

STUART

Installation, Operatation & Maintenance Instructions

Please leave this instruction booklet with the home owner as it contains important guarantee, maintenance and safety information



Read this manual carefully before commencing installation.
This manual covers the following products:

BEP 130
Pt. No. 46727

BEP 150
Pt. No. 46728



PRODUCT DESCRIPTION

The Electrastream unit is a packaged hot water and central heating unit designed to provide hot water and wet heating to water filled radiators, using electricity as the primary fuel.

The Electrastream is a 9 kW (30,000 btu) system suitable for flats, apartments, offices and other small dwellings.

STORAGE

If this product is not to be installed immediately on receipt, ensure that it is stored in a dry, frost and vibration free location in its original packaging.

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WARNINGS:

- **DO NOT** remove or adjust any component part of the unvented water heater: contact the **INSTALLER**.
- Plumbing must remain as supplied, do not add to or change any plumbing or connections.
- In the event of hot water/steam being emitted at the discharge pipe or tundish, switch the system off and contact installer – refer to trouble shooting.
- Scalding water and steam can be emitted from the discharge pipe. In accordance with guidelines position the discharge so there is no hazard to property or people (especially children).
- This installation is subject to Building Regulation Approval, notify the Local Authority of intention to install. Use only Manufacturer's recommended replacement parts.
- **Warning: ISOLATE THE TRI-CORE HEATER BEFORE REMOVING ITS COVER.**
- **Warning: The water temperature setting must not be set above 65 °C to avoid scalding.**
- Under no circumstances should the system be operated without the cylinder TPRV fitted and working correctly.
- Plastic pipe and fittings must not be used within 1 metre of the cylinder
- All wiring must be carried out to and comply with current IEE wiring Regulations. and comply with any relevant regulation that apply at the time of the installation.
- Using incorrect cable size will invalidate the warranty. Loose connections will result in overheating, arcing and possibly fire. **ENSURE ALL CONNECTIONS ARE TIGHT.**
- Ensure that no water can come into contact with any electrical device before the electrical supply is turned back on.
- The Electrastream unit must be commissioned by a competent person, failure to do so will invalidate the guarantee.
- Always turn off the heating system and electricity supply to the Electrastream before removing covers and working on the Electrastream System.
- Any service requirements of specific components must be carried out to the specified manufacturer's instructions.
- To install an Electrastream Heating System the installer must be fully competent, suitably qualified and hold a relevant unvented certificate and any applicable licence that may be require by the local inspectorate for installation of an unvented hot water storage system.

In some areas the Local Authority may require notification by means of a building notice or by the submission of full plans for the proposed installation of an unvented hot water storage system.

Note: In some areas it is a criminal offence to install an unvented hot water storage system without notifying the local authority or without the relevant licence.

- The Water Bye-laws and Current Building Regulations (paying particular attention to G3 and Part L 1 & 2) and HSE requirements should be considered when installing an Electrastream system.

Please read installation details carefully as they are intended to ensure this product provides long, trouble free service. Failure to install the unit in accordance with the installation instructions will lead to invalidation of the warranty.

This product must be installed by a competent person and must not be modified in any way.

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CHECKLIST

IMPORTANT: With the appliance removed from its packaging check for any damage prior to installation. If any damage is found contact Altecnic Ltd within 24 hours of receipt.

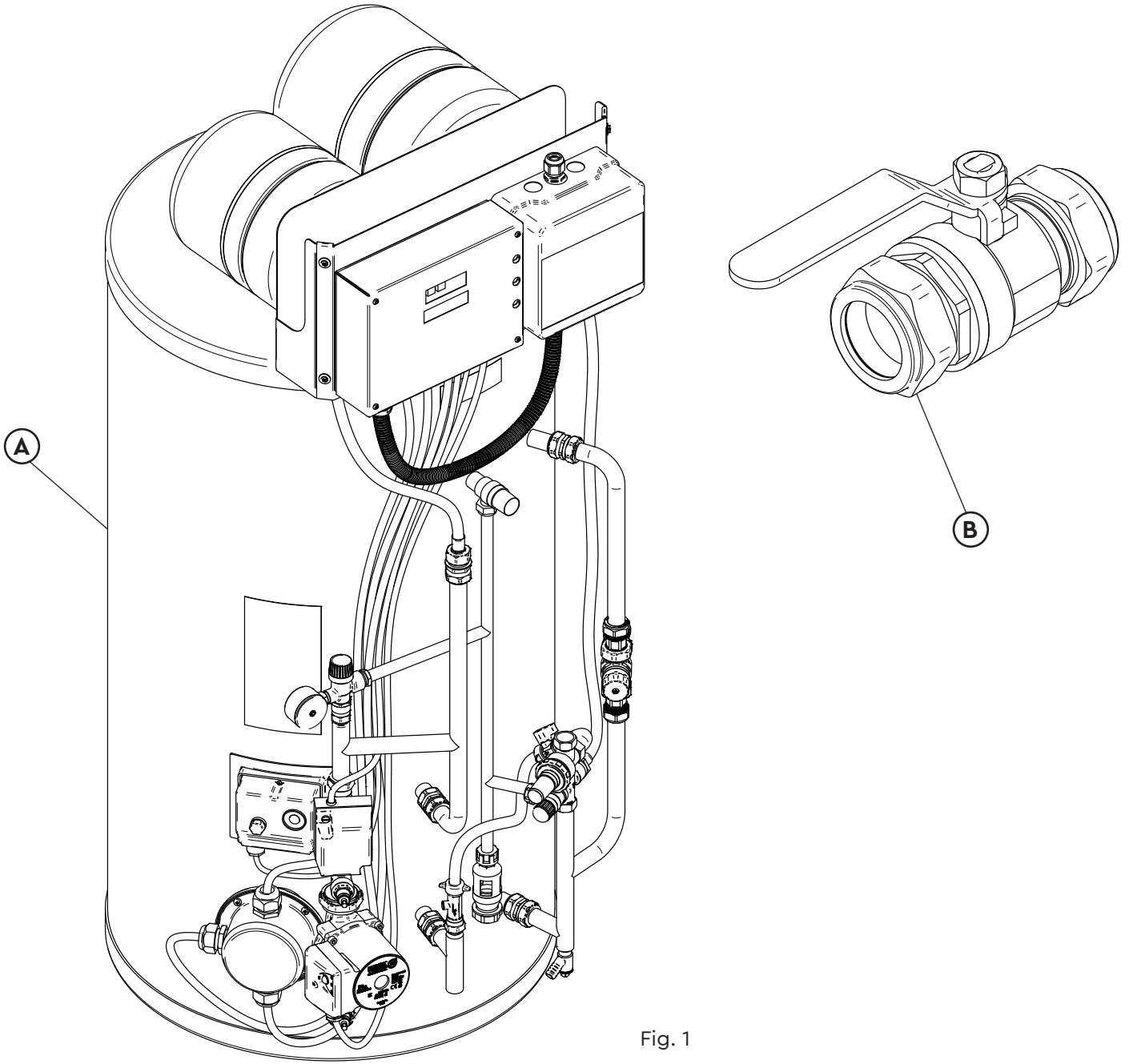


Fig. 1

Item	Description	Qty	Item	Description	Qty
Ⓐ	Electrastream unit	1	Ⓑ	22 mm lever isolating valve	2

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1 LOCATION - GENERAL

1.1 Siting the Electrastream unit:

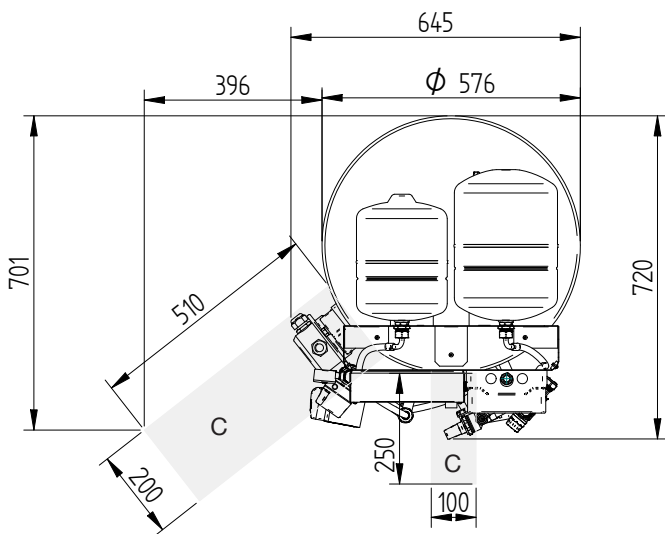
Note: The Electrastream units are designed for indoor use only.

The cylinder must always be installed vertically, at a convenient above ground location within the property. As the Electrastream is part of a sealed system, the cylinder is equally effective on any floor. The floor must give adequate support to the filled cylinder, refer to weights in Fig. 2.

The Electrastream must not be installed in any enclosed space where the air temperature could exceed the maximum electrical design ambient of 30 °C. Adequate ventilation should be provided for airing cupboards and enclosed compartments. Humidity may also present a problem within airing cupboards.

For servicing and cylinder replacement, clearance is required all round the cylinder - recommended 100 mm minimum.

The cylinder may be installed below ground i.e. in a basement, providing that the expansion relief discharge pipe is plumbed to a metal receptacle with a suitable pump and switch arrangement in accordance with, current Building Regulations.



Cylinder Model	Capacity	A	B	*Weight Empty	*Weight Full
BEP 130	130 litres	1200 mm	957 mm	49.5 kg	179.5 kg
BEP 150	150 litres	1325 mm	1085 mm	54.5 kg	204.5 kg

C - Minimum space required in the event of a replacement part

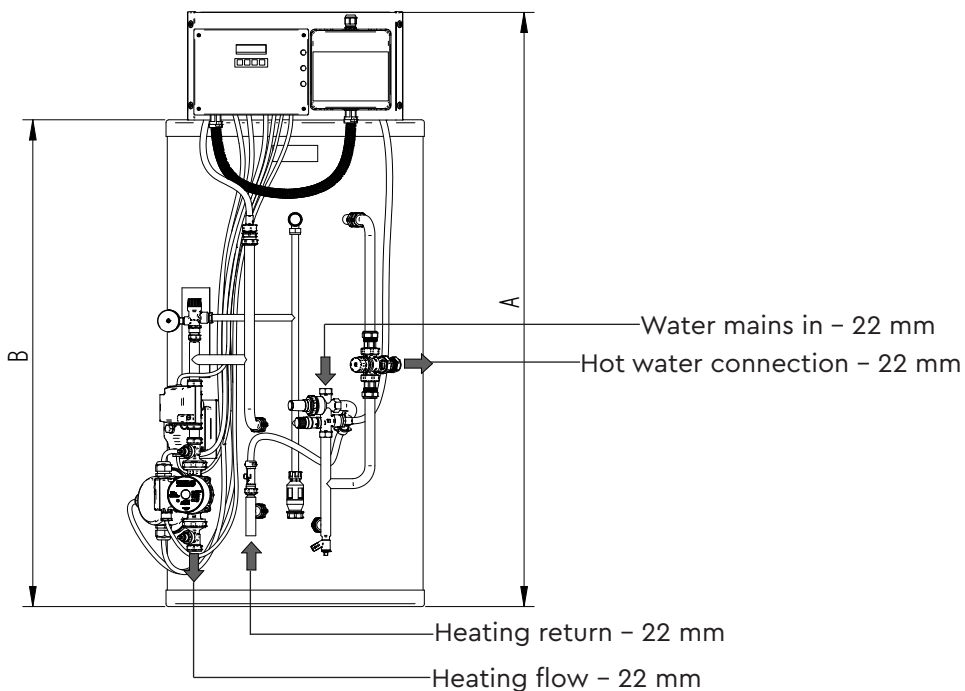



Fig. 2

Cont...

- 1.2 **Frost protection:** The Electrastream unit must be located in a dry position, frost free and protected from freezing, particularly when installed in a loft.
To comply with Building Regulations, all necessary pipework must be suitably lagged.
- 1.3 **Connecting the water supply:** All pipework should be installed using good plumbing practice. We recommend 22 mm mains cold water supply is used to avoid performance loss.
- 1.4 **Scale protection:**
- 
- **In areas of hard water, determined by the calcium content being 200 ppm or greater, an effective water conditioner must be installed in the cold feed to avoid damage and invalidation of the guarantee.**
 - **Suitable water conditioning devices include the Stuart Catalytic Water conditioner model C3-22 (product code 46617). For installations requiring flow rates in excess of 22 litres/min please contact Stuart Turner Ltd for guidance.**
 - **Damage caused by scale will invalidate the guarantee.**
- Higher water temperatures of 65 °C and above can cause excessive scale.
The location and position of the water conditioner should be as per the manufacturer's recommendations.
- 1.5 **Check water pressure & flow rates:** Stuart Turner recommends 1.5 bar pressure at 20 litres/minute flow rate as the minimum requirements for satisfactory operation. The unit will still operate below this, but it may not be possible to run two or more outlets at the same time.
- 1.6 **Pipework to taps:** Ideally 22 mm pipe should supply the outlets throughout the property with short lengths (max 1 metre) runs of 15 mm going to baths, showers, and basin taps. Smaller bore pipe can be used to suit taps but may lead to loss of performance.
- 1.7 **Shut off valves:** Lever valves are supplied separately and must be fitted as close as possible to the unit on the mains cold supply feed to the combination valve and to the blending valve (see Fig. 3) feeding hot water services.
- 1.8 **Drain valve:** A drain valve is incorporated onto the pipework to be used to drain the cylinder, when required during commissioning or maintenance (Fig. 4) to allow for maintenance work.

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1.9 System layout schematic:

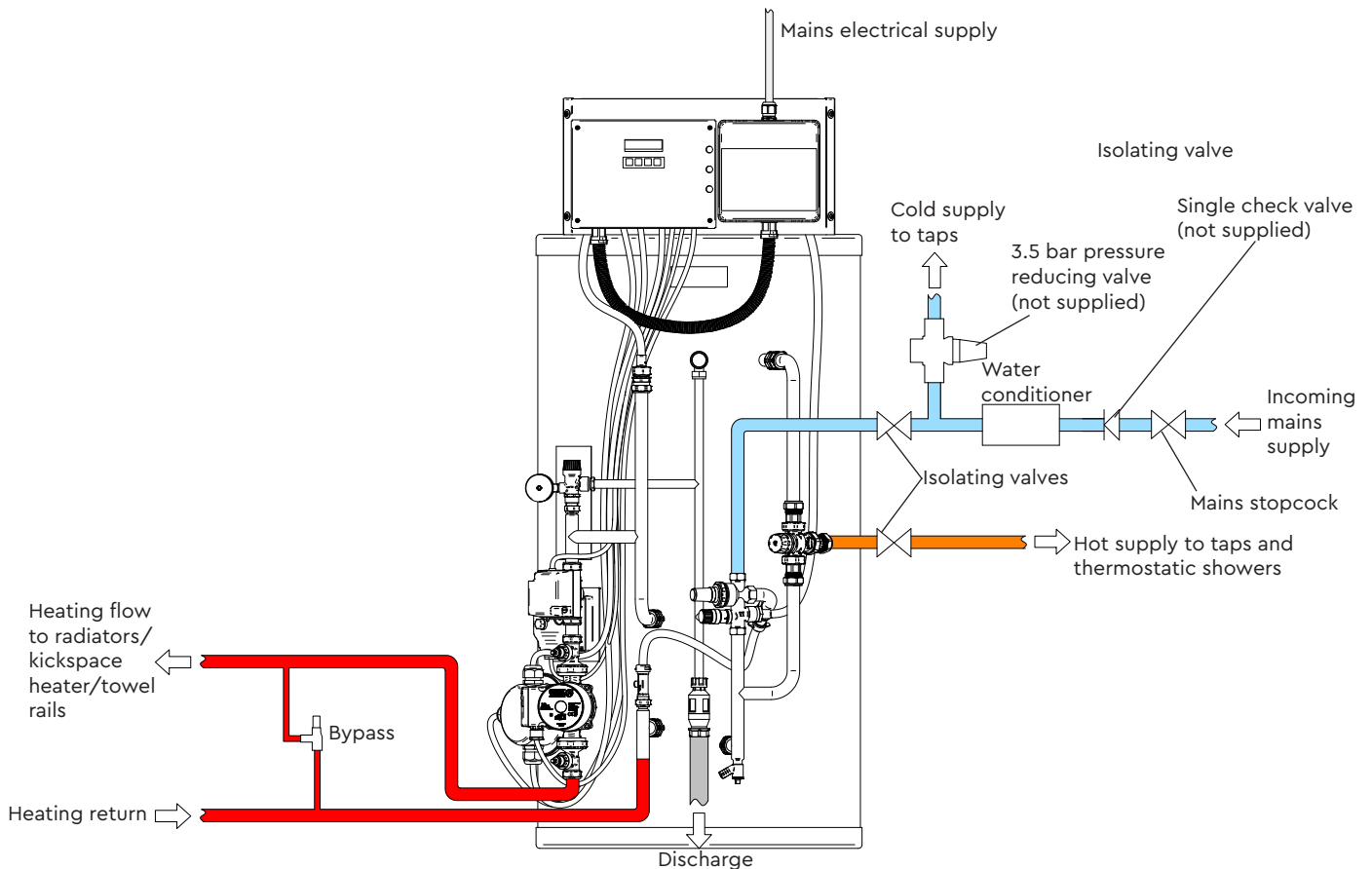


Fig. 3

- 1.10 **Mains pressure reducing valve (not supplied):** If the mains pressure is more or fluctuates above 4 bar, a mains pressure reducing valve must be fitted to the cold services in order to balance hot/cold water supplied. This should be positioned as shown, refer to schematic in Fig. 3.
- 1.11 **Bypass (not supplied):** An automatic bypass valve should be fitted between the flow and return of the heating system, normally after the pump but before any radiator take offs. The valve must be set to suit the pressure of the system, refer to the manufacturer's instructions.
- 1.12 **Room thermostat (not supplied):** A standard room thermostat with no built in timers or functions is recommended.
Important: When a programmable room thermostat is used it should only be set to call for heat when 'Economy Tariff' is available.

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2 KEY FEATURES



Important: Plumbing must remain as supplied. Do not add or change any plumbing or connections.

Note: Image shown with cables removed

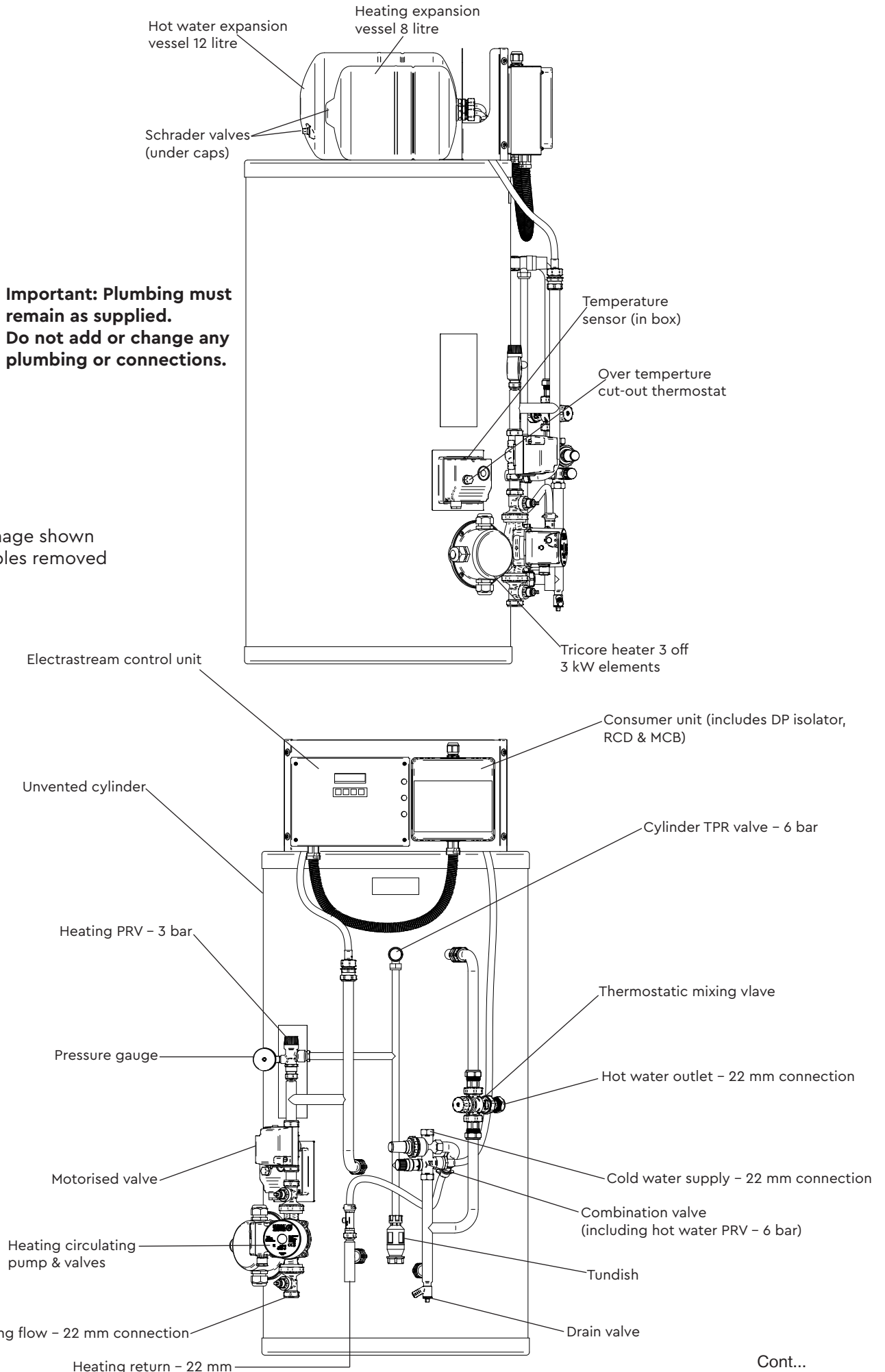


Fig. 4

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3 PIPEWORK CONNECTIONS

3.1 **Hot/cold services:** The cold water mains supply is connected to the combination valve via the lever isolating valve supplied, which limits incoming pressure to 3.5 bar and has an integral NRV.

The hot water outlet pipework is connected to the outlet of the mixing valve via the lever isolating valve supplied.

Provision should also be made in the cold services to tee/feed cold outlets prior to the Electrastream connection.

Both of these connections are for 22 mm pipe.

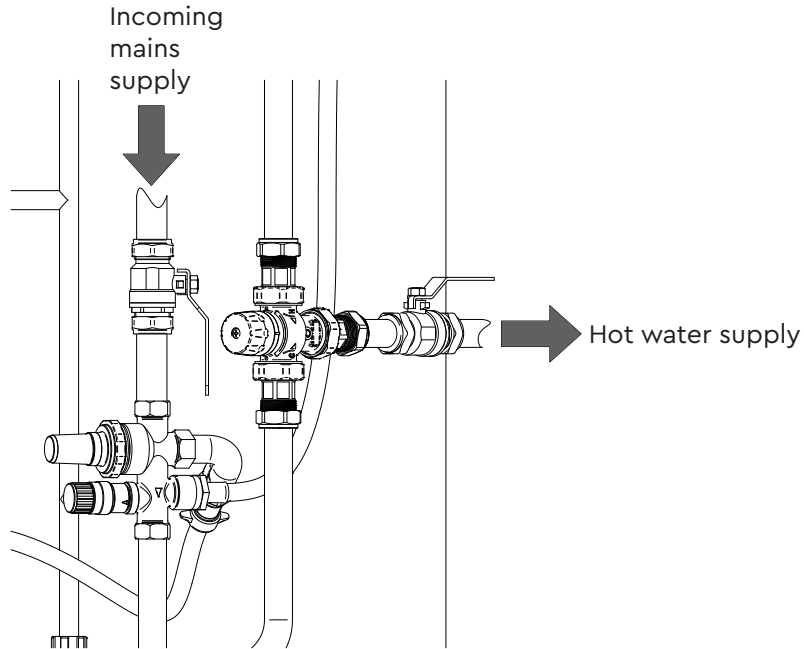


Fig. 5

3.2 Heating system:

- a) The total output from the Electrastream for hot water and heating is 9 kW @ 240 V having a maximum output of 30,000 BTU and should be sized for systems requiring no more than this.
- b) The heating system pipework is connected to the underside of the circulating pump. The return pipework from the heating system is to be connected to the bottom of the coil, to the short pipework that is also connected to the filling loop.

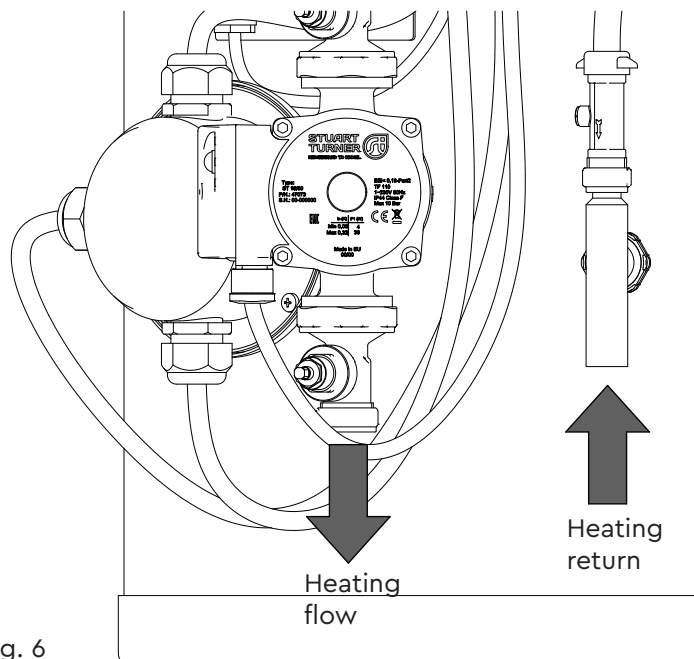


Fig. 6

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- 3.3 **Tundish:** The Electrastream unit is supplied with a temperature & pressure relief (TPR) valve and Pressure relief (PR) valve fitted and plumbed to the Tundish. The unit must be positioned to allow the tundish to be visible to the occupants and away from electrical services. The discharge pipe from the tundish should terminate in a safe place where there is no risk to persons in the vicinity of the discharge and be made of metal. The discharge pipe must be 22 mm copper pipe. Regulations do not permit more than 3 × 90 degree bends between the Electrastream unit and the outflow. Between the TPR and the first 90 degree bend there must be a fall of at least 300 mm. The fall of the pipework must be continuous and the pipe should terminate in the gully or be bent backwards onto an outside in a place where discharge cannot be injurious to persons.



Warning: Scalding water and steam can be blown out of the discharge pipe. Position the discharge so that it is not a hazard to property or people (especially children).

3.4 **Discharge pipework:**

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 3.5

The discharge pipe (D1) from the vessel up to and including the tundish is supplied by Stuart Turner Ltd. 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 spaces as the unvented hot water storage system and be fitted as close as possible to, and lower than, the safety device, with no more than 600 mm of pipe between the valve outlet and the tundish.

3.5 **The discharge pipe (D2):** The discharge pipe (D2) from the tundish should:

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

Be installed with a continuous fall of at least 1 in 200 thereafter.

The discharge pipe (D2) should be made of metal or other material that has been demonstrated to be capable of safely withstanding temperatures of the water discharged and is clearly and permanently marked to identify the produce and performance standard (e.g. as specified in the relevant part of BS 7291-1:2006 Thermostatic pipes and fittings for hot and cold water for domestic purposes and heating installations in buildings, General Requirements).

3.6 **Termination of discharge pipe:** The discharge pipe (D2) from the tundish should terminate in a safe place where there is no risk to persons in the vicinity of the discharge.

Examples of acceptable discharge arrangements are:

To a trapped gully in the end of the pipe below a fixed grating and above the water seal.

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

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

The discharge would consist of high temperature water and steam. Asphalt, roofing felt and non-metallic rainwater goods may be damaged by such discharges.

Cont...

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

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

- a) Contain a mechanical seal, not incorporating a water trap, which allows water into the branch pipe without allowing foul air from the drain to be ventilated through the tundish;
- b) Be a separate branch pipe with no sanitary appliances connected to it;
- c) If plastic pipes are used as branch pipes carrying discharge from a safety device they should be either Polybutalene (PB) to Class S of BS 7291-2:2006 or cross linked polyethylene (PE-X) to Class S of BS 7291-2:2006; and
- d) Be continuously marked with a warning that no sanitary appliances should be connected to the pipe.

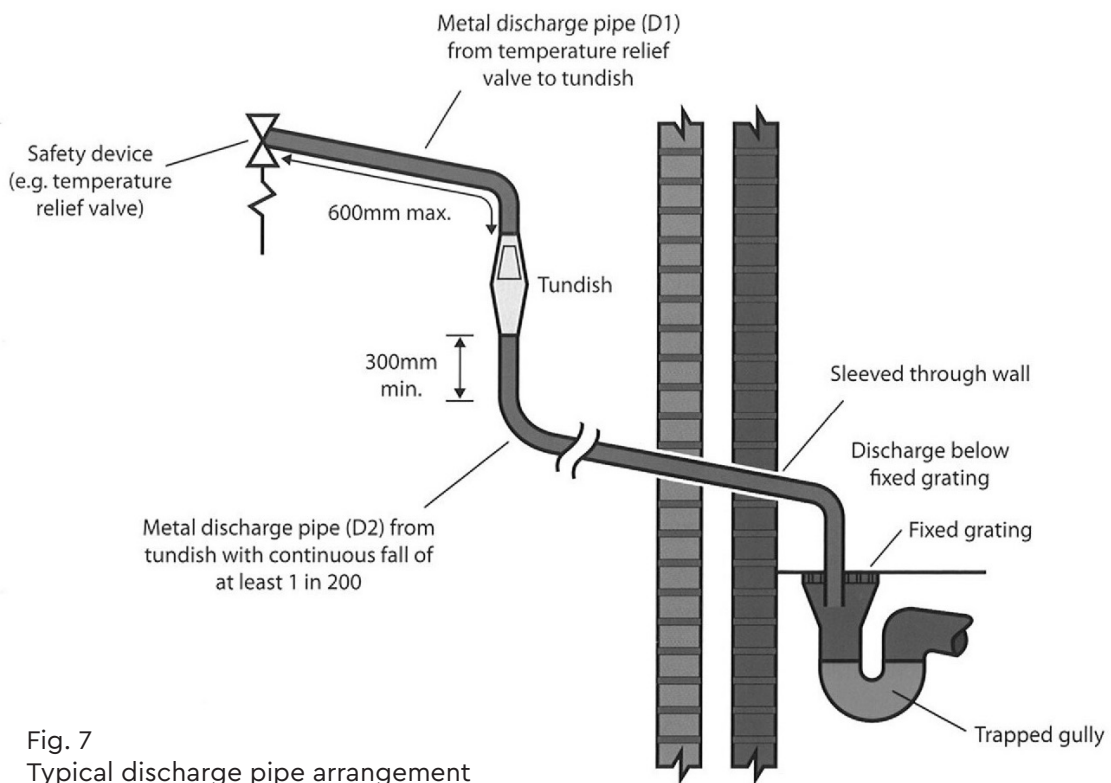


Fig. 7
Typical discharge pipe arrangement

3.7 Worked example and pipe sizing:

The example below is for a G $\frac{1}{2}$ 6 with a discharge pipe (D2) having 4 No. 22 mm elbows and length of 7 m from the **tundish** to the point of discharge.

From Table 1:

Maximum resistance allowed for a straight length of 22 mm copper discharge pipe (D2) from a G $\frac{1}{2}$ **temperature relief valve** is: 9.0 m

Subtract the resistance for 4 No. 22 mm elbows at 0.8 m each = 3.2 m

Therefore the maximum permitted length equates to: 5.8 m which is less than the actual length of 7 m therefore calculate the next largest size.

Maximum resistance allowed for a straight length of 28 mm copper discharge pipe (D2) from a G $\frac{1}{2}$ **temperature relief valve** is: 18 m

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

Therefore the maximum permitted length equates to: 14 m

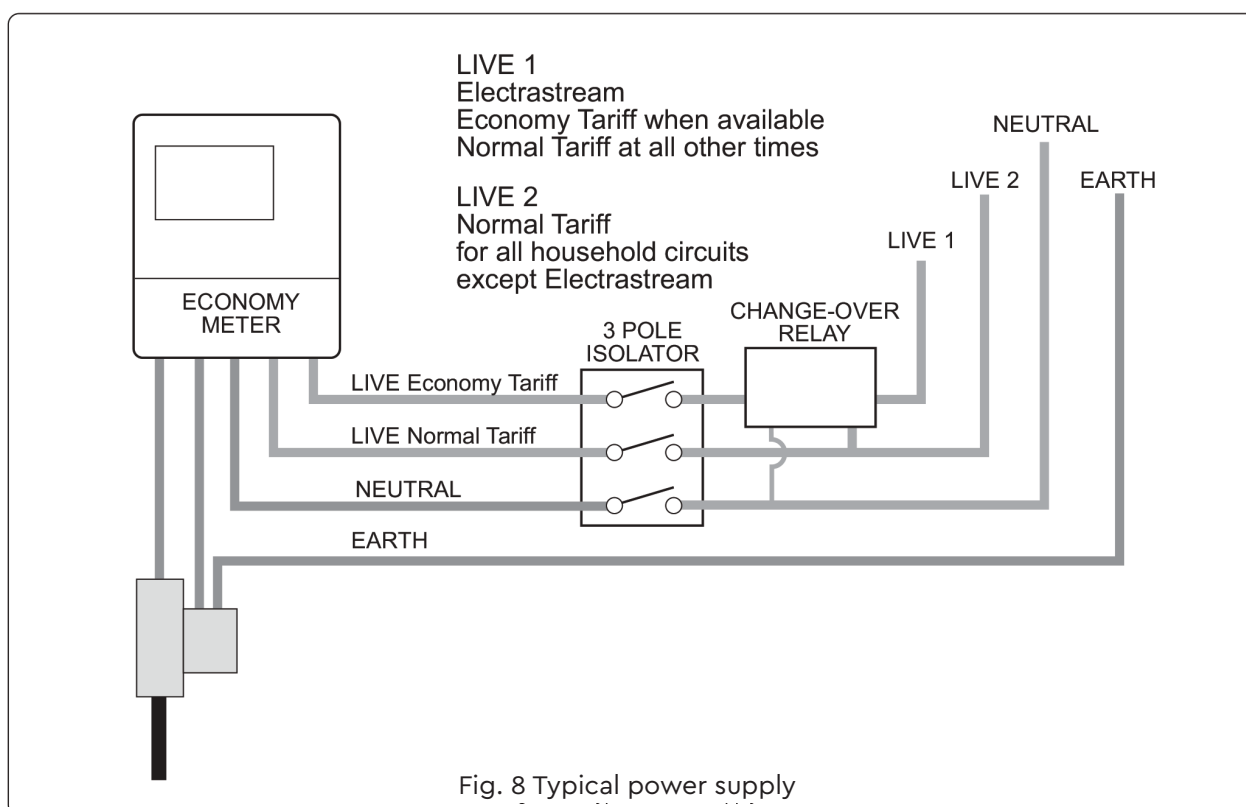
As the actual length is 7 m, a 28 mm (D2) copper pipe will be satisfactory.

Valve outlet size	Minimum size of discharge to Tundish (D1)*	Minimum size of discharge pipe from Tundish (D2)*	Maximum resistance allowed expressed as a length of straight pipe, i.e. no elbows or bends	Resistance created by each elbow or bend
G $\frac{1}{2}$	15 mm	22 mm 28 mm 35 mm	up to 9 m up to 18 m up to 27 m	0.8 m 1.0 m 1.4 m
G $\frac{3}{4}$	22 mm	28 mm 35 mm 42 mm	up to 9 m up to 18 m up to 27 m	1.0 m 1.4 m 1.7 m
G 1	28 mm	35 mm 42 mm 54 mm	up to 9 m up to 18 m up to 27 m	1.4 m 1.7 m 2.3 m

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4 ELECTRICAL INSTALLATION

- 4.1 **Regulations:** The electrical installation must be carried out in accordance with the current national electrical regulations and installed by a qualified person.
- 4.2 Before starting work on the electrical supply ensure power supply is isolated.
- 4.3 **DO NOT** allow the supply cord to contact hot surfaces
- 4.4 **DO NOT** switch the power on until the unit has been filled with water and has been earthed.
- 4.5 **Safety:** The mains supply to the unit must be connected through the 40 Amp RCD (fitted).
- 4.6 **Electrical supply:** The main incoming electrical supply to the property should be of adequate voltage, current and temperature rating for the requirements of the Electrastream as well as all other electrical requirements within the property. It is advised to turn the switch off when hot water and heating are not required i.e. holidays etc.
- 4.7 **Off – peak electrical supply:** To achieve the most efficient performance from the Electrastream it is strongly recommended to use an 'Economy 18' Off-Peak electrical supply. Other off-peak options such as 'Economy 7' or 'Economy 10' tariffs are also available from most UK electrical suppliers.
Consult the local electricity suppliers to determine what economy tariff options are available before installing the Electrastream.
- 4.8 **Typical power supply:** Figure 8 shows a typical power supply for economy meters. Consult electricity supply company for specific requirements.



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4.10 **Wiring of the unit:** The Electrastream Unit is supplied wired, therefore only a mains cable (not supplied) is required to be installed through the cable gland located at the top of the RCD box. This 3 core cable suitably sized is connected into the live, neutral and earth of the RCD.

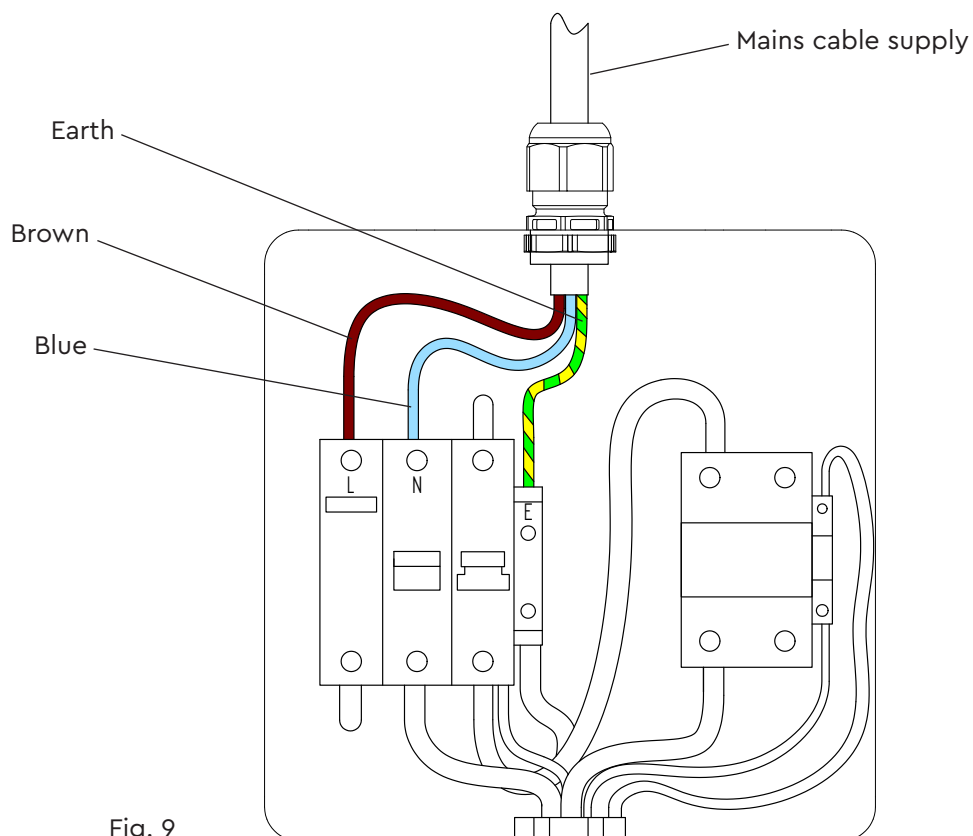
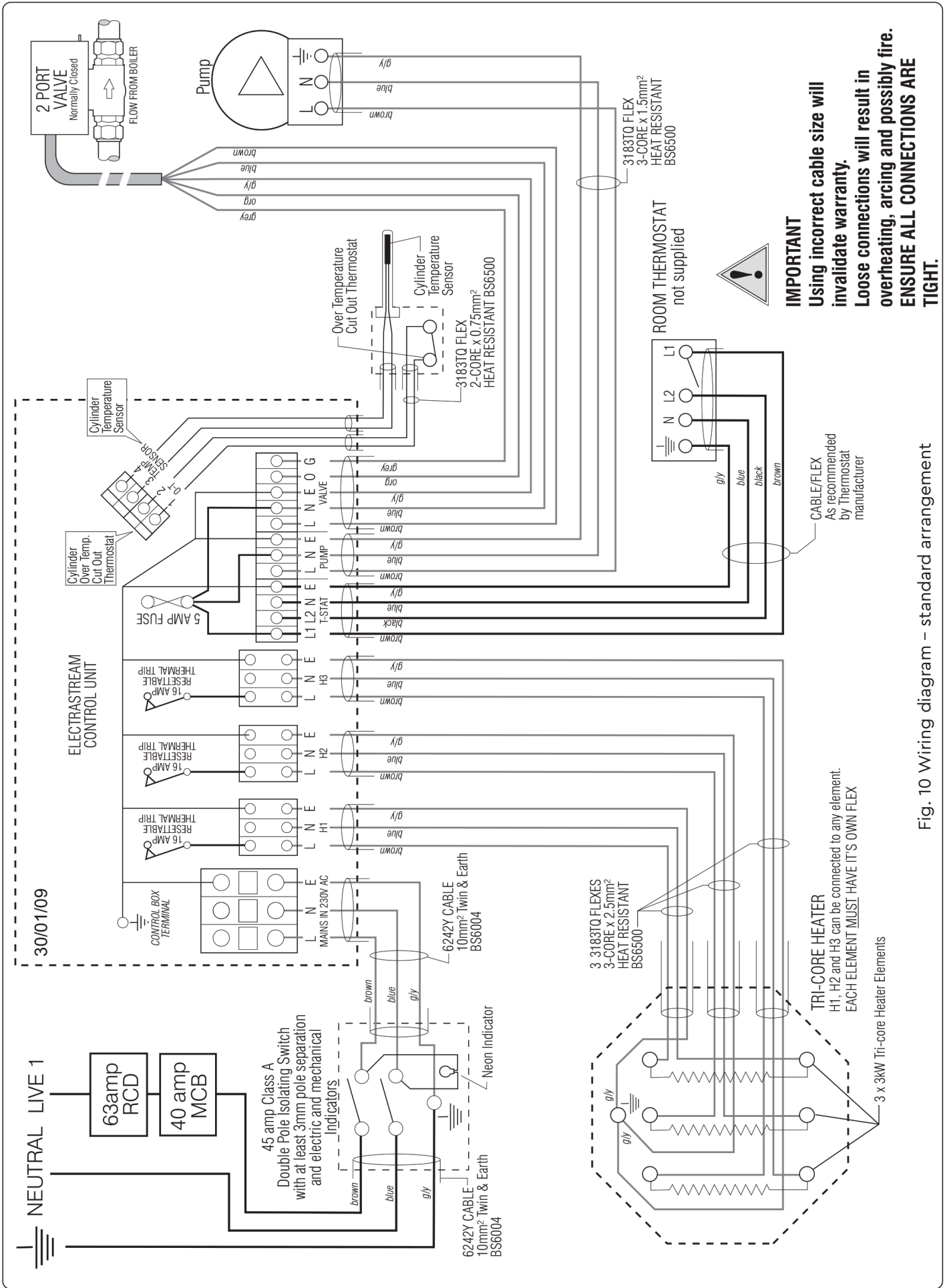


Fig. 9



IMPORTANT
 Using incorrect cable size will invalidate warranty.
 Loose connections will result in overheating, arcing and possibly fire.
ENSURE ALL CONNECTIONS ARE TIGHT.

CABLE/FLEX
 As recommended by Thermostat manufacturer

TRI-CORE HEATER
 H1, H2 and H3 can be connected to any element.
 EACH ELEMENT MUST HAVE IT'S OWN FLEX

3 x 3kW Tri-core Heater Elements

Fig. 10 Wiring diagram – standard arrangement

5 COMMISSIONING

- 5.1 **IMPORTANT** it is the responsibility of the installer to ensure that the Electrastream System is properly commissioned. Should the commissioning not be carried out, then the manufacturers guarantee and any extended warranty, will become null and void.

Wet System

- 5.2 **System flushing:** The pipework system should be flushed out prior to the Electrastream being connected to ensure any contaminants/chemical residues and foreign bodies are removed from elsewhere in the system.

5.3 **Expansion vessel pressure – hot water: (Cream vessel)**

The air pressure should be set to 0.1 bar greater than the system pressure and must be set as part of the commissioning procedure.

Capacity 12 litres

If the hot water vessel needs to have its air charge checked or replenished, it should be carried out as follows:

- a) Isolate unit electrically
 - b) Isolate water supply using the isolating valves
 - c) Release the system water pressure by opening a system outlet (tap)
 - d) Check air charge at Schrader valve (under the cap) using a tyre pressure gauge
 - e) Replenish air charge to suit the system if required by injecting air into the vessel via the Schrader valve using a car or bicycle pump, ensuring a system outlet valve remains open during this procedure to allow the vessel to exhaust any excess water.
 - f) Close all systems taps, open the isolating valves and turn on electrical power.
 - g) After the pressure has been changed, commission the unit see Section 5.5 onwards.
- 5.4 **Expansion vessel pressure – heating system: (Grey vessel)**

Maximum charge pressure 1.5 bar

Maximum working temperature 90 °C

Maximum Working Pressure 3 bar

Capacity 8 litres (for maximum system expansion of 7 litres)

The vessel pre charged is factory set to 1.9 bar, therefore it must be adjusted to suit the system before commissioning continues.

The expansion vessel is supplied mounted on the unit, this is suitable for systems with a static head of up to 5 metres. If the static head is greater than 5 metres the charge pressure of the expansion vessel will need to be increased. Increase the pressure using a standard car tyre pump and pressure gauge when the system is empty (zero pressure). Expansion vessels are suitable for systems requiring a maximum expansion of 7 litres as detailed above. For systems requiring more expansion a second expansion vessel will be required. BS7074 Part 1 includes information on this requirement.

Note: Normally expansion requirement is 4% of the system water content including the unvented cylinder coil

5.5 **Hot water system pre-fill check:**

- a) Check the hot water heating discharge pipes and tundish are correctly installed to conform to the Building Regulations G3.
- b) Check all pipe connections are water tight.
- c) Check the drain valve is closed.
- d) If fitted, check that the Scale Protection Device or water softener has been fitted according to manufacturer's instructions.

5.6 **Filling hot water system:**

- a) Open all shut off valves
- b) Open the incoming water isolating valve (mains stopcock) to the Electrastream and allow the unit to fill.
- c) Open all domestic taps in turn to purge the air
- d) Check system for leaks including around the Tri-Core heater.
- e) Check no water is discharging from any relief valves.

Cont...

- f) Test the operation of the Temperature & Pressure relief valve by turning the manual test cap and ensure the water flows freely and safely to waste.
- g) Test the operation of the combination valve PRV by turning the manual test cap and ensure the water flows freely and safely to waste.
- h) Set hot water Mixing valve to 'max'.

5.7 Heating system pre-fill check:

- a) Check filling loop is fitted correctly
- b) Check all radiator valves are fitted and tight.
- c) Check all radiator air vents are closed.
- d) Check all drain valves are closed.

5.8 Flushing and filling heating system:

- a) Carry out fill only after hot water system has been flushed and cleaned.
- b) Close all radiator valves.
- c) Connect filling loop and fill heating pipes using last radiator in line to bleed air.
- d) Check for leaks
- e) Using hose or suitable container, drain heating pipes.
- f) Repeat flushing pipes as required and fill.
- g) Open radiator valves and bleed air to fill all radiators.
- h) Drain heating system again.
- i) On final refill, add proprietary additives as manufactures instructions. Fill to 1 bar.
- j) Set pressure gauge red arrow to the black arrow (cold fill pressure – 1 bar).

Electrical

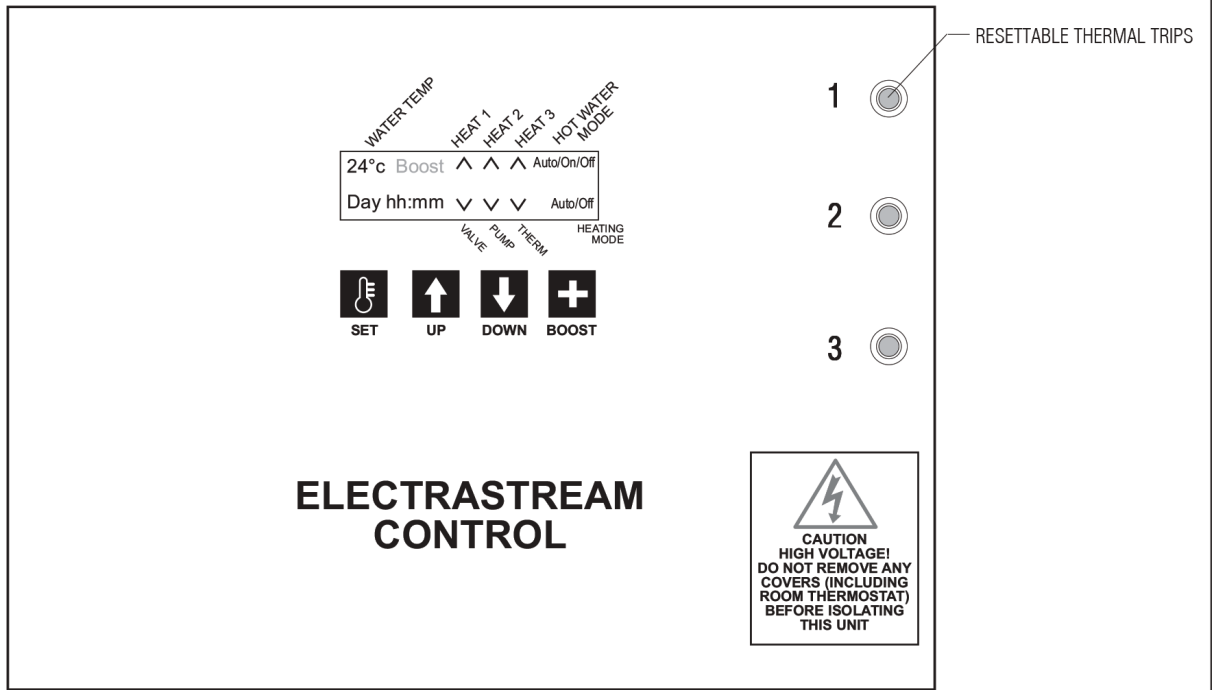
5.9 Electrical check:

- a) Check that all wiring including earth wiring has been installed correctly
- b) Check tri-core heater cover, Electrastream controller cover and all other electrical covers are correctly fitted.
- c) Check tundish is positioned so that any spillage or spray from the tundish would not contact any electrical components and is visible.
- d) Check **ALL** wiring connections have been made
- e) Check the required earth continuity conductors have been fitted.

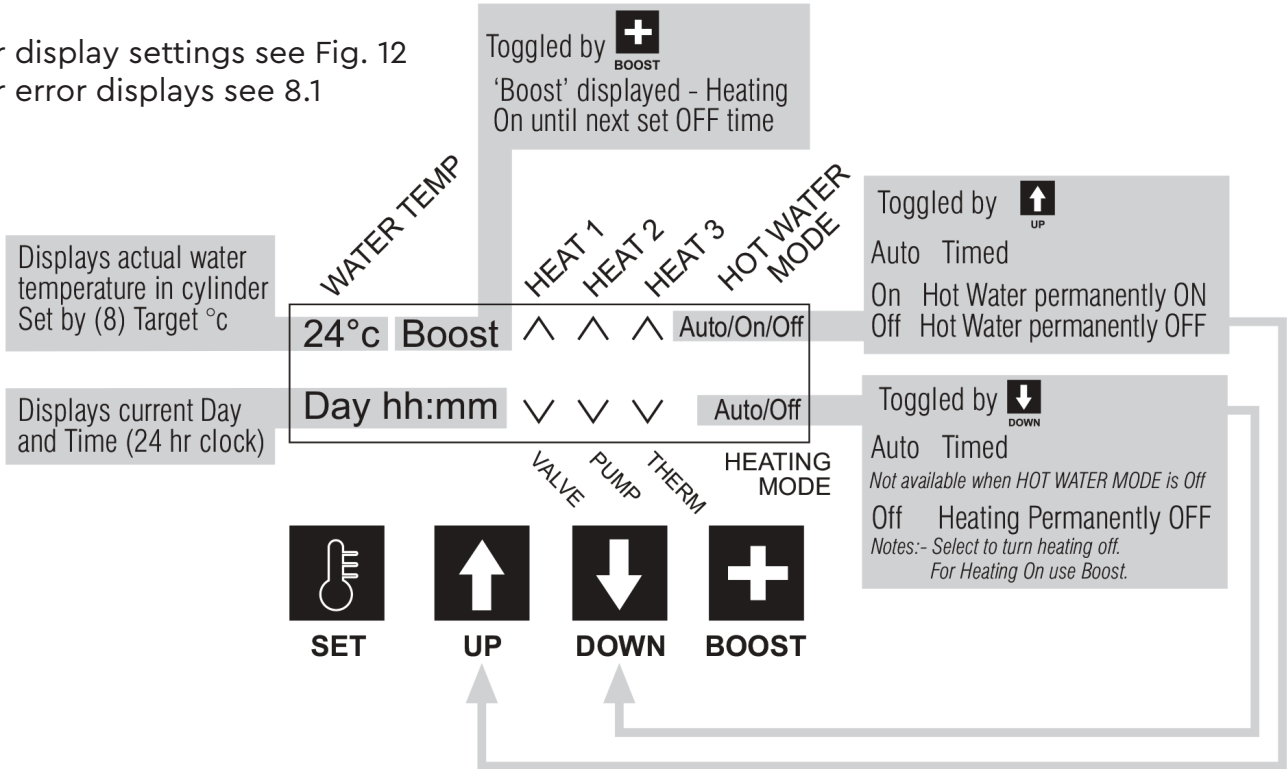
5.10 Setting and testing controls:

- a) Switch on Electrastream mains isolator.
- b) On the Electrastream control unit, set date and time (see Fig. 12)
- c) Set times to suit economy tariff.
- d) Set target temperature to 65°C
- e) If heating/hot water is not On press Boost and set room thermostat for heat.
- f) Wait for the cylinder and heating to heat up.
- g) Check for leaks and bleed the system again when it is up to temperature.
- h) Check pressure gauge black arrow, this will show the heating system working pressure. This should be less than 2.8 bar.
- i) Check operation of the Electrastream control unit – Fig. 11.
- j) When timer is set for heat and the room thermostat is set above the ambient – the motorised valve should be open and the pump should be running. When the room thermostat is reset below ambient the pump should stop and the valve should close. When the timer is not set for heat, the pump should no run and the valve should be closed regardless of room thermostat setting.
- k) Fill in details in the log book.

5.11 Overview of control unit:



For display settings see Fig. 12
For error displays see 8.1



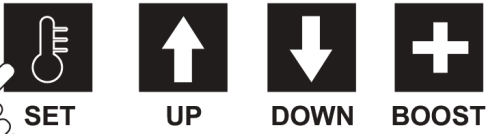
- | | | | | |
|--------------|---|---|----------|--|
| HEAT 1 | ^ | Indicates Element 1 is ON | HEAT 1 ! | Indicates heater element has failed – see 5.17 |
| HEAT 2 | ^ | Indicates Element 2 is ON | HEAT 2 ! | Indicates heater element has failed – see 5.17 |
| HEAT 3 | ^ | Indicates Element 3 is ON | HEAT 3 ! | Indicates heater element has failed – see 5.17 |
| VALVE | ∨ | Indicates Heating Valve is OPEN | | |
| PUMP | ∨ | Indicates Heating Pump is ON | | |
| THERM | ∨ | Indicates Room Stat is calling for heat | | |
| TEST 1.....5 | | Indicates heater test is being performed after midnight, this may take up to 30 minutes | | |

Fig. 11 Electrastream control unit – normal screen

Cont...

NORMAL SCREEN

24°C Boost ^ ^ ^ Auto/On/Off
 Day hh:mm v v v Auto/Off



(1) Time
Day hh:mm

TIME & DATE

(2) Start 1
hh:mm

(3) Stop 1
hh:mm

(4) Start 2
hh:mm

(5) Stop 2
hh:mm

(6) Start 3
hh:mm

(7) Stop 3
hh:mm

(8) Target
65 °C

HEATING & HOT WATER

Hrs Run = 0000.1
 0000.0 0000.0

WATER TEMP.

When SET is pressed, time settings are displayed for 10 seconds, display then reverts back to normal screen

Repeat pressing SET to index through settings.

Use to increment time up

Use to increment time down

Use to select hours (hh:) or minutes (:mm)

Notes:-

All times are given in 24 hour clock.

Maximum cylinder temperature setting (Target °C) is 70°C.

For error displays see 8.1

Display only. Indicates the total hours that each tri-core heater element has been in operation. (For service engineers information only.)

Fig. 12 Electrastream control unit – display settings

Cont...

6 GENERAL OPERATION

- 6.11 **Heating motorised valve:** When the room thermostat is calling for heat and the Electrastream control unit is set for heat ON, the heating motorised valve will open allowing water to the radiators.
Display icon 'Valve V' indicates valve is open
- 6.12 **Pump:** The heating circulating pump is controlled by Electrastream Control Unit in response to the room thermostat.
The pump has 3 speeds, it is normally set to speed 2 (II). Consult Electrastream installer before changing this setting.
Display icon 'Pump V' indicates the pump is ON.
- 6.13 **Room thermostat:**
IMPORTANT: When a programmable room thermostat is used it should only be set to call for heat when 'Economy Tariff' is available.
The room thermostat controls the heat within the property.
When the room thermostat is calling for heat and the Electrastream control unit is set for heat ON, the heating circulating pump will run, pumping water through the radiators.
Display icon 'Therm V' indicates the room thermostat is calling for heat.
- 6.14 **TRI-CORE heater elements:** The three elements heat the water in the cylinder when the Electrastream control unit is programmed for a heat cycle. The elements are switched on and off by the control unit in response to the temperature within the cylinder as detected by the temperature sensor. They have a staggered switch on sequence that prevents sudden high load on the power supply.
The control unit also limits the use of the elements for efficiency.
For example: When the hot water within the cylinder is within 2° of the set Target 65 °C, only one element will be on. When the hot water is between 2° and 4 °C below the set target, then two elements will be on. When the hot water within the cylinder is below 6 °C of the set target, then all three elements will be on.
Display icons 'Heat 1 ^', 'heat 2 ^' and 'heat 3 ^' indicate that the elements are heating. If a '!' is displayed, this indicates a fault with the element, see Section 9.1.
- 6.15 **Residual current device (RCD) :** The Electrastream system will be protected by a residual current device, this will automatically switch off the electric supply if an earth fault develops. This should be tested at least every three months.
- 6.16 **Element resettable thermal trips:** Each of the three elements of the tri-core heater is protected by a 16 Amp Resettable thermal trip, these have their reset buttons located on the front of the Electrastream Control Unit (see Fig 13).
In the event of electrical overload on an element the relevant thermal trip will trip out, when this occurs the button will pop up and the screen will display '!' under the relevant heat.

To reset the thermal trip:

1. Turn OFF the Electrastream mains isolating switch
2. Look at the three buttons; button(s) that are protruding have tripped out.
3. Press the button in, if the button stays in when the power is turned on, then trip has been reset.
However if the button pops out again a possible fault exists – contact the installer.

The Electrastream will still operate with one or two elements working, but this is not satisfactory and the installer must be contacted to rectify the fault as soon as possible.

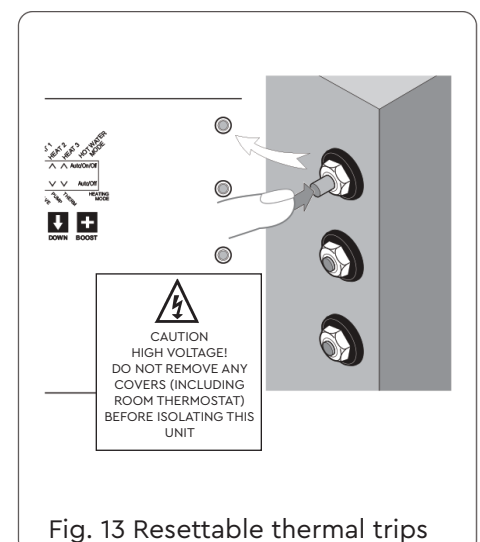


Fig. 13 Resettable thermal trips

6.17 Temperature & pressure relief discharge:

Note: The Tundish or discharge pipe should remain visible, do not box in or cover up. The Electrastream hot water cylinder has a Temperature/ Pressure relief valve (TPRV); in the event of the pressure within the cylinder becoming too high, the TPR valve will vent. The heating system has its own Pressure relief valve (PRV) and in the event of the pressure within the heating system becoming too high, the PRV will vent. The combination valve also includes a PRV. These PRVs can be manually opened by turning the red knob clockwise, to close the valve continue turning clockwise until it clicks.

A Tundish provides an air break when pressure is being vented from the cylinder TPRV. When pressure is being vented, water/steam will be evident at the Tundish and from the discharge pipe of the tundish.

In the event of hot water/steam being emitted at the discharge pipe or tundish, switch the system off and contact installer.

6.18 Thermostatic mixing valve: The mixing valve will be fitted in the supply to the hot taps/ outlets. This valve mixes hot water from the cylinder with cold water to provide hot water of a constant temperature at the taps.

The recommended maximum hot water temperature at the taps is 60 °C.

The recommended setting of the valve is between No.4 and 6 (49° to 58 °C).

The mixing valve is factory set to the following approximate mixed outlet temperatures:

Knob Position	Min	1	2	3	4	5	6	7	Max
Output Temp °C	27 °	32 °	38 °	44 °	49 °	53 °	58 °	63 °	67 °
	Recommended								

The mixing valve may have specific servicing requirements – refer to manufacturer’s instructions.



The water temperature must never exceed 65 °C as is will cause excessive scale in hard water areas and can cause scalding.

6.19 Economy tariffs: Regional electricity supplier shave their own 'Off-Peak' tariffs that will provide an economical supply of power for the Electrastream system.

It is vital that the time settings of the Electrastream control unit are set to make the most use of the available 'off – peak' tariffs.

6.20 Normal tariffs: IMPORTANT: Operating the Electrastream during normal tariffs will increase running costs.

Normal tariffs are at all times that are not designated for 'Off-Peak', the cost of electricity during normal times will be more expensive. Therefore avoid setting heating and hot water ON during these periods.

6.21 **Setting heat and hot water requirements:** Figure below shows a 24 hour clock with typical use of the Electrastream during 'Off- Peak' economy 10 settings.
 Note:- Self Test – After 3am each day the unit carries out a self test period for approx. 30 minutes.
 This can be overridden if required.

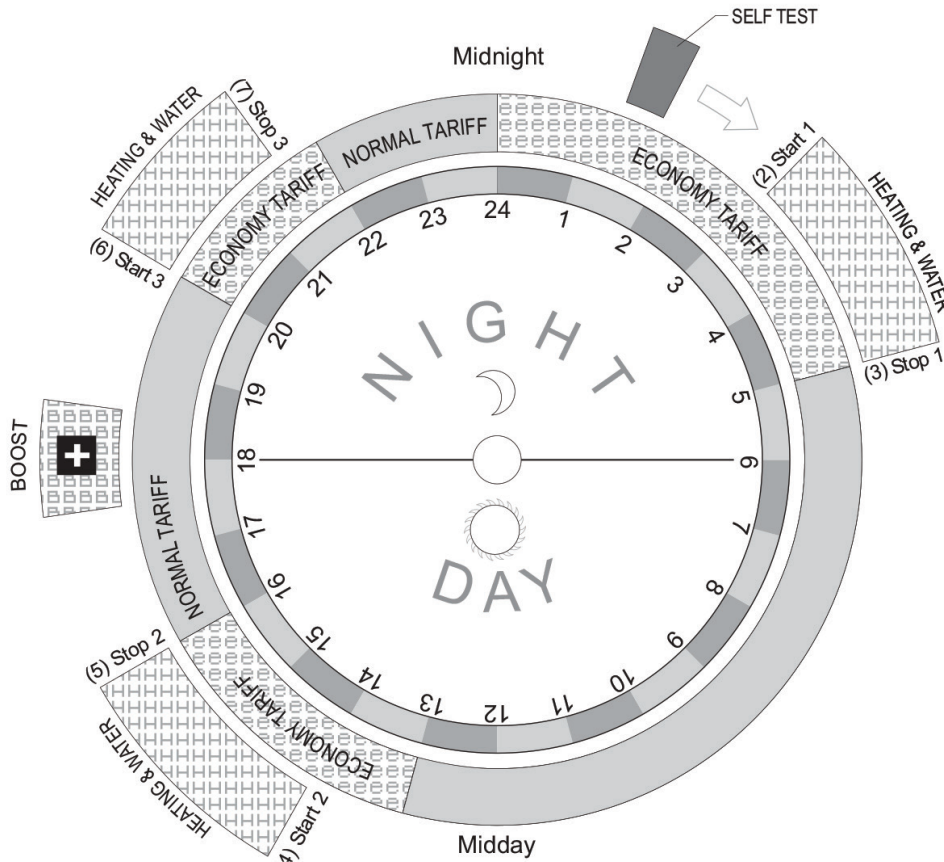


Fig. 14

IMPORTANT: Operating the Electrastream during normal tariffs will increase running costs.

All times fall within Economy Tariff

Start 1 – 03.00 (3am)

Start 2 – 14.00 (2pm)

Start 3 – 20.00 (8pm)

Stop 1 – 05.00 (5am)


Stop 2 – 16.00 (4pm)


Stop 3 – 21.30 (9.30pm)



Note:- * The electricity supply company has to make special arrangements to the property's electrical supply to enable Electrastream to be used during both 'off- peak' and 'normal' tariffs- consult the installing electrician.

'Boost 

To turn hot water and heating OFF during ON periods (auto) press  twice. It will require switching to Auto again when required.

To turn heating only OFF during ON period (auto) and during 'Boost' press . It will require switching to Auto again when required.

To turn hot water only ON during OFF periods (auto) press . It will require switching to Auto again when required.

To turn hot water and heating ON during OFF periods (auto) press  then . Both will require switching to Auto again when required.

Cont...

6.22 **Handing over:**

- a) Complete the logbook supplied
- b) The installer should re-check the system and ensure it is completely satisfactory before demonstrating to the end user.
- c) The end user should be aware of the following –
 1. The most cost effective use of the Electrastream system using economy and standard tariffs.
 2. How to set the temperature of the tap hot water (mixing valve).
 3. How to set all Electrastream Controller functions.
 4. How to set room thermostat.
 5. The function of the Pressure Relief Valves and Combination valve and that over pressure will cause steam and scalding water to be emitted from the discharge pipes.
 6. That the tundish is supplied as a visual identification for over pressure.
 7. The procedure to follow in the event of over pressure. See Section 9.
- d) This manual and supplements must be left with the end user together with a copy of the completed guarantee form.

6.23 **For further technical support:** Phone the Stuart Turner TechAssist team on +44 (0) 800 31 696 80. Our staff are trained to help and advise you over the phone.

7 MAINTENANCE / SERVICING

7.1 Routine service:

- a) Servicing and maintenance should only be carried out by a competent unvented hot water installer or Stuart Turner Ltd authorised personnel.
- b) The Electrastream system should have a routine service at least once in 12 months to optimise its safety, efficiency and performance.
- c) Only use genuine Stuart Turner. The use of other parts will invalidate the warranty.
IMPORTANT: Always turn off the heating system and electricity supply to the system – this includes the room thermostat cover.
Also carry out any service requirements of specific components as specified by the manufacturer's instructions.
The final fill of the heating system should include the correct dose of a suitable scale/ corrosion inhibitor.

7.2 Service procedure:

1. Confirm with the customer the unit's service history and locate logbook.
2. Check cylinder model and serial number is listed in the logbook.
3. Visually inspect cylinder and vessels for damage, metal failure and signs of leaks.
4. Visually inspect all Electrastream pipework for damage, metal failure and signs of leaks.
5. Set control unit to midnight to run self test and check Electrastream control unit for error messages.
6. Record mains pressure, system pressure and heating operating pressure.
7. Turn the heating OFF at Electrastream Control unit.
8. Turn the electrical supply to the Electrastream OFF at the isolating switch.
9. Momentarily open the combination TPR valve and check that the water drains freely and safely to and from the tundish.
10. Open combination PRV momentarily and close, valve should shut off. Repeat if valve sticks. If valve will not shut off, replace valve.
11. Open heating TPRV momentarily and close, valve should shut off. Repeat if valve sticks. If valve will not shut off replace valve.
12. Close the Stopcock
13. Open the hot and cold taps, attach a hose to the cylinder drain valves and empty the system.
14. Remove tri-core heater, remove limescale and examine the element and seal. Refit if in good condition. In hard water areas it is probably better to replace the tri-core heater if heavily scaled. Fit tri-core heater and seal .
Note: If heavy scaling is evident then descaling the system is recommended. Ensure system is fully flushed following descaling.
15. Clean and check the in-line strainer in the combination valve – replace if require.
16. Check strainers and operation of mixing valve
17. Close all drain valves and refill system
18. Check that no water is passing through the combination valve or the pressure relief valves, this will be evident at the tundish.
19. Switch on the Electrastream isolator, set timer for midnight then set control unit and room thermostat for heat.
20. Wait for the system to self check and heat up
21. Check temperature of hot tap water, adjust as required, max 60 °C
22. Check for leaks and bleed system again when the system is up to temperature.
23. Check operation of room thermostat and timer.
24. Check the RCD operation. Notes: testing the RCD will not affect the operation of the Electrastream Control Unit
25. Enter details of service into the logbook.

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- 7.3 **Replacing the TRI-CORE heater:** When replacing the Tri-core heater the relays on the Electrastream Control Unit must be checked for operation –
1. Heat cylinder
 2. Observe the control unit and wait for the actual temperature to reach the set target (65 °C)
 3. When set target temperature is reached, Heat 1, Heat 2 and Heat 3 will indicate all elements are off (not displayed).
 4. If a continued rise is observed when Heat 1, Heat 2 and Heat 3 show that elements are OFF, it indicates that the relay of the control needs replacing. Consult Stuart Turner Ltd.
- 7.4 **RCD testing:** The RCD must be tested at least every three months, this is done by pressing the RCD 'Test' or 'T' button, this should switch the supply off. Reset RCD to On after test. If the RCD appears not to be working correctly contact your installer or a qualified electrician.
Note: Testing the RCD will not cause loss of the Electrastream Control Unit settings.
- 7.5 **Drain hot water system:**
- a) Turn off incoming water isolating valve (mains stopcock).
 - b) Using hose and suitable containers, drain all water from the cylinder and pipework using drain valves.
 - c) Remove and clean in-line strainer of combination valve
- 7.6 **Cleaning hot water system:**
- a) Using proprietary chlorination product, chlorinate the domestic hot water system as per manufacturer's instructions.
 - b) Drain the system, following the steps in Section 6.5, then fill and drain to flush as many times as recommended.
 - c) Refill system.

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8 TECHNICAL SPECIFICATION

Pump Model		BEP 130 46727	BEP 150 46728
General	Guarantee	1 year	
	Approvals	CE	
Features	Cylinder capacity	130 litres	150 litres
	Coils	Single	
	ERP rating	B	
Performance	Maximum water supply pressure	12 bar	
	Operating pressure	3.5 bar	
Coil	Coil rating	27 kW	
	Coil surface area	0.54 m ²	
Cylinder & hot water system	DHW expansion vessel size	12 litres	
	DHW expansion vessel pre-charge pressure	1.9 bar	
	Cylinder TPRV setting - pressure	7 bar	
	Cylinder TPRV setting - temperature	90 °C	
	Maximum primary pressure	3.5 bar	
	Reheat time ($\Delta t=60$ °C)	25 minutes	29 minutes
	Heat loss in 24 hrs @ 65 °C	0.97 kWh	1.06 kWh
Heating System	Expansion vessel size	8 litres	
	Maximum system expansion	7 litres	
	Expansion vessel pre-charge pressure (as supplied)	0.7 bar	
	Maximum working pressure	3.5 bar	
	Maximum working temperature	90 °C	
	Heating pressure relief valve (PRV)	6 bar	
Combination valve	Pressure reducing valve	3.5 bar	
	Maximum pressure	12 bar	
	Pressure relief valve (PRV)	6 bar	
Environmental	Ambient temperature	4 °C - 30 °C	
Construction	Tank	Stainless steel	
Electrical	Power supply / phase / frequency	230 V a.c. / 1 / 50 Hz	
	Power consumption	9 kW	
	Fuse rating	40 Amp	
Physical	Width	645 mm	
	Depth	720 mm	
	Height	1200 mm	1325 mm
	Empty weight	49.5 Kg	54.5 Kg
	Filled weight	179.5 Kg	204.5 Kg

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9 TROUBLE SHOOTING

Checks should be carried out by the installer or competent person only.

Symptoms	Probable Cause	Recommended Action
No COLD Water Supply	Valves interrupting flow	Check the mains water supply has not been interrupted. Check the stopcock and all valves on the mains water supply are correctly installed. Check the stopcock and any valves on the mains supply are fully open.
Reduced Pressure	Valves partly closed	Check the stopcock and any valves on the mains supply are fully open.
	Strainers are blocked	Check the combination valve in-line strainer is not blocked – clean or replace as required Check strainers and any other fittings are not blocked – clean or replace as required.
	Poor mains pressure	Check mains pressure has not reduced.
No Hot Water/ Heating	No Power to the Electrastream	Check the power to the Electrastream is ON – isolating switch . Check the RCD or MCB have not tripped.
	Power cut	Check mains supply as it may have been interrupted
	Error messages are displayed	Check for error messages on the control unit display.
	Incorrect control setup	Check timers and target temperature on Electrastream Control unit are set correctly.
	Trip cut-out	Check over temperature cut-out, Reset system by switching heating and hot water OFF and allow for water to cool or run some hot water off, then remove cap and press the button. Check cylinder thermostat probe is installed correctly. Hold probe in hand to check temperature rise/ correct operation of probe.
	Trip cut-out	Check 16 Amp resettable thermal trips and 5 Amp Fuse in Electrastream Control Unit.
	Incorrect valve installation	Check strainers and operation of mixing valve. Check cold water combination valve is fitted correctly.
Water Leaks		Turn off Electric supply, turn off the mains water supply to the house via the stopcock. Make allowance to store some cold water for necessities Open both cold and hot taps to drain the cylinders of water thus preventing any further leaks.
Poor Flow rate	Valves partly closed	Check all isolation valves are fully open Check in line strainers and operation of mixing valve.
Cold Water discoloured	Problem with mains supply	Check mains supply – it may have been interrupted Check water conditioner (when fitted) is operating correctly.
Hot water discoloured	Damage to coil	Cylinder coils may be fractured, consult Stuart Turner Ltd.

Cont...

Water/Steam being seen at the discharge pipe or tundish	Pipework installation	User to.. Turn off the system at the isolator or consumer unit. Turn on a hot tap until it runs cold to reduce the pressure and temperature. Turn on the radiators – ensuring all thermostatic valves are open. Contact Installer.
	Loss of pressure in expansion vessel	Installer: Check there are no restrictions in the hot water pipework. Check for loss of pressure in the hot water expansion vessel. Check for loss of pressure in the heating expansion vessel.
	Pressure Relief valve activated	Check for back feed of high mains pressure from expansion valve. Check pressure reducing valve (on combination valve)
	Heating system malfunction	The heating system should not be run with all the radiators turned off unless there is a bypass valve in the system Check for air in the heating system Check that the cylinder temperature sensor has not been dislodged from the phial in the cylinder. With the heating elements and heating pump turned OFF: check for error messages on the Electrastream Control unit; check target temperature of the Electrastream control unit

9.1 **Error displays:** When any of the following errors are displayed call TechAssist on +44 (0) 800 31 969 80 for a service engineer.

Error Code	What does it mean?
ERROR 1	When displayed, it indicates a faulty or disconnected temperature sensor. Heating is disabled.
ERROR 2	When displayed, it indicates either the auxiliary 5 amp fuse has blown or the pump, motorised valve or room thermostat is fault or that the heating is disabled.
ERROR 3	When displayed, it indicates that ALL heating elements failed heater test. Heating is disabled.
ERROR 5	One or more of the controller 'set', 'up', 'down' or 'boost' buttons are stuck or held down.
HEAT	When ! is displayed under Heat 1, Heat 2 or Heat 3 it indicates a tri-core element has failed. Check the resettable thermal trips in the Electrastream Control unit.

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10 THE ELECTRASTREAM GUARANTEE

Congratulations on purchasing a Stuart Turner product.

We are confident this product will provide many years of trouble free service as all our products are manufactured to the very highest standard.

All Electrastream products are guaranteed to be free from defects in materials or workmanship for 1 year from the date of purchase, we will repair, free of charge, any defects in the cylinder resulting from faults in material or workmanship, repairing or exchanging the whole unit as we may reasonably decide.

To comply with the terms of the guarantee, this unit must be:

- Installed indoors in a frost free environment
- Connected to a public water supply maintained by a local water authority
- Serviced annually and log book completed

Not covered by this guarantee:

- a) Damage arising from incorrect installation, improper use, unauthorised repair, normal wear and tear and defects which have a negligible effect on the value or operation of the cylinder.
- b) Any failure caused by lime-scale.
- c) It has been used solely for the purpose of heating potable water that complies with current (at the time of installation) EU standards and is not fed with water from a private source.
- d) The unit must not be modified in any way.
- e) Being subjected to excessive pressure or electrolytic action from dissimilar materials, or attack from any salt deposits.

This guarantee does not cover a procedure of flushing the system not in accordance to the WRAS guidelines pertaining to BS 6700.

Reasonable evidence must be supplied that the product has been purchased within the guarantee term prior to the date of claim (such as proof of purchase or the pump serial number).

This guarantee is in addition to your statutory rights as a consumer. If you are in any doubt as to these rights, please contact your local Trading Standards Department.

In the event of a claim please telephone '**TechAssist**' or return the cylinder with the accessories removed e.g pipes etc. If you have any doubt please consult a professional.

+44 (0) 800 31 969 80

Proof of purchase should accompany the returned unit to avoid delay in investigation and dealing with your claim.

You should obtain appropriate insurance cover for any loss or damage which is not covered by Stuart Turner Ltd in this provision.

Please record here for your records.

CYLINDER MAKE & MODEL.	CYLINDER SERIAL NO.	DATE PURCHASED



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