Installation, use and maintenance instructions
安装，使用以及维护说明书

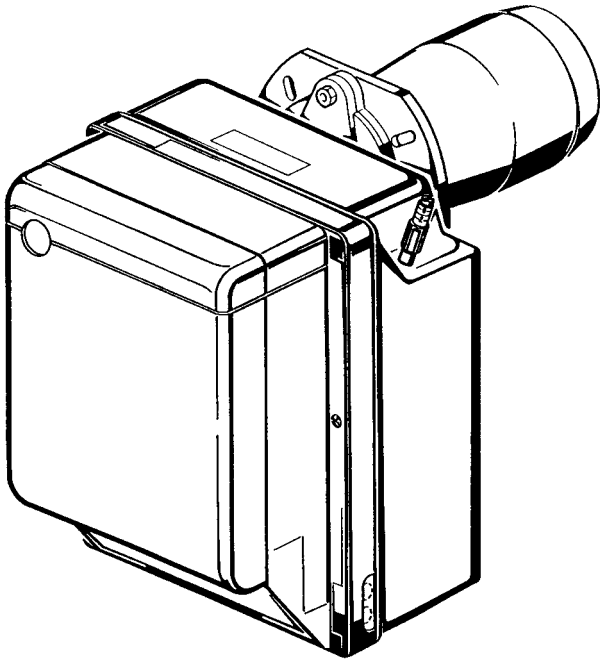
RIELLO

GB **Light oil burner**

CN **轻油燃烧器**

One stage operation
一段火运行

CE



Gulliver

CODE - 编码	MODEL - 型号	TYPE - 型号
20023828	RG4S	396 T1

20023744 (1) - 05/2010

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 - 2004/108/EC, Low Voltage 73/23/EEC - 2006/95/EC, Machines 98/37/EEC - 2006/42/EC and Efficiency 92/42/EEC.

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 – Photoresistance

8 – Hydraulic jack

9 – Start delaying device

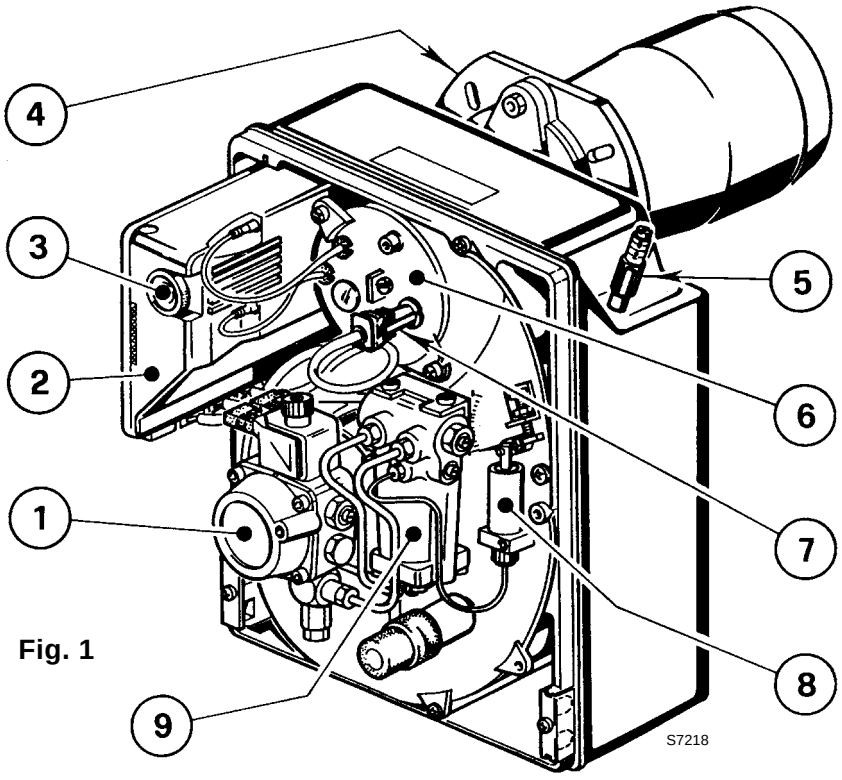


Fig. 1

1.1 BURNER EQUIPMENT

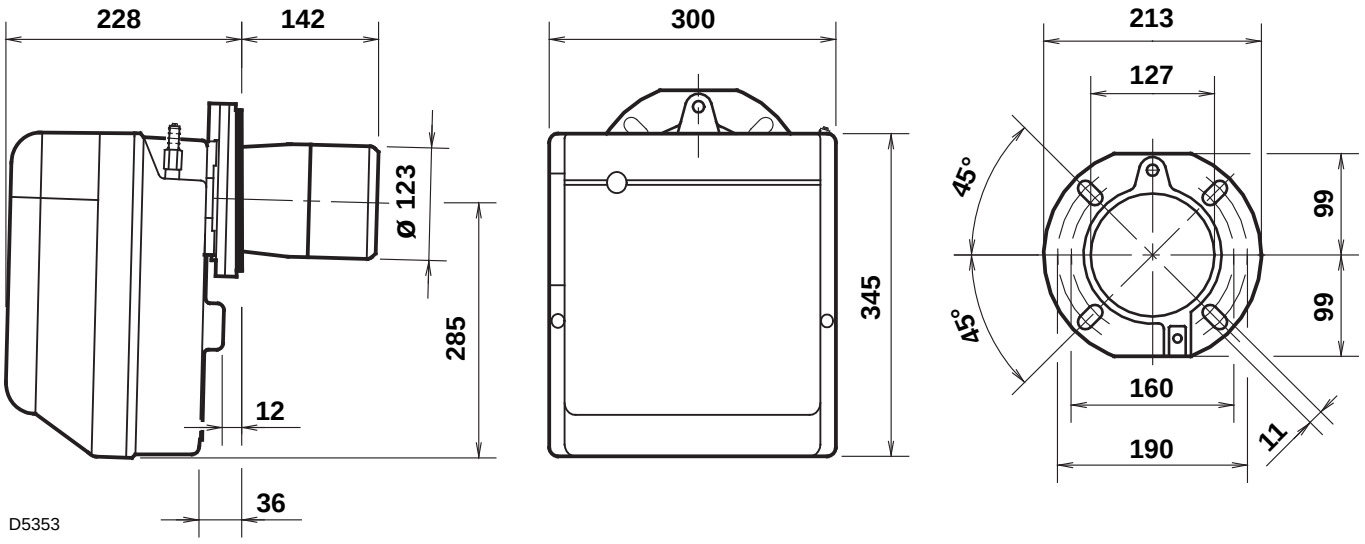
Flange with insulating gasket . . . .No. 1
Screw and nuts for flange . . . . . .No. 1
7 pin plug. . . . . .No. 1
Screw and nuts for flange to be fixed to boiler . No. 4
Flexible oil pipes with nipples. . . . . No. 2

2. TECHNICAL DATA

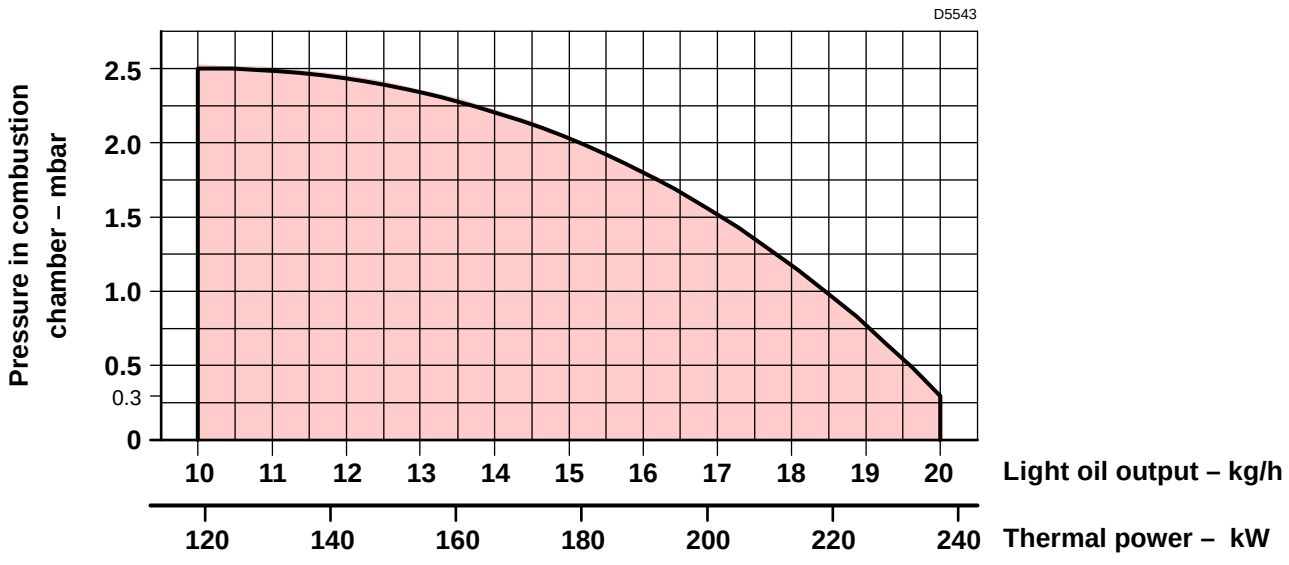
2.1 TECHNICAL DATA

TYPE	396 T1
Output - Thermal power	10 – 20 kg/h - 118.5 – 237 kW
Fuel	Light oil, max. viscosity at 20°C: 6 mm^2/s
Electrical supply	Single phase, ~50Hz 230 V ± 10%
Motor	Run current 2 A – 2730 rpm – 286 rad/s
Capacitor	6.3 μF
Ignition transformer	Secondary 8 kV – 16 mA
Pump	Pressure: 8 – 15 bar
Absorbed electrical power	0.39 kW

2.2 OVERALL DIMENSIONS



2.3 WORKING FIELD, (as EN 267)



3. INSTALLATION

3.1 BOILER FIXING

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

Fig. 2

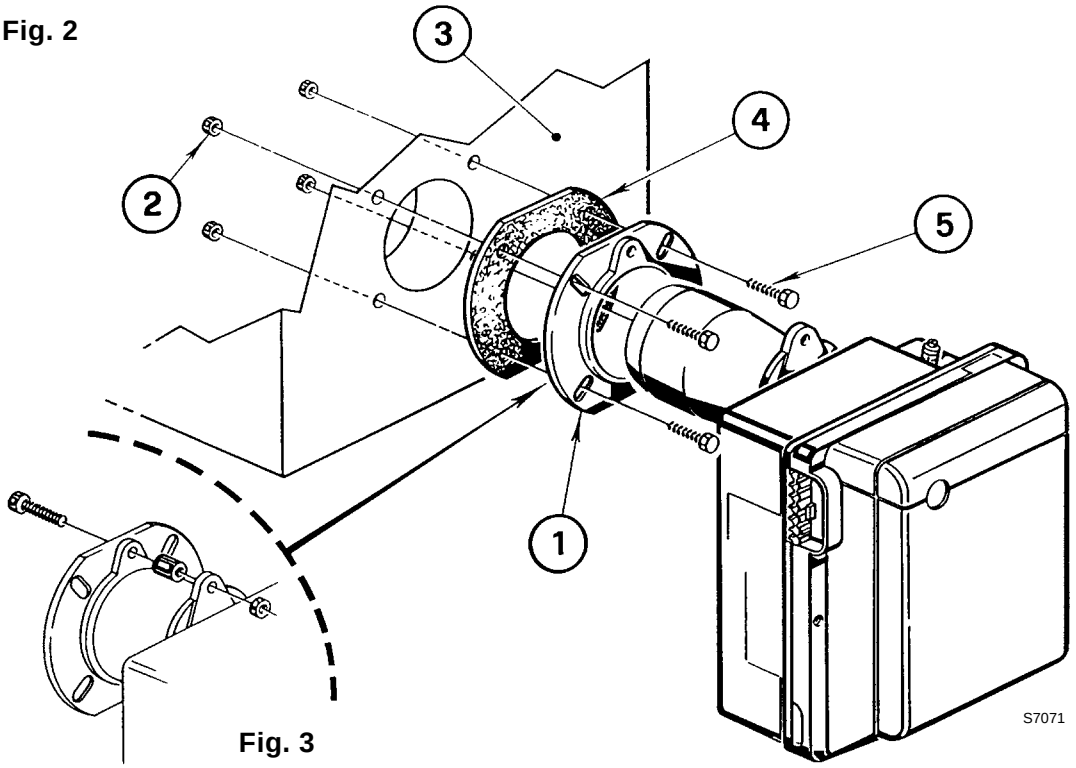


Fig. 3

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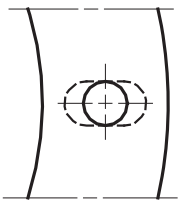


Fig. 4

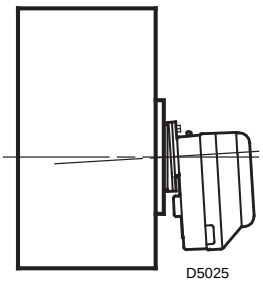


Fig. 5

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).

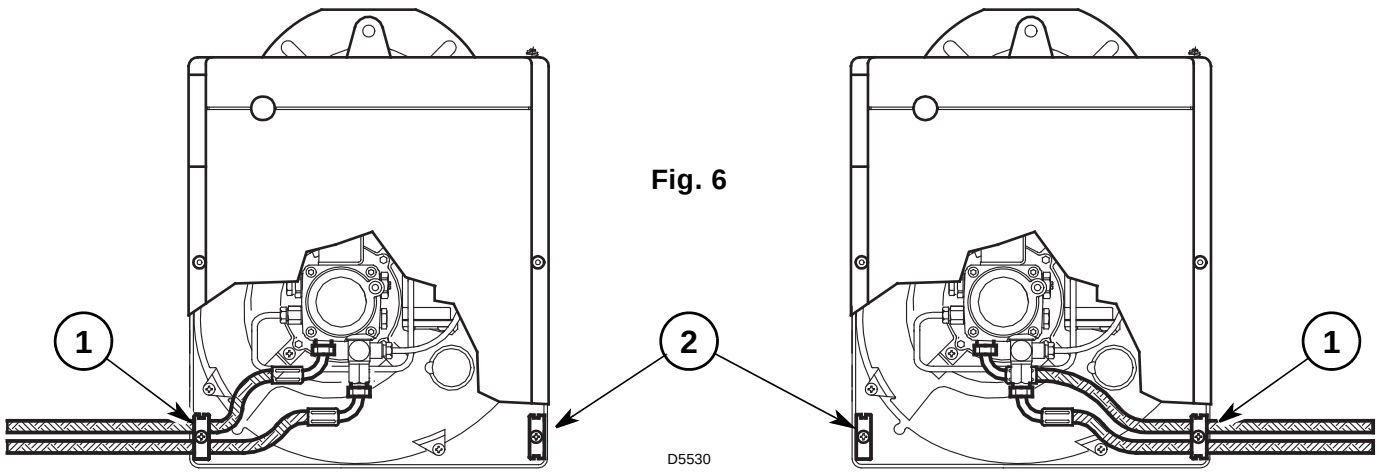


Fig. 6

3.3 HYDRAULIC SYSTEMS

WARNING:

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

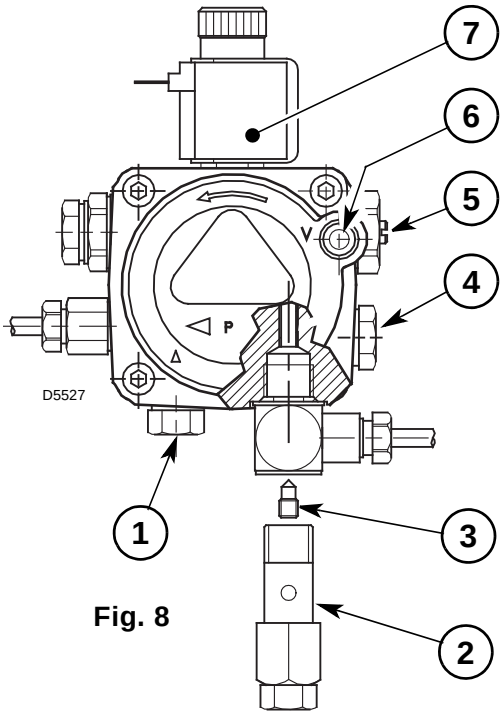


Fig. 8

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

SYSTEM NOT PERMITTED IN GERMANY

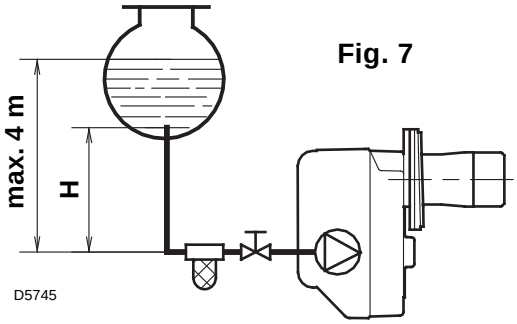


Fig. 7

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. 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 (fig. 10) 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

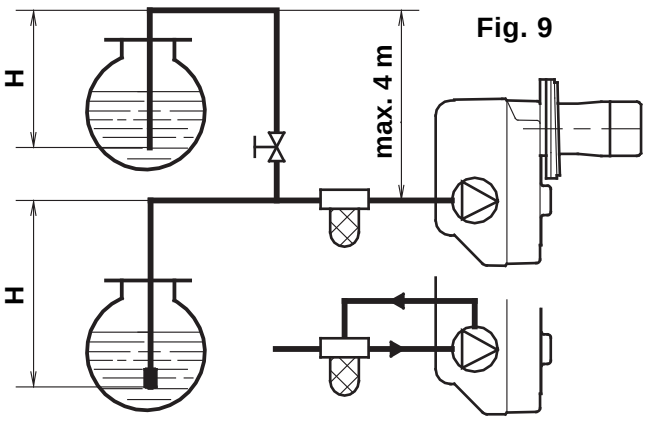


Fig. 9

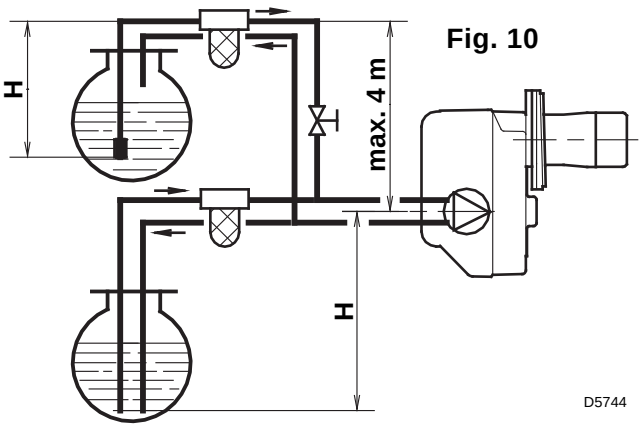


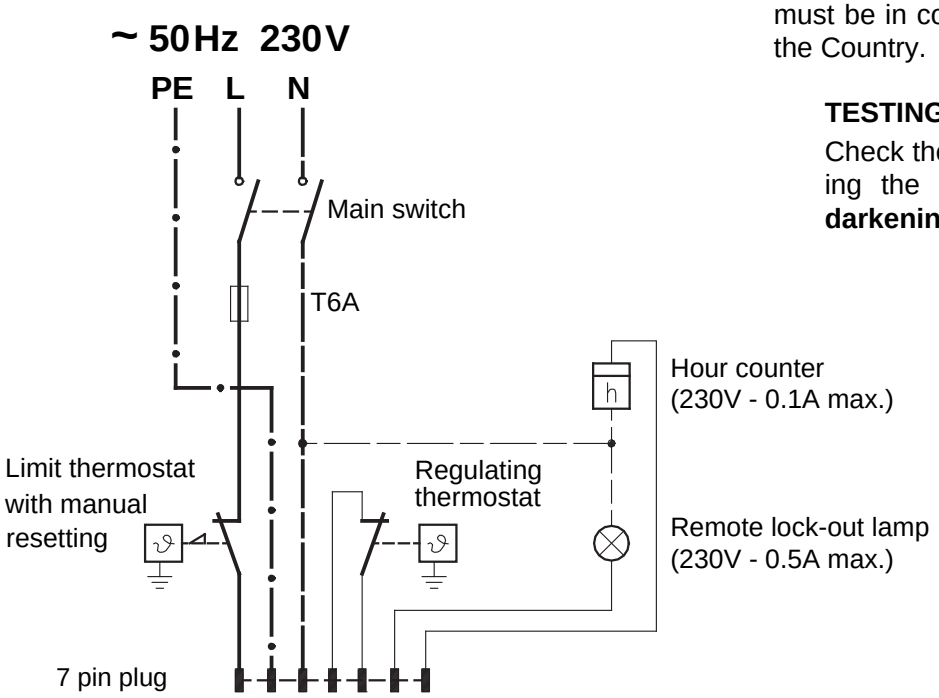
Fig. 10

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

3.4 ELECTRICAL WIRING

WARNING

DO NOT EXCHANGE NEUTRAL WITH PHASE



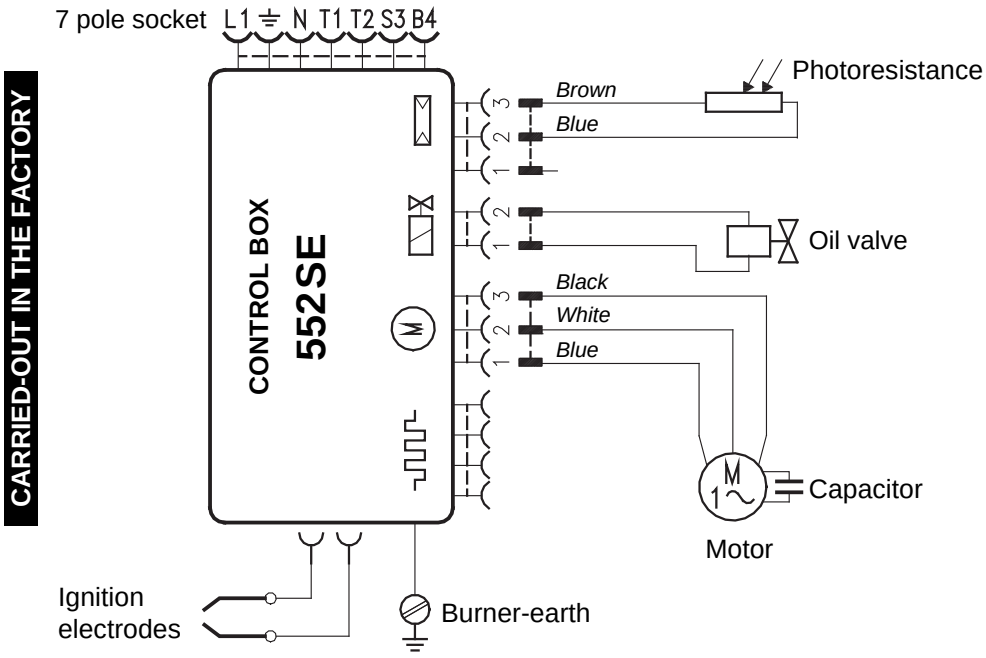
NOTES:

– Wires of 1 mm^2 section.

– 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.



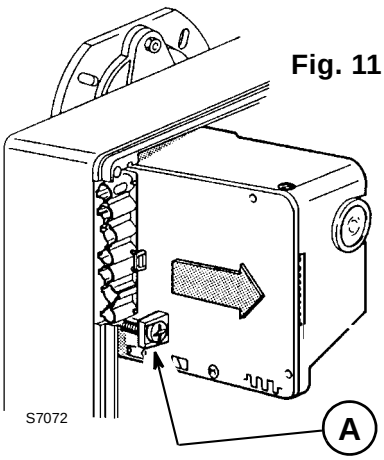


Fig. 11

CONTROL BOX

To remove the control-box from the burner, loosen screw (**A**, fig. 11) after removing all components, the 7 pin plug **and earth wire**.

In case of disassembly of the control box, retighten the screw (A) with a torque wrench setting of 1 – 1.2 Nm.

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, 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 schedule.

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.

Nozzle		Pump pressure	Burner output	Combustion head adjustment	Air damper adjustment	
					Low-flame	High-flame
GPH	Angle	bar	kg/h ± 4%	Set-point	Set-point	Set-point
2.50	60°	12	10.0	0	0.2	1.4
3.00	60°	12	12.0	1	0.4	2.1
3.50	60°	12	14.0	2.5	0.7	3.0
4.00	60°	12	16.1	4	0.9	3.5
4.50	60°	12	18.1	6	1.4	4.5
4.50	60°	14	19.5	6	1.4	6.0

4.2 RECOMMENDED NOZZLES:

Monarch type R
Delavan type W *(up to 3,00 GPH)*
Delavan type B *(over 3,00 GPH)*
Steinen type SS - S; Danfoss type B - S

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

- Remove nozzle-holder assembly (1) after loosing screws (2) and nut (3), remove the small cables (4) from the control box and the photoresistance (5).
- Withdraw the small cables (4) from the electrodes, remove the diffuser disc-holder assembly (8) from the nozzle-holder assembly (1) after loosing screw (3, fig. 13, page 7).
- **Screw the nozzle (9) correctly and tighten it as shown in fig. 12.**

Attention

During the reassembly of the nozzle-holder assembly screw the nut (3) as shown in the figure below.

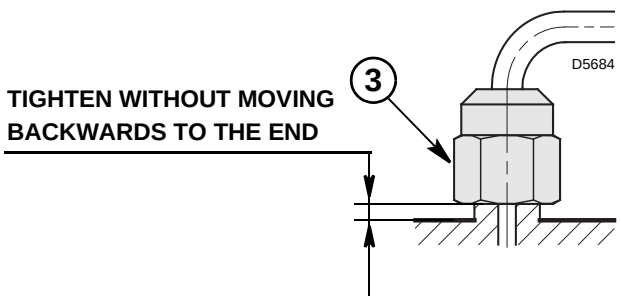
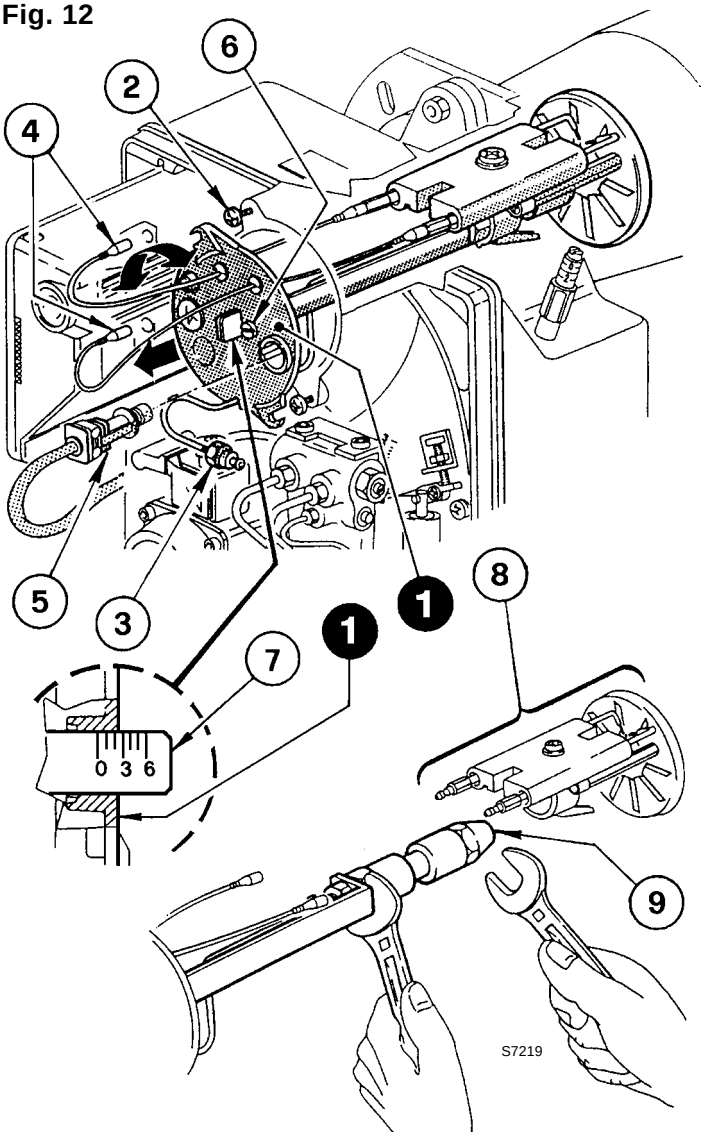


Fig. 12



4.3 COMBUSTION HEAD SETTING (see fig. 12, page 6)

It depends on the output of the burner and is carried out by rotating clockwise or counterclockwise the setting screw (6) until the set-point marked on the regulating rod (7) is level with the outside plane of the nozzle-holder assembly (1).

- In the sketch the combustion head is set for an output of 3.50 GPH at 12 bar.
  The set-point **2.5** of the regulating rod (7) is at the same level with the outside plane of the nozzle-holder assembly (1) as shown in the schedule.

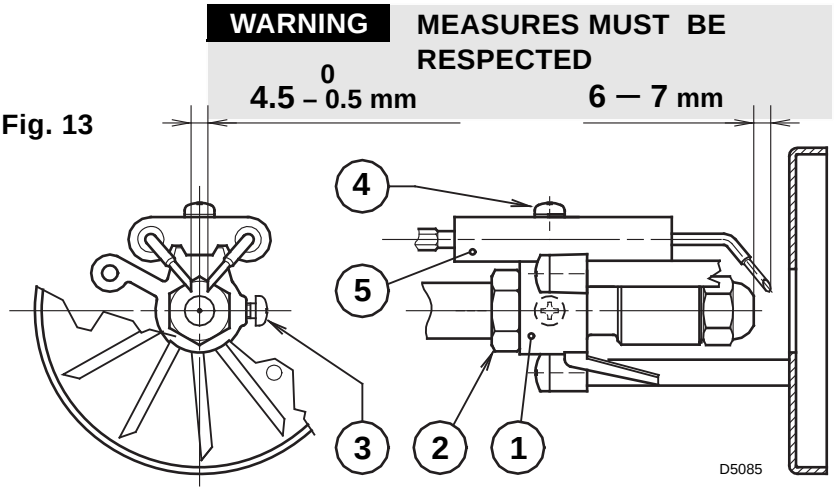
4.4 ELECTRODES ADJUSTMENTS (see fig. 13)

ATTENTION

Lean the diffuser disc-holder assembly (1) on the nozzle-holder (2) and lock it by screw (3). For prospective adjustments loosen screw (4) and move the electrodes assembly (5).

To have access to the electrodes carry out operation as described in **chapter 4.2** (page 6) **"RECOMMENDED NOZZLES".**

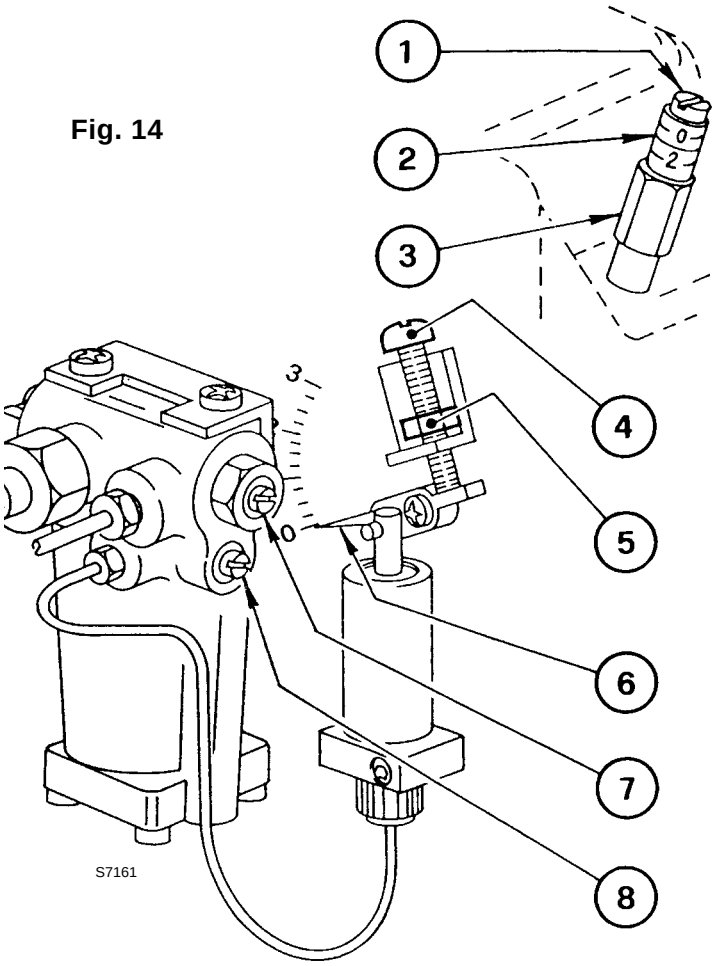
Fig. 13



4.5 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 9 bar.
After 3 - 9 seconds, it automatically increases to 12 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.

Fig. 14



■ 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).

ADJUSTMENT START DELAYING DEVICE

This is set at 9 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 (7), always after having loosened screw (8).

■ HIGH-FLAME SETTING (see fig. 14, page 7)

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

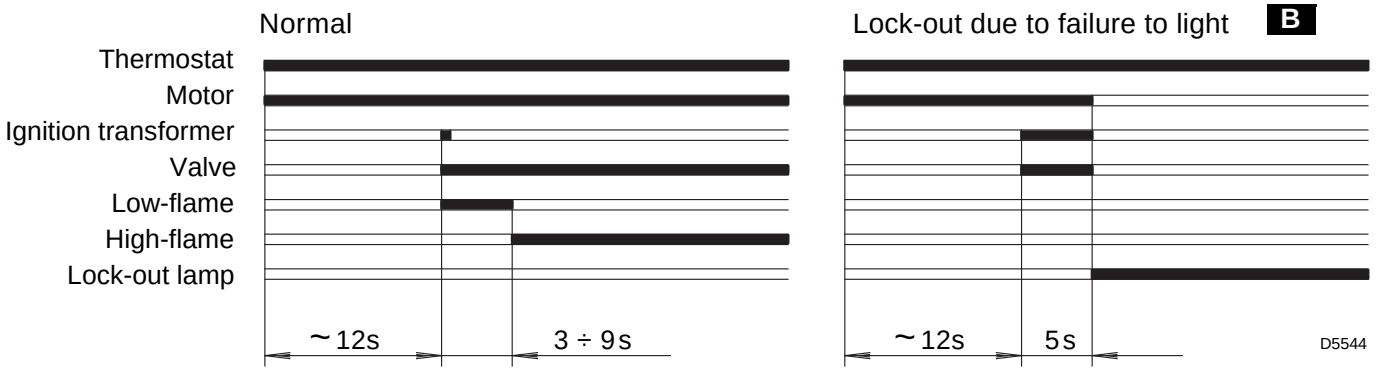
This is set at 12 bar at the factory.

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.**

4.6 BURNER START-UP CYCLE



B 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, (7, fig. 1, page 1).
- Check for correct fuel consumption.
- Replace the nozzle (see fig. 12, page 6) and check the correct position of electrodes (fig. 13, 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
The burner will not start when the adjustment 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 thermostat limit is not lock out.
	The photoresistance sees false light.	Eliminate the light.
	Start thermostats are faulty.	Replace them.
	The connections in the control box are wrongly inserted.	Check and connect completely all the plugs.
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.

目录

1. 燃烧器描述

一段火轻油燃烧器 .

➤ 燃烧器保护等级为 IP 40, EN 60529.

➤ 燃烧器符合下列标准 : EMC 89/336/CEE - 2004/108/CE, 低电压 73/23/CEE - 2006/95/CE, 机械 98/37/EEC - 2006/42/EC 和效率 92/42/EEC.

1 – 油泵

2 – 控制盒

3 – 带锁定指示灯的复位按钮

4 – 带绝热石棉垫的法兰

5 – 风门调节机构

6 – 喷嘴座

7 – 光电管

8 – 液压缸

9 – 启动延迟装置

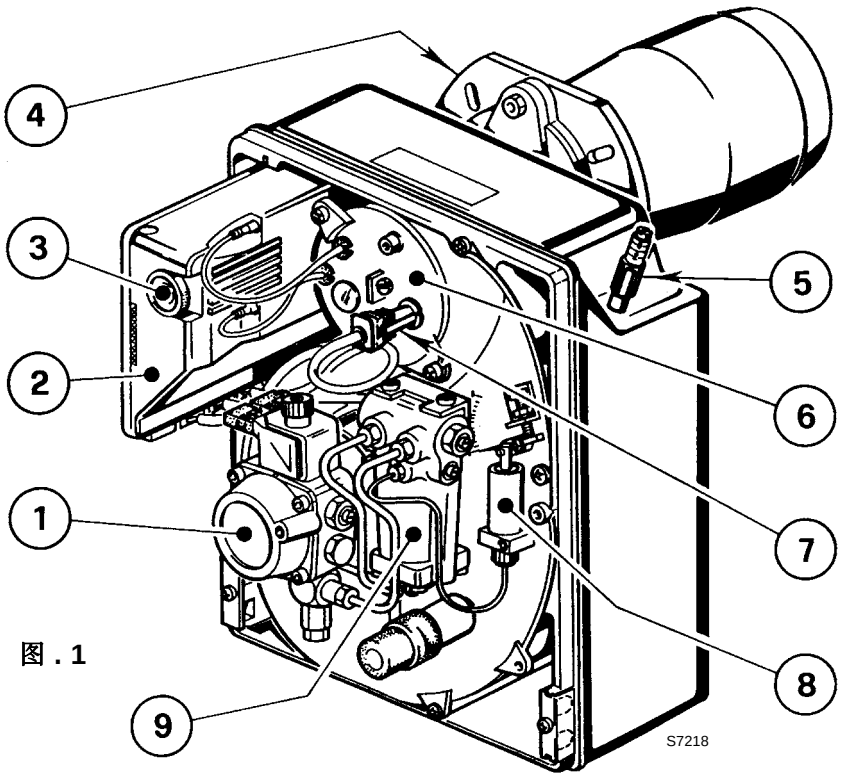


图 . 1

1.1 燃烧器附件

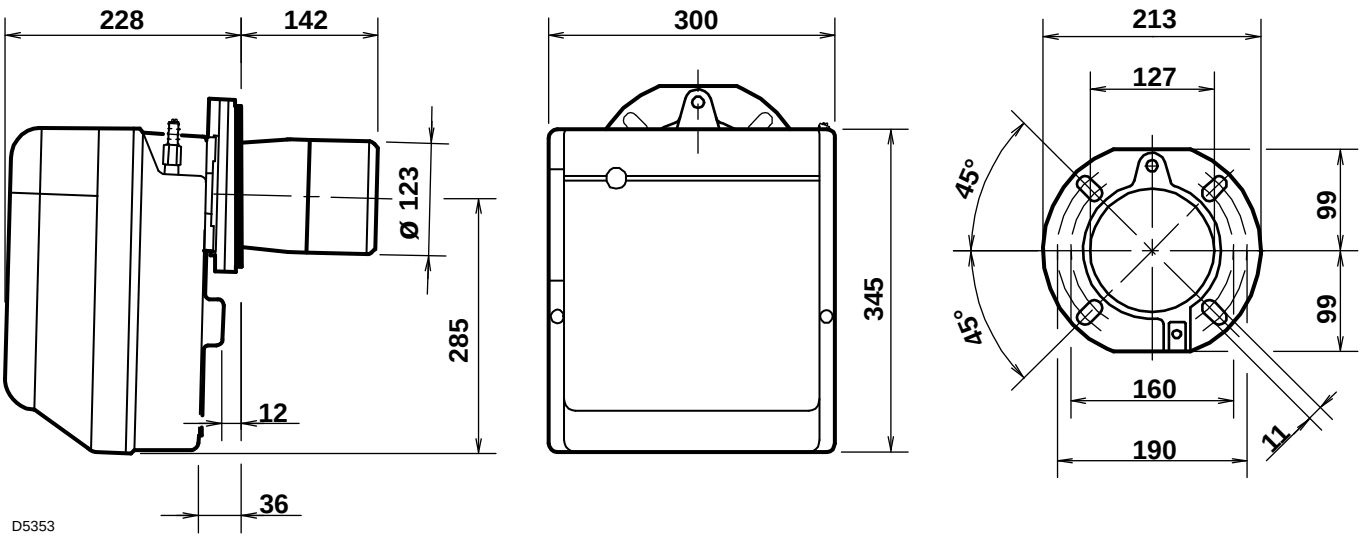
带绝热石棉垫的法兰 . . . . . 数量 . 1
法兰用螺栓螺母 . . . . . 数量 . 1
7 针插头 . . . . . 数量. 1
将法兰安装到锅炉上的螺栓螺母 . . . . . 数量 . 4
带变径头的油软管 . . . . . 数量 . 2

2. 技术参数

2.1 技术参数

类型	396T1
热出力	10 – 20 kg/h - 118.5 – 237 kW
燃料	轻油 , 在 20 °C 时粘度 4 – 6 mm^2/s
电源	单相 , ~50Hz 230V ± 10%
马达	运行电流 2A – 2730 rpm – 286 rad/s
电容	6.3 µF
点火变压器	次级 8 kV – 16 mA
油泵	压力： 8 – 15 bar
电功耗	0.39 kW

2.2 外观尺寸



2.3 工作范围 (按照 EN 267)

3. 安装

3.1 锅炉安装

➤ 将螺栓和螺母放在法兰 (1) 上 , (参见图 . 3).
➤ 如有必要，对石棉垫扩孔 (4), (参见图 . 4).
➤ 用螺栓 (5) 和螺母 (2) 将法兰 (1) 安装到炉门 (3) 上，**必须将石棉垫 (4) 放在中间** , (参见图 . 2).
➤ 安装后，确保燃烧器如 图 5 所示，燃烧器微微向上倾斜 .

图 . 2

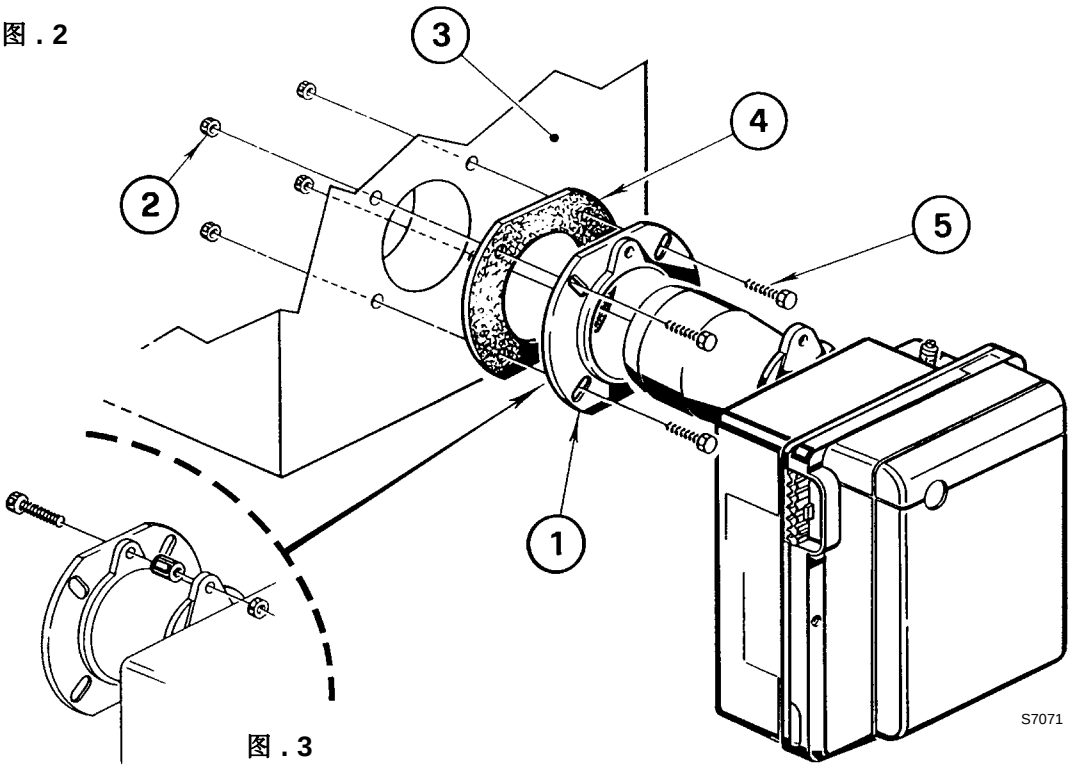


图 . 3

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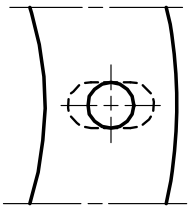


图 . 4

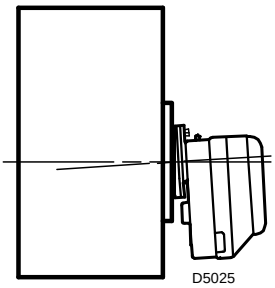


图 . 5

3.2 燃料供给

燃烧器允许油软管从任何一边进入，左侧或右侧 .
根据燃油管线的位置 (到燃烧器的右侧或左侧) 对应的连接板 **(1)** 和堵塞板 **(2)** 应保留 , (参见图 . 6).

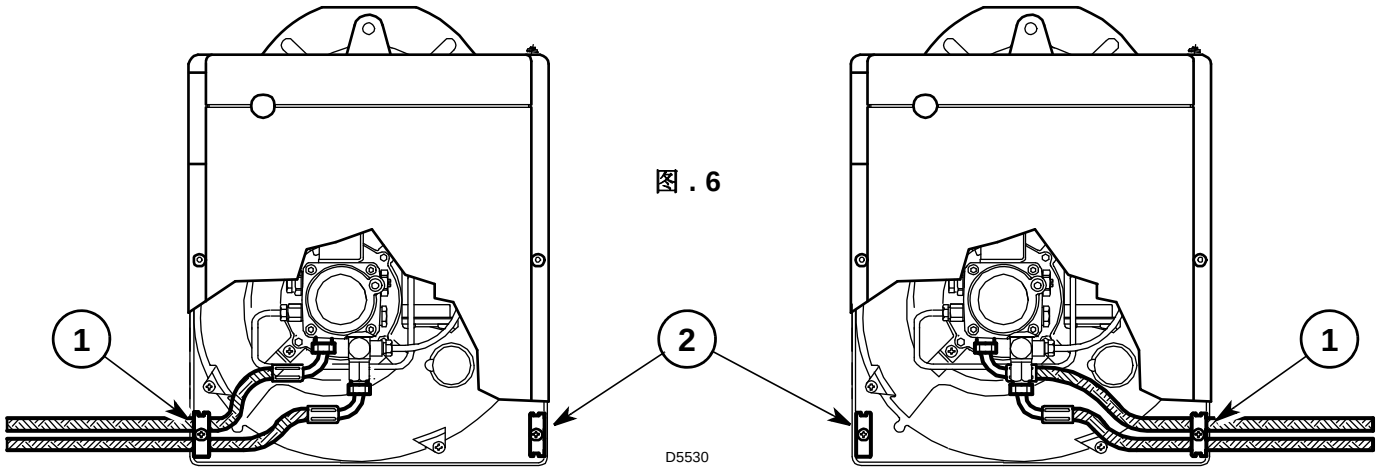


图 . 6

3.3 液压系统

警告：

- **设计时泵是按双管运行的。如单管运行，须拧下回油螺钉 (2), 移开旁路螺钉 (3) 后再拧紧螺钉 (2). (参见图 .8).**
- **在供油管路上必须装滤网 .**
- **启动燃烧器之前，确保回油管无堵塞 . 过大的背压会使泵的密封损坏**

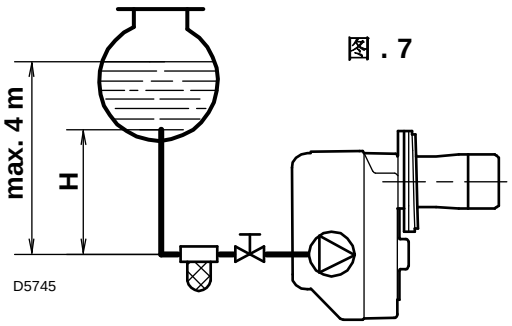


图 . 7

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

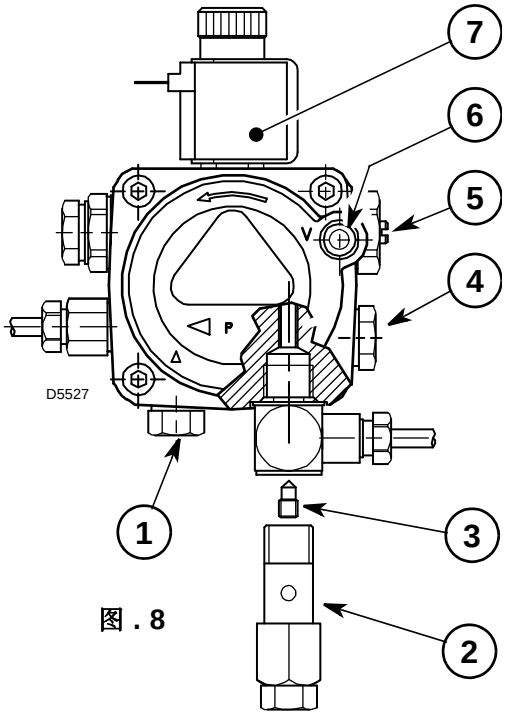


图 . 8

1 *- 供油管*
2 *- 回油管*
3 *- 旁路螺钉*
4 *- 压力表接口*
5 *- 压力调节螺钉*
6 *- 真空表接口*
7 *- 阀门*

油泵启动：

在图 . 7 所示系统中，松开油压表接口螺钉 (6, 图 . 8) 直到有油流出就可以了 .

在图 . 9 和图。 10 所示系统中 启动燃烧器直到油泵充油 . 如在燃料到达油泵之前锁定，至少等 20 秒才能再次启动 . 油泵进油真空度不能超过 0.4 bar (30 cm Hg). 大于这一值，气体可能从油中分离出来，所以油管一定要完全拧紧。

在低位油箱系统中 (图 . 10) 回油管应回到油箱中与入油管相同的水平高度，在这种情况下，不需止回阀，然而如果回油管回到比燃料表面高的位置，必须装一个止回阀。

这种方法不如前一种方法，因为阀门有可能漏油 .

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

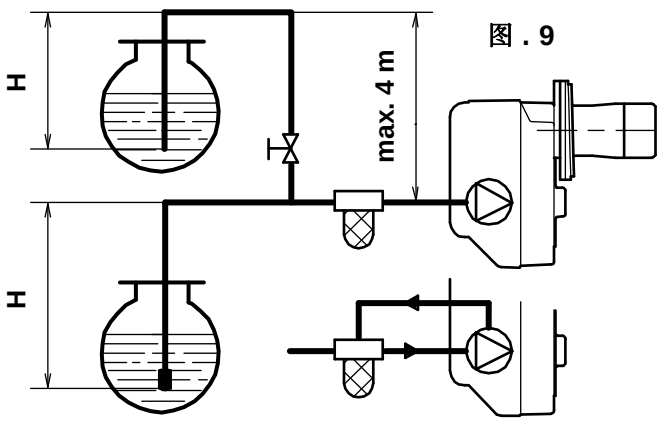


图 . 9

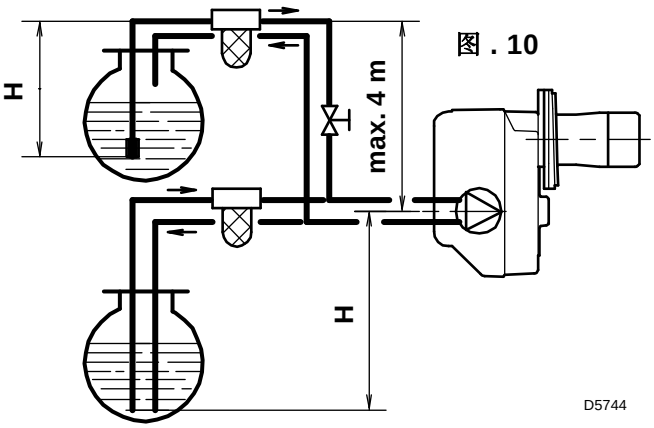


图 . 10

H = 高度差 ; **L** = 供油管最大长度 ; **I. D.** = 油管内径 .

3.4 电气连接

警告

不要将火线与零线接反

注意：

– 电线截面积：1 mm^2 .

– 连线的安装必须符合所在国家的强制规定 .

试验：

– 断开温控器开关，检查燃烧器是否停机 .
.

– 遮黑光电管，检查燃烧器是否锁定 .

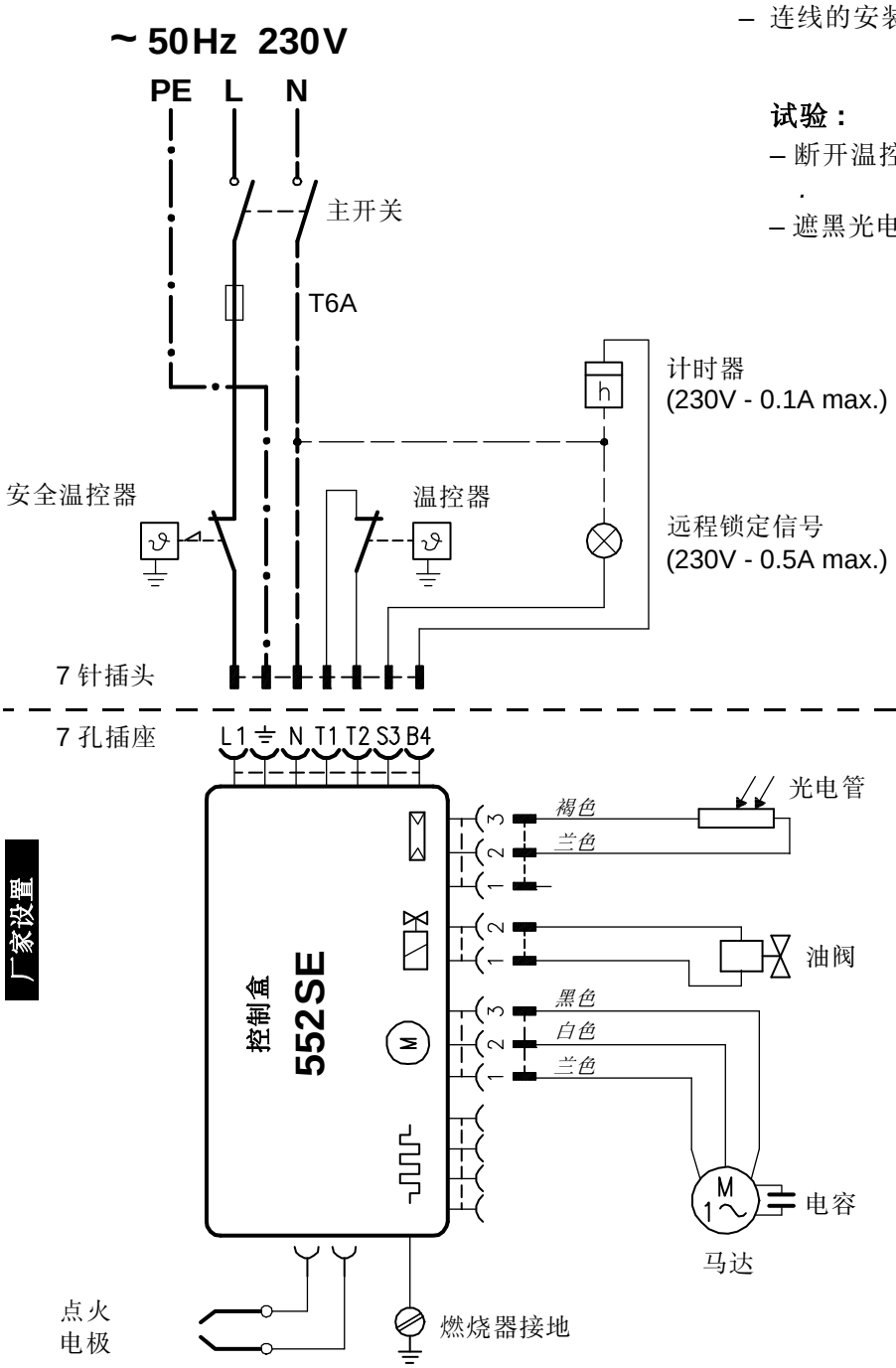
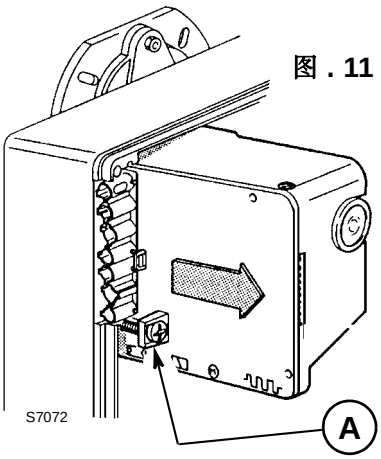


图 . 11



控制盒

要移去控制盒，在移走所有组件：7 针插头和地线后，松开螺钉 **(A, 图** . 11) 后，沿箭头方向拔出 .

在移开控制盒后，用螺丝刀（ 1 – 1.2 Nm ）紧上螺钉 **(A) .**

4. 工作

4.1 燃烧调节

根据效率标准 92/42/EEC，调试燃烧器必须参考锅炉的使用说明 , 这一工作包括调整烟气中的 CO 和 CO_2 ，烟温及锅炉中的平均水温。

要达到所需要的出力，应按照下表选择合适的喷嘴，调整泵压，设定燃烧头和风门 .

表中的数值由 CEN 锅炉测得 (按照 EN 267).
参考条件：12.5% CO_2 ，在海平面，油温和室温为 20 °C.

喷嘴		泵压	燃烧器输出	燃烧头设置	风门调节	
					小火	大火
GPH	**角度**	**bar**	**kg/h ± 4%**	**设定点**	**设定点**	**设定点**
2.50	60°	12	10.0	0	0.2	1.4
3.00	60°	12	12.0	1	0.4	2.1
3.50	60°	12	14.0	2.5	0.7	3.0
4.00	60°	12	16.1	4	0.9	3.5
4.50	60°	12	18.1	6	1.4	4.5
4.50	60°	14	19.5	6	1.4	6.0

4.2 推荐的喷嘴：

Monarch 类型 R
Delavan 类型 W *(最大到 3,00 GPH)*
Delavan 类型 B *(超过 3,00 GPH)*
Steinen 类型 SS - S; Danfoss 类型 B - S

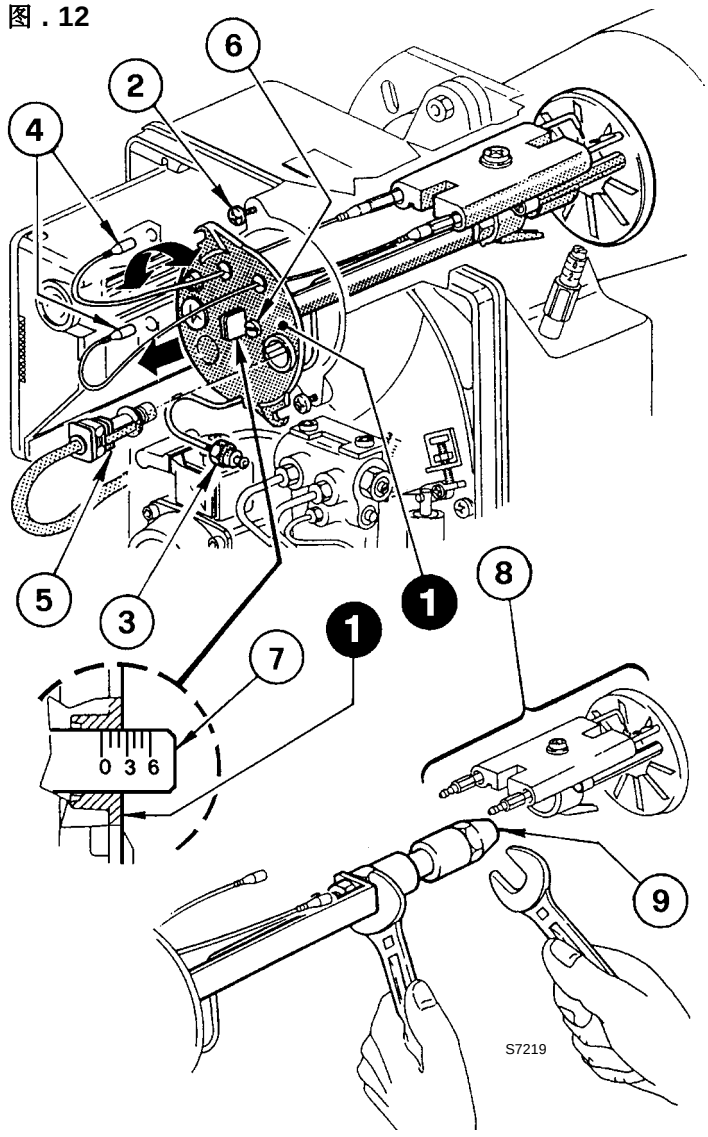
按如下步骤安装喷嘴 (参见图 . 12):

➤ 拧松螺钉 (2) 和螺母 (3) 后取下喷嘴座 (1), 从控制盒和光电管 (5) 取下连接电缆 (4).

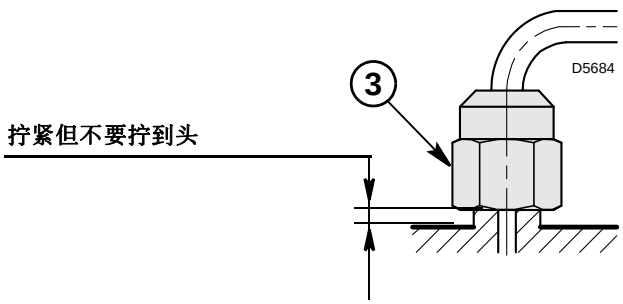
➤ 从电极上移去电缆 (4) , 松开螺钉 (3, 图. 13,P7)后从喷嘴座 (1) 上移去 旋流盘 (8) .

➤ **正确地拧上喷嘴 (9) 按图 . 12 所示拧紧 ..**

图 . 12



注意
如图所示，在重新安装喷嘴座时应拧紧螺母 (3) .



4.3 燃烧头设定 (参见图 . 12,P. 6)

根据燃烧器的出力 , 通过顺时针和逆时针转动设定螺丝 (6) 来进行 , 直到设定的调节杆 (7) 上的刻度点与喷嘴座 (1) 的外边缘对齐 .

➤ 在简图中 , 燃烧器的设定对应于 3. 50 GPH 油压为 12 bar 时的出力 .
如图所示 , 调节杆 (7) 上的设定点 2. 5 与喷嘴座 (1) 的外边缘对齐 .

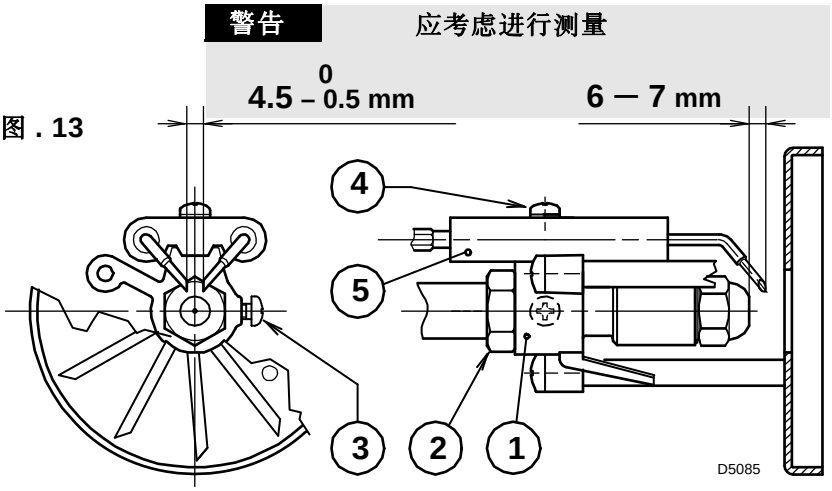
4.4 电极的调整 (参见图 . 13)

注意

将旋流盘组件 (1) 放在喷嘴座 (2) 上 , 用螺钉 (3) 锁紧 .
要调整时 , 松开螺钉 (4) 移去电极装置 (5).

要转动电极 , **按 节 "4.2 推荐的喷嘴 " 所述来进行** (P. 6).

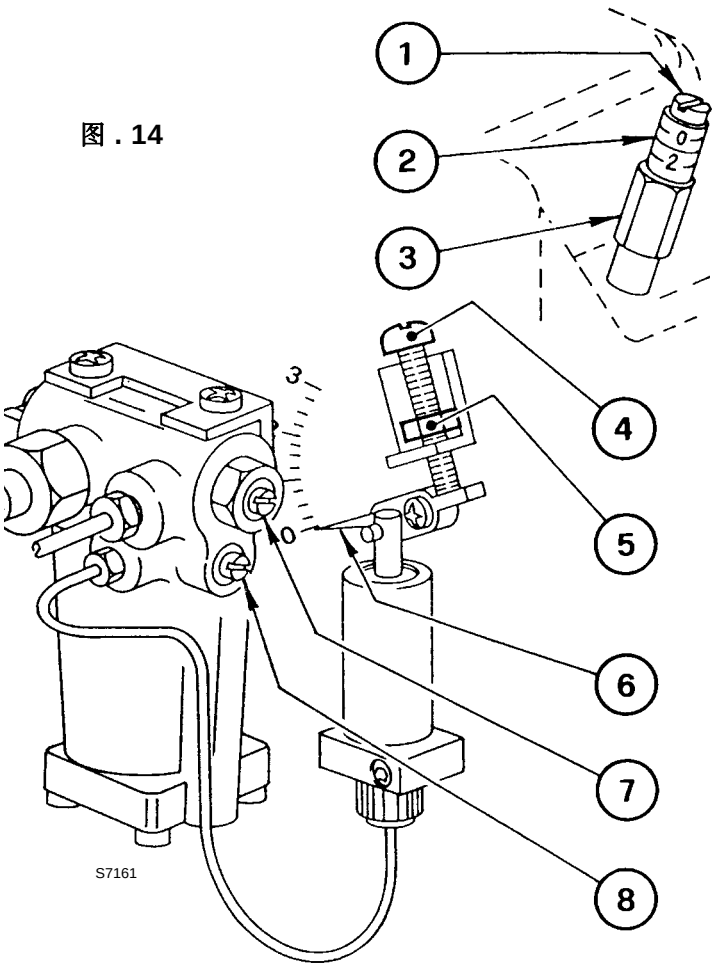
图 . 13



4.5 泵压及空气输出

不考虑锅炉型号 , 为了保证燃烧器的顺利启动 , 安装了一个液压设备 , 独立于控制盒来降低燃料和空气量 .
在点火时 , 喷嘴处的压力为 9 bar.
3 - 9 秒后 , 自动升到 12 bar.
空气流量在最初时调节到低流量 , 在油压转变时会自动转成大火流量 .

图 . 14



■ 点火低流量时的设定 (参见图 . 14)

风门的调节

拧松螺钉 (8) 约一圈 ; 这时燃烧器保持在小火的位置 .
拧松螺母 (5), 转动螺钉 (4) 直到指针 (6) 到达指定的位置 .
然后锁定螺母 (5) 及拧紧螺钉 (8).

启动延迟装置的调节

出厂设定为 9 bar .
压力表必须安装在接口处 (4, 图 . 8, P 4).
如有必要重新设定压力或调节这个压力 , 通常应在松开螺钉 (8) 后调节螺钉 (7).

■ **大火的设定 (参见图 . 14, P 7)**

风门调节

松开螺母 (3), 转动螺钉 (1), 直到指示器 (2) 在所需的位置 .
然后锁定螺母 (3).

泵压调节

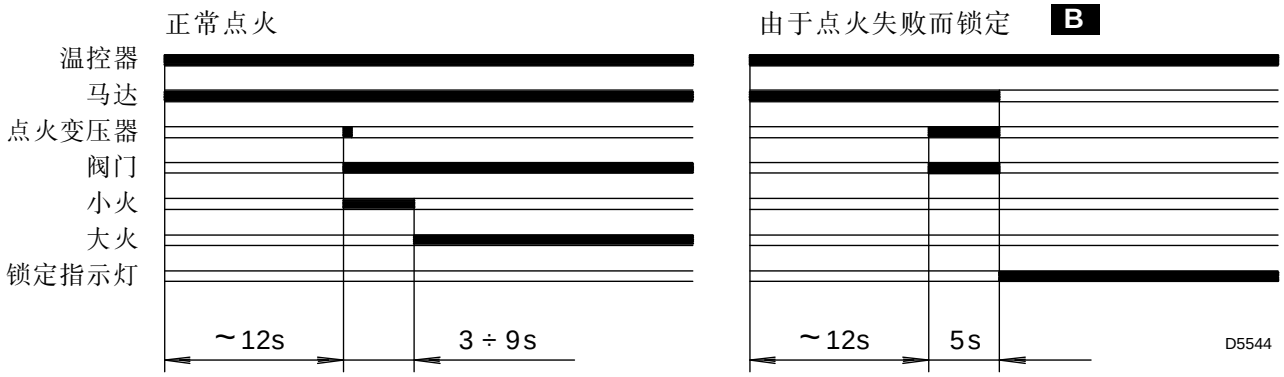
出厂设定为 12 bar .

压力表必须安装在接口处 (4, 图 . 8, P 4).

如有必要重新设定压力或调节这个压力 , 可调节压力调节螺钉 (5, 图 . 8,P 4).

燃烧器关机后 , 风门会自动关闭 , **除非烟囱处的最大负压力超过 0. 5mbar.**

4.6 燃烧器启动程序



B 由控制盒上的信号灯指示燃烧器锁定 (3, 图 . 1, P 1).

5. 维护

燃烧器需要由有资格的技术人员按照当地法规和标准进行定期性的维护 .

维护对于燃烧器的可靠性是必要的 , 可避免燃料的过量消耗以及随之而来的污染 .

在进行维护清理之前 , 必须将系统的主电源开关关掉 , 以切断燃烧器的电源 .

基本的检查有 :

➤ 检查进油管及回油管是否有堵塞或凹陷 .

➤ 清理进油管及油泵中的过滤器 .

➤ 清理光电管 , (7, 图 . 1, P. 1).

➤ 检查燃料消耗是否正常 .

➤ 如需要更换喷嘴 (图 . 12,P. 6) 和检查电极的位置 (图 . 13, P. 7).

➤ 清理燃烧头中燃料出口和旋流盘 .

➤ 让燃烧器不间断地运行 10 分钟 , 按手册正确设置所有组件 , **然后进行燃烧测试以检查以下各项 :**

- 烟囱处的烟温 ;
- CO_2 (%)的含量;
- CO (ppm)的含量;
- 测量烟气中的黑度值 .

6. 故障 / 解决方法

下面是造成启动故障或燃烧器非正常运行等问题的原因及相应的解决方法 .
故障通常会造成位于控制盒 (3, 图 . 1, P. 1) 复位按钮键中的锁定指示灯亮 .
当锁定灯亮时，只有按复位按钮燃烧器才会重新启动，此后如果燃烧器运行正常，锁定可以归因于暂时故障 .
如果继续锁定，一定要查找原因，并加以解决 .

故障	可能的原因	解决方法
当温控器闭合时，燃烧器不启动 .	无电源 .	检查 7 针插头中的 L1-N 线之间的电压是否存在 .
		检查保险丝的状况 .
		检查安全温控器是否锁定 .
	光电管感受到虚假火焰 .	消除光源 .
	温控器失效 .	更换 .
	控制盒的接线错误 .	检查并重新连接
在预吹扫及点火周期时燃烧器运行正常，但 5 秒后锁定 .	光电管脏 .	清理 .
	光电管失效 .	更换 .
	脱火或熄火 .	检查油泵压力及燃料的输出 .
		检查风量 .
		更换喷嘴 .
		检查电磁阀线圈 .
燃烧器启动并有点火延迟 .	点火电极位置不对 .	按手册的说明进行调节 .
	风量过大 .	按手册的说明设定空气出力 .
	喷嘴脏或损坏 .	更换 .

注意
制造商不能对由于安装或燃烧器调节错误，由于不合适的或不合理的应用，由于未按照说明书指示操作，或由于非专业人员的参与而造成的人，动物的伤害负责任 .

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