

Technical Information

Remeha P 300

Remeha P 300

- Pressurized boiler
- Heat output: 278 - 709 kW



OR remeha



Clean Heat

CONTENTS

Preface	3	6 Installation requirements	7
1 Description of the unit	3	6.1 Installation recommendations in the boiler house	7
1.1 General	3	6.2 Base details	7
1.2 Burners	3	7 Assembly guidelines and installation requirements	8
2 Construction data	3	7.1 General	8
2.1 General	3	7.2 Boiler assembly	8
2.2 Sections	3	7.3 Water connections	8
2.3 Casing	3	8 Instrument panel	8
3 Technical data and dimensions	4	8.1 Equipment contents	8
3.1 Dimensions	4	8.2 Lay out of the instrument panel	8
3.2 Technical data	5	8.3 Wiring diagram instrument panel	9
3.3 Quotation specifications	5	9 Commissioning	10
4 Output data	5	9.1 Pressurized boiler with gas burner	10
4.1 Boiler efficiency	5	9.1.1 Commissioning procedure	10
4.2 Combustion efficiency	5	9.1.2 Putting out of operation	10
5 Application data	6	9.2 Pressurized boiler with oil burner	10
5.1 Hot water version	6	9.2.1 Commissioning procedure	10
5.1.1 Water temperature	6	9.2.2 Putting out of operation	10
5.1.2 Water pressure	6	10 Fault finding	11
5.1.3 Flow rate	6	10.1 High Limit thermostat lockout	11
5.1.4 Water treatment	6	11 Maintenance recommendations	11
5.2 Economisers	6	11.1 General	11
5.3 Flue gas discharge	6	11.2 Maintenance instructions	11
5.4 Noise production	7		

PREFACE

These technical instructions contain useful and important information for the correct operation and maintenance of the Remeha boiler, model P 300.

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 it's 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 DESCRIPTION OF THE UNIT

1.1 General

High efficiency pressurised boiler, suitable for use with natural gas and light oil, by means of a pressure jet burner. Also available with a condensing unit (ECO) (for natural gas only).

The boiler meets the requirements of the CE regulations in the following directives:

- Gas appliance directive no. 90/396/EEC
- Electrical low voltage directive no. 73/23/EEC
- E.M.C. directive no. 89/336/EEC
- Efficiency directive no. 92/42/EEC.

Classification type for evacuation of the combustion products: B23.

1.2 Burners

In principle all pressure jet burners are suitable, subject to prior adjustment to the boiler capacity and boiler construction.

The individual boiler satisfies inspection requirement for central heating boilers.

2 CONSTRUCTION DATA

2.1 General

The boiler block consists of cast iron sections which are assembled by means of tapered nipples. The boiler is designed on the basis of the triple pass principle. The boiler block is insulated with a 100 mm thick layer of glass wool.

2.2 Sections

The sections are made of pearlitic cast iron. Weights and measures of the sections:

Section	Measures (H x W) mm	Weights kg
Front	1026 x 630	93
Intermediate	1026 x 640	106
Rear	1026 x 630	114

2.3 Casing

Steel casing, finished with a high quality insulation. The front door is suitable for left or right opening as desired.

3 TECHNICAL DATA AND DIMENSIONS

3.1 Dimensions

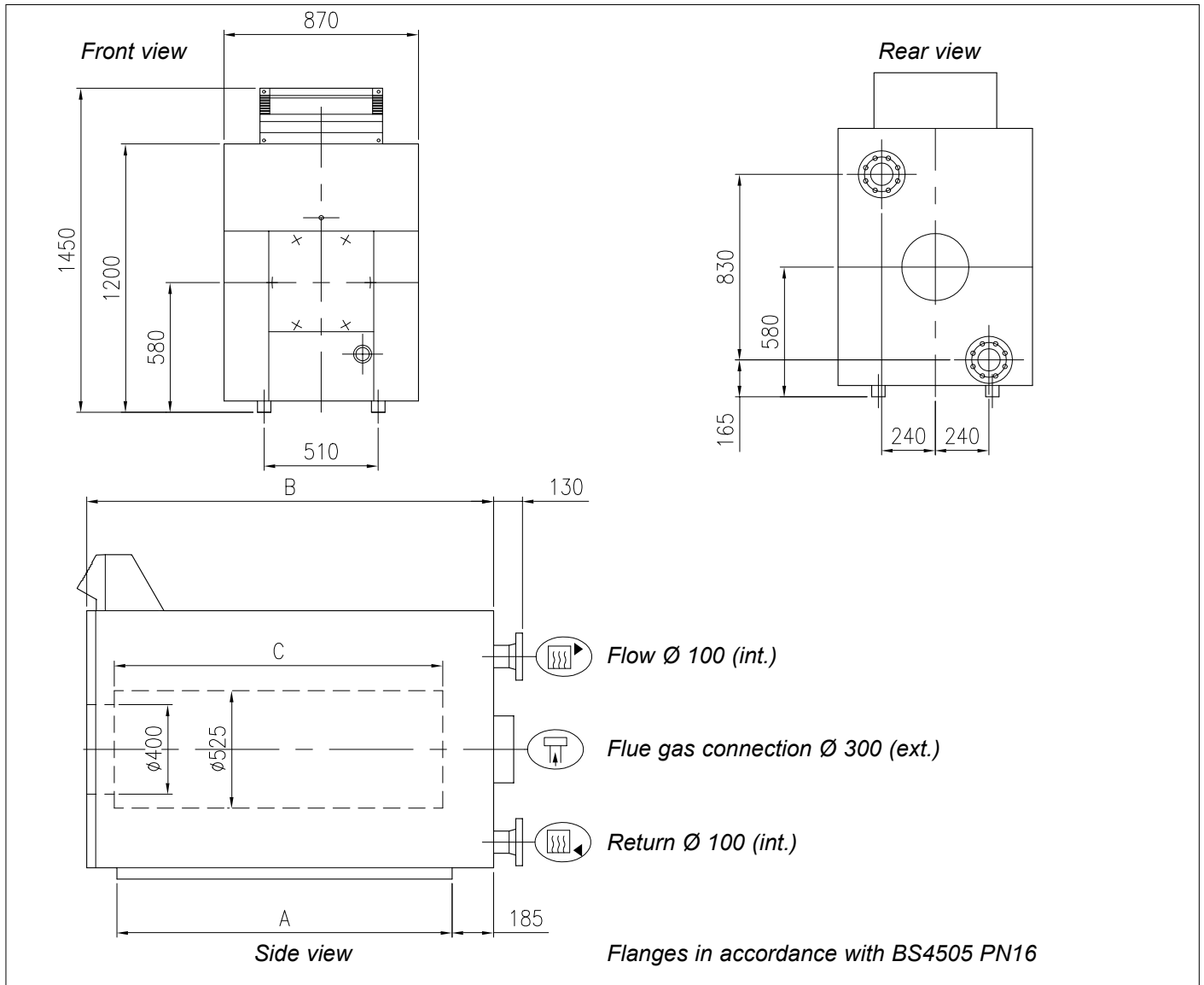


Fig. 01 Dimensions of the Remeha P 300

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No. of sections	Sizes			Weight (dry) approx.
	A	B	C	
	mm	mm	mm	kg
8	1200	1520	1170	1040
9	1350	1670	1320	1145
10	1500	1820	1470	1250
11	1650	1970	1620	1355
12	1800	2120	1770	1460
13	1950	2270	1920	1565
14	2100	2410	2070	1670
15	2250	2560	2220	1775
16	2400	2710	2370	1880

3.2 Technical data

No. of sections	Output	Nominal heat input		Combustion chamber resistance*	Combustion gas side contents	Gas rate**	Waterresistance		Water contents	Flue gas flow rate
							T=20°C	T=10°C		
	kW	kW-GCV	kW-NCV	mbar	m ³	m ³ /h	mbar	mbar	liters	kg/h
8	106 - 278	345	311	1.1	0.43	33	11	45	146	485
9	128 - 331	410	369	1.4	0.48	39	14	56	163	576
10	149 - 383	473	425	1.9	0.53	45	18	72	180	663
11	170 - 437	538	484	2.4	0.58	51	22	88	197	756
12	192 - 491	603	542	3.4	0.63	57	27	108	214	846
13	210 - 543	665	598	4.0	0.68	63	34	136	231	933
14	233 - 596	728	655	4.5	0.73	69	42	168	248	1022
15	255 - 651	794	714	4.8	0.78	76	50	200	265	1115
16	278 - 709	862	775	5.0	0.83	82	57	228	282	1210

* Determined with 20% excess air

** G20 (NGA) = 34,0 MJ/m³ NCV

3.3 Quotation specifications

- Heat exchanger manufactured from corrosion resistant "pearlite" cast iron
- Maximum operating pressure of 6 bar
- Maximum operating temperature of 95°C
- Sectional design with three passes for max efficiency and a generously sized combustion chamber for minimising NO_x production
- Water cooled base and rear sections
- Large insulated door (hinged left or right) allowing easy access for service operations
- Supplied in broken down form for ease of delivery and site access
- Powder coated enamel steel casing
- 80 - 100 mm thick glass wool insulation
- Suitable for use with a Natural gas, and/or 35 sec oil fired pressure jet burner (matched with most popular burner manufacturers)
- Supplied as standard with on/off switch, temperature indication, control and high limit thermostats
- Manufactured to ISO 9001
- CE approved.

4 OUTPUT DATA

4.1 Boiler efficiency

Up to 82.2% at H_s (91.3% at H_i) at full load and upto 87.0% at H_s (96.7% at H_i), at part load.

Average water temperature 70°C (80/60°C).

4.2 Combustion efficiency

Up to 82.6% at H_s (91.8% at H_i) at full load and 88.1% at H_s (97.9% at H_i) at part load.

Note: Hi = NCV; Hs = GCV

5 APPLICATION DATA

5.1 Hot water version

5.1.1 Water temperature

Maximum water temperature is 110°C.

The minimum acceptable return water temperature is, both for gas and oil fired boilers 40°C, at a flow rate corresponding to a ΔT of 20°C at nominal heat output.

5.1.2 Water pressure

Maximum pressure 6 bar. The boiler is suitable for open and sealed systems up to a maximum pressure of 6 bar and a minimum pressure of 0.8 bar. Installation of the boiler on rooftop or in basement is possible.

5.1.3 Flow rate

The minimum flow rate through the boiler is obtained from the following formula:

$$\frac{\text{Nominal heat output (kW)}}{70} = \text{m}^3/\text{h}$$

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

5.1.4 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.

5.2 Economisers

ECO's can be delivered upon request (for natural gas only). For specifications please refer to Technical information ECO 13/14/15.

5.3 Flue gas discharge

For the discharge of the flue gases, chimney draught is not required.

Tests have shown that very good combustion results are obtained with zero draught at the boiler outlet.

5.4 Noise production

The noise level taken at a distance of 1 m around the boiler is approx. 70 to 90 dBA. The noise level at the chimney outlet will, depending on load, type of burner and chimney situation, vary from 70 to 90 dBA, taken at a distance of 1 m from the outlet. If this noise production gives rise to problems in the immediate vicinity, then noise reducing or absorbing measures should be taken.

The values that have been taken for the graph in Fig. 02, are averages obtained from various measurements carried out at a distance of approx. 1 m around the boiler and at a height of approx. 1 m.

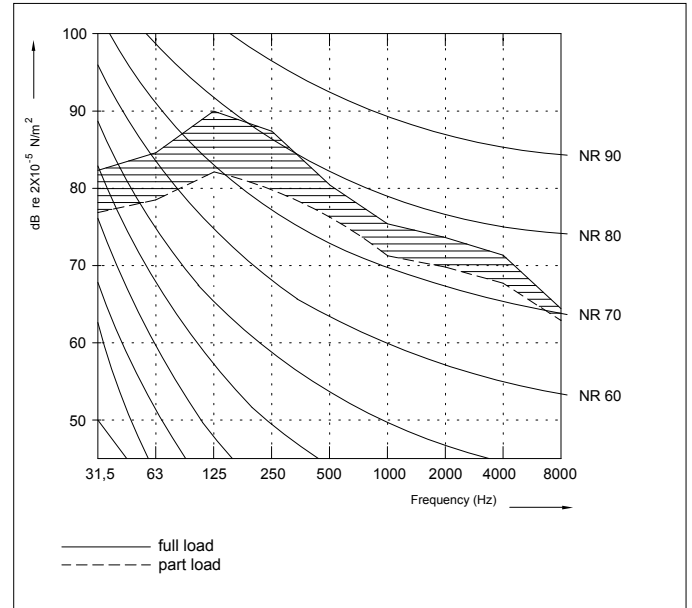


Fig. 02 Noise measurement Remeha P 300 without noise silencer

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6 INSTALLATION REQUIREMENTS

6.1 Installation recommendations in the boiler house

The necessary minimum installation space of the boiler can be seen from Fig. 03.

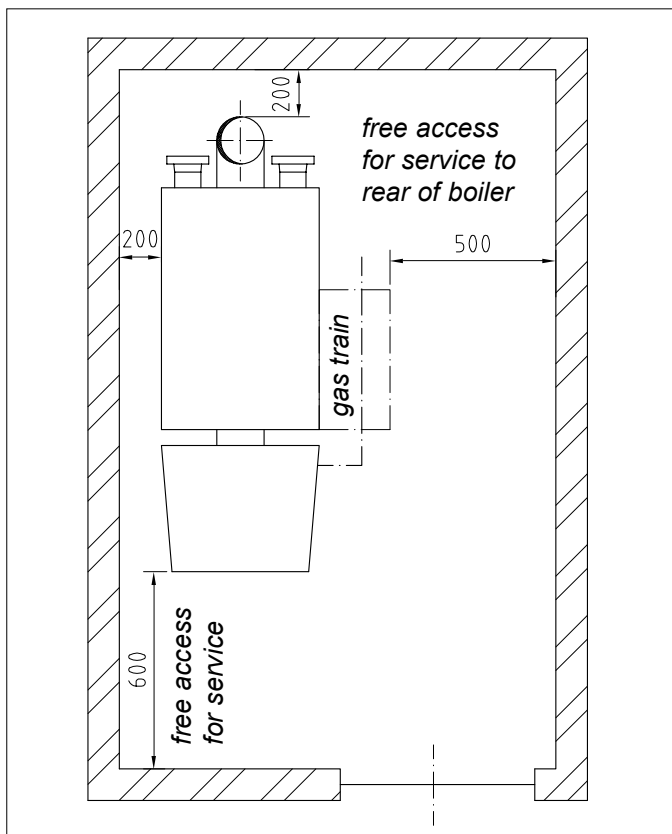


Fig. 03 Installation space of the Remeha P300

6.2 Base details

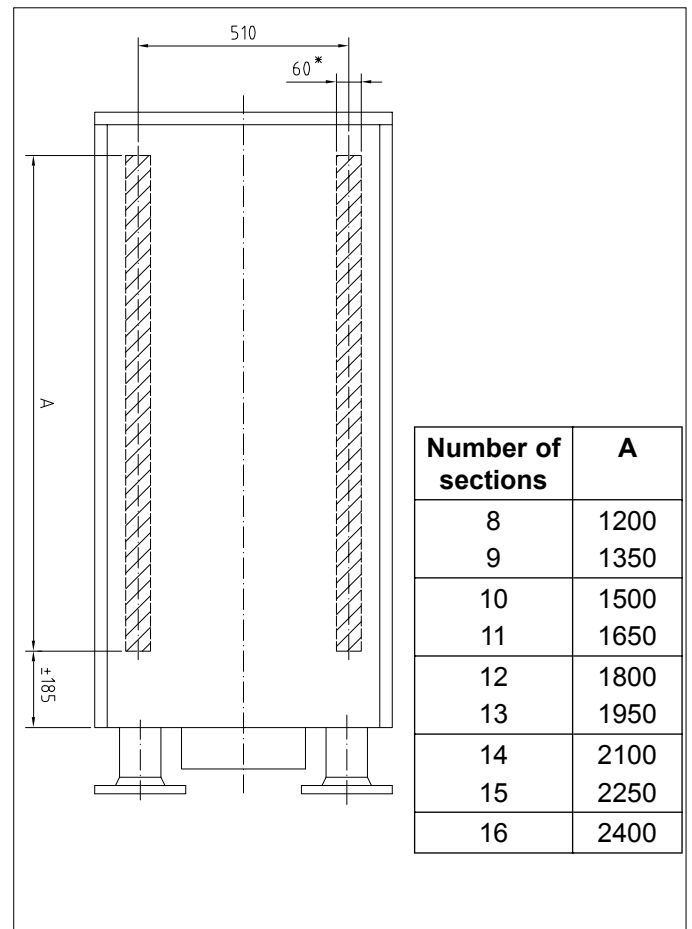


Fig. 04 Base details

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* 50 mm with vibration damper

7 ASSEMBLY GUIDELINES AND INSTALLATION REQUIREMENTS

7.1 General

The Remeha P 300 boiler is delivered in individual sections. The sizes are such that all parts can enter the boiler house through a normal door entrance. The casing and equipment parts are delivered in packaged units. If necessary, the boiler can be put into operation without casing. The casing can be added at a later stage without disconnecting the water connections.

7.2 Boiler assembly

Assembly and installation of the boiler may only be carried out by a recognised and approved engineer and in accordance with the assembly manual. Local regulations laid down by the relevant authorities must be adhered to.

7.3 Water connections

The water connections are at the rear of the boiler. The flow and return connections consist of flanged connections in accordance with DIN 2633. The top flange at the front of the boiler is provided with 3 x R 1/2" threaded holes for the fitting of the thermostat pockets. The return connection is provided with a R 3/4" threaded hole in which a drain off cock is fitted.

8 INSTRUMENT PANEL

8.1 Equipment contents

The panel contains all the necessary control and measuring instruments required to control the boiler. The connections have to be made on a terminal strip. The capillaries and sensor wires, which come from the control panel, are placed in the instrument pockets that are fitted at the front of the boiler. Several extra options can be built into the panels. Ask our technical department.

8.2 Lay out of the instrument panel

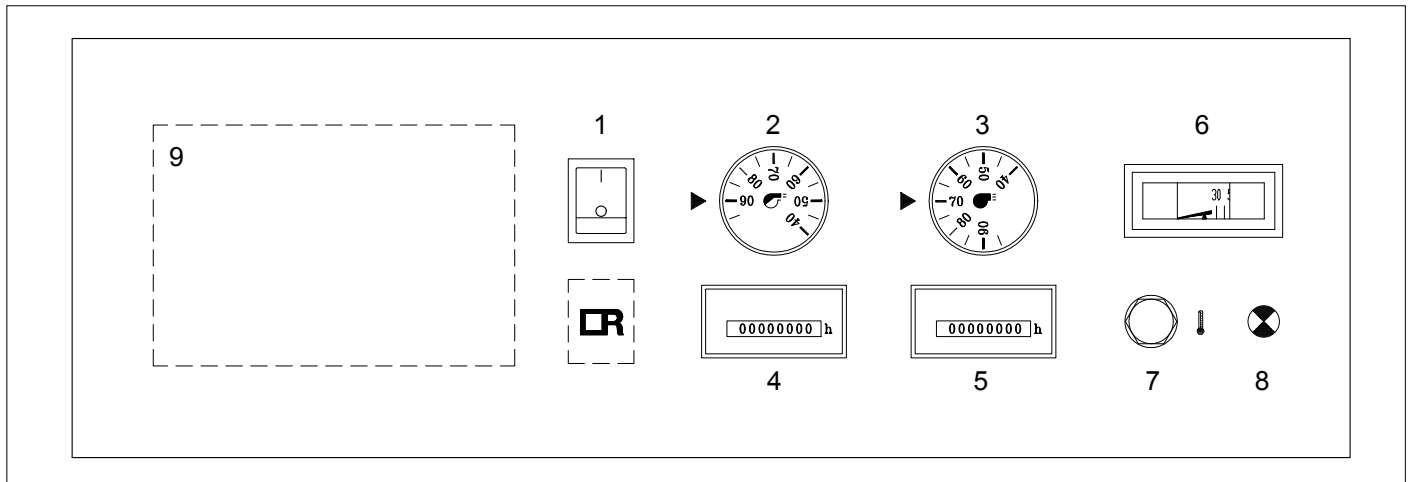
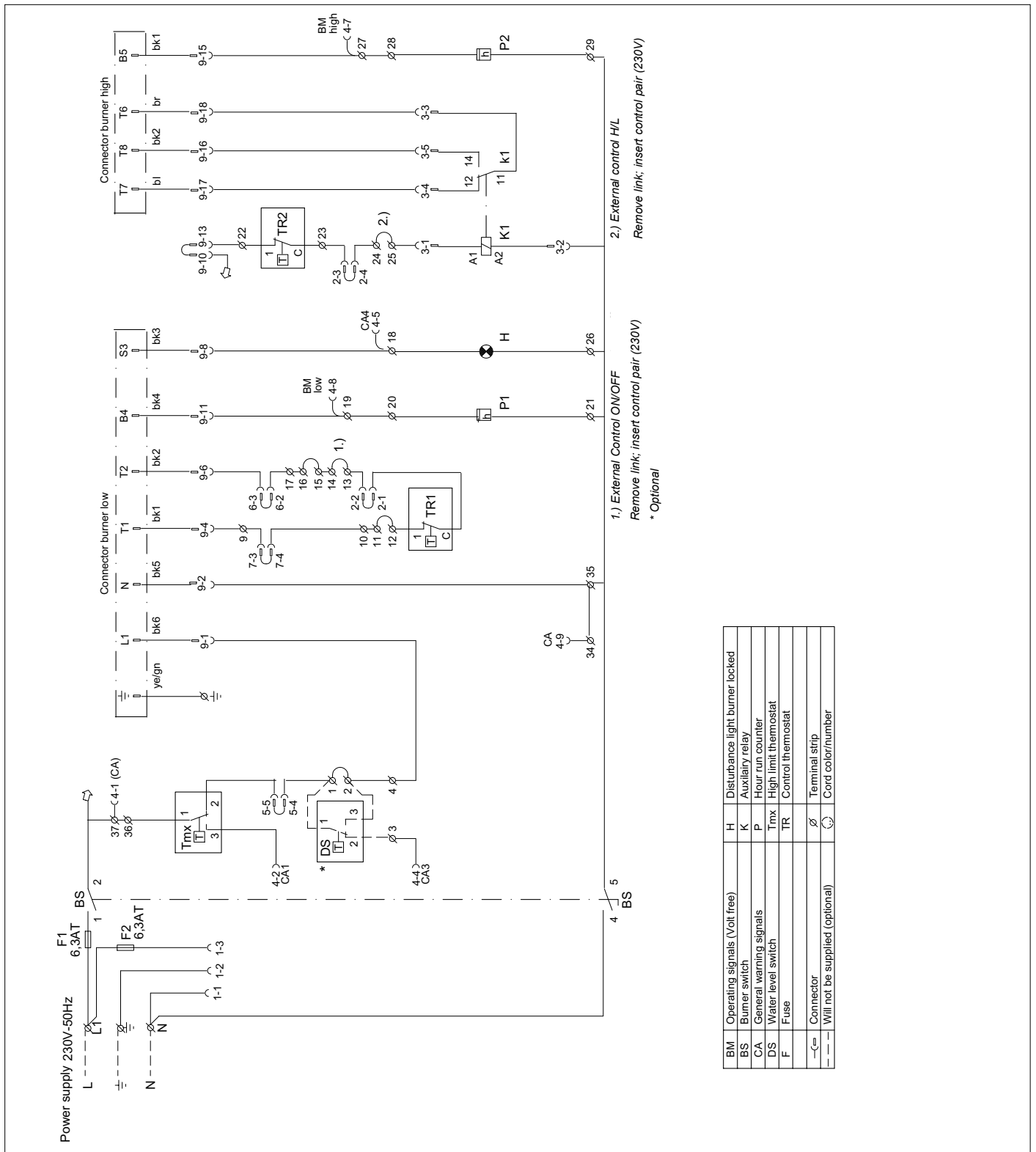


Fig. 05 Layout of the instrument panel High/Low with hour run meters

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1. Operating switch (On/Off).
2. Control thermostat. Setting between 35°C - 90°C.
3. High/Low thermostat. Setting between 35°C - 90°C.
4. Hours run meter total running hours.
5. Hours run meter full load running hours.
6. Analogue thermometer water temperature.
7. High limit thermostat 110°C (locking).
8. Central warning light.
9. Option for **rematic**® weather compensator.

8.3 Wiring diagram instrument panel



BM	Operating signals (Volt free)	H	Disturbance light burner locked
BS	Burner switch	K	Auxiliary relay
CA	General warning signals	P	Hour run counter
DS	Water level switch	Tmx	High limit thermostat
F	Fuse	TR	Control thermostat
—C—	Connector	∅	Terminal strip
---	Will not be supplied (optional)	⊗	Cord color/number

Fig. 06 Wiring diagram instrument panel

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9 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

9.1 Pressurized boiler with gas burner

9.1.1 Commissioning procedure

If the boiler is to be put into operation again following a period of non-use, then the following procedure must be carried out:

- Open the main gas cock.
- Switch the weather-compensator (if fitted) over to manual operation (☞).
- Turn the thermostats to their highest setting.
- Switch on the circulation pump.
- Switch on the main switch.
- Switch on the operation switch in the instrument panel.
- Consult burner manufacturers commissioning details.

Warning:

If the instrument panel is fitted with a weather compensator, set the program switch to 'manual' position (☞). The following will now take place:

- The gas burner fan will start running so that during the purging time the combustion chamber will be ventilated with the air damper fully opened.
- The air damper will then go into start position.
- Ignition flame lights up and is checked.
- Then the control box gives the all clear signal for the burner to switch over to full load.

9.1.2 Putting out of operation

It is sufficient to switch off the operation switch on the instrument panel. It is **important** that in the event of work being carried out on the burner, the boiler/burner unit must be completely electrically isolated and the main gas cock must be shut.

9.2 Pressurized boiler with oil burner

9.2.1 Commissioning procedure

If the boiler is to be put into operation again following a period of non-use, then the following procedure must be carried out:

- Open the main oil cock.
- Switch the weather-compensator (if fitted) over to manual operation (☞).
- Turn the thermostat to their highest setting.
- Switch on the circulation pump.
- Switch on the main switch.
- Switch on the operation switch in the instrument panel.
- Consult burner manufacturer commissioning details.

Warning:

If the instrument panel is fitted with a weather compensator, set the program switch to 'manual' position (☞). The following will now take place:

- The oil burner fan will start running so that during the purging time the combustion chamber will be ventilated with the air damper fully opened.
- The air damper will then go into start position.
- Ignition flame lights up and is checked.
- Then the control box gives the all clear signal for the burner to switch over to full load.

9.2.2 Putting out of operation

It is sufficient to switch off the operation switch on the instrument panel. It is **important** that in the event of work being carried out on the burner, the boiler/burner unit must be completely electrically isolated and the main oil cock must be shut.

10 FAULT FINDING

10.1 High Limit thermostat lockout

- Check the water circulation (circulation pump). Reset the High Limit thermostat ('reset' button is on the instrument panel under the cover cap of the High Limit thermostat).
- Advise the installer in the event of continued lock outs.

11 MAINTENANCE RECOMMENDATIONS

11.1 General

Depending on the operating conditions, the block and the burner must be checked and cleaned one or more times a year.

11.2 Maintenance instructions

- Cleaning of the boiler:
 - Put boiler out of operation.
 - Open the front door, if necessary after dismantling the burner.
 - Remove the retarders.
 - Clean the combustion chamber and flue passes using a suitable brush.
 - Clean the removed retarders.
 - Remove the rear panel of the boiler and remove the cleaning cover (underneath the smoke box).
 - Vacuum clean the boiler and the combustion chamber.
 - Renew the front door seals after cleaning the boiler.
 - Re-assemble the removed parts and close the front door.
 - Re-assemble the burner (if dismantled).
- Check the boiler combustion side for leakage.
- Check the equipment for proper functioning and if necessary re-adjust the gas control and safety equipment.
- Check combustion by means of combustion gas analyses.
- Check the water connections.

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