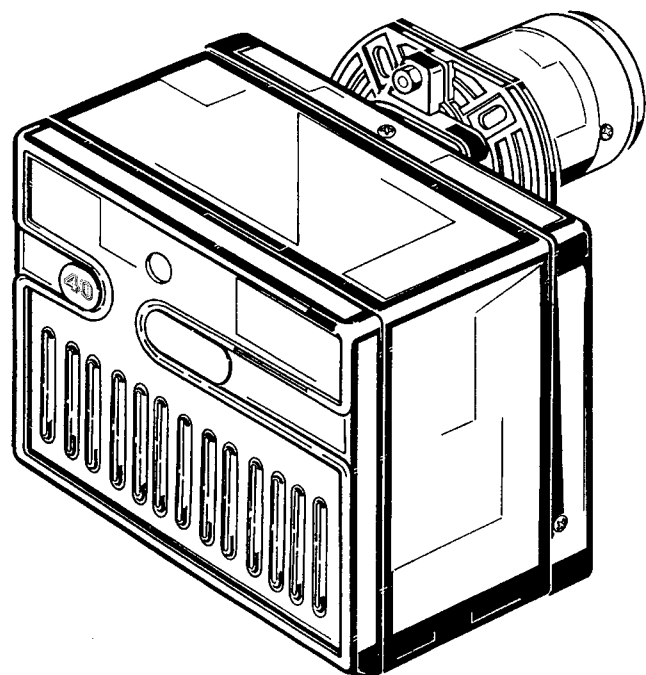


**GB** Light oil burner

**CN** 轻油燃烧器

One stage operation  
一段火运行



CODE - 编码

MODEL - 型号

TYPE - 类型

20013633

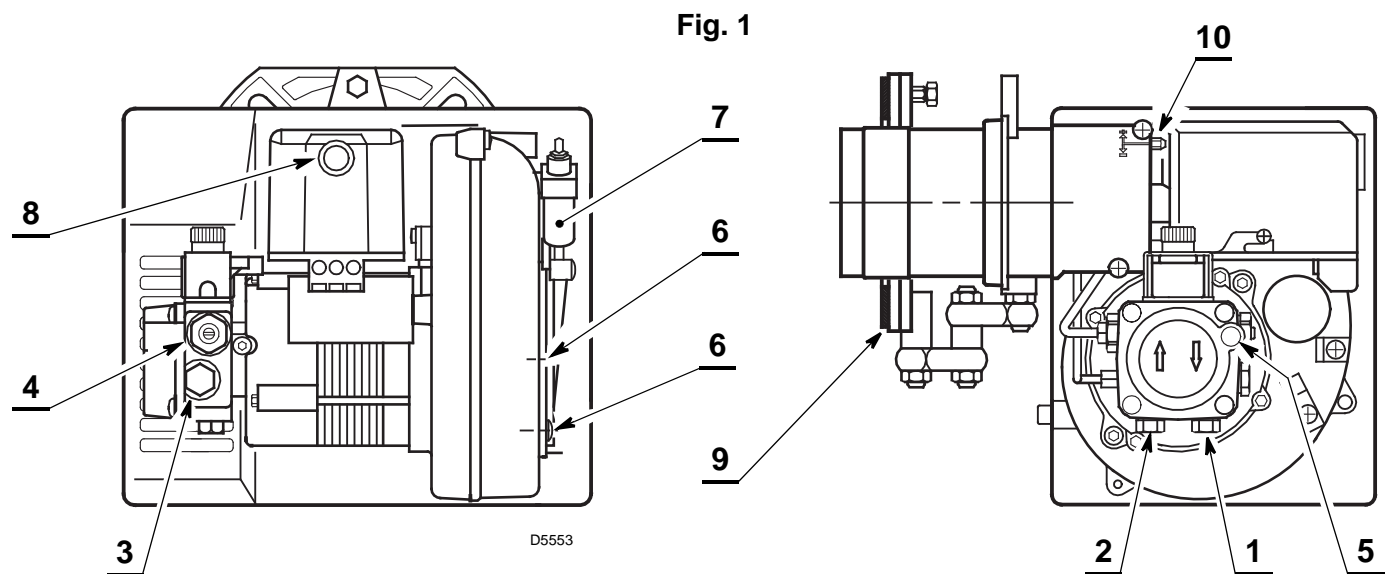
G5

445T1

## TECHNICAL DATA

TYPE	445T1
Thermal power – output	28 – 60 kW – 2.3 – 5 kg/h
Fuel	Light oil, max. viscosity at 20 °C: 6 mm <sup>2</sup> /s
Electrical supply	Single phase, 230V ± 10% ~ 50Hz
Motor	Run current 0.75A – 2850 rpm – 298 rad/s
Capacitor	4 μF
Ignition transformer	Secondary 8 kV – 16 mA
Pump	Pressure 7 – 15 bar
Absorbed electrical power	0.130 kW

- ◆ Burner with CE marking in conformity with EEC Directives: EMC 2004/108/EC, Low Voltage 2006/95/EC, Machines 2006/42/EC.
- ◆ The burner meets protection level of IP 40, EN 60529.



- 1 – Return line
- 2 – Suction line
- 3 – Gauge connection
- 4 – Pump pressure regulator
- 5 – Vacuum gauge connection
- 6 – Screws fixing air damper
- 7 – Hydraulic jack with air damper
- 8 – Lock-out lamp and reset button
- 9 – Flange with insulating gasket
- 10 – Combustion head adjustment screw

### HYDRAULIC JACK OPERATION 7)(Fig. 1)



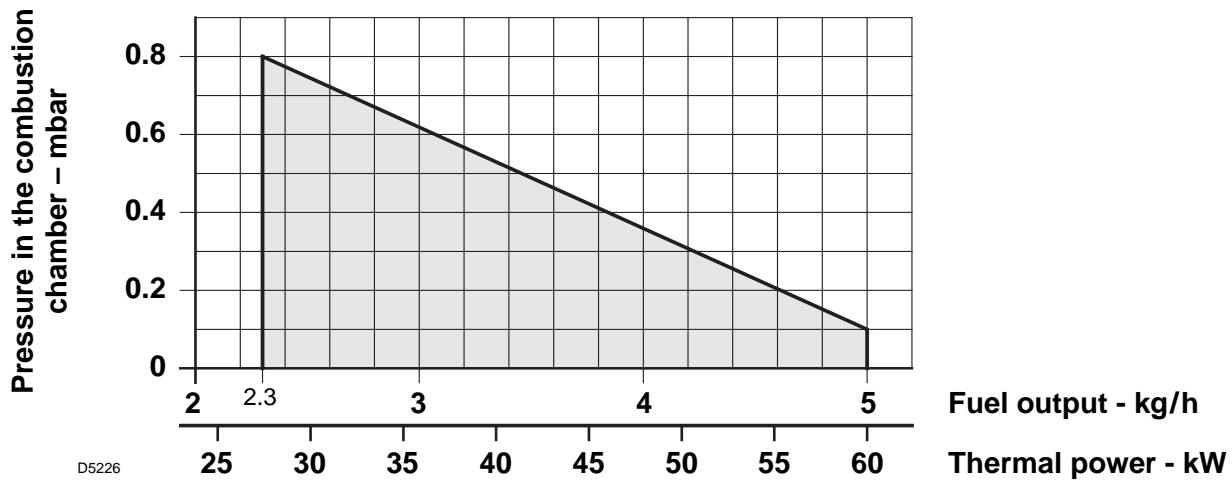
It is strongly recommended a periodic check of the pump pressure operation (annually or better every six months, if the burner operation is continuous). If the value is lower than 1 bar, compared to that one of the initial setting, please check the cleaning of the pump and line filters.

In case the pressure setting was not restorable, please replace the pump, in order to guarantee that the pump pressure during the pre-purge time is at least 3.7 bar.

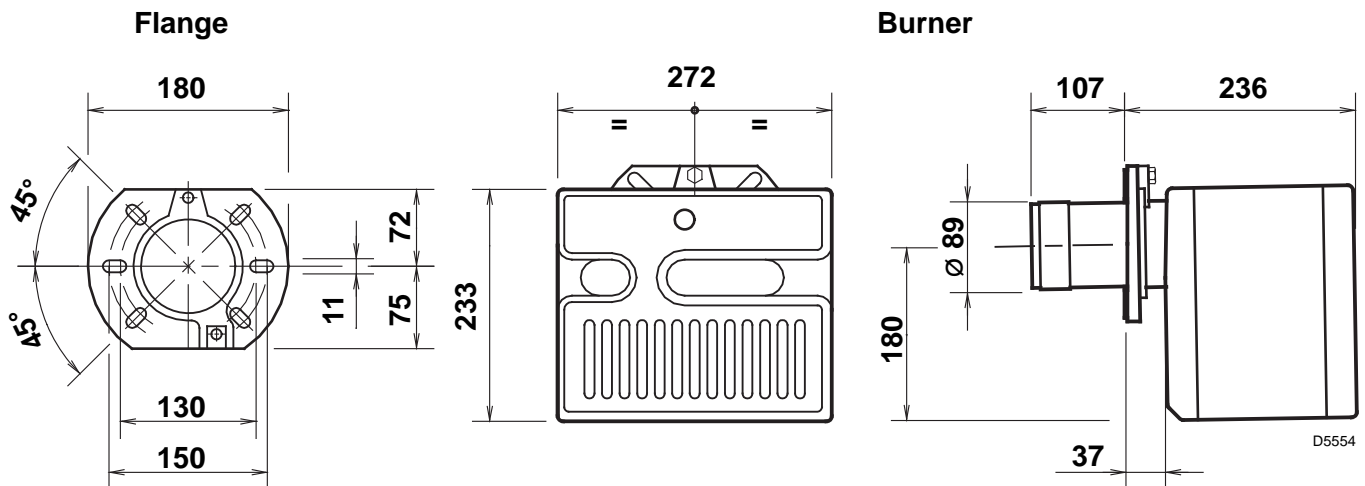
## BURNER EQUIPMENT

Quantity	Description
2	Flexible oil pipes with nipples
1	Flange with insulating gasket
4	Screws and nuts for flange to be fixed to boiler
1	Hinge
1	Screw and nuts for flange
1	Grommet

## FIRING RATE



## OVERALL DIMENSIONS



## BOILER FIXING

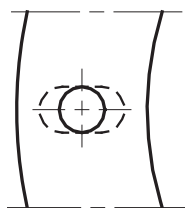
It is necessary that the insulating gasket (9, fig. 1) is placed between the boiler door and the burner flange.

This insulating gasket has **six holes**, which, if necessary, can be modified as shown on the drawing on the right.

**Verify that the installed burner is lightly leaned towards the button.**

(See figure 2).

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



D5242

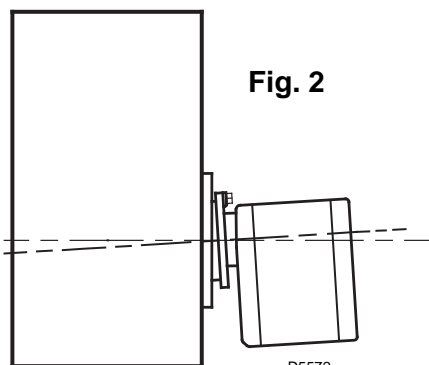
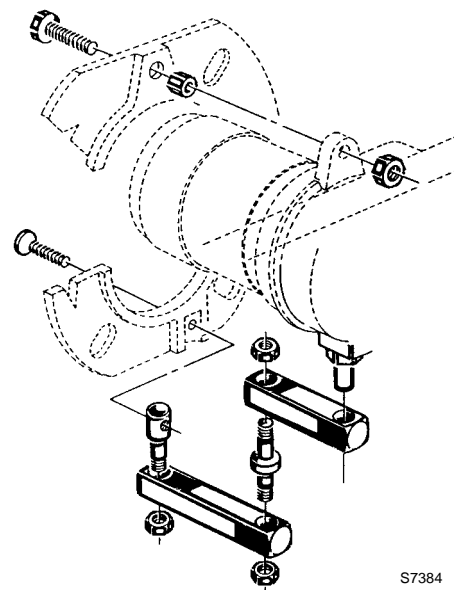


Fig. 2

D5572

## BURNER FIXING AND HINGE ASSEMBLY



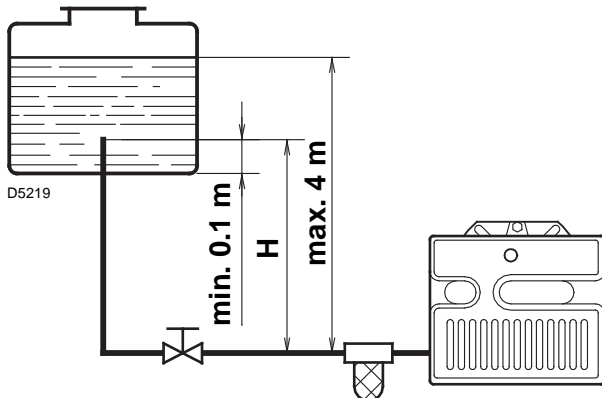
S7384

## HYDRAULIC SYSTEMS

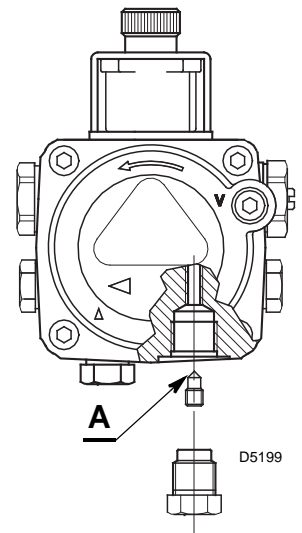
**Warning:** before starting the burner make sure that the return pipe-line is not clogged: any obstruction would cause the pump seals to break.

### WARNING

The pump is supplied for use with a two pipe system. For use on a one pipe system, it is necessary to **remove the by-pass screw (A)**, (see figure).



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



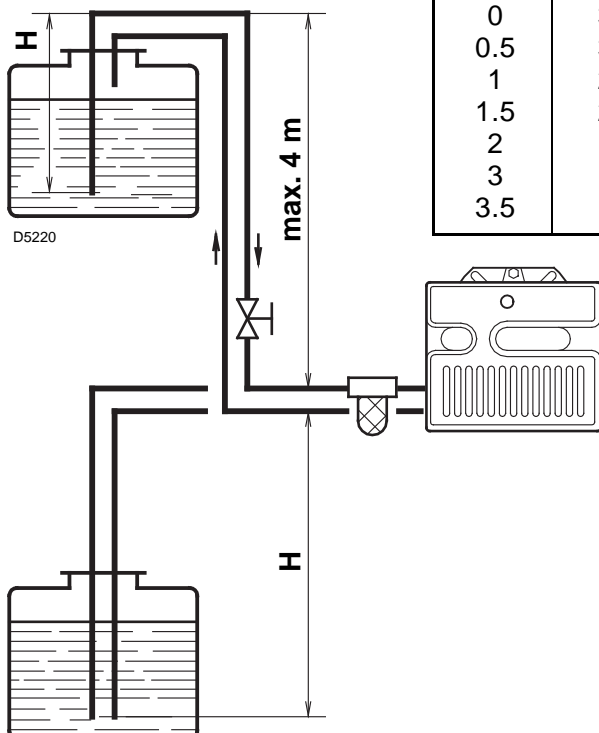
### PRIMING THE PUMP

Loosen the plug of the vacuum gauge (5, fig. 1, page 1) and wait until the fuel flows out.

**H** = Difference of level.

**L** = Max. length of the suction line.

**I.D.** = Internal diameter of the oil pipes.



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

The pump vacuum should not exceed a maximum of 0.4 bar (30 cm Hg). Beyond this limit gas is released from the oil.

**Oil lines must be completely airtight. The return line should terminate in the oil tank at the same level as the suction line;** in this case a non-return valve is not required.

When the return line arrives over the fuel level, a non-return valve must be used.

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

### PRIMING THE PUMP

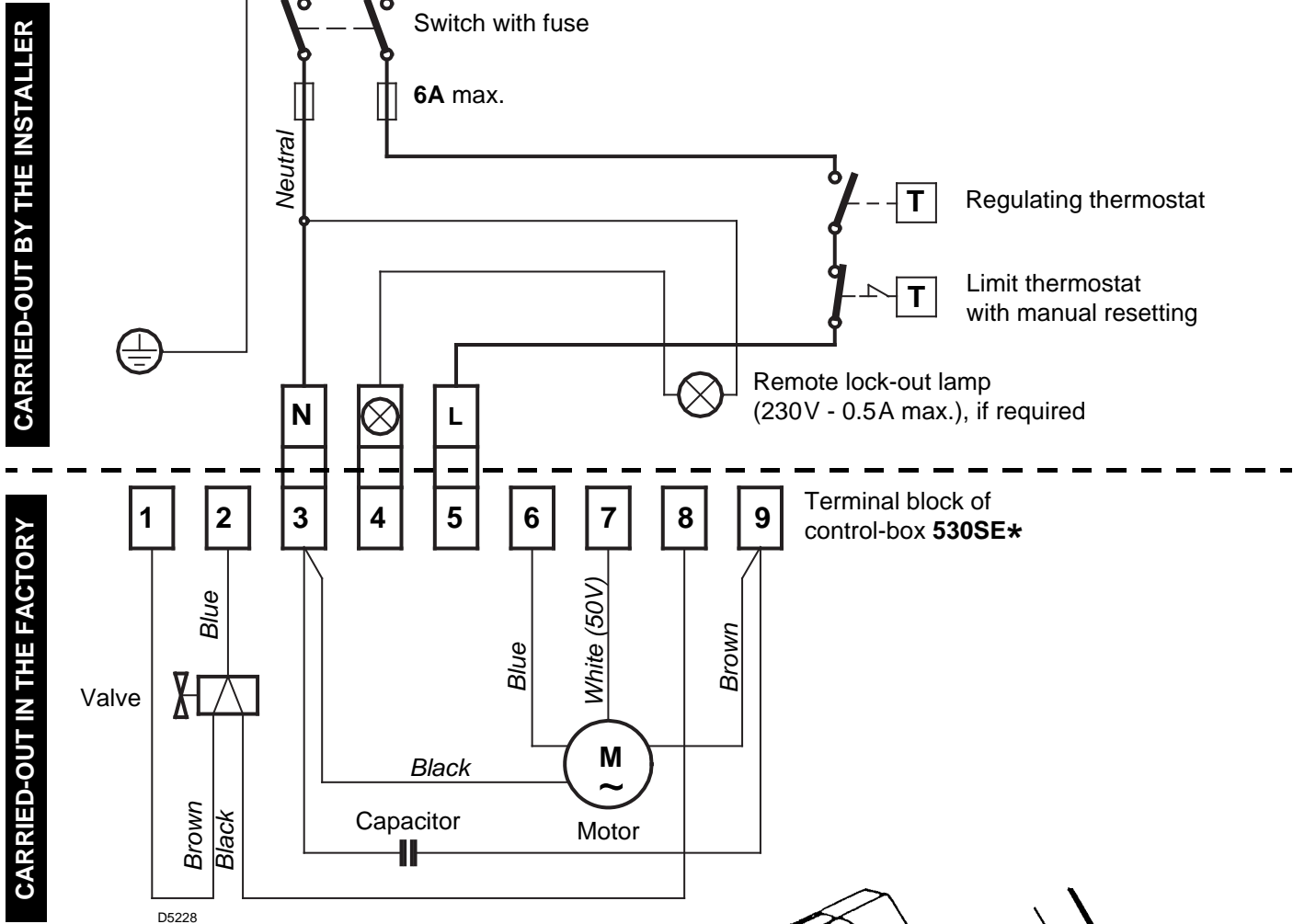
Start the burner and wait for the priming. Should lock-out occur prior to the arrival of the fuel, await at least 20 seconds before repeating the operation.

**A filter must be installed on the suction fuel line.**

# ELECTRICAL WIRING

230V ~ 50Hz

**WARNING**  
Do not exchange the neutral with the phase.



## NOTES

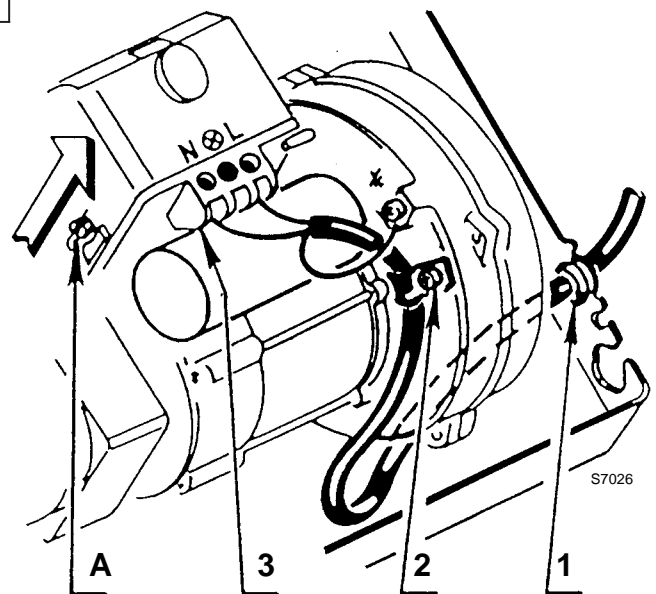
- Wires of 1 mm<sup>2</sup> section.
- The electrical wiring carried out by the installer must be in compliance with the rules in force in the Country.
- **To remove the control-box from the burner, loosen screw (A) (see figure) and pull towards the arrow.**
- The photoresistance is fitted directly into the control-box (underneath the ignition-transformer) on a plug-in support.

## TESTING

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

## ATTENTION

Do not connect burner's grounding, to failure indicator terminal ⊗. This may result the destroy of the control box.



## RUN OF THE ELECTRICAL CABLE

- |                    |                  |
|--------------------|------------------|
| 1 - Grommet        | N - Neutral      |
| 2 - Cable-clamp    | L - Phase        |
| 3 - Terminal block | ⊕ - Burner-earth |

## 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<sub>2</sub> 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 nozzle then adjust the pump pressure, the setting of the combustion head and the air damper opening in accordance with the following schedule.

The values shown in the table are measured on a CEN boiler (as per EN 267).

They refer to 12.5% CO<sub>2</sub> at sea level and with light oil and room temperature of 20 °C.

Nozzle <b>1</b>		Pump pressure <b>2</b>	Burner output	Comb. head adjustment <b>3</b>	Air damper adjustment <b>4</b>
GPH	Angle	bar	kg/h ± 4%	Set-point	Set-point
0.60	60°/80°	11	2.3	1.5	2
0.65	60°/80°	12	2.6	2	2.2
0.75	60°	12	3.0	2.5	2.5
0.85	60°	12	3.4	3	3
1.00	60°	12	4.0	4	4.5
1.10	60°	12	4.4	5	6
1.25	60°	12	5.0	6	7

**1 RECOMMENDED NOZZLES:** Monarch type R - NS; Delavan type W - A - E  
Steinen type H - Q ; Danfoss type H

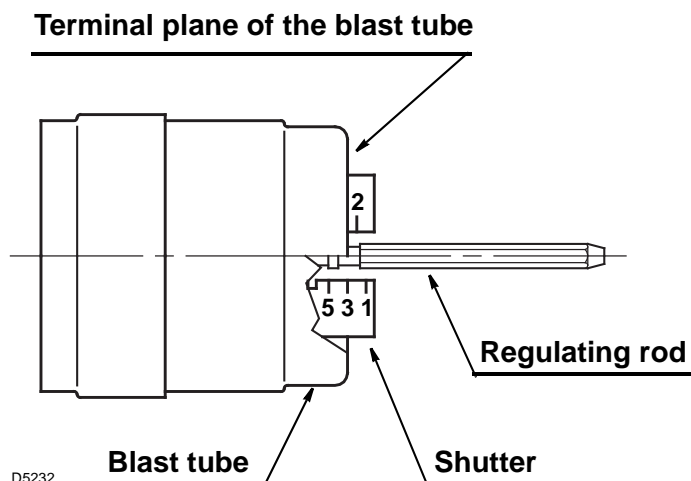
**Angle:** 60° : in most cases.

80° : in case of flame detachment, during ignitions at low temperatures.

**2 PUMP PRESSURE 12 bar :** the pump leaves the factory set at this value

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

**3 COMBUSTION HEAD SETTING:** This is done when fitting the nozzle, with the blast tube removed. It depends on the output of the burner and is carried out by rotating the regulating rod, till the terminal plane of the blast tube is level with the set-point, as indicated in the schedule.



In the sketch on the left, the combustion head is set for an output of 0.85 GPH at 12 bar, while the shutter is level with set-point **3**, as required by the above schedule.

Combustion head settings indicated in the schedule are valid for most cases.

The setting of the fan output according to the installation should normally be done only through the air damper. Should one subsequently want to retouch also the setting of the combustion head, with the burner running, operate on the rod (1) with a 6 mm spanner (2) as follows:

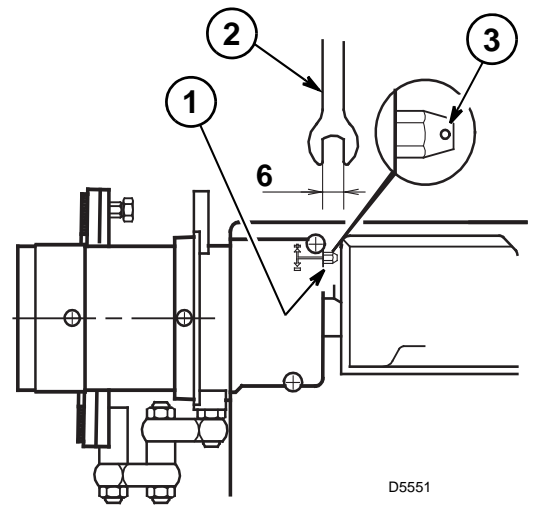
**Turn to the right: (sign +)**, in order to increase the volume of air entering the combustion chamber and thus diminishing its pressure.

There is a reduction of CO<sub>2</sub> and the adhesion of the flame to the air diffuser disc improves.

*(Setting advisable for ignitions at low temperatures).*

**Turn to the left: (sign -)**, in order to reduce the volume of air entering the combustion chamber and thus increasing its pressure. The CO<sub>2</sub> improves and the adhesion of the flame to the diffuser tends to reduce. *(This setting is not advisable for ignitions at low temperatures).*

In any case do not bring the combustion head setting more than one point away from that indicated in the schedule. One set-point corresponds to 3 turns of the rod; a hole (3) at its end facilitates counting the number of turns.



#### 4 AIR DAMPER ADJUSTMENT:

The mobile air damper (A) operated by the jack (B) assures the complete opening of the air intake.

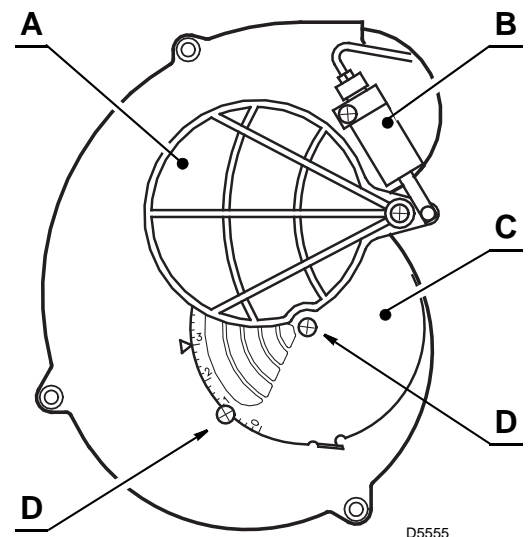
The regulation of the air-rate is made by adjusting the fixed air damper (C), after loosening the screws (D). When the optimal regulation is reached, **screw tight the screws (D)** to assure a free movement of the mobile air damper (A).

The settings indicated in the schedule refer to the burner with its metal cover fitted and the combustion chamber with "zero" depression.

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.



**It is important to take account of the fact that the air output of the fan differs according to whether the burner has its metal cover fitted or not.**

Therefore we recommended to proceed as follows:

- adjust the air damper as indicated in the schedule (4, page 5);
- mount the cover, simply by means of the upper screw;
- check smoke number;
- 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.

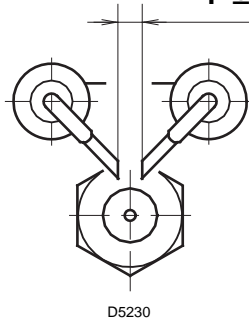


## ELECTRODE SETTING (See fig. 3)

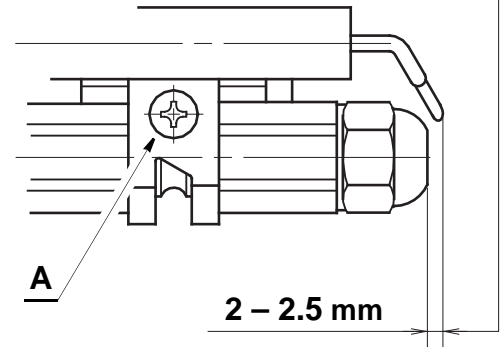
### Attention:

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

Fig. 3



**IMPORTANT:  
THESE DIMENSIONS  
MUST BE OBSERVED**



## BURNER START-UP CYCLE



## ADJUSTMENTS, TO AVOID FLAME - DETACHMENT, AT BURNER - IGNITION

This inconvenience can occur, when the temperature of the light-oil decreases below +8 °C.

### 1) CORRECT POSITIONING OF THE ELECTRODES

See fig. 3.

### 2) PUMP - SETTING

The pump is factory set, at a pressure of 12 bar.

When the temperature of the light oil decreases below +8 °C, increase the pressure to 14 bar.

### 3) COMBUSTION-HEAD SETTING

Regulate the combustion-head one set-point further ahead than indicated in the instructions.

**Example:** *the instructions require to set the combustion-head on set-point 3.  
Instead, the setting is made on set-point 4.*

### 4) FAN - AIR DAMPER ADJUSTMENT

Adjust the damper, reducing the excess air until the Bacharach number is not near 1.  
(i.e. a combustion with the lowest possible excess-air).

