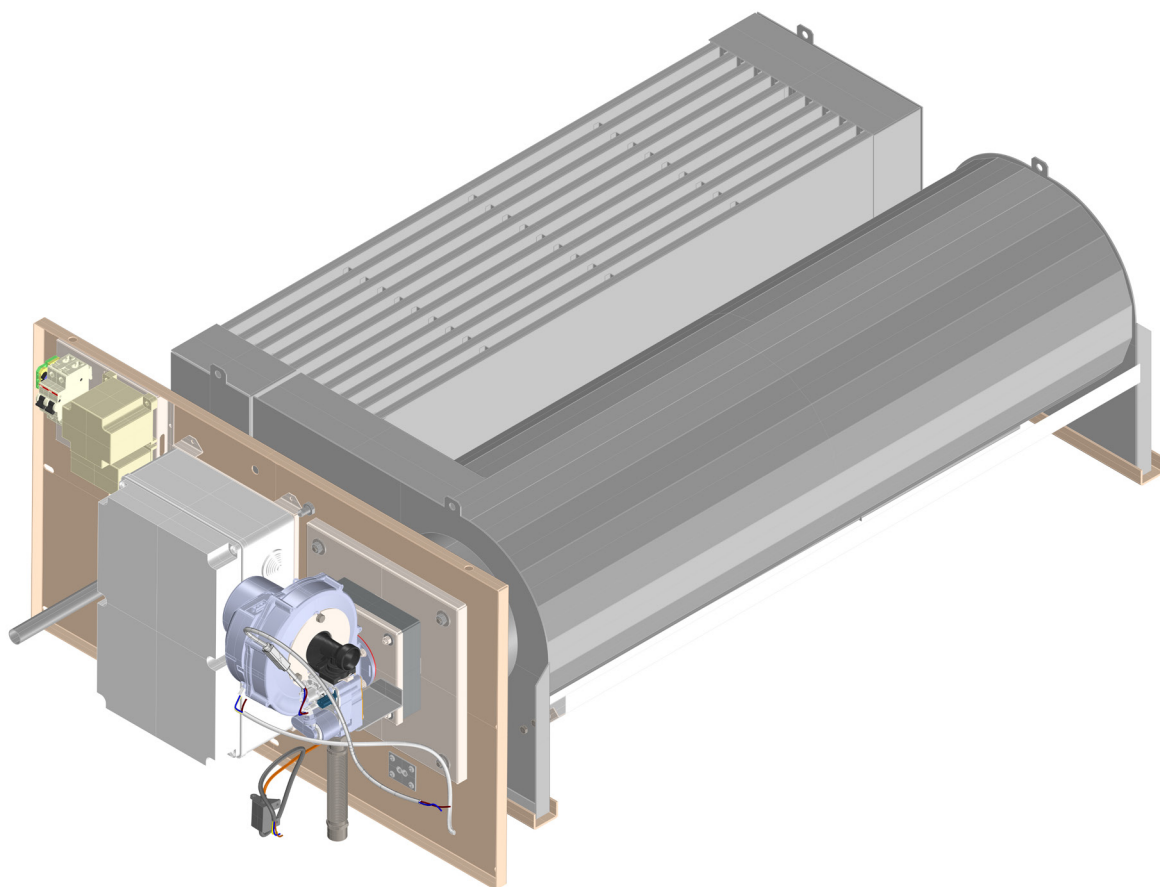


EOLO LX

HEAT EXCHANGER
GAS UNIT



SYSTEMA

Instruction manual
installation, use and maintenance

ENGLISH



00EN20220601



Rev. 00EN20220601

Symbols used in the manual



Note

Useful reference information for proper device operation.



Important

Important information and recommended practice.



DANGER

In this manual, the word DANGER combined with the danger symbol indicates a danger with a high level of risk which, if not avoided, will result in death or severe injury.



WARNING

In this manual, the word WARNING combined with the warning symbol indicates a danger with a medium level of risk, which, if not avoided, could result in death or severe injury.



CAUTION

In this manual, the word WARNING combined with the warning symbol indicates a danger with a medium level of risk, which, if not avoided, could result in death or severe injury.



READ CAREFULLY BEFORE USE; KEEP THE MANUAL FOR FURTHER REFERENCE

Before installation, make sure that the local distribution conditions, the nature of the gas and the pressure correspond to the settings of the device.

Systema Polska reserves a right to modify product content for the purposes of product improvement at sole discretion without preliminary notice.

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1 GENERAL RULES



These appliances are designed and built according to EU Regulation 2016/426 (GAR). Please, read this manual before use of the device.

- It is mandatory to follow the instructions in this manual, particularly concerning safety rules.
- In no case will Systema be responsible for any direct or indirect damage to humans, animals, or property, resulting from user's failure to follow the instructions given in this manual.
- This Operation Manual is an important and integral part of the device and should be stored carefully for further reference.



- Please, carefully read the instructions and warnings contained in this manual before installation and use of the device, as they provide important information regarding safety, installation, operation, and maintenance.
- If the manual is lost, please contact the manufacturer immediately.
- In case of change of owner or new tenant, please provide all the documentation related to the heating device to the new owner/tenant.
- When transferring the product to a new user please check the integrity and completeness of the device and its components. If the device and/or its components do not comply with the requirements, contact the seller.
- When installation work is complete, the installer should provide the owner with the necessary documentation to certify that installation has been carried out in a workmanlike manner and complies with the applicable country regulations.
- Excessively high temperatures in a heated space may be harmful to health and are a waste of energy. We recommend using your device reasonably.
- The manufacturer is responsible for the compliance of its product with the applicable rules at the time of the product selling.
- Compliance with the current legislation and regulations for the design of the systems, its installation, operation, and maintenance are the sole responsibility of the designer, installer and user.
- Distribution of this product without prior notice to the manufacturer is prohibited. In the country where the device was finally installed specific documentation is required, depending on the country of destination of the product.
- Additional devices installed in the same room or directly communicating rooms are considered as a single system, with a heat output equal to the sum of the thermal flows of the individual devices.

WARNING



- To ensure proper behavior of devices, it is important to strictly follow the manufacturer's instructions, to use original accessories and spare parts and to have the system maintained by qualified personnel (at least once a year).
- Do not install devices in areas, intended for trade or industrial activities, where the storage of materials and processing thereof pose the risk of gas, vapor or dust generation, which can cause fires or explosions.
- It should be possible to exchange air regularly in sites where the devices are installed, according to the current regulations.
- Installation, routing of gas pipes, electrical connection, the initial startup, and maintenance should be carried out by qualified personnel, following the instructions in this manual and should comply to the current national and local regulations of the country where the system is installed.
- Gas supply and electrical connections should comply with the current national and local regulations of the country where the system is installed. Where required, they should be designed by a qualified professional.
- The systems (gas pipes, power sources, etc.) should be designed without creating obstacles or risks to personnel.
- Do not use gas pipes for grounding of electric devices.
- Before starting devices, please check:
 - that the parameters of the electric power supply and gas supply networks are compatible with the instructions given in this manual and on the devices' nameplates;
 - that tightness of the gas supply system complies with the applicable standards and dimensions, and is equipped with all the necessary safety and control devices required by current regulations;
 - the proper routing and operation of gas exhaust and air intake pipelines;
 - the correct realization and operation of the delivery conduit of the condensate drain.
- This device should be used for its intended purpose only. Any other use is considered improper and therefore dangerous.
- In no case will the manufacturer be subjected to civil or criminal liability for any damage to humans or animals due to incorrect installation, adjustment and maintenance, modifications and tampering, use of non-original spare parts and accessories, incorrect and/or improper use of the device, noncompliance with the manufacturer's instructions and intervention of unqualified personnel.
- If the device is not used for long periods, it is recommended to perform the following operations:
 - turn the device main power switch and system master switch to OFF;
 - close the main shut-off gas valve.
- After long periods when the device was not used we recommend to contact the technical support or qualified technical personnel to put the device back into operation.
- If the device is stopped and/or malfunctioning, please turn it off. Any repair or replacement of components should be

carried out only by qualified personnel using only original spare parts. Failure to follow these rules may compromise the safety of the device.

- Do not leave packaging elements (nylon, polystyrene foam, wood, staples, etc.) within the reach of children and/or unattended, as they can be potential sources of danger and pollution. Collect and keep them in a special place.
Keep in mind that the use of electricity and gas-operated products must comply with some basic rules:
- The product shouldn't be used by disabled persons without assistance and children.
- If there is a smell of gas, do not operate electrical devices (such as switches), electrical appliances, etc. In such cases proceed as follows:
 - open the doors and windows to ensure air change in the premises;
 - close the main shut-off gas valve.
 - in case of a breakdown do not try to manage it by yourself, but immediately call qualified personnel or technical support.
- Do not touch the device barefoot and with wet or moist parts of the body.
- Do not attempt to clean or service the device when it is connected to the electric power supply. To carry out these operations it is first necessary to set the system master switch to OFF and close the supply of the fuel gas.
- It is strictly prohibited to tamper with or modify the safety and control systems without authorization and specific instructions from the device manufacturer.
- Do not pull, detach or twist the device's electrical cables, even when they are disconnected from a power source.
- Do not open the device while it is in operation, first set the main power switch to OFF.
- Do not place objects on top of the device, or insert them in exhaust and combustion air intake pipes.
- Do not touch the combustion chamber, exhaust pipe or other hot parts during the device operation, as hot surfaces can cause burns. These surfaces may remain hot even after the device is turned off. Turn off the system in case of activities conducted near the equipment and continuously monitor the control panel to prevent it from being turned on.
- Do not tamper with the device control system at the control panel during maintenance. During maintenance, the service technician must place a warning sign on the system control panel with the following message: "The device is under maintenance. DO NOT operate the device control panel!".
- Do not use the fixing system to support the weight of other devices or equipment. Specifications for the fixing system in this manual take into account only the weight of one device with the exhaust and air intake pipes.
- Do not use the device as a support base and/or walkable surface.
- Do not block/cover the blower intake or air supply inlet.



Note

To switch off the device, always use the room thermostat, not the main switch on the ground control panel. The reason is that overheating of the combustion chamber can occur with subsequent damage to the device itself.

1.1 EXPLOITATION

The condensing gas unit EOLO LX series are heat generators designed to be used as a module for heating inside the air handling units and roof-tops.

The power is regulated automatically, modulating the heat input from minimum to maximum.

Thanks to the use of a premixed burner, specially designed for this specific application, high combustion efficiency is obtained.

In order to function, the unit must be connected to a gas supply system, to the electricity network, as well as to a flue gas discharge pipe and a condensate drain pipe.



Note

Insert the EOLO LX series gas units in a system with an adequate air flow rate (see the nominal air flow rate indicated in tables 2.1 and 2.2)

1.2 TERMS AND DEFINITIONS

TERMS	DESCRIPTION
Damage	Physical damage, personal injury or deterioration of property, and/or contamination of the environment.
Danger	A potential source of damage.
Qualified professional	A person who is properly trained, prepared and/or has relevant technical experience in the subject, allowing him to perceive risks and avoid dangers arising during the use of the product, and who has the necessary technical and professional certificates, if this is stipulated by the current legislation.
Risk	Combination of the probability of the damage occurrence and its severity.
User	Person or entity using the devices.
Modulatiig	The device can automatically adjust its heat output in a certain range, depending on the actual temperature of the airflow supplied to the room, or the actual temperature of the room, based on the control values set from the ground control panel.
GCV (Unit MJ/m³)	Higher calorific value, the total amount of heat released by a unit quantity of fuel, when it is burned completely with oxygen, and when the products of combustion are returned to ambient temperature. This quantity includes the heat of condensation of any water vapor contained in the fuel and of the water vapor formed by the combustion of any hydrogen contained in the fuel.
NCV (Unit MJ/m³)	Lower calorific value, the total amount of heat released by a unit quantity of fuel with a certain amount of water vapor, when it is burned completely with oxygen and when the products of combustion are not returned to ambient temperature.
Nominal Heat Input (unit kW)	It is the product of the lower calorific value (NCV) of the fuel used and the flow rate of fuel burned.
Nominal heat output (unit kW)	It corresponds to the reduced heat input of the heat output lost to the chimney.
Rated heating capacity (kW)	rated heating capacity ($P_{rated,h}$) means the heating capacity of a heat pump, warm air heater or fan coil units when providing space heating at 'standard rating conditions', expressed in kW; (simbolo $P_{rated,h}$)
Minimum capacity (kW)	minimum capacity' means the minimum heating capacity of the warm air heater (P_{min}), expressed in kW;
Nominal values of powers and efficiency	These are the maximum power and efficiency values of an appliance specified and guaranteed by the manufacturer for continuous operation.
Warm air heater	Warm air heater means an air heating product that transfers the heat from a heat generator directly to air and incorporates or distributes this heat through an air-based heating system;
B1 warm air heater	B1 warm air heater' means a warm air heater using gaseous/liquid fuels specifically designed to be connected to a natural draught flue that evacuates the residues of combustion to the outside of the room containing the B1 warm air heater and for drawing the combustion air directly from the room; a type B1 warm air heater is marketed as a B1 warm air heater only.
C2 warm air heater	C2 warm air heater' means a warm air heater using gaseous/liquid fuels specifically designed for drawing the combustion air from a common duct system to which more than one appliance is connected and extracting flue gas to the duct system; a type C2 warm air heater is marketed as a C2 warm air heater only
C4 warm air heater	C4 warm air heater' means a warm air heater using gaseous/liquid fuels specifically designed for drawing the combustion air from a common duct system to which more than one appliance is connected and extracting flue gas to another pipe of the flue system; a type C4 warm air heater is marketed as a C4 warm air heater only;
Slave	Card (SCP674V202MB) installed on the machine equipped with a port for connecting the device to a serial network.

Tab. 1.1 Definition

2 FEATURES

2.1 TECHNICAL DATA

Description		Unit	EOLO LXC 50	EOLO LXD 70	EOLO LXE 90	EOLO LXE+ 110
Operation		-	Range rated	Range rated	Range rated	Range rated
Category		-	see tab. 5.1, pag. 49			
Type		-	B ₂₃			
Nominal heat input (NCV)		kW	50 (45)*	70 (65)*	90	110
Min. heat input (NCV)		kW	10	14	18	22
Efficient at nominal power		%	96	96	96	96
Efficient at min. power		%	109	109	109	109
Gas consumption 15 °C 1013 mbar	G 20	m³/h	5,29	7,41	9,52	11,64
	G 25	m³/h	6,15	8,62	11,08	13,54
	G 2.350	m³/h	7,35	10,29	13,23	16,17
	G 27	m³/h	6,45	9,04	11,62	14,20
	G 30	kg/h	3,94	5,52	7,10	8,67
	G 31	kg/h	3,88	5,44	6,99	8,55
Supply gas pressure		mbar	see tab. 5.1, pag. 49			
Arflow min. / max.		m³/h	4200/6900	7100/11100	13500/16000	20500/24500
Diameter of gas connection		Inch	3/4	3/4	3/4	3/4
Exhaust pipe diameter		mm	100	100	100	100
Maximum pressure in exhaust		Pa	120	120	120	120
Exhaust mass flow (*)		kg/h	86	119	155	187
El. Supply		V/Hz	2/PE ~50Hz 400V			
Nominal electrical power		kW	0,065	0,135	0,173	0,170
Operating temperature (min ÷ max)		°C	-20÷40			
Noise level (1 meter from the appliance)		dB(A)	48	51	52	53
Weight		kg	100	120	155	155
MAIN COMPONENTS OF THE UNIT						
Exchanger			LXC35-30-075_5x5	LXD35-30-110_5x5	LXE35-30-135_5x5	LXE35_30_135 5x5
Burner			VIP 1 HW a	VIP 2 HW	VIP 3 HW a	VIP 3 HW b
Burner head			Ø129 x 120	Ø154 x 120	Ø159 x H 120	Ø159 x H 120
Gas valve			VK4205	VK4205	VK4415	VK4415
Gas blower			NRG 118	RG 148	NRG 137	NRG 137
Venturi			45900451-56	45900451-56	45900450N-020	45900450N-020
Flame controler			Genius M82		Brahma DFC M32C WY3 R00	
Control electronics (motherboard)			SCP674V130B1			
Automatic control electronics (slave board)			SCP674V202MB			

Tab. 2.1 Tecnic data (1 of 2)

(*) For gases G25 / G27 / G2.350

(**) Referred to methane G 20

Description		Unit	EOLO LXF 130	EOLO LXG 170	EOLO LXH 230
Operation			Range rated	Range rated	Range rated
Category			vedi tab. 5.1, pag. 49		
Type			B ₂₃		
Nominal heat input (NCV)		kW	130	170	230
Min. heat input (NCV)		kW	26	34	46
Efficient at nominal power		%	96	96	97
Efficient at min. power		%	109	109	109
Gas consumption 15 °C 1013 mbar	G 20	m³/h	13,76	17,99	24,34
	G 25	m³/h	16,00	20,92	28,31
	G 2.350	m³/h	19,11	24,99	33,81
	G 27	m³/h	16,78	21,94	29,69
	G 30	kg/h	10,25	13,41	18,14
	G 31	kg/h	10,10	13,21	17,87
Supply gas pressure		mbar	vedi tab. 5.1, pag. 49		
Arflow min. / max.		m³/h	15000/23000	26000/28000	33000/35000
Diameter of gas connection		Inch	1"	1"1/4	1"1/4
Exhaust pipe diameter		mm	130	130	150
Maximum pressure in exhaust		Pa	120	120	120
Exhaust mass flow (*)		kg/h	220	296	382
El. Supply		V/Hz	2/PE ~50Hz 400V		
Nominal electrical power		kW	0,180	0,250	0,250
Operating temperature (min ÷ max)		°C	-20÷40		
Noise level (1 meter from the appliance)		dB(A)	53	56	57
Weight		kg	195	260	310
MAIN COMPONENTS OF THE UNIT					
Exchanger			LXF33-45-150_5x5	LXG35-55-175_5x5	LXH35-63-175_12x12
Burner			VIP 4 HW a	VIP 4 HW b	VIP 5 HW b
Burner head			Ø154 x H 180	Ø168 x H 180	Ø168 x H 180
Gas valve			VK4415	VR415	VR420
Gas blower			RG 175	RG 175	G1G 170
Venturi			45900450N-030	VMU185	VMU300
Flame controler			Genius M82	Brahma DFC M32C WY3 R00	
Control electronics (motherboard)			SCP674V130B1		
Automatic control electronics (slave board)			SCP674V202MB		

Tab. 2.1 Technical data (2 of 2)

(*) Referred to methane G 20

2.2 IDENTIFICATION PLATE AND INFORMATION LABELS

Some information labels are applied to the appliance packaging (fig. 2.1).

The product identification label is applied to the device (fig. 2.4) where all the identification data that distinguish the device and the warning labels are indicated.

Among these indications there is the unique serial number for each product, thanks to this number the manufacturer can precisely identify the model and all the technical data relating to the product in case of assistance requests. All labels must be kept intact on the device and must be replaced if they become illegible.

Together with the instruction manual, there are labels to be used when changing fuel (fig.2.2).

i Important
the serial number of the product is essential for an adequate and rapid assistance.

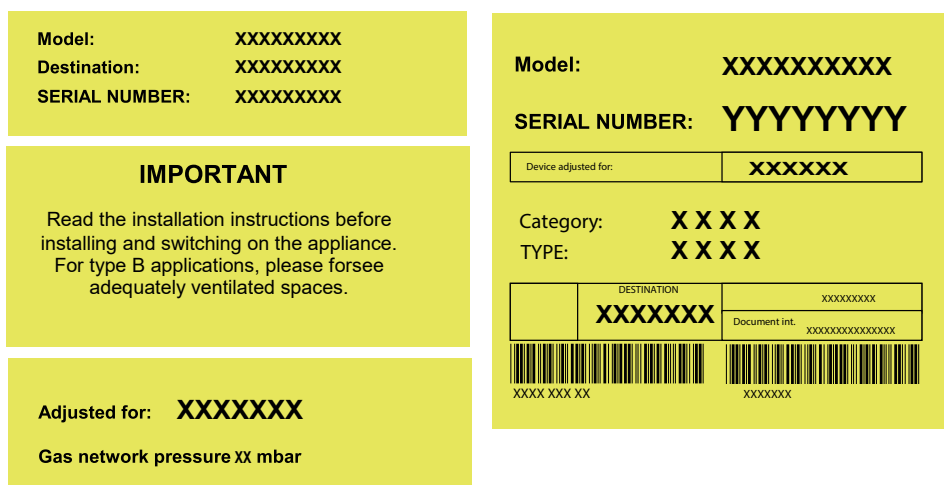


Fig. 2.1 Labels placed on the appliance packaging

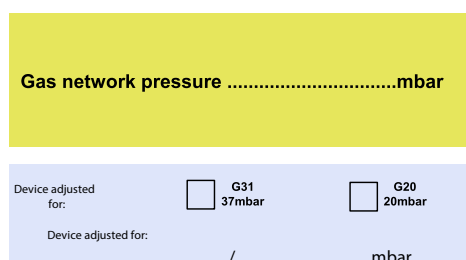
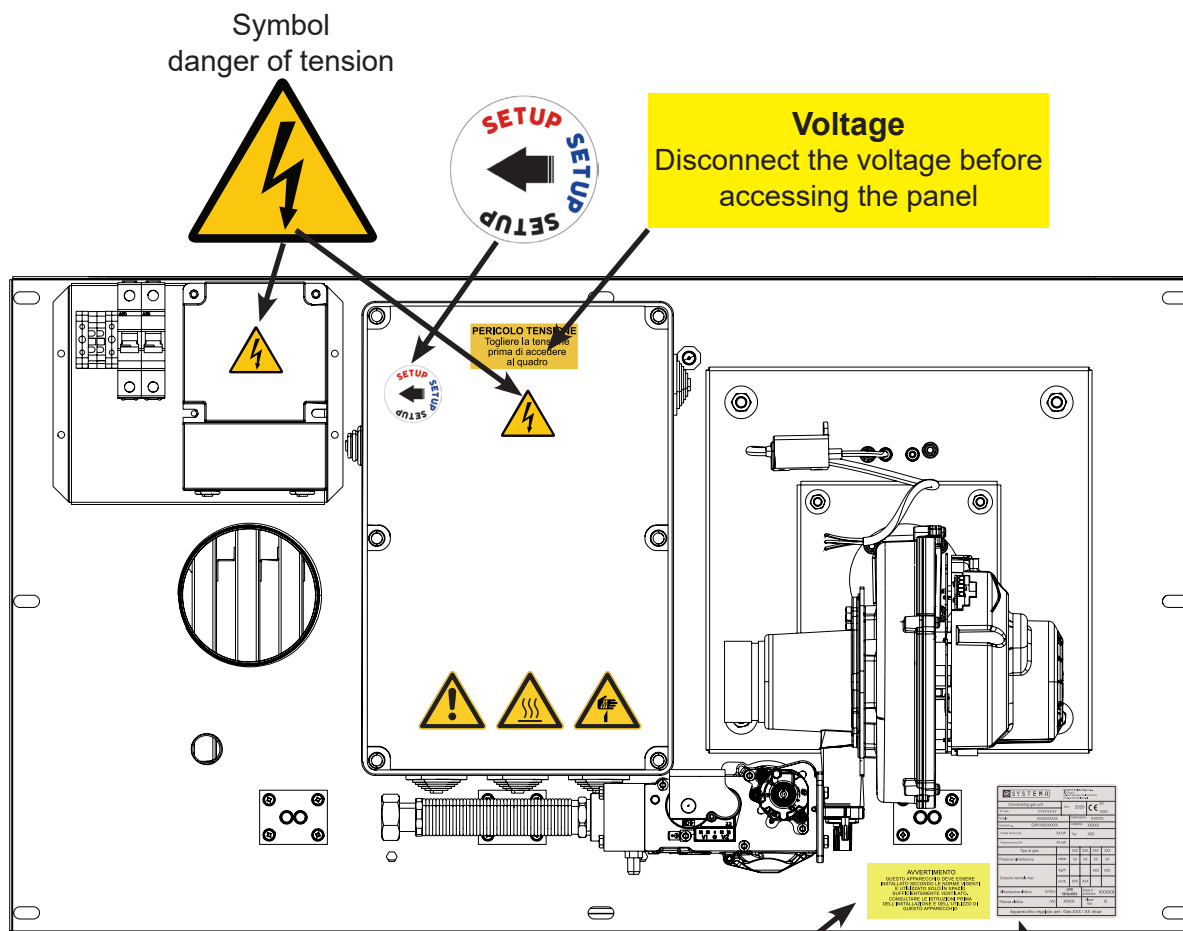


Fig. 2.2 Labels to be used for fuel changes

On the packaging there are warning symbols for the mandatory use of personal protective equipment (fig. 2.3).



Fig. 2.3 Labels placed on the packaging for the obligation of individual protection devices



IMPORTANT

Read the installation instructions before installing and switching on the appliance.
For type B applications, please forsee adequately ventilated spaces.

SYSTEMA		SYSTEMA POLSKA Sp. z o.o. ul. Długa 5 98-220 Zduńska Wola/ POLSKA www.systemapolska.pl	
Condensing gas unit		Year	2020
Serial no.:	LXXXXXX	CE	XX XXXX
Model	EOLO LXC 50	Destination	FRANCE
Certificate no.:	XXXXXX	Category	II 2ES3P
Nominal heat input (Hi) [kW]	50 kW	Type	B23
Nominal heat output	47 kW		
Type of gas		G20	G25 G31
Gas network pressure	kPa	2,0	2,5 3,7
Nominal gas consumption	kg/h		3,88
	m³/h	5,29	6,15
Electrical supply (V/Hz)	2/PE 50Hz/400V	Protection class	IP00
Max. electr. power (W)	72	Classe NOx	5
Device adjusted for: Gas G20 / 2,0kPa			

Fig. 2.4 Location of the identification plate and warning labels

2.3 OVERALL DIMENSINS

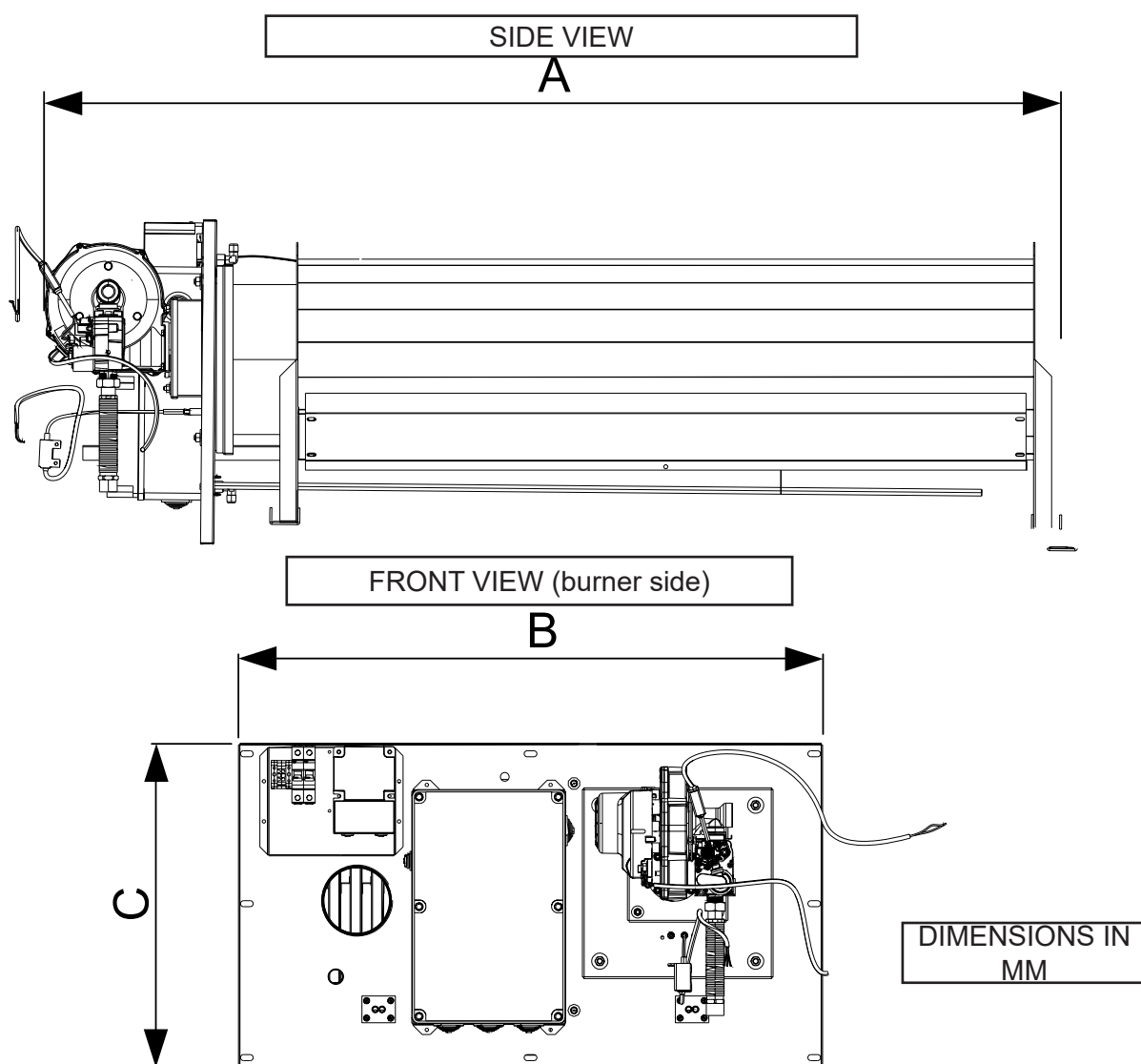


Fig. 2.4 Overall dimensions

Dim.	EOLO LXC 50	EOLO LXD 70	EOLO LXE 90	EOLO LXE+ 110	EOLO LXF 130	EOLO LXG 170	EOLO LXH 230
A	1022	1518	1785	1785	1906	2212	2212
B	873	873	873	873	814	818	934
C	485	485	485	485	549	714	822

Tab. 2.4 Overall dimensions

2.4 COMPONENT ARRANGEMENT

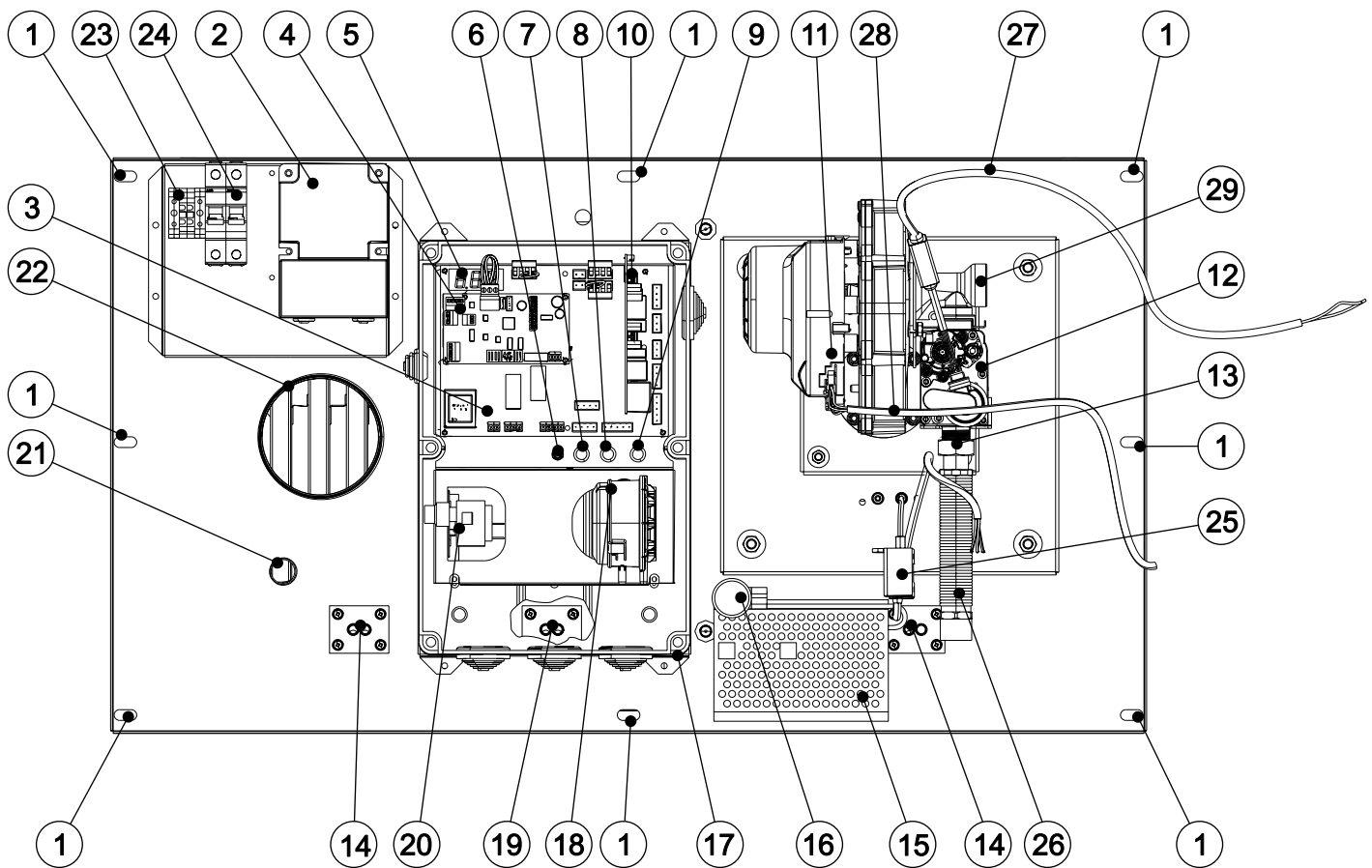


Fig. 2.5 Component arrangement

POS.	DESCRIPTION	POS.	DESCRIPTION
1	8 holes for fixture fixing	16	Capillary thermostat $0 \div 40$ ° C
2	400/230 V transformer and MODBUS connection	17	Control unit
3	SCP674V130B1 motherboard	18	Minimum air flow pressure switch (Pa)
4	SCP674V202MB slave card	19	Limit thermostat capillary housing
5	SCP674V130B1 board display	20	Safety thermostat (Tso)
6	Reset button (Sr)	21	Condensate drain connection
7	Red lamp - burner in block	22	Flue gas exhaust connection
8	Green lamp - flame confirmation	23	Power supply connection
9	White lamp - power supply present on burner controller	24	Circuit breaker - general switch (Q1)
10	Burner controller - Genius M82 or Brahma DFC M32C WY3 R00	25	Ignition transformer (Tacc)
11	Premix burner	26	Anti-vibration joint
12	Gas valve (EV)	27	Gas valve power cable
13	Gas connection	28	Gas blower wire
14	Housing for 4 outlet airflow temperature probes	29	Venturi
15	Lo temperature kit 150 W with capillary thermostat $0 \div 40$ ° C (optional)		

Tab. 2.5 Components

2.5 LIST OF COMPONENTS

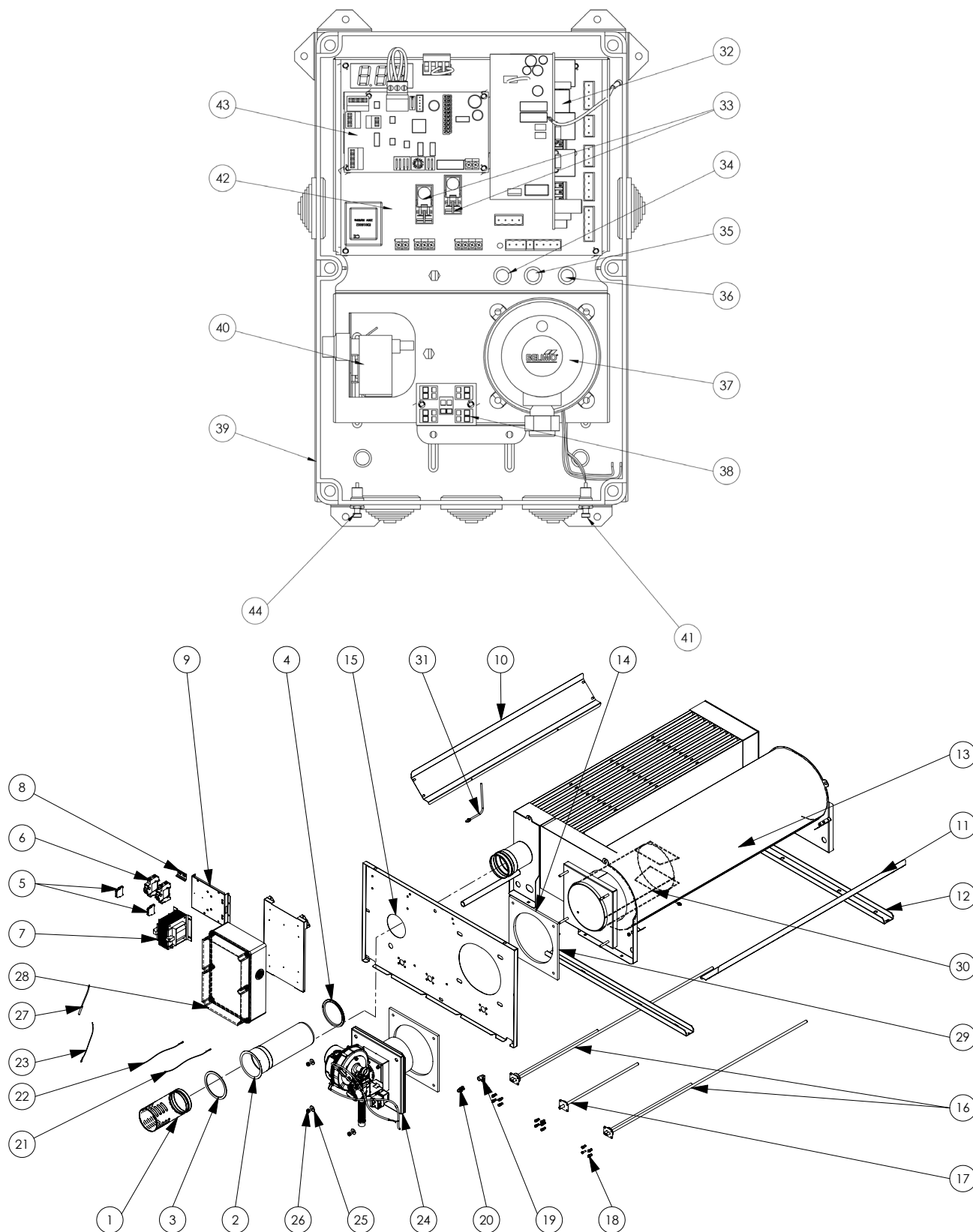


Fig. 2.6 Components

Tab. 2.6

POS.	DESCRIPTION	No.
1	Horizontal exhaust terminal	1
2	Exhaust extention	1
3	Chimney gasket	1
4	Chimney gasket	1
5	Yellow-green PE protective conductor terminal	2
6	Bipolar overload switch	2
7	Transformer 400/230 V (TR)	1
8	DIN bar for fixing terminals and magnetothermic swich	1
9	Swich & transformer suuport plate	1
10	Air deflector L=990 mm	1
11	Air deflector L=1077 mm	1
12	Fixing guide	1
13	Plate heat exchanger	1
14	Combustion head support plate	1
15	Mounting plate	1
16	Housing for inlet air flow temperatite sensor	2
17	Capillary housing for extreme thermostat L= 450/450 mm	1
18	Sensor housing mounting screws	12
19	Elbow 1/8	1
20	pressure measurement connection	1
21	Air flow temperature probe L=2000 mm (P4)	2
22	Air flow temperature probe L=1500 mm (P4)	1
23	Air flow temperature probe L=1250 mm (P4)	2
24	Burner (see paragraph 2.6)	1
25	Washer M8x24x2	4
26	M8 torch locking nut	4
27	Probe (PT 1000) heat exchanger extreme temoerature (P1)	1
28	Complete electrical panel	1
29	Electrical panel - set	1
30	Heta-resistant tube	1
31	Pipe	1
32	Flame control board	1
33	Burner protection fuse	2
34	Red lamp light signal in block	1
35	Green flame signal lamp	1
36	White lamp indicating power supply present	1
37	Min air flow pressure switch (Pa)	1
38	4 pin adaper	1
39	Insulation box with cover for electrical installation	1
40	Safety thermostat (Tso)	1
41	Reset button (Sr)	2
42	SCP674V130B1 motherboard	1

2.6 BURNER

2.6.1 VIP 1 HW

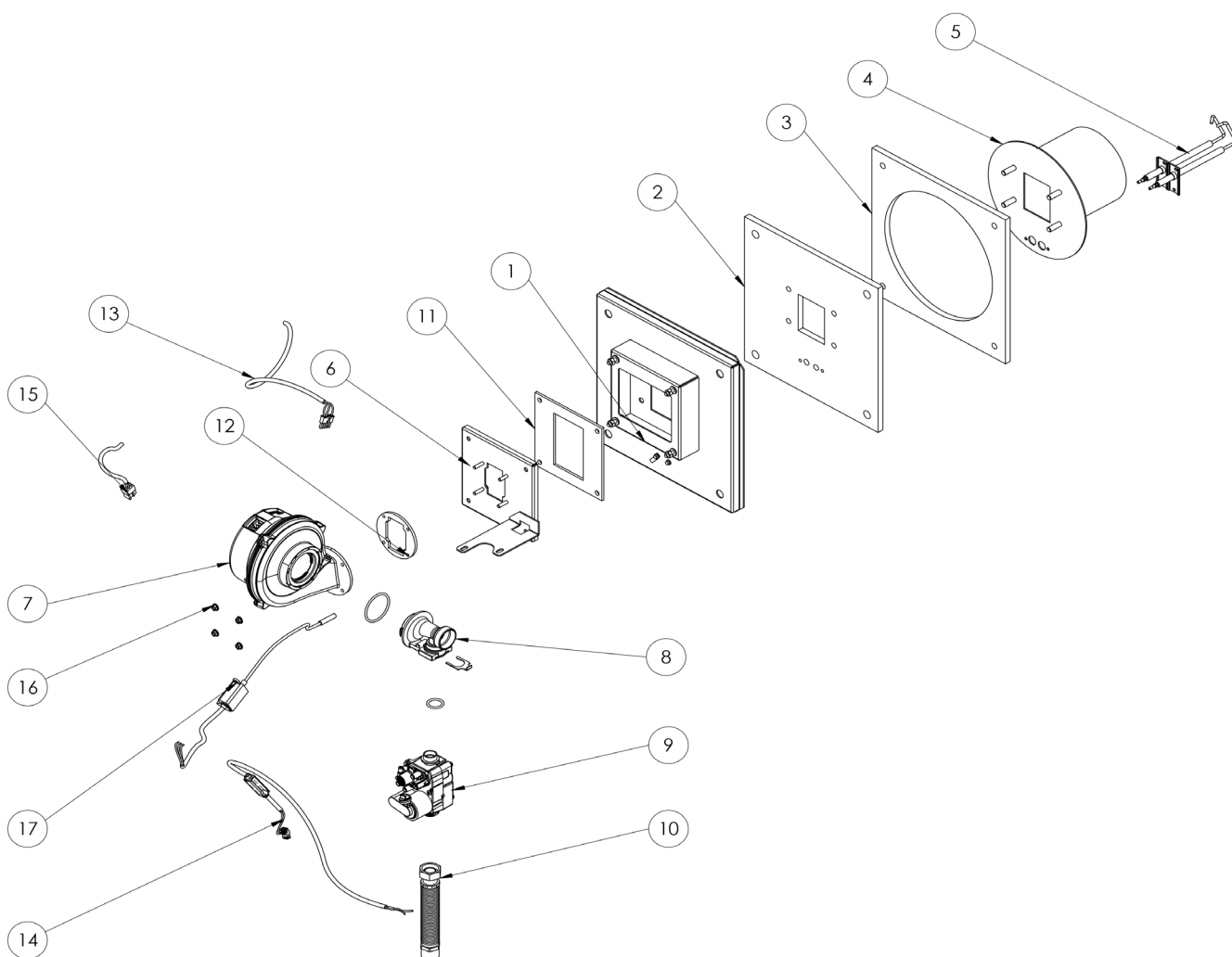


Fig. 2.7 Burner VIP 1 HW

POS.	DESCRIPTION	CODE	POS.	DESCRIPTION	CODE
1	Burner plate	70PLDM0008	10	3/4 anti-vibration joint	12ARPG6007
2	Insulating gasket	94CNGU0080	11	Gas blower gasket	00CNOR3000
3	Insulating gasket	94CNGU0082	12	Silicon gasket	94CNOR3021
4	Burner head	70PAGL0000	13	Gas blower control cable	70OKWI0000
5	Electrode set	94CNEL0035	14	Solenoid valve wire supply	00CECO1109
6	Blower support		15	Gas blower wire supply	70OKWI0003
7	Gas blower NRG118	94CNVE0019	16	Nut M6	10WSNA2021
8	Gas air-mixer	94CNIM0033	17	Transformer	00CNAC2008
9	Solenoid valve	94CEVA0010			

Tab. 2.7

2.6.2 VIP 2 HW

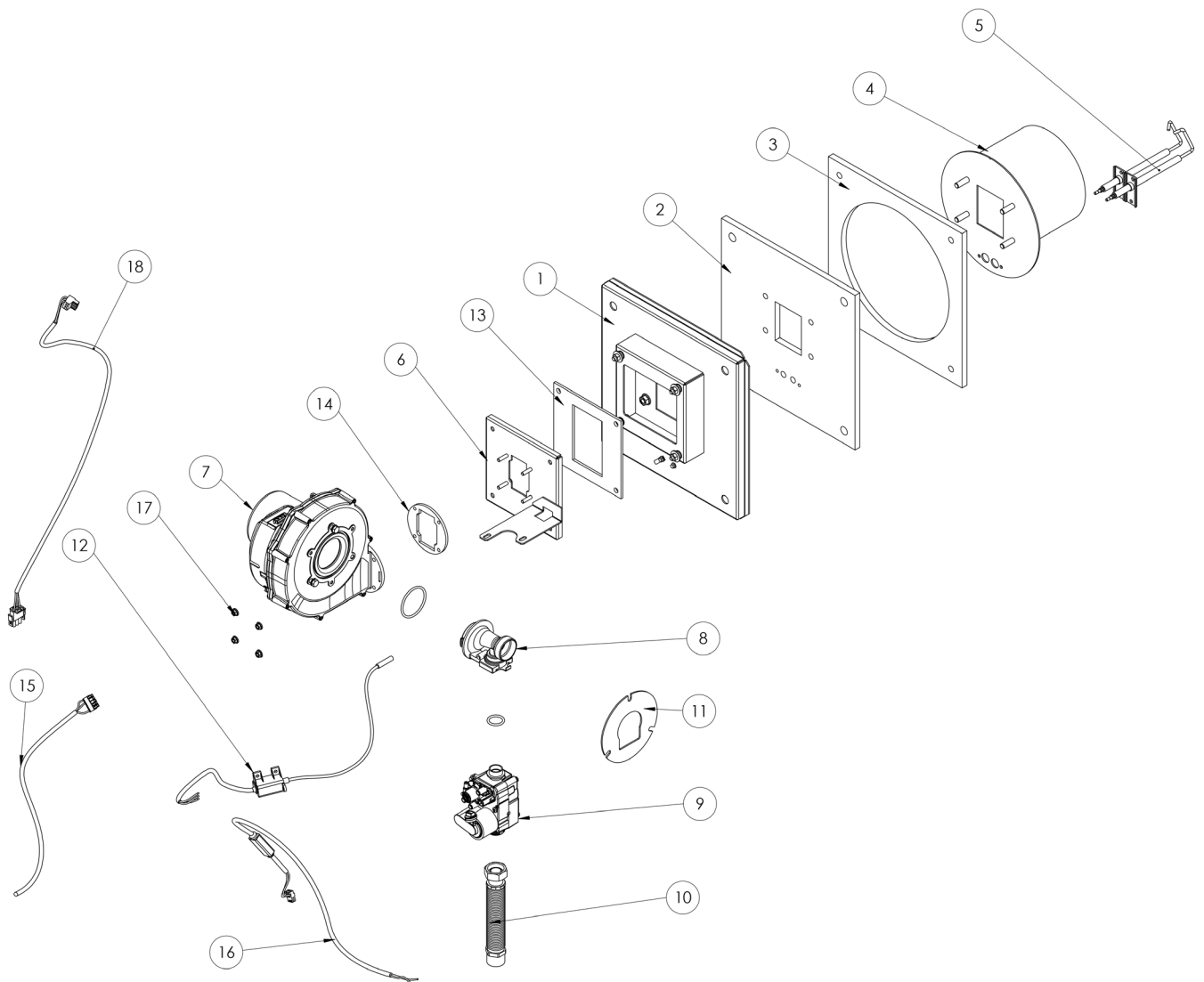


Fig. 2.8 Burner VIP 2 HW

POS.	DESCRIPTION	CODE	POS.	DESCRIPTION	CODE
1	Burner plate	70PLDM0008	10	3/4" anti-vibration joint	12ARPG6007
2	Insulating gasket	94CNGU0080	11	Mixer ring	85PLPI0000
3	Insulating gasket	94CNGU0082	12	Transformer	00CNAC2008
4	Burner head	70PAGL0001	13	Blower gasket	00CNOR3000
5	Electrode - set	94CNEL0035	14	Silicon gasket	94CNOR3021
6	Gas blower support		15	Gas blower control cable	70OKWI0000
7	Gas blower	94CNVE0012	16	Solenoid valve wire supply	00CECO1109
8	Gas air-mixer	94CNM0033	17	Gas blower wire supply	70OKWI0007
9	Solenoid valve	94CEVA0010	18	Nut M6	10WSNA2041

Tab. 2.8

2.6.3 VIP 3 HW a/b

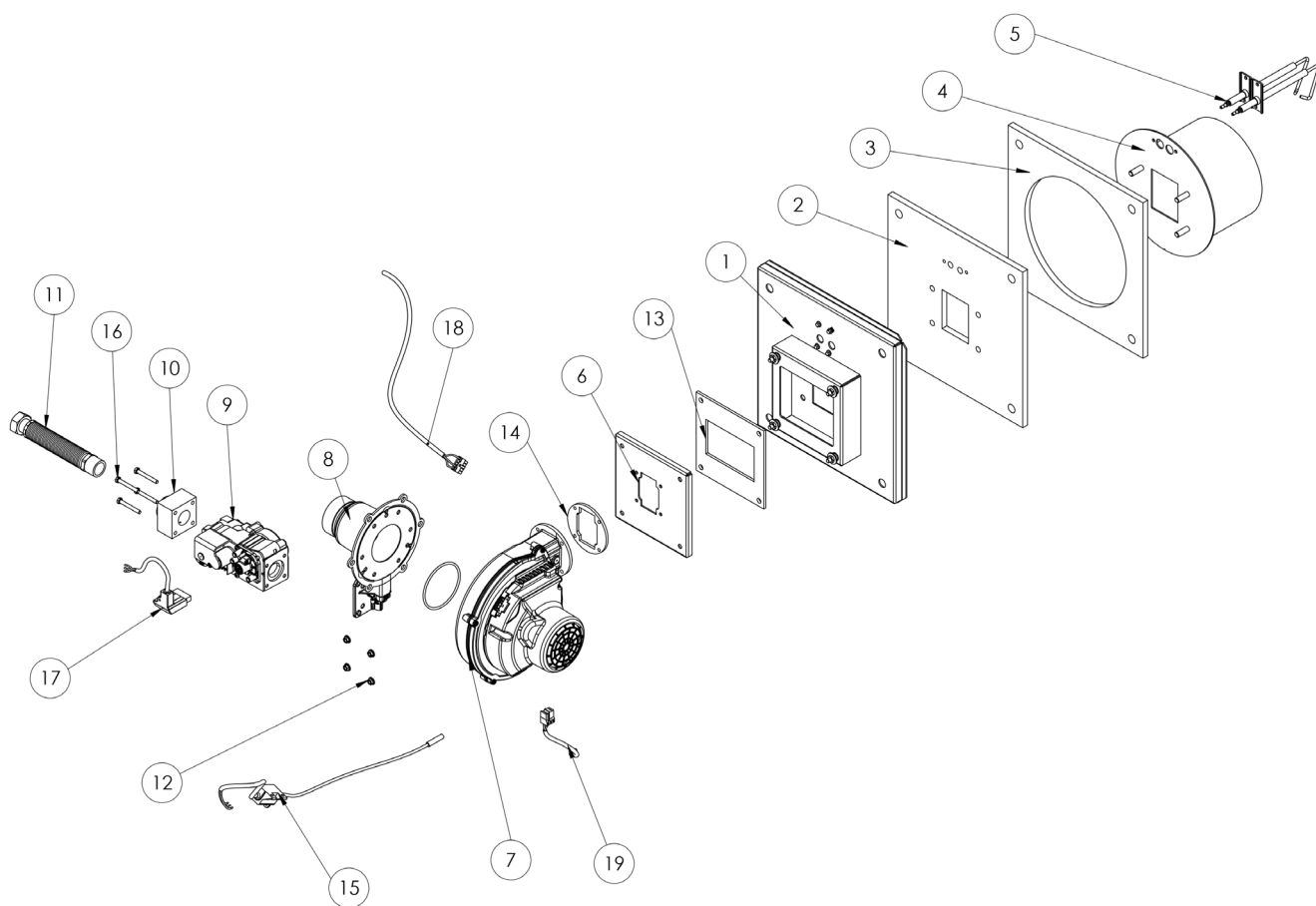


Fig. 2.9 Burner VIP 3 HW a/b

POS.	DESCRIPTION	CODE	POS.	DESCRIPTION	CODE
1	Burner plate	70PLDM0008	11	3/4" anti-vibration joint	12ARPG6007
2	Insulating gasket	94CNGU0080	12	Nut M6	10WSNA2041
3	Insulating gasket	94CNGU0082	13	Blower gasket	00CNOR3000
4	Burner head	70PAGL0003	14	Silicon gasket	94CNOR3021
5	Electrode - set	94CNEL0035	15	Transformer	00CNAC2008
6	Gas blower support	70PLDM0006	16	Hex screw M5x35	
7	Gas blower	94CNVE0016	17	Solenoid valve wire supply	00CECO1106
8	Gas air-mixer	94CNIM0023	18	Gas blower control cable	70OKWI0000
9	Solenoid valve	94CEVA0011	19	Gas blower wire supply	70OKWI0003
10	Gas connection	94ARSZ6009			

Tab. 2.9

2.6.4 VIP 4 HW a

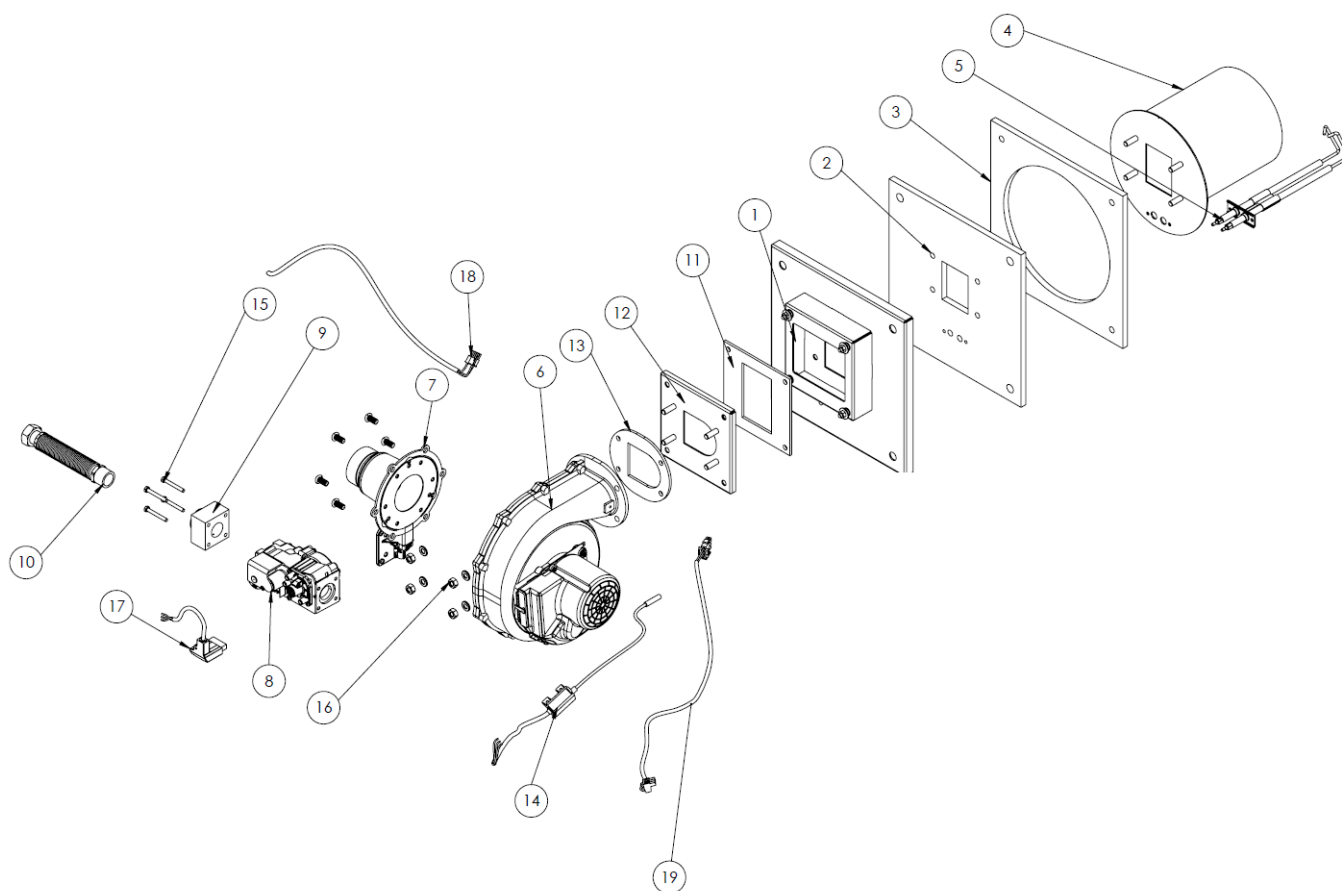


Fig. 2.10 Burner VIP 4 HW a

POS.	DESCRIZIONE	CODICE	POS.	DESCRIZIONE	CODICE
1	Burner plate	70PLDM0002	11	Blower gasket	00CNOR3000
2	Insulating gasket	94CNGU0080	12	Gas blower support	70PLDM0006
3	Insulating gasket	94CNGU0082	13	Blower gasket	94CNGU0062
4	Burner head	70PAGL0004	14	Transformer	00CNAC2008
5	Electrode	94CNEL0023	15	Nut M5	10WSWK2136
6	Gas blower NRG 175	94CNVE0013	16	Nut M8	10WSNA2022
7	Gas air-mixer	94CNIM0023	17	Solenoid valve wire supply	00CECO1106
8	Solenoid valve	94CEVA0011	18	Gas blower control cable	70OKWI0001
9	Gas connection 3/4	94ARSZ6009	19	Gas blower wire supply	70OKWI0004
10	3/4" anti-vibration joint	12ARPG6007			

Tab. 2.10

2.6.5 VIP 4 HW b

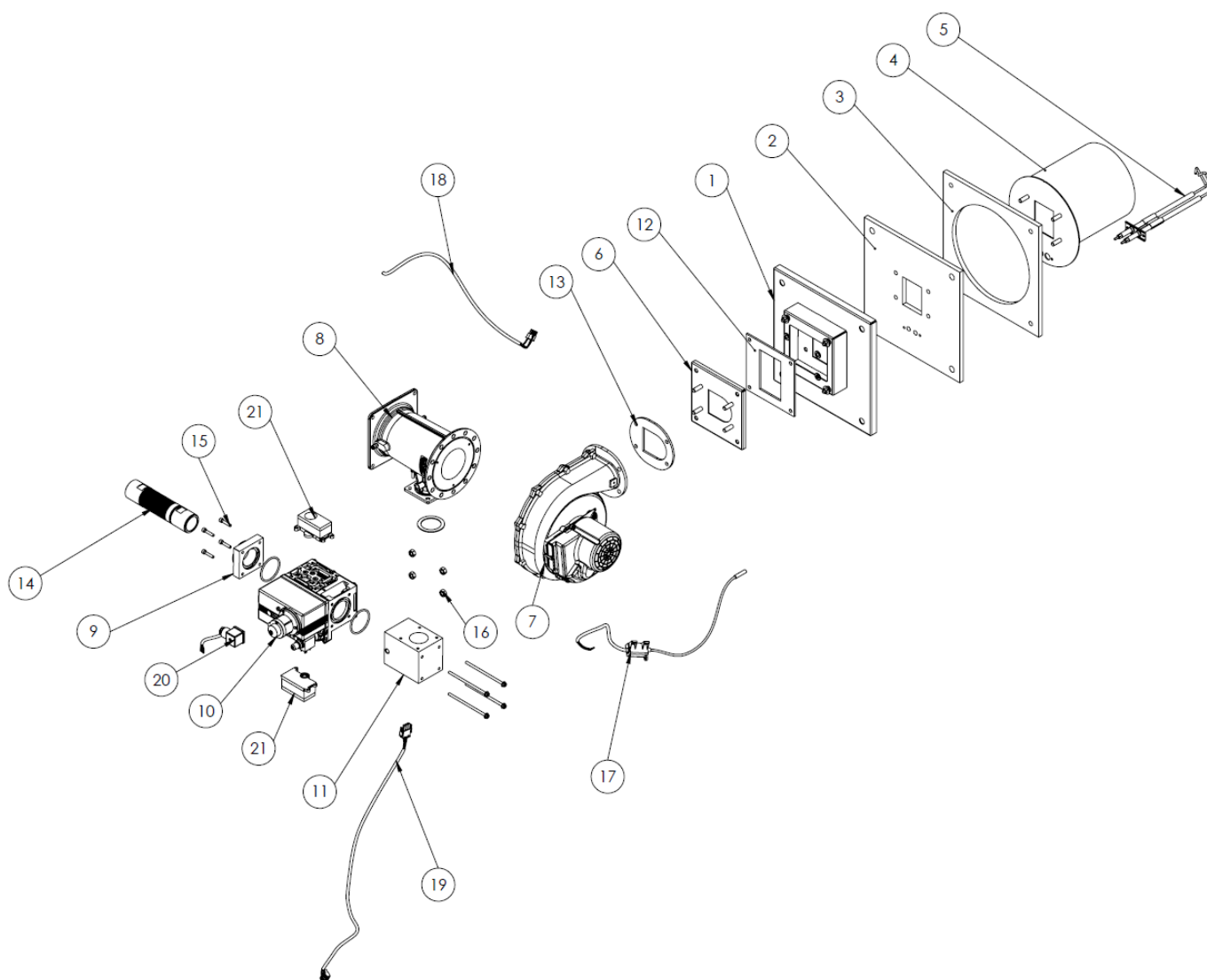


Fig. 2.11 Burner VIP 4 HW b

POS.	DESCRIZIONE	CODICE	POS.	DESCRIZIONE	CODICE
1	Burner plate	70PLDM0002	12	Blower gasket	00CNOR3000
2	Insulaing gasket	94CNGU0080	13	Blower gasket	94CNGU0062
3	Insulaing gasket	94CNGU0082	14	5/4" anti-vibration joint	22CNGI0615
4	Burner head	70PAGL0005	15	Screw M5x25 DIN 912	10WSSR2050
5	Electrode	94CNEL0023	16	Nut M8 DIN 934	10WSNA2022
6	Gas blower support	70PLDM0007	17	Transformer	00CNAC2008
7	Gas blower	94CNVE0013	18	Gas blower control cable	70OKWI0002
8	Gas air-mixer	94CNIM0015	19	Gas blower wire supply	70OKWI0005
9	Flange connection 5/4"	94ARSZ6013	20	Solenoid valve wire supply	70OKWI0006
10	Solenoid valve	94CEVA0005	21	Pressure swich	00CEPR1151
11	Flange connection	94ARSZ6014			

Tab. 2.11

2.6.6 VIP 5 HW a

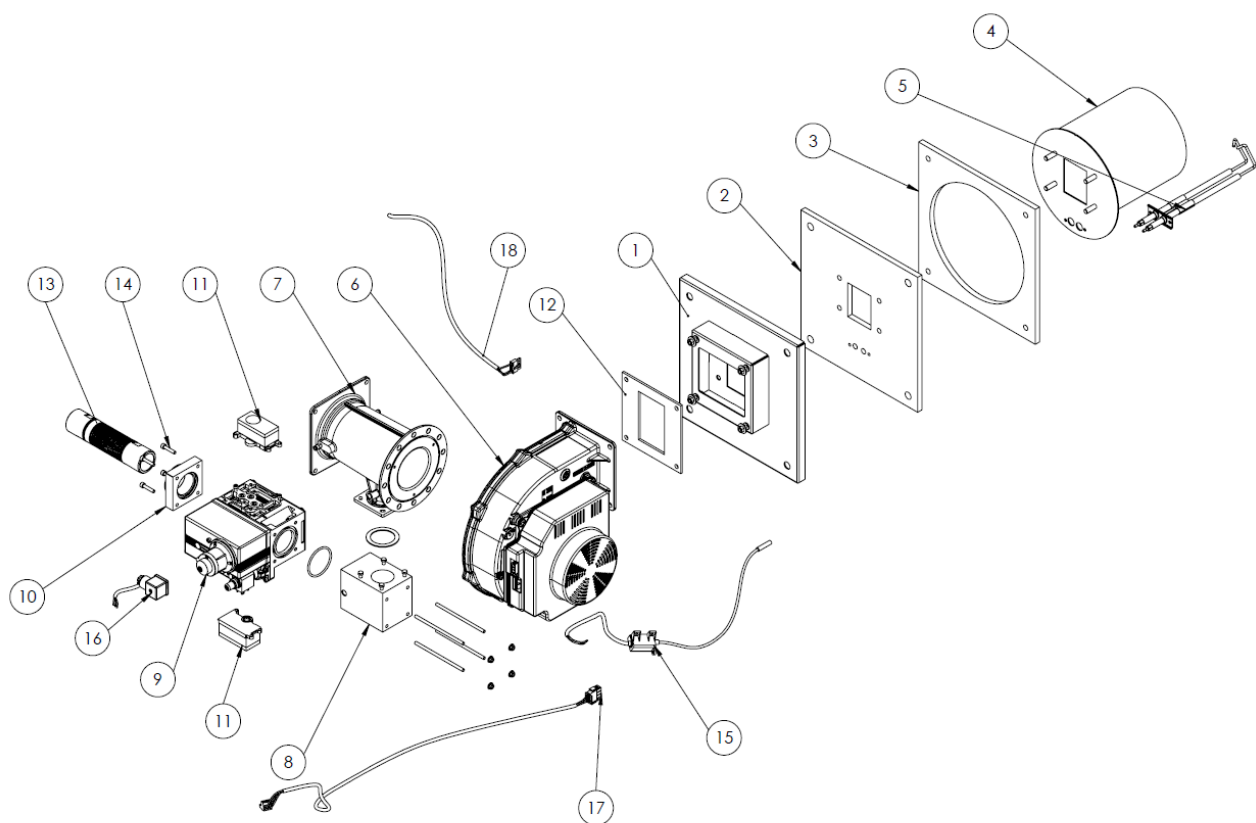


Fig. 2.12 Burner VIP 5 HW a

POS.	DESCRIZIONE	CODICE	POS.	DESCRIZIONE	CODICE
1	Burner plate	70PLDM0002	12	Blower gasket	00CNOR3000
2	Insulating gasket	94CNGU0080	13	5/4" anti-vibration joint	22CNGI0615
3	Insulating gasket	94CNGU0082	14	Screw M5x25	10WSSR2050
4	Burner head	70PAGL0006	15	Transformer	00CNAC2008
5	Electrode	94CNEL0023	16	Solenoid valve wire supply	70OKWI0006
6	Gas blower G1G	94CNVE0017	17	Gas blower wire supply	70OKWI0005
7	Gas air-mixer	94CNIM0016	18	Gas blower contro cable	70OKWI0002
8	Flange connection 5/4"	94ARSZ6014			
9	Solenoid valve	94CEVA0005			
10	Flange connection 5/4"	94ARSZ6013			
11	Pressure switch	00CEPR1151			

Tab. 2.12

3 WIRING

The power supply must be adequate to the electric power of the device. The maximum electrical power is shown on the rating plate and in data sheet (tab. 2.1 - page 8 and 9).T

Use the wiring diagram (fig. 3.1). in this manual for any work related to the electrical installation.



WARNING

The electrical connections must be made by qualified personnel with the appropriate skills and in compliance with the national and local regulations in force on the subject and as reported in this manual.



Important

The ON-OFF command can take place via:

- GO contact (connector J5 of the SCP674V202MB slave board)
- Remote signal via MODBUS (connector J11 of the SCP674V202MB slave board)

The heat output of the burner will be automatically modulated.

The temperature of the supply air flow can be detected:

- from the system probe via MODBUS
- from probes P4, average of 4 probes (connector J3 of the SCP674V202MB slave board)

The temperature of the inlet air flow is measured by means of the P3 probe (connector J3 of the SCP674V202MB slave board)

Legend fig. 3.1

ACC = Ignitor

Bp = premix burner

Em = Ground electrode

ETR = 150 W resistance kit with capillary thermostat $0 \div 40 \text{ } ^\circ\text{C}$
(optional)

EV = Gas valve

F3 = Burner protection fuse

F4 = Burner protection fuse

Ft = TR transformer primary protection fuse

GO = Manual burner ignition control

Hb = Block signal lamp

Hd = Display

Hf = Flame signaling lamp

Hon = Luminaire signaling lamp powered

Kr = Relay for heater R1

(optional, included in the low temperature kit)

M82 = Genius M82 or Brahma DFC M32C WY3 R00 flame control board

MODBUS = MODBus network connection (+ A; -B; S)

Pa = Minimum air flow pressure switch

PE = Protective conductor

Pg- = Minimum gas pressure switch

(optional IN C-D-E-F BOX / standard in G-H BOX)

Pg+ = Maximum gas pressure switch with manual reset

(optional IN C-D-E-F BOX / standard in G-H BOX)

P1 = Probe (PT 1000) exchanger limit temperature

P3 = Inlet air flow temperature probe (NTC)

P4.1 ... P4.4 = Probe (NTC) outlet air flow temperature

Pp = Motherboard programming button (KEY), to be connected only when programming the card

Q1 = 400 V ac main circuit breaker, curve D

EOLO LXC 50 = 1 A EOLO LXF 130 = 2 A

EOLO LXD 70 = 1 A EOLO LXG 170 = 2 A

EOLO LXE 90 = 2 A EOLO LXH 230 = 3 A

EOLO LXE + 110 = 2 A

R1 = 150 W resistor (optional, included in the low temperature kit)

SCP674V130B1 = Motherboard mod. SCP674V130B1 for command and control of the device

SL3 = Slave card mod. SCP674V202MB

Sr = Reset button - normally open contact (neutral)

Tr1 = $0 \div 40 \text{ } ^\circ\text{C}$ capillary thermostat for R1 resistance (optional, included in the low temperature kit)

Tacc = Ignition transformer

TR = Transformer 400/230 V

EOLO LXC 50 = 160 VA EOLO LXF 130 = 260 VA

EOLO LXD 70 = 160 VA EOLO LXG 170 = 260 VA

EOLO LXE 90 = 260 VA EOLO LXH 230 = 560 VA

EOLO LXE + 110 = 260 VA

Tso = Safety thermostat with manual reset

Vp = Premix burner fan

Xc = Genius M82 or Brahma DFC M32C WY3 R00 flame control board housing

XS = Power line connectors

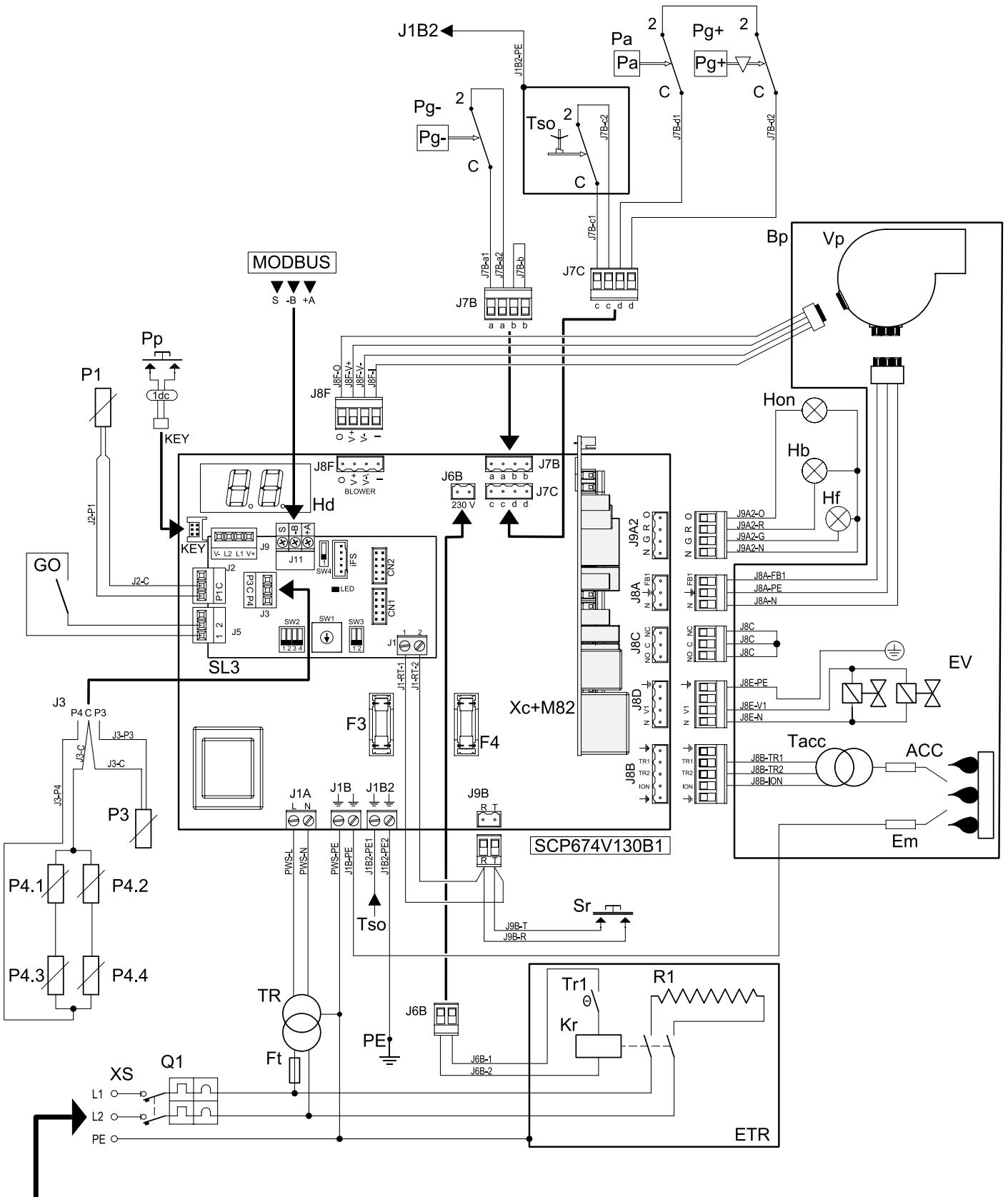


Fig. 3.1 Wiring diagram



WARNING
 It is mandatory to connect the appliance to earthing system, taking care to leave the ground wire slightly longer than the line wires so that in case of accidental pulling, the ground wire is the last one to be removed.

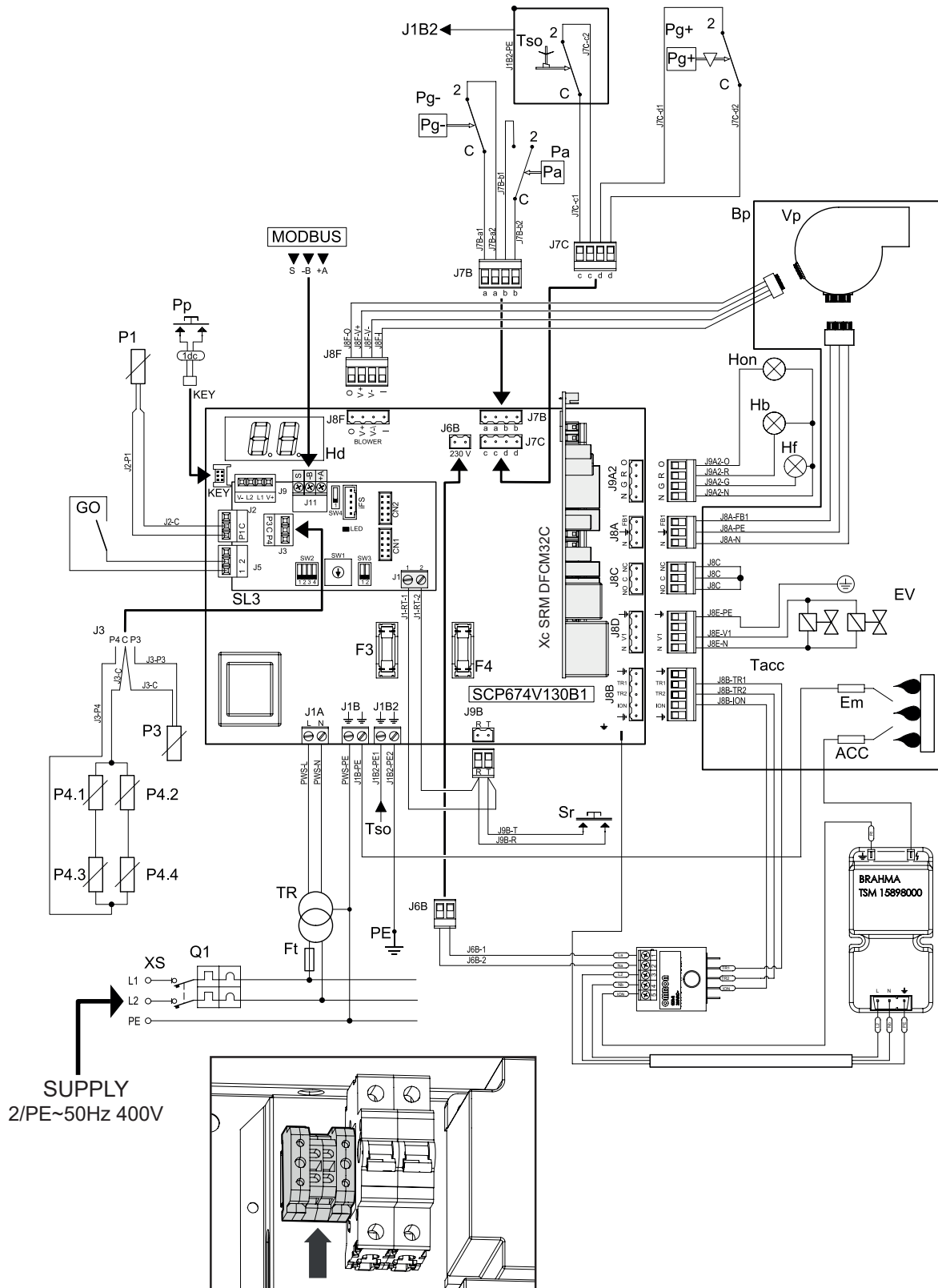


Fig. 3.1b Wiring Diagram (used since 01.05.2022)

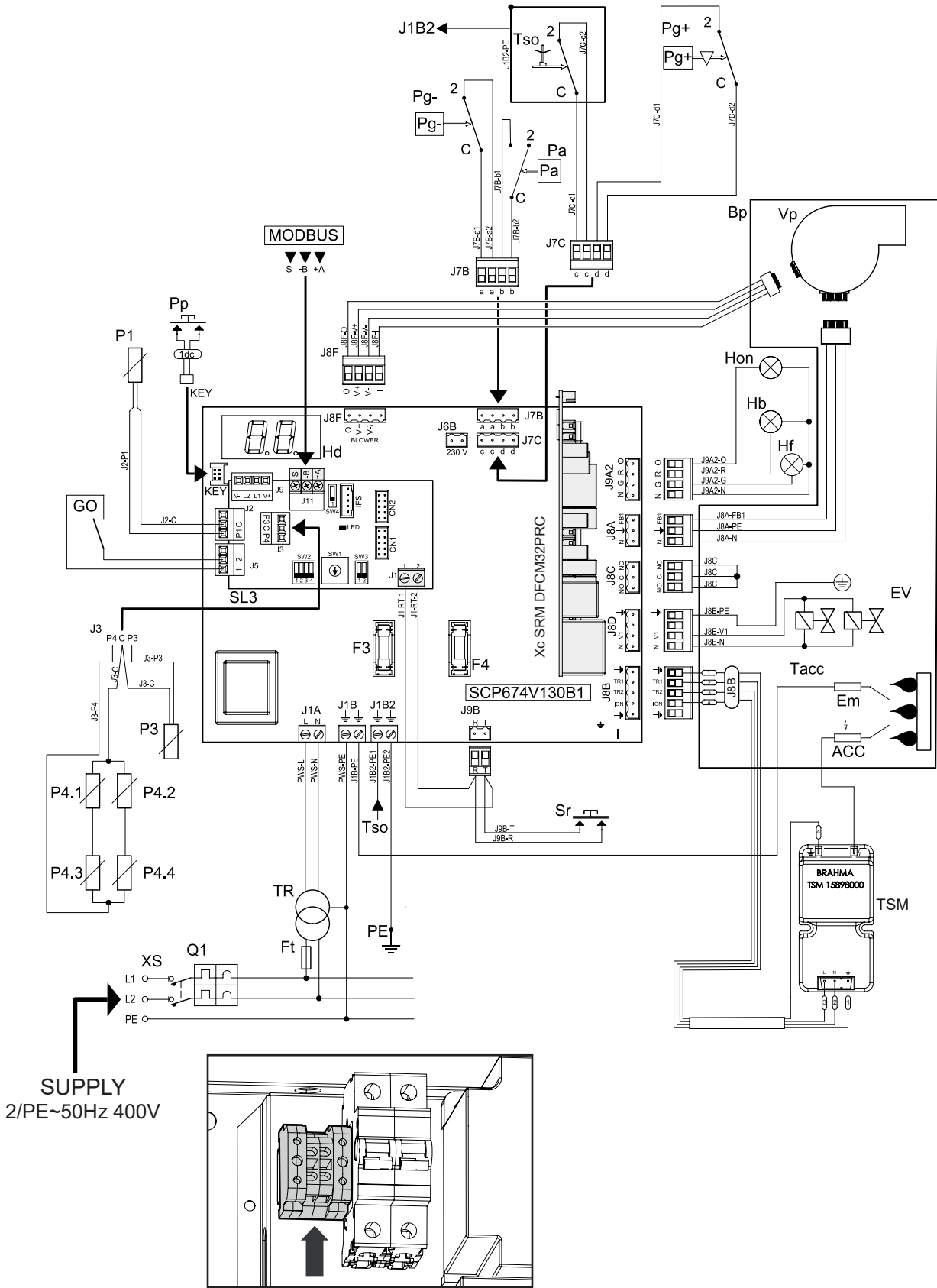
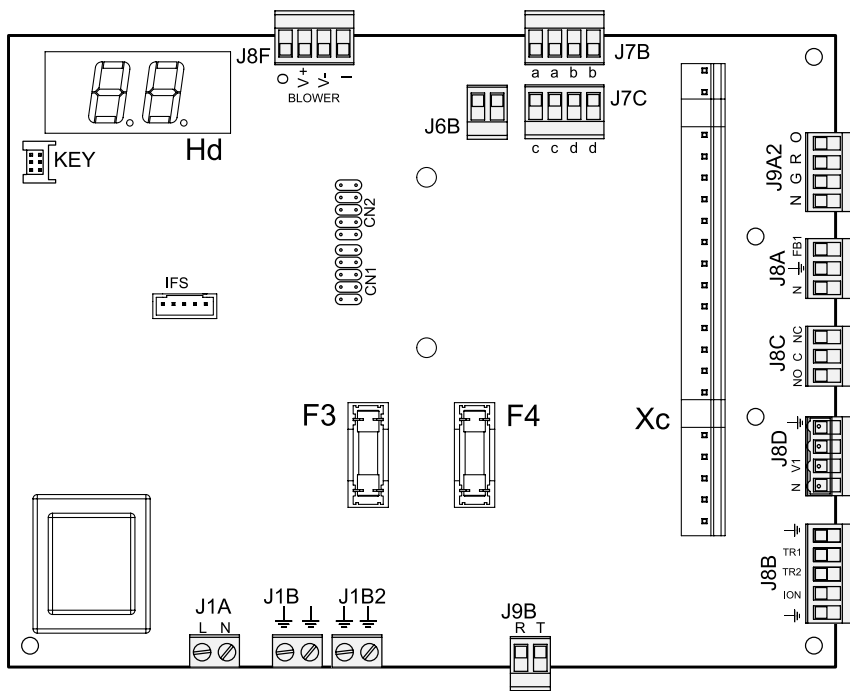


Fig. 3.1c Wiring Diagram (used since 01.03.2023)

3.1 SCP674V130B1 CARD CONNECTIONS (MAIN BOARD)





FUSE

F3/F4 = 3,15 AF (protection of burner)

Fig. 3.2 SCP674V130B1 motherboard

CONNECTOR	CLAMP	DESCRIPTION	NUMBERING CABLE	COMPONENT CONNECTED
CN1; CN2		Connectors for the SCP674V202MB slave board	--	SCP674V202MB
J1A	L	General power supply (phase)	PWS-L	TR
	N	General power supply (neutral)	PWS-N	TR
J1B; J1B2		Protective conductor	PWS-PE	Connector XS (PE)
		Protective conductor	J1B-PE	Em
		Protective conductor	J1B2-PE1	Tso
		Protective conductor	J1B2-PE2	PE
J6B		Kr resistance kit relay power supply (optional) - 230 V 0.5 A	J6B-1	Tr1 (if present)
		Kr resistance kit relay power supply (optional) - 230 V 0.5 A	J6B-2	Kr (if present)
J7B	a	Minimum gas pressure switch connection (optional), otherwise the contacts are connected in bridge	J7B-a1	Pg- (if present)
	a		J7B-a2	Pg- (if present)
	b	Contacts connected in bridge	J7B-b	
	b		J7B-b	

Tab 3.1 Legend of SCP674V130B1 card connections (1 of 2)

CONNECTOR	CLAMP	DESCRIPTION	NUMBERING CABLE	COMPONENT CONNECTED
J7C	c	Safety thermostat connection with manual reset	J7B-c1	Tso
	c		J7B-c2	Tso
	d	Connection of air flow differential flow switch - automatic reset, maximum gas pressure switch (optional)	J7B-d1	Pa, Pg+ (se presente)
	d		J7B-d2	Pa, Pg+ (se presente)
J8A	FB1	Gas blower connection (phase)	J8A-FB1	Vp
		Gas blower connection (protective conductor)	J8A-PE	Vp
	N	Gas blower connection (neutral)	J8A-N	Vp
J8B	TR1	Ignitor connection	J8B-TR1	Tacc
	TR2		J8B-TR2	Tacc
	ION		J8B-ION	Tacc
J8C	NC; C; NO	Contacts connected in bridge	J8C	---
J8D		Gas valve connection (protective conductor)	J8E-PE	EV
	V1	Gas valve connection (phase)	J8E-V1	EV
	N	Gas valve connection (neutral)	J8E-N	EV
J8F	0	PWM output for motor control max. 10mA	J8F-O	Vp
	V+	Pole (+): 18-28VDC unprotected, max. 30mA	J8F-V+	Vp
	V-	Pole (-) GND	J8F-V-	Vp
	I	Hall sensor connection	J8F-I	S1
J9A2	O	Power supply burner controller lamp (F) 230Vac	J9A2-O	Hon
	R	Burner lockout signal lamp (F) 230Vac	J9A2-R	Hb
	G	Flame confirmation light - flame in operation (F) 230Vac	J9A2-G	Hf
	N	Neutral output, N, 230Vac	J9A2-N	Hon, Hb, Hf
J9B	R	Consent to reset pending alarms, machine reset	J1-RT-2/J9B-T	Sr; SL3-J1
	T		J1-RT-1/ J9B-R	Sr; SL3-J1
iFS	---	iFS port for copying parameters or updating board firmware	---	---
KEY	---	Connector for programming button	---	Pp

Tab 3.1 Legend of SCP674V130B1 card connections (2 of 2)

3.2 SCP674V202MB SLAVE CARD CONNECTIONS

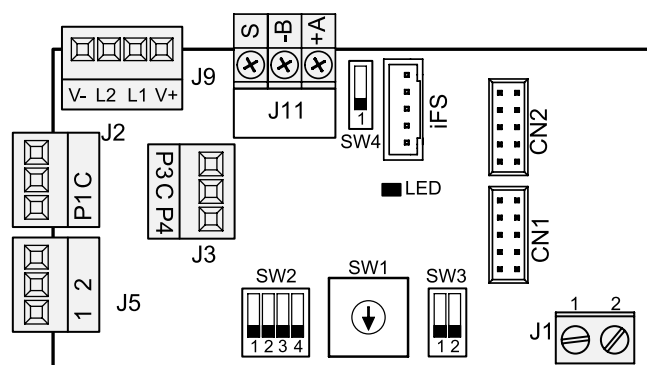


Fig. 3.3 SCP674V202MB slave communication with RS 485 serial port

CONNECTOR	CLAMP	DESCRIPTION	NUMBERING CABLE	COMPONENT CONNECTED
CN1; CN2		Connectors for connection to the motherboard		SCP674V030MB
IFS		TTL serial interface	—	—
J1	1	Reset contact	J1-RT-1	SCP674V30MB (J9B)
	2		J1-RT-2	SCP674V30MB (J9B)
J2	C	Common probes P1	J2-C	P1
	P1	Probe P1, burner temperature	J2-P1	P1
J3	P3	Inlet air probe, P3.	J3-P3	P3
	C	Common probe P3 and P4	J3-C	P3-P4.1...P4.4
	P4	Inlet air outlet probes, P4.1 ... P4.4 (4 probes)	J3-P4	P4.1; P4.2; P4.3; P4.4
J5	1-2	Burner consent contact. Close to start the burner		GO
J9	V+	Connector for terminal connection to earth SCP674V122T2 (only for SERVICE)	Not connected	SCP674V122T2 (V+)
	L1		Not connected	SCP674V122T2 (L1)
	L2		Not connected	SCP674V122T2 (L2)
	V-		Not connected	SCP674V122T2 (V-)
J11	+A	MODBUS network connection		
	-B			
	S			

Tab 3.2 Legenda connctions slave SCP674V202MB

4 OPERATION OF THE APPLIANCE

4.1 CHARACTERISTICS OF THE COMMAND AND CONTROL BOARD SCP-674V130B1

WE RECOMMEND:

- Avoid crossing the cables between them by separating very low voltage connections from the connections referred to the loads;
- Protect the power supply of the unit and wire of temperature probs from electrical disturbances;
- Before carrying out any maintenance, disconnect all electrical connections;
- When making the connections to the burners, respect the specifications provided by the manufacturer;
- Check that the conditions of use such as power supply voltage, ambient temperature and humidity are within the indicated limits.

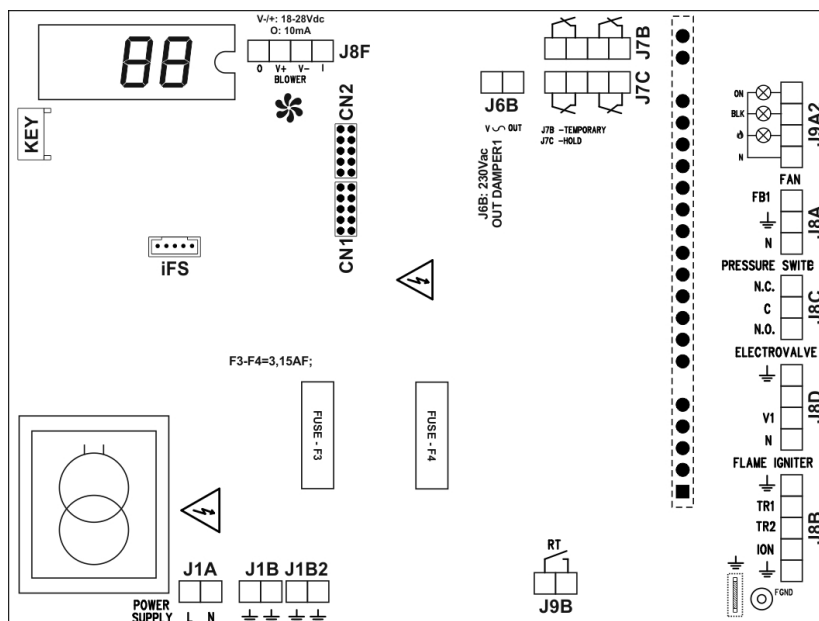


Fig. 4.1 Motherboard SCP674V130B1 command and control board to be combined with SCP674V202MB PCB

General characteristics

Power supply: 230 Vac +/- 10% the power input
 Display visualization: 0 ÷ 99
 Consumption: 7 VA
 Board size: 193x144x35 (max) mm
 Data storage: On EEPROM memory
 Front protection: IP00
 Conditions of use: Ambient temperature $-10 \div 50^{\circ}\text{C}$;
 Storage temperature: $-20 \div 70^{\circ}\text{C}$
 Ambient relative humidity: 30-80%, non-condensing

Display:
 2-digit display

Inputs:
 5 contacts.
 3 opto-isolated light inputs.

Outputs:
 1 230 Vac power output;
 1 PWM output;
 Data output: TTL serial iFS interface

Connections:

Screw and spring terminals for wires with a maximum section of 1.5 mm² with the exception of J1A / J1B terminal blocks with terminal blocks for wires with a maximum section of 4 mm²

4.2 SIGNALS ON THE DISPLAY

DISPLAY	STATE BURNER	CONDITION	DESCRIPTION
--	Turned off	Regular	Test phase
-0	Starting up	Regular	Combustion chamber pre-purge phase.
00	Starting up	Regular	Pre-ignition / BOOST phase
11	Starting up	Regular	Ignition phase, waiting for the flame indicator present
rt	Turned off	In block	RESET burner
-	Turned off	Regular	GO contact open - no command to run
PF	Turned off	Regular	GO contact open - combustion chamber ventilation after burner shutdown - no command to operation
0...99	Switched on	Regular	Flame present (indicates the working thermal power in %,)
ALARMS			
E0	Turned off	Alarm	Alarm: SCP674V130B1 board without SCP674V202MB board.
E2	Turned off	Alarm	Generic alarm, contact J7B open (minimum pressure switch Pg- if present)
E3	Turned off	Alarm	Serious alarm in progress or occurred, contact J7C open (Tso, Pa, Pg + if present). The burner is blocked until it is reset; to eliminate the serious alarm signal and restart the burner, close the RT contact (reset).
E4	Turned off	Alarm	Burner block alarm; If the alarm persists for more than 2 minutes, the burner stops.
E5	Turned off	Alarm	Blower minimum rpm value exceeded alarm. When this event occurs, the burner switches off.
E6	Turned off	Alarm	Maximum blower rpm value exceeded alarm. When this event occurs, the burner switches off.
E7	Turned off	Alarm	Startup test failed alarm. When alarm E7 occurs, the burner locks out. To cancel the alarm signal, remove and restore power to the board
E8	Turned off	Alarm	Burner probe high temperature alarm, probe P1 of SCP674V202MB.
E9	Turned off	Alarm	Lockout light alarm and operation light on simultaneously. To eliminate the alarm signal and restart the burner, close the RT contact (Sr button).
Ed	Turned off	Alarm	Serious alarm, corrupt parameter database. Contact the service center and check the values of parameters rL, rH and Y9. To eliminate the error And after entering the rL / rH / Y9 parameters with the data provided by the burner manufacturer, turn off the power supply of the board for at least 10 seconds.
EE	Turned off	Alarm	EEPROM faulty alarm; try switching the instrument off and on again.

Tab. 4.2 Signaling on display

4.3 MAINBOARD OPERATION

At each burner ignition, operation command (via MODBUS or GO contact) from the SCP674V202MB board, the SCP674V130B1 motherboard performs:

1)	the internal test phase, during this phase appears on the display	--
2)	combustion chamber pre-ventilation cycle. The duration of the cycle depends on parameter Y0; during this phase the PWM power is 50%, appears on the display	-0
3)	the pre-ignition / BOOST cycle. The duration of the cycle depends on parameter Y1; during this phase the PWM power depends on parameter Y2, appears on the display	00
4)	The initialisation / ignition phase. The board remains in this state for a maximum of 2 seconds, until the gas valve light comes on. If the gas valve light does not come on, the board will repeat the pre-ventilation and pre-ignition cycle	11
5)	Normal operation of the burner. The power delivered by the burner depends on the SCP674V202MB extension board connected to the SCP674V130B1 and varies between (rL + r0) and rH. During this phase the display shows the value of the delivered power.	0...99
6)	The opening of the GO contact involves the shutdown of the burner output, see paragraph 4.5 in this regard; with the machine off, the display shows the message	-

4.4 BURNER SHUTDOWN - COMBUSTION CHAMBER POST VENTILATION

When the set point temperature is reached, or from an OFF command via MODBUS, the burner switches off. 5 seconds after switching off the burner starts the ventilation of the combustion chamber, PF, in this phase the blower output power is at 50%. Ventilation of the combustion chamber lasts 2 minutes.

PF

When the machine stopped, the display shows the message:

-

4.4.1 Burner shutdown due to the opening of a safety contact

1)	The opening of one or both contacts connected to the temporary safety terminal J7B (minimum pressure switch Pg-, if present) causes the shutdown. The opening of the burner and the display shows:	E2
1.1)	The burner resumes normal operation when the open safety devices are closed.	
2)	The opening of one or both of the contacts connected to the J7C hold safety terminal (Tso, Pa, Pg + if present) causes the burner to shut down and the display shows:	E3
3)	The burner remains blocked as long as the serious alarm signal persists, the serious alarm event is saved in the memory and persists even in the absence of power. To restart the burner it is not sufficient to close the J7C contact. To cancel the serious alarm event, close J7C and reset the board, RT reset contact (connector J9B) using the Sr.	

4.4.2 Burner shutdown due to burner fan speed exceeding

- 1) If the alarm occurs for the fan rpm below the minimum value, the burner stops and the following message appears on the display:

E5

- 1.1) To restart the burner, turn off and power on the board.

- 2) If the alarm occurs that the fan rpm exceeds the maximum value, the burner stops and the following message appears on the display:

E6

- 2.2) To restart the burner, turn off and power on the board again.

4.5 RESET OF BURNER

To reset the burner, press the Sr button for at least 5 seconds or send the signal via MODBUS to the SCP-674V030MB board or close the RT reset contact (connector J9B) for at least 2 seconds.

The reset of the GENIUS M82 or Brahma DFC M32C WY3 R00 flame control board is manual.

4.6 BURNER OPERATING PARAMETERS



Important

Parameter Y2 is the only one that can be modified, for the other parameters it is only possible to view the set value.

To check the parameter values, proceed as follows:

- 1) disconnect the power supply of the SCP674V130B1 board, connect the SCP674V021 button (key **P**) to the KEY port of the board;










- 2) power up the board again, press and hold the **P** key to scroll through the list of parameters;



- 3) release the **P** key as soon as the desired parameter is displayed, the value of the parameter will now flash on the display for about 3 seconds;



To modify parameter Y2, the only modifiable parameter in the list, proceed as follows:

1)	disconnect the power supply of the SCP674V130B1 board, connect the SCP674V021 button (P key) to the KEY port of the board;	
2)	power up the board again, press and hold the P key to scroll through the list of parameters;	
3)	press the P key until PA appears;	
4)	release the P key, the value 00 will now appear on the display;	
5)	press the P key again to enter the correct password, 33, then wait 3 seconds without pressing the key to save the entered value. The entered password remains in memory for 4 minutes.	
6)	press and hold the P key until the display shows Y2; release the key pressed, the parameter value will now flash on the display;	
7)	press the P key again to modify the parameter value; then wait 3 seconds without pressing the key to save the entered value.	

SIGN	PARAMETER	RANGE	UNIT	DEFAULT
PA	Password modification of parameter Y2	0...99	--	-
Y2	Burner modulation power during pre-ignition time (BOOST) 0% = rL; 99% = rH	0...99	%	50
rL	Minimum burner fan speed value (read only) Note: rL is a functional value, not a safety one.	0...rH	%	-
ro	Offset of rL during normal operation (read only)	0...60	%	-
rH	Max burner fan speed value (read only) Note: rH is a functional, not a safety value.	rL...99	%	-
Y0	Start-up pre-purge time (read only)	10...99	Sec	-
Y1	Pre-ignition time (BOOST) (read only)	0...99	Sec	-
Y9	Burner type: maximum speed and number of fan slots. (read only) 1 = RG 148 (VIP 2 HW), RG 175 (VIP 4 HW a), NRG 137 (VIP 3 HW a / b); 2 = NRG 118 (VIP 1 HW); 3 = G1G 170-AB53-01 (VIP 5 HW a).	1...3	-	-
HH	Release firmware (read only)	-	-	-

Tab 4.3 Burner operating parameters

4.7 SCP674V202MB SLAVE BOARD FEATURES

General characteristics

Power supply: From motherboard SCP674V130B1.
 Working range: P3 and P4: $-50.0 \dots 150$ °C with NTC probes
 Dimensions: $\sim 60 \times 110 \times 25$ mm
 Data storage: On EEPROM memory
 Conditions of use: Ambient temperature $-10 \div 50$ °C;
 Storage temperature $-20 \div 70$ °C
 Ambient relative humidity: 30/80%, non-condensing
 Connections: screw terminals for wires with a maximum section of 1.5 mm² or 2.5 mm²
 Inputs: 3 probe inputs: P1 PT1000, P3 and P4 NTC 10K Ω @ 25 °C
 Outputs: relay K1 SPST 3 (1) A 250Vac
 Data output: TTL serial iFS interface

Serial communication for
 MODBus protocol: RS-485 serial port for MODBus:
 the maximum length allowed for the network connection is 1000 meters
 Card connection
 SCP674V202MB - keyboard
 SCP674V122T2 To connect the SCP674V202MB board to the SCP674V122T2 keyboard displayed, use a 4-pole cable.
 The maximum length allowed for the connection is 15 meters

4.7.1 Main features

CONNECTION TO THE SCP674V130B1 BOARD:

the connection to the SCP674V130B1 board is extremely simple, just insert the SCP674V202MB board in the CN1 and CN2 connectors of the SCP674V030MB board and set the SW1, SW2 switches correctly.

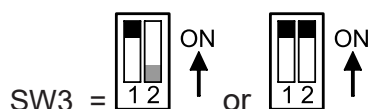
MODBUS NETWORK CONNECTION:

The communication between the devices takes place bidirectionally on the RS-485 serial line using 2 wires (2-pole twisted shielded cable, for example: Belden model 8762 with 2-pole twisted PVC sheath + braid, 20 AWG, nominal capacitance between conductors 89 pF, nominal capacitance between conductor and braid 161 pF); the maximum length of the line can reach 1000 meters.

KEYBOARD SCP674V122T2 AUTOMATIC DECIMAL POINT: only for SERVICE.4.7.2 Modbus

MAIN INFORMATION: An asynchronous 485 serial communication has been implemented in the SCP-674V202MB device which complies with the standard ModBus protocol, widely used and standardized, which allows the SCP674V202MB devices to be easily inserted into any network characterized by a client / server serial transmission (master / slave) compatible with this communication standard.

ModBus communication of the device is enabled only if DIP Swicht 3 is set in the following ways:



The standard establishes the communication structure, in which a single master is connected via a serial bus to a maximum of 247 slaves, uniquely identified by their address. Communication always begins on the part of the master, while the slaves respond only if addressed by the master and cannot communicate with each other.

The master can send its request to the slaves in two ways:

- unicast mode: the master addresses the slave by sending a request containing the serial address of the desired device (possible addresses from 1 to 247). In this situation the slave, once the received request has been made, sends a response to the master.

- broadcast mode: the master sends a request, typically for writing, to all the slaves who execute the request without sending a response. In this case the master uses the slave address 0, reserved for broadcast mode. ModBus communication takes place by sending data packets along the serial line, the packet complies with the following scheme:

Tab. 4.5

Slave address	Function Code	Data	Error Check
---------------	---------------	------	-------------

4.7.2.1 Serial configuration of devices

Communication protocol: ModBUS RTU

Physical layer: RS485;

Communication speed: 9600bps or 19200bps (see SW2 dip 3);

Data field: 8 bits;

Parity bit: none;

No. of stop bits: 1;

Minimum time between 2 attempts: 500 msec;

ModBUS functions implemented: FUN3, FUN6;

Maximum length of FUN3 multiple reading: 5 indexes maximum;

MINIMUM time of 3.5 char between one frame and another frame;

MAXIMUM time of 1.5 char between one byte and another byte of a frame;

4.7.2.2 Network / slave device addresses

The address of a network / slave device can take values between 1 and 247.

The value "0" is reserved for the broadcast address. If address 0 is used then all the network modules will execute the write-only command of a Holding type register, without returning any response.

4.7.2.3 Exception codes

If the device is unable to execute a command received, it will respond with an exception code, in particular:

- Function not implemented: 0x01. When an unimplemented function is required. For example: when the network master asks for a function other than 0x03 and 0x06.
- Area not implemented: 0x02. When an area not present is required. For example: when a logical area not implemented in the device is required.
- Invalid index area: 0x03. When the value of a logical area is out of range. For example:
 - when the field of an absent area is required;
 - when more than 5 elements are requested at the same time;
 - write an out of range value;
 - write a value in a read-only area;
- Write / read error: 0x04. When the read / write command of a field is unsuccessful. For example: writing of the "SP1C" parameter was not done correctly.
- Busy / busy device: 0x06. When the device does not execute the command received because it is busy in other operations. In this case the network master must repeat the command.

The exception code that is forwarded to the network master has the following format:

Slave address	code function + 0x80	exception code	CRC (LSByte)	CRC (MSByte)
---------------	-------------------------	----------------	--------------	--------------

Tab. 4.6

4.7.2.4 COMMAND DESCRIPTION

- READ A HOLDING REGISTER, 0x03.

Example of reading query:

Tab 4.7

Slave address	Code Function	Register address (MSByte)	Register address (LSByte)	N°of registers (MSByte)	N°of registers (LSByte)	CRC (LSByte)	CRC (MSByte)
---------------	---------------	---------------------------	---------------------------	-------------------------	-------------------------	--------------	--------------

- Slave address: MODBus address of the slave module to read
- Function code: for example 0x03.
- Register address: MODBus address of the starting register.
- Number of registers: it is the number of registers to read. Max 5 registers a time.
- CRC: the Cyclical Redundancy. Check is automatically calculated by the transmitting device according to the frame received and checks the contents of the entire message.

Structure of a normal response from the slave to the master query:

Slave address	Function	Byte count	data byte n°1	data byte n° N	CRC (LSByte)	CRC (MSByte)
---------------	----------	------------	---------------	------	----------------	--------------	--------------

Tab 4.8

- Byte count: it is the number of bytes in the register data byte field, CRC excluded.
- Data byte: it is the value associated to the reading registers. First the MSByte part and then the LSByte part.

WRITE SINGLE REGISTER, 0x06.

Function not available in all devices.

Example of writing query

Tab. 4.9

Slave address	Code	Register address (MSByte)	Register address (LSByte)	data (MSByte)	data (LSByte)	CRC (LSByte)	CRC (MSByte)
---------------	------	---------------------------	---------------------------	---------------	---------------	--------------	--------------

- Slave address: MODBus address of the slave module to be written;
- function code: for example = 0x06.
- register address: MODBus address of the register to be written.
- data: value to be written.
- CRC: the Cyclical Redundancy

Check is automatically calculated by the transmitting device according to the frame received and checks the contents of the entire message.

The replay of the writing query has the following format:

Tab. 4.10

Slave address	Code	Register address (MSByte)	Register address (LSByte)	N°of registers (MSByte)	N°of registers (LSByte)	CRC (LSByte)	CRC (MSByte)
---------------	------	---------------------------	---------------------------	-------------------------	-------------------------	--------------	--------------

CRC

The transmitter automatically calculates the CRC using the transmitted data/frame. The resulted value is attached to the end of the data. The receiver re-calculates the CRC, then compares its result to the received CRC; if the two values are different the frame is ignored. The exception is not generated in case of a broadcast writing command.

The transmitted data have always the following structure:

Word : single data register															
MSByte : most significant byte								LSByte : less significant byte							
bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0

Tab. 4.11

REGISTER ADDRESS:

The address of the slave module is the address showed in the first field of the MODBus command.

The register address is the register to read/write. All the registers are 16Bit register, 1 Word, also if they have only an 8 bit parameter.

From here all the address are in decimal numbering.

4.8 SCP674V202MB SLAVE CARD PROGRAMMING

4.8.1 SCP674V202MB card encoding for network operation

Using the SW1 + SW2 switches it is possible to assign an address to each network interface (slave card SCP674V202MB) or disable the network port if the card is mounted on a single machine, disconnected from the network.

The network controller recognizes the network interfaces by the number with which they are coded.

**Important**

Do not assign the same address to two or more SLAVES (SCP674V202MB network interface) in order to avoid conflict situations with the consequent blocking of the system.

**Please note**

Change the DIP switches only when the device is switched off.

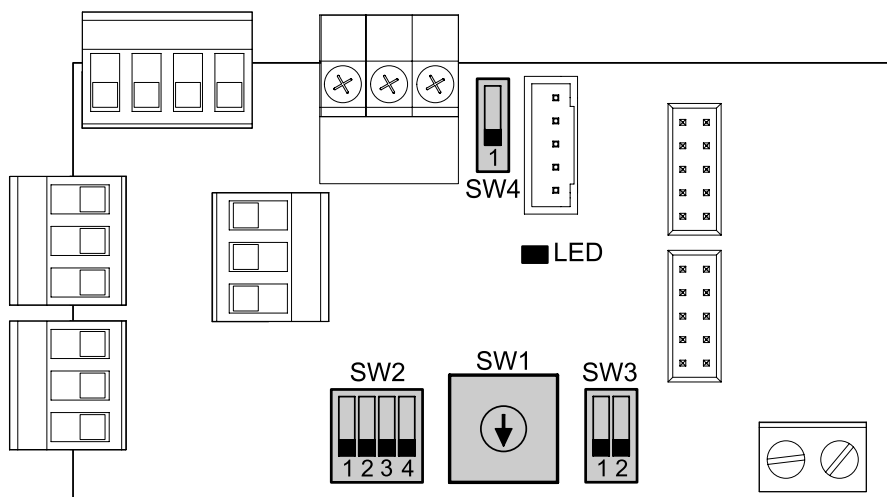






Fig. 4.2 Position DIP Switch in slave SCP674V202MB

SW2 (DEP 1io 2)	Position SW1 (rotating)	Addressing SALVE(module SCO674V202MB)
	0,1...F	1,1...15
	0...F	16...31
	0...F	32...47
	0...F	48...63

Tab 4.12 Adress of slave card

Address 0 (zero) cannot be assigned to an SCP674V202MB card. If SW2 = 0 + SW1 = 0 is set, the card automatically assumes address = 1.



$$\text{SW2 } \begin{array}{|c|c|c|c|} \hline \square & \square & \square & \square \\ \hline 1 & 2 & 3 & 4 \\ \hline \end{array} \uparrow \text{ON} + 0 \text{ (SW1)} = \text{address 1}$$

The LED placed on the module shows the working status of the module and of network connection:

Normal flashing. Frequency 1Hz	SCBus communication in progress, card working.
Steady on.	No SCBus network communication.
Fast flashing. Frequency 4 / 5Hz	Card not working.

Tab. 4.13

If the modbus port is in operating by the dip n ° 3 of SW2 the MODBus communication speed is set:




SW2 (DIP 3)	FUNCTION DESCRIPTION
	baud rate: 9600 bps.
	baud rate: 19200 bps.

Tab 4.14 MODBus communication speed setting

4.8.2 DIP Switch Configuration 3

SW3, dip n ° 1: enable / disable Modbus port;

SW3, dip n ° 2, probes P3 and P4: connected directly to the SCP674V202MB board or switched via MODBus

SW3 (DIP 1/DIP 2)	FUNCTION DESCRIPTION
	Modbus port disabled, SCP674V202MB board not connected to any Modbus network. Probes P3 and P4 connected directly to terminal J3 of the SCP674V202MB board.
	Modbus port enabled, SCP674V202MB board connected to a Modbus network. Probes P3 and P4 connected directly to terminal J3 of the SCP674V202MB board.
	Modbus port enabled, SCP674V202MB board connected to a Modbus network. Values of probes P3 and P4 passed via MODBus (see paragraph 4.9.6, page 39)


Tab 4.15 Enable Modbus port and P3 and P4 probes

4.8.3 Configuration DIP Swicht 4

DIP swicht 4 has the function of identifying the last device in the network and inserting the end-of-line resistance. In an RS-485 Modbus rest, the last network device, the one farthest from the control panel (master) on the ground, must have the end of line resistance.

Resistance which can be:

- enabled directly by SW4, DIP 1 in the ON position (see table 4.16).
- mounted at the ends of the + A and –B terminals (connector J11) of the SCP674V202MB slave board. In this case, leave DIP 1 of SW4 in the OFF position.

SW4	FUNCTION DESCRIPTION
	WITH RS 485 NETWORK, in the last network device, set the DIP switch to the ON position.

Tab 4.16 Last device setting for network closure

4.8.4 Menu SET-POINT: SET

Set-point, SP = burner adjustment temperature.



Please note

The SP parameter is saved in the EEPROM memory; rewriting the parameter value multiple times shortens the memory duration.

MODBUS: SET menu - set-point: modbus index base register 1 (base Reg. 1 column) in reading and writing.

Reg. base 1	SIGN	PARAMETER	RANGE	UM	DEFAULT
1025	SP	Set-point. (steps of 0.1 signed)	-50...150	°C	40°

Tab 4.17

4.8.5 FUNCTIONS menu: Fnc - burner RESET

The functions menu contains the rSt parameter: reset relay activation / burner reset start.

To start the burner reset, set the rSt parameter to YES:

- The SCP674V202MB + SCP674V130B1 board performs a manual reset.
- The duration of the reset depends on parameter L2:
 - If L2 < 3s. the board will only reset the burner.
 - If L2 ≥ 5s. the card will carry out both the reset of the burner and the reset of the SCP674V130B1 card after serious alarm. With L2 ≥ 5s. at each start of the reset the serious alarm signals pending on the SCP674V130B1 board will be deleted.



Please note

In case of alarm 18, permanent alarm, HOLD, reset the card for at least 5s.

If the reset command is blocked, see parameters H30 and H31.

With H31 = 1 it is not possible to reset a burner in lockout more than 5 times within 15 minutes. After 5 attempts in 15 minutes, the reset command is blocked and parameter H30 = 1. To unlock the reset command set H30 = 2.

MODBUS: The Fnc – functions: modbus indexes base register 1 (column Reg base 1) in reading and writing

Reg. base 1	SIGN	PARAMETER	RANGE	UM	DEFAULT
1543	rSt	Reset SCP674V202MB. 0=no; 1=yes;	0..1	-	0
1544	K-lock	Permanent keyboard lock 0=no; 1=yes;	0..1	-	0
1546	A-M	Burner SCP674V202MB ignition/shutdown. 0 = OFF: board off, in-stand-by. 1 = board enabled for power-up, waiting for the GO command from the terminal 1one2 (connector J5). 2 = ON: board enabled at power-up, GO command from Modbus	0..2	-	0

Tab 4.18

4.8.6 Menu INFO: inFo

The base register 1 modbus indexes are indicated in the base register 1 column.

Reg. base 1	PARAMETER/DESCRIPTION	NOTE
	MODBUS: General information (read-only indexes)	
1	Name firmware : LTSE + LTS	MSByte : LTSE; LSByte : LTS;
2	Version firmware, Par. HH.	LSByte : version firmware
	MODBUS: Probe inputs - inFo menu (read-only indices)	
257	Probe P1	Probe value P1
261	Probe P3	Probe value P3
263	Probe P4	Probe value P4
1542	PiM	Power of the PWM burner
	MODBUS: Probe inputs - inFo menu (indices in writing only with SW3 DIP 1 = ON and DIP 2 = ON: see tab. 4.9.2, page 37)	
280	Probe P4	Probe value P4
	MODBUS: Burner output status, keyboard lock status (read-only indices)	
513	Keyboard lock.	MSByte: Bit 4: keyboard lock, 0=no; 1=YES;
516	Burner status.	LSByte: Bit 0: burner output, 0=off; 1=ON;

Tab 4.19

4.8.7 Menu ALARMS: ALSt

The alarms menu contains the list of pending alarms.

MODBUS. Alarms status - ALSt menu: modbus indexes base register 1 (base Reg. 1 column) read only.

Reg. base 1	PARAMETER/DESCRIPTION	NOTE	
769	Probe alarms.	MSByte :	LSByte : Bit 0: alarm n°20, probe P1 fault; Bit 2: alarm n°22, probe P3 fault; Bit 3: alarm n°23, probe P4 fault;
771	Other alarms	MSByte : Bit 0: alarm n°41, burner overheating.	LSByte : Bit 0: alarm n°17, burner lockout; Bit 2: alarm n°19, AG1; Bit 3: alarm n°18, AG2; Bit 4: alarm n°59, no probes via modbus;

Tab 4.20

ALARM	DESCRIPTION OF ALARM	
10	EEPROM broken, switch OFF the device and start it again	
17	Burner lockout.	
18	Alarm AG2, hold alarm: air filter 1 or 2 alarm. Check the status of the J7C inputs on the SCP674V130B1	
19	Alarm AG1, temporary alarm : pressure gas or b-thermostat alarm. Check the status of the J7B inputs on the SCP674V130B1 .	
20	P1 probe in short-circuit or not connected or temperature over instrument limits. Check the cable to the probe.	
22	P3 probe in short-circuit or not connected or temperature over instrument limits. Check the cable to the probe.	
23	P4 probe in short-circuit or not connected or temperature over instrument limits. Check the cable to the probe.	
41	Overheating alarm of the burner. The alarm stops when the temperature goes back to normal values. When the alarm overheating of the burner occurs the power of the PWM burner goes to the minimum value 0%.	
59	If DIP 1 = ON and DIP 2 = OFF or DIP 1 = ON and DIP 2 = ON No MODBus connection. Write at least every 30 minutes the value of the parameter A-M. (tab. 4.18)	
	If DIP 1 = ON and DIP 2 = ON The value of the P4 probe has not been written correctly via modbus. To avoid the alarm signal, the value of P4 (table 4.19) must be written at least once every 10 minutes.	

Tab 4.21

4.8.8 Menu PARAMETERS

Parameter type legend and relative password

☉ = USER parameters (password = any).

I = INSTALLER parameters. Before changing the value, read the instructions carefully (password = 95).

C = MANUFACTURER parameters. These parameters are typically set by the manufacturer, the default values may be different from those recommended. Any modification may cause the connected equipment to malfunction. These parameters are only visible by entering the correct password.



Note

The parameters are saved in the EEPROM memory; rewriting the parameter values multiple times shortens the memory duration.

MODBUS: Menu PAR: modbus indexes base register 1 (column Base Reg. 1) in reading / writing

R.b1	Cod	*	Parameter	PA	Range	UM	Def
/			Regulating probe parameters				
1026	/C1	E (R/W)	Calibration probe P1 – overheating burner probe	I	-50...50	°C	0,0
1027	/C3	E (R/W)	Calibration probe P3 – fan probe inlet air	I	-12...12	°C	0,0
1028	/C4	E (R/W)	Calibration probe P4 – fan probe outlet air	I	-12...12	°C	0,0
1029	/S	E (R/W)	Reading stability AD inputs	I	0...5	-	2
r			Regulator parameters				
1030	rd	E (R/W)	Set-point differential	U	0,1...12	°C	1
1031	rd4	E (R/W)	Burner cut-off differential	U	0...50	°C	4
L			Output parameters				
1032	L2	E (R/W)	Reset pulse duration.	F	1...30	S	1
1033	LbP	E (R/W)	Proportional band.	I	1...30	°C	7
1034	LrA	E (R/W)	Automatic correction of max value of the PWM. It is the value of the burner maximum power in case of outside temperature $P3 \geq Ln8$.	I	15...100	%	35*
1035	Ln6	E (R/W)	Minimum value of the inlet air temperature to calculate the algorithm of automatic correction of the max PWM value.	I	-20...Ln8	°C	0
1036	Ln8	E (R/W)	Maximum value of the inlet air temperature to calculate the algorithm of automatic correction of the max PWM value.	I	Ln6...30	°C	20
1037	F0t	E (R/W)	Integral time	F	50...999	S	400
A			Alarm parameters				
1038	Ad	E (R/W)	Alarm differential	F	0,1...99	°C	30
1039	AH	E (R/W)	Overheating burner alarm. 0 = alarm disabled;	I	0...600	°C	300*
1043	At	E (R/W)	Ht temperature alarm delay	I	0...15	min	15
H			Other paraemters				
1040	H30	E (R/W)	Reset command availability (only if H31=1): 0=reset command available; F=reset command locked, you reset the burner more than 5 times within 15min.; 2=to unlock the reset command.	U	0...2	-	0
1041	H31	E (R/W)	To enable the reset command counter function: 0=no. It's always possible to reset the burner; F=yes. You can reset the burner at maximum 5 times in 15minutes. If you exceed the 5 attempts within 15min. then the burner command locks.	F	0...1	-	0
1045	H90	E (R/W)	Value to determinate the PWM value when the burner temperature, P1, is between AH-Ad and AH . The PWM power inside this band automatically limits its power between the max, 100% or LrA , and a minimum value set on H90 .	I	0...100	%	35
				<p>When the temperature of the burner exceeds the AH limit and before the alarm A 41 occurs then the PWM value: + assumes the H90 value, if PWM value is greater than H90; + is the same, if PWM value is smaller than H90;</p>			
2	HH	E (R)	Release firmware (read only)	U	-	-	14
1042	HL	E (R/W)	Keyboard lock. no; YES;	U	no..YES	-	no
1044	H08	E (R/W)	Maximum interval between two writes via Modbus of the variables A-M and/or P4 to avoid the A 59 alarm, no modbus communication, (Read parameter n°13) NOTE: from the keyboard SCP674V122T2 the parameter range is limited to : 60 ...999.	U	0...1800	S	60
				Set-point			
1025	SP	E (R/W)	Set-point at power on of the device. (step 0,1°C with sign)	U	-50...150	°C	40

*Depend of model

Tab 4.21 SCP674V202MB operating parameters

4.8.9 Burner operation mode (PWM)

The SCP674V202MB board, when the burner is lit, has a single operating mode: the PWM burner automatically modulates the power to keep the supply air flow temperature as equal as possible to the set set-point, SP (tab. 4.17, page 38).

The burner output turns on if:

- GO consent is present: burner start consent command. The GO can be given by digital input, terminals 1 and 2, connector J5 of the SCP674V202MB board, or via MODBus; (see section 4.8.2, page 32)
- the supply air temperature, detected by the P4 probe, is lower than SP-rd;

Upon ignition, the power supplied by the burner is at a minimum, 0%, until the burner operating light also lights up.

With the light on, the burner gradually increases its power, + 1% every second, until the power value proportional to the difference between the temperature detected by P4 and SP is reached.

When the proportional value is reached, the burner regulation continues with P.I. (proportional integral).

When the SP + rd4 threshold is exceeded or in the absence of the GO, the burner switches off completely.

The maximum power delivered by the burner varies according to the inlet air temperature detected by the P3



Note

In case of probe error (SCP674V130B1 motherboard display, see paragraph 4.2 page 27):

E1 = the burner power limitation to minimum function is deactivated;

E3 = the automatic correction function of the maximum value of the PWM output is disabled;

E4 = the burner output is off.

probe, see the NOTE at the end of the paragraph;

If the temperature detected by probe P1 is greater than AH, alarm 41, the burner power is limited to the minimum.

To obtain an optimal regulation, set the following parameters correctly:

LbP: ampiezza banda proporzionale;

- **rd4**: burner shutdown differential;
- **F0t**: integral time.

Consider that:

- the increase in the proportional band reduces the temperature fluctuations but increases the deviation between the detected temperature P4 and the set point SP;
- the excessive decrease of the proportional band involves the decrease of the deviation but increases the temperature oscillation, overshooting effect;
- the decrease of the integral time F0t implies an improvement of the integral action and leads, when fully operational, to the cancellation of the deviation;
- too short integral times increase the weight of the integral action.



Note

If the parameters LrA, Ln6 and Ln8 are appropriately configured, they enable the automatic correction of the maximum power of the PWM based on the variation of the inlet air temperature, P3:

the warmer the inlet air temperature, the more the maximum value of the PWM output will drop towards LrA. If $P3 \geq Ln8$ then $\max \text{ PWM} = LrA$;

the colder the inlet air temperature, the more the maximum value of the PWM output will approach the maximum of PWM.

If $P3 \leq Ln6$ then $\max \text{ PWM} = 100\%$;

For example: with $LrA = 50\%$; $Ln6 = -10^\circ \text{C}$; $Ln8 = 10^\circ \text{C}$:

- If $P3 = -10^\circ \text{C} = Ln6$ then the maximum of the PWM is equal to 100% of the maximum power;

- If $P3 = 0^\circ \text{C}$ then the maximum PWM is equal to 75% of the maximum power;

- If $P3 = 10^\circ \text{C} = Ln8$ then the maximum PWM is equal to 50% of the maximum power;

To disable the automatic correction of the maximum power, set $Ln6 = Ln8$ or $LrA = 100$.

5 GAS INSTALLATION



WARNING

The gas piping must be made by qualified personnel with adequate skills and in compliance with the national and local regulations in force on the subject and as reported in this booklet.



WARNING

Perform the leak test in accordance with current legislation before putting the gas supply system into service.



Important

The sizing of the pipes and any pressure reducers must be such as to guarantee correct operation of the appliances. The materials used must comply with the regulations in force in the country of installation of the system.

5.1 CONNECTION OF THE APPLIANCE

- a) The appliance cannot withstand pressures higher than 50 mbar (0.05 bar) otherwise the gas valve membranes may break.
- b) For natural gas: always install on the main line upstream, after the counter, a pressure stabilizer and a pressure gauge with a scale of 0 ÷ 60 mbar (0.06 bar) and adjust the pressure to the values shown in tab. 5.1; a higher pressure can create bad combustion, difficulty in igniting the flame.
- c) For LPG gas (Butane-Propane): a "1st stage" pressure reductor must be installed near the tank in order to reduce the pressure to 1.5 bar; on the main external line outside a building,
Always install a "2nd stage" pressure reductor to reduce the pressure to the values shown in tab. 5.1.
After the "II ° stage" reductor, install a pressure gauge scale 0 ÷ 60 mbar (0.06 bar) and adjust the pressure to the values shown in tab. 5.1; a higher pressure can create bad combustion, difficulty in igniting the flame.
- d) A pressure gauge must always be installed upstream and downstream of the main gas supply line in a visible manner with a scale of 0 ÷ 60 mbar (0.06 bar) in order to check any difference in pressure upstream and downstream and therefore the reach of the entire network.
- e) It is also possible, by closing the general gate valve and turning off all appliances, to check the tightness of the system and the gas valves, checking, after a short period, for any pressure drop on the pressure gauges.
- f) Always connect the appliances with a ball valve and anti-vibration flexible gas joint.
- g) Gas supply pressure adjustment: all appliances are tested and calibrated in the factory for the pressures for which they are designed (see burner plate data or table 5.1).



WARNING

Seal the gas valve adjustment body after calibration.

Country	Sign	Category	Pressure	Country	Sign	Category	Pressure
Albania	AL	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar	Luxembourg	LU	I _{2E}	G20=20 mbar
Austria	AT	I _{2H3B/P}	G20=20 mbar G30/G31=50 mbar	Macedonia	MK	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar
Belgium	BE	I _{2E(R)}	G20/G25=20/25 mbar	Malta	MT	I _{3B/P}	G30/G31=30mbar
Belgium	BE	I _{3P}	G31=37 mbar	Norway	NO	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar
Bulgaria	BG	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar	Netherlands	NL	I _{3B/P}	G30/G31=30 mbar
Cyprus	CY	II _{2H3P}	G20=20 mbar G31=37 mbar	Poland	PL	II _{2ELwLs3PB/P}	G20/G27=20 mbar G2.350=13 mbar G30/G31=37 mbar
Cyprus	CY	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar	Portugal	PT	II _{2H3P}	G20=20 mbar G31=37 mbar
Croatia	HR	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar	UK	GB	II _{2H3P}	G20=20 mbar G31=37 mbar
Denmark	DK	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar	Czech Republic	CZ	II _{2H3P}	G20=20 mbar G30/G31=28-30/37 mbar
Estonia	EE	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar	Romania	RO	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar
Finland	FI	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar	Romania	RO	II _{2L3B/P}	G25=20 mbar G30/G31=30 mbar
France	FR	II _{2ESi3P}	G20/G25=20/25 mbar G30/G31=28-30/37mbar	Slovakia	SK	II _{2H3P}	G20=20 mbar G31=37 mbar
Germany	DE	II _{2ELL3B/P}	G20=20 mbar G25=20 mbar G30/G31=50 mbar	Slovakia	SK	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar
Greece	GR	II _{2H3P}	G20=20 mbar G31=37 mbar	Slovenia	SI	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar
Greece	GR	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar	Slovenia	SI	II _{2H3P}	G20=20 mbar G31=37 mbar
Ireland	IE	II _{2H3P}	G20=20 mbar G31=37 mbar	Spain	ES	II _{2H3P}	G20=20 mbar G31=37 mbar
Iceland	IS	I _{3B/P}	G30/G31=30 mbar	Sweden	SE	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar
Italy	IT	II _{2H3P}	G20=20 mbar G31=37 mbar	Switzerland	CH	II _{2H3P}	G20=20 mbar G31=37 mbar
Latvia	LV	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar	Turkey	TR	II _{2H3P}	G20=20 mbar G31=37 mbar
Lithuania	LT	II _{2H3P}	G20=20 mbar G31=37 mbar	Turkey	TR	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar
Lithuania	LT	II _{2H3B/P}	G20=20 mbar G30/G31=30 mbar	Hungary	HU	I _{2H3B/P}	G20= 25 mbar G30/G31=30 mbar

Tab 5.1 Categories of gas and supply pressure

**Important**

For methane supply with pressures higher than 20 mbar (200 mm w.g.), always provide a pressure stabilizer for each appliance and adjust the pressure to 20 mbar.

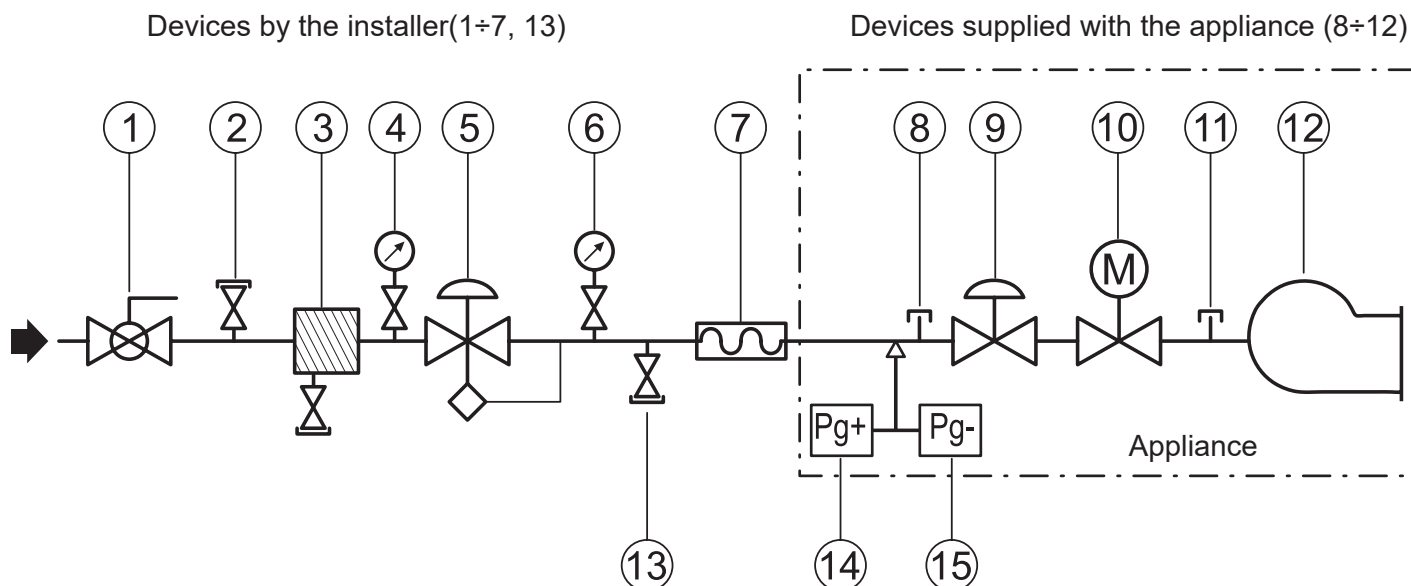


Fig. 5.1 Gas connection

POS.	DESCRIPTION
1	Manual gas shut-off ball valve
2	Gas pressure point upstream of the pressure regulator
3	Gas filter
4	Manometer upstream of the pressure regulator with push button valve
5	Gas pressure regulator with minimum and maximum pressure block device (outlet pressure = 0.04 bar) - For inlet pressures <0.04 bar, provide a stabilizer
6	Manometer downstream of the pressure regulator with push button valve
7	Anti-vibration joint
8	Gas pressure socket at the inlet of the appliance's gas valve
9	Gas pressure regulator placed on the appliance's gas valve
10	Safety solenoid valve
11	Gas pressure outlet located at the outlet of the appliance's gas valve
12	Burner
13	Ball valve with bleed
14	Maximum gas pressure switch with manual reset (40 mbar) - optional
15	Minimum gas pressure switch (20 mbar) - optional

Tab 5.2 Gas components

6 INSTALLATION

**WARNING**

Entrust all installation operations to professionally qualified personnel responsible in compliance with current national and local legislation in force in the country of installation of the system and with the contents of this manual.

**WARNING**

During the installation operations, the personnel must be equipped with individual protection devices in accordance with current legislation.

6.1 PRELIMINARY UNLOADING OPERATIONS

**WARNING**

Unloading from material handling equipment and transfer to the place of installation must be carried out using means suitable for the arrangement of the load and the weight.

All material lifting and transport operations must be carried out by experienced and informed personnel regarding the operational methods of the intervention and the prevention and protection rules to be implemented.

The handling of the material must take place according to the procedures described in this manual.

Make the area of operations inaccessible to strangers by delimiting it with barriers to prevent it from staying and passing under loads.

Use suitable lifting and handling means that comply with current standards, do not install pulleys for lifting materials and do not place superstructures to reach higher heights.

6.2 CONDENSATE DRAIN

Pay particular attention to the construction of the condensate conveying pipes; an incorrectly constructed piping can compromise the correct functioning of the appliance.

For the construction of the condensate conveying pipes, use materials suitable to withstand the mechanical, thermal and chemical stresses of the condensates over time (for example stainless steel pipes or plastic material for the passage of cold water).

Do not use copper or iron pipes, materials that are easily attacked and perishable by the acidity of the condensate.

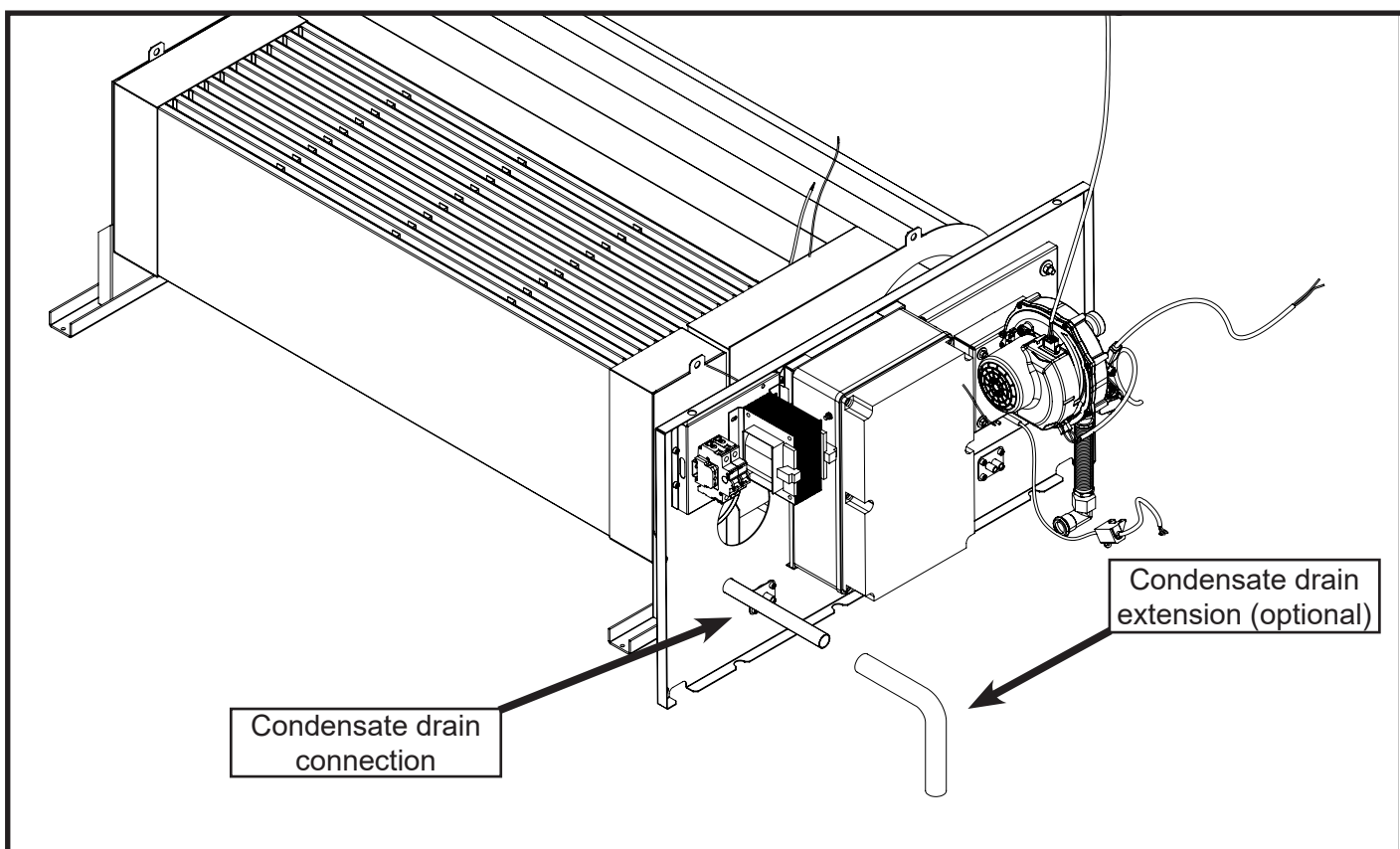


Fig. 6.1 Position of the condensate drain connection

6.2.1 Condensate drain connection

The exchangers are equipped with a condensate drain connection in the front part of the exchanger, under the connection for the flue gas discharge pipe. The factors to be taken into consideration when constructing the condensate drain piping are:

- avoid the stagnation of condensate inside the exchanger;
- avoid the stagnation of condensate inside, except for the liquid head present in the siphon or similar device;
- avoid freezing of condensation water in the pipeline;
- compensate for any pressure changes within the sewer system or other evacuation collection system where the drain is connected, which could affect the operating conditions of the appliance or gas system;
- for the correct disposal of the combustion condensates, it is necessary to assess whether the current legislation requires the need to neutralize the condensates with a special system.

6.2.2 Condensate stagnation in the exchanger

- Install the exchanger perfectly level to maintain the natural inclination of the tube bundle and allow the condensate to flow out, preventing it from accumulating inside the exchanger during normal operation.

6.2.3 Frost protection

- The condensate drain pipe must be adequately protected to prevent condensation water from freezing.
- Install the condensate collection system inside the heated rooms.
- In the case of the appliance installed outdoors with winter temperatures, it is possible to leave the condensate drain without connections to pipes, checking that the current legislation allows it.
- In the case of the external way of the condensate drain pipe, it may be necessary to install a heating cable.

6.2.4 Discharge into the drainage system

- The connection of the condensate drain to the sewerage system must take place at atmospheric pressure, i.e. by dripping into a siphoned container, or equivalent device, designed to prevent the return of fumes, if required by current legislation, a suitable neutralizer of the acidity of the condensate.

pH of the condensate discharged from the device is in the range of 4 - 5



Important

For the realization of the condensate drain, always refer to the requirements of current legislation since in some countries all the types of drain described are not allowed.

6.3 ANTI-VIBRATION CONNECTOR ASSEMBLY

6.3.1 Anti-vibration connectors for modules: EOLO LXC, EOLO LXD, EOLO LXE, EOLO LXE+, EOLO LXF



Important

Attention! Anti-vibration connectors should be assembly in linearity way. It is allow to bend anti-vibration connector under the following condition. Use the Emipiu 3/4" as anti-vibration connector with cat. no. 12ARPG6007. See on drawing Fig. 6.7

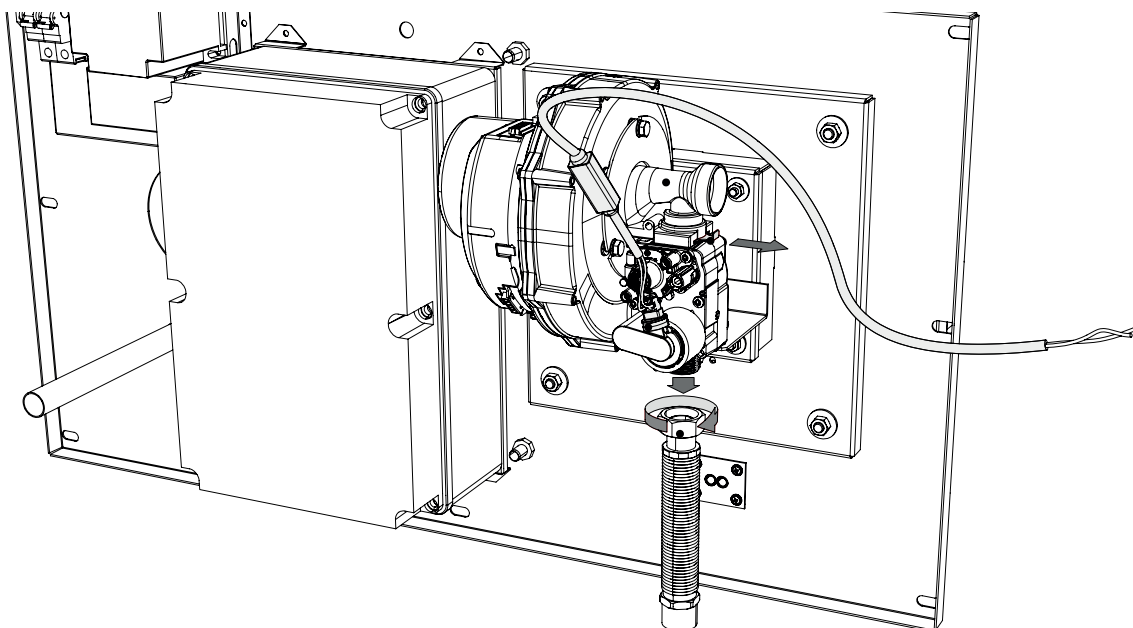


Fig. 6.2

6.3.2 Anti-vibration connectors for modules: EOLO LXG, EOLO LXH



Important

Attention! Always make control to linearity of anti-vibration connection, especially during fixing gas connection components. There is installed anti-vibration connector size G5-4 with cat. no. 22CNGI0615



Attention!

Do not fix the anti-vibration connection in axially way. Avoid axial twisting on during tightening.

Do not bend the anti-vibration connector. Always assemble it mount in a straight position without any turning down.

Follow the instructions below. Any errors in the installation of the gas connector disqualify the device for further use. Do not use device in future, after doing any mistake during assembling

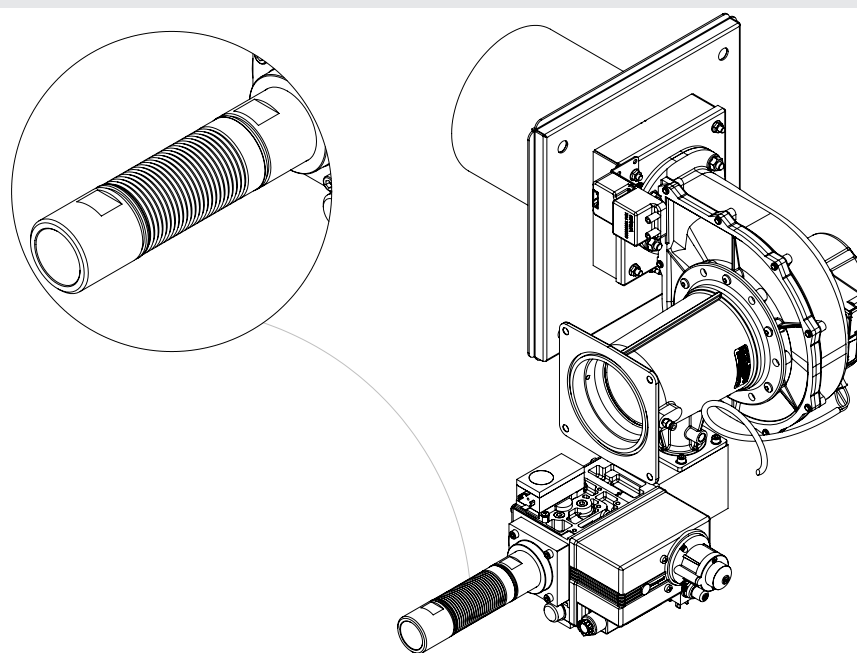


Fig. 6.3 Correct way of assembling ant-vibration connection for module EOLO LXG

6.4 EXHAUST DUCTS



Important

Do not install EOLO LX appliances in environments with mechanical extraction ventilation and local depression.

The vacuum room can compromise the functionality of the EOLO LX appliances.

The appliances are supplied with a horizontal flue terminal (fig. 6.3). To install a vertical flue pipe, remove the horizontal terminal, fit a 90 ° bend, the vertical pipe and the rainproof terminal (fig. 6.4).

To size the flue gas exhaust duct it is necessary to calculate the total pressure drop generated by the duct itself.

The total head loss allowed by the exhaust pipe is 120 Pa and the mass flow rate values of the fumes (for methane G 20) are shown in table 2.1, pages 7 and 8.



Important

Use approved pipes and fittings with sealed gaskets, suitable for resisting the condensation of the combustion products of gaseous fuels.

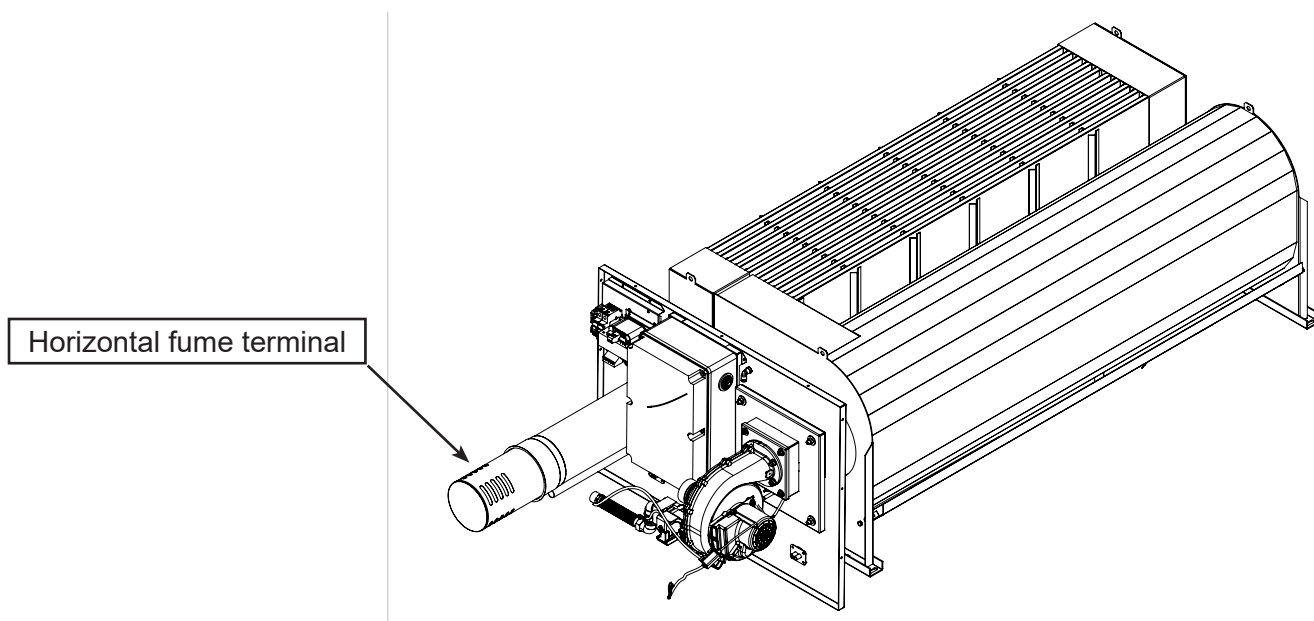


Fig. 6.4 Standard horizontal exhaust fumes terminal

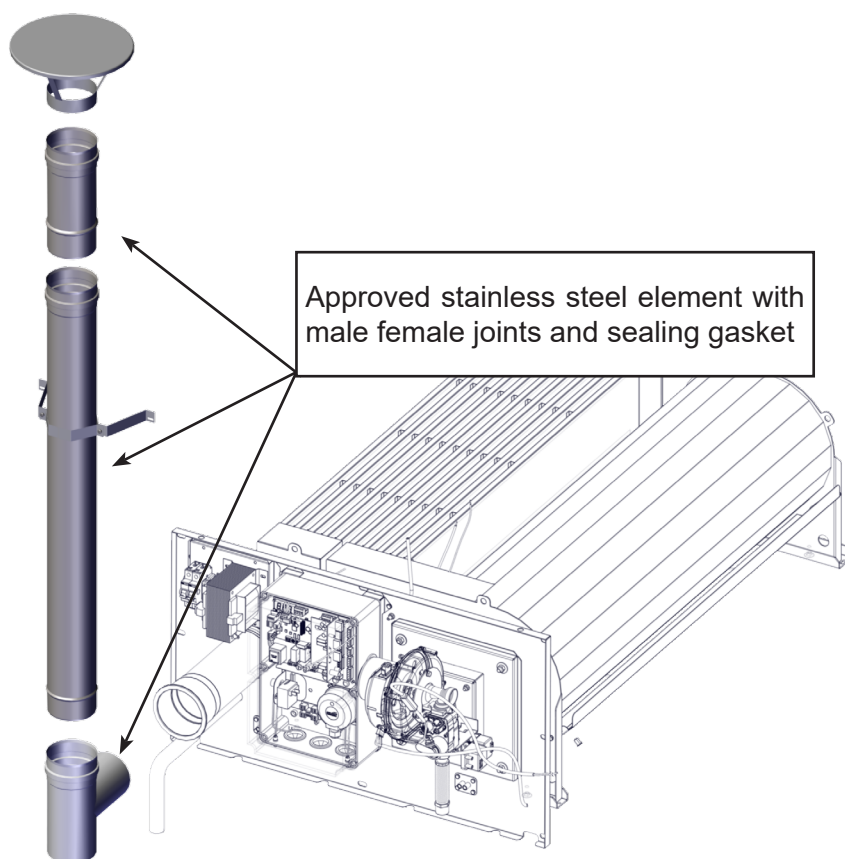


Fig. 6.5 Vertical exhaust fumes terminal

The devices were supplied with a horizontal flue terminal (fig. 6.4) up to February 2023. Vertical solution was available as option then.



Important
Mount the horizontal elements of the flue gas duct with a slight slope ($1^\circ \div 3^\circ$) towards the appliance to avoid the stagnation of the condensate inside the flue gas duct.

6.5 APPLICATION IN AIR CONDITIONING SYSTEMS WITH REFRIGERANT GAS

If the appliance is inserted inside an air duct or inside coil systems with refrigerant gas for direct cooling / heating (heat pump) installed in the same channel system, it is recommended to use of NON flammable or NON flammable (A1) and NON toxic (B1) refrigerant fluids (ISO 817 "Refrigerants - designations and safety classification").

	SAFETY GROUP	
	Lower Toxicity	Higher Toxicity
Higher Flammability	A3	B3
Flammable	A2	B2
Lower flammability	A2L	A2BL
No flame Propagation	A1	B1

Tab. 6.1

Example: the refrigerant gas R410A is classified as A1

Example: R32 refrigerant gas is classified as A2L. (low flammability)

However, its use must be CAREFULLY ASSESSED BY THE MANUFACTURER ASSEMBLING THE COMPLETE FINAL AND READY-TO-USE AIR CONDITIONING UNIT (the manufacturer bears full responsibility for the correct operation of the unit). Consider the amount of refrigerant in the batteries, internal gas pressure, flammability limit 12.7 - 33.4 vol%. And the self-ignition temperature of the refrigerant 648 ° C (for other technical data, see the safety data sheet of the gas mentioned).

Account must be taken of the maximum surface temperature that can be reached from the outer surface of the heat exchanger on which the heated air stream is flowing;

this temperature should be compared with the refrigerant auto-ignition temperature and the risk assessed.



WARNING

The manufacturer of the air conditioning system must provide adequate information in the installation, use and maintenance manual for the use of refrigerating gases and risk assessment.

6.6 CONDITIONS INSTALLING THE APPLIANCE IN AN EXTERNAL HOUSING AS AIR HANDLING UNIT

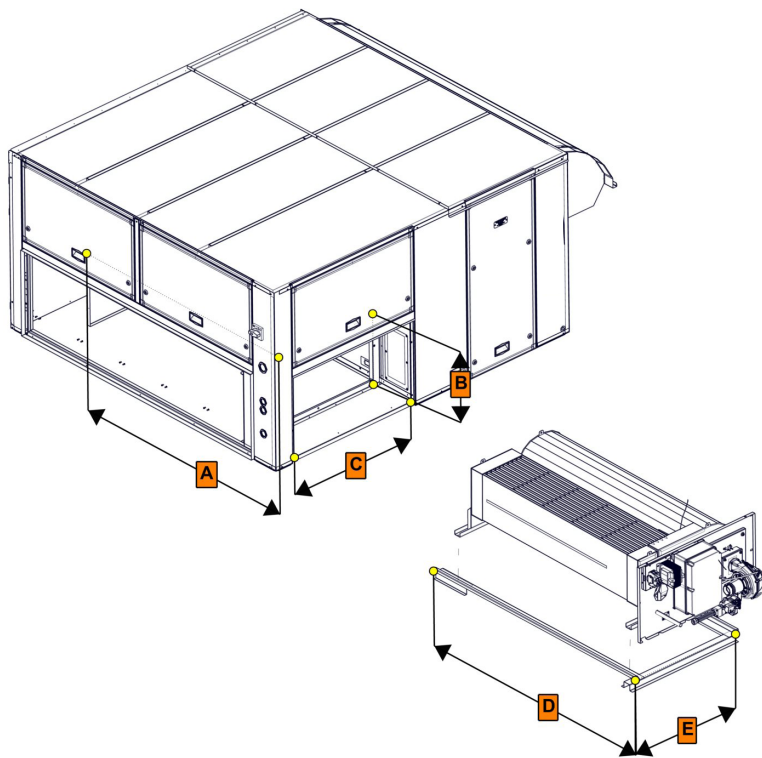
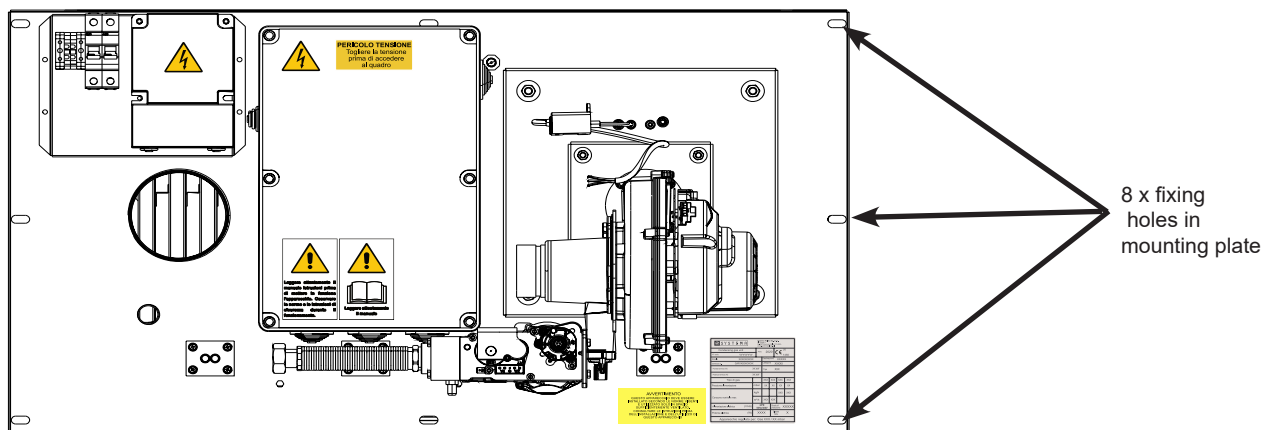


Fig. 6.6 Dimensions of the space for installing the gas unit

MODEL	A	B	C	D	E
EOLO LXC 50	1200	870	500	800	810
EOLO LXD 70	1650	870	500	1300	810
EOLO LXE 90	1910	870	500	1600	810
EOLO LXE+ 110	1910	870	500	1600	810
EOLO LXF 130	2050	820	570	1650	745
EOLO LXG 170	2350	820	725	1900	770
EOLO LXH 230	2350	950	850	1900	820

The device is fixed by attaching the mounting plate to the previously prepared flange. See the drawing below. Do not fix the feet of the exchanger to allow free expansion



7 TESTING AND START-UP OF THE SYSTEM

7.1 DRY TEST (WITHOUT FUEL GAS)

Carry out a test without the use of combustible gas after installing the thermal unit inside the box. Use the SCP674V122T terminal or activate the thermal module with consent via MODBUS.

Check for the following events:

- the flame control equipment makes three ignition attempts;
- the control equipment goes into the lockout situation (red lockout signal lamp (Hb) lights up);
- minimum air flow pressure switch intervention (Pa);
- activation of post ventilation when the burner is switched off to cool the combustion chamber.



Important

Check the activation of the post-ventilation when the burner is switched off to cool the combustion chamber.

7.2 PRELIMINARY OPERATIONS



WARNING

Entrust all testing and start-up operations to professionally qualified personnel responsible in compliance with the current national and local legislation in force in the country where the system is installed and as reported in this booklet.

During the testing operations, the personnel must be equipped with individual protection devices in accordance with current legislation.



WARNING

Have the appliances perform an annual check by qualified personnel with adequate skills and in compliance with the national and local regulations in force on the subject and as reported in this booklet.



WARNING

The user must not intervene on the controls of the devices placed on the control panel during the testing activities.

The maintenance technician must place a warning sign on the control panel of the plant for the entire duration of the maintenance activities where the following sentence is reported: "System undergoing maintenance, IT IS FORBIDDEN to perform operations on the control panel of the appliances."

Before commissioning, follow the instructions below:

- check the tightness of the gas system;
- check that the appliance is set up for the available gas (if necessary, consult paragraph 8.1 on changing fuel, page 61), check the gas type and pressure (see paragraph 5.1 on page 44) and turn on the gas;

- check that the pressure and type of gas comply with data indicated on the appliance firm plate;
 - check that the gas flow rate corresponds to data indicated on the appliance firm plate;
 - seal the gas valve adjustment body after calibration;
 - check the correct electrical connection between the burner, the electrical panel and the power supply network;
 - ensure good ground system, check the voltage value.
- At this point the device can be put into operation.

7.3 STARTING UP THE APPLIANCE

- 1) Vent the gas supply line and carefully let the remaining air out of the pipes.
 - 2) Restore the gas supply piping after venting and check that there are no leaks, use a soapy solution or equivalent product, do not use open flames.
 - 3) Power on electrical supply, close the main switch and close a contact for start up the burner.
 - 4) After the pre-wash time, the ignition spark occurs. After the third failed ignition attempt, the device locks out. After 10 seconds, it is possible to unlock the appliance by resetting the burner control equipment.
 - 5) After opening the gas solenoid valve, the burner ignites.
 - 6) After the stabilization of the working conditions (about 15 min.), Carry out a combustion analysis and a performance measurement. The steady state is considered to have been reached when the temperature of the combustion products has stabilized, i.e. when it does not vary more than $\pm 2^\circ \text{C}$. Carry out the analysis at maximum and minimum thermal load of the burner.
 - 7) Check that the intervention of the safety thermostat (Tso) switches off the burner.
- After completing commissioning, draw up the commissioning report and instruct the personnel on the use and maintenance of the device.



TP - Pre-purge time

30s. - Genius M82 / BRAHMA SRM

60s. - BRAHMA SRM since 1 July 2022

TS - Safety time 5s.

Response time in case of flame failure: < 1s

Number of ignition attempts: 3

Operating diagram of burner controller GENIUS M82/BRAHMA SRM

7.4 ADJUSTMENTS

If during the testing phase one of the following operating anomalies occurs due to incorrect regulation of the air gas ratio, and one of the following conditions occurs:

- the burner does not have excellent ignition at BOOST power (= Y2);
- efficiency or flue gas temperature are different from those shown in this manual;
- at minimum power the burner produces resonances, it will be possible to make adjustments by acting on the gas valve as described in the following points.

MODEL	MODEL OF BURNER	GAS VALVE MODEL
EOLO LXC 50	VIP 1 HWa	VK4205VE5002B
EOLO LXD 70	VIP 2 HW	VK4205VE5002B
EOLO LXE 90	VIP 3 HW a	VK4415V1002B
EOLO LXE+ 110	VIP 3 HW a	VK4415V1002B
EOLO LXF 130	VIP 4 HW a	VK4415V1002B
EOLO LXG 170	VIP 4 HW b	VR415VE
EOLO LXH 230	VIP 5 HW a	VR420VE

Tab. 7.1 Gas valve models

7.4.1 Gas unit with gas valves VR4205VE5002B and VK4415V1002B

- Use flue gas analyser and compare results with the values in the table on page 61.
- Perform the adjustments in the order shown:

- FIRST OPERATION

Gas / air ratio adjustment by increasing the air signal to the maximum (maximum burner power with maximum set point) and acting on the screw (7) to obtain the exhaust gas composition. To decrease the outlet gas flow rate, turn the screw anticlockwise, to increase, slowly turn clockwise.

- SECOND OPERATION

Offset adjustment by reducing the air signal to a minimum (minimum power by acting on the SET POINT = flow temperature + (RD4 + 1) and acting on the internal screw (4) bringing the combustion parameters to the required value. To increase the gas flow rate, tighten the screw clockwise, to reduce the gas flow unscrew anticlockwise.

- Check maximum power by returning the fan to maximum speed and check the combustion values and if necessary, adjust the flow rate again with the screw (6).

- Final combustion check
- Tighten the screws (2), (3) and (6).

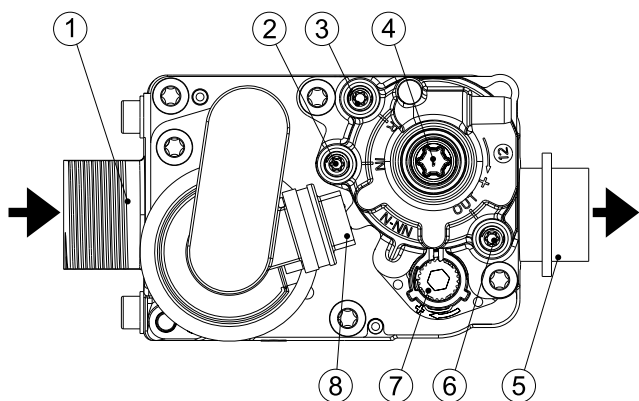


Fig. 7.1 VR4205VE5002B gas valve

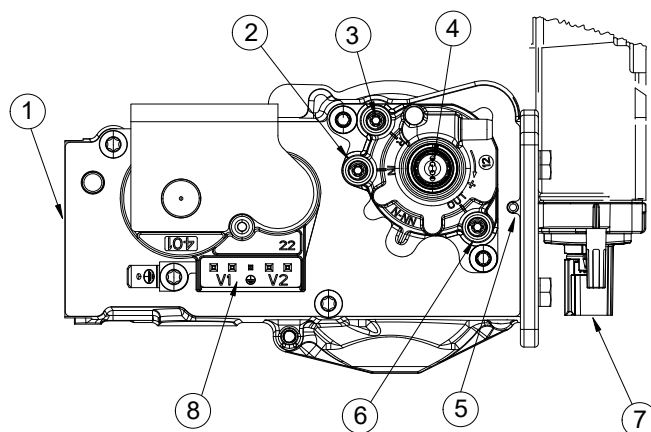


Fig. 7.2 Gas valve VK4415V1002B

POS.	DESCRIPTION	OPERATING INSTRUCTIONS
1	Gas inlet	
2	INLET gas intake	Point for measuring the supply gas pressure. The gas supply pressure must not exceed 50 mbar
3	Gas pressure intake before the regulator	Point for measuring the gas pressure before the regulator
4	Off set regulator	Internal hexagonal screw for adjusting the minimum gas flow rate. Regulates the values of CO ₂ , CO, NOX in combustion at minimum power
5	Gas outlet	
6	Outlet gas pressure	Point for measuring the burner gas pressure (downstream of the regulator). In the pre-wash procedure, a depression proportional to the fan speed is detected. During operation, the outlet gas pressure is detected.
7	Maximum gas flow regulator	Maximum gas flow adjustment screw. Adjusts the values of CO ₂ , CO, NOX in combustion at maximum power
8	Electrical connectors	

Tab 7.1 Key for gas valves VR4205VE5002B and VK4415V1002B



WARNING

Seal the gas valve adjustment body after calibration and check that the pressure measurement screws (2), (3), (6) upstream and downstream of the solenoid valve have been screwed back.

7.4.2 Gas unit with gas valve VR415VE5024

1) Use the smoke analyzer to check that the combustion values are correct and correspond to the tab. 7.5 on page 62.

2) Perform the adjustments in the order shown:

- Remove the protection cap (4).

FIRST OPERATION

- Gas / air ratio adjustment by increasing the air signal to the maximum (maximum burner power with maximum set point) and acting on the hexagonal nut (7) to obtain the optimal combustion value. To decrease the outlet gas flow rate, turn the nut clockwise, to increase it, turn slowly counterclockwise.

SECOND OPERATION

- Offset adjustment by reducing the air signal to a minimum (minimum power by acting on the SET POINT = flow temperature + (RD4 + 1) and acting on the internal screw (6) bringing the combustion parameters to the required value. To increase the gas pressure, tighten the screw anticlockwise, to reduce the gas flow, unscrew clockwise.
- Check the maximum power by bringing the fan back to maximum speed and check the combustion values and if necessary, adjust the flow rate again with the hexagonal nut (6).

4) Final combustion check.

5) Tighten the screw (3).

6) Put back the protection cap (4).



WARNING

Seal the gas valve adjustment body after calibration and check that the pressure measurement screw downstream of the solenoid valve has been screwed back.

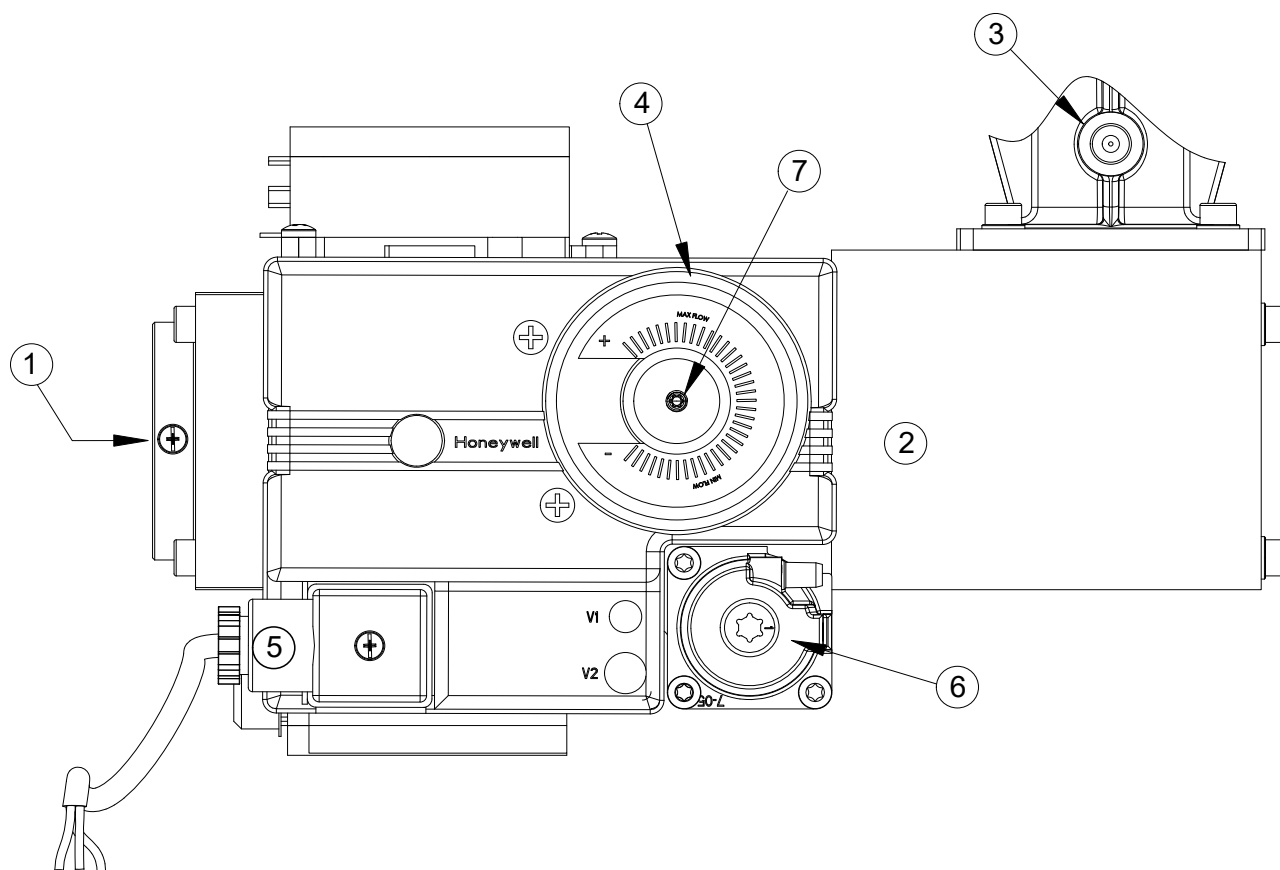


Fig 7.3 VR415VE5024 gas valve

POS.	DESCRIPTION	OPERATING INSTRUCTIONS
1	Gas inlet	
2	Gas outlet	
3	Outlet gas pressure	Point for measuring the burner gas pressure (downstream of the regulator). In the pre-wash procedure, a depression proportional to the fan speed is detected. During operation, the outlet gas pressure is detected.
4	Protective cap	
5	Electrical connectors	
6	Offset regulator	Internal screw for adjusting the minimum gas flow rate. Regulates the values of CO ₂ , CO, NO _x in combustion at minimum power
7	Maximum gas flow regulator	Maximum gas flow rate adjustment nut. Adjusts the values of CO ₂ , CO, NO _x in combustion at maximum power

Tab 7.1 Legend for gas valve VR415VE5024

7.5 POSITION OF ELECTRODES

For correct ignition and flame detection, the electrodes must be positioned inside the head cone in the position in the drawing.

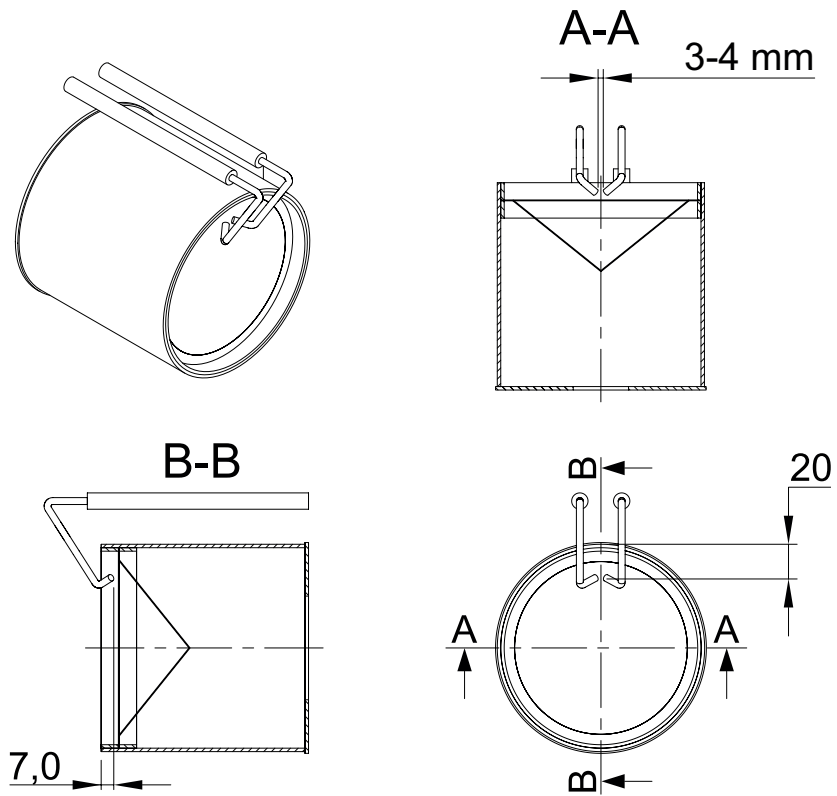


Fig. 7.4 Electrode position

8 MAINTENANCE



WARNING

Entrust all maintenance operations to professionally qualified personnel responsible in compliance with the current national and local regulations in force in the country of installation of the system and with the contents of this booklet.



WARNING

Before starting maintenance work, disconnect the power supply and shut off the gas supply. The user must not intervene on the controls of the devices placed on the control panel during maintenance activities.

The maintenance technician must place a warning sign on the control panel of the plant for the entire duration of the maintenance activities where the following sentence is reported: "System undergoing maintenance, IT IS FORBIDDEN to perform operations on the control panel of the appliances."



WARNING

During maintenance operations, the personnel must be equipped with personal protective equipment in accordance with current legislation.



WARNING

Have the appliances perform an annual check by qualified personnel with adequate skills and in compliance with the national and local regulations in force on the subject and as reported in this booklet.

In case of unusual behavior from the appliance, immediately disconnect it from the electricity and gas supply and call the assistance service.

If the appliance is equipped with an air filter, pay particular attention to its cleaning. The dirty filter can cause overheating, blocking and damage to the appliance.

Before the start of the winter season, carry out a complete overhaul of the appliance to avoid malfunctions during use. Maintenance should be performed not less than once a year.

During maintenance carry out the following operations:

- check the general condition of the device;
- unscrew the 4 screws (6d) that block the combustion head support (13) and remove the burner (1);
- make a visual inspection of the dry chamber (2);
- check the condition and position of the electrodes (3), clean them if dirty and reposition them if necessary;
- check the condition of the combustion head (4), clean it if dirty;
- check the condition of the gas mixer (venturi) (5), if necessary, clean it with a rag or a brush;
- reassemble the burner (1) and check the tightening of the screws / nuts (6) of the burner and of the electrodes;
- check the threaded connections of the gas system (7) and the tightness of the gaskets of the device (8), replace them if necessary;
- check the condition of the electrical system, conductors, terminals, etc. (9).
- check the status of the PT1000 probe (P1, connected to connector J2 of the SCP674V202MB board) (10);
- check that the smoke exhaust duct is not obstructed;
- check the condition of the combustion chamber (11) and of the heat exchanger (12);
- Once the checks and maintenance have been completed, after having powered the device and opened the main gas valve:
 - check the gas pressure upstream and downstream of the solenoid valve, adjust the maximum and minimum flow if necessary;
 - check the tightness of the gas system;

- check the burner adjustment and carry out the combustion analysis.



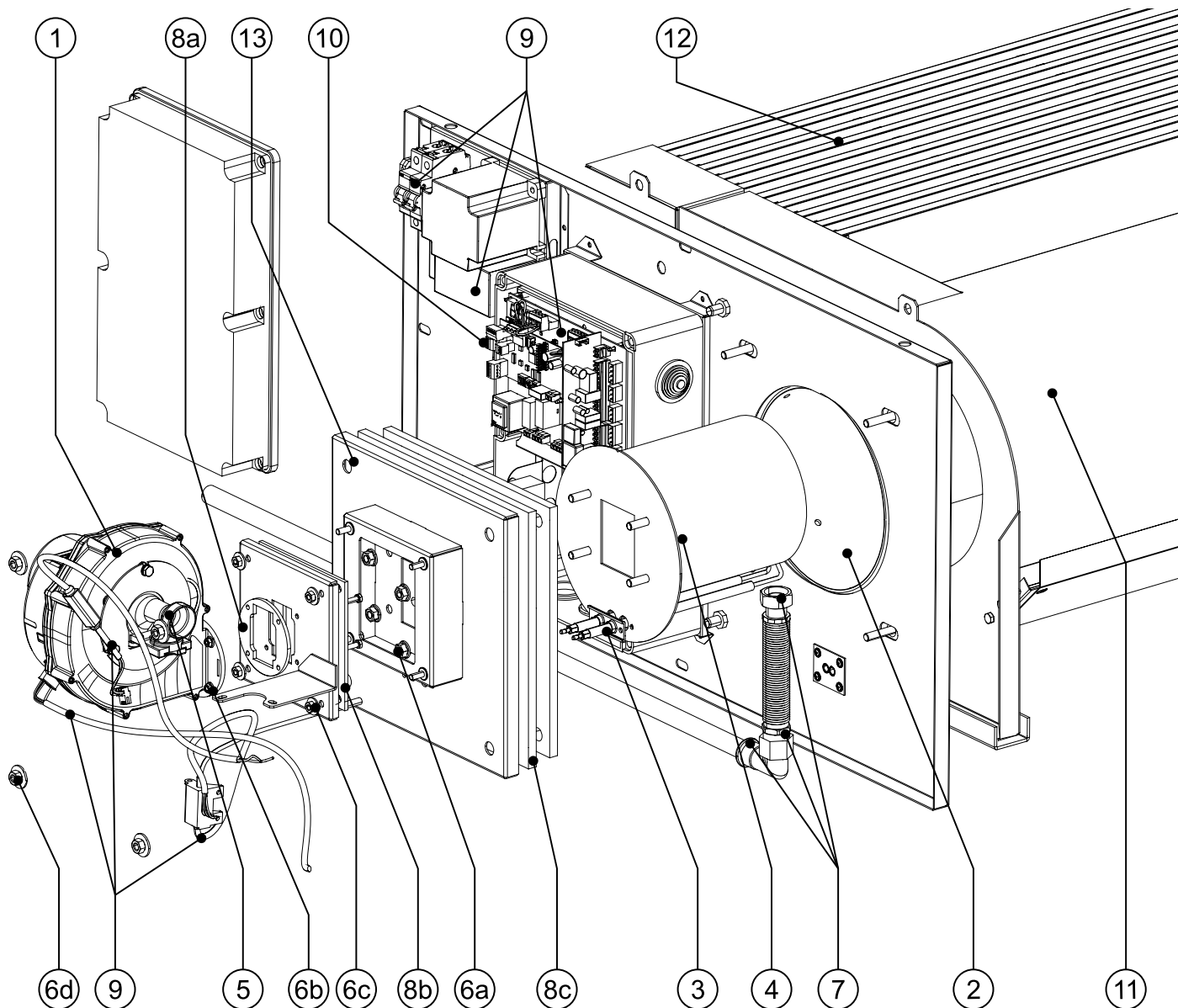
Important

Put the appliance back into operation once the maintenance operations have been completed.



WARNING

Seal the regulating organ of the gas solenoid valve after calibration.



POS.	DESCRIPTION	Q.TY	POS.	DESCRIPTION	Q.TY
1	Burner	1	7	Gas system threaded connections	Various
2	Inlet combustion tube	1	8a	Blower seal	1
3	Electrodes	2	8b	Blower support gasket	1
4	Combustion head	1	8c	Combustion head support gaskets	2
5	Gas mixer (Venturi)	1	9	Electrical system, conductors, terminals, etc.	Various
6a	Combustion head fixing nuts	4	10	PT1000 probe (P1) connected to connector J2	1
6b	Blower fixing nuts	4	11	Combustion chamber	1
6c	Blower plate fixing nuts	4	12	Exchanger	1
6d	Combustion head support fixing nuts	4	13	Combustion head support	1

8.1 FUEL CHANGE

The appliances are equipped with Premix burners without nozzles.

The air-gas mixing is carried out in the Venturi type mixer with an integrated inlet air pressure switch. The adequate quantity of gas is aspirated proportionally by the passing air flow.

To change the fuel gas it is necessary to make calibration of gas valves and if necessary change venturi.

Table 8.2 shows the models of solenoid valves with Venturi model relative identification code according to the calibration to the type of gas.

MODEL	BURNER	MODEL OF GAS VALVE		G 20; G 25; G 27,	G 2.350	G 30; G 31
EOLO LXC 50	VIP 1 HWa	VK4205VE5002B	COD.	45.900.451 056	45.900.451 040	45.900.451 056
EOLO LXD 70	VIP 2 HW	VK4205VE5002B	COD.	45.900.451 056	45.900.451 040	45.900.451 056
EOLO LXE 90	VIP 3 HW a	VK4415V1002B	COD.	45.900.450-020	45.900.450-010	45.900.450-020
EOLO LXE+ 110	VIP 3 HW a	VK4415V1002B	COD.	45.900.450-020	45.900.450-010	45.900.450-020
EOLO LXF 130	VIP 4 HW a	VK4415V1002B	COD.	45.900.450-030	45.900.450-020	45.900.450-030
EOLO LXG 170	VIP 4 HW b	VR415VE	COD.	VMU185	VMU150	VMU185
EOLO LXH 230	VIP 5 HW b	VR420VE	COD.	VMU300	VMU300	VMU300

Tab. 8.2 Gas valve and venturi models based on gas

Models			EOLO LXC50		EOLO LXD 70		EOLO LXE90		EOLO LXE+110		EOLO LXF130		EOLO LXG170		EOLO LXH230	
Gas	Parameter	Unit	max	min	max	min	max	min	max	min	max	min	max	min	max	min
G 20	Exhaust gas T.	°C	170	43	112	28	137	34	145	39	132	39	115	32	110	28
	CO ₂	%	8,7	8,6	8,5	8,6	8,5	8,6	8,7	8,9	8,7	8,6	8,9	8,9	8,9	8,9
	NOX (O ₂ =0%)	ppm	37	20	29	22	29	26	34	22	30	21	32	21	31	20
G 25	Exhaust gas T.	°C	165	39	110	28	135	34	140	39	133	38	114	32	110	29
	CO ₂	%	8,7	8,5	8,6	8,5	8,5	8,6	8,7	8,7	8,7	8,5	8,8	8,7	8,7	8,9
	NOX (O ₂ =0%)	ppm	37	20	29	32	29	26	34	22	30	21	32	21	31	20
G 31	Exhaust gas T.	°C	175	42	111	28	140	35	145	39	132	39	115	32	110	28
	CO ₂	%	10,3	10,4	10,3	10,3	10,2	10,4	10,3	10,4	10,3	10,2	10,8	10,7	10,9	10,7
	NOX (O ₂ =0%)	ppm	40	28	32	31	32	29	37	25	33	24	35	24	34	23



Important

Put the appliance back into operation once the fuel change operations have been completed.



WARNING

Seal the regulating points of the gas valve after any calibration.

8.1.1 Replacement of the Venturi for gas valve VK4205VE5002B

1. Disconnect the power supply.
2. Close the main gas valve before the appliance.
3. Disconnect the power supply cable (3), fig. 8.2.
4. Unscrew the hose coupling (2).
5. Remove the locking fork (1) holding the solenoid valve so that it does not fall.

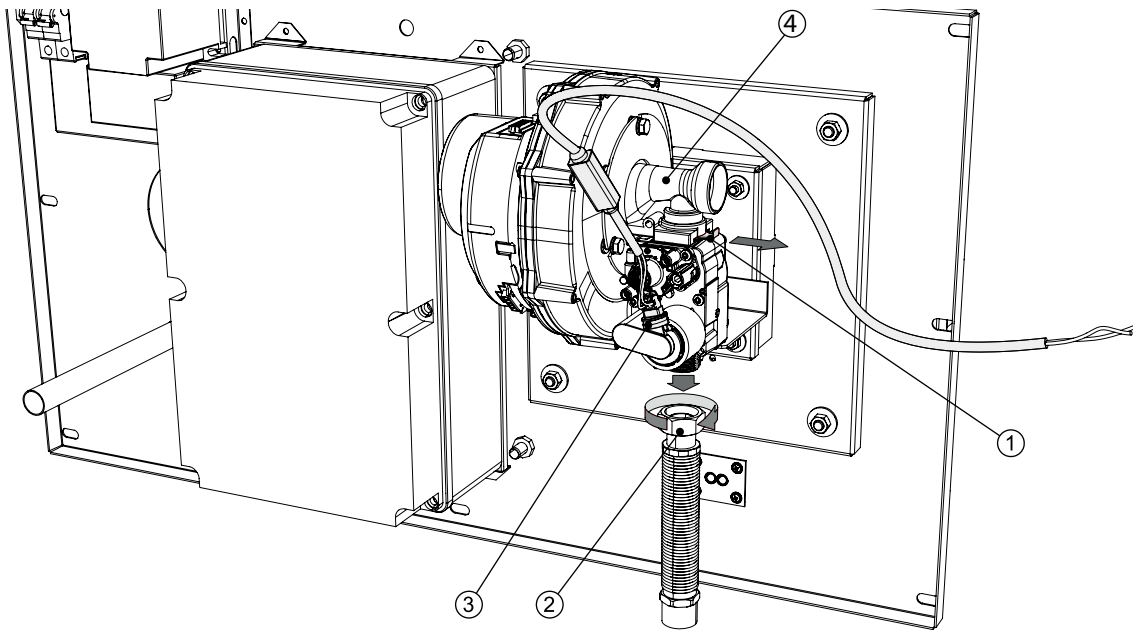


Fig. 8.2

6. Remove the gas valve and replace if necessary venturi (4) with the model suitable for the fuel gas to be used (see table 8.2).

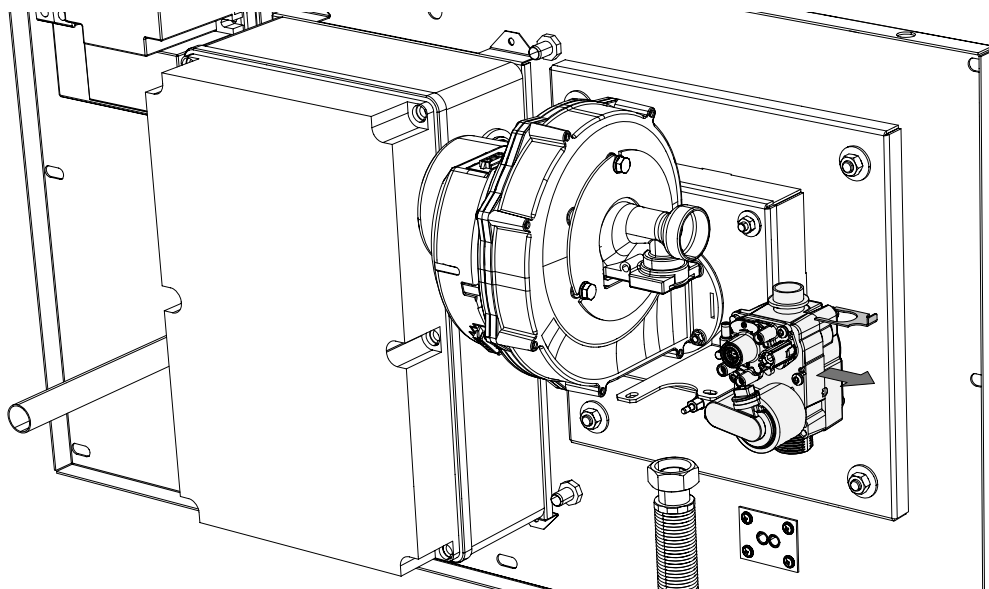
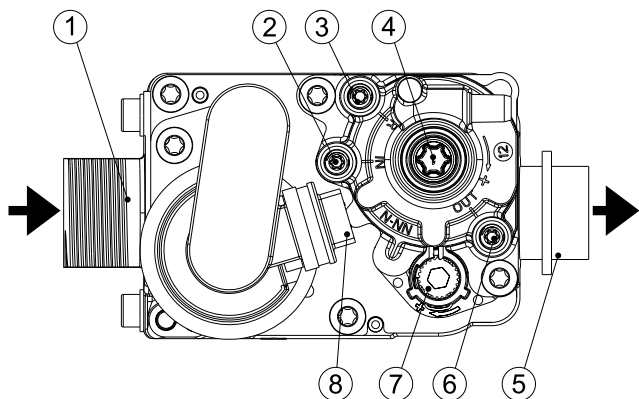


Fig. 8.3

7. Lock the gas valve with the locking fork (1).
8. Screw on the hose coupling (2).
9. Restore the electrical connection (3).
10. Check the gas tightness on the joints before putting the appliance into service.
11. Open the main gas valve.



12. Affix the appropriate sticker ("Regulated for ...") indicating the new type of gas to the plate supplied with the appliance.
13. Put the appliance back into operation.

8.1.2 Pre-settings of gas valve VK4205VE5002B after gas type change.





For this procedure use regulator (7) - Throttle next number (4) - offset regulator.

Gas pre-setting regulation EOLO LXC 50			Screw pre-adjustment		CO ₂ percentage in fumes	
Gas	Gas network pressure (2)	Venturi type	Throttle (7)	Offset (4)	min. heat input	max. heat input
G20	20 mbar	45.900.451 056	full open next close 3,75	full open next close 4	8,7	8,6
G25	25 mbar	45.900.451 056	full open	full open next close 3,5	8,7	8,5
G31	37 mbar	45.900.451 040	full open next close 4,5	full open next close 5	10,3	10,4

 - turn left
 - turn right

Gas pre-setting regulation EOLO LXD 70			Screw pre-adjustment		CO ₂ percentage in fumes	
Gas	Gas network pressure (2)	Venturi type	Throttle (7)	Offset (4)	min. heat input	max. heat input
G20	20 mbar	45.900.451 056	full open next close 3,75	full open next close 6	8,5	8,6
G25	25 mbar	45.900.451 056	full open	full open next close 5	8,6	8,5
G31	37 mbar	45.900.451 040	full open next close 5	full open next close 6,5	10,3	10,3

 - turn left
 - turn right

8.1.3 Replacement of the Venturi for gas valve VK4415V1002B

1. Disconnect the power supply.
2. Close the gas shut-off valve on the appliance.
3. Disconnect the solenoid valve from the power supply (3), fig. 8.4.
4. Unscrew the locking screws of the flexible joint (4).
5. Unscrew the screws locking the fan (1) holding the solenoid valve (2) so that it does not fall.

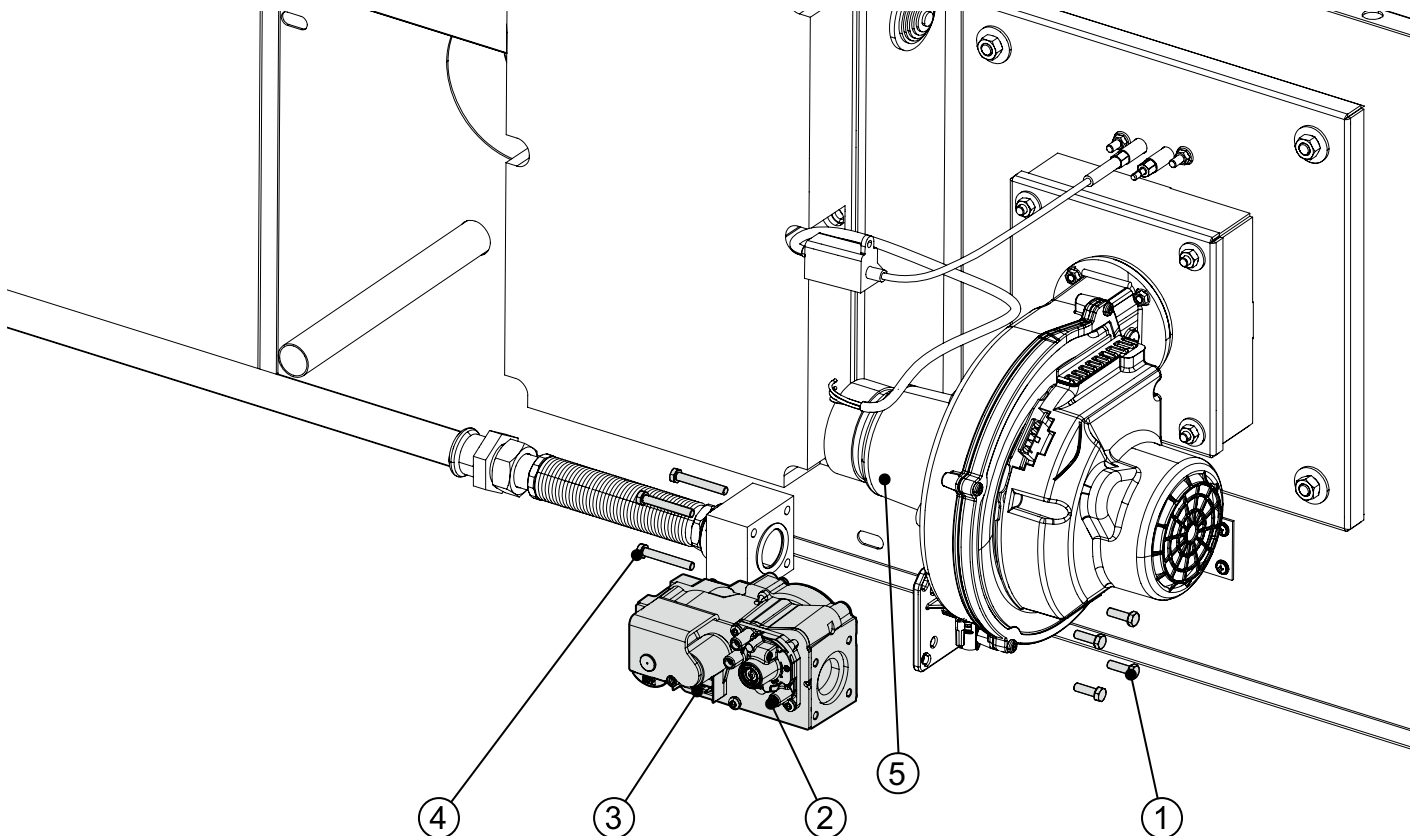
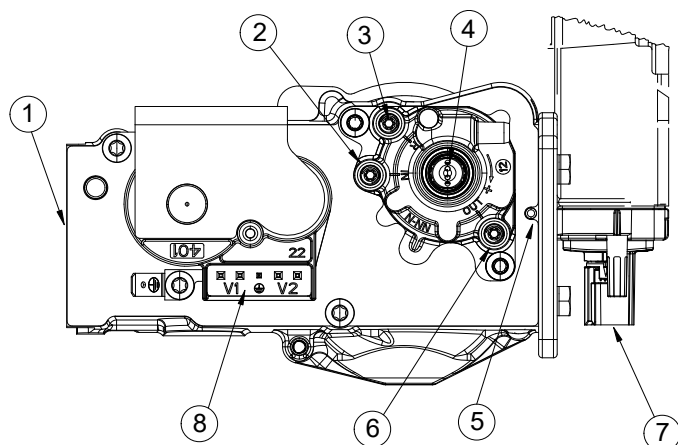


Fig. 8.4

6. Replace the venturi (5) with the model suitable for the fuel gas to be used (see table 8.2).
7. Lock the solenoid valve to the fan with the screws (1).
8. Screw in the screws of the flexible coupling connection (4).
9. Restore the electrical connection (3).
10. Paste the appropriate sticker ("Regulated for ...") indicating the new type of gas on the plate supplied with the appliance.
11. Open the main gas valve.
12. Check the gas tightness on the joints before putting the appliance into service.
13. Put the appliance back into operation.

8.1.4 Pre-settings of gas valve VK4415V1002B after gas type change.



For this procedure use regulator (7), (for max gas flow) and offset regulator (4), (for min gas flow)

Gas pre-setting regulation EOLO LXE 90			Screw pre-adjustment				CO2 percentage in fumes	
Gas	Gas input pressure (2)	Ventouri type	Throttle (7)		Offset (4)		min. heat input	max. heat input
G20	20 mbar	45.900.450-020	full open next close 48	↻ ↻ ↻	full open next close 5	↻ ↻ ↻	8,5	8,6
G25	25 mbar	45.900.450-020	full open next close 40	↻ ↻ ↻	full open next close 4	↻ ↻ ↻	8,5	8,6
G31	37 mbar	45.900.450-020	full open next close 54	↻ ↻ ↻	full open next close 5	↻ ↻ ↻	10,2	10,4

↻ - turn left
↻ - turn right

Gas pre-setting regulation EOLO LXE+ 110			Screw pre-adjustment				CO2 percentage in fumes	
Gas	Gas input pressure (2)	Ventouri type	Throttle (7)		Offset (4)		min. heat input	max. heat input
G20	20 mbar	45.900.450-020	full open next close 48	↻ ↻ ↻	full open next close 5	↻ ↻ ↻	8,7	8,9
G25	25 mbar	45.900.450-020	full open next close 40	↻ ↻ ↻	full open next close 4	↻ ↻ ↻	8,7	8,8
G31	37 mbar	45.900.450-020	full open next close 54	↻ ↻ ↻	full open next close 5	↻ ↻ ↻	10,3	10,4

↻ - turn left
↻ - turn right

Gas pre-setting regulation EOLO LXF 130			Screw pre-adjustment				CO2 percentage in fumes	
Gas	Gas input pressure (2)	Ventouri type	Throttle (7)		Offset (4)		min. heat input	max. heat input
G20	20 mbar	45.900.450-030	full open next close 33	↻ ↻ ↻	full open next close 4,5	↻ ↻ ↻	8,7	8,6
G25	25 mbar	45.900.450-030	full open next close 28	↻ ↻ ↻	full open next close 4	↻ ↻ ↻	8,7	8,5
G31	37 mbar	45.900.450-030	full open next close 50	↻ ↻ ↻	full open next close 5	↻ ↻ ↻	10,3	10,2

↻ - turn left
↻ - turn right

8.1.5 Replacement of the Venturi for gas valve VR415/ VR420

1. Disconnect the power supply.
2. Close the gas shut-off valve on the appliance.
3. Disconnect the solenoid valve from the power supply (3), fig. 8.4.
4. Unscrew the locking screws of the flexible joint (4).
5. Unscrew the screws locking the fan (1) holding the solenoid valve (2) so that it does not fall.

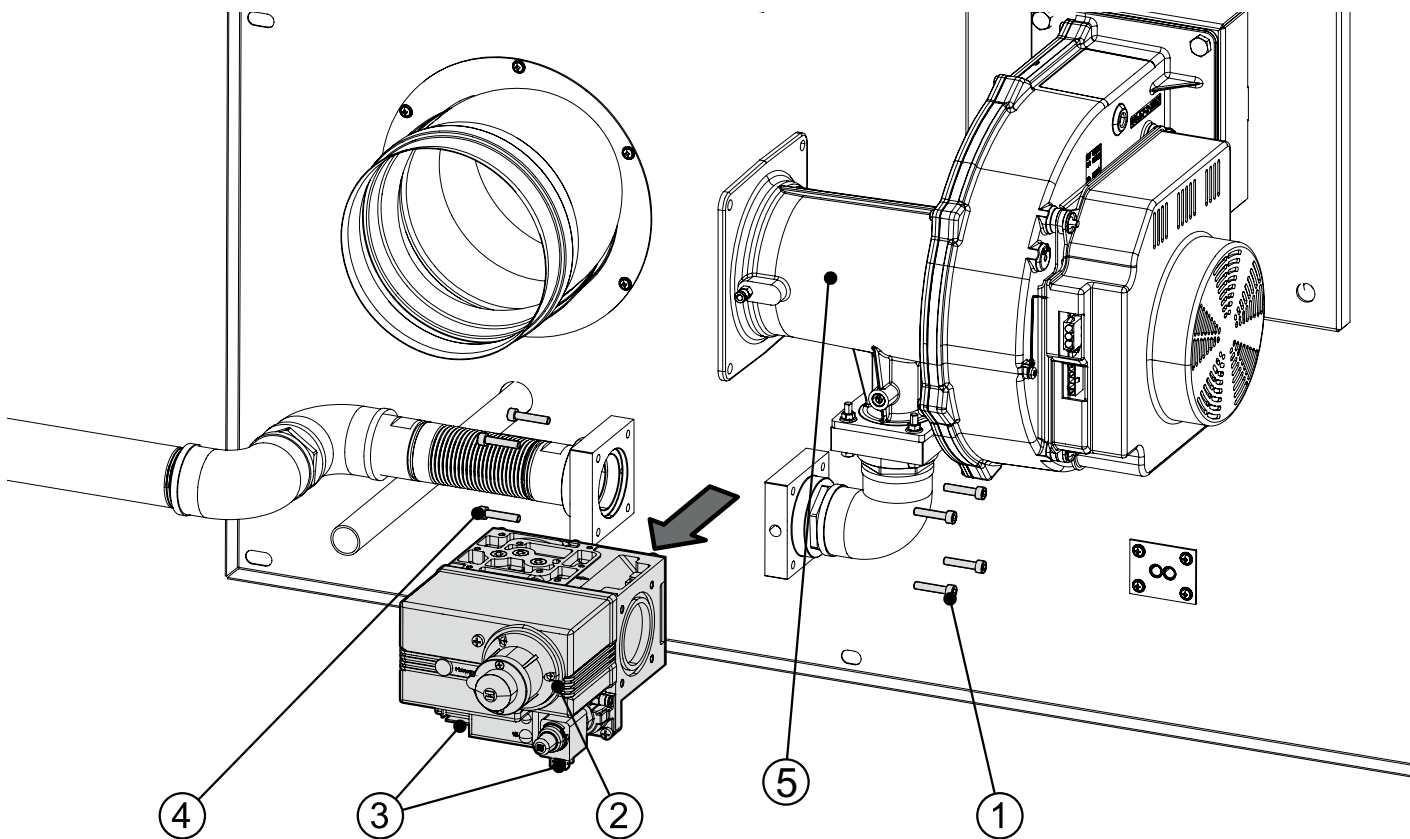
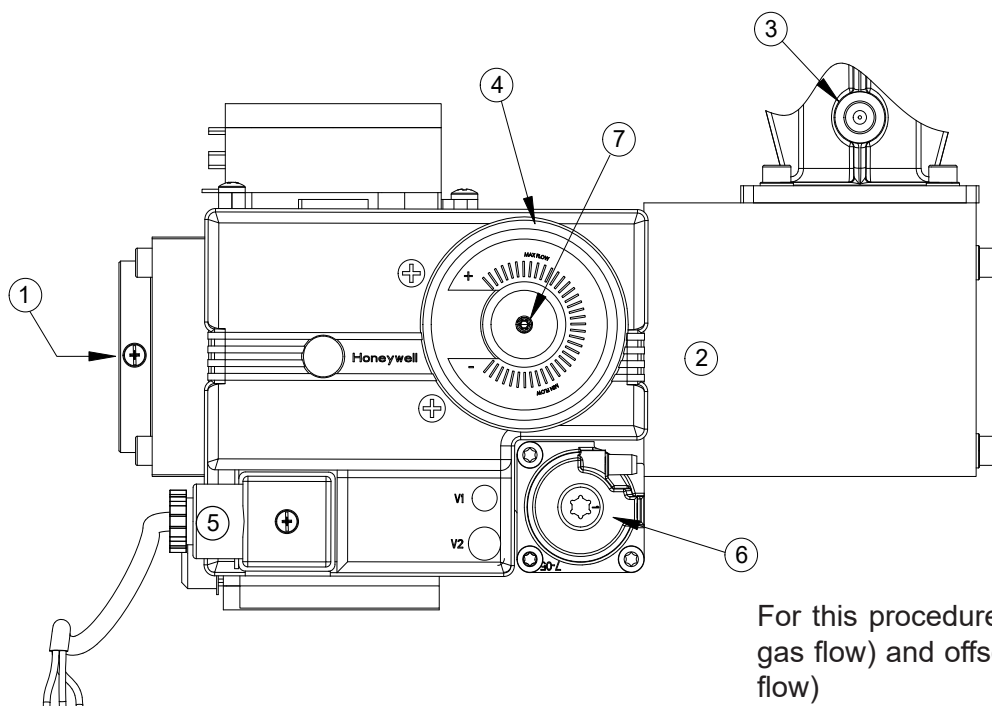


Fig. 8.4

6. Replace the venturi VMU (5) with the model suitable for the fuel gas to be used (see table 8.2).
7. Lock the solenoid valve to the fan with the screws (1).
8. Screw in the screws of the flexible coupling connection (4).
9. Restore the electrical connection (3).
10. Paste the appropriate sticker ("Regulated for ...") indicating the new type of gas on the plate supplied with the appliance.
11. Open the gas tap.
12. Check the gas tightness on the joints before putting the appliance into service.
13. Put the appliance back into operation.

8.1.6 Pre-settings of gas valve VR415/VR420 after gas type change.



For this procedure use regulator (7), (for max gas flow) and offset regulator (4), (for min gas flow)

GAS VALVE HONEYWALL VR415

Gas pre-setting regulation EOLO LXG 170			Screw pre-adjustment		CO2 percentage in fumes	
Gas	Gas input pressure (2)	Ventouri type	Throttle (7)	Offset (4)	min. heat input	max. heat input
G20	20 mbar	VMU 185	full open next close 2,5	full close next open 3,5	8,9	8,9
G25	25 mbar	VMU 185	full open next close 1,5	full close next open 3	8,8	8,8
G31	37 mbar	VMU 185	full open next close 4,5	full close next open 4	10,8	10,7

- turn left
 - turn right

GAS VALVE HONEYWALL VR420

Gas pre-setting regulation EOLO LXH 230			Screw pre-adjustment		CO2 percentage in fumes	
Gas	Gas input pressure (2)	Ventouri type	Throttle (7)	Offset (4)	min. heat input	max. heat input
G20	20 mbar	VMU 300	full open next close 3,25	full close next open 3	8,8	8,9
G25	25 mbar	VMU 300	full open next close 2	full close next open 2,5	8,8	8,9
G31	37 mbar	VMU 300	full open next close 5	full close next open 4,5	10,8	10,7

- turn left
 - turn right

8.2 FAULTS AND REMEDIES

In case the device does not work or works incorrectly, it must be turned off. All elements must be repaired or replaced by specialized personnel. Spare parts must be original. Using the device can be dangerous if these principles are not respected.

ANOMALY: the appliance does not switch on	
CAUSES	REMEDIES
1) No power supply	1) Check the power supply
2) Motherboard fuses faulty	2) Replace fuses
3) No communication between internal control board and external control and command board	3) Check electrical connections and communication, in case of failure replace either the internal board or the command and control panel
4) There is no power	4) Check the position of the switches on the control panels and on the general panel

ANOMALY: the appliance does not turn on and after three ignition attempts it goes into lockout, upon reset, after three more attempts it continues to lock	
CAUSES	REMEDIES
1) Power supply reversed between phase and neutral	1) Connect correctly and respect the phase and neutral polarity
2) Lack of gas in the burner	2) Check the gas supply line
3) Wrong type of gas	3) Check that the type of gas complies with that indicated on the plate. Contact assistance or authorized and qualified personnel.
4) Wrong gas pressure	4) Check the pressure with the values shown on the plate. Seal the gas valve adjustment organ after calibration.
5) The ignition electrode (s) are incorrectly positioned or not working	5) Position the electrode / s correctly, see diagram in this manual or replace them with original spare parts
6) Poor grounding	6) Check the grounding
7) Ignitor broken	7) Check if the discharge occurs and / or replace it with an original spare
8) Control unit faulty	8) Check the operation of the control unit and / or replace it with an original spare
9) Gas valve does not activate	9.1) Check the gas supply on the valve and its operation, replace with original spare parts if necessary
	9.2) Motherboard faulty replace with original spare parts
	9.3) Check operation of the gas valve coils. Replace with original spare parts if necessary
	9.4) Check the operation of the control unit, replace with original spare parts if necessary
10) The valve opens but there is no gas at the valve outlet towards the burner premix fan	10) Gas valve filter dirty or clogged with installation residues, check filter and clean or replace filter with original spare parts
11) Presence of air in the gas supply channel	11) If necessary, bleed the air from the system
12) Dirty combustion head	12) Clean combustion head and check operation
13) Gas nozzle blocked	13) Clean the gas nozzle and check operation
14) Wrong parameters of the burner	14) Check and set the gas parameters correctly as indicated in this booklet. The operation can be carried out by assistance or by authorized and qualified personnel.
15) Wrong parameters of the PWM burner in burner ignition	15) Check parameter Y2 and / or set it by increasing it gradually until correct ignition
CONTINUED ON NEXT PAGE	

ANOMALY: the appliance does not turn on and after three ignition attempts it goes into lockout, upon reset, after three more attempts it continues to lock

CAUSES	REMEDIES
16) The premix burner motor does not work and / or the internal premix burner fan card is faulty	16.1) Check that there is voltage in the premix fan of the kettle and check the electrical connection, connect the motor correctly or in case of failure replace it with an original spare
	16.2) Control unit faulty, check the operation of the control unit and / or replace it with an original spare
	16.3) Motherboard faulty check the operation of the motherboard and / or replace it with an original spare
17) exhaust terminal locked or too long	17) Check the maximum length and diameter of the smoke outlet as indicated in this booklet, and / or check that it is not blocked, then free the smoke outlet if necessary

ANOMALY: the appliance turns on but after a short time goes into lockout

CAUSES	REMEDIES
18) Dirty or clogged air filters	18) Check air channel filters, differential pressure switch for filters broken or dirty, blocked, clean or replace with original spare
19) Check the safety fuses on the motherboard	19) Replace the fuses
20) No communication between internal control board and command and external control panel	20) Check electrical connections and communication, in case of failure replace either the internal board or the command and control panel
21) Check the minimum gas pressure switch	21) Check the inlet gas supply

ANOMALY: Gas blower starts but the control equipment does not give signals to tignition and / or the gas valve

CAUSES	REMEDIES
22) Motherboard faulty	22) Check the operation of the motherboard and / or replace with an original spare
23) The flame control equipment is faulty.	23) Replace the equipment with an original spare

ANOMALY: the appliance is electrically powered but does not turn on

CAUSES	REMEDIES
24) No communication between internal control board and command and external control panel	24.1) Check power supply, electrical connections and communication, in case of failure replace either the internal board or the command and control panel
	24.2) Check the power supply of the remote control panel
	24.3) Check the control panel parameters
	24.4) Check the correct settings on the motherboard
25) Intervention of a security	25) Check the intervention of the safety devices and relative alarms in point 5.1 on page 47

9 WARRANTY

9.1 OBJECT AND DURATION OF THE WARRANTY

- 1) The Warranty is limited to defects in material or workmanship of the components supplied by SYSTEMA. In case of material or workmanship defects, SYSTEMA will repair or replace the defective parts free of charge, EXPRESSLY EXCLUDING ANY OTHER FORM OF WARRANTY OR INDEMNITY, BOTH LEGAL OR CONVENTIONAL.

The replaced parts will be promptly returned to SYSTEMA, ex its factory in Zdunska Wola - Poland, at the user's expense.

In the event of an intervention under warranty, the user will be charged the fixed right of call, in addition to the kilometer reimbursement, if the place of intervention is more than ten kilometers from the headquarters of the S.C. (Service Center).

- 2) The validity of the Warranty starts from the "Commissioning", provided that it occurs within 6 (six) months from the date of purchase of the device by the purchaser. In any case, the Warranty expires after 18 (eighteen) months from the SYSTEMA invoice date.
- 3) Any replacement of defective parts (or the entire appliance) will not extend the original expiry date of the Warranty. The Warranty on the replaced parts will cease with the expiry date of the Appliance Warranty.
- 4) The "warranty duration" will be 1 (one) years on each component of the appliance.

9.2 WARRANTY EXCLUSIONS

- 1) The Guarantee does not operate in the case of:
 - a) defects not attributable to defects in material or workmanship, without limitation:
 - breakages occurred during transport;
 - non-compliance of the system with local laws and regulations in force;
 - failure to comply with the installation specifications given in the technical notes supplied with the appliance and / or the good practice standards;
 - damage caused by accidents, fire, accidents in general or negligence not attributable to SYSTEMA;
 - b) tampering or failures due to interventions by unauthorized personnel;
 - c) defects caused by anomalies depending on the electricity or fuel supply network;
 - d) failures due to: poor maintenance, neglect or improper use, voltage variations in the power supply, humidity and dust in the premises, incorrect sizing and / or faulty installation;
 - e) corrosion or breakage caused by: stray currents, condensation, overheating caused by incorrect adjustment of the gas pressures in the supply or to the burner, or by the use of combustible gas with caloric characteristics different from those on the plate;
 - f) use of non-original spare parts or parts not authorized by SYSTEMA;
 - g) normal wear and tear;
 - h) products not properly guarded or stored.
 - i) lack of scheduled annual maintenance.

9.3 OPERATION AND EFFECTIVENESS OF WARRANTY

- 1) In order to make the guarantee effective and effective, the user must:
 - a) ask your installer for the name of the authorized service for the "First ignition";
 - b) show the Certificate of Guarantee to the personnel in charge, complete it in its entirety and request the stamping and signature of the C.A. in the appropriate spaces.

9.4 RESPONSIBILITY

The customer exempts the supplier from any liability for accidents or damage that may occur to machines or systems during operation. The supplier is liable to the buyer only within the limits of the aforementioned warranty obligations.

10 SHUTDOWN AND DISPOSAL

10.1 SHUTDOWN

If it is necessary to store the appliances for a long period of time, it is recommended to carry out the following operations:

turn the main switch to the "O" position and disconnect the appliances from the mains;
close the gas supply valve and disconnect the appliances from the gas mains;
seal the end of the pipe where the appliance was connected with a threaded plug;
in the event of a change of owner or a new tenant, deliver all the documentation regarding the Infra appliances to the new owner / tenant.



WARNING

Have all disconnection operations carried out by qualified personnel with the appropriate skills and in compliance with the national and local regulations in force on the subject and the contents of this manual.

10.2 DISPOSAL

The symbol shown in fig. 10.1 indicates that the product at the end of its useful life is a waste of electrical and electronic equipment (WEEE), which must be collected separately and not disposed of together with other mixed urban waste.

Illegal disposal of the product by the user involves the application of administrative sanctions provided for by current legislation.

Please note that, pursuant to art. 192 of Legislative Decree 152/2006, the abandonment and uncontrolled deposit of waste are prohibited. Anyone who violates this rule "is required to proceed with the removal, recovery or disposal of waste and the restoration of the state of the places jointly with the owner and with the holders of real or personal rights of enjoyment over the area, which such violation is attributable by way of willful misconduct or negligence, based on the investigations carried out, jointly with the parties concerned, by the persons in charge of control.

The separate collection of equipment for subsequent start-up for recycling, treatment and environmentally compatible disposal contributes to safeguarding the environment and protecting human health, reduces the consumption of resources and favors the reuse and / or recycling of waste materials. which the equipment is composed of.

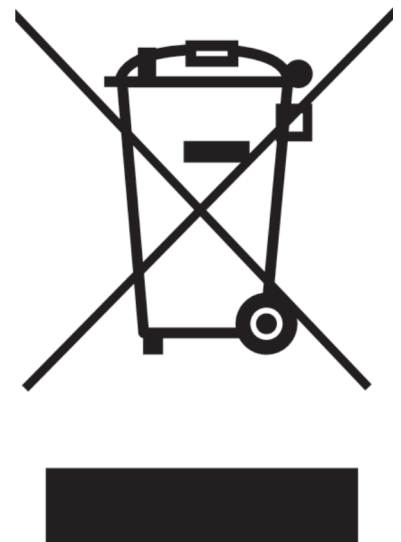


Fig. 10.1



WARNING

Dismantling operations must be performed by qualified personnel with the appropriate skills and in compliance with the applicable regulations.



WARNING

During the dismantling operations, the personnel must be equipped with personal protective equipment in accordance with current legislation.



DANGER

All dismantling operations must be carried out with the appliance switched off, disconnected from the electricity and gas supply: before any dismantling operation, disconnect the electricity supply by opening the main switch and disconnect the system from the electricity mains, close the gas interception valve and the gas shut-off valves to the appliances. If the piping is not dismantled, seal the terminals where the appliances were connected with threaded caps.

REPORT OF COMMISSIONING

Data: _____

1. SYSTEM IDENTIFICATION DATA

Business name	
VAT number	
Address	
Responsible name	
Total nominal power of heating system [kW]	

2. DATA OF THE COMPANY THAT OPERATES THE SYSTEM

Ragion	
VAT number	
Address	
Phone	
E-mail	

3. DATA OF APPLIANCE

Model	
Min / max heat output [kW]	
Fuel	
Type exhaust and intake ducts	<input type="checkbox"/> B ₂₃
Installation internal/external	<input type="checkbox"/> Internal <input type="checkbox"/> External

4. PRELIMINARY CHECKS

Operation description	Result
Check if the instruction manual for use and maintenance of the appliance is present	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Not verified
Check whether the instruction manual of the command and control panel is present.	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Not verified
Check the tightness of the gas system (use gas detector a soapy solution or equivalent product, do not use open flames)	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Not verified
Check that the pressure and type of gas comply with the data indicated on the appliance plate	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Not verified
Check the correctness of the electrical connection	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Not verified
Check the exact electrical connection (phases, neutral)	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Not verified
Check the value of the supply voltage	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Not verified
Check that the safety devices are not tampered with and / or short-circuited	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Not verified
Check that the temperature regulation system is working	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Not verified
Can the appliance be put into operation?	<input type="checkbox"/> YES <input type="checkbox"/> NO
Comments regarding commissioning:	

5. COMMISSIONING

Description	executed	Value measured / set
Bleed the gas supply line	<input type="checkbox"/> YES <input type="checkbox"/> NO	---
Restore the gas supply pipe after bleeding and check that there are no leaks (use a soapy solution or equivalent product, do not use open flames)	<input type="checkbox"/> YES <input type="checkbox"/> NO	---
Power the appliance electrically (close the main switch after setting the room thermostat to the maximum temperature)	<input type="checkbox"/> YES <input type="checkbox"/> NO	---
Measure the electrical absorption	<input type="checkbox"/> YES <input type="checkbox"/> NO	_____ [A]
After the pre-purge time, does the ignition spark occur?	<input type="checkbox"/> YES <input type="checkbox"/> NO	---
Check the intervention of the Tso thermostat protection (*).	<input type="checkbox"/> YES <input type="checkbox"/> NO	---
Does the flame ignite? (After the third failed ignition attempt, the appliance locks up. After 10 seconds, it is possible to unlock the appliance by re-setting the burner control equipment).	<input type="checkbox"/> YES <input type="checkbox"/> NO	---

(*) The intervention of the Tso thermostat causes the appliance to stop, to make it restart, it is necessary to act on the reset button (Sr).

The Tso thermostat is equipped with manual reset, before pressing the reset button (Sr), the thermostat must be reset to restore operation of the appliance.

6. CHECK OF COMBUSTION PARAMETERS

Wait for the appliance to reach full capacity (about 15 minutes) to carry out a combustion analysis and a performance measurement. The steady state is considered to have been reached when the temperature of the combustion products has stabilized, i.e. when it does not vary more than $\pm 2^\circ \text{C}$.

controlled value	UNIT	Measured value at maximum capacity	Measured value at minimum capacity
Gas pressure at burner	[mbar]		
Fuel flow	[m ³ /h or kg/h]		
Thermal flow measured	[kW]		
Fumes temperature	[°C]		
Combustion air temperature	[°C]		
O2	[%]		
CO2	[%]		
CO	[ppm]		
CO (O2 = 3%)	[ppm]		
Lambda	-		
NOX (O2 = 0%)	[ppm]		
NOX	[mg/kWh]		
Combustion efficiency	[%]		
Result of verification of the combustion parameters			<input type="checkbox"/> Positiv <input type="checkbox"/> Negativ

Final requirements
Final remarks

Can the appliance work?	<input type="checkbox"/> YES <input type="checkbox"/> NO
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The technician also declines any responsibility for accidents to people, animals or things resulting from tampering with the system or appliance by third parties, or from lack of subsequent maintenance. In the presence of deficiencies found and not eliminated, the plant manager undertakes, within a short time, to resolve them by notifying the operator in charge.

Maintenance is recommended by _____

Time of arrival / departure at the plant _____ / _____
 Technician who carried out the check: Name and Surname _____
 Signature of Technician _____
 Legible signature, on examination, the plant manager _____

DEKLARACJA ZGODNOŚCI UE
Declaration of EU-Conformity



Nr 2021/A/002

Producent: Systema Polska Sp. z o.o.
Manufacturer: 98-220 Zduńska Wola, ul. Długa 5, Polska

Identyfikacja wyrobu: Gazowy, kondensacyjny ogrzewacz pomieszczeń.
Product : Condensing gas air heater

Typ: EOLO LX ...
Type:

Model: EOLO LXC50, EOLO LXD70, EOLO LXE90, EOLO LXE+110, EOLO LXF130,
EOLO LXG170, EOLO LXH230,
Type:

Niniejsza deklaracja zgodności wydana zostaje na wyłączną odpowiedzialność producenta.

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Wymienione powyżej przedmioty niniejszej deklaracji są zgodne z odpowiednimi wymaganiami unijnego prawodawstwa harmonizacyjnego:

The subject matter of this declaration mentioned above is in accordance with the relevant requirements of the European Union harmonization legislation:

Dyrektywy: GAR 2016/426/WE
Directive: LVD 2014/35/UE
EMC 2014/30/UE

Rozporządzenia: UE 2016/2281 (Ekoprojekt)
Regulation: Ecodesign

Odwołania do norm w odniesieniu do których deklarowana jest zgodność:

References to standards for which compliance is declared:

EN 17082:2019, EN 437:2019 EN 55014-1:2017, EN 55014-2:2015,
EN 61000-6-2:2005+AC:2005, EN 61000-6-4:2007/A1:2011,
EN 61000-3-2:2014, EN 61000-3-3:2013 EN 60335-1:2012, EN 60335-2:2016

Certyfikat: GAR1450DL0004
Certificate:

Numer referencyjny jednostki notyfikowanej: **1450**
Reference number of the certificate of notified body:

Ostatnie dwie cyfry roku, w którym naniesiono oznaczenie CE: **21**
The last two digits of the year in which the CE marking was fixed:

Zduńska Wola 18.01.2021 r.

Prezes Zarządu
Federico Cortelazzo

In order to improve the quality of its products, Systema Polska Sp. z o.o. reserves the right to modify its characteristics without notice.

Systema Polska Sp. z o.o.

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98-220 Zduńska Wola

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