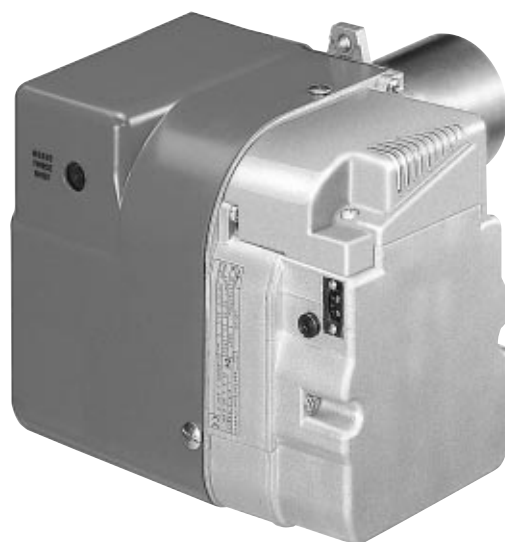
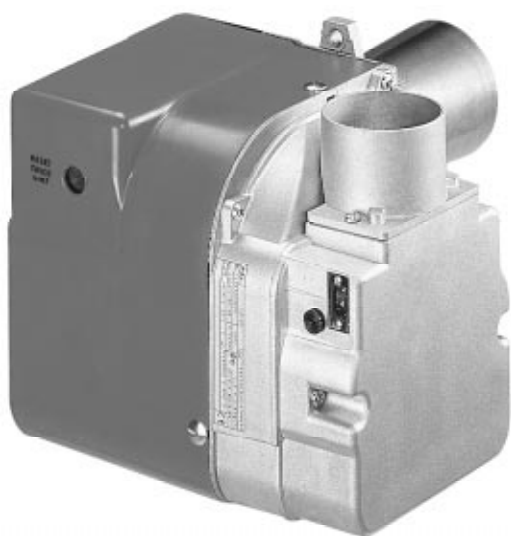




**KEROSENE AND LIGHT OIL
BURNER**



KEROSENE BURNER



| CODE | MODEL | TYPE |
|---------|---------------|--------|
| 3748357 | RDB1 70 - 90 | 483T50 |
| 3748557 | RDB1 50 - 70 | 485T50 |
| 3513007 | RDB1 WM 50/70 | 501T2K |
| 3748757 | RDB2 90 - 120 | 487T50 |

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1. BURNER DESCRIPTION

One stage kerosene and light oil burner.

- In case of **BF** applications the intake air temperature must not be over 70°C.
- CE Certification No.: **0036 0326/01** (483T50) – **0036 0316/01** (501T2K), as 92/42/EEC.
- The burner meets protection level of IP 40, EN 60529.
- Burner with CE marking in conformity with EEC directives: EMC 89/336/EEC, Low Voltage 73/23/EEC, Machines 98/37/EEC and Efficiency 92/42/EEC.

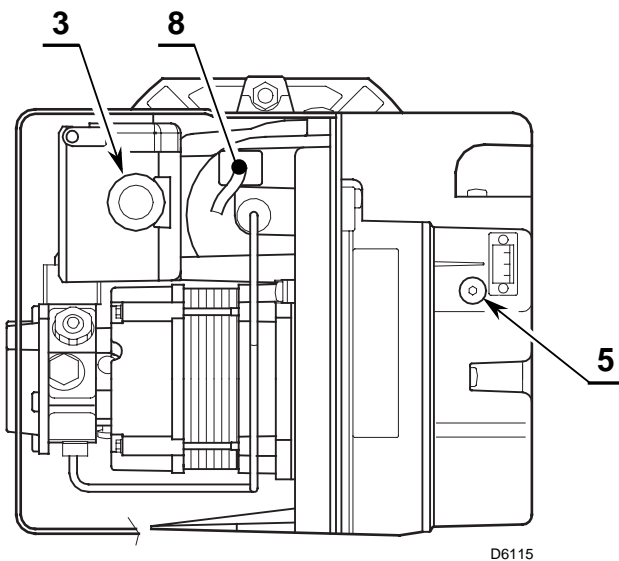
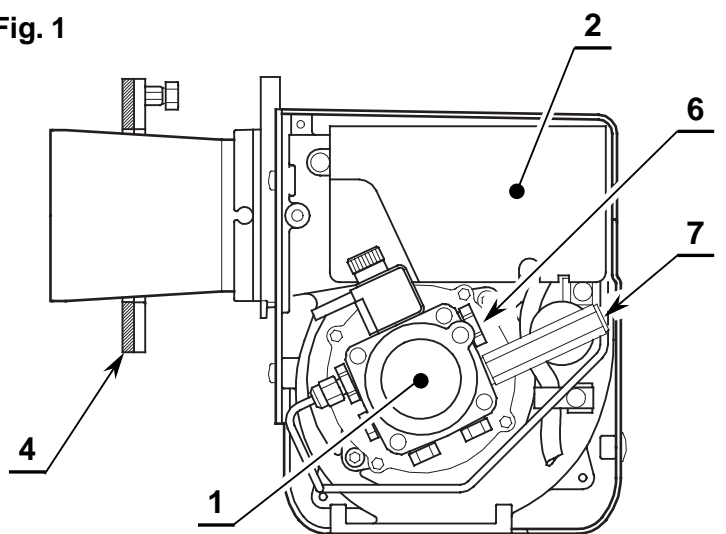


Fig. 1



- 1 – Pump
- 2 – Control-box
- 3 – Reset button with lock-out lamp
- 4 – Flange with insulating gasket

- 5 – Air damper adjustment screw
- 6 – Pump pressure adjustment screw
- 7 – Pressure gauge port
- 8 – Photoresistance

1.1 BURNER EQUIPMENT

- Flange with insulating gasket No. 1
- Screw and nuts for flange No. 1
- Hexagonal key No. 1
- Flexible oil pipe with nipple No. 1

- Screws and terminal screw for feeding cable . . . No. 3
- Screw of by-pass pump No. 1
- Nuts for flange to be fixed to boiler No. 2

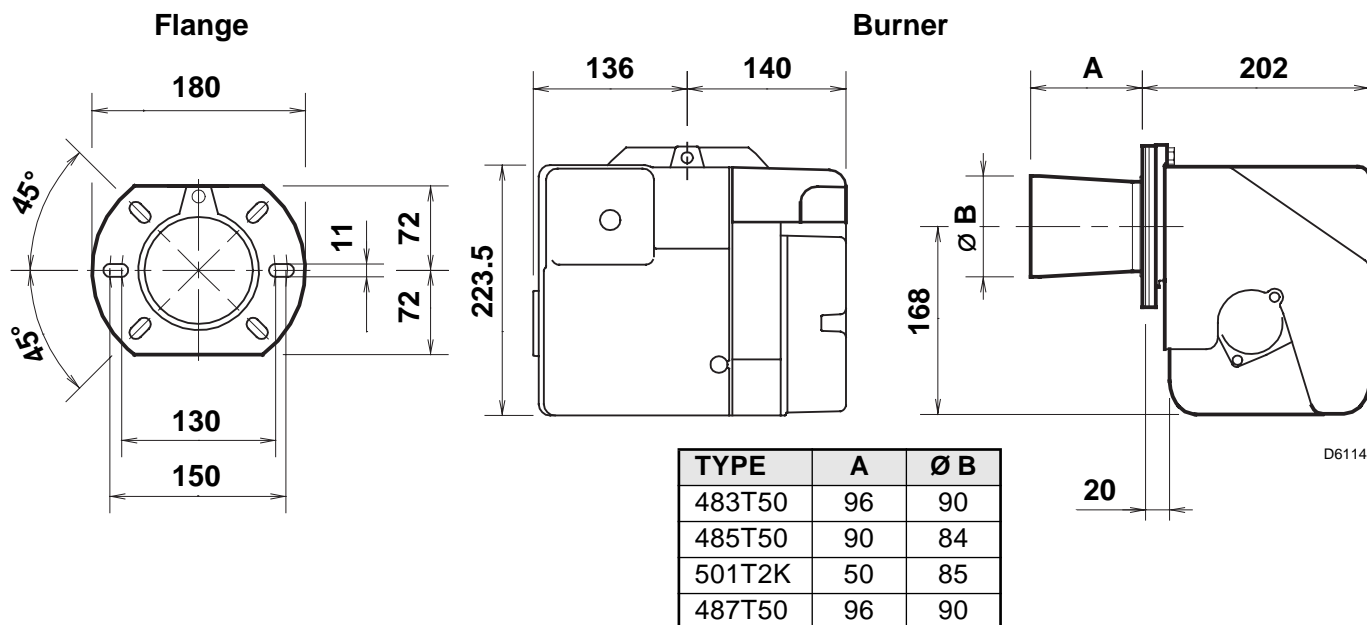
2. TECHNICAL DATA

2.1 TECHNICAL DATA

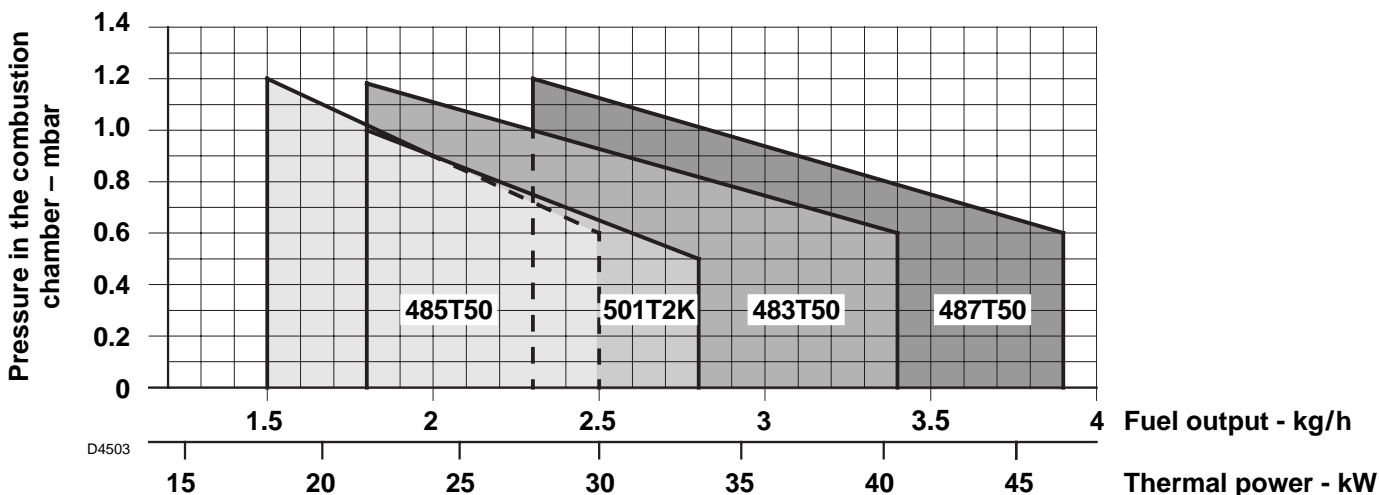
| TYPE | 483T50 | 485T50 | 501T2K | 487T50 | |
|---|---|-------------|-----------|-------------|-------------|
| Output – Thermal power (with air at 20°C) | kg/h | 1.8 – 3.4 | 1.5 – 2.5 | 1.8 – 2.8 | 2.3 – 3.9 |
| | kW | 21.6 – 40.6 | 18 – 29.9 | 21.6 – 33.5 | 27.6 – 46.6 |
| Fuel | Kerosene, viscosity 1.6 – 6 mm ² /s at 20 °C (<i>H_i</i> = 11.97 kWh/kg) Light oil, viscosity 4 – 6 mm ² /s at 20 °C ♦ (<i>H_i</i> = 11.86 kWh/kg) | | | | |
| Electrical supply | Single phase, ~ 50Hz 230V ± 10% | | | | |
| Motor | Run current 0.7 A – 2700 rpm – 283 rad/s | | | | |
| Capacitor | 4.5 µF | | | | |
| Ignition transformer | Secondary 8 kV – 16 mA | | | | |
| Pump | Kerosene, maximum pressure 10 bar (145 psi) Light oil, maximum pressure 15 bar (218 psi) | | | | |
| Absorbed electrical power | kW | | | 0.115 | 0.125 |

♦ Light oil is not permitted on low level discharge of flue gas products.

2.2 OVERALL DIMENSIONS



2.3 FIRING RATES, (as EN 267)



3. INSTALLATION

THE BURNER MUST BE INSTALLED IN CONFORMITY WITH LEGISLATION AND LOCAL STANDARDS.

3.1 BOILER FIXING

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

Fig. 2

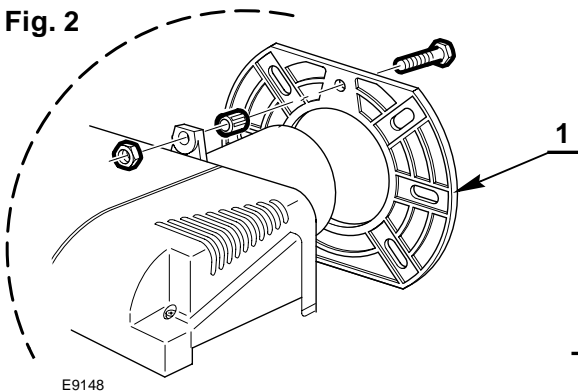
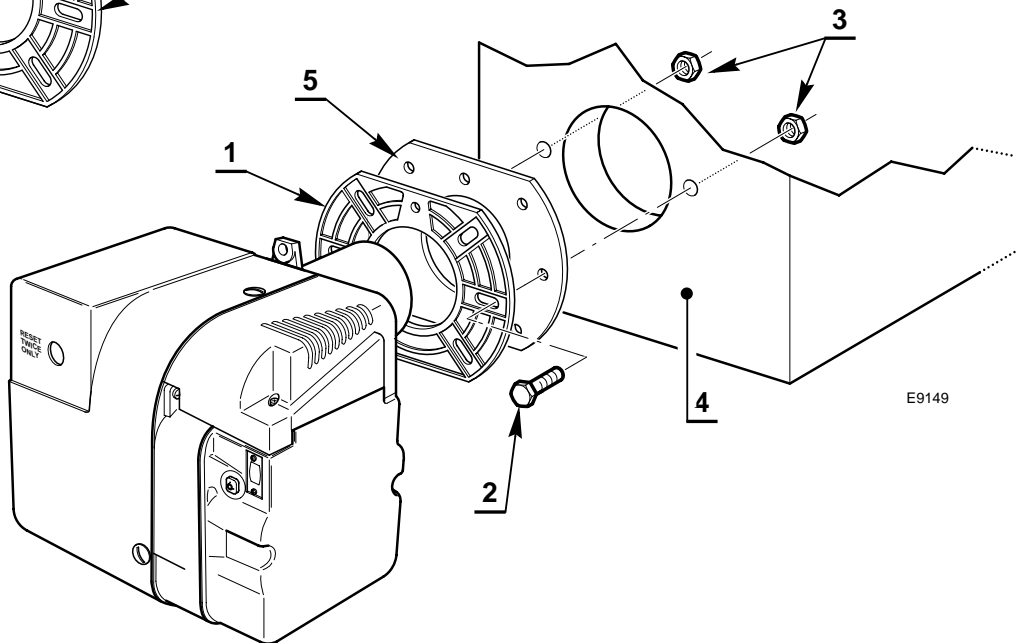


Fig. 3



3.2 BURNER ASSEMBLY

CF APPLICATION

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

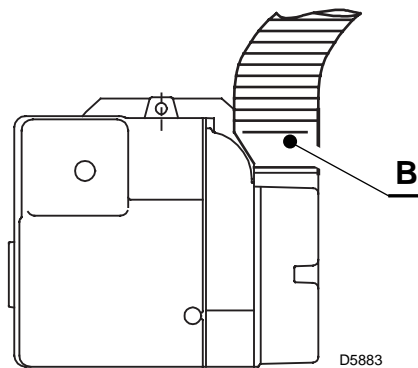
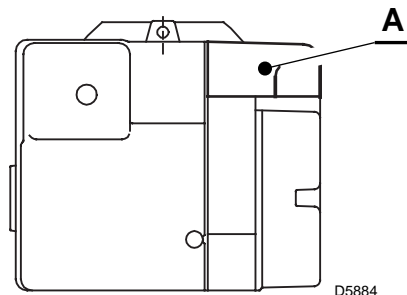
BF APPLICATION

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.

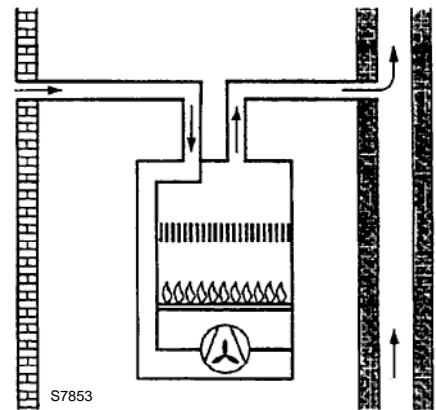
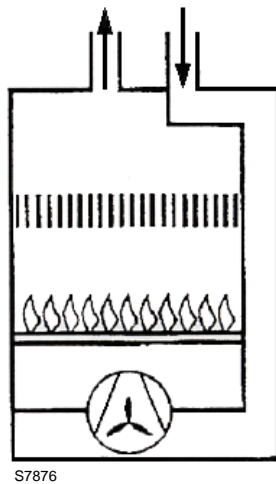
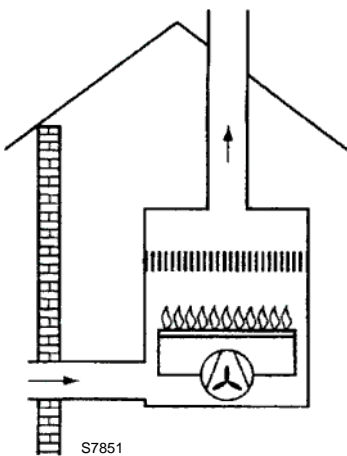


- The intake-tube / burner system must not allow a loss of over 2 m³/h at 0.5 mbar:
for instance, the above requirements will be met if you use flues for pressure exhaust of flue gases (the condensation kind).
- Make sure the air intake tube's inlet is positioned so that it is not likely to be obstructed by foreign matter and, where necessary, use suitable screens.
- The temperature of the incoming air must not exceed 40 °C;
- 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.

BURNER INSTALLATION MUST COMPLY WITH ONE OF THE INSTALLATIONS ILLUSTRATED IN THE FIGURES BELOW.

ATTENTION

- 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.).
- Coaxial tubes must not be installed for any reason.



3.3 HYDRAULIC SYSTEMS

WARNING:

- Check periodically the flexible pipes conditions. Using kerosene, they have to be replaced at least every 2 years.
- A metal bowl filter with replaceable micronic filter must be fitted in the oil supply pipe.
- 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), screw the by-pass screw (3) and then screw the return flexible oil pipe. (See fig. 4).
- 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.

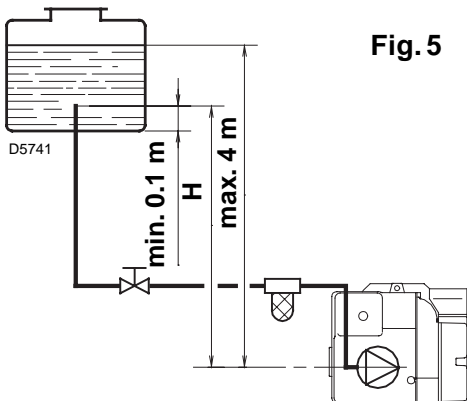
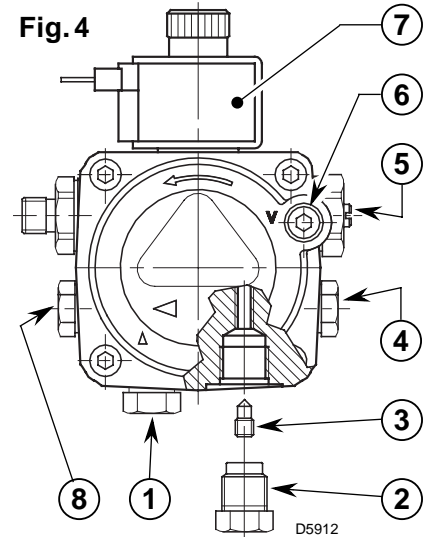


Fig. 5

| H meters | L meters | |
|----------|------------|-------------|
| | I. D. 8 mm | I. D. 10 mm |
| 0.5 | 10 | 20 |
| 1 | 20 | 40 |
| 1.5 | 40 | 80 |
| 2 | 60 | 100 |



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

PRIMING PUMP

On the system in fig. 5 it is sufficient to loosen the suction gauge connection (6, fig. 4) and wait until oil flows out.

On the systems in fig. 6 and 7 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.

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.

In the vacuum systems (fig. 7) 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.

| H meters | L meters | |
|----------|------------|-------------|
| | I. D. 8 mm | I. D. 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 |

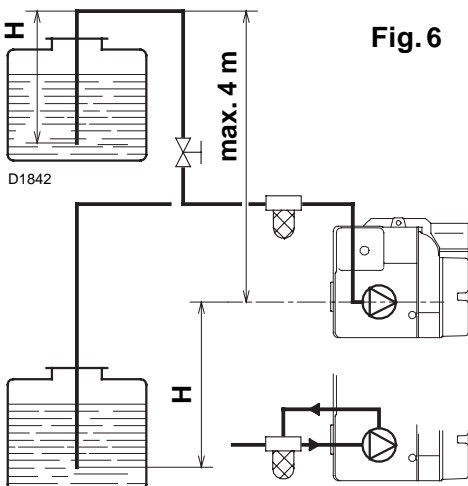


Fig. 6

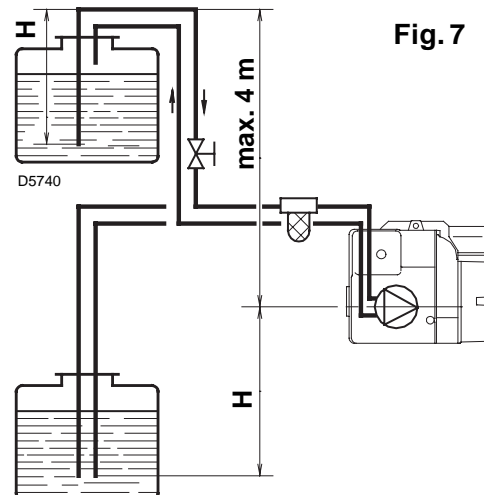


Fig. 7

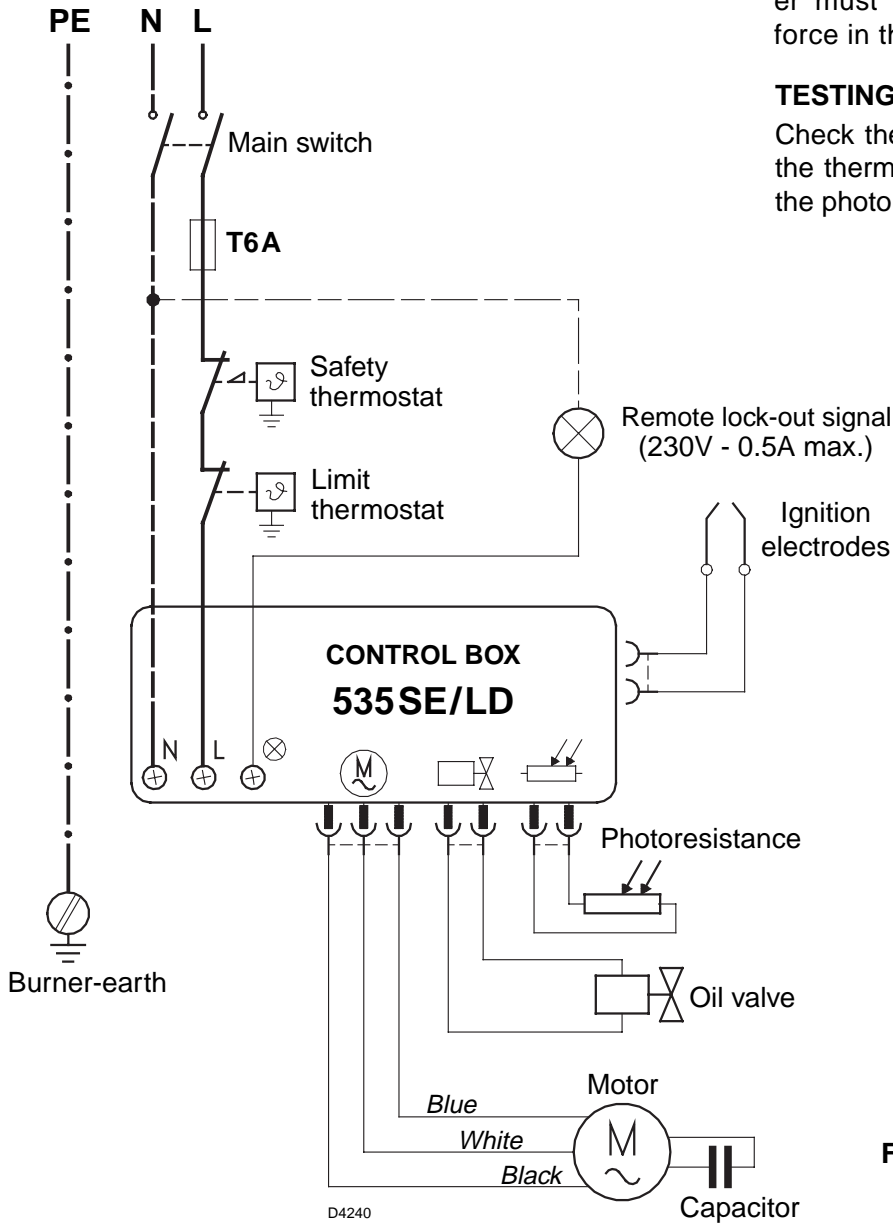
H = difference of level L = Max. length of the suction line I.D. = Interminal diameter of the oil pipes.

3.4 ELECTRICAL WIRING

WARNING

DO NOT EXCHANGE NEUTRAL WITH PHASE

~ 50Hz - 230V



NOTES:

- Wires of min. 1 mm² section.
(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.

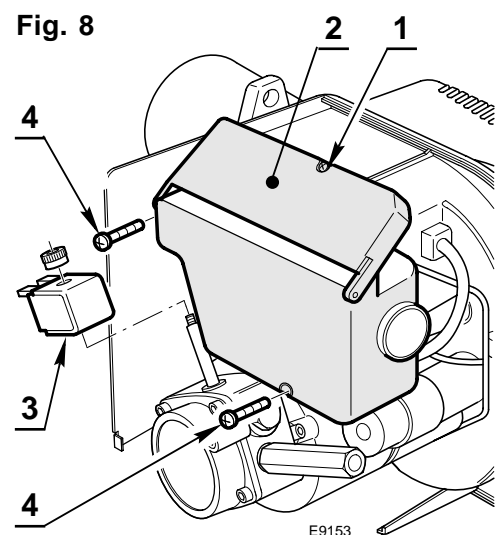
TESTING:

Check the shut-down of the burner by opening the thermostats and the lock-out by **darkening** the photoresistance.

CONTROL BOX (see fig. 8)

To remove the control box from the burner follow of the instruction:

- Loosen the screw (1), open the protection (2) and remove all components.
- Remove the coil (3).
- Loosen the two screws (4).
- Move a little the control box and remove the high voltage leads.



4. WORKING

4.1 COMBUSTION ADJUSTMENT

In conformity with Efficiency Directive 92/42/EEC 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 CO₂ concentration in the flue gases, their temperatures and the average temperature of the water in the boiler.

4.2 NOZZLES RECOMMENDED : Delavan type W; Steinen type Q - S; Danfoss type H - S.

Angle : 60° - In most cases.

80° - In case of flame detachment, during ignitions at low temperatures.

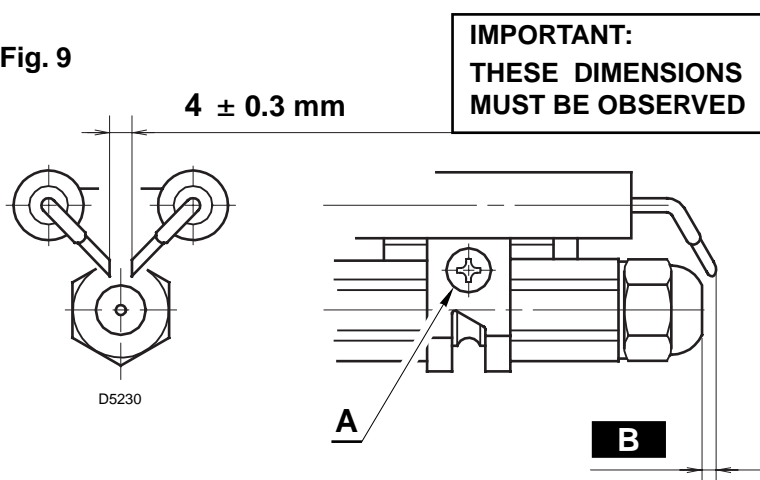
4.3 ELECTRODES SETTING

ATTENTION

Before removing or assembling the nozzle, loosen the screw (A, fig. 9) and move the electrodes ahead.

| TYPE | B |
|---------|------------|
| 483T50 | 3 – 3.5 mm |
| 485T50 | 2 – 2.5 mm |
| 501 T2K | 2 – 2.5 mm |
| 487T50 | 3 – 3.5 mm |

Fig. 9



4.4 PUMP PRESSURE

The pump leaves the factory set for kerosene working.

10 bar: maximum pressure for kerosene.

FOR LIGHT OIL INCREASE PRESSURE

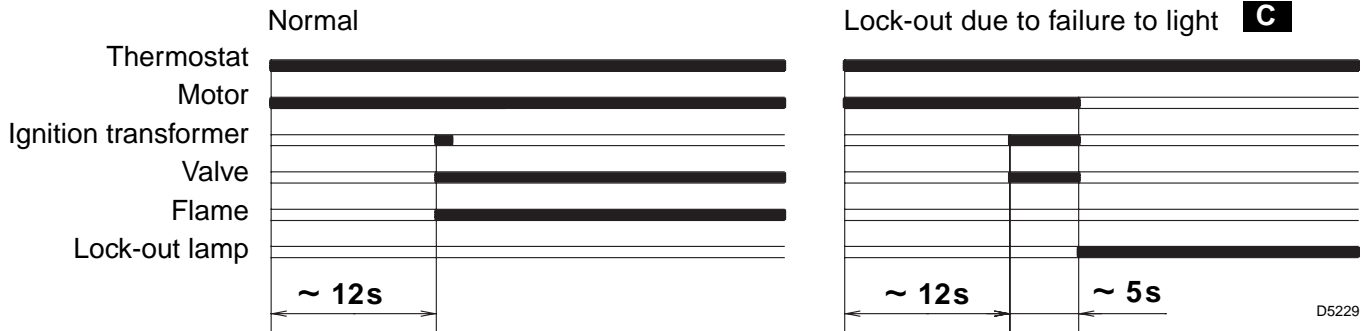
12 bar: pressure suitable for light oil in most cases.

14 bar: improves flame retention; it is therefore suitable for ignitions at low temperatures.

4.5 AIR DAMPER ADJUSTMENT

The air damper is set in factory. This regulation is 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.

4.6 BURNER START-UP CYCLE



C Lock out is indicated by a lamp on the control box (3, fig. 1, page 1).

5. MAINTENANCE

The burner requires periodic maintenance carried out by a qualified and authorised technician **in conformity with legislation and local standards**.

Maintenance is essential for the reliability of the burner, avoiding the excessive consumption of fuel and consequent pollution.

Before carrying out any cleaning or control always first switch off the electrical supply to the burner acting on the main switch of the system.

THE BASIC CHECK ARE:

- Check that there are not obstructions or dents in the supply or return oil pipes.
- Clean the filter in the oil suction line and in the pump.
- Clean the photoresistance, (8, fig. 1, page 1).
- Check for correct fuel consumption.
- Replace the nozzle and check the correct position of electrodes (fig. 9, page 7).
- Clean the combustion head in the fuel exit area, on the diffuser disc.
- Leave the burner working without interruptions for 10 min. and set rightly all the components stated in this manual. **Then carry out a combustion check verifying:**
 - Smoke temperature at the chimney;
 - Content of CO₂ (%);
 - Content of CO (ppm);
 - Smoke value according to opacity smokes index according to Bacharach scale.

6. FAULTS / SOLUTIONS

Here below you can find some causes and the possible solutions for some problems that could cause a failure to start or a bad working of the burner. A fault usually makes the lock-out lamp light which is situated inside the reset button of the control box (3, fig. 1, page 1). When lock out lamp lights the burner will attempt to light only after pushing the reset 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 is not lock out. |
| | Resistance or start thermostats are faulty. | Replace them. |
| Burner runs normally in the prepurge and ignition cycle and locks out after 5 seconds ca. | The photoresistance is dirty. | Clear it. |
| | The photoresistance 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. |

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.

