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ASSEMBLY INSTRUCTIONS FOR

ASSEMBLY TOOL

A bar Pulling up tool, which is returnable after assembly has been successfully completed, is made available for assembling the boiler block.

The complete pulling up kit CIS/CISM consists of the following:

- 1) Pulling up flange at the top rear section
- 1) Pulling up flange at the bottom rear section
- 1) Pulling up flange at the intermediate section
- 1) Pulling up flange at the bottom front section
- 4) Pulling up flange at the top front section
- 5) Pulling up piping
- 2.1) Basic bar
- 2.2) Extension
- 2.3) End piece

Case containing press tool

- 3.1) Free running ratchet spanner
- 3.2) Stop pins
- 3.3) Pulling up nut with thrust bearing

Items needed for construction: flat chisel, mallet, brush, small round smoothing file, emery cloth, cleanser (e.g. petroleum), inspection lamp, spanner.

Advice on the use of the pulling-up tools.

- 1) The pulling up flanges at the rear section are screwed onto the boiler flow and return connections.
- 2) The basic bars are inserted through the openings of the press flanges and ports so that the screw ends are situated out of the ports at the front. (The basic bars can be extended, as necessary.)
- 3) The pulling up flanges at the intermediate section or front section are pushed over the basic bar screw end from the front.
- 4) The Stop pins are inserted at the back through one of the transverse borings of the pulling up bar.
- 5) The pulling up nuts are screwed onto the basic bar screw end, from the front until they take up the slack on the pulling up tool flanges.
- 6) The free-running ratchet spanners are put on the starting nuts.

Boiler base

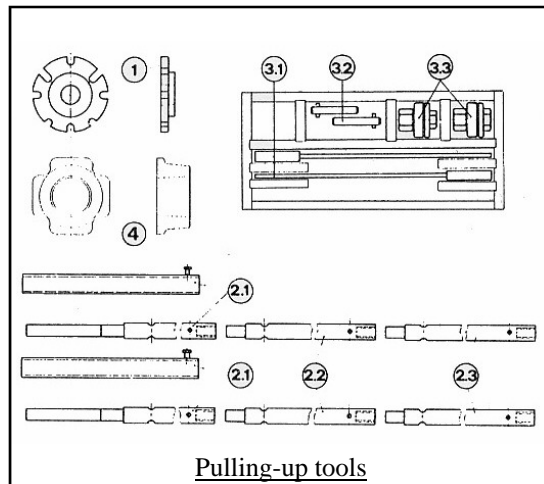
The boiler base is to be constructed in accordance with our base plans. The boiler block may stand on an iron frame set in concrete. The boiler base must stand on a level, non combustible base which is capable of supporting the weight of the boiler, water content and any ancillary equipment. These dimensions provide a 50mm excess around the boiler jackets.

STREBEL CIS

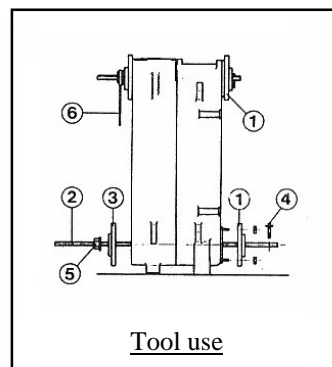
No. of sections	Width (B) (mm)	Length (A) (mm)	Min.Thickness (mm)
5	850	860	60
6	850	970	60
7	850	1080	60
8	850	1190	60
9	850	1300	60
10	850	1410	60
11	850	1520	60
12	850	1630	60
13	850	1740	60
14	850	1850	60

STREBEL CISM

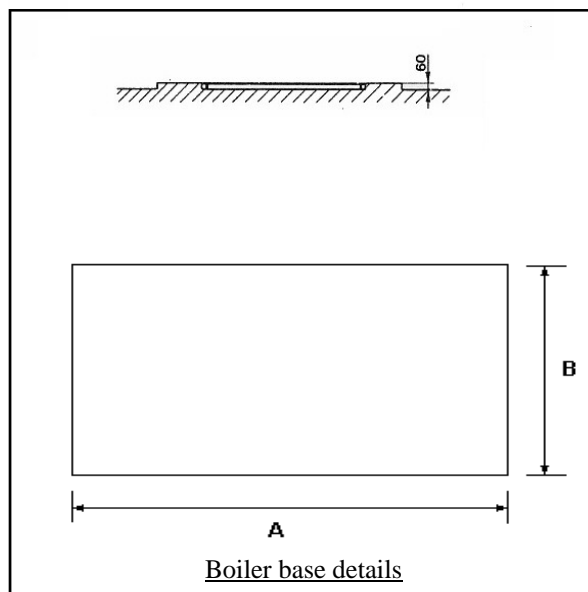
No. of sections	Width (B) (mm)	Length (A) (mm)	Min. Thickness (mm)
10	904	1862	60
11	904	2012	60
12	904	2162	60
13	904	2312	60
14	904	2462	60
15	904	2612	60



Pulling-up tools



Tool use

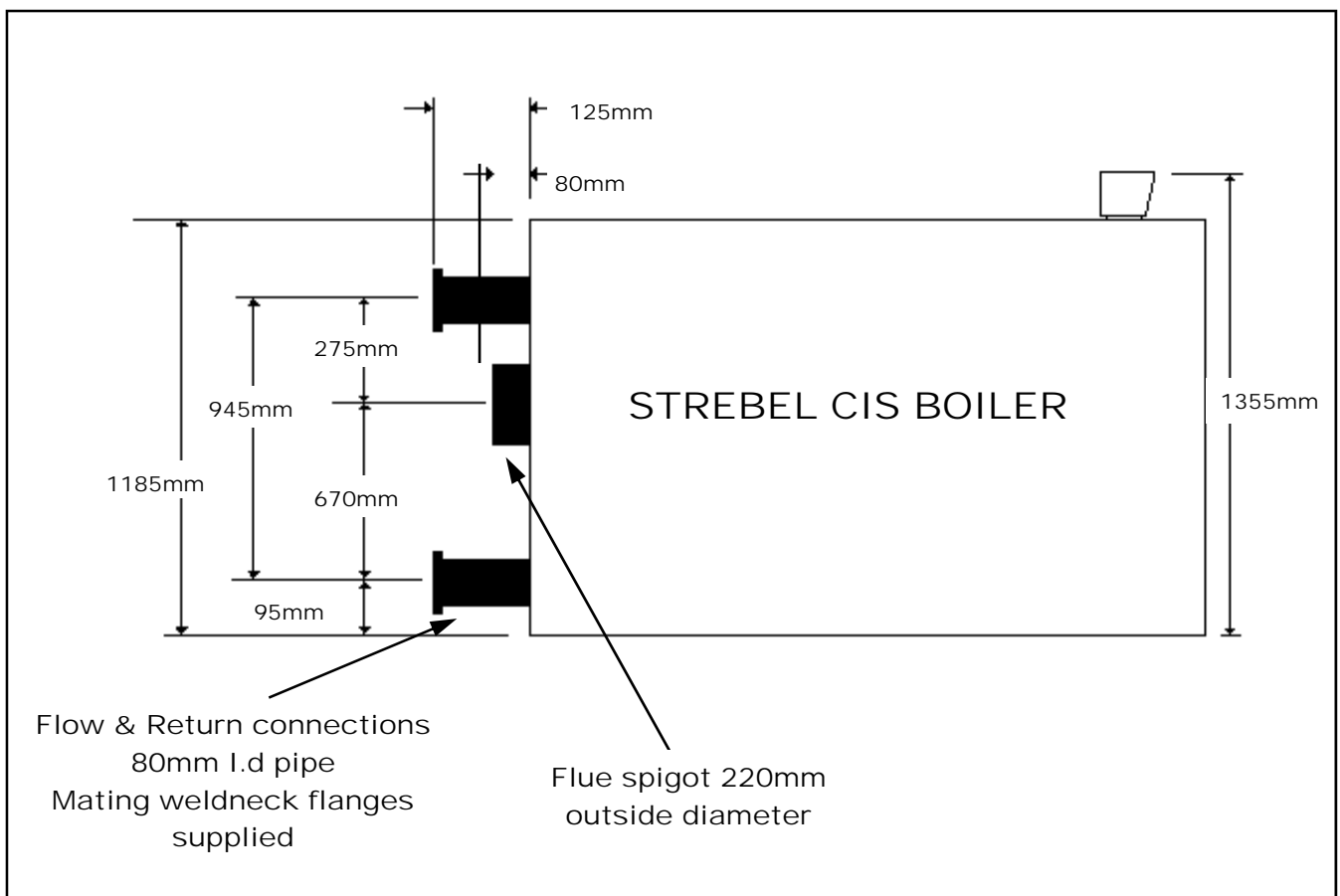


Boiler base details

STREBEL CIS – TECHNICAL DATA

No. of Sections	90.5													
	5	6	7	8	9	10	11	12	13	14				
Nominal Output	kW	103	126	149	172	195	218	241	264	287	310			
Nominal Input	kW	113.2	138.5	163.7	189	214.3	239.6	264.8	290.1	315.4	340.7			
Efficiency	%													
Fuel Consumption:														
Natural Gas	m ³ /hr	11.5	14.1	16.7	19.3	21.9	24.5	27.1	29.7	32.2	34.9			
Extra Light Heating Oil	kg/hr	9.59	11.74	13.87	16.02	18.16	20.31	22.44	24.58	26.73	28.87			
Max. Working Pressure	bar	4												
Max. Boiler Operating Temp.	°C	90												
Combustion Chamber Pressure	mbar	2												
Approx. Flue Gas Temp.	°C	185												
Flue Gas Volume	kg/sec	0.053	0.065	0.077	0.088	0.100	0.112	0.124	0.136	0.148	0.149			
Water Volume of Boiler	litres	56.4	65.4	74.4	83.4	92.4	101.4	110.4	119.4	128.4	137.4			
Combustion Chamber Volume	cm ³	81.79	100.73	119.68	138.62	157.56	176.51	195.45	214.39	233.33	252.27			
Hydraulic Resistance @ 10°C Δ T	mbar	0.20	0.24	0.25	0.31	0.37	0.43	0.50	0.55	0.63	0.71			
Dimensions:														
Height	mm	1355												
Width	mm	750												
Depth	mm	737	847	957	1067	1177	1287	1397	1507	1617	1717			
Depth of Combustion Chamber	mm	475	585	695	805	915	1025	1135	1245	1355	1465			
Flue Spigot Diameter	mm	225												
Flow & Return Connections	mm	80												
Weight of Boiler	kg	505	585	665	745	825	905	985	1065	1145	1225			

STREBEL CIS Series - Connection Dimensions



STREBEL CISM – TECHNICAL DATA

No. of Sections		10	11	12	13	14	15
Nominal Output	kW	330	400	470	550	620	690
Nominal Input	kW	360	438	512	600	678	754
Efficiency	%	91.5					
Fuel Consumption:							
Natural Gas	m ³ /hr	36.1	43.9	51.4	60.2	71.1	82.3
Extra Light Heating Oil	kg/hr	30.2	36.8	43.1	50.5	58.0	65.5
Max. Working Pressure	bar	4					
Max. Boiler Operating Temp.	°C	90					
Combustion Chamber Pressure	mbar	0.9	1.4	2.2	3.2	5	6.2
Approx. Flue Gas Temp.	°C	165 - 190					
Flue Gas Volume	kg/sec	0.088	0.100	0.120	0.135	0.156	0.180
Water Volume of Boiler	litres	252	277	302	327	352	377
Combustion Chamber Volume	cm ³	314	347	381	414	449	485
Hydraulic Resistance							
@ 20°C Δ T	mbar	0.90	1.35	1.90	2.60	3.34	4.20
@ 10°C Δ T	mbar	3.40	3.90	5.30	8.60	12.40	16.70
Dimensions:							
Height	mm	1237					
Width	mm	904					
Depth	mm	1762	1912	2062	2212	2362	2512
Depth of Combustion Chamber	mm	1377	1527	1677	1827	1977	2127
Flue Spigot Diameter	mm	250	250	250	300	300	300
Flow & Return Connections	mm	100					
Weight of Boiler	kg	1660	1815	1970	2125	2280	2435

ASSEMBLY INSTRUCTIONS FOR:

STREBEL CIS
STREBEL CIS

Boiler erection.

Wall clearances.

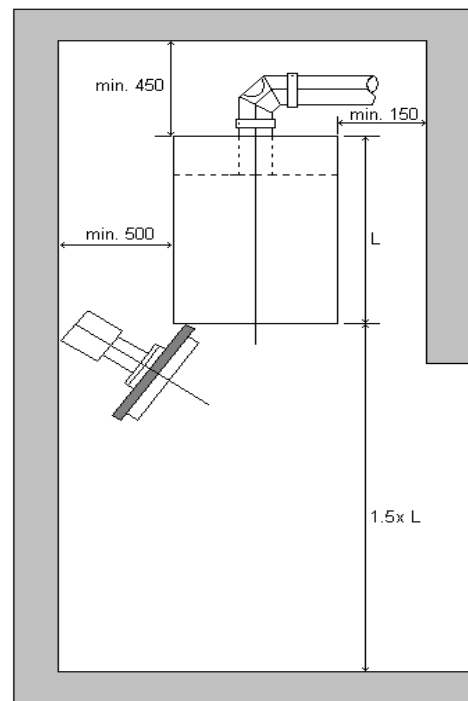
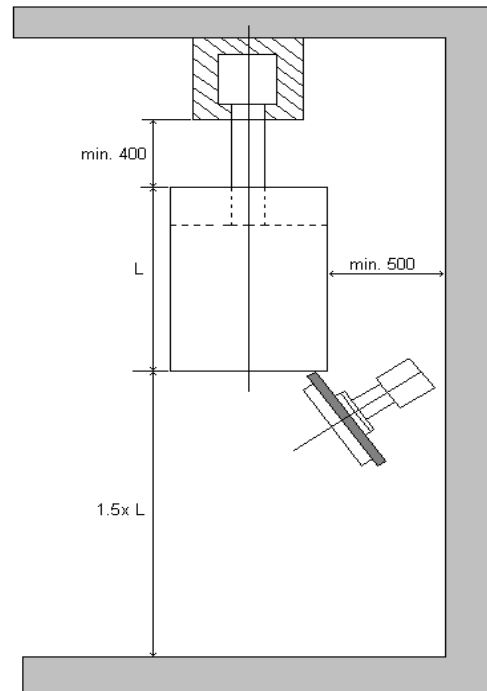
There must be free space around the boiler to access the boiler for servicing purposes. The space in front of the boiler must be of distance equal to 1.5 times the depth (L).

Access at one side should be a minimum of 500mm allowing free movement to the rear of the boiler again for servicing purposes.

These areas around the boiler must be kept free from debris, especially, free from combustible materials.

Components required:

- Number of sections: front, rear and from 3 to 12 intermediate sections (according to boiler size).
- Boiler nipples: 8 to 26 (according to boiler size).
- Boiler sealing mastic.
- Nipple jointing oil.
- Tie bars.
- Injector.
- 2" Plug
- 2" x 1/2" bush.
- Thermometer pocket.
- Thermostat pocket.
- 1/2" self-closing valve for altitude (pressure) gauge.



ASSEMBLY INSTRUCTIONS FOR:

Important Assembly Advice:

Please read through before starting the assembly!

The boiler is normally delivered in individual sections, which are assembled as a boiler block by means of tapered nipples.

The watertight joint between two boiler sections is a high-precision press fit between the boiler nipple and nipple port. The block assembly must be carried out accordingly with precision.

The following points should be observed during assembly:

No damage to the nipple and borings should be apparent.

Before a nipple is inserted and a section fitted, the nipple and the boring should be inspected. Any damage, e.g. to the face of the boring, destroys the nipple seal and leads to leakage.

Attention! Minor damage (transport damage) to the faces of the boiler nipple or to the nipple ports (A) can be corrected with a small smoothing file and emery cloth without affecting the water tightness of the joint.

- The accompanying nipple jointing oil sealing compound serves as a lubricant as well as a waterproof seal and must be used.
- During the assembly no dirt should be allowed to remain on the nipples or in the boring. These should be inspected during each assembly phase, but particularly before fixing on the pulling-up flanges. Particles of dirt, which are not removed, can lead to leakage.
- During the boiler block assembly take care that the various boiler sections are fitted to the various positions, depending on the model.
- Boiler nipples and nipple ports must align exactly at all stages of the assembly.
- An inclined inserted nipple leads to leakage.

A boiler section is built on basically in three stages: In addition, certain specific points should be observed at each stage:

Stage 1: Drive nipple into boring with care

Inspect nipple and boring for damage.

Smear linseed oil sealing compound over nipple and boring. Gently drive nipple into flow and return nipple ports using a mallet or synthetic hammer. The nipples must remain firm and exactly vertical in the nipple ports and must be able to take the next boiler section without twisting from nipple port. Take care, inclined nipples lead to leakage.

Stage 2: Joining the boiler section to both inserted nipples.

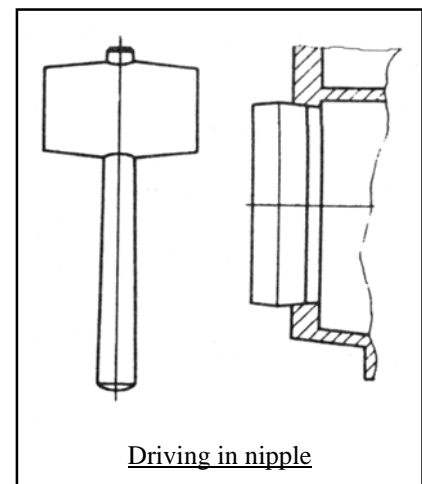
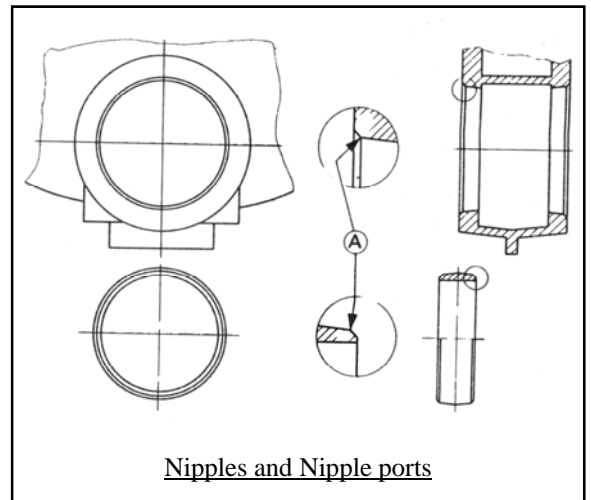
Inspect nipple and nipple port for damage.

Smear linseed oil sealing compound over nipple and nipple port. Cover one section with boiler mastic sealing strand. Place boiler section in front of both inserted nipples. Raise the boiler section with the inserted nipples using a flat chisel at all times under the section feet. The inserted nipples must stand approx. 1 to 2 mm higher than the boring of the section, which is to be joined. Using a crowbar, raise boiler section to the inserted nipples until nipple and nipple ports mate and hold.

Inspect boring once again for any dirt deposits before fixing the pulling-up flanges. Remove dirt deposits if necessary.

Stage 3: To assemble boiler sections using bar pulling-up tool.

Take care during the pulling-up process that the clearance between both boiler and section is even. If the clearance is uneven insert a flat chisel into the narrow point and continue pulling-up until the clearance is even again.



ASSEMBLY INSTRUCTIONS FOR:

Assembly of the boiler block from individual sections

Starting with the rear section to the front, the boiler block is assembled on the boiler base.

1. Erect and support the rear section (A).
2. Clean the rear section sealing grooves and place boiler mastic sealing strand into the sealing grooves.
3. Clean nipple and port. Inspect and smear with nipple jointing oil
4. Drive nipple into flow and return ports
5. Level the first intermediate section onto both rear section nipples.
6. Pull on intermediate section with pulling up tool. Fix on pulling up flanges, starting nuts and ratchet spanners; tighten the starting nuts evenly (C). The clearance between the two sections must be equal when pulling-up. If clearance is unequal insert a flat chisel in the narrower point and continue pulling-up until clearance is equal again.

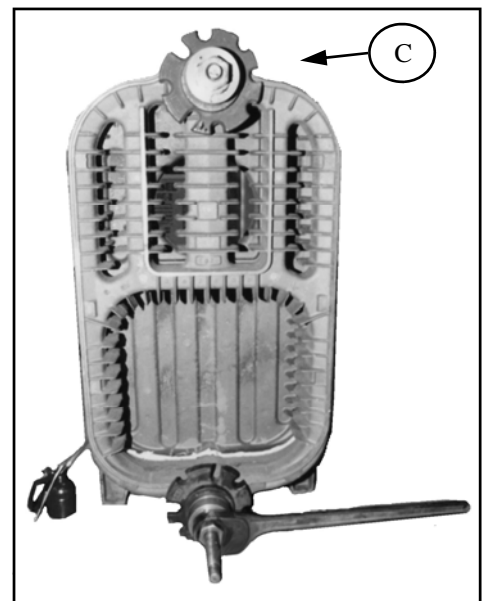
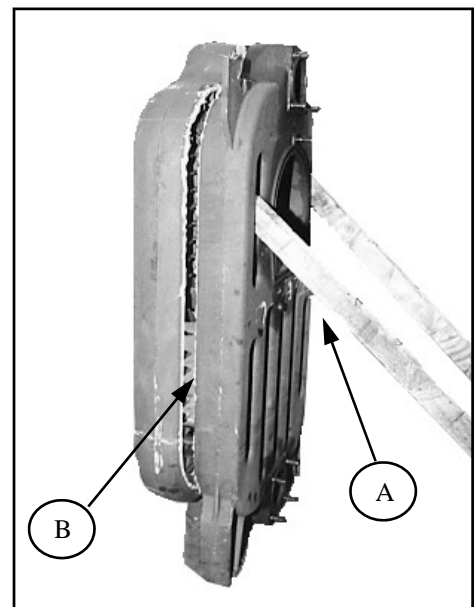
Avoid using **excessive force** and smooth out excess mastic.

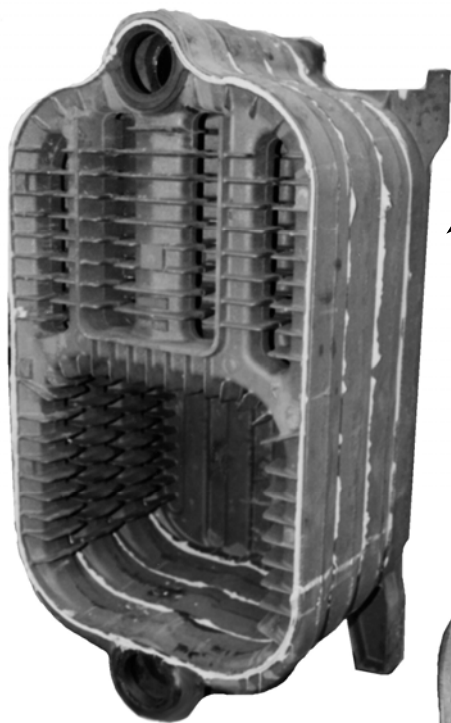
Add on only one section at a time in each case.
Further sections are added accordingly.

7. On completion of the boiler block. Push pulling up bars through the lugs on the ready assembled boiler block. Slide a flat washer and nut onto the tie bars at the front and rear respectively and screw on hexagonal nut. Hold fast one nut and draw on the other nut until tight.

Boiler Block Alignment

Any unevenness between boiler base and section feet can be levelled out by laying metal shims underneath the boiler section feet.





Front view showing the first three intermediate sections after 'pulling up'.

Front view showing the complete boiler block without the burner door or flue pass door.



Rear view of the complete boiler block.



ASSEMBLY INSTRUCTIONS FOR:

Assembly of fixtures

1. Fit 2" plug into the bottom tapping on the front section of the boiler (A).
2. Fit the 2" x 1/2" bush to the upper tapping of the boiler front section for the thermostat pocket (B+C).
3. Next fit the thermostat pocket (1/2" diameter) into the bush (B).
4. Fit the thermometer pocket into the tapping immediately to the right of the self closing valve (C)
5. Fit the 1/2" self-closing valve for the altitude (pressure) gauge into the upper left hand tapping (D)
6. Fit the injector into the return connection with joggle to the bottom.
7. Connect flange to the lower return connection.
8. Connect the flow header to the upper tapping of the rear section.

Burner door assembly

1. Attach M12 screw with eye into the tapping on the front section ensuring that there is a 40mm gap between the centre of the eyelet to the edge of the front section and tighten locking nut (J).
2. Attach the threaded bolts M12 x 80 mm into the right hand tappings on the lower half of the front section.
3. Put ceramic sealing cord into the groove on the lower part of the front section (I).
4. Place burner door with insulation onto the eyelets and insert hinge pins 12 x 63 mm.
5. Close burner door, check alignment and tighten nuts M12 with washers.
6. Attach burner flange plate onto burner door.
7. Repeat procedure swapping eye bolt fixings with threaded bolts fitting the hinge on the right hand side, if required.

Upper flue-way door

Use the same procedure as above to fit the flue-way door.

Boiler jacket assembly

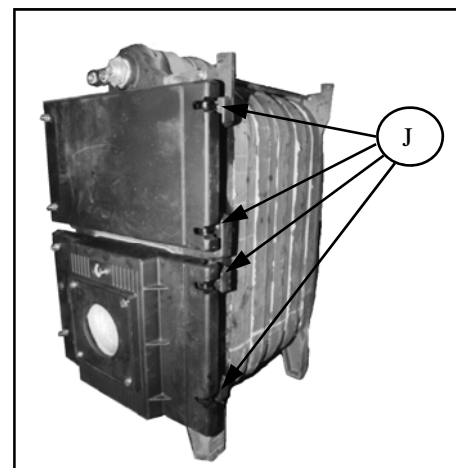
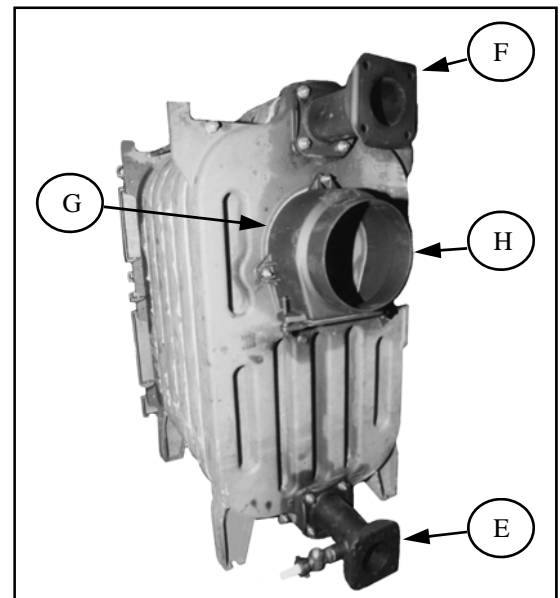
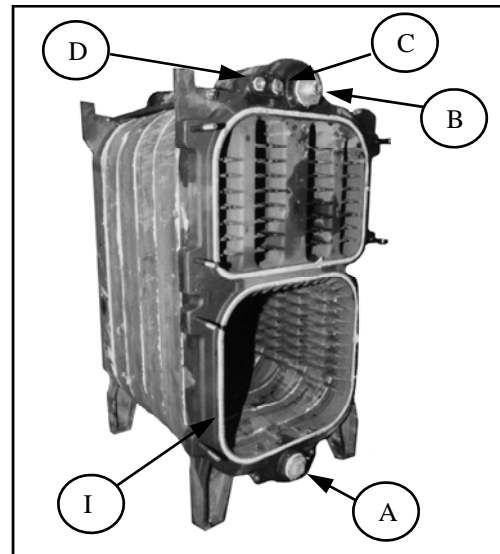
1. Hang the insulated side jackets on the upwardly protruding jacket supports on the front and rear sections.
2. Fit the rear bottom jacket to the side jackets by pushing the spring clips into the side jackets and securing further up with M6 self tapping screws.
3. Repeat procedure with the rear upper jacket.
4. Fit the upper jacket and insulation by sliding over the side jackets and securing with M6 self-tapping screws.
5. The lower front jacket is fitted by pushing together using spring clips.

Assembly of Flue Hood

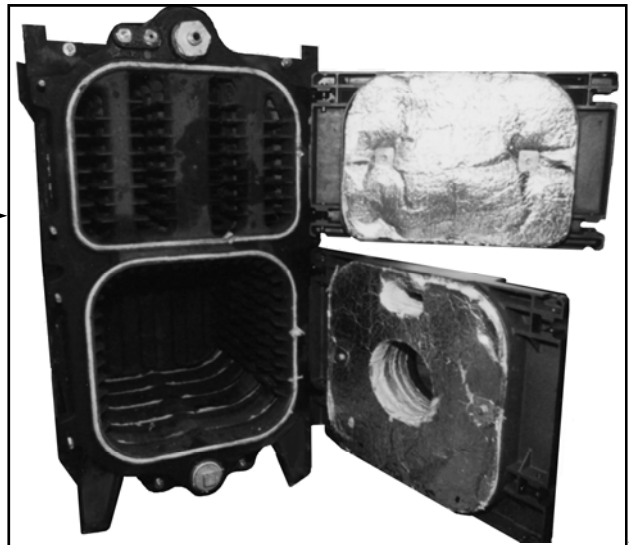
1. Put the ceramic fibre sealing cord (900mm) into the groove in the rear section of the boiler (G).
2. Align the complete flue hood casting and bolt on using the M8 nuts (H).

Flow and return connections

1. These are bolted onto the rear section of the boiler using the M12 nuts and washers (E+F).



Completed boiler block with burner door and flue pass door hinged on the right.



Front view showing the side jackets and the doors bolted closed.

Top view showing insulation prior to fitting the top jacket.



ASSEMBLY INSTRUCTIONS FOR:

Instrument control panel assembly.

Description of the instrument control panel

Instrument control panel OS-04 consists of the following parts:

- Instrument panel casing.
- Altitude (pressure) sensor.
- Thermometer.
- Stage 1 control thermostat.
- Stage 2 control thermostat.
- Limit thermostat.
- Hours run counter for stage 1 & 2.
- Stage 1 and stage 2 ON/ OFF lamps.
- Burner lockout lamp (reset button).
- Terminal connections.

Assembly of instrument control panel

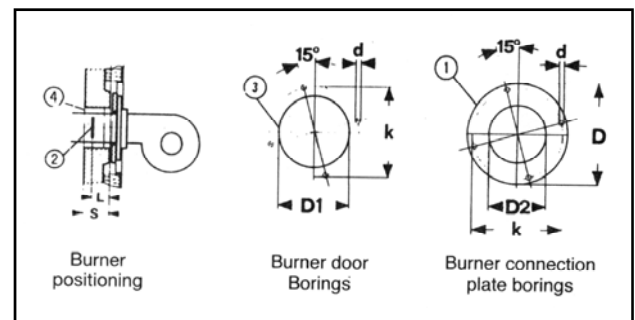
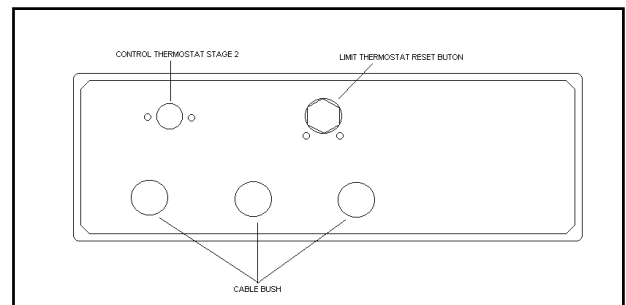
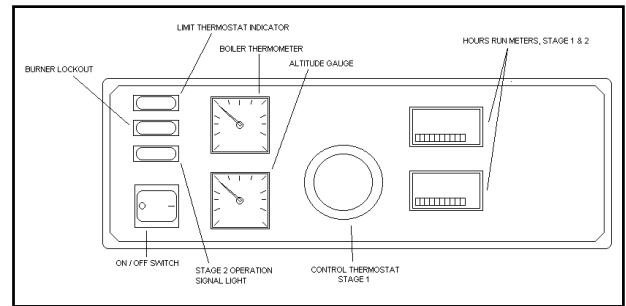
1. Attach instrument control panel casing to the upper jacket on the boiler.
2. Push the altitude (pressure) sensor, thermometer, stage 1&2 thermostats and the limit thermostat, wiring through the slotted hole in the upper jacket.
3. Push connection wires through into the control panel and connect according to the wiring diagram.
4. The burner connections run from the burner to the conduits on the side jackets and again up through the slotted hole in the upper jacket to the control panel.
5. Ensure unused holes in the control panel casing are plugged with rubber stoppers.

WARNING: The length of the wires should be such that there is enough wire to fully open and close the burner door.

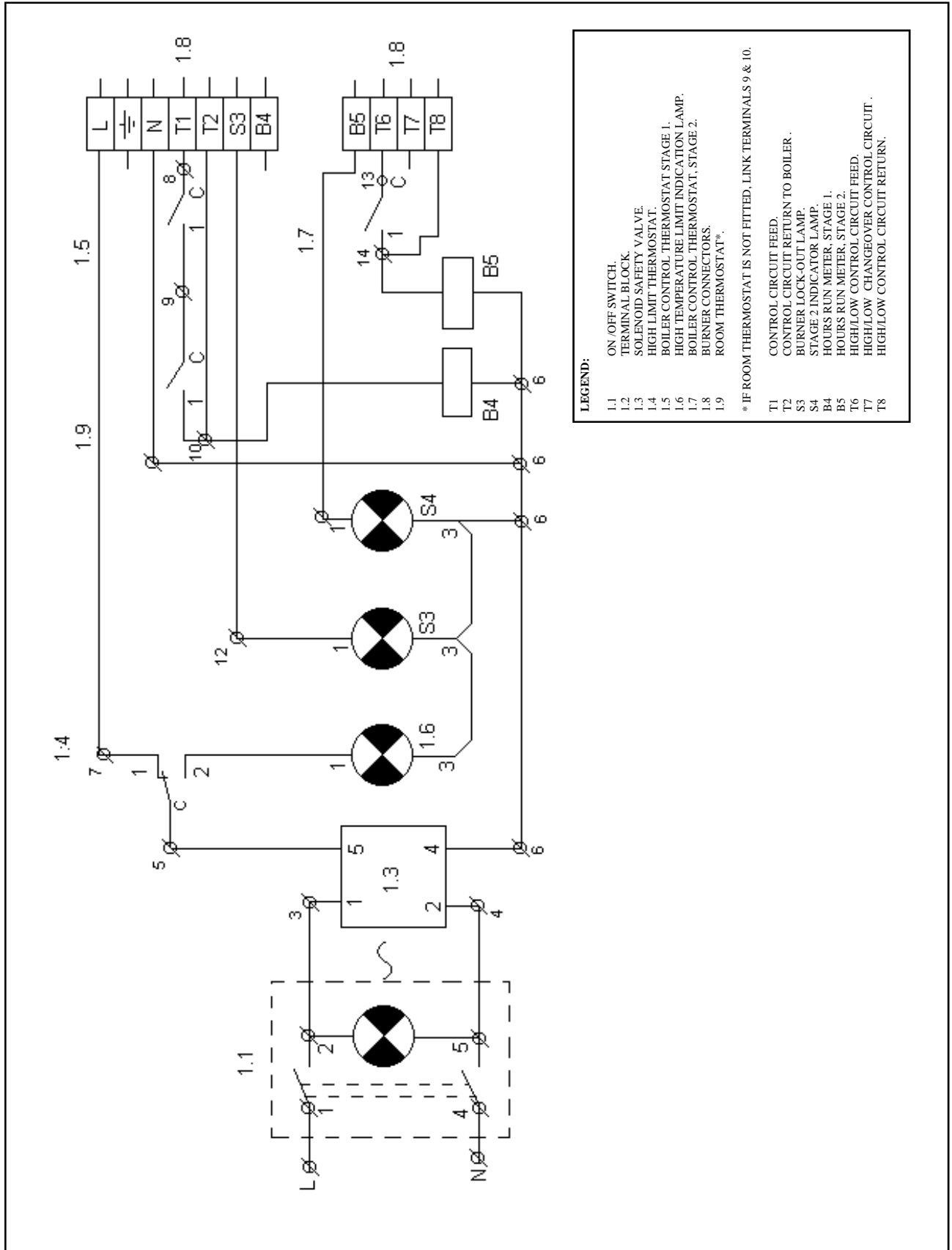
Assembling the burner

1. Only have the burner commissioned by a qualified combustion engineer. Cables and pipes for electricity and oil should be fitted flexible to allow full swing of door.
2. Fit burner to burner door with a suitable burner plate
3. When assembling the burner, the position of the diffuser disc (2) should be observed.
4. The largest possible diameter of the burner is limited by the boring (3) in the burner door
5. With regard to the choice of burner, the burner head equipment stipulated by the manufacturer concerned should be used
6. Wrap burner draught tube with cerafelt fibre to insulate gap (4)
7. Electrical connection should be made according to the circuit diagram in the instrument panel and IEE regulations. Please follow operating instructions for details regarding burner setting.

The burner should only be commissioned by a Qualified Combustion Engineer



WIRING DIAGRAM

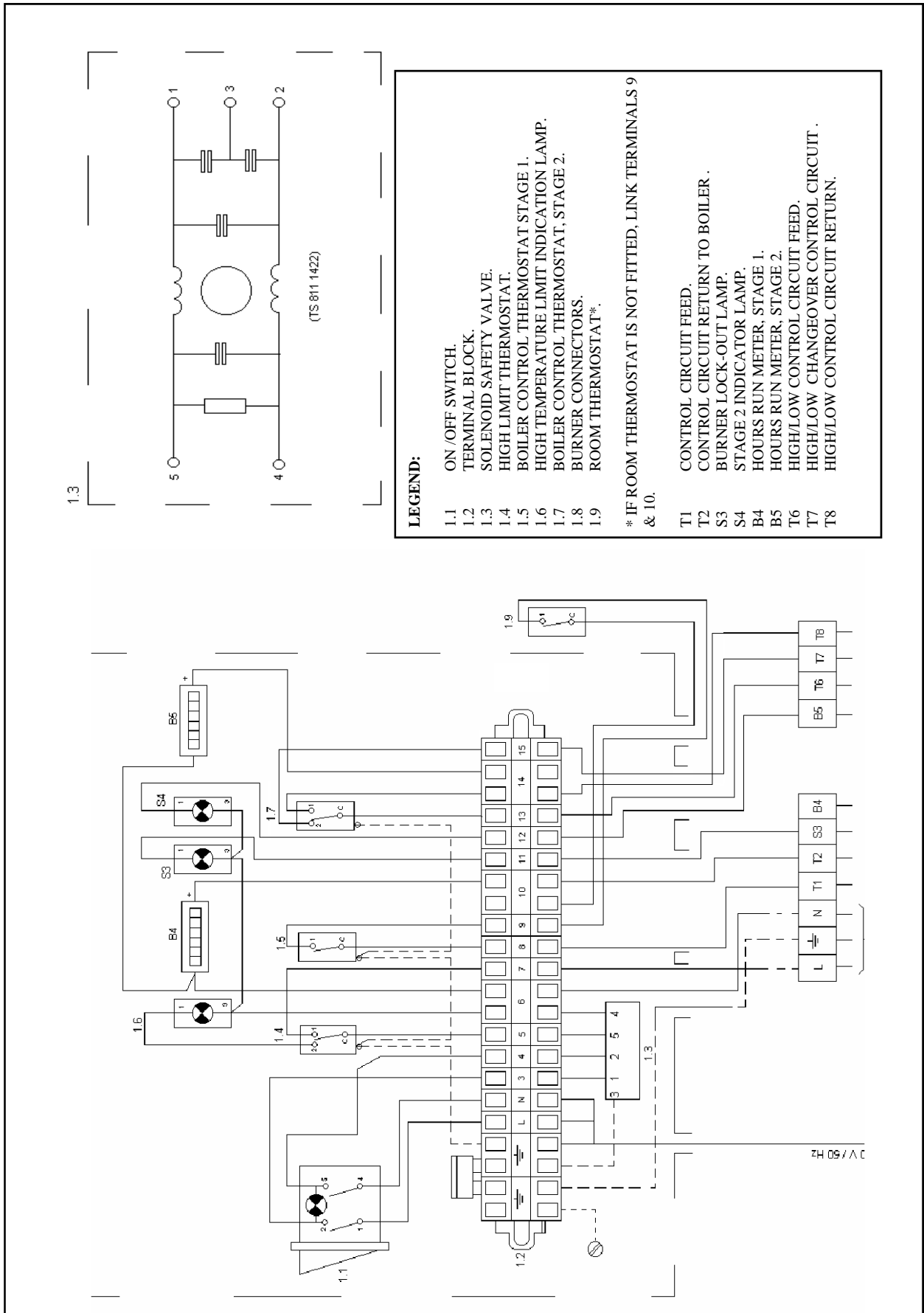


LEGEND:

- 1.1 ON / OFF SWITCH.
- 1.2 TERMINAL BLOCK.
- 1.3 SOLENOID SAFETY VALVE.
- 1.4 HIGH LIMIT THERMOSTAT.
- 1.5 BOILER CONTROL THERMOSTAT STAGE 1.
- 1.6 HIGH TEMPERATURE LIMIT INDICATION LAMP.
- 1.7 BOILER CONTROL THERMOSTAT STAGE 2.
- 1.8 BURNER CONNECTORS.
- 1.9 ROOM THERMOSTAT*.

* IF ROOM THERMOSTAT IS NOT FITTED, LINK TERMINALS 9 & 10.

- T1 CONTROL CIRCUIT FEED.
- T2 CONTROL CIRCUIT RETURN TO BOILER.
- S3 BURNER LOCK-OUT LAMP.
- S4 STAGE 2 INDICATOR LAMP.
- B4 HOURS RUN METER, STAGE 1.
- B5 HOURS RUN METER, STAGE 2.
- T6 HIGH/LOW CONTROL CIRCUIT FEED.
- T7 HIGH/LOW CHANGEOVER CONTROL CIRCUIT.
- T8 HIGH/LOW CONTROL CIRCUIT RETURN.



ASSEMBLY INSTRUCTIONS FOR:

Before start-up check whether:

1. There is sufficient water in the boiler and the heating system; the pointer on the altitude (pressure) gauge is in the green sector.
2. All valves in the heating flow and return are open.
3. The heating system has been fully vented.
4. The burner door is closed securely.
5. The burner plug is wired in correctly.
6. The fresh air supply to the boiler room is open.
7. Oil or gas supply is sound and purged.
8. All fuses are intact.
9. The mains switch is turned on.

Fault finding

Heating is cold

- Is boiler up to temperature? Check correct heat settings of heating circuit controls.
- If automatic control does not operate ie is faulty, switch off "control" switch off "control" switch and regulate via "manual" control. Consult specialist.
- If boiler temperature has dropped and burner indicates malfunction, refer to the burner suppliers' instructions (press malfunction button).

General check on whether:

- Fuse is intact.
- Mains switch is turned on and other controls are calling for heat.
- Burner plug is correctly plugged in.
- Heating pump and filling pump are operating.
- Burner indicates malfunction.
- Control is switched on and displays the correct time.
- All valves are open.
- Fuel is available.
- All switches and knobs are set as per instructions.
- Boiler has switched off due to excess temperature.

Maintenance

- Clean the boiler regularly, proceed as follows:
 - Turn off mains switch and control.
 - Open burner door.
 - Clean heating gas flue-ways and combustion chamber.
 - Close burner door and tighten nuts firmly.
- Never tap water from the boiler for domestic use.
- If the system is to be out of operation for an extended period of time, clean the boiler thoroughly, spray it out with a mixture of oil and graphite and close the door firmly.
- If there is a frost hazard when the system is out of operation, drain the boiler. Leave the stop-cock open (unless it contains anti-freeze).
- Perform maintenance of heating controls and burner according to the manufacturers' instructions.

Hazards:

- Operate the boiler at a maximum temperature of 95°C. If the boiler overheats as a result of incorrect operation, switch the burner off immediately. Do not refill with water until the boiler has cooled off.
- Never fill the hot boiler with cold water.
- Flue gas temperature of less than 160°C can cause sooting in masonry chimneys.
- Consult the heating installers' service department if heating gas flue-ways become severely fouled or condensation occurs.
- Only refill the oil tank when the system is switched off. Start up no earlier than the next day, so the dirt which has been disturbed in the tank can settle again.
- Inspect the door seal gasket between the front section and the door. If the gasket is damaged, a specialist should fit a replacement. Close the cleaning door ensuring it is firmly sealed. Check all the door bolts are firmly tightened.

THE COMPANY RESERVES THE RIGHT TO CHANGE SPECIFICATIONS AND DIMENSIONS WITHOUT NOTICE

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