GB

Forced draught gas burner

Modulating operation

CODE	MODEL	TYPE
20155875	RS 810/M BLU	S032T

20163413 (5) - 06/2021

Translation of the original instructions

1 Declarations

Declaration of conformity in accordance with ISO / IEC 17050-1		
Manufacturer:	RIELLO S.p.A.	
Address:	Via Pilade Riello, 7 37045 Legnago (VR)	
Product:	Forced draught gas burner	
Model and type:	RS 810/M BLU	S032T
These products are in compliance with the following Technical Standards:		
EN 676		
EN 12100		
and according to the European Directives:		
GAR	2016/426/EU	Gas Appliances Regulation
MD	2006/42/EC	Machine Directive
LVD	2014/35/EU	Low Voltage Directive
EMC	2014/30/EU	Electromagnetic Compatibility
PED	2014/68/EU (**only FS2**)	Pressure Equipment Directive
Such products are marked as follows:		
CE 0085	**CE-0123CU1067**	RS 810/M BLU (Class 3 EN 676)

The quality is guaranteed by a quality and management system certified in accordance with ISO 9001:2015.

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	Model	Type	Output
Forced draught gas burner	RS 810/M BLU	S032T	1200 - 8010 kW

Legnago, 03.05.2021

Research & Development Director
RIELLO S.p.A. - Burner Department
Mr. F. Maltempi

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 Service of the area;
- ➤ is designed for use by qualified personnel;
- ➤ offers important indications and instructions relating to the installation safety, start-up, use and maintenance of the burner.

Symbols used in the manual

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

2.1.2 General dangers

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

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

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

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

2.1.3 Other symbols

DANGER: LIVE COMPONENTS

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

DANGER: FLAMMABLE MATERIAL

This symbol indicates the presence of flammable materials.

DANGER: BURNING

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

DANGER: CRUSHING OF LIMBS

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

WARNING: MOVING PARTS

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

DANGER: EXPLOSION

This symbol signals places where an explosive atmosphere is present. An explosive atmosphere is defined as a mixture of dangerous substances with air, under atmospheric conditions, 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.

MOUNT CASING

This symbol indicates that it is mandatory to mount casing again after maintenance, cleaning or checks.

ENVIRONMENTAL PROTECTION

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

IMPORTANT INFORMATION

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

➤ This symbol indicates a list.

Abbreviations used

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

2.1.4 Delivery of the system and the instruction manual

When the system is delivered, it is important that:

➤ the instruction manual is delivered to the user by the system manufacturer, with the recommendation to keep it in the room where the heat generator is to be installed.

➤ The instruction manual shows:
– the serial number of the burner;

.....

– the address and telephone number of the nearest Assistance Centre.

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

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

2.2 Guarantee and responsibility

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

WARNING

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

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

➤ incorrect installation, start-up, use and maintenance of the burner;
➤ improper, incorrect or unreasonable use of the burner;
➤ intervention of unqualified personnel;
➤ carrying out of unauthorised modifications on the equipment;
➤ use of the burner with safety devices that are faulty, incorrectly applied and/or not working;
➤ installation of untested supplementary components on the burner;
➤ powering of the burner with unsuitable fuels;
➤ faults in the fuel supply system;
➤ use of the burner even following an error and/or an irregularity;
➤ 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;
➤ the use of non-original components, including spare parts, kits, accessories and optional;
➤ force majeure.

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

3 Safety and prevention

3.1 Introduction

The burners have been designed and built in compliance with current regulations and directives, applying the known technical rules of safety 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.

In particular:

it can be applied to boilers operating with water, steam, diathermic oil, and to other users expressly named by the manufacturer; the type and pressure of the fuel, the voltage and frequency of the electrical power supply, the minimum and maximum deliveries for which the burner has been regulated, the pressurisation of the combustion chamber, the dimensions of the combustion chamber and the room 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 functioning only if all burner components are intact and positioned correctly.

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.

In addition:

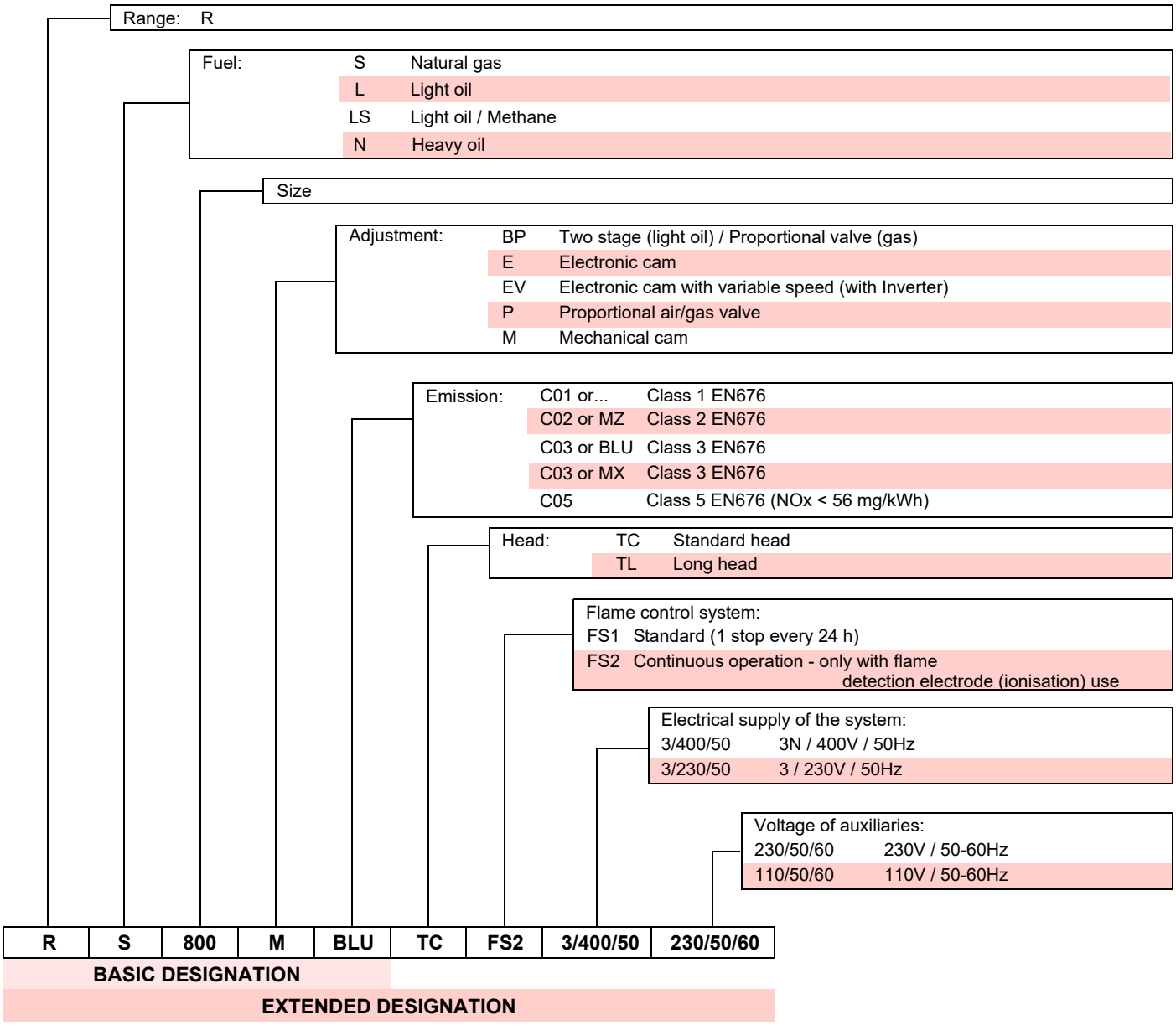
➤ the user must take all the measures necessary to prevent unauthorised people gaining access to the machine;

➤ 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
RS 810/M BLU FS2	3/400/50	Star/Delta	20155875

Tab. A

4.3 Burner categories - Countries of destination

Gas category	Destination country
I_{2H}	AT-BG-CH-CZ-DK-EE-ES-FI-GB-GR-HU-HR-IE-IS-IT-LT-LV-NO-PT-RO-SE-SI-SK-TR
I_{2ELL}	DE
I_{2EK}	BE
I_{2Er}	FR
$I_{2E(R)}$	BE
I_{2E}	LU - PL

Tab. B

4.4 Technical data

Model			RS 810/M BLU
Power (1) Output (1)	min - max	kW	1200/3500 ÷ 8010
Fuels			Natural gas: G20 (methane gas) - G25
Gas pressure at max. output (2) - Gas: G20/G25		mbar	49.7/73
Operation			FS2: Continuous
Standard applications			Boilers: water, steam, diathermic oil
Ambient temperature		°C	0 - 40
Combustion air temperature		°C max	60
Burner weight		Kg	300
Noise levels (3)	Sound pressure Sound power	dB(A)	88.3 103.00

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 the test point 21)(Fig. 4 on page 11) with zero pressure in the 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 rated output. The sound power is measured with the “Free Field” method, as per EN 15036, and according to an “Accuracy: Category 3” measuring accuracy, as set out in EN ISO 3746.

4.5 Electrical data

Model		RS 810/M BLU
Main electrical supply		3N ~ 400V +/-10% 50 Hz
Fan motor IE3	rpm V kW A	2950 400/690 22 39.4/22.7
Ignition transformer	V1 - V2 I1 - I2	230 V - 1 x 8 kV 1 A - 20 mA
Absorbed electrical power	kW max	24.5
Protection level		IP 54

Tab. D

4.6 Maximum dimensions

The maximum dimensions of the burner are shown 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 A and R positions.

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

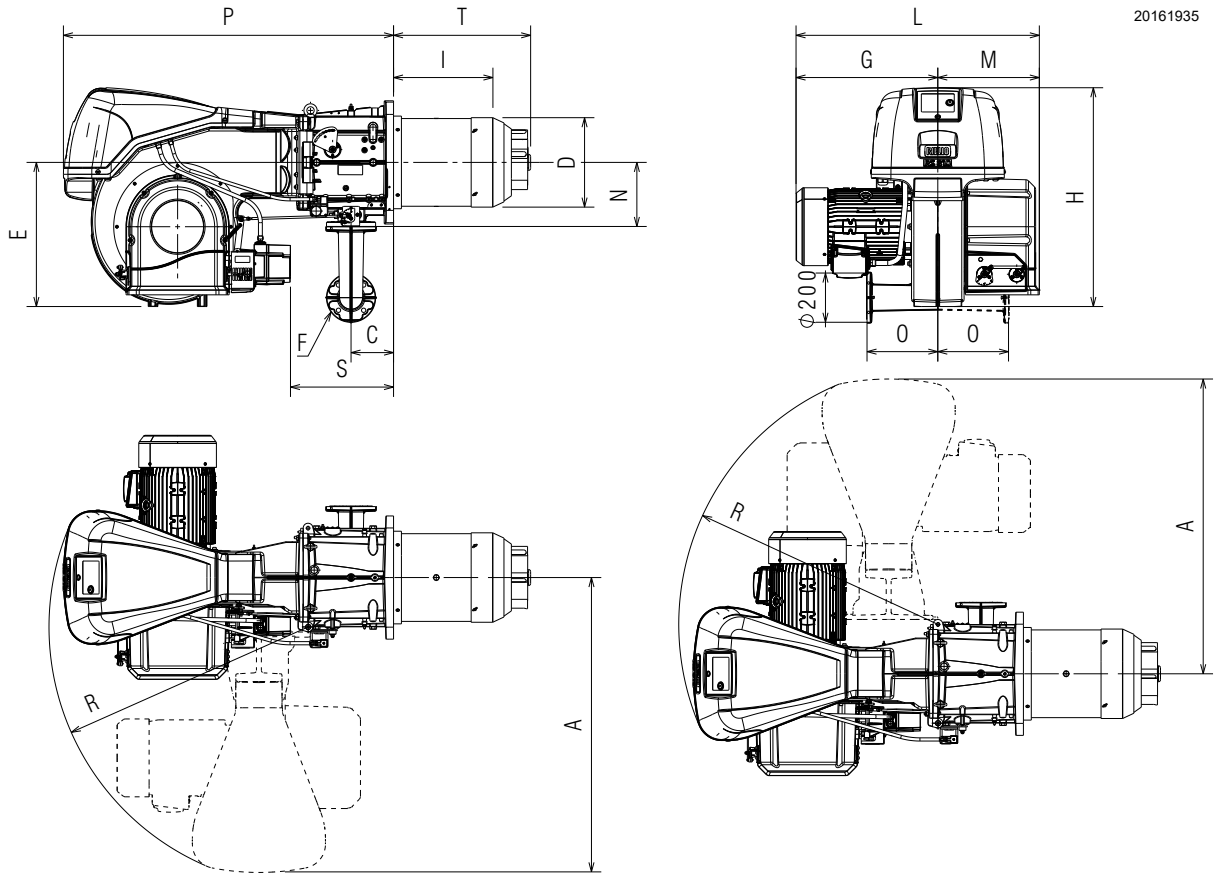


Fig. 1

mm	A	C	D	E	F	G	I	L	M	N	P	R	S	T
RS 810/M BLU	1197	173	363	585	DN80	577	405	990	413	260	1345	1055	420	558

Tab. E

4.7 Burner equipment

Thermal insulation screen . . . . . No. 1
Gasket for gas train . . . . . No. 2
M 12 x 16 replacement screws to secure the combustion head . . No. 2
M18 x 70 screws to secure the burner to the boiler . . . . . No. 4
∅ 18 washer to secure the burner to the boiler . . . . . No. 4
M16 x 67 stud bolts to fix the gas elbow to the pipe coupling . . . . . No. 8
M16 nuts to fix the gas elbow to the pipe coupling . . . . . No. 8
∅ 16 washer to secure the gas flange . . . . . No. 8
Pressure kit switch . . . . . No. 1
Instructions . . . . . No. 1
Spare parts list . . . . . No. 1

4.8 Firing rates

The **MAXIMUM OUTPUT** is chosen from within the diagram area (Fig. 2).

The **MINIMUM OUTPUT** must not be lower than the minimum limit of the diagram:

Model	kW
RS 810/M BLU	1200

WARNING

The firing rate value (Fig. 2) has been obtained considering an ambient temperature of 20C, an atmospheric pressure of 1013 mbar (approx. 0 m a.s.l.), and with the combustion head adjusted as shown on page 19.

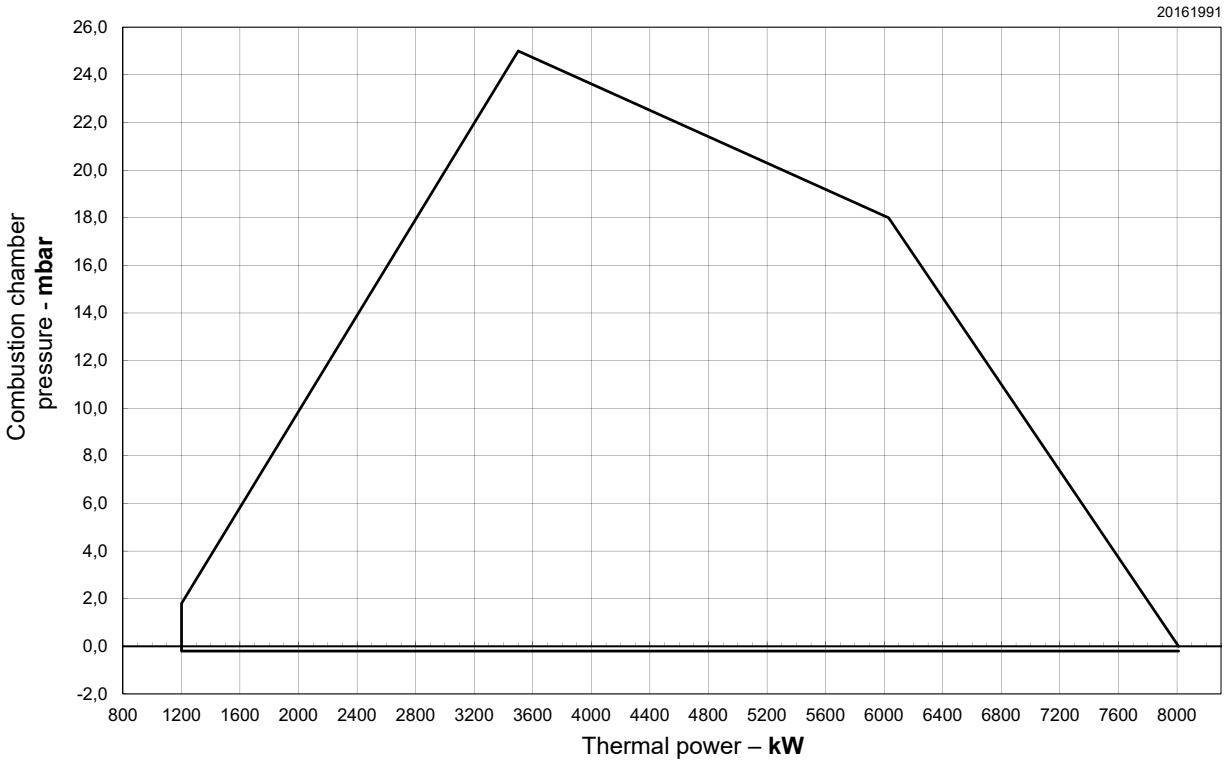


Fig. 2

4.9 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 regulations.

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.

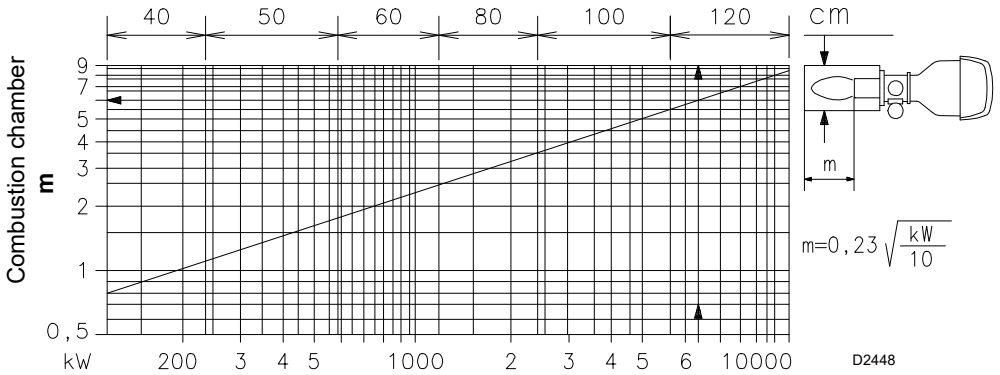


Fig. 3

4.10 Burner description

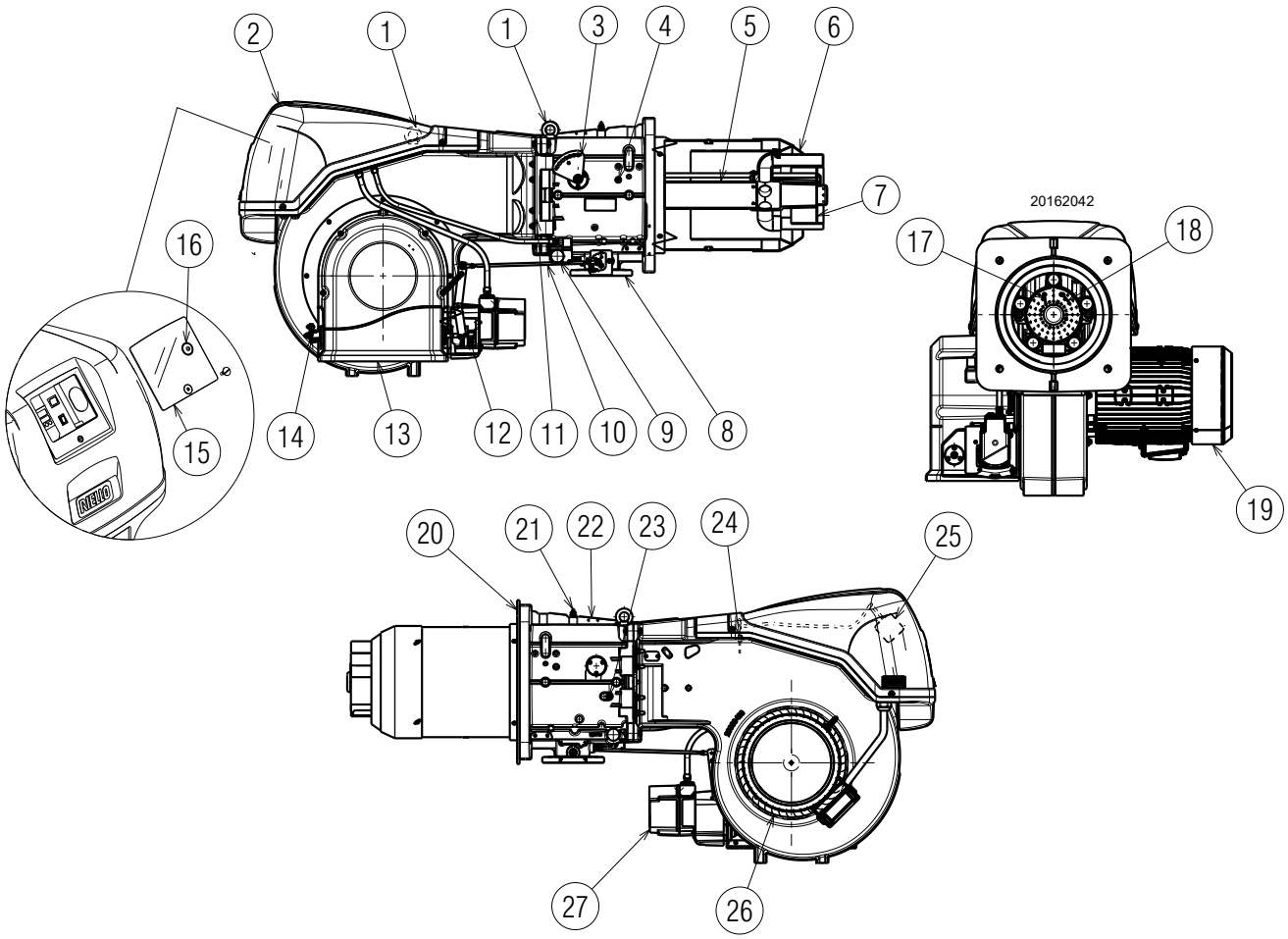


Fig. 4

1 Lifting rings
2 Cover for electrical panel
3 Lever for combustion head movement
4 Air pressure test point for combustion head
5 Combustion head
6 Shutter
7 Flame stability disc
8 Gas inlet flange
9 Maximum gas pressure switch
10 Lever for gas butterfly valve control
11 Hinge for burner opening
12 Adjustable profile cam
13 Air inlet for fan
14 Air damper control lever
15 Protection for viewing port
16 Reset button
17 Ignition electrode
18 Flame sensor probe
19 Fan motor
20 Gasket for boiler fixing
21 Gas pressure test point for combustion head
22 Pipe coupling
23 Air pressure test point for combustion head
24 Pressure test point for air pressure switch “+”
25 Air pressure switch
26 Fan
27 Servomotor for air dampers

CAUTION

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

When the burner is closed, the hinge can be refitted on the opposite side.

4.11 Electrical panel description

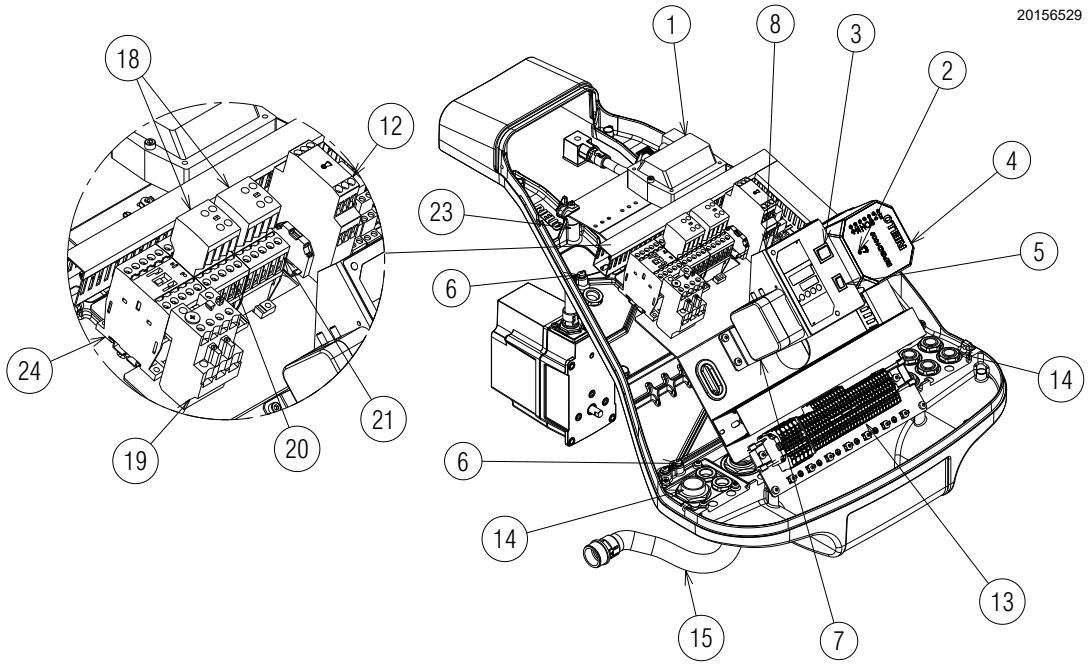


Fig. 5

1 Ignition transformer
2 Burner state indicator light and reset button. For further information see section Burner ignition
3 OFF-automatic-manual selector
4 Electrical control box
5 Power increase - power reduction selector
6 Earth terminal
7 Air pressure switch
8 Bracket for applying the kits
9 Relay with clean contacts for signalling the burner is operating
10 Relay with clean contacts for signalling the burner is in lockout
11 Auxiliary circuits fuse (includes a spare fuse)
12 Timer for star/triangle start up
13 Main terminal supply board
14 Supply cables and external connections passage. See section “Electrical wiring” on page 22.
15 Motor cables sheath
16 Maximum gas pressure switch sheath
17 Servomotor sheath
18 Direct start up line contactor
19 Thermal relay (with reset button)
20 Triangle contactor (Star/triangle start up)
21 Star contactor (Star/triangle start up)
22 Auxiliary contacts (Star/triangle start up)
23 Ionisation probe cable
24 Star/triangle start-up line contactor

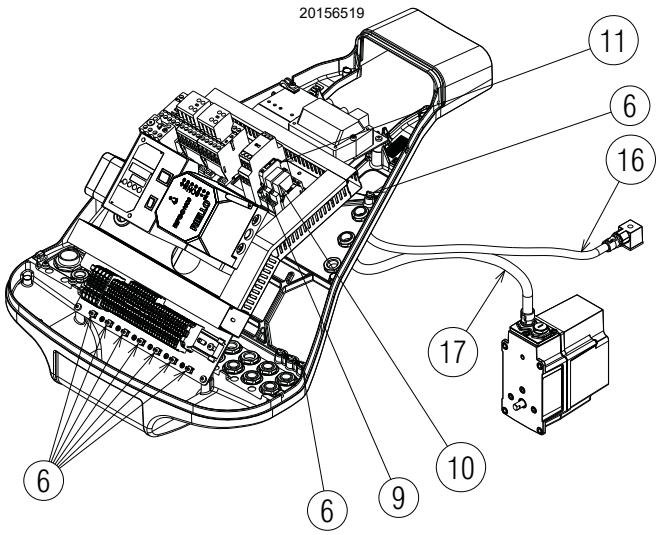


Fig. 6

4.12 RFGO-A22 control box

Warnings

WARNING

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. Riello S.p.A. cannot assume any responsibility for damage resulting from unauthorised interventions!

- ➤ 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). Check the system is not powered and cannot be accidentally reconnected. Failure to do this will lead to the risk of electrocution.
- ➤ 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 the safety and reliability of the control box, 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.

Fig. 7

Technical data

Mains voltage	AC 230 V -15 % / +10 %
Mains frequency	50 / 60 Hz
Primary fuse (external)	max. 10 A
Weight	approx. 1 kg
Power absorption	approx. AC 3.5 VA
Protection level	IP40
Safety class	II
Environmental conditions:	
Operation	DIN EN 60721-3-1
Mechanical conditions	Class 1K2
Temperature range	Class 1M2
Humidity	-40...+60 °C
	< 95 % r.h. (without condensing)

Tab. F

Mechanical structure
The control box is made of plastic to resist knocks, heat and flame propagation.
The electronic flame signal amplifier is integrated into the control box.

4.13 Servomotor SQM41 ...

Warnings

WARNING

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

Avoid opening, modifying or forcing the servomotor.

- ➤ All interventions (assembly and installation operations, assistance, etc.) must be carried out by qualified personnel.
- ➤ 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.
- ➤ Fully disconnect the burner from the mains when working near terminals and servomotor connections.
- ➤ Condensation and exposure to water are not allowed.
- ➤ For safety reasons, the servomotor must be checked after long periods of non-use.

S8907

Fig. 8

Technical data

Mains voltage	230 V -15% +10%
Mains frequency	50 / 60 Hz
Power absorption	7 ... 15 VA
Motor	Synchronous
Drive angle	Varying between 0° and 135°

WARNING

Absolutely do not adjust the red cam No. 1 more than 90° to prevent serious or irreversible damage to the mechanical adjustment parts.

Protection level	Max. IP 66, with appropriate cable entry
Cable entry	2 x M16
Cable connection	terminal board for 0.5mm^2 (min.) and 2.5mm^2 (max.)
Rotation direction	Clockwise
Rated torque (max.)	10 Nm
Holding torque	5 Nm
Operation time	30 s. at 90°
Weight	approx. 2 kg
Environmental conditions:	
Operation	-20....+60° C
Transport and storage	-20...+60°C

Tab. G

4.14 Calibration of the thermal relay

The thermal relay serves to avoid damage to the motor due to an excessive absorption increase or if a phase is missing.

For calibration **2)**, see the table in the wiring diagram.

To reset, in case of an intervention of the thermal relay, press the “RESET” button 1) of Fig. 9.

The red “TEST” button 3) opens the NC (95-96) contact and stops the motor.

CAUTION

The automatic reset can be dangerous. This operation is not foreseen in the burner operation. **Therefore do not position the “RESET” button 1) on “A”.**

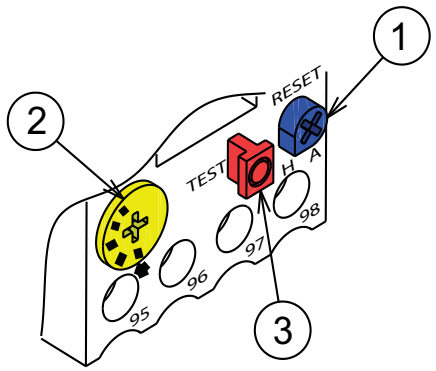


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Fig. 9

4.15 Motor rotation

As soon as the burner starts up, go in front of the cooling fan of the fan motor and check it is rotating anticlockwise (Fig. 10).

If this is not the case:

➤ set the burner switch to “0” (off) and wait for the control box to carry out the switch-off phase.

DANGER

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

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

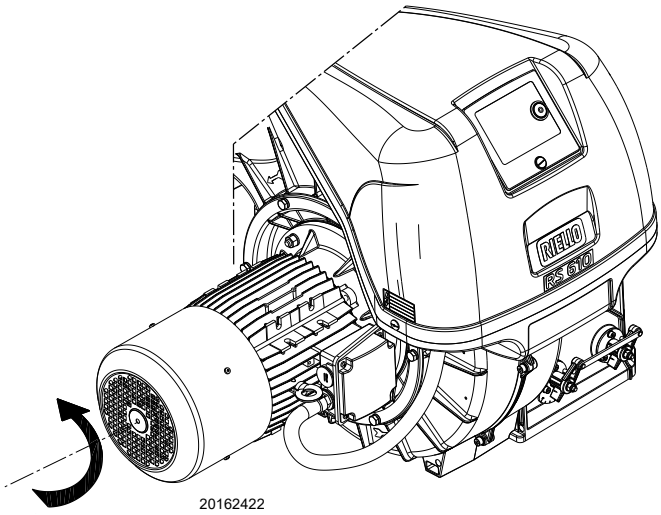

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Fig. 10

5 Installation

5.1 Notes on safety for the installation

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

DANGER

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

WARNING

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

DANGER

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

WARNING

The handling operations for the burner can be highly dangerous if not carried out with the greatest attention: keep any unauthorised people at a distance; check the integrity and suitableness of the available means of handling.
Check also that the area in which you are working is empty and that there is an adequate escape area (i.e. a free, safe area to which you can quickly move if the burner should fall).
When handling, keep the load at not more than 20-25 cm from the ground.

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

CAUTION

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

5.3 Preliminary checks

Checking the consignment

CAUTION

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

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

Checking the characteristics of the burner

Check the identification label of the burner, showing:
- ➤ the model (**A**) (Fig. 11) 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 data of the burner's minimum and maximum output possibilities (**H**) (see Firing rate)
  Warning. The burner output must be within the boiler's firing rate;
- ➤ the category of the appliance/countries of destination (**I**).

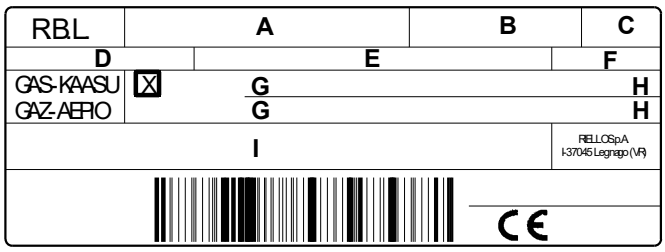

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Fig. 11

WARNING

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

5.4 Operating position

WARNING

- ➤ The burner is designed to operate only in positions **1**, **2**, **3** and **4** (Fig. 12).
- ➤ 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** permit operation but make maintenance and inspection of the combustion head more difficult.

DANGER

- ➤ Any other position could compromise the correct operation of the appliance.
- ➤ Installation **5** is prohibited for safety reasons.

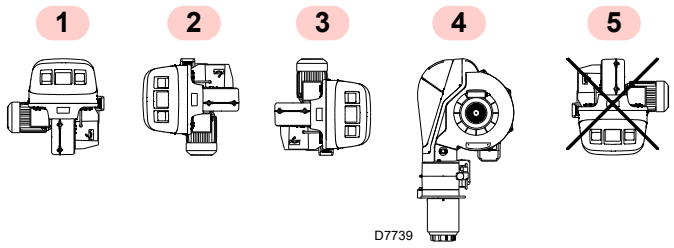


Fig. 12

5.5 Removal of the locking screws from the shutter

WARNING

Remove the screws and the nuts 1)-2)(Fig. 13), before installing the burner on the boiler.

Replace them with the screws 3) M12 X 16 supplied with the burner.

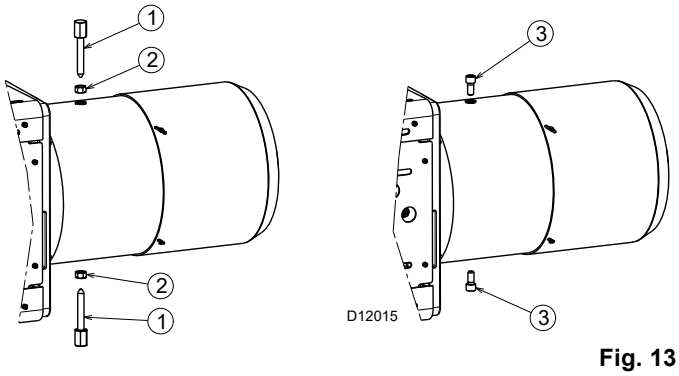


Fig. 13

5.6 Preparing the boiler

5.6.1 Boring the boiler plate

Pierce the closing plate of the combustion chamber, as in Fig. 14. The position of the threaded holes can be marked using the thermal insulation screen supplied with the burner.

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 refractory.

For boilers with front flue passes 1)(Fig. 15 on page 18) or flame inversion chamber, a protection in refractory material 5) must be inserted between the boiler fettling 2) and the flame funnel 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. 15 on page 18) is not necessary, unless expressly requested by the boiler manufacturer.

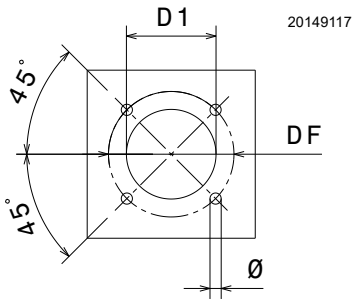


Fig. 14

mm	D1	DF	∅
RS 810/M BLU	400	495	M18

Tab. H

5.7 Securing the burner to the boiler

Prepare a suitable lifting system using rings 3)(Fig. 15).

- ➤ Fit the heat insulation supplied onto the blast tube 4)(Fig. 15).
- ➤ Fit the entire burner onto the boiler hole prepared previously (Fig. 14 on page 17), and fasten with the screws supplied.

WARNING

The seal between burner and boiler must be airtight.

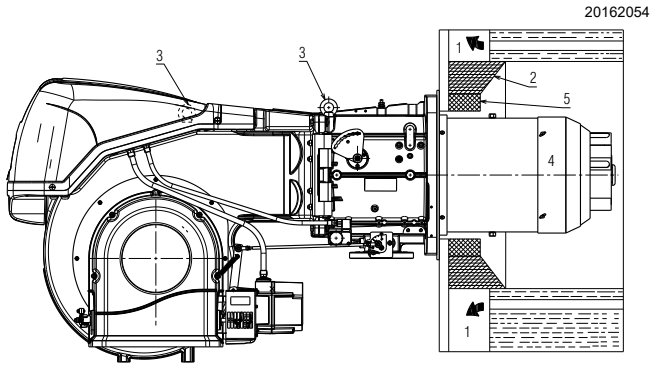


Fig. 15

5.8 Access to head internal part

- ➤ Unhook the tie-rod 1)(Fig. 16) of the gas butterfly valve movement lever, removing the nut.
- ➤ Disconnect the socket 2) of the gas pressure switch.
- ➤ Remove the 4 fixing screws 3).
- ➤ Open the burner on the hinge as in Fig. 16.
- ➤ Unhook the probe cables and electrode 4).
- ➤ Turn the underneath part of the elbow 5) anticlockwise up to release it from its housing.
- ➤ Undo the screw 6) with pressure test point.
- ➤ Remove the internal part of the head 7).

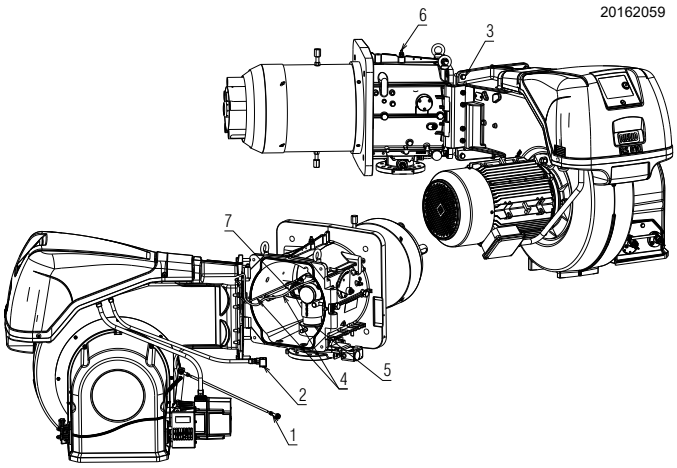


Fig. 16

5.9 Probe-electrode position

WARNING

Check that the probe and the electrode are placed as in Fig. 17, according to the dimensions indicated.

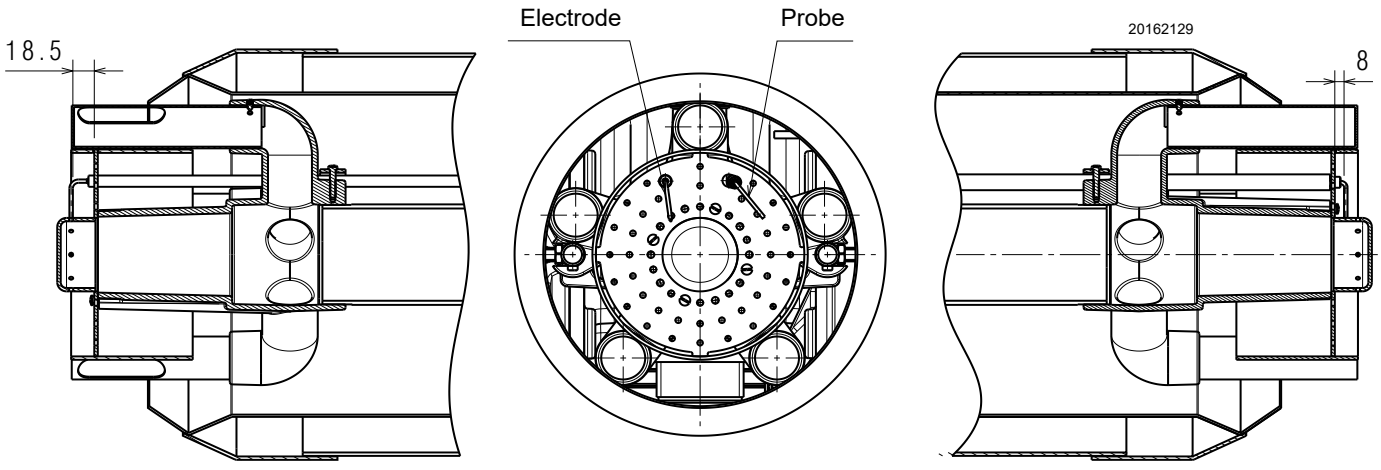


Fig. 17

5.10 Combustion head adjustment

In order to optimise performance, the burner is equipped with a variable geometry combustion head which operates on the basis of the delivered output.

According to the same rotation of the air servomotor, it is possible to change the combustion head opening by moving the lever 2)(Fig. 18) on the holes (1-2-3-4-5-6), after loosening the screw 1). The choice of the hole (1-2-3-4-5-6) to use is based on the following table, according to the required output.

These output values may not match with the actual values as the combustion conditions change according to the plant.

The factory regulation corresponds to the minimum output (coupling position: **1)**.

Coupling position	Output (kW)
3	3500
4	4333
5	5166
6	6000
6	8010

Tab. I

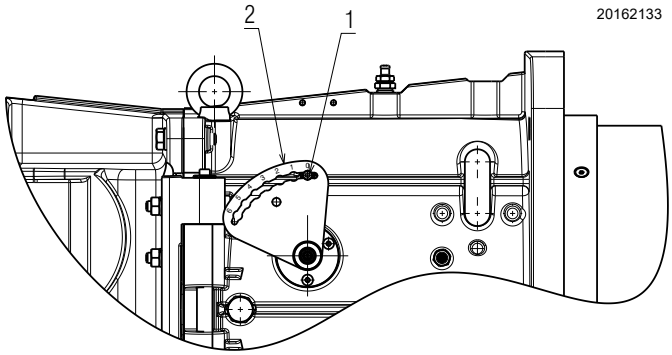


Fig. 18

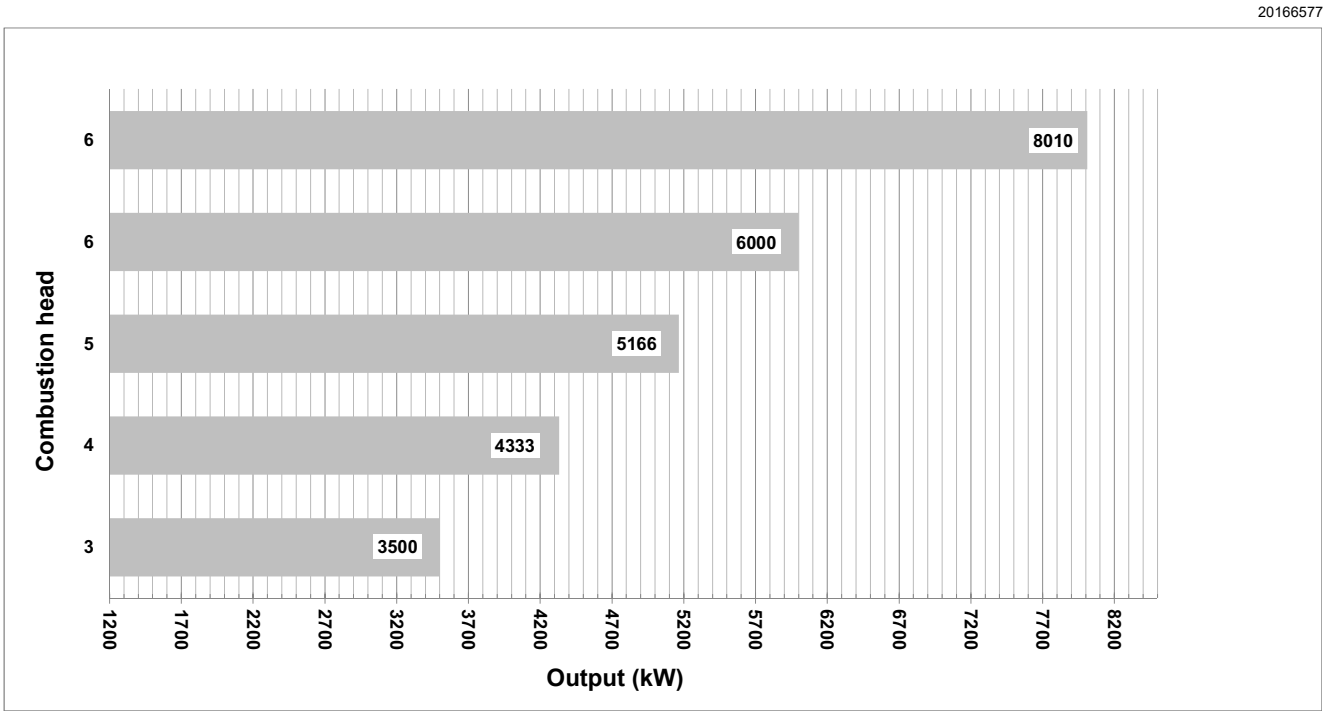


Fig. 19

5.11 Gas feeding

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

Precautions: avoid knocking, attrition, sparks and heat.

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

WARNING

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

5.11.1 Gas feeding line

Key (Fig. 20 - Fig. 21 - Fig. 22 - Fig. 23)

1 Gas input pipe
2 Manual valve
3 Vibration damping joint
4 Pressure gauge with push-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, provided as an accessory or integrated, based on the gas train code. In compliance with the EN 676 standard, the leak detection control is compulsory for burners with maximum outputs over 1200 kW.
9 Gasket, for “flanged” versions only
10 Pressure adjuster
P2 Up-line pressure of valves/adjuster
P3 Upstream pressure of the filter
L Gas train, supplied separately
L1 The responsibility of the installer

WARNING

For applications according to the Pressure Equipment Directive PED 2014/68/EU, the installer is required to provide:
- suitable means for draining and venting as defined in clause K.10 of DIN EN 676;
- valve proving system as defined in clause K. 14.4 of DIN EN 676.

MBC “threaded”

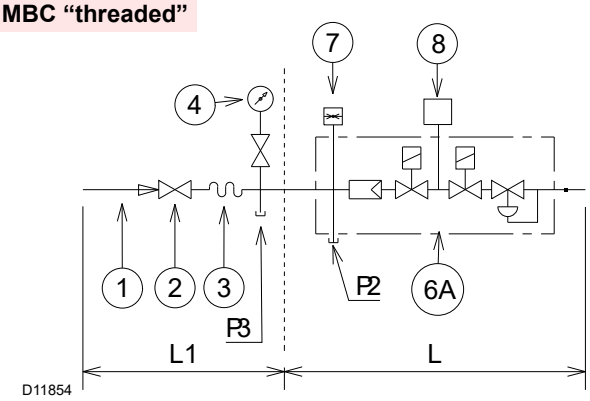


Fig. 20

MBC “flanged”-VGD

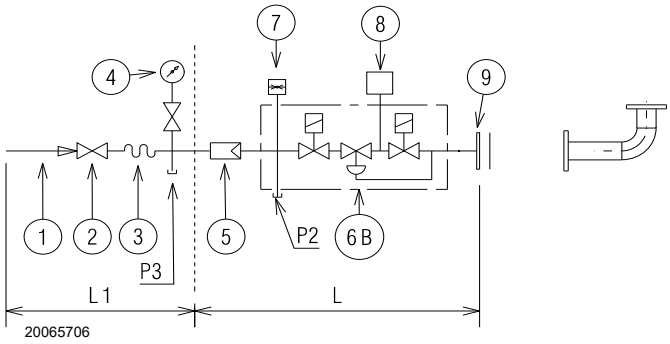


Fig. 21

DMV “flanged or threaded”

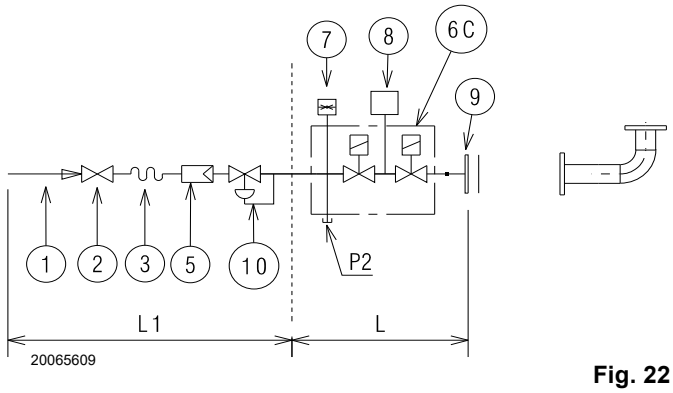


Fig. 22

CB “flanged or threaded”

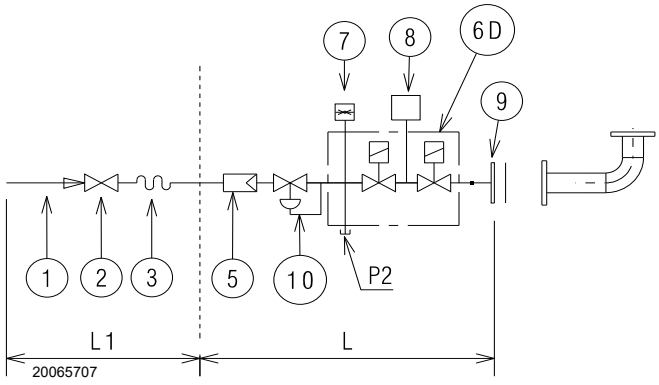


Fig. 23

5.11.2 Gas train

Approved according to standard EN 676 and provided separately from the burner.

5.11.3 Gas train installation

Disconnect the electrical power using the main system switch.

Check that there are no gas leaks.

Beware of train movements: danger of crushing of limbs.

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

The operator must use appropriate tools for installation.

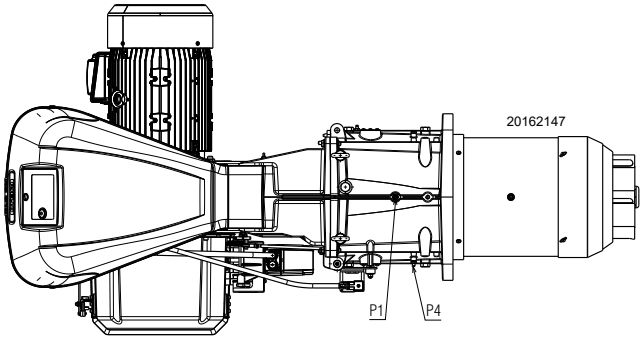


Fig. 24

5.11.4 Gas pressure

Tab. J indicates the minimum pressure drops along the gas supply line, depending on the maximum burner output.

The values shown in Tab. J refer to:
– Natural gas G 20 NCV 9.45 kWh/Sm^3 (8.2 Mcal/Sm^3)
– Natural gas G 25 NCV 8.13 kWh/Sm^3 (7.0 Mcal/Sm^3)

Column 1

Pressure drop on combustion head.
Gas pressure measured at the test point P1) (Fig. 24), with:
- Combustion chamber at 0 mbar;
- Burner working at maximum output;
- Combustion head adjusted as in page 19.

Column 2
Pressure loss at gas butterfly valve with maximum opening: 90°.

Calculate the approximate maximum output of the burner in this way:

– subtract the combustion chamber pressure from the gas pressure measured at test point P1) (Fig. 24).
– Find, in the table Tab. J related to the burner concerned, the pressure value closest to the result of the subtraction.
– read the corresponding output on the left.

Example for with G20 natural gas:
Maximum output operation

Gas pressure at test point P1) (Fig. 24)	=	27,6 mbar
Pressure in combustion chamber	=	2 mbar
27,6 - 2	=	25,6 mbar

A pressure of 25.6 mbar, column 1, corresponds in the table Tab. J to an output of 5750 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 P1) (Fig. 24), set the MAX output required from the burner operation:
– find the nearest output value in the table Tab. J for the burner in question.
– read, on the right (column 1), the pressure at the test point P1) (Fig. 24).
– Add this value to the estimated pressure in the combustion chamber.

Example for with G20 natural gas:
Required burner maximum output operation: 5750 kW

Gas pressure at an output of 5750 kW	=	25,6 mbar
Pressure in combustion chamber	=	2 mbar
25,6 + 2	=	27,6 mbar

Pressure required at test point P1) (Fig. 24).

The heat output and gas pressure data in the head refer to operation with gas butterfly valve fully open (90°).

kW	**1** Δp (mbar)		**2** Δp (mbar)	
	G 20	G 25	G 20	G 25
3500	9.5	14.0	0.4	0.6
4250	14	20.6	0.6	1.0
5000	19.4	28.5	0.9	1.4
5750	25.6	37.7	1.2	1.8
6500	32.7	48.1	1.5	2.3
7250	40.7	59.9	1.9	2.9
8010	49.7	73.0	2.3	3.5

Tab. J

5.12 Electrical wiring

Notes on safety for the electrical wiring

DANGER

- The electrical wiring must be carried out with the electrical supply disconnected.
- Electrical wiring must be made in accordance with the regulations currently in force in the country of destination and by qualified personnel. Refer to the wiring diagrams.
- The manufacturer declines all responsibility for modifications or connections different from those shown in the wiring diagrams.
- Check that the electrical supply of the burner corresponds to that shown on the identification label and in this manual.
- The burners have been set for continuous operation. This means it should compulsorily be stopped at least once every 72 hours (with the only use of the electrode for the flame detection- ionization) to enable the control box to check its own efficiency at start-up. Normally the boiler's thermostat/pressure switch ensures that the burner stops. If this is not the case, a time switch (IN) should be fitted in series to provide for burner shut-down at least once every 72 hours. Refer to the wiring diagrams.
- 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, you must apply a time switch 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:

DANGER

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

DANGER

Turn off the fuel interception tap.

DANGER

Avoid condensate, ice and water leaks from forming.

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

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

5.12.1 Supply cables and external connections passage

All the cables to be connected to the burner must be threaded through cable grommets. The use of the cable grommets can take various forms; by way of example see Fig. 25.

Key (Fig. 25)
1 Electrical supply - Bore for M32
2 Consents / Safety devices - Bore for M20
3 Minimum gas pressure switch - Bore for M20
4 VPS gas valve leak detection control kit- Bore for M20
5 Gas train - Bore for M20
6 Available - Bore for M20
7 Available - Bore for M16

Cable grommets used in the factory:
A - Fan motor
B - Maximum gas pressure switch
C - Air/gas servomotor

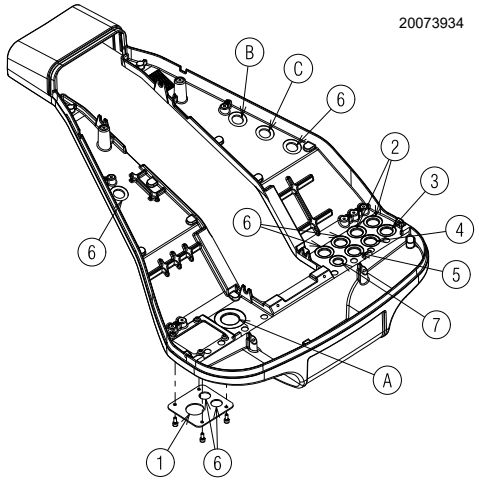


Fig. 25

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

6 Start-up, calibration and operation of the burner

6.1 Notes on safety for the first start-up

WARNING

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

WARNING

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

WARNING

Before igniting the burner, see the paragraph “Safety test - with gas feeding closed” on page 29.

6.2 Adjustments prior to ignition

Combustion head adjustment is already described on page 19.

In addition, the following adjustments must also be made:

- ➤ Open manual valves up-line from the gas train.
- ➤ Adjust the minimum gas pressure switch to the start of the scale.
- ➤ Adjust the maximum gas pressure switch to the end of the scale.
- ➤ Adjust the air pressure switch 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. 26), with socket (+) on the gas pressure of the pipe coupling and (-) in the combustion chamber.
  The manometer readings are used to calculate MAX burner output using the Tab. J.
- ➤ Connect two lamps or testers to the two gas line solenoids to check the exact moment in which voltage is supplied. This operation is unnecessary if each of the two solenoids is equipped with a pilot light that signals voltage passing through.

CAUTION

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.

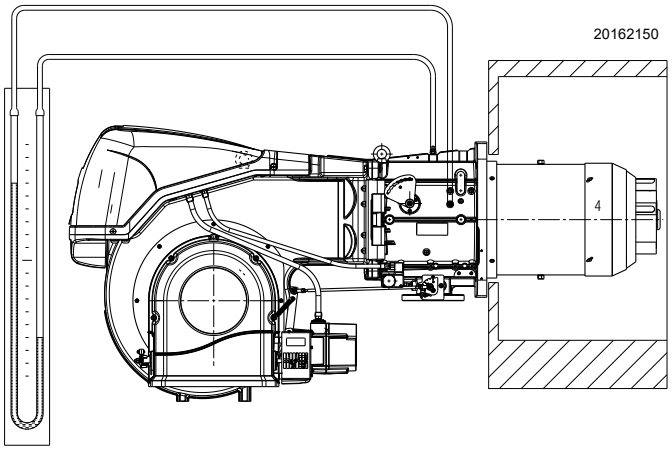


Fig. 26

6.3 Burner start-up

Turn off the thermostats/pressure switches and check the light signal 2) comes on Fig. 5 on page 12.

Put the selector 1)(Fig. 27) in position “**MAN**”.

Start of the fan motor. As the burner is not fitted with a device to check the sequence of the phases, the motor rotation may be incorrect.

As soon as the burner starts up, go in front of fan motor cooling fan and check it is rotating anticlockwise or else in the direction of the arrow shown in the diagram (burner description).

If this is not the case:

- ➤ put the switch 1) of Fig. 27 to “OFF” and wait for the control box carries out the switching off phase;

DANGER

disconnect the burner's electrical supply, since this operation should be carried out in the absence of the electrical supply;

- ➤ Invert the phases on the three-phase power supply;
- ➤ repeat the start-up procedure.

WARNING

Make sure that the lights or testers connected to the solenoids, or the pilot lights on the solenoids themselves, indicate that no voltage is present.
If voltage is present, stop the burner **immediately** and check the electrical wiring.

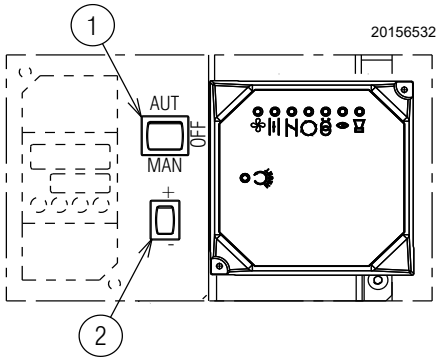


Fig. 27

6.4 Burner ignition

The burner should light after having performed the above steps.

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

Two types of burner failure may occur:

➤ **Control box lockout**: if the control box push-button (red led) 2)(Fig. 5 on page 12) lights up, it indicates that the burner is in lockout. Refer to the control box diagnostics for the causes of the lockout. release by pressing the push-button 2)(Fig. 5 on page 12). See control box reset.

➤ **Motor lockout because of thermal relay intervention**: because of an erroneous calibration of the thermal relay or problems with the motor or the main power supply. Release by pressing the button on thermal relay, see section “Calibration of the thermal relay” on page 15..

If ignition is still not achieved, it may be that gas is not reaching the combustion head within the safety time period of 3 seconds. In this case increase gas ignition delivery.

The arrival of gas at the pipe coupling is indicated by the U-type pressure gauge (Fig. 26).

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

6.5 Servomotor adjustment

The servomotor (Fig. 28) provides simultaneous adjustment for the air damper, by means of the adjustable profile cam and the gas butterfly valve. Completes a rotation of 90° in 30 s.
After the adjustment made in the factory to its 6 cams to allow an initial ignition. Check that they are as shown below. In the event of a modification, follow what is described below for each cam:

Camma I **(RED): 90°**
(The same for all models). Limits the rotation towards the maximum.

WARNING

In the event of a variation, absolutely do not adjust beyond 90°.

Cam II **(BLUE): 0**
(The same for all models). Limits the rotation towards the minimum. With the burner off the air damper and the gas butterfly valve should be closed: 0°. It is recommended that no adjustments are made.

Cam III **(ORANGE): 10°** Adjusts the ignition position and MIN. output.

Cam IV-V-VI **(YELLOW/BLACK/GREEN):** Do not use, they have no effect on the operation of the burner.

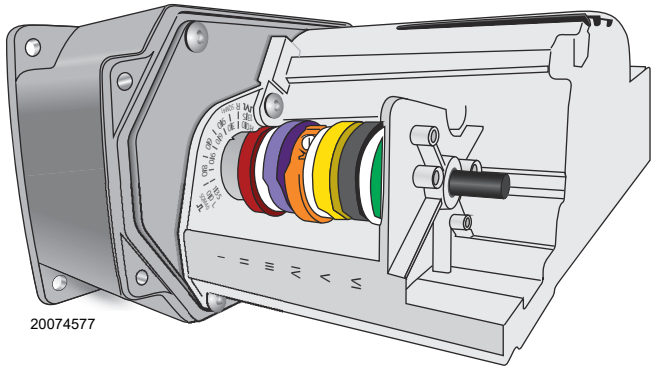


Fig. 28

6.6 Air / fuel adjustment

The air/fuel synchronisation is carried out using a servomotor 1)(Fig. 29) which, when connected directly to the air dampers, acts on the gas butterfly valve by means of an adjustable profile cam 2) and suitable leverage.

WARNING!
MOVING PARTS

DANGER: CRUSHING OF LIMBS

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 nearest possible to the maximum opening (90°).

The choking of the air, taking into account the maximum combustion output, takes place by varying the adjustment of the combustion head (See “Combustion head adjustment” on page 19).

On the gas butterfly valve, fuel step according to the burner output required, with servomotor completely open, is carried out by the pressure stabiliser placed on the train.

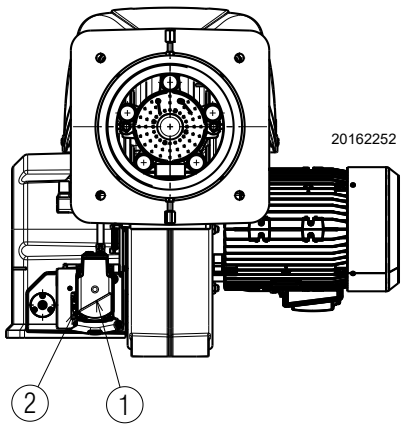


Fig. 29

6.6.1 Burner adjustment

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

Adjust in sequence:
1 - Output upon ignition
2 - MAX output
3 - MIN output
4 - Intermediate outputs between Min. and Max.
5 - Air pressure switch
6 - Maximum gas pressure switch
7 - Minimum gas pressure switch

6.6.2 Output upon ignition

Ignition must occur at a lower output than the max. operation output. Regulations provide that the ignition output of this burner must be equal to or less than 1/3 of the MAX operation output.

Example: MAX operation output of 8010 kW.

Ignition output must be equal to or lower than:

2670 kW with ts = 3 s.

In order to measure the ignition output:
- ➤ disconnect the plug-socket (Fig. 4 on page 11) on the ionisation probe cable (the burner starts up and then goes into lockout after the safety time has elapsed).
- ➤ Perform 10 ignitions with consecutive lockouts.
- ➤ Read the quantity of gas burned on the meter.
- ➤ This quantity must be equal to or lower than the quantity given by the formula:

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

Example for G 20 gas (9.45 kWh/Sm^3):

Max. operation output: 8010 kW corresponding to 846.7 Sm^3/h.

After 10 ignitions with their lockouts, the delivery indicated on the meter must be equal to or less than: 846.7 : 360 = 2.35 Sm^3

Air adjustment

The air is adjusted by varying the angle of cam III) (Fig. 31) and by using the selector 2)(Fig. 27 on page 23). To adjust the cam of the servomotor, see Fig. 31 A).

6.6.3 Maximum output

The MAX output must be set within the firing rate indicated in Fig. 2 on page 10.

In the above instructions we left the burner running at the MIN output. Now press the “increase output” button 2)(Fig. 27 on page 23), and keep it pressed until the servomotor has opened the air damper and the gas butterfly valve.

Adjustment of gas delivery

Measure the gas delivery on the gas meter.

A rough indication can be obtained from Tab. J on page 21, just read the gas pressure on the “U” pressure gauge, see Fig. 26 on page 23, and follow the indications.
- ➤ If delivery needs to be reduced, diminish outlet gas pressure; if it is already very low, slightly close the VR adjustment valve.
- ➤ If delivery needs to be increased, increase the adjuster outlet gas pressure.

Air adjustment

The air is adjusted by varying the angle of cam I) (Fig. 27 on page 23) and by using the selector 2)(Fig. 27 on page 23). To adjust the cam of the servomotor, see Fig. 31 A).

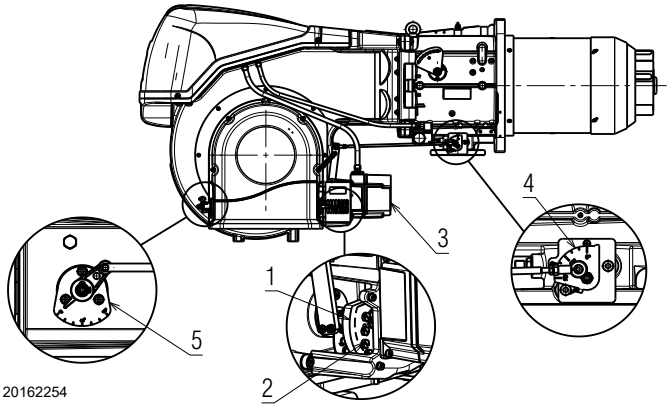


Fig. 30

Key (Fig. 30)
1 Cam
2 Adjustment screws
3 Servomotor
4 Graduated sector for gas butterfly valve
5 Air damper graduated sector

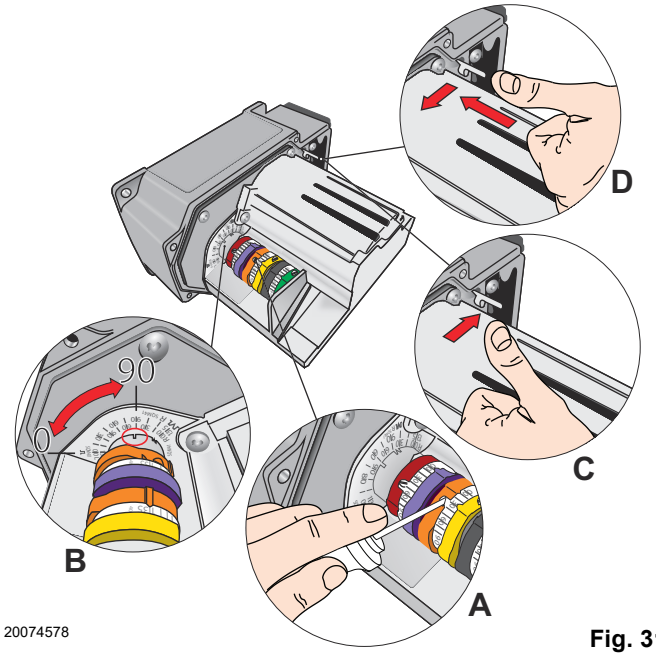


Fig. 31

6.6.4 Minimum output

Min output must be selected within the firing rate range shown on Fig. 2 on page 10.

Press button 2)(Fig. 27 on page 23) “Diminishing output” and keep it pressed until the servomotor regains (Fig. 31 B, page 25) the adjustment made in the factory: See page 24 and as a consequence adjusting the air damper 5) and the gas butterfly valve 4)(Fig. 30 on page 25).

Adjustment of gas delivery

Progressively adjust the end profile of the mechanical cam I) Fig. 30 on page 25, using the screws 2).

For example, calibrate the minimum output to 800 kW, check the emissions and if necessary increase or decrease the opening of the air damper (See “Air adjustment” on page 25). Bring the output to 800 kW using the screws 2) of the mechanical cam 1)(Fig. 30 on page 25) and check the emissions.

Air adjustment

The regulation of the air is carried out using the angle of the cam III) of the servomotor (Fig. 28 on page 24) and by using the selector 2)(Fig. 27 on page 23). To adjust the cam of the servomotor, see Fig. 31 A, page 25).

NOTE:

The servomotor follows the adjustment of cam III only when the angle of the cam is reduced. If it is necessary to increase the angle of the cam, you must first increase the angle of the servomotor by means of the “output increase” key, then increase the angle of cam III, and finally bring the servomotor to the position of MIN output, with the “Output reduction” key.

To adjust the cam III, see Fig. 31 A and B, page 25.

6.6.5 Intermediate outputs

Air adjustment

No adjustment is required

Adjustment of gas delivery

After adjusting the maximum and minimum output of the burner, carry out air adjustment on higher intermediate positions of the servomotor. The passage from one position to the next one is obtained by pressing the button 2) on the symbol (+) or (-) (Fig. 27 on page 23). For a brief period press the button 2)(Fig. 27 on page 23) “Output increase” so that the servomotor rotates by about 20°, see servomotor graduated index Fig. 31 B, page 25) and the air damper graduated index 5)(Fig. 30 on page 25).

Screw or unscrew the screw 2) of the mechanical cam (Fig. 30 on page 25) to increase or decrease the gas output so as to adjust it to the corresponding air output, to obtain optimal combustion.

Proceed in the same way with the other screws.

Take care that the cam profile variation is progressive.

Switch off the burner using the switch 1)(Fig. 27), OFF position, release the mechanical cam 1)(Fig. 30 on page 25) to separate the gears of the servomotor, pressing and shifting downwards the button 3)(Fig. 31 D) and check a few times, by rotating the mechanical cam 1)(Fig. 30) manually backwards and forwards, that the movement is smooth and without any hindrance.

It is recommended that the mechanical cam 1)(Fig. 30 on page 25) be bound again to the servomotor by shifting button 3)(Fig. 31 C, page 25) upwards.

As far as is possible, try not to move those screws at the ends of the mechanical cam that were previously adjusted for the opening of the gas butterfly valve to MAX and MIN output.

NOTE:

Once you have finished adjusting the “MAX - MIN - INTERMEDIATE” outputs, check ignition once again: noise emission at this stage must be identical to the following stage of operation. If you notice any sign of pulsations, reduce the ignition stage delivery.

6.7 Pressure switch adjustment

6.7.1 Air pressure switch - check CO

Adjust the air pressure switch (Fig. 32) after performing all other burner adjustments with the air pressure switch set to the start of the scale.

With the burner operating at MIN output, increase adjustment pressure by slowly turning the relative 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 anticlockwise a little bit more.

WARNING

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 into the chimney, slowly close the fan suction inlet (for example with cardboard) and check that the burner locks out, before the CO in the fumes exceeds 1%.

On **RS 810/M BLU** burners the air pressure switch is fitted in an “absolute” mode, that is, connected only to the pressure test point “+” 24)(Fig. 4 on page 11).

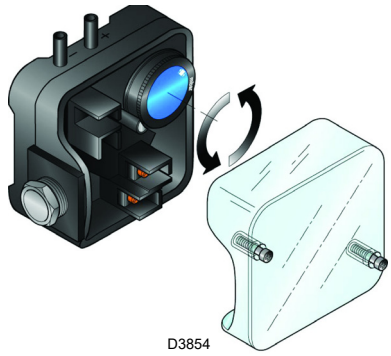


Fig. 32

6.7.2 Maximum gas pressure switch

Adjust the maximum gas pressure switch (Fig. 33) 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.

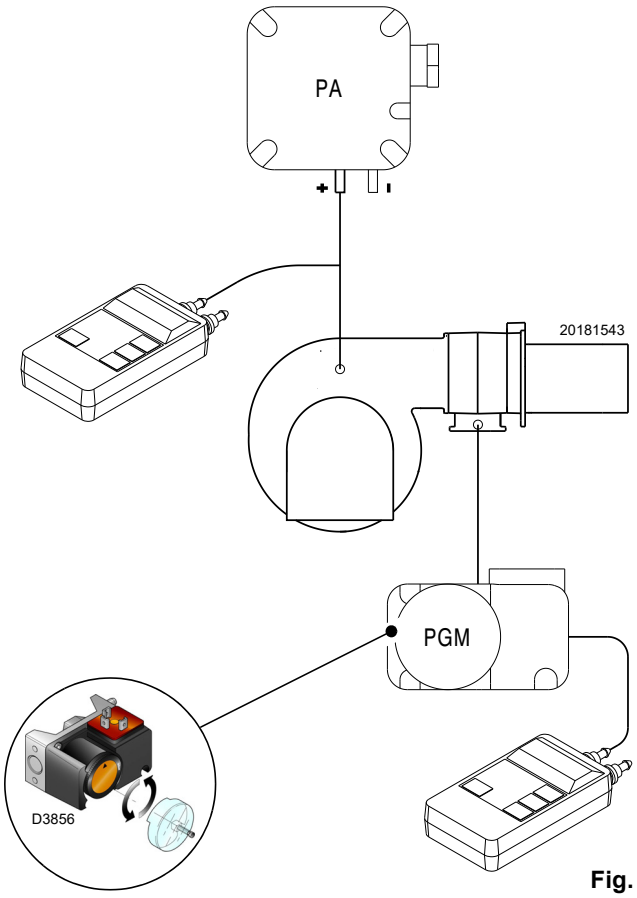


Fig. 33

6.7.3 Minimum gas pressure switch

Adjust the minimum gas pressure switch (Fig. 34) after performing all the other burner adjustments with the pressure switch set to the start of the scale.

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

Then turn the knob anticlockwise by 0.2 kPa (2 mbar) and repeat burner start-up to ensure it is uniform.

If the burner locks out again, turn the knob anticlockwise again by 0.1 kPa (1 mbar).

WARNING

1 kPa = 10 mbar

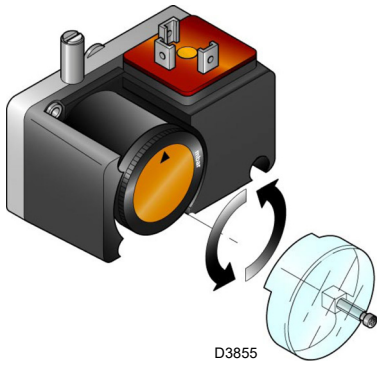


Fig. 34

6.8 Operation sequence of the burner

6.8.1 Burner start-up

0s TL thermostat/pressure switch closure.

6s Fan motor start. Servomotor starts: rotates 90° towards the right, i.e. until the intervention of the contact on the cam I).

38s The air damper is positioned to MAX output.

38s Pre-purging phase with air delivery of the MAX output. Duration 32 seconds.

70s The servomotor rotates left up to the angle set on the cam II).

102s The air damper and the gas butterfly valve set to MIN output (with cam II).

103s Ignition electrode strikes a spark.

109s The VS safety valve and the VR adjustment valve open (rapid opening). The flame is ignited at a low output level, point A (Fig. 35). There follows a progressive increase of the input, slow opening of the valve, up to the MIN output, point B (Fig. 35).

112s The spark goes out.

133s The starting cycle ends.

6.8.2 Operation

Burner without the RWF... output regulator (See kit)
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. (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).
– If subsequently the temperature or pressure increases until TR opens, the burner progressively decreases its output to the MIN value (section E-F). The sequence repeats endlessly.
– 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 the cam 2)(Fig. 31 on page 25).
  The air damper closes completely to reduce heat losses to a minimum.

For every change of output, the servomotor will automatically change the gas output (butterfly valve), the air output (fan damper) and the air pressure.

Burner with the RWF ... output regulator (See kit)
See manual enclosed with the adjuster.

6.8.3 Ignition failure

If the burner does not fire (Fig. 36), it goes into lockout within 3 sec. after the gas valve opens, 112 seconds after the control device TL closes and the pre-purging phase starts and lasts 17 seconds.

6.8.4 Burner flame goes out during operation

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

Normal ignition
(n° = seconds from instant 0)

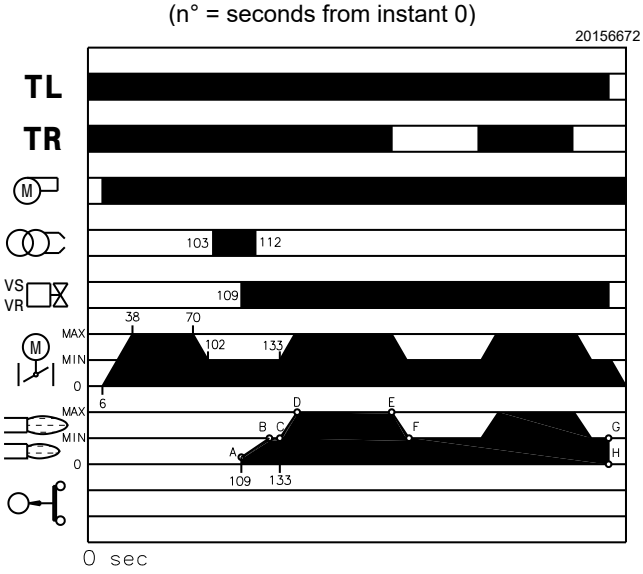


Fig. 35

Ignition failure

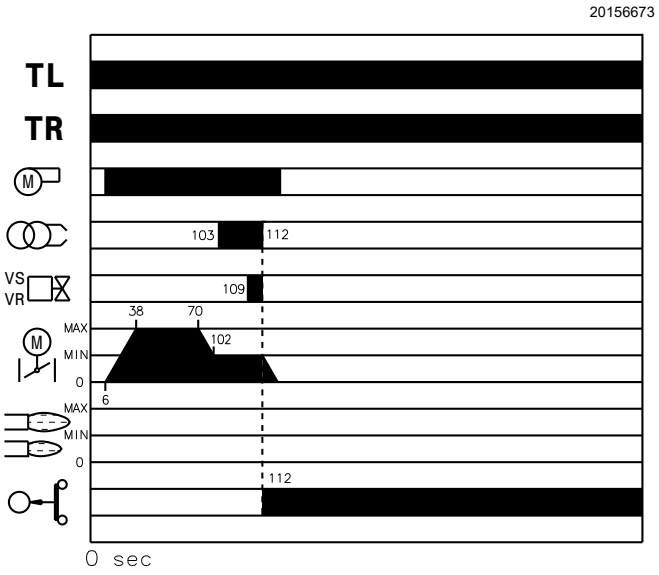


Fig. 36

7 Maintenance

7.1 Notes on safety for the maintenance

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

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

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

Before carrying out any maintenance, cleaning or checking operations:

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

Close the fuel interception tap.

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.

7.2.2 Safety test - with gas feeding closed

For its safe commissioning it is very important to make sure that the electrical wiring has been carried out correctly between the gas valves and the burner.

To this end, after checking that the connections have been made in conformity with the burner's wiring diagram, a starting cycle should be carried out with the gas tap closed (dry test).

1 The manual gas valve should be closed with the locking/releasing device (“lock-out / tag out” procedure).
2 Make sure the limit electric contacts of the burner close
3 Make sure the contact of the minimum gas pressure switch closes
4 Proceed with a tentative start up of the burner.

The starting cycle should occur with the following phases:

– Starting the fan motor for pre-purging
– Carrying out the gas valve leak detection control, if applicable
– Completing the pre-purging
– Reaching the ignition point
– Power supply of the ignition transformer
– Power supply the gas valves.

Since the gas is closed, the burner will not be able to start and its control box will stop or go into a safety lockout.

The effective supplying of the gas valves can be checked with the insertion of a tester; some valves are fitted with light signals (or closure/opening position indicators) that are activated when the electrical supply arrives.

IF THE ELECTRICAL SUPPLY OF THE GAS VALVES OCCURS AT AN UNEXPECTED MOMENT, DO NOT OPEN THE MANUAL VALVE, DISCONNECT THE ELECTRICAL SUPPLY, CHECK THE WIRING; CORRECT THE ERRORS AND CARRY OUT THE ENTIRE 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 discharge gases.
Significant differences with respect to the previous check indicate the points where more 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 are not excess wear or loosen screws.
Clean the outside of the burner.

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

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.

Flame presence check

Check the level of the flame detection signal with the “Check mode” function from the flame control: the LEDs from 2 to 6 indicate the flame signal level, respectively. See “LED indicator and special function” on page 31.

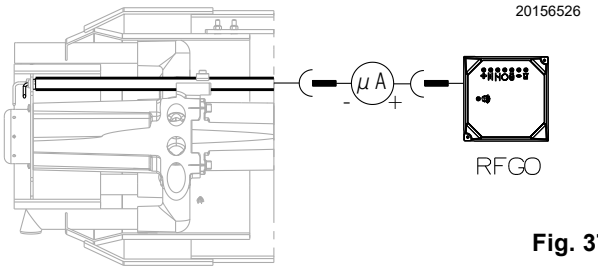


Fig. 37

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.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.

Gas leaks

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

Gas filter

Replace the gas filter when it is dirty.

Combustion

If the combustion values measured before starting maintenance do not comply with applicable legislation or do not indicate efficient combustion, consult the Tab. K or contact our Technical Support Service to implement the necessary adjustments.
It is advisable to set the burner according to the type of gas used and following the indications in Tab. K.

EN 676		Air excess			
		Max. output $\lambda \leq 1.2$		Min. output $\lambda \leq 1.3$	
GAS	CO_2 theoretical max. 0% O_2	CO_2 % Calibration		CO	NO_X
		$\lambda = 1.2$	$\lambda = 1.3$	mg/kWh	mg/kWh
G 20	11.7	9.7	9.0	≤ 100	≤ 170
G 25	11.5	9.5	8.8	≤ 100	≤ 170
G 30	14.0	11.6	10.7	≤ 100	≤ 230
G 31	13.7	11.4	10.5	≤ 100	≤ 230

Tab. K

7.2.4 Safety components

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

Safety component	Life cycle
Flame control	10 years or 250.000 operation cycles
Flame sensor	10 years or 250.000 operation cycles
Gas valves (solenoid)	10 years or 250.000 operation cycles
Pressure switches	10 years or 250.000 operation cycles
Pressure adjuster	15 years
Servomotor (electronic cam)	10 years or 250.000 operation cycles
Oil valve (solenoid)	10 years or 250.000 operation cycles
Oil regulator	10 years or 250.000 operation cycles
Pipes/ oil fittings (metallic)	10 years
Flexible hoses (if present)	5 years or 30.000 pressurised cycles
Fan impeller	10 years or 500.000 start-ups

Tab. L

7.3 Opening the burner

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

Close the fuel interception tap.

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

See “Access to head internal part” on page 18.

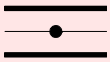
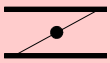
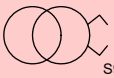
7.4 Closing the burner

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

Carry out all maintenance work and mount the casing again.

8 LED indicator and special function

8.1 Description of LED lamps

 S9740	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.
 S9741	Open damper	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.
 S9742	Closed damper	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.
 S9744	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.
 S9746	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. M

T = Terminal
PTFI = Pilot ignition attempt
MTFI = Ignition attempt with main fuel valve

8.2 Check mode function

By the reset push button on the main panel of the control flame the check mode functions are available (prepurging, ignition, 1st safety time and 2nd safety time).

The CHECK MODE is designed to facilitate the checking of the working phase of the burner.
This function is particularly useful during the burner first commissioning or during maintenance.

To enable the check mode function:

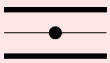
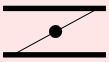
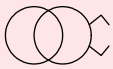
- keep the reset button pressed, see chapter 8 for more details, for at least 3 seconds, the status LED changes from green to yellow to signal that the control device is in check mode;
- the control device locks out during pre-purging, after a timeout of max 30 minutes the flame control will automatically exit the check mode function;
- check mode has a 2 minute timeout during the 2nd safety time. When the time out is expired, the flame control goes back to the normal operating status;
- check mode has a 2 minute timeout during the MTFI status. When the time out is expired, 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.

8.3 Flame control lock-out or emergency stop condition

The RFGO control device can be locked (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.

8.4 LED lamps: burner operating status

OPERATING STATUSES INDICATED BY LEDS DURING NORMAL OPERATION AND CHECK MODE

Operation LED ● = ON	Fan	Open damper	Closed damper	Modulation	Ignition	Flame	Status
Icon	 S9740	 S9741	 S9742	 S9743	 S9744	 S9745	 S9746
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. N

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 See “Problems - Causes - Remedies signalled by LED indicators” on page 33.“.

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 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.
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.


WARNING

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.


WARNING

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.

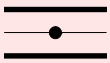
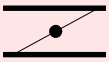
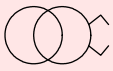
It is not admitted to tamper with or act on the system or control in a way that could compromise the product safety or warranty.
Any tests on safety devices or on loads, such as fan motor, valves, igniter, flame sensors, must be performed with the shut-off valves closed and by qualified personnel.

Do not by-pass nor exclude the safety devices connected to the flame control.
Failure to observe these guidelines will exclude any liability.


WARNING

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

No	Faults	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6	LED 7
	Operation LED ● = ON	Fan	Open damper	Closed damper	Auto	Ignition	Flame	Status
	Icon	 S9740	 S9741	 S9742	 S9743	 S9744	 S9745	 S9746
1	Post-diagnostics fault	●						Red
2	Local reset		●					Red
3	Combustion air fan fault	●	●					Red
4	Supervisor processor diagnostics fault			●				Red
5	FR- NO Flame at the end of the 2nd safety time (MTFI)	●		●				Red
6	FR: internal circuit fault		●	●				Red
7	Internal communication fault	●	●	●				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 voltage or frequent fault	●		●	●			Red
14	Internal processor fault		●	●	●			Red
15	Internal processor fault	●	●	●	●			Red
o. 16	No flame: 1st 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 2nd safety time (MTFI)	●		●		●		Red
21	Safety relay fault		●	●		●		Red
22	Supervisor processor fault	●	●	●		●		Red
23	Supervisor memory test fault				●	●		Red
24	Flame loss during the operation (AUTO)	●			●	●		Red
25	Supervisor processor data memory fault		●		●	●		Red
26	Supervisor processor internal fault	●	●		●	●		Red
27	Not used							
28	Not used							
29	Operating temperature out of range		●	●	●	●		Red
30	Code memory fault	●	●	●	●	●		Red
31	FR: external short circuit						●	Red
32	Check mode timeout (manual)	●					●	Red
33	False flame in stand-by mode		●				●	Red
34	Not used							
35	Internal processor timeout			●			●	Red
36	Internal processor timeout	●		●			●	Red
37	Combustion air check timeout		●	●			●	Red
38	Internal processor timeout	●	●	●			●	Red
39	Internal processor timeout				●		●	Red
40	Internal hardware fault	●			●		●	Red
41	Internal hardware fault		●		●		●	Red
42	Main processor fault	●	●		●		●	Red
43	Supervisor processor fault			●	●		●	Red
44	Supervisor processor timeout	●		●	●		●	Red
45	Off-specification mains voltage		●	●	●		●	Red

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. O

Fault explanation

No	Faults	Cause	Solution
1	Post-diagnostics fault	Initial power diagnostics fault Make sure that the status of inlets and outlets is correct upon ignition	Check T12, T13 and T14
2	Local reset	The user started the manual reset or the reset switch is faulty	Check T21 inlet or reset for normal operation
3	Combustion air fan fault	No Air Check signal (T14) during the bleed cycle or Air Check signal loss during the burner operation	Check the fan or the air pressure switch
4	Supervisor processor diagnostics fault	The system detected the presence of voltage on T16, T17, T18 or T19 at the wrong moment or there is no voltage when necessary	Check the wiring and make sure that the system is operating on a single-phase line (50/60Hz)
5	FR- No flame at the end of the 2nd safety time (MTFI)	No flame at the end of the second safety time	Inspect the system, check the gas pressure, inspect the flame detection electrode, check the wiring, 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 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	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
o. 16	No flame: 1st safety time (PTFI)	No flame at the end of the first safety time	Inspect the system, check the gas pressure, check the flame sensor, check the wiring, etc.
17	Wiring fault	The system detected the presence of voltage on critical terminals (T16, T17, T18 or T19) at the wrong moment or there is no voltage when necessary	Inspect the wiring and make sure that the system is operating on a single-phase line (50/60Hz)
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
20	UV: no flame at the end of the 2nd safety time (MTFI)	No flame at the end of the 2nd safety time	Inspect the system, check the gas pressure, check the 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 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		
28	Not used		
29	Operating temperature out of range	Operating temperature below -40°C or above 70°C	Bring the control device within the specified 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) detected during the Stand-by status	Check flame sensor or interference

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	The system detected the presence of voltage on T17 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
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 modulation equipment
54	Direct ignition valve feedback fault	The system detected the presence of voltage on T18 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
55	Internal processor fault	Internal fault	Replace the control device
56	UV: false flame during operation	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 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 sensor and the flame OR use an orifice to reduce the view field
63	Internal hardware fault	Internal fault	Replace the control device

Tab. P

A Appendix - Accessories

Analogue control signal converter kit

Burner	Type	Code
RS 810/M BLU	0/2 - 10V 0/4 - 20mA	20074479

Kit for modulating operation

Burner	Output regulator	Code
RS 810/M BLU	RWF 50.2 3-POINT OUTLET	20073595
	RWF 55.5 COMPLETE WITH RS-485 INTERFACE	20074441
	RWF 55.6 COMPLETE WITH RS-485/PROFIBUS INTERFACE	20074442

Burner	Probe	Adjustment field	Code
RS 810/M BLU	PT 100 temperature	- 100...+ 500°C	3010110
	4 - 20 mA pressure	0...2.5 bar	3010213
	4 - 20 mA pressure	0...16 bar	3010214
	4 - 20 mA pressure	0... 25 bar	3090873

Potentiometer kit

Burner	Code
RS 810/M BLU	20074487

Continuous purging kit

Burner	Code
RS 810/M BLU	20074542

Soundproofing box kit

Burner	Type	dB(A)	Code
RS 810/M BLU	C7	10	20177776

Spacer kit

Burner	Code
RS 810/M BLU	20008903

Gas trains in compliance with EN 676

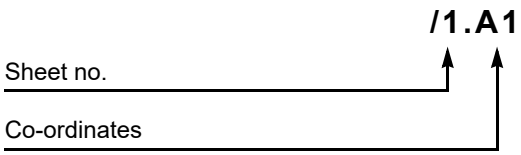
Please refer to manual.

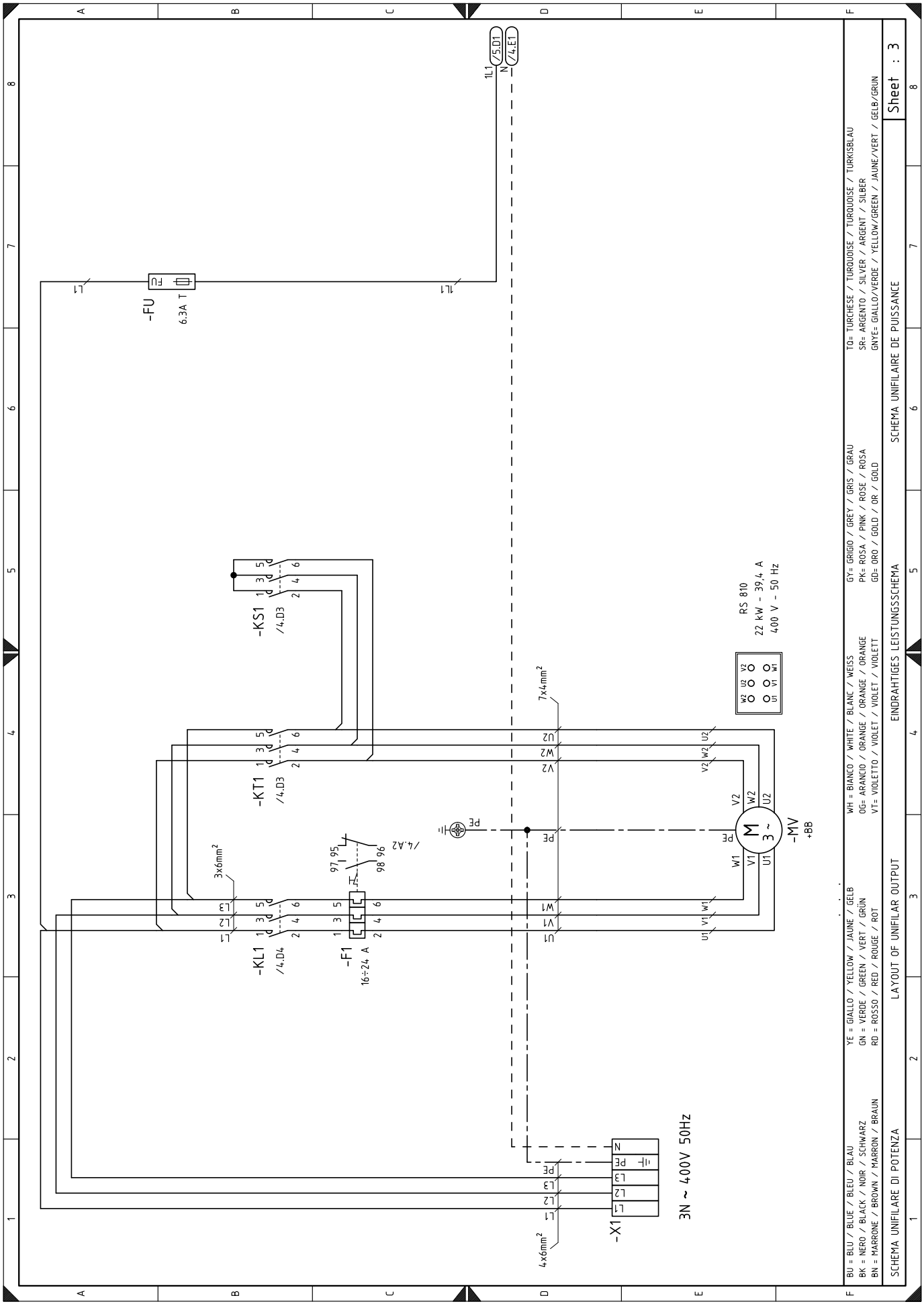
WARNING

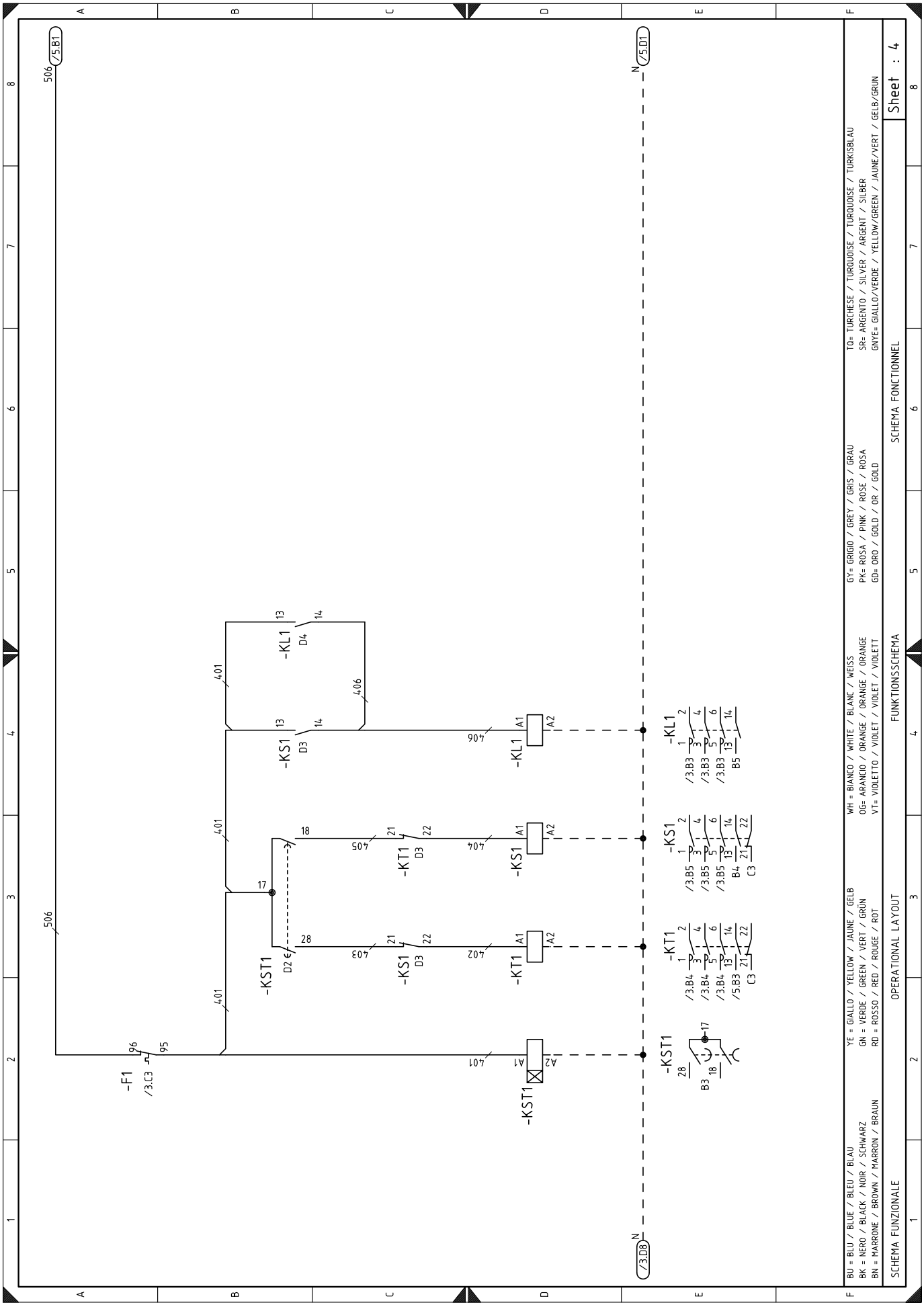
The installer is responsible for the addition of any safety device not foreseen in this manual.

B Appendix - Electrical panel layout

2 Indication of references




-FU
6.3A T
-KS1
/4.D3
-KT1
/4.D3
-KL1
/4.D4
-F1
16÷24 A
/4.A2
-MV
+BB
RS 810
22 kW - 39,4 A
400 V - 50 Hz
-X1
3N ~ 400V 50Hz
7x4mm²
3x6mm²
4x6mm²
BU = BLU / BLEU / BLAU
BK = NERO / BLACK / NOIR / SCHWARZ
BN = MARRONE / BROWN / MARRON / BRAUN
YE = GIALLO / YELLOW / JAUNE / GELB
GN = VERDE / GREEN / VERT / GRÜN
RD = ROSSO / RED / ROUGE / ROT
WH = BIANCO / WHITE / BLANC / WEISS
OG= ARANCIO / ORANGE / ORANGE / ORANGE
VT= VIOLETTO / VIOLET / VIOLET / VIOLETT
GY= GRIGIO / GREY / GRIS / GRAU
PK= ROSA / PINK / ROSE / ROSA
GD= ORO / GOLD / OR / GOLD
TQ= TURCHESE / TURQUOISE / TURQUOISE / TURKISBLAU
SR= ARGENTO / SILVER / ARGENT / SILBER
GNYE= GIALLO/VERDE / YELLOW/GREEN / JAUNE/VERT / GELB/GRUN
SCHEMA UNIFILARE DI POTENZA
LAYOUT OF UNIFILAR OUTPUT
ENDRAHTIGES LEISTUNGSSCHEMA
SCHEMA UNIFILAIRE DE PUISSANCE
Sheet : 3


SCHEMA FUNZIONALE
OPERATIONAL LAYOUT
FUNKTIONSSCHEMA
SCHEMA FONCTIONNEL
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BK = NERO / BLACK / NOIR / SCHWARZ
BN = MARRONE / BROWN / MARRON / BRAUN
YE = GIALLO / YELLOW / JAUNE / GELB
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GD= ORO / GOLD / OR / GOLD
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SR= ARGENTO / SILVER / ARGENT / SILBER
GNYE= GIALLO/VERDE / YELLOW/GREEN / JAUNE/VERT / GELB/GRUN
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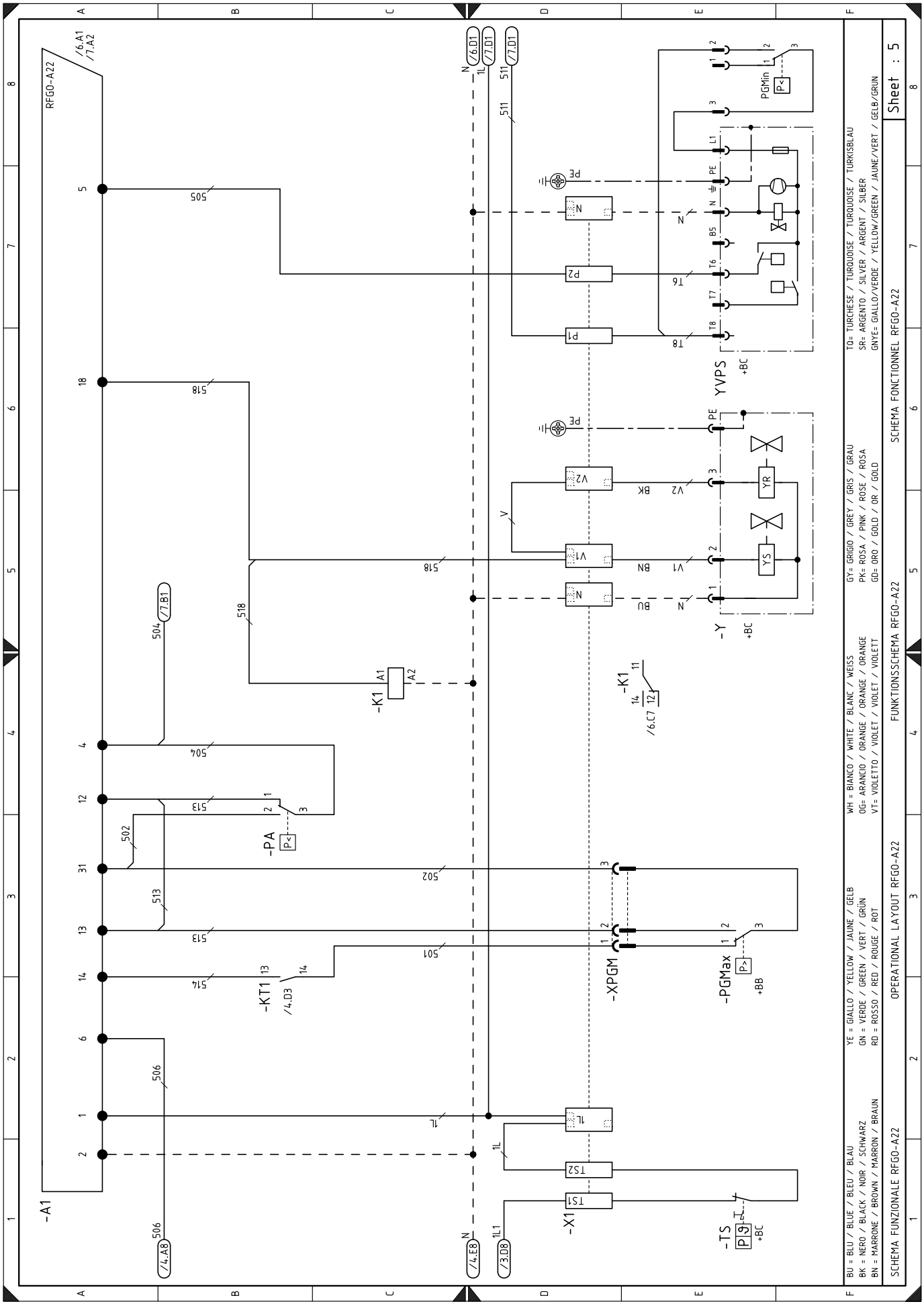
-KST1
-KL1
-KS1
-KT1
/5.B1
/5.D1
/3.D8
/3.C3


RFGO-A22
-A1
-K1
-KT1
-PA
-XPGM
-PGMax
-X1
-TS
-Y
YVPS
PGMin
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OPERATIONAL LAYOUT RFGO-A22
FUNKTIONSSCHEMA RFGO-A22
SCHEMA FONCTIONNEL RFGO-A22
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BN = MARRONE / BROWN / MARRON / BRAUN
YE = GIALLO / YELLOW / JAUNE / GELB
GN = VERDE / GREEN / VERT / GRÜN
RD = ROSSO / RED / ROUGE / ROT
WH = BIANCO / WHITE / BLANC / WEISS
OG= ARANCIO / ORANGE / ORANGE / ORANGE
VT= VIOLETTO / VIOLET / VIOLET / VIOLETT
GY= GRIGIO / GREY / GRIS / GRAU
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TQ= TURCHESE / TURQUOISE / TURQUOISE / TURKISBLAU
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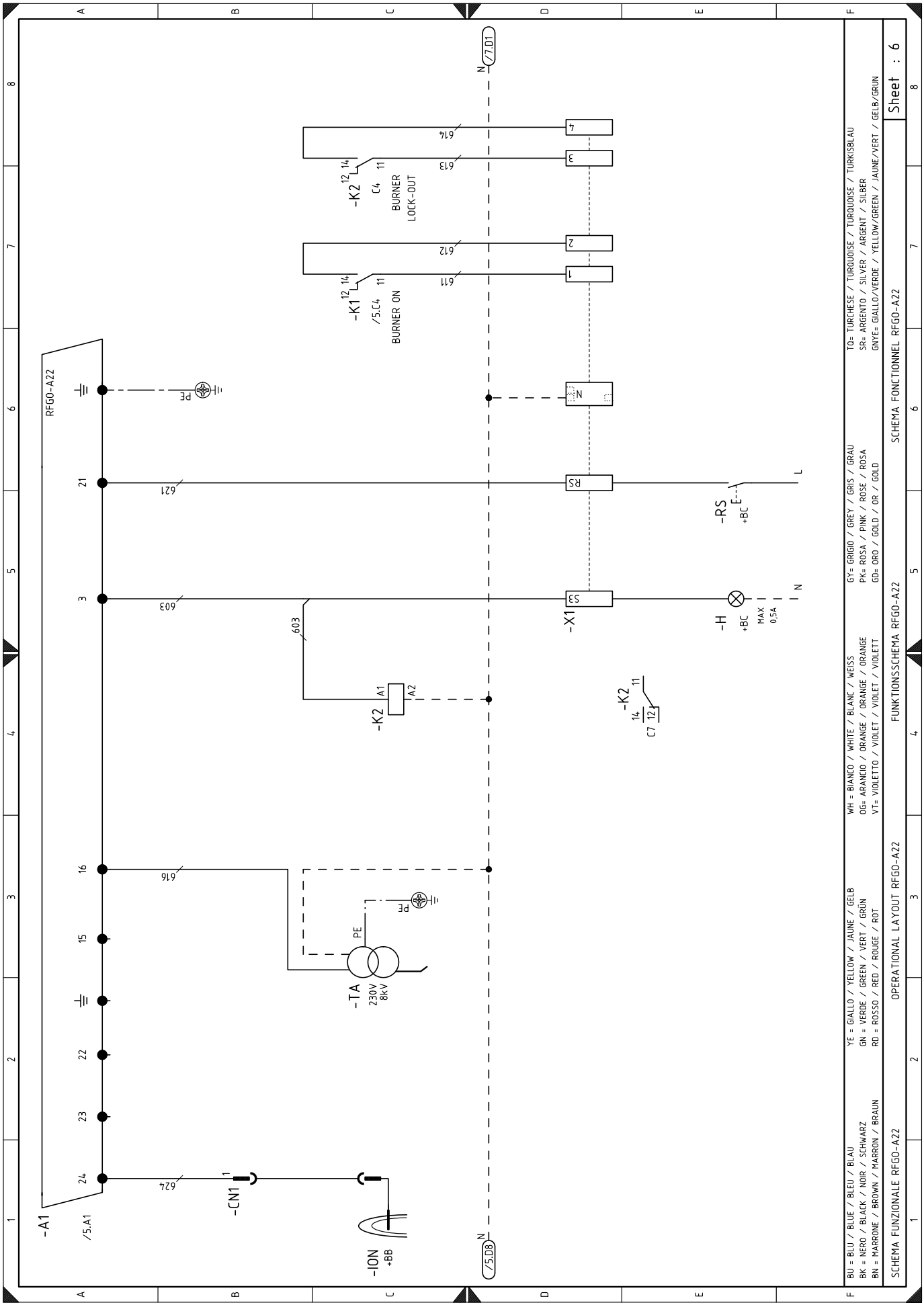
GNYE= GIALLO/VERDE / YELLOW/GREEN / JAUNE/VERT / GELB/GRUN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OPERATIONAL LAYOUT RFGO-A22
FUNKTIONSSCHEMA RFGO-A22
SCHEMA FONCTIONNEL RFGO-A22
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BK = NERO / BLACK / NOIR / SCHWARZ
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YE = GIALLO / YELLOW / JAUNE / GELB
GN = VERDE / GREEN / VERT / GRÜN
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GY= GRIGIO / GREY / GRIS / GRAU
PK= ROSA / PINK / ROSE / ROSA
GD= ORO / GOLD / OR / GOLD
TQ= TURCHESE / TURQUOISE / TURQUOISE / TURKISBLAU
SR= ARGENTO / SILVER / ARGENT / SILBER
GNYE= GIALLO/VERDE / YELLOW/GREEN / JAUNE/VERT / GELB/GRUN
RFGO-A22
-A1
/5.A1
-CN1
-ION
+BB
-TA
230V
8kV
-K1
/5.C4
BURNER ON
-K2
C4
BURNER
LOCK-OUT
-K2
A1
A2
-K2
C7
-X1
-RS
+BC
-H
+BC
MAX
0,5A
/7.D1
/5.D8
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L
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612
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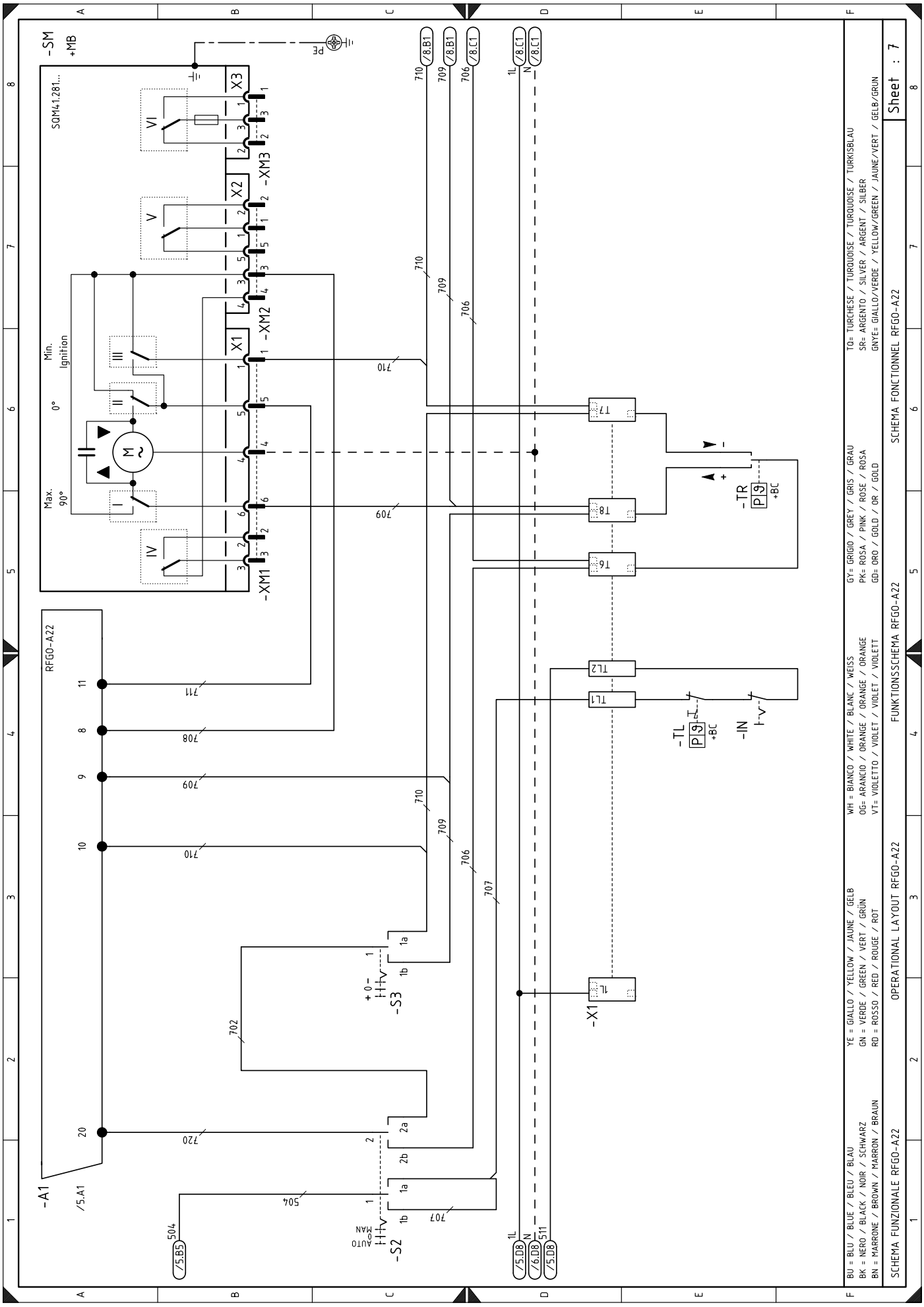
614
621
603
616
624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+MB
SQM41.281...
PE
X3
X2
X1
-XM3
-XM2
-XM1
VI
V
III
II
I
IV
Min.
Ignition
0°
Max.
90°
RFGO-A22
-A1
/5.A1
-S3
-S2
-X1
-TR
-TL
-IN
/8.B1
/8.C1
/5.B5
/5.D8
/6.D8
SCHEMA FUNZIONALE RFGO-A22
OPERATIONAL LAYOUT RFGO-A22
FUNKTIONSSCHEMA RFGO-A22
SCHEMA FONCTIONNEL RFGO-A22
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BK = NERO / BLACK / NOIR / SCHWARZ
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YE = GIALLO / YELLOW / JAUNE / GELB
GN = VERDE / GREEN / VERT / GRÜN
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OG= ARANCIO / ORANGE / ORANGE / ORANGE
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TQ= TURCHESE / TURQUOISE / TURQUOISE / TURKISBLAU
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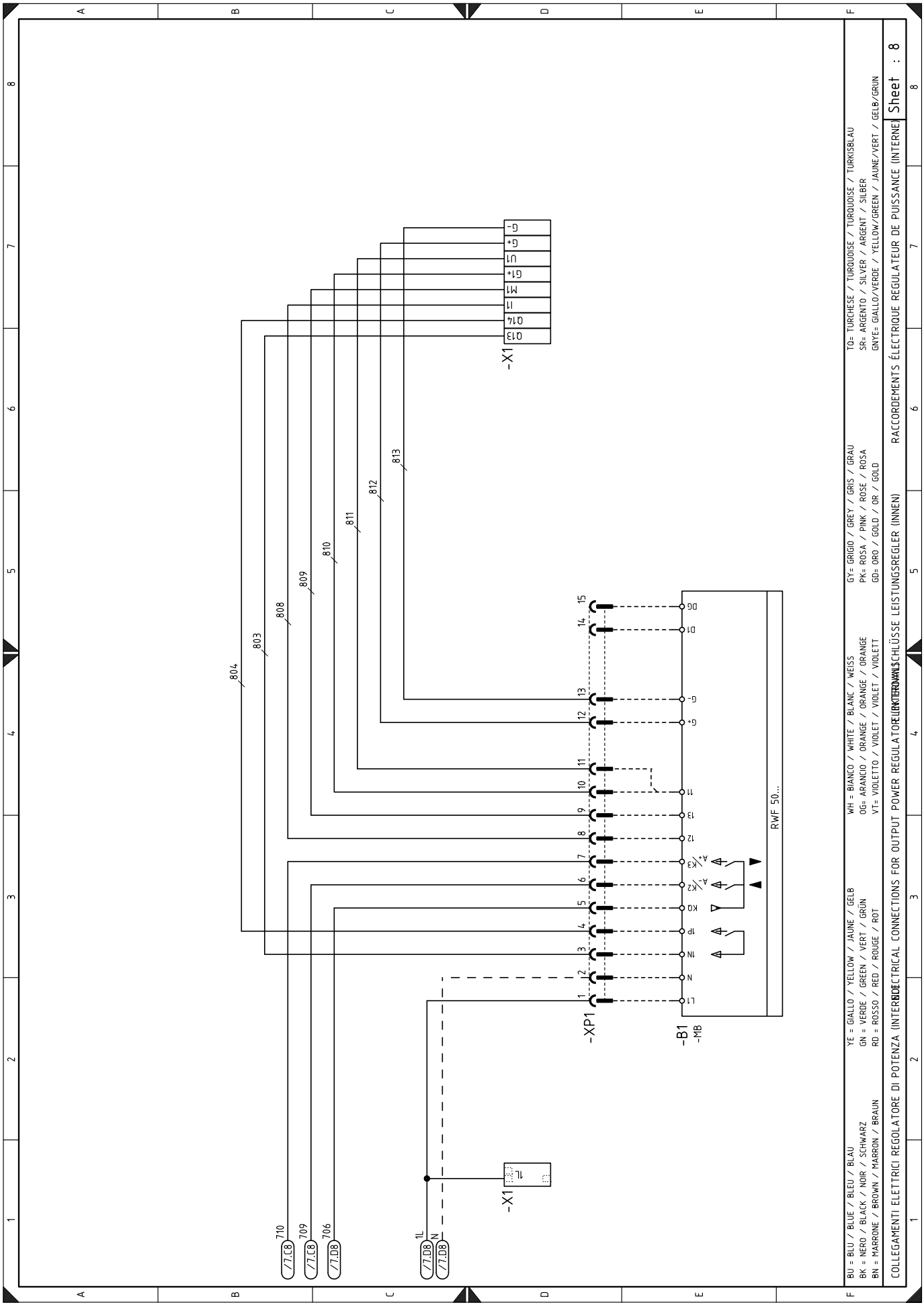
COLLEGAMENTI ELETTRICI REGOLATORE DI POTENZA (INTERNI) ELECTRICAL CONNECTIONS FOR OUTPUT POWER REGULATOR (INTERNAL) ANSCHLÜSSE LEISTUNGSREGLER (INNEN) RACCORDEMENTS ÉLECTRIQUE REGULATEUR DE PUISSANCE (INTERNE)
Sheet : 8
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BK = NERO / BLACK / NOIR / SCHWARZ
BN = MARRONE / BROWN / MARRON / BRAUN
YE = GIALLO / YELLOW / JAUNE / GELB
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WH = BIANCO / WHITE / BLANC / WEISS
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GY= GRIGIO / GREY / GRIS / GRAU
PK= ROSA / PINK / ROSE / ROSA
GD= ORO / GOLD / OR / GOLD
TQ= TURCHESE / TURQUOISE / TURQUOISE / TURKISBLAU
SR= ARGENTO / SILVER / ARGENT / SILBER
GNYE= GIALLO/VERDE / YELLOW/GREEN / JAUNE/VERT / GELB/GRUN
-X1
-XP1
-B1
-MB
RWF 50...
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709
706
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1L
N
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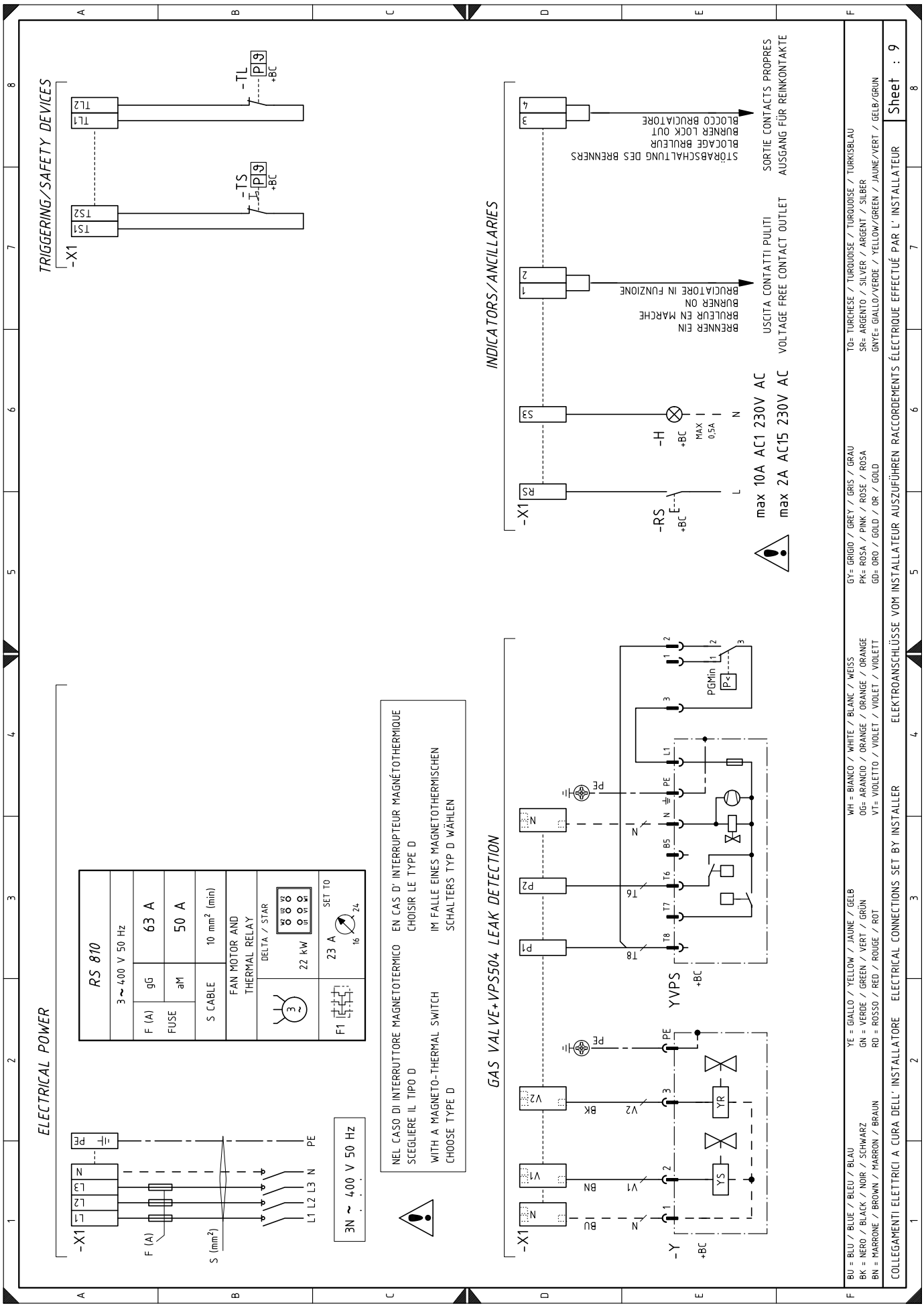
TRIGGERING/SAFETY DEVICES
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TL2
TL1
-TL
P9
+BC
TS2
TS1
-TS
P9
+BC
INDICATORS/ANCILLARIES
-X1
4
3
STÖRABSCHALTUNG DES BRENNERS
BLOCAGE BRULEUR
BURNER LOCK OUT
BLOCCO BRUCIATORE
2
1
BRENNER EIN
BRULEUR EN MARCHE
BURNER ON
BRUCIATORE IN FUNZIONE
S3
-H
+BC
MAX
0,5A
N
L
R5
-RS
+BC
USCITA CONTATTI PULITI
SORTIE CONTACTS PROPRES
VOLTAGE FREE CONTACT OUTLET
AUSGANG FÜR REINKONTAKTE
max 10A AC1 230V AC
max 2A AC15 230V AC
ELECTRICAL POWER
-X1
L1
L2
L3
N
PE
F (A)
S (mm²)
L1 L2 L3 N PE
RS 810
3 ~ 400 V 50 Hz
F (A)
FUSE
gG
63 A
aM
50 A
S CABLE
10 mm² (min)
FAN MOTOR AND
THERMAL RELAY
DELTA / STAR
22 kW
SET TO
23 A
16
24
F1
3N ~ 400 V 50 Hz
NEL CASO DI INTERRUTTORE MAGNETOTERMICO EN CAS D' INTERRUPTEUR MAGNÉTOTHERMIQUE
SCEGLIERE IL TIPO D CHOISIR LE TYPE D
WITH A MAGNETO-THERMAL SWITCH IM FALLE EINES MAGNETOTHERMISCHEN
CHOOSE TYPE D SCHALTERS TYP D WÄHLEN
GAS VALVE+VPS504 LEAK DETECTION
-X1
N
P1
P2
PE
BU
BN
BK
V1
V2
2
3
YS
YR
-Y
+BC
YVPS
T8
T6
T7
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L1
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+BC
BU = BLU / BLEU / BLAU
BK = NERO / BLACK / NOIR / SCHWARZ
BN = MARRONE / BROWN / MARRON / BRAUN
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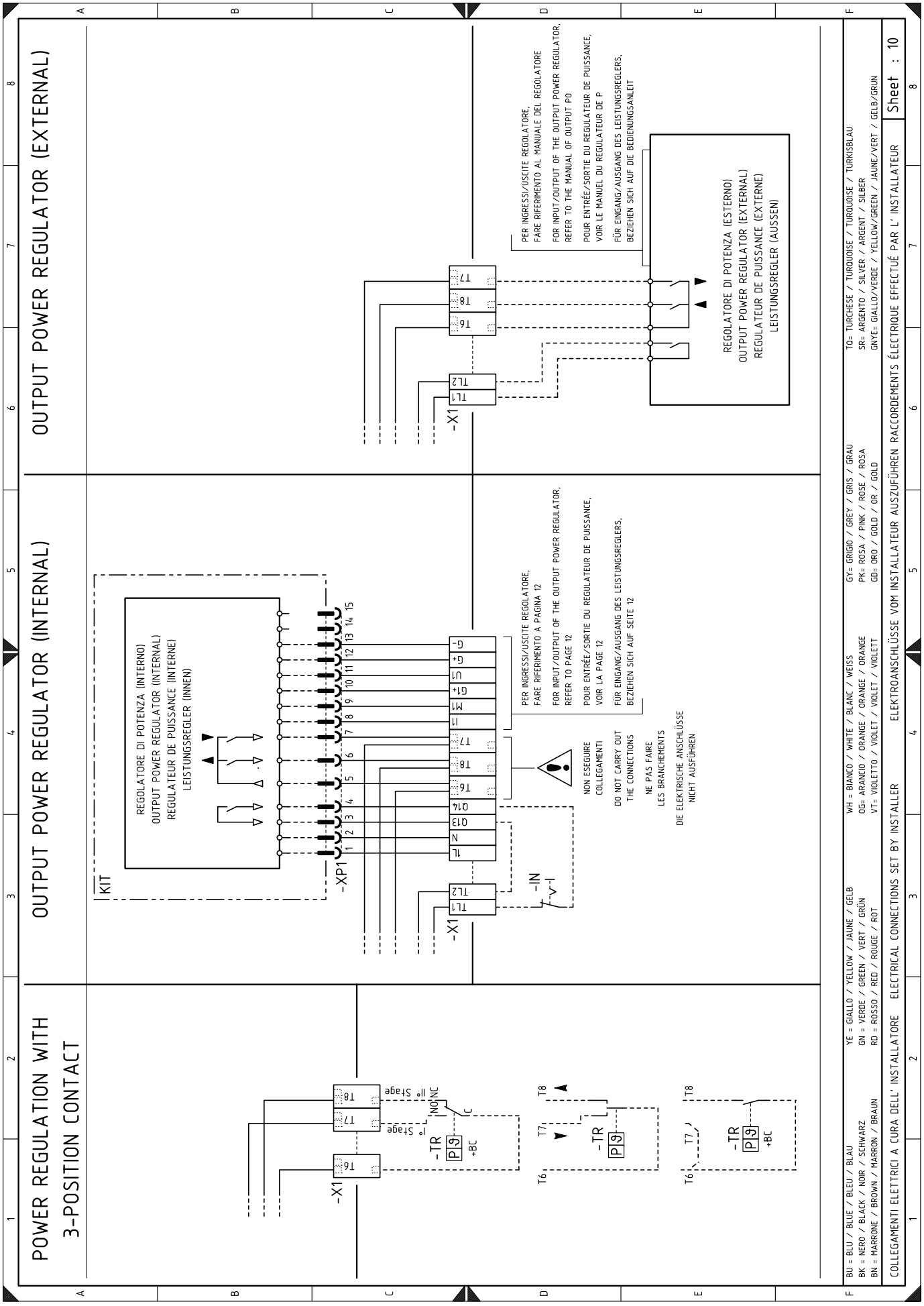
TQ= TURCHESE / TURQUOISE / TURQUOISE / TURKISBLAU
SR= ARGENTO / SILVER / ARGENT / SILBER
GNYE= GIALLO/VERDE / YELLOW/GREEN / JAUNE/VERT / GELB/GRUN
COLLEGAMENTI ELETTRICI A CURA DELL' INSTALLATORE ELECTRICAL CONNECTIONS SET BY INSTALLER ELEKTROANSCHLÜSSE VOM INSTALLATEUR AUSZUFÜHREN RACCORDEMENTS ÉLECTRIQUE EFFECTUÉ PAR L' INSTALLATEUR
Sheet : 9


POWER REGULATION WITH
3-POSITION CONTACT
OUTPUT POWER REGULATOR (INTERNAL)
OUTPUT POWER REGULATOR (EXTERNAL)
REGOLATORE DI POTENZA (INTERNO)
OUTPUT POWER REGULATOR (INTERNAL)
REGULATEUR DE PUISSANCE (INTERNE)
LEISTUNGSREGLER (INNEN)
REGOLATORE DI POTENZA (ESTERNO)
OUTPUT POWER REGULATOR (EXTERNAL)
REGULATEUR DE PUISSANCE (EXTERNE)
LEISTUNGSREGLER (AUSSEN)
KIT
-XP1
-X1
-IN
-TR
PER INGRESSI/USCITE REGOLATORE, FARE RIFERIMENTO AL MANUALE DEL REGOLATORE
FOR INPUT/OUTPUT OF THE OUTPUT POWER REGULATOR, REFER TO THE MANUAL OF OUTPUT PO
POUR ENTRÉE/SORTIE DU REGULATEUR DE PUISSANCE, VOIR LE MANUEL DU REGULATEUR DE P
FÜR EINGANG/AUSGANG DES LEISTUNGSREGLERS, BEZIEHEN SICH AUF DIE BEDIENUNGSANLEIT
PER INGRESSI/USCITE REGOLATORE, FARE RIFERIMENTO A PAGINA 12
FOR INPUT/OUTPUT OF THE OUTPUT POWER REGULATOR, REFER TO PAGE 12
POUR ENTRÉE/SORTIE DU REGULATEUR DE PUISSANCE, VOIR LA PAGE 12
FÜR EINGANG/AUSGANG DES LEISTUNGSREGLERS, BEZIEHEN SICH AUF SEITE 12
NON ESEGUIRE COLLEGAMENTI
DO NOT CARRY OUT THE CONNECTIONS
NE PAS FAIRE LES BRANCHEMENTS
DIE ELEKTRISCHE ANSCHLÜSSE NICHT AUSFÜHREN
1° Stage
2° Stage
BU = BLU / BLUE / BLEU / BLAU
BK = NERO / BLACK / NOIR / SCHWARZ
BN = MARRONE / BROWN / MARRON / BRAUN
YE = GIALLO / YELLOW / JAUNE / GELB
GN = VERDE / GREEN / VERT / GRÜN
RD = ROSSO / RED / ROUGE / ROT
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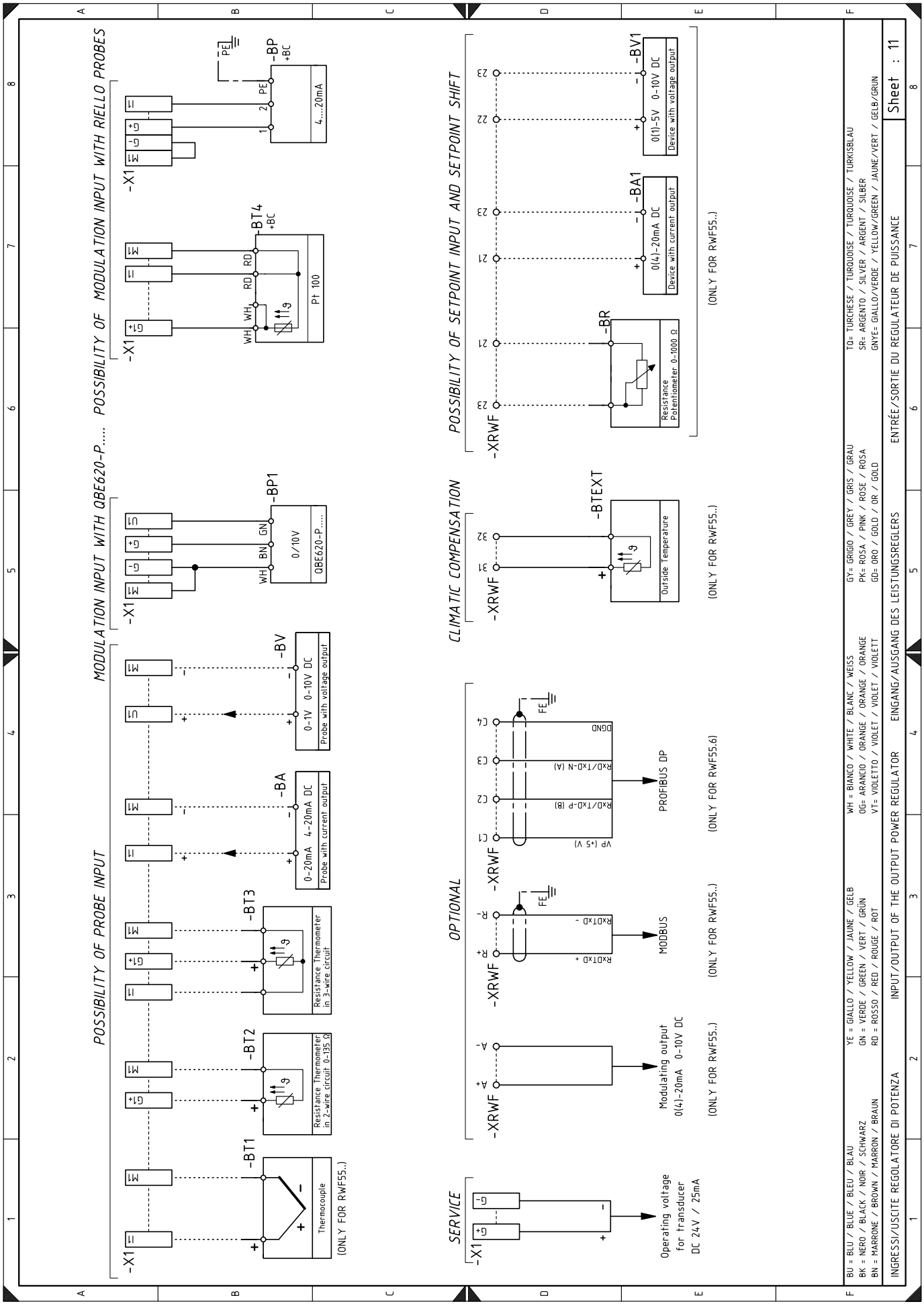
OG= ARANCIO / ORANGE / ORANGE / ORANGE
VT= VIOLETTO / VIOLET / VIOLET / VIOLETT
GY= GRIGIO / GREY / GRIS / GRAU
PK= ROSA / PINK / ROSE / ROSA
GD= ORO / GOLD / OR / GOLD
TQ= TURCHESE / TURQUOISE / TURQUOISE / TÜRKISBLAU
SR= ARGENTO / SILVER / ARGENT / SILBER
GNYE= GIALLO/VERDE / YELLOW/GREEN / JAUNE/VERT / GELB/GRÜN
COLLEGAMENTI ELETTRICI A CURA DELL' INSTALLATORE ELECTRICAL CONNECTIONS SET BY INSTALLER ELEKTROANSCHLÜSSE VOM INSTALLATEUR AUSZUFÜHREN RACCORDEMENTS ÉLECTRIQUE EFFECTUÉ PAR L' INSTALLATEUR
Sheet : 10


POSSIBILITY OF PROBE INPUT
MODULATION INPUT WITH QBE620-P..... POSSIBILITY OF MODULATION INPUT WITH RIELLO PROBES
CLIMATIC COMPENSATION
POSSIBILITY OF SETPOINT INPUT AND SETPOINT SHIFT
OPTIONAL
SERVICE
-X1
-BT1
Thermocouple
(ONLY FOR RWF55..)
-BT2
Resistance Thermometer in 2-wire circuit 0-135 Ω
-BT3
Resistance Thermometer in 3-wire circuit
-BA
0-20mA 4-20mA DC
Probe with current output
-BV
0-1V 0-10V DC
Probe with voltage output
-BP1
QBE620-P.....
0/10V
-BP
4...20mA
-BT4
Pt 100
-XRWF
-BTEXT
Outside Temperature
-BR
Resistance Potentiometer 0-1000 Ω
-BA1
0(4)-20mA DC
Device with current output
-BV1
0(1)-5V 0-10V DC
Device with voltage output
Modulating output
0(4)-20mA 0-10V DC
Operating voltage for transducer DC 24V / 25mA
MODBUS
PROFIBUS DP
(ONLY FOR RWF55..)
(ONLY FOR RWF55.6)
BU = BLU / BLEU / BLAU
BK = NERO / BLACK / NOIR / SCHWARZ
BN = MARRONE / BROWN / MARRON / BRAUN
YE = GIALLO / YELLOW / JAUNE / GELB
GN = VERDE / GREEN / VERT / GRÜN
RD = ROSSO / RED / ROUGE / ROT
WH = BIANCO / WHITE / BLANC / WEISS
OG= ARANCIO / ORANGE / ORANGE / ORANGE
VT= VIOLETTO / VIOLET / VIOLET / VIOLETT
GY= GRIGIO / GREY / GRIS / GRAU
PK= ROSA / PINK / ROSE / ROSA
GD= ORO / GOLD / OR / GOLD
TQ= TURCHESE / TURQUOISE / TURQUOISE / TURKISBLAU
SR= ARGENTO / SILVER / ARGENT / SILBER
GNYE= GIALLO/VERDE / YELLOW/GREEN / JAUNE/VERT / GELB/GRUN
INGRESSI/USCITE REGOLATORE DI POTENZA
INPUT/OUTPUT OF THE OUTPUT POWER REGULATOR
EINGANG/AUSGANG DES LEISTUNGSREGLERS
ENTRÉE/SORTIE DU REGULATEUR DE PUISSANCE
Sheet : 11

Wiring layout key

A1	Electrical control box
B1	Output power regulator RWF40 internal
BA	Input in current DC 0...20 mA, 4...20 mA
BA1	Input in current DC 0...20 mA, 4...20 mA to modify remote setpoint
BP	Pressure probe
BP1	Pressure probe
BR	Remote setpoint potentiometer
BT1	Thermocouple probe
BT2	Probe Pt100, 2 wires
BT3	Probe Pt100, 3 wires
BT4	Probe Pt100, 3 wires
BTEXT	External probe for climatic compensation of the setpoint
BV	Input in voltage DC 0...1 V, 0...10 V
BV1	Input in voltage DC 0...1 V, 0...10 V to modify remote setpoint
F1	Fan motor thermal relay
FU	Auxiliary circuits safety fuse
H	Burner working lighting signal output
IN	Burner manual stop electric switch
ION	Ionisation probe
KL1	Star/triangle starter line contactor
KT1	Star/triangle starter triangle contactor
KS1	Start/triangle starter star contactor
KST1	Star/triangle starter timer
K1	Clean contacts output relay burner operating
K2	Clean contacts output relay burner lockout
MV	Fan motor
PA	Air pressure switch
PE	Burner earth
PGMin	Minimum gas pressure switch
PGMax	Maximum gas pressure switch
RS	Remote reset switch
S2	Off / automatic / manual selector
S3	Power increase / power reduction selector
SM	Servomotor
TA	Ignition transformer
TL	Limit thermostat/pressure switch
TR	Adjustment thermostat/pressure switch
TS	Safety thermostat/pressure switch
Y	Gas adjustment valve + gas safety valve
YVPS	Valve leak detection device
X1	Main terminal supply board
XM1	Servomotor connector 1
XM2	Servomotor connector 2
XM3	Servomotor connector 3
XP1	Connector for RWF output power regulator kit ... or signal converter
XPGM	Maximum gas pressure switch connector
XRWF	Terminal board for output power regulator RWF ...

If there is a problem with the fuse **FU**, there is a spare one in the fuse holder.

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