ElectroMax

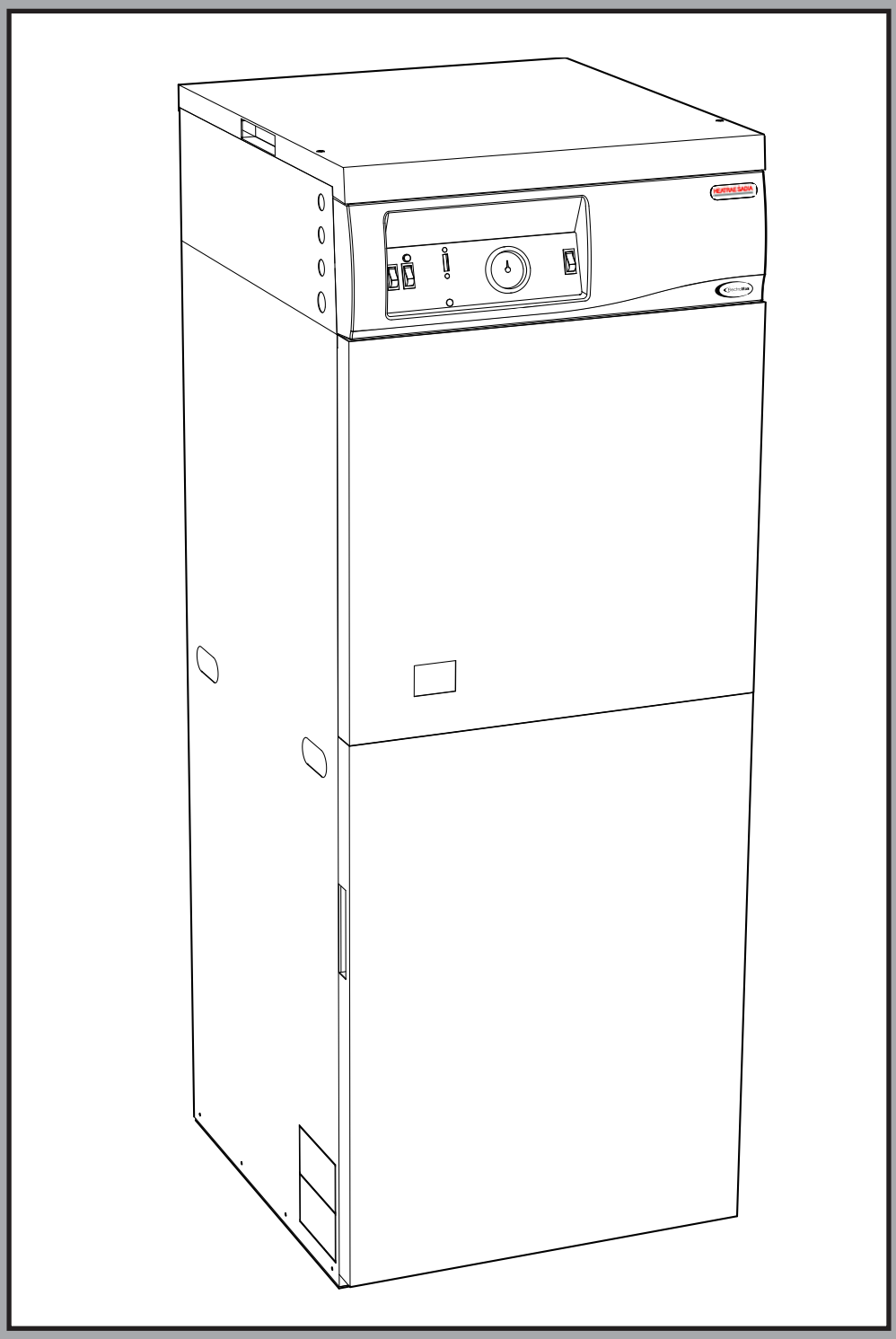
HEATRAE SADIA

The quality name in water heating

ELECTROMAX

Combined Electric Flow Boiler and Direct Unvented Water Heater

INSTALLATION & SERVICING INSTRUCTIONS



Please read and understand these instructions before starting work
Please leave this leaflet with the user following installation and commissioning

Contents

1.0 Introduction

1.1 Important Notes

The Electromax must be installed in accordance with the manufacturer's instructions and all relevant regulations in force at the time of installation.

The Electromax Domestic Hot Water Cylinder is of the UNVENTED type. Its installation is subject to Building Regulation G3 (England and Wales), Technical Standard P3 (Scotland) or Building Regulation P5 (Northern Ireland). Installation must be carried out by a competent person.

Please read and understand these instructions before installing the Electromax. Following installation and commissioning the operation of the Electromax, the central heating system and associated controls should be explained to the customer and these instructions left with them for future reference.

The Electromax electric central heating boiler must be installed into a sealed (pressurized) primary system. Following installation of the primary system the system should be flushed in accordance with BS 7593 and an inhibitor added.

The Electromax Domestic Hot Water cylinder is directly heated by means of electric immersion heaters. The electric central heating boiler although housed in the same casing operates completely independently to the cylinder. It is strongly recommended that the water heating is done by means of an Off-Peak electrical supply.

The use of an Off-Peak tariff that provides at least three off peak electricity periods, such as Economy 10, is recommended. Where possible the central heating "on" periods should be programmed to coincide with the off peak electricity periods available during the day. This will ensure maximum economy of the system. Refer to Table 2, Page 19 "Tariff Guide" for information on the off peak periods available from various electricity providers.

The Electromax does not contain any substances harmful to health; it does not contain any asbestos. Small quantities of adhesives and sealants used in the manufacture of the product are cured and present no known hazards.

1.2 Basic operation of the Electromax

The Electromax is an integrated electric flow boiler and direct electrically heated unvented domestic water heating cylinder.

The domestic hot water is preferentially heated by an Off Peak electricity supply via an immersion heater that is specially designed to heat virtually the complete cylinder capacity. A "Boost" immersion heater is also provided to allow a smaller quantity of water to be heated should the stored hot water be fully used during the day. The cylinder is factory insulated with a low heat loss expanded polyurethane foam.

The electric flow boiler must be installed into a sealed (pressurized) primary system. It is suitable for conventional radiator based central heating systems and is supplied fitted with all necessary primary sealed system functional and safety controls, including the circulating pump and primary expansion vessel. The boiler automatically responds to lower central heating loads by reducing (modulating) the boiler output which saves wasteful on-off cycling. For summer use the boiler can be switched off on the Electromax control panel, however a "pump exercise" facility will energise the circulating pump for a brief period every day to prevent pump seizure through long periods without use.

Time and temperature control of the central heating is by means of a Programmable Room Thermostat which is supplied loose with the Electromax for remote siting in a suitable, convenient position.

The necessary cold water mains supply controls are supplied in a kit for installation on site in a suitable, convenient position. These must be fitted to comply with Building Regulation G3 and Water Fittings Regulations or Byelaws.

1.3 Storage, Unpacking and Handling

The Electromax is delivered in protective expanded polystyrene packaging with reinforced corner posts. The assembly is shrunk wrapped in heavy duty polythene. The Electromax unvented fitting kit is supplied boxed and attached to the main assembly by 2 polypropylene bands. The assembly must be stored upright, under cover in dry conditions. Units must not be stacked. The packaging must be removed prior to installation.

Note the weight of the product and the handling instructions applied to the packaging. If using a handling device, eg. A sack barrow, to manually move the Electromax, trucking must be done from the rear to avoid damage to the outer panels.

The Electromax should be lifted and handled by two persons. Handholds are provided in the top rear panel, in both side panels and underneath the Electromax assembly to aid lifting. Stooping should be avoided and protective clothing worn when necessary.

The packaging is recyclable and should be disposed of in accordance with environmental guidelines.

1.4 Contents check list

Within the Electromax packaging the following components are supplied. Please check that all parts are available before commencing installation.

- Electromax unit
- Cold Water Combination Valve comprising Pressure Reducing Valve, Strainer, Check Valve and Expansion Valve
- Unvented system Expansion Vessel (18 litre, pre-charged to 3.5 bar)
- Wall mounting bracket for Expansion Vessel
- Programmable Room Thermostat
- Immersion heater key spanner
- Hose connection adaptor for primary system drain valve
- Set of Cable Entry Glands and blanking plugs (3 x 20mm, 1 x 25.4mm)
- Installation Manual
- User Instructions
- Fitting template

2.0 Technical Data

Specification / feature	
Electric Boiler & Primary Circuit	
Electrical Input (max)	9 kW at 240 V
	8.3kW at 230 V
Electrical supply voltage	220 to 240 V
Electrical supply frequency	50 Hz
Electrical supply rating	37.5 Amps at 240 V
RCD rating	45 Amps. Trip rating 30mA.
Internal fuse rating (Pump supply)	2 Amps
Primary system type	Sealed
Primary system operating pressure (min)	100kPa (1 bar)
Primary system pressure relief valve setting	300kPa (3 bar)
Primary system Expansion Vessel	12 litre. Pre-charged to 100kPa (1 bar)
Primary Flow Temperature	Adjustable from 65 to 80 deg C
Automatic bypass valve	Supplied fitted. Adjustable 0.1 to 0.5 bar differential pressure
Primary circulating pump	Supplied fitted. Grundfos UPS 15-50
Automatic air vent	Supplied fitted.
Temporary filling loop	Supplied fitted.
DHW cylinder	
Off Peak immersion heater input	3kW at 240 V
	2.8kW at 230 V
Boost immersion heater input	3kW at 240 V
	2.8kW at 230 V
Rated Pressure	600kPa (6 bar).
Pressure reducing valve	350kPa (3.5 bar). Integral with Cold Water Combination Valve
Expansion Valve	600kPa (6 bar). Integral with Cold Water Combination Valve
DHW Expansion Vessel	18 litre. Pre-charged to 350kPa (3.5 bar)
Temperature/Pressure Relief Valve	90 deg C / 10 bar
Combined thermostat and thermal cut-out	Thermostat adjustable 10 to 70 deg C. Re-settable cut-out 80 deg C
Check Valve	Integral with Cold Water Combination Valve
Strainer	Integral with Cold Water Combination Valve
Insulation	CFC/HCFC expanded polyurethane. Ozone depletion potential zero.
	Global Warming potential 3.1
Complete unit	
Unit weight (empty)	74 kg
Unit weight (full)	256 kg
Packaged weight	81 kg
Packaged dimensions H x W x D (mm)	Electromax unit : 1566 x 600 x 650
	Installation Kit : 320 x 315 x 610
Unit Dimensions	See Dimensions Diagram

Cylinder Performance

Capacity (litres)	**Off Peak heater 3kW** Time to heat (mins) Thro' 45deg C	Thro' 50deg C	**Boost heater 3kW** Quantity heated thro' 45deg C in 60 mins	**Heat Loss** kWh/24h
180	180	200	57 litres	1.95

Diagram 1 Dimensions

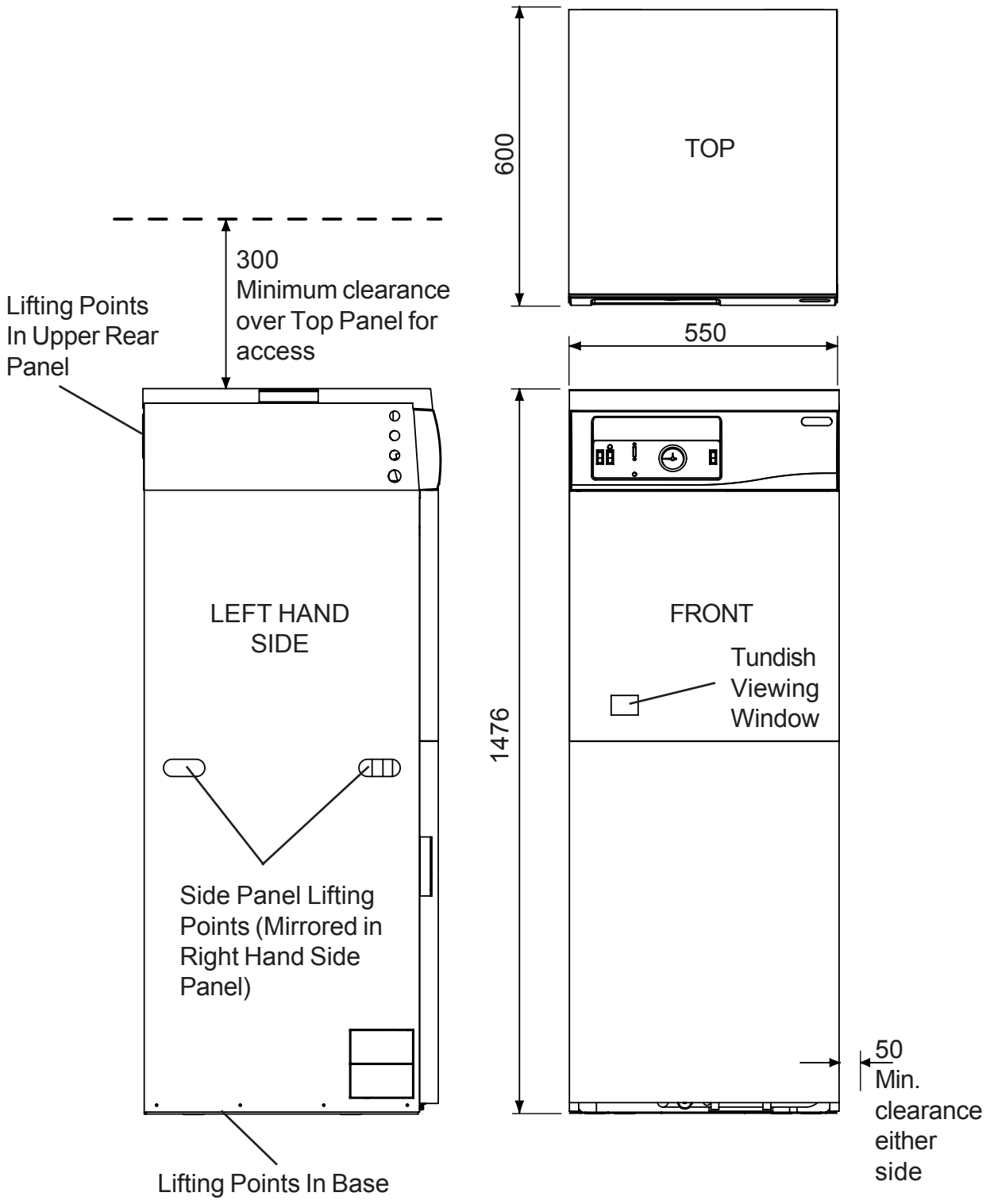


Diagram 2 Key Components

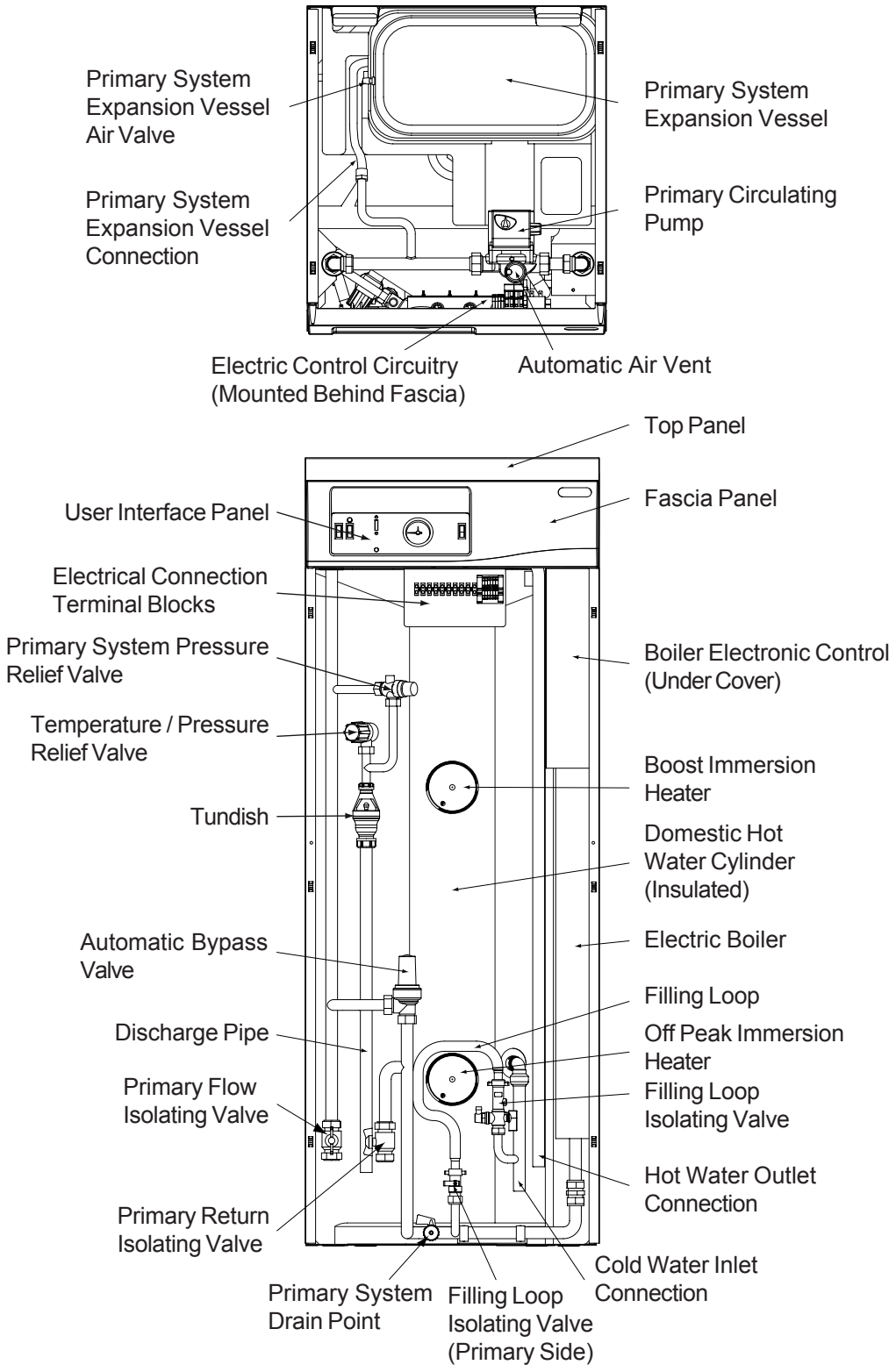


Diagram 3 Pump Characteristics

SPEED SETTING	SPEED R.P.M.	INPUT POWER (W)	FULL LOAD CURRENT (A)	LOCKED ROTOR CURRENT (A)
III	2300	50	0.23	0.30
II	2100	45	0.20	0.25
I	1700	35	0.16	0.20

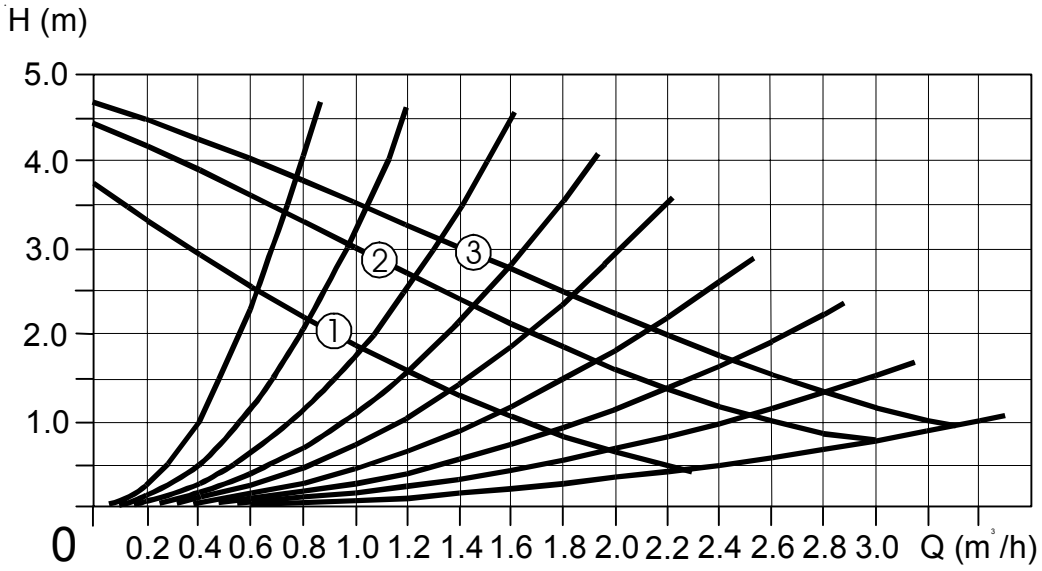
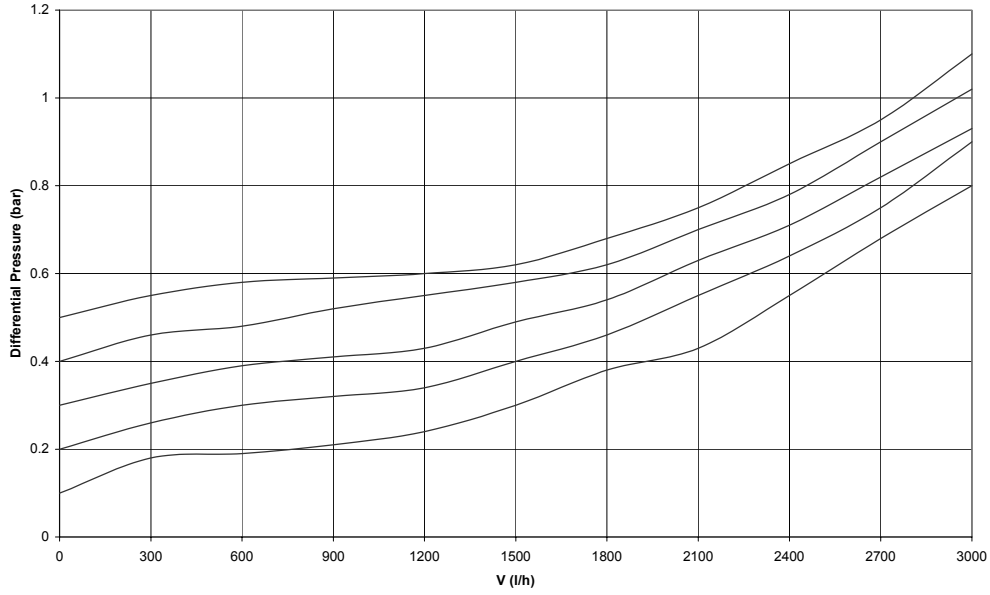


Diagram 4 Automatic Bypass Valve Characteristics



3.0 General Requirements

3.1 Location of the Electromax

The Electromax must not be sited outside or in any location where it could be exposed to the weather. It must be installed in a dry and frost free environment.

The Electromax must be vertically mounted on a flat, level surface capable of supporting the "full" weight of the unit. When full the unit weighs a total of 256kg.

The location chosen must allow the discharge pipe from the unvented cylinder safety valves to be correctly installed. Domestic hot water pipe runs should be kept as short as possible for maximum economy. Sufficient access must be allowed around the unit to allow removal of the front and top panels for servicing and maintenance of the system. Refer to Diagram 1, page 6 for details of recommended minimum clearances.

An installation template is supplied with the unit to aid in location and layout of pipework connections.

3.2 Water supply

Bear in mind that the mains water supply to the property will be supplying both the hot and cold water requirements simultaneously. **It is recommended that the maximum water demand be assessed and the water supply be checked to ensure this demand can be satisfactorily met.**

NOTE: A high mains water pressure will not always guarantee high flow rates.

Wherever possible the mains water supply pipe should be in 22mm OD (copper) or 25mm OD (Blue MDPE). The minimum mains water supply requirements should be 1.0 bar and 20 litres per minute flowrate. At these values outlet flowrates may be poor if several outlets are used simultaneously, the higher the available pressure and flowrate the better the system performance will be.

The Electromax unvented cylinder has an operating pressure of 3.5 bar which is controlled by the Cold Water Combination Valve. The Cold Water Combination Valve can be connected to a maximum mains supply pressure of 16 bar. The water supply must be of wholesome water quality (Fluid Category 1 as defined by the Water Supply Regulations 1999).

In some areas of the UK the water supply may have a high level of natural hardness. Whilst this is not detrimental to the quality of the water, in water heating systems the calcium carbonate which causes the water's "hardness" can precipitate onto hot surfaces and in time adversely affect hot water performance. If the temporary hardness of the cold water mains supply exceeds 200mg/l (check with your Water Supply Company) it is recommended that some form of water treatment is considered. Any device selected must be suitable for use in unvented water heating systems and not unduly affect the flow rate capacity to the Electromax cylinder, consult the manufacturer of the device for details.

3.3 Pipework, Fittings and Outlet / Terminal Fittings

NOTE: All pipework, fittings and terminal fittings must be compatible with unvented systems and have a rated operating pressure of at least 6 bar. Where plastic pipe / fittings are being used the rated pressure must be achievable at outlet temperatures that can be expected within the hot water distribution pipework. If in doubt, consult the manufacturer of the fittings selected.

The Electromax unvented cylinder can be used in conjunction with most types of terminal fittings. It is advantageous in many mixer showers or taps to have balanced pressure hot and cold water supplies, in these instances the balanced cold water supply should be teed off the supply to the Electromax immediately after the Cold Water Combination Valve (see diagram 5).

Branches to cold outlets where drinking water may be drawn should be taken directly from the main supply before the Cold Water Combination Valve to avoid the possibility of warm expanded water being drawn from cold taps.

3.4 Treatment of the Primary (Central Heating) Circulating System

Primary water circulating systems will be subject to corrosion unless an appropriate water treatment is applied. Without treatment the efficiency of the system will be reduced over time as corrosion sludge accumulates within the system, risking damage to the pump and valves, system noise and circulation problems.

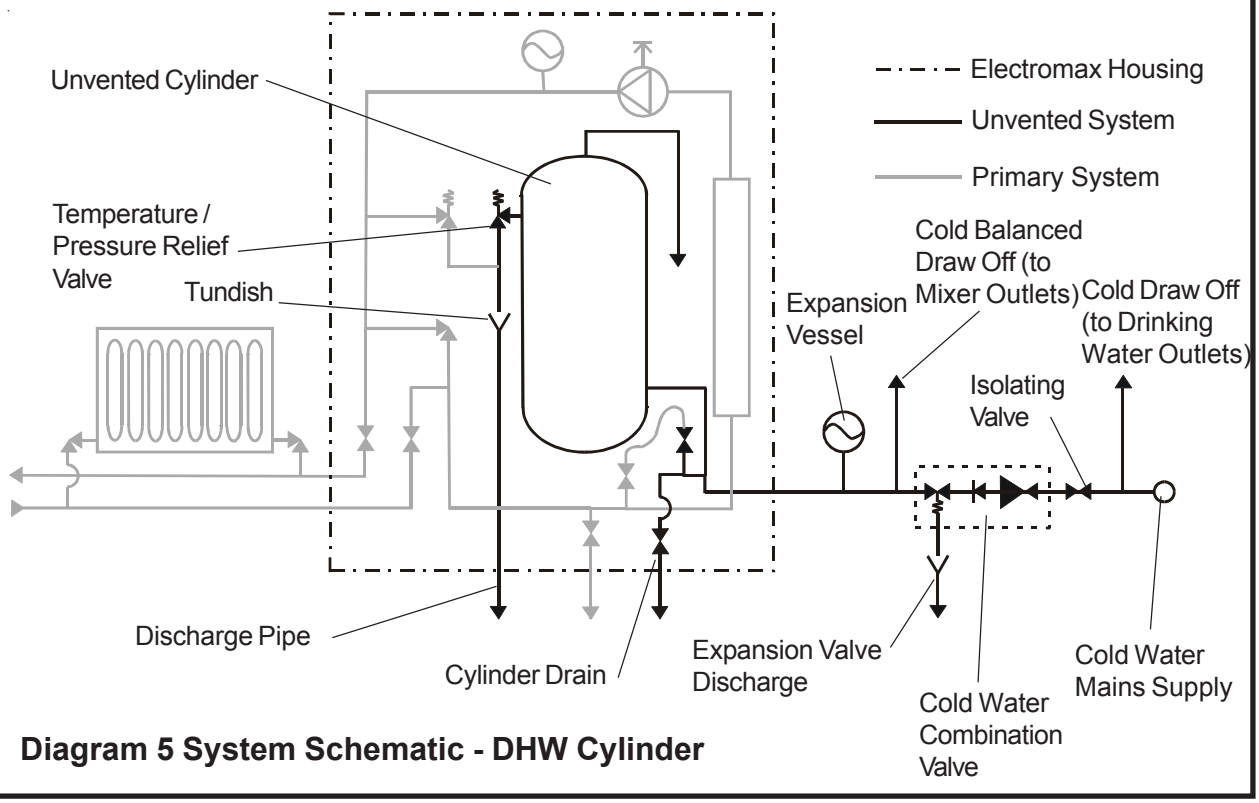


Diagram 5 System Schematic - DHW Cylinder

For optimum performance after installation the Electromax boiler and its associated central heating system must be flushed in accordance with the guidelines given in BS 7593:1992 “Treatment of water in domestic hot water central heating systems”. This must involve the use of a proprietary cleanser, such as GE Betz Sentinel X300 or X400, Fernox “Superfloc” or Salamander System Cleanser. Follow the manufacturer’s instructions to ensure correct cleansing of the system.

For long term protection against corrosion and scale, after flushing the system should be dosed with an inhibitor such as GE Betz Sentinel X100, Fernox MB-1 or Copal, or Salamander System Inhibitor in accordance with the guidelines given in BS 7593:1992.

Failure to flush and add inhibitor to the system will invalidate the appliance warranty.

3.5 Sealed Primary Systems

The Electromax boiler must be installed in a sealed primary system. All necessary primary system controls are supplied fitted to the Electromax. The sealed system expansion vessel fitted has a capacity of 12 litres which, as a general guide, will be suitable for a central heating system of up to approximately 9 radiators. If in doubt the total primary system volume must be calculated to determine if additional expansion volume is required.

The Electromax initial primary system cold fill pressure is 1.0 bar. The expansion vessel size = 0.11 x the total system volume. The boiler and pipework within the Electromax hold approx. 2 litres of water, therefore additional system expansion volume will only be necessary for systems that exceed 107 litres.

The Electromax boiler incorporates an automatic air vent at its highest point (fitted to the pump housing, see Diagram 6). If any primary pipework is routed above the level of the Electromax additional air vents must be fitted to the highest points of the flow and return pipes and at any point where air is likely to collect.

An automatic bypass valve is fitted to the Electromax to allow thermostatic radiator valves to be fitted to the system.

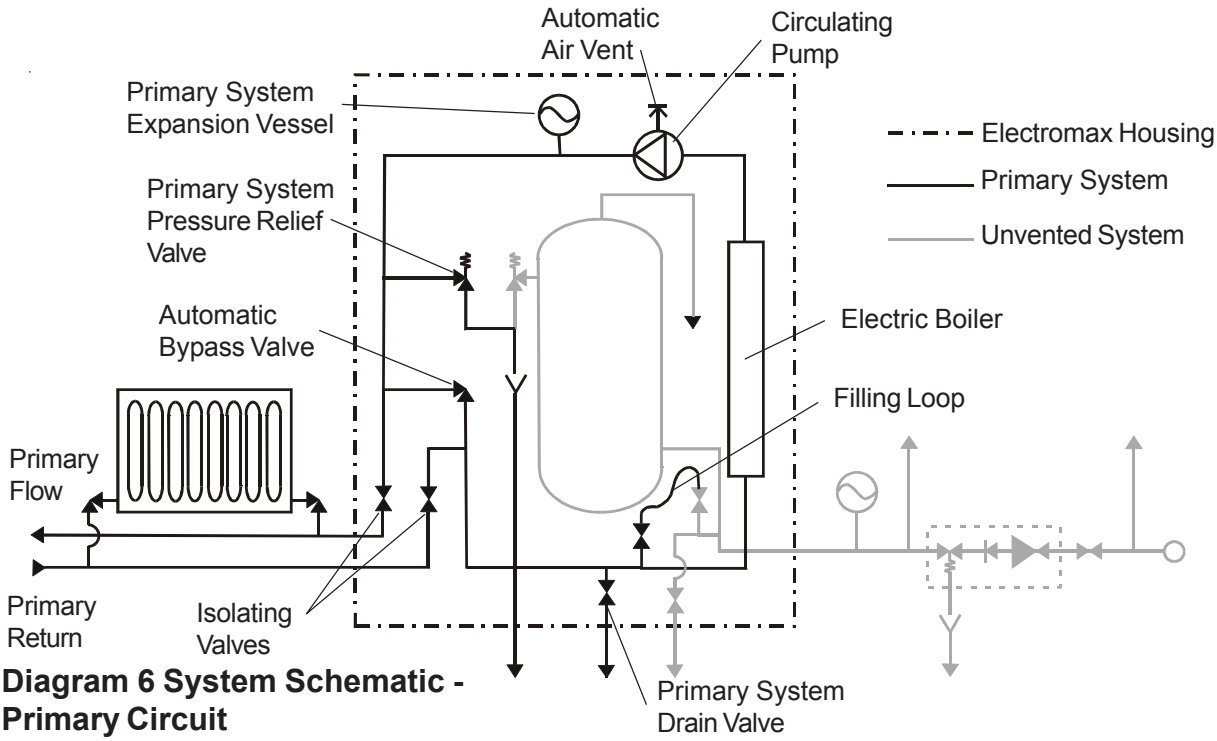


Diagram 6 System Schematic - Primary Circuit

4.0 Installation - General

4.1 Positioning the Electromax

Decide where the Electromax is to be installed. Reference must be made to the dimensions of the unit and the minimum access space requirements (see Diagram 1, page 6). Consideration must also be taken of the routing of the pipework to the unit, provision of the discharge pipe and siting of any external controls such as the Cold Water Combination Valve and secondary system Expansion Vessel. Pipework can be connected from below the unit or from the left and right hand sides. Knock-outs are provided in the side panels for side connections. A template is provided to aid in positioning the unit and determining the pipework entry locations.

If using side entry pipework the following connections are made to the Electromax (when viewed from front of unit see Diagram 2, page 7):
Left hand side
Primary flow, primary return, discharge pipe

Right hand side
Cold water inlet supply, hot outlet supply

Note the weight of the product (see Technical Specifications) and adopt safe lifting techniques. A two man lift is recommended. Hand holds are provided in the left and right hand side panels, the rear and underside. If the front panels are removed prior to positioning in its final installation position **DO NOT** lift using the exposed pipework assembly.

4.2 Removal of Panels

Refer to Diagram 7. For installation and commissioning the front and top panels must be removed. The lower front panel must be removed before the upper front panel.

The lower front panel (Panel A on Diagram 7) is secured by spring clips and is removed by pulling forward using the finger recesses either side of the panel. Once removed, the two M5 screws securing the lower edge of the upper front panel must be removed. The upper front panel (Panel B on Diagram 7) must then be removed by pulling forward to disengage it from the remaining spring clips.

The top panel (Panel C on Diagram 7) is secured by two screws and spring clips. To remove, unscrew the two securing screws on the top panel and then pull upwards using the finger recesses either side of the panel.

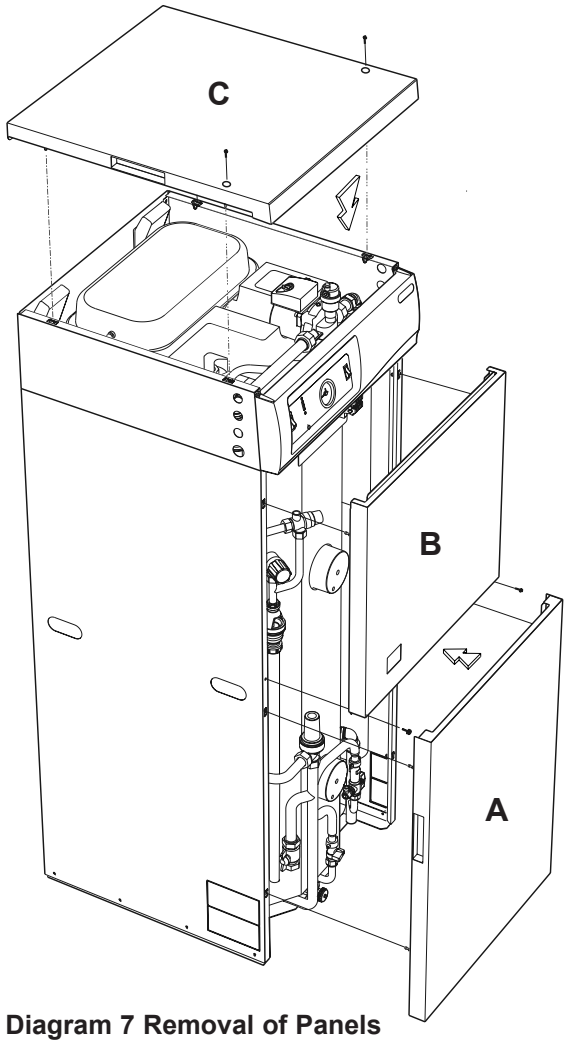


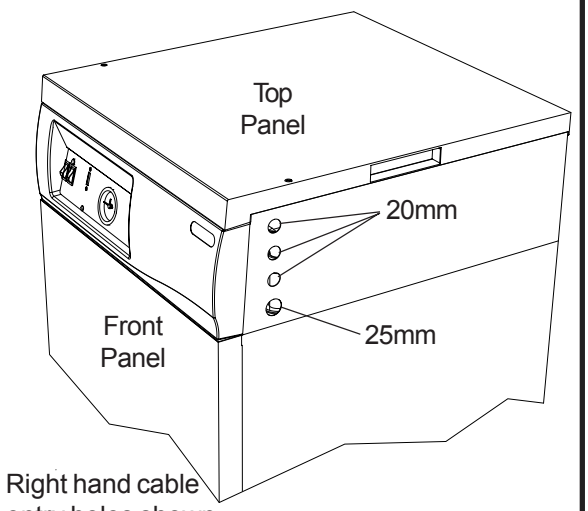
Diagram 7 Removal of Panels

4.3 Cable Entry Positions

The electrical supply cables can be routed to enter the unit from the left or right hand side (see Diagram 8). There are four cable entry holes in each upper side panel; one 25mm diameter and three 20mm diameter. The accessory kit contains a set of cable glands and snap fit blanking plugs. The cable glands should be fitted into the cable entry holes on the side selected for cable entry and secured in place using the lock nuts supplied. The remaining four cable entry holes not used should be blanked off using the appropriate blanking plugs supplied.

The cable glands must be used to secure the electrical supply cables when fitted. Failure to do so can result in the cables straining internal electrical connections and possible electrical failure as a result. Failure due to inadequate cable securing will not be cover by the warranty.

Diagram 8 Cable Entry Positions

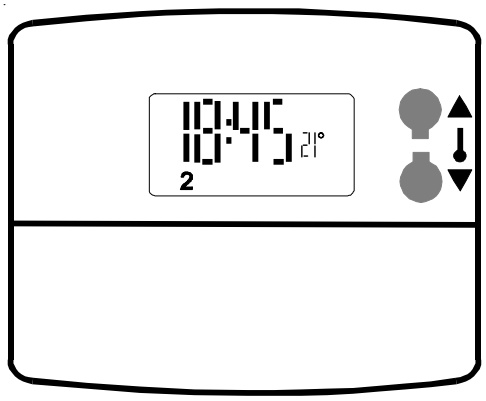


Right hand cable entry holes shown. Left hand holes are mirrored in left hand panel.

4.4 Programmable Room Thermostat

The Electromax is supplied with a Danfoss TP5000 Programmable Room Thermostat. This is supplied in the accessory kit supplied with your unit. Follow the installation instructions provided with the Programmable Room Thermostat for correct siting and mounting of the unit. If the radiators are to be fitted with Thermostatic Radiator Valves (TRV's) the room where the Programmable Room Thermostat is located **must not** have a TRV fitted in compliance with BuildingRegulation Part L.

Diagram 9 Programmable Room Thermostat



5.0 Installation - Plumbing

5.1 Pipe fittings

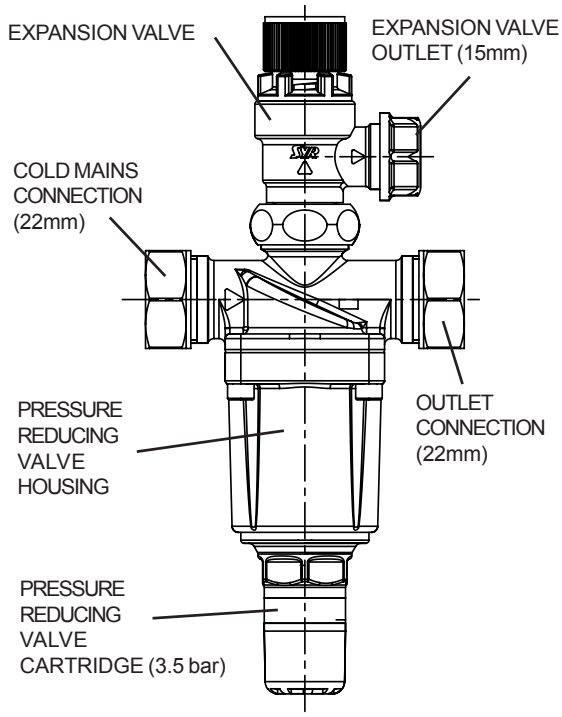
Pipe connections to the Electromax must be made using 22mm compression type fittings. Solder connections directly to the unit must not be made as the heat may damage the insulation materials used. Damage caused by heat applied to solder fittings in close proximity to the unit will not be covered by the warranty. Solder connections may be used elsewhere in the system away from the Electromax unit. Use water soluble flux for making soldered joints and ensure any flux residue is removed following installation.

5.2 Cold Water Combination Valve

The Cold Water Combination Valve can be connected anywhere on the cold water mains supply prior to the Electromax unit, however it must be possible to connect the secondary system Expansion Vessel between this valve and the cold inlet connection of the unit. Whilst it is often more convenient to do so, there is no requirement to site the valve close to the unit, it can be located at a point remote from the unit if this is more convenient. However, ensure the discharge from the Expansion Valve (see Diagram 10) can be correctly installed. The Expansion Valve connection must not be used for any other purpose.

The Cold Water Combination Valve is installed as a complete one-piece unit. The valve incorporates an Isolating Valve, a Pressure Reducer, a Strainer, an Expansion Valve and a single Check Valve. The valve can be fitted in any orientation to suit the installation, however, ensure the valve is installed with the direction of flow arrows (stamped on the side of the brass body) pointing towards the Electromax unit.

Diagram 10 Cold Water Combination Valve



5.3 Secondary Expansion Vessel

The Secondary (DHW) Expansion Vessel is supplied in the accessory kit and must be fitted to the cold water supply to the Electromax to accommodate any water expansion that results from heating the water inside the cylinder. The Expansion Vessel must be fitted between the Cold Water Combination Valve and the cold inlet of the Electromax cylinder (see Diagram 5, page 10).

The Expansion Vessel must be adequately supported, a wall mounting bracket is supplied for this purpose. The location of the Expansion Vessel should allow access for maintenance. This will entail access to the air valve on top of the unit to check and, if necessary, re-charge the vessel pre-charge pressure. The vessel pre-charge pressure is 3.5 bar.

5.4 Balanced Cold Water Supplies

It is advantageous in many mixer showers or taps to have balanced pressure hot and cold water supplies, in these instances the balanced cold water supply should be teed off the supply to the Electromax immediately after the Cold Water Combination Valve (see diagram 5, page 10).
Branches to cold outlets where drinking water may be drawn should be taken directly from the main supply before the Cold Water Combination Valve to avoid the possibility of warm expanded water being drawn from cold taps.

5.5 Outlet Pipework

The pipework from the Electromax to the hot outlet fittings should be in 22mm pipe with short runs of 15mm pipe to showers and basins. Small bore pipe can be used to suit some taps, but runs should be kept as short as possible. Pipe sizes may vary due to system design.

5.6 Secondary Circulation

Secondary circulation is not recommended for the Electromax as it is intended for Off-Peak electrical operation. During other periods the electricity supply is interrupted to the immersion heaters so no reheating will take place. Circulating the stored water would gradually cool it to an unacceptable temperature.

5.7 Discharge Pipework

It is a requirement of Building Regulations that any discharge from an unvented system should be visible and safely conveyed away from the system without danger to persons in or about the building where it is installed. The discharge pipe should be fitted in accordance with the requirements and guidance notes of Building Regulations. Building Regulation G3 Requirements and Guidance section 3.9 are reproduced in the following sections.

Information Sheet No.33 available from the British Board of Agrement gives further advice on discharge pipe installation. For discharge pipe arrangements not covered by G3 Guidance or BBA Info sheet No. 33 advice should be sought from either your local Building Control Officer or Heatrae Sadia. The discharge pipework supplied fitted to the Electromax will convey any discharge from the unvented cylinder Temperature and Pressure Relief Valve and the sealed system Pressure Relief Valve. A discharge pipe will also be required from the Expansion Valve fitted to the Cold Water Combination Valve. Where practical this can be teed into the discharge pipe from the Electromax. It is recommended that an additional tundish is fitted into this discharge pipe to give an early indication of operation of the Expansion Valve.

In some instances it may be possible to discharge into an internal waste system and soil stack. To do this a self sealing waste valve must be fitted into the discharge pipe after the tundish to prevent foul odours or back-pressurisation from the waste system entering the building via the tundish. **In these systems it is essential that the tundish is fitted in a visible position as the final point of discharge will not be visible.** Consult the manufacturer's recommendations with respect to the correct fitting, orientation and waste and soil stack materials selection. It will also be necessary to get dispensation from your local Building Control Officer to discharge in this manner. Discharges from an unvented system can be up to 95°C for several minutes, **ensure any waste or soil pipe connected to the discharge can safely accept these conditions.**

G3 REQUIREMENT
"…there shall be precautions…to ensure that the hot water discharged from safety devices is safely conveyed to where it is visible but will

not cause danger to persons in or about the building."

G3 GUIDANCE SECTION 3.9

The discharge pipe (D1) (see Diagram 11, page 17) from the vessel up to and including the tundish is generally supplied by the manufacturer of the hot water storage system. Where otherwise, the installation should include the discharge pipe(s) (D1) from the safety device(s). In either case the tundish should be vertical, located in the same space as the unvented hot water storage system and be fitted as close as possible and within 500mm of the safety device e.g. the temperature relief valve.

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

a. be at least one pipe size larger than the nominal outlet size of the safety device uness its total equivalent hydraulic resistance exceeds that of a straight pipe 9m long i.e. discharge pipes between 9m and 18m equivalent resistance length should be two pipe sizes larger, and so on. Bends must be taken into account in calculating the flow resistance. Refer to Diagram 11, Table 1 and the worked example.

An alternative approach for sizing discharge pipes would be to follow BS6700:1987 *Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their cartilages,* Appendix E, section E2 and Table 21.

b. have a vertical section of pipe at least 300mm long below the tundish before any elbows or bends in the pipework.

c. be installed with a continuous fall.

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

Examples of acceptable discharge arrangements are:

i. ideally below a fixed grating and above the water seal in a trapped gully.

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

iii. Discharges at high level; e.g. into a metal hopper and metal down pipe with the end of the discharge pipe clearly visible (tundish visible or not) or onto a roof capable of withstanding high temperature discharges of water and 3m from any plastics guttering system that would collect such discharges (tundish visible).

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

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

Worked example of discharge pipe sizing
The example below is for a G1/2 temperature relief valve with a discharge pipe (D2) having 4 No. elbows and length of 7m from the tundish to the point of discharge.
From Table 1:
Maximum resistance allowed for a straight length of 22mm copper discharge pipe (D2) from a G1/2 temperature relief valve is 9.0m.
Subtract the resistance allowed for 4 No. 22mm elbows at 0.8m each = 3.2m
Therefore the permitted length equates to: 5.8m
5.8m is less than the actual length of 7m therefore calculate the next largest size.
Maximum resistance allowed for a straight length of 28mm pipe (D2) from a G1/2 temperature relief valve equates to 18m.
Subtract the resistance of 4 No. 28mm elbows at 1.0m each = 4.0m
Therefore the maximum permitted length equates to 14.0m
As the actual length is 7m, a 28mm (D2) copper pipe will be satisfactory.

Table 1 Sizing of Copper Discharge Pipes (D2) for Common T&P Relief Valve Sizes

Valve outlet size	Minimum size of discharge pipe D1	Minimum size of discharge pipe D2 from tundish	Maximum resistance allowed, expressed as a length of straight pipe (I.e. no elbows or bends)	Resistance created by each elbow or bend
G1/2	15mm	22mm	up to 9m	0.8m
		28mm	up to 18m	1.0m
		35mm	up to 27m	1.4m
G3/4	22mm	28mm	up to 9m	1.0m
		35mm	up to 18m	1.4m
		42mm	up to 27m	1.7m
G1	28mm	35mm	up to 9m	1.4m
		42mm	up to 18m	1.7m
		54mm	up to 27m	2.3m

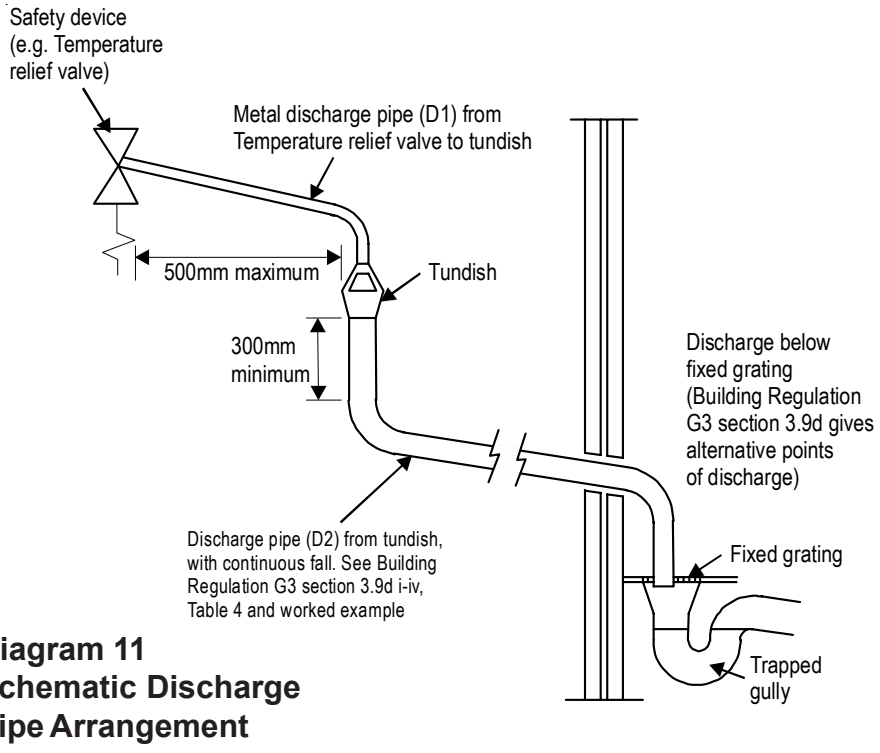


Diagram 11
Schematic Discharge Pipe Arrangement

5.8 Primary (Central Heating) Pipework

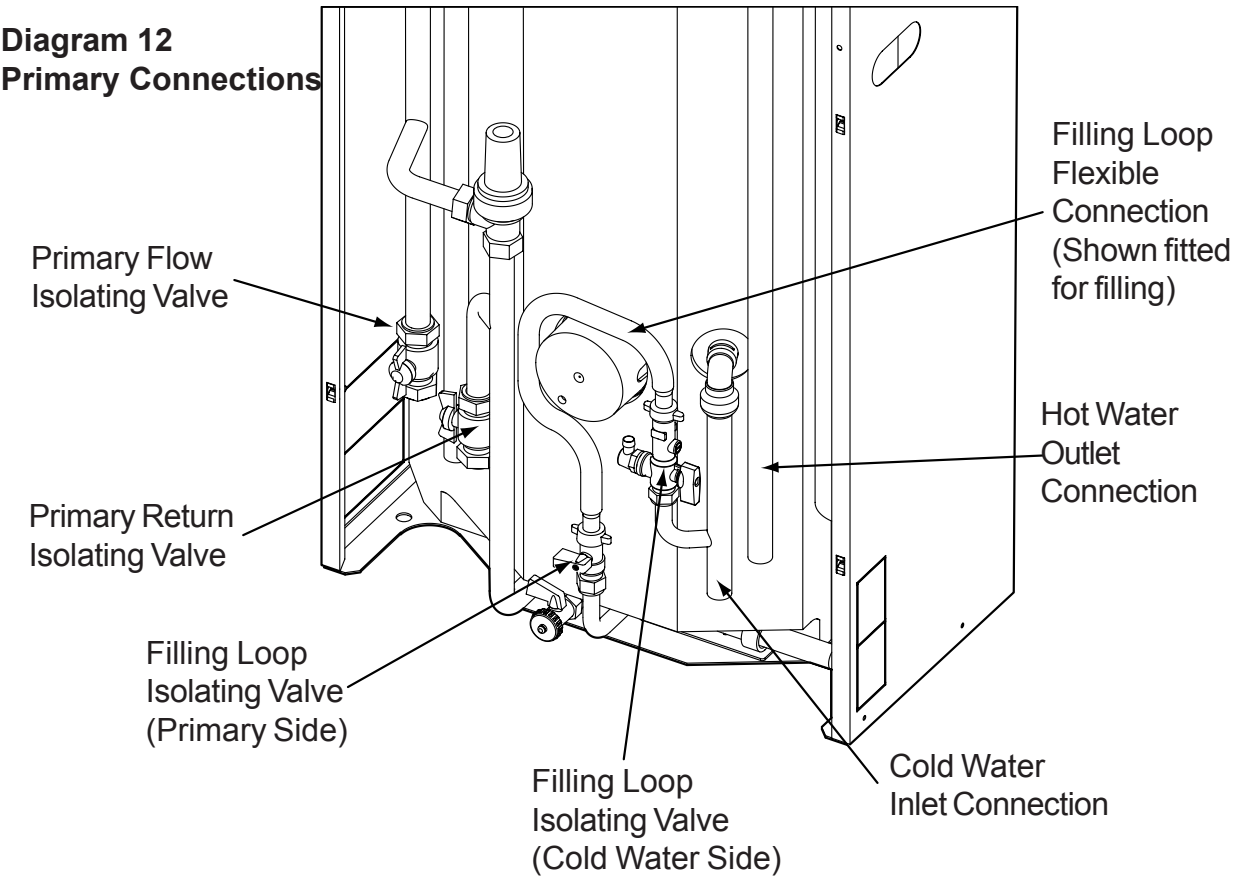
Connections to the Electromax primary flow and return must be in 22mm o/dia. pipe. Isolating valves are fitted to the Electromax unit on the primary flow and return connections to enable the Electromax boiler to be isolated from the primary circuit for maintenance and servicing. Connections to the isolating valves are 22mm compression.

Conventional radiator based central heating design considerations should be made in selecting the radiators and circulating pipework sizes. The maximum output from the Electromax boiler is 9kW, ensure the radiator load does not exceed this. NOTE: The Electromax boiler is dedicated to the space heating only, the domestic hot water is heated by separate immersion heaters, so there is no requirement to allow a hot water loading factor in designing the primary system.

Use water soluble flux for making soldered joints and ensure any flux residue is removed following installation.

A filling loop is provided within the Electromax casing to fill the primary circuit directly from the cold water supply. When the system is full and correctly pressurized the flexible hose of the filling loop should be disconnected from the primary circuit.

Diagram 12
Primary Connections



6.0 Installation - Electrical

6.1 Important Notes

All wiring must be carried out in accordance with the current IEE Wiring Regulations.

The Electromax electrical installation must be carried out by a competent installer in accordance with any relevant regulations in force at the time of installation and the requirements of these instructions to ensure correct operation.

The main incoming electrical supply to the property must be of sufficient current rating and voltage for the Electromax and any other electrical requirements for the property.

The consumer unit must be fitted with a double pole RCD with a trip sensitivity of 30mA capable of breaking the full load current to BS EN 61008:1994.

A correctly rated MCB must be used in the supply to the Electromax boiler and immersion heaters. The MCB to the boiler must be rated at 45A. The MCB to each immersion heater must be rated at 16A. It may be necessary to fit a blanking plate between the 45A MCB and other MCB's in the consumer unit to provide ventilation, check with the MCB manufacturer.

Each circuit must incorporate an isolating switch which must have a minimum contact separation of at least 3mm in all poles.

6.2 Off-Peak and 24 hour Electrical Supply

To obtain optimum performance and lowest running costs from your Electromax unit it should be connected to an Off-Peak electrical supply. The "Economy 10" tariff, which is available from most major electricity suppliers, is recommended. Table 2 shows the suppliers that offer "Economy 10" and the times that "off peak" electricity is supplied. Other Off-Peak tariffs may be suitable, consult the Heatrae Sadia Specification Team or your electricity supplier for further advice.

With an Off-Peak electrical supply there will be two sets of electrical outputs from the consumer unit or two separate consumer units. One will supply the circuits that have a dedicated off peak use (such as night storage heaters or off peak water heater), the other will provide a 24 hour supply to circuits in use throughout the day (such as lighting, sockets, etc.).

ECONOMY 10 PROVIDERS				
Electricity Supplier	**Off-Peak Times**			**GMT or Clock**
Midlands	midnight - 5.00 am	1.00 - 4.00 pm	8.00 - 10.00 pm	GMT
Norweb	midnight - 5.00 am	1.00 - 4.00 pm	8.00 - 10.00 pm	GMT
Southern	midnight - 5.00 am	1.00 - 4.00 pm	8.00 - 10.00 pm	GMT
South Wales	midnight - 5.00 am	1.00 - 4.00 pm	8.00 - 10.00 pm	GMT
South Western	midnight - 5.00 am	1.00 - 4.00 pm	8.00 - 10.00 pm	GMT
Yorkshire	midnight - 5.00 am	1.00 - 4.00 pm	8.00 - 10.00 pm	GMT
Scottish Hydro	4.30 - 7.30 am	1.00 - 4.00 pm	8.30 pm - 12.30 am	Clock
Scottish Power	4.30 - 7.30 am	1.30 - 4.30 pm	8.30 pm - 12.30 am	Clock
Manweb	4.30 - 7.30 am	1.00 - 4.00 pm	8.30 pm - 12.30 am	Clock

Table 2 Economy 10 Providers

Off Peak supply connection

A suitable electrical connection must be taken from the Off Peak supply to the Electromax terminal block. The supply cable should be 1.5mm^2 cross sectional area 3 core HOFR sheathed cable and must be routed into the Electromax via one of the 20mm cable glands previously fitted (see section 3.3, page 10). The Live (Brown) conductor should be connected to the termination marked "OFF PEAK SUPPLY L"; the Neutral (Blue) conductor should be connected to the termination marked "OFF PEAK NEUTRAL N"; the Earth (Green/Yellow) conductor should be connected to one of the terminations marked "EARTH CONNECTIONS ⏚ ". See above (section 5.1, page 14) for MCB and isolation requirements.

24 Hour supply connection (NB NOT Boiler connection)

A suitable electrical connection must be taken from the 24 Hour supply to the Electromax terminal block. The supply cable should be 1.5mm^2 cross sectional area 3 core HOFR sheathed cable and must be routed into the Electromax via one of the 20mm cable glands previously fitted (see section 3.3, page 10). The Live (Brown) conductor should be connected to the termination marked "24 HOUR SUPPLY L"; the Neutral (Blue) conductor should be connected to the termination marked " 24 HOUR NEUTRAL N"; the Earth (Green/Yellow) conductor should be connected to one of the terminations marked "EARTH CONNECTIONS ⏚ ". See section 6.1, page 19 for MCB and isolation requirements.

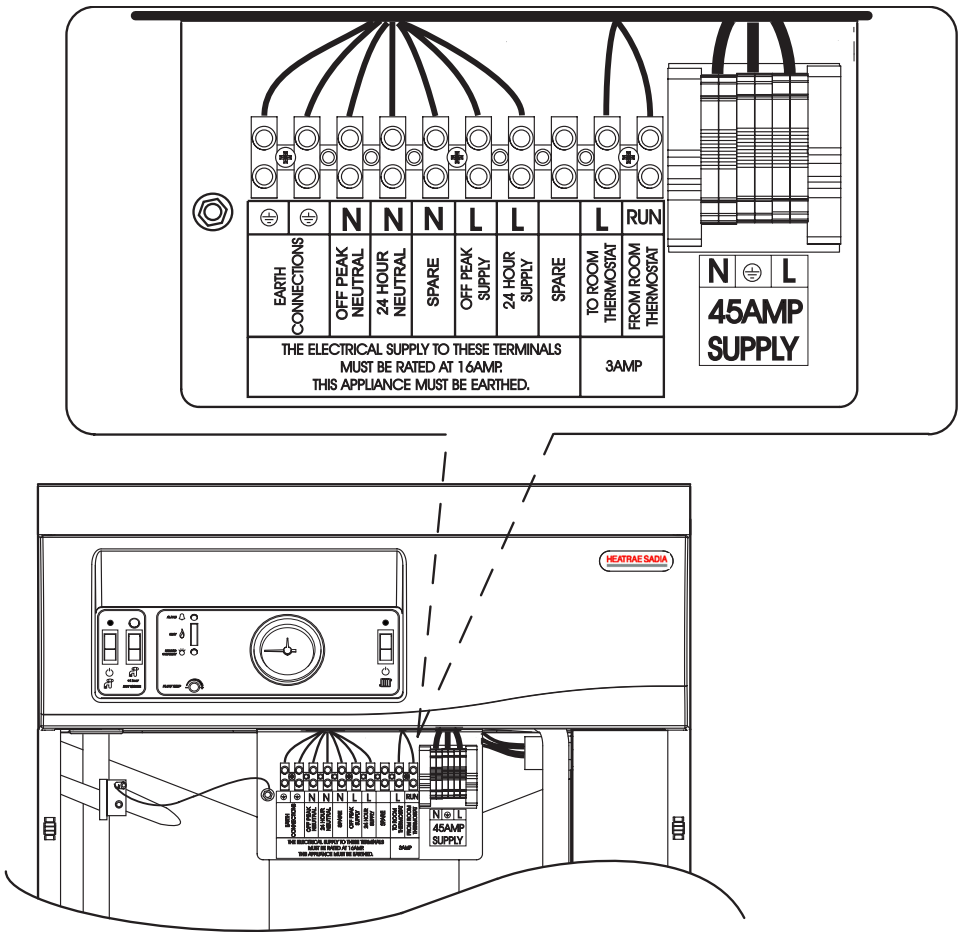


Diagram 13 Electrical Supply Connection Block

6.3 Boiler Connection (45 Amp)

The Electromax boiler has a rated maximum output of 9kW at 240V ~ . The supply cable must therefore be separate and dedicated to the boiler. The supply cable should be a minimum of 6mm^2 cross sectional area, check the IEE Wiring Regulations for correct cable sizing). It must be routed into the Electromax via the 25mm cable gland previously fitted (see section 3.3, page 10). The Live (Brown) conductor should be connected to the termination marked “L 45 AMP SUPPLY”; the Neutral (Blue) conductor should be connected to the termination marked “N 45AMP SUPPLY”; the Earth (Green/Yellow) conductor should be connected to the termination marked “⏚ 45 AMP SUPPLY “. Where “twin and earth” cable is being used the bare earth conductor should be sleeved with suitable Green / Yellow earth cable sleeving. See section 6.1, page 19 for MCB and isolation requirements.

6.4 Programmable Room Thermostat Connection

Refer to the Instruction Leaflet supplied with the Programmable Room Thermostat and Diagram 14 (Schematic Wiring Diagram). Connection to the Electromax should be with 2 core cable of 0.5mm^2 to 1.0mm^2 cross sectional area suitable for a 240V supply, bell wire MUST NOT be used. The cable must be routed into the Electromax via one of the 20mm cable glands previously fitted (see section 3.3, page 10). One conductor should be connected to the termination marked “TO ROOM THERMOSTAT L”; the other conductor should be connected to the termination marked “FROM ROOM THERMOSTAT RUN”.

Please note that the terminations on the Programmable Room Thermostat marked “B COM” and “C N/O” should be used. Connection to terminal “A N/C” will result in incorrect operation of the Electromax boiler. The clock function of the Programmable Room Thermostat is battery operated (2 x AA/ MN1500/LR alkaline batteries supplied).

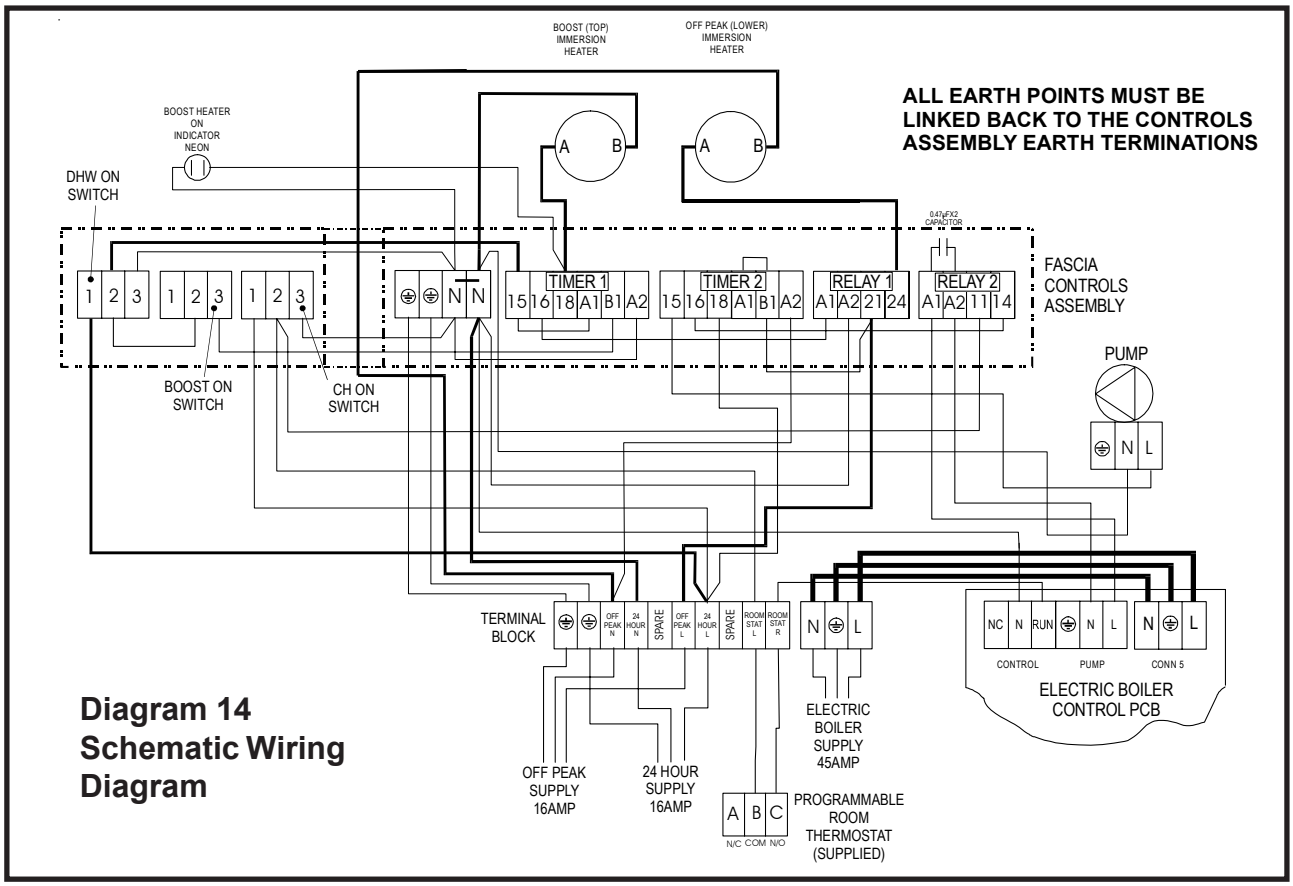


Diagram 14
Schematic Wiring Diagram

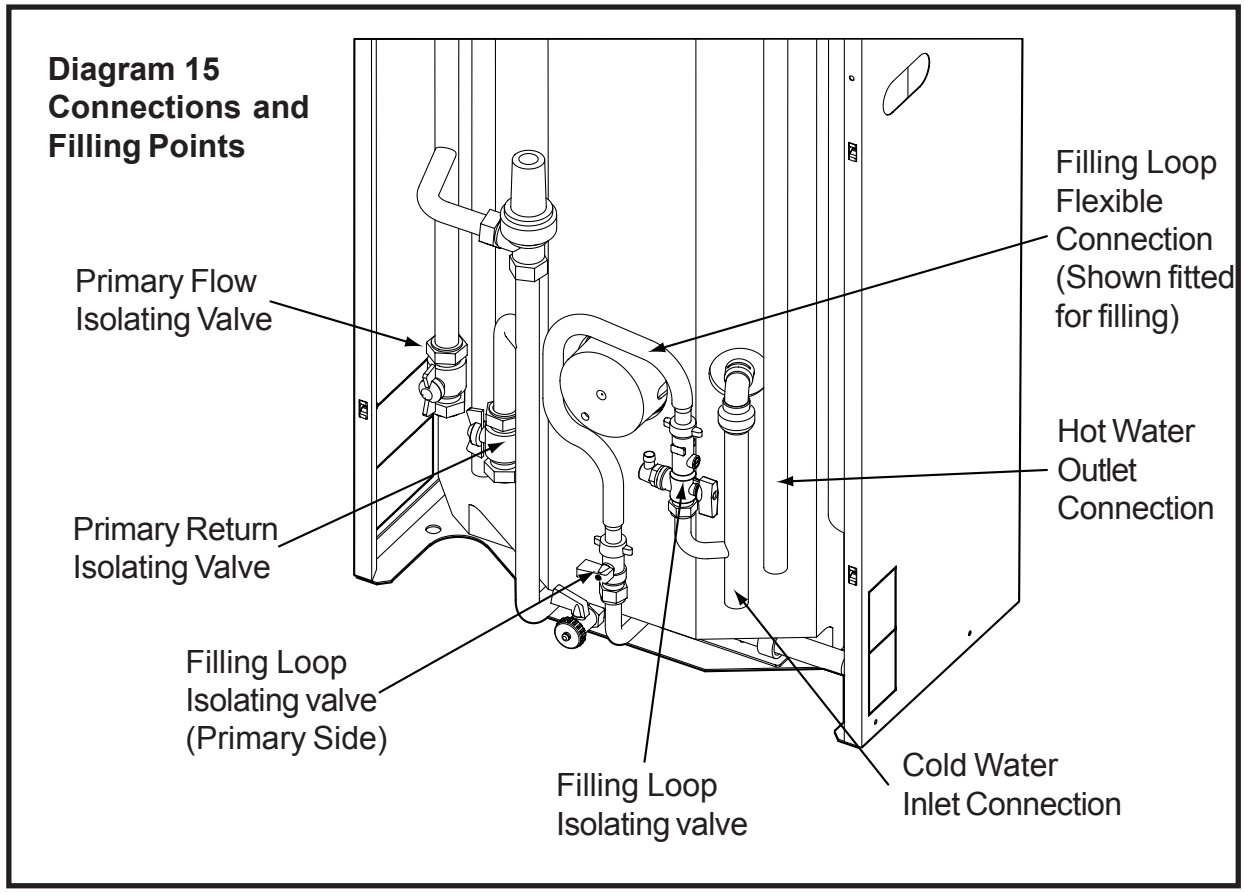
7.0 Commissioning

IMPORTANT : DO NOT SWITCH ON THE ELECTRICAL SUPPLIES TO THE ELECTROMAX UNTIL THE CYLINDER AND PRIMARY CIRCUIT HAVE BEEN CORRECTLY FILLED WITH WATER

7.1 Filling The Electromax Cylinder

a. Check that all connections to the Electromax are tight.
b. Open a hot tap furthest from the Electromax.
c. Check the Primary System Filling Loop isolating valves are closed (see Diagram 15).
d. Open the cold water supply isolating valve and allow the Electromax cylinder to fill. When water issues from the tap, allow to run for a few minutes to thoroughly flush through any residue, dirt or swarf, then close tap.
e. Open successive hot taps and any cold outlet supplied by a balanced take off to purge any air from the system.
f. Check all connections (including immersion heater connections) for leaks and rectify as necessary.
g. The strainer housed within the Cold Water Combination Valve should be cleaned to remove any debris that may have been flushed through the main supply pipe. Refer to section 8.2, page 27 for instructions on how to do this.

Diagram 15
Connections and Filling Points



7.2 Filling The Sealed System Primary Circuit

a. The primary system must be flushed in accordance with BS 7593 and the manufacturer's instructions supplied with the flushing agent selected.
b. Connect the Primary Filling Loop and tighten connections (see Diagram 15).
c. Check all radiator valves are in the open position.
d. Open the Filling Loop isolating valves and allow primary system to fill until the pressure gauge on the fascia of the Electromax reads approx. 2.0 bar.
e. Purge air from all radiators and air vent points in the primary system.
f. Check the primary system pressure. This should be between 1.0 and 1.5 bar. If lower, open Filling Loop isolating valves until gauge reads approx. 2.0 bar. Repeat air purging operation. This sequence may need to be repeated several times to ensure all air is purged from the system.
g. Check primary system for leaks and rectify as necessary.
h. When the pressure gauge remains steady at between 1.0 and 1.5 bar ensure both Filling Loop isolating valves are closed and remove Filling Loop flexible hose from the Primary system connection point.

7.3 Check The Operation of the Safety Valves

a. Slowly manually open, for a few seconds, the Temperature and Pressure Relief Valve on the Electromax (see Diagram 16). Check water discharged runs freely away through the tundish and discharge pipework. Close valve, ensure water flow stops and valve reseats correctly.

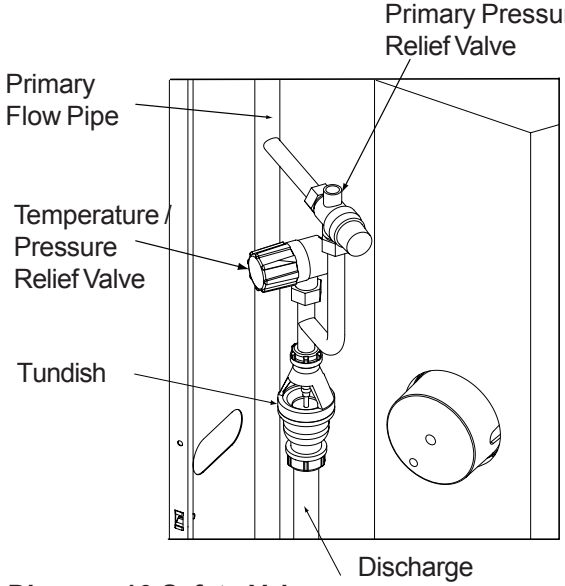


Diagram 16 Safety Valve and Tundish Positions

b. Repeat the above steps for the Expansion Valve situated on the Cold water Combination Valve (see Diagram 17)

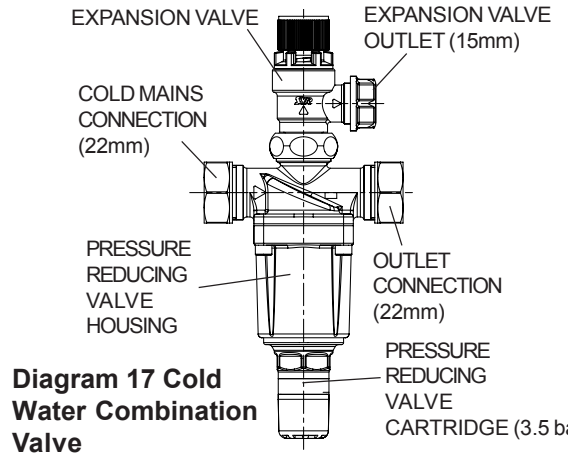


Diagram 17 Cold Water Combination Valve

c. Repeat the above steps for the Primary System Pressure Relief Valve on the Electromax (see Diagram 16). After this operation check that the primary system pressure has not dropped below 1.0 bar. If it has re-connect the Filling Loop and refill until the gauge reads between 1.0 and 1.5 bar. Always close Filling Loop isolating valves and remove hose from the primary system.

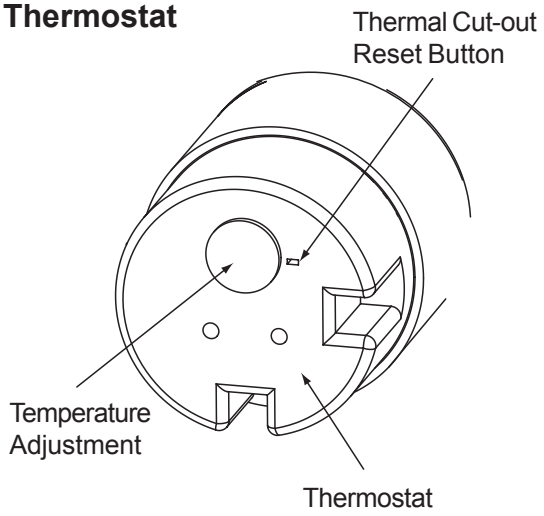
7.4 Set The Programmable Room Thermostat

a. Fit the batteries supplied to the Programmable Room Thermostat. The battery compartment is located behind the hinged cover under a snap fit panel. Ensure the batteries are inserted with the correct polarity (I.e. “+” to “+”, “-” to “-”.
b. Using the instructions supplied with the Programmable Room Thermostat set the time and day on the clock display.
c. The Programmable Room Thermostat is supplied with a number of factory preset programmes, these are listed in the instruction leaflet. These can be reset to other periods depending on the users requirements.
d. NOTE: To obtain lower running costs it is recommended that central heating on times be programmed to co-incide (wherever feasible) with any “Off-Peak” tariff periods available during the day. The Economy 10 tariff will provide at least two periods during the day at a lower cost “Off-Peak” rate, refer to Table 2 for details of the available “Off-Peak” times from various electricity suppliers. Heating times can, of course, be programmed to run outside these times.
e. NOTE: The Programmable Room Thermostat does not control the Domestic Hot Water (DHW) heating times.

7.5 Preliminary Electrical Checks

a. Check all electrical connections are tight. Loose connections can cause over-heating of terminals and the possibility of a fire.
b. Check all earth bonding links are connected, are tight and un-damaged.
c. The electrical system should be checked for Earth Continuity, Short Circuits, Polarity and Resistance to Earth.
d. The immersion heaters are factory set to give a hot water storage temperature of approx. 60°C (between graduations 4 and 5 on the thermostat). The full temperature adjustment range is from 10° to 70°C (1 to 5 on the thermostat). If required the thermostats should be readjusted by removing the immersion heater covers and rotating the thermostat adjustment knob (see Diagram 18) using a flat bladed screwdriver. Replace the covers before operating the unit.

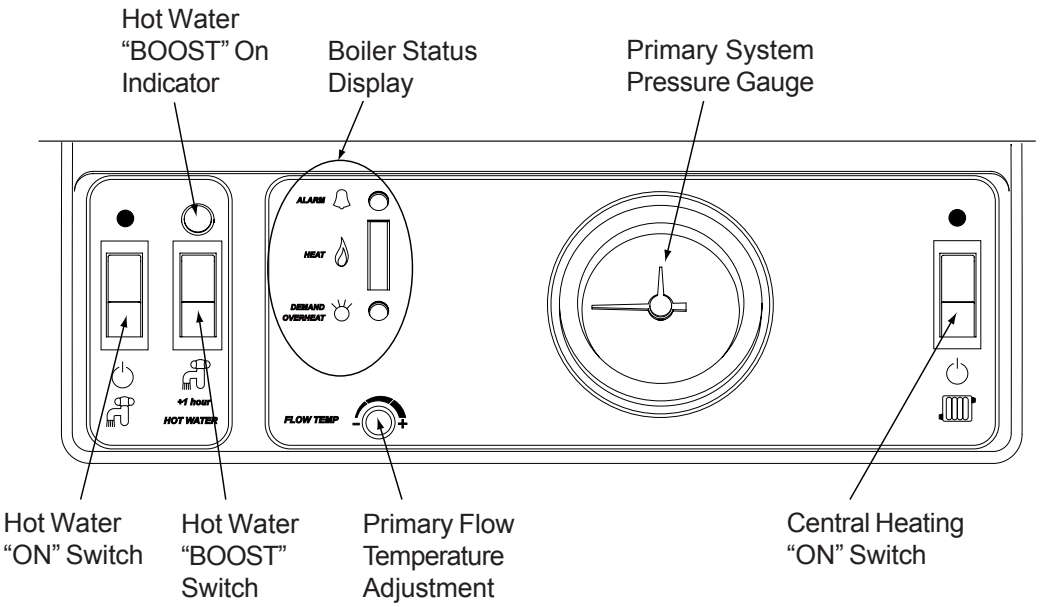
Diagram 18 Immersion Heater Thermostat



7.6 Check Operation of the Electric Boiler

a. Switch on the 24 Hour electrical supply and Boiler supply MCB’s. Switch on the isolation switches.
b. Switch on the CH “on” switch (see Diagram 19). The switch should be illuminated when on.
c. Set the “FLOW TEMP” adjustment (see Diagram 19) to minimum position.

Diagram 19 Fascia Panel Features



d. Set the Programmable Room Thermostat to be calling for heat (the set programme may need to be over-ridden to do this, refer to the instructions supplied with the Programmable Room Thermostat to do this).
e. The boiler "DEMAND" indicator will flash green and the pump should run.
f. After approx. 2-3 minutes the "DEMAND" indicator will remain illuminated green (no longer flashing) and the "HEAT" indicator will illuminate. The height of the "HEAT" indicator will vary as the boiler heat input modulates the power.
g. Check the primary FLOW pipework from the Electromax begins to rise in temperature.
h. When the boiler is operating at its maximum power output ("HEAT" indicator fully illuminated) set the pump speed to give a 5° to 10° C differential between the primary flow and return connections at the boiler.
i. Set the Programmable Room Thermostat to be satisfied (not calling for heat). The "HEAT" and "DEMAND" indicators should no longer be illuminated, however the pump may continue to run for a short period (pump over-run facility) to dissipate the heat from the boiler heat exchanger if required.
j. When the system is hot bleed all radiators and air vents to remove any residual air from the system.

7.7 Setting the Automatic By-pass Valve

a. Loosen the brass locking screw on top of the adjustment cap of the by-pass valve (see Diagram 42).
b. Turn the adjustment knob fully clockwise so that the number 5 coincides with the indicator arrow on the body of the valve.
c. With the boiler on ("DEMAND" and "HEAT" indicators illuminated) and the pump running, slowly turn the adjustment knob anti-clockwise until hot water can be felt on the outlet side of the by-pass valve.
d. Turn the adjustment knob clockwise by half a turn. Lock in position by tightening the brass locking screw.

7.8 Check Operation of the Immersion Heaters

a. The Off-Peak immersion heater is controlled by the Off-Peak electrical supply and will only switch on during Off-Peak supply periods as defined by your electricity supplier (refer to Table 2, page 19 for Off-Peak on times).
b. Switch on the Off-Peak electrical supply MCB and isolating switch.
c. Switch on the Domestic Hot Water "on" switch (indicated by a "tap" symbol, see Diagram 19, page 25). The switch should be illuminated when on.
d. Press the DHW Boost switch (indicated by a "tap" symbol followed by "+1 hour", see Diagram 19, page 25). The DHW Boost indicator should illuminate.
e. The DHW Boost immersion heater should only operate for a period of one hour or until the set temperature on its control thermostat is reached. After one hour the DHW Boost indicator light will go out.

7.9 Demonstration to User

Following Commissioning any panels or covers removed must be replaced and fully secured in place. The system, its function and control should be fully explained to the user. This must include:

a. DHW supply –
   Explain how the complete cylinder is only heated by Off-Peak electricity.
   Explain how a one hour DHW boost can be obtained if a day time top up is required.
b. Central Heating –
   Explain how the central heating system works.
   Explain the operation of the Programmable Room Thermostat and the settings that have been programmed.
   Explain how the Programmable Room Thermostat can be over-ridden if required.
c. System malfunction –
   Explain what to do if the system malfunctions or the "Alarm" indicators are illuminated.
d. System maintenance –
   Explain the necessity for the system to receive regular maintenance to ensure its continued safe and efficient operation.
e. User Instructions –
   Hand over the Electromax Installation Instructions, the Danfoss TP 5000 Installation and User Instructions and the Electromax User Instructions.

8.0 Maintenance

8.1 Maintenance requirements

To ensure the continued optimum performance of the Electromax it should be regularly maintained. Maintenance should be carried out by a competent person and any replacement parts used should be authorized Heatrae Sadia Electromax spare parts. It is recommended that maintenance is carried out annually and should include the checks detailed in the sections below. The primary system inhibitor concentration should also be checked and topped up if necessary.

IMPORTANT: Disconnect ALL electrical supplies before removing the covers or panels to the appliance.

8.2 Check cylinder water supply

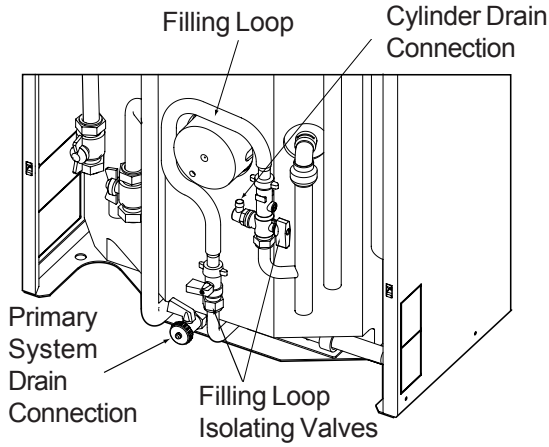
a. Turn off the mains water supply to the Electromax and release the system pressure by opening a hot tap. Some hot water will flow for a short while, this is normal.
b. Using an Allen Key unscrew the four fixing screws on the Cold water Combination Valve Pressure Reducing Valve Housing (see Diagram 17, page 23). Remove the moulded housing.
c. Pull the Pressure Reducing Valve Cartridge from the Housing. The Strainer will be removed with the Pressure Reducing Valve Cartridge. Wash any particulate matter from the Strainer mesh under clean running water.
d. Replace the Pressure Reducing Valve Cartridge in the Housing and re-fit to the brass body of the Cold Water Combination Valve. Secure using the four Allen screws previously removed.
e. Remove the dust cap from the top of the Secondary Expansion Vessel. Check the charge pressure of the Vessel using a tyre pressure gauge. The pressure (with system de-pressurised) should be 3.5 bar. If lower than the required setting it should be re-charged using a tyre pump (Schrader valve type). DO NOT over charge. Re-check the charge pressure and when correct replace the dust cap.

8.3 Descaling immersion heaters

In hard water areas where no water treatment measures have been taken the immersion heaters may require descaling. The Electromax cylinder must be drained before the immersion heaters can be removed.

a. Disconnect the electrical supplies to the Electromax.
b. Remove the front panels (refer to section 3.2).
c. Connect a hose to the DHW drain point (see Diagram 20) and unscrew square headed stop plug to allow water to drain from the cylinder. If water fails to drain from the cylinder vent the unit by manually opening the Temperature/ Pressure Relief Valve.
d. Remove the immersion heater covers by unscrewing the securing screws.

Diagram 20 Drain Points



e. Disconnect the wiring from the immersion heater thermostats. Remove the thermostats by carefully pulling outwards from the immersion heaters.
f. Unscrew immersion heater backnuts using the key spanner supplied with the unit. Remove the immersion heaters. Over time the immersion heater gaskets may become stuck to the mating surface, to break the seal insert a round bladed screwdriver into one of the pockets on the immersion heater and gently lever up and down.
g. Carefully remove any scale from the surface of the immersion heater elements. DO NOT use a sharp implement as damage to the element surface could be caused. Ensure sealing surfaces are clean and seals are undamaged. If in doubt fit new sealing gaskets.
h. Replace the immersion heaters ensuring the right angled element is inserted into the lower immersion heater boss and hangs vertically downwards towards the base of the unit.
i. Secure the immersion heaters in place using the backnuts previously removed. It may be helpful to support the immersion heater using a round bladed screwdriver inserted into one of the thermostat pockets whilst the backnut is tightened.
j. Replace the thermostats by carefully plugging the two male spade terminations on the underside of the thermostat head into the corresponding terminations on the element.
k. Rewire the immersion heaters in accordance with Diagram 14, page 21. Refit and secure the immersion heater covers.
l. Close the drain tap and turn on mains water supply.
m. When water flows from the hot tap allow to flow for a short while to purge air and flush through any disturbed particles.
n. Close hot tap and then open successive hot taps to purge any air.

8.4 Operation of cylinder safety valves

a. Slowly open the Temperature and Pressure Relief Valve by twisting its cap for a few seconds.
b. Check water is discharged and that it flows freely through the tundish and discharge pipework.
c. Release valve cap and check water flow stops and valve re-seats correctly.
d. Repeat the procedure above for the Expansion Valve located on the Cold Water Combination Valve.

8.5 Operation of Primary System Safety Valve

a. Close the primary flow and return isolating valves (see Diagram 15, page 22).
b. Slowly open the Primary System Pressure relief valve (see Diagram 16, page 23) by twisting its cap for a few seconds.
c. Check water is discharged and that it flows freely through the tundish and discharge pipework.
d. Release valve cap and check water flow stops and valve re-seats correctly.

8.6 Primary System Expansion Vessel Charge Pressure

a. Open the Primary System Pressure Relief Valve and allow water to flow until the system pressure gauge drops to zero.
b. Remove the top panel (refer to section 4.2).
c. Remove the dust cap from the Primary System Expansion Vessel (see Diagram 21).
d. Check the charge pressure of the Vessel using a tyre pressure gauge. The

pressure (with system de-pressurised) should be 1.0 to 1.2 bar. If lower than the required setting it should be re-charged using a tyre pump (Schrader valve type). DO NOT over charge. Re-

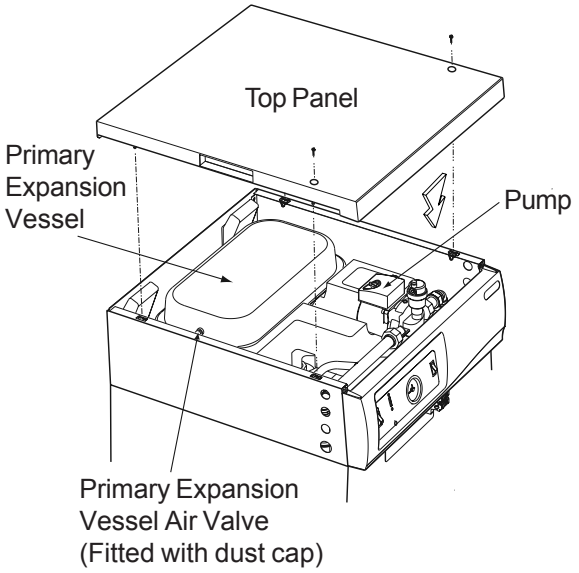


Diagram 21 Primary Expansion Vessel Position

check the charge pressure and when correct replace the dust cap.

e. Connect the Filling Loop. Open the Filling Loop isolating valves and allow system to re-pressurise to approx. 1.5 bar.
f. Close the Filling Loop isolating valves and remove the flexible hose.
g. Open the primary flow and return isolating valves.

8.7 Electrical checks

a. Inspect all electrical terminations for signs of over-heating.
b. Check all terminations are tight.
c. Check cable glands are tightened and grip cables securely.
d. Replace all panels before re-starting system.

9.0 Fault Finding and Servicing

9.1 Fault Finding

The fault finding diagrams can be used to diagnose problems with the Electromax unit. These checks should be carried out by a competent installer or an authorized Heatrae Sadia service engineer or agent. A range of replacement parts (see Section 9.2) is available should any major component be suspected as faulty. The instructions in Section 9.2 detail how to remove and replace key components and assemblies. **Observe all safety warnings before removing any components, if in doubt contact Heatrae Sadia for further advice.**

Diagram 22 Electric Boiler Fault Finding Master

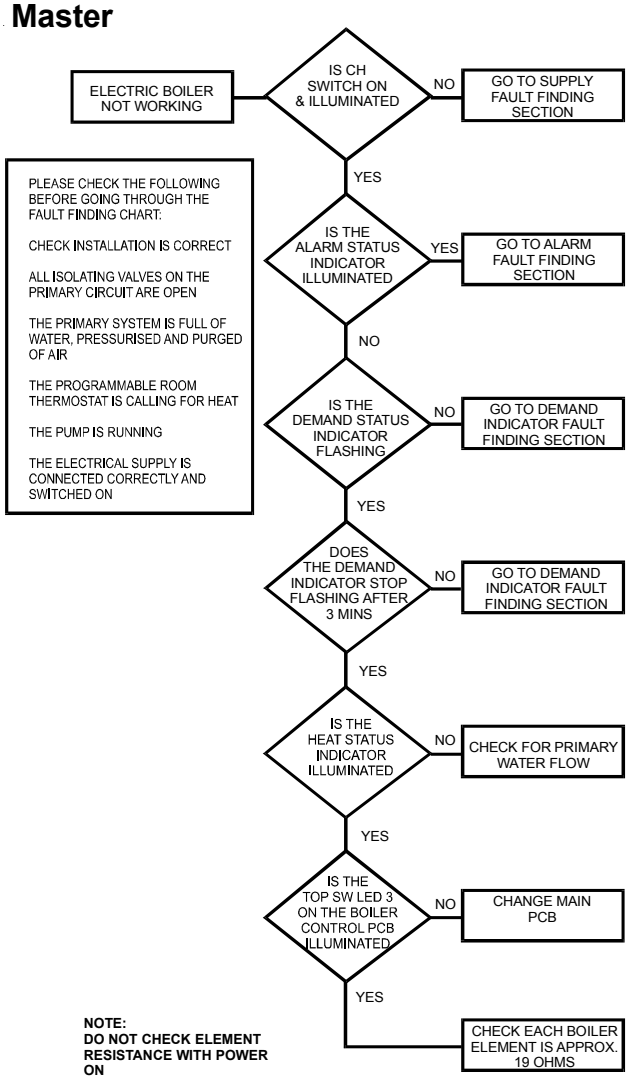


Diagram 23 Electric Boiler Fault Finding Supply Faults

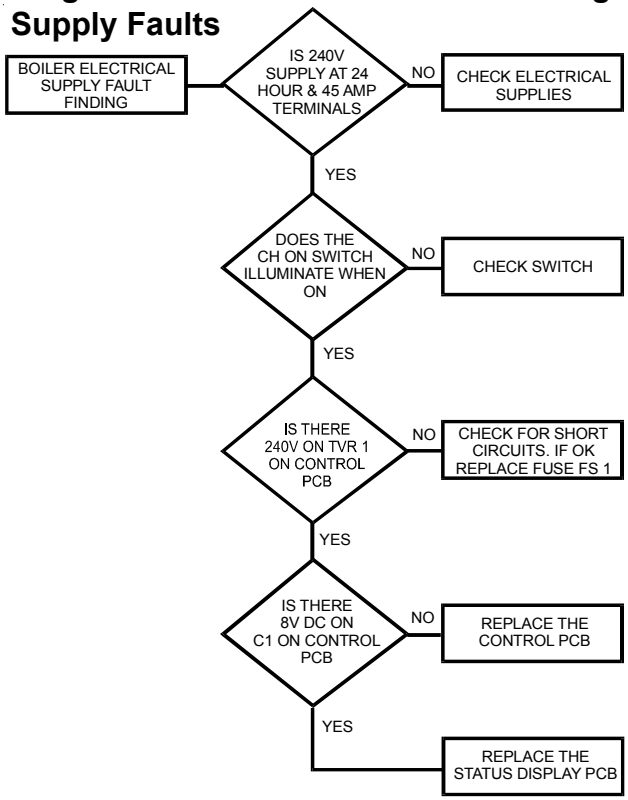


Diagram 24 Electric Boiler Fault Finding Alarm 1

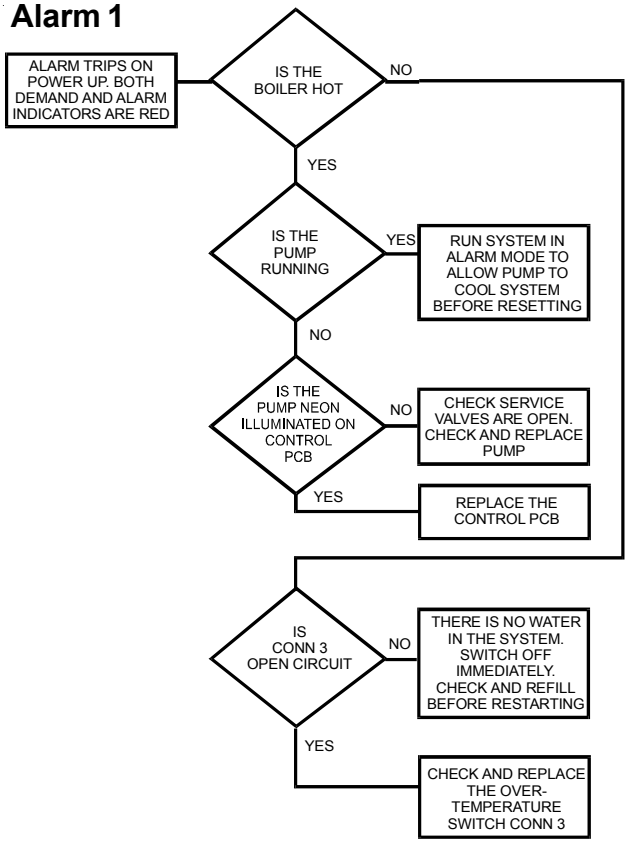


Diagram 25 Electric Boiler Fault Finding Alarm 2

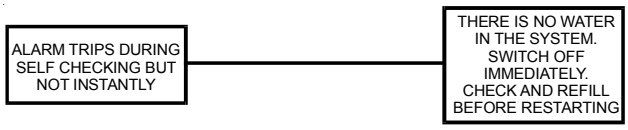


Diagram 26 Electric Bolier Fault Finding Alarm 3

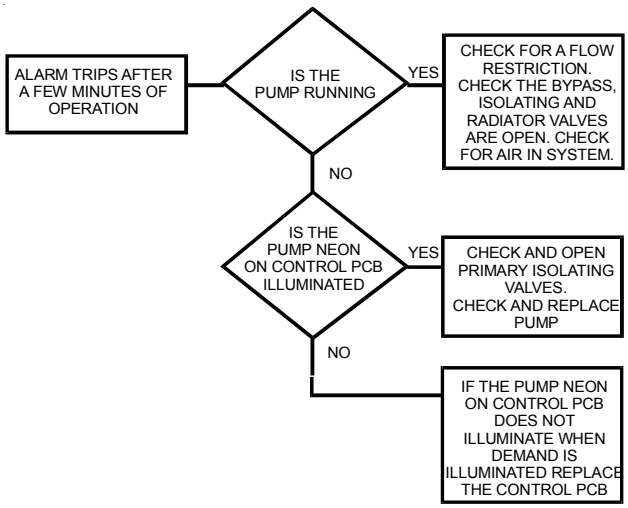


Diagram 27 Electric Boiler Fault Finding Alarm 4

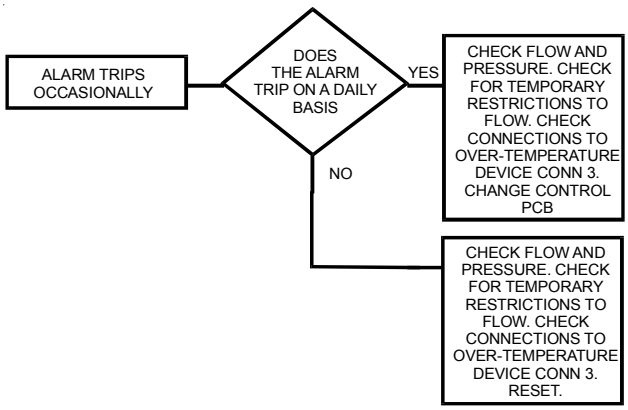


Diagram 28 Electric Boiler Fault Finding Demand Faults 1

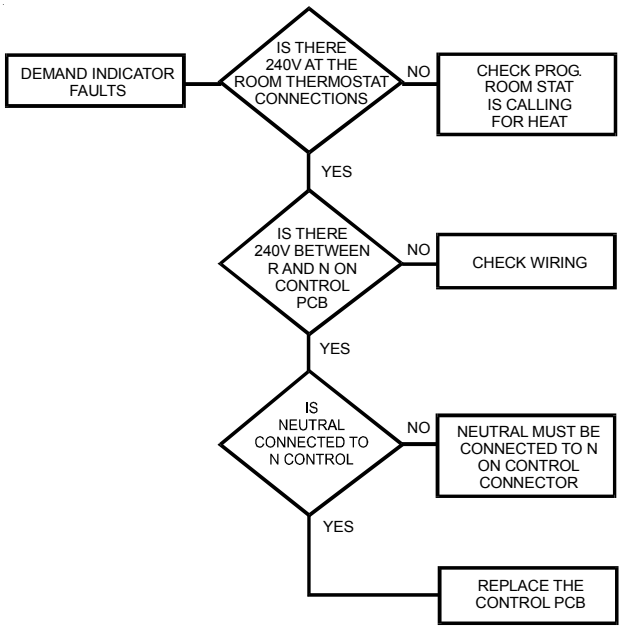
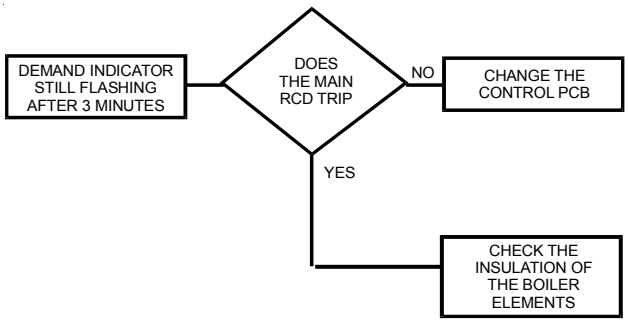


Diagram 29 Electric Boiler Fault Finding Demand Faults 2



Alarm Reset

To reset the unit after an ALARM condition:

a. Switch off the electrical supply

b. Correct the fault, check the system is full of water, is set to the correct pressure and there is a good flow of water around the primary circuit.

c. Switch the electrical supply back on

Diagram 30 Water Heater Fault Finding Master

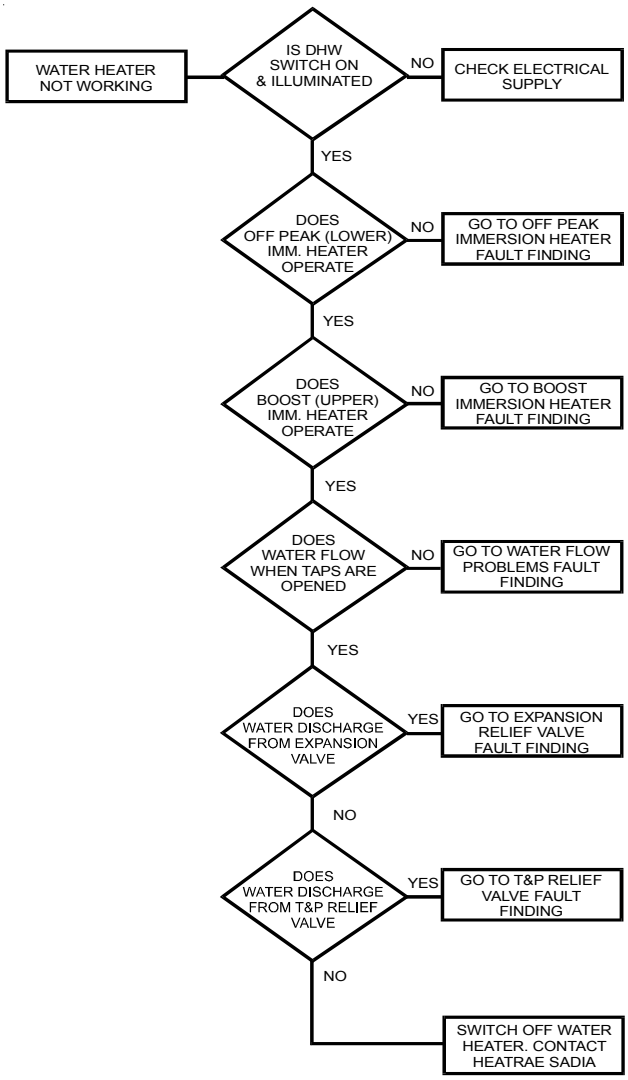


Diagram 31 Water Heater Fault Finding Off Peak (Lower) Immersion Heater Faults

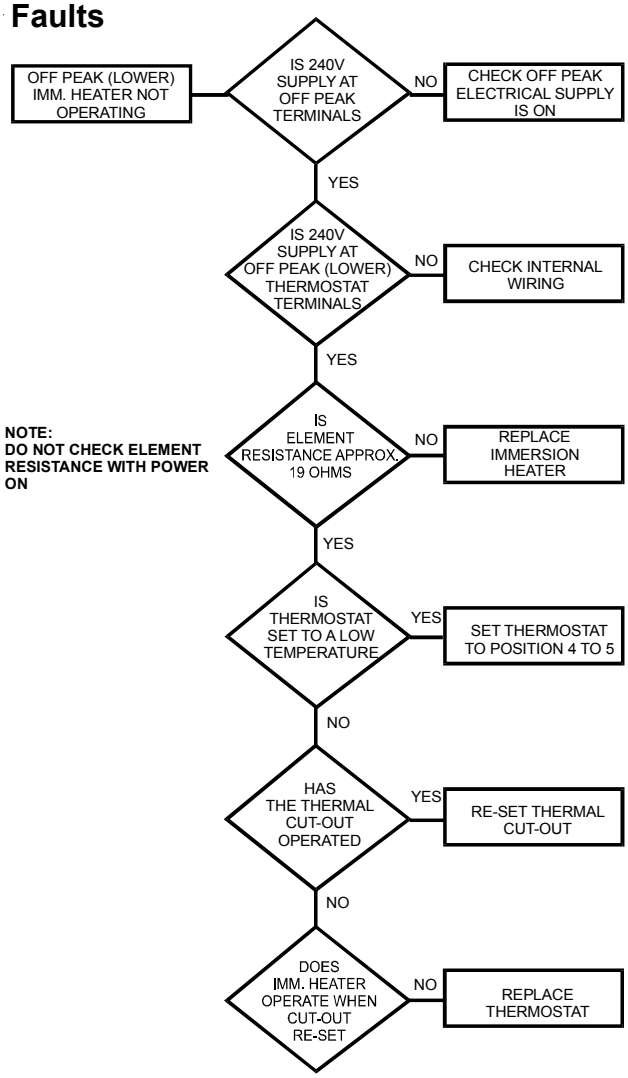


Diagram 32 Water Heater Fault Finding
Boost (upper) Immersion Heater Faults

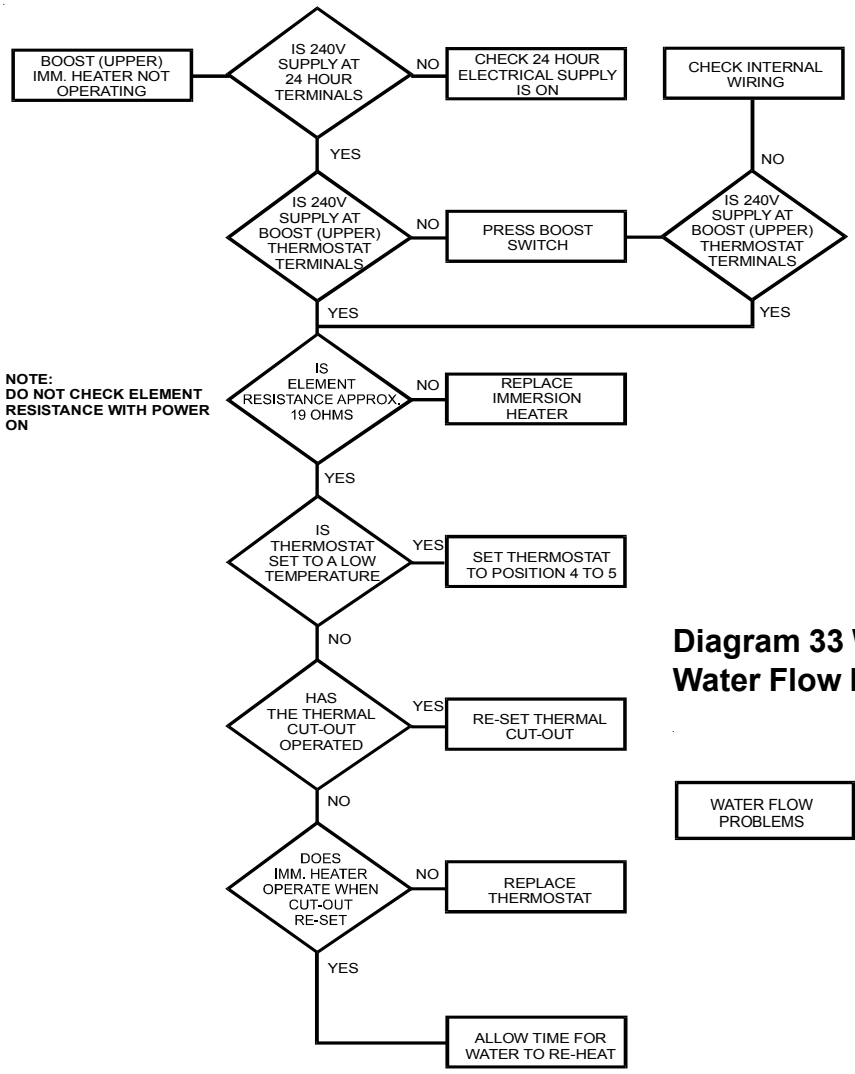


Diagram 33 Water Heater Fault Finding
Water Flow Faults

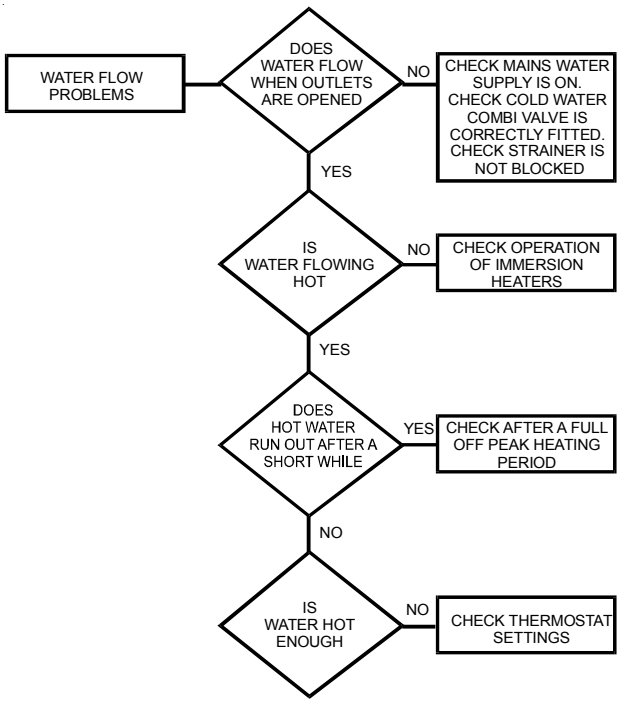


Diagram 34 Water Heater Fault Finding Expansion Valve Faults

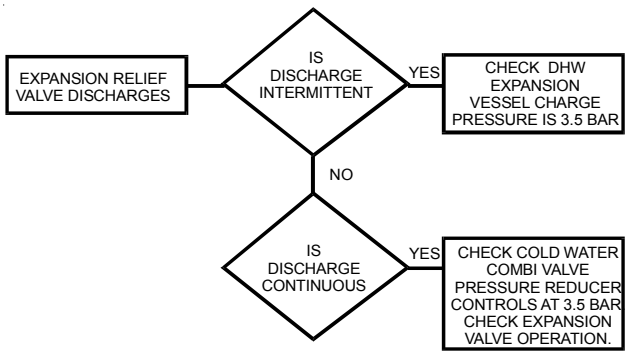
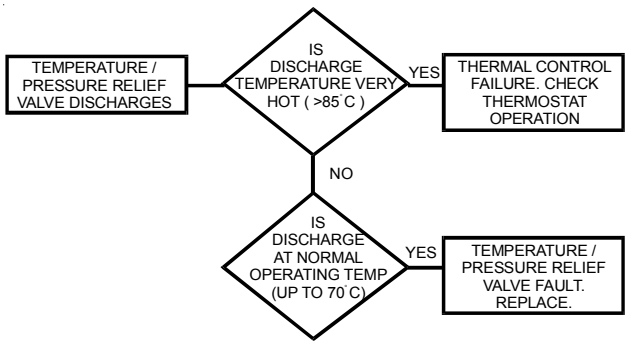


Diagram 35 Water Heater Fault Finding Temperature & Pressure Relief Valve Faults



9.2 Replacement Parts

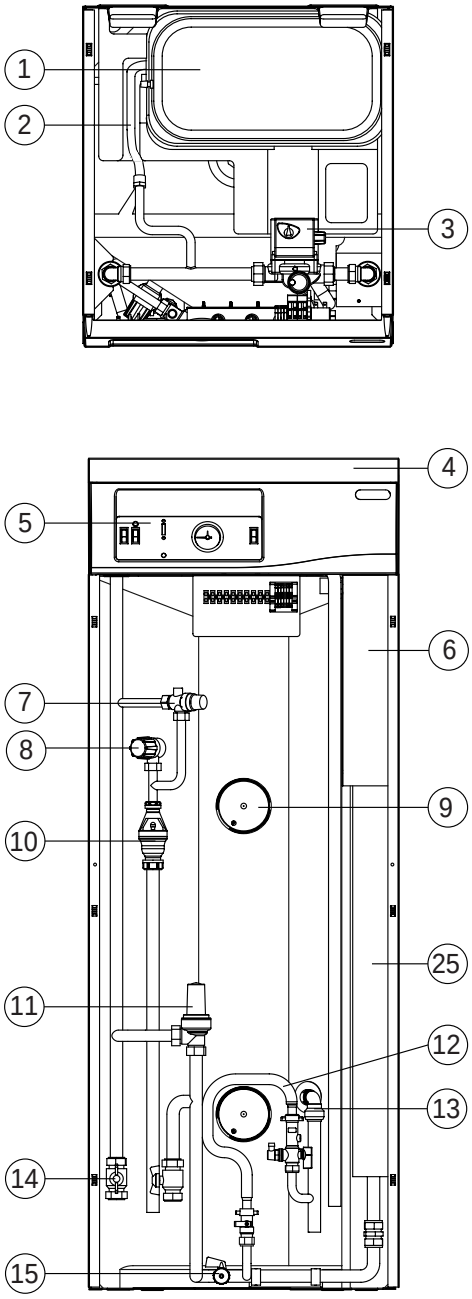
A range of replacement parts is available for the Electromax unit. Refer to the following diagrams to aid in identifying the parts you require and the relevant Heatrae Sadia order code. Only use genuine Heatrae Sadia parts, the use of un-approved spare parts may render the warranty invalid. Parts should be replaced by a competent installer or authorized Heatrae Sadia service engineers or agents.

Product Views Replacement Parts

Description	Part Number
1. Expansion vessel	95607034
2. Hose - expansion vessel	95607035
3. Pump assembly	See Diagram 37
4. Top lid assembly	95614022
5. Electronics and surround panel	See Diagram 39
6. Boiler circuit protection lid	95614085
7. Pressure relief valve	95607036
8. Temperature and pressure valve	95605023
9. Element assembly	See Diagram 38
10. Tundish	95605838
11. Differential bypass valve	95605034
12. Filling loop assembly	95607039
13. 22mm Inlet connection - snapfit	95607040
14. Radiator shut off valves	95605035
15. Bleed Valve	95605038
16. Front panel assembly top (not shown)	95614028
17. Front panel assy bottom (not shown)	95614025
18. Pressure reducing valve (not shown)	95605873
19. Cold control pack (not shown)	95605033
20. Expansion vessel (not shown)	95607864
21. Danfoss programmable room Stat	95607044
22. Expansion relief valve cartidge 8 bar	95605870
23. Cold water combination valve body including isolating valve	95605871
24. Expansion core housing	95605872
25. 9kw electric boiler spares:-	
Main power PCB assembly	95915046
Fuse T 2A 240V	95612709
Temperature switch	95613628
Note: - Thermistor assembly	95612709
9kw electric boiler body	95608002

Where appropiate replacement parts are supplied with all the necessary screws, washers, etc. to allow for a like for like change.

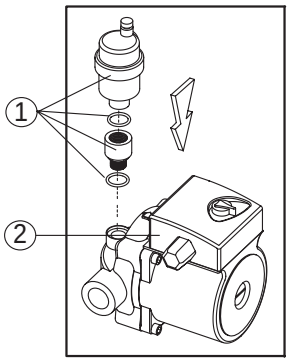
Diagram 36 - Product Views



Pump Assembly Replacement Parts

Description	Part Number
1. Auto air vent and extension	95605031
2. Pump	95605032

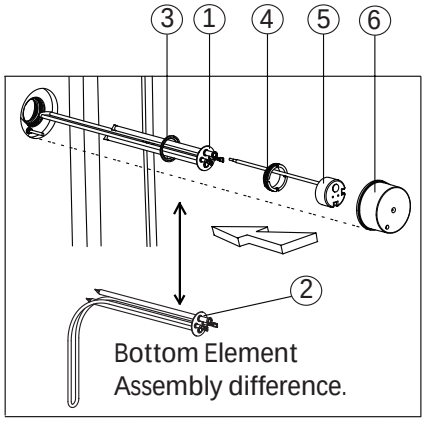
Diagram 37 - Pump Assembly



Element Assembly Replacement Parts

Description	Part Number
1. Immersion heater (upper)	95606947
2. Immersion heater (lower)	95606946
3. Immersion heater gasket	95611822
4. Immersion heater backnut	95607869
5. Thermostat	95612599
6. Immersion heater cover	95614020
7. Ket spanner (not shown)	95607861

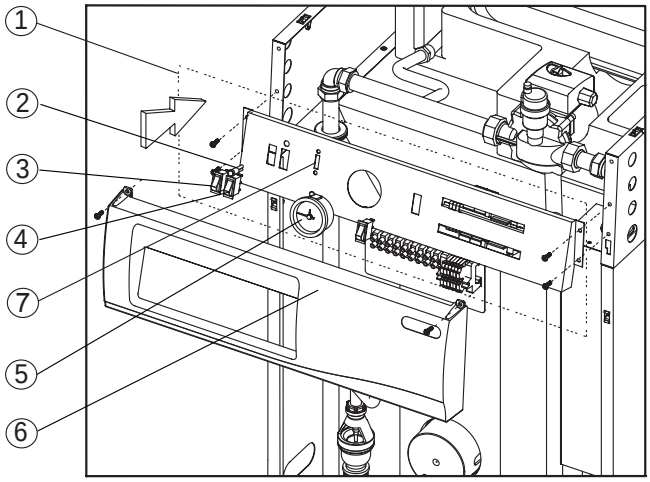
Diagram 38 - Element Assemblies



Electronics Assembly Replacement Parts

Description	Part Number
1. Complete controls assembly	95612018
2. Green neon	95607033
3. Green switch	95613001
4. Black switch	95613002
5. System pressure gauge	95607032
6. Front facia panel	95614026
7. Control PCB	95615008

Diagram 39 - Electronics Assembly



9.3 Servicing

WARNING: DISCONNECT FROM ALL ELECTRICAL SUPPLIES BEFORE BEGINNING ANY WORK ON THE UNIT. THE WATER CONTAINED IN EITHER THE WATER HEATER CYLINDER OR THE PRIMARY HEATING CIRCUIT MAY BE VERY HOT – CARE MUST BE TAKEN TO AVOID SCALDING.

To remove any water carrying parts the system must first be drained. The water heater cylinder and primary circuit are not connected so must be drained separately. It is not necessary to drain the system for all servicing actions, those that require draining are indicated.

9.3.1 Draining the Electromax Primary Circuit

a. To avoid draining the complete primary radiator circuit the Electromax Primary circuit can be isolated by shutting off the primary circuit isolating valves fitted on the Primary Flow and Return pipes (see Diagram 15, page 22)
b. Relieve the system pressure by twisting the red cap located on the Primary Pressure Relief Valve (see Diagram 16, page 23). Observe the system pressure indicated on the Primary System Pressure Gauge located on the fascia panel of the Electromax.
c. Remove the sealing cap from the front of the Primary Drain Valve (see Diagram 20, page 27) and replace it with the hose connector supplied.
d. Attach a hose to the hose connector and secure in place with a hose clip. Place the discharge point of the hose at a point below the level of the Electromax where the water drained will safely drain away.
e. Open the Primary Drain Valve and allow the water to drain from the Primary circuit.
f. Water carrying parts attached to the Electromax Primary circuit can now be removed. However, take care when removing parts as some residual water may still be contained and this may be very hot.

9.3.2 Draining the Electromax Water Heater Cylinder

a. Turn off the mains water supply to the unit.
b. Open a hot tap supplied by the Electromax to relieve the system pressure. Caution: some hot water will flow from the tap!
c. Attach a hose to the hose connection on the drain point of the Filling Loop (see Diagram 20, page 27). Place the discharge point of the hose at a point below the level of the Electromax where the water drained will safely drain away.
d. Open the square headed drain screw (see Diagram 20, page 27) and allow the unit to drain.

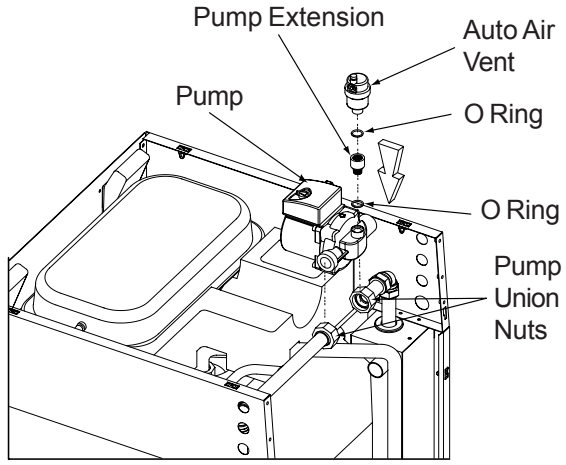
9.3.3 Removing the Automatic Air Vent (see Diagram 40, page 38) DRAIN PRIMARY

a. The Automatic Air Vent is located on the Pump body. It can be removed either with the Pump fitted or removed.
b. Unscrew the Pump Extension and remove assembly from Pump body.
c. Unscrew the Automatic Air Vent from the Pump Extension.
d. Replacement is a reversal of the above procedure. Ensure that the 'O' ring seals are correctly located before replacement.

9.3.4 Removing the Primary circulating pump (see Diagram 40) DRAIN PRIMARY

a. Unscrew top of Pump electrical housing and remove by pulling upwards.
b. Unscrew Pump cable securing gland. Disconnect Pump connections from terminals by pressing the spring loaded clips. Remove Pump cable.
c. Unscrew the union nuts from each end of the Pump body and slide back along pipework.
d. The Pump can now be lifted from the unit.
e. Replacement is a reversal of the above procedure. Ensure the Pump sealing washers are correctly located before tightening union nuts. Ensure the correct electrical connections are made (Brown wire to “L” terminal, Blue wire to “N” terminal, Green/Yellow wire to “ ⏚ “ terminal). Secure the electrical cable by tightening the Cable Gland.

Diagram 40 Pump Removal

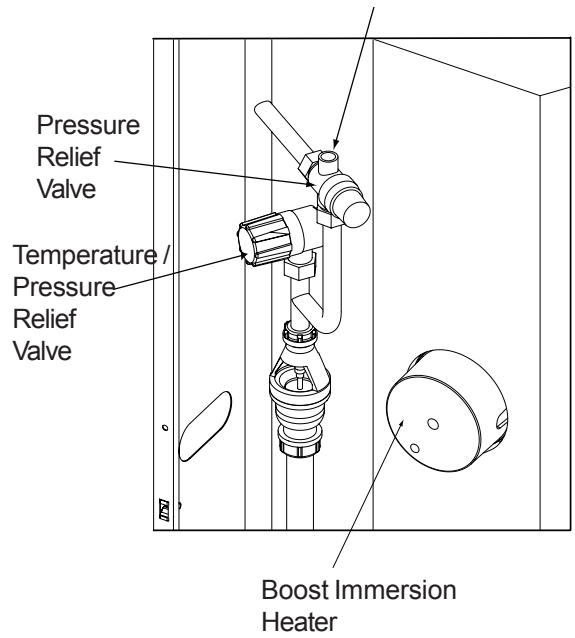


Note: Fascia Panel not shown for clarity

9.3.5 Removing the Primary System Pressure Relief Valve (see Diagram 41) DRAIN PRIMARY

a. Unscrew the Pressure Gauge connection and remove from Pressure Relief Valve body.
b. Unscrew compression connections at inlet and outlet of the valve.
c. Remove Pressure Relief Valve.
d. Replacement is a reversal of the above procedure. Ensure all connections are correctly made and tight.

Diagram 41 Pressure Relief Valve Removal



9.3.6 Removing the Automatic Bypass Valve (see Diagram 42) DRAIN PRIMARY

a. Unscrew the compression connections at inlet and outlet of the Valve.
b. Remove the Automatic Bypass Valve.
c. Replacement is a reversal of the above procedure. Ensure all connections are correctly made and tight.

9.3.7 Removing the Electric Boiler assembly (see Diagram 43) DRAIN PRIMARY

a. Remove cover from over the Electric Boiler Control pcb.
b. Disconnect cables from the terminal blocks and pull back through cable entry bush.
c. Unscrew Electric Boiler Control Housing from right hand side panel.
d. Unscrew the compression fitting from the lower (return) pipe to the Electric Boiler.
e. Disconnect the “Push Fit” connection from the upper (flow) pipe from the Electric Boiler.
f. The Electric Boiler assembly can now be removed. To aid removal lower the assembly until the Control Housing is approximately half way down the unit and slightly flex the right hand side panel outwards.
g. Replacement is a reversal of the above procedure. Ensure cables are routed into the Control Housing through the cable entry bush. Ensure all electrical connections are correctly made (refer to wiring diagram 14, page 21) and tightened fully. **Loose terminations can overheat and cause a fire hazard.**

Diagram 42 Auto By-pass Valve Removal

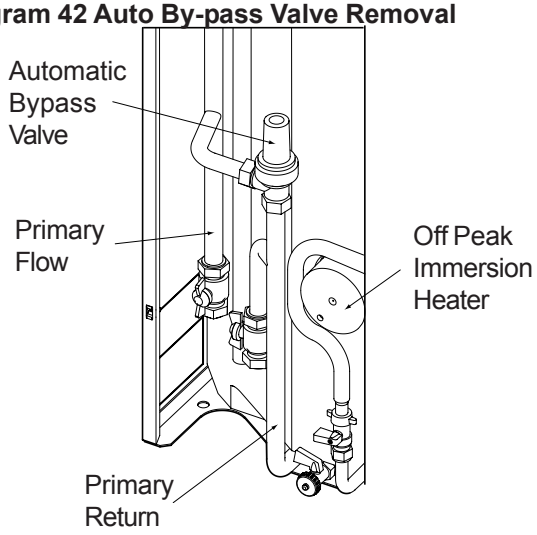
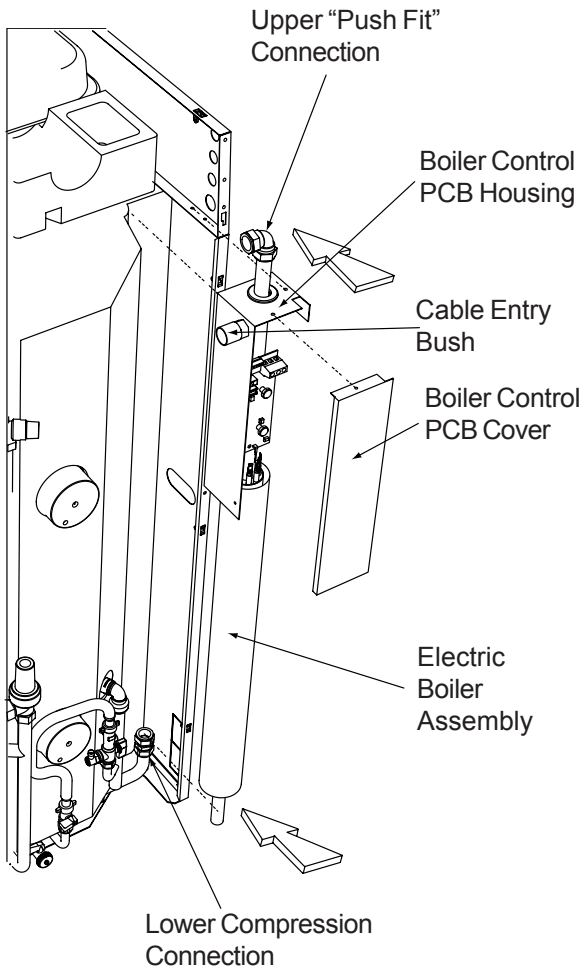


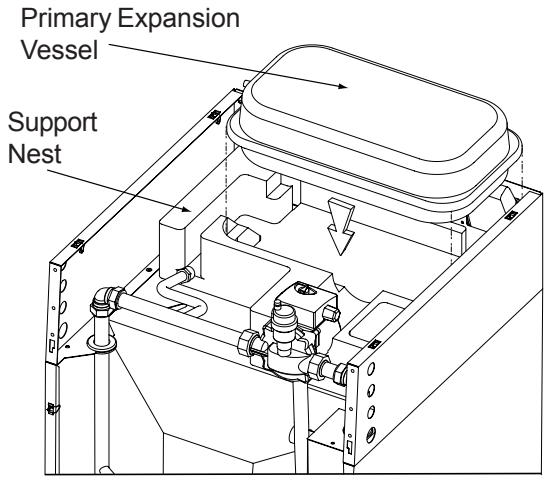
Diagram 43 Electric Boiler Removal



9.3.8 Removing the Primary System Expansion Vessel (see Diagram 44) DRAIN PRIMARY

a. Unscrew union nut at connection between the Expansion Vessel and the flexible hose coupling.
b. Lift Expansion Vessel from moulded support nest. **Note: the Expansion Vessel may contain some water, take care not to spill this into the product by lifting from the connection end of the vessel.**
c. Replacement is a reversal of the above procedure. Ensure Vessel is inserted into support nest the correct way up with the Air Valve towards the top. Ensure sealing washer is correctly fitted.

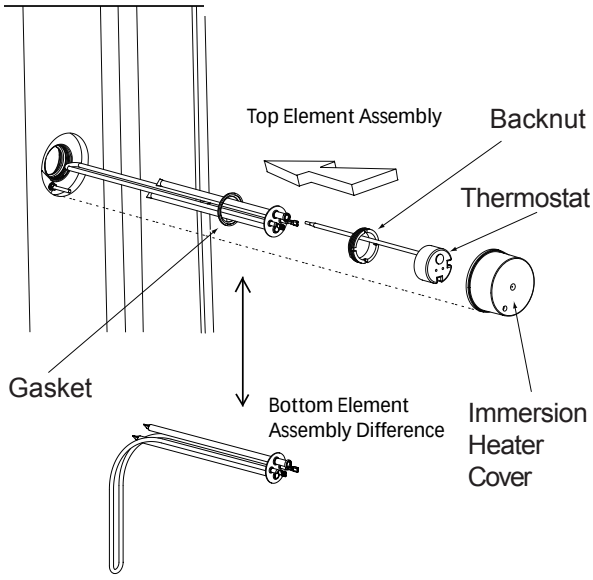
Diagram 44 Primary Expansion Vessel Removal



9.3.9 Removing the Immersion Heaters (see Diagram 45) DRAIN CYLINDER

a. Remove the immersion heater covers by unscrewing the securing screws.
b. Disconnect the wiring from the immersion heater thermostats. Remove thermostats by carefully pulling outwards from the heaters.
c. Unscrew immersion heater backnuts using the key spanner supplied with the unit. Remove the immersion heaters. Over time the immersion heater gaskets may become stuck to the mating surface, to break the seal insert a round bladed screwdriver into one of the pockets on the immersion heater and gently lever up and down.
d. Replacement is a reversal of the above procedure. Note: the upper and lower immersion heaters are of different configurations. The “right angled” element version should be used in the lower immersion heater boss, the “straight” element version should be used in the upper immersion heater boss. Ensure the “right angled” element is inserted into the lower boss so the element hangs vertically downwards towards the base of the unit.

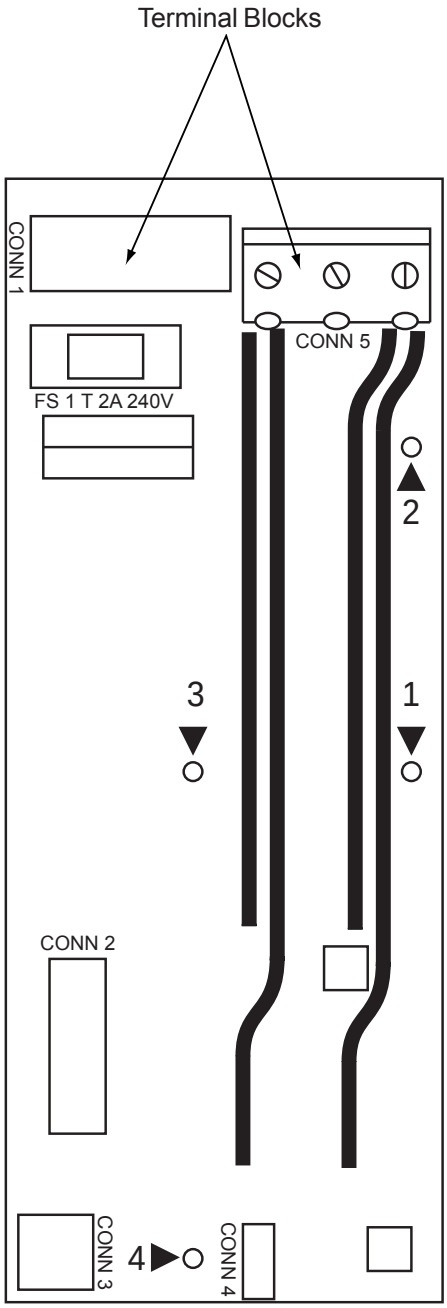
Diagram 45 Immersion Heater Removal



9.3.10 Removing the Electric Boiler Main Control PCB

a. Remove cover from over the Electric Boiler Control pcb (see Diagram 43, page 39).
b. Disconnect cables from the terminal blocks.
c. Unplug ribbon cable connector CONN 2.
d. Unplug the thermistor connector from CONN 4. Unplug the over-temperature cut-out connector from CONN 3.
e. Remove the pcb securing screws (numbered 1 to 4 on Diagram).
f. Carefully remove the pcb assembly from the Boiler pipework. This may be stiff and gentle prising from the top may be required.
g. Disconnect the cables from the Electric Boiler element connections.
h. Replacement is a reversal of the above procedure. Ensure the correct element connections are made. The element terminals are colour coded to correspond with the same colour connecting wires from the pcb, ensure they are connected to the correct elements. Ensure heat sink compound is applied to the underside of the heat sink. Refit the pcb tightening the fixing screws in the order indicated on Diagram 46. Ensure all electrical connections are correctly made (refer to wiring diagram 14, page 21) and tightened fully. **Loose terminations**

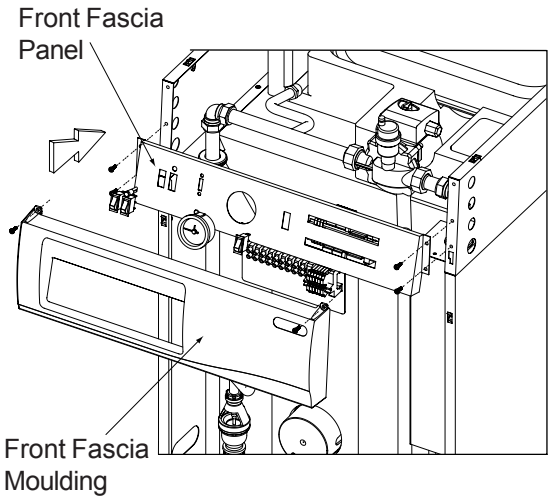
Diagram 46 Electric Boiler Control PCB



9.3.11 Removing the Front Fascia Panel (see Diagram 47) DRAIN PRIMARY

a. Unscrew the securing screws from the top of the front fascia moulding (Note: these screws can only be accessed with the Top Panel removed).
b. Push the front fascia moulding up slightly and then pull forward to remove.
c. Disconnect all supply cables to the terminal blocks.
d. Disconnect the Earth Bonding cable from the terminal adjacent to the teminal blocks.
e. Disconnect internal wiring from the Pump (see section 9.3.4) and the Electric Boiler (see section 9.3.7).
f. Disconnect the Pressure Gauge connection from the Primary System Pressure Relief Valve (see section 9.3.5).
g. Unscrew the four fixing screws securing the Front Fascia Panel to the side panels and remove.
h. The following components of the Front Fascia Panel are replaceable: “Boost” immersion heater “ON” indicator neon, “Boost” immersion heater switch, “DHW ON” and “CH ON” switches, Pressure Gauge, Boiler Status pcb

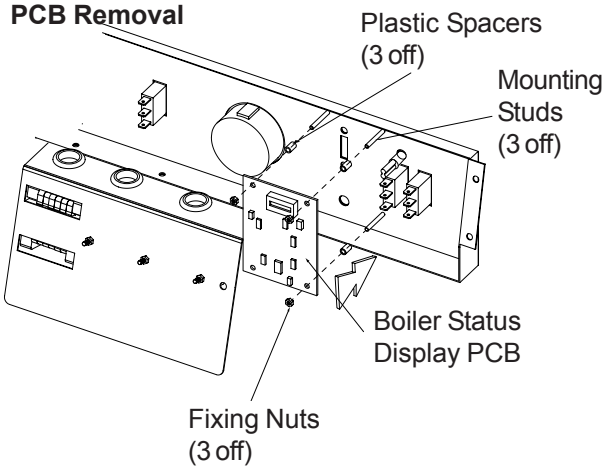
Diagram 47 Fascia Panel Removal



9.3.12 Removing the Boiler Status Display PCB (located on the Fascia Panel) (see Diagram 48)

a. Unscrew the four securing nuts from the mounting pillars on the reverse of the Fascia Panel.
b. Carefully remove the Boiler Status Display pcb from the mounting pillars.
c. Replace with new Boiler Status Display pcb. Ensure that plastic spacers are located on the mounting pillars under the pcb. Ensure the nuts are equally tightened.

Diagram 48 Boiler Status Display PCB Removal



View on rear of Fascia Panel
(wires removed for clarity)

10.0 Guarantee

This product is guaranteed against faulty materials and manufacture. The following guarantee periods apply from the date of purchase:

Stainless steel cylinder	10 years
Electric boiler	2 years
DHW Expansion Vessel	5 years
All other valves, fittings and electrical parts	2 years

provided that:

- The unit has been installed in accordance with the Installation and Service instructions and all relevant Codes of Practice and Regulations in force at the time of installation, and that all necessary controls and safety valves have been fitted correctly.
- Any valves and controls fitted are of Heatrae Sadia recommended type and specification.
- The unit has not been modified or tampered with in any way, and has been regularly maintained as detailed in these instructions.
- The Domestic Hot Water cylinder has only been used for the storage of wholesome water as defined by the Water Supply (Water Fittings) Regulations 1999.
- The primary water circuit has been flushed and treated with a suitable inhibitor ad is used only for domestic heating purposes.
- Within 60 days of installation the user completes and returns the Guarantee Registration Card supplied with the unit in order to register the product.

The unit is not guaranteed against damage by frost, and the immersion heaters are not guaranteed against excessive scale build-up.

Periodic loss of charge pressure from the Expansion Vessels is normal (indicated by an intermittent discharge of water from the Expansion or Primary Pressure Relief Valves) and is not covered under the product guarantee.

This guarantee does not affect your statutory rights.

Environmental Information

This product is manufactured from many recyclable materials. At the end of its useful life it should be disposed of at a Local Authority Recycling Centre in order to realise the full environmental benefits.

Insulation of the DHW Cylinder is by means of an approved CFC/HCFC free polyurethane foam with an ozone depletion factor of zero and a Global Warming Potential (GWP) of 3.1.

11.0 Spares Stockists

For the fast and efficient supply of spares please contact the stockists listed below.

Electric Water Heating Co.
2 Horsecroft Place, Pinnacles, Harlow,
Essex, CM19 5BT
Tel: 0845 0553811
E-mail: sales@ewh.co.uk

Eyre & Elliston
Unit 12, Spitfire Way, Airlinks Industrial Estate,
Heston, Middlesex, TW5 9NR
Tel: 020 8573 0574

Parts Center
Network 65 Business Park, Bentley Wood Way,
Burnley, Lancashire, BB11 5ST
Tel: 01282 834403
www.partscenter.co.uk

Newey & Eyre
Specialist Products Division
Please contact your local branch

UK Spares Ltd.
Tower Lane, Warmley, Bristol, BS30 8XT
Tel: 0117 961 6670

William Wilson Ltd.
Unit 3A, 780 South Street, Whiteinch,
Glasgow, G14 0SY
Tel: 0141 434 1530

The policy of Heatrae Sadia Heating is one of continuous product development and, as such, we reserve the right to change specifications without notice.

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The quality name in water heating

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Service Fax: 01603 420349