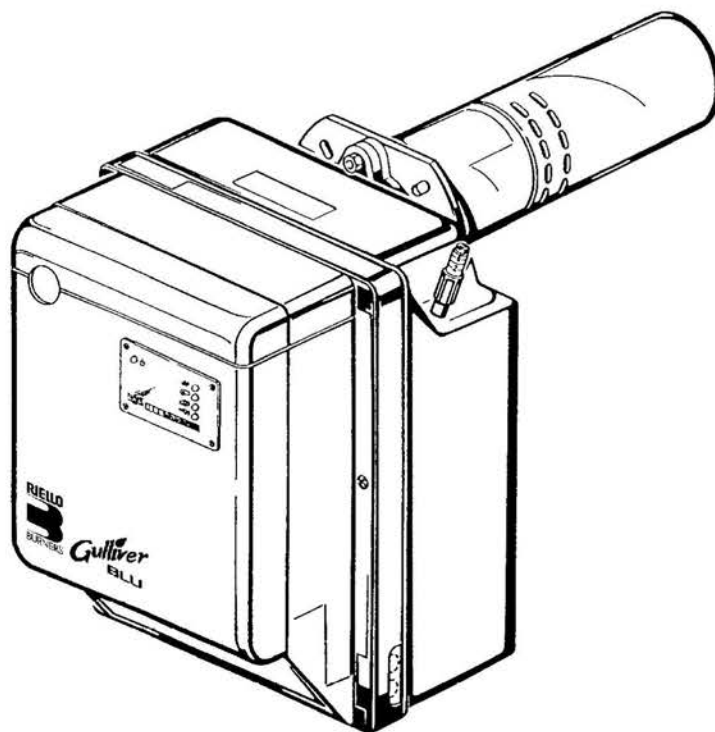




- I** Bruciatori di gasolio
- D** Öl-Gebläsebrenner
- F** Brûleurs fioul
- GB** Oil burners

Funzionamento monostadio
Einstufiger Betrieb
Fonctionnement à 1 allure
One stage operation



Gulliver
BLU

CODICE CODE	MODELLO - MODELL MODELE - MODEL	TIPO - TYP TYPE
3738850	BG5	388 T1
3738851	BG5E Con/mit/avec/with FLAME MONITOR	388 T1

INDEX

1. BURNER DESCRIPTION.....	1	4. WORKING	6
1.1 Burner equipment.....	1	4.1 Combustion adjustment.....	6
2. TECHNICAL DATA	2	4.2 Pump pressure and air output	7
2.1 Technical data	2	4.3 Electrodes adjustment.....	8
2.2 Overall dimensions.....	2	4.4 Flame detector adjustment	8
2.3 Working field	2	4.5 Fuel heating	8
3. INSTALLATION.....	3	4.6 Burner start-up cycle.....	9
3.1 Boiler fixing	3	5. MAINTENANCE	9
3.2 Fuel supply	3	6. MODEL WITH "FLAME MONITOR"	10
3.3 Hydraulic systems	4	7. FAULTS / SOLUTIONS.....	11
3.4 Electrical wiring	5		

1. BURNER DESCRIPTION

One stage gas oil burner with low pollutant emissions (Nitric Oxide NO_x, Carbon monoxide CO and unburnt Hydrocarbons), in conformity with the environmental mark "Blauer Engel" RAL-UZ9, Edition February 2001.

The burner has a device (compensator) which is integral with the air damper that sets the air output.

This device keeps the oxygen level as necessary for the combustion despite any changing of the room temperature.

The dimension of the boiler's combustion chamber must respond to specific values, in order to guarantee a combustion with the lowest polluting emissions rate.

The RIELLO Technical Service Personnel will be glad to give you all the information for a correct matching of this burner to the boiler.

- 1 – Oil pump
- 2 – Control-box
- 3 – Reset button with lock-out lamp
- 4 – Flange with insulating gasket
- 5 – Air damper adjustment assembly
- 6 – Nozzle holder assembly
- 7 – Flame detector
- 8 – Hydraulic jack
- 9 – Temperature probe of the compensator
- 10 – Start delaying device

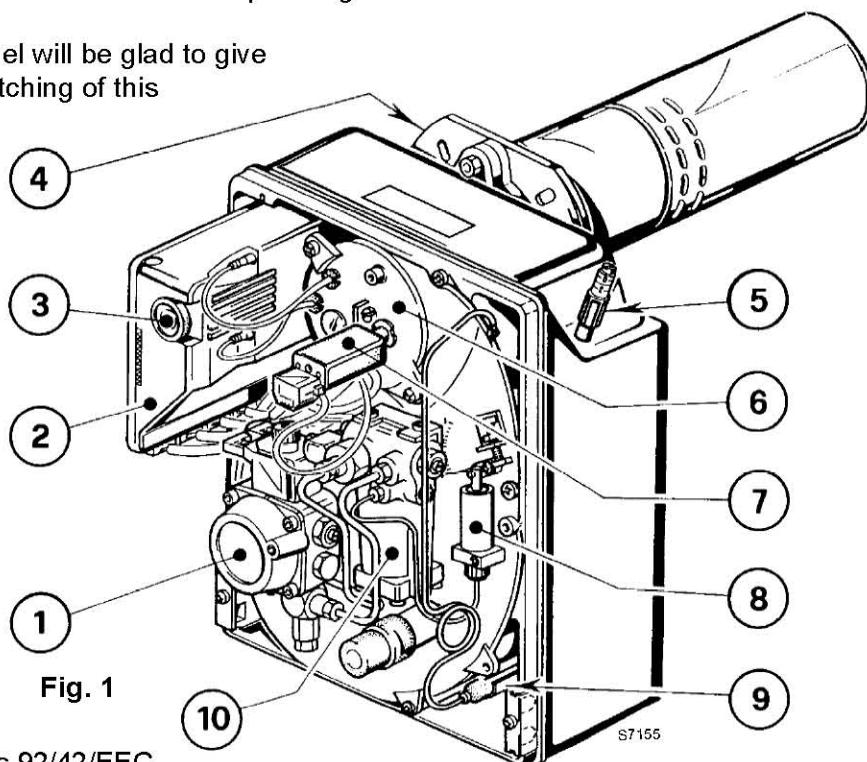


Fig. 1

- CE Certification No.: **0036 0268/99** 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.

1.1 BURNER EQUIPMENT

Flange with insulating gasket . . . No. 1
Screw and nuts for flange No. 1

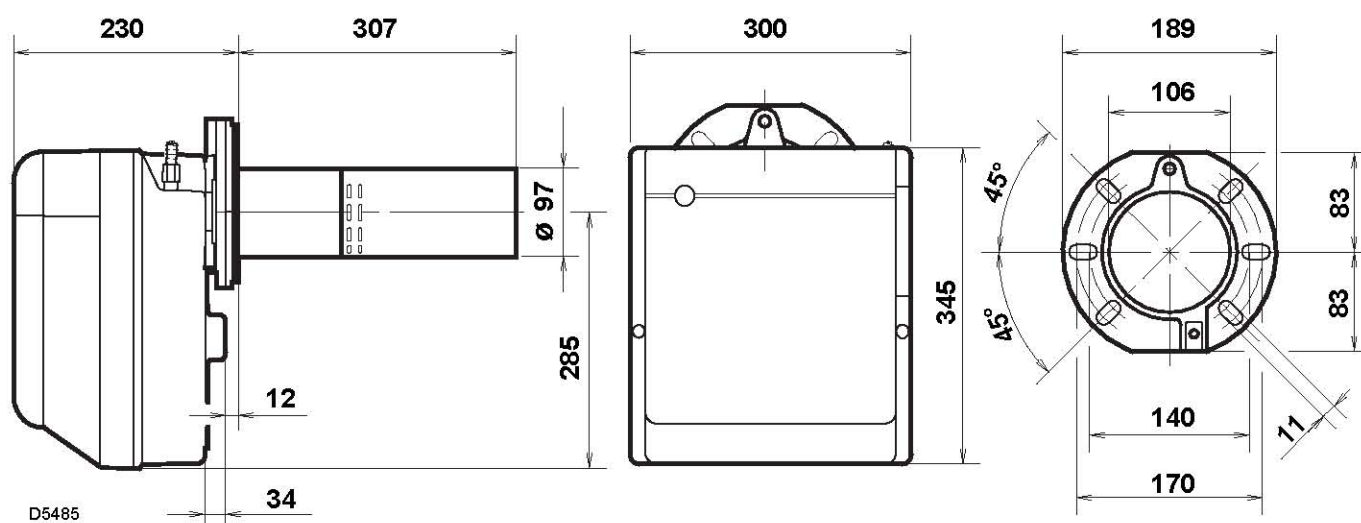
Screw and nuts for flange to be fixed to boiler . . . No. 4
Flexible oil pipes with nipples No. 2

2. TECHNICAL DATA

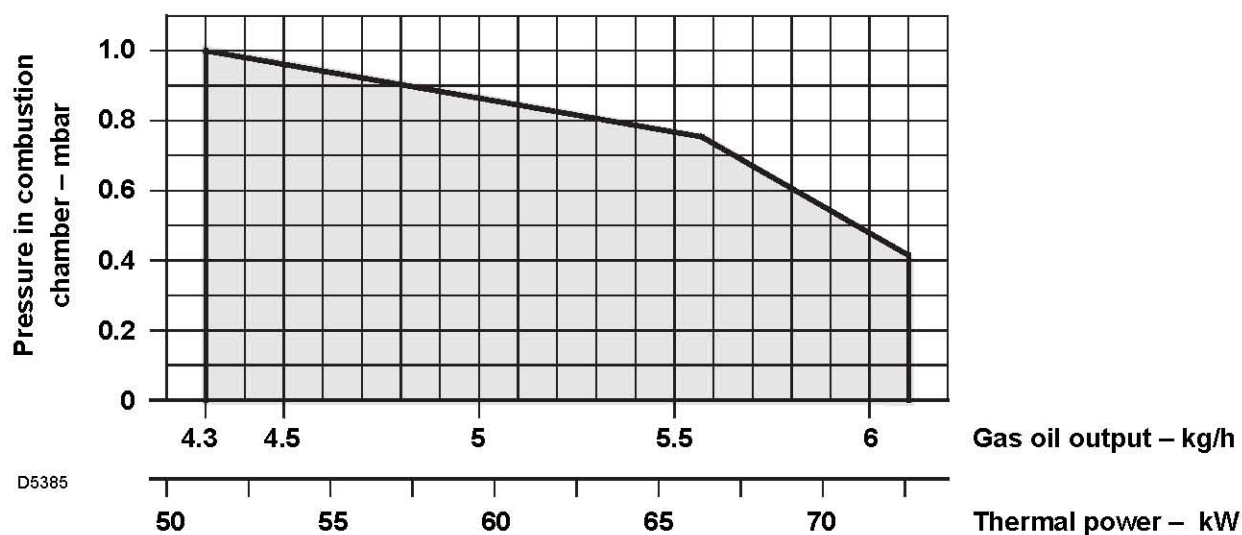
2.1 TECHNICAL DATA

Output	4.3 – 6.1 kg/h
Thermal power	51 – 72.3 kW
Fuel	Gas oil, viscosity 4 – 6 mm ² /s at 20 °C
Electrical supply	Single phase, 230V ± 10% ~ 50Hz
Motor	Run current 1.8A – 2750 rpm – 289 rad/s
Capacitor	6.3 µF
Ignition transformer	Secondary 8 kV – 16 mA
Pump	Pressure 8 – 15 bar
Absorbed electrical power	0.47 kW

2.2 OVERALL DIMENSIONS



2.3 WORKING FIELD (as EN 267)



3. INSTALLATION

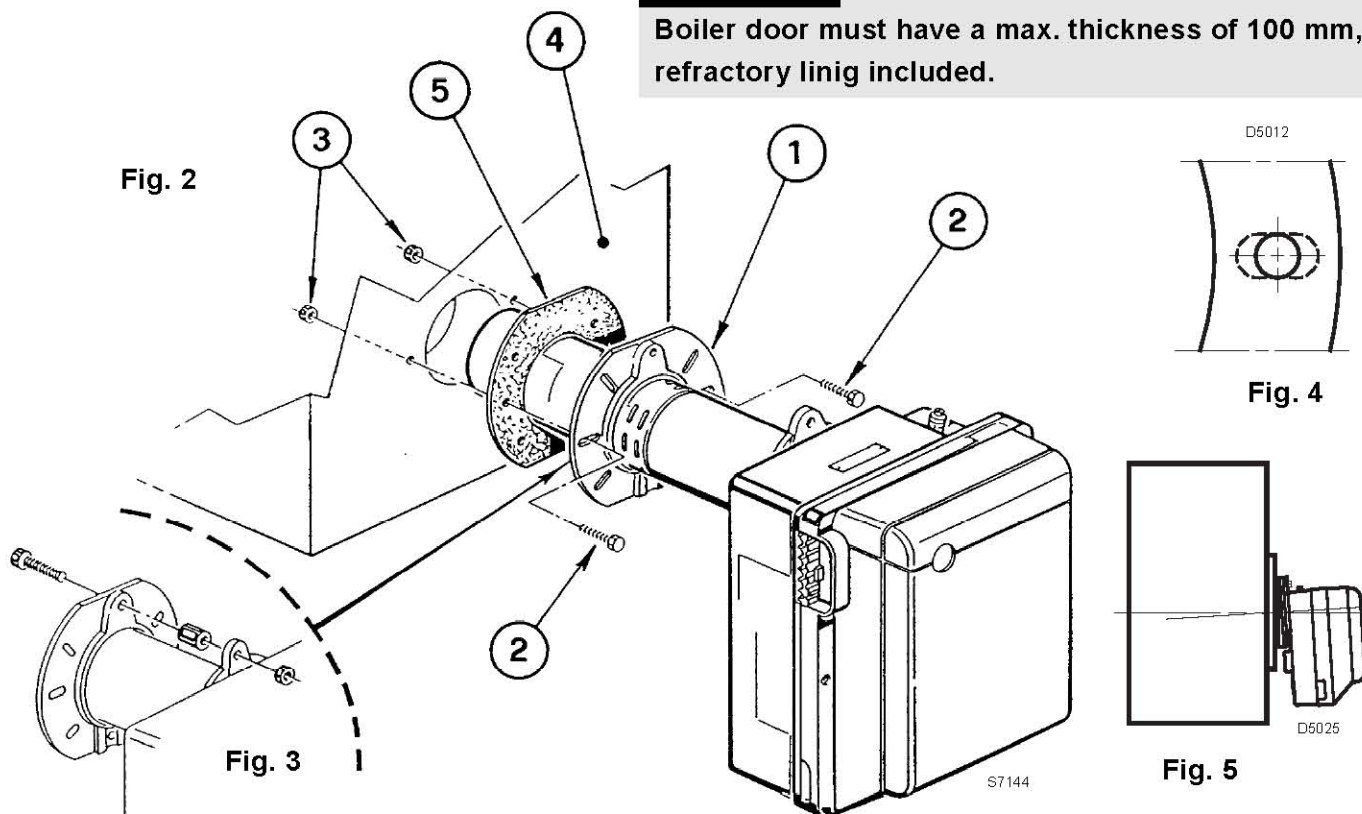
THE BURNER MUST BE INSTALLED IN CONFORMITY WITH LEGISLATION AND LOCAL STANDARDS.

3.1 BOILER FIXING

- Put on the flange (1) the screw and two nuts (see fig. 3).
- Widen, if necessary, the insulating gasket holes (5) (see fig. 4).
- 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. 2).
- After installation ensure that burner is lightly inclined as in fig. 5.

IMPORTANT

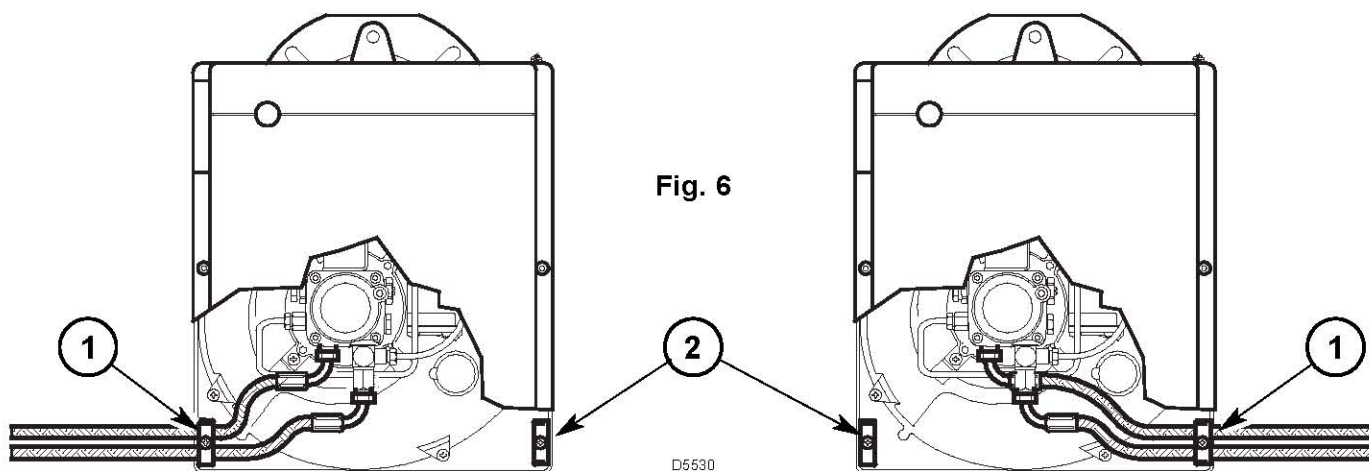
Boiler door must have a max. thickness of 100 mm, refractory lining included.



3.2 FUEL SUPPLY

The burner is designed to allow entry of the oil supply pipes on either side.

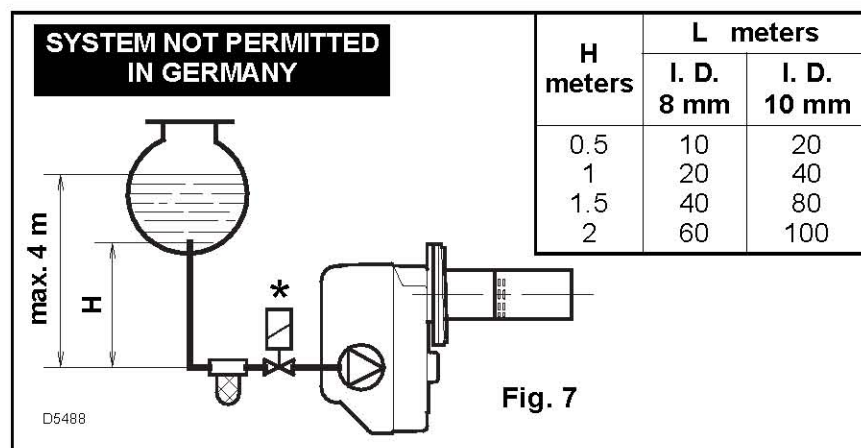
Depending on the oil supply pipes position (to the right or to the left hand side of the burner) the fixing plate (1) and closing plate (2) should be reversed (see fig. 6).



3.3 HYDRAULIC SYSTEMS

WARNING:

- Before starting the burner make sure that the return pipeline is not clogged.
An excessive back pressure would cause the damage of the pump seal.
- The pump is designed to allow working with two pipes.
In order to obtain one pipe working it is necessary to unscrew the pin (2), remove the by-pass screw (3) and then screw again the pin (2), (see fig. 8).



PRIMING PUMP:

On the system in fig. 7 it is sufficient to loosen the suction gauge connection (6, fig. 8) and wait until oil flows out.

On the systems in fig. 9 and 10 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 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.

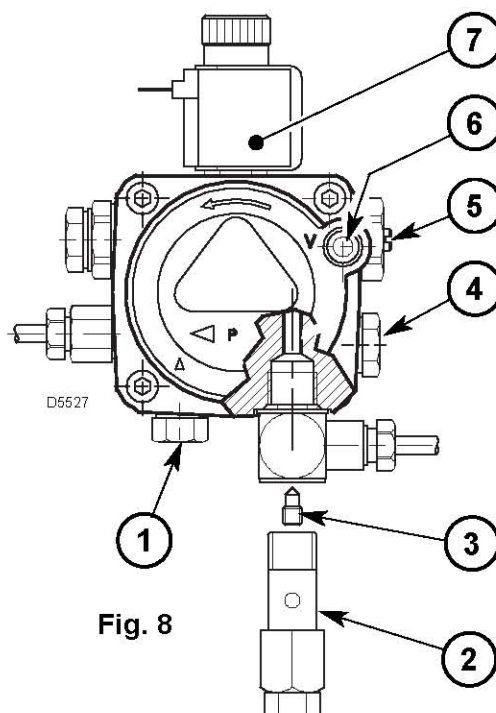
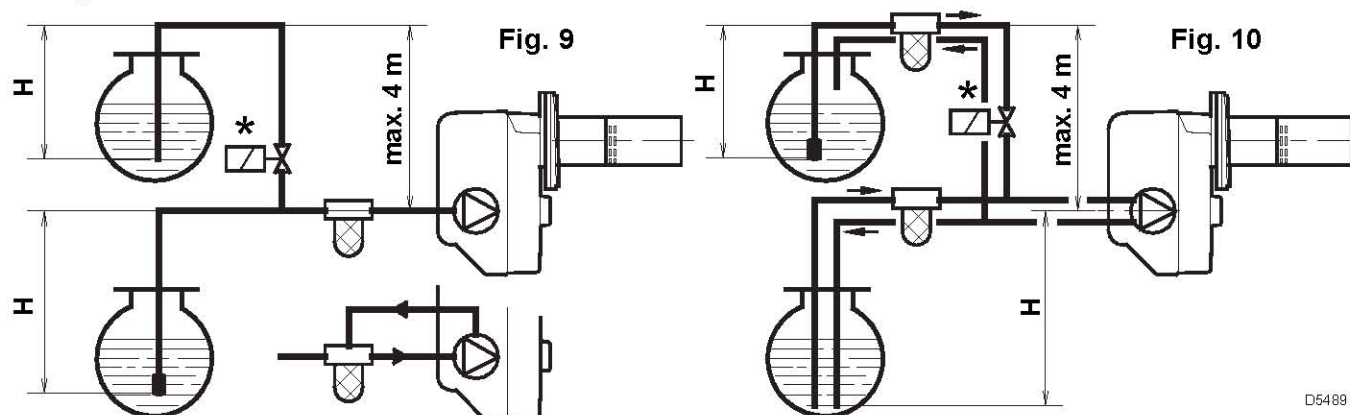


Fig. 8

- 1 - Suction line
- 2 - Return line
- 3 - By-pass screw
- 4 - Gauge connection
- 5 - Pressure adjuster
- 6 - Suction gauge connection
- 7 - 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

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

* **ONLY FOR ITALY:** Automatic shut-off device as per Ministry of Internal Affairs' regulation no. 73 dated 7/29/71.

H = difference of level;

L = max. length of the suction line;

I. D. = internal diameter.

3.4 ELECTRICAL WIRING

WARNING

DO NOT EXCHANGE NEUTRAL WITH PHASE

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.

***(See page 4).** Connect the automatic shut-off device (230V - 0.5A max.) to the clamps **N - T2** of the 7 pin plug.

TESTING:

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

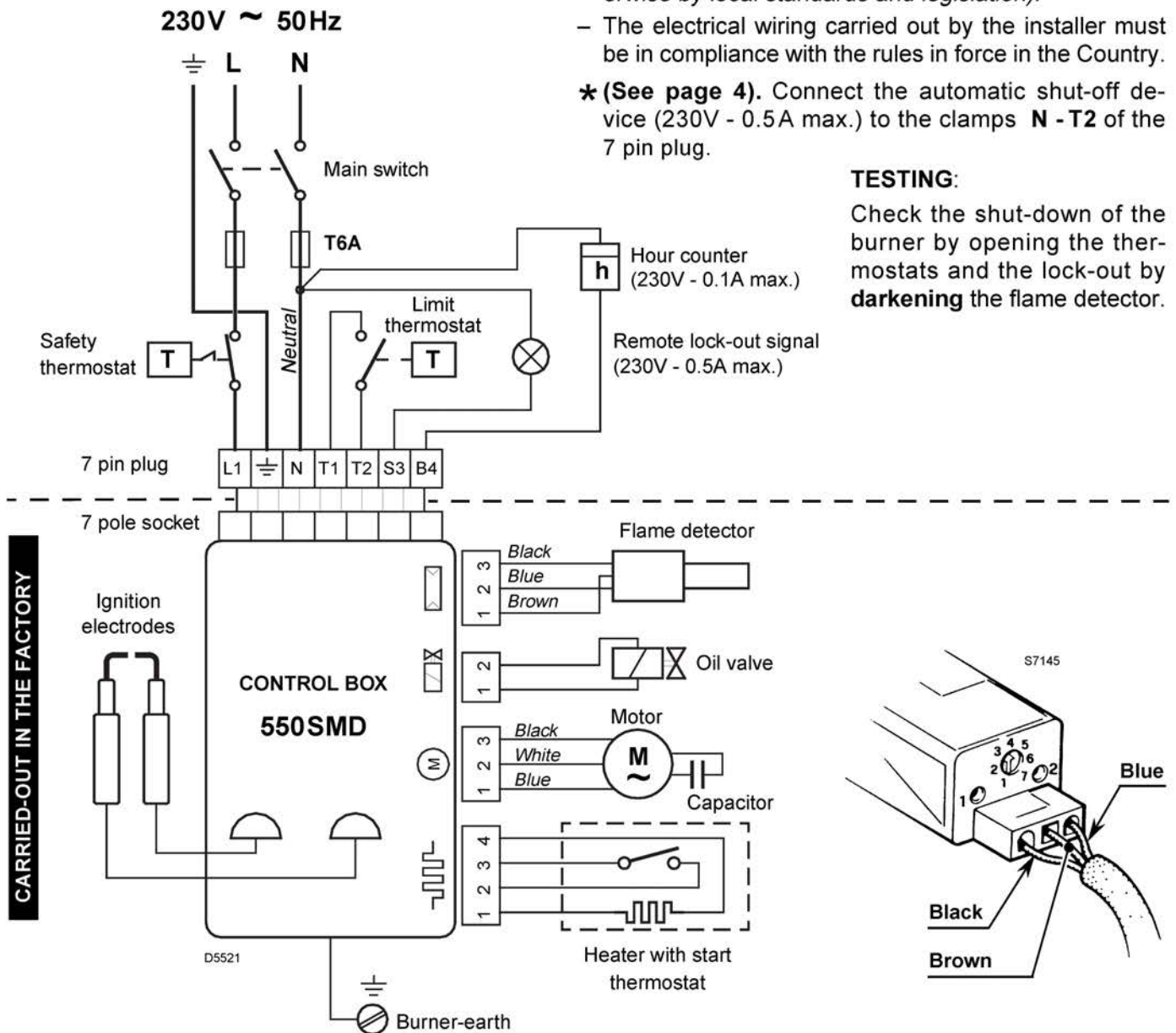
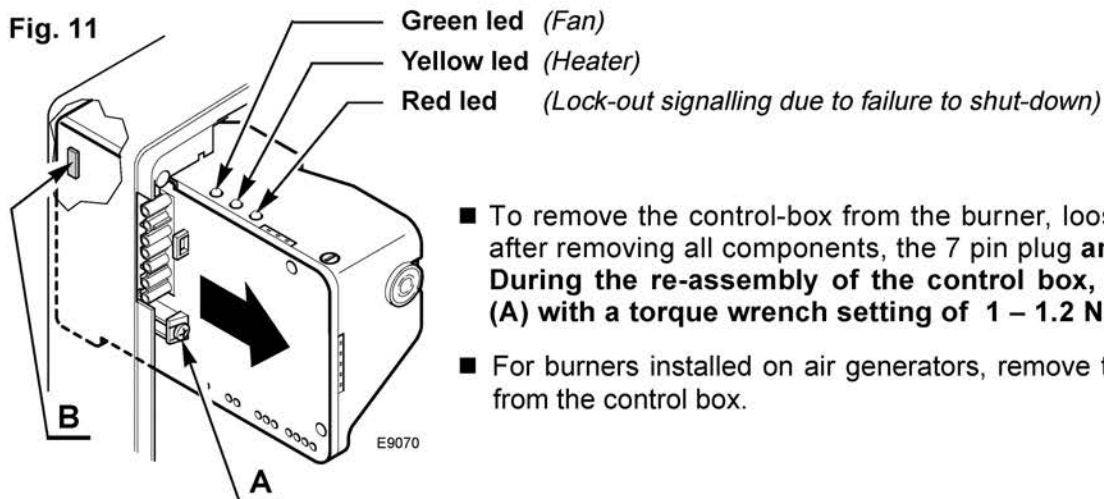


Fig. 11



■ To remove the control-box from the burner, loosen screw (A, fig. 11) after removing all components, the 7 pin plug and earth wire. **During the re-assembly of the control box, retighten the screw (A) with a torque wrench setting of 1 – 1.2 Nm.**

■ For burners installed on air generators, remove the bridge (B, fig. 11) from the control box.

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, adjust the pump pressure and the air damper opening in accordance with the following schedule.

The **high-flame** values in the table refer to 12.5% CO₂ at sea level and to "zero" pressure in the combustion chamber.

1		Pump pressure	Burner output	Air damper adjustment	
Nozzle				Low-flame	High-flame
GPH	Angle	bar	kg/h ± 4%	Set-point	Set-point
1.10	80°	13	4.3	0.3	3.1
1.25	80°	14	5.1	0.6	3.9
1.35	80°	14	5.5	0.7	4.7
1.50	80°	14.5	6.2	0.9	6.0

In the output range from 4.3 to 6.1 kg/h and using the u. m. nozzles (with filter Delavan DROPSTOP type 60030), it has been reached the combustion values as per RAL-UZ 9, Edition February 2001 (environmental mark - GERMANY):

Type : Delavan 1.10 GPH - 80° W
Delavan 1.35 GPH - 80° W
Delavan 1.50 GPH - 80° W

1 NOZZLES TO BE USED:

Delavan 80° W
 with filter DROPSTOP type 60030.

TO FIT NOZZLE CARRY OUT THE FOLLOWING ACTIONS (see fig. 12):

- Remove nozzle-holder assembly (1) after loosening screws (3) and nut (5), remove the small cables (7) from the control box, the socket (6) and the flame detector (4).
- Withdraw the small cables (7) from the electrodes, remove the diffuser disc-holder assembly (8) from the nozzle-holder assembly (1) after loosening screw (3, fig. 15, page 8).
- Screw the nozzle (9) correctly and tighten it as shown in figure.

ATTENTION

- During the reassembly of the nozzle-holder assembly screw the nut (5) as shown in the fig. 13.
- In order to guarantee the sealing of the fan in its seat, make sure that there is at least 1 mm of spring tension between nozzle-holder assembly and casing. Therefore the fixing split pin (2) will have to be extended at least of 1 mm beyond the flange of the nozzle-holder assembly.

TIGHTEN WITHOUT
 MOVING BACKWARDS
 TO THE END

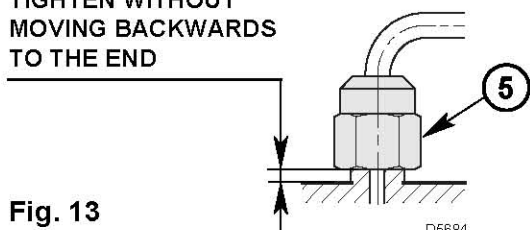


Fig. 13

D5684

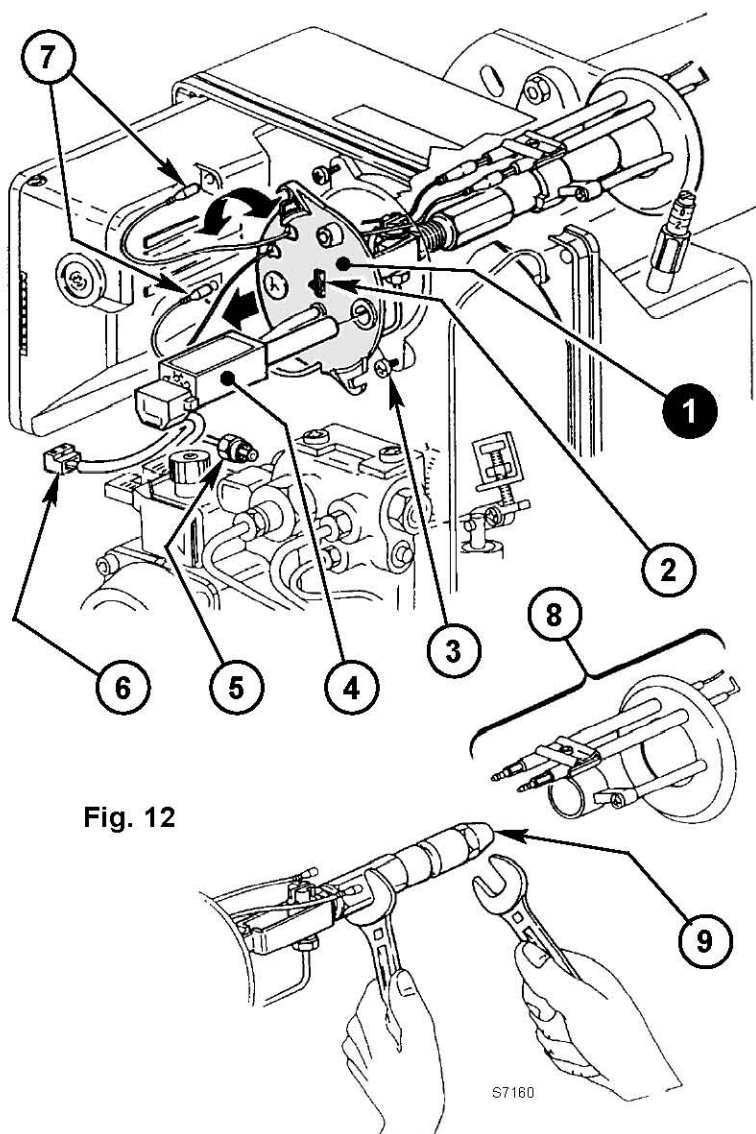


Fig. 12

S7160

4.2 PUMP PRESSURE AND AIR OUTPUT

The burner, in order to guarantee good smooth starts, irrespective of the type of boiler, is fitted with a hydraulic device which, independently of the control-box, reduces the fuel- and air-flow.

At ignition, the pressure at the nozzle is 12 bar. After 3 - 9 seconds, it automatically increases to 14 bar.

The air-flow, initially adjusted to the low setting, is, at the change-over of pressure, automatically brought to the air-flow required for the big flame.

■ SETTING FOR THE LOW IGNITION-FLAME (See fig. 14)

ADJUSTMENT OF AIR SHUTTER

Unloosen the screw (8), by approximately one full turn; in this way, the burner remains permanently on low flame. Unloosen the nut (5), turn the screw (4) until the indicator (6) reaches the position desired.

Then lock the nut (5) and tighten the screw (8).

ATTENTION:

- The values of the set-points stated in the table are only indicative.
- Carry out the setting with CO₂ not lower than 13%.

ADJUSTMENT START DELAYING DEVICE:

This is set at 12 bar at the factory.

It is advisable not to reduce this value.

The pressure gauge must be mounted in place of plug (4, fig. 8, page 4). Should it be necessary to re-set or alter such pressure, this can be done, by adjusting screw (7), always after having loosened screw (8).

■ HIGH-FLAME SETTING

(See fig. 14)

AIR-DAMPER ADJUSTMENT

Loosen the nut (3), turn the screw (1), until the indicator (2) is in the required position.

Then, lock the nut (3).

PUMP-ADJUSTMENT:

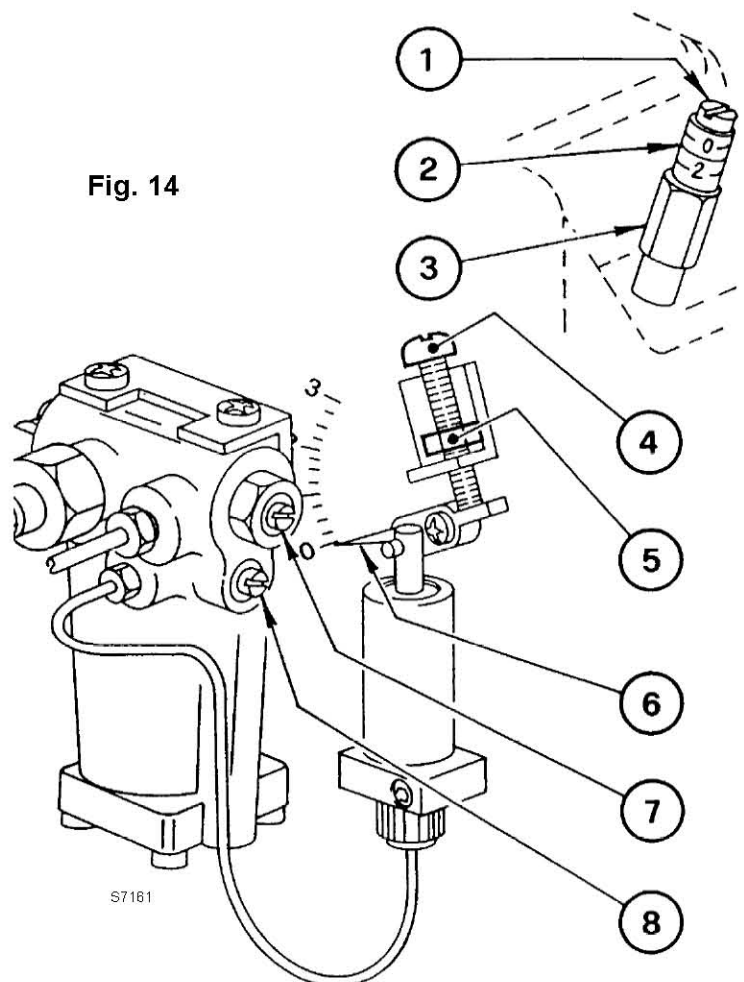
This is set at 14 bar at the factory.

The pressure gauge must be mounted in place of plug (4, fig. 8, page 4).

Should it be necessary to re-set or alter such pressure, this can be done, by adjusting screw (5, fig. 8, page 4).

When burner shuts down the air damper automatically closes till a **max. chimney depressure of 0.5 mbar**.

Fig. 14



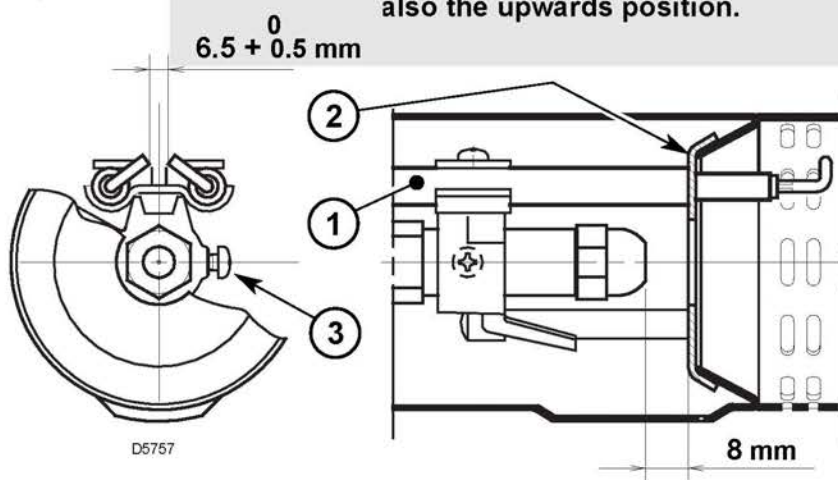
4.3 ELECTRODES ADJUSTMENT

ATTENTION

Lean insulators (1) to disc (2), (see fig. 15).

To have access to the electrodes carry out operation as described in **chapter 4.1** (page 6) **“NOZZLES TO BE USED”**.

Fig. 15



4.4 FLAME DETECTOR ADJUSTMENT

(See fig. 16)

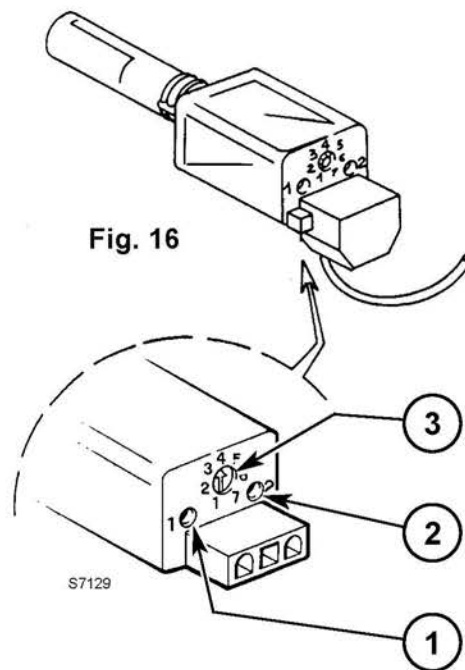
The sensitivity of the flame detector can be adjusted with a potentiometer (3). It is factory-set to position 4.

Led (1) indicates the sensitivity.

Led (2) indicates the operation.

- During pre-ventilation **both leds are switched off.**
- Optimal sensitivity during stable operation is shown when **both leds are switched on.**
- If led (1) pulsates, turn the potentiometer until it switches on in a steady manner. Then, first turn the pointer counterclockwise until the led pulsates. Next, increase the sensitivity by turning the pointer clockwise one or two notches.
- **Wait at least 5 minutes, then make sure that the adjustment done as above allows a correct starting program of the burner.**

Fig. 16

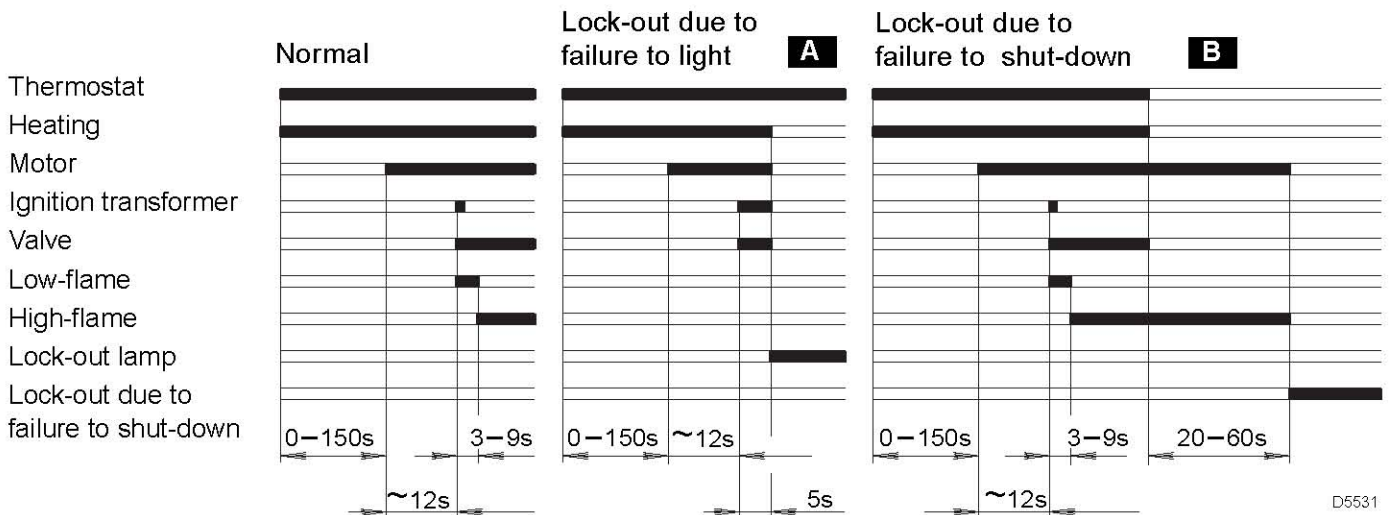


4.5 FUEL HEATING

In order to assure regular ignition and working also at low temperature the burner has an oil pre-heater fitted in combustion head. The pre-heater starts when thermostats close.

When the required temperature for ignition is reached the thermostat fitted on the nozzle holder starts the burner. The pre-heater remains energised during working and cuts out when burner shuts-down.

4.6 BURNER START-UP CYCLE



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

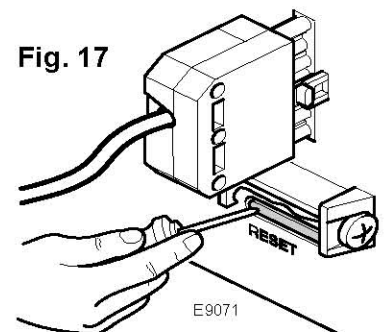
B In this case the burner will not reset because there is a serious fault.

CALL THE SERVICE AGENT

The authorized service agent must:

- Restore the working by moving backward the control box, keeping it supplied and acting on the reset tongue (see fig. 17).
- Check the efficiency of:
 - Flame detector (7, fig. 1, page 1).
 - Pump: interception valve (7), or pressure adjuster piston (5), see fig. 8, page 4.

Fig. 17



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 CHECKS 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.
- Check for correct fuel consumption.
- Replace the nozzle.
- Clean the combustion head in the fuel exit area, on the turbulating 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.

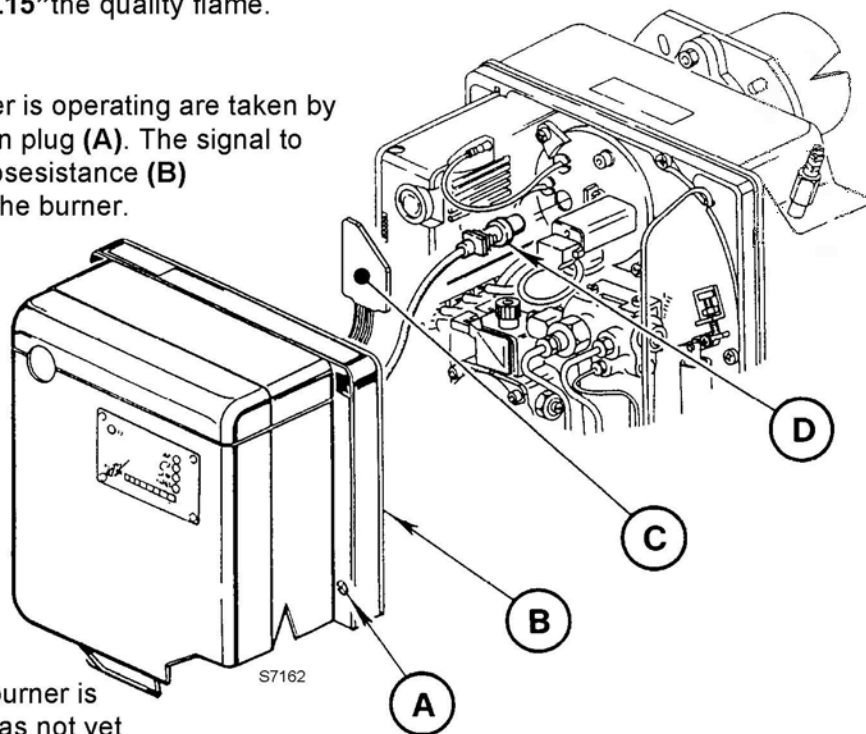
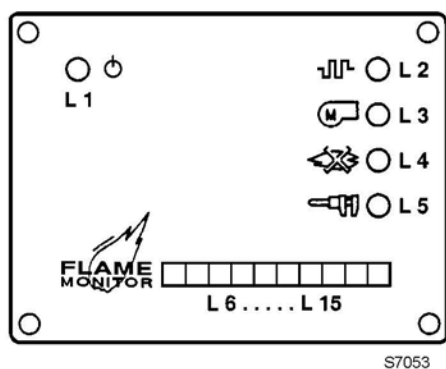
6. MODEL WITH “FLAME MONITOR”

THIS DEVICE ENABLES TO:

- Supervise through the leds “L1 – L5” how the burner is working.
- Supervise through the leds “L6 – L15” the quality flame.

OPERATION

The signals to supervise how the burner is operating are taken by the control box 550SMD through a 9 pin plug (A). The signal to supervise the flame is taken by a photoresistance (B) added to the normal flame detector of the burner.



L1 SIGNALING OF WAIT

When the led is on it means that the burner is connected to the electric power but it has not yet started the working programme (setting thermostat open).

L2 SIGNALING OF PRE HEATING

When the led is on it means that the gasoil has been pre-heated and this occurs when the thermostat closes. This lead is off when the best spraying temperature has been reached.

L3 SIGNALING OF PRE-VENTILATION

When the led is on it means that in the combustion chamber there is the ventilation phase.

L4 SIGNALING OF LOCK OUT DUE TO IGNITION FAILURE

When the led is on it means that there is lock out that can be resetted by the user.

L5 SIGNALING OF LOCK OUT DUE TO SHUTTING OFF FAILURE

When the led is on it means that a remarkable trouble has been detected. This kind of lock out comes into action if at the opening of the setting thermostat there is still a flame presence. It can be resetted only the technical service (see paragraph 4.6 and 7).

L6...L15 SIGNALING OF THE FLAME CONDITION

A blue flame means a good combustion with low polluting emissions. This happens when 1 or 2 green leds are on but this has to be checked with special instruments.

As a rule you have to set the probe sensitivity (*this has to be done after 5 minutes of continuous working of the burner*) acting with a screwdriver in the hole (E) until one green led is on.

If then the flame colour verges on yellow the combustion is not good and therefore the colour of the bar first verges on the yellow area and then to the red one.

NOTE: To remove the cover (B) from the burner, loosen the screws (A) and take back the cover of some centimeters, then take away the pin plug (C) and the photoresistance (D) from their locations.

7. FAULTS / SOLUTIONS

Here below you can find some causes and the possible solutions for 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 doesn't start when the limit thermostat closes.	Lack of electrical supply.	Check presence of voltage in the L1 - N clamps of the 7 pin plug.
		Check the conditions of the fuses.
		Check that safety thermostat is not lock out.
	Heating and start thermostats are faulty.	Replace them.
	The connections in the control box are wrongly inserted.	Check and connect completely all the plugs.
	Lock-out because of a failure to turn off (event B page 9).	Call technical assistance.
The burner remains in the pre-purge phase.	The flame detector sees strange light (Led 1 is switched on).	Eliminate the light.
Burner runs normally in the prepurge and ignition cycle and locks out after 5 seconds ca.	The flame detector is dirty.	Clear it.
	The flame detector 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.
Yellow flame.	Nozzle dirty or worn.	Replace it.
	Defect in the air output.	Adjust the air output.
	Pump pressure is not correctly set.	Verify the pressure and the output of the fuel and adjust them according to the instructions of this manual.
	Air suction inlet is clogged.	Clear it.
	Obstruction in the exhaust circuit.	Clear it.
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 according to the instructions of this manual.
	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.