

GB **Dual fuel light oil/gas burners**

CN **双燃料轻油 / 燃气燃烧器**

Two-stage operation
两段火运行



RLS

CODE - 代码	MODEL - 型号	TYPE - 类型
20079208	RLS 70	687 T1
20079215	RLS 100	688 T1
20079217	RLS 130	689 T1



Original instructions

说明书原文翻译

DECLARATION	page 2
TECHNICAL DATA	3
Electrical data	3
Burner description	4
Packaging - Weight	4
Max. dimensions	4
Standard equipment	4
Firing rates	5
Test boiler	5
Commercial boilers	5
INSTALLATION	6
Boiler plate	6
Blast tube length	6
Securing the burner to the boiler	6
Choice of nozzles for the 1st and 2nd stage	7
Nozzle assembly	7
Adjustments before first firing (light oil operation)	7
Electrical system	9
Electrical connections	10
Light oil supply	11
Hydraulic connections	11
Hydraulic system	12
Pump	12
Pump priming	12
Burner calibration (light oil operation)	12
Servomotor	13
Gas feeding	14
Gas train	14
Gas pressure	15
Adjustment before firing (gas operation)	16
Burner starting	16
Burner firing	16
Burner calibration	16
LPG - Propane - Butane operation	18
Burner operation	19
MAINTENANCE	20
Gas combustion checks	21
FAULTS - POSSIBLE CAUSES - SOLUTIONS	22
ACCESSORIES	23

Declaration of conformity in accordance with ISO / IEC 17050-1

Manufacturer: RIELLO S.p.A.
Address: Via Pilade Riello, 7
37045 Legnago (VR)
Product: Dual fuel light oil/gas burner
Model: RLS 70 - 100 - 130

These products are in compliance with the following Technical Standards:

EN 676
EN 267
EN 12100

and according to the European Directives:

MD	2006/42/EC	Machine Directive
LVD	2006/95/EC	Low Voltage Directive
EMC	2004/108/EC	Electromagnetic Compatibility

The quality is guaranteed by a quality and management system certified in accordance with UNI EN ISO 9001.

Legnago, 10.10.2013

Executive Director
RIELLO S.p.A. - Burner Department
Mr. G. Conticini



Research & Development Director
RIELLO S.p.A. - Burner Department
Mr. R. Cattaneo



TECHNICAL DATA

MODEL			RLS 70	RLS 100	RLS 130
Output ⁽¹⁾ Delivery ⁽¹⁾	2nd stage	kW kg/h	465 - 817 39 - 69	698 - 1163 59 - 98	930 - 1512 78 - 130
	min. 1st stage	kW kg/h	232 19	349 29,5	465 39
Fuel			LIGHT OIL, viscosity at 20 °C: 6 mm ² /s max (1,5 °E - 6 cSt) NATURAL GAS: G20 (methane) - G21 - G22 - G23 - G25 GPL - G30 (propane) - G31 (butane)		
Gas pressure at maximum delivery ⁽²⁾ Gas: G20/G25/G31		mbar	7.4/10.6/9.4	11.5/17.0/13.1	14.1/12.1/18.8
Operation			- Intermittent (min. 1 stop in 24 hours) - Two-stage (high and low flame) and single-stage (all - nothing)		
Nozzles		number	2		
Standard applications			Boilers: water, steam, diathermic oil		
Ambient temperatur		°C	0 - 40		
Combustion air temperature		°C max	60		
Pump	delivery (at 12 bar)	kg/h	220		
	pressure range	bar	10 - 20		
	fuel temperatur	° C max	60		
Noise levels ⁽³⁾	Sound pressure	dBA	74	77.5	80
	Sound power		85	89.5	91

(1) Reference conditions: Ambient temperature 20°C - Barometric pressure 1000 mbar - Altitude 100 m s.l.m.

(2) Upstream pressure of the gas train 1)(A)p.13 as indicated by EN676 Standard, with 0 mbar in the combustion chamber and at the maximum burner output.

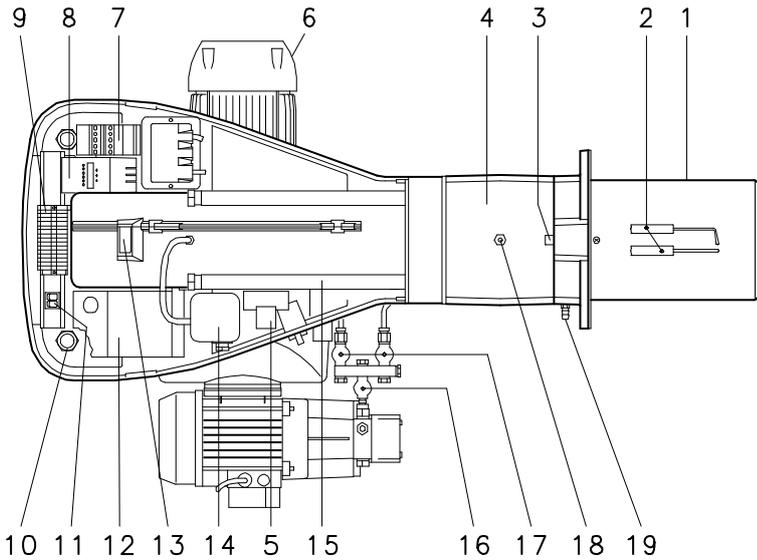
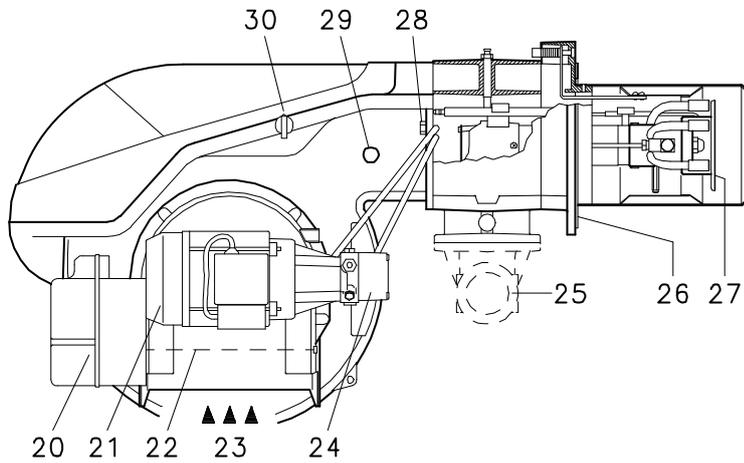
(3) Sound pressure measured in manufacturer's combustion laboratory, with burner operating on test boiler and at maximum rated output. The sound power is evaluated, in line with the regulations, on a spherical surface centred on the burner and with a radius of 1 metre.

ELECTRICAL DATA

MODEL			RLS 70	RLS 100	RLS 130
Main electrical supply			3 ~ 230/400V 50Hz		
Control circuit power supply			1N ~ 230V 50Hz		
Fan motor IE2	rpm		2880	2870	2900
	Hz		50	50	50
	V		230 / 400	230 / 400	230 / 400
	W		1100	1500	2200
	A		4.3 - 2.5	5.9 - 3.4	7.9 - 4.6
Pump motor	rpm		2700		
	Hz		50		
	V		230		
	W		550		
	A		3.6		
Pump motor capacitor	µF		25		
Ignition transformer	V1 - V2		230 V - 2 x 5 kV		
	I1 - I2		1,9 A - 30 mA		
Absorbed electrical power	W max		2000	2400	3200
Protection level			IP 44		

BURNER CATEGORIES

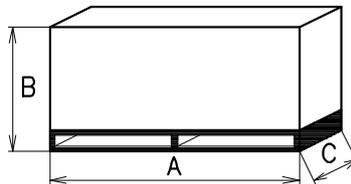
COUNTRY	CATEGORY
IT - AT - GR - DK - FI - SE	II ₂ H3B / P
ES - GB - IE - PT	II ₂ H3P
NL	II ₂ L3B / P
FR	II ₂ E _r 3P
DE	II ₂ ELL3B / P
BE	I ₂ E(R)B, I ₃ P
LU - PL	II ₂ E3B/P



(A)

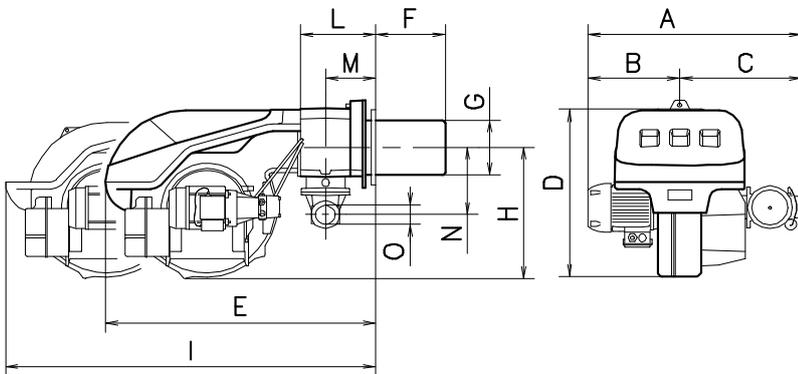
D1175

mm	A	B	C	kg
RLS 70	1405	1000	660	70
RLS 100	1405	1000	660	73
RLS 130	1405	1000	660	76



(B)

D36



mm	A	B	C	D	E	F ⁽¹⁾	G	H	I	L	M	N	O
RLS 70	691	296	395	555	840	250-385	179	430	1161	214	134	221	2"
RLS 100	707	312	395	555	840	250-385	189	430	1161	214	134	221	2"
RLS 130	733	338	395	555	840	250-385	189	430	1161	214	134	221	2"

(1) Blast tube: short-long

(C)

D1176

BURNER DESCRIPTION (A)

- 1 Combustion head
- 2 Ignition electrodes
- 3 Screw for combustion head adjustment
- 4 Sleeve
- 5 Relay
- 6 Fan motor
- 7 Motor contactor and thermal cut-out with reset button
- 8 LED PANEL
- 9 Terminal strip
- 10 Fairleads for electrical connections by installer
- 11 Two switches:
 - one "burner off - on"
 - one for "1st - 2nd stage"
- 12 Control box with lock-out pilot light and lock-out reset button
- 13 Flame inspection window
- 14 Minimum air pressure switch (differential operating type)
- 15 Slide bars for opening the burner and inspecting the combustion head
- 16 Safety solenoid valve
- 17 1st and 2nd stage valves
- 18 Gas pressure test point and head fixing screw
- 19 Air pressure test point
- 20 Servomotor. When the burner is not operating the air gate valve is fully closed in order to reduce to a minimum heat dispersion from the boiler due to the flue draught which draws air from the fan suction inlet.
- 21 Pump motor
- 22 Air gate valve
- 23 Air inlet to fan
- 24 Pump
- 25 Gas input pipework
- 26 Boiler mounting flange
- 27 Flame stability disk
- 28 Screw securing fan to sleeve
- 29 Cell UV
- 30 OIL/GAS selector

Two types of burner failure may occur:

Control Box Lock-out: if the control box 12)(A) pushbutton lights up, it indicates that the burner is in lock-out.

To reset, press the pushbutton.

Motor trip: release by pressing the pushbutton on thermal relay 7)(A).

PACKAGING - WEIGHT (B) - Approximate measurements

- The burners stands on a wooden base which can be lifted by fork-lifts. Outer dimensions of packaging are indicated in (B).
- The weight of the burner complete with packaging is indicated in Table (B).

MAX. DIMENSIONS (C) - Approximate measurements

The maximum dimensions of the burner are given in (C).

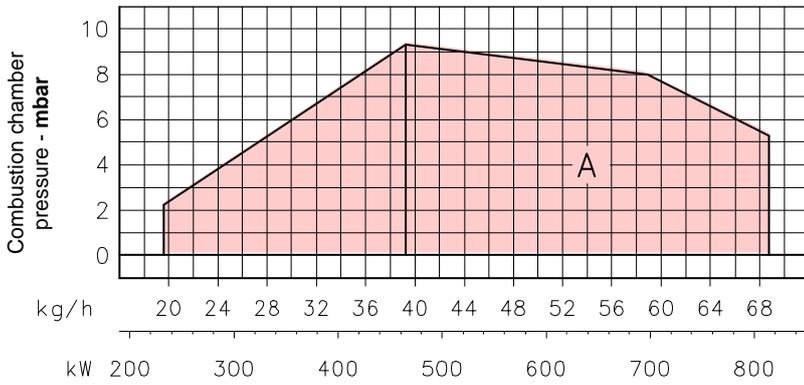
Bear in mind that inspection of the combustion head requires the burner to be opened and the rear part withdrawn on the slide bars.

The maximum dimension of the burner when open, without casing, is given in measurement I.

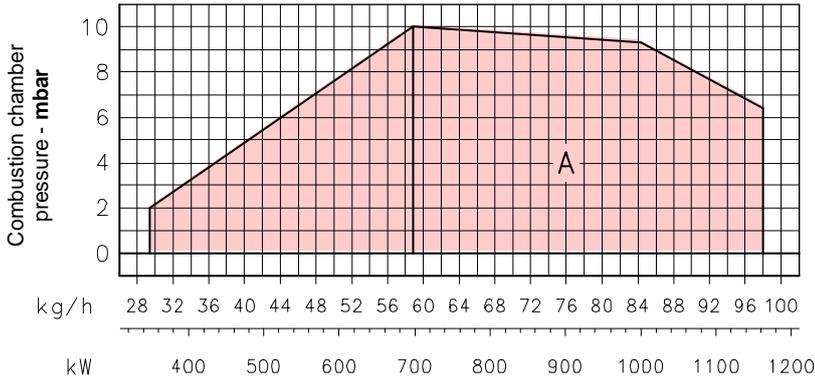
STANDARD EQUIPMENT

- 1 - Gas train flange
- 1 - Flange gasket
- 4 - Flange fixing screws M 10 x 35
- 1 - Thermal insulation screen
- 4 - Screws to secure the burner flange to the boiler: M 12 x 35
- 2 - Flexible hoses
- 2 - Nipples for flexible hoses with gasket
- 1 - KIT for LPG operation
- 1 - Label for LPG operation
- 1 - Instruction booklet
- 1 - Spare parts list

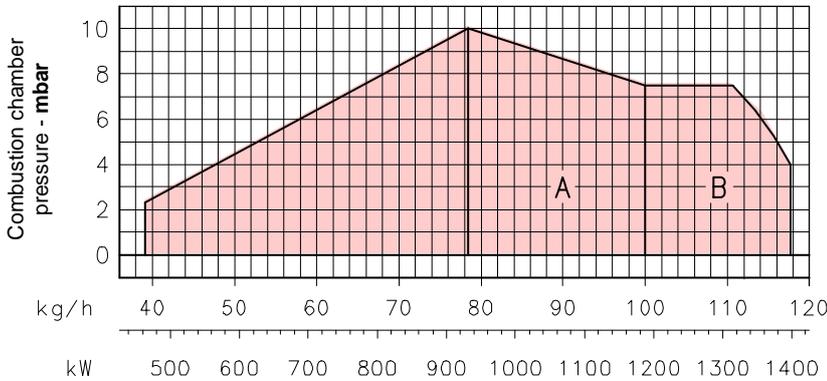
RLS 70



RLS 100



RLS 130



FIRING RATES (A)

The burners can work in two ways: one-stage and two-stage.

MAXIMUM OUTPUT must be selected in area A.

In order to utilize also area B (RLS 130) it is necessary to perform the calibration of the combustion head as explained on page 8.

MINIMUM OUTPUT must not be lower than the minimum limit shown in the diagram:

RLS 70	= 232 kW	= 19.0 kg/h
RLS 100	= 349 kW	= 29.5 kg/h
RLS 130	= 465 kW	= 39.0 kg/h

Important:

The firing rate area values have been obtained considering a surrounding temperature of 20°C, and an atmospheric pressure of 1000 mbar (approx. 100 m above sea level) and with the combustion head adjusted as shown on page 8.

TEST BOILER (B)

The firing rates were set in relation to special test boilers, according to EN 676 and EN 267 regulations.

Figure (B) indicates the diameter and length of the test combustion chamber.

Example: Output 650 Mcal/h:
diameter 60 cm - length 2 m.

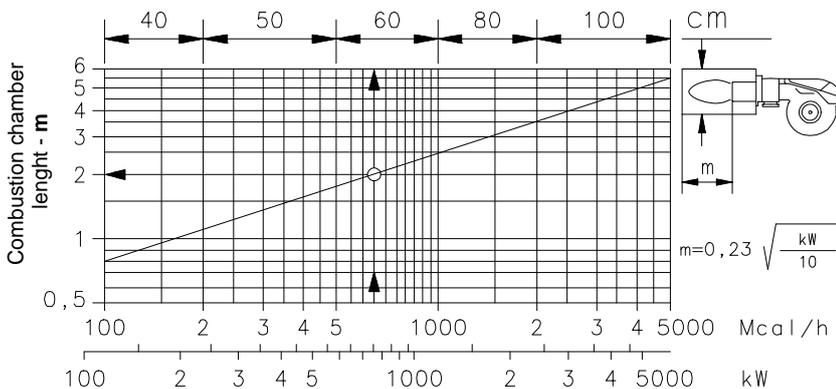
COMMERCIAL BOILERS

The burner/boiler combination does not pose any problems if the boiler is CE type-approved and its combustion chamber dimensions are similar to those indicated in diagram (B).

If the burner must be combined with a commercial boiler that has not been CE type-approved and/or its combustion chamber dimensions are clearly smaller than those indicated in diagram (B), consult the manufacturer.

(A)

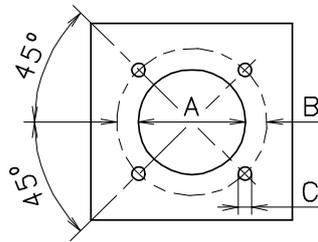
D1194



(B)

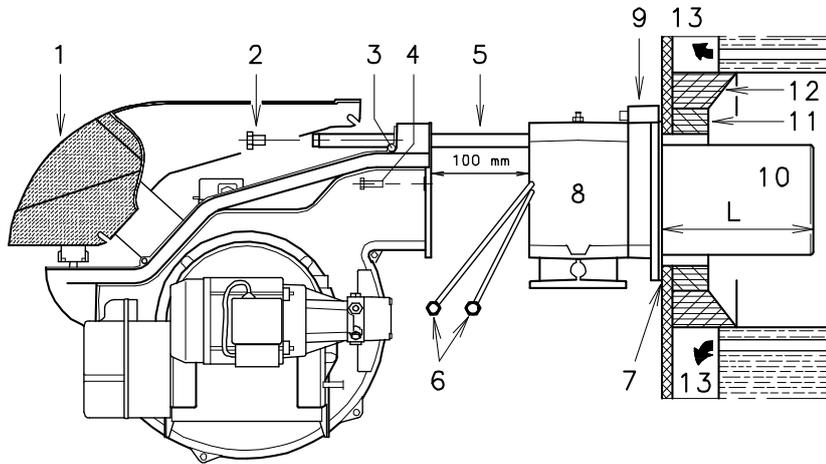
D715

mm	A	B	C
RLS 70	185	275-325	M 12
RLS 100	195	275-325	M 12
RLS 130	195	275-325	M 12



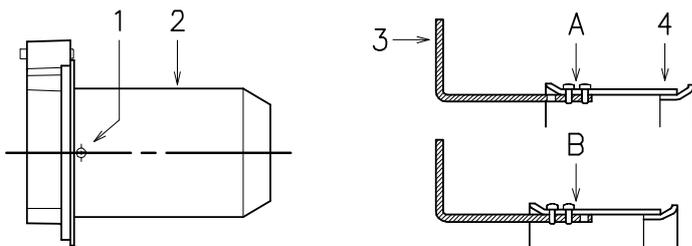
(A)

D455



(B)

D1172



(C)

D1192

INSTALLATION

BOILER PLATE (A)

Drill the combustion chamber locking plate as shown in (A). The position of the threaded holes can be marked using the thermal screen supplied with the burner.

BLAST TUBE LENGTH (B)

The length of the blast tube must be selected according to the indications provided by the manufacturer of the boiler, and in any case it must be greater than the thickness of the boiler door complete with its fettling. The range of lengths available, L (mm), is as follows:

Blast tube 10):	RLS 70	RLS 100	RLS 130
• short	250	250	250
• long	385	385	385

For boilers with front flue passes 13) or flame inversion chambers, protective fettling in refractory material 11) must be inserted between the boiler fettling 12) and the blast tube 10).

This protective fettling must not compromise the extraction of the blast tube.

For boilers having a water-cooled front the refractory fettling 11)-12)(B) is not required unless it is expressly requested by the boiler manufacturer.

SECURING THE BURNER TO THE BOILER (B)

Detach the combustion head from the burner, fig. (B):

- Disconnect the oil pipes by unscrewing the two connectors 6).
- Loosen the 4 screws 3) and remove the cover 1).
- Remove the screws 2) from the slide bars 5).
- Remove the 2 screws 4) and pull the burner back on slide bars 5) by about 100 mm.
- Disconnect the electrode wires and then pull the burner completely off the slide bars.

COMBUSTION HEAD CALIBRATION

At this point check, for model RLS 130, whether the maximum delivery of the burner in 2nd stage operation is contained in area A or in area B of the firing rate. See page 5.

If it is in area A then no operation is required.

If, on the other hand, it is in area B:

- unscrew the screws 1)(C) and disassemble the blast tube 2).
- Move the fixing of the rod 3)(C) from position A to position B, thereby causing the shutter 4) to retract.
- Now refit the blast tube 2)(C) and the screws 1).

Once this operation has been carried out (if it was required):

- secure the flange 9)(B) to the boiler plate, interposing the thermal insulating screen 7)(B) supplied with the burner.
- Use the 4 screws, also supplied with the unit, after first protecting the thread with an anti-locking product.

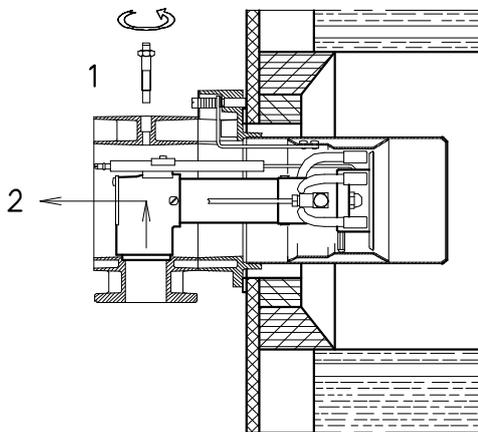


The seal between burner and boiler must be airtight.

WARNING

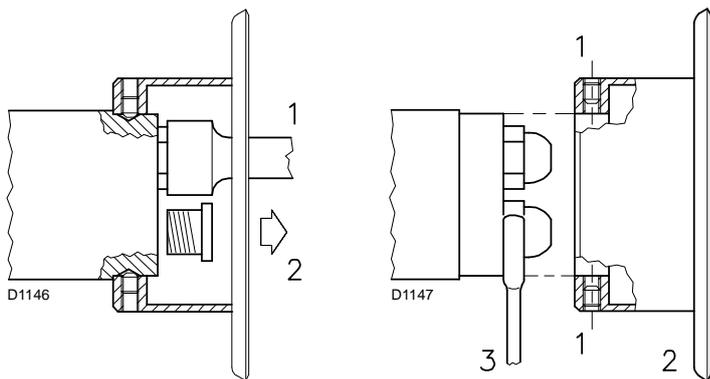
GPH	kg/h			kW 12 bar
	10 bar	12 bar	14 bar	
5.00	19.2	21.2	23.1	251.4
5.50	21.1	23.3	25.4	276.3
6.00	23.1	25.5	27.7	302.4
6.50	25.0	27.6	30.0	327.3
7.00	26.9	29.7	32.3	352.3
7.50	28.8	31.8	34.6	377.2
8.00	30.8	33.9	36.9	402.1
8.30	31.9	35.2	38.3	417.5
8.50	32.7	36.1	39.2	428.2
9.00	34.6	38.2	41.5	453.1
9.50	36.5	40.3	43.8	478.0
10.0	38.4	42.4	46.1	502.9
10.5	40.4	44.6	48.4	529.0
11.0	42.3	46.7	50.7	553.9
12.0	46.1	50.9	55.3	603.7
12.3	47.3	52.2	56.7	619.1
13.0	50.0	55.1	59.9	653.5
13.8	53.1	58.5	63.3	693.8
14.0	53.8	59.4	64.5	704.5
15.0	57.7	63.6	69.2	754.3
15.3	58.8	64.9	70.5	769.7
16.0	61.5	67.9	73.8	805.3
17.0	65.4	72.1	78.4	855.1

(A)



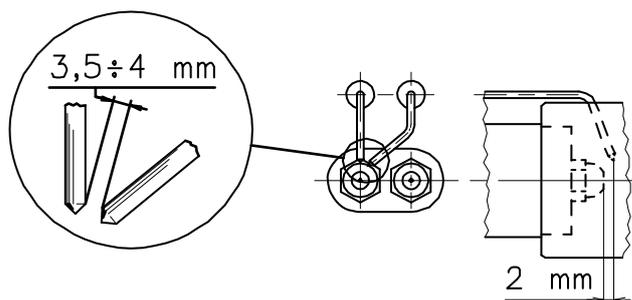
(B)

D1122



(C)

(D)



(E)

D1124

CHOICE OF NOZZLES FOR 1ST AND 2ND STAGE

The burner complies with the emission requirements of the EN 267 standard.

In order to guarantee that emissions do not vary, recommended and/or alternative nozzles specified by Riello in the Instruction and warning booklet should be used.



It is advisable to replace the nozzle once a year during periodical maintenance.



The use of nozzles other than those specified by Riello S.p.A. and inadequate regular maintenance may result into emission limits non-conforming to the values set forth by the regulations in force, and in extremely serious cases, into potential hazards to people and objects.

The manufacturing company shall not be liable for any such damage arising from nonobservance of the requirements contained in this manual.

Both nozzles must be chosen from among those listed in Table (A).

The first nozzle determines the delivery of the burner in the 1st stage.

The second nozzle works together with the 1st nozzle to determine the delivery of the burner in the 2nd stage.

The deliveries of the 1st and 2nd stages must be contained within the value range indicated on page 3.

Use nozzles with a 60° spray angle at the recommended pressure of 12 bar.

The two nozzles usually have equal deliveries.

NOZZLE ASSEMBLY

Remove screw 1)(B) and extract the internal part 2)(B).

Fit two nozzles with the box spanner 1)(C) (16 mm), after having removed the plastic plugs 2)(C), fitting the spanner through the central hole in the flame stability disk or loosen screws 1)(D), remove disk 2)(D) and replace the nozzles using the wrench 3)(D).

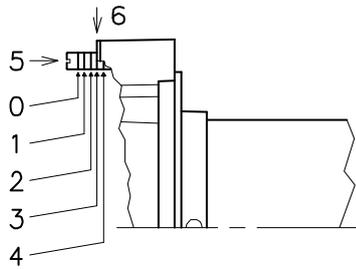
Do not use any sealing products such as gaskets, sealing compound, or tape. Be careful to avoid damaging the nozzle sealing seat. The nozzles must be screwed into place tightly but not to the maximum torque value provided by the wrench.

The nozzle for the 1st stage of operation is the one lying beneath the firing electrodes.



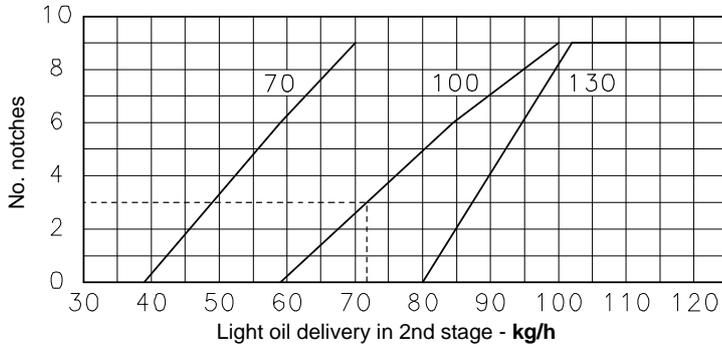
Make sure that the electrodes are positioned as shown in figure (E).

SETTING THE COMBUSTION HEAD



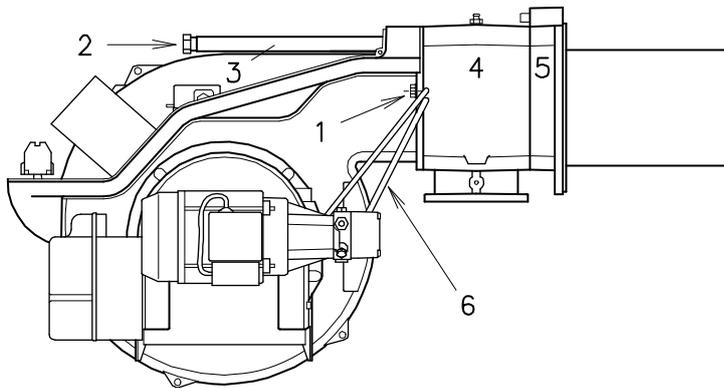
(A)

D1149



(B)

D1193



(C)

D1173

Refit the burner to the slide bars 3)(C) at approximately 100 mm from the sleeve 4) - burner positioned as shown in fig. (B)p.6 - insert the ignition electrode cables and then slide the burner up to the sleeve so that it is positioned as shown in fig. (C).

Refit screws 2)(C) on slide bars 3).

Secure the burner to the sleeve by tightening screws 1).

Connect the oil pipes again by screwing on the two connectors 6)(B)p.6.



When fitting the burner on the two slide bars, it is advisable to gently draw out the high tension cables until they are slightly stretched.

ADJUSTMENTS BEFORE FIRST FIRING (light oil operation)

• Combustion head setting

The setting of the combustion head depends exclusively on the delivery of the burner in the 2nd stage.

Turn screw 5)(A) until the notch shown in diagram (B) is level with the front surface of flange.

Example: Burner RLS 100

2nd stage burner delivery = 72 kg/h.

If diagram (B) is consulted it is clear that for this delivery, the combustion head must be adjusted using notch 3, as shown in fig. (B).

• Pump adjustment

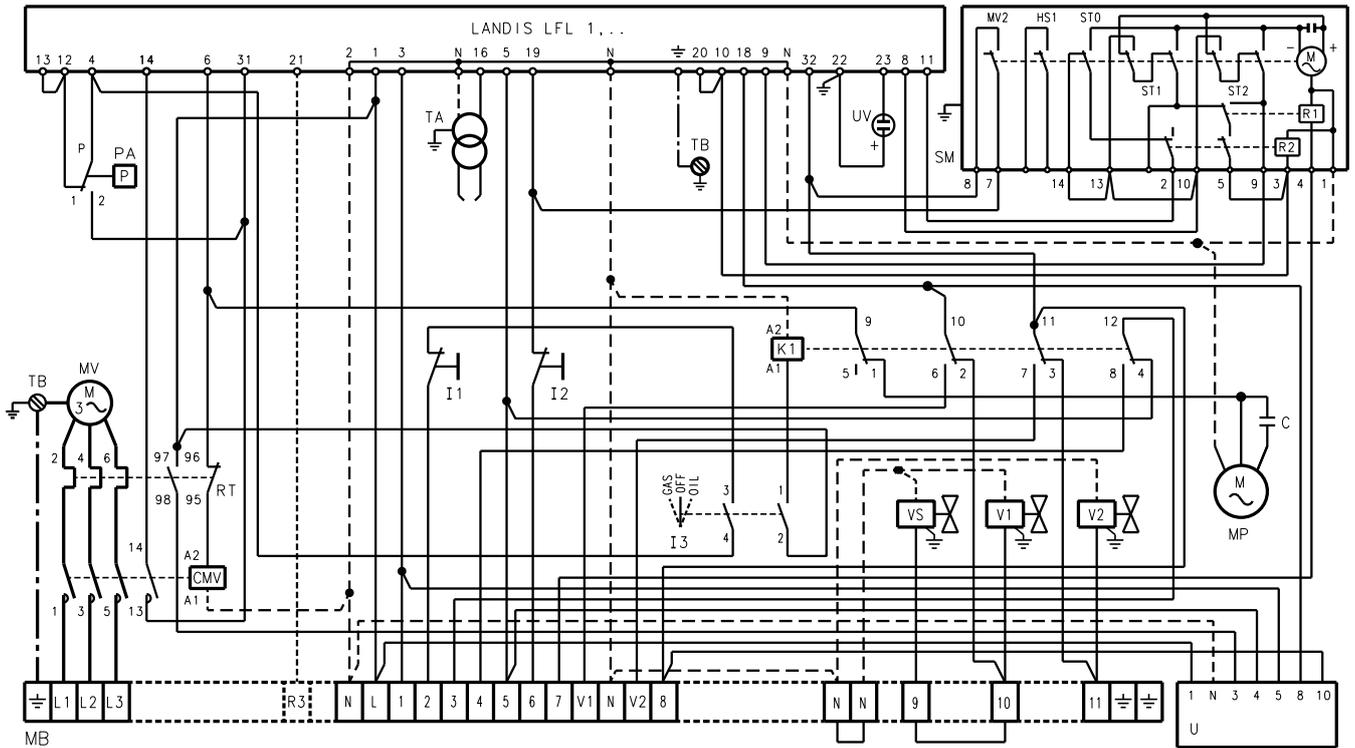
No settings are required for the pump, which is set to 12 bar by the manufacturer. This pressure must be checked and adjusted (if required) after the burner has been ignited.

The only operation required in this phase is the application of a pressure gauge on the appropriate pump attachment.

• Fan gate adjustment

The first time the burner is fired leave the factory setting unchanged for both 1st stage and 2nd stage operation.

ELECTRICAL SYSTEM



(A)

D3493

ELECTRICAL SYSTEM FACTORY-SET

- The burners leave the factory preset for **400V** power supply.
- If **230V** power supply is used, change the motor connection from star to delta and change the setting of the thermal cut-out as well.

Key to layout (A)

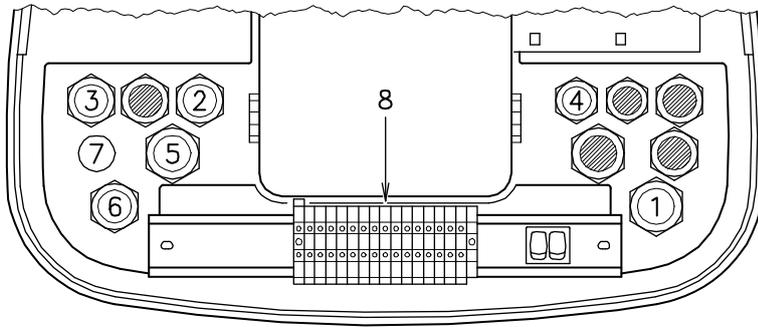
C	Capacitor
CMV	Motor contactor
K1	Relay
LFL 1.322	Control box
I1	Switch: burner on - off
I2	Switch: 1st - 2nd stage
I3	Olio/gas selector
MB	Burner terminal strip
MV	Fan motor
MP	Pump motor
PA	Air pressure switch
RT	Thermal cut-out
SM	Servomotor
TA	Ignition transformer
TB	Burner ground
U	LED PANEL
UV	UV cell
V1	1st stage light-oil valve
V2	2nd stage light-oil valve
VS	Safety oil valve

NOTE

- The burners leaves the factory preset for **400V** power supply. If **230V** power supply is used, change the fan motor connection from star to delta and change the setting of the thermal cut-out as well.
- The burners have been type- approved for intermittent operation. This means they should compulsorily be stopped at least once every 24 hours to enable the control box to check its own efficiency at start-up. Burner halts are normally provided for automatically by the boiler load control system. If this is not the case, a time switch should be fitted in series to IN to provide for burner shut-down at least once every 24 hours.
- The burners are factory set for two-stage operation and must therefore be connected to control device TR. Alternatively, if single stage operation is required, instead of control device TR install a jumper lead between terminals 6 and 7 of the terminal strip.

WARNING

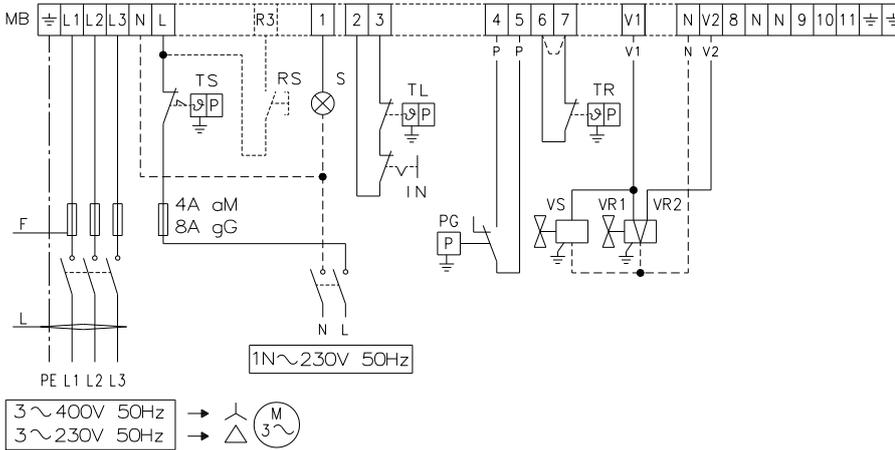
Do not invert the neutral with the phase wire in the electricity supply line.



(A)

D1174

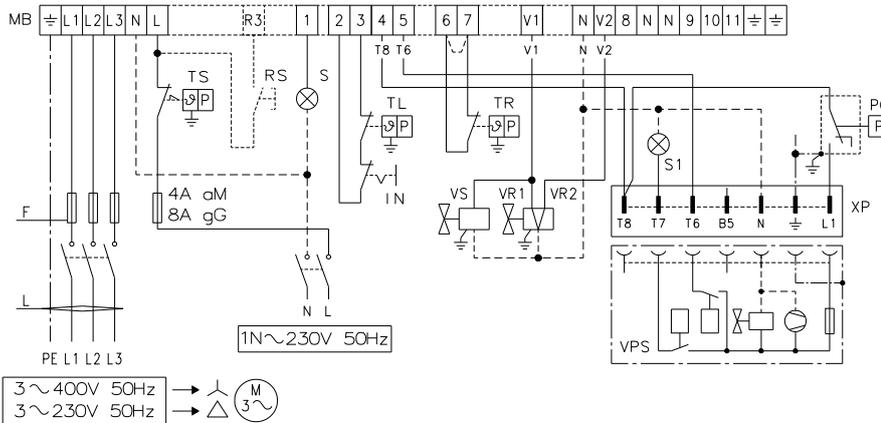
WITHOUT LEAK DETECTION CONTROL DEVICE



(B)

20081670

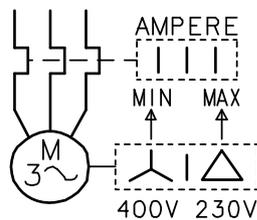
WITH VPS LEAK DETECTION CONTROL DEVICE



(C)

20081671

CALIBRATION OF THERMAL RELAY



(D)

D867

		RLS 70		RLS 100		RLS 130	
		230 V	400 V	230 V	400 V	230 V	400 V
F	A	6A aM 12A gG	4A aM 8A gG	8A aM 16A gG	4A aM 8A gG	10A aM 20A gG	6A aM 12A gG
L	mm ²	1.5	1.5	2.5	1.5	2.5	1.5

(E)

ELECTRICAL CONNECTIONS

Use flexible cables according to EN 60 335-1

Regulations:

- if in PVC sheath, use at least HO5 VV-F;
- if in rubber sheath, use at least H05 RR-F.

All the wires to connect to the burner terminal strip 8)(A) must enter through the supplied fair-leads.

The fairleads and hole press-outs can be used in various ways; the following lists show one possible solution:

- 1- Pg 13.5 Three-phase power supply
- 2- Pg 11 Single-phase power supply
- 3- Pg 11 Remote control device TL
- 4- Pg 9 Remote control device TR
- 5- Pg 13.5 Gas valves
- 6- Pg 13.5 Gas pressure switch or gas valve leak detection control device
- 7- Pg 11 Open the hole, if a pipe union is to be added

LAYOUT (B)

Electrical connection without leak detection control device

LAYOUT (C)

Electrical connection with leak detection control device

Gas valve leak detection control takes place immediately before every burner start-up.

Fuses and cables cross-section layouts (B-C), see table (D).

Cross-section when not indicated: 1,5 mm²

KEY TO LAYOUTS (B) - (C)

- IN - Burner manual stop switch
- XP- Plug for leak detection control device
- MB- Burner terminal strip
- PG- Min. gas pressure switch
- RS- Remote lock-out reset button (if present)
- S - Remote lock-out signal
- S1 - Remote lock-out signal of leak detection control device
- TR- High-low mode load remote control system: controls operating stages 1 and 2. If the burner is to be set up for single stage operation, replace the remote control device TR with a jumper.
- TL - Load limit remote control system: shuts down the burner when the boiler temperature or pressure reaches the pre-set value.
- TS- Safety load control system: operates when TL is faulty.
- VR1-Adjustment valve 1st stage
- VR2-Adjustment valve 2nd stage
- VS- Safety valve

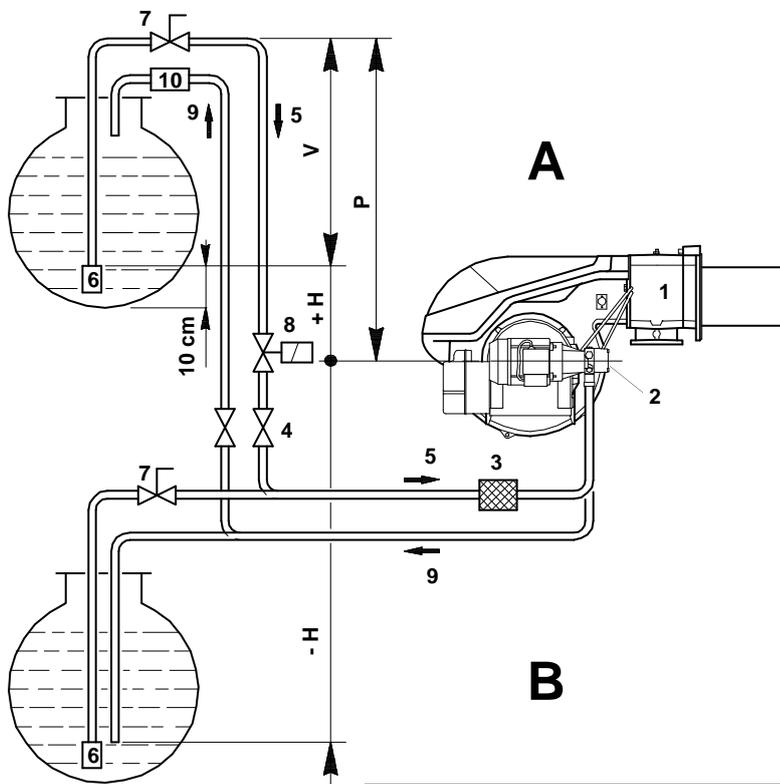
LAYOUT (C)

Calibration of thermal cut-out

This is required to avoid motor burn-out in the event of a significant increase in power absorption caused by a missing phase.

- If the motor is star-powered, **400V**, the cursor should be positioned to "MIN".
- If the motor is delta-powered, **230V**, the cursor should be positioned to "MAX".

Even if the scale of the thermal cut-out does not include rated motor absorption at **400V**, protection is still ensured in any case.



+/- H m	L m		
	Ø 12 mm	Ø 14 mm	Ø 16 mm
+ 4	71	138	150
+ 3	62	122	150
+ 2	53	106	150
+ 1	44	90	150
+ 0,5	40	82	150
0	36	74	137
- 0,5	32	66	123
- 1	28	58	109
- 2	19	42	81
- 3	10	26	53
- 4	-	10	25

LIGHT OIL SUPPLY (A)

The burner is equipped with a self-priming pump which is capable of feeding itself within the limits listed in the table at the side.

The tank higher than the burner A

The distance "P" must not exceed 10 meters in order to avoid subjecting the pump's seal to excessive strain; the distance "V" must not exceed 4 meters in order to permit pump self-priming even when the tank is almost completely empty.

The tank lower than the burner B

Pump depression values higher than 0.45 bar (35 cm Hg) must not be exceeded because at higher levels gas is released from the fuel, the pump starts making noise and its working life-span decreases.

It is good practice to ensure that the return and suction lines enter the burner from the same height; in this way it will be more improbable that the suction line fails to prime or stops priming.

Key (A)

H = Pump/Foot valve height difference

L = Piping length

Ø = Inside pipe diameter

1 = Burner

2 = Pump

3 = Filter

4 = Manual on/off valve

5 = Suction line

6 = Foot valve

7 = Rapid closing manual valve

remote controlled (only Italy)

8 = On/off solenoid valve (only Italy)

9 = Return line

10 = Check valve (only Italy)

HYDRAULIC CONNECTIONS (B)

The pumps are equipped with a by-pass that connects return line and suction line. The pumps are installed on the burner with the by-pass closed by screw 6(A)p. 12.

It is therefore necessary to connect both hoses to the pump.

The pump will break immediately if it is run with the return line closed and the by-pass screw inserted.

Remove the plugs from the suction and return connections of the pump.

Insert the hose connections with the supplied seals into the connections and screw them down.

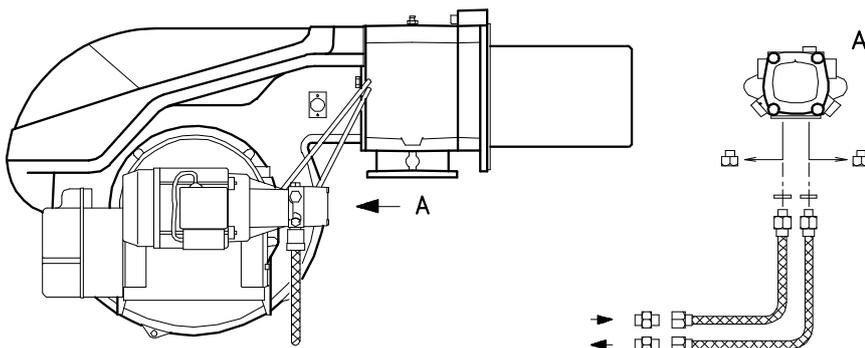
Take care that the hoses are not stretched or twisted during installation.

Install the hoses where they cannot be stepped on or come into contact with hot surfaces of the boiler and where they do not hamper the opening of the burner.

Now connect the other end of the hoses to the suction and return lines by using the supplied nipples.

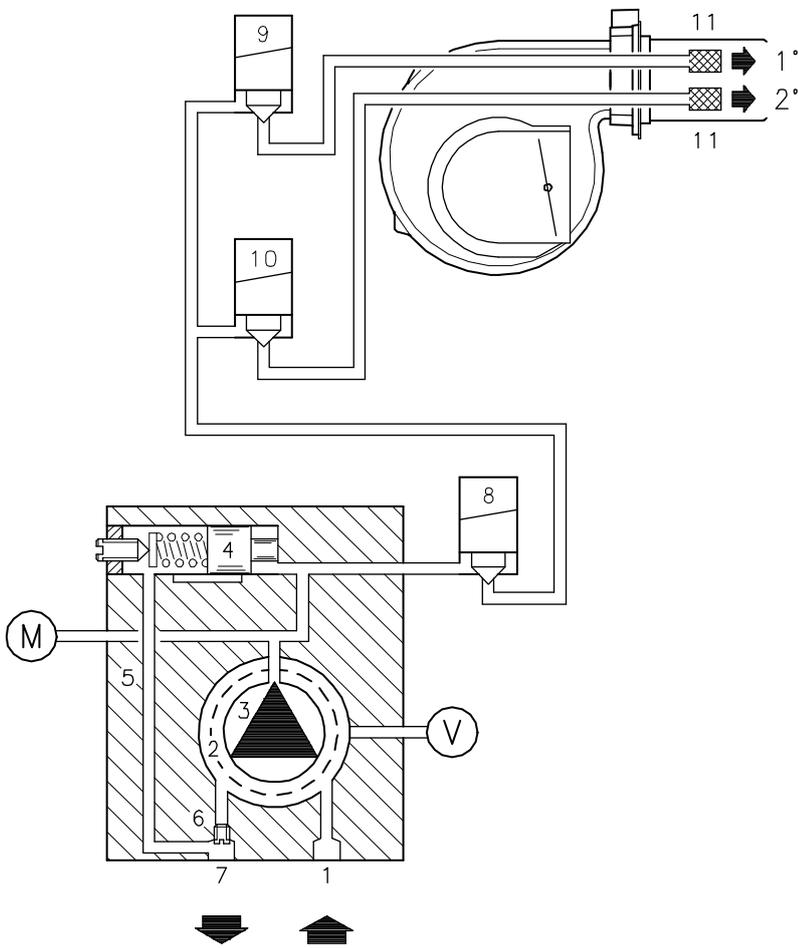
(A)

D1178



(B)

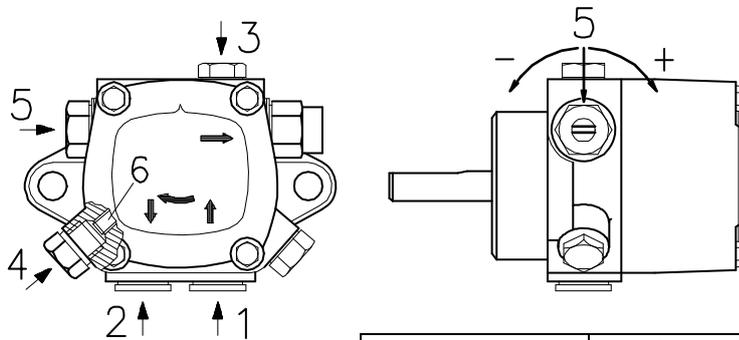
D1185



(A)

D1184

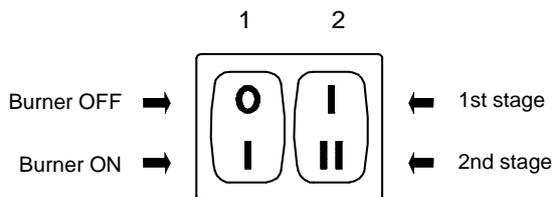
PUMP - SUNTEC AJ6 CC



		AJ6 CC
A	kg/h	220
B	bar	10 - 20
C	bar	0,45
D	cSt	2.8 - 75
E	°C	60
F	bar	2
G	bar	12
H	mm	0.15

(B)

D1177



(C)

D469

HYDRAULIC SYSTEM

Key (A)

- 1 Pump suction
- 2 Filter
- 3 Pump
- 4 Pressure governor
- 5 Return pipe
- 6 By-pass screw
- 7 Pump return
- 8 Safety solenoid
- 9 1st stage valve
- 10 2nd stage valve
- 11 Filter
- M Pressure gauge
- V Vacuumter

PUMP (B)

- 1 - Suction G 1/4"
- 2 - Return G 1/4"
- 3 - Pressure gauge attachment G 1/8"
- 4 - Vacuum meter attachment G 1/8"
- 5 - Pressure governor

- A - Min. delivery rate at 12 bar pressure
- B - Delivery pressure range
- C - Max. suction depression
- D - Viscosity range
- E - Max light oil temperature
- F - Max. suction and return pressure
- G - Pressure calibration in the factory
- H - Filter mesh width

PUMP PRIMING

- Before starting the burner, make sure that the tank return line is not clogged. Obstructions in the line could cause the sealing organ located on the pump shaft to break. (The pump leaves the factory with the by-pass closed).
- Also check to make sure that the valves located on the suction line are open and that there is sufficient fuel in the tank.
- For self-priming to take place, one of the screws 3)(B) must be loosened in order to bleed off the air contained in the suction line.
- Start the burner by closing the control devices, with switch 1)(A) in the "ON" position and with switch 30)(A)p.4 in the "OIL" position.
- The pump can be considered to be primed when the light oil starts coming out of the screw 3)(B).
Stop the burner: switch 1)(C) set to "OFF" and tighten the screw 3)(B).

The time required for this operation depends upon the diameter and length of the suction tubing. If the pump fails to prime at the first starting of the burner and the burner locks out, reset the burner, and then repeat the starting operation. Do not illuminate the cell UV or the burner will lock out.

BURNER CALIBRATION (light-oil operation)

N.B.

It is advisable to first set the burner for operating on oil and then for gas.

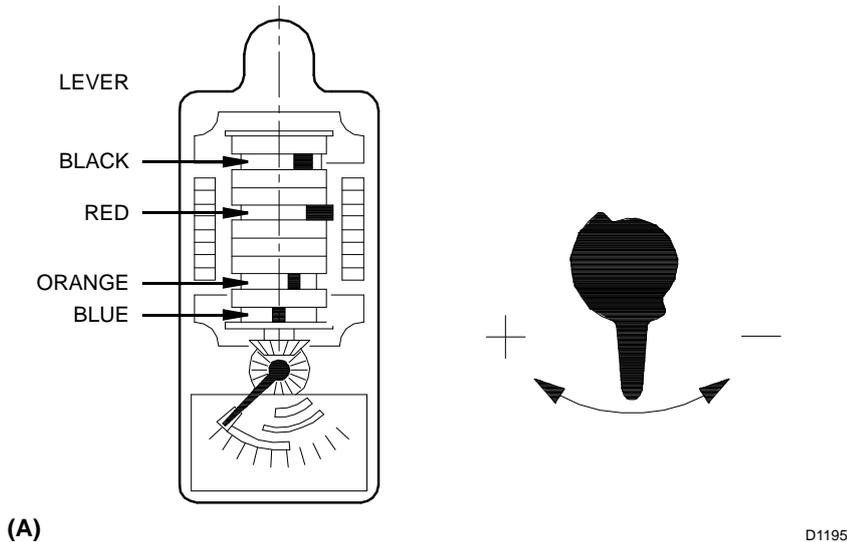
WARNING

Execute the fuel exchange when the burner is off.

FIRING

Set switch 1)(C) to "ON".
During the first firing, during the passage from the 1st to the 2nd stage, there is a momentary lowering of the fuel pressure caused by the filling of the 2nd stage nozzle tubing.
This lowering of the fuel pressure can cause the burner to lock-out and can sometimes give rise to pulsations.

SERVOMOTOR



OPERATION

The optimum calibration of the burner requires an analysis of the flue gases at the boiler outlet and interventions on the following points.

• 1st and 2nd stage nozzles

See the information listed on page 11.

• Combustion head

The adjustment of the combustion head already carried out (page 8) need not be altered unless the 2nd stage delivery of the burner is changed.

• Pump pressure

12 bar: This is the pressure calibrated in the factory which is usually sufficient for most purposes. Sometimes, this pressure must be adjusted to:

10 bar in order to reduce fuel delivery. This adjustment is possible only if the surrounding temperature remains above 0 °C;

14 bar in order to increase fuel delivery or to ensure firings even at temperatures of less than 0 °C.

In order to adjust pump pressure, use the screw 5)(B)p. 12.

• 1st stage fan air gate valve

Keep the burner operating at 1st stage by setting the switch 2)(C)p. 12 to the 1st stage position. The fan air gate valve is adjusted by moving the orange lever of the servomotor.

• 2nd stage fan air gate valve

Set switch 2)(C)p. 12 to the 2nd stage position. The fan air gate valve is adjusted by moving the red lever of the servomotor.

SERVOMOTOR (A)

The servomotor adjusts the air gate valve. The servomotor rotates through 90° in 5 seconds.

Do not alter (for the time-being) the factory setting for the 4 levers.

A graduated plate with 4 coloured sectors marks the lever operation point.

Blue lever

Sets the position of the air gate valve while the burner is shut down: air gate valve closed.

Orange lever

Sets the position of the air gate valve during 1st stage operation.

Red lever

Sets the position of the air gate valve during 2nd stage operation.

Black lever

Establishes when the 2nd stage gas or light oil valve opens.

It must always operate (just) before the red lever and after the orange lever.

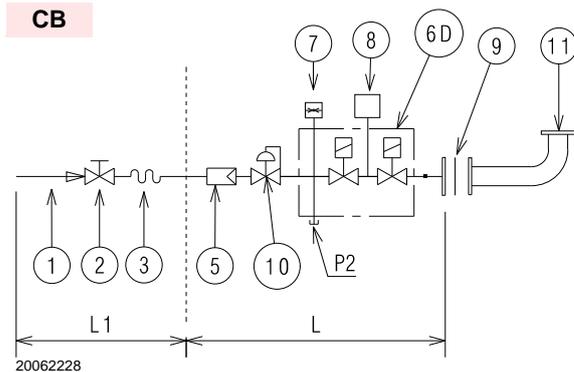
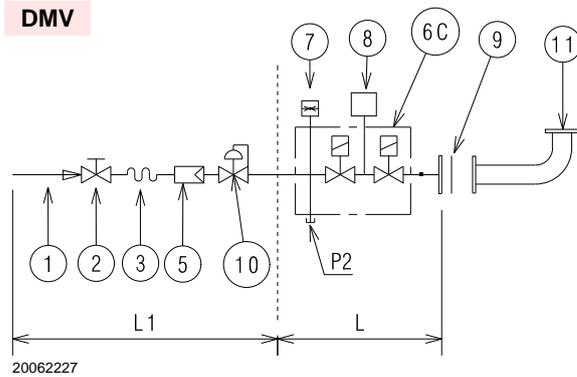
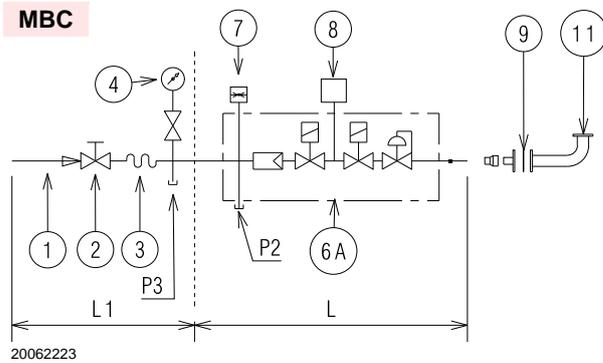
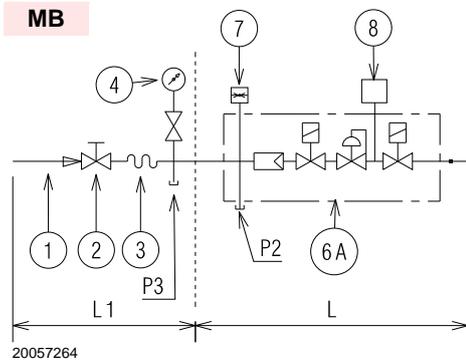
It must not operate with the red lever as this may prevent the gas or light oil valve from opening at all.

It must not operate straight after the orange lever to avoid combustion in the absence of air.

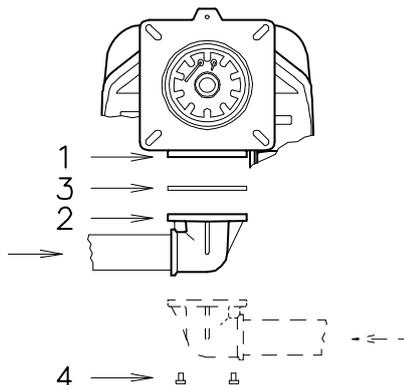
For gas or light oil valve opening to approach that of 2nd stage air gate valve position, rotate the black lever to the left; to delay opening time, rotate the lever to the right.

In brief, the levers must be operated in the following sequence:

- 1° Blue lever
- 2° Orange lever
- 3° Black lever
- 4° Red lever



(A)



(B)

GAS FEEDING



Explosion danger due to fuel leaks in the presence of a flammable source.

Precautions: avoid knocking, attrition, sparks and heat.

Make sure that the fuel interception tap is closed before performing any operation on the burner.



The fuel supply line must be installed by qualified personnel, in compliance with current standards and laws.

KEY (A)

- 1 Gas input pipe
- 2 Manual valve
- 3 Vibration damping joint
- 4 Pressure gauge with pushbutton cock
- 5 Filter
- 6A Includes:
 - Filter
 - working valve
 - safety valve
 - pressure adjuster
- 6C Includes
 - safety valve
 - working valve
- 6D Includes:
 - safety valve
 - working valve
 - pressure adjuster
 - filter
- 7 Minimum gas pressure switch
- 8 Leak detection device, supplied as an accessory or incorporated, based on the gas train code. In compliance with the EN 676 standard, the leak detection control is compulsory for burners with maximum outputs over 1200 kW.
- 9 Gasket, for "flanged" versions only
- 10 Pressure adjuster
- 11 Train-burner adaptor, supplied separately
- P2 Upstream pressure of valves/adjuster
- P3 Upstream pressure of the filter
- L Gas train supplied separately
- L1 The responsibility of the installer

GAS TRAIN

Type-approved in accordance with EN 676 and supplied separately from the burner.

To select the correct model of the gas train, refer to the "burner-gas train combination" manual supplied.

See the accompanying instructions for the adjustment of the gas train.

GAS TRAIN INSTALLATION

- The gas train must be connected to the gas attachment 1)(B), using flange 2), gasket 3) and screws 4) supplied with the burner.
- The gas train can enter the burner from the right or left side, depending on which is the most convenient, see fig. (B).
- Make sure that the pressure governor calibration range (colour of the spring) comprises the pressure required by the burner.

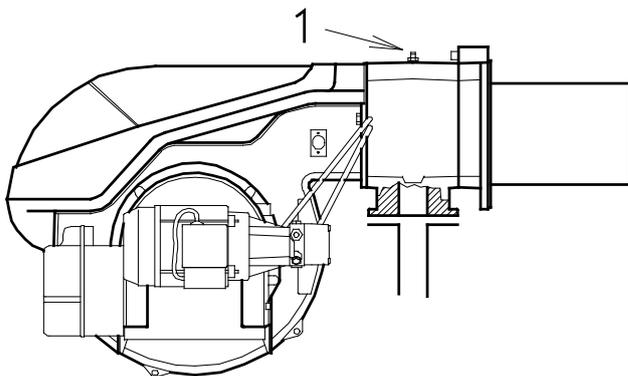


The gas solenoids must be as close as possible to the burner, to ensure that the gas reaches the combustion head within the safety time of 3s.

Ensure that the maximum pressure to the burner is within the calibration range of the pressure regulator.

Mod.	kW	1 Δp (mbar)	
		G20	G31
RLS 70	465	5.5	6.3
	504	5.6	6.4
	543	5.7	6.5
	582	5.7	6.5
	621	5.8	6.6
	661	5.9	6.8
	700	6	7
	739	6	7.2
	778	6.1	7.5
	817	6.2	7.8
RLS 100	695	8	10.3
	747	8.2	10.5
	799	8.5	10.7
	851	8.7	10.9
	903	9	11.2
	955	9.2	11.4
	1007	9.4	11.6
	1059	9.6	11.7
	1111	9.8	11.9
	1163	10	12
RLS 130	930	9.3	10.5
	995	9.4	10.8
	1059	9.6	11.2
	1124	9.8	11.7
	1189	10.1	12.3
	1253	10.4	12.9
	1318	10.8	13.6
	1383	11.2	14.5
	1447	11.9	15.8
	1512	13	17.5

(A)



(B)

S9000

GAS PRESSURE

The adjacent table shows minimum pressure losses along the gas supply line depending on the burner output in 2nd stage operation.

The values shown in the table refer to:

- Natural gas G20 PCI 9.45 kWh/Sm³ (8.2 Mcal/Sm³)
- LPG G31 PCI 27 kWh/Sm³ (23,2 Mcal/Sm³)

Column 1

Pressure loss at combustion head.

Gas pressure measured at test point 1)(B), with:

- Combustion chamber at 0 mbar
- Burner operating in 2nd stage
- Gas G20 (methane) - G31 (propane)

Calculate the approximate 2nd stage output of the burner thus:

- subtract the combustion chamber pressure from the gas pressure measured at test point 1)(B).
- Find the nearest pressure value to your result in column 1 of the table for the burner in question.
- Read off the corresponding output on the left.

Example - RLS 100

- 2nd stage operation
 - Natural gas G20 PCI 10 kWh/Sm³
 - Gas pressure at test point 1)(B)= 11,4 mbar
 - Pressure in combustion chamber= 2 mbar
- $$11,4 - 2 = 9,4 \text{ mbar}$$

A 2nd stage output of 1007 kW shown in table corresponds to 9,4 mbar pressure, column 1, gas G20.

This value serves as a rough guide, the effective delivery must be measured at the gas meter.

To calculate the required gas pressure at test point 1)(B), set the output required from the burner in 2nd stage operation:

- find the nearest output value in the table for the burner in question.
- Read off the pressure at test point 1)(B) on the right in column 1.
- Add this value to the estimated pressure in the combustion chamber.

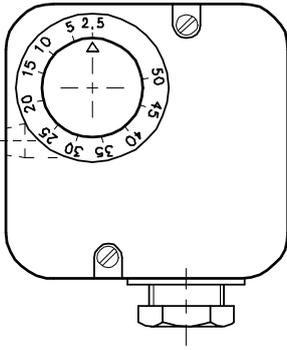
Example - RLS 100

- Required burner output in 2nd stage operation: 1007 kW
 - Natural gas G20 PCI 10 kWh/Sm³
 - Gas pressure at burner output of 1007 kW, taken from column 1, G 20= 9,4 mbar
 - Pressure in combustion chamber= 2 mbar
- $$9,4 + 2 = 11,4 \text{ mbar}$$
- pressure required at test point 1)(B).



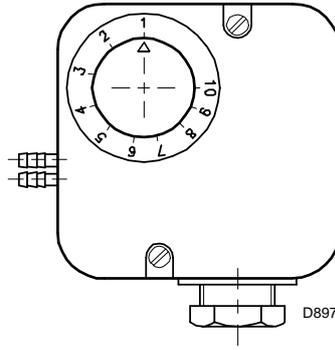
For LPG use the gas train with 1"1/2 or 2" diameter.

MIN GAS PRESSURE SWITCH

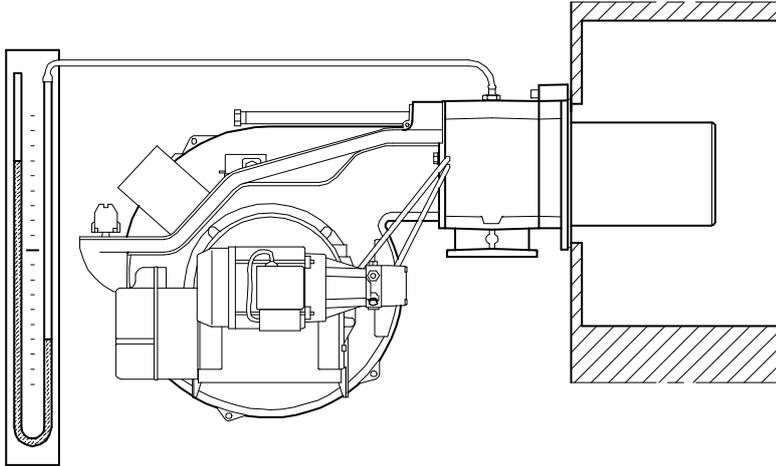


(A)

AIR PRESSURE SWITCH

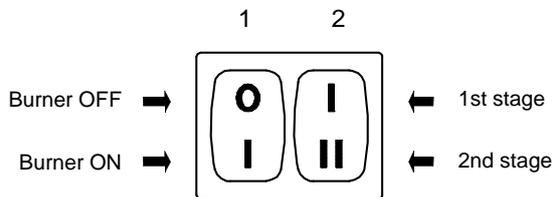


(B)



(C)

D1180



(D)

D469

ADJUSTMENTS BEFORE FIRST FIRING (gas operation)

Adjustment of the combustion head has been illustrated on page 8.

In addition, the following adjustments must also be made:

- Open manual valves up-line from the gas train.
 - Adjust the minimum gas pressure switch to the start of the scale (A).
 - Adjust the air pressure switch to the zero position of the scale (B).
 - Purge the air from the gas line.
 - Continue to purge the air (we recommend using a plastic tube routed outside the building) until gas is smelt.
 - Fit a U-type manometer (C) to the gas pressure test point on the sleeve.
- The manometer readings are used to calculate the 2nd stage operation burner power using the tables on page 7.
- Connect two lamps or testers to the two gas line solenoid valves VR1 and VS to check the exact moment at which voltage is supplied.
- This operation is unnecessary if each of the two solenoid valves is equipped with a pilot light that signals voltage passing through.

Before starting up the burner it is good practice to adjust the gas train so that ignition takes place in conditions of maximum safety, i.e. with gas delivery at the minimum.

BURNER STARTING (gas operation)

N.B.: It is advisable to first set the burner for operating on oil and then for gas.

WARNING

Execute the fuel exchange when the burner is off.

Close the control devices and set:

- switch 1)(D) to "ON" position
- switch 2)(D) to "1st stage" position

As soon as the burner starts make sure that the lamps or testers connected to the solenoids, or pilot lights on the solenoids themselves, indicate that no voltage is present. If voltage is present, then **immediately** stop the burner and check electrical connections.

BURNER FIRING (gas operation)

Having completed the checks indicated in the previous heading, the burner should fire. If the motor starts but the flame does not appear and the control box goes into lock-out, reset and wait for a new firing attempt.

If firing is still not achieved, it may be that gas is not reaching the combustion head within the safety time period of 3 seconds.

In this case increase gas firing delivery.

The arrival of gas at the sleeve is indicated by the U-type manometer (C).

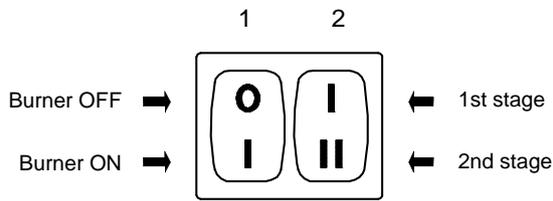
Once the burner has fired, now proceed with global calibration operations.

BURNER CALIBRATION (gas operation)

The optimum calibration of the burner requires an analysis of the flue gases at the boiler outlet.

Adjust successively:

- 1 - 2nd stage burner output
- 2 - 1st stage burner output
- 3 - First firing output
- 4 - Air pressure switch
- 5 - Minimum gas pressure switch



(A)

D469

1 - 2ND STAGE OUTPUT

2nd stage output of the burner must be set within the firing rate range shown on page 5.

Set switch 2)(A) to the 2nd stage position: the servomotor will open the air gate valve at the previously set value for oil and will control the opening of the 2nd stage gas valve VR2.

Gas calibration

Adjust gas delivery to the amount of air.

- If delivery needs to be reduced, diminish outlet gas pressure and, if it is already very low, slightly close 2nd stage adjustment valve VR2.
- If delivery needs to be increased, increase outlet gas pressure.

2 - 1ST STAGE OUTPUT

Burner power in 1st stage operation must be selected within the firing rate range shown on page 5.

Set the switch 2)(A) to the 1st stage position: the servomotor will close the air gate valve at the previously set value for oil and will control the opening of the 1st stage gas valve VR1.

Adjusting gas delivery

Adjust gas delivery to the amount of air by adjusting the 1st stage gas valve VR1.

3 - FIRING OUTPUT (gas operation)

According to EN 676 Regulations:

Burners with MAX output up to 120 kW

Firing can be performed at the maximum operation output level. Example:

- Max. operation output : 120 kW
- Max. firing output : 120 kW

Burners with MAX output above 120 kW

Firing must be performed at a lower output than the max. operation output. If the firing output does not exceed 120 kW, no calculations are required. If firing output exceeds 120 kW, the regulations prescribe that the value be defined according to the control box safety time "ts":

- For $t_s = 2s$, firing output must be equal to or lower than 1/2 of max. operation output.
- For $t_s = 3s$, firing output must be equal to or lower than 1/3 of max. operation output.

Example: MAX operation output of 600 kW.

Firing output must be equal to or lower than:

- 300 kW con $t_s = 2s$
- 200 kW con $t_s = 3s$

In order to measure the firing output:

- Extract the UV cell 29)(A)p.4 (the burner will ignite and lock-out at the end of a safety period).
- Perform 10 firings with consecutive lock-outs.

On the meter read the quantity of gas burned.

- This quantity must be equal to or lower than the quantity given by the formula:

$$\frac{\text{Sm}^3/\text{h} \text{ (max. burner delivery)}}{360}$$

360

Example: for gas G 20 (10 kWh/Sm³):

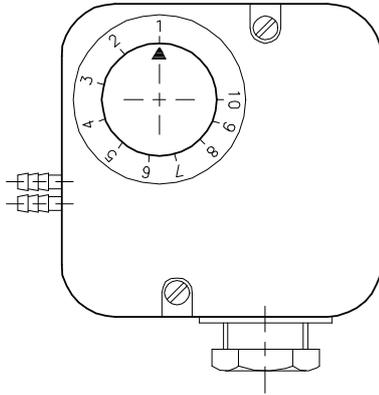
Max. operation output: 600 kW corresponding to 60 Sm³/h

After 10 firings with lock-outs, the delivery read on the meter must be equal to or lower than:

$$60 : 360 = 0,166 \text{ Sm}^3$$

Firing output must be adjusted on the gas valve throttle.

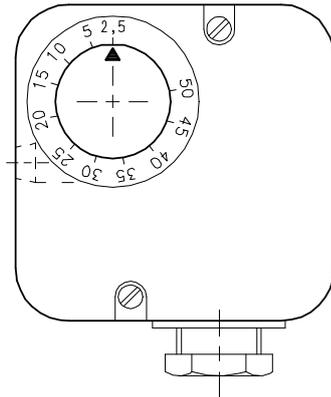
AIR PRESSURE SWITCH



(A)

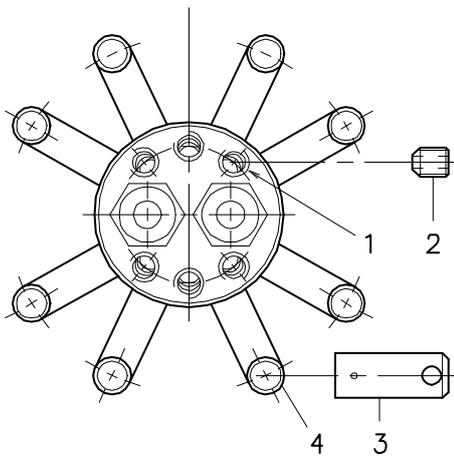
D521

MIN. GAS PRESSURE SWITCH



(B)

D896



(C)

D1181

4 - AIR PRESSURE SWITCH (A) - CO CHECK

Adjust the air pressure switch after having performed all other burner adjustments with the air pressure switch set to the start of the scale (A). With the burner operating in 1st stage, increase adjustment pressure by slowly turning the relative knob clockwise until the burner locks out. Then turn the knob anti-clockwise by about 20% of the set point and repeat burner starting to ensure it is correct. If the burner locks out again, turn the knob anti-clockwise a little bit more.

Attention: as a rule, the air pressure switch must limit the CO in the fumes to less than 1% (10.000 ppm). To check this, insert a combustion analyser into the chimney, slowly close the fan suction inlet (for example with cardboard) and check that the burner locks out, before the CO in the fumes exceeds 1%.

The air pressure switch may operate in "differential" operation in two pipe system. If a negative pressure in the combustion chamber during pre-purging prevents the air pressure switch from switching, switching may be obtained by fitting a second pipe between the air pressure switch and the suction inlet of the fan. In such a manner the air pressure switch operates as differential pressure switch.

Warning: the use of the air pressure switch with differential operation is allowed only in industrial applications and where rules enable the air pressure switch to control only fan operation without any reference to CO limit.

5 - MINIMUM GAS PRESSURE SWITCH (B)

Adjust the minimum gas pressure switch after having performed all the other burner adjustments with the pressure switch set at the start of the scale (B). With the burner operating in 2nd stage, increase adjustment pressure by slowly turning the relative knob clockwise until the burner locks out. Then turn the knob anti-clockwise by 2 mbar and repeat burner starting to ensure it is uniform. If the burner locks out again, turn the knob anti-clockwise again by 1 mbar.

LPG - PROPANE - BUTANE OPERATION

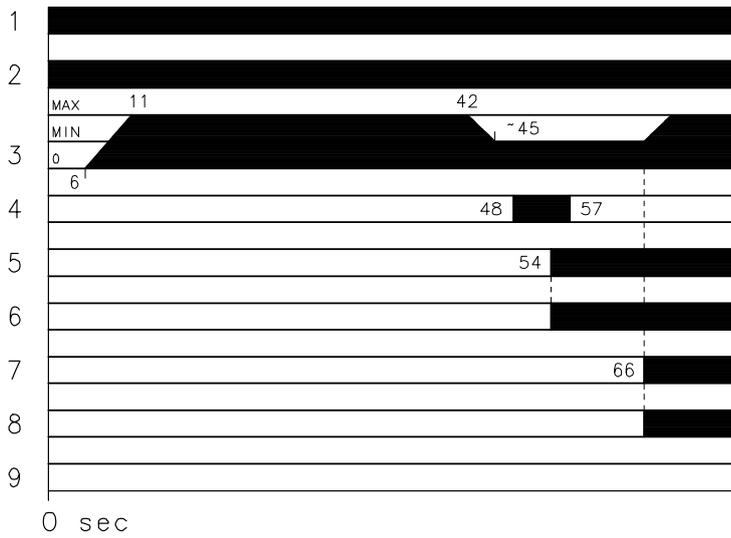
The burners can also operate on LPG-Propane-Butane gases. In this case it is necessary to assemble the nozzles 2)(C) on the holes 1)(C) and the caps 3)(C) on the small pipes 4)(C) supplied with the burner.

Apply the self-adhesive label for LPG operation near the characteristic label.

The firing rate range and burner adjustment are similar to those for natural gas. The G31 (Propane) gas pressure is shown on page 26.

Gas train: use the gas train for natural gas, see page 28, with 1"1/2 or 2" diameter.

NORMAL FIRING
(n° = seconds from instant 0)



(A)

D1144

BURNER OPERATION

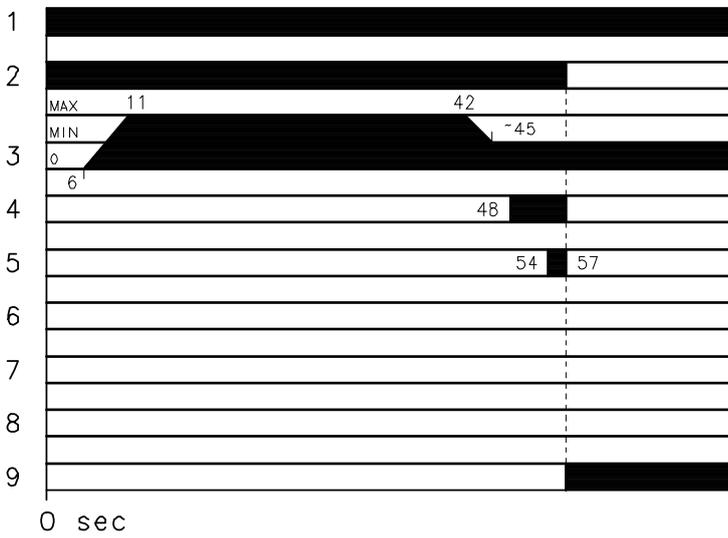
Key (A) - (B)

- 1 - Thermostat
- 2 - Motor
- 3 - Air gate valve
- 4 - Ignition transformer
- 5 - First valve
- 6 - First flame
- 7 - Second valve
- 8 - Second flame
- 9 - Lock-out

BURNER FLAME GOES OUT DURING OPERATION

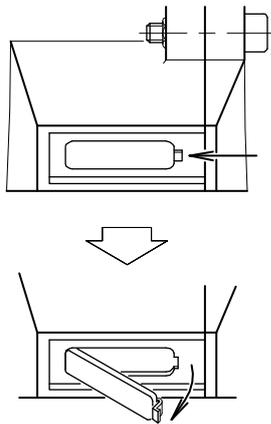
If the flame should accidentally go out during operation, the burner will lock out within 1s.

NO FIRING



(B)

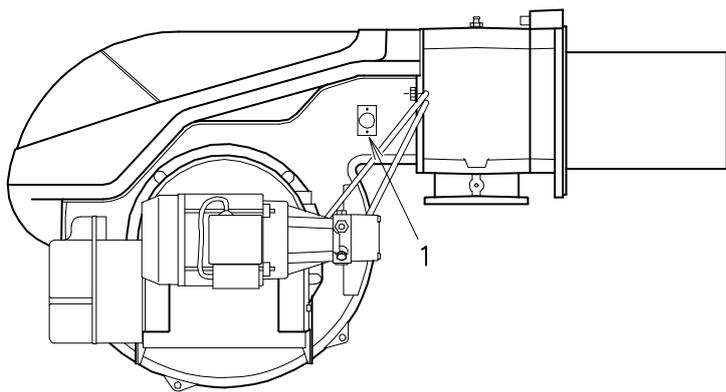
D1145



(A)

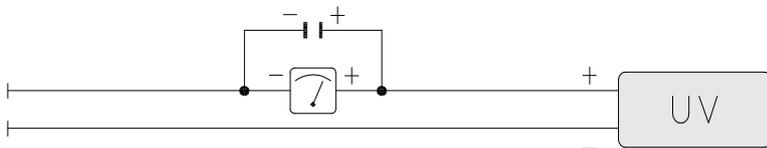
D484

UV CELL



(B)

D1182



(C)

D1143

MAINTENANCE

NOTES ON SAFETY FOR THE MAINTENANCE

The periodic maintenance is essential for the good operation, safety, yield and duration of the burner.

It allows you to reduce consumption and polluting emissions and to keep the product in a reliable state over time.



The maintenance interventions and the calibration of the burner must only be carried out by qualified, authorised personnel, in accordance with the contents of this manual and in compliance with the standards and regulations of current laws.

Before carrying out any maintenance, cleaning or checking operations:



Disconnect the electrical supply from the burner by means of the main system switch.



Close the fuel interception tap.

Combustion

The optimum calibration of the burner requires an analysis of the flue gases. Significant differences with respect to the previous measurements indicate the points where more care should be exercised during maintenance.

Flame inspection window

Clean the flame inspection window (A).

Combustion head

Open the burner and make sure that all components of the combustion head are in good condition, not deformed by the high temperatures, free of impurities from the surroundings and correctly positioned. If in doubt, disassemble the elbow fitting.

Nozzles (light oil)

Do not clean the nozzle openings; do not even open them. The nozzle filters however may be cleaned or replaced as required.

It is advisable to replace nozzles every year during regular maintenance operations. Combustion must be checked after the nozzles have been changed.

UV cell

Clean the glass cover from any dust that may have accumulated. The photo-electric cell 1)(B) is held in position by a pressure fit and can therefore be removed by pulling it outward forcefully.

Current to the uv photocell (C)

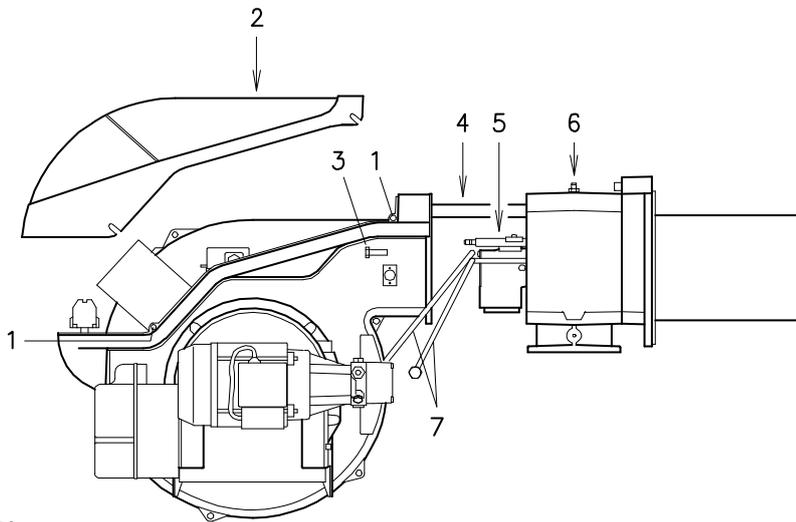
Min value for a good work: 70 µA.
If the value is lower, it can depend on:

- exhausted photocell;
- low current (lower than 187 V);
- bad regulation of the burner.

In order to measure the current, use a microammeter of 100 µA c.c., connected to the photocell, as in the scheme, with a capacitor of 100 µF - 1V c.c. at the same level of the instrument.

Flexible hoses (light oil)

Check to make sure that the flexible hoses are still in good condition and that they are not crushed or otherwise deformed.



(A)

D1183

Gas leaks

Make sure that there are no gas leaks on the pipework between the gas meter and the burner.

Gas filter

Change the gas filter when it is dirty.

Burner

Check for excess wear or loose screws. Also make sure that the screws securing the electrical leads in the burner connections are fully tightened. Clean the outside of the burner.

Combustion

Adjust the burner if the combustion values found at the beginning of the operation do not comply with the regulations in force, or at any rate, do not correspond to good combustion. Use the appropriate card to record the new combustion values; they will be useful for subsequent controls.

GAS COMBUSTION CHECKS

CO₂

It is better to set the burner with CO₂ not higher than 10% (gas with Pci 8600 kcal/m³). This way avoiding a loss of calibration setting (for example draft variation) that could cause combustion with little air and the production of CO.

CO

It must be not higher than 100 mg/kWh.

TO OPEN THE BURNER (A)



Disconnect the electrical supply from the burner by means of the main system switch.

- Loosen screws 1) and withdraw the cover 2)
- Disconnect the light-oil pipes 7)
- Remove screws 3) and pull the burner back by about 100 mm on the slide bars.
- Disconnect the electrode leads and then pull the burner fully back.
- Now extract the internal part 5) after having removed the screw 6).

TO CLOSE THE BURNER (A)

- Push the burner until it is about 100 mm from the sleeve.
- Re-connect the leads and slide in the burner until it comes to a stop.
- Refit screws 3) and pull the leads gently out until they are slightly stretched.
- Reconnect the light-oil pipes.

FAULTS - POSSIBLE CAUSES - SOLUTIONS

SYMBOL (1)	FAULT	PROBABLE CAUSE	SUGGESTED REMEDY
◀	The burner does not start	1 - No electrical power supply 2 - A limiter or safety control device is open 3 - Control box lock-out 4 - Control box fuses blown 5 - Erroneous electrical connections 6 - Defective control box. 7 - No gas supply 8 - Mains gas pressure insufficient. 9 - Minimum gas pressure switch fails to close 10 - Air pressure switch in operating position 11 - Cam I I servomotor contact does not operate	Close all switches - Check connections Adjust or replace Reset control box Replace (2) Check connections Replace Open the manual valves between meter and train Contact your GAS COMPANY Adjust or replace Adjust or replace Adjust cam I I or replace servomotor control box terminals 11-8
	The burner does not start and a function lock out occurs	12 - Flame simulation 13 - Defective capacitor (RS 28/M) 14 - Defective motor remote control switch (RS 38-50/M) 15 - Defective electrical motor 16 - Motor protection tripped (RS 38-50/M)	Replace control box Replace Replace Reset thermal cut-out when third phase is re-connected
▲	The burner starts but stops at maximum gate valve setting	17 - Cam I servomotor contact does not operate	Adjust cam I or replace servomotor control box terminals 9-8
P	The burner starts and then locks out	Air pressure switch inoperative due to insufficient air pressure: 18 - Air pressure switch adjusted badly 19 - Pressure switch pressure point pipe blocked 20 - Head wrongly adjusted	Adjust or replace Clean Adjust
■	The burner starts and then locks out	21 - Fault in flame detection circuit.	Replace control box
▼	The burner stays in the pre-purge stage	22 - Cam I I I servomotor contact does not operate	Adjust cam I I I or replace servomotor control box terminals 10-8
1	After pre-purge and safety time, the burner goes to lock-out and the flame does not appear	23 - The solenoid VR allows little gas through 24 - Solenoid valves VR or VS fail to open 25 - Gas pressure too low 26 - Ignition electrode wrongly adjusted. 27 - Electrode grounded due to broken insulation 28 - High voltage cable defective 29 - High voltage cable deformed by high temperature 30 - Ignition transformer defective 31 - Erroneous valve or transformer electrical connections 32 - Control box defective 33 - A cock down-line of the gas train is closed 34 - Air in pipework.	Increase Renew the coil or rectifier panel Increase pressure at governor Adjust Replace Replace Replace and protect Replace Repeat connection Replace Open Bleed air
	The burner goes to lock-out right after flame appearance	35 - The solenoid VR allows little gas through 36 - Ionisation probe wrongly adjusted. 37 - Faulty electrical connections for probe 38 - Insufficient ionisation (less than 6 µA). 39 - Probe grounded 40 - Max. gas pressure switch operates. 41 - Defective control box.	Increase Adjust Repeat connection Check probe position Withdraw or replace cable Adjust or replace Replace
	The burner repeats the starting cycle without lock out	42 - Mains gas pressure is near the value to which the min. gas pressure switch gas is adjusted. The repeated drop in pressure which follows valve opening causes temporary opening of the pressure switch itself, the valve immediately closes and the burner comes to a halt. Pressure increases again, the pressure switch closes again and the firing cycle is repeated. The sequence repeats endlessly.	Reduce operating pressure of minimum gas pressure switch. Replace gas filter.
	Lock out without symbol indication	43 - Flame simulation	Replace control box
	During operation, the burner stops in lock out	44 - Probe or ionisation cable grounded 45 - Fault on air pressure switch 46 - Max. gas pressure switch operates.	Replace worn parts Replace Adjust or replace
◀	Lock out when burner stops	47 - Flame remains in combustion head	Eliminate persistence of flame or replace control box
	Ignition with pulsation	48 - Poorly adjusted head 49 - Ignition electrode wrongly adjusted. 50 - Poorly adjusted fan air gate: too much air. 51 - Output during ignition phase is too high	Adjust Adjust Adjust Reduce

(1) The control box is fitted with a disc which rotates during the firing programme, which can be seen through the transparent lock-out reset button. When the burner does not fire or comes to halt following a fault, the symbol which appears behind the reset button indicates the type of problem.
 (2) The fuse is located in the rear part of the control box. A pull-out fuse is also available as a spare part which can be fitted after breaking the tag on the panel which holds it in place.

ACCESSORIES (optional):**• EXTENDED HEAD KIT**

Burner	Standard length (mm)	Length obtainable with the kit (mm)	Code
RLS 70	250	385	3010345
RLS 100	250	385	3010346
RLS 130	250	385	3010347

• SOUNDPROOFING BOX KIT

Burner	Box type	Code
RLS 70-100-130	C4/5	3010404

• GAS MAX PRESSURE SWITCH KIT

Burner	Code
RLS 70-100-130	3010493

• DEGASSING UNIT

Burner	Filter	Code
RLS 70-100	With filter	3010055
RLS 70-100	Without filter	3010054

• GAS TRAINS IN COMPLIANCE WITH EN 676

Please refer to manual.

Important: the installer is responsible for the addition of any safety device not foreseen in the present manual.

声明	页码 2
技术数据	3
电气数据	3
燃烧器描述	4
包装 - 重量	4
最大尺寸	4
标准配置	4
出力范围	5
测试锅炉	5
商用锅炉	5
安装	6
锅炉钢板	6
燃烧筒长度	6
安装燃烧器到锅炉	6
1 段火及 2 段火喷嘴选择	7
喷嘴安装	7
首次点火前调节 (轻油运行)	7
电气系统	9
电气连接	10
轻油供应	11
液压连接	11
液压系统	12
油泵	12
油泵启动	12
燃烧器校准 (轻油运行)	12
伺服马达	13
燃气供应	14
燃气阀组	14
燃气压力	15
首次点火前调节 (燃气运行)	16
燃烧器启动	16
燃烧器点火	16
燃烧器校准	16
LPG - 丙烷 - 丁烷运行	18
燃烧器运行	19
维护	20
燃气燃烧状态检测	21
故障 - 可能的原因 - 解决方案	22
配件	23

符合 ISO / IEC 17050-1 标准声明

制造商： RIELLO S.p.A.
地址： Via Pilade Riello, 7
37045 Legnago (VR)
产品名称： 双燃料轻油 / 燃气燃烧器双燃料轻油 / 燃气燃烧器
型号： RLS 70 - 100 - 130

以上产品符合如下技术标准：

EN 676
EN 267
EN 12100

且符合如下欧洲指令：

MD	2006/42/EC	机械指令
LVD	2006/95/EC	低电压指令
EMC	2004/108/EC	电磁兼容性

产品质量符合 UNI EN ISO 9001 质量管理体系标准。

Legnago, 10.10.2013

执行总监
RIELLO S.p.A. - 燃烧器部
Mr. G. Conticini



研发总监
RIELLO S.p.A. - 燃烧器部
Mr. R. Cattaneo



技术数据

型号			RLS 70	RLS 100	RLS 130
功率 ⁽¹⁾ 出力 ⁽¹⁾	2 段火	kW kg/h	465 - 817 39 - 69	698 - 1163 59 - 98	930 - 1512 78 - 130
	最小 1 段火	kW kg/h	232 19	349 29,5	465 39
燃料			轻油, 20 °C 时的粘度: 6 mm ² /s 最大 (1,5 °E - 6 cSt) 天然气: G20 (甲烷) - G21 - G22 - G23 - G25 GPL - G30 (丙烷) - G31 (丁烷)		
最大出力时的燃气压力 ⁽²⁾ 燃气: G20/G25/G31		mbar	7.4/10.6/9.4	11.5/17.0/13.1	14.1/12.1/18.8
运行			- 间歇式运行 (每 24 小时至少停机一次) - 两段火 (高 - 低火焰) 以及单段火 (启动 - 停机)		
喷嘴		数量	2		
适用范围			锅炉: 热水锅炉、蒸汽锅炉、导热油炉		
环境温度		°C	0 - 40		
助燃空气温度		°C 最高	60		
油泵	流量 (压力为 12 bar 时)	kg/h	220		
	压力范围	bar	10 - 20		
	燃料温度	°C 最高	60		
噪音水平 ⁽³⁾	声压	dBA	74	77.5	80
	声功率		85	89.5	91

(1) 参考条件: 环境温度 20°C - 大气压力 1000 mbar - 海拔 100 m s.l.m.

(2) 燃气阀组上游压力 1)(A)p.13 如 EN676 如 EN676 标准所示, 炉膛内压力为零且燃烧器处于最大出力状态时。

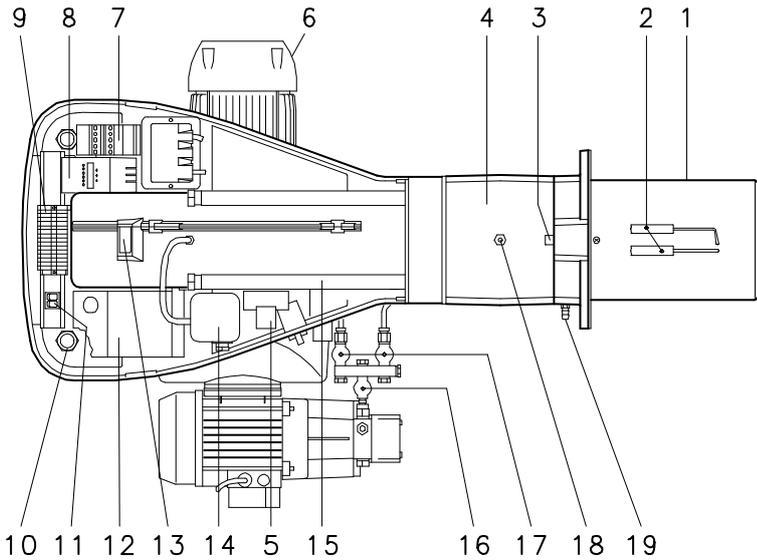
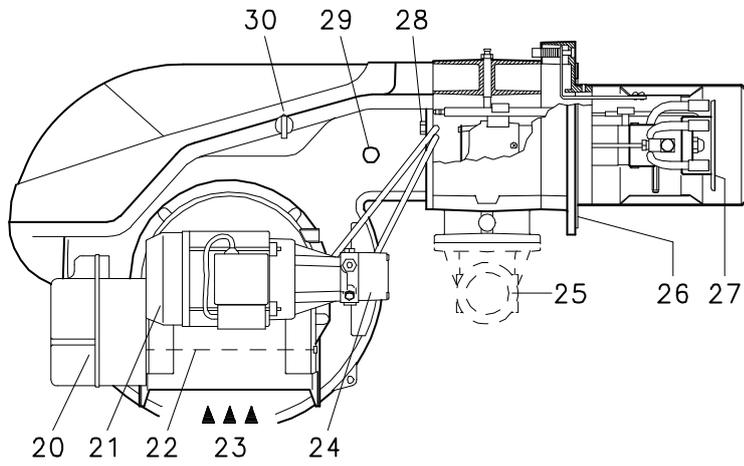
(3) 噪声值于制造商实验室内的测试锅炉上测得, 且燃烧器处于最大额定出力状态。根据相关规定, 声功率的测定集中在以燃烧器为中心、半径为 1 米的球形空间内。

电气数据

型号		RLS 70	RLS 100	RLS 130
主电源 电源控制回路		3 ~ 230/400V 50Hz 1N ~ 230V 50Hz		
风机马达 IE2	rpm	2880	2870	2900
	Hz	50	50	50
	V	230 / 400	230 / 400	230 / 400
	W	1100	1500	2200
	A	4.3 - 2.5	5.9 - 3.4	7.9 - 4.6
油泵马达	rpm	2700		
	Hz	50		
	V	230		
	W	550		
	A	3.6		
油泵马达电容器	μF	25		
点火变压器	V1 - V2 I1 - I2	230 V - 2 x 5 kV 1,9 A - 30 mA		
吸收电功率	W 最大	2000	2400	3200
电气保护等级		IP 44		

燃烧器类别

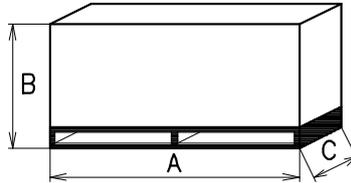
适用国家	类别
IT - AT - GR - DK - FI - SE	II ₂ H3B / P
ES - GB - IE - PT	II ₂ H3P
NL	II ₂ L3B / P
FR	II ₂ E _r 3P
DE	II ₂ ELL3B / P
BE	I ₂ E(R)B, I ₃ P
LU - PL	II ₂ E3B/P



(A)

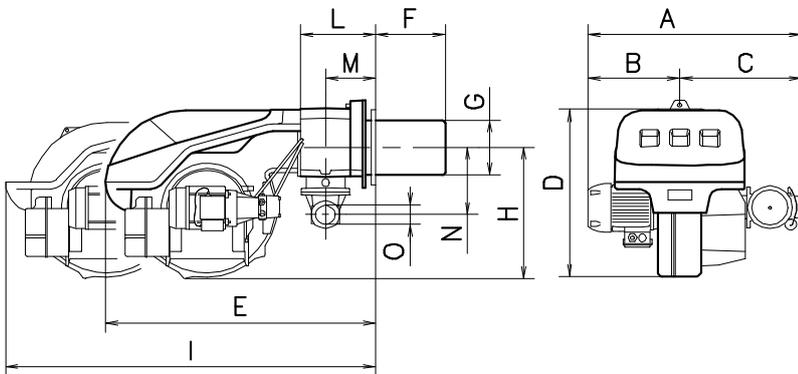
D1175

mm	A	B	C	kg
RLS 70	1405	1000	660	70
RLS 100	1405	1000	660	73
RLS 130	1405	1000	660	76



(B)

D36



mm	A	B	C	D	E	F ⁽¹⁾	G	H	I	L	M	N	O
RLS 70	691	296	395	555	840	250-385	179	430	1161	214	134	221	2"
RLS 100	707	312	395	555	840	250-385	189	430	1161	214	134	221	2"
RLS 130	733	338	395	555	840	250-385	189	430	1161	214	134	221	2"

(1) 燃烧筒：标准 - 加长

(C)

D1176

燃烧器描述 (A)

- 1 燃烧头
- 2 点火电极
- 3 燃烧头调整螺丝
- 4 燃烧筒
- 5 继电器
- 6 风机马达
- 7 带复位按钮的马达接触器和热断路器
- 8 LED 指示灯面板
- 9 接线端子板
- 10 电气连接用导缆孔，由安装人员负责
- 11 两个开关：
 - 其一，“燃烧器停机 - 启动”开关
 - 其二，燃烧器“1 - 2 段火”转换开关
- 12 控制盒，带锁定指示灯及锁定复位按钮
- 13 火焰检查窗
- 14 最小风压开关
（“微分”运行）
- 15 滑杆系统，用于打开燃烧器及检查燃烧头
- 16 安全电磁阀
- 17 1 段火和 2 段火阀门
- 18 燃气压力测试点及燃烧头固定螺丝
- 19 风压测试点
- 20 伺服马达。燃烧器停机时风门阀关闭以减少因风机开启产生气流所造成的锅炉热量损失。
- 21 油泵马达
- 22 风门阀
- 23 风机进风口
- 24 油泵
- 25 燃气进气管路
- 26 锅炉安装法兰
- 27 稳焰盘
- 28 固定风机到燃烧头用螺丝
- 29 UV 电眼
- 30 燃油 / 燃气选择器

两种燃烧器故障：

控制盒锁定：如果控制盒 12)(A) 按钮指示灯亮起，则显示燃烧器锁定。可按此按钮进行复位。
马达跳闸：按下热继电器 7)(A) 上的按钮可恢复供电。

包装 - 重量 (B) - 大概值

- 燃烧器整机放置于能由叉车吊起的木质底盘上。其带包装的外观尺寸如表 (B) 所示。
- 燃烧器带外包装的整体重量如表 (B) 所示。

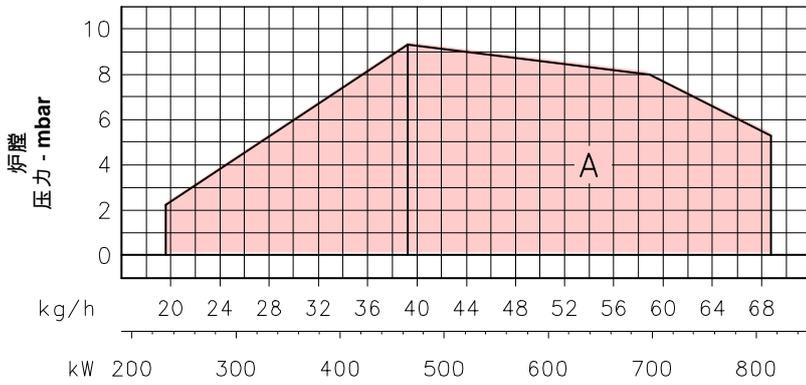
最大尺寸 (C) - 大概值

燃烧器最大尺寸如表 (C) 所示。请谨记检查燃烧头时需要打开燃烧器，将其后部从滑杆上取下。将燃烧器打开后，其不带外罩的最大尺寸如图 I 所示。

标准配置

- 1 - 燃气阀组法兰
- 1 - 法兰垫片
- 4 - 法兰固定螺丝 M 10 x 35
- 1 - 隔热垫
- 4 - 固定燃烧器法兰到锅炉用螺丝：M 12 x 35
- 2 - 软管
- 2 - 带垫圈的软管接头
- 1 - LPG 运行组件
- 1 - LPG 运行标签
- 1 - 操作手册
- 1 - 零部件目录

RLS 70



出力范围 (A)

燃烧器可以两种方式运行：1 段火和 2 段火。

最大出力必须在 A 区内选择。

要利用 B 区 (RLS 130)，需要按第 8 页所示对燃烧头进行校准。

最小出力不得低于图中所示的最小值。：

RLS 70	= 232 kW	= 19.0 kg/h
RLS 100	= 349 kW	= 29.5 kg/h
RLS 130	= 465 kW	= 39.0 kg/h

重要提示：

出力范围内所示数值在以下条件下获得：环境温度为 20 °C，大气压力位 1000 mbar (大约海拔高度为 100 米)，燃烧头调整至如第 8 页所示状态。

测试锅炉 (B)

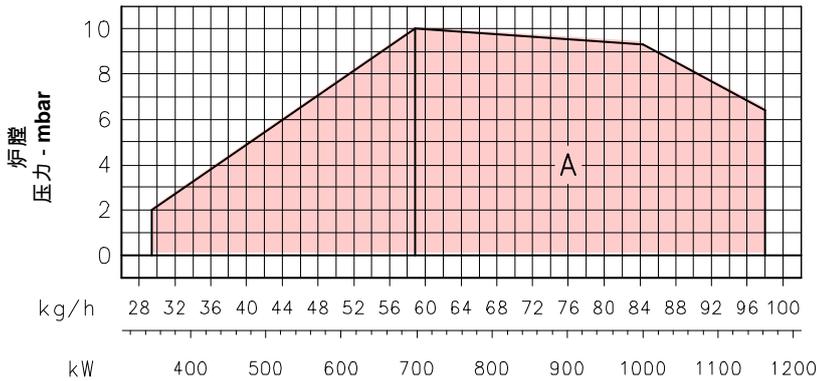
出力曲线根据 EN 676 标准在专用测试锅炉上获得。

图 (B) 为测试锅炉的炉膛直径及长度。

举例：出力 650 Mcal/h:

直径 = 60 cm; 长度 = 2 m。

RLS 100

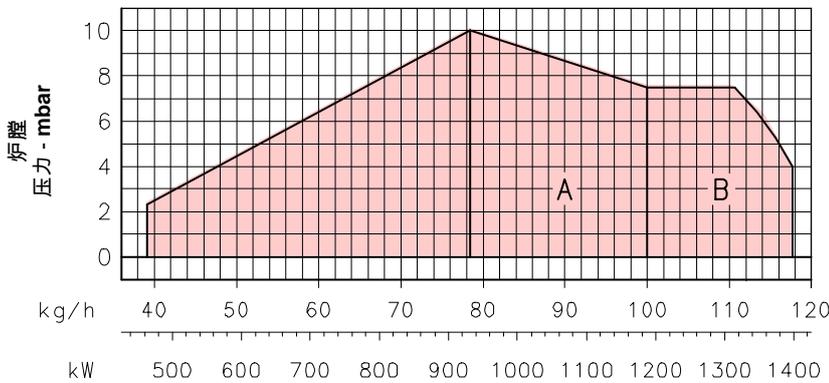


商用锅炉

若锅炉符合 CE 类的认证标准，则燃烧器和锅炉相匹配，炉膛尺寸与图 (B) 中所示尺寸相似。

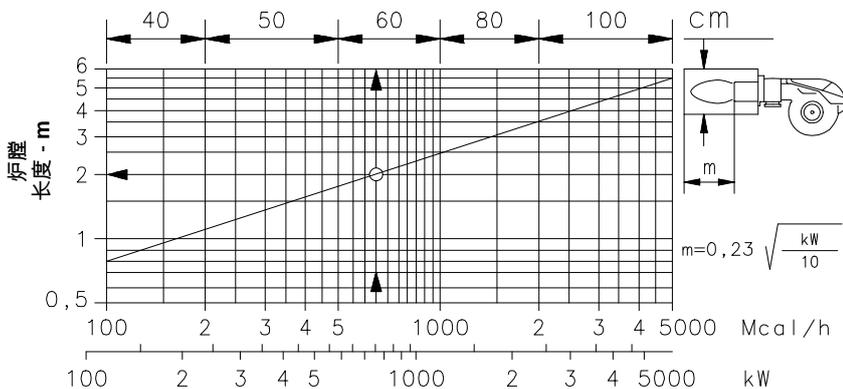
如果要将燃烧器安装于未经 CE 认证的锅炉上及/或锅炉炉膛尺寸明显小于图 (B) 所示尺寸，请咨询制造商。

RLS 130



(A)

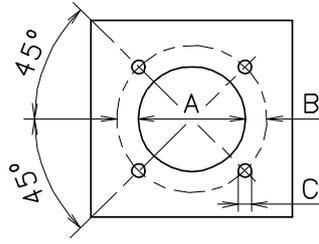
D1194



(B)

D715

mm	A	B	C
RLS 70	185	275-325	M 12
RLS 100	195	275-325	M 12
RLS 130	195	275-325	M 12



(A)

D455

安装

锅炉钢板 (A)

如 (A) 所示，在炉膛定位板上钻孔。随燃烧器提供的隔热垫可帮助确定导缆孔的位置。

燃烧筒长度 (B)

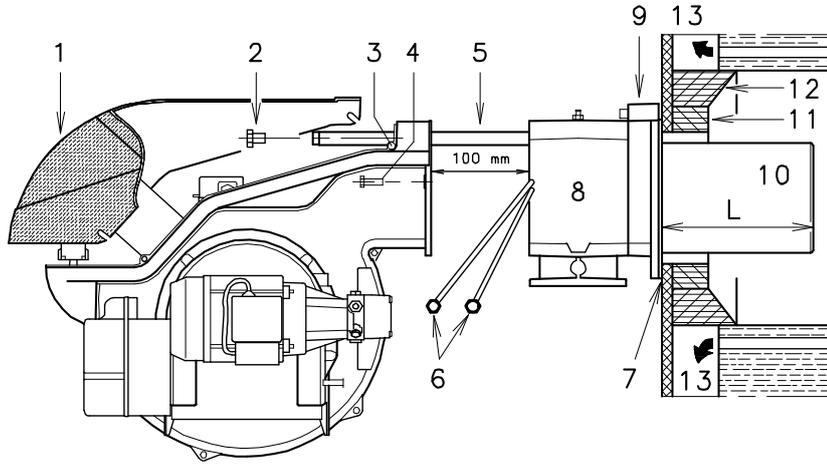
必须根据锅炉生产商提供的数据选择合适长度的燃烧筒，且在任何情况下其厚度必须大于锅炉钢板加炉补的厚度之和。可选的长度范围 L (mm) 如下：

燃烧筒 10):	RLS 70	RLS 100	RLS 130
• 标准	250	250	250
• 加长	385	385	385

带前烟道 13) 或回焰炉膛的锅炉，其使用耐火材料制成的保护性炉补 11) 必须装于锅炉炉补 12) 和燃烧筒 10) 之间。

此保护性炉补不得妨碍取下燃烧筒。

带水冷却前板的锅炉，则不需要耐火材料制成的炉补 11)-12)(B)，除非锅炉制造商另有要求。



(B)

D1172

固定燃烧器到锅炉上 (B)

从燃烧器上取下燃烧头，如图 (B)：

- 拧下两个连接器 6) 的螺丝，取下输油管。
- 拧下 4 个螺丝 3)，取下外罩 1)
- 从滑杆 5) 上取下螺丝 2)
- 取下 2 个螺丝 4)，将燃烧器沿滑杆 5) 拉出大约 100 mm。
- 断开点火电极电缆，将燃烧器从滑杆上取下。

燃烧头校准

RLS 130 型燃烧器在 2 段火运行，其出力范围的 A 区或 B 区，燃烧头校准见第 5 页。

如果燃烧器出力在 A 区范围，则无需任何操作。

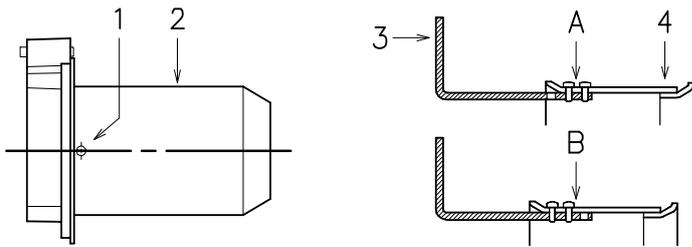
如果出力在 B 区范围，则按以下步骤操作：

- 拧下螺丝 1)(C)，拆下燃烧筒 2)。
- 将拉杆 3)(C) 从 A 处移动到 B 处，拉开风挡百叶 4)。
- 将燃烧筒 2)(C) 和螺丝 1) 重新安装到原位。

进行上述操作后 (如需要)：

- 固定法兰 9)(B) 到锅炉钢板，并在两者间加装燃烧器随附的隔热屏 7)(B)。
- 使用随附的 4 个螺丝拧紧抗锁定装置。

燃烧器与锅炉间必须达到气密标准。



(C)

D1192

GPH	kg/h			kW 12 bar
	10 bar	12 bar	14 bar	
5.00	19.2	21.2	23.1	251.4
5.50	21.1	23.3	25.4	276.3
6.00	23.1	25.5	27.7	302.4
6.50	25.0	27.6	30.0	327.3
7.00	26.9	29.7	32.3	352.3
7.50	28.8	31.8	34.6	377.2
8.00	30.8	33.9	36.9	402.1
8.30	31.9	35.2	38.3	417.5
8.50	32.7	36.1	39.2	428.2
9.00	34.6	38.2	41.5	453.1
9.50	36.5	40.3	43.8	478.0
10.0	38.4	42.4	46.1	502.9
10.5	40.4	44.6	48.4	529.0
11.0	42.3	46.7	50.7	553.9
12.0	46.1	50.9	55.3	603.7
12.3	47.3	52.2	56.7	619.1
13.0	50.0	55.1	59.9	653.5
13.8	53.1	58.5	63.3	693.8
14.0	53.8	59.4	64.5	704.5
15.0	57.7	63.6	69.2	754.3
15.3	58.8	64.9	70.5	769.7
16.0	61.5	67.9	73.8	805.3
17.0	65.4	72.1	78.4	855.1

(A)

选择 1 段火和 2 段火喷嘴

燃烧器符合 EN 267 标准所规定的排放标准。为了保证稳定排放，应使用利雅路操作手册中推荐使用的喷嘴。



建议每年进行定期维护时更换喷嘴。



使用非利雅路公司指定喷嘴以及缺乏定期维护可能会导致排放超出强制标准规定的限值；严重时，还会导致人员伤亡及财产损失。

因未按本手册进行操作导致的任何损害，制造商将不承担任何责任。

两个喷嘴均需在表 (A) 中选择。

1号喷嘴控制燃烧器在1段火运行模式时的出力大小。

2号喷嘴与1号喷嘴一起控制燃烧器在2段火运行模式时的出力大小。

1段火及2段火的出力大小必须在第3页所示的数值范围内。

建议压力为 12 bar 时，喷嘴喷射角度为 60°。

通常，两个喷嘴的出力大小相同。

喷嘴安装

取下螺丝 1)(B) 并且取出内部组件 2)(B)。

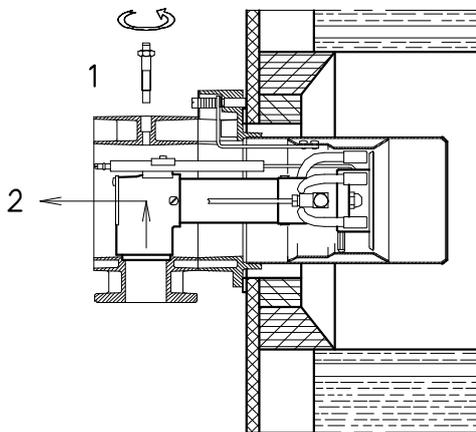
在取下塑料塞子 2)(C)，用扳手 1)(C) (16 mm)，安装两个喷嘴，将扳手伸入火焰稳定盘的中心孔或拆下螺丝 1)(D)，取下稳焰盘 2)(D) 并用扳手 3)(D) 装好喷嘴。

请勿使用任何密封材料，如密封垫、复合密封材料或密封胶带。注意不要损坏喷嘴的密封座。安装时必须将喷嘴拧到位，但不要拧脱扣。

1 段火运行时的喷嘴位于点火电极下。

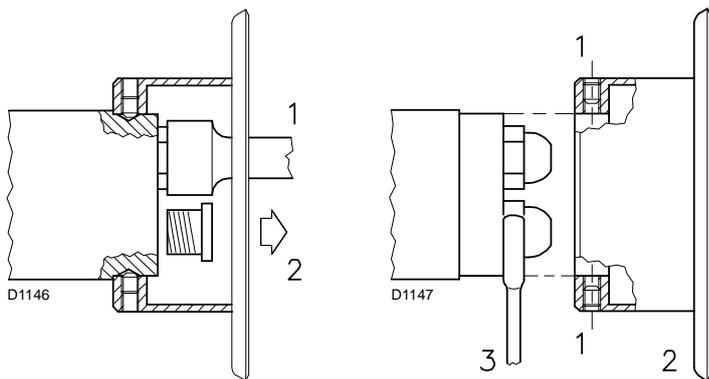


确认点火电极连接位置如图 (E) 所示。



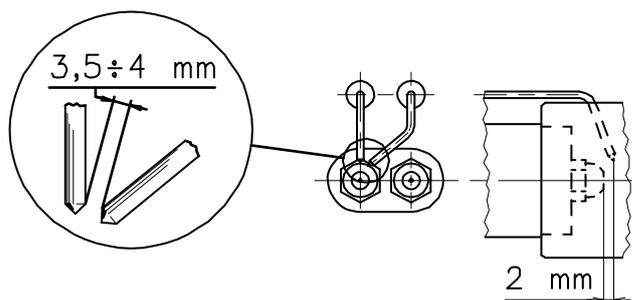
(B)

D1122



(C)

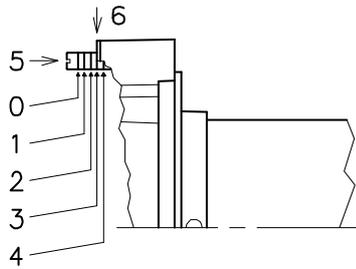
(D)



(E)

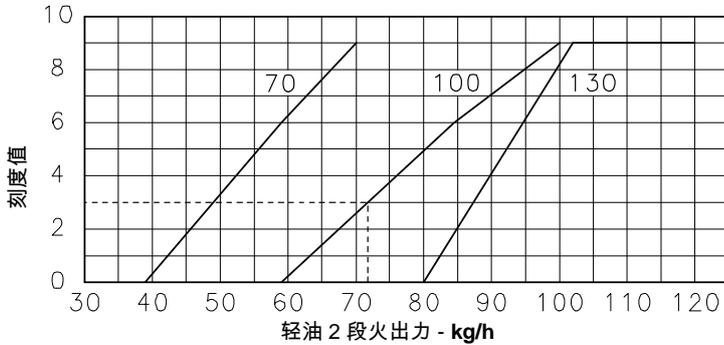
D1124

设定燃烧头



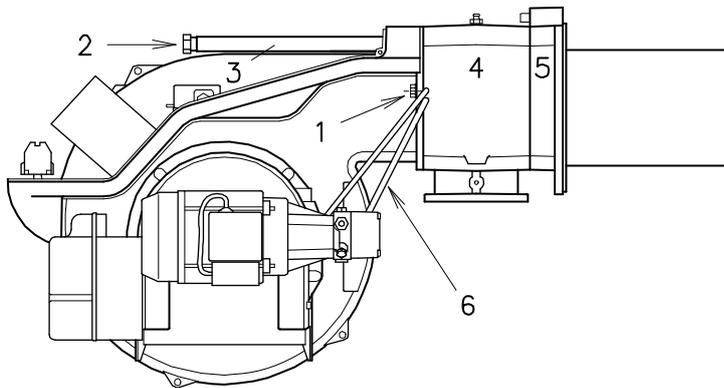
(A)

D1149



(B)

D1193



(C)

D1173

将燃烧器重新安装到滑杆 3(C) 上，从燃烧筒 4) 处推进大约 100 mm - 燃烧器位置如图 (B) 页 6 所示 - 插入点火电极线，然后将燃烧器沿滑杆滑动至燃烧筒处，直至燃烧器位置如图 (C) 所示。重新拧紧滑杆 3) 上的螺丝 2(C)。拧紧螺丝 1)，将燃烧器固定到燃烧头上。用螺丝拧紧两个连接器上，如图 6)(B) 页 6 所示，接好输油管。



将燃烧器安装到两个滑杆上时，好后，建议轻轻的拉出点火电极的电缆，直至它们被轻轻的拉紧。

点火前调节 (轻油运行)

• 燃烧头设定

燃烧头的设定完全取决于燃烧器 2 段火出力。拧紧螺丝 5)(A) 直至图 (B) 所示刻度位置，此为法兰的外沿位置。

• 举例：燃烧器型号 RLS 100

燃烧器 2 段火出力 = 72 kg/h.

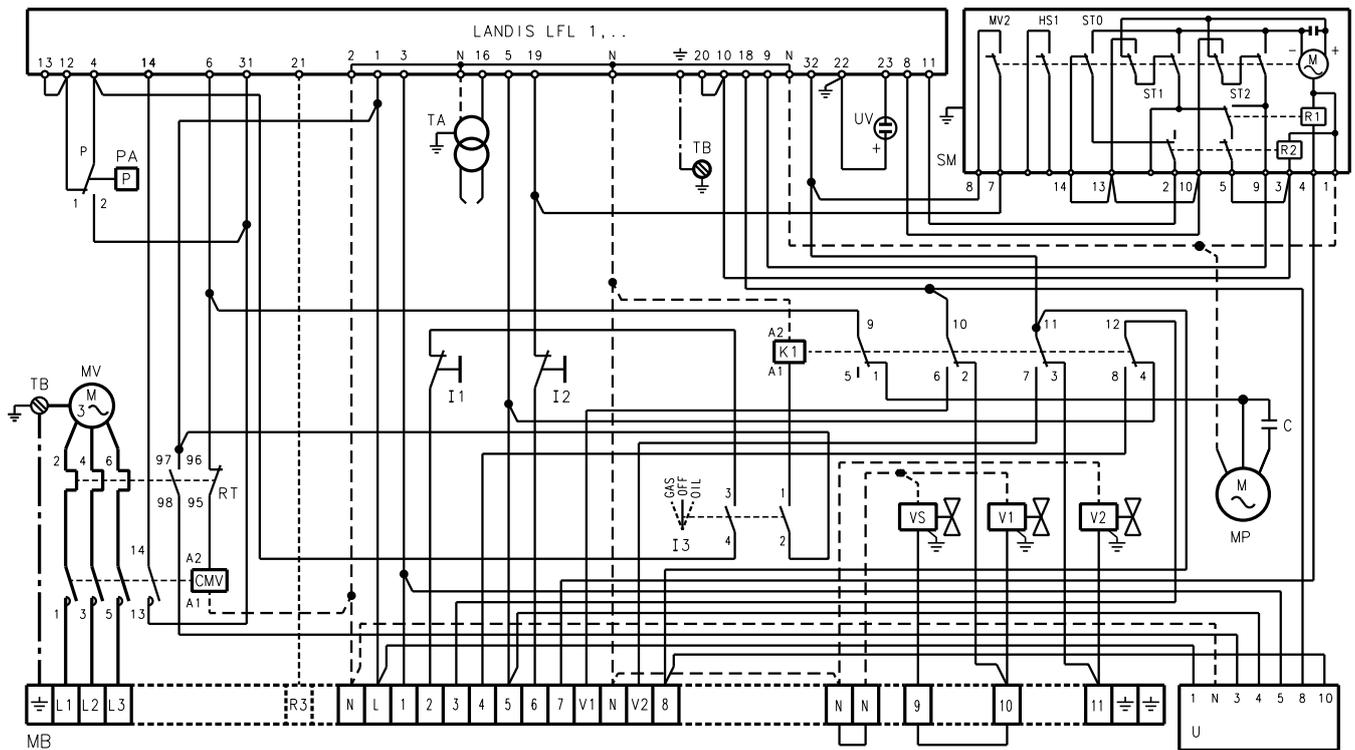
查图 (B) 可知在此出力要求下，需将燃烧头调整至刻度 3，如图 (B) 所示。

• 油泵调节

油泵无需调节，出厂时已由制造商按气压 12 bar 的标准进行设定。燃烧器点火后需对这一压力进行检查，如有必要则需调整。此阶段所需的唯一操作为油泵安装压力表。

• 风门调节

燃烧器初次点火时，请勿改变燃烧器出厂时工厂对 1 段火及 2 段火运行所设定的参数。



(A)

D3493

工厂预设电气系统

- 工厂预设燃烧器电源电压为 **400V**。
- 如果使用电压为 **230V**，马达连接应从星型改为角型，同时改变热继电器设定。

图例 (A)

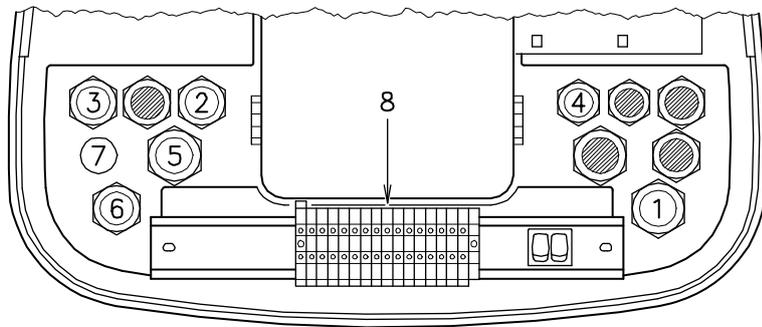
C	电容器
CMV	马达接触器
K1	继电器
LFL 1.322	控制盒
I1	开关： 燃烧器 启动 - 停机
I2	开关：1 段火 - 2 段火
I3	燃油 / 燃气 选择器
MB	燃烧器接线端子板
MV	风机马达
MP	油泵马达
PA	风压开关
RT	热继电器
SM	伺服马达
TA	点火变压器
TB	燃烧器接地
U	LED 指示灯面板
UV	UV 电眼
V1	1 段火轻油阀
V2	2 段火轻油阀
VS	安全油阀

注意

- 工厂预设燃烧器电源电压为 **400V**。
如果使用电压为 **230V**，马达连接应从星型改为角型，同时改变热继电器设定。
- 燃烧器为间歇式运行，即每 24 小时至少强制停机一次，以便使控制盒检测其启动时的有效性。通常由锅炉负荷控制系统自动将燃烧器停机。
如果不是这种情况，应将一个计时器串联至 IN 开关位置，以使燃烧器每 24 小时至少停机一次。
- 工厂预设燃烧器为两段火运行，因此应将燃烧器连接到控制装置 TR。
如果燃烧器需要单段火运行，则不需要连接控制装置 TR，而应该用跳接线连接接线端子 6 和 7。

警告

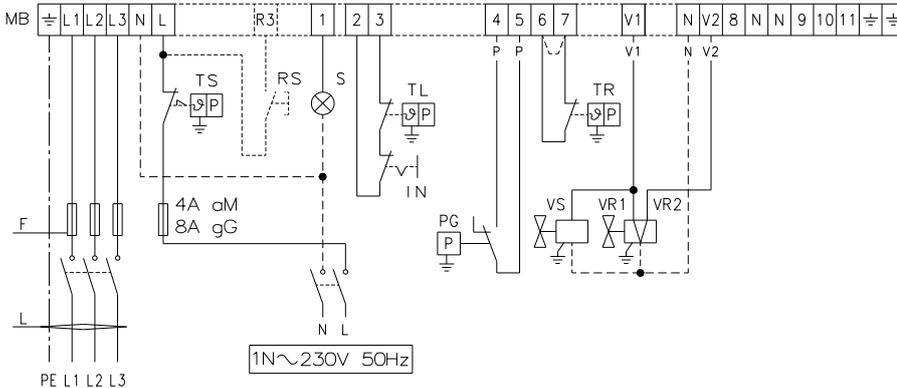
进行电气连接时，注意不要将零线和相线接反。



(A)

D1174

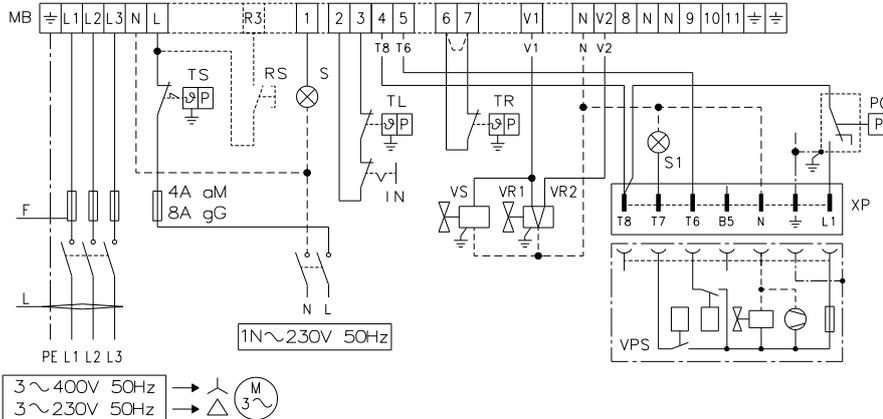
不带泄露检测装置



(B)

20081670

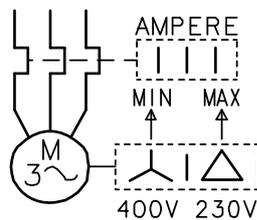
带泄露检测装置 VPS



(C)

20081671

热继电器校准



(D)

D867

		RLS 70		RLS 100		RLS 130	
		230 V	400 V	230 V	400 V	230 V	400 V
F	A	6A aM 12A gG	4A aM 8A gG	8A aM 16A gG	4A aM 8A gG	10A aM 20A gG	6A aM 12A gG
L	mm ²	1.5	1.5	2.5	1.5	2.5	1.5

(E)

电气连接

使用符合 EN 60 335-1 标准的电缆：

- 如果为 PVC 套管，最低标准为 HO5 VV-F；
- 如果为橡胶套管，最大标准为 H05 RR-F。

所有连接到燃烧器接线端子板8(A)的导线都必须穿过引线管。

引线管和卡扣可以有不同的使用方法；下面列出的为其中一种：

- 1- Pg 13.5 三相电源
- 2- Pg 11 单相电源
- 3- Pg 11 远程控制装置 TL
- 4- Pg 9 远程控制装置 TR
- 5- Pg 13.5 燃气阀
- 6- Pg 13.5 燃气压力开关或燃气泄露检测装置
- 7- Pg 11 增加管接头时，打开开孔。

接线图 (B)

不带泄露检测装置的电气连接

接线图 (C)

带泄露检测装置的电气连接

燃气泄露检测装置在燃烧器每次启动前启动。

保险丝及电缆接线图截面 (B-C)，见表 (D)。

小于 1,5 mm² 的截面积未标出。

图例 (B) - (C)

- IN - 燃烧器手动停机开关
- XP- 泄露检测装置用插头
- MB- 燃烧器接线端子板
- PG- 最小燃气压力开关
- RS- 远程锁定复位按钮 (如有)
- S - 远程锁定信号
- S1- 燃气泄露检测装置的远程锁定信号
- TR- 高-低负荷模式远程控制系统：
控制系统控制 1 段火和 2 段火的运行。如果燃烧器设定为单段火运行，使用跳接线替换远程控制装置 TR。
- TL - 负荷限位远程控制系统：
锅炉温度或压力达到预设值时，将燃烧器停机。
- TS- 安全负荷控制系统 :TL 有故障时运行。
- VR1- 1 段火调节阀
- VR2- 2 段火调节阀
- VS- 安全阀

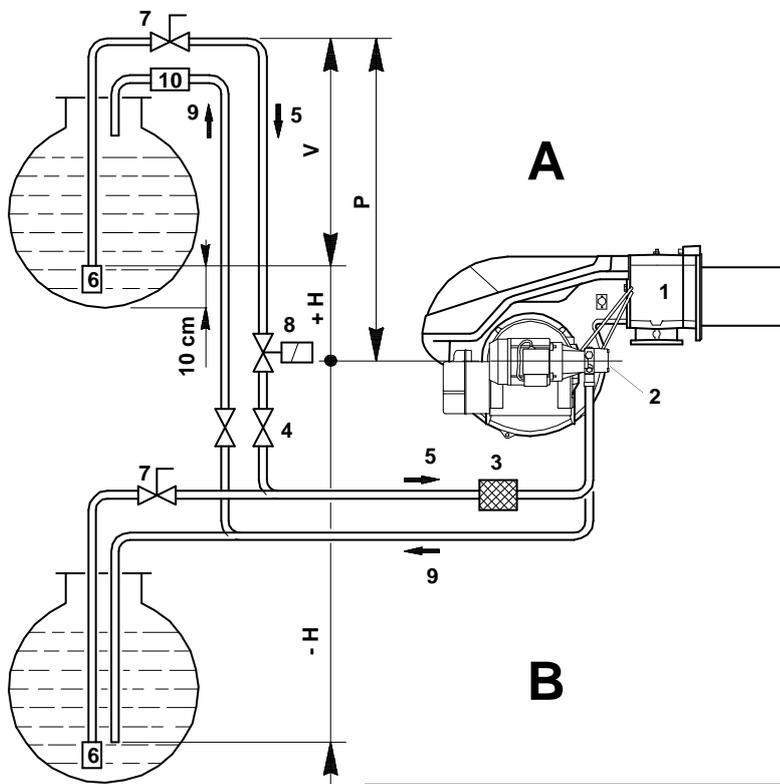
接线图 (C)

热继电器校准

校准热继电器可以避免因缺相导致吸收功率突然增加而造成的马达损坏。

- 如果马达未星型连接，400V，指针应位于 "MIN" (最小) 位置。
- 如果马达未角型连接，230V，指针应位于 "MAX" (最大) 位置。

即使热继电器的工作范围小于马达额定吸收功率 400V，仍可对设备起到保护作用。



轻油供应 (A)

燃烧器配置一台自吸泵，可对燃烧器自动送油。自吸泵的高度见左表。

高位油箱 A

为了避免破坏油泵密封，高度“P”不能超过 10 米；为了油箱即使在油量极少的情況下能启动油泵，高度“V”不能超过 4 米。

低位油箱 B

油泵吸入口真空度不能超过 0.45 bar (35 cm Hg)，真空度过高会造成燃油汽化，油泵启动噪音大，且会降低油泵寿命。保持燃烧器回油管和进油管在相同水平高度，这样可以避免进油管吸不到油。

图例 (A)

- H = 油泵 / 脚阀高度差
- L = 管路长度
- ∅ = 管路内径
- 1 = 燃烧器
- 2 = 油泵
- 3 = 过滤器
- 4 = 手动启动 / 停机 阀门
- 5 = 进油管
- 6 = 脚阀
- 7 = 快关手动阀远程控制 (仅适用于意大利)
- 8 = 开 / 关 电磁阀 (仅适用于意大利)
- 9 = 回油管
- 10 = 止回阀 (仅限意大利)

+/- H m	L m		
	∅ 12 mm	∅ 14 mm	∅ 16 mm
+ 4	71	138	150
+ 3	62	122	150
+ 2	53	106	150
+ 1	44	90	150
+ 0,5	40	82	150
0	36	74	137
- 0,5	32	66	123
- 1	28	58	109
- 2	19	42	81
- 3	10	26	53
- 4	-	10	25

液压连接 (B)

油泵配有旁路系统可以连接进油管和回油管。油泵安装在燃烧器上时，旁路系统被螺丝 6)(A) p.12 封住。

需要连接两根软管到油泵上。

如回油管关闭且旁路系统螺丝为插入状态，此时运行油泵会立即损坏油泵。

拆下油泵入口及回油口的堵头。

将所附的密封垫加入到连接管连接到油泵并拧紧。

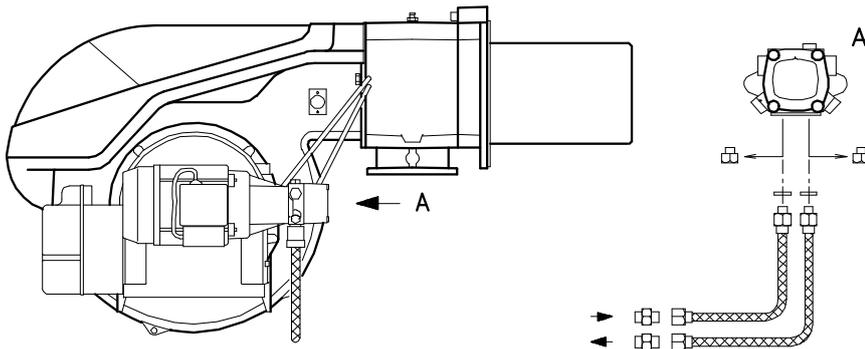
注意安装软管时不要拉伸或扭曲软管。

软管应安装在不易被踩踏的位置，不能接触到锅炉的高温表面，亦不能妨碍打开燃烧器进行检修。

现在可以用随附的软管接头将软管的另一端与进油管路和回油管路相连接。

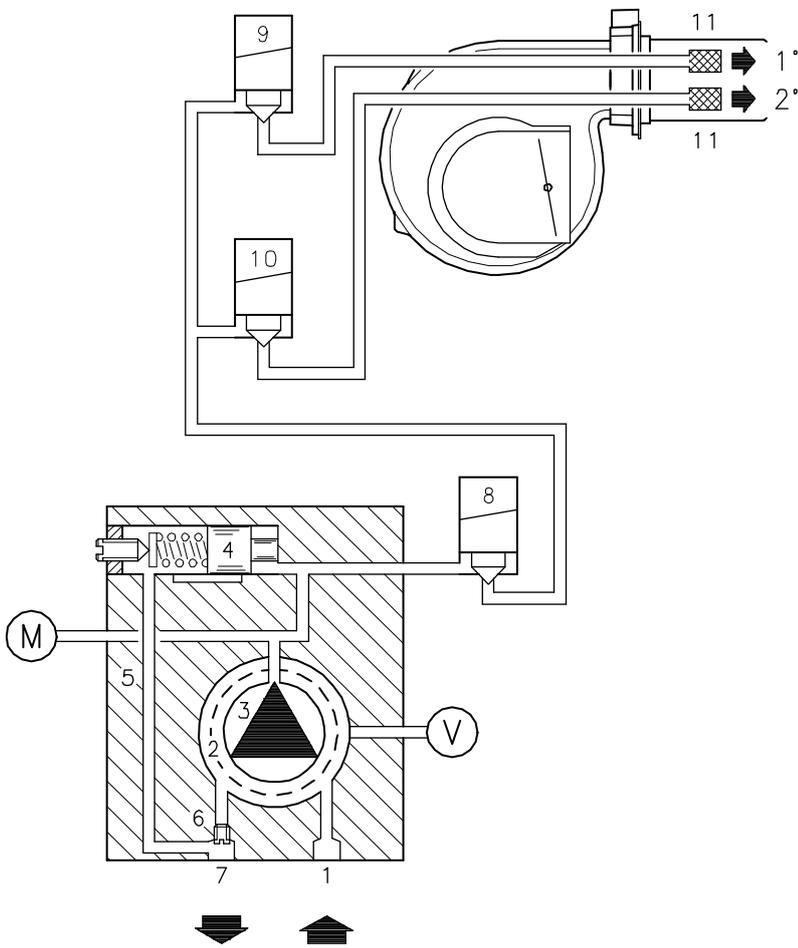
(A)

D1178



(B)

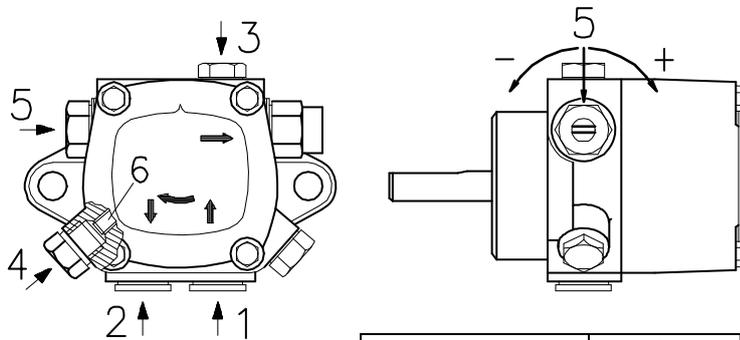
D1185



(A)

D1184

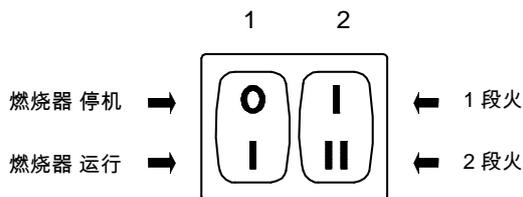
油泵 - SUNTEC AJ6 CC



		AJ6 CC
A	kg/h	220
B	bar	10 - 20
C	bar	0,45
D	cSt	2.8 - 75
E	°C	60
F	bar	2
G	bar	12
H	mm	0.15

(B)

D1177



(C)

D469

液压系统

图例 (A)

- 1 油泵进油管
- 2 过滤器
- 3 油泵
- 4 调压阀
- 5 回油管
- 6 旁路螺丝
- 7 油泵回油管
- 8 安全电磁阀
- 9 1 段火阀门
- 10 2 段火阀门
- 11 过滤器
- M 压力计
- V 真空计

油泵 (B)

- 1 - 进油管 G 1/4"
 - 2 - 回路 G 1/4"
 - 3 - 压力表附件 G 1/8"
 - 4 - 真空计附件 G 1/8"
 - 5 - 调压阀
- A - 气压为 12 bar 时的最小输油量
 B - 输油压力范围
 C - 油泵吸入口最大真空度
 D - 粘度范围
 E - 轻油最高温度
 F - 最大进油及回油压力
 G - 出厂时的压力校准
 H - 过滤网宽度

油泵启动

- 启动燃烧器前，确认油箱回油管畅通。回油管堵塞可能损坏油泵轴上的密封圈。（油泵出厂时旁路系统已被堵塞）。
 - 检查确认进油管路上的阀门为开启状态，且油箱中有足够量的燃油。
 - 启动自吸功能时，松开油泵上的螺丝 3)(B)，排出进油管路上的空气。
 - 将控制盒电源闭合，启动燃烧器。将开关 1)(A) 置于 "ON" 位置，同时开关 30)(A)p.4 置于 "OIL" 位置。
 - 若从螺丝 3)(B) 处有油漏出，则可认为油泵运行正常。
- 将燃烧器停机时，将开关 1)(C) 置于 "OFF" 位置并拧紧螺丝 3)(B)。
- 启动所需时间取决于进油管直径及长度。如果首次启动油泵失败且燃烧器锁定，需复位燃烧器，之后再次启动燃烧器。
- 不要调暗 UV 电眼，否则燃烧器会锁定。

燃烧器校准 (轻油运行)

注意

建议首次校准燃烧器时以轻油运行参数为准，之后再使用燃气运行。

警告

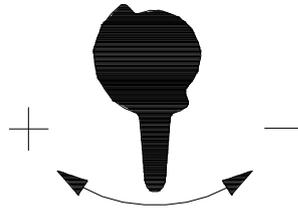
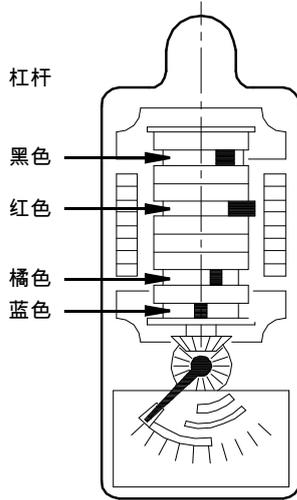
若将燃烧器燃料由燃油更换为燃气，必须在停机时进行。

点火

将开关 1)(C) 置于 "ON" 位置。

首次点火时，当 1 段火运行转换为 2 段火运行时，会因燃油需将 2 段火喷嘴管路注满而出现短暂的油压下降现象。这一压力的下降可能会导致燃烧器锁定，有时还会引起燃烧器震动。

伺服马达



(A)

D1195

运行

燃烧器的优化校核需要在锅炉排气口安装烟气分析仪，并对以下部分进行调整：

• 1 段火和 2 段火喷嘴

内容详见第 11 页。

• 燃烧头

除改变 2 段火时燃烧器的送油量外，其它有关燃烧头调整之事宜按之前相关内容（第 8 页）进行操作。

• 油泵压力

12 bar: 此压力位出厂时的预设值，可以满足大部分用户的需求。有些情况下，也需对此压力做出调整，如：
10 bar 在此压力下，可减小燃油输送量，但环境温度需在 0°C 以上。

14 bar 在此压力下，可增加燃油输送量。此压力还可保证温度低于 0°C 时，燃烧器仍能点火启动。

调整油泵压力，可使用螺丝 5(B)p. 12。

• 1 段火风机风门阀

将开关 2)(C)p. 12 设定至 1 段火位置，使燃烧器处于 1 段火运行状态。通过调节伺服马达橘色控制杆调节风机风门阀。

• 2 段火风机风门阀

设定开关 2)(C)p. 12 至 2 段火位置。

通过调节伺服马达红色控制杆调节风机风门阀。

伺服马达 (A)

伺服马达调节风门阀。

伺服马达在 5 秒内旋转 90°。

目前先不要改变工厂预设的 4 个调节器的状态。

4 色刻度表标记调节器的调节位置。

蓝色控制杆

燃烧器停机时，设定风门阀的位置：风门阀全关。

橘色控制杆

燃烧器 1 段火运行时，设定风门阀的位置。

红色控制杆

燃烧器 2 段火运行时，设定风门阀的位置。

黑色控制杆

设定 2 段火燃气或燃油阀的开启度。

应仅在红色控制杆后和橘色控制杆前使用。

不得和红色控制杆同时使用，否则会阻碍燃气阀或轻油阀开启。

不得在橘色控制杆后直接使用，这样可避免燃烧器在缺乏空气时燃烧。

燃气阀或轻油阀开启角度接近 2 段火风门阀位置，向左转动黑色控制杆；要以延长阀门开启时间，向右转动控制杆。

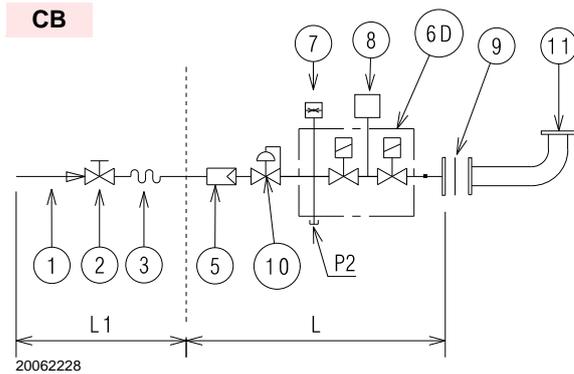
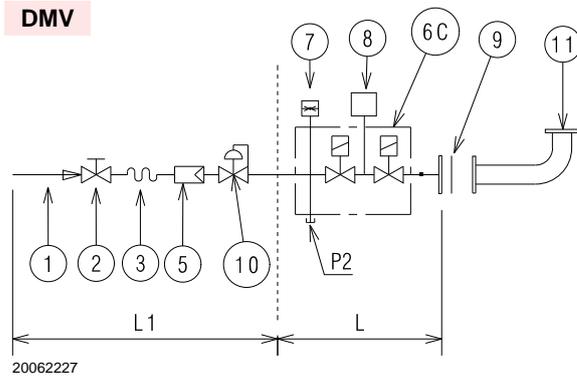
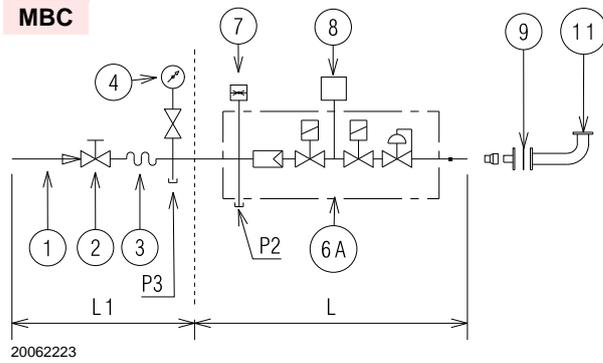
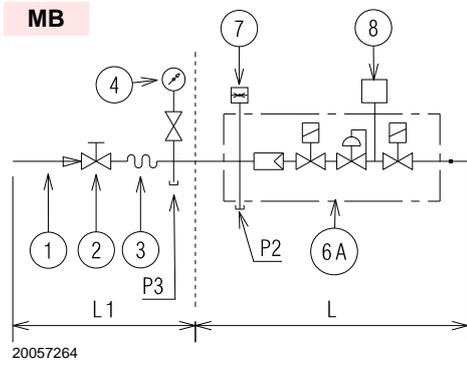
总之，以上各控制杆应该下列顺序操作：

1° 蓝色控制杆

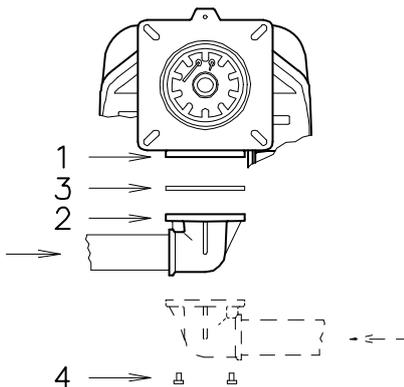
2° 橘色控制杆

3° 黑色控制杆

4° 红色控制杆



(A)



(B)

燃气供应



在有可燃物的环境中发生燃料泄漏时，可能会有爆炸危险。

注意：避免敲击、摩擦、火花及加热。在对燃烧器进行任何操作前，检查确认燃料截止阀全关。



燃气供应管路必须由具有资质的人员安装，且符合安装地的强制标准。

图例 (A)

- 1 燃气输入管路
- 2 手动阀
- 3 减震器
- 4 带按键锁的压力表
- 5 过滤器
- 6A 包括：
 - 过滤器
 - 运行阀
 - 安全阀
 - 调压器
- 6C 包括
 - 安全阀
 - 运行阀
- 6D 包括：
 - 安全阀
 - 运行阀
 - 调压器
 - 过滤器
- 7 最小燃气压力开关
- 8 燃气阀泄漏检测装置，根据燃气阀组代码，此装置为机内集成或随机配件。按 EN 676 标准要求，最大出力大于 1200 kW 的燃烧器必须强制安装泄漏检测装置。
- 9 垫片，仅适用于“法兰”型
- 10 调压器
- 11 燃气阀组 - 燃烧器适配器，需单独订购
- P2 阀门 / 调压器上游压力
- P3 过滤器上游压力
- L 燃气阀组需单独订购
- L1 由安装人员负

燃气阀组

燃气阀组符合 EN 676 标准，不包含在燃烧器内，为单独订购组件。

请参考手册中“燃烧器 - 燃气阀组”一节选择正确的燃气阀组型号

查看随附的手册调节燃气阀组。

燃气阀组安装

- 使用随附的法兰(2)，垫片(3)和螺丝(4)将燃气阀组必须和其附件 1)(B) 进行连接。
- 燃气阀组可以安装在燃烧器右侧或左侧，以方便为原则，见图 (B)。
- 检查确认压力调节器校准范围(弹簧颜色)与燃烧器所需压力相符。

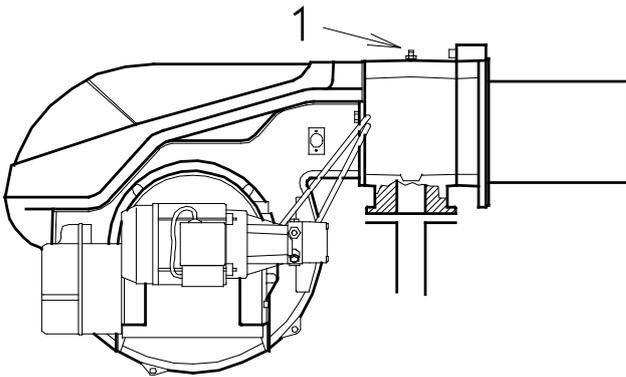


燃气电磁阀应尽可能靠近燃烧器，以保证燃气在 3 秒安全时间内到达燃烧头。

确保燃烧器承受的最大压力在压力调节器的校准范围之内。

Mod.	kW	1 Δp (mbar)	
		G20	G31
RLS 70	465	5.5	6.3
	504	5.6	6.4
	543	5.7	6.5
	582	5.7	6.5
	621	5.8	6.6
	661	5.9	6.8
	700	6	7
	739	6	7.2
	778	6.1	7.5
	817	6.2	7.8
RLS 100	695	8	10.3
	747	8.2	10.5
	799	8.5	10.7
	851	8.7	10.9
	903	9	11.2
	955	9.2	11.4
	1007	9.4	11.6
	1059	9.6	11.7
	1111	9.8	11.9
	1163	10	12
RLS 130	930	9.3	10.5
	995	9.4	10.8
	1059	9.6	11.2
	1124	9.8	11.7
	1189	10.1	12.3
	1253	10.4	12.9
	1318	10.8	13.6
	1383	11.2	14.5
	1447	11.9	15.8
	1512	13	17.5

(A)



(B)

S9000

燃气压力

左表列出燃烧器在 2 段火出力运行时，燃气供应管路的最小压力损失。

表中所示数值为：

- 天然气 G20 PCI 9.45 kWh/Sm³ (8.2 Mcal/Sm³)
- LPG G31 PCI 27 kWh/Sm³ (23,2 Mcal/Sm³)

栏 1

燃烧头压力损失。

测试点 1)(B) 处燃气压力，此时：

- 炉膛背压为 0 mbar；
- 燃烧器为 2 段火运行
- 燃气 G20 (甲烷) - G31 (丙烷)

计算 燃烧器的 2 段火时的大概出力，可按如下方法进行：

- 将测试点 1)(B) 处测得的燃气压力减去炉膛背压。
- 在表的栏 1 找到与得数最接近的值。
- 读出左边的出力值即为近似出力值。

举例 - RLS 100

- 2 段火运行
 - 天然气 G20 PCI 10 kWh/Sm³
 - 测试点 1)(B) 处的燃气压力 = 11,4 mbar
 - 炉膛内压力 = 2 mbar
- $$11,4 - 2 = 9,4 \text{ mbar}$$

使用天然气 G20 时，表栏 1 中与 9,4 mbar 压力近似的相应的 2 段火出力为 1007 kW。

此值只能作为参考值，精确的出力值应根据燃气计量表测量。

为了计算 压力测试点 1)(B) 处的燃气压力，将燃烧器设定为 2 段火所需出力运行：

- 在表中找出最近似的出力值。
- 读出右边栏 1 中压力测试点 1)(B) 处的压力值。
- 将此压力值与与炉膛估计压力相加。

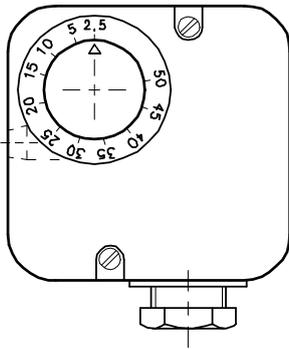
举例 - RLS 100

- 燃烧器运行所需最大出力：1007 kW
 - 天然气 G20 PCI 10 kWh/Sm³
 - 燃烧器出力为 1007 kW 时，从表栏 1 查出 G 20 压力为 = 9,4 mbar
 - 炉膛内压力 = 2 mbar
- $$9,4 + 2 = 11,4 \text{ mbar}$$
- 测试点 1)(B) 处所需燃气压力。



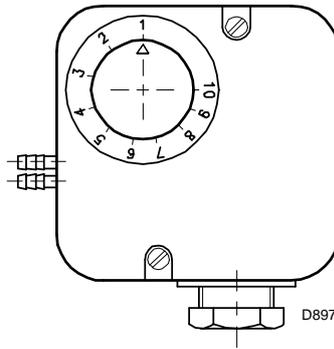
燃烧器以 LPG 运行时，使用直径为 1 1/2 或 2" 的燃气阀组。

最小燃气压力开关

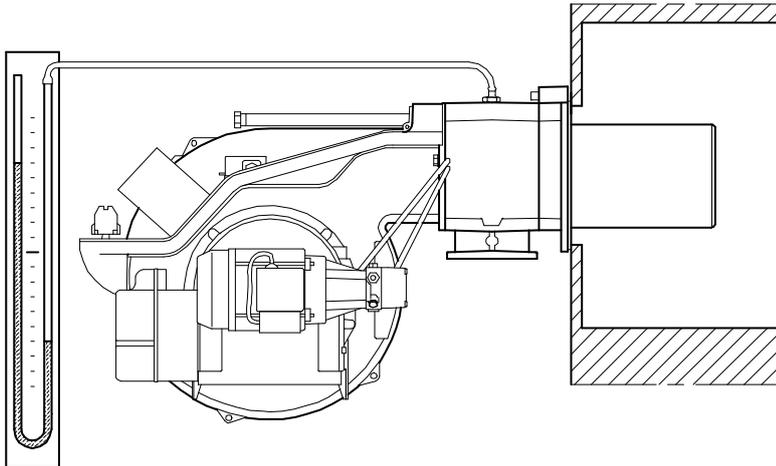


(A)

风压开关

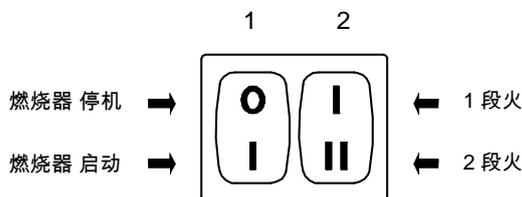


(B)



(C)

D1180



(D)

D469

点火前调节

(燃气运行)

燃烧头的调整已于第 8 页详述。

此外，还必须进行下列调整：

- 打开燃气阀组前的手动阀。
- 调整最小燃气压力开关到量程的开始位置 (A)。
- 调整风压开关到量程零位置 (B)。
- 排尽燃气管路中的空气。

连续排放空气 (建议使用一根塑料管接到室外排放) 直至闻到燃气的味道。

- 在燃烧头压力测试点处安装一个 U 型压力表 (C)。

根据第 7 页上的表，可用压力表上读数来计算燃烧器 2 段火运行出力。

- 连接两个灯泡或万用表到两个电磁阀 VR 和 VS 上，用以检查何时给电磁阀供电。

如果两个电磁阀已安装了指示灯显示何时通过电流，则无需进行此步骤。

启动燃烧器前，最好先调整燃气阀组以便燃烧器能在最安全的情况下点火，如使燃气流量最小。

燃烧器启动 (燃气运行)

注意：建议首次运行燃烧器时使用燃油，之后再使用燃气。

警告

必须在燃烧器停机更换燃料。

关闭控制装置并将

- 开关 1)(D) 置于 "ON" 位置
- 开关 2)(D) 置于 "1 段火" 位置

燃烧器一启动，检查确认连接到电磁阀上的灯泡或万用表，电磁阀自带的指示灯，显示电磁阀未通电。如果显示电磁阀通电，则应立即将燃烧器停机，并检查电气连接。

燃烧器点火 (燃气运行)

完成以上检查步骤后，可进行燃烧器点火。如果电机启动，但未产生火焰，且控制盒锁定，则复位并等待下一次点火。

如果点火仍未成功，有可能是燃气在 3 秒的安全时间内未到达燃烧头。

在此情况下，应增加点火燃气量。

燃气是否到的燃烧头可通过 U 型压力表 (D) 查看。

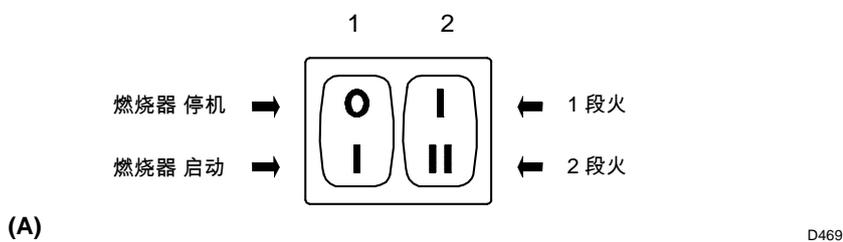
一旦点火成功，即可进行全面的校准工作。

燃烧器校准 (燃气运行)

在锅炉排放口使用烟气分析仪，以便对燃烧器进行最优校准。

继续调节：

- 1 - 燃烧器 2 段火出力
- 2 - 燃烧器 1 段火出力
- 3 - 首次点火出力
- 4 - 风压开关
- 5 - 最小燃气压力开关



1 - 2 段火出力

2 燃烧器 2 段火出力必须设定在第 5 页所示的出力范围之内。

设定开关 2)(A) 至 2 段火位置：伺服马达将在运行至轻油预设值时开启风门阀，并控制 2 段火燃气阀 VR2 的开启度。

燃气校准

根据空气量调节燃气输出量。

- 如需减小供气量，则可降低燃气压力；如果此时压力已经较低，则可关闭调节阀 VR2。
- 如需增大供气量，增大燃气压力。

2 - 1 段火出力

燃烧器 1 段火时的出力必须在第 5 页所示的出力范围内选择。

设定开关 2)(A) 至 1 段火运行位置：伺服马达将在运行至轻油预设值时关闭风门阀，并控制 1 段火燃气阀 VR1 的开启度。

风量调节

根据空气量，通过调节 1 段火燃气阀 VR1，调节燃气输送量。

3 - 点火出力 (燃气运行)

根据 EN 676 标准：

燃烧器最大出力为 120 kW

点火功率可以为燃烧器运行最大出力。举例：

- 运行最大出力 : 120 kW
- 点火最大出力 : 120 kW

燃烧器最大出力高于 120 kW

点火出力必须低于最大运行出力。若点火出力低于 120 kW，无需进行另外计算。若点火出力高于 120 kW，EN 676 标准规定点火出力应根据控制盒所标明的安全时间 "ts" 进行调整：

- 当 "ts" = 2s 时，点火出力必须小于等于燃烧器运行最大出力的 1/2。
- 当 "ts" = 3s 时，点火出力必须小于等于燃烧器最大出力的 1/3。

举例： 燃烧器最大出力为 600 kW。

点火出力必须小于等于：

- 300 kW，当 ts = 2 s 时；
- 200 kW，当 ts = 3 s 时。

如何测定点火出力：

- 取下 UV 电眼 29)(A)p.4 (燃烧器点火，安全时间后进入锁定状态)。
- 在持续的锁定状态下进行点火 10 次。
- 在燃气表上读出燃烧的燃气体量。

此燃气体量应小于或等于根据以下公式所计算出的数值：

$$\frac{\text{Sm}^3/\text{h} \text{ (燃烧器最大供气量)}}{360}$$

360

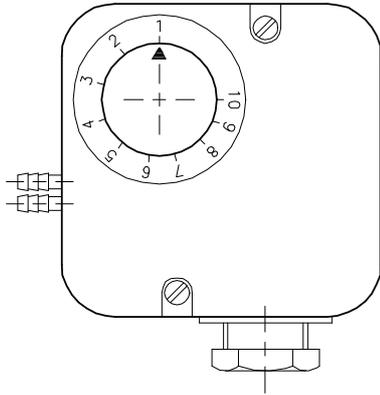
举例： 以燃气 G 20 (10 kWh/Sm³) 为例：

最大运行出力为 600 kW，燃烧器供气量为 60 Nm³/h。

持续的锁定状态下进行点火 10 次后，燃气表上显示的供气量必须等于或小于：

$$60 : 360 = 0,166 \text{ Sm}^3$$

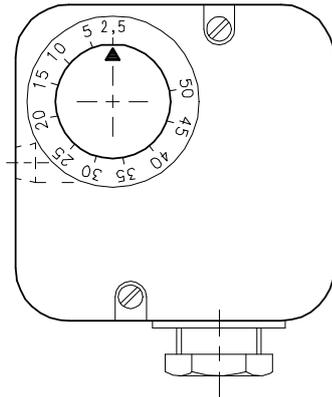
必须用燃气节流阀调节点火出力。



(A)

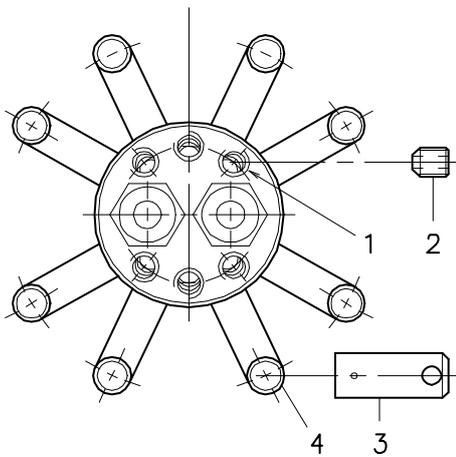
D521

最小燃气压力开关



(B)

D896



(C)

D1181

4 - 风压开关 (A) - CO 监测

在进行上述燃烧器各部分调节时，风压开关置于量程 (A) 的开始位置。上述所有调整结束后，方可调节风压开关。

燃烧器以 1 段火运行时，要增大压力，需顺时针缓慢转动手柄直至燃烧器锁定。

逆时针转动手柄约设定点的 20%，再次启动燃烧器并确认启动正常。

如果燃烧器再次锁定，则再将手柄逆时针转动一点。

注意：通常，风压开关必须将烟气中的 CO 浓度限定在 1% (10.000 ppm) 以内。

要检查这一点，需要在烟囱处安插一个烟气分析仪，缓慢关闭风机进气口（如使用一个硬纸板）并检查燃烧器是否在烟气中 CO 浓度超过 1% 前锁定。

风压开关可以在双管路系统中以“微分”模式运行。如果在预吹扫阶段，炉膛内负压阻碍风压开关开启，需要在风压开关和风机进风口之间安装第二根管子，才能开启开关。此时，风压开关作为“微分”压力开关运行。

警告：以“微分”模式工作时，风压开关只适用于工业领域，或符合当地允许风压开关仅控制风机运行的规定，不参考 CO 限定值。

5 - 最小燃气压力开关 (B)

上述调整结束后，开始调节最小燃气压力开关，此时开关位置应置于量程开始位置 (B)。

当燃烧器为 2 段火运行时，通过逆时针旋转压力调节手柄降低压力直至燃烧器锁定。

之后，顺时针旋转手柄调节 2 mbar，使燃烧器重新点火。

若此时燃烧器再次锁定，继续沿顺时针方向旋转手柄 1 mbar。

LPG - 丙烷 - 丁烷运行

燃烧器还可以使用 LPG- 丙烷 - 丁烷运行。在这种情况下，需要安装喷嘴 2)(C) 到软管 1)(C) 上，并将管帽 3)(C) 安装到燃烧器附带的小管 4)(C) 上。

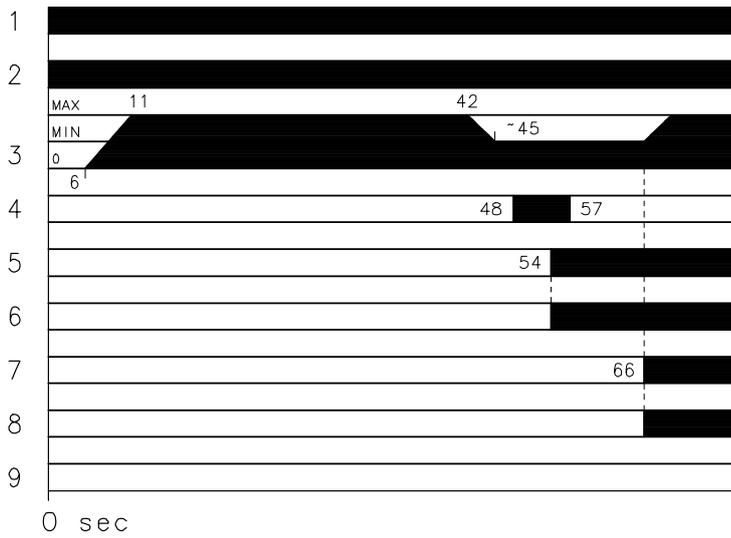
使用 LPG 运行，请将 LPG 运行专用自粘标签贴于设备特性标签旁。

此时，燃烧器的出力范围以及调节方式与使用天然气时类似。

G31 (丙烷) 的燃气压力见第 26 页。

燃气阀组：使用与运行天然气相同的燃气阀组，直径为 1"1/2 或 2"，见第 28 页。

正常点火
(n° = 从 0 秒开始计算的秒数)



(A)

D1144

燃烧器运行

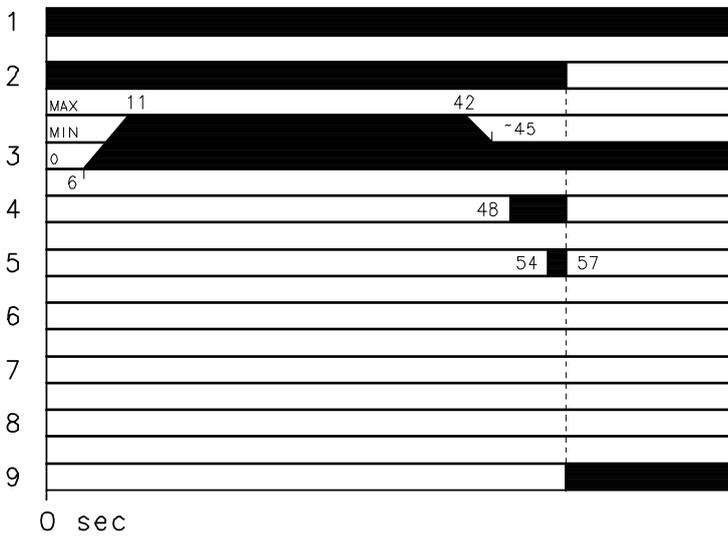
图例 (A) - (B)

- 1- 温控器
- 2- 马达
- 3- 风门阀
- 4- 点火变压器
- 5- 1 段火阀
- 6- 1 次火焰
- 7- 2 段火阀
- 8- 2 次火焰
- 9- 锁定

燃烧器运行中火焰消失

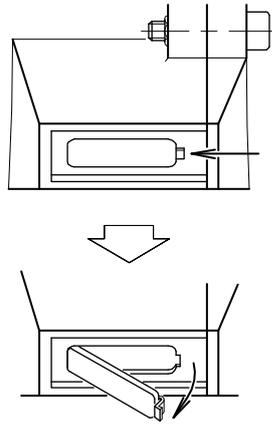
如果运行中火焰突然熄灭，燃烧器将在 1 秒内锁定。

无火焰



(B)

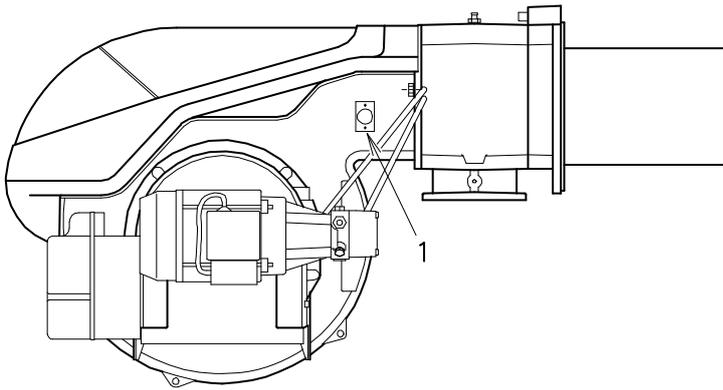
D1145



(A)

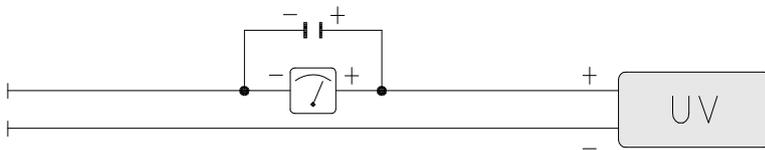
D484

UV CELL



(B)

D1182



(C)

D1143

维护

维护安全注意事项

定期维护对保持燃烧器良好的运行状态、安全性、工作效率及耐用性都非常重要。

定期维护可降低燃料消耗和污染排放，并且能保证产品的耐用性。



燃烧器的维护和校准必须由具有资质的专业技术人员操作，且符合本手册要求和安装地的强制标准。

在进行任何维护、清洁及检查之前，需做到



通过切断系统主开关切断燃烧器电源。



关掉燃料截留开关。

燃烧状态

燃烧器的最优校准需要安装烟气分析仪。如果任何参数与之前测量数值出入较大，则需在维护时特别注意这些参数的校准。

火焰检查窗

清洁火焰检查窗 (A)。

燃烧头

打开燃烧器，确认燃烧头所有部件状态良好，没有出现因高温变形或有污物附着其上等情况，且燃烧头位置正确。如有疑问，拆下弯头查看。

喷嘴 (轻油)

不要清洁喷嘴开口处。切记不得打开喷嘴。如需要，可清洁或更换喷嘴过滤网。

建议每年定期维护时更换喷嘴。更换喷嘴后必须重新检查燃烧状况。

UV 电眼

清洁 UV 电眼外的玻璃罩。在一定压力作用下，UV 电眼 1)(B) 被安装到位，如需取下，可将其用力向外拉出。

UV 电眼处的电流 (C)

UV 电眼正常工作的最小电流为：70 μ A。

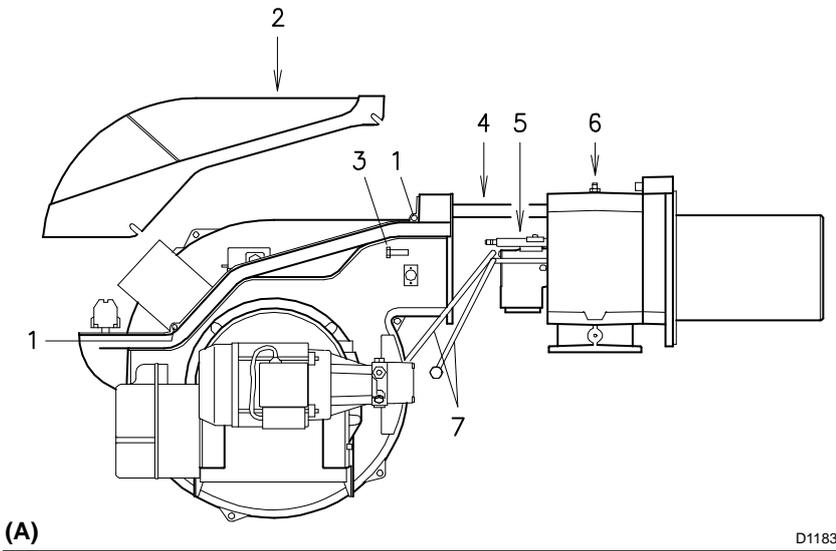
如果电流低于此值，可能由于以下原因造成：

- 光电管报废；
- 电压过低 (低于 187 V)；
- 燃烧器调节不当。

要测量电眼电流，可使用 100 μ A c.c. 的微安计，按电气连接图将其与电眼连接，同时在电眼同水平的位置，连接一个量程在 100 μ F - 1V c.c. 的电容器。

软管 (轻油)

检查软管以确认其状态良好，没有遭碾压或出现变形的情况。



燃气泄漏检测

确认燃气表和燃烧器之间的连接管路没有燃气泄漏。

燃气过滤器

过滤器脏时请更换。

燃烧器

检查确认是否有螺丝使用过度或松动的情况。同时确认固定燃烧器接线端子板电气导线的各螺丝没有任何松动。清洁燃烧器外部。

燃烧状态

如果在燃烧器运行的初始阶段获得的燃烧数据不符合当地强制标准，或者在任意出力下燃烧效果不好，则需调整燃烧器。用卡片记录新产生的燃烧数据，可作为之后对燃烧器进行维护的参考信息。

燃气燃烧状态检查

CO₂

最好将燃烧器的 CO₂ 排放量设定为低于 10% (燃气热值为 Pci 8600 kcal/m³)。这样可以避免校准设置不当 (如因校核标准改变) 以及由此产生的少量空气燃烧以及 CO 的排放。

CO

CO 排放量不得高于 100 mg/kWh。

打开燃烧器 (A)



通过切断系统主开关切断燃烧器电源。

- 拧松螺丝 1)，打开机盖 2)
- 拆下轻油管路 7)
- 取下螺丝 3)，沿滑杆拉出燃烧器约 100 mm。
- 断开电极导线，将燃烧器完全取下。
- 取下螺丝 6) 后，可将内部部件 5) 取出。

闭合燃烧器 (A)

- 将燃烧器推回大约 100 mm。
- 重新接通电极导线，将燃烧器沿滑杆滑动至不能再滑动为止。
- 重新拧紧螺丝 3)，将电极导线向外轻轻拉紧。
- 重新连接轻油管路

故障 - 可能的原因 - 解决方案

信号 (1)	故障	可能的故障原因	建议解决方案
◀	燃烧器无法启动	1 - 无电源 2 - 限位或安全控制装置开启 3 - 控制盒锁定 4 - 控制盒保险丝熔断 5 - 电气连接错误 6 - 控制盒故障 7 - 无燃气 8 - 主燃气管路压力不足 9 - 最小燃气压力开关未能闭合 10 - 风压开关在运行位置 11 - 凸轮 I 伺服马达触点 控制盒端子 11-8	闭合所有开关 - 检查电气连接 调整或更换 复位控制盒 更换 (2) 检查电气连接 更换 打开燃气表和燃气阀组件的手动阀 联系燃气公司 调整或更换 调整或更换 调整凸轮 I 或更换伺服马达
	燃烧器无法启动并锁定	12 - 虚假火焰 13 - 电容器故障 (RS 28/M) 14 - 马达远程控制开关故障 (RS 38-50/M) 15 - 马达故障 16 - 马达锁定 (RS 38-50/M)	更换控制盒 更换 更换 重新连接三相复位热断路器
▲	燃烧器启动, 但风门开启最大时停机	17 - 伺服马达触点不能运行	调节凸轮 I 或更换伺服马达控制盒端子 9-8
P	燃烧器启动, 随后锁定	因风压过小造成风压开关失灵: 18 - 风压开关调整不当 19 - 压力开关测试点处管路堵塞 20 - 燃烧头调整不当	调节或更换 清洁 调节
■	燃烧器启动, 随后锁定	21 - 火焰检测回路故障	更换控制盒
▼	燃烧器一直处于预吹扫阶段	22 - 凸轮 III 伺服马达触点不能运行	调整凸轮 III 或更换伺服马达控制盒端子 10-8
1	预吹扫即安全时间后, 燃烧器锁定, 但未出现火焰	23 - 电磁阀 VR 允许通过的燃气量小 24 - 电磁阀 VR 或 VS 开启失败 25 - 燃气压力过低 26 - 点火电极调整不当 27 - 因绝缘损坏而使电极接地 28 - 高压电缆损坏 29 - 高温使高压电缆变形 30 - 点火变压器故障 31 - 阀门或变压器电气连接错误 32 - 控制盒故障 33 - 燃气阀组下行旋塞关闭 34 - 管路中有空气	增大 更新线圈或整流器面板 通过压力调节器增大压力 调节 更换 更换 更换并保护 更换 重新连接 更换 打开 排出空气
	出现火焰后燃烧器立即锁定	35 - 电磁阀 VR 允许通过的燃气量小 36 - 离子探针调节不当 37 - 探针电气连接错误 38 - 检测电流不足 (小于 6 μA) 39 - 探针接地 40 - 最大燃气压力开关运行 41 - 控制盒故障	增大 调节 重新连接 检查探针位置 切断或更换电缆 调节或更换 更换
	燃烧器重复启动周期, 未锁定	42 - 主管路燃气压力接近最小燃气压力 开关设定的燃气压力值。 阀门开启之后压力不断下降, 导致压力开关暂时 开启, 立即关闭阀门, 燃烧器停机。压力再次 增大, 压力开关再次闭合, 点火周期重启。 此循环不断重复, 不停止。	降低最小压力开关处的运行压力。 更换燃气过滤器
	未显示信号而锁定	43 - 虚假火焰	更换控制盒
	在运行阶段, 燃烧器锁定时停机	44 - 探针或离子电缆接地 45 - 风压开关故障 46 - 最大燃气压力开关运行	更换磨损部件 更换 调节或更换
◀	燃烧器停机时锁定	47 - 燃烧头处持续火焰 或虚假火焰	消除持续火焰 或更换控制盒
	脉冲点火	48 - 燃烧头调整不当 49 - 点火电极调整错误 50 - 风机阀门调整不当: 风量过大 51 - 电离阶段出力过大	调节 调节 调节 减小

(1) 控制盒安装有一个随点火程序启动而旋转的圆盘, 可通过透明锁定复位按钮进行查看。如果燃烧器未能点火或因故障停机, 复位按钮后面出现的信号会提示故障类型。

(2) 保险丝位于控制盒后部。此外还有备用的插入式保险丝, 可在撕下其上覆盖的标签后安装使用。

配件 (可选):

• **加长燃烧头**

燃烧器	标准长度 (mm)	加长燃烧头长度 (mm)	代码
RLS 70	250	385	3010345
RLS 100	250	385	3010346
RLS 130	250	385	3010347

• **消音柜**

燃烧器	型号	代码
RLS 70-100-130	C4/5	3010404

• **燃气最大压力开关**

燃烧器	代码
RLS 70-100-130	3010493

• **排气单元**

燃烧器	过滤器	代码
RLS 70-100	带过滤器	3010055
RLS 70-100	不带过滤器	3010054

• **符合 EN 676 标准的燃气阀组**

见手册。

注意：由设备安装人员负责安装本手册未列出的安全装置。

RIELLO

Registered Office - 公司注册所在地 :
RIELLO S.p.A.
I-37045 Legnago (VR)
Tel.: +39.0442.630111
[http:// www.riello.it](http://www.riello.it)
[http:// www.rielloburners.com](http://www.rielloburners.com)

Manufacturing site:
Riello Heating Equipment (Shanghai) CO., LTD
No. 388, Jinbai Road - Jinshan Industrial Zone
201506 - Shanghai
CHINA

生产场所 :
Riello Heating Equipment (Shanghai) CO., LTD
利雅路热能设备(上海)有限公司
上海市金山工业区金百路 388 号