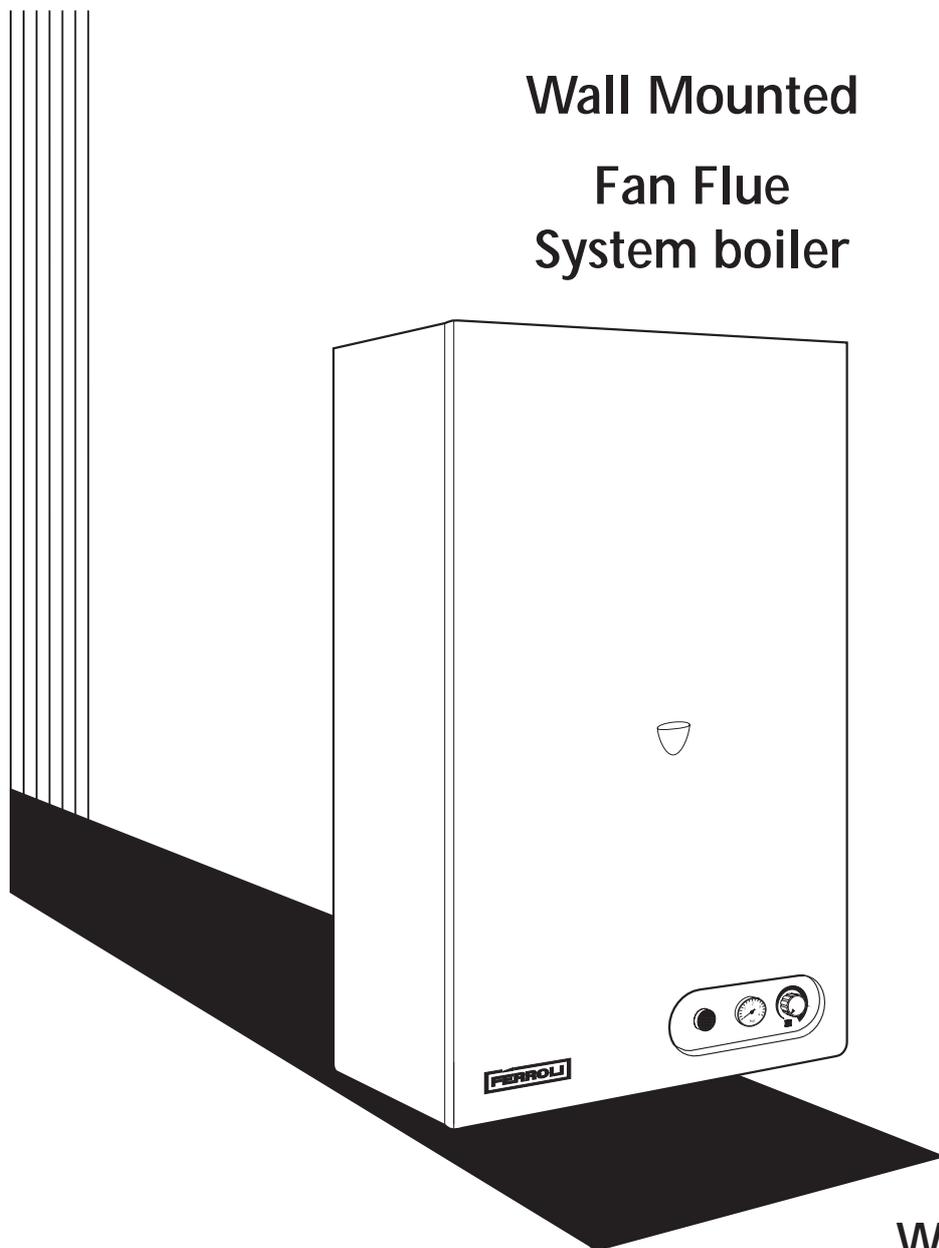




TEMPRA

Wall Mounted
Fan Flue
System boiler



Appr. nr. B 94.04 A - CE 0063 AQ 2150

Wall mounted fanned
flue boiler

Phone numbers:

Installer _____

Service Engineer _____

Serial N° _____

INSTALLATION AND USE INSTRUCTIONS

Please read these Instructions
thoroughly before using
the appliance

These Instructions must be left with the appliance User.

INDEX

1. General description and information
2. Technical specification
3. Installation details
4. Installation
5. Boiler connections
6. Electrical connections
7. Commissioning

1. GENERAL DESCRIPTION AND INFORMATION

1.1 Information

1. Installation must be carried out by a competent person, and in accordance with the relevant requirements of the current issues of:
 - A. Gas Safety (Installation & Use) Regulations. 1994
 - B. Building Regulations.
 - C. Building Standards (Scotland) Regulations.
 - D. I.E.E. Wiring Regulations.
 - E. Bye-laws of the local water undertaking.

Guidance on Installation is provided in this booklet, but due account must be taken of the detailed recommendations of the current issues of:

- BS 5440 Part 1 2000:** Flues.
BS 5440 Part 2 1989: Air supply.
BS 6798: Installation.
BS 5449: Pumped systems.
BS 5546: Domestic hot water.
BS 6700: Water supply.
BS 6891: Gas supply.
BS 7074 Part 1: Expansion vessels.
BS 7593: Treatment of water in domestic hot water central heating systems.

For installation in timber framed buildings, refer to the British Gas Publication **Guide for gas installation in timber framed housing - REF DM2.**

2. It is essential that the boiler be installed strictly in accordance with these Instructions and the documents, detailed above.
3. To avoid the possibility of injury, care must be taken when handling sheet metal components.

1.2 Introduction

The **TEMPRA Boiler** is a "room-sealed" appliance: it takes in the air required for combustion and encloses all the combustion products in an hermetic compartment. The discharge of fumes and intake of combustion air are managed through air/flue pipes that may be run horizontally in all directions, or through a concentric flue running vertically or horizontally.

The main components of the boiler are:

- A compact heat exchanger in copper, formed by four pipes with external finning and internal turbulence activators.
- A combustion chamber insulated to reduce heat loss and thus improve efficiency.
- Nine stainless steel burners, an oxidation- and thermal shock-resistant material specially developed for this product.
- A fan to discharge combustion products and draw in combustion air.

- A boiler thermostat overheat thermostat and frost thermostat.
- A steel room-sealed compartment treated against corrosion, enclosing all the above components.
- An air differential pressure switch which, to ensure safe operation, allows burner ignition only when the fan functions normally.
- A newly-designed gas ignition valve assembly, comprising a range rated regulator gas valve and a flame control device. (Ignition is by an intermittent pilot flame; which lights the main burners.)
- An expansion vessel, pump, automatic air vent and air separator .
- A temperature sensor.
- Pressure gauge.
- Pressure relief valve set at 3 bar.

2. TECHNICAL SPECIFICATION

2.01. Technical data

Model

TEMPRA sealed system boiler

		Natural gas (G20)		Propane LPG (G31)	
		Max	Min	Max	Min
Nominal heat input (gross)		kW 21.6	kW 12.8	kW 21.1	kW 12.5
Nominal heat input (net)		kW 19.5	kW 11.5	kW 19.5	kW 11.5
Nominal heat output		kW 17.6	kW 9.7	kW 17.6	kW 9.7
		Natural gas (G20)		LPG (G31)	
fl Main injectors	mm	1.2		0.77	
fl Gas supply		1/2"		1/2"	
Number of injectors	N_j	9		9	
Working gas inlet pressure	mbar	20		37	
Burner pressure	min mbar	5		13	
	Max mbar	15		36	
Gas rate	m^3/h	2.06		-	
	kg/h	-		1.51	
Maximum system pressure	bar	3			
fl Water connections		3/4"			
Dimensions	Height	mm	750		
	Width	mm	420		
	Depth	mm	275		
Weight	kg	40			
Electrical supply	V/Hz	230/50			

2.02. Appliance dimensions

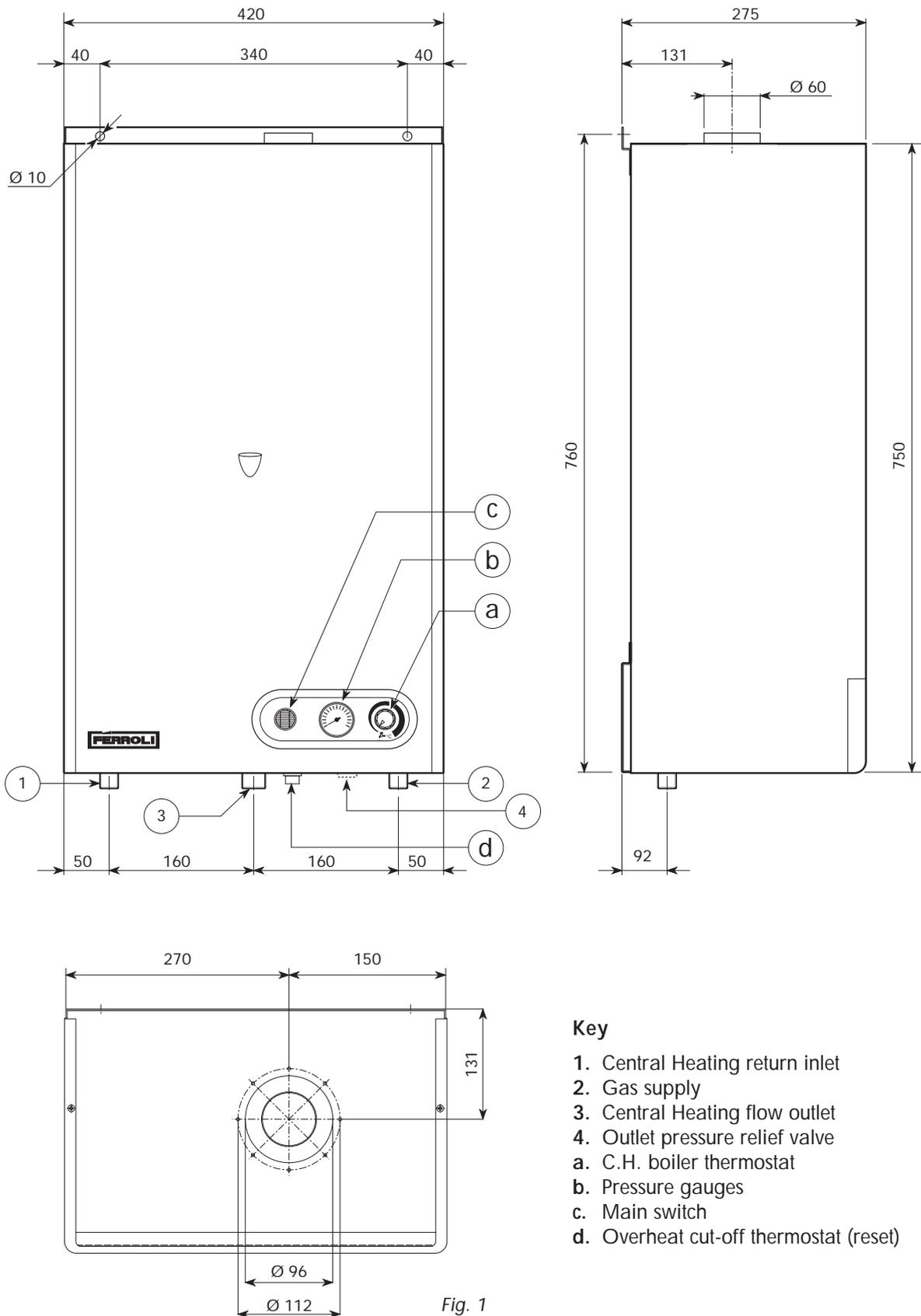


Fig. 1

3.0 INSTALLATION DETAILS

3.1 Gas Safety (Installation & Use) Regulations: 1994

In the interest of safety, it is the law that all gas appliances are installed by a competent person in accordance with the above Regulations, Building Regulations/Building Standards Scotland, Codes of Practice, current I.E.E. Regulations and the byelaws of the Local Water Undertaking. Failure to comply with the Regulations may lead to prosecution; it is in your interest and that of safety to ensure that the law is complied with.

Important - If the boiler is to be fitted in a timber framed building it should be fitted in accordance with the British Gas publication; Guide for Gas Installation in Timber Frame Housing; Reference DM2. If in doubt advice must be sought from the Local Gas Region of British Gas Plc.

3.2 Location of Boiler

The installation of the **TEMPRA** must be on a suitable non-combustible load bearing wall which will provide an adequate fixing for the boiler mounting bolts. The location should be in an area where the water pipes will not be subjected to frost conditions. In siting the boiler the following limitations **must** be observed:

The boiler may be installed in any room or internal space, although particular attention is drawn to the requirements of the current, i.e. wiring regulations and in Scotland the electrical provisions of the building regulations applicable in Scotland, with respect to the installation of the boiler in a room or internal space containing a bath or shower.

Where a room sealed appliance is installed in a room containing a bath or shower any electrical switch or appliance control utilising mains electricity, should be so situated that it cannot be touched by a person using the bath or shower.

3.3 Terminal Position

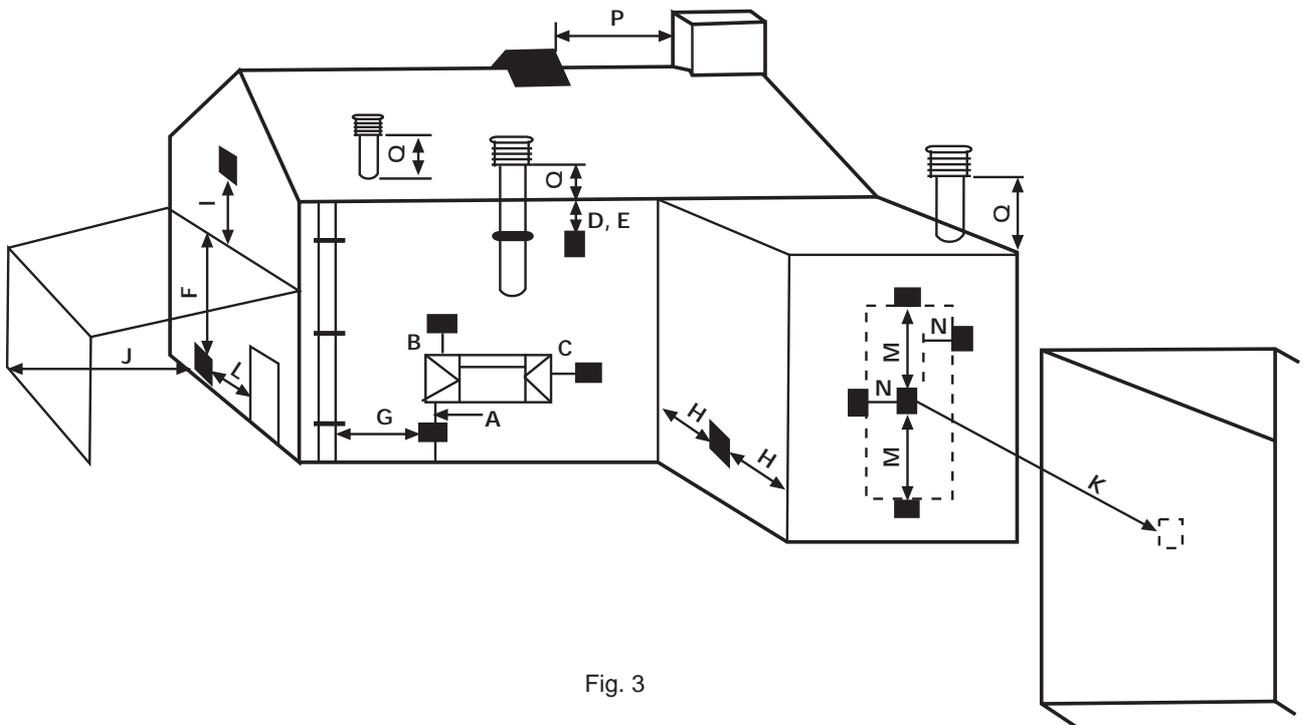


Fig. 3

Minimum dimensions of flue terminal positions

Dimensions	Terminal position (kW input expressed in net)	Balanced flues room sealed		Open flues	
		Natural draught	Fanned draught	Natural draught	Fanned draught
A ^a	Directly below an opening, air brick, (0-7 kW) opening windows, etc. (>14-32 kW) (>7-14 kW) (>32-70 kW)	300 mm 600 mm 1500 mm 2000 mm	300 mm	Not allowed	300 mm
B ^a	Above an opening, air brick, (0-7 kW) opening windows, etc. (>7-14 kW) (>14-32 kW) (>32-70 kW)	300 mm 300 mm 300 mm 600 mm	300 mm	Not allowed	300 mm
C ^a	Horizontally to an opening, air brick, (0-7 kW) opening windows, etc. (>7-14 kW) (>14-32 kW) (>32-70 kW)	300 mm 400 mm 600 mm 600 mm	300 mm	Not allowed	300 mm
D	Below gutters, soil pipes or drain pipes	300 mm	75 mm	Not allowed	75 mm
E	Below eaves	300 mm	200 mm	Not allowed	200 mm
F	Below balconies or car port roof	600 mm	200 mm	Not allowed	200 mm
G	From a vertical drain pipe or soil pipe	300 mm	150 mm ^b	Not allowed	150 mm
H	From an internal or external corner	600 mm	300 mm	Not allowed	200 mm
I	Above ground roof or balcony level	300 mm	300 mm	Not allowed	300 mm
J	From a surface facing the terminal (also see 6.1.2)	600 mm	600 mm	N/A	600 mm
K	From a terminal facing the terminal	600 mm	1200 mm	N/A	1200 mm
L	From an opening in the car port (e.g. door, window) into the dwelling	1200 mm	1200 mm	N/A	1200 mm
M	Vertically from a terminal on the same wall	1500 mm	1500 mm	N/A	1500 mm
N	Horizontally from a terminal on the same wall	300 mm	300 mm	N/A	300 mm
O	From the wall on which the terminal is mounted	N/A	N/A	N/A	50 mm
P	From a vertical structure on the roof	N/A	N/A	See Table 2 and Fig. 6b	N/A
Q	Above intersection with roof	N/A	N/A	See Table 2 and Fig. 4	150 mm

NOTE N/A = Not applicable

^a In addition, the terminal should not be nearer than 150 mm (fanned draught) or 300 mm (natural draught) to an opening in the building fabric formed for the purpose of accommodating a built-in element such as a window frame, (see Figure C2). Separation distances are linked to the rated heat inputs as shown.

^b This dimension may be reduced to 75 mm for appliances of up to 5 kW heat input.

Minimum Clearance mm

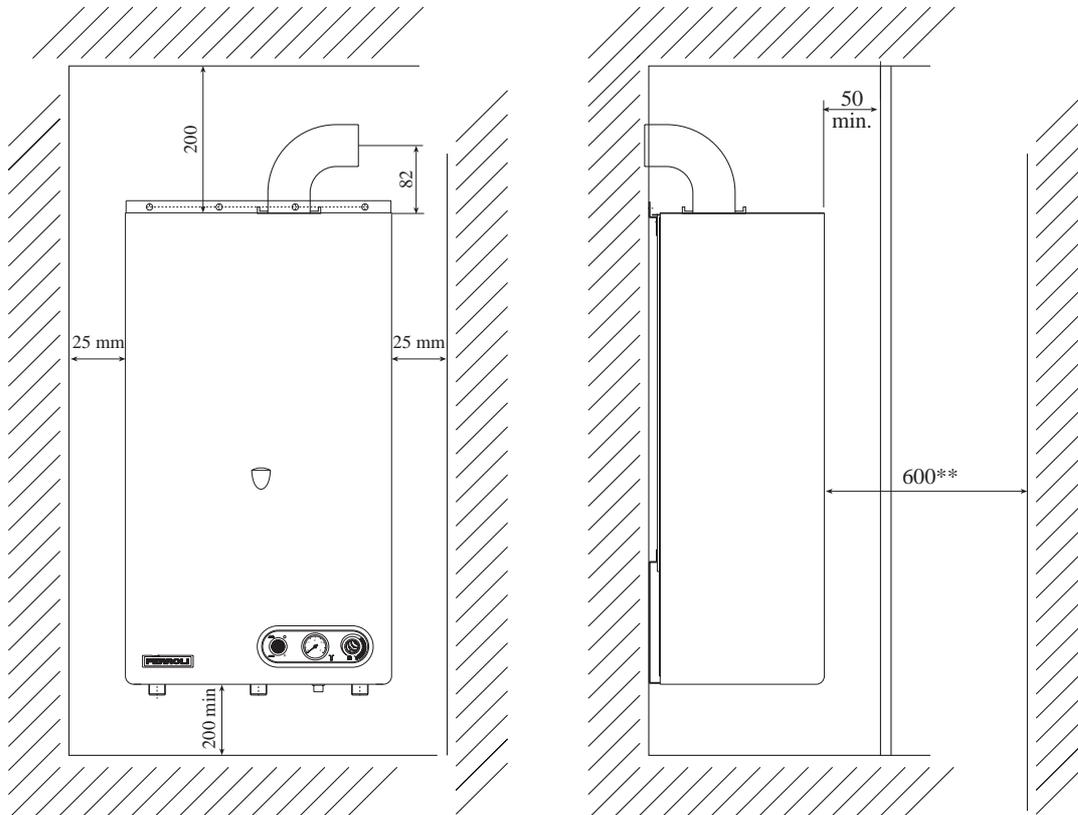


Fig. 4

NOTES

** Access to the front of the boiler must be available for maintenance (min. 600 mm).

3.4 Air Supply

The room in which the boiler is installed does not require a purpose provided vent.

3.5 Flue system

The boiler allows the flue outlet to be taken from the rear of the boiler or from either side.

A standard flue length of 0.75 metres is provided. Alternative lengths of two or three metres can be supplied.

It is absolutely **essential**, to ensure that products of combustion discharging from the terminal cannot re-enter the building, or enter any adjacent building, through ventilators, windows, doors, natural air infiltration, or forced ventilation/air conditioning.

3.6 Gas Supply

If necessary the local Gas Region should be consulted, at the installation planning stage, in order to establish the availability of an adequate supply of gas.

An existing service pipe must **not** be used without prior consultation with the Local Gas Region.

A gas meter can only be connected by the Local Gas Region, or by a Local Gas Region's Contractor. Installation pipes should be fitted in accordance with BS6891-1988.

Appliance inlet working pressure must be 20 mbar MINIMUM.

Pipework from the meter to the boiler must be of an adequate size.

Do not use pipes of a smaller size than the boiler inlet gas connection.

The complete installation must be tested for gas soundness and purged as described in BS6981-1988.

All pipework must be adequately supported. An isolating gas valve is provided and should be fitted.

3.7 Water System

Central Heating

It must be a sealed system. Detailed recommendations are given in BS6798, BS5449, BS6700 and CP342 Part. 2. Pipework not forming part of the useful heating surface should be insulated to prevent any heat losses or possible freezing (i.e. in roof spaces or ventilated underfloor spaces). Drain taps should be positioned at the lowest point of the system in accessible locations to permit the whole system to be drained down. The drain taps should be in accordance with BS2879. Copper tubing to BS2871, Part. 1 is recommended for water carrying pipework. Pipework in horizontal runs should have a gradient where possible to facilitate the removal of air. It should be ensured that the boiler heat exchanger is not a natural point for collecting air. A typical heating system with domestic hot water circuit is illustrated in fig. 5-6.

Important - A bypass must be fitted to ensure a minimum flow rate through the boiler of 6 l/min.

3.8 Make up Water

Provision must be made for replacing water lost from sealed system. Reference should be made to BS6798, for methods of filling and making up sealed systems. There must be no direct connection between the boiler's central heating system and the mains water supply. The use of mains water to charge and pressurise the system directly, is conditional upon the Local Water Byelaw. Again any such connection must be disconnected after use fig. 7.

Attention - Is drawn to the Model Water Byelaws.

Fittings manufactured from duplex (alpha-beta) brass are not acceptable for underground use and certain water undertakings will not accept their use above ground.

Sealed system - "Y" Plan

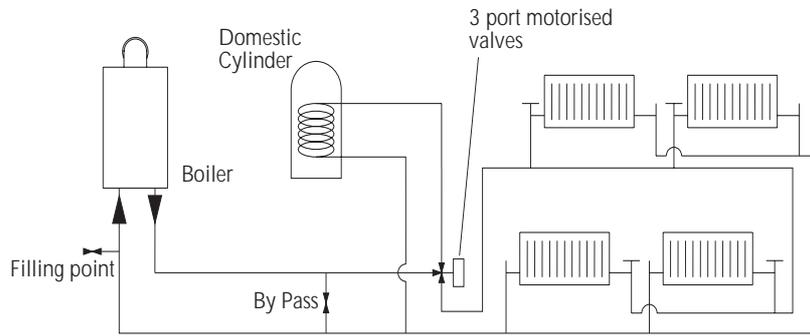


Fig. 5

Sealed system - "S" Plan

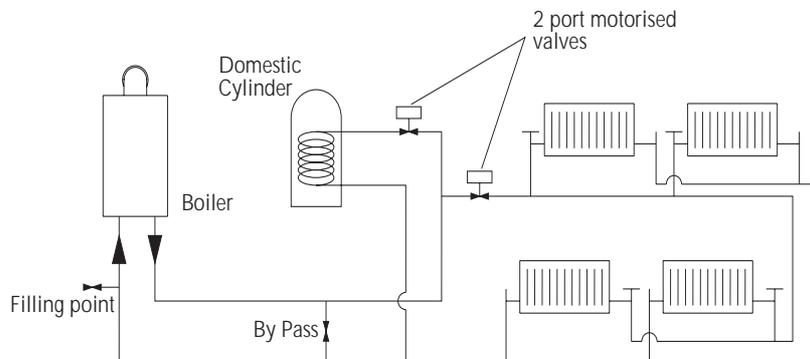


Fig. 6

NOTE: A bypass must be fitted to ensure a minimum flow rate of 6 l/min. through the boiler.

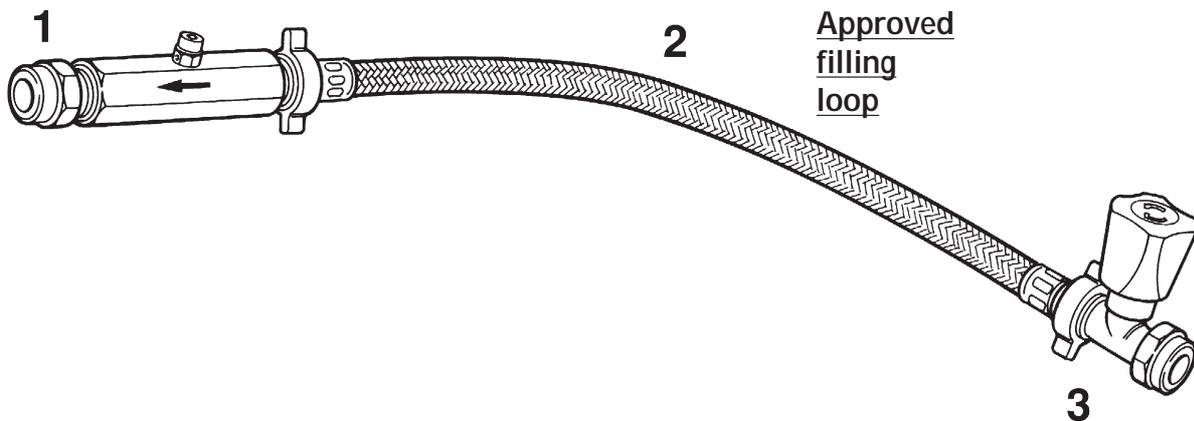


Fig. 7

- Key**
- 1. Filling point C.H.
 - 2. Temporary connection
 - 3. Cold water supply

3.9 Built-in Central Heating Water Circulating Pump

The pump head available for circulating the water is given in fig. 8.

N.B. - The pump is factory set at position 3. The pump is a Grundfos type UPS 15-50 series.

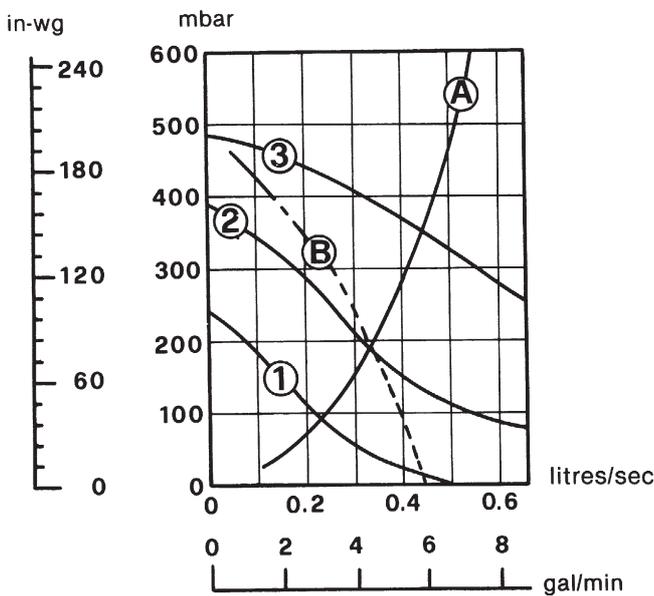
Grundfos Pump performance graph

Note - Minimum flow through boiler heat exchanger at any time should not fall below 6 litres per minute.

If required an additional expansion vessel may be fitted to the central heating return inlet.

If the total volume of water in the system exceeds 40 litres an additional expansion vessel must be fitted to the central heating return inlet.

Pump performance curve Grundfos UPS 15-50



1 2 3 Speed settings
A Boiler pressure drop
B Max. available pump head C.H.

Fig. 8

SIZING OF ADDITIONAL EXPANSION VESSELS:

Deduct from the value given in the table the 6 litre vessel supplied.

Note

1. Fill C.H. installation to min. 1.5 bar.
2. Select by preference the expansion vessel for increased system pressure of 2.0 bar
3. Expansion vessel must be fitted to Central Heating Return Inlet
4. The standard 6 litres expansion vessel is charged to 1 bar

Fig. 9

SAFETY VALVE SETTING (bar)	3.0					
VESSEL CHARGE PRESSURE (bar)	0.5		1.0		1.5	
INITIAL SYSTEM PRESSURE (bar)	1.0	1.5	2.0	1.5	2.0	2.0
TOTAL WATER CONTENT of SYSTEM	EXPANSION VESSEL VOLUME (litres)					
LITRES						
25	3.5	6.5	13.7	4.7	10.3	8.3
50	7.0	12.9	27.5	9.5	20.6	16.5
75	10.5	19.4	41.3	14.2	30.9	24.8
100	14.0	25.9	55.1	19.0	41.2	33.1
125	17.5	32.4	68.9	23.7	51.5	41.3
150	21.0	38.8	82.6	28.5	61.8	49.6
175	24.5	45.3	96.4	33.2	72.1	57.9
200	28.0	51.8	110.2	38.0	82.4	66.2
For syst. volumes other than those given above, mult. the syst. volume by the factor across	0.140	0.259	0.551	0.190	0.412	0.33

4. INSTALLATION

4.1 Unpacking

The appliance is delivered in 2 cartons.

- 4.1.1 The large carton contains the boiler, and the Installation/Serviceing and Users Instructions.
- 4.1.2 The second carton contains the wall fixing bolts (x2), flue assembly, and boiler bend, gas cock and 3/4" x 1/2" bush.

4.2 Wall mounting

After selecting a suitable place for the boiler, mark location for fixing holes. Using 8 mm drill, drill 60 mm deep holes to accept fixing bolts and insert. Tighten nuts until secure, then remove nuts leaving studs protruding, hang boiler and refits nuts to secure.

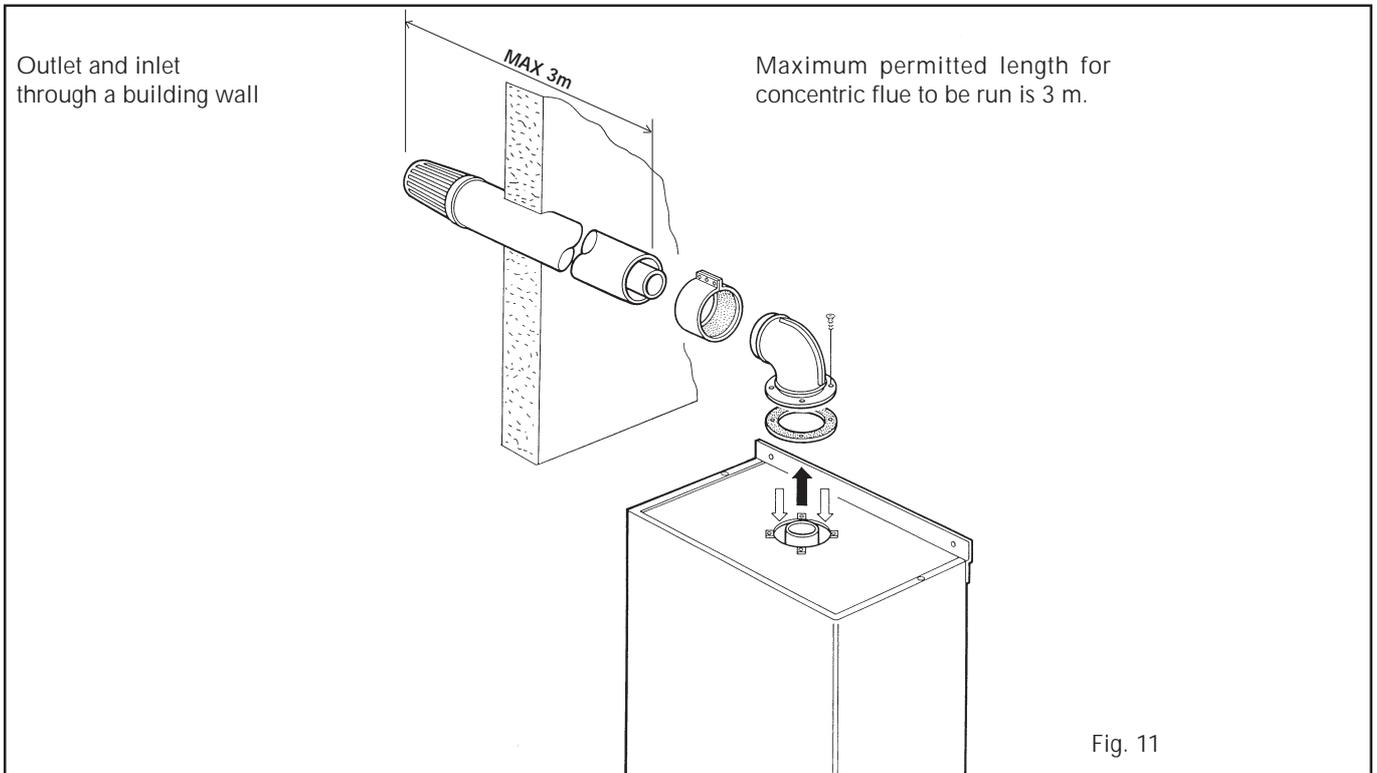


Fig. 10

4.3 Preparing the flue assembly

The boiler is supplied with 0.75 m of concentric flue which can be run from either side or to the back of the appliance. If a longer flue is required 2 m and 3 m lengths are available.

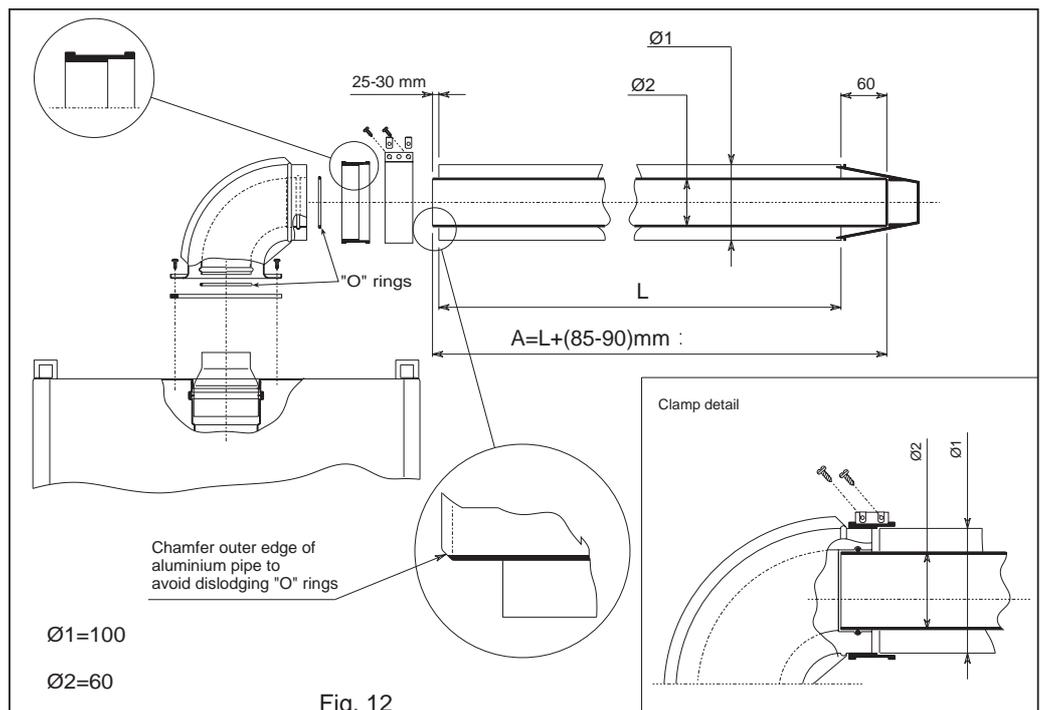
An example of using the concentric flue.



Flue connection

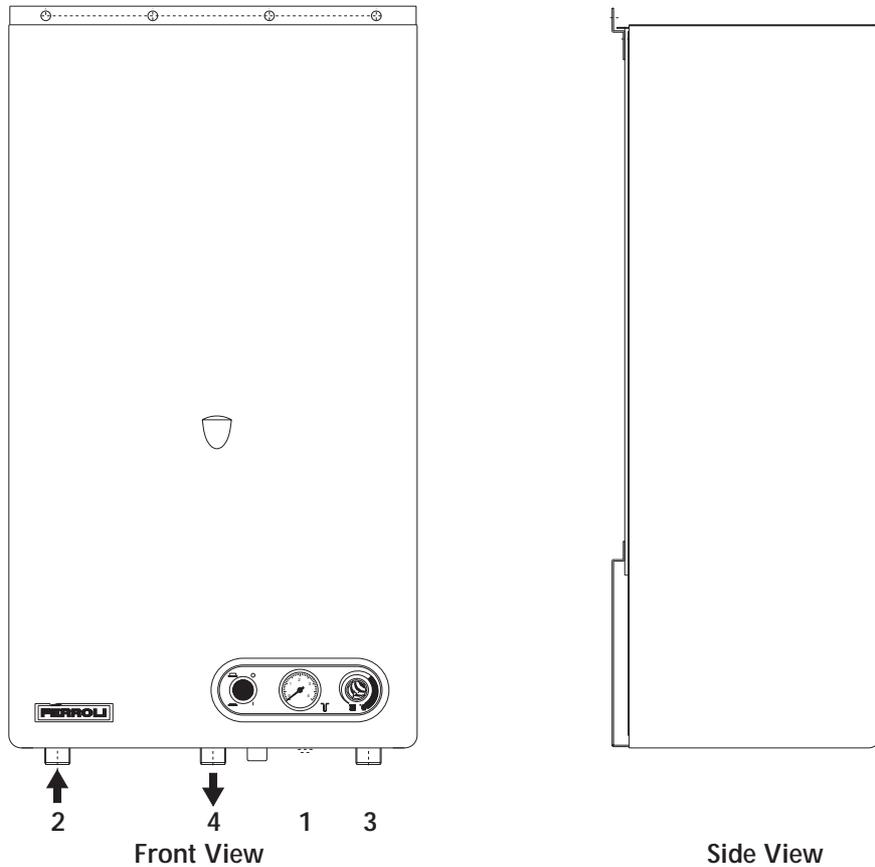
Drawing below shows how concentric flue should be assembled - the main points being:

1. Inner flue pipe (aluminium) needs to be 85 - 90 mm longer than plastic air intake pipe
2. The air intake (plastic) pipe only butts to the elbow
3. Care must be taken not to dislodge "O" rings



5. Boiler connections

Gas, Water and Electrical



- | | |
|---------------------------------|-------------|
| 1. Outlet pressure relief valve | 1/2" FEMALE |
| 2. Return | 3/4" MALE |
| 3. Gas Service Cock Connection | 1/2" FEMALE |
| 4. Flow | 3/4" MALE |

5.1 Gas supply

1. Further guidance: BS 6891, BS 6798, Gas Safety (Installation and Use) Regulations 1994.
2. Ensure the supply pipe, the gas meter and existing or new pipework will serve the maximum gas rate of all the appliance served by that meter.
3. An inlet working pressure of 20 mbar will be required at the boiler.
4. Always test for soundness of gas supply pipes in accordance with BS 6891.

5.2 Pressure relief valve

Connect the pressure relief valve discharge pipe (1/2") to the outside of the building, where possible over a drain. The discharge must be such that it will not be hazardous to occupants or passers - by or cause damage to external electrical components or wiring. The pipe should be directed towards the wall.

6. ELECTRICAL SUPPLY AND CONNECTIONS

All electrical installation work must be carried out by a qualified electrician, and all work shall be in accordance with the current issue of the IEE wiring regulations.

Supplied for use on 230 V ~ 50 Hz supply, protected by a 3 Amp fuse.

The boiler must be earthed.

The method of connection to the mains supply must allow complete isolation from that supply either by:

a) Use of 3 A fused double pole switch having a contact separation of at least 3 mm. Such a switch must supply the appliance and immediate control circuits **only** (eg room thermostat, programmer etc.)

OR

b) Use of an unswitched shuttered socket outlet and 3 A fused 3 pin plug both complying with BS 1363. All external cables must be suitable for mains voltage and should be PVC insulated cable at least 0.75 mm² (24/0.2 mm), to BS 6500.

All external circuits for the control of the boiler must be wired and isolated from the same isolator as that which serves the boiler.

6.1 Electrical connection

1. The **TEMPRA** boiler requires a permanent live supply to the appliance (live, neutral and earth) together with a switched line from the system controls to operate the burner.
2. When using external controls remove link wire between terminals 4 -5.
3. Run live connection from terminal 4 to external switch controls and return switch line into terminal 5.

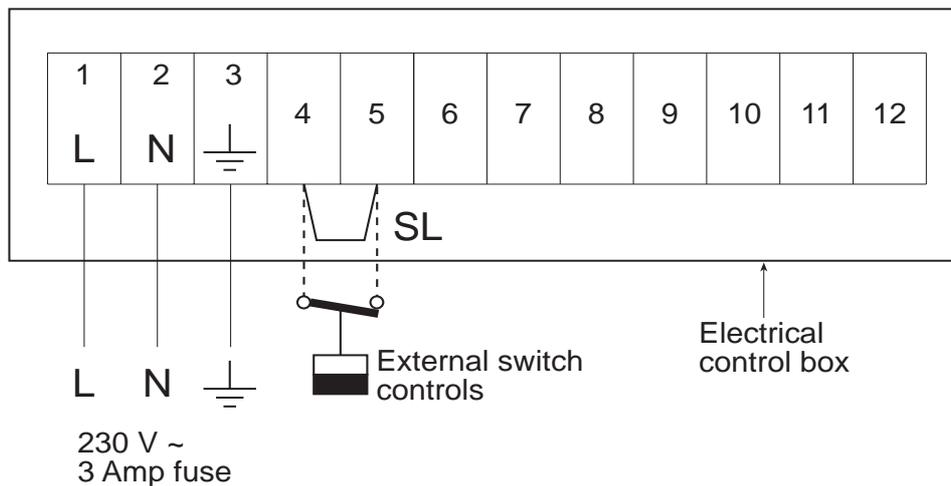
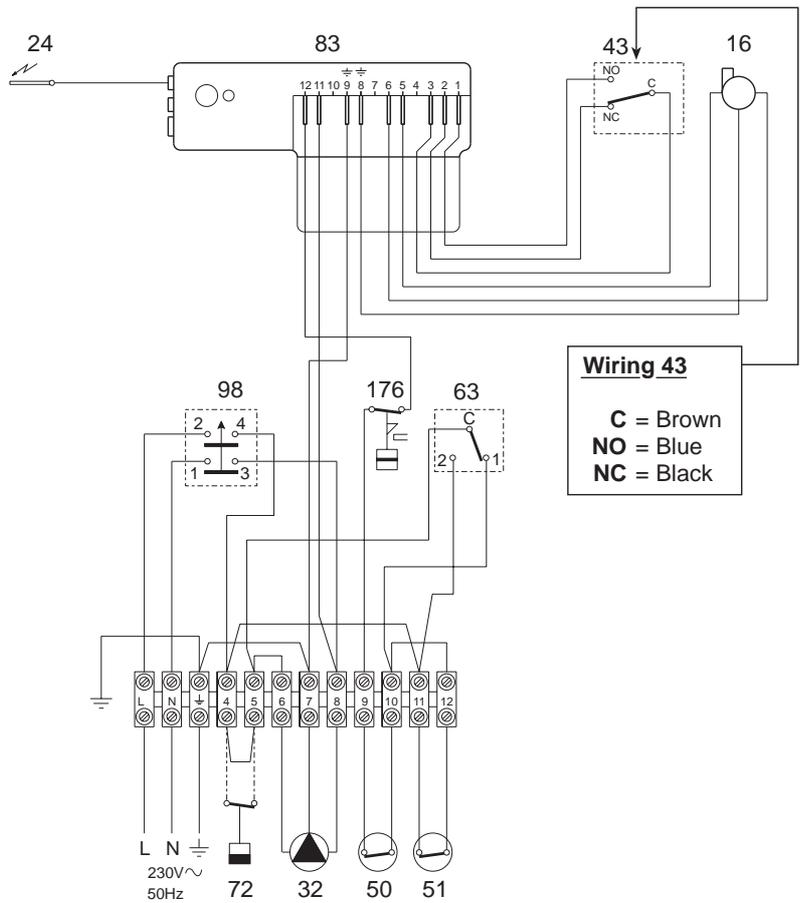


Fig. 18

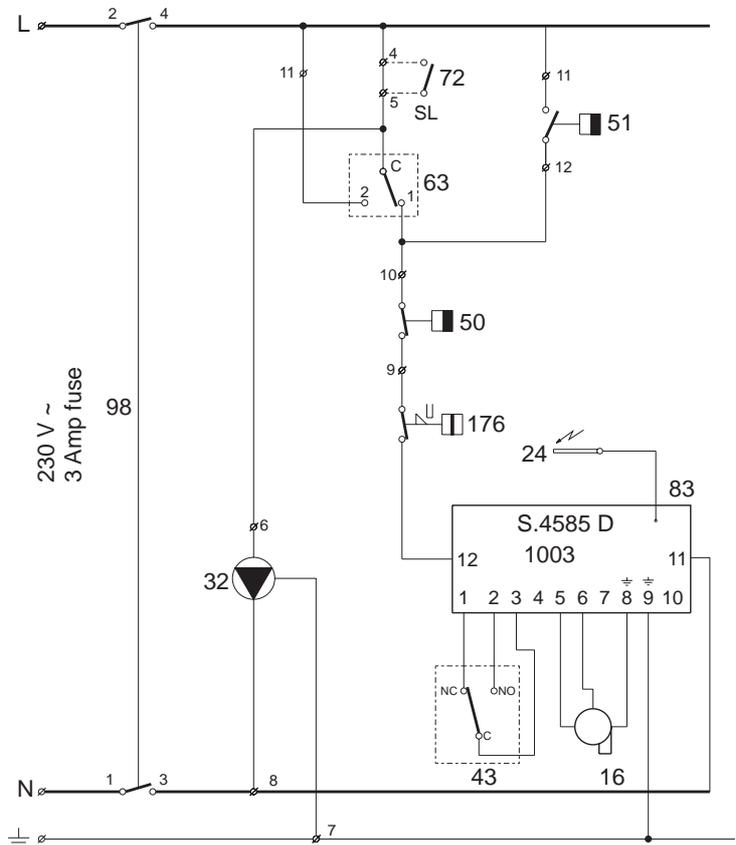
WARNING: If external controls are fitted to the system, check terminals 1, 2, 4, and 5 to ensure they are voltage free prior to working on the boiler.

6.2 Electrical connections diagram



- 16. Fan
- 24. Spark electrode
- 32. Central heating pump
- 43. Air pressure switch
- 50. Central heating limit thermostat
- 51. Central heating frost thermostat
- 63. C.H. boiler thermostat
- 72. External controls
- 83. Full sequence automatic control
- 98. Switch
- 176. Overheat CUT-OFF thermostat

6.3 General wiring diagram



- 16. Fan
- 24. Spark electrode
- 32. Central heating pump
- 43. Air pressure switch
- 50. Central heating limit thermostat
- 51. Central heating frost thermostat
- 63. C.H. boiler thermostat
- 72. External controls
- 83. Full sequence automatic control
- 98. Switch
- 176. Overheat CUT-OFF thermostat

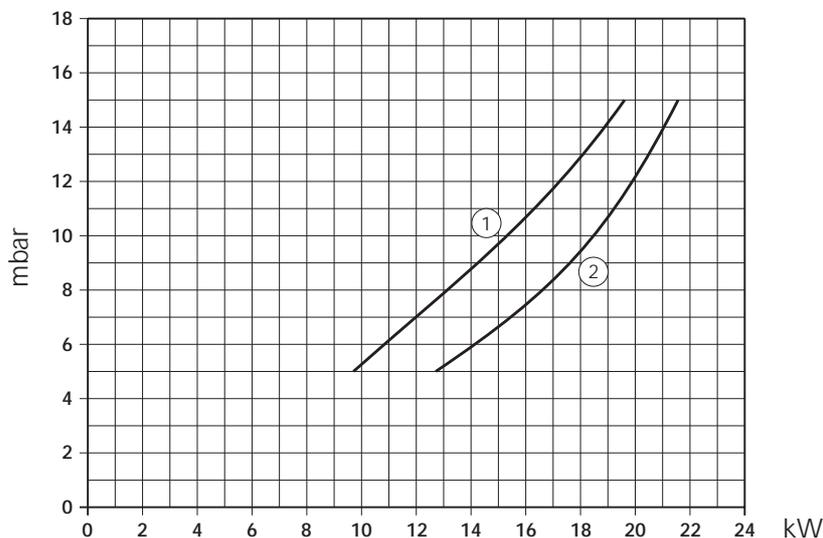
15. Commissioning

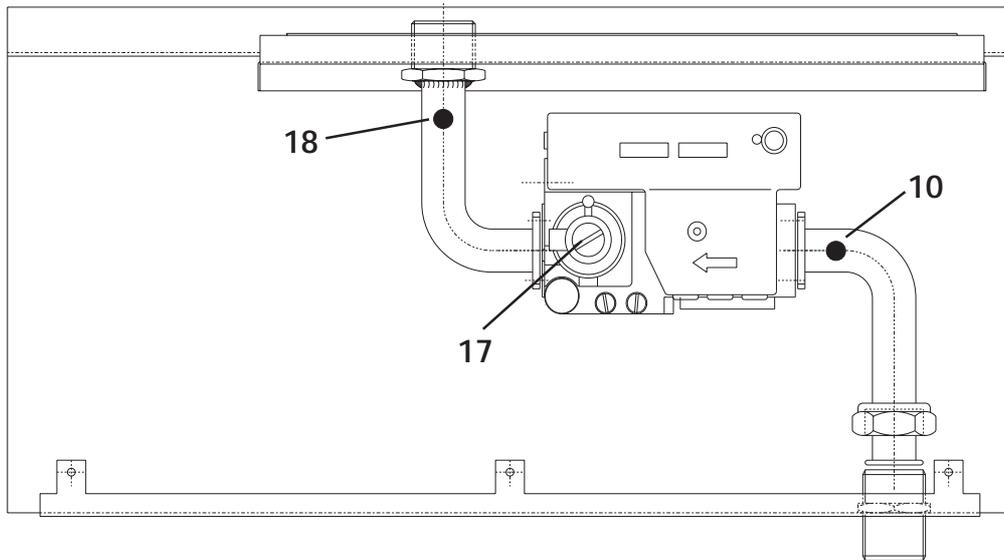
Carry out preliminary electrical system checks i.e. EARTH CONTINUITY, RESISTANCE TO EARTH, SHORT CIRCUIT AND POLARITY using a suitable test meter.

1. Remove the outer case and lower cover.
2. Test for gas soundness up to the boiler service cock - BS 6891.
3. Flush the system cold, without the boiler in circuit.
4. Fill the complete circuit and vent the system, fill to about a=1.5 bar at this stage.
5. Check the system for water soundness, rectifying any leaks.
6. Reduce the pressure to the approximate initial design pressure.
7. Open all radiator valves.
8. Loosen the screw within the pressure test point on the burner supply pipe and attach a suitable pressure gauge.
9. Open the boiler service cock.
10. Open all doors and windows, loosen the screw in the inlet pressure test point, and purge the gas supply BS 6891. Retighten the screw. Allow gas to disperse.
11. Set any external control to an **ON** condition, and turn the thermostat knob to maximum.
12. Turn on the electricity supply. Check that the pump runs.
13. A continuous spark will light the pilot (viewed through window) and the main burner.
14. Heat Input Adjustment. The Input is pre-set to 16.7 kW but can be adjusted to any value in the range quoted in Technical Data - the burner pressure must always be checked anyway. Remove the cap from the adjustment screw.

CH	② HEAT INPUT (Gross) kW	BURNER PRESSURE mbar	CH set to	① HEAT OUTPUT kW
MAX	21.6	15	—	17.6
MED	16.7	8	—	13
MIN	12.8	5	—	9.7

Burner pressure to C.H. Heat Output ① / Heat Input ②





Key

- 10. Inlet pressure test point
- 17. Adjustment screw burner pressure (turn clockwise to increase pressure)
- 18. Burner pressure test point

- 15. After 10 minutes, adjust the heat input to the required value. (Anticlockwise to decrease).
Replace the cap.
- 16. **NOTE** - If the required pressure cannot be obtained, the inlet working pressure should be checked (20 mbar is required with burner on!)
- 17. Allow the system to reach heated equilibrium. On sealed systems check that the pressure does not exceed 2.6 bar (in which case a larger expansion vessel will be needed).
- 18. Turn off burner.
- 19. Flush the system whilst hot, and refill.
- 20. Remove the pressure gauge, tighten the screw.
- 21. Relight and check for gas soundness.
- 22. Mark the Data Badge to indicate the set heat input.
- 23. Replace the lower cover and outer case.
- 24. Adjust the thermostat control knob to the required setting.
- 25. Hand over to the user:
 - a) Explain the function and control of the boiler, including any external controls.
 - b) Advise against obstruction of purpose provided ventilation, and of the flue terminal.
 - c) Give advice on frost protection of parts.
 - d) Advise arrangement of an annual Service Contract.
 - e) Hand all Instructions and literature to the user.

Phone numbers:

Installer _____

Service Engineer _____

**BECAUSE OF OUR CONSTANT ENDEAVOUR FOR IMPROVEMENT DETAILS
MAY VARY SLIGHTLY FROM THOSE QUOTED IN THESE INSTRUCTIONS.**



ALL SPECIFICATIONS SUBJECT TO CHANGE

**Lichfield Road, Branston Industrial Estate, Burton Upon Trent, Staffordshire DE14 3HD
Tel. 08707 282 885 - Fax 08707 282 886**
