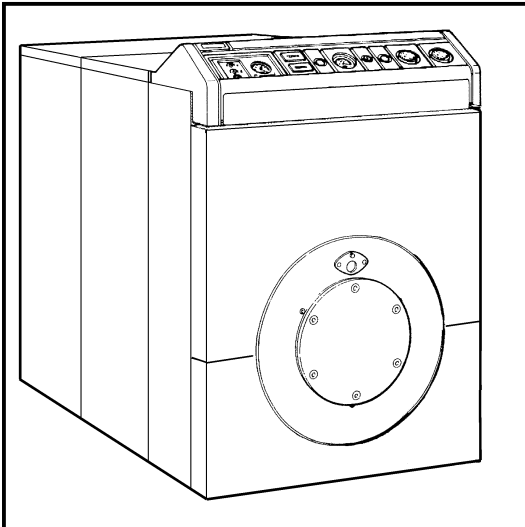


# Instructions for installation and operation



## GN4

**HIGH PERFORMANCE  
CAST IRON BOILER**

**FOR LIQUID and/or  
GASEOUS FUELS**





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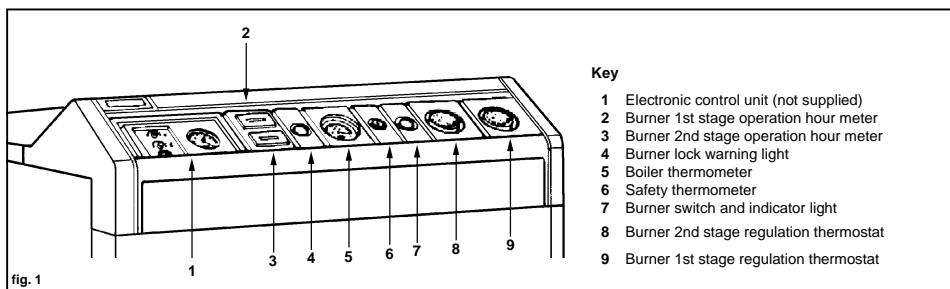
## GENERAL

### Description

The **GN4** boiler is a new high performance heat generator designed to produce hot water for central heating systems, operating with either liquid fuel and/or gas burners.

The boiler body consists of cast iron elements assembled with steel cone inserts and tie rods. Particular attention has been paid to the profile with optimum division of the fins ensuring high thermal efficiency and considerable energy savings.

The boiler is insulated with a thick layer of rock wool to minimise heat loss.

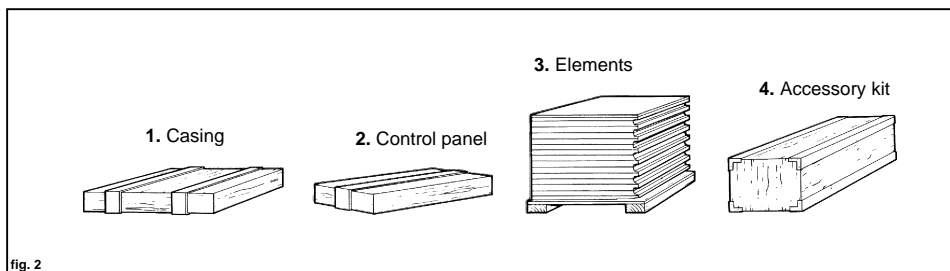


### Packaging (ill. 2)

The **GN4** boiler is split into four packages as follows:

1. Casing
2. Control panel
3. Elements making up the boiler body
4. Accessory kit for assembling the elements

**N.B.** The tools for assembly of the elements are available from your area agent.



## CHARACTERISTICS

### Technical specifications (ill. 3)

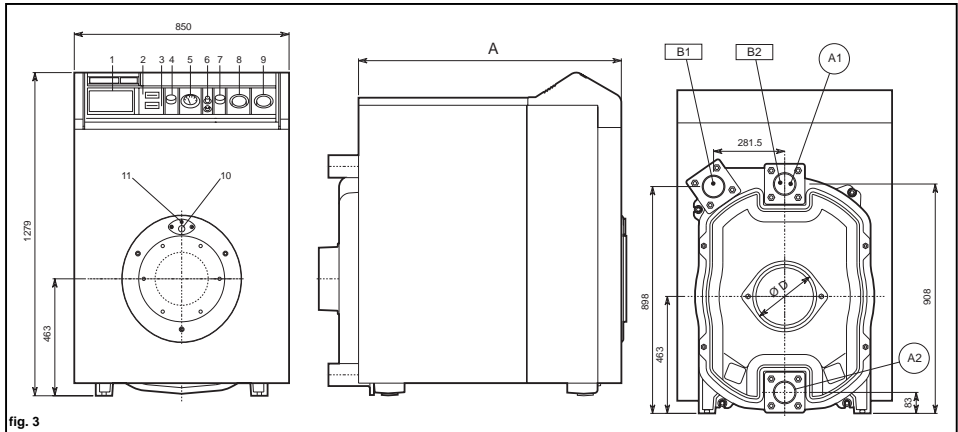


fig. 3

**Key**

- |  |   |  |
|--|---|--|
| <ol style="list-style-type: none"> <li>1. Electronic control unit (optional)</li> <li>2. Burner 1st stage operation hour meter</li> <li>3. Burner 2nd stage operation hour meter</li> <li>4. Burner lock warning light</li> <li>5. Boiler thermometer</li> </ol> | <ol style="list-style-type: none"> <li>6. Safety thermostat</li> <li>7. Burner switch and indicator light</li> <li>8. Burner 2nd stage regulation thermostat</li> <li>9. Burner 1st stage regulation thermostat</li> <li>10. Pressure inlet fitting in combustion chamber</li> <li>11. Inspection window for flame control</li> </ol> | <ol style="list-style-type: none"> <li>A1. Central heating flow outlet DN 80 - 3" gas</li> <li>A2. Central heating return inlet DN 80 - 3" gas</li> <li>B1. Low temperature central heating flow outlet DN 80 - 3" gas</li> <li>B2. Low temperature central heating return inlet DN 80 - 3" gas</li> </ol> |
|--|---|--|

Model	Delivered heat output		heat output		N° elements	Water content dm <sup>3</sup>	Length of combustion chamber L mm	Dimensions of combustion chamber Ø mm
	Max.	Min.	Max.	Min.				
GN4.07/200	200	120	217	128	7	143	880	500
GN4.08/250	250	150	270	160	8	163	1010	500
GN4.09/300	300	180	324	192	9	183	1140	500
GN4.10/360	360	215	388	229	10	203	1270	500
GN4.11/420	420	250	452	266	11	223	1400	500
GN4.12/480	480	290	516	309	12	243	1530	500
GN4.13/560	560	330	600	352	13	263	1660	500
GN4.14/650	650	390	695	416	14	283	1790	500

Model	Operating pressure	A mm	D Ø	Combustion chamber pressure drop Δp mbar	Water pressure drop Δp mbar Δt 20°	Body weight kg.
	bar					
GN4.07/200	4	1040	180	0,5	20	840
GN4.08/250	4	1170	180	0,8	30	950
GN4.09/300	4	1300	250	0,7	42	1060
GN4.10/360	4	1430	250	1,0	54	1170
GN4.11/420	4	1560	250	1,4	65	1280
GN4.12/480	4	1690	250	1,7	77	1390
GN4.13/560	4	1820	250	2,6	88	1500
GN4.14/650	4	1950	250	3,5	100	1610

**Casing (ill. 4)**

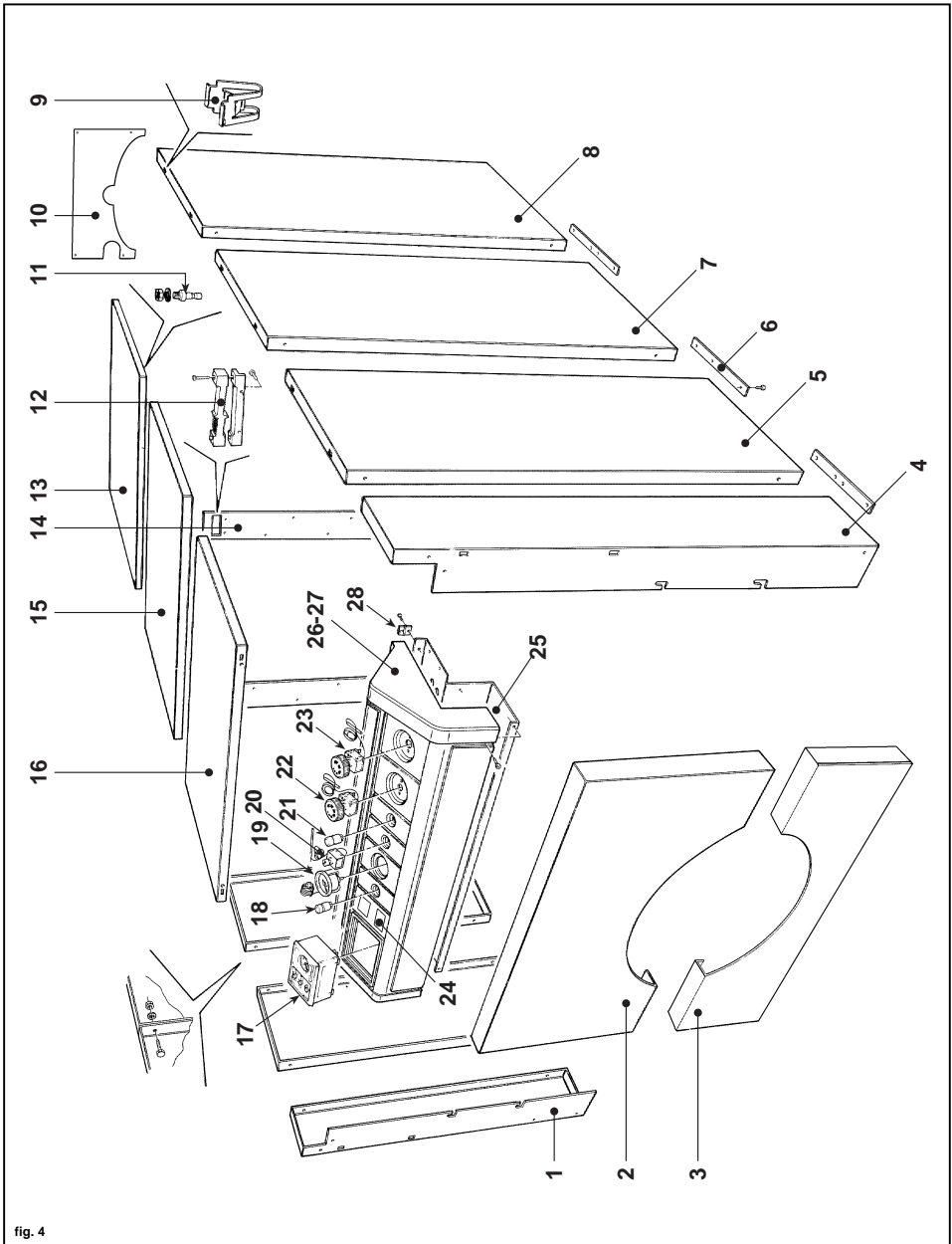


fig. 4

1	3703465/0	Front left side panel, complete
2	3703466/0	Top front panel, complete
3	3703467/0	Bottom front panel, complete
4	3703464/0	Front right side panel, complete
5	3702759/0	Type 1 sectional side panel, complete
6	3120747/0	Bracket, side panel fixing
7	3702760/0	Type 2 sectional side panel, complete
8	3702761/0	Type 3 sectional side panel, complete
9	3100021/0	Pin coupling spring
10	3114204/0	Casing rear wall
11	3400064/0	Coupling pin
12	3650363/1	Dual cable clamp
13	3702766/0	Type 3 complete sectional cover
14	3114203/0	Casing support rear plate
15	3702765/0	Type 2 complete sectional cover
16	3702764/0	Type 1 complete sectional cover
17	3500338/0	Screen-printed plug
18	3620039/0	Red pilot light
19	3645001/0	Thermometer 0-120 °C
20	3640145/0	Safety thermometer
21	3610020/0	Unipolar switch
22	3670128/0	Complete knob for thermostat
23	3640121/0	Regulating thermostat
24	3650480/0	Clock
25	3120752/0	Wiring support plate
26	3820090/0	Control panel
27	3850485/2	Wiring
28	3410044/2	Hinge

**Boiler body (ill. 5)**

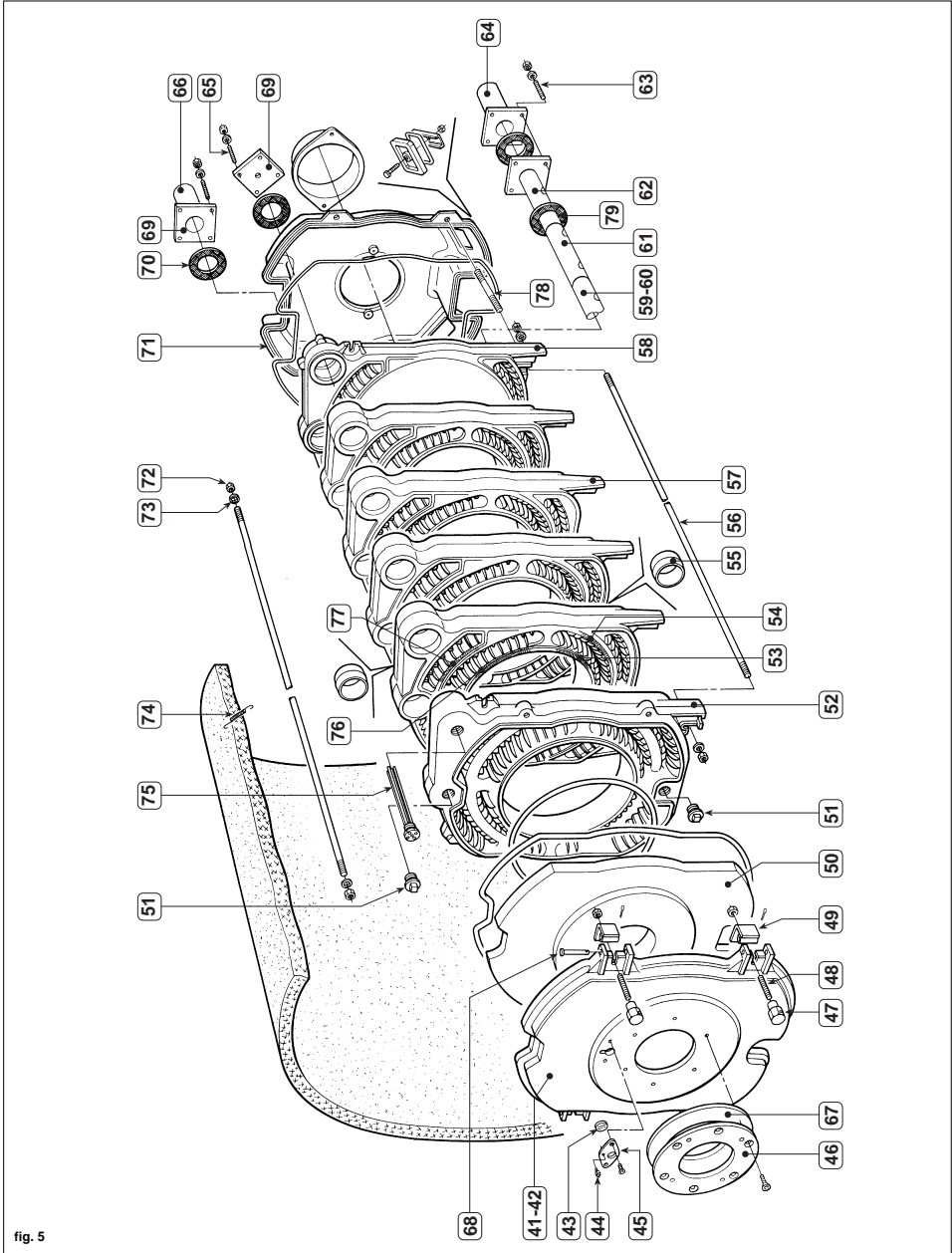
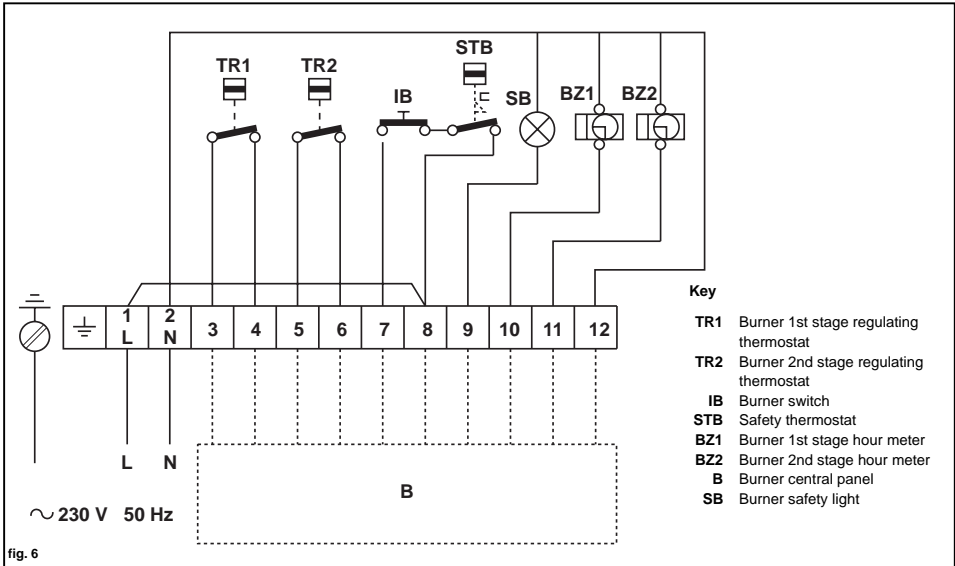


fig. 5

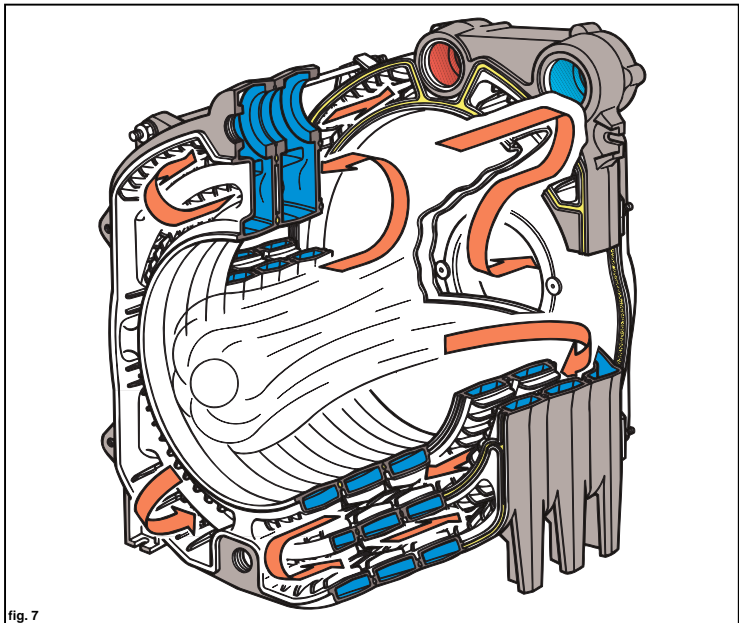


41	3320252/0	Boiler burner door, finished
42	3800703/0	Burner door, complete
43	3535293/0	Mica disk Ø44 - Thickness 0.5
44	3340028/0	Pressure test point
45	3400885/0	Inspection window flange
46	3215253/0	Flange Ø340 - thickness 12
47	3401067/1	Door handle
48	3450582/0	Stud bolt M16x76
49	3410059/0	Boiler door hinge
50	3532088/0	Burner holder insulation
51	3360132/0	Plug
52	3300568/0	Front element, finished
53	3532086/0	Fibre piece 8x1600
54	3532085/0	Fibre piece 8x825
55	3420508/0	Cone insert
56a	3440339/0	Tie rod M16x910
56b	3440340/0	Tie rod M16x1040
56c	3440341/0	Tie rod M16x1170
56d	3440342/0	Tie rod M16x1300
56e	3440343/0	Tie rod M16x1430
56f	3440344/0	Tie rod M16x1560
56g	3440345/0	Tie rod M16x1690
56h	3440346/0	Tie rod M16x1820
57	3300569/0	Intermediate element, finished
58	3300570/0	Rear element, finished
59	3840761/0	Rear diffuser pipework L 352.5
60	3840762/0	Rear diffuser pipework L 482.5
61	3422406/0	Intermediate diffuser pipe
62	3840760/0	Front diffuser pipework
63	3450336/0	Stud bolt M16x75
64	3844366/1	Flanged pipe L 180
65	3450312/0	Stud bolt M16x65
66	3844763/1	Flanged pipe with knob
67	3535291/0	Gasket
68	3450584/0	Plug
69	3401156/0	Blind flange
70	3510018/0	Gasket Øe 133 - Øi 90 - Thickness 4
71	3310089/0	Smokebox
72	3450493/0	Thick nut M16
73	3450494/0	Spring MDE 34x16.3x2
74	3430022/0	Insulating fixing spring
75	3340081/1	Sheath 1" 1/4x235
76	3532084/0	Fibre piece 8x740
77	3532087/0	Fibre piece 8x2730
78	3450583/0	Threaded bar M12x130
79	3370086/0	Gasket

**Wiring diagram (ill. 6)**



**Flue gas path**



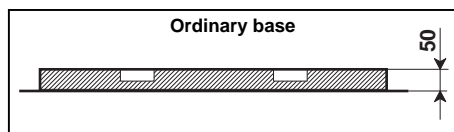
## INSTALLATION

Boiler installation must be carried out by qualified personnel only, following the manufacturer's instructions and in compliance with all relevant laws and regulations.

In particular, regulations regarding safety and the construction and location of flues should be observed.

### Base (ill. 9)

The **GN4** boiler does not require any special kind of foundation; a simple concrete base is sufficient, reinforced if necessary with metal plates to facilitate positioning of the boiler. In some cases, for special types of installation, a special acoustically insulated base may be required.



Elements	A mm	L mm
GN4.07	910	1140
GN4.08	1040	1270
GN4.09	1170	1400
GN4.10	1300	1530
GN4.11	1430	1660
GN4.12	1560	1790
GN4.13	1690	1920
GN4.14	1820	2050

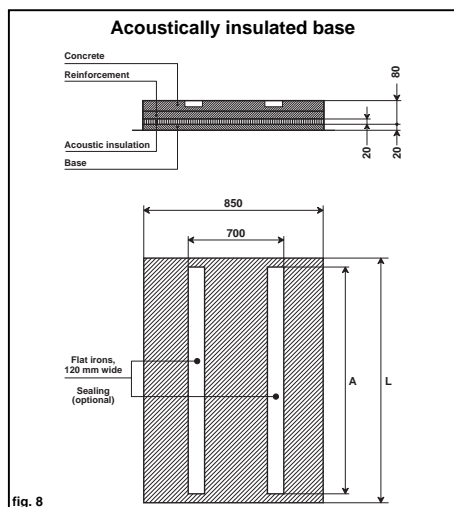
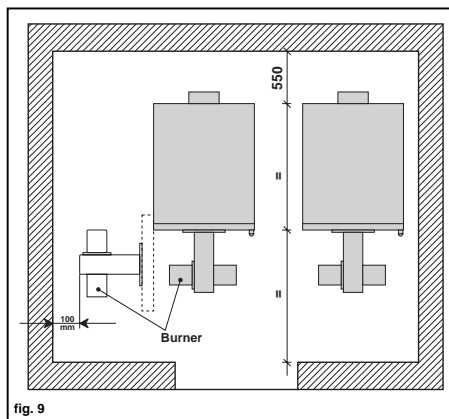


fig. 8

### Positioning the boiler (ill. 10)

When constructing the base, ensure that after assembly of the boiler with the burner on the front door, the door can open without the burner hitting the wall or another boiler. In other words, leave a space of at least 100 mm on the door-opening side.

In addition, a space equal to the length of the boiler must be left opposite the boiler so that the cylinder can be taken out of the combustion chamber.



### Electrical connection

Completion of the electrical connection between the control panel and boiler and the connections between the burner and heating system will be the responsibility of qualified installation personnel.

The boiler must be connected to an efficient earth installation.

**Ferrolì S.p.A.** declines all responsibility for injury to persons and/or damage to property caused by failure to connect the appliance to an efficient earth installation.

### Water connection

Connect the boiler water circuit according to the instructions given near each coupling and in the technical specifications.

Ensure that the pipes are not under tension. A safety valve must be fitted in the central heating circuit as near as possible to the boiler, ensuring there are no obstructions or gate valves between the valve and boiler. Pressure must be 3 bars.

The appliance is not supplied with expansion tank and installation must therefore be performed by the installer. Remember that when cold, appliance pressure should be between 0.5 and 1 bars.

**Connection to low temperature central heating system (ill. 10)**

The delivery circulation flow must be calculated with a  $\Delta t$  of between 10 °C and 30 °C.

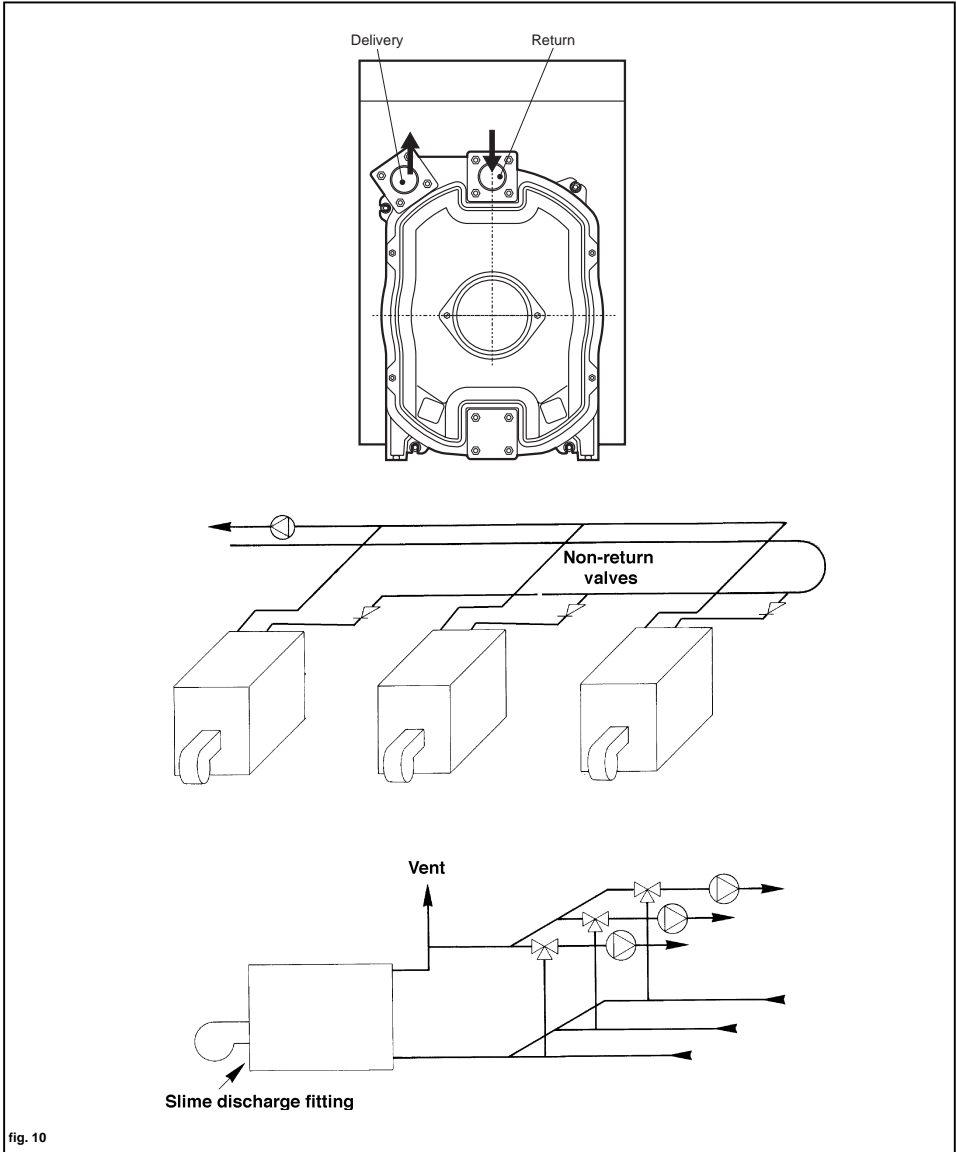


fig. 10

**Connection to traditional central heating system (ill. 11)**

A boiler recirculation pump must be fitted to prevent faulty circulation in the generators. Also, the non-return valves must be fitted upstream of the return connection.

The recirculation flow (in m<sup>3</sup>/h) must be between:

$$\frac{P}{6} \text{ and } \frac{P}{52}$$

**P** = Power of each boiler expressed in kW.

**Example:** for GN4.09 (300 kW)  
recirculation flow must be between

$$\frac{300}{6} = 50 \text{ m}^3/\text{h} \quad (13,9 \text{ l/s})$$

$$\text{and } \frac{300}{52} = 5,8 \text{ m}^3/\text{h} \quad (1,6 \text{ l/s})$$

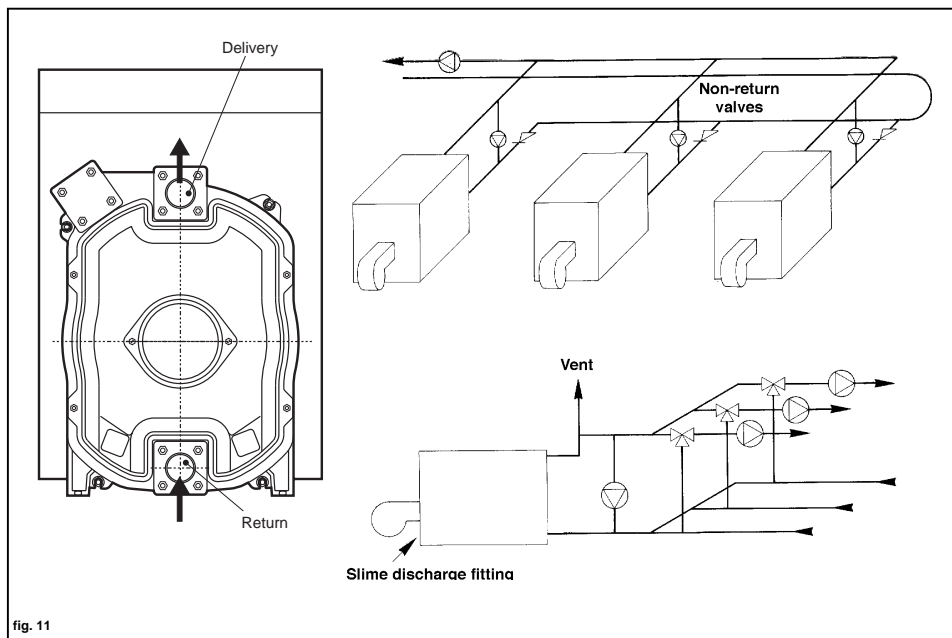


fig. 11

**Flue connections**

The boiler should be connected to an efficient flue constructed in accordance with current regulations. The pipe connecting the boiler to the flue must be made of suitable material, in other words resistant to temperature and corrosion. Particular care should be taken over joint seals, ensuring thermal insulation between boiler and flue to avoid condensation.

The burner must be connected to the recirculation pump. It will come on only if the pump is working. As an accessory, a flow control device in series with the thermostat TH can be fitted on the return to the boiler, downstream of the recirculation pump.

## ASSEMBLING THE BOILER BODY

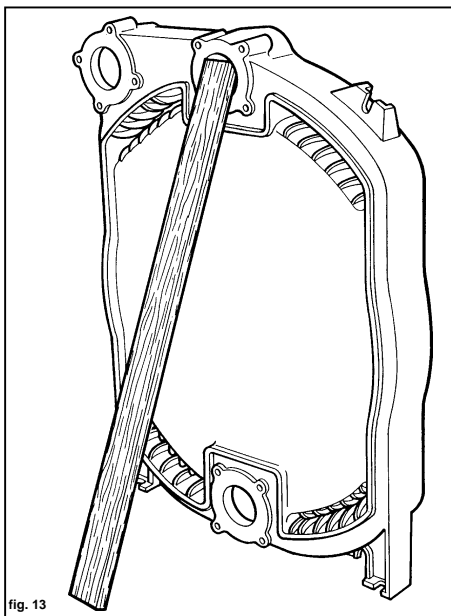


fig. 13

- 1 (fig. 13) Rest the rear element against a wooden batten, ensuring that it is stable for the whole of the assembly operations.

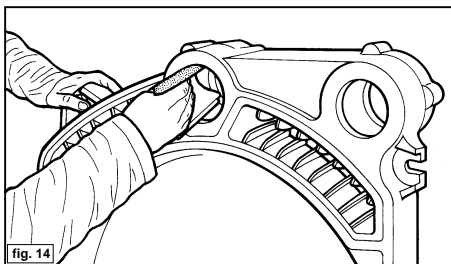


fig. 14

- 2 (fig. 14) Clean the cone insert housings with solvent for grease. Using fine sandpaper, thoroughly clean the cone insert housing on the rear element and then on all the other elements making up the boiler body in order to eliminate any rust.

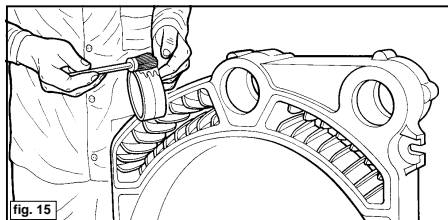


fig. 15

- 3 (fig. 15) Clean the cone inserts with solvent for grease. Using a soft brush, spread a thin layer of red lead (contained in the assembly kit) on the cone insert and its housing.

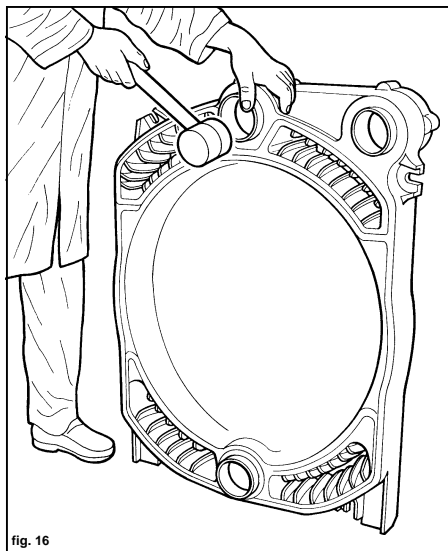


fig. 16

- 4 (fig. 16) Fit the cone insert into its housing, knocking it in with a wooden hammer.

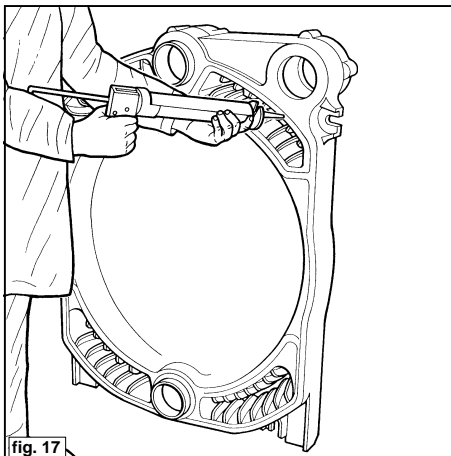


fig. 17

5 (fig. 17) Using the silicone included in the assembly kit, spread a thin strip around the sealing gasket housing (on both sides of the intermediate element).

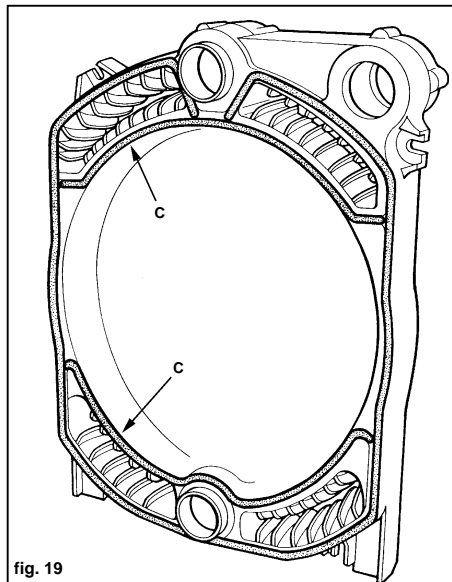


fig. 19

7 (fig. 19) Add the other two pieces C.

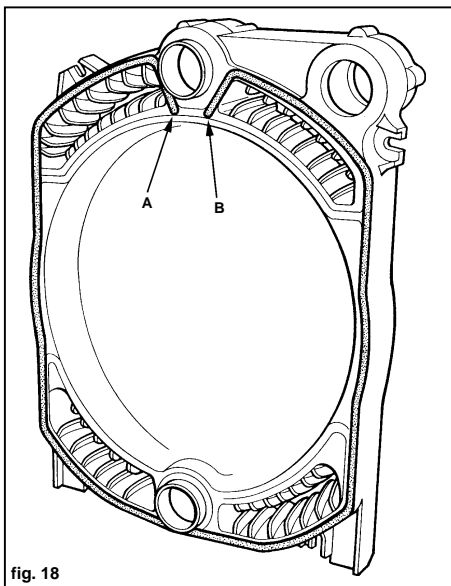


fig. 18

6 (fig. 18) Starting from point A, fit the sealing gasket in its housing. Follow the path shown until you reach point B.

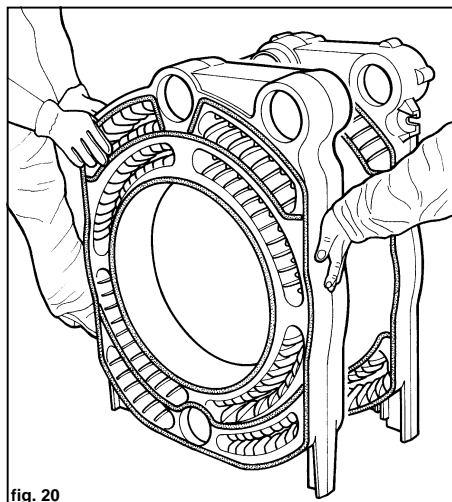


fig. 20

8 (fig. 20) Position the first intermediate element next to the rear element, after preparing it as described for the rear element (points 3 - 4 - 5 - 6 - 7).

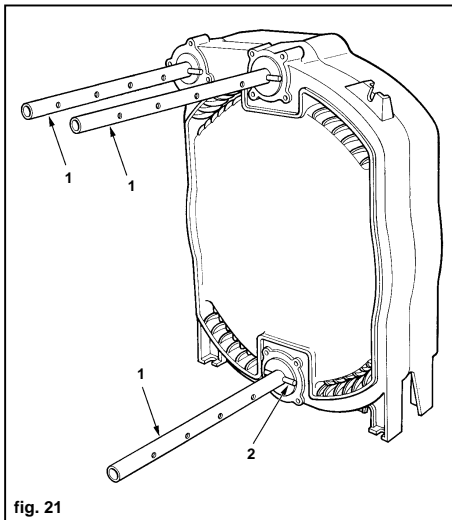


fig. 21

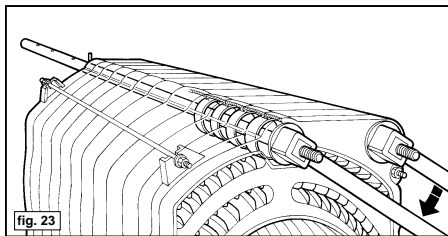


fig. 23

**9** (fig. 21-22-23) Insert the tie rod 1 between the two elements, fit the nut 3 on the threaded end, position the stop pin 2 on the tie rod hole at the end of the two elements and, by means of the spanner 4, tighten the unit until the two elements are perfectly joined.

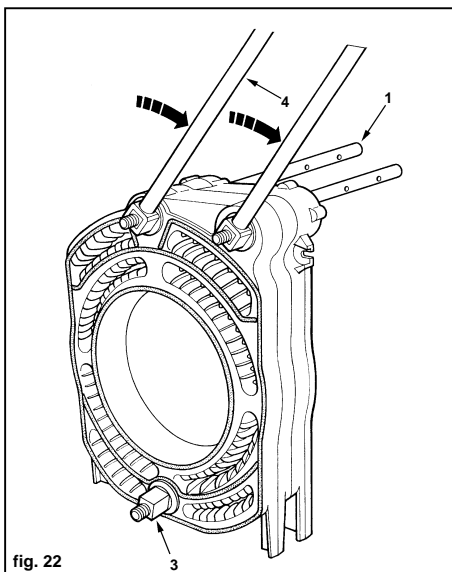


fig. 22

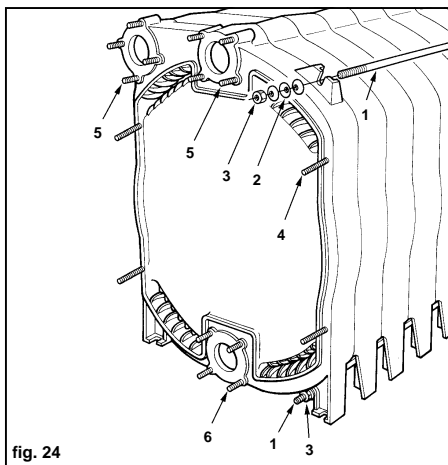


fig. 24

**10** Proceed as described in the above paragraph until all the body elements have been fitted.

**11** (fig. 24-25) Fit the four tie rods "1", the six Belleville washers "2" in the rear part of the boiler body and then tighten the nuts "3".

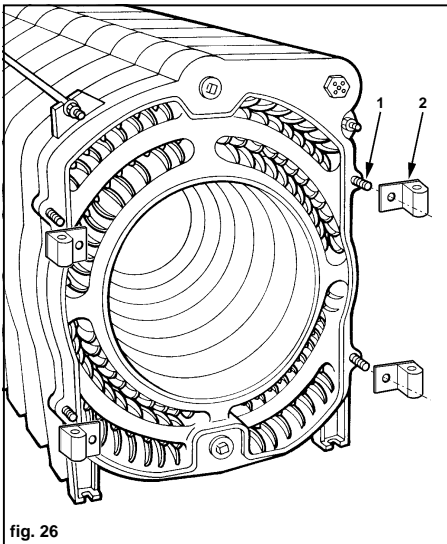
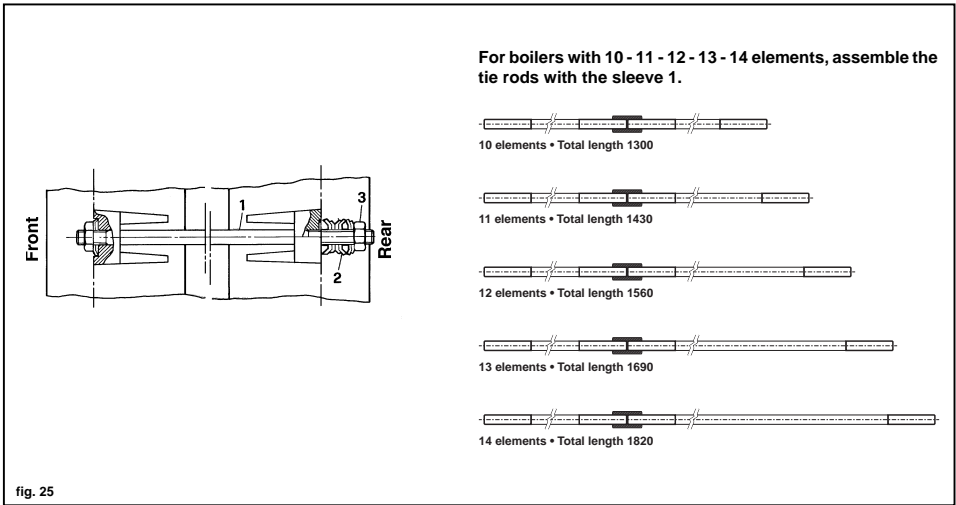
**12** (fig. 24) Fit the following on the rear side of the boiler body:

- The four stud bolts "4" (M12x130) of the smokebox.
- The four stud bolts "5" (M 16x65) of the upper flange.
- The four stud bolts "6" (M16x75) of the lower flange.

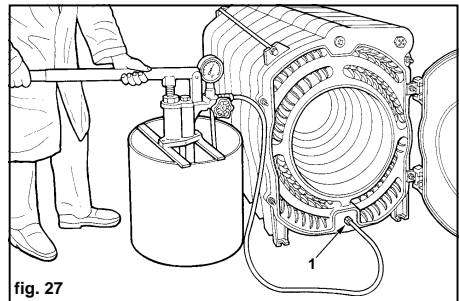
**Fitting the tie rods with the Belleville spring washers (fig. 25).**

**N.B.:** The washers must be fitted as shown in the drawing (opposed) and the nuts must not be tightened too hard in order not to squash the washers.





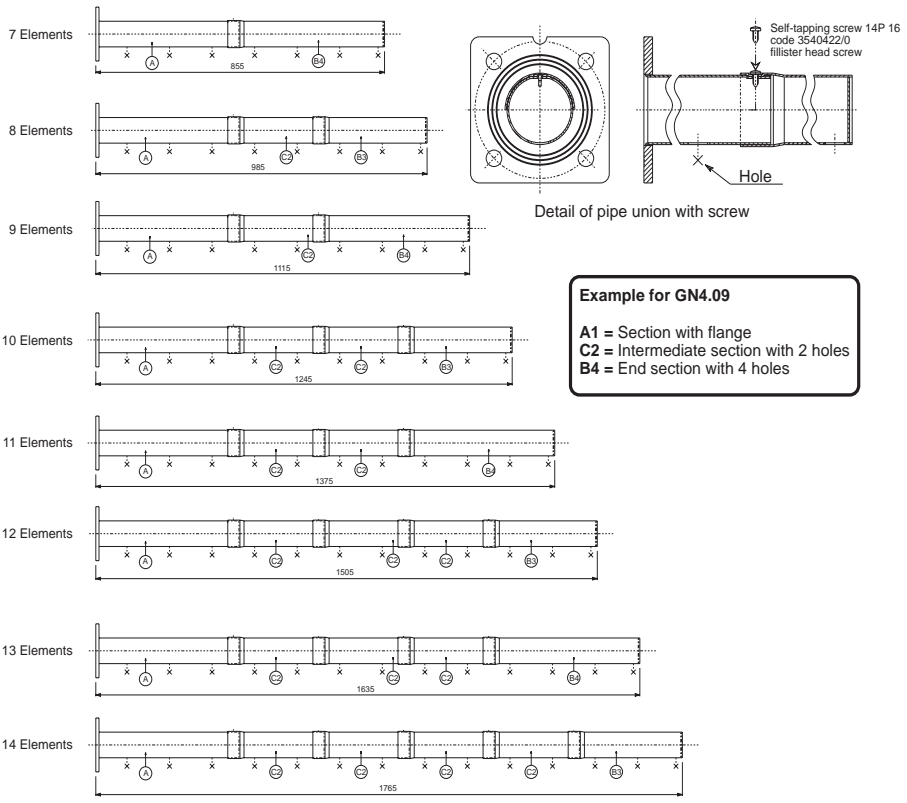
13 (fig. 26) Fit the four stud bolts 1 with hinges 2 on the front side of the boiler body.



14 (fig. 27) Connect the pump to fitting 1 and let water in at a pressure of 8 bars. Wait a few minutes before checking for leaks. Check that the flue gas seal between the elements is correct.

**Ferrolì S.p.A** accepts no liability for damage to property or injuries to persons caused by leaks of water and flue gas from the boiler due to assembly errors or inaccurate seal checks.

**Composition of water diffuser pipe**



Pipes	7 Elem.	8 Elem.	9 Elem.	10 Elem.	11 Elem.	12 Elem.	13 Elem.	14 Elem.
<b>A</b> (cod. 384 )	1	1	1	1	1	1	1	1
<b>C2</b> (cod. 384 )	---	1	1	2	2	3	3	4
<b>B3</b> (cod. 384 )	---	1	---	1	---	1	---	1
<b>B4</b> (cod. 384 )	1	---	1	---	1	---	1	---
Self-tapping screw 14Px16 code 3540422/0 fillister head screw	1	2	2	3	3	4	4	5

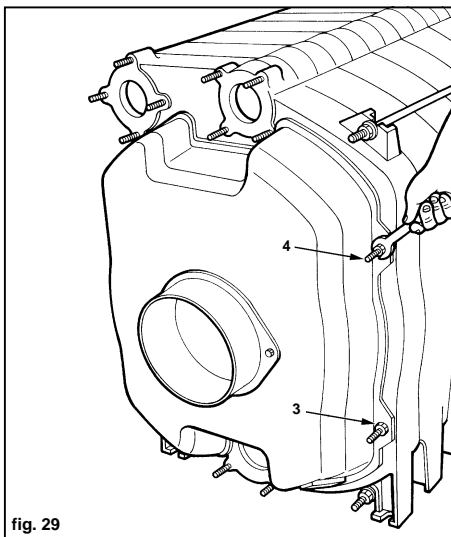


fig. 29

15 (fig. 29) Fit the smokebox on the four stud bolts 4, securing it with the nuts 3.

**Positioning and fitting the delivery pipe with connection to a traditional central heating system**

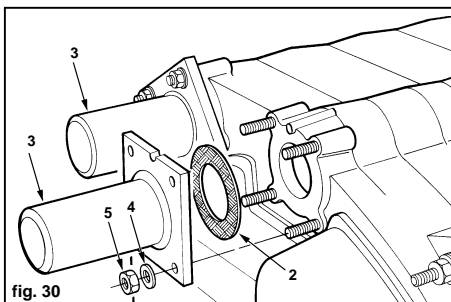


fig. 30

16 (fig. 30) Fit the flanged pipe "3" after inserting the gasket "2" and the washers "4" and then tighten with the nuts "5".

**Positioning and fitting the diffuser pipe with connection to a traditional central heating system via the lower boiler coupling (fig. 31)**

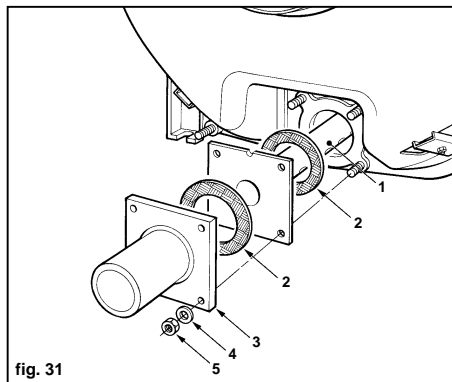


fig. 31

17 (fig. 31) Fit the diffuser pipe "1" to the lower boiler coupling in the traditional version or to the upper boiler coupling (ill. 32) in the low temperature version, if necessary in parts, inserting the gasket "2" in between.

Ensure that the notch on the flange is facing upwards and that the water holes are therefore facing downwards. Fit the second gasket "2", the flanged pipe "3" and the washers "4" and then tighten by means of the nuts "5".

**Positioning and fitting the diffuser pipe with connection to a low temperature central heating system via the upper boiler coupling (ill. 32).**

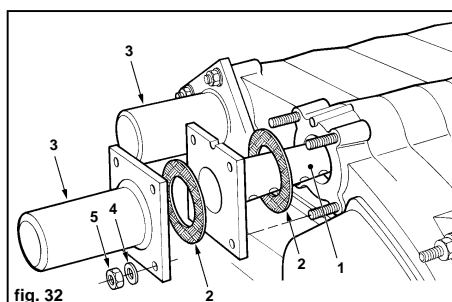
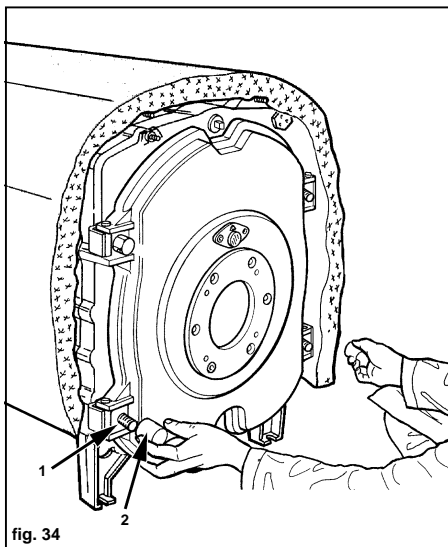
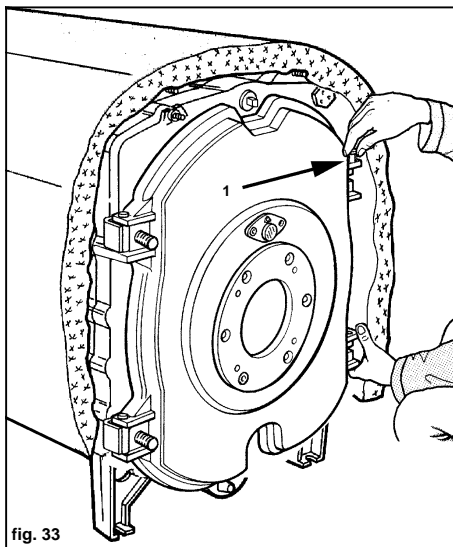


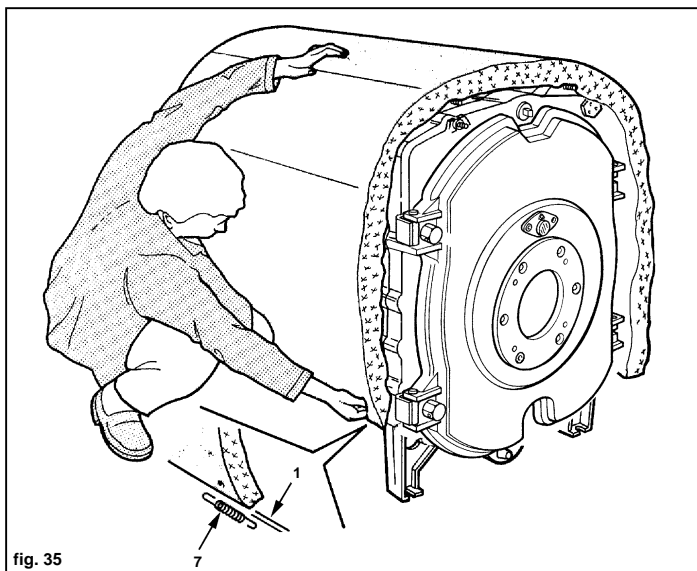
fig. 32

18 (fig. 32) Fit the diffuser pipe "1", in parts if necessary, inserting the gasket "2" in between. Ensure that the notch on the flange is facing upwards and that the water holes are therefore facing downwards. Fit the second gasket "2", the flanged pipe "3" and the washers "4" and then tighten by means of the nuts "5".



19 (fig. 33) Fit the burner door, hinging it to the supports by means of the pins "1".

20 (fig. 34) Secure the door by screwing the nuts "2" onto the stud bolts "1".



21 (fig. 35) Cover the boiler body with the sheet of rock wool provided, fixing it to the tie rods "1" (fig. 35) by means of the clips "7" included in the assembly kit.

fig. 35

## ASSEMBLING THE CASING

**22** (Ill. 36) Prepare the right and left sides, choosing the number of side panels according to the boiler dimensions.

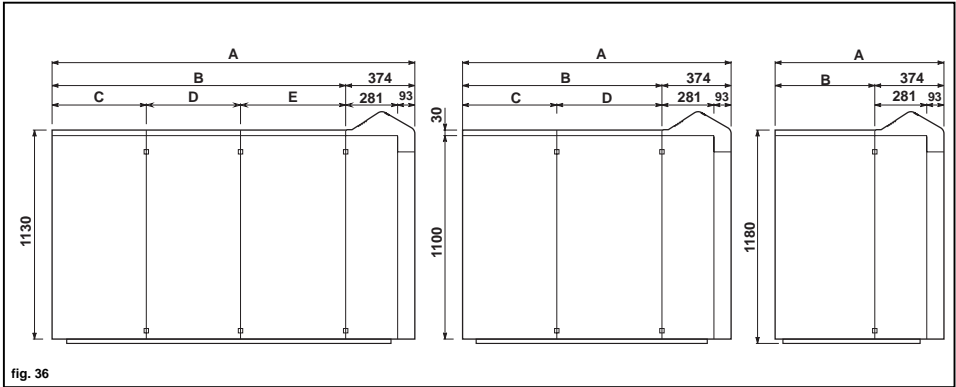


fig. 36

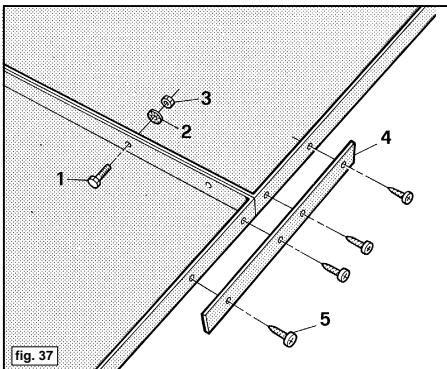


fig. 37

**23** (fig. 37) Join the panels by means of the screws 1, washers 2 and nuts 3, reinforcing them at the bottom with the metal plates 4 secured with the screws 5.

	A	B	C	D	E
7 elem.	1040	666	—	—	—
8 elem.	1186	812	406	406	—
9 elem.	1316	942	406	536	—
10 elem.	1446	1072	536	536	—
11 elem.	1576	1202	666	536	—
12 elem.	1706	1332	666	666	—
13 elem.	1852	536	536	536	406
14 elem.	1982	1608	536	536	536

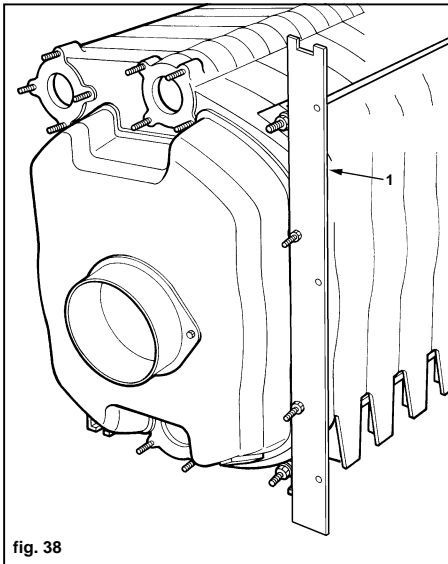


fig. 38

24 (fig. 38) Assemble the rear panels "1" on the stud bolts of the smokebox without fixing them.

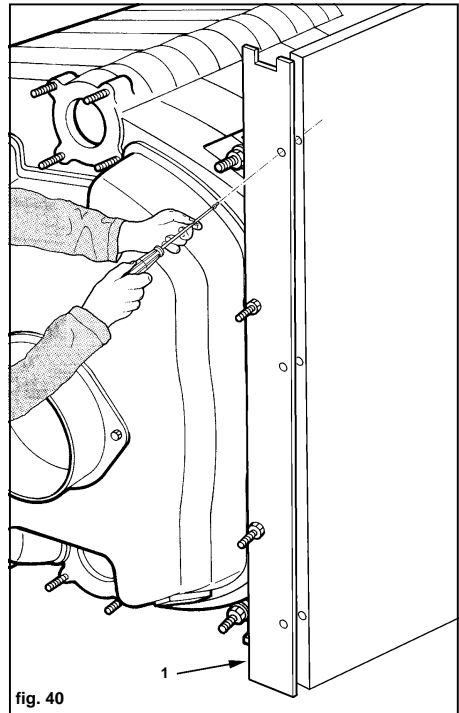


fig. 40

26 (fig. 40) Fix the side panels on the supports "1" from the rear by means of self-tapping screws.

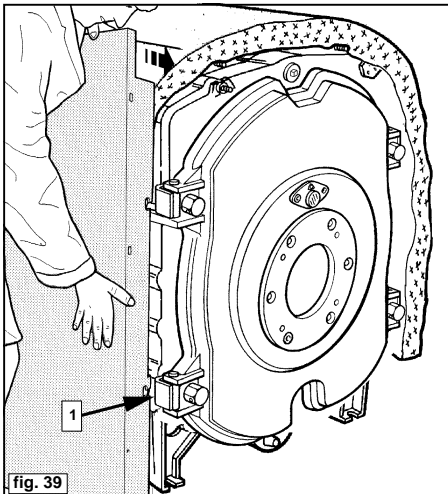


fig. 39

25 (fig. 39) Insert the complete side panels between the door hinge support 1 and the boiler body, ensuring that the slots fit into the correct position. Tighten by means of the nuts.

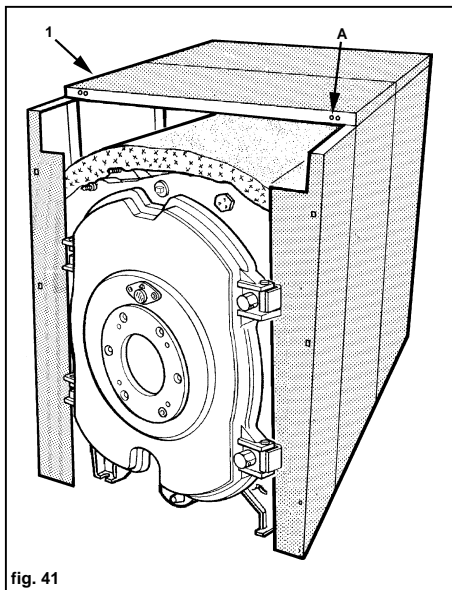


fig. 41

27 (fig. 41) Fit the top panels 1, according to the boiler dimensions, ensuring that the drain points A are facing the front of the boiler.

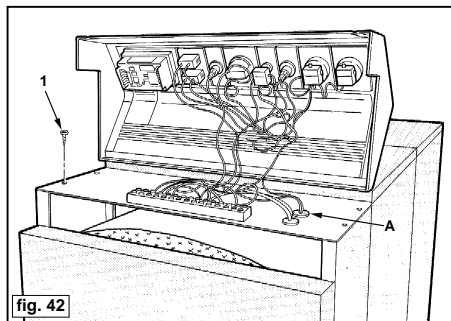


fig. 42

28 (fig. 42) Fit the instrument control panel, securing it with the four self-tapping screws 1. Pass the four capillaries (thermometer, safety thermostat and regulating thermostats) through hole A and make the electrical connections according to the diagram in fig. 6.

**N. B.** The electrical connections between burner and boiler must be made by qualified personnel.

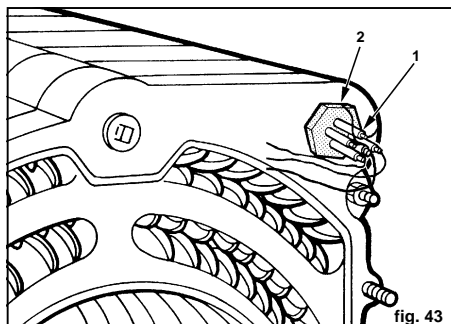


fig. 43

29 (fig. 43) Unwind the capillaries and insert the four probes "1" in the sheath "2".

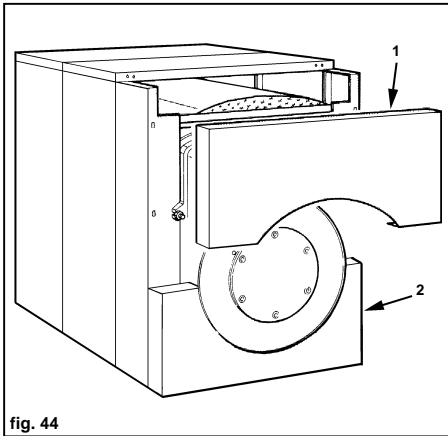


fig. 44

**30.** (fig. 44) Fit the top front panel "1" and the bottom one "2" in their housings by means of pins and springs.

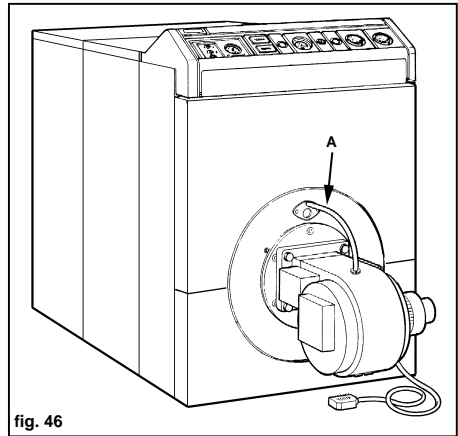


fig. 46

**32** (fig.46) Assemble the burner following the manufacturer's instructions. Connect a tube for cooling the boiler inspection window to the burner air intake (A).

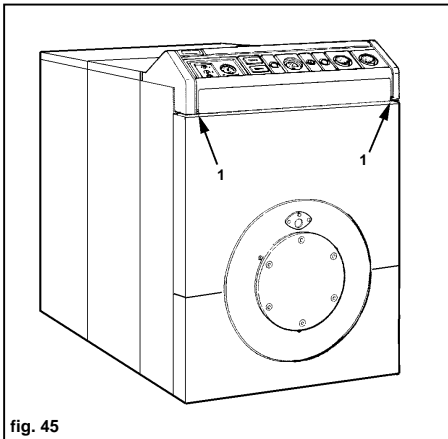


fig. 45

**31** (fig. 45) Close the instrument control panel and secure it with the two self-tapping screws "1".



## CHECKS

### Before starting up for the first time

Before starting up for the first time, it is good practice to check that:

- a) the system is filled to the right pressure and has been correctly bled;
- b) there are no water or fuel leaks;
- c) the electrical power supply is correct;
- d) the entire flue duct has been correctly laid and is not too near or does not cross inflammable parts;
- e) there are no inflammable substances near the appliance;
- f) the burner is suitable for the power of the boiler;
- g) the water cut-off valves are open.

### Burner

Oil or gas jet burners for pressurised furnaces can be used if their operating characteristics are suited to the dimensions of the boiler furnace and to its overpressure.

The burner must be chosen following the manufacturer's instructions, according to fuel consumption, pressures and the length of the combustion chamber. Twin-flame burners must have a primary flame equal to at least 50% of the rated boiler power.

Boiler efficiency and correct operation of the burner depend above all on accurate regulation.

**N.B.** Before starting up the boiler, check the burner door and smokebox seal.

## REGULATION

### Positioning the thermostats (ill. 47)

The thermostats are factory set to a minimum value of 30°C and maximum of 90°C. If you wish to alter the range, proceed as follows:

- a) Remove the thermostat knob.
- b) Dismantle the circlip 3 and the stops 1 and 2.
- c) Re-position the stops 1 and 2 in their housings numbered "X" corresponding to the required temperature range (see table).
- d) Re-fit the knob on the thermostat, ensuring that the pin 4 is positioned between the two knob stops.

Minimum value		Maximum value	
X	°C	X	°C
26	30	12	80
24	40	14	70
21	50	17	60
19	60	19	50
16	70	22	40

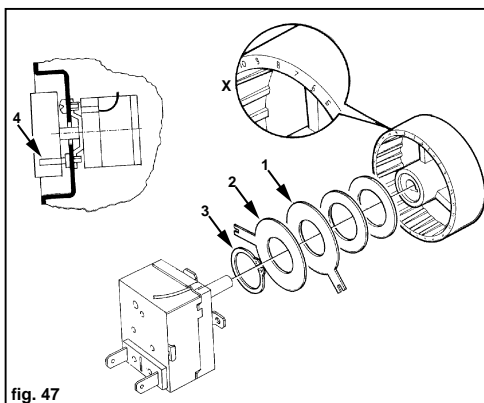


fig. 47

**MAINTENANCE**

Maintenance of the boiler must be performed by qualified personnel only. It is good practice to have the appliance serviced at least once a year, before the winter. Servicing must include not only cleaning of the boiler - correct operation of all its control and safety devices and of the burner must also be checked, in addition to the condition of the flue gas outlet duct.

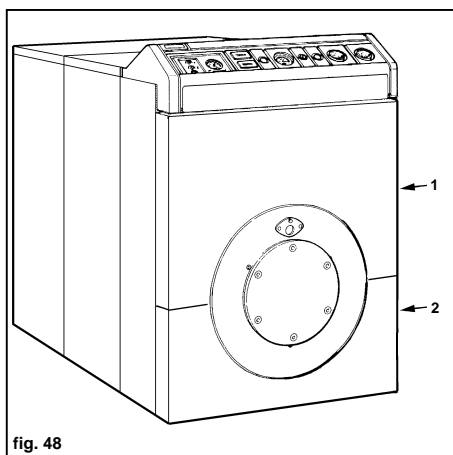


fig. 48

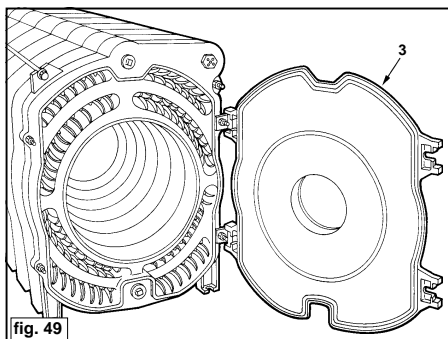


fig. 49

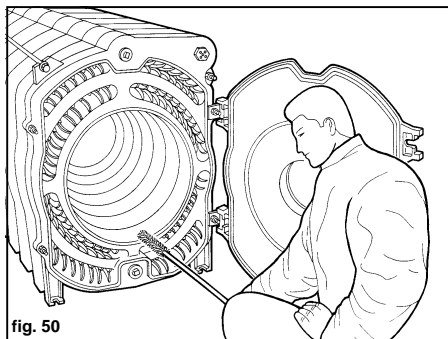


fig. 50

**Cleaning the boiler**

- 1 Switch off the mains power supply to the boiler.
- 2 (fig. 48) Remove the top front panel "1" and the bottom one "2".
- 3 (fig. 49) Open the door by unscrewing the knobs.
- 4 (fig. 50) Clean the inside of the boiler and the whole length of the flue gas outlet duct using a steel brush or compressed air.
- 5 Re-close the door, securing it with the knob. For cleaning of the burner, refer to the instructions provided by the manufacturer.





ALL SPECIFICATIONS SUBJECT TO CHANGE

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