URB-SH40-FGR *(M- ... CN ... EF)*

(18P1140)

LMV5x

Microprocessor controlled

Gas burners

MANUAL OF INSTALLATION - USE - MAINTENANCE

CIB UNIGAS

BURNERS - BRUCIATORI - BRULERS - BRENNER - QUEMADORES - ГОРЕЛКИ

M099864CB 0.0 07/2019

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.

1) GENERAL INTRODUCTION

- The equipment must be installed in compliance with the regulations in force, following the manufacturer's instructions, by qualified personnel.
- Qualified personnel means those having technical knowledge in the field of components for civil or industrial heating systems, sanitary hot water generation and particularly service centres authorised by the manufacturer.
- Improper installation may cause injury to people and animals, or damage to property, for which the manufacturer cannot be held liable.
- Remove all packaging material and inspect the equipment for integrity.

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

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

- Before any cleaning or servicing operation, disconnect the unit from the mains by turning the master switch OFF, and/or through the cut-out devices that are provided.
- Make sure that inlet or exhaust grilles are unobstructed.
- In case of breakdown and/or defective unit operation, disconnect the unit. Make no attempt to repair the unit or take any direct action.

Contact qualified personnel only.

Units shall be repaired exclusively by a servicing centre, duly authorised by the manufacturer, with original spare parts 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 damages resulting from improper installation, use and failure to comply with the instructions supplied by the manufacturer.The occurrence of any of the following circustances 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

2) SPECIAL INSTRUCTIONS FOR BURNERS

- The burner should be installed in a suitable room, with ventilation openings complying with the requirements of the regulations in force, and sufficient for good combustion.
- Only burners designed according to the regulations in force should be used.
- This burner should be employed exclusively for the use for which it was designed.
- Before connecting the burner, make sure that the unit rating is the same as delivery mains (electricity, gas oil, or other fuel).
- Observe caution with hot burner components. These are, usually, near to the flame and the fuel pre-heating system, they become hot during the unit operation and will remain hot for some time after the burner has stopped.

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

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

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

Special warnings

- Make sure that the burner has, on installation, been firmly secured to the appliance, so that the flame is generated inside the appliance firebox.
- Before the burner is started and, thereafter, at least once a year, have qualified personnel perform the following operations:

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

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

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

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

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

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

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

- In case of a burner shut-down, reser 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.

3) GENERAL INSTRUCTIONS DEPENDING ON FUEL USED

3a) ELECTRICAL CONNECTION

- For safety reasons the unit must be efficiently earthed and installed as required by current safety regulations.
- It is vital that all saftey requirements are met. In case of any doubt, ask for an accurate inspection of electrics by qualified personnel, since the manufacturer cannot be held liable for damages that may be caused by failure to correctly earth the equipment.
- Qualified personnel must inspect the system to make sure that it is adequate to take the maximum power used by the equipment shown on the equipment rating plate. In particular, make sure that the system cable cross section is adequate for the power absorbed by the unit.
- No adaptors, multiple outlet sockets and/or extension cables are permitted to connect the unit to the electric mains.
- An omnipolar switch shall be provided for connection to mains, as required by the current safety regulations.
- The use of any power-operated component implies observance of a few basic rules, for example:

  - do not touch the unit with wet or damp parts of the body and/or with bare feet;
  - do not pull electric cables;
  - do not leave the equipment exposed to weather (rain, sun, etc.)

unless expressly required to do so;

- do not allow children or inexperienced persons to use equipment;

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

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

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

3b) FIRING WITH GAS, LIGHT OIL OR OTHER FUELS

GENERAL

- The burner shall be installed by qualified personnel and in compliance with regulations and provisions in force; wrong installation can cause injuries to people and animals, or damage to property, for which the manufacturer cannot be held liable.
- Before installation, it is recommended that all the fuel supply system pipes be carefully cleaned inside, to remove foreign matter that might impair the burner operation.
- Before the burner is commissioned, qualified personnel should inspect the following:

a the fuel supply system, for proper sealing;

b the fuel flow rate, to make sure that it has been set based on the firing rate required of the burner;

c the burner firing system, to make sure that it is supplied for the designed fuel type;

d the fuel supply pressure, to make sure that it is included in the range shown on the rating plate;

e the fuel supply system, to make sure that the system dimensions are adequate to the burner firing rate, and that the system is equipped with all the safety and control devices required by the regulations in force.

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

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.

DIRECTIVES AND STANDARDS

Gas burners

European directives

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

Harmonized standards

-UNI EN 676 (Automatic forced draught burners for gaseous fuels)
-EN 55014-1 (Electromagnetic compatibility- Requirements for house hold 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);

Light oil burners

European directives

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

Harmonized standards

-UNI EN 267-2011(Automatic forced draught burners for liquid fuels)
-EN 55014-1 (Electromagnetic compatibility- Requirements for house hold 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);

National Standard

-UNI 7824 (Atomizing burners of the monobloc type. Characteristics and test methods)

Heavy oil burners

European Directives

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

Harmonized standards

-UNI EN 267(Automatic forced draught burners for liquid fuels)
-EN 55014-1 (Electromagnetic compatibility- Requirements for house hold 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);

Norme nazionali / National Standard

-UNI 7824 (Atomizing burners of the monobloc type. Characteristics and test methods.

Gas - Light oil burners

European Directives

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

Harmonized standards

-UNI EN 676 (Automatic forced draught burners for gaseous fuels)
-UNI EN 267(Automatic forced draught burners for liquid fuels)
-EN 55014-1 (Electromagnetic compatibility- Requirements for house hold 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);

Norme nazionali / National Standard

-UNI 7824 (Atomizing burners of the monobloc type. Characteristics and test methods.

Gas - Heavy oil burners

European directives:

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

Harmonized standards

-UNI EN 676 (Automatic forced draught burners for gaseous fuels)
-EN 55014-1 (Electromagnetic compatibility- Requirements for house hold 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);

National Standard

- UNI 7824 (Atomizing burners of the monobloc type. Characteristics and test methods.

Industrial burners

European directives

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

Harmonized standards

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

Burner 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

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.	--

SYMBOLS USED



WARNING! Failure to observe the warning may result in irreparable damage to the unit or damage to the environment



DANGER! Failure to observe the warning may result in serious injuries or death.

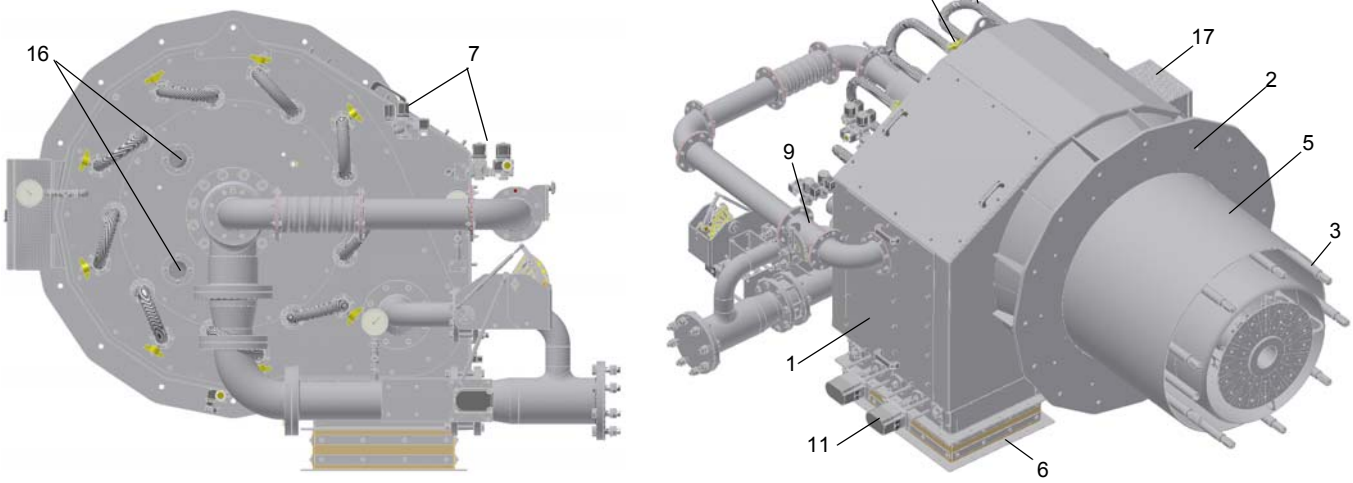


WARNING! Failure to observe the warning may result in electric shock with lethal consequences

Figures, illustrations and images used in this manual may differ in appearance from the actual product.

PART I: SPECIFICATIONS

BURNERS FEATURES



Note: the figure is indicative only.

Keys:

1. Wind box
2. Burner flange
3. Gas lances and nozzles
5. Blast tube
6. Air damper
7. Pilot gas train
8. Pilot burner
9. Butterfly valve
11. Air actuator
12. Flexible hoses
13. Manual valves
14. Flame detector
16. Inspection window
17. Junction box
18. Eye bolts

Windbox and Register Assembly

The burner windbox is assembled of heavy gauge welded steel.

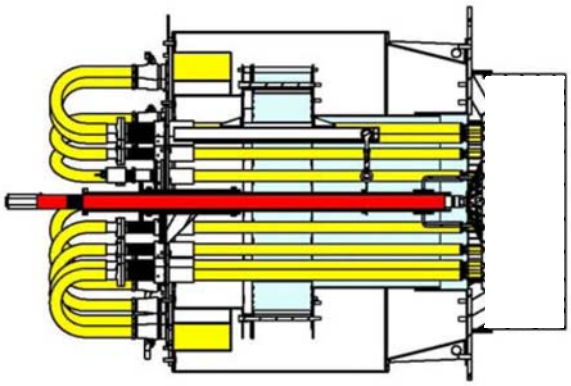
Insulated windboxes for use with pre-heated combustion air are available.

The offered machines are forced natural gas burners, designed with a single or a double air registers in reference to the output that the machine must develop.

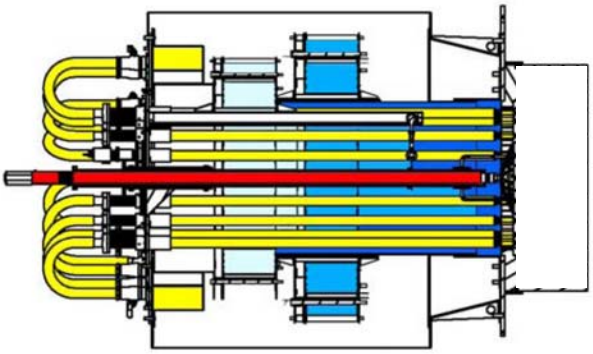
Two inspection doors are provided. They are not only useful for the maintenance, but they also offer the possibility to switch the position of the air damper to one of them, if the lay-out of the plant requires any adjustments on the site, or to add a second damper in case of a second combustion air stage or a flue gas recirculation where required.

Burner registers are designed and mounted in the windbox to permit an easy access for maintenance and to ensure a balanced air distribution in the windbox.

Each register is complete with a manual control handle and a mechanical indicator. The air registers will be adjusted in the proper position at the start-up, to ensure a proper flame distribution in the combustion chamber and an optimum mixing of fuel with turbulent air, to reach an high efficiency in terms of heat exchange and emission values.



Single register configuration



Double register configuration

Gas lances and nozzles

The natural gas flow, regulated by a motorised butterfly valve, reaches a gas ring and, passing through flexible hoses and manual valves, it enters into several lances to be guided up to the gas nozzles.

The stainless steel nozzle series is distributed all around the refractory blast tube, in order to optimize the gas distribution into the combustion chamber, for an high combustion efficiency and to limit the production of thermal oxides of nitrogen (NOx) and carbon monoxide (CO).

Each lance, so each nozzle, can be adjusted and removed during the operation in the plant (start-up and maintenance).

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	LT	RO	TR	CH
I_{2E}	LU	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$I_{2E(R)B}$	BE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I_{2L}	NL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I_{2ELL}	DE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I_{2Er}	FR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Burner model identification

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

Type	**URB-SH40-FGR**	Model	**M.**	**MD.**	**S.**	**CN.**	**Y.**	**8.**	**150.**	**EF**
	(1)		**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**

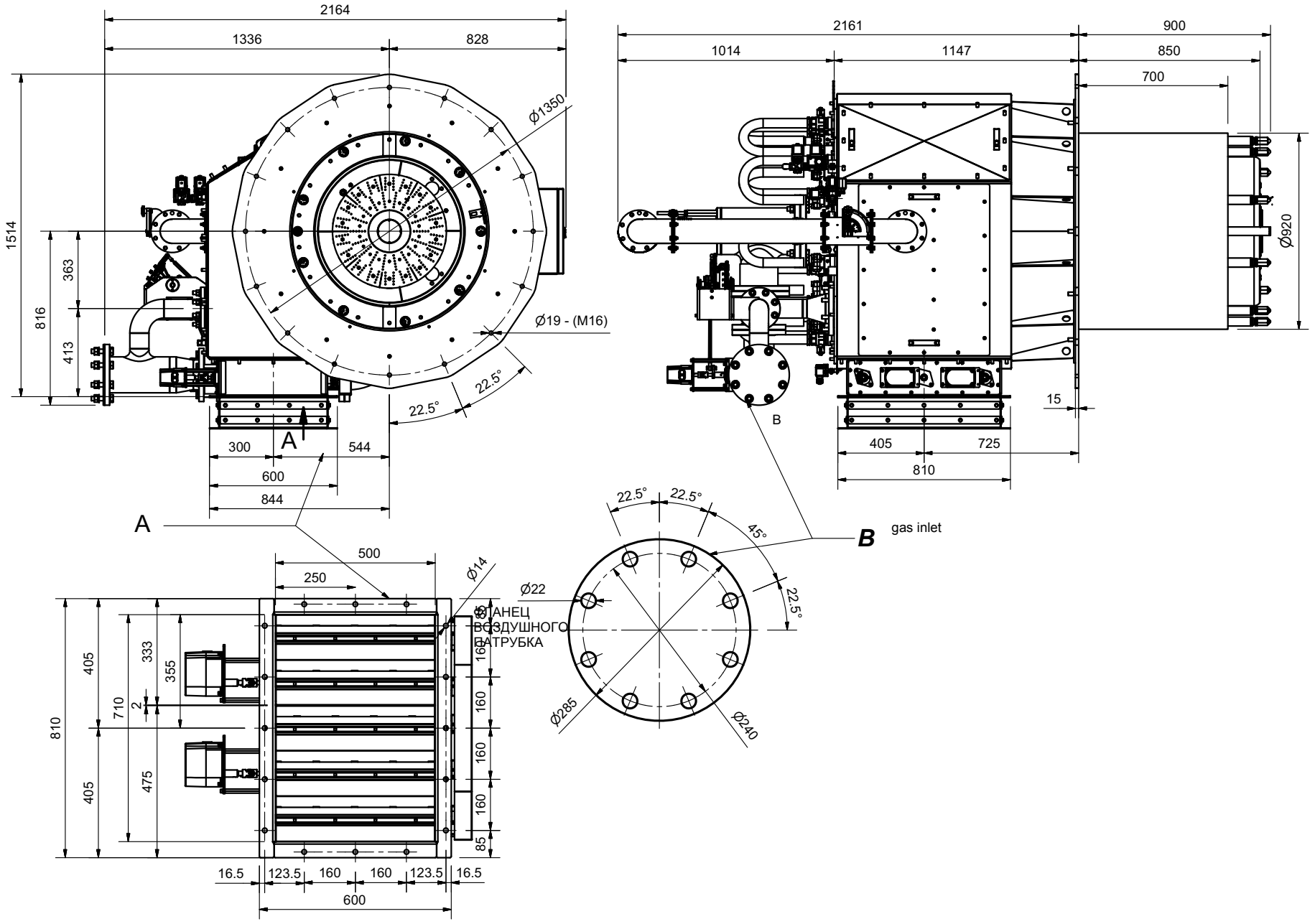
1	BURNER TYPE	**URB-SH40-FGR**
2	FUEL	M - Natural gas
3	OPERATION (Available versions)	MD - Fully modulating
4	BLAST TUBE	S - Standard L - Extended
5	DESTINATION COUNTRY	* - see data plate
6	BURNER VERSION	Y - Special G - Control panel and junction box
7	EQUIPMENT	8 = 2 gas valves + gas proving system + maximum gas pressure switch
8	GAS CONNECTION	125 = DN125 - 150 = DN150
9	MICRO-PROCESSOR CONTROL	EF = Medium-large burners complete with electronic cam and temperature-compensated flue gas recirculation, without O_2 monitoring, without inverter. EG = Medium-large burners complete with electronic cam, inverter and temperature-compensated flue gas recirculation, without O_2 monitoring ER = Medium-large burners complete with electronic cam, inverter and temperature-compensated flue gas recirculation, with O_2 monitornig

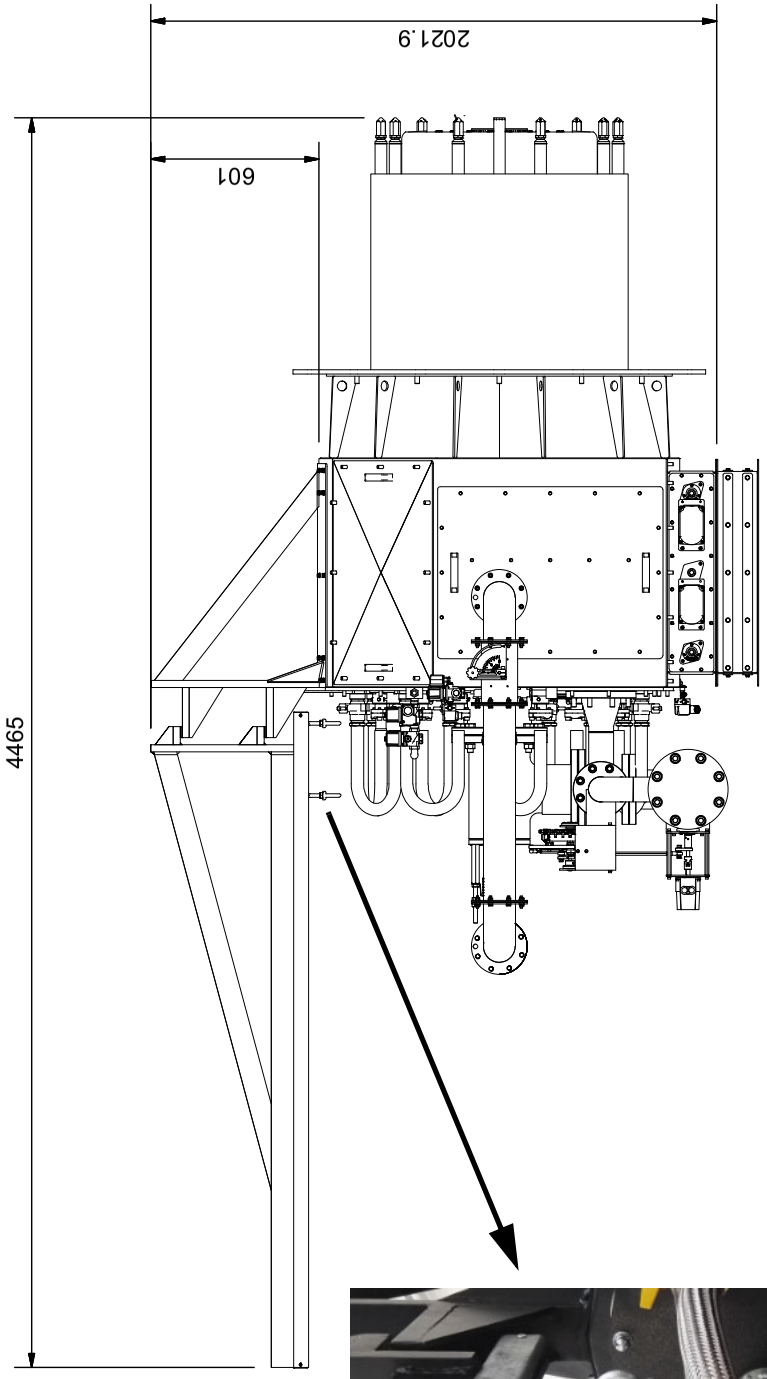
Technical Specifications

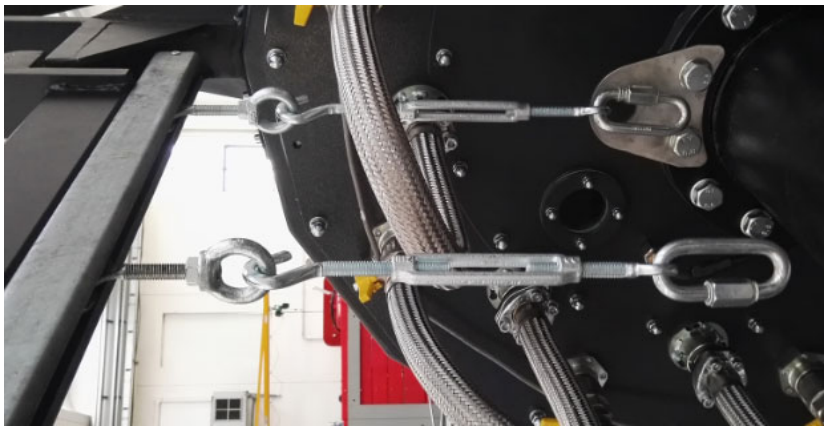
BURNER TYPE		**URB-SH40-FGR**	
Output	min - max kW	8800 - 40000	
Fuel		M - Natural gas	
Category		(see next paragraph)	
Gas rate	min.-max. (Stm^3/h)	931 - 4233	
Gas pressure		(see Note 2)	
Power supply		230V 1N~ 50Hz	
Total power consumption	kW	0.5	
Approximate weight	kg	1200	
Protection		IP54	
Operation		Fully modulating	
Gas train	Ø Valves / Connections	125 / DN125	150 / DN150
Operating temperature	°C	-10 ÷ +50	
Storage Temperature	°C	-20 ÷ +60	
Working service		Continuous	

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 = 600 mbar** **Minimum gas pressure = see gas curves.**

Overall dimensions (mm)

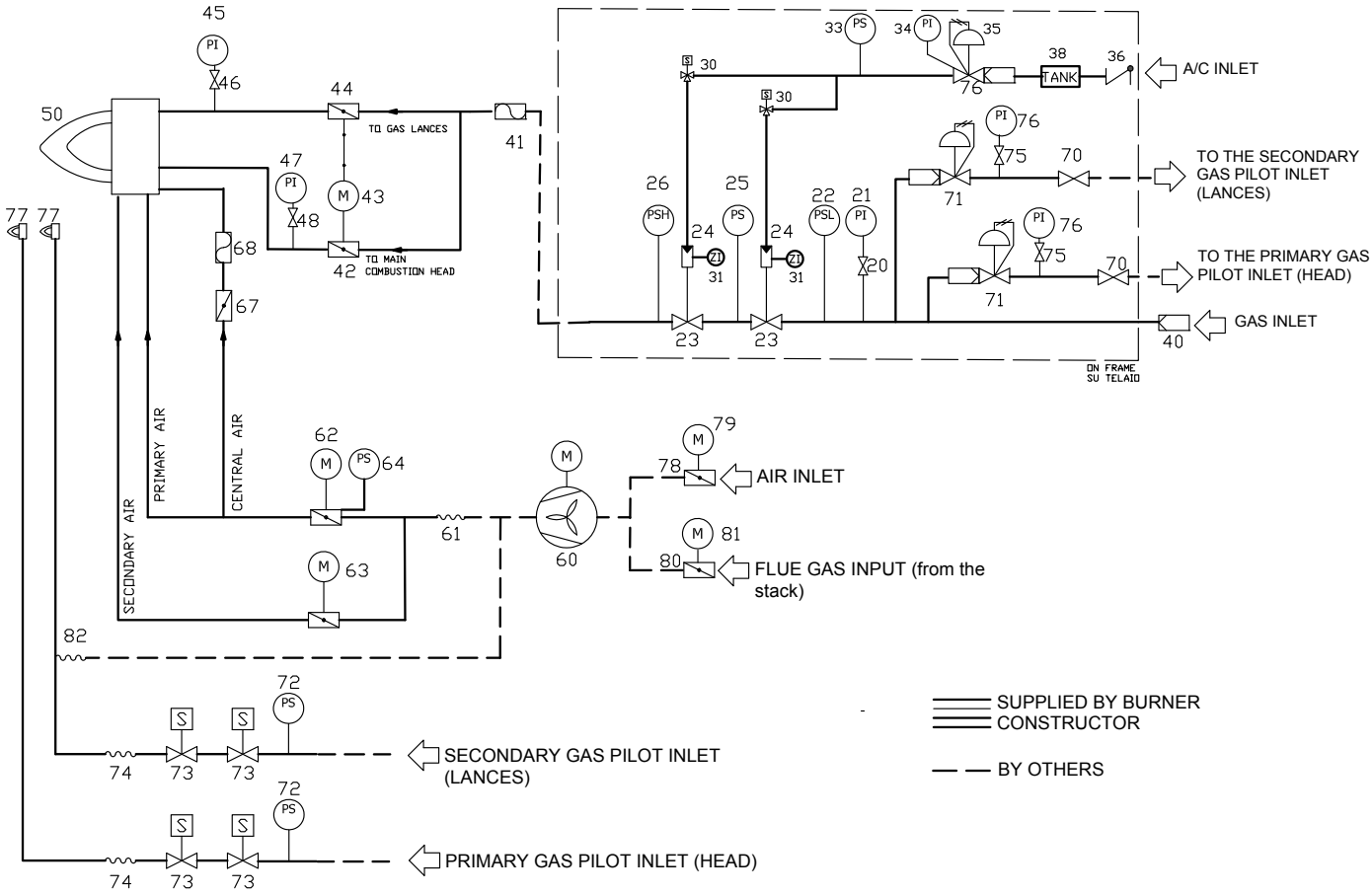






Eyebolts

Fig. 4 - **Hydraulic diagram - gas**



	Main gas train		**Combustion air train**
20	Manual valve	61	Bellows unit
21	Pressure gauge (0 - 1 bar)	62	Primary Air damper with actuator
22	Pressure switch (min.)	63	Air pressure switch
23	Safety valve	64	Secondary Air damper with actuator
24	Pneumatic actuator	65	Manual valve
25	Pressure switch (gas proving pressure switch)	66	Pressure gauge
26	Pressure switch (max.)	67	Central air damper
31	End-switch	68	Bellows unit
40	Filter		**Pilot gas train**
41	Bellows unit	70	Manual valve
42	Butterfly valve	71	Pressure governor with filter
43	Actuator	72	Pressure switch
44	Butterfly valve	73	Solenoid valve
45	Pressure gauge (0 - 1 bar)	74	Flexible hose
46	Manual valve	75	Manual valve
47	Pressure gauge (0 - 400 mbar)	76	Pressure gauge
48	Manual valve	77	Pilot burner
50	Burner		**FGR+air train**
	Compressed air train	60	Draught fan
30	3-way Solenoid valve	78	Air Damper
33	Pressure switch	79	Air damper actuator
34	Pressure gauge	80	Flue gas damper
35	Pressure governor with filter	81	Flue gas damper actuator
36	Non-return valve	82	Flexible hose
38	Tank		

Items not included in the supply: 60, 70Items supplied loose: 40, 41, 78, 79, 80, 81

PART II: INSTALLATION

MOUNTING AND CONNECTING THE BURNER

Transport and storage

ATTENTION! The equipment must be installed in compliance with the regulations in force, following the manufacturer's instructions, by qualified personnel. All handling operations must be carried out with appropriate resources and qualified personnel

ATTENTION: Use intact and correctly dimensioned hoisting equipment, conforms to the local regulations and health and safety regulations. Do not stand under lifted loads.

If the product must be stored, avoid humid and corrosive places. Observe the temperatures stated in the burner data table at the beginning of this manual.

Matching the burner to the boiler

Packing

The burners are despatched in wooden crates whose dimensions are:

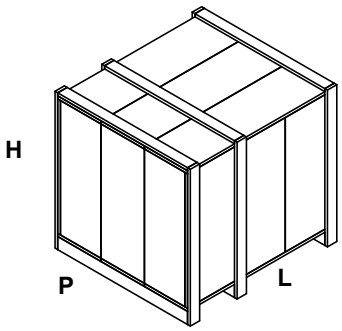
11320 mm x 2669 mm x 2300 mm (L x P x H)

Packing cases of this type are affected by humidity and are not suitable for stacking.

The following are placed in each packing case:

- burner and gas train;
- accessories
- envelope containing this manual.

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



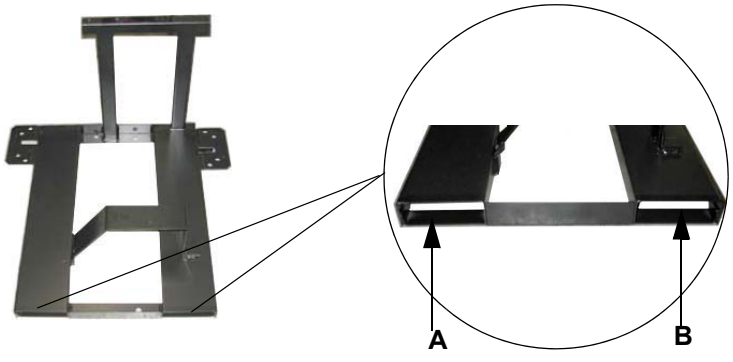
Handling the burner

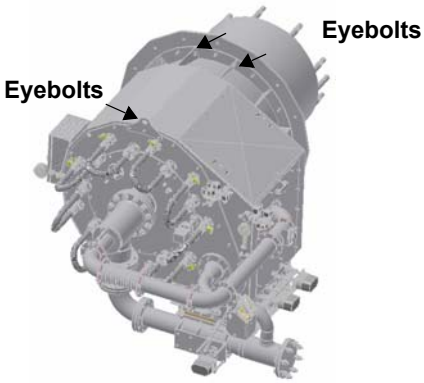
WARNING! The handling operations must be carried out by specialised and trained personnel. If these operations are not carried out correctly, the residual risk for the burner to overturn and fall down still persists.

To move the burner, use means suitable to support its weight (see paragraph "Technical specifications").

The unpacked burner must be lifted and moved only by means of a fork lift truck.

The burner is mounted on a support provided for handling the burner by means of a fork lift truck: the forks must be inserted into the A anb B ways. Remove the support before the burner mounting to the boiler. Lift the burner by means the eyebolts.





The burner is provided with eyebolts, for handling operations.

Put the sealing material between the burner flange and the boiler.



Sealing material is not supplied ceramic fibre plait is reccomended!

Sizing of the FGR pipe (FGR burners only)

ATTENTION! Performance curve is obtained in a plant according to the example picture, sizing the pipe as per the below example.

""

FGR system for URB applications:

The supply includes a conveyor with the two shutters described below:

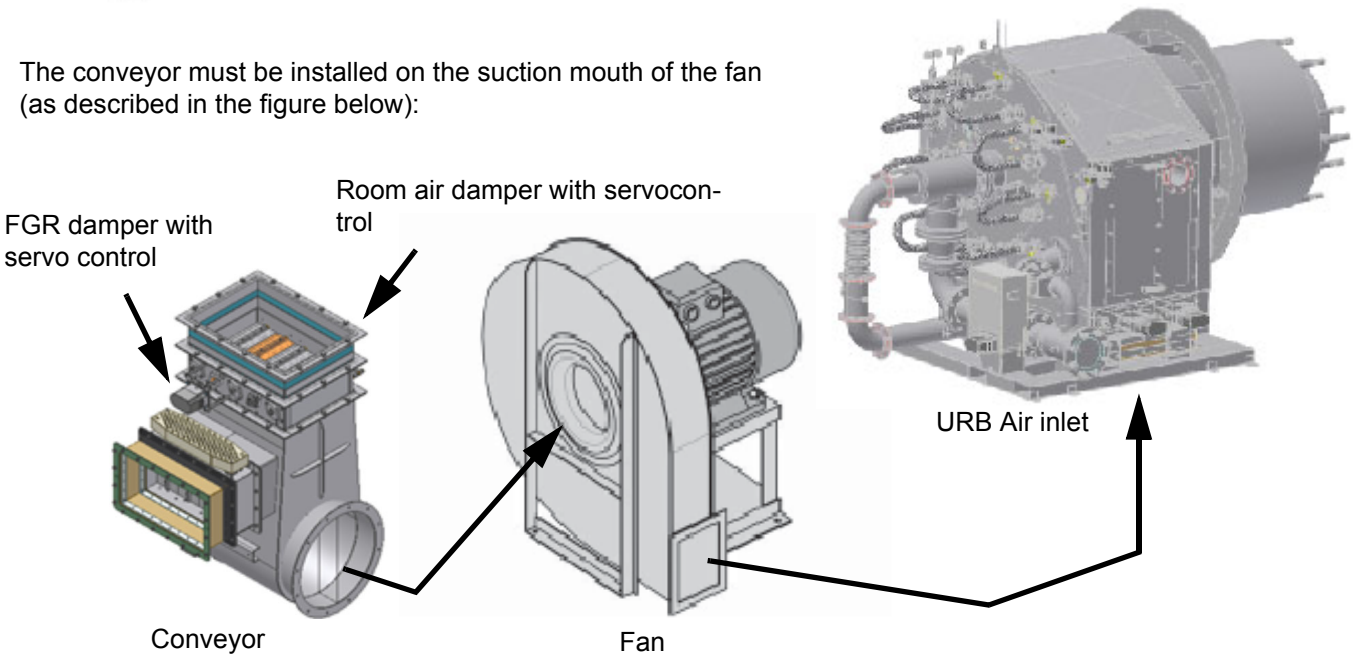


N. 1 Air damper with servocontrol



N. 1 Flue gas damper with servocontrol

The conveyor must be installed on the suction mouth of the fan (as described in the figure below):

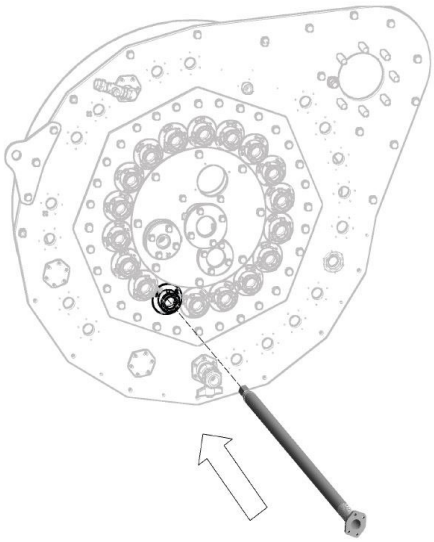


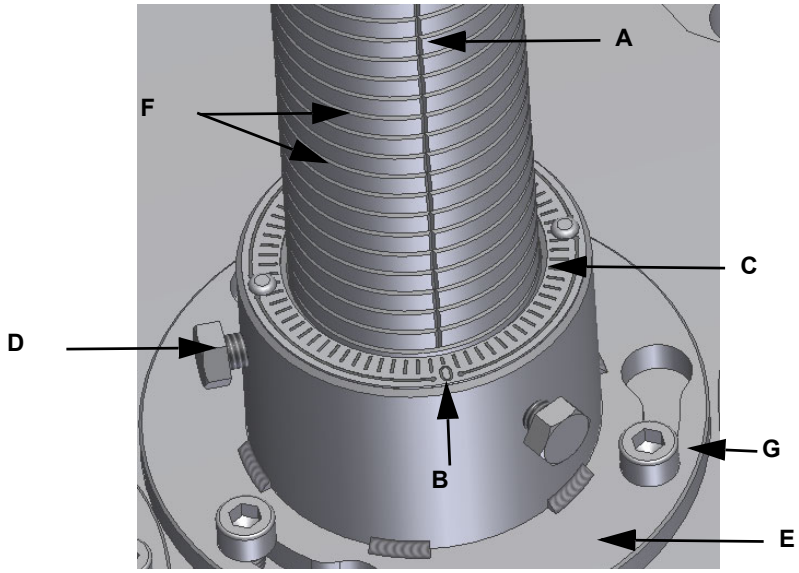
They are not included in the supply: channeling from fan to burner, flue gas piping and condensation drain (for the ducting, it is recommended to use insulated double-walled stainless steel pipe and provide for the condensation discharge on the flue gas channel).

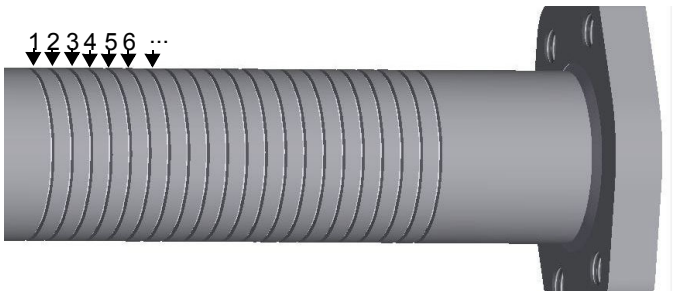
ATTENTION! We recommend to install a safety net at the air damper inlet or at the air inlet in case of air canalization (safety net not included in the supply).

The inner dimensions of the FGR duct must be provided according to the flue gas damper size provided in the supply.
The damper for the flue gas and the one for ambient air (both provided supplied loose) must be installed onto a coupling that must be mounted on the fan's inlet according to the scheme in the picture above.
The coupling in the picture is to be taken just as reference/example and it is not included in the supply. It must be designed and provided by the customer.

Mounting the gas guns





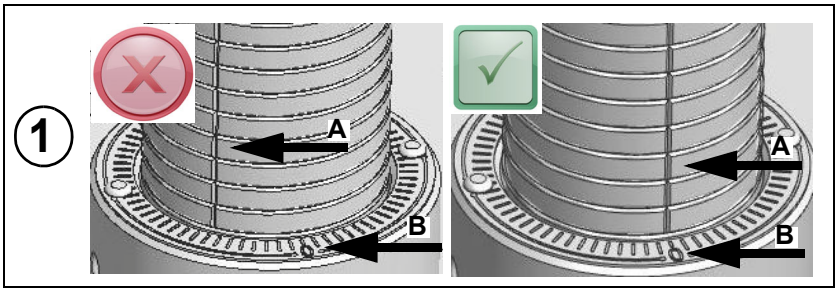


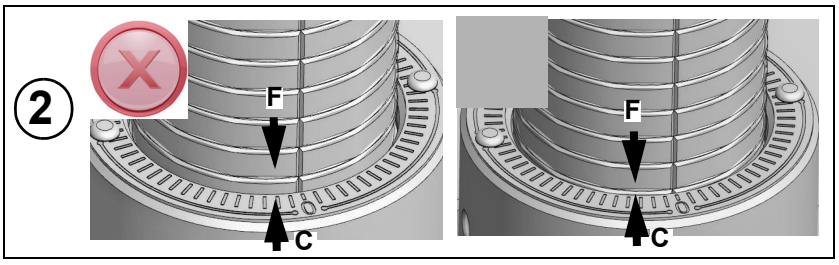
1 Align the reference notch **(A)** to the “0” mark **(B)**

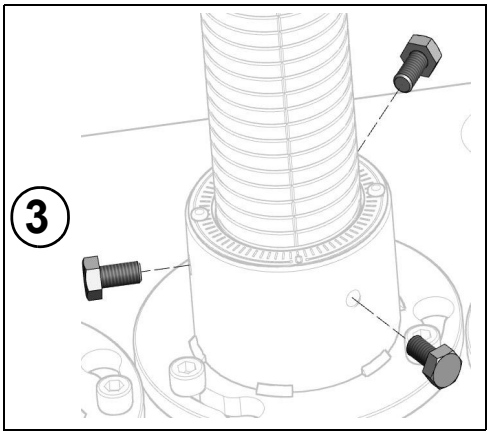
2 Align the ring **(F)** with the edge **(C)**

3 Once the nozzle “0” position is set, tighten the three grub screws (ref. **D**) around the removable flange (ref **E**). Insert the flange (**E**) inside its site.

In order to keep the lance referance and position during the mantenaince operation act on the allen screw (pos. **G**), rotate the flange and remove the lance.



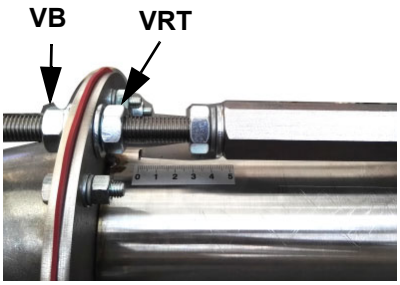


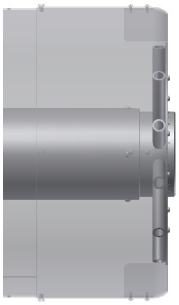


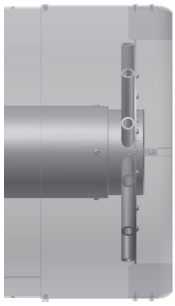
ATTENTION: the zero (ref. B) position must be directed towards the axis of the flame

ATTENTION: During maintenance operation don't exchange the lance or their reference position

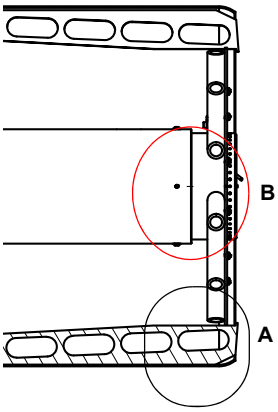
.The combustion head position affects the flame stability.The diffuser position must be set during the commissioning according to the regulation needs. The diffuser position is factory set as shown in figure ”A” (x = 10 mm). If different settings are required, it is possible to change the position: loosen the VB screw and slightly move the combustion head backwards, turning clockwise the knob VRT. Fasten VB screw when the adjustment is accomplished.

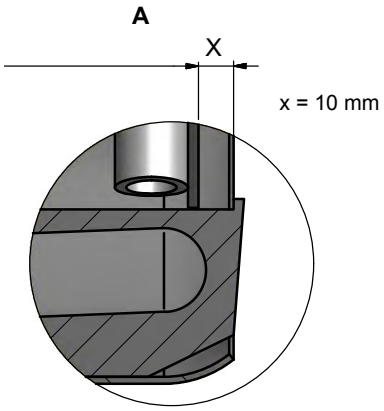


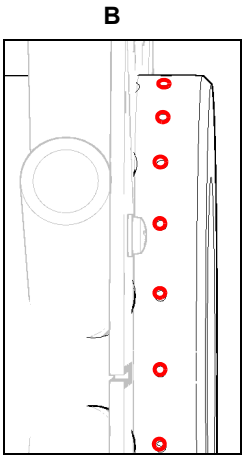

“all-ahead” position


“all-backwards” head position

Depending on the boiler application, it is possible to act on the holes (figure B) to improve the flame stability and NOx, CO emission values. If necessary, close/open the holes in figure “B” using the screws kit given with the burner.



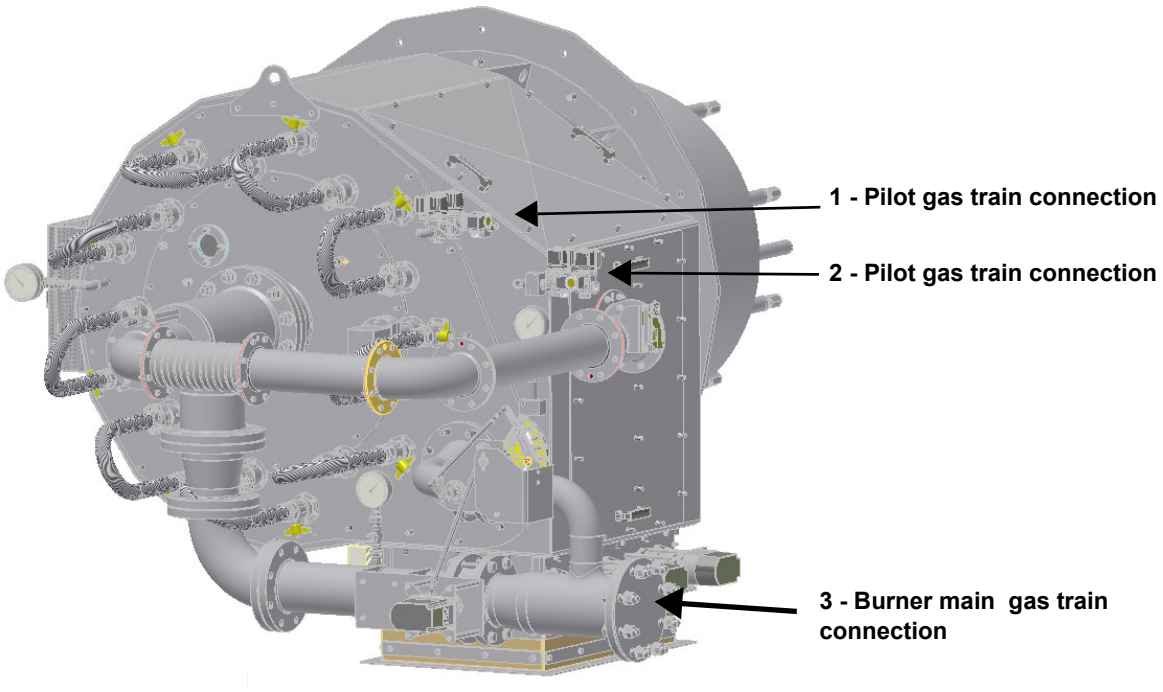


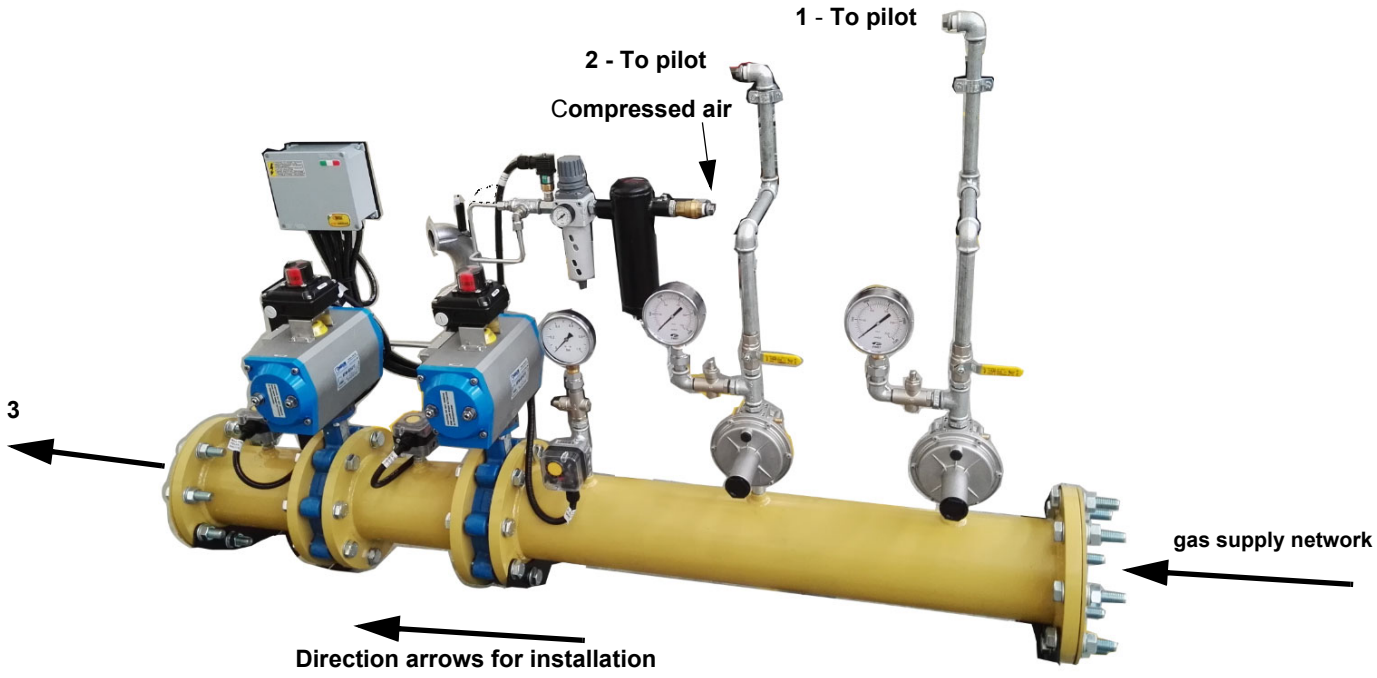


GAS TRAIN CONNECTIONS

Referring to the P&ID of the burner, execute the connection.

WARNING: BEFORE EXECUTING THE CONNECTIONS TO THE GAS PIPE NETWORK, BE SURE THAT THE MANUAL CUTOFF VALVES ARE CLOSED.





ATTENTION: THE BURNED GAS RATE MUST BE READ AT THE GAS FLOW METER.

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 reccomended 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 electrically all its elements: gas valves group and pressure switches.

ATTENTION: once the gas train is mounted according to the diagram on Fig. 4, the gas proving test mus be performed, according to the procedure set by the laws in force.

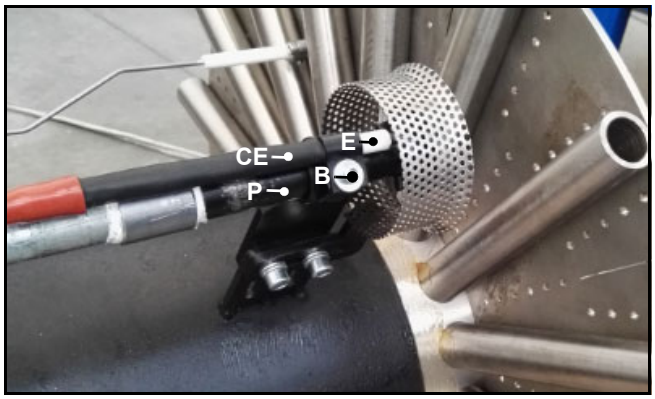
ATTENTION: it is recommended to mount filter and gas valves to avoid that extraneous material drops inside the valves, during maintenance and cleaning operation of the filters (both the filters outside the valves group and the ones built-in the gas valves).

Replacing the ignition electrode

ATTENTION: avoid the electrode to get in touch with metallic parts (blast tube, head, etc.), otherwise the boiler operation would be compromised. Check the electrode position after any intervention on the combustion head.

To replace the ignition electrode, proceed as follows:

1 remove the burner cover
2 disconnect the electrode (E) cable (CE);
3 remove the combustion head (see par. “Removing the combustion head”);
4 loose screw (B) that fasten the ignition electrode (E) to the burner pilot (P);
5 remove the electrode and replace it, referring to the values quoted on figure.



Pilot burner

The burner is equipped with an electrically ignited gas pilot which can be operated with either natural or liquid petroleum gas.

It is composed by a net diffuser, an electrode for ignition, an isolator, one or two electromagnetic valves and a pressure governor. Pilots utilise also a raw gas tube that induces raw fuel into the pilot flame that greatly increases its size for ease of main flame ignition.

The pilot provides sufficient flame to instantly, reliably ignite the main burner fuel, providing that pressure has to be regulated in order to have a good flame; it means that:

- pressure has not to drop too much for not loosing the flame
- pressure has not to increase too much for avoiding flame breaking.

The additional pipe T increases the flame length and facilitates the ignition

The pilot gas train is already installed to the burner, the following connections must be executed:

- connection from the filter with stabiliser to the gas pilot valve
- connection between pilot valves and the main gas train, by means of the pipe provided with the burner.

ELECTRICAL CONNECTIONS

WARNING! 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.

WARNING! 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.

ATTENTION: Connecting electrical supply wires to the burner teminal block MA, be sure that the ground wire is longer than phase and neutral ones.

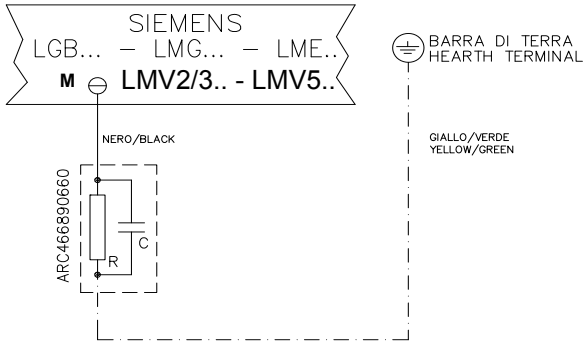
To execute the electrical connections, proceed as follows:

1 execute the electrical connections to the supply terminal board as shown in the attached wiring diagrams;
2 check the direction of the fan motor (see next paragraph);
3 do not reverse phase with neutral
4 ensure burner is properly earthed
5 refer to the attached document "RECOMMENDATIONS FOR LMV5x CONNECTIONS"

Note on elecrtical supply

If the power supply to the burner is 230V three-phase or 230V phase-phase (without a neutral), with the Siemens control box, between the terminal 2 (terminal X3-04-4 in case of LMV2x, LMV3x, LMV5x, LME7x) on the board and the earth terminal, an RC Siemens RC466890660 filter must be inserted.

Key
C - Capacitor (22nF/250V)
LME / LMV - Siemens control box
R - Resistor (1MΩ)
M - Terminal 2 (LGB,LMC,LME), terminal X3-04-4 (LMV2x, LMV3x, LMV5, LME7x)
RC466890660 - RC Siemens filter



For LMV5 control box, please refer to the clabeling recommendations avaible on the Siemens CD attached to the burner

PART III: OPERATION

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

DANGER: 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!

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 AUTHORISED 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 EXCEPT FOR ITS MAINTENANCE.

TO SECURE THE MACHINE, ACT ON THE ISOLATOR SWITCH. IN CASE OF ANOMALIES THAT REQUIRED A SHUT DOWN OF THE BURNER, IT'S POSSIBLE TO ACT ON THE AUXILIARY LINE SWITCH, LOCATED ON THE BURNER FRONT PANEL.

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.

ADJUSTING AIR AND FUEL FLOW RATES

Adjusting air and gas flow rates

WARNING! 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 fuel decrease slowly until the normal combustion values are achieved.

WARNING: any changes to the burner setting (intervention on the combustion head, air register, leverages, components for adjusting the flow rate, etc.) must be performed by qualified personnel, checking the combustion parameters by flue gas analyzer. This applies to all operations described in the following paragraphs.

WARNING! the combustion air excess must be adjusted according to the values in the following chart.

Recommended combustion parameters		
Fuel	Recommended (%) CO_2	Recommended (%) O_2
Natural gas	9 ÷ 10	3 ÷ 4,8

Adjustments - brief description

The air and fuel rates adjustments must be performed at the maximum ouptput first (“high flame”): see the LMV5.. related manual..

- Check that the combustion parameters are in the suggested limits.
- Then, adjust the combustion values by setting the “fuel/air” ratio” curvepoints (see the LMV5.. related manual).
- Set, now, the low flame output, 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.

Adjusting procedure

Go on adjusting the burner.

Users can set only the LMV parameters that can be accessed without password: (see “Adjusting the temperature set-point”).

The Siemens AZL User Interface allows programming the Siemens LMV system and monitoring the system data.



The user interface is made of:

1. display: it showes menus and parameters
2. ESC key (previous level): it goes back to the prevoius level menu or exits the programming mode without changing data.
3. ENTER key (next level): it confirms the data changing and jumps to the next menu/parameter.
4. SELECT keys: they select a menu item and change the parameter values.

As far as the settings, see the LMV5 related manual.

By following the “air/gas ratio” curvepoints setting procedure on the LMV5.. manual, adjusting the air and gas flow rates: check, continuosly, the flue gas analisys, as to avoid combustion with little air; dose the air according to the gas flow rate change following the steps quoted below.

Once the throttle valve is completely opened, 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:

Start-up procedure

1 Turn the burner on.

2 the LMV control box starts the system test cycle: the AZL display shows the **System Test** message; at the end of the test, it shows the main page and the system stops (the safety chain is open) waiting for the startup enabling signal (standby - Program phase no. 12)

Setpoint	80°C
Act.value	78°C
Fuel	GAS
Standby	12

Main page

3 check the fan motor rotation (see related paragraph).
4 make the safety chain enabling the system to start up
5 the combustion cycle starts: the system will show the operating stages

- Prepurging (program phase no.30)
- Driving to ignition position (program phase no.36)
- Ignition position (program phase no.38)
- Fuel (the fuel solenoid valves open)
- Flame (the flame lights up)
- Driving to low flame (the actuator drives to low flame).
NOTE: the **C** and **A**, on the .
Once the ignition cycle ends, the main page is shown:

Setpoint	80°C
Act.value	78°C
Load	24%
Flame	60%

Main page

Set point: temperature set-point
Act value: actual temperature value
Load: load percentage (burner output)
Flame: percentage of flame detection current.
By pressing the ENTER key the display shows the second page:

Fuel	0.0	Air	1.8
Ax		VSD	0.0
Ax		O2	
Ax		Ld.	0.0

Second page

Fuel: it shows (in degrees) the fuel actuator position.
Air: it shows (in degrees) the air actuator position.
Ax1..3: auxiliaries.
VSD: % value on the inverter maximum frequency
O2: oxygen percentage
Ld: load percentage (burner output).

Press the ENTER key to go back to the main page.
To access the **main menu**, from the main page, press the ESC key tiwce:

OperationalStat
Operation
ManualOperation
Params & Display

Main menu

By pressing the ESC key once, the ***Operational Status*** (first item in the main menu) menu is directly shown:

Normal operation
Status/Reset
Fault History
Lockout History

the ***Operational Status*** menu provides the following items:

Normal operation: by selecting this item and pressing the ENTER key, the main page is showed; press ESC to go back to the main menu.

Status/Reset: it shows system errors or faults occuring / it represents the lockout reset function.

Fault History: by selecting this item and pressing the ENTER key, the Lockout History will be showed about the last 21 faults occured.

Lockout History: by selecting this item and pressing the ENTER key, the Lockout History will be showed about the last 9 lockouts occured, and the related date and hour.

Alarm act/deact: enable/disable the horn in case of alarm.

Fault History

To visualise the **Fault History**, select it and press the ENTER key. The message will be as:

1 Class:			05Gas
code	BF	Phase:	10
Diag.:	00	Lod:	0.0
Start No.			88

alternating by an error message as:

O2 control and
limiter automat
deactivated

To see the other Fault History pages, press the arrow keys.

To exit the Fault History pages, press ESC.

Lockout History

To visualise the **Lockout History**, choose the related item and press ENTER. The message will be:

1	10.08.07		13.47
C:71	D:00	F:	12
Start No.			88
Load	0.0		Gas

alternating by an error message as:

No flame at end
of safety time

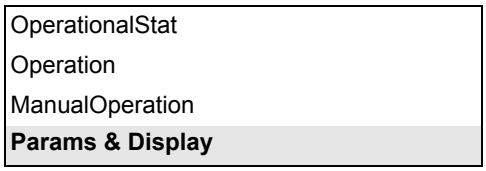
To see the other Lockout History pages, press the arrow keys.

To exit the Lockout History pages, press ESC.

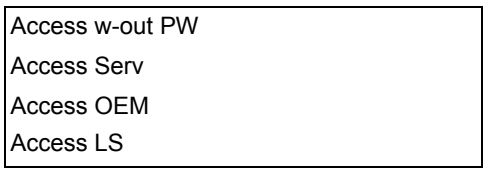
Setting the temperature/pressure set-point value

To set the temperature/pressure set-point value, that is the generator operating temperature/pressure; proceed as follows.

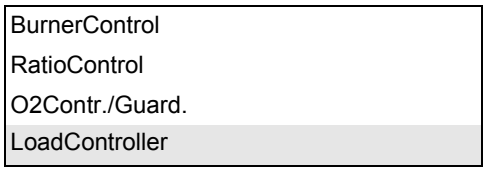
From the main page, enter the main menu by pressing the ESC key twice:



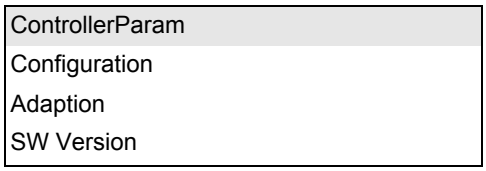
by means of the arrow keys, select “Params&Display”, press ENTER: the system will ask you to enter the proper password



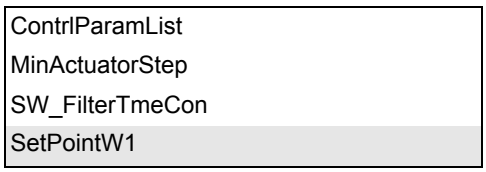
by means of the arrow keys, select “Access w-out pass” (access without password - user level), confirm by pressing ENTER.
The other levels require password reserved to the Technical Service, to the Manifacurer, etc.
The menu shown accessing without password is the following:



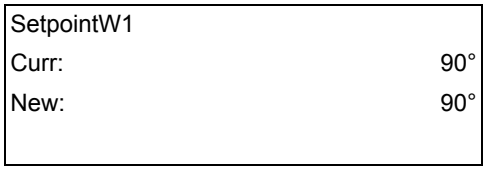
Choose “LoadController” and press ENTER: the following menu is shown:



Choose “ControllerParam” and press ENTER: the following menu is shown:



Choose “**SetPointW1**” and press ENTER:



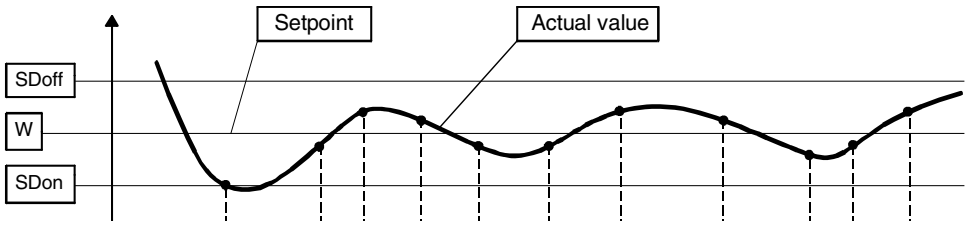
Curr: it shows the current set-point; use the arrows keys to change.

NOTE: the availabel range for this parameter depends on the probe provided; the unit measure of the detected value and its limits are bound up with parameters set at the “Service” level.

Once the new set-point is set, confirm by pressing ENTER, otherwise exit without changings by pressing ESC.

Press ESC to exit the set-point programming mode.

Once the temperature set-point W1 is imposed, set the Switch-on (SDon) and the Switch-off (SDoff) point of the 2-position controller:



To set these values, select the item SD_ModOn (SDOn), by scrolling down the “Load controller” menu with the arrow keys and press ENTER:

SetpointW1
SetpointW2
SD_ModOn
SD_ModOff

the display will show:

SD_ModOn	
Curr::	1.0%
New:	1.0%

The deafult value for this parameter is1% that is, the burner will light again at a temperature 1% lower than the set-point. Change value, if needed, by means of the arrow keys; press ENTER to confirm and the press ESC to exit. Press only ESC to exit without changing.

Now choose SD_ModOff always scrolling down theLoad Controller menu, by menas of the arrow keys, and press ENTER.

SetpointW1
SetpointW2
SD_ModOn
SD_ModOff

the display will show:

SD_ModOff	
Curr::	10.0%
New:	10.0%

The deafult value for this parameter is10% that is, the burner will turn off at a temperature 1% higher than the set-point.

Change value, if needed, by means of the arrow keys; press ENTER to confirm and the press ESC to exit. Press only ESC to exit without changing. Press the ESC key until the following menu is shown:

BurnerControl
RatioControl
O2Contr./Guard.
LoadController

scroll this menu down until the tiem “AZL” is reached

LoadController
AZL
Actuators
VSD Module

confirm by pressing ENTER:

Times
Languages
DateFormat
PhysicalUnits

Times: it sets the “Summer (SUM) Time / Winter (WIN) Time” operation and the continent (EU - Europe; US - United States)

Sum/Winter Time
Time EU/US

choose the Summertime/Wintertime mode desired and cofirm by pressing ENTER; press ESC to exit. Set the time zone (Time EU/US) in the same way.

Languages: it allows setting the current language

Language	
Curr::	Italiano
New:	English

choose the desired language and cofirm by pressing ENTER; press ESC to exit.

DateFormat: it allows setting the date format as DD-MM-YY (day-month-year) or MM-DD-YY (month-day-year)

DateFormat	
Curr::	DD-MM-YY
New:	MM-DD-YY

choose the desired format and cofirm by pressing ENTER; press ESC to exit.
PhysicalUnits: it allows setting the measuring units for temperature and pressure

UnitTemperature
UnitPressure

Settable temperature units: °C or °F
Settable pressure units: bar or psi.

- choose the desired unit and cofirm by pressing ENTER; press ESC to exit.
- choose the temperature and pressure unit and cofirm by pressing ENTER; press ESC to exit.

System lockout

If the system locks out, the following message will appear:

1	10.08.07		13.47
C:71	D:00	F:	12
Start No.			88
Load	0.0		Gas

call the Technical Service and tell the message data.

Cold start thermal shock (CSTP)

If the generator cannot suffer thermal shocks, the CSTP (Cold Start Thermal Schock) function can be enabled. This function is already set by the Technical service (access by reserved password).

if this function is enabled, when the burner starts upthe “Thermal shock protection activated” message will be showed.

If this function is not enabled, after startup, the burner will rapidly increase the load according to the requested value and, if necessary, to the maximum output.

Manual mode

To by-pass the thermal protection or not to let the buner operate in high flame stage (maximum output) after ignition, the manual mode is provided.

To choose the manual mode (Manual Operation), use the SELECT arrow keys

OperationalStat
Operation
ManualOperation
Params & Display

Items to be set are the following:

SetLoad
Autom/Manual/Off

SetLoad: to set the required load percentage

SetLoad	
Curr::	0.0%
New:	20.0%

set the required percentage and confirm by pressing ENTER; press ESC to exit.

choose “Autom/Manual/Off

SetLoad
Autom/Manual/Off

Autom/Manual/Off	
Curr::	Automatic
New:	Burner On

three modes are provided:

Automatic: automatic operation

Burner on: manual operation

Burner off: burner in stand-by

If the BurnerOn mode is choosen,the burner does not follow the modulator and probe settings, but operates at the set load.

Caution: if BurnerOff mode is selected, the burner stays in stand-by.
Caution: in the BurnerOn mode, the safety thresholds are set by the Technical Service.

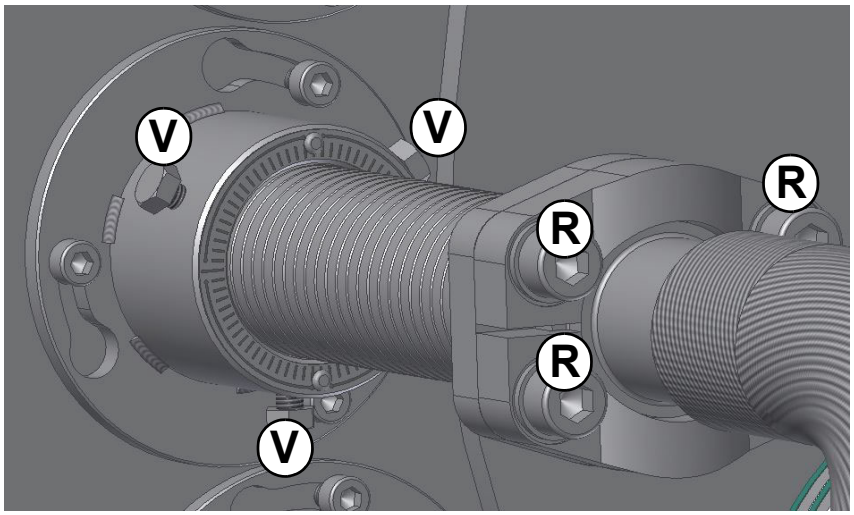
For further details, see the LMV5x annexed manuals.

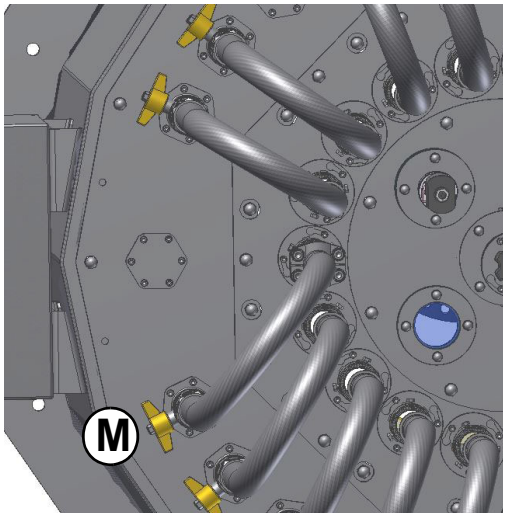
ADJUSTMENTS FOR GAS OPERATION

Adjusting the gas gun

The gas lances are already factory-set at standard position. Only when necessary, change the position following the next procedure:

- to move the lance back or forth, loosen the screws **V**, on each lance
- to rotate the lance, close the gas manual valve **M** on the lance, loosen the four screws **R** and **V** screws, without removing them; then rotate the lance in order to change the combustion according to the combustion resulted values.
- after the adjustment, remember to fasten all the screws





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

Setting air 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.



Calibration gas leakage pressure switch (PGCP)

- remove the pressure switch plastic cover;
- adjust the PGCP pressure switch to the same value set for the minimum gas pressure switch;
- replace the plastic cover.

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 upstreaam 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 paragrph. 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.

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.

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 o 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.

Adjusting the pilot gas flow rate: gas valve Brahma EG12xR and pressure governor

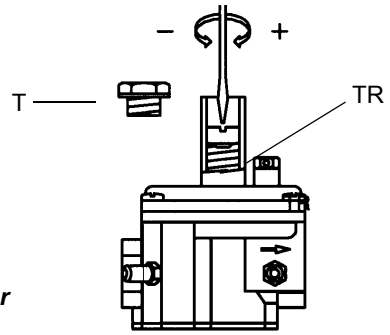
To change the pilot gas valve flow rate, proceed as follows:

1 remove the protection on the bottom of the valve, moving it counterclockwise (see next picture);

2 rotate clockwise the nut 1 as shown in to close the valve or counterclockwise to open.

To perform gas pressure adjustment, act on the pressure governor as follows (see next picture):

3 remove the cap **T**: to increase the gas pressure at the outlet use a screwdriver on the screw **TR** as shown in the next picture. Screw to increase the pressure, unscrew to decrease; once the regulation is performed, replace cap **T**.



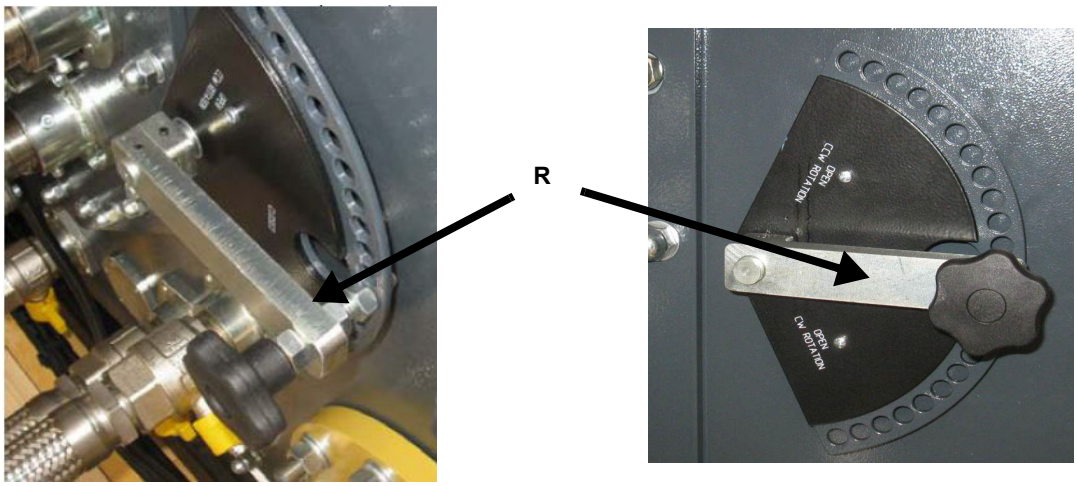
Gas pressure governor

Adjusting the air register

If necessary, adjust the air register, by moving the R selector:

- central position: register closed.
- counterclockwise rotation (CCW): the flame rotates couterclockwise
- clockwise rotation (CW):the flame rotates clockwise

Note: the more the register is opened, the more the flame rotate and enlarge itself



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

PART IV: 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 MANAUL CUTOFF VALVES CLOSED!

ATTENTION: READ CAREFULLY THE "WARNINGS" CHAPTER AT THE BEGINNIG OF THIS MANUAL.

ROUTINE MAINTENANCE

- Clean and examine the gas filter cartridge and replace it if necesssary;
- Remove and clean the combustion head;
- Examine and clean the ignition electrodes, adjust and replace them if necessary;
- Examine and clean the detection electrode/photoelement (according to the burner models), replace it if necessary, in case of doubt, check the detection circuit, after the burner start-up;
- Clean and grease leverages and rotating parts.

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

WARNING: 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 inbetween 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).

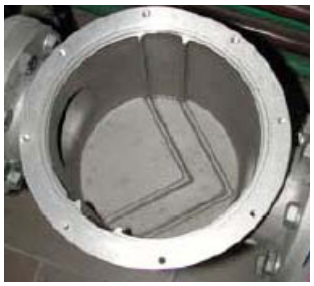
A



B



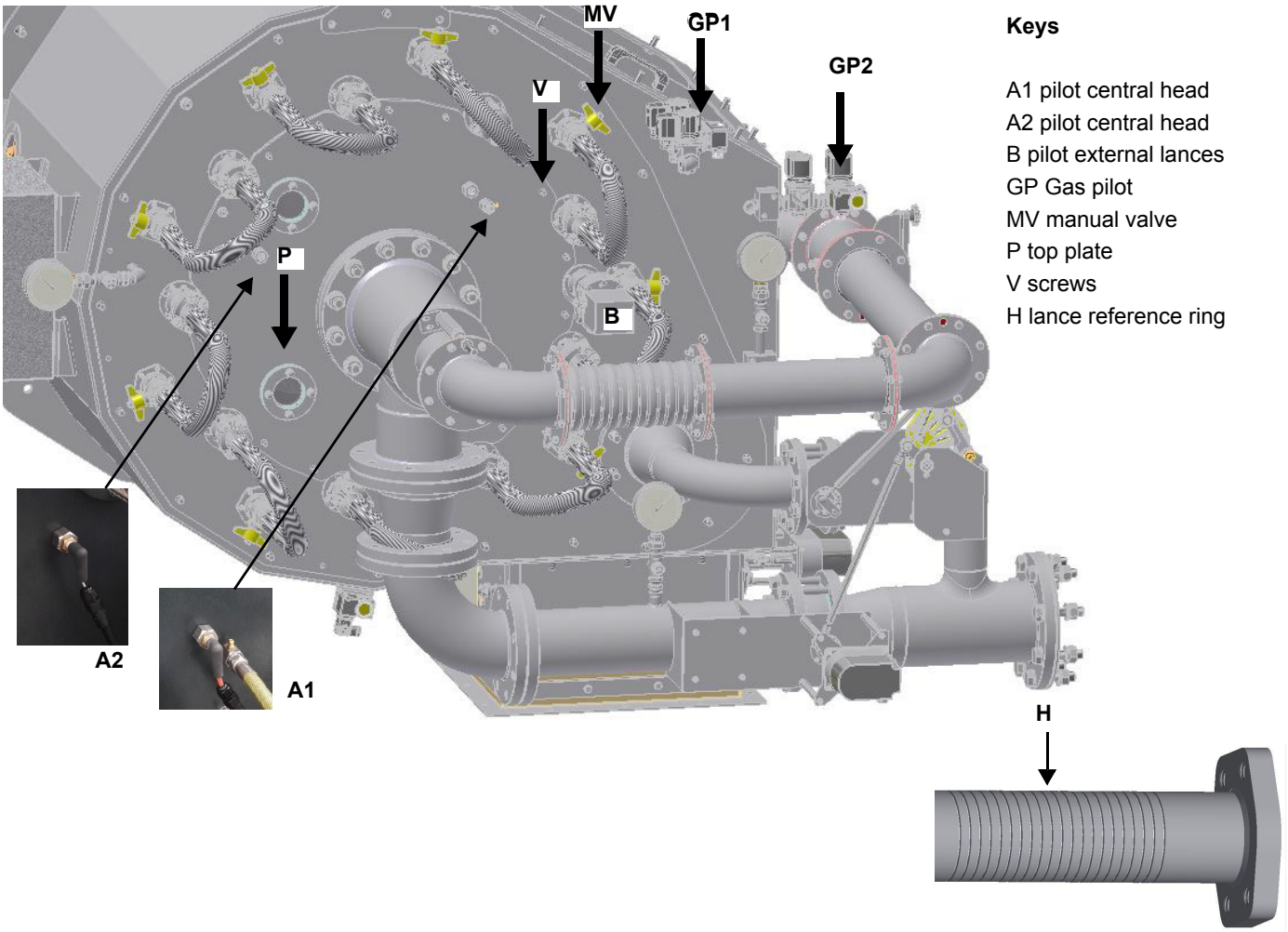
C



Removing the combustion head

- Check the gas lances positioning on their reference, in order to re-establish the same positioning later
- Close the manual valves (MV) at the gas flexible hoses inlet
- Remove the gas pilot (GP) after having disconnected the flexible hoses.
- Remove the gas lances (GL) after having disconnected the flexible hoses
- Remove all the electrical connections.
- Remove the flame detector out of its holder (FSH)
- Loosen the (V) screws that fasten the top plate P
- Remove the top plate (P) and the gas pilot (the operation is simplified by the internal support with guide)
- Clean the combustion head by means of a vacuum cleaner; scrape off the scale by means of a metallic brush.

To assemble the combustion head, reverse the operations described bove



Keys

A1 pilot central head
A2 pilot central head
B pilot external lances
GP Gas pilot
MV manual valve
P top plate
V screws
H lance reference ring

ATTENTION: to assemble the combustion head, reverse the operation described above.

To reassemble the gas lances, pay attention to insert them in the same position as before, checking the references H on the operator side top plate (P)

Replacing the ignition electrode

ATTENTION: avoid the electrode to get in touch with metallic parts (blast tube, head, etc.), otherwise the boiler operation would be compromised. Check the electrode position after any intervention on the combustion head.

To replace the ignition electrode, proceed as follows:

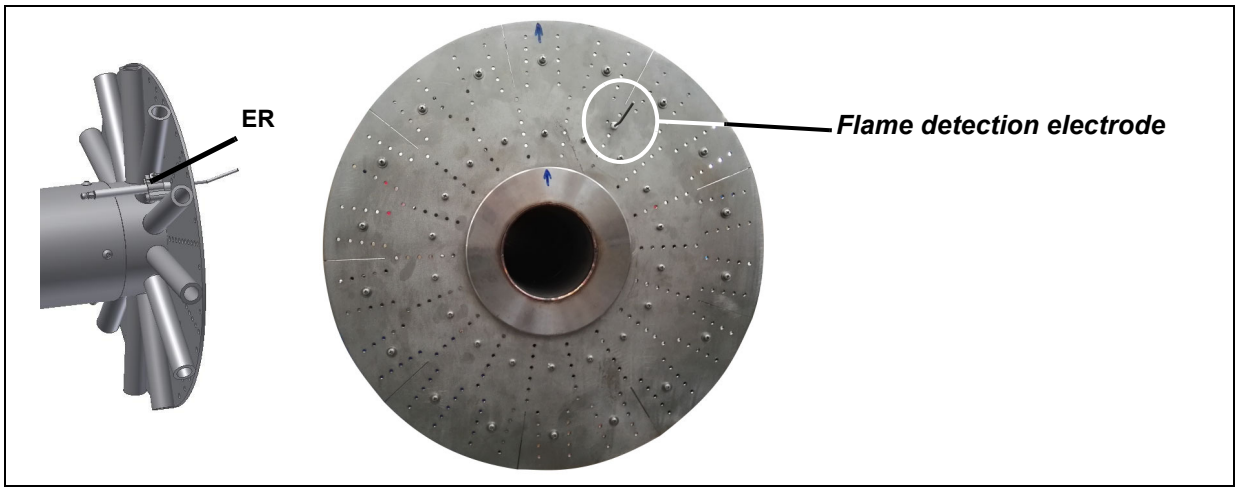
- disconnect the electrode cable (EC – see picture above)
- loose the screws that fasten the ignitor plate and remove the ignitor ass.y;
- loosen the screw that fixes the ignition electrode to the burner ignitor;
- remove the electrode and replace it.
-

Replacing the detection electrode (natural gas burners)

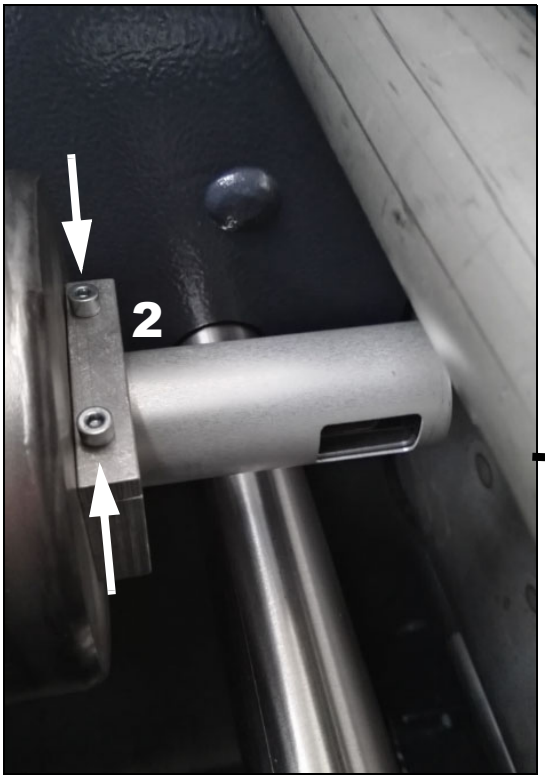
ATTENTION: avoid the electrode to get in touch with metallic parts (blast tube, head, etc.), otherwise the boiler operation would be compromised. Check the electrode position after any intervention on the combustion head.

To replace the detection electrode, proceed as follows:

1 remove the combustion head according to the procedure on paragraph “Removing the combustion head”;
2 by means of an allen key, loose the fixing screws of the detection electrode **ER** and replace it;
3 replace the combustion head.



PHOTOCELL



To maintenance the photocell:

1 - Loosing the 4 bolts,
remove the UV support from it's seat

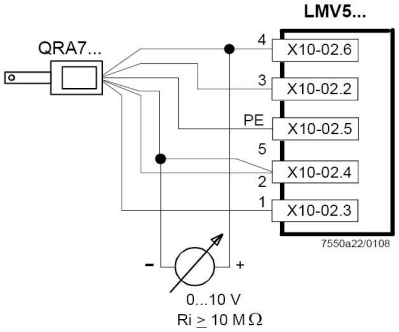
2 - Loosing the 2 screws the UV,
scanner is free to be removed



Checking the detection current

To check the detection signal follow the scheme in the picture below. If the signal is less than the value indicated, check the position of the detection electrode or detector, the electrical contacts and, if necessary, replace the electrode or the detector.

Control box	Minimum detection signal
LMV5	3.5 Vdc



Assignment of LMV5… terminals:

X10-02 pin 2	QRI... supply
X10-02 pin 3	L
X10-02 pin 4	N
X10-02 pin 5	PE
X10-02 pin 6	QRI... signal

Fig. 5

Seasonal stop

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

1 turn the burner main switch to 0 (Off position)
2 disconnect the power mains
3 close the fuel valve of 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”.

TROUBLESHOOTNG GUIDE - Gas operation

BURNER DOESN'T LIGHT	* No electric power supply	* Wait until power supply is back
	* Main switch open	* Close the switch
	* Thermostats open	* Check set points and thermostat connections
	* Bad thermostat set point or broken thermostat	* Set or replace the thermostat
	* No gas pressure	* Restore gas pressure
	* Safety devices (manually operated safety thermostat or pressure switch and so on) open	* Restore safety devices; wait that boiler reaches its temperature then check safety device functionality.
	* Broken fuses	* Replace fuses. Check current absorption
	* Fan thermal contacts open (only three phases)	* Reset contacts and check current absorption
	* Burner control locked out	* Reset and check its functionality
	* Burner control damaged	* Replace burner control
GAS LEAKAGE: BURNER LOCKS OUT (NO FLAME)	* Gas flow too low	* Increase the gas flow * Check gas filter cleanness * Check butterfly valve opening when burner is starting (only Hi-Low flame and progressive)
	* Ignition electrodes discharge to ground because dirty or broken	* Clean or replace electrodes
	* Bad electrodes setting	* Check electrodes position referring to instruction manual
	* Electrical ignition cables damaged	* Replace cables
	* Bad position of cables in the ignition transformer or into the electrodes	* Improve the installation
	* Ignition transformer damaged	* Replace the transformer
BURNER LOCKS OUT WITH FLAME PRESENCE	* Bad flame detector set	
	* Flame detector damaged	* Replace or adjust flame detector
	* Bad cables of flame detector	* Check cables
	* Burner control damaged	* Replace burner control
	* Phase and neutral inverted	* Adjust connections
	* Ground missing or damaged	* Check ground continuity
	* Voltage on neutral	* Take off tension on neutral
	* Too small flame (due to not much gas)	* Adjust gas flow * Check gas filter cleanness
	* Too much combustion air	* Adjust air flow rate
BURNER CONTINUES TO PERFORM PRE-PURGE	* Burner control damaged	* Replace burner control
	* Air servomotor damaged	* Replace servomotor
BURNER CONTINUES TO PERFORM ALL ITS FEATURES WITHOUT IGNITING THE BURNER	* Air pressure switch damaged or bad links	* Check air pressure switch functions and links
	* Burner control damaged	* Replace burner control
BURNER LOCKS OUT WITHOUT ANY GAS FLOW	* Gas valves don't open	* Check voltage on valves; if necessary replace valve or the burner control * Check if the gas pressure is so high that the valve cannot open
	* Gas valves completely closed	* Open valves
	* Pressure governor too closed	* Adjust the pressure governor
	* Butterfly valve too closed	* Open the butterfly valve
	* Maximum pressure switch (if installed) open.	* Check connection and functionality
	* Air pressure switch doesn't close the NO contact	* Check connections * Check pressure switch functionality
BURNER LOCKS OUT AND THE CONTROL WINDOW SHOWS A P	* Air pressure switch damaged (it keeps the stand-by position or badly set	* Check air pressure switch functionality * Reset air pressure switch
	* Air pressure switch connections wrong	* Check connections
	* Air fan damaged	* Replace motor
	* No power supply	* Reset power supply
	* Air damper too closed	* Adjust air damper position
BURNER LOCKS OUT DURING NORMAL RUNNING	* Flame detector circuit interrupted	* Check wiring * Check photocell
	* Burner control damaged	* Replace burner control
	* Maximum gas pressure switch damaged or badly set	* Reset pressure switch or replace it
WHEN STARTING THE BURNER OPENS FOR A WHILE THE VALVES AND THEN REPEATS FROM THE BEGINNINGTHE CYCLE FROM PRE-PURGE	* Gas pressure switch badly set	* Reset the pressure switch
	* Gas filter dirty	* Clean gas filter
	* Gas governor too low or damaged	* Reset or replace the governor
BURNER STANDS WHILE RUNNING WITHOUT ANY SWITCHING OF THERMOSTATS	* Thermal contacts of fan motor open	* Reset contacts and check values * Check current absorption
FAN MOTOR DOESN'T START	* Internal motor wiring broken	* Replace wiring or complete motor
	* Fan motor starter broken	* Replace starter
	* Fuses broken (three phases only)	* Replace fuses and check current absorption
BURNER DOESN'T SWITCH TO HIGH FLAME	* Hi-low flame thermostat badly set or damaged	* Reset or replace thermostat
	* Servomotor cam badly set	* Reset servomotor cam
SOMETIMES THE SERVOMOTOR RUNS IN THE WRONG WAY	* Servomotor capacitor damaged	* Replace capacitor

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