



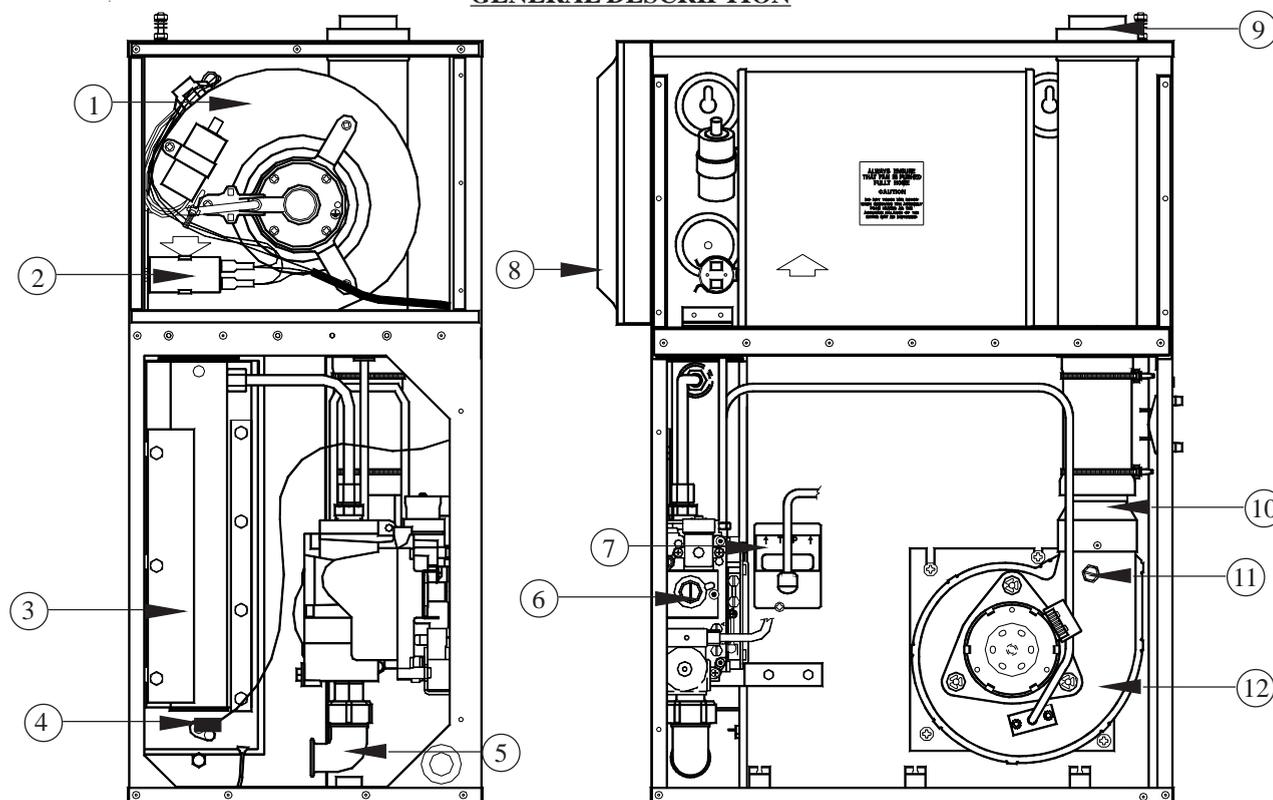
JANSTAR
MODULATING WARM AIR HEATER
with SYSTEM E-T Control
INSTALLATION, COMMISSIONING & SERVICING INSTRUCTIONS
G.C. No 42 451 07

Publication No. ZZ 757/9
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This appliance has been tested and certified for use with natural gas.

1.

GENERAL DESCRIPTION



Key	Description
1	Air circulating fan
2	Fan energy capacitor
3	Burner assembly
4	Ignition/detection electrode
5	Gas connection
6	Multifunctional control

Key	Description
7	Fan delay/ Overheat limit control
8	Air filter (L H shown)
9	Flue outlet/combustion air inlet
10	Fan to flue connection
11	Flue gas test point
12	Combustion air fan

Fig. 1
JANSTAR Principal Components

- 1.1 The Johnson & Starley JANSTAR is a all mounted, room sealed, fan assisted, down flow warm air heater with SYSTEM E-T control. It is designed for use with a concentric air inlet/flue, which enables combustion air to be admitted to the burner, whilst combustion products are discharged to the outside, via a concentric terminal.
- 1.2 The air heater output varies automatically between 8.0 kW (27,300Btu/h) and 2.0 kW (6,800 Btu/h) for horizontal flued installations, and 8.5 kW (29000Btu/h) and 2.8 kW (9600Btu/h) for vertical flued installations.
- 1.3 The appliance is supplied assembled for left hand return air entry. For conversion to right hand return entry, refer to Section 4. If return air is via the top of the fan chamber, a side blanking plate (Pt No W800-0133000) is required. An adaptor kit is available which permits the appliance to be converted to an upflow model. The appliance may be base duct mounted. The JANSTAR is also provided with the facility for connection to a remote time control (not supplied), with volt-free contacts (i.e. The switching supply is provided by JANSTAR), to enable selection of operating times.
- 1.4 A mesh filter, for air return duct mounting, is supplied as standard. However, a Cleanflow electronic filter is offered as an alternative option.

THIS APPLIANCE CONFORMS TO BS EN 55014

Installation shall be in accordance with the current editions of:-

Building Standards (Scotland) (Consolidation) Regulations

Building Regulations

Gas Safety (Installation and Use) Regulations (as amended)

BS7671 Institute of Electrical Engineers (IEE.) Wiring Regulations

BS6891 Installation of Low Pressure Gas Pipework of up to 28mm (R1) in domestic premises (2nd family gases).

BS5440 Pt.1 (Flues for Gas Appliances)

BS5440 Pt.2 (Air Supply for Gas Appliances)

BS5864 Installation of Gas Fired Ducted Air Heaters

British System Design Manual "Gas Fired Warm Air Heating"

Model and Local Authority Bye-laws

IMPORTANT: STATUTE LAW DEFINES THAT ALL GAS APPLIANCES MUST BE INSTALLED BY COMPETENT PERSONS, (i.e. CORGI REGISTERED INSTALLERS) IN ACCORDANCE WITH THE GAS SAFETY (INSTALLATION AND USE) REGULATIONS (CURRENT EDITION). FAILURE TO COMPLY WITH THESE REGULATIONS MAY LEAD TO PROSECUTION.

2. HEATER COMPARTMENT AND CLEARANCES (See BS5864)

- 2.1 A minimum clearance of 15mm ($\frac{5}{8}$ in) at either side of the heater, and 150mm (6in) above the heater, should be allowed. For service access, a minimum of 450mm (18in) is required at the front of the heater, and 75mm at the left hand side. Space must also be allowed, in a compartment installation, to permit the removal of the heater. If a Cleanflow electronic air filter is to be fitted in the compartment, allowance must be made for this in the width of the compartment. The compartment must be of a fixed rigid structure and the internal construction must be of half-hour fire resistance to internal fire; the inside lining or finishing of the enclosure must be noncombustible or a class 1 finish (see also BS 476).
- 2.2 In airing cupboard installations, the part used as the air heater compartment must comply with the relevant section of BS 5864 and must be completely separated by either a noncombustible partition or a perforated metal partition with the perforations not exceeding 13mm (0.5in).
- 2.3 In under-stair installations, the compartment must comply with the relevant section of BS5864, provided that, in addition, all internal surfaces, including the base, are of, or lined with noncombustible material.

3. VENTILATION AND COMBUSTION AIR

- 3.1 A room sealed appliance does not require a combustion air vent in the room or internal space in which it is installed. If the appliance is installed in a compartment, the minimum total free area of the high and low level ventilation air vents must be as specified in Table 1 below, (in reference to BS5440 Pt 2, Table 1).

Position of air vents	Air from room or internal space	Air direct from outside
High level	89cm ² (14 in ²)	45cm ² (7 in ²)
Low level	89cm ² (14 in ²)	45cm ² (7 in ²)

**TABLE 1
MINIMUM EFFECTIVE AREAS**

4. ADAPTING TO RIGHT HAND AIR ENTRY

- 4.1 Remove the return air spigot and the short side cover from the left hand side of the appliance, and lay to one side.
- 4.2 Remove the long side cover from the right hand side of the appliance, and reassemble it on the left hand side, ensuring that the **slots are towards the front** of the appliance.
- 4.3 Reassemble the short side cover and the return air spigot on the right side of the appliance, ensuring that the **slots in the side cover are towards the front** of the appliance.

5. DUCT SYSTEM

(See British Design Manual - Gas Fired Warm Air Heating).

IMPORTANT: All duct work MUST be mechanically secured, and sealed with ducting tape.

5.1 RETURN AIR

- 5.1.1 Room sealed appliances may be installed without return air ducting, provided that the path between the return air grille and the appliance return air inlet is protected in such a manner that the required airflow will be maintained at all times. Where no ducting is fitted, a finger guard (Ref. FGJ, available from Johnson and Starley Ltd.), MUST be fitted.

- 5.1.2 The return air system should be constructed of fire-resistant material. It is extremely important that the correct size of return air grilles and ducting is used. The return air duct size should be NOT LESS THAN 225mm x 200mm (9in x 8in). If flexible duct is used, the duct diameter should be NOT LESS THAN 250mm (10in) dia. The return air grille should have a free area of not less than 645cm² (100in²).
- 5.1.3 An adequate and unobstructed return air path is essential from areas not served by a directly ducted return and to which warm air is delivered. All such rooms should be fitted with relief grilles which have a free area of 0.0088m²/kW (1in²/250Btu/h) of heat supplied to the room. The only exceptions are kitchens, bathrooms, and WC's.
- 5.1.4 For top return, a 'starter' knockout is provided to assist in creating the required aperture in the fan chamber top.

5.2 WARM DELIVERED AIR

- 5.2.1 All duct work, including riser ducts, should be fully insulated with 50mm (2in) glass fibre or similar. If extended duct runs are taken below floor level, these should be similarly insulated and in addition, wrapped with a sound proof barrier, and protected from crushing.
- 5.2.2 The duct system should be carefully designed (as detailed in the guidelines in the British Design Manual) to suit the needs of its specific heating requirements and building layout. The type of duct system, i.e. radial/extended/stepped plenum should be installed using the least number of fittings to minimise air flow resistance.

6. INSTALLATION REQUIREMENTS

6.1 AIR HEATER

- 6.1.1 Heater mounting is by means of five screws (provided) into a wall or structure sufficiently rigid to support the appliance without deflection (for mounting hole positions see Fig. 8. The weight of the appliance is 25kg. Recommended screw size is No 10 x 2 in with suitable wall plugs. Attach the plenum to the underside of the appliance using the four M4 x 16 screws and gasket provided. **NOTE:** Ensure that the aperture in the gasket is correctly aligned with the warm air outlet on the underside of the appliance. Position the return air and warm air outlet spigots to suit the application before mounting the assembly on the wall. For replacement, the appliance may be fitted to an existing base plenum, with any blanking plates being mechanically secured and sealed.

6.2 FLUES (See BS 5440 Pt. 1 Flues)

- 6.2.1 The maximum allowable flue length is 5.0m plus one 90° bend for horizontally flued appliances, and 11.0m plus terminal for vertically flued appliances.
- 6.2.2 The minimum allowable flue length is 350mm plus one 90° bend for horizontally flued appliances, and the length of the terminal (1240mm) for vertically flued appliances. For applications where the flue exits directly through a wall, the telescopic flue supplied with the heater may be used, as shown in Fig. 2.
- 6.2.3 The horizontal flue shall be installed with horizontal runs having a continuous fall to the terminal of at least 1.:50 (refer to Table 2 below).

Flue Length	Fall
1 m	20mm
2 m	40mm
3 m	60mm
4 m	80mm
5 m	100mm

Table 2
1:50 flue fall

- 6.2.4 The overall flue shall be kept as short as possible, with the minimum number of bends. The flue should terminate in its direction, with the terminal section meeting the outer side of the wall, or roofing at the point where it begins to flare out, (refer to Fig. 2). One 90° horizontal bend is equivalent to 1m of straight flue, a 45° horizontal bend is equivalent to 0.5m of straight flue. One 90° vertical bend, where the bend radius is equal to the flue diameter, is equivalent to 1.3m of flue; one 90° vertical bend, where the bend radius is equal to 0.5 flue diameter, is equivalent to 2.9m of flue; and a 45° bend, where the bend radius is equal to the flue diameter, is equivalent to 0.85m of flue.

- 6.2.5 Sufficient support brackets (not supplied) shall be fitted to bear the weight of the total flue system.
- 6.2.6 The annular space between the flue assembly and surrounding structure **must** be sealed. If a cement sealant is used, then the flue pipe must be coated with a suitable varnish at that point, to prevent corrosive attack of the aluminium pipe.
- 6.2.7 For a vertical flue, a 60/100mm dia. concentric flue available from Johnson & Starley must be used.
- 6.2.8 For a horizontal flue, the terminal supplied must be used. It shall be positioned in accordance with the recommendations of BS 5440 Pt. 1, Clause 8 and Appendix B, and be guarded against damage and for protection of passers-by, by using a terminal guard (Tower Flue Components Type K4), obtainable from builders' merchants and Johnson & Starley (Pt No 1000-0002870).

6.2.9 The flue/air duct spigot on the appliance is female. For horizontal flued appliances, the flue/air duct should be constructed that such that condensate cannot leak from the joints. Therefore, on vertical runs, all female ends should face away from the appliance, and on horizontal runs should face towards the appliance, as depicted in Fig. 3. To reverse the lay of joints, it is recommended to use male/male adaptors, available from Johnson & Starley (Pt Nos. 1000-0002840 [inner], and 1000-0002850 [outer]). The flue should be constructed working from the appliance towards the telescopic flue.

6.2.10 Construction of flue joints.

- a. Coat the end of the inner tube with silicone sealant capable of withstanding temperatures of up to 200°C (not provided), and insert it fully into the female end of the next tube.
- b. Using 3.3mm dia. drill, drill one hole through the assembly and secure with 1 x blind pop rivet (provided).
- c. Fit 1 x centring clip (provided) over the tube, immediately down flow of the joint.
- d. Slide the outer tube over the centring clip; assembly, secure and seal the outer joint in the same manner as the inner joint.

NOTE: Only use the BLIND POP RIVETS PROVIDED.

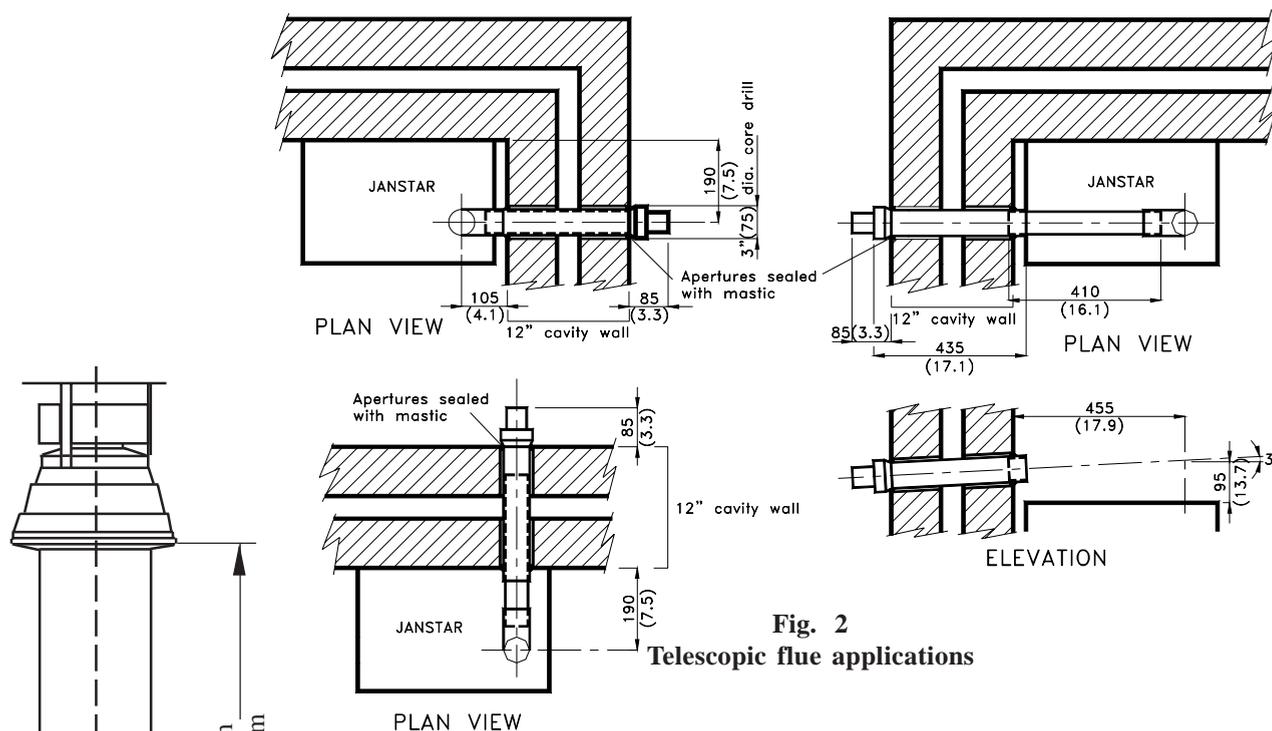


Fig. 2
Telescopic flue applications

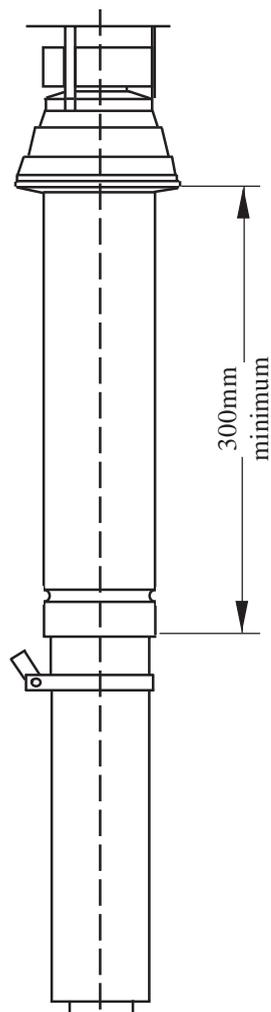


Fig. 3
Vertical flue application

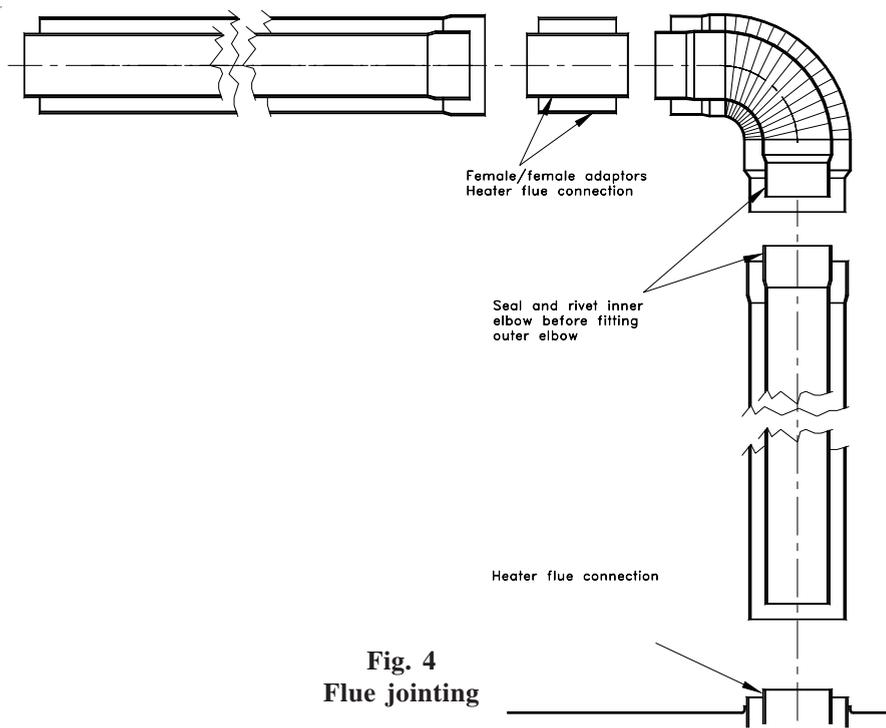


Fig. 4
Flue jointing

6.3 CONDENSATE

- 6.3.1 When firing at low rate, the unit will produce condensate which must be drained away. A JDT1 kit, which externally drains the condensate away from the flue terminal is available for horizontal flued applications. Vertical flued applications require the fitment of an in-line condensate trap within 0.5 m of the unit, in the first vertical flue run, and before any bends in the flue run. Such a trap, with a 32 mm male drainage connection, is available for this purpose.
- 6.3.2 Condensate from vertical flued applications must be drained away using 32 mm or 20 mm internal diameter, rigid plastic pipe, connected to the condensate drain using KUTERLITE 700 or similar straight coupling. The pipe should be installed in such a manner, that it forms a continuous downward slope away from the unit at a minimum 3° angle (6 mm per 100 mm, or, 0.75 in per foot run), and that the risk of mechanical damage and interior interference is minimised. The pipe is to be protected against frost damage.

6.4 ELECTRICAL

- 6.4.1 **Mains:** The heater is supplied with mains cable (PVC sheathed, high temperature resistant, 3 core [Brown-Blue-Green/Yellow], 6A, 0.75mm²), connected to a terminal block and exiting from the heater at the bottom right hand rear. The cable is suitable for a 230V 50Hz single phase supply and must be protected by a 5A fuse, and an earth wire must be connected. A double pole switch or fused spur box should also be used. All wiring conform to I.E.E. regulations, (current edition).
- 6.4.2 **Thermista-stat:** A Thermista-stat is provided with the appliance; this acts as a room thermostat, and also as a summer air flow switch. The Thermista-stat wiring is to be connected to terminals 3 and 4 on the air heater control panel, (marked 'THERMISTA-STAT'), polarity being unimportant. It should be located where there is free air circulation, and approximately 1.5m (5ft) from the floor. The following locations should be avoided.
- In a room where temperature is greatly affected by the sun or any other heat source (e.g. radiant fire, wall light fitting or TV set).
 - Near an outside door or windows, or on an outside wall.
 - Where it can be affected by warm air ducts, diffusers, waste pipes or the heater itself.
 - Where it can be subject to vibration.
- 6.4.3 **Time Control:** If an external time control (not supplied) is to be fitted, connect the live supply to terminal 7, the neutral to terminal 6, and the time-switch output to terminal 5. If no time control is fitted, link terminal 5 and 7.

6.5 GAS (see BS 5864 and BS 6891)

- 6.5.1 An independent gas supply pipe from the gas meter is to be preferred wherever possible. However, when this is not possible, the pipe must be capable of taking the complete input of the heater and all other gas appliances being served by this same pipe. This supply should be suitably sized to conform to British Standards requirements of no more than 1.0 mbar (0.4 in. wg.) pressure drop (see table of discharge in BS 6891).
- 6.5.2 The 1/2 in union gas cock (supplied) must be fitted externally in the gas inlet of the heater for easy isolation during servicing. The gas pipe should be fitted and installed as to be durable, substantial and gas tight. Gas entry to the air heater may be through the left hand side, right hand side front, or rear, to an Rc1/2 (1/2 in B.S.P. internal (taper) thread).

7. COMMISSIONING

- 7.1 Ensure the following:
- 7.1.1 Gas and Electrical supplies are **OFF**.
 - 7.1.2 Filter, fan and fan compartments are free from obstructions.
 - 7.1.3 All registers or grilles are open and conform to design specifications.
 - 7.1.4 Return, relief and ventilation air installations are adequate.
 - 7.1.5 Adhesive label is removed from the centre of the combustion air fan to expose the motor cooling slots.
- 7.2 Turn ON the gas supply to the heater.
- 7.3 Test for gas soundness at supply, Multifunctional control, Pilot and Main burners using proprietary detection fluid, sealing any leaks found, and purge the whole gas pipe as described in BS 6891.
- 7.4 Set the Thermista-stat to maximum setting (9).
- 7.5 Ensure that the remote time control (if fitted) is in the **ON** mode.
- 7.6 Switch on the electrical supply to the heater. The combustion air fan will start up immediately; after a minimum of 30 seconds, the burner will automatically ignite and the green '**BURNER ON**' indicator will illuminate.

- 7.6.1 If the burner fails to light (amber '**LOCKOUT**' illuminated): Reinststate the ignition sequence by allowing 10 seconds to elapse, and then press and release the '**RESET**' button.
- 7.6.2 If the burner ignites but then extinguishes: An automatic purging sequence will take place, which lasts for approximately 30 seconds. Following this, a second ignition will take place.
- 7.7 Set the time control (if fitted) to the required 'Heating On' periods and adjust the Thermista-stat to the desired comfort setting. The burner will then initially operate at maximum output until it reaches the set comfort level, whereby the heater modulates to maintain the required comfort level.
- 7.8 **BURNER PRESSURE CHECK:**
- Note: The Burner pressure is factory set and MUST NOT BE ADJUSTED.**
- 7.8.1 Turn the gas and electrical supplies to OFF.
- 7.8.2 Link Terminal block connection '**3**' to '**TEST**' terminal.
- 7.8.3 Referring to Fig. 5, remove and retain the Burner Pressure Test Point blanking screw, and fit pressure a test gauge to the test point.
- 7.8.4 Turn ON the gas and electrical supplies.
- 7.8.5 Reinststate the ignition sequence as detailed in sub-para 7.6.1
- 7.8.6 Ensure that the burner ignites, and allow 15 minutes of operation to elapse to ensure stability.
- 7.8.7 Referring to Table 3, ensure that the burner pressure is within the limits specified for the installed flue length.
- 7.8.8 If the differential burner pressure is not within the limits stated, run the appliance for a further 10 minutes and then re-check the burner pressure. If the pressure is still not within the stated limits, contact Johnson and Starley Ltd. Service Department, since rectification requires the use of special equipment.
- 7.8.9 Turn the gas and electrical supplies to OFF.
- 7.8.10 Remove the link from Terminal block connection '**3**' to '**TEST**' terminal.
- 7.8.11 Remove the pressure test gauge, and refit pressure test point blanking screw.
- 7.8.12 Turn ON the gas and electrical supplies.
- 7.9 **WARM AIR SYSTEM BALANCING:**
- 7.9.1 Set the Thermista-stat to the '**SUMMER AIRFLOW**' position (fully clockwise switched position), and check that the air circulation fan is running full speed, without the burner operating.
- 7.9.2 Balance the system to provide the required volume proportions at the warm air outlets.
Note: If the system includes ceiling diffusers, it is important that the velocities of air through these (except in very small rooms such as bathrooms) are at least 1.5m/s (300ft/min). In order to achieve this, it may be necessary to blank off part of the outlet face.
- 7.9.3 Reset the Thermista-stat to the require comfort level setting.
- 7.10 **AUTOMATIC CONTROLS CHECK:** Lighting the heater and allowing it to operate for a short time will effectively check these controls.
- 7.11 **SAFETY CHECK:**
- 7.11.1 Turn OFF the gas supply at service cock and ensure that Multifunctional control fail-safe operates (indicated by loud click from Multifunctional control).
- 7.11.2 Turn the gas supply ON at service cock, and ensure that the burner ignites.
- 7.12 **FAN PERFORMANCE:** No provision is made for fan speed adjustment, since the fan speed is automatically determined by the appliance, and the demand for heat.

	HORIZONTAL FLUE APPLICATIONS			VERTICAL FLUE APPLICATIONS		
	kW	MJ/h	Btu/h	kW	MJ/h	Btu/h
INPUT	9.80	35.3	33,500	10.5	37.8	35,800
OUTPUT	8.0	29.0	27,300	8.57	30.86	29,200
Gas rate cv 1037 Btu/h	0.92m ³ /h (32.3 ft ³ /h)					
Burner setting pressure (hot)	8.9mbar (3.6 in wg)			10.2mbar (4.1 in wg)		
Main Injector	BRAY 15/850					

Table 3
Main Burner Pressure Settings

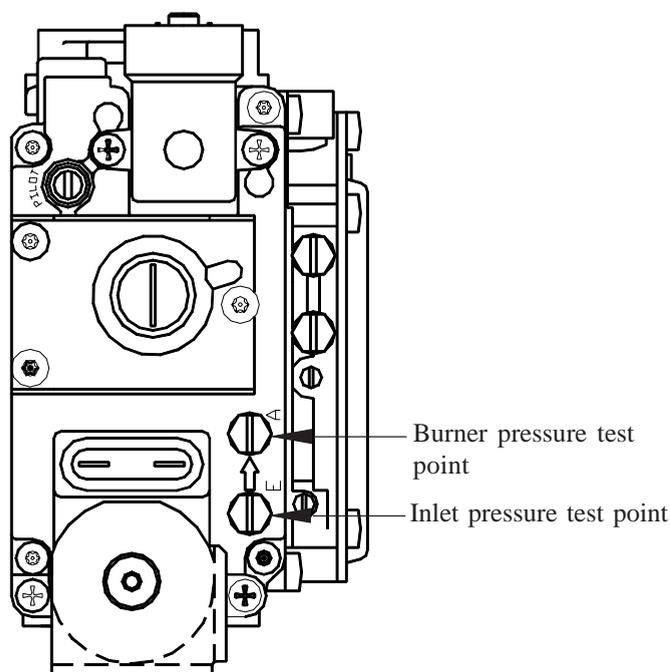


Fig. 5
Multifunctional control

8. INSTRUCTIONS FOR USERS

- 8.1 If the building is unoccupied, ensure that the Instructions for User are left taped to the air heater for the User, and Installation Instructions are left at or near the air heater for use on future service calls.
- 8.2 If the building is occupied, hand the User Instructions over and ensure that the User understands:
- 8.2.1 How to operate the Thermista-stat/room thermostat, time and heater ON/OFF switch and summer air circulation switch, and that the time control must be reset following a power failure.
 - 8.2.2 How to turn off the appliance, and switch off electrical supply to the heater.
 - 8.2.3 How to remove, clean and refit the air filter and at what intervals (i.e. fortnightly, or for new houses, weekly).
 - 8.2.4 How to control the heating system by opening and closing warm air outlets.
 - 8.2.5 That the heater must be serviced at least once a year by a competent person to ensure efficient and safe operation.
 - 8.2.6 That the red instructions for safe use have been pointed out and understood.
 - 8.2.7 That the air grilles on the heater or heater compartment; grilles and ventilators in the walls, windows or doors of the building must not be obstructed.
 - 8.2.8 That expert help must be obtained if malfunction of the appliance occurs.
 - 8.2.9 How to obtain summer air circulation.
 - 8.2.10 How to reset the appliance if LOCKOUT occurs.

9. SERVICING

IMPORTANT: Ensure that gas and electricity supplies are isolated before commencing any maintenance or replacement of components. After completion of any maintenance, always test for gas soundness and carry out a complete functional test of the appliance in accordance with Commissioning Instructions.

9.1 ROUTINE MAINTENANCE:

- 9.1.1 Operate appliance and check for correct function.
- 9.1.2 Clean the air circulation fan and the air filter.

Note: The air/fuel ratio is controlled automatically and therefore combustion is and will remain extremely clean. In the unlikely event of this ratio deviating from the norm, the system will lock out. It is, therefore, not necessary to remove the burner assembly for internal inspection during an annual service.

- 9.1.3 Reassemble all items in reverse order and carry out the commissioning procedure as detailed in Sect 6.

9.2 MULTIFUNCTIONAL CONTROL REMOVAL:

- 9.2.1 Ensure that the gas and electrical supplies are switched off.
- 9.2.2 Remove the heater front cover.
- 9.2.3 Remove the 2 x screws securing the heater front door, and the open front door.
- 9.2.4 Remove the central securing screws and disconnect the 2 x electrical plugs from the Multifunctional control.
- 9.2.5 Disconnect the two 6mm and one 8mm pipes from the top of the multifunctional control.
- 9.2.6 Disconnect the gas supply union from beneath the multifunctional control.
- 9.2.7 Remove the 2 x screws securing the multifunctional control mounting bracket to the heater body, and withdraw the multifunctional control.
- 9.2.8 Refitting or replacement is in reverse order. **Note:** If the multifunctional control is to be replaced, transfer the pipe fittings and mounting bracket to the new unit.

9.3 BURNER ASSEMBLY REMOVAL:

- 9.3.1 Referring to 9.2, remove the multifunctional control.
- 9.3.2 Disconnect the igniter lead from the ignition/detection electrode.
- 9.3.3 Disconnect the gas feed pipe from the burner assembly.
- 9.3.4 Remove the four hexagonal burner manifold fixing screws from the manifold front flange, and slacken the three hexagonal screws at the rear of the manifold.
- 9.3.5 Slide the manifold down to disengage the air connection, and then forward to disengage the rear screws. Withdraw the burner manifold and burner face plate.
- 9.3.6 Refitting or replacement is in reverse order, ensuring that the metal fibre on the burner face plate is **TOWARDS** the manifold.

9.4 BURNER ASSEMBLY CLEANING:

- 9.4.1 Referring to 9.3, remove the burner assembly.
- 9.4.2 Using a soft brush, lightly brush the burner manifold inside and out, taking care to avoid damaging the injector.
- 9.4.3 Using a vacuum cleaner with nozzle attachment, carefully clean the burner face plate element if necessary. **DO NOT USE** a wire brush or sharp implement, since the element is fragile and easily damaged.

9.5 AIR CIRCULATION FAN REMOVAL AND CLEANING:

- 9.5.1 Ensure that the electrical supply is switched off.
- 9.5.2 Remove the heater front cover.
- 9.5.3 Remove the six screws securing the fan chamber cover and remove the cover.
- 9.5.4 Remove the lower of the two capacitors from its spring clip.
- 9.5.5 Remove the air circulation fan securing screw, and slide the fan from its locating channel.
- 9.5.6 Supporting the air circulation fan, disconnect 2 x black, and 1 x green/yellow conductors from the terminal block situated on the fan casing.
- 9.5.7 Remove all dust from both the impeller and motor, taking care to avoid disturbance of the fan balancing.
- 9.5.8 Refitting or replacement is in reverse order, referring to Fig. 7 for correct wiring.

9.6 REMOVAL OF INJECTOR:

- 9.6.1 Referring to 9.3, remove the burner assembly.
- 9.6.2 Using 14mm A/F ring spanner, undo the nut and washer, and remove injector from burner manifold.
- 9.6.3 Refitting or replacement is in reverse order.

9.7 FUSE REPLACEMENT:

- 9.7.1 Ensure that the electrical supply is switched off.
- 9.7.2 Remove the heater front cover.
- 9.7.3 Remove the 2 x screws securing the heater front door, and open front door.
- 9.7.4 Replace the appliance fuse, situated in the inside of the front door at the top left hand side. **The only fuse to be fitted is 20mm, T3.15 (slow blow).**

9.8 **TRANSFORMER REMOVAL:**

- 9.8.1 Ensure that the electrical supply is switched off.
- 9.8.2 Remove the heater front cover.
- 9.8.3 Remove the 2 x screws securing the heater front door, and open front door.
- 9.8.4 Disconnect the leads from the transformer.
- 9.8.5 Release 2 x securing screws, nuts and lock washers, and withdraw transformer from the electrical panel.
- 9.8.6 Refitting or replacement is in reverse order, ensuring the leads are correctly reconnected to the transformer.

9.9 **IGNITION/DETECTION ELECTRODE REMOVAL:**

- 9.9.1 Referring to 9.3, remove the burner assembly.
- 9.9.2 Remove the securing nut and washer, and carefully remove the electrode from the burner.
- 9.9.3 Refitting or replacement is in reverse order, taking care to avoid bending the electrode since its profile is critical.

9.10 **IGNITION MODULE REMOVAL:**

- 9.10.1 Ensure that the electrical supply is switched off.
- 9.10.2 Remove the heater front cover.
- 9.10.3 Remove the 2 x screws securing the heater front door, and open front door.
- 9.10.4 Disconnect the ignition lead from the ignition module.
- 9.10.5 Disconnect the ignition module edge connector plug.
- 9.10.6 Remove the 2 x securing screws and withdraw the ignition module.
- 9.10.7 Refitting or replacement is in reverse order.

9.11 **CONTROL MODULE REPLACEMENT:**

- 9.11.1 Ensure that the electrical supply is switched off.
- 9.11.2 Remove the heater front cover.
- 9.11.3 Remove the 2 x screws securing the heater front door, and open front door.
- 9.11.4 Disconnect the ribbon cable from the combustion air fan, by gripping the plug. **Do not pull on the ribbon cable.**
- 9.11.5 Disconnect the 2 x grey, and 1 x violet conductors from the transformer.
- 9.11.6 Disconnect the following conductors from the listed terminal strip connections:
 - a. Pink from '3',
 - b. Pink from '4',
 - c. White from '5',
 - d. Yellow from '10',
 - e. Orange from '12',
 - f. Orange from '13',
 - g. Red from '14',
 - h. Blue from '15'.

9.11.7 Remove the 2 x securing screws and nuts, and remove the control module.

9.11.8 Refitting or replacement is in reverse order.

9.12 **COMBUSTION AIR FAN REMOVAL:**

- 9.12.1 Ensure that the electrical supply is switched off.
- 9.12.2 Remove the heater front cover.
- 9.12.3 Remove the 2 x screws securing the heater front door, and open front door.
- 9.12.4 Disconnect the ribbon cable from the combustion air fan, by gripping the plug. **Do not pull on the ribbon cable.**
- 9.12.5 Remove 2 x screws securing the 6mm pipe to the combustion air fan, release the tubing nut at the multifunctional control, and withdraw the 6mm pipe complete with clamping plate and gasket.
- 9.12.6 Remove the upper and lower screws securing combustion air fan, and withdraw the fan complete with gasket.
- 9.12.7 Refitting or replacement is in reverse order.

Important: Ensure that both gaskets are undamaged, and that the flue connection is sound. Only use the securing screws supplied, as longer screws will cause damage to the heat exchanger.

9.13 FAN DELAY/OVERHEAT (LIMIT) CONTROL (FDC) REMOVAL:

- 9.13.1 Ensure that the electrical supply is switched off.
- 9.13.2 Remove the heater front cover.
- 9.13.3 Remove the 2 x screws securing the heater front door, and open front door.
- 9.13.4 Disconnect the five conductors in the FDC lead from the control panel terminal strip, having first noted their positions.
- 9.13.5 Release 2 x screws securing FDC to the bulkhead, and withdraw the FDC from the heater.
- 9.13.6 Refitting or replacement is in reverse order.

9.14 OVERHEAT CUTOFF (THERMAL SWITCH) REMOVAL:

- 9.14.1 Ensure that the electrical supply is switched off.
- 9.14.2 Remove the heater front cover.
- 9.14.3 Remove the 2 x screws securing the heater front door, and open front door.
- 9.14.4 Disconnect the two conductors from the thermal switch.
- 9.14.5 Release the two securing screws and withdraw the switch.
- 9.14.6 Refitting or replacement is in reverse order.

9.15 MAINS FILTER REMOVAL:

- 9.14.1 Ensure that the electrical supply is switched off.
- 9.14.2 Remove the heater front cover.
- 9.14.3 Remove the 2 x screws securing the heater front door, and open front door.
- 9.14.4 Disconnect the two conductors from the thermal switch.
- 9.14.5 Release the two securing screws and withdraw the switch.
- 9.14.6 Refitting or replacement is in reverse order.

9.16 HEAT EXCHANGER REMOVAL:

- 9.15.1 Referring to 9.3, remove the burner assembly.
- 9.15.2 Referring to 9.9, remove the Ignition/detection electrode.
- 9.15.3 Referring to 9.12, remove the combustion air fan, including complete removal of the two upper securing screws.
- 9.15.4 Referring to 9.13, remove the fan delay/overheat (limit) control.
- 9.15.6 Disconnect the base plenum from its associated duct work, and remove it from the appliance by releasing the two screws from inside the plenum, and one hexagonal screw from the appliance floor.
- 9.15.7 Release the two hexagonal screws securing the heat exchanger at the burner aperture, and withdraw the heat exchanger from the appliance through the base aperture.
- 9.15.8 Refitting or replacement is in reverse order, ensuring that the two upper combustion fan securing screws are fitted before fully tightening the heat exchanger securing screws at the burner aperture.

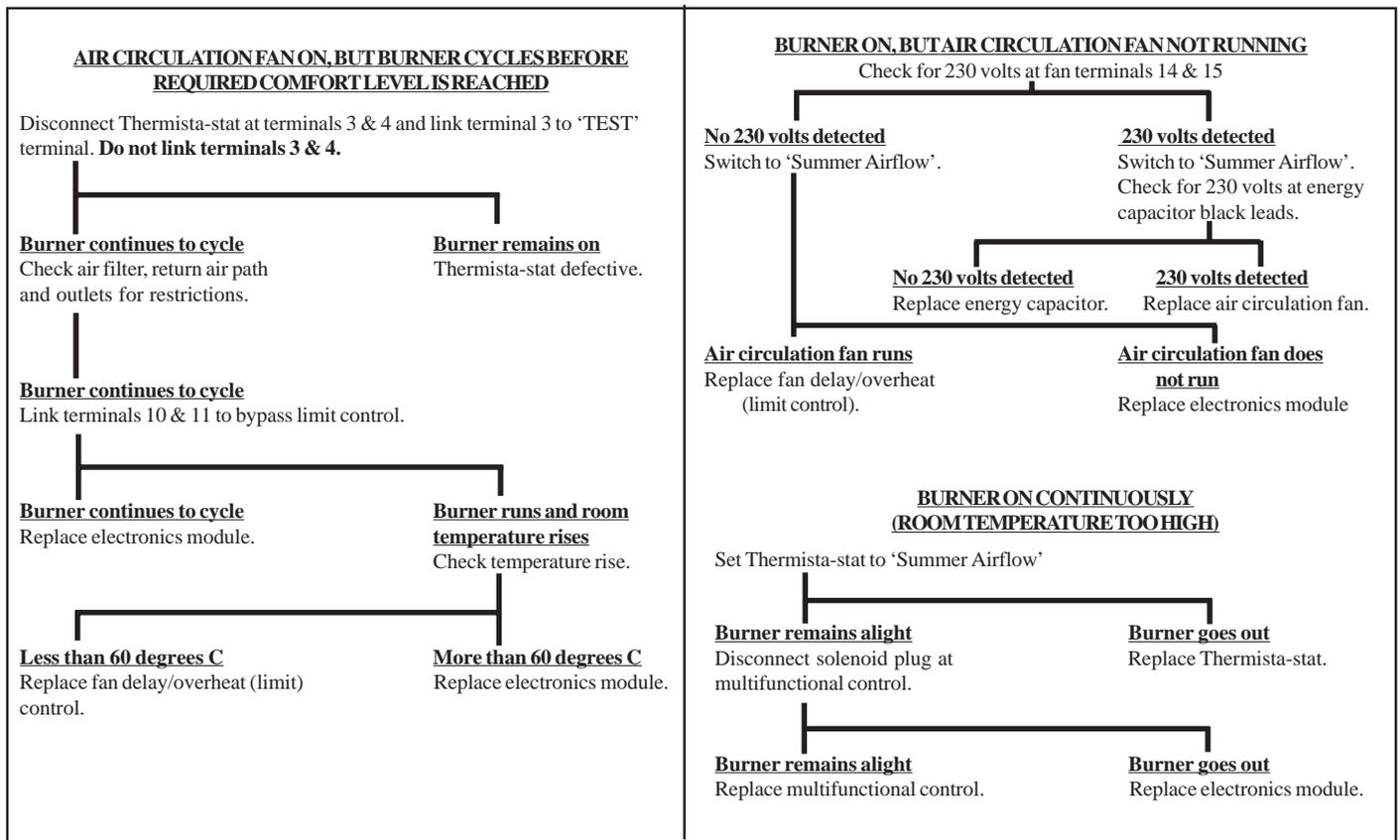
10. DEFECT DIAGNOSIS

- 10.1 **IMPORTANT: If an electrical fault occurs after installation of the appliance, preliminary earth continuity, polarity and resistance to earth checks should be carried out with a multimeter. On completion of any service/defect rectification tasks which have required the breaking and remaking of electrical connections, then continuity, polarity and resistance to earth checks should be repeated.**
- 10.2 **Note:** When purging or checking gas supplies, ensure that there is adequate ventilation to the room or cupboard, and all naked lights are extinguished.
- 10.3 **Care must be taken during replacement and handling of electronic assemblies, i.e. printed circuit board module, fan delay/overheat (limit) control and Thermista-stat. It is not practical to rectify defects in these assemblies except in the factory, and any attempt to do so may render any guarantee or factory replacement arrangement invalid.**

10.4 GENERAL INFORMATION:

- 10.4.1 This appliance is fitted with an automatic sequence control which also provides a spark ignition and flame detection facility. If the ignition/detection electrode fails to detect the presence of a flame during normal operating conditions, it will cause the multifunctional control to close. The control will then make one attempt at re-ignition by repeating the pre-purge/ignition cycle and then lock out (indicated by the amber light). The combustion air fan will continue to run, provided there is a demand for heat. Operation of the time control (if fitted) or if the room temperature exceeds plenum the set comfort level will simply cause the appliance to switch off (green light goes out). In this case, restoration of the electrical supply will initiate the ignition sequence.
- 10.4.2 If the combustion air fan will not start when the electrical supply to the appliance is on, and there is a demand for heat, the defect lies in the control module or the combustion air fan. Check that the connections to the fan are sound, and then, if necessary, change the control module followed by the combustion air fan.
- 10.4.3 If lockout occurs and it is known that gas is being supplied to the appliance, attempt to restart the appliance by pressing and releasing the reset button. If this attempt to restart the appliance is unsuccessful, check the electrode lead and the electrode for damage and replace as necessary. **Note:** It is possible to obtain a spark, even when the electrode lead is damaged, but the lead may not be able to conduct the very small detection current to the ignition/detection control. If there is no evidence of damage to the electrode or lead, replace the ignition control unit.
- 10.4.4 The appliance is also fitted with an overheat cutout device mounted on the face of the control module. This device will cause the appliance to shut down if an overheat situation should arise due to a lack of adequate ventilation. Therefore it is important that the minimum installation clearances are maintained, and that the ventilation apertures on the sides and inside the appliance remain unblocked.

DEFECT DIAGNOSIS FLOW CHART



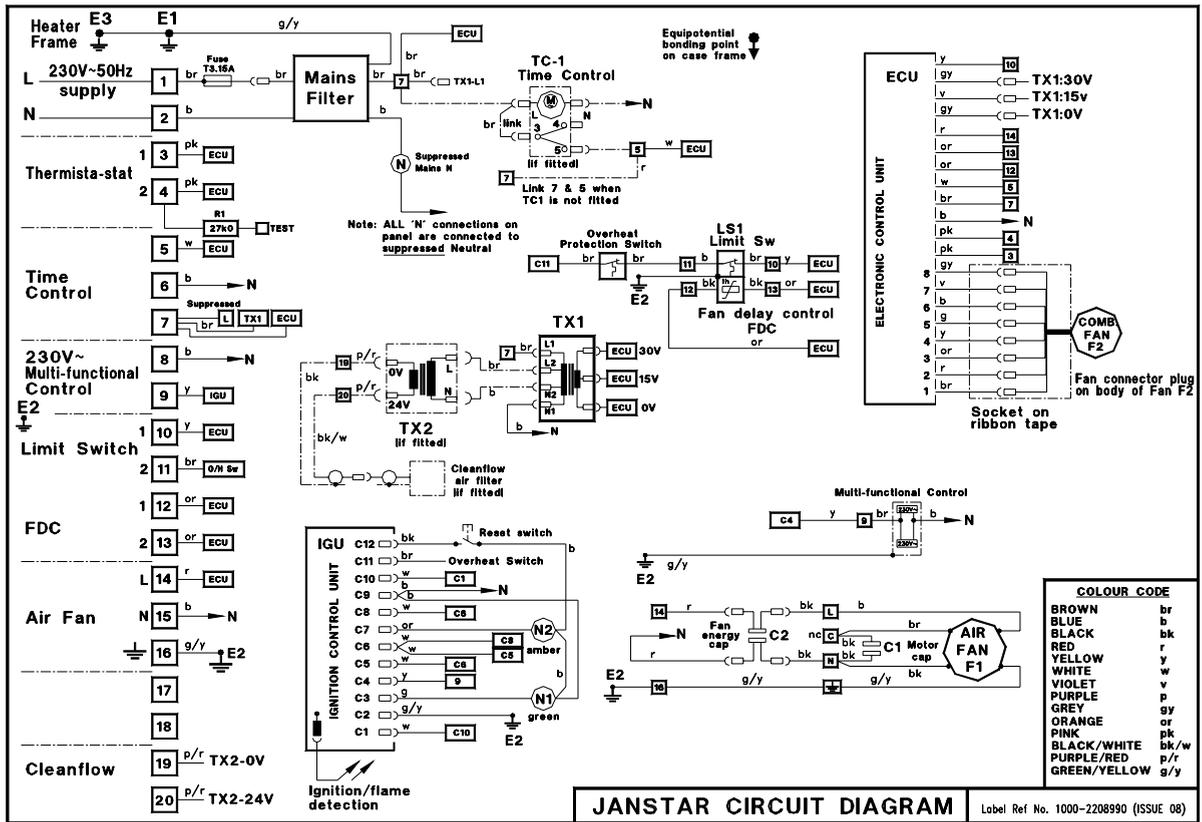


Fig. 7 JANSTAR functional flow circuit diagram

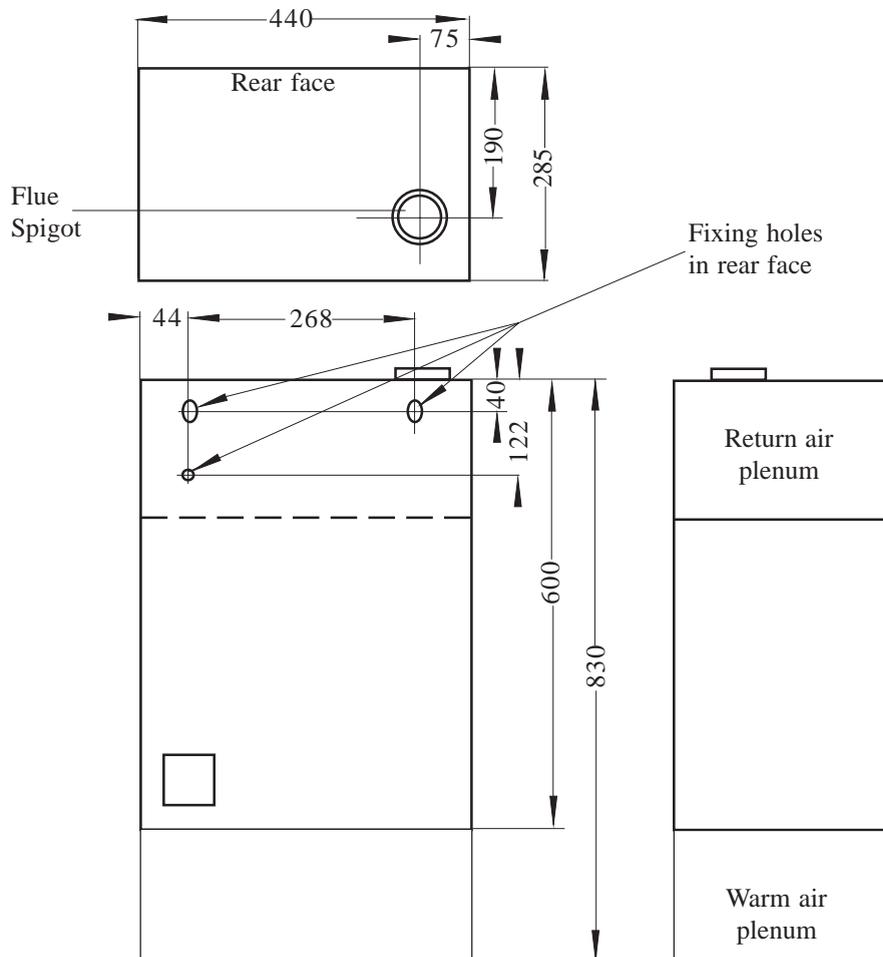


Fig. 8 Principal dimensions (mm)

11.

SHORT LIST OF SPARES

G.C. No	MAKER'S No	DESCRIPTION	QTY
E00 124	W800-0701000	Burner assembly	1
E00 125	W800-0774000	Burner metal fibre assembly	1
245 549	1000-1500840	Gasket - burner top plate	1
398 219	1000-0704560	Injector Bray Cat 15/850	1
245 530	W800-0300000	Heat exchanger assembly	1
245 533	1000-0704500	Multifunctional control valve SIT Novamix 828	1
245 534	1000-0704490	Ignition/detection electrode	1
245 535	1000-0516440	Fan delay/overheat (limit) control	1
245 536	1000-0516400	Electronics module	1
245 537	1000-0516250	Transformer	1
245 525	1000-0515730	Transformer (Cleanflow filter)	1
173 118	1000-0516420	Ignition module	1
245 531	W800-0515005	Combustion air fan assembly	1
173 120	1000-0516200	Air circulation fan	1
245 538	1000-0504710	Capacitor 4 μ F	1
245 509	1000-0513820	Fuse T3.15A	1
245 514	1000-0515620	Thermista-stat	1
173 119	1000-0516830	Overheat cutout device	1
	1000-0519500	EMC Filter	1

Johnson and Starley prides itself on its ability to supply spare parts quickly and efficiently. If you have a problem in obtaining a spare part, please contact Johnson and Starley Spares Department at the address below.

Telephone: (01604) 762881

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