

Kerosene burners

One stage operation



CODE	MODEL	TYPE
3513008	RDB1 26	501T1K
3513603	RDB2 38	502T3K

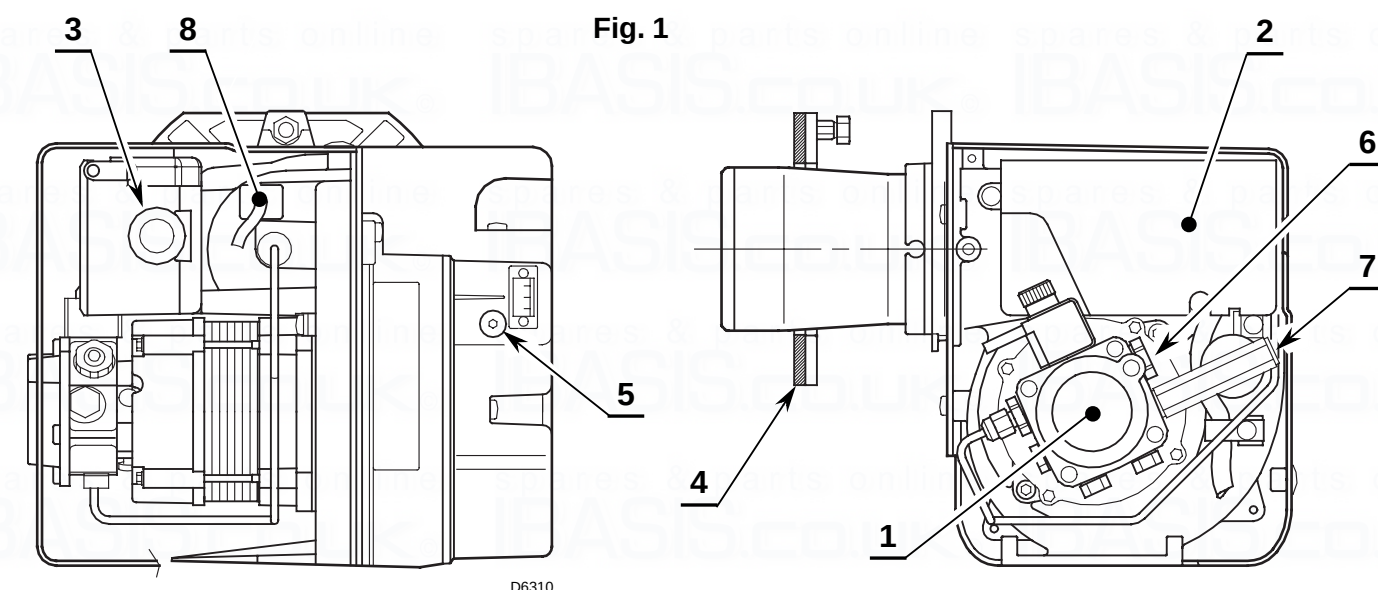
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1. BURNER DESCRIPTION

One stage kerosene burner.

- In case of **BF** applications the intake air temperature must not be over 70°C.
- 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.
- CE Certification No.: **0036 0316/01** as 92/42/EEC.



- | | |
|-------------------------------------|------------------------------------|
| 1 – Pump | 5 – Air damper adjustment screw |
| 2 – Control-box | 6 – Pump pressure adjustment screw |
| 3 – Reset button with lock-out lamp | 7 – Pressure gauge port |
| 4 – Flange with insulating gasket | 8 – Photoresistance |

1.1 BURNER EQUIPMENT

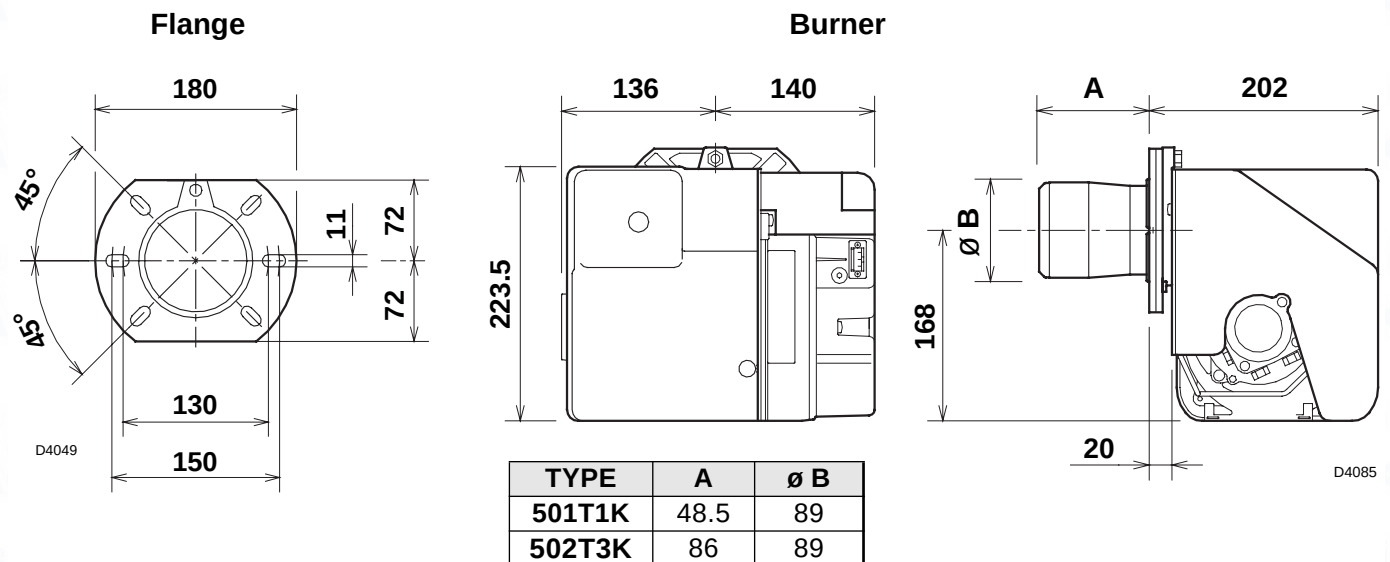
Flange with insulating gasket . . .	No. 1	Screw of by-pass pump	No. 1
Screw and nuts for flange	No. 1	Bolts for flange to be fixed to boiler	No. 4
Hexagonal key	No. 1	Screw and terminal screw for feeding cable. . .	No. 3
Flexible fuel pipe with nipple . . .	No. 1		

2. TECHNICAL DATA

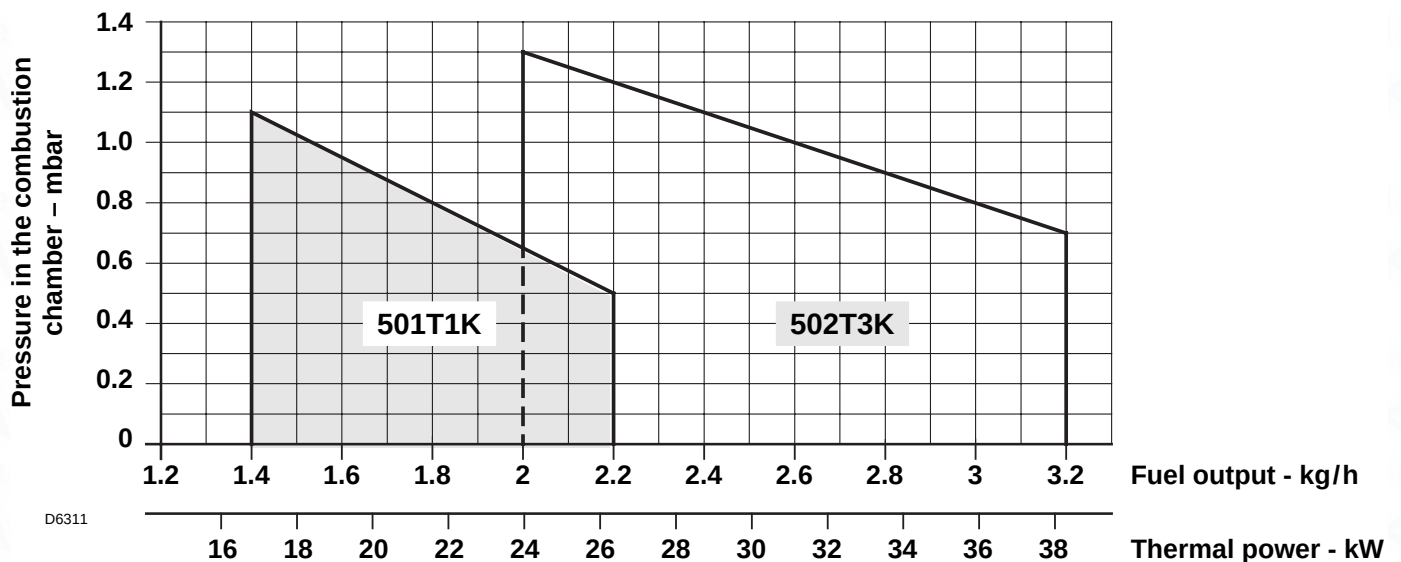
2.1 TECHNICAL DATA

TYPE	501T1K	502T3K
Output - Thermal power (with air at 20 °C)	1.4 – 2.2 kg/h	2 – 3.2 kg/h
	16.8 – 26.3 kW	24 – 38.3 kW
	(H _i = 11.97 kWh/kg)	
Fuel	Kerosene, viscosity 1.6 – 6 mm ² /s at 20 °C	
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)	
Absorbed electrical power	0.115 kW	0.125 kW

2.2 OVERALL DIMENSIONS



2.3 FIRING RATES, (as EN 267)

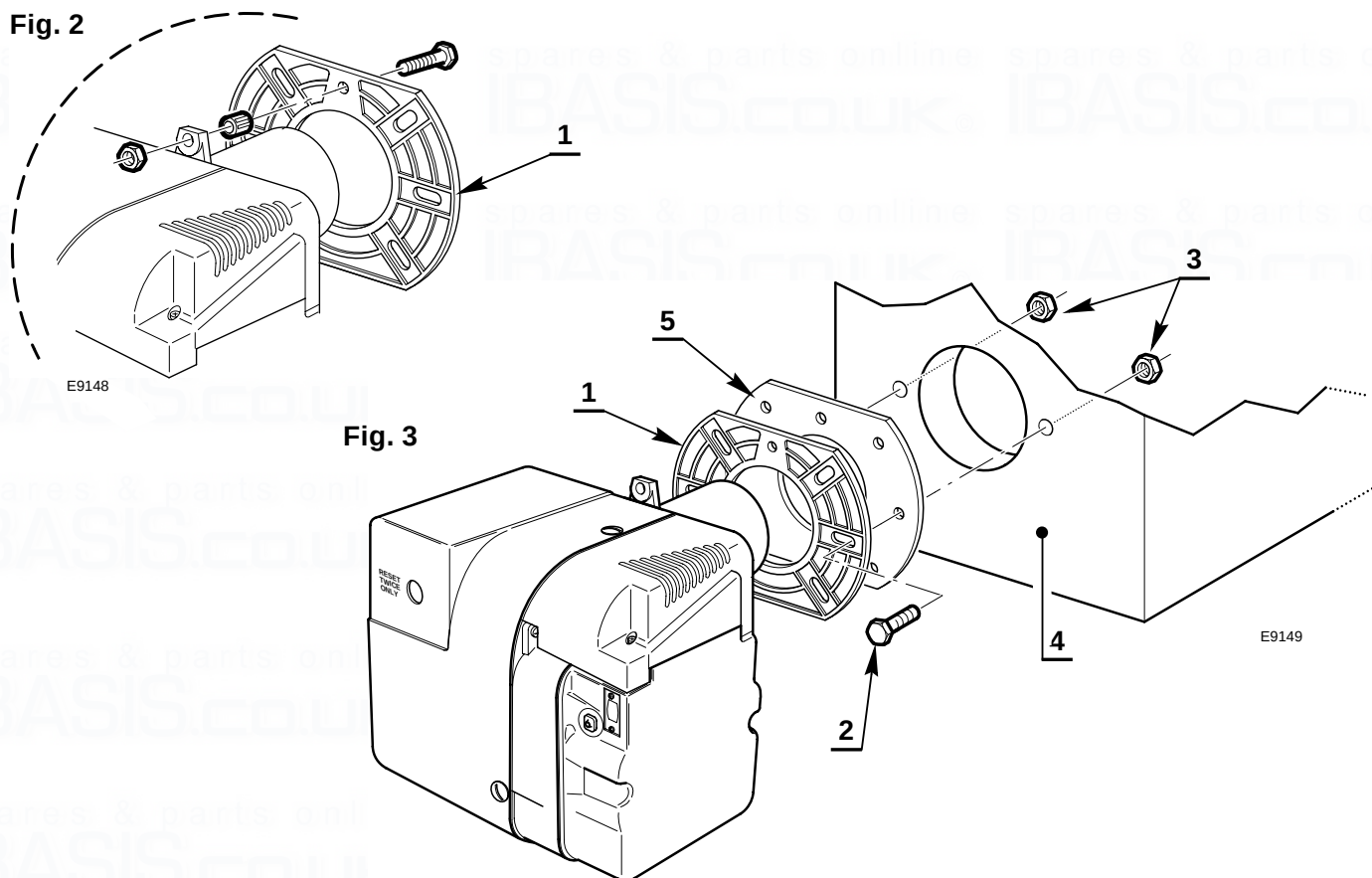


3. INSTALLATION

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

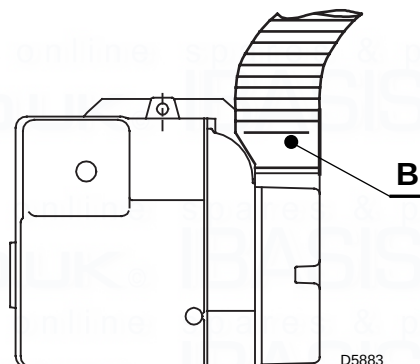
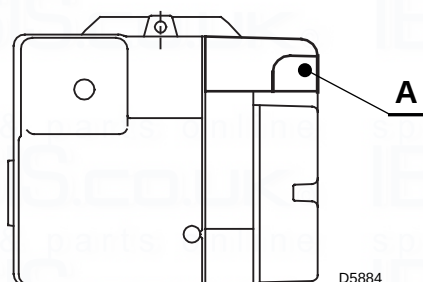
3.1 BOILER FIXING

- 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).



3.2 MOUNTING THE BURNER

- 1) In case of **CF** applications, the burner shall not operate without protection of the suction inlet.
- 2) 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 tube connected at the socket **(B)**.



3.3 HYDRAULIC SYSTEMS

WARNING:

- 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.

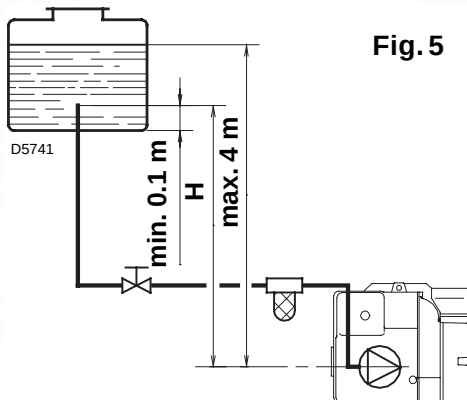
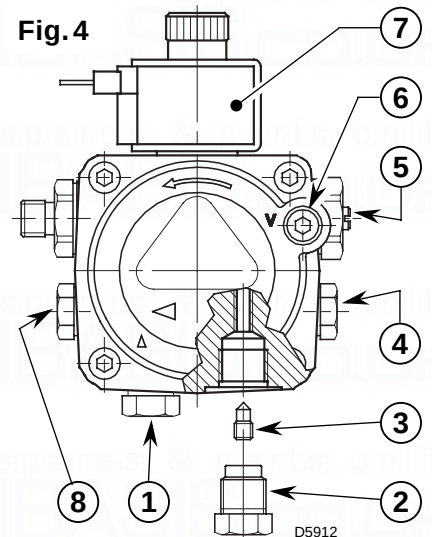


Fig. 5

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

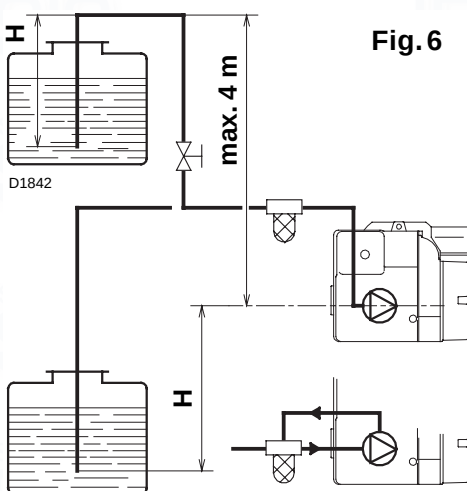


Fig. 6

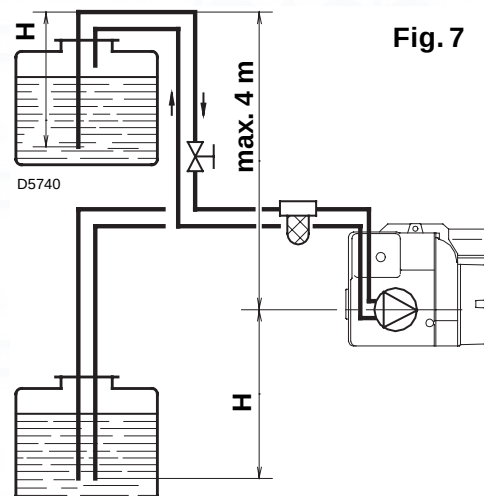


Fig. 7

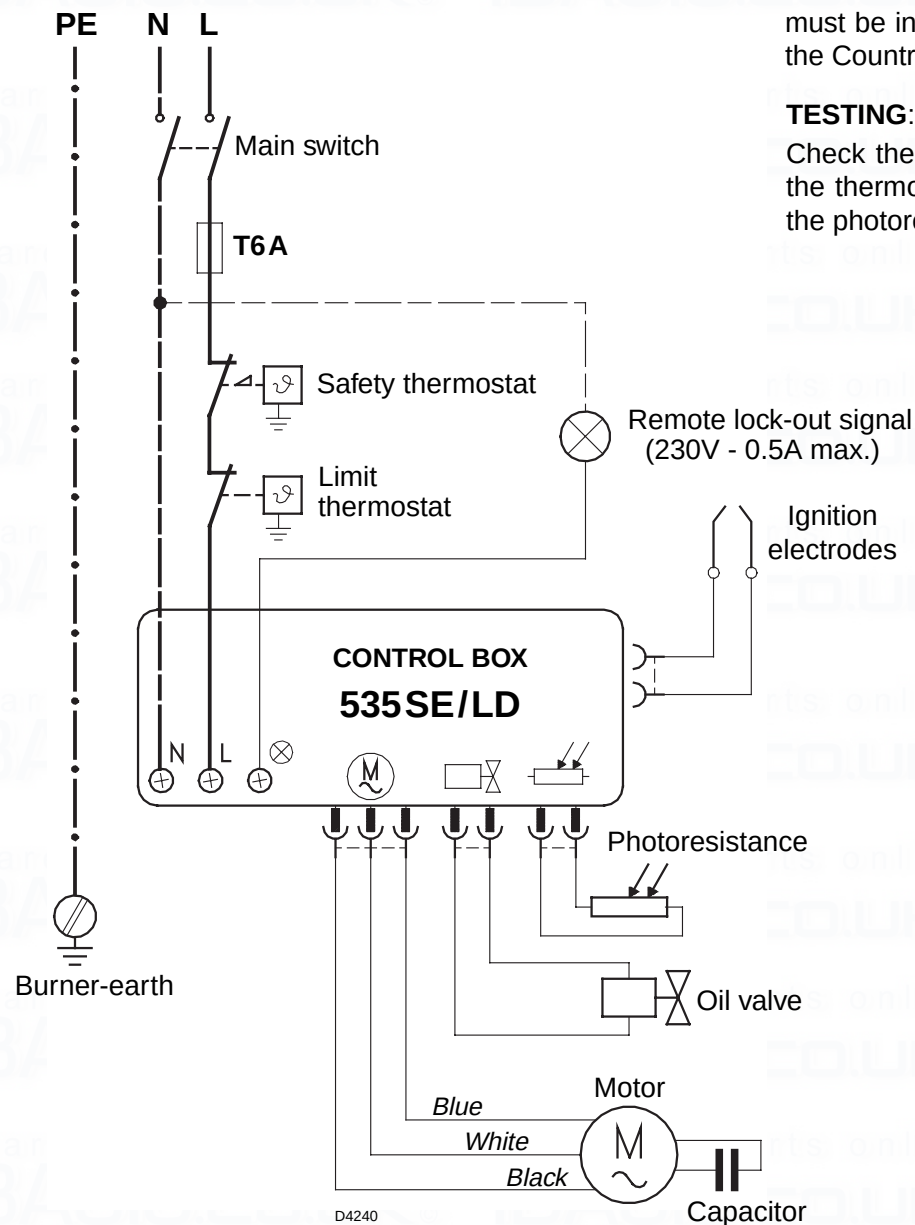
- Check periodically the flexible pipes conditions.
Using kerosene, they have to be replaced at least **every 2 years**.
 - A metal bowl filter with replaceable micronic filter must be fitted in the oil supply pipe.
- H = difference of level L = Max. lenght of the suction line I.D. = Interminal diameter 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.

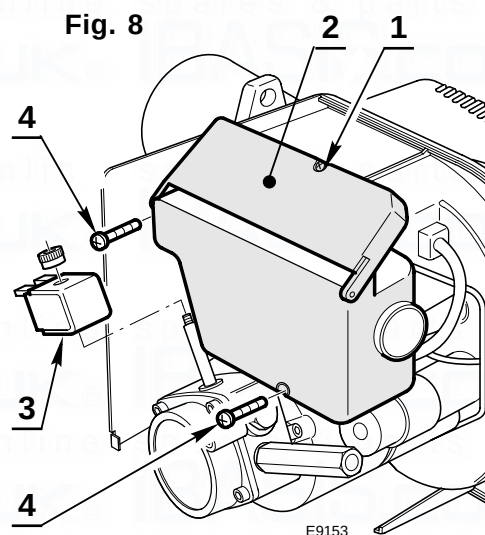
TESTING:

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.

To suit the required appliance output, choose the proper nozzle and adjust the pump pressure, the setting of the combustion head, and the air damper opening in accordance with the following table.

The values shown in the table are measured on a CEN boiler (as per EN 267). They refer to 12.5% CO₂ at sea level and with fuel and room temperature of 20°C.

TYPE	Nozzle		Pump pressure	Burner output	Air damper adjustment
	GPH	Angle	bar	kg/h $\pm$ 4%	Set-point
501T1K	0.50	60°	7	1.40	1.7
	0.60	60°	8	1.79	3.4
	0.65	60°	8	1.94	4
	0.75	60°	7.5	2.17	5
502T3K	0.65	60°	8.5	2.00	3.3
	0.75	60°	8	2.24	3.8
	0.85	60°	8	2.54	4.7
	1.00	60°	8	2.99	5.5
	1.10	60°	9	3.17	6.5

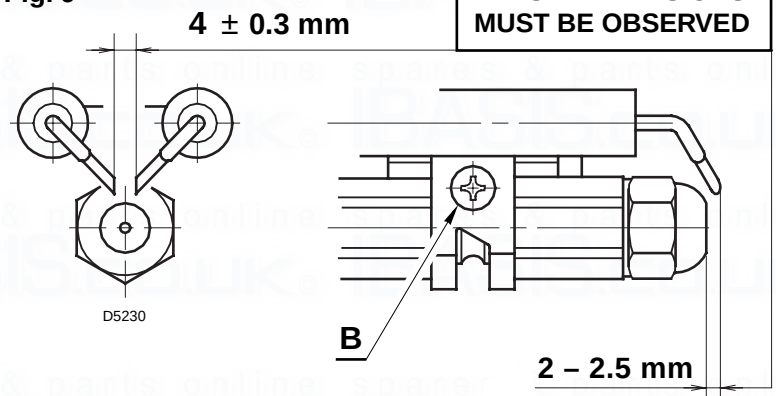
4.2 NOZZLES RECOMMENDED : Delavan type W - E; Monarch type R - NS
Steinen type Q - H; Danfoss type EH - ES.

4.3 ELECTRODES SETTING

ATTENTION

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

Fig. 9



4.4 PUMP PRESSURE:

8 bar: the pump leaves the factory set at this value.
10 bar: maximum pressure for kerosene.

4.5 AIR DAMPER ADJUSTMENT

The settings indicated in the table 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.

4.6 BURNER START-UP CYCLE



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

5. 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.
	The photoresistance sees false light.	Eliminate the light.
Burner runs normally in the prepurge and ignition cycle and locks out after 5 seconds ca.	The connections in the control box are wrongly inserted.	Check and connect completely all the plugs.
	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.
Burner starts with an ignition delay.	Check the coil of solenoid valve.	
	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.