

Technical information

Remeha Gas 350

R e m e h a G a s 3 5 0

- Atmospheric gas boiler
- 64 - 174 kW



 broag

TABLE OF CONTENT

Preface	3	7 Assembly and installation guidelines	9
1 Boiler description	3	7.1 General	9
2 Construction details	3	7.2 Boiler assembly	9
2.1 General	3	7.3 Water connections	9
2.2 Burners	3	7.4 Pocket the thermostat capillaries	9
2.3 Boiler Floor	3	7.5 Water pressure	9
2.4 Delivery	3	8 Gas supply	10
3 Dimensions and technical data	4	8.1 General	10
3.1 Dimensions Remeha Gas 350	4	8.2 Gas pressure	10
3.2 Technical data	4	8.3 Injectors	10
3.3 Quotation specifications	5	8.4 Operation on propane	10
4 Application information	5	9 Electrical supply	10
4.1 L.P.H.W. system	5	9.1 General	10
4.1.1 Water temperature	5	9.2 Control box	10
4.1.2 Water pressure	5	9.3 Electrical connections	10
4.1.3 Water flow	5	9.4 Electrical information	11
4.1.4 Water treatment	5	9.5 Wiring diagrams	11
4.1.5 Noise level	6	10 Commissioning	12
4.2 Chimneys	6	10.1 Commissioning the boiler	12
4.3 Installation standards	6	10.2 Switching off the boiler	13
5 Typical boiler installations	7	11 Maintenance	14
5.1 Installation 1	7	12 Trouble shooting	14
5.2 Installation 2	7	12.1 Communication	15
6 Control and safety equipment	8	12.2 Fault causes	15
6.1 General	8		
6.2 Instrument panel	8		
6.3 Standard electronic gas train High/Low	8		
6.3.1 Schematic	8		
6.4 Specification control box	9		
6.4.1 Specification Ignition transformer	9		
6.5 Functions	9		
6.5.1 General	9		
6.5.2 Flame control (lock out)	9		
6.5.3 Thermostats (shutdown / lock out)	9		
6.5.4 Water pressure switch - optional (shut down)	9		
6.5.5 Gas pressure switch LD - optional (shut down)	9		
6.5.6 Down draught thermostat - optional (shut down)	9		

PREFACE

These technical instructions contain useful and important information for the correct operation and maintenance of the Remeha boiler, model Gas 350. Read these instructions carefully before putting the boiler into operation, familiarise yourself with its control functions and operation, strictly observing the instructions given. Failure to do so may invalidate warranty or prevent the boiler from operating. A competent Engineer, with the relevant certification (i.e. CORGI, ACOPS, IEE regs. etc.) must carry out the installation and commissioning of the boiler. On completion a copy of the boiler log / commissioning sheet should be returned to Broag Ltd for record purposes.

If you have any questions, or if you need more information about specific subjects relating to this boiler, or its installation please do not hesitate to contact us. The data published in these technical instructions is based on the latest information (at date of publication) and may be subject to revisions. We reserve the right to continuous development in both design and manufacture, therefore any changes to the technology employed may not be retrospective nor may we be obliged to adjust earlier supplies accordingly.

1 BOILER DESCRIPTION

The Remeha Gas 350 boiler is a cast iron sectional floor standing gas fired boiler with Class II reduced NO_x burners. Supplied c/w control high/low and high limit thermostats, automatic ignition and flame failure safety controls. Suitable for all qualities of natural gas and propane, cat. II_{2H3B/P}. The Remeha Gas 350 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,
- Low voltage directive no. 73/23/EEC.

Remeha Gas 350 PIN: 0063AS3842
Classification type for evacuation of the combustion products: B_{11BS}, B₁₁.
For further advice or information contact Broag Ltd.
The Remeha Gas 350 is supplied with electronic junction with insulated casings.

2 CONSTRUCTION DETAILS

2.1 General

The Remeha Gas 350 is a floor standing boiler complete with temperature and safety controls. The cast iron sectional heat exchanger is assembled using conical nipples and jointing compounds and ceramic rope. The finished unit is cased in an insulated enamel coated steel enclosure. The boiler has a built in draught diverter. It has water and gas connections within the casings at the rear right hand side (when viewed from the front). The boiler is supplied prewired requiring only permanent mains supply and external control connections.

2.2 Burners

The burners are stainless steel, atmospheric type with cooling rods to reduce the flame temperature. They guarantee a low noise level and a reduced NO_x-emission. Front and top access is required for service work to be carried out.

2.3 Boiler Floor

The Remeha Gas 350 boiler is supplied as standard with reflecting floor plates with ventilation underneath.

2.4 Delivery

The boilers are supplied in sections for on site assembly. The gas train, control panel, burners and casings supplied loose for fitting one site by others. The 4 - 6 units can also be delivered pre-assembled with the main block pressure tested.

3 DIMENSIONS AND TECHNICAL DATA

3.1 Dimensions Remeha Gas 350

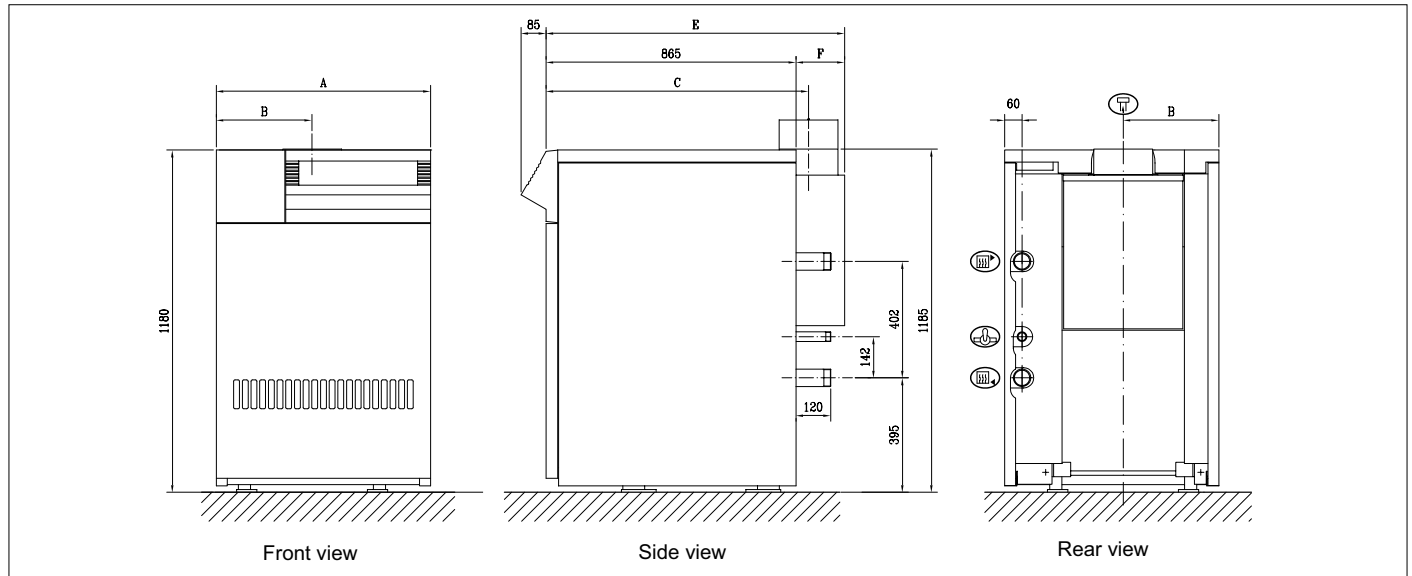


fig. 01 Dimensions Remeha Gas 350

- Flow R2" (BSP M)
- Return R2"
- Gas connection 4 - 6 sections R1"
7 - 9 sections R1¼"
- Flue gas Ø D

Number of sections		4	5	6	7	8	9
A	mm	640	740	840	940	1040	1140
B	mm	280	330	380	430	480	530
C	mm	905	905	905	930	930	930
Ø D	mm	200	200	200	200	250	250
E	mm	1030	1030	1030	1080	1080	1080
F	mm	165	165	165	215	215	215

table 01 Dimensions

3.2 Technical data

Number of sections			4	5	6	7	8	9
Nominal heat output		kW	64	87	109	130	152	174
Nominal heat input	Hi / NCV	kW	72	97	121	145	169	193
	Hs / GCV	kW	80	108	134	161	188	214
Gas consumption		m ³ /h	7.6	10.3	12.8	15.3	17.9	20.4
Flue temperature		°C	154	152	146	138	138	142
Water resistance	Δt = 10°C	mbar	5	13	21	30	41	52
	Δt = 20°C	mbar	2	3	5	8	10	13
Water contents		litre	45	51	58	65	71	78
Boiler weight (dry)		kg	335	390	445	500	555	610
Flue gas flow rate		kg/h	219	239	255	271	398	407

table 02 Technical data Remeha Gas 350

3.3 Quotation specifications

General specifications:

- Heat exchanger manufactured from corrosion resistant "pearlite" cast iron
- Maximum operating pressure of 6 bar
- Maximum operating temperature of 95°C
- Electronic ignition as standard
- High/low operation as standard
- Reduced NO_x burners (CE class 2)
- Built in draft diverter
- Supplied in broken down form, the models 4-6 sections can also be delivered pre-assembled
- Powder coated enamel steel casing
- 80 mm thick glass wool insulation
- Suitable for use with a Natural gas (propane available as an option)
- Minimum return water temperature 20°C
- Supplied as standard with on/off switch, temperature indication, control and high limit thermostats
- Efficiency 81.5% (GVC)
- Manufactured to ISO 9001
- CE approved

Optional:

- Hours run meters
- BMS contacts for remote indication
- Water pressure switch
- Down draught thermostat
- *rematic*[®] control.

4 APPLICATION INFORMATION

4.1 L.P.H.W. system

4.1.1 Water temperature

Maximum water temperature is 110°C (high limit thermostat).

Highest operating boiler water temperature is 95°C (control thermostat).

Minimum return water temperature is 20°C at a flow rate related to a Δt of 20°C (flow/return temp).

4.1.2 Water pressure

Boiler sections are factory pressure tested to 10 bar.

Maximum pressure test boiler block is 8 bar.

Maximum working pressure is 6 bar.

Minimum working pressure is 0.8 (sealed system) or 0.3 (open vented).

4.1.3 Water flow

The minimum water flow through the boiler on shut down is:

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

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

4.1.4 Water treatment

The system should be filled with mains cold water (for the UK this will usually have a pH of between 7 and 8). Pressurised installations with a boiler/system content ratio of 1:10 or less should not require water treatment, provided that the following conditions apply:

1. The system is flushed thoroughly to remove all fluxes and debris and then filled completely once.
2. Make up water is limited to 5 % per annum.
3. The hardness of the water does not exceed 360 ppm (20°D).

All scale deposits will reduce the efficiency of the boiler and should be prevented. However provided the above is complied with any scale produced will not be too detrimental to the boiler efficiency and will not reduce the anticipated life expectancy of the boiler.

NOTE: Scale deposits in excess of 3 to 5 mm will reduce boiler efficiency and greatly increase the risk of premature casting failure.

As most systems contain a variety of metals which can react with each other to cause corrosion. It is considered good practice to provide some form of water treatment (especially in open vented systems) in order to prevent or reduce the following:

- Metallic corrosion;
- Formation of scale and sludge;
- Microbiological contamination;
- Chemical changes in the untreated system water.

Suitable chemicals and their use should be discussed with a specialist water treatment company prior to carrying out any work. The specification of the system and manufacturers recommendations must be taken into account, along with the age and condition of the system. New systems should be flushed thoroughly to remove all traces of flux, debris, grease and metal swarf generated during installation. Care to be taken with old systems to ensure any black metallic iron oxide sludge and other corrosive residues are removed, again by thoroughly flushing, ensuring that the system is drained completely from all low points.

NOTE: Please ensure that the new boiler plant is not in circuit when the flushing takes place, especially if cleaning chemicals are used to assist the process.

Under no circumstances is the boiler to be operated with cleaning chemicals in the system.

To Summarise:

- Minimise water loss;
- Prevent pumping over in open vented systems;
- Provide adequate air venting at all high points;
- Keep pH level between 7 - 9 when using additives;
- Maximum chlorine content of 200 mg/l;

Take advice on the suitability of inhibitors.

4.1.5 Noise level

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

4.2 Chimneys

The average flue gas temperature is so low (108-173°C) that the chimney must be made in accordance with the guidelines of British Gas, BS 6644 and IG 10.

4.3 Installation standards

The following instructions must be adhered to when the Remeha Gas 350 is installed:

Gas Safety (installation and use) Regulations 1984 (as amended).

In addition to the above regulations, this boiler must be installed in compliance with:

- Current I.E.E. Regulations for electrical installations;
- Local building regulations;
- The Building Standards (Scotland);
- (Consolidation) Regulations;
- By-laws of the local water undertaking;
- Health and Safety Document No 635 'The Electricity at Work Regulations 1989'.

It should also be in accordance with the relevant recommendations in the current editions of the following British Standards and Codes of Practice, viz. BS 5440 Pt 1 and 2, BS 5449, BS 5546, BS 6798, BS 6891 and BG.DM2.

Lawfully all gas appliances must be installed by competent persons (e.g. Corgi, ACOPS).

Failure to install appliances correctly could lead to prosecution.

It is in your own interest and that of safety to ensure that the law is complied with.

Important:

The Remeha Gas 350 is a certified appliance and must not be modified or installed in any way contrary to these 'Installation and Servicing Instructions'. Manufacturer instructions must NOT be taken in any way as when overriding statutory obligations.

5 TYPICAL BOILER INSTALLATIONS

5.1 Installation 1

Recommended layout for one boiler installation, measurements in mm.

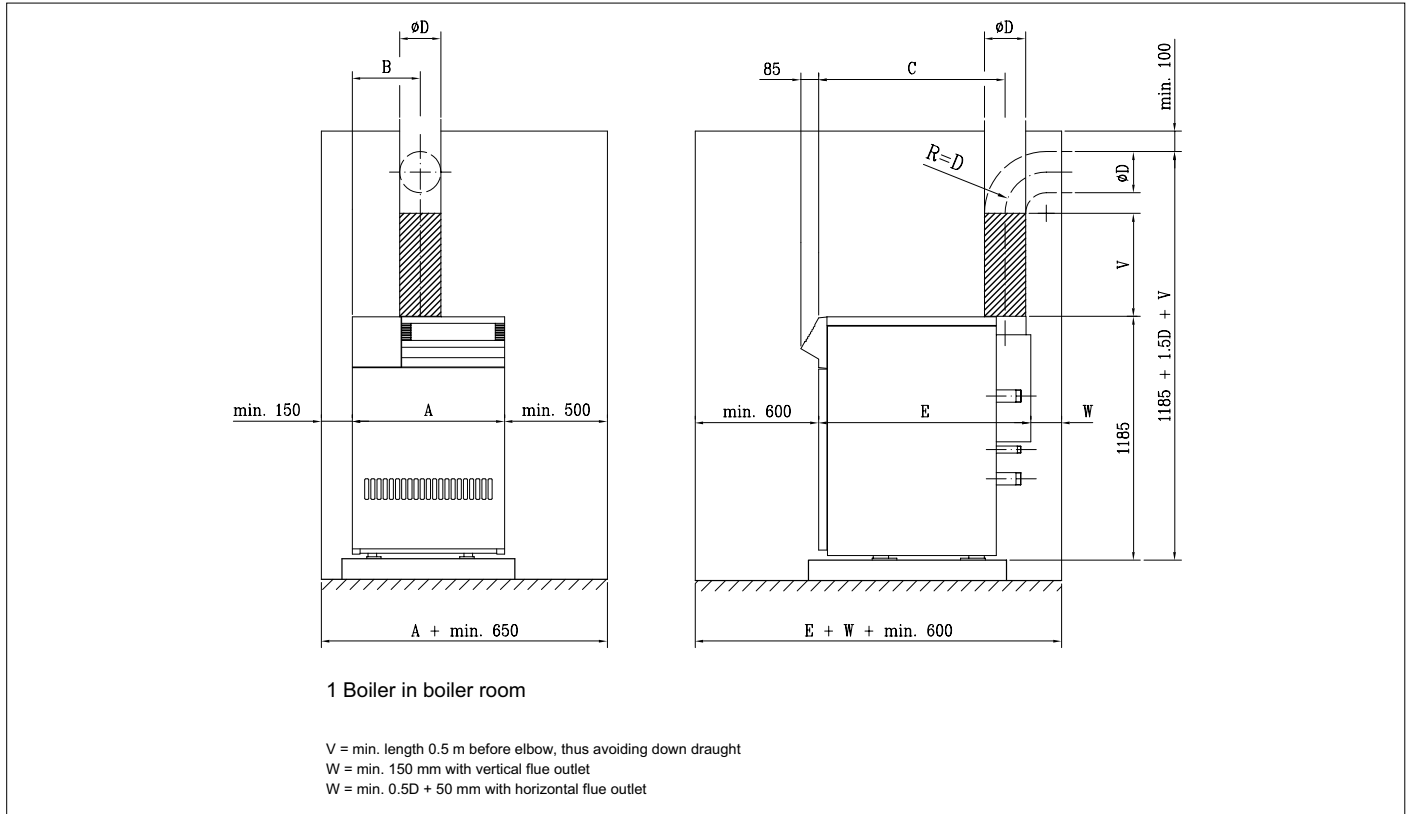


fig. 02 One boiler

5.2 Installation 2

Recommended layout for two-boiler installation, measurements in mm.

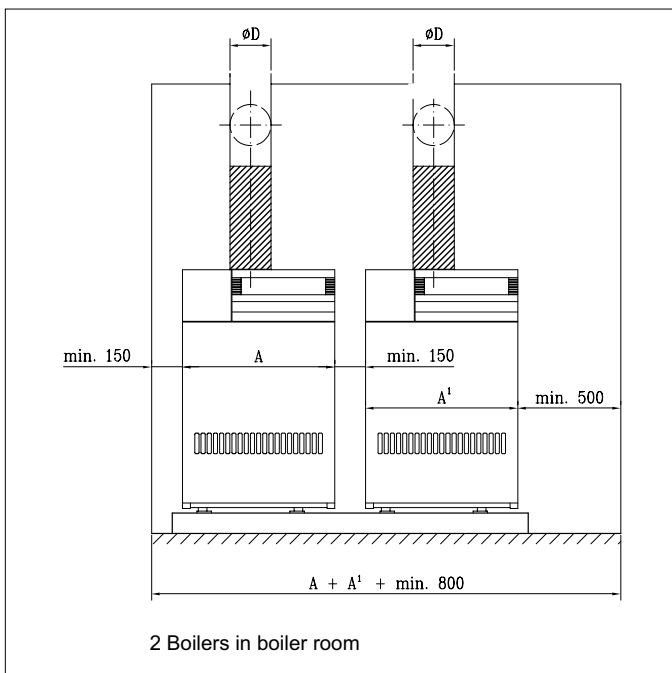


fig. 03 Two boilers

number of sections	Dimensions				
	A	B	C	Ø D	E
4	640	280	905	200	1030
5	740	330	905	200	1030
6	840	380	905	200	1030
7	940	430	930	200	1080
8	1040	480	930	250	1080
9	1140	530	930	250	1080

6 CONTROL AND SAFETY EQUIPMENT

6.1 General

The Remeha Gas 350 is supplied with electronic control and safety equipment with ionisation flame detection.

6.2 Instrument panel

The Remeha Gas 350 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, simple or complex volt free modules 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.

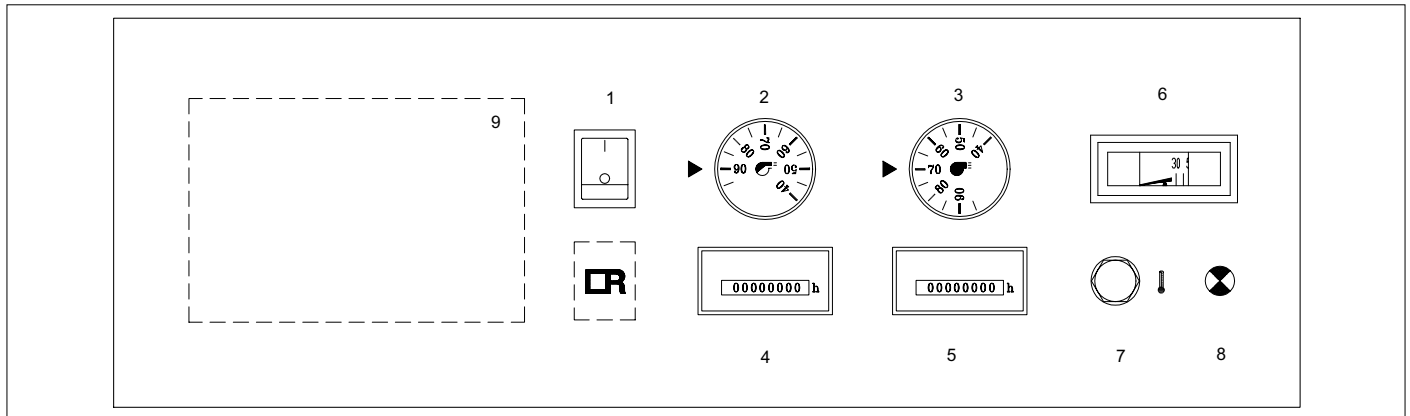


fig. 04 Instrument panel

The instrument panel contains:

1. Operating switch (On/Off);
2. Control thermostat On/Off, range 35°C-95°C;
3. Control thermostat High/Low, range 35°C-95°C;
4. Hour run meter total running hours (option);
5. Hour run meter full load hours (option);
6. Analogue thermometer for flow temperature;
7. High – limit thermostat pre set to 110°C;
8. Lock out warning lamp;
9. Option for **rematic**® weather compensator.

6.3 Standard electronic gas train High/Low

6.3.1 Schematic

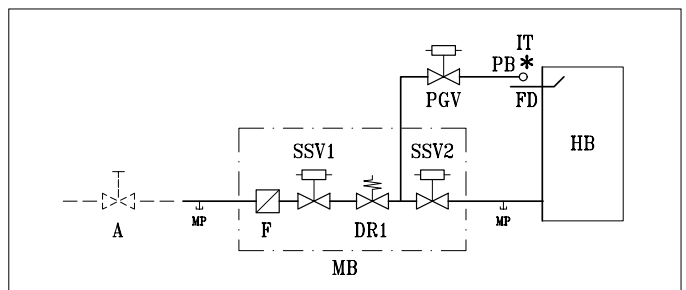


fig. 05 Schematic layout gas train

Legend

- A Gas cock
- PB Pilot burner
- DR Gas pressure governor
- F Gas filter
- HB Main burners
- PGV Pilot gas valve
- MP Measuring point
- SSV Safety shut off valve
- FD Ionisation probe
- MB Gas multiblock
- IT Ignition transformer
- Not supplied as standard

6.4 Specification control box

Control box	: Satronic DKG 972-27
Mains supply	: 230 V – 50 Hz
Minimum ionisation current	: min 3 μ A (DC)
Reaction time flame protection	: 1 sec.
Safety time	: \leq 10 sec.
Maximum ambient temperature	: 60 °C
Injector size pilot burner	: \varnothing 0.5 mm
Injector size main burner	: \varnothing 4.0 mm
Burner pressure full load (high calorific gas)	: 14.0 mbar (100%)
Burner pressure part load (high calorific gas)	: 5.0 mbar (60%)
Start repetitions	: 5x

Warning: control box is phase / neutral sensitive.

6.4.1 Specification Ignition transformer

Ignition transformer:	Satronic ZT. 870
Ignition voltage:	16 kV
Distance electrodes:	3,5 \pm 1 mm.

6.5 Functions

6.5.1 General

The following functions (standard and optional) will, when activated, either lock out or shut down the boiler. For all options full fitting instructions are included in the option pack.

6.5.2 Flame control (lock out)

The flame is monitored using ionisation flame detection. In the event of a flame failure the boiler will lock out. Manual intervention is required to reset the boiler (on the control box) once the cause of the problem has been rectified.

6.5.3 Thermostats (shutdown / lock out)

- Control thermostat On/Off: shutdown (35°C-95°C);
The boiler will automatically resume operation when the flow temperature falls below the set point.
- Control thermostat High/Low: shutdown (35°C-95°C);
The boiler will automatically resume operation when the flow temperature falls below the set point.
- High Limit thermostat: lock out at 110°C;
The boiler will lock out. Manual intervention is required to reset the boiler (on the instrument panel) once the cause of the problem has been rectified.

6.5.4 Water pressure switch - optional (shut down)

The boiler can be fitted with an optional water pressure switch. If the water pressure drops below the set value (0.8 bar), the boiler will shut down. When the water pressure returns to 1 bar, the boiler will resume operation again.

Type: SIT 340

6.5.5 Gas pressure switch LD - optional (shut down)

The boiler can be fitted with an optional gas pressure switch LD. If the supply gas pressure drops below the set value (12 mbar; for natural gas only), the boiler will shut down. When the supply gas pressure returns above this set value the boiler will resume operation again.

Type: Dungs GW50 A5.

6.5.6 Down draught thermostat - optional (shut down)

The boiler can be fitted with an optional down draught thermostat. When the temperature in the draught diverter rises above the down draught thermostat set point, the boiler will shut down. It automatically resets after 3 minutes, provided that the temperature also falls.

Type: Honeywell L6068A; fixed set point is 70°C.

7 ASSEMBLY AND INSTALLATION GUIDELINES

7.1 General

The boiler is suitable for operating at a maximum working pressure of 6 bar. It can be installed in open vented system with a minimum pressure of 0.3 bar or in sealed system with a minimum pressure of 0.8 bar.

7.2 Boiler assembly

The boiler is supplied with full assembly instructions. On request special assembly tools can be hired from Broag on a daily basis. However, Broag (or a Broag approved boiler erection engineer) can provide boiler assembly services and / or building supervision.

7.3 Water connections

The boiler water connections (2" male thread) are fitted at the rear of the boiler (right hand connections only). The two sections have a $\frac{3}{4}$ " BSP tapping, the right hand end section to accept a drain/off cock and the left hand end section to accept a plug.

7.4 Pocket the thermostat capillaries

The multi pocket for the thermostat capillaries is fitted in the flow connection of the boiler.

7.5 Water pressure

Each section is hydraulically tested at 10 bar. Operating pressure between 0.3 and 6 bar. The boiler can be fitted with an optional 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. To minimise risk of sediment or foreign particles entering the control valves, an approved filter can be fitted into the pipe system downstream. The gas supply should be conforming to the British Gas safety regulations.

8.2 Gas pressure

Natural gas, cat. I_{2H 3B/P} (20 mbar).
 Maximum gas pressure at inlet 100 mbar. Recommended min gas pressure required at the boiler is 17 mbar with it operating at high fire.
 Main burner pressure settings:
 full load: 14.0 mbar
 part load: 5.0 mbar
 Pilot burner pressure settings: 13 mbar
 Gas inlet pressure: 17 - 100 mbar

8.3 Injectors

Injector size main burner: 4.0 mm
 Injector size ignition burner: 0.5 mm

8.4 Operation on propane

The boiler is supplied, as standard set for natural gas, therefore the boiler must be converted to propane **BEFORE** the boiler is fired and commissioned for the first time on propane.

Important: The boiler can only operate **ON/OFF** once converted to propane!

For operation on propane the main burner injectors and pilot burner injector (Ø 0.25 mm) must be replaced. Also the burner pressure must be adjusted. **It is important to remove the cooling rods from the burners, including their supports.**

Use our conversion kit for propane and follow the fitting and commissioning instructions.

Technical data for operation on propane are shown in table 03

Note: Place the sticker from the conversion kit to indicate that the boiler has been changed for propane firing.

Number of sections	Heat output	Heat input Hi	Burner pressure ¹⁾	Gas consumption ²⁾		Injector size main burner	Injector size pilot burner
	kW	kW	mbar	m ³ /h	kg/h	Ø mm	Ø mm
4	64	72	28	2.9	5.6	2.5	0.25
5	87	97	28	4.0	7.5	2.5	0.25
6	109	121	28	4.9	9.4	2.5	0.25
7	130	145	28	5.9	11.2	2.5	0.25
8	152	169	28	6.9	13.1	2.5	0.25
9	174	193	28	7.9	15.0	2.5	0.25

table 03 Technical data propane

¹⁾ The burner pressure may never vary more than 20% of the inlet pressure

²⁾ Caloric value propane = 24.44 kWh/m³ = 12.9 kWh/kg

9 ELECTRICAL SUPPLY

9.1 General

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

9.2 Control box

The Satronic control box is fitted behind the front casing.

9.3 Electrical connections

The boiler is pre-wired requiring only a mains supply and external controls connected to the control panel. The boiler can be fitted as an option, with a basic or an extended signalling print.

Functions of the basic signalling print:

- general alarm
- operating signals stage 1 and stage 2

Functions of the extended signalling print:

- general alarm
- operating signals stage 1 and stage 2
- no power supply
- valve leakage failure
- burner failure
- low water level
- down draught thermostat
- water level control
- high limit thermostat.

9.4 Electrical information

Main supply: 230 V-50 Hz (L/N)
 Power consumption running: 110 W
 Maximum fuse: 6.3 A (slow blow)

9.5 Wiring diagrams

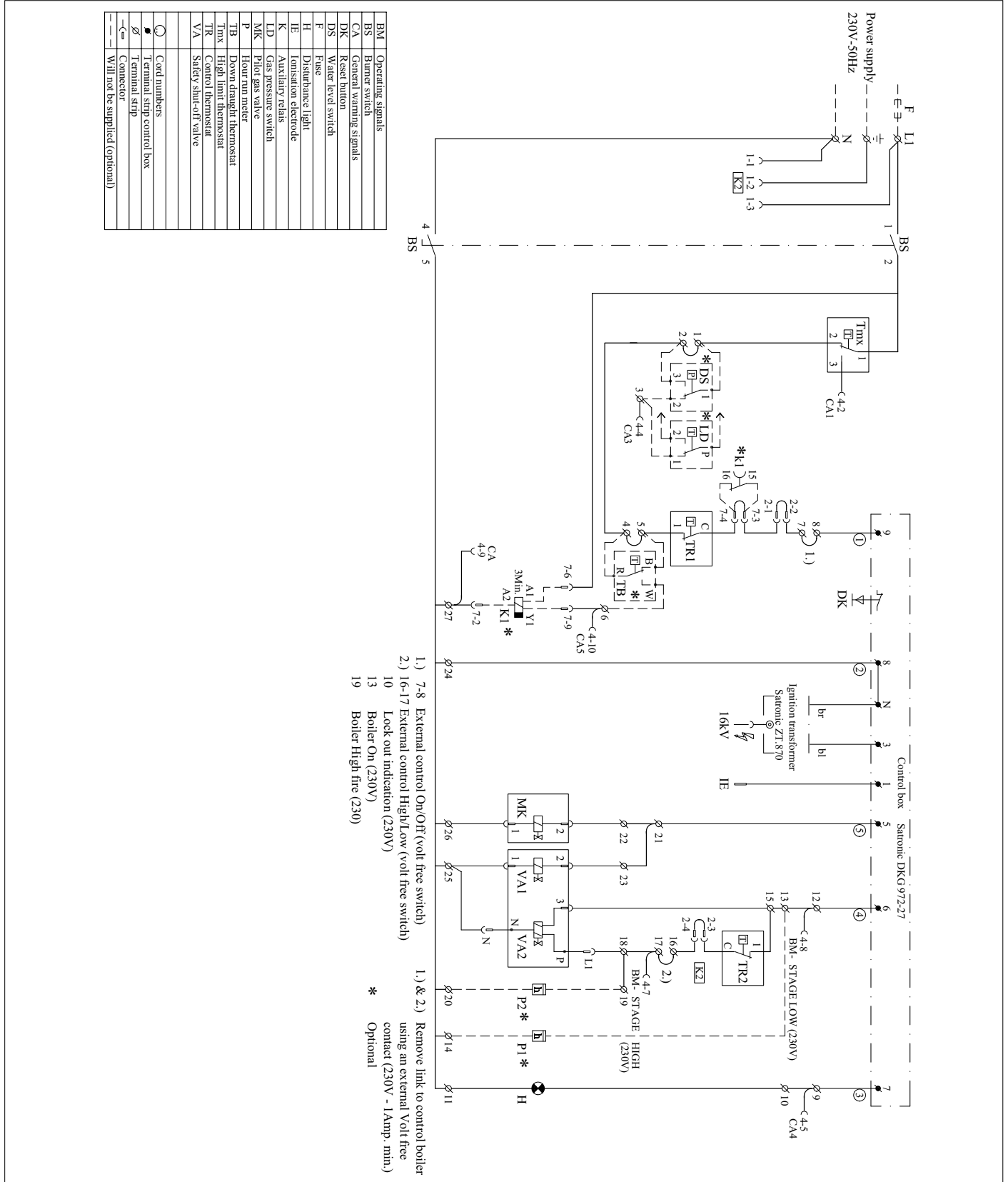


fig. 06 Electrical principle diagram

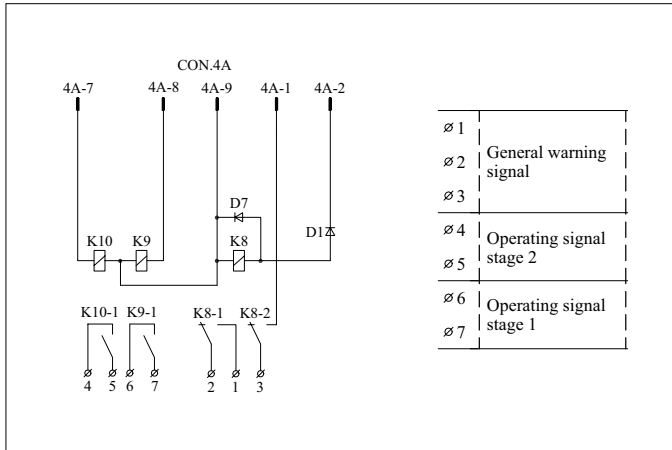


fig. 07 Optional basic signalling print

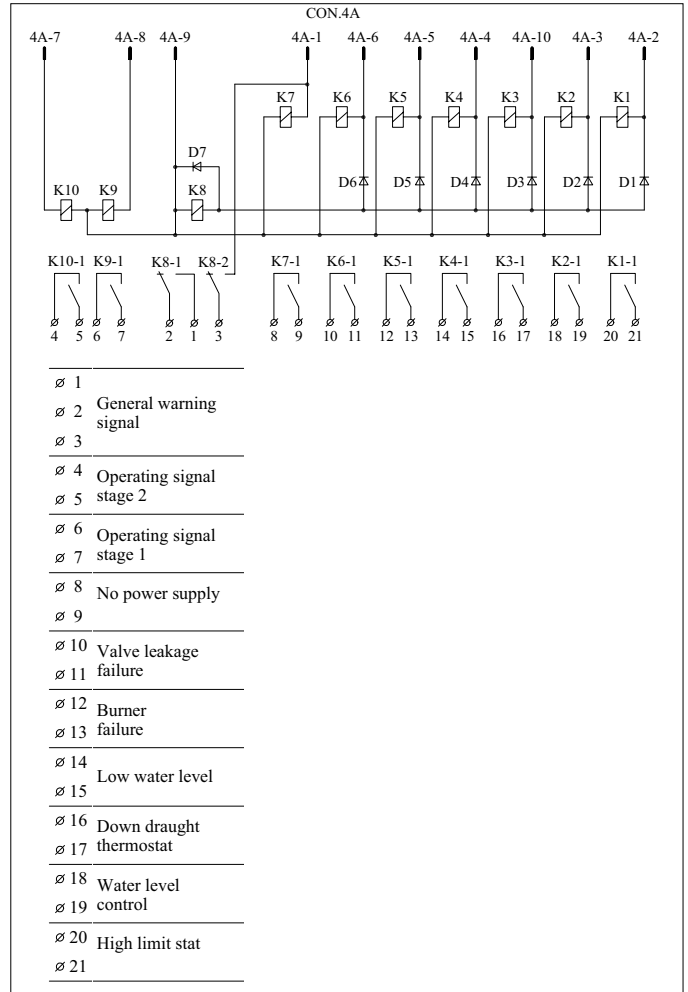


fig. 08 Optional complex signalling print

10 COMMISSIONING

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

Important: commissioning for propane, first see par. 8.4

10.1 Commissioning the boiler

1. Check the gas connections.
 2. Check the electrical supply (L/N and earth).
- Warning:** control box is phase / neutral sensitive.
3. Check the water connections and whether the installation is full and under system pressure.
 4. Switch on the circulation pump and check the rotation direction.
 5. Open the main gas cock (purge gas pipeline).
 6. Switch on the electrical supply.
 7. Set both the thermostats to about 85°C.
 8. If a control system is built in: put the selector switch on manual operation.
 9. Switch on the boiler.

10. After a waiting time of about 3 seconds the ignition starts. The magnetic valve MK opens and ignition burner lights. At a minimum ionisation current of 3 μ A the safety gas valve will open. The boiler runs.
11. Let the boiler run for a couple of minutes on high fire to clear any air still in the gas pipe.
12. Set the correct **full load burner pressure** by means of the pressure regulator on the gas multiblock gas valve (see fig. 09, pos. a).

Warning: When the required burner pressure can not be reached because of low inlet pressure, ensure that the pressure regulator remains within its operating range.

Now do the following:

- Set the burner pressure to the highest possible value (but not over the required full load burner pressure).
- Turn the pressure regulator anticlockwise until the burner pressure is affected.
- The burner pressure is now limited, this will prevent the boiler from being over gassed should the inlet gas pressure increase.

13. Set the correct **part load burner pressure**:

- Turn the High/Low thermostat to its minimum setting (35°C). When the flow temperature is over 35°C, the boiler will burn at part load.
- Set the part load burner pressure by turning the adjustment ring (*fig. 09, pos. b*).
- To check the high fire setting: Turn the High/Low thermostat to 85°C and check the full load burner pressure (if necessary re-adjust).

The speed of opening of the main gas valve can also be adjusted to ensure a smooth light up. Setting the hydraulic brake on the main gas valve as follows:

- Remove the setting cap (*fig. 09, pos. c*) and turn it upside down on the hydraulic brake.
- Turn it clockwise to slow down, anticlockwise to speed up.
- Check both burner pressures again and if necessary re-adjust.

14. Check the **thermostats** for the correct operation setting.

15. Check the **flame control on the control box**

- Start the boiler with disconnected ionisation probe, after the ignition phase the pilot gas valve must close. The boiler will lock out.
- Reset by pressing the reset button on the control box.
- Then disconnect the ionisation probe during operation, the pilot gas valve must close immediately. The boiler will lock out.
- Reset by pressing the reset button on the control box.

16. **Water level control:**

- Check the water level.
- Check the operation of the water level control by disconnecting the electrode. The boiler should go to lock out
- Create a shortcut between the electrode and earth. The boiler should go to lock out
- Reset by pressing the reset button on the instrument panel. The boiler will resume operation

17. Check the **down draught thermostat** by pressing the bimetallic strip on the thermostat. The boiler will shut down for 3 minutes. After that the boiler will resume operation.

18. Send the initial commissioning report CE to Broag.

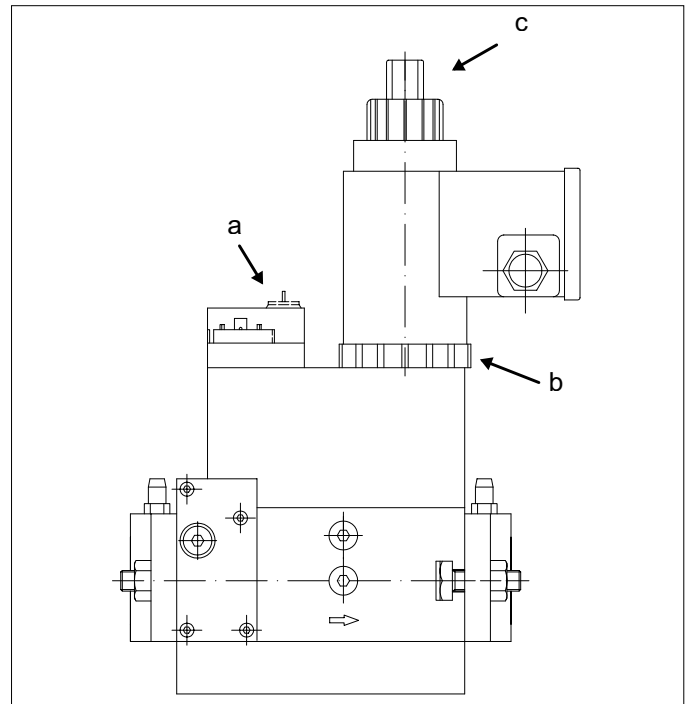


fig. 09 Dungs MB-ZRDLE 410/412 B01 S52

- a. Pressure regulator
- b. Part load adjustment ring
- c. Hydraulic brake (setting cap)

10.2 Switching off the boiler

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

Warning: The boiler can be damaged, when the temperature falls below freezing point and it is switched off and full of water.

Note:

Commissioning must only be carried out by a qualified engineer with the relevant product training and certification i.e. Acops - Corgi. A commissioning data sheet / log-book must be completed on site for issue to owner.

11 MAINTENANCE

To maintain maximum efficiency it is essential to service the boiler, check safety parameters and re-set combustion once a year.

Normal Service Maintenance

- Isolate power, controls and gas supply.
- Remove front and top casings and flue hood covers.
- Remove gas manifold.
- Remove the burners and floor plates.
- Clean the internal flue ways of the boiler.
- Clean the floor underneath the boiler and boiler room.
- Clean the burners internally and externally using a soft brush.
- Clean the plates under the burners as well - they must be fitted and in the correct place for the combustion to be correct
- Clean the gas train, ignition, pilot burner, thermostats and wiring.
- Check and reset/replace ignition electrode and ionisation probe as found necessary.
- Re-assemble boiler.
- Check ignition and ionisation cables for connections and continuity.
- Restore power, controls and gas supply.
- Check start program, ignition time and safety times.
- Check flame protection and thermostats.
- Check boiler input at 100% (full load) and 60% (part load) load.
- Carryout combustion efficiency test.
- Check the boiler and immediate installation connections for water leaks (seals).
- Check gas train and gas pipe for gas leaks.
- Check flue connections.
- Clean boiler casings.
- Complete a commissioning report and fill in the boiler logbook if available.

12 TROUBLE SHOOTING

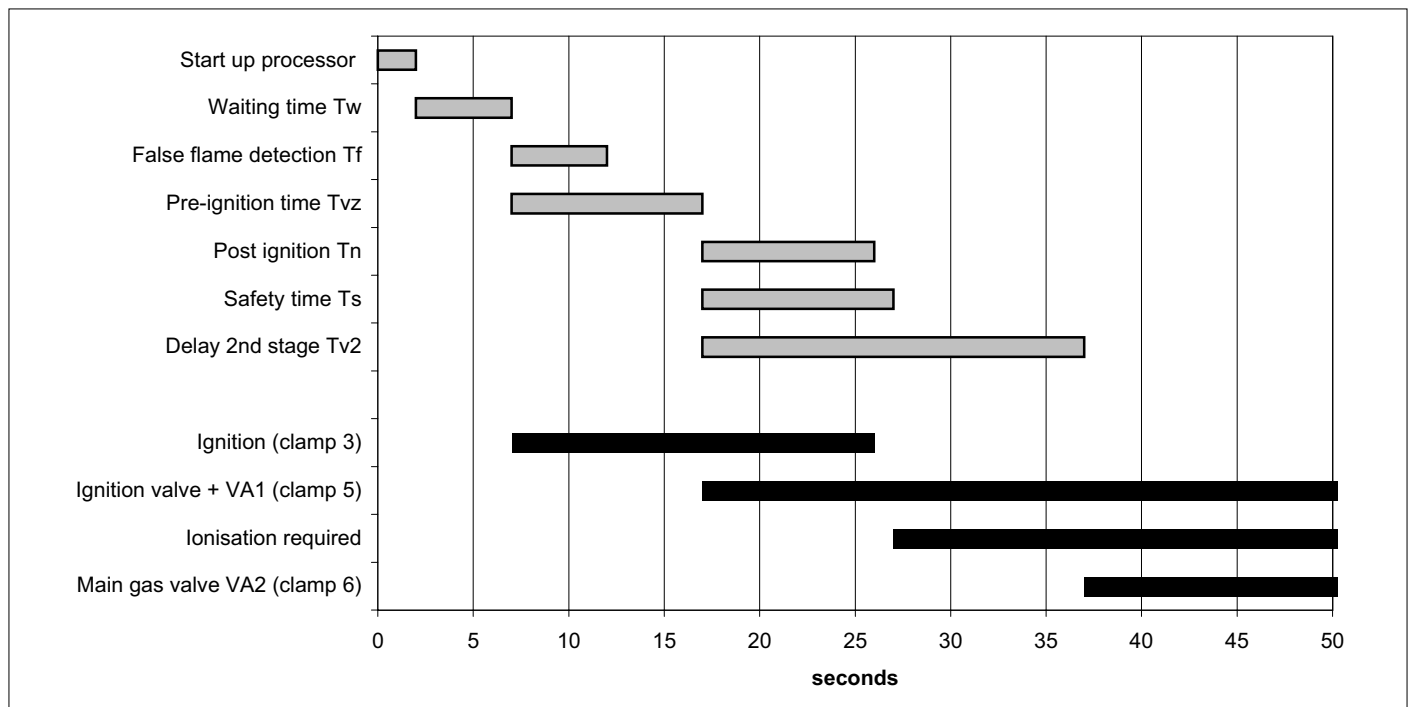


fig. 10 Switch diagram

12.1 Communication

The control box communicates by using a flash code.
An LED inside the reset button of the control box displays this flash code.

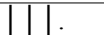

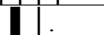
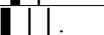
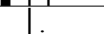
flash code	meaning of codes
	waiting time T_w
	pre-ignition (T_{vz})
	safety time (T_s) and post ignition time (T_n)
	delay time to valve V_2 (T_{v2})
	running

table 04 Program phases









flash code	meaning	cause
	low mains voltage (shut down)	
	Internal fuse defect	control box defect
	lock out	no flame detection within safety time T_s
	early flame	ionisation probe may be faulty
	manual lock out	

table 05 Error messages

 = long pulse
 = short pulse
 = short pause

12.2 Fault causes

In case of a failure the LED is permanently illuminated.
Every 10 seconds the illumination is interrupted by a flash code.

In case of all failures the gas supply is interrupted.

Fault	Possible cause:
Burner not working => shut down	<ul style="list-style-type: none"> - no heat demand - no mains supply - voltage < 187 V - continuously tension on terminal A
2-3 seconds after applying mains => lock out	<ul style="list-style-type: none"> - control box not reset
Burner starts, no flame => lock out	<ul style="list-style-type: none"> - false flame detected - no ignition - no gas supply
Burner starts, flame established => lock out after safety time (T_s)	<ul style="list-style-type: none"> - ionisation current < 1,5 μA - phase and neutral reversed - ionisation probe damaged or dirty

table 06 Trouble shooting

**Broag Ltd.**

Remeha House
Molly Millars Lane
RG41 2QP WOKINGHAM, Berks.
United Kingdom

Tel: 0118 9783434

Fax: 0118 9786977

uk.remeha.com

boilers@broag-remeha.com

Midlands Branch Office

Unit 3 Kestrel Close
Quarry Hill Industrial Estate
Ilkeston
Derbyshire DE7 4RD

Tel: 0115 944 0778

Fax: 0115 944 0588

© Copyright

All technical and technological information contained in these technical instructions, as well as any drawings and technical descriptions furnished by us remain our property and shall not be copied in part or whole without our prior consent in writing.

Subject to alterations



51247-0303