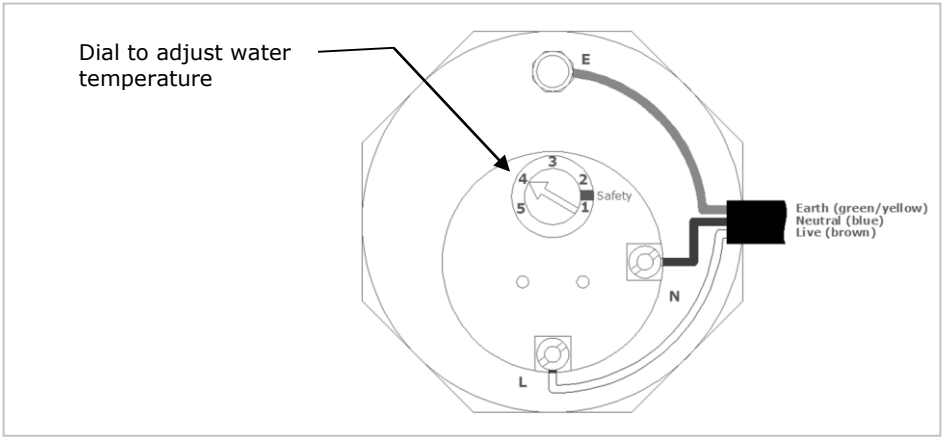


Figure 18: Adjustment water temperature direct electric heating element

10.2.2 Water temperature auxiliary heating

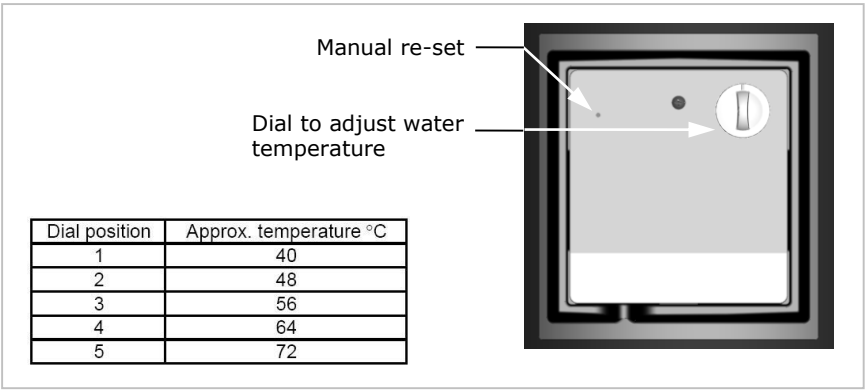
The water temperature achieved by the auxiliary heating system depends on the setting of the thermostat on:

- the cylinder AND

- the auxiliary heating source

The adjustment at the cylinder is carried out on the twin thermostat fitted to the cylinder as shown in Figure 19. In the event that the high temperature cut-out engages, it will be necessary to manually reset the thermostat. Use a suitable electrically insulated tool to push the manual reset button and inform the installer.

If the domestic hot water temperature is controlled by a sensor connected to the heat pump control unit, the thermostat on the cylinder should be turned to maximum to avoid any conflicting control signals.



Dial position	Approx. temperature °C
1	40
2	48
3	56
4	64
5	72

Figure 19: Adjustment water temperature auxiliary source

10.3 Maintenance

The maintenance of this appliance must be carried out by a suitably qualified person only. It is recommended to maintain the unit on an annual basis. Isolate all electrical supplies from the unit before commencing work. Danger of electrical shock! See section 7.

10.4 Troubleshooting

Fault	Cause	Solution
A No water from hot water taps	A.1 Stop valve closed A.2 Strainer blocked A.3 Pressure reducing valve fitted against flow	A.1 Open stop valve A.2 Turn water supply off, clean strainer and re-commission A.3 Re-fit with arrow showing in direction of flow
B No hot water	B.1 Timer/Programmer not set correctly B.2 Auxiliary heating malfunction B.3 Direct heating mal function B.4 Auxiliary/direct heating high limit thermostat has tripped	B.1 Set timer/programmer correctly B.2 Consult auxiliary heating system instructions B.3 Call for qualified person to check immersion heater B.4 Reset limit thermostat(s) and inform installer
C Intermittent water discharge through tundish on warm-up	C.1 Expansion vessel lost charge	C.1 Check expansion vessel (see commissioning/maintenance), top up or replace
D Continuous discharge	D.1 Pressure reducing valve not working D.2 Pressure relief or T&P valve not seating correctly D.3 Malfunction of high limit thermostat or appliance	D.1 Check pressure after valve and replace if faulty D.2 Manually lift valve once or twice to clear debris, otherwise replace D.3 Check function of thermostats and appliances
E Leakage from casing	E.1 Compression/threaded joints not formed correctly	E.1 Re-seal joints with care
F Hot water from cold tap	F.1 Hot pipe work being routed adjacent to cold pipe work F.2 Leaking seal in mixer tap	F.1 Insulate hot pipe work or re-route F.2 Replace seals in mixer tap
G Metallic noise from system	G.1 Pipe work not sufficiently supported	G.1 Add extra pipe work fixings
H Humming noise from system during re-heat	H.1 Air in system H.2 Flow rate well in excess of specification	H.1 Bleed system thoroughly and re-pressurize H.2 Reduce pump speed

Notes

Notes

Notes

MAINS PRESSURE HOT WATER STORAGE SYSTEM COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the storage system as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission this equipment to the manufacturer's instructions may invalidate the warranty but does not affect statutory rights.

Customer Name _____ Telephone Number _____

Address _____

Cylinder Make and Model _____

Cylinder Serial Number

Commissioned by *(print name)* _____ Registered Operative ID Number _____

Company Name _____ Telephone Number _____

Company Address _____

_____ Commissioning Date _____

To be completed by the customer on receipt of a Building Regulations Compliance Certificate*:

Building Regulations Notification Number *(if applicable)* _____

ALL SYSTEMS PRIMARY SETTINGS (Indirect heating only)

Is the primary circuit a sealed or open vented system?	Sealed ☐	Open ☐	
What is the maximum primary flow temperature?			°C

ALL SYSTEMS

What is the incoming static cold water pressure at the inlet to the system?				bar
Has a strainer been cleaned of installation debris (if fitted)?	Yes ☐		No ☐	
Is the installation in a hard water area (above 200ppm)?	Yes ☐		No ☐	
If yes, has a water scale reducer been fitted?	Yes ☐		No ☐	
What type of scale reducer has been fitted?				
What is the hot water thermostat set temperature?				°C
What is the maximum hot water flow rate at set thermostat temperature (measured at high flow outlet)?				l/min
Time and temperature controls have been fitted in compliance with Part L of the Building Regulations?			Yes ☐	
Type of control system (if applicable)	Y Plan ☐	S Plan ☐	Other ☐	
Is the cylinder solar (or other renewable) compatible?	Yes ☐		No ☐	
What is the hot water temperature at the nearest outlet?				°C
All appropriate pipes have been insulated up to 1 metre or the point where they become concealed			Yes ☐	

UNVENTED SYSTEMS ONLY

Where is the pressure reducing valve situated (if fitted)?			
What is the pressure reducing valve setting?			*bar*
Has a combined temperature and pressure relief valve and expansion valve been fitted and discharge tested?	Yes ☐	No ☐	
The tundish and discharge pipework have been connected and terminated to Part G of the Building Regulations		Yes ☐	
Are all energy sources fitted with a cut out device?	Yes ☐	No ☐	
Has the expansion vessel or internal air space been checked?	Yes ☐	No ☐	

THERMAL STORES ONLY

What store temperature is achievable?		°C
What is the maximum hot water temperature?		°C

ALL INSTALLATIONS

The hot water system complies with the appropriate Building Regulations	Yes ☐
The system has been installed and commissioned in accordance with the manufacturer's instructions	Yes ☐
The system controls have been demonstrated to and understood by the customer	Yes ☐
The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer	Yes ☐

Commissioning Engineer's Signature

Customer's Signature

(To confirm satisfactory demonstration and receipt of manufacturer's literature)

*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.

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

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

Dimplex a division of GDC Group Ltd
Millbrook House Grange Drive, Hedge End, Southampton SO30 2DF
Tel.: 0845 600 5111
e-mail: aftersales@dimplex.co.uk
www.dimplex.co.uk