GB

Light oil burners

Two-stage operation

CODE	MODEL
3470310	RL 44 MZ
3470311	RL 44 MZ
3470340	RL 44 MZ
3470341	RL 44 MZ

20215913 (3) - 09/2025

Translation of the original instructions

1 Declaration

Declaration of Conformity A.R. 8/1/2004 & 17/7/2009 – Belgium	
Manufacturer/Distributed by:	RIELLO S.p.A. 37045 Legnago (VR) Italy Tel. ++39.0442630111 www.riello.com
It is hereby certified that the apparatuses specified below conform with the model of the type described n the CE conformity declaration and they are produced and placed in circulation in conformity with the provisions defined in L.D. dated January 8, 2004 and July 17, 2009.	
Type of product:	Light oil burner
Model:	RL 44 MZ
Regulation applied:	EN 267 and A.R. dated January 8, 2004 - July 17, 2009
Measured value:	RL 44 MZ CO max: 6 mg/kWh NOx max: 143 mg/kWh

2 Information and general warnings

2.1 Information about the instruction manual

2.1.1 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 Centre 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.

Symbols used in the manual

In some parts of the manual you will see triangular DANGER signs. Pay great attention to these, as they indicate a situation of potential danger.

2.1.2 General dangers

The **dangers** can be of **3 levels**, as indicated below.

Maximum danger level!
This symbol indicates operations which, if not carried out correctly, cause serious injury, death or long-term health risks.

This symbol indicates operations which, if not carried out correctly, may cause serious injury, death or long-term health risks.

This symbol indicates operations which, if not carried out correctly, may cause damage to the machine and/or injury to people.

2.1.3 Other symbols

DANGER: LIVE COMPONENTS

This symbol indicates operations which, if not carried out correctly, lead to electric shocks with lethal consequences.

DANGER: FLAMMABLE MATERIAL

This symbol indicates the presence of flammable materials.

DANGER: BURNING

This symbol indicates the risks of burns due to high temperatures.

DANGER: CRUSHING OF LIMBS

This symbol indicates the presence of moving parts: danger of crushing of limbs.

WARNING: MOVING PARTS

This symbol indicates that you must keep limbs away from moving mechanical parts; danger of crushing.

DANGER: EXPLOSION

This symbol signals places where an explosive atmosphere may be present. An explosive atmosphere is defined as a mixture - under atmospheric conditions - of air and flammable substances in the form of gases, vapours, mist or dust in which, after ignition has occurred, combustion spreads to the entire unburned mixture.

PERSONAL PROTECTION EQUIPMENT

These symbols indicate the equipment that must be worn and kept by the operator for protection against threats against safety and/or health while at work.

OBLIGATION TO ASSEMBLE THE COVER AND ALL THE SAFETY AND PROTECTION DEVICES

This symbol signals the obligation to reassemble the cover and all the safety and protection devices of the burner after any maintenance, cleaning or checking operations.

ENVIRONMENTAL PROTECTION

This symbol gives indications for the use of the machine with respect for the environment.

IMPORTANT INFORMATION

This symbol indicates important information that you must bear in mind.

➤ This symbol indicates a list.

Abbreviations used

Ch.	Chapter
Fig.	Figure
Page	Page
Sec.	Section
Tab.	Table

2.1.4 Delivery of the system and the instruction manual

When the system is delivered, it is important that:

➤ the instruction manual is delivered 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 must carefully inform the user about:
– the use of the system;
– any further tests that may be required before activating the system;
– maintenance, and the need to have the system checked at least once a year by a representative of the manufacturer or another specialised technician.
To ensure a periodic check, the manufacturer recommends the drawing up of a Maintenance Contract.

2.2 Guarantee and responsibility

The manufacturer guarantees its new products from the date of installation, in accordance with the regulations in force and/or the sales contract. At the moment of the first start-up, check that the burner is integral and complete.

ATTENTION

Failure to observe the information given in this manual, operating negligence, incorrect installation and carrying out of non authorised modifications will result in the annulment by the manufacturer of the guarantee that it supplies with the burner.

In particular, the rights to the guarantee and the responsibility will no longer be valid, in the event of damage to things or injury to people, if such damage/injury was due to any of the following causes:

➤ incorrect installation, start-up, use and maintenance of the burner;
➤ improper, incorrect or unreasonable use of the burner;
➤ intervention of unqualified personnel;
➤ carrying out of unauthorised modifications on the equipment;
➤ use of the burner with safety devices that are faulty, incorrectly applied and/or not working;
➤ installation of untested supplementary components on the burner;
➤ powering of the burner with unsuitable fuels;
➤ faults in the fuel supply system;
➤ continuation of use of the burner when a fault has occurred;
➤ repairs and/or overhauls incorrectly carried out;
➤ modification of the combustion chamber with inserts that prevent the regular development of the structurally established flame;
➤ insufficient and inappropriate surveillance and care of those burner components most likely to be subject to wear and tear;
➤ use of non-original components, including spare parts, kits, accessories and optional;
➤ force majeure.

The manufacturer furthermore declines any and every responsibility for the failure to observe the contents of this manual.

3 Safety and prevention

3.1 Introduction

The burners have been designed and built in compliance with current regulations and directives, applying the known technical safety rules and envisaging all the potential danger situations.

It is necessary, however, to bear in mind that the imprudent and clumsy use of the equipment may lead to situations of death risk for the user or third parties, as well as the damaging of the burner or other items. Inattention, thoughtlessness and excessive confidence often cause accidents; the same applies to tiredness and sleepiness.

It is a good idea to remember the following:

➤ The burner must only be used as expressly described. Any other use should be considered improper and therefore dangerous.

Specifically:

it can be applied to boilers operating with water, steam, diathermic oil, and to other uses expressly named by the manufacturer; the type and pressure of the fuel, the voltage and frequency of the electrical power supply, the minimum and maximum deliveries for which the burner has been regulated, the pressurisation of the combustion chamber, the dimensions of the combustion chamber and the ambient temperature must all be within the values indicated in the instruction manual.

➤ Modification of the burner to alter its performance and destinations is not allowed.

➤ The burner must be used in exemplary technical safety conditions. Any disturbances that could compromise safety must be quickly eliminated.

➤ Opening or tampering with the burner components is not allowed, apart from the parts requiring maintenance.

➤ Only those parts envisaged by the manufacturer can be replaced.

The manufacturer guarantees safety and proper operation only if all burner components are intact and correctly positioned.

3.2 Personnel training

The user is the person, body or company that has acquired the machine and intends to use it for the specific purpose. He is responsible for the machine and for the training of the people working around it.

The user:

➤ undertakes to entrust the machine exclusively to suitably trained and qualified personnel;

➤ undertakes to inform his personnel in a suitable way about the application and observance of the safety instructions. With that aim, the user undertakes to ensure that everyone knows the use and safety instructions for his own duties;

➤ Personnel must observe all the danger and caution indications shown on the machine.

➤ Personnel must not carry out, on their own initiative, operations or interventions that are not within their province.

➤ Personnel must inform their superiors of every problem or dangerous situation that may arise.

➤ The assembly of parts of other makes, or any modifications, can alter the characteristics of the machine and hence compromise operating safety. The manufacturer therefore declines any and every responsibility for any damage that may be caused by the use of non-original parts.

In addition:

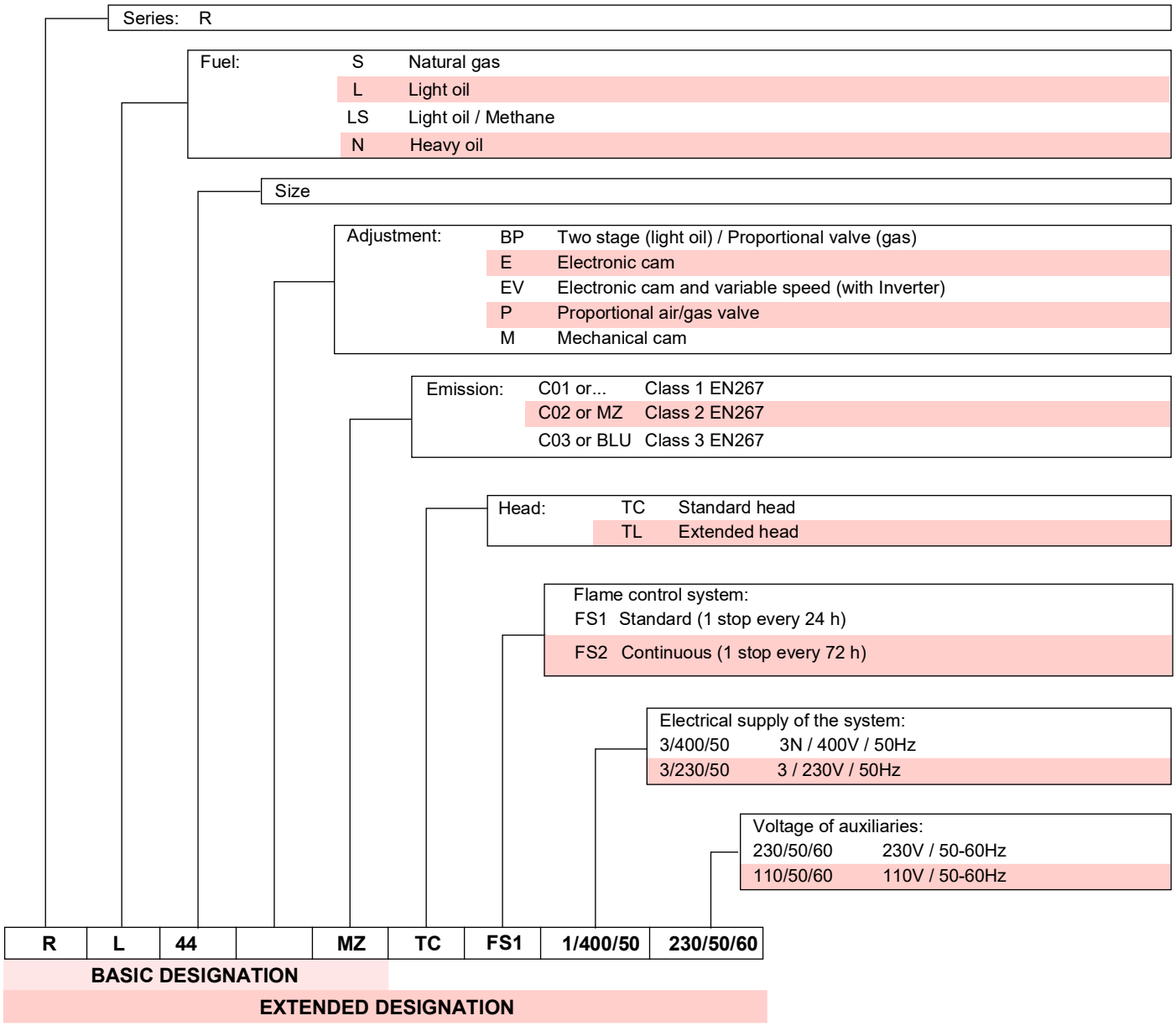
➤ must take all the measures necessary to prevent unauthorised people gaining access to the machine;

➤ the user must inform the manufacturer if faults or malfunctioning of the accident prevention systems are noticed, along with any presumed danger situation;

➤ personnel must always use the personal protective equipment envisaged by legislation and follow the indications given in this manual.

4 Technical description of the burner

4.1 Burner designation



4.2 Models available

Designation	Blast tube length mm	Electrical supply	Code
RL 44 MZ	TC (220)	1/230/50-60	3470310
RL 44 MZ	TL (354)	1/230/50-60	3470311
RL 44 MZ	TC (220)	3/230-400/50-60	3470340
RL 44 MZ	TL (354)	3/230-400/50-60	3470341

4.3 Technical data

MODEL			RL 44 MZ
Power (1) Output (1)	2nd stage	kW Mcal/h kg/h	235 - 485 204 - 418 20 - 41
	1st stage	kW Mcal/h kg/h	155 - 235 133 - 204 13 - 20
Fuel			Light oil
- Lower calorific value		kWh/kg Mcal/kg	11.8 10.2
- Density		kg/dm^3	0.82 - 0.85
- Viscosity at 20°C		mm^2/s max	6 (1.5°E - 6 CsT)
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 temperature		°C	0 - 40
Combustion air temperature		°C max	60
Noise level (2)			
	Sound pressure	dB(A)	70
	Sound power	dB(A)	81
Burner weight (complete with packaging)		kg	33

Tab. A

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

(2) Sound pressure measured in manufacturer's combustion laboratory, with burner operating on test boiler and at maximum rated output. The sound power is measured with the “Free Field” method, as per EN 15036, and according to an “Accuracy: Category 3” measuring accuracy, as set out in EN ISO 3746.

4.4 Electrical data

MODEL		RL 44 MZ	
Electrical supply	V Hz	230 ~ +/-10% 50/60 - single-phase	230 - 400 with neutral ~ +/-10% 50/60 - three-phase
Electrical power consumption	W max	700	750
Protection level		IP40	

Tab. B

4.5 Overall dimensions

The maximum dimensions of the burner are given in Fig. 1.

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 U-U.

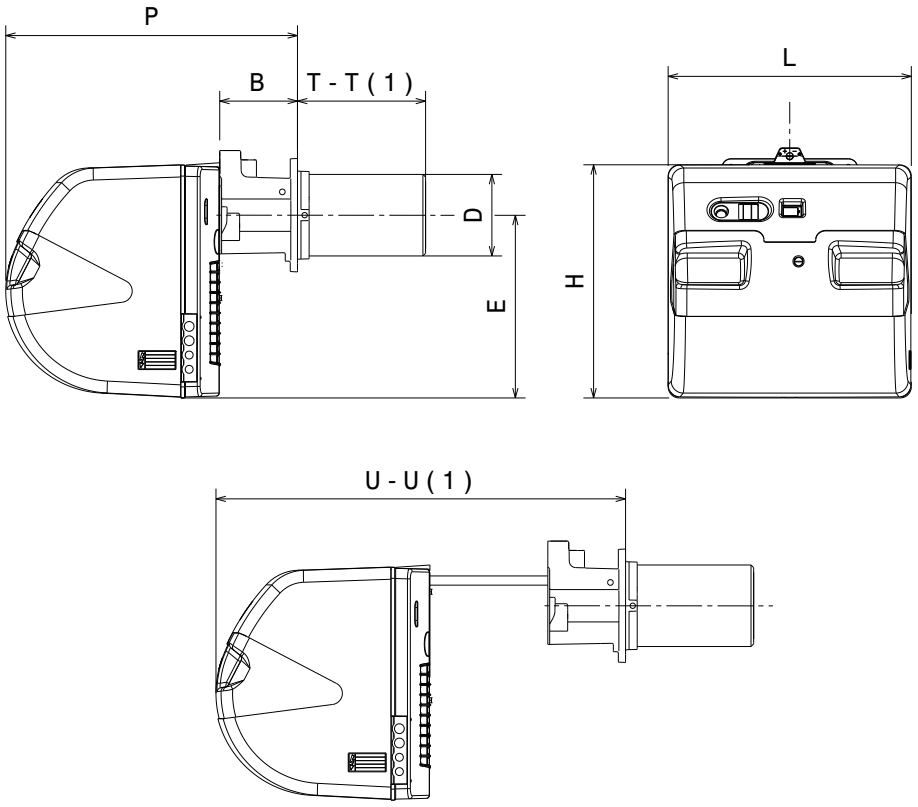


Fig. 1

MODEL (mm)	B	D	E	H	L	P	T - T (1)	U - U (1)
RL 44 MZ	133	Ø 152	305	390	442	508	220 - 354	790 - 925

Tab. C

(1) Blast tube: short-long

4.6 Standard equipment

2 - Hoses
2 - Gaskets for hoses
2 - Nipples for hoses
1 - Thermal insulation screen
2 - Extensions for slide bars (for model with 351 mm blast tube)
4 - Screws to secure the burner flange to the boiler: M8 x 25
2 - Plugs for electrical connections (RL 44 MZ single-phase)
3 - Plugs for the electrical connection (RL 44 MZ three-phase)
1 - Instruction booklet
1 - Spare parts list

4.7 Firing rates

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

- ➤ **1st stage output** must be selected within area A of the adjacent diagrams.
- ➤ **2nd stage output** must be within area B. This are supplies the maximum output of the burner according 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 area B.

ATTENTION

The firing rate value (Fig. 2) has been obtained considering an ambient temperature of 20 °C, an atmospheric pressure of 1013 mbar (approx. 0 m above sea level), and with the combustion head adjusted as shown on page 17.

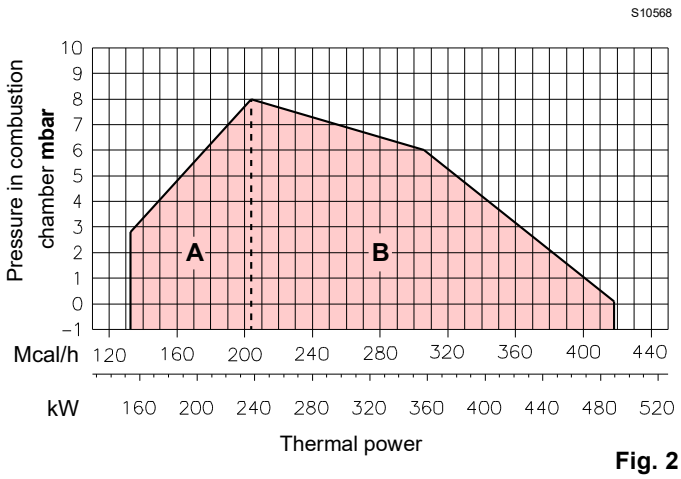


Fig. 2

4.8 Test boiler

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

Fig. 3 indicates the diameter and length of the test combustion chamber.

Example Output 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.

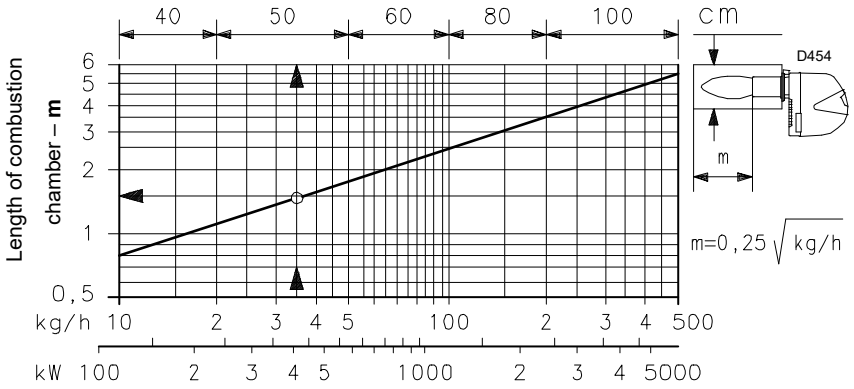


Fig. 3

4.9 Burner description

1 Ignition electrodes
2 Combustion head
3 Screw for combustion head adjustment
4 Flame sensor for flame presence control
5 Screw for fixing fan to flange
6 Slide bars for opening the burner and inspecting the combustion head
7 Hydraulic cylinder for regulation of the air gate valve in 1st and 2nd stage positions.
When the burner is not operating the air gate valve is fully closed in order to reduce heat dispersion from the boiler due to the flue draught which draws air from the fan suction inlet.
8 1st and 2nd stage valve assembly
9 Pump
10 Plate prearranged to drill 4 holes for the passage of hoses and electrical cables.
11 Air inlet to fan
12 Fan pressure test point
13 Boiler mounting flange
14 Flame stability disk
15 Flame inspection window
16 Extensions for slide bars 6)
17 Motor contactor and thermal RELAY reset button (RL 44 MZ three-phase)
18 Motor capacitor (RL 44 MZ single-phase)
19 Flame control with lockout pilot light and lockout reset button
20 Two switches:
- one “burner off - on”
- one for “1st - 2nd stage operation”
21 Sockets for electrical connections
22 Air damper
23 Pump pressure adjustment
24 Plate prearranged to drill 2 holes for the passage of hoses.

Two types of burner failure may occur:

Flame control lockout: if the flame control 19)(Fig. 4) 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.

Motor lockout (RL 44 MZ three-phase): release by pressing the pushbutton on thermal relay 17)(Fig. 4).

20216687

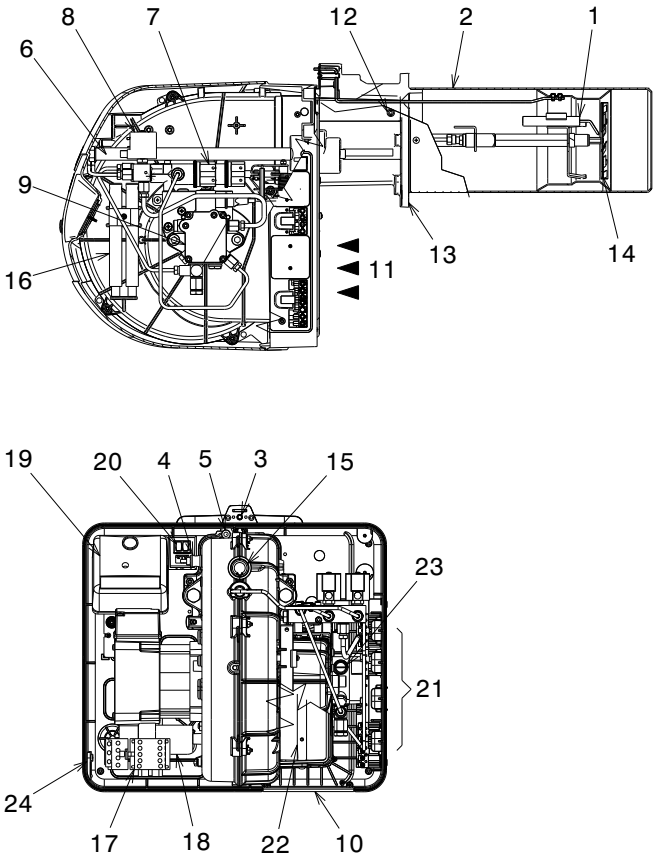


Fig. 4

5 Installation

5.1 Notes on safety for the installation

After carefully cleaning all around the area where the burner is to be installed, and arranging for the environment to be illuminated correctly, proceed with the installation operations.

DANGER

All the installation, maintenance and disassembly operations must be carried out with the electricity supply disconnected.

ATTENTION

The installation of the burner must be carried out by qualified personnel, as indicated in this manual and in compliance with the standards and regulations of the laws in force.

DANGER

The combustion air inside the boiler must be free from hazardous mixes (e.g.: chloride, fluoride, halogen); if present, it is highly recommended to carry out cleaning and maintenance more frequently.

5.2 Handling

The burner packaging includes a wooden platform, it is therefore possible to handle the burner (still packaged) with a pallet truck or fork lift truck.

ATTENTION

Burner handling operations can be highly dangerous if not carried out with the greatest attention: distance unauthorised personnel, check integrity and suitability of the means available.
Check also that the area in which you are working is empty and that there is an adequate escape area (i.e. a free, safe area to which you can quickly move if the burner should fall).
During handling, keep the load at no more than 20-25 cm from the ground.

After positioning the burner near the installation point, correctly dispose of all residual packaging, separating the various types of material.

CAUTION

Before proceeding with the installation operations, carefully clean all around the area where the burner will be installed.

5.3 Preliminary checks

Checking the consignment

CAUTION

After removing all the packaging, check the integrity of the contents. In the event of doubt, do not use the burner; contact the supplier.

The packaging elements (wooden cage or cardboard box, nails, clips, plastic bags, etc.) must not be abandoned as they are potential sources of danger and pollution; they should be collected and disposed of in the appropriate places.

Checking the characteristics of the burner

Check the identification label of the burner, showing:
- ➤ the model (**A**)(Fig. 5) and type of burner (**B**);
- ➤ the year of manufacture, in cryptographic form (**C**);
- ➤ the serial number (**D**);
- ➤ the data for electrical supply and the protection level (**E**);
- ➤ the absorbed electrical power (**F**);
- ➤ the types of fuel used and the relative supply pressures (**G**);
- ➤ the data of the burner's minimum and maximum output possibilities (**H**) (see Firing rate).

20188727

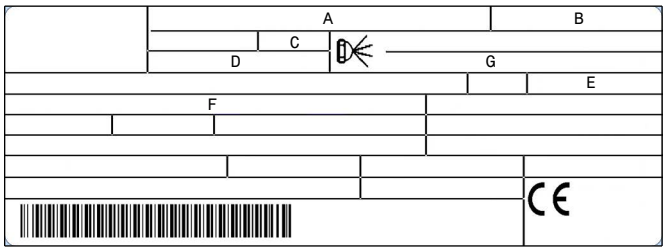


Fig. 5

ATTENTION

The output of the burner must be within the boiler's firing rate.

ATTENTION

A burner label, or any other component, that has been tampered with, removed or is missing, prevents the definite identification of the burner and makes any installation or maintenance work difficult.

5.4 Operating position

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 27.

ATTENTION

Any other position could compromise the correct working of the appliance.

Installation **5** is prohibited for safety reasons.

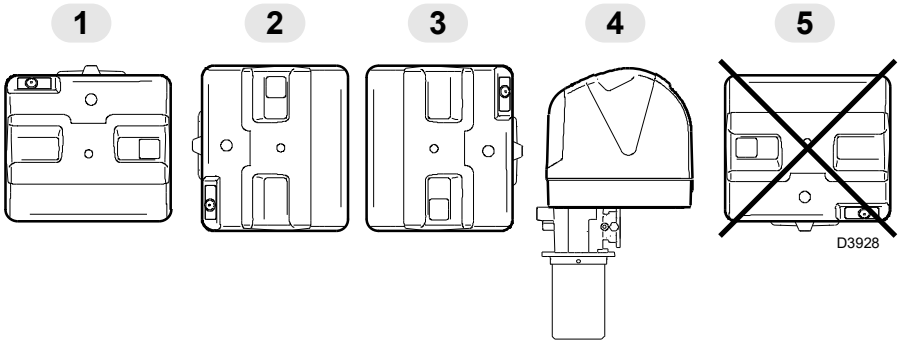


Fig. 6

5.5 Boiler plate

Drill the combustion chamber locking plate as shown in Fig. 7.

The position of the threaded holes can be marked using the thermal screen supplied with the burner.

mm	A	B	C
RL 44 MZ	160	224	M 8

Tab. D

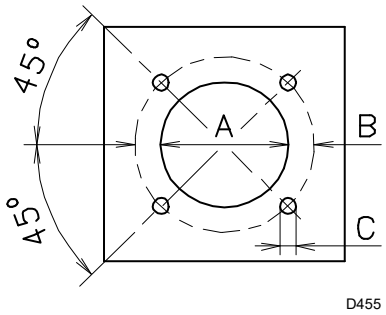


Fig. 7

5.6 Blast tube length

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)(Fig. 8)	RL 44 MZ
• short	220
• long	355

For boilers with front flue passes 10)(Fig. 8) 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)(Fig. 8) is not required unless it is expressly requested by the boiler manufacturer.

5.7 Securing the burner to the boiler

Provide an adequate lifting system.

ATTENTION

The burner-boiler seal must be airtight

Dismantle the pipe coupling 5) from the burner 4) (Fig. 8):

- ➤ 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)to the boiler plate and insert the supplied insulating gasket 6);
- ➤ use the four screws supplied after protecting the thread with antiseizing products.

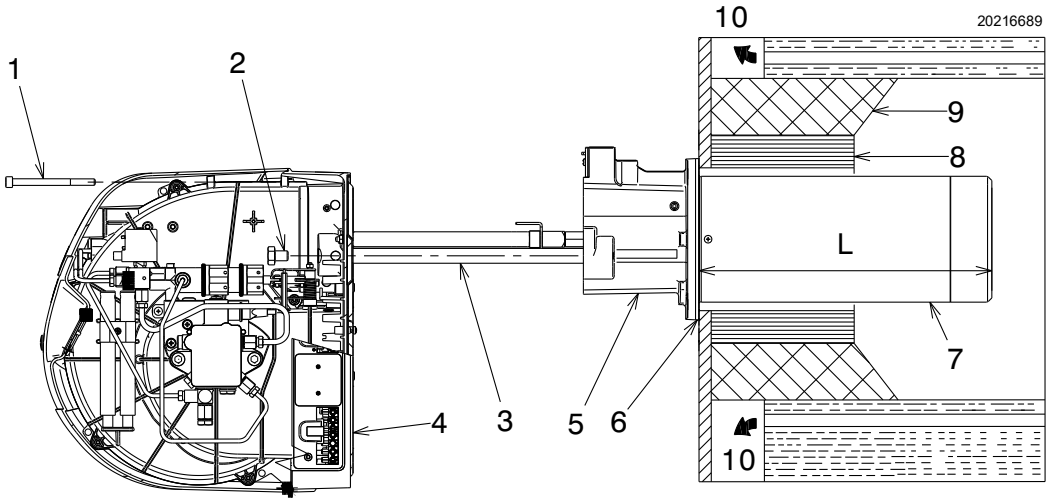


Fig. 8

5.8 Nozzle installation

5.8.1 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.

ATTENTION

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.

Both nozzles must be chosen from among those listed in Tab. E and Tab. E.

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 8.

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

The two nozzles usually have equal deliveries, but the 1st stage nozzle may have the following specifications if required:

- ➤ a delivery less than 50% of the total delivery whenever the back-pressure peak must be reduced at the moment of firing;
- ➤ a delivery higher than 50% of the total delivery whenever the combustion during the 1st stage must be improved.

Example with RL 44 MZ (light oil)

Boiler power = 270 kW - efficiency 90%

Power required by the burner =

270 : 0.9 = 300 kW

300 : 2 = 150 kW per nozzle

therefore, two equal, 60°, 12 bar nozzles are required:

1° = 3.00 GPH - 2° = 3.00 GPH,

or the following two different nozzles:

1° = 2.50 GPH - 2° = 3.50 GPH,

or:

1° = 3.50 GPH - 2° = 2.50 GPH.

5.8.2 Nozzles recommended

Model	Light oil
RL 44 MZ	Delavan 45° A

Table nozzles - light oil

GPH	kg/h (1)			kW
	10 bar	12 bar	14 bar	12 bar
1.50	5.8	6.5	7.0	77.0
1.75	6.8	7.5	8.2	89.0
2.00	7.7	8.5	9.2	100.8
2.25	8.6	9.5	10.4	112.7
2.50	9.6	10.6	11.5	125.7
2.75	10.7	11.8	12.8	139.3
3.00	11.5	12.7	13.8	150.6
3.50	13.5	14.8	16.1	175.5
4.00	15.4	17.0	18.4	201.6
4.50	17.3	19.1	20.7	226.5
5.00	19.2	21.2	23.0	251.4
5.50	21.1	23.3	25.3	276.3
6.00	23.1	25.5	27.7	302.4

Tab. E

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

5.8.3 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)(Fig. 9) (16 mm), after having removed the plastic plugs 2)(Fig. 9), fitting the spanner through the central hole in the flame stability disk.

ATTENTION

- ➤ Do not use any sealing products such as: gaskets, tape or sealants.
- ➤ 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 nozzle 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 (Fig. 10)

Make sure that the electrodes are positioned as shown in Fig. 10.

ATTENTION

Place the electrode on the ignition pilot observing the dimensions specified in Fig. 10.

Finally remount the burner 4)(Fig. 11) 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. 7 on page 13.
– Remove the nuts 1)(Fig. 12) and the diffuser disc assembly 2)
– Use spanner 3)(Fig. 12) to change the nozzles.

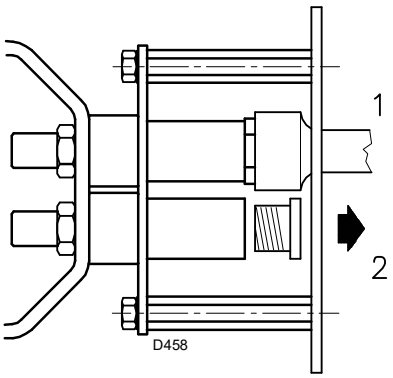


Fig. 9

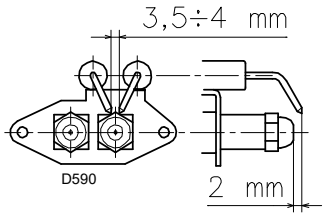


Fig. 10

20216690

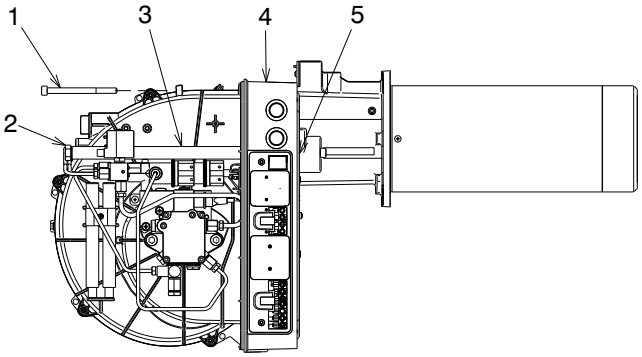


Fig. 11

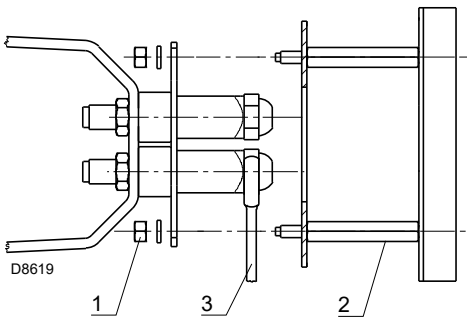


Fig. 12

5.9 Combustion head adjustment

At this point of the installation, nozzle and pipe coupling are fixed to the boiler as in Fig. 8 on page 14. The setting of the combustion head depends exclusively on the output of the burner in the 2nd stage - in other words, the combined output of the two nozzles selected on page 15 is a particularly simple operation.

Turn screw 1)(Fig. 13) until the notch on the sheet 2)(Fig. 13) is level with the plate 3)(Fig. 13).

The RL 44 MZ Model with two 3.00 GPH nozzles and 12 bar pump pressure.

Find the delivery of the two 3.00 GPH nozzles in Tab. E on page 15:

12.7 + 12.7 = 25.4 kg/h
(corresponding to 300 kW).

Diagram (Fig. 14) shows that for an output of 25.4 kg/h the burner RL 44 MZ needs a combustion head notch regulation 3.

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 (Fig. 14).

Once the regulation of the head has been concluded, refit the burner 4)(Fig. 8 on page 14) on the guides 3)(Fig. 8 on page 14) at approximately 100 mm from the pipe coupling 5)(Fig. 8 on page 14), insert the electrode cables and then slide the burner as far as the pipe coupling.

Replace the screws 2)(Fig. 8 on page 14) on the guides 3)(Fig. 8 on page 14).

Fix the burner to the pipe coupling with the screw 1)(Fig. 8 on page 14).

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.

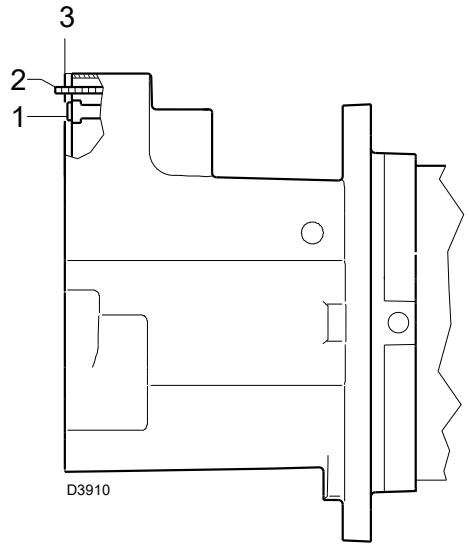


Fig. 13

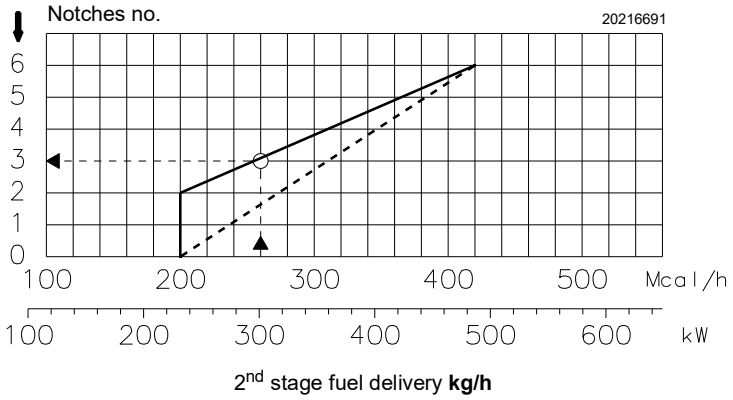


Fig. 14

6 Hydraulic system

6.1 Light oil supply

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

Precautions: avoid knocking, attrition, sparks and heat.

Make sure the fuel shut-off valve is closed before performing any operation on the burner.

ATTENTION

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

ATTENTION

Where at all possible avoid the use of two pipe systems where the circulated fuel is returned to the tank.
If this cannot be avoided make sure that the return pipe is normally below the surface of the fuel level within the storage tank.

DANGER

It is strongly recommended a periodic check of the pump pressure operation (annually or better every six months, if the burner operation is continuous).

CAUTION

You are advised to use additional filters on the fuel supply line.
Riello recommends a good quality fuel filter at the tank (Fig. 15 - Fig. 16) and a secondary filter (100 μ for light oil) are used to protect the burner pump and nozzle from contamination.

6.1.1 Double-pipe circuit

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

The tank higher than the burner A (Fig. 15)

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 (Fig. 15)

Pump depression values higher than 0.4 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.

6.1.2 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 Tab. F.

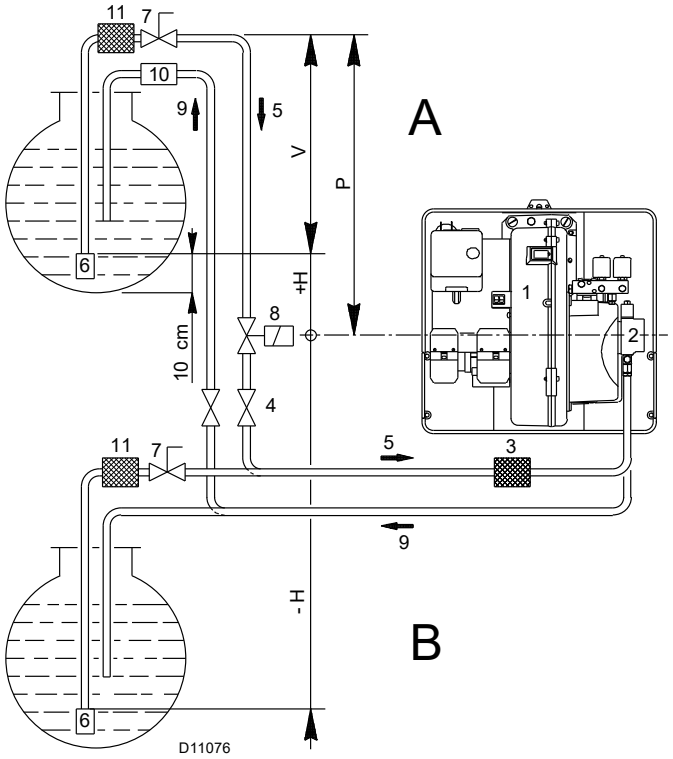


Fig. 15

Key (Fig. 15)
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)
11 Tank filter

+ H - H (m)	L (m) Ø 8 mm	Ø 10 mm	Ø 12 mm
+ 4,0	35	90	152
+ 3,0	30	80	152
+ 2,0	26	69	152
+ 1,0	21	59	130
+ 0,5	19	53	119
0	17	48	108
- 0,5	15	43	97
- 1,0	13	37	86
- 2,0	9	27	64
- 3,0	4	16	42
- 4,0	-	6	20

Tab. F

6.1.3 Single-pipe circuit

In order to obtain single-pipe working it is necessary to unscrew the return hose, remove the by-pass screw 6)(Fig. 27) and then screw the plug 7)(Fig. 27).

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.

For the priming pump loosen the screw 3)(Fig. 18) in order to bleed off the air contained in the suction line and wait until the fuel flows out.

Key (Fig. 16)
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)
11 Tank filter

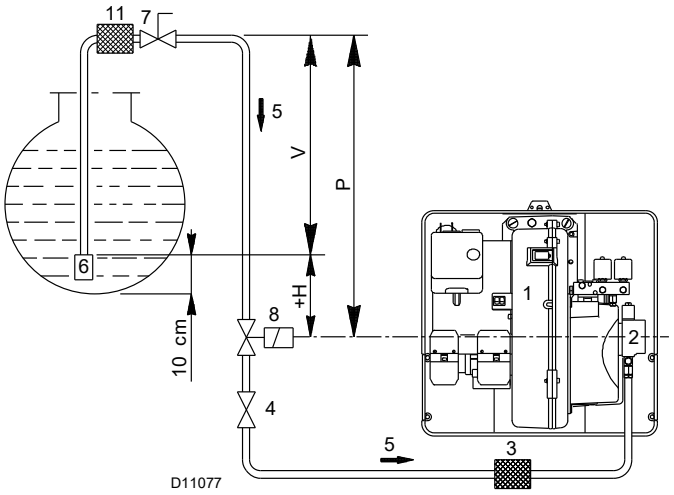


Fig. 16

+/- H (meters)	L (meters) Ø 8 mm	Ø 10 mm	Ø 12 mm
+ 4.0	51	100	100
+ 3.0	45	100	100
+ 2.0	39	95	100
+ 1.0	33	80	100
+ 0.5	29	72	100

Tab. G

6.2 Hydraulic connections

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)(Fig. 27 on page 26).

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

ATTENTION

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.

ATTENTION

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

Pass the hoses through the holes on the left-hand plate 5)(Fig. 17), 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.

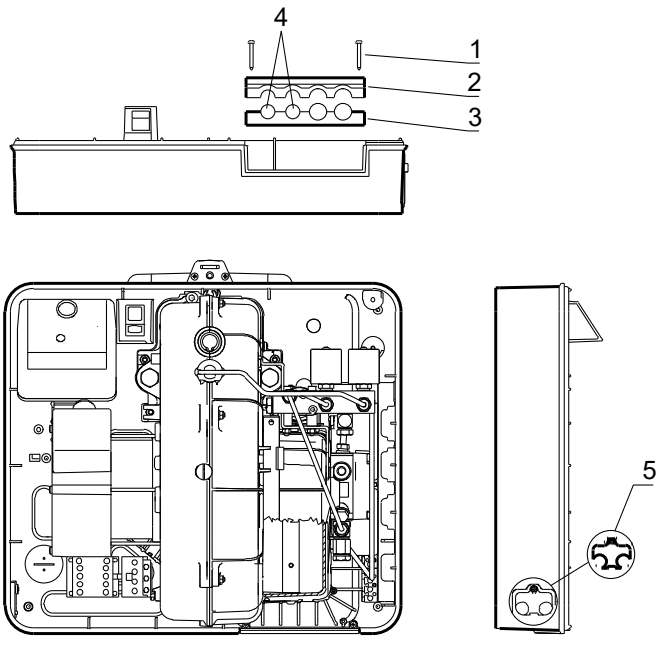


Fig. 17

6.3 Pump

RL 44 MZ - PUMP SUNTEC ALV65

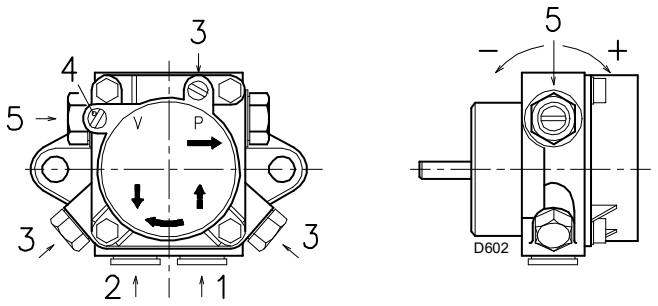


Fig. 18

Key (Fig. 18)

1	- Suction line	G 1/4”
2	- Return line	G 1/4”
3	- Gauge connection	G 1/8”
4	- Vacuometer connection	G 1/8”
5	- Pressure adjustment screw	

6.3.1 Technical data

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

		ALV65C
A	kg/h	68
B	bar	4 - 25
C	bar	0.45
D	cSt	2 - 12
E	°C	60
F	bar	2
G	bar	12
H	mm	0.15

Tab. H

6.3.2 Pump priming

ATTENTION

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)(Fig. 18) 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 with switch 1)(Fig. 19) in the "ON" position. 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 the burner: switch 1)(Fig. 19) set to "OFF" and tighten the screw 3).

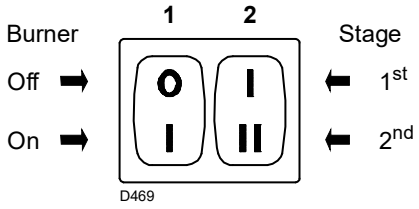


Fig. 19

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.

And so on. After 5 or 6 starting operations allow 2 or 3 minutes for the transformer to cool.

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

ATTENTION

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.

7 Electrical system

7.1 Notes on safety for the electrical wiring


DANGER

- ➤ The electrical wiring must be carried out with the electrical supply disconnected.
- ➤ Electrical wiring must be carried out by qualified personnel and in compliance with the regulations currently in force in the country of destination. Refer to the wiring diagrams.
- ➤ The manufacturer declines all responsibility for modifications or connections different from those shown in the wiring diagrams.
- ➤ Do not invert the neutral with the phase in the electrical supply line. Any inversion would cause a lockout due to firing failure.
- ➤ Check that the electrical supply of the burner corresponds to that shown on the identification label and in this manual.
- ➤ The burners have been set for intermittent operation (FS1). This means they should compulsorily be stopped at least once every 24 hours to enable the flame control to perform checks of its own start-up efficiency. Normally the boiler's thermostat/pressure switch 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. Refer to the wiring diagrams.
- ➤ The electrical safety of the device is obtained only when it is correctly connected to an efficient earthing system, made according to current standards. It is necessary to check this fundamental safety requirement. In the event of doubt, have the electrical system checked by qualified personnel.
- ➤ The electrical system must be suitable for the maximum input power of the device, as indicated on the label and in the manual, checking in particular that the section of the cables is suitable for the input power of the device.
- ➤ For the main power supply of the device from the electricity mains:
  - do not use adapters, multiple sockets or extensions;
  - use an omnipolar switch, as indicated by the current safety standards.
- ➤ Do not touch the device with wet or damp body parts and/or in bare feet.
- ➤ Do not pull the electric cables.

Before carrying out any maintenance, cleaning or checking operations:


DANGER

disconnect the electrical supply from the burner by means of the main system switch;


DANGER

isolate the fuel supply


DANGER

Avoid condensate, ice and water leaks from forming.

If the cover is still present, remove it and proceed with the electrical wiring according to the wiring diagrams.

Use flexible cables in compliance with the EN 60 335-1 standard.

7.2 Electrical wiring

All the cables to be connected to the burner are fed through the grommets (Fig. 20).
The use of the grommets can take various forms; by way of example we indicate the following mode:

RL 44 MZ single phase

1- 7 pole socket for single phase power supply, thermostat/ pressure switch TL
2- 4 pole socket, thermostat/pressure switch TR
3- 5 pole socket
5 - 5AHousing for the nozzles
(Drill if 5A nozzles are required)

RL 44 MZ three-phase

1- 7 pole socket for single-phase power supply, thermostat/ pressure switch TL
2- 4 pole socket, thermostat/pressure switch TR
3- 5 pole socket for three phase supply
5 - 5AHousing for the nozzles (Drill if 5A nozzles are required)

NOTE

➤ The RL 44 MZ three-phase model leaves the factory with provision for a **400V** power supply.
If **230V** power supply is used, change the motor connection from star to delta and change the setting of the thermal relay as well.

➤ The burners 44 MZ leave the factory ready for two-stage functioning and must therefore be connected to the thermostat/pressure switch TR.
Alternatively, if single stage operation is required, instead of thermostat/pressure switch TR install a jumper lead between terminals T6 and T7 of plug X4.

20216692

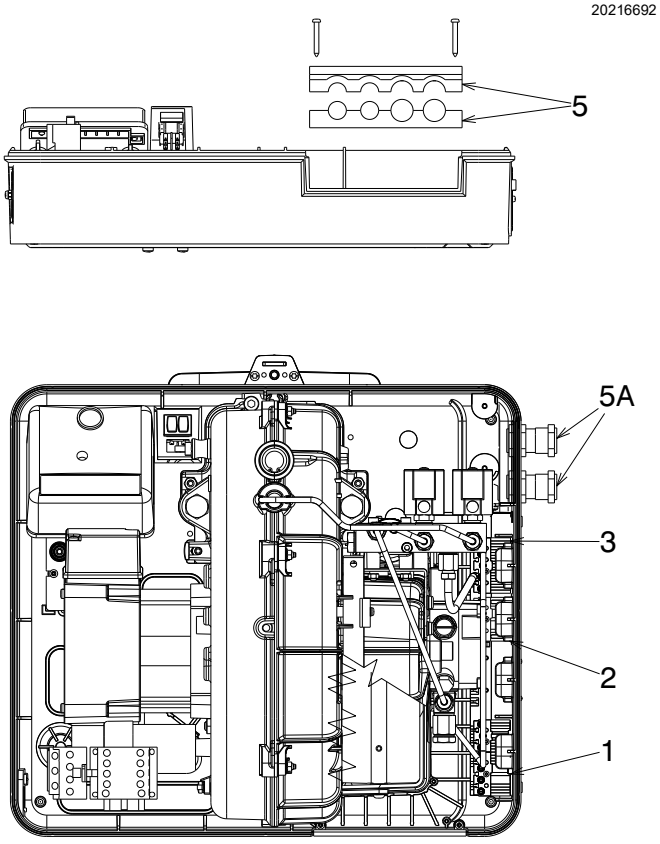


Fig. 20

After carrying out maintenance, cleaning or checking operations, reassemble the cover and all the safety and protection devices of the burner.

7.3 Thermal relay calibration (RL 44 MZ three phase)

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

If the motor is star-powered, **400V**, the cursor should be positioned at "MIN".

If the motor is delta-powered, **230V**, the cursor should be positioned at "MAX".

Even if the scale of the thermal relay does not include rated motor input power at 400V, protection is still ensured in any case.

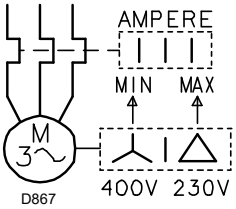


Fig. 21

8 Start-up, calibration and operation of the burner

8.1 Notes on safety for the first start-up

ATTENTION

The first start-up of the burner must be carried out by qualified personnel, as indicated in this manual and in compliance with the standards and regulations of the laws in force.

ATTENTION

Check the correct working of the adjustment, command and safety devices.

8.2 Burner calibration

ATTENTION

Qualified personnel with the right instruments must handle the burner's start-up.

8.2.1 Firing

Set switch 1)(Fig. 22) 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 lockout 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 fuel solenoid valve occur.

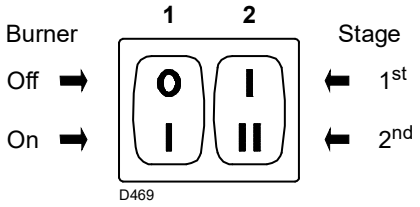


Fig. 22

8.2.2 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 15.

- **Combustion head**

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

- **Pump pressure (light oil)**

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 is only possible if the room temperature is above 0 °C. Never fall below 10 bar: at which pressures the cylinders may have difficulty in opening;

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)(Fig. 18 on page 20).

- **1st stage fan air gate valve**

Keep the burner operating at 1st stage by setting the switch 2)(Fig. 22) to the 1st stage position.
Opening of the air gate valve 1)(Fig. 23) must be adjusted in proportion to the selected nozzle: the index 7)(Fig. 23) must be aligned with the specified in Tab. I.
This adjustment is achieved by turning the hex element 4):
– in rh direction (- sign) the opening is reduced;
– in lh direction (+ sign) the opening increases.

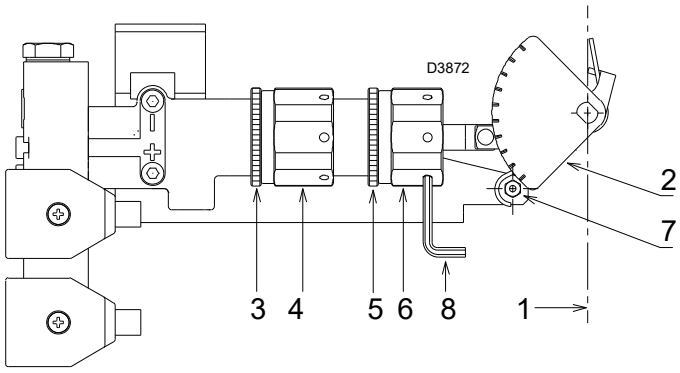


Fig. 23

1st STAGE

GPH	α
3.00	20
3.50	24
4.00	26
4.50	28
5.00	30

α = Notch No.

2nd STAGE

kg/h	mbar
20	4.2
22	4.7
24	4.9
26	5.1
29	5.4
32	5.6
35	6.3
38	7.4
40	8.6
41	9.0

mbar = Air pressure in 1) with zeropressure in 2)

Tab. I

Example:
RL 44 MZ - 1st stage nozzle 3.00 GPH:
notch 22° aligned with index 7)(Fig. 23).
When the adjustment is terminated lock the hex element 4) with the ring nut 3).

- **2nd stage fan air damper valve**

Set switch 2)(Fig. 22) to the 2nd stage position and adjust the air gate valve 1)(Fig. 23) by turning the hex element 6), after having loosened the ring nut 5).

Air pressure at attachment 1)(Fig. 24) must be approximately the same as the pressure specified in Tab. I plus the combustion chamber pressure measured at attachment 2).

Refer to the example in the Fig. 24.

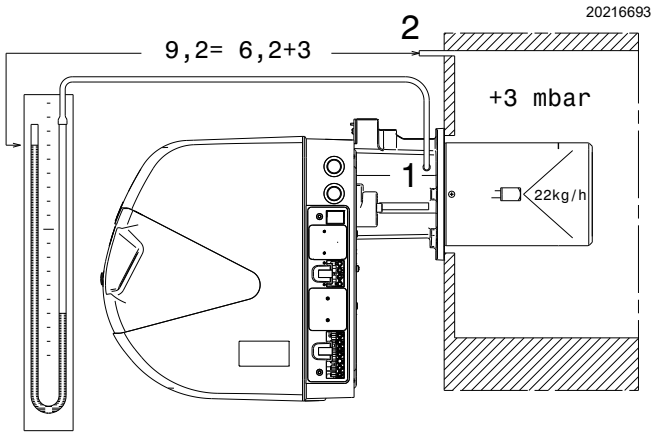


Fig. 24

NOTE:
in order to facilitate adjustment of hex elements 4) and 6)(Fig. 23 on page 23), use a 3 mmc Allen key 8)(Fig. 23 on page 23).

8.3 Burner operation

8.3.1 Burner starting

Starting phases with progressive time intervals shown in seconds:

- Control device TL closes.
- After about 3s:
- **0 s :** The flame control 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. The hydraulic cylinder 15), piston A, opens the air gate valve: pre-purging begins with the 1st stage air delivery.
- **22 s :** The solenoid valves open 8); and the fuel passes through the piping 9) and filter 10) and is then sprayed out through the nozzle, igniting when it comes into contact with the spark. This is the 1st stage flame.
- **29 s :** The ignition transformer switches off.
- **36 s :** If the control device TR is closed or has been replaced by a jumper wire, the 2nd stage solenoid valve 11) is opened and the fuel enters the valve 12) and raises the piston which opens two passages: one to piping 13), filter 14), and the 2nd stage nozzle, and the other to the cylinder 15), piston B, that opens the fan air gate valve in the 2nd stage. The starting cycle comes to an end.

8.3.2 Firing failure

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

The flame control red pilot light will light up.

8.3.3 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.

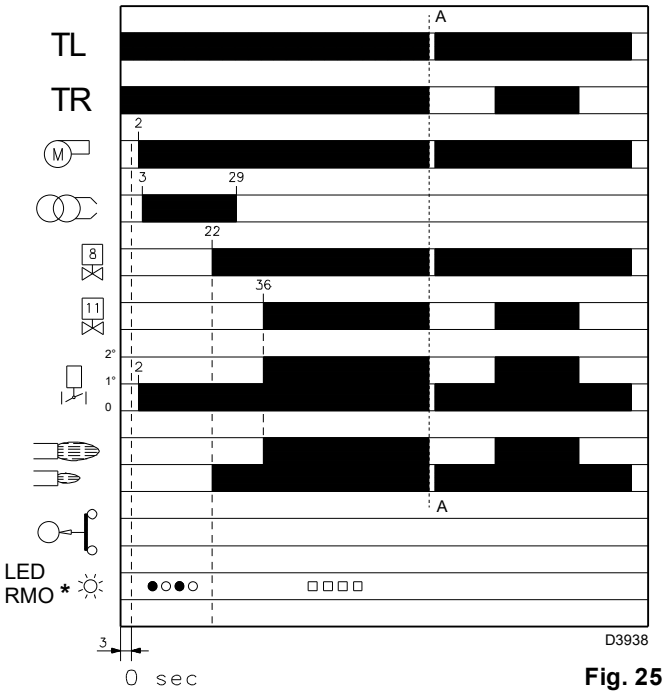


Fig. 25

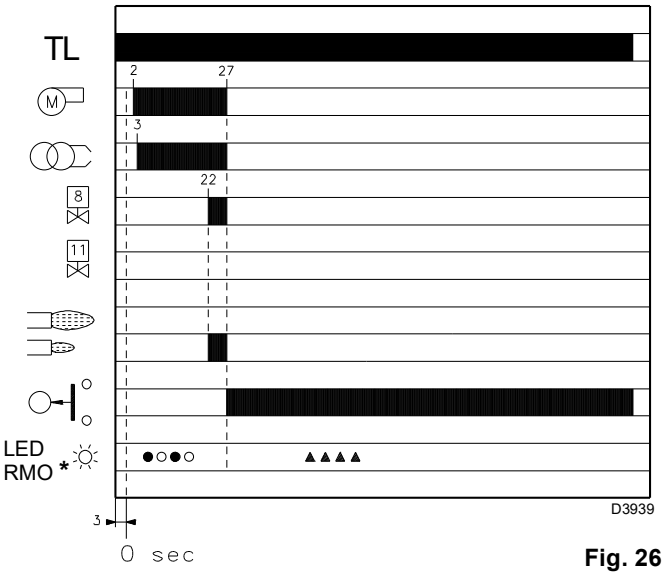


Fig. 26

* ❍ Off ● Yellow ❒ Green ▲ Red

8.4 Steady state operation

8.4.1 System equipped with one control device TR

Once the starting cycle has come to an end, the command of the 2nd stage solenoid valve passes on to the control device TR that controls boiler temperature or pressure.

- When the temperature or the pressure increases until the control device TR opens, solenoid valve 11) closes, and the burner passes from the 2nd to the 1st stage of operation.
- When the temperature or pressure decreases until the control device TR closes, solenoid valve 11) opens, and the burner passes from the 1st to the 2nd stage of operation, and so on.
- The burner stops when the demand for heat is less than the amount of heat delivered by the burner in the 1st stage. In this case, the remote control device TL opens, solenoid valve 8) closes, the flame immediately goes out. The fan's air damper valve closes completely.

8.4.2 System not equipped with control device TR (jumper wire installed)

The burner is fired as described in the case above. If the temperature or pressure increase until control device TL opens, the burner shuts down (Section A-A in the diagram).

When the solenoid valve 11) de-energizes, the piston 12) closes the passage to the 2nd stage nozzle and the fuel contained in the cylinder 15), piston B, is discharged into the return piping 7).

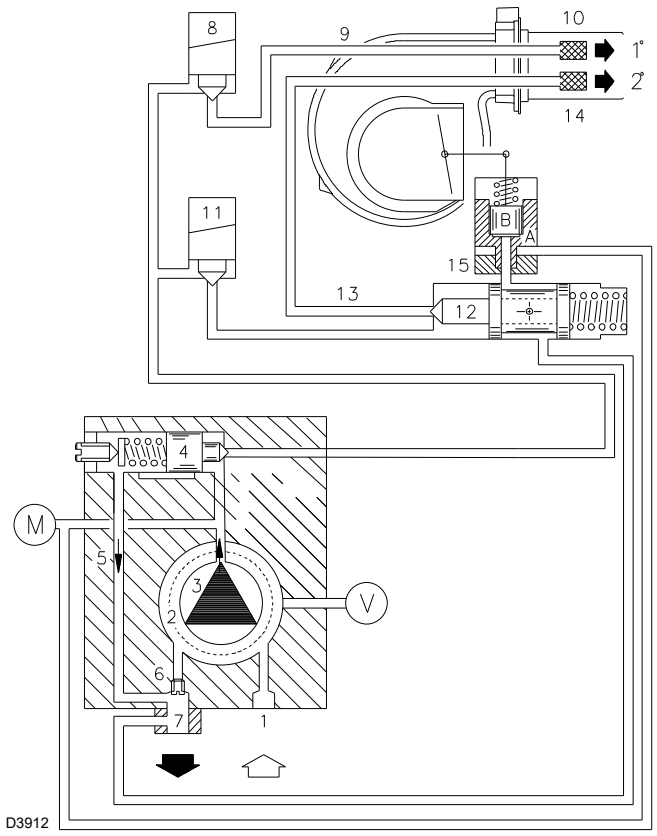


Fig. 27

8.5 Final checks

➤ Obscure the flame sensor 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 flame sensor and switch on the control devices:
the burner should start and then go into lockout after about 10 s.

➤ Obscure the flame sensor while the burner is in 2nd stage operation, the following must occur in sequence: flame extinguished within 1s, pre-purging for about 20s, sparking for about 5s, burner goes into lockout.

➤ Switch off control device TL followed by control device TS while the burner is operating:
the burner should stop.

9 Maintenance

9.1 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.


DANGER

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:


DANGER

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


DANGER

Close the fuel shut-off valve.

Wait for the components in contact with heat sources to cool down completely.

9.2 Maintenance programme

9.2.1 Maintenance frequency

The gas combustion system should be checked at least once a year by a representative of the manufacturer or another specialised technician.

9.2.2 Checking and cleaning

The operator must use the required equipment during maintenance.

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. The depression must be less than 0.4 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 vacuometer 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.
Delivery pressure must correspond with the table on Tab. I on page 23. Please check that the supply line and filters are clear. The use of a pump vacuum gauge will assist in this.

This measure permits the cause of the anomaly to be traced to either the suction line or the pump.
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.

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.

Hoses

- ➤ Check periodically the flexible pipes conditions. They have to be replaced at least **every 2 years**.
- ➤ In case of use of light oil and bio fuel blends, it is strongly recommended to inspect **even more frequently** the hoses and replace them where contamination has occurred.
- ➤ Check to make sure that the hoses are still in good condition.


ATTENTION

Any contact with elements such solvents, thinners or cleaning fluids that have a polar base, along with any aggressive elements present within the fuel will void any warranty of the flexible hose.

Flame sensor

Clean the glass cover from any dust that may have accumulated. To extract the sensor 4)(Fig. 4 on page 11) pull it outward forcefully it is only pressed in.

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.

Filters (Fig. 28)

Check the following filter baskets:

• on line 1) • in the pump 2) • at the nozzle 3), and clean or replace if necessary.

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.

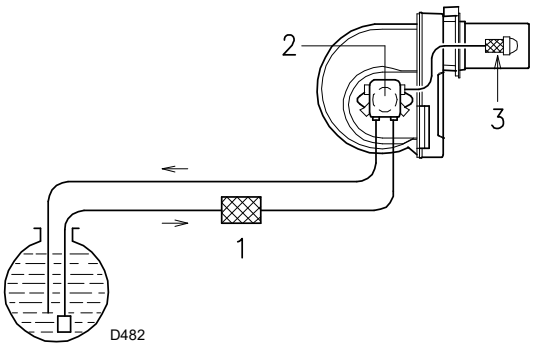


Fig. 28

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.

Fuel tank

If water or contamination is present within the fuel tank, it is essential that this is removed before the equipment is to be used.

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.

9.2.3 Maintenance of the electrical panel

If it is necessary to maintain the electrical panel A)(Fig. 31) it is possible just to remove the fan assembly B)(Fig. 31) to get better access to the electrical components.

With the burner open as in Fig. 31, disconnect the electrode cables and remove the head unit 8)(Fig. 31) by undoing the two screws 9)(Fig. 31).

Disconnect the cables relative to the fan motor, remove the 3 screws 10)(Fig. 31) on the protective sheet and the two screws 11)(Fig. 31) and slide out the fan assembly B)(Fig. 31) from the guides 4) - 5)(Fig. 31).

Finally it is possible to use 2 of the 3 screws 10)(Fig. 31) to fix the electrical panel to the pipe coupling in the points indicated on Fig. 29, and then perform the maintenance operations.

9.2.4 Possible pump and/or coupling replacement

Carry out the fitting following the instructions in the Fig. 30.

9.2.5 Safety components

The safety components must be replaced at the end of their life cycle indicated in Tab. J. The specified life cycles do not refer to the warranty terms indicated in the delivery or payment conditions.

Safety component	Life cycle
Flame control	10 years or 250,000 operation cycles
Flame sensor	10 years or 250,000 operation cycles
Gas valves (solenoid)	10 years or 250,000 operation cycles
Pressure switches	10 years or 250,000 operation cycles
Pressure adjuster	15 years
Servomotor (electronic cam) (if present)	10 years or 250,000 operation cycles
Oil valve (solenoid) (if present)	10 years or 250,000 operation cycles
Oil regulator (if present)	10 years or 250,000 operation cycles
Oil pipes/ couplings (metallic) (if present)	10 years
Fan impeller	10 years or 500,000 start-ups

Tab. J

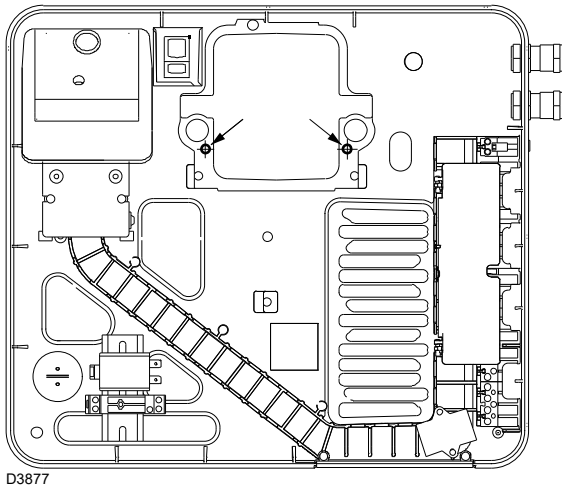


Fig. 29

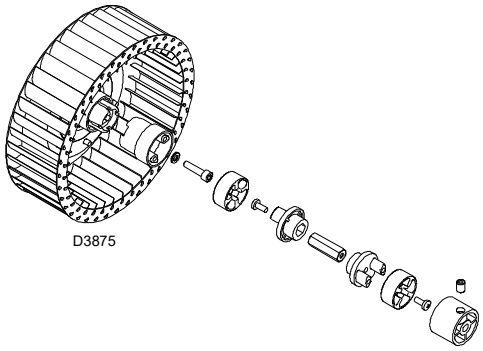


Fig. 30

9.3 Opening the burner

DANGER

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

DANGER

Close the fuel shut-off valve.

Wait for the components in contact with heat sources to cool down completely.

– Remove screw 1)(Fig. 31) 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).

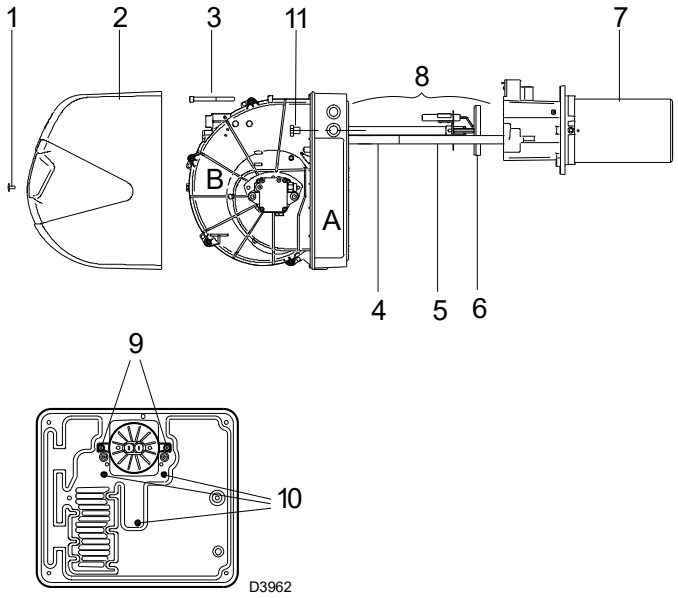


Fig. 31

9.4 Closing the burner

Refit following the steps described but in reverse order; refit all burner components as they were originally assembled.

After carrying out maintenance, cleaning or checking operations, reassemble the cover and all the safety and protection devices of the burner.

A Appendix - Accessories (optional)

LONG COMBUSTION HEAD KIT

Burner	Code
RL 44	3010425

CLEAN CONTACT KIT

Burner	Code
RL 44	3010419

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 flame control and the burner.

Burner	Code
RL 44	3010386

DEGASSING UNIT

It may occur that a certain amount of air is contained in the fuel sucked up by the pump.
This air may originate from the fuel 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:

Burner	Code
RL 44 (with filter)	3010055

Degassing unit characteristics

Burner output		80 kg/h max
Fuel pressure		0.7 bar max
Ambient temperature		40 °C max
Fuel temperature		40 °C max
Attachment (without filter)	connectors	FF G 1/4 tank side FM G 3/8 conic burner side
Attachment (with filter)	connectors	FF G 3/8 tank side FM G3/8 conic burner side

SPACER KIT

If the burner head penetration into the combustion chamber needs reducing, varying thickness spacer is available:

Burner	Spacer Thickness (mm)	Code
RL 44	90	3010095

CONNECTION FLANGE KIT

A kit is available for use where the burner opening on the boiler is of excessive diameter

Burner	Code
RL 44	3010138

SOUND PROOFING BOX

If noise emission needs reducing even further, sound-proofing boxes is available:

Burner	Box type	Average noise [dB(A)](*)	Code
RL 44	C1/3	10	3010403

VOLT FREE CONTACT KIT

A volt free contact kit is available for installation onto the burner. It can be used for a remote interface between burner operationg signals. Every burner can be equipped with a single kit to remote the flame presence signal and the burner lockout indication.

Burner	Code
RL 44	3010419

PC INTERFACE KIT

To connect the flame control to a personal computer for the transmission of operation, fault signals and detailed service information, an interface adapter with PC software IS available.

Burner	Code
RL 44	3002719

GROUND FAULT INTERRUPTER KIT

A “Ground fault interrupter kit” is available as a safety device for electrical system fault.

Burner	Code
RL 44	3010448

POST-VENTILATION KIT

To have 20 s ventilation after opening of thermostats chain, a special kit is available.

Burner	Code
RL 44	3010453

HOURS COUNTER KIT

To measure the burner working time a hours counter kit is available.

Burner	Code
RL 44	3010450

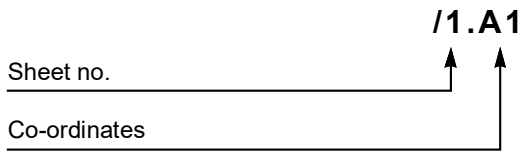
ATTENTION

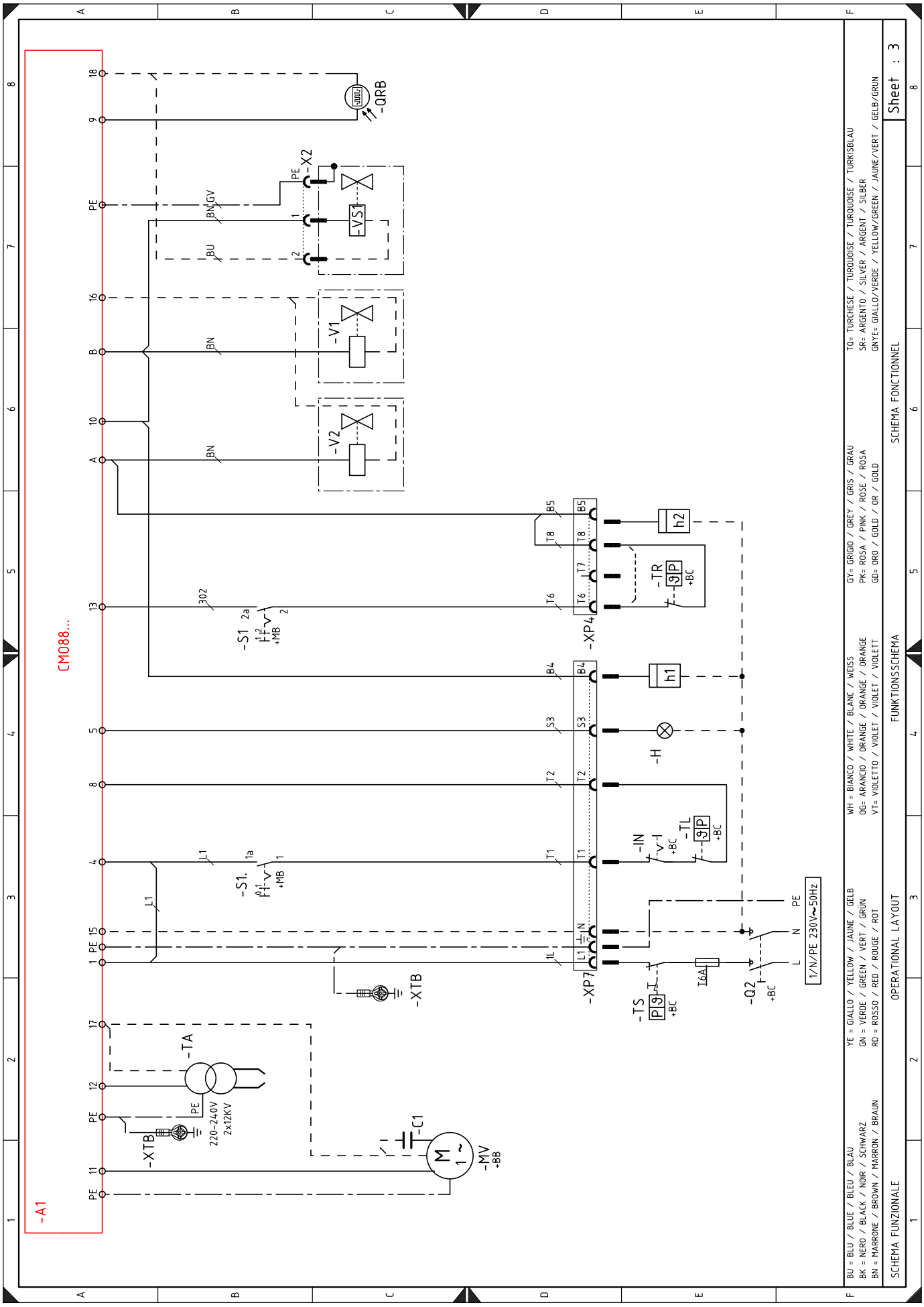
The installer is responsible for the addition of any safety device not foreseen in this manual.

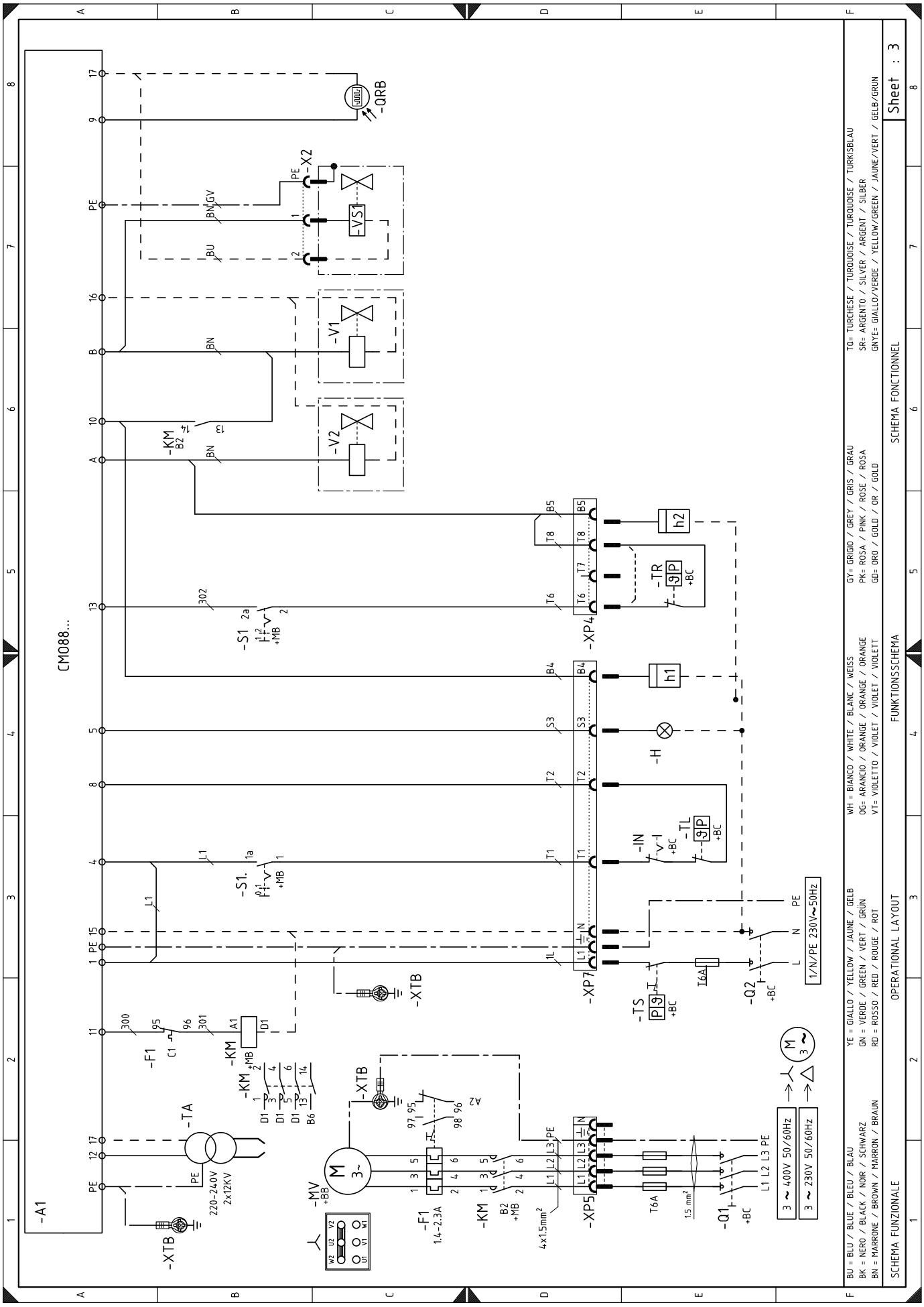
B Appendix - Electrical panel layout

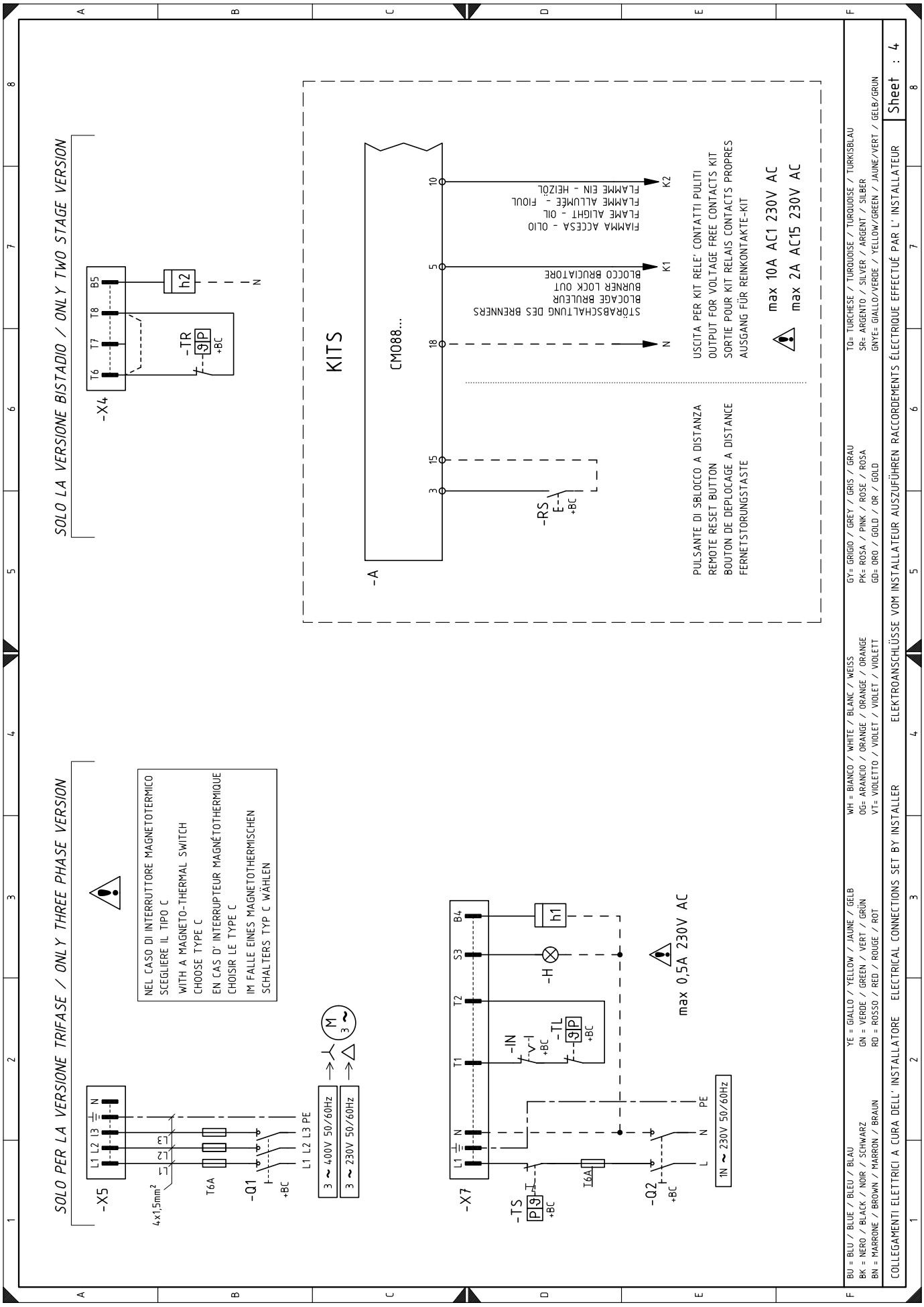
1	**Contents**
2	Indication of references
3	**RL 44 - 1 phase** functional diagram
3	**RL 44 - 3 phase** functional diagram
4	Electrical connections set by installer

2 Indication of references




-A1
CM088...
-QRB
-X2
-VS1
-V1
-V2
-S1
-XP4
-TR
-H
-IN
-TL
-XP7
-TS
-Q2
-XTB
-TA
-C1
-MV
+BB
SCHEMA FUNZIONALE
OPERATIONAL LAYOUT
FUNKTIONSSCHEMA
SCHEMA FONCTIONNEL
Sheet : 3
1/N/PE 230V~50Hz
BU = BLU / BLUE / BLEU / BLAU
BK = NERO / BLACK / NOIR / SCHWARZ
BN = MARRONE / BROWN / MARRON / BRAUN
YE = GIALLO / YELLOW / JAUNE / GELB
GN = VERDE / GREEN / VERT / GRÜN
RD = ROSSO / RED / ROUGE / ROT
WH = BIANCO / WHITE / BLANC / WEISS
OG= ARANCIO / ORANGE / ORANGE / ORANGE
VT= VIOLETTO / VIOLET / VIOLET / VIOLETT
GY= GRIGIO / GREY / GRIS / GRAU
PK= ROSA / PINK / ROSE / ROSA
GD= ORO / GOLD / OR / GOLD
TQ= TURCHESE / TURQUOISE / TURQUOISE / TURKISBLAU
SR= ARGENTO / SILVER / ARGENT / SILBER
GNYE= GIALLO/VERDE / YELLOW/GREEN / JAUNE/VERT / GELB/GRUN


CM088...
-A1
-QRB
-X2
-VS1
-V1
-V2
-KM
-S1
-XP4
-TR
h2
-XP7
h1
-H
-IN
-TL
-TS
-Q2
1/N/PE 230V~50Hz
-XTB
-TA
220-240V
2x12KV
-F1
1.4-2.3A
-KM
-MV
-XP5
-Q1
T6A
4x1.5mm²
3 ~ 400V 50/60Hz
3 ~ 230V 50/60Hz
BU = BLU / BLUE / BLEU / BLAU
BK = NERO / BLACK / NOIR / SCHWARZ
BN = MARRONE / BROWN / MARRON / BRAUN
YE = GIALLO / YELLOW / JAUNE / GELB
GN = VERDE / GREEN / VERT / GRÜN
RD = ROSSO / RED / ROUGE / ROT
WH = BIANCO / WHITE / BLANC / WEISS
OG= ARANCIO / ORANGE / ORANGE / ORANGE
VT= VIOLETTO / VIOLET / VIOLET / VIOLETT
GY= GRIGIO / GREY / GRIS / GRAU
PK= ROSA / PINK / ROSE / ROSA
GD= ORO / GOLD / OR / GOLD
TQ= TURCHESE / TURQUOISE / TURQUOISE / TURKISBLAU
SR= ARGENTO / SILVER / ARGENT / SILBER
GNYE= GIALLO/VERDE / YELLOW/GREEN / JAUNE/VERT / GELB/GRUN
SCHEMA FUNZIONALE
OPERATIONAL LAYOUT
FUNKTIONSSCHEMA
SCHEMA FONCTIONNEL
Sheet : 3


SOLO PER LA VERSIONE TRIFASE / ONLY THREE PHASE VERSION
SOLO LA VERSIONE BISTADIO / ONLY TWO STAGE VERSION
NEL CASO DI INTERRUTTORE MAGNETOTERMICO
SCEGLIERE IL TIPO C
WITH A MAGNETO-THERMAL SWITCH
CHOOSE TYPE C
EN CAS D' INTERRUPTEUR MAGNÉTOTHERMIQUE
CHOISIR LE TYPE C
IM FALLE EINES MAGNETOTHERMISCHEN
SCHALTERS TYP C WÄHLEN
-X5
-X4
-X7
-Q1
-Q2
-TR
-TS
-TL
-IN
-H
-A
-RS
h1
h2
T6A
I6A
4x1,5mm²
3 ~ 400V 50/60Hz
3 ~ 230V 50/60Hz
1N ~ 230V 50/60Hz
max 0,5A 230V AC
KITS
CM088...
PULSANTE DI SBLOCCO A DISTANZA
REMOTE RESET BUTTON
BOUTON DE DEPLOCAGE A DISTANCE
FERNENTSTÖRUNGSTASTE
STÖRABSCHALTUNG DES BRENNERS
BLOCAGE BRULEUR
BURNER LOCK OUT
BLOCCO BRUCIATORE
FIAMMA ACCESA - OLIO
FLAME ALIGHT - OIL
FLAMME ALLUMÉE - FIOUL
FLAMME EIN - HEIZÖL
USCITA PER KIT RELE' CONTATTI PULITI
OUTPUT FOR VOLTAGE FREE CONTACTS KIT
SORTIE POUR KIT RELAIS CONTACTS PROPRES
AUSGANG FÜR REINKONTAKTE-KIT
max 10A AC1 230V AC
max 2A AC15 230V AC
BU = BLU / BLUE / BLEU / BLAU
BK = NERO / BLACK / NOIR / SCHWARZ
BN = MARRONE / BROWN / MARRON / BRAUN
YE = GIALLO / YELLOW / JAUNE / GELB
GN = VERDE / GREEN / VERT / GRÜN
RD = ROSSO / RED / ROUGE / ROT
WH = BIANCO / WHITE / BLANC / WEISS
OG= ARANCIO / ORANGE / ORANGE / ORANGE
VT= VIOLETTO / VIOLET / VIOLET / VIOLETT
GY= GRIGIO / GREY / GRIS / GRAU
PK= ROSA / PINK / ROSE / ROSA
GD= ORO / GOLD / OR / GOLD
TQ= TURCHESE / TURQUOISE / TURQUOISE / TURKISBLAU
SR= ARGENTO / SILVER / ARGENT / SILBER
GNYE= GIALLO/VERDE / YELLOW/GREEN / JAUNE/VERT / GELB/GRUN
COLLEGAMENTI ELETTRICI A CURA DELL' INSTALLATORE
ELECTRICAL CONNECTIONS SET BY INSTALLER
ELEKTROANSCHLÜSSE VOM INSTALLATEUR AUSZUFÜHREN RACCORDEMENTS ÉLECTRIQUE EFFECTUÉ PAR L' INSTALLATEUR
Sheet : 4

WIRING DIAGRAM KEY

A - Flame control
+BB - Components on burners
+BC - Components on boiler
C1 - Capacitor
F1 - Fan motor thermal relay
FR - Flame sensor
H - Remote lockout signalling
IN - Manual burner arrest switch
h1 - Hour counter
h2 - Hour counter
KM - Motor contact maker
MV - Fan motor
Q1 - Three-phase knife switch
Q2 - Single phase knife switch
RS - Remote burner reset button (accessory)
S1 - Switch: burner on-off
S2 - Switch: 1st - 2nd stage
TA - Ignition transformer
TL - Extreme thermostat/pressure switch
TR - Adjustment thermostat/pressure switch
TS - Safety thermostat/pressure switch
XP4 - 4 pole socket
XP5 - 5 pole socket
XP7 - 7 pole socket
XTB - Shelf earth
XTM - Fan unit earth
X4 - 4 pin plug
X5 - 5 pin plug
X7 - 7 pin plug
V1 - Ignition solenoid /1st stage
V2 - 2nd stage solenoid

RIELLO S.p.A.
I-37045 Legnago (VR)
Tel.: +39.0442.630111
http:// www.riello.it
http:// www.riello.com