

Installation and Servicing Instructions

Alpha Plus District Heating Units

**for
Domestic Hot water and
Low Pressure or Direct Central Heating**

For Technical help or for Service call ...
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Alpha
HEATING INNOVATION

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Leave these instructions with the User

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1 INTRODUCTION

The Alpha Plus district heating units are hydraulic units designed for various heating applications within individual domestic dwellings served by a district heating scheme.

The Low Pressure Heating unit comprises of:-

1 Domestic Hot Water Unit - Model DHW (Part No. 6.3000100)

This unit provides instantaneous hot water indirectly from a district heating circuit via a plate heat exchanger. The main components are pre-assembled and mounted on a back panel. Isolation valves, strainer and wall fixings are supplied.

2 Low Pressure Central Heating Unit - Model LPCH (Part No. 6.3000300)

This unit is to be used in conjunction with the DHW unit and provides central heating to the dwelling indirectly from the district heating circuit via a plate heat exchanger. It incorporates all the necessary components, i.e. pump, expansion vessel, safety valve, pressure gauge, filling loop, pressure switch etc. required to provide a sealed central heating system with a maximum working pressure of 2.5 bar (refer to Fig. 1).

The Direct Heating unit comprises of:-

1 Domestic Hot Water unit as described above.

2 Direct Central Heating unit - Model DCH (Part No. 6.3000200)

This unit must be used in conjunction with the DHW unit and will provide central heating to the dwelling directly from the district heating circuit. The central heating radiators used must be suitable for at least 8 bar working pressure.

Note: Differential pressure control valves and an automatic by-pass valve for fitting to the district heating circuit are not provided in the above units and need to be supplied by the installer.

The above district heating units comply with the following requirements:-

Electrical requirements of BS EN60335-1

EMC requirements of BS EN55014-2, BS EN61000-6-3, BS EN6100-7:2008

UK Water Regulations / Byelaws (Scotland)

Northern Ireland Water Regulations.

IMPORTANT

The installation should also be in accordance with the following British Standards and requirements:-

All current Department of Environment Building Regulations, i.e. Approved Document L1

Building Standards (Scotland), Regulations issued by the Scottish Development Department

UK Water Regulations / Byelaws (Scotland)

Health and Safety Document No. 635 (The Electricity At Work Regulations 1989)

Forced circulation hot water systems, BS EN12828:2003, BS EN12831:2003, BS EN14336:2004

Design, installation, testing and maintenance of services supplying water, BS 6700:2006, BS EN806-2:2005, BS EN806-3:2006

BS 5546:2000 Installation of hot water supplies for domestic purposes

BS 7983:2001 Code of Practice for treatment of water in heating systems

BS 7671:2008 Requirements for electrical installations, IEE Wiring Regulations

Note: Manufacturer's instructions must NOT be taken in anyway as over-riding statutory obligations.

2 TECHNICAL DATA

2.1 DISTRICT HEATING CIRCUIT (and Direct Heating Circuit)

Max. Working Pressure	8 bar
Min. Working Pressure	1 bar
Max. Flow Temperature	95° C
Max. Differential Pressure	4 bar
Flow Connection	22 mm
Return Connection	22 mm

2.2 SECONDARY CIRCUIT Domestic Hot Water

Max. Working Pressure	8 bar
Min. Working Pressure	0.2 bar
Heat Output to Water (approx)	20 to 28 kW
DH Circuit Flow Rate reqd for Max. Output	15 to 20 l/min
Max. Flow Rate at 35° C Rise (approx)	12 l/min
Min. Required Flow Rate	2.5 l/min
Adjustable Outlet Temperature up to	60° C
Max. Outlet Temperature (approx)	62° C
Mains Inlet Connection	15 mm
DHW Outlet Connection	15 mm

2.3 LOW PRESSURE CENTRAL HEATING

Sealed System

Max. Working System Pressure	2.5 bar
Min. System Pressure	0.5 bar
Max. System Temperature	85° C
Safety Valve Setting	3 bar
Expansion Vessel Size (pre-charge press)	8 L @ 1 bar
Flow Connection	22 mm
Return Connection	22 mm
Relief Valve Discharge Connection	15 mm
Recommended System Pressure (Cold)	1.0 bar

2.4 COMPONENTS

Low Pressure Heating Unit

CH Heat Exchanger	Stainless steel 14 plate
CH On/Off 2-way Valve	Brass body with removable actuator
Strainer for DH and CH	Brass 22 mm comp. with stainless steel filter
DH/CH Isolation Valves	Brass 22 mm compression
Pump with AAV and Separator	Grundfoss 15/60
LP Pressure Switch	Set at 0.5 bar switching
Expansion Vessel	8 litre pre-charged to 1 bar
Pressure Relief Valve/Gauge	Set at 3 bar

Direct Heating Unit

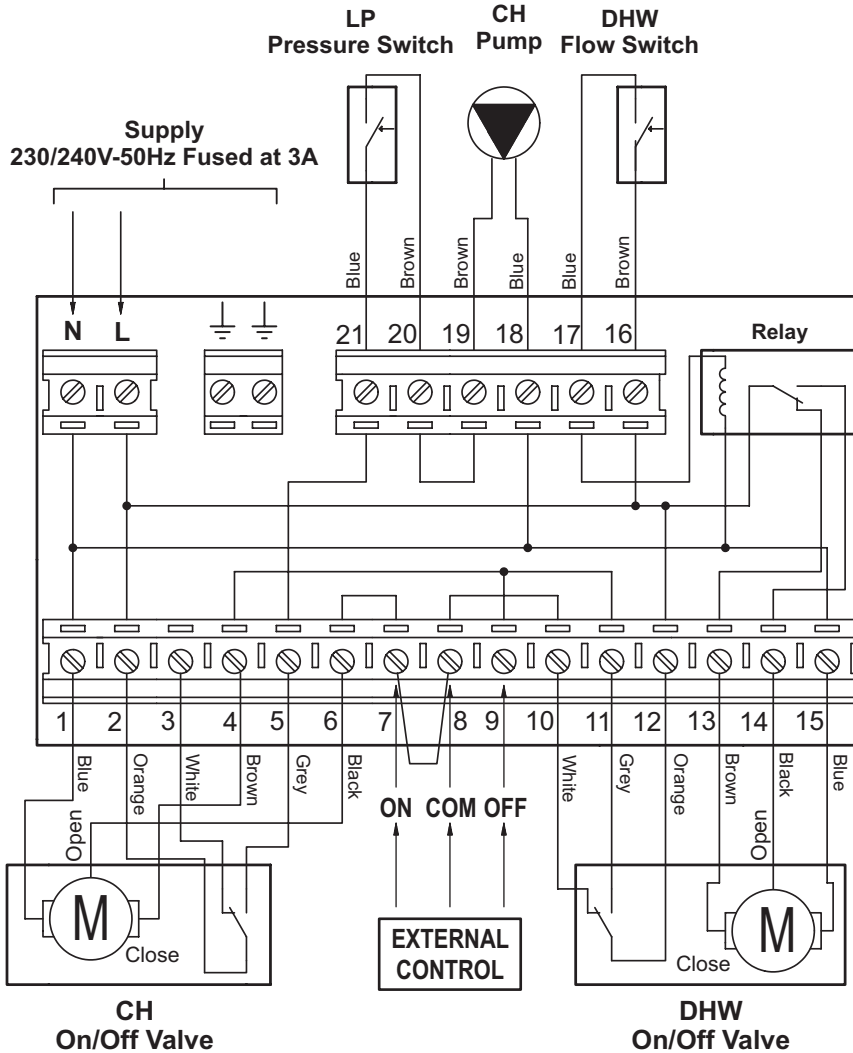
CH/DHW On/Off 2-way Valve	Brass body with removable actuator
DH/CH Isolation Valves	Brass 22 mm compression

Domestic Hot Water Unit

DHW Heat Exchanger	Stainless steel 23 plate
Hot Water Thermostatic Valve	Brass body with removable temp. sensor
DHW On/Off 2-way Valve	Brass body with removable actuator
DHW Flow Switch and Strainer	Nylon with 1/2" brass connection
Strainer for DH	Brass 22 mm comp. with stainless steel filter
DH Isolation Valve	Brass 22 mm compression
Cold Water Inlet Valve	Brass 15 mm compression

2.5 ELECTRICAL

Supply	230/240 V ~ 50 Hz
External Fuse	3 A
Power Consumption (Direct heating unit)	6 W
Power Consumption (Low Pressure heating unit)	116 W



2.6 INSTALLATION

Dimensions of each unit assembled unit (includes cover)	Height	510 mm
	Width	300 mm
	Depth	210 mm
Minimum clearances required	Top	10 mm
	Bottom	200 mm
	Sides	5 mm
	Front	450 mm
Assembled weight of units	DHW unit	7.4 kg
	LPCH	8 kg
	DCH	1.4 kg

2.7 LOW PRESSURE CENTRAL HEATING SCHEMATIC

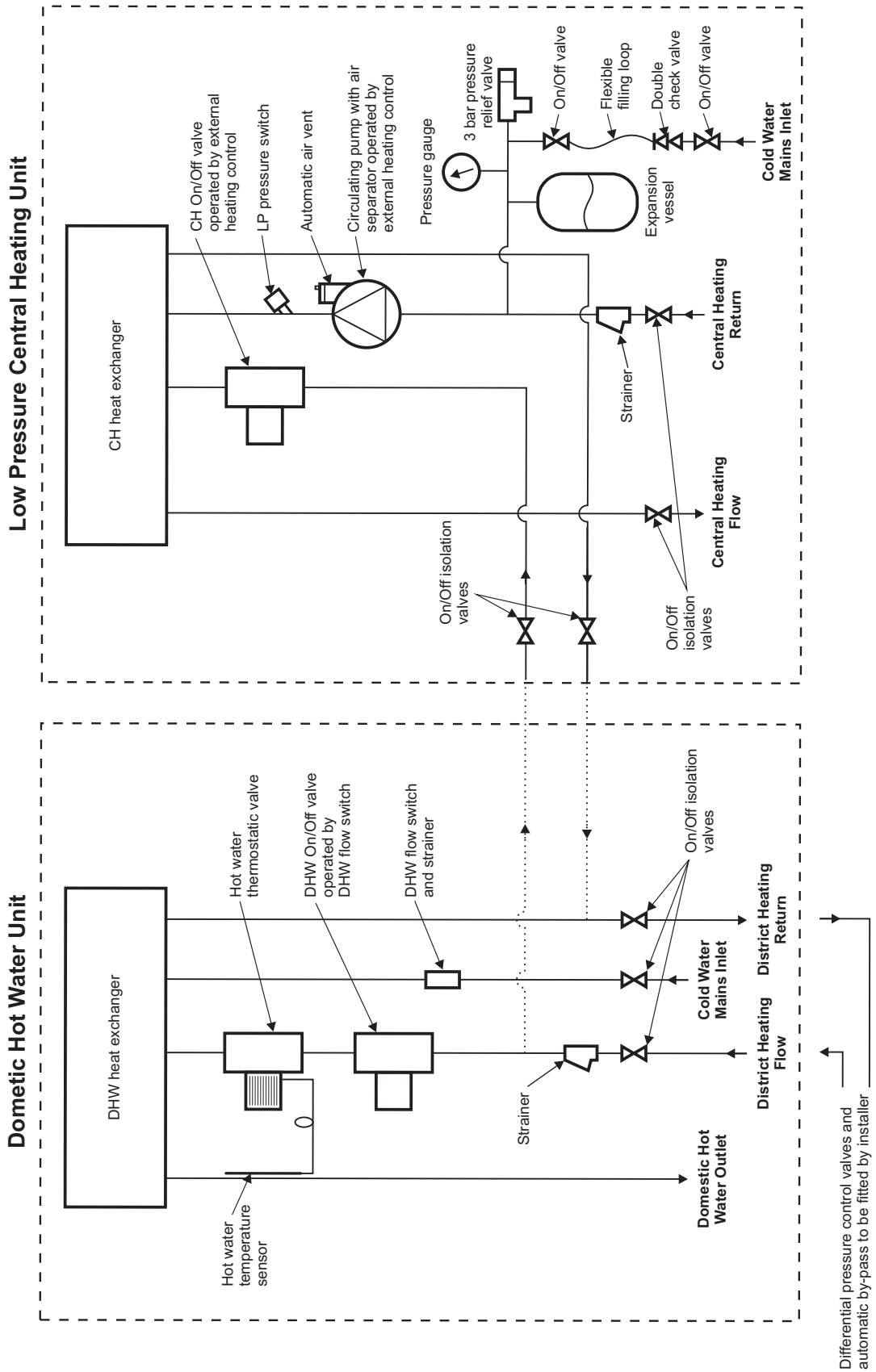


Fig. 1 Low Pressure Central Heating

2.8 DIRECT CENTRAL HEATING SCHEMATIC

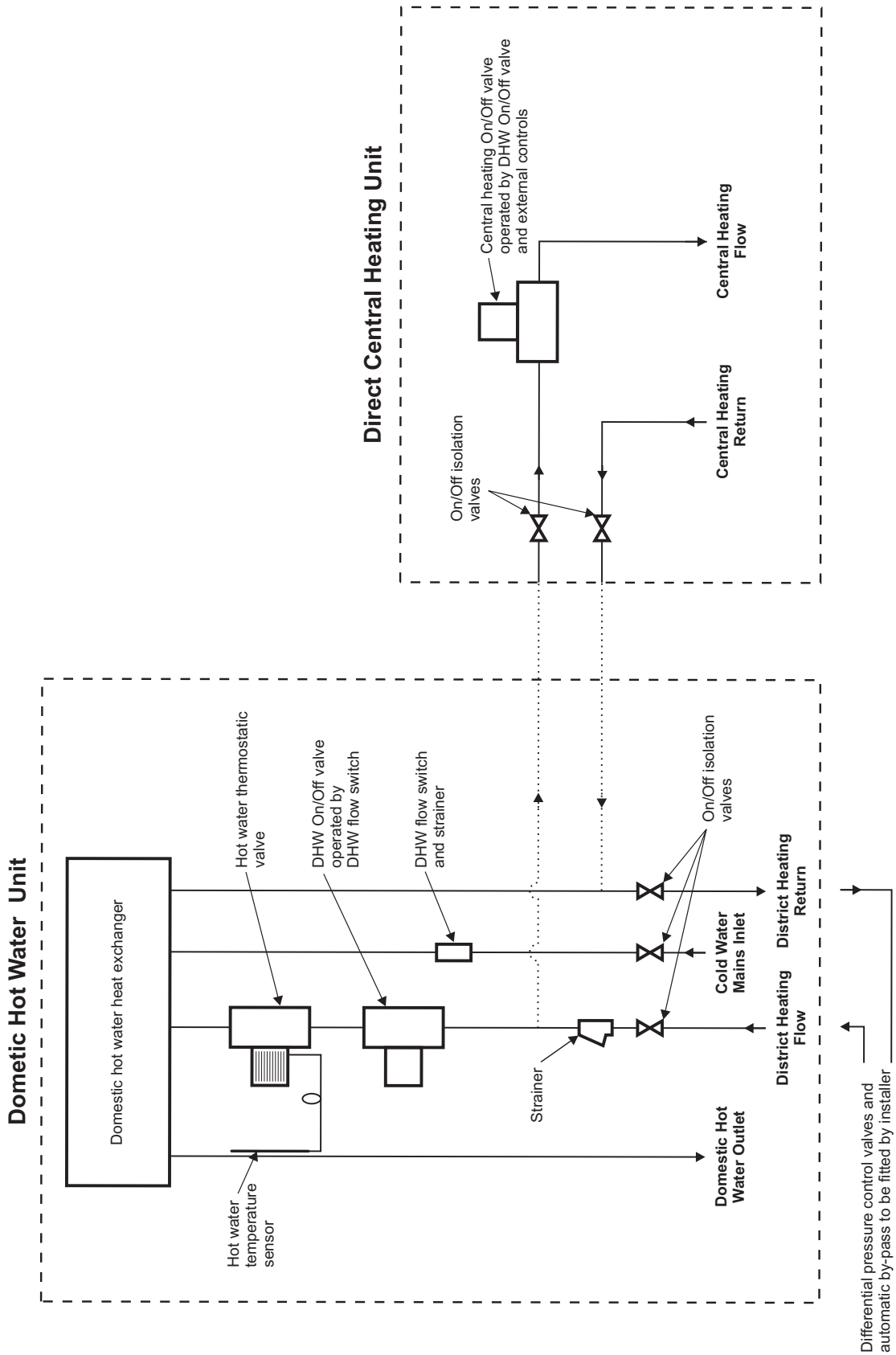


Fig. 2 Direct Central Heating

3 OPERATION

Domestic hot water is available continuously and always takes priority over central heating. If a demand for hot water is required during a central heating period, the controls will automatically switch to the hot water mode until the demand is satisfied. This interruption in the central heating is only when the demand for hot water is present and should not be noticed by the user.

3.1 DOMESTIC HOT WATER MODE

When there is a demand for hot water, the flow switch operates and the DHW valve is opened via a relay. District heating water is circulated to the DHW heat exchanger thus heating the incoming mains water. The hot water is maintained at the set temperature by the hot water thermostatic valve regulating the district heating water flow to the heat exchanger. When the flow switch senses that hot water is no longer required, the DHW valve closes.

3.2 CENTRAL HEATING

Low pressure heating - If there is a call for heating from an external control, the central heating valve opens and district heating water is circulated to the central heating heat exchanger. The pump will start and circulate the central heating water to the dwelling's radiators via the heat exchanger. When there is a demand for hot water, the central heating valve will close and will not open until the hot water demand has been satisfied.

Note: If the pressure in the central heating system falls below 0.5 bar, the pressure switch will operate and stop the pump from running until the system has been re-pressurised above 0.5 bar.

Direct heating - If there is a call for heating from an external control, the central heating valve opens and allow district heating water to circulate to the dwelling's radiator circuit. When there is no demand for heating the central heating valve will close. If there is a demand for hot water, the central heating valve will close and will not open until the hot water demand has been satisfied.

If the system is installed where discharges from safety devices may not be apparent, i.e. in dwellings occupied by blind, infirm or disabled people, consideration should be given to the installation of an electronically operated device to warn when discharge takes place.

4 INSTALLATION

4.1 UNPACKING

1. The contents of each box is as follows:-

- DHW Box Assembled unit - panel mounted with heat exchanger, flow switch, DHW valve, HW thermostatic valve and sensor, control box, pipework and front casing
Screws and wall plugs
Two 22 mm isolation valves, strainer and 15 mm isolation valve
- LPCH Box Assembled unit - panel mounted with heat exchanger, pump with AAV and separator, CH valve, pressure switch and pipework
Four 22 mm isolation valves, strainer, screws and wall plugs
Sealed system kit
- DCH Box CH valve and two 22 mm isolation valves

2. Unpack and remove the loose items.

4.2 UNIT LOCATION

- 1 The unit is not suitable for external installation. It must be installed vertically on a flat vertical wall which is capable of supporting its weight.
- 2 Decide upon the position of the unit, taking into consideration the clearances required (refer to Section 2.6).
- 3 Refer to the Fig. 3 or 4 for the layout and location of the unit(s).

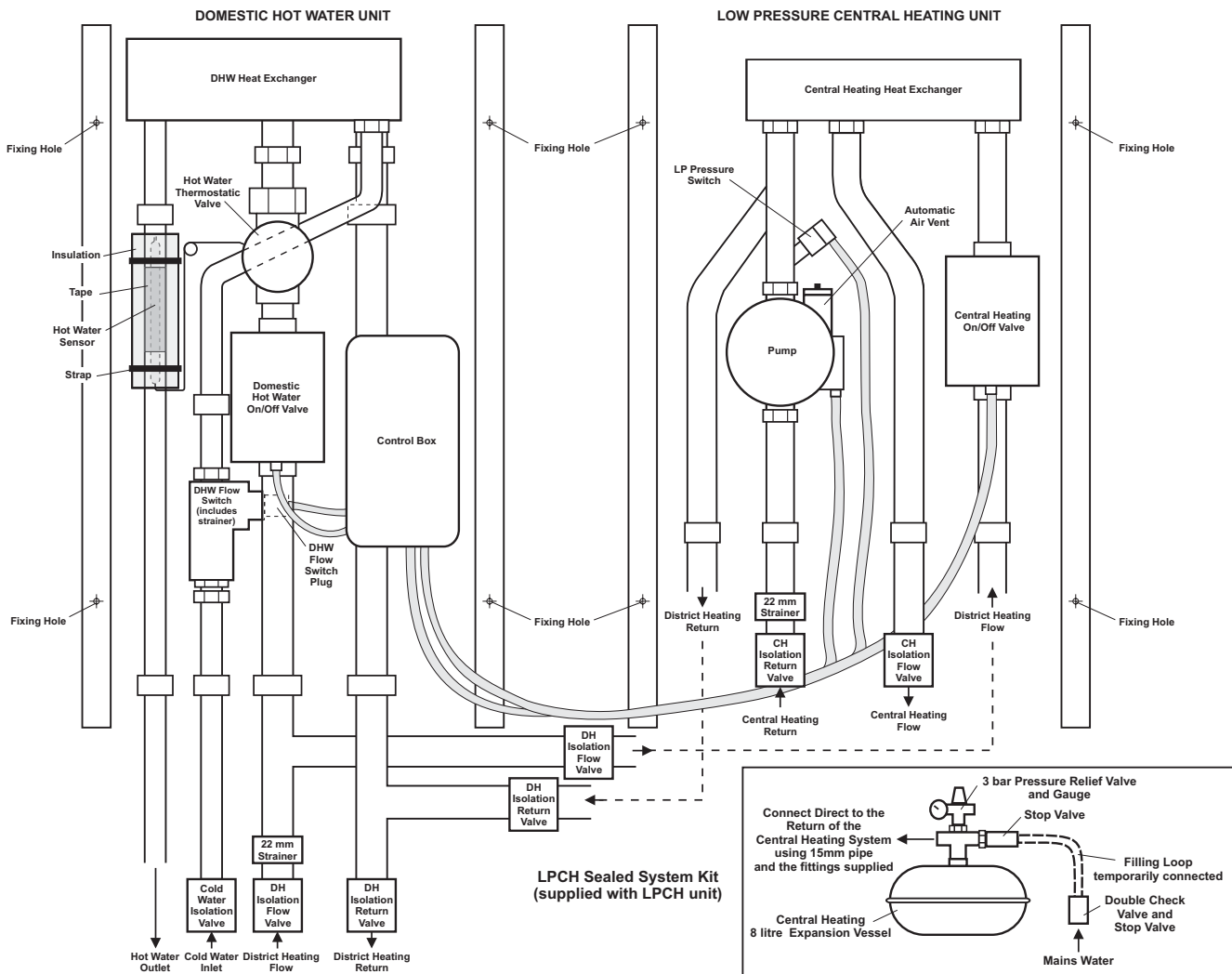


Fig. 3 Low Pressure Central Heating

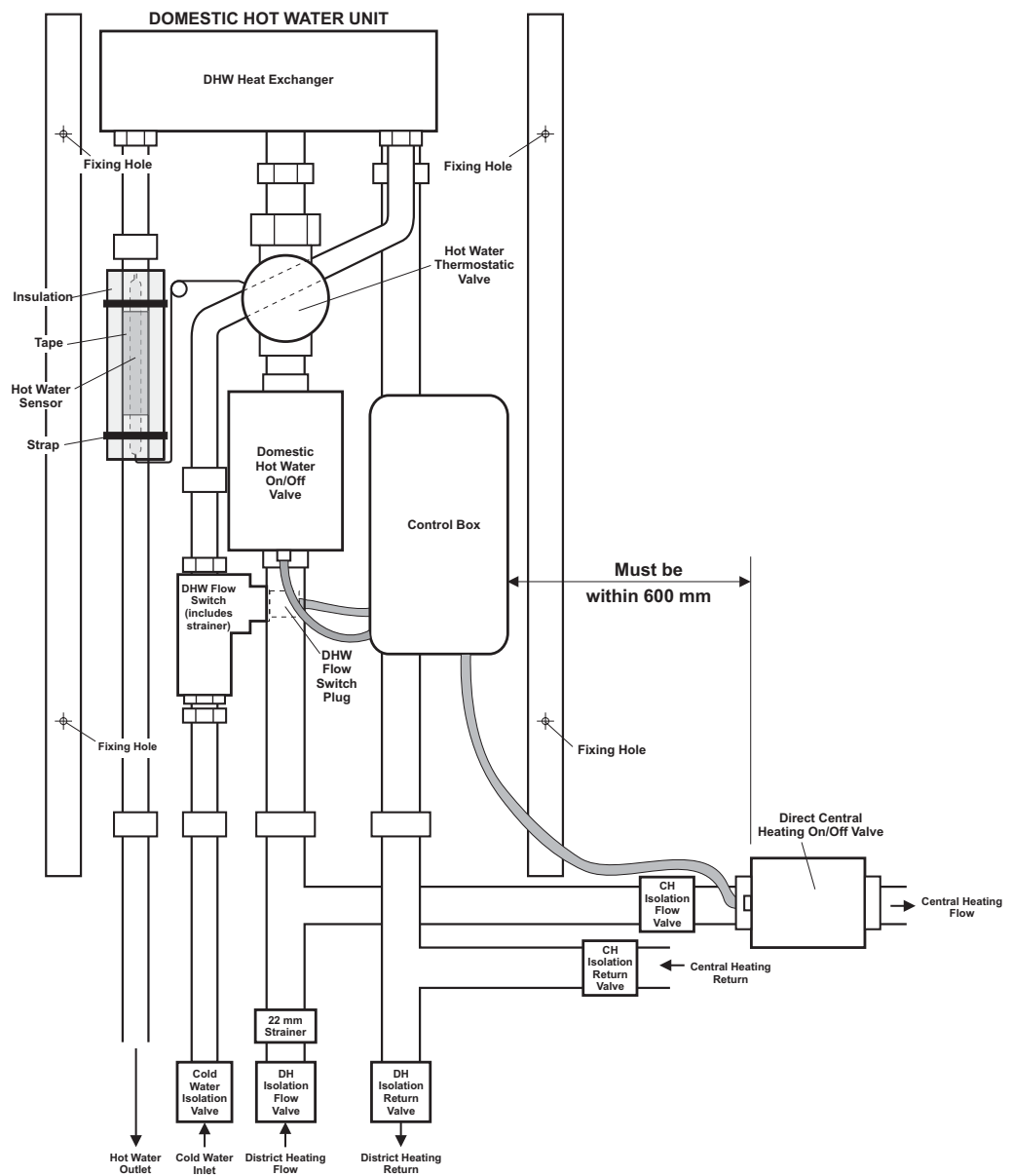


Fig. 4 Direct Central Heating

4.3 FIT THE DOMESTIC HOT WATER UNIT

- 1 Hold the unit on the wall in the required position, ensuring it is level, and mark the position of the fixing holes. Drill the fixing holes in the wall to accept the wall plugs and screws provided.
- 2 Screw the two top fixings into place leaving the screw heads slightly proud of the wall.
- 3 Hang the unit onto the screws via the keyhole slots.
- 4 Introduce the two bottom screws and tighten all fixings.

4.4 CONNECT THE PIPEWORK - See Fig. 3 or 4

- 1 Thoroughly flush out **ALL** the system pipework.

Note - Low Pressure Central Heating: An automatic system by-pass must always be fitted.

- 2 Connect a 15 mm isolating valve to the cold water inlet pipe of the unit and then connect the domestic hot water pipework.
- 3 Using 'T' connections, connect the district heating flow and return connections to the domestic hot water unit as shown in Fig. 3 or 4.

If a low pressure central heating unit is used - fit it in position as shown in Fig. 3 and described in Sections 4.2 and 4.3. Fit two of the 22 mm isolation valves between the units.

Note: Ensure the low pressure central heating unit is located within 300 mm of the domestic hot water unit. This will allow the cables to be directly connected into the unit's control box.

If a direct central heating unit is used - fit the central heating valve and isolating valves in the positions shown in Fig. 2.

Note: Ensure the central heating valve is located within 600 mm of the domestic hot water unit. This will allow it's cable to be directly connected into the unit's control box.

- 4 **If a low pressure central heating unit is used** - fit the 22 mm strainers supplied to the district heating flow pipe and to the central heating return pipe. Fit the 22 mm isolation valves to the central heating flow and return. Ensure the strainers are always fitted after the valves so that isolation allows cleaning of the filter. See Fig. 1.

If a direct central heating unit is used - fit the 22 mm strainer supplied to the district heating flow pipe and then fit the two isolation valves to the district heating flow and return pipes. See Fig. 2.

4.5 FIT THE SEALED SYSTEM KIT - Low Pressure Central Heating Unit Only

- 1 Assemble the components of the sealed system kit as shown in the instructions supplied with the kit.

Notes: Check that the expansion vessel has been charged to 1 bar before connecting it to the system.

The pressure relief valve discharge pipe must be routed to a drain in such a manner that it may be seen, but cannot cause injury to persons or property.

4.6 CONNECT THE CENTRAL HEATING VALVE CABLE - Refer to Section 7.1

- 1 Gain access to the domestic hot water unit terminal block by removing the four screws securing the control box cover.
- 2 Pass the central heating valve cable through a cable clamp and connect the wires to terminal block as follows (refer to diagram in Section 7.1):
 - Brown to terminal 4
 - Black to terminal 6
 - Blue to terminal 1
 - Grey to terminal 5
 - Orange to terminal 2
 - White to terminal 3
- 3 Tighten the cable clamp by hand until the cable is secured.

4.7 CONNECT THE CENTRAL HEATING PUMP CABLE - Low Pressure Central Heating Unit Only

- 1 Pass the central heating pump cable through a cable clamp and connect the wires to terminal as follows (refer to diagram in Section 7.1):
 - Brown to pump L (No. 19)
 - Blue to pump N (No. 18)
 - Green/Yellow to pump earth
- 2 Tighten the cable clamp by hand until the cable is secured.

4.8 CONNECT THE PRESSURE SWITCH - Low Pressure Central Heating Unit Only

- 1 Pass the pressure switch cable through a cable clamp and connect the wires to terminal (refer to diagram in Section 7.1):
 - Brown wire to terminal 20
 - Blue wire to terminal 21
- 2 Tighten the cable clamp by hand until the cable is secured.

4.9 CONNECT THE ELECTRICAL SUPPLY - Refer to Section 2.4

The unit requires a 230/240 V ~ 50 Hz mains supply, fused at 3 A.

The unit must be earthed.

There must only be one common isolator, providing complete electrical isolation, for the unit and any external controls.

The unit has been fitted with a supply cable, however, if it is necessary to fit a new cable use PVC insulated cable not less than 0.75 mm² (24 x 0.2 mm) to BS 6500 Table 16, the unit should be connected to a fused three pin plug and un-switched shuttered socket outlet (both complying with BS 1363), or a fused double pole switch with a contact separation of at least 3 mm in both poles.

Wiring external to the unit must be in accordance with the current IEE Wiring Regulations (BS 7671).

Note: If external controls are fitted, they MUST be suitable for 230/240 V switching and MUST be single pole, 2-way/ changeover switching.

- 1 Gain access to the domestic hot water unit terminal block by removing the four screws securing the control box cover.
- 2 Should the mains cable need extending or replacing, pass the new cable through the cable clamp and connect as follows:
Brown to L
Blue to N
Green/Yellow to earth
Ensure correct polarity.
Note: Ensure that the length of the earth wire is such that if the supply cable is pulled out of its clamp, the live and neutral wires become taut before the earth wire.
- 3 If an external control, i.e. room thermostat or external clock is to be fitted, remove the link between terminals 7 and 8. Pass the cable through the cable clamp and connect to terminals 7, 8 and 9 using 7 as switched live and 9 as heating off. See Section 7.1.
- 4 Ensure that there is sufficient free cable to allow the control box cover to be removed providing access to the main terminal block, then tighten the cable clamps by hand.
- 5 Carry out electrical system checks - short circuit, polarity, earth continuity and resistance to earth using a suitable multimeter.
- 6 Replace the control box cover and secure in position using the four screws previously removed.



Fig. 5

5 COMMISSIONING

5.1 FILL THE DOMESTIC HOT WATER PIPEWORK

- 1 Open the cold water mains inlet valve.
- 2 Turn on all the hot water taps and allow water to flow until there is no air present.
- 3 Turn off the taps and check for water soundness, rectifying if necessary.

5.2 FILL THE DISTRICT HEATING PIPEWORK

- 1 Open the district heating flow and return isolation valves.
- 2 Manually open the domestic hot water valve to allow water to flow by pushing the white lever down to midway and in on the valve's actuator. This will hold the valve in the open position.
- 3 Check for water soundness, rectifying if necessary.

5.3 FILL THE CENTRAL HEATING SYSTEM

Low pressure sealed system

- 1 Open the central heating flow and return isolation valves.
- 2 Connect the filling loop and open the valves to allow water to flow into the system.
- 3 Continue to fill the system until the pressure gauge indicates 1.0 bar.
- 4 Close the filling loop valves and vent all radiators and pump of air. Repeat this procedure if necessary.
- 5 Check for water soundness, rectifying if necessary.
- 6 Check the operation of the pressure relief valve by turning the head anti-clockwise until it clicks.
- 7 Check that the system pressure is at 1.0 bar, open the filling loop valves to top up if necessary.
- 8 Ensure the filling loop valves are closed and disconnect it from the mains water supply.

Note: An automatic system by-pass must always be fitted.

Direct system

- 1 Open the central heating flow and return isolating valves and allow the district heating water to flow into the system.
- 2 Vent each radiator etc. to remove any air.
- 3 Check for water soundness, rectifying if necessary.

5.4 CHECK THE SYSTEM OPERATION

- 1 Turn on the electrical supply.
- 2 Turn on the central heating and the central heating valve should open.
- 3 Open a hot water tap and check that the domestic hot water valve opens, the central heating valve closes and hot water is supplied.
- 4 Set the outlet temperature as required, by adjusting the thermostat control knob (setting 9 gives approximately 55 to 60° C).
- 5 Turn off the tap and check that the domestic hot water valve closes and the central heating valve opens.

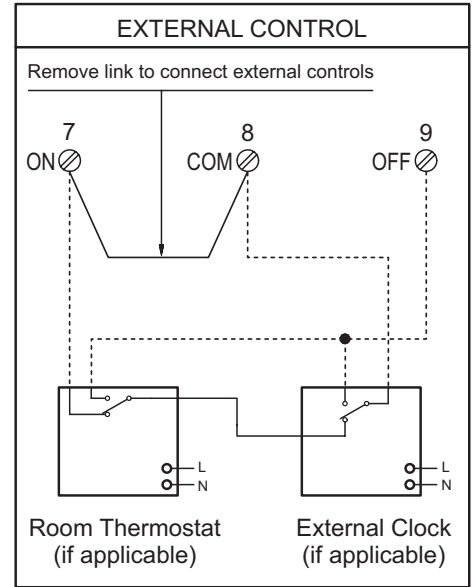
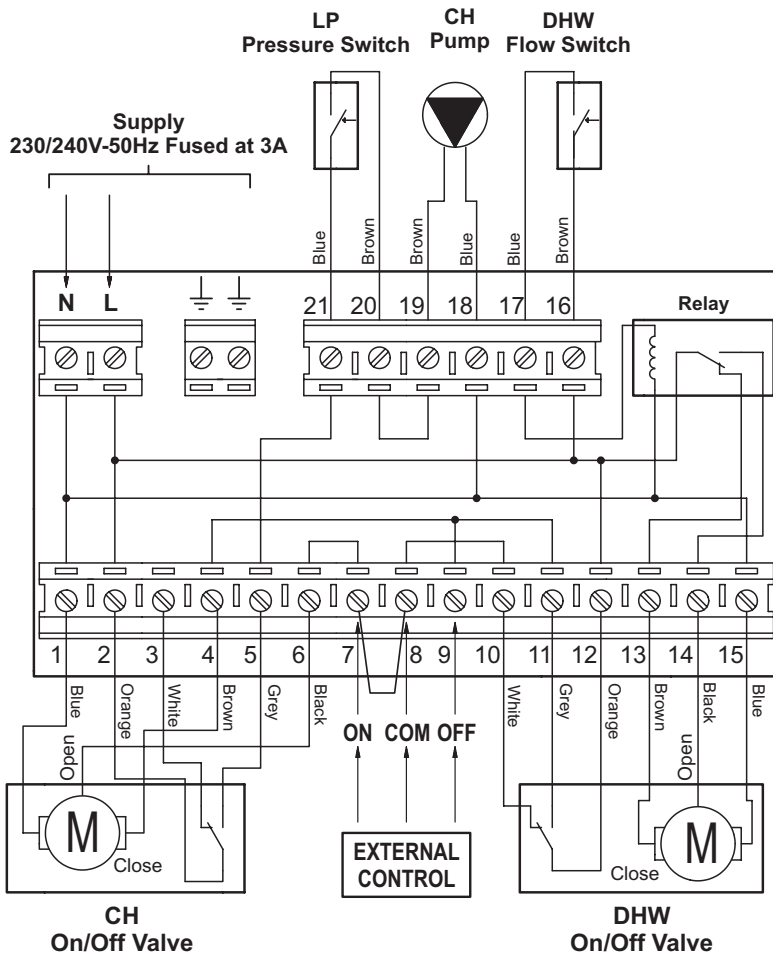
6 SERVICE and COMPONENT REPLACEMENT

Each component is easily removable for replacement or cleaning without needing to remove other components.

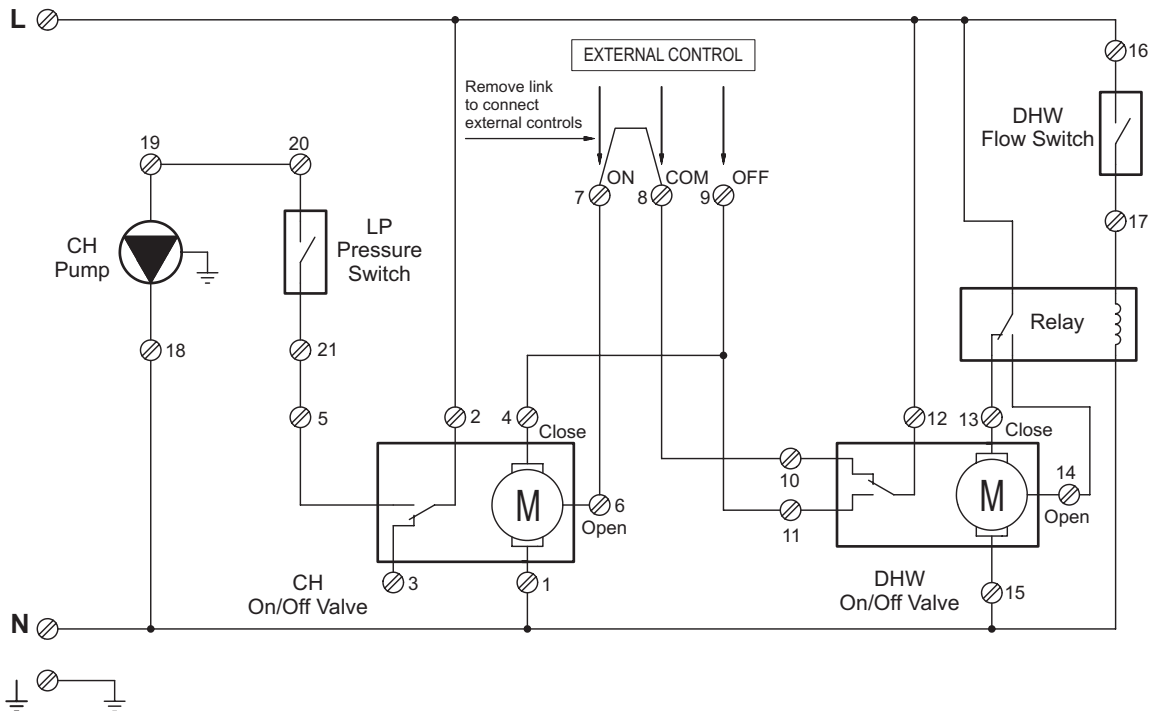
Note: Isolate the electrical supply before removing the casing.

7 WIRING DIAGRAMS

7.1 CONTROL WIRING



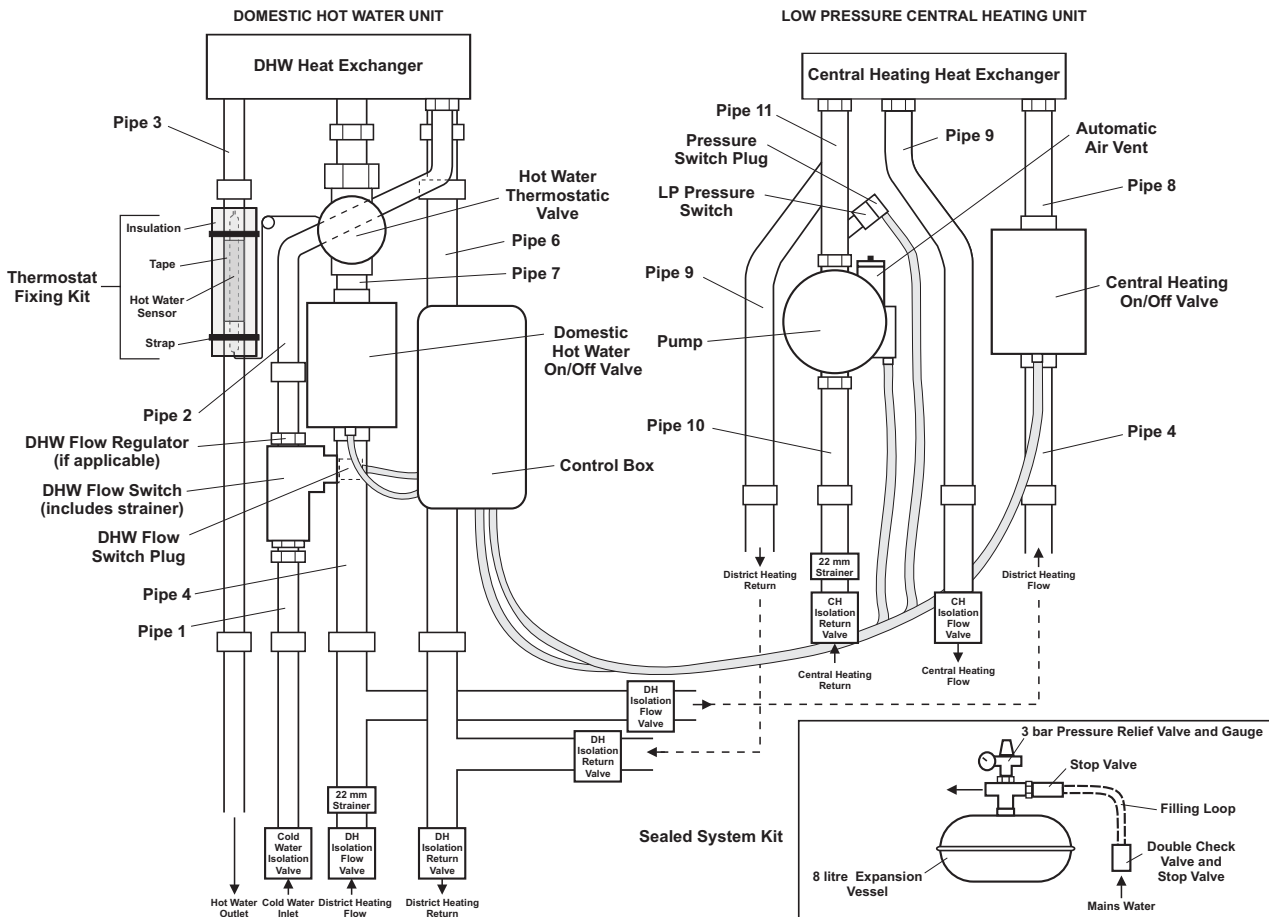
7.2 FUNCTIONAL FLOW WIRING



8 SHORT PARTS LIST

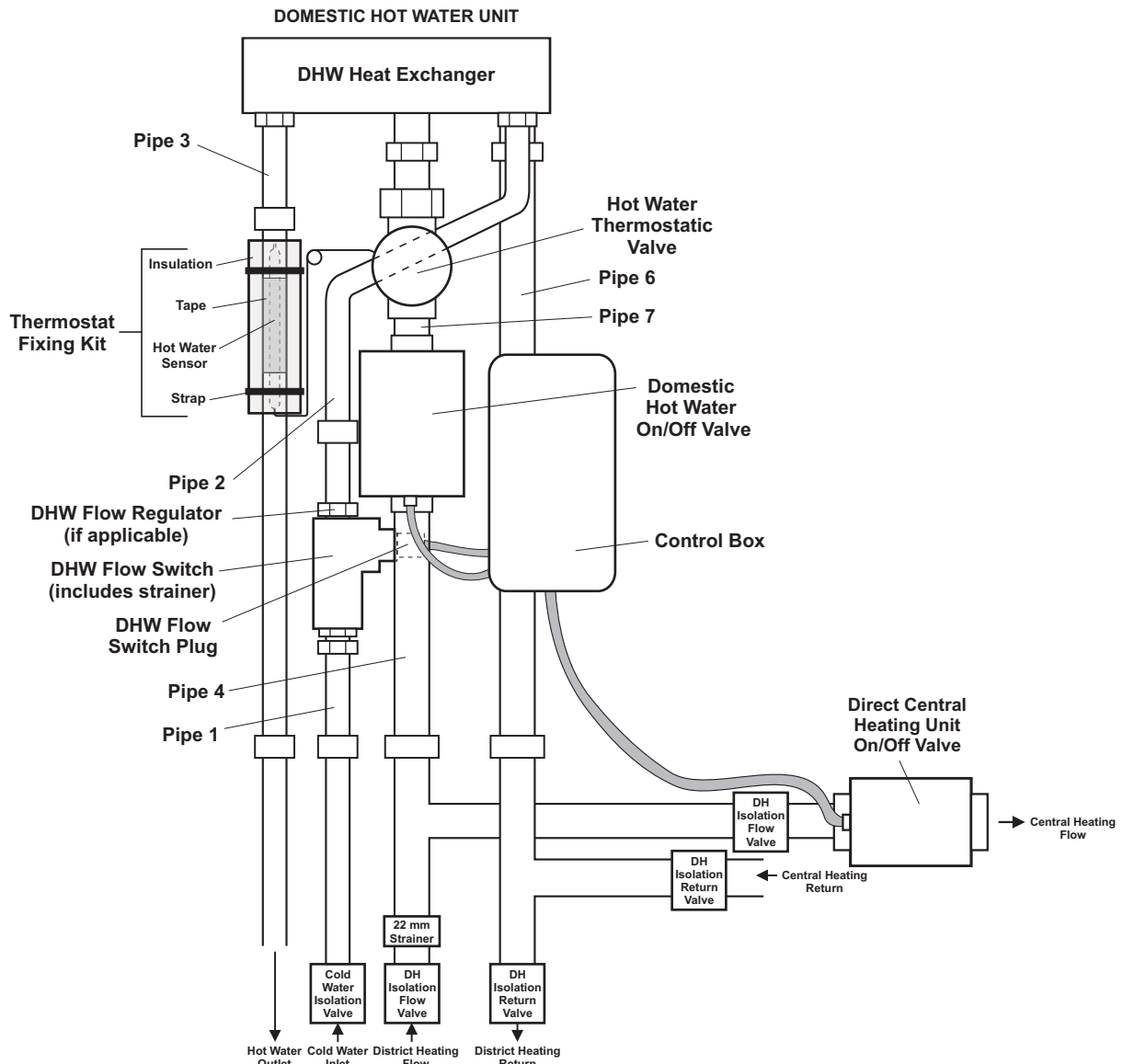
8.1 DOMESTIC HOT WATER UNIT WITH LOW PRESSURE CENTRAL HEATING UNIT

Description	Alpha part No.
Domestic hot water heat exchanger	1.020259
Domestic hot water flow switch	1.015142
Pipe 1 - mains inlet/flow switch	1.019921
Pipe 2 - flow switch/heat exchanger	1.019922
Pipe 3 - domestic hot water outlet	1.019923
Pipe 4 - district heating flow	1.019924
Pipe 6 - district heating return	1.019924
Pipe 7 - 22 mm x 60 mm	6.3000144
Electrical plug - flow switch	6.3000111
Relay (control box)	1.027345
Control box assembly	3.020221
PCB (relay included)	1.024112
Thermostat body	6.3000131
Thermostat head and sensor	6.3000130
15 mm isolation valve	6.3000141
22 mm isolation valve	6.3000142
22 mm strainer	6.3000143
Thermostat sensor fixing tape	1.028925
Domestic hot water flow regulator - 10 L	1.016595
Central heating heat exchanger	1.020066
Pump 15/60	1.015610
Automatic air vent	1.010771
Sealed system kit	3.016691
Pipe 8 - district heating flow/heat exchanger	1.020754
Pipe 9 - low pressure central heating flow/district heating return	1.020755
Pipe 10 - low pressure central heating return/pump	1.022084
Pipe 11 - low pressure central heating heat exchanger/pump	1.022084
Pressure switch	1.018320
Electrical plug - pressure switch	6.3000333
Casing assembly	3.017053
Domestic hot water/central heating actuator	1.024789
Domestic hot water/central heating valve body	1.028843
Thermostat sensor insulation	1.025738



8.2 DOMESTIC HOT WATER UNIT WITH DIRECT CENTRAL HEATING UNIT

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PCB (relay included)	1.024112
Thermostat body	6.3000131
Thermostat head and sensor	6.3000130
15 mm isolation valve	6.3000141
22 mm isolation valve	6.3000142
22 mm strainer	6.3000143
Thermostat sensor fixing tape	1.028925
Domestic hot water flow regulator - 10 L	1.016595
Casing assembly	3.017053
Domestic hot water/central heating actuator	1.024789
Domestic hot water/central heating valve body	1.028843
Thermostat sensor insulation	1.025738



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*These instructions have been carefully prepared but we reserve the right to alter the specification at any time in the interest of product improvement.
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