

P60 VS

P72 VS

P73 VS

Multihead gas burners

MANUAL OF INSTALLATION - USE - MAINTENANCE



BURNERS - BRUCIATORI - BRULERS - BRENNER - QUEMADORES - ГОРЕЛКИ

DANGERS, WARNINGS AND NOTES OF CAUTION

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.

The following:

- Entails the customer's acknowledgement and acceptance of the company's general terms and conditions of sale, in force at the date of order confirmation and available in the appendix to the current price lists.
- Is intended exclusively for specialised, experienced and trained users able to operate in conditions that are safe for people, the device and the environment, and in full compliance with the requirements set out on the following pages and with current health and safety regulations.

Information regarding assembly/installation, maintenance, replacement and repair is always and exclusively intended for (and therefore only to be carried out by) specialised personnel and/or directly by the Authorised Technical Service

IMPORTANT :

The supply has been made at the best conditions on the basis of the customer's order and technical indications concerning the state of the places and the installation systems, as well as the need to prepare certain certifications and / or additional adaptations with respect to the standard observed and transmitted for each product. In this respect, the manufacturer declines any responsibility for complaints, malfunctions, criticalities, damages and/or anything else consequent to incomplete, inaccurate and/or missing information, as well as failure to comply with the technical requirements and installation regulations, initial start-up, operational management and maintenance.

For proper operation of the device, it is necessary to ensure the readability and conservation of the manual, also for future reference. In case of deterioration or more simply for reasons of technical and operational insight, contact the manufacturer directly. Text, descriptions, images, examples and anything else contained in this document are the exclusive property of the manufacturer. Any reproduction is prohibited.

RISK ANALYSIS

Instruction manual delivered with the device:

This 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. In the event of damage or loss, another copy must be requested from the local customer service centre;

Delivery of the system and instruction manual

The supplier of the system is obliged to accurately inform the user about:-
Use of the system;

- any further testing that may be necessary before activating the system;
- maintenance and the requirement to have the system checked at least once a year by a contractor or other specialised technician.

To ensure periodic monitoring, the manufacturer recommends drawing up a Maintenance Agreement.

WARRANTY AND LIABILITY

In particular, warranty and liability claims will no longer be valid in the event of damage to persons and/or property if such damage is 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;
- Operation by unqualified personnel;
- Carrying out of unauthorised changes to the device;
- 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 after an error and/or fault has occurred;
- Repairs and/or overhauls incorrectly carried out;
- Modification of the combustion chamber with inserts that prevent the regular development of the structurally established flame;
- Insufficient and inappropriate supervision and care of the burner components most subject to wear and tear;
- Use of non-original components, whether spare parts, kits, accessories and optionals;
- Force majeure.

Furthermore, the manufacturer declines all responsibility for non-compliance with this manual.



WARNING! Failure to comply with this manual, operational negligence, incorrect installation and unauthorised modifications will result in the manufacturer's warranty for the burner being voided.

Personnel training

The user is the person, organisation or company that has acquired the appliance and intends to use it for the specific purpose. The user is responsible for the appliance and for training the personnel that operate it.

The user:

- Undertakes to entrust the machine to suitably trained and qualified personnel;
- Must take all measures necessary to prevent unauthorised people gaining access to the appliance;
- Undertakes to adequately inform personnel about application and observance of the safety requirements, and therefore ensure that they are familiar with the operating instructions and safety requirements;
- Must inform the manufacturer if any faults or malfunctions of the accident prevention systems occur, and if there is any suspected danger;
- Personnel must always use the personal protective equipment required by law and follow the instructions provided in this manual;
- Personnel must observe all danger and caution notices on the appliance;
- Personnel must not carry out, on their own initiative, operations or interventions outside their area of expertise;
- Personnel must inform their superiors of any problem and danger that may arise;
- The assembly of parts of other makes, or any modifications made, may alter the characteristics of the appliance and may therefore compromise operational safety. The manufacturer therefore declines all responsibility for damages arising from the use of non-original parts.

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 cutout 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 and accessories.

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.
- 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 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.

The damages resulting from improper installation, use and failure to comply with the instructions supplied by the manufacturer. The occurrence of any of the following circumstances may cause explosions, polluting unburnt gases (example: carbon monoxide CO), burns, serious harm to people, animals and things:

- Failure to comply with one of the WARNINGS in this chapter
- Incorrect handling, installation, adjustment or maintenance of the burner
- Incorrect use of the burner or incorrect use of its parts or optional supply

SPECIAL INSTRUCTIONS FOR BURNERS

a Make the following checks:

- • 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 shutoff 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 fire-box.
- 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 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.
- The unit shall be operated and serviced by qualified personnel only, in compliance with the regulations in force.

GENERAL INSTRUCTIONS DEPENDING ON FUEL USED

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 should be switched off.

FIRING WITH GAS, LIGHT OIL OR OTHER FUELS GENERAL

General Warnings

- 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.

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;
- 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.

Using oil pressure gauges

Generally, pressure gauges are equipped with a manual valve. Open the valve only to take the reading and close it immediately afterwards.

Safety and prevention

- 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.

SYMBOLS USED

	WARNING	Failure to observe the warning may result in irreparable damage (electrical or mechanical source respectively) to the unit or damage to the environment
	DANGER!	Failure to observe the warning may result in serious injuries or death (electrical or mechanical source respectively).
	NOTE	This symbol distinguishes warnings of an annotative, reminder, general nature

BURNER SAFETY

The burners- and the configurations described below - comply with the regulations in force regarding health, safety and the environment. For more in-depth information, refer to the declarations of conformity that are an integral part of this Manual.

DANGER! Incorrect motor rotation can seriously damage property and injure people.

Do not touch any mechanical moving parts with your hands or any other part of your body. Injury hazard

Do not touch any parts containing fuel (i.e. tank and pipes). Scalding hazard

Do not use the burner in situations other than the ones provided for in the data plate.

Do not use fuels other than the ones stated.

Do not use the burner in potentially explosive environments.

Do not remove or by-pass any machine safety devices.

Do not remove any protection devices or open the burner or any other component while the burner is running.

Do not disconnect any part of the burner or its components while the burner is running.

Untrained staff must not modify any linkages.

- After any maintenance, it is important to restore the protection devices before restarting the machine.

- All safety devices must be kept in perfect working order.

- Personnel authorized to maintain the machine must always be provided with suitable protections.

ATTENTION: while running, the parts of the burner near the generator (coupling flange) are subject to overheating. Where necessary, avoid any contact risks by wearing suitable PPE.

DIRECTIVES AND STANDARDS

Gas burners

European directives

- 2016/426/UE** (appliances burning gaseous fuels)
- 2014/35/UE** (Low Tension Directive)
- 2014/30/UE** (Electromagnetic compatibility Directive)
- 2006/42/CE** (Machinery Directive)

Harmonized standards

- UNI EN 676** (Automatic forced draught burners for gaseous fuels)
- EN 55014-1** (Electromagnetic compatibility- Requirements for household appliances, electric tools and similar apparatus)
- EN 60204-1:2006** (Safety of machinery – Electrical equipment of machines.)
- CEI EN 60335-1** (Specification for safety of household and similar electrical appliances);
- CEI EN 60335-2-102** (Household and similar electrical appliances. Safety. Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections).
- UNI EN ISO 12100:2010** (Safety of machinery - General principles for design - Risk assessment and risk reduction);

Industrial burners

European directives

- 2006/42/CE** (Machinery Directive)
- 2014/35/UE** (Low Tension Directive)
- 2014/30/UE** (Electromagnetic compatibility Directive)
- 2006/42/CE** (Machinery Directive)

Harmonized standards

- EN 746-2** (Industrial thermoprocessing equipment - Part 2: Safety requirements for combustion and fuel handling systems)
- EN 55014-1** (Electromagnetic compatibility- Requirements for household appliances, electric tools and similar apparatus)
- EN 60204-1:2006** (Safety of machinery – Electrical equipment of machines.)
- CEI EN 60335-1** (Specification for safety of household and similar electrical appliances);
- UNI EN ISO 12100:2010** (Safety of machinery - General principles for design - Risk assessment and risk reduction);

BURER DATA PLATE

For the following information, please refer to the data plate:

- Burner type and burner model: must be reported in any communication with the supplier
- Burner ID (serial number): must be reported in any communication with the supplier
- Date of production (year and month)
- Information about fuel type and network pressure

Consump

Type	--
Model	--
Year	--
S.Number	--
Output	--
Oil Flow	--
Fuel	--
Category	--
Gas Pressure	--
Viscosity	--
El.Supply	--
El.Consump.	--
Fan Motor	--
Protection	--
Drwaing n°	--
P.I.N.	--

TYPE OF FUEL USED

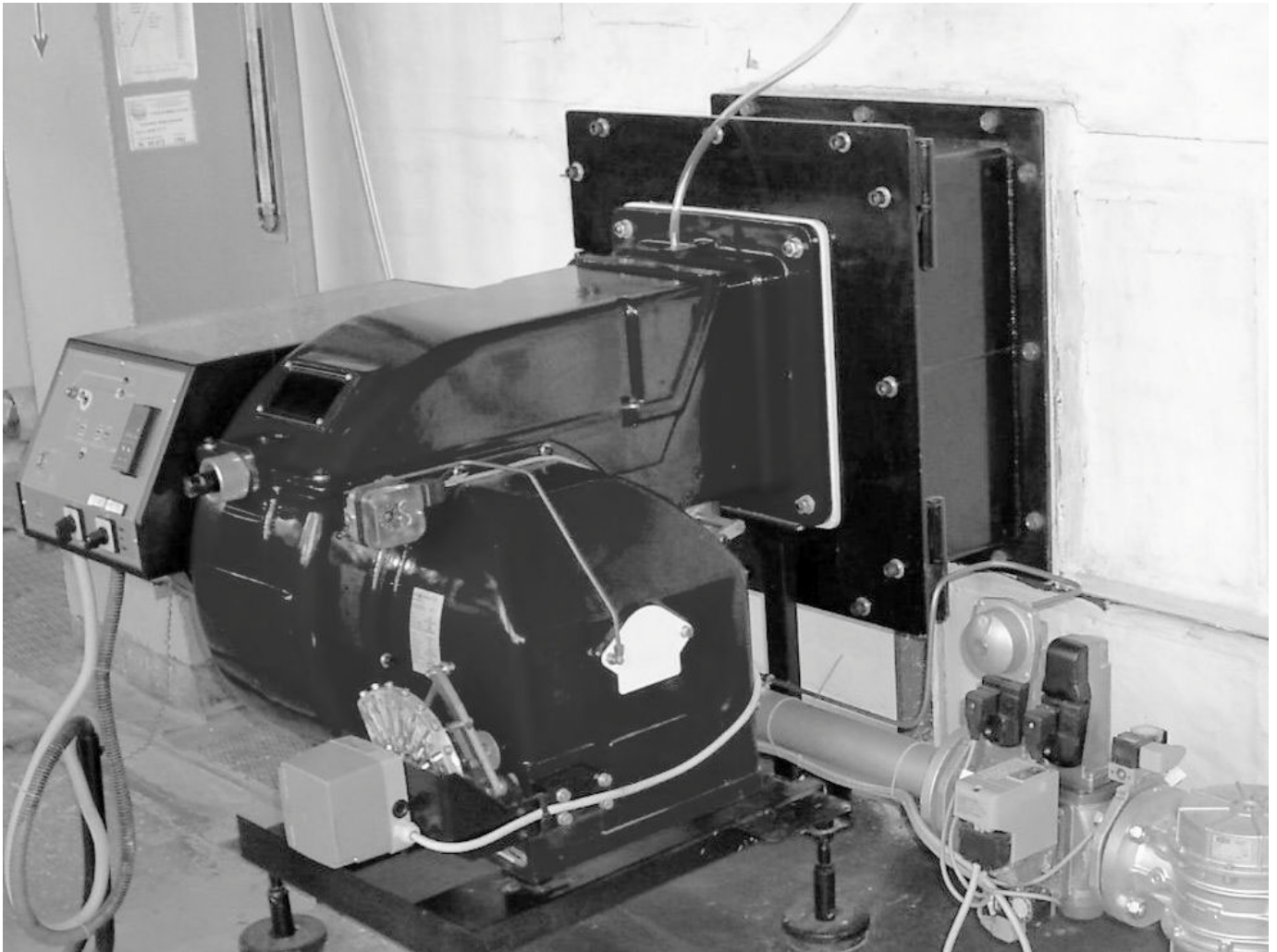


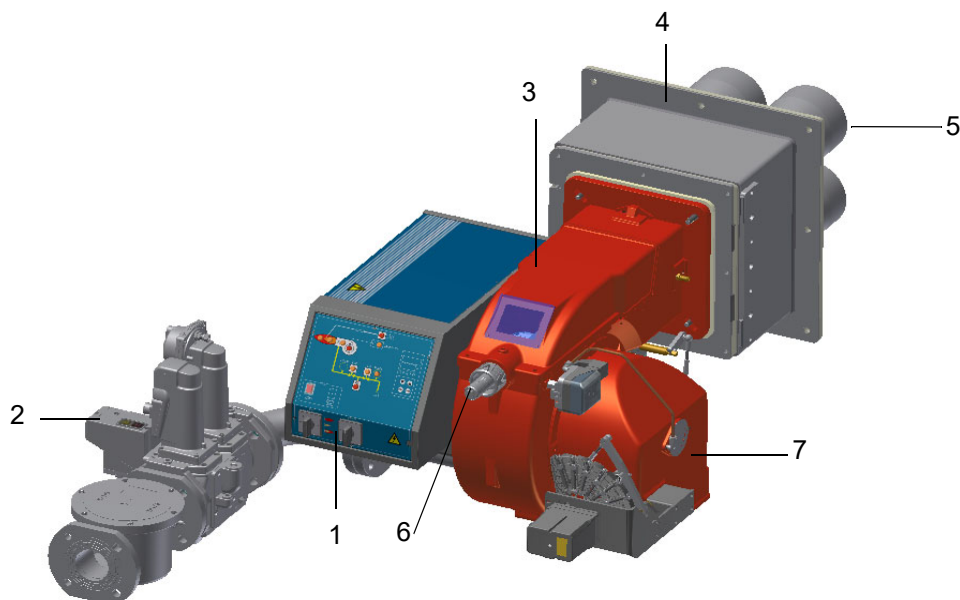
DANGER! The burner must be used only with the fuel specified in the burner data plate.

Type	--
Model	--
Year	--
S.Number	--
Output	--
Oil Flow	--
Fuel	--
Category	--
Gas Pressure	--
Viscosity	--
El.Supply	--
El.Consump.	--

PART I: SPECIFICATIONS

These burners are designed to be installed into boilers provided with very big combustion chamber but the tube nest very close to the burner stochole. The flame produced by this burner series is very short, but has the energy necessary to take up all the combustion chamber and then exchange this energy to the water, as to get very high efficiency. The construction and test of these burners are performed both in laboratories and directly on site, observing the peculiarities of these boilers: the need to operate in slight depression and to heat the boiler in low flame for a long time before exploiting the highest performance. The flame is divided into smaller flames performing the same output but distributing the energy uniformly without stressing the boiler structure. To complete this product range, the flame modulation is performed by a modulator with pressure probe connected to. These burners can be provided for all kinds of fuels and can be designed according to the customer requests. They are provided with all the safety requirements according to the Standards in force These burners can be installed in the newest microprocessor-controlled systems.





Note: the figure is indicative only

- 1 Control panel with startup switch
- 2 Gas valve group
- 3 Cover
- 4 Flange
- 5 Blast tube-Combustion head group
- 6 Head adjusting ring nut
- 7 Air tank

Gas operation: the gas coming from the supply line passes through filter, gas valves and pressure regulator. This one forces the pressure in the utilisation limits. The electric actuator, that moves proportionally the air damper and the gas butterfly valve, uses an adjusting cam with variable shape. This one allows the optimisation of the gas flue values, as to get an efficient combustion. The combustion head positioning determines the burner's output. The combustion head determines the energetic quality and the geometry of the flame. Fuel and comburent are routed into separated ways as far as the zone of flame generation (combustion chamber).

The control panel, placed on the burner's front side, shows each operating stage.

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

Type P72	Model	M-.	PR.	S.	RU.	VS.	8.	50
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1)BURNER TYPE	P60..VS - P72..VS - P73..VS							
(2)FUEL	M - Natural gas							
(3)OPERATION	PR - Progressive MD - Fully modulating							
(4)BLAST TUBE	S - standard							
(5)DESTINATION COUNTRY	* - see data plate							
(6)BURNER VERSION	VS - Short flame							
(7)EQUIPMENT	0 = 2 Gas valves 1 = 2 Gas valves + gas proving system 7 = 2 Gas valves+high gas pressure switch 8 = 2 Gas valves + gas proving system+high gas pressure switch							
(8)GAS CONNECTION	40 = Rp1 1/2 50 = Rp2 65 = DN65 80 = DN80							

Specifications

BURNER TYPE		P60..VS	P72..VS	P73..VS
Output	min. - max. kW	332 - 1100	300 - 1650	300 - 2150
Fuel		Natural gas		
Category		see next paragraph "Gas category"		
Gas rate	min - max (Stm ³ /h)	35 - 116	32 - 174.6	32 - 227,6
Gas pressure	min.- max. mbar	(see Note 2)		
Power supply		400V 3N ~ 50Hz		
Total power consumption	kW	2	2.7	3.5
Electric motor	kW	1.5	2.2	3
Protection		IP40		
Approx. weight	kg	235	290	305
Operation		Progressive Fully modulating		
Gas Train		40	-	-
Valves size/Gas connection		1"1/2 / Rp1"1/2	-	-
Gas Train		50	50	-
Valves size/Gas connection		2" / Rp2	2" / Rp2	-
Gas Train		65	65	65
Valves size/Gas connection		2"1/2 / DN65	2"1/2 / DN65	2"1/2 / DN65
Gas Train		80	80	80
Valves size/Gas connection		3" / DN80	3" / DN80	3" / DN80
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 (net calorific value H _i = 34.02 MJ/Stm ³).
Note2:	Maximum gas pressure = 360mbar (with Dungs MBDLE.. valves) = 500mbar (with Siemens VGD ..gas valves). Minimum gas pressure = see gas curves.

*** 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																				
I _{2H}	AT	ES	GR	SE	FI	IE	HU	IS	NO	CZ	DK	GB	IT	PT	CY	EE	LV	SI	MT	SK	BG
I _{2E}	LU	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I _{2E(R) B}	BE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I _{2L}	NL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I _{2ELL}	DE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I _{2Er}	FR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

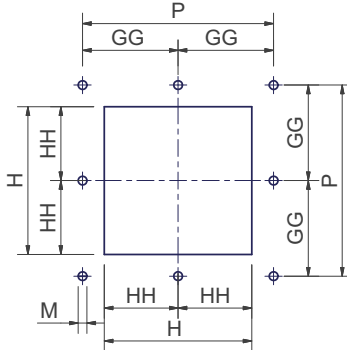
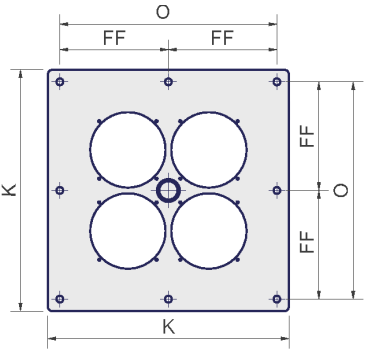
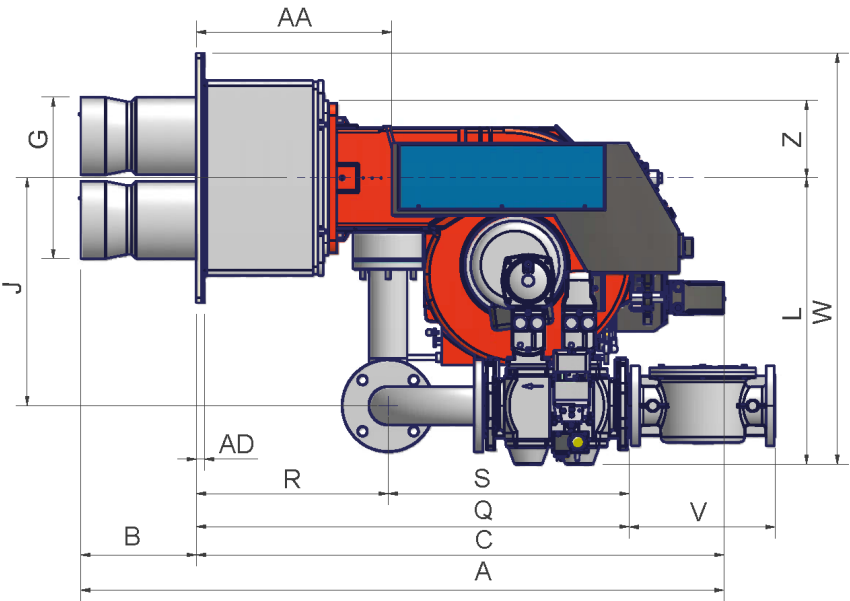
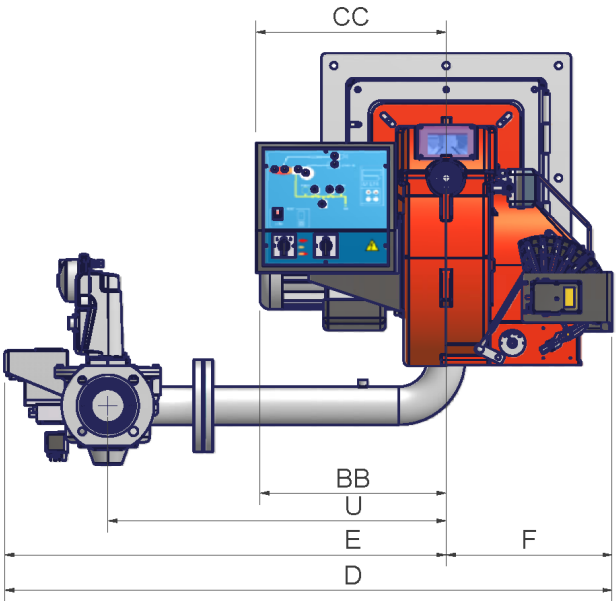
CAUTION: pay attention to the burner mounting; all the blast tubes must get into the combustion chamber, going further than the inner side of the boiler fitting.

Matching the burner to the boiler

To correctly match the burner to the boiler verify the necessary input and the pressure in combustion chamber are included in the burner performance curve; otherwise the choice of the burner must be revised consulting the burner manufacturer.

Overall dimensions (mm)

8

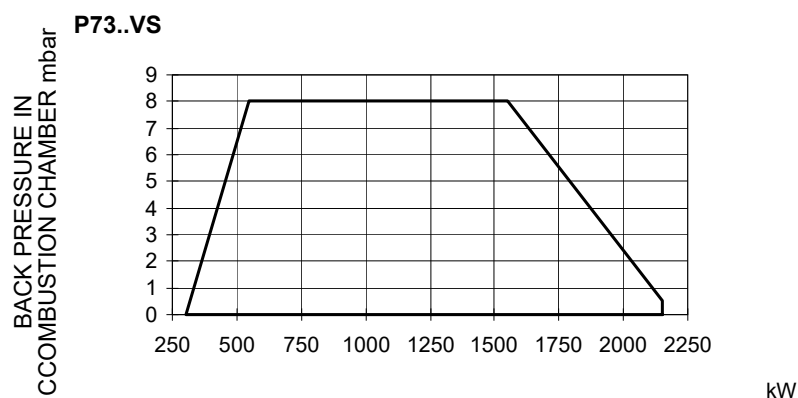
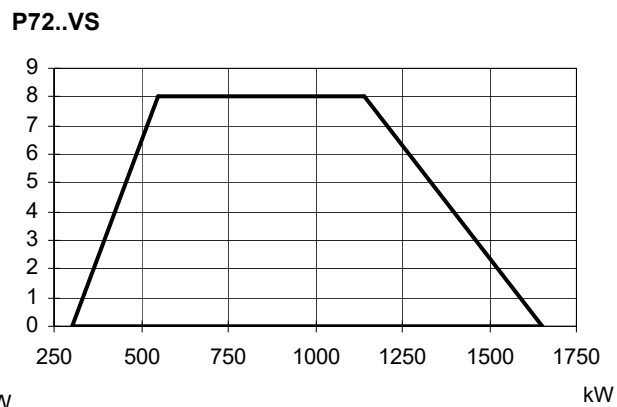
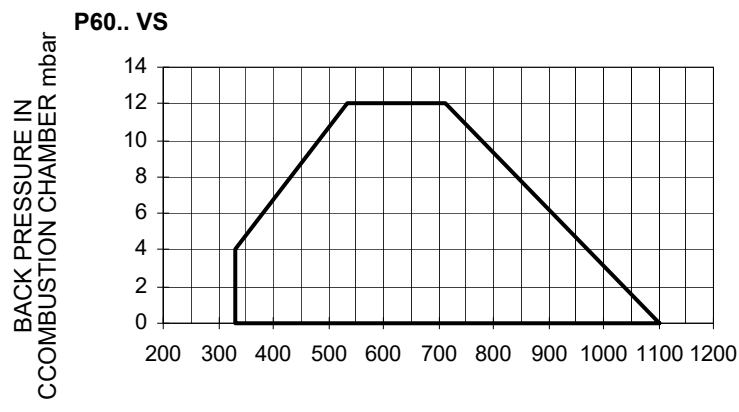


Boiler plate drilling

	DN	A	AA	AD	B	BB	C	CC	D	E	F	FF	G	GG	H	HH	J	K	L	M	O	P	Q	R	S	U	V*	W	Z
P60 VS - 1.40	40	1185	324	16	195	314	990	362	931	619	312	225	266	225	306	153	189	500	344	M12	450	450	693	366	327	444	x	594	120
P60 VS - 1.50	50	1185	324	16	195	314	990	362	1013	701	312	225	266	225	306	153	189	500	344	M12	450	450	701	366	335	526	x	594	120
P60 VS - 1.65	65	1185	324	16	195	314	990	362	1058	746	312	225	266	225	306	153	250	500	376	M12	450	450	803	366	437	539	290	626	120
P72 VS - 1.50	50	1338	392	16	281	373	1057	381	1026	694	332	225	312	225	364	182	208	500	376	M12	450	450	719	384	335	519	x	626	155
P72 VS - 1.65	65	1338	392	16	281	373	1057	381	1216	884	332	225	312	225	364	182	455	500	573	M12	450	450	867	384	483	678	290	823	155
P72 VS - 1.80	80	1338	392	16	281	373	1057	381	1251	919	332	225	312	225	364	182	455	500	587	M12	450	450	919	384	535	710	319	837	155
P73 VS - 1.50	50	1289	392	16	232	373	1057	381	1026	694	332	225	324	225	364	182	208	500	376	M12	450	450	719	384	335	519	x	626	155
P73 VS - 1.65	65	1289	392	16	232	373	1057	381	1216	884	332	225	324	225	364	182	455	500	573	M12	450	450	867	384	483	678	291	823	155
P73 VS - 1.80	80	1289	392	16	232	373	1057	381	1251	919	332	225	324	225	364	182	455	500	587	M12	450	450	919	384	535	710	319	837	155

*

Performance curves

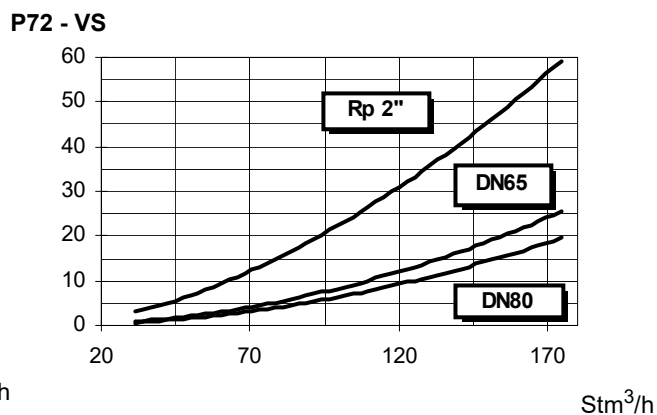
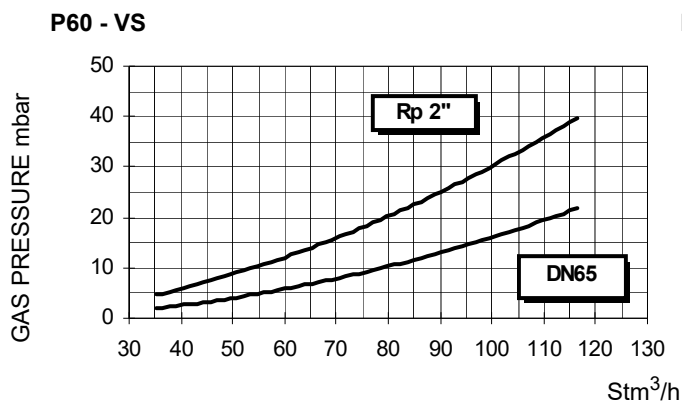


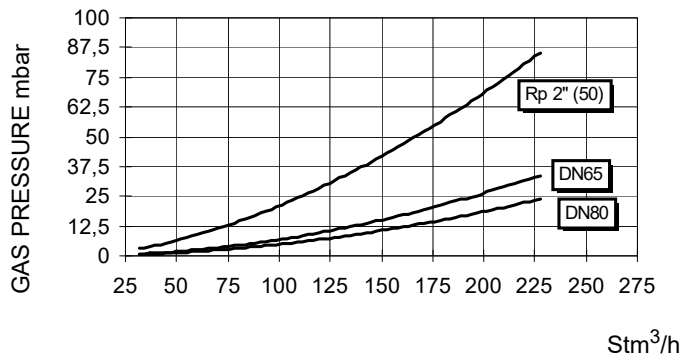
To get the input in kcal/h, multiply value in kW by 860.

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

Pressure in the network - gas rate curves



P73 - VS

Caution: the gas rate value is quoted on the x-axis, the related network pressure is quoted on the y-axis (pressure value in the combustion chamber is not included). To know the minimum pressure at the gas train inlet, necessary to get the requested gas rate, add the pressure value in the combustion chamber to the value read on the y-axis.

PART II: INSTALLATION

MOUNTING AND CONNECTING THE BURNER

Packing

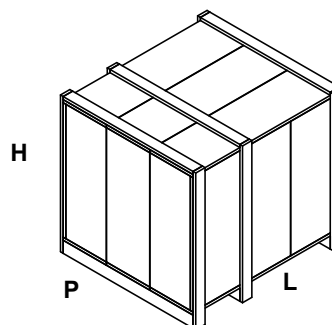
The burners are despatched wooden cages whose dimensions:

P60 VS: 1390 x 870 x 960 mm (L x P x H)

P72 VS - P73 VS: 1480 x 950 x 1110 mm (L x P x H)

Packing cases of this kind are affected by humidity and are not suitable for stacking. The following are placed in each packing case:

- burner with gas train detached;
- gasket to be inserted between the burner and the boiler;
- envelope containing this manual



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

Fitting the burner to the boiler

To perform the installation, proceed as follows:

- 1 fix 4 holes on the boiler's door, according to the burner's drilling plate described on paragraph "Overall dimensions";
- 2 place the gasket on the burner's flange;
- 3 install the burner into the boiler;
- 4 fix the burner to the stud bolt, by means of the fixing nuts, according to Fig. 1.
- 5 After fitting the burner to the boiler, ensure that the gap between the blast tube and the refractory lining is sealed with appropriate insulating material (ceramic fibre cord or refractory cement).

Key

- 1 Burner
- 2 Fixing nut
- 3 Washer
- 4 Sealing gasket
- 5 Stud bolt
- 6 Blast tube

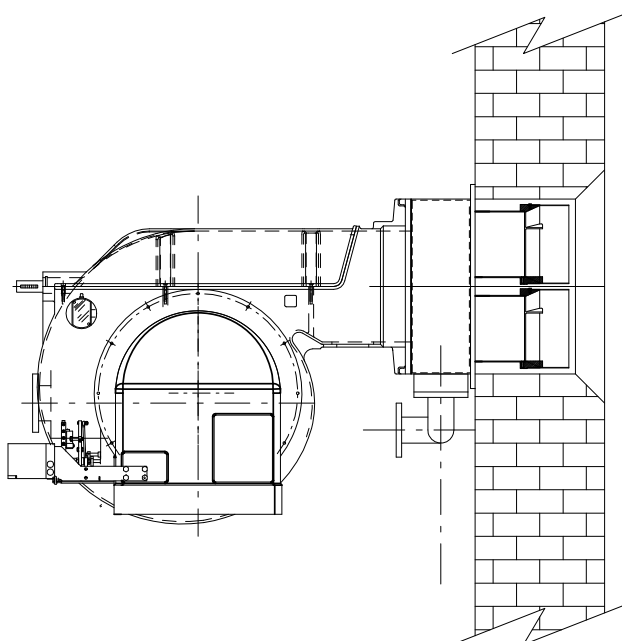
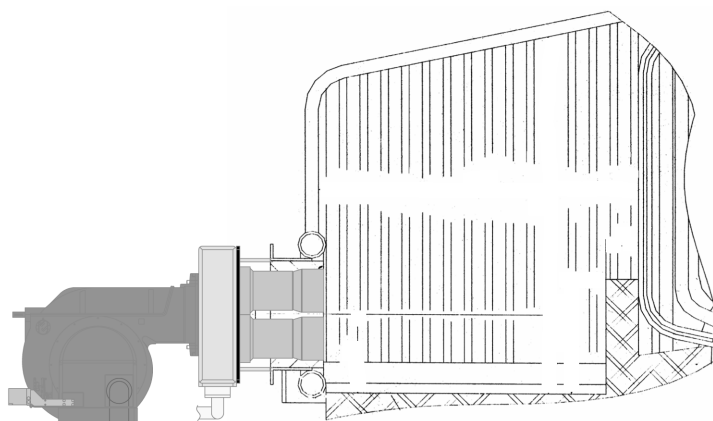


Fig. 1



CAUTION: Pay particular attention when mounting the burner, ensuring that the nozzles are fully inserted inside the wall of the boiler.

Electrical wiring

- !** **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.**
- !** **ATTENTION: before executing the electrical connections, pay attention to turn the plant's switch to OFF and be sure that the burner's main switch is in 0 position (OFF) too. Read carefully the chapter "WARNINGS", and the "Electrical connections" section.**
- !** **WARNING: The burner is provided with a jumper between terminals 6 and 7; in the event of connecting the high/ low flame thermostat remove this jumper before connecting the thermostat.**
- !** **IMPORTANT: while connecting electric supply wires to burner's teminal block be sure that ground wire should be longer than phase and neutral ones.**
- !** **WARNING: if the cable that connects the thermostats and the control box should be longer than 3 meters, insert a sectioning relay following the attached electrical wiring diagram.**

To execute the electrical connections, proceed as follows:

- 1 remove the cover from the electrical board, unscrewing the fixing screws;
- 2 execute the electrical connections to the supply terminal board as shown in the following diagrams,
- 3 check the direction of the fan motor (see next paragraph)
- 4 refit the panel cover.

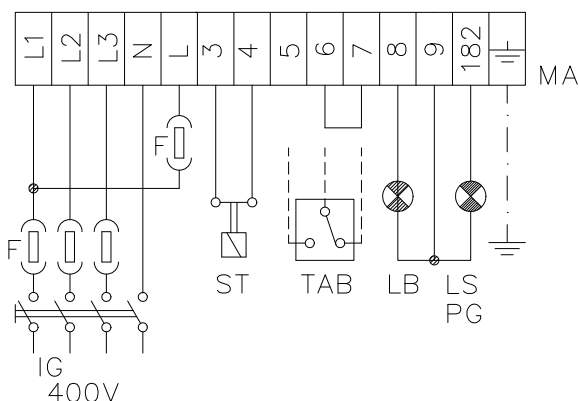


Fig. 2 - Progressive burners

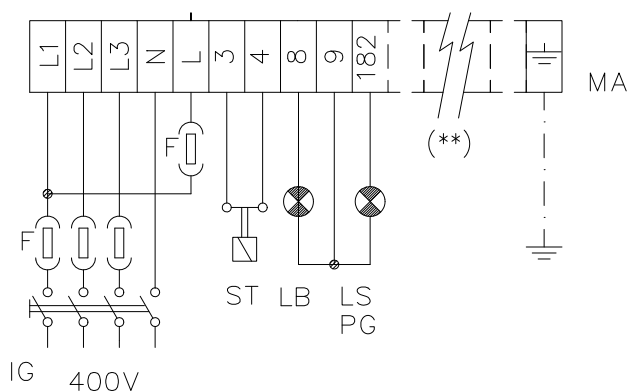


Fig. 3 - Modulating burners

(**) Probe connection for modulating burners (Fig. 4).

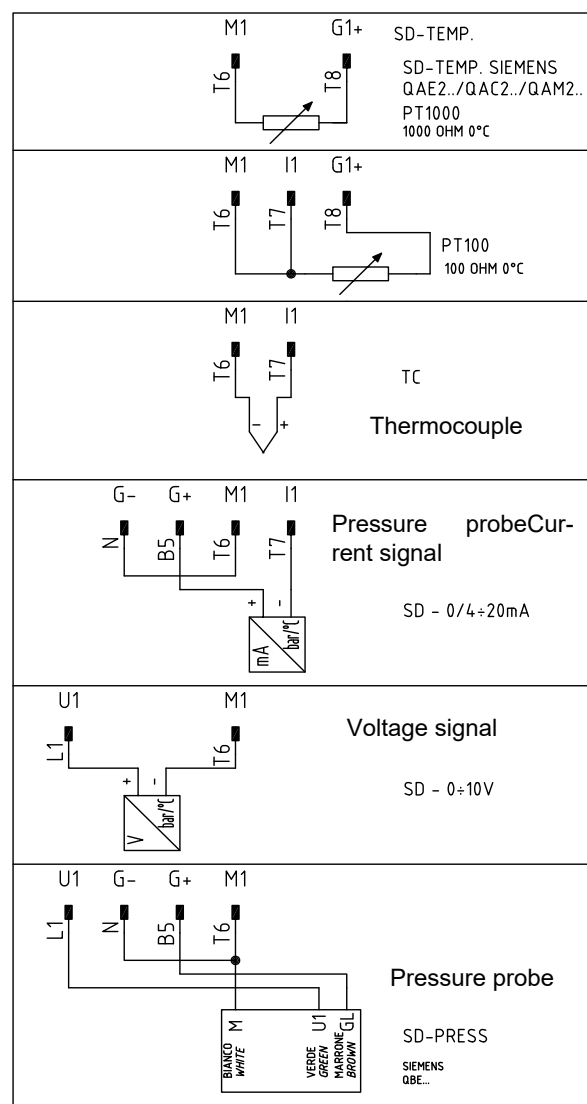


Fig. 4 - Probe connection

Rotation of fan motor

After completing the electrical connection of the burner, remember to check the rotation of the fan motor. The motor should rotate in an anti-clockwise direction looking at cooling fan. In the event of incorrect rotation reverse the three-phase supply and check again the rotation of the motor.



CAUTION: adjust the thermal cut-out according to the motor rated current value.

NOTE ON ELECTRICAL SUPPLY

If the power supply to the burner is 230V three-phase or 230V phase-phase (without a neutral), with the Siemens LGB2... or LME2... flame control device, between the terminal 2 on the board and the earth terminal, an RC Siemens RC466890660 filter must be inserted

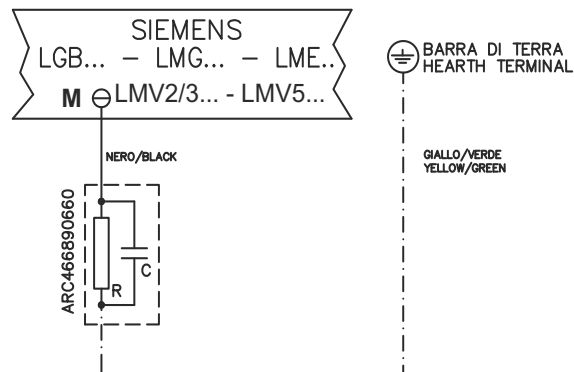
Key

C - Capacitor (22nF/250V)

LGB - LME - Siemens flame control device

R - Resistor (1Mohm)

RC466890660 - RC Siemens filter

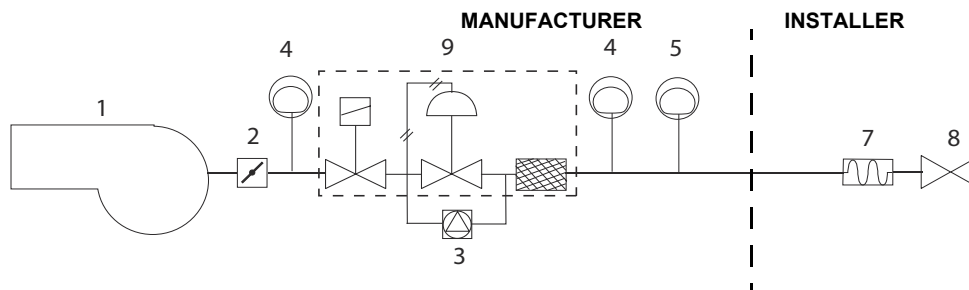


GAS TRAIN CONNECTIONS

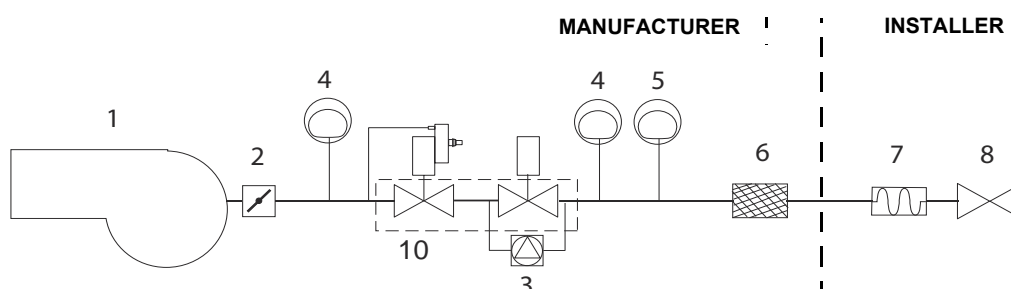
The diagrams show the components of the gas train included in the delivery and which must be fitted by the installer. The diagrams are in compliance with the current laws.

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.

Gas train with valves group MB-DLE (2 valves + gas filter + pressure governor + pressure switch) + leakage control VPS504



Gas train with valves group VGD 20/40.. with built-in gas pressure governor + VPS504 gas proving system



Key

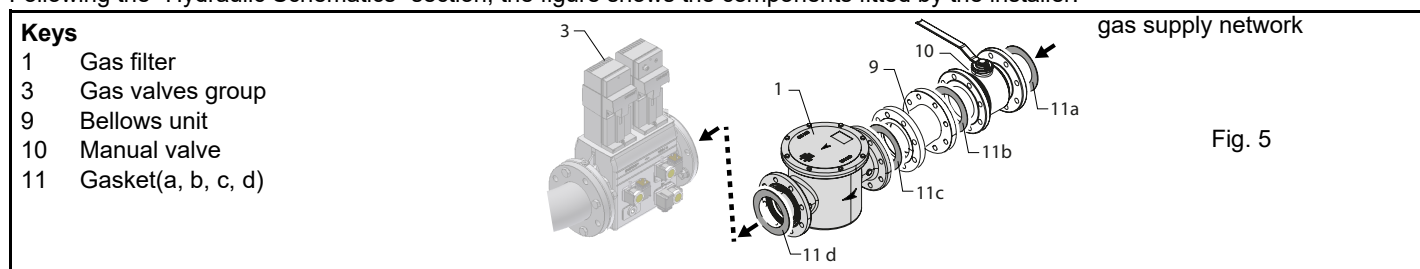
- 1 Burner
- 2 Butterfly valve
- 3 Gas proving system
- 4 Maximum gas pressure switch (option)
- 5 Minimum gas pressure switch
- 6 Gas filter
- 7 Bellow joint
- 8 Manual cutoff valve
- 9 MB-DLE Valves group
- 10 VGD Valves group

*Note: the maximum gas pressure switch can be mounted either upstream or downstream the gas valve but upstream the butterfly gas valve (see item no.4 in the scheme above).

GAS TRAIN CONNECTIONS

- WARNING:** before executing the connections to the gas pipe network, be sure that the manual cutoff valves are closed.
- 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).
- ATTENTION:** once the gas train is mounted, the gas proving test must be performed, according to the procedure set by laws in force.
- CAUTION:** The direction of gas flow must follow the arrow on the body of the components mounted on the gas ramp (valves, filters, gaskets...).
- CAUTION:** Remove caps and covers from units before installation.
- NOTE:** the bellows unit, the manual cutoff valve and the gaskets are not part of the standard supply

Following the "Hydraulic Schematics" section, the figure shows the components fitted by the installer.



Procedure to install the double gas valve unit: 2 flanges are required to mount the gas valve assemblies.

- Valves up to 2" are supplied with special threaded flanges.
- Valves of DN65 and above are supplied with PN16 flanges.

Gas Filter (if provided)


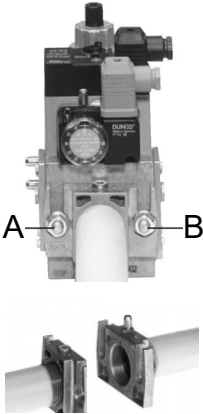
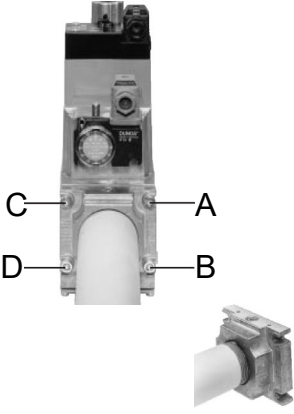
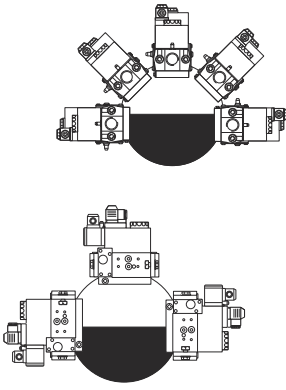
The gas filters remove the dust particles that are present in the gas, and prevent the elements at risk (e.g.: burner valves, counters and regulators) from becoming rapidly blocked. The filter is normally installed upstream from all the control and on-off devices.

- ATTENTION:** it is recommended to install the filter with gas flow parallel to the floor in order to prevent dust fall on the safety valve during maintenance operation.

Once the train is installed, connect the gas valves group and pressure switches plugs.

MultiBloc MB-DLE - Assembling the gas train**Mounting**

- 1 Mount flange onto tube lines: use appropriate sealing agent
- 2 Insert MB-DLE: note position of O rings
- 3 Remove MultiBloc between the threaded flanges
- 4 After installation, perform leakage and functional test
- 5 Disassembly in reverse order

	MB-DLE 405.. 412	MB-DLE 415.. 420	MOUNTING POSITIONS
 <p>(O-Ring)</p>			
Fig. 6	Fig. 7	Fig. 8	Fig. 9

DUNGS MBE - Components and position of pressure switches

DUNGS MBE..
Mounting positions

On equipment versions Facile VD-R must be installed upstream valve

1 PGMIN minimum gas pressure switch

2 PGMIN minimum gas pressure switch (alternative to 1)

3 PGCP leakage control gas pressure switch

4 PGMAX maximum gas pressure switch

5 Actuator with integrated pressure stabiliser

6 On-Off actuator

7 Valve body (Threaded)

8 Valve body (Flange)

PS pressure sensor connection to VD-R actuator and gas train

Attention: In the case of the MBE... valve, a pressure limit switch downstream of the safety valve is mandatory.

Pressure taps MultiBloc MBE

1, 2, 3, 5 Sealing plug G1/8 ISO 228

4 G3/4 for system accessories

6, 7 Sealing plug G1/4 ISO 228

8 For version VB...L only: connection for vent line

VB-2½L=1¼"NPT

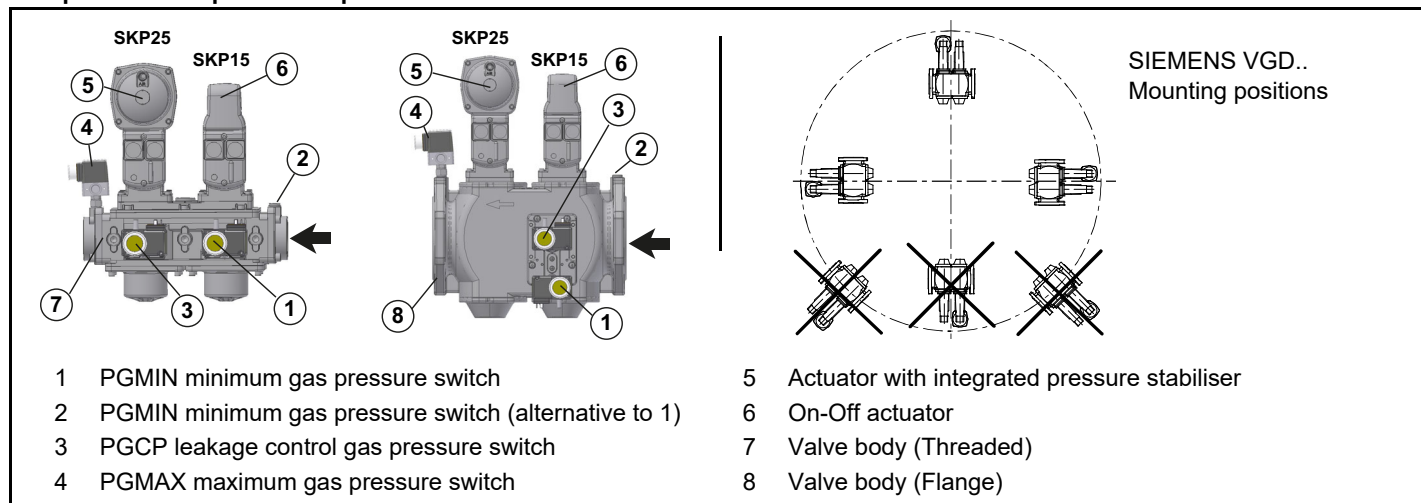
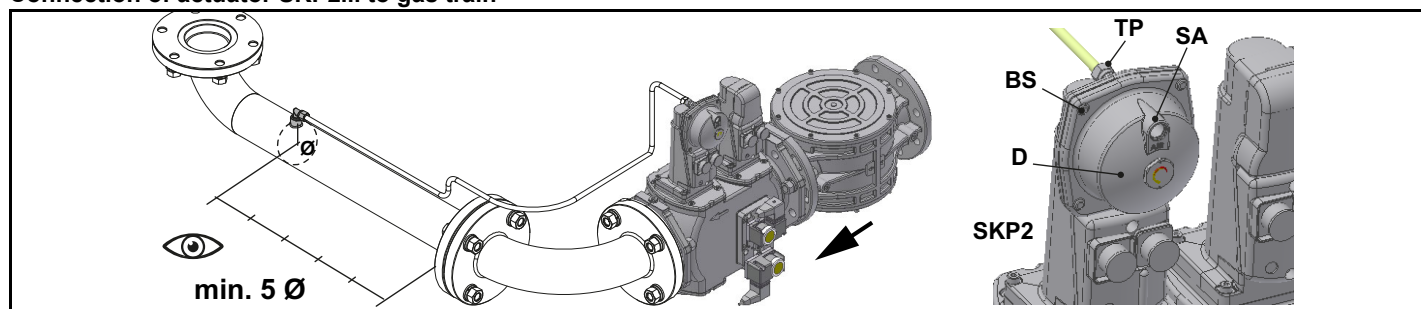
VB-3L=1½"NPT

VB-4L=2"NPT

VB-5L=2"NPT

1, 2, 3, 4 Sealing plug G1/8 ISO 228

5 Locking screw For version VB-2L only: connection for vent line NPT 1

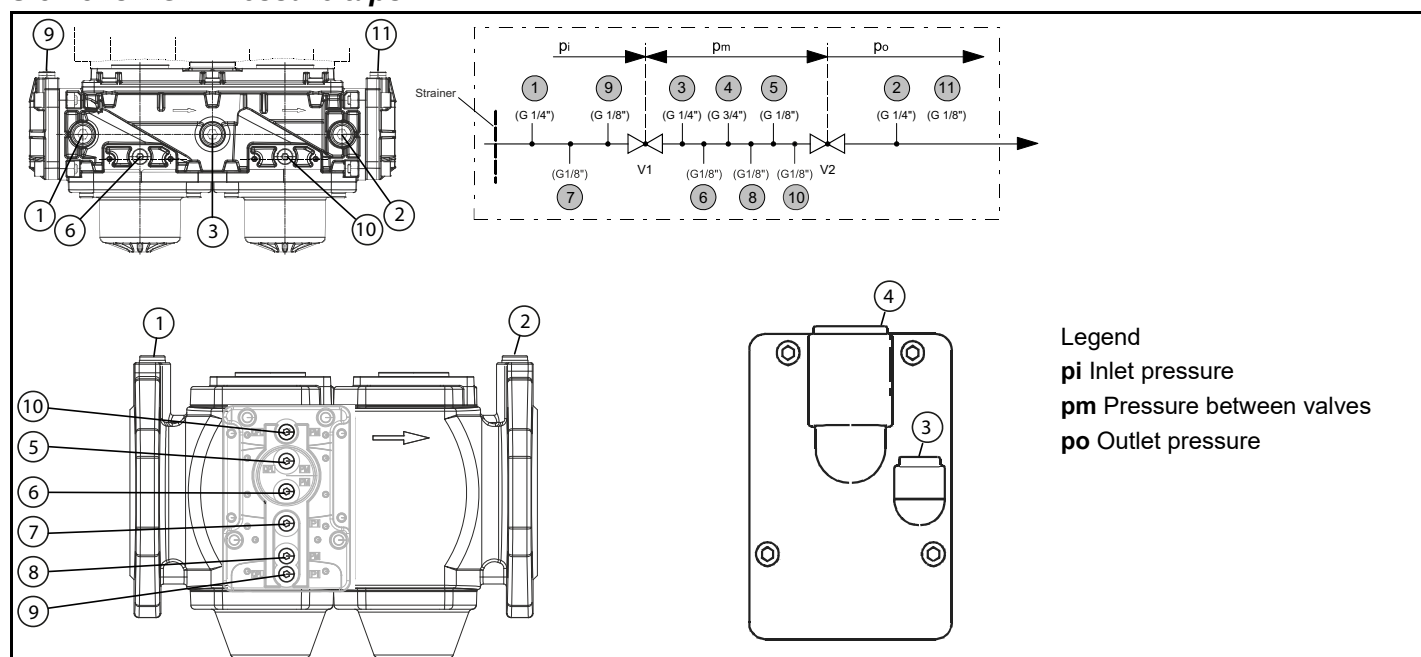
Siemens VGD20.. e VGD40..**Components and position of pressure switches****Connection of actuator SKP2... to gas train****Siemens SKP2.. (pressure governor)**

- Connect the reference gas pipe (**TP** in figure; 8mm-external size pipe supplied loose), to the gas pressure nipples placed on the gas pipe, downstream the gas valves: gas pressure must be measured at a distance that must be at least 5 times the pipe size.
- Leave the blowhole free (**SA** in figure). Should the spring fitted not permit satisfactory regulation, ask one of our service centres for a suitable replacement.

- D: pressure adjustment spring seat



WARNING: removing the four screws BS causes the device to be unserviceable!

Siemens VGD Pressure taps

Gas Proving System VPS504

The VPS504 checks the operation of the seal of the gas shut off valves. This check, carried out as soon as the boiler thermostat gives a start signal to the burner, creates, by means of the diaphragm pump inside it, a pressure in the test space of 20 mbar higher than the supply pressure. To install the DUNGS VPS504 gas proving system on the MD-DLE valves group, proceed as follows:

- 1 turn off gas supply.;
- 2 Switch off power supply.
- 3 remove the Multibloc screw plugs (Fig. 10-A);
- 4 insert sealing rings (10,5 x 2,25) into VPS 504 (Fig. 10-B - Fig. 11)
- 5 Torque screws 3, 4, 5, 6 (M4 x16) Fig. 11-C

Only use screws with metric thread on reassembly (modification, repair).

- 6 On completion of work, perform a leak and functional test.

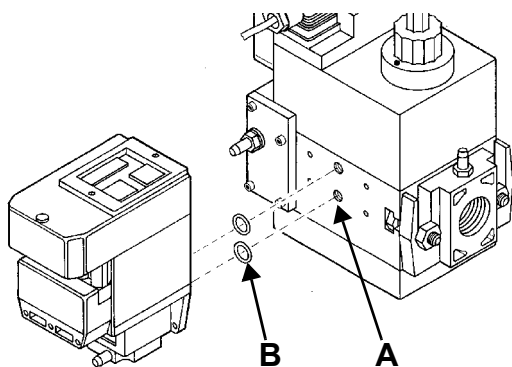


Fig. 10

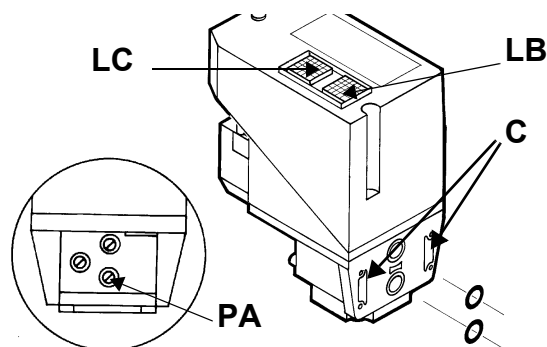


Fig. 11

When wishing to monitor the test, install a pressure gauge ranged to that of the pressure supply point **PA** (Fig. 11). If the test cycle is satisfactory, after a few seconds the consent light **LC** (yellow) comes on. In the opposite case the lockout light **LB** (red) comes on. To restart it is necessary to reset the appliance by pressing the illuminated pushbutton **LB**.

Once the train is installed, connect electrically all its elements: gas valves group, pressure switches, gas proving system.



ATTENTION: once the gas train is mounted according to the diagram on Fig. 8, the gas proving test must be performed, according to the procedure set by the laws in force.

ADJUSTMENTS



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 IMMEDIATELY INVALIDATE!



IMPORTANT! the combustion air excess must be adjusted according to the in the following chart:

Recommended combustion parameters		
Fuel	Recommended (%) CO ₂	Recommended (%) O ₂
Natural gas	9 ÷ 10	3 ÷ 4.8

Combustion head gas pressure curves depending on the flow rate

Curves are referred to pressure = 0mbar in the combustion head!

The curves referred to the gas pressure in the combustion head, depending on the gas flow rate, are referred to the burner properly adjusted (percentage of residual O₂ in the flues as shown in the "Recommended combustion values" table and CO in the standard limits). During this stage, the combustion head, the gas butterfly valve and the actuator are at the maximum opening. Refer to Fig. 12, showing the correct way to measure the gas pressure, considering the values of pressure in combustion chamber, surveyed by means of the pressure gauge or taken from the boiler's Technical specifications.

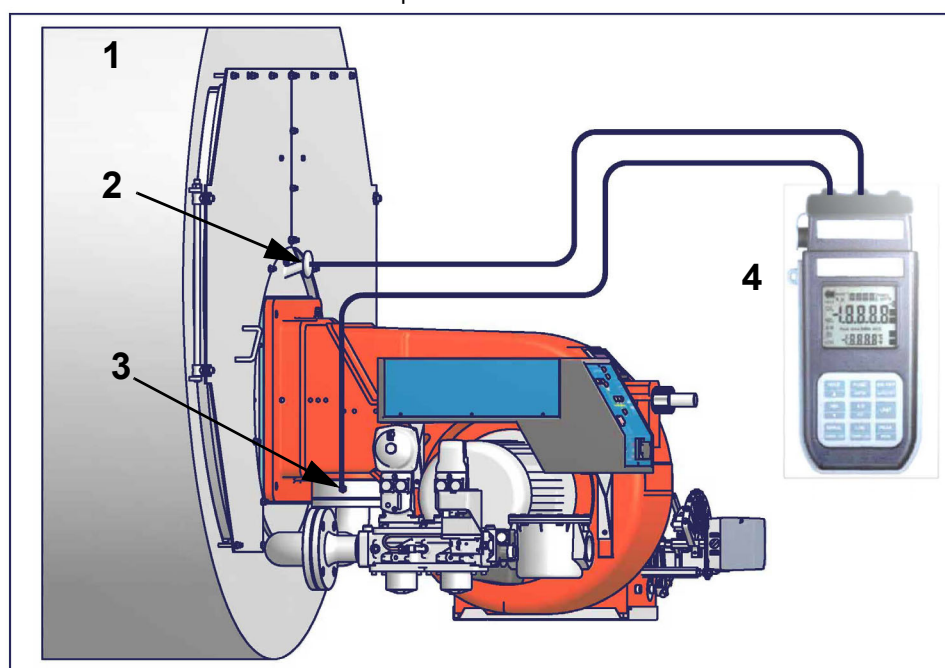


Fig. 12

Key

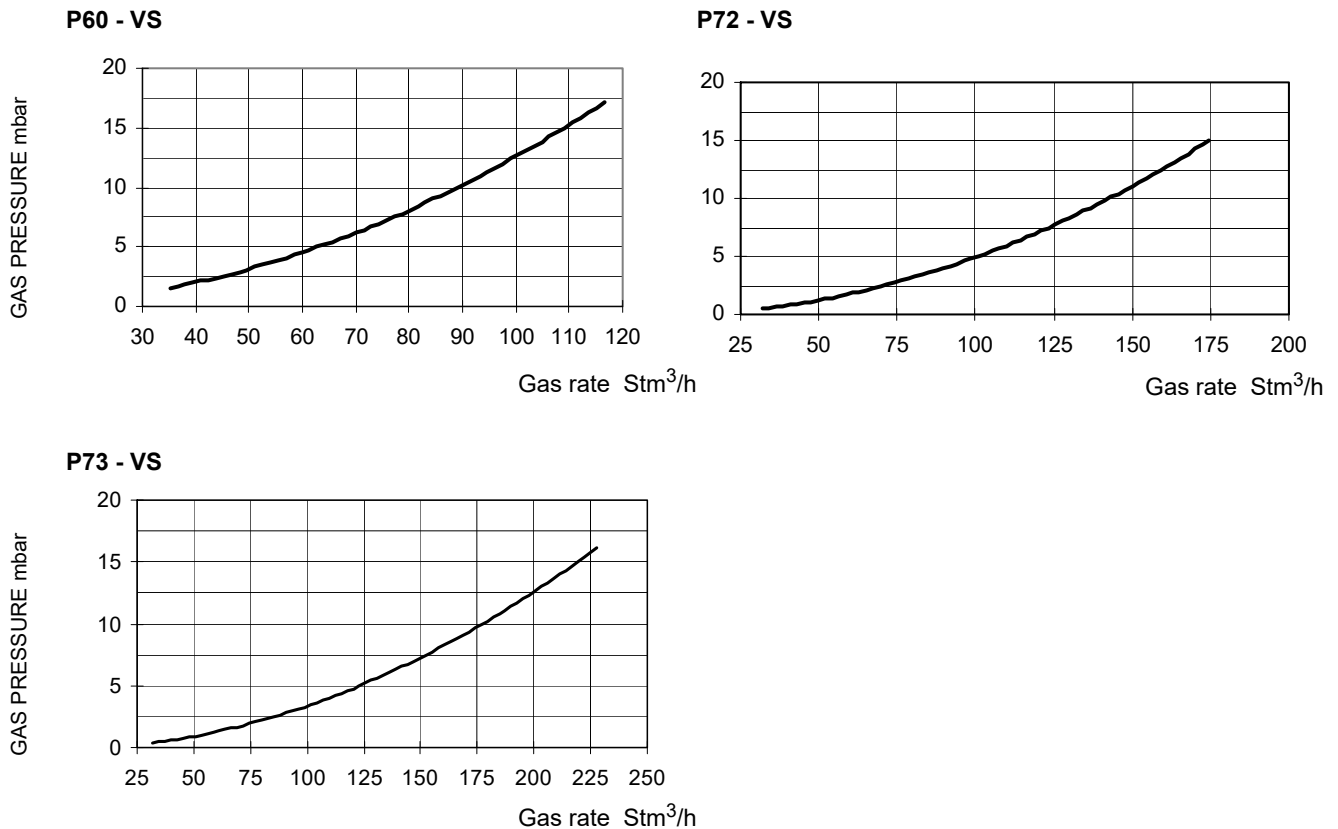
- 1 Generator
- 2 Pressure outlet on the combustion chamber
- 3 Gas pressure outlet on the butterfly valve
- 4 Differential pressure gauge

Measuring the gas pressure in the combustion head

In order to measure the pressure in the combustion head, insert the pressure gauge probes: one into the combustion chamber's pressure outlet to get the pressure in the combustion chamber and the other one into the butterfly valve's pressure outlet of the burner. On the basis of the measured differential pressure, it is possible to get the maximum flow rate: in the pressure - rate curves (showed on the next paragraph), it is easy to find out the burner's output in Stm³/h (quoted on the x axis) from the pressure measured in the combustion head (quoted on the y axis). The data obtained must be considered when adjusting the gas flow rate.

NOTE: THE PRESSURE-RATE CURVES ARE GIVEN AS INFORMATION ONLY; FOR A PROPER SETTING OF THE GAS RATE, PLEASE REFER TO THE GAS METER READING.

Pressure - rate in combustion head curves



Gas Filter

The gas filters remove the dust particles that are present in the gas, and prevent the elements at risk (e.g.: burners, counters and regulators) from becoming rapidly blocked. The filter is normally installed upstream from all the control and on-off devices.

VPS504 Gas proving system

The VPS504 checks the operation of the seal of the gas shut off valves. This check is carried out as soon as the boiler thermostat gives a start signal to the burner, creating, by means of the diaphragm pump inside it, a pressure in the test space of 20 mbar higher than the supply pressure.

When wishing to monitor the test, install a pressure gauge ranged to that of the pressure supply point PA.

If the test cycle is satisfactory, after a few seconds the consent light LC (yellow) comes on. In the opposite case the lockout light LB (red) comes on.

To restart it is necessary to reset the appliance by pressing the illuminated pushbutton LB.

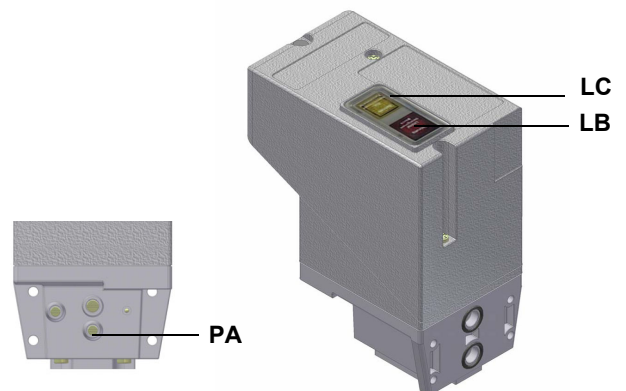


Fig. 13

Adjustments - brief description

Adjust the air and gas flow rates at the maximum output ("high flame") first, by means of the air damper and the adjusting cam respectively.

- Check that the combustion parameters are in the suggested limits.
- Check the flow rate measuring it on the counter or, if it was not possible, verifying the combustion head pressure by means of a differential pressure gauge, as described on par. "Measuring the gas pressure in the combustion head" on page 11.
- Then, adjust the combustion values corresponding to the points between maximum and minimum: set the shape of the adjusting cam foil. The adjusting cam sets the air/gas ratio in those points, regulating the opening-closing of the throttle gas valve.
- Set, now, the low flame output, acting on the low flame microswitch of the actuator in order to avoid the low flame output increasing too much or that the flues temperature gets too low to cause condensation in the chimney.

Air and Gas Flow Rate Settings

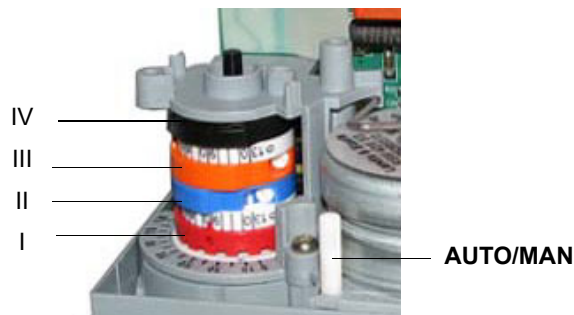
DUNGS MB-DLE gas valves group: Before starting the burner up, adjust the valves group slow opening: to set the slow opening

remove cover **T**, reverse it upside down and use it as a tool to rotate screw **VR**. Decrease the ignition flow rate by screwing, increase it by unscrewing. Do not use a screwdriver on the screw **VR**!

Note: the screw **VS** must be removed only in case of replacement of the coil (see picture on page 24).

- 1 turn the burner on by means of the burner switch (placed on the burner control panel - see Dèñ. 59)
- 2 check the fan motor rotation (see pag. 12).
- 3 Before starting the burner up, drive the high flame actuator microswitch matching the low flame one (in order to let the burner operates at the lowest output) to safely achieve the high flame stage.

Siemens SQN72



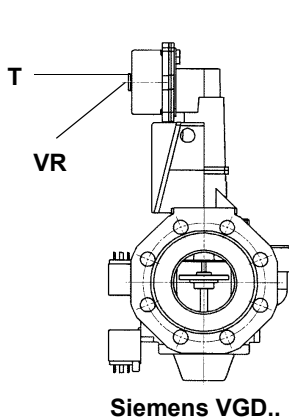
	Siemens SQN72
High flame position (set to 90°)	I (red)
Low flame and ignition position	III (orange)
Stand-by position (set to 0°)	II (blue)
Not used	IV (black)

In the servocontrol BERGER STA6B3.41 e STA12B3.41, the manual air damper control is not provided.

- 4 Start the burner up by means of the thermostat series and wait until the pre-purge time comes to an end and that the burner starts up;
- 5 drive the burner to high flame stage, by means of the thermostat **TAB** (high/low flame thermostat - see Wiring diagrams), as far as fully-modulating burners, see related paragraph.
- 6 Then move progressively the microswitch to higher values until it reaches the high flame position; always check the combustion values and eventually adjusting the gas by means of the valves group stabiliser.
- 7 go on adjusting air and gas flow rates: check, continuously, the flue gas analysis, as to avoid combustion with little air; dose the air according to the gas flow rate change following the steps quoted below;
- 8 acting on the pressure stabiliser of the valves group, adjust the **gas flow rate in the high flame stage** as to meet the values requested by the boiler/utilisation:

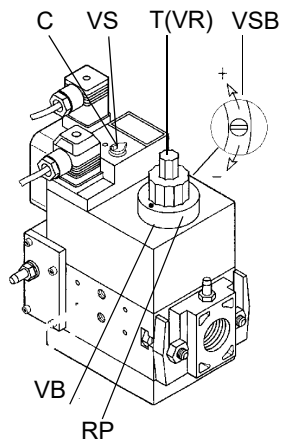
- **Multibloc MB-DLE**: the valve is adjusted by means of the **RP** regulator after slackening the locking screw **VB** by a number of turns. By unscrewing the regulator **RP** the valve opens, screwing the valve closes. The pressure stabilizer is adjusted by operating the screw **VS** located under the cover **C**. By screwing down the pressure is increased and by unscrewing it is reduced. **Note**: the screw **VS** must be removed only in case of replacement of the coil.

- **Siemens VGD valves group**: remove cap **T** and act on the **VR** adjusting screw to increase or decrease the pressure and consequently the gas rate; screwing **VR** the rate increases, unscrewing it decreases (see next figure):



Siemens VGD..

Fig. 14



Dungs Multibloc MB-DLE

Fig. 15

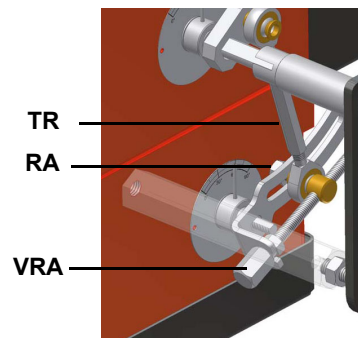


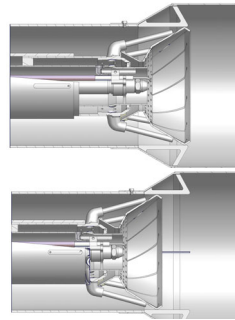
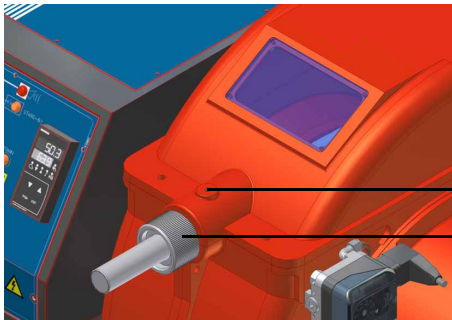
Fig. 16

- 9 To adjust the **air flow rate in the high flame stage**, loose the **RA** nut and screw **VRA** as to get the desired air flow rate: moving

the rod **TR** towards the air damper shaft, the air damper opens and consequently the air flow rate increases, moving it far from the shaft the air damper closes and the air flow rate decreases.

Note: once the procedure is performed, be sure that the blocking nut **RA** is fastened. Do not change the position of the air damper rods.

- 10 Only if necessary, change the combustion head position: to let the burner operate at a lower output, loose the **VB** screw and move progressively back the combustion head towards the MIN position, by turning clockwise the **VRT** ring nut. Fasten **VB** screw when the adjustment is accomplished.

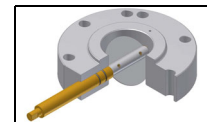
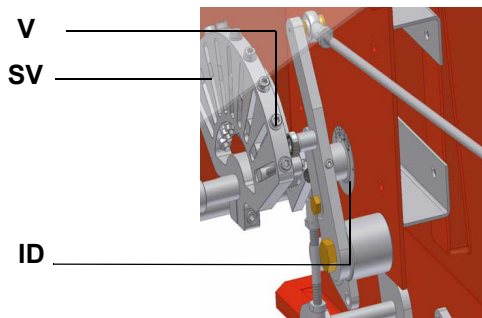
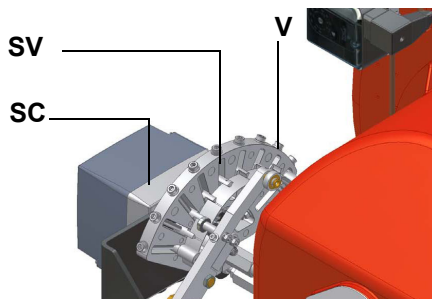


"MAX" head position

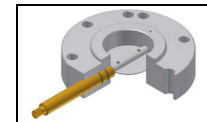
"MIN" head position

Attention! if it is necessary to change the head position, repeat the air and gas adjustments described above.

- 11 the air and gas rate are now adjusted at the maximum power stage, go on with the point to point adjustment on the **SV** adjusting cam as to reach the minimum output point.



Gas throttle valve open



Gas throttle valve closed

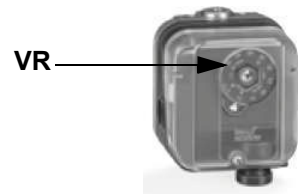
- 12 as for the point-to-point regulation, move the gas low flame microswitch (cam III) a little lower than the maximum position (90°);
- 13 set the **TAB** thermostat to the minimum in order that the actuator moves progressively towards the low flame position;
- 14 move cam ST1 to the minimum to move the actuator towards the low flame until the two bearings find the adjusting screw that refers to the lower position: screw **V** to increase the rate, unscrew to decrease.
- 15 Move again cam ST1 towards the minimum to meet the next screw on the adjusting cam and repeat the previous step; go on this way as to reach the desired low flame point.

Now adjust the pressure switches (see next par.).

Calibration of air and gas pressure switches

The **air pressure switch** locks the control box if the air pressure is not the one requested. If it happens, unlock the burner by means of the control box unlock pushbutton, placed on the burner control panel.

The **gas pressure switches** check the pressure to avoid the burner operate when the pressure value is not in the requested pressure range.



Calibration of air pressure switch

To calibrate the air pressure switch, proceed as follows:

- Remove the transparent plastic cap.
- Once air and fuel setting have been accomplished, startup the burner.
- During the pre-purge phase of the operation, turn slowly the adjusting ring nut **VR** in the clockwise direction (to increase the adjusting pressure) until the burner lockout, then read the value on the pressure switch scale and set it to a value reduced by 15%.
- Repeat the ignition cycle of the burner and check it runs properly.
- Refit the transparent plastic cover on the pressure switch.

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.

Adjusting the maximum gas pressure switch (when provided)

To calibrate the maximum pressure switch, proceed as follows according to its mounting position:

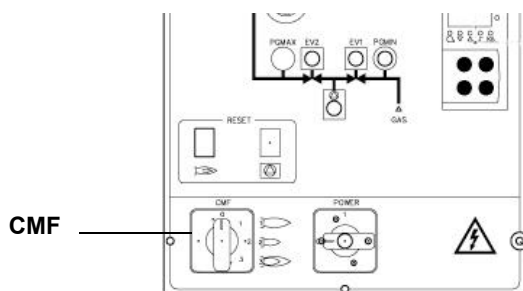
- 1 remove the pressure switch plastic cover;
- 2 if the maximum pressure switch is mounted upstream the gas valves: measure the gas pressure in the network, when flame is off; by means of the adjusting ring nut **VR**, set the value read, increased by the 30%.
- 3 if the maximum pressure switch is mounted downstream the "gas governor-gas valves" group and upstream the butterfly valve: light the burner, adjust it according to the procedure in the previous paragraph. Then, measure the gas pressure at the operating flow rate, downstream the "gas governor-gas valves" group and upstream the butterfly valve; by means of the adjusting ring nut **VR**, set the value read on step 2, increased by the 30%;
- 4 replace the plastic cover.

Fully modulating burners

To adjust the fully-modulating burners, use the **CMF** switch on the burner control panel (see next picture), instead of the **TAB** thermostat as described on the previous paragraphs about the progressive burners. Go on adjusting the burner as described before, paying attention to use the CMF switch instead of **TAB**.

The **CMF** position sets the operating stages: to drive the burner to the high-flame stage, set CMF=1; to drive it to the low-flame stage, set CMF=2.

To move the adjusting cam set CMF=1 or 2 and then CMF=0.



- CMF = 0 stop at the current position
- CMF = 1 high flame operation
- CMF = 2 low flame operation
- CMF = 3 automatic operation

PART II: OPERATION

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



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". Read carefully the "WARNINGS" chapter in this manual.

- Turn to the ON position the mains switch A on the burner front panel.
- Check the flame control box is not in the lockout position (light B on), if necessary reset it by means of the pushbutton C (reset);
- Check that the control thermostats or pressure switches enable the burner to operate.
- Check the gas supply pressure is sufficient (light D on), if necessary, adjust the pressure switches.

Only burners provided with the gas proving system: the check cycle of the gas proving system starts; the end of this check is signalled by the light of the lamp on the device. When the valves check is finished, the startup cycle of the burner begins. In the case of a leak in a valve, the gas proving system locks and the lamp E lights. To reset the device press the device pushbutton.

- At the beginning of the start-up cycle, the servocontrol brings the air damper to the fully open position and then starts the fan motor, thus initiating the prepurge phase. During the prepurge phase, the complete opening of the air damper is signalled by the illumination of light F on the front panel.
- At the end of pre-priming, the air damper moves to the ignition position, the ignition transformer is switched on (indicated by warning light H on the front panel) and, after a few seconds, the two gas valves EV1 and EV2 are energised (warning lights L and I on the front panel).
- A few seconds after the gas valves open, the ignition transformer is excluded from the circuit and control indicator H goes out:

A few seconds after the gas valves open, the ignition transformer is switched off. The burner is ignited in low flame, after a few seconds two-stage operation begins and the burner increases or decreases capacity, directly controlled by the external thermostat (in the progressive version) or the modulator (P in Fig. 25, only on modulating burners).

For further information on the modulating controller, please refer to the modulating controller manual.

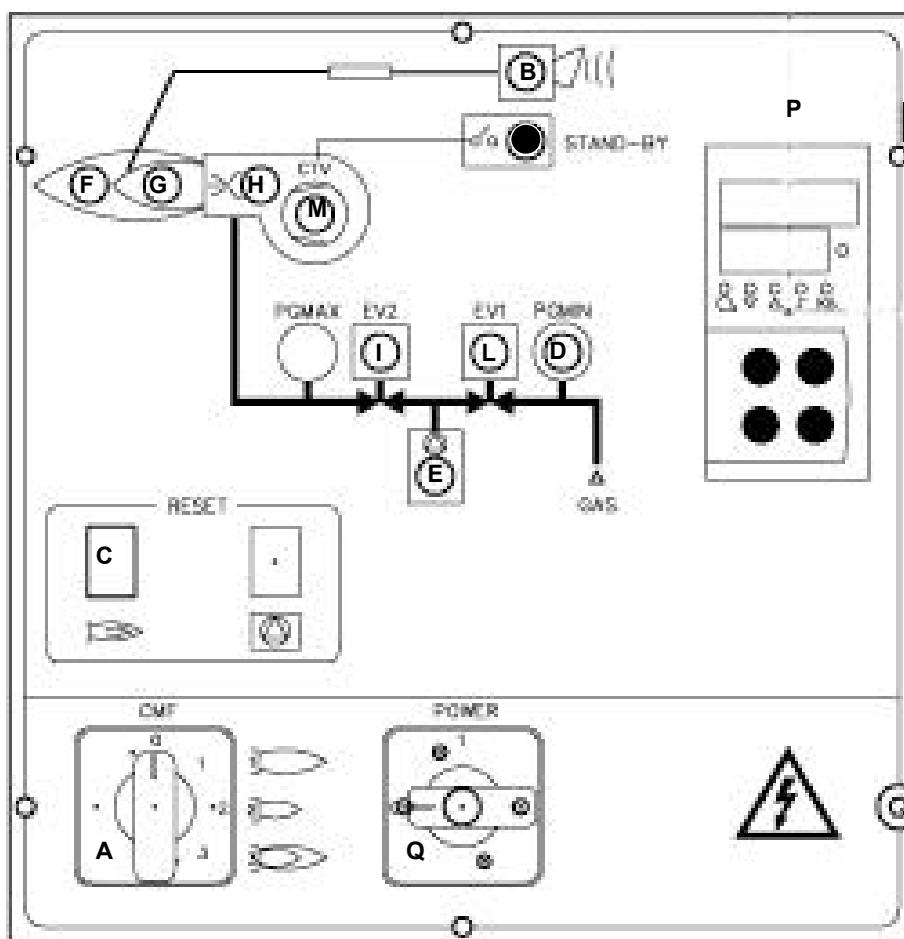
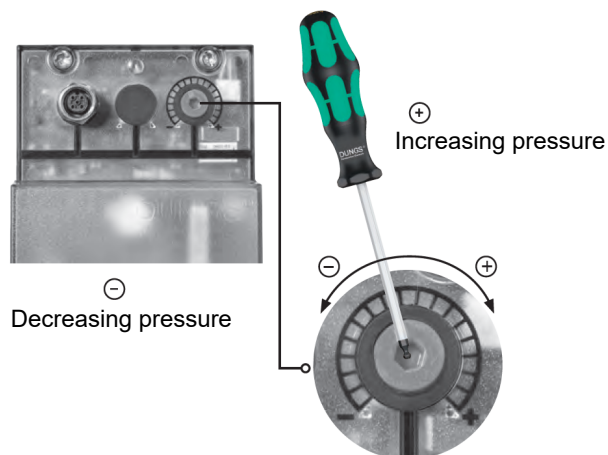


Fig. 17 - Control panel with startup switch

Legend

- A Main switch on - off
- B Lock indicator light
- C Burner control unit release button
- D Gas pressure switch consent indicator light
- E Gas valve tightness control block indicator light (only burners with tightness control)
- F High-flame warning light (or open air damper, when preventive)
- G Low flame warning light
- H Ignition transformer operation indicator lamp
- I EV2 valve opening indicator
- L EV1 valve opening indicator
- M Fan motor thermal relay trip warning light (three-phase only); to release the thermal relay, the switchboard must be opened.
- P Modulator (modulating burners only)
- Q Manual operation selector switch: 0) stop - 1) high flame - 2) low flame - 3) automatic

MultiBloc MBE Regulation VD-R whith PS



Setting scale is „Not“ linear! Various sensors available. Output pressure according to sensor's measuring range.



Adjust the outlet pressure to the value specified by the burner or equipment manufacturer!



While making outlet pressure adjustments, do not exceed a value that creates a hazardous condition to the burner!

Fig. 18

ATTENTION: To set the outlet pressure of the VD-R regulator, act on the adjustment ring nut (Fig. 10)

The position of the indicator in the dial indicates the value of the outlet pressure calculated as a percentage of the full scale of the PS sensor (Fig. 11)

Outlet pressure	MIN	10%	25%	50%	75%	MAX
PS-10/40	4 mbar 0,4 kPa 2 "w.c.	10 mbar 1,0 kPa 4 "w.c.	25 mbar 2,5 kPa 10 "w.c.	50 mbar 5,0 kPa 20 "w.c.	75 mbar 7,5 kPa 30 "w.c.	100 mbar 10,0 kPa 40 "w.c.
PS-50/200	20 mbar 2,0 kPa 8 "w.c.	50 mbar 5,0 kPa 20 "w.c.	125 mbar 12,5 kPa 50 "w.c.	250 mbar 25,0 kPa 100 "w.c.	375 mbar 37,5 kPa 150 "w.c.	500 mbar 50,0 kPa 200 "w.c.

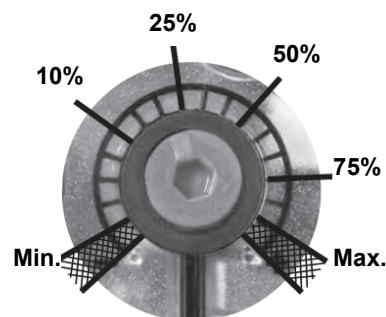


Fig. 19

Adjusting output pressure for positive pressure systems (requires PS-10/40 or PS-50/200):

Pressure taps MultiBloc MBE

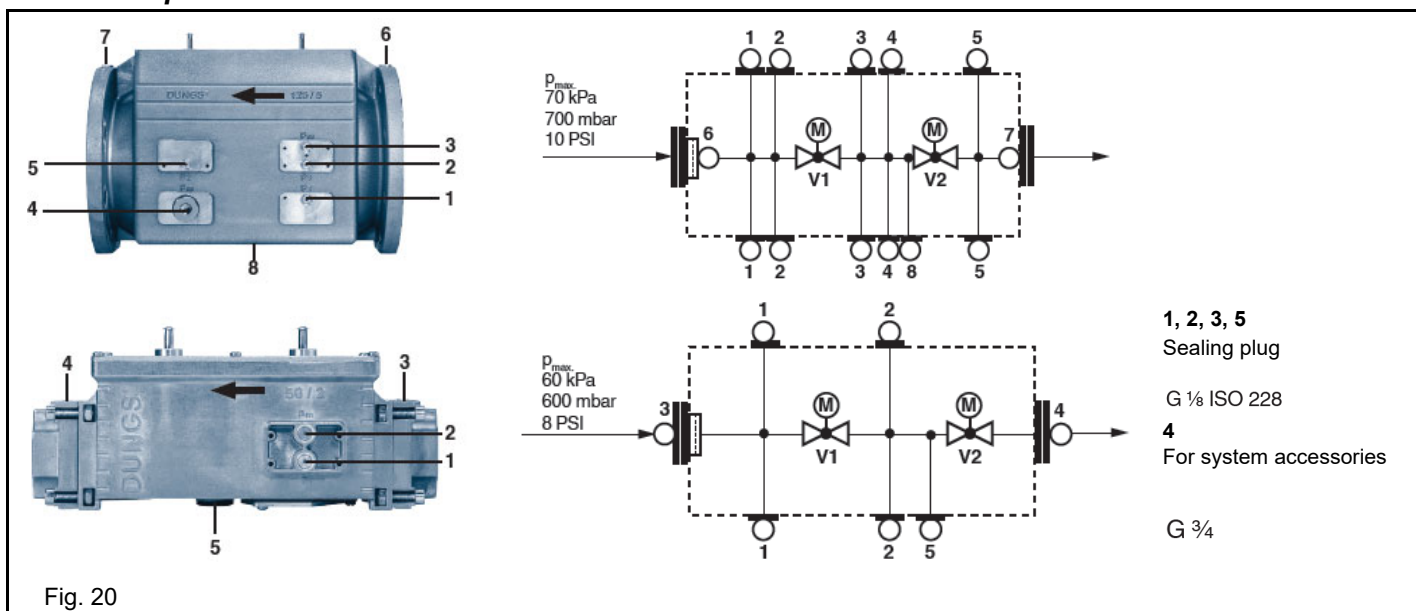


Fig. 20

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.

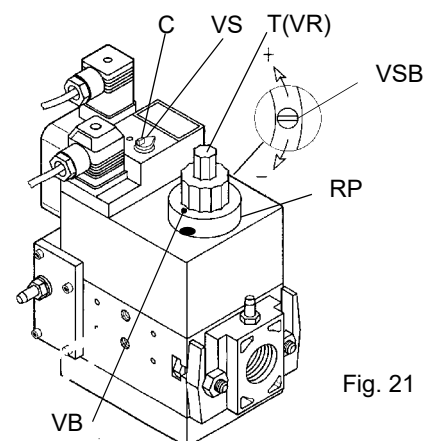


Fig. 21

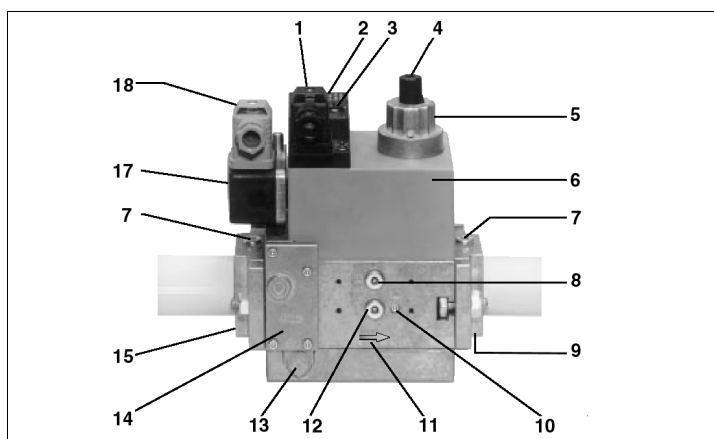


Fig. 22

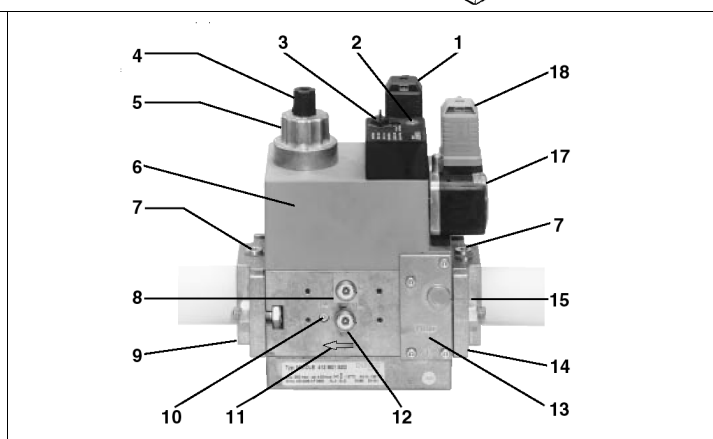


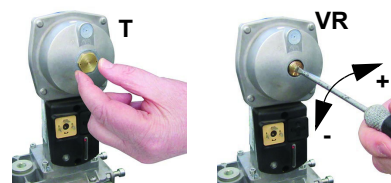
Fig. 23

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 |

Gas valveversion with SKP2 (built-in pressure stabilizer)

To increase or decrease gas pressure, and therefore gas flow rate, remove the cap **T** and use a screwdriver to adjust the regulating screw **VR**. Turn clockwise to increase the flow rate, counterclockwise to reduce it.



PART III: MAINTENANCE

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.

PERIODICAL SERVICING

- Cleaning and examining the gas filter cartridge, if necessary replace it (see next paragraphs).
- Removal, examination and cleaning of the combustion head (see Fig. 60)
- Check of ignition electrode, cleaning, adjustment and, if necessary, replacement (see page 66)
- Check of detection electrode, cleaning, adjustment and, if necessary, replacement; in case of doubt, check the detection circuit following the diagram in Fig. 64 and Fig. 66, after turning the burner back into operation.
- Cleaning and greasing of leverages and rotating parts.



ATTENTION when servicing, if it was necessary to disassemble the gas train parts, remember to execute the gas proving test, once the gas train is reassembled, according to the procedure imposed by the law in force.

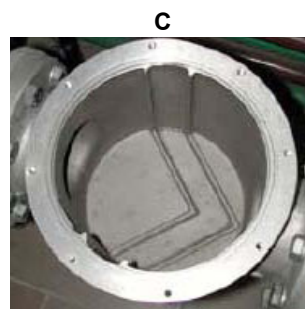
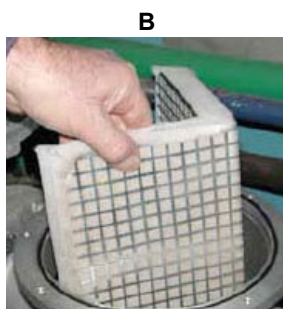
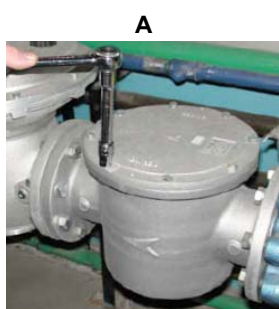
Gas filter maintenance



ATTENTION when servicing, if it was necessary to disassemble the gas train parts, remember to execute the gas proving test, once the gas train is reassembled, according to the procedure imposed by the law in force. **ATTENTION:** Before opening the filter, close the manual cutoff valve downstream the filter and bleed the gas; check that inside the filter there is no pressurised gas.

To clean or remove the filter, proceed as follows:

- 1 remove the cap unscrewing the fixing screws (A);
- 2 remove the filtering cartridge (B), clean it using water and soap, blow it with compressed air (or replace it, if necessary)
- 3 replace the cartridge in its proper position taking care to place it in between the guides as not to hamper the cap replacement;
- 4 be sure to replace the “O” ring into its place (C) and replace the cover fastening by the proper screws (A).



Removing the filter in the MULTIBLOC DUNGS MB-DLE 415 - 420 B01 1" 1/2 - 2"

- Check the filter at least once a year!
- Change the filter if the pressure difference between pressure connection 1 and 2 (Fig. 24-Fig. 25) $\Delta p > 10$ mbar.
- Change the filter if the pressure difference between pressure connection 1 and 2 (Fig. 24-Fig. 25) 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 ÷ 6 (Fig. 26).
- 3 Change filter insert.
- 4 Re-insert filter housing, screw in screws 1 ÷ 6 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.

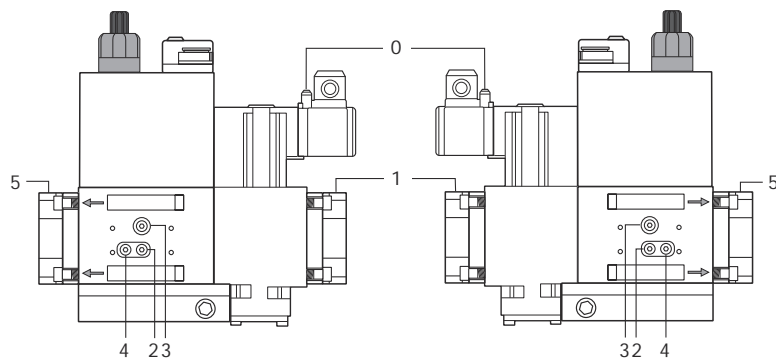


Fig. 24

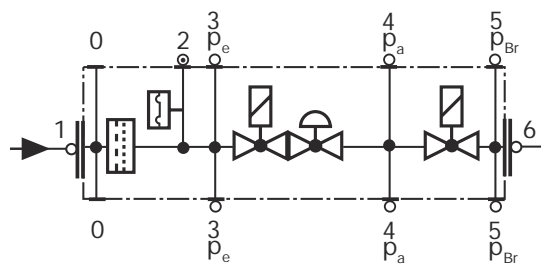


Fig. 25

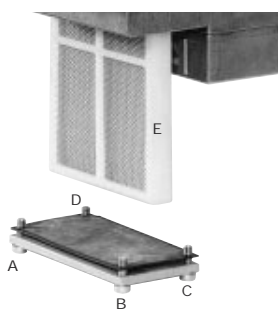
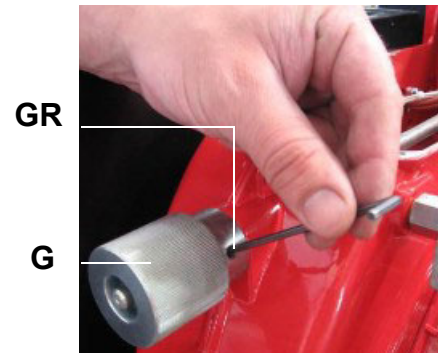
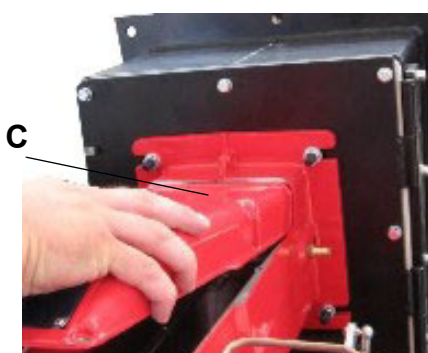
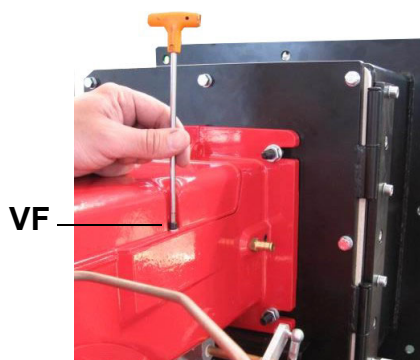


Fig. 26

Removing the combustion head

To disassemble the combustion head assembly, proceed as follows:

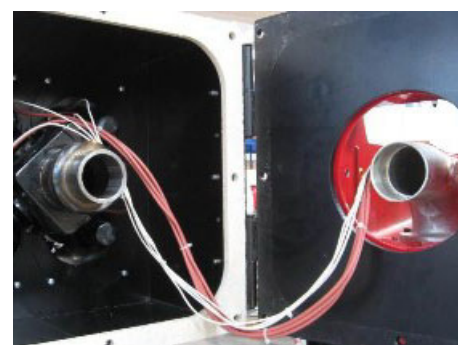
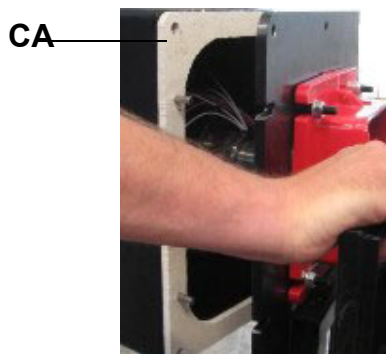
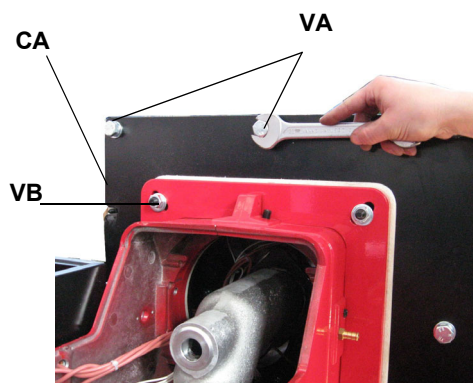
- 1 unscrew the four VF fixing screws that secure cap C from the rest of the burner: remove the cap;



- 2 unscrew the grub screws GR securing the head adjustment ring G
- 3 Unscrew the threaded rod A for head adjustment;
- 4 push the rod forward and then pull it out by pulling it towards you;

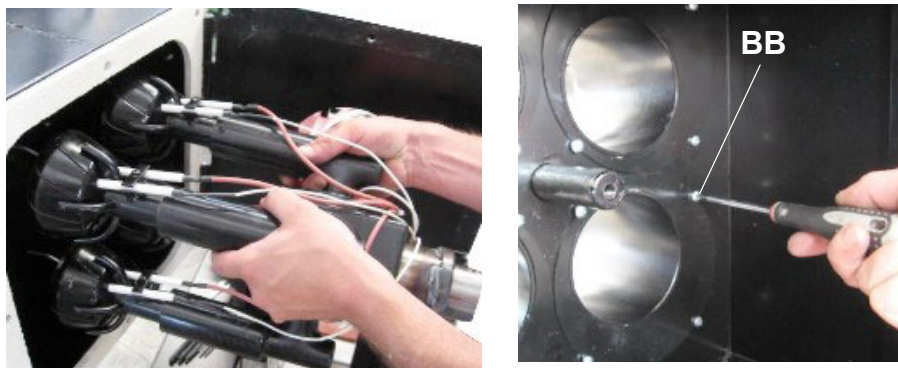


- 5 Unscrew the eight VA screws securing the air box CA;
- CAUTION:** Do not remove the fixing screws of the VB burner flange!
- 6 open the AC air box;

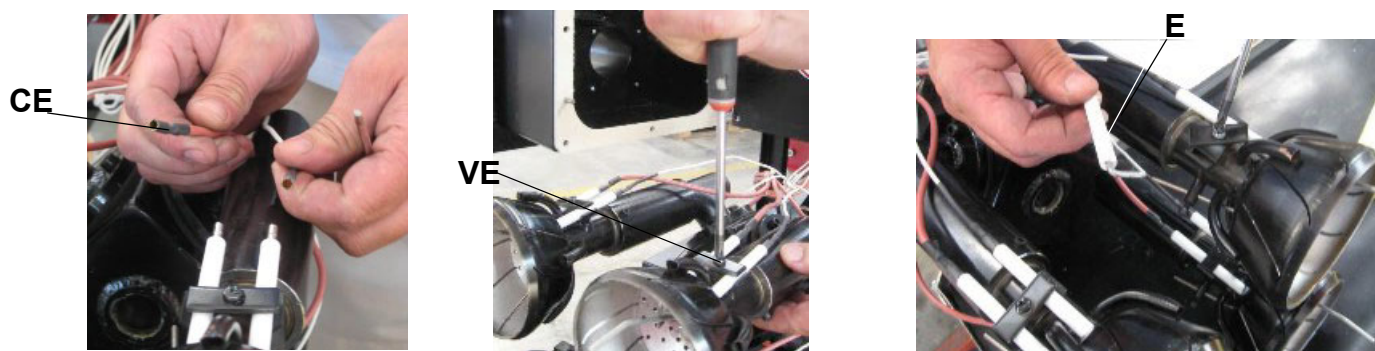


- 7 pull out the head assembly as shown in the figure below;

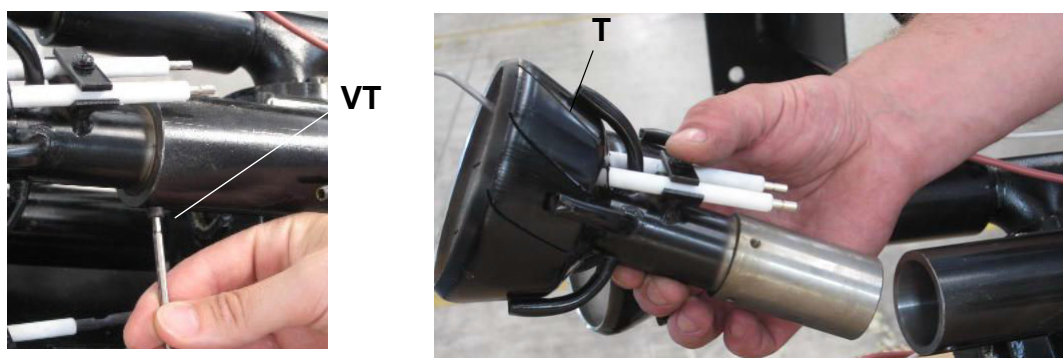
- 8 to replace the nozzles, if damaged, unscrew the BB screws and remove each nozzle by pulling it towards you as shown in the figure below;



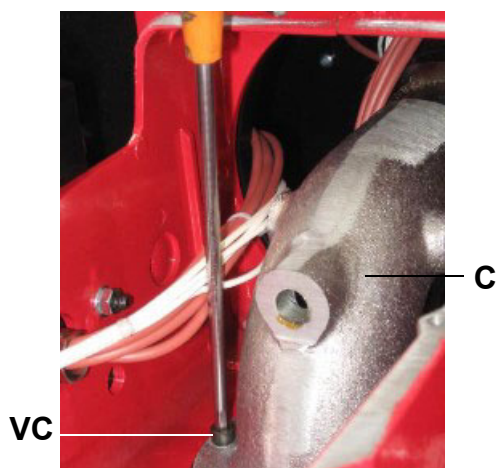
- 9 Replace EC electrode cables, if damaged, following the sequence of combustion heads indicated by the letters on the electrode cables (see page 10);
 10 To remove the electrodes, loosen the VE fastening screws;
 11 Remove electrodes E by pulling them out of the holders; replace electrodes if damaged;



- 12 To remove the combustion head T, remove the fixing screws VT;



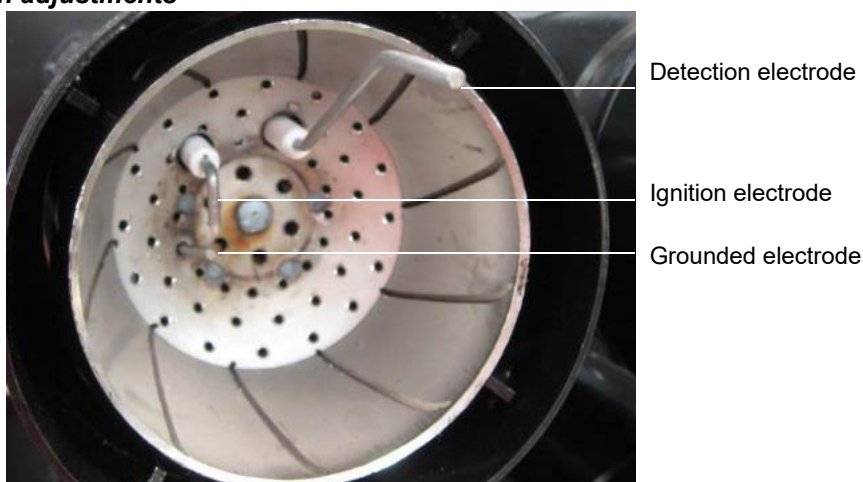
- 13 Pull out the combustion head: to clean the combustion head, suck out impurities, and use a wire brush to remove fouling;
 14 To replace the collector, if damaged, unscrew the VC screws at the base of the collector and pull it out.



CAUTION: When refitting the manifold, remember to insert the 'O' ring. When centring the heads, do not fasten the screws completely at the base of the collector. Secure them after centring. Do not touch the hinge and burner flange screws.

15 For reassembly, follow the steps in reverse order, paying attention to the dimensions of the electrodes.

Electrodes position adjustments



Matching the combustion heads and the control boxes

The combustion head is modae of four heads: one is provided with Siemens QRA detection probe connected to the Siemens LFL control box (Fig. 57-Fig. 59-A); the other three heads are provided with Krom-Schroeder UVS5 probes, connected to the Krom-Schroeder IFW15 flame detectors (Fig. 57-Fig. 59-B-C-D).



Fig. 27



Fig. 28

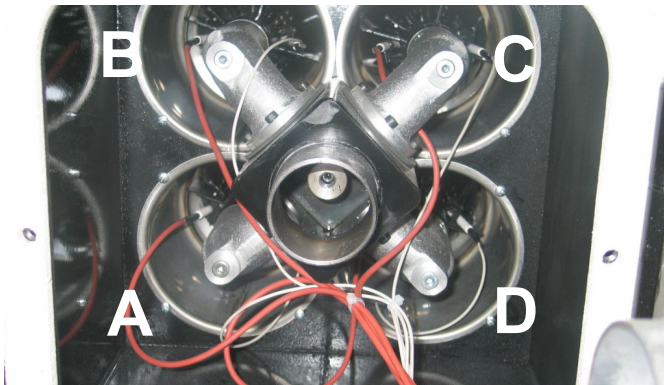


Fig. 29

Checking the detection current

To check the detection current follow the diagram on the following pictures. If the signal is less than the quoted value, check the position of the detector, the electrical contacts and, if necessary, replace the detector.

Control box	Minimum detection signal
Siemens LGB..	3 μ A
Siemens LME21-22	3 μ A

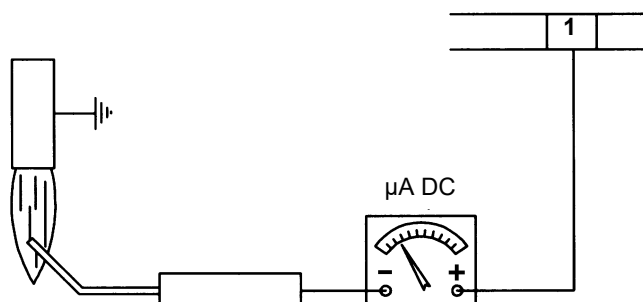


Fig. 30

Detection current control (Krom Schroeder)

To check the detection current follow the diagram on the following pictures. If the signal is less than the quoted value, check the position of the detector, the electrical contacts and, if necessary, replace the detector.

Control box	Minimum detection signal
Krom Schroeder IFW15	1 μ A

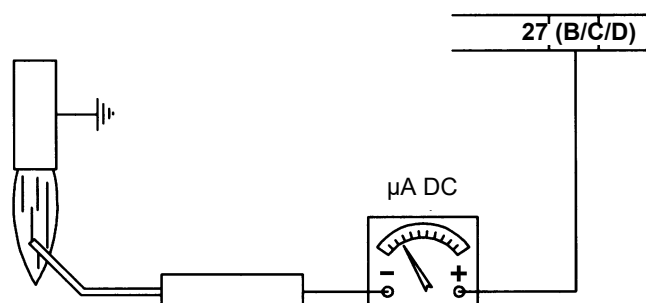


Fig. 31

Seasonal stop

To stop the burner in the seasonal stop, proceed as follows:

- 1 turn the burner's main switch to 0 (Off position)
- 2 disconnect the power mains
- 3 close the fuel valve in the supply line.

Burner disposal

In case of disposal, follow the instructions according to the laws in force in your country about the "Disposal of materials".

ATTENTION:

- 1 - Power supply: 400V 50Hz 3N a.c.three-phase and 230V 50Hz 1N a.c. monophase
- 2 - Don't reverse phase and neutral
- 3 - Ensure the burner is properly earthed

TROUBLESHOOTING

CAUSE	TROUBLE											
	THE BURNER DOESN'T START	CONTINUE WITH PRE- PURGE	DOESN'T START AND LOCK-OUT	DOESN'T START AND REPEATS THE CYCLE	STARTS AND REPEATS THE CYCLE	STARTS AND LOCK-OUTB	THE FLAME MONITOR DEVICE DOESN'T GIVE CONSENT TO START	DOESN'T SWITCH TO HIGH FLAME	DOESN'T RETURN IN LOW FLAME	HE SERVO CONTROL IS LOCK AND VIBRATE	LOCK-OUT DURING OPERATION	TURNS OF AND REPEATS CYCLE DURING OPERATION
MAIN SWITCH OPEN	●											
LACK OF GAS	●			●								
MAXIMUM GAS PRESSURE SWITCH DEFECTIVE (IF PROVIDED)	●		●									
THERMOSTATS/PRESSURE SWITCHES DEFECTIVE	●			●								●
OVERLOAD TRIPPED INTERVENTION	●											
AUXILIARIES FUSE INTERRUPTED	●											
CONTROL BOX FAULTY	●	●	●			●					●	
DEFECTIVE SERVOCONTROL (IF PROVIDED)	●	●	●				●					
AIR PRESSURE SWITCH FAULT OR BAD SETTING	●					●	●				●	
MINIMUM GAS PRESSURE SWITCH DEFECTIVE OR GAS FILTER DIRTY	●			●	●		●					●
IGNITION TRANSFORMER FAULT			●									
IGNITION ELECTRODES BAD POSITION			●									
DETECTION ELECTRODE BAD POSITION						●					●	
BUTTERFLY VALVE BAD SETTING			●			●						
DEFECTIVE GAS GOVERNOR			●	●	●							●
GAS VALVE DEFECTIVE			●									
BAD CONNECTION OR DEFECTIVE HIGH/LOW FLAME THERMOSTAT OR PRESSURE SWITCH (IF PROVIDED)							●	●	●	●		
WRONG SETTING SERVO CONTROL CAM							1	1	1			
UV PROBE DIRTY OR DEFECTIVE (IF PROVIDED)			1			1					1	
PHASE-NEUTRAL INVERTED						s						
PHASE-PHASE SUPPLY OR PRESENCE OF VOLTAGE ON THE NEUTRAL CONDUCTOR(*)						s						

1 = with any control box;

s = with only LGB2../LMG2../LME11/LME2..

(*) In such cases, insert the circuit SIEMENS "RC466890660" () See chapter "Electrical connections")

SPARE PARTS

Desription	P60..VS	P72..VS	P73A..VS
CONTROL BOX Siemens LME..	2020468	2020468	2020468
CONTROL BOX - Krom-Schroeder IFW15	2020114	2020114	2020114
DETECTION ELECTRODE	2080108	2080116	2080116
IGNITION ELECTRODE	2080218	2080218	2080218
GAS FILTER - Rp2	2090119	2090119	2090119
GAS FILTER - DN65	2090117	2090117	2090117
GAS FILTER - DN80	2090112	2090112	2090112
GAS FILTER	2110013	2110033	2110033
GAS FILTER	2110065	2110065	2110065
GAS FILTER	2110068	2110068	2110068
FAN WHEEL	2150044	2150038	2150068
AIR PRESSURE SWITCH	2160065	2160065	2160065
GAS PRESSURE SWITCH- DUNGS GW50 A5	2160076	2160076	2160076
GAS PRESSURE SWITCH- DUNGS GW150 A5	2160077	2160077	2160077
GAS PRESSURE SWITCH- DUNGS GW50 A6	2160085	2160085	2160085
IGNITION TRANSFORMER	2170233	2170233	2170233
MOTOR	2180432	218021101	218025601
GAS VALVE GROUP Dungs MB-DLE415 - Rp1 1/2	21903L3	-	-
GAS VALVE GROUP Dungs MB-DLE420 S20 - Rp2	21903L4	-	-
GAS VALVE GROUP Dungs MB-DLE420 S50 - Rp2	-	21903N2	21903N2
GAS VALVE GROUP Siemens VGD.. - Rp2	2190171	2190171	2190171
GAS VALVE GROUP Siemens VGD.. -- DN65	2190172	2190172	2190172
GAS VALVE GROUP Siemens VGD.. - DN80	-	2190169	2190169
GAS VALVE ACTUATOR SKP15	2190181	2190181	2190181
GAS VALVE ACTUATOR GAS VALVE ACTUATOR SKP25	2190183	2190183	2190183
GAS PROVING SYSTEM	2191604	2191604	2191604
GAS PROVING SYSTEM	2440014	2440014	2440014
ACTUATOR - BERGER STA	2480053	2480053	2480053
ACTUATOR - SIEMENS SQN72	24800A4	24800A4	24800A4
BURNER MODULATOR	2570112	2570112	2570112
COMBUSTION HEAD	30600Q1	30600Q9	30600P1
BLAST TUBE	30900L5	30900M8	30900K5
IGNITION CABLE	6050159	6050159	6050159
DETECTION CABLE	6050217	6050217	6050217

NOTE: it is recommended to mention the burner ID number on the spare parts request form.



C.I.B.UNIGAS S.p.A.
Via L.Galvani ,9 - 35011Campodarsego (PD) - ITALY
Tel. +39 049 9200944 - Fax +39 049 9200945
website:www.cibunigas.it-e-mail:cibunigas@cibunigas.it

Note: specifications and data subject to change. Errors and omissions exceptd.

LME73.000Ax + PME73.831AxBC LME73.831AxBC



Service instruction manual

M12921CB Rel.1.2 02/2016

GENERAL FEATURES

LME/ is suitable for gas, light and heavy oil burners

LME7 series has two devices: LME73.000 (hardware) and PME73.831AxBC (programmable unit). The LME73.831AxBC is also available: it has a built in software and it is not programmable.

LME7 is inside the control panel. If supplied, PME73.831BC is inside the LME7;

The display AZL23.. or AZL21.. is available for Service and hardware setup.

LME7... are used for the startup and supervision of 2-stage/progressive, modulating forced draft gas burners in intermittent operation.

The flame is supervised with an ionization probe, optionally with UV flame detector QRA2..., QRA4.U or QRA10....

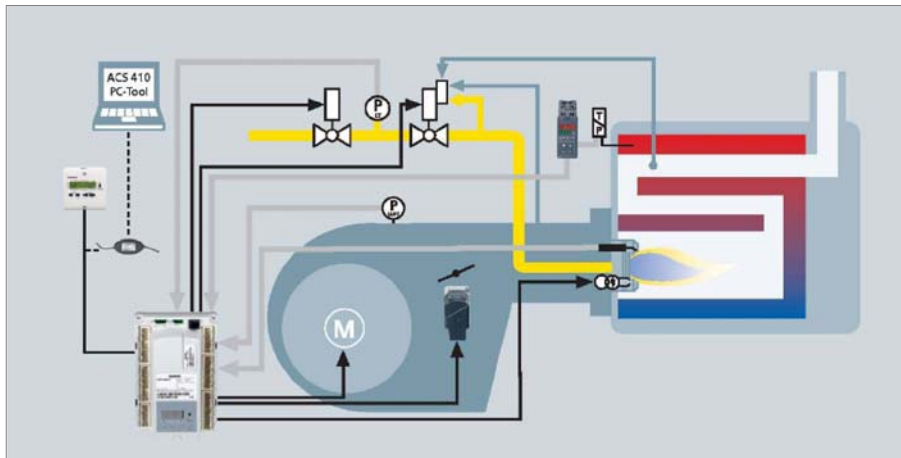
Integrated in the LME7... basic unit are:

- Burner control
- BCI
- Control for one actuator
- Lockout reset button (info button)
- 3 multicolor signal lamp LED for operations and fault notifications
- 3 x 7-segment display for service, fault and operating state information
- Interface for program module (no function)

Passwords protect the different parameter levels against unauthorized access. Basic settings that the plant operator can make on site require no password.

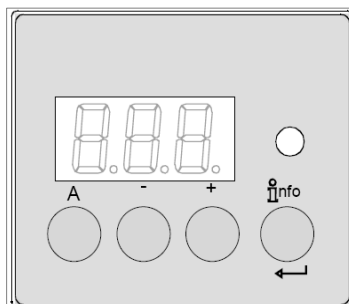
Functions:






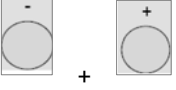
- Undervoltage detection
- Electrical remote reset facility
- Accurate control times thanks to digital signal handling
- Multicolor indication of fault status and operating state messages
- Air pressure supervision with function check of air pressure switch during start and operation (gas)
- Repetition limitation
- Controlled intermittent operation after 24 hours of continuous operation*
- BCI
- Indication of program sequence



* after no more than 24 hours of continuous operation, the burner control initiates automatic controlled shutdown followed by a restart.



User interface :



	Button A <ul style="list-style-type: none"> - Display preset output - In lockout position: Power value to the time of fault
	Info and Enter button <ul style="list-style-type: none"> - Reset in the event of fault, changeover visual diagnostic of the cause of fault (refer to chapter Diagnostics of cause of fault)
	- button <ul style="list-style-type: none"> - Display flame signal current 2 or phases display - In lockout position: MMI phase to the time of fault
	+ button <ul style="list-style-type: none"> - Display flame signal current 1 or phases display - In lockout position: MMI phase to the time of fault
	3 multicolor signal lamp <ul style="list-style-type: none"> - Refer to chapter "Blink code table"
	+ and - button: Escape function (press + and - simultaneously) <ul style="list-style-type: none"> - No adoption of value - One menu level up - Keep depressed for >1second for backup / restore function

First startup when PME is supplied or PME replacement:

First startup:

- 1) insert a new PME
- 2) turn the power on; The display shows "rst" and "PrC" one after the other.
- 3) keep pushing the INFO  button more than 3 seconds; "run" appears; PME parameters will be transferred to LME
- 4) at the end, "End" and "rst" appears one after the other; Later (2'), the control box locks out "Loc 138"
- 5) reset the control box by pressing the INFO  button (for less than 3 seconds)
Now the display shows "OFF"; the burner is ready to be started.



Replacement:

- 1) Turn off the burner, replace the existing PME with a new one
- 2) For the first startup, repeat the above procedure, from step 2.

List of phase display on board LME :

Phase number of 7-segment display	LED	Function
Standby		
OFF	Off	Standby, waiting for heat demand
P08	Off	Mains ON / test phase (e.g. detector test)
Startup		
P21	Yellow	Safety valve ON, air pressure switch test / POC test (timeout / locking
P22	Yellow	Fan motor ON / air pressure switch test / settling time
P24	Yellow	Actuator opens in prepurging position
P30	Yellow	Prepurging
P36	Yellow	Actuator closes in ignition load / low-fire position
P38	Yellow blinking	Preignition time
P40	Yellow blinking	1st safety time (TSA1) / ignition transformer ON
P42	Green	Safety time (ignition transformer OFF), flame check
P44	Green	Interval: End of safety time and fuel valve 1 (V1) ON Interval: End of safety time and load controller (LR) release
P50 Green	P50 Green	2nd safety time (TSA2)
P54 Green	P54 Green	P259.01: Actuator opens in > low-fire
P54 Green	P54 Green	P260: Actuator closes in low-fire
oP1 Green	oP1 Green	Interval until release of load controller target (analog or 3-position step input)
Operation		
oP	Green	Operation, modulating operation
Shutdown		
P10	Yellow	Shutdown, actuator opens in CLOSE position (home run)
P72	Yellow	Actuator opens in high-fire position / end of operation
P74	Yellow	Postpurging
Valve proving		
P80	Yellow	Test space evacuating
P81	Yellow	Checking time fuel valve 1
P82	Yellow	Test space filling
P83	Yellow	Checking time fuel valve 2
Waiting phases (start prevention)		
P01	Red / yellow blinking	Undervoltage
P02	Yellow	Safety loop open
P04	Red / green blinking	Extraneous light on burner startup (timeout / locking after 30 s)
P90	Yellow	Pressure switch-min open
Lockout		
LOC	Red	Lockout phase

Operation :

	The lockout reset button (info button) (EK) is the key operating element for resetting the burner control and for activating / deactivating the diagnostics functions.
	The multicolor signal lamp (LED) is the key indicating element for visual diagnostics.

Both lockout reset button (EK) and signal lamp (LED) are located in the control panel.

There are 2 diagnostics choices:

1. Visual diagnostics: Indication of operating state or diagnostics of cause of fault
2. Diagnostics: Via internal display or to AZL2.. display and operating unit

Visual diagnostics:

In normal operation, the different operating states are indicated in the form of color codes according to the color code table given below.

Color code table for multicolor signal lamp (LED) :

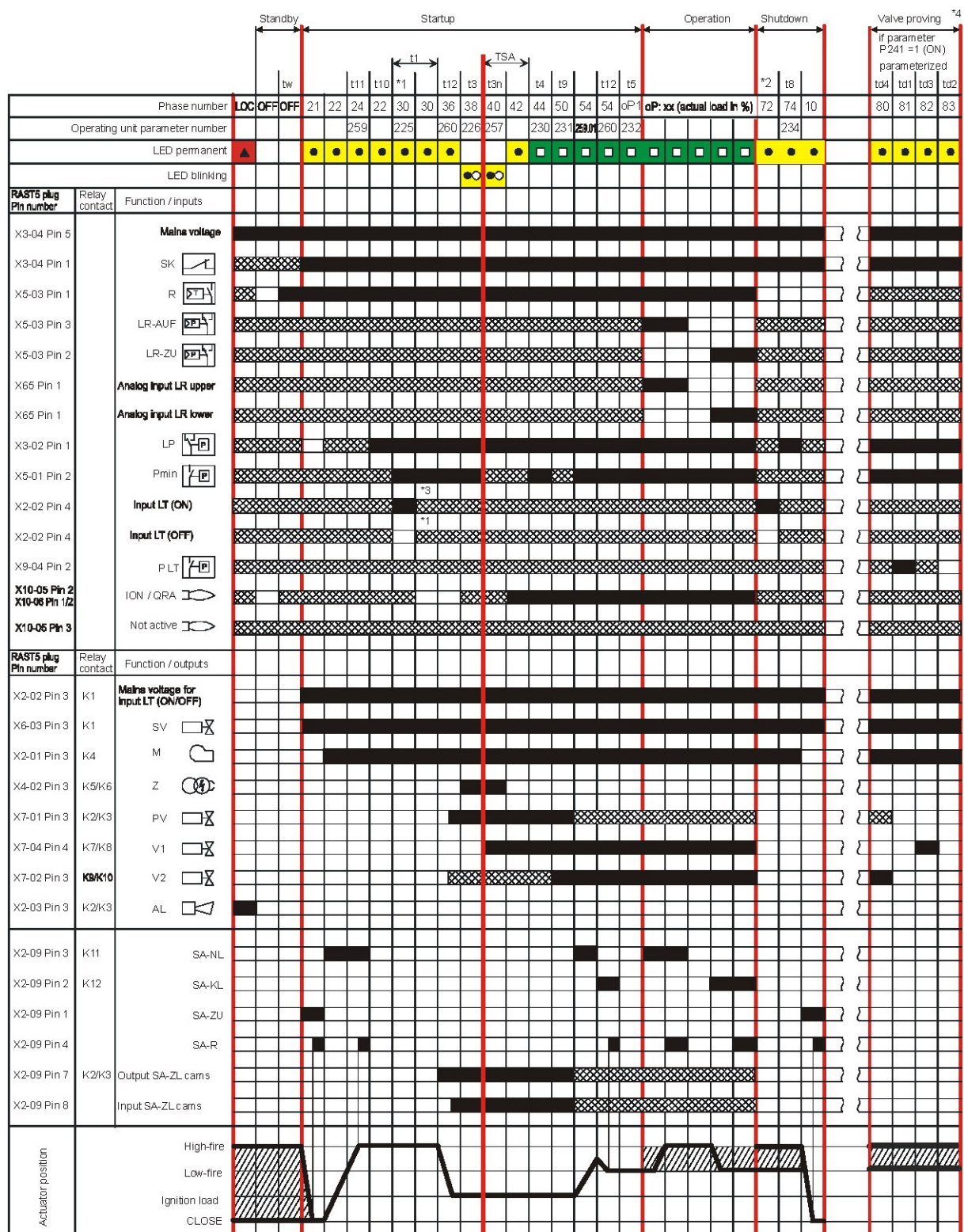
State	Color code	Color
Waiting time (tw), other waiting states	○	OFF
Ignition phase, ignition controlled	● ○ ● ○ ● ○ ● ○ ● ○ ● ○	Blinking yellow
Operation, flame o.k.	□	Green
Operation, flame not o.k.	□ ○ □ ○ □ ○ □ ○ □ ○ □ ○	Blinking green
Extraneous light on burner startup	□ ▲ □ ▲ □ ▲ □ ▲ □ ▲ □ ▲	Green-red
Undervoltage	● ▲ ● ▲ ● ▲ ● ▲ ● ▲ ● ▲	Yellow-red
Fault, alarm	▲	Red
Error code output (refer to «Error code table»)	▲ ○ ▲ ○ ▲ ○ ▲ ○ ▲ ○ ▲ ○	Blinking red
Interface diagnostics	▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲	Red flicker light
Heating request	●	Yellow
Heating request	● ● ▲ ● ● ▲ ● ● ▲ ● ● ▲ ● ● ▲	Yellow

Key

.....	Steady on
○	Led off
▲	Led red
●	Led yellow
□	Led green

Version 1:

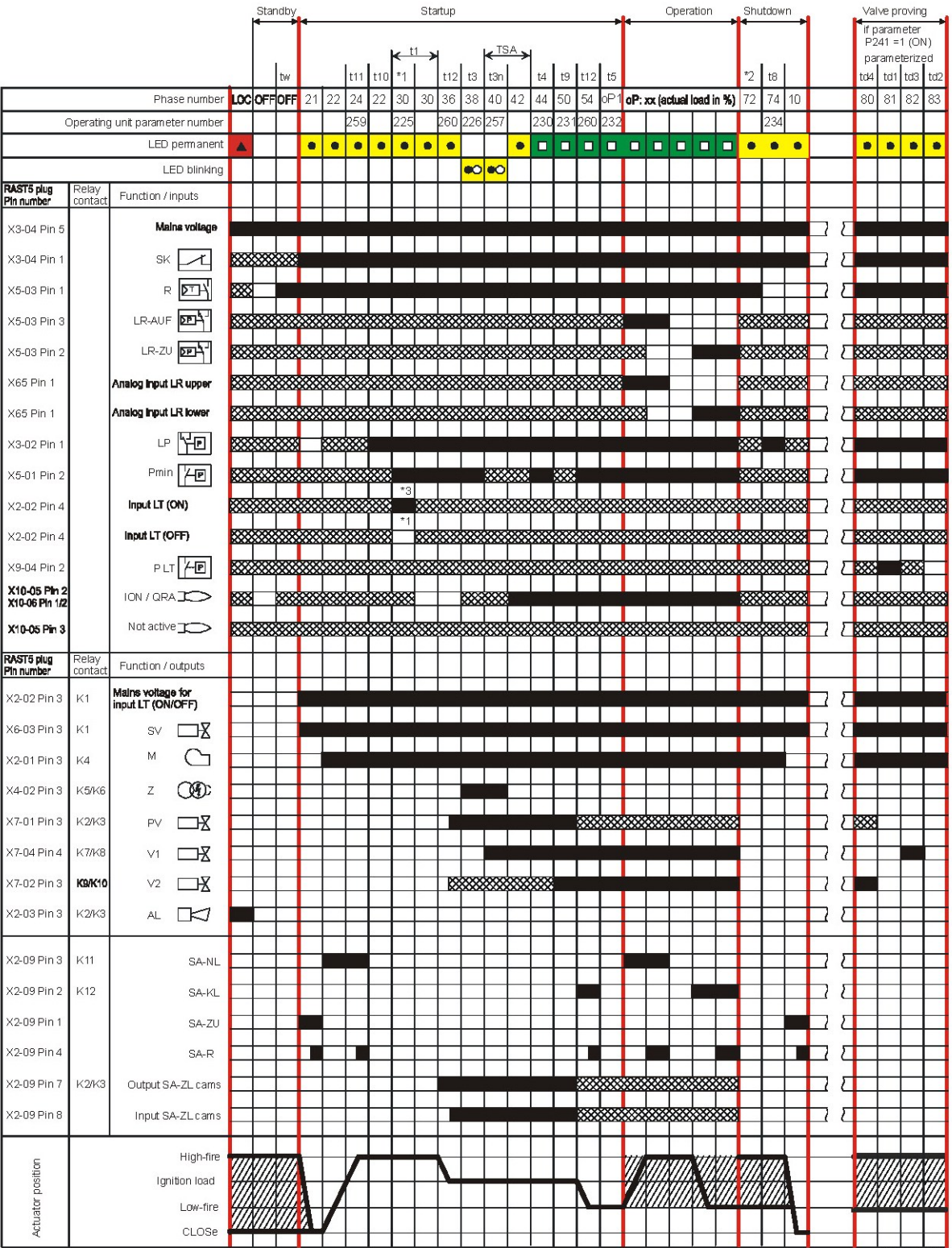
- Ignition load < low-fire
- Prepurging in high-fire
- Parameter 515 = 1 (condition parameter 259.01 > 0 seconds)



Program sequence :

Version 2:

- Ignition load > low-fire
- Prepurging in high-fire
- Parameter 515 = 1 (condition parameter 259.01 = 0 seconds)



7114d04e/0112

Phase number	Function
LOC	Lockout phase
OFF	Standby, waiting for heat demand
oP	Operation, modulating operation
oP1	Interval until release of load controller target (analog or 3-position step input)
01	Under voltage
02	Safety loop open
04	Extraneous light on burner startup (timeout/locking after 30 seconds)
08	Mains ON/test phase (e.g. detector test)
10	Shutdown, actuator opens in CLOSE position (homerun)
21	Safety valve ON, air pressure switch OFF, actuator opens in CLOSE position
22	Part 1: Fan motor ON
	Part 2: Specified time (t10) air pressure switch (LP)
	Message (timeout) stabilization air pressure switch
24	Actuator opens in prepurge position
30	Part 1: Prepurge time (t1) without extraneous light test
	Valve proving after mains ON, lockout
	Part 2: Prepurge time (t1) with extraneous light test
36	Actuator closes in ignition load
38	Preignition (t3)
40	Postignition time (t3n), parameter 257 + 0.3 seconds
42	Flame detection
44	Interval (t4): End of safety time (TSA) and burner valve 2 ON
50	2nd safety time (t9)
54	Parameter 259.01: Actuator opens in > low-fire
	Parameter 260: Actuator closes in low-fire
72	End of operation, checking if valve proving (LT) shall be performed
74	Postpurging (t8)
80	Test space evacuation (td4)
81	Test time (td1) fuel valve 1 (V1)
82	Test space filling (td3)
83	Test time (td2) fuel valve 2 (V2)
90	Pressure switch-min open □ safety shutdown
*1	Valve proving is conducted when...
	- parameter 241.00 = 1 and parameter 241.02 = 1, or
	- parameter 241.00 = 1 and parameter 241.01 = 0
*2	Valve proving is conducted when...
	- parameter 241.00 = 1 and parameter 241.02 = 1, or
	- parameter 241.00 = 1 and parameter 241.01 = 1
*3	Valve proving (LT) will not be performed

Error code table :

Red blink code of fault signal lamp (LED)	Possible cause
2 x blinks	No establishment of flame at the end of the safety time (TSA)
	<ul style="list-style-type: none"> - Faulty or soiled flame detector - Faulty or soiled fuel valves - Poor adjustment of burner, no fuel - Faulty ignition equipment
3 x blinks	Air pressure switch (LP) faulty <ul style="list-style-type: none"> - Loss of air pressure after specified time (t10) - Air pressure switch (LP) welded in no-load position
4 x blinks	Extraneous light on burner startup
5 x blinks	Time supervision air pressure switch (LP) <ul style="list-style-type: none"> - Air pressure switch (LP) welded in working position
6 x blinks	Actuator position not reached <ul style="list-style-type: none"> - Actuator faulty - Wrong adjustment of cam - Actuator defective or blocked - False connection - Misadjustment
7 x blinks	Too many losses of flame during operation (limitation of repetitions) <ul style="list-style-type: none"> - Faulty or soiled flame detector - Faulty or soiled fuel valves - Poor adjustment of burner
8 x blinks	Free
9 x blinks	Free
10 x blinks	Wiring error or internal error, output contacts, other faults
12 x blinks	Valve proving (LT) <ul style="list-style-type: none"> - Fuel valve 1 (V1) leaking
13 x blinks	Valve proving (LT) <ul style="list-style-type: none"> - Fuel valve 2 (V2) leaking
14 x blinks	Error in connection with valve closure control POC
15 x blinks	Error code ≥ 15
	Error code 22: Error of safety loop (SL)

During the time the cause of fault is diagnosed, the control outputs are deactivated:

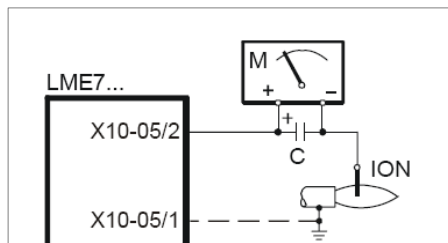
- Burner remains shut down
- External fault indication (AL) at terminal X2-03, pin 3 steady on

Diagnostics of cause of fault is quit and the burner switched on again by resetting the burner control. Press the lockout reset button (info button) for about 1 second (<3 seconds).

Flame detection – detection electrode :

Short-circuit current	Max. AC 1 mA
Required detector current	Min. DC 2 μ A, display approx. 45 %
Possible detector current	Max. DC 3 μ A, display approx. 100 %
Permissible length of detector cable (laid separately)	30 m (core-earth 100 pF/m)

Measuring circuit



Keys

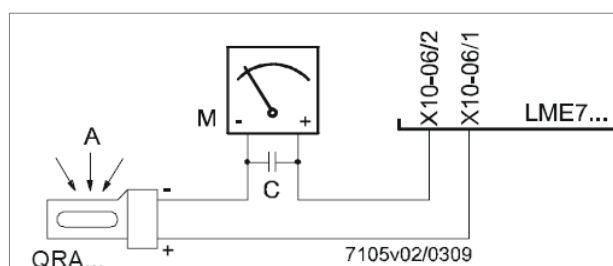
- C - Electrolytic condenser 100...470 μ F; DC 10...25 V
- ION - Ionization probe
- M - Microammeter Ri max. 5,000 Ω

Flame detection – UV probe :

Threshold values when flame is supervised by QRA...

- Start prevention (extraneous light)	Intensity (parameter 954) approx. 12 %
- Operation	Intensity (Parameter 954) approx. 13 %
Operating voltage	AC 280 V \pm 15 %
Mains frequency	50...60 Hz \pm 6 %
Required detector current	Min. 70 μ A
Possible detector current	
- Operation	Max. 700 μ A
Perm. length of detector cable	
- Normal cable, laid separately ¹⁾	Max. 100 m

¹⁾ Multicore cable not permitted



Keys

- A - Exposure to light
- C - Electrolytic condenser 100...470 μ F; DC 10...25 V
- M - Microammeter Ri max. 5,000 Ω

Warning!

Input QRA... is not short-circuit-proof!

Short-circuits of X10-06/2 against earth can destroy the QRA... input

Simultaneous operation of flame detector QRA... and detection electrode is not permitted

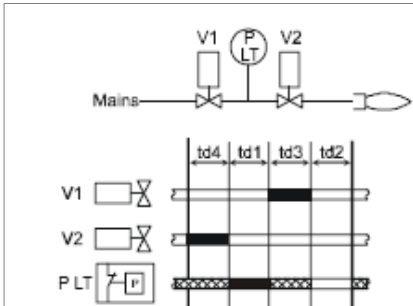
To make certain the age of the UV tube can be determined, the LME7... basic unit must always be connected to mains supply.

Gas proving system :

Valve proving is dependent on input valve proving ON / OFF (X2-02). When a leak is detected, the gas valve proving function ensures that the gas valves will not be opened and that ignition will not be switched on. Lockout will be initiated.

Valve proving with separate pressure switch (P LT)

- Step 1: td4 – Evacuation of test space
Gas valve on the burner side is opened to bring the test space to atmospheric pressure.
- Step 2: td1 – Test atmospheric pressure
When the gas has closed, the gas pressure in the test space must not exceed a certain level.
- Step 3: td3 Filling of test space
Gas valve on the mains side opens to fill the test space.
- Step 4: td2 – Test gas pressure
When the gas valve has closed, the gas pressure in the test space must not drop below a certain level.



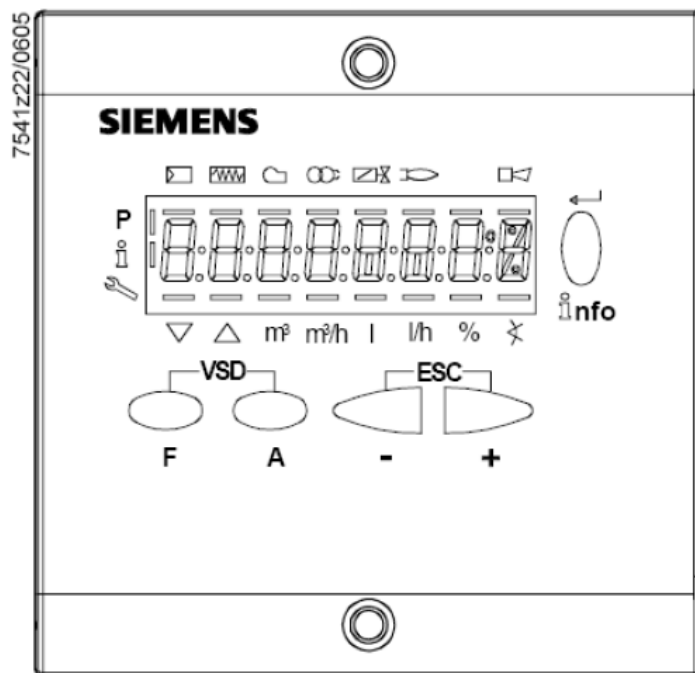
Controllo tenuta con pressostati separati

- Keys
- td1 Test atmospheric pressure
 - td2 Test gas pressure
 - td3 Filling of test space
 - td4 Evacuation of test space
 - V... Fuel valve
 - PLT Pressure switch valve proving
 - Input / output signal 1 (ON)
 - Input / output signal 0 (OFF)
 - Input permissible signal 1 (ON) or 0 (OFF)

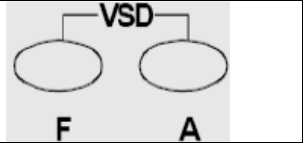
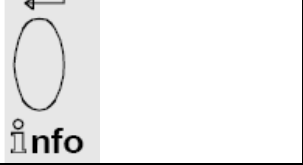


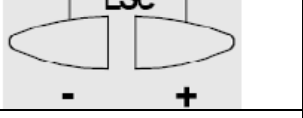
No.	Parameter
242	Valve proving evacuation of test space
243	Valve proving time test atmospheric pressure
244	Valve proving filling of test space
245	Valve proving time test gas pressure

Instruction, control and modify via AZL2x :

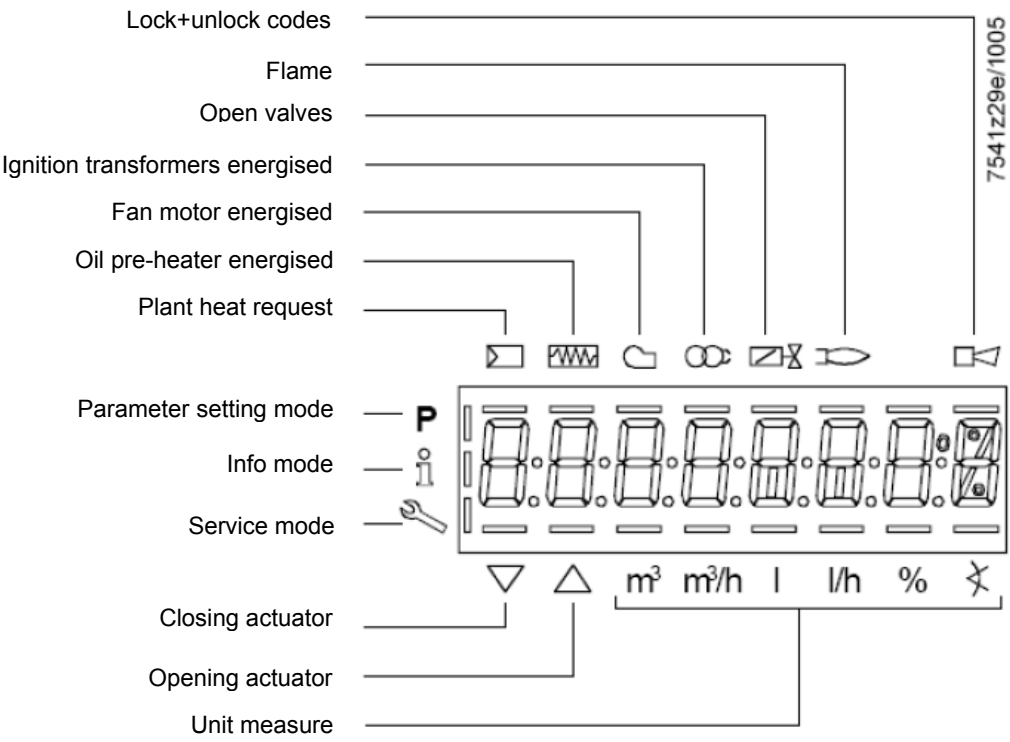
The AZL2x.. display/programming unit is shown below:




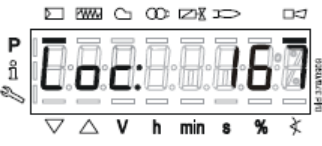
The keys functions are the following:

	<p>Key F + A While pressing the two keys contemporarily, the code message will appear: by entering the proper password it is possible to access the Service mode.</p>
	<p>Info and Enter keys Used for Info and Service menues Used as Enter key in the setting modes Used as Reset key in the burner operation mode Used to enter a lower level menu</p>
	<p>Key - Used for one menu level down Used to decrease a value</p>
	<p>Key + Used for one menu level up Used to increase a a value</p>
	<p>Keys (+ & -) = ESC By pressing + and - at the same time, the ESCAPE function is performed No adoption of value One menu level down</p>


The display will show these data:



While pushing the  button together with whatever else button, LME73 locks out; the display shows



On stand-by position,  appears

On operation, all the phases appears with their number. 

List of phase with display AZL2x :

Phase number	Function
Standby	
OFF	Standby, waiting for heat request
Ph08	Power ON / test phase (e.g. detector test)
Startup	
Ph21	Safety valve ON, air pressure switch test / POC test (timeout / locking after 5 seconds), actuator opens in low-fire position / CLOSE position
Ph22	Fan motor ON or air pressure switch test / settling time
Ph24	Actuator travels to the prepurge position
Ph30	Prepurging
Ph36	Actuator closes until ignition load / low-fire is reached, and parameter 259.02: Actuator opens to a position > ignition load
Ph38	Preignition
Ph40	1st safety time (TSA1) / ignition transformer ON
Ph42	Safety time (ignition transformer OFF), flame check
Ph44	Interval: End of safety time and fuel valve 1 (V1) ON
Ph50	2nd safety time (TSA2)
Ph54	P259.01: Actuator opens in > low-fire
Ph54	P260: Actuator closes in low-fire
oP1	Interval until release of load controller target (analog or 3-position step input)
Operation	
oP	Operation, modulating operation
Shutdown	
Ph10	Shutdown, actuator opens in CLOSE position (home run)
Ph72	Actuator opens in high-fire position / end of operation
Ph74	Postpurging
Valve proving	
Ph80	Test space evacuating
Ph81	Checking time fuel valve 1
Ph82	Test space filling
Ph83	Checking time fuel valve 2
Waiting phases (start prevention)	
Ph01	Undervoltage
Ph02	Safety loop open
Ph04	Extraneous light at burner startup (timeout / locking after 30 seconds)
Ph90	Pressure switch-min open → safety shutdown
Lockout	
LOC	Lockout phase

Error code list with operation via internal AZL :

Error code	Clear text	Possible cause
Loc 2	No establishment of flame at the end of the safety time (TSA)	<ul style="list-style-type: none"> - Faulty or soiled fuel valves - Faulty or soiled flame detector - Poor adjustment of burner, no fuel - Faulty ignition equipment
Loc 3	Air pressure faulty (air pressure switch (LP) welded in no-load position, decrease to specified time (t10) (air pressure switch (LP) response time)	Air pressure switch (LP) faulty <ul style="list-style-type: none"> - Loss of air pressure signal after specified time (t10) - Air pressure switch (LP) is welded in no-load position
Loc 4	Extraneous light	Extraneous light when burner startup
Loc 5	Air pressure faulty, air pressure switch welded in working position	Time out air pressure switch (LP) <ul style="list-style-type: none"> - Air pressure switch (LP) is welded in working position
Loc 6	Fault of actuator	<ul style="list-style-type: none"> - Actuator faulty or blocked - Faulty connection - Wrong adjustment
Loc 7	Loss of flame	Too many losses of flame during operation (limitation of repetitions) <ul style="list-style-type: none"> - Faulty or soiled fuel valves - Faulty or soiled flame detector - Poor adjustment of burner
Loc 8	---	Free
Loc 9	---	Free
Loc 10	Error not relatable (application), internal error	Wiring error or internal error, output contacts, other faults
Loc 12	Valve proving	Fuel valve 1 (V1) leak
Loc 13	Valve proving	Fuel valve 2 (V2) leak
Loc 22	Safety loop open	<ul style="list-style-type: none"> - Gas pressure switch-max open - Safety limit thermostat cut out
Loc 138	Restore process successful	Restore process successful
Loc 167	Manual locking	Manual locking
Loc: 206	AZL2... incompatible	Use the latest version

y means of a proper use of the keys, it is possible to enter the various level parameters, as shown in the following flow chart :



Info level :



Keep pushing the **Info** button until



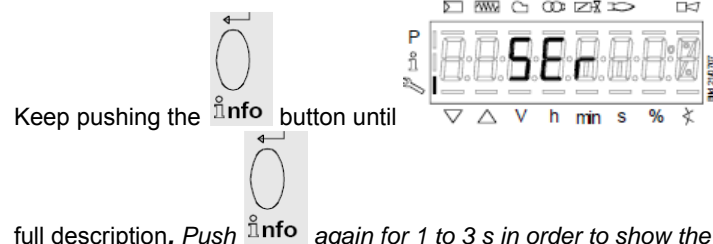
appears. Use + or - for scrolling the parameter list. If on the right side a dash-dot appears, it means the display doesn't show the

full description. Push **Info** again for 1 to 3 s in order to show the full description.

Below the visible **Info** parameters:

Parameter number	Parameter list PME73.000Ax + PME73.831AxBC LME73.831AxBC	Edit	Value range		Resolution	Factory setting	Password level reading from level	Password level writing from level
			Min.	Max.				
100	General							
102	Identification date	Read only	---	---	---		Info	---
103	Identification number	Read only	0	9999	1		Info	---
113	Burner identification	Read only	x	xxxxxxx	1		Info	---
164	Numbers of startups resettable	Resettable	0	999999	1		Info	Info
166	Total number of startups	Read only	0	999999	1		Info	---
170.00	Switching cycles actuator relay K12	Read only	0	999999	1		Info	---
170.01	Switching cycles actuator relay K11	Read only	0	999999	1		Info	---
170.02	Switching cycles actuator relay K2	Read only	0	999999	1		Info	---
170.03	Switching cycles actuator relay K1	Read only	0	999999	1		Info	---
171	Max. switching cycles actuator relay	Read only	0	999999	1		Info	---

Service level :



Keep pushing the **info** button until **58.7** appears. Use + or - for scrolling the parameter list. . If on the right side a dash-dot appears, it means the display doesn't show the

full description. Push **info** again for 1 to 3 s in order to show the full description.

Below the visible **Info** parameters:

Parameter number	Parameter list PME73.000Ax + PME73.831AxBC LME73.831AxBC	Edit	Value range		Resolution	Factory setting	Password level reading from level	Password level writing from level
			Min.	Max.				
700	Error history							
701	Current error: 00: Error code 01: Startup meter reading 02: MMI phase 03: Power value	Read only	2 0 --- 0%	255 999999 --- 100%	1 1 --- 1		Service	---
702	Error history former 1: 00: Error code 01: Startup meter reading 02: MMI phase 03: Power value	Read only	2 0 --- 0%	255 999999 --- 100%	1 1 --- 1		Service	---
•								
•								
•								
711	Error history former 10: 00: Error code 01: Startup meter reading 02: MMI phase 03: Power value	Read only	2 0 --- 0%	255 999999 --- 100%	1 1 --- 1		Service	---

900	Process data							
936	Normalized speed	Read only	0%	100%	0.01 %		Service	---
951	Mains voltage	Read only	0 V	LME73.000A1: 175 V LME73.000A2: 350 V	1 V		Service	---
954	Flame intensity	Read only	0%	100%	1%		Service	---

Parameter level (Heating engineering) :

This level lets the engineer to modify some burner parameters. It is protect with a 4 digit password (SO level) and a 5 digit password (OEM level)

Password input : push **F** and **A** buttons together until the display shows "**code**" and 7 underlines. The left one flashes. By **+** or **-** move the flashing underline until it is on the desired position and push "enter". The underline becomes a dash. By means of **+** or **-**, choose the right character and push "enter". Input the whole password and the **PARA** appears and later on **000 Int**.

Scroll the parameters using **+** or **-**: **000Int, 100, 200, 500, 600 are on the display**. Choose the proper parameter group with the **enter** button and scroll the options with **+** e poi **-** (below the full par set: the two columns on the right give the level access). Choose the parameter to be modified with "enter" is writing is allowed. The parameter now flashes: **+** or **-** modifies the parameter and **enter** confirms. **+** and **-** pushed together move the menu one step back. Push **+** and **-** several times in order to get the home position..

Parameter number	Parameter list PME73.000Ax + PME73.831AxBC LME73.831AxBC	Edit	Value range		Resolution	Factory setting	Password level reading from level	Password level writing from level
			Min.	Max.				
0	Internal parameter							
41	Heating engineers password (4 characters)	Edit	xxxx	xxxx	---		---	OEM
42	OEM's password (5 characters)	Edit	xxxxx	xxxxx	---		---	OEM
60	Backup / restore	Edit	Restore	Backup	---		---	SO
100	General							
123	Min. power control step	Edit	1%	10%	0.1		SO	SO
140	Mode display of Display and operating unit AZL2... 1 = Standard (program phase) 2 = Flame 1 (QRA... / ION) 3 = Flame 2 (QRB... / QRC...) 4 = Active power (power value)	Edit	1	4	4		SO	SO
200	Burner control							
224	Specified time (t10) air pressure switch (LP)	Edit	0 s	13.818 s	0.294 s	12,054	SO	OEM
225	Gas: Prepurge time (t1)	Edit	0 s	1237 s	4.851 s	29,106	SO	OEM
226	Gas: Preignition time (t3)	Edit	1.029 s	37.485 s	0.147 s	2,058	SO	OEM
230	Interval (t4): End of safety time (TSA) - fuel valve 1 (V1) ON	Edit	3.234 s	74.97 s	0.294 s	3,234	SO	OEM
231	Interval (t9): Fuel valve 1 (V1) ON - pilot valve (PV) OFF	Edit	0 s	74.97 s	0.294 s	2,940	SO	OEM
232	Interval (t5): Pilot valve (PV) OFF - load controller (LR) release	Edit	2.058 s	74.97 s	0.294 s	8.820	SO	OEM
234	Gas: Postpurge time (t8)	Edit	0 s	1237 s	4.851 s	0	SO	OEM
239	Gas: Intermittent operation after 24 hours of continuous operation 0=OFF 1=ON	Edit	0	1	1	1	SO	OEM

240	Repetition in the event of loss of flame during operation 0 = None 1 = None 2 = 1 x Repetition	Edit	0	2	1	0	SO	OEM
241.00	Valve proving 0 = Off 1 = On	Edit	0	1	1	1	SO	OEM
241.01	Valve proving 0 = During prepurge time (t1) 1 = During postpurge time (t8)	Edit	0	1	1	0	SO	OEM
241.02	Valve proving 0 = According to P241.01 1 = During prepurge time (t1) and postpurge time (t8)	Edit	0	1	1	0	SO	OEM
242	Valve proving test space evacuating	Edit	0 s	2.648 s	0.147 s	2,646	SO	OEM
243	Valve proving time test atmospheric pressure	Edit	1.029 s	37.485 s	0.147 s	10,290	SO	OEM
244	Valve proving test space filling	Edit	0 s	2.648 s	0.147 s	2,646	SO	OEM
245	Valve proving time test gas pressure	Edit	1.029 s	37.485 s	0.147 s	10,290	SO	OEM
254	Response time detector error 0 = 1 s 1 = 3 s	Edit	0	1	1	0	SO	OEM
257	Gas: Postignition time (t3n – 0.3 seconds)	Edit	0 s	13.23 s	0.147 s	2,205	SO	OEM
259.00	Opening time of actuator (t11) (timeout for lockout)	Edit	0 s	1237 s	4.851 s	67,914	SO	OEM
259.01	Opening time of actuator from ignition load to low-fire position	Edit	0 s	37.485 s	0.147 s	14,994	SO	OEM
259.02	Opening time of actuator from low-fire to ignition load position	Edit	0 s	37.485 s	0.147 s	14,994		
260	Closing time of actuator (t12) (timeout for lockout)	Edit	0 s	1237 s	4.851 s	67,914	SO	OEM
500	Ratio control							
515	Actuator position during prepurge time (t1) and postpurge time (t8) 0: Purging in low-fire 1: Purging in high-fire	Edit	0	1	1	1	SO	OEM
560	Pneumatic combustion control 0 = off / 3-step modulation 1 = PWM fan / analog modulation 2 = air damper / analog modulation (feedback potentiometer ASZxx.3x required)	Edit	0	2	1	1	SO	SO

600	Power setting							
654	Analog input (feedback potentiometer ASZxx.3x required) 0 = 3-position step input 1 = 0...10 V 2 = 0...135 Ω 3 = 0...20 mA 4 = 4...20 mA with lockout at I < 4 mA 5 = 4...20 mA	Edit	0	5	1	0	SO	SO

WARNING	
Parameter Num. : 41 42 60 123 140 242 243 244 245 259.01	Adjustable parameters from SO or OEM levels for LME73.831AxBC

Note: Specifications and data subject to change. Errors and omissions excepted.