

GB **Light oil burner**

CN **轻油燃烧器**

One stage operation
一段火运行



RIELLO 40

CODE - 编码	MODEL - 型号	TYPE - 类型
20033538	G20	474T58

INFORMATION ABOUT THE INSTRUCTION MANUAL

INTRODUCTION

The instruction manual supplied with the burner:

- is an integral and essential part of the product and must not be separated from it; it must therefore be kept carefully for any necessary consultation and must accompany the burner even if it is transferred to another owner or user, or to another system. If the manual is lost or damaged, another copy must be requested from the Technical Assistance Service **RIELLO** of the area;
- is designed for use by qualified personnel;
- offers important indications and instructions relating to the installation safety, start-up, use and maintenance of the burner.

DELIVERY OF THE SYSTEM AND THE INSTRUCTION MANUAL

When the system is delivered, it is important that:

- The instruction manual is supplied to the user by the system manufacturer, with the recommendation to keep it in the room where the heat generator is to be installed.
- The instruction manual shows:

- the serial number of the burner;

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- the address and telephone number of the nearest Assistance Centre;

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- The system supplier carefully informs the user about:
 - the use of the system,
 - any further tests that may be necessary before the system is started up,
 - maintenance and the need to have the system checked at least once a year by the manufacturer or another specialised technician.

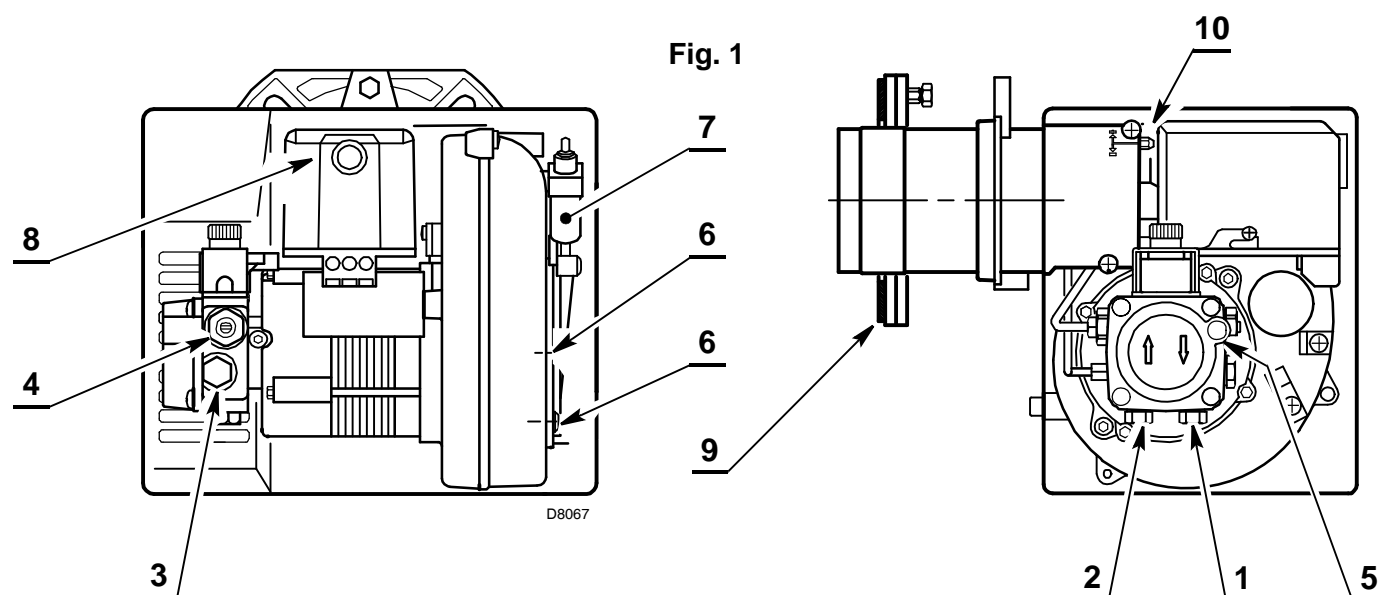
To ensure a periodic check, **RIELLO** recommends the drawing up of a Maintenance Contract.

TECHNICAL DATA

TYPE	474T58
Thermal power – output	95 – 213 kW – 8 – 18 kg/h
Fuel	Gas oil, viscosity 4 – 6 mm ² /s at 20 °C
Electrical supply	Single phase, 220V ± 10% ~ 60Hz
Motor	Run current 2.15A – 3250 rpm – 340 rad/s
Capacitor	4 µF
Ignition transformer	Secondary 8 kV – 16 mA
Pump	Pressure 8 – 15 bar
Absorbed electrical power	0.4 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).

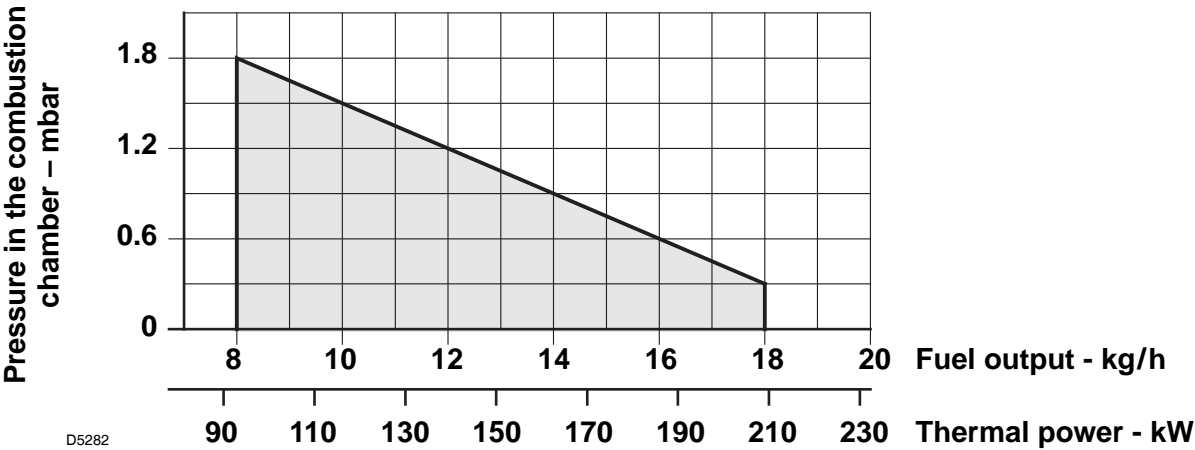
If the value is lower than 1 bar, compared to that one of the initial setting, please check the cleaning of the pump and line filters.

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.

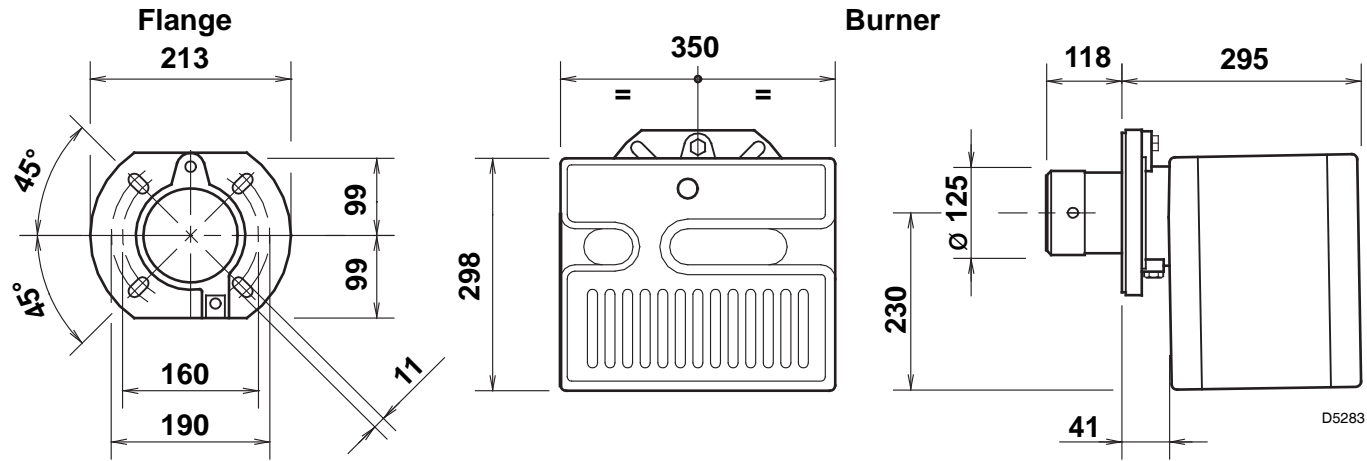
BURNER EQUIPMENT

Quantity	Description
2	Flexible pipes with nipples
1	Flange with insulating gasket
4	Screws and nuts for flange
1	Maintenance assembly
1	Screw with two nuts for flange
1	Cable grommet

WORKING FIELD



OVERALL DIMENSIONS



INSTALLATION

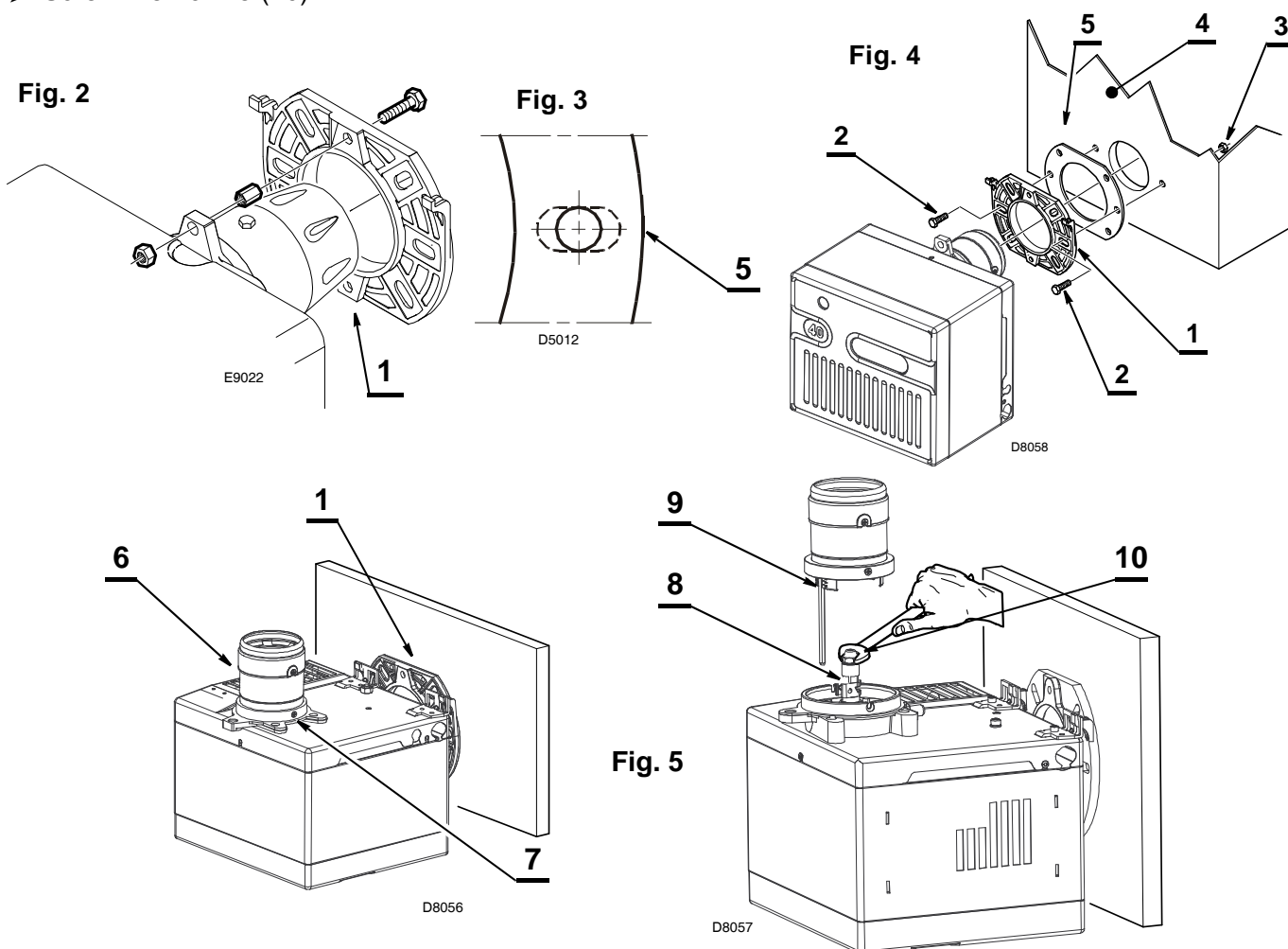
BOILER FIXING

- Put on the flange (1) the screw and two nuts, (see fig. 2).
- Widen, if necessary, the insulating gasket holes (5), (see fig. 3).
- 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. 4).

MAINTENANCE POSITION

Access to the combustion head, diffuser disc / electrodes unit and nozzle, (see fig. 5).

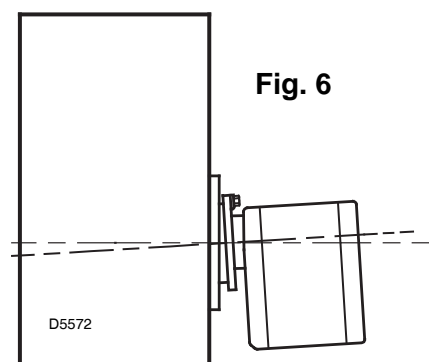
- Remove the burner out of the boiler, after loosening the fixing nut to the flange.
- Hook the burner to the flange (1), by removing the combustion head (6) after loosening the fixing screws (7).
- Remove the diffuser disc-holder assembly (9) from the nozzle-holder (8) after loosening its fixing screw.
- Screw the nozzle (10).



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

(See figure 6).

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



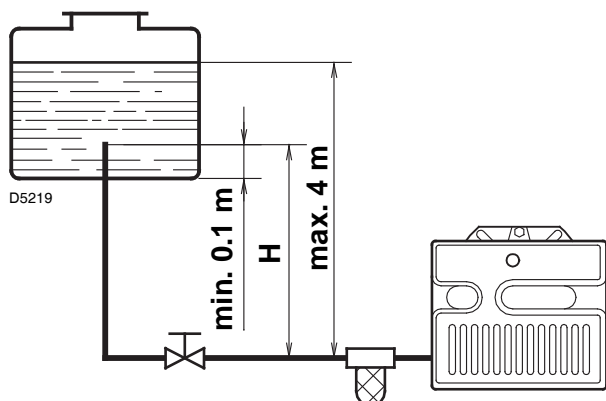
HYDRAULIC SYSTEMS

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

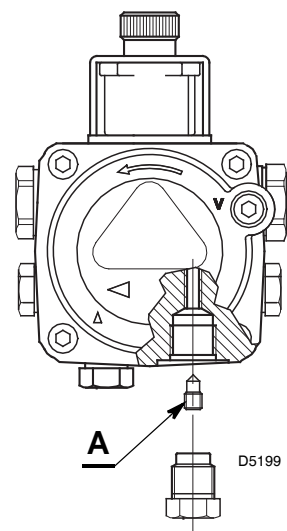
WARNING

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



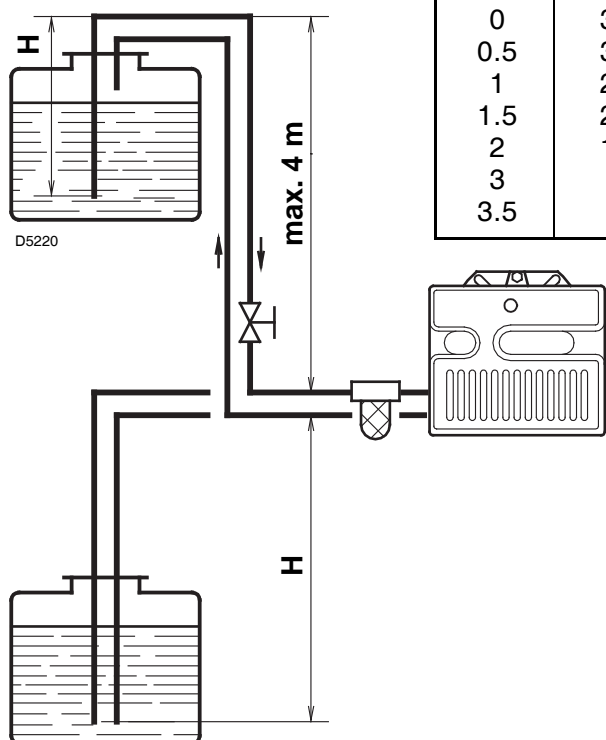
PRIMING THE PUMP

Loosen the plug of the vacuum gauge (5, fig. 1) 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.

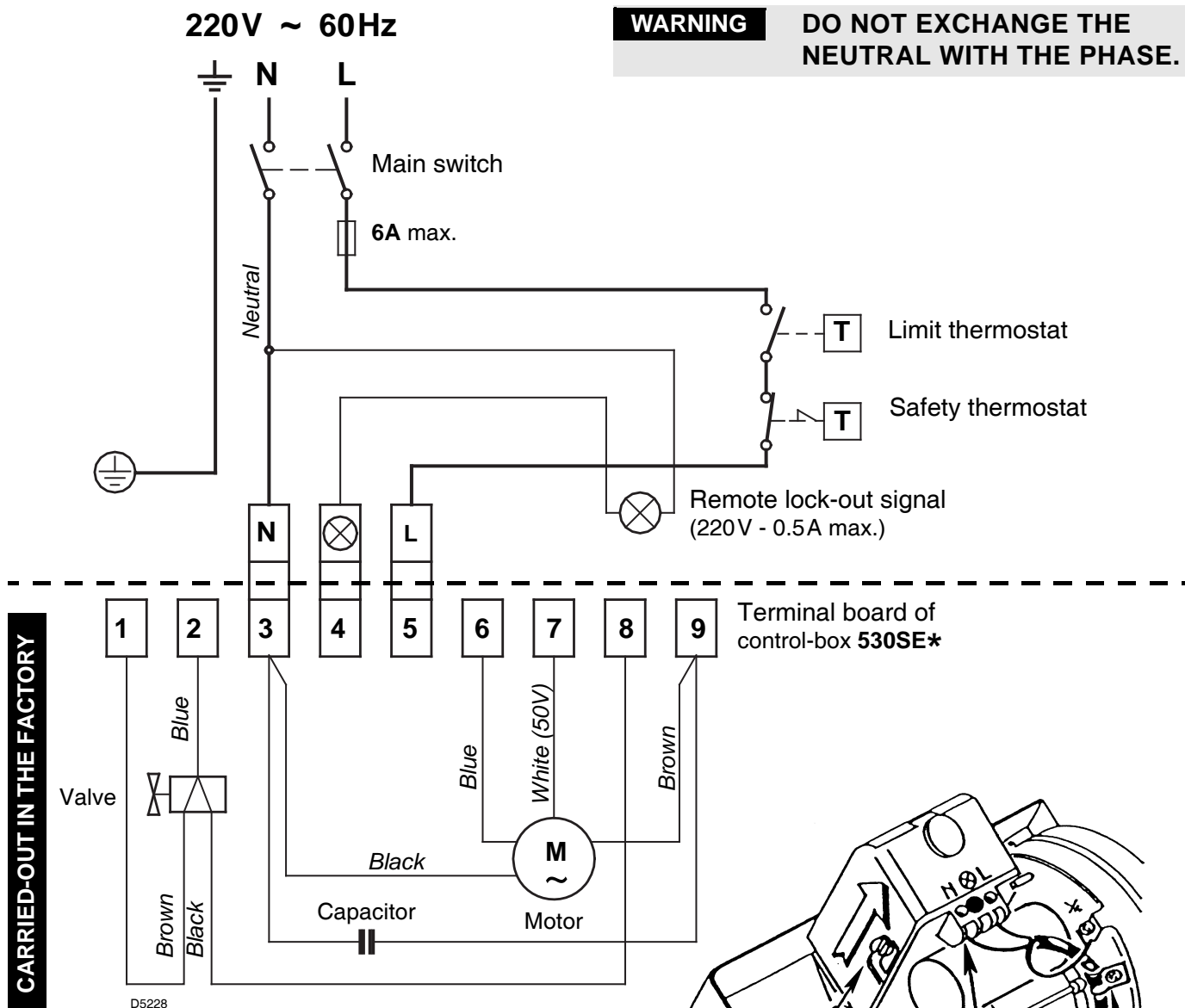
This solution however is less safe than previous one, due to the possibility of leakage of the valve.

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

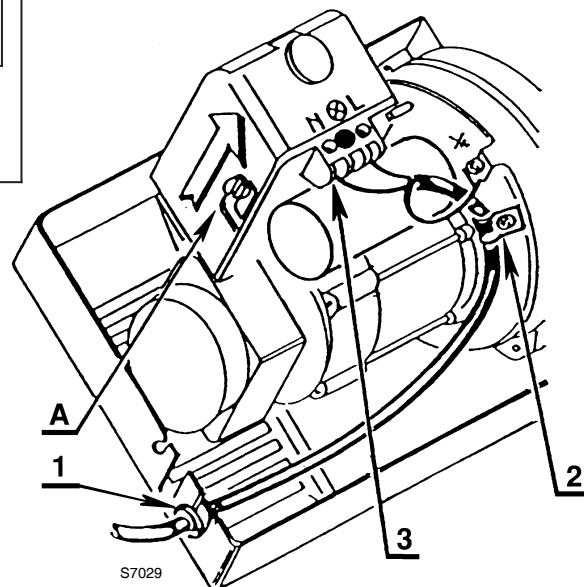


NOTES:

- 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.
- 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.



RUN OF THE ELECTRICAL CABLE

- | | |
|--------------------|------------------|
| 1 - Cable grommet | N - Neutral |
| 2 - Cable-clamp | L - Phase |
| 3 - Terminal board | ⏏ - Burner-earth |

ATTENTION

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

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, 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% CO₂ at sea level and with light oil and room temperature of 20 °C.

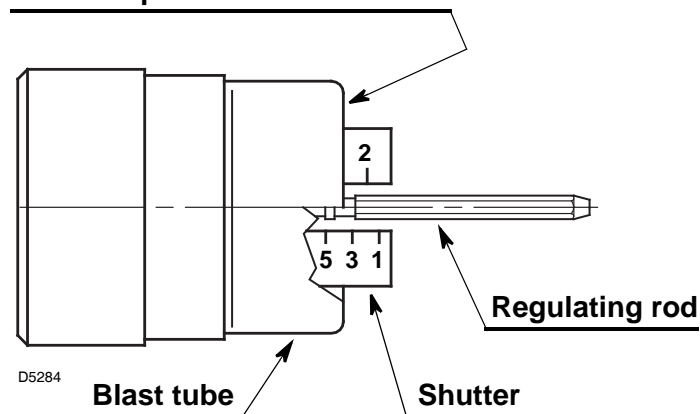
Nozzle 1		Pump pressure 2	Burner output	Comb. head adjustment 3	Air damper adjustment 4
GPH	Angle	bar	kg/h ± 4%	Set-point	Set-point
2.00	60°	12	8.0	1	2.2
2.25	60°	12	9.0	1.5	2.6
2.50	60°	12	10.0	2	2.8
3.00	60°	12	12.0	2.5	3.5
3.50	60°	12	14.0	3.5	4.0
4.00	60°/45°	12	16.1	5	5.5
4.50	60°/45°	12	18.0	6	6.5

- 1 NOZZLES RECOMMENDED:** Monarch type R - PLP ; Delavan type B - W
Steinen type S - SS ; Danfoss type S - B
- Angle:** 60° : in most cases. Particularly suited to avoid flame-detachment during ignition.
45° : for narrow and long combustion-chambers.

- 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.

Terminal plane of the blast tube



In the sketch on the left, the combustion head is set for an output of 3.50 GPH at 12 bar, while the shutter is level with set-point 3.5, 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 CO₂ and the adhesion of the flame to the air diffuser disc improves.

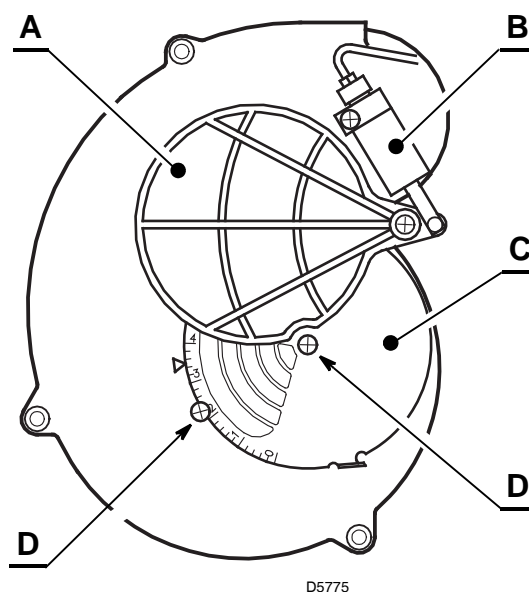
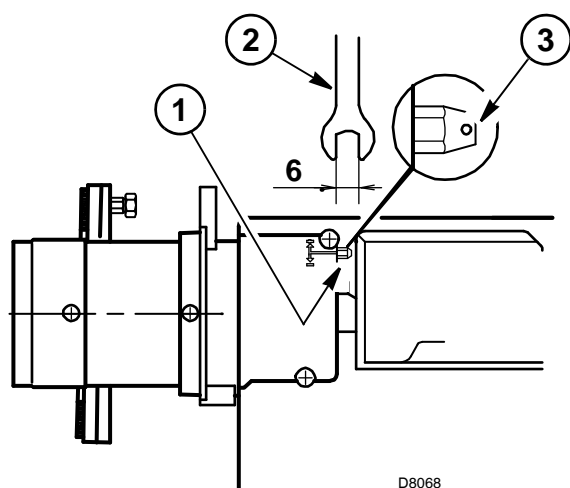
(Setting advisable for ignitions at low temperatures).

TURN TO THE LEFT: (sign -)

In order to reduce the volume of air entering the combustion chamber and thus increasing its pressure. The CO₂ 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.

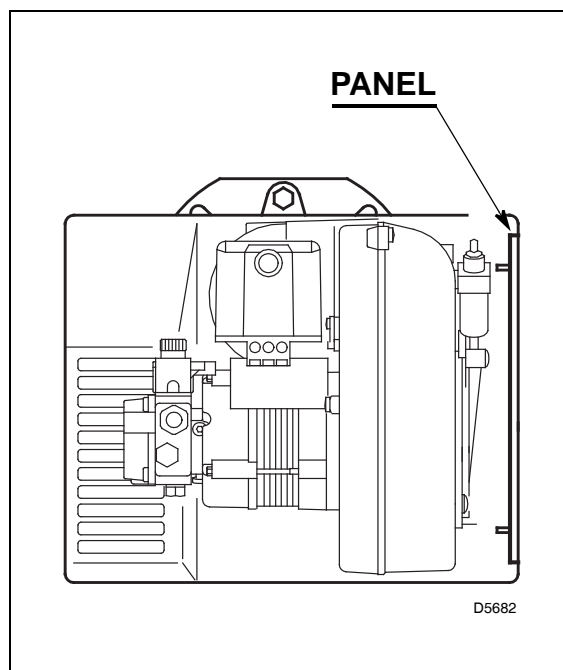
It is important to take account of the fact that the air output of the fan differs according to whether the burner has its metal cover fitted or not.

Therefore we recommended to proceed as follows:

- adjust the air damper as indicated in the schedule (4, page 6);
- 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.

NOTE:

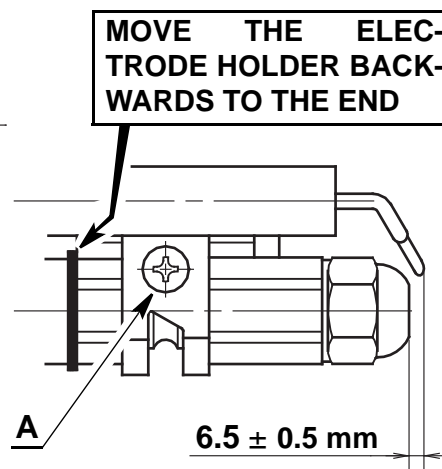
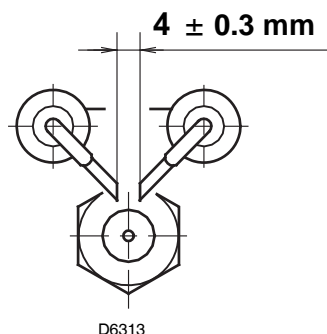
When the burner works at a firing rate higher than 17 kg/h remove the panel fitted inside the metal cover. (See figure).



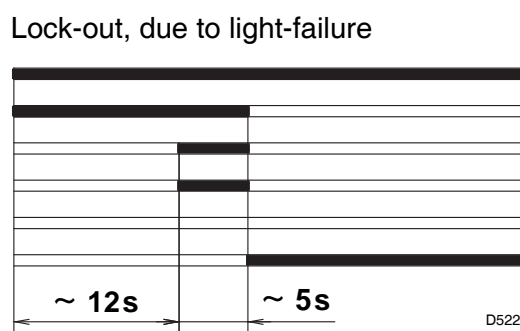
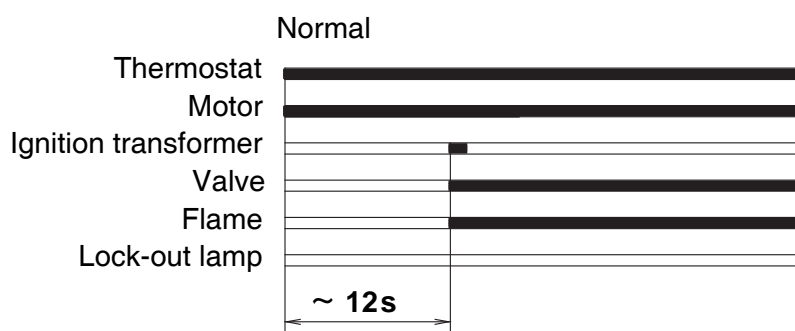
ELECTRODES ADJUSTMENTS

Attention:

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



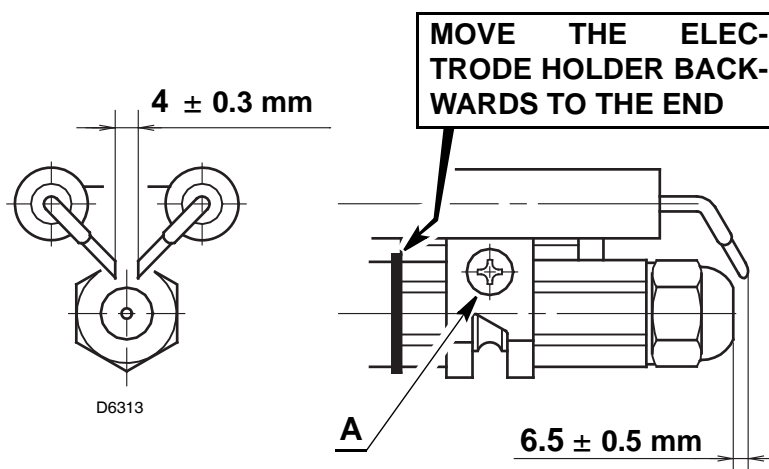
BURNER START-UP CYCLE



D5229

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

1) CORRECT POSITIONING OF THE ELECTRODES



2) NOZZLE: ATOMIZING ANGLE

Choose 60° nozzle.

3) PUMP - SETTING

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

When the temperature of the gas-oil decreases below $+ 5^\circ \text{C}$, increase the pressure to 14 bar.

4) 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 3.5.
Instead, the setting is made on set-point 4.5.

5) 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).

说明书的相关信息

引言

- 说明书随燃烧器一起提供：
- 它是产品不可或缺的组成部分，不得将其与产品分离；因此必须小心保存以便查阅，如果将燃烧器转给另一个用户或转移至另一个系统，则说明书必须跟随燃烧器一起转移。如果说明书损坏或丢失，则必须从您就近的 **RIELLO** Technical Assistance Centre（技术支持中心）索取说明书的复印件；
 - 说明书只能由有资格的人员使用；
 - 说明书提供了有关燃烧器安装、启动、使用和维护的重要指示和安全警告。

系统和说明书的交付

- 一旦交付系统：
- 系统制造商也必须将说明书交付给用户，并建议其将说明书保存在热发生器的安装区域附近。
 - 说明书上显示：
 - 燃烧器的序列号；

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- 最近 Assistance Centre（支持中心）的地址和电话号码；

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- 系统制造商必须告知用户有关以下内容的准确信息：
 - 系统的使用；
 - 启动系统前需要进行的测试；
 - 必需的维护和检查（每年必须由制造商代表或别的专业技术人员至少检查系统一次）。
- 要保证定期检查，**RIELLO** 建议遵照 Maintenance Contract（维护合同）的规定。

技术数据

型号	474T58
热出力 – 功率	95 – 213 kW – 8 – 18 kg/h
燃料	轻油, 20 °C 时的粘度 4 – 6 mm ² /s
电源	单相, 220V ± 10% ~ 60Hz
马达	运行电流 2.15 A – 3250 rpm – 340 rad/s
电容	4 μF
点火变压器	二级 8 kV – 16 mA
油泵	压力 8 – 15 bar
消耗的功率	0.4 kW

■ 燃烧器带 CE 标志, 符合 EEC 指令: EMC 2004/108/EC, 低电压 2006/95/EC, 机械 2006/42/EC。

■ 根据 EN 60529 指令, 燃烧器达到电气保护等级 IP 40。

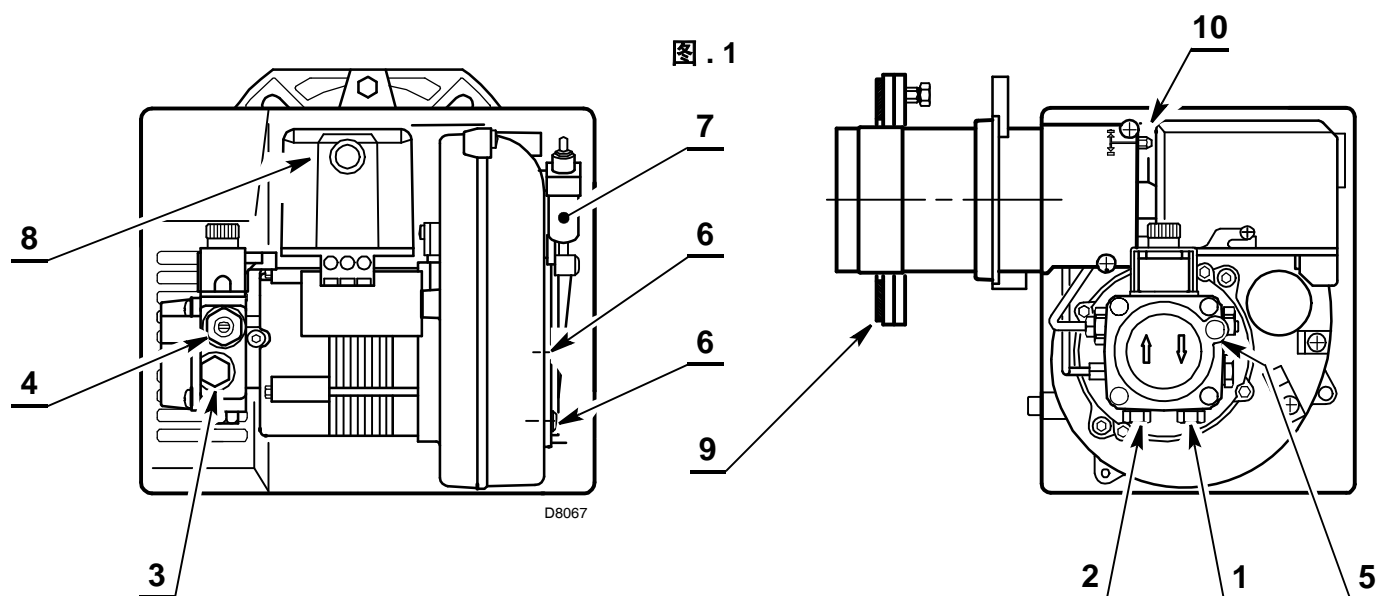


图 . 1

- 1 – 回油管路
- 2 – 进油管路
- 3 – 油压表表座
- 4 – 油泵压力调节器
- 5 – 真空计表座
- 6 – 安装风门挡板用螺丝
- 7 – 带风门挡板的液压缸
- 8 – 锁定指示灯及复位按钮
- 9 – 带隔热垫的法兰
- 10 – 燃烧头调节用螺丝

液压千斤顶运作方式 7) (图 1)



强烈建议周期性地检查泵压力是否正常运作 (每年一次, 或者在燃烧器不断运行的情况下, 建议检查的时间为六个月一次)。

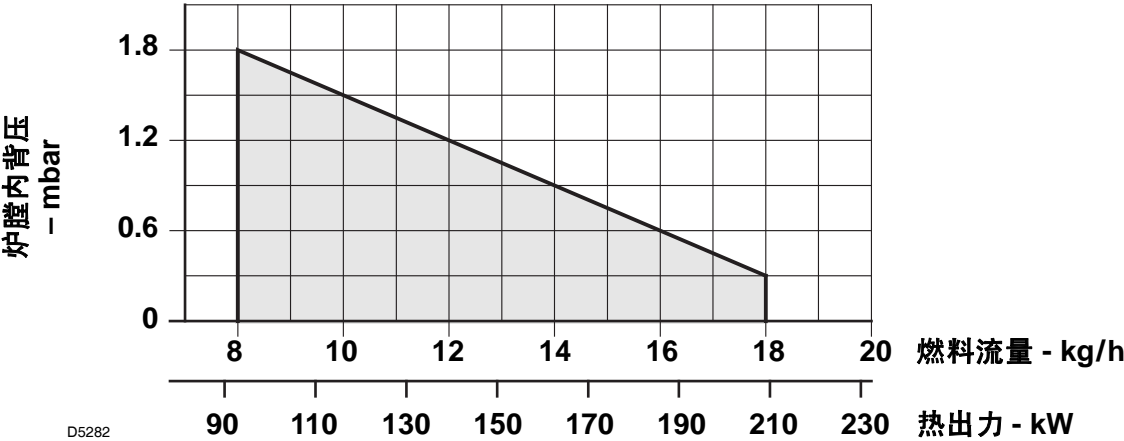
如果压力值比初始设定值小 1 巴, 检查泵和线路中的过滤器是否干净。

如果压力无法复位, 请更换泵以便保证预吹扫过程中, 压力至少为 3.7 巴。

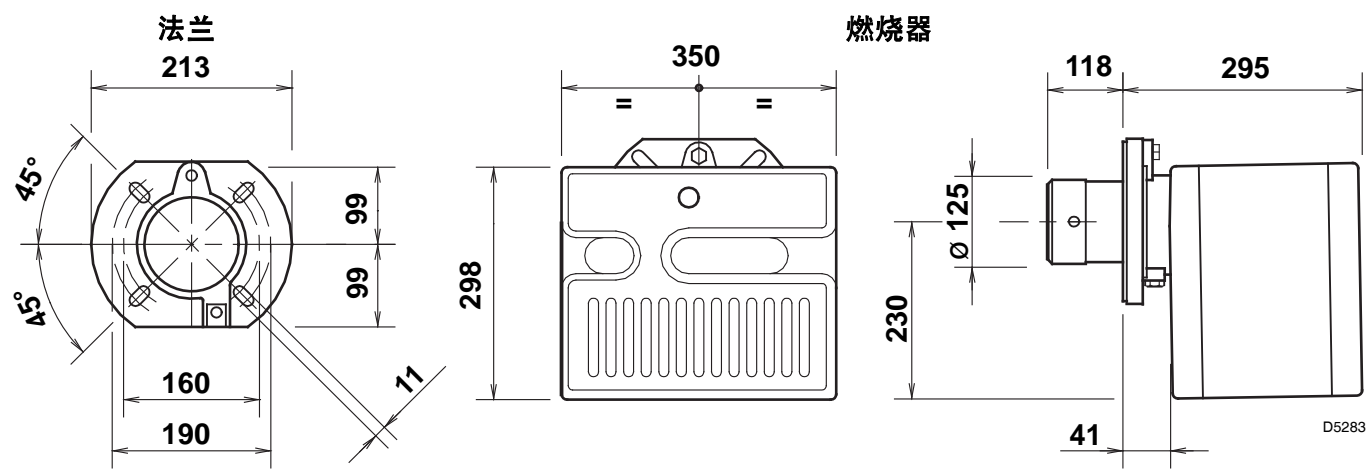
燃烧器配件

数量	描述
2	带接口的软管
1	带隔热垫的法兰
4	法兰用螺丝和螺母
1	维护附件
1	法兰用带两个螺母的螺丝
1	电缆接头

出力范围



外观尺寸



安装

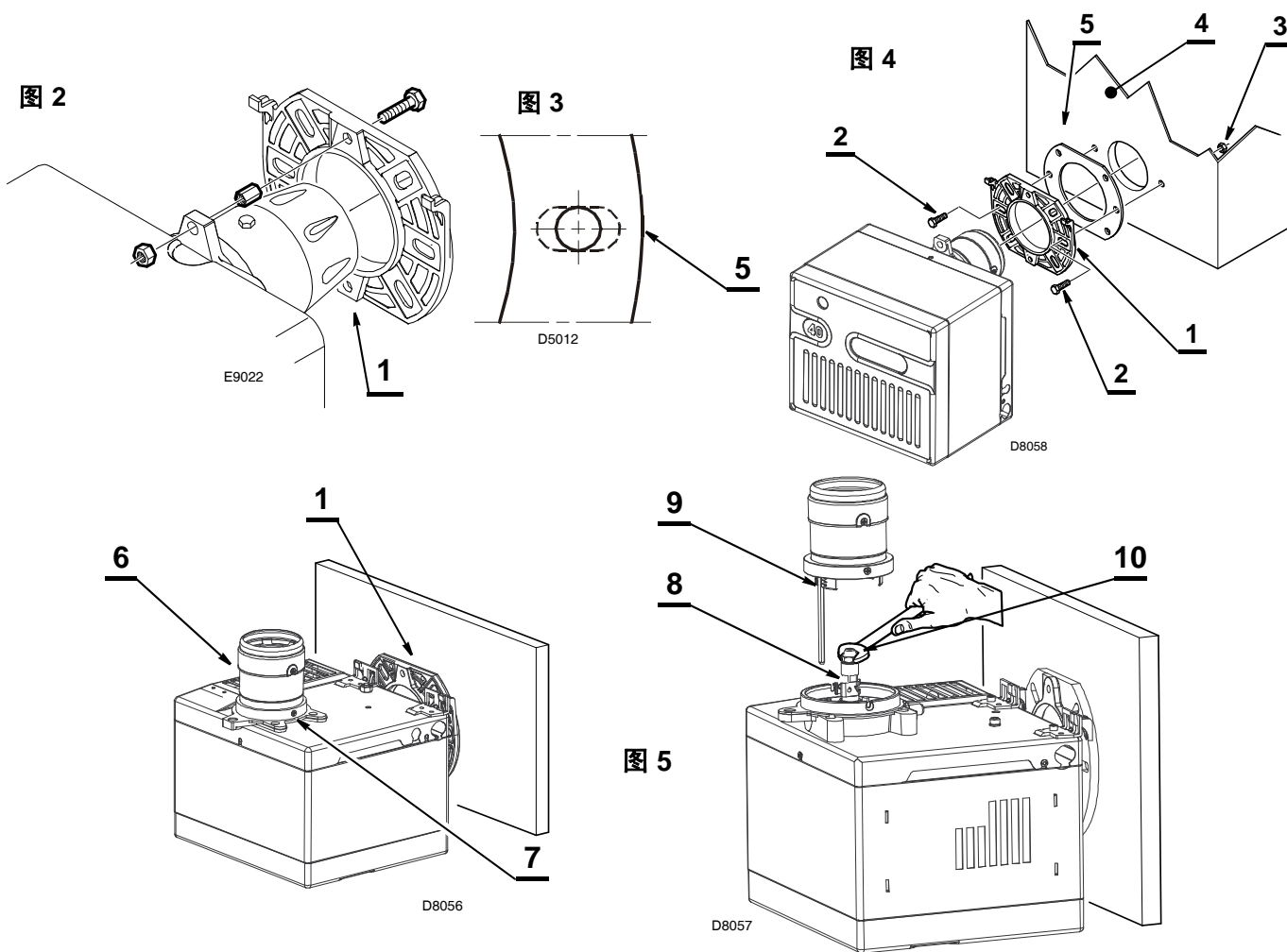
锅炉安装

- 安装法兰 (1)，螺丝及两个螺母 (见图 2)。
- 如需要，可扩大隔热垫上的孔 (5)，(见图 3)。
- 安装法兰 (1) 到锅炉炉门 (4)，使用螺丝 (2) 和 (如需要) 螺母 (3)，中间插入隔热垫 (5)(见图 4)。

维修位置

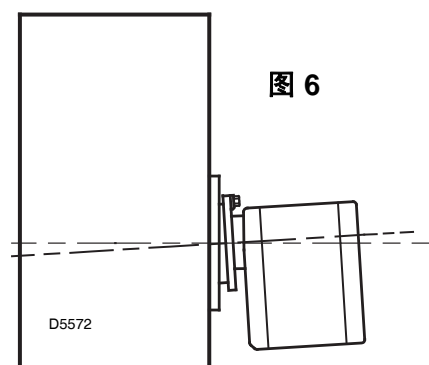
对燃烧头、稳焰盘 / 点火电极及喷嘴进行操作，(见图 5)。

- 拧松固定法兰用螺母，将燃烧器从锅炉中取出。
- 拧松固定螺丝 (7)，取下燃烧头 (6)，将燃烧器挂在法兰 (1) 上。
- 拧松固定螺丝，从喷嘴支架 (8) 上取下稳焰盘支架 (9)。
- 拧下喷嘴 (10)。



检查确认已安装好的燃烧器稍稍向按钮倾斜。
(见图 6)。

燃烧器的设计允许在燃烧器左侧或右侧安装输油管路。

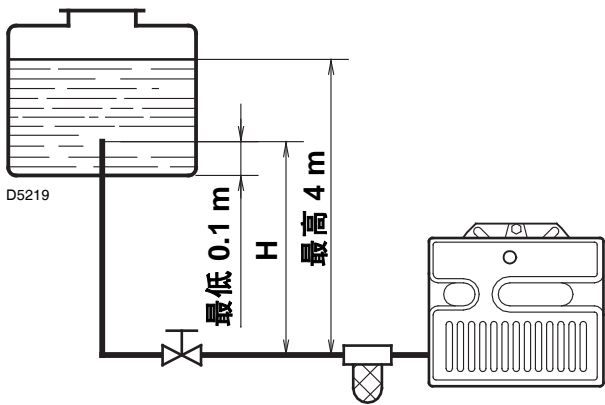


油管路系统

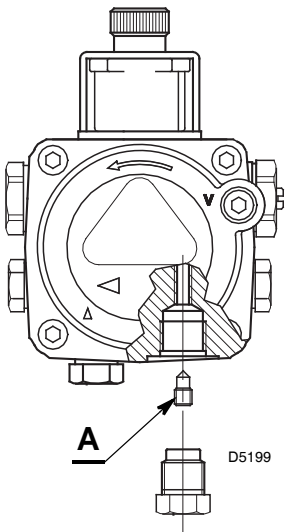
警告：启动燃烧器前，必须确认回油管路没有堵塞：任何堵塞都有可能破坏油泵的密封性。

警告

油泵使用双管路系统。
使用单管路系统时，必须移除旁路螺丝 (A), (见图)。



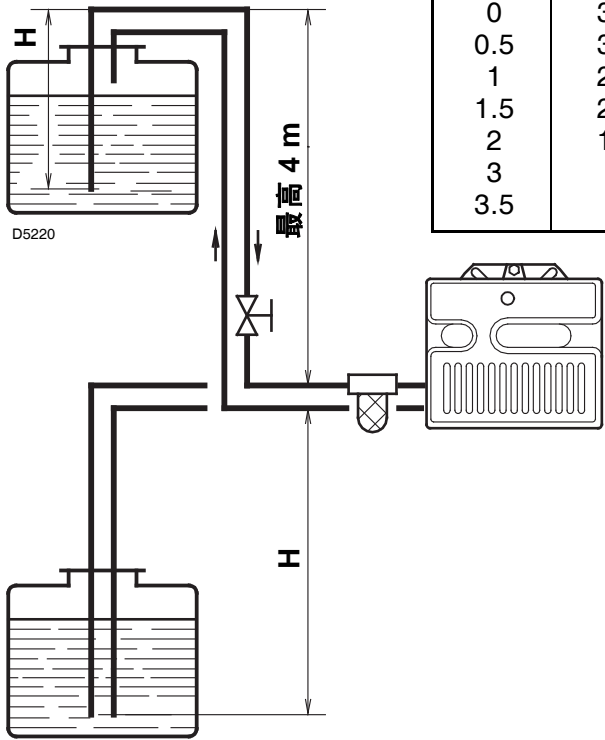
H m	L m	
	I. D. 8 mm	I.D. 10 mm
0.5	10	20
1	20	40
1.5	40	80
2	60	100



H = 高度差
L = 进油管最大长度
I.D.= 管路内径

启动油泵

拆掉真空计表座的堵头螺栓 (5, 图 1)，等待直至燃油流出。



H m	L m	
	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

油泵真空度最大不得超过 0.4 bar (30 cm Hg)。

超过此真空度，会造成油气分离。

油管必须完全密封，达到气密水平。

回油管进入油箱的终端高度应与进油管高度相同；这样就不需使用止回阀。

如果回油管到达高度超过油箱内燃油高度，则必须使用止回阀。

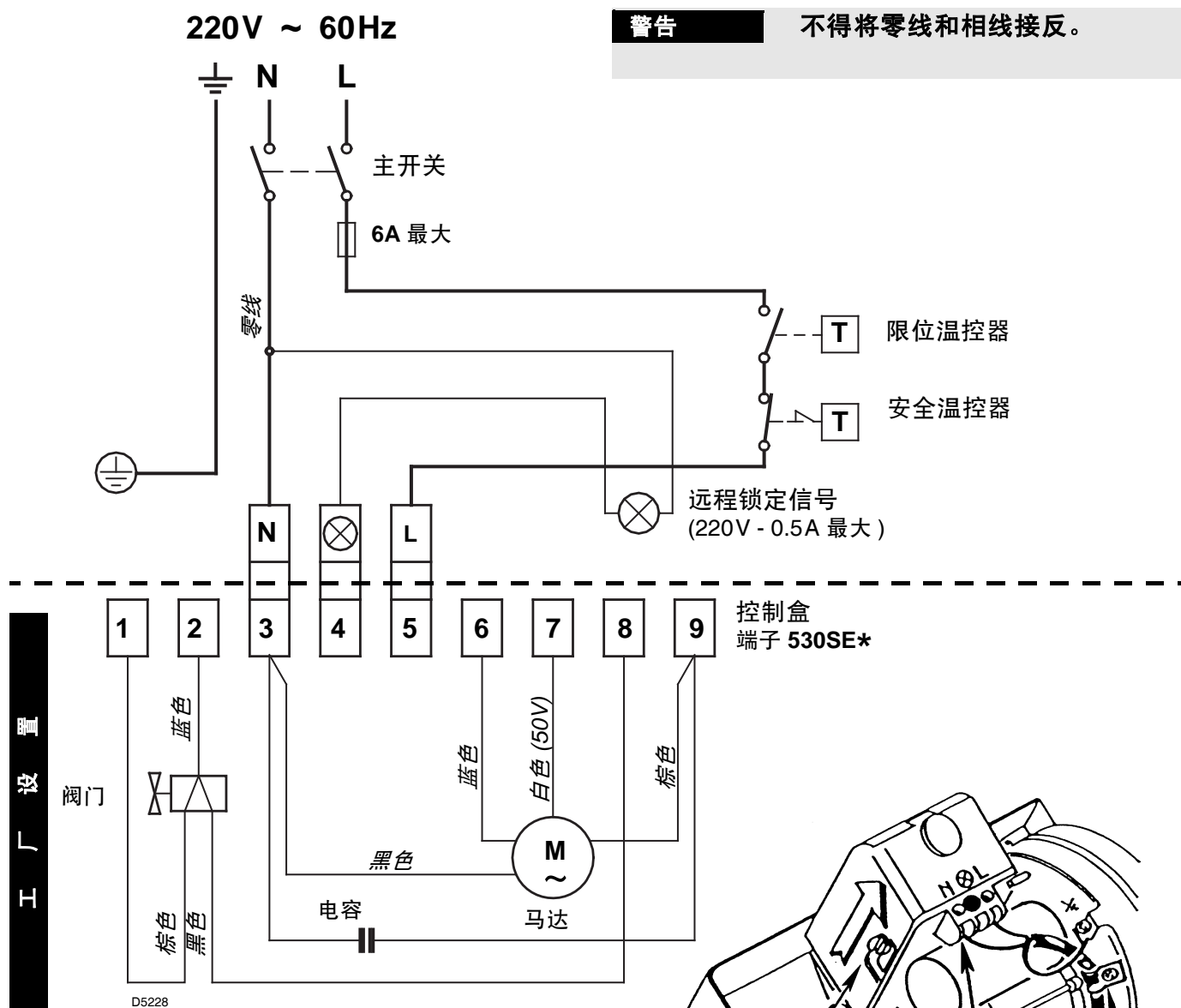
相比较而言，后一种方法安全性差，因为阀门处有可能有燃油泄漏。

启动油泵

启动燃烧器，等待油泵启动。如果在燃油进入油泵前燃烧器锁定，请等待至少 20 秒后，再重新操作。

进油管路上必须安装一个过滤器。

电气接线

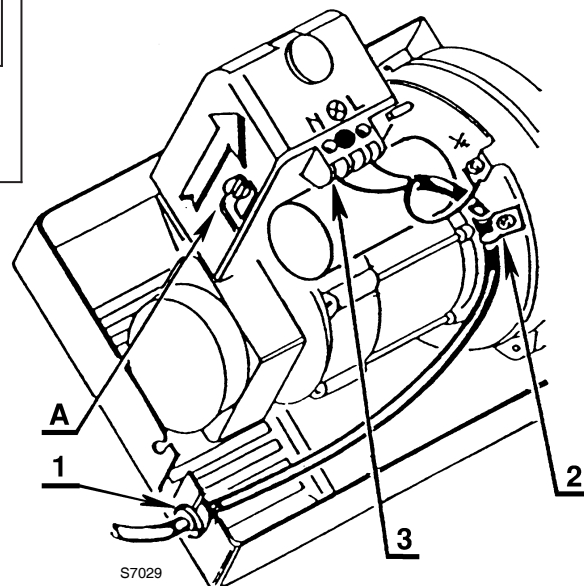


注意：


- 截面积最小为 1 mm² 导线。
(安装地法律有强制要求的除外)。
- 安装人员进行电气接线必须符合安装地的强制标准。
- **要从燃烧器上拆下控制盒，首先拧松螺丝(A) (见图)，然后按照箭头所指方向拉出控制盒。**
- 光敏电阻直接安装在控制盒内的一个插件支架上 (位于点火变压器下面)。

测试

断开温控器检查燃烧器停机功能。



电缆

- 1 - 电缆环状接头 N - 零线
2 - 电缆夹 L - 相线
3 - 接线端子板  - 燃烧器接地

注意

注意 不得连接燃烧器的接地到带 ⊗ 标记的端子，否则可能会损坏控制盒。

燃烧状态调整

燃烧器安装到锅炉上必须符合效率指令 92/42/EEC，必须按照锅炉手册进行调整和测试，包括检验核实烟气中的 CO 和 CO₂ 浓度、温度以及锅炉内的平均水温。

为了满足所需出力，需要根据下表选择适合的安装喷嘴、调整油泵压力以及风门挡板开度。

表中所列数值为在欧标锅炉上测得（根据 EN 267）。

测试参考条件：海拔高度为零、使用燃料为轻油、室温为 20 °C 时，CO₂ 排放水平为 12.5%。

喷嘴 1		油泵压力 2	燃烧器出力	燃烧头调整 3	风门挡板调节 4
GPH	角度	bar	kg/h ± 4%	设定点	设定点
2.00	60°	12	8.0	1	2.2
2.25	60°	12	9.0	1.5	2.6
2.50	60°	12	10.0	2	2.8
3.00	60°	12	12.0	2.5	3.5
3.50	60°	12	14.0	3.5	4.0
4.00	60°/45°	12	16.1	5	5.5
4.50	60°/45°	12	18.0	6	6.5

1 推荐喷嘴

: Monarch 型号 R - PLP; Delavan 型号 B - W
Steinen 型号 S - SS ; Danfoss 型号 S - B

角度： 60°：适用于大多数情况，特别利于点火时避免发生脱火现象。
45°：适用于狭长的炉膛。

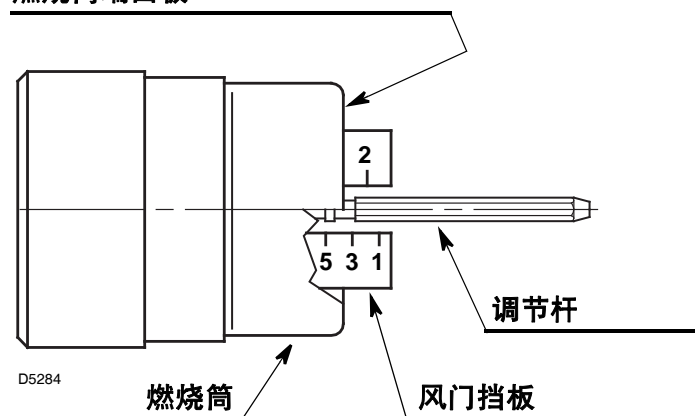
2 油泵压力

12 bar - 油泵出厂时所设定的压力值。
14 bar - 需要在低温时点火，为了加强火焰的稳定性。

3 燃烧头设定：

安装喷嘴时需要设定燃烧头，此时需要拆下燃烧筒。根据燃烧器出力设定燃烧头，通过转动调节杆进行操作，直至燃烧筒端面板与设定点对齐，如上表所示。

燃烧筒端面板



左图所示：压力为 12 bar、燃烧器出力为 3.50 GPH 时的燃烧头设定情况，此时风门挡板高度与设定点 3.5 同高，如上表所示。

在大多数情况下，上表所列的燃烧头设定值均为有效值。

通常情况下，根据安装情况，通过风门挡板来调节风量。如果之后想再次设定燃烧头，可用 6 mm 扳手 (2) 转动调节杆 (1)，如下所示：

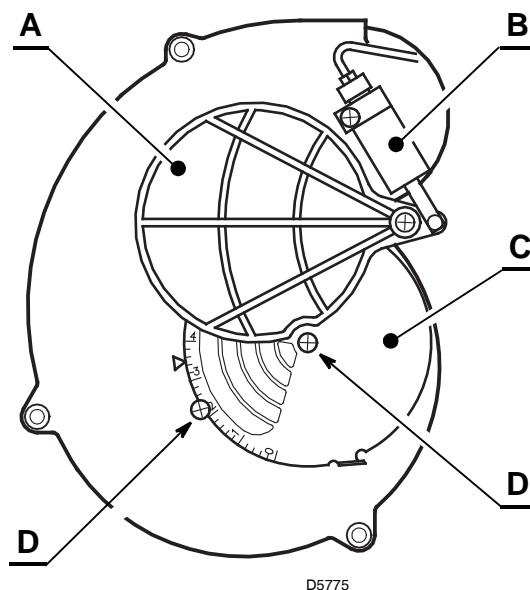
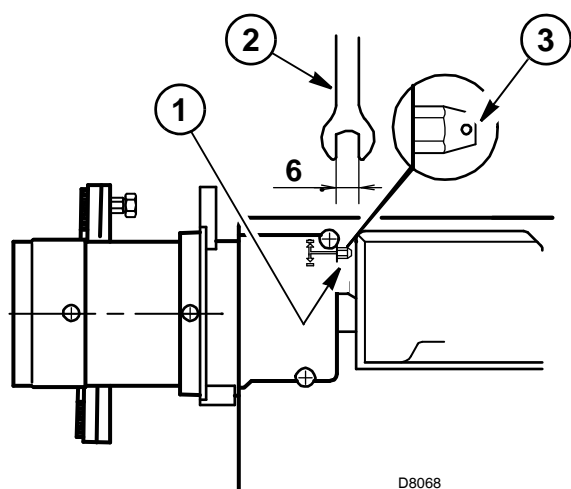
向右转动：(符号 +)

增加进入炉膛内的空气量，降低压力。这样可降低 CO_2 排放并增大火焰在稳焰盘上的稳定。
(低温点火时建议按此进行调节)。

向左旋转：(符号 -)

减少进入炉膛的空气量，增大压力。这样增加低 CO_2 排放并降低火焰在稳焰盘上的稳定。
(不建议在低温点火时按此进行调节)。

在任何情况下，燃烧头的设定值与表中所列数值误差应小于一个点。一个设定点对应调节杆上的 3 个调节圈数；通过调节杆末端上的孔 (3) 可以查看调节圈数。



4 风门挡板调节：

通过操作液压缸 (B)，调节可移动风门挡板 (A)，确保风门挡板进气口全开。

拧松螺丝 (D)，通过调节固定风挡 (C)，可调节空气量。当达到最优调节时，**拧紧螺丝 (D)** 以保证可移动风挡 (A) 调节灵活。

表中所列设定值的参考条件：燃烧器装有金属外罩且炉膛背压为零。

表中所给设定值仅供参考。

因为任何安装都有其不可预测的工作条件：如实际的喷嘴出力；炉膛内的正压和负压；需要的过量空气，等等。以上所有条件都有可能需要对风门挡板进行不同的设定。

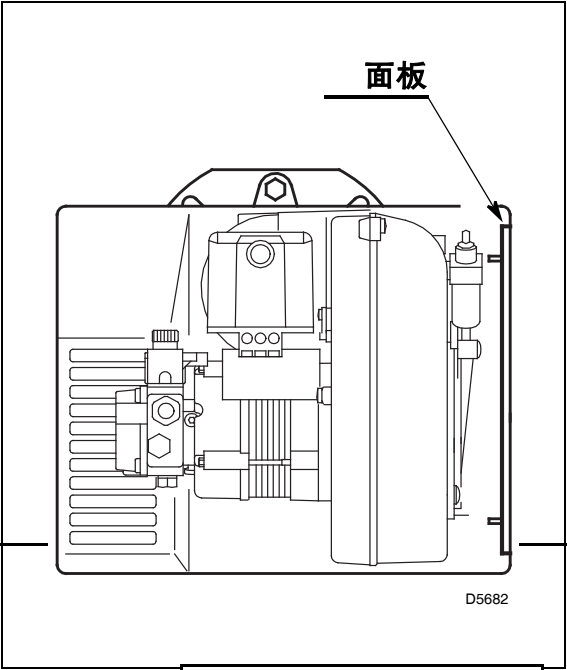
必须注意燃烧器装或不装金属外罩，其风机出风量会有所不同。

因此，建议按照以下步骤操作：

- 按表 (4, 页 6) 中所示调节风门挡板；
- 通过上部螺丝安装外罩；
- 检查烟气排放数值；
- 如果需要调节空气量，需松开螺丝，取下外罩，调节风门挡板后，再重新安装外罩，最后再次检查烟气排放数值。

注意：

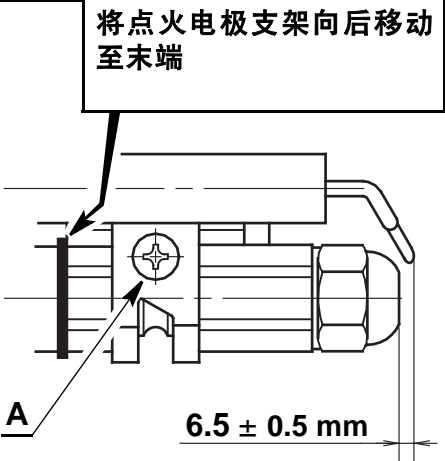
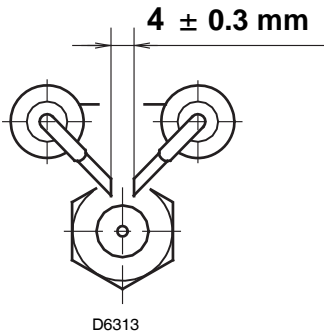
如果燃烧器以高于 17 kg/h 的负荷运行，请拆除金属外罩内的隔音材料 (见图)。



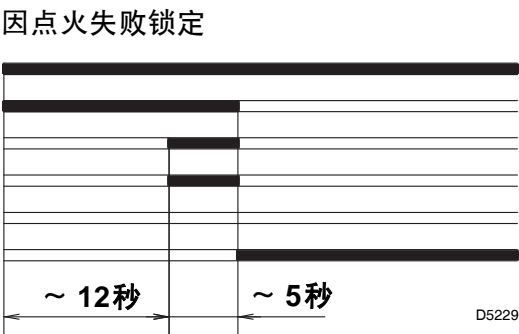
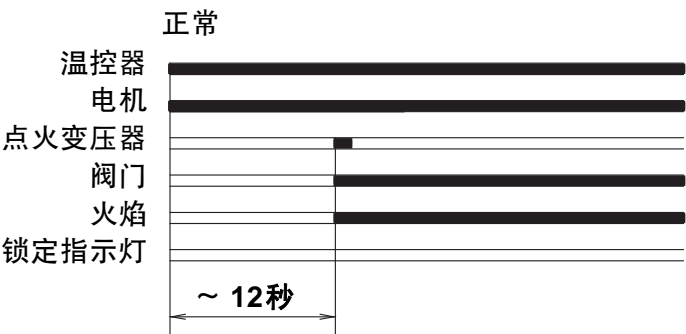
点火电极调整

注意：

拧松螺丝 (A) 且移动点火电极后方可安装或拆下喷嘴。

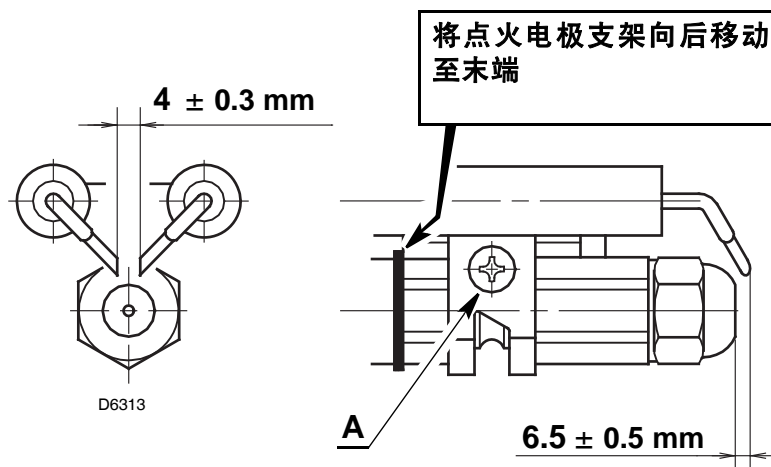


燃烧器启动周期



燃烧器点火时调节以避免脱火

1) 点火电极的正确位置



2) 喷嘴：雾化角度

选择 60° 喷嘴。

3) 油泵 - 设定

油泵出厂时，压力设定为 12 bar。

当轻油温度降低至 + 5 °C 以下，将压力增大至 14 bar。

4) 燃烧头设定

调节燃烧头时，将设定点设在手册要求的数值加一点处。

举例： 按手册要求需将燃烧头设定在设定点 3.5。
实际操作中，设定值为 4.5。

5) 风机风门挡板设定

调节风门挡板，减少过量空气直至 Bacharach 黑度小于 1。

(例如：在尽可能少的过量空气条件下燃烧)。



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