

Dual fuel light oil/gas burners

Progressive two-stage or modulating operation

CE UK CA

CODE	MODEL	ТҮРЕ
20147815	RLS 1000/M MX	1311 T
20147814	RLS 1200/M MX	1312 T

20148180 (3) - 02/2022



Translation of the original instructions

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1	Declar	Declarations									
2	Inform	Information and general warnings									
	2.1	Information about the instruction manual									
	2.2	Guarantee and responsibility									
3	Safety	and prevention									
	3.1	Introduction									
	3.2	Personnel training									
4	Techni	ical description of the burner	7								
	4.1	Burner designation									
	4.2	Models available	7								
	4.3	Burner categories - Countries of destination	7								
	4.4	Technical data									
	4.5	Electrical data									
	4.6	Maximum dimensions									
	4.7	Firing rates									
	4.8	Test boiler									
	4.9	Burner description									
	4.10	Electrical panel description									
	4.11	Burner equipment									
	4.12	Control box RFGO-A22									
	4.13	Servomotor (SQM10.1)									
5	Installa	ation									
	5.1	Notes on safety for the installation									
	5.2	Handling									
	5.3	Preliminary checks									
	5.4	Operating position									
	5.5	Removing the shutter lockout screws									
	5.6	Preparing the boiler									
	5.7	Securing the burner to the boiler									
	5.8	Access to head internal part									
	5.9	Electrode position									
	5.10	Nozzle installation									
	5.11	Combustion head adjustment									
	5.12	Light oil supply									
	5.13	Pump									
	5.14	Gas supply									
	5.15	Activation of the burner lance									
	5.16	Electrical connections									
	5.17	Calibration of the thermal relay									
	5.18	Motor rotation									
6	Start-u	ıp, calibration and operation of the burner									
	6.1	Notes on safety for the first start-up									
	6.2	Adjustments prior to ignition (light oil)									
	6.3	Burner ignition (light oil)									
	6.4	Adjustments prior to ignition (gas)									
	6.5	Burner start-up (gas)									
	6.6	Burner ignition									
	6.7	Change of fuel									

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	6.8	Servomotor adjustment	
	6.9	Combustion air adjustment	
	6.10	Burner adjustment and output modulation	
	6.11	Air / fuel adjustment	
	6.12	Pressure switch adjustment	
	6.13	Operation sequence of the burner	
	6.14	Final checks (with burner operating)	
7	Mainte	enance	
	7.1	Notes on safety for the maintenance	
	7.2	Maintenance programme	
	7.3	Opening the burner	
	7.4	Closing the burner	40
8	LED in	ndicator and special function	41
	8.1	Description of LED lamps	41
	8.2	Check mode function	41
	8.3	Flame control lock-out or emergency stop condition	41
	8.4	LED lamps: burner operating status	
9	Proble	ems - Causes - Remedies signalled by LED indicators	43
A	Appen	ndix - Accessories	48
в	Appen	ndix - Electrical panel layout	49



1 Declarations

Declaration of Co	onformity in accordan	ce with ISO / IEC 17	050-1						
Manufacturer:		RIELLO S.p.A.	RIELLO S.p.A.						
Address:			Via Pilade Riello, 7 37045 Legnago (VR)						
Product:		Dual fuel light oil/o	jas burners						
Model and type:		RLS 1000/M MX RLS 1200/M MX							
These products ar	e in compliance with the	e following Technical	Standards:						
EN 676									
EN 267									
EN 12100									
and according to the	ne European Directives	:							
GAR		2016/426/EU		Gas Devices Regulation					
MD		2006/42/EC		Machine Directive					
LVD		2014/35/EU		Low Voltage Directive					
EMC		2014/30/EU		Electromagnetic Compatibility					
PED		2014/68/EU (FS2	only)	Pressure Equipment Directive					
Such products are	marked as indicated b	elow:							
	RLS 1000/M MX	CE-0085CN0119	Class 2 (EN 267) - Clas	ss 3 (EN 676)					
77	RLS 1200/M MX	CE-0085CN0120	Class 2 (EN 267) - Clas	ss 3 (EN 676)					
The quality is gua	aranteed by a quality a	and management sy	ystem certified in accor	dance with ISO 9001:2015.					
Legnago, 03.05.20)21			elopment Director					
			•	Burner Department					
			Mr. F. I	Maltempi					
				<i>>/</i>					
			AZ	· ·					
			/						

Manufacturer's Declaration							
RIELLO S.p.A. declares that the following products comply with the NOx emission limits specified by German standard "1. BImSchV revision 26.01.2010".							
Product	Туре	Model	Output				
Dual fuel light oil/gas burners	1311 T 1312 T	RLS 1000/M MX RLS 1200/M MX	1200 - 10600 kW 1500 - 11500 kW				

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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, <u>cause</u> serious injury, death or long-term health risks.



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



This symbol indicates operations which, if not carried out correctly, <u>may cause</u> 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

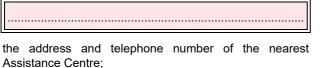
Ch.	Chapter
Fig.	Figure
Page	Page
Sec.	Section
Tab.	Table

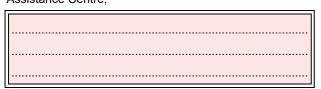


2.1.4 Delivery of the system and the instruction manual

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;





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.



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.

- 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.

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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;

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, he 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.

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.

In addition:

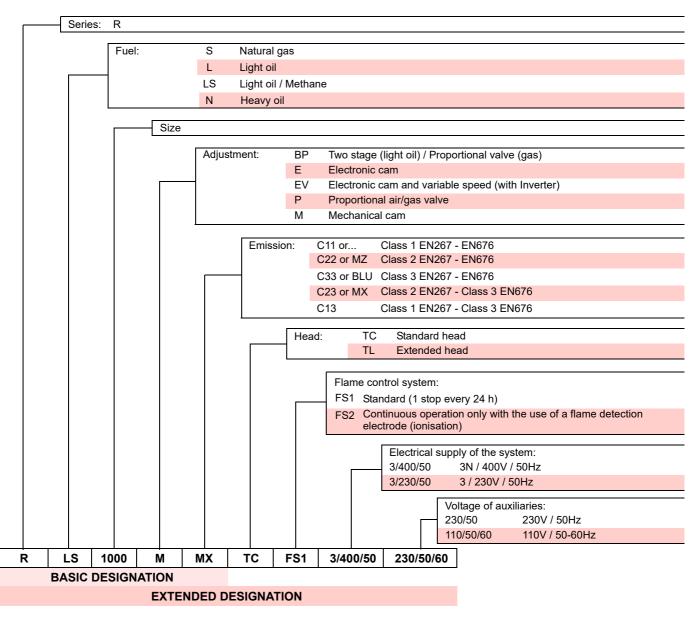


- must take all the measures necessary to prevent unauthorised people gaining access to the machine;
- the user must inform the manufacturer if faults or malfunctioning of the accident prevention systems are noticed, along with any presumed danger situation;
- personnel must always use the personal protective 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		Voltage	Start-up	Code
RLS 1000/M MX	TC	3/400/50	Star/Triangle	20147815
RLS 1200/M MX	TC	3/400/50	Star/Triangle	20147814

Tab. A

4.3 Burner categories - Countries of destination

Country of destination	Gas category
SE - FI - AT - GR - DK - ES - GB - IT - IE - PT - IS - CH - NO	I _{2H}
DE	I _{2ELL}
NL	I _{2L} - I _{2E} - I ₂ (43.46 ÷ 45.3 MJ/m ³ (0°C))
FR	l _{2Er}
BE	I _{2E(R)B}
LU - PL	I _{2E}
	Tab. B

4.4 Technical data

Model			RLS 1000/M MX	RLS 1200/M MX	
Туре			1311 T 1312 T		
Output ₍₁₎ Delivery ₍₁₎	min - max kW kg/t		1200/3750 ÷ 10600 100/315 ÷ 867	1500/5500 ÷ 11500 171/462 ÷ 942	
Fuels			 Light oil, max. viscosity at 20 °C: 6 mm²/s (1.5 °E - 6 cSt) Natural gas: G20 (methane) - G25 		
Gas pressure at max. output Gas: G20/G25	t ₍₂₎ - mba	r	67.8/101.1	97.2/145	
Operation			 Intermittent (min. 1 stop in 24 hours) Progressive two-stage or modulating by kit (see accessories) 		
Pump Output at 30 ba Pressure range Fuel temperatu	e bar		1400 9/40 140	1826 9/40 140	
Nozzles	numb	er	1		
Standard applications			Boilers: water, steam, diathermic oil		
Ambient temperature °C			0 - 50		
Combustion air temperature °C max			60	0	
Noise levels (3) Sound p Sound p	pressure dB(A	()	85.4 96.4	84.4 95.4	
Weight	kg		500	540	

Tab. C

(1) Reference conditions: Ambient temperature 20°C - Gas temperature 15°C - Barometric pressure 1013 mbar - Altitude 0 m a.s.l.

(2) Pressure at test point 5)(Fig. 4 on page 11) with zero pressure in combustion chamber and at maximum burner output.

(3) Sound pressure measured in manufacturer's combustion laboratory, with burner operating on test boiler and at maximum output. The sound power is measured using the "Free Field" method, required by EN 15036 standard, and according to an "Accuracy: Category 3" measurement, as described in EN ISO 3746.

4.5 Electrical data

Model		RLS 1000/M MX RLS 1200/M MX			
Electrical power supply		3N ~ 400)V 50 Hz		
Fan motor IE3	rpm V kW A	2950 400/690 22 39.4/22.7	2930 400/690 25 44/25.4		
Pump motor IE3	rpm V kW A	1458 230/400 2.2 9.3/5.4	1400 400 4 8.2		
Ignition transformer	V1 - V2 I1 - I2				
Electrical power consumption Light oil Gas	kW max	27.4 25	32.9 28		
Protection level		IP	55		

Tab. D



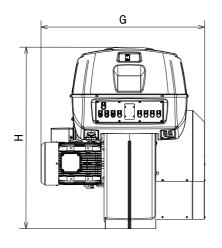
4.6 Maximum dimensions

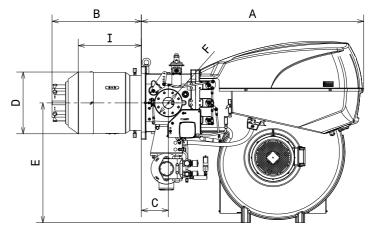
The dimensions of the burner are given in Fig. 1.

Bear in mind that inspection of the combustion head requires the burner to be opened and the rear part turned on the hinge.

The maximum dimensions of the open burner are indicated by the L and R positions.

The I position is reference for the refractory thickness of the boiler door.





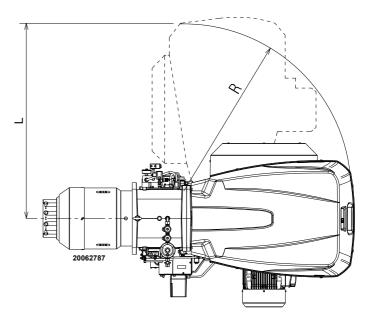


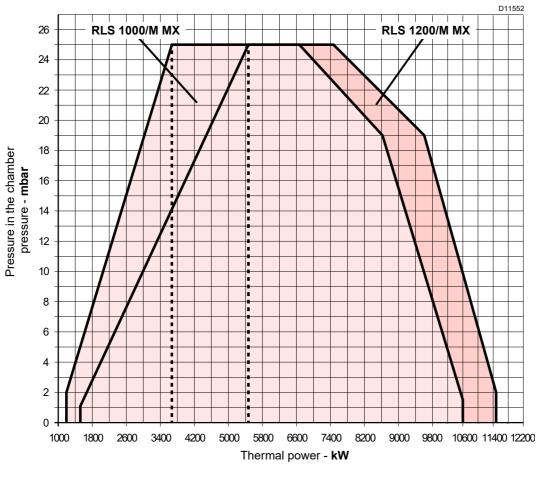
Fig. 1

mm	Α	В	С	D	Е	F	G	Н	I	L	R
RLS 1000/M MX	1637	674	200	413	885	DN80	1206	1338	484	1425	1350
RLS 1200/M MX	1637	658	200	456	885	DN80	1250	1338	465	1425	1350
											Tab. E

4.7 **Firing rates**

The MAXIMUM OUTPUT is chosen from within the continuous diagram area (Fig. 2). The **MINIMUM OUTPUT** must not be lower than the minimum limit of the diagram: WARNING RLS 1000/M MX = 3750 kW RLS 1200/M MX = 5500 kW 26 **RLS 1000/M MX** 24 22 20 18

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 a.s.l.), and with the combustion head adjusted as shown on page 19.



4.8 **Test boiler**

The burner/boiler combination does not pose any problems if the boiler is EC approved and its combustion chamber dimensions are similar to those indicated in the diagram (Fig. 3).

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

The firing rates were obtained in special test boilers, according to EN 676 standard.

In Fig. 3 you can see the diameter and length of the test combustion chamber.

Example:

Output 7000 kW - diameter 120 cm - length 6 m

MODULATING RATIO

The modulating ratio, obtained in test boilers, according to standard (EN 676 for gas, EN 267 for light oil), is of 4:1 for light oil and 7:1 for gas.

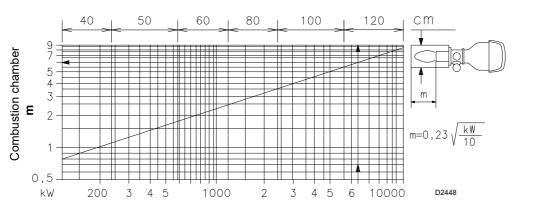
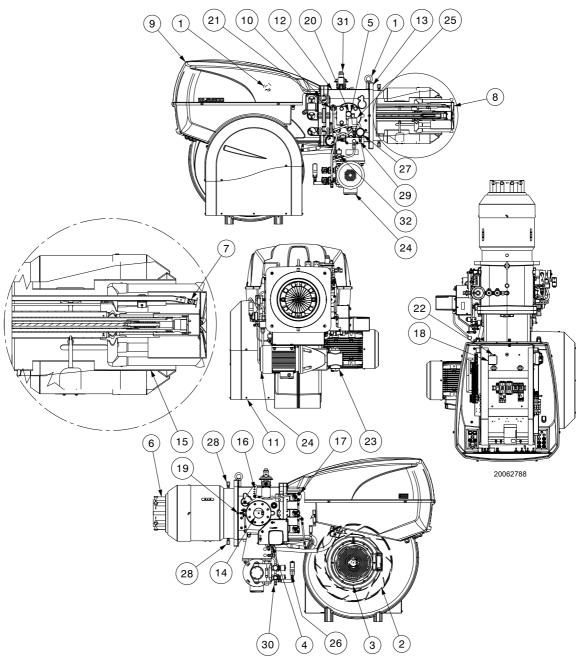


Fig. 2

Fig. 3

Technical description of the burner

4.9 Burner description



- 1 Lifting rings
- 2 Impeller
- 3 Fan motor
- 4 Air damper servomotor
- 5 Combustion head gas pressure test point
- 6 Combustion head
- 7 Ignition pilot
- 8 Flame stability disc
- 9 Electrical panel casing
- 10 Hinge for opening the burner
- 11 Fan air inlet
- 12 Pipe coupling
- 13 Gasket for boiler fixing
- 14 Gas train flange
- 15 Shutter
- 16 Combustion head movement lever
- 17 Air damper movement levers
- 18 Air pressure switch (differential type)
- 19 Combustion head air pressure test point
- 20 Maximum gas pressure switch with pressure test point
- 21 UV cell
- 22 Pressure test point for air pressure switch "+"

- 23 Pump
- 24 Pump motor
- 25 Maximum oil pressure switch
- 26 Minimum oil pressure switch
- 27 Nozzle return pressure gauge
- 28 Screws to lock the shutter during transportation (replace them with the M12x25 screws supplied as standard)
- 29 Oil modulator
- 30 Pressure gauge connection
- 31 Pilot gas train
- 32 3-way valve for the mechanical activation of the burner lance



The burner can be opened to the right or to the left without links to the fuel supply side.

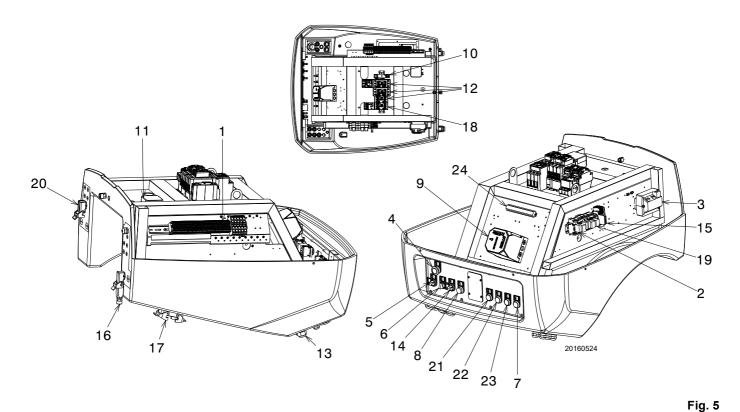


The gas can only enter from the left side of the burner as shown in Fig. 4.





4.10 **Electrical panel description**



- Main terminal supply board 1
- Dry contact relay output 2
- 3 Ignition transformer
- 4 Stop push-button
- 5 OFF-automatic-manual selector
- 6 Power increase - power reduction selector
- Fan/pump motor, motor thermal relay indicator light 7
- 8 Burner lockout warning lamp and reset switch
- 9 Electrical control box
- 10 Timer
- 11 Air pressure switch
- 12 Fan motor contactor and thermal relay, star-triangle starter
- 13 Supply cables, external connections and kits
- 14 Fuel selector and enable signal to remote fuel selector
- 15 Auxiliary circuits fuse
- Plug/socket servomotor 16
- 17 Valve/pump motor plug/socket, Pgm (deriv. unit)
- 18 Pump motor contactor and thermal relay

4.11 **Burner equipment**

Gasket for gas train flangeNo. 1Gas flange fixing screws, M 16 x 70No. 8
Thermal flange gasket
M 12 x 25 screws
M 20 x 70 screws to secure the burner flange
to the boiler No. 4
Light gas flexible hoses No. 2
Fitting 1" - 3/4" (RLS 1000/M MX) No. 1
Fitting 1" - 1" 1/2 (RLS 1200/M MX) No. 1
Fitting 1" - 1/2" No. 1
Rotating elbow 1" 1/2 No. 1
Instruction
Spare parts list No. 1

- 19 Oil/Gas selection relay
- Flame sensor plug/sensor socket 20
- Light signalling of mains live state 21
- Heat request lighting signal 22
- Light signalling of main fuel valve open Terminal board for RWF50 kit 23
- 24

NOTE

Two types of burner lockout may occur:

Control box lockout: if the button (red LED) of control box ≻ 9)(Fig. 5) and signal button 8) light up, the burner is locked out.

Release by pressing button 8).

Motor lockout: release by pressing the button on thermal > relay.

4.12 Control box RFGO-A22

Important notes



To avoid accidents, material or environmental damage, observe the following instructions!

The control box is a safety device! Avoid opening or modifying it, or forcing its operation. The Manufacturer cannot assume any responsibility for damage resulting from unauthorised work!

- ➤ All interventions (assembly and installation operations, assistance, etc.) must be carried out by qualified personnel.
- Before modifying the wiring in the control box connection area, fully disconnect the system from the power supply (omnipolar separation).
- Protection against electrocution from the control box and all connected electric components is obtained with the correct assembly.
- Before any intervention (assembly and installation operations, assistance, etc.), ensure the wiring is in order and that the parameters are correctly set, then make the safety checks.
- ➤ Falls and collisions can negatively affect the safety functions. In this case, the control box must not be operated, even if it displays no evident damage.

For safety and reliability, comply with the following instructions:

- avoid conditions that can favour the development of condensate and humidity. Otherwise, before switching on again, make sure that the entire control box is perfectly dry!
- Static charges must be avoided since they can damage the control box's electronic components when touched.

Use

The control box is a control and supervision system of medium and large capacity forced draught burners.

If used with the flame detection electrode the system can operate continuously whereas, with the use of UV sensors it operates intermittently with stop and restart request at least once every 24h.

Installation notes

- Make sure that the electrical wiring inside the boiler complies with national and local safety regulations.
- Do not confuse the powered conductors with the neutral ones.
- Ensure that spliced wires cannot get into contact with neighbouring terminals. Use adequate ferrules.
- Arrange the H.V. ignition cables separately, as far as possible from the control box and the other cables.
- When wiring the unit, make sure that AC 230 V mains voltage cables are run strictly separate from extra low-voltage cables to avoid risks of electrical shock hazard.



Fig. 6

Technical data

Mains voltage	AC 230 V -15% / +10%
Mains frequency	50 / 60 Hz
Primary fuse (external)	Refer to the electric system
Weight	approx. 1.1 kg
Power absorption	approx. AC 7 VA
Protection level	IP40
Safety class	II
Environmental conditions	
Operation	DIN EN 60721-3-1
Climatic conditions	Class 1K2
Mechanical conditions	Class 1M2
Temperature range	-40+60°C
Humidity	< 90% RH (non-condensing)
	Tab E

Tab. F

Electrical wiring of the flame detector

It is important for signal transmission to be almost totally free of any disturbances or loss:

- Always separate the detector cables from the other cables:
- The capacitive reactance of the line reduces the size of the flame signal.
- Use a separate cable.
- Respect the allowed cable lengths.
- The ionisation probe is not protected against the risk of electrocution. When connected to the electricity supply, the ionisation probe must be protected against any accidental contact.
- Position the ignition electrode and the ionisation probe so that the ignition spark cannot form an arc on the probe (risk of electric overcharge).

4.13 Servomotor (SQM10.1...)

Important notes



To avoid accidents, material or environmental damage, observe the following instructions!

Avoid opening, modifying or forcing the actuators.

- ► All interventions (assembly and installation operations, assistance, etc.) must be carried out by qualified personnel.
- Before modifying the wiring in the connection area of the servomotor, fully disconnect the burner control device from the power supply (omnipolar separation).
- ➤ To avoid the risk of electrocution, protect the connection terminals in a suitable manner and correctly fix the cover.
- ► Check the wiring is in order.
- ➤ Falls and collisions can negatively affect the safety functions. In this case, the servomotor must not be operated, even if it displays no evident damage.

Assembly notes

- Check the relevant national safety standards are respected.
- When assembling the servomotor and connecting the damper, the gears can be disengaged by means of a lever, allowing the drive shaft to be easily adjusted in both directions of rotation.



Fig. 7

Technical data

AC 220240V, 50 Hz –15 % / +10 % AC 220 V, 60 Hz –15 % / +10 %
10 (3) A, AC 24250 V
up to 160° (full scale)
option
IP 54, DIN 40050
I
approx. 1.7 kg
synchronous motor
9 VA
IS:
DIN EN 60 721-3-1 Class 1K3 Class 1M2 -20+70°C < 95% RH

Tab. G



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.



5

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



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.



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.



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.



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



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. 8) 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 gas used and the relative supply pressures (G);
- the possible minimum and maximum output data of the burner (H) (see Firing rate).
 Warning. The burner output must be within the firing rate of the boiler;
- the category of the appliance/countries of destination (I);
- ► light oil maximum viscosity (L).

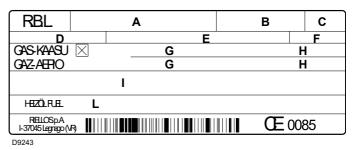


Fig. 8



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



5.4 Operating position

Π



DANGER

- The burner is designed to operate only in positions 1, 2, 3 and 4 (Fig. 9).
- 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 operation but make maintenance and inspection of the combustion head more difficult.
 - ➤ Any other position could compromise the correct operation of the appliance.
 - ► The installation **5** is prohibited for safety reasons.

5.5 Removing the shutter lockout screws

Remove the screws 1)-2) and nuts before fitting the burner onto the boiler (Fig. 10).

Replace them with the screws 3) M12x25 supplied as standard.

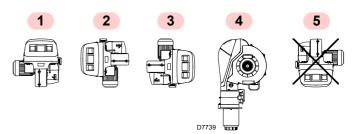


Fig. 9

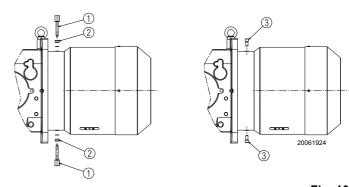
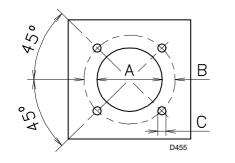


Fig. 10

5.6 Preparing the boiler

5.6.1 Boring the boiler plate

Pierce the closing plate of the combustion chamber, as in Fig. 11. The position of the threaded holes can be marked using the thermal insulation screen supplied with the burner.



mm	Α	в	С
RLS 1000/M MX	460	608	M 20
RLS 1200/M MX	500	608	M 20
			Tab. H

5.6.2 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.

For boilers with front flue passes 1)(Fig. 12) or flame inversion chamber, a protection in refractory material 5) must be inserted between the boiler fettling 2) and the blast tube 4).

This protection must not compromise the extraction of the blast tube.

For boilers with a water-cooled front piece, a refractory lining 2)-5)(Fig. 12) is not necessary, unless expressly requested by the boiler manufacturer.

Eig 11



5.7 Securing the burner to the boiler

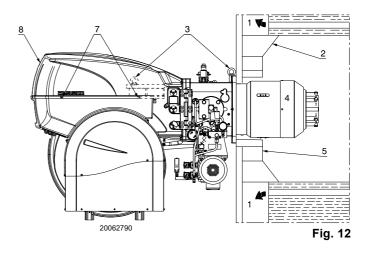


Prepare a suitable lifting system using rings 3)(Fig. 12).

- Fit the heat insulation supplied onto the blast tube 4).
- ➤ Fit the entire burner onto the boiler hole prepared previously, as in Fig. 11, and fasten with the screws supplied.



The seal between burner and boiler must be airtight.



5.8 Access to head internal part

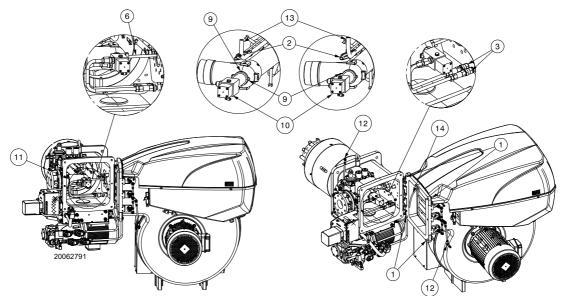
In order to reach inside the combustion head (Fig. 13) proceed as follows:

- disconnect the electrical connections of the servomotor pump motor derivation unit;
- disconnect the levers related to the cam and the movement of the head 12);
- unscrew the 4 fixing screws 1) and open the burner on the hinge;
- disconnect the cable 14) from the electrode 2);
- disconnect the light oil pipes unscrewing the two pipe fittings 3).



Be careful as some drops of fuel may leak out during this phase.

- ► Release the ignition pilot fitting 13);
- remove the gas pressure screw/test point 6) of the head;
 unscrew the locking screw of the oil lance 9) and extract the oil lance from the combustion head 10);
- ▶ pull out the inner part of the head 5).



5.9 Electrode position



Position the electrode on ignition pilot according to the dimensions shown in Fig. 14.

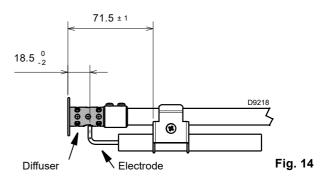


Fig. 13

5.10 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 Riello in the Instruction and warning booklet should be used.



CAUTIO

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

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

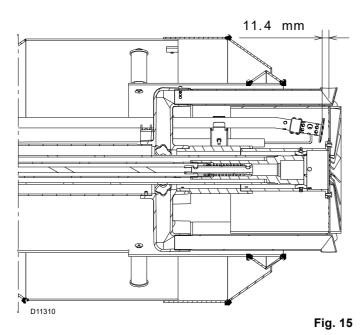
The manufacturing Company shall not be liable for any such damage arising from nonobservance of the requirements contained in this manual.

Fit the nozzle with a 24 mm (for RLS 1000/M MX) and 41 mm (for RLS 1200/M MX) box wrench, passing from the centre opening of the flame stability disc (Fig. 15).

Fit the nozzles with the fuel interception rod on the nozzle holder. To calibrate the delivery range of operation of the nozzle, adjust the fuel pressure on the nozzle return line, according to Tab. I.



- 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.



5.10.1 Recommended nozzle

Model	Nozzle	
RLS 1000/M MX	BergonzoFluidics	type B5 60° type W2 60°
RLS 1200/M MX	– Bergonzo	type C3 - C5 60°

Complete range of nozzles:

- Bergonzo type B5 60°:
 350 375 400 425 450 475 500 525 550 575 600
 650 700 750 800 850 900.
- Bergonzo type C3 C5 60°:
 700 800 900 1000 1100.
- Fluidics type W2 60°: 375 - 400 - 450 - 500 - 550 - 600 - 650 - 700 - 750.

Nozzle	kg/h	Delivery pressure (bar)	Return pressure (bar)	kg/h	kW
	350	18	8	100	1200
60°	550	20	17.5	315	3750
B5 6(600	20	6	140	1675
	000	22	16	563	6700
Bergonzo	750	20	6.5	180	2150
ergo	750	22	19	722	8600
ä	m 900	16	4	168	2000
	900	20	15	867	10300
	700	18	3	172	2043
60°	700	20	16	462	5500
C5	700	18	3	172	2043
3-	700	20	19	635	7550
02	000	17	5	237	2815
lon	2 900	18	17.5	791	9400
Bergonzo	1100	16	6	273	3242
ш	1100	18	16.5	961	11425

Tab. I

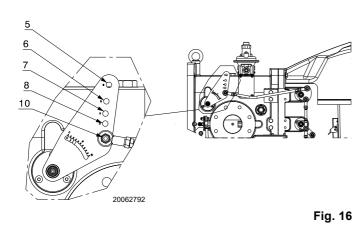


5.11 Combustion head adjustment

The air damper servomotor 4)(Fig. 4), beyond varying the air output according to the output demand, through a leverage varies the combustion head adjustment.

This system allows an optimum adjustment also at minimum firing rate.

Similarly to servomotor rotation, it is possible to vary the opening of the combustion head moving the tie-rod on the holes (5-6-7-8-10)(Fig. 16).



The selection of the hole to be used is determined based on the maximum output requested, as illustrated in Tab. J.

In the factory, the hole is adjusted for the maximum stroke (hole 10, Fig. 16).

	Lavaraga hala	Output	t (kW)
	Leverage hole	From	То
Σ	5	1200	3750
000	5	3750	6700
RLS 1000/M	8	6700	8600
RL	8	8600	10600
Σ	5	1500	5500
200	5	5500	7500
RLS 1200/M	6	7500	9600
R	10	9600	11500

Tab. J



The gas pipes leave the factory calibrated at notch 1.

The adjustment shown in Fig. 17 allows the gas pipes to be positioned in the best way for the application on which the burner is installed (e.g. boilers with flame inversion chamber).

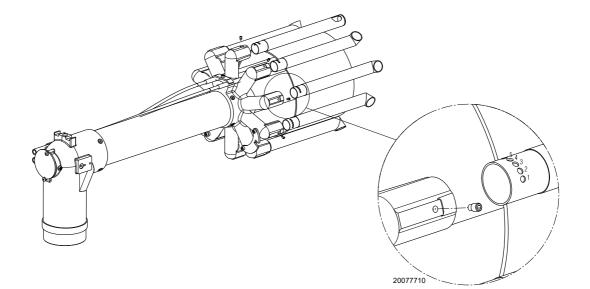


Fig. 17

5.12 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.



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

5.12.1 Double-pipe circuit

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

Tank higher than burner A (Fig. 18)

The distance "P" must not exceed 10 meters in order to avoid subjecting the pumps 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.

Tank lower than burner B (Fig. 18)

The pump depression value must not exceed 0.45 bar (35 cm Hg). Because at higher levels gas is released from the fuel; the pump becomes noisy and its lifetime is shortened.

It is good practice to ensure that the return and suction lines enter the burner from the same height; the suction line is more difficult to disconnect.

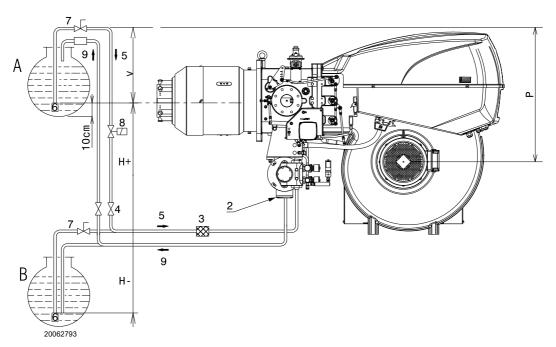
5.12.2 Loop circuit

The loop circuit is composed of a duct starting from the tank and going back to it, in which an auxiliary pump makes the pressurised fuel flow. A branch from the loop supplies 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 Tab. K.

,	F	RLS 100	00/M M	X	F	RLS 120	00/M M	X
+/- H [m]		Ø [mm]				Ø [mm]		
[]	20	22	24	27	22	24	27	36
4.0	26	45	73	138	19	33	65	300
3.0	22	39	63	120	16	28	55	260
2.0	18	33	53	102	13	23	45	220
1.0	15	26	44	84	10	18	38	185
0.5	13	23	39	75	9	16	33	165
0	11	20	34	66	7	13	30	145
-4.0	-	-	-	-	-	-	-	-
-3.0	-	-	-	12	-	-	-	30
-2.0	-	7	14	30	-	-	11	70
-1.0	7	14	24	48	-	9	20	108
-0.5	9	17	29	57	5	11	25	125
0	11	20	34	66	7	13	29	145

Tab. K



Key (Fig. 18)

- H = Pump/Foot valve height difference
- \emptyset = Inside pipe diameter
- 1 = Burner
- 2 = Pump
- 3 = Filter
- 4 = Manual on/off valve
- 5 = Suction line
- 6 = Foot valve
- 7 = Quick closing manual valve with remote control (Italy only)

- Fig. 18
- 8 = On/off solenoid valve (Italy only). See electrical layout. Connections to be carried out by the installer (SV).
- 9 = Return line

5.12.3 Hydraulic connections



Make sure that the hoses to the pump supply and return line are installed correctly.

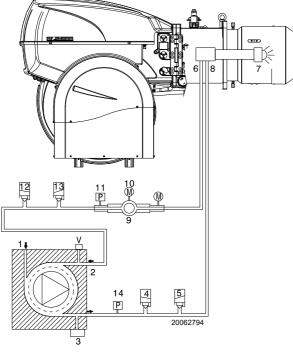


WARNING

Follow the instructions below:

- Tighten the flexible hoses with the supplied > gaskets.
- During the installation, hoses must not be > stressed with twisting.
- Position hoses so that they cannot be > stepped on or get into contact with hot parts of the boiler and so that they allow burner opening.
- Finally, connect the other end of the flexible hoses to the suction and return line ducts.

5.12.4 Hydraulic circuit diagram



Key (Fig. 19)

- Pump suction line 1
- 2 Pump return line and nozzle return line
- 3 Pump pressure regulator
- 4 Delivery safety valve
- 5 Delivery safety valve
- 6 Nozzle delivery line
- Nozzle without interception rod 7
- 8 Nozzle return line
- 9 Pressure variator on nozzle return line
- 10 Pressure variator servomotor
- Pressure switch on nozzle return line 11
- 12 Safety valve on nozzle return line
- 13 Safety valve on nozzle return line
- Pressure switch on pump delivery line 14
- Pressure gauges Μ
- Vacuometer connection V

OPERATION

Pre-purging phase:valves 4), 5), 12) and 13) closed.

Ignition and operation phase: valves 4), 4), 12) and 13) open. Stop: all valves closed.

5.12.5 Pressure variator

Calibration pressure on return line

With a servomotor position of 20°, the nut and the corresponding lock nut 6)(Fig. 20), are fixed in contact with the eccentric 3). During the rotation towards 130° of the servomotor, the eccentric will push the modulator shaft, taking the pressure, read on the pressure gauge 2)(Fig. 20), to the desired value.

To calibrate the eccentric, loosen screws 7), and turn screw 4) until the desired eccentricity is obtained.

- By turning screw 4) to the right (+) the eccentricity increases, thereby increasing the difference between the maximum and minimum capacity of the nozzle.
- By turning screw 4) to the left (-) the eccentricity decreases, thereby decreasing the difference between the maximum and minimum capacity of the nozzle.

Calibration pressure on delivery line

To adjust the delivery pressure, operate on the pump as described on page 22.

Example:

if you use a 750 kg/h nozzle and you want to obtain an output of 6650 kW, the pressure read on the pressure gauge 3)(Fig. 20) (max. pressure on return circuit) must be approx. 19 bar.

Relevant delivery pressure read on the pressure gauge 2), must be 22 bar (see table on page 18).

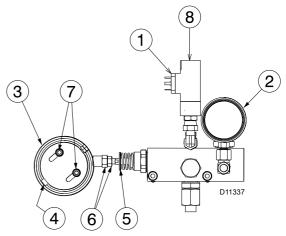


Fig. 19

Fig. 20

Key (Fig. 20)

- Maximum oil pressure switch 1
- 2 Return pressure gauge
- 3 Variable eccentric
- 4 Eccentric adjustment screw
- 5 Piston stop ring
- 6 Piston calibration nut and lock nut
- 7 Eccentric locking screws
- 8 Adjustment screw/calibration for maximum oil pressure switch



For a correct calibration, the eccentric 3) must operate on the entire range of travel of the servomotor (20° ÷ 130°): a pressure variation must correspond to each servomotor variation.



Never drive the variator piston fully home: the stop ring 5) determines the maximum stroke.



Screw 8)(Fig. 20) does not need adjusting as it has been calibrated in the factory

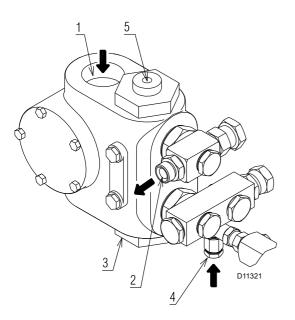
- To control the outlet delivery of the nozzle, proceed as follows:
- > open the burner following the instructions on page 17,
- connect a pipe to the nozzle, simulate the ignition and > proceed with the weighing at the maximum and minimum pressures.

If at the maximum delivery of the nozzle (maximum pressure on the return line) pressure oscillations can be seen on the pressure gauge 2), slightly reduce the pressure until they disappear.

5.13 Pump

Technical data 5.13.1

RLS 1000/M MX Pump **RLS 1200/M MX** VBHRG VBHGRP Min. delivery rate at 40 bar pressure 1160 kg/h 1660 kg/h Delivery pressure range 9 - 40 bar 9 - 40 bar Max. suction depression 0.6 bar 0.6 bar 6 - 800 cSt 6 - 800 cSt Viscosity range 140 °C 140 °C Max. light oil temperature 5 bar Max. suction and return pressure 5 bar Pressure calibration in the factory 22 bar 22 bar



G 3/4" (RLS 1000/M)

G 1/4"

G 1/4"

G 1" 1/2 (RLS 1200/M) G 1"

Key (Fig. 21)

- Suction line 1
- 2 Return line
- 3 Vacuometer connection
- 4 Gauge connection
- 5 Pressure adjuster

Fig. 21

NOTE:

The burner is factory calibrated with maximum pressure on the return line of approximately 19.5 bar and delivery pressure of approximately 22 bar.

5.13.2 Priming pump

WARNING

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

Tab. L

Obstructions in the line could cause the sealing organ located on the pump shaft to break.

- In order for the pump (Fig. 21) to be able to self-prime, the screw 4) must be loosened to purge the air in the suction line
- Start the burner by closing the remote controls. As soon as the burner starts, check the direction of rotation of the fan blade
- The pump can be considered to be primed when the light oil > starts coming out of the screw 4).
- Close the burner and undo the screws 4). >

The time required for this operation depends upon the diameter and length of the suction tubing.

If the pump fails to prime at first start-up and the burner locks out, wait approx. 15 seconds, reset the burner, and then repeat the start-up operation. And so on.

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

Do not light the UV cell in order to prevent the burner lockout; the burner locks out in any case about ten second after its start.



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 vacuometer 4)(Fig. 21) 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.

5.14 Gas 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.



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

5.14.1 Gas feeding line

Key (Fig. 22 - Fig. 23 - Fig. 24 - Fig. 25)

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

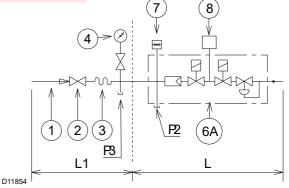


For applications compliant with Pressure Equipment Directive PED 2014/68/EU, the installer must provide for the use of:

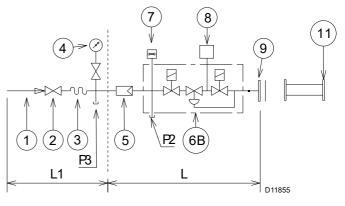
- devices suitable for drain and ventilation, as set out in clause K.10 of standard DIN EN 676;

- leak detection control devices, as set out in clause K.14.4 of standard DIN EN 676.



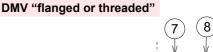


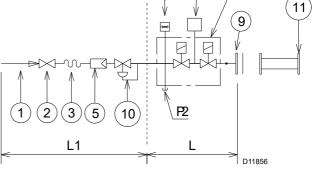
MBC "flanged"-VGD





6C







CB "flanged or threaded"

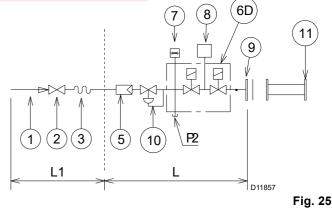


Fig. 22

RIELLO

Installation

5.14.4 Gas pressure

5.14.2 Gas train

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

5.14.3 Gas train installation



Disconnect the power supply using the system main switch.



Check that there are no gas leaks.



Pay attention when handling the train: danger of crushing of limbs.



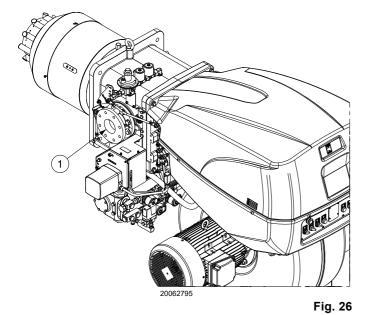
Make sure that the gas train is properly installed by checking for any fuel leaks.

The operator must use the required equipment



during installation.

The gas train is prearranged to be connected to the burner by the flange 1)(Fig. 26).



	kW	1 ∆p (mbar)		2 ∆p (mbar)	
	KVV	G 20	G 25	G 20	G 25
	3750	9.2	13.7	1.0	1.4
	4000	10.8	16.0	1.1	1.6
	4500	13.9	20.7	1.4	2.1
	5000	17.0	25.4	1.7	2.5
	5500	20.2	30.1	2.1	3.1
ΧW	6000	23.3	34.8	2.4	3.7
ž	6500	26.4	39.4	2.9	4.3
RLS 1000/M	7000	30.4	45.3	3.3	5.0
S 1	7500	34.8	51.9	3.8	5.7
RL	8000	39.2	58.5	4.4	6.5
	8500	43.6	65.1	4.9	7.3
	9000	49.2	73.3	5.5	8.2
	9500	55.0	82.0	6.1	9.2
	10000	60.8	90.7	6.8	10.1
	10600	67.8	101.1	7.6	11.4
	5500	23.1	34.5	2.1	3.1
	6000	27.9	41.6	2.4	3.7
	6500	32.6	48.7	2.9	4.3
	7000	37.4	55.7	3.3	5.0
ΜX	7500	42.1	62.8	3.8	5.7
RLS 1200/M MX	8000	48.3	72.1	4.4	6.5
200	8500	54.5	81.3	4.9	7.3
s 1	9000	60.7	90.6	5.5	8.2
RL	9500	67.0	99.8	6.1	9.2
	10000	74.3	110.8	6.8	10.2
	10500	81.9	122.2	7.5	11.2
	11000	89.6	133.6	8.2	12.3
	11500	97.2	145.0	9.0	13.4
					Tab. M

Tab. M indicates the pressure drops of the combustion head and

gas butterfly valve depending on the burner operating output.



Data of head thermal power and gas pressure refer to operation with gas butterfly valve fully open (90°).

The values shown in Tab. M refer to:

- Natural gas G 20 NCV 9.45 kWh/Sm³ (8.2 Mcal/Sm³)
- Natural gas G 25 NCV 8.13 kWh/Sm³ (7.0 Mcal/Sm³)

Column 1

Combustion head pressure drop.

Gas pressure measured at test point 1)(Fig. 27), with:

- combustion chamber at 0 mbar;
- burner working at maximum modulating output;
- combustion head adjusted as in page 19.

Column 2

Pressure drop at gas butterfly valve 2)(Fig. 27) with maximum opening: 90° .



To calculate the approximate output at which the burner operates:

- subtract the combustion chamber pressure from the gas pressure measured at test point 1)(Fig. 27).
- Find in Tab. M on page 24 related to the burner concerned, the pressure value closest to the result of the subtraction.
- Read the corresponding output on the left.

Example RLS 1000/M MX with natural gas G20:

Operation at maximum modulating output		
Gas pressure at test point 1)(Fig. 27)	=	44.2 mbar
Pressure in combustion chamber	=	5 mbar
44.2 - 5	=	39.2 mbar

A pressure of 39.2 mbar, column 1, corresponds in the table Tab. M to an output of 8000 kW.

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

To calculate the required gas pressure at test point 1)(Fig. 27), set the maximum modulating output required from the burner operation:

- find the nearest output value in Tab. M on page 24 for the _ burner in question.
- Read, on the right (column 1), the pressure at the test point 1)(Fig. 27).
- Add this value to the estimated pressure in combustion chamber.

Example RLS 1000/M MX with natural gas G20:

Operation at maximum modulating output			
Gas pressure at an output of 8000 kW	=	39.2 mbar	
Pressure in combustion chamber	=	5 mbar	
39.2 + 5	=	44.2 mbar	
pressure required at test point 1)(Fig. 27)			

essure required at test point 1)(Fig. 27).

5.14.5 Pilot - gas train connection

The burner is equipped with a dedicated gas train fixed to the sleeve.

> Connect it to the main gas train, downstream of the filter or pressure adjuster (according to the configuration).

Oil burners (with LPG pilot) can be directly connected to the LPG cylinder.



Supply pressure 68 ÷ 500 mbar.

5.14.6 Ignition pilot

For proper operation, adjust gas pressure (measured at pressure test point 1)(Fig. 28) as follows:

Model	Gas	mbar	Sm³/h
RLS 1000/M MX	G20	1.5	12.3
	G31	1.4	3.2
RLS 1200/M MX	G20	40	14.3
	G31	30	7.1



Check the stability of the pilot flame before igniting the main burner.

In case of ignition problems, check:

- the correct positioning of the ignition electrode; ≻
- the gas pressure, according to the specifications.

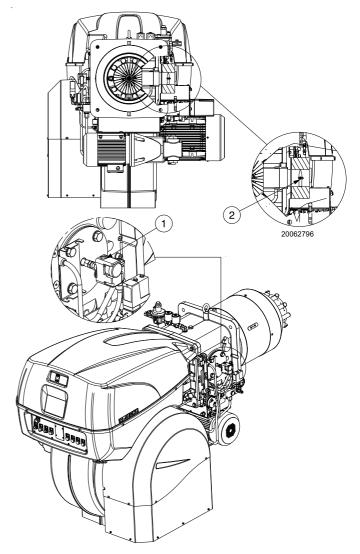
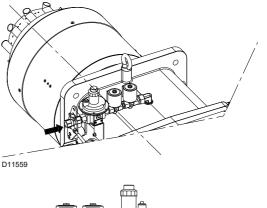


Fig. 27



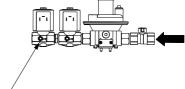


Fig. 28

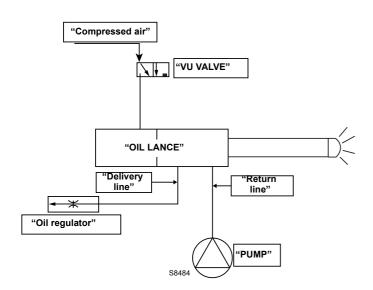
Tab. N

1

5.15 Activation of the burner lance

The burner is equipped with a spray lance for light oil. Fig. 29 shows the 3-way valve used for the mechanical activation of the burner lance and the point at which the compressed air input A) must be connected.

It must operate at 6 ÷ 7 bar.



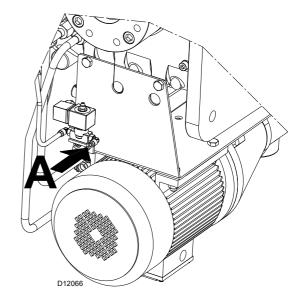


Fig. 29



5.16 Electrical connections

Notes on safety for the electrical wiring



- ► 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 operation (FS1).
- The RFGO safety device features two built-in flame amplifiers which allow using it for applications with UV sensor only, FR sensor only or with both sensors (UV+FR). The FR amplifier circuit is subject to constant auto-control, which allows to use it for applications requiring a burner operating cycle longer than 24 hours. When it is used as a UV control, the system is considered as non-permanent, requiring one burner recycle every 24 hours. Normally, burner stopping is guaranteed by the boiler's thermostat/pressure switch.

If this is not the case, a time switch must be applied to L-N in series, 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 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, in compliance with 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:

5.16.1 Supply cables and external connections passage

through cable grommets, as shown in Fig. 30.

All the cables to be connected to the burner should be passed

DANGER

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



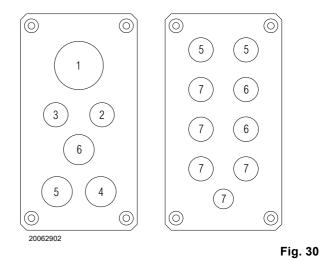
Close the fuel shut-off valve.



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.



Key (Fig. 30)

- 1 Electrical power supply
- 2 Minimum gas pressure switch
- 3 Pressure switch for VPS gas valve leak detection
- 4 Gas train
- 5 Enabling signals / Safety devices
- 6 Available
- 7 Available



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

5.17 Calibration of the thermal relay

The thermal relay (Fig. 31) serves to avoid damage to the motor due to an excessive absorption increase or if a phase is missing. For calibration 2), refer to the table indicated in the electrical

layout (electrical wiring by the installer).

To reset, in case of thermal relay activation, press the "RESET" button 1).

The button "STOP" 3) opens the NC contact (95-96) and stops the motor.

Insert a screwdriver in the window "TEST/TRIP" 4) and move it in the arrow direction (to the right) to carry out the thermal relay test.



The automatic reset can be dangerous.

This operation is not foreseen in the burner operation.

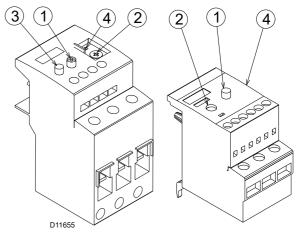


Fig. 31

5.18 Motor rotation

As soon as the burner starts, place yourself in front of the cooling fan of the fan motor and check that it turns anticlockwise (Fig. 32).

If this is not the case:

➤ put the switch of the burner to "0" (off) and wait until the control box carries out the switching off phase.



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

► Invert the phases on the three-phase motor power supply.

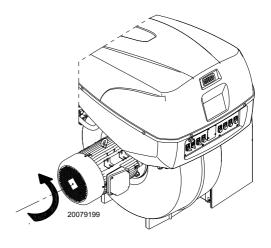


Fig. 32



Start-up, calibration and operation of the burner

6.1 Notes on safety for the first start-up



6

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.



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



Before starting up the burner, refer to section "Safety test - with no gas supply" on page 37.

6.2 Adjustments prior to ignition (light oil)



It is recommended to adjust first the light oil burner and then the gas burner.

Carry out the fuel change with burner off.

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

6.2.1 Nozzle

See information on page 18.

6.2.2 Combustion head

The adjustment of the combustion head already carried out on page 19 need not to be altered unless the 2nd stage output of the burner is changed.

6.2.3 Pump pressure

In order to change pump pressure, act on screw 5)(Fig. 21 on page 22). See information on page 18.

6.2.4 Fan damper

Refer to the adjustment of the servomotor on page 31.

6.3 Burner ignition (light oil)

Position the selector 1)(Fig. 33) on "AUTO".

Position the selector 2) on "OIL" to select light oil fuel.

When the limit thermostat (TL) is closed, the "**CALL FOR HEAT**" 3) signal must be switched on.

At first ignition, there is a momentary drop in fuel pressure due to the filling of the nozzle piping. This lowering of the fuel pressure

can cause the burner to lockout and can sometimes give rise to pulsations.

If the burner locks out again, refer to chapter "Problems - Causes - Remedies signalled by LED indicators" on page 43.

Once the following adjustments have been made, the ignition of the burner must generate a noise similar to the noise generated during operation.

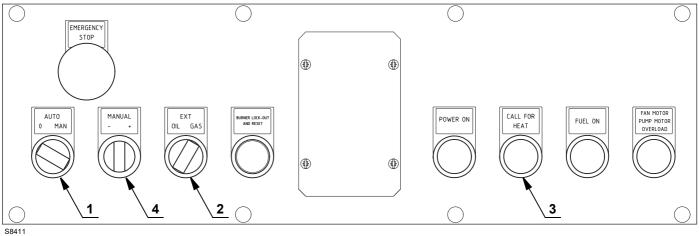


Fig. 33

6.4 Adjustments prior to ignition (gas)

In addition, the following adjustments must also be made:

- Slowly open the manual valves situated upstream of the gas train.
- Adjust the minimum gas pressure switch (Fig. 41 on page 34) to the start of the scale.
- Adjust the maximum gas pressure switch (Fig. 40 on page 34) to the end of the scale.
- Adjust the air pressure switch (Fig. 39 on page 34) to the start of the scale.
- Purge the air from the gas line.

We recommend using a plastic tube routed outside the building and to purge air until gas is smelt.

➤ Fit a U-type pressure gauge or a differential pressure gauge (Fig. 34), with socket (+) on the gas pressure of the pipe coupling and (-) in the combustion chamber.

Used to approximately calculate the MAX burner output.

Connect two lamps or testers to the two gas line solenoid valves to check the exact moment in which voltage is supplied.

This operation is not required if each of the two solenoid valves is equipped with a pilot light that signals voltage passing through.

6.5 Burner start-up (gas)

Close the remote controls and set the switch 1)(Fig. 33) to "AUTO".

Position the selector 2) on "GAS" to select gas as fuel.

Check that the lamps or testers connected to the solenoid valves, or the pilot lights on the solenoid valves, indicate that no voltage is present. If they indicate the presence of voltage, stop the burner immediately and check the electric connections.

When the limit thermostat (TL) is closed, the heat request indication "**CALL FOR HEAT**" 3)(Fig. 33) must be displayed and the burner starts the starting cycle.

6.6 Burner ignition

If the motor starts but the flame does not appear and the control box goes into lockout, reset and wait for a new ignition attempt.

If ignition does not occur, it is possible that gas is not reaching the combustion head within the safety time period of 3 seconds. Therefore, it is necessary to increase gas ignition delivery.

The arrival of gas to the sleeve is indicated by the U-type pressure gauge (Fig. 34).

If the burner locks out again, refer to chapter "Problems - Causes - Remedies signalled by LED indicators" on page 43.



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

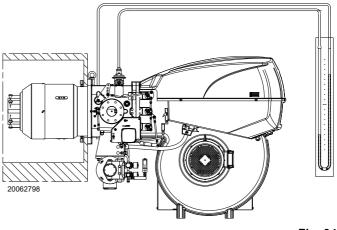


Fig. 34



In the event the burner stops, in order to prevent any damage to the installation, do not unblock the burner more than twice in a row. If the burner locks out for a third time, contact the customer service.



In the event there are further lockouts or faults with the burner, the maintenance interventions 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.

Once ignition has taken place, proceed with burner global calibration operations.

6.7 Change of fuel

There are two change of fuel options:

- 1 with selector 2)(Fig. 33);
- 2 with a remote selector connected to the main terminal board. Positioning the selector 2)(Fig. 33) to "**EXT**" activates the remote selection of the fuel.

Start-up, calibration and operation of the burner

6.8 Servomotor adjustment

The servomotor (Fig. 35) simultaneously adjusts, through driving gears, the output and pressure of the air, and the flow rate of the fuel being used.

It is equipped with adjustable cams which operate as many switches.

- **Cam I:** limits the servomotor limit switch on the maximum position (about 130°) (light oil operation).
- **Cam II:** limits the servomotor limit switch at the 0° position. With the burner off the air damper is completely closed (light oil and gas operation).
- Cam III: regulates the minimum modulating output. Position 30° is factory set (minimum light oil operation).
- **Cam IV:** limits the servomotor limit switch at the maximum position (about 130°) (light oil operation).
- Cam V: regulates the minimum modulating output. Factory set at position 30° (gas operation).

The fuel/combustion synchronization is made by means of a servomotor connected to two variable profile cams, which act on the outlet air damper 1)(Fig. 36) and gas damper 2) and on the

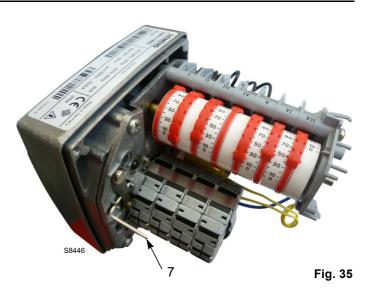
It is advisable, to reduce the loss and for a wide calibration field, to adjust the servomotor to the maximum of the output used, the

Remaining cams:not used

6.9

Lever 7: Servomotor release

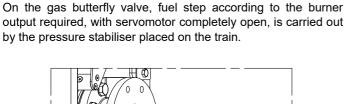
combustion head by appropriate levers.



The values indicated in Tab. O and Tab. P can be a reference for a good combustion calibration.						
		Air ex	cess			
EN 676		$\begin{array}{l} \text{Max. output} \\ \lambda \leq \textbf{1.2} \end{array}$	$\begin{array}{l} \text{Max. output} \\ \lambda \leq 1.3 \end{array}$	со		
	Theoretical max.	CO ₂ % Calibration				
GAS	CO ₂ 0 % O ₂	λ = 1.2	λ = 1.3	mg/kWh		
G 20	11.7	9.7	9	≤ 100		
G 25	11.5	9.5	8.8	≤ 100		
G 30	14.0	11.6	10.7	≤ 100		
G 31	13.7	11.4	10.5	≤ 100		

G 30	14.0	11.6	10.7	≤ 100
G 31	13.7	11.4	10.5	≤ 100
Tab. O				
		Air excess		
	EN 267	$\begin{array}{l} \text{Max. output} \\ \lambda \leq \textbf{1.2} \end{array}$	$\begin{array}{l} \text{Min. output} \\ \lambda \leq \textbf{1.3} \end{array}$	со
Theo	Theoretical max CO ₂ 0 % O ₂	CO ₂ % Calibration		mg/kWh
		λ = 1.2	λ = 1.3	
	15.2	12.6	11.5	≤ 100

Tab. P



nearest possible to the maximum opening (130°).

Combustion air adjustment

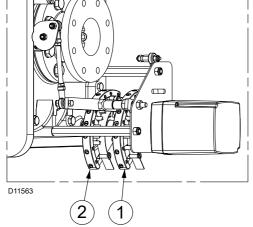


Fig. 36

6.10 Burner adjustment and output modulation

6.10.1 Maximum output

The servomotor (Fig. 35 on page 31) must be adjusted to the maximum opening so that the air dampers are completely open.

6.10.2 Minimum output

MIN output must be selected within the firing rate range indicated on page 10.

Turn the selector 4)(Fig. 33 on page 29) "output reduction", and keep "-" pressed until the servomotor has closed the air damper and the gas butterfly valve at 35° (adjustment made in the factory).

Air adjustment

The starting profile of cam 1)(Fig. 37) must be progressively adjusted by turning the screws 2)(Fig. 37).



If possible, do not turn the first screw, since this is used to set the air damper to its fully closed position.

6.10.3 Intermediate outputs

After adjusting the maximum and minimum output of the burner, carry out air and gas adjustment on several intermediate positions of the servomotor.

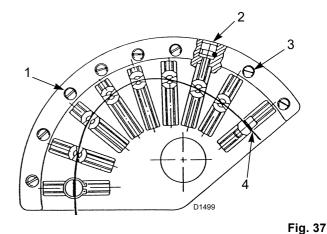
The passage from one position to the next one is obtained by pressing the selector 4)(Fig. 33 on page 29) on the symbol "+" or "-".

For better adjustment repeatability, take care to stop the rotation of the cam unit when the upper bearing that slides on the profile 4)(Fig. 37) is aligned with one of the adjustment screws 2).

Screw or unscrew the pre-set screw 2) to increase or decrease the air output so as to adjust it to the corresponding gas output.



After output adjustment (maximum, minimum and intermediate), it is important to lock all the air adjustment screws 2) by the locking screws 3) so as to avoid possible movements from the position of air - gas calibration.



Key (Fig. 37)

- 1 Cam 2 Adjustment screws
- 3 Locking screws
- 4 Adjustable profile

6.11 Air / fuel adjustment

The following adjustments must be performed during the calibration of the air/fuel ratio:

A Oil pump outlet pressure:

turn screw 5)(Fig. 21 on page 22), on the pump.

B Air cam:

turn the adjustment screws 2)(Fig. 37) after having loosened screws 3).

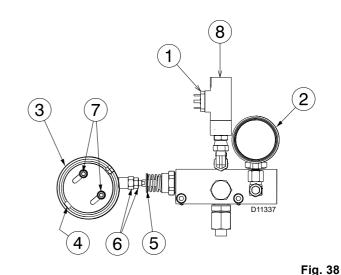
C Gas cam:

turn the adjustment screws 2)(Fig. 37) after having loosened screws 3).

D Oil cam:

modify the eccentricity by turning the screw 7)(Fig. 38) after having loosened the screws 6).

By tightening the screw 7) the eccentricity increases, thereby increasing the difference between the maximum and minimum return pressure of the nozzle.



Key (Fig. 38)

- 1 Maximum oil pressure switch
- 2 Return pressure gauge
- 3 Variable eccentric
- 4 Eccentric adjustment screw
- 5 Piston stop ring
- 6 Piston calibration nut and lock nut
- 7 Eccentric locking screws
- 8 Adjustment screw/calibration for maximum oil pressure switch

6.11.1 Burner calibration procedure

- Install the nozzle suitable to achieve the maximum desired output.
- Verify that the eccentricity of the oil cam is such to make a travel of about 8 mm on the shaft of oil modulator.
 Normally, with a shaft stroke of 8 mm, the pressure variation needed for the modulation of the minimum to maximum output is obtained.
 To verify this, manually rotate the cam after having released

the servomotor with the lever 7)(Fig. 35 on page 31), so that the travel of the shaft is not exaggerated or insufficient. Remember to block the servomotor after the verification.

- Switch on the burner with the selector on the control panel in manual "MAN" 1) position (Fig. 33 on page 29).
 At this point, after the pre-purging phase, the servomotor stops at about 45°.
- Adjust the outlet pressure of the pump as shown in point A (oil pump outlet pressure) to obtain an outlet pressure to the nozzle of 24 - 25 bar.
- Adjust the minimum return pressure to approx. 6 bar. To do so, the length of the shaft 5)(Fig. 38 on page 32) must be varied by means of nut 6).
- Calibrate the air delivery by adjusting the variable profile cam with the screws 2)(Fig. 37 on page 32).
- Having performed this first adjustment, increase the output supplied via the automatic return selector on the control panel. Pause after a 15° rotation of the servomotor and perform another adjustment by means of the variable profile cam of the air.

It is recommended to perform a calibration that will prevent the formation of a smoky flame and arrive as soon as possible to the maximum output (maximum stroke of the servomotor 130°); on the eccentric screw 5)(Fig. 38 on page 32), calibrate the pressure on the return line to obtain the output desired and requested by the nozzle, and then go back to calibrate the intermediate points.

- Then recheck the values of the combustion parameters at the various modulation outputs and if necessary make the necessary adjustments.
- ➤ Turn off the burner and wait for the complete shut-down of the fan motor.
- ➤ Now move the selector 2)(Fig. 33 on page 29) to "GAS", perform a new ignition and check the correct gas operation at the desired output.

If this is not so, calibrate the gas cam as in point C (Gas Cam) mentioned above.

With the optimal adjustment achieved, remember to lock the adjustment screws of the cam profiles by means of screws 3)(Fig. 37 on page 32).



When calibrating the cams, never go beyond the travel limits of the servomotor 0° - 130° to avoid any sticking.

Carrying out a manual travel 0 - 130° of the cams, check that there are no mechanical stops before the micro-switches 1-2 of the servomotor are activated.

6.12 Pressure switch adjustment

6.12.1 Air pressure switch - check CO

Adjust the air pressure switch after performing all other burner adjustments with the air pressure switch set to the start of the scale (Fig. 39).

With the burner operating at MIN output, increase adjustment pressure by slowly turning the relevant knob clockwise until the burner locks out.

Then turn the knob anticlockwise by about 20% of the set point and repeat burner start-up to ensure it is correct.

If the burner locks out again, turn the knob slightly anticlockwise.



In conformity with the standard, the air pressure switch must prevent the air pressure falling below 80% of the adjusted value and the CO in the flue gases exceeding 1% (10,000 ppm).

To check this, insert a combustion analyser in the flue, slowly reduce the burner air setting (for example with a piece of cardboard) and verify that the burner locks out before the CO value in the flue gases exceeds 1%.

The air pressure switch is installed in the "absolute" position, i.e. it is connected only to the pressure test point "+" 22)(Fig. 4).

6.12.2 Maximum gas pressure switch

Adjust the maximum gas pressure switch (Fig. 40) after making all other burner adjustments with the maximum gas pressure switch set to the end of the scale.

To calibrate the maximum gas pressure switch, open the tap and then connect a pressure gauge to its pressure test point.

The maximum gas pressure switch must be regulated to a value no higher than 30% of the measurement read on the gauge when the burner is working at maximum output.

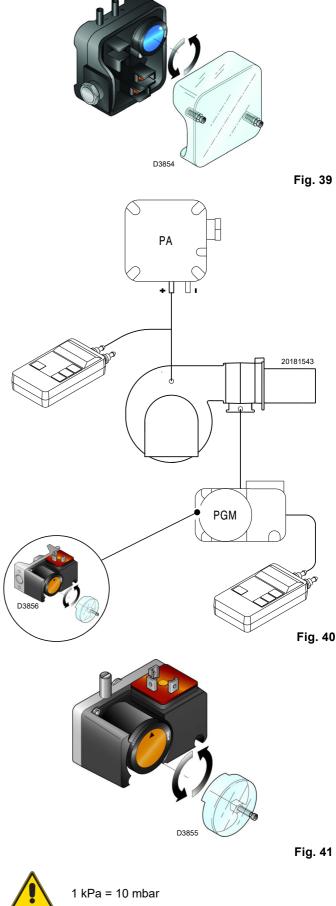
After making the adjustment, remove the pressure gauge and close the tap.

6.12.3 Minimum gas pressure switch

The purpose of the minimum gas pressure switch is to prevent the burner from operating in an unsuitable way due to too low gas pressure.

Adjust the minimum gas pressure switch (Fig. 41) after having adjusted the burner, the gas valves and the gas train stabiliser. With the burner operating at maximum output:

- install a pressure gauge downstream of the gas train stabiliser (for example at the gas pressure test point on the burner combustion head);
- choke slowly the manual gas cock until the pressure gauge detects a decrease in the pressure read of about 0.1 kPa (1 mbar). In this phase, verify the CO value which must always be less than 100 mg/kWh (93 ppm).
- Increase the adjustment of the gas pressure switch until it intervenes, causing the burner shutdown;
- remove the pressure gauge and close the cock of the gas pressure test point used for the measurement;
- open completely the manual gas cock.



WARNING

6.13 Operation sequence of the burner

6.13.1 Burner start-up

- 0s TL thermostat/pressure switch closure. Fan motor start-up.
- 6s Servomotor start-up: rotate to the right by 130°, i.e. until the contact intervenes on the cam 1).
- If it's operating with oil or cam 4) if it's operating with gas.The air damper is positioned to MAX output.
- Pre-purging stage with MAX output air delivery.
- 80s The servomotor rotates towards the left until the angle set on the cam 3).

If it's operating with oil or cam 5) if it's operating with gas.

- 109s The air damper and the gas butterfly valve adopt the MIN output position.
- 113s Ignition electrode strikes a spark.
- 116s The pilot valves VP1 and VP2 open. The flame is ignited at a low output level, point A (Fig. 42).
- 119s The spark goes out.
- 130s The safety valve VS opens, along with the adjustment valve VR (quick opening). The output is then progressively increased, with the valve opening slowly up to MIN output, point B (Fig. 42).
- 143s The start-up cycle ends.

6.13.2 Steady state operation

Burner without RWF50 output regulator

Once the start-up cycle is completed, the servomotor command moves on to the TR thermostat/pressure switch that controls the pressure or the temperature in the boiler, point C (Fig. 42).

(The electrical control box continues to check the presence of the flame and the correct position of the air and gas maximum pressure switches).

- If the temperature or the pressure is low so the thermostat/ pressure switch TR is closed, the burner progressively increases the output up to the MAX value (section C-D).
- Then if the temperature or pressure increases until the TR opens, the burner progressively decreases its output to the MIN value (section E-F). And so on.
- The burner locks out when the heat request is less than the heat supplied by the burner at MIN output, (section G-H).

The TL thermostat/pressure switch opens, and the servomotor returns to angle 0° limited by the contact of cam 2).

The air damper closes completely to reduce heat losses to a minimum.

For every change of output, the servomotor will automatically change the gas flow rate (butterfly valve), the airflow (fan damper) and the air pressure (2 shutters in the combustion head).

Burner with RWF50 output regulator

See the manual supplied with the regulator.

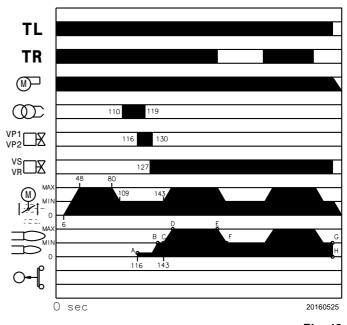
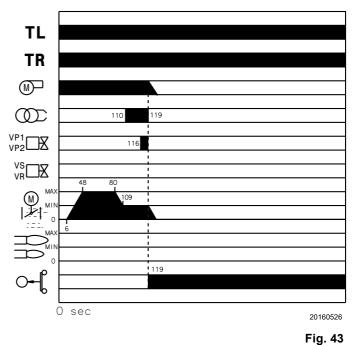


Fig. 42

IGNITION FAILURE



6.13.3 Burner flame goes out during operation

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

6.13.4 Ignition failure

If the burner does not ignite (Fig. 43), it locks out within 3 s after the gas valve opens, 119 s after the TL closes and the postpurging phase starts lasting 17s.



Start-up, calibration and operation of the burner

6.14 Final checks (with burner operating)

 Open the thermostat/pressure switch TL Open the thermostat/pressure switch TS 	\Box	The burner must stop
 Turn the knob of the gas maximum pressure switch to the minimum end of scale position Turn the air pressure switch knob to the maximum end of scale position 	\Box	The burner must stop in lockout
 Turn off the burner and cut off the power Disconnect the minimum gas pressure switch connector 	\Box	The burner must not start
 Disconnect flame sensor electrical connections 	\Box	The burner must stop in lockout due to ignition failure
		Tab. Q



Make sure that the mechanical locking systems on the adjustment devices are fully tightened.



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.



7

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

Before carrying out any maintenance, cleaning or checking operations:



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



Close the fuel shut-off valve.



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

7.2 Maintenance programme

7.2.1 Maintenance frequency



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

Safety test - with no gas supply 7.2.2

To perform commissioning in safety conditions, it is very important to check correct wiring between gas valves and burner.

For this purpose, after checking that connections comply with the burner wiring diagrams, it is necessary to carry out a start-up cycle with gas cock closed (dry test).

- 1 The manual gas valve must be closed using the locking/ unlocking device ("Lock-out / tag out" procedure).
- 2 Ensure that burner limit electrical contacts are closed
- 3 Ensure that minimum gas pressure switch contact is closed
- Try to start the burner 4

The start-up cycle must occur according to the following steps:

- Fan motor start-up for pre-purging
- Gas valve leak detection control, if applicable
- Pre-purging completion _
- Achievement of the ignition point _
- Power supply of the ignition transformer
- Supply of gas valves

As gas is closed, the burner cannot ignite and its control box will switch to stop or safety lockout condition.

The actual supply of gas valves can be checked by inserting a tester; some valves are equipped with lights (or closing/opening position indicators) that activate as soon as they are powered.



POWER SUPPLY OF GAS VALVES IF OCCURS IN UNEXPECTED MOMENTS, DO NOT OPEN THE MANUAL VALVE. DISCONNECT POWER SUPPLY, CHECK WIRINGS, CORRECT THE ERRORS AND CARRY OUT THE WHOLE TEST AGAIN.

7.2.3 Checking and cleaning



The operator must use the required equipment during maintenance.

Combustion

Carry out an analysis of the combustion flue gases.

Significant differences with respect to the previous measurements indicate the points where most care should be exercised during maintenance.

Combustion head

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

Burner

Check that there is no excess wear or loosen screws, especially on cams 3)(Fig. 37).

Clean the outside of the burner.

Clean and grease the adjustable profile of the cams.

Fan

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

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.

Check Mode

With burner flame on:

- hold the reset button on the flame control pressed for at least 3 sec.;
- > the button colour will change from green to yellow;
- each operating status signalling LED will be compared to 20% of the maximum brightness;
- press the reset button again (<0.5sec) to reset the standard operation of the signalling LEDs.

7.2.4 Safety components

The safety components should be replaced at the end of their life cycle indicated in the following table.



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			
Gas valves (solenoid)	operation cycles			
Pressure switches	10 years or 250.000			
FIESSULE SWILLIES	operation cycles			
Pressure adjuster	15 years			
Servomotor (electronic	10 years or 250.000			
cam)(if any)	operation cycles			
Oil valve (solenoid)(if any)	10 years or 250.000			
	operation cycles			
Oil regulator (if present)	10 years or 250.000			
On regulator (in present)	operation cycles			
Oil pipes/ couplings (metallic) (if present)	10 years			
Flexible hoses (if present)	5 years or 30.000 pressurised cycles			
Fan impeller	10 years or 500.000 start-ups			
	Tab B			

Tab. R



LIGHT OIL OPERATION

Pump

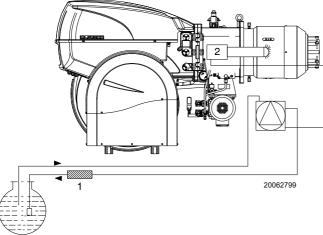
<u>The delivery pressure</u> must comply with the table on page 18. <u>The depression</u> must be less than 0.45 bar.

Unusual noise must not be evident during pump operation.

If the pressure is unstable, or 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 problem lies in the suction line, check the filter is clean and that air is not entering the piping.

Filters (Fig. 44)

Check the filtering baskets on line 1) and at nozzle 2) present in the system. 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.



GAS OPERATION

Gas leaks

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

Gas filter

Change the gas filter when it is dirty.

Combustion

If the combustion values measured before starting maintenance do not comply with applicable Standards or do not indicate efficient combustion, consult the table below or contact our Technical Support Service to implement the necessary adjustments.

		Air ex			
	EN 676	$\begin{array}{l} \text{Max. output} \\ \lambda \leq \textbf{1.2} \end{array}$	$\begin{array}{l} \text{Max. output} \\ \lambda \leq \textbf{1.3} \end{array}$	со	
GAS	Theoretical max CO ₂	CO ₂ % Calibration		mg/kWh	
GAS	0 % O ₂	λ = 1.2	λ = 1.3	mg/kwm	
G 20	11.7	9.7	9	≤ 100	
G 25	11.5	9.5	8.8	≤ 100	
G 30	14.0	11.6	10.7	≤ 100	
G 31	13.7	11.4	10.5	≤ 100	

Tab. T



Nozzles

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

Do not clean the nozzle openings.

Flexible hoses

Check to make sure that the hoses are still in good condition.

Fuel tank

Approximately every 5 years, suck any water on the bottom of the tank using a separate pump.

Combustion

If the combustion values measured before starting maintenance do not comply with applicable Standards or do not indicate efficient combustion, consult the table below or contact our Technical Support Service to implement the necessary adjustments.

	Air ex			
EN 267	$\begin{array}{l} \text{Max. output} \\ \lambda \leq \textbf{1.2} \end{array}$	$\begin{array}{l} \text{Min. output} \\ \lambda \leq \textbf{1.3} \end{array}$	со	
Theoretical max CO ₂	CO ₂ % Calibration		mg/kWh	
0 % O ₂	λ = 1.2	λ = 1.3	iiig/kttii	
15.2	12.6	11.5	≤ 100	

Tab. S



7.3 Opening the burner



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

Close the fuel shut-off valve.

- Remove the tie-rods 1) and 4)(Fig. 45) of the head movement and damper opening lever, loosening nut 2);
- disconnect the socket 3) of the servomotor;
- Disconnect the socket 7) of the derivation unit;
- ► remove the screws 5).

At this point, it is possible to open the burner on the hinge.



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

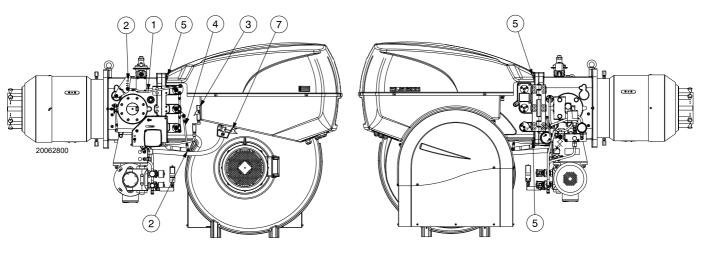


Fig. 45

7.4 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.



LED indicator and special function

8.1 Description of LED lamps

8

59740	Fan	It turns on when the fan motor is powered (T6) and blinks when RUN/CHECK switch is set to "CHECK" during damper movement phases, PTFI AND MTFI.
	Damper open	It blinks when the air damper is moving towards the maximum opening position until the position-reached feedback sent by the servomotor is received, then it stays steadily on for the time set by the flame control.
	Damper closed	If blinks when the air damper is moving towards the minimum opening position until the position-reached feedback sent by the servomotor is received, then it stays steadily on until the end of the pre-purging time.
S9743	Auto	It indicates that the burner is ready for the output modulation.
59744	Ignition	It blinks during the ignition phase (1st safety time) and stays steadily on during the MTFI.
	Flame	It blinks during the first safety time and stays steadily on if the flame detection has been correctly performed.
59746	Alarm	It turns on in red when a lock-out condition occurs. Together with the other indicators, it indicates the type of fault during the lock-out phase. Together with the other LEDs, it indicates the operating status during the normal cycle.
		Tab. U

T = Terminal

PTFI = Pilot ignition attempt

MTFI = Ignition attempt with main fuel valve

8.2 Check mode function

By means of the reset button on-board the flame control, it is possible to use a control function during start-up phases. (prepurging, ignition, 1st safety time and 2nd safety time).

This function, indicated as CHECK MODE, is designed to facilitate checking the phases of the burner and of the safety devices monitored by the flame control.

This function is particularly useful during the burner first commissioning or during maintenance.

To enable the check mode function:

- keep the reset button pressed, vedi "LED lamps: burner operating status" a pag. 42, for more details, for at least 3 seconds, the status LED changes from green to yellow to signal that the control device is in check mode;
- the control device locks out during pre-purging, after a timeout of max 30 minutes the flame control will automatically exit the check mode function;

8.3 Flame control lock-out or emergency stop condition

The RFGO control device can be locked out (emergency stop) at any time during the operating cycle and unlocked when already locked (lock-out) by simply pressing the key on the front panel or by means of the terminal T21 on the support base. check mode has a 2 minute timeout during the 2nd safety time.

When it ends, the flame control goes back to the normal operating status;

- check mode has a 2 minute timeout during the MTFI status. When it ends, the flame control goes back to the normal operating status;
- during the check mode 1st or 2nd safety time, the flame signal level can be indicated by the 5 central LEDS on the flame control central panel, which turn on proportionally.
 Each lit LED (starting from the flame LED) represents 20% of the signal power.

To exit the check mode function, press the reset button; the flame control will go back to the normal operating mode.

8.4 LED lamps: burner operating status

OPERATING STATUSES INDICATED BY LEDS DURING NORMAL OPERATION AND CHECK MODE

Operation LED • = ON	Fan	Damper open	Damper closed	Modulation	Ignition	Flame	Status
Icon	59740	 		() 59743	59744	S9745	59746
Power OFF/ON							OFF
Not ready/ Diagnostics							Green
Standby			•				Green
Servomotor movement (Note 3)	•	OFF Flashing	Flashing OFF				Green
Waiting for closing	Green blinking	•	,				Green
OPEN (before ignition)	•	•					Green
Minimum (before ignition)	•		•				Green
Ignition	•		•		•		Green
PTFI	•		•		•	Green blinking	Green
MTFI	•		•			•	Green
Active modulation	•			•		•	Green
Minimum output position	•		•			•	Green
With flame present	•	•				•	Green
Economy mode	•		•				Green
Check during maximum opening phase	Flashing	•					Yellow
Check during minimum closing phase	Flashing		•				Yellow
Check during ignition phase with pilot PTFI	Flashing	• Note 1	• Note 1	• Note 1	Note 1	• Note 1	Yellow
Check during ignition phase with main fuel valve MTFI	Flashing	• Note 1	• Note 1	• Note 1	Note 1	• Note 1	Yellow
Fault/lock-out	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Red
End of the cycle	•		•	•			Green

Tab. V

- 1. LEDs form a progress bar which indicates the Flame Signal Power in order to orientate the sensors during commissioning (LEDs "Grow" upwards, moving away from the Status at 20% intervals of flame power.)
- 2. LEDs indicate the error or lock-out code for troubleshooting.
- 3. LEDs change from ON to BLINKING to OFF showing the servomotor movement control until the position-reached feedback is received vedi "Problems Causes Remedies signalled by LED indicators" a pag. 43".



9

Problems - Causes - Remedies signalled by LED indicators

When an emergency stop occurs, the control device LEDs indicate the cause of the stop.

The terminal T3 is not powered.

The device operating status is internally memorised in case of any lack of power supply.

The device lock-out condition can be caused by pressing (<1sec.) the reset button on the flame control front side or through the remote reset - terminal T21 on the base.

Since the reset button is very sensitive, do not press it strongly during the reset operation.

Unlocking the control device

The RFGO control device can be reset in two ways: reset button and remote reset terminal.

The remote reset must be a normally open connected button between T21 and flame control power supply voltage (see illustrative diagrams):

- the reset is performed when a faulty condition is detected by the flame control.
- Press the reset button to reset the system after a lock-out.
- Pressing the reset button during operation will cause an emergency stop.
- The reset or emergency stop condition can be obtained also by using the remote reset with the same modalities.
- The number of reset attempts is limited to a maximum of 5 within 15 minutes.

Error / RFGO LED lock-out Codes

During an alarm condition, the status LED becomes steady red. The remaining LEDs turn on according to a coded sequence which identifies the lock-out cause.

The following table shows the different LED Lock-out codes.



The device described in this manual can cause material problems, severe injuries or death.

It is the owner or user's responsibility to make sure that the equipment described is installed, used and commissioned in compliance with the requirements provided both by national and local law. The lock-out condition indicates the presence of a fault which occurred during the operating cycle or during stand-by mode.

Before performing an unlock attempt, it is necessary to restore the original optimal operating conditions.



Thermal unit's operation, maintenance and troubleshooting interventions must be carried out by trained personnel.

The persons who solve lock-out problems or reset the control device must observe the error codes to solve the problems described in this product technical data sheet.

It is not admitted to tamper with or act on the system or control in a way that could compromise the product safety or warranty.

Any tests on safety devices or on loads, such as fan motor, valves, igniter, flame sensors, must be performed with the shut-off valves closed and by qualified personnel.

Do not by-pass nor exclude the safety devices connected to the flame control.

Failure to observe these guidelines will exclude any liability.



The regulation prohibits the system from allowing more than 5 remote reset attempts within a 15 minute time window.

If more than 5 attempts are performed without solving the lock-out, the system will prevent the user to perform further remote resets and force him/her to wait for the 15 minutes to elapse.

The remote reset operation will be restored at the end of the waiting time.

It is recommended that qualified personnel evaluate the lock-out condition and implement the solution which is suitable for the fault to be solved.

Error / RFGO LED lock-out codes

Operation IED = ON Cont Fan Open damper Coleed damper Auto Ignition Flame Status Ion Image: Status	No.	Faults	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6	LED 7
Image: strate Image: strate<			Fan			Auto	Ignition	Flame	Status
2 Local reset • • Red 3 Combustion air fan fault • • Red 4 Supervisor processor diagnostics fault • • Red 5 FR- ND Flame at the end of the 2 nd safety time (MTFi) • • Red 6 FR: internal fault • • • Red 7 Internal communication fault • • • Red 8 Red reset • • Red Red 9 FR: internal fault • • • Red 10 Data memory test fault • • • Red 11 Data memory test fault • • Red Red 13 Mains voltage of requent fault • • Red Red 14 Internal processor fault • • Red Red<			S 9740	 \$9741	\$9742	() 59743	59744	S9745	S9746
3 Combustion air fan fault • • Red Red 4 Supervisor processor diagnostics fault • • Red Red 5 FR- NO Flame at the end of the 2 ^{NM} • • Red Red 6 FR: Internal communication fault • • Red Red 7 Internal communication fault • • Red Red 10 bate memory test fault • • Red Red 11 Data memory test fault • • Red Red 13 Mains voltage or frequent fault • • Red Red 14 Internal processor fault • • Red Red 16 Internal processor fault • • Red Red 16 Not faure: 1 ^M safety time (PTFI) • • Red Red 16 Rot max: 1 ^M safety time (PTFI) • • Red Red 17 Wining fault • • • Red Red 2 Sa	1	Post-diagnostics fault	•						Red
4 Supervisor processor diagnostics fault • • Red 5 FR- NO Flame at the end of the 2 rd safety time (MTF) • Red 6 FR: internal accult fault • • Red 7 Internal communication fault • • Red 8 Remote reset • • Red 9 FR: internal fault • • Red 10 Data memory test fault • • Red 12 Data memory test fault • • Red 13 Internal processor fault • • Red 14 Internal processor fault • • Red 15 Internal processor fault • • Red 16 No flame: 1 st safety time (PTFI) • • Red 17 Wring fault • • Red 18 Safety relay fault • • Red 19 Combustion airflow switch fault in the rest position monty test fault • • Red 20 UY: non	2	Local reset		•					Red
5 FR. NO Flame at the end of the 2 nd safety time (MTFI) • • Red 6 FR: internal communication fault • • Red 7 Internal communication fault • • Red 8 Remote reset • • Red 10 Data memory test fault • • Red 11 Data memory test fault • • Red 12 Data memory test fault • • Red 13 Mains voltage or frequent fault • • Red 14 Internal processor fault • • Red 15 Internal processor fault • • Red 16 No fame: 1 st safety time (PTFI) • • Red 17 Winng fault • • Red 18 Safety relay fault • • Red 19 Combustion airflow switch fault in the rest position • Red 12 Safety relay fault • • Red 22 Supervisor processor fau	3		•	•					Red
safety time (MTF)	4	Supervisor processor diagnostics fault			•				Red
7 Internal communication fault • • Red 8 Remote reset • Red 9 FR: internal fault • Red 10 Main processor fault • Red 12 Data memory test fault • • Red 13 Mains voltage or frequent fault • • Red 14 Internal processor fault • • Red 15 Internal processor fault • • Red 16 No flame: 1 st safety time (PTFI) • • Red 17 Wring fault • • • Red 18 Safety relay fault • • Red Red 19 Combustion airflow switch fault in the rest position • • Red 20 UV: no flame at the end of the 2 nd safety time (MTFI) • • Red 21 Safety relay fault • • Red 22 Supervisor processor fault • • Red 23 Supervisor processor fault	5		•		•				Red
8 Remote reset • Red 9 FR: internal fault • • Red 10 Main processor fault • • Red 11 Data memory test fault • • Red 12 Data memory test fault • • Red 13 Mains votage or frequent fault • • Red 14 Internal processor fault • • Red 15 Internal processor fault • • Red 16 No flame: 1 ^{et} safety time (PTFI) • • Red 17 Wring fault • • • Red 18 Safety relay fault • • Red 10 Combustion airflow switch fault in the rest position • Red 20 UV: no flame at the end of the 2 nd safety relay fault • • Red 21 Safety relay fault • • Red Red 23 Supervisor processor fault • • Red 24 Flame loss during the	6	FR: internal circuit fault		•	•				Red
9 FR: internal fault • • Red 10 Main processor fault • • Red 11 Data memory test fault • • Red 12 Data memory test fault • • Red 13 Mains voltage or frequent fault • • Red 14 Internal processor fault • • Red 15 Internal processor fault • • Red 16 No fiame: 1 st safety time (PTFI) • • Red 17 Wing fault • • • Red 18 Safety relay fault • • Red Red 19 Combustion airflow switch fault in the rest position • • Red 20 UV: no flame at the end of the 2 nd safety relay fault • • Red 23 Supervisor processor fault • • Red 23 Supervisor processor fault • • Red 24 Flame loss during the operation (AUTO) • • Red	7	Internal communication fault	•	•	•				Red
10 Main processor fault • • Red 11 Data memory test fault • • Red 12 Data memory test fault • • Red 13 Mains voltage or frequent fault • • Red 14 Internal processor fault • • Red 15 Internal processor fault • • Red 16 No fame: 1 ^{al} safety time (PTFI) • • Red 17 Wring fault • • • Red 18 Safety relay fault • • • Red 19 Combustion airflow switch fault in the rest position • • Red 20 UV: no flame at the end of the 2 nd safety time (MTFI) • • Red 21 Safety relay fault • • • Red 22 Supervisor memory test fault • • Red 23 Supervisor processor fault • • Red 24 Flame loss during the operation (AUTO) • •	8	Remote reset				•			Red
11 Data memory test fault • • • Red 12 Data memory test fault • • • Red 13 Mains voltage or frequent fault • • • Red 14 Internal processor fault • • • Red 16 Internal processor fault • • • Red 17 Wining fault • • • Red 18 Safety relay fault • • • Red 19 Combustion airlinow switch fault in the rest position • • Red 20 UV: no filame at the end of the 2 nd safety time (NTFI) • • Red 21 Safety relay fault • • • Red 21 Safety relay fault • • • Red 22 Supervisor processor fault • • Red 23 Supervisor processor fault • • Red 24 Flame loss during the operation fault • • Red	9	FR: internal fault	•			•			Red
12 Data memory test fault • • • Red 13 Mains voltage or frequent fault • • • Red 14 Internal processor fault • • • Red 15 Internal processor fault • • • Red 16 No flame: 1 st safety time (PTFI) • • Red 17 Wring fault • • • Red 18 Safety relay fault • • Red 20 UV: no flame at the end of the 2 nd safety time (MTFI) • • Red 21 Safety relay fault • • Red 22 Supervisor processor fault • • Red 23 Supervisor processor fault • • Red 24 Flame loss during the operation (AUTO) • • Red 25 Supervisor processor internal fault • • Red 26 Supervisor processor internal fault • • Red 27 Not used •	10	Main processor fault		•		•			Red
13 Mains voltage or frequent fault • • • Red 14 Internal processor fault • • • Red 15 Internal processor fault • • • Red 15 Internal processor fault • • • Red 16 No fame: 1* safety time (PTFI) • • Red Red 17 Wring fault • • • Red Red 18 Safety relay fault • • Red Red 20 UV: no flame at the end of the 2 nd safety time (MTFI) • • Red 21 Safety relay fault • • Red Red 23 Supervisor processor fault • • Red Red 24 Flame loss during the operation (AUTO) • • Red Red 25 Supervisor processor internal fault • • Red Red 26 Supervisor processor internal fault • • Red Red 27 Not used	11	Data memory test fault	•	•		•			Red
14 Internal processor fault • • • Red 15 Internal processor fault • • • Red 16 No flame: 1 st safety time (PTFI) • • Red 17 Wiring fault • • • Red 18 Safety relay fault • • • Red 19 Combustion airflow switch fault in the rest position • • Red 20 UV: no flame at the end of the 2 nd safety riley fault • • Red 21 Safety relay fault • • • Red 23 Supervisor processor fault • • Red 23 Supervisor processor data memory fault • • Red 24 Flame loss during the operation (AUTO) • • Red 25 Supervisor processor internal fault • • • Red 25 Supervisor processor internal fault • • • Red 26 Operating temperature out of range • • •	12	Data memory test fault			•	•			Red
15 Internal processor fault • • • Red 16 No flame: 1 st safety time (PTFI) • • Red 17 Wiring fault • • Red 18 Safety relay fault • • Red 18 Safety relay fault • • Red 20 UV: no flame at the end of the 2 nd safety time (MTFI) • • Red 21 Safety relay fault • • • Red 22 Supervisor processor fault • • Red 23 Supervisor processor fault • • Red 24 Supervisor processor fault • • Red 25 Supervisor processor fault • • Red 26 Supervisor processor internal fault • • Red 27 Not used • • Red 28 Nepervisor processor internal fault • • Red 29 Operating temperature out of range • • Red	13	Mains voltage or frequent fault	•		•	•			Red
16 No flame: 1 st safety time (PTFI) • • Red 17 Wring fault • • Red 18 Safety relay fault • • Red 19 Combustion airlow switch fault in the rest position • • Red 20 UV: no flame at the end of the 2 nd safety time (MTFI) • • • Red 21 Safety relay fault • • • • Red 21 Safety relay fault • • • Red 22 Supervisor processor fault • • Red 23 Supervisor processor fault • • Red 24 Flame loss during the operation (AUTO) • • Red 25 Supervisor processor internal fault • • • Red 27 Not used • • • Red 28 Not used • • • Red 31 FR: external short circuit • • • Red 32 Check	14	Internal processor fault		٠	•	•			Red
17 Wining fault • • Red 18 Safety relay fault • • Red 19 Combustion ainflow switch fault in the rest position • • Red 20 UV: no flame at the end of the 2 nd safety time (MTF) • • Red 21 Safety relay fault • • • Red 22 Supervisor processor fault • • • Red 23 Supervisor processor fault • • • Red 24 Flame loss during the operation (AUTO) • • • Red 24 Flame loss during the operation (AUTO) • • • Red 25 Supervisor processor internal fault • • • Red 26 Supervisor processor internal fault • • • Red 26 Supervisor processor internal fault • • • Red 27 Not used • • • Red 30 Code memory fault • • • <td>15</td> <td>Internal processor fault</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td> <td></td> <td></td> <td>Red</td>	15	Internal processor fault	•	•	•	•			Red
17 Wiring fault • • • Red 18 Safety relay fault • • • Red 19 Combustion airflow switch fault in the rest position • • Red 20 UV: no fiame at the end of the 2 nd safety relay fault • • • Red 21 Safety relay fault • • • Red Red 22 Supervisor processor fault • • • Red 23 Supervisor processor fault • • Red 24 Flame loss during the operation (AUTO) • • Red 25 Supervisor processor internal fault • • • Red 26 Supervisor processor internal fault • • • Red 27 Not used • • Red • • Red 29 Operating temperature out of range • • • Red 31 FR: external short circuit • • • Red 32 Check mode	16	No flame: 1 st safety time (PTFI)	•				•		Red
18 Safety relay fault • • • • Red 19 Combustion airflow switch fault in the rest position • • • Red 20 UV: no flame at the end of the 2 nd safety time (MTF) • • • Red 21 Safety relay fault • • • Red 21 Safety relay fault • • • Red 23 Supervisor processor fault • • • Red 23 Supervisor processor fault • • • Red 24 Flame loss during the operation (AUTO) • • • Red 25 Supervisor processor internal fault • • • Red 26 Supervisor processor internal fault • • • Red 27 Not used • • • • Red 30 Code memory fault • • • • Red 32 Check mode timeout (manual) • • • • Red	17			•			•		Red
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fault••••Red26Supervisor processor internal fault••••Red27Not used•••••Red28Not used•••••Red29Operating temperature out of range••••Red30Code memory fault••••Red30Code memory fault••••Red31FR: external shot circuit••••Red32Check mode timeout (manual)••••Red33False flame in stand-by mode•••Red34Not used•••Red35Internal processor timeout•••Red36Internal processor timeout•••Red37Combustion air check timeout•••Red38Internal processor timeout•••Red39Internal processor timeout••••Red40Internal hardware fault••••Red41Internal hardware fault••••Red42Main processor fault••••Red43Supervisor processor fault••••Red44Supervisor pro	24		•			•	•		Red
27Not usedImage: Second	25			•		•	•		Red
28Not usedImage: Sector of the sector	26	Supervisor processor internal fault	•	•		•	•		Red
29Operating temperature out of range•••••Red30Code memory fault••••••Red31FR: external short circuit•••••Red32Check mode timeout (manual)••••Red33False flame in stand-by mode••••Red34Not used••••Red35Internal processor timeout••••Red36Internal processor timeout••••Red37Combustion air check timeout••••Red39Internal processor timeout••••Red39Internal hardware fault••••Red41Internal hardware fault••••Red42Main processor fault••••Red43Supervisor processor fault••••Red44Supervisor processor timeout••••Red43Supervisor processor timeout••••Red44Supervisor processor fineout••••Red44Supervisor processor timeout••••Red44Supervisor processor timeout•••• <td>27</td> <td>Not used</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	27	Not used							
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31FR: external short circuitImage: circuit is a c	29	Operating temperature out of range		•	•	•	•		Red
32Check mode timeout (manual)•Image: Check mode timeout (manual)•Red33False flame in stand-by mode••Red34Not used•••Red35Internal processor timeout•••Red36Internal processor timeout•••Red37Combustion air check timeout•••Red38Internal processor timeout•••Red39Internal processor timeout•••Red40Internal hardware fault••••Red41Internal hardware fault••••Red43Supervisor processor fault••••Red44Supervisor processor timeout••••Red44Supervisor processor timeout••••Red	30	Code memory fault	•	•	•	•	•		Red
33False flame in stand-by mode••Red34Not used••••Red35Internal processor timeout•••Red36Internal processor timeout•••Red37Combustion air check timeout•••Red38Internal processor timeout•••Red39Internal processor timeout•••Red40Internal hardware fault•••Red41Internal hardware fault•••Red43Supervisor processor fault•••Red44Supervisor processor timeout•••Red44Supervisor processor timeout••••Red44Supervisor processor timeout••••Red44Supervisor processor timeout••••Red	31	FR: external short circuit						٠	Red
34Not usedInternal processor timeoutInternal processor faultInternal processor fault<	32	Check mode timeout (manual)	•					٠	Red
35Internal processor timeoutInternal processor faultInternal process	33	False flame in stand-by mode		•				•	Red
36Internal processor timeout•••••Red37Combustion air check timeout•••••Red38Internal processor timeout••••Red39Internal processor timeout••••Red40Internal hardware fault••••Red41Internal hardware fault••••Red42Main processor fault••••Red43Supervisor processor fault••••Red44Supervisor processor timeout••••Red	34	Not used							
37Combustion air check timeoutImage: Combustion air check timeoutIm	35	Internal processor timeout			•			•	Red
38Internal processor timeout••••Red39Internal processor timeoutRed40Internal hardware fault•Red41Internal hardware fault••••Red42Main processor fault••••Red43Supervisor processor fault••••Red44Supervisor processor timeout••••Red	36	Internal processor timeout	•		•			•	Red
39Internal processor timeoutInternal hardware faultInternal hardware fault	37	Combustion air check timeout		•	•			•	Red
40Internal hardware fault•Image: Second sec	38	Internal processor timeout	•	•	•			•	Red
41Internal hardware fault••••Red42Main processor fault••••Red43Supervisor processor fault••••Red44Supervisor processor timeout••••Red	39	Internal processor timeout				•		•	Red
42Main processor fault••••Red43Supervisor processor fault••••Red44Supervisor processor timeout••••Red	40	Internal hardware fault	•			•		•	Red
43Supervisor processor fault•••Red44Supervisor processor timeout•••Red	41	Internal hardware fault		•		•		•	Red
44 Supervisor processor timeout • • • Red	42	Main processor fault	•	•		•		•	Red
	43	Supervisor processor fault			•	•		•	Red
45 Off-specification mains voltage • • • Red	44	Supervisor processor timeout	•		•	•		•	Red
	45	Off-specification mains voltage		•	•	•		•	Red

Problems - Causes - Remedies signalled by LED indicators



No.	Faults	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6	LED 7
46	Off-specification mains voltage	•	•	•	•		•	Red
47	UV: Internal fault					•	•	Red
48	Supervisor processor fault	•				•	•	Red
49	Main processor fault		•			•	•	Red
50	Ignition feedback fault	•	•			•	•	Red
51	Pilot feedback fault			•		•	•	Red
52	Piloted valve feedback fault	•		•		•	•	Red
53	Actuator feedback waiting time expired		•	•		•	•	Red
54	Direct ignition valve feedback fault	•	•	•		•	•	Red
55	Internal processor fault				•	•	•	Red
56	UV: false flame during operation			•	•	•	•	Red
57	FR: false flame during operation	•		•	•	•	•	Red
58	T8 inlet fault		•	•	•	•	•	Red
59	Internal hardware fault	•			•	•	•	Red
60	Local reset fault	•	•	•	•	•	•	Red
61	Open POC fault		•		•	•	•	Red
62	UV: strong UV flame fault	•	•		•	•	•	Red
63	Internal hardware fault					•		Red

Tab. W

Fault explanation

1 Post-diagnostics fault Initial power diagnostics fault Check T12, T13 and T14 2 Local reset The user that the status of inputs and operation Check T12, T13 and T14 3 Combustion air fan fault No Air Check signal loss during the back signal loss during the lo	No	- Equito	Cause	Solution
Make sure that the status of inputs and outputs is correct upon ignition Check T12, T13 and T14 2 Local reset The user started the manual reset or the reset switch is fault Check T21, T13 and T14 3 Combustion air fan fault No Ar Check signal (T14) during the blee cycle or Xr Check signal (T41) during the second salety internal fault Inspect the system, check the gas pressure heavism. 7 FR: Internal fault Internal fault Internal fault Replace the control device 10 Main voltage or frequent fault Internal fault Replace the control device 11 Data memory test fault Internal fault Replace the control device 13	-			Solution
reset switch is faulty operation 3 Combustion air fan fault No Air Check signal (114) during the bieled cycle or Air Check signal loss during the diagnostics fault Check the fan or the air pressure switch 4 Supervisor processor The system detected the presence of wrong moment or there is no voltage when necessary Check the wring and make sure that the wrong moment or there is no voltage when necessary 5 FR: No flame at the end of the 2 rd safety time (MTFI) No flame at the end of the second safety time Impact the system, hock the gas pressure inspect the control device 6 FR: Internal circuit fault Internal fault Replace the control device 7 Internal communication fault Internal fault Replace the control device 8 Remole reset The user pressed the remole reset builton Replace the control device 10 Main processor fault Internal fault Replace the control device 11 Data memory test fault Internal fault Replace the control device 13 Mains voltage or frequent fault Internal fault Replace the control device 16 Internal fault Replace the control device Check the input power supply	1	Post-ulagnostics laut	Make sure that the status of inputs and	Check T12, T13 and T14
4 Supervisor processor The system detected the presence of wrong moment or there is no voltage when necessary Check the wining and make sure that the wrong moment or there is no voltage when necessary 5 FR: No flame at the end of the main fault No flame at the end of the second safety imspect the system, include the control device 7 Internal communication fault Internal fault Replace the control device 8 Remote reset The suser pressue at button of the flame detection electrode the reset as which is discontinuous/grammer. Check the remote switch is discontinuous/grammer. 9 FR: internal fault Internal fault Replace the control device 10 Main processor fault Internal fault Replace the control device 12 Data memory test fault Internal fault Replace the control device 13 Mains voltage or frequency Internal fault Replace the control device 14 Internal fault Internal fault Replace the control device 15 Internal fault Replace the control device Check the input power supply 14 Internal fault Replace the control device Check the input power supply 14 Internal fault Replace the control device In	2	Local reset		
diagnostics fault voltage on 116, T17, T18 at the mecessary Check the Wining and Index Suff Under Internal Suff T16, T17, T18 at the spect the State detection electrode, check the wining, etc. 5 FR- No flame at the end of the 2 rd safety time (MTFI) No flame at the end of the second safety inspect the State detection electrode, check the wining, etc. 6 FR: internal circuit fault Internal fault Replace the control device 7 Internal fault Internal fault Replace the control device 8 Remote reset The user pressed the remote reset button of the reset switch is discontinuous/dynamic Replace the control device 10 Main processor fault Internal fault Replace the control device 11 Data memory test fault Internal fault Replace the control device 13 Mains voltage on rifequency Off-specification power supply voltage and/ or frequency Check the input power supply 14 Internal fault Internal fault Replace the control device 16 No flame: 1 st safety time (PTFI) No flame at the end of the first safety time voltage on critical terminals (T16, T17, T16 voltage on critical terminal	3		cycle or Air Check signal loss during the burner operation	Check the fan or the air pressure switch
2 nd safety time (MTFI) No flame at the end of the second safety inspect the fixme detection electrode, check time wring, etc. 6 FR: internal circuit fault Internal fault Replace the control device 7 Internal communication fault Internal fault Replace the control device 8 Remote reset The user pressed the remote reset buttor or the reset switch is discontinuous/dynamic Check the remote switch 9 FR: internal fault Internal fault Replace the control device 10 Main processor fault Internal fault Replace the control device 11 Data memory test fault Off-specification power supply voltage and or frequency Check the input power supply 14 Internal processor fault Internal fault Replace the control device 15 Internal processor fault Internal fault Replace the control device 16 No flame at the end of the first safety time PTFI) No flame at the end of the 2 nd safety time Inspect the system, check the gar pressure check the U/f flame sensor, check th the system is check the U/f flame sensor, check the flame sensor or the fuel flow internal fault 17 Wiring fault Internal fault Replace the control device 18 Safety relay faul	4		voltage on T16, T17, T18 or T19 at the wrong moment or there is no voltage when	Check the wiring and make sure that the system is operating on a single-phase line (50/60Hz)
7 Internal communication fault Internal fault Replace the control device 8 Remote reset The user pressed the remote reset button or the user pressed the remote reset button of Main processor fault Check the remote switch 10 Main processor fault Internal fault Replace the control device 13 Mains voltage or frequent fault Internal fault Replace the control device 14 Internal processor fault Internal fault Replace the control device 16 Internal processor fault Internal fault Replace the control device 16 Internal processor fault Internal fault Replace the control device 17 Wiring fault The system detected the presence of voltage when necessary Internal fault Replace the control device 18 Safety relay fault Internal fault Replace the control device Internal fault 19 Combustion airflow switch fault in the rest position Internal fault Replace the control device 20 UV: no flame at the end of the 2nd safety rime (MTFi) No flame at the end	5			Inspect the system, check the gas pressure, inspect the flame detection electrode, check the wiring, etc.
8 Remote reset The user pressed the remote reset button or the reset switch is discontinuous/dynamic. Check the remote switch 9 FR: internal fault Internal fault Replace the control device 10 Main processor fault Internal fault Replace the control device 11 Data memory test fault Internal fault Replace the control device 12 Data memory test fault Internal fault Replace the control device 13 Mains voltage or frequent fault Off-specification power supply voltage and/ or frequency Replace the control device 14 Internal processor fault Internal fault Replace the control device 15 Internal processor fault Internal fault Replace the control device 16 No flame: 1 st safety time (PTFI) No flame at the end of the first safety time Inspect the wiring and make sure that the system is operating on a single-phase lin (50/60Lz) 18 Safety relay fault Internal fault Replace the control device 19 Check the input power supply Check the uV flame sensor, check the wiring, etc. 21 Safety relay fault Internal fault Replace the control device 22 Supervisor processor fault<	6	FR: internal circuit fault	Internal fault	Replace the control device
Check the lenk of switch Check the lenk of switch 9 FR: internal fault Internal fault Replace the control device 10 Main processor fault Internal fault Replace the control device 11 Data memory test fault Internal fault Replace the control device 12 Data memory test fault Internal fault Replace the control device 13 Mains voltage or frequent fault Internal fault Replace the control device 14 Internal processor fault Internal fault Replace the control device 16 Internal processor fault Internal fault Replace the control device 16 No flame: 1 st safety time (PTFI) No flame at the end of the first safety time voltage ontor interial terminals (16, 117, 115, 117, 115 or 119, 114 or 119,	7	Internal communication fault	Internal fault	Replace the control device
10 Main processor fault Internal fault Replace the control device 11 Data memory test fault Internal fault Replace the control device 12 Data memory test fault Internal fault Replace the control device 13 Mains voltage or frequent fault Off-specification power supply voltage and/or frequency Check the input power supply 14 Internal processor fault Internal fault Replace the control device 15 Internal processor fault Internal fault Replace the control device 16 No flame: 1 st safety time (PTFI) No flame at the end of the first safety time voltage on critical terminals (116, 117, 117, 116, 117, 117, 116, 117, 117	8	Remote reset		Check the remote switch
11 Data memory test fault Internal fault Replace the control device 12 Data memory test fault Internal fault Replace the control device 13 Mains voltage or frequent fault Off-specification power supply voltage and or frequency Check the input power supply 14 Internal processor fault Internal fault Replace the control device 15 Internal processor fault Internal fault Replace the control device 16 No fiame: 1 st safety time (PTFI) No fiame at the end of the first safety time or 119 at the wrong moment or there is no voltage on critical terminals (T16, T17, T18 or T19) at the wrong moment or there is no voltage when necessary Inspect the system, check the gas pressure check the UV fiame sensor, check th system is operating on a single-phase lin for T19 at the wrong moment or there is no voltage when necessary 18 Safety relay fault Internal fault Replace the control device 19 Combustion airflow switch fault in the rest position Open the circuit upon T13 start-up Check the wiring for the air pressure check the UV fiame sensor, check the wiring, etc. 21 Safety relay fault Internal fault Replace the control device 23 Supervisor processor fault Internal fault Replace the control device 24 Fiame los	9	FR: internal fault	Internal fault	Replace the control device
12 Data memory test fault Internal fault Replace the control device 13 Mains voltage or frequent fault Off-specification power supply voltage and/ or frequency Check the input power supply 14 Internal processor fault Internal fault Replace the control device 15 Internal processor fault Internal fault Replace the control device 16 No flame: 1 st safety time (PTFI) No flame at the end of the first safety time voltage on critical terminals (T16, T17, T18 or T19) at the worog moment or there is no voltage when necessary Inspect the system, check the gas pressure check the UV flame sensor, check th system is operating on a single-phase lin (5060Hz) 20 UV: no flame at the end of the 2rd safety time (MTFI) No flame at the end of the 2 nd safety time wing, etc. Replace the control device 21 Safety relay fault Internal fault Replace the control device 22 Supervisor processor fault Internal fault Replace the control device 23 Supervisor processor internal fault Internal fault Replace the control device 24 Flame loss during the operation fault Internal fault Replace the control device 24 Supervisor processor internal fault Internal fault Replace the control device 25 Supervisor processor internal fault Internal fault Replace the control devic	10	Main processor fault	Internal fault	Replace the control device
13 Mains voltage or frequent fault Internal processor fault Off-specification power supply voltage and or frequency Check the input power supply 14 Internal processor fault Internal fault Replace the control device 16 No flame: 1 st safety time (PTFI) No flame at the end of the first safety time Replace the control device 17 Wiring fault The system detected the presence of voltage on critical terminals (T16, TT, T4) or T19) at the wrong moment or there is no voltage when necessary Inspect the system, check the dags pressure check the UV flame sensor, check th wiring, etc. 18 Safety relay fault Internal fault Replace the control device 19 Combustion airflow switch fault in the rest position Open the circuit upon T13 start-up Check the wiring for the air pressure switch safety time (MTFI) 20 UV: no flame at the end of the 2 nd safety time (MTFI) No flame at the end of the 2 nd safety time 2 nd safety time (MTFI) No flame at the end of the 2 nd safety time 2 nd safety time (MTFI) Replace the control device 21 Safety relay fault Internal fault Replace the control device Inspect the system, check the flame sensor or the fuel flow line (AUTO) 23 Supervisor processor data memory fault Internal fault Replace the control device 24 Flame loss	11	Data memory test fault	Internal fault	Replace the control device
14 Internal processor fault Internal fault Replace the control device 15 Internal processor fault Internal fault Replace the control device 16 No flame: 1 st safety time (PTFI) No flame at the end of the first safety time Inspect the system, check the gas pressure detected the presence of voltage on critical terminals (T16, T17, T18 or T19) at the wrong moment or three is no voltage when necessary Inspect the wiring and make sure that the system is operating on a single-phase lin (50/60H2) 18 Safety relay fault Internal fault Replace the control device 19 Combustion airflow switch fault in the end of the 2 nd safety time (MTFI) No flame at the end of the 2 nd safety time (MTFI) Inspect the system, check the gas pressure check the UV flame sensor, check th wiring, etc. 20 UV: no flame at the end of the 2 nd safety time (MTFI) No flame at the end of the 2 nd safety time (MTFI) Internal fault Replace the control device 23 Supervisor processor fault Internal fault Replace the control device Internal fault Replace the control device 24 Safety relay fault Internal fault Replace the control device Internal fault Replace the control device 25 Supervisor processor internal fault Internal fault Replace the control device <	12	Data memory test fault	Internal fault	Replace the control device
15 Internal processor fault Internal fault Replace the control device 16 No flame: 1 st safety time (PTFi) No flame at the end of the first safety time Inspect the system, check the gas pressure check the UV flame sensor, check the UV flame sensor, check the V flame sensor, che	13	Mains voltage or frequent fault		Check the input power supply
16 No flame: 1 st safety time (PTFI) No flame at the end of the first safety time Inspect the system, check the gas pressure check the UV flame sensor, check th the Vitage on critical terminals (T16, T17, T18 or Vitage on critical terup on trange on critage on critical terup o	14	Internal processor fault	Internal fault	Replace the control device
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19 Combustion airflow switch fault in the rest position Open the circuit upon T13 start-up Check the wiring for the air pressure switch inspect the system, check the gas pressure check the UV flame sensor, check the uring, etc. 20 UV: no flame at the end of the 2 nd safety time (MTFI) No flame at the end of the 2 nd safety time Inspect the system, check the gas pressure check the UV flame sensor, check the wiring, etc. 21 Safety relay fault Internal fault Replace the control device 22 Supervisor processor fault Internal fault Replace the control device 23 Supervisor processor fault Internal fault Replace the control device 24 Flame loss during the operation (AUTO) Loss of flame Check the flame sensor or the fuel flow line 25 Supervisor processor internal fault Internal fault Replace the control device 26 Supervisor processor internal fault Internal fault Replace the control device 27 Not used Internal fault Replace the control device 28 Not used Operating temperature below -40°C or range Bring the control device Internal fault 30 Code memory fault Internal fault Replace the control device Inspect the flame detection electrode	17	Wiring fault	voltage on critical terminals (T16, T17, T18 or T19) at the wrong moment or there is no	Inspect the wiring and make sure that the system is operating on a single-phase line (50/60Hz)
in the rest positionOpen the check the upon TTS startupCheck the wining for the air pressure swhere20UV: no flame at the end of the 2 nd safety time (MTFI)No flame at the end of the 2 nd safety timeInspect the system, check the gas pressure check the UV flame sensor, check th wiring, etc.21Safety relay faultInternal faultReplace the control device22Supervisor processor faultInternal faultReplace the control device23Supervisor processor faultInternal faultReplace the control device24Flame loss during the operation (AUTO)Loss of flameCheck the flame sensor or the fuel flow line25Supervisor processor data memory faultInternal faultReplace the control device26Supervisor processor internal faultInternal faultReplace the control device27Not usedInternal faultReplace the control device29Operating temperature out of rangeOperating temperature below -40°C or above 70°CBring the control device30Code memory faultInternal faultReplace the control device31FR: external short circuitExternal short circuit between T24 and EARTHInspect the flame detection electrode32Check mode timeout (manual)The interval for the manual mode (30)Ext the manual mode correctly to avoi timeout33False flame in stand-by modeUnexpected flame (false or parasitic flame)Check flame cancer or interfarenee	18	Safety relay fault	Internal fault	Replace the control device
2 nd safety time (MTFI)No flame at the end of the 2 nd safety timecheck the UV flame sensor, check the wiring, etc.21Safety relay faultInternal faultReplace the control device22Supervisor processor faultInternal faultReplace the control device23Supervisor memory test faultInternal faultReplace the control device24Flame loss during the operation (AUTO)Loss of flameCheck the flame sensor or the fuel flow line25Supervisor processor data memory faultInternal faultReplace the control device26Supervisor processor internal faultInternal faultReplace the control device27Not usedInternal faultReplace the control device28Not usedOperating temperature below -40°C or rangeBring the control device within the specifie temperature nominal values30Code memory faultInternal faultReplace the control device31FR: external short circuitExternal short circuit between T24 and EARTHInspect the flame detection electrode32Check mode timeout (manual)The interval for the manual mode (30 minutes) to end has elapsedExit the manual mode correctly to avoi timeout33False flame in stand-by modeUnexpected flame (false or parasitic flame)Check flame sensor or interfarance	19		Open the circuit upon T13 start-up	Check the wiring for the air pressure switch
22Supervisor processor faultInternal faultReplace the control device23Supervisor memory test faultInternal faultReplace the control device24Flame loss during the operation (AUTO)Loss of flameCheck the flame sensor or the fuel flow line25Supervisor processor data memory faultInternal faultReplace the control device26Supervisor processor internal faultInternal faultReplace the control device27Not usedInternal faultReplace the control device28Not usedOperating temperature out of rangeOperating temperature below -40°C or above 70°CBring the control device within the specifie temperature nominal values30Code memory faultInternal faultReplace the control device31FR: external short circuitExternal short circuit between T24 and EXARTHInspect the flame detection electrode32Check mode timeout (manual)The interval for the manual mode (30 minutes) to end has elapsedExit the manual mode correctly to avoi timeout33False flame in stand-by modeUnexpected flame (false or parasitic flame)Check flame concept or interformeroe	20		No flame at the end of the 2 nd safety time	Inspect the system, check the gas pressure, check the UV flame sensor, check the wiring, etc.
23 Supervisor memory test fault Internal fault Replace the control device 24 Flame loss during the operation (AUTO) Loss of flame Check the flame sensor or the fuel flow line 25 Supervisor processor data memory fault Internal fault Replace the control device 26 Supervisor processor internal fault Internal fault Replace the control device 27 Not used Internal fault Replace the control device 28 Not used Operating temperature out of range Operating temperature below -40°C or above 70°C Bring the control device within the specifie temperature nominal values 30 Code memory fault Internal fault Replace the control device 31 FR: external short circuit External short circuit between T24 and EARTH Inspect the flame detection electrode 32 Check mode timeout (manual) The interval for the manual mode (30 minutes) to end has elapsed Exit the manual mode correctly to avoi timeout 33 False flame in stand-by mode Unexpected flame (false or parasitic flame) Check flame center or interfaremen	21	Safety relay fault	Internal fault	Replace the control device
24 Flame loss during the operation (AUTO) Loss of flame Check the flame sensor or the fuel flow line 25 Supervisor processor data memory fault Internal fault Replace the control device 26 Supervisor processor internal fault Internal fault Replace the control device 26 Supervisor processor internal fault Internal fault Replace the control device 27 Not used Internal fault Replace the control device 28 Not used Operating temperature below -40°C or above 70°C Bring the control device within the specifie temperature nominal values 30 Code memory fault Internal fault Replace the control device 31 FR: external short circuit External short circuit between T24 and EARTH Inspect the flame detection electrode 32 Check mode timeout (manual) The interval for the manual mode (30 minutes) to end has elapsed Exit the manual mode correctly to avoid timeout 33 False flame in stand-by mode Unexpected flame (false or parasitic flame) Check flame on concer or interforence	22	Supervisor processor fault	Internal fault	Replace the control device
(AUTO)Loss of nameCheck the name sensor of the rule now inte25Supervisor processor data memory faultInternal faultReplace the control device26Supervisor processor internal faultInternal faultReplace the control device27Not usedInternal faultReplace the control device28Not usedOperating temperature out of rangeOperating temperature below -40°C or above 70°CBring the control device within the specifie temperature nominal values30Code memory faultInternal faultReplace the control device31FR: external short circuitExternal short circuit between T24 and EARTHInspect the flame detection electrode32Check mode timeout (manual)The interval for the manual mode (30 minutes) to end has elapsedExit the manual mode correctly to avoi timeout33False flame in stand-by modeUnexpected flame (false or parasitic flame)Check flame cancer or interforence	23	Supervisor memory test fault	Internal fault	Replace the control device
memory faultinternal faultReplace the control device26Supervisor processor internal faultInternal faultReplace the control device27Not used	24	(AUTO)	Loss of flame	Check the flame sensor or the fuel flow line
faultInternal faultReplace the control device27Not used		memory fault	Internal fault	Replace the control device
28Not usedImage: Second	26	fault	Internal fault	Replace the control device
29Operating temperature out of rangeOperating temperature below -40°C or above 70°CBring the control device within the specifie temperature nominal values30Code memory faultInternal faultReplace the control device31FR: external short circuitExternal short circuit between T24 and EARTHInspect the flame detection electrode32Check mode timeout (manual)The interval for the manual mode (30 minutes) to end has elapsedExit the manual mode correctly to avoi timeout33False flame in stand-by modeUnexpected flame (false or parasitic flame) Check flame concer or interformero				
rangeabove 70°Ctemperature nominal values30Code memory faultInternal faultReplace the control device31FR: external short circuitExternal short circuit between T24 and EARTHInspect the flame detection electrode32Check mode timeout (manual)The interval for the manual mode (30 minutes) to end has elapsedExit the manual mode correctly to avoi timeout33False flame in stand-by modeUnexpected flame (false or parasitic flame) Check flame concer or interforence				
31 FR: external short circuit External short circuit between T24 and EARTH Inspect the flame detection electrode 32 Check mode timeout (manual) The interval for the manual mode (30 minutes) to end has elapsed Exit the manual mode correctly to avoid timeout 33 False flame in stand-by mode Unexpected flame (false or parasitic flame) Check flame conser or interference	29	Operating temperature out of range		Bring the control device within the specified temperature nominal values
32 Check mode timeout (manual) The interval for the manual mode (30 minutes) to end has elapsed Exit the manual mode correctly to avoid timeout 33 False flame in stand-by mode Unexpected flame (false or parasitic flame) Check flame senser or interference	30	Code memory fault	Internal fault	Replace the control device
33 False flame in stand-by mode minutes) to end has elapsed timeout	31	FR: external short circuit		Inspect the flame detection electrode
	32	Check mode timeout (manual)	minutes) to end has elapsed	•
	33	False flame in stand-by mode		Check flame sensor or interference

Problems - Causes - Remedies signalled by LED indicators

No.	Faults	Cause	Solution
34	Not used		
35	Internal processor timeout	Internal fault	Replace the control device
36	Internal processor timeout	Internal fault	Replace the control device
37	Combustion air check timeout	The system could not perform verification tests of the combustion air during the burner sequence	Check the wiring or the air pressure switch
38	Internal processor timeout	Internal fault	Replace the control device
39	Internal processor timeout	Internal fault	Replace the control device
40	Internal hardware fault	Internal fault	Replace the control device
41	Internal hardware fault	Internal fault	Replace the control device
42	Main processor fault	Internal fault	Replace the control device
43	Supervisor processor fault	Internal fault	Replace the control device
44	Supervisor processor timeout	Internal fault	Replace the control device
45	Off-specification mains voltage	Off-specification mains voltage/frequency	Check the mains voltage level or the frequency. Contact the factory if the problem persists
46	Off-specification mains voltage	Off-specification mains voltage/frequency	Check the mains voltage level or the frequency. Contact the factory if the problem persists
47	UV: Internal fault	Internal fault	Replace the control device
48	Supervisor processor fault	Internal fault	Replace the control device
49	Main processor fault	Internal fault	Replace the control device
50	Ignition feedback fault	The system detected the presence of voltage on T16 at the wrong moment or there is no voltage when necessary	Check the wiring and make sure that the earthing is appropriate If the problem persists, contact the distributor/factory
51	Pilot feedback fault		Check the wiring and make sure that the earthing is appropriate. If the problem persists, contact the distributor/factory
52	Piloted valve feedback fault	The system detected the presence of voltage on T19 at the wrong moment or there is no voltage when necessary	Check the wiring and make sure that the earthing is appropriate If the problem persists, contact the distributor/factory
53	Actuator feedback waiting time expired	No actuator feedback on T8 for more than 10 minutes	Check the wiring Check the modulating equipment
54		The system detected the presence of voltage on T18 at the wrong moment or there is no voltage when necessary	
55	Internal processor fault	Internal fault	Replace the control device
56	• .	False flame detected before ignition	Check the flame sensor
57	FR: false flame during operation	False flame detected before ignition	Check the wiring Check the flame sensor Make sure that the earthing is appropriate
58	T8 inlet fault	The system detected the presence of voltage on T8 at the wrong moment or there is no voltage when necessary	Check the wiring Check the actuator
59	Internal hardware fault	Internal fault	Replace the control device
60	Local reset fault	Local reset button pressed for more than 10 seconds or reset button locked	If the problem persists, replace the control device
61	Open POC fault	The fuel valve is open at the wrong moment	Check the wiring
62	UV: strong UV flame fault	The flame sensor is too close to the flame	Increase the distance between the flame sensor and the flame OR use an orifice to reduce the view field
63	Internal hardware fault	Internal fault	Replace the control device
			Tab V

Tab. X



Α

Appendix - Accessories

Output regulator kit for modulating operation

With modulating operation, the burner continuously adjusts its output to the heat request, thereby ensuring a great stability of the controlled parameter: temperature or pressure.

The parts to be ordered are two:

- output regulator to be installed to the burner; ٠
 - probe to be installed to heat generator.

Parameter to be controlled		Probe		Output regulator	
	Adjustment field	Туре	Code	Туре	Code
Temperature	- 100+ 500°C	PT 100	3010110	RWF50	20101190
Pressure	02.5 bar 016 bar	Output probe 420 mA	3010213 3010214	RWF50 RWF55	20101190

Output regulator kit with signal 4-20 mA, 0-10V

The parts to be ordered are two:

- the analogue signal converter;
- the potentiometer

Burner	Potentiometer		Analogue Signal Converter		
RLS 1000/M MX	Туре	Code	Туре	Code	
RLS 1200/M MX	ASZ	3013532	E5202	3010390	

Continuous purging kit

Burner	Code
RLS 1000/M MX RLS 1200/M MX	3010094

Soundproofing box kit

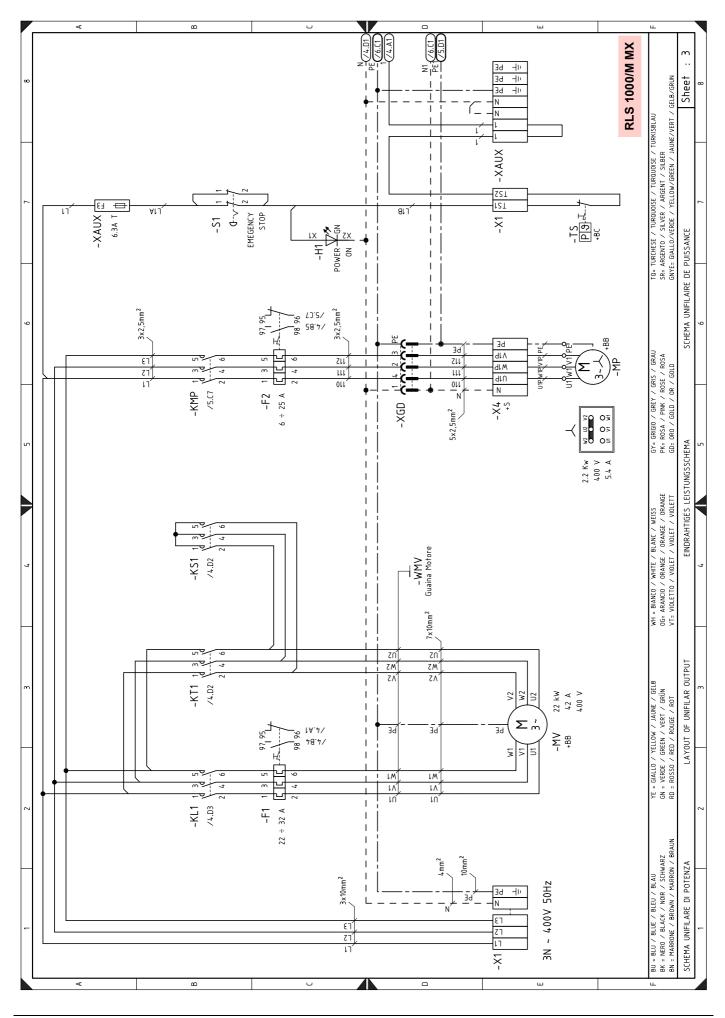
Burner	Code
RLS 1000/M MX RLS 1200/M MX	3010401

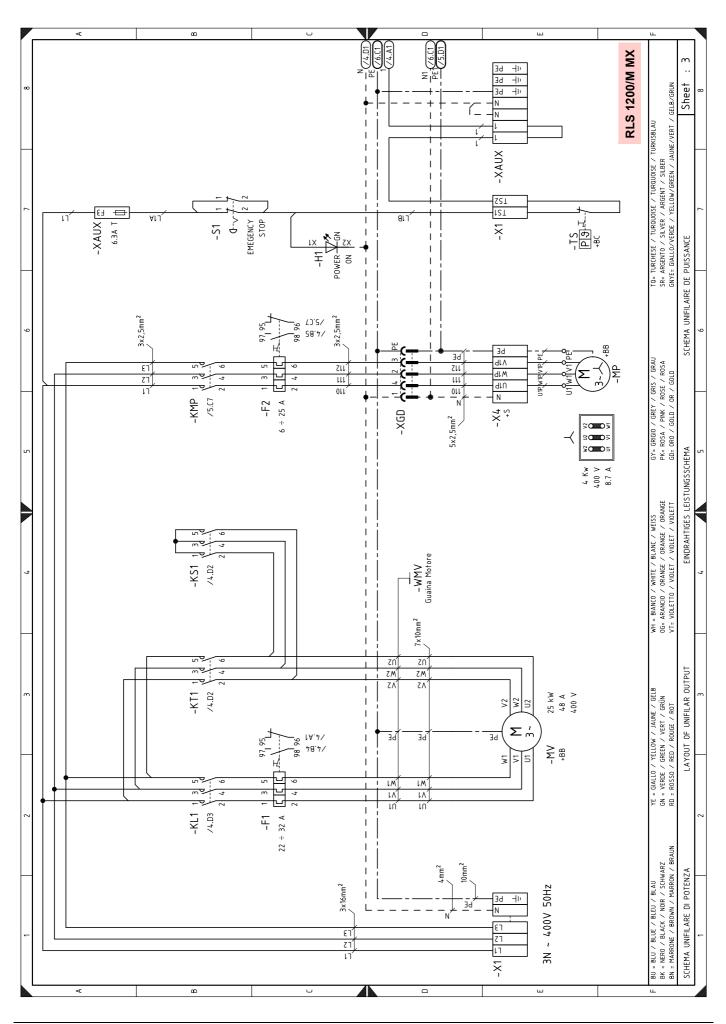
Gas trains in compliance with EN 676

Please refer to manual.

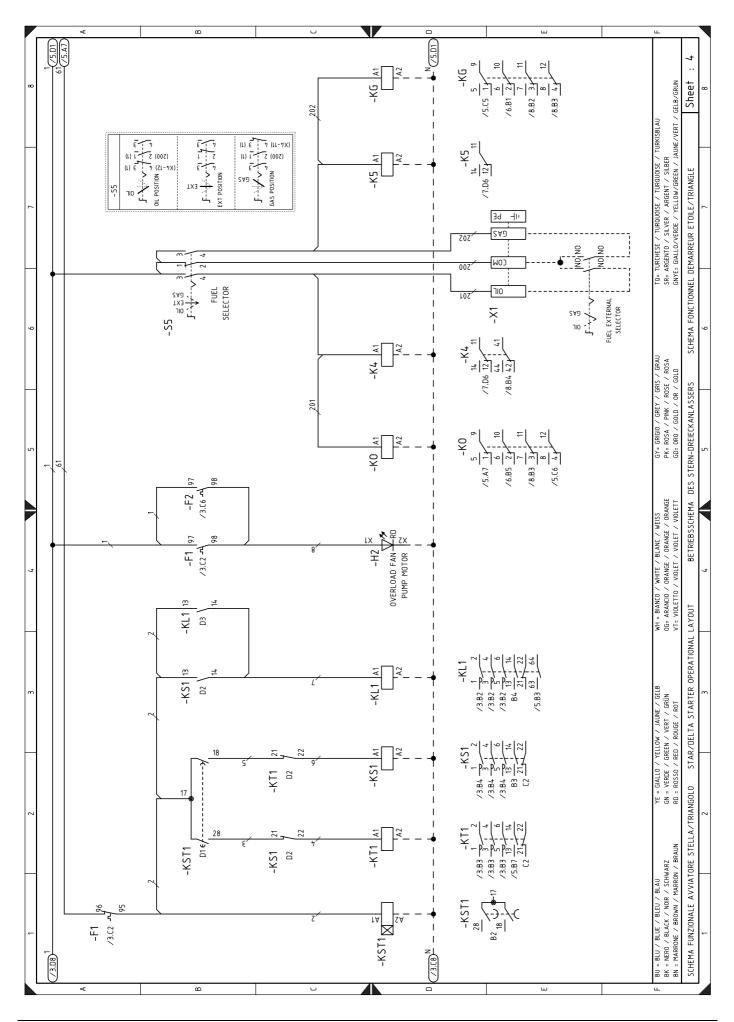
В	Appendix - Electrical panel layout
1	Index of layouts
2	Indication of references
3	Single line power layout RLS 1000/M MX RLS 1200/M MX
4	Functional layout star/triangle starter
5	Functional layout RFGO-A22
6	Functional layout RFGO-A22
7	Functional layout RFGO-A22
8	Functional layout RFGO-A22
9	Electrical wiring kit RWF50 internal
10	Electrical wiring to be carried out by the installer RLS 1000/M MX RLS 1200/M MX
11	Electrical wiring that is the responsibility of the installer
12	Functional layout RWF50
13	Electrical wiring kit RWF50 external

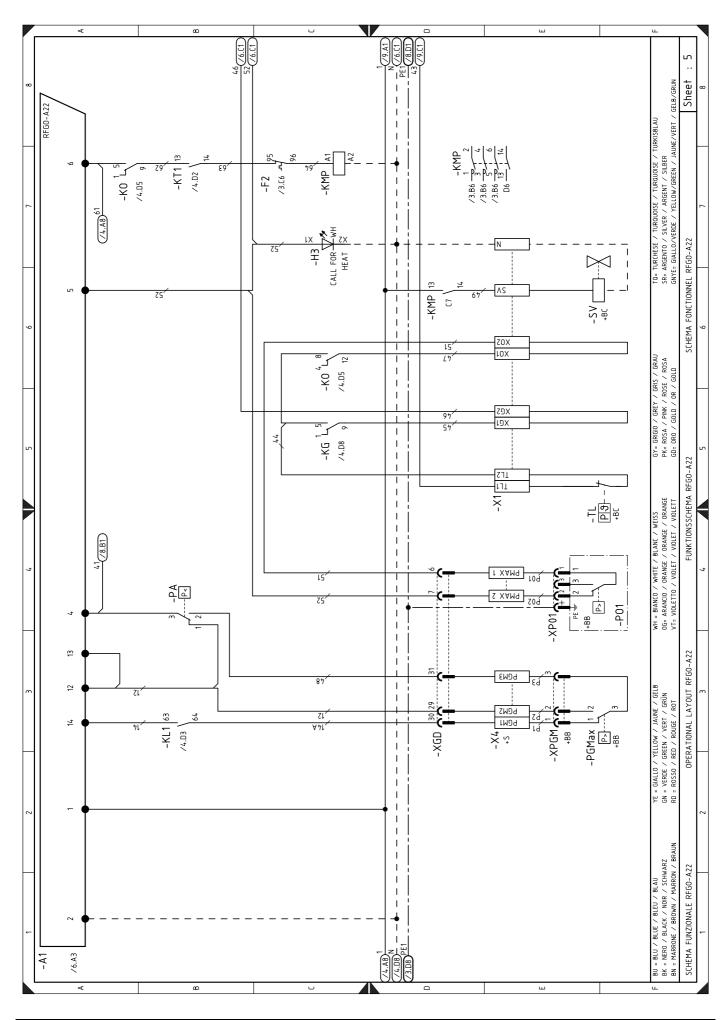
2	Indication of references			
		Sheet no.	/1.A1 ↑ ↑	
		Coordinates		

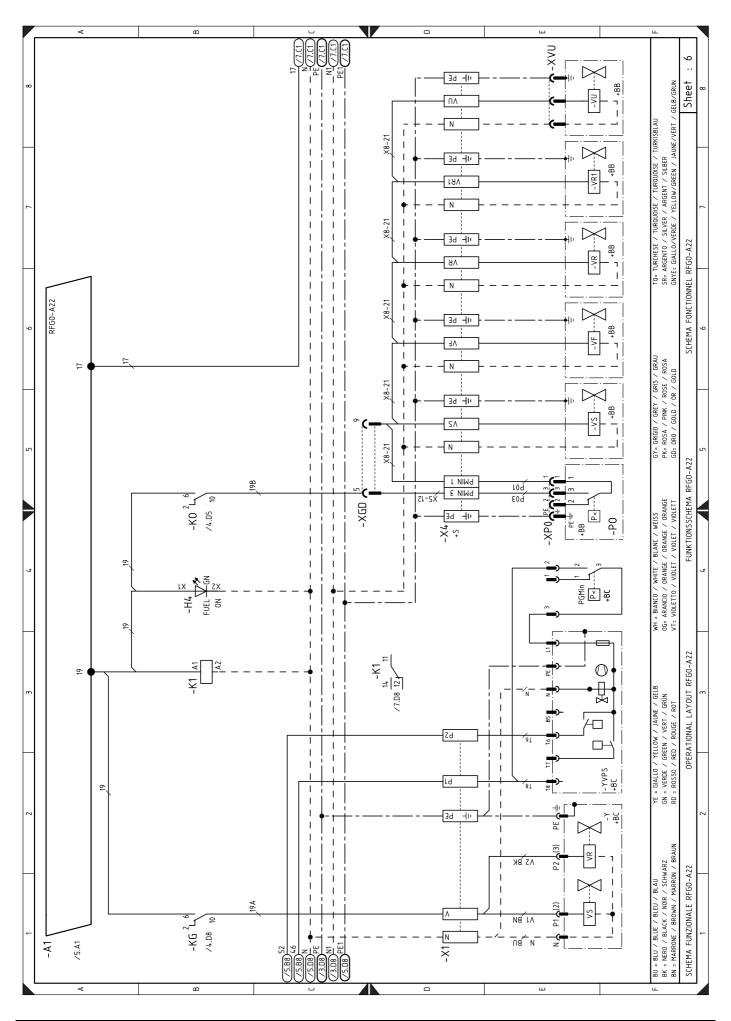


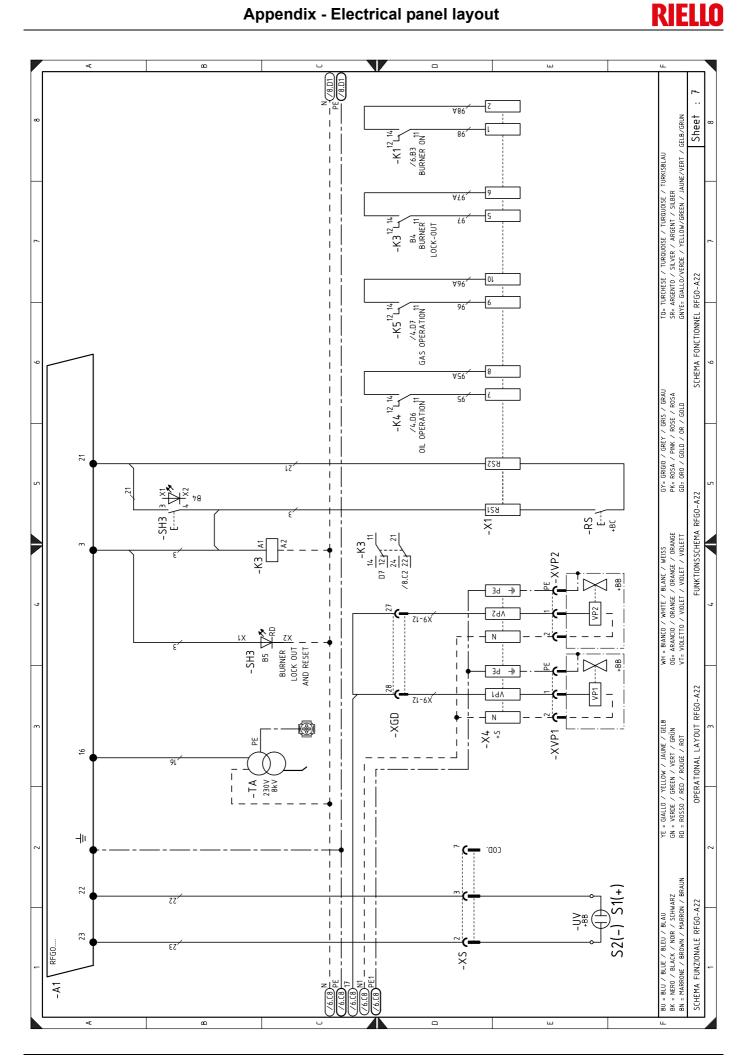




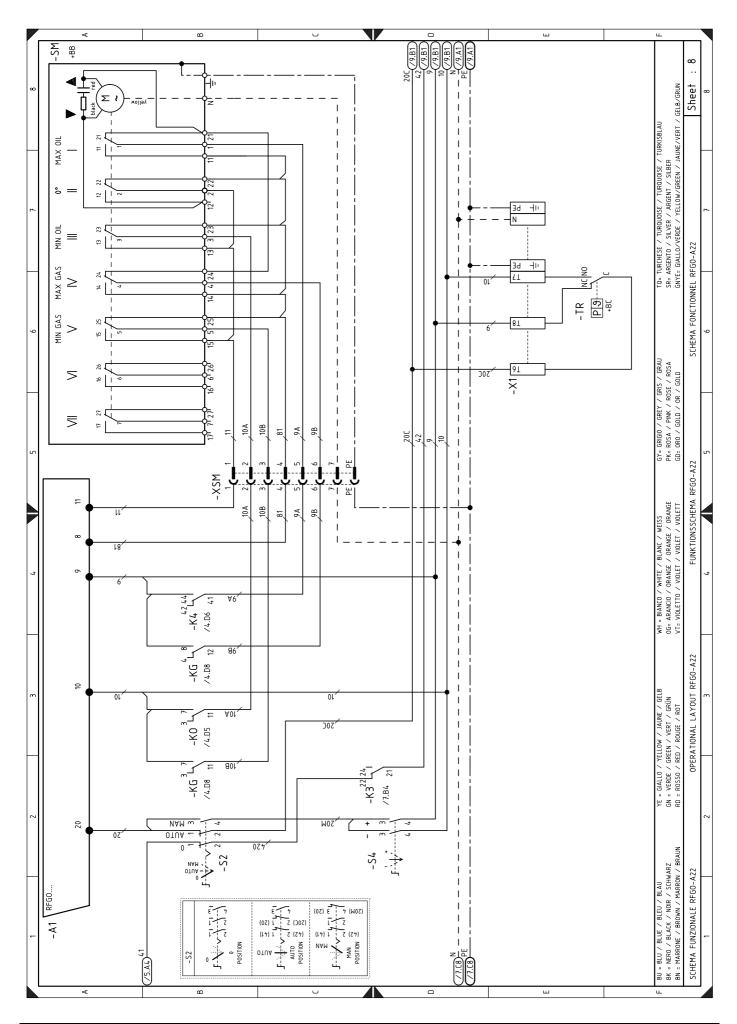




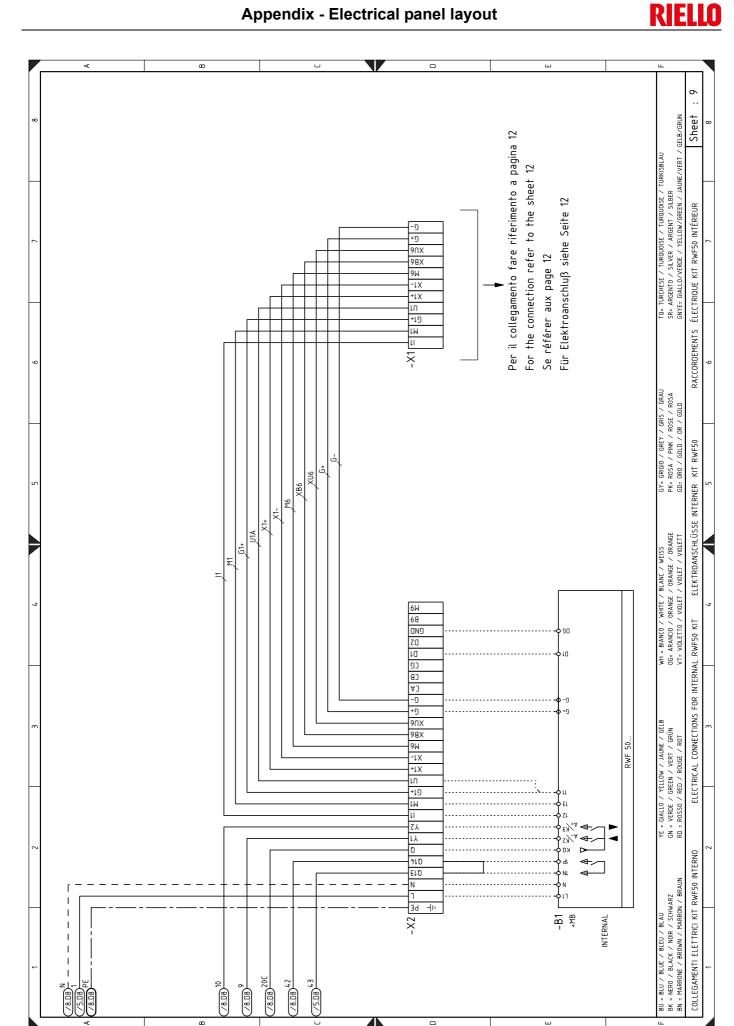


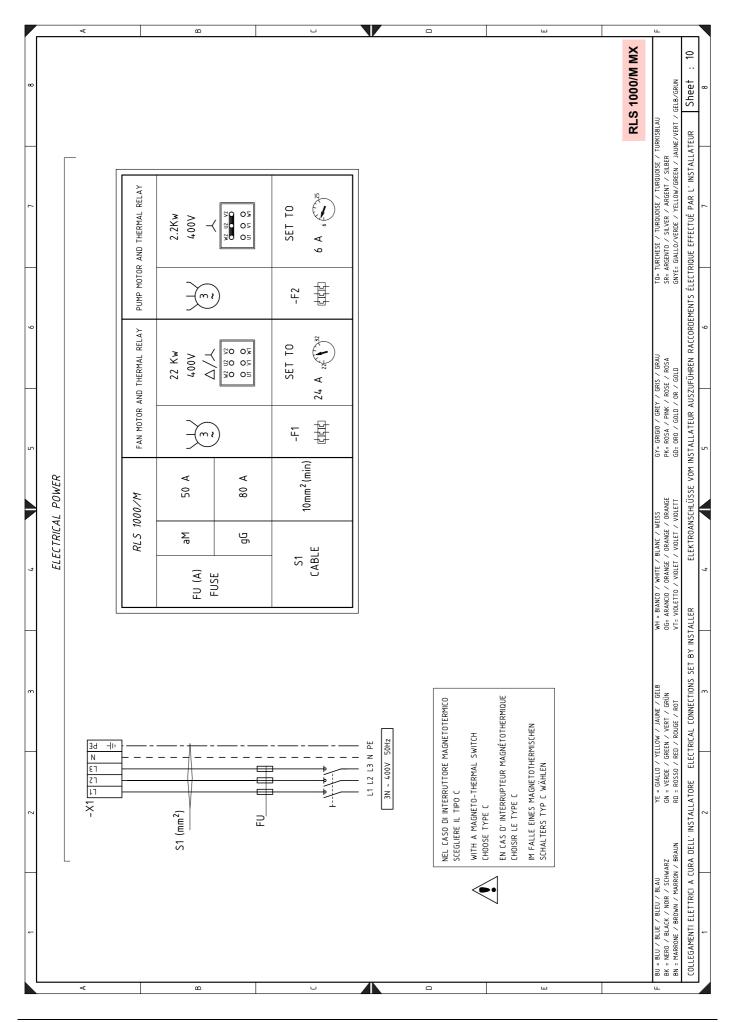


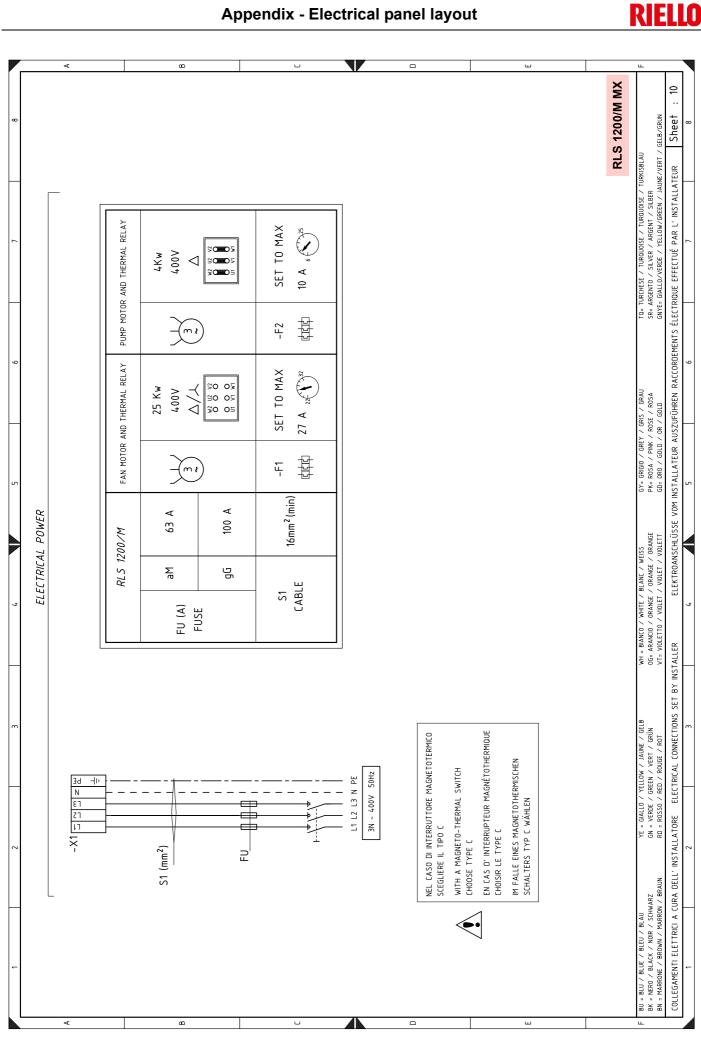




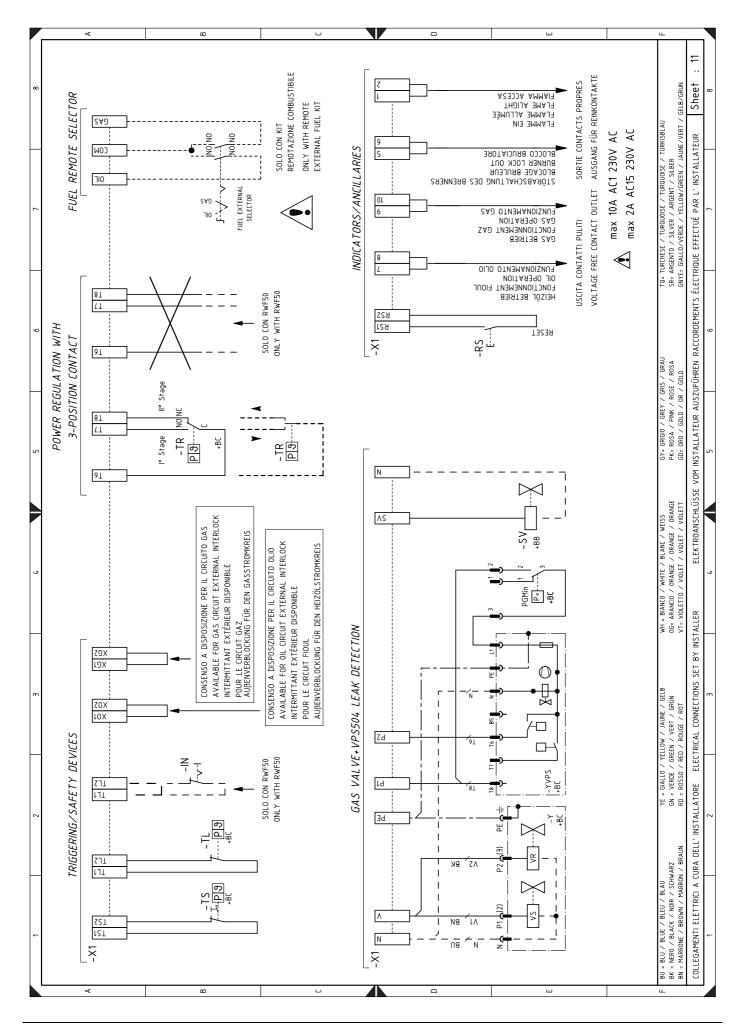


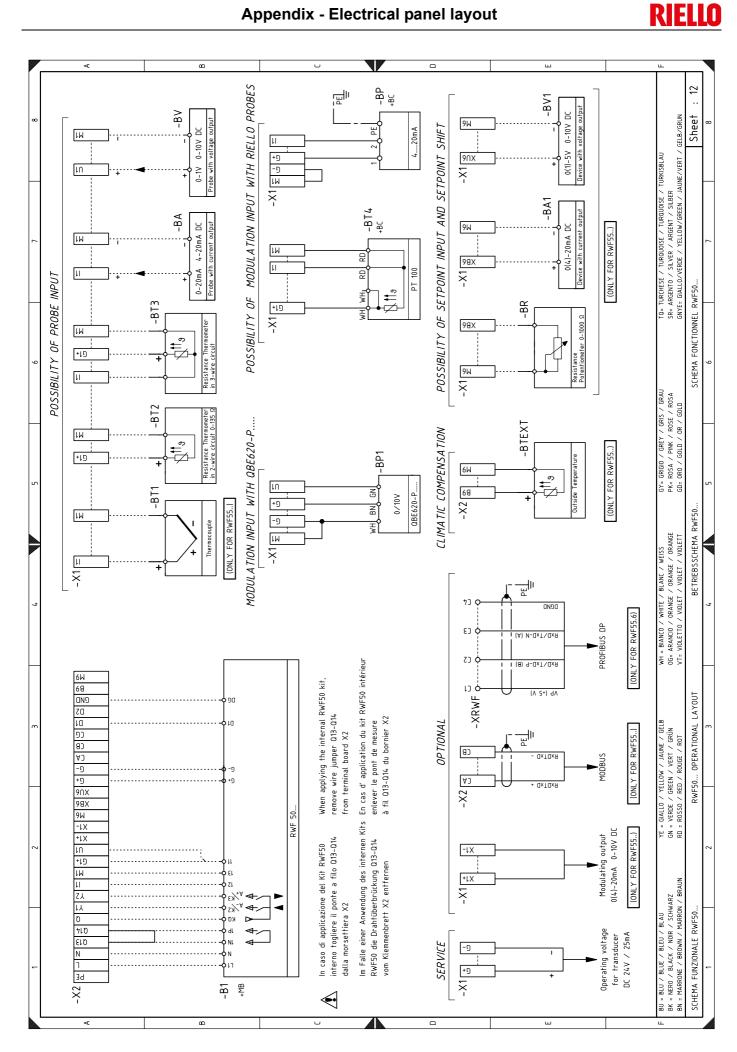












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L L			Per il collegamento fare riferimento alle istruzioni presenti sul kit	For the connection refer to the instructions supplied with the kit	Se référer aux instructions reportées sur le kit pour le branchement	Für die Anschlüsse siehe Anweisungen im Kit			10- TURCHESE / TURQUOISE / TURQUOISE / TURKISBLAU Sta. ARGENTO / SILVER / ARGENT / SILBER GNYE- GALLOVYERDE / YELLOW/GREEN / JAUNE/VERT / GELØ/GRUN	RACCORDEMENTS ÉLECTRIQUE KIT RWF50 EXTÉRIEUR	7
6		L	Per il collegam alle istruzioni	For the connec instructions su	Se référer aux sur le kit pour	Für die Anschl				RACCORDEMENTS ÉL	9
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4									WH = BIANCO / WHITE / BLANC / WEISS 06= ARANCIO / ORANGE / ORANGE / ORANGE VT= VOLETTO / VOLET / VOLET / VOLET /	ELEKTROANSCHLÜSSE EXTERNER KIT RWF50	4
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X4



B1 Internal RWF output power regulator XAUX Auxiliary terminal board Derivation unit con B2 External RWF output power regulator XGD ΒA Probe with output under current XI Output device in current to modify remote setpoint XI BA1 XI BP Pressure probe XI BP1 Pressure probe X BR Remote setpoint potentiometer X Thermocouple probe BT1 Probe Pt100, 2 wires X' X' X' Y BT2 BT3 Probe Pt100, 3 wires BT4 Probe Pt100, 3 wires BTEXT External probe for climatic compensation of the Y١ setpoint ΒV Probe with output under voltage Device with output under voltage for change of remote BV1 setpoint FU Three-phase line fuses Fan motor thermal relay F1 F2 Pump motor thermal relay F3 Auxiliary fuse Burner ON warning lamp H1 H2 Fan motor and pump motor lockout warning lamp H3 Heat request lighting signal H4 Burner working lighting signal KL1 Star/triangle starter line contactor and direct start-up KMP Pump motor contactor KT1 Star/triangle starter triangle contactor KS1 Start/triangle starter star contactor KST1 Star/triangle starter timer Burner ON dry contact output relay K1 K3 Burner lockout dry contact output relay Output relay for light oil operation clean contacts K4 K5 Output relay for gas operation clean contacts KG Gas operation relay KO Light oil operation relay MP Pump motor Fan motor MV Air pressure switch PA PE Burner earth PGM Maximum gas pressure switch PGMin Minimum gas pressure switch PO Oil pressure switch PO1 Maximum oil pressure switch on return line RS Remote burner reset button S1 Emergency stop button S2 Off / automatic / manual selector S4 Output increase / decrease selector S5 Fuel selector and enable signal to remote fuel selector Burner reset button and lockout signal SH3 SM Servomotor SV External safety valve TA Ignition transformer TL Limit thermostat/pressure switch TR Adjustment thermostat/pressure switch ΤS Safety thermostat/pressure switch UV Flame sensor VF Light oil operation valve VP1 Pilot valve 1 VP2 Pilot valve 2 VR Light oil return valve VR1 Light oil return valve Safety light oil valve VS VU Nozzle valve X1 Main supply terminal board X2 Terminal board for kit RWF

Wiring layout key

Electrical control box

A1

GD	Derivation unit connector
PGM	Maximum gas pressure switch connector
PO	Oil pressure switch connector
PO1	Oil return pressure switch connector
RWF	Terminal board for RWF50 output power regulator
S	Flame sensor connector
SM	Servomotor connector
VP1	Pilot valve 1 connector
VP2	Pilot valve 2 connector
VU	Nozzle valve connector
	Gas adjustment valve + gas safety valve
VPS	Gas valve leak detection device

Light oil unit terminal board



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