Dimplex®

Zeroth

Installation
Service Manual

300005069 Rev 1 06/08/26

Contents

1.0 Introduction

Welcome to the Zeroth Energy System by Dimplex. This product is designed to provide space heating, space cooling* and domestic hot water all year round. It does this by extracting energy from, or returning energy to, a low temperature energy loop distributed throughout the building. The Zeroth appliance is fully integrated into the dwellings heating and cooling control system, which allows the user to adjust ambient temperatures and comfort levels at a single central location. To guarantee domestic hot water is maintained independent of the energy loop, an immersion heater is installed in the water cylinder as a back up feature.

**Only available on selected models*

1.1 Product Identification

If support is required, it is important to know the serial number and series letter of the appliance (Fig. 1). This can be found at the bottom right of the appliance. See back page for contact details.

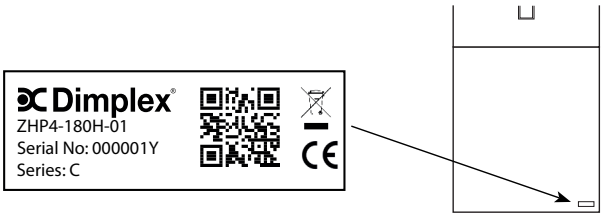


Fig. 1: Product Identification

1.2 Safety Symbols

The following symbols are used throughout the manual, please refer to this section which explains the nature of the information. Section 1.3 is a collection of the safety information included in the manual.

General Warnings

Indicates a general warning against actions which could result in damage to the system or personal injury to the installer and/or user.

Electrical Warnings

Indicates any hazard of an electrical nature.

Information

Indicates tips and advice for the smooth operation of the system.

1.3 Safety Information

No isolating device may be fitted between the inlet group and the cold water inlet on the cylinder, as by doing so important safety devices could be isolated!
It is important that the tundish is positioned away from any electrical components.
It is important to check the pre-charge pressure of the expansion vessel membrane before filling the cylinder. This has been factory set to 1.5 bar (with exception of the Blue 8l expansion vessel set to 2 bar). The pre-charge should be greater than or equal to 1.5 bar.

The maintenance of this appliance must be carried out by a suitably trained and competent 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! 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.

Warning, danger of electrical shock, multiple supplies to the product.

A high level cut-out is fitted to the product for each heat source. This should never activate under normal operation.

Ensure all electrical supplies are isolated before any assembly or connection work begins. Electrical work must only be carried out by trained and competent Personnel. Please wait 15 minutes before removing Inverter Box Cover. Inverter board capacitors need to discharge completely.

1.4 Important Information

INSTALLATION & MAINTENANCE

The installation of this product must be carried out by a trained and competent person authorised by Glen Dimplex UK Ltd. Any servicing or repairs should only be undertaken by a manufacturer approved service agent, using exact manufacturer approved spare parts.

Maintenance of this appliance must also be carried out by a trained and competent person. It is recommended to maintain the unit on an annual basis. Please contact the manufacturer for further information.

The product casing must not be washed with chemicals, if the casing becomes dirty during installation or during its life, please use a cloth which is damp with warm soapy water to remove stains or marks. Avoid cleaning near the controller.

POWER SUPPLY:

Temporary power supplies (generators) are not suitable for use with this product. Connection of a generator to the product may cause irreparable damage, Glen Dimplex UK Ltd will assume no responsibility for damages or delays caused by the connections of a temporary power generator (including consequential and indirect / accidental damages) and replacements will be charged at full cost to the contractor responsible.

ESD:

Observe precautions for Handling electrostatic sensitive devices. Ensure wrist strap is always worn.

TRANSPORTATION DAMAGE:

Glen Dimplex UK Ltd cannot accept liability for any damage caused to the product after it has been unloaded from the transportation vehicle. It is the contractors responsibility to ensure the product does not get damaged once the product has been unloaded. Glen Dimplex UK Ltd will assume no responsibility for damages or delays caused by failures/damages due to handling damage (including consequential and indirect / accidental damages) and replacements will be charged at full cost to the contractor responsible.

REFRIGERANT:

The appliance contains a fluorinated greenhouse gas (R410A), with a Global Warning Potential (GWP) value of 2088. Do not release R410A into the atmosphere, adhering to F-Gas Regulations.

CYLINDER REGULATIONS:

The cylinder supplied is an unvented model and therefore must be fitted and commissioned by a competent person trained in the installation of these systems. The product is supplied with factory fitted safety devices, but the discharge arrangement must be fitted in situ and certified.

WATER PRESSURE RATINGS:

The product has maximum stated operational water pressures, exceeding these ratings may cause irreparable damage, Glen Dimplex UK Ltd will assume no responsibility for damages or delays caused by failures due to over-pressurisation (including consequential and indirect / accidental damages) and replacements will be charged at full cost to the contractor responsible.

MANUAL RETENTION:

The specifications and information supplied in this manual may be subject to change without notice at the discretion of Glen Dimplex UK Ltd. All attempts have been made to ensure that this document is complete and that the information supplied is correct at the time of publication, however Glen Dimplex UK Ltd will assume no responsibility for damages (including consequential and indirect / accidental damages) resulting from reliance on the information presented in this document.

PRODUCT DISPOSAL:

This product has been manufactured from mostly recyclable materials. At the end of the product's life, it should be disposed of at a Local Authority Recycling Centre

2.0 Delivery and Handling

The Zeroth unit is only permitted to be transported in the vertical position (see Fig. 2). At no stage up to installation should the appliance be tilted beyond 45°, as this could result in damage beyond repair.

Irreversible damage could be caused to the appliance if tilted beyond 45⁰.

Please note that handling, installation and use of this product is subject to the Health and Safety at Work Act.

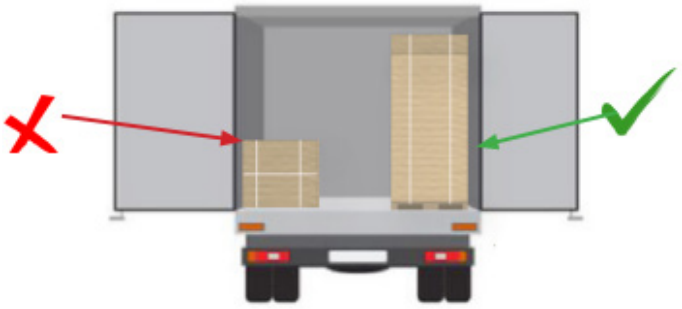


Fig. 2 : Transport Position

At all stages of transport and storage, it must be kept in a dry location and not exposed to freezing temperatures. When moving the product, it is recommended that a pallet truck is utilised. Please check that the product is secure on the pallet before moving (see Fig. 2).

Given the size of the unit (Section 2.2) and depending on 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 appliance.

Glen Dimplex UK Ltd cannot accept liability for any damage caused to the product after it has been unloaded from the transportation vehicle. It is the contractors responsibility to ensure the product comes to no damage from this point on.

Observe the product packaging labels for guidance on how to store and transport

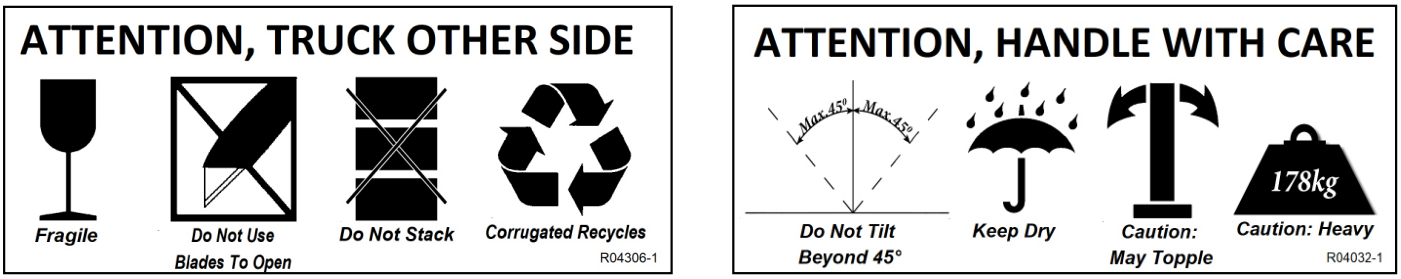


Fig. 3 : Packaging Labels

2.1 Packaging and Installation of feet

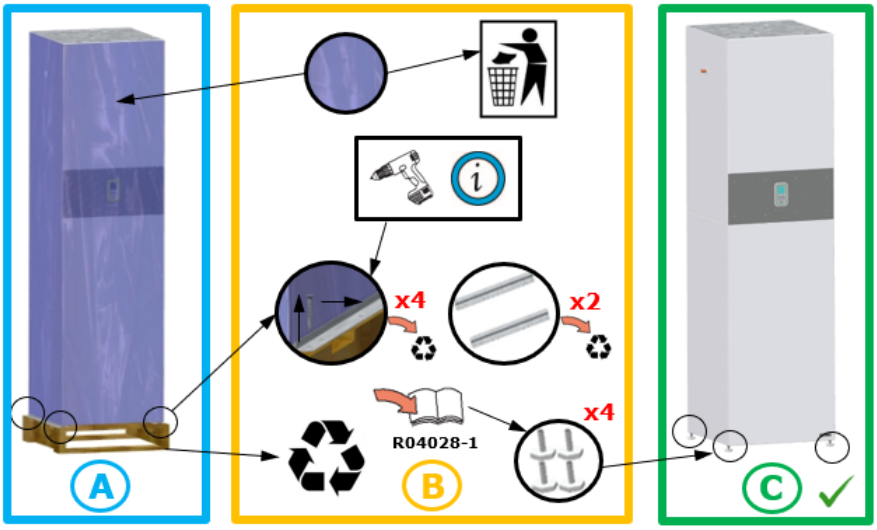


Fig. 4 : Packaging

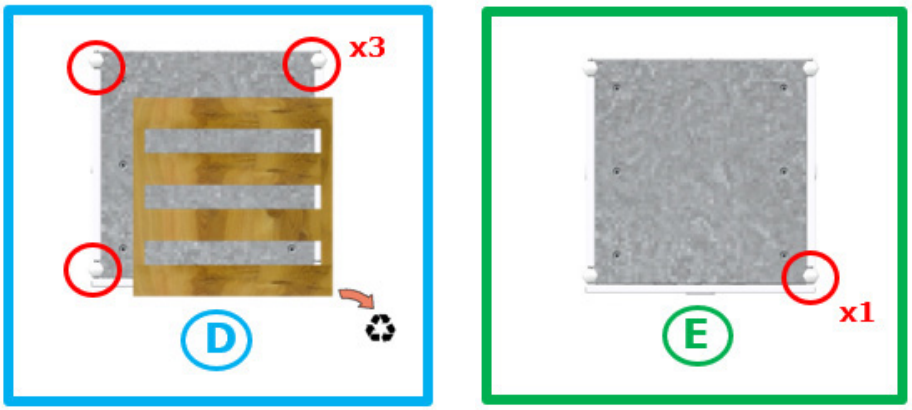
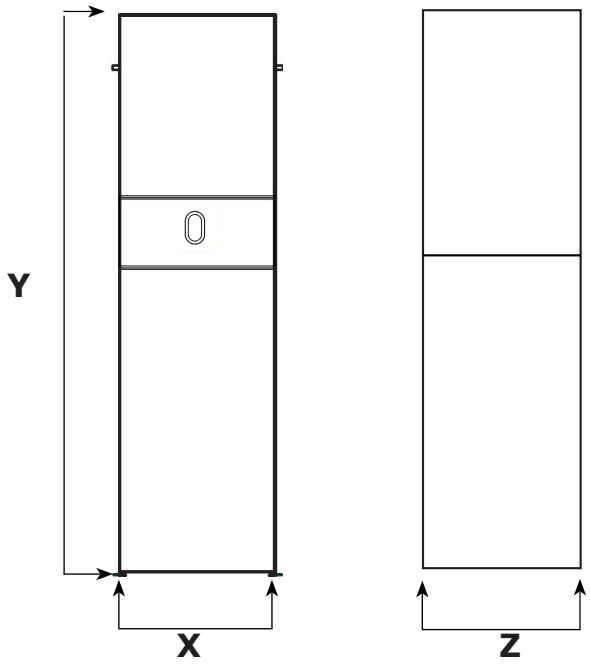


Fig. 5: Fitting the Feet

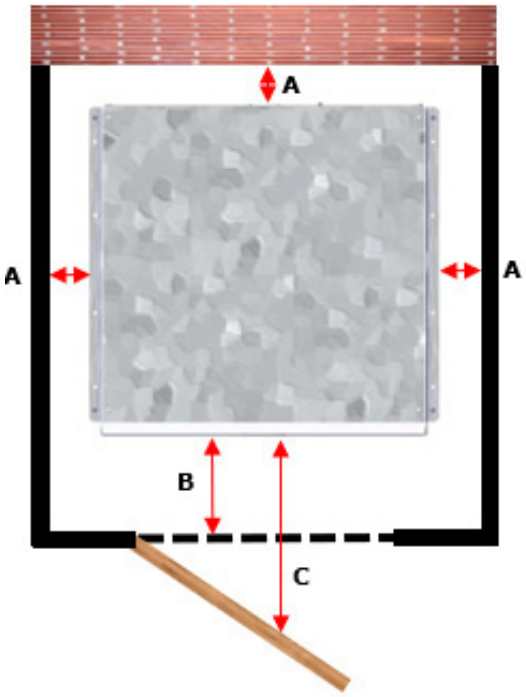
2.2 Dimensions and Weight



Dimensions and Weight		Units
Width (**X**)	550	mm
Height (**Y**)	2000	mm
Depth (**Z**)	560	mm
Footprint of 2 way Pallet	600 x 600	mm
Height on Pallet	2130	mm
Required Ceiling Height	2300	mm
Weight	178[C]/168[H]	Kg

[C] *Heating and cooling enabled*
[H] *Heating only enabled*

Fig. 6 : Dimensions and Weight



Minimal Distance from Cupboard Wall		Units
A Distance	50	mm
B Distance	100	mm
C Distance*	600	mm

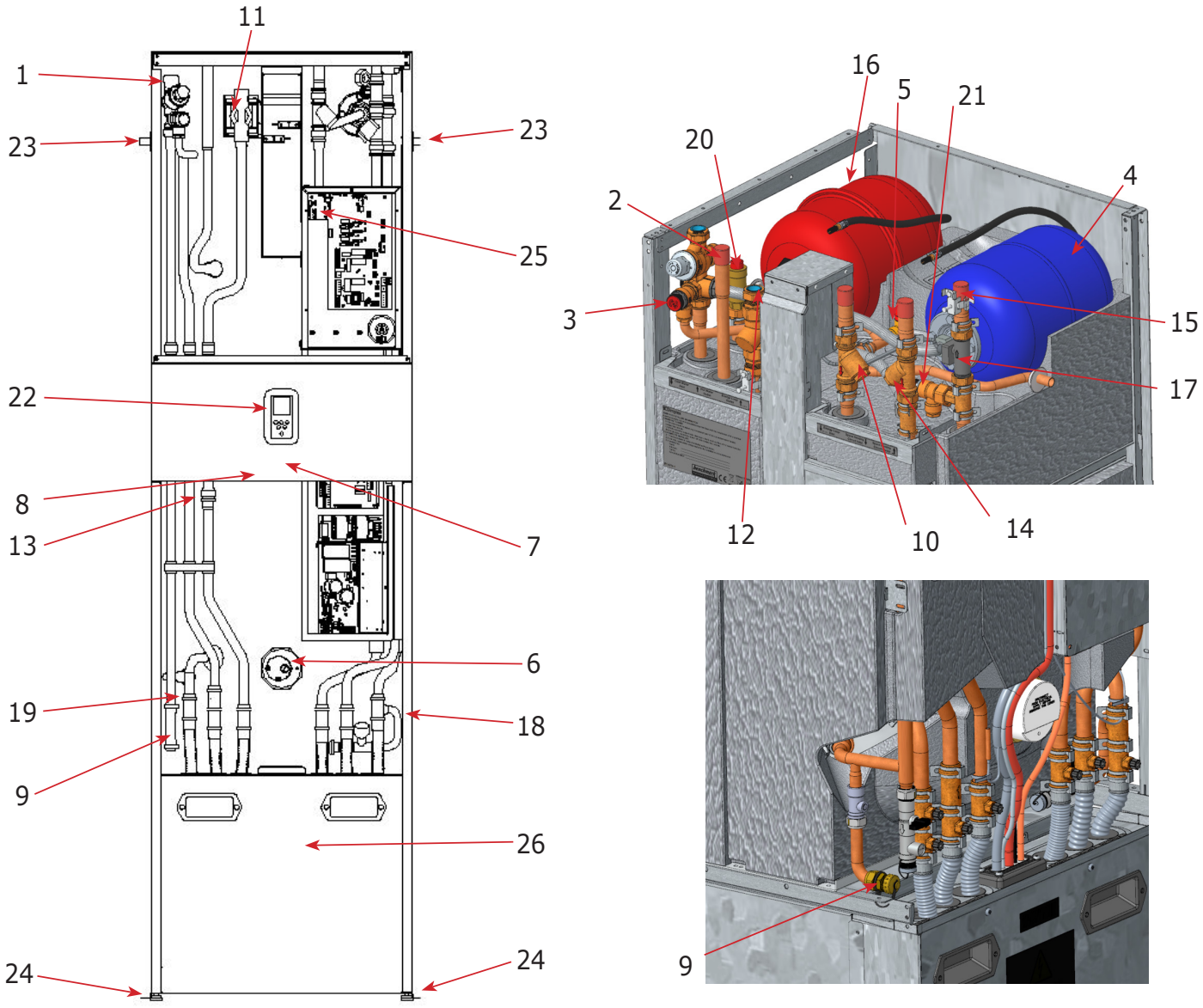
Fig. 7 : Minimal Distances

*Ensure there is 600mm clearance for the front of the appliance. This is to allow for changing the immersion in a safe manner

3.0 Product Overview

3.0.1 Heating Only Product Overview

The Zeroth comes pre-plumbed and pre-wired. Fig. 8 gives the location of the components in Table 1.



DWH Circuit	
1	Cold Water Inlet Group
2	Hot Water Outlet
3	Pressure Relief Valve
4	8l DHW Expansion Vessel
5	T&P Valve
6	Immersion Heater
7	Thermostat
8	Temperature Sensor
9	Cyl Drain Valve

Energy Loop	
10	Inlet, Filter/Strainer
11	PIC Valve
12	Energy Loop Outlet
13	Flow Meter

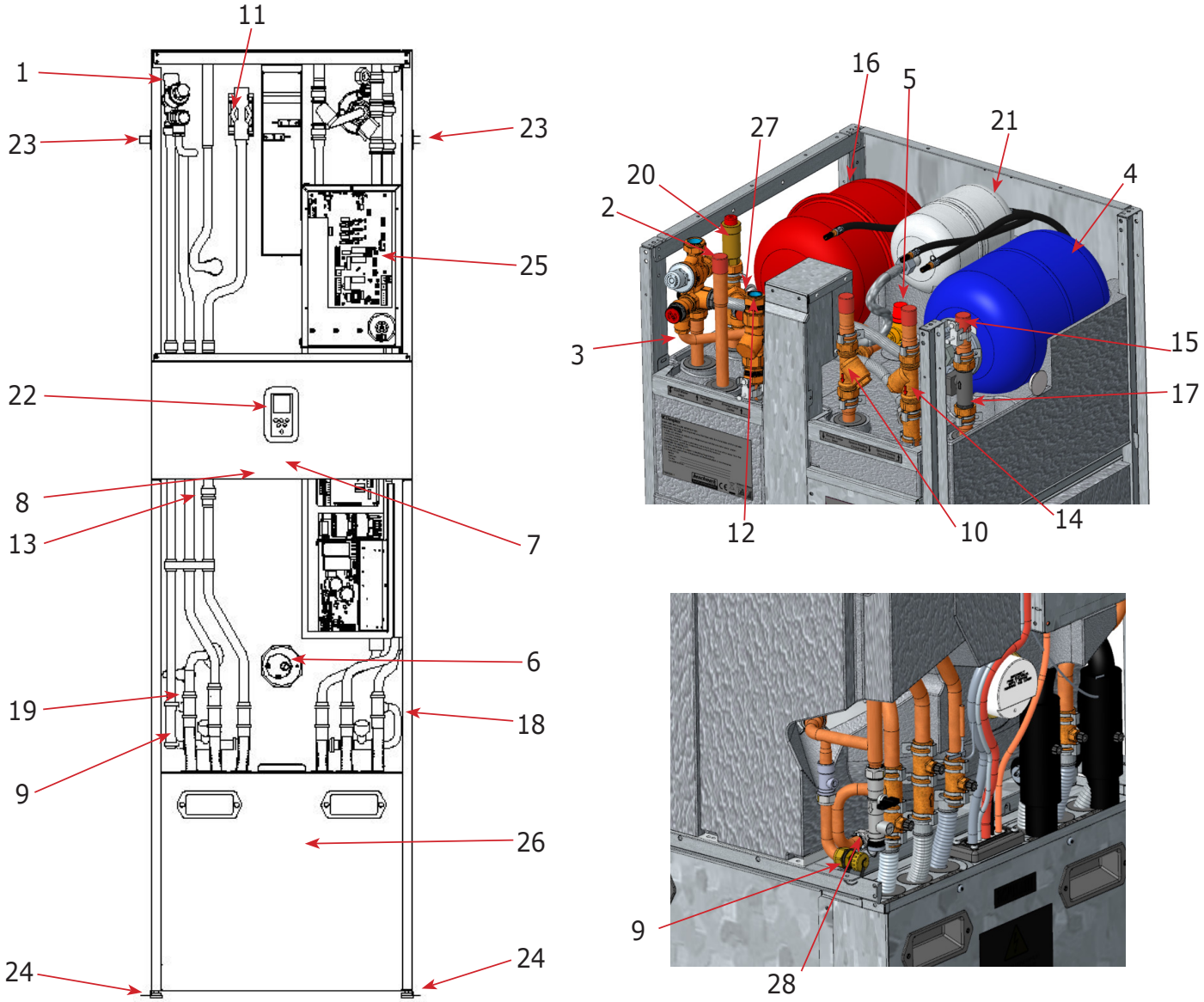
Space Heating and Cooling Loop	
14	Inlet, Filter/Strainer
15	Outlet
16	8l SH Expansion Vessel
17	Flow Meter
18	Fill Loop

Additional Components	
19	DHW Coil Fill Loop and Drain
20	Auto-Airvent
21	DHW Coil Pressure Relief Valve (X-102034, X-102041)
22	User Interface / Controls
23	Discharge from T&P
24	Adjustable Feet
25	Primary Electrical Connections
26	Heatpump Module

Fig. 8 : Heating Only Product Overview

3.0.2 Heating and Cooling Product Overview

The Zeroth comes pre-plumbed and pre-wired. Fig. 9 gives the location of the components in Table 1.



DWH Circuit	
1	Cold Water Inlet Group
2	Hot Water Outlet
3	Pressure Relief Valve
4	8l DHW Expansion Vessel
5	T&P Valve
6	Immersion Heater
7	Thermostat
8	Temperature Sensor
9	Cyl Drain Valve

Energy Loop	
10	Inlet, Filter/Strainer
11	PIC Valve
12	Energy Loop Outlet
13	Flow Meter

Space Heating and Cooling Loop	
14	Inlet, Filter/Strainer
15	Outlet
16	8l SH Expansion Vessel
17	Flow Meter
18	Fill Loop

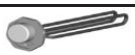
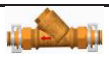
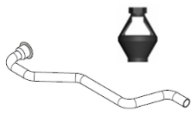
Additional Components	
19	DHW Coil Fill Loop and Drain
20	Auto-Airvent
21	2l DHW Coil Expansion Vessel (X-102188, X-102195, 400000495)
22	User Interface / Controls
23	Discharge from T&P
24	Adjustable Feet
25	Primary Electrical Connections
26	Heatpump Module
27	Pressure Relief Valve
28	DHW Filling Loop (X-102188, X-102195, 400000495)

Fig. 9 : Heating and Cooling Product Overview

3.1 Scope of Delivery

Table 1 illustrates some key components that are provided with the Zeroth and are critical at point of installation. Some of these components are factory fitted and others are provided in an accessories bag.

The Zeroth is supplied with an accessories kit fitted under the top metal cover on the product, adjacent to the expansion vessels. There is also a bag adhered to the back of the product that contains the feet.

Scope of Delivery					
Pre-fitted parts and connections		**Cylinder**	**Energy Loop**	**Heating /Cooling Circuit**	**DHW Circuit**
2kW Immersion		✓	-	-	-
T&P valve		1/2",7bar/90°C	-	-	-
Inlet control group		✓	-	-	-
High-limit Stat		✓	-	-	-
Flow Control Valve with Actuator PIC		-	✓	-	-
Expansion Vessels**		-	-	✓	✓
1/2 air vent auto		-	-	✓	✓
3/4" M Strainer Spares ASM		-	✓	✓	-
***Domed Feet Kit**		✓	-	-	-
- M8 Domed Foot x 4			-	-	-
***Accessories kit consisting of:-**		✓	-	-	-
- 15mm/22mm Tundish					
- 15mm Copper Pipe T&P Drain					
- Filling Loop Hose					
- Zeroth User Instructions Manual					

**Heating Only models have 2 Expansion Vessels, Heating & Cooling Models have a 3rd vessel on DHW Coil

Table 1: Scope of Delivery

* These items are supplied loose and must be installed. Some items are Product number dependent.

4.0 Pre-Installation

Please read the following section carefully before commencing installation. If in any doubt, please contact support (see details found at the back of the manual). 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.

4.1 Initial Checks

Pipework – the pipe runs should be as short as possible with maintenance access considered. Unused pipework should be removed and all remaining pipework 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.

4.2 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. Please also see Section 2.0 regarding manual handling.

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 waterborne 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 installer.

Waterborne 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 temperature and timer settings.

4.3 Siting Considerations

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

- structural integrity
- access for installation, operation, maintenance and replacement
- routing of discharge pipework
- access to water mains supply, hot and cold water distribution pipes
- access to suitable electricity supply
- location in relation to remaining system components
- frost protection

The Zeroth appliance is designed to be floor standing, vertically mounted, indoors and in a frost free environment. The appliance may be located on a flat and level surface, provided it is sufficiently robust to support the weight of the appliance 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 guarantee conditions.

The position and orientation of the appliance should be such that easy access is provided for servicing the controls. A minimum distance of 600mm in front of the unit is required to replace immersion heater and access heat pump. The immersion heater boss can also be used as an access to view inside cylinder. When installing the appliance all labels should be clearly visible and ensure that no pipework hinders any work to be carried out on the various components.

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

4.4 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

Table 2 : Safe performance of the unvented cylinder

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 pipework should have at least an inside diameter of 19mm and should meet the requirements of the water regulations for the supply of wholesome water.

We recommend an annual maintenance inspection is carried out on the domestic hot water cylinder. In hard water areas this should include inspection of the 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 a 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 trained and competent technician.

4.5 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 (see Fig. 10).

4.5.1 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 pipework 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.

The pressure-relief device is to be operated regularly to remove lime deposits and to verify that it is not blocked

4.5.2 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 Fig. 10).

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

4.5.3 Discharge Pipe D2

According to the Building Regulations 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 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 than the nominal outlet size of the safety device and so on; bends must be taken into account in calculating the flow resistance. See Fig. 10, Table 3 and the worked example.

4.5.4 Discharge Pipe Material

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".

It is strongly recommended that only metal pipework should be used. No responsibility will be taken for any damage caused from discharges.

"NHBC Technical Guidance Document 8.1" provides guidelines on the use of alternative materials for discharge pipe work.

Polypropylene pipes and fittings, are an acceptable alternative material. Polypropylene pipes and fittings should be marked to either BS 5254 'Specification for Polypropylene waste pipe and fittings' or BS EN 1451-1 'Plastic piping systems for soil and waste discharge (low and high temperature) within the building structure'. The pipe should be marked with the following at max 1m intervals:

- Manufacturer's identification.
- The number of the British Standards 'BS 5254' or 'BS EN 1451'.
- The material code (PP).
- The nominal size.

As polypropylene cannot be solvent welded, push joints should be used. Polypropylene pipework should be adequately supported in accordance with the manufacturer's recommendations (normally clipped at 300mm centres). Polypropylene pipework can be affected by sunlight so is unsuitable for use externally.

4.5.5 Termination of Discharge Pipe

The Building Regulations state that *"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."

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.

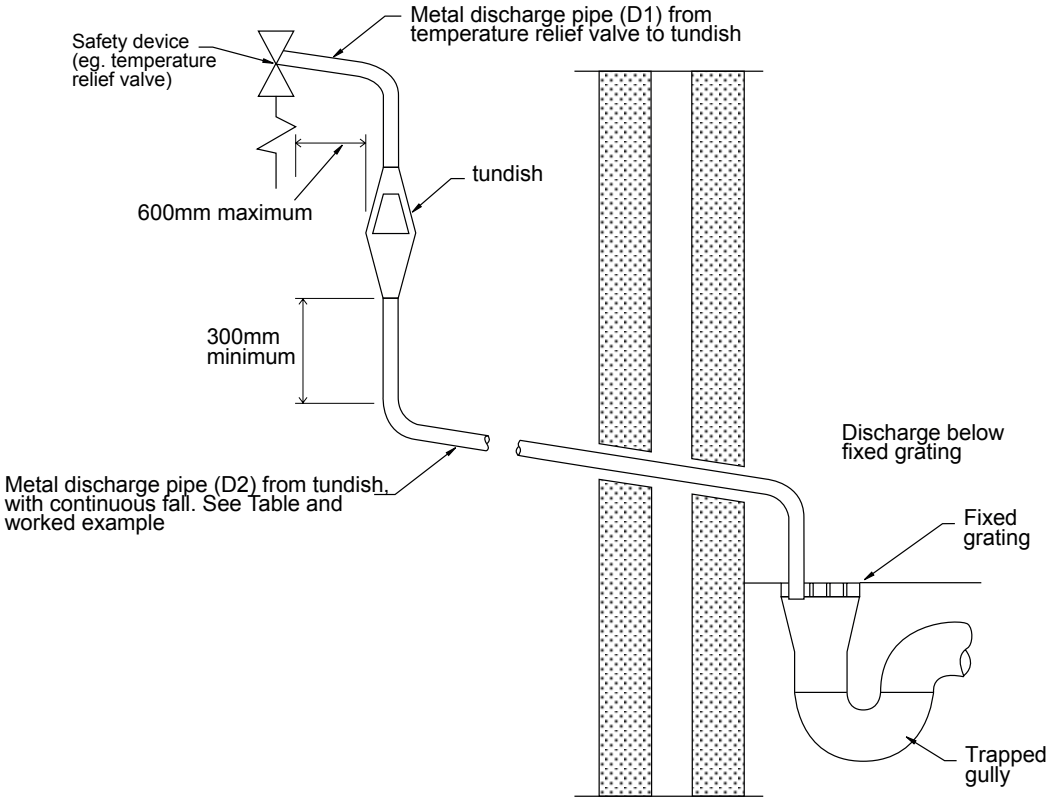


Fig. 10 : Typical Discharge Arrangement

Should plastic discharge pipe be used as described in Section 4.5.4, a Hep$_V$o (BV1) valve must be fitted directly below the tundish, be vertical in orientation, adjacent to the water cylinder and be visible and easily accessible. When terminating into a soil stack it is critical the specifications of the soil stack can accept high temperature discharge water.

"NHBC Technical Guidance Document 8.1" provides guidelines on the use of alternative materials for discharge pipe work and guidelines on installation of necessary fittings and components that make the cylinder discharge arrangement compliant with regulations when using plastic components.

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 subtracted for each elbow or bend [m]
G½	15	22	9	0.8
		28	18	1.0
		35	27	1.4
G¾	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

4.5.6 Worked Example

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

From Fig. 13, 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:
  a. contain a mechanical seal, which allows water into the branch pipe without allowing foul air from the drain to be ventilated through the tundish.
  b. be a separate branch pipe with no sanitary appliances connected to it.
  c. 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.
  d. be continuously marked with a warning that no sanitary appliances should be connected to the pipe.

5.0 Installation

The Zeroth appliance is manufactured with many of the hydraulic and electrical connections factory fitted. During installation, the installer must take the following steps:

1. Remove front panels.
2. Make the domestic hot water cylinder inlet and outlet connections.
3. Connect the energy loop outlet and inlet to the energy loop.
4. Connect the space heating outlet and inlet to the space heating circuit.
5. Remove the electrical wiring box front cover.
6. Wire the primary electrical connections.
7. Install the back up immersion heater connection.
8. Install the SH and DHW timer control connections.

5.1 Removing the Front Panels

The Zeroth front panels must be removed to access the hydraulic and electrical connections which must be made during installation.

Before removing the panels, ensure all electrical circuits to the appliance are isolated and switched off.

Ensure that the components in the electrical box do not get wet and the cover is securely fastened after installation.

The system should only be energised when all the panels are in place.

Potential risk of damaging the User Interface and PCBA's from Electrostatic Discharge. Observe precautions for Handling electrostatic sensitive devices. Ensure wrist strap is always worn.

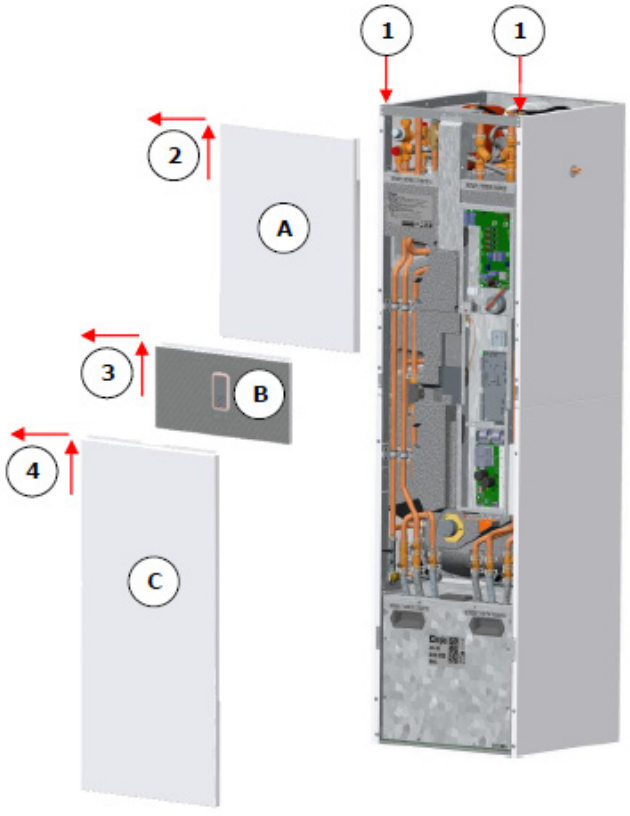


Fig. 11 : Removing Front Covers

To remove the front panels from the Zeroth, follow the procedure shown in Fig. 11:

- Step 1. Unscrew two screws holding both sides of the top front panel.
- Step 2. Pull up panel A and then pull out to remove.
- Step 3. Pull up panel B and then pull out to remove.

Caution: Disconnect cable from User Interface by unclipping cable plug from PCB connector on rear side of User Interface.

- Step 4. Pull up panel C and then pull out to remove.

Ensure that cable access covers are closed correctly before making any plumbing connections.

Follow the steps in reverse in order to replace the panels.

5.2 Plumbing Installation

Fig. 12 below highlights the plumbing connections that must be made during the installation. All plumbing connections can be found at the top of the Zeroth

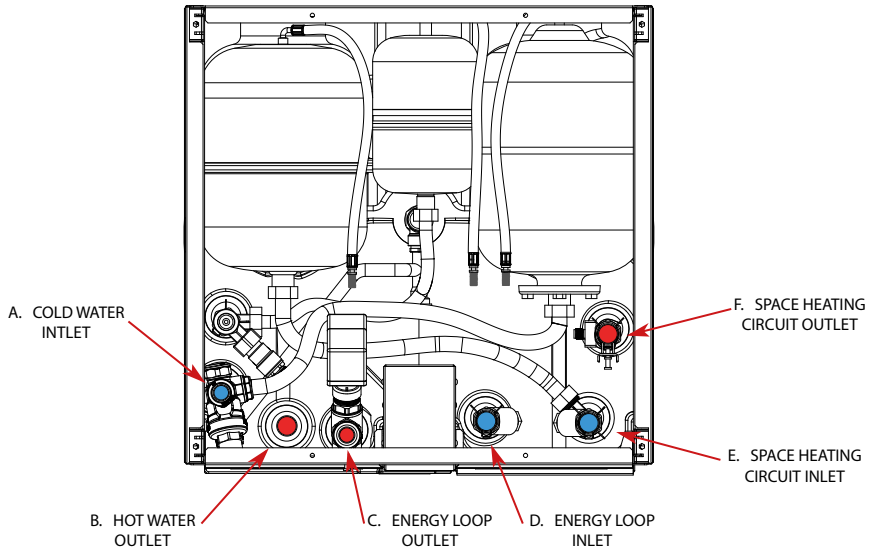


Fig. 12 : Plumbing Connections

5.2.1 Cold Water Inlet

The Zeroth cold water inlet (A) manifold is factory fitted. This valve contains a pressure reducing valve, non-return valve, expansion relief valve and strainer. The connection is a 22mm compression fitting.

Section 4.1 provides guidance on initial checks to complete prior to installing the cold water supply.

No isolating device may be fitted between the inlet group and the cold water inlet connection on the cylinder as by doing so could result in important safety devices being isolated.

5.2.2 Hot Water Outlet

The hot water outlet connection, (B) provides hot water throughout the building and must be distributed as required to various water consuming outlets.

The connection on the Zeroth is a 22mm plain copper pipe connection.

Pipe runs should be executed as short as possible and dead legs avoided. All pipe work should be lagged in accordance with regulatory requirements to prevent thermal losses from the system and formation of condensation.

5.2.3 Energy Loop

The energy loop is the connection between the product and the plant room. The energy loop outlet and inlet connections are located on the top of the Zeroth as highlighted in Fig. 12.

The energy loop outlet connection (C) is a PIC valve with a 22mm compression fitting. The energy loop inlet connection (D) is a 22mm plain copper tube.

It is recommended to connect to this pipe using an isolation valve for ease of maintenance in the future if required.

5.2.4 Space Heating Loop

The space heating/cooling circuit must be installed in line with the building contract documents supplied to the contractor by Dimplex. All heating and cooling system schematics and diagrams or deviations from schematics issued must be agreed with Dimplex in advance of installation.

The space heating outlet connection on the Zeroth (F) is a 22mm plain pipe copper fitting. The space heating inlet connection (E) is also a plain pipe 22mm copper fitting.

The space heating circuit must be fitted with an expansion relief valve, since this is not part of the Zeroth system.

There is a 8l expansion vessel integrated into the Zeroth, however, it is the responsibility of the heat emitter system designer to suitably size the requirements for thermal expansion.

5.2.5 Buffer Requirements

Zeroth must be connected to a 25l buffer in parallel connection

All types of cooling and heat emitter circuits will require a parallel buffer. The apartment hydronic circuit will require its own secondary circulation pump, this can be controlled by the zeroth unit or by independent controls. Where the pump is to be controlled by the Zeroth unit a cable with a free length of 1.5M shall be provided at the top of the unit for connection by a trained and competent Engineer during Set to Work.

The parallel buffer allows the zeroth unit to run independently of the heating circuits radiators or underfloor systems ΔT or flow rates, typically domestic heating circuits operate on a ΔT of 10°C, utilising a parallel buffer allows the Zeroth unit to operate without interruption from the heating or cooling circuit.

Good design of the secondary circuit should be observed and pressure operated bypass provided to minimise system noise as demand is reduced and to protect the secondary circulation pump. Note: On heating and cooling models either two port valves or a diverter valve will be required to ensure that only the selected circuit receives flow (either heating or cooling not both).

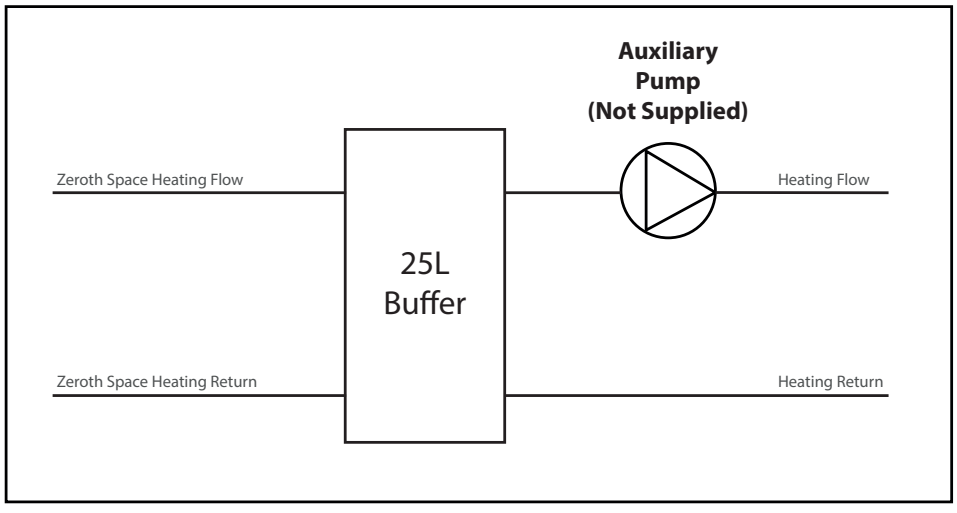


Fig. 13 : Heating Only Buffer Arrangement

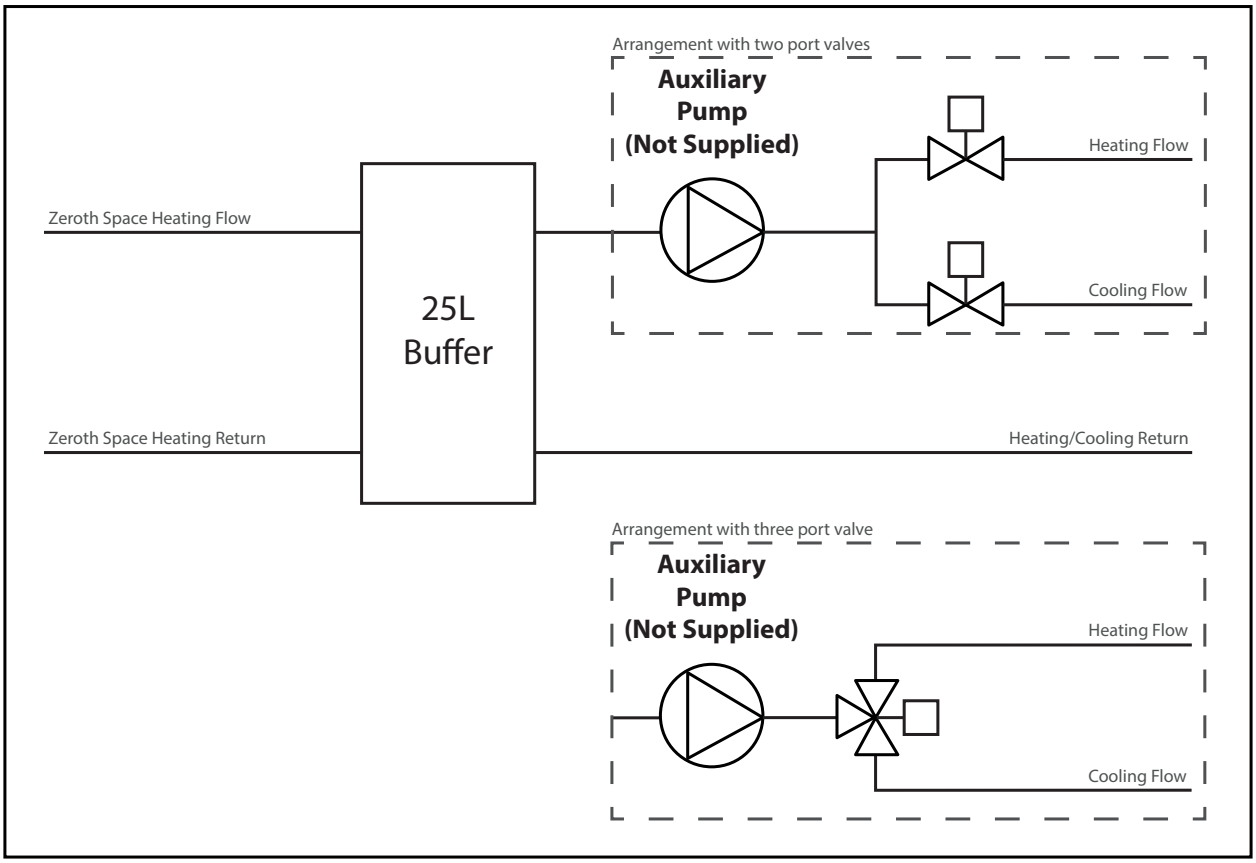


Fig. 14 : Heating and Cooling Buffer Arrangement

5.2.5 Discharge Pipework

The Zeroth is supplied with an accessories bag that contains the tundish and discharge pipe. The discharge pipe can be installed at either side of the appliance, whichever is most convenient at point of installation, i.e. LHS or RHS. A blanking grommet is provided which must be fitted to the opening in the Zeroth that is not used as part of the discharge pipework.

Note: The discharge pipework must be installed and certified by an unvented cylinder qualified installer (G3 in England and Wales or The Water Supply (Water Fittings) Byelaws 2014 in Scotland). The discharge valve must be properly tested for functionality and never shut.

For detailed information on the installation requirements refer to Section 4.5 of this manual.

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.

5.2.6 Terminating the Condensate Tray

The product is supplied with a Condensate Tray, to prevent water entering the product from above. The Condensate Tray drain is located at the back of the product and can be connected to the discharge pipework (after the tundish) using a flexible hose or condensate discharge pipe which is provided with the product.

5.2.7 Condensate Discharge Pipe

A flexible hose is fitted to the rear of the Zeroth that captures any discharge water from the heating coil PRV (Pressure Relief Valve) or the cold water inlet ERV (Expansion Relief Valve). The flexible hose must be routed to a suitable drain point in line with Building Regulation requirements.

5.3 Electrical Installation

The installer must reference the supplementary electrical schematic provided by the contractor as guidelines for installation of the complete heating system. This schematic details all primary electrical connections required and provides relevant information in relation to any ancillary connections, such as additional circulation pumps, control valves and thermostats etc. that are necessary for the installation.

Please contact support if supplementary wiring details are not available.

The installer must take responsibility for the following items during the installation of the Zeroth.

- Suitably rated power cables for all circuits.
- Evidence of fully tested cables between the isolator and the consumer unit.
- Adequate cable labels and warning signs.

A trained and competent Engineer will set the system to work and make all electrical connections to the Zeroth as part of this procedure.

The installer must NOT connect any electrical connections into the Zeroth appliance. All electrical connection to the Zeroth appliance should only be made by a trained and competent Engineer. The electrical installation should only be made adjacent to the Zeroth as shown in the following sections.

5.3.1 Scope of Work

The installer must carry out the following set of work to complete their section of the system wiring.

1. Heat Pump Mains Supply
2. Back up Immersion Heater Mains Supply
3. Ancillary Control Box Wiring

The installer is required to ensure the electrical installation is compliant with the latest BS EN 7671. Final power connections inside the product can only be made by Engineers approved by the manufacturer (Glen Dimplex UK Ltd) for this product.

Ensure all supplies to the product are isolated before removing the access panels to the product.

5.3.2 Electrical Connections

Fig. 16 illustrates the scope of electrical connections to be made when providing mains power to the Zeroth appliance.

The Zeroth requires multiple supplies consisting of mains power to the heat pump and the immersion heater as well as mains power to the central control unit via control thermostats.

- Heat Pump Supply – mains connection cable that supplies the compressor of the Zeroth. The installer must provide a local means of isolation typically through a double pole isolator switch. For 4kW and 6kW models, the isolator must be supplied mains power from the main consumer unit via a 16A Type B RCBO, trip characteristic C, < 30mA, maximum current rating 13A. For 9kW the model, the isolator must be supplied mains power from the main consumer unit via a 20A Type B RCBO, trip characteristic C, < 30mA, maximum current rating 20A. From the isolator the installer must wire a 3-core cable to the top of the Zeroth appliance with 2m surplus cable to allow a trained and competent Engineer to complete the connections.

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

- Immersion Heater Supply – mains connection cable that supplies the backup immersion heater of the Zeroth. The installer must provide a local means of isolation typically through an isolator switch. The isolator must be supplied mains power from the main consumer unit via a 10A Type B RCBO, trip characteristic B, < 30mA, maximum current rating 9A. From the isolator the installer must wire a 3-core cable to the top of the Zeroth appliance with 2m surplus cable to allow a trained and competent Engineer to complete the connections.

The installer must NOT connect any electrical connections into the Zeroth appliance. The electrical installation should only be made adjacent to the Zeroth as shown in the following sections allowing 2m extra cable length from the top of the Zeroth so a trained and competent Engineer can complete the electrical connections.

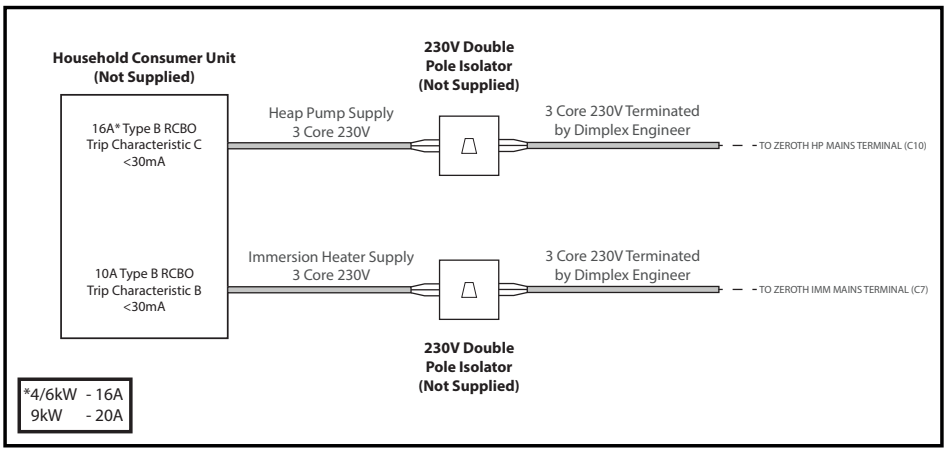


Fig. 15 : Installer connections, mains, heat pump and immersion heater supplies

5.3.3 Ancillary Controls

The Zeroth system ancillary controls must be wired into a suitably sized wiring centre or junction box and from there connected into the Zeroth by a trained and competent Engineer. The ancillary electrical connections consist of the following connections and are illustrated in Fig. 16 & Fig. 17. For all ancillary connections the Zeroth unit does not supply power. It only switches external supply. A seperate power supply is required for ancillary connections such as DHW Timer.

Please contact support if supplementary wiring details are not available. Ancillary Connections include:

1. Remote Back Up Immersion Heater Switch (not supplied) – should be fitted in the building and placed for convenient access by the end user to activate the backup immersion heater. The installer must connect a 230V supply into an isolator, 10A rated [fused]. From the isolator the cable to the Zeroth must have sufficient length for a trained and competent Engineer to make the physical connection to the appliance.
2. Space Heating Thermostat – must be terminated into a wiring centre [not supplied]. A trained and competent Engineer will make all connections from the wiring centre to the Zeroth. The wiring centre should be positioned adjacent to the Zeroth with all connections completed as per the electrical system schematic. The space heating thermostat must be accessible to the end user who will use the device to manage the space heating temperature controls.
3. Domestic Hot Water Timer – must be terminated into a wiring centre [not supplied]. A trained and competent Engineer will make all connections from the wiring centre to the Zeroth. The wiring centre should be positioned adjacent to the Zeroth with all connections completed as per the electrical system schematic. The timer must be accessible to the end user who can use the device to set up a daily/weekly hot water heating program.

The Space Heating and Domestic Hot Water Timer may be 230V or Volt Free feeds into the Zeroth. The installer must clearly identify the supply voltage of these connections within the junction box [not supplied].

The installer must NOT connect any electrical connections into the Zeroth appliance. The electrical installation should only be made adjacent to the Zeroth as shown.

5.3.4 Ancillary Connections 230V

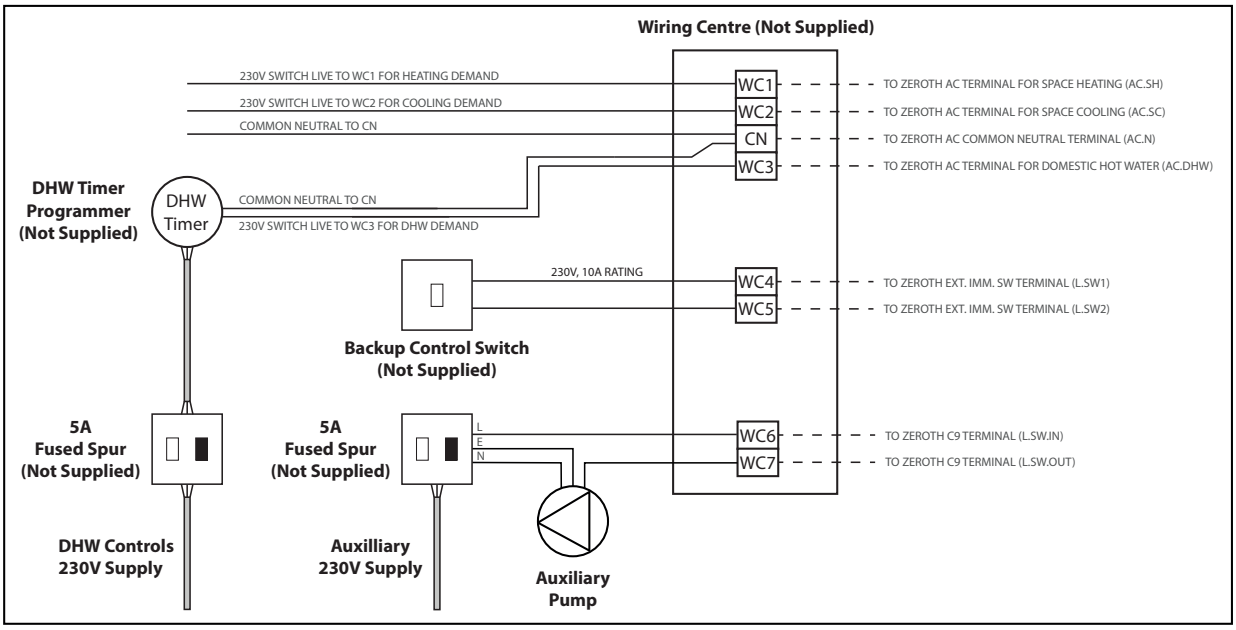


Fig. 16 : Installer Ancillary Connections 230V

5.3.5 Ancillary Connections Volt Free

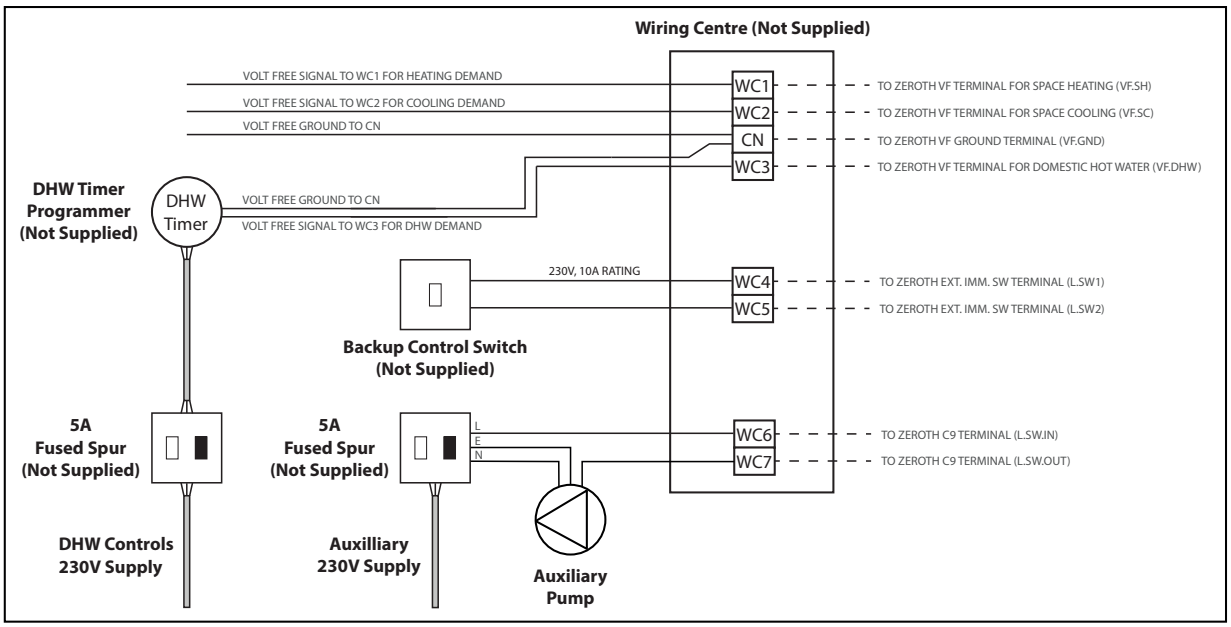


Fig. 17 :Installer Ancillary Connections Volt Free

Any wires or cables that have been fitted but not connected, must be safety insulated to avoid the risk of electrocution.

Wires and cables must be clearly labelled and tagged accordingly to identify their purpose as well as voltage.

5.4 Immersion Heaters

The back-up immersion heater supplied with the DHW cylinder comes pre-wired. The electrical wiring for this product is shown in Fig. 18.

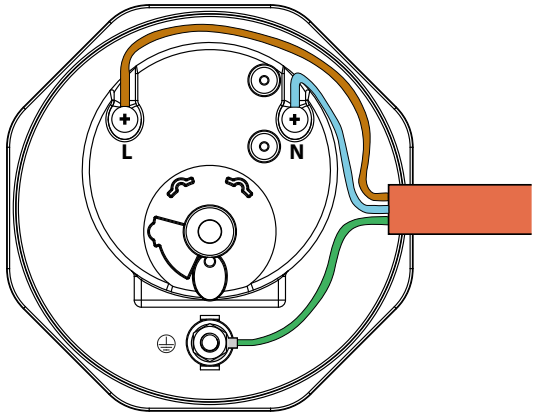


Fig. 18 : Immersion Wiring Diagram

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" and the water in the cylinder will fail to heat. This denotes a fault somewhere in the system and an appropriate investigation shall be carried out before the cut-out is reset. Use a suitable sized implement to reset the pin by pushing it hard into its original position. Access to the immersion heater thermostat button can be accessed by removing the top, mid and bottom covers as per section 5.1. Then removing the immersion cover to locate the immersion heater and reset button.

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.

The immersion heater thermostat must not be opened under any circumstances.

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.

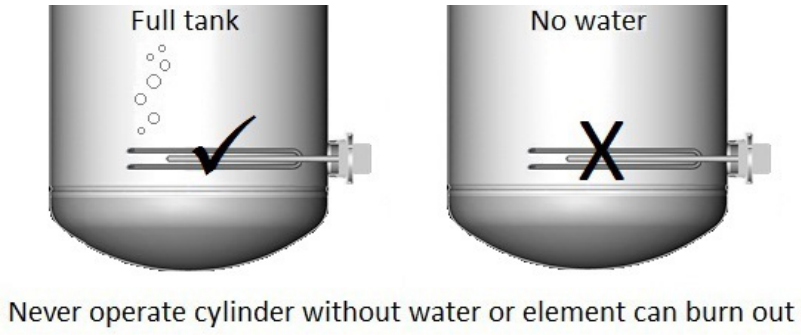


Fig. 19 : Correct Operation of Immersion Heater

5.5 Installer Checks

Upon completion of the installation of the product, the installer should reference the below check list to ensure all aspects of the Zeroth installation have been carried out to required standards and that every element of the installation has been captured.

This page may be printed as a useful guide to tick the relevant boxes associated with each step of the installation.

Step	Details	Complete
1.0	- Initial Checks	
1.1	• Product inspected and accepted	
1.2	• Scope of delivery verified	
1.3	• Risk assessment complete	
1.4	• Product access and clearances allowed	
1.5	• Cold water supply performance checked	
1.6	• Commissioning certificate complete	
1.7	• Outer panels replaced correctly	
2.0	- DHW Cylinder Checks	
2.1	• Local means of water isolation fitted	
2.2	• Cold water inlet supply fitted	
2.3	• Expansion vessel pre-charge pressure set to 2 bar	
2.4	• Hot water outlet connection made	
2.5	• Tundish installed, G3 compliant	
2.6	• Air removed from the system	
2.7	• Condensate Tray discharge connected	
3.0	- Energy Loop	
3.1	• Inlet and outlet connections made to the Zeroth	
3.2	• Means of local isolation to the energy loop available	
3.3	• Air bleed or purge valve and fittings fitted to the circuit	
4.0	- Space Heating & Cooling Loop	
4.1	• Inlet and outlet connections made to the Zeroth	
4.2	• Means of local isolation to the loop available	
4.3	• Expansion vessel pre-charge pressure set to 1.5 bar	
4.4	• Air bleed or purge valve and fittings fitted to the circuit	
5.0	- Electrical Installation	
5.1	• Primary supply and immersion heater supply points available	
5.2	• Immersion heater boost switch installed	
5.3	• Heating controls cables available for fitting to the Zeroth	
5.4	• DHW cables are also available for fitting to the Zeroth	
6.0	- Heating system scheme/schematic reviewed and adhered to	

*This list is intended as a guide, not an exhaustive summary.

Table 4 : Installer Checks

5.6 Pre-commissioning Checks

At the time of commissioning, complete all relevant sections of the Checklist located at the back of the user guide.

The following commissioning procedures only detail the required steps to be taken for the potable water loop:

- 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 cold water inlet group.
- Make final mains connection on inlet control group and check all connections and joints to ensure they have been tightened and secured correctly.
- 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.
- Check the pre-charge in the expansion vessel and ensure it is at least 2 bar. Note actual pressure on label on expansion vessel.
- 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.
- Close the hot water tap.
- Check all joints for leaks, even those not having been altered especially when replacing a vented cylinder.
- Open T&P relief valve to ensure proper discharge and check after closing that valve is not dripping.
- 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 pipework and ensure proper operation.
- Instruct user in the operation of the unit.
- Complete the technical data label on the cylinder with legible and permanent writing.

5.7 Primary Connections

The heat pump mains connector [1] must be connected to the Zeroth terminals as illustrated in Fig. 20. The cable should be appropriately sized by the installer from a 12/13A isolator. The immersion heater main supply [2] must be connected to the Zeroth as illustrated in Fig. 16 and also supplied from a 12/13A isolator.

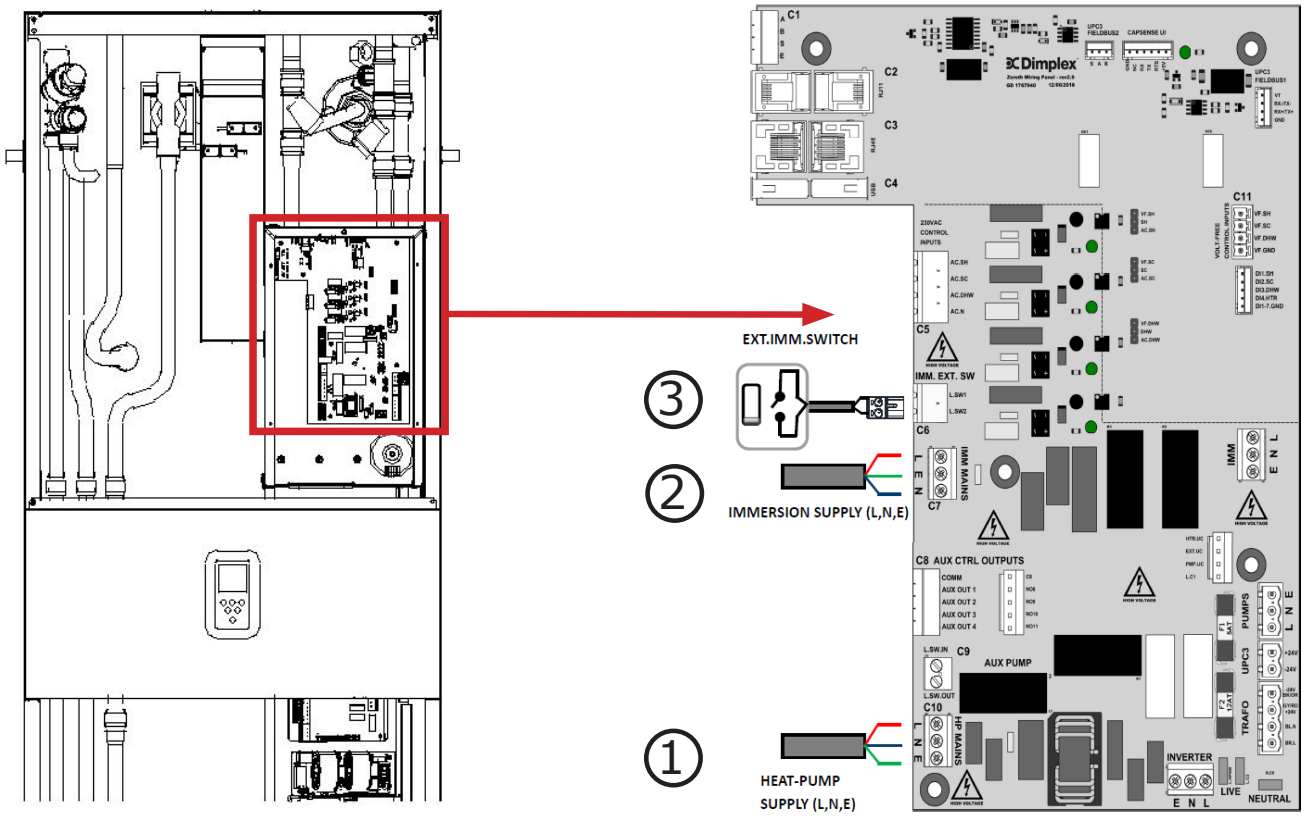


Fig. 20 : Primary Connections

5.7.1 Auxiliary Connections

There may be a requirement to make auxiliary connections during installation of the Zeroth unit. It is the responsibility of the consultant/M&E designer to liaise with Dimplex to ensure the equipment specified is compatible with the Zeroth energy system.

Dimplex must authorise and formally sign off the system schematic prior to any installation of the Zeroth.

Auxiliary Connections include:

- Space heating and DHW controls
- Additional circulation pump

5.7.2 Additional Circulation Pump

The connection of an additional heating/cooling circulation pump is possible. The additional circulator must be supplied with an independent power supply isolated with a max 5A fused spur. The Zeroth unit does not power the pump it only switches external live. Fig. 21 illustrates the electrical connections between the pump and the Zeroth system.

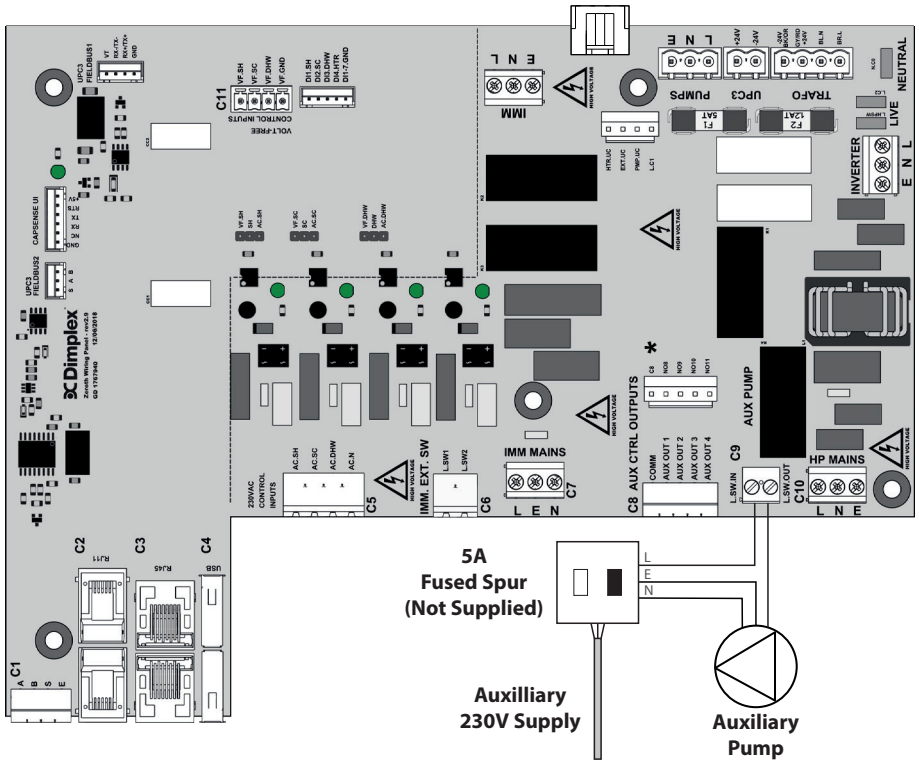


Fig. 21 : Connecting Auxiliary Pump

The pump live after the isolator must be connected to the Zeroth Auxiliary Control terminal of the Zeroth as illustrated. Live into the Zeroth relay is to the terminal labelled "L.SW1". The pump live is then fed from terminal labelled "L.SW2" to activate the circulation pump.

5.7.3 Space Heating and DHW Controls

The system schematic may include scope for space heating, cooling and domestic hot water auxiliary controls. These external control systems can be wired back to the Zeroth to initiate the various modes whenever the control system produces a demand request. The Zeroth unit can accept a Volt Free input or a 230V input signal from auxiliary controllers.

Fig. 22 illustrates the positions on the Zeroth wiring panel PCB where the Volt Free control connections must be made. The Space Heating, Space Cooling and Domestic Hot Water controller outputs can be connected into the 4 way terminal block.

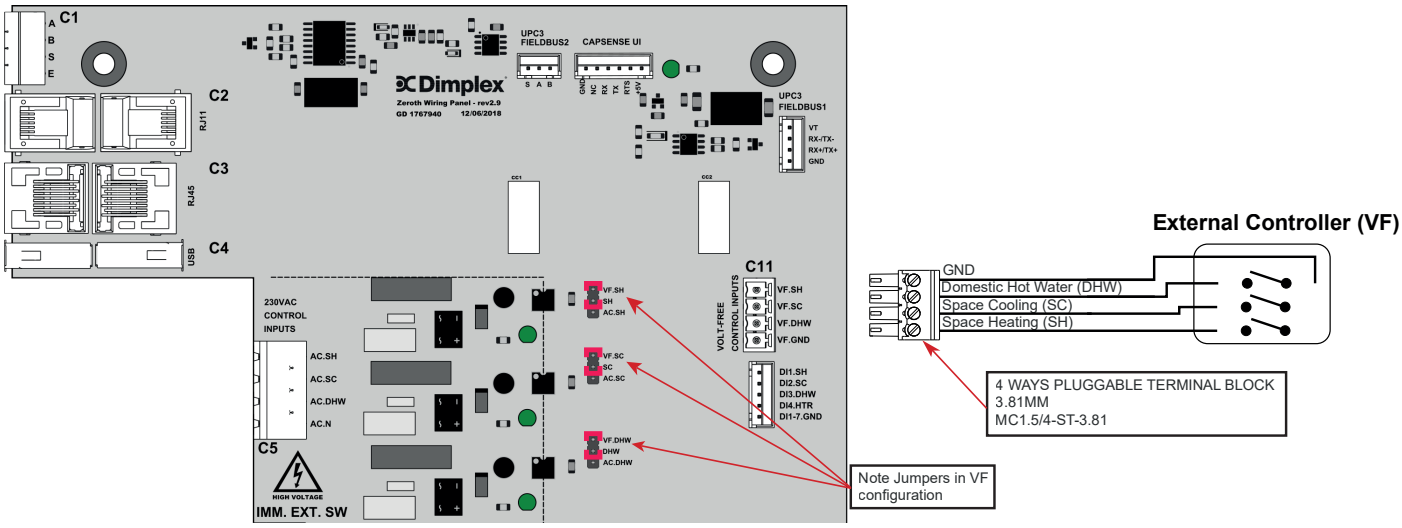


Fig. 22 : Volt Free Control Connections

The 4 way plugs shown for the inputs (both 230V and VF) are already supplied with the product, plugged into the installer connection circuit board.

Fig. 23 illustrates the positions on the Zeroth wiring panel PCB where the 230V connections must be made. The Space Heating, Space Cooling and Domestic Hot Water controller outputs can be connected into the 4 way terminal block.

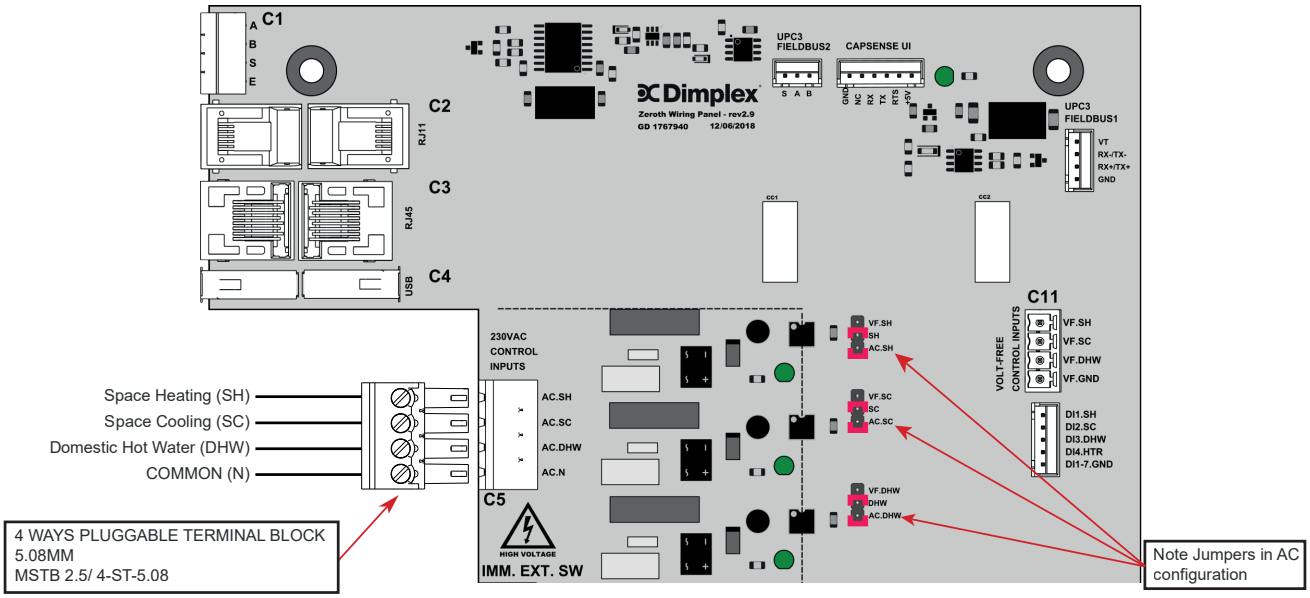


Fig. 23 : 230 Volt Control Connections

The position of the Jumpers on the PCB must be set according to the input voltage as shown in the corresponding diagrams.

5.8 Draining and Refilling the Appliance

By changing certain components within the Zeroth, it may be required to drain and refill the relevant loop. In addition to replacing parts, if the appliance is not in use for an excess of 1 month, it must be drained down by a competent person and recommissioned before use. The immersion must be switched off at the mains before draining the cylinder.

The compilation of a risk assessment is strongly recommended before commencing any work in accordance with the Health and Safety at Work Act.

Use appropriate PPE when working on Zeroth.

Open the hot taps in the property to allow as much hot water to escape as possible and leave hot taps open.

Ensure all electrical and liquid supplies to Zeroth are isolated before commencing any work, using safe isolation procedure. If this isn't possible, do not proceed until this can be arranged.

5.8.1 How to Drain DHW Cylinder

When draining the DHW Cylinder, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 5.8.
2. Lay down a dust sheet in front of the Zeroth. Use a wet vac to ensure clean and fast draining. Ensure there is a bucket and rags to hand to mop up any spillages.
3. Isolate the mains cold water supply, energy loop flow/return and space heating and cooling flow/return loops, located at the top of Zeroth.
4. Open the hot taps in the property to allow the hot water cylinder pressure to dissipate, then close taps.
5. Connect a hose pipe from a suitable drainage point to the drain valve shown in Fig. 24. Using a screw driver, open the isolator to start the flow of water from the cylinder, see Fig. 25.

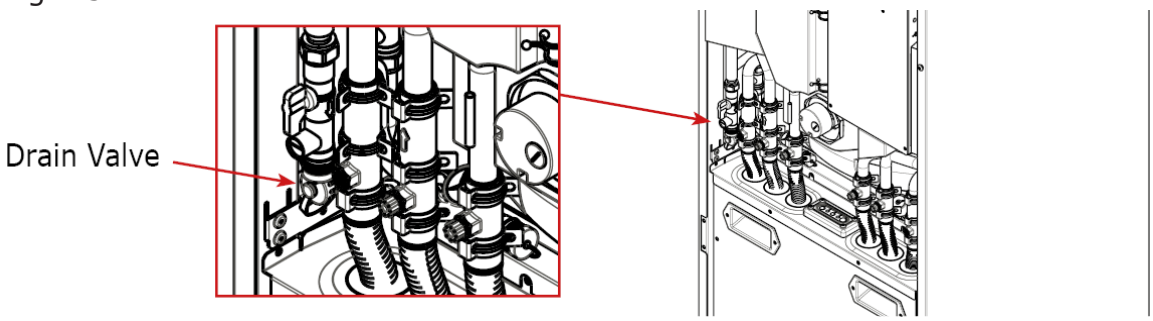


Fig. 24 : Drain Valve

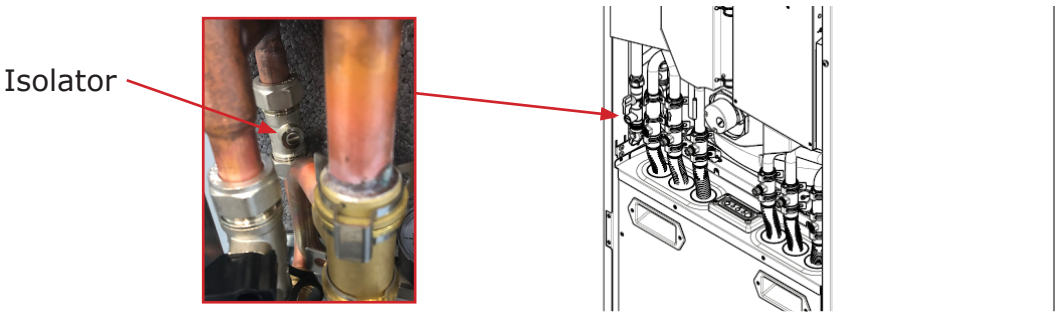


Fig. 25 : Isolator

6. The T&P valve, see Fig. 26, can also be held open to allow air to enter when draining the cylinder.
7. Once drained, use a screw driver to close the isolator and T&P valve

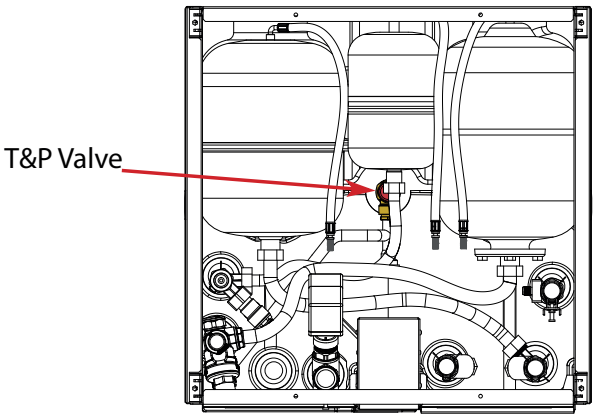


Fig. 26 : T&P Valve

8. Remove hose from cylinder drain valve.
9. Use a wet vac to ensure clean and fast draining. Ensure there are rags to hand to mop up any spillages

5.8.2 How to Fill DHW Cylinder

To fill the cylinder:

1. Connect water supply to Cold Water Inlet Group marked 1 in Fig. 27.
2. Close isolator and drain valve, marked 2 in Fig. 27.
3. Open all taps in the property, so that air can escape when the cylinder is being filled.
4. Turn on water supply
5. Allow cylinder to fill with water
6. Wait for flow of water to regulate and become steady.
7. Slowly close taps and allow cylinder to pressurise.
8. Cylinder should pressurise to predetermined pressure.

Do not close water supply when cylinder is filled.

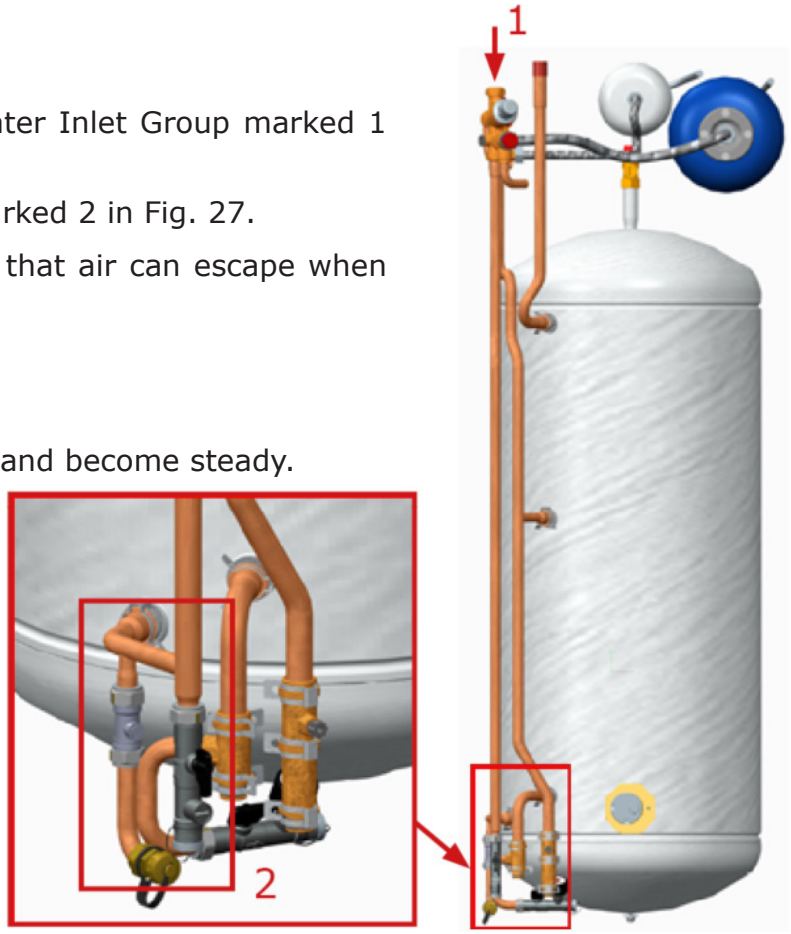


Fig. 27 : Fill DHW Cylinder

5.8.3 How to Drain DHW Coil

On Heating Only models DHW coil will drain through space heating loop. See section 5.8.7

When draining the DHW Coil, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0.
2. Isolate the mains cold water supply, energy loop flow / return and heating / cooling flow / return loops, located at the top of the Zeroth.
3. Lay down a dust sheet in front of the Zeroth. Use a wet vac to ensure clean and fast draining. Ensure there is a bucket and rags to hand to mop up any spillages.
4. Connect a hose from a suitable drainage point to the isolator valve shown in Fig. 25. Open isolator shown in Fig. 28 to allow flow of water from the coil.

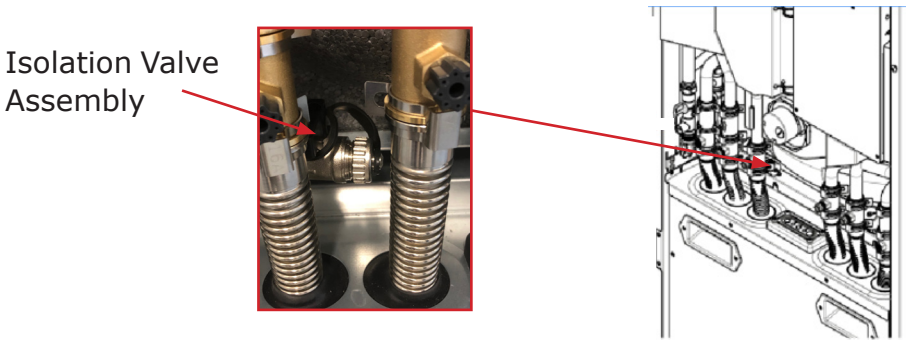


Fig. 28 : Isolation Valve Assembly

5. Once drained, close the isolation Valve.
6. Remove hose from isolator valve assembly.
7. Clean up any spillages.

5.8.4 How to Fill DHW Coil

On Heating Only models DHW coil will fill through space heating loop. See section 5.8.8

To fill the coil, follow option A or B.

Option A

1. Fill cylinder.
2. Connect filling loop hose between filling loop valve and isolation valve.
3. Ensure water supply is still connected to the Cold Water Inlet Group and water supply is on.
4. Open filling loop valve and isolation valve.
5. Allow coil to fill with water.
6. Allow coil to pressurise to 2 bar.
7. Close the filling loop valve and the isolation valve.
8. Remove hose.

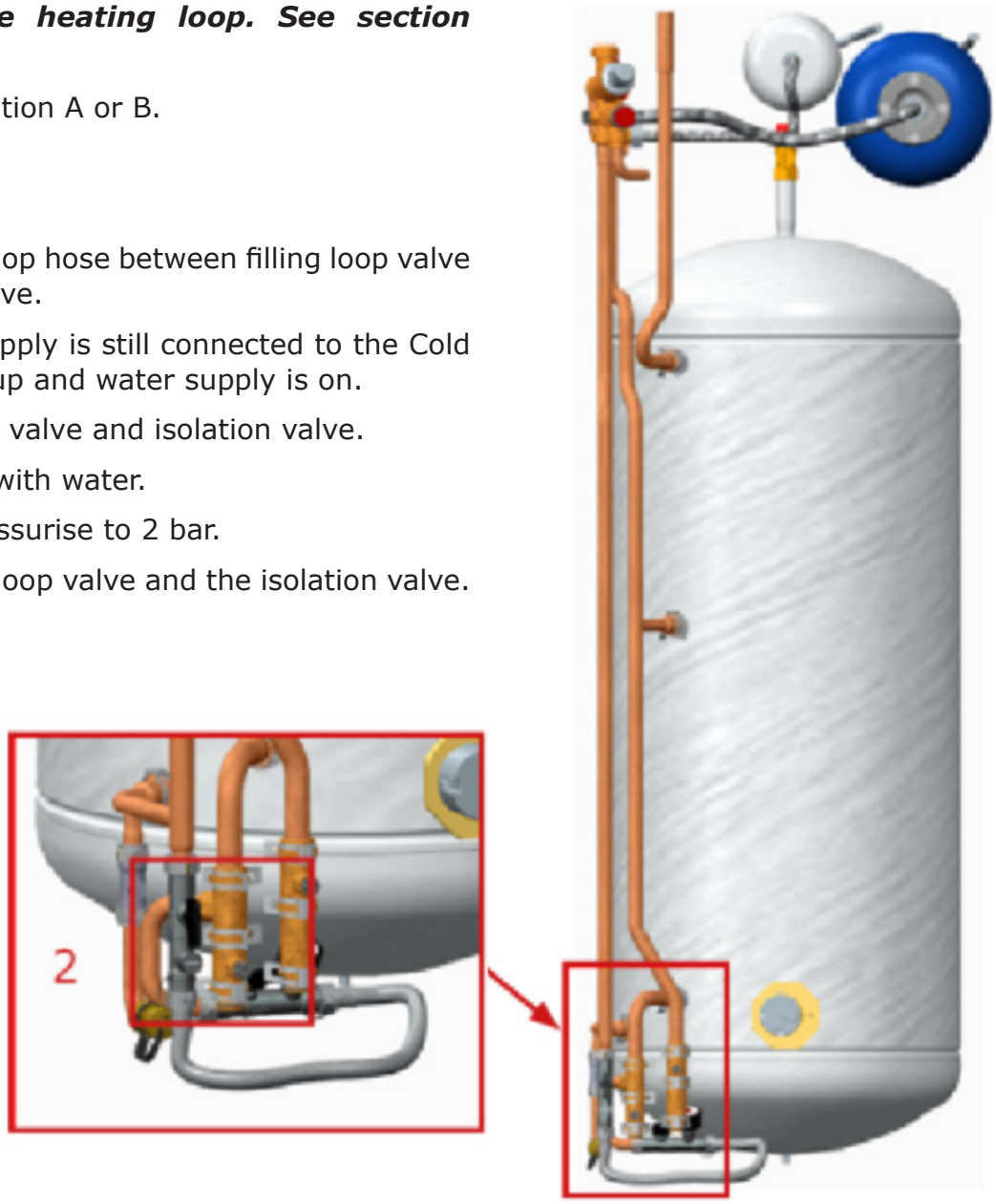


Fig. 29 : Fill DHW Coil

Option B:

1. Connect water supply directly to isolation valve.
2. Open isolation valve.
3. Turn water supply on.
4. Allow coil to fill with water.
5. Allow coil to pressurise to 2 bar.
6. Close isolation valve.
7. Turn off and remove water supply.

Fig. 30 : Isolation Valve Assembly

5.8.5 How to Drain Energy Loop

Follow the steps in the order below:

1. Follow the relevant safety precautions highlighted in Section 9.0.
2. Lay down a dust sheet in front of the Zeroth. Use a wet vac to ensure clean and fast draining. Ensure there is a bucket and rags to hand to mop up any spillages.
3. Isolate the mains cold water supply, energy loop flow / return and heating / cooling flow / return loops, located at the top of Zeroth.
4. Loosen the highlighted drain valve knobs shown in Fig. 31 and use a wet vacuum cleaner to remove the water in the pipework.

Take care when opening the drain valve knob as this part completely detaches from the fitting and could be sucked into the vacuum.

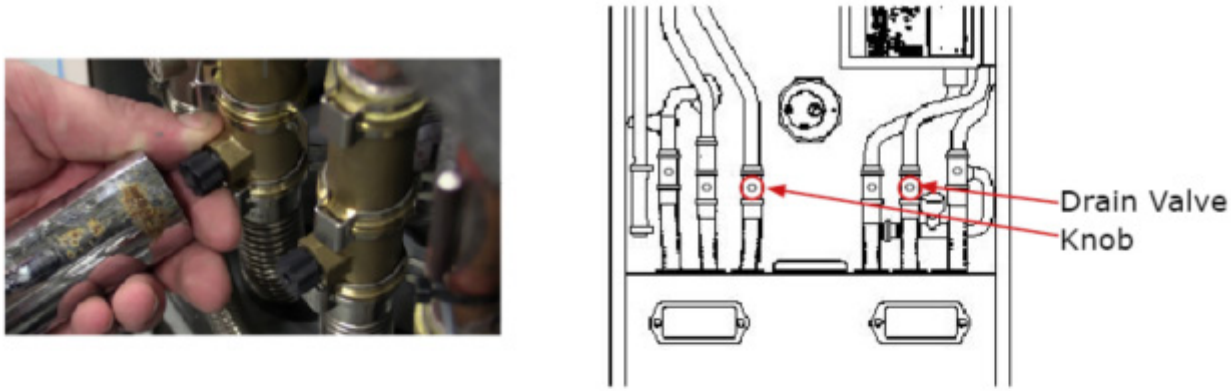


Fig. 31 : Drain Valve Knob

5. Once all water is removed, close the drain valves.
6. Clean up any spillages.

5.8.6 How to Fill Energy Loop.

To fill the Energy Loop:

1. Connect flush and fill kit to energy loop inlet and outlet.
2. Make sure the PIC Valve, is open.
3. Open valves on flush and fill kit.
4. Turn flush and fill kit pump on and allow water to circulate through the loop.
5. Once air has been removed from the system, close the outlet valve on the flush and fill kit and allow loop to pressurise.
6. Once loop is pressurised close inlet valve and turn off pump.

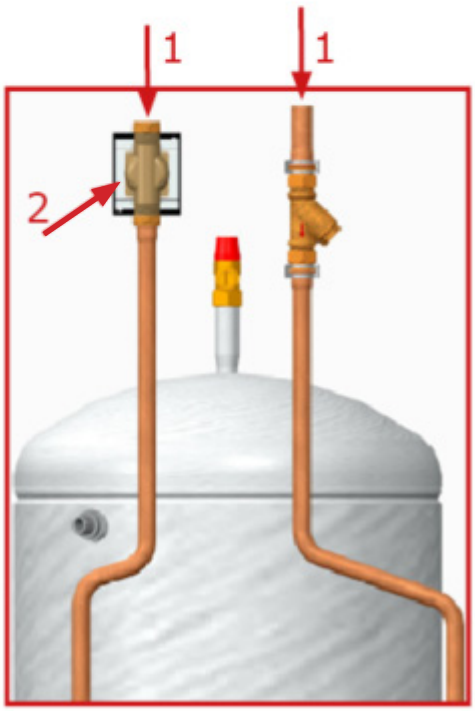


Fig. 32 : Fill Energy Loop

5.8.7 How to Drain Space Heating Loop

Follow the steps in the order below:

1. Follow the relevant safety precautions highlighted in Section 9.0.
2. Lay down a dust sheet in front of the Zeroth. Use a wet vac to ensure clean and fast draining. Ensure there is a bucket and rags to hand to mop up any spillages.
3. Isolate the mains cold water supply, energy loop flow / return and heating / cooling flow / return loops, located at the top of Zeroth.
4. Connect a hose from a suitable drainage point to the isolation valve shown in Fig. 33. Open black isolation valve assembly shown in Fig. 30 to allow flow of water from the coil.
5. Once drained, close the isolation valve and space heating loop.

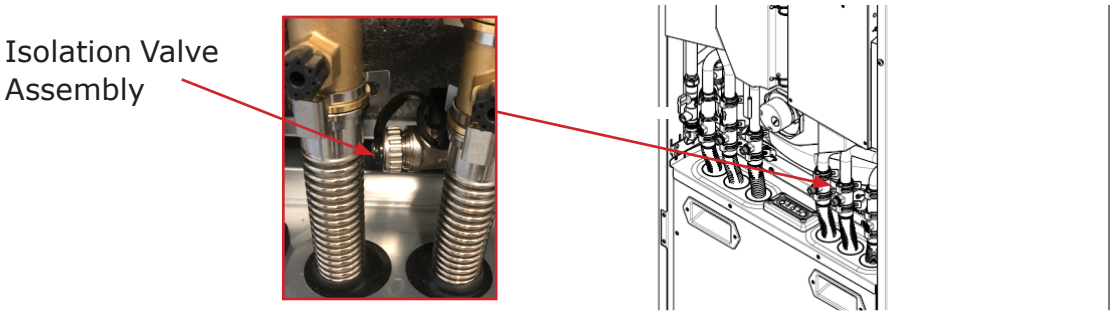


Fig. 33 : isolation Valve Assembly

6. Remove hose from cylinder drain valve.
7. Clean up any spillages.

5.8.8 How to Fill Space Heating Loop

To fill the Space Heating Loop:

1. Connect flush and fill kit to energy loop inlet and outlet.
2. Make sure the PIC valve is open.
3. Open valves on flush and fill kit.
4. Turn flush and fill kit pump on and allow water to circulate through the loop.
5. Once air has been removed from the system, close the outlet valve on the flush and fill kit and allow loop to pressurise.
6. Once loop is pressurised close inlet valve and turn off pump.

6.0 Set to Work Instructions

This section details the procedure which should be followed when commissioning the Zeroth appliance. Each step should be followed in the order described. The set to work procedure for the product once installed must only be carried out by a trained and competent Engineer (i.e. an approved agent of Glen Dimplex UK Ltd).

Plug in PGD tool (Programmable Graphic Display) is required to complete set to work.

Step 1: Visual Inspection

- Visual check for damage to product.
- Visual check that thermostats, plumbing etc. all complete.
- Refer to Table 4 for Installer checklist.

Step 2: Electrical Connections

- Wire in power cables and control cables.

Step 3: Power Test

- Power on product.

Step 4: Software Check

- Plug in PGD (Programmable Graphic Display) screen, refer to section 11.2.1.
- Check and record software versions for UI, inverter and Zeroth.

Login at Service level: 1234

Go to Service Menu -> Sw.Info

All software versions will be displayed. The check-box next to the inverter and UI confirms Modbus communication link is good. If they are not "ticked" then the cabling will need to be re-checked.

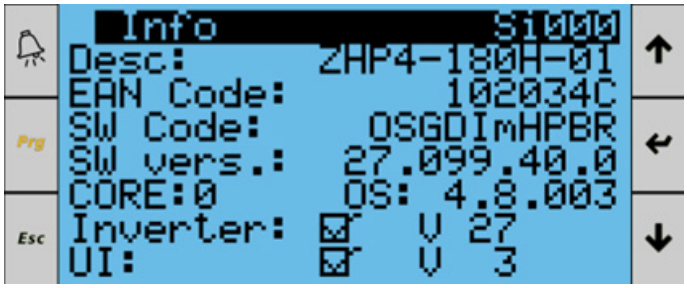


Fig. 34 : Software Information

Software versions must be recorded as well as software updated (if applicable) before updating, or doing a factory reset of the unit, the compressor, pump etc. Run hours should also be recorded if the Zeroth is not a "new" installation. The run hours can then be added back into the software at a later step.

Commission Screen:

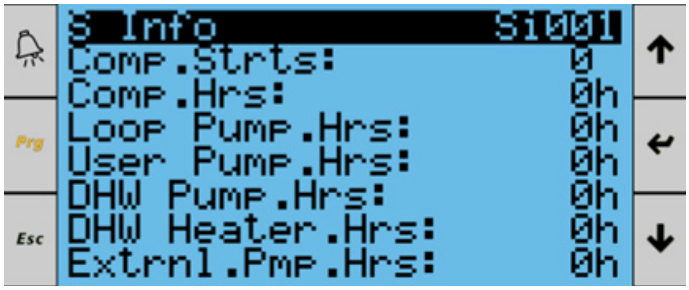


Fig. 35 : Commissioning Screen

Step 5: Plumbing pre-checks

- Run all pumps, open all valves. Check and top up system pressures, bleed for air, clean strainers, verify loop flow and temperature is within range.

Login at Service level: 1234

Go to Service Menu -> Sys.Checks

In Sys. checks all of the pumps/valves can be turned on/opened in order to help bleed the system of air. The flow rates and temperatures for each loop are also displayed so that they can be monitored.

Source Loop screen:

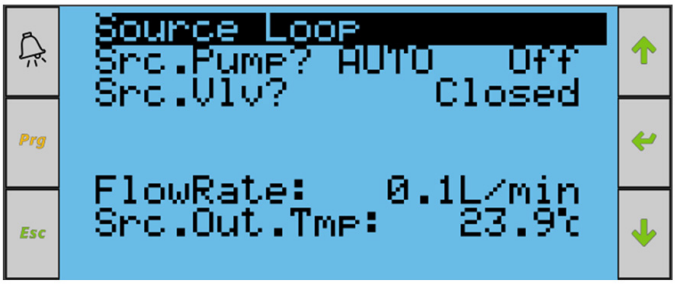


Fig. 36 : Source Loop Screen

Space/User Loop Screen:

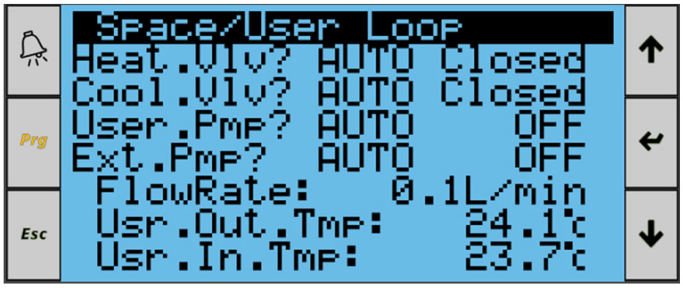


Fig. 37 : Space / User Loop Screen

DHW Loop Screen:

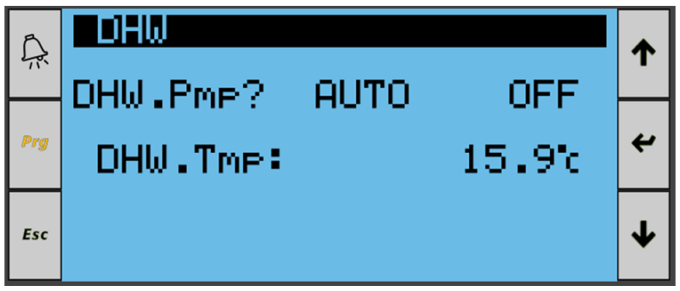


Fig. 38 : DHW Loop Screen

Step 6: Software Set-to-Work (Commission)

- Begin configuration of system (modes, setup aux pump etc).

Note: Software commission procedure starts at this step.

Login at Service level: 1234

Go to Service Menu -> Commission

6.1 Time/Date:

Set the time and date on the Zeroth.

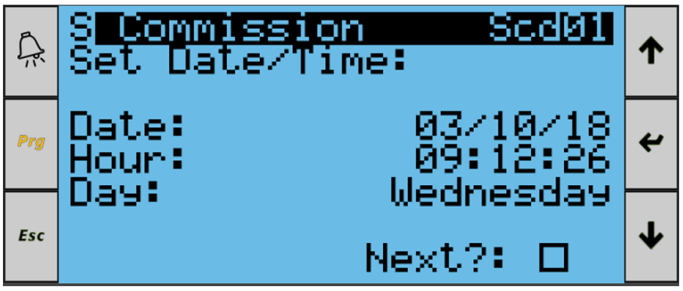


Fig. 39: Set Time and Date

6.2 Unit Mode:

Enable the working modes of the Zeroth . Tick the modes you want to enable . DHW Mode is enabled permanently by default. If a timer is connected then the "DHW Timer" option must be checked.

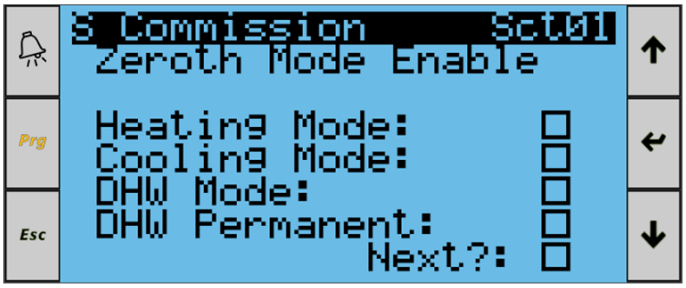


Fig. 40 : Unit Mode

6.3 H/C Valve

Configure the heating/cooling valve as per schematic.

Enable/Configure the External pump as per schematic.

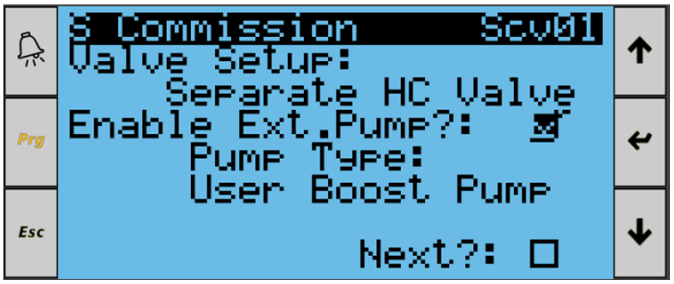


Fig. 41 : Heating / Cooling Valve

6.4 Pumps Setup

Setting the internal User pump speed to be used when the compressor is off.

- Open the heating circuit and adjust pump speed until flow rate is greater than specified.
- Open Cooling Circuit and close Heating Circuit and make sure flow rate is greater than specified. Increase pump speed if required.

If when engaging the pump there is no flow (shown on the flow meter), then rotate the pump using a screwdriver as shown in Fig. 43.

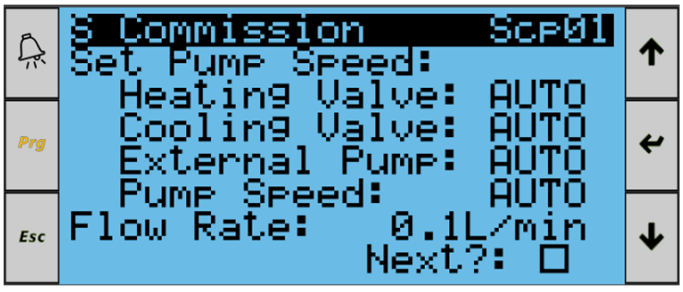


Fig. 42 : Pumps Setup

Fig. 43 : Rotate the Pump

6.5 Front UI

Check functions on the Front UI.

- Online Status should be ticked if UI is connected/powered and communicating over modbus.
- Adjust offsets on UI and check PGD for feedback.
- Turn "Thermal System" on/off on UI and check PGD for feedback.

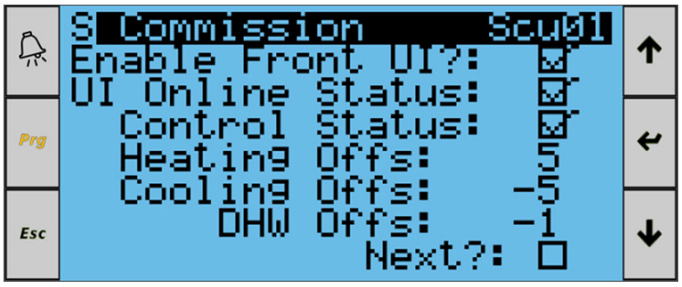


Fig. 44 : Front UI

6.6 Setpoints

Set the Heating, Cooling and DHW setpoints.

- In Heating mode the Return/Inlet temperature probe is used for control.
- In Cooling mode the Flow/Outlet temperature probe is used for control.
- In DHW mode the DHW temperature probe is used for control.

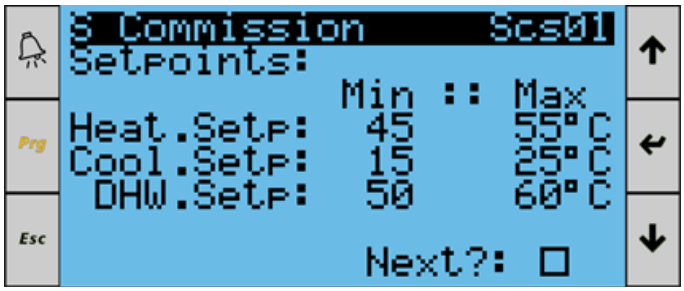


Fig. 45 : Setpoints

6.7 Test Inputs

Check that all external controls are wired correctly and are being detected by the Zeroth.

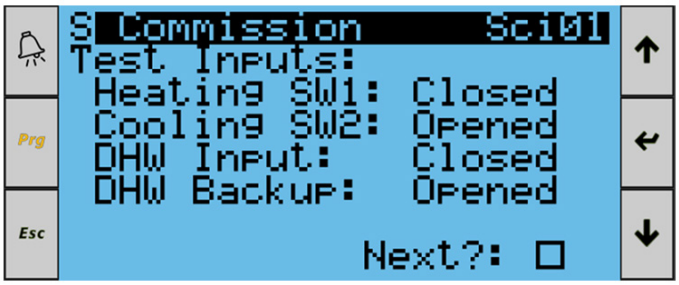


Fig. 46 : Test Inputs

6.8 Finish Commission

Tick the box to finish the software set-to-work (commission).

Fig. 47 : Finish Commission

The time and date of the commission will then be recorded.

Fig. 48 : Unit Commissioned

Step 7 Run Hours Adjust

Login at Service level: 1234

Go to Service Menu -> Run.Hrs.Adjust

If the Zeroth has been recommissioned or if the software has been updated, the run hours must be adjusted in order to maintain a record of the compressor, pump etc. run hours.

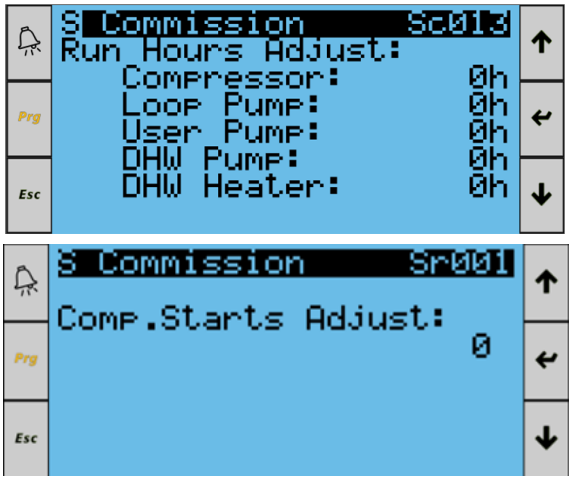


Fig. 49 : Run Hours Adjust

Step 8 Anti-Legionella

Login at Service level: 1234

Go to Service Menu -> Legionella

Once enabled the setpoint for the Anti-Legionella request can be set. Disinfection temperature and duration can be set. The setpoint tolerance is used to set acceptable tolerance (example ±0.2°C) of set target temperature (60°C ±0.2). Frequency of Anti-Legionella can be;

1. Fixed Days (Certain days of the week)
2. Fixed Period (Every nth set day)

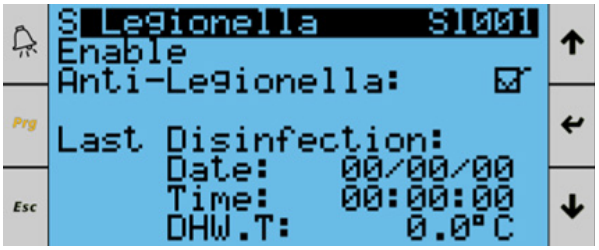


Fig. 50 : Configure Legionella Procedure

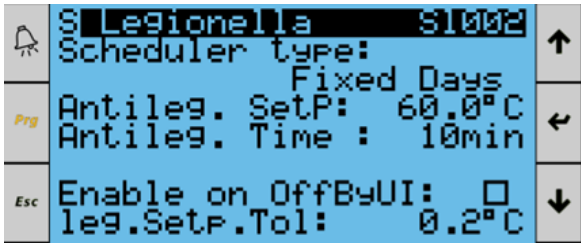


Fig. 51 : Anti-Legionella Setpoint

Option-1: Fixed Days Scheduling

In Fixed Days scheduling you can set certain days of the week to carryout Anti-Legionella cycle. Time of the disinfection can also be adjusted.

Fig. 52 : Anti-Legionella Scheduler

Option-2: Fixed Period Schedule

In Fixed Period scheduling you can set how often the disinfection should happen (Everyday or every nth day). Time of the disinfection can also be adjusted.

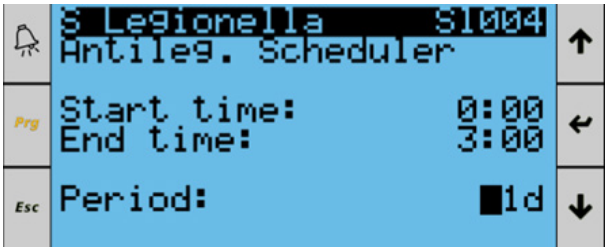


Fig. 53 : Anti-Legionella Scheduler

Step 9 Quick-Start:

Functionality tests – Quick-Start. Run indefinitely until engineer turns off or set point reached.

- Heating
- Hot Water
- Cooling
- Immersion Heater (ideally operate this while heating/cooling test is going on)

Login at Service level: 1234
Go to Service Menu -> Quick-Start

The Zeroth can be forced into each mode, but only one Quick-Start mode can be activated at a time. Once the Zeroth reaches the set temperature the Quick-Start mode is automatically disabled.

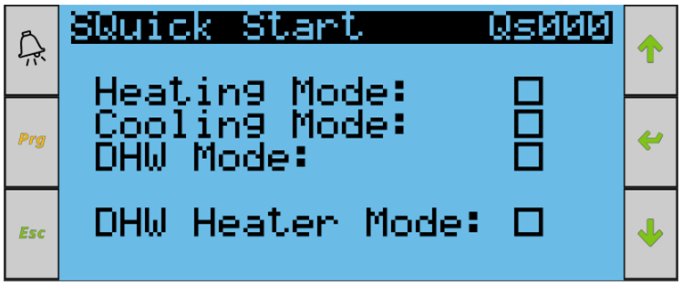


Fig. 54 : Quick-Start Mode

Step 10 Unit On/Off:

Note: The Front UI will also need to be "Thermal System On" in order for the Zeroth to resond to demands from climate controls.

When all tests are finished the Unit can be switched ON.

Set the Unit to ON on this screen, it will then be ready to operate and will respond to requests automatically.

Fig. 55 : Unit On/Off

Other: Factory Reset/ Log Export

Login at Service level: 1234

Go to Service Menu -> Factory

Log Export:

The logs can be exported to USB and then retrieved using a laptop.

1. Disconnect USB cable if connected.
2. Select YES using the PGD.
3. Wait for operation to complete.
4. Plug in USB cable to laptop.
5. Copy .csv file onto local drive and rename for records.
6. Disconnect USB cable.

Fig. 56 : Log Export

Factory Reset:

To reset all parameters to factory defaults, select YES.

The controller will reboot, all settings will be at default pre-commissioned values.

Fig. 57 : Factory Reset

7.0 Operation

The Zeroth Energy System fully integrates with standard space heating and hot water control systems. The end user should only adjust the dwelling space heating thermostats to match their comfort requirements and the Zeroth Energy System will adjust accordingly. To do this, simply increase or decrease the room thermostat to the desired temperature and the Zeroth energy system will adjust to meet comfort level accordingly. Refer to the thermostat manufacturers user guide if unsure how to use it.

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.

The appliance must be permanently connected to the building electricity supply. Once the Zeroth has been set to work by an approved trained and competent Engineer, the unit must be left powered at all times to sure that the unit remains fully operational and fault free. For example Zeroth periodically runs the pumps to ensure they do not lock up. If Zeroth is left disconnected for long periods of time it must be re-commisioned.

Once the system has been fully commissioned, no user intervention with the appliance should be required to fully enjoy the comfort and benefits of unvented hot water, efficient space heating and space cooling.

Glen Dimplex UK Ltd cannot take responsibility for ensuring safe operation of the appliance outside of the scope of intended use.

The Zeroth appliance is factory set to deliver user comfort at peak operational efficiency. For further modification please see Advanced User Controls (see Section 7.3).

7.1 User Interface Overview

The Zeroth User Interface (UI) is located on the front of the appliance, shown in Fig. 58, and performs several functions.

- Provides a status of the system operation, i.e. on/off.
- Adjusts comfort levels.
- Display of system errors.

The UI consists of the following elements as shown in Fig. 58.

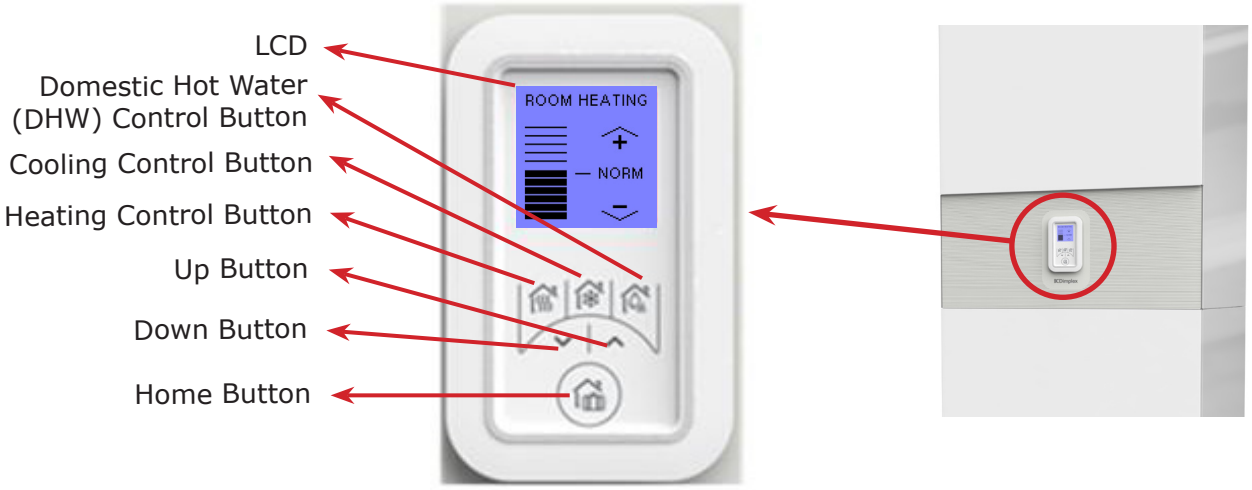


Fig. 58 : User Interface Overview

After 1 minute of inactivity, the LCD screen goes into power saving mode. This results in the screen only powering down, the appliance remains functional as required. Pressing the Home Button powers the screen back up.

7.2 Thermal System On/Off

Turning the Thermal System off (standby mode) will result in no heating, cooling or hot water and may take some time in order to return to normal usage.

- To select standby mode, press the Home Button to energise the screen.
- Pressing the Home Button a second time gives the option to enter standby mode.
- Use the down arrow to place a tick in the OFF box, then press the Home Button to apply the change entering standby mode. Screen shown in Fig. 59.
- To deactivate standby mode, press the Home Button so that it displays the green screen shown in Fig. 59.

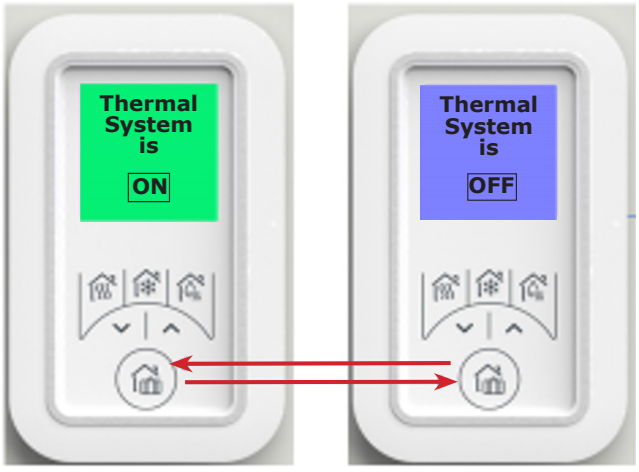


Fig. 59 : Thermal System On/Off

7.3 Advanced User Controls

The settings on the appliance itself should not need to be adjusted. However, should the heating system fail to achieve user comfort levels, by adjusting the central heating system controller, an advanced menu on the appliance can be accessed to vary the capacity of the Zeroth appliance. Please use the relevant contact details found at the back of the manual, for further advice in respect to the options below.

Within the advanced user controls functions, three parameters can be adjusted to optimise the operation of the Zeroth Thermal System:

- Heating Controls.
- Cooling Controls.
- Domestic Hot Water Controls.

Each can be adjusted by following the steps below:

- Press the corresponding button highlighted in Fig. 60.
- Change to the desired comfort level by using the up and down arrows.
- Having selected the comfort level, simply press the Home Button when the desired level is selected to store it.

Fig. 60 : Advanced User Controls

There are 11 levels of comfort for each operating mode. The up and down arrows vary the comfort levels from "Cooler" through to "Hotter" in order to meet the required need.

7.4 Troubleshooting

In any circumstances when the heating/cooling* system fails to deliver desired levels of comfort, the user should follow the guidance provided in this section to either resolve any issue, contact technical support, or activate back up.

**Cooling is only available on selected models*

7.4.1 Fault Screen

If there is a fault with the Zeroth Energy System, the following screen will be displayed on the user interface:

- System Fault - Contact Support (see details found at the back of the manual).

Fig. 61 : Fault Screen

7.4.2 Domestic Hot Water - Manual Mode

A wall mounted switch, which may be located adjacent to the Zeroth appliance, switches the backup immersion heater from Automatic to Manual Mode. This switch should only be activated should the Zeroth fail to deliver hot water in normal mode.

The back-up switch location is determined by the building electrical designer and may be placed in another location in the building. Please consult the facilities manager should the back-up switch be difficult to locate.

When activated, this switch keeps the immersion heater activated until manually switched off.

In domestic hot water Manual Mode, the appliance will heat the entire volume of the water cylinder, 180l to 60°C.

Attention, when the immersion heater back-up switch is activated a "⏀" symbol appears on the User Interface to flag the immersion heater is in Manual Mode. To avoid increasing energy bills, please switch off the back up immersion heater switch after use.

Fig. 62 : Fault Screen (Manual Mode)

8.0 Servicing

The following section details important checks which must be carried out when servicing the appliance. To meet with guarantee requirements, the cylinder must be serviced annually. After servicing, complete the relevant Service Record section of the Checklist located on the inside back pages of the User Guide.

The maintenance of this appliance must be carried out by a suitably trained and competent 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!

8.1 DHW Cylinder Checks

DHW Cylinder Checks	
- Checklist servicing unvented water cylinder	
- Pressure relief valve function	
- Auto-Airvent function	
- T&P valve function	
- Expansion vessel charge pressure - 2 bar	
- DHW temperature probe properly located and functional	
- Safety temperature probe properly located and functional	
- Heating coil loop system pressure	
- Heating coil loop expansion vessel pressure	
- Heating coil loop expansion relief valve operation	
- Back-up immersion heater operation	
- DHW pump operation	

Table 5 : DHW Cylinder Checks

8.2 Space Heating Circuit

Space Heating Circuit Checks	
- Pressure relief valve function*	
• Visually check that the pressure relief valve (PRV) is not leaking.	
- System operating pressure check	
• Visually check pressure gauge on heating side (see drawing for location). Pressure should be above 1 bar.	
- Expansion vessel charge pressure check	
• Should be pre-set to 1.5 bar.	
- Flow meter function	
• Run Plant circulation pump from PGD. Include link on PGD. Check flow against Set to Work flow rate.	
- Filter/strainer checked and cleaned	
• Close isolation valves before opening strainer. Drain pipe at drain valve point with a wet vac. Clean strainer and refit. System might need refilling and re-pressurising.	
- Space heating pump operation	
• Same as Flow meter function above. Combine them together.	

*(Not supplied on Heating & Cooling Units)

Table 6 : Space Heating Circuit Checks

8.3 Energy Loop Circuit

Energy Loop Circuit	
- PIC valve check	
• Use SW to open valve: check flow rate on PGD and physically check the valve is in the open position after 30s. (could also listen for flow going through the valve). Source pump might need to be switched on too. Check PIC Valve setting and that actuator is correctly fitted on the valve.	
- Check flow meter	
• Same test as above. Combine all these procedures and make sure the correct reading is showing on the PGD.	
- Flow rate check	
• Make sure that minimum flow is met. If not, check strainer and come back to this flow check. Make sure valves are fully open and there are no restriction on that loop.	
• If PIC valve is fitted, adjust flow to make sure minimum flow is met.	
- System filter check	
• Close isolation valves before opening strainer. Drain pipe at drain valve point with a wet vac. Clean strainer and refit.	
- Energy loop pump operation	
• Same as Flow meter function above. Combine them together.	

Table 7 : Energy Loop Circuit Checks

8.4 Heat Pump Unit

Heat Pump Unit	
- EEV (Electrical Expansion Valve) working	
• This can only be checked when the heat pump is running for sufficient time. EEV (opening and Superheat signal can be checked against pre-defined value to check correct operation)	
- 4-way valve operation	
• A special function is required to by-pass the 1h change-over delay between heating and cooling.	
• Typical test should be Heating showing a positive temperature difference on the water side and cooling showing a negative Delta T after a few minutes of running.	
- Pumps	
• Source and Heating pump tested above. DHW pump operation could be tested using a sensitive clamp A-meter?	
- Sensor replacement	
• Check during operation of the heat pump.	
- Refrigeration charge check	
• Check from running the heat pump and checking EEV opening, Superheat signal and calculated capacity against (flow rate x Cp x DT) on the heating side.	
- Digital check parameters on screen	
• Check Software version number.	

Table 8 : Heat Pump Unit Circuit Checks

8.5 Annual Service

The Zeroth Heat Pump must be serviced at least once every 12 months by a competent and suitably qualified engineer, in accordance with the instructions contained within this manual and all applicable legislation, regulations, and industry standards in force at the time of service.

Annual servicing is essential to maintain the safety, efficiency, reliability, and performance of the product and is a condition of the manufacturer's guarantee. The product is supplied with a standard guarantee of 2 years from the guarantee commencement date (refer to the Installation Certificate for details).

Responsibility for ensuring that the product is serviced within the required interval rests with the property owner or operator. Failure to maintain the product in accordance with these requirements may adversely affect product safety, efficiency, performance, and guarantee eligibility.

At each service visit, the service engineer must complete the relevant Service Record / Checklist contained within this manual as evidence that servicing has been carried out in accordance with the manufacturer's requirements.

9.0 Replacing Parts

This section describes how to remove and replace components on the Zeroth and Section 12.0 directs to spares for the components which have been identified as replaceable. Section 5.1 illustrates how to remove the front panels of the unit.

All parts must be supplied by the manufacturer, with work carried out by a trained and competent and approved service agent, otherwise the guarantee will no longer apply.

Ensure all electrical and liquid supplies to Zeroth are isolated before commencing any work, using safe isolation procedure. If this isn't possible, do not proceed until this can be arranged.

Use appropriate PPE when working on Zeroth. Carry out an assessment to determine risk and if assistance is required.

In order to replace components, it may be necessary to empty the cylinder of water. To do so, follow the relevant steps highlighted in Section 5.8.

After servicing, complete the relevant Service Record section of the Checklist located at the back of the User Guide associated with the product. Completion of the Service Record is a condition of guarantee.

9.1 Replacing Heat Pump Module

HP Module Weight: Max 62kg. Ensure that a risk assesment is completed before handling the heat pump module.

When replacing the heat pump module, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and Section 5.8
2. Remove top, middle and bottom front panels of the appliance, refer to Section 5.1 for more details.
3. Follow the draining procedure for DHW coil, energy loop and space heating loop detailed in Section 5.8.3, 5.8.5 and 5.8.7 respectively.
4. Once drained, remove the fast fit clips between each metal flexi pipe and brass valve body.
5. Remove the metal earthing bracket. See Fig. 63).
6. Remove the remaining two screws top left and right holding the Heat Pump to the chassis.

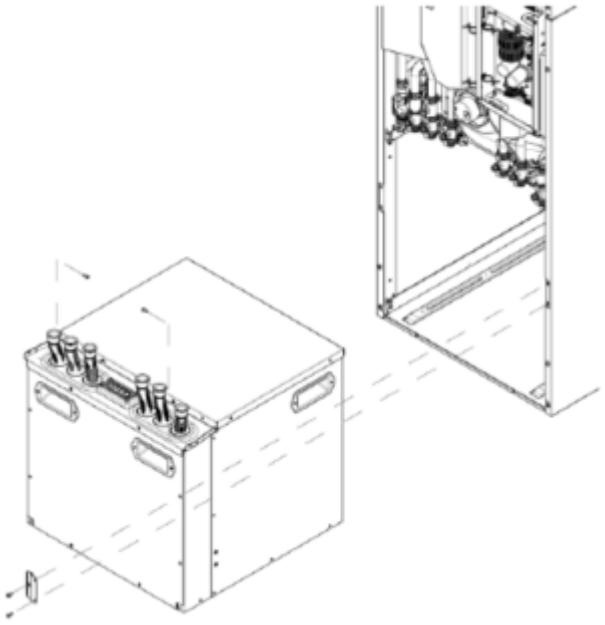


Fig. 63 : Heat Pump Module

7. Pull each metal flexi hose pipe downward and away from the brass valve body. Use a wet vac to remove any residual water.

Use a rag to catch drips and use a wet vacuum to remove any residue liquid left in each pipe.

Use gloves and other appropriate PPE when working on the Heat Pump module as there may be sharp edges on the chassis.

Caution - liquids used in the energy loop and heating circuits may contain inhibitor chemicals and may still be hot.

8. Remove the metal covers to expose the PCB's. See Fig 64.

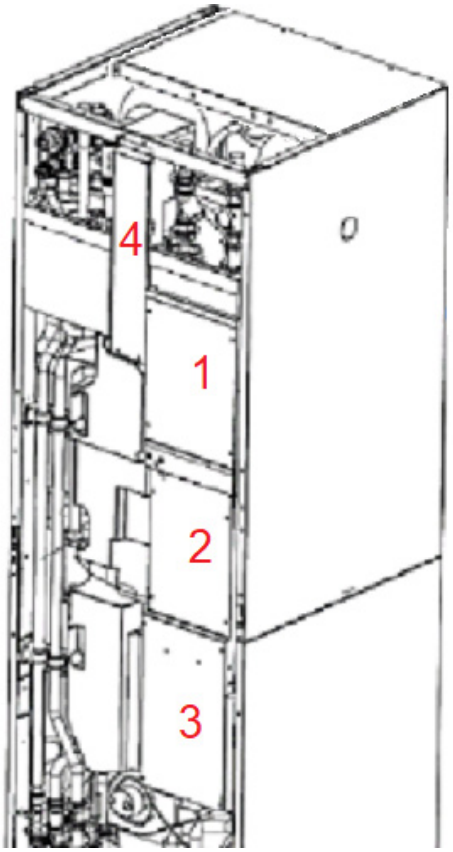


Fig. 64 : Remove metal covers

9. All the heat pump module cables need to be removed from the wiring box to allow the heat pump module to be removed. Best practice is to work right to left. See Fig 65.

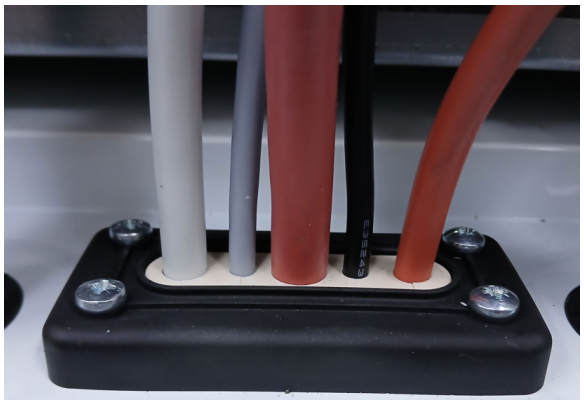


Fig. 65 : Heat Pump Module Wire Looms

10. Remove the inverter cable by snipping the retaining cable tie, unplugging the connection, popping out the cable gland and sliding out the front. Do not clip cable ties fixing windings and do not unwind wire from coil.

Fig. 66 : Remove Inverter Cable

11. On the Controller PCB, remove the cable EEV1 plugged into the bottom of the PCB that controls the Expansion Valve. See Fig 67.

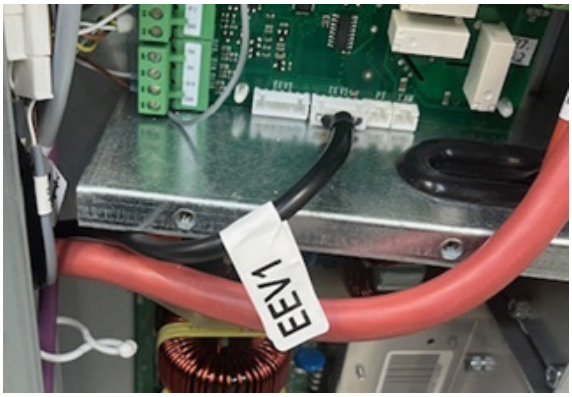


Fig. 67: Expansion valve cable

12. Remove Supply Loom by disconnecting the 5 seperate connections shown. Unplug cconnector for PUMPS, terminal for Cut-out and terminal for L.HPSW. Unscrew N03 and N3 from respective connectors. See Fig 68.

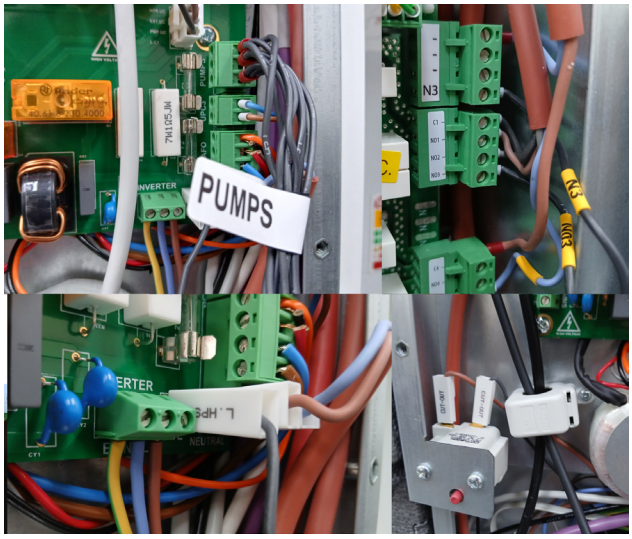


Fig. 68 : Remove Supply Loom Connections

13. Unscrew Y3 from its connector and leave in place. See Fig. 69.

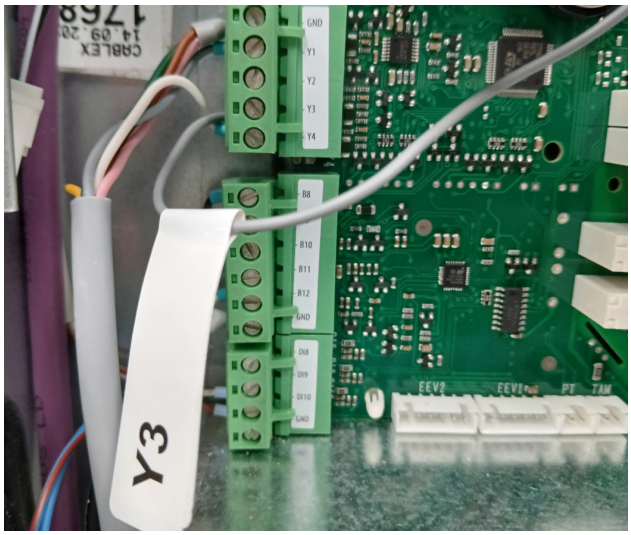


Fig. 69 : Remove Y3 from Connector

14. Remove PWM loom from wiring box. See Fig. 70.

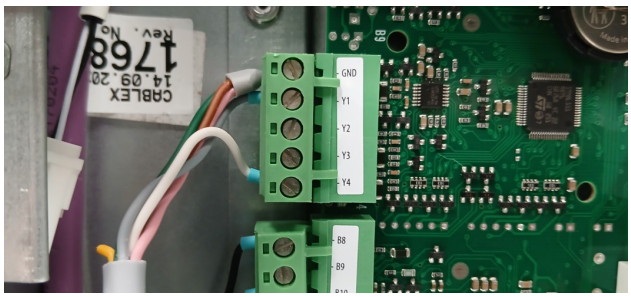


Fig. 70 : Remove PWM Loom

15. On the Loop Flowmeter to the left of the Zeroth, unscrew the connector and remove by feeding back through the respective cable glands in the wiring box. See Fig. 71

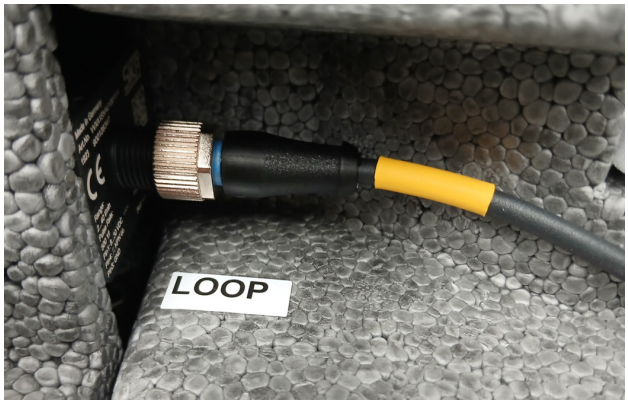


Fig. 71 : Remove Loop Flowmeter Cable

16. On the Space Heating (SH) Flowmeter to the top right of the Zeroth, unscrew the connector and remove by feeding back through the respective cable glands in the wiring box. See Fig. 72

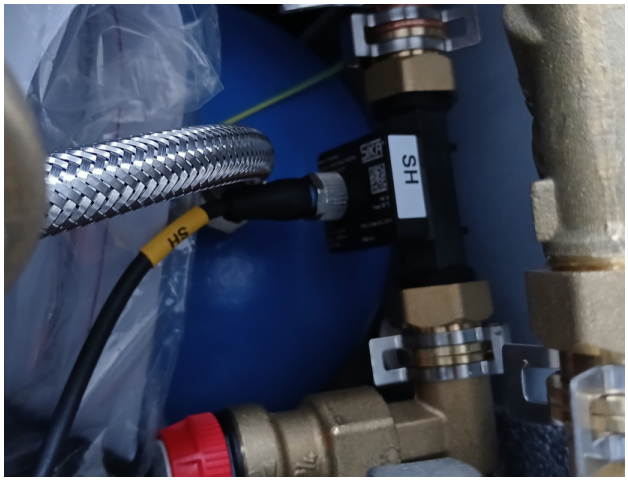


Fig. 72 : Remove SH Flowmeter Cable

17. Disconnect the sensor probes B1, B2, B3 and B10. See Fig. 73

Fig. 73 : Disconnect Sensor Probes

18. Unplug +Vdc/GND/+5VR connector from PCBA. See Fig. 74.

Fig. 74 : Disconnect Sensor Probes

19. Unplug 9 pin connector on the left, B1 - B7/GND/+Vdc, from PCBA. See Fig. 75.

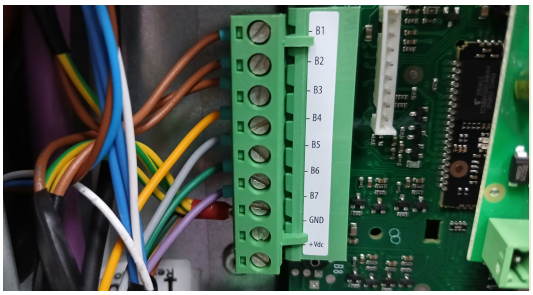


Fig. 75 : Unplug B1-B7/GND/+Vdc Connector

20. Unplug 6 pin connector on the left, B8 - B12/GND, from PCBA. See Fig. 76.

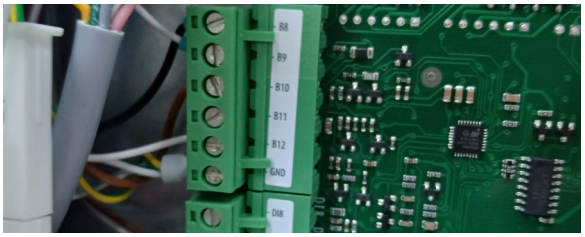


Fig. 76 : Unplug B8-B12/GND Connector

21. Remove the complete sensors loom (15. - 20.) from the wiring box. And ensure that all 5 wiring looms are removed cleanly. See Fig. 77.

Fig. 77 : Ensure all looms disconnected

22. Remove the Heat Pump Module completely from the chassis. Use the handles provided on the front and sides. Ensure safe handling practises are used.
23. Be careful to avoid personal injury or property damage and ensure a dust sheet is protecting the floor against any risk of damage.
24. The replacement Heat Pump Module comes pre-fitted with all wiring. Slide the Heat Pump Module into position.
25. Re-thread all cables through the cable gland and re-wire according to the labels on the plugs in reverse order 21 - 8.
26. Reconnect flexi hoses from the Heat Pump Module to the brass valves and replace all pipe clips.
27. Before refilling the system, check the in-line strainers for debris.
28. Open isolation valves at the top of the Zeroth to allow liquids to flow down into the heat pump module; check for any leaks and fix as required.
29. Follow Section 5.8.4 to refill the DHW coil to 1.0 Bar. Refill the remainder following Section 5.8.4.
30. Energise the Zeroth.
31. Using the PGD, log into the service menu. Ensure the software is current.
32. If no software changes are needed, go to service option D "Run hrs adj" info page SI001 showing run hours. Record run hours on the job sheet; once complete zero the run hours for the compressor and pumps that have been replaced.
33. It is advised to recommission the system or to activate each pump in turn at 100% speed so that air is purged.
34. Close the isolation valves for the filling loop and remove the filling loop hose (to comply with WRAS), catching any drips with a rag.
35. Ensure the earth plate is re-fitted.
36. Ensure the backup DHW switch works correctly (energises the immersion element). Leave it switched off before leaving the premises.
37. Record the old and new Heat Pump serial numbers on the job sheet.
38. Complete Service Section located at the back of the User Guide.
39. Refit front panels on the Zeroth in reverse order shown in Section 5.1.
40. Remove old Heat Pump Module from the premises and subsequent uplift arrangement should be made from the engineer.
41. Refit outer covers in the reverse order shown in Section 5.1. Ensure mains power is reconnected and site is left clean and tidy.

9.2 Replacing Immersion

Be aware that water in the DHW tank may still be hot.

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

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front, middle and bottom panels of the appliance, see Section 5.1.
3. Follow the draining procedure for DHW cylinder detailed in Section 5.8.1.
4. Using an appropriate sized spanner remove the immersion cover from the immersion. See Fig. 78.

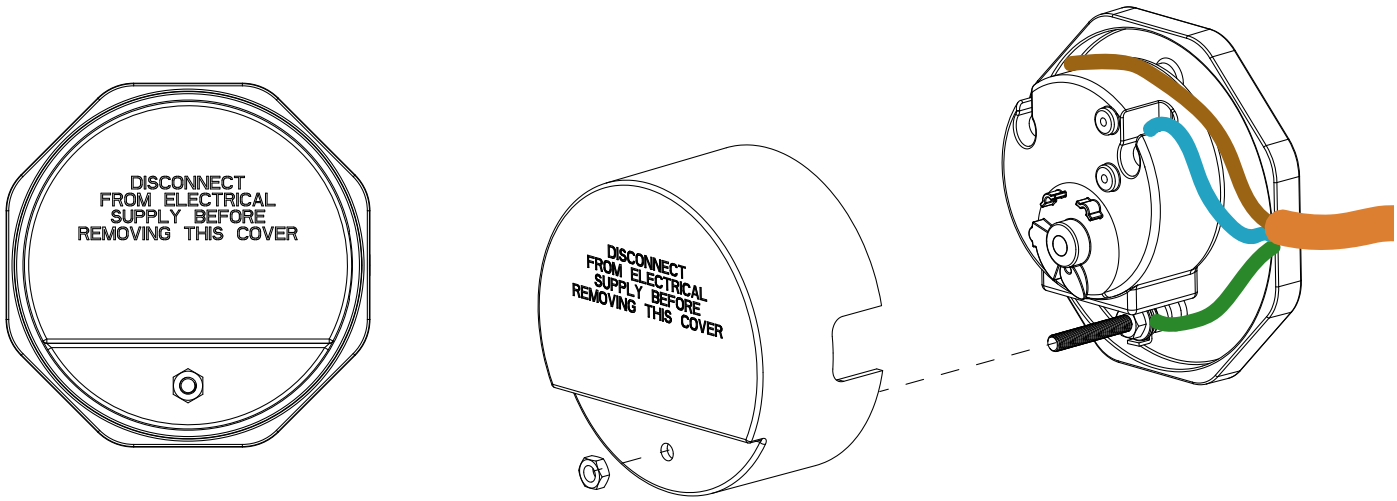


Fig. 78 : Remove Immersion Cover

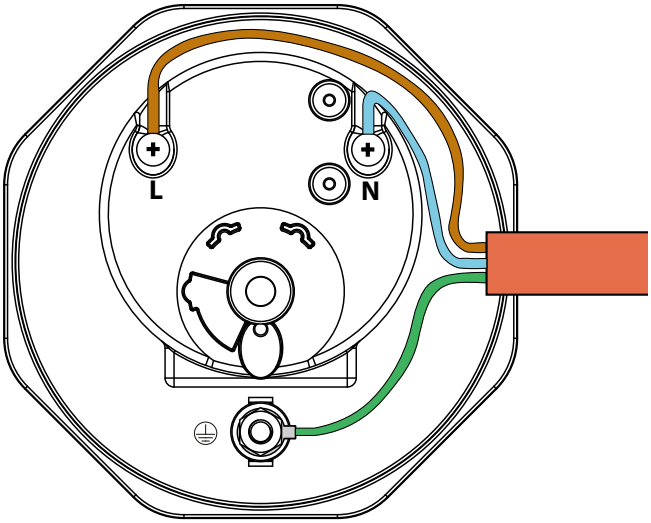


Fig. 79: Immersion Wiring

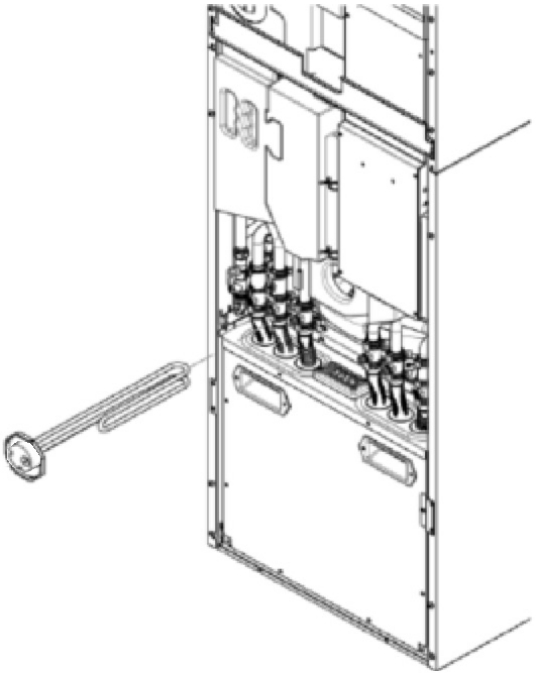


Fig. 80: Remove Immersion

5. Disconnect the wires to the immersion. Ensure all fixings for securing earth and immersion cover are retained. See Fig. 79.
6. Using an appropriately sized box spanner remove the immersion assembly and remove from the cylinder. See Fig. 80.
7. Replace with new component and torque to 40 Nm.
8. Re-wire as per Fig. 79.
9. Before the cylinder is pressurised, check the pressure of the DHW expansion vessel; this can be done using the schrader hose. Ensure vessel is set to 2 bar, if it fails to hold a charge, replace the vessel.
10. Close all hot taps and ensure cylinder drain valve is closed. Open the cold-water isolation valve and check the cylinder drain is not dripping and ensure there are no leaks around the boss.
11. Open each hot tap in turn to allow cylinder to refill with water and to purge air from hot water pipework. The T&P valve can also be opened to allow air to escape when filling the tank, then remove hose from cylinder drain see Section 5.8.1.
12. Switch on power supplies to Zeroth and use the immersion element boost switch to power up the immersion. Test the immersion element is working, the element should draw around 8.7 Amps.
13. Switch off the manual boost switch for hot water. refit immersion cover. Refit outer covers in the reverse order see Section 5.1. Ensure mains power is reconnected and site is left clean and tidy.

9.3 Replacing Expansion Vessels

9.3.1 Replacing Heating Circuit Expansion Vessel

DHW Coil expansion vessel is only available on Heating and Cooling models.

When replacing the space heating expansion Vessel, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 8.0 and 5.8.
2. Remove top front, middle and bottom panels of the appliance, see Section 5.1.
3. Follow the draining procedure for space heating loop in Section 5.8.7.

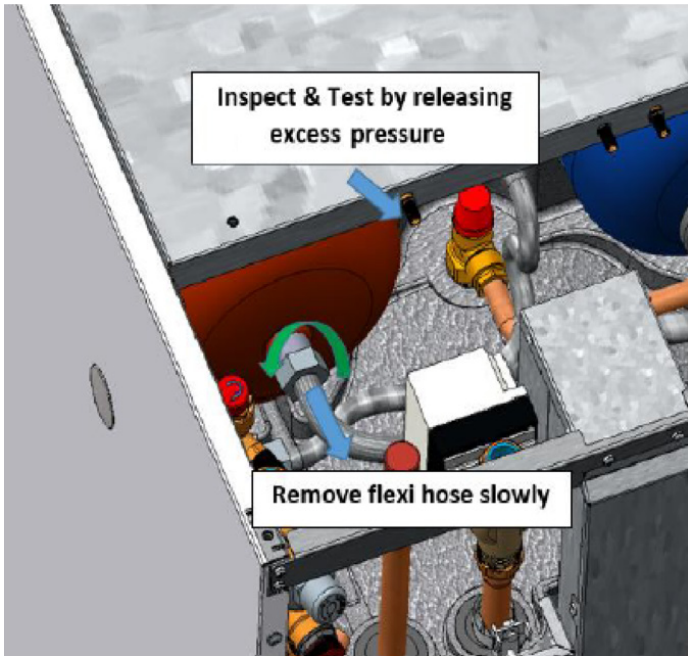


Fig. 81 : Expansion Vessels

If local isolation of electricity supplies and heating circuit is not possible, do not proceed further until this has been arranged.

4. Isolate heating inlet and outlet pipework above Zeroth.
5. Disconnect the flexible hose from the 8-litre space heating expansion vessel allowing the small amount of water in the hose to drain away into condensate tray.
6. Inspect and Test: Check pre-charge pressure of existing expansion vessel is 1.5 bar and recharge if required. If it fails to hold a charge, a replacement is needed.
7. Disassemble the bracket holding down the expansion vessels by unscrewing the four screws shown in Fig. 82. Remove the three locknuts attaching the schrader extension hose and the bracket.

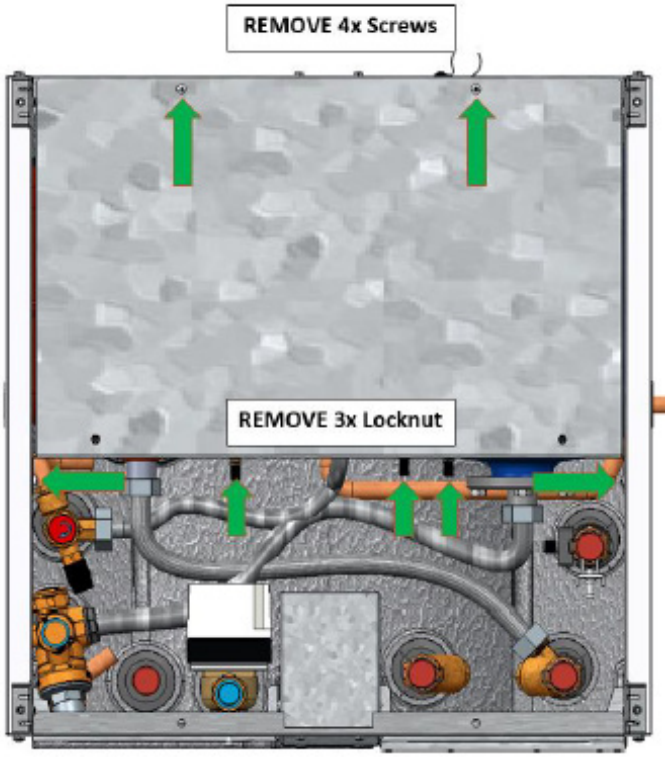


Fig. 82 : Removing Locknuts

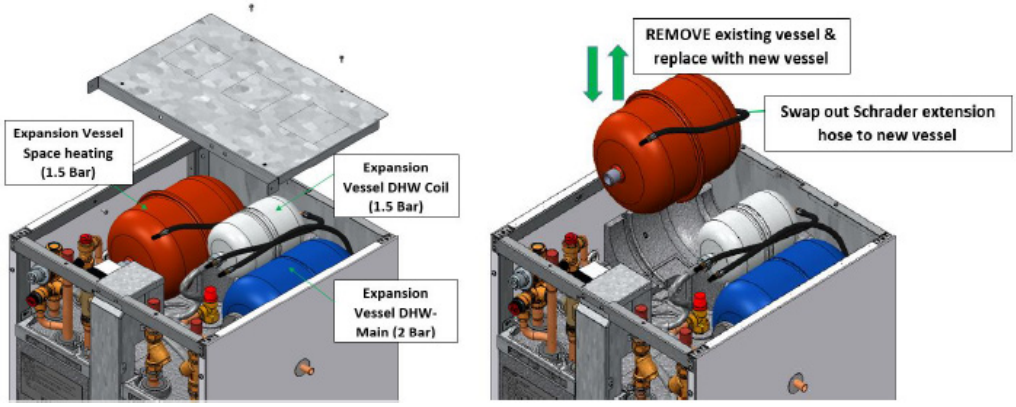


Fig. 83 : Swapping Out Schrader Extension

8. Fit new 8 litre space heating expansion vessel, refit the flexible hose and schrader extension hose; ensure vessel recharged to 1.5 bar.
9. Open space heating circuit inlet and outlet; ensure there are no leaks from the expansion vessel and hose connection.

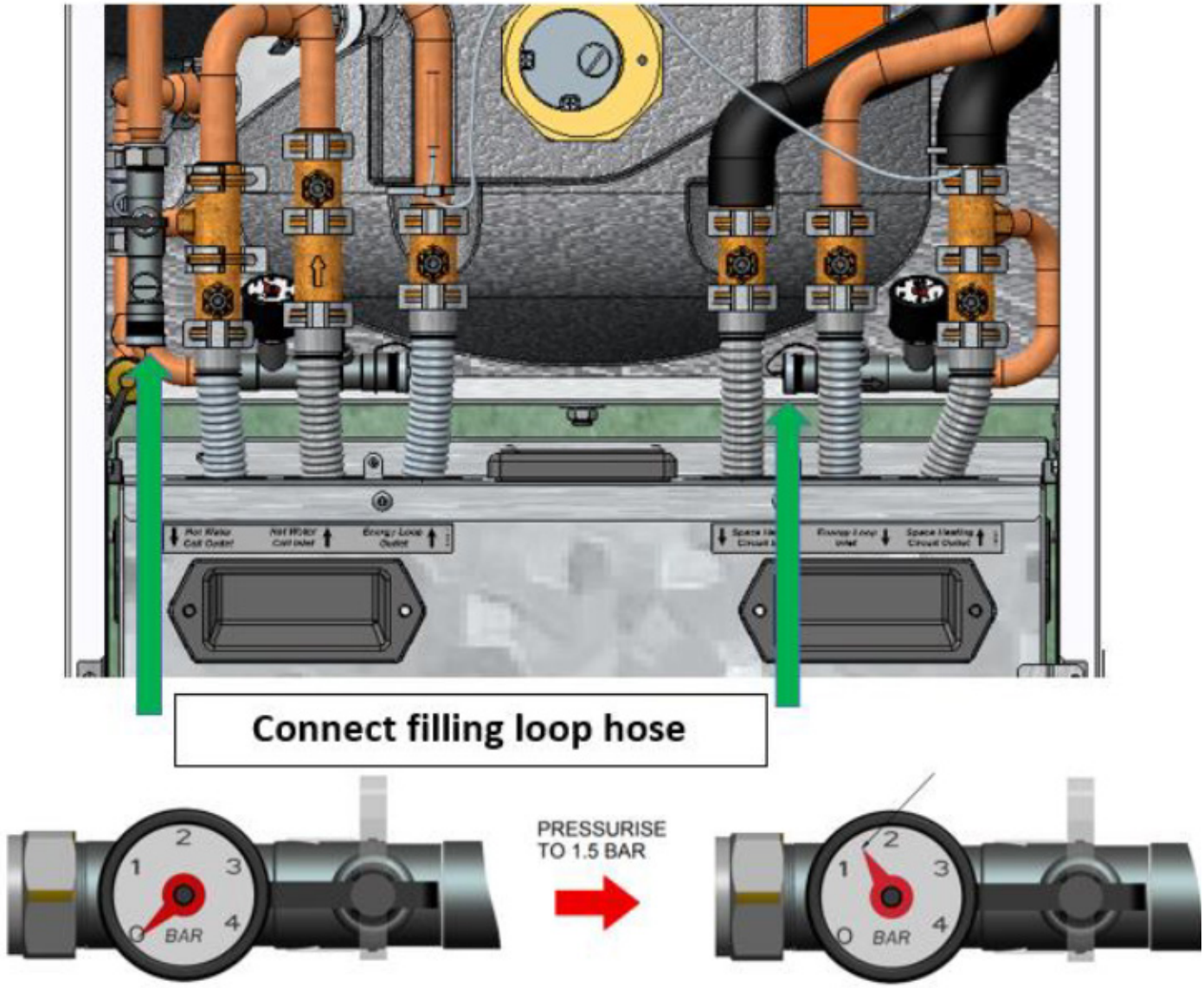


Fig. 84: Connect Filling Loop Hose

10. Refill and re-pressurise the heating circuit using filling loop hose provided. (Refer to section 5.8.8).
11. Close both isolation valves. Remove filling loop hose and leave inside Zeroth.
12. Assemble the expansion vessel bracket and attach the schrader extension hoses to the bracket using three locknuts.
13. Check there are no leaks from the expansion vessel at both the water connection fitting and the schrader hose fittings..
14. Refit outer covers in the reverse order, see Section 5.1 and ensure mains power is reconnected and the site is left clean and tidy.

9.3.2 Replacing DHW Coil Expansion Vessel

DHW Coil expansion vessel is only available on Heating and Cooling models.

When replacing the DHW coil expansion vessel, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front, middle and bottom panels of the appliance, see Section 5.1.
3. Follow the draining procedure for DHW coil in Section 5.8.3.

If local isolation of electricity supplies and heating circuit is not possible, do not proceed further until this has been arranged.

It may help to open the Expansion Relief Valve to aid in relieving pressure in the DHW Coil.

4. Disconnect the flexible hose from the 2 litre DHW coil expansion vessel, allowing the small amount of water in the hose to drain away into condensate tray.
5. Inspect and Test: Check pre-charge pressure of existing expansion vessel is 1.5 bar and recharge if required. If it fails to hold a charge, a replacement is needed.
6. Disassemble the bracket holding down the expansion vessels by unscrewing the four screws shown in Fig. 86; also remove the three locknuts attaching the schrader extension hose and the bracket.

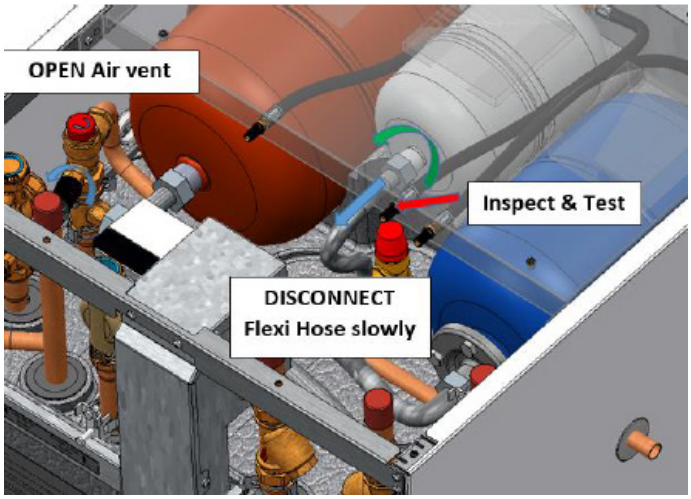


Fig. 85 : Disconecting Flexible Hose

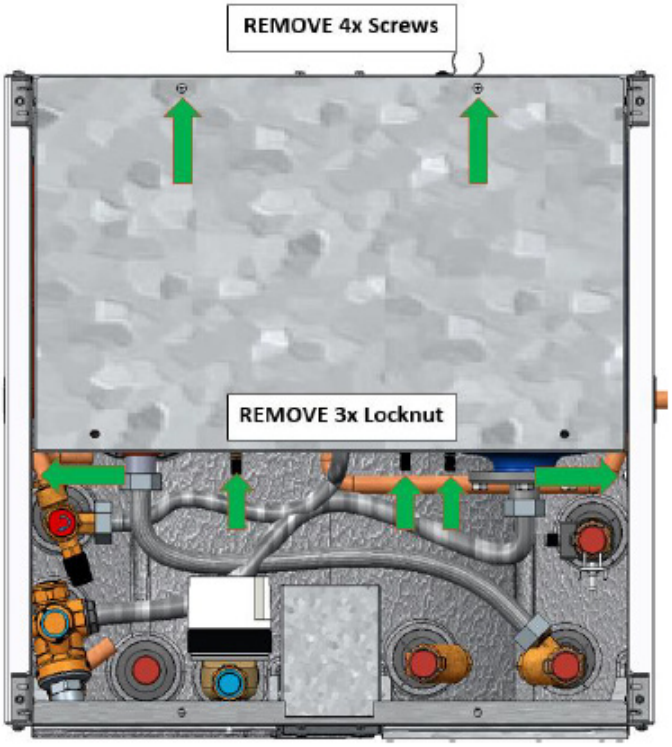


Fig. 86 : Removing Locknuts and screws

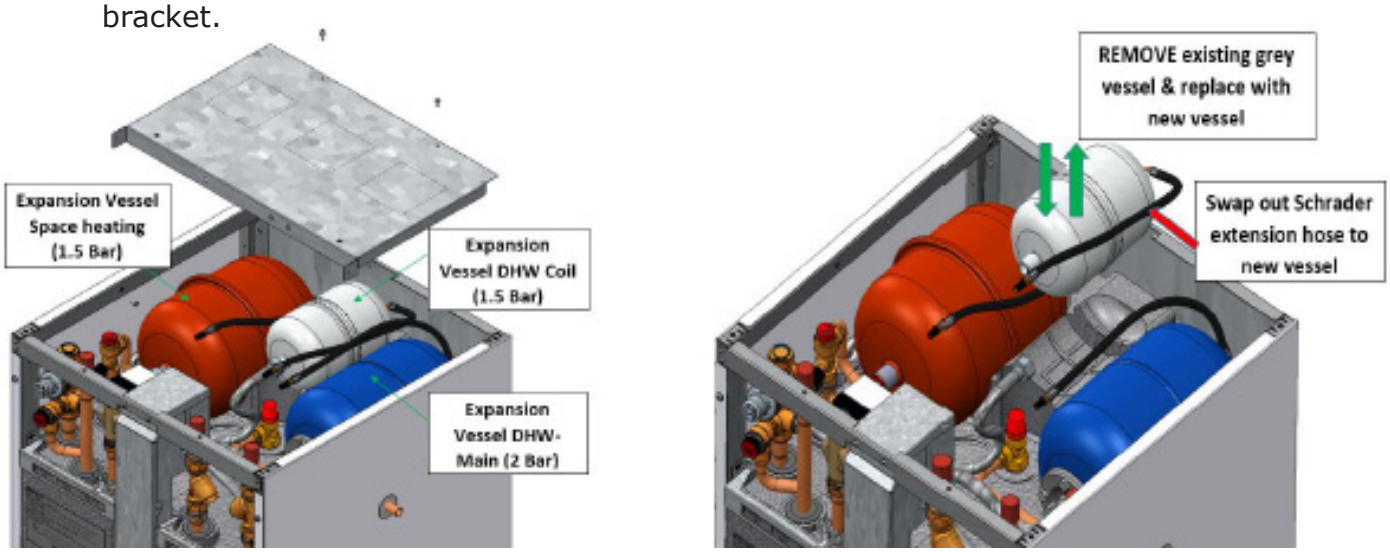


Fig. 87 : Removing and Replacing Expansion Vessel

7. Fit new 2 litre DHW coil expansion vessel and refit the flexible hose and schrader extension hose. The schrader extension hose must be in inspected to ensure it it still in a good condition. Ensure expansion vessel recharged to 1.5 bar.
8. Refill and pressurise DHW coil to 1.5 Bar (using the filling loop hose provided). (Refer to section 5.8.4).

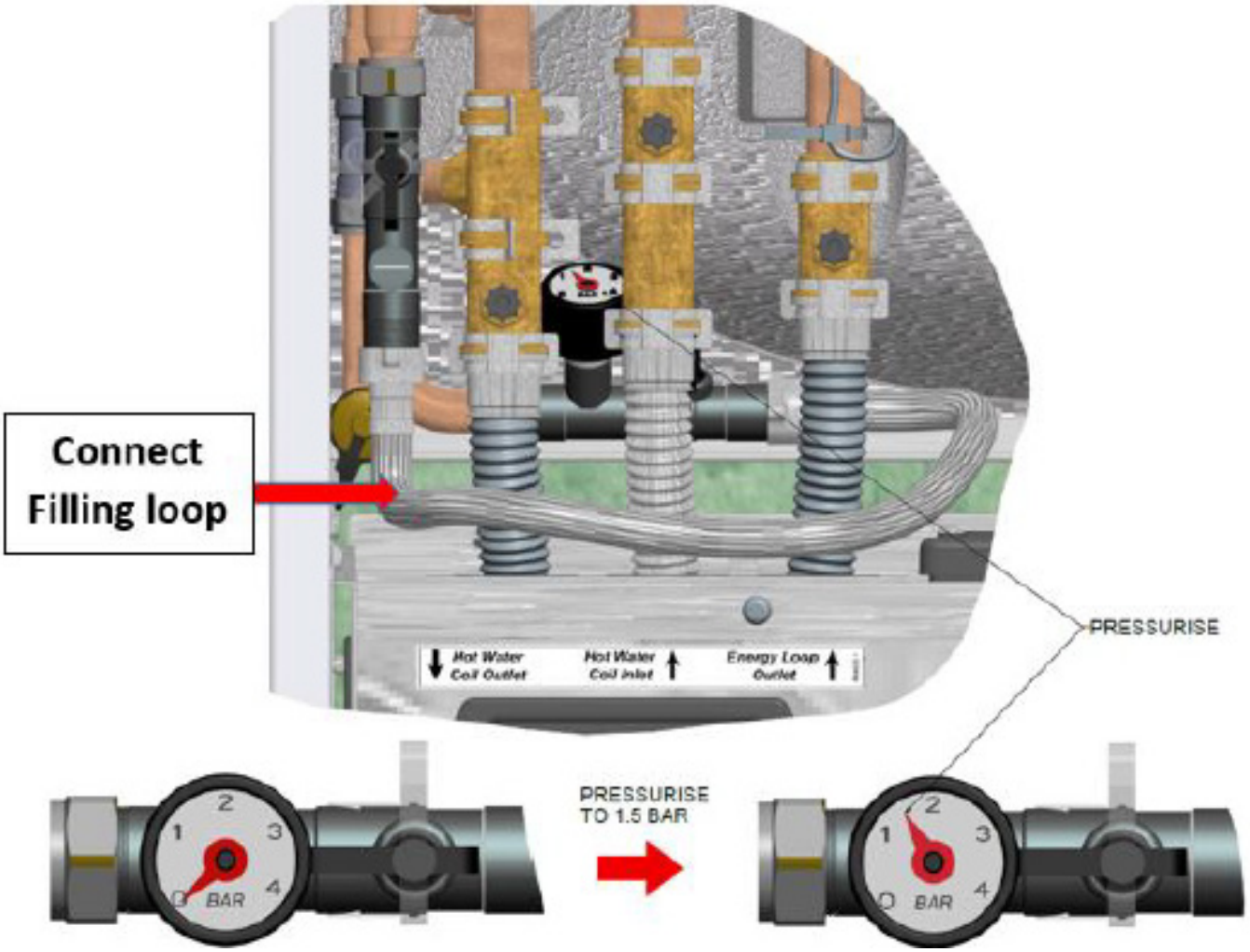


Fig. 88 : Connecting Filling Loop

9. Close both isolation valves. Remove filling loop hose and leave inside Zeroth.
10. Assemble the expansion vessel bracket and attach the schrader extension hoses to the bracket using three locknuts.
11. Check there are no leaks from the expansion vessel.
12. Refit outer covers in the reverse order, see Section 5.1 and ensure mains power is reconnected. Carry out functional test of system to ensure correct operation. Ensure site is left clean and tidy.

9.3.3 Replacing DHW Expansion Vessel.

DHW Coil expansion vessel is only available on Heating and Cooling models.

When replacing the DHW expansion Vessel, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front, middle and bottom panels of the appliance, see Section 5.1.
3. Follow the draining procedure for DHW cylinder in Section 5.8.1.

If local isolation of electricity supplies and heating circuit is not possible, do not proceed further until this has been arranged.

4. Disconnect the flexible hose from the 8-litre DHW expansion vessel, allowing the small amount of water in the hose to drain away into condensate tray.
5. Inspect and Test: Check pre-charge pressure of existing expansion vessel is 2 bar and recharge if required. If it fails to hold a charge, a replacement is needed.
6. Disassemble the bracket holding down the expansion vessels by unscrewing the four screws shown in Fig. 90; remove the locknuts attaching the schrader extension hose and the bracket.
7. Fit new 8 litre DHW expansion vessel and refit the flexible hose and schrader extension hose; ensure expansion vessel is recharged to 2 bar.

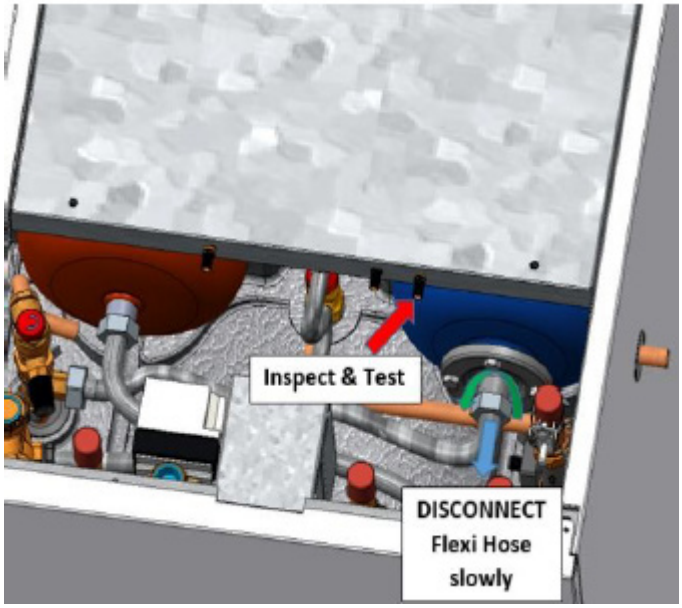


Fig. 89 : Inspect and Test

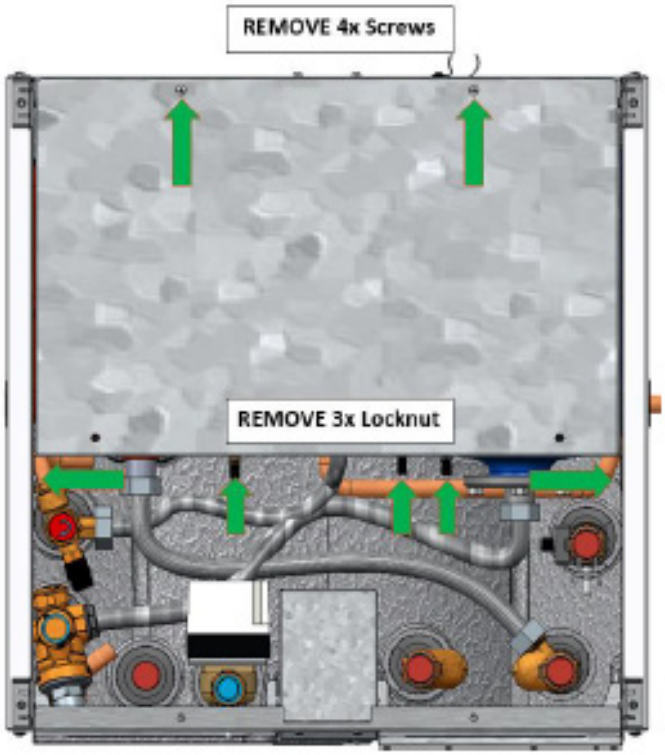


Fig. 90 : Removing Locknuts and screws

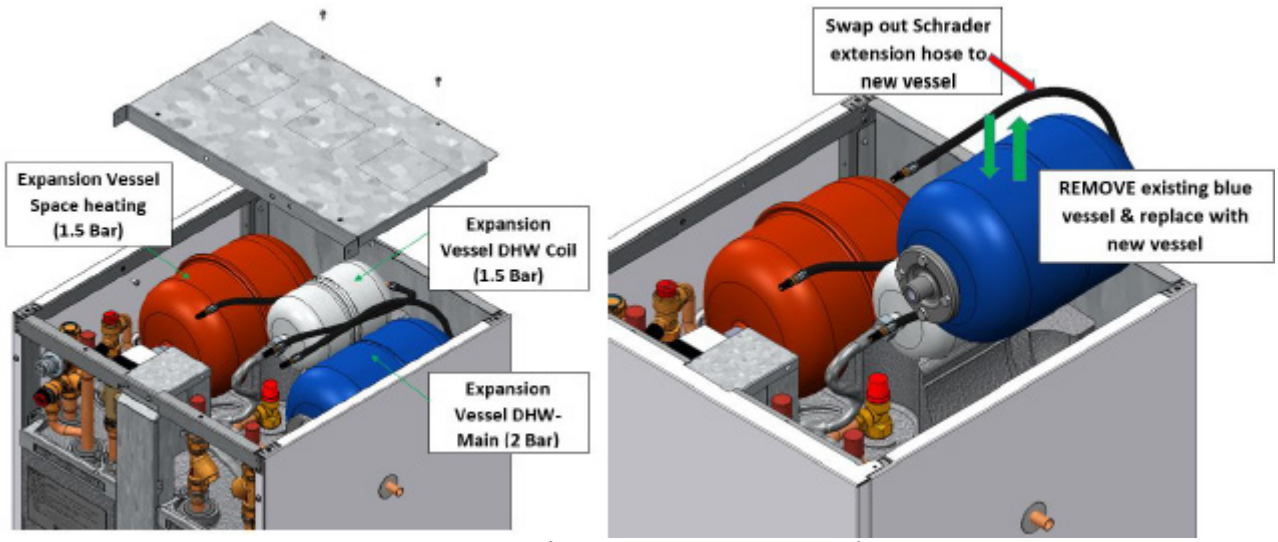


Fig. 91 : Replacing expansion vessel

8. Open refill and pressurise DHW cylinder (Refer to section How to Fill the DHW Cylinder 5.8.2).
9. Assemble the expansion vessel bracket and attach the schrader extension hoses to the bracket using three locknuts.
10. Check there are no leaks from the expansion vessel.
11. Refit outer covers in the reverse order, see Section 5.1, ensure mains power is reconnected and the site is left clean and tidy.

9.4 Replacing T&P Valve

DHW Coil expansion vessel is only available

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.

on Heating and Cooling models.

When replacing the T&P valve, follow the steps in the order below:Follow relevant safety precautions highlighted in Section 9.0 and 5.8.

1. Remove top front, middle and bottom panels of the appliance, see Section 5.1.
2. Follow the draining procedure for DHW Cylinder detailed in Section 5.8.1.
3. Disassemble the bracket holding down the expansion vessels by unscrewing the four screws shown in Fig. 92. Remove the three locknuts attaching the schrader extension hose and the bracket. This will allow the 2 litre DHW coil expansion vessel to be moved out of the way to facilitate removing the T&P valve.
4. Release excess pressure (twist T&P Cap).
5. Remove T&P Drain pipe attached to T&P valve.
6. Unscrew the T&P valve. Some force may be needed as the existing valve is secured in place with thread sealant.
7. Apply thread sealant to the new T&P valve.

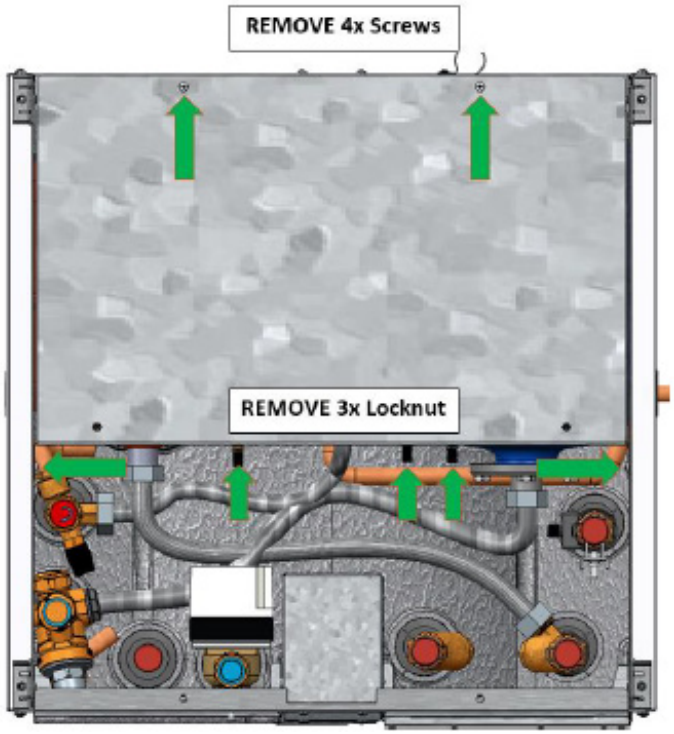


Fig. 92 : Locknut and screw removal

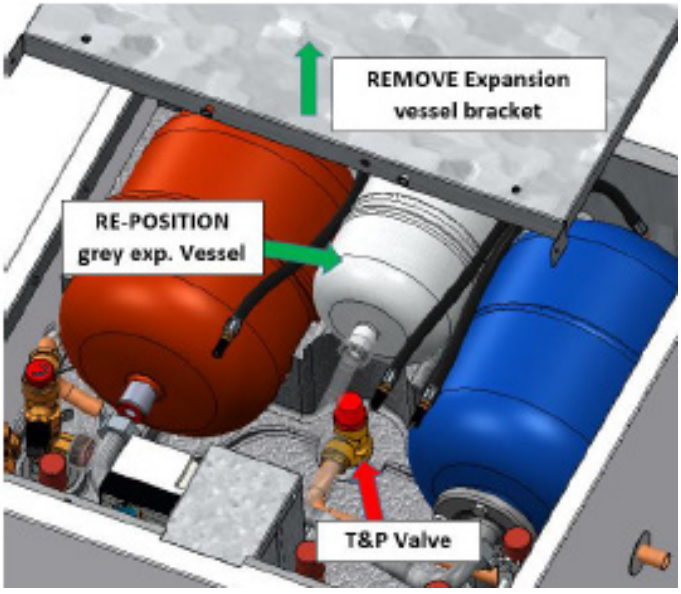


Fig. 93 : Re-positioning Expansion vessel

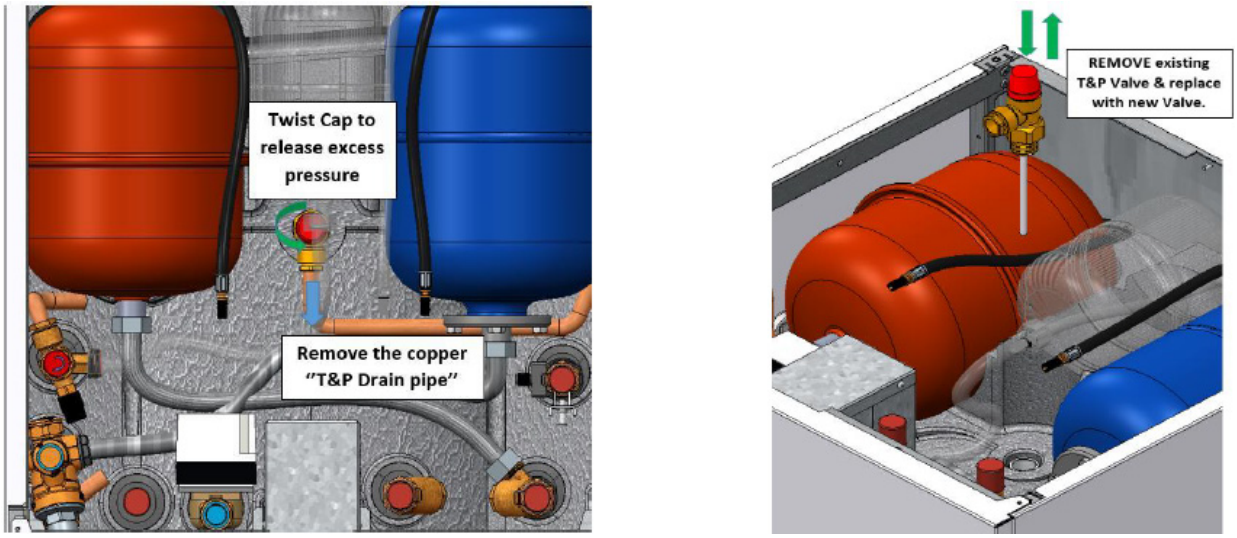


Fig. 94 : Removing T&P Pipe

8. Fit the new T&P valve to the cylinder
9. Refit T&P Drain pipe to T&P valve.
10. Inspect & Test 8 litre DHW expansion vessel whilst DHW cylinder is not pressurised; ensure it is set to 2 Bar.
11. Turn on cold water supply and check that the T&P valve is not leaking.
12. Turn on hot water taps briefly to purge air from pipe work. Open T&P valve to purge air from cylinder.
13. Refit 2 litre DHW coil expansion vessel. Assemble the expansion vessel bracket and attach the schrader extension hoses to the bracket using three locknuts.
14. Refill according to Section 5.8.2.
15. Switch on both electrical supplies. Carry out functional test of system to ensure correct operation and carry out any other service actions required. T&P should not open when water is at 60ºC.
16. Refit outer covers in reverse order, see Section 5.1 and ensure mains power is reconnected and site is left clean and tidy.

9.5 Testing and Replacing Flow Meters

9.5.1 Testing and Replacing Flow Meters – AL010 error (User Pump)

When replacing the flow meter, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front, middle and bottom panels of the appliance, refer to Section 5.1 for more details.
3. Where required for the following steps follow the draining and filling procedures for energy loop and space heating loop detailed in Section 5.8.
4. Plug in PDG screen, refer to section 11.2.1. Press Alarm button to check what errors have occurred if any.
5. Error code AL010 = No flow present with User Pump 1 active. If this error occurs, verify the circulation pump runs correctly, at the correct speed and there are no air locks.
6. If code is AL011 = No flow present with Source loop pump active. If this error occurs, see section 11.4.

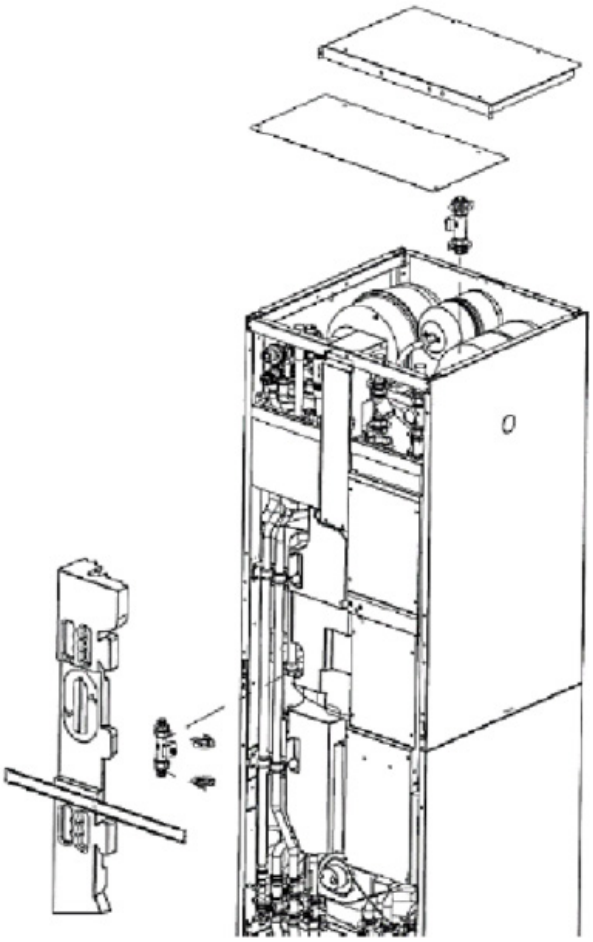


Fig. 95 : Flow Meter

7. The User Pump can be run manually. Log into service level 1234 – Service Menu – System Checks – SP001 page. Switch on the pump and check the recorded flow rate. If flow rate is too low check in Outputs – SP002 page. The user pump speed can be adjusted and then the flow rate checked again.
8. If flow is still poor or non-existent, check the in line strainer for the heating circuit is not blocked. First isolate both mains supplies and heating circuit flow and return pipes above the Zeroth. Use drain valve on the pipe below with a wet vac to drain pipe to help prevent spills.

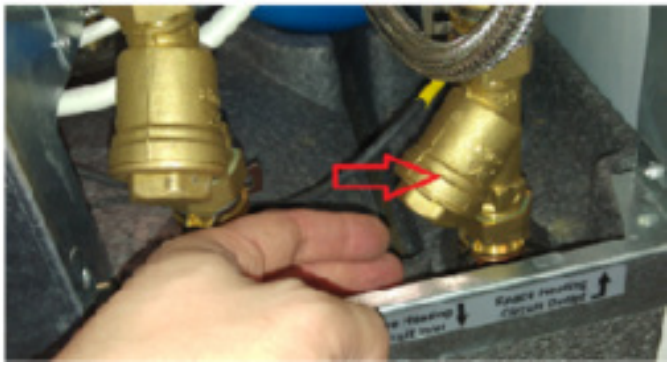


Fig. 96 : Strainer assembly

9. Unscrew the filter cover on the strainer assembly. Rinse out the strainer and replace, tightening up the front cover. Some water may leak out in the process but should be captured by the EPS condensate tray. If the pipe has been drained with a wet vac this should be minimal. The valve body will rotate, so that any leaking water can spill onto the EPS tray.

Fig. 97 : Cleaning strainer

10. Check the hydraulic layout of the installation to ensure correct bypass position and no other isolation valves are closed.
11. Open heating circuit isolation valves and switch on both supplies. Check flow rate again on PGD screen. If flow rate is recording as zero despite feeling water turbulence, check the connector plug on the flow meter is correctly connected and the supply plug and B12 plugs on the Controller PCB are pushed in. The Flow meter is supplied with +13V DC and GND (Ground) from 3 pole connector shown. Check this with multimeter and if supply is dead, replace Controller PCB. See Section 9.15 on replacing Controller PCB.

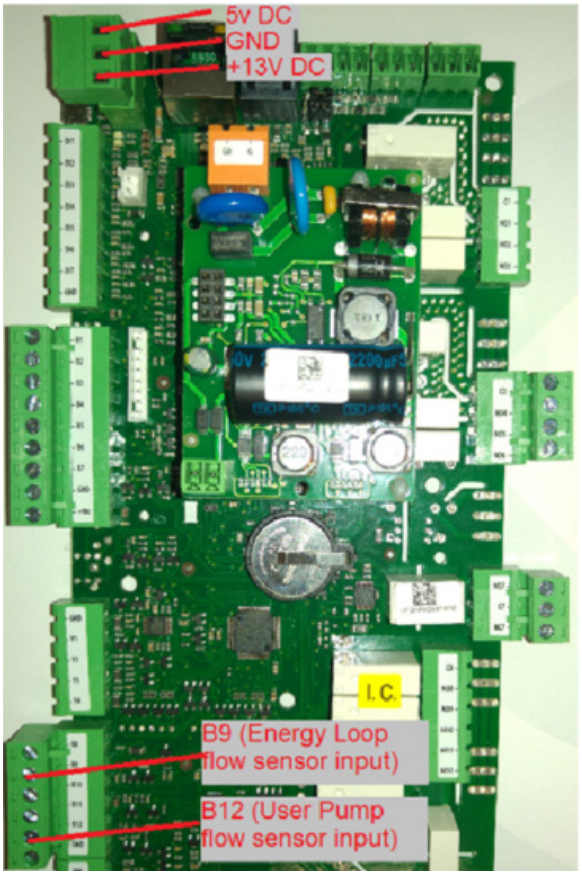


Fig. 98 : Sensor Inputs

12. When there is flow, there is a 0 – 2v DC signal voltage coming from the flow meter to the Controller PCB on Connector B12 and GND. Using a multimeter, check the voltage between B12 and GND.
13. If the voltage between B12 and GND is 0V despite flow, check the wire plug is correctly pushed into the flow meter body and screwed firmly in. If the connection looks fine and there is still 0V between B12 and GND, despite good flow, change the flow sensor (see below).

The voltage and flow rates are shown in this table:

Input Flow Rate (l/min)	Voltage	FR	Error (l/min)	% Error
2.0	0.57	2.8	-0.8	41
2.5	0.60	3.3	-0.8	31
3.0	0.63	3.6	-0.6	22
3.5	0.68	4.3	-0.8	23
4.0	0.71	4.7	-0.7	17
4.5	0.76	5.2	-0.7	16
5.0	0.81	5.9	-0.9	17
5.5	0.84	6.3	-0.8	14
6.0	0.87	6.7	-0.7	12
6.5	0.92	7.4	-0.9	13
7.0	0.96	7.8	-0.8	12
7.5	0.99	8.2	-0.7	9
8.0	1.03	8.7	-0.7	9
8.5	1.05	9.0	-0.5	5
9.0	1.11	9.7	-0.7	8
9.5	1.15	10.2	-0.7	8
10.0	1.19	10.7	-0.7	7
10.5	1.23	11.2	-0.7	7
11.0	1.28	11.9	-0.9	8
11.5	1.32	12.4	-0.9	8
12.0	1.35	12.8	-0.8	6
12.5	1.39	13.3	-0.8	6
13.0	1.43	13.8	-0.8	6
13.5	1.46	14.2	-0.7	5
14.0	1.51	14.8	-0.8	6
14.5	1.55	15.3	-0.8	5
15.0	1.59	15.8	-0.8	5
15.5	1.63	16.3	-0.8	5
16.0	1.67	16.8	-0.8	5
16.5	1.70	17.2	-0.7	4
17.0	1.75	17.8	-0.8	5
17.5	1.80	18.5	-1.0	5
18.0	1.84	19.0	-1.0	5
18.5	1.88	19.5	-1.0	5
19.0	1.92	20.0	-1.0	5
19.5	1.96	20.5	-1.0	5
20.0	2.00	21.0	-1.0	5

Table 9 : Voltage and Flow Rates

14. Check if the voltage on B12 is indicating good flow, but the PGD screen shows 0L/min flow rate, check the jack plug is fully inserted into the Controller PCB. If the connection is good, the Controller PCB is faulty and should be replaced.

15. If the flow sensor needs to be replaced after carrying out the above checks, power down both Zeroth supplies. Isolate heating circuit flow and return valves at the top of the unit. Ensure the systems are drained down.
16. Unscrew the lock ring on the connector plug from the body of the flow meter and remove the plug. Pull the fast-fit clips off the two brass ends of the flow meter bodyand remove the flow meter from the pipework. The small amount of water should be caught by the EPS drip tray on top of the heat pump.

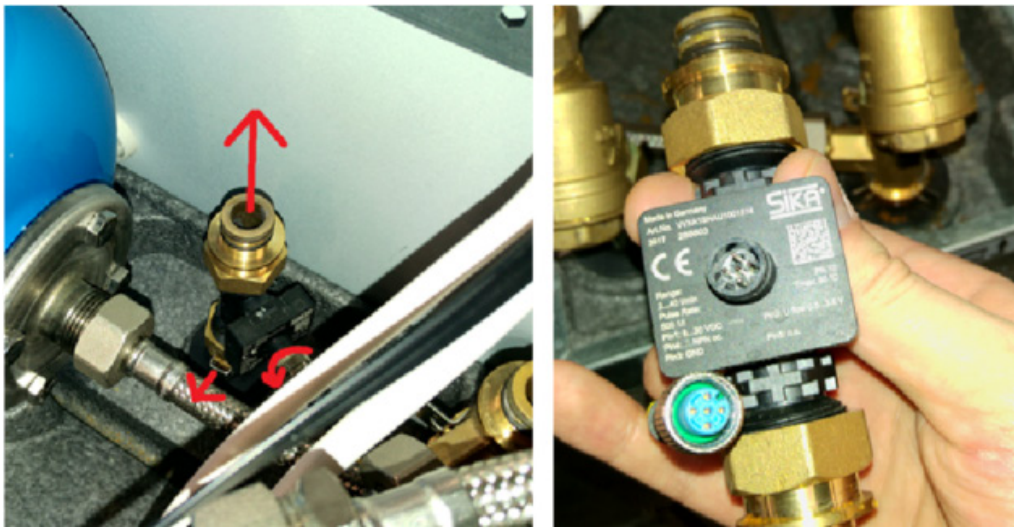


Fig. 99 : Replacing the flow meter

17. Replace the flow meter with a new one, refitting in the reverse order and ensuring the directional arrow on the side of the flow meter is pointing in the direction of flow. Re-fit the fast-fit clips and screw the existing cable plug into the new flow meter body.
18. Open isolation valves and power up both electrical supplies to Zeroth. If there are manual air vents above the heat pump, open these briefly to expel any trapped air. Use the filling loop to top up the heating circuit pressure if required.
19. Using the PGD, check flow on screen again. If there is still no flow detected, yet the pump is working and water turbulence can be felt, change the cable connecting the flow meter to the Controller PCB.
20. Once the flow meter is confirmed as reading correctly and flow is within specification, ensure there are no leaks around the flow meter. Refit inner electrical covers (ensuring correct overlaps as shown).
21. Refit bottom cover for the electrical box first, then middle cover and top cover last.
22. Refill according to Section 5.8.
23. Refit outer covers in reverse order shown in Section 5.1 and ensure mains power is reconnected and site is left clean and tidy.

9.5.2 Testing and Replacing Flow Meters – AL011 error (Source Loop)

When replacing the flow meter, follow the steps in the order below:

1. Remove front panels (see Section 5.1)
2. Plug in PDG screen, refer to section 11.2.1. Press Alarm button to check what errors have occurred if any.
3. If code is AL011 = No flow present with Energy loop pump active. Verify the circulation pump runs correctly, at the correct speed and there are no air locks.
4. Error code AL010 = No flow present with User Pump 1 active.
5. The User Pump can be run manually. Log into service level 1234 – Service Menu – System Checks – SP000 page. Switch on pump and check the recorded flow rate. If flow rate is too low check in Outputs – SP003 page. The user pump speed can be adjusted and then the flow rate checked again.
6. If flow is poor or non-existent, check the Energy loop isolation valves are not closed and the inline strainer for the Source loop circuit is not blocked and the energy loop is under pressure. Isolate both mains supplies and heating circuit flow and return pipes above Zeroth to check the strainer. Ensure to drain the pipe at the drain valve below with a wet Vac.
7. Unscrew the filter cover on the strainer assembly. Rinse out the strainer and replace, tightening up the front cover. Some water may leak out in the process but should be captured by the EPS condensate tray (the valve body can rotate to direct any leaks).
8. Open energy loop isolation valves and switch on both supplies. Check flow rate again on PDG screen. If flow rate is recorded as zero despite feeling water turbulence, check the connector plug on the flow meter is correctly connected and the supply plug and B9 plugs on the Controller PCB are pushed in. The flow meter is supplied with +13V DC and GND from 3 pole connector shown. Check this with multimeter and if supply is dead, replace Controller PCB. See Section 9.15 on replacing Controller PCB.

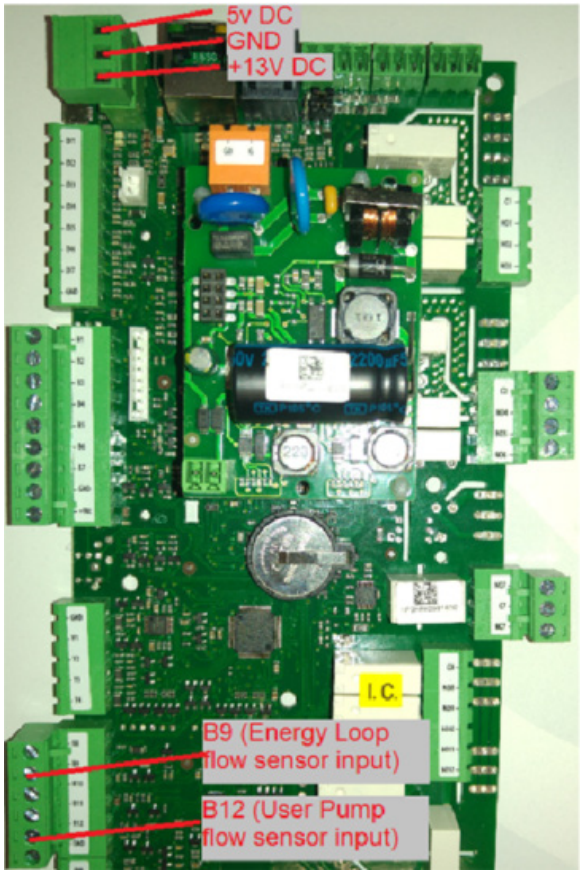


Fig. 100 : Controller PCB

9. When there is flow, there is a 0 – 2V DC signal voltage coming from the flow meter to the Controller PCB on Connector B9 and GND. Using a multimeter, check the voltage between B9 and GND.
10. If the voltage between B9 and GND is 0V despite flow present, check the wire plug is correctly pushed into the flow meter body and screwed firmly in. If the connection is fine and there is still 0V between B9 and GND, despite good flow, change the flow meter (see below).
11. Check the voltage and flow rates which are shown in Table 6. If the voltage on B9 is indicating good flow, but the PGD screen shows 0L/min flow rate, check the jack plug is fully inserted into the Controller PCB. If the connection is good, the Controller PCB has failed and should be replaced.
12. If the flow meter needs to be replaced after carrying out the above checks, power down both Zeroth supplies. Isolate energy loop flow and return valves at the top of the unit.
13. Remove the front vertical EPS cover to expose the Energy Loop flow meter.
14. Using a bucket, or ideally a wet vacuum, open the drain valve shown and drain as much water as possible from the length of pipe before the removal of the flow meter from the pipe.

Be careful if opening the bleed screw fully to speed up the draining process, as the plastic screw will detach from the brass body of the valve and is likely to be sucked down the vacuum hose!

15. Close the valve after as much water as possible is removed.

Fig. 101 : Drain valve

16. Unscrew the lock ring on the connector plug from the body of the flow meter and remove the plug. Pull the fast-fit clips off the two brass ends of the flow meter body. Pull the flow meter out from the pipework and clean up any spills.

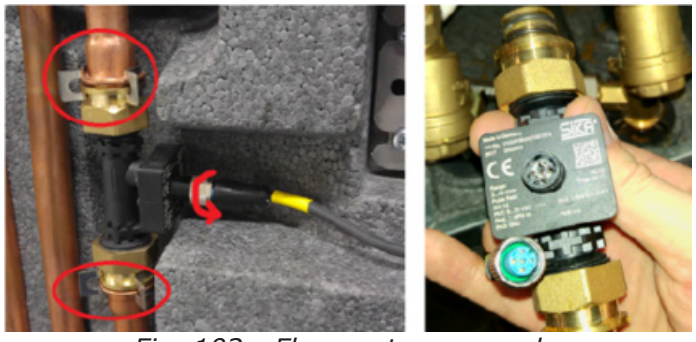


Fig. 102 : Flow meter removal

17. Replace the flow meter with a new one, refitting in the reverse order and ensuring the directional arrow on the side of the flow meter is pointing in the direction of flow. Re-fit the fast-fit clips and screw the existing cable plug into the new sensor body.
18. Check the black bleed screw valve just above the heat pump module is closed! Open the energy loop isolation valves and power up both electrical supplies to the Zeroth.

19. Using the PGD, check flow on screen again. If there is no flow detected, yet the pump is working and water turbulence can be felt, change the cable connecting the flow meter to the Controller PCB.
20. Once the flow meter is confirmed as reading correctly and flow is within specification, ensure there are no leaks around the flow meter. Refit front EPS insulation and electrical panel covers, ensuring correctly overlapping panels (front bottom cover, front middle cover and front top cover).
21. Refit outer covers in the reverse order shown in Section 5.1 and ensure mains power is reconnected, and site is left clean and tidy.

9.6 Replacing Non-Return Valve

When replacing the Non-Return Valve, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front, middle and bottom panels of the appliance, see Section 5.1.
3. Follow the draining procedure for DHW coil detailed in Section 5.8.3.
4. Once drained, remove the fast-fit clips between each metal flexi pipe and brass valve body.
5. Disconnect the non-return valve and replace it with the new part.

Ensure O-rings are fitted and arrow on non-return valve is in the direction of flow.

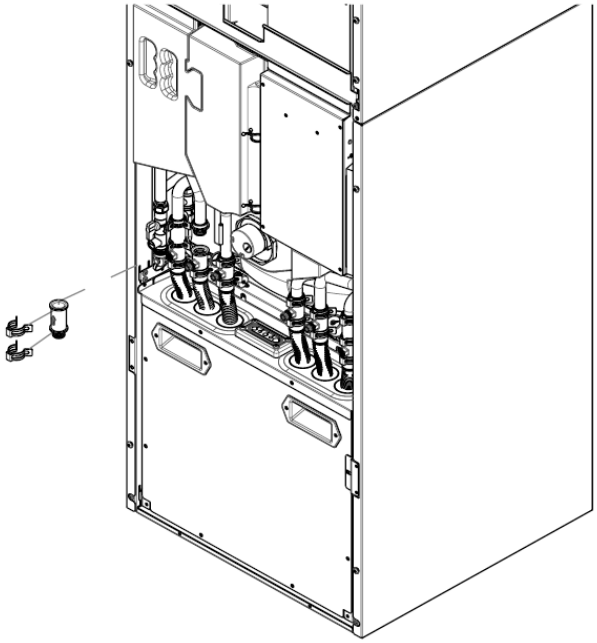


Fig. 103 : Non-Return Valve

6. Refill according to Section 5.8.
7. Refit outer covers in the reverse order see Section 5.1 and ensure mains power is reconnected and site is left clean and tidy.

9.7 Replacing the Flow Control Valve (PIC Valve)

When replacing the Flow Control valve, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front, middle and bottom panels of the appliance, see Section 5.1.
3. Follow the draining procedure for energy loop, see Section 5.8.5.
4. Remove the wiring box covers.
5. Disconnect the connected wires in the wiring box connected to the flow control valve and track them back to the component.
6. Disconnect the flow control valve and replace with the new part (22mm compression fittings both ends of the flow control valve).
7. Re-wire as shown in Fig. 105. Note: Green wire should be trimmed back.
8. Ensure the compression fittings have no leaks and the directional arrow on the valve is in the correct direction of flow.
9. Refit outer covers in reverse order Section 5.1 and ensure mains power is reconnected and site is left clean and tidy.

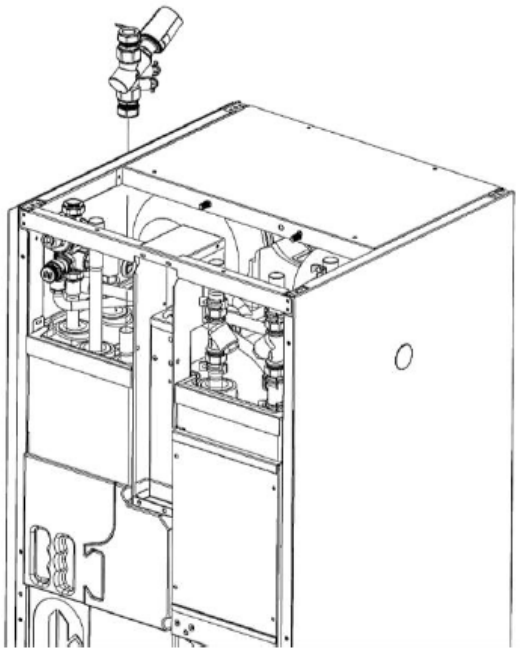


Fig. 104 : Flow Control Valve

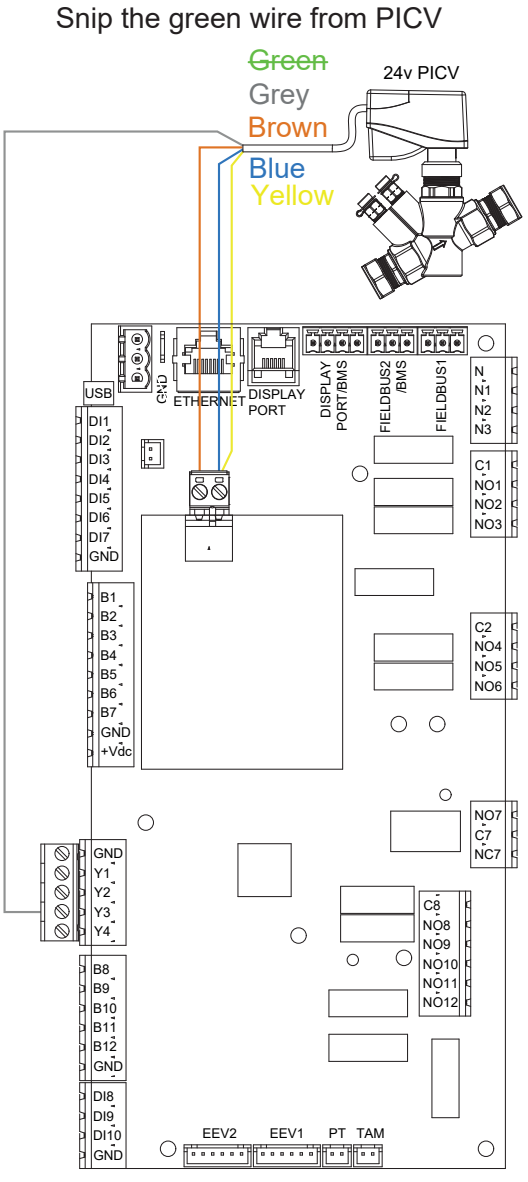


Fig. 105 : Flow Control Valve with Actuator Wiring

9.8 Replacing the Strainer Assembly

9.8.1 Replacing the Energy Loop Strainer Assembly

When replacing the strainer found in the energy loop, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front panels of the appliance as required, see Section 5.1.
3. Follow the draining procedure for energy loop see Section 5.8.5. Ensure to Wet Vac drain Valve below the strainer.
4. Remove fast-fit fittings on top and bottom of strainer.
5. Secure the new part in the direction of flow.
6. Ensure O-rings are attached with the fast-fit clips.
7. Refill according to Section 5.8.
8. Refit outer covers in reverse order see Section 5.1 and ensure mains power is reconnected and site is left clean and tidy.

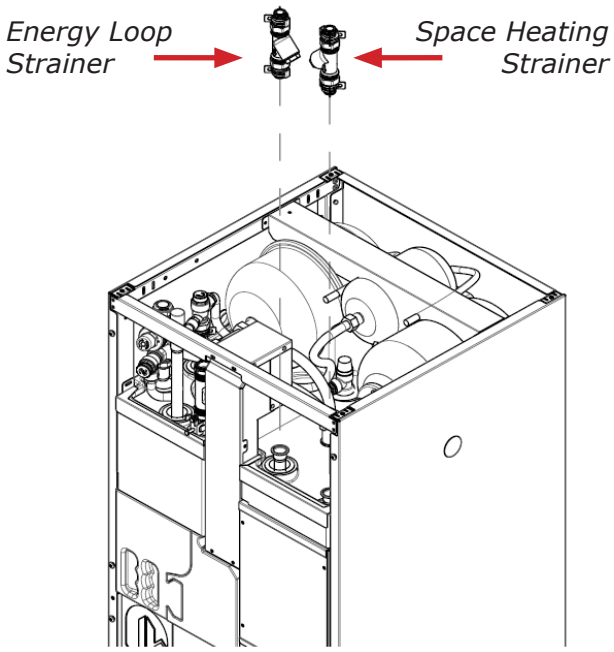


Fig. 106 : Strainer Assembly

9.8.2 Replacing the Space Heating Strainer Assembly

When replacing the strainer found in the space heating, see Fig. 106, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front panels of the appliance as required, see Section 5.1.
3. Follow the draining procedure for space heating loop detailed in Section 5.8.7. Ensure to Wet Vac drain Valve below the strainer.
4. Remove fast-fit fittings on top and bottom of strainer.
5. Secure the new part in the direction of flow.
6. Ensure O-rings are attached with the fast-fit clips.
7. Refill according to Section 5.8.
8. Refit outer covers in the reverse order shown in Section 5.1 and ensure mains power is reconnected and site is left clean and tidy.

9.9 Replacing Auto-AirVent

When replacing the automatic air vent, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front panel of the appliance as required, see Section 5.1.
3. Follow the draining procedure for DHW coil see Section 5.8.3. Note: For Heating only Models DHW coil will drain through space heating loop. See section 5.8.7.
4. Remove fast fit clips and Auto-airvent.
5. Replace with new part, ensure O-rings are fitted.
6. Refit top front cover, see Section 5.1. Ensure mains power is reconnected, and site is left clean and tidy.

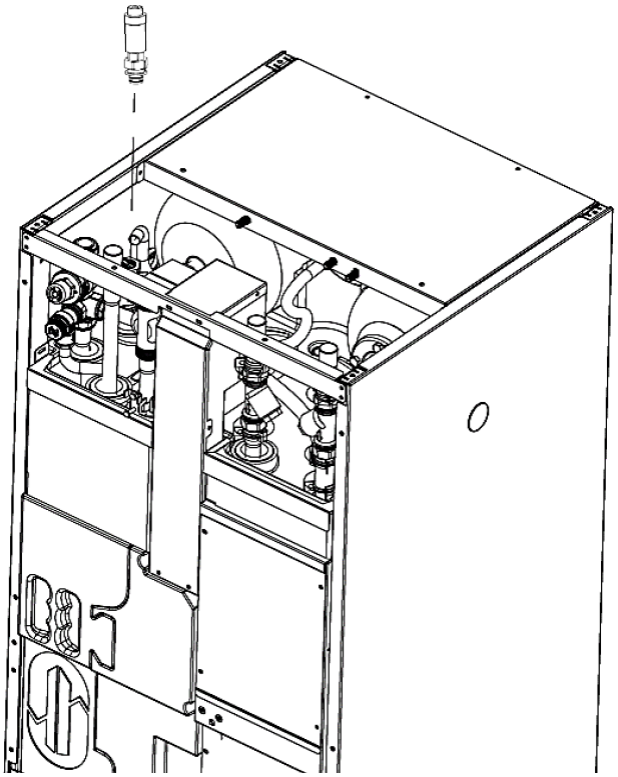


Fig. 107 : Auto-airvent

9.10 Replacing Pressure Relief Valve

9.10.1 Replacing PRV Heating and Cooling Models

When replacing the Pressure Relief Valve, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front panel of the appliance as required, see Section 5.1.
3. Follow the draining procedure for DHW coil see Section 5.8.3.
4. Remove fast fit clips and Auto-airvent.
5. Remove fast-fit PRV assembly part shown in Fig. 108.
6. Replace with new part ensure O-rings are used.
7. Refit Auto-airvent and fast fit clips.
8. Refit top front cover, see Section 5.1. Ensure mains power is reconnected, and site is left clean and tidy.

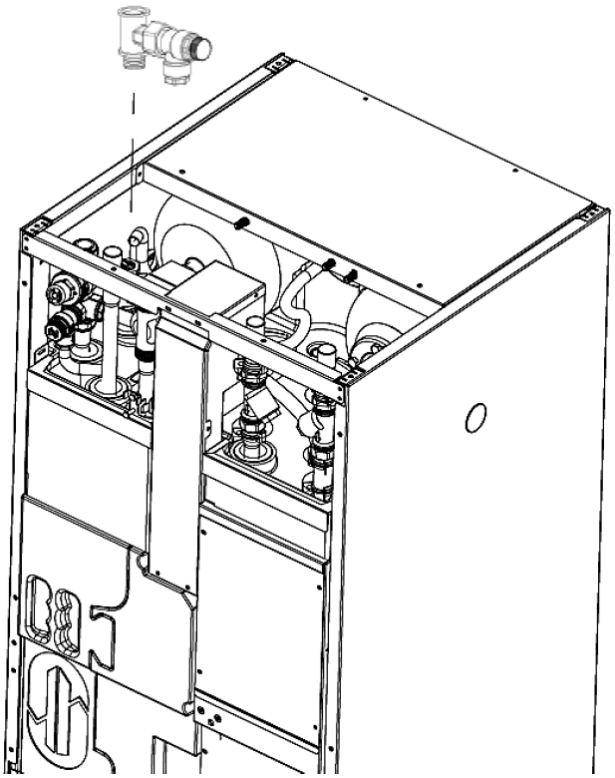


Fig. 108 : Pressure Relief Valve

9.10.2 Replacing PRV Heating Only Models

When replacing the Pressure Relief Valve, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front panel of the appliance as required, see Section 5.1.
3. Follow the draining procedure for space heating loop see Section 5.8.7.
4. Remove fast fit clips and Flowmeter.
5. Remove fast-fit PRV assembly part shown in Fig. 108.
6. Replace with new part ensure O-rings are used.
7. Refit Flowmeter and fast fit clips.
8. Refit top front cover, see Section 5.1. Ensure mains power is reconnected, and site is left clean and tidy.

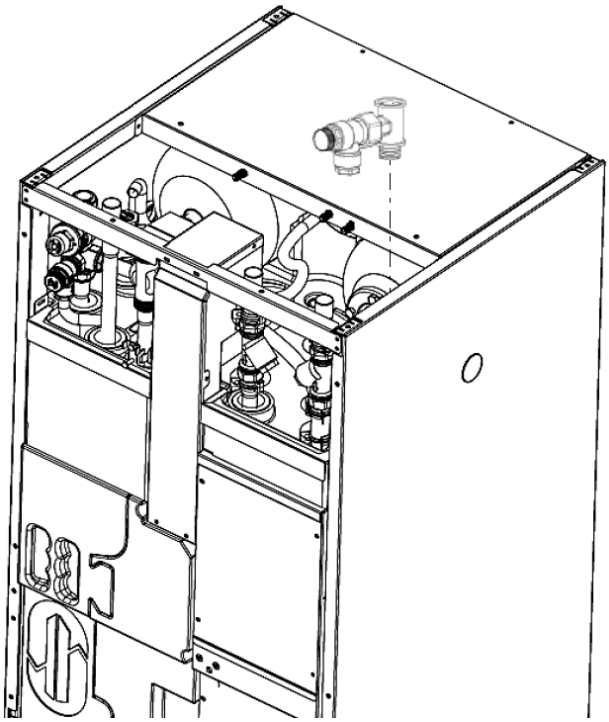


Fig. 108 : Pressure Relief Valve

9.11 Replacing Contactor

When replacing the contactor, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front, middle and bottom panels of the appliance, see Section 5.1.
3. Remove the wiring box covers exposing the PCBs see Fig. 109.
4. Disconnect all wires from the Contactor. See Fig. 110.
5. Locate and detach contactor removing the four screws see Fig. 109.
6. Replace with new part as per the wiring diagram. Secure the four screws and replace the covers of the wiring box.
7. Refit outer covers in reverse order see Section 5.1 and ensure mains power is reconnected and site is left clean and tidy.

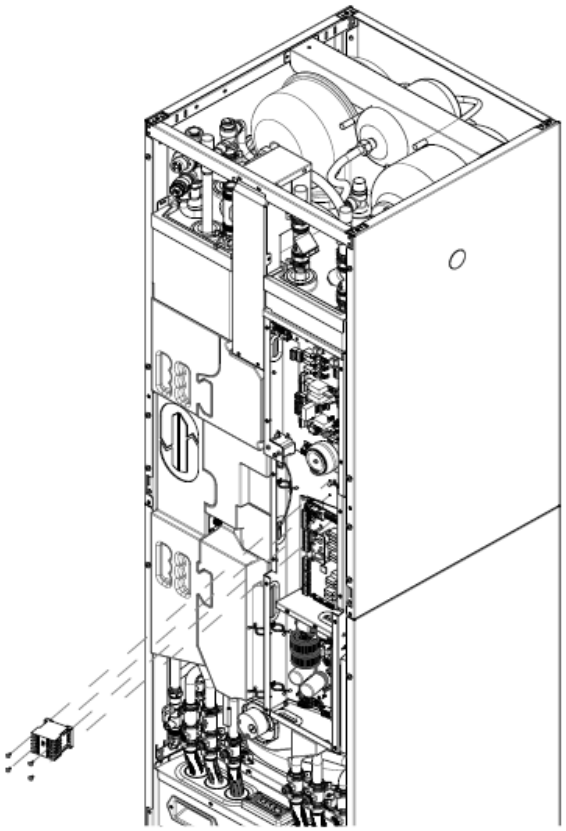


Fig. 109 : Contactor

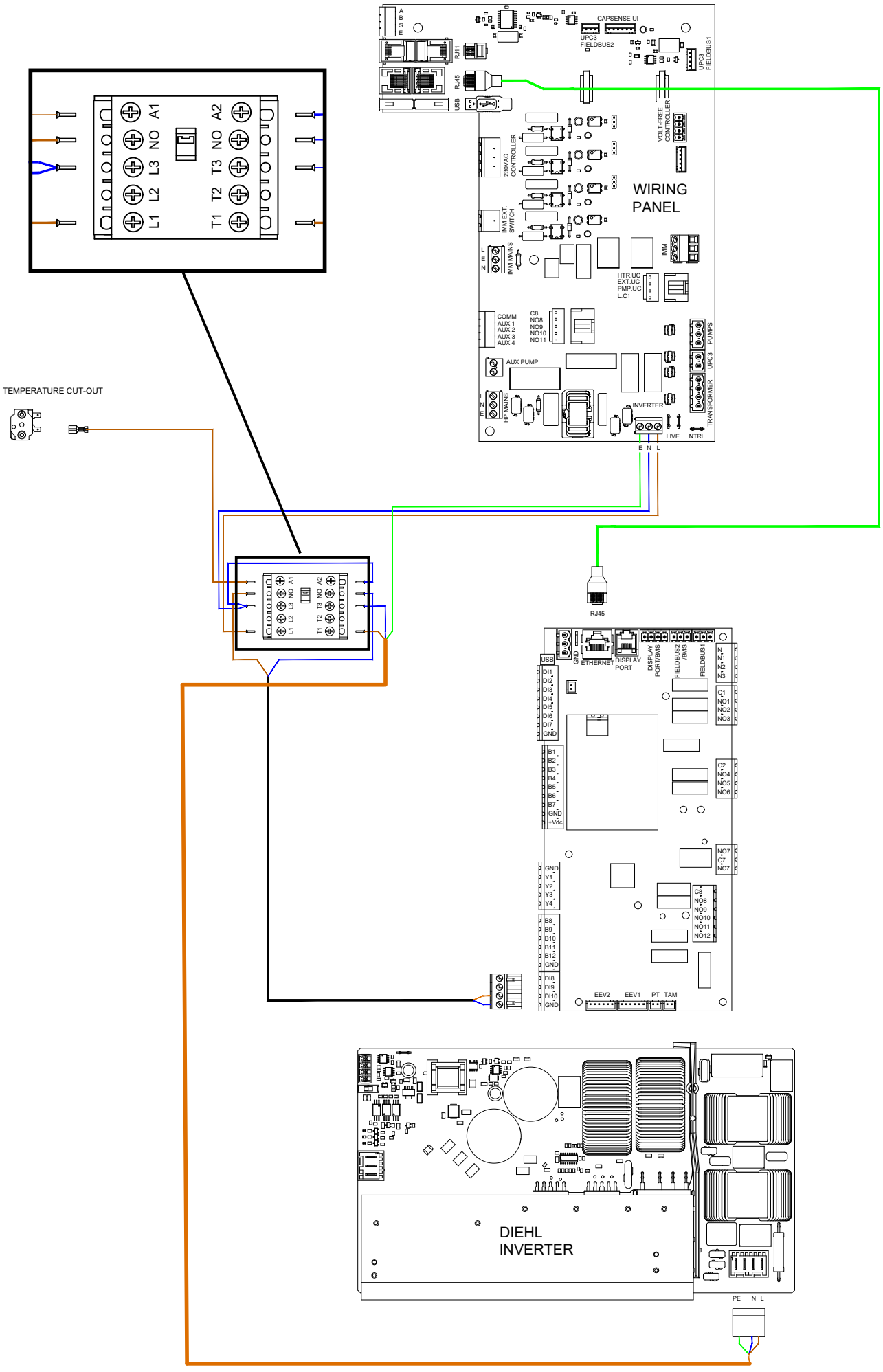


Fig. 110 : Contactor Wiring

9.12 Replacing Filling Loop

9.12.1 Replacing Filling Loop DHW Coil

When replacing the Filling Loop DHW Coil, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front, middle and bottom panels of the appliance, see Section 5.1.
3. Follow the draining procedure for DHW coil see Section 5.8.3.
4. Detach the Hot Water Coil Outlet marked in Fig. 111 with "A". This is to allow easy access to remove the filling loop.
5. Detach and remove the filling loop replacing with the spare part and tigthen.
6. Reattach connection "A".
7. Follow the filling procedure for DHW coil see Section 5.8.3.
8. Refit outer covers in reverse order see Section 5.1 and ensure mains power is reconnected and site is left clean and tidy.

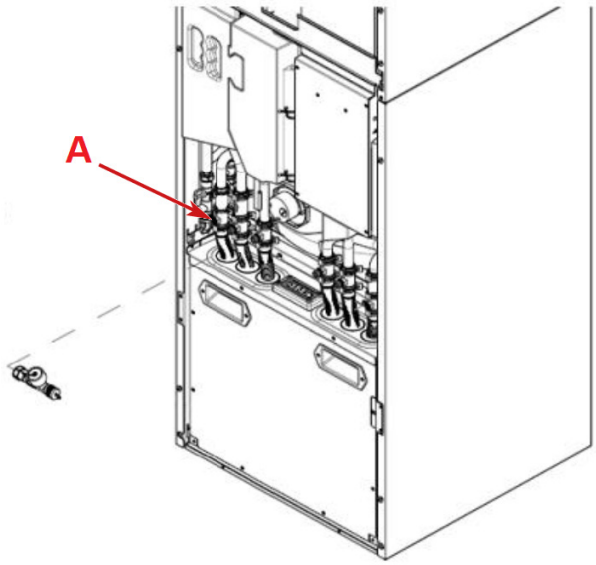


Fig. 111 : Replacing Filling Loop DHW Coil

*Note: DHW Filling loop only appears on Heating and Cooling Models.

To replace the pressure gauges in the filling loops first remove the fast-fit fittings and remove the pressure gauge assembly. To replace the gauges, it is best to clamp them in a vice when removing the fitting.

9.12.2 Replacing Filling Loop Space Heating

When replacing the Filling Loop Space Heating, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front, middle and bottom panels of the appliance, see Section 5.1.
3. Follow the draining procedure for space heating loop see Section 5.8.7.
4. Detach the Space Heating Circuit Outlet hose connection marked in Fig. 112 with "B". This is to allow easy access to remove the filling loop.
5. Detach and remove the filling loop replacing with the spare part and tighten.
6. Reattach connection "B".
7. Follow the filling procedure for Space Heating see Section 5.8.8.
8. Refit outer covers in reverse order see Section 5.1 and ensure mains power is reconnected and site is left clean and tidy.

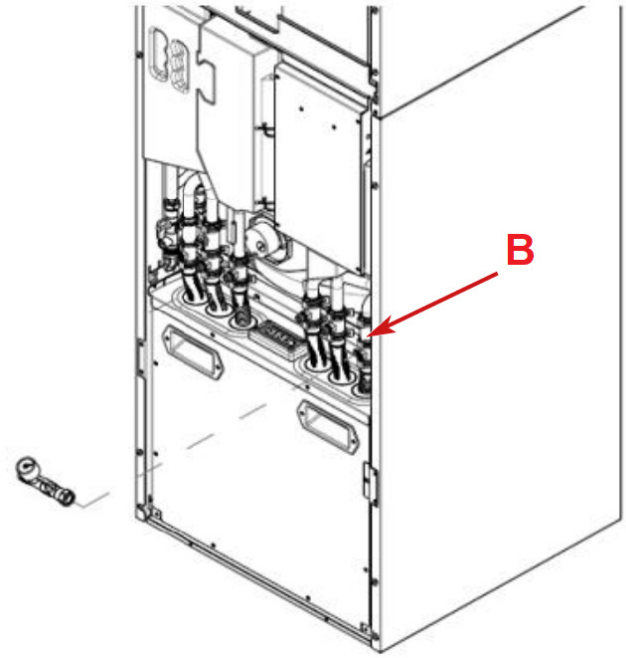


Fig. 112 : Replacing Filling Loop Space Heating

To replace the pressure gauges in the filling loops first remove the fast-fit fittings and remove the pressure gauge assembly. To replace the gauges, it is best to clamp them in a vice when removing the compression fitting.

9.13 Replacing Cold Water Inlet Group

When replacing the Inlet Group, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0 and 5.8.
2. Remove top front, middle and bottom panels of the appliance, see Section 5.1.
3. Follow the draining procedure for DHW Cylinder detailed in Section 5.8.1.
4. Remove the hose connecting the inlet group to the blue expansion vessel. First remove the hose fitting on the expansion vessel before removing the hose fitting on the inlet group.
5. Use a spanner or a clamp to stop the inlet group from spinning when removing the compression fitting.
6. When installing the replacement ensure the pressure relief valve is facing towards the front of the Zeroth.

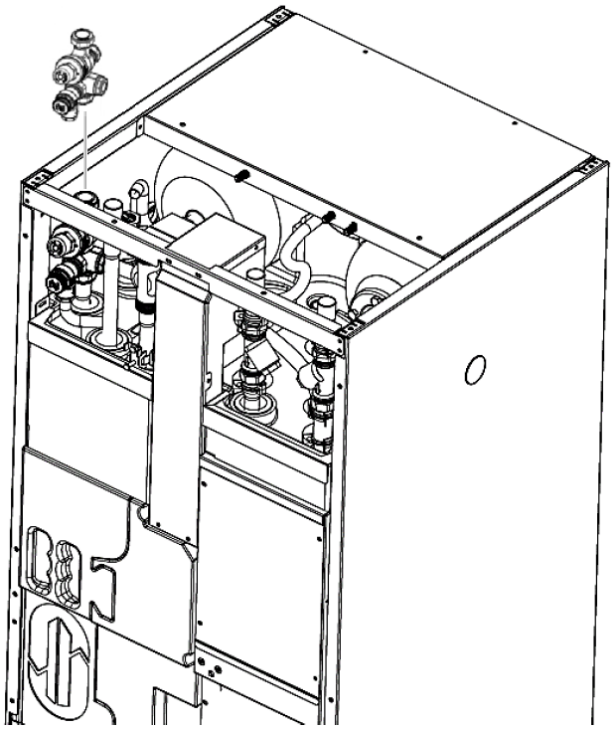


Fig. 113 : Replacing Inlet Group

7. Follow the filling procedure for DHW Cylinder see Section 5.8.2.
8. Refit outer covers in reverse order see Section 5.1 and ensure mains power is reconnected and site is left clean and tidy.

9.14 Replacing UI

When replacing the UI, follow the steps in the order below:

1. Follow relevant safety precautions highlighted in Section 9.0.
2. Remove top front and middle panels off the appliance, see Section 5.1. Place panel on a soft surface to avoid scratching the glass.
3. Remove the screws highlighted in Fig. 114 to remove metal enclosure marked C.
4. Carefully detach wire connected to UI to avoid damage and reattach to the replacement UI.
5. Secure the UI to the panel using the screws previously removed.

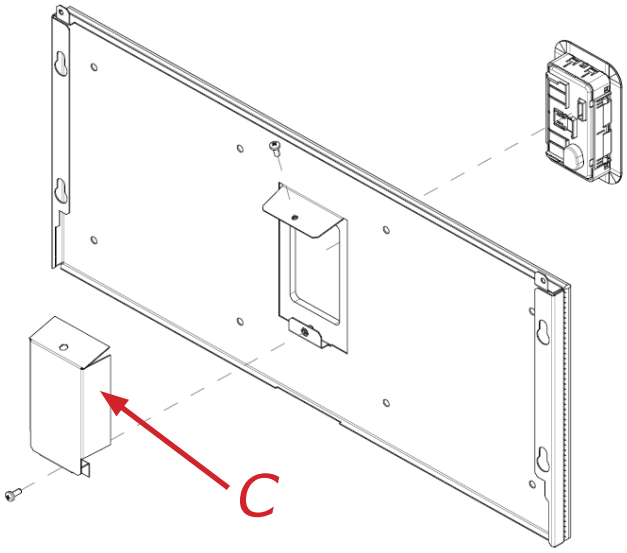


Fig. 114 : Replacing UI

6. Refit outer covers in reverse order see Section 5.1 and ensure mains power is reconnected.
7. Power up the device and confirm correct operation.
8. Ensure site is left clean and tidy.

9.15 Replacing Controller PCB

Fig. 115 shows the location of the Controller PCB on the Zeroth. To install the replacement, follow the procedure below:

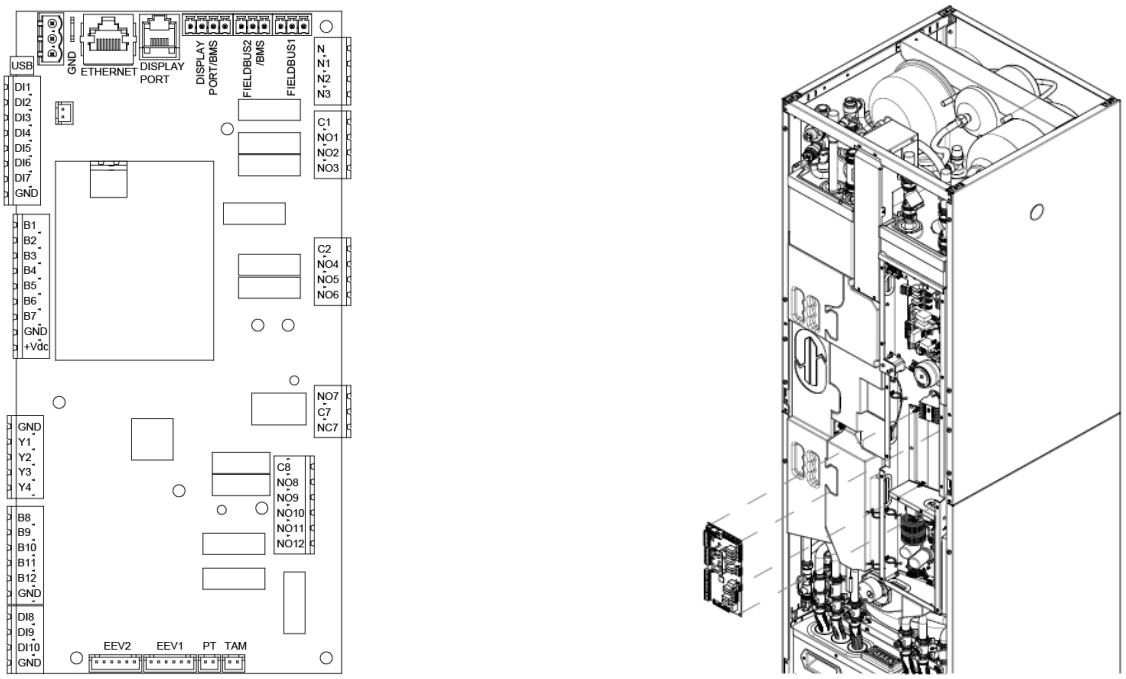


Fig. 115 : Replacing Controller PCB

1. Isolate as per 9.0.
2. Remove covers from the electrical box as per section 5.1.
3. Disconnect cables, connectors and wires.
4. Re-wire replacement Controller PCB using the wiring diagram shown in Section 15.0.
5. Once complete check all the connections.
6. Refit outer covers in the reverse order shown in Section 5.1. Ensure mains power is reconnected, and site is left clean and tidy.

9.16 Replacing Interface PCB

Fig. 111 shows the location of the Interface PCB. Follow the procedure below to replace an Interface PCB.

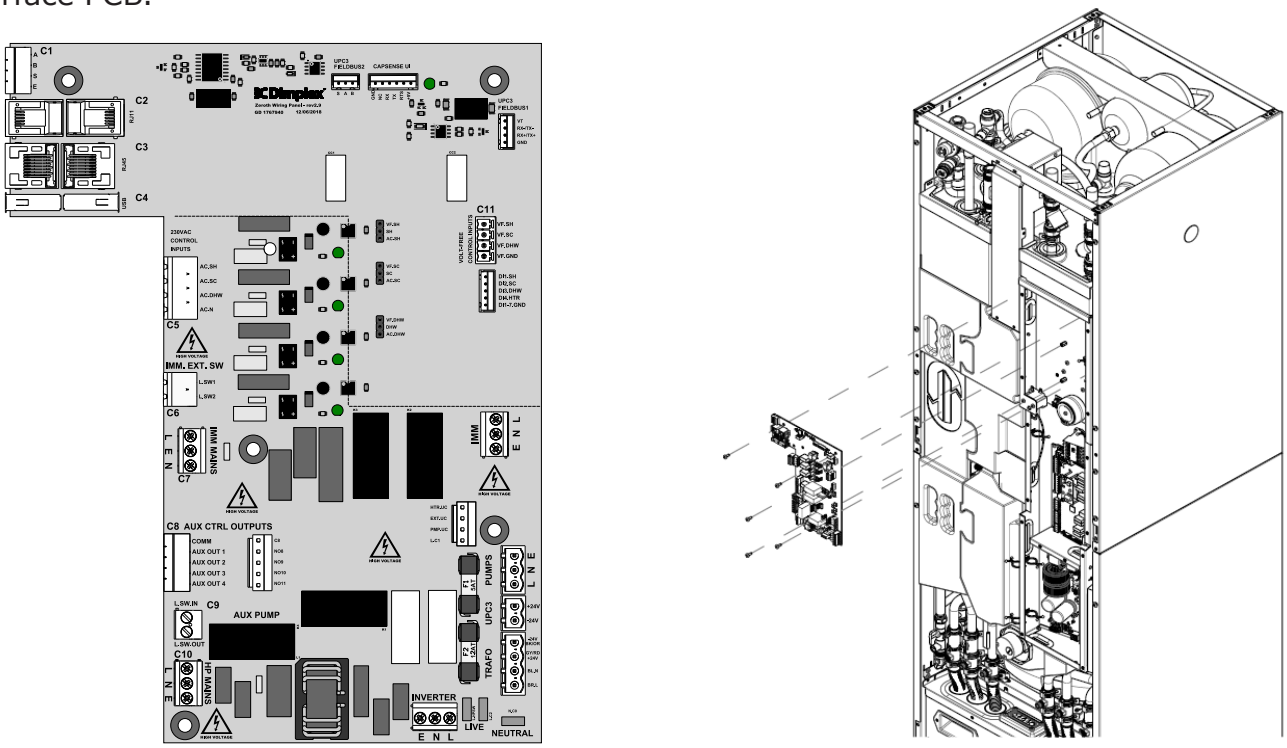


Fig. 116 : Replacing Interface PCB

1. Isolate as per Section 9.0.
2. Remove covers from the electrical box as shown in section 5.1.
3. Disconnect cables, connectors and wires.
4. Re-wire replacement Interface PCB using the wiring diagram shown in Section 15.
5. Once complete check all the connections.
6. Refit outer covers in the reverse order shown in Section 5.1. Ensure mains power is reconnected, and site is left clean and tidy.

10.0 Fault Finding

Issue	Checks	Action
No domestic hot water	Check mains power to the Zeroth appliance is switched on.	Turn on mains power supply to the appliance.
	Check the Zeroth UI and ensure the Thermal System is On.	Refer to Section 7.2 to turn on Thermal System.
	Check if fault screen is presented on the UI, refer to Section 5.1.	Contact support.
Domestic hot water temperature too low	Check if fault screen is presented on the UI, refer to Section 5.1.	Contact support.
	Increase temperature set point.	Refer to section 7.3 Advanced User Controls.
Domestic hot water temperature too hot	Check the immersion heater back up switch is not permanently on.	Refer to section 7.3 Advanced User Controls.
Space heating/cooling not working	Ensure thermostat settings are not set too low.	Check thermostat settings.
	Ensure heat emitters (e.g radiators) have not been isolated or switched off.	Check heat emmiter valves are fully open.
	Check mains power to the Zeroth is switched on.	Turn on mains power supply to the Zeroth.
	Check if fault screen is presented on the UI, refer to Section 5.1.	Contact support.
	Check the set temperature is suitable (shown in section 4.0).	Adjust temperature control thermostat higher for additional heat or lower for cooling.
Space heating/ cooling not achieving temperature set point	Check wall thermostat.	Adjust if required.
	Check if fault screen is presented on the UI, refer to Section 5.1.	Contact support.
	Increase temperature set point.	Refer to section 7.3 Advanced User Controls.
Back up immersion heater not working	Check that the switch is in the on position.	Turn the backup immersion heater switch off and on again.
Water discharge from appliance	Check water is coming from the unit and/or connections to the unit.	Report fault to an approved Service Engineer.

Table 10 : Fault Finding

11.0 Alarm codes

Electrical Safety

Disconnect completely from mains supply before removing covers.

The Zeroth Energy System is equipped with multiple mains supplies. Mains voltage is present on Main, Immersion and Control Circuits. Ensure all supplies are isolated before removing covers and attempting to work on Zeroth System. Ensure that national electrical codes are adhered to when servicing Zeroth Energy System.

Recover Refrigerant

This product contains greenhouse gases covered under the Kyoto Protocol.

All refrigerant used in Zeroth Products must be recovered and recycled according to national regulations. Refrigerant must never be vented to atmosphere.

Refrigeration System

The refrigeration system is pressurised with refrigerant gas.

Do not attempt to pierce or drill into any component within the heat pump module. Never apply heat to any part of the heat pump module using a heat gun or open flame. Do not attempt to disturb any refrigerant containing connection on heat pump module while pressurised. Refer all servicing on refrigeration circuit to a qualified refrigeration service engineer.

Safety First

Exercise caution when working on the Zeroth unit. Please pay attention to sharp edges, very hot and very cold surfaces and moving parts.

Hydraulic Circuit

Exercise extreme caution when working on Zeroth Hydraulic Circuit. The hydraulic system contains water under pressure which may be at high temperature. If suddenly released there is a risk of scalding and burns. Ensure system is suitably cool and depressurised before attempting service work.

11.1 Tools Required

The following tools are required to diagnose and rectify faults with the Zeroth:

1. Programmable Graphical Display (PGD) Module and Connection Cable
2. Assorted Screwdrivers of different sizes
3. Electricians Screwdriver Set
4. Socket Set
5. Multimeter with Volts/Amps/Ohms measurement capability
6. Calibrated Temperature Sensor/Infrared Thermometer

11.2 Reading Alarm Codes on Zeroth

11.2.1 Connecting PGD to Zeroth

1. Unscrew the top securing screws on the front cover, lift up and off the Zeroth.
2. Remove top cover panel for the wiring conduit to gain access to the PGD Port.
3. The PGD cable is terminated with an RJ-11 jack which is plugged into the socket as shown in Fig. 112. Access the socket by removing the front cover panel as shown.
4. Press cable plug until the locking snap clicks into position.
5. If not already connected, insert other end of PGD cable into the socket on the back of the PGD.

PGD - Programmable Graphical Display

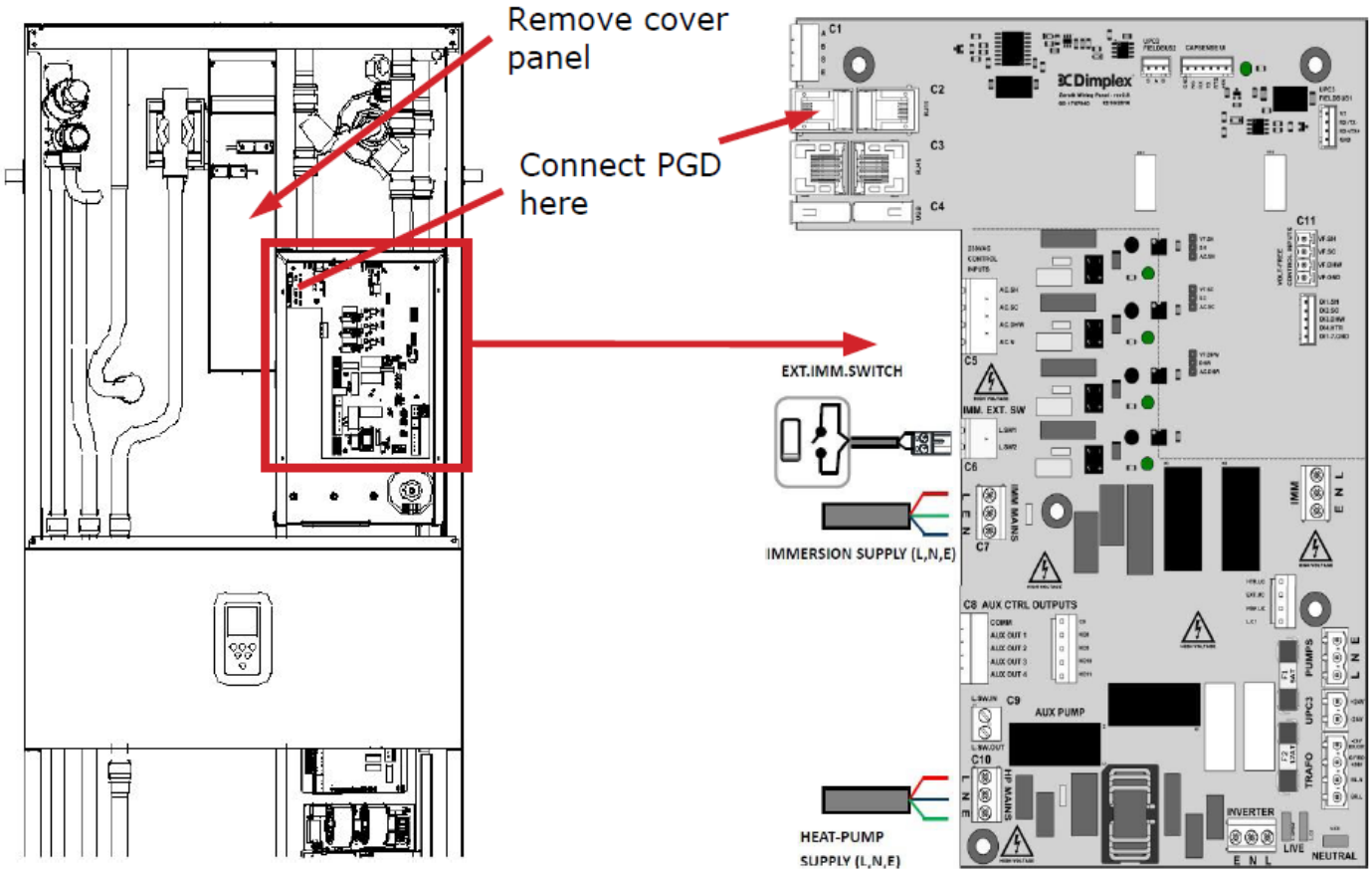


Fig. 117 : Remove cover panel and connect PGD as shown

11.2.2 Checking Alarm Codes with PGD Module

1. If connected correctly, the PGD should show the current state of the system.
2. To determine an alarm code, press the PRG key and enter the service password. On Zeroth, the default password is 1234.
3. Display the alarm codes currently logged by pressing the alarm key on the top left.

11.2.3 Clearing Alarm Codes

Take the following steps to clear alarm codes:

1. Power cycle the Zeroth.
2. Remove power from Zeroth by isolating at main switch, all alarms will automatically clear.
3. Reapply power, the controller will enter start-up sequence. The alarm will return if conditions persist.
4. Press the alarm key on the PGD to clear alarm codes. The alarm will be flagged if conditions persist.
5. Some alarms cannot be cleared immediately. In some cases, a minimum time must elapse before the alarm can be cleared. Alarms associated with the source loop will auto-clear when conditions return to normal.

11.2.4 Shutdown with Multiple Alarms

If the Zeroth shut downs with multiple alarm codes, it is likely that some of the generated alarms will be directly related to the shutdown triggering alarm.

For example, a shutdown alarm will cause an automatic disconnect of the inverter unit, which in turn will generate additional alarms. It may be the case that some alarms are due to system behaviour as triggered by an existing alarm and do not necessarily represent a separate fault with the system.

In this case, if the cause of the shutdown is determined, any additional alarms can be cleared. If no further re-occurrence exists, then no action is required.

In the case of multiple alarms, it is the responsibility of the service engineer to examine each individual alarm to determine whether it is the cause of the malfunction, or consequence of the shutdown.

11.3 Probe Alarms

Error Code	Fault	Range	Temp. Check Location	Probe Location	Failure Cause and Corrective Action
AL004	Water inlet (return) temperature probe on user side	0-70°C	Pipe surface either side of probe	B4	1. Temperature outside probe range: a. Check temperature in location specific to probe alarm. b. If temperature outside limits, allow to settle within limits. Alarm will auto reset. 2. Multiple alarms: a. Check and investigate other alarms including water flow rate, pump operation and system filter alarms. 3. Probe resistance issue: a. Check temperature in location specific to probe alarm. b. If temperature within limits, check resistance and connections. c. **AL034 ONLY:** Measure discharge temperature as cylinder heats water up to 55°C. Check alignment between measured temperature and Zeroth sensor. If deviation more than ± 3°C, stop test, remove probe. d. Disconnect probe from specified probe location on main PCB. e. Immerse probe in water at 25°C. Probe resistance should be 10kΩ at 25°C. f. If resistance incorrect or unstable and connections correct, change probe. g. If no resistance or grounding is present, change probe. h. If resistance correct, change control PCB.
AL005	Water outlet (flow) temperature probe on user side	0-70°C	Pipe surface either side of probe	B3	
AL018	DHW temperature probe	0-75°C	Pipe surface of DHW cylinder in several locations	B2	
AL019	Source outlet water temperature probe	0-70°C	Pipe surface either side of probe	B1	
AL034	Discharge temperature probe	0-140°C	Set to DHW mode with source temperature at 25°C. Check temperature on surface of discharge line from compressorCheck temperature on surface of discharge line from compressor	Discharge line	
AL035	Suction temperature probe	-20-70°C	Set to DHW mode with source temperature at 25°C. Check temperature on surface of suction line to compressor	B5	
AL133	Local board temperature probe	-20-70°C	Remove front panel from control box, check temperature around and on surface of probe	B10	

Table 11 : Probe Alarms

11.4 Flow Meter Alarms

Error Code	Fault	Channel	Failure Cause and Corrective Action
AL010	Flow rate on user circuit	N/A	1. Restriction or air lock: a. Check user/source circuit pump runs. b. If pump runs but no flow rate, identify and rectify restriction or air lock in system. 2. Wiring connections: a. If pump does not run, check power supply at pump terminals and demand signal on pump speed control cable (0-10V). If no mains supply at pump, check wiring connections and rectify as necessary. 3. Faulty PCB: a. If no demand signal, check signal present at PCB. b. If signal not present, ensure control is calling for cooling water. If control is calling for water but no signal present, change PCB. 4. Faulty pump: a. If signal present at board but not at pump, check wiring b. If signal and mains power at pump but pump does not run, replace pump. 5. System blockages: a. If alarm persists and pump verified to run, check circuit for blockage and air locks. b. Check system pressure and top up with water as necessary. Flush system to clear blockages. When circuit clear, return unit to service.
AL011	Flow rate on source circuit	N/A	
AL134	Source circuit flow meter	B9	1. Faulty flow meter: a. Check if flow rate is outside range of flow meter (2l/m-40l/m). b. Drain down and disconnect the outlet of the flow meter. c. Connect reference flow meter in series with existing flow meter. d. If no flow meter available, direct outlet of flow meter to measuring container and measure using bucket and stopwatch. e. Check existing flow meter by replacing known functional equivalent and checking flow rate. If flow rate corrects on replacement, replace existing flow meter. 2. Faulty PCB: a. If flow rate incorrect, locate flow meter signal connections at specified channel. Using multimeter, measure supply voltage to flow sensor both when flow sensor is in circuit and out of circuit. b. If outside voltage range 5V ±10% in circuit or out of circuit replace PCB. 3. Resistance issue: a. If flow supply voltage corrects, check voltage output from flow meter. Output voltage should be 0.5VDC for 2l/m and 3.5VDC for 40l/m. Measure voltage at specified channel with both flow meter in circuit and out of circuit. b. If reading incorrect or unstable, check connections. If connections correct, change sensor. c. If no resistance or grounding present, replace sensor. d. If resistance is correct, change controller PCB.
AL135	User circuit flow meter	B12	

Table 12 : Flowmeter Alarms

11.5 Zeroth Anti-Freeze Alarm Group

Error Code	Fault	Failure Cause and Corrective Action
AL027	Flow rate on user circuit	1. Low user/source outlet temperature: a. Minimum allowed temperature is 5°C. b. Alarm will reset when the water temperature increases above 7°C. 2. Circuit blockages/bends/debris: a. AL029/30 ONLY: Check with network operator for source circuit issues. Verify flow rates and temperatures with operator. b. Check flow rates on user/source circuit in heat mode. c. Run unit in space heating mode and check temperatures as shown in Appendix A. d. Run unit in cooling mode and check temperatures and pressures. e. If flow rate corrects but temperature drops rapidly, check system water pressure. Top up user circuit and re-pressurise if necessary. f. If flow rate and temperature regulation erratic, check system for air, rectify and refill as necessary. Check hydronic circuit for blockages, bends or debris. 3. Thermostat issue: a. Check existing flow meter functionality by replacing flow meter with known functional equivalent and checking flow rate. b. Drain down and disconnect the outlet of the flow meter. c. Connect reference flow meter in series with existing flow meter. d. If flow rate and temperatures correct but system repeatedly pulls down to 5°C resulting in shut downs, check room thermostat for correct regulation and if necessary, adjust lower limit. 4. Undersized heat emitters/absorbers: a. If system continues draw down to 5°C with no other faults and system operating correctly, heat emitters/absorbers undersized for application and cannot absorb enough heat to maintain flow temperature above 5°C.
AL028	Flow rate on source circuit	
AL029	Antifreeze alarm source side (heat)	
AL030	Antifreeze alarm source side (cooling)	
AL098	Low evaporating temperature (user side - cooling mode)	1. Multiple alarms: a. Check for other alarms, low flow alarms on user/source circuit, other low temperature and expansion valve MOP alarms. 2. Scale build-up on water side heat transfer surface: a. Check the flow rates and temperatures on the water side of the user/source circuit. b. If flow rates acceptable but temperature difference between inlet and outlet is less than 2°C, the heat exchanger may have scale build-up on water side heat transfer surface. c. Flush user side of system. Flushing the system on the source side may not be possible. If flushing does not fix problem, replace heat pump module. d. Run unit again and verify evaporator pressure is correct.
AL110	Evaporating temperature below set point (source side - heating mode)	

Table 13 : Anti-freeze Alarms

11.6 Zeroth High Pressure Transducer Alarm Group

Error Code	Fault	Failure Cause and Corrective Action
AL032	High pressure transducer alarm	1. AL032: Record pressure on low pressure sensor. Check high pressure sensor voltage at B7 on main PCB, verify it corresponds to suction transducer. (0.5V-4.5V ratiometric = 0–46 bar). 2. AL033: Record pressure on high pressure transducer. Check low pressure sensor voltage at B8 on main PCB, verify it corresponds to high pressure transducer. (0.5V-4.5V ratiometric = 0 – 19 bar). 3. If output voltage incorrect, check sensor supply voltage. If supply voltage outside of range (4.5V–5.5V), check wiring. If no fault found, change PCB. 4. If supply voltage correct but output voltage incorrect, change sensor. 5. If sensor reading correct and no issue with operational temperatures, replace heat pump module. **NOTE:** Before considering changing PCBA refrigerant pressure chould be checked using a gauge to rule out a refrigerant issue.
AL033	Low pressure transducer alarm	
AL105	High pressure switch alarm	1. High discharge pressure: a. If high side pressure too high, high pressure switch will open. This occurs at discharge pressure of 42 bar. High pressure switch in software also triggers at 41 bar. b. Both will auto reset when pressure drops below reset threshold. 2. High discharge temperature: a. If surface temperature of discharge line exceeds 120°C, high temperature klixon on compressor discharge line will open circuit. 3. Cylinder high temperature cut-out: a. Cylinder high temperature cut out located in control box. b. Manually reset by pressing red button on cut-out adjacent to control PCB. **NOTE:** For more info on high pressure and AL105, refer to Appendix C.
AL106	Low pressure switch alarm	1. Multiple alarms: a. Check for other alarms. Check operating, source, ambient and user (space heating and DHW) temperatures. 2. Expansion valve fault/Low charge: a. Allow temperatures to stabilise before running unit again. b. Set space heating temperature to 20°C and loop temperature to 25°C. Set to run in heat mode first. c. If AL106 triggered after very short time period, either a fault with expansion valve or charge is low. d. Test expansion valve motor on existing valve body to check correct action. 3. Internal blockage: a. Alarm caused by internal blockage restricting flow.

Table 14 : High Pressure Transducer Alarms

11.7 Zeroth Domestic Hot Water Alarms

Error Code	Fault	Failure Cause and Corrective Action
AL141	Timeout Alarm DHW heater	1. Maximum heating time reached: a. Heater has run for maximum time, now in timeout mode. b. Can reset alarm if necessary, to unblock heater request. Control will auto reset once 7-hour block time elapsed. 2. User side leaks/issues: a. Check no taps are continuously running on user side. b. Check for leaks/issues causing continuous loss of water. 3. Immersion heater fault: a. Using multimeter, check power is present at immersion heater terminals and immersion heater thermostat. b. If power present, check resistance of immersion heater element (ensure continuity across thermostat). If immersion heater element is open circuit, replace immersion heater. c. If no power to immersion heater, check cables and connections. Check PCB wiring and main control PCB and replace if necessary.
AL140	Anti-Legionella cycle failure	

Table 15 : Domestic Hot Water Alarms

11.8 Zeroth Network / Other Alarms

Error Code	Fault	Failure Cause and Corrective Action
AL139	Alarm active	1. Alarm active: a. Triggered when alarm active more than 30 minutes. Another alarm will be present. b. When rectified, AL139 can be cleared from front panel.
AL094	High differential pressure on compressor start	1. Faulty pressure sensors a. Reset heat pump and check pressure and temperature readings. b. If pressure sensors are faulty replace heat pump module. 2. Source loop temperature out of specification: a. If source loop temperature outside of range 18-30°C ± 2°C, inform loop operator that loop temperature out of specification. 3. Loop is cold and cylinder or space heating circuit at very high temperature a. Check source circuit temperature is within specification. b. System should be restarted when loop temperature is within specification limits (Delta T source circuit vs water circuit is below 45k 4. Differential remains high after shutdown a. Refrigerant cannot equalize, change heat pump module
AL142	High source outlet temperature	1. Multiple alarms: a. Check and investigate other alarms. 2. Source loop temperature out of specification: a. If source loop temperature outside of range 18-30°C ± 2°C, inform loop operator that loop temperature out of specification. 3. Flow restrictions: a. If loop temperature 25°C ± 2°C, check source loop flow rate. b. If source loop flow rate low, see Appendix A, check source loop for flow restrictions, or if pump unable to deliver flow. 4. Faulty sensor/PCB: a. Check discharge temperature, pressure, evaporator superheat and zone temperature. If no fault found, clear alarms. Run system with source at 25°C, space cooling at 20°C. b. If source outlet temperature out of range 14-35°C and alarm triggered again, check source outlet temperature sensor with reference measurement device. c. If source outlet temperature correct, check wiring and control PCB. If necessary, replace control PCB. If issue persists, replace heat pump module.
AL143	Low source outlet temperature	
AL106	4-way valve wrong position	1. Failed to fully engage/wrong position: a. Check 4-way valve as described in Appendix B.

Table 16 : Network/Other Alarms

11.9 Electronic Expansion Valve Group

Error Code	Fault	Failure Cause and Corrective Action
AL136	Expansion valve group alarm	1. Alarm active: a. Triggered when any electronic expansion valve alarm triggered. b. Each alarm in group will auto reset when condition clears. This alarm will not auto reset if triggered 3 times in 1-hour period. Manual reset with PGD required.
AL046	Low superheat of refrigerant gas	1. User circuit flow issue: a. If unit in cooling mode, check user circuit flow rate. b. Flow rate check should indicate if there is a problem. 2. Source circuit flow issue: a. If unit in heating mode, check source circuit flow rate. b. If source circuit flow rate low, inform network operator. 3. Low source/user loop temperature: a. If flow rates correct, check source loop temperature and user loop temperature. If source loop below 20°C, inform network operator. Adjust to 20-30°C. b. If user loop temperature below 25°C, adjust thermostat until user loop rises above 25°C. 4. Faulty heat pump module: a. If no flow rate or temperature faults, replace heat pump module. b. Retest system to ensure no re-occurrence of alarm.
AL048	MOP protection activated	1. Building loop fault: a. Source side temperatures should not exceed 35°C. b. If above this threshold, escalate to loop/network operator. 2. Room thermostat/heat emitter issue: a. User side temperatures should not exceed 55°C. b. If above this threshold, check for correct operation of room thermostat. Check for damage/debris on heat emitters. 3. Pressure sensor alarms: a. On PGD, check compressor suction and discharge pressure are equal. b. If readings too high/low, check for pressure sensor alarms. 4. Faulty pressure sensor: a. Verify sensor output voltage correct for both transducers. b. If supply voltage correct but output voltage incorrect, change sensor. 5. Refrigeration circuit fault: a. If both sensors reading correctly, replace heat pump module.
AL047	LOP protection activated	1. Multiple alarms: a. Check and investigate other alarms. b. Check operating, loop, user (both space heating and DHW) and ambient temperatures. c. If loop temperatures very low, separate alarm also triggered. 2. Faulty heat pump module: a. Allow temperatures to stabilise before running again. b. Set space heating to 20°C and loop temperature to 25°C. Run in heat mode. c. If alarm triggered after short time period, replace heat pump module.
AL050	Low suction temperature	

Table 17 : Expansion Valve Group Alarms

11.10 Envelope Group

Error Code	Fault	Failure Cause and Corrective Action
AL137	Envelope group alarm	1. Alarm active: a. Triggered when any envelope alarms triggered. b. Each alarm in group will auto reset when condition clears. This alarm will not auto reset if triggered 3 times in 1-hour period. Manual reset with PGD required.
AL037	High pressure ratio	1. Source/user loop temperature issue: a. If unit in cooling mode, check source temperature. b. Set source loop to 25°C and user loop to 20°C.
AL038	High discharge pressure	1. Source/user loop temperature issue: a. If unit in cooling mode, check user temperature. b. Set source loop to 25°C and user loop to 25°C. 2. Other issue: a. If unit in cooling mode, check source temperature and flow rate. Adjust if necessary. b. **AL038:** If no fault with source/user circuits, check discharge pressure sensor reading on PGD. c. **AL039:** If no fault with source/user circuits, check current against max. current draw with current clamp. d. If there is no apparent fault and alarm still triggered, replace heat pump module.
AL039	High compressor current	
AL040	High suction temperature	
AL041	LOP pressure activated	1. Source/user loop temperature issue: a. If unit in cooling mode, check source temperature. b. Set source loop to 25°C and user loop to 20°C. 2. Other issue: a. If unit in heating mode, check source temperature and flow rate. Adjust if necessary. b. If there is no apparent faults and alarm still triggered, replace heat pump module.
AL043	Low suction temperature	
AL044	Low suction pressure	
AL045	Low suction pressure	

Table 18 : Envelope Group Alarms

11.11 Inverter Group

Error Code	Fault	Failure Cause and Corrective Action
AL138	Inverter fault	1. Alarm active: a. Triggered when any inverter alarms triggered. b. Each alarm in group will auto reset when condition clears. This alarm will not auto reset if triggered 3 times in 1-hour period. Manual reset with PGD required.
AL111	Communication timeout	1. Faulty inverter: a. Check Modbus connection between inverter and main control PCB. b. Verify all connections are correct. c. If alarm persists, change inverter and Modbus connection cable. 2. Faulty PCB: a. If problem persists, change main control PCB and Modbus connection cable.

Table 19 : Inverter Group Alarms

Error Code	Fault	Failure Cause and Corrective Action
AL112	Over current	1. High current load/voltage on compressor: a. Lower source loop temperature and room temperature load. 2. **AL120/121/129/130 ONLY:** Source loop issue: a. Check source loop water inlet temperature and flow rate. b. Ensure there is good thermal contact between cooling pipe and inverter heatsink. 3. Other issue: a. If problem persists, change inverter and Modbus connection cable. b. If problem persists, change heat pump module c. On replacement of inverter or heat pump module, ensure there is no re-occurrence of the alarm. d. **AL112/113 ONLY:** If still not addressed, change main control PCB and Modbus connection cable.
AL113	PFC current too high	
AL114	DC output over voltage	
AL115	DC output under voltage	
AL118	Max. output current exceeded	
AL119	Max. input current exceeded	
AL120	Heatsink over-temperature	
AL121	Inverter over-temp	
AL127	High output current	
AL128	High input current	
AL129	Heatsink max. limit exceeded	
AL130	Heatsink warning	
AL131	Resistance load imbalance	
AL132	Speed control fault	
AL116	Inverter AC output over voltage	1. Mains voltage issue: a. Check main supply voltage to unit and at inverter terminals. b. Compare to appliance voltage on unit rating plate. c. Correct problem if issue with mains voltage. d. **AL117:** Check if power to inverter interrupted for any reason, such as power spike, cut or disconnection of contactor. 2. Other issue: a. If problem persists, change inverter. b. If problem persists, change heat pump module.
AL117	Inverter AC output under voltage	
AL122	Internal sensor failure	1. Inverter board failure: a. Power cycle the unit. b. Power down unit for a few minutes before re-applying power. 2. Faulty inverter/heat pump module: a. If alarm persists, swap inverter out with known functioning inverter. b. If replacement functions correctly, replace existing inverter. c. If problem persists, replace heat pump module.

Table 19 (Cont.) : Inverter Group Alarms

Error Code	Fault	Failure Cause and Corrective Action
AL123	Locked rotor	1. Check locked rotor condition: a. Disconnect mains supply and measure resistance of compressor stator windings. b. Disconnect connections from inverter to compressor for accurate resistance measurement. Contact Glen Dimplex UK Customer Support to compare measured stator winding resistance info. c. If winding and insulation resistance correct, reconnect compressor. d. Measure current draw to inverter. e. If power applied, compressor does not run and alarm triggered, compressor is in locked rotor condition. 2. Faulty heat pump module: a. If compressor rotor locked, check suction and discharge pressures using PGD. b. If not equal, open expansion valve manually to equalise pressures. c. If compressor starts as normal, check expansion valve operation. d. If compressor rotor remains locked, replace heat pump module. e. Inverted may also need to be replaced.
AL124	Phase loss/dropped	1. Connection loose/missing: a. Check electrical connections between inverter and compressor. b. Correct connections if loose or missing. 2. Faulty inverter: a. Disconnect from mains supply and disconnect compressor power supply cables. b. Measure compressor stator windings resistance using multimeter and compare to specifications on back of manual. c. If stator resistance corrects and no ground continuity, reapply power. d. Start compressor and measure each phase voltage to compressor. e. If there is a phase missing, change inverter. 3. Faulty heat pump module: a. If all phases present and compressor does not run, change heat pump module.
AL125	Compressor speed too low	1. Compressor restart: a. Power down unit and disconnect main electrical supply. b. Allow system to cool for 10 minutes before reapplying power. c. Set to cooling mode, run for 30 minutes. Check functionality of compressor and inverter.. 2. Faulty inverter/heat pump module: a. If compressor fails to start, check for other alarms. b. If no other alarms, change inverter. c. If compressor still fails to start, change heat pump module.
AL126	Inverter offline	1. Wiring/Connections: a. Using multimeter, check voltage on inverter input terminals. b. If no power, check wiring and fuses on main distribution PCB. c. If power present, check Modbus connection between mainc ontrol PCB and inverter. d. If no Modbus data, check cable at both ends. 2. Faulty inverter/heat pump module: a. If compressor fails to start, check for other alarms. b. If no other alarms, change inverter. c. If compressor still fails to start, change heat pump module.

Table 19 (Cont.) : Inverter Group Alarms

11.12 Appendix A : Diagnosing a Low Flow Condition

If the Zeroth unit is suspected to have a low flow condition on the source or user side, the service engineer will be required to check the flow rates on the system and make necessary adjustments to ensure correct operation. A low flow condition is suspected either from unstable temperatures, very low or high pressures on refrigeration circuit or low flow alarms.

Take the following steps to diagnose a low flow condition:

1. Check the water circuit flow rate on the user and source side.
2. Check the flow rate on the PGD as measured by the flow meter.
3. If the flow meter is faulty, replace the flow meter with a known functional flow meter.
4. If this is unavailable, install a calibrated flow meter in line with the existing flow meter on the Zeroth.
5. If a flow meter is unavailable, measure the flow rate using a bucket and stopwatch to roughly determine flow rate.
6. If the flow rate is less than 4 l/m, check the circuit for dirt, blockages and leaks. Check that no pipes are kinked or damaged. Flush out system and rinse thoroughly to remove contaminants from system.
7. If the flow rate does not change after flushing system and rinsing. Check system water pressure and adjust if necessary.
8. If water pressure is correct, check the pump operation. The pumps operate using a proportional voltage (0-5V) on a control signal.
9. Ensure that the pump is receiving the correct signal to operate correctly. If the pump is receiving signal and no other issues, replace the pump.
10. If the pump is receiving an incorrect signal and no other fault is found with wiring, replace the main control PCB.

11.13 Appendix B : Checking 4-way Valve Operation

The Zeroth Energy System is equipped with a reversible heat pump which operates using a 4-way reversing valve. The 4-way valve is a pilot operated device which uses pressure to shift an internal valve spool between heating and cooling positions.

Pressure is applied on the internal spool by means of an externally mounted solenoid valve. As a result, the 4-way valve relies on both an electrical signal to open the solenoid valve but also on the correct pressure to shift the valve spool from cool to heat positions and vice versa.

Take the following steps to check 4-way valve operation:

1. Measure the temperature at the valve inlet, and on the lines to condenser, evaporator and suction.
2. If the valve is in the incorrect position or stuck/malfunctioning in heat mode, the condenser tube shall be warm.
3. Likewise, in cooling mode, the evaporator tube shall be warm.
4. If this is the case, check the high and low side pressures on the PGD.
5. The pressure difference between high and low pressures should be between 3 and 18 bar.
6. If pressure is outside this range, investigate the cause of the high pressure before examining the 4-way valve operation further.

7. If the PGD indicates a pressure difference between 3 and 18 bar, set the Zeroth into heating mode and then into cooling mode.
8. Disconnect the connector plug to cycle the 4-way valve.
9. Cycle up to 5 time to free the valve/internal components.
10. If the valve cannot be freed, tap the valve at one end to move the spool over.
11. If the problem persists, Heat pump module may need to be replaced.

11.14 Appendix C : Diagnosis of High Pressure

The Zeroth Refrigeration System has a high-pressure cut-out switch which triggers when the compressor discharge pressure exceeds 42bar. The microprocessor controller is designed to take action and control the Zeroth out of a high-pressure condition, but the safety cut-out will activate to prevent damage to the Zeroth System.

Take the following steps to check if the unit cuts on high pressure:

1. Check if the unit cuts out on heating, cooling or DHW mode and see if it repeatedly cuts out on other modes.
2. Ensure the system is filled and de-aerated.
3. If an independent thermostat is used, check that the thermostat is not calling for excessively high temperatures and check that the space heating flow temperature is within an acceptable range.
4. On DHW mode, check the heat pump switches out of DHW heating mode on reaching setpoint and does not continue to run.
5. Check space heating flow rates are within specification.
6. If all temperatures are in specification, replace the heat pump module.

12.0 Spare Parts List

Only genuine Dimplex spare parts must be used to ensure safe and reliable operation of the Zeroth Energy System.

The official and up-to-date spare parts list is available online by:

Clicking the link: Zeroth Energy System | Dimplex

Entering the URL:

https://www.dimplex.co.uk/products/heat-pumps/ambient-loop-network/zeroth-energy-system

or Scanning the QR Code:

Use of non-approved parts may invalidate guarantee and could compromise system safety and performance.

13.0 Software Upgrade by USB

Software updates or changes must only be made by a Dimplex Engineer. For information on software verison contact Glen Dimplex UK Ltd.

Connect a USB cable from your laptop to the USB connection on the Zeroth. The Controller will show up on your computer as a removable device.

The software for the zeroth controller has a file extension *.ap1

Copy the update file from your computer into the UPGRADES folder on the removable device.

Once the file transfer has completed remove the USB cable from the controller so that the controller can read the update file.

If the ap1 is named Autorun.ap1 then the update file will automatically be loaded and the update process will start.

If the update file was named Zeroth.X.X.X.ap1 then you will have to manually start the update procedure.

To manually start the update, hold down the ALARM Button and ENTER Button together for 3 seconds or until the PGD menu appears.

Scroll down to the UPGRADE menu and hit ENTER

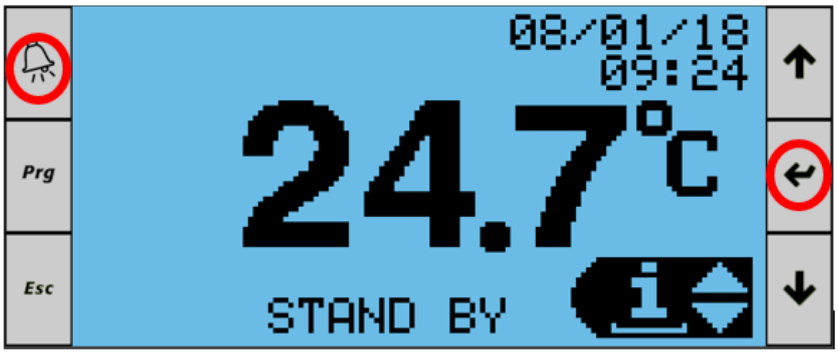


Fig. 118 : Manually Start Update

Scroll down to the UPGRADE menu and hit ENTER

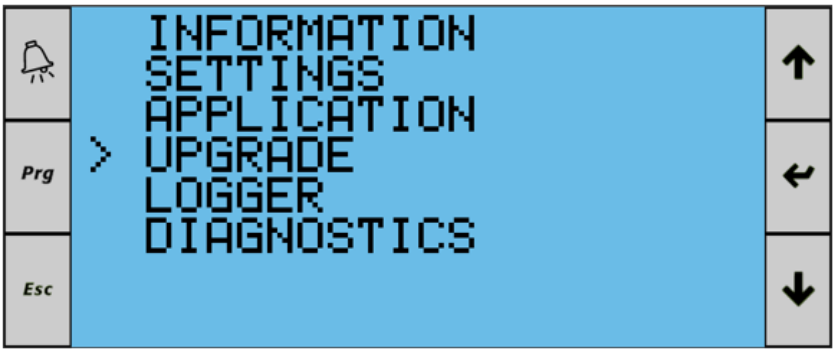


Fig. 119 : Upgrade Menu

If the upgrade file has been uploaded successfully then it will appear in this list. Hit Enter on the ap1 file you want to update to.

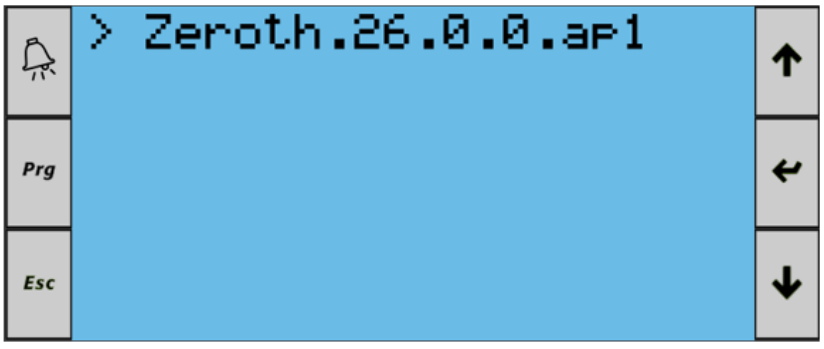


Fig. 120 : Successful Upload Screen

Press Enter to confirm update

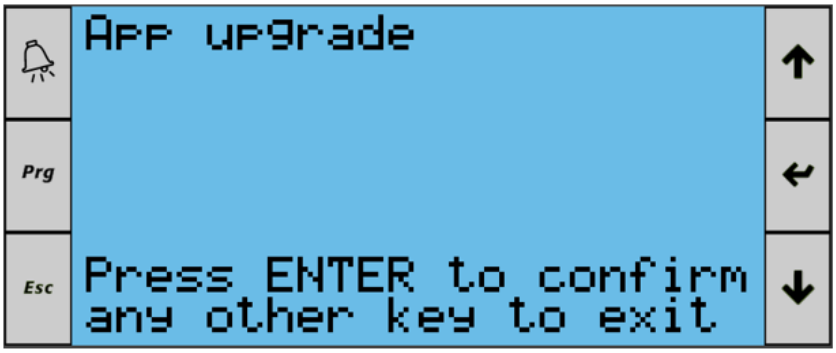


Fig. 121 : Confirm Update Screen

The update process will start

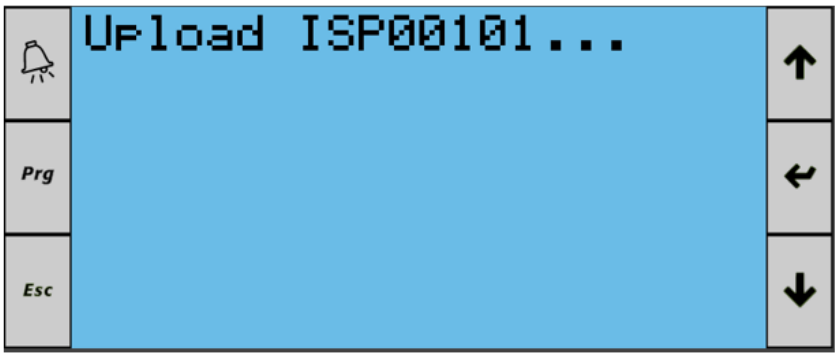


Fig. 122 : Update Processing Screen

The PGD screen will remain on this screen for some time…~5mins

Fig. 123 : Install New App Screen

When the update is successful the device will restart, showing the Zeroth logo and then will show the main screen

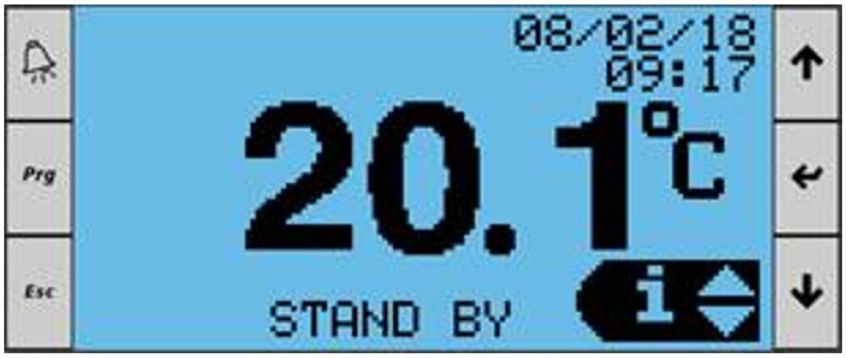


Fig. 124 : Main Screen

13.1 Checking the Zeroth Software Version:

To check software version. Go to information

Fig. 125 : Information Screen

Press up to go to the last screen

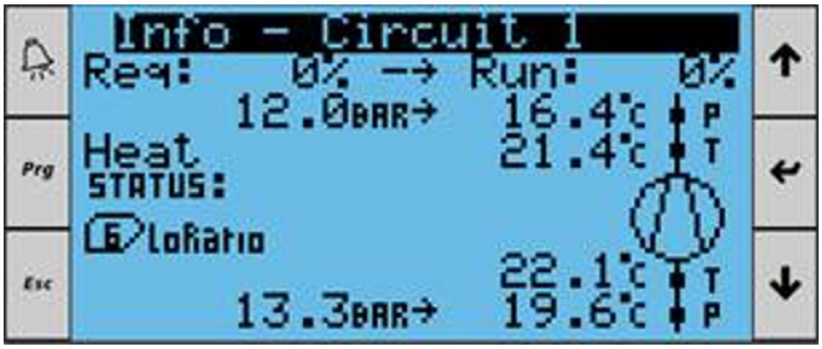


Fig. 126 : Last Screen

Press Enter

Fig. 127 : Other Information Screen

Press up to go to software information screen

Software version and OS version are displayed here

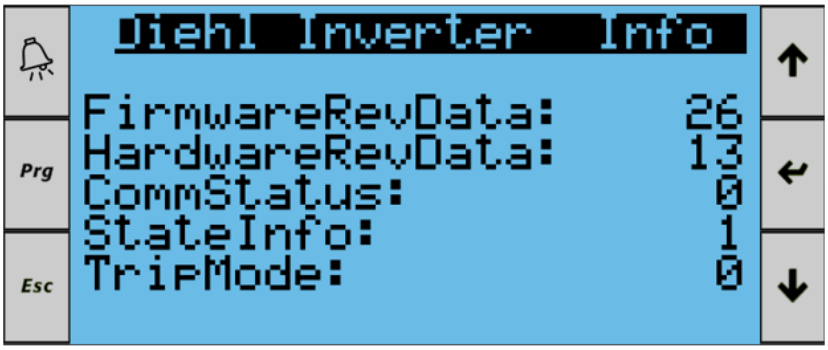


Fig. 128 : Software Information Screen

14.0 Technical Specification

14.1 4kW & 6kW Heating Only Technical Specification

	Units	ZHP4-180H-01	ZHP6-180H-01
Operating limits			
Heating water temperature (min / max)	°C	20 / 55	20 / 55
Energy loop temperature	°C	25	25
Performance data / flow rates			
Heating output / COP @ S25 / W35	kW / COP	4.0 / 9.3	6.4 / 8.4
Heating output / COP @ S25 / W55	kW / COP	4.6 / 4.3	6.0 / 4.1
Heating output / COP @ S20 / W35	kW / COP	4.2 / 8.0	6.2 / 7.2
Heating output / COP @ S20 / W55	kW / COP	4.2 / 3.9	6.0 / 3.8
Heating output / COP @ S15 / W35	kW / COP	4.1 / 6.5	6.2 / 6.0
Heating output / COP @ S15 / W55	kW / COP	4.1 / 3.5	6.1 / 3.5
Minimum heating / cooling water flow rate (5K ΔT)	l / s	0.19	0.29
Required buffer volume	l	25	25
Available pump head @ nominal fl ow rate	kPa	54	35.5
Source data / flow rates			
Required capacity from loop @ S25 / W35	kW	3.6	5.6
Minimum flow rate from loop (5K ΔT)	l / s	0.17	0.25
Maximum static pressure rating	Bar	10	10
Dimensions, weights and filling quantities			
Dimensions (W x D x H)	mm	550 x 560 x 2000	
Filled weight / weight without packaging (empty)	kg	353 / 178	
Loop / heating connections	mm	22 copper stub	
Drain discharge (19mm clear hose)	mm	1.5m length supplied loose	
Discharge (G3 T&P valve)	mm	½" F BSP	
CWM inlet / DHW outlet connections	mm	22 copper stub	
IP rating		IPX4	
Expansion vessel (heating)	l	8	8
Refrigerant	Type / kg	R410A / 0.7	R410A / 0.7
Sound power level @ stand. rating condition	dB(A)	34	36
Noise rating	NR	35	35
Electrical connections			
Nominal voltage / phase / frequency	V / P / Hz	230 / 1 / 50	230 / 1 / 50
Nominal power consumption @ S25 / W35	kW	0.43	0.76
Maximum power consumption @ S25 / W55	kW	1.06	1.46
Power factor @ S25 / W35	PF	0.98	0.98
Fuse protection (HP module)	Rating	C 16A	
Immersion rating (cylinder)	kW	2.0	
Fuse protection (immersion)	Rating	B 10A	
Number of electrical supplies		2	
Hot water cylinder			
Type		Unvented	
Material / insulation		Stainless steel / EPS foam	
T&P valve rating		7 Bar or 90°C	
Maximum water inlet pressure	bar	6	
Storage volume	l	172	
Mixed water at 40°C V40	l	709	
Expansion vessel (hotwater)	l	8	
Declared ErP load profile		XXL	
Integrated electric immersion rating	kW	2.0	
Maximum temperature with immersion	°C	60	
Water regulations		G3 KIWA approval to EN12897	
T&P valve		Factory fitted	
Standing heat loss EN12897-2016 (KIWA)	kWh / 24	1.97	
Standing heat loss EN15332-2007 (SAP)	kWh / 24	1.63	
Cylinder heat up time (from 10 to 60°C)	hrs	2.75	2.0
Accessories supplied loose		Tundish, discharge pipework, 1.5m hose, adjustable feet	

Table 20 : 4kW & 6kW Heating Only Technical Specification

14.2 4kW & 6kW Heating and Cooling Technical Specification

	Units	ZHP4-180C-01	ZHP6-180C-01
Operating limits			
Heating water temperature (min / max)	°C	20 / 55	20 / 55
Cooling water temperature (min / max)	°C	8 / 25	8 / 25
Energy loop temperature	°C	25	25
Performance data / flow rates			
Heating output / COP @ S25 / W35	kW / COP	4.0 / 9.3	6.4 / 8.4
Heating output / COP @ S25 / W55	kW / COP	4.6 / 4.3	6.0 / 4.1
Heating output / COP @ S20 / W35	kW / COP	4.2 / 8.0	6.2 / 7.2
Heating output / COP @ S20 / W55	kW / COP	4.2 / 3.9	6.0 / 3.8
Heating output / COP @ S15 / W35	kW / COP	4.1 / 6.5	6.2 / 6.0
Heating output / COP @ S15 / W55	kW / COP	4.1 / 3.5	6.1 / 3.5
Cooling output / EER @ S25 / W10	kW / EER	4.0 / 5.1	4.4 / 5.1
Minimum heating / cooling water flow rate (5K ΔT)	l / s	0.19	0.29
Required buffer volume	l	25	25
Available pump head @ nominal flow rate	kPa	54	35.5
Source data / flow rates			
Required capacity from loop (heat) @ S25 / W35	kW	3.6	5.6
Required capacity from loop (cool) @ S25 / W10	kW	4.8	5.3
Minimum flow rate from loop (5K ΔT)	l / s	0.17	0.25
Maximum static pressure rating	Bar	10	10
Dimensions, weights and filling quantities			
Dimensions (W x D x H)	mm	550 x 560 x 2000	
Filled weight / weight without packaging (empty)	kg	353 / 178	
Loop / heating connections	mm	22 copper stub	
Drain discharge (19mm clear hose)	mm	1.5m length supplied loose	
Discharge (G3 T&P valve)	mm	½" F BSP	
CWM inlet / DHW outlet connections	mm	22 copper stub	
IP rating		IPX4	
Expansion vessel (heating)	l	8	8
Refrigerant	Type / kg	R410A / 1.05	R410A / 1.05
Sound power level @ stand. rating condition	dB(A)	34	36
Noise rating	NR	35	35
Electrical connections			
Nominal voltage / phase / frequency	V / P / Hz	230 / 1 / 50	230 / 1 / 50
Nominal power consumption @ S25 / W35	kW	0.43	0.76
Maximum power consumption @ S25 / W55	kW	1.06	1.46
Power factor @ S25 / W35	PF	0.98	0.98
Fuse protection (HP module)	Rating	C 16A	
Immersion rating (cylinder)	kW	2.0	
Fuse protection (immersion)	Rating	B 10A	
Number of electrical supplies		2	
Hot water cylinder			
Type		Unvented	
Material / insulation		Stainless steel / EPS foam	
T&P valve rating		7 Bar or 90°C	
Maximum water inlet pressure	bar	6	
Storage volume	l	172	
Mixed water at 40°C V40	l	709	
Expansion vessel (hotwater)	l	8	
Declared ErP load profile		XXL	
Integrated electric immersion rating	kW	2.0	
Maximum temperature with immersion	°C	60	
Water regulations		G3 KIWA approval to EN12897	
T&P valve		Factory fitted	
Standing heat loss EN12897-2016 (KIWA)	kWh / 24	1.97	
Standing heat loss EN15332-2007 (SAP)	kWh / 24	1.63	
Cylinder heat up time (from 10 to 60°C)	hrs	2.75	2.0
Accessories supplied loose		Tundish, discharge pipework, 1.5m hose, adjustable feet	

Table 21 : 4kW & 6kW Heating and Cooling Technical Specification

14.3 9kW Heating and Cooling Technical Specification

	Units	ZHP9-180C-01
Operating limits		
Heating water temperature (min / max)	°C	20 / 55
Cooling water temperature (min / max)	°C	10 / 18
Energy loop temperature nominal	°C	25
Performance data / flow rates		
Heating output / COP @ S25 / W35	kW / COP	9.3 / 8.4
Heating output / COP @ S25 / W45	kW / COP	9.4 / 6.2
Heating output / COP @ S25 / W55	kW / COP	9.4 / 4.8
Cooling output / EER @ S25 / W10	kW / COP	7.5 / 5.5
Min heating / cooling water flow rate (5K ΔT)	l/s	0.42
Required buffer volume	**l**	**25**
Available pump head @ nominal flow rate	kPa	35.5
Source data / flow rates		
Required capacity from loop (heat) @ S25 / W35	kW	7.8
Required capacity from loop (cool) @ S25 / W10	kW	9.2
Min flow rate from loop (5K ΔT)	l/s	0.308
Maximum static pressure rating on energy loop	Bar	10
Dimensions, weights and filling quantities		
Dimensions (W x D x H)	mm	550 x 560 x 2000
Filled weight / weight without packaging (empty)	kg	360 / 185
Loop / heating / cooling connections	mm	22 copper stub
Drain discharge (19mm clear hose)	mm	1.5m length supplied loose
Discharge (G3 T&P valve)	mm	½" F BSP
CWM inlet / DHW outlet connections	mm	22 copper stub
IP rating		IPX4
Expansion vessel (heating)	l	8
Refrigerant	Type / kg	R410A / 1.1
Sound power level @ stand. rating condition	dB(A)	41
Noise rating	NR	35
Electrical connections		
Nominal voltage / phase / frequency	V / P / Hz	230 / 1 / 50
Nominal power consumption @ S25 / W35	kW	1.2
Maximum power consumption @ S25 / W55	kW	2
Power factor @ S25 / W35	PF	0.98
Fuse protection (HP module)	Rating	C 16A
Immersion rating (cylinder)	kW	2.0
Fuse protection (immersion)	Rating	B 10A
Number of electrical supplies		2
Hot water cylinder		
Type		Unvented
Material / insulation		Stainless steel / EPS foam
T&P valve rating		7 Bar or 90°C
Maximum water inlet pressure	bar	6
Storage Volume	l	172
Mixed water at 40°C V40	l	709
Expansion vessel (hotwater)	l	8
Declared ErP load profile		XXL
Integrated electric immersion	kW	2
Maximum temperature with immersion	°C	60
Water regulations		G3 KIWA approval to EN12897
T&P valve		Factory fitted
Standing heat loss EN12897-2016 (KIWA)	kWh / 24	1.97
Standing heat loss EN15332-2007 (SAP)	kWh / 24	1.63
Cylinder heat up time (from 10 to 60°C)	Hrs	1.5
Accessories supplied loose		Tundish, discharge pipework, 1.5m hose, adjustable feet

Table 22 : 9kW Heating and Cooling Technical Specification

15.0 Servicing Guarantee Information

Zeroth - Service Plan Overview

At Glen Dimplex UK Ltd (Dimplex), we are committed to supporting the full life cycle of the Zeroth Energy System – from design and installation through to ongoing maintenance. Our aim is to ensure the system continues to operate safely, efficiently, and reliably for many years, giving peace of mind to developers, consultants, and property owners alike.

Choosing manufacturer-led servicing is the best way to safeguard performance and protect your investment. It ensures that all work is carried out by trained and competent Engineers or approved service partners using genuine parts, and that your product guarantee remains valid. With Dimplex, support is straightforward – one point of contact for advice, service, or repair whenever you need it.

Managed Installation Process

At Glen Dimplex UK Ltd (Dimplex), we are committed to supporting the full life cycle of the Zeroth Energy System – from design and installation through to ongoing maintenance. Our aim is to ensure the system continues to operate safely, efficiently, and reliably for many years, giving peace of mind to developers, consultants, and property owners alike.

Choosing manufacturer-led servicing is the best way to safeguard performance and protect your investment. It ensures that all work is carried out by trained and competent engineers or approved service partners using genuine parts, and that your product guarantee remains valid. With Dimplex, support is straightforward – one point of contact for advice, service, or repair whenever you need it.

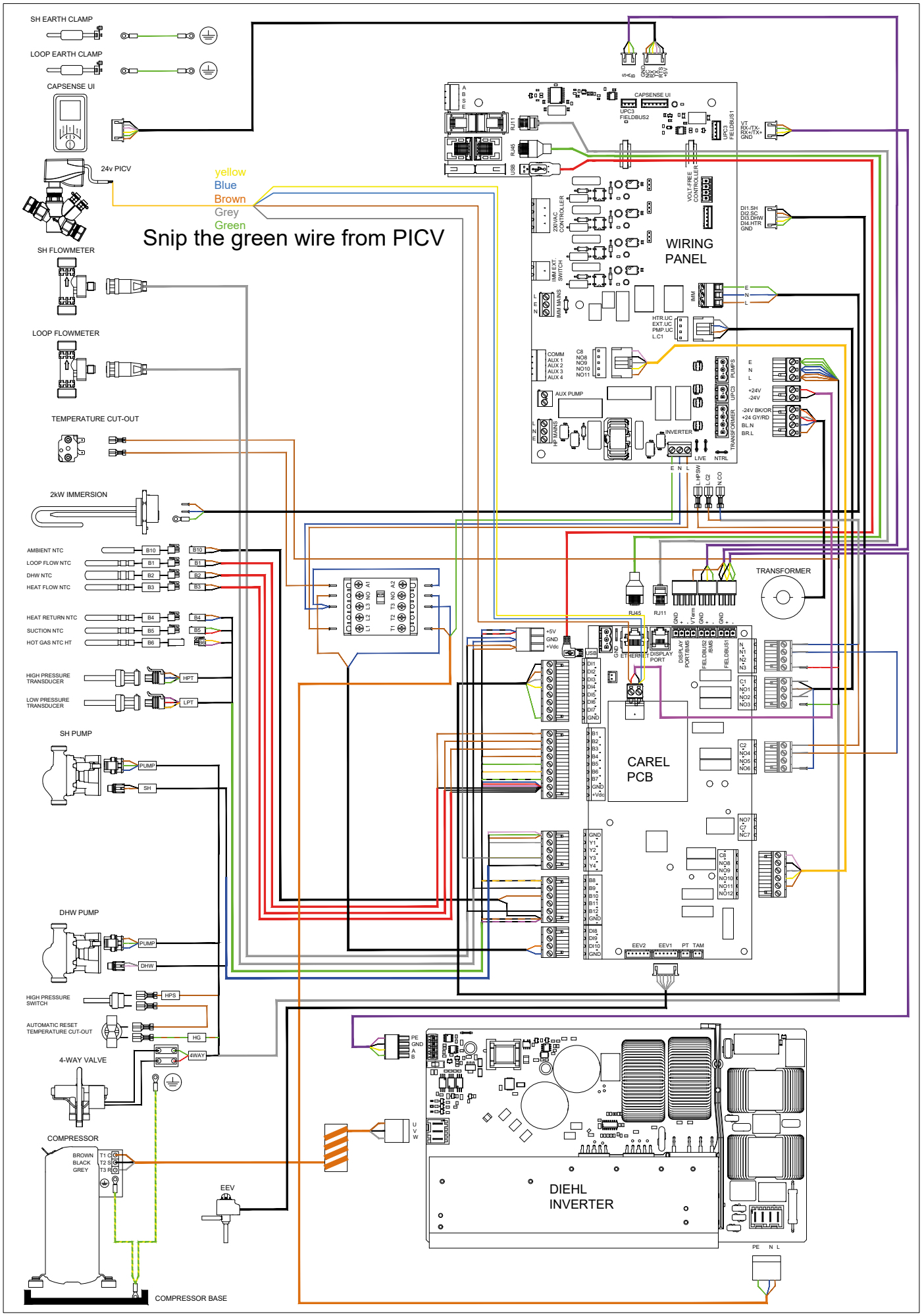
Heat Pump Product Guarantee

Standard cover: 2 years (parts and labour), subject to guarantee terms and conditions.

To view the full guarantee terms and conditions, please visit:

https://www.gdhv.com/legal/en-gb/guarantee-terms-conditions

16.0 Electrical Connections (Fig. 130)



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 will invalidate the guarantee, 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 ____________________

ALL SYSTEMS

What is the static cold water pressure at the inlet to the system? ________ ☐ psi

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 according to CSA Standards and local codes? ________ Yes ☐

What is the hot water termperature at the nearest outlet? ________ ☐ °C

All appropriate pipes have been insulated up to 1 metre or the point where they become concealed. ________ Yes ☐

ALL SYSTEMS

What is the static cold water pressure at the inlet to the system? ..... ☐ psi

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 according to CSA Standards and local codes? ..... Yes ☐

What is the hot water termperature 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? ..... ☐ psi

Has a combined tempearture and pressure relief valve been fitted and discharge tested? ..... Yes ☐ No ☐

The tundish and discharge pipework have been connected and terminated according to CSA Standards and local codes? ..... Yes ☐

Are all energy devices fitted with a cut out device? ..... Yes ☐ No ☐

ALL INSTALLATIONS

The hot water system complies with the appropriate CSA Standards and local codes? ..... Yes ☐

The system has been installed and commissioned with the manufacturer's instructions. ..... Yes ☐

The system controls have been demonstrated to and understood by the customer. ..... Yes ☐

The manufacturer's literature, including this 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)

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 .....

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Signature .....

SERVICE 4 Date .....

Engineer Name .....

Company Name .....

Telephone Number .....

Comments .....

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Signature .....

SERVICE 5 Date .....

Engineer Name .....

Company Name .....

Telephone Number .....

Comments .....

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Signature .....

SERVICE 6 Date .....

Engineer Name .....

Company Name .....

Telephone Number .....

Comments .....

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Signature .....

SERVICE 7 Date .....

Engineer Name .....

Company Name .....

Telephone Number .....

Comments .....

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Signature .....

SERVICE 8 Date .....

Engineer Name .....

Company Name .....

Telephone Number .....

Comments .....

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Signature .....

SERVICE 9 Date .....

Engineer Name .....

Company Name .....

Telephone Number .....

Comments .....

.....

.....

.....

Signature .....

SERVICE 10 Date .....

Engineer Name .....

Company Name .....

Telephone Number .....

Comments .....

.....

.....

.....

Signature .....

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. Glen Dimplex UK Ltd reserve the right to revise products, literature and guarantee terms without prior notice due to a policy of continuous improvement.

To speak to customer services please contact:

www.dimplex.co.uk

Glen Dimplex UK Ltd
Millbrook House, Grange Drive, Hedge End,
Southampton, SO30 2DF

Glen Dimplex Europe
Airport Road, Cloghran,
Co. Dublin K67 VE08

This manual is available online, follow the link by scanning the QR Code below: