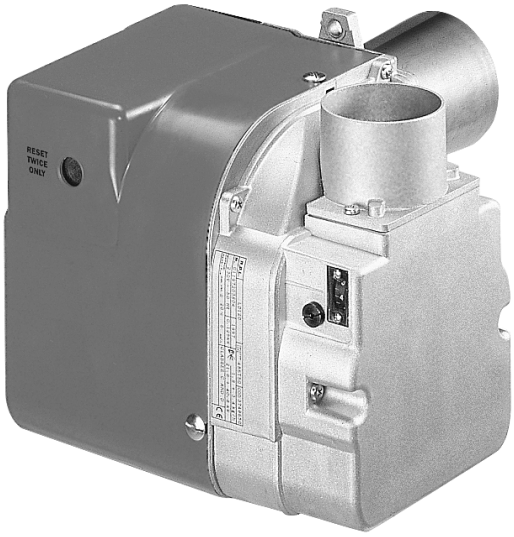
GB

Light oil burner

One stage operation



CODE	MODEL	TYPE
20040062	RDB1R GRANT MILTON 20 kW	501T1R

20166849 (3) - 09/2021

Original instructions

1 Declaration

Declaration of Conformity in accordance with ISO / IEC 17050-1

These products are in compliance with the following Technical Standards:

- EN 12100
- EN 267

According to the European Directives:

MD	2006/42/EC	Machine Directive
LVD	2014/35/UE	Low Voltage Directive
EMC	2014/30/UE	Electromagnetic Compatibility

The quality is guaranteed by a quality and management system certified in accordance with ISO 9001:2015.

2 Product ERP Guidelines

SPECIFICATION FOR THE EUROPEAN UNION ONLY

GUIDELINES FOR THE PLACING ON THE MARKET AND/OR PUTTING INTO SERVICE OF BURNERS, IN ACCORDANCE WITH THE REGULATION (EU) No. 813/2013 IMPLEMENTING DIRECTIVE 2009/125/EC.

A RIELLO burner (Heat Generator), where it is matched with a water-based boiler (Heater Housing) with a nominal output ≤ 400 kW, providing heat for heating purposes and heat to deliver sanitary hot water, can be installed:

- With boilers (heater housings) already in service in the field, for replacement, in conformity to Article 1, paragraph 2, point (G) of the EU Regulation No. 813/2013;
- With boilers (heater housings) on a new installation, if they have emissions complying with the requirement of Annex II, paragraph 4 of the EU regulation No. 813/2013.

3 Information and general warnings

3.1 Information about the instruction manual

3.1.1 Introduction

The instruction manual supplied with the burner:

- ➤ is an integral and essential part of the product and must not be separated from it; it must therefore be kept carefully for any necessary consultation and must accompany the burner even if it is transferred to another owner or user, or to another system. If the manual is lost or damaged, another copy must be requested from the Technical Assistance Service of the area;
- ➤ is designed for use by qualified personnel;
- ➤ offers important indications and instructions relating to the installation safety, start-up, use and maintenance of the burner.

Symbols used in the manual

In some parts of the manual you will see triangular DANGER signs. Pay great attention to these, as they indicate a situation of potential danger.

3.1.2 General dangers

The **dangers** can be of **3 levels**, as indicated below.

Maximum danger level!
This symbol indicates operations which, if not carried out correctly, cause serious injury, death or long-term health risks.

This symbol indicates operations which, if not carried out correctly, may cause serious injury, death or long-term health risks.

This symbol indicates operations which, if not carried out correctly, may cause damage to the machine and/or injury to people.

3.1.3 Other symbols

DANGER: LIVE COMPONENTS

This symbol indicates operations which, if not carried out correctly, lead to electric shocks with lethal consequences.

DANGER: FLAMMABLE MATERIAL

This symbol indicates the presence of flammable materials.

DANGER: BURNING

This symbol indicates the risks of burns due to high temperatures.

DANGER: CRUSHING OF LIMBS

This symbol indicates the presence of moving parts: danger of crushing of limbs.

WARNING: MOVING PARTS

This symbol indicates that you must keep limbs away from moving mechanical parts; danger of crushing.

DANGER: EXPLOSION

This symbol signals places where an explosive atmosphere may be present. An explosive atmosphere is defined as a mixture - under atmospheric conditions - of air and flammable substances in the form of gases, vapours, mist or dust in which, after ignition has occurred, combustion spreads to the entire unburned mixture.

PERSONAL PROTECTION EQUIPMENT

These symbols indicate the equipment that must be worn and kept by the operator for protection against threats against safety and/or health while at work.

OBLIGATION TO ASSEMBLE THE COVER AND ALL THE SAFETY AND PROTECTION DEVICES

This symbol signals the obligation to reassemble the cover and all the safety and protection devices of the burner after any maintenance, cleaning or checking operations.

ENVIRONMENTAL PROTECTION

This symbol gives indications for the use of the machine with respect for the environment.

IMPORTANT INFORMATION

This symbol indicates important information that you must bear in mind.

➤ This symbol indicates a list.

Abbreviations used

Ch.	Chapter
Fig.	Figure
Page	Page
Sec.	Section
Tab.	Table

3.1.4 Delivery of the system and the instruction manual

When the system is delivered, it is important that:

➤ the instruction manual is delivered to the user by the system manufacturer, with the recommendation to keep it in the room where the heat generator is to be installed.

➤ The instruction manual shows:
– the serial number of the burner;

.....

– the address and telephone number of the nearest Assistance Centre

.....
.....
.....

➤ The system supplier must carefully inform the user about:
– the use of the system;
– any further tests that may be required before activating the system;
– maintenance, and the need to have the system checked at least once a year by a representative of the manufacturer or another specialised technician.
To ensure a periodic check, the manufacturer recommends the drawing up of a Maintenance Contract.

3.2 Guarantee and responsibility

The manufacturer guarantees its new products from the date of installation, in accordance with the regulations in force and/or the sales contract. At the moment of the first start-up, check that the burner is integral and complete.

WARNING

Failure to observe the information given in this manual, operating negligence, incorrect installation and carrying out of non authorised modifications will result in the annulment by the manufacturer of the guarantee that it supplies with the burner.

In particular, the rights to the guarantee and the responsibility will no longer be valid, in the event of damage to things or injury to people, if such damage/injury was due to any of the following causes:

➤ incorrect installation, start-up, use and maintenance of the burner;
➤ improper, incorrect or unreasonable use of the burner;
➤ intervention of unqualified personnel;
➤ carrying out of unauthorised modifications on the equipment;
➤ use of the burner with safety devices that are faulty, incorrectly applied and/or not working;
➤ installation of untested supplementary components on the burner;
➤ powering of the burner with unsuitable fuels;
➤ faults in the fuel supply system;
➤ continuation of use of the burner when a fault has occurred;
➤ repairs and/or overhauls incorrectly carried out;
➤ modification of the combustion chamber with inserts that prevent the regular development of the structurally established flame;
➤ insufficient and inappropriate surveillance and care of those burner components most likely to be subject to wear and tear;
➤ use of non-original components, including spare parts, kits, accessories and optional;
➤ force majeure.

The manufacturer furthermore declines any and every responsibility for the failure to observe the contents of this manual.

1

4 Safety and prevention

4.1 Introduction

The burners have been designed and built in compliance with current regulations and directives, applying the known technical rules of safety and envisaging all the potential danger situations.

It is necessary, however, to bear in mind that the imprudent and clumsy use of the equipment may lead to situations of death risk for the user or third parties, as well as the damaging of the burner or other items. Inattention, thoughtlessness and excessive confidence often cause accidents; the same applies to tiredness and sleepiness.

It is a good idea to remember the following:

➤ The burner must only be used as expressly described. Any other use should be considered improper and therefore dangerous.

In particular:

it can be applied to boilers operating with water, steam, diathermic oil, and to other uses expressly foreseen by the manufacturer; the type and pressure of the fuel, the voltage and frequency of the electrical power supply, the minimum and maximum deliveries for which the burner has been regulated, the pressurisation of the combustion chamber, the dimensions of the combustion chamber and the room temperature must all be within the values indicated in the instruction manual.

➤ Modification of the burner to alter its performance and destinations is not allowed.

➤ The burner must be used in exemplary technical safety conditions. Any disturbances that could compromise safety must be quickly eliminated.

➤ Opening or tampering with the burner components is not allowed, apart from the parts requiring maintenance.

➤ Only those parts envisaged by the manufacturer can be replaced.

WARNING

The manufacturer guarantees safety and proper functioning only if all burner components are intact and positioned correctly.

4.2 Personnel training

The user is the person, body or company that has acquired the machine and intends to use it for the specific purpose. He is responsible for the machine and for the training of the people working around it.

The user:

➤ undertakes to entrust the machine exclusively to suitably trained and qualified personnel;

➤ undertakes to inform his personnel in a suitable way about the application and observance of the safety instructions. With that aim, the user undertakes to ensure that everyone knows the use and safety instructions for his own duties;

➤ Personnel must follow all the danger and caution indications shown on the machine.

➤ Personnel must not carry out, on their own initiative, operations or interventions that are not within their province.

➤ Personnel are obliged to inform their superiors of every problem or dangerous situation that may arise.

➤ The assembly of parts of other makes, or any modifications, can alter the characteristics of the machine and hence compromise operating safety. The manufacturing company therefore accepts no responsibility whatsoever for any which may result from the use of non-original parts.

In addition:

➤ must take all the measures necessary to prevent unauthorised people gaining access to the machine;

➤ the user must inform the manufacturer if faults or malfunctioning of the accident prevention systems are noticed, along with any presumed danger situation;

➤ personnel must always use the personal protective equipment envisaged by legislation and follow the indications given in this manual.

5 Technical description of the burner

5.1 Technical data

Model	RDB1R
Output (1) Thermal power (1)	1.4 - 2.2 kg/h 16.6 - 26 kW
Fuel	Light oil, viscosity 4 ÷ 6 mm^2/s at 20°C
Electrical supply Max power supply Short circuit current	Single phase, ~ 50Hz, 230 V ± 10% 1 A ~ 4 A ~
Fan motor	Intensity 0.75 A Velocity 2800 rpm – 294 rad/s
Capacitor	4.5 µF
Ignition transformer	Secondary 8 kV – 16 mA
Pump	Pressure; 8 ÷ 15 bar
Absorbed electrical power	0.25 kW
Protection level	IP 20

Tab. A

(1) Conditions of reference; Ambient temperature 20 °C - Barometric pressure 1013 mbar - Altitude 0 m above sea level. (Hi = 11.86 kWh/kg).

5.2 Burner description

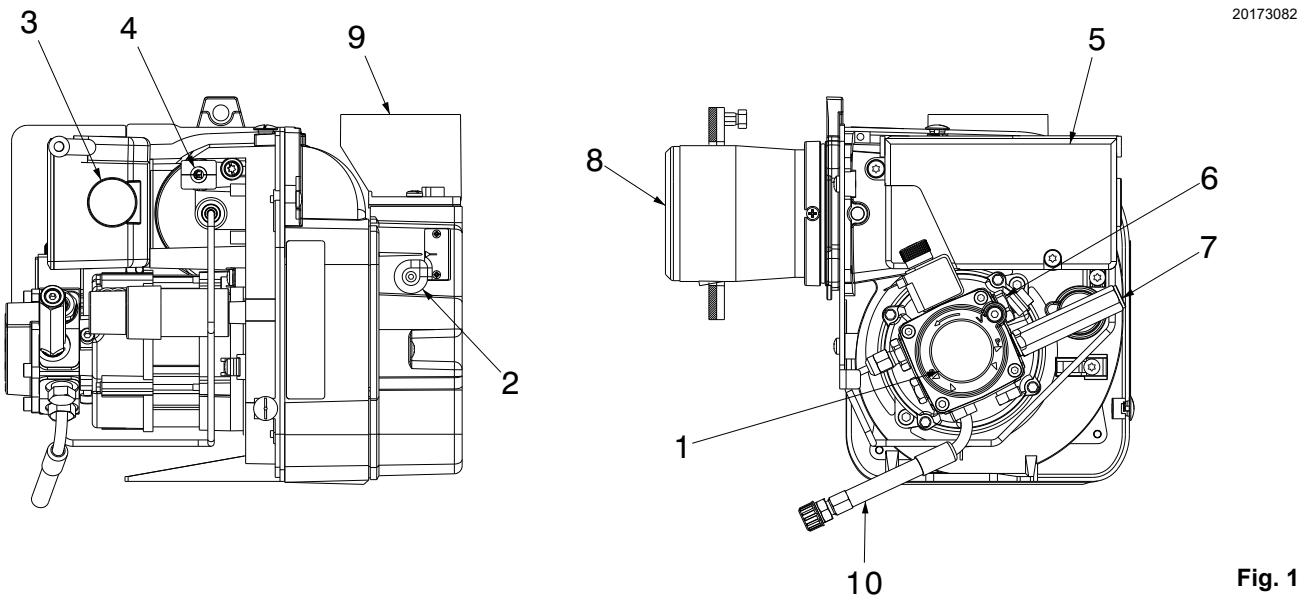


Fig. 1

1 Pump
2 Air damper adjustment screw
3 Reset button with lock-out lamp
4 Flame sensor
5 Control-box
6 Pump pressure adjustment screw
7 Pressure gauge port
8 Blast tube
9 Snorkel
10 Hose

5.3 Burner equipment

Hose . . . . . No. 1
Fitting for hose . . . . . No. 1
Hexagonal key . . . . . No. 1
Screws of by-pass pump . . . . . No. 1
Instruction manual + Spare part list . . . . . No. 1

5.4 Overall dimensions

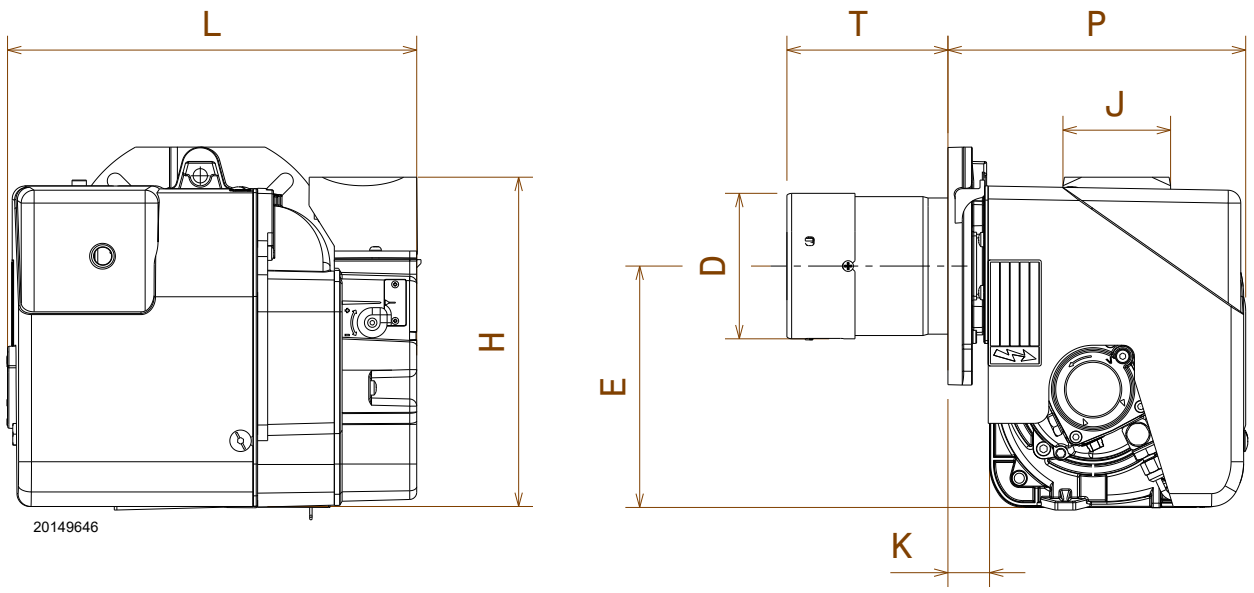


Fig. 2

Model	D	E	H	J	K	L	P	T
RDB1R	89	170	232	75	20	276	207	86

Tab. B

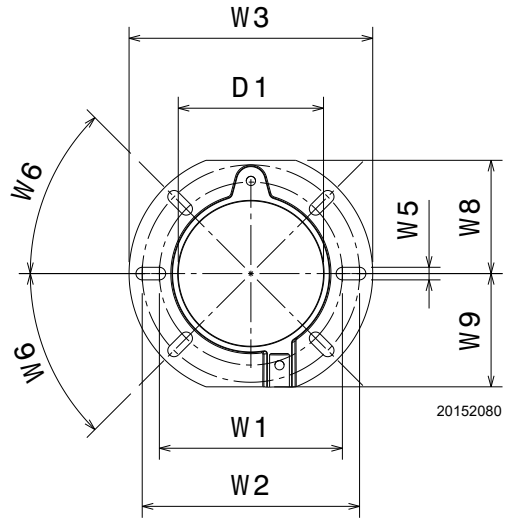


Fig. 3

Model	D1	W1	W2	W3	W5	W6	W8	W9
RDB1R	92	130	150	180	11	45°	72	72

Tab. C

5.5 Firing rate (as EN 267)

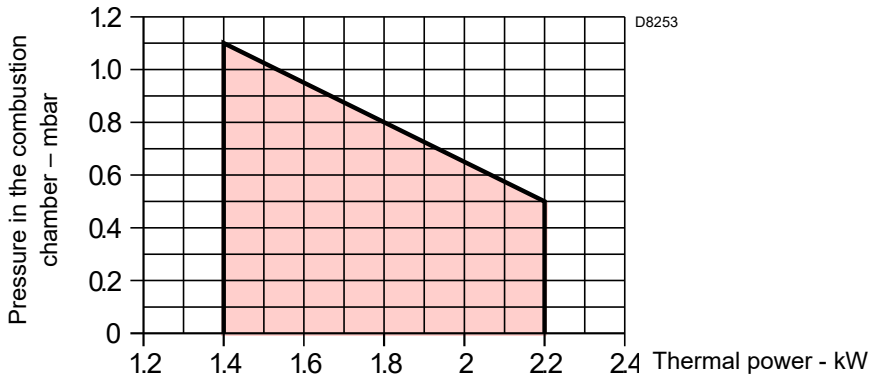


Fig. 4

6 Installation

6.1 Notes on safety for the installation

After carefully cleaning all around the area where the burner will be installed, and arranging the correct lighting of the environment, proceed with the installation operations.

DANGER

All the installation, maintenance and disassembly operations must be carried out with the electricity supply disconnected.

WARNING

The installation of the burner must be carried out by qualified personnel, as indicated in this manual and in compliance with the standards and regulations of the laws in force.

6.2 Handling

The packaging of the burner includes a carton box, so it is possible to move the burner (still packaged) with a transpallet truck or fork lift truck.

WARNING

The handling operations for the burner can be highly dangerous if not carried out with the greatest attention: keep any unauthorised people at a distance; check the integrity and suitableness of the available means of handling.
Check also that the area in which you are working is empty and that there is an adequate escape area (i.e. a free, safe area to which you can quickly move if the burner should fall).
When handling, keep the load at not more than 20-25 cm from the ground.

After positioning the burner near the installation point, correctly dispose of all residual packaging, separating the various types of material.

CAUTION

Before proceeding with the installation operations, carefully clean all around the area where the burner will be installed.

6.3 Preliminary checks

Checking the consignment

CAUTION

After removing all the packaging, check the integrity of the contents. In the event of doubt, do not use the burner; contact the supplier.

The packaging elements (wooden cage or cardboard box, nails, clips, plastic bags, etc.) must not be abandoned as they are potential sources of danger and pollution; they should be collected and disposed of in the appropriate places.

Checking the characteristics of the burner

Check the identification label of the burner, showing:
- ➤ the model **A**)(Fig. 5) and type of burner **B**);
- ➤ the year of manufacture, in cryptographic form **C**);
- ➤ the serial number **D**);
- ➤ the electrical input power **E**);
- ➤ the types of fuel used and the relative supply pressures **F**);
- ➤ the data of the burner's minimum and maximum output possibilities **G**)(see Firing rate).

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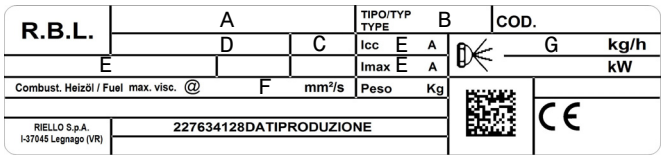


Fig. 5

WARNING

The output of the burner must be within the boiler's firing rate;

WARNING

A burner label that has been tampered with, removed or is missing, along with anything else that prevents the definite identification of the burner makes any installation or maintenance work difficult.

6.4 Working position

WARNING

The burner is designed to operate only in the positions **1**, and **3** (Fig. 6).
Installation **1** is preferable, as it is the only one that allows performing maintenance operations as described in this manual. Installations **2**, **3** and **4** allow working operations but not maintenance with hooking to the boiler.

DANGER

Any other position could compromise the correct operation of the appliance. Installation **5** is forbidden for safety reasons.

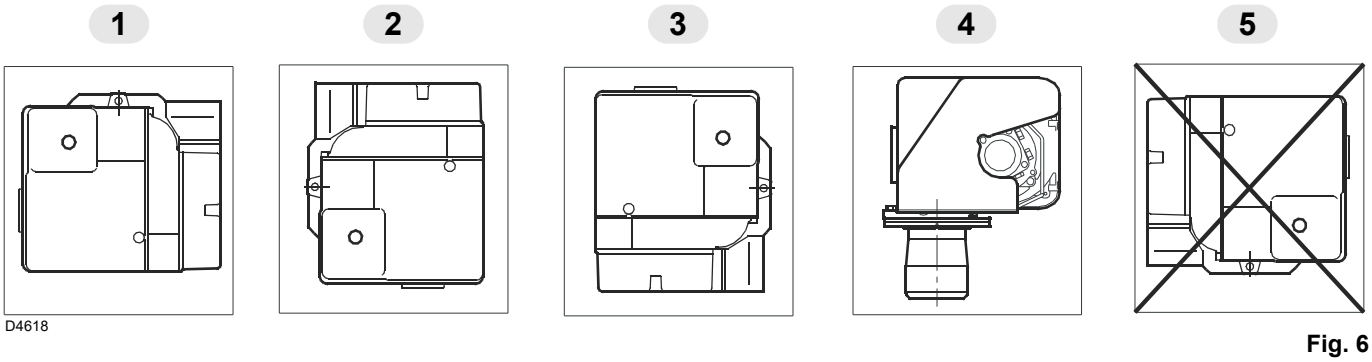


Fig. 6

6.5 Boiler fixing

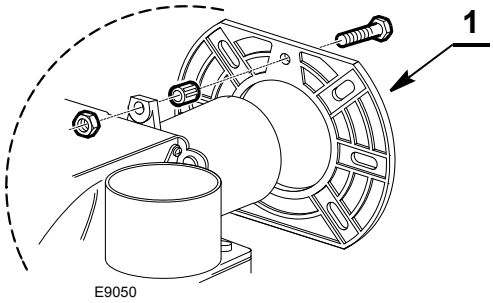


Fig. 7

Provide an adequate lifting system of the burner.

- Put on the flange 1)(Fig. 7) the screw and two nuts.
- Fix the flange 1)(Fig. 8) to the boiler door 4) using screws 2) and (if necessary) the nuts 3) interposing the insulating gasket 5).

WARNING

The seal between burner and boiler must be airtight.

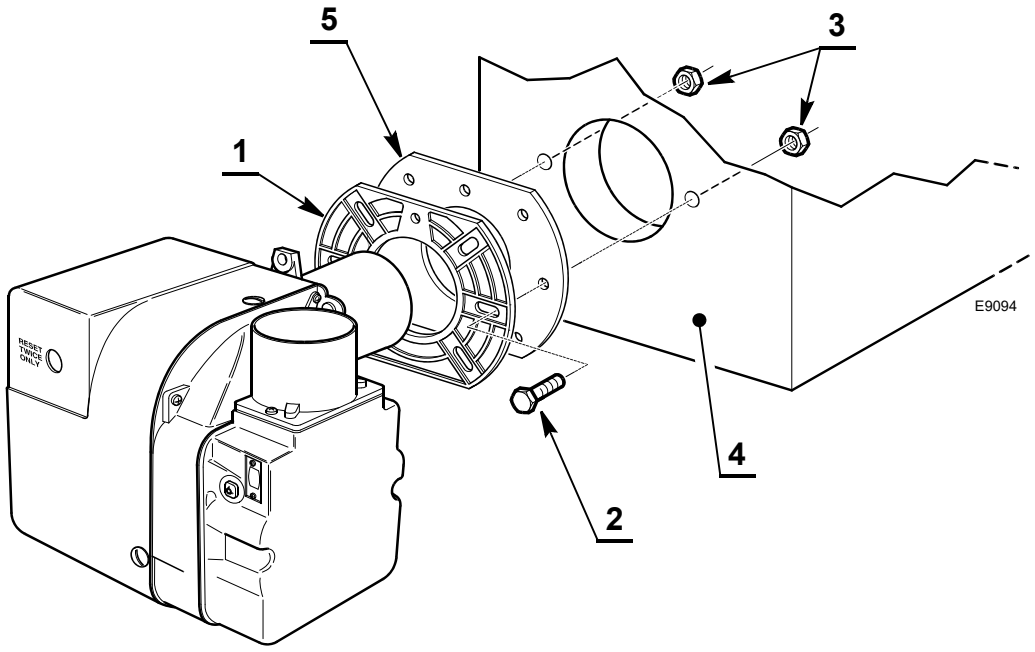


Fig. 8

6.6 Burner assembly

CF Application (Fig. 9)

In case of **CF** applications, the burner shall not operate without protection **(A)** of the suction inlet.

BF Application (Fig. 10)

CAUTION

The temperature of the incoming air must not exceed 70 °C.

WARNING

For correct BF application, the burner must be installed on an appropriate BF boiler.

In case of **BF** applications an optional snorkel and gasket are available replacing **(A)** with **(B)**.
This item can be supplied separately.

The combustion air supply is through a flexible or rigid pipe connected to the air intake.

Consequently, you must comply with the following requirements and instructions:

➤ The combustion air intake tube must be:
- fastened securely to the burner;
- made of a suitable material, with temperature characteristics in the range - 30 °C to 80 °C;
- in compliance with all requirements of applicable regulations in force in the country of destination.

➤ The intake-tube / burner system must not allow a loss of over 2 m^3/h at 0.5 mbar:

for instance, the above requirements will be met if you use flues for pressure exhaust of flue gases (the condensation kind).

➤ Make sure the air intake tube's inlet is positioned so that it is not likely to be obstructed by foreign matter and, where necessary, use suitable screens.

➤ The inside diameter of the hose must be at least 80 mm.

➤ The intake tube can be up to 6 metres in length.

WARNING

Length is reduced if there are bends in the intake section.

For instance, using a tube with a smooth inside surface, you must allow for the following losses:
– for each 45° bend, tube length is reduced by 0.5 m;
– for each 90° bend, tube length is reduced by 0.8 m.

NOTE:
Burner installation must in any case comply with the flue systems included within the boiler approved configuration.

WARNING

➤ Under no circumstances should the air's entry in the hose intake area be obstructed.

➤ The hose must not be blocked in any way or feature a shutting device (valves, membranes etc.).

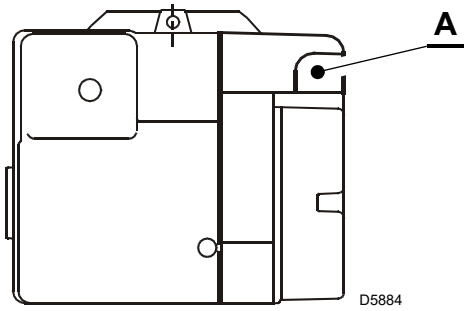


Fig. 9

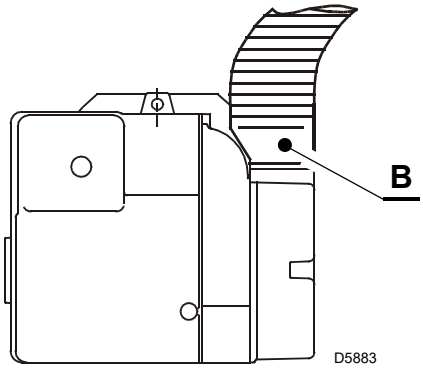


Fig. 10

6.7 Light oil supply

6.7.1 Pump

Explosion danger due to fuel leaks in the presence of a flammable source.

Precautions: avoid knocking, attrition, sparks and heat.

Make sure the fuel shut-off valve is closed before performing any operation on the burner.

WARNING

The fuel supply line must be installed by qualified personnel, in compliance with current standards and laws.

WARNING

Before activating the burner, ensure that the return line in the tank is not clogged.

The presence of any obstacle would cause the rupture of the seal device located on the pump shaft.

➤ The pump is designed to allow working with one pipe.
In order to obtain two pipes working it is necessary to unscrew the return plug 2)(Fig. 11), screw the by-pass screw 3),supplied as burner equipment and then screw the return hose.

WARNING

The suction plug 1) is made of plastic. Once removed, it must not be used again.

In single-pipe installations, the plug in the return line 2) must be totally in steel.

➤ In the two pipes systems, before starting the burner make sure that the return pipe-line is not clogged. An excessive back pressure would cause the damage of the pump seal.
➤ Check periodically the flexible pipes conditions.
➤ A metal bowl filter (60 µm) with replaceable micronic filter must be fitted in the oil supply pipe.

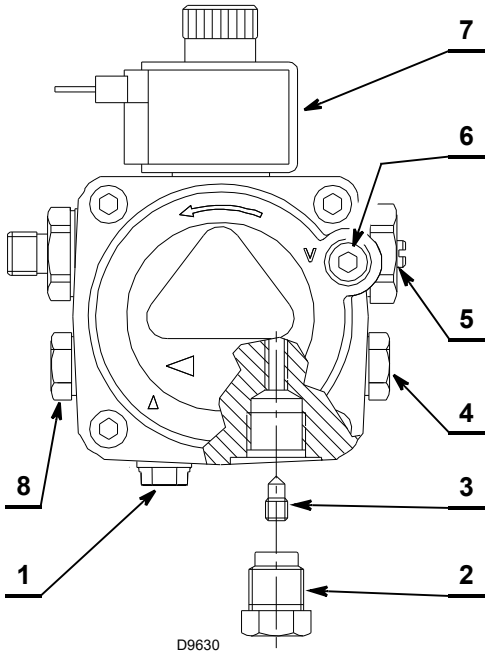


Fig. 11

Key (Fig. 11)

1	Suction line	6	Suction gauge connection
2	Return line	7	Valve
3	By-pass screw	8	Auxiliary pressure test point
4	Gauge connection		
5	Pressure adjuster		

WARNING

Periodically check the condition of the flexible hoses.

It is necessary to install a filter on the fuel supply line.

6.7.2 Priming pump

On the system in Fig. 12 it is sufficient to loosen the suction gauge connection 6)(Fig. 11) and wait until oil flows out.

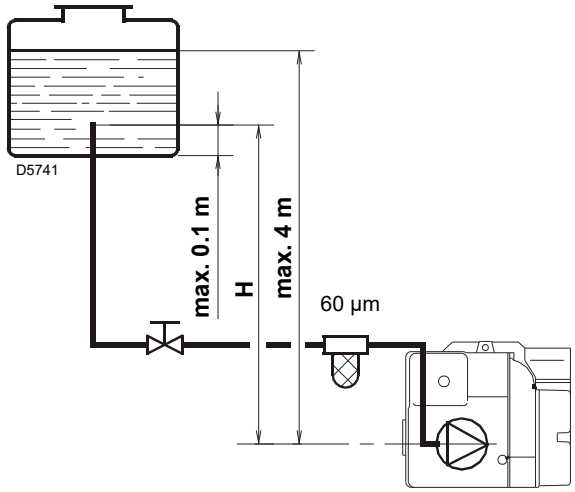


Fig. 12

H metres	L metres Ø (8 mm)	Ø (10 mm)
0.5	10	20
1	20	40
1.5	40	80
2	60	100

Tab. D

H difference of level
L maximum length of the suction line
Ø internal diameter of the oil pipes

On the systems in Fig. 13 and Fig. 14 start the burner and wait for the priming.

Should lock-out occur prior to the arrival of the fuel, await at least 20 seconds before repeating the operation.

WARNING

In order to purging air from oil lines and filters repeat for maximum 5 times the complete operation programme, to protect the pump.
The pump suction should not exceed a maximum of 0.4 bar (30 cm Hg). Beyond this limit gas is released from the oil. Oil pipes must be completely tight.

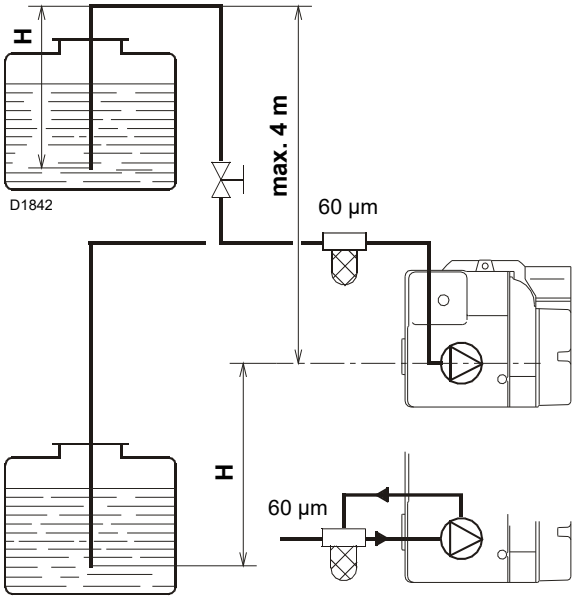


Fig. 13

H metres	L metres Ø (8 mm)	Ø (10 mm)
0	35	100
0.5	30	100
1	25	100
1.5	20	90
2	15	70
3	8	30
3.5	6	20

Tab. E

H difference of level
L maximum length of the suction line
Ø internal diameter of the oil pipes

In the vacuum systems (Fig. 14) the return line should terminate within the oil tank at the same level as the suction line. In this case a non-return valve is not required. Should however the return line arrive over the fuel level, a non-return valve is required.

This solution however is less safe than previous one, due to the possibility of leakage of the valve.

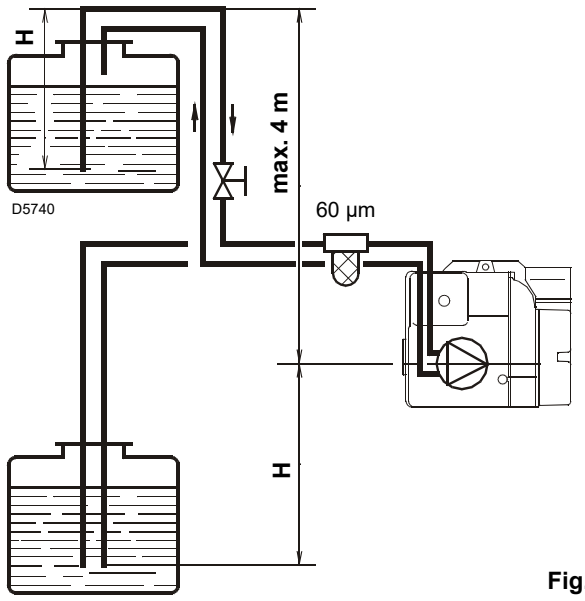


Fig. 14

NOTE:
In case of digital applications the priming pump is possible not only with the previous procedure but also with a specific function implemented into the digital control box (see 4.7.9, page 10). In this case the priming pump time could be longer.

6.8 Electrical wiring

Notes on safety for the electrical wiring

- The electrical wiring must be carried out with the electrical supply disconnected.
- Electrical wiring must be carried out by qualified personnel and in compliance with the regulations currently in force in the country of destination. Refer to the wiring diagrams.
- The manufacturer declines all responsibility for modifications or connections different from those shown in the wiring diagrams.
- Do not invert the neutral with the phase in the electrical supply line. Any inversion would cause a lockout due to firing failure.
- Check that the electrical supply of the burner corresponds to that shown on the identification label and in this manual.
- The burners have been set for intermittent operation. This means they should compulsorily be stopped at least once every 24 hours to enable the control box to perform checks of its own start-up efficiency. Normally the boiler's thermostat/pressure switch ensures the stopping of the burner.
  If this is not the case, it is necessary to apply in series with IN a timer switch that turns off the burner at least once every twenty-four hours. Refer to the wiring diagrams.
- The electrical safety of the device is obtained only when it is correctly connected to an efficient earthing system, made according to current standards. It is necessary to check this fundamental safety requirement. In the event of doubt, have the electrical system checked by qualified personnel.
- The electrical system must be suitable for the maximum input power of the device, as indicated on the label and in the manual, checking in particular that the section of the cables is suitable for the input power of the device.
- For the main power supply of the device from the electricity mains:
  do not use adapters, multiple sockets or extensions;
  use an omnipolar switch, as indicated by the current safety standards.
- Do not touch the device with wet or damp body parts and/or in bare feet.
- Do not pull the electric cables.

Before carrying out any maintenance, cleaning or checking operations:

Turn off the burner's power supply using the main system switch.

Turn off the fuel interception tap.

Avoid condensate, ice and water leaks from forming.

After carrying out maintenance, cleaning or checking operations, reassemble the cover and all the safety and protection devices of the burner.

6.8.1 Control box

WARNING

All the installation, maintenance and dismantling operations should be performed voltage free.

The replacement of the Control box must be performed by qualified personnel, as indicated in this manual and in accordance with standards and regulations in force.

To remove the active block, follow these instructions;

- ➤ Loosen the screw 1), open the protection 2) and remove all components.
- ➤ Remove the coil 3).
- ➤ Loosen the two screws 4).

WARNING

- ➤ The safety housing can be used on the burners with or without the heater.
- ➤ If the heater is damaged, introduce the bridge 7) (Fig. 16) into the safety housing so that the burner can operate without the heater until the heater is replaced.

NOTE:
As a spare part, the housing is delivered with the bridge 7) (Fig. 16) in place.

If you replace a housing and if the heater is in operating state, you must remove the bridge 7) before putting the cabinet in place.

The resistor cables and thermostat must also be connected.

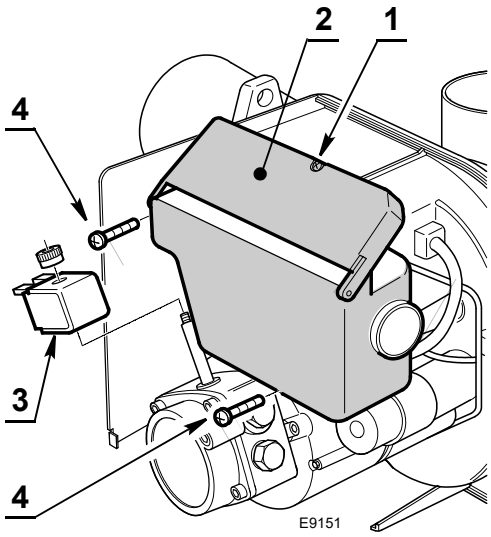


Fig. 15

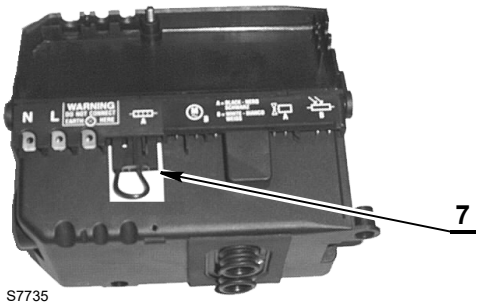


Fig. 16

6.8.2 Electrical diagram

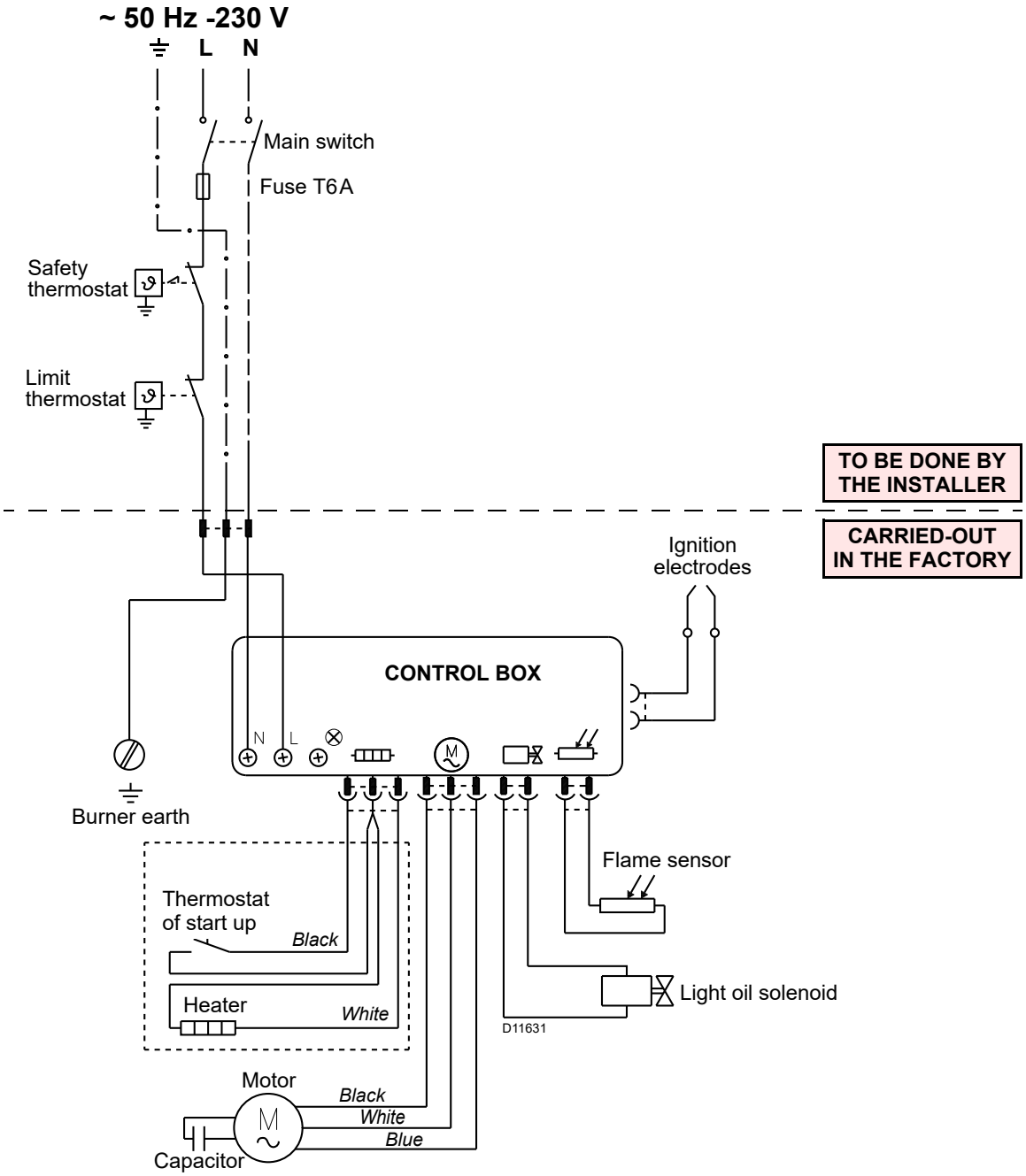


Fig. 17

WARNING

- **Do not swap neutral and phase over, follow the diagram shown carefully and carry out a good earth connection.**
- The section of the conductors must be at least 1 mm^2.
  (Unless requested otherwise by local standards and legislation).
- The electrical wiring carried out by the installer must be in compliance with the rules in force in the country.

Testing

Check the shut-down of the burner by opening the thermostats and the lock-out by darkening the flame sensor.

7 Operation

7.1 Notes on safety for the first start-up

WARNING

The first start-up of the burner must be carried out by qualified personnel, as indicated in this manual and in compliance with the standards and regulations of the laws in force.

WARNING

Check the correct working of the adjustment, command and safety devices.

7.2 Combustion adjustment

In conformity with EN 267, the application of the burner on the boiler, adjustment and testing must be carried out observing the instruction manual of the boiler, including verification of the CO and CO_2 concentration in the flue gases, their temperatures and the average temperature of the water in the boiler.

WARNING

The combustion air is sucked from outside, therefore, there can be sensitive temperature variations that can influence the percentage value of the CO_2. It is advisable to adjust the CO_2 according to the diagram.
For example: with an combustion air temperature of 20°C, adjust the CO_2 to 12.5% (± 0.2%).

The values in Tab. F are referred to 12.5% CO_2, at sea level and with ambient temperature and gas oil at 20 ° C.

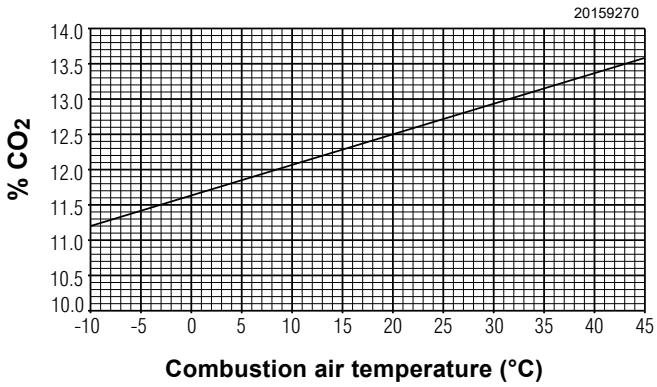


Fig. 18

Nozzle		Pump pressure	Burner output	Air damper adjustment	Combustion head adjustment
GPH	Angle	bar	kg/h ± 4%	Set-point	Set-point
0.40	80° S	14.5	1.7	3.5	Fixed

Tab. F

7.3 Recommended nozzles

The burner complies with the emission requirements set by the EN 267 standard. To ensure continuity of emissions, it is necessary to use the recommended nozzles.

WARNING

It is advisable to replace the nozzles every year during routine maintenance.

CAUTION

The use of nozzles different to those prescribed by the manufacturer or incorrect periodic maintenance can cause emissions that exceed the limits foreseen by the standard in force, and in extreme cases cause harm to people or objects.

It is understood that the damage caused by failure to comply with the requirements contained in this manual are not in any way attributable to the manufacturer.

7.3.1 Nozzle choice

To adjust the flow range in which the nozzle must operate, adjust the minimum and maximum fuel pressure of on the back of the jet.

7.4 Pump pressure

The pump is factory set to the values indicated. Tab. F.

7.5 Air damper adjustment

The settings indicated in the schedule are purely indicative.

Each installation however, has its own unpredictable working conditions: actual nozzle output; positive or negative pressure in the combustion-chamber, the need of excess air, etc.

All these conditions may require a different air-damper setting.

7.6 Electrodes setting

Before removing or assembling the nozzle, loosen the screw B) (Fig. 19) and move the electrodes ahead.

WARNING

The measures in Fig. 19 must be respected.

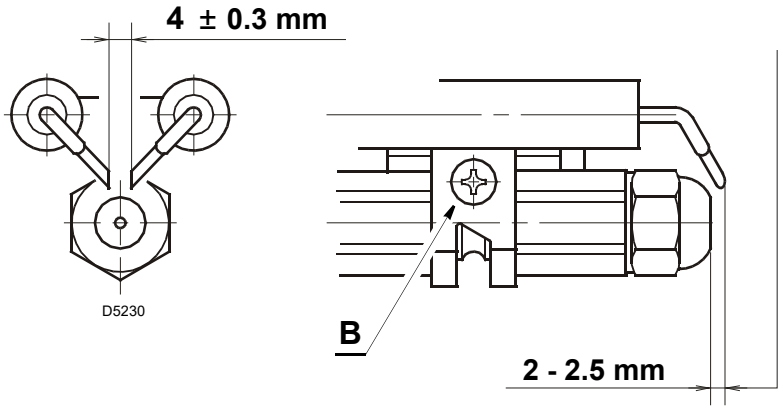


Fig. 19

7.7 Fuel heating

In order to obtain smooth starting and operation across its output range the burner is fitted with an electric resistance, which heats up the light oil in the nozzle line.

This resistance is energized when the thermostat calls for heat and after a delay of approximately two minutes depending on room temperature, the motor will start.

The resistance remains energised during working and cuts out when burner shuts-down.

7.8 Operation programme

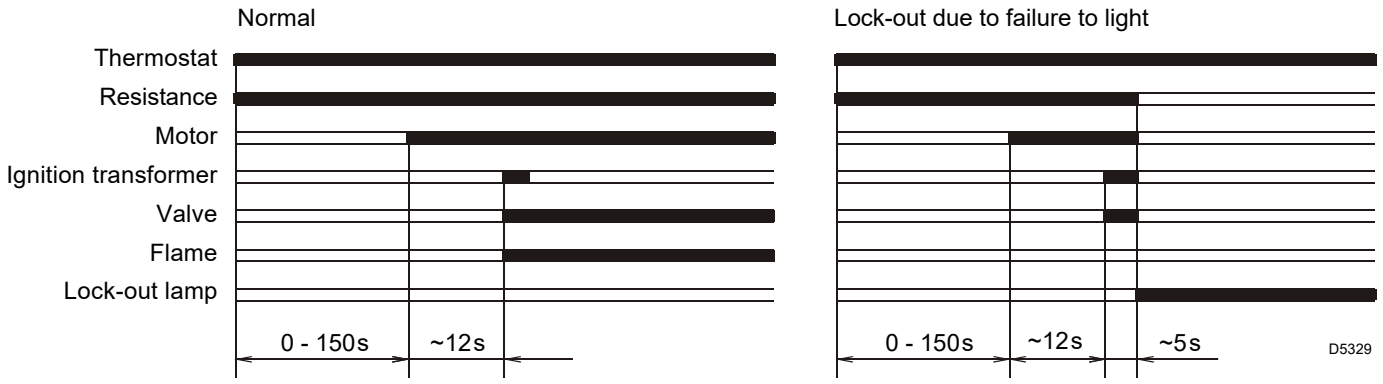


Fig. 20

WARNING

Lock out is indicated by a lamp on the control box 5) Fig. 1 to page 6

8 Maintenance

8.1 Notes on safety for the maintenance

The periodic maintenance is essential for the good operation, safety, yield and duration of the burner.

It allows you to reduce consumption and polluting emissions and to keep the product in a reliable state over time.

The maintenance interventions and the calibration of the burner must only be carried out by qualified, authorised personnel, in accordance with the contents of this manual and in compliance with the standards and regulations of current laws.

Before carrying out any maintenance, cleaning or checking operations:

Turn off the burner's power supply using the main system switch.

Turn off the fuel interception tap.

Wait for the components in contact with heat sources to cool down completely.

8.2 Maintenance programme

8.2.1 Maintenance frequency

The combustion system should be checked at least once a year by a representative of the manufacturer or another specialised technician.

8.2.2 Checking and cleaning

The operator must use the required equipment during maintenance.

Fan cleaning

Make sure there is no dust accumulated inside the fan or its blades, as this could reduce the air output, causing polluting combustion.

Perform maintenance operations, being careful not to damage or disrupt the fan during cleaning.

Combustion

Perform an analysis of combustion gases.
Significant differences compared to the previous test indicate the points where the maintenance operation will need to be more thorough.

Combustion head

Open the burner and check that all parts of the combustion head are intact, are not distorted by the high temperatures, are free of environmental impurities, and are positioned correctly.

Boiler

Clean the boiler according to the instruction booklet, so as to be able to find the original combustion data, in particular; pressure in the combustion chamber and flue gas temperatures.

Pump

In case of unstable pressure or excessively noisy pump, remove the flexible hose from the line filter and suck up the fuel from a tank located near the burner. This operation can identify if it is the suction line which is responsible for the fault or the pump.
On the contrary, if the cause of anomalies is related to the suction line, check that there is no clogged filter on the line or air intake on the line.

Filters

Check the line filters and the nozzle present in the system. If necessary, clean or replace them.

If you notice rust or other impurities inside the burner, suck up any water and impurities deposited at the bottom of the tank with a separate pump.

Nozzles

It is advisable to replace the nozzles every year during routine maintenance.
Avoid cleaning the nozzle openings.

Flexible hoses

Check that they are in good condition.

Tank

Every 5 years, or as needed, remove water or impurities that have been deposited at the bottom of the tank, using a separate pump.

Combustion

If combustion values recorded at the start of the intervention do not meet the standards in force or do not allow for good combustion, see the table below and contact the after-sales service so that any necessary adjustments can be made.

Allow the burner to work at full speed for about 10 minutes, checking all the parameters specified in this manual.
Then perform a combustion analysis by checking;

- Flue gases temperature.
- CO2 percentage;
- CO content (ppm);
- The smoke index on the Bacharach scale.

9 Faults / Solutions

Here below you can find some causes and the possible solutions for some problems that could cause a failure to start or incorrect operation of the burner.

A fault usually makes the lock-out led signal which is situated inside the reset push-button of the control box (5, Fig. 1 to page 6).

When lock out lamp lights the burner will attempt to light only after pushing the reset push-button. After this if the burner functions correctly, the lock-out can be attributed to a temporary fault.

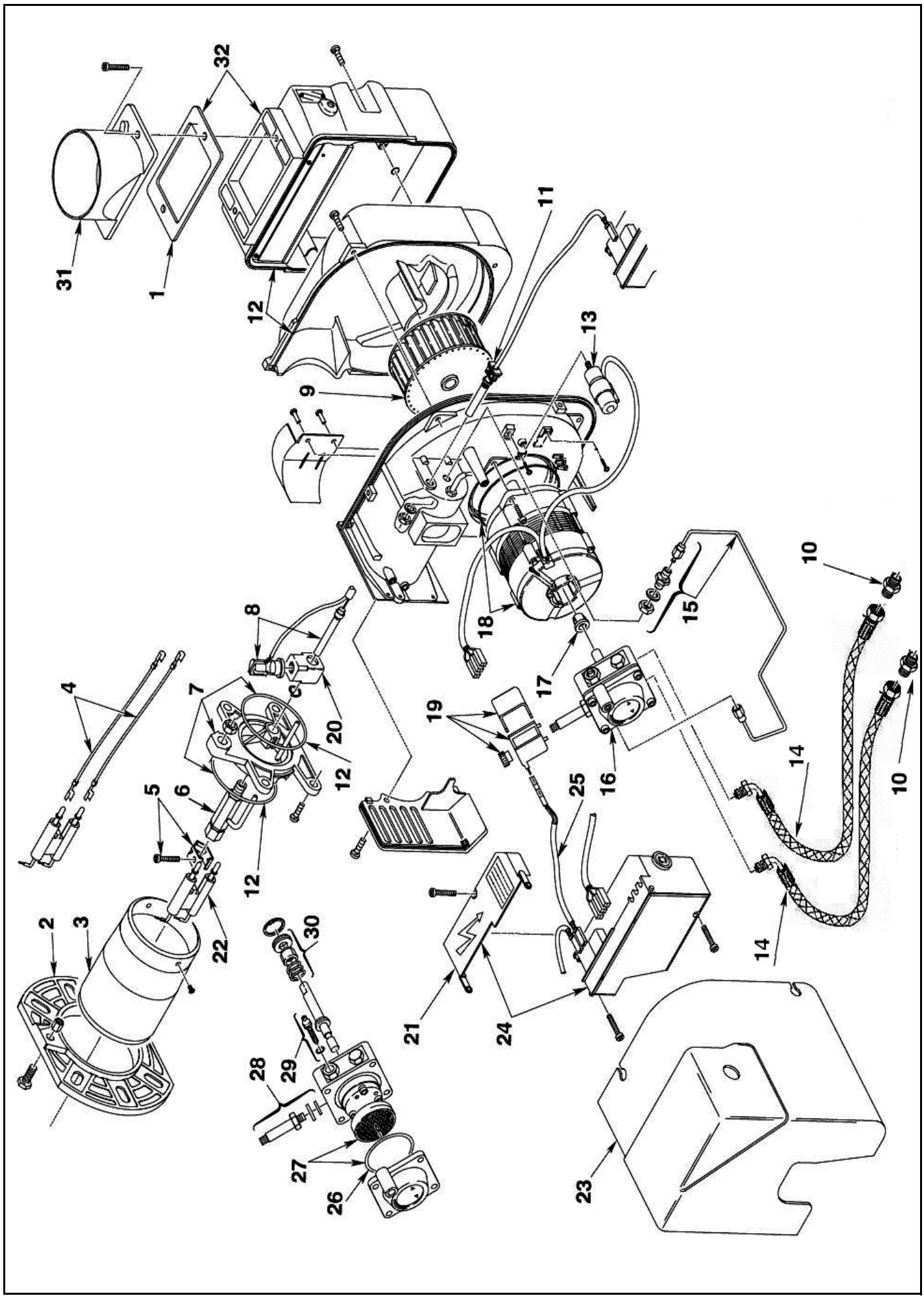
If however the lock out continues the cause must be determined and the solution found.

FAULTS	POSSIBLE CAUSES	SOLUTION
The burner will not start when the limit thermostat closes.	Lack of electrical supply.	Check presence of voltage in the L - N clamps of the control box.
		Check the conditions of the fuses.
		Check that safety thermostat limit is not lock out.
	The flame sensor sees false light.	Eliminate the light.
	Resistance or start thermostats are faulty.	Replace them.
	The connections in the control box are wrongly inserted.	Check and connect completely all the plugs.
Burner runs normally in the prepurge and ignition cycle and locks out after 5 seconds ca.	The flame sensor is dirty.	Clean it.
	The flame sensor is defective.	Change it.
	Flame moves away or fails.	Check pressure and output of the fuel.
		Check air output.
		Change nozzle.
		Check the coil of solenoid valve.
Burner starts with an ignition delay.	The ignition electrodes are wrongly positioned.	Adjust them according to the instructions of this manual.
	Air output is too high.	Set the air output.
	Nozzle dirty or worn.	Replace it.

Tab. G

WARNING

The manufacturer cannot accept responsibility for any damage to persons, animals or property due to error in installation or in the burner adjustment, or due to improper or unreasonable use or non observance of the technical instruction enclosed with the burner, or due to the intervention of unqualified personnel.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N.	COD.	DESCRIPTION	BURNER SERIAL NUMBER	*
1	**3020086**	SEAL		B
2	**3006384**	FLANGE		
3	**3002507**	CUP - SHAPED HEAD		A
4	**3008794**	HIGH VOLTAGE LEAD		
5	**3006552**	ELECTRODE BRACKET		
6	**3008855**	NOZZLE HOLDER		C
7	**3008845**	COLLAR		
8	**3002437**	HEALTER ASSEMBLY		
9	**3005708**	FAN		C
10	**3003602**	CONNECTOR		C
11	**20137157**	FLAME SENSOR		
12	**3008878R**	KIT SEALS		
13	**20071576**	CAPACITOR 4,5 µF		B
14	**3007621**	HOSE		A
15	**3008842**	TUBE AND CONNECTOR		
16	**20034559**	PUMP		C
17	**3000443**	JOINT		A
18	**20071577**	MOTOR + CAPACITOR		C
19	**3008648**	COIL		C
20	**3008856**	CONNECTOR		C
21	**3008649**	PROTECTION		
22	**3007513**	ELECTRODE ASSEMBLY		A
23	**3008879**	COVER		
24	**3008652**	CONTROL BOX		B
25	**3008851**	LEAD COIL		C
26	**3007162**	O-RING		A
27	**3008653**	FILTER - O-RING		A
28	**3007582**	NEEDLE VALVE		B
29	**3008651**	REGULATOR		
30	**3000439**	PUMP SEAL		A
31	**3020281**	BF SNORKEL		
32	**3008647**	AIR DAMPER ASSEMBLY		

*

ADVISED PARTS
A = Spare parts for minimum fittings - A+B = Spare parts for basic safety fittings - A+B+C = Spare parts for extended safety fittings

RIELLO

RIELLO S.p.A.
I-37045 Legnago (VR)
Tel.: +39.0442.630111
http:// www.riello.it
http:// www.riello.com

20166849