



These instructions are to be left with the User or adjacent to the Gas Meter

HI-SPEC ELJAN/SEL and SER WATER HEATERS

Including WM variant for wall mounting

INSTALLATION, COMMISSIONING & SERVICING INSTRUCTIONS

HI-SPEC ELJAN/SEL G.C. No 53-416-29
HI-SPEC ELJAN/SER G.C. No 53-416-30

Publication No. ZZ 900/4
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WARNING: This appliance MUST be EARTHED

This appliance has been tested and certified by B G Technology for use with Natural Gas G20

1. GENERAL DESCRIPTION

- 1.1 HI-SPEC ELJAN/SEL and /SER are gas fired circulators which can generate up to 62.5 litres/h (13.7 gal/h) of hot water when used in conjunction with the Johnson & Starley HI-SPEC J25RS air heater in SE-duct applications. The HI-SPEC ELJAN/SEL is fitted to the left hand side of the air heater, whilst the HI-SPEC ELJAN/SER is fitted to the right hand side.
- 1.2 HI-SPEC ELJAN/SEL and /SER may be adapted for fixing directly to the SE-duct wall. They are then referred to as HI-SPEC ELJAN/SEL/WM and HI-SPEC ELJAN/SER/WM respectively. The /SEL/WM has the controls on the right, whilst the /SER/WM has its controls on the left hand side.
- 1.3 All models are suitable for use in a gravity fed circuit serving a hot water storage cylinder (tank) and may be used efficiently with indirect storage systems, or, in soft water areas, direct systems. Indirect systems are preferred; direct systems should only be used when recommended by the Local Water Authority. A pump and up to 3 radiators may also be incorporated into the circuit if required.
- 1.4 When used in a sealed system application, HI-SPEC ELJAN/SE models must be fitted with an Overheat Cutoff Device - CK1 kit, fitted in accordance with the instructions supplied with that kit.
- 1.5 The gas supply to the main burner is controlled by a Multifunctional Control. In addition, an electrically operated solenoid valve is fitted to permit the main burner to be remotely switched on and off.

2. TECHNICAL DATA

2.1 NATURAL GAS:

Injector:	1.55mm diameter.
Setting pressure:	18.7mbar (7.5 in wg).
Gas rate:	0.42m ³ /h (14.8 ft ³ /h).
Input:	4.4 kW (15,000 Btu/h).
Output:	3.32 kW (11,340 Btu/h).
Gas connection:	R ¹ / ₄ (1/ ₄ in BSP external taper).
Gas service cock:	R ¹ / ₄ (1/ ₄ in BSP) gas cock and union (supplied loose).

2.2 WATER:

Maximum output:	62.5 litres/h (13.7 gal/h) raised by 44.5°C (80°F).
Water temperature:	adjustable between 45°C (113°F) and 85°C (185°F).
Temperature control:	allows settings below selected maximum.
Maximum working head:	20m (65 ft).
Minimum working head:	1m (3.3 ft).
Minimum circulation head:	356mm (14 in).
Water connections:	Rp ³ / ₄ (3/ ₄ in BSP) internal parallel.

2.3 ELECTRICAL SUPPLY:

230V 50 Hz fuse rated at 3A. Connection to solenoid valve by DIN 43650 plug.

2.4 INSTALLATION AND SERVICING CLEARANCES:

IMPORTANT: Care must be taken to ensure that adequate space is provided at the front and 'open' sides of the circulator for installation purposes.

'Open' side:	12mm (1/ ₂ in).
Front:	300mm (12 in) for servicing.
Top:	250mm (10 in) above Multifunctional control.

Access to control MUST NOT be RESTRICTED.

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).
 BS 6798 Specification for installation of gas fired hot water boilers of rated input not exceeding 60kW.
 BS 5449 Forced circulation hot water systems.
 BS 5546 Installation of gas hot water supplies for domestic purposes, (2nd Family Gas).
 BS 7671 Institute of Electrical Engineers (I.E.E.) Wiring Regulations
 BS 6891 Installation of Low Pressure Gas Pipework of up to 28mm (R1) in domestic premises (2nd family gases).
 BS 5440 Pt. 1 (Flues for Gas Appliances)
 BS 5440 Pt. 2 (Air Supply for Gas Appliances)
 BS 5864 Installation of Gas Fired Ducted Air Heaters
 BS 6700 Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.
 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.

3. GENERAL REQUIREMENTS

3.1 VENTILATION:

3.1.1 An SE-duct 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.

Note: These free areas allow for the operation of the appliance in combination with a HI-SPEC J25 RS air heater.

Position of air vents	/SEL and /SER		/SEL/WM and /SER/WM	
	Air from room or internal space	Air direct from outside	Air from room or internal space	Air direct from outside
High level	132cm ² (20 in ²)	66cm ² (10 in ²)	40cm ² (6.5 in ²)	20cm ² (3.25 in ²)
Low level	132cm ² (20 in ²)	66cm ² (10 in ²)	80cm ² (13 in ²)	40cm ² (6.5 in ²)

Table 1
Minimum Effective areas

Note: High and low air vents must communicate with the same room or internal space, or both must be on the same wall to outside air.

3.2 GAS SUPPLY:

- 3.2.1 Installation pipes should be fitted in accordance with BS 6891.
- 3.2.2 Pipework from the gas meter to the appliance must be of adequate size. Pipes of a smaller size than the appliance inlet gas connection must not be used.
- 3.2.3 The complete installation must be tested for gas soundness and purged as described in the above British Standard.

3.3 WATER:

- 3.3.1 Detailed recommendations for the water circulation system are given in BS 6798, BS 5449 (for small bore and microbore central heating systems), and BS 5546. To ensure good circulation in gravity circuits, flow pipes should be designed to run vertically from the water heater before running laterally. Any lateral run of pipework should be not more than twice the previous vertical length. Pipework should be installed with a rise towards the vent point.
- 3.3.2 Draining points must be located in accessible positions to permit the draining of the whole system, including the appliance and hot water storage vessel. A draining point should be fitted at the lowest point of the water heating circuit, and, in the case of an indirect system, another must also be fitted at the lowest point of the cold feed. Draining points should be at least $\frac{1}{2}$ in. nominal size and in accordance with BS 2879.
- 3.3.3 Economy valves can only be used in a direct installation.

Note: Indirect systems are preferred to avoid the possibility of scale formation. Direct systems should only be used when recommended by the local Water Authority.

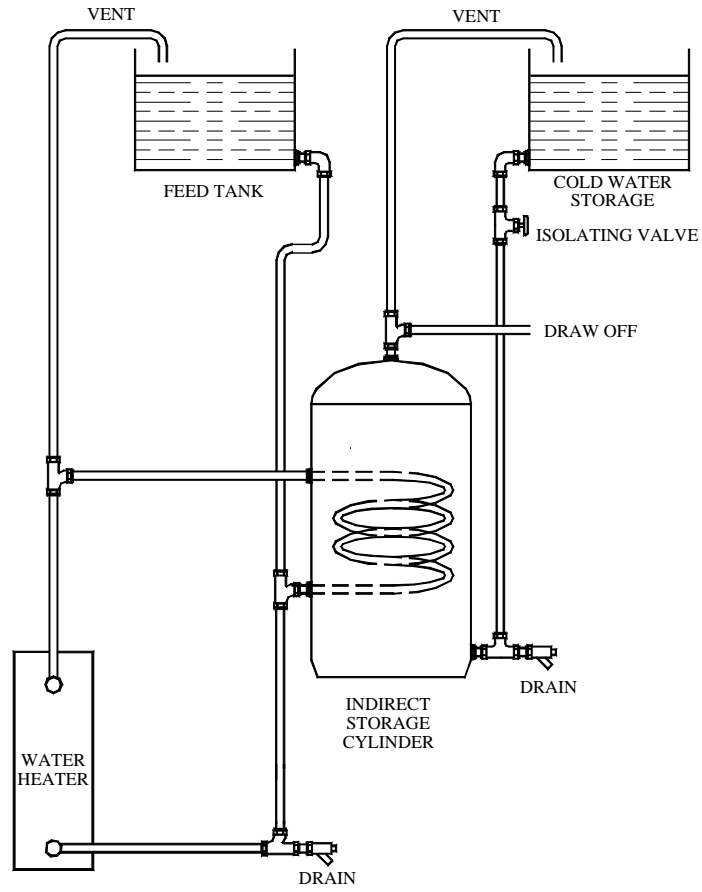


Fig. 1a.
Typical Gravity fed Indirect cylinder application.

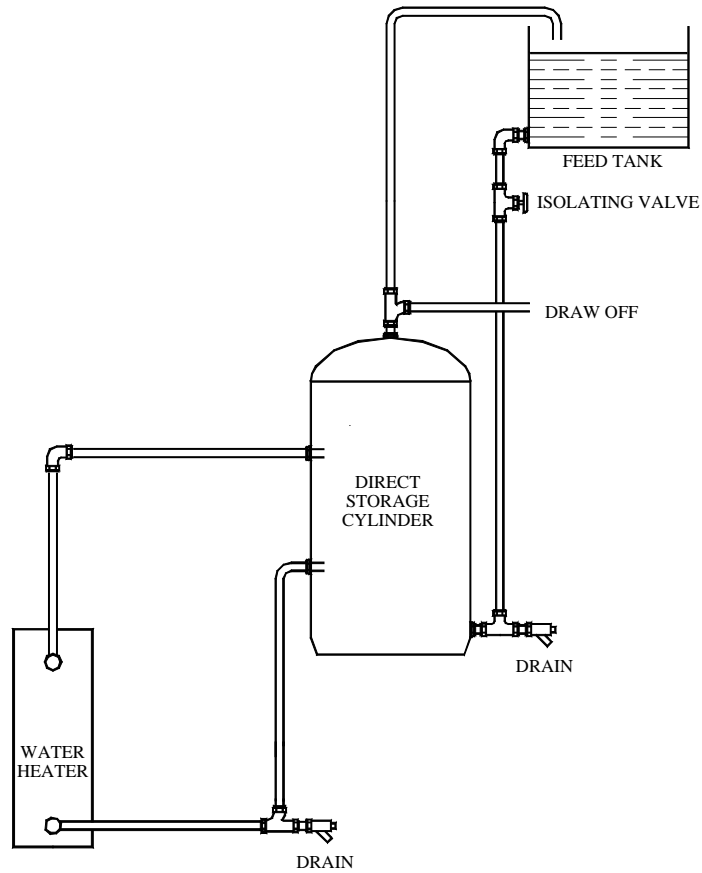


Fig. 1b.
Typical Gravity fed Direct cylinder application.

3.4 ELECTRICAL:

- 3.4.1 Wiring external to the appliance must be installed in accordance with I.E.E. Regulations (current edition) for electrical installations and any other local regulations which apply. It is recommended that a single electrical supply serves both the air heater and water heater. The means of isolation for the appliance must be via double pole switch having a contact separation of NOT LESS THAN 3mm in each pole.

4. INSTALLATION

Note: For /SEL and /SER appliances, paragraphs 4.1 to 4.5 are applicable, whereas for SEL/WM and SER/WM variants, paragraphs 4.1 to 4.2 and 4.6 to 4.7 apply. Paragraphs 4.8 onwards are common for all applications.

4.1 SE-DUCT:

WARNING: Many SE-Ducts are constructed of asbestos based materials, and because of dimensional variations between Johnson & Starley and other manufacturers' equipment, a certain amount of SE-Duct rework will need to be carried out by REGISTERED CONTRACTORS:

- 4.1.1 In some situations the SE-Duct may be completely exposed and special components needed to complete the installation. Consult Johnson & Starley Service Department if this situation is encountered. A special supplement describing a recommended fitting procedure is available (Publication No. ZZ559).

4.2 IDENTIFICATION AND COMPONENT CHECK:

- 4.2.1 The HI-SPEC ELJAN/SEL and /SER are to be installed on in combination with a Johnson & Starley HI-SPEC J25RS air heater, whilst ELJAN/ SEL/WM and /SER/WM are to be mounted directly onto the SE-Duct. Components contained in both packs are to be identified and checked.

Description	Qty
HI-SPEC ELJAN/SEL (or SER) water heater assembly	1
Union gas cock	1
SEL/SER models only	
Transfer box (left or right hand. complete with 4 x water heater fixing screws)	1
Sealing plate	1
Tie Rod assembly, complete with heater bracket & nut	2
Rope Ring seal	6
Eye bolt	1
Masonry plug for eye bolt	1
Sealing Tape	1
SEL/WM and SER/WM models only (JAN3 SEW kit)	
Mounting plate	2
Blanking plate with spigots	1
M5 x 12 pan head screw	8
M5 Hex nut	4
Rope Ring seal	2
Template	1

4.3 /SEL & /SER: SE-DUCT PREPARATION:

- 4.3.1 Since these instructions are based upon the replacement of a Sugg type 22/WH 'Halcyon' air heater, it will only be necessary to re-cut the Flue Outlet (upper aperture) in the SE-Duct when replacing this type of heater. Replacement of any other heater may require the re-cutting of both SE-Duct apertures.
- 4.3.2 Referring to Fig. 2, note the position of the two datum points.
- 4.3.3 Remove all sealing material from the top of the existing plenum.
- 4.3.4 Referring to Fig. 2, mark and cut apertures A and B in the SE-Duct and clear all debris (if replacing a Sugg type 22/WH 'Halcyon', only aperture A will be required since aperture B corresponds with the existing Combustion Air Inlet).
- 4.3.5 Seal the redundant hole(s) in the SE-Duct using suitable cement or blanking material to provide a flat surface on both inner and outer faces of the duct.
- 4.3.6 Referring to Fig. 2, drill and fit the eyebolt masonry plug, having first noted the handing of the water heater (eyebolt to the left of the air heater for HI-SPEC ELJAN/SER, and eyebolt to the right of the air heater for HI-SPEC ELJAN/SEL).

4.4 PLENUM BLANKING:

Due to base plan variations between original and replacement heaters, it will be necessary to blank off part or parts of the Plenum aperture. This is carried out at the discretion of the installer, but it is important that a suitable non-combustible material is used and that the perimeter of the remaining aperture is bounded by the sealing tape (provided) to ensure a good seal between the air heater and the plenum. Installers are to ensure that any plates fitted are mechanically secured and sealed.

4.5 /SEL & /SER FITTING:

4.5.1 Referring to Fig. 3, measure the thickness of the SE-Duct wall, mark and cut the transfer box spigots as follows:

- Combustion Air Spigot:** The combustion air spigot can finish flush with, but not protrude beyond, the SE-Duct wall (i.e. the maximum spigot length must **not be greater than the thickness of the SE-Duct wall + 12mm**).
- Flue Spigot:** The flue spigot length is critical and **must be cut to the thickness of the SE-Duct wall + 38mm**.

4.5.2 Offer up the transfer box to the SE-Duct wall such that the spigots engage their respective holes, and using the box as a template, mark through the fixing hole positions. Remove the transfer box, drill and plug the fixing holes.

4.5.3 Ensuring that a rope ring seal is fitted to both water heater spigots, fix the water heater to the transfer box top and bottom side brackets, using the 4 screws (provided).

4.5.4 Place a rope ring seal on each of the transfer box spigots, and fit the sealing plate to the bottom spigot.

4.5.5 Align the transfer box assembly with the fixing holes in the SE-Duct, and secure the assembly to the wall using suitable fixings compatible with the SE-Duct wall material. ENSURE that the transfer box assembly is effectively sealed against the SE-Duct wall.

4.5.6 Position the remaining rope ring seals onto the air heater spigots and place the air heater onto the plenum to engage the spigots with the transfer box apertures.

4.5.7 Hook one tie rod onto the eyebolt wall fixing and secure using the 'T' shaped bracket hooked around the front of the air heater.

4.5.8 Hook the second tie rod onto the centre bracket on the side of the transfer box, and secure using the 'Z' shaped bracket to the side of the air heater. Trim the tie rod to length as required.

4.5.9 Carefully tighten the tie rods such that the are heater is effectively sealed against the transfer box assembly.

NOTE: If the heater is not installed in a compartment, a suitable guard or insulation of noncombustible material **MUST** be provided around exposed parts of the transfer box assembly.

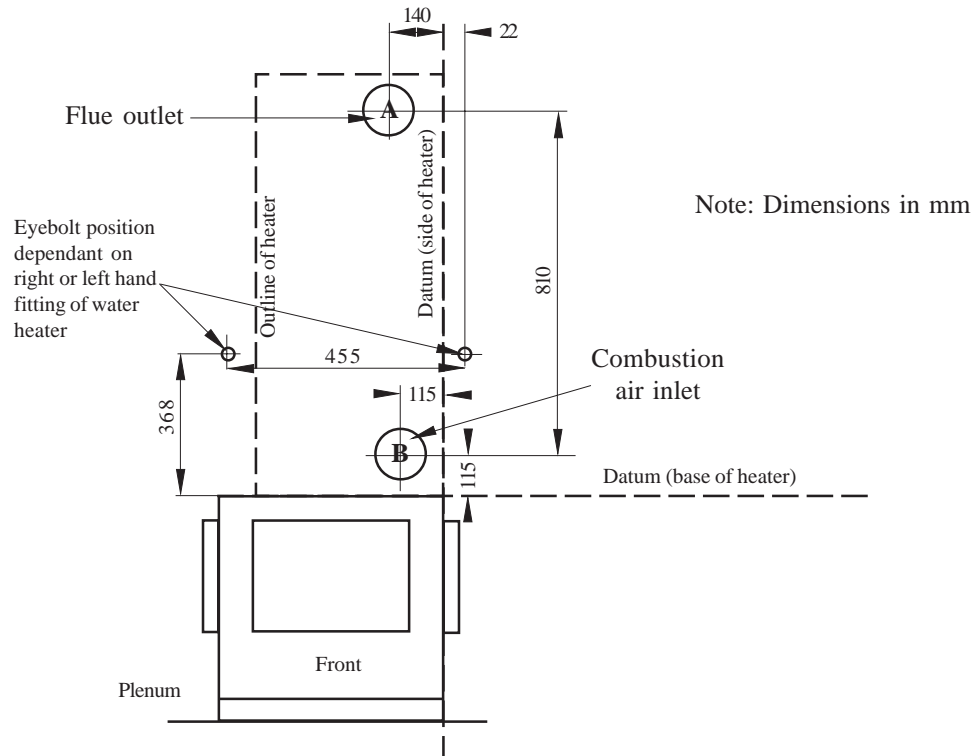


Fig. 2
Location of apertures and fixing holes
in SE-Duct wall

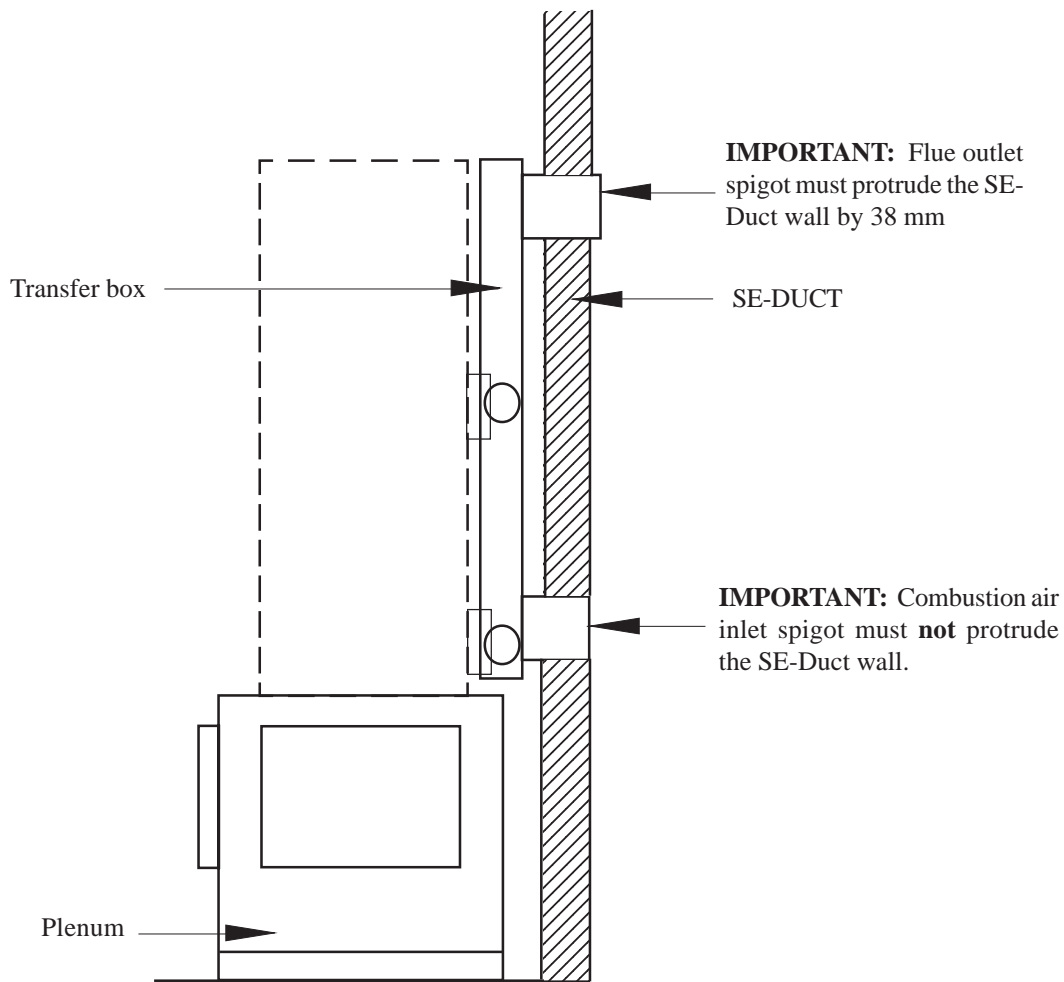


Fig. 3
Side view (without water heater)

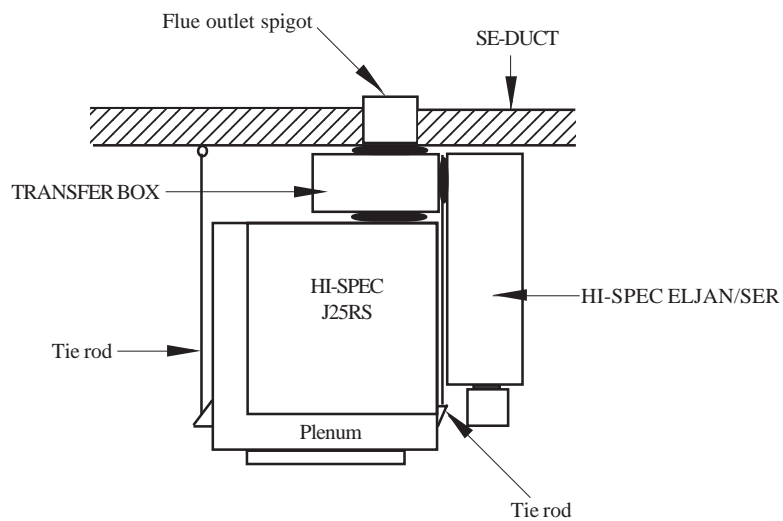


Fig. 4
Plan view with water heater (right hand fitting)

4.6 /SEL/WM & /SER/WM: DUCT PREPARATION:

- 4.6.1 Select the position on the SE-Duct for mounting the appliance, ensuring that there is enough room at the side of the appliance to enable the pilot burner to be seen through the viewing port, and for the removal of the Burner and Controls Assembly for servicing.
- 4.6.2 Using the template provided, mark and cut the 2 x 125 mm dia. Air Inlet and Flue Outlet holes in the SE-Duct wall, and clear any debris from the duct.
- 4.6.3 Measure the thickness of the SE-Duct wall, mark and cut the blanking plate spigots as follows:
 - a. **Lower Spigot:** The combustion air spigot can finish flush with, but not protrude beyond, the SE-Duct wall
 - b. **Upper Spigot:** The flue spigot length is critical and **must be** cut to the **thickness of the SE-Duct wall + 38mm.**

4.7 /SEL/WM & /SER/WM FITTING:

- 4.7.1 Mount the blanking plate to the SE-Duct with the spigots engaged with their correct apertures. Mark the position of the 6 x fixing holes on the duct wall, remove the blanking plate and drill and plug the fixing holes.
- 4.7.2 Secure the blanking plate to the SE-Duct wall using 6 screws (not provided) and sealing with mastic compound.
- 4.7.3 Make good the lower aperture in the SE-Duct wall to provide a neat sharp edge to the spigot on the INSIDE of the duct.
- 4.7.4 Referring to Fig. 5, fit the mounting plates to the water heater as shown, using 4 x M5 screws and nuts (provided) ensuring that the screw heads are on the spigot side and noting the orientation of the mounting plates ('long' end towards the appliance controls).
- 4.7.5 Fit a rope ring seal to each of the water heater spigots, offer and secure the appliance to the blanking plate using the 4 remaining M5 screws to the bushes in the top and bottom flanges.

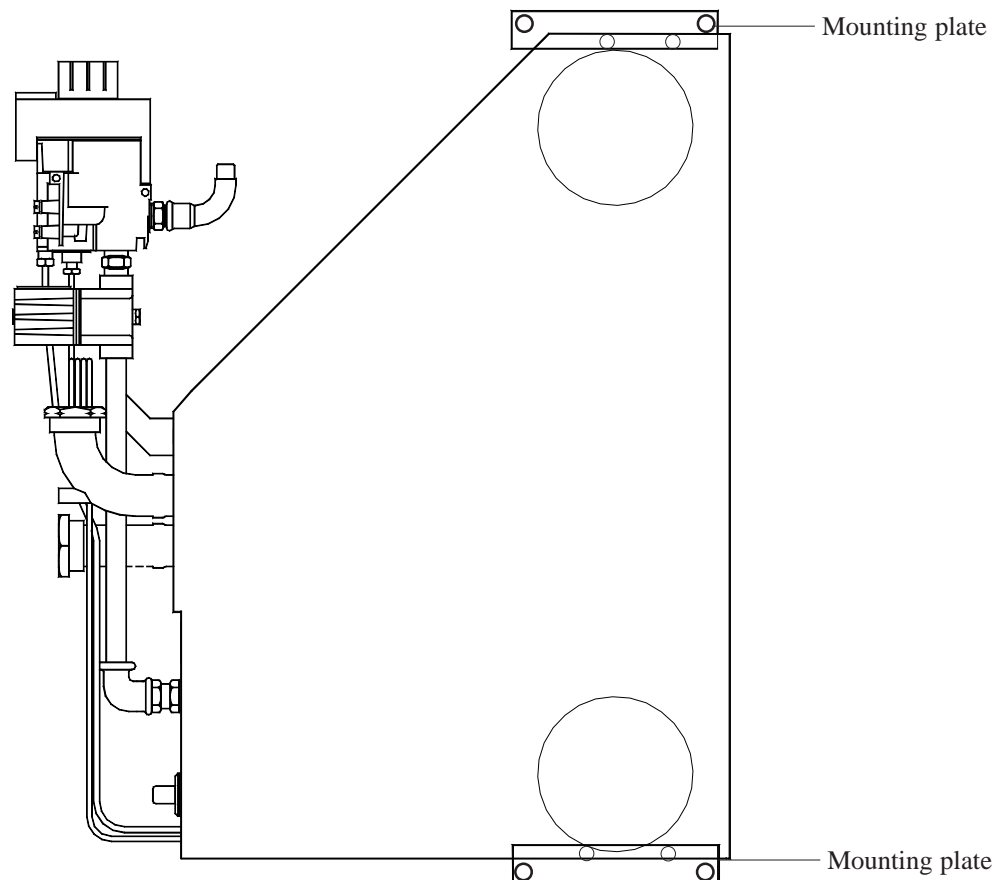


Fig. 5
Mounting brackets fitted to /WM VARIANT

4.8 WATER CONNECTIONS:

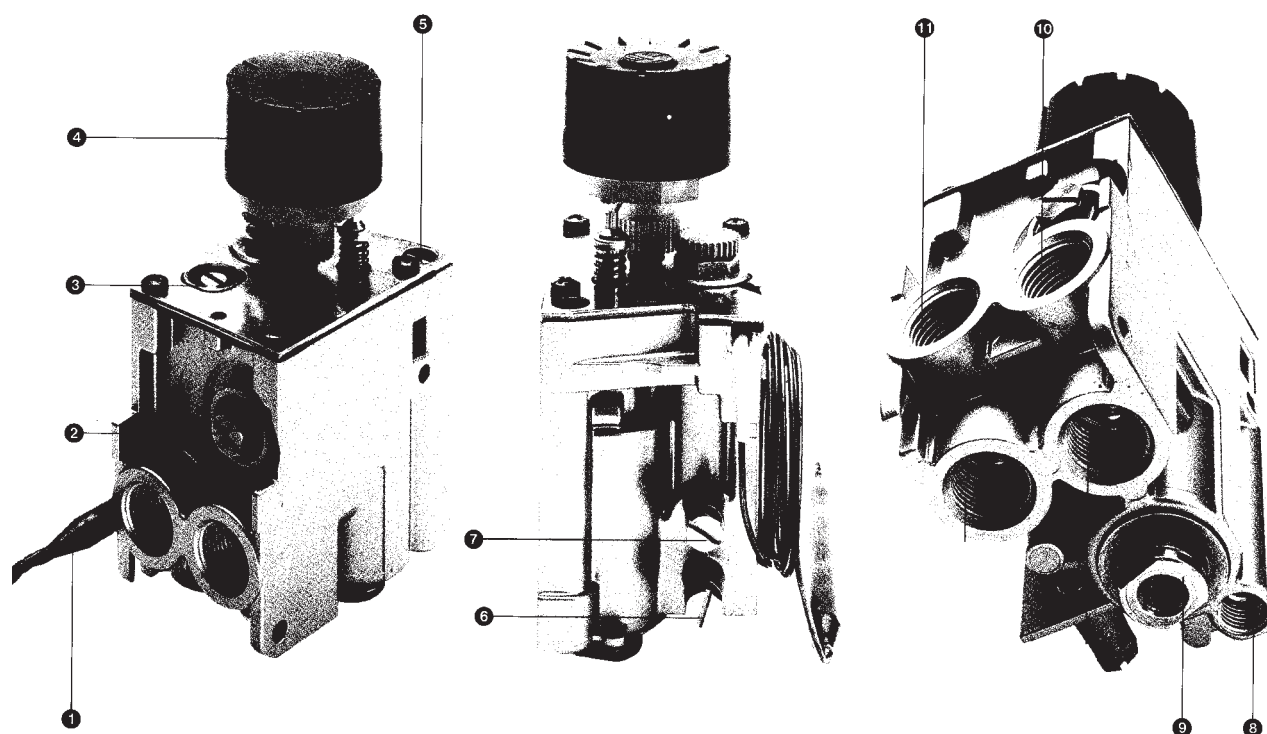
- 4.8.1 Connect the flow and return pipes as required and as detailed in paragraph 3.3. Union fittings should be used at the points of connection to the appliance to enable subsequent dismantling of the heat exchanger. Ensure that the return pipework does not restrict access to the thermostat phial, or prevent the removal of the Burner and Controls assembly for servicing.
- 4.8.2 Thoroughly flush the system through prior to the installation of the pump (if fitted), ensuring that all valves are open.

4.9 ELECTRICAL CONNECTIONS:

- 4.9.1 Connect the Solenoid valve to the external switch (not provided) as follows:
- a. Release the centre fixing screw remove the Solenoid plug from the valve.
 - b. Remove the Solenoid plug cover, and connect the mains electrical supply from the external switch as follows:
 - i. **BROWN** conductor to terminal '2'
 - ii. **BLUE** conductor to terminal '1'
 - iii. **GREEN/YELLOW** conductor to the earth terminal
 - c. Refit the Solenoid plug cover, reconnect the plug to the valve ensuring that the cable is lowermost, and secure using the centre fixing screw.

4.10 GAS CONNECTIONS:

- 4.10.1 Connect the gas supply via the union gas service cock (provided), ensuring that the supply pipework does not obstruct the removal of the Burner and Controls assembly for servicing.
- 4.10.2 Test the installation for gas soundness using a proprietary leak detection fluid, and purge the system in accordance with BS 6891.



- | | | |
|-------------------------------|------------------------|------------------------------|
| 1. Thermostat phial | 2. Max Flow Adjuster | 3. Min Flow Adjuster |
| 4. Temperature Control | 5. Pilot Adjuster | 6. Inlet Pressure Test Point |
| 7. Outlet Pressure Test Point | 8. Gas outlet to pilot | 9. Safety Magnetic unit |
| 10. Gas inlet to main burner | 11. Gas outlet | |

Fig. 6
Multifunctional control

5. COMMISSIONING

5.1 IGNITION OF PILOT AND MAIN BURNERS:

WARNING: If the Pilot burner is extinguished either intentionally or unintentionally, no attempt must be made to relight the gas for a minimum of 3 minutes.

- 5.1.1 Ensure that the gas and electrical supplies are OFF.
- 5.1.2 Referring to Fig. 6, remove the Multifunctional Control Outlet Pressure test point cover and fit a pressure test gauge.
- 5.1.3 Fill the water circulation system, clearing any air locks and check for water soundness.
- 5.1.4 Switch on the gas supply to the appliance.
- 5.1.5 Set the Multifunctional Control temperature control to the position marked '*'.
- 5.1.6 Whilst observing the Pilot burner through the viewing port, press and hold the Multifunctional Control temperature control and repeatedly press and release the ignition button until the Pilot burner is lit.
- 5.1.7 After 20 seconds release the Temperature control and let it spring out; ensure that the Pilot burner remains alight. If the Pilot burner extinguishes, rotate the Temperature control clockwise to the '●' position and ensure that the Temperature control is fully reset. Wait three minutes and repeat step 5.1.7, holding the Temperature control pressed for a longer period, until Pilot burner remains alight.
- 5.1.8 With the Pilot burner lit, ensure that the pilot flame is approximately 15 mm in length and just envelopes the thermocouple tip, adjusting the Pilot Adjuster as necessary (referring to Fig. 6).
- 5.1.9 Switch on the electrical supply to the appliance.
- 5.1.10 Set the Set the Temperature control to '4', and ensure that the Main burner ignites.

Note: The Temperature control provides a range of adjustment from 40°C at setting '1', to 80°C at setting '7'. If used in a direct system, the water temperature should not exceed 60°C or setting '4'.

- 5.1.11 Check the system for gas soundness using a proprietary leak detection fluid, and sealing any leaks found.
- 5.1.12 Allow the appliance to operate for approximately 3 minutes to ensure stability.

5.2 MAIN BURNER PRESSURE TEST:

- 5.2.1 Set the Temperature control to position '7' and ensure that the pressure gauge indicates 18.7 mbar (7.5 in wg.), setting the Max Flow adjuster to provide the required indication (referring to Fig. 6).
- 5.2.2 Ensure that the appliance controls function correctly.

5.3 SYSTEM FLUSHING:

- 5.3.1 Set the Temperature control to the required operational setting, and allow the system to reach its working temperature.
- 5.3.2 Switch OFF the gas supply at the supply cock and isolate the electrical supply to the appliance.
- 5.3.3 Rapidly drain and refill the system, clearing any airlocks and checking for water soundness.
- 5.3.4 Remove the pressure test gauge and refit the Outlet Pressure Test Point cover.
- 5.3.5 Relight the appliance in accordance with Section 5.1.4 to 5.1.7, and set the Temperature control to the users requirements.

6. USER INSTRUCTIONS

- 6.1 If the building is unoccupied, ensure that the User Instructions (including those for the air heater) are left with the appliance. These Installation instructions are to be left with the appliance for service use.
- 6.2 If the building is occupied, hand over the User Instructions, and ensure that the User knows the following:
 - 6.2.1 How to use the circulator (water heater) independently of the air heater.
 - 6.2.2 How to light the appliance.
 - 6.2.3 How to adjust the water temperature.
 - 6.2.4 If fitted, how to operate the Time Control.
 - 6.2.5 That the appliance must be serviced at least once a year, and by a competent person, to ensure efficient and safe operation.
 - 6.2.6 That the RED instructions for safe use have been pointed out and understood.
 - 6.2.7 What to do in the event of an emergency shut down.
 - 6.2.8 What to do in the event of a gas leak. (i.e. turn off the gas, extinguish any naked flames, ventilate the area, NOT to operate any electrical switches, and to call the emergency service of the local gas authority [e.g. TRANSCO]).
 - 6.2.9 If the system incorporates a water pressure gauge, and the pressure indication falls below the 'normal' level when the system is cold or if hot water is being discharged, that there is a fault in the system and expert advice MUST be sought.

7. SERVICING

IMPORTANT: BEFORE commencing any servicing or replacement of components, ENSURE THAT THE GAS SUPPLY IS TURNED OFF, the ELECTRICAL SUPPLY IS ISOLATED, and if necessary, the water supply is turned OFF and the system drained down. On completion of any servicing ensure that any air locks are cleared, test for gas and water soundness, and fully commission the appliance in accordance with the Installation, Commissioning and Servicing instructions.

7.1 ROUTINE MAINTENANCE:

- 7.1.1 Operate the appliance and check for correct function of the Burner and Controls assembly.
- 7.1.2 Remove the Burner and Controls assembly as detailed in section 7.2, inspect and clean the main burner and injector as necessary. Examine the main burner for cracks, including hairline cracks, and exchange the burner as necessary.
- 7.1.3 Inspect and clean the pilot burner and injector as necessary.
- 7.1.4 Check the condition of the thermocouple and ignition lead, cleaning or replacing as necessary.
- 7.1.5 Inspect the Heat Exchanger flueways, clean by brushing from above and below and taking care to avoid damaging the surrounding insulation. Remove debris from the Heat Exchanger and Burner aperture using a vacuum cleaner or air duster. Clean any debris from the heat shield at the base of the appliance.
- 7.1.6 Test the appliance for gas soundness and check that the appliance and controls operate correctly.
- 7.1.7 Ensure that the flue products are clearing satisfactorily.

7.2 BURNER AND CONTROLS ASSEMBLY REMOVAL:

- 7.2.1 Ensure that the gas and electrical supplies to the appliance are turned OFF.
- 7.2.2 Disconnect the gas supply from the Multifunctional Control.
- 7.2.3 Disconnect the electrical plug from the Solenoid Valve.
- 7.2.4 Remove the thermostat phial retaining plug and carefully withdraw the thermostat phial from the flow pocket.
- 7.2.5 Remove the 5 securing screws and withdraw the Burner and Controls Assembly.
- 7.2.6 Refitment or replacement is in reverse order, taking care to ensure the integrity and correct location of the burner front plate seal.

7.3 MAIN BURNER AND INJECTOR REMOVAL:

- 7.3.1 Remove the Burner and Controls assembly as detailed in Section 7.2.
- 7.3.2 Disconnect the ignition lead from the igniter electrode.
- 7.3.3 Disconnect the Thermocouple from the Multifunctional Control, taking care to avoid damaging the capillary.
- 7.3.4 Disconnect the pilot gas feed pipe from the Multifunctional Control.
- 7.3.5 Remove the 2 pilot burner fixing screws and withdraw the Pilot Burner assembly.
- 7.3.6 Partially release the main burner lock nut and unscrew the Main Burner from the Main Injector.
- 7.3.7 Unscrew the Main Injector from the gas connection.
- 7.3.8 Refitment or replacement is in reverse order.

Note: If the Main Injector is to be replaced, ensure that it is correctly marked, referring to the data badge for details.

7.4 MAIN BURNER AND INJECTOR CLEANING:

- 7.4.1 Remove the Burner and Controls assembly as detailed in Section 7.2.
- 7.4.2 Remove the Main Burner and Injector as detailed in Section 7.3.
- 7.4.3 Thoroughly clean the Main Burner, both inside and out, with a soft brush. **Do not enlarge, distort or damage the burner holes.**
- 7.4.4 Clean the Main injector as necessary. **Do not enlarge, distort or damage the Main Injector aperture.**
- 7.4.5 Refit the Main Burner and Injector in reverse order.

7.5 PILOT BURNER ASSEMBLY REMOVAL AND REPLACEMENT:

- 7.5.1 Remove the Burner and Controls assembly as detailed in Section 7.2.
- 7.5.2 Disconnect the ignition lead from the Igniter Electrode.
- 7.5.3 Disconnect the pilot gas feed pipe from the Pilot Burner.
- 7.5.4 Disconnect the Thermocouple from the Multifunctional Control, taking care to avoid damaging the capillary.

- 7.5.5 Remove the 2 clamping screws from the Pilot Burner assembly, and release the Thermocouple, Igniter Electrode and Pilot Burner.
 - 7.5.6 Release the screw in the base of the Pilot Burner and unscrew the Pilot Injector.
 - 7.5.7 Refitment or replacement is in reverse order.
- 7.6 **MULTIFUNCTIONAL CONTROL AND SOLENOID VALVE REMOVAL:**
- 7.6.1 Ensure that the gas and electrical supplies to the appliance are turned OFF.
 - 7.6.2 Disconnect the gas supply from the Multifunctional Control.
 - 7.6.3 Disconnect the electrical plug from the Solenoid Valve.
 - 7.6.4 Remove the thermostat phial retaining plug and carefully withdraw the thermostat phial from the flow pocket.
 - 7.6.5 Disconnect the Pilot Gas Feed pipe from the Multifunctional Control.
 - 7.6.6 Unscrew the Multifunctional Control from the Solenoid Valve, ensuring that the male reducer is retained.
 - 7.6.7 Unscrew the Solenoid Valve from the Main Gas Feed pipe, ensuring that the male reducer is retained.
 - 7.6.8 Refitment or replacement is in reverse order.
- 7.7 **SOLENOID VALVE COIL REMOVAL:**
- 7.7.1 Ensure that the electrical supply to the appliance is turned OFF.
 - 7.7.2 Disconnect the electrical plug from the Solenoid Valve.
 - 7.7.3 Remove and retain the circlip securing the Solenoid Valve Coil to the Solenoid Valve, and withdraw the coil.
 - 7.7.4 Refitment or replacement is in reverse order.
- 7.8 **PIEZO UNIT REMOVAL:**
- 7.8.1 Remove the Burner and Controls assembly as detailed in Section 7.2.
 - 7.8.2 Disconnect the ignition and earth leads from the Igniter Electrode.
 - 7.8.3 Release the Piezo Unit locking nut and withdraw the Piezo Unit.
 - 7.8.4 Refitment or replacement is in reverse order.
- 7.9 **WATERWAY REMOVAL:**
- 7.9.1 Remove the Burner and Controls assembly as detailed in Section 7.2.
 - 7.9.2 Turn OFF the water supply to the appliance and drain down the system.
 - 7.9.3 Remove the 3 remaining screws from the front plate and withdraw the waterway from the main body.
 - 7.9.4 Carefully remove the insulation panels.
 - 7.9.5 Refitment or replacement is in reverse order.
Note: The side insulation panels are tapered. Ensure that they are fitted with the thicker end towards the front of the appliance, and also ensure that there is approximately a 1mm gap between the waterway and the water heater body insulation by running a steel rule between them.
- 7.10 **HEAT EXCHANGER ACCESS:**
- 7.10.1 Remove the Burner and Controls assembly as detailed in Section 7.2.
 - 7.10.2 Remove the 6 screws securing the inspection cover and withdraw the cover.
 - 7.10.3 Refitment is in reverse order.

8.

DEFECT DIAGNOSIS

- 8.1 **IMPORTANT: If an electrical defect 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 maintenance/fault-finding task that has required the breaking and remaking of electrical connections, then checks of continuity, polarity, and resistance to earth must be repeated.**

	SYMPTOM	POSSIBLE CAUSE	REMEDY
a.	Pilot will not light.	i. No gas supply to heater. ii. Gas supply pipe not purged. iii. Pilot orifice restricted. iv. Piezo system faulty.	Check for gas at inlet pressure test point on Multifunctional control. Purge gas supply pipe in accordance with BS 6891. Clear pilot orifice or replace pilot injector. Check igniter, lead, and electrode.
b.	Pilot burner goes out.	i. Connection between thermocouple and Multifunctional control not secure. ii. Multifunctional control faulty. iii. Thermocouple faulty. iv. Pilot flame too small.	Check connection is secure. Replace. Replace. Adjust as detailed in Section 5.1.
c.	Main burner will not	i. Temperature control accidentally turned clockwise during lighting procedure. ii. Solenoid valve not operating, (indicated by loud 'click' when switched on). iii. Thermostat phial hot. iv. Multifunctional control faulty.	Reset Temperature control to '●', wait 3 minutes and then repeat lighting procedure. Make sure solenoid is supplied with power. Replace Solenoid Coil. Draw off hot water and check burner comes on when thermostat has cooled. Replace.
d.	Solenoid Valve noisy (buzzing).	i. Solenoid Coil faulty. ii. Solenoid Valve faulty.	Replace. Replace.
e.	Insufficient hot water.	i. Short burner operating period due incorrect plumbing. ii. Pump not operating.	Check plumbing with special attention to lateral runs. Replace.
f.	Water temperature outside usable range.	i. Thermostat out of calibration. ii. Gas rate incorrect. iii. Thermostat phial or capillary damaged.	Set thermostat either higher or lower, or replace Multifunctional control. Check burner pressure, if correct clear main injector orifice. Replace Multifunctional Control.

IMPORTANT: If a faulty heater control may have resulted in excessively high water temperatures, (i.e. above 85°C or 185°F), the hot water cylinder should be checked to establish whether it is a SELF PRIMING type. If this is the case, the circuit should be drained down and refilled to ensure that the air seal in the cylinder between the primary and secondary circuits is properly established.

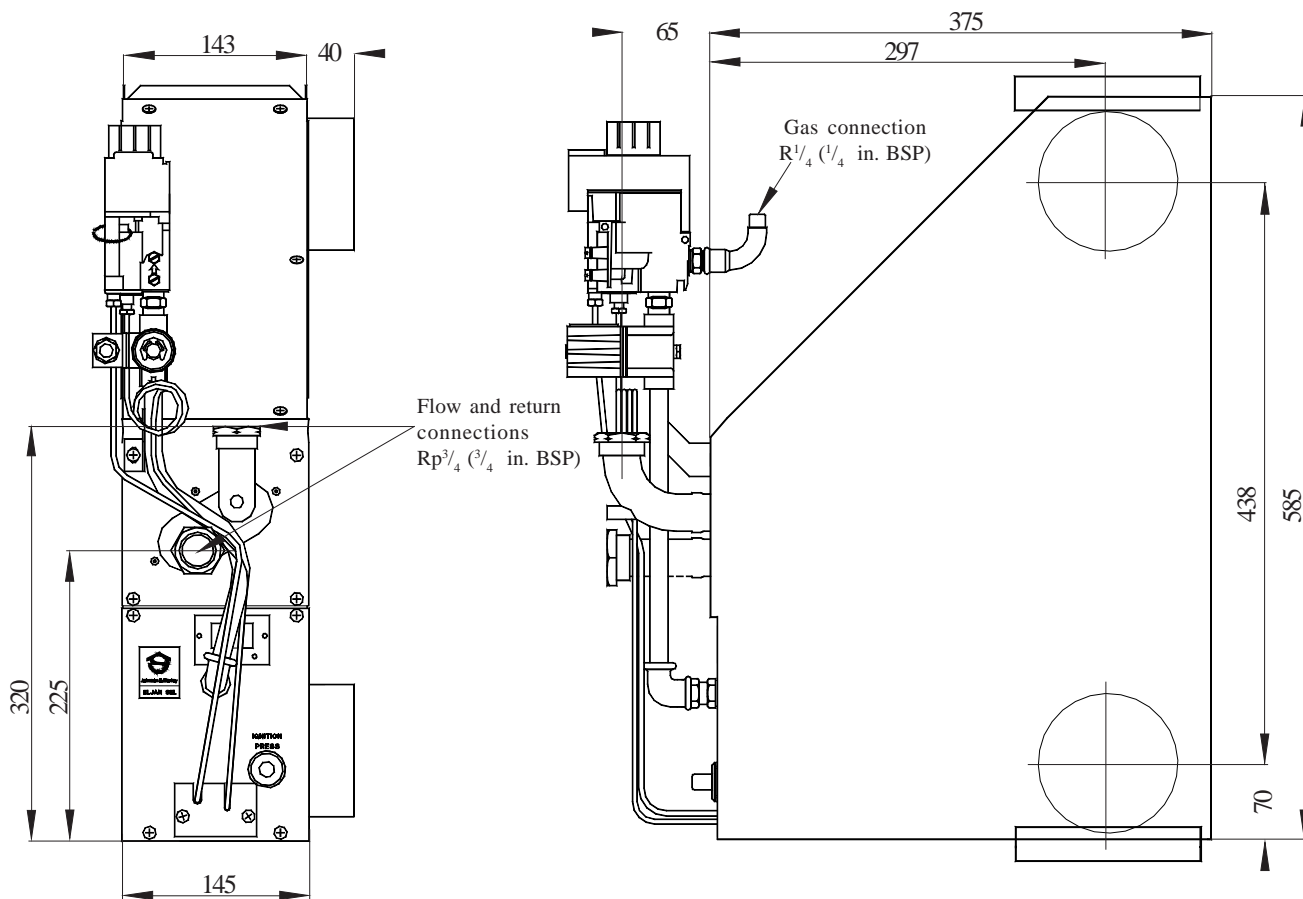


Fig. 7
Principle dimensions (in mm)
(ELJAN SEL shown)

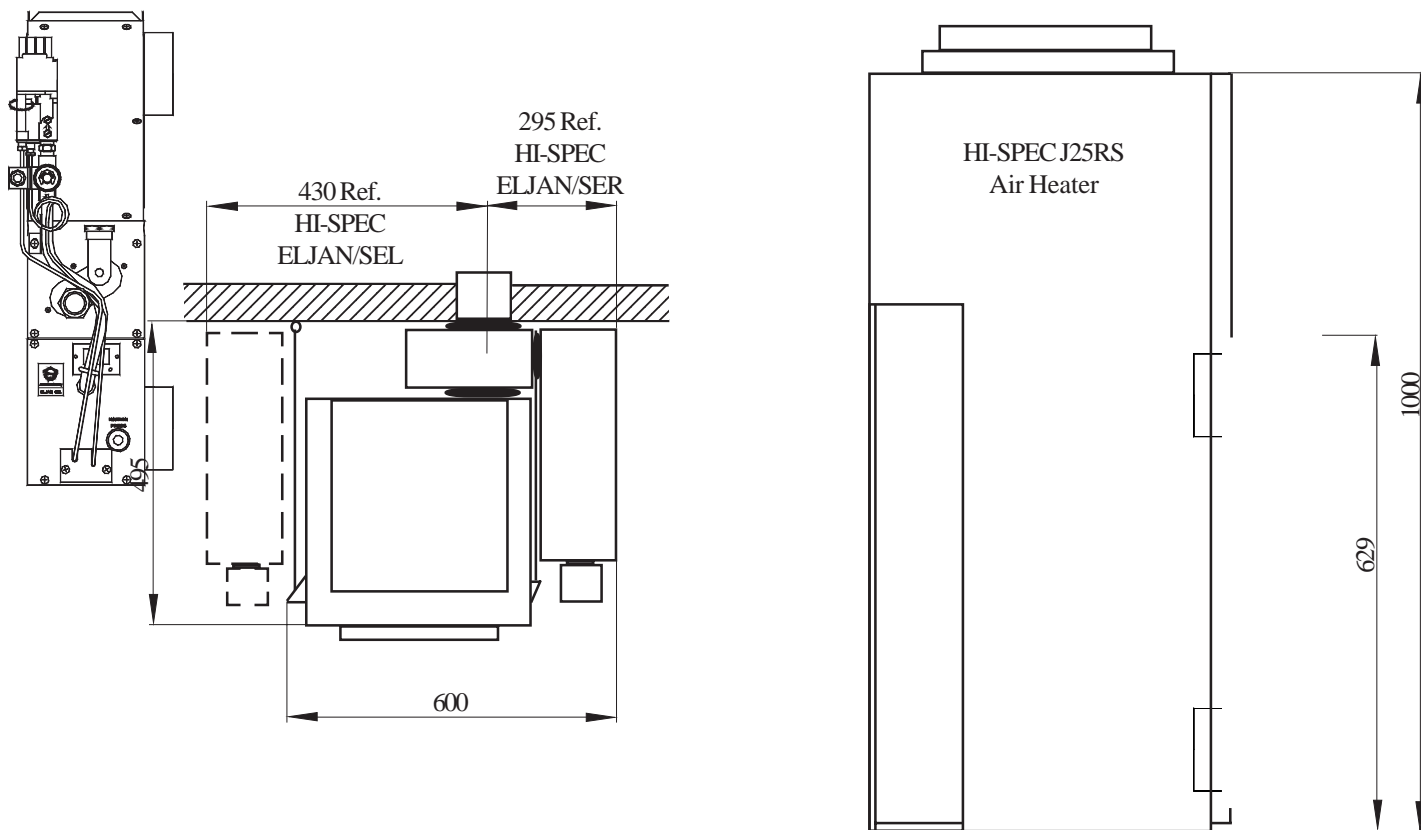


Fig. 8
HI-SPEC ELJAN SEL fitted to HI-SPEC J25RS Air Heater
dimensions (in mm)

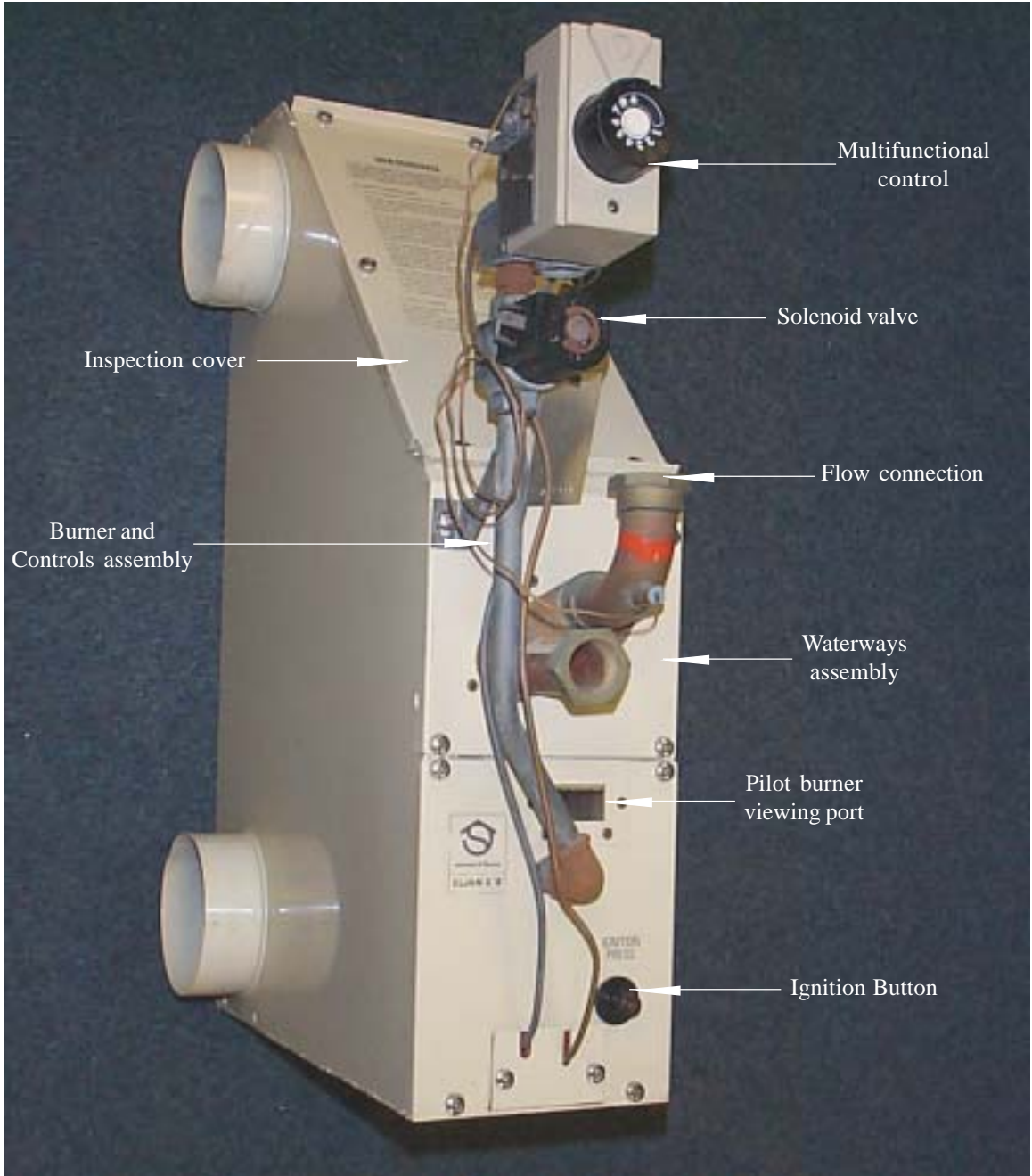


Fig. 9
Component Layout
(HI-SPEC ELJAN SER)

10.

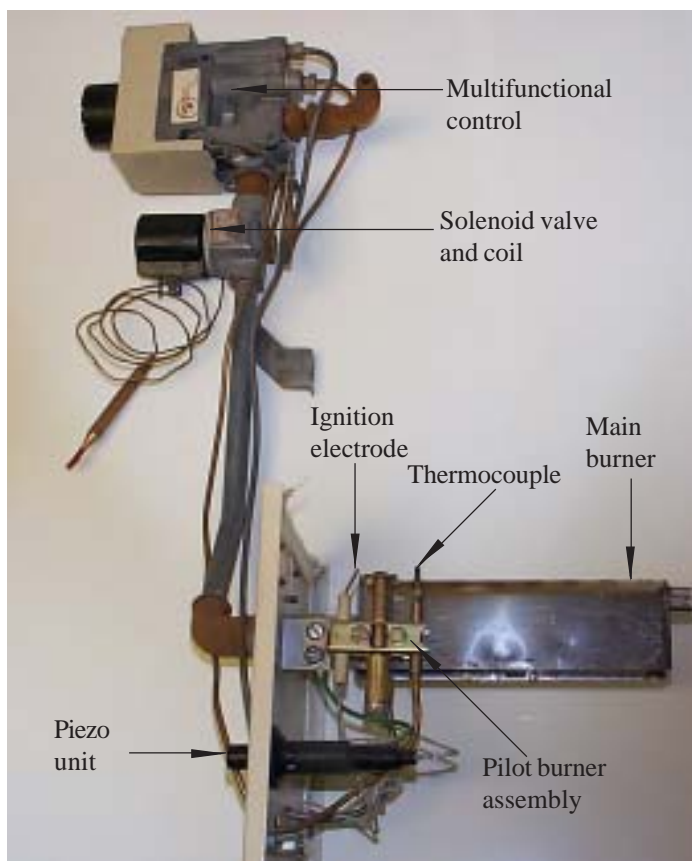
SHORT LIST OF SPARES**HI-SPEC ELJAN/SEL, /SER and WM variants**

Fig. 10
Component Layout
(Burner and Controls assembly)

IMPORTANT: When ordering replacement Burner and Controls assembly for HI-SPEC ELJAN/SEL/WM variant, use HI-SPEC ELJAN/SER, and vice versa for HI-SPEC ELJAN/SER/WM appliance.

KEY	G.C No	MFR'S No	DESCRIPTION	QTY
1a	232-873	S00226	Waterway Assembly kit (straight) complete with insulation	1
1b		S00964	Waterway assembly kit (twisted) complete with insulation	1
2a	245 245	ELJ0-0700000	Burner and Controls assembly (HI-SPEC ELJAN/SEL & SER/WM)	1
2b	245 246	ELJ0-0700010	Burner and Controls assembly (HI-SPEC ELJAN/SER & SEL/WM)	1
3	245 259	1000-0701065	Multifunctional control kit EUROSIT 630	1
4	397 823	1000-0505790	Solenoid Valve	1
5	397 824	1000-0505805	Solenoid valve coil	1
6	397 825	BOS 00562	Main Burner	1
7		BOS 02018/1	Pilot Burner assembly including pilot injector	1
8	381 750	1000-0701710	Thermocouple	1
9	244 825	BOS 02287NSE	Main Injector	1
10	397 826	1000-0500360	Plug DIN 115170 with PG9 cable clamp	1
11	382 587	BOS 02022	Igniter electrode	1
12	395 945	1000-0700570	Piezo unit	1
13	397 819	BOS 02394	Electrode lead	1
14	230 328	1000-2500070	Phial retaining plug	1
15		1000-0501260	Earth lead	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

Fax: (01604) 767408

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