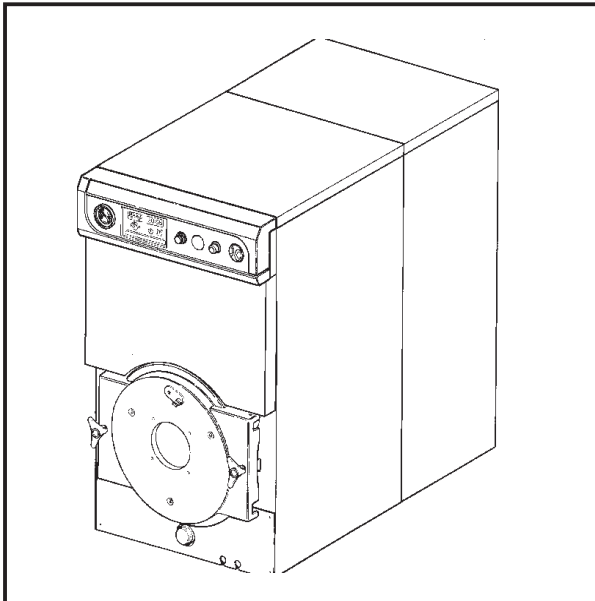
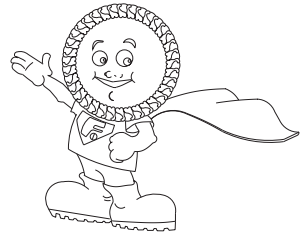




INSTALLATION AND OPERATING INSTRUCTIONS



GN2

HIGH EFFICIENCY
CAST IRON BOILER
FOR LIQUID and/or
GAS FUELS



INDEX

1. Technical information	page 3
2. Dimensional and technical characteristics	page 3
3. Packing and dispatch	page 5
4. Boiler assembly	page 6
5. Shell assembly	page 11
6. Installation	page 19
7. Inspections and adjustments	page 20
8. Maintenance	page 21
9. Boiler parts	page 22

Technical information

1.01 Introduction

GN2 is a new high efficiency heat generator producing hot water for heating purposes. It can operate with either a liquid and/or gas fuel fired burner 1° or 2° stage.

The boiler unit consists of cast iron parts assembled by steel rods and links, the shape of which has been particularly designed to achieve optimum fin distribution. This ensures high thermal efficiency and consequently high energy savings. The boiler is insulated by a thick layer of glass wool to reduce heat loss to the minimum.

Key

- 1 Thermometer
- 2 Arrangement for automatic control
- 3 Mains switch
- 4 Overheat cut-off thermostat
- 5 C.H. boiler thermostat

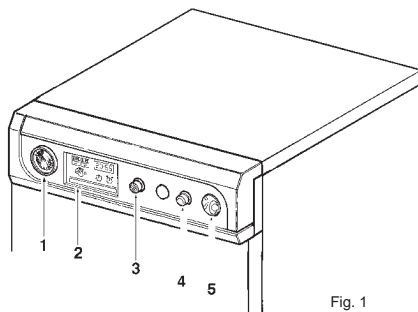


Fig. 1

1.02 Function of the adjusting and safety devices

Manually reset safety thermostat 3 (fig. 1)

This is activated when the temperature in the boiler during the heating phase reaches a value beyond which a dangerous condition could be created.

Boiler regulating thermostat 5 (fig. 1)

Used to adjust the temperature in the boiler by means of its adjuster knob. This thermostat controls the 1° or 2° stage burner. In the case of use of 1° stage burner, you must not connect the B2 block (2° stage burner).

Ambient thermostat

This is not standard supply, but can be mounted at the Installer's charge.

It is connected in series with the regulating thermostat and contemporaneously controls both the burner and the plant circulator during the heating phase. It is advisable to install this thermostat for greater comfort and energy savings.

2. Dimensional and technical characteristics

2.01 Load loss characteristics (fig. 2)

The load losses of the hydraulic circuit pertaining to each boiler model, are specified in the following diagram which refers to the water flow rates corresponding to temperatures between 10 and 20°C.

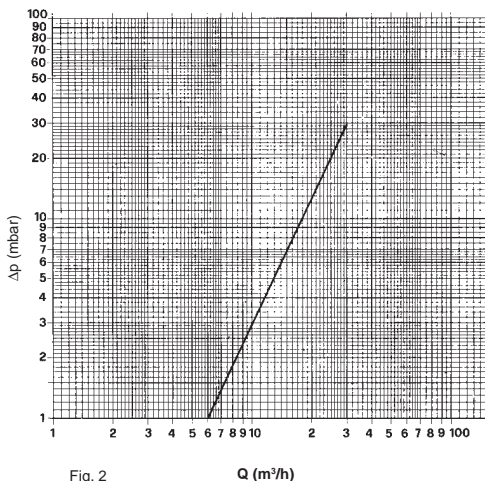
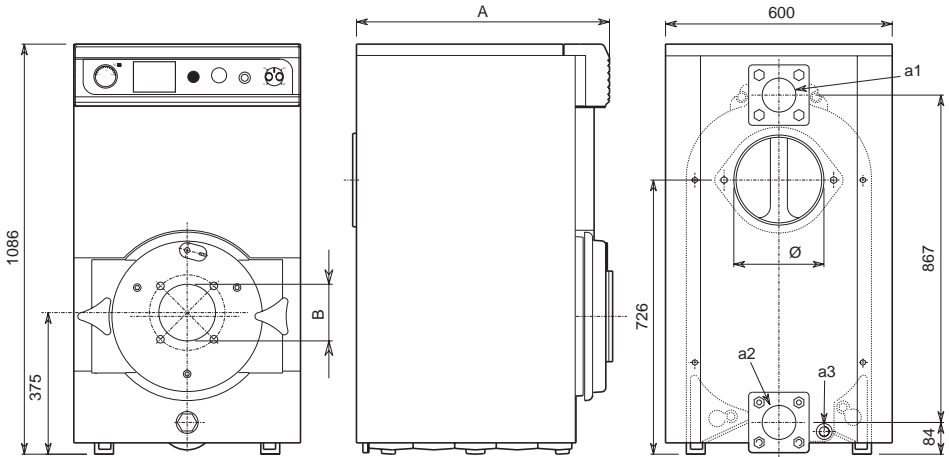


Fig. 2

2.02 Dimensional and technical brief (fig. 3 - table 1)



Key

a1 - PLANT DELIVERY ND 80 - 3"

a2 - PLANT RETURN ND 80 - 3"

a3 - 3/4" BOILER DRAIN

Fig. 3

Table 1

Model	Heat and D.H.W. (gross) gas Max.	Heat and D.H.W. (net) gas+oil Max.	Heat and D.H.W. output	Heat and D.H.W. (gross) gas Min.	Heat and D.H.W. (net) gas+oil Min.	Potenza termica Min.	N° element	Water capacity dm ³	Combustion chamber length mm	Combustion chamber dimension Ømm
GN2 05	128,8	116	105	88,8	80	73	5	49	505	400
GN2 06	153,3	138	125	100	95	87	6	57	615	400
GN2 07	177,7	160	145	122,2	110	101	7	65	725	400
GN2 08	202,2	182	165	138,8	125	115	8	73	835	400
GN2 09	226,6	204	185	155,5	140	129	9	81	945	400
GN2 10	251,1	226	205	172,2	155	143	10	89	1055	400
GN2 11	275,5	248	225	188,8	170	157	11	97	1165	400
GN2 12	300	270	245	205,5	185	171	12	105	1275	400
GN2 13	324,4	292	265	222,2	200	185	13	113	1385	400
GN2 14	348,8	314	285	238,8	215	199	14	121	1495	400

Model	Working pressure bar	A	B	Ø	Combustion chamber load loss Δp mbar	Combustion chamber volume dm ³	Water load losses		Weight of unit kg.
							Δt 10	Δt20	
GN2 05	4	670	130	180	0,4	63	2,8		310
GN2 06	4	780	130	180	0,4	77	3,4		361
GN2 07	4	890	130	180	0,4	91	4,8	0,5	412
GN2 08	4	1000	150	200	0,4	104	6,5	0,8	463
GN2 09	4	1110	150	200	0,4	118	8,5	1,8	514
GN2 10	4	1220	150	200	0,4	132	11	2,2	565
GN2 11	4	1330	150	200	0,4	146	13	2,6	616
GN2 12	4	1440	150	200	0,4	160	16	3,2	670
GN2 13	4	1550	150	200	0,4	174	19	4	725
GN2 14	4	1660	150	200	0,4	187	23	4,5	780

NOTE: - The maximum operational temperature of the plant heating water is 90°C.

3. Packing and dispatch (fig. 4)

Boiler **GN2** can be supplied in two versions, with the boiler unit either assembled or in parts.

Three packs will be dispatched in the first case:

1. Boiler unit
2. Shell
3. Control panel

In the second case, there will be the following 4 packs:

2. Shell
3. Control panel
4. Kit of parts forming the boiler unit
5. Kit of accessories with which to mount the elements.

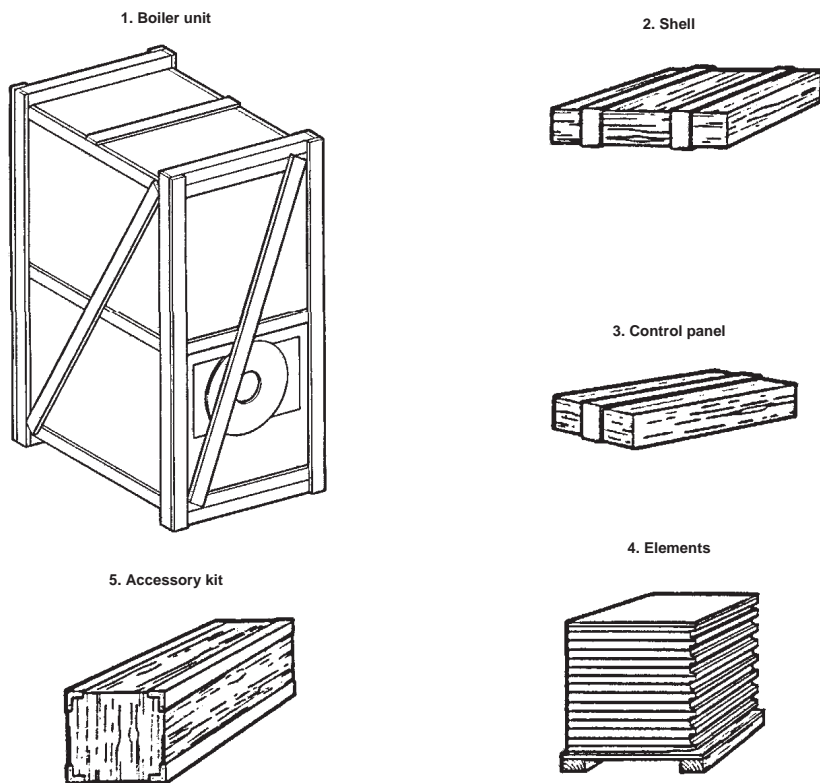


Fig. 4

4. Boiler assembly

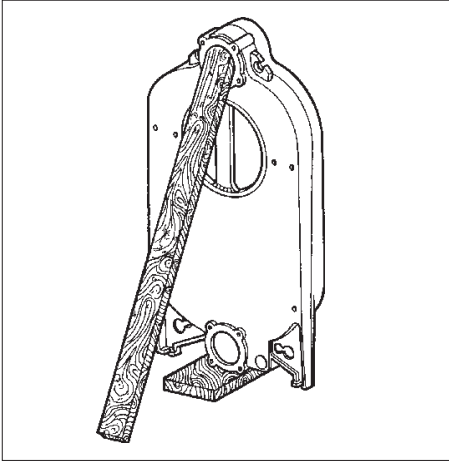


Fig. 5

4.01 (Fig. 5) Use a 12 mm strip of wood to shim the rear element. Now rest it on a second strip, checking that it remains stable throughout the assembly operations.

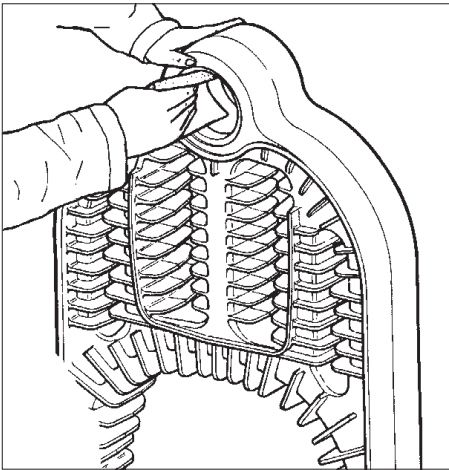


Fig. 6

4.02 (Fig. 6) Use fine glasspaper to thoroughly clean the housing of the link on the rear element and of all other elements forming the boiler unit.

Boiler unit

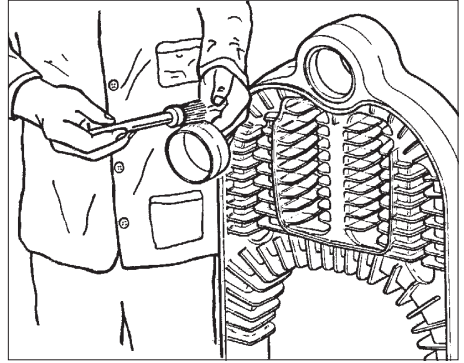


Fig. 7

4.03 (Fig. 7) Using the tin in the assembly kit, spread a thin layer of minium on the link and its housing, using a soft brush.

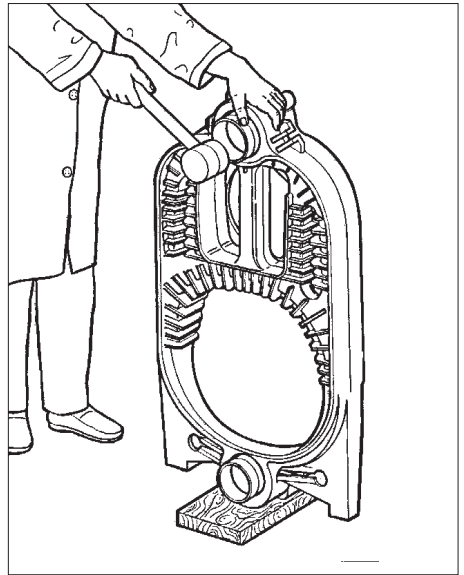


Fig. 8

4.04 (Fig. 8) Mount the link in its housing, tapping lightly with a wooden mallet.

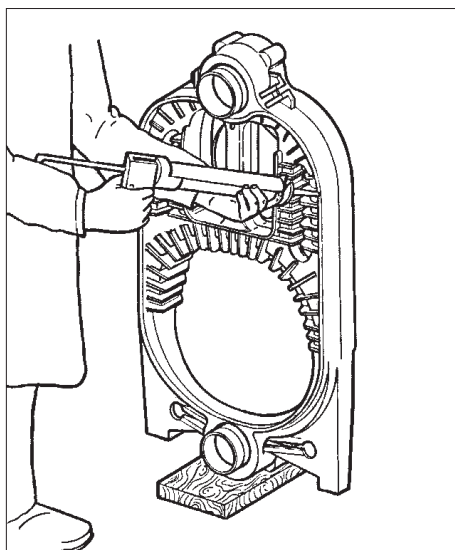


Fig. 9

4.05 (Fig. 9) Using the tube of silicone in the assembly kit, spread a small amount of this product in the retention seal housing.

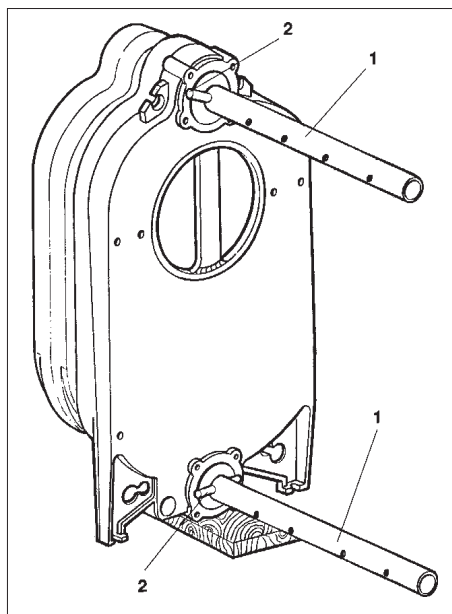


Fig. 11

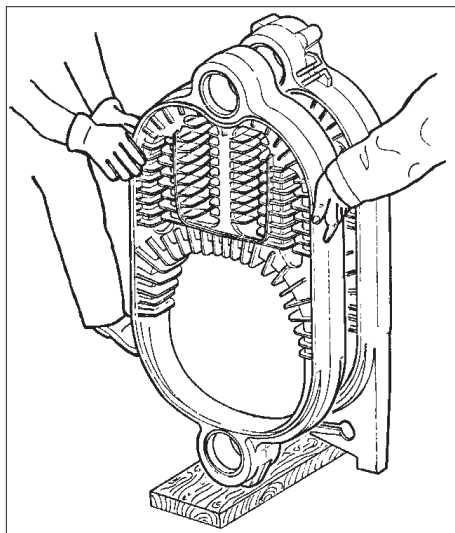


Fig. 10

4.06 (Fig. 10) Near the first intermediate element to the rear element.

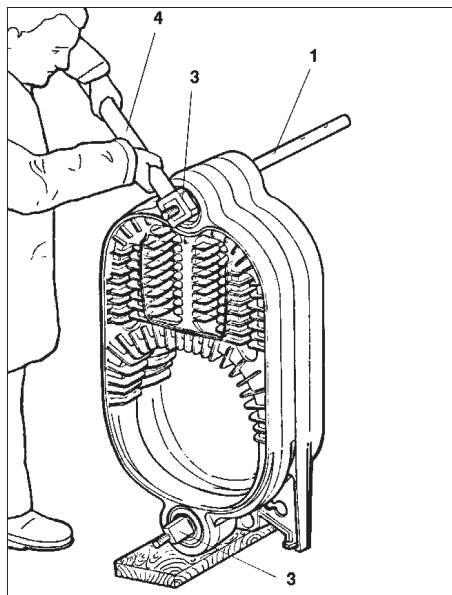


Fig. 12

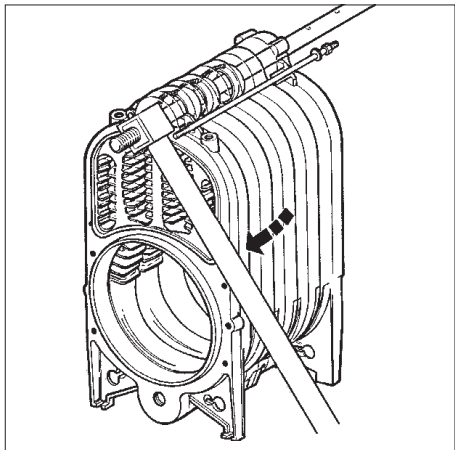


Fig. 13

4.07 (Figs 11 - 12 - 13) Insert rod 1 between the two elements, mount nut 3 on the threaded end, place stop pin 2 on the hole of the rod near the pair of elements then clamp the unit together using a N° 4 wrench until the two elements have been perfectly joined together.

4.08 Proceed as described in the previous paragraph until all the elements forming the boiler unit have been mounted.

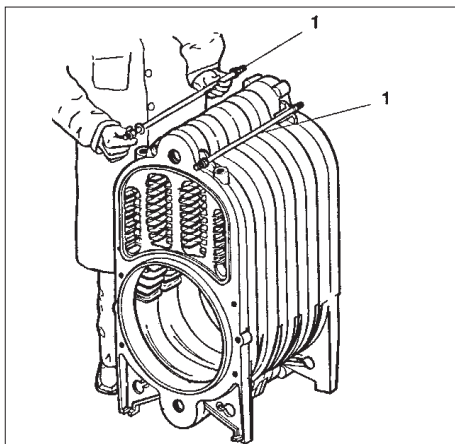


Fig. 14

4.09 (Figs 14 - 15 - 16) Mount the four rods «1», the Belleville washers «2» as shown in fig. 15 and finally torque nuts «3».

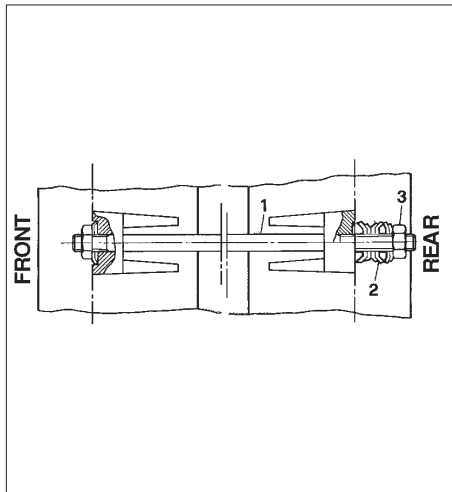


Fig. 15

Mounting the rods with the Belleville washers.

NOTE: The Belleville washers must be mounted in an opposed way as shown in the diagram while the nuts must be fixed in order to prevent them from being crushed.

For GN2 boilers with 12 - 13 - 14 elements, mount the rods with sleeve part 1, remembering to fully tighten the sleeve thread on both sides.

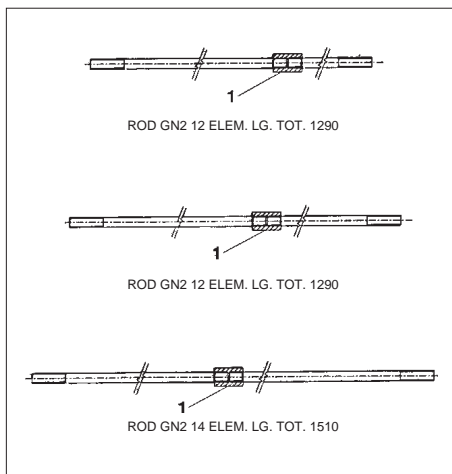


Fig. 16

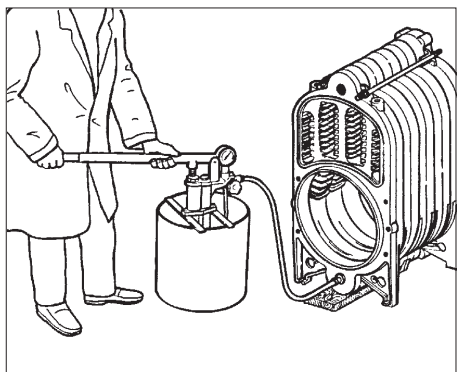


Fig. 17

4.10 (Fig. 17) Using the relative pump, connect to coupling 1 and pump in water under pressure (8 bar). Wait a few minutes before checking that there are no leaks. Now check that smoke retention between the elements is correct.

Industrie FER S.r.l. declines all responsibility for damage to persons or property caused by water or smoke leaks from the boiler due to incorrect assembly or failure to check retention.

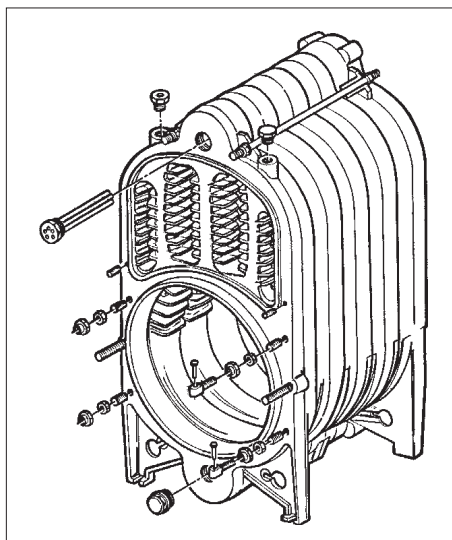


Fig. 19

4.11 (Fig. 19) Mount all parts on the front side as shown in the diagram.

4.12 (Fig. 20) Assembly detail of the servicing door and burner hatch.

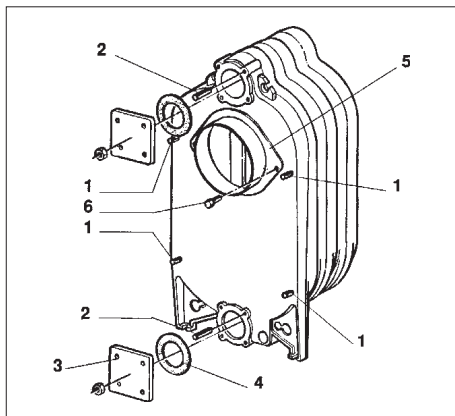


Fig. 18

- Mount the following parts on the rear side of the boiler:
- four stud bolts (1)
- eight stud bolts (2) with their relative flanges (3) and seals (4)
- Mount the collar (5) with the screws (6) and spread a small amount of silicone (included in the kit) around the retention seal housing on the rear end.

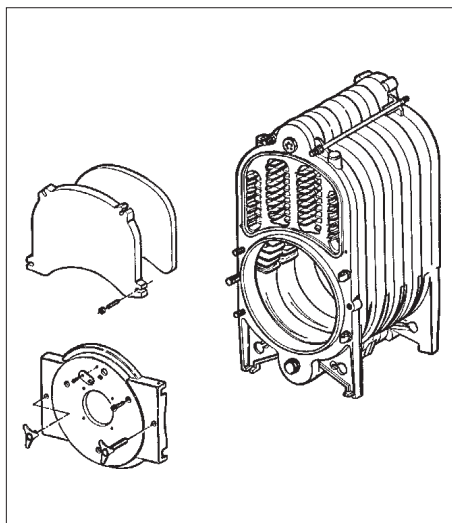


Fig. 20

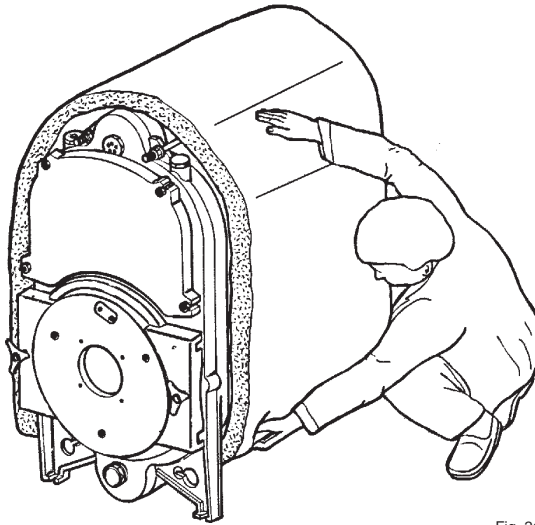


Fig. 21

4.13 (Fig. 21) Cover the boiler unit with the supplied mineral wool insulation.

4.14 (Fig. 22) The boiler unit can also be supplied already assembled. It will be sent straight from the factory on a pallet. Remove bolts 1 fixing the boiler to the pallet and place the boiler itself in its final installation position. Now proceed by mounting the various panels.

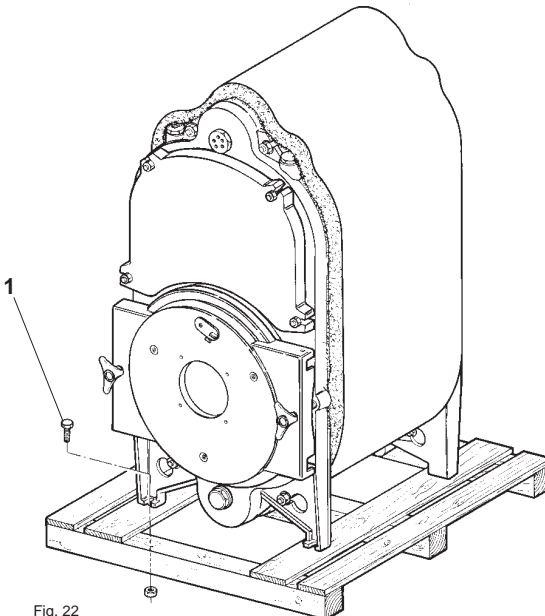


Fig. 22

4.15 (Fig. 23) When positioning the boiler unit, check that after burner assembly the front door is able to open without striking against the wall or any other nearby boiler, i.e. leave a space of at least 100 mm as shown in the figure.

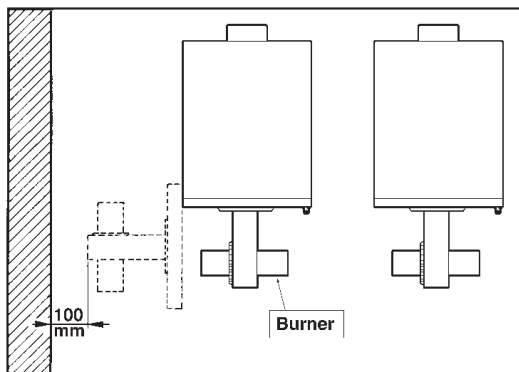


Fig. 23

5. Shell assembly

5.01 (Fig. 24) Mount rear panel 1 on stud bolts 2 without fixing it.

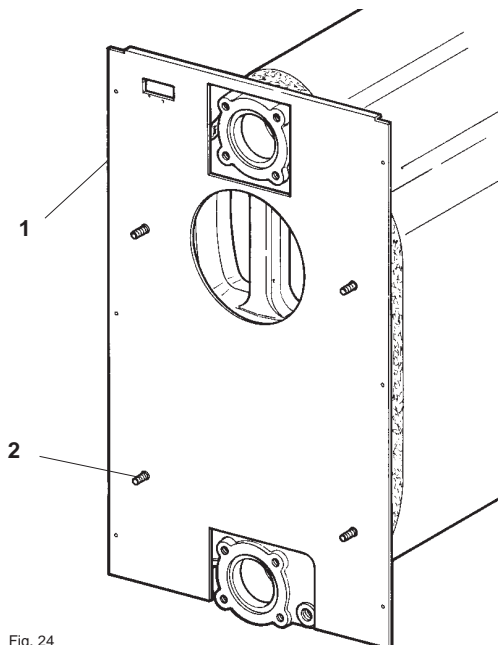


Fig. 24

5.02 (Fig. 25) Prepare the right and left sides, choosing the number of side panels according to the boiler dimensions (see table)(fig. 25).

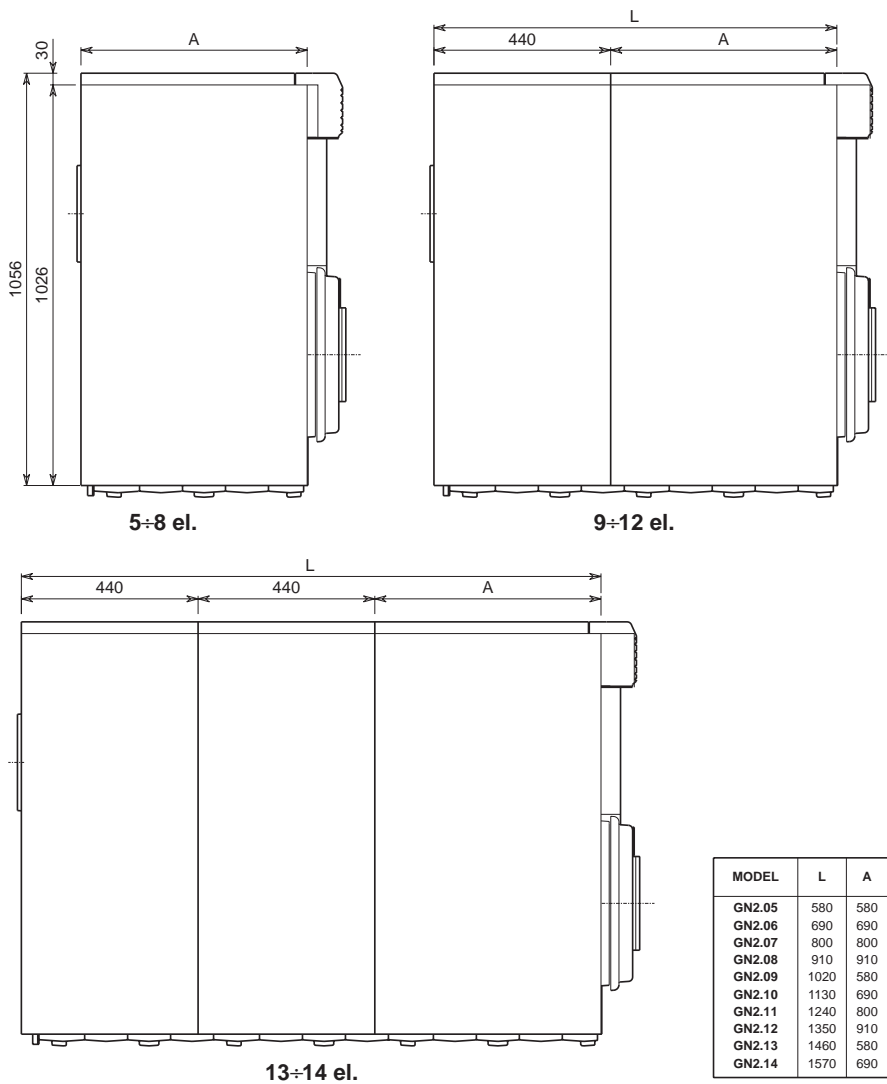


Fig. 25

5.03 (Fig. 26) Connect the panels together using screws 1, washers 2 and nuts 3, reinforcing their lower part with strips 4 fixed with screws 5.

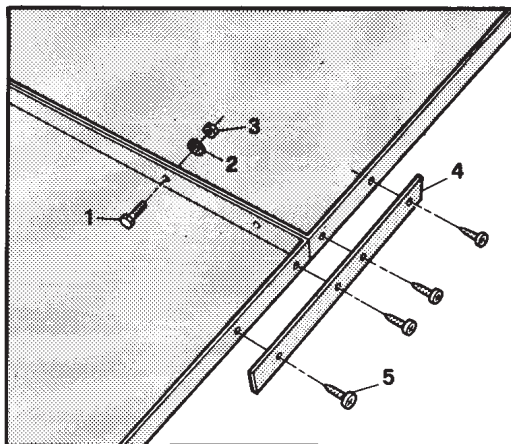


Fig. 26

5.04 (Fig. 27) Slacken nuts 1 on the right-hand side of the boiler.

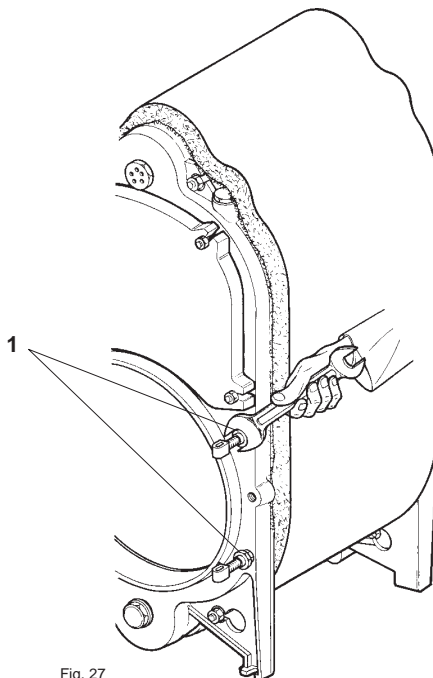


Fig. 27

5.05 (Fig. 28) Insert the complete right side between rods 1 and the boiler unit, checking that the machined slots fit into their correct position. Now torque nuts 2.

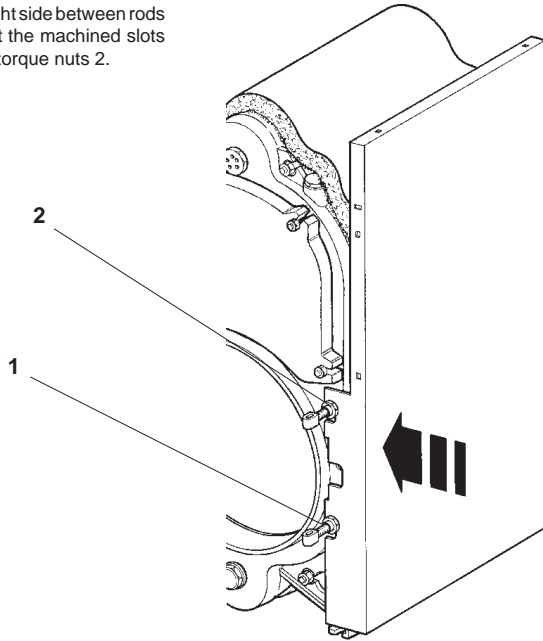


Fig. 28

5.06 (Fig. 29) Fix the right-hand side to the rear panel using screws 1.

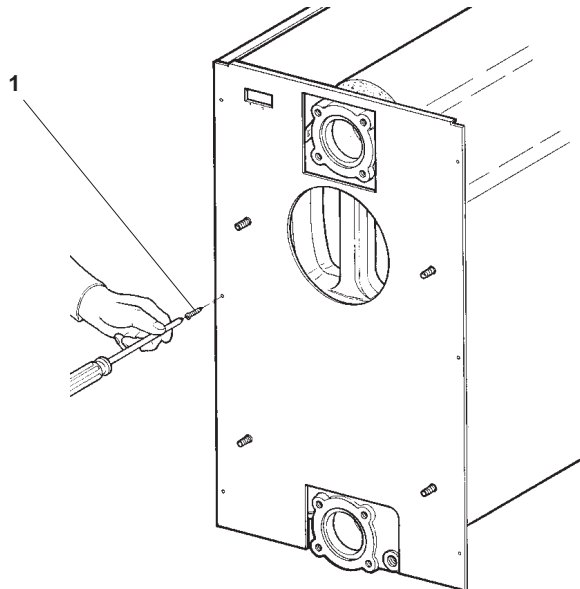


Fig. 29

5.07 (Fig. 30) Slacken nuts 1 on the left-hand side of the boiler and mount the left-hand side part, checking that the machined slots fit into their correct position. Now torque nuts 1.

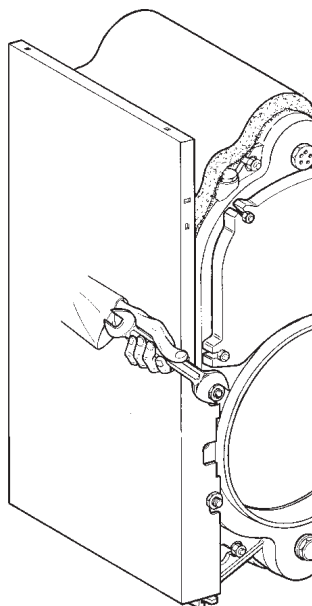


Fig. 30

5.08 Now fix the left-hand side to the rear panel using screws 1 in the same way as right side assembly (fig. 29).

5.09 (Fig. 31) Fix front lower panel 2 with the four self-threading

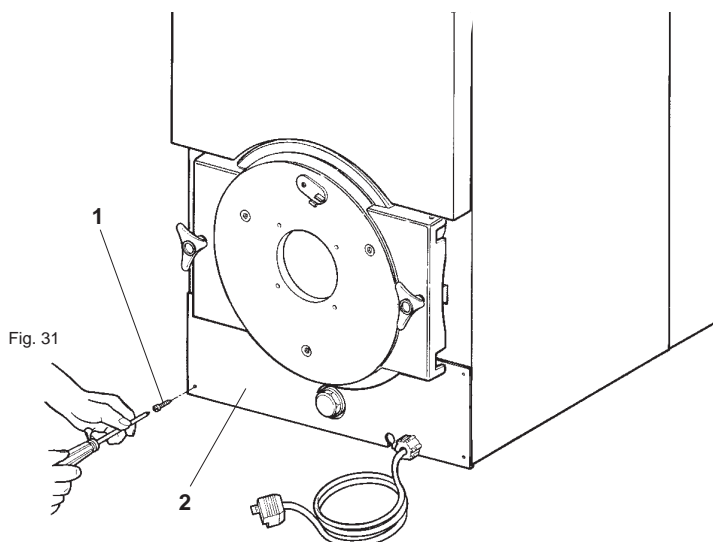


Fig. 31

5.10 Overturn the capillary tube of water gauge 6 (fig. 1) and screw its union to the relative sheath on the front part of the boiler unit (fig. 32).

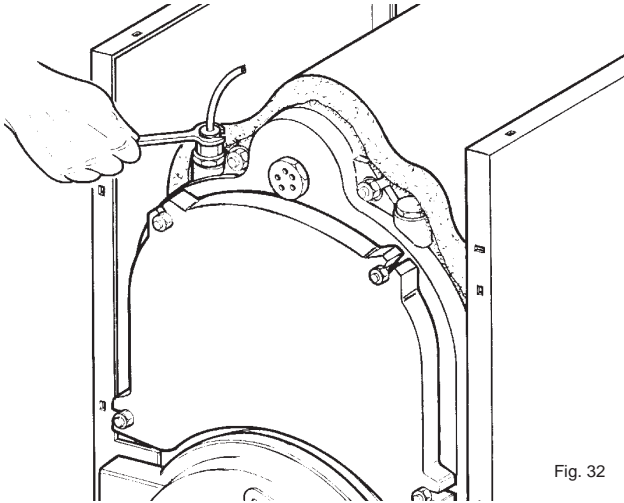


Fig. 32

5.11 (Fig. 33) Fix the upper panel 1, according to the dimension of the boiler. Prepare the front lower pannel 2, fixing the grommet 3 for the cable of the burner. Fix angle 4 on the both sides. Fix the safety wiring box 5 on upper angle.

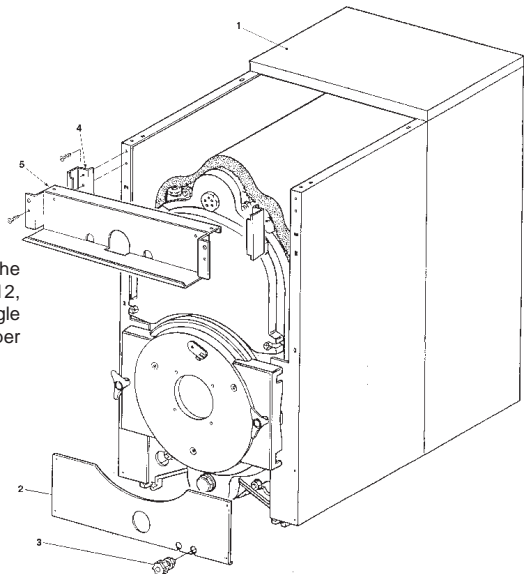


Fig. 33

5.12 (Fig. 34) Overturn the capillary tubes and insert the 3 probes 1 into sheath 2 (- adjuster thermostat - safety thermostat - thermometer).

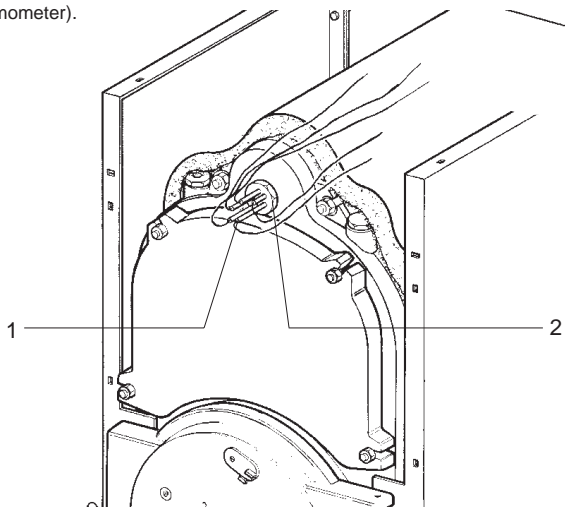


Fig. 34

5.13 (Fig. 35) Fix angle 1 (right-left), assemble the panel 2 and the control pannel. Fix safety box 3 by self-threading screw 4 inside the angles 1. Insert the board on the panel 2 and fix sideways with the screw 5 Cover the board with the safety cap 6.

NOTE: The electrical connections between the burner and boiler are at the charge of Qualified Personnel.

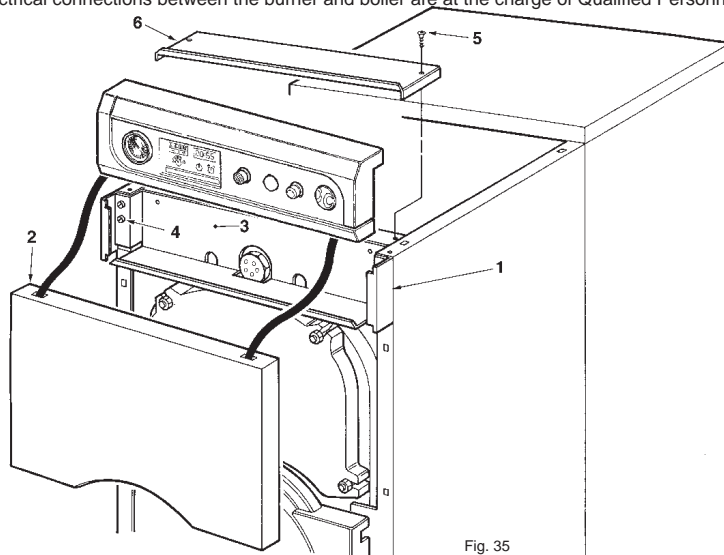


Fig. 35

5.14 (Fig. 36) Overturn the electrical mains cable, allow it to pass under the boiler unit and fix it with the relative screws 2 on to core hitch 3 on the rear wall.

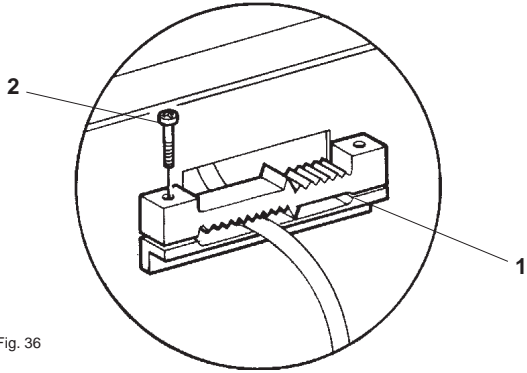


Fig. 36

5.15 (Fig. 37) Mount upper front panel 1.

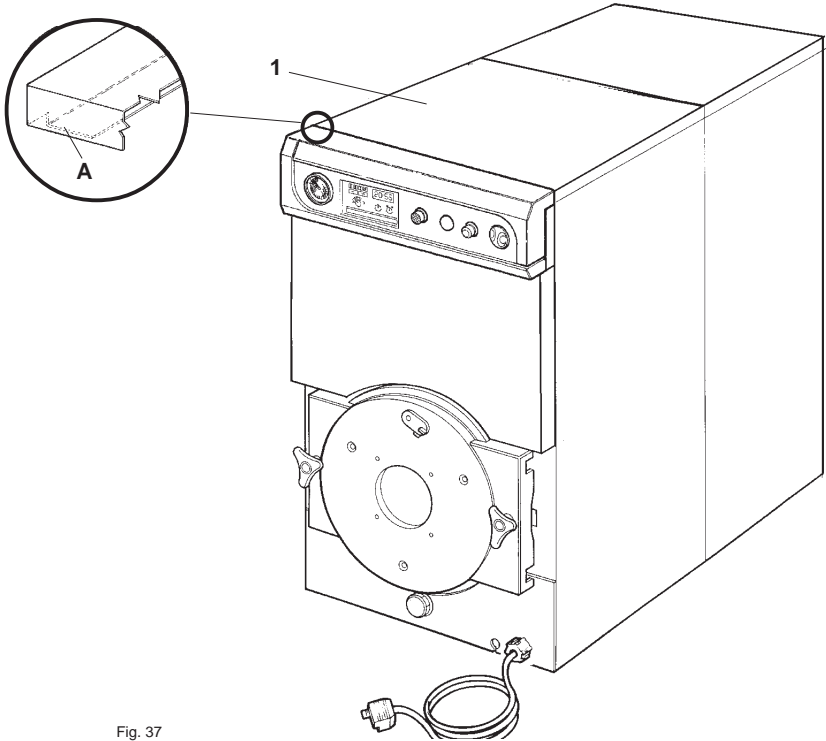


Fig. 37

6. Installation

Boiler installation must only be carried out by Qualified Personnel in compliance with the Manufacturer's instructions and according to all laws and provisions in merit.

You are particularly advised to comply with all safety regulations governing the construction and location of smoke stacks.

6.01 Electrical connection

Connect the circulator, the burner and the ambient thermostat (if used) according to the indications applied to the relative cables and in compliance with the enclosed wiring diagram (fig. 38). Always install a bipolar circuit-breaker between the mains socket and the appliance. The opening between the contacts of this circuit-breaker should be at least 3 mm and it should be equipped with fuses.

Always connect the appliance to a good grounding system. Industrie FERROLI S.p.A. declines all responsibility for damages to persons or property caused by failure to connect the appliance to a good grounding system.

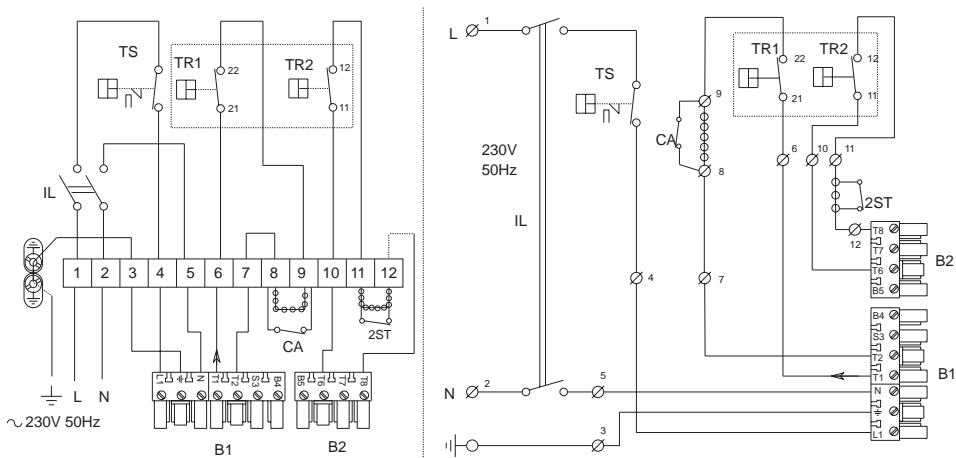


Fig. 38

Key

- IL = Main switch
- CA = Contact auxiliary
- TR1 = Boiler thermostat 1 stage
- TR2 = Boiler thermostat 2 stage
- TS = Safety thermostat
- B1 = Burner 1 stage
- B2 = Burner 2 stage
- 2ST = Contact 2 stage
- ⊖⊖⊖⊖ Remove the line if room thermostat is fitted

6.02 Connection to the water main

Connect the appliance to the water main in compliance with the indications given near each coupling and according to those shown in figure 2 of this handbook.

Connection must ensure that the pipes are free from tensions. It is essential to mount a safety valve on the heating circuit as near as possible to the boiler without any obstructions or on-off device between this and the valve itself.

The appliance is not supplied with expansion tank. Connection to this device must therefore be carried out by the installer.

6.03 Connection to the smoke stack

Always connect the boiler to a good smoke stack built in compliance with the current provisions in merit. The duct between the boiler and the smoke stack must be made of a suitable material, i.e. able to withstand the temperatures and rust resistant. Always check that all joints are well sealed and thermally insulate the entire duct between the boiler and stack in order to prevent condensation from forming.

7. Inspections and adjustments

7.01 Before initial ignition

Before switching on for the first time, it is advisable to check that:

- a) the system has been filled at the correct pressure and is well vented;
- b) there are no water or fuel leaks;
- c) the electric power supply is correct;
- d) the entire smoke duct has been correctly made and that it has not been installed too near or through inflammable parts;
- e) that there are no inflammable substances near the appliance;
- f) that the burner is proportional to the boiler rating;
- g) that the water on-off valves are open.

7.02 Initial ignition

Having carried out the preliminary inspections, proceed with the following ignition manoeuvres:

1. Open the fuel on-off valve.
2. Adjust thermostat 5 (fig. 1) to the required value.
3. Close the switch upstream of the boiler and switch 4 (fig. 1) on the control panel.

The burner will start and the boiler begin to operate.

7.03 After initial ignition

After having switched on the boiler for the first time, it is advisable to check that:

- a) the burner operates correctly. This inspection should be made with the relative instruments;
- b) the thermostats operate correctly;
- c) water circulates around the system;
- d) the fumes are completely disposed of through the stack.

7.04 Switching off the boiler

For short periods at a standstill, just use switch 4 (fig. 1) on the control panel.

If the boiler is to remain inoperative for a long period, besides operating switch 4, it is also essential to shut the fuel on-off valve.

When the boiler remains for long periods at a standstill during the winter period, prevent damage from freezing by pouring antifreeze fluid into the system or by completely emptying the boiler.

The boiler should only be serviced by Qualified Personnel.

It is advisable to have the appliance checked at least once a year, before the winter season. Besides the state of cleanliness of the boiler, this inspection should also include correct operation of all boiler control and safety devices plus the burner.

8. Maintenance

8.01 Cleaning the boiler

Switch off the boiler.

8.02 (Fig. 39) open door 2 by unscrewing the relative knobs 1.

8.03 Remove panels 3 and 4 (fig. 39)

Now clean inside the boiler.

Check the entire smoke duct and clean it if necessary.

Consult the Manufacturer's instructions when cleaning the burner.

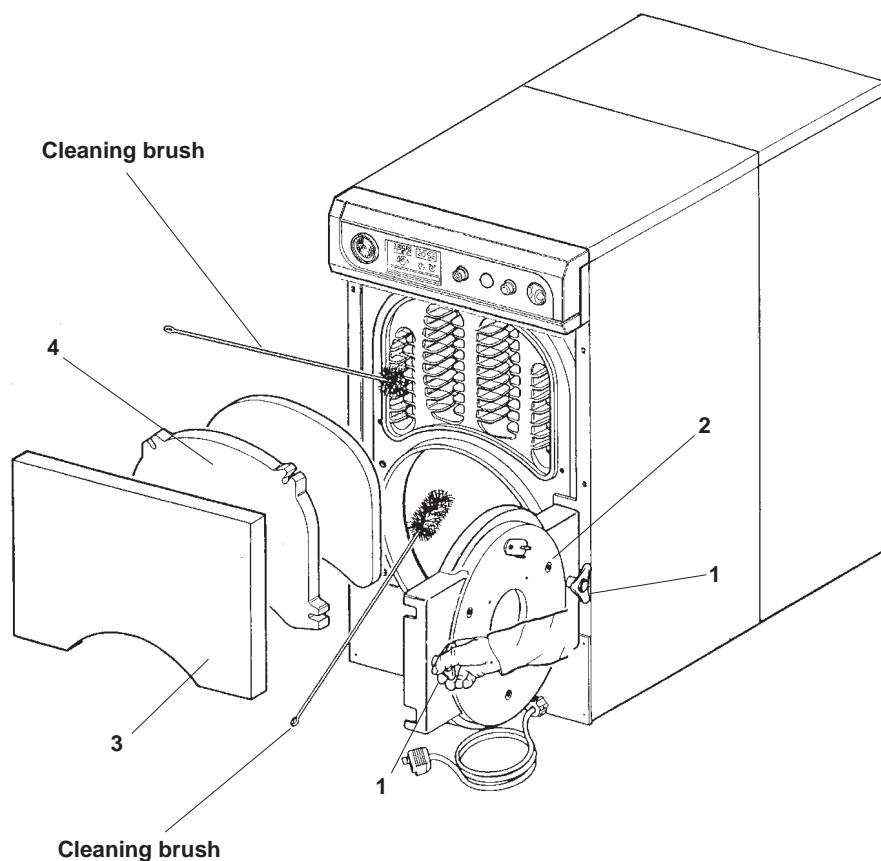
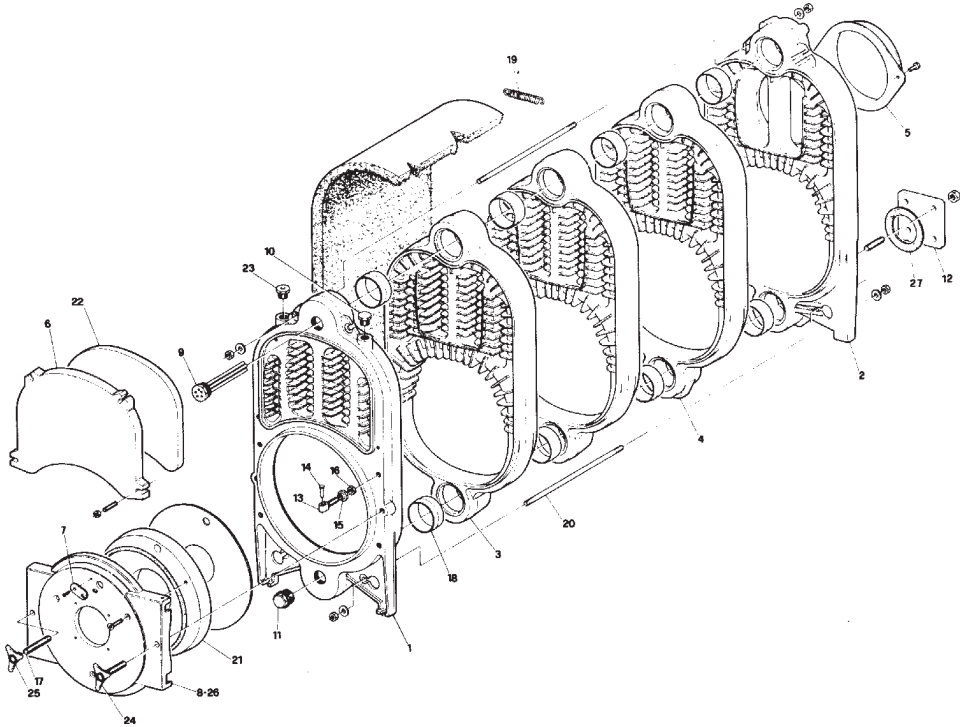


Fig. 39

9. Boiler parts

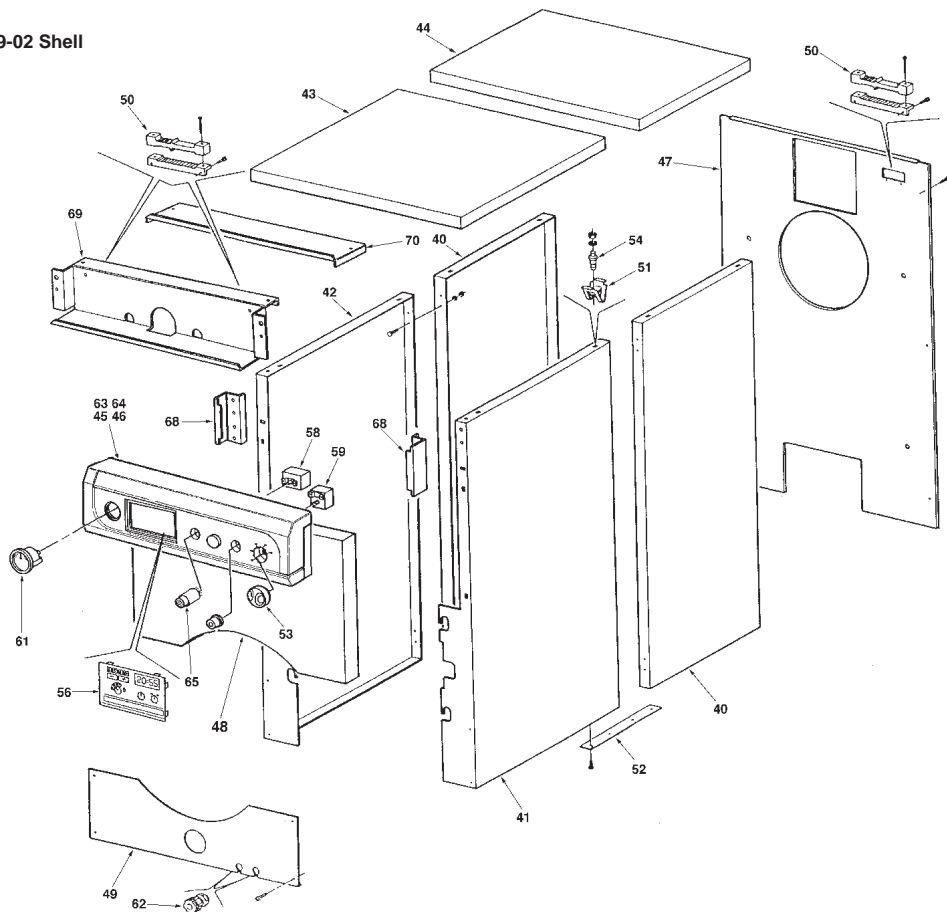
9.01 Boiler unit



Key

1	33004770	FRONT ELEMENT	19	34300220	CLENCHING SPRING ISO WIRE D. 0.8
2	33004780	REAR ELEMENT	20	34403470	ROD M12x500
3	33004790	INTERMEDIATE ELEMENT	20	34403480	ROD M12x610
4	33004800	INTERMEDIATE ELEMENT PLUS FEET	20	34403490	ROD M12x720
5	33100740	SMOKEBOX COLLAR	20	34403500	ROD M12x830
6	33202141	UPPER SERVICING DOOR	20	34403510	ROD M12x940
7	33202150	TELLTALE	20	34403520	ROD M12x1050
8a	33202170	BOILER BURNER DOOR	20	34403530	ROD M12x1180
8b	33202190	BOILER BURNER DOOR	20	34403540	ROD M12x1290
9	33400811	SHEATH 1"1/4x235 (5 BULBS)	20	34403550	ROD M12x1400
10	34000610	HEX PLUG	20	34403560	ROD M12x1510
11	33601320	1 1/4 FE00 HEX PLUG	21	35316450	BURNER DOOR INSULATION D. 392x45
12	38443650	FLANGE O. 160x160 THICKNESS 16	22	35316461	SERVICE DOOR INSULATION
13	34008930	PLUG M16 FOR DOOR HINGES	23	36901140	1/2" NPT CHECK VALVE FOR WATER GAUGE
14	34008940	PLUG 12x50 UNI 1713	24	37511630	COMPLETE DOOR HANDLE
15	34008950	BUSHING M16xM20 FOR SIDES	25	34010670	HANDLE M16
16	34008960	NUT M20 H7 FOR SIDE FIXING	26a	38008670	COMPLETE BURNER DOOR
17	34010230	PLUG M16x115 FOR HANDLE	26b	38008680	COMPLETE BURNER DOOR
18	34205080	LINK ID 94.4 ED 100.22 LENGTH 45	27	35100180	RUBBER SEAL ED 133 ID 90 THICKNESS 4

9-02 Shell



Key

40	37025850	COMPLETE MODULAR SIDE PANEL	49	37025840	COMPLETE LOWER FRONT PANEL
41a	37029020	COMPLETE RIGHT FRONT SIDE PANEL N° 1	50	36503630	DUAL CORE HITCH FERROLI TYPE
41b	37029030	COMPLETE RIGHT FRONT SIDE PANEL N° 2	51	31000210	MO/A3 PRONG COUPLING CLIP
41c	37029040	COMPLETE RIGHT FRONT SIDE PANEL N° 3	52	31207470	SIDE FIXING BRACKET
41d	37029050	COMPLETE RIGHT FRONT SIDE PANEL N° 4	53	35002420	DISK WITH GROUND SYMBOL
42a	37028980	COMPLETE LEFT FRONT SIDE PANEL N° 1	54	34000640	FE00 COUPLING PRONG
42b	37028990	COMPLETE LEFT FRONT SIDE PANEL N° 2	56	35003390	JIG FOR GEARCASE
42c	37029000	COMPLETE LEFT FRONT SIDE PANEL N° 3	58	36401450	SAFETY KEY LS 541572 C. 1500 110 C
42d	37029010	COMPLETE LEFT FRONT SIDE PANEL N° 4	59	36401880	C.H. BOILER THERMOSTAT
43a	37029060	COMPLETE MODULAR COVER N° 1	61	36400790	THEMOMANOMETER
43b	37029070	COMPLETE MODULAR COVER N° 2	62	36500200	RUBBER CORE HITCH ART. 302 QVA
43c	37029080	COMPLETE MODULAR COVER N° 3	63	36501900	TERMINAL STRIP OK 432/12-500K/12
43d	37029090	COMPLETE MODULAR COVER N° 4	64	36502651	TERMINAL 1-12 IND.PLATE
44	37025980	COMPLETE MODULAR COVER N° 5	65	36100290	MAIN SWITCH
45	38509150	CONTROL PANEL WITH INSTRUMENTS	68	31135920	SPACER
46	35005420	BOILER INSTRUMENT PANEL	69	32911030	SAFETY WIRING BOX
47	37025820	COMPLETE REAR WALL	70	32911040	SAFETY WIRING CAP
48	37025830	COMPLETE UPPER FRONT PANEL			

01/98

cod. 3540732/0



ALL SPECIFICATIONS SUBJECT TO CHANGE

Stockton Close, Minworth Industrial Park, Minworth, Sutton Coldfield, West Midlands B76 1DH
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