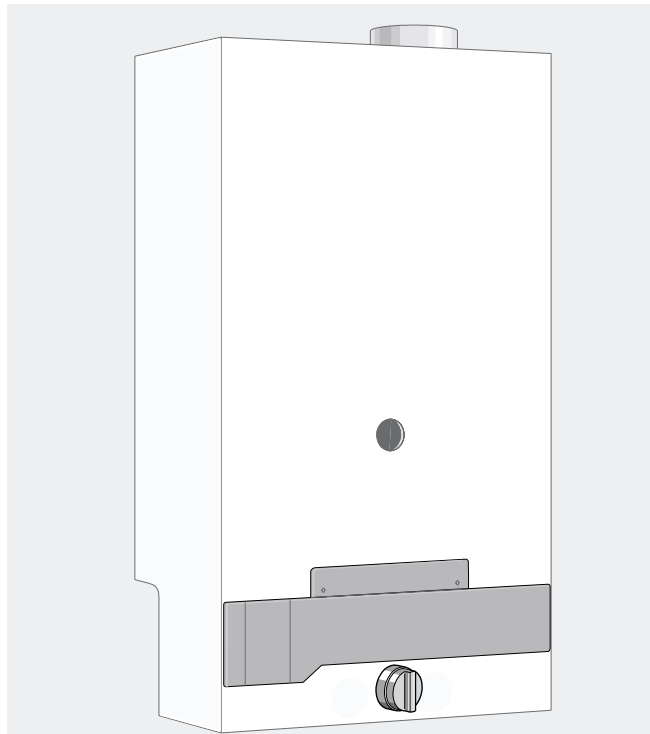




# WR325 RSF

ROOM SEALED FAN-ASSISTED MULTIPOINT WATER HEATER

## INSTALLATION AND SERVICING INSTRUCTIONS



Cat: II<sub>2H3+</sub>  
GC NUMBER  
52 311 022

6 720 605 997 (02.04) JS

**IMPORTANT: THESE INSTRUCTIONS APPLY IN GREAT BRITAIN AND IRELAND ONLY  
THESE INSTRUCTIONS ARE TO BE LEFT WITH THE USER OR AT THE GAS METER**

This appliance must be installed by a competent person in accordance  
with the CURRENT Gas Safety (Installation and Use) Regulations

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## 1 Installation Regulations

1.1 Gas Safety (Installation and Use) Regulations, 1998: It is the law that all gas appliances are installed by a competent person in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution. It is in your interest, and that of safety, to ensure compliance with the law.

1.2 The manufacturers notes must not be taken, in any way, as overriding statutory obligations.

1.3 The compliance with a British Standard or European Norm does not, of itself, confer immunity from legal obligations.

1.4 The installation of the appliance must be in accordance with the relevant requirements of the current Gas Safety (Installation and Use) Regulations, current IEE Wiring Regulations (BS7671), Building Regulations, Building Standards (Scotland) and Local Water Byelaws.

1.5 The installation should be in accordance with the following British Standards unless otherwise indicated:  
BS 6798:1987 Specification for installation of gas fired hot water boilers of rated input not exceeding 60 kW [gross].  
BS 5546:1990 Installation of gas hot water supplies for domestic purposes.  
BS 5440:1:1990 Flues and Ventilation for gas appliances of rated input not exceeding 60 kW [gross]: Flues.  
BS 5440:2:1989 Flues and Ventilation for gas appliances of rated input not exceeding 60kW [gross]: Air Supply.  
BS 6891:1988 Installation of low pressure gas pipework installations up to 28mm (R1).  
BS 6700: Domestic water supply in buildings.  
BS 7593: Water treatment in domestic heating systems.

1.6 To ensure that the installation will perform to the highest standards, the system and components should conform to any other relevant Standards.

1.7 The appliance and/or components conform, where applicable, to the Essential Requirements of the Gas Appliance Directive, the EMC Directive and the Low Voltage Directive.

1.8 In accordance with the requirements of COSHH the appliance does not contain any substances which are harmful to health.

1.9 Product liability regulations indicate that, in certain circumstances, the installer can be held responsible, not only for mistakes on his part but also for damage from the use of faulty materials. We advise that, to avoid any risk, only quality approved branded fittings are used.

1.10 The advice and instructions given in this document

covers, as far as possible, the foreseeable situations which may arise. Contact Worcester Heat Systems Technical Information Department, Telephone: 0990 266241, for advice on specific installations.

## 2 General Information

2.1 This appliance is not suitable for external installation.

2.2 The appliance controls are set to provide a maximum output of 21.4 kW for domestic hot water.

2.3 The control circuit provides direct burner ignition. A pilot is not used.

2.4 PRINCIPAL APPLIANCE COMPONENTS. See Fig. 1.  
A low thermal capacity Gas to Water heat exchanger.  
Fully modulating controls in the domestic hot water mode of operation.  
Temperature safety cut-out controls.  
A water flow regulator.  
A standard telescopic horizontal flue assembly giving flue lengths from 135mm to 615mm.  
Optional extra extension flue kits to provide for flue lengths up to 3500mm.  
Optional vertical flue kit to provide for flue lengths up to 2600mm including vertical terminal.  
Optional 45° and 90° flue bends.

2.5 ELECTRICAL SUPPLY  
Mains supply: 230V ~, 50 Hz.  
External fuse: 3A.  
Internal fuses: T2.5A, 250V and T2.0A, 250V.

2.6 GAS SUPPLY  
Check the data plate (located on the inner cover of the appliance) to ensure the appliance has been set up for the correct gas supply. The appliance can be set up for either of the following gases: Natural gas (G20) or Propane (G31). A conversion kit including instructions is available to change the appliance from one gas to the other.  
The appliance requires 2.6 m<sup>3</sup>/h (96 ft<sup>3</sup>/hr) of natural gas (G20) or 1.0 m<sup>3</sup>/hr (37 ft<sup>3</sup>/hr) (1.9 kg/h) of propane gas (G31). The gas meter and supply pipes must be capable of supplying this quantity of gas in addition to the demands of any other appliances being served. The meter governor should deliver a dynamic pressure of 20mbar (8in wg) for natural gas or 37mbar (14.4 in wg) for propane at the inlet to the appliance.

The complete installation, including the gas meter, must be tested for soundness and purged. Refer to BS 6891.

## 2.7 PACKING

The appliance and flue components are packed in separate cartons.

## 2.8 GENERAL INSTALLATION

Any specified ventilation openings made into a wall or compartment door must not be obstructed.

If the appliance is to be fitted into a compartment then the compartment must conform to the requirements of BS 5440:2:1989 and BS 6798.

Notwithstanding the instructions given in BS 5440:2:1989 and BS 6798, this appliance may be fitted in a compartment with no vents as long as the minimum clearances stated in Section 6: Air Supply, are maintained.

Do not place anything on top of the appliance.

The clearances specified for servicing must be maintained.

It is generally advised to fit a bypass to all systems.

## 2.9 FLUE

The appliance has a multi-directional horizontal fanned flue system.

The standard telescopic flue assembly length is from 135mm to 615mm.

Extension flue lengths are available from 500mm to 3500mm.

A vertical flue kit is available for up to 2600mm including a vertical terminal.

Optional 45° and 90° flue bends are available.

A terminal guard, Type K2, GC 393 553, is available from Tower Flue Components, Vale Rise, Tonbridge, TN9 1TB.

Do not allow the flue terminal fitted to the outside wall to become obstructed or damaged.

A kit for internal fixing of the flue is available separately.

## 2.10 CONTROLS

The electronic control system and gas valve controls the heat input in response to the domestic hot water requirements.

The ON/OFF switch is used to turn the appliance on and off.

The DHW control varies the flow rate and therefore controls the water temperature. As the flow rate decreases (clockwise) the temperature increases.

## 2.11 SYSTEM NOTES IMPORTANT

Check that no dirt is left in either the gas or water pipework as this could cause damage to the appliance. Thoroughly flush the cold water mains supply in accordance with the recommendations of BS7593: 1992.

Purge the gas supply before finally connecting the appliance.

## 2.12 SHOWERS, BIDETS, TAPS AND MIXING VALVES

Hot and cold taps and mixing valves used in the system must be suitable for operating at mains pressure.

Thermostatically controlled shower valves will guard against the flow of water at too high a temperature.

If using a pressure equalising valve, set the Domestic Hot Water temperature control knob to the 'MAX' position.

Hot and cold mains fed water can be supplied direct to an over-rim flushing bidet subject to local Water Company requirements.

With all mains fed systems the flow of water from the individual taps will vary with the number of outlets operated simultaneously and the cold water mains supply pressure to the property. Flow balancing using 'Ball-o-Fix' type valves is recommended to avoid an excessive reduction in flow to individual outlets. For further information contact Worcester Heat Systems Technical Helpline.

## 2.13 SAFETY CONSIDERATIONS

The appliance must not be operated in a waterless condition.

The appliance must not be operated with the boiler casing cover removed.

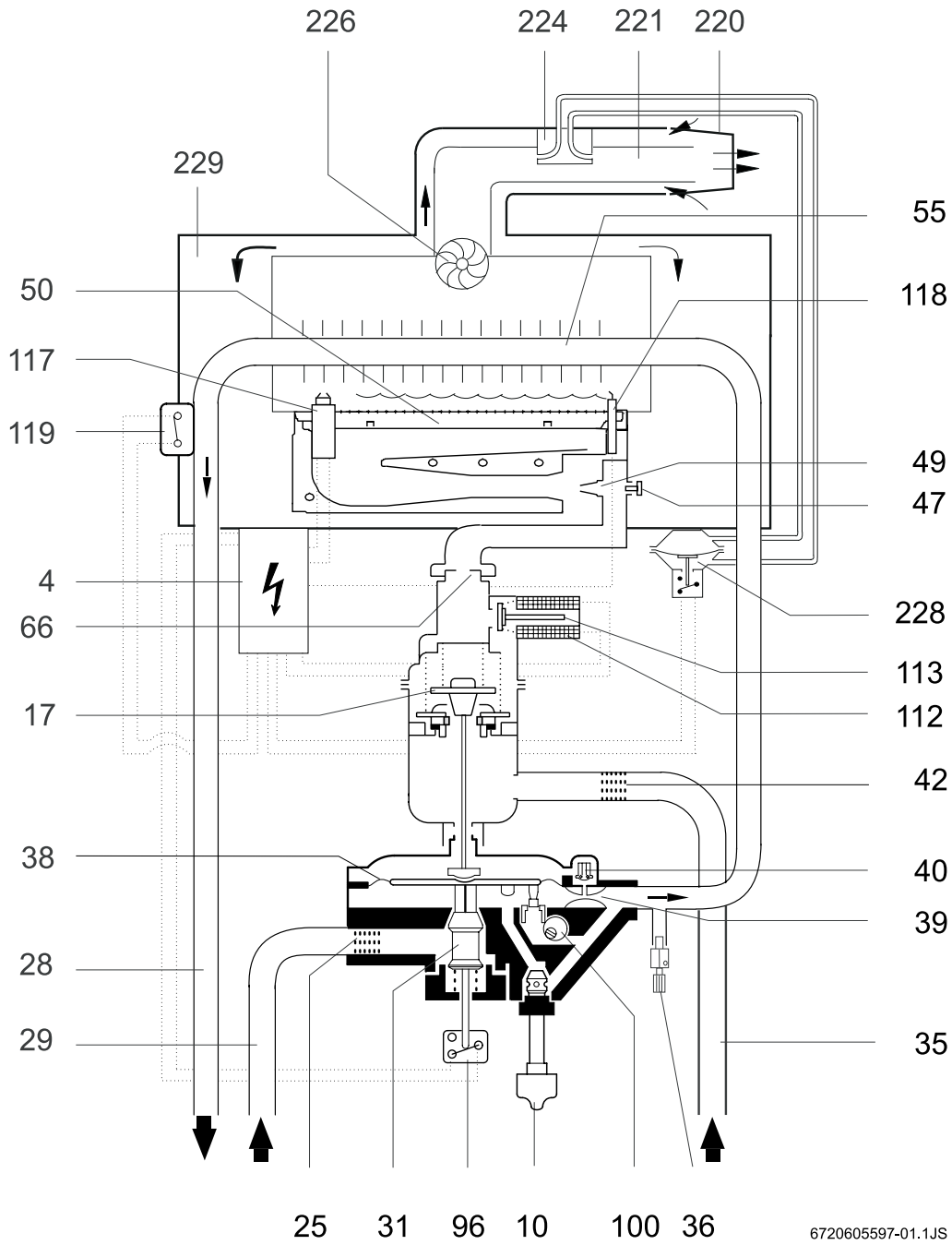
Work must not be carried out on the appliance without the gas and electricity supplies being switched off.

Checks must be made to ensure that the ventilation openings made into walls and partitions are of the correct size and are not obstructed.

## 2.14 OPERATION

Domestic Hot Water: With a demand for hot water the burner will light and then automatically adjust its output to maintain the temperature of the delivered water. When hot water is no longer required, the burner will extinguish. The fan may continue to run for a short period to dissipate the residual heat from the appliance.

Appliance water flow diagram.



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Fig. 1

- |    |                            |     |   |
|----|----------------------------|-----|---|
| 4  | Control unit               | 55  | Heat exchanger                          |
| 10 | Water flow rate control    | 66  | Restrictor                              |
| 17 | Gas valve                  | 96  | Microswitch                             |
| 25 | Water filter               | 100 | Adjusting screw for temperature setting |
| 28 | Hot water outflow pipe     | 112 | Solenoid valve                          |
| 29 | Cold water inlet pipe      | 113 | Main valve                              |
| 31 | Water flow rate regulator  | 117 | Igniter electrodes                      |
| 35 | Gas supply pipe            | 118 | Sensor electrode                        |
| 36 | Drain plug                 | 119 | Safety temperature limiter              |
| 38 | Diaphragm                  | 220 | Flue terminal                           |
| 39 | Venturi                    | 221 | Concentric air/flue duct                |
| 40 | Slow ignition valve        | 224 | Differential air pressure sensor        |
| 42 | Gas filter                 | 226 | Fan                                     |
| 47 | Burner pressure test point | 228 | Differential air pressure switch        |
| 49 | Burner injector            | 229 | Combustion chamber                      |
| 50 | Burner                     |     |   |

### 3 Technical Data

	Nat. Gas	LPG
Minimum rated output (Pmin)	7.0 kW	7.0 kW
Maximum rated output (Pn)	21.4 kW	21.4 kW
Rated input (Qn)	24.3 kW	24.3 kW
Gas rate (maximum)	2.6 m <sup>3</sup> /h	1.9 kg/h
Number of injectors	14	14
Injector diameter (mm)	1.15	0.74
Pilot injector marking	115	74
Burner pressure	12.6 mbar	27.2 mbar
Height (mm)	700	700
Width (mm)	388	388
Depth (mm)	220	220
Dry weight	16 kg	16 kg

**Table 1 - GENERAL**

Maximum cold water supply inlet pressure	12 bar (180 p.s.i)
Minimum cold water supply inlet pressure to operate the appliance	0.15 bar (1.5 p.s.i)
Minimum cold water supply inlet pressure for maximum domestic hot water flow	0.6 bar (9 p.s.i)
Domestic hot water delivery with temperature control knob fully anticlockwise	12 litres/minute at 25°C temperature rise
Domestic hot water delivery with temperature control knob fully clockwise	6 litres/minute at 55°C temperature rise

**Table 2 - PERFORMANCE**

FLUE DETAILS		
HORIZONTAL FLUE (Side or Rear)	mm	inches
FLUE DIAMETER	100	3,9
WALL HOLE DIAMETER	110	4,25
WALL HOLE DIAMETER (using internal flue fitting kit)	150	5,9
STANDARD FLUE - MINIMUM LENGTH	135	5,0
STANDARD FLUE - MAXIMUM LENGTH	615	19,7
EXTENDED FLUE - MAXIMUM LENGTH	3500	137,8

**Table 3**

## 4 Siting the Appliance

4.1 The appliance may be installed in any room although particular attention is drawn to the requirements of the current I.E.E. Wiring Regulations BS 7671 and, in Scotland, the electrical provisions of the Building Regulations applicable in Scotland, with respect to the installation of appliances in rooms containing baths or showers.

Where a room sealed appliance is installed in a room containing a bath or shower, any electrical switch or appliance control using mains electricity must not be able to be touched by a person using the bath or shower.

4.2 The appliance is not suitable for external installation.

4.3 The appliance does not require any special wall protection.

4.4 The wall must be capable of supporting the weight of the appliance. See Table 1.

4.5 The clearances given in figure 2 must be available for installation and for servicing.

4.6 The appliance can be installed in a cupboard used for airing clothes provided that the requirements of BS 6798 and

BS 5440:2 are maintained.

Notwithstanding the instructions given in BS 5440:2, this appliance may be fitted in a compartment with no vents as long as the minimum clearances stated in Section 6: Air Supply, are maintained.

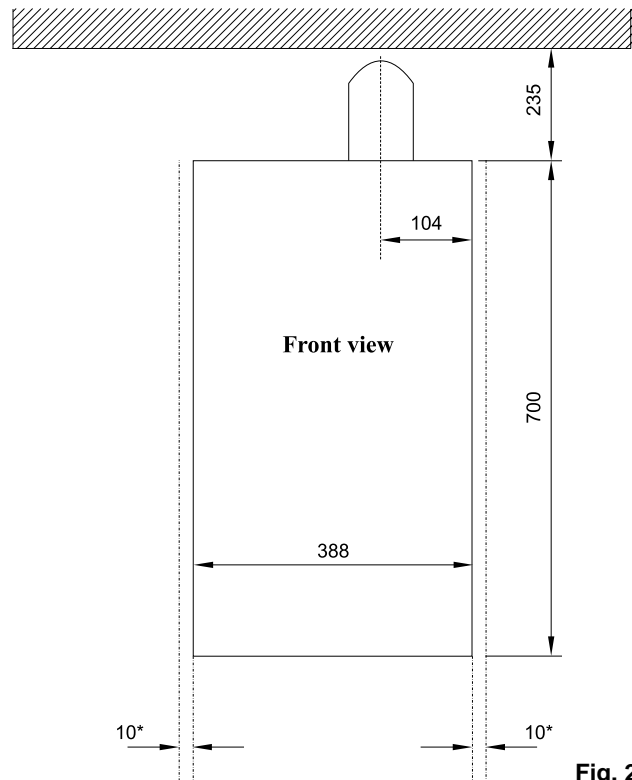
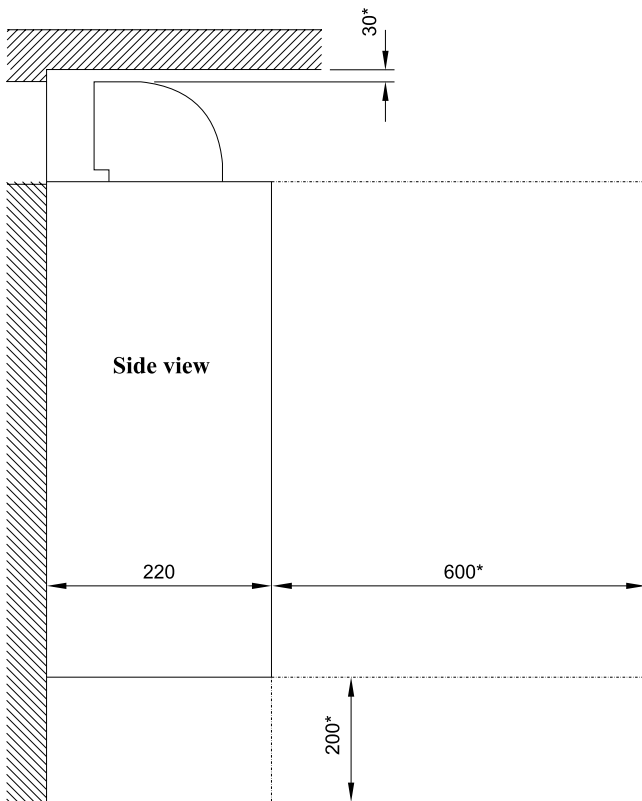
4.7 The airing space must be separated from the boiler space by a perforated non-combustible partition. Expanded metal or rigid wire mesh is acceptable provided that the major dimension is less than 13mm. See BS 6798:1987.

4.8 No combustible surface must be within 75mm of the casing. See BS476: 4.

4.9 The distance between the inner face of a cupboard door and the cabinet front should not be less than 75mm.

4.10 Always consider the possible need to disconnect the pipes from the appliance after installation.

4.11 LPG Installation: The appliance shall not be installed in a room or internal space below ground level when it is intended for use with LPG. This does not preclude the installation into rooms which are basements with respect to one side of the building but open to ground level on the opposite side.



\* space required for installation and servicing

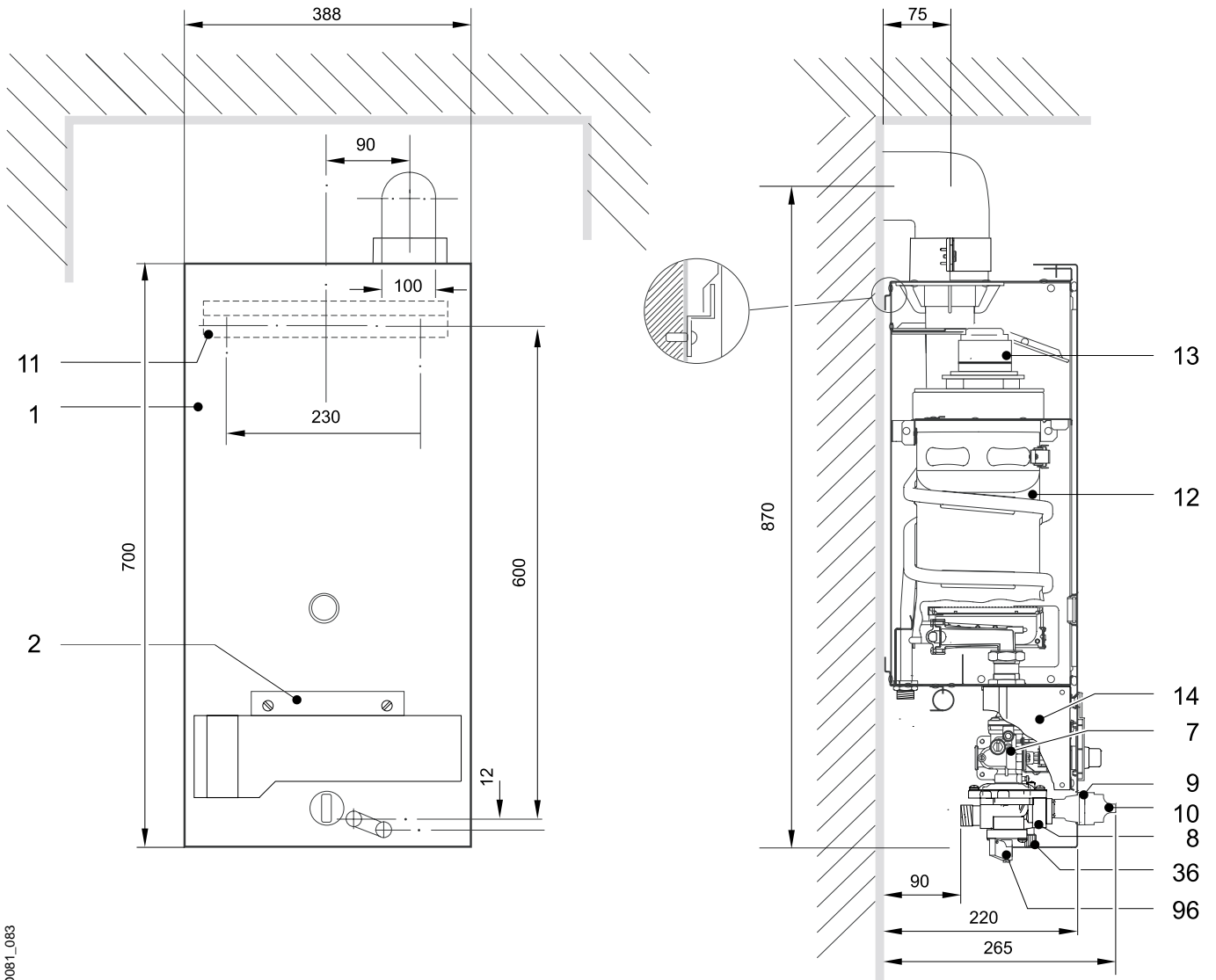
all measurements in mm.

	Installation	Service*
Above the turret	30 mm	30 mm
In front	600 mm	600 mm
Below	200 mm	200 mm
Right-hand side	10 mm	10 mm
Left-hand side	10 mm	10 mm

Table 4

\* For cupboard installations refer to section 6

**Measurements and connections (sizes given in mm.)**



**Fig. 3**

- |    |                      |    |                  |
|----|----------------------|----|------------------|
| 1  | Front cover          | 11 | Mounting bracket |
| 2  | Shield               | 12 | Heat exchanger   |
| 7  | Gas valve assembly   | 13 | Fan              |
| 8  | Water valve assembly | 14 | Ignition unit    |
| 9  | Fixing screw         | 36 | Sealing screw    |
| 10 | Temperature selector | 96 | Micro-switch     |

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## 5 Siting the Flue terminal

See Fig. 4

- 5.1 The flue must be installed as specified in BS 5440:Part 1 and the Building Regulations.  
 5.2 The terminal must not cause an obstruction or the discharge cause a nuisance.  
 5.3 If the terminal is fitted within 1000mm of a plastic or painted gutter or within 500mm of painted eaves then an aluminium shield at least 1000mm long should be fitted to the

underside of the gutter or painted surface.

- 5.4 If a terminal is fitted less than 2 metres above a surface to which people have access then a guard must be fitted. See Section 2.9.  
 5.5 The terminal guard must be evenly spaced about the flue terminal and fixed to the wall using plated screws.  
 5.6 In certain weather conditions a terminal may steam and siting where this could cause a nuisance should be avoided.  
 5.7 Take care to ensure that combustion products do not enter ventilated roof voids.

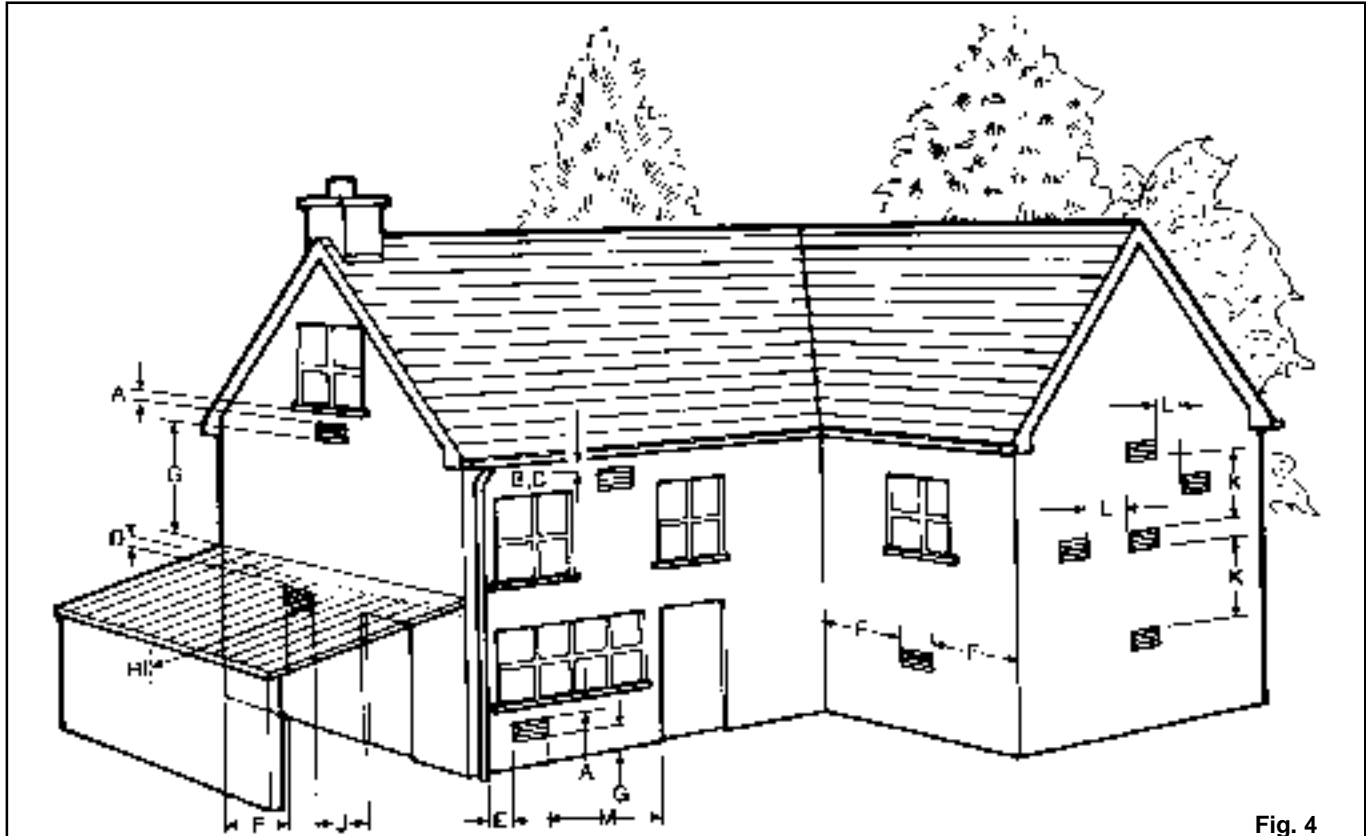


Fig. 4

TERMINAL POSITION	MIN. DISTANCE	TERMINAL POSITION	MIN. DISTANCE
A - directly below an openable window or other opening e.g. air brick.	300 mm (12 in.)	I - From a terminal facing a terminal.	1200 mm (47 in.)
B - Below gutters, soils pipes or drain pipes.	75 mm (3 in.)	J - From an opening in a car port (e.g. door window) into dwelling.	1200 mm (47 in.)
C - Below eaves.	25 mm (1 in.)	K - Vertically from a terminal on the same wall.	1500 mm (60 in.)
D - Below balconies or car port roof.	25 mm (1 in.)	L - Horizontally from a terminal on the same wall.	300 mm (12 in.)
E - From vertical drain pipes and soil pipes.	25 mm (1 in.)	M - From door, window or air vent (achieve where possible).	300 mm (12 in.)
F - From internal or external corners.	25 mm (1 in.)		
G - Above ground, roof or balcony level.	300 mm (12 in.)		
H - From a surface facing a terminal.	600 mm (24 in.)		

## 6 Air supply

- 6.1 The appliance does not require a separate vent for combustion air.  
 6.2 The appliance can be fitted in a cupboard with no vents for cooling but the minimum clearances must be increased to those given below. (Note: The clearances at the front are for a removable panel, e.g. a door).

Above the Turret	30 mm
Above casing	235 mm
Below casing	200 mm
Right-hand side	75 mm
Left-hand side	75 mm
In front	250 mm

Table 5

- 6.3 If the appliance is to be fitted in a cupboard or compartment with less clearance than those in table 5 (minimum clearances are given in Section 5. Siting the Appliance) then permanent air vents for cooling are required. One at high level and one at low level, either direct to outside air or to a room. Both vents must pass to the same room or be on the same wall to the outside air.

6.4 The minimum free areas required are given below.

POSITION OF AIR VENTS	AIR FOM THE ROOM	AIR DIRECT FROM OUTSIDE
HIGH LEVEL	220 cm <sup>2</sup>	110 cm <sup>2</sup>
LOW LEVEL	220 cm <sup>2</sup>	110 cm <sup>2</sup>

Table 6

- 6.5 Refer to BS 6798 and BS 5440:2 for additional information.



## 7 Hot Water Supply

7.1 The following are general requirements and, if necessary, reference should be made to the local Water Company before fitting the appliance.

7.2 MAINS COLD WATER INLET. Devices capable of preventing the flow of expansion water must not be fitted unless separate arrangements have been made.

7.3 The final 600mm of the mains cold water connection to the appliance should be made in copper tube only.

7.4 The appliance is suitable for a mains pressure of up to 12 bar (180 lb/in<sup>2</sup>).

7.5 The appliance is fitted with a mains supply isolating valve.

7.6 The maximum domestic hot water flow rate is 12.0 litres/min ( $\pm 15\%$ ) (2.7 gallons/min).

7.7 In winter (when the mains inlet water temperature is lower) a reduced flow rate at the taps may be required to achieve the type of hot water delivery temperature available in warmer weather.

7.8 It is suggested that long pipe runs to the taps or shower should be insulated to prevent the rapid cooling of domestic hot water after a tap or shower has been turned off.

7.9 Hot and cold taps and mixing valves used with this appliance must be suitable for operating at mains pressure and temperatures of 65°C.

7.10 No anti-syphonage arrangements are necessary except for some loose head showers. See also Section 8.11 following.

7.11 Thermostatically controlled or pressure equalising shower valves will guard against the flow of water at too high a temperature.

7.12 The head of a loose head shower must not fall closer than 25mm (1in) above the top edge of the bath to prevent its immersion in bath water. Alternatively the shower must be fitted with an anti-syphonage device at the point of the flexible hose connections.

7.13 The supply of hot and cold mains water direct to a bidet is permitted, (subject to local Water Company requirements), provided that the bidet is of the over-rim flushing type. The outlet(s) should be shrouded and unable to have any temporary hand held spray attached. No anti-syphonage arrangements are necessary.

## 8 Gas supply

The appliance requires 1.0 m<sup>3</sup>/hr of gas. The gas meter and supply pipes must be capable of supplying this quantity of gas in addition to the demand from any other appliances being served. Refer to BS 6891 for further information.

The meter governor should deliver a dynamic pressure of 20 mbar (8 in w.g.) at the appliance.

The complete installation, including the gas meter, must be tested for soundness and purged. Refer to BS 6891.

A gas service cock must be fitted before each appliance, a gas service cock is supplied with every appliance.

**Important:** if the 1.0 m<sup>3</sup>/hr gas rate to the appliance cannot be reached, the specified hot water conditions will not be achieved. This could result in customer complaints. Always ensure that the gas supply is adequate.

## 9 Electrical

See Fig. 10.

9.1 MAINS SUPPLY.

230 V ~, 50 Hz, 65 watts.

External Fuse: 3A.

Internal Fuses: T1.25A, 250V and T0.8A, 250V.

9.2 It must be possible to completely isolate the appliance.

9.3 The following connection alternatives must be used:

A 3 amp fused three-pin plug and unswitched shuttered socket outlet (both complying with the requirements of BS 1363) or a double pole isolator with a contact separation of 3mm in all poles and supplying the appliance and controls only.

9.4 The appliance must be earthed.

9.5 Mains Cable. 0.75mm<sup>2</sup> (24 x 0.20mm) to BS 6500 Table 16.

9.6 The wiring between the appliance and the electrical supply must comply with current IEE Wiring Regulations and any local regulations, which apply.

9.7 SAFETY CHECK.

After installation or in the event of an electrical fault the electrical system shall be checked for short circuits, fuse failure, incorrect polarity of connections, earth continuity and resistance to earth.

## 10 Installation

The installation must be carried out by competent persons.

On delivery, check to make sure that the packaging has not been damaged. If there is evidence of damage, contact your supplier immediately.

Check the 10 digit code number on the appliance carton to ensure that the correct appliance for the gas supply has been supplied.

The code number for a natural gas appliance is 7 702 311 028.

The code number for an LPG appliance is 7 702 411 028.

### 10.1 Appliance Installation

a) Unpack the appliance and take care to remove the installation kit which is packed on top of the polystyrene packing

The kit comprises of the following:

- One gas service cock with fibre washer

- One cold water isolating cock complete with fibre washer

- One water discharge pipe complete with brass swivel union

- Four fixing screws and wall plugs.

b) Lay the appliance on its back and pull off the Temperature control knob. Unscrew the temperature control outer bezel, slide-up the fascia cover and unscrew the two screws to release the casing from the appliance. Lift up the lower front edge of the case and slide towards the top of the heater to unhook the case from the back panel.

c) Offer up the wall mounting bracket to the wall and mark the positions for the two fixing screws. Drill two holes and fit the wall plugs and screws.

Hang the appliance on the bracket and secure the appliance back panel to the wall through one of the two holes located at the lower left hand side of the panel.

d) Make up the gas supply to the upper connection on the gas control assembly using the fibre washer provided. Fit the gas isolation cock as close as possible to the appliance (see fig. 5, pos. 1).

e) Connect the appliance to the incoming cold water supply via the fitting which includes the stop valve. A fibre washer is provided (see fig. 5, pos. 2).

f) Connect the appliance to the domestic water remote draw off points via the outlet fitting.

g) Turn on the water supply to the appliance. Open the stop valve on the inlet fitting to the appliance and the open the hot and cold water taps.

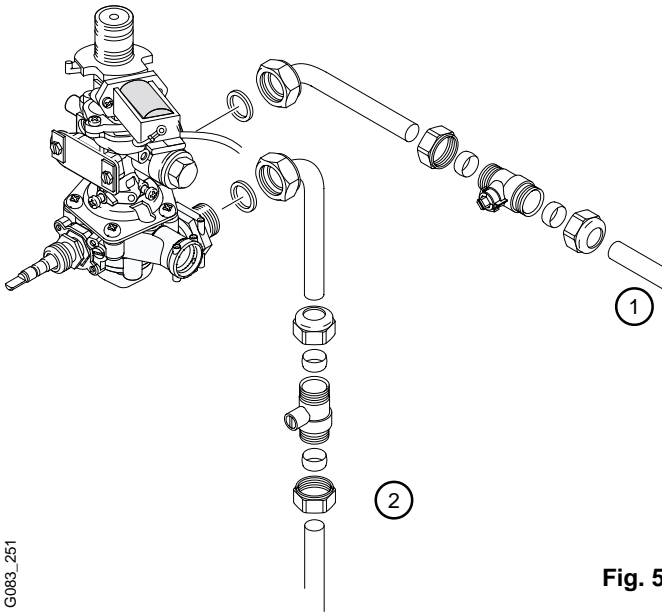


Fig. 5

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**IMPORTANT:**

To ensure the correct operation of the appliance a restrictor ring must be fitted to the fan inlet, where applicable, to suit the flue configuration used.

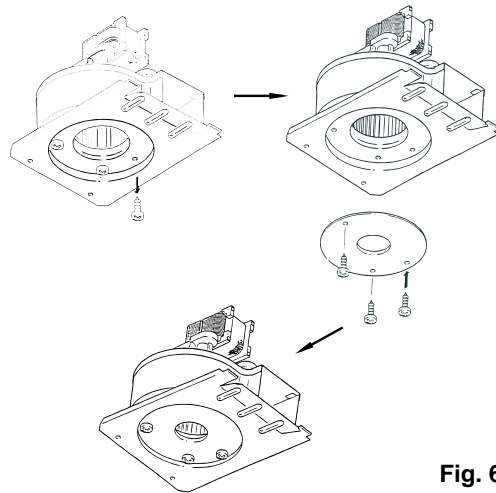


Fig. 6

Allow water to flow to vent the system and close the taps.  
**h)** If the appliance is not to be commissioned straight away, re-fit the appliance casing and control knobs.

**10.2 Installation of Flue**

**FLUE OPTIONS**

The standard flue length is from 135mm to 615mm measured from the appliance casing to the outer wall. Extension flue kits, a vertical take-off adapter, and 90° flue bends and 45° flue bends are available to increase the length and redirect the flue as follows.

**Horizontal balanced flue:**

- a) From 135mm to 3500mm straight flue.
- b) From 135mm to 2500mm when a 90° flue bend is required.
- c) From 135mm to 1500mm when two 90° flue bends are required.

**Vertical balanced flue:**

- a) From 500mm to 2600mm straight flue.
- b) From 500mm to 2600mm when two 45° bends are required.

A 90° flue bend is equivalent to 1000mm of straight flue. A 45° flue bend is to half a 90° bend.

Refer to Figs. 9 and 10 to determine whether extension kits, 90° flue bends, 45° flue bends, or adapters are required.

The maximum number of 90° flue bends allowed is two, in addition to the flue turret

The flue turret can be replaced by a flue bend with no reduction in flue length.

**Flue components**

- 1. Adapter, boiler to turret.
- 2. Adapter, item 1 to vertical flue.
- 3. Flue Turret.
- 4. Standard air duct.
- 5. Standard flue duct.
- 6. Restrictor rings, 4 off (Fan inlet).
- 7. Flue terminal.
- 8. Extension air duct.
- 9. Extension flue duct.
- 10. In-line flue elbows (45° and 90°).

Refer to table 7 for relation of restrictor ring / flue length.

The flue must be installed as specified in BS 5440 Part 1.

**NOTE: READ THIS SECTION FULLY BEFORE COMMENCING INSTALLATION.**

- 1. Horizontal
  - a) Without Elbows

Length (mm)	Restrictor
up to 2000	54
2001 - 3500	-

- b) With 1 x 90° or 2 x 45° elbows

Length (mm)	Restrictor
up to 2500	-

- c) With 2 x 90° elbows

Length (mm)	Restrictor
up to 1500	-

- 2. Vertical

- a) Without Elbows

Length (mm)	Restrictor
up to 2600	-

- b) With 2 x 45° elbows

Length (mm)	Restrictor
up to 2600	-

**Table 7**

### 10.3 GENERAL FITTING

Check that the appliance carton contains: Appliance, installer's instruction pack, gas and water fittings, wall plate, user's information pack and installer's hardware pack.

Check that the position chosen for the appliance is in accordance with the instructions given in Sections 4 and 5.

For vertical flue installation, refer to the instructions supplied with the vertical flue kit.

Mark the position of the fixing holes and the position of the flue hole centre line onto the wall see fig. 2.

**Side Flue -** Extend the horizontal flue central line from Fig. 2 along the appropriate wall. Check that it remains horizontal and measure 180 mm upwards and mark a horizontal line. Measure 75 mm from the junction of the walls and mark a vertical line, which will then give the position of the flue hole in the side wall. Drill the four fixing holes 60mm deep for No. 12 size plugs. Cut the flue duct hole at 110mm diameter (150mm dia. for internal fitting). Ensure that the hole is horizontal through the wall.

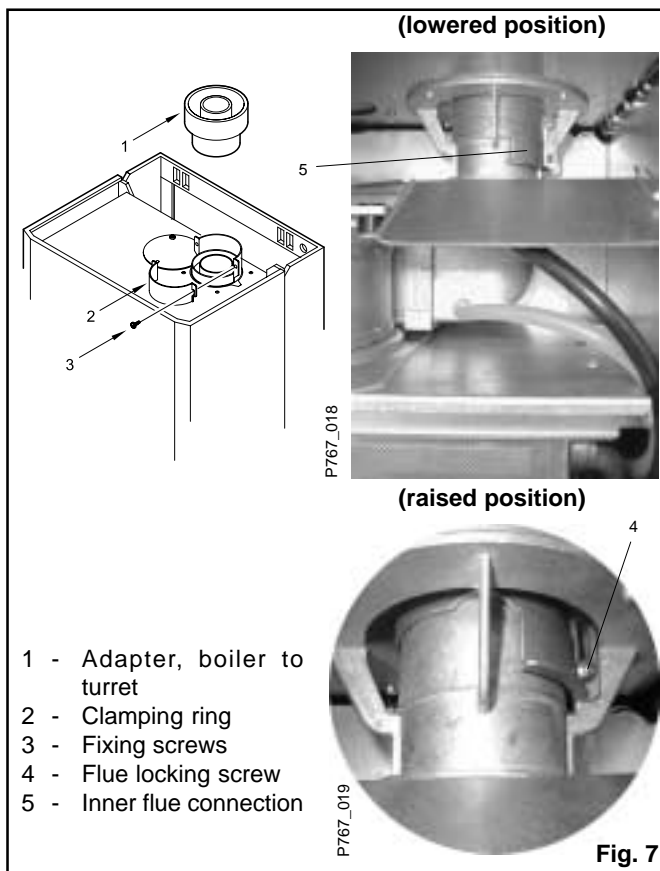
Fix the top wall plate and check that it is horizontal before tightening the screws.

Lift the appliance onto the top mounting plate. Make up the gas and water connections ensuring that the face to face joint rings are correctly located.

If the air and flue duct assembly is to be fitted from inside the room then the ducts must be cut to length, assembled and inserted through the wall at this stage before fitting the flue elbow and adapters to the appliance. Refer to Section 10.4 following for the assembly of the air and flue ducts.

### 10.4 AIR AND FLUE DUCT PREPARATION AND ASSEMBLY

Before starting the installation, instal the adaptor supplied with the appliance.

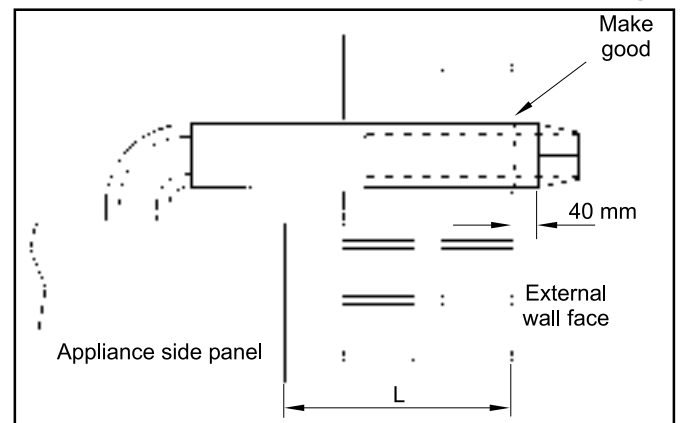
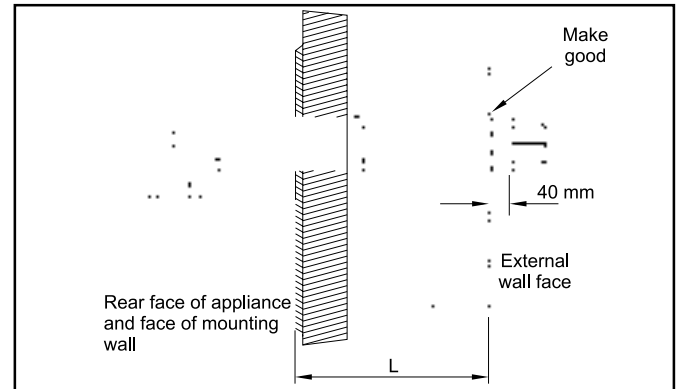


Check the contents of the standard flue duct kit against the packing list. Similarly check the extension duct kits if applicable. Remove all the packing from the ducts and terminal assembly. The standard flue kit is telescopic, and requires no cutting providing that the total length of the flue assembly is 500mm long measured from the appliance casing to the outer wall face. See dimension L, Figs. 8 and 9. When dimension L is greater than 500mm extension flue assemblies will be required.

It will not be necessary to cut either the ducts attached to the turret or the terminal unless L = 500mm to 600mm.

Measure and cut the air and flue ducts to length ensuring that the cuts are square and free from burrs. Always check the dimensions before cutting the ducts.

All extension duct dimensions refer to the straight lengths. The socketed ends must not be removed or included in any measurement.



### 10.5 EXTERNAL FITTING OF THE DUCT ASSEMBLY

Measure distance L.

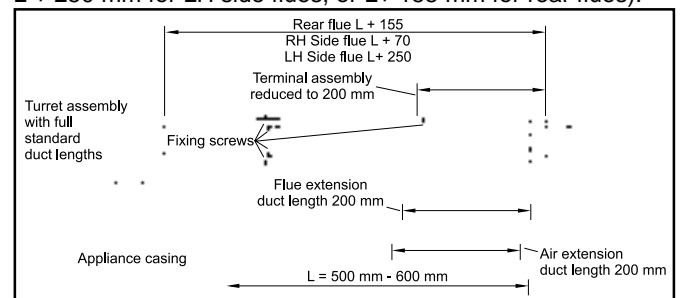
RH Side flue duct length = L + 70 mm.

LH Side flue duct length = L + 250 mm.

Rear flue duct length = L + 155 mm.

Do not cut either the turret or the terminal assembly ducts unless L = 500 to 600mm.

1) Should L = 500 to 600mm then cut the terminal assembly ducts reducing the length of the ducts to 200mm. Then cut each extension to 200mm (see fig 15). Assemble the flue as described below ensuring the correct length (L + 70 mm for RH side flues, L + 250 mm for LH side flues, or L+ 155 mm for rear flues).



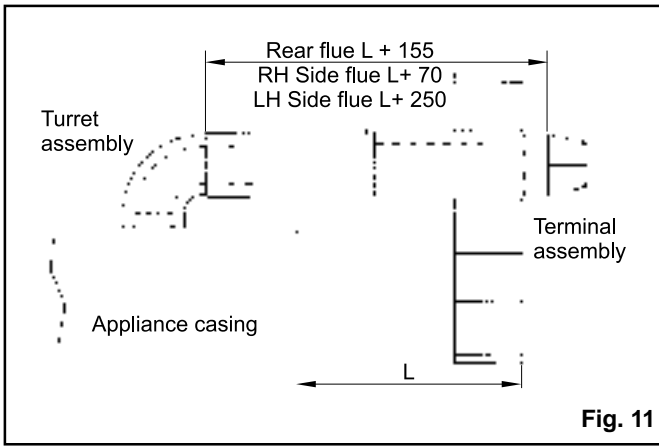


Fig. 11

2) If  $L$  is within the range 127mm to 500mm then the flue can be telescopically adjusted to the correct length ( $L + 70$  mm for RH side flue,  $L + 250$  mm for LH side flue or  $L + 155$  mm for rear flue). The ducts are then fixed by drilling a pilot hole through the hole in the air duct and screwing the self tapping screw provided into the two ducts (see fig. 11).

3) If  $L$  is within any of the following ranges it will not be necessary to cut the extension ducts:

0.88m to 1.10m, 1.63m to 1.85m or 2.38m to 2.5m.

Each extension duct must be connected to the first section of flue or the previous extension duct by firstly fitting the inner flue ducts together and pilot drilling and fixing (see fig. 12). Then the outer air ducts can be similarly fixed using the pair of screws provided. The flue terminal section can then be telescopically adjusted and fixed as before (see fig. 11) ensuring the correct length ( $L + 70$  mm for RH side flues,  $L + 250$  mm for LH side flues, or  $L + 155$  mm for rear flues).

4) In the event of  $L$  not falling within any of the above ranges it will be necessary to cut the FIRST extension length. The air and flue duct lengths should both be reduced to the same length:  $L - 240$ mm where one extension is used;  $L - 990$ mm with two extensions and  $L - 1,740$ mm with three (see fig. 12). The flue can then be assembled ensuring that the cut extension is fitted to the turret duct assembly first and that the flue is adjusted to the correct length of ( $L + 70$  mm for RH side flues,  $L + 250$  mm for LH side flues, or  $L + 155$  mm for rear flues) (see fig 11).

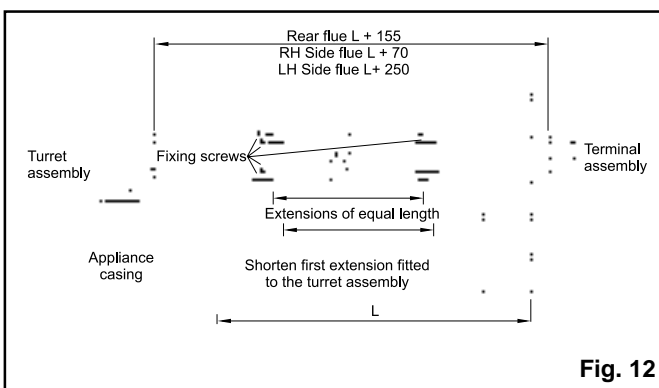


Fig. 12

5) Finishing the flue.

Apply the plastic tape provided to the last section of flue where it will be sealed to the external brickwork.

Remove the front clamp from the boiler flue connection and lower the flue duct sleeve by slackening the single locking screw at the RH side of the internal flue duct (fig. 7).

Fit the turret complete with boiler adapter to the flue system. From inside, push the assembly through the wall, align the flue turret with the boiler flue connection. For side flues the turret will need to be twisted into place through  $90^\circ$  to locate into the boiler flue connection. Replace the clamp and raise the inner flue connection and lock into place (fig. 7).

Make good the internal and external brickwork or rendering.

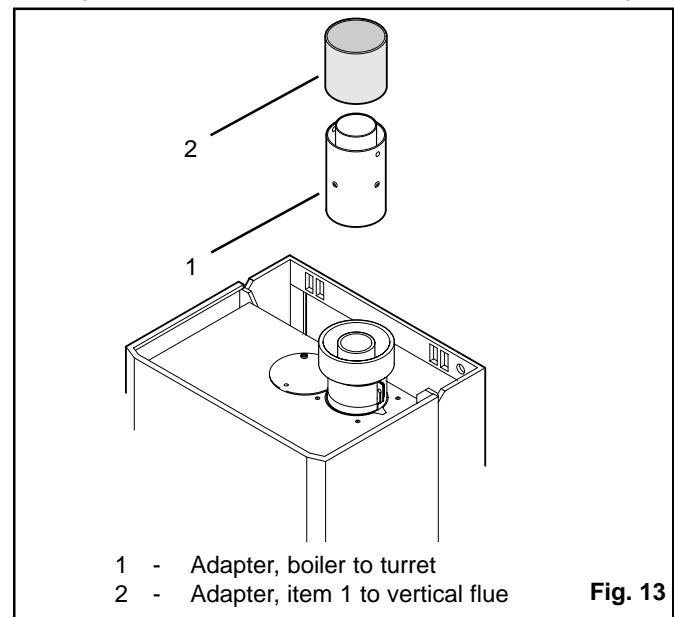


Fig. 13

## 10.6 INTERNAL FITTING OF THE DUCT ASSEMBLY

The rubber sealing gasket and the clamping ring are available from Worcester Heat Systems. Measure and cut the ducts as previously described for external fitting (Section 10.4). Fix the ducts to the terminal and fit the rubber sealing gasket and clamp to the terminal. Centralise the gasket and tighten the clamping ring. See Fig. 14. Slide the flue centering ring onto the air duct and tighten the screw. See Fig. 14. Fix the ducts and terminal assembly to the flue turret and boiler as described in Section 10.4 preceding, together with the appropriate restrictor ring. Apply the plastic tape provided to the last section of the flue where it will be sealed to the external brickwork. Push the assembly through the wall so that the gasket flange is against the outside of the wall. See Fig. 14. Align the flue turret and adapter with the socket on the appliance, slide or twist the turret into the boiler flue connection as described in section 10.4 preceding together with the appropriate restrictor ring.

6) Fitting the restrictor ring

Refer to table 7 to select the correct restrictor ring depending on the equivalent length of the flue system.

Remove the fan, as described in replacement of parts. Remove the three screws holding the fan to its mounting plate and position the appropriate restrictor in the recess on the fan mounting, plate and refit the three screws securing the restrictor, mounting plate and fan. Replace the fan on the boiler.

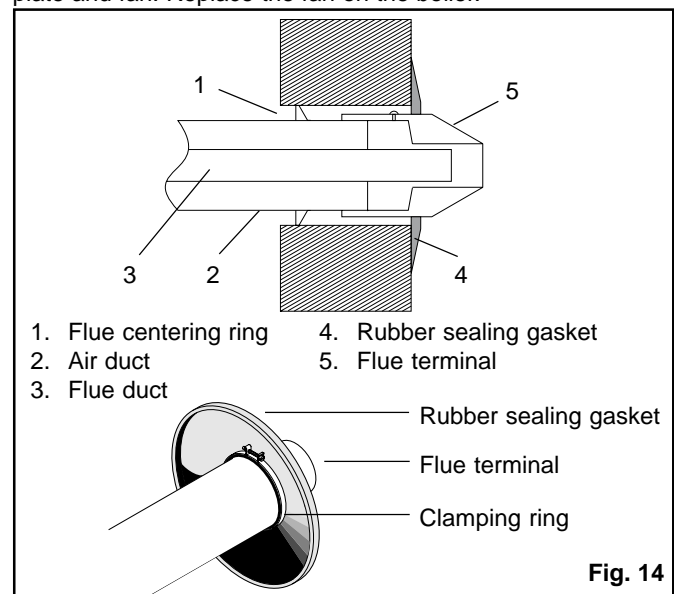


Fig. 14

## 10.7 FLUE BENDS

See Figs. 15 and 16.

Measure distances X, Y and Z as appropriate.

RH Side flue duct length =  $X + 70$  mm. See Fig. 14.

LH Side flue duct length =  $X + 250$  mm.

Rear flue duct length =  $X + 155$  mm. See Fig. 15.

Cut the flue and air ducts which are to make up the first section X such that both the assemblies are of equal length (either  $X + 70$  mm,  $X + 250$  mm or  $X + 155$  mm). Extensions will be necessary to allow X to be larger than 250 mm. Any extension ducts are fixed by drilling a pilot hole through the hole in the duct or elbow and screwing the self tapping screw provided into the two ducts. (See Fig. 15). The length Y is the distance between bends the ducts must be cut to  $Y - 162$  mm. The swaged ends must be removed from the extension tube and only the air duct needs fixing. See Fig. 15. Z is the final flue length from the last elbow to the outside face of the external wall. The first duct sections fitted to the elbow must have unswaged ends. The length of the air ducts should be  $Z - 196$  mm. The inner flue duct must be 30 mm longer than the air duct. If  $Z - 196$  mm is less than 160 mm then the terminal section will need to be shortened to the same length as the extension flue section fitted to the elbow (length  $Z - 100$ ). If flue extensions are needed to attain the required length care must be taken to ensure that the last section of flue is longer than 260 mm.

Each extension must be connected to the previous section of flue or bend by firstly fitting the inner flue ducts together and pilot drilling and fixing as above (See Fig. 15). Then the outer air ducts can be similarly fixed using a pair of screws provided. The flue terminal section can then be telescopically adjusted and fixed as before (See Fig. 15), ensuring the correct length of  $Z - 41$ . The silicon sealant supplied should be applied to the flue ducts which engage into elbows. See Fig. 15.

From inside, push the assembly through the wall. Align the flue turret and adapter with the socket on the appliance, slide or twist the turret into the boiler flue connection as described in section 10.6 preceding, together with the appropriate restrictor ring.

Make good the internal and external brickwork or rendering.

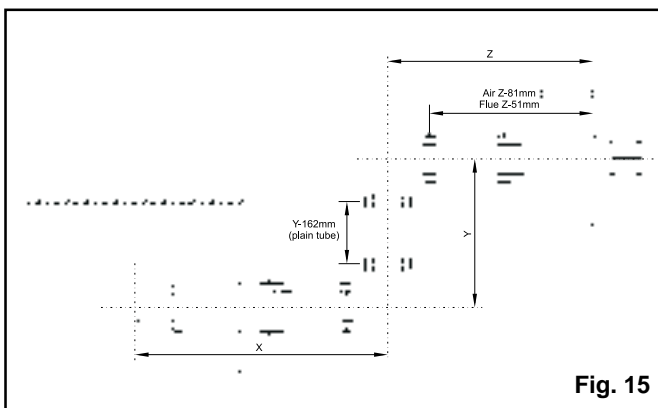


Fig. 15

## 10.8 VERTICAL ADAPTER

Fit the vertical flue adapter to the boiler flue adapter in place of the turret.

Measure and fit the flue as in Section 10.7 except the first section length is  $X + 50$  mm measured from the top of the vertical flue adapter. The minimum length for X is 100 mm. See Fig. 16.

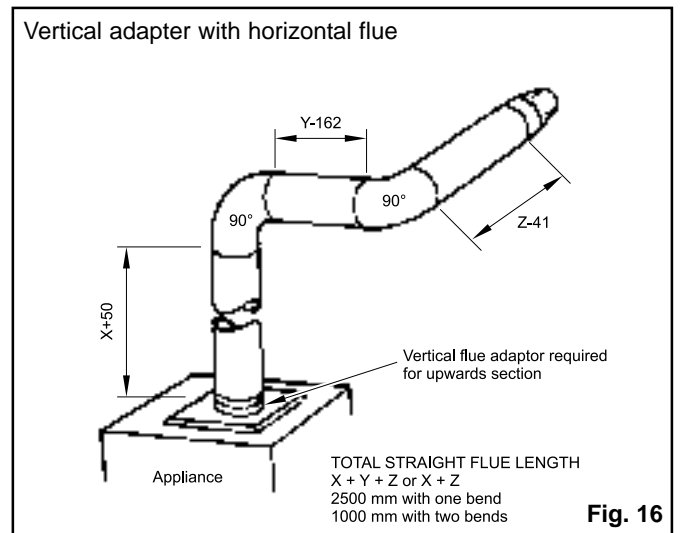


Fig. 16

## 10.9 FINAL INSTALLATION

Check that all the water and gas connections have been tightened. Remove the 2 screws and the control panel cover and connect the mains electrical supply to the appliance at terminals L and N. See Figures 17 and 18. The electrical leads must pass through the appropriate space in the control panel and be fixed with the cable clamps provided. Refit the control panel cover.

Test the gas supply pipework up to the appliance for soundness as indicated in BS 6891. If the appliance is not to be commissioned immediately, replace the cabinet casing. Check that the gas supply, the electrical supply and the water connections are all turned off. If the premises are to be left unoccupied during frosty conditions, then drain any water from the appliance and system.

Wiring Diagram

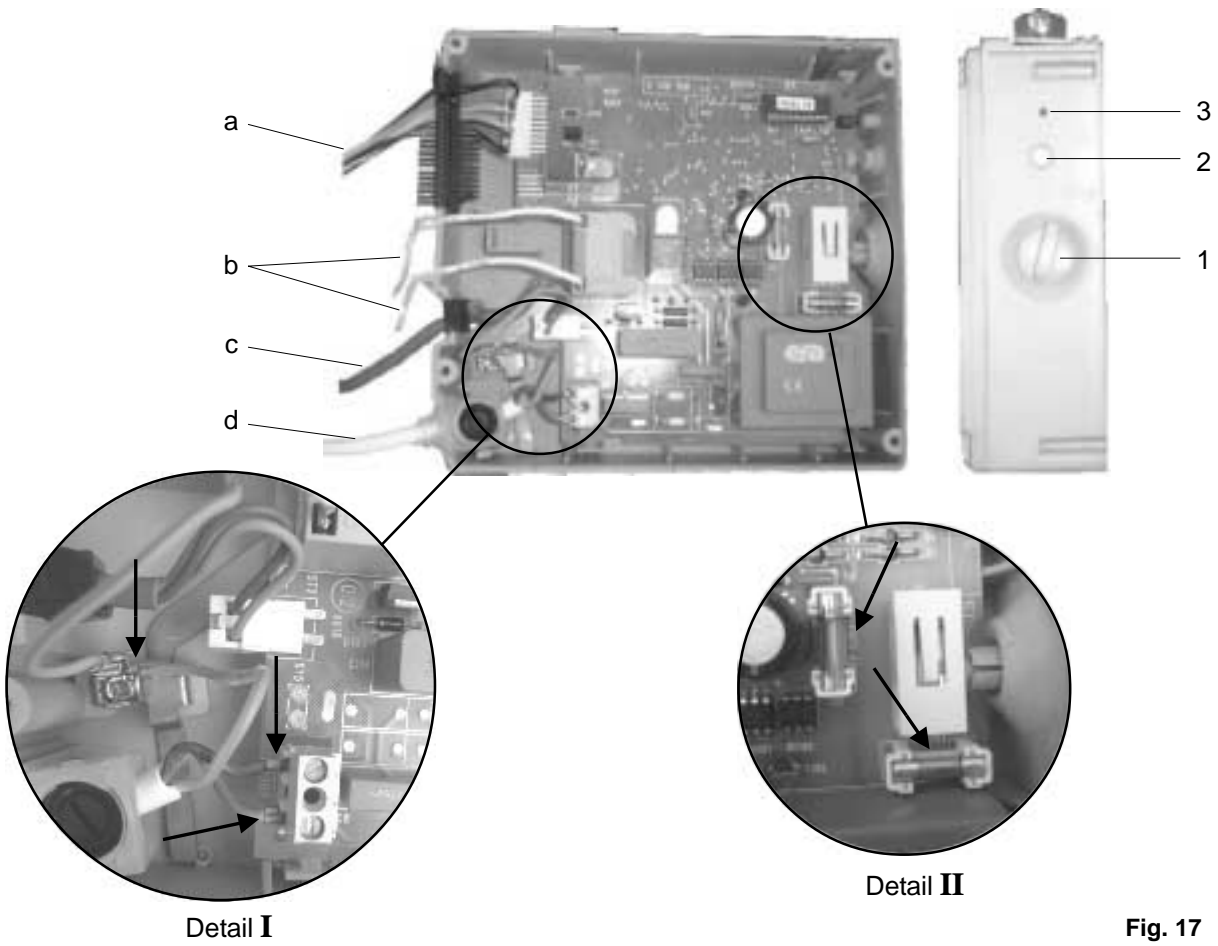
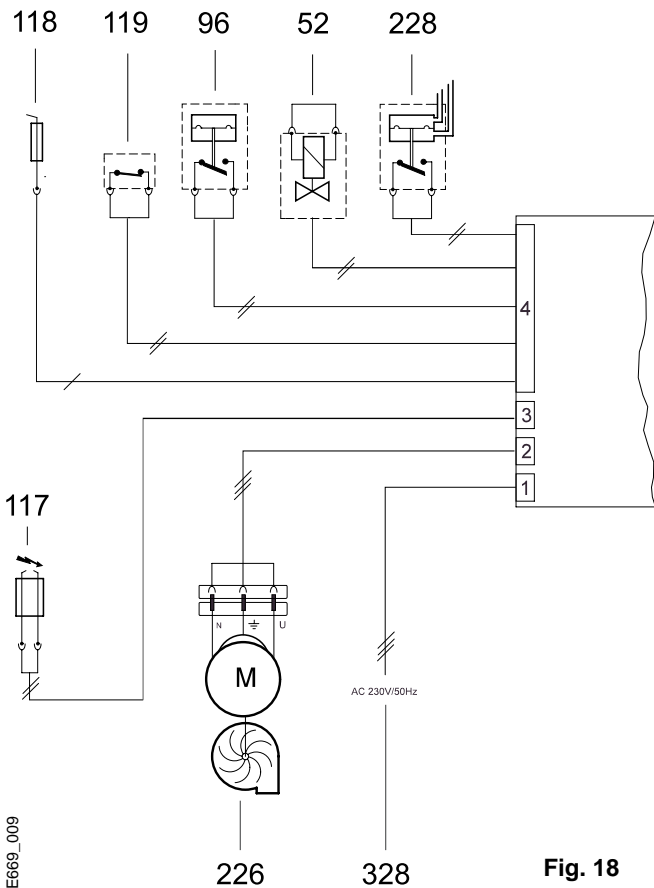


Fig. 17



- 1 On/Off switch
- 2 Reset button
- 3 LED
- 52 Solenoid valve, 24 V DC
- 96 Microswitch, 5 V DC
- 117 Ignition electrodes
- 118 Flame sensor electrode
- 119 Safety temperature limiter, 5 V DC
- 226 Fan, 230 V AC / 50 Hz
- 228 Differential air pressure switch, 5 V DC
- 328 Power supply cable, 230 V AC / 50 Hz

Fig. 18

E669\_009

## 11 Commissioning The Appliance

### 11.1 SUMMARY

Domestic Hot Water System. Check that the mains water supply has been fully flushed out at installation.

Gas Service. The complete system, including the meter, must be inspected and tested for soundness and purged as indicated in BS 6891.

### 11.2 APPLIANCE PREPARATION

Remove the cabinet casing.

Check that the electrical supply and the gas supplies to the appliance are off.

Check that all the water connections throughout the system are tight.

### 11.3 APPLIANCE OPERATION

Turn off the gas and electricity supplies to the appliance.

Loosen the burner pressure test point screw, located on the gas supply pipe to the burner manifold (pos. 1) and connect a pressure gauge.

Turn on the gas and electricity supplies.

Turn on a hot water tap to create a demand for hot water.

A continuous ignition spark will occur until the burner is alight and sensed by the control circuit. The burner pressure should be 12,6 mbar for natural gas and 35 mbar for Propane.

If the burner pressure cannot be achieved then check that the inlet pressure at the appliance is 20mbar for natural gas and 37mbar for propane.

If the appliance does not light, check that it is not in the 'lockout' state by pressing the lockout reset LED button. See Fig. 20.

Check that fully heated water is available from the tap.

Gradually close the hot tap and check that the burner pressure drops. Fully open the tap and check that the burner pressure rises. Fully close the tap and check that the burner goes off. The fan may continue running until the appliance has cooled to a preset temperature.

### 11.4 COMPLETION OF COMMISSIONING

Disconnect the pressure gauge and tighten the test point screw. Restart the appliance and check for gas soundness around the test point screw.

Refit the cabinet casing.

If the appliance is being passed over to the user immediately, refer to Section 12 - Instructions to the User and set the controls to the users requirements.

If the appliance is to be left inoperative, check that the Operating Switch is set to OFF. Turn off the gas service cock and switch off the electricity supply.

If there is any possibility of the appliance and system being left inoperative for long periods during frosty conditions, drain the appliance and system.

## 12 Instructions To The User

12.1 Tell the user how to operate the appliance and hand over the Users Instructions leaflet.

12.2 Tell the user what to do if the appliance is not to be used in frosty weather.

12.3 Tell the user of the importance of regular servicing. Worcester Heat Systems Ltd. offer a comprehensive maintenance contract.

12.4 Set the controls to the user's requirements.

12.5 Refer to instructions on back page.

## 13 Inspection and Service

### 13.1 SERVICING

To ensure efficient operation of the heater it must be checked and serviced as necessary at regular intervals.

The frequency of servicing will depend upon the particular installation conditions and usage, but once per year should generally be adequate.

It is the law that any service work must be carried out by a competent person such as British Gas or other Corgi registered personnel.

### 13.3 PRE-SERVICE INSPECTION

Check that the flue terminal and terminal guard (if fitted) are clear.

If the heater is in a compartment, check that the ventilation openings if required in the compartment door or walls are clear. See section 6-Air supply.

Check the all pipework and remake any joints or fittings which show signs of leakage.

Operate the heater taking note of any faults.

### IMPORTANT

Disconnect the electricity supply at the mains and turn off the gas service cock before servicing.

### 13.3 DISMANTLE THE HEATER

To carry out a full and comprehensive service of the heater remove the following parts to gain access to the components which need to be checked or serviced.

#### (a) Cabinet casing

Remove the control knob and unscrew the bezel. Slide up the upper facia section and remove the two screws. Pull forward the lower casing and remove by unhooking at the top.

#### (b) Fan

Disconnect the electrical connections and unscrew the two screws at the front. Remove the fan by pulling to the left. Inspect and clean the impeller with a soft brush if necessary.

#### (c) Burner

Disconnect the electrodes and unscrew the union nut. Turn the burner over inside the heat exchanger and remove from the heater. Inspect and clean with a soap and water solution and a soft brush if necessary.

#### (d) Heat exchanger

Remove the fan and burner as described above. Cover the gas supply orifice. Inspect and clean the fins with a soft brush if necessary.

## 14 Replacement of Parts

### IMPORTANT

Switch off the electricity and gas supplies before replacing any components. After the replacement of any components, check for gas soundness where relevant and carry out functional checks as described in section 11- Commissioning.

#### 14.1 Fan

Check that the electricity supply is turned off. Remove the fan as described in 13.3 (b). Fit the replacement fan in the reverse order making sure it is correctly engaged into the seal.

#### 14.2 Limit thermostat

Pull off the two connectors, unscrew the bracket and remove the thermostat. Fit the replacement thermostat in the reverse order making sure a good connection with the heat exchanger is made.

#### **14.3 Heat exchanger**

Check that the electricity supply is turned off. Remove the fan as described in 13.3 (b). Unscrew the two screws and remove the cross-piece at the top. Isolate from the incoming cold water supply and drain down the heater. Disconnect the inlet and outlet pipes outside the base of the combustion chamber. remove the retaining screw inside the heat exchanger and remove from the heater. Fit the replacement heat exchanger in the reverse order.

#### **14.4 Burner**

Remove the burner as described in 13.3 (c). Fit the replacement burner in the reverse order ensuring that it is located correctly.

#### **14.5 Electrodes**

Remove the burner as described in 13.3 (c). slacken the clamping screw and slide the electrode upwards. Fit the replacement burner in the reverse order ensuring that it is located correctly.

#### **14.6 Injectors**

Remove the burner as described in 13.3 (c). Remove the burner manifold to expose the injectors. The injectors can then be removed and replaced as required. Fit the replacement burner in the reverse order ensuring that it is located correctly.

#### **14.7 Micro-switch**

Slacken the three screws from underneath and release the housing from the valve body. \*Unscrew the three screws and remove the black plastic cover. Remove the spade terminals from the microswitch. Replace the switch in the reverse order and check the adjustment as follows;

Turn all hot water taps off.

Remove the small black plastic cover from underneath the switch.

With the electricity on, turn the screw anti-clockwise until the fan starts.

Turn the screw clockwise 1½ times to reset the switch.

This adjustment must be carried out whenever any of the water valve components have been disturbed.

#### **14.8 Water valve**

Remove the micro-switch as described in 14.7. Drain the water circuit. Disconnect the inlet connection at the rear of the valve. Pull out the retaining clip at the right hand side of the valve. Slacken the two screws at the base of the gas valve and lower the water valve. Fit the venturi to the new valve. Fit the replacement valve in the reverse order ensuring that both the face to face joint and o-ring seal are correctly positioned.

#### **14.9 Gas valve**

Remove the water valve as described in 14.8. unplug the electrical connections from the solenoid. Undo the inlet connection at the rear of the valve. Undo the union connection inside the combustion chamber and remove the valve. Fit the replacement valve in the reverse order ensuring that the seals are correctly positioned and gas tight. Re-commission the heater as described in section 11.

#### **14.10 Air pressure switch**

Carefully pull off the sensing tubes from the switch noting the position of the coloured tubes. Unscrew the screw from inside the combustion chamber and remove the switch. Remove the two screws and remove the cover to expose the spade terminals. Fit the replacement switch in the reverse order ensuring that the tubes are correctly fitted.

#### **14.11 Internal fuses**

Undo the screw and remove the control box housing from the heater. Remove the four screws and remove the cover. Remove, check and replace the fuses if required. Re-assemble in the reverse order.

#### **14.12 Control board**

Remove the control box and cover as described in 14.11. Carefully unplug the two multi-way plugs and the ignition lead terminals. Disconnect the mains connections from the terminal and pull away the locking clamp. Carefully release the control board from the plastic clips and remove. Fit the new control board in reverse order.



## 15 Fault Finding

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Appliance does not ignite. Warning lamp is off.	Damaged fuse. No electricity supply.	Replace fuse. Check electricity supply.
Appliance does not ignite. Warning lamp is on.	No gas supply.	Check gas supply.
Appliance does not ignite. Warning lamp blinks.	Safety temperature device activated.	Check safety temperature device and PCB connections.*
Low burner flame, water does not heat up.	Insufficient gas pressure.  Dirty/damaged gas filter or burner.	Check if gas container freezes while in use. If so, place it in a warmer location (only L.P.G.).  Check if gas inlet governor (L.P.G.) is of appropriate type, and is in good working order. Replace if necessary.*  Clean gas filter and burner.*
Insufficient water temperature.	Wrong output selected.	Check position of water temperature selector. Adjust according to your output needs.
Insufficient water flow.	Insufficient water pressure. Dirty taps or mixers. Blocked water valve. Blocked heat exchanger (scale).	Check and adjust. Check and clean. Clean the filter.* Clean and de-scale.*

\* Situations only to be handled by authorized personnel

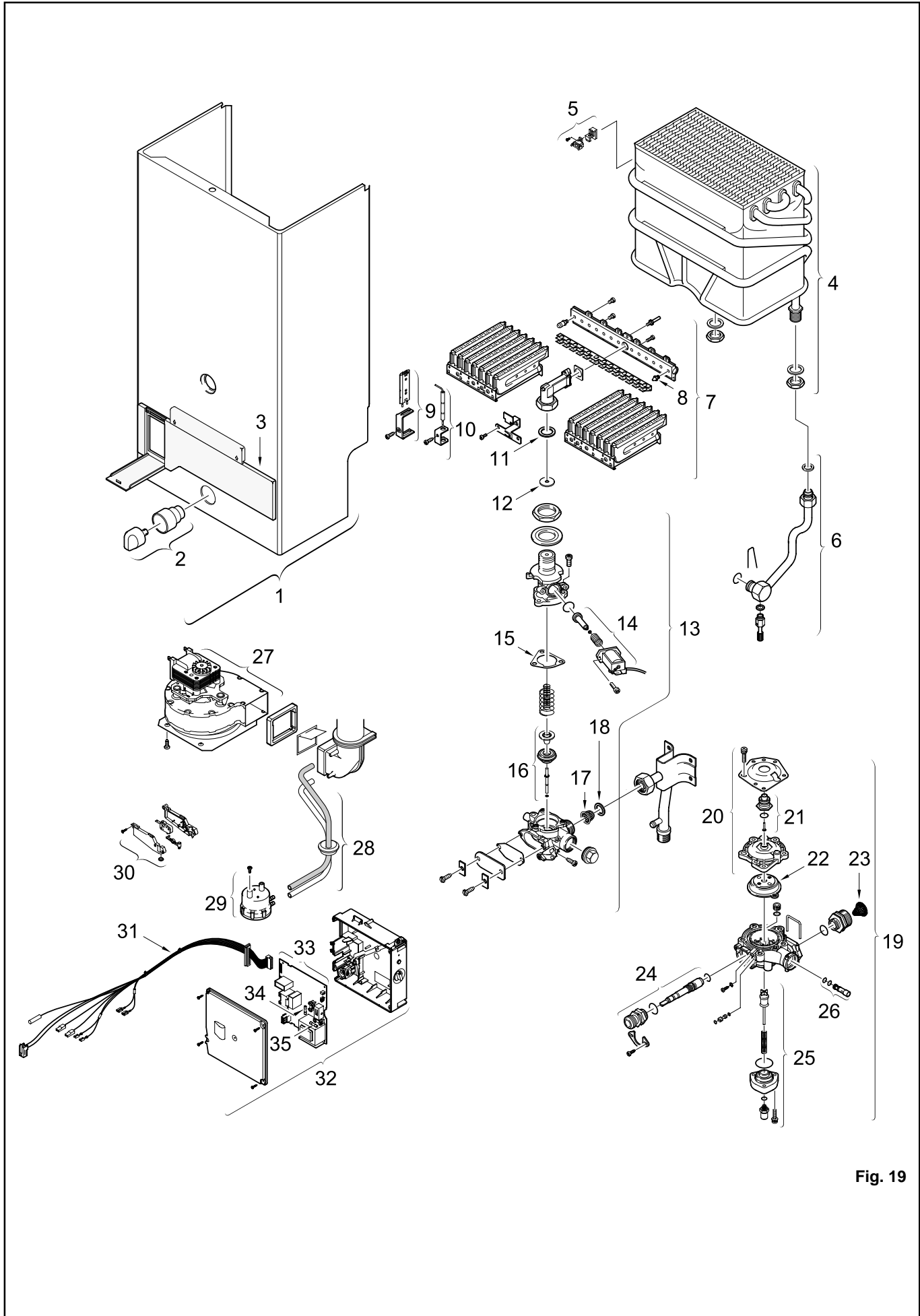


Fig. 19

## Parts List

	Description	Propane	Natural Gas
1	Front cover assembly	8 705 421 486 0	
2	Water flow selector handle - complete	8 702 000 219 0	
3	Fascia assembly	8 705 506 473 0	
4	Heat exchanger	8 705 406 198 0	
5	High limit thermostat	8 707 206 151 0	
6	Cold water inlet pipe	8 700 705 645 0	
7	Burner assembly	8 708 120 340 0	8 708 120 335 0
8	Burner injector ( 115 )	8 708 202 127 0	8 708 202 115 0
9	Ignition electrode	8 708 107 008 0	
10	Flame sensor	8 708 107 009 0	
11	Washer	8 710 103 060 0	
12	Throttle disc ( 6.2 )	-----	8 700 100 191 0
13	Gas valve assembly	8 707 011 773 0	8 707 011 771 0
14	Magnetic unit	8 707 201 026 0	
15	Gasket	8 701 004 001 0	
16	Poppet valve head - complete ( 2E )	8 708 500 310 0	8 708 500 309 0
17	Gas filter	8 700 507 002 0	
18	Washer	8 700 103 014 0	
19	Water valve assembly	8 707 002 637 0	
20	Cover assembly	8 705 500 101 0	
21	Repair set for water valve cover	8 700 306 114 0	
22	Diaphragm ( F )	8 700 503 075 0	
23	Water filter	8 700 507 001 0	
24	Selector screw assembly	8 708 500 289 0	
25	Volumetric water governor assembly	8 705 705 021 0	
26	Venturi assembly	8 708 205 279 0	
27	Fan assembly	8 707 204 005 0	
28	Set of hoses	8 700 703 049 0	
29	Air pressure switch	8 707 406 007 0	
30	Microswitch assembly	8 707 200 007 0	
31	Harness / 24V	8 714 402 071 0	
32	Control box assembly	8 717 207 437 0	
33	Printed circuit board	8 748 300 348 0	
34	Fuse (T1.25A, 250V)	1 904 521 338 0	
35	Fuse (T0.8A, 250V)	1 904 522 735 0	

( ) Code n°

Table 8

## Operation

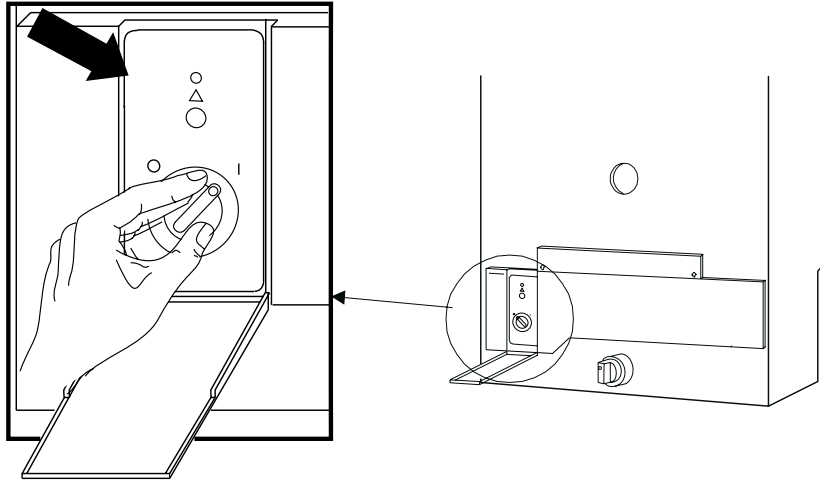
### Switching On/Off

#### Switching On:

Turn the on-off switch to position "I"

#### Switching Off:

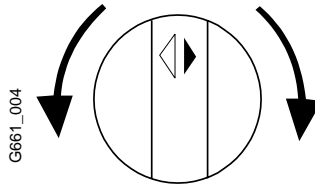
Turn the on-off switch to position "0"



### Temperature regulation:

Turn anti-clockwise

Water flow increases,  
temperature diminishes



Turn clockwise

Water flow decreases,  
temperature increases.

### Safety Cut-Out

If the appliance does not light, open flap next to control panel.

If warning lamp is on (ignition has failed), press reset button (light will go out) and ignition procedure will be repeated.

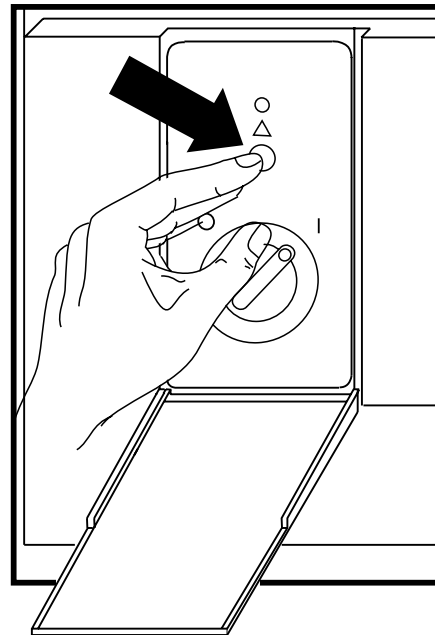


Fig. 20

# WORCESTER

Worcester Heat Systems Limited, Cotswold Way, Warndon, Worcester WR4 9SW.  
Telephone: (01905) 754624. Fax: (01905) 754619

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