Technical information

Remeha Gas 450

Remeha Gas 450

- Atmospheric gas boiler with reduced NOx emission
- 217 - 344 kW

remeha
Clean Heat

CONTENTS

PREFACE

These technical instructions contain useful and important information for the proper operation and maintenance of the Remeha central heating boiler, model Gas 450. Further it contains important directions to prevent accidents and serious damage before putting it into service and during operation of the boiler, to allow as far as possible a safe and trouble free operation. Read these instructions carefully before putting the boiler into operation, familiarize yourself with its operation and control and strictly observe the directions given.

If you have any questions, or if you want more information about specific items relating to this boiler, please do not hesitate to contact us.
The data published in these technical instructions is based on the most recent information and is given subject to later revisions.
We reserve the right to modify the construction and/or design of our products at any moment, without obligation to update earlier supplies accordingly.

1. BOILER DESCRIPTION

The Remeha Gas 450 boiler is a cast iron sectional boiler with atmospheric burners.
Suitable for all qualities of natural gas and LPG, cat. II 2H3P (LPG version on request)
The Remeha Gas 450 central heating boiler is approved according to the following European directives:

- Gas appliance directive no. 90/396/EEC
- Efficiency directive no. 92/42/EEC
- E.M.C. directive no. 89/336/EEC

and complies with the following directives:

- Low voltage directive no. 73/23/EEC
- Machine directive no. 89/392/EEC.

Classification type for evacuation of the combustion products: B11 BS.
For further advice or information contact Broag Ltd.

The Remeha Gas 450 is supplied with electronic junction with insulated casings.
Water connections $2^1/_2$" BSP.

2. CONSTRUCTIONS

2.1 General

- Boiler block of cast iron sections nippled together with conical nipples.
- Gas and water connections are at the rear of the boiler.
- Instrument panel is fitted in the front casing and must be assembled on the same side as the gas and water connections.
  Instrument panel must be assambled on the same side of gas and water connections.
- Cleaning of the cast iron block from top of the boiler.
- The control and safety equipment is fitted behind the front casings.
- The boiler is entirely prewired.
- Gas and water connections can be assembled both left and right.

2.2 Burners

The burners are stainless steel, atmospheric burners with cooling rods to reduce the flame temperature. They guarantee a low noise level and a reduced NOx-emission.

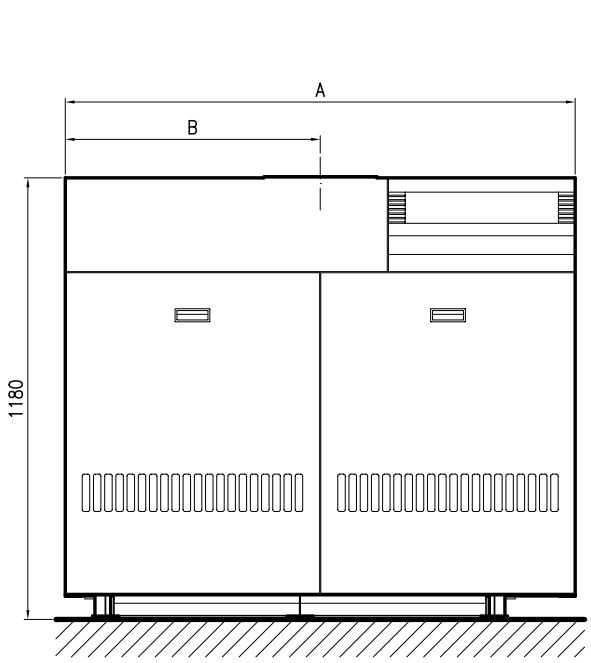
2.3 Boiler floor

The Remeha Gas 450 boiler is supplied as standard with reflecting floor plates with ventilation underneath.

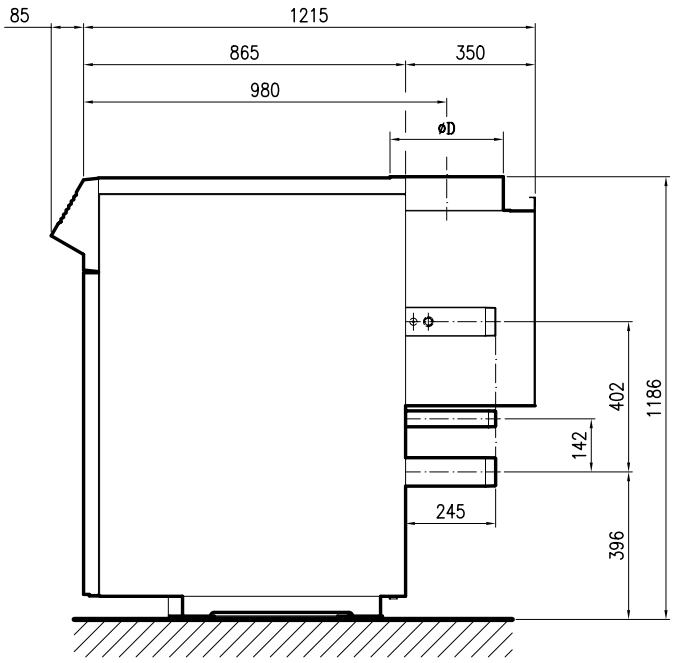
2.4 Delivery

The total range is supplied in parts for site assembly.

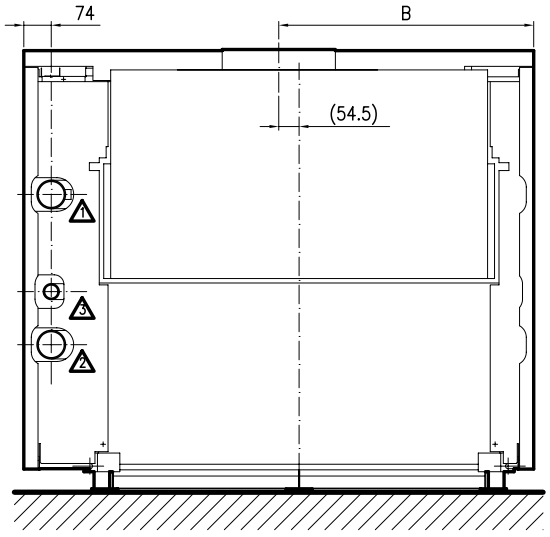
3. TECHNICAL INFORMATION AND DIMENSIONS



Front view



Side view



Rear view

1 *Flow R 2½"*
2 *Return R 2½"*
3 *Gas connection: R 1¼"*

Note:
Right hand execution is shown: instrument panel, gas and water connections on the right hand side; left hand execution is mirror image

Fig. 01 Dimensions

Number of sections	Heat output	Heat input		Gasrate	Dimensions			Water resistance		Water content	Boiler weight	Mass flue rate
		Hs	Hi		A	B	Ø D	³t = 10°C	³t = 20°C			
	kW	kW	kW	m³/h	mm	mm	mm	mbar	mbar	l	kg	kg/h
11	217	268	241	25.0	1365	682.5	300	84	21	91	725	544
13	262	322	290	30.1	1565	782.5	300	120	30	105	835	654
15	307	376	338	35.1	1763	881.5	350	164	41	118	950	752
17	344	420	378	39.2	1963	981.5	350	208	52	131	1060	831

** Connections can also be assembled on the other side*

4. APPLICATION

4.1 L.P.H.W. system

4.1.1 Water temperature
Maximum water temperature is 110°C (high limit thermostat).
Highest boiler operation water temperature is 95°C (control thermostat).
Minimum return water temperature is 20°C at a flowrate related to a ³t of 20°C (flow/return temperature).

4.1.2 Water pressure
Boiler sections pressure test at 10 bar.
Maximum pressure test boiler block is 8 bar.
Maximum working pressure is 6 bar.
Minimum working pressure boiler is 0.8 bar.
Optional a water pressure switch set at 0.8 bar can be supplied with the boiler.

4.1.3 Water flow
The minimum water flow through the boiler is:

$$\frac{\text{Output boiler in kW}}{93} = \ldots \text{ m}^3/\text{h}$$

This minimum flow must be maintained for 5 minutes after the burner stops firing to avoid high temperature shut-down due to residuel heat gain.
Due to the design and manufacture of the boiler no specific minimum water flow requirement exists other than high-temperature protection.

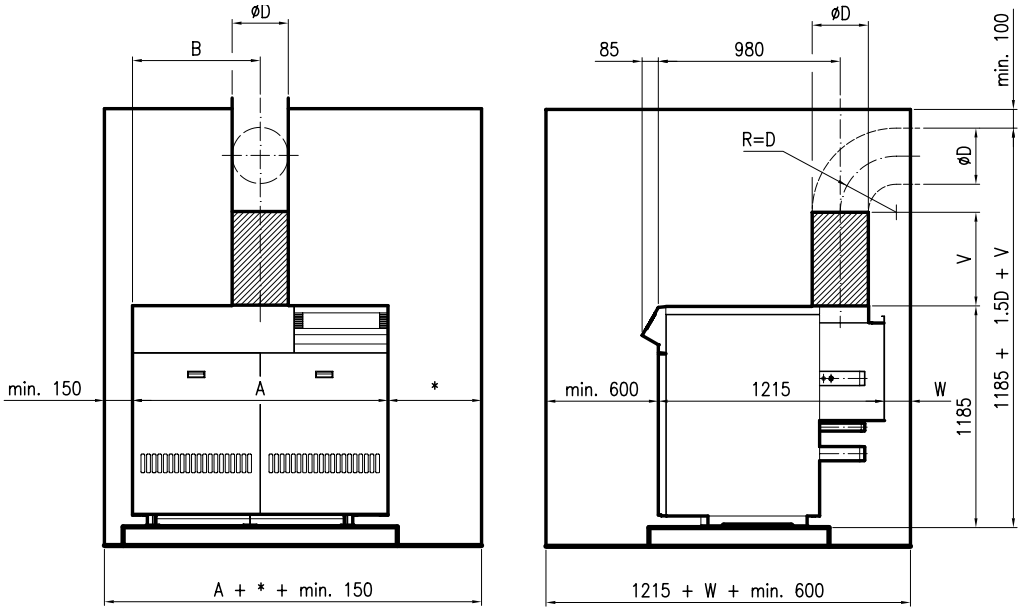
4.1.4 Water treatment
Water treatment under normal circumstances is not necessary (see our water quality recommendations).

4.1.5 Noise level
The noise level measured around the boiler depending on boiler room construction is about 50 dBA.
(Noise level taken at 1 meter from the boiler).

4.2 Chimneys
The average flue gas temperature is so low that the chimney must be in accordance with the guidelines of British Gas and BS 6644.

5. TYPICAL BOILER INSTALLATIONS

1 boiler in boiler room

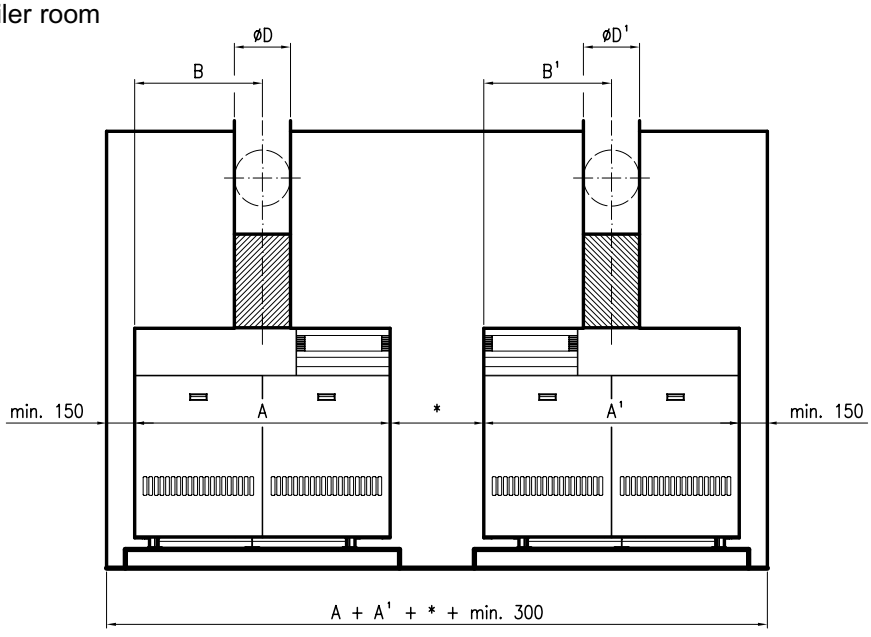


V = min. length 0.5 m before elbow, thus avoiding down-draught
W = min. 150 mm with vertical flue outlet
W = min. 0.5D + 50 mm with horizontal flue outlet

** = free access to rear of boiler*
Note:
Right hand execution is shown: instrument panel, gas and water connections on the right hand side; left hand execution is mirror image

Fig. 02 Installation 1

2 boilers in boiler room



** = free access to rear of boiler*

Note:
Both right and left hand execution are shown:
- *left boiler: instrument panel, gas and water connections on the right hand side;*
- *right boiler: instrument panel, gas and water connections on the left hand side.*

Fig. 03 Installation 2

		Dimensions (mm)		
		A	**B**	**Ø D**
Number of sections	**11**	1365	682.5	300
	13	1565	782.5	300
	15	1763	881.5	350
	17	1963	981.5	350

6. REGULATION AND SAFETY EQUIPEMENT

6.1 General
The Remeha Gas 450 is supplied with electronic control and safety equipment with ionisation flame detection.

6.2 Instrument panel
The Remeha Gas 450 is supplied with an instrument panel that is fitted in the front of the boiler. The standard instrument panel can be extended with the fitting of the following options: hour run meters, water pressure switch, down draught thermostat, no volt contacts and/or ***rematic***® control.

All connections are pre-wired and fitted with plugs. The capillaries from the control panel should be fitted in the pocket of the boiler, which is fitted in the flow connection of the boiler.

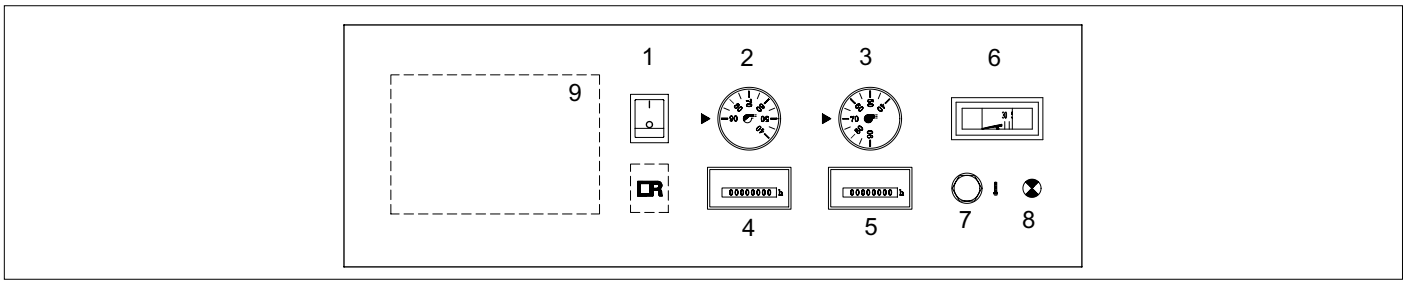


Fig. 04 Layout of the instrument panel, extended with hour counters

1. Operating switch (On/Off)
2. Control thermostat On/Off. Setting between 35 - 95°C
3. Control thermostat high/low. Setting between 35 - 95°C
4. Hour run meter total running hours (not standard)
5. Hour run meter full load hours (not standard)
6. Analogue thermometer for water temperature
7. High - Limit thermostat 110°C (pre set)
8. Warning light (lock out)
*9. Option for **rematic**® weather compensator*

6.3 Standard electronic gas train High/Low

6.3.1 Schematic

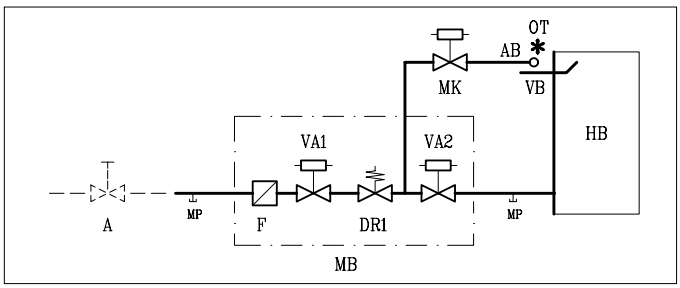


Fig. 05 Gastrain

Legend
A Gas cock
AB Pilot burner
DR Gas governor
F Gas filter
HB Main gas burners
MB Gas multibloc
OT Ignition transformer
MK Pilot gas valve
MP Measuring point
VA Safety shut off valve
VB Ionisation probe
- - - - Not supplied.

6.3.2 Specification
1 Gas Multi-Bloc contains:
  2 Safety shut off valves
  1 Gas governor
  1 Gas filter
1 Pilot gas valve
1 Pilot burner with ionisation probe and ignition probe

6.3.3 Control panel behind front panel
1 Control box Satronic
1 Ignition transformer 16 kV

6.4 Functions

6.4.1 Flame protection
Flame protection by means of ionisation flame detection.

6.4.2 Down draught thermostat
Optional the boiler can be fitted with a down draught thermostat. When there is down draught of the flue gases this thermostat will switch off the boiler.
Fixed setpoint is 70°C.

6.4.3 Thermostats
Control thermostat On/Off 35°-95°C.
Control thermostat High/Low 35°-95°C.
High-Limit thermostat locks out at 110°C.

7. ASSEMBLING AND INSTALLATION GUIDELINES

7.1 General
The boiler is suitable for operating at a maximum working pressure of 6 bar and a minimum pressure of 0.8 bar. Boiler can be installed in open or closed systems.

7.2 Boiler assembly
Broag can provide special tools on loan for the boiler assembly with detailed building instructions. However, building supervision and/or actual boiler erection services can be provided by Broag or an approved boiler erection engineer.

7.3 Water connections
The boiler water connections ($2^1/_2$" BSP) are fitted at the rear of the boiler (can be assembled either left or right). The two end sections have a $^3/_4$" BSP tapping with plug, one end section to accept a drain/off cock (to be assembled on the same side as the gas/water connections) and other end section to accept a plug.

7.4 Pocket for instrument panel
The thermostat pocket is fitted in the flow connection of the boiler.

7.5 Water pressure
Each section is hydraulically tested to at least 10 bar. Maximum test pressure for the assembled boiler block is 8 bar. Operating pressure between 0.8 bar and 6 bar. Optional the boiler can be fitted with a water pressure switch, set at 0.8 bar.

8. GAS SUPPLY

8.1 General
The gas train is fitted behind the front casing.
The local Gas authority should be consulted to ensure that an adequate pressure and supply is available at the boilers maximum output. To minimise risk of sediment or foreign particles entering the control valves, an approved filter may be fitted into the pipe work downstream.
The gas supply should be conform to the British Gas safety regulations.

8.2 Gas pressure
Cat. I_2H
Maximum gas pressure at inlet 100 mbar.
Burner pressure:
- full load : 14.0 mbar (100%)
- part load : 5.0 mbar (60%)
- injector size: 3.85 mm Ø

Note: LPG version on request.

9. ELECTRICAL SUPPLY

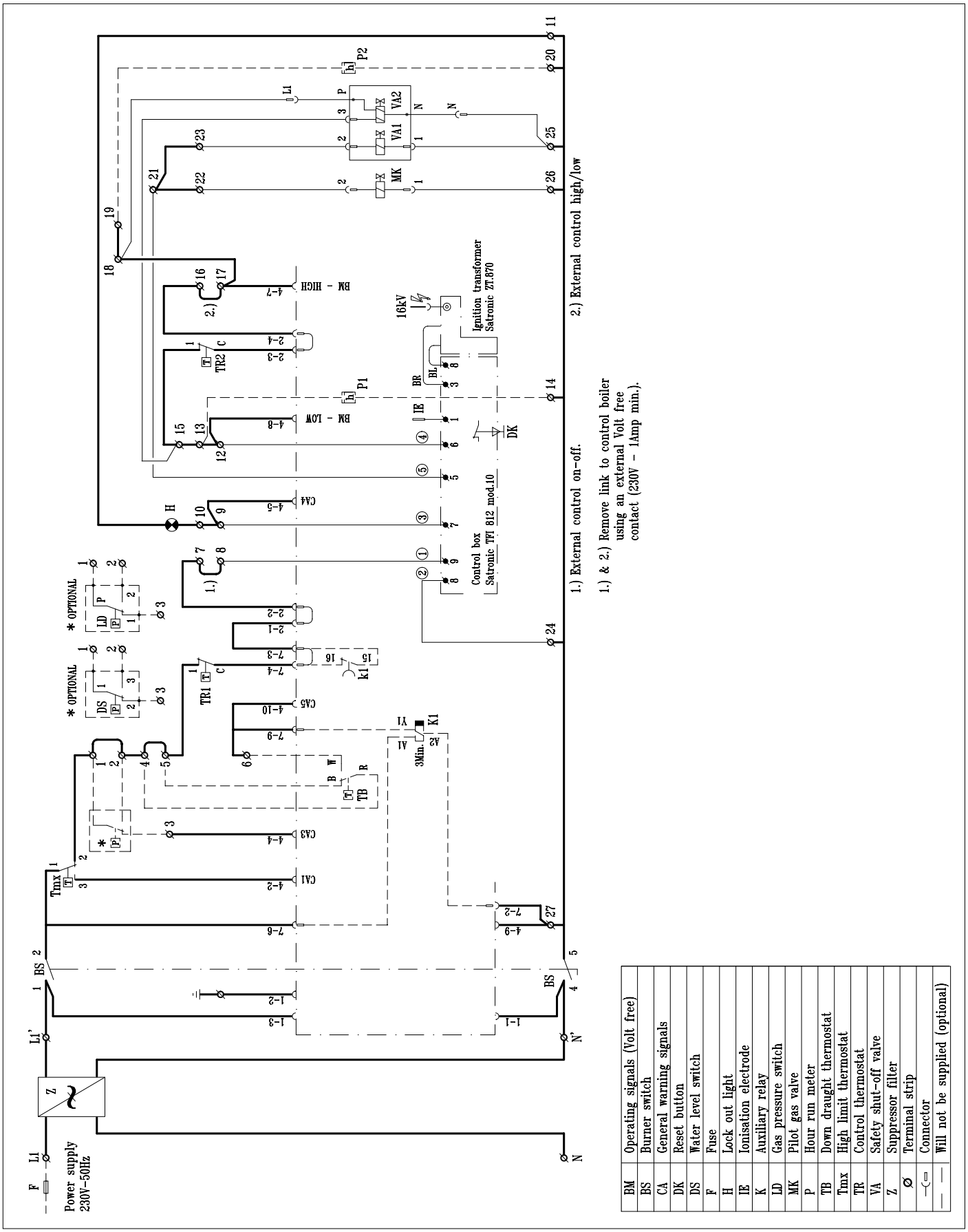
9.1 General
The electrical installation must conform to the IEE regulations and also to local authority requirements.

9.2 Control panel
A control panel is fitted behind the front casing on the same side as the water and gas connections.

9.3 Electrical connections
The boiler is pre-wired. Only the main supply should be wired to the control panel.

9.4 Electrical data
Main supply : 230 V-50Hz (L/N).
Running current: 155 VA.
Installed fuse : 6 Amp.

9.5 Wiring diagram boiler



BM	Operating signals (Volt free)
BS	Burner switch
CA	General warning signals
DK	Reset button
DS	Water level switch
F	Fuse
H	Lock out light
IE	Ionisation electrode
K	Auxiliary relay
LD	Gas pressure switch
MK	Pilot gas valve
P	Hour run meter
TB	Down draught thermostat
Tmx	High limit thermostat
TR	Control thermostat
VA	Safety shut-off valve
Z	Suppressor filter
Ø	Terminal strip
—⊂⊃	Connector
— —	Will not be supplied (optional)

Fig. 06 Wiring diagram

10. COMMISSIONING

Note:
Commissioning to only be carried out by a qualified engineer with the relevant training and certification i.e. Acops - Corgi and a commissioning data sheet completed on site for issue to owner.

10.1 Technical information

Control box: Satronic TFI 812-2 mod. 10.
Main supply: 230 V-50 Hz.
Minimum ionisation current: 3 µA.
Reaction time flame protection: 1 sec.
Safety time: < 10 sec.
Maximum ambient temperature: 60°C.
Injector size pilot burner: Ø 0.5 mm.
Injector size main burner: Ø 3.85 mm.
Burner pressure full load: 14.0 mbar (100%).
Burner pressure part load: 5.0 mbar (60%).

Warning:
Control box is neutral/phase sensitive: if incorrectly connected the boiler will not start.

10.2 Commissioning the boiler

1. Check gas connections.
2. Check electrical supply (L/N and earth).
3. Check water connections and if installation is filled.
4. Switch on circulation pump and check rotation direction.
5. Open main gas cock (release air in gas pipe work).
6. Switch on electrical supply.
7. Set the control thermostats at about 85°C.
8. After a waiting time of about 3 seconds you will get ignition. At a minimum ionisation current of 3 µAmp the safety gas valve will open. The boiler is on.
9. Let the boiler run for a couple of minutes to get rid of air in the gas pipe.
10. Set the correct burner pressure.
11. Check the thermostats for correct operation.
12. Check the flame protection, by starting with the ionisation probe disconnected.
13. Send the commissioning reports to Broag.

10.3 Switching off the boiler

1. Set boiler controls to off.
2. Allow system to cool.
3. Switch off the electrical supply.
4. Turn off the gas cock.

11. MAINTENANCE

11.1 General

It is essential for efficient operation, to service the boiler, the gas train and clean the boiler room once a year.

11.2 Maintaining the boiler

1. Remove the front casing of the boiler.
2. Remove the top casing and the top of the flue hood.
3. Clean the internal flue ways of the boiler with a steel cleaning brush (available from Broag).
4. Clean the boiler room and the floor underneath the boiler.
5. Clean the burners internally and externally and check the kanthal bars.
6. Clean the boiler casings.
7. Clean the gas train, ignition, pilotburner, thermostats and wiring.
8. Check the gas train and pipe for gas leakage.
9. Check the start program, ignition time and safety times.
10. Check flame protection and thermostats.
11. Check the boiler input at 100% (full load) and 60% (part load).
12. Make a combustion efficiency calculation.
13. Check the boiler and installation for water leakage.

Remeha Gas 450

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