



MANUAL OF INSTALLATION OPERATION MAINTENANCE

GAS BURNERS FOR PIZZA OVENS

DORIGO SERIES

PZ3

WARNINGS

THIS MANUAL IS SUPPLIED AS AN INTEGRAL AND ESSENTIAL PART OF THE PRODUCT AND MUST BE DELIVERED TO THE USER.

INFORMATION INCLUDED IN THIS SECTION ARE DEDICATED BOTH TO THE USER AND TO PERSONNEL FOLLOWING PRODUCT INSTALLATION AND MAINTENANCE.

THE USER WILL FIND FURTHER INFORMATION ABOUT OPERATING AND USE RESTRICTIONS, IN THE SECOND SECTION OF THIS MANUAL. WE HIGHLY RECOMMEND TO READ IT.

CAREFULLY KEEP THIS MANUAL FOR FUTURE REFERENCE.

1) GENERAL INTRODUCTION

The equipment must be installed in compliance with the regulations in force, following the manufacturer's instructions, by qualified personnel.

Qualified personnel means those having technical knowledge in the field of components for civil or industrial heating systems, sanitary hot water generation and particularly service centres authorised by the manufacturer.

Improper installation may cause injury to people and animals, or damage to property, for which the manufacturer cannot be held liable.

* Remove all packaging material and inspect the equipment for integrity.

In case of any doubt, do not use the unit - contact the supplier.

The packaging materials (wooden crate, nails, fastening devices, plastic bags, foamed polystyrene, etc), should not be left within the reach of children, as they may prove harmful.

* Before any cleaning or servicing operation, disconnect the unit from the mains by turning the master switch OFF, and/or through the cut-out devices that are provided.

* Make sure that inlet or exhaust grilles are unobstructed.

* In case of breakdown and/or defective unit operation, disconnect the unit. Make no attempt to repair the unit or take any direct action.

Contact qualified personnel only.

Units shall be repaired exclusively by a servicing centre, duly authorised by the manufacturer, with original spare parts.

Failure to comply with the above instructions is likely to impair the unit's safety.

To ensure equipment efficiency and proper operation, it is essential that maintenance operations are performed by qualified personnel at regular intervals, following the manufacturer's instructions.

* When a decision is made to discontinue the use of the equipment, those parts likely to constitute sources of danger shall be made harmless.

* In case the equipment is to be sold or transferred to another user, or in case the original user should move and leave the unit behind, make sure that these instructions accompany the equipment at all times so that they can be consulted by the new owner and/or the installer.

* For all the units that have been modified or have options fitted then original accessory equipment only shall be used.

* This unit shall be employed exclusively for the use for which it is meant. Any other use shall be considered as improper and, therefore, dangerous.

The manufacturer shall not be held liable, by agreement or otherwise, for damages resulting from improper installation, use and failure to comply with the instructions supplied by the manufacturer.

2) SPECIAL INSTRUCTIONS FOR BURNERS

* The burner should be installed in a suitable room, with ventilation openings complying with the requirements of the regulations in force, and sufficient for good combustion.

* Only burners designed according to the regulations in force should be used.

* This burner should be employed exclusively for the use for which it was designed.

* Before connecting the burner, make sure that the unit rating is the same as delivery mains (electricity, gas oil, or other fuel).

* Observe caution with hot burner components. These are, usually, near to the flame and the fuel pre-heating system, they become hot during the unit operation and will remain hot for some time after the burner has stopped.

* When the decision is made to discontinue the use of the burner, the user shall have qualified personnel carry out the following operations:

a) Remove the power supply by disconnecting the power cord from the mains.

b) Disconnect the fuel supply by means of the hand-operated shut-off valve and remove the control handwheels from their spindles.

Special warnings

* Make sure that the burner has, on installation, been firmly secured to the appliance, so that the flame is generated inside the appliance firebox.

* Before the burner is started and, thereafter, at least once a year, have qualified personnel perform the following operations:

a) set the burner fuel flow rate depending on the heat input of the appliance;

b) set the flow rate of the combustion-supporting air to obtain a combustion efficiency level at least equal to the lower level required by the regulations in force;

c) check the unit operation for proper combustion, to avoid any harmful or polluting unburnt gases in excess of the limits permitted by the regulations in force;

d) make sure that control and safety devices are operating properly;

e) make sure that exhaust ducts intended to discharge the products of combustion are operating properly;

f) on completion of setting and adjustment operations, make sure that all mechanical locking devices of controls have been duly tightened;

g) make sure that a copy of the burner use and maintenance instructions is available in the boiler room.

* In case of repeated burner shut-downs, do not continue re-setting the unit manually. Contact qualified personnel to take care of such defects.

* The unit shall be operated and serviced by qualified personnel only, in compliance with the regulations in force.

3) GENERAL INSTRUCTIONS DEPENDING ON FUEL USED

3a) ELECTRICAL CONNECTION

* For safety reasons the unit must be efficiently earthed and installed as required by current safety regulations.

* It is vital that all safety requirements are met. In case of any doubt, ask for an accurate inspection of electrics by qualified personnel, since the manufacturer cannot be held liable for damages that may be caused by failure to correctly earth the equipment.

* Qualified personnel must inspect the system to make sure that it is adequate to take the maximum power used by the equipment shown on the equipment rating plate. In particular, make sure that the system cable cross section is adequate for the power absorbed by the unit.

* No adaptors, multiple outlet sockets and/or extension cables are permitted to connect the unit to the electric mains.

An omnipolar switch shall be provided for connection to mains, as required by the current safety regulations.

The use of any power-operated component implies observance of a few basic rules, for example:

- do not touch the unit with wet or damp parts of the body and/or with bare feet;
- do not pull electric cables;
- do not leave the equipment exposed to weather (rain, sun, etc.) unless expressly required to do so;
- do not allow children or inexperienced persons to use equipment;

* The unit input cable shall not be replaced by the user.

In case of damage to the cable, switch off the unit and contact qualified personnel to replace.

* When the unit is out of use for some time the electric switch supplying all the power-driven components in the system (i.e. pumps, burner, etc.) should be switched off.

3b) FIRING WITH GAS, GASOIL OR OTHER FUELS GENERAL

* The burner shall be installed by qualified personnel and in compliance with regulations and provisions in force; wrong installation can cause injuries to people and animals, or damage to property, for which the manufacturer cannot be held liable.

* Before installation, it is recommended that all the fuel supply system pipes be carefully cleaned inside, to remove foreign matter that might impair the burner operation.

* Before the burner is commissioned, qualified personnel should inspect the following:

- a) the fuel supply system, for proper sealing;
- b) the fuel flow rate, to make sure that it has been set based on the firing rate required of the burner;
- c) the burner firing system, to make sure that it is supplied for the designed fuel type;
- d) the fuel supply pressure, to make sure that it is included in the range shown on the rating plate;
- e) the fuel supply system, to make sure that the system dimensions are adequate to the burner firing rate, and that the system is equipped with all the safety and control devices required by the regulations in force.

* When the burner is to remain idle for some time, the fuel supply tap or taps should be closed.

b) immediately open doors and windows to create an air flow to purge the room;

c) close the gas valves;

d) contact qualified personnel.

* Do not obstruct the ventilation openings of the room where gas appliances are installed, to avoid dangerous conditions such as the development of toxic or explosive mixtures.

SPECIAL INSTRUCTIONS FOR USING GAS

* Have qualified personnel inspect the installation to ensure that:

- a) the gas delivery line and train are in compliance with the regulations and provisions in force;
- b) all gas connections are tight;
- c) the boiler room ventilation openings are such that they ensure the air supply flow required by the current regulations, and in any case are sufficient for proper combustion.

* Do not use gas pipes to earth electrical equipment.

* Never leave the burner connected when not in use. Always shut the gas valve off.

* In case of prolonged absence of the user, the main gas delivery valve to the burner should be shut off.

Precautions if you can smell gas

- a) do not operate electric switches, the telephone, or any other item likely to generate sparks;



WARNING: to grant safety, install a CO detector in the room where the burner is installed: the CO detector should control an external gas cut-off valve manually operated. The CO concentration in air must not be higher than 0.05%. For any suggestions on brands and models, please contact the “Centro Internazionale della pizza”

Burner model identification

Burners are identified by burner type and model. Burner model identification is described as follows.:

Type	PZ3	Model	M-.	RM.	L.	*.	A.	0.	15
	(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) BURNER TYPE	PZ3								
(2) FUEL	M - Natural gas L - LPG								
(3) OPERATION	RM - Manual regulation								
(4) BLAST TUBE	L - Extended								
(5) DESTINATION COUNTRY	* - see data plate								
(6) BURNER VERSION	A - Standard								
(7) EQUIPMENT	0 = 2 valves								
(8) GAS CONNECTION	15 = Rp1/2								

Specifications

BURNER TYPE		PZ3 M-.RM..	PZ3 L-.RM..
Output	min. - max. kW	7 - 35	7 - 35
Fuel		Natural gas	L.P.G.
Category		see next paragraph	I _{3B/P}
Gas flow rate	min.-max. Stm ³ /h	0.7 - 3.7	0.3 - 1.3
Gas pressure	min.-max. mbar	(see Note 2)	
Electric supply		230V 3~ / 400V 3N ~ 50Hz	
Total power consumption	W	230	
Fan motor	W	40	
Protection		IP40	
Weight	kg	12	
Operation		Manual Regulation	
Gas train 15	Valves size/Gas connection	1/2" - Rp1/2	
Operating temperature	°C	-10 ÷ +50	
Storage Temperature	°C	-20 ÷ +60	
Working service*		Intermittent	

Note1:	All gas flow rates are referred to Stm ³ /h (1013 mbar absolute pressure, 15 °C temperature) and are valid for G20 gas (nett calorific value H _i = 34.02 MJ/Stm ³)
Note2:	Maximum gas pressure = 360 mbar

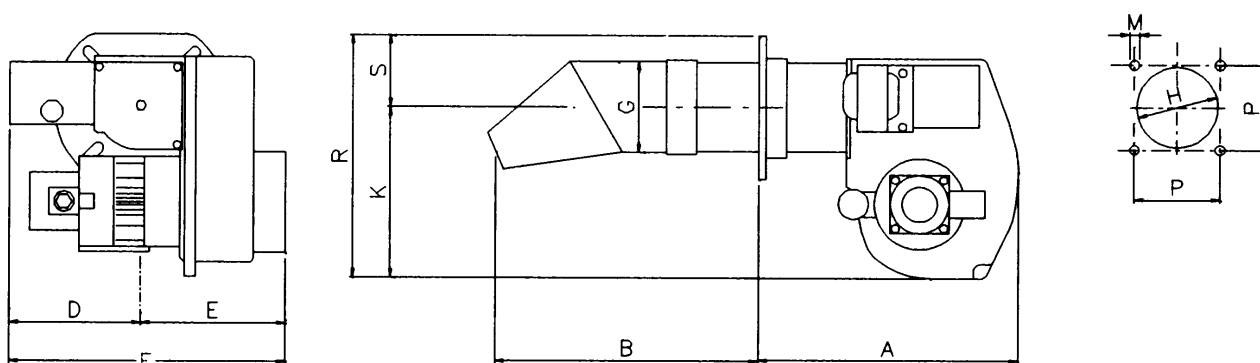
NOTE: if the fuel is changed from L.P.G. to natural gas or viceversa, please contact the burner manufacturer to provide the proper changes to the burners.

*** NOTE ON THE WORKING SERVICE:** the control box automatically stops after 24h of continuous working. The control box immediately starts up, automatically.

Country and usefulness gas categories

GAS CATEGORY	COUNTRY																									
	AT	ES	GR	SE	FI	IE	HU	IS	NO	CZ	DK	GB	IT	PT	CY	EE	LV	SI	MT	SK	BG	LT	RO	TR	CH	
I _{2H}																										
I _{2E}	LU	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
I _{2E(R) B}	BE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
I _{2L}	NL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
I _{2ELL}	DE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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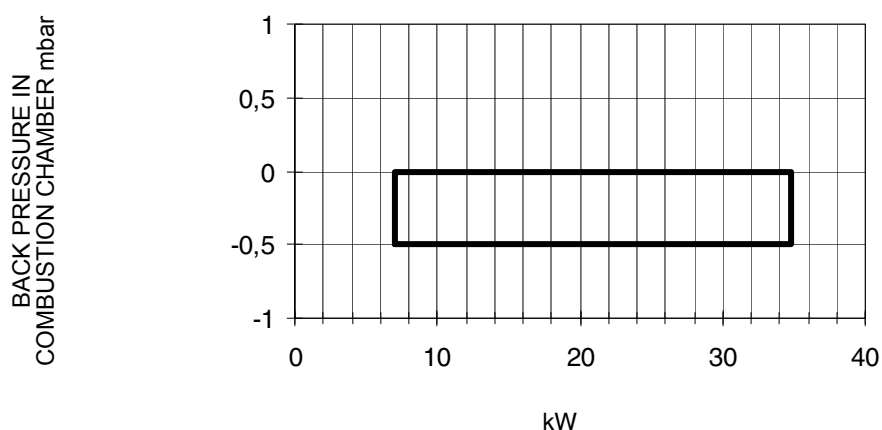
Overall dimensions (mm)



	A	B	D	E	F	G	K	R	S	H	Pmin	Pmax	M
PZ3	230	600	140	150	290	90	170	242	72	100	85	134	M8

Performance curves

PZ3 RM



To get the input in kcal/h, multiply value in kW by 860.

Data are referred to standard conditions: atmospheric pressure at 1013mbar, ambient temperature at 15°C...

NOTE: The performance curve is a diagram that represents the burner performance in the type approval phase or in the laboratory tests, but does not represent the regulation range of the machine. On this diagram the maximum output point is usually reached by adjusting the combustion head to its "MAX" position (see paragraph "Adjusting the combustion head"); the minimum output point is reached setting the combustion head to its "MIN" position. During the first ignition, the combustion head is set in order to find a compromise between the burner output and the generator specifications, that is why the minimum output may be different from the Performance curve minimum.

To set the output, according to the oven type, see the next table:

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DORIGO OVEN CLASSIFIED TABLE

CLASS	REQUIRED OUTPUT	MODEL	A	L1	DOVE MATERIAL	PLANE MATERIAL	CHIMNEY
DORIGO 85		DORIGO 85 G	85	40	CRUDO VIBRATO	CRUDO VIBRATO	20
DA 0,25 MC A 0,30 MC	7 - 18 KW					MATTONI COTTI	20
DORIGO 100		DORIGO 100 G	100	44	CRUDO VIBRATO	CRUDO VIBRATO	20
DA 0,3 MC A 0,4 MC	7 - 21 KW	DORIGO T 85	100	44	CRUDO VIBRATO	MATTONI COTTI	20
DORIGO 115		DORIGO 115 G	115	44	CRUDO VIBRATO	CRUDO VIBRATO	20
DA 0,4 MC A 0,5 MC	7 - 24 KW	DORIGO T 95	115	44	CRUDO VIBRATO	MATTONI COTTI	20
DORIGO 130		DORIGO 130 G	130	44	CRUDO VIBRATO	CRUDO VIBRATO	20
DA 0,5 MC A 0,65 MC	7 - 26 KW	DORIGO T 110	130	44	CRUDO VIBRATO	MATTONI COTTI	20
DORIGO 145		DORIGO 145 G	145	44	CRUDO VIBRATO	CRUDO VIBRATO	20
DA 0,65 MC A 0,75 MC	7 - 28 KW	DORIGO T 115	145	44	CRUDO VIBRATO	MATTONI COTTI	20
		DORIGO T 128 G	145	44	CRUDO VIBRATO	MATTONI COTTI	20
DORIGO 165		DORIGO 165 G	165	50	CRUDO VIBRATO	CRUDO VIBRATO	20
DA 0,75 MC A 0,85 MC	7 - 32 KW	DORIGO T 128	165	50	CRUDO VIBRATO	MATTONI COTTI	20
		DORIGO T 144 G	165	50	CRUDO VIBRATO	MATTONI COTTI	20
DORIGO 185		DORIGO 185 G	185	50	CRUDO VIBRATO	CRUDO VIBRATO	20
DA 0,85 MC A 0,95 MC	7 - 34,8 KW	DORIGO T 144	185	50	CRUDO VIBRATO	MATTONI COTTI	20

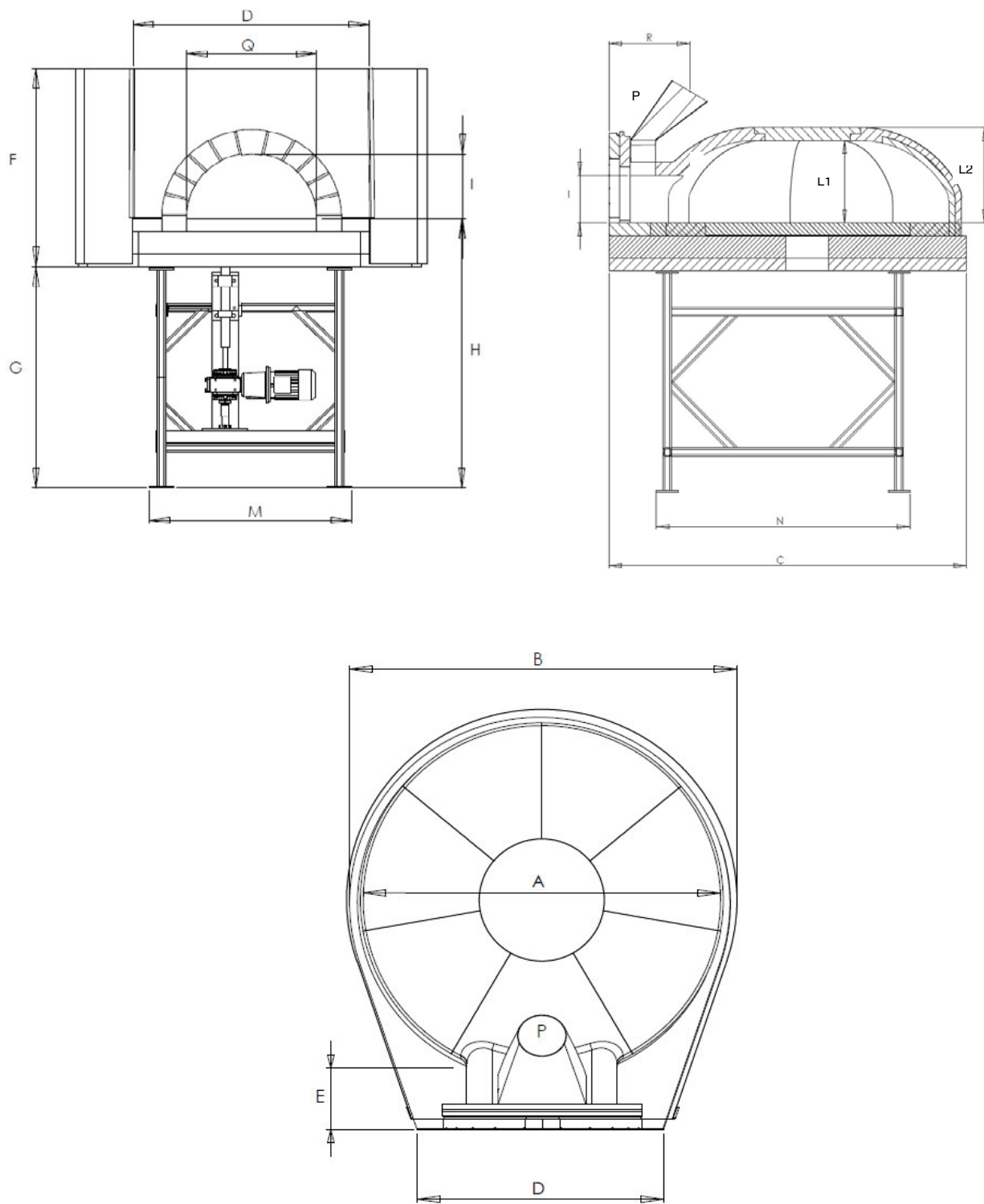
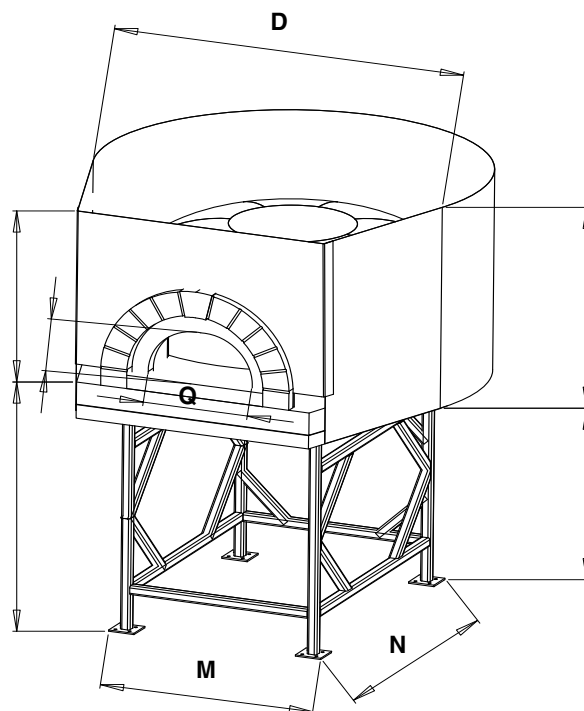
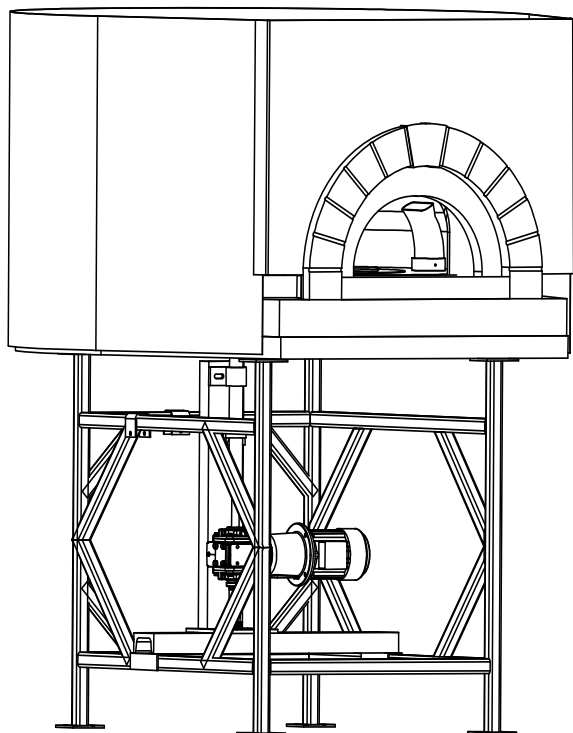


Fig. 1



	OVEN MODEL	85	100	T 85 G	115	T 95 G	145	T 115	T 128 G	165	T 128	T 144 G
A	COOKIN SURFACE SIZE	85	100	85	115	95	145	115	128	165	128	144
B	OUTER WIDTH	114	135	135	150	150	180	180	180	200	200	200
C	OUTER DEPTH	122	145	145	160	160	190	190	190	210	210	210
D	FRONT OUTER WIDTH	100	100	100	100	100	100	100	100	100	100	100
E	SILL DEPTH	24	30	36	30	37	30	42	37	30	50	43
F	HEIGHT FROM BASE UPWARDS	90	90	90	90	90	90	90	90	90	90	90
G	HEIGHT FROM GROUND TO BASE FRAME	100	100	100	100	100	100	100	100	100	100	100
H	WORKTOP HEIGHT	120	120	125	120	125	120	125	125	120	125	125
I	HEIGHT OVEN MOUTH	25	28	28	28	25	28	25	25	28	25	25
L1	INSIDE DOME HEIGHT	41	44	39	44	39	44	39	39	50	45	45
L2	OUTSIDE DOME HEIGHT	53	56	56	56	56	56	56	56	62	62	62
M	PEDESTAL WIDTH	78	57	57	67	67	88	88	88	100	100	100
N	PEDESTAL DEPTH	100	100	117	117	117	117	117	117	150	150	150
P	FLUE DIAMETER	19,5	19,5	19,5	19,5	19,5	19,5	19,5	19,5	19,5	19,5	19,5
Q	OVEN MOUTH WIDTH	45	58	58	58	58	58	58	58	58	58	58
R	FLUE CONNECTION DEPTH	30	30	30	30	30	30	30	30	30	30	30
S	TOTAL OVEN WEIGHT	700	800	1050	950	1200	1200	1450	1550	1400	1650	1750

MOUNTINGS AND CONNECTIONS

Packing

Burners are despatched in cardboard packages whose dimensions are.: 760 x 440 x 520 mm (L x P x H).

Packing cases of this type are affected by humidity; the maximum number of cases to be stacked is shown outside the packing. The following are placed in each packing case.

- burner with gas train
- detached electric panel provided with quick connector and cables.
- gasket to be inserted between the burner and the oven
- envelope containing this manual

To get rid of the burner's packing, follow the procedures laid down by current laws on disposal of materials.

Mounting the burner on the oven

To assemble the burner in the oven, proceed as follows.

- 1 Make a 100mm diameter hole in the cooking surface of the oven, as shown in Fig. 2; the position of the hole may be to the right (A in Fig. 2) or to the left (B in Fig. 2), of the oven access opening, as preferred by the user (in case also of rotating plane).
- 2 Slide out the blast tube by unscrewing the four fastening screws VB (Fig. 3).
N.B.: when removing the blast tube from the burner, pay careful attention to the position of the reference tooth, as this must be positioned in the same way when assembling the burner.
- 3 Fasten the sliding flange supplied with the burner to the cooking surface, over the previously made 100mm hole (see point 1), as shown in Fig. 3. Remember to insert the gasket supplied between the flange and the cooking surface.
- 4 N.B.: for greater simplicity, the sliding flange can alternatively be fastened to the adjustable stand shown in Fig. 4 (supplied separately).
- 5 Fit the blast tube into the sliding flange and secure it using the three fastening screws, so that it protrudes 30mm into the oven. (Fig. 3)
- 6 Fit the burner to the lower part of the blast tube, making sure the reference tooth is correctly aligned on the casing of the burner, and then secure it by retightening the four screws VB (Fig. 3).
- 7 Place the extension on the blast tube, making sure the reference tooth is correctly aligned (Fig. 4)
N.B.: the blast tube extension must point towards the centre of the oven; this operation can be performed more simply using the specific tool (supplied separately).

Fasten the electrical panel to the oven using the screws supplied, and make the electrical connections to the burner using the multiple connector (cable length: 2.5m); to connect the electrical panel to the mains power supply, follow the instructions provided further on.

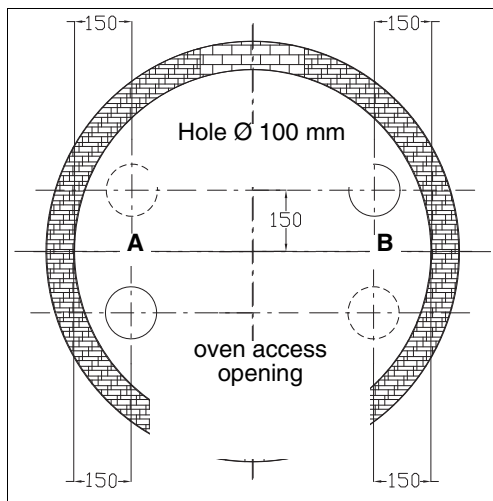


Fig. 2

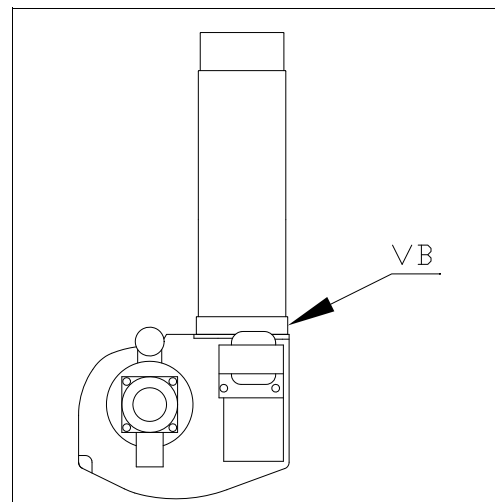


Fig. 3

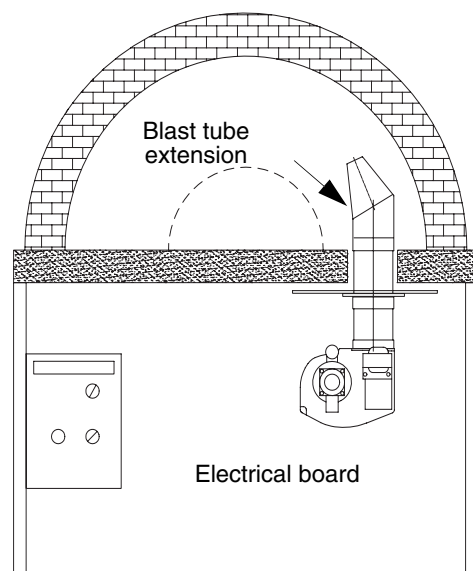
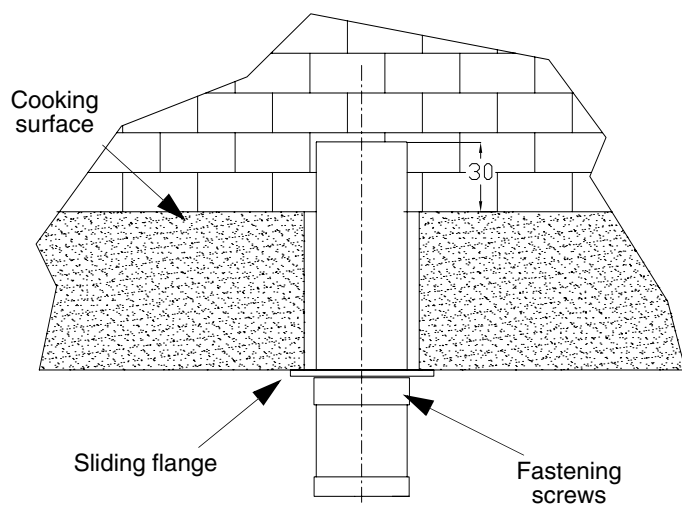


Fig. 4



Manual Adjustment

Electric Borad



Fig. 5

ELECTRICAL CONNECTIONS

- Access the electrical board
 - Carry out electrical connection as shown in Fig. 6
- Close the electrical board

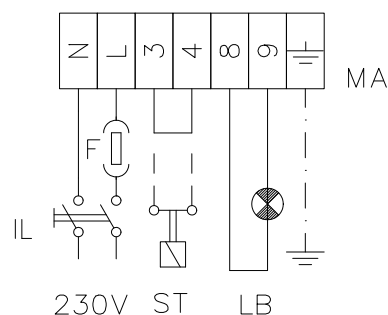


Fig. 6

RESPECT THE BASIC SAFETY RULES. MAKE SURE OF THE CONNECTION TO THE EARTHING SYSTEM. DO NOT REVERSE THE PHASE AND NEUTRAL CONNECTIONS. FIT A DIFFERENTIAL THERMAL MAGNET SWITCH ADEQUATE FOR CONNECTION TO THE MAINS.

GAS TRAIN INSTALLATION DIAGRAMS

Fig. 7 shows the diagrams with the gas train components which are included in the delivery and those which must be fitted by the customer. The diagram complies with regulations in force.

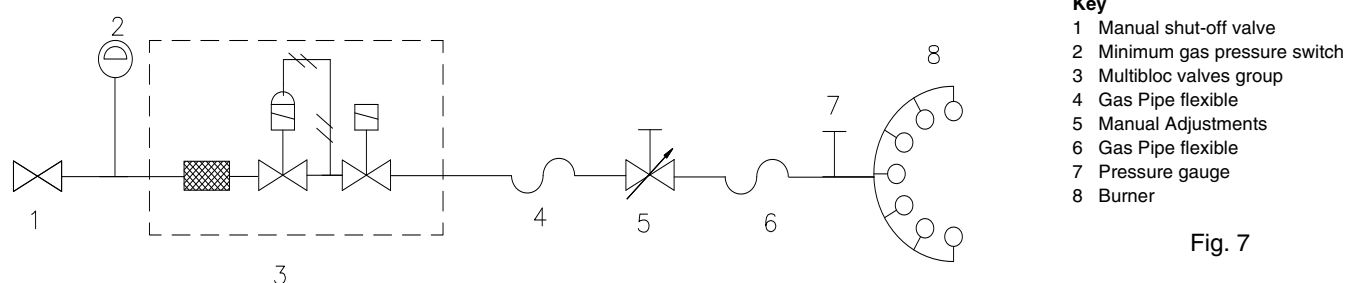


Fig. 7

NOTE: If the fuel supply is changed from L.P.G. to Methane or vice-versa, contact the manufacturer to make the necessary modifications to the burner.



Pressure gauge.7 in Fig. 7

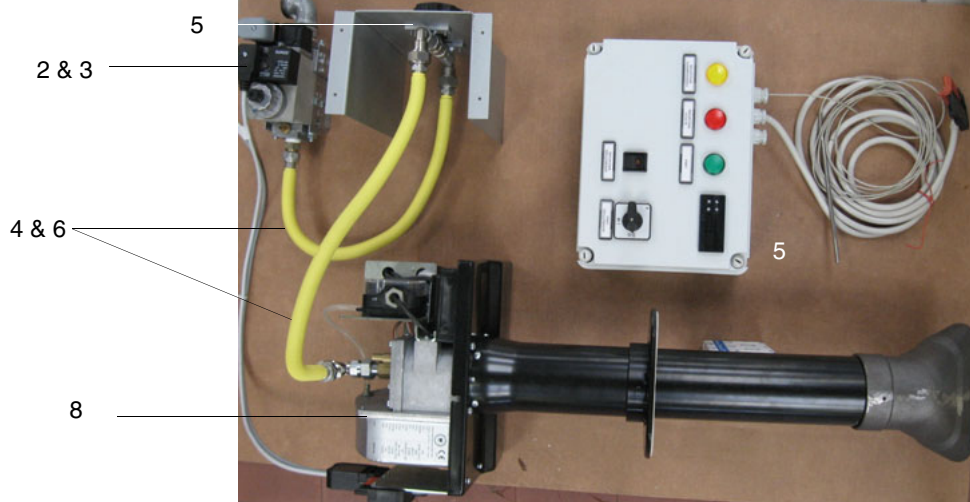


Fig. 8

Gas train connections

The next figures show the gas train components which are included in the delivery and those which must be fitted by the customer. The diagram complies with regulations in force..

	ATTENTION: BEFORE EXECUTING THE CONNECTIONS TO THE GAS PIPE NETWORK, BE SURE THAT THE MANUAL CUTOFF VALVES ARE CLOSED. READ CAREFULLY THE "WARNINGS" CHAPTER AT THE BEGINNING OF THIS MANUAL.
	ATTENTION: once the gas train is mounted according to the diagram on Fig. 5, the gas proving test must be performed, according to the procedure set by the laws in force.
	ATTENTION: it is recommended to mount filter and gas valves to avoid that extraneous material drops inside the valves, during maintenance and cleaning operation of the filters (both the filters outside the valves group and the ones built-in the gas valves).

REGULATION

	ATTENTION: before starting the burner up, be sure that the manual cutoff valves are open and check that the pressure upstream the gas train complies the value quoted on paragraph "Technical specifications". Be sure that the mains switch is closed.
	ATTENTION: During commissioning operations, do not let the burner operate with insufficient air flow (danger of formation of carbon monoxide); if this should happen, make the gas decrease slowly until the normal combustion values are achieved.
	WARNING: NEVER LOOSE THE SEALED SCREWS! OTHERWISE, THE DEVICE WARRANTY WILL BE INVALIDATE!

Adjusting the gas valves group

Multibloc MB-DLE

The multibloc unit is a compact unit consisting of two valves, gas pressure switch, pressure stabilizer and gas filter.

The valve is adjusted by means of the **RP** regulator after slackening the locking screw **VB** by a number of turns. By unscrewing the regulator **RP** the valve opens, screwing the valve closes. To set the fast opening remove cover **T**, reverse it upside down and use it as a tool to rotate screw **VR**. Clockwise rotation reduces start flow rate, anticlockwise rotation increases it.

Do not use a screwdriver on the screw **VR**!

The pressure stabilizer is adjusted by operating the screw **VS** located under the cover **C**. By screwing down the pressure is increased and by unscrewing it is reduced.

Note: the screw **VSB** must be removed only in case of replacement of the coil.

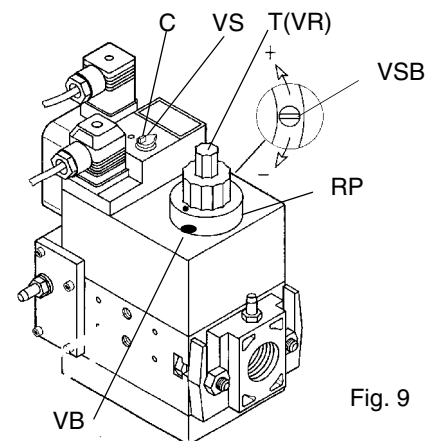


Fig. 9

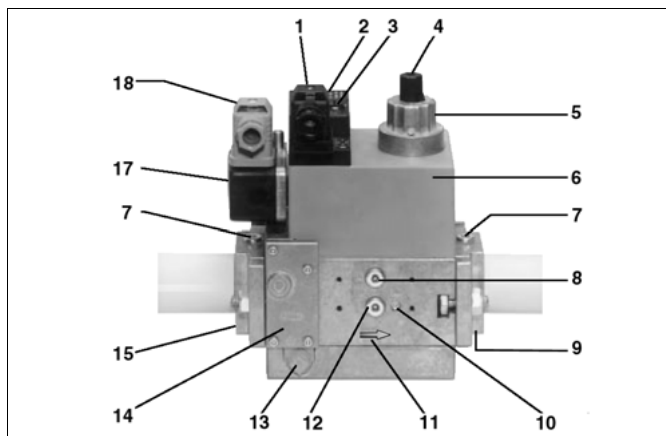


Fig. 10

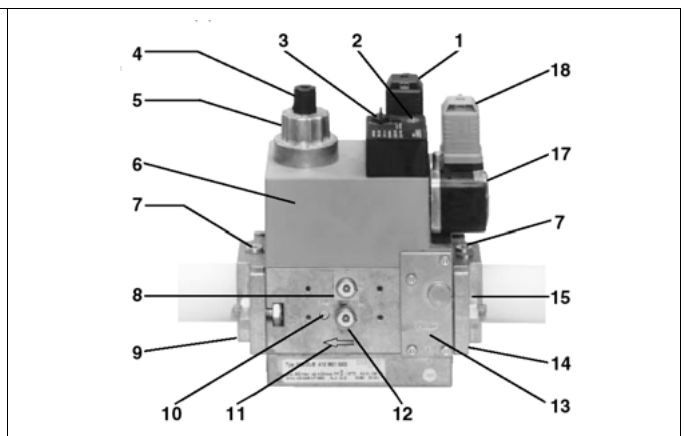


Fig. 11

Key

- | | |
|--|---|
| 1 Electrical connection for valves | 9 Output flange |
| 2 Operation display (optional) | 10 Test point connection M4 downstream of valve 2 |
| 3 Pressure governor closing tap | 11 Gas flow direction |
| 4 Start setting cap | 12 Test connection G 1/8 downstream of valve 1, on both sides |
| 5 Hydraulic brake and rate regulator | 13 Vent nozzle pressure regulator |
| 6 Coil | 14 Filter (below cover) |
| 7 Test point connection G 1/8 | 15 Input flange |
| 8 Test point connection G 1/8 downstream of valve 1, on both sides | 17 Pressure switch |
| | 18 Pressure switch electric connection |

Calibration of low gas pressure switch

As for the gas pressure switch calibration, proceed as follows:

- Be sure that the filter is clean.
- Remove the transparent plastic cap.
- While the burner is operating at the maximum output, test the gas pressure on the pressure port of the minimum gas pressure switch.
- Slowly close the manual cutoff valve (placed upstream the pressure switch, see gas train installation diagram), until the detected pressure is reduced by 50%. Pay attention that the CO value in the flue gas does not increase: if the CO values are higher than the limits laid down by law, slowly open the cutoff valve as to get values lower than these limits.
- Check that the burner is operating correctly.

- Clockwise turn the pressure switch adjusting ring nut (as to increase the pressure value) until the burner stops.
- Slowly fully open the manual cutoff valve.
- Refit the transparent plastic cover on the pressure switch.

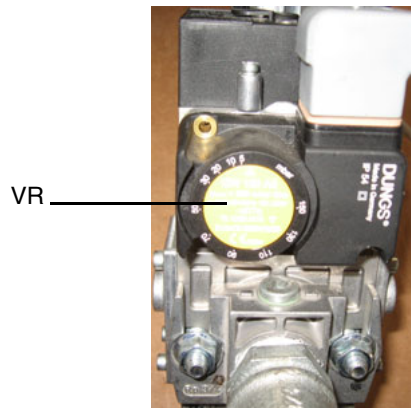


Fig. 12 -

Air flow rate adjustment

WARNING: During commissioning adjustment operations, do not let the burner operate with insufficient air flow (danger of formation of carbon monoxide); if this should happen, shut down the burner, increase the opening of the air damper and start up the burner again to ensure the purging of the carbon monoxide from the combustion chamber. To set the air flow rate, turn the screw VBS referring to the index I.

N.B.: after the commissioning on the plant, seal VS screw.

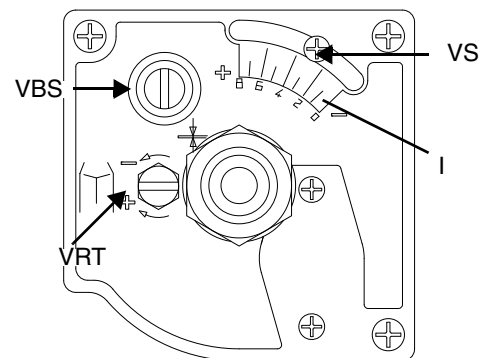


Fig. 13

Removing the combustion head

The combustion head positioning is factory-set.

VRT (Fig. 13): combustion head adjusting screw.

Calibration of air pressure switch

Calibration is carried out as follows.:

- Remove the transparent plastic cap.
- With the burner in operation, after air and gas setting has been completed, slowly turn the adjusting ring nut VR in the clockwise direction until the burner lockout, read the value on the pressure switch scale and reduce it by 1 mbar.

Repeat the ignition cycle of the burner and check it starts properly.

Refit the transparent plastic cover on the pressure switch.

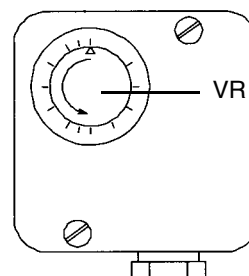


Fig. 14

Safety thermostat

The safety thermostat is set to 100 °C. The bulb is located between the smoke exhaust and the opening to the oven .It is equipped with a manual reset button. It is installed inside the control panel or near the smoke exhaust.

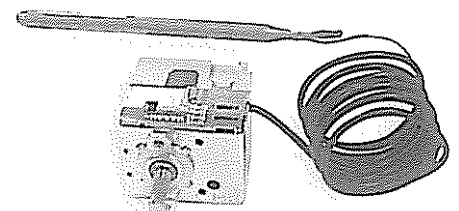


Fig. 15

LIMITATIONS OF USE

THE BURNER IS AN APPLIANCE DESIGNED AND CONSTRUCTED TO OPERATE ONLY AFTER BEING CORRECTLY CONNECTED TO A HEAT GENERATOR (E.G. BOILER, HOT AIR GENERATOR, FURNACE, ETC.), ANY OTHER USE IS TO BE CONSIDERED IMPROPER AND THEREFORE DANGEROUS.

THE USER MUST GUARANTEE THE CORRECT FITTING OF THE APPLIANCE, ENTRUSTING THE INSTALLATION OF IT TO QUALIFIED PERSONNEL AND HAVING THE FIRST COMMISSIONING OF IT CARRIED OUT BY A SERVICE CENTRE AUTHORIZED BY THE COMPANY MANUFACTURING THE BURNER.

A FUNDAMENTAL FACTOR IN THIS RESPECT IS THE ELECTRICAL CONNECTION TO THE GENERATOR'S CONTROL AND SAFETY UNITS (CONTROL THERMOSTAT, SAFETY, ETC.) WHICH GUARANTEES CORRECT AND SAFE FUNCTIONING OF THE BURNER.

THEREFORE, ANY OPERATION OF THE APPLIANCE MUST BE PREVENTED WHICH DEPARTS FROM THE INSTALLATION OPERATIONS OR WHICH HAPPENS AFTER TOTAL OR PARTIAL TAMPERING WITH THESE (E.G. DISCONNECTION, EVEN PARTIAL, OF THE ELECTRICAL LEADS, OPENING THE GENERATOR DOOR, DISMANTLING OF PART OF THE BURNER).

NEVER OPEN OR DISMANTLE ANY COMPONENT OF THE MACHINE.

OPERATE ONLY THE MAIN SWITCH, WHICH THROUGH ITS EASY ACCESSIBILITY AND RAPIDITY OF OPERATION ALSO FUNCTIONS AS AN EMERGENCY SWITCH, AND ON THE RESET BUTTON.

IN CASE OF A BURNER SHUT-DOWN, RESET THE CONTROL BOX BY MEANS OF THE RESET PUSHBUTTON. IF A SECOND SHUT-DOWN TAKES PLACE, CALL THE TECHNICAL SERVICE, WITHOUT TRYING TO RESET FURTHER.

WARNING: DURING NORMAL OPERATION THE PARTS OF THE BURNER NEAREST TO THE GENERATOR (COUPLING FLANGE) CAN BECOME VERY HOT, AVOID TOUCHING THEM SO AS NOT TO GET BURNT.


OPERATION

- Startup the burner by means of the mains switch on the burner electrical board.
- Check that the flame control device is not locked and, eventually, release it with the released pushbutton, accessible opening the electrical board.
- The burner startup phase begins; the flame control device runs the burner fan.
- At the end of the pre-purge phase the solenoid valves are energized and the burner starts up.
- By means of the manual selector "ALTA - BASSA", is possible the choice between the desired operating mode.

Notes for proper use of the oven

- 1 Before proceeding with normal use of the oven, it is advisable to light several times on a low flame to eliminate residual humidity within the structure. This will prevent potential breakages.
- 2 Turn on, slowly on a small flame, until the refractory material achieves a clear coloration, a sign of the optimum temperature for cooking food, which on the inside oven surface reaches 450° C, while the internal volume of air will have a temperature of approximately 250° C. In all cases there must not be any signs of black-coloured incrustations, a sign the oven is cold and therefore not suited for cooking.

Micro or macro cracking due to building features (fattori costruttivi) or thermal expansion are features specific to the refractory material and do not compromise its stability, longevity or their functionality.

	1 NEVER LIGHT THE BURNER PLACE WITH THE DOOR PANEL IN PLACE. NON-COMPLIANCE WITH THIS RULE MAY CAUSE SERIOUS DAMAGE TO THE STRUCTURE OF THE OVEN ITSELF
	2 DO NOT USE PLASTIC BRUSHES TO CLEAN THE ELECTRODES
	3 DO NOT LIGHT THE BURNER ON MAXIMUM
	4 DO NOT POINT THE AIR COMPRESSOR TOWARDS THE AIR-PRESSURE SWITCH INSIDE THE TRANSPARENT TUBE.

ADJUSTING NECOS THERMOSTAT



Keys keyboard

The device OFF and ON is made (beside from menu) pressing the X and ENTER keys for 3s respectively. When the unit is ON, by pressing the ENTER key for 3s you have access to the following menu.

To move inside the menu and to change the selected parameters you have to use the UP, DOWN, ENTER keys (to go down to the next menu level and to confirm your choice), ESC (to go up to the previous menu level and to not confirm). The way this menu looks like can be changed using the Excel table ('Main_Menu' sheet)

Alarms table

Each alarm is characterized by: » code: it unambiguously identifies the alarm; it is shown on display; » description: it is shown on LCD display only; » the cause of the alarm; » the alarm reset type between manual or automatic; » the delay on signalling the alarm at start up or in steady state; » the action on the alarm and warning relay. Here follows the default settings:

User interface in case of alarms

To look at the active alarms you have to select the ALA/Act menu item. Using the UP and DOWN keys you can scroll the active alarms. To reset the alarms of manual reset type you have to select the ALA/rES menu item.

menu code	sub-menu code	function	notes
Prb		Probes values	You can see in sequence the values of the 4 probes (UP and DOWN) keys: the probe code is on display A (Pb1,..., Pb4) and the probe value is on display B (not present or fault probes are indicated with "----"). Probes values have the decimal point if it is enabled by the dPt parameter. When the value shown on display A is greater then 99.9°C, the decimal point is automatically removed.
LOG		Login	It define the access level to menu and parameters. Password is the one set in PL1, PL2 and PL3 parameters.
PAr		Parameters menu	Access to parameters (you have to login first)
ALA		Alarms menu	Access to alarm management
	Act	Active alarms	Active alarms display
	rEs	Reset alarms	Reset of the manual reset alarms
Loc		Lock/Unlock functions	See "Locking code"
OFF		Device OFF	Output are deactivated, alarms not managed, OFF on display B (press ENTER for 3 seconds to switch ON the device)

PARAMETER ADJUSTING

PAR - REG

Pb3 Probe 3

St3 Probe 3 Setpoint MAX 400°

AL3 Probe 3 low threshold 10°

AH3 Probe high threshold MAGG 20° St3

d03 Probe 3 Differential 3°

Pb4 Probe 4

St4 Probe 4 Setpoint MAX 50°

AL4 Probe 4 low threshold 10°

AH4 Probe 4 high threshold MAGG 20° St4

d04 Probe 4 Differential 3°

At least once a year carry out the maintenance operations listed below. In the case of seasonal servicing, it is recommended to carry out the maintenance at the end of each heating season; in the case of continuous operation the maintenance is carried out every 6 months.

	WARNING: ALL OPERATIONS ON THE BURNER MUST BE CARRIED OUT WITH THE MAINS DISCONNECTED AND THE FUEL MANUAL CUTOFF VALVES CLOSED!
	ATTENTION: READ CAREFULLY THE "WARNINGS" CHAPTER AT THE BEGINNING OF THIS MANUAL..

PERIODIC OPERATIONS

- Check and cleaning the gas filter cartridge and, if necessary, replace it.
 - Remove, examine and clean the combustion head.
 - Check ignition cable and electrode, clean and adjust it and, eventually, replace it (Fig. 19)
 - Check the detection cable and the detection electrode, clean and adjust the electrode and, eventually replace it (Fig. 19)
- If in doubt, check the detection circuit, after restarting the burner, as shown in Fig. 20.

Removing the filter in the MULTIBLOC DUNGS MB-DLE 405..412

- Check the filter at least once a year!
- Change the filter if the pressure difference between pressure connection 1 and 3 (Fig. 16-Fig. 17) is $\Delta p > 10$ mbar.
- Change the filter if the pressure difference between pressure connection 1 and 3 (Fig. 16-Fig. 17) is twice as high compared to the last check.

You can change the filter without removing the fitting.

- 1 Interrupt the gas supply closing the on-off valve.
- 2 Remove screws 1 ÷ 4 using the Allen key n. 3 and remove filter cover 5 in Fig. 18.
- 3 Remove the filter 6 and replace with a new one.
- 4 Replace filter cover 5 and tighten screws 1 ÷ 4 without using any force and fasten.
- 5 Perform leakage and functional test, $p_{max.} = 360$ mbar.
- 6 Pay attention that dirt does not fall inside the valve.

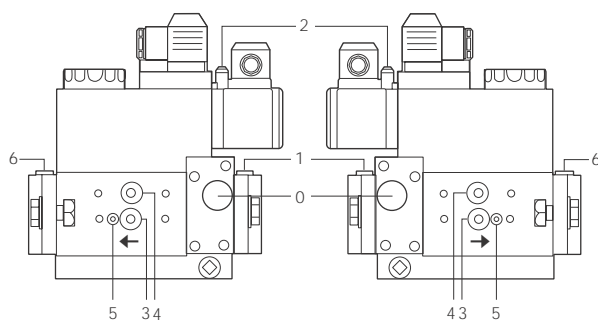


Fig. 16

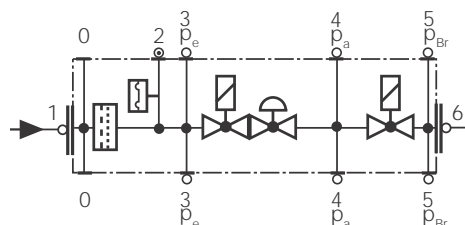


Fig. 17

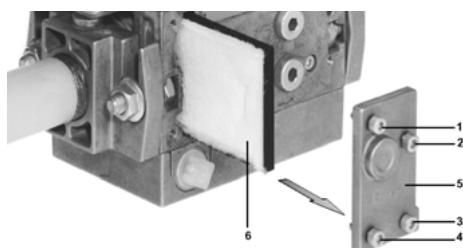


Fig. 18

Removing the combustion head

To carry out the service operations, the burner must be removed from the oven, operating in the reverse order the instructions on page 11.

Correct electrodes position

Follow directions on Fig. 19 .Position the top of the ignition electrode at a distance of 3 - 4 mm from a gas hole. .

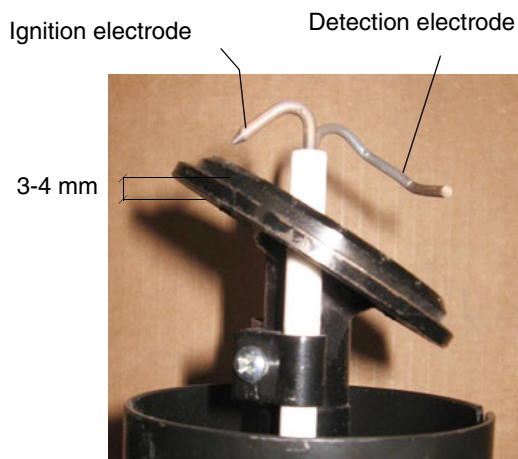


Fig. 19



Fig. 20

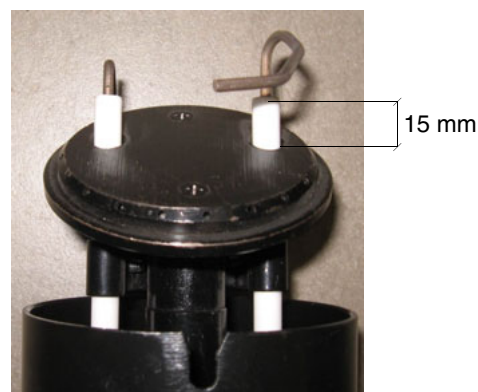
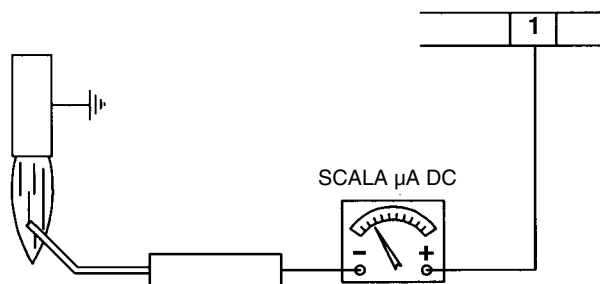


Fig. 21

Checking of the ionization current

To measure the detection signal follow the diagram in Fig 22
If the signal is less than the indicated value, check the position of the detection electrode, the electric contacts and, if necessary, replace the detection electrode.

Fig. 22

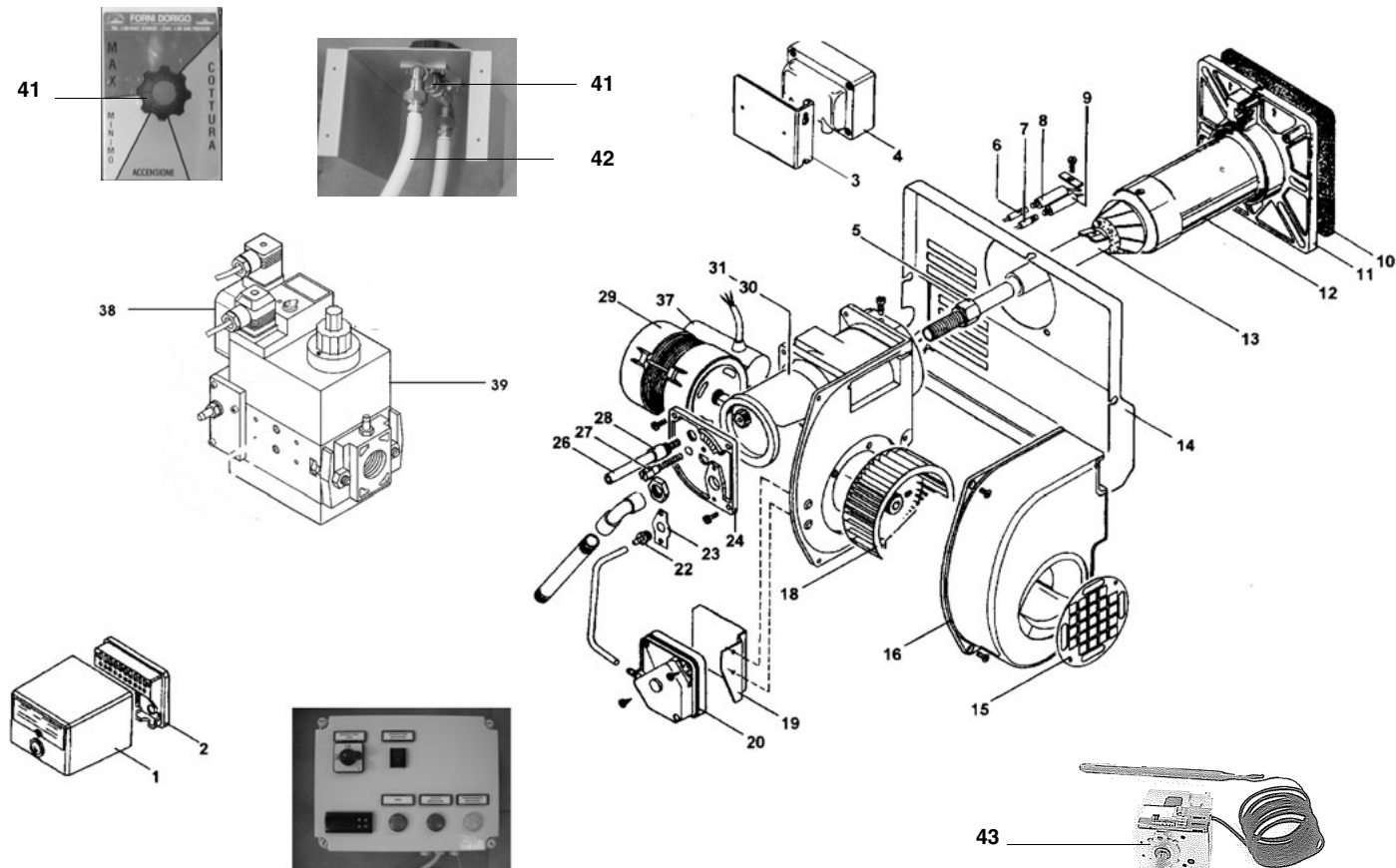


Flame control device model	Min. detection signal
LME..	3 μ A

TROUBLESHOOTING

CAUSE / FAULT	THE BURNER DOESN'T START	THE BURNER CONTINUES THE PRE- PURGE PHASE	THE BURNER DOESN'T START AND STOPS	THE BURNER DOESN'T START AND REPEATS CYCLE	THE BURNER STARTS AND REPEATS CYCLE	THE BURNER STOPS DURING OPERATION	THE BURNER STOPS AND REPEATS CYCLE DURING OPERATION
LACK OF GAS	●						
FAULTY GAS PRESSURE SWITCH	●						
FAULTY MAXIMUM PRESSURE SWITCH	●						
FAULTY AIR PRESSURE SWITCH	●		●			●	
FAULTY FLAME CONTROL DEVICE	●	●	●			●	
AIR PRESSURE SWITCH FAULTY OR NOT CALIBRATED						●	
GAS PRESSURE SWITCH NOT CALIBRATED				●	●		●
FAULTY IGNITION TRANSFORMER			●				
WRONG ELECTRODES POSITION			●				
FAULTY GAS GOVERNOR				●	●		●
WRONG POSITION OF THE DETECTION ELECTRODE						●	

SPARE PARTS



POS.	DESCRIPTION	PZ3
1	FLAME CONTROL DEVICE LME11	2020466
2	SOCKET FOR FLAME CONTROL DEVICE LME..	
3	SUPPORT BRACKET FOR FLAME CONT. DEVICE	
4	TRANSFORMER	2170119
5	COMBUSTION HEAD CENTRAL TUBE	
6	DETECTION CABLE	6050214
7	IGNITION CABLE	6050153
8	DETECTION ELECTRODE	2080320
9	IGNITION ELECTRODE	2080319
10	GASKET	2110046
11	SLIDING FLANGE	
12	BLAST TUBE	
13	COMBUSTION HEAD NATURAL GAS	3060582
13	COMBUSTION HEAD LPG GAS	3060595
14	BOTTOM	
15	PROTECTION MESH	
18	FAN	2150020
19	SUPPORT BRACKET FOR PRESSURE SWITCH	-
20	AIR PRESSURE SWITCH	2160060
22	PRESSURE GAUGE	-
24	COMBUSTION HEAD SUPPORT FLANGE	-
26	AIR DAMPER ADJUSTING SCREW	-
28	SLOT FOR AIR DAMPER ADJUSTING SCREW	-
29	MOTOR	2180093
30	CYLINDRICAL AIR DAMPER	-
31	AIR DAMPER GEAR	-
37	CAPACITOR	-
39	VALVES GROUP MULTIBLOC MB-DLE 405	2190339
38	STABILIZER FILTERS	
41	MANUAL ADJUSTMENT	2570203
43	GAS PIPE FLEXIBLE	234FX63
43	IMIT THERMOSTAT LS1 - 100° - 3m capillary	

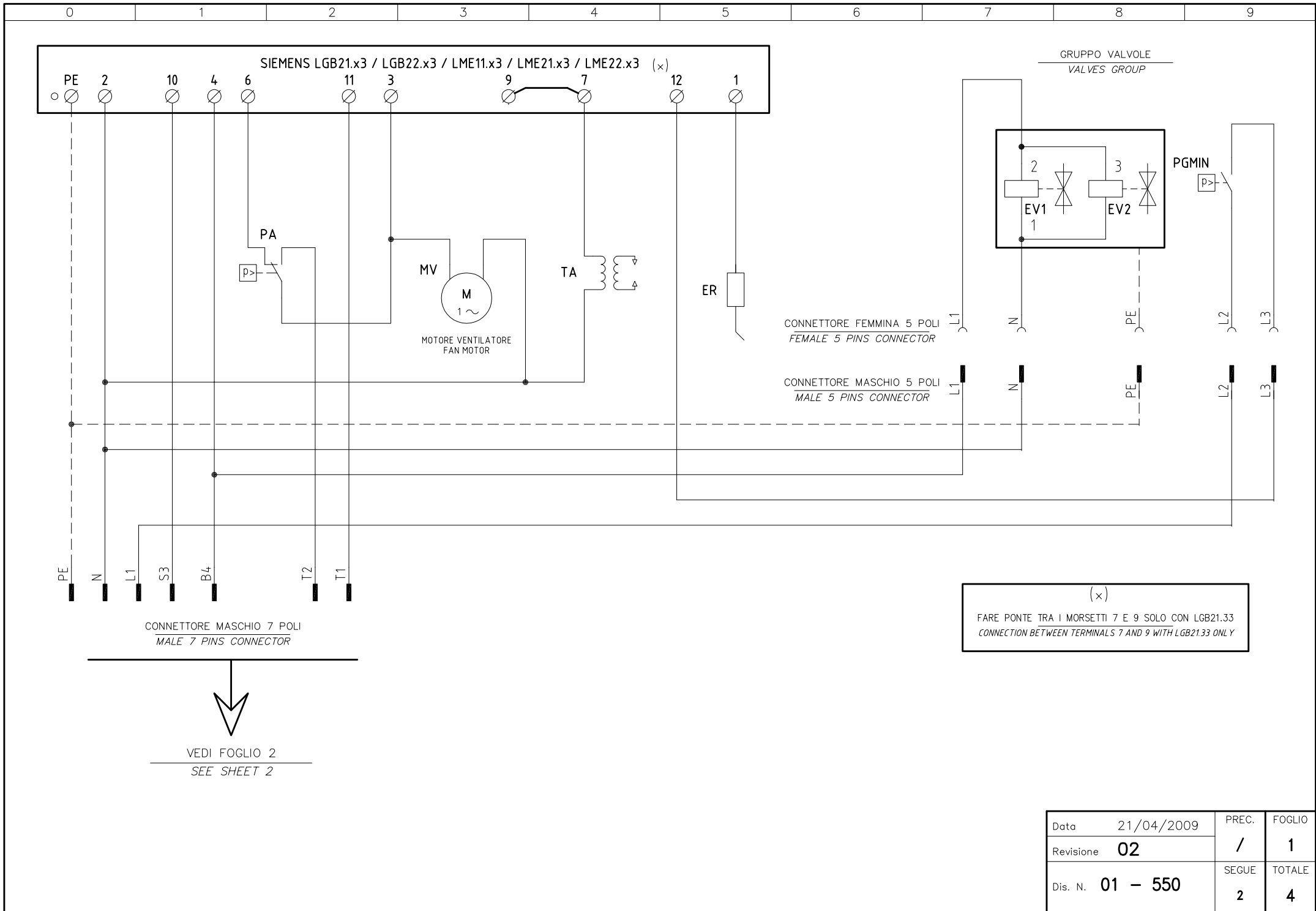
WIRING DIAGRAM

Key

ER	Ionization probe
EV1	Gas electro-valve I° stage
EV2	Gas electro-valve II° stage
F	Fuse
IAB	High/low flame selector
IL	Main switch
L	Phase
LAF	Burner in high flame indicator light
LB	Burner lockout indicator light
LBF	Burner in low flame indicator light
LL	Voltage detection indicator light
LGB../LME..	SIEMENS flame monitor device (alternative / optional)
MA	Supply terminal block
MC	Terminal block for connection of burner components
MV	Fan motor
N	Neutral
PA	Combustion air pressure switch
PG	Low gas pressure switch
ST	Series of thermostats
TA	Ignition transformer

WARNING:

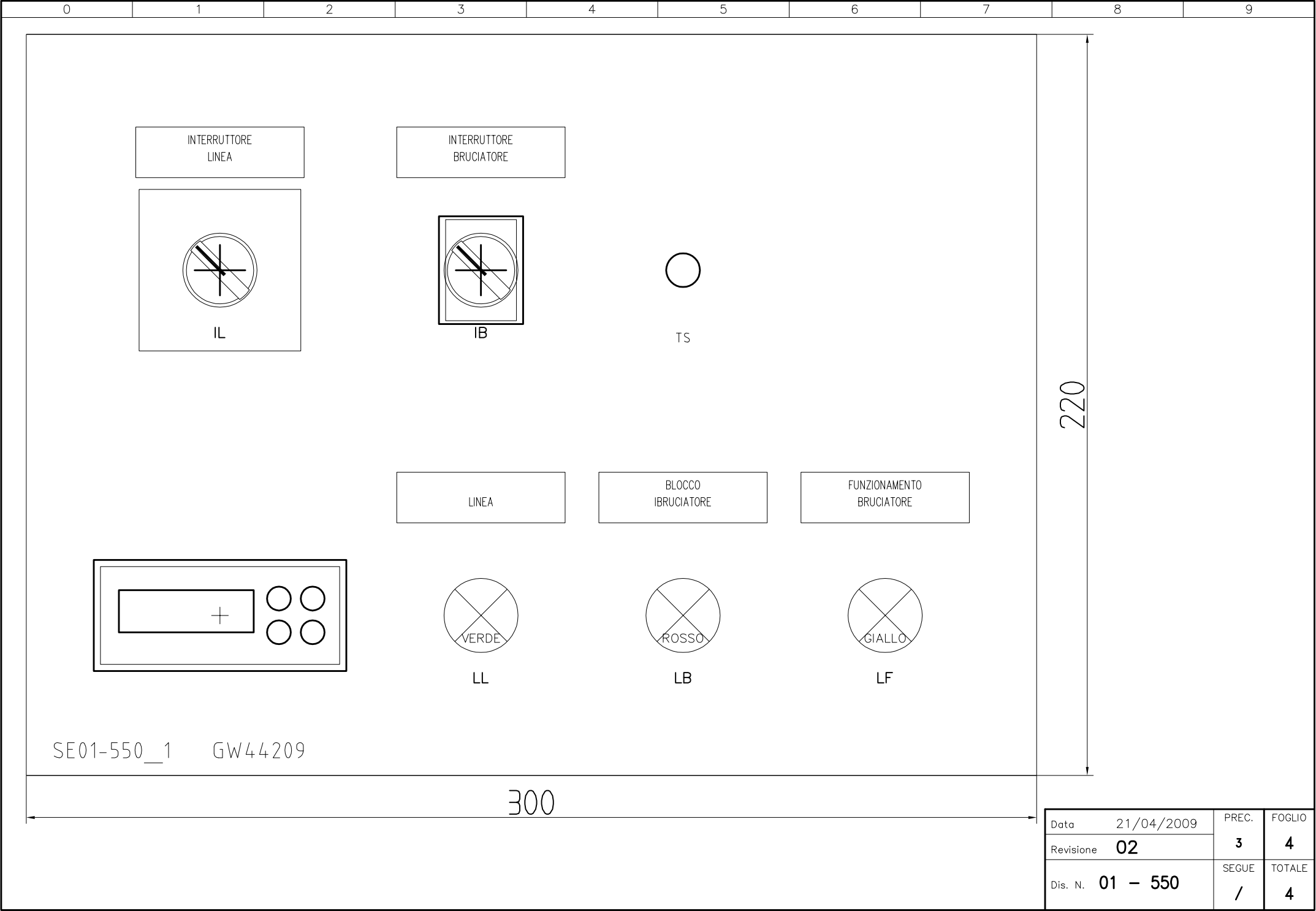
- 1 - Electrical supply 230V 50Hz 2N a.c.
- 2 - Do not reverse phase with neutral
- 3 - Ensure the burner is properly hearted





Data	21/04/2009	PREC.	FOGLIO
Revisione	02	1	2
Dis. N.	01 - 550	SEGUE	TOTALE
		3	4

0	1	2	3	4	5	6	7	8	9
SIGLA/ITEM	FOGLIO/SHEET	FUNZIONE	FUNCTION						
ER	1	ELETTRODO RILEVAZIONE FIAMMA	FLAME DETECTION ELECTRODE						
EV1	1	ELETTROVALVOLA GAS LATO RETE (O GRUPPO VALVOLE)	UPSTREAM GAS SOLENOID VALVE (OR VALVES GROUP)						
EV2	1	ELETTROVALVOLA GAS LATO BRUCIATORE (O GRUPPO VALVOLE)	DOWNSTREAM GAS SOLENOID VALVE (OR VALVES GROUP)						
MV	1	MOTORE VENTILATORE	FAN MOTOR						
PA	1	PRESSOSTATO ARIA	AIR PRESSURE SWITCH						
PGMIN	1	PRESSOSTATO GAS DI MINIMA PRESSIONE	MINIMUM GAS PRESSURE SWITCH						
SIEMENS LGB.. / LME..	1	APPARECCHIATURA CONTROLLO FIAMMA	CONTROL BOX						
TA	1	TRASFORMATORE DI ACCENSIONE	IGNITION TRANSFORMER						
FU2.1	2	FUSIBILE DI LINEA	LINE FUSE						
FU2.3	2	FUSIBILE LINEA TERMOSTATO	THERMOSTAT LINE FUSE						
IB	2	INTERRUTTORE LINEA BRUCIATORE	BURNER LINE SWITCH						
IL	2	INTERRUTTORE ON/OFF BRUCIATORE	BURNER ON/OFF SWITCH						
KA2.5	2	RELE' AUSILIARIO	AUXILIARY RELAY						
KA2.6	2	RELE' AUSILIARIO	AUXILIARY RELAY						
LB	2	LAMPADA SEGNALAZIONE BLOCCO BRUCIATORE	INDICATOR LIGHT FOR BURNER LOCK-OUT						
LB1	2	LAMPADA SEGNALAZIONE BLOCCO BRUCIATORE	INDICATOR LIGHT FOR BURNER LOCK-OUT						
LF	2	LAMPADA SEGNALAZIONE FUNZIONAMENTO BRUCIATORE	INDICATOR LIGHT BURNER OPERATION						
LL	2	LAMPADA SEGNALAZIONE TENSIONE QUADRO	INDICATOR LIGHT FOR ELECTRIC BOX SUPPLY						
NECOS MCX06C4500010	2	TERMOSTATO ELETTRONICO (OPTIONAL)	ELECTRONIC THERMOSTAT (OPTIONAL)						
SD_FU	2	SONDA DI TEMPERATURA FUMI	SMOE TEMPERATURE PROBE						
SD_LV	2	SONDA TEMPERATURA LAVORO	WORK TEMPERATURE PROBE						
TR	2	TRASFORMATORE AUSILIARIO	AUXILIARY TRANSFORMER						
TS	2	TERMOSTATO DI SICUREZZA	SAFETY THERMOSTAT						



220

300

SE01-550_1 GW44209

Data	21/04/2009	PREC.	FOGLIO
Revisione	02	3	4
Dis. N.	01 - 550	SEGUE	TOTALE
		/	4

APPENDIX

SIEMENS LME11/21/22 CONTROL BOX

The series of equipment LME.. is used for the startup and supervision of 1- or 2- stage gas burners. The series LME.. is interchangeable with the series LGB.. and LMG..., all diagrams and accessories are interchangeable, the main features are:

- Indications of error codes by a signalling multicolor LED in the lockout reset button;
- Programmer fix times for the digital management of signals.

Comparative table

LGB Series	LMG Series	LME Series
---	LMG 25.33	LME 11.33
LGB 21.33	LMG 21.33	LME 21.33
LGB 22.33	LMG 22.33	LME 22.33

Preconditions for burner startup

- Burner control must be reset
- All contacts in the line are closed, request for heat
- No undervoltage
- Air pressure switch LP must be in its "no-load" position
- Fan motor or AGK25 is closed
- Flame detector is darkened and there is no extraneous light

Undervoltage

Safety shutdown from the operating position takes place should mains voltage drop below about AC 175 V (at UN = AC 230 V)

Restart is initiated when mains voltage exceeds about AC 185 V (at UN = AC 230 V).

Controlled intermittent operation

After no more than 24 hours of continuous operation, the burner control will initiate automatic controlled shutdown followed by a restart.

Reversed polarity protection with ionization




If the connections of live conductor (terminal 12) and neutral conductor (terminal 2) are mixed up, the burner control will initiate lockout at the end of the safety time "TSA".

Control sequence in the event of fault

If lockout occurs, the outputs for the fuel valves, the burner motor and the ignition equipment will immediately be deactivated (< 1 second).

Operational status indication

In normal operation, the different operating states are showed by means of the multicolor LED, inside the lockout reset button:

	red LED Steady on
	yellow LED
	green LED	○... Off

During startup, status indication takes place according to the table:

Status	Color code	Color
Waiting time tw, other waiting states	○.....	Off
Ignition phase, ignition controlled	●○●○●○●○●○●○	Flashing yellow
Operation, flame ok	□.....	Green
Operation, flame not ok	□○□○□○□○□○□○	Flashing green
Extraneous light on burner startup	□▲□▲□▲□▲□▲□▲	Green - red

Status	Color code	Color
Undervoltage	●▲●▲●▲●▲●▲	Yellow - red
Fault, alarm	▲.....	Red
Error code output (refer to "Error code table")	▲○ ▲○ ▲○ ▲○	Flashing red

START-UP PROGRAM

As far as the startup program, see its time diagram:

A Start command (switching on)

This command is triggered by control thermostat / pressure controller «R». Terminal 12 receives voltage and the programming mechanism starts running. On completion of waiting time «tw» with the LME21..., or after air damper «SA» has reached the nominal load position (on completion of «t11») with the LME22..., fan motor «M» will be started.

tw Waiting time

During the waiting time, air pressure monitor «LP» and flame relay «FR» are tested for correct contact positions.

t11 Programmed opening time for actuator «SA»

(Only with LME22...) The air damper opens until the nominal load position is reached. Only then will fan motor «M» be switched on.

t10 Specified time for air pressure signal

On completion of this period of time, the set air pressure must have built up, or else lockout will occur.

t1 Prepurge time

Purging the combustion chamber and the secondary heating surfaces: required with low-fire air volumes when using the LME21... and with nominal load air volumes when using the LME22.... The diagrams show the so-called prepurge time «t1» during which air pressure monitor «LP» must indicate that the required air pressure is available. The effective prepurge time «t1» comprises interval end «tw» through «t3».

t12 Programmed closing time for actuator «SA»

(Only with LME22...) During «t12», the air damper travels to the low-fire position.

t3 Preignition time

During «t3» and up to the end of «TSA», flame relay «FR» is forced to close. On completion of «t3», the release of fuel is triggered at terminal 4.

TSA Ignition safety time

On completion of «TSA», a flame signal must be present at terminal 1. That flame signal must be continuously available until shutdown occurs, or else flame relay «FR» will be deenergized, resulting in lockout.

t4 Interval BV1 and BV2-LR

Time between the end of TSA and the signal to the second fuel valve BV2 or to the load controller LR

B - B' Interval for flame establishment

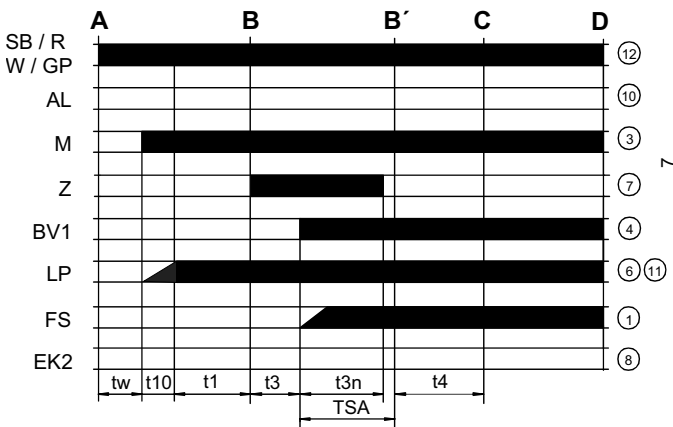
C Burner operation position

C - D Burner operation (heat production)

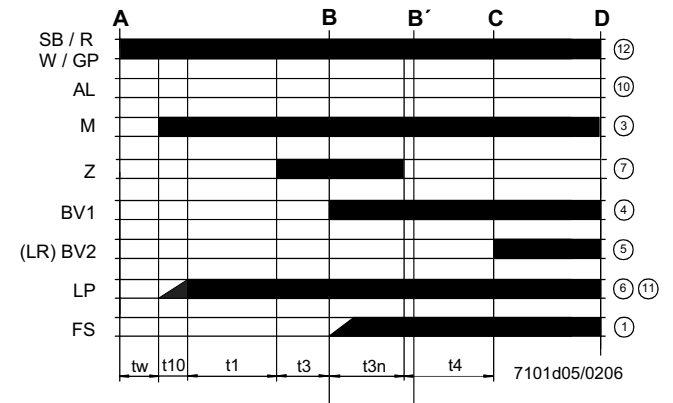
D Controlled by "R" shutdown

The burner stops and the control device is ready for a new startup.

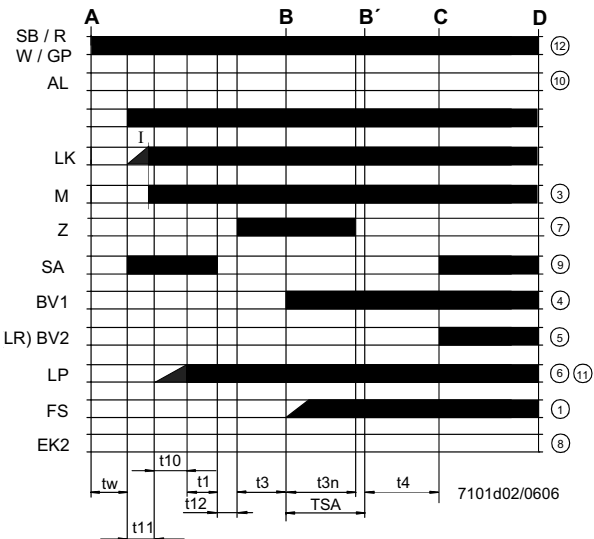
LME11 control sequence



LME21 control sequence



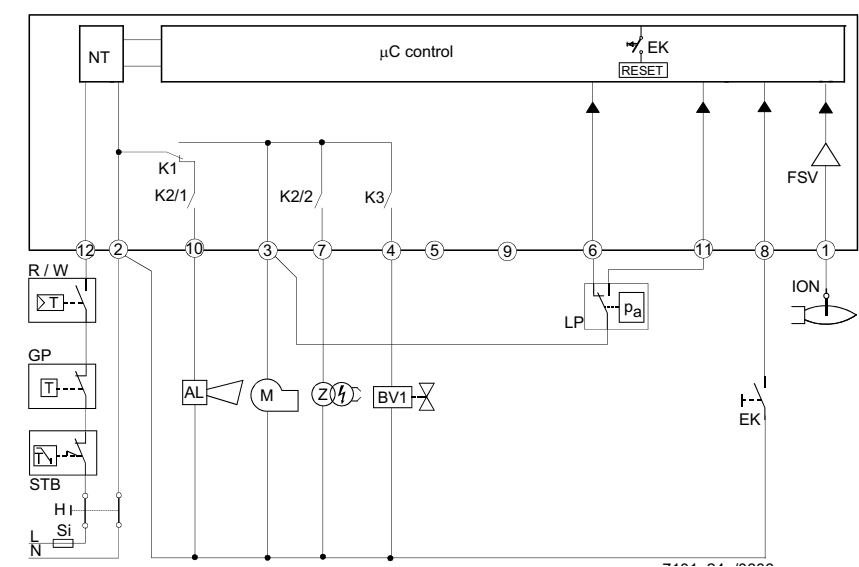
LME22 control sequence



Control sequence

- tw Waiting time
- t1 Purge time
- TSA Ignition safety time
- t3 Preignition time
- t3n Postignition time
- t4 Interval between BV1 and BV2/LR
- t10 Specified time for air pressure signal
- t11 Programmed opening time for actuator SA
- t12 Programmed closing time for actuator SA

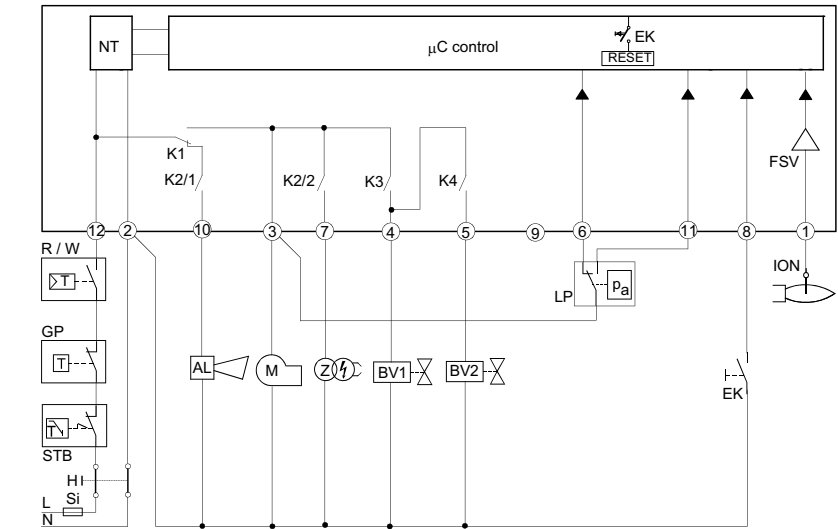
LME11 connection diagram



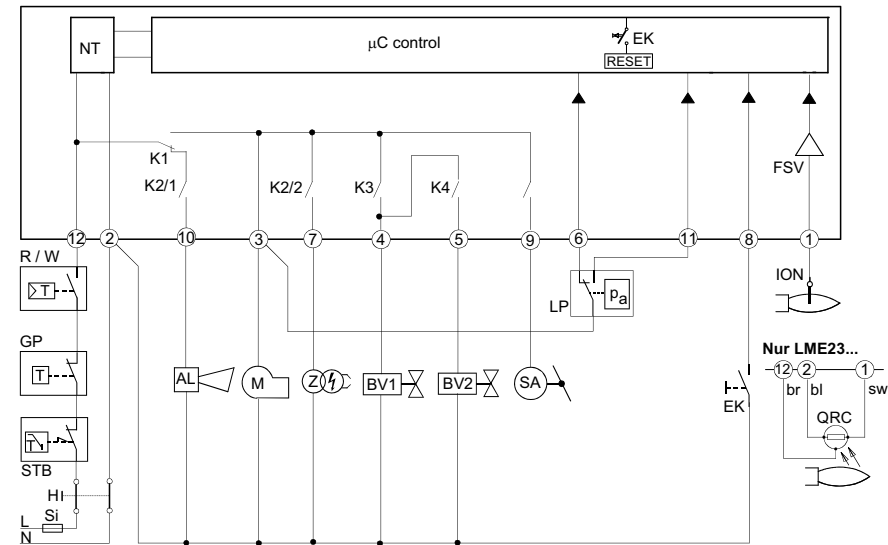
Connection diagram

- AL Error message (alarm)
- BV Fuel valve
- EK2 Remote lockout reset button
- FS Flame signal
- GP Gas pressure switch
- LP Air pressure switch
- LR Load controller
- M Fan motor
- R Control thermostat/pressurestat
- SB Safety limit thermostat
- W Limit thermostat /pressure switch
- Z Ignition transformer

LME21 connection diagram



LME22 connection diagram



CONTROL PROGRAM IN THE EVENT OF FAULT

- If a fault occurs, all outputs will immediately be deactivated (in less than 1s).
- After an interruption of power, a restart will be made with the full program sequence.
- If the operating voltage drops below the undervoltage threshold, a safety shutdown is performed.
- If the operating voltage exceeds the undervoltage threshold, a restart will be performed.
- In case of extraneous light during "t1", a lockout occurs.
- In case of extraneous light during "tw", there is a prevention of startup and a lockout after 30 seconds.
- In case of no flame at the end of TSA, there will be max. 3 repetitions of the startup cycle, followed by a lockout at the end of TSA, for mod. LME11..; directly a lockout at the end of TSA for LME21-22 models.
- For LME11 model: if a loss of flame occurs during operation, in case of an establishment of flame at the end of TSA, there will be max. 3 repetitions, otherwise a lockout will occur.
- For LME21-22 models: if a loss of flame occurs during operation, there will be a lockout.
- If the contact of air pressure monitor LP is in working position, a prevention of startup and lockout after 65 seconds will occur.
- If the contact of air pressure monitor LP is in normal position, a lockout occurs at the end of t10.
- If no air pressure signal is present after completion of t1, a lockout will occur.

CONTROL BOX LOCKED

ERROR CODE TABLE	
2 blinks **	No establishment of flame at the end of TSA <ul style="list-style-type: none">- Faulty or soiled fuel valves- Faulty or soiled flame detector- Inadequate adjustment of burner, no fuel- Faulty ignition equipment
3 blinks ***	The air pressure switch does not switch or remains in idle position: <ul style="list-style-type: none">- LP is faulty- Loss of air pressure signal after t10- LP is welded in normal position.
4 blinks ****	- Extraneous light when burner starts up.
5 blinks *****	- LP is working position.
6 blinks *****	Free.
7 blinks *****	Loss of flame during operation <ul style="list-style-type: none">- Faulty or soiled fuel valves- Faulty or soiled flame detector- Inadequate adjustment of burner
8 ÷ 9 blinks	Free
10 blinks *****	Faulty output contacts <ul style="list-style-type: none">- Wiring error- Anomalous voltage on output terminals- Other faults
14 blinks *****	- CPI contact not closed.

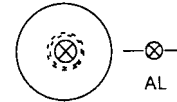
RESETTING THE BURNER CONTROL

When lockout occurs, the burner control can immediately be reset, by pressing the lockout reset button for about 1..3 seconds. The LME.. can only be reset when all contacts in the line are closed and when there is no undervoltage.

LIMITATION OF REPETITIONS (only for LME11.. model)

If no flame is established at the end of TSA, or if the flame is lost during operation, a maximum of 3 repetitions per controller startup can be performed via "R", otherwise lockout will be initiated. Counting of repetitions is restarted each time a controlled startup via "R" takes place.

In the event of lockout, the LME.. remains locked and the red signal lamp (LED) will light up. The burner control can immediately be reset. This state is also maintained in the case of mains failure.



DIAGNOSTICS OF THE CASE OF FAULT

- Press the lockout reset button for more than 3 seconds to activate the visual diagnostics.
- Count the number of blinks of the red signal lamp and check the fault condition on the "Error code table" (the device repeats the blinks for regular intervals).

During diagnostics, the control outputs are deactivated:

- the burner remains shut down;
- external fault indication is deactivated;
- fault status is showed by the red LED, inside the LME's lockout reset button according to the "Error code table":

TECHNICAL CHARACTERISTICS

Mains voltage	120V AC +10% / -15% 230V AC +10% / -15%
Frequency	50 ... 60 Hz +/- 6%
Power consumption	12VA
External primary fuse	max. 10 A (slow)
input current at terminal 12	max. 5 A
Thermostats cable length	max. 3 m
Index of protection	IP40 (to be ensured during mounting)
Operating conditions	-20... +60 °C, < 95% UR
Storage conditions	-20... +60 °C, < 95% UR
Weight	approx. 160 g

SIEMENS LGB 21/22.. CONTROL BOX

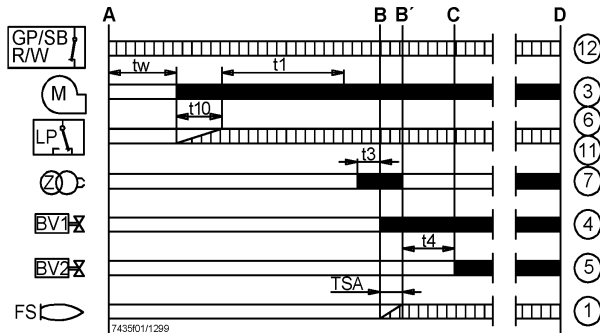
Function

The programme run is shown in the diagrams. The required and permissible input signals for the control part and flame supervision part are pictured as a hatching correspondingly in the function diagrams. If these input signals are missing, the controller interrupts the start-up programme and initiates a lock-out at the place where the safety regulations demand it.

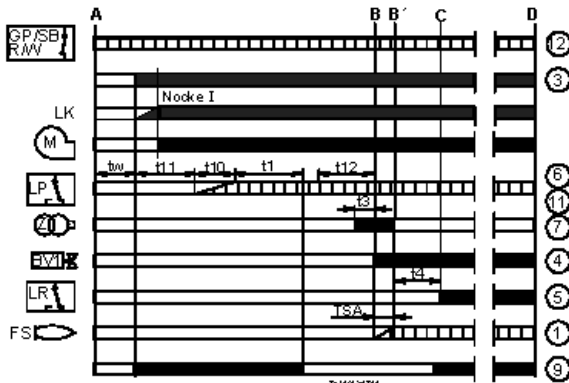
The LGB types are fitted with under voltage protection, i.e. the load relay AR is de-energized when the supply voltage falls below 160 V. The burner control automatically attempts a new start-up when the supply voltage again exceeds 160 V

- A Start-up command from the temperature or pressure controller "R"
- A-C Start-up programme
- C-D Burner operation (heat production corresponding to the control commands)
- D Controlled shut-down by "R"

LGB21



LGB22



Key for operation diagram

- A - C Startup sequence
- tw Waiting time, 8s for LGB21, 9s for LGB22
- t1 Prepurge time 30s
- TSA Ignition safety time 3s
- t3 Preignition time, 2s for LGB21, 3s for LGB22
- t4 Interval «BV1-BV2» or «BV1-LR», 8s
- t10 Specified time for air pressure signal, 5s for LGB21, 3s for LGB22
- t11 Programmed opening time for actuator «SA», max. 12s
- t12 Programmed closing time for actuator «SA», max. 11s
- BV Fuel valves
- FS Flame presence signal
- GP Gas pressure switch
- LP Air pressure switch
- LR Load controller
- M Fan motor
- R Temperature or pressure controller
- W Safety thermostat or pressure switch
- Z Ignition transformer
- 1...12 Terminals of the burner flame controls on AGK11's socket
- Command signal from flame control
- ▨ Input signals

Conditions for starting up the burner:

- The burner control must not be locked out.
- The contacts of the gas pressure switch "GP", the temperature or pressure switch "W" and the controller "R", must be closed.

Start-up programme

A Start command (switching on)

This command is triggered by control thermostat / pressure controller «R». Terminal 12 receives voltage and the programming mechanism starts running. On completion of waiting time «tw» with the LGB21..., or after air damper «SA» has reached the nominal load position (on completion of «t11») with the LGB22..., fan motor «M» will be started.

tw Waiting time

During the waiting time, air pressure monitor «LP» and flame relay «FR» are tested for correct contact positions.

t11 Programmed opening time for actuator «SA»

(Only with LGB22...) The air damper opens until the nominal load position is reached. Only then will fan motor «M» be switched on.

t10 Specified time for air pressure signal

On completion of this period of time, the set air pressure must have built up, or else lockout will occur.

t1 Prepurge time

Purging the combustion chamber and the secondary heating surfaces: required with low-fire air volumes when using the LGB21... and with nominal load air volumes when using the LGB22.... The diagrams show the so-called prepurge time «t1» during which air pressure monitor «LP» must indicate that the required air pressure is available. The effective prepurge time «t1» comprises interval end «tw» through «t3».

t12 Programmed closing time for actuator «SA»

(Only with LGB22...) During «t12», the air damper travels to the low-fire position.

t3 Preignition time

During «t3» and up to the end of «TSA», flame relay «FR» is forced to close. On completion of «t3», the release of fuel is triggered at terminal 4.

TSA Ignition safety time

On completion of «TSA», a flame signal must be present at terminal 1. That flame signal must be continuously available until shutdown occurs, or else flame relay «FR» will be deenergized, resulting in lockout.

t4 Interval

LGB21...: time to the release of the second fuel valve «BV2»

LGB22...: on completion of «t4», the heat source is controlled depending on the load (release of load controller «LR»)

B - B' Interval for flame establishment

C Burner operation position

C - D Burner operation (heat production)

Operation of the burner at the maximum strength or, with a flame controller for the load.

D Controlled by "R" shutdown

The burner stops, waiting for the next ignition.

Command program in the event of a defect

In the event of a defect the inflow of fuel is interrupted. When the block occurs in the preventilation time (not indicated by the symbol) the causes may be the air pressostat LP or a premature signal of flame presence.

- With voltage failure: repetition of the start-up with complete programme
- Premature presence of flame at the start of preventilation time: safety stop (block)
- Contact of air pressostat LP stuck during time t_w : start-up cannot take place.
- Air pressure failure after t_{10} : safety stop after safety time TSA
- Absence of confirmation of air pressure: safety stop(block) after t_{10}
- Failure to start up the burner: safety stop after safety time TSA
- Absence of flame during functioning: immediate safety stop.
- Checking the ignition spark with QRE: with absence of spark there is no consent to the fuel, safety stop (block) after time t_2 .

Unblocking the appliance

Unblocking of the appliance can be effected immediately after the safety stop without causing modification of the programme.

Indicator of the command programme of the defective item

On the front part of the safety appliance is located a plexiglass lunette under which there is the indicator disc of programme's progress.

In the event of safety stop, the programmer stops. The disc shows, as follows, the position of the programme at which the interruption occurred:

- no start-up, the command ring is open
- |||| interval t_w or t_{10} on LGB21; t_w or t_{11} on LGB22
- ▲ air damper open (LGB22)
- P safety stop (block) through absence of the air pressure signal (LGB21) or because (LGB22) the air damper is not open
- ➡➡ interval t_1 , t_3 (t_{12})
- ▼ fuel consent (LGB22)
- 1 safety stop (block) through absence of the flame signal at the end of the 1st safety time
- 2 consent of the 2nd fuel valve (LGB 21) or consent at the power regulator (LGB22)
- oooo functioning of the burner at partial or maximum power (or return to the service position)

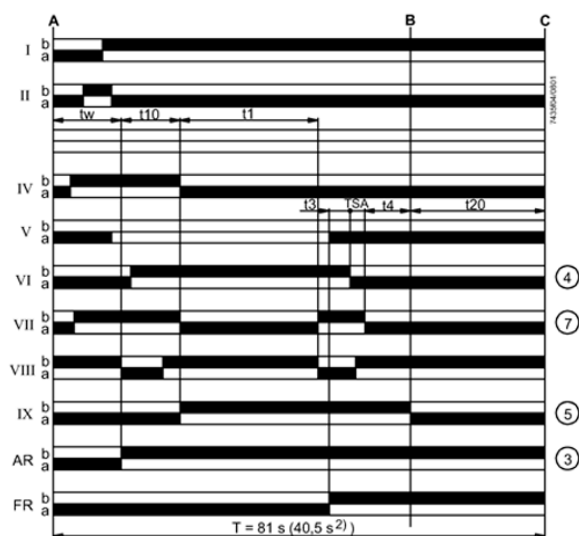
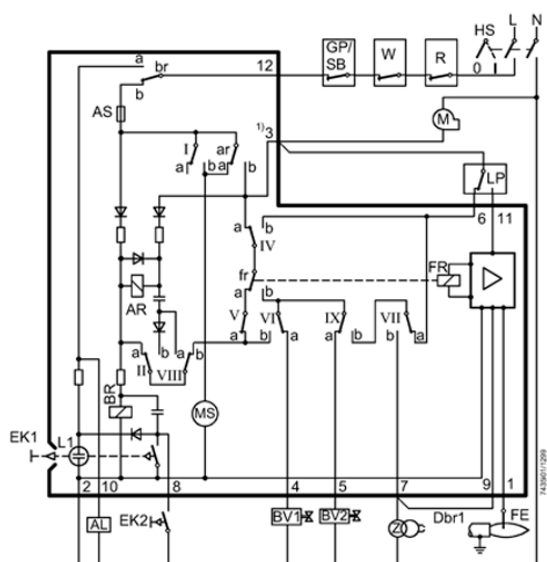
Specifications

Supply voltage	220 V AC -15%...240 VAC +10%
Frequency	50 Hz -6%...60 Hz +6%
Consumption	3 VA
Flow rate of the contacts at terminals	
- terminal 3	max. 3 A (15 A max. for 0.5s)
- terminals 4, 5, 7	max. 2 A
- terminal 10	max. 1 A
- terminal 12 (for U_{max} 264 V)	max. 5 A*
Fuse max.	10 A, with slow blow-out
Radio disturbance	N - VDE0875
Protection	IP40
Permissible ambient temperature	
- operating	-20....+ 60°C
- transport and storage	-40....+ 70°C
Mounting pos. permitted	any
Mass (weight) without/with basec.	230/310 g
Mass (weight) AGK66	c. 12 kg
*) At permissible voltage and that is 187...264 V	

Key - internal diagram

AL	Block signal
AR	Main relay with "ar" contacts
BR	Block relay with "br" contacts
BV	Fuel valve
Dbr1	U bolt
EK	Unblocking button
FE	Detection electrode
FR	Flame relay with "fr" contacts
GP	Gas pressostat
HS	Main selector
L	Phase conductor
L1	Block light (blinking)
LP	Air pressostat
M	Fan motor
MS	Synchronous motor
N	Neutral conductor
R	Thermostat or pressostat
W	Safety thermostat or pressostat
Z	Ignition transformer

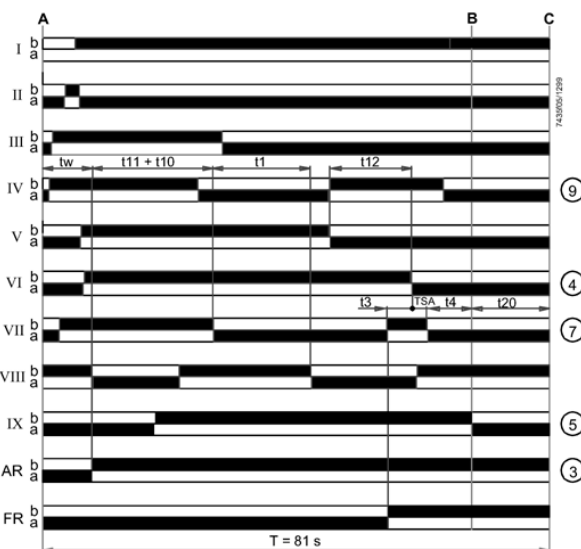
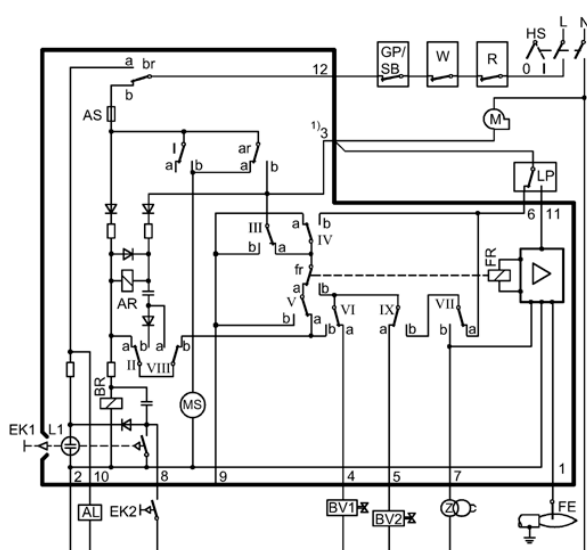
LGB21



Key - programmer's diagram

A	start-up (command from regulator "R")
B	burner operation
C	program start position (start up)
tw	waiting time
t1	pre-ventilation time
TSA	safety time
t3	pre-ignition time
t4	interval of time BV1-BV2 or BV1-LR
t10	waiting time for confirmation of air pressure
t11	air damper movement time to open position
t12	air damper movement time to close position
t20	travel time for auto-return of the programmer
T	programmer's total time
I.IX	contacts of programmer's cams

LGB22





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