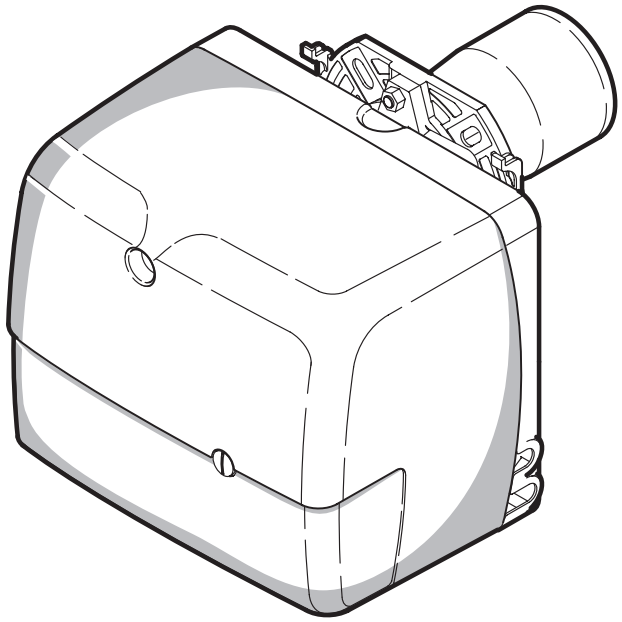
GB

Oil burners

One stage operation



CODE	MODEL - MODELE	TYPE
8099000	SIME MACK 3	514 T1R
8099010	SIME MACK 4	515 T3R
8099030	SIME MACK 5	515 T5R

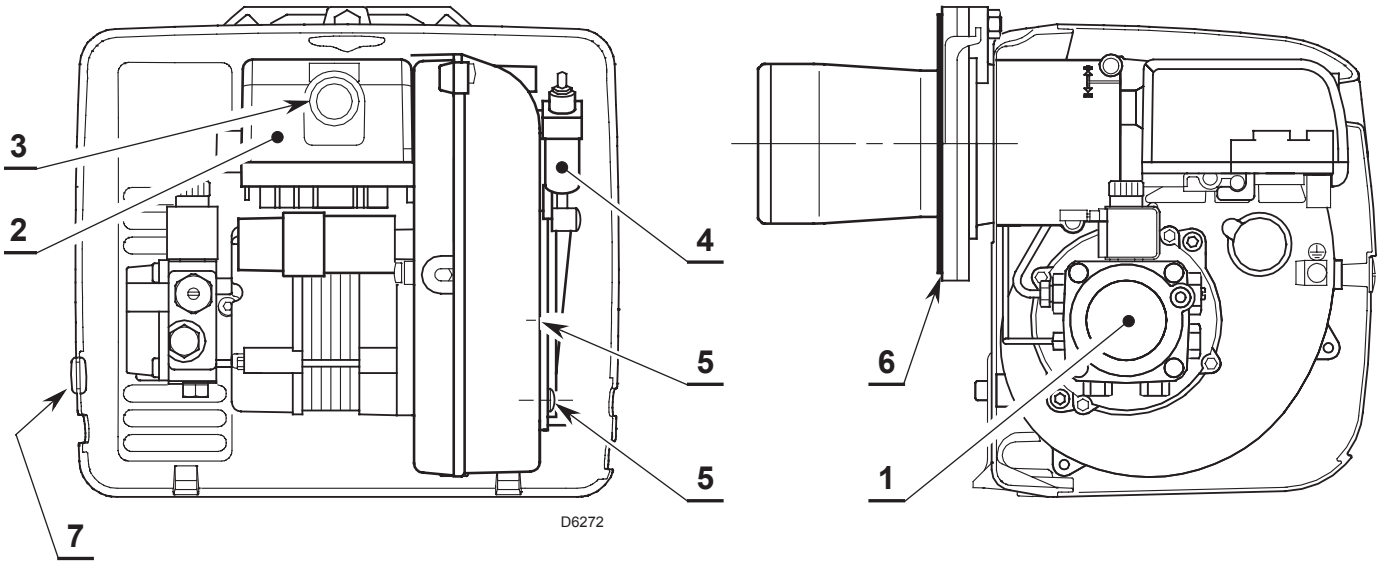
INDEX

1. BURNER DESCRIPTION

One stage light oil burner.

- 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 – Oil pump
2 – Control-box
3 – Reset button with lock-out lamp
4 – Hydraulic jack with air-damper
5 – Screws fixing air-damper
6 – Flange with insulating gasket
7 – Grommet

1.1 BURNER EQUIPMENT

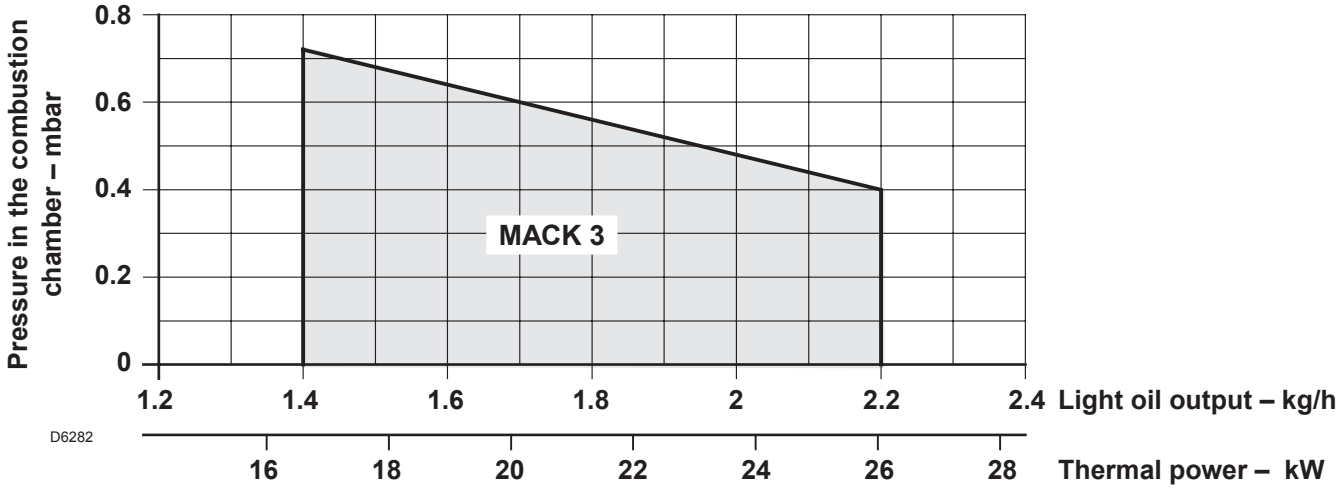
Flange with insulating gasket . . . .No. 1
Screw and nuts for flange . . . . . .No. 1
Grommet . . . . . .No. 1
Screws and nuts for flange to be fixed to boiler . . No. 4
Flexible oil pipes with nipples . . . . . No. 2
7 pin plug . . . . . No. 1

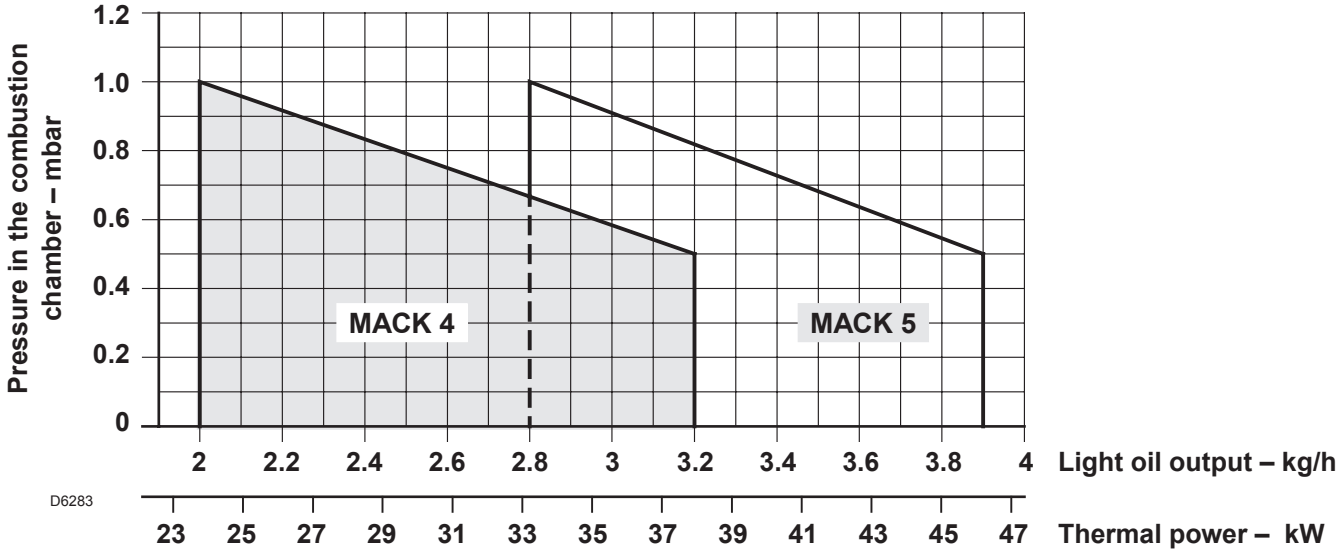
2. TECHNICAL DATA

2.1 TECHNICAL DATA

Model		MACK 3	MACK 4	MACK 5
Output	kg/h	1.4 – 2.2	2.0 – 3.2	2.8 – 3.9
Thermal power	kW	16.6 – 26	23.8 – 37.9	33.3 – 46.2
		(H_i = 11.86 kWh/kg)		
Fuel		Light oil, max. viscosity at 20°C: 6 mm^2/s		
Electrical supply		Single phase, ~ 50Hz 230V ± 10%		
Motor		Run current 0.7A – 2850 rpm – 298 rad/s		
Capacitor		4 μF		
Ignition transformer		Secondary 8 kV – 16 mA		
Pump		Pressure: 7 – 15 bar		
Absorbed electrical power		0.165 kW	0.185 kW	

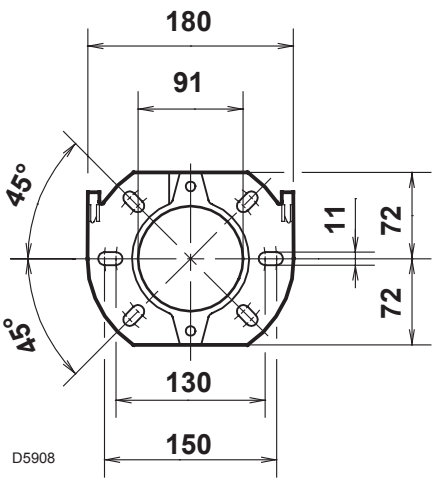
2.2 WORKING FIELDS (as EN 267)



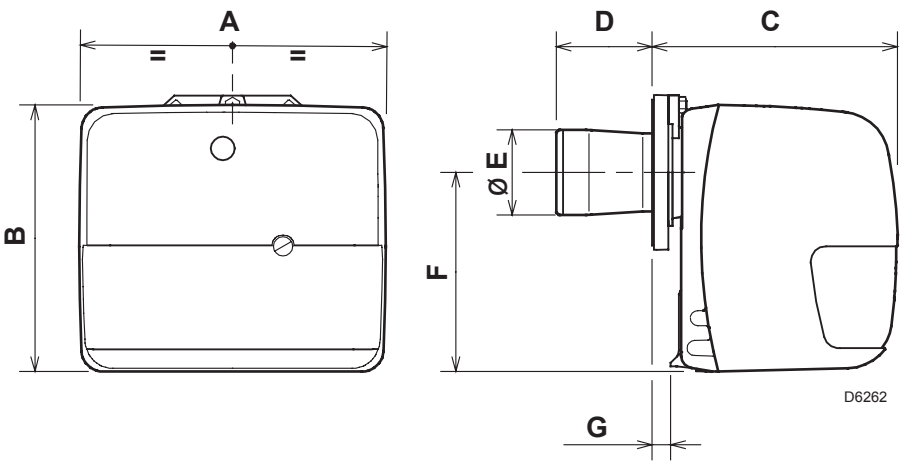


2.3 OVERALL DIMENSIONS

Flange



Burner



Model	A	B	C	D	Ø E	F	G
MACK 3	268	229	208	86	89	170	10
MACK 4 - MACK 5	285	249	230	86	89	186	16

3. INSTALLATION

3.1 BOILER FIXING

➤ Put on the flange (1) the screw and two nuts, (see fig. 2).

➤ Widen, if necessary, the insulating gasket holes (5).

➤ 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

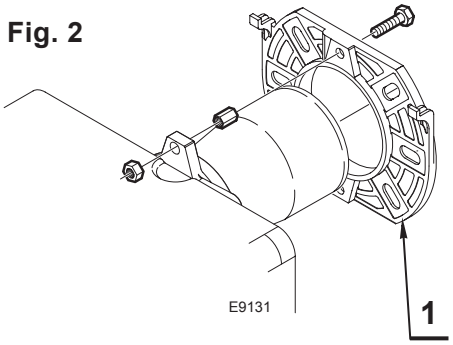
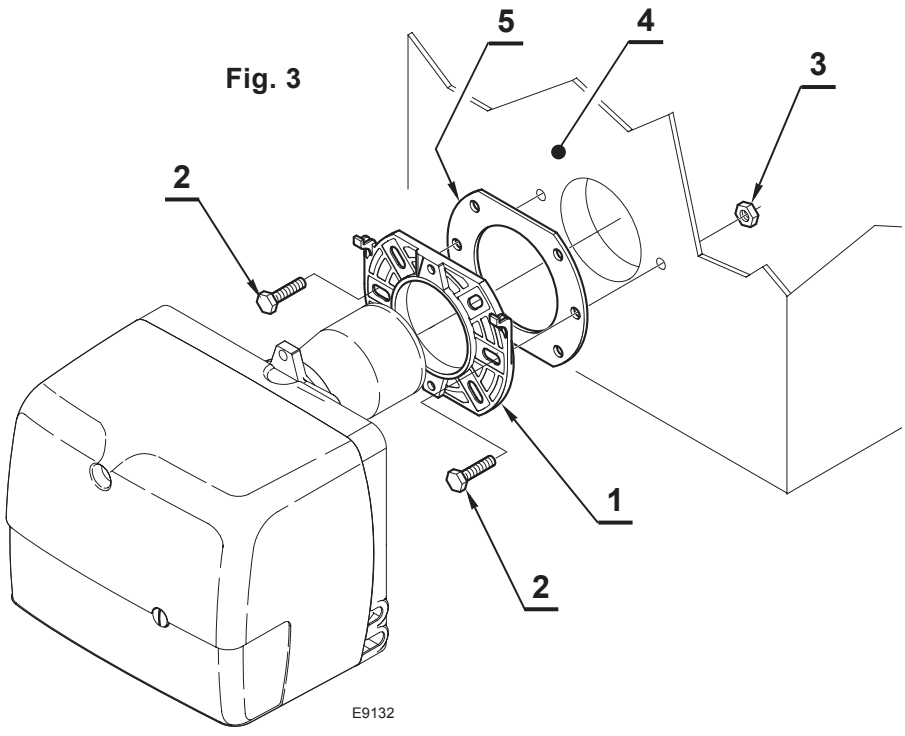


Fig. 3



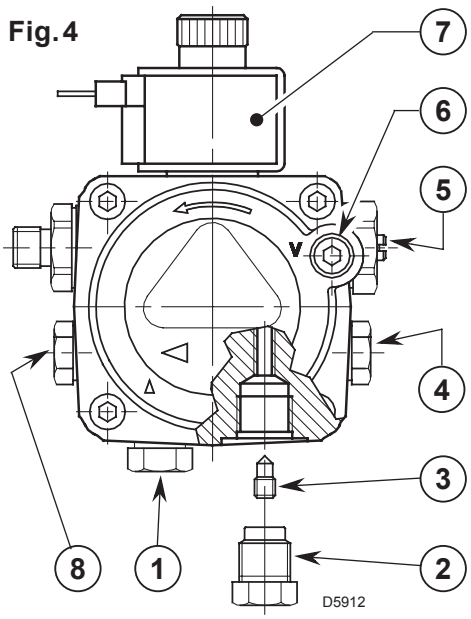
3.2 HYDRAULIC SYSTEMS

The burner is designed to allow entry of the flexible oil-lines on either side of the burner.

WARNING:

- **It is necessary to install a filter on the fuel supply line. The standard filter code 6276200 and that one with recirculation code 6276201 are available on request.**
- The pump is designed to allow working with two pipes. In order to obtain one pipe working it is necessary to unscrew the return plug (2), remove the by-pass screw (3) and then screw again the plug (2), (see fig. 4).
- 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. 4



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

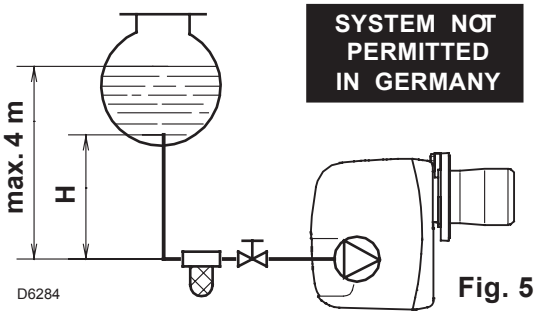


Fig. 5

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

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

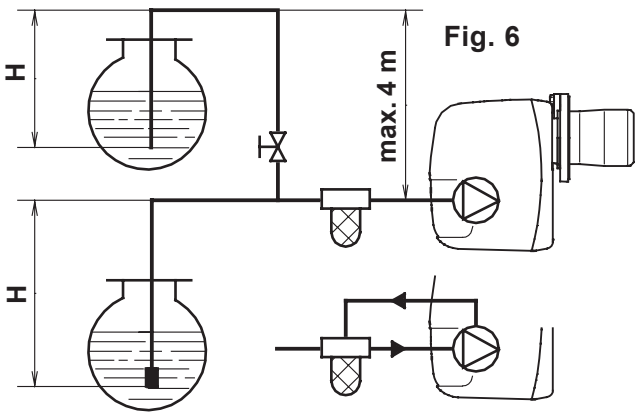


Fig. 6

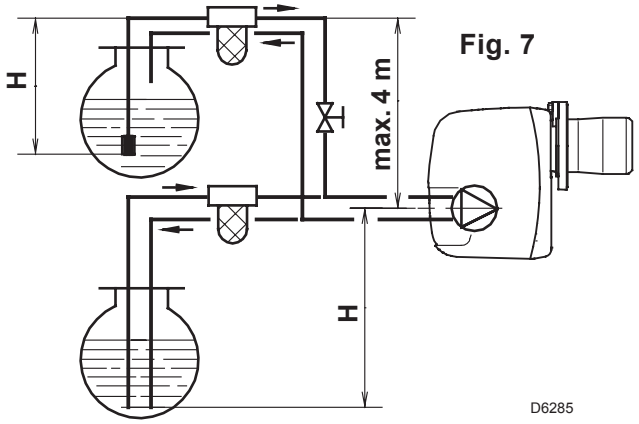


Fig. 7

H = difference of level; **L** = max. length of the suction line; **I. D.** = internal diameter of the oil pipes.

3.3 ELECTRICAL WIRING

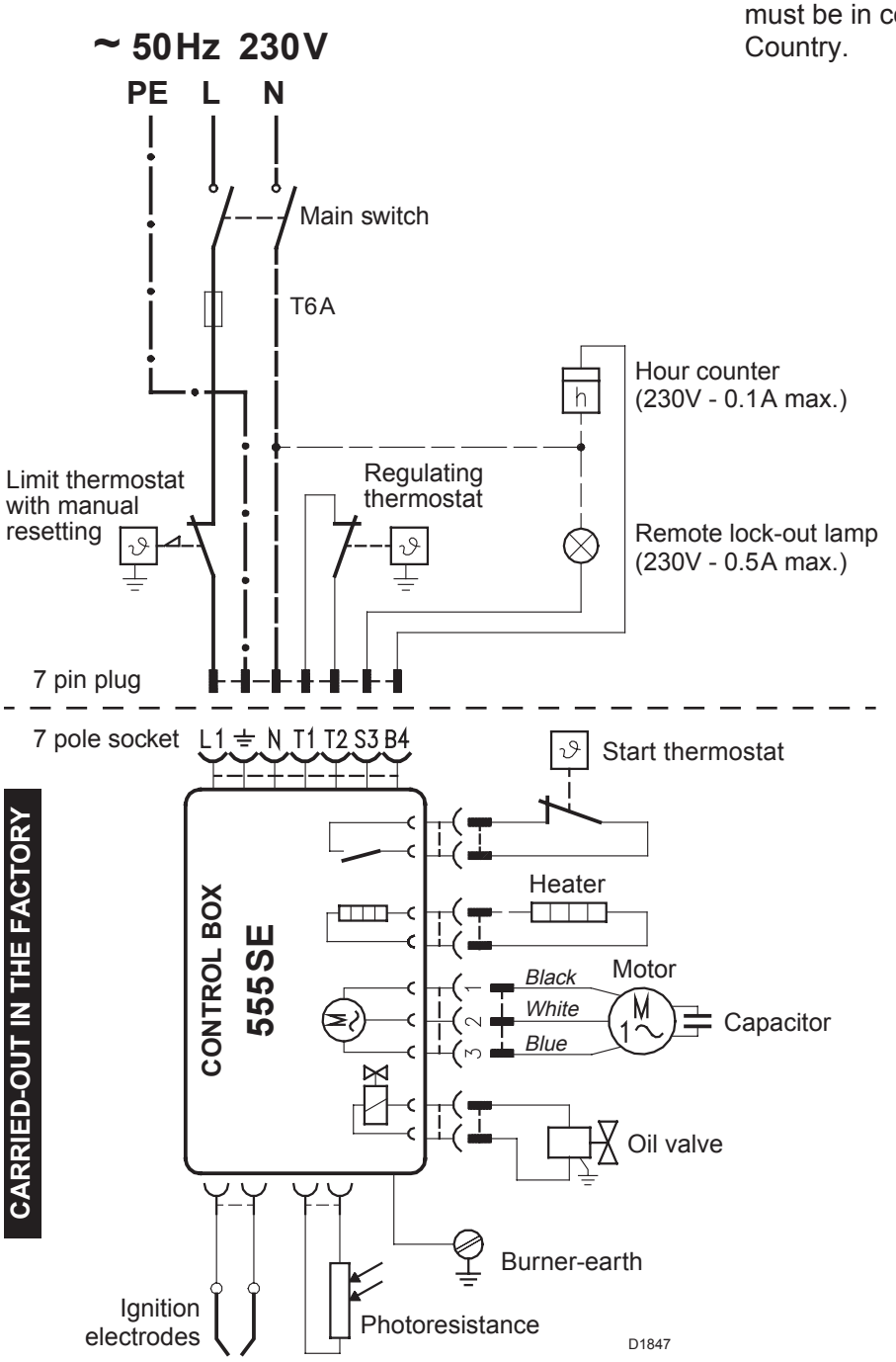
WARNING

DO NOT EXCHANGE NEUTRAL WITH PHASE

NOTES:

– Wires of 1 mm2 section.

– The electrical wiring carried out by the installer must be in compliance with the rules in force in the Country.



CARRIED-OUT IN THE FACTORY

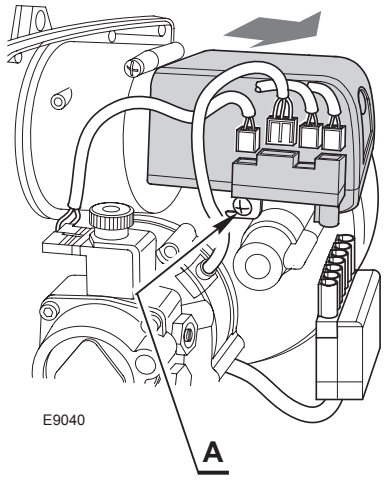
TESTING

Check the shut-down of the burner by opening the thermostats.

CONTROL BOX

To remove the control-box from the burner, loosen screw (**A,** fig. 8) and pull to the arrow direction, after removing all components, the 7 pin plug and earth wire.

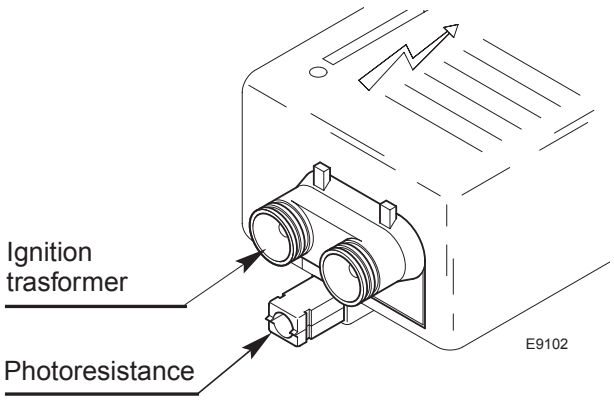
Fig. 8



ACCESS TO THE PHOTORESISTANCE (See fig. 9)

The photoresistance is fitted directly into the control-box *(underneath the ignition-transformer)* on a plug-in support.

Fig. 9



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 CO_2 concentration in the flue gases, their temperatures and the average temperature of the water in the boiler.
To suit the required appliance output, fit the proper nozzle, then adjust the pump pressure and the air damper opening in accordance with the following table.

■ ADJUSTMENTS CARRIED OUT IN FACTORY FOR SIME BOILERS

The values shown in the table are measured on a SIME boiler (as per EN 267).
They refer to 12.5% CO_2 at sea level and with light oil and room temperature of 20 °C.

Table B

BOILER	BURNER		Nozzle		Pump pressure	Burner output	Air damper adjustment
	Code	Model	GPH	Angle	bar	kg/h ± 4%	Set-point
Rondò-Estelle 3	**8099000**	**MACK 3**	0.55	60° S	12	2.1	3.7
Rondò-Estelle 4	**8099010**	**MACK 4**	0.75	60° W	12.5	2.9	2.9
Rondò-Estelle 5	**8099030**	**MACK 5**	0.85	60° W	14	3.5	3.8

■ APPROXIMATE ADJUSTMENTS FOR INSTALLATION ON OTHER BOILERS

The values shown in the table are measured on a CEN boiler (as per EN 267).
They refer to 12.5% CO_2 at sea level and with light oil and room temperature of 20 °C.

Model	Nozzle		Pump pressure	Burner output	Air damper adjustment
	GPH	Angle	bar	kg/h ± 4%	Set-point
MACK 3	0.40	80°	10	1.4	1.7
	0.40	80°	12	1.5	1.8
	0.50	60°	12	1.9	2.4
	0.55	60°	13	2.2	3.5
MACK 4	0.55	60°	11	2.0	1.6
	0.60	60°	12	2.3	1.7
	0.65	60°	12	2.5	2.2
	0.75	60°	12	2.9	2.5
	0.85	60°	11.5	3.2	3.2
MACK 5	0.75	60°	11.5	2.8	2.2
	0.85	60°	12	3.3	2.5
	1.00	60°	12.5	3.9	3.6

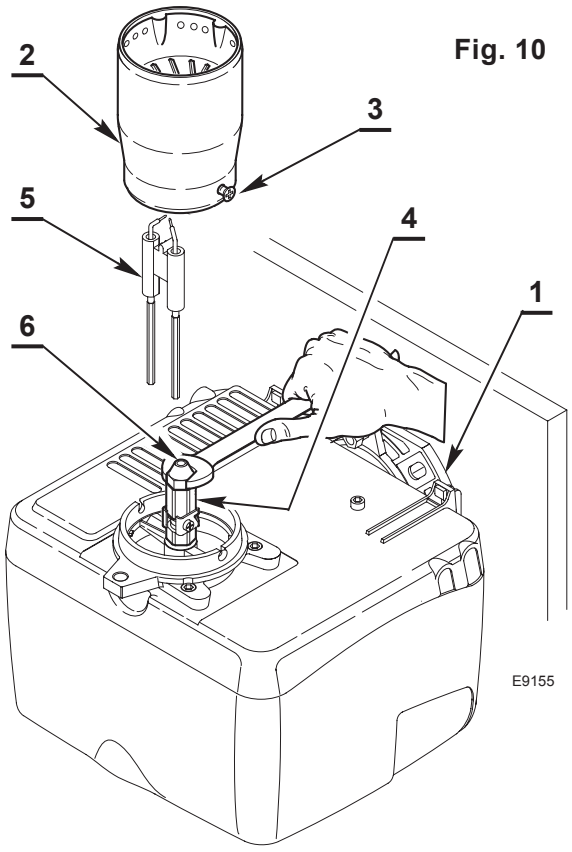


Fig. 10

4.2 NOZZLES RECOMMENDED:

Monarch type R - NS ; Delavan type W-E
Steinen type H - Q ; Danfoss type H - S.

MAINTENANCE POSITION

Access to the combustion head, electrodes and nozzle, (see fig. 10).

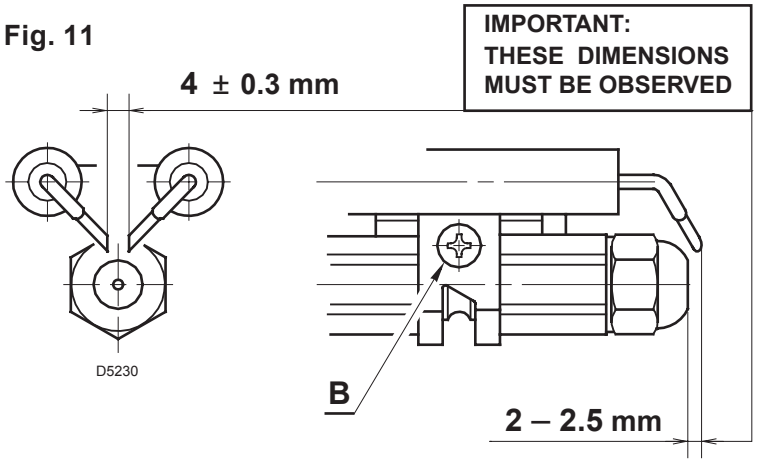
- ➤ Remove the burner out of the boiler, after loosing the fixing nut to the flange.
- ➤ Hook the burner to the flange (1), by removing the combustion head (2) after loosing the fixing screws (3).
- ➤ Remove the electrodes assembly (5) from the nozzle-holder (4) after loosing its fixing screw (**B**, fig. 11, page 7).
- ➤ Screw the nozzle (6).

4.3 ELECTRODES SETTING

ATTENTION

Before removing or assembling the nozzle, loosen the screw (**B**, fig. 11) and move the electrodes ahead.

Fig. 11

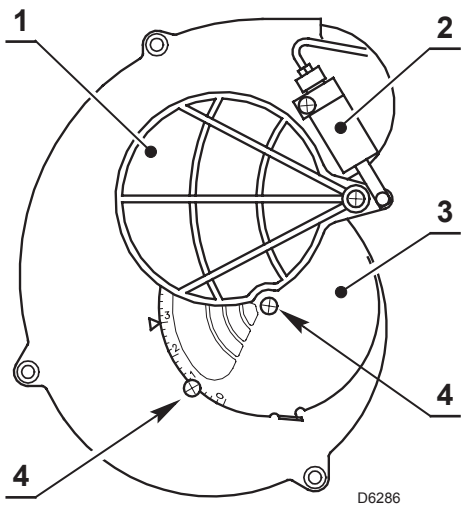


4.4 AIR DAMPER ADJUSTMENT, (see fig. 12)

The mobile air damper **(1)** operated by the jack **(2)** assures the complete opening of the air intake.
The regulation of the air-rate is made by adjusting the fixed air damper **(3)**, after loosing the screws **(4)**. When the optimal regulation is reached, **screw tight the screws (4)** to assure a free movement of the mobile air damper **(1)**.

The settings, indicated in the table (page 6), refer to the burner with its cover fitted and combustion chamber with depression zero. These regulations 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.

Fig. 12



It is important to take account of the fact that the air output of the fan differs according to whether the burner has its cover fitted or not. Therefore we recommended to proceed as follows:

- ➤ Adjust the air damper as indicated in the table.
- ➤ Mount the cover.
- ➤ Check smoke number and CO_2.
- ➤ Should it become necessary to modify the air output, remove the cover by loosening the screw, adjust the air damper, remount the cover and finally recheck the smoke number.

4.5 PUMP PRESSURE:

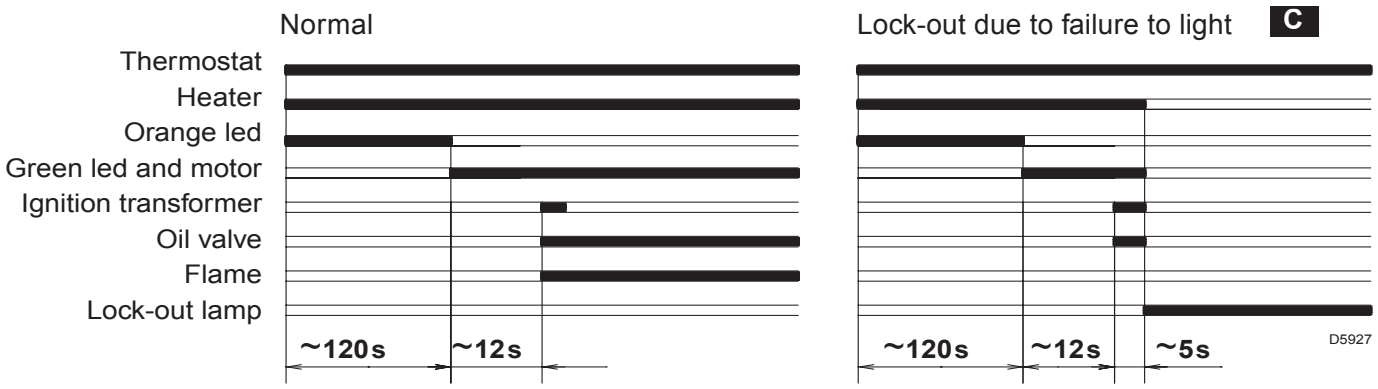
The pump is set in factory according to the value indicated in the table B at page 6.

4.6 FUEL HEATING

In order to assure regular ignition and working also at low temperatures the burner has an oil pre-heater fitted in combustion head. The pre-heater starts when thermostats close and it is indicated by the ignition of an orange led placed on the control box.

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

4.7 BURNER START-UP CYCLE



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

5. MAINTENANCE

Burner requires a periodic maintenance carried out by a qualified and authorized technicians.
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.
- ► Clean the photoresistance, (see fig. 9, page 5).
- ► Check for correct fuel consumption.
- ► Replace the nozzle (see fig. 10, page 6) and check the correct position of electrodes (fig. 11, 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 CO_2 (%);
  - 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
All led are off and the burner does not start.	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 thermostat limit is not lock out.
	The connections in the control box are wrongly inserted.	Check and connect completely all the plugs.
The orange led is always on and the burner does not start.	Heater and start thermostat are faulty.	Replace them.
The green led is on and the burner remains in the prepurge phase.	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 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 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.

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