GB

Light oil burner

Two stage operation

CODE	MODEL
20027567	RL 42 BLU

20216385 (2) - 11/2025

Translation of the original instructions

1 Declarations

Declaration of Conformity A.R. 8/1/2004 & 17/7/2009 – Belgium	
Manufacturer:	RIELLO S.p.A. 37045 Legnago (VR) Italy Tel. ++39.0442630111 www.riello.com
Distributed by:	RIELLO NV VAN MARCKE HQ LAR Blok Z 5, B-8511 Kortrijk (Aalbeke) BE Tel. +32 56 23 7511 e-mail: riello@vanmarcke.be URL. www.vanmarcke.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 42 BLU
Regulation applied:	EN 267 and A.R. dated January 8, 2004 - July 17, 2009
Values measured:	CO max: 5 mg/kWh NOx max: 69 mg/kWh

Manufacturer's Declaration

RIELLO S.p.A. declares that the following products comply with the NOx emission limits specified by German standard "**1. BImSchV reliese 26.01.2010**".

Product	Type	Model	Power
Light oil burner	998T1	RL 42 BLU	191 - 598 kW

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.

WARNING

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.

WARNING

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 Technical data

Model			RL 42 BLU
Output (1) Delivery (1)	2nd stage (high pressure)	kW Mcal/h kg/h	323 - 598 278 - 514 27 - 50.3
	1st stage (low pressure)	kW Mcal/h kg/h	191 - 311 164 - 267 16 - 26.2
Fuel - Net calorific value - Density - Viscosity at 20 °C		 kWh/kg Mcal/kg kg/dm^3 mm^2/s max	Light oil 11.8 10.2 (10.200 kcal/kg) 0.82 - 0.85 6 (1.5 °E - 6 cSt)
Operation			- Intermittent (min. 1 stop in 24 hours) - Two-stage (high and low flame) and single-phase (all - nothing)
Pump	- delivery (at 12 bar) - pressure range - fuel temperature	kg/h bar °C max	60 4 - 25 60
Nozzles		number	1
Standard applications			Boilers: water, steam, diathermic oil
Ambient temperature		°C	0 - 40
Combustion air temperature		°C max	60
Noise levels (2)	Sound pressure Sound power	dB(A)	76 87
Weight		kg	42

Tab. A

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

4.2 Electrical data

Model		RL 42 BLU
Electrical supply		230-400V/3/50Hz
Electrical power consumption	W max	1650
Electrical protection		IP 44

Tab. B

4.3 Models available

Designation	Voltage	Code
RL 42 BLU	230-400/3/50	20027567

4.4 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 give by measurement U-U.

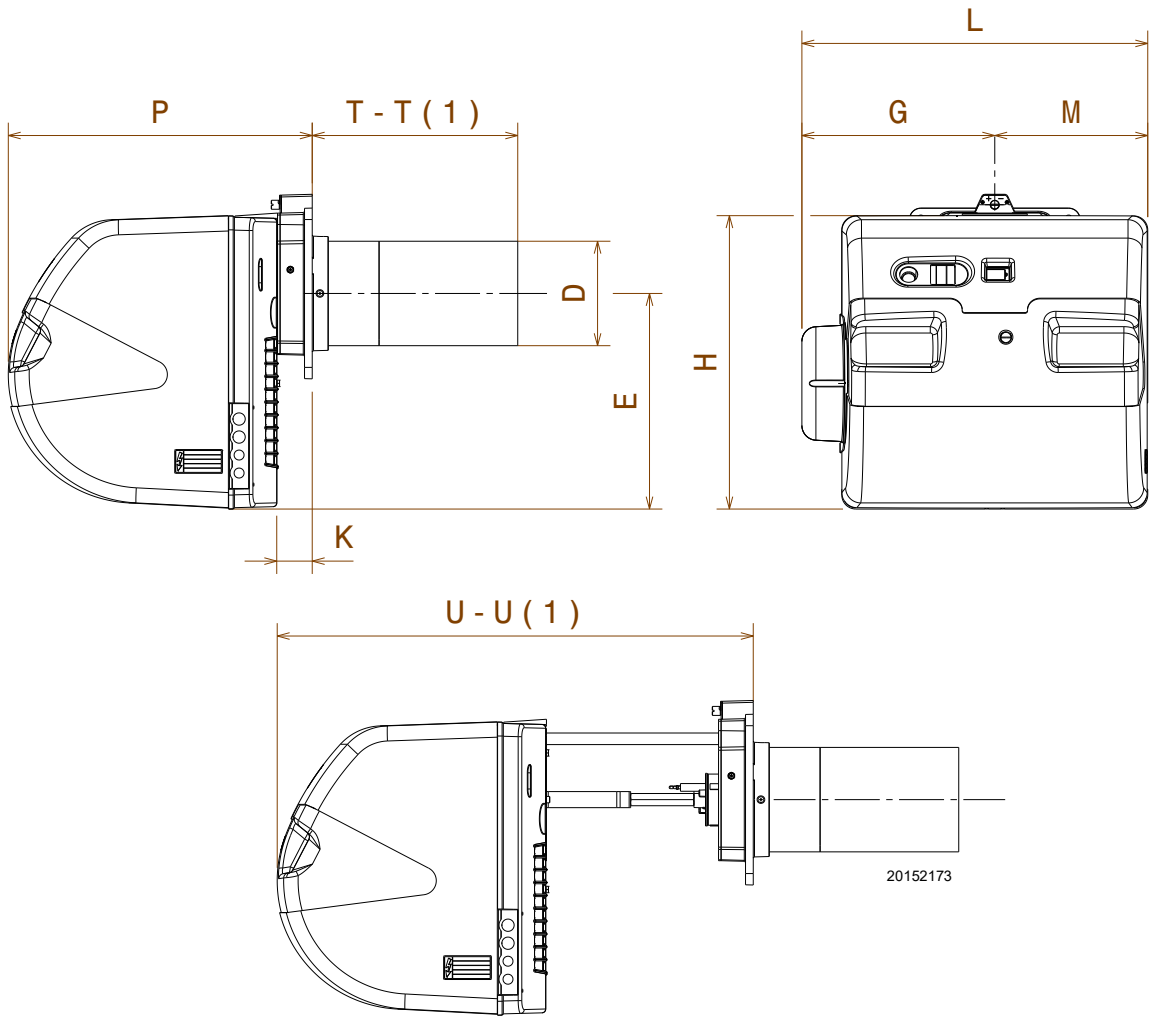

Fig. 1

mm	D	E	G	H	K	L	M	P	T - T (1)	U - U (1)
RL 42 BLU	Ø 163	335	315	490	55	548	238	473	320 / -	680 / -

Tab. C

(1) Blast tube: short-long

4.5 Firing rate

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

1st stage DELIVERY must be selected within area **A** of the adjacent diagrams.

2nd stage DELIVERY must be selected within area **B**.
This area provides the maximum 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 area **B**.

The firing rate area values have been obtained considering a surrounding temperature of 20 °C, and an atmospheric pressure of 1000 mbar (approx. 100 m above sea level) and with the combustion head adjusted as shown on pag. 19.

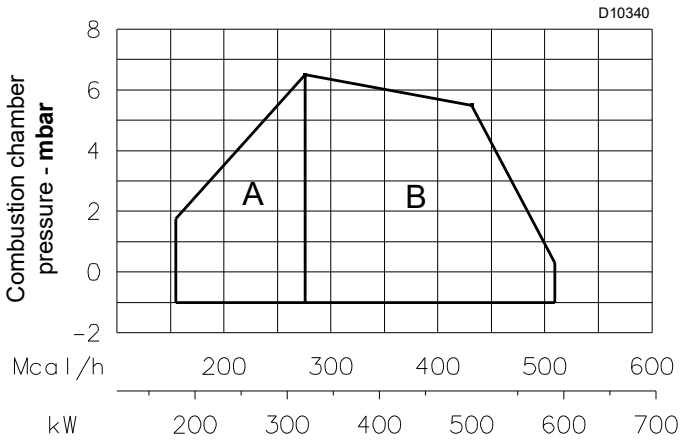

Fig. 2

4.6 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:
Delivery 16 kg/h
diameter 40 cm
length 1 m

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

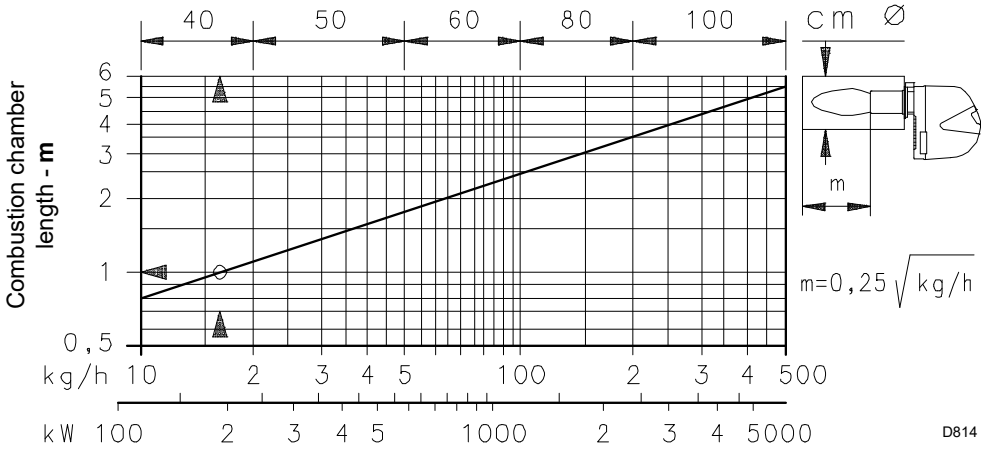

Fig. 3

4.6.1 Commercial boilers

The burners are designed exclusively for combustion chambers with flue gas outlet from the bottom (for example three flue gas passes), accessible via the door.

Max thickness of the frontal boiler wall: 150 mm.

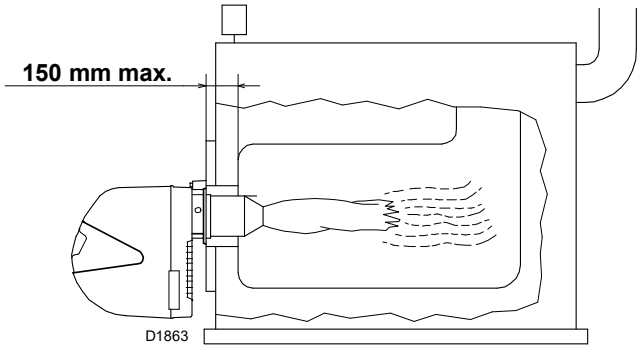

Fig. 4

4.7 Burner description

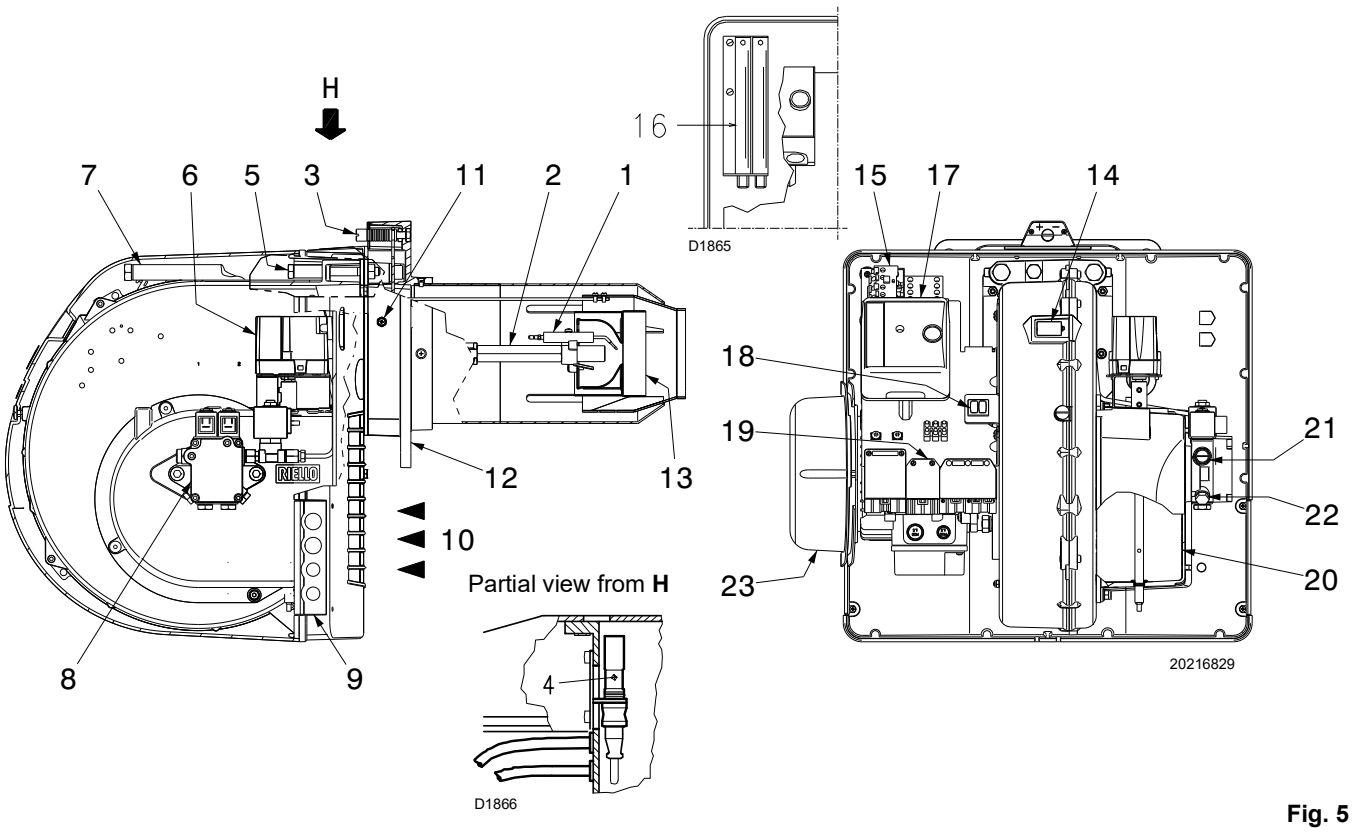

Fig. 5

1 Ignition electrodes
2 Combustion head
3 Screw for combustion head adjustment
4 Flame sensor
5 Screw for fixing fan to flange
6 Servomotor
7 Slide bars for opening the burner and inspecting the combustion head
8 Pressure stage 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 Flameholder
14 Flame inspection window
15 Starter
16 Extensions for slide bars 7)
17 Flame control with lock-out pilot light and lock-out reset button
18 Two switches:
- one "burner off - on"
- one for "1st - 2nd stage operation"

19 Plugs for electrical connections
20 Air gate valve
21 Pump adjustment (low pressure)
22 Pump adjustment (high pressure)
23 Motor protection

NOTE:
If the flame control 18)(Fig. 5) pushbutton lights up, it indicates that the burner is in lock-out.

To reset, press the pushbutton, no sooner than 10 s after the lock-out.

4.8 Burner equipment

Nozzle . . . . . No. 1
Flexible hoses (L = 1530 mm) . . . . . No. 2
Gaskets for flexible hoses . . . . . No. 2
Nipples for flexible hoses . . . . . No. 2
Thermal insulation screen . . . . . No. 1
Screws M8 x 25 to secure the burner flange to the boiler . No. 4
Fairleads for electrical connections . . . . . No. 3
Instruction. . . . . No. 1
Spare parts list . . . . . No. 1

5 Installation

5.1 Notes on safety for the installation

After carefully cleaning all around the area where the burner will be installed, and arranging the correct lighting of the environment, proceed with the installation operations.

DANGER

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

WARNING

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.

5.2 Handling

The burner packaging includes a wooden platform, so it is possible to move the burner (still packaged) with a transpallet truck or fork lift truck.

WARNING

The handling operations for the burner can be highly dangerous if not carried out with the greatest attention: keep any unauthorised people at a distance; check the integrity and suitableness of the available means of handling.

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 the handling, keep the load at not more than 20-25 cm from the ground.

CAUTION

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

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.

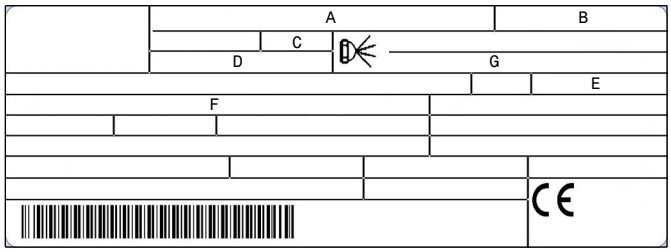

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Fig. 6

Checking the characteristics of the burner

Check the identification label of the burner, showing:

- the model **A**)(Fig. 6) and type of burner **B**);
- the year of manufacture, in cryptographic form **C**);
- the serial number **D**);
- the electrical power consumption **E**);
- the types of fuel used and the relative supply pressures **F**);
- the data of the burner's minimum and maximum output possibilities **G**) (see Firing rate).

WARNING

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

WARNING

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

5.4 Operating position

WARNING

The burner is designed to work only in the positions **1**, **2**, **3** and **4** (Fig. 7).

Installation **1** is preferable, as it is the only one that allows the maintenance operations as described in this manual.

Installations **2**, **3** and **4** allow the working, but make the operations of maintenance and checking of the combustion head more difficult pag. 19.

DANGER

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

Installation **5** is forbidden, for safety reasons.

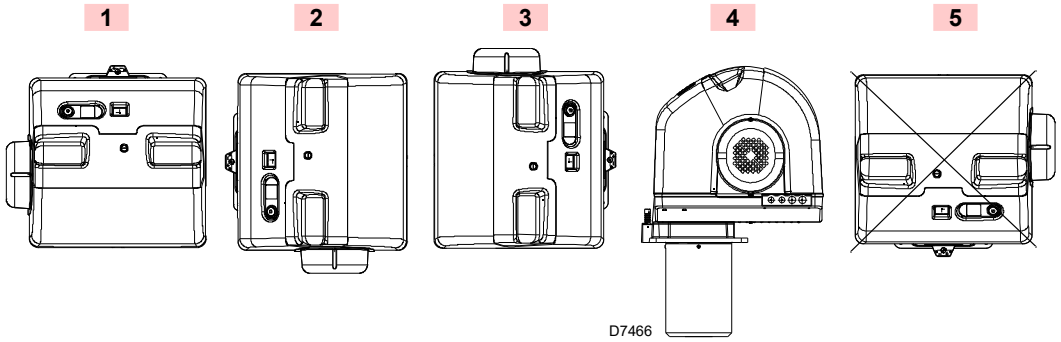

Fig. 7

WARNING

Before assembling the casing, it is necessary to fix the engine protection supplied 1)(Fig. 8) onto the bracket 2) using the appropriate screws 3) with a nut and a washer.

Fix the bracket to the front shield of the burner, using the screws 4).

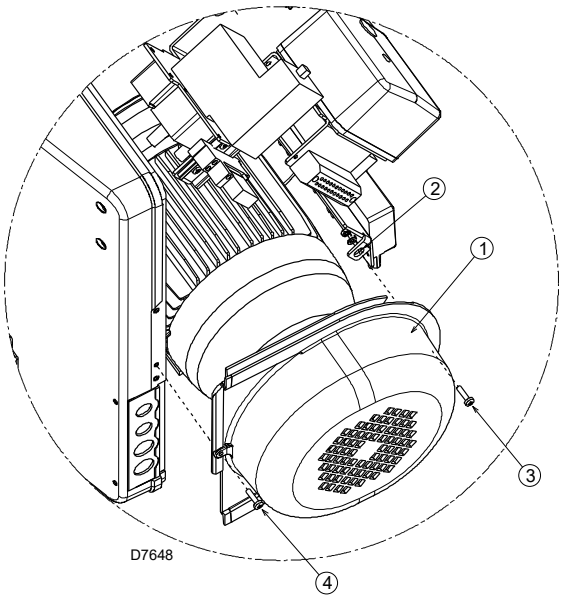

Fig. 8

5.5 Preparing the boiler

5.5.1 Boring the boiler plate

Drill the combustion chamber locking plate as shown in Fig. 9.

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

mm	A	B	C
RL 42 BLU	185	275 - 325	M12

Tab. D

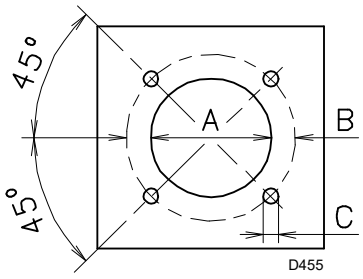

Fig. 9

5.6 Securing the burner to the boiler

Protective fettling in refractory material 8)(Fig. 10) 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.
➤ Remove the screws 2) from the two slide bars 3).
➤ Remove the screw 1) fixing the burner 4) to the flange 5).
➤ Withdraw the combustion head 10) from the burner 4).
➤ Secure flange 5) to the boiler plate interposing the supplied gasket 6).
➤ Use the 4 screws provided after having protected the thread with antiscruffing products (high-temperature grease, compounds, graphite). The burner-boiler seal must be airtight.

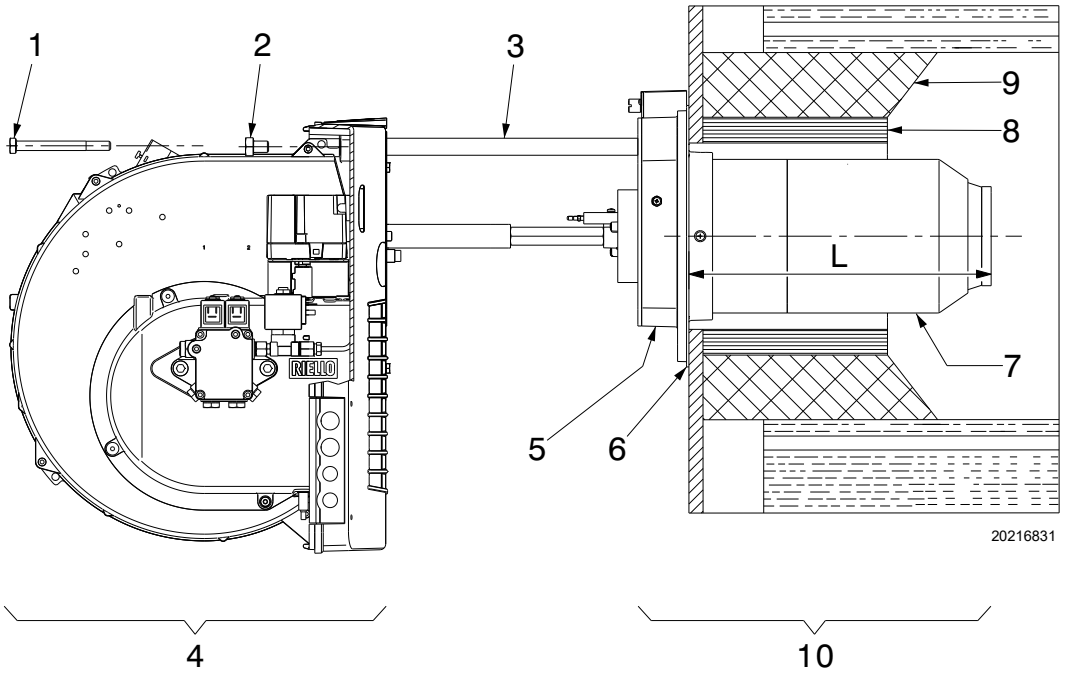

Fig. 10

5.7 Nozzle installation

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 the manufacturer 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 the manufacturer 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.

5.7.1 Choice of nozzle

The nozzle must be chosen from among those listed in Tab. E.

The deliveries of the 1st and 2nd stages must be contained within the value range indicated on pag. 9.

GPH	Kg/h					
	8 bar	10 bar	11 bar	12 bar	14 bar	21 bar
6	20.4	22.4	23.6	24.6	26.4	32.2
6.5	22.1	24.3	25.5	26.7	28.5	34.9
7	23.8	26.2	27.5	28.7	30.7	37.6
7.5	25.5	28	29.5	30.8	32.9	40.3
8	27.2	29.9	31.4	32.8	35.1	43
8.5	28.9	31.8	33.4	34.9	37.3	45.7
9	30.6	33.6	35.3	37	39.5	48.4
9.5	32.3	35.5	37.3	39	41.7	51.1
10	34	37.4	39.3	41.1	43.9	53.8

Tab. E

5.7.2 Recommended nozzle

- **Delavan type A 60°**

WARNING

Use nozzles **Delavan type A 60°**.

In case of moisture due to narrow combustion chamber, it is possible to use nozzles **Delavan type A 45°**.

5.7.3 Nozzle assembly

- ➤ Loosen the screws 2)(Fig. 11) and remove the flameholder unit 1), remove the plastic plugs 3) and assemble the nozzles: do not use any sealing products such as gaskets, sealing compound, or tape.
- ➤ Be careful to avoid damaging the nozzle sealing seat.
- ➤ The nozzles must be screwed into place tightly but not to the maximum torque value provided by the wrench.
- ➤ Make sure that the electrodes are positioned as shown in Fig. 12.
- ➤ Finally remount the burner 4)(Fig. 13) to the slide bars 3) and slide it up to the flange 5), keeping it slightly raised to prevent the flameholder unit from pressing against the slide bars 6) of the blast tube.
- ➤ Tighten the screws 2)(Fig. 13) on the slide bars 3) and screw 1) that attaches the burner to the flange.
- ➤ If it proves necessary to change the nozzle with the burner already fitted to the boiler, open the burner on the slide bars as shown in Fig. 10, pag. 13, after having mounted the extensions 16)(Fig. 5, pag. 10), and proceed as described above.

NOTE:
The nozzle supplied may be used if it matches required delivery, otherwise it should be replaced with a different one whose delivery suits the system.

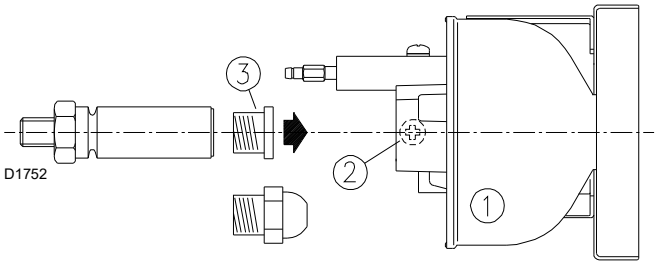

Fig. 11

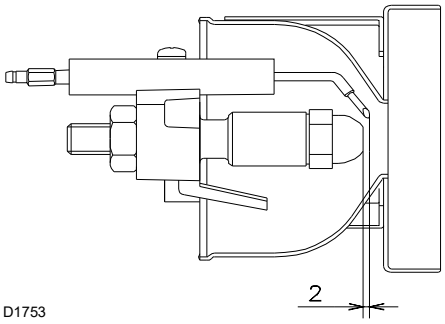

Fig. 12

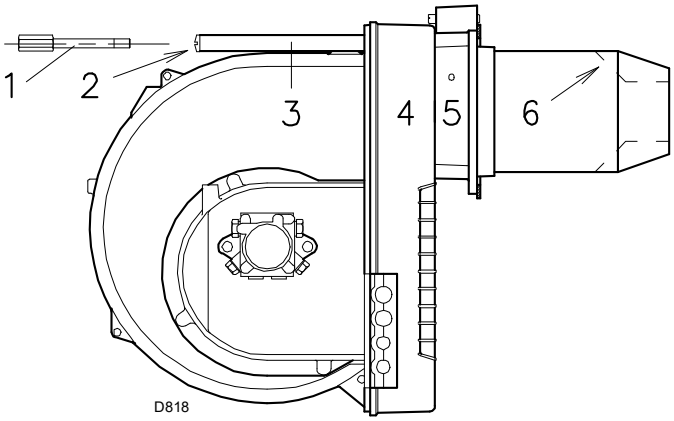

Fig. 13

5.8 Hydraulic system

5.8.1 Fuel supply

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.

There are three types of fuel hydraulic circuits:
– Double-pipe circuits (the most common)
– Single-pipe circuits
– Loop circuits

According to the burner/tank layout, either of two fuel supply systems can be used:

- siphon-type (with the tank higher than the burner)
- suction-type (with the tank lower than the burner)

5.8.2 Double-pipe siphon-type systems

The distance P (**A**, Fig. 14) 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.

5.8.3 Double-pipe suction-type systems

Pump depression values higher than 0.45 bar (35 cm Hg)(**B**, Fig. 14) must not be exceeded because at higher levels gas is released from the fuel, the pump starts making noise and its working life-span decreases.

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

Useful suggestions for both systems A and B

➤ Use copper pipes whenever possible.
➤ Any curves used in the system should be made with the widest possible radius.
➤ Use biconic connectors at both ends of the pipe.
➤ Whenever the burner is installed in areas with extremely cold winter climates (temperatures lower than - 10°C), we recommend insulating both the tank and the piping. Avoid the smallest of the three pipe diameters provided in the Table and lay the piping along the most sheltered route possible. The paraffin in the fuel begins to solidify below 0°C, and the filters and nozzle begin to clog accordingly.
➤ Install a filter on the suction lines with a transparent plastic bowl if possible in order to permit the regular flow of fuel and quick checking of the state of the filter.
➤ The return pipe does not require an on/off valve, but if the user desires to insert one, a lever-type valve should be selected which clearly indicates when the valve is open or closed (if the burner starts with the return pipe closed, the sealing organ located on the pump shaft will break).
➤ Copper pipes must be installed to a position with respect to the burner that allows the latter to be fully retracted on its slide bars without stretching or twisting the flexible hoses.
➤ If more than one burner is operating in the same room, each one must be equipped with its own suction pipe; the return pipe may be shared by all, providing it is sufficiently sized.
➤ The suction line must be perfectly airtight. In order to check the seal, close the pump's return line. Install a T union on the vacuum meter attachment. On one branch of this T install a pressure gauge and on the other branch inject air at a pressure of 1 bar. After the air injection, the gauge must remain at a constant pressure.

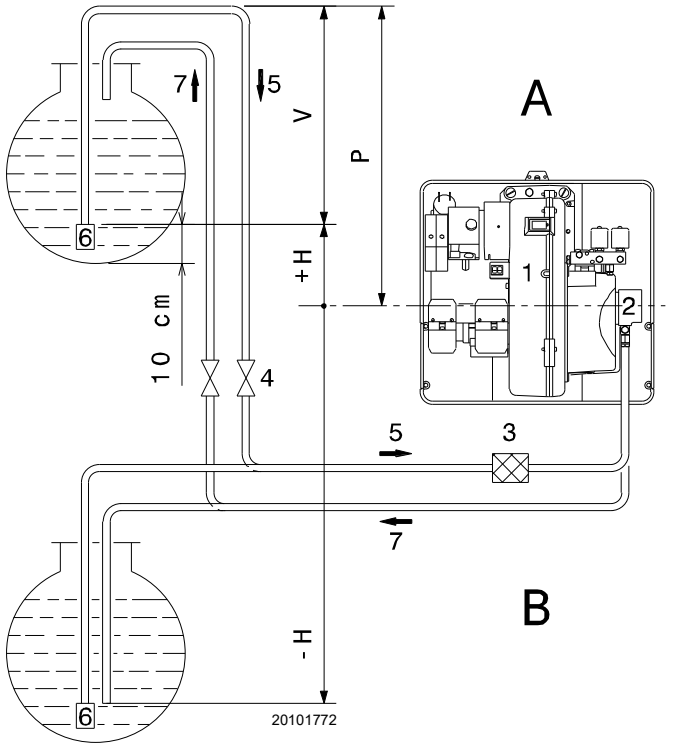

Fig. 14

+H -H	L m		
m	ø 8 mm	ø 10 mm	ø 12 mm
+4	52	134	160
+3	46	119	160
+2	39	104	160
+1	33	89	160
+0,5	30	80	160
0	27	73	160
-0,5	24	66	144
-1	21	58	128
-2	15	43	96
-3	8	28	65
-4	-	12	33

Tab. F

Legend (Fig. 14)

H Pump/Foot valve height difference
L Piping length
values calculated for light oil:
- viscosity 6 cSt / 20 °C
- density 0,84 kg/dm^3
- temperature 0 °C
- max. altitude 200 m (s.l.m.)

ø Inside pipe diameter
1 Burner
2 Pump
3 Filter
4 Manual on/off valve
5 Suction line
6 Foot valve
7 Return line

5.8.4 Single-pipe systems

There are two solutions possible:

➤ Pump external by-pass (**A**, Fig. 15) (recommended)
Connect the two flexible hoses to an automatic degassing unit.
In this case screw 7)(Fig. 26) must not be removed: pump internal by-pass closed.

➤ Pump internal by-pass (**B**, Fig. 15)
Connect only the flexible suction hose to the pump.
Remove screw 7)(Fig. 26), which can be accessed from the return union: pump internal by-pass open.
Plug the pump return line connection.
This solution is possible only with low pump depression values (max. 0.2 bar) and perfectly-sealed piping.

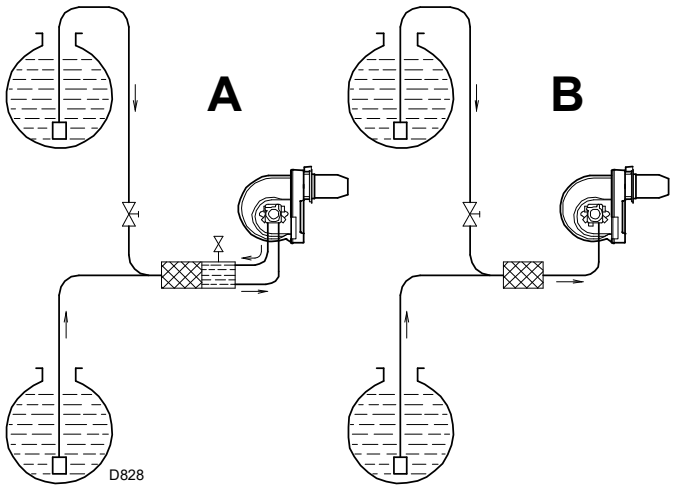

Fig. 15

5.8.5 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.

5.8.6 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 7)(Fig. 26). 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.

Route the hoses through the holes in the plate, preferably using those on the rh side:

➤ unscrew the screws 1)(Fig. 16), 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.

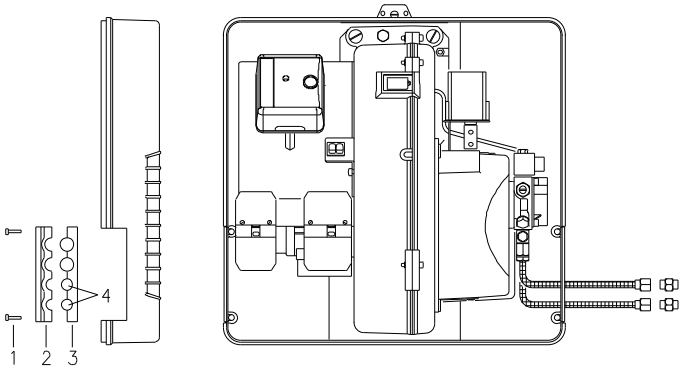

Fig. 16

5.8.7 Pump

Technical data

Min. delivery rate at 12 bar pressure	60 kg/h
Delivery pressure range	4 - 25 bar
Max. suction depression	0.45 bar
Viscosity range	2 - 12 cSt
Light oil max. temperature	60° C
Max. suction and return pressure	2 bar
Pressure calibration in the factory	high pressure 22 bar low pressure 9 bar
Filter mesh width	0.150 mm

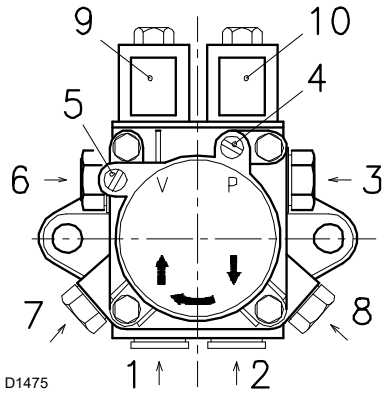

Fig. 17

Legend (Fig. 17)

1	Suction	G 1/4”
2	Return with screw for by-pass	G 1/4”
3	Outlet at the nozzle	G 1/8”
4	Pressure gauge attachment	G 1/8”
5	Vacuum meter attachment	G 1/8”
6	Screw for low pressure regulation	
7	Screw for high pressure regulation	
8	Pressure output or pressure gauge attachment	
9	Low/high pressure switch valve	
10	Safety valve	

5.8.8 Pump priming

WARNING

Before starting the burner, make sure that the tank return line is not clogged.

Obstructions in the line could cause the sealing organ located on the pump shaft to break.
(The pump leaves the factory with the by-pass closed).

- ➤ Also check to make sure that the valves located on the suction line are open and that there is sufficient fuel in the tank.
- ➤ In order for self-priming to take place, one of the screws 4)-8)(Fig. 17) 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. 18) 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 4) or 8). Stop the burner: switch 1)(Fig. 18) set to “OFF” and tighten the screw 4) or 8).

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.

WARNING

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.

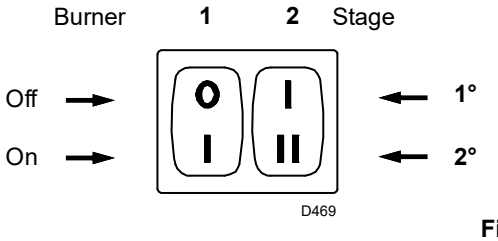

Fig. 18

5.9 Collegamenti elettrici

Notes on safety for the electrical wiring

DANGER

- The electrical wiring must be carried out with the electrical supply disconnected.
- Electrical wiring must be made in accordance with the regulations currently in force in the country of destination and by qualified personnel. Refer to the wiring diagrams.
- The manufacturer declines all responsibility for modifications or connections different from those shown in the wiring diagrams.
- Check that the electrical supply of the burner corresponds to that shown on the identification label and in this manual.
- The burner has been type-approved for intermittent use. 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, burner stopping is guaranteed by the boiler's thermostat/pressure switch. If this is not the case, a time switch should be fitted in series to TL to stop the burner at least once every 24 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. Do not use the gas tubes as an earthing system for electrical devices.
- The electrical system must be suitable for the maximum power absorption of the device, as indicated on the label and in the manual, checking in particular that the section of the cables is suitable for that level of power absorption.
- For the main power supply of the device from the electricity mains:
  – do not use adapters, multiple sockets or extensions;
  – make provisions for an omnipolar switch with a gap between the contacts of at least 3 mm (over-voltage category III), as required by current safety regulations.
- 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 system main switch.

DANGER

Close the fuel shut-off valve.

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 according to EN 60 335-1 standard.

The use of cable grommets can take various forms; the following way is just one possible solution (Fig. 19):

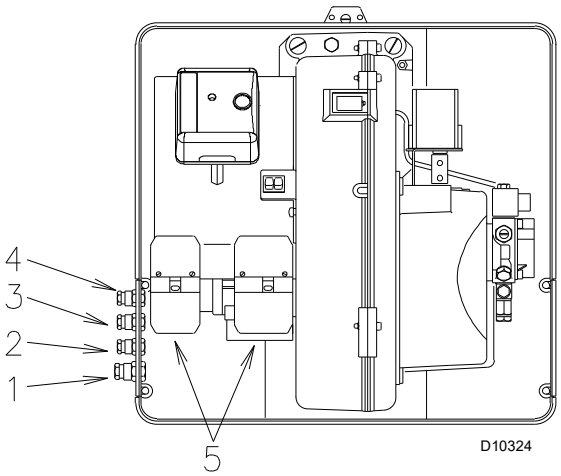

Fig. 19

1 Pg 11 Three-phase power supply
2 Pg 11 Single-phase power supply
3 Pg 9 Control device TL
4 Pg 9 Control device TR

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

6 Start-up, calibration and operation of the burner

6.1 Notes on safety for the first start-up

WARNING

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.

WARNING

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

6.2 Adjustments before first firing

6.2.1 Combustion head setting

The setting of the combustion head depends exclusively on the delivery of the burner in the 2nd stage - in other words, the combined delivery of the two nozzles selected on pag. 13.

Turn screw 4)(Fig. 20) until the notch shown in diagram (Fig. 21) is level with the front surface of flange 5)(Fig. 20).

Example:

Burner with 8.00 GPH nozzle and 14 bar pump pressure: from Tab. E, pag. 13 a delivery of 35.1 kg/h is obtained.

Diagram (Fig. 21) indicates that for a delivery of 35.1 kg/h the burner requires the combustion head to be set to approx. 4 notches, as shown in Fig. 20.

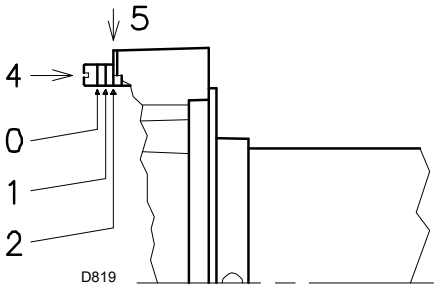

Fig. 20

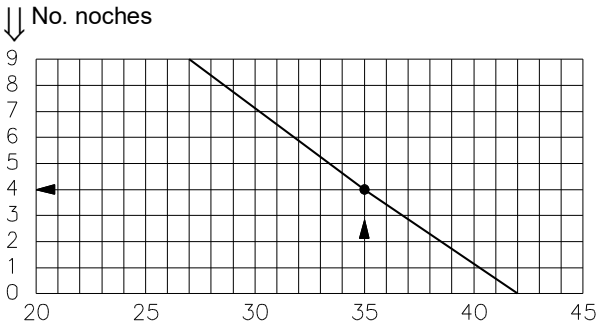

Fig. 21

6.2.2 Pump adjustment

No settings are required for the pump, which is set by the manufacturer to:
– 22 bar: high pressure
– 9 bar: low pressure

this pressure must be checked and adjusted (if required) after the burner has been ignited.

6.2.3 Fan gate adjustment

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

In summing up, the adjustments to be executed prior to the first firing are:
➤ Selection and installation of the nozzle
➤ Adjustment of combustion head

The following aspects need not be modified:
➤ Pump pressure
➤ Air gate valve adjustment, 1st stage
➤ Air gate valve adjustment, 2nd stage

6.2.4 Servomotor

Cam I: Set to 0° (air damper closed in shut-down position). To open partially, increase this setting (Fig. 22).

Cam II: Factory set to 50°.
Controls the position of the air damper at the 2nd stage - it follows the servomotor only when opening. To reduce the angle, go to the 1st stage, reduce the angle, and return to 2nd stage to check the effect of your adjustment.

Cam III: Factory set to 40°.
Enables the 2nd stage valve. Set it between cams IV-V, so that it always anticipates cam II.

Cam IV-V: Factory set to 30°.
Controls the position of the 1st stage and must always anticipate cams II and III.
It follows the servomotor only when closing.
To increase the angle, go to the 2nd stage, increase the setting angle, and return to 1st stage to check the effect of your adjustment.

NOTE:
If you increase the angle from the 1st stage position while the burner is operating, the burner will stop.

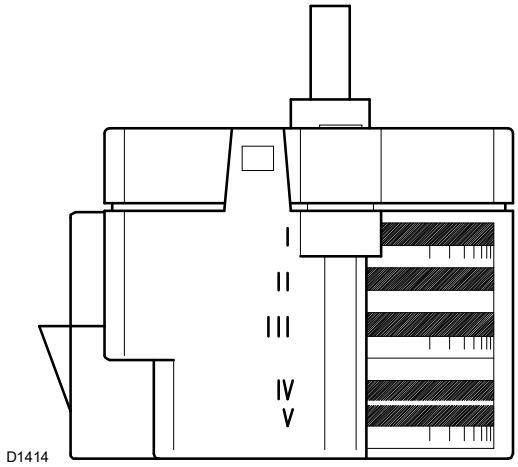

Fig. 22

6.3 Burner calibration

6.3.1 Firing

Set switch 1)(Fig. 23) to “ON” and switch 2) to “1st stage”.

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 in Tab. G.

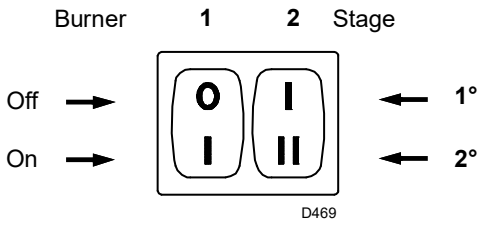

Fig. 23

6.3.2 Operation

Interventions on the following points.

Nozzle
See the information listed on pag. 13.

Pump pressure
In order to adjust 1st stage pressure, use the screw 6)(Fig. 17).
In order to adjust 2nd stage pressure, use the screw 7)(Fig. 17).

Some combinations may cause pulsation during the 2nd stage under high pressure; in such an event reduce the atomizing pressure or use a nozzle with a full coned shaped spray and, if the desired power is still not achieved, fit a larger nozzle.

6.3.3 Combustion head

In order to adjust the combustion head, use the screw 4)(Fig. 20).

For final adjustment of the combustion head, perform fume analysis at the boiler outlet.

6.4 Burner operation

6.4.1 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 sucks the fuel from the tank through the piping and the filter and pumps it under pressure to delivery. The piston rises and the fuel returns to the tank through the piping.
The screw closes the by-pass heading towards suction and the solenoid valves, de-energized, close the passage to the nozzles.

– **5 s**: The servomotor opens the air gate valve: pre-purging begins with the 1st stage air delivery.

– **26 s**: The solenoid valves open 8) and 15); and the fuel passes through the piping 12) and filter 13) and is then sprayed out through the nozzle, igniting when it comes into contact with the spark. This is the 1st stage flame.

– **32 s**: The ignition transformer switches off.

– **33 s**: If the control device TR is closed or has been replaced by a jumper wire, the servomotor opens the fan air gate valve in the 2nd stage.

– **35 s**: The 2nd stage solenoid valve is opened.
The starting cycle comes to an end.

Legend (Fig. 24) - (Fig. 25)

Yellow Red Green Off

For further details see pag. 24.

NORMAL FIRING

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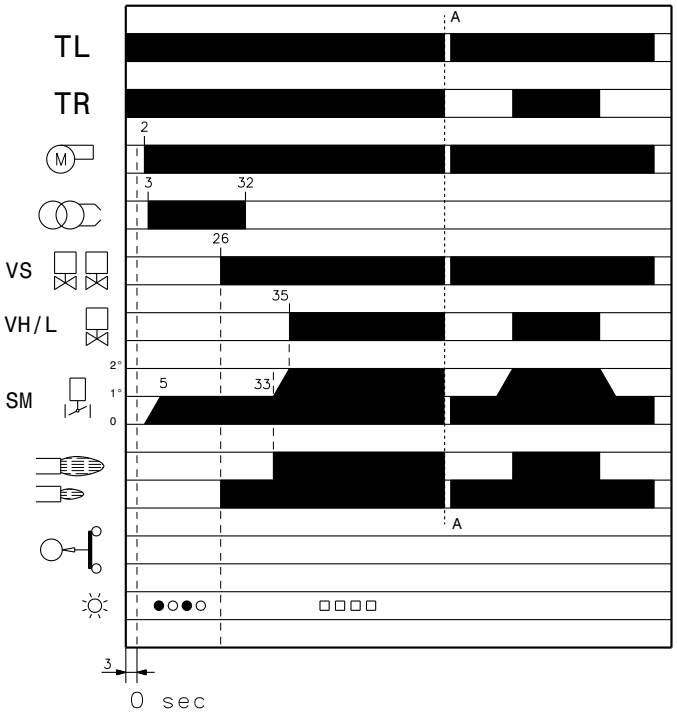

Fig. 24

NO FIRING

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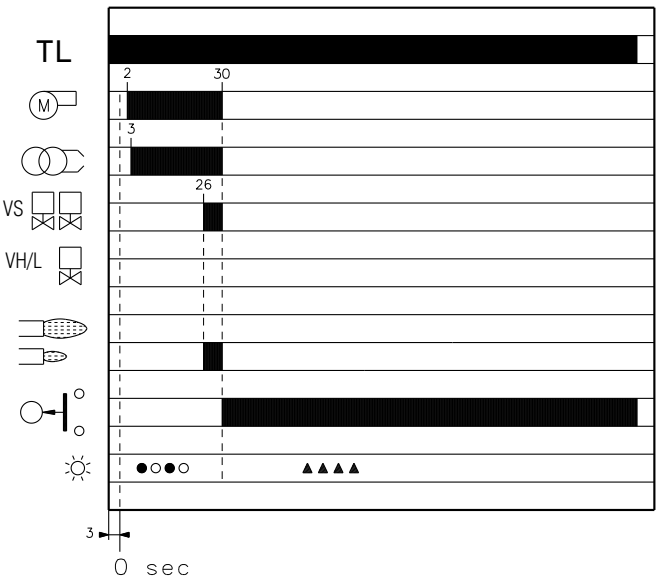


Fig. 25

6.4.2 Steady state operation

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)(Fig. 26) opens, 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) closes, 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 valves 8) and 15) close, the flame immediately goes out. The fan's air damper valve closes completely.

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 Fig. 24).

6.4.3 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.

6.4.4 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.

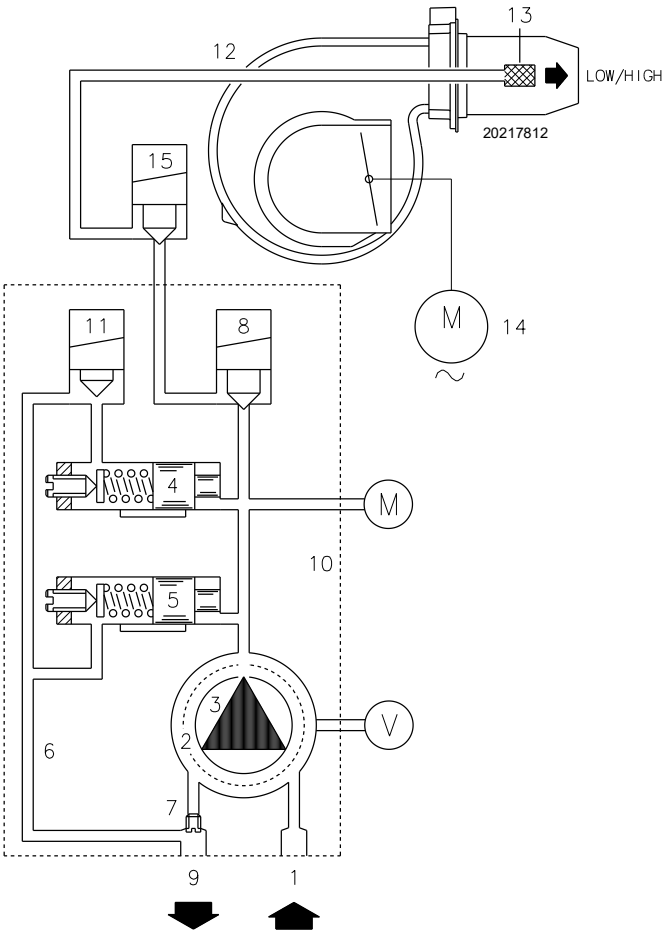


Fig. 26

6.5 Final checks

- ➤ Obscure the flame sensor and switch on the control devices:
  the burner should start and then lock-out about 10 s after opening of the 1st stage operation valve.
- ➤ Obscure the flame sensor while the burner is in operation:
  it should follow the extinguishing of the flame within 1 s, the repetition of the starting cycle and the burner's lock-out.
- ➤ Switch off control device TL followed by control device TS while the burner is operating:
  the burner should stop.

7 Maintenance

7.1 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 electricity supply from the burner by means of the main switch of the system;

DANGER

close the fuel interception tap.

7.2 Maintenance programme

7.2.1 Maintenance frequency

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

7.2.2 Checking and cleaning

Pump

The pressure must be stable and at the same level as measured during the previous check.

The depression must be less than 0.45 bar. Values different from those measured previously may be due to a different level of fuel in the tank.

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 vacuum meter 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.

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.

Filters

Check the following filter boxes (Fig. 27):
- on line 1)
- in the pump 2)
- at the nozzle 3)

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.

Then clean the insides of the pump and the cover sealing surface.

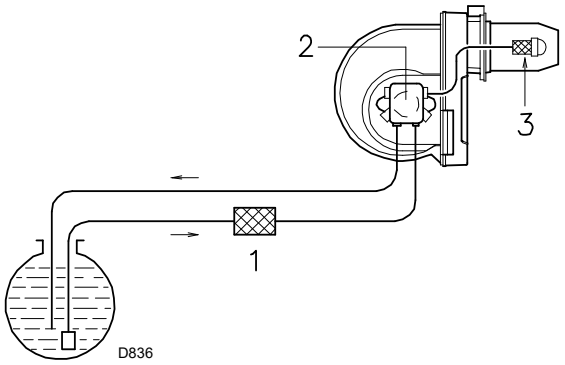


Fig. 27

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

Flame sensor

To extract the flame sensor 1)(Fig. 28) loosen the screws 2) and unhook the support 3).

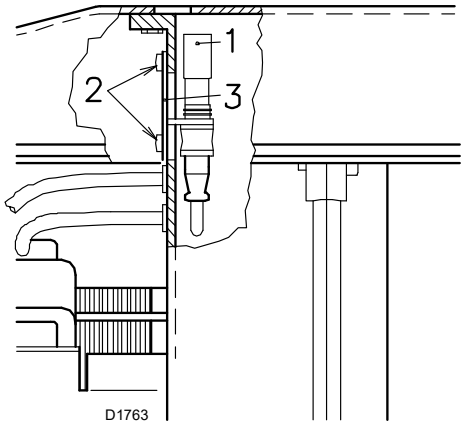


Fig. 28

Flame inspection window

Clean the glass whenever necessary (Fig. 29).

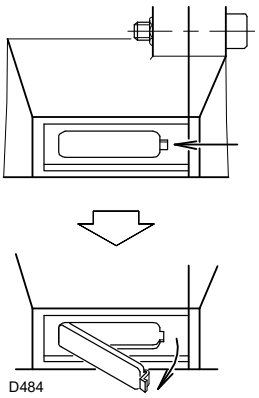


Fig. 29

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.

Lastly, check the condition of the flue gas stack.

Fuel pump and/or couplings replacement

In conformity with Fig. 30.

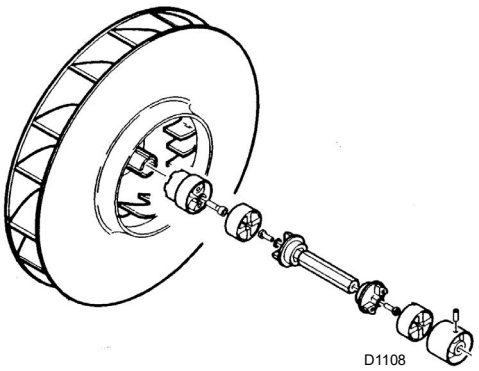


Fig. 30

7.3 Burner start-up cycle diagnostics

During start-up, indication is according to the followin 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	▲■▲■▲■▲■▲

Legend: ● Yellow ■ Green ○ off ▲ Red

7.4 Resetting the flame control and using diagnostics

The flame control 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 (**lock-out**), and then press the reset button.

The flame control 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.

RED LED on wait at least 10s	Lock-out	Press reset for > 3s	Pulses	Interval 3s	Pulses
			●●●●		●●●●

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

7.4.1 Resetting the flame control

To reset the flame control, 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.

7.4.2 Visual diagnostics

Indicates the type of burner malfunction causing lock-out.

To view diagnostics, proceed as follows:

➤ Hold the button down for more than 3 seconds once the red LED (burner lock-out) 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 Tab. G.

7.4.3 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 flame control etc…

To view diagnostics, proceed as follows:

➤ Hold the button down for more than 3 seconds once the red LED (burner lock-out) 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 flame control's initial state must be restored using the resetting procedure described above.

Button pressed for	Flame control status
Between 1 and 3 seconds	Flame control reset without viewing visual diagnostics
More than 3 seconds	Visual diagnostics of lock-out 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 flame control identifies the possible types of malfunction.

7.5 Opening burner

Disconnect the electrical supply from the burner.

➤ Remove screw 1)(Fig. 31) and withdraw the casing 2).

➤ Unscrew screw 3).

➤ Pull part A backward keeping it slightly raised to avoid damaging the flameholder 6) on blast tube 7).

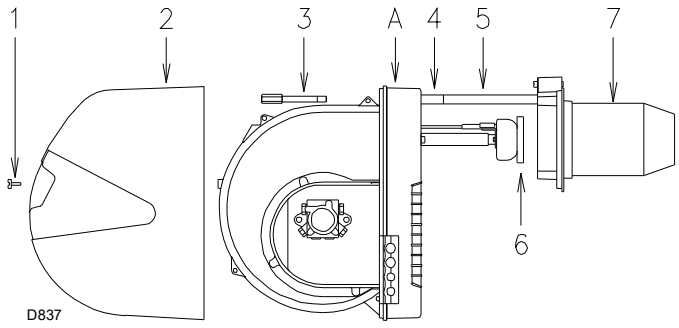


Fig. 31

7.6 Closing the burner

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

8 Faults - Possible causes - Solutions

Find a list of faults, causes and possible solutions for a set of failures that may occur and result in irregular burner operation or no functioning at all.

If a burner malfunction is detected, first of all:

- check that the electrical wiring is adequately connected;
- check whether fuel is delivered;
- check that every adjustment parameter is adequately set.

Signal	Fault	Probable cause	Suggested remedy
No blink	The burner does not start	No electrical power supply	Close all switches - Check fuses
		A limit or safety control device is open	Adjust or replace
		Flame control lock-out	Reset flame control (no sooner than 10 s after the lock-out)
		Pump is jammed	Replace
		Erroneous electrical connections	Check connections
		Defective flame control	Replace
		Defective electrical motor	Replace
		Servomotor faulty or wrongly adjusted	Adjust or replace
2 x blinks ● ●	After pre-purge and the safety time, the burner goes to lock-out at the end of the safety time	No fuel in tank; water on tank bottom	Top up fuel level or suck up water
		Inappropriate head and air damper adjustments	Adjust
		Light oil solenoid valves fail to open (1st stage or safety)	Check connections; replace coil
		1st nozzle clogged, dirty, or deformed	Replace
		Dirty or poorly adjusted firing electrodes	Adjust or clean
		Grounded electrode due to broken insulation	Replace
		High voltage cable defective or grounded	Replace
		High voltage cable deformed by high temperature	Replace and protect
		Ignition transformer defective	Replace
		Erroneous valves or transformer electrical connections	Check
		Flame control defective	Replace
		Pump unprimed	Prime pump and see “Pump unprimes”
		Pump/motor coupling broken	Replace
		Pump suction line connected to return line	Correct connection
		Valves up-line from pump closed	Open
		Filters dirty: line - pump - nozzle	Clean
		Defective flame sensor or flame control	Replace flame sensor or flame control
		Dirty flame sensor	Clean
		1st stage operation of cylinder is faulty	Change the cylinder
		Motor protection tripped	Reset thermal cut-out
		Defective motor command control device	Replace
		Missing phase thermal cut-out trips	Reset thermal cut-out when third phase is re-connected
		Incorrect motor rotation direction	Change motor electrical connections
		Servomotor faulty or wrongly adjusted	Adjust or replace
4 x blinks ● ● ● ●	The burner starts and then goes into lock-out	flame sensor short-circuit	Replace flame sensor
		Light is entering or flame is simulated	Eliminate light or replace flame control
7 x blinks ● ● ● ● ● ● ●	Flame detachment	Poorly adjusted head	Adjust
		Poorly adjusted or dirty firing electrodes	Adjust
		Poorly adjusted fan air gate: too much air	Adjust
		1st nozzle is too big (pulsation)	Reduce 1st nozzle delivery
		1st nozzle is too small (flame detachment)	Increase 1st nozzle delivery
		1st nozzle dirty, or deformed	Replace
		Inappropriate pump pressure	Adjust to between 10 and 14 bar
		1st stage nozzle unsuited to burner or boiler	See nozzle table reduce 1st stage
		Defective 1st stage nozzle	Replace
	The burner does not pass to 2nd stage	Control device TR does not close	Adjust or replace
		Defective flame control	Replace
		2nd stage sol. valve coil defective	Replace
		Piston jammed in valve unit	Replace entire unit
		Servomotor faulty or wrongly adjusted	Adjust or replace
	Fuel passes to 2nd stage but air remains in 1st	Low pump pressure	Increase
		2nd stage operation of cylinder is faulty	Change cylinder
	Burner stops at transition between 1st and 2nd stage. Burner repeats starting cycle.	Nozzle dirty	Renew nozzle
		flame sensor dirty	Clean
		Excess air	Reduce
	Uneven fuel supply	Check if cause is in pump or fuel supply system	Feed burner from tank located near burner

Signal	Fault	Probable cause	Suggested remedy
	Internally rusted pump	Water in tank	Suck water from tank bottom with separate pump
	Noisy pump, unstable pressure	Air has entered the suction line	Tighten connectors
		- Depression value too high (higher than 35 cm Hg):	
		Tank/burner height difference too great	Feed burner with loop circuit
		Piping diameter too small	Increase
		Suction filters clogged	Clean
		Suction valves closed	Open
		Paraffin solidified due to low temperature	Add additive to light oil
	Pump unprimes after prolonged pause	Return pipe not immersed in fuel	Bring to same height as suction pipe
		Air enters suction piping	Tighten connectors
	Pump leaks light oil	Leakage from sealing organ	Replace pump
	Smoke in flame	Not enough air	Adjust head and fan gate
	- dark Bacharach	Nozzle worn or dirty	Replace
		Nozzle filter clogged	Clean or replace
		Erroneous pump pressure	Adjust to between 10 - 14 bar
		Flame stability spirat dirty, loose, or deformed	Clean, tighten in place, or replace
		Boiler room air vents insufficient	Increase
	- yellow Bacharach	Too much air	Adjust head and fan gate
	Dirty combustion head	Nozzle or filter dirty	Replace
		Unsuitable nozzle delivery or angle	See recommended nozzles
		Loose nozzle	Tighten
		Impurities on flame stability spiral	Clean
		Erroneous head adjustment or not enough air	Adjust; open gate valve
		Blast tube length unsuited to boiler	Contact boiler manufacturer
10 x blinks ● ● ● ● ● ● ● ● ● ●	The burner goes to lock-out	Connection or internal fault	
		Presence of electromagnetic disturbance	Use the radio disturbance protection kit

Tab. G

A Appendix - Accessories

Extended head Kit

Burner	L (mm) Standard head	L (mm) Head obtainable with the kit	Code
RL 42 BLU	295	430	20024155

Soundproofing box kit

Burner	Type	dB(A)	Code
RL 42 BLU	C4/5	10	3010404

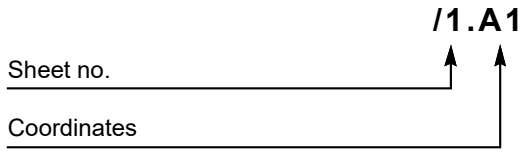
Degasser kit

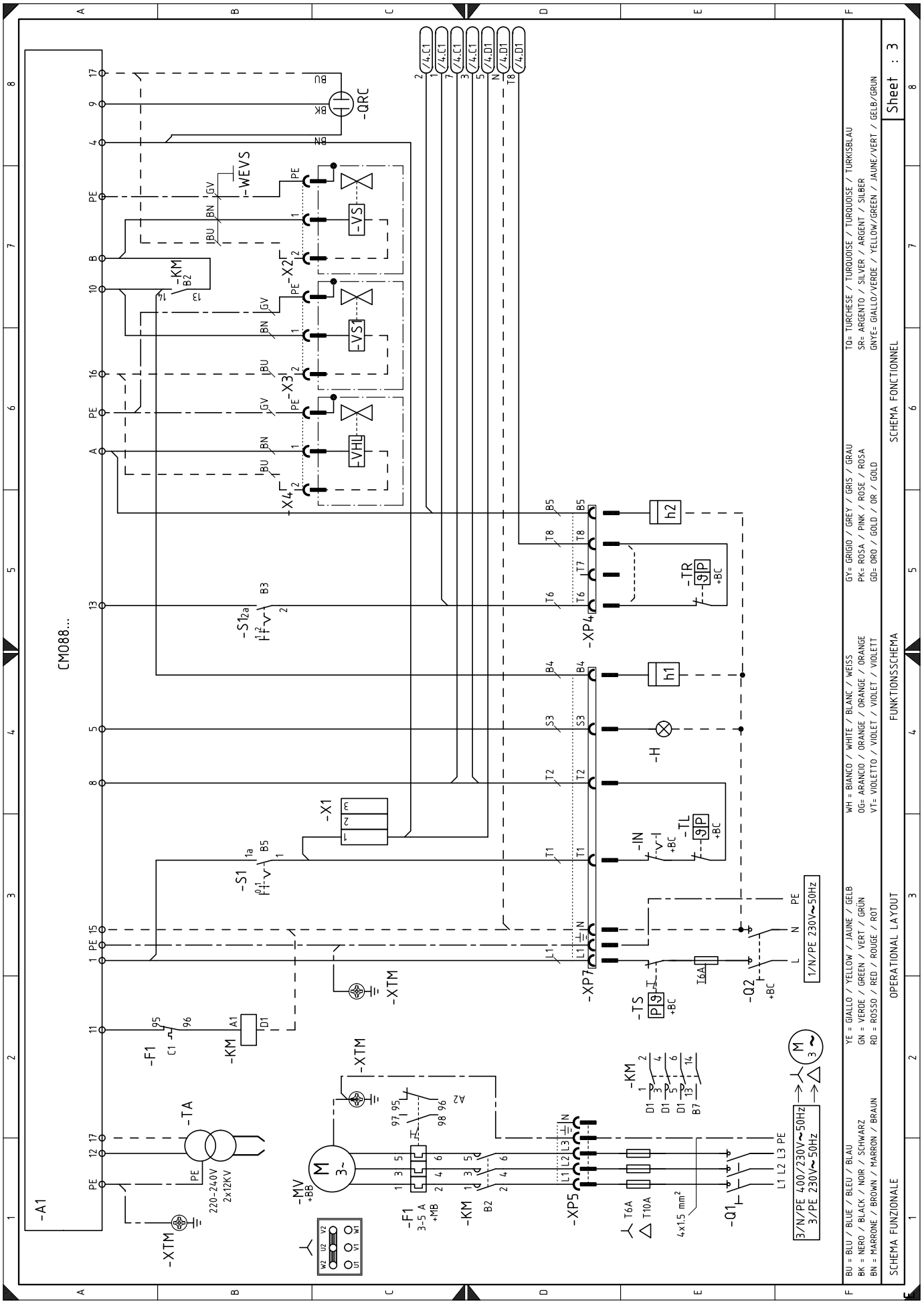
Burner	Filter	Code
RL 42 BLU	with filter	3010055
RL 42 BLU	without filter	3010054

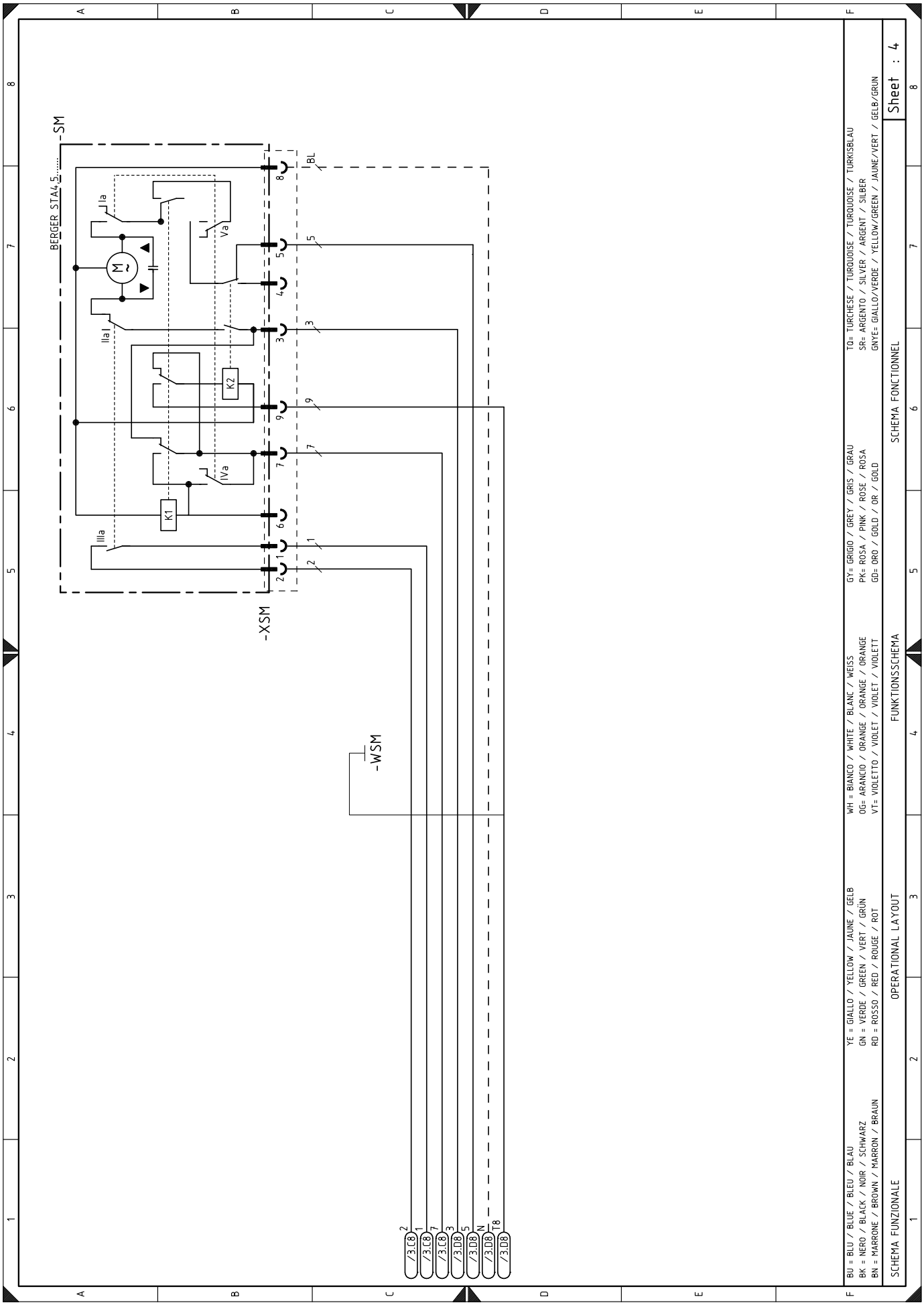
B Appendix - Electrical panel layout

1	**Index of layouts**
2	References layout
3	Operational layout
4	Operational layout
5	Electrical connections set by installer

2 Reference layout




CM088...
-A1
-XTM
-TA
220-240V
2x12KV
-F1
3-5 A
+MB
-KM
B2
-MV
+BB
-XP5
-Q1
4x1.5 mm²
T6A
T10A
3/N/PE 400/230V~50Hz
3/PE 230V~50Hz
-S1
-S12a
-X1
-XP7
-IN
-TL
-TS
-H
h1
h2
-XP4
-TR
-Q2
1/N/PE 230V~50Hz
-X2
-X3
-X4
-VS
-VS1
-VHL
-WEVS
-QRC
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


-SM
BERGER STA44.5
Ia
IIa
IIIa
IVa
Va
K1
K2
-XSM
-WSM
BL
/3.C8
/3.C8
/3.C8
/3.D8
/3.D8
/3.D8
/3.D8
N
T8
BU = BLU / BLUE / BLEU / BLAU
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SCHEMA FUNZIONALE
OPERATIONAL LAYOUT
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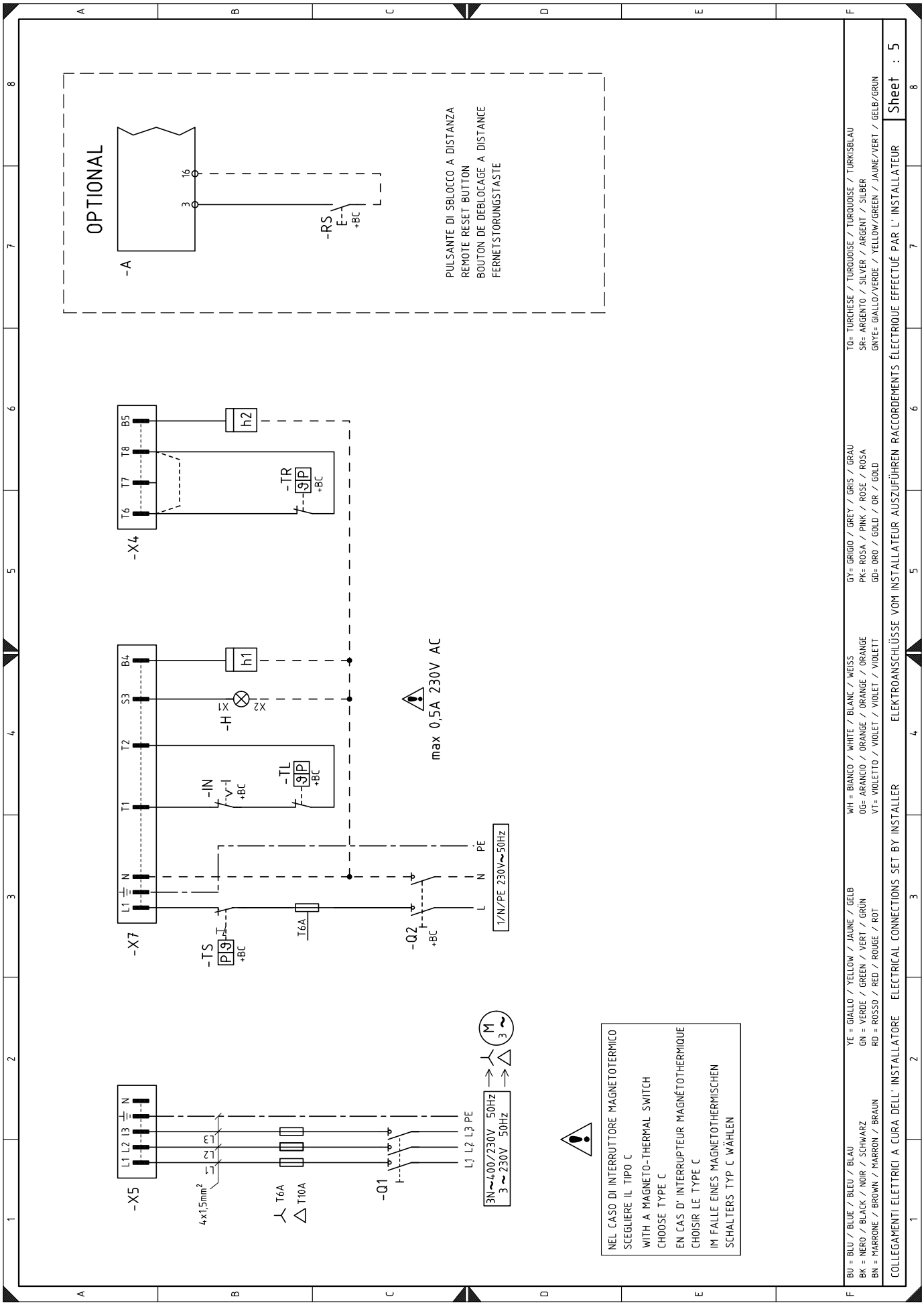
SCHEMA FONCTIONNEL
Sheet : 4


OPTIONAL
-A
-RS
PULSANTE DI SBLOCCO A DISTANZA
REMOTE RESET BUTTON
BOUTON DE DEBLOCAGE A DISTANCE
FERNETSTORUNGSTASTE
-X4
-TR
h2
-X7
-H
h1
-IN
-TL
-TS
T6A
-Q2
max 0,5A 230V AC
1/N/PE 230V~50Hz
-X5
4x1,5mm²
T6A
T10A
-Q1
L1 L2 L3 PE
3N~400/230V 50Hz
3~230V 50Hz
M
3~
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
BU = BLU / BLUE / BLEU / BLAU
BK = NERO / BLACK / NOIR / SCHWARZ
BN = MARRONE / BROWN / MARRON / BRAUN
YE = GIALLO / YELLOW / JAUNE / GELB
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TQ= TURCHESE / TURQUOISE / TURQUOISE / TÜRKISBLAU
SR= ARGENTO / SILVER / ARGENT / SILBER
GNYE= GIALLO/VERDE / YELLOW/GREEN / JAUNE/VERT / GELB/GRÜN
COLLEGAMENTI ELETTRICI A CURA DELL' INSTALLATORE ELECTRICAL CONNECTIONS SET BY INSTALLER ELEKTROANSCHLÜSSE VOM INSTALLATEUR AUSZUFÜHREN RACCORDEMENTS ÉLECTRIQUE EFFECTUÉ PAR L' INSTALLATEUR
Sheet : 5

Legend

A1 - Flame control
H - Remote lock-out signal
h1 - 1st stage hourcounter
h2 - 2nd stage hourcounter
IN - Manual burner stop switch
MV - Fan motor
QRC - Flame sensor
Q1 - Three phase knife switch
Q2 - Single phase knife switch
RS - Remote reset button
SM - Servomotor
S1 - Switch: burner off - on
S1 1-2 - Switch: 1st and 2nd stage
TA - Ignition transformer
TL - Limit control device system:
this shuts down the burner when the boiler temperature or pressure exceeds the setpoint value
TR - High-low mode control device system:
this controls operating stages 1st and 2nd and is necessary only for two-stage operation
TS - Safety control device system:
this operates when TL is faulty
T6A - Fuse
VH/L - High/low pressure solenoid valve
VS - Security solenoid valve
XP4 - 4 pole socket
XP5 - 5 pole socket
XP7 - 7 pole socket
XSM - Servomotor connector
XTM - Burner ground (earth) connection
X1 - Burner terminal strip
X4 - 4 pole plug
X5 - 5 pole plug
X7 - 7 pole plug

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