

**GB** **Light oil burners**

**CN** **轻油燃烧器**

One stage operation  
一段火运行



CODE - 编码	MODEL - 型号	TYPE - 类型
20033840	RL 34/1 MZ	971 T



## IDENTIFICATION

The Identification Plate on the product gives the serial number, model and main technical and performance data. If the Identification Plate is tampered with, removed or missing, the product cannot be clearly identified, thus making any installation or maintenance work potentially dangerous.

## GENERAL WARNINGS

The dimension of the boiler's combustion chamber must respond to specific values, in order to guarantee a combustion with the lowest polluting emissions rate.

You are therefore advised to consult the Technical Assistance Department before choosing this type of burner for the combination with a boiler.

Qualified personnel are those with the professional and technical requirements indicated by Law no. 46 dated 5 March 1990. The commercial organisation has a widespread network of agencies and technical offices whose personnel participates periodically in instructional and refresher courses at the company training centre.

This burner must only be used for the application it was designed for.

The manufacturer cannot accept responsibility for any damage to persons, animals or property due to errors in installation or in the burner adjustment, or due to improper or unreasonable use or non-observance of the technical instructions enclosed with the burner, or due to the intervention of unqualified personnel.

## USER INFORMATION


If faults arise in firing or operation, the burner performs a "safety stop", which is signalled by the red burner lockout LED. To rearm start-up conditions, press the reset button. When the burner starts up again, the red LED goes out.

This operation can be repeated for a maximum of 3 times. If the "safety stop" recurs, then the Technical Assistance Centre must be contacted.

## BASIC SAFETY MEASURES

- Children or inexperienced persons must not use the appliance.
- Under no circumstances must the intake grids, dissipation grids and ventilation vents in the installation room be covered up with cloths, paper or any other material.
- Unauthorised persons must not attempt to repair the appliance
- It is dangerous to pull or twist the electric leads.
- Cleaning operations must not be performed if the appliance is not disconnected from the main power supply.
- Do not clean the burner or its parts with inflammable substances (e.g. petrol, alcohol, etc.).  
The cover must be cleaned with soapy water.
- Do not place anything on the burner.
- Do not leave containers and inflammable products in the installation room.

The following symbols are used in this manual:

 **ATTENTION** = for actions requiring special care and adequate preparation.

 **FORBIDDEN** = for actions **THAT MUST NOT** be performed.

<b>TECHNICAL DATA</b> .....	page 2
Variants .....	2
Accessories .....	2
Burner description .....	3
Packaging - Weight .....	3
Max. dimensions .....	3
Standard equipment .....	3
Firing rates .....	4
Test boiler .....	4
<b>INSTALLATION</b> .....	5
Operating position .....	5
Boiler plate .....	5
Blast tube length .....	5
Securing the burner to the boiler .....	5
Choice of nozzles .....	6
Nozzle assembly .....	6
Combustion head adjustment .....	7
Fan gate adjustment .....	7
Hydraulic system .....	8
Pump .....	9
Pump priming .....	9
Burner calibration .....	10
Burner operation .....	11
Final checks .....	12
Maintenance .....	12
Burner start-up cycle diagnostics .....	14
Resetting the control box and using diagnostics .....	14
Faults - Possible causes - Solutions .....	15
<b>APPENDIX</b> .....	16
Electrical wiring .....	16
Electrical panel layout .....	17

**N.B.**

Figures mentioned in the text are identified as follows:

1)(A) =Part 1 of figure A, same page as text;

1)(A)p.3 =Part 1 of figure A, page number 3.

**NOTE**

In conformity with Efficiency Directive 92/42/EEC the application of the burner on the boiler, adjustment and testing must be carried out observing the instruction manual of the boiler, including verification of the CO and CO<sub>2</sub> concentration in the flue gases, their temperatures and the average temperature of the water in the boiler.

## INFORMATION ABOUT THE INSTRUCTION MANUAL

### INTRODUCTION

The instruction manual supplied with the burner:

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

### DELIVERY OF THE SYSTEM AND THE INSTRUCTION MANUAL

When the system is delivered, it is important that:

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

.....

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

.....  
 .....  
 .....

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

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

## TECHNICAL DATA

MODEL		RL 34/1 MZ
TYPE		971 T
POWER <sup>(1)</sup> OUTPUT <sup>(1)</sup>	kW	107 - 398
	Mcal/h	92 - 342
	kg/h	9 - 33.6
FUEL		LIGHT OIL
- net calorific value	kWh/kg	11.8
	Mcal/kg	10.2 (10,200 kcal/kg)
- density	kg/dm <sup>3</sup>	0,82 - 0,85
- viscosity at 20 °C	mm <sup>2</sup> /s max	6 (1.5 °E - 6 cSt)
OPERATION		<ul style="list-style-type: none"> <li>Intermittent (min. 1 stop in 24 hours)</li> <li>Single-stage (all - nothing)</li> </ul>
NOZZLES	number	2
STANDARD APPLICATIONS		Boilers: water, steam, diathermic oil
AMBIENT TEMPERATURE	°C	0 - 40
COMBUSTION AIR TEMPERATURE	°C max	60
ELECTRICAL SUPPLY	V	230 ~ +/-10%
	Hz	50/60 - single-phase
ELECTRIC MOTOR	rpm	2800
	W	300
	V	220 - 240
	A	2.4
MOTOR CAPACITOR	µF/V	12.5/450
IGNITION TRANSFORMER	V1 - V2	230 V - 2 x 12 kV
	I1 - I2	0.2 A - 30 mA
PUMP output (at 12 bar) pressure range fuel temperature	kg/h	45
	bar	7 - 14
	°C max	60
ELECTRICAL POWER CONSUMPTION	W max	600
PROTECTION LEVEL		IP40
IN CONFORMITY WITH EC DIRECTIVES		2006/42 - 89/336 - 2004/108 - 73/23 - 2006/95 - 92/42
NOISE LEVEL <sup>(2)</sup>	SOUND PRESSURE SOUND POWER	dB(A) 68 79

(1) Reference conditions: Ambient temperature 20°C - Barometric pressure 1013 mbar - Altitude 0 m a.s.l.

(2) Noise emission tests carried out as specified in EN 15036-1 with measurement accuracy  $\sigma = \pm 1.5$  dB, in the manufacturer's combustion chamber with burner operating on test boiler at maximum output.

## VARIANTS

Model	Code	Electrical supply	Blast tube length mm
RL 34/1 MZ	20033840	single-phase	216

## ACCESSORIES (optional):

• KIT LONG HEAD	Code <b>3010426</b>
• KIT CLEAN CONTACTS	Code <b>3010419</b>
• KIT POST-PURGING	Code <b>3010453</b>
• KIT HOURCOUNTER	Code <b>3010450</b>
• KIT GROUND FAULT INTERRUPTER	Code <b>3010448</b>
• RADIO DISTURBANCE PROTECTION KIT If the burner is installed in places particularly subject to radio disturbance (emission of signals exceeding 10 V/m) owing to the presence of an INVERTER, or in applications where the length of the thermostat connections exceeds 20 metres, a protection kit is available as an interface between the control box and the burner.	Code <b>3010386</b>

### • DEGASSING UNIT

It may occur that a certain amount of air is contained in the light oil sucked up by the pump. This air may originate from the light oil itself as a consequence of depressurisation or air leaking past imperfect seals.

In double-pipe systems, the air returns to the tank from the return pipe; in single-pipe systems, the air remains in circulation causing pressure variations in the pump and burner malfunctions.

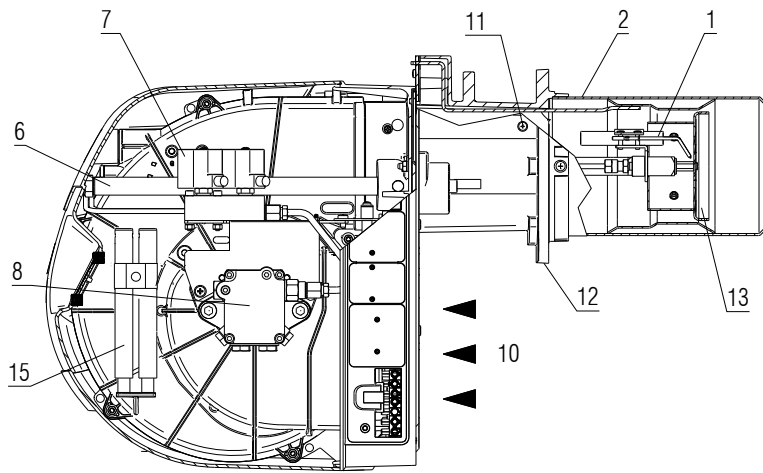
For this reason, we advise installing a degassing unit near the burner in single-pipe installations. Degassing units are provided in two versions:

CODE **3010054** without filter

CODE **3010055** with filter

#### Degassing unit characteristics

- Burner output : 80 kg/h max
- Light oil pressure : 0.7 bar max
- Ambient temperature : 40 °C max
- Light oil temperature : 40 °C max
- Attachment connectors : 1/4 inch



## BURNER DESCRIPTION (A)

- 1 Ignition electrodes
- 2 Combustion head
- 3 Screw for combustion head adjustment
- 4 Photocell for flame presence control
- 5 Screw for fixing fan to flange
- 6 Slide bars for opening the burner and inspecting the combustion head
- 7 Valve assembly
- 8 Pump
- 9 Plate prearranged to drill 4 holes for the passage of hoses and electrical cables.
- 10 Air inlet to fan
- 11 Fan pressure test point
- 12 Boiler mounting flange
- 13 Flame stability disk
- 14 Flame inspection window
- 15 Extensions for slide bars 6)
- 16 Motor capacitor
- 17 Control box with lockout pilot light and lock-out reset button
- 18 Socket for electrical connections
- 19 Air damper
- 20 Pump pressure adjustment
- 21 Plate prearranged to drill 2 holes for the passage of hoses.

Two types of burner failure may occur:

**Control box lockout:** if the control box 17)(A) pushbutton (red led) lights up, it indicates that the burner is in lockout.

To reset, hold the pushbutton down for between 1 and 3 seconds.

## PACKAGING-WEIGHT (B) - approximate measurements

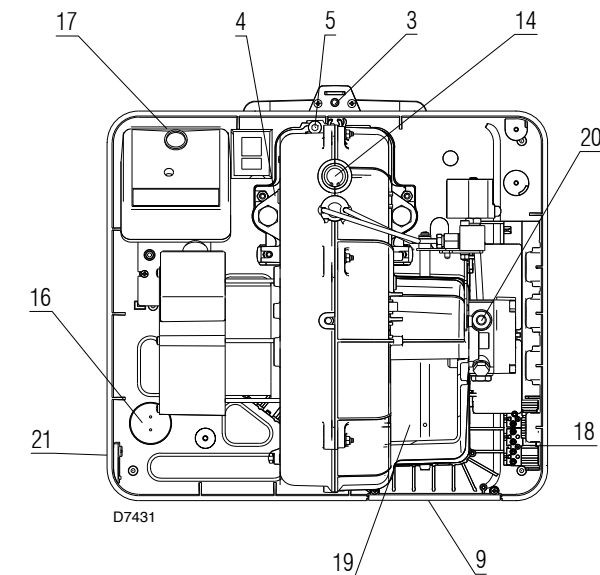
- The burners are shipped in cardboard boxes with the maximum dimensions shown in table (B).
- The weight of the burner complete with packaging is indicated in table (B).

## MAX. DIMENSIONS (C) - approximate measurements.

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

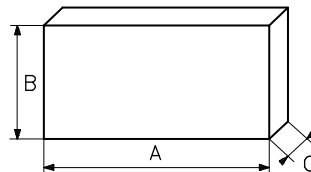
Bear in mind that inspection of the combustion head requires the burner to be opened and the rear part withdrawn on the slide bars.

The maximum dimension of the burner, without casing, when open is given by measurement O.



(A)

mm	A	B	C	kg
RL 34/1 MZ	1000	500	485	32

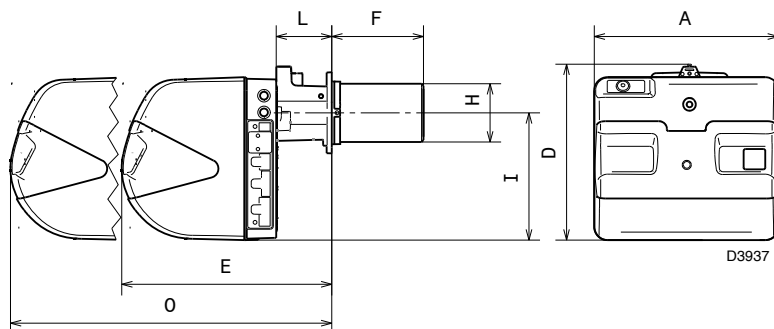


(B)

D88

## STANDARD EQUIPMENT

- 2 - Flexible pipes
- 2 - Gaskets for flexible pipes
- 2 - Nipples for flexible pipes
- 1 - Thermal insulation screen
- 2 - Extensions 15)(A) for slide bars 6)(A) (for model with 351 mm blast tube)
- 4 - Screws to secure the burner flange to the boiler: M 8 x 25
- 1 - 7 pin plug for the electrical connection
- 1 - Instruction booklet
- 1 - Spare parts list

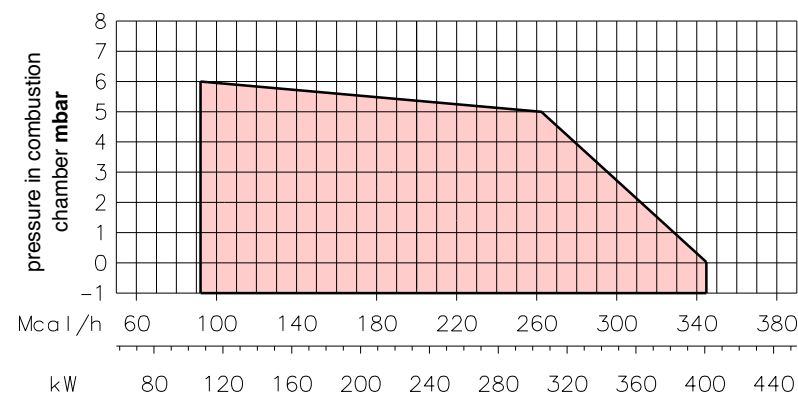


D3937

mm	A	D	E	F <sup>(1)</sup>	H	I	L	O <sup>(1)</sup>
RL 34/1 MZ	442	422	508	216 - 351	140	305	138	780 - 915

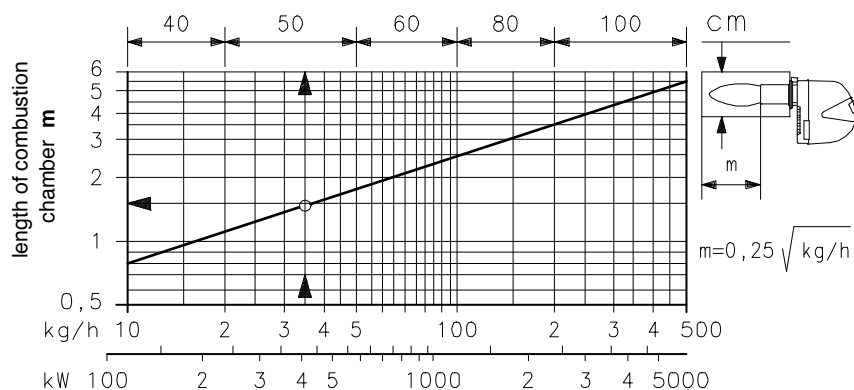
(1) blast tube: short - long

(C)



(A)

D9412



(B)

D454

### FIRING RATES (A)

The burner delivery must be selected within area of the adjacent diagram.

This area is called firing rate and provides the delivery of the burner in relation to the pressure in the combustion chamber.

The work point may be found by plotting a vertical line from the desired delivery and a horizontal line from the pressure in the combustion chamber. The intersection of these two lines is the work point which must lie within firing rate.

#### Important:

the FIRING RATE area values have been obtained considering a surrounding temperature of 20 °C, and an atmospheric pressure of 1013 mbar (approx. 0 m above sea level) and with the combustion head adjusted as shown on page 7.

### TEST BOILER (B)

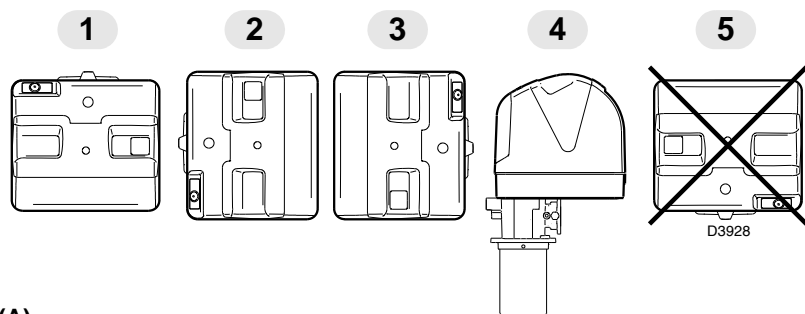
The firing rate was set in relation to special test boilers in accordance with the methods defined in EN 267 standards.

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

**Example:** Delivery 35 kg/hour:

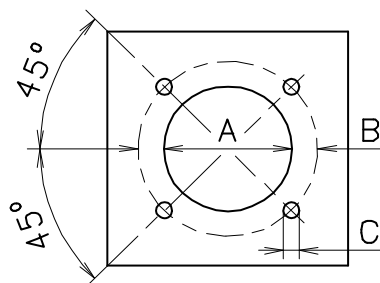
diameter = 50 cm; length = 1.5 m.

Whenever the burner is operated in a much smaller commercially-available combustion chamber, a preliminary test should be performed.



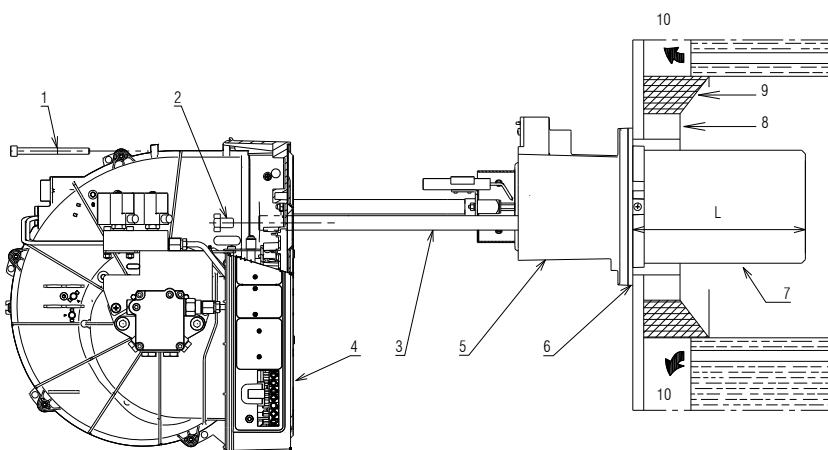
(A)

mm	A	B	C
RL 34/1 MZ	160	224	M 8



D455

(B)



D7433

(C)

## INSTALLATION

**⚠ THE BURNER MUST BE INSTALLED IN CONFORMITY WITH LEGISLATION AND LOCAL STANDARDS.**

### OPERATING POSITION (A)

**⚠** The burner is designed to work only in the positions **1, 2, 3 and 4**.

Installation **1** is preferable, as it is the only one that allows performing maintenance operations as described in this manual. Installations **2, 3 and 4** permit operation but make maintenance and inspection of the combustion head difficult, page 14.

**⊘** Any other position could compromise the correct working of the appliance. Installation **5** is prohibited for safety reasons.

### BOILER PLATE (B)

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

### BLAST TUBE LENGTH (C)

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, is as follows:

Blast tube 7):

- short 216
- long 351

For boilers with front flue passes 10) or flame inversion chambers, protective fettling in refractory material 8) must be inserted between the boiler's fettling 9) and the blast tube 7).

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

For boilers having a water-cooled front the refractory fettling 8)-9)(C) is not required unless it is expressly requested by the boiler manufacturer.

### SECURING THE BURNER TO THE BOILER (C)

Dismantle the nozzle assembly 7) and the pipe coupling 5) from the burner 4):

- Remove the screws 2) from the two slide bars 3).
- Remove the screw 1) and move the burner on the guides 3).

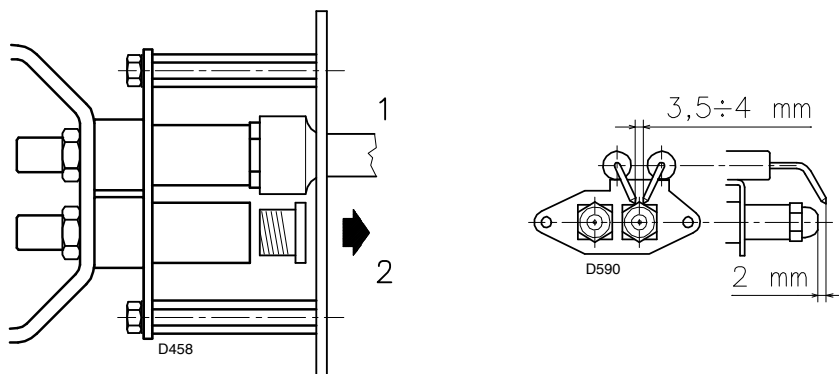
Fix assembly 5) and 7) (C) to the boiler plate and insert the supplied insulating gasket 6) C). Use the four screws supplied after protecting the thread with antiseizing products. The burner-boiler seal must be airtight.



GPH		kg/h (1)			kW 12 bar	Nozzles recommended
1°	2°	10 bar	12 bar	14 bar		
1.25	+	1.00	8.7	9.7	10.5	<b>DANFOS 60° B</b> <b>DELAVAN 60° A</b> <b>DELAVAN 60° W</b>
1.50	+	1.00	9.7	10.8	11.7	
1.75	+	1.00	10.7	11.8	12.9	
2.00	+	1.00	12.5	13.9	15.0	
2.25	+	1.50	14.4	15.9	17.3	
2.50	+	1.75	16.3	18.0	19.6	
2.75	+	1.75	17.3	19.1	20.7	
3.00	+	2.00	19.2	21.2	23.0	
3.00	+	2.25	20.2	22.3	24.2	
3.50	+	2.25	22.1	24.4	26.5	
3.50	+	2.50	23.0	25.4	27.7	
4.00	+	2.75	25.9	28.6	31.1	
4.00	+	3.00	26.9	29.7	32.3	

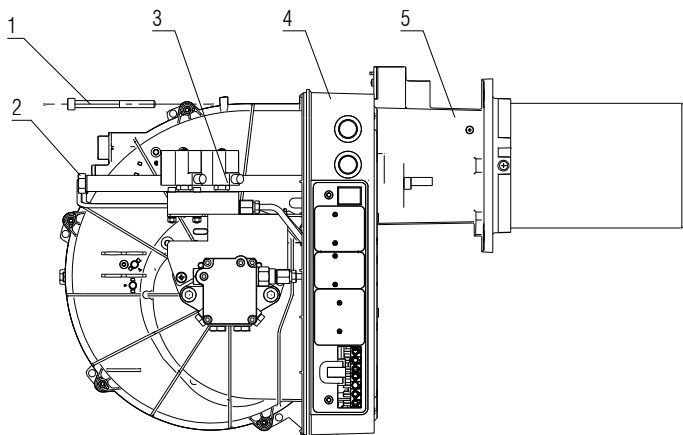
(1) We get the indicated delivery when both nozzles are working and light oil has the following characteristics: density 0.84 kg/dm<sup>3</sup> - viscosity 4.2 cSt/20 °C - temperature 10 °C

(A)



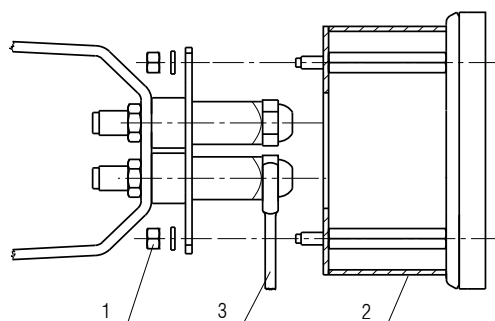
(B)

(C)



(D)

D7434



(E)

D3869

## CHOICE OF NOZZLES (A)

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.

**Warning:** It is advisable to replace nozzles every year during regular maintenance operations.

**Caution:** 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.

Choose the couple of nozzles among those given in table (A).

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

When the burner fires only the first nozzle works. Its delivery is higher than that of the second nozzle in order to assure a good flame stabilisation to the stability disk, though the fan delivery has been adjusted for both working nozzles.

Whenever ignition takes place with unusual noise or pulsations, you should reduce the first nozzle delivery making sure that the flame stabilisation is still satisfactory.

Subsequently also the second nozzle starts working.

The burner's operating delivery consists of the sum of the two nozzles deliveries.

## Example

Boiler output = 230 kW

Efficiency 90 %

Output required by the burner =

$230 : 0,9 = 255 \text{ kW}$

In table (A) the following nozzles are recommended:

1° = 3,0 GPH + 2° = 2,0 GPH - 60° - 12 bar.

## NOZZLE ASSEMBLY

At this stage of installation the burner is still disassembled from the blast tube; it is therefore possible to fit two nozzles with the box spanner 1) (B) (16 mm), after having removed the plastic plugs 2)(B), fitting the spanner through the central hole in the flame stability disk. Do not use any sealing products such as gaskets, sealing compound, or tape. Be careful to avoid damaging the nozzle sealing seat. The nozzle must be screwed into place tightly but not to the maximum torque value provided by the wrench.

The firing nozzle is the one lying beneath the firing electrodes fig. (C)

Make sure that the electrodes are positioned as shown in fig. (C).

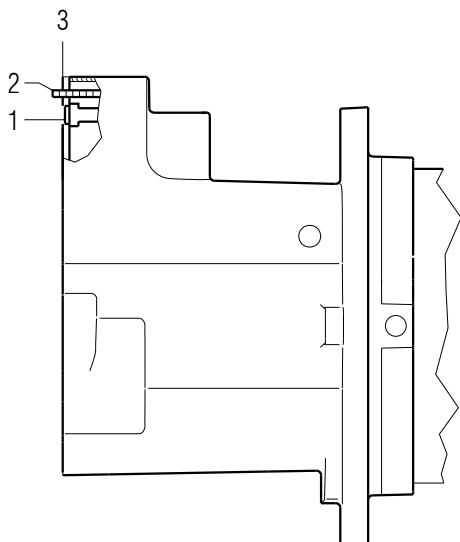
Finally remount the burner 4)(D) to the slide bars 3) and slide it up to the flange 5), keeping it slightly raised to prevent the flame stability disk from pressing against the blast tube.

Tighten the screws 2) on the slide bars 3) and screw 1) that attaches the burner to the flange.

If it proves necessary to change a nozzle with the burner already fitted to the boiler, proceed as outlined below:

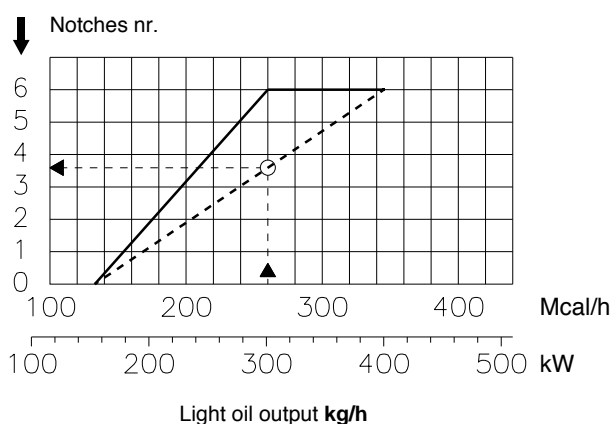
- Open the burner on its guides as shown in fig. (C) p.5.
- Remove the nuts 1)(E) and the diffuser disc assembly 2)
- Use spanner 3)(E) to change the nozzles.

## COMBUSTION HEAD ADJUSTMENT



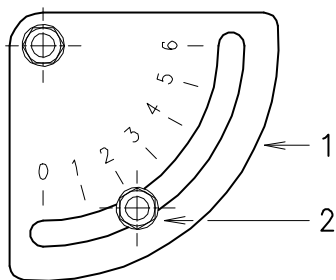
(A)

D3910



(B)

D7435



(C)

D593

## COMBUSTION HEAD ADJUSTMENT

At this point of the installation, nozzle and pipe coupling are fixed to the boiler as in fig. (C) p. 5. The setting of the combustion head depends exclusively on the output of the burner - in other words, the combined output of the two nozzles selected on page 6 is a particularly simple operation.

Turn screw 1)(A) until the notch on the sheet 2(A) is level with the plate 3)(A).

### Example

RL 34/1 MZ with nozzles:

$1^\circ = 3.50 \text{ GPH} + 2^\circ = 2.50 \text{ GPH}$  and 12 bar pump pressure.

Find the delivery of the two nozzles in table (A)p. 6:

25.4 kg/h (corresponding to 301 kW).

Diagram (B) shows that for an output of 25.4 kg/h the burner RL 34/1 MZ needs a combustion head notch regulation 3.5 approx.

### Note

If the pressure in the chamber is equal to 0 mbar, the air must be adjusted with reference to the hatched line on the diagram (B).

Once the regulation of the head has been concluded, refit the burner 4)(C)p.5 on the guides 3)(C)p.5 at approximately 100 mm from the pipe coupling 5)(C).5, insert the electrode cables and then slide the burner as far as the pipe coupling. Replace the screws 2)p.5 on the guides 3)p.5. Fix the burner to the pipe coupling with the screw 1)p.5.

### Attention

On closing the burner on the two guides it is advisable to gently pull the high voltage wires outwards until they are under slight tension.

## FAN GATE ADJUSTMENT

The fan gate is set using the indexed selector 1)(C), after having loosened the nut 2)(C).

The first time the burner is fired, this setting should be left as originally set by the manufacturer: notch 2, see fig. (C).

## HYDRAULIC SYSTEM

### FUEL SUPPLY

#### Double-pipe circuit (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 less probable that the suction line fails to prime or stops priming.

#### The loop circuit

A loop circuit consists of a loop of piping departing from and returning to the tank with an auxiliary pump that circulates the fuel under pressure. A branch connection from the loop goes to feed the burner. This circuit is extremely useful whenever the burner pump does not succeed in self-priming because the tank distance and/or height difference are higher than the values listed in the table.

#### Key to lay-out (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 with suction line. The pumps are installed on the burner with the by-pass closed by screw 6)(B)p.11.

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

The pump will break down 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.

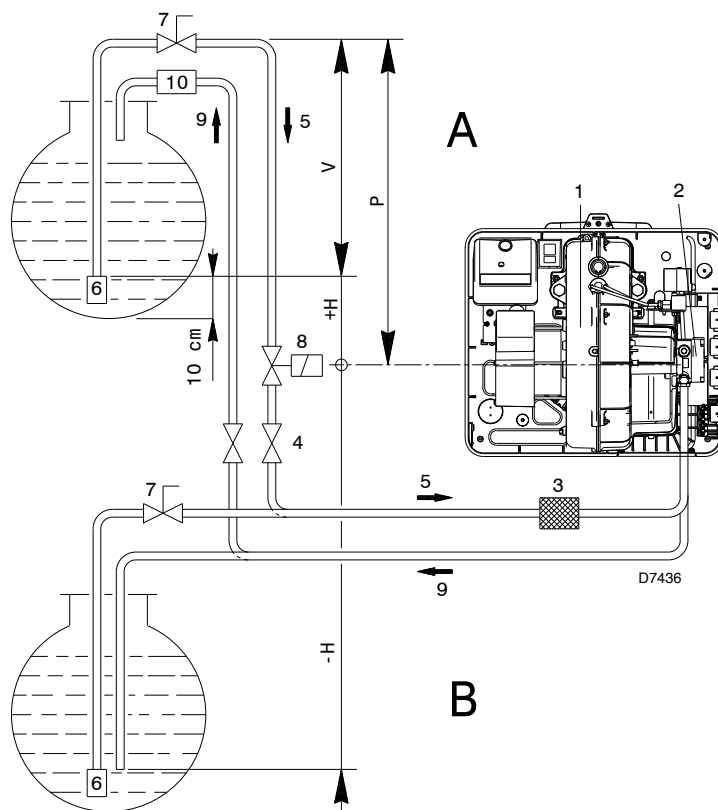
Insert the hose connections with the supplied seals into the connections and screw them down.

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

Pass the hoses through the holes on the left-hand plate 5)(B), removing the thin diaphragm that closes the two holes or as per the following instructions: unscrew the screws 1), now divide the insert piece into its two parts 2) and 3) and remove the thin diaphragm blocking the two passages 4).

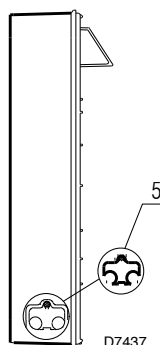
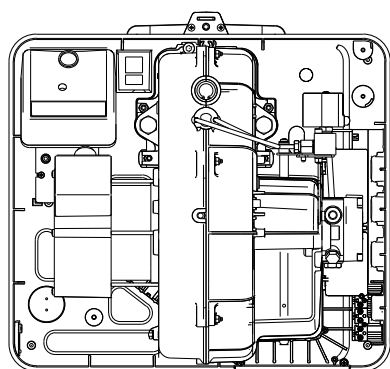
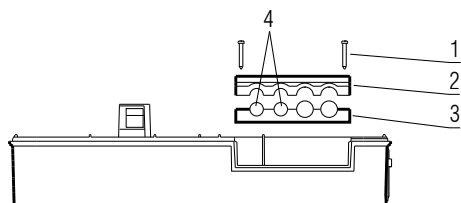
Install the hoses where they cannot be stepped on or come into contact with hot surfaces of the boiler.

Now connect the other end of the hoses to the supplied nipples, using two wrenches, one to hold the nipple steady while using the other one to turn the rotary union on the hose.



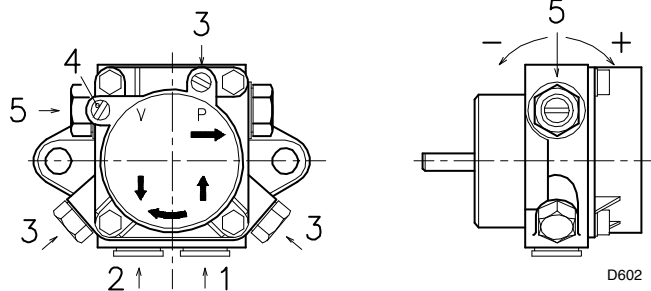
+ H - H (m)	L (m)		
	Ø (mm)		
	8	10	12
+ 4.0	52	134	160
+ 3.0	46	119	160
+ 2.0	39	104	160
+ 1.0	33	89	160
+ 0.5	30	80	160
0	27	73	160
- 0.5	24	66	144
- 1.0	21	58	128
- 2.0	15	43	96
- 3.0	8	28	65
- 4.0	-	12	33

(A)



(B)

PUMP SUNTEC AN 57 C



		AN 57 C
A	kg/h	45
B	bar	10 - 18
C	bar	0,45
D	cSt	2 - 75
E	°C	60
F	bar	2
G	bar	12
H	mm	0,150

(A)

PUMP (A)

- 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 adjustment screw

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

PUMP PRIMING

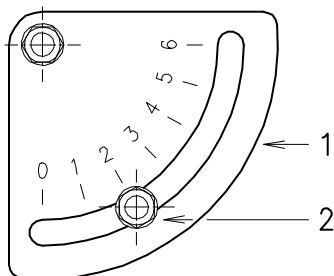
- Before starting the burner, make sure that the tank return line is not clogged. Obstructions in the line could cause the sealing organ located on the pump shaft to break.  
(The pump leaves the factory with the by-pass closed).
- In order for self-priming to take place, one of the screws 3)(A) of the pump must be loosened in order to bleed off the air contained in the suction line.
- Start the burner by closing the control devices and the electrical network switch. The pump must rotate in the direction of the arrow marked on the cover.
- The pump can be considered to be primed when the light oil starts coming out of the screw 3). Stop immediately the burner and tighten the screw 3).

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, wait approx. 15 seconds, reset the burner, and then repeat the starting operation as often as required. After 5 or 6 starting operations allow 2 or 3 minutes for the transformer to cool.

Do not illuminate the photocell or the burner will lock out; the burner should lock out anyway about 10 seconds after it starts.

Important:

The a.m. operation is possible because the pump is already full of fuel when it leaves the factory. If the pump has been drained, fill it with fuel through the opening on the vacuum meter prior to starting; otherwise, the pump will seize. Whenever the length of the suction piping exceeds 20-30 meters, the supply line must be filled using a separate pump.

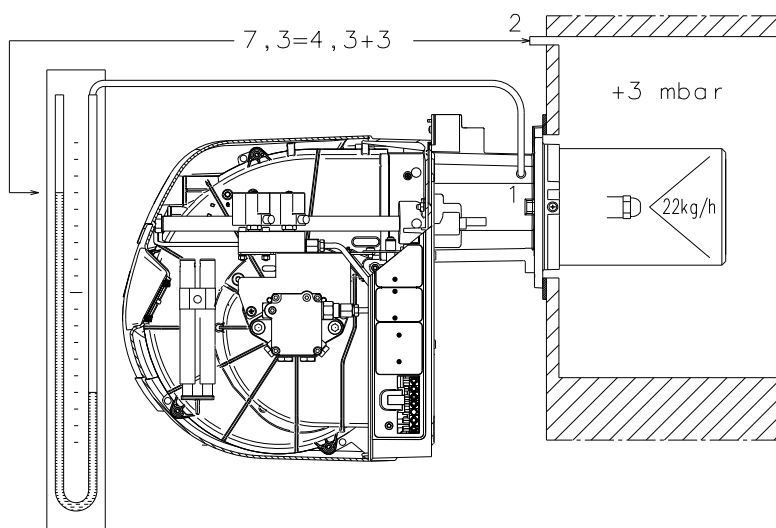


(A)

D593

AIR PRESSURE IN 1) WITH ZERO PRESSURE IN 2)

kg/h	mbar
9	3.6
10	3.7
12	3.8
14	3.9
16	4.0
18	4.1
20	4.2
22	4.3
24	4.4
26	4.9
28	5.6
30	6.4
32	7.1
34	7.9



(B)

D7438

## BURNER CALIBRATION

### ⚠ ATTENTION

**QUALIFIED PERSONNEL WITH THE RIGHT INSTRUMENTS MUST HANDLE THE BURNER'S START-UP.**

### FIRING

During the first firing, when the 2nd nozzle piping is being filled, a temporary decrease in fuel pressure takes place. This lowering of the fuel pressure can cause the burner to lock-out and can sometimes give rise to pulsations.

Once the following adjustments have been made, the firing of the burner must generate a noise similar to the noise generated during operation. If one or more pulsations or a delay in firing in respect to the opening of the light oil solenoid valve occur, see the suggestions provided on p. 15: causes 29 - 35.

### 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 nozzles

See the information listed on page 6: "Choice of nozzles".

#### • Combustion head

The adjustment of the combustion head already carried out (see page 7) need not be altered unless the 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)(A)p. 9.

#### • Fan air gate valve

Adjust the fan air gate valve by using the indexed selector 1)(A) after having loosened the nut 2)(A).

This setting must be adapted case by case to the burner's delivery (while both nozzles are operating) and combustion chamber pressure.

Air pressure at attachment 1)(B) must be approximately the same as the pressure specified in table (B) plus the combustion chamber pressure measured at attachment 2).

Refer to the example in the adjacent figure.

## BURNER OPERATION

### BURNER STARTING (A) - (B)

Starting phases with progressive time intervals shown in seconds:

- Control device TL closes.
- After about 3s:
- 0 s : The control box starting cycle begins.
- 2 s : The fan motor starts.
- 3 s : The ignition transformer is connected.

The pump 3) sucks the fuel from the tank through the piping 1) and the filter 2) and pumps it under pressure to delivery. The piston 4) rises and the fuel returns to the tank through the piping 5) - 7). The screw 6) closes the by-pass heading towards suction and the solenoid valves 8) - 11), de-energized, close the passage to the nozzles.

Prepurging begins with the max. air delivery.

- 22 s : The solenoid valve 8) opens and the fuel passes through the piping 9) and filter 10) and is then sprayed out through the 1st nozzle, igniting when it comes into contact with the spark. This is the ignition flame.
  - 29 s : The ignition transformer switches off.
  - 36 s : The solenoid valve 11) opens, the fuel passes through the piping 13) and filter 14) and is then sprayed out through the 2nd nozzle. This is the operating flame.
- The starting cycle comes to an end.

### STEADY STATE OPERATION

When the boiler temperature or pressure increases until control device TL opens, the burner shuts down.

### FIRING FAILURE

If the burner does not fire, it goes into lock-out within 5 s of the opening of the 1st nozzle valve and 30 s after the closing of control device TL.

The control box red pilot light will light up.

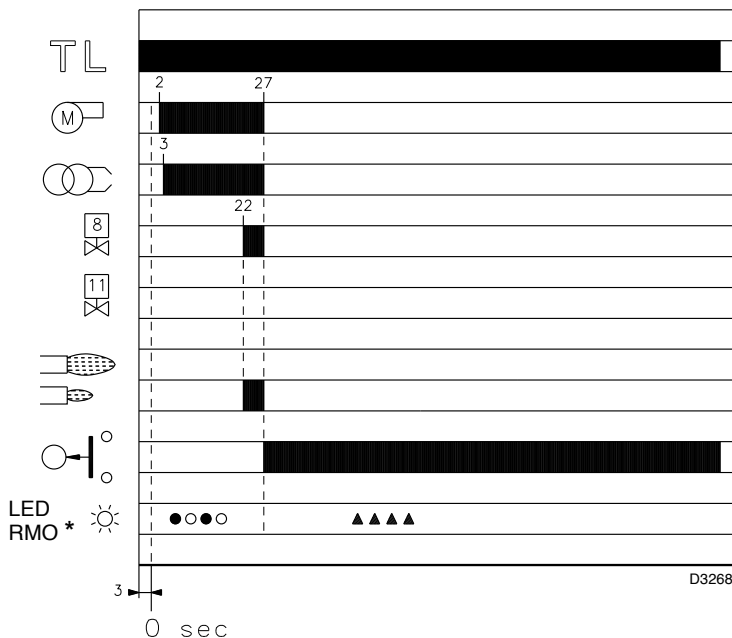
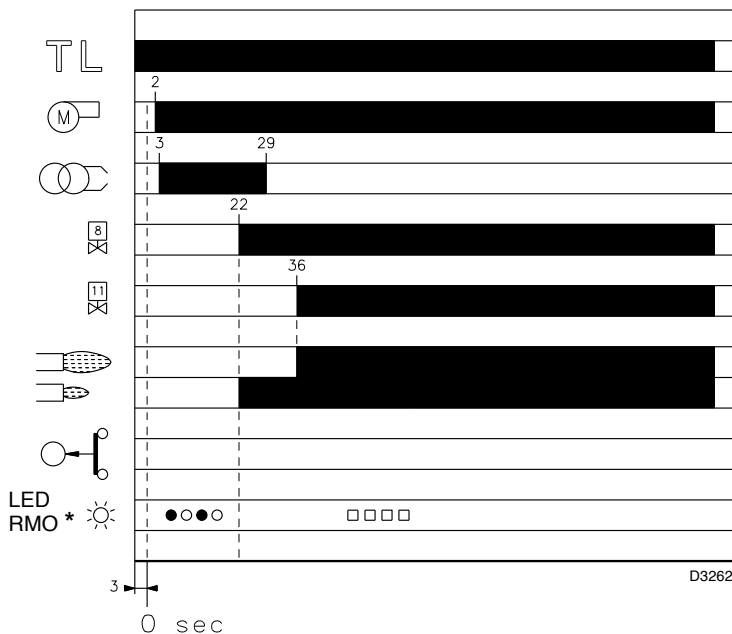
### UNDESIRED SHUTDOWN DURING OPERATION

If the flame goes out during operation, the burner shuts down automatically within 1 second and automatically attempts to start again by repeating the starting cycle.

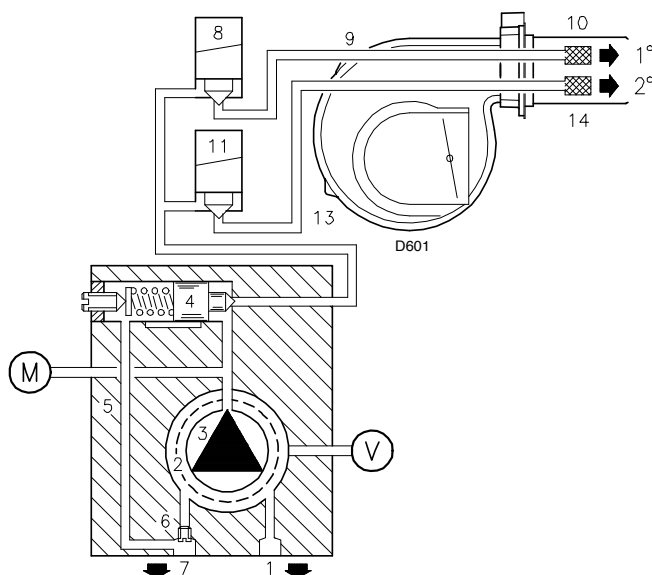
### Figure (B)

M = Pressure gauge

V = Vacuum meter

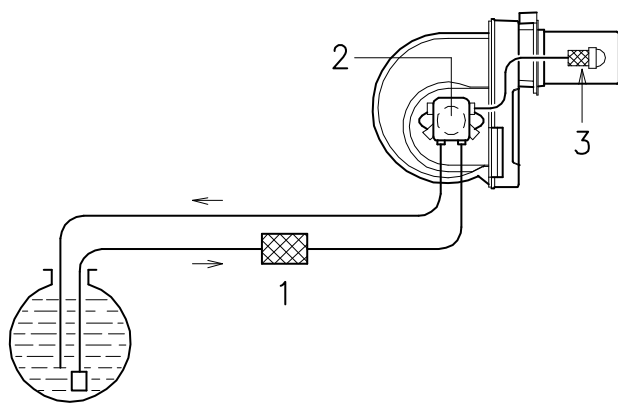


(A)



(B)

(A)





D482


## FINAL CHECKS

- Obscure the photocell and switch on the control devices: the burner should start and then lockout about 5 s after opening of the 1st nozzle operation valve.
- Illuminate the photocell and switch on the control devices: the burner should start and then go into lockout after about 10 s.
- Obscure the photocell while the burner is operating, the following must occur in sequence: flame extinguished within 1 s, pre-purging for about 20 s, sparking for about 5 s, burner goes into lock-out.
- Switch off control device TL while the burner is operating: the burner should stop.

## MAINTENANCE

 The burner requires periodic maintenance carried out by a qualified and authorised technician **in conformity with legislation and local standards**.

 Periodic maintenance is essential for the reliability of the burner, avoiding the excessive consumption of fuel and consequent pollution.

 Before carrying out any cleaning or control always first switch off the electrical supply to the burner acting on the main switch of the system.

### 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.

### Pump

The delivery pressure must be stable at 12 bar. The depression must be less than 0.45 bar. Unusual noise must not be evident during pump operation.

If the pressure is found to be unstable or if the pump runs noisily, the flexible hose must be detached from the line filter and the fuel must be sucked from a tank located near the burner. This measure permits the cause of the anomaly to be traced to either the suction piping or the pump.

If the pump is found to be responsible, check to make sure that the filter is not dirty. The vacuumeter is installed upstream from the filter and consequently will not indicate whether the filter is clogged or not. Contrarily, if the problem lies in the suction line, check to make sure that the filter is clean and that air is not entering the piping.

### Filters (A)

Check the following filter boxes:

- on line 1) • in the pump 2) • at the nozzle 3), and clean or replace as required.

If rust or other impurities are observed inside the pump, use a separate pump to lift any water and other impurities that may have deposited on the bottom of the tank.

### Fan

Check to make sure that no dust has accumulated inside the fan or on its blades, as this condition will cause a reduction in the air flow rate and provoke polluting combustion.

### Combustion head

Check to make sure that all the parts of the combustion head are in good condition, positioned correctly, free of all impurities, and that no deformation has been caused by operation at high temperatures.

### Nozzles

Do not clean the nozzle openings.

It is advisable to replace nozzles every year during regular maintenance operations.

The change of nozzle requires the combustion to be controlled.

### Photocell

Clean the glass cover from any dust that may have accumulated. To extract the photocell 4) (A)p.3 pull it outward forcefully. it is only pressed in.

### Flexible hoses

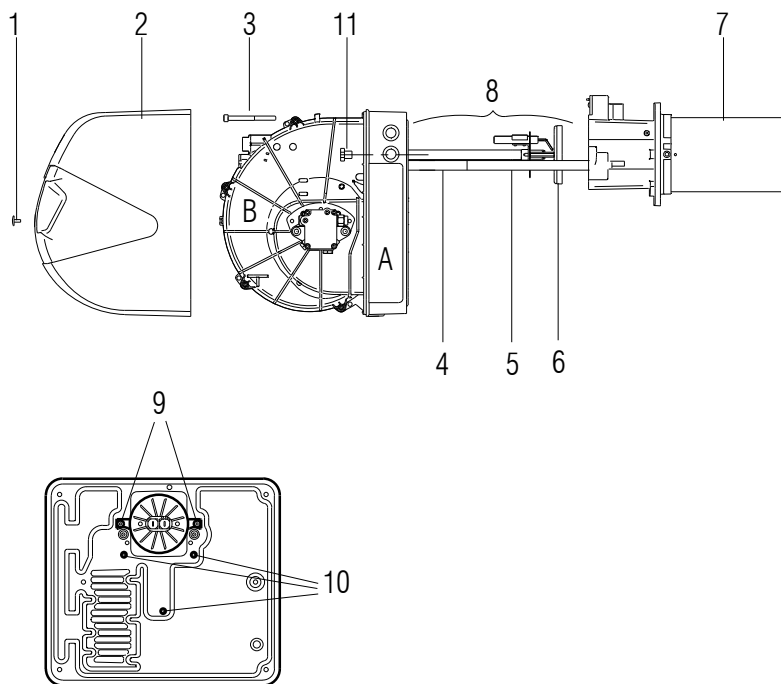
Check to make sure that the flexible hoses are still in good condition and that they are not crushed or otherwise deformed.

### Fuel tank

Approximately every 5 years, or whenever necessary, suck any water or other impurities present on the bottom of the tank using a separate pump.

### Boiler

Clean the boiler as indicated in its accompanying instructions in order to maintain all the original combustion characteristics intact, especially the flue gas temperature and combustion chamber pressure.



(A)

D3962

#### TO OPEN THE BURNER (A)

- Switch off the voltage
- Remove screw 1 and withdraw the casing 2)
- Unscrew screw 3)
- Fit the two extensions 4), on the burner, on the guides 5) (model with nozzle 351 mm)
- Pull part A backward keeping it slightly raised to avoid damaging the disk 6) on blast tube 7).

#### MAINTENANCE OF THE ELECTRICAL PANEL (B)

If it is necessary to maintain the electrical panel A)(Fig. A) it is possible just to remove the fan assembly B)(Fig. A) to get better access to the electrical components.

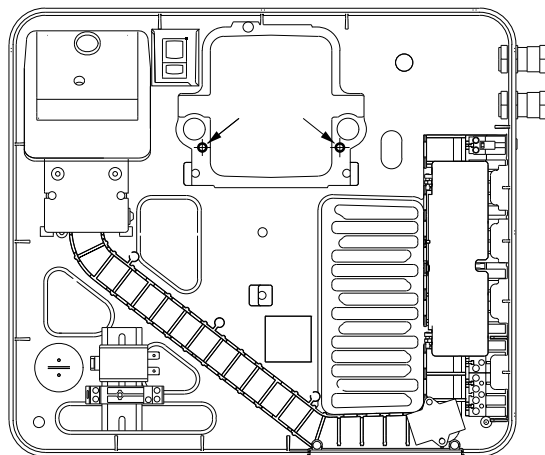
With the burner open as in fig. (A), disconnect the electrode cables and remove the head unit 8)(A) by undoing the two screws 9)(A).

Disconnect the cables relative to the fan motor, remove the 3 screws 10)(A) on the protective sheet and the two screws 11)(A) and slide out the fan assembly B)(Fig. A) from the guides 4) - 5)(A).

Finally it is possible to use 2 of the 3 screws 10)(A) to fix the electrical panel to the pipe coupling in the points indicated on fig. (B), and then perform the maintenance operations.

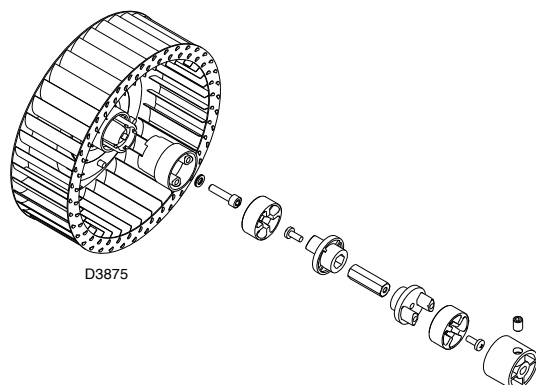
#### POSSIBLE PUMP AND/OR COUPLING REPLACEMENT (C)

Carry out the fitting following the instructions in the figure (C).



(B)

D3877



(C)



## BURNER START-UP CYCLE DIAGNOSTICS

During start-up, indication is according to the following table:

COLOUR CODE TABLE	
Sequences	Colour code
Pre-purging	● ○ ● ○ ● ○ ● ○ ●
Ignition phase	● ○ ● ○ ● ○ ● ○ ●
Operation, flame ok	□ □ □ □ □ □ □ □ □
Operating with weak flame signal	□ ○ □ ○ □ ○ □ ○ □
Electrical supply lower than ~ 170V	● ▲ ● ▲ ● ▲ ● ▲ ●
Lock-out	▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲
Extraneous light	▲ □ ▲ □ ▲ □ ▲ □ ▲
<b>Key:</b> ○ Off      ● Yellow      □ Green      ▲ Red	

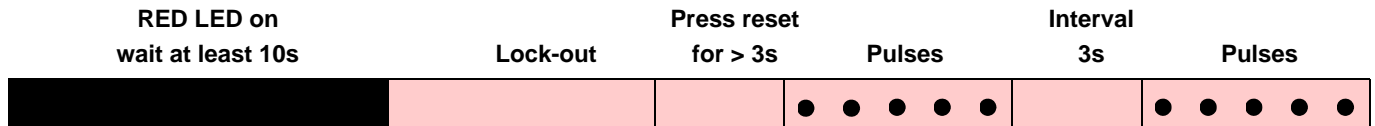
## RESETTING THE CONTROL BOX AND USING DIAGNOSTICS

The control box features a diagnostics function through which any causes of malfunctioning are easily identified (indicator: **RED LED**).

To use this function, you must wait at least 10 seconds once it has entered the safety condition (**lockout**), and then press the reset button.

The control box generates a sequence of pulses (1 second apart), which is repeated at constant 3-second intervals.

Once you have seen how many times the light pulses and identified the possible cause, the system must be reset by holding the button down for between 1 and 3 seconds.



The methods that can be used to reset the control box and use diagnostics are given below.

## RESETTING THE CONTROL BOX

To reset the control box, proceed as follows:

- Hold the button down for between 1 and 3 seconds.  
The burner restarts after a 2-second pause once the button is released.
- If the burner does not restart, you must make sure the limit thermostat is closed.

## VISUAL DIAGNOSTICS

Indicates the type of burner malfunction causing lockout.

To view diagnostics, proceed as follows:

- Hold the button down for more than 3 seconds once the red LED (burner lockout) remains steadily lit.  
A yellow light pulses to tell you the operation is done.  
Release the button once the light pulses. The number of times it pulses tells you the cause of the malfunction, according to the coding system indicated in the table on page 15.

## SOFTWARE DIAGNOSTICS

Reports burner life by means of an optical link with the PC, indicating hours of operation, number and type of lock-outs, serial number of control box etc ...

To view diagnostics, proceed as follows:

- Hold the button down for more than 3 seconds once the red LED (burner lockout) remains steadily lit.  
A yellow light pulses to tell you the operation is done.  
Release the button for 1 second and then press again for over 3 seconds until the yellow light pulses again.  
Once the button is released, the red LED will flash intermittently with a higher frequency: only now can the optical link be activated.

Once the operations are done, the control box's initial state must be restored using the resetting procedure described above.

BUTTON PRESSED FOR	CONTROL BOX STATUS
Between 1 and 3 seconds	Control box reset without viewing visual diagnostics.
More than 3 seconds	Visual diagnostics of lockout condition: (Led pulses at 1-second intervals).
More than 3 seconds starting from the visual diagnostics condition	Software diagnostics by means of optical interface and PC (hours of operation, malfunctions etc. can be viewed)

The sequence of pulses issued by the control box identifies the possible types of malfunction, which are listed in the table on page 15.

SIGNAL	FAULT	PROBABLE CAUSE	SUGGESTED REMEDY
No blink	The burner does not start	1 - No electrical power supply 2 - A limit or safety control device is open 3 - Control box lock-out 4 - Pump is jammed 5 - Erroneous electrical connections 6 - Defective control box 7 - Defective electrical motor 8 - Defective capacitor	Close all switches - Check fuses Adjust or replace Reset control box (no sooner than 10 s after the lock-out) Replace Check connections Replace Replace Replace
4 x blinks ● ● ● ●	The burner starts and then goes into lock-out	9 - Photocell short-circuit 10 - Light is entering or flame is simulated	Replace photocell Eliminate light or replace control box
2 x blinks ● ●	After pre-purge and the safety time, the burner goes to lock-out at the end of the safety time	11 - No fuel in tank; water on tank bottom 12 - Inappropriate head and air damper adjustments 13 - Light oil solenoid valves fail to open (1st nozzle) 14 - 1st nozzle clogged, dirty, or deformed 15 - Dirty or poorly adjusted firing electrodes 16 - Grounded electrode due to broken insulation 17 - High voltage cable defective or grounded 18 - High voltage cable deformed by high temperature 19 - Ignition transformer defective 20 - Erroneous valves or transformer electrical connections 21 - Control box defective 22 - Pump unprimed 23 - Pump/motor coupling broken 24 - Pump suction line connected to return line 25 - Valves up-line from pump closed 26 - Filters dirty: line - pump - nozzle 27 - Defective photocell or control box 28 - Dirty photocell	Top up fuel level or suck up water Adjust, see page 7 Check connections; replace coil Replace Adjust or clean Replace Replace Replace and protect Replace Check Replace Prime pump and see "Pump unprimed" Replace Correct connection Open Clean Replace photocell or control box Clean
7 x blinks ● ● ● ● ● ● ●	Flame detachment	29 - Poorly adjusted head 30 - Poorly adjusted or dirty firing electrodes 31 - Poorly adjusted fan air gate: too much air 32 - 1st nozzle is too big (pulsation) 33 - 1st nozzle is too small (flame detachment) 34 - 1st nozzle dirty, or deformed 35 - Inappropriate pump pressure	Adjust, see page 6 Adjust, see page 6 Adjust Reduce 1st nozzle delivery Increase 1st nozzle delivery Replace Adjust
	Uneven fuel supply	36 - Check if cause is in pump or fuel supply system	Feed burner from tank located near burner
	Internally rusted pump	37 - Water in tank pump	Suck water from tank bottom with separate pump
	Noisy pump, unstable pressure	38 - Air has entered the suction line - Depression value too high (higher than 35 cm Hg): 39 - Tank/burner height difference too great 40 - Piping diameter too small 41 - Suction filters clogged 42 - Suction valves closed 43 - Paraffin solidified due to low temperature	Tighten connectors Feed burner with loop circuit Increase Clean Open Add additive to light oil
	Pump unprimed after prolonged pause	44 - Return pipe not immersed in fuel 45 - Air enters suction piping	Bring to same height as suction pipe Tighten connectors
	Pump leaks light oil	46 - Leakage from sealing organ	Replace pump
	Smoke in flame - dark Bacharach  - yellow Bacharach	47 - Not enough air 48 - Nozzle worn or dirty 49 - Nozzle filter clogged 50 - Erroneous pump pressure 51 - Flame stability spirat dirty, loose, or deformed 52 - Boiler room air vents insufficient 53 - Too much air	Adjust head and fan gate, see page 7 Replace Clean or replace Adjust to between 10 - 14 bar Clean, tighten in place, or replace Increase Adjust head and fan gate, see page 7
	Dirty combustion head	54 - Nozzle or filter dirty 55 - Unsuitable nozzle delivery or angle 56 - Loose nozzle 57 - Impurities on flame stability spiral 58 - Erroneous head adjustment or not enough air 59 - Blast tube length unsuited to boiler	Replace See recommended nozzles, page 6 Tighten Clean Adjust, see page 10; open gate valve Contact boiler manufacturer
10 x blinks ● ● ● ● ● ● ● ● ● ●		60 - Connection or internal fault 61 - Presence of electromagnetic disturbance	Use the radio disturbance protection kit)

## APPENDIX

### Electrical wiring



#### NOTES

Electrical wiring must be made in accordance with the regulations currently in force in the country of destination and by qualified personnel.

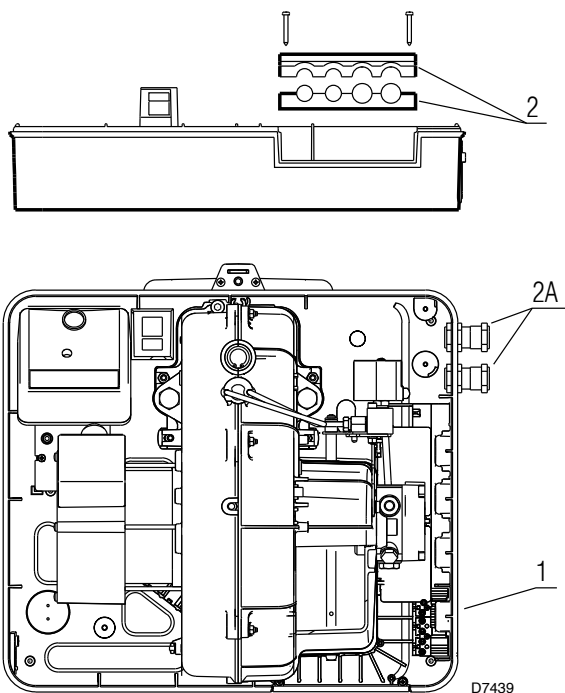
Riello S.p.A. declines all liability for modifications or connections other than those shown on these diagrams.

Use flexible cables according to standard EN 60 335-1.

All the cables to be connected to the burner are fed through the grommets.

The use of the grommets can take various forms; by way of example we indicate the following mode:

- 1- 7 pole socket for single phase power supply, thermostat/pressure switch TL
- 2 - 2A Housing for the nozzles  
(Drill if 2A nozzles are required)



#### NOTES

- The RL 34/1 MZ 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 perform checks of its own efficiency at start-up. Normally the boiler's limit thermostat pressure switch TL ensures the stopping of the burner. If this is not the case, it is necessary to apply in series with IN a timer switch that turns off the burner at least once every twenty-four hours.



#### ATTENTION:

- Do not invert the neutral with the phase wire in the electricity supply line. Any inversion would cause a lockout due to firing failure.
- Only use original spare parts to replace the components.



## 识别

产品铭牌上印有序列号、型号、主要技术及性能数据。如果铭牌被篡改、拆除或丢失，产品型号不容易识别，安装或维修过程中会存在潜在危险。

## 通用警告

为了保证燃烧污染物排放降至最低，锅炉燃烧室的尺寸必须满足特定尺寸。

建议在给特殊锅炉选择燃烧器时，咨询我们的技术支持部门。

有资质人员是指那些经过专业培训机构培训合格的专业技术人员。

该燃烧器只能用于设计时指定的应用。

由于错误安装或错误调整，或不正确或不合理使用，或没有遵照随燃烧器附带的使用说明书来使用，或由无资质人员操作等因素所造成的任何人、畜、财产损失，制造商概不负责。

## 用户告知


如果燃烧器在点火或运行中出现故障，燃烧器执行“安全停机”，会有红色 LED 指示灯指示燃烧器锁定。要重新启动燃烧器，按一下复位按钮。燃烧器重新启动后，红色 LED 指示灯熄灭。


这个操作最多允许重复 3 次，如果“安全停机”还是发生，请联系我们的技术支持部门。

## 基本安全规则

- 严禁未成年人和无资质人员操作此设备。
- 在安装燃烧器房间的通风孔，进气格栅，排气格栅上不允许覆盖衣物、纸张或其他任何东西。
- 非认证人员不允许维修燃烧器。
- 拉出或缠绕电源插头是危险的。
- 清洁燃烧器前要断开主电源。
- 不要使用易燃物来擦拭燃烧器（如酒精、汽油等）。
- 盖子可以用肥皂水擦拭。
- 不要在燃烧器上放置任何东西。  
不要在安装燃烧器的房间放置易燃物。

本手册使用的如下符号，解释如下：

 **注意** = 操作者需要特别注意并有所准备。

 **禁止** = 对操作者，**决不允许这样做**。

技术参数	页码 2
可选型号	2
配件	2
燃烧器描述	3
包装 - 重量	3
最大尺寸	3
标准配置	3
出力图	4
试验锅炉	4
安装	5
安装位置	5
锅炉法兰	5
燃烧筒长度	5
固定燃烧器到锅炉上	5
喷嘴选择	6
喷嘴安装	6
燃烧头设置	7
风门调节	7
管路系统	8
油泵	9
油泵启动	9
燃烧器校准	10
燃烧器运行	11
最终检查	12
维护	12
燃烧器启动周期故障诊断	14
复位控制盒及执行故障诊断	14
故障 - 可能原因 - 故障排除	15
附录	16
电气接线	16
配电盘接线图	17

## 注意

文中所涉及数字标识定义如下：

1)(A) = 图 A 第 1 部分，内容见本页；

1)(A)p.3 = 图 A 第 1 部分，内容见第 3 页。

## 注意事项

根据效率指令 92/42/EEC，锅炉燃烧器的使用、调试及测试必须按锅炉使用手册进行，包括检查烟气中 CO 和 CO<sub>2</sub> 的浓度及温度，以及锅炉的平均水温。

## 介绍

燃烧器随附使用手册：

- 说明书是产品必不可少的组成部分，因此需妥善保管此手册以备查阅；若燃烧器易主，也需随附此手册。若此手册丢失或损毁，需向 **RIELLO** 本地技术服务部 索取；
- 为有资质的操作人员编写；
- 内容包括燃烧器的安全安装、启动、使用及维护等重要操作的说明。

## 系统的交付及使用手册

系统交付使用后，需特别注意以下事项：

- 建议用户将系统制造商提供的用户使用手册存放于热发生器安装室内。
- 使用手册内有：
  - 燃烧器序列号：

.....

- 最近技术支持中心地址及电话：

.....

- 系统供应商需特别告知用户以下内容：
    - 系统的使用，
    - 系统启动前所需的进一步测试，
    - 由制造商或专业技术人员进行至少每年一次的维护或必要的系统检查。
- 为保证对系统进行定期检查，**RIELLO** 建议制定维护维修合同。

## 技术参数

型号		RL 34/1 MZ
型号		971 T
热功率 (1)	kW	107 - 398
出力 (1)	Mcal/h	92 - 342
	kg/h	9 - 33.6
燃料		轻油
- 净热值	kWh/kg	11.8
	Mcal/kg	10.2 (10,200 kcal/kg)
- 密度	kg/dm³	0,82 - 0,85
- 20 °C 时的粘度	最大 mm²/s	6 (1.5 °E - 6 cSt)
运行		<ul style="list-style-type: none"> <li>• 间歇运行 ( 每 24 小时至少停机 1 次 )</li> <li>• 一段火 ( 开 - 关 )</li> </ul>
喷嘴	数量	2
标准应用		锅炉：热水炉，蒸汽炉，导热油炉
环境温度	°C	0 - 40
助燃空气温度	最高 °C	60
电源	V	230 ~ +/-10%
	Hz	50/60 - 单相
电机	rpm	2800
	W	300
	V	220 - 240
	A	2.4
电机电容	µF/V	12.5/450
点火变压器	V1 - V2	230 V - 2 x 12 kV
	I1 - I2	0.2 A - 30 mA
油泵	出力 (12 bar 时)	45
	压力范围	7 - 14
	燃油温度	最高 °C 60
消耗电功率	最大 W	600
电气保护等级		IP40
符合的 EC 指令		2006/42 - 89/336 - 2004/108 - 73/23 -2006/95 - 92/42
噪音水平 (2)	声压	68
	声功率	79

(1) 参考条件：环境温度 20°C - 气压 1013 mbar - 海拔 0 m a.s.l.

(2) 噪音排放测试根据 EN 15036-1 进行，测量误差为  $\sigma = \pm 1.5$  dB。噪声于制造商实验室的实验锅炉上测得，且燃烧器处于最大额定出力时的噪声值。

## 可选型号

型号	编号	电源	燃烧筒长度 mm
RL 34/1 MZ	20033840	单相	216

## 配件 ( 可选 ):

• 加长燃烧头	编号 3010426
• 接触器组件	编号 3010419
• 后吹扫装置	编号 3010453
• 计时器	编号 3010450
• 接地故障断路器	编号 3010448
• 电磁干扰防护组件 如果由于附近有变频器，使得燃烧器受到电磁干扰（电磁信号强度大于 10 V/m），或温控器的连接线长度超过 20 米时，需要在电气控制与燃烧器之间安装电磁干扰防护装置。	编号 3010386

## • 油气分离装置

空气可能随轻油一起被吸入油泵。这些空气可能由于负压或密封不良而存在于轻油中。

在双管系统中，空气可经回油管回到油箱中；在单管系统中，空气仍存在于油路循环系统中，会引起油泵压力变化及燃烧器故障。

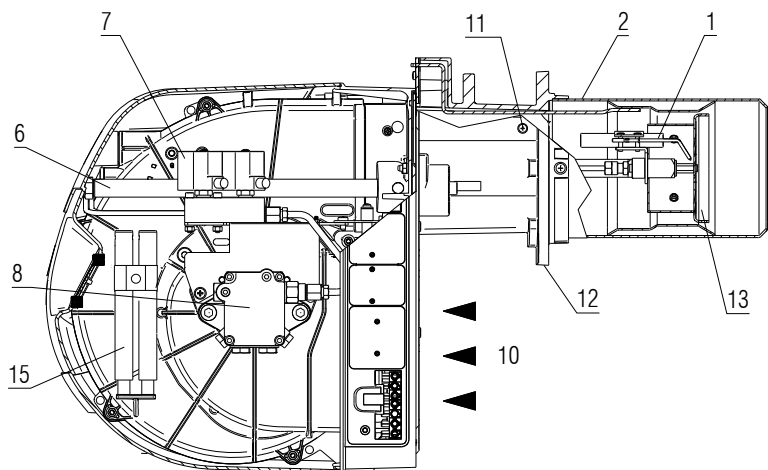
因此，我们建议在安装单管系统时，在燃烧器附近安装一个油气分离装置。油气分离装置有以下两个型号：

编号 3010054 未装过滤器

编号 3010055 装有过滤器

## 油气分离装置特性

- 燃烧器出力：最大 80 kg/h
- 轻油压力：最大 0.7 bar
- 环境温度：最高 40 °C
- 轻油温度：最高 40 °C
- 附件连接接口：1/4 英寸



#### 燃烧器描述 (A)

- 1 点火电极
- 2 燃烧头
- 3 燃烧头调节螺栓
- 4 火焰监控的电眼
- 5 固定风机的螺栓
- 6 打开燃烧器及检查燃烧头用滑杆
- 7 电磁阀
- 8 油泵
- 9 穿软管及电缆用预留 4 孔平板
- 10 空气入口
- 11 风机压力测试点
- 12 连接锅炉的用法兰
- 13 火焰稳焰盘
- 14 火焰检查窗
- 15 滑杆 6) 的加长杆
- 16 电机电容
- 17 带锁定指示灯及锁定复位按钮的控制盒
- 18 电气连接用插座
- 19 风门挡板
- 20 油泵压力调节钮
- 21 穿软管用预留 2 孔平板

可能发生的燃烧器故障：

**控制盒锁定：**如果控制盒 17)(A) 的按钮 (红色 led) 灯亮起，则显示燃烧器锁定。如要复位，按住该按钮 1-3 秒。

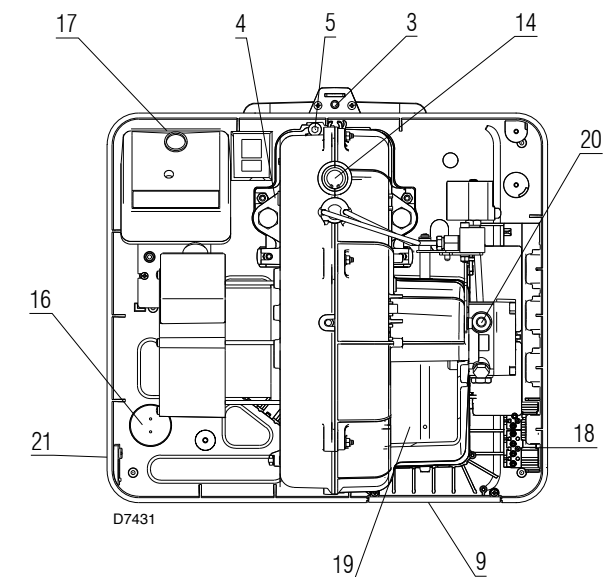
#### 包装 - 重量 (B) - 大概值

- 燃烧器使用纸箱包装运输，其最大尺寸参见表 (B)。
- 燃烧器连同包装盒重量参见表 (B)。

#### 最大尺寸 (C) - 大概值。

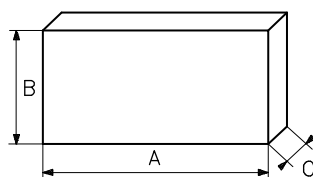
燃烧器最大尺寸如表 (C) 所示。

注意检查燃烧头时需要将燃烧器沿滑杆拉出。去除包装后，燃烧器的最大尺寸如 O 列所示。



(A)

mm	A	B	C	kg
RL 34/1 MZ	1000	500	485	32

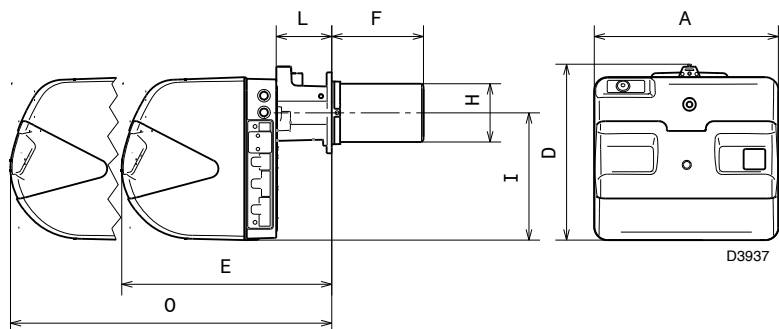


(B)

D88

#### 标准配置

- 2 - 软管
- 2 - 软管垫圈
- 2 - 带垫圈的软管接头
- 1 - 隔热垫
- 2 - 滑杆 6)(A) 的加长杆 15)(A) (351 mm 燃烧筒型号专用)
- 4 - 固定燃烧器法兰到锅炉上的螺栓：M 8 x 25
- 1 - 电气连接用 7 针插头
- 1 - 说明书
- 1 - 配件表



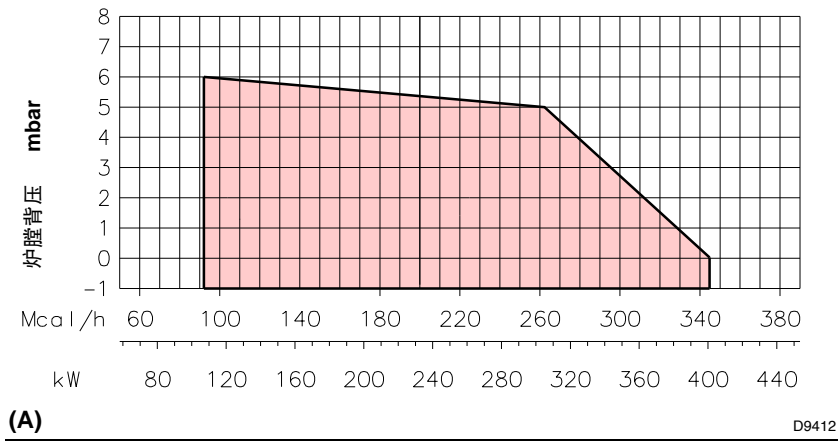
D3937

mm	A	D	E	F <sup>(1)</sup>	H	I	L	O <sup>(1)</sup>
RL 34/1 MZ	442	422	508	216 - 351	140	305	138	780 - 915

(1) 燃烧筒：标准 - 加长

(C)





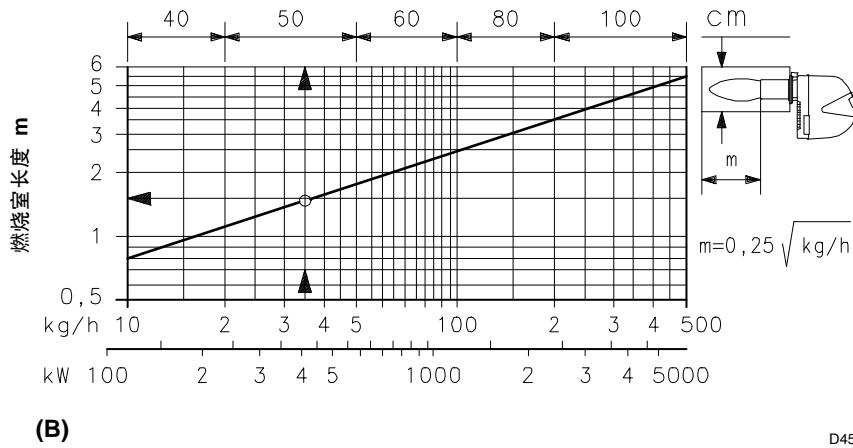
### 出力图 (A)

燃烧器出力必须落在左图所示区域内。  
这一区域为燃烧器工作区，燃烧器出力和燃烧室内背压紧密相关。

从燃烧器喷油量处划一条垂直线，从炉膛背压处划一条水平线，两线交叉点即为工作点，此点必须位于所示工作区内。

#### 重要：

出力图的值在如下条件下获得：环境温度 20 °C，大气压 1013 mbar (约 0 m 海拔)，燃烧头按第 7 页所示调整。



### 试验锅炉 (B)

出力图是根据 EN 267 标准在专用试验锅炉上进行测试绘制而成的。

图 (B) 给出试验锅炉炉膛直径和长度。

**举例：**流量 35 kg/ 小时：


直径 = 50 cm ； 长度 = 1.5 m。


若燃烧器安装于小于尺寸表所示燃烧室时，需进行预测试。

安装

 燃烧器的安装必须符合当地法律及标准。

安装位置 (A)

 燃烧器只能安装于位置 1, 2, 3 及 4。  
安装位置 1 为最优，因为只有在此位置才能如本手册所述对燃烧器进行维护。安装位置 2, 3 及 4 允许燃烧器运行，但不利于维护和检修燃烧头，第 14 页。

 任何其它的安装位置都可能对燃烧器的正常运行带来危害。  
为保证安全，禁止将燃烧器安装于位置 5。

锅炉连接法兰 (B)

按图 (B) 所示在锅炉上钻固定孔。可以用随机带的隔热垫划钻孔位置。

燃烧筒长度 (C)

燃烧筒的长度必须根据锅炉制造商所提供的说明书来选择，并且任何情况下必须大于锅炉前炉墙和炉衬的总厚度。可供选择的长度 L，如下：

燃烧筒 7)：

- 标准 216
- 加长 351

对于带前烟箱 10) 或反转火焰的锅炉，必须在炉衬 9) 及燃烧筒 7) 之间插入耐火材料制作的防护炉衬 8)。

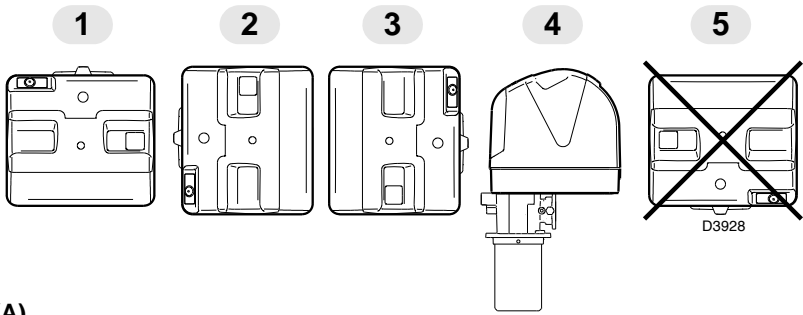
防护炉衬不能妨碍燃烧筒的移动。  
对于有前水冷壁的锅炉炉衬 8)-9)(C) 可以省略，除非锅炉厂商特别要求。

固定燃烧器到锅炉上 (C)

从燃烧器 4) 上拆下燃烧头 7) 及多岐管 5)：

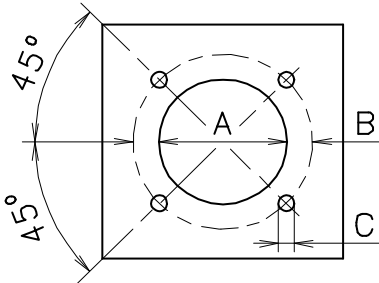
- 拆下两个滑杆 3) 上的螺栓 2)。
- 拆下螺栓 1) 并沿滑杆 3) 拉出燃烧器。

将组件 5) 和 7) (C) 穿上随供的隔热垫片 6) (C) 后安装到锅炉上。用随附的四颗螺栓固定。燃烧器和锅炉之间必须密封。



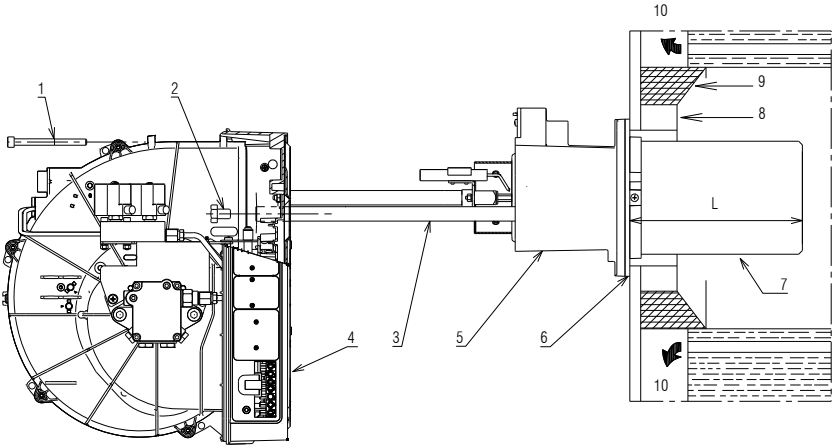
(A)

mm	A	B	C
RL 34/1 MZ	160	224	M 8



(B)

D455



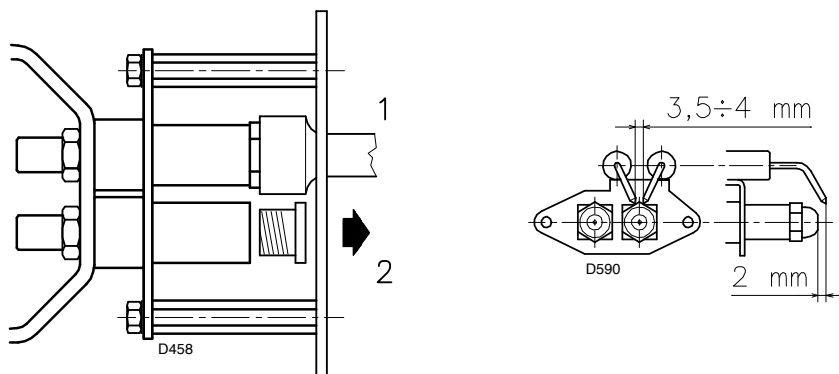
(C)

D7433

GPH		kg/h (1)			kW 12 bar	推荐喷嘴
1°	2°	10 bar	12 bar	14 bar		
1.25	+	1.00	8.7	9.7	10.5	DANFOS 60° B DEHAVAN 60° A DEHAVAN 60° W
1.50	+	1.00	9.7	10.8	11.7	
1.75	+	1.00	10.7	11.8	12.9	
2.00	+	1.00	12.5	13.9	15.0	
2.25	+	1.50	14.4	15.9	17.3	
2.50	+	1.75	16.3	18.0	19.6	
2.75	+	1.75	17.3	19.1	20.7	
3.00	+	2.00	19.2	21.2	23.0	
3.00	+	2.25	20.2	22.3	24.2	
3.50	+	2.25	22.1	24.4	26.5	
3.50	+	2.50	23.0	25.4	27.7	
4.00	+	2.75	25.9	28.6	31.1	
4.00	+	3.00	26.9	29.7	32.3	

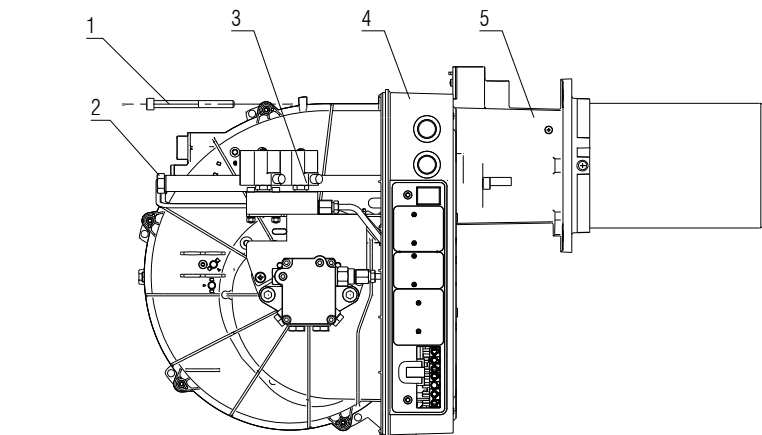
(1) 在两个喷嘴同时工作时，可获得所示流量。此时轻油具有以下特性：密度 0.84 kg/dm<sup>3</sup>  
- 粘度 4.2 cSt/20 °C - 温度 10 °C

## (A)



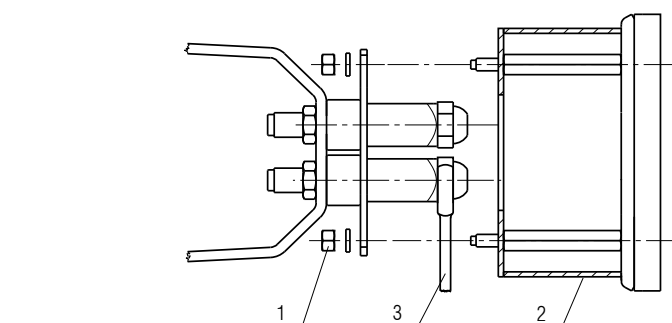
## (B)

## (C)



## (D)

D7434



## (E)

D3869

## 喷嘴选择 (A)

燃烧器符合 EN 267 标准所规定的排放要求。

为了保证排放稳定，应使用本操作手册所列出的利雅路公司推荐及 / 或提供的专用喷嘴。



**警告：** 在定期的维护操作中，建议每年更换一次喷嘴。



**注意：** 不使用利雅路公司提供的专用喷嘴或不进行定期维护，可能会导致排放不能达到强制标准要求，如问题严重还会给人员和财物带来潜在危害。

任何由于未遵守本操作手册内要求而造成的损失，制造商概不负责。

在给出的表 (A) 中选择所需的两个喷嘴。

建议在压力为 12 bar 时，喷嘴喷射角度为 60°。

燃烧器点火时，只有 1 号喷嘴启动。此时 1 号喷嘴流量大于 2 号喷嘴以保证稳焰盘上火焰的稳定性，虽然需要同时对两个喷嘴进行风量调节。

若点火时出现过太噪音或震动，应该减小 1 号喷嘴的流量以保证火焰的稳定性。

之后，2 号喷嘴开始工作。

燃烧器运行时的流量为 2 个喷嘴流量的总和。

## 举例

锅炉出力 = 230 kW

效率 90 %

燃烧器所需出力 =

230 : 0,9 = 255 kW

推荐表 (A) 所示下列喷嘴：

1° = 3,0 GPH + 2° = 2,0 GPH - 60° - 12 bar。

## 喷嘴安装

安装进行到此阶段，燃烧筒还未安装，因此可以在取下塑料塞 2)(B) 后，用 16 mm 扳手 1)(B) 将两个喷嘴从火焰稳定盘的中心进行安装。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。

点火喷嘴位于点火电极下，如图 (C)。

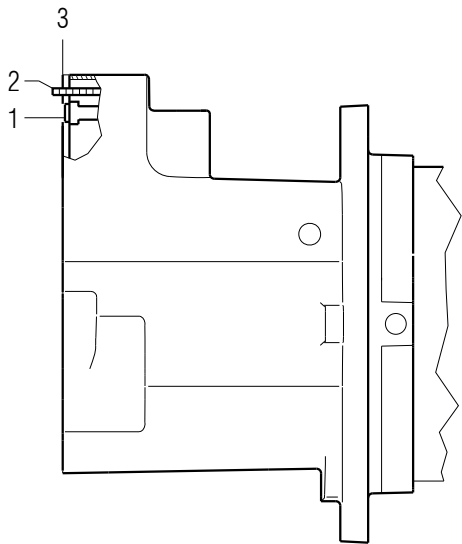
请确认点火电极连接位置如图 (C) 所示。

最后将燃烧器 4)(D) 重新安装到滑杆 3) 上，并将其一直推到多歧管 5) 处，滑动时将燃烧器轻微托起，避免火焰稳定盘与燃烧筒发生摩擦。将拧紧滑杆 3) 上的螺栓 2) 和的螺栓 1) 使燃烧器和法兰密封。

如确需为已安装到锅炉上的燃烧器更换喷嘴，则需按以下提示步骤操作：

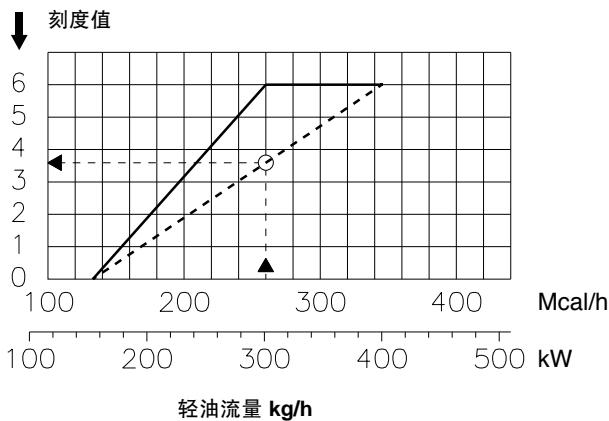
- 按图 (C) 第 5 页所示，拉出燃烧器。
- 取下螺母 1)(E) 及稳焰盘 2)。
- 使用扳手 3)(E) 更换喷嘴。

燃烧头调节



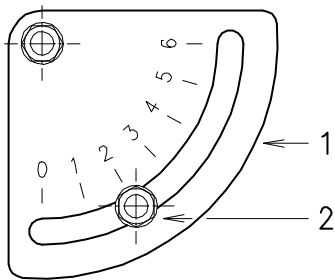
(A)

D3910



(B)

D7435



(C)

D593

燃烧头调节

安装进行到这一阶段，如图 (C) 第 5 页所示，喷嘴和管接口安装到锅炉上。只需按燃烧器的最大出力来调整燃烧头的设置，简单的说在第 6 页选择的两个喷嘴的总出油量即为燃烧器最大出力。旋转螺栓 1)(A) 直至指示杆 2)(A) 上的刻槽与面板 3)(A) 的表面对齐。

举例

RL 34/1 MZ 型号所配喷嘴：

$1^\circ = 3.50 \text{ GPH} + 2^\circ = 2.50 \text{ GPH}$  及 12 bar 油泵压力

两个喷嘴的流量见表 (A) 第 6 页：

25.4 kg/h ( 相当于 301 kW)。

图 (B) 显示在流量为 25.4 kg/h 时，RL 34/1 MZ 型燃烧器燃烧头的设置数值约为 3.5 。

注意

如果燃烧室内压力为 0 mbar 时，需按图 (B) 阴影线所示调整空气量。

燃烧头调整完成后，将燃烧器 4)(C) ( 第 5 页 ) 重新装回到滑杆 3)(C) ( 第 5 页 ) 上，在多岐管 5)(C) ( 第 5 页 ) 大约 100 mm 处，连接好电极电缆，然后将燃烧器完全关闭。

将螺栓 2)( 第 5 页 ) 装回滑杆 3)( 第 5 页 ) 上。

用螺栓 1)( 第 5 页 ) 将燃烧器与油管接口固定好。

注意

燃烧器安装好后，建议轻轻的拉出点火电极的电缆，直至它们被轻轻的拉紧。

风门调节

拧松螺母 2)(C) 后，用刻度调整杆 1)(C) 调整风门开度。

燃烧器首次点火时，应将此设置位于制造商最初的出厂设置刻度 2 上，见图 (C)。

## 管路系统

### 燃油供应

#### 双管系统 (A)

燃烧器必须配置一台自吸泵，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；为了油泵在油箱油量极少的情况下依然能吸到油，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。

最好是保持燃烧器进油管和回油管在相同水平高度，这样可以避免进油管吸不到油。

#### 循环回路

循环回路是一个闭合管路，燃油在循环油泵作用下从油箱抽出，再回到油箱。从此闭合管路中引出一个支管来为燃烧器供油。这一循环回路在以下情况下特别有用，即当油箱距离太远或高度差大于表中所列数据时，燃烧器不能自动注油启动。

#### 图例 (A)

H = 油泵 / 底阀高度差

L = 管道长度

Ø = 管道内径

1 = 燃烧器

2 = 油泵

3 = 过滤器

4 = 手动阀

5 = 进油管

6 = 底阀

7 = 快关手动阀远程控制 (仅限意大利)

8 = 开 / 关 电磁阀 (仅限意大利)

9 = 回油管

10 = 止回阀 (仅限意大利)

#### 管路连接 (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，旁路系统被螺栓 6)(B)( 第 11 页 ) 封住了。

需要连接两根软管到油泵上。

如回油管关闭且安装了旁路螺栓，运行油泵将导致油泵立即损坏。

拆下油泵进油口与回油口的堵头。

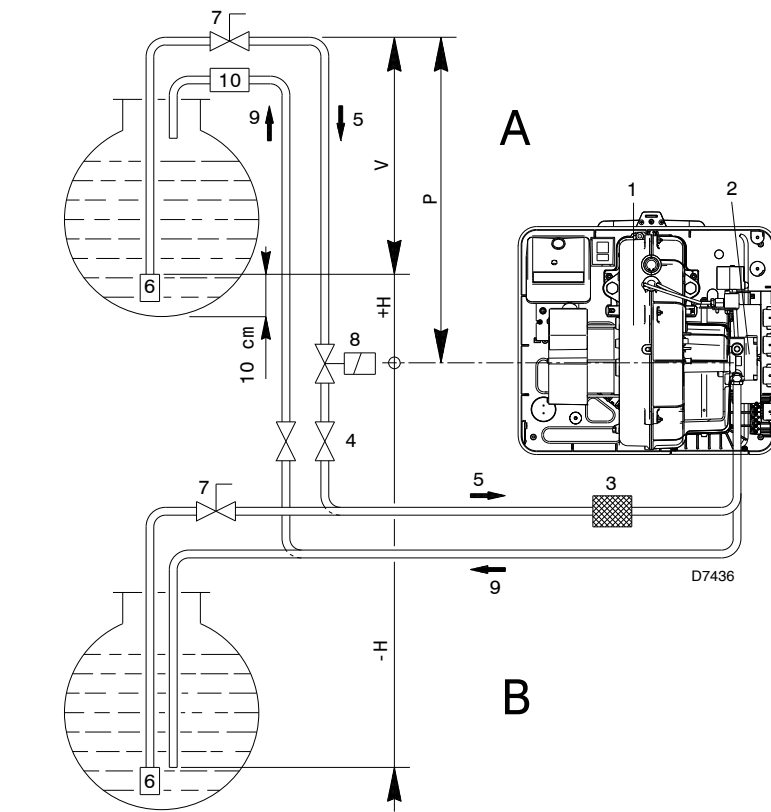
将所附的密封垫加入到连接管连接到油泵并拧紧。

注意安装软管时不要拉伸或扭曲软管。

将软管从左手面板 5)(B) 上的孔中穿过，将管上的两个堵帽取下，或按如下操作：拧松螺栓 1)，然后将连接件分成 2) 和 3) 两部分并去罩塞住两个管头 4) 的堵帽。

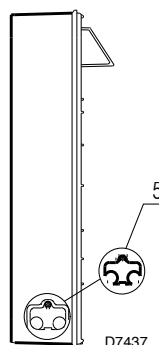
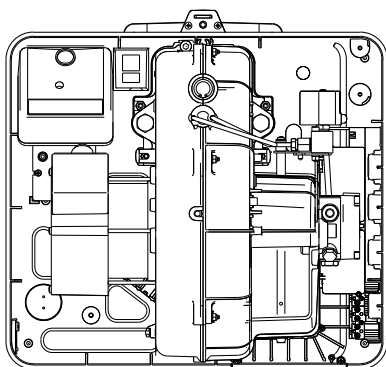
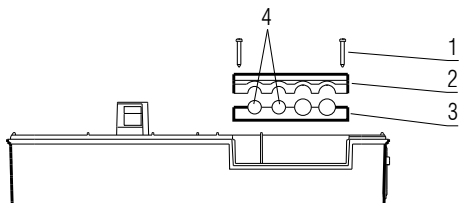
软管应安装在不易被绊到的位置，不能接触到锅炉的高温表面，不能影响到燃烧器检修时的打开。

现在可以安装剩余零件，使用两个扳手，其一固定凸出部，另一个转动软管上的螺扣。



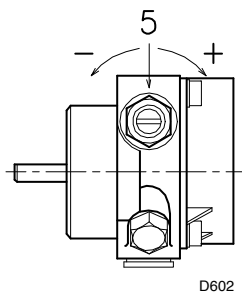
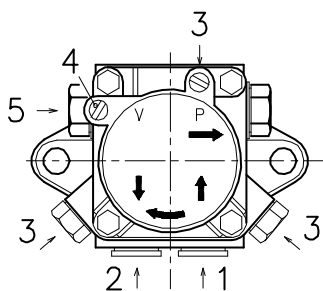
+ H - H (m)	L (m)		
	Ø (mm)		
	8	10	12
+ 4.0	52	134	160
+ 3.0	46	119	160
+ 2.0	39	104	160
+ 1.0	33	89	160
+ 0.5	30	80	160
0	27	73	160
- 0.5	24	66	144
- 1.0	21	58	128
- 2.0	15	43	96
- 3.0	8	28	65
- 4.0	-	12	33

(A)



(B)

# 油泵 SUNTEC AN 57 C



## 油泵 (A)

- 1 - 供油 G 1/4"
- 2 - 回油 G 1/4"
- 3 - 压力表座 G 1/8"
- 4 - 真空表座 G 1/8"
- 5 - 压力调节螺栓

- A - 压力为 12 bar 时最小输油量
- B - 压力范围
- C - 吸入口最大真空度
- D - 粘度范围
- E - 轻油最高油温
- F - 最大吸入及回油压力
- G - 工厂预设压力
- H - 滤网孔宽度

## 油泵启动

- 启动燃烧器前，确认油箱回油管路畅通。回油管路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)。

- 首次启动时，松开油泵上的螺栓 3)(A)，以便排出进油管路中的空气。
- 将启动控制开关及电源开关闭合，启动燃烧器。油泵转动方向必须与燃烧器外壳上所标箭头方向一致。
- 若从螺栓 3) 处有油漏出，则可认为能正常运行。立刻停止燃烧器并拧紧螺栓 3)。

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，等待大约 15 秒后，复位燃烧器，之后按规定的启动间隔再次启动燃烧器。启动 5 或 6 次后请间隔 2 至 3 分钟，以利于变压器的冷却。

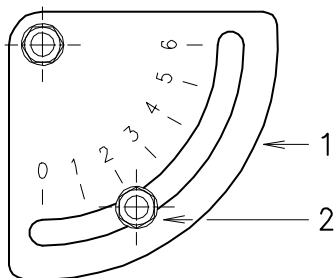
不要拔除光电管，否则燃烧器会锁定；燃烧器将在启动后 10 秒锁定。

## 注意：

油泵在出厂时已经注满油。如果有油泻出，请从油泵的真空表座处注油，否则会损坏油泵。当供油管的长度超过 20-30 米时，请另加一台独立的油泵。

		AN 57 C
A	kg/h	45
B	bar	10 - 18
C	bar	0,45
D	cSt	2 - 75
E	°C	60
F	bar	2
G	bar	12
H	mm	0,150

(A)

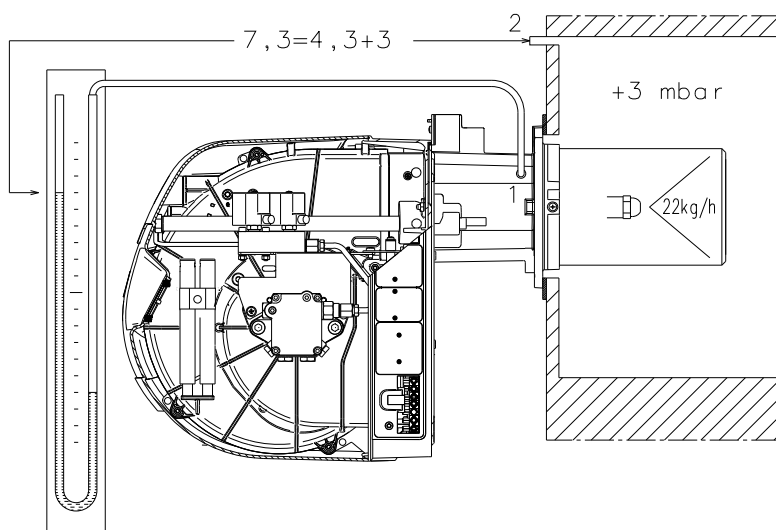


(A)

D593

在测点 2) 的压力为零时测点 1) 的风压

kg/h	mbar
9	3.6
10	3.7
12	3.8
14	3.9
16	4.0
18	4.1
20	4.2
22	4.3
24	4.4
26	4.9
28	5.6
30	6.4
32	7.1
34	7.9



(B)

D7438

## 燃烧器校核



注意

启动燃烧器必须由取得资质且有合适操作工具的人员进行操作。

### 点火

首次点火时，当 2 号喷嘴的管路注油时，会出现暂时性的油压下降。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。

一旦完成下列调整，燃烧器点火时的噪音就应该接近其运行时的噪音。如果燃烧器在开启轻油电磁阀时出现一两次震动或延迟点火现象，其原因请查看 15 页上第 29-35 项。

### 运行

燃烧器的最佳校核需要在锅炉排烟口安装烟气分析仪，并对以下部分进行调整：

#### • 1 号及 2 号喷嘴

内容详见第 6 页“喷嘴选择”。

#### • 燃烧头

除非燃烧器的最大出力发生了改变，否则燃烧头按第 7 页描述调整后就不需要改变了。

#### • 油泵压力

12 bar：此压力为出厂时的预设值，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 为了减小燃油量，只有在环境温度高于 0°C 时，才能作此调整。

14 bar 为了增加燃油量，或者保证环境温度低于 0°C 时的点火启动。

调整油泵压力，可使用螺栓 5)(A)( 第 9 页)。

#### • 风门挡板

拧松螺母 2)(A)，通过刻度调整杆 1)(A) 调整风门开度。

这一设置必须根据燃烧器燃油量（当两个喷嘴同时运行时）及炉膛背压进行具体调整。

测点 1)(B) 的风压值必须接近表 (B) 所示压力与测点 2) 所测炉膛背压的和。

参见左图。

## 燃烧器运行

### 燃烧器启动 (A) - (B)

启动阶段各步骤的时间间隔以秒计，显示如下：

- 启动控制装置 TL 闭合。

大约 3 秒后：

- **0 秒**：控制盒启动循环开始。
- **2 秒**：风机马达启动。
- **3 秒**：点火变压器通电。

油泵 3) 通过油管 1) 及滤油器 2) 将燃油吸入泵中，并开始加压送油。活塞 4) 升高，油通过油管 5)-7) 流回油箱。螺栓 6) 将泵内旁路堵塞，电磁阀 8)-11) 断电，关闭油路。

以最大通风量进行预吹扫阶段。

- **22 秒**：电磁阀 8) 开启，燃油流经油管 9) 和滤油器 10)，由 1 号喷嘴喷出，遇点火电极打出的火花后点燃。此为点火火焰。
  - **29 秒**：点火变压器断电。
  - **36 秒**：电磁阀 11) 开启，燃油流经油管 13) 和滤油器 14)，由 2 号喷嘴喷出。此为运行火焰。
- 至此，启动周期结束。

### 稳态运行

当锅炉温度或压力增大至控制装置 TL 断开，燃烧器停机。

### 点火失败

如果燃烧器点火失败，会在 1 号喷嘴阀开启 5 秒之内或控制装置 TL 闭合 30 秒后进入锁定状态。控制盒指示灯将会亮红灯。

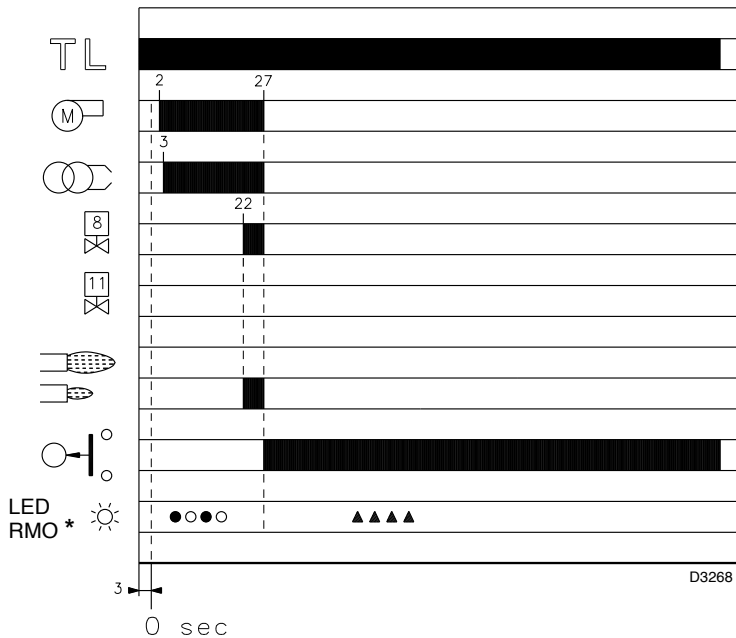
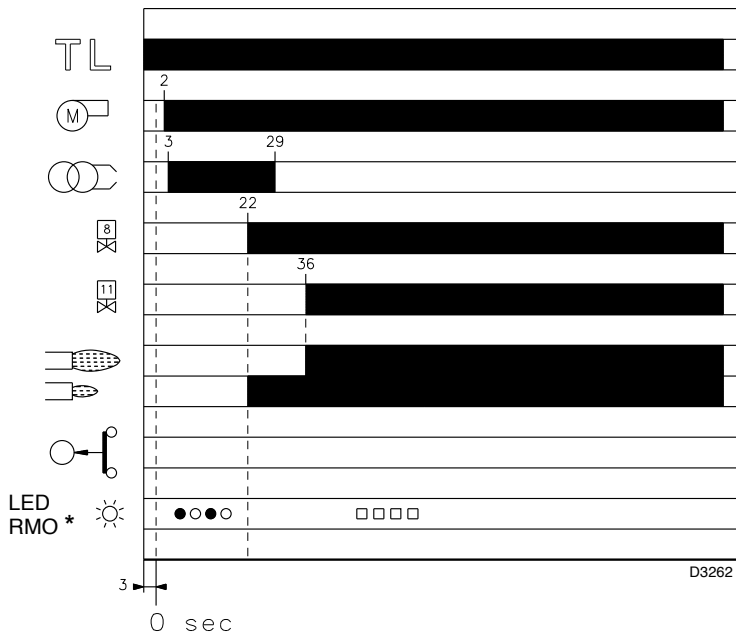
### 燃烧器运行中意外停机

如果运行过程中火焰熄灭，燃烧器将会在 1 秒内自动关闭，并且会自动进入启动阶段启动。

### 图例说明 (B)

M = 压力表

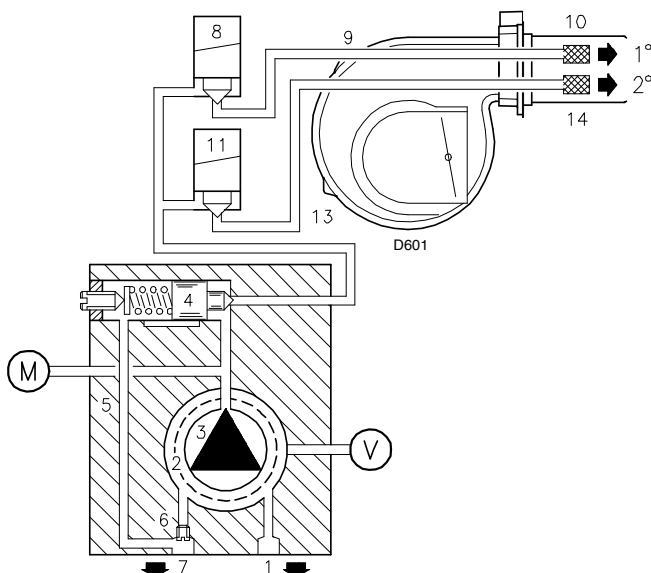
V = 真空表



\* ○ 灯灭      ● 黄色      □ 绿色      ▲ 红色  
详见第 14 页。

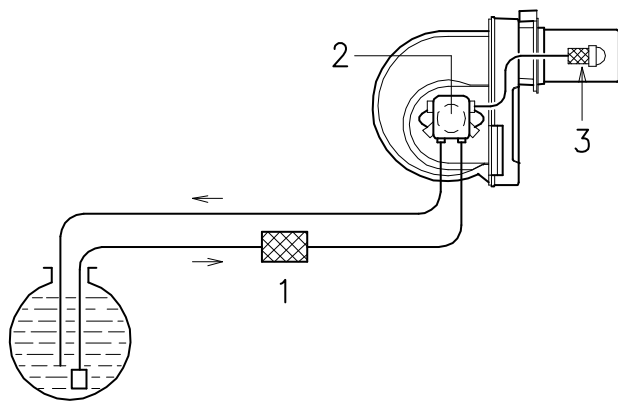
(A)

(B)





(A)



D482

## 最终检查

- 闭合启动控制开关并遮住光电管：燃烧器将启动，并在 1 号喷嘴的电磁阀开启 5 秒后锁定。
- 闭合启动控制开关并照亮光电管：燃烧器将启动，并在大约 10 秒后锁定。
- 燃烧器运行时拔出光电管，会接连出现以下情况：火焰 1 秒内熄灭，预吹扫约 20 秒，点火约 5 秒，燃烧器进入锁定状态。
- 燃烧器运行时断开启动控制开关 TL：燃烧器将停止运行。

## 维护

- ⚠ 燃烧器需定期由具有资质的**具有当地规范和标准认证**的技术人员进行维护。
- ⚠ 定期检修可保证燃烧器的良好性能，避免燃油的过度消耗以及增加污染物的排放。
- ⚠ 在进行任何清洗或操作之前，请先切断燃烧器系统主电源开关。

## 燃烧

燃烧器的最佳校核需要烟气分析仪。维护时与原有数据存在较大差异的地方应多加注意。

## 油泵

油泵工作时压力必须稳定在 12 bar。

真空 必须低于 0.45 bar。

油泵工作时必须保持噪音不能过大。

如果压力不稳或噪音过大，从过滤器上拆下软管，并从靠近燃烧器的油箱中吸油。这样检查可以分析判断问题出在进油管还是油泵。

如果油泵工作异常，检查并确保过滤网未被堵塞。真空表一般安装在过滤器前，因此不能显示过滤网是否被堵塞。另一方面，如果问题出在进油管上，检查并确保过滤网清洁以及进油管内没有空气进入。

## 过滤器 (A)

检查下列过滤器：

- 管路 1) • 油泵 2) • 喷嘴 3)，需要时清洁并更换过滤网。

如果油泵内生锈或有污物，请使用另一个油泵将油箱底部的水或污物抽出。

## 风机

检查确保风机内部及扇叶上没有灰尘积聚，灰尘会减少空气流量并增加燃烧污染物的排放。

## 燃烧头

检查确保燃烧头的所有部件性能完好、安装正确以及未被污染，没有因为高温运行而变形。

## 喷嘴

不要清洁喷嘴口。

建议在定期维护时每年更换喷嘴。

## 光电管

清洁玻璃罩上可能积聚的任何灰尘。拉出光电管 4) (A) (第 3 页)。安装时推进去即可。

## 软管

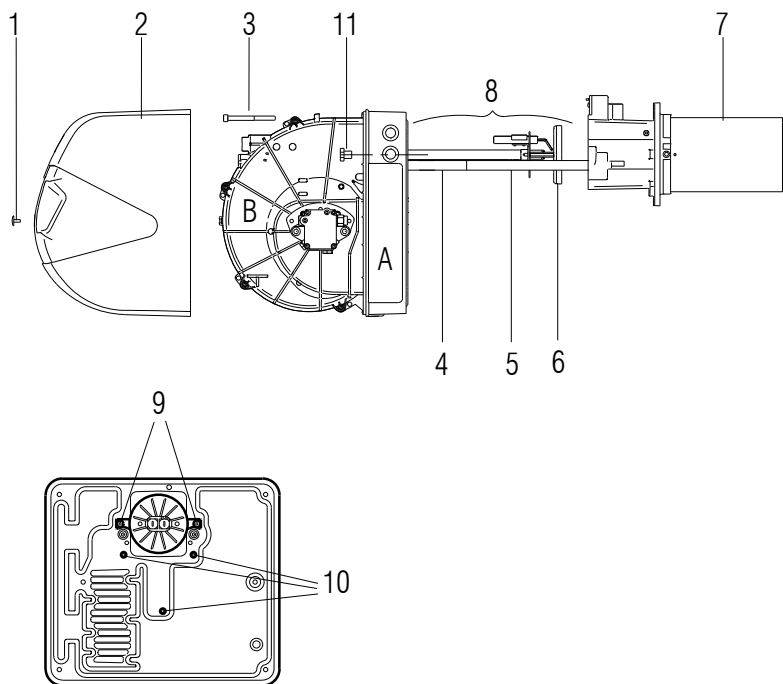
检查确认软管完好无损。

## 燃料箱

大约每隔 5 年、或任何需要的时候、或燃料箱底部进水或有污物时，需要用另外一部独立的油泵清理油箱。

## 锅炉

为了使保持最初的燃烧性能不被破坏，请按随附说明书上的要求清洁锅炉，特别要注意烟气温度及燃烧室背压。



(A)

D3962

### 打开燃烧器 (A)

- 断开所有电源
- 拆下螺栓 1)，取下保护盖 2)
- 拆下螺栓 3)
- 将两个加长段 4) 接在滑杆 5) 上 (仅适用于 351 mm 加长燃烧器头型号)
- 略抬起机体 A，向后拉，注意不要碰坏在燃烧筒 7) 里的稳焰盘 6)。

### 配电盘的维护 (B)

如需检修配电盘 A)( 图 A)，可以先取下风机组件 B)( 图 A) 以方便对电气元件进行维修操作。

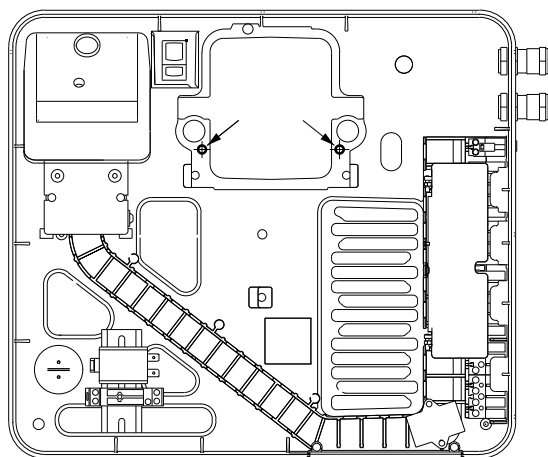
如图 (A) 所示，打开燃烧器时，需断开电缆电极并拧下 2 个螺栓 9)(A)，取下燃烧头 8)(A)。

断开与风机相连的电缆，取下保护垫上的 3 个螺栓 10)(A) 和另外 2 个螺栓 11)(A)，沿滑杆 4) - 5)(A) 中取出风机组件 B)( 图 A)。

最后，可以使用 3 个螺栓中的其中 2 个按图 (B) 所示的位置将配电盘与管路接口处连接，之后可进行维修操作

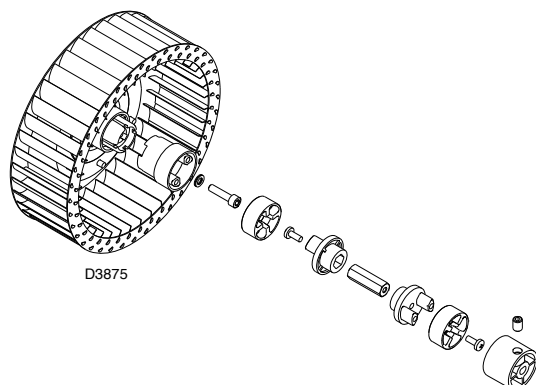
### 可能进行的油泵及 / 或管路接口更换 (C)

按图 (C) 给出的说明进行维修。



(B)

D3877



(C)

### 燃烧器启动过程故障诊断

启动过程中，各阶段指示见下表：

颜色代码表	
启动过程	颜色代码
预吹扫	●○●○●○●○●
点火阶段	●○●○●○●○●
运行，火焰正常	□□□□□□□□□
运行，火焰较弱	□○□○□○□○□
电压低于 ~ 170V	●▲●▲●▲●▲●
锁定	▲▲▲▲▲▲▲▲▲
外部光源	▲□▲□▲□▲□▲
图例：	○ 灯灭                      ● 黄色                      □ 绿色                      ▲ 红色

**复位控制盒及使用故障诊断功能**  
 控制盒具有故障诊断功能，因此能很容易确定故障原因（指示器：**红色 LED 指示灯**）。  
 要使用这一功能，须等燃烧器进入安全保护状态（锁定状态）至少 10 秒之后再按下复位按钮。  
 控制盒指示灯闪烁（相隔 1 秒），闪烁以 3 秒间隔不断重复出现。  
 可根据指示灯的闪烁次数来判断可能的故障原因，系统复位时必须按住按钮 1-3 秒。

红色 LED 指示灯亮 等待至少 10 秒	锁定	按下复位按钮 时间大于 3 秒	闪烁	间隔 3 秒	闪烁
			● ● ● ● ●		● ● ● ● ●

复位控制盒及使用故障诊断功能方法如下。

**复位控制盒**  
 复位控制盒程序如下：

- 按住复位按钮 1-3 秒。  
 松开复位按钮 2 秒后燃烧器重启。  
 若启动控制开关处于断开状态，则燃烧器不能重启。

**视觉故障诊断**  
 指示引起燃烧器锁定的故障类型。  
 查看故障诊断，按以下步骤操作：

- 当红色 LED 持续亮起（燃烧器锁定）时，按住按钮超过 3 秒。  
 黄灯闪烁说明操作成功。  
 指示灯闪烁则松开按钮。指示灯闪烁次数指示故障原因，如第 15 页列表所示。

**软件故障诊断**  
 通过红外线与 PC 电脑连接，报告燃烧器使用寿命，显示运行时间、锁定次数及类型、控制盒序列号等……  
 查看故障诊断，按以下步骤操作：

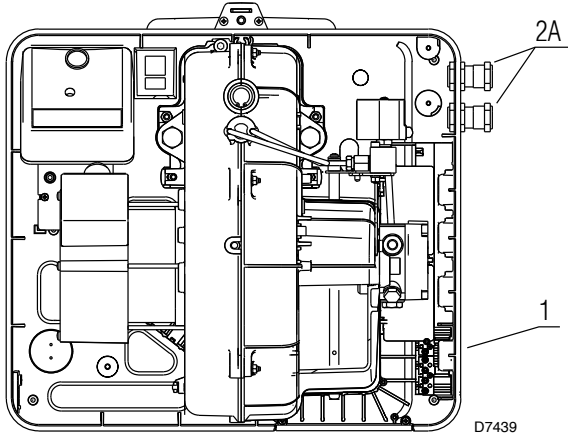
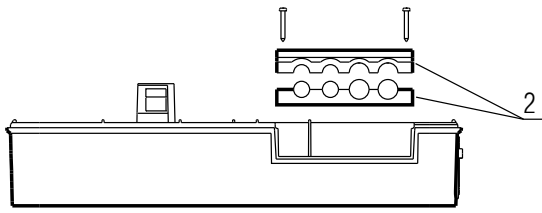
- 当红色 LED 持续亮起（燃烧器锁定）时，按住按钮超过 3 秒。  
 黄灯闪烁说明操作成功。  
 松开按钮 1 秒之后再次按下按钮超过 3 秒直至黄灯再次闪烁。  
 松开按钮，红色 LED 高频闪烁：此时红外线连接被激活。

一旦操作成功，必须按照上述控制盒复位程序将控制盒恢复到初始状态。

按键时间	控制盒状态
1 - 3 秒	复位控制盒，不进入视觉诊断状态。
大于 3 秒	在锁定状态进行视觉故障诊断： (Led 指示灯以 1 秒间隔闪烁)。
开始视觉故障诊断后超过 3 秒	通过红外线与 PC 电脑连接进行软件故障诊断（可查看运行时间、故障等）

控制盒指示灯闪烁情况指示故障类型，如第 15 页列表所示。

闪烁	故障	可能的故障原因	排除故障的建议
不闪烁	燃烧器未启动	1 - 电源没电 2 - 启动或安全控制开关断开 3 - 控制盒锁定 4 - 油泵卡住 5 - 不正确的电气连接 6 - 控制盒损坏 7 - 电机损坏 8 - 电容损坏	关闭所有电源 - 检查保险丝 调整或更换 复位控制盒 ( 锁定 10 秒后 ) 更换 检查接线 更换 更换 更换
闪烁 4 次 ● ● ● ●	燃烧器启动之后进入锁定状态	9 - 光电管短路 10 - 有外部光源进入或虚假火焰	更换光电管 消除光源或更换控制盒
闪烁 2 次 ● ●	预吹扫及安全时间过后，燃烧器进入锁定状态	11 - 油箱中没有油：油箱底部有水 12 - 燃烧头及风门调节不当 13 - 燃油电磁阀没有打开 (1 号喷嘴) 14 - 1 号喷嘴堵塞、脏或损坏 15 - 点火电极脏或调节不当 16 - 由于绝缘破损电极接地 17 - 高压电缆损坏或接地 18 - 高压电缆由于高温而损坏 19 - 点火变压器损坏 20 - 阀组或点火变压器电气连接错误 21 - 控制盒损坏 22 - 油泵不启动 23 - 油泵 / 电机联轴器损坏 24 - 油泵吸油管和回油管接反 25 - 油泵上游的阀关闭 26 - 过滤网脏：油路 - 油泵 - 喷嘴 27 - 光电管或控制盒损坏 28 - 光电管脏	增加油到相应水平或抽走油箱底部水 调整，见第 7 页 检查接线或更换线圈 更换 调整或清洁 更换 更换 更换或采取保护措施 更换 检查 更换 启动油泵，参见“油泵不启动” 更换 正确连接 开启 清洁 更换光电管或控制盒 清洁
闪烁 7 次 ● ● ● ● ● ● ●	脱火	29 - 燃烧头调整不当 30 - 点火电极调整不当或脏 31 - 风门调整不当：风量过大 32 - 1 号喷嘴流量过大 ( 脉冲点火 ) 33 - 1 号喷嘴流量过小 ( 脱火 ) 34 - 1 号喷嘴脏或损坏 35 - 油泵压力调整不当	调整，见第 6 页 调整，见第 6 页 调整 减小 1 号喷嘴流量 增大 1 号喷嘴流量 更换 调整
	燃料供应不稳定	36 - 检查油泵	从燃烧器附近的油箱为燃烧器供油
	油泵内生锈	37 - 油箱内有水	用另一个泵将油箱内水抽干
	油泵噪音大，压泵不稳	38 - 进油管有空气 - 油泵进油真空度过高 ( 高于 35 cm Hg ) 39 - 油箱 / 燃烧器高度差过大 40 - 管道直径太小 41 - 进油管过滤网堵塞 42 - 进油阀关闭 43 - 温度过低，燃油凝固	紧固接头 采用循环回路为燃烧器供油 增大 清洁 开启 向燃油中加入添加剂
	油泵长时间使用后不启动	44 - 回油管没有燃油 45 - 进油管有空气	升高到与进油管同样高度 紧固接头
	油泵漏油	46 - 由密封圈处泄露	更换油泵
	冒黑烟 - 黑度等级	47 - 空气不足 48 - 喷嘴磨损或脏 49 - 喷嘴过滤网堵塞 50 - 油泵压力不够 51 - 稳火叶片脏，松动或损坏 52 - 锅炉房通风不足 53 - 空气过量	调整燃烧头及风门，见第 7 页 更换 清洁或更换 调整至 10 - 14 bar 清洁，紧固或更换 增大 调整燃烧头及风门，见第 7 页
	燃烧头脏	54 - 喷嘴或过滤网脏 55 - 喷嘴流量或角度不当 56 - 喷嘴松动 57 - 稳火叶片上有杂物 58 - 燃烧头调整不当或空气不足 59 - 燃烧筒长度与锅炉不匹配	更换 参见推荐喷嘴，见第 6 页 固定 清洁 调整，见第 10 页：打开风门阀 联系锅炉制造商
闪烁 10 次 ● ● ● ● ● ● ● ● ● ●		60 - 接线错误或内部故障 61 - 存在电磁干扰	启动电磁干扰保护装置



## 电气接线



## 注意

电气接线必须符合该国的强制性法规，且必须由具有相关资质的人员执行。

擅自修改接线或不按接线图接线所造成的损失，意大利利雅路股份有限公司概不负责。

根据 EN 60 335-1 标准使用柔性电缆。

所有连接到燃烧器的电缆必须穿过穿线孔。

穿线孔可以有不同的用法；下面是其中一种模式：

1-

7 孔插座 供单相供电，温度 / 压力开关 TL

2 - 2A

喷嘴使用

(如需要使用 2A 喷嘴，需要钻孔)

## 注意

- RL 34/1 MZ 型号的燃烧器只能间歇运行，即燃烧器必须每 24 小时停机一次来检测控制盒在启动循环中的有效性。

正常情况下，锅炉的温度 / 压力启动开关 TL 会保证燃烧器的停机。如果不能实现，则需在燃烧器上串接一个计时开关来实现燃烧器至少每 24 小时停机一次。



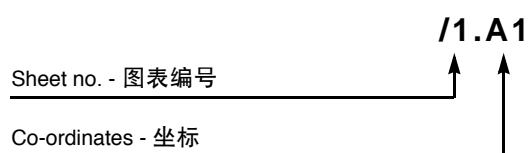
## 警告：

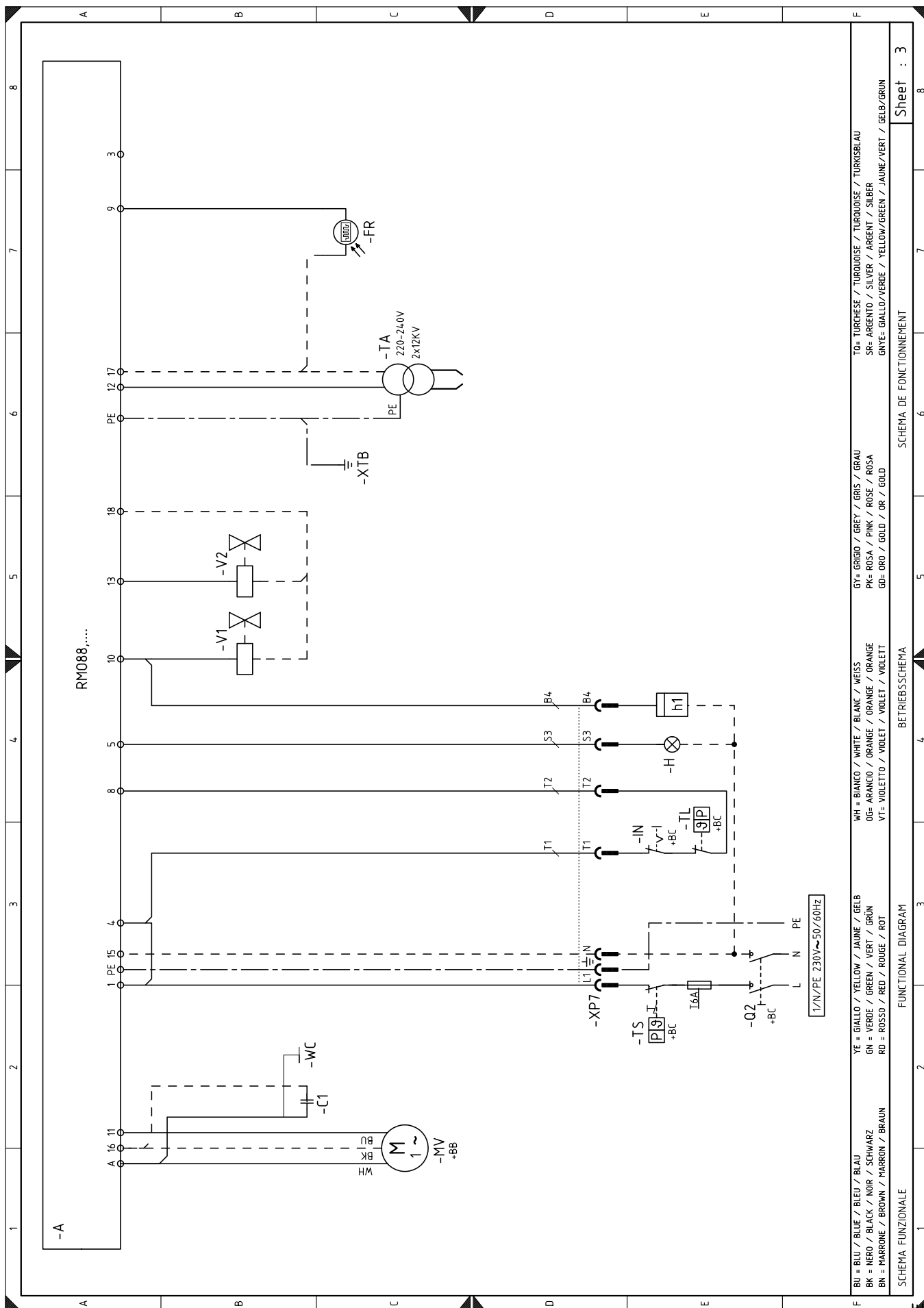
- 不要把零线和相线反接。任何反接可能造成点火失败，燃烧器锁定。
- 所有损坏部件的更换必须使用原厂配件。

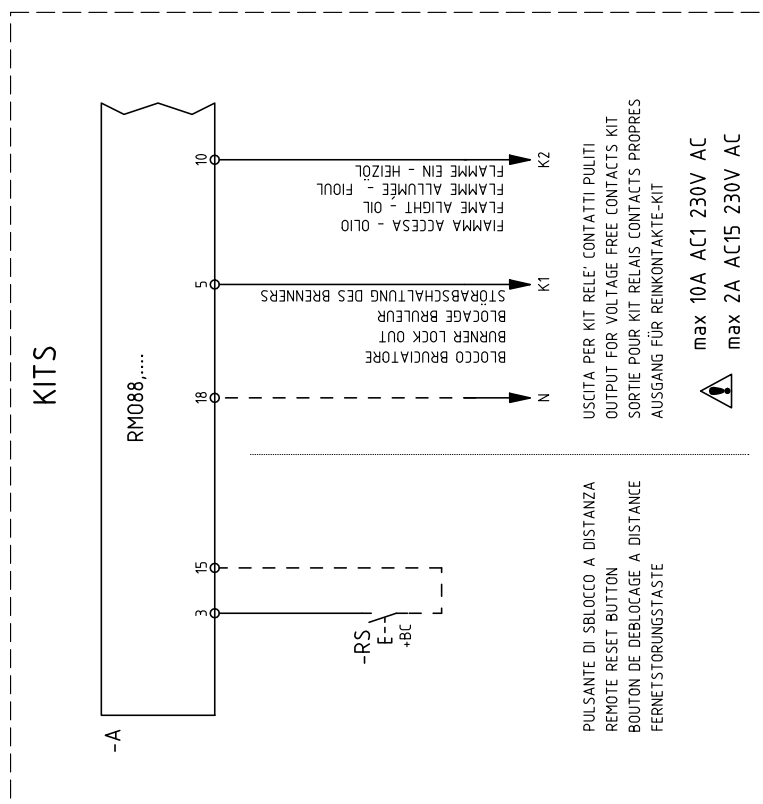
## Electrical panel layout - 电气接线图

<b>1</b>	<b>INDEX - 目录</b>
<b>2</b>	Indication of references - 参考指示
<b>3</b>	Functional diagram - 功能图
<b>4</b>	Electrical connections set by installer - 安装人员用电气连接图

### **2** Indication of references - 参考指示







F	BU = BLU / BLUE / BLEU / BLAU	YE = GIALLO / YELLOW / JAUNE / GELB	WH = BIANCO / WHITE / BLANC / WEISS	GY= GRIGIO / GREY / GRIS / GRAU	TO= TURCHESE / TURQUOISE / TURKISBLAU
	BK = NERO / BLACK / NOIR / SCHWARZ	GN = VERDE / GREEN / VERT / GRÜN	OG= ARANCIO / ORANGE / ORANGE	PK= ROSA / PINK / ROSE / ROSA	SR= ARGENTO / SILVER / ARGENT / SILBER
	BN = MARRONE / BROWN / MARRON / BRAUN	RD = ROSSO / RED / ROUGE / ROT	VT= VIOLETTO / VIOLET / VIOLET	GD= ORO / GOLD / OR / GOLD	GNYE= GIALLO/VERDE / YELLOW/GREEN / GELB/GRÜN
COLLEGAMENTI ELETTRICI A CURA DELL' INSTALLATORE			ELEKTROANSCHLÜSSE VOM INSTALLATEUR AUSZUFÜHREN		
ELECTRICAL CONNECTIONS SET BY INSTALLER			ÉLECTRIQUE EFFECTUÉE PAR L' INSTALLATEUR		
Sheet : 4					



## KEY TO ELECTRICAL LAYOUT

<b>A</b>	- Electrical control box
<b>BB</b>	- Components on burners
<b>BC</b>	- Components on boiler
<b>C1</b>	- Capacitor
<b>FR</b>	- Photocell
<b>H</b>	- Remote lockout signalling
<b>h1</b>	- Hour counter
<b>IN</b>	- Manual burner arrest switch
<b>MV</b>	- Fan motor
<b>Q2</b>	- Single phase knife switch
<b>RS</b>	- Remote burner reset button (accessory)
<b>TA</b>	- Ignition transformer
<b>TL</b>	- Limit thermostat/pressure switch
<b>TS</b>	- Safety thermostat/pressure switch
<b>V1</b>	- Ignition solenoid
<b>V2</b>	- Operating solenoid
<b>WC</b>	- Capacitor connection
<b>X7</b>	- 7 pin plug
<b>XP7</b>	- 7 pole socket
<b>XTB</b>	- Shelf earth

## 电气图图例说明

<b>A</b>	- 控制盒
<b>BB</b>	- 燃烧器部件
<b>BC</b>	- 锅炉部件
<b>C1</b>	- 电容
<b>FR</b>	- 光电管
<b>H</b>	- 远程锁定信号
<b>h1</b>	- 计时器
<b>IN</b>	- 燃烧器手动开关
<b>MV</b>	- 风机电机
<b>Q2</b>	- 单相闸刀开关
<b>RS</b>	- 燃烧器远程复位按钮 (配件)
<b>TA</b>	- 点火变压器
<b>TL</b>	- 温度 / 压力启动开关
<b>TS</b>	- 温度 / 压力安全开关
<b>V1</b>	- 点火电磁阀
<b>V2</b>	- 工作阀
<b>WC</b>	- 电容器连接
<b>X7</b>	- 7 针插头
<b>XP7</b>	- 7 孔插座
<b>XTB</b>	- 机架接地







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