

Installation, use and maintenance manual for radiant belts and Girad burners



GSR00_2021_EN

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NOTES

This instruction manual must always accompany the GIRAD radiant belt, so that it can be consulted by the maintenance technician or the user whenever it is necessary.

The GIRAD radiant belts must be installed in compliance with the laws in force in every country, and according to the manufacturer's instructions, by professionally qualified personnel who have specific technical training in the radiant heating field.

Use and maintenance personnel must be compulsorily familiar with the contents of this manual before commissioning the system; in case of loss or damage of this manual, request a copy immediately by contacting the Service Center Fraccaro, mentioning the system identification data shown on the plates, supplied with the generator. Incorrect installation or improper use of the system could cause damage to people, animals or things, which the manufacturer is not responsible for.

Before carrying out any cleaning or maintenance operations disconnect the generator from supply mains by using the switch on the electrical system and/or the interceptance parts; if the generator breaks down and/or malfunctions, deactivate it and contact our Technical Assistance office in the area. Do not attempt to repair it.

Whenever the system will not be used for long periods of time the gas taps must be closed and the tension must be removed by means of the electrical feed switch of the generator.

To ensure the efficiency of the appliance and proper operation it is necessary to have the annual maintenance performed by personnel from our Technical Service Center according to the manufacturer's instructions. Fraccaro s.r.l. could not be held responsible for damages, bad working or breakdowns if annual maintenance were not carried.

Only authorized adults can use the machine.

The first start up, as with the transformation of gas from one family of gas to another, must only be carried out by authorized personnel from the Fraccaro srl Technical Assistance offices.

USE

Unskilled people are not permitted to use any equipment fed by electrical energy and the following precautions must be observed:

- do not touch the equipment with wet or damp hands or body;
- adequately protect the generator from atmospheric agents if installed outside;
- make an efficient grounding system according to the safety laws in force;
- do not use gas tubes as grounding for electrical equipment;
- do not touch hot parts of the system such as the exchanger tubes, the exhaust gas expulsion duct, which are superheated for some time during and after running; do not wet the generator with sprays of water or other liquids; do not place any object on the generator or the radiant belts.

Act as in the following if there is the odor of gas:

- do not operate electrical switches or any other object that can provoke sparks;
- immediately open doors and windows to create an air current that clears out the area and close the gas taps;
- ask professionally qualified personnel to intervene.

INSTALLATION TIPS

This equipment must be installed in compliance with laws in force and if the generator is installed inside the building the area must be well ventilated. Consult the instruction manual before installing and using the equipment.

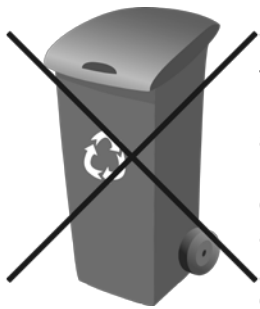
STORAGE AND WAREHOUSING

Material such as burners, radiant modules, accessories, etc. have not to be stocked outside but have to be stocked in dry environment without humidity in the air before and after installation. Furthermore, they have not to be covered with any nylon cover sheet and/or any other plastic material.



FRACCARO SRL IS NOT RESPONSIBLE IF THE ASSEMBLY INSTRUCTIONS IN THIS MANUAL ARE NOT FOLLOWED. INCORRECT INSTALLATION AND MAINTENANCE CAN CAUSE THE SYSTEM TO MALFUNCTION OR TO NOT FUNCTION AT ALL. THE INCORRECT INSTALLATION, MAINTENANCE, IMPROPER POWER SUPPLIES, MODIFIED INSTALLATION PREMISES OR DIFFERENT FROM THOSE CONVEYED DURING ORDER CONFIRMATION, UNAUTHORISED CHANGES, NON ORIGINAL SPARE PARTS MAY CAUSE A BAD FUNCTIONING AND/OR MALFUNCTIONING OF THE SYSTEM.

USEFUL INSTRUCTIONS ABOUT WASTE DISPOSAL



- The demolition and disposal of the system is the sole responsibility of the owner, who must comply with the laws in force in his country regarding safety, respect and protection of the environment.
- The product must not be disposed of as ordinary waste but treated at a special recycling centre managed by the local authority.
- By ensuring that this product is disposed of correctly, you will help prevent possible negative consequences for the environment and human health; abandonment in accessible areas constitutes a serious danger to people and animals and the responsibility for any damage is borne by the owner.
- All dismantling operations for demolition must be carried out with the system switched off and disconnected from the electricity, water and gas supply.
- During the removal of any insulating materials (glass wool/rock wool, not classified as hazardous under current European regulations), it is recommended to use protective gloves for the hands and masks for the respiratory tract, in order to prevent any irritation.
- Remove all electrical components;
- Separate the accumulators from the electronic boards;
- Scrap the structure of the system components through authorised companies;
- The treatment of liquids must be carried out by authorised and specialised installers, in compliance with the regulations in force.
- The materials used for packaging are all recyclable (paper/cardboard; plastic; polystyrene; wood); it is recommended that packaging not subject to return should be sorted and disposed of correctly.
- Upon demolition, the CE marking, this manual and other related documents must be destroyed.

TECHNICAL FEATURES OF THE GENERATORS

MODELS		Modulating generators							Modulating generators with condenser						
		GSR50.1A - GSR50.1H	GSR100.2H	GSR100.1A - GSR100.1H	GSR100.1EA - GSR100.1EH	GSR150A - GSR150H	GSR200.1A - GSR200.1H	GSR200.2H	GSR300.1A - GSR300.1H	GSR100.2HC	GSR100.1HC	GSR100.1EHC	GSR150HC	GSR200.1HC	GSR200.2HC
		GSRxxxA= Girad standard version with fixed chimney gate GSRxxxH= Girad standard version with motorized chimney gate													
Min-max power	[kW]	35÷50	70÷100	90÷115	120÷150	140÷200	210÷300	70÷100	90÷115	120÷150	140÷200	210÷300			
Consumption PCS	G20 [m³sth]	3,3÷4,8	6,7÷9,5	8,6÷11,0	11,4÷14,3	13,3÷19,1	20÷28,6	6,7÷9,5	8,6÷11,0	11,4÷14,3	13,3÷19,1	20÷28,6			
	G31 [Kg/h]	2,5÷3,6	5,0÷7,1	6,4÷8,2	8,6÷10,7	10÷14,3	15÷21,4	5,0÷7,1	6,4÷8,2	8,6÷10,7	10÷14,3	15÷21,4			
Type of burner		Atmospheric													
Type of condenser							CD - 003			CD - 004					
Gas attachment diameter		1/2"	3/4"	1 1/4"			1 1/2"	3/4"	1 1/4"			1 1/2"			
Condenser tubes attachment diameter		3/4"													
Condenser flue gas discharge attachment diameter	[mm]	200													
Power supply	[VAC 1N]	1~ \ N \ 50 Hz 230V					3~ \ N \ 50 Hz 400V		1~ \ N \ 50 Hz 230V			3~ \ N \ 50 Hz 400V			
Installed electric power	[Watt]	370	1500	1100			3000	2320	1920			3820			
Electric drain at first startup	[A]	2,2	8,5	4,8			4,6	12,3	8,6			8,4			
Generator weight	[kg]	88	96	115	119	127	165	173	191	210	214	257	280	303	
Average temperature of combustion smokes at discharge (at condensation steady condition)	[°C]	40 - 50													
Average quantity of condensation	[l/h]						7,5÷9	10÷10,5		11÷11,7		14÷17,5			
No. of split venturi in vacuum air streak	[n°]	4	7	10		14	21	7	10		14		21		
Weight of radiant strip with 2 tubes/1 tube Ø 300 mm TYPE A	kg/m						25/18								
Weight of radiant strip with 2 tubes/1 tube Ø 200 mm TYPE A	kg/m	19/16							19/16						
Weight of radiant strip with 2 tubes/1 tube Ø 300 mm TYPE B	kg/m						19/11								
Weight of radiant strip with 2 tubes/1 tube Ø 200 mm TYPE B	kg/m	12/8							12/8						
Minimum and maximum virtual lengths															
Min/max virtual length Ø 200 mm 1 tube	[m]	42/72	54/90				54/90								
Min/max virtual length Ø 200 mm 2 tubes	[m]	21/36	27/45				27/45								
Min/max virtual length Ø 300 mm 1 tube	[m]			54/150	60/156	76/168	102/234	156/324	54/150	60/156	76/168	102/234	156/324		
Min/max virtual length Ø 300 mm 2 tubes	[m]			27/75	30/78	38/84	51/117	78/162	27/75	30/78	38/84	51/117	78/162		
Diameter of radiating strips	[mm]	200			300			200	300						
Gas category		I2H, I2E, I2E+, I3P, I12H3P, I12E+3P							I2H, I2E, I2E+, I3P, I12H3P, I12E+3P						
Air required for correct combustion	[m³/h]	70/100	140/200	160/230	200/300	300/400	400/600	140/200	160/230	200/300	300/400	400/600			



The inrush current can reach values of about 5 - 8 times the rated current.

Tab. 1

EXTERNAL DIMENSIONS OF THE GENERATORS MODEL GSR50.1-GSR100.1-GSR100.1E-GSR150

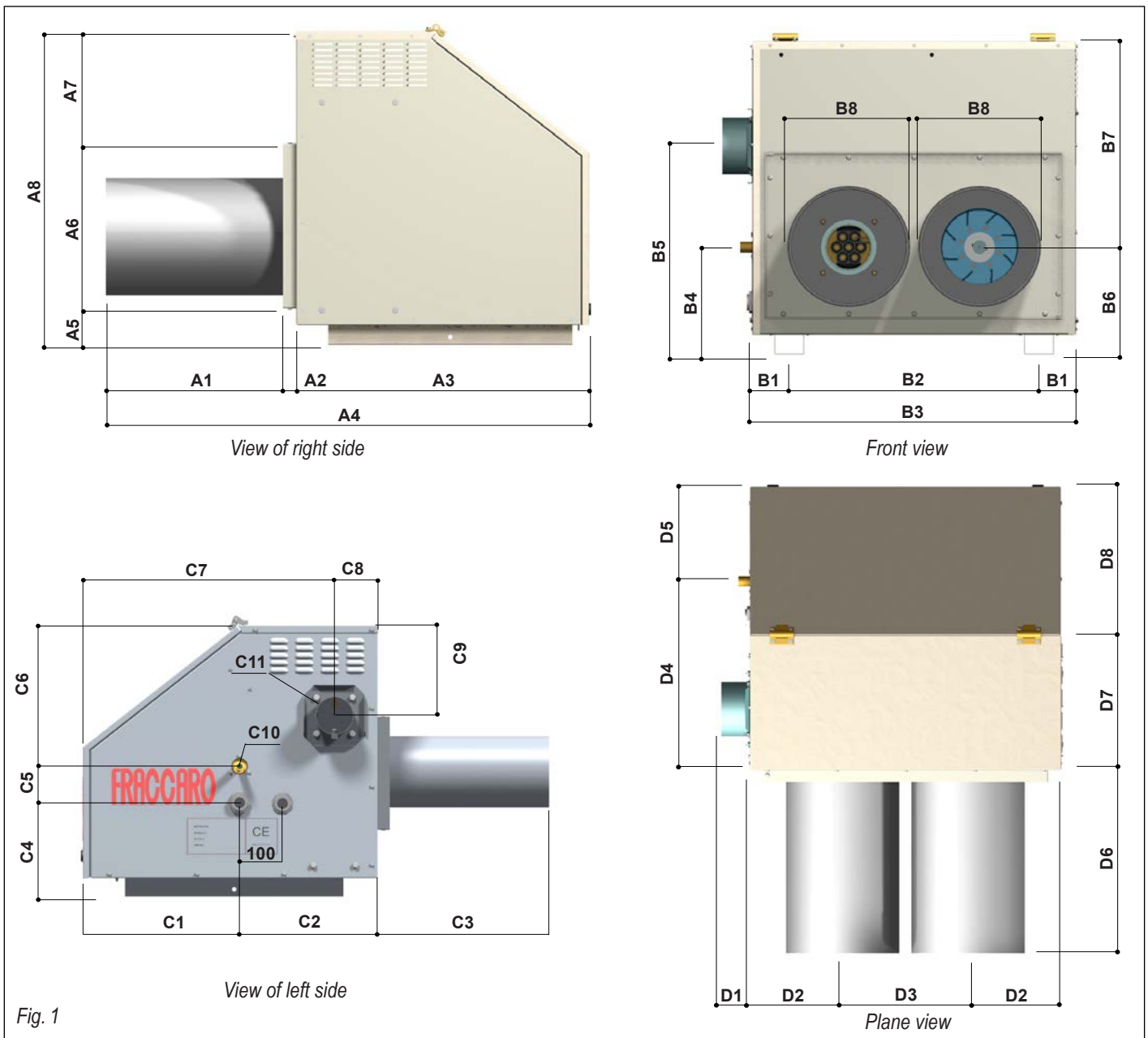


Fig. 1

Generator Type	Dimensions [mm]															
	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	B7	B8
GSR50.1	438	34	810	1282	183	310	251	744	133	493	742	357	496	342	402	Ø196
GSR100.1 GSR100.1E GSR150	443	36	965	1442	125	420	252	795	95	630	819	334	591	334	462	Ø296
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11					
GSR50.1	351	458	472	257	100	388	692	119	250	Ø 1/2"	Ø 104					
GSR100.1	370	593	477	195	140	462	800	165	205	Ø 3/4"	Ø 144					
GSR100.1E GSR150	371	595	478	195	140	462	800	168	205	Ø 1 1/4"						
	D1	D2	D3	D4	D5	D6	D7	D8								
GSR50.1	75	271	260	379	431	472	380	422								
GSR100.1 GSR100.1E GSR150	75	245	330	491	475	475	535	431								

Tab. 2

EXTERNAL DIMENSIONS OF THE GENERATORS MODEL GSR100.2-200.1-200.2-300.1

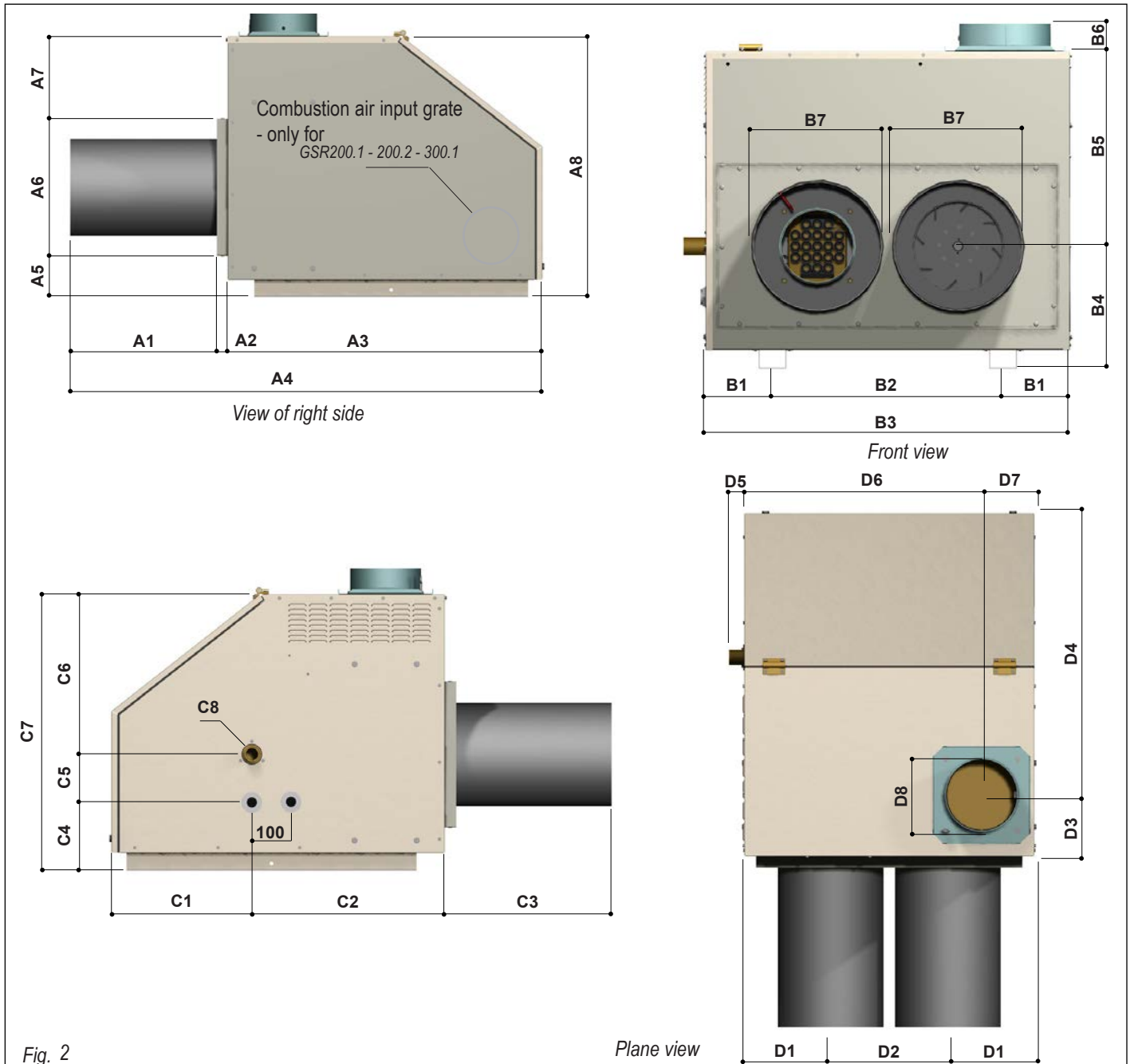
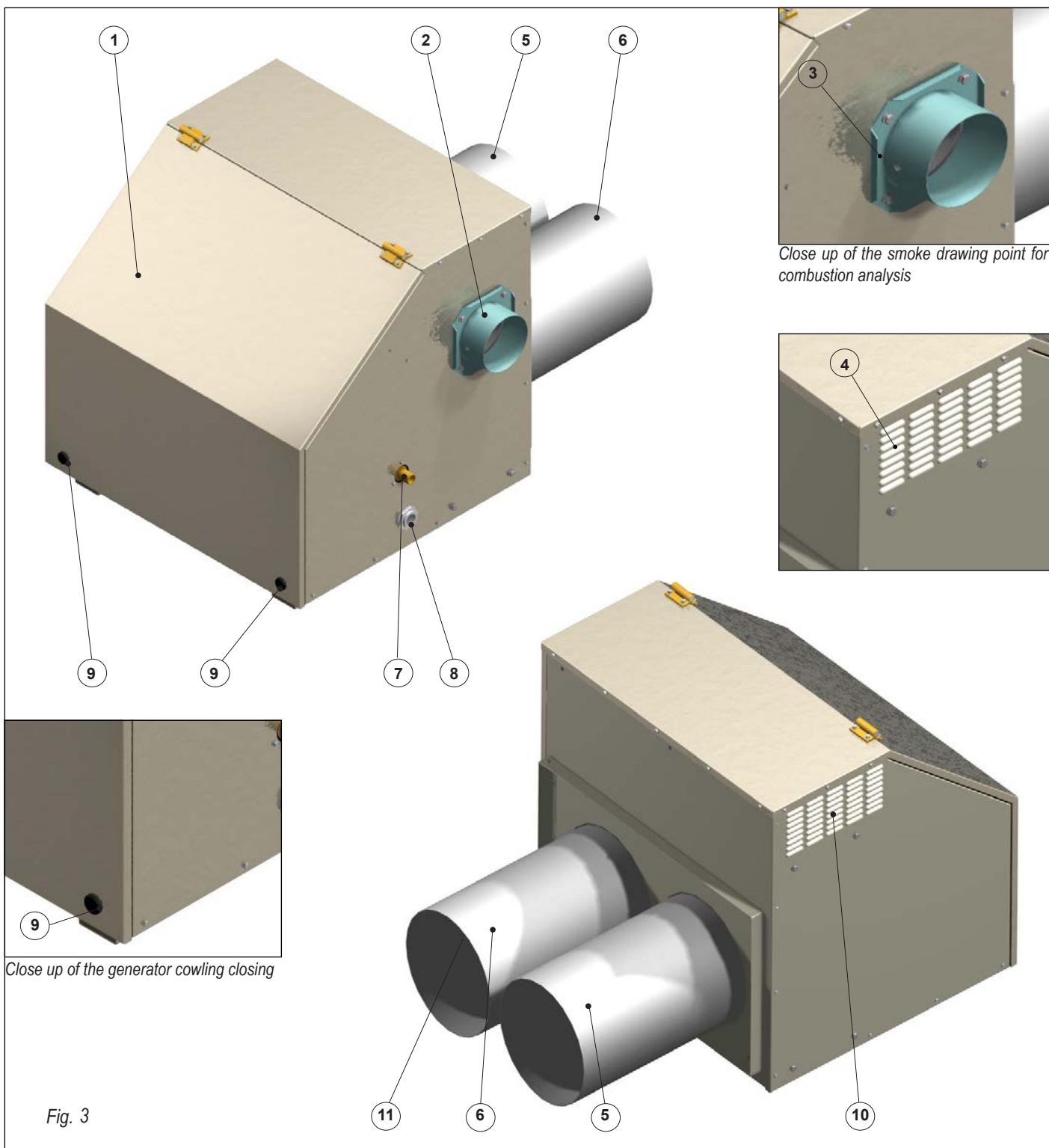


Fig. 2

Plane view

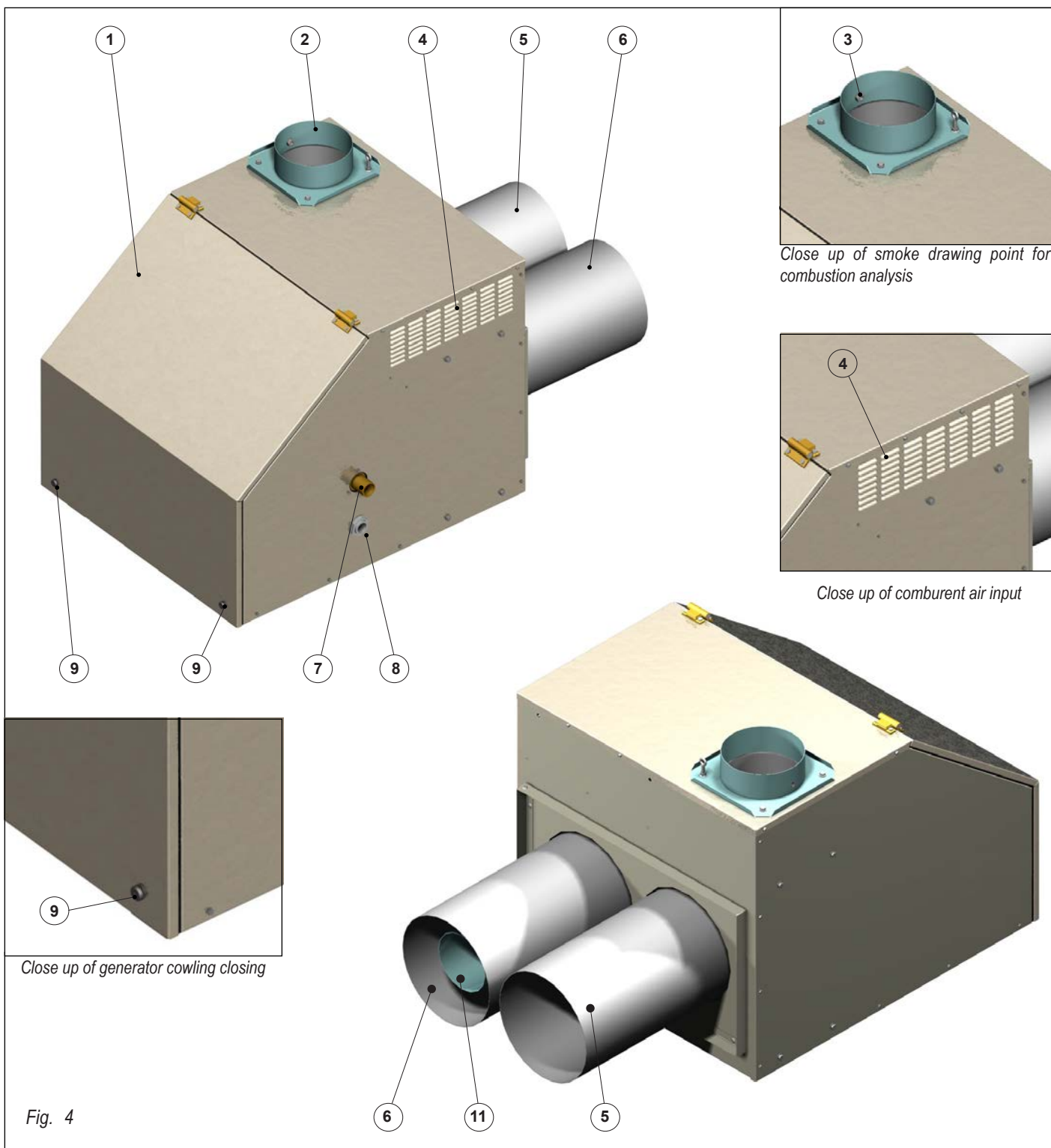
Generator Type	Dimensions [mm]														
	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	B7
GSR100.2	438	33	810	1281	183	310	251	744	126	493	745	342	402	77	Ø196
GSR200.1	456		964	1453	124	420	253	795	96	630	819	334	462	75	Ø297.5
GSR200.2			1012	1498	112	446	308	866	180		990		532		Ø352.5
GSR300.1															
	C1	C2	C3	C4	C5	C6	C7	C8	Tab. 3						
GSR100.2	301	510	473	224	119	401	744	Ø 3/4"							
GSR200.1	437	527	490	196	139	461	796	Ø 1"¼							
GSR200.2	508	504				532	866	Ø 1"½							
GSR300.1															
	D1	D2	D3	D4	D5	D6	D7	D8							
GSR100.2	242	260	118	693	29	600	148	Ø 144							
GSR200.1	242	330	166	800	45	670	150	Ø 205							
GSR200.2	305	385	198	815	75,5	816,5	179								
GSR300.1															

COMPONENTRY TECHNOLOGY OF THE GENERATORS MODEL GSR50.1-GSR100.1-GSR100.1E-GSR150

**Legend:**

- 1 = Generator external skirt;
- 2 = Exhaust gas expulsion duct connection;
- 3 = Close up of smoke drawing point for combustion analysis;
- 4 = Close up of comburent air input;
- 5 = Superheated air return flue connection (exhaust fan side);
- 6 = Superheated air throw duct connection (burner side);
- 7 = Gas connection 1/2" (GSR50); 3/4" (GSR100.1); 1"1/4 (GSR100.1E, GSR150);
- 8 = Electrical feed connection 1~\N\50Hz 230V ;
- 9 = Generator cowling closings;
- 10 = Combustion air input grate;
- 11 = Combustion chamber (not visible from this angling).

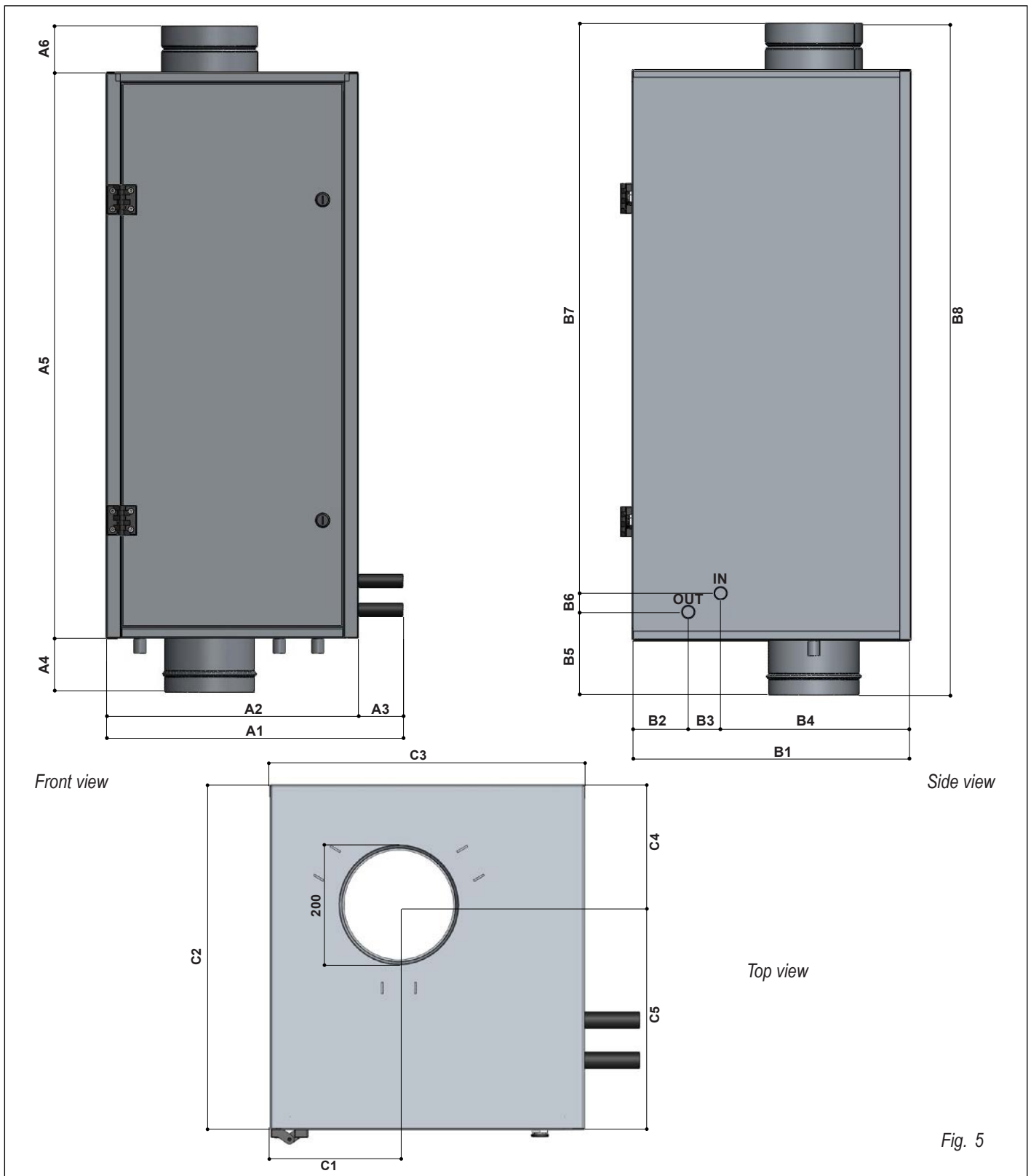
COMPONENTRY TECHNOLOGY OF THE GENERATORS MODEL GSR100.2-200.1-200.2-300.1



Legend:

- 1 = Generator external skirt;
- 2 = Exhaust gas expulsion duct connection;
- 3 = Close up of smoke drawing point for combustion analysis;
- 4 = Close up of combustent air input;
- 5 = Superheated air return flue connection (exhaust fan side);
- 6 = Superheated air throw duct connection (burner side);
- 7 = Gas connection 1" 1/4 (GSR200.1 - GSR200.2); 1" 1/2 (GSR300.1);
- 8 = Electrical feed connection (GSR200.1) 1~N\50Hz 230V; (GSR200.2 - GSR300.1) 3~N\50Hz 400V;
- 9 = Generator cowling closings;
- 10 = Combustion chamber (not visible from this angling).

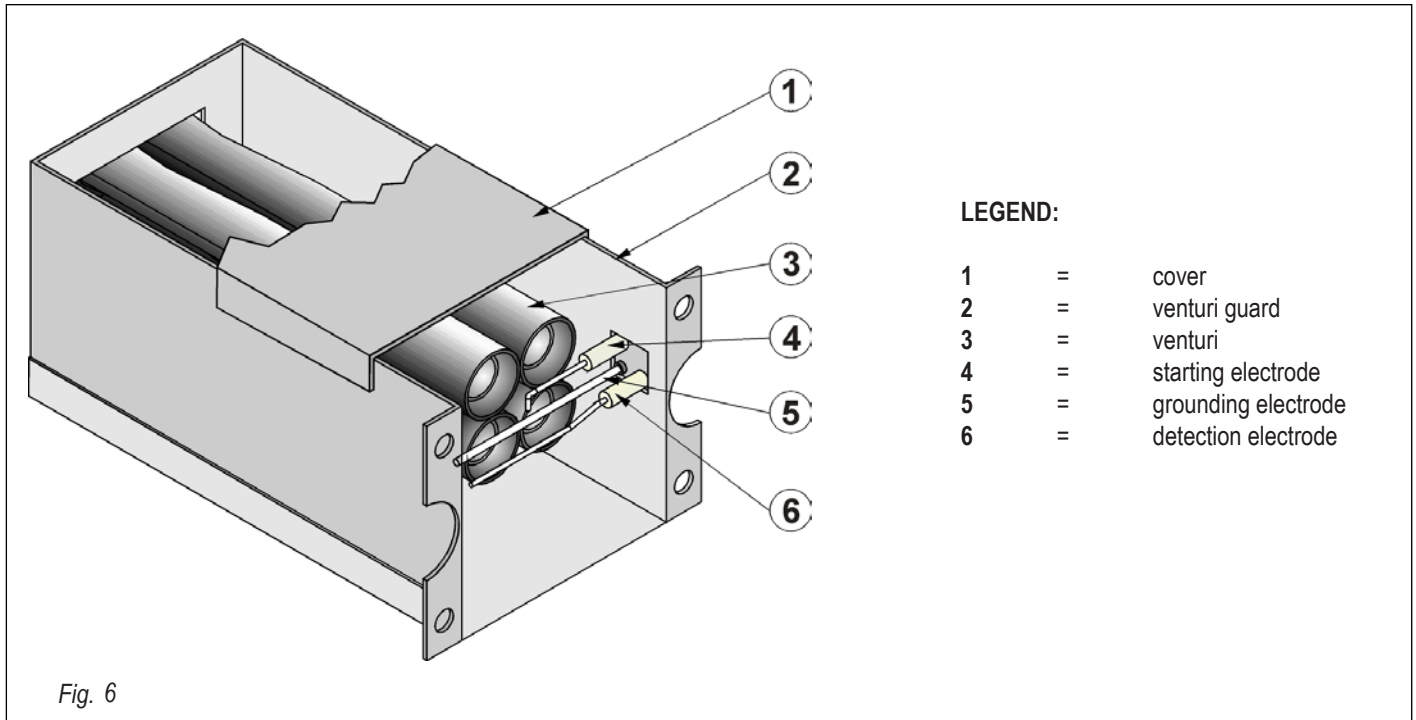
EXTERNAL DIMENSIONS OF THE CONDENSERS



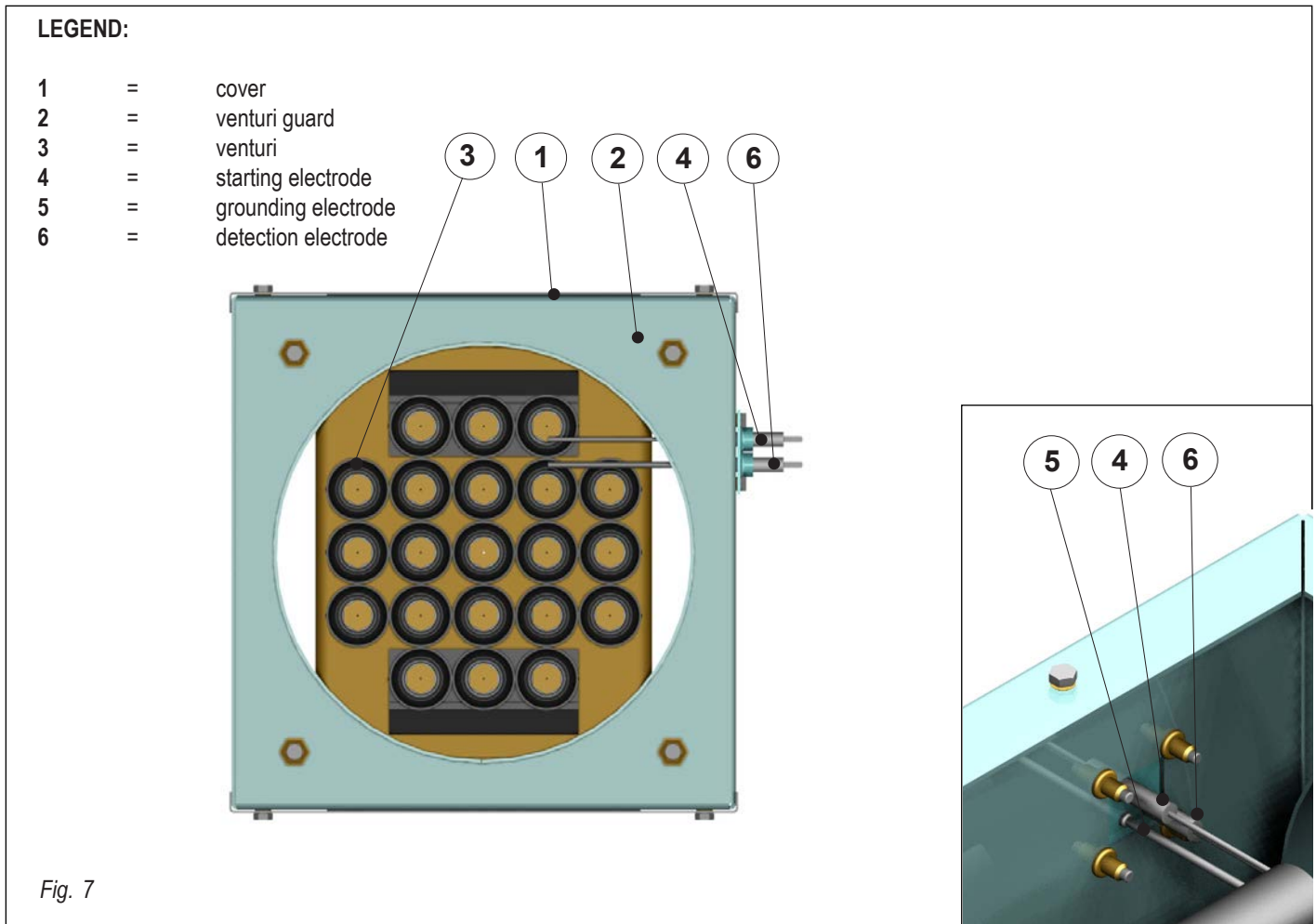
Type of condenser	Dimensions [mm]										
	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5
CD-003	600	550	50	118	1003	100	597	138,5	50	408,5	180
CD-004	600	550	50	118	1236	100	602	125,5	60	417,5	180
	B6	B7	B8	C1	C2	C3	C4	C5	C6		
CD-003	80	960	1220	225	602	200	211	391	390		
CD-004	85	1200	1455	225	602	200	211	391	390		

Tab.4

COMBUSTION GROUP FOR GENERATOR MODEL GSR50.1

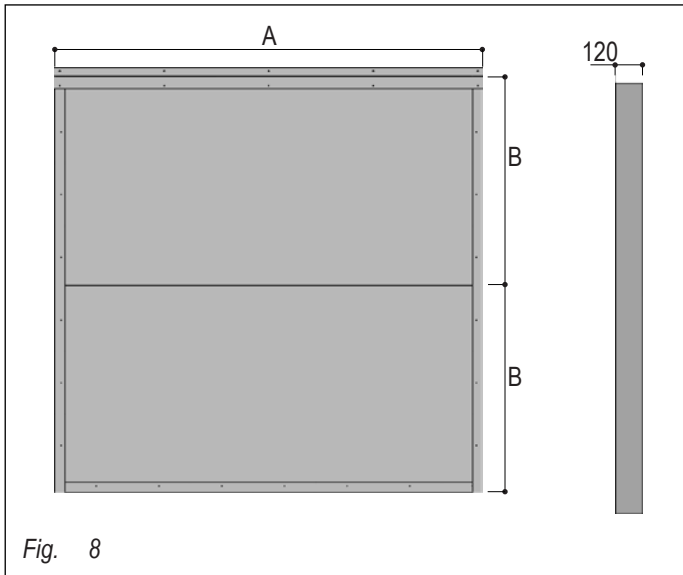


COMBUSTION GROUP FOR GENERATOR MODEL GSR100.2 - GSR100.1 - GSR100.1E - GSR150 - GSR200.1 - GSR200.2 - GSR300.1



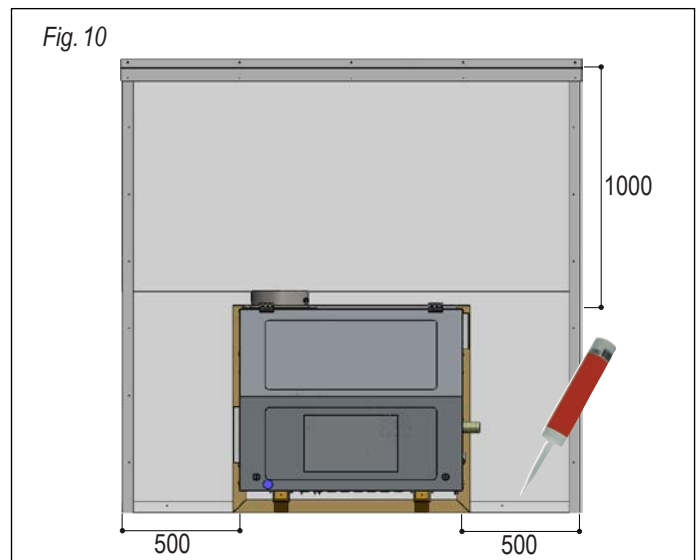
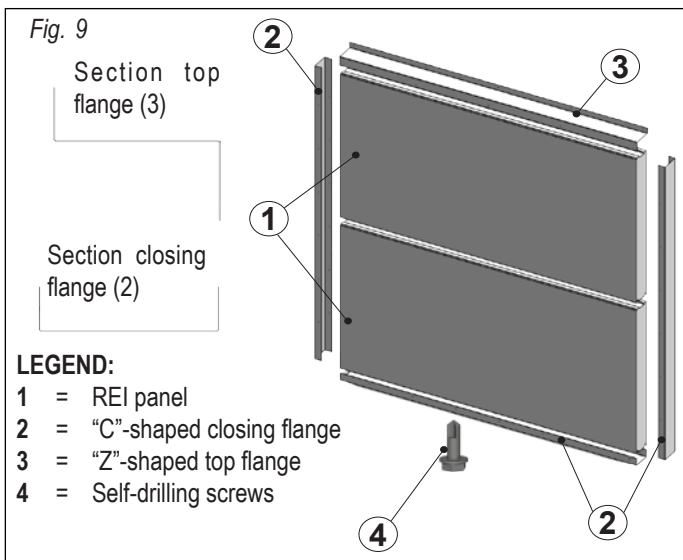
A close up of the electrode block is shown in fig. 6, the upper cover has been removed for better viewing.

EXTERNAL DIMENSIONS OF THE REI SANDWICH PANEL



GENERATOR MODEL	PANEL DIMENSIONS (mm)		
	A	B	Weigh [Kg]
GSR50.1 GSR100.2	1750	1000	78
GSR100.1 GSR100.1E GSR150 GSR200.1	1820		81
GSR200.2 GSR300.1	2050		100

Tab. 5



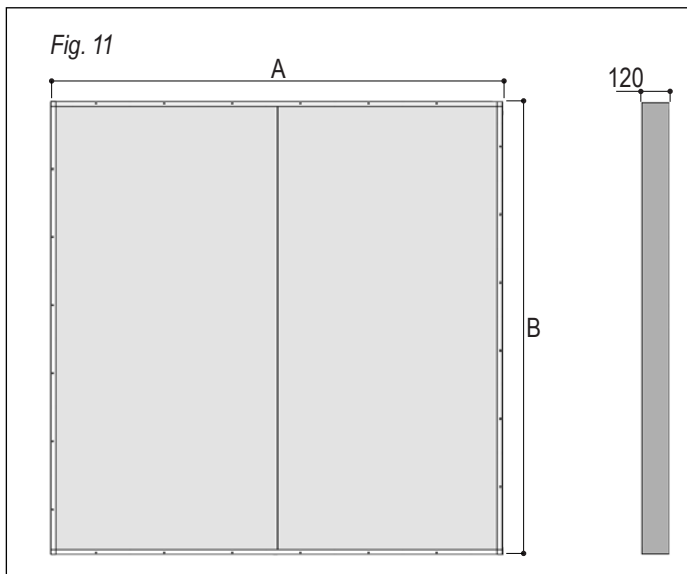
As required by applicable regulations, place the generator at least 1 m from the upper projection of the generator and 0,5 m from the side projections, as shown in fig. 10.

The REI panel consists of two panels placed horizontally compared to the wall and fixing guides. The dimensions are summarised in fig. 8 and tab. 5; the elements, making up the panel are shown in fig. 9.

For all versions, except GSR200.1 - GSR300.1, the upper and lower closing profile must be cut to size as shown in table 5 (column A).

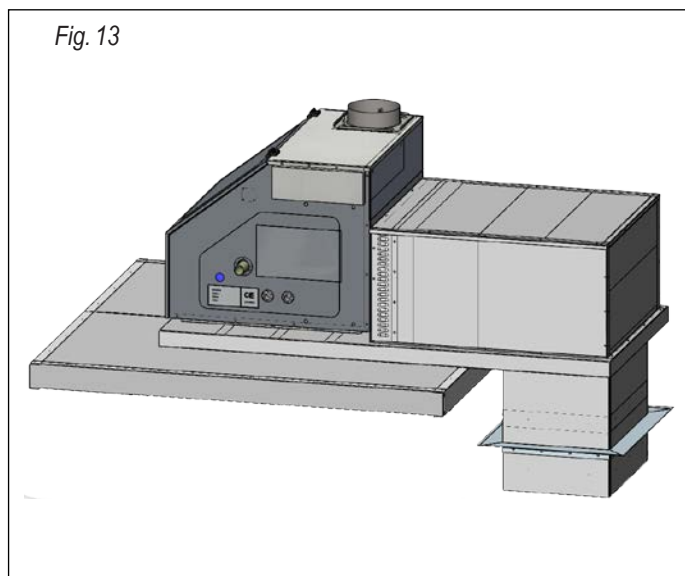
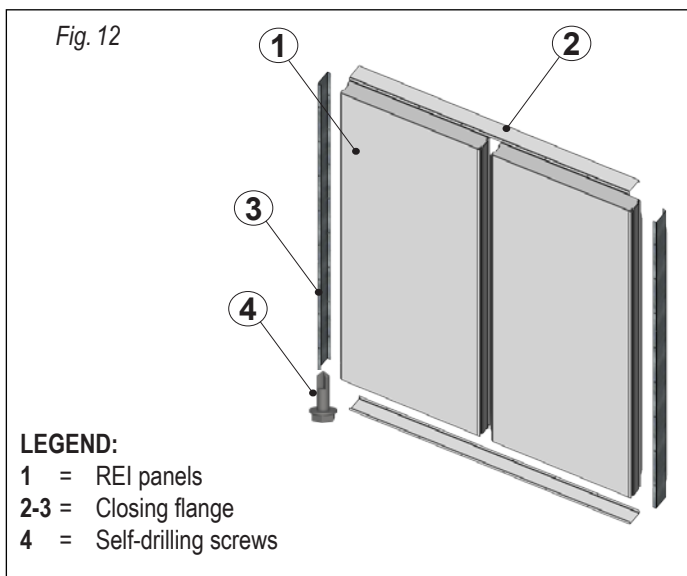
Drill a hole in the REI panel, suited to the type of burner (see measures of the generator in the previous paragraphs); secure the REI panel to the wall by placing the top guide 3 over the panel and fixing everything with anchors; position the bracket over the REI panel, securing it in place (see next paragraphs) and finally fix the generator. If the wall is not suitable for the anchors, provide a supporting metal structure to support the generator, a bracket and REI panel with at least M8 threaded bars and lock nut. Seal all edges and crevices.

EXTERNAL DIMENSIONS OF THE REI SANDWICH PANEL ON THE ROOF



GENERATOR MODEL	ROOF PANEL DIMENSIONS (mm)		
	A	B	Weight [Kg]
GSR50.1 GSR100.2 GSR100.1 GSR100.1E GSR150 GSR200.1 GSR200.2 GSR300.1	2000	2030	100

Tab. 6

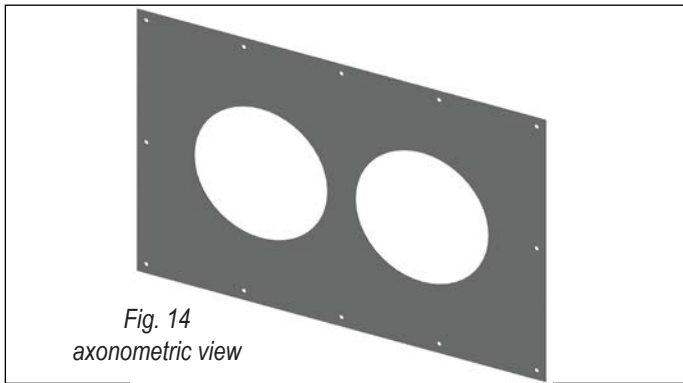


The REI panel consists of two equal sized panels. The size requirements are summarised in fig. 12 and tab. 8; the elements, making up the panel are shown in fig. 12.

The closing profile (2-3) is already supplied to be installed and, therefore, should not be cut. The measurements of the profiles, to be used for assembly, are shown in table 6. Provide a suitable support structure for the REI panels.

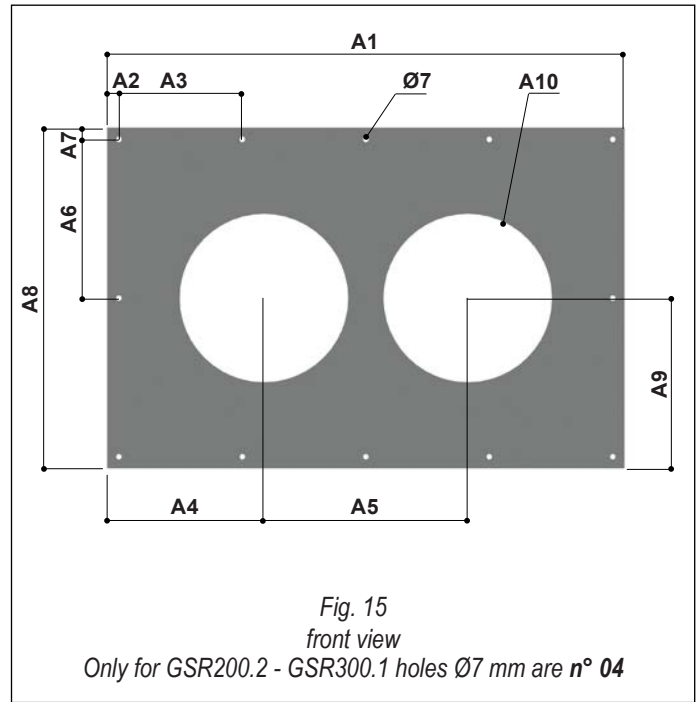
Make sure to follow the instructions as required by local regulations (0,5 m projection on all four sides).

HOLE COVER PLATE



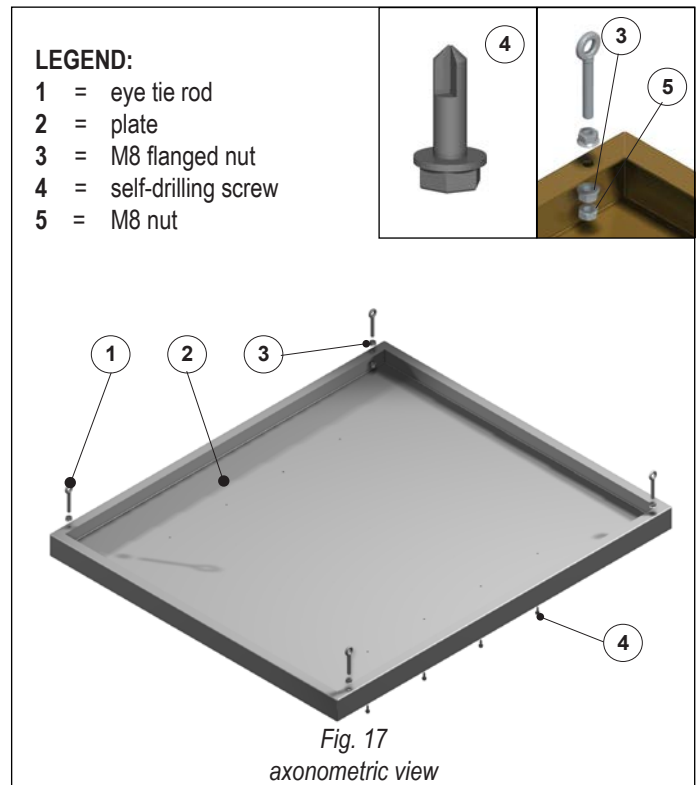
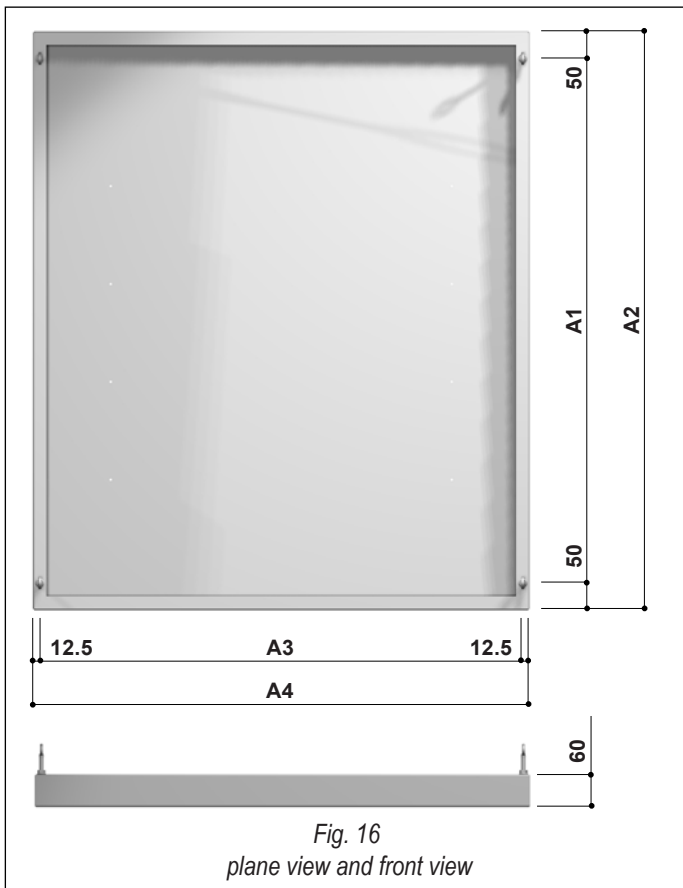
Generator Type	Dimensions [mm]									
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
GSR50.1 GSR100.2	680		162,5	210	260	212,5		455	227,5	Ø 215
GSR100.1 GSR100.1E GSR150 GSR200.1	855	15	206,4	262,5	330	225	15	480	240	Ø 315
GSR200.2 GSR300.1	980		237,5	297,5	385	220		690	345	Ø 370

Tab. 7



CEILING PLATE

The ceiling plate is outfitted with self-drilling screws, M8 flanged nuts and and eye tie rods to fasten the generator.

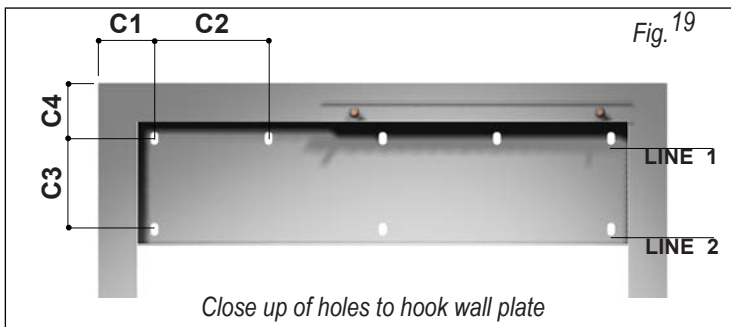
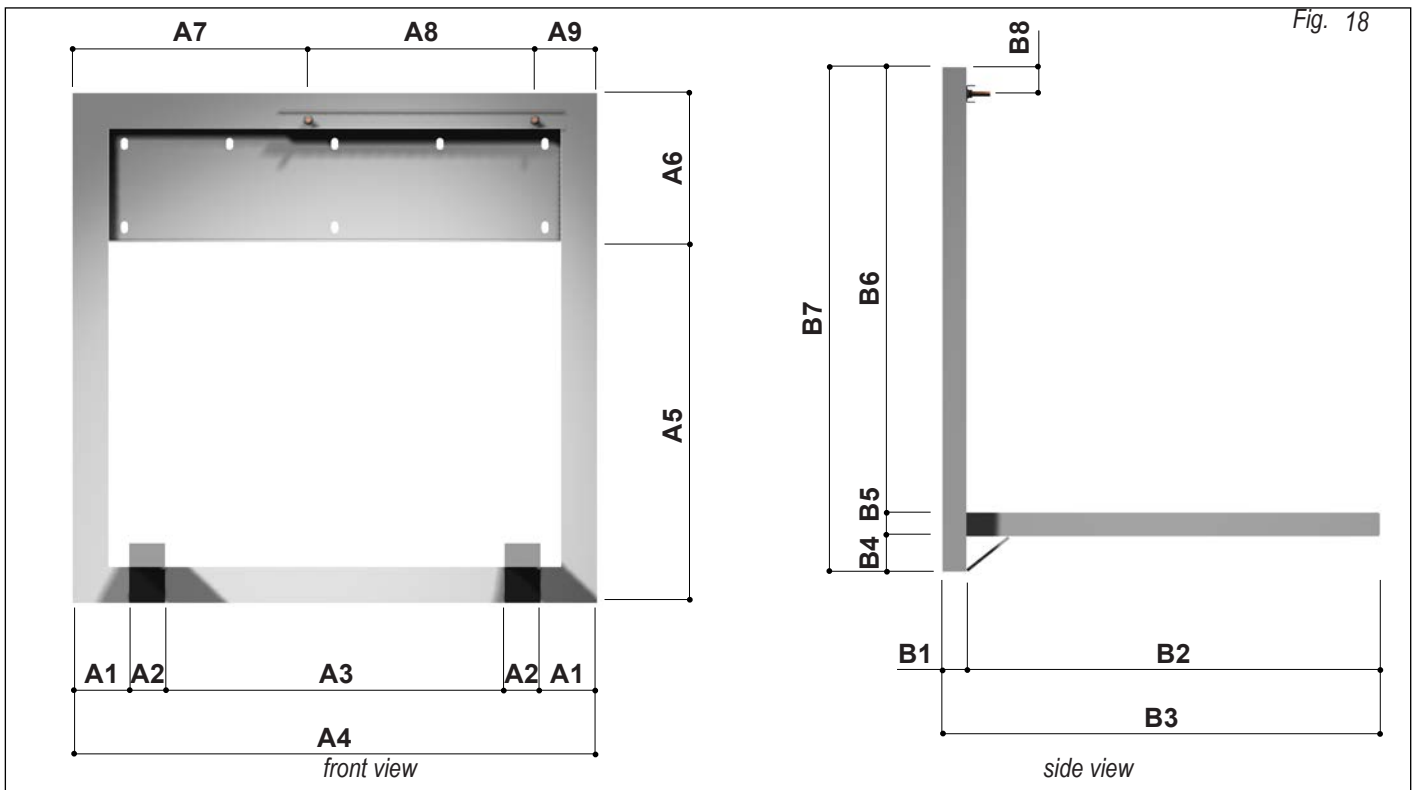


Attention! Always close the eye tie rods with nut and lock nut.

Generator Type	Dimensions [mm]			
	A1	A2	A3	A4
GSR50.1 GSR100.2 GSR100.1 GSR100.1E GSR150 GSR200.1	965	1065	890	915
GSR200.2 GSR300.1	1015	1115	1090	1115

Tab. 8

WALL PLATE



Generator Type	Dimensions [mm]								
	A1	A2	A3	A4	A5	A6	A7	A8	A9
GSR50.1 GSR100.2	108,5		433	710	552	248	386	300	84
GSR100.1 GSR100.1E GSR150 GSR200.1	95	60	570	880	605	250	395	380	105
GSR200.2 GSR300.1	185		1060	630	630	300	441	526	93
	B1	B2	B3	B4	B5	B6	B7	B8	
GSR50.1 GSR100.2		626,5	666,5			700	800	43	
GSR100.1 GSR100.1E GSR150 GSR200.1	40	700	740	60	40	755	855	45	
GSR200.2 GSR300.1		970	1010			830	930	50	
	C1	C2	C3	C4	Ø holes	N° holes line 1	N° holes line 2		
GSR50.1 GSR100.2	84	150,5	140	83					
GSR100.1 GSR100.1E GSR150 GSR200.1	87	176,5	140	85	20	5		5	
GSR200.2 GSR300.1	83	222,5	190					3	

Tab.9

ROOF PLATE

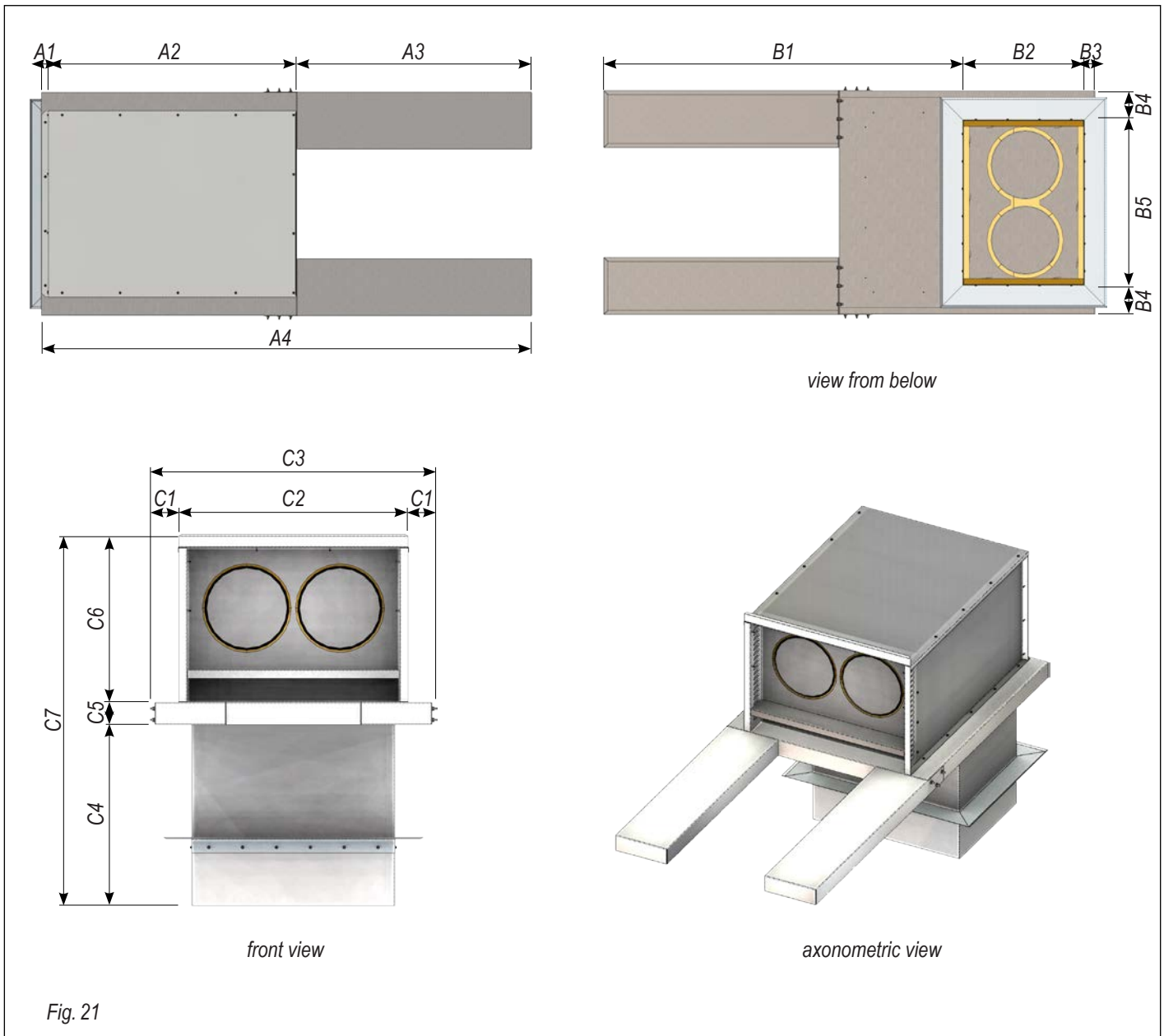


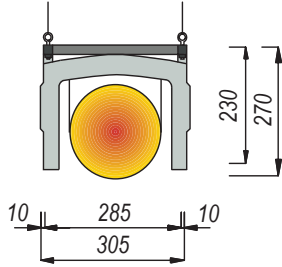
Fig. 21

Generator Type	Dimensions [mm]															
	A1	A2	A3	A4	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	C7
GSR50.1 GSR100.2	32	1024	1036	2092	1568	430	93	180,5	549	100	745	945	644	80	540	1264
GSR100.1 GSR100.1E GSR150 GSR200.1		1096		2164	1583	530	50	130,5	719	100	819	1015			597	1321
GSR200.2 GSR300.1		1174	1039	2245	1661,5		52,5	180,5		62	995	1116			606	1330

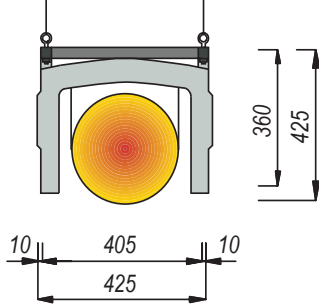
Tab.10

RADIANT BELT WITH 1 TUBE

Cross-section of circular radiant part with 1 tube Ø 200 mm

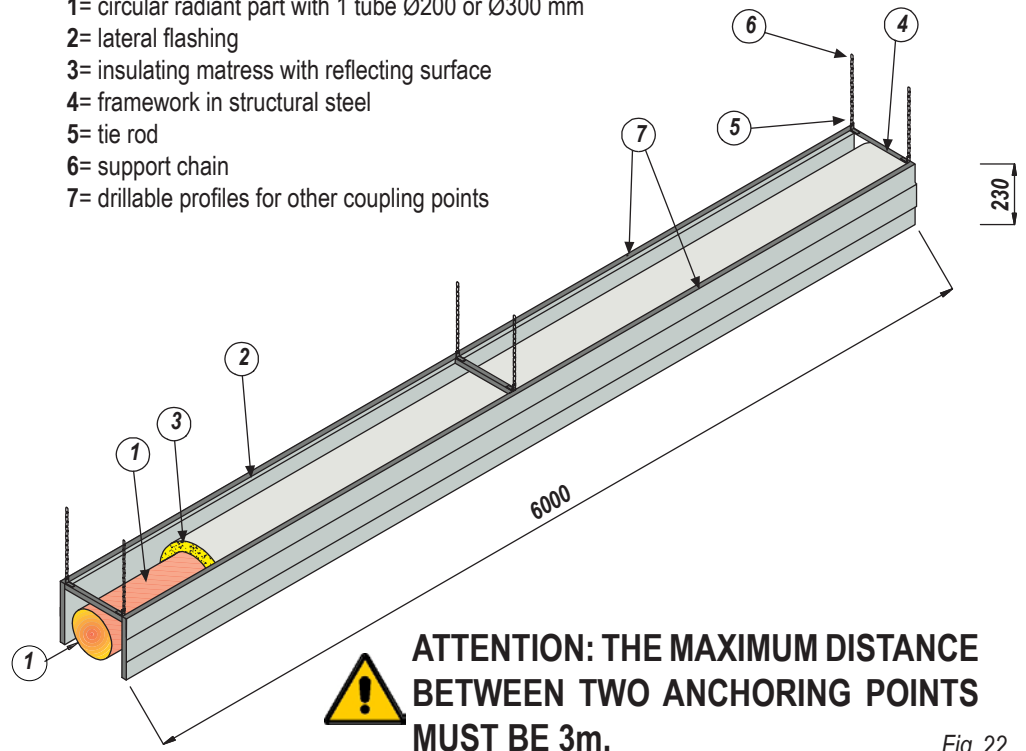


Cross-section of circular radiant part with 1 tube Ø 300 mm



LEGEND:

- 1= circular radiant part with 1 tube Ø200 or Ø300 mm
- 2= lateral flashing
- 3= insulating matress with reflecting surface
- 4= framework in structural steel
- 5= tie rod
- 6= support chain
- 7= drillable profiles for other coupling points

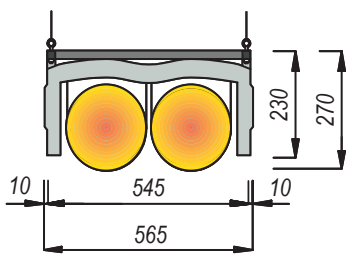


ATTENTION: THE MAXIMUM DISTANCE BETWEEN TWO ANCHORING POINTS MUST BE 3m.

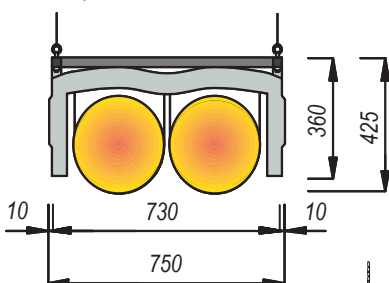
Fig. 22

RADIANT BELT WITH 2 TUBES

Cross-section of circular radiant part with 2 tubes Ø 200 mm

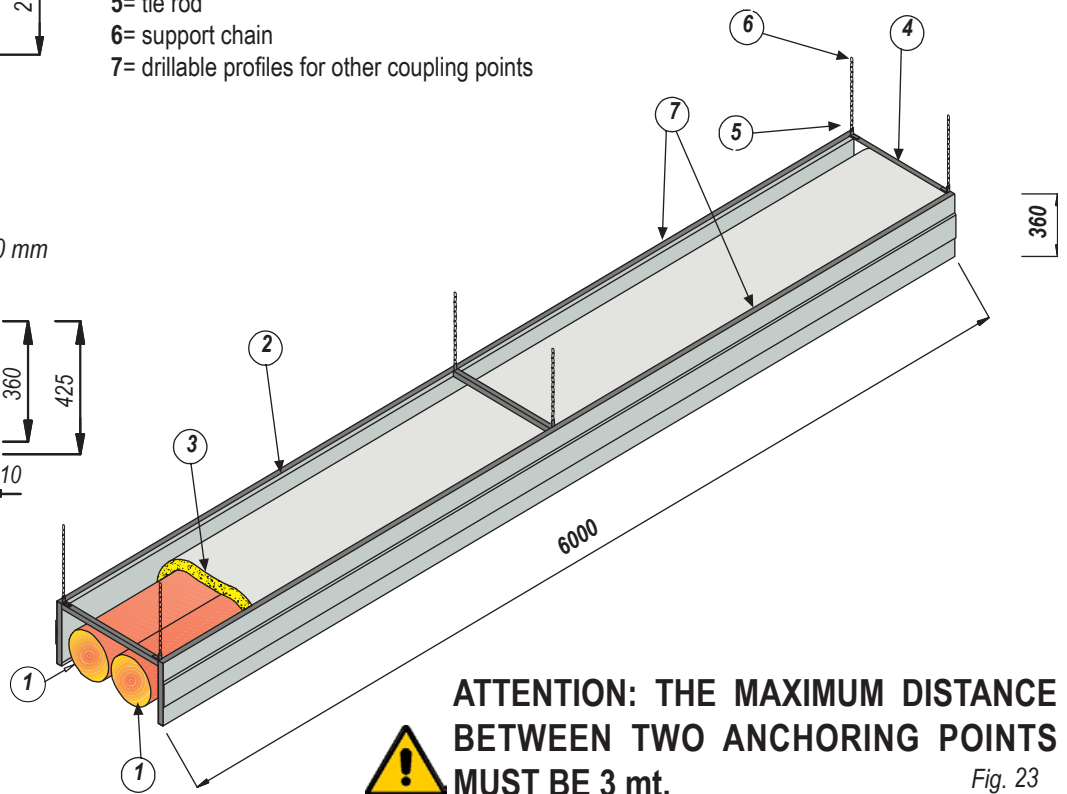


Cross-section of circular radiant part with 2 tubes Ø 300 mm



LEGEND:

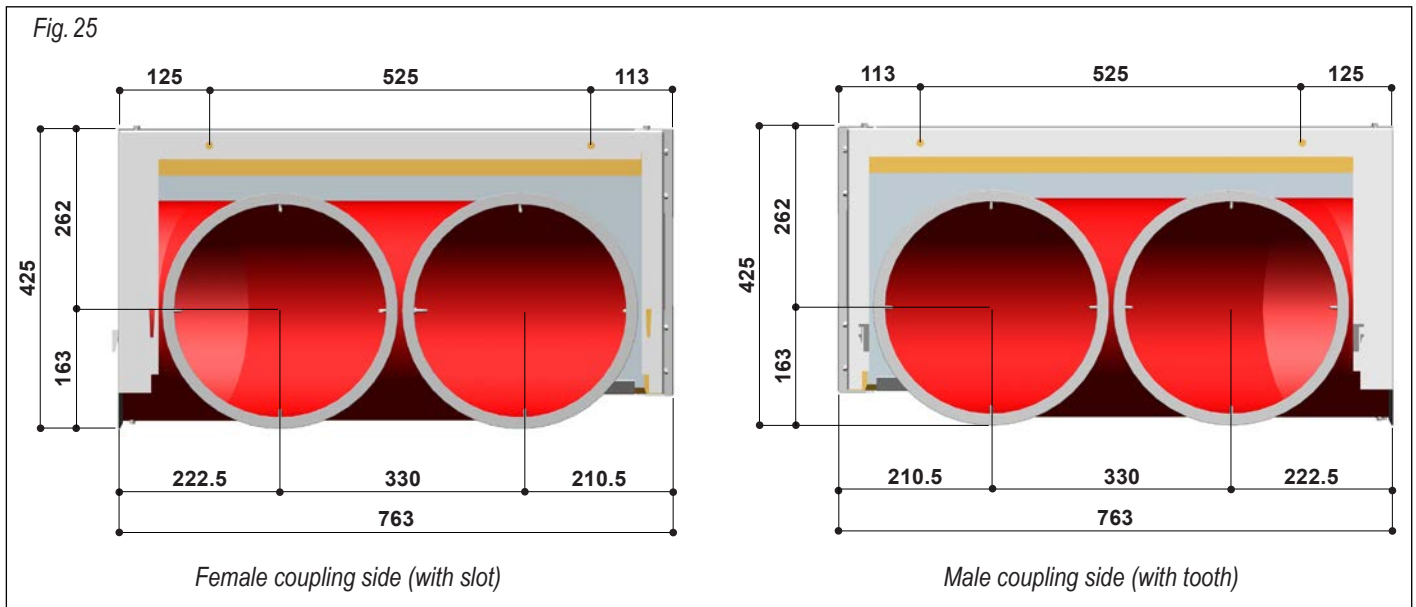
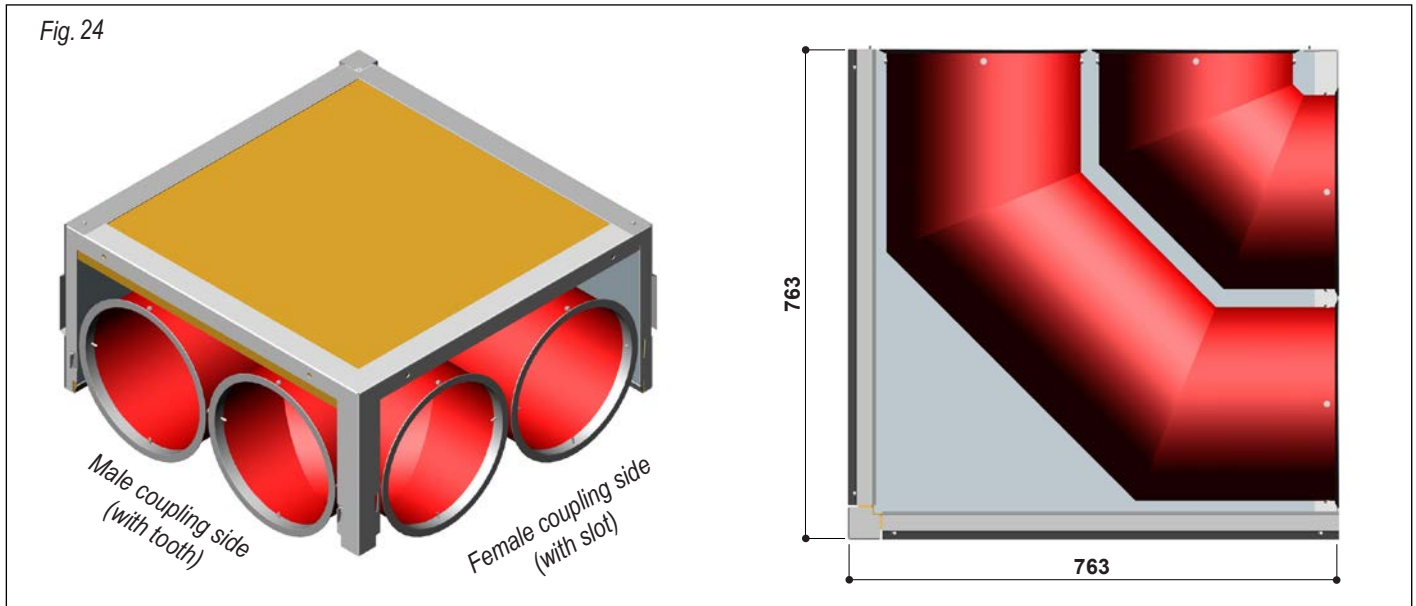
- 1= circular radiant part with 2 tubes Ø200 or Ø300 mm
- 2= lateral flashing
- 3= insulating matress with reflecting surface
- 4= framework in structural steel
- 5= tie rod
- 6= support chain
- 7= drillable profiles for other coupling points



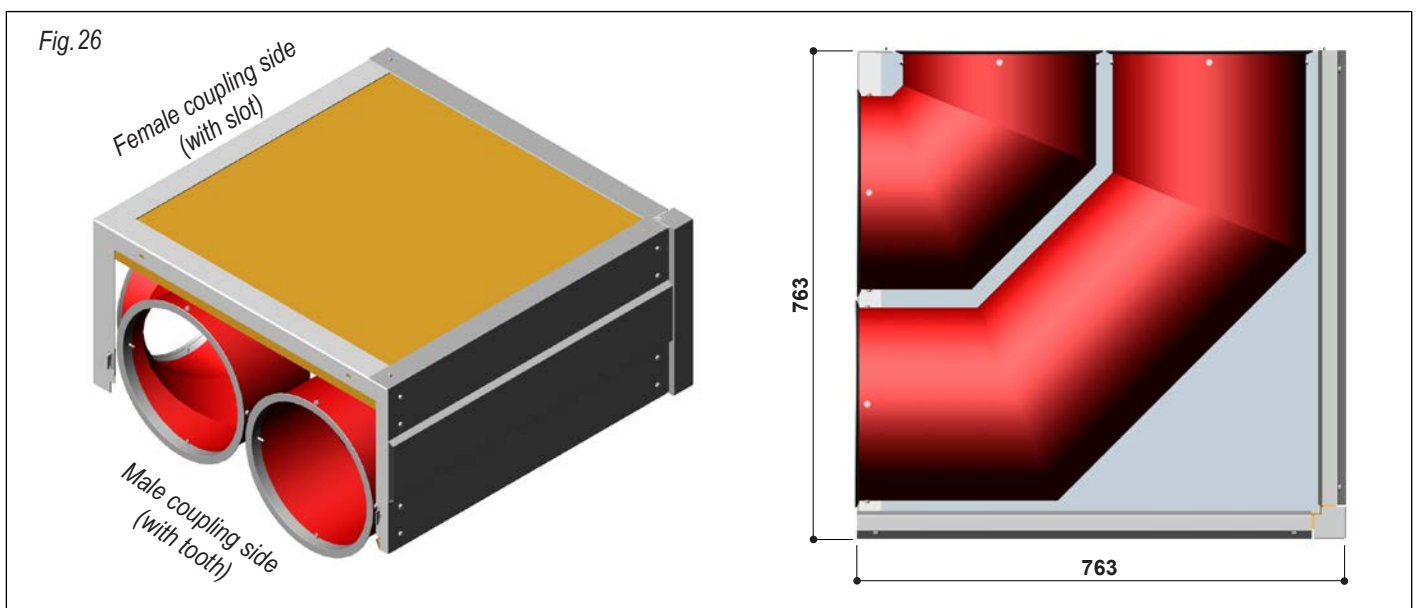
ATTENTION: THE MAXIMUM DISTANCE BETWEEN TWO ANCHORING POINTS MUST BE 3 mt.

Fig. 23

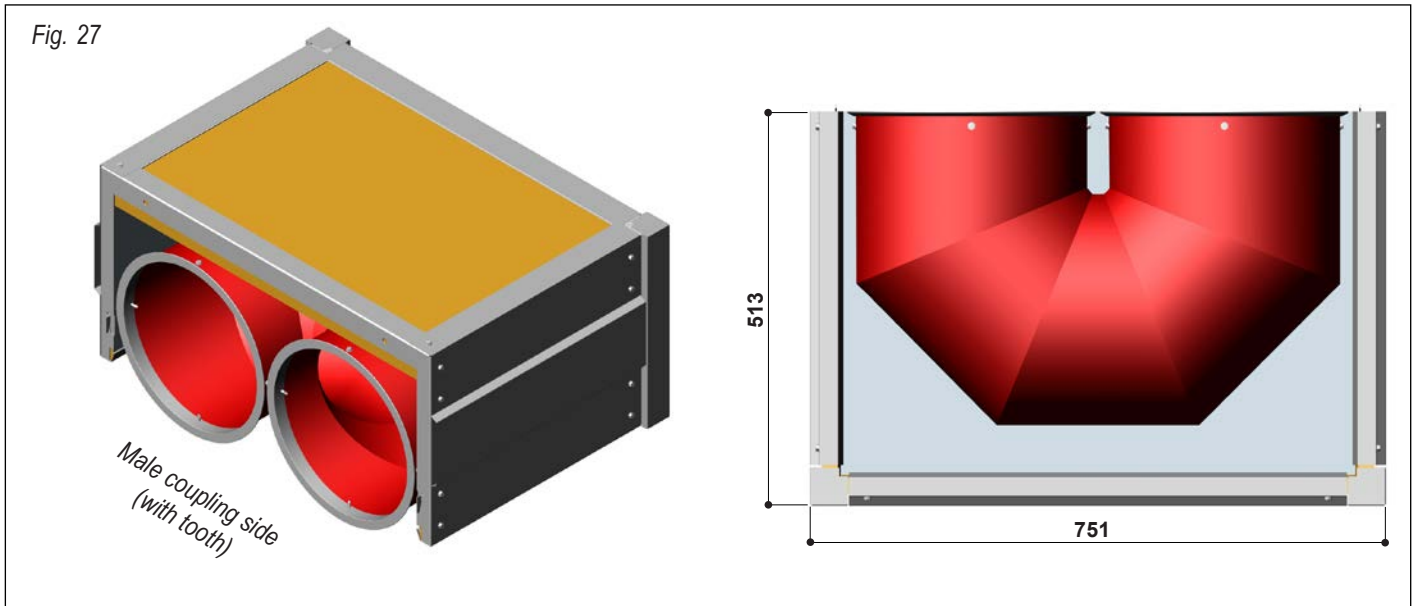
RADIANT MODULE RIGHT ELBOW FOR DOUBLE TUBE Ø 300 mm



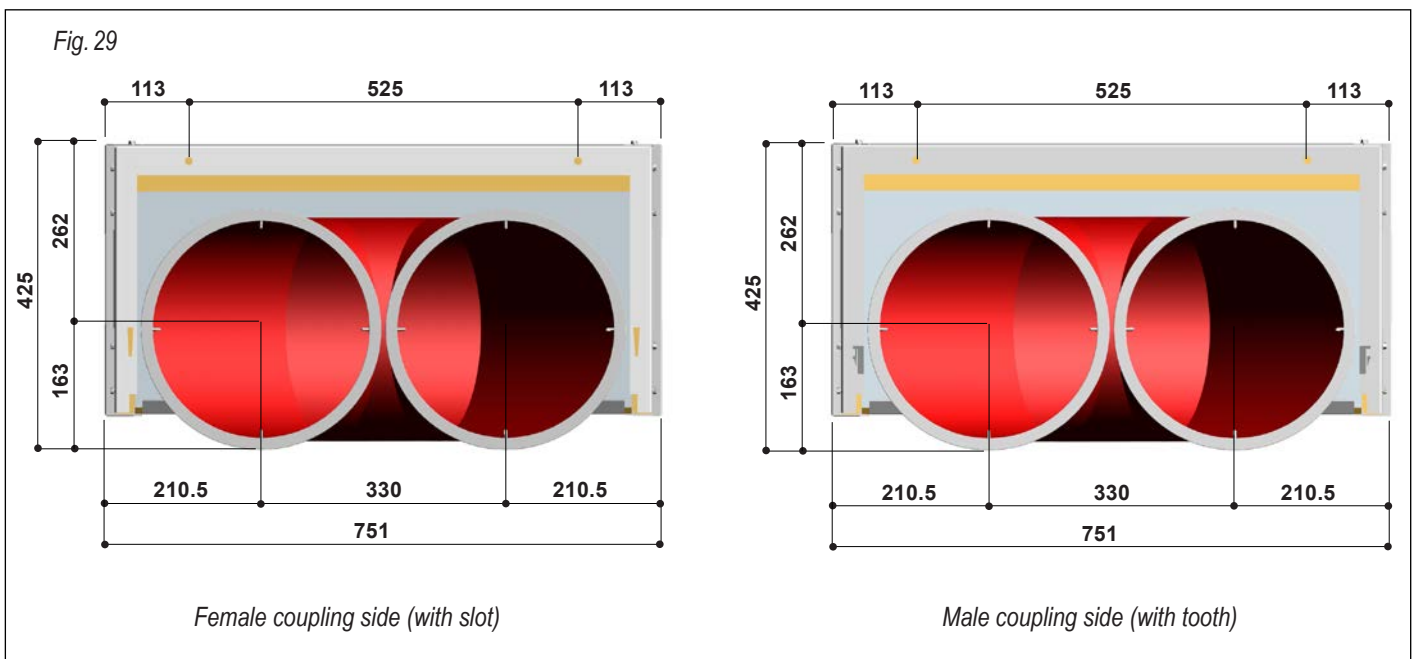
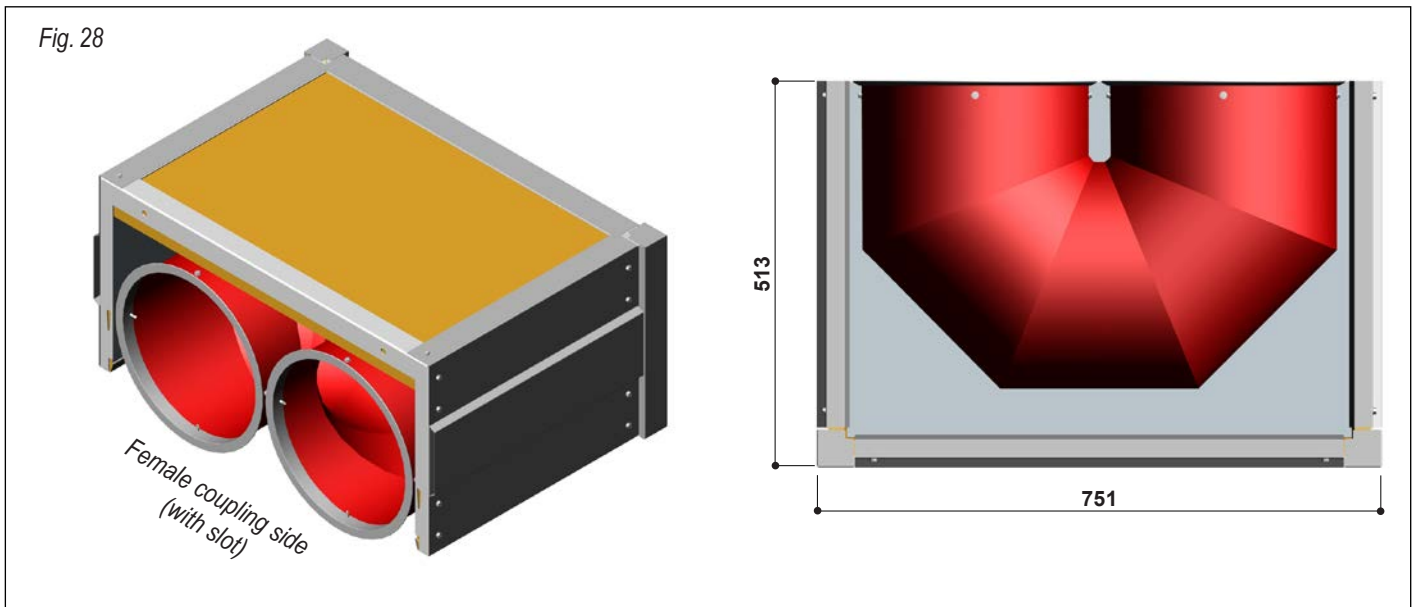
RADIANT MODULE LEFT ELBOW FOR DOUBLE TUBE Ø 300 mm



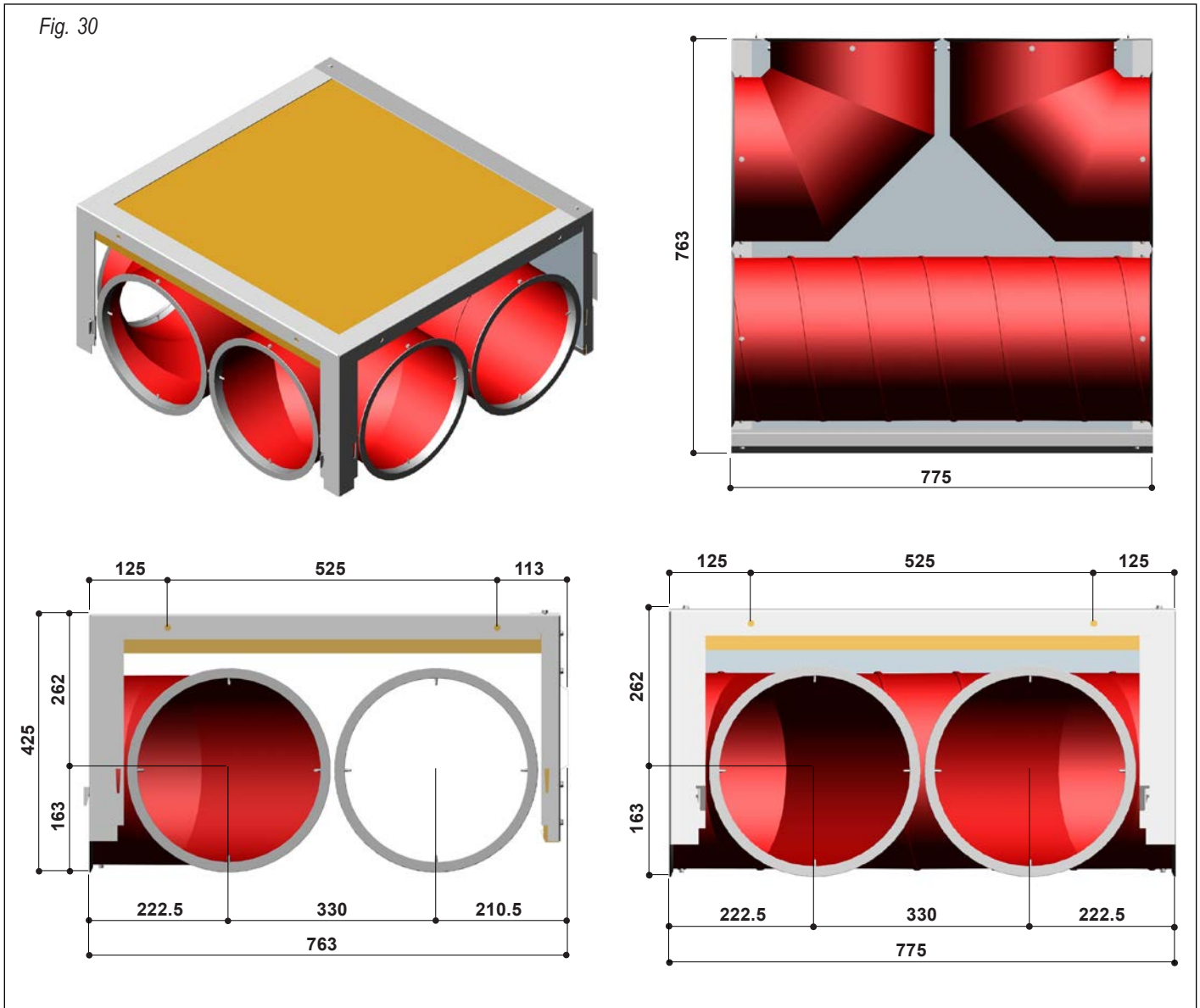
RADIANT MODULE MALE TERMINAL FOR DOUBLE TUBE Ø 300 mm



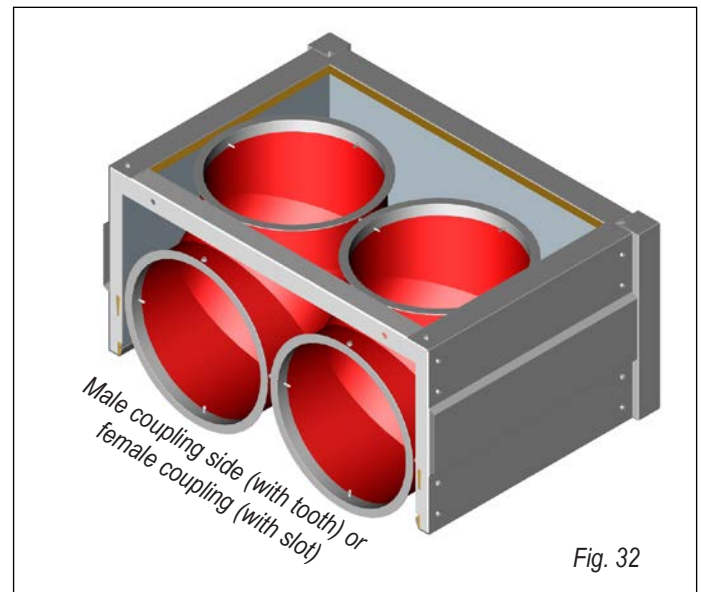
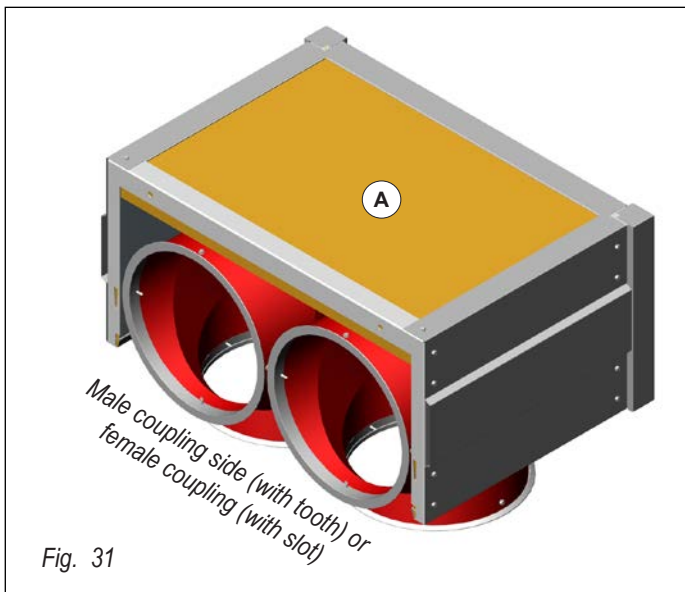
RADIANT MODULE FEMALE TERMINAL FOR DOUBLE TUBE Ø 300 mm



UNION TEE RADIANT MODULE FOR DOUBLE TUBE Ø 300 mm

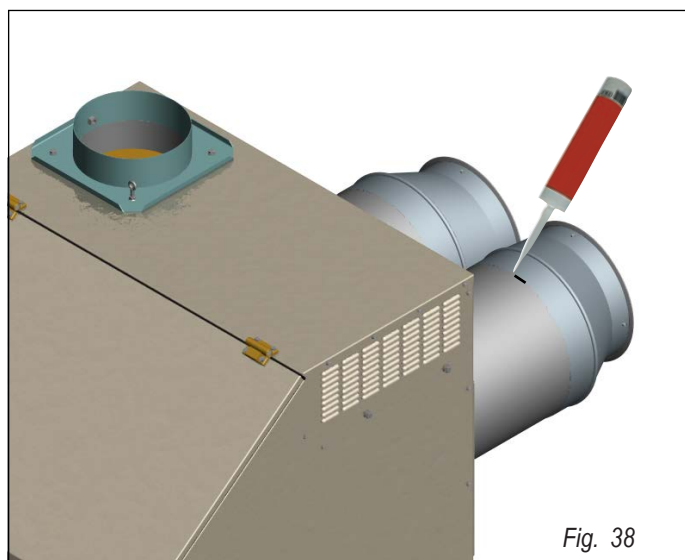
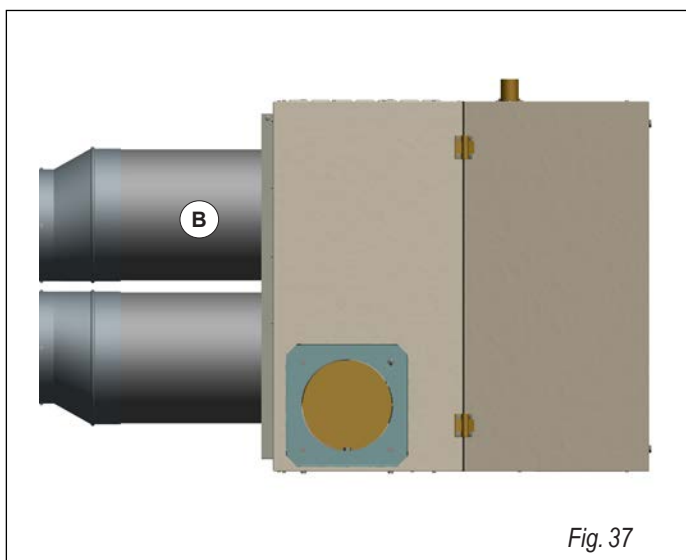
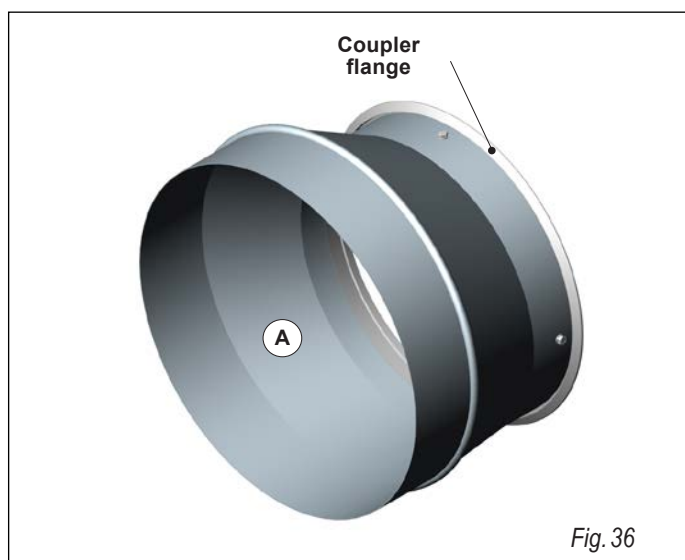
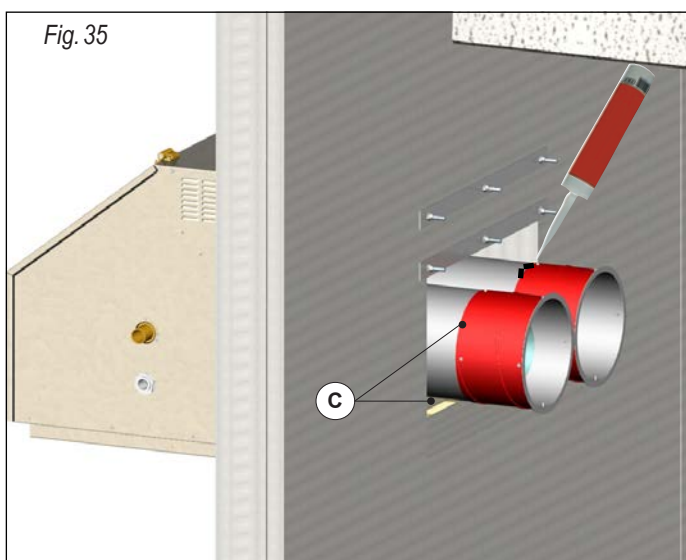
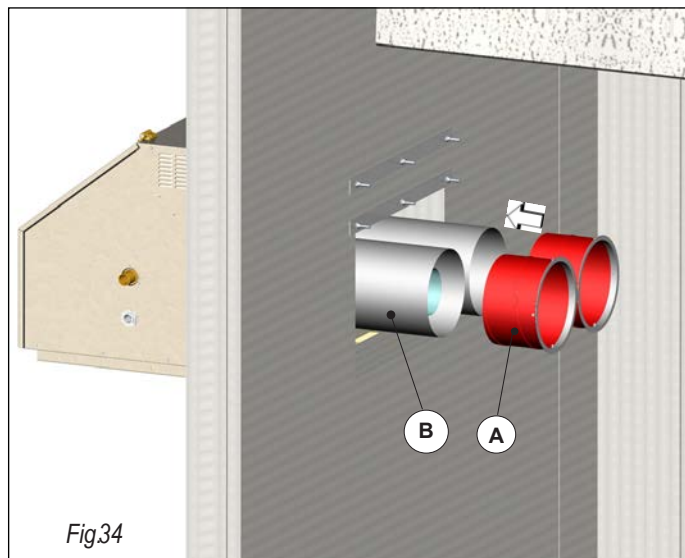
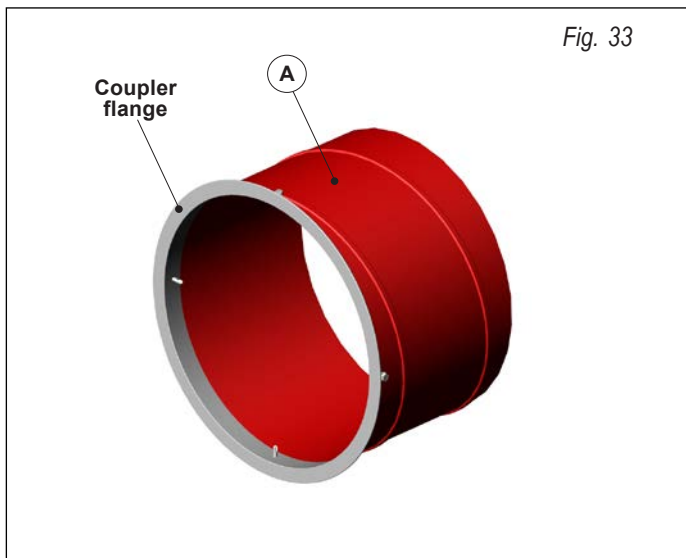


HEIGHT CHANGE RADIANT MODULE FOR DOUBLE TUBE Ø 300 mm



The height change module in fig. 31 and fig. 32 uses the same frame with the same dimensions as the closing module. It is produced in the male version (with tooth) and the female version (with slot). In the case of use as in fig. 30, remove the upper insulation panel (A) fig. 32. This must be done at the work site.

INSTALLATION OF THE GENERATOR CONNECTION\FLANGED BELT



For generators model **GSR50.1 - GSR100.2 - GSR100.1 - GSR100.1E - GSR150 - GSR200.1**

Before installing the radiant belt, insert the couplerflange (A) in fig. 33 in the generator tubes (B), fig. 34, making sure that the coupler flange is facing towards the inside of the building. Fasten with the 4 self-drilling screws (C) for each coupling and seal with silicone and connections (fig. 35).

For generators models **GSR200.2 - GSR300.1**

Before installing the radiant belt, insert the coupler flange (A) in fig. 37 in the generator tubes (B) as in fig. 38, making sure that the coupler flange is facing towards the inside of the building. Fasten with the 4 self-drilling screws (C) for each coupling and seal with silicone and connections (fig. 38).

WALL INSTALLATION OF THE GENERATOR

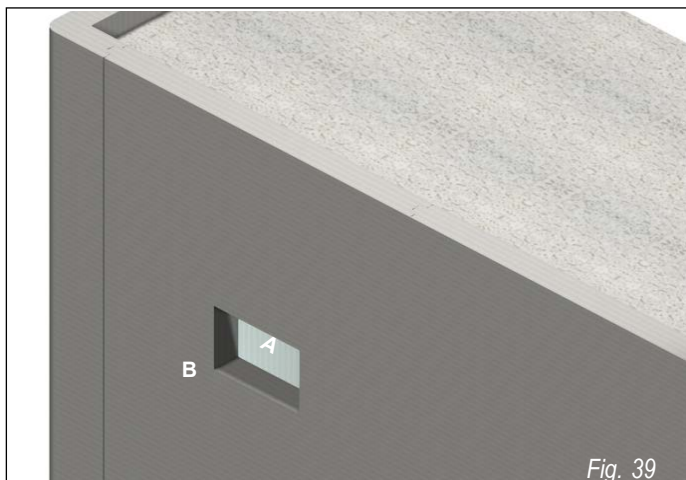


Fig. 39

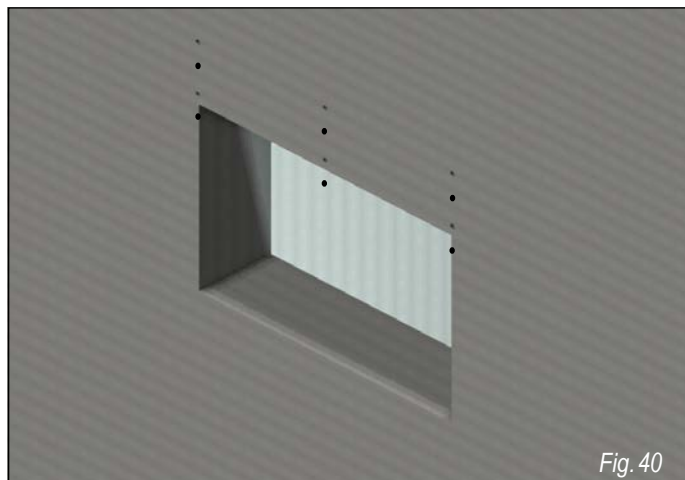


Fig. 40

Create a rectangular hole on the wall of the building as shown in fig. 39. For the models **GSR200.2 - GSR300.1**: A= 800 mm - B= 450 mm; for **GSR100.1, GSR100.1E, GSR150** and **GSR200.1**: A= 700 mm - B= 400 mm, for **GSR50.1 - GSR100.2**: A=550 mm - B= 300 mm. Create a minimum of **n°06** holes with \varnothing 12 mm on the wall of the building as shown in fig. 40. See tab. 9 on page 14 for the distance between hole centers. The holes are used as a fastening seat for the **M12** threaded bars.

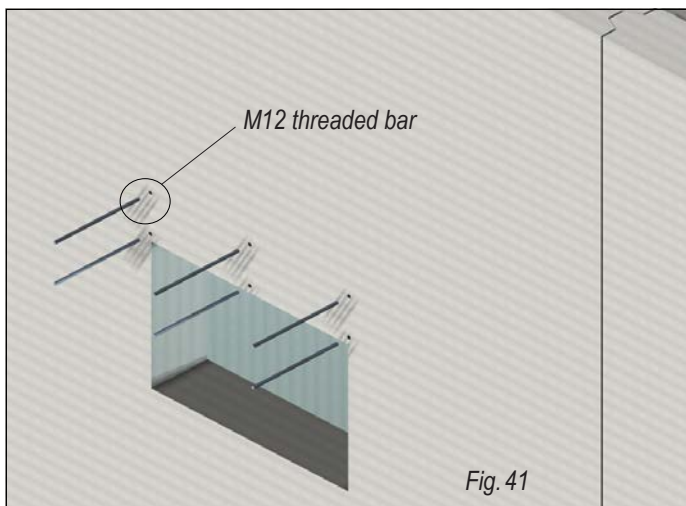


Fig. 41

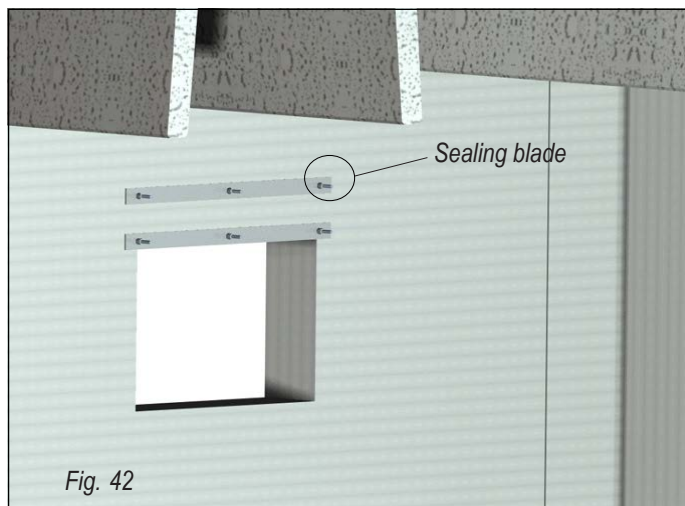


Fig. 42

Insert the M12 threaded bars in the previously created holes as shown in fig. 41. Insert a blade, a disk or a profile in the internal wall of the building in order to guarantee a greater sealing surface for the threaded bars as shown in fig. 42.



Fig. 43

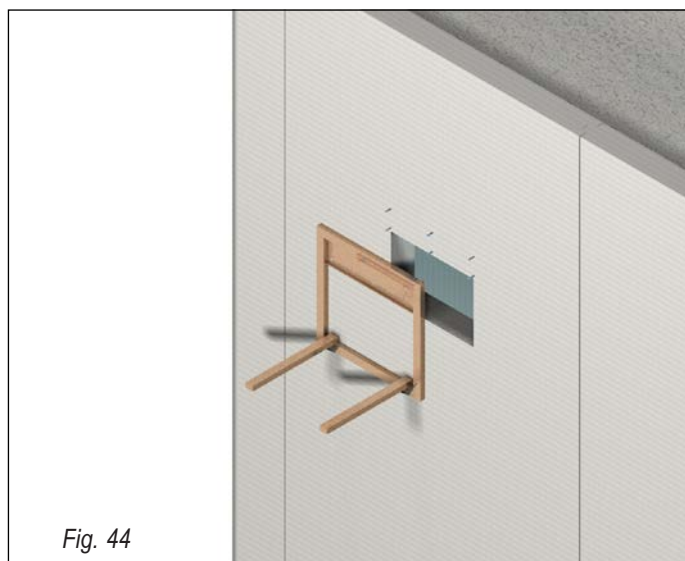
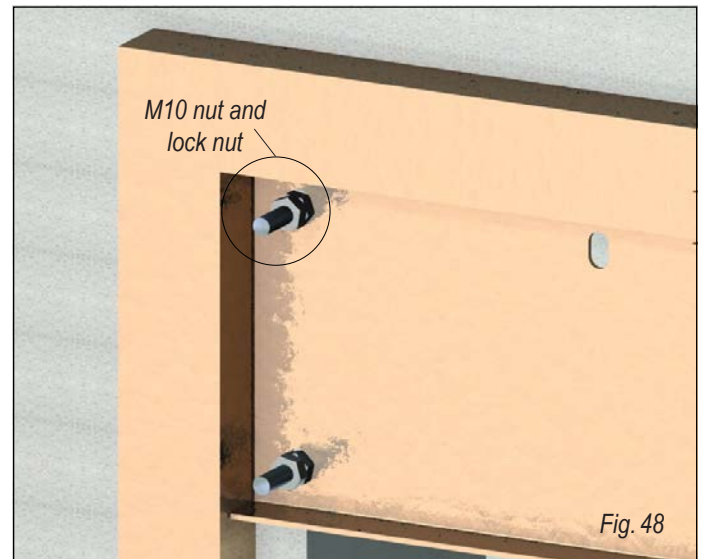
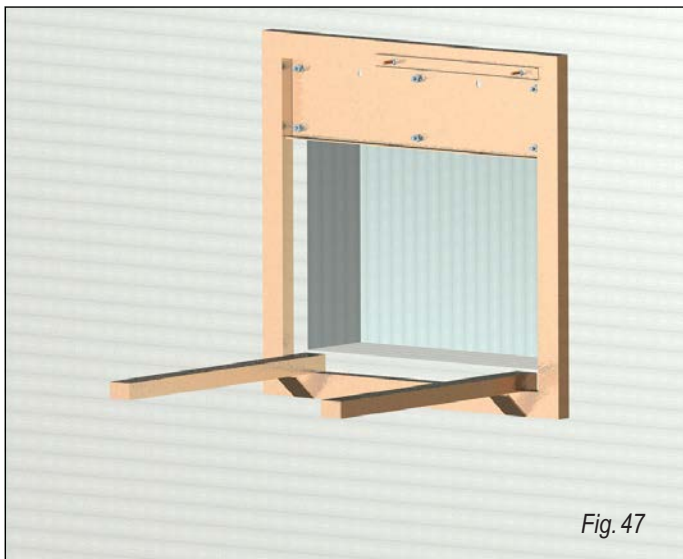
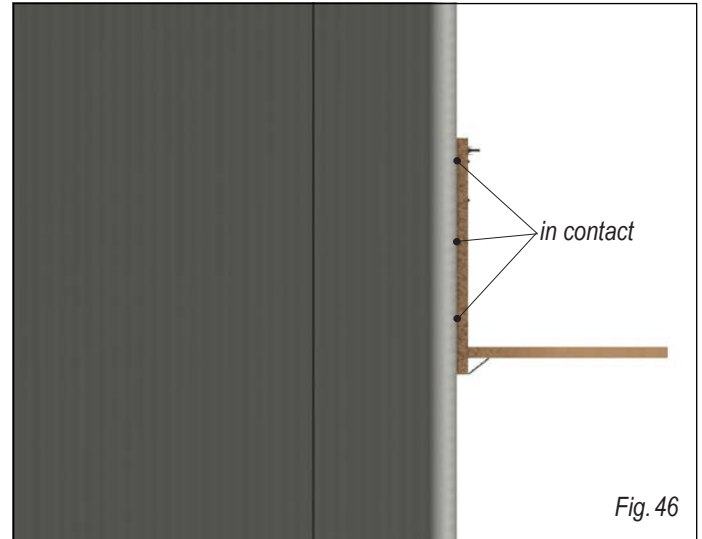


Fig. 44

Fasten the blades with the threaded bars by means of M12 nut and lock nut as shown in fig. 43. Insert the threaded bars previously fastened to the wall in the plate holes as in fig. 44.

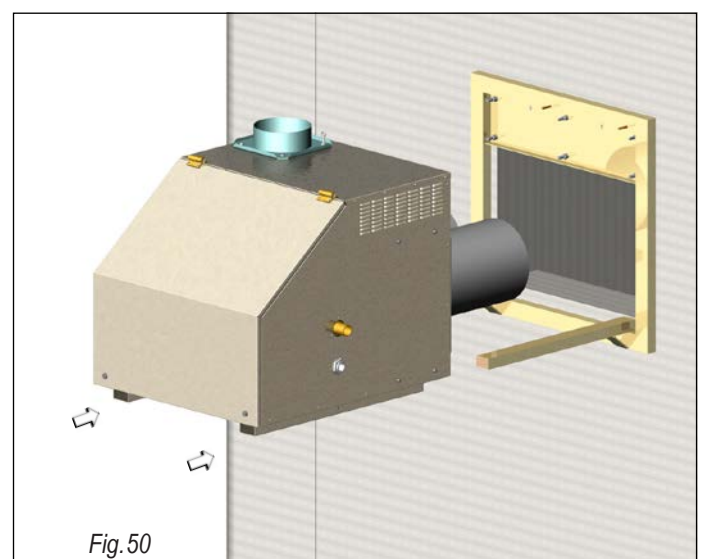
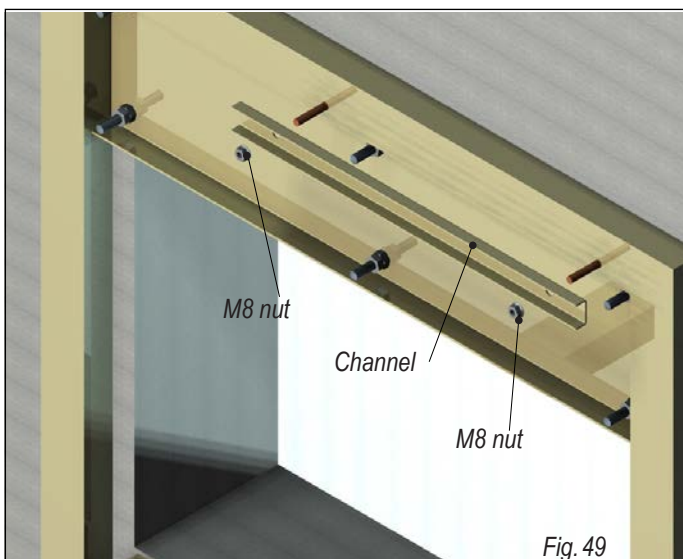


Attention! Always use the nut and lock nut to fasten the blades!

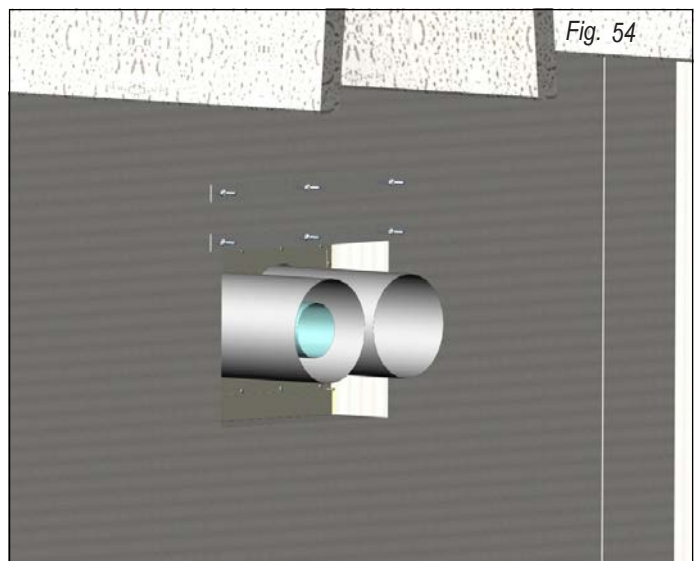
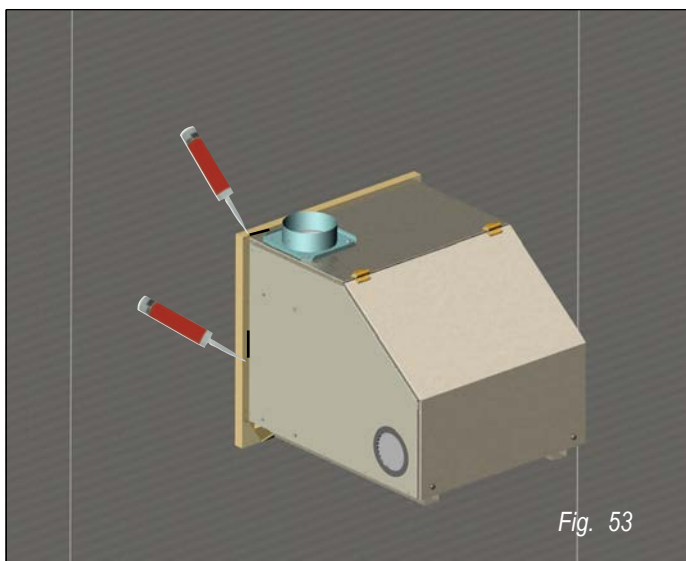
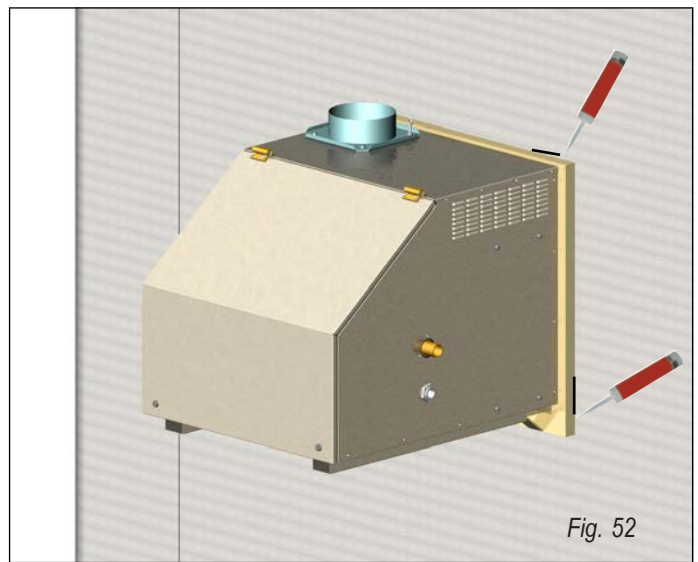
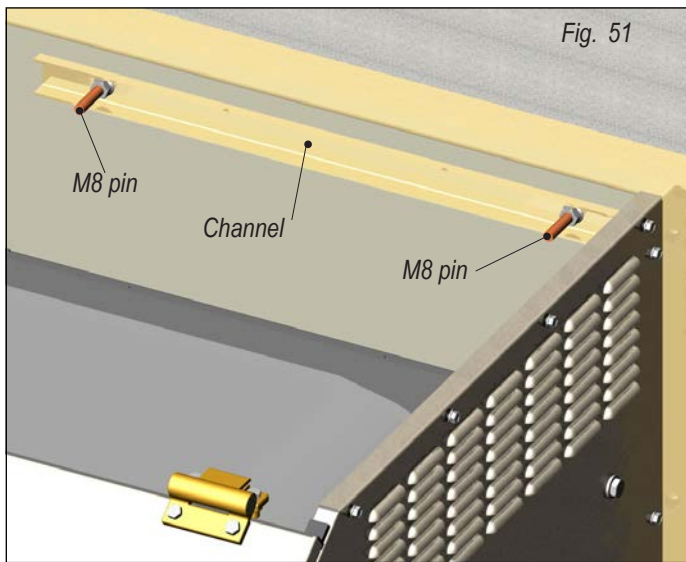


Place the plate on the building wall in such a way that there is no light between the plate and the wall as in fig. 45 and fig. 46. Fasten the plate to the wall by means of the nut and lock nut as in figs. 47 and 48.

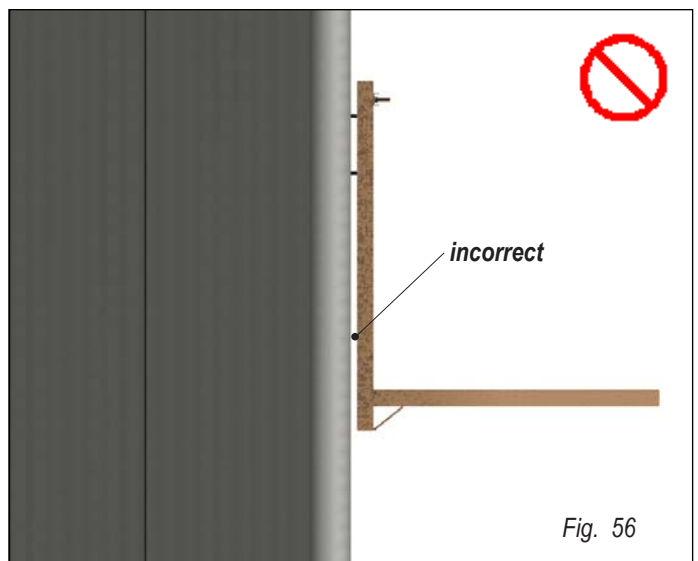
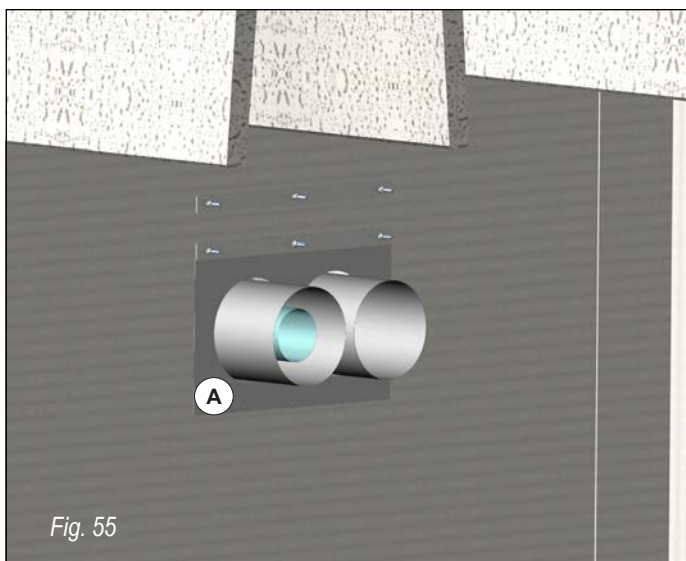
! Always fasten the plate to the wall with the nut and lock nut.



Remove the channel in the plate by unscrewing the two M8 nuts as in fig. 49. Insert the generator in the plate (fig. 50) in such a way that the two M8 pins go into the holes of the generator cowling, fasten the channel with the two M8 nuts inside the generator, fig 51.

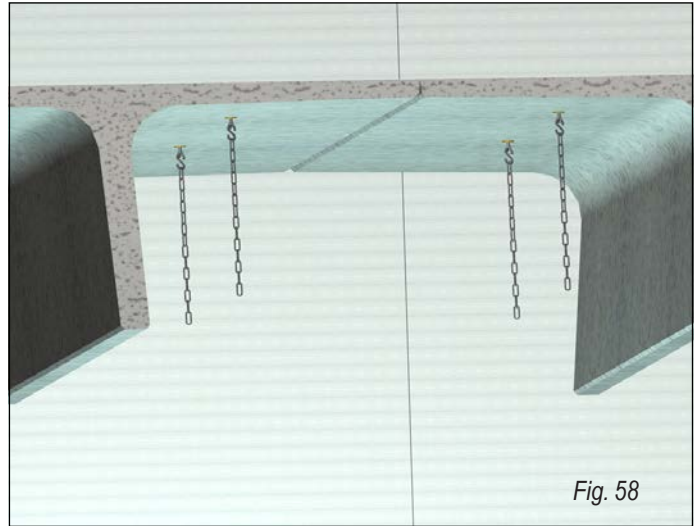
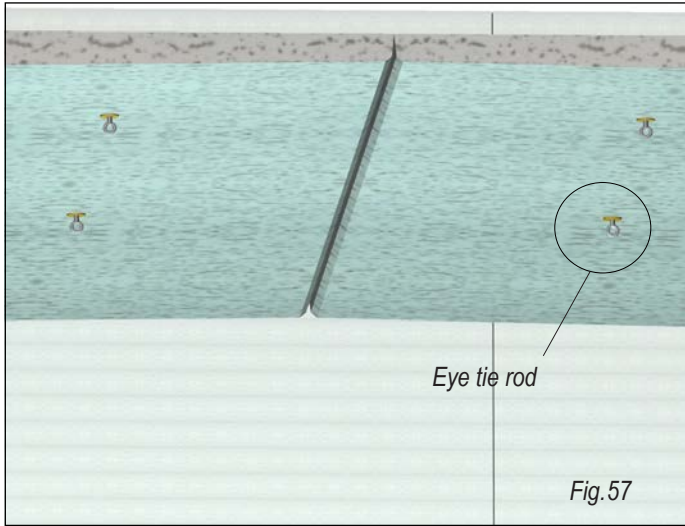


Silicone the upper side and the two lateral ones of the plate with the building wall as in fig. 52. Silicone the same sides of the plate with the generator (fig.53). The inside view of the generator placed on the wall is shown in fig. 54. Use the hole cover plate (A) to internally cover the rectangular hole previously made in the building wall as in fig. 54.

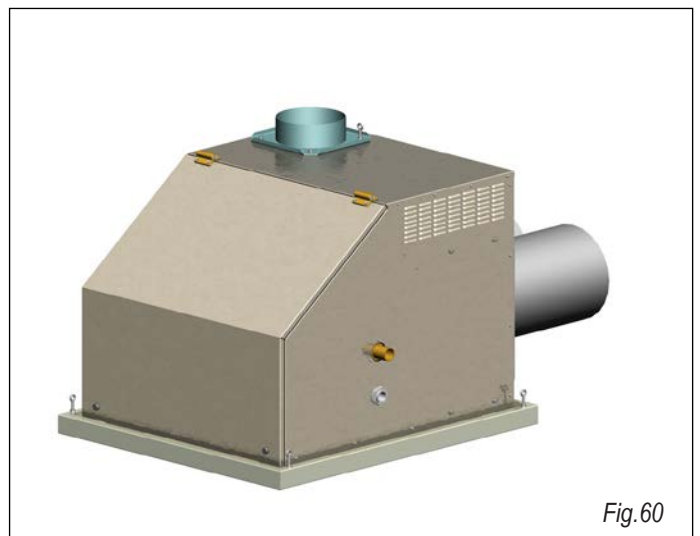
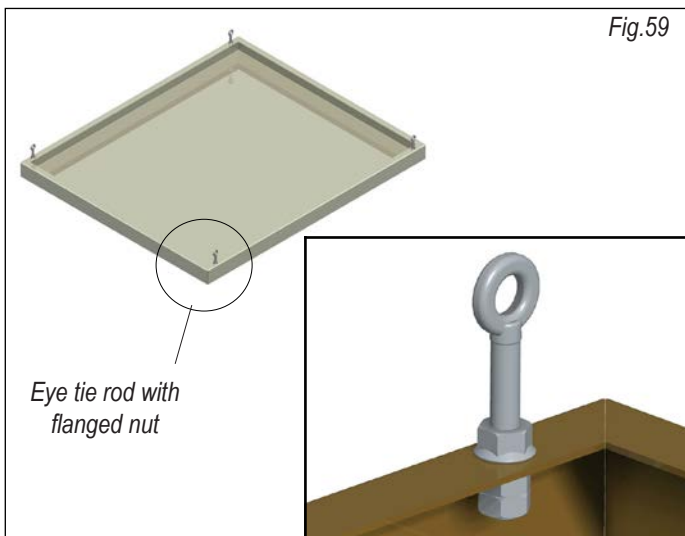


An error in the installation of the bracket to the building wall is shown in fig. 56. There must be **NO** light between the external wall and the bracket, the two surfaces must be in **CONTACT**.

CEILING INSTALLATION OF THE GENERATOR



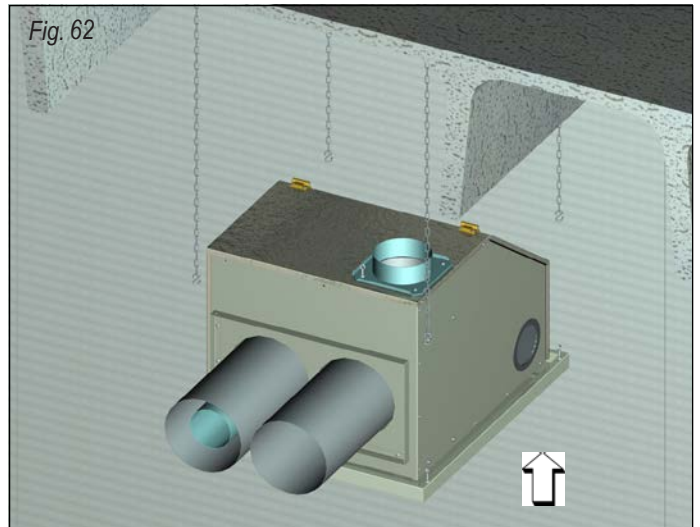
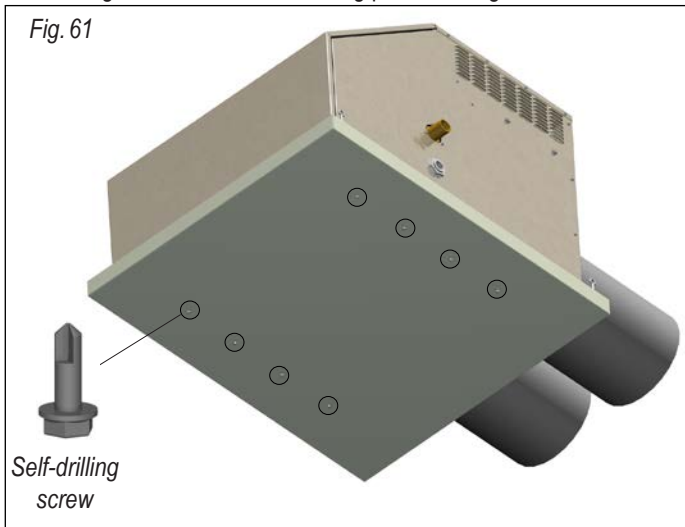
Prrange points of anchorage on the ceiling with eye dowels or with analogous brackets depending on the type of covering as in fig. 57. Fasten the S hooks with the chains in the previously prranged points of anchorage on the ceiling as in fig. 58.



Hook and fasten the eye tie rods in the holes of the ceiling plate with the flanged nut provided as in fig. 59.

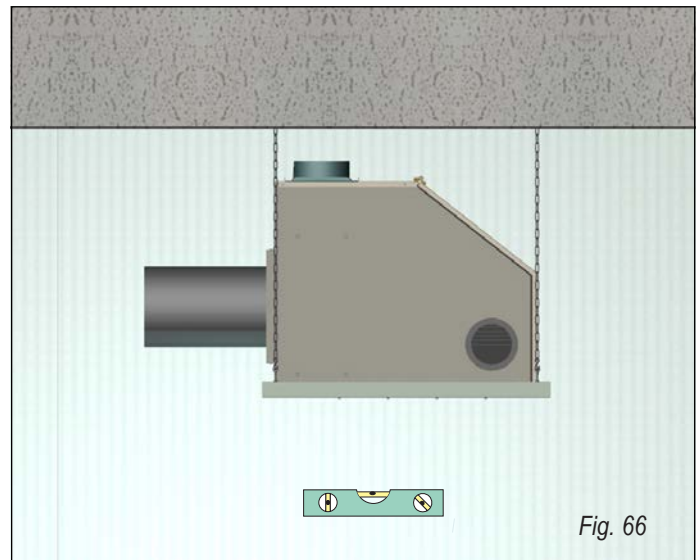
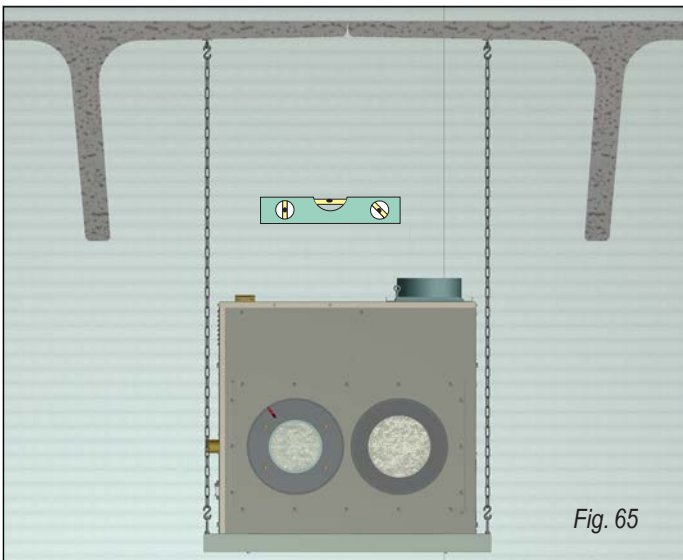
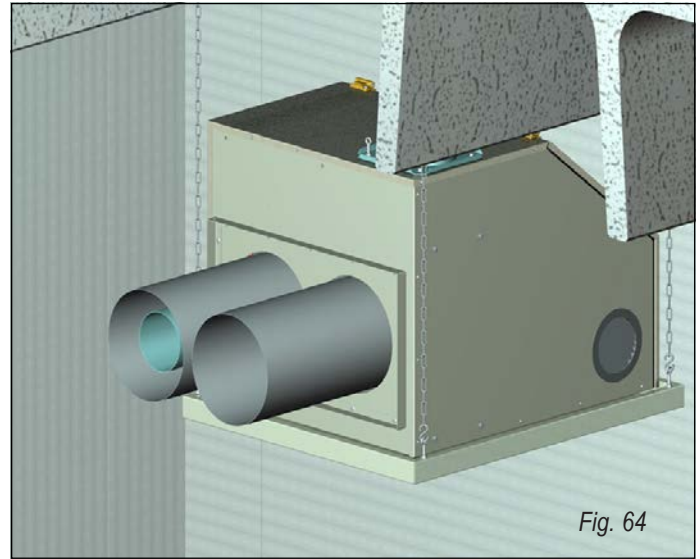
⚠ Fasten the eye tie rods with the nut and lock nut!

Place the generator above the ceiling plate as in fig. 60.



Fasten the base of the plate with the generator by means of the self-drilling screws as in fig. 61. Bring the generator fastened to the plate into position to be coupled with the chains by means of the S hooks (fig. 62).

⚠ Always use a friction screwdriver to fasten the self-drilling screws.

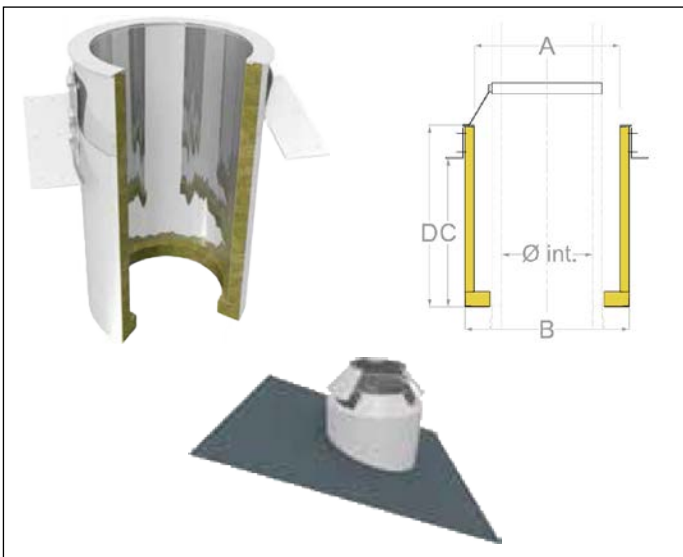


Hook the plate on the chains with the S hooks as in figs. 63 and 64. Make sure that the generator is levelled both longitudinally and transversally by adjusting the eye tie rods, see figs. 65 and 66. **At the end of the installation tighten all the S hooks.**

KIT EXHAUST DUCTS CONNECTION

Designed, tested and certified accessory for roof fire prevention.

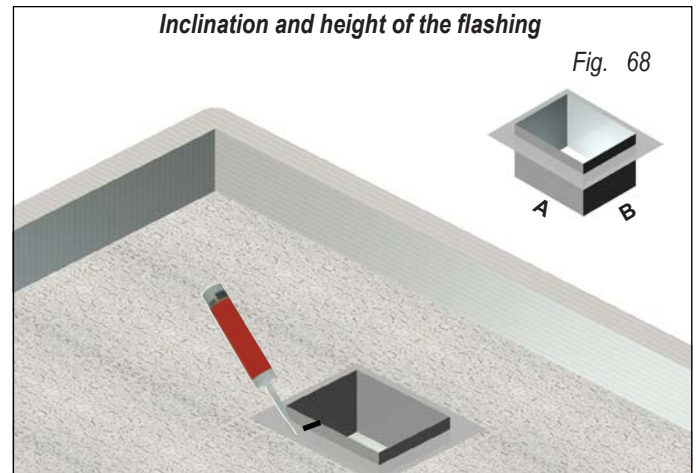
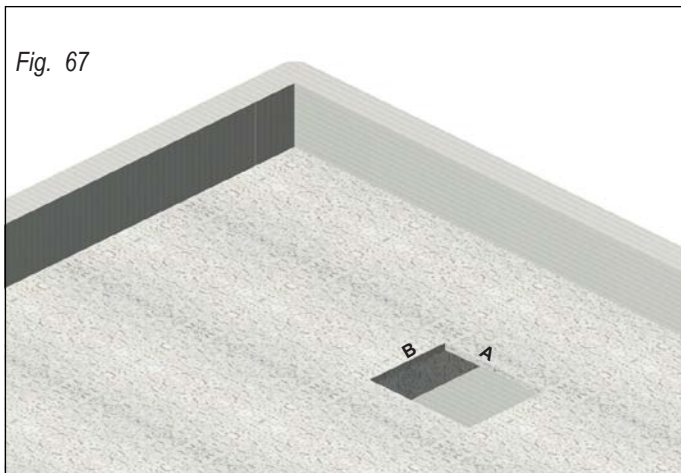
In accordance to UNI / TS standards 11278 - UNI 10683 and UNI EN 1856-1 temperature of any combustible material near or in contact with the chimney have not exceed certain parameters. The whole system has been designed in accordance to those standards, which allow the exhaust ducts to cross walls, roofs and floors - even with flammable material (wood, beads, etc.) in direct contact with the smoke flue.



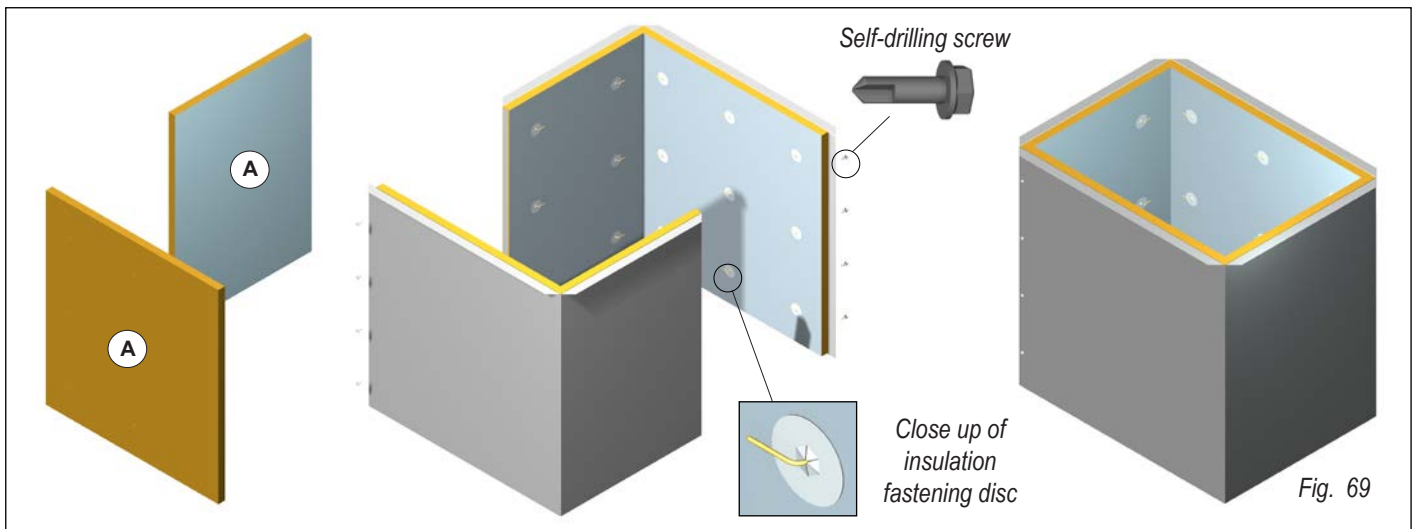
internal Ø	100	150	200	250
A	250	300	350	400
B	300	350	400	450
C	400	400	400	400
D	500	500	500	500

The faldale is needed to connect the roof (inclined one too) to the exhaust ducts: it is completely waterproofness. Its special shape allows it to be used on roofs with slopes from 5 ° to 30 °. Its base consists of a 1 mm lead plate, which grants an easy adaptation to any type of cover.

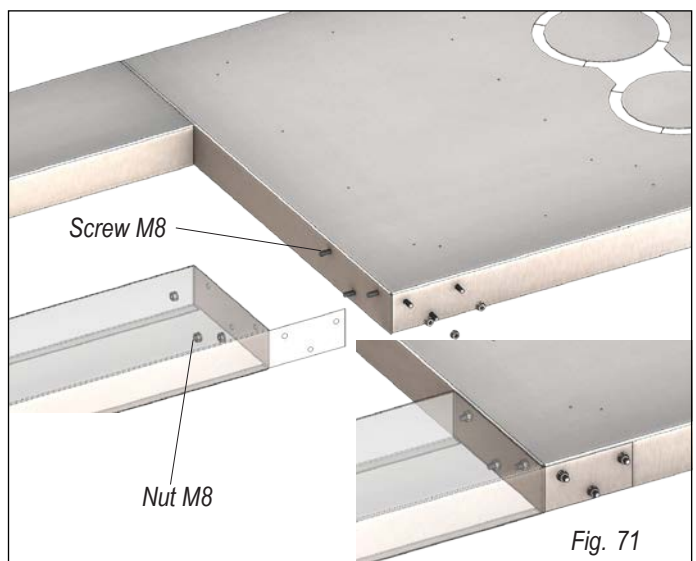
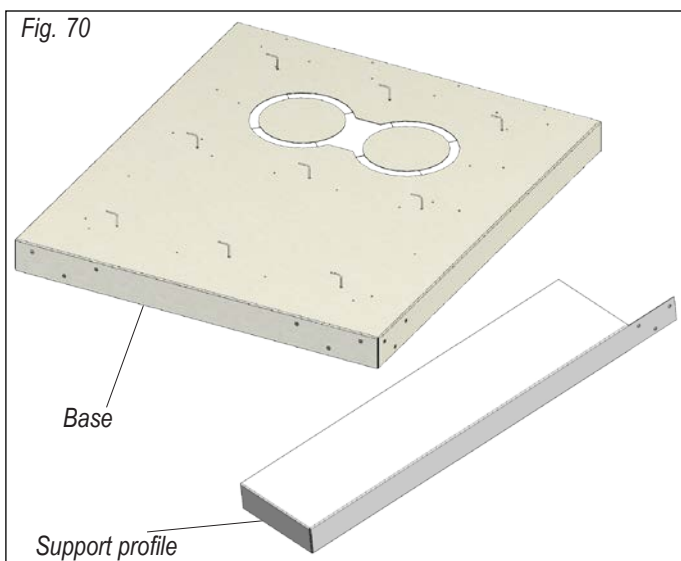
ROOF INSTALLATION OF THE GENERATOR



Create a rectangular hole on the cover of the building as in fig. 67. The hole, for belts with tube \varnothing 300 mm, must have the dimensions: **A** = 760 mm; **B** = 570 mm. Fasten and seal all the edge of the flashing (fig. 68). Flashing dimensions for tube \varnothing 200 mm: **A** = 590 mm; **B** = 470 mm. The dimensions and the inclination of the flashing plate are drawn.



Internally insulate the radiant tube guard. Cut the insulation provided in panels **(A)** to size; fasten the insulation pieces with the reflecting side visible on nails welded into the protection sheets by means of the fastening discs (see close up). Assemble the internal protection of the radiant tubes with the self-drilling screws as in fig. 69. Use the disks located on the base (fig. 69) to cut the insulation as required, then remove disks (fig. 69).



Assembling the base of the roof plate with the two Girad's support profiles (fig. 70). Use the supplied M8 screws and nuts to fix the support profiles to the base as shown in figure 71. Fasten the base, from the lower side, of the roof plate with the previously insulated and assembled protection by means of the self-drilling screw (fig. 72). If necessary, check the bracket and the REI panel according to the shape of the roof (fig. 80). For assembling by means of self-drilling screws, the metal sheet is provided with guide holes to avoid coupling mistakes.

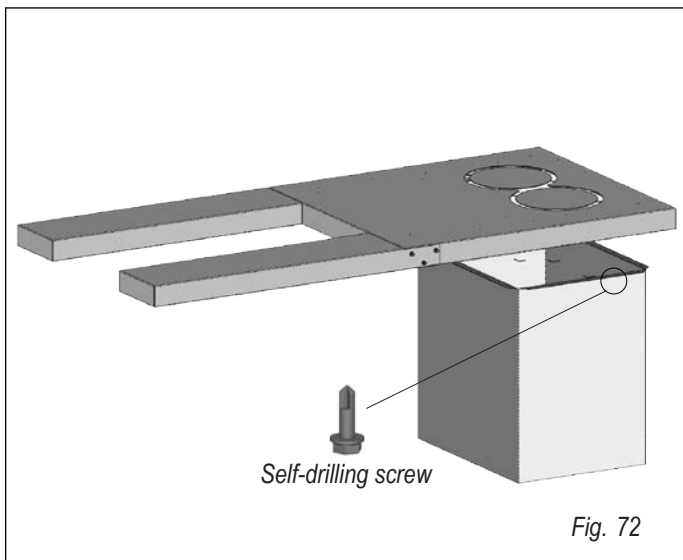


Fig. 72

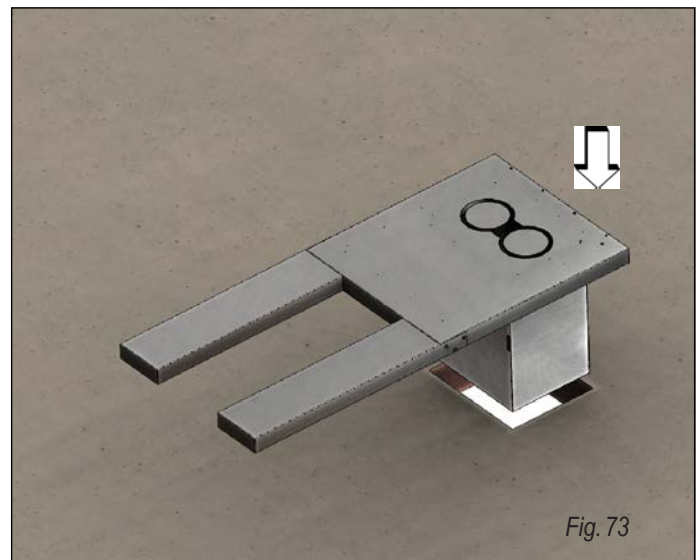


Fig. 73

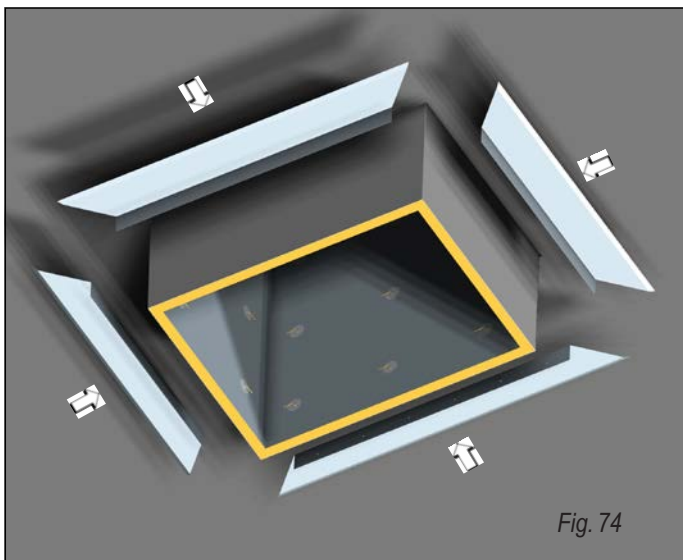


Fig. 74

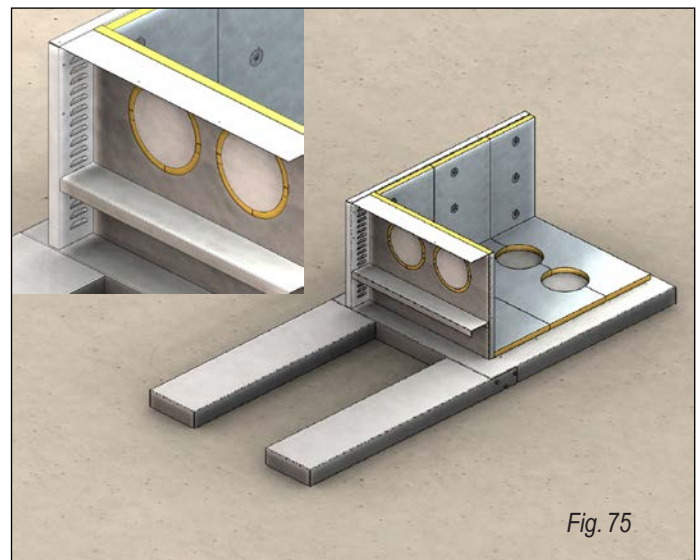


Fig. 75

Insert the ceiling frame closure as in fig. 74, fixing it with self-drilling screws; only for this coupling, there are no guide holes
 Assembly on the base one of the two side metal sheets and the front guard metal sheet, fixing them with self-drilling screws, where the guide holes are present. Concerning side metal sheet, the aeration grid must be towards the front (fig. 75), with holes downwards. Cut insulation as required (for front metal sheet use the disks provided, then remove them), fix it, **with aluminate side visible**, with the small disks provided, into the metal sheet's nails. Place the generator over the support profiles (fig. 75) and push it until it rests perfectly against the crosspiece on the front of plate (fig. 76). Insert the flanged joints (fig. 75), not fixing them for now. For generators models GSR200.2 - GSR300.1, instead of flanged joints, reduced flanged joints are used (fig. 36).

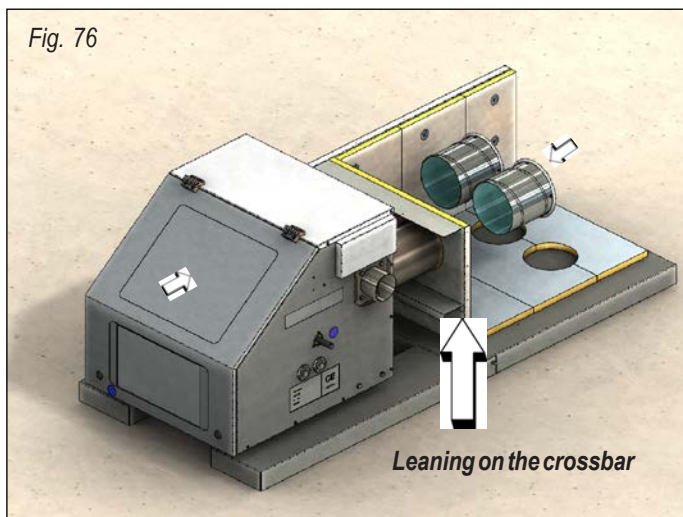


Fig. 76

Leaning on the crossbar

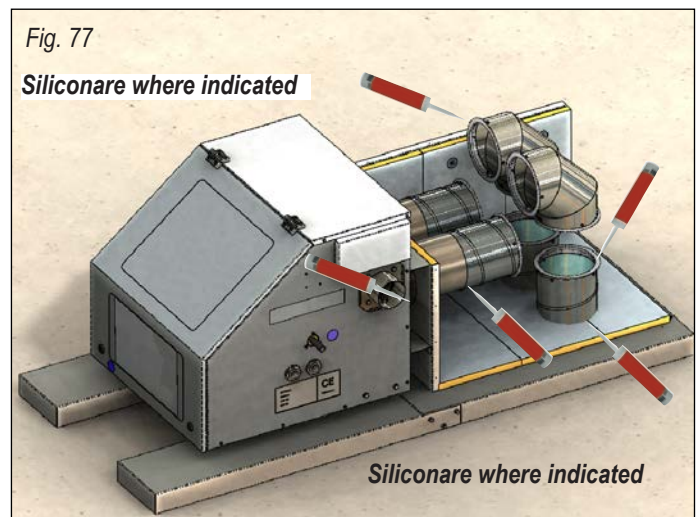


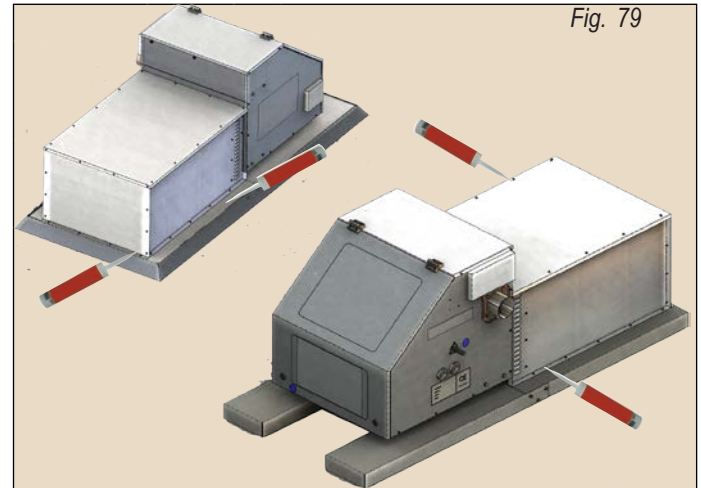
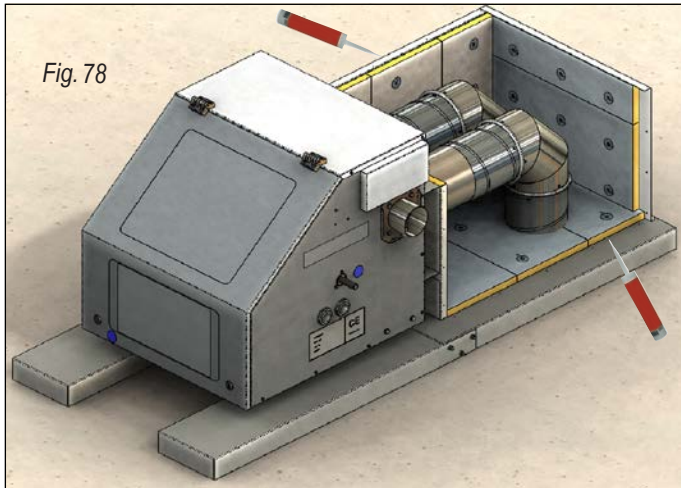
Fig. 77

Siliconare where indicated

Siliconare where indicated

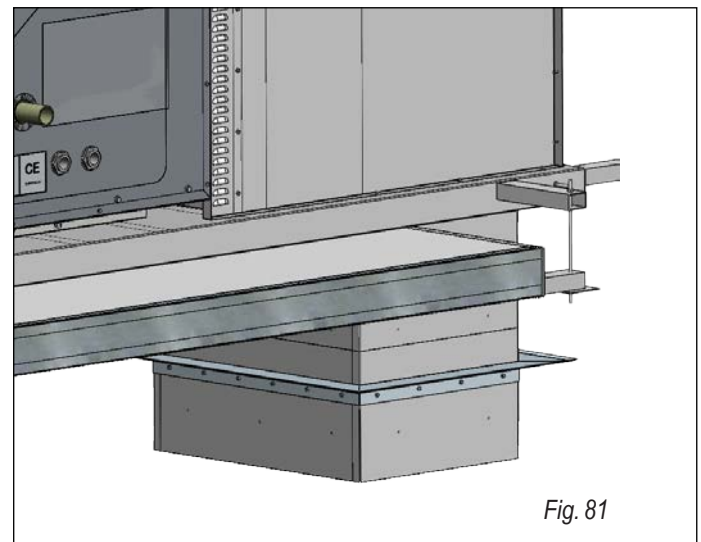
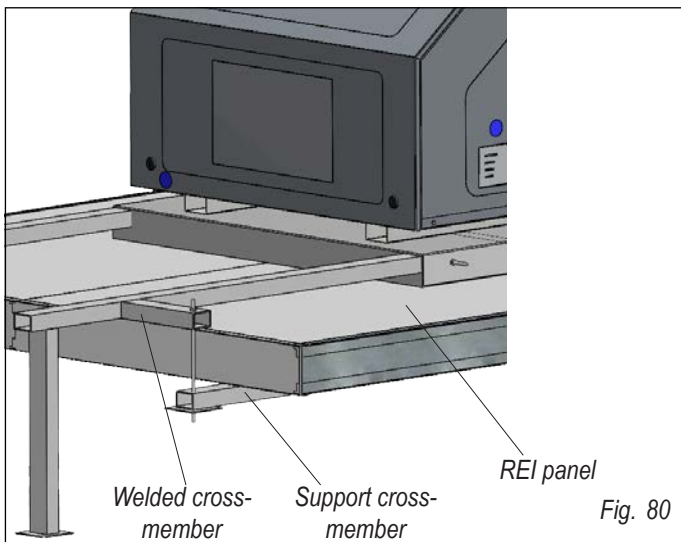
THE HOLES MUST BE TOTALLY CLOSED (FIG. 77).

After cutting as required the exchanger pipe, insert connection flanges and seal them, insert exchanger pipes and flanged elbows and fix them with the closing rings provided. All joints have to be sealed with silicone (fig. 77). Apply silicone also between flanged couplings and the generator and block them with self-drilling screws (fig. 78).

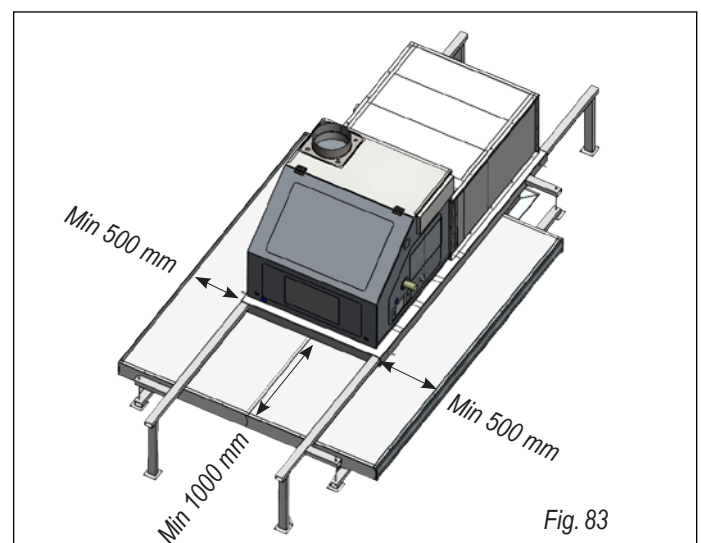
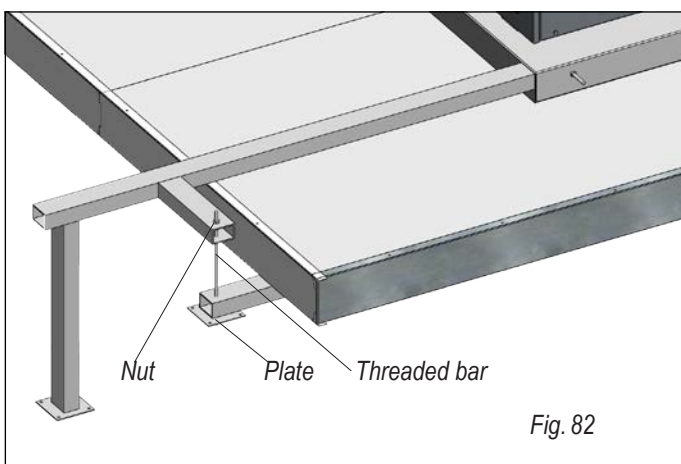


Assemble the remaining parts of the ceiling shelf with the base, fixing them with self-drilling screws as shown in fig. 79, always inserting the insulation, as well, **with the aluminized side in view**. Cut the rain protection profiles to size and fix them with self-drilling screws, sealing with silicone, as shown in fig. 79. **Silicone all the joints between the cover plates and all the fixing screws.**

ASSEMBLY AND POSITIONING OF THE GENERATOR WITH REI PANEL ON ROOF



Secure the roof corbel as shown above. Weld a cross-member on the support structure of the generator on all four sides (fig 80 - 81).



Use the supplied cross-member, cut it according to requirements, drill a hole at each end and insert the threaded bar, anchored to the plate, with a nut (fig. 82). Place the REI panel over the support member and tighten the threaded bar, until the REI panel does not rest on the ceiling corbel. Repeat the operation for all four sides (fig. 83). Finally, place the REI panel according to the instructions on page 12.

INSTALLATION OF THE GENERATOR ON A SAWTOOTH ROOF

Qualified personnel (designer, civil engineer, etc. etc.) has to check that the roof or the structure where the generator is positioned is compliant and correctly sized to support the weight of the generator complete with bracket and REI fire-resistant roof panel.



FRACCARO SRL declines all liability if the values concerning the bearing capacity of the roof or of the support structure are not communicated and/or verified.

In fig. 84 some examples of structures for the installation of the generator on sawtooth roof.



It is possible, depending on the window frame structure, the maximum 45 ° inclination of the generator.

Fig. 84

For the horizontal installation of the generator it is necessary to provide a covering of the pipes and a perfect sealing between the window frame and the sheet metal profiles. It is also possible to realize, if the window frame allows it, the structure for the crossing of pipes, with the same dimensions as the REI fire-resistant roof panel.

In the case of horizontal installation of the generator, waterproof structures, insulated on the inside and perfectly sealed on the outside, must be provided. **Always safeguard the frame structure and if there are plastic covers, remove them to avoid the risk of melting the plastic itself.**

Fig. 85 shows an example of how the linear section of the pipes crossing the window could be realized.



Fig. 85

Pay close attention to the sealing. DANGER OF WATER INFILTRATION



INSTALLATION OF THE EXHAUST GAS DUCT FOR GSR50.1 - GSR100.1 - GSR100.1E - GSR150 ON THE WALL

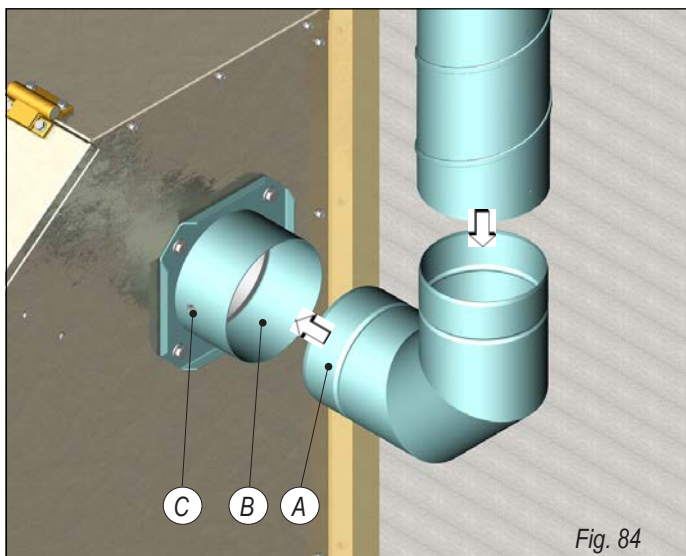


Fig. 84

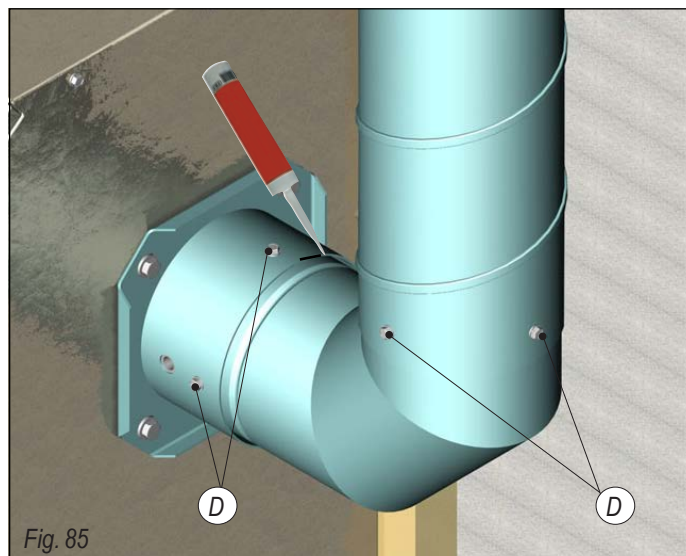


Fig. 85

Insert the elbow (A) on the exhaust gas duct connection of the generator (B) until the combustion test tap nut (C), see fig. 84. Seal the elbow on the exhaust gas duct connection of the generator and all the other connections with silicone. Fasten all the connections with 4 self-drilling screws (D), see fig. 85.

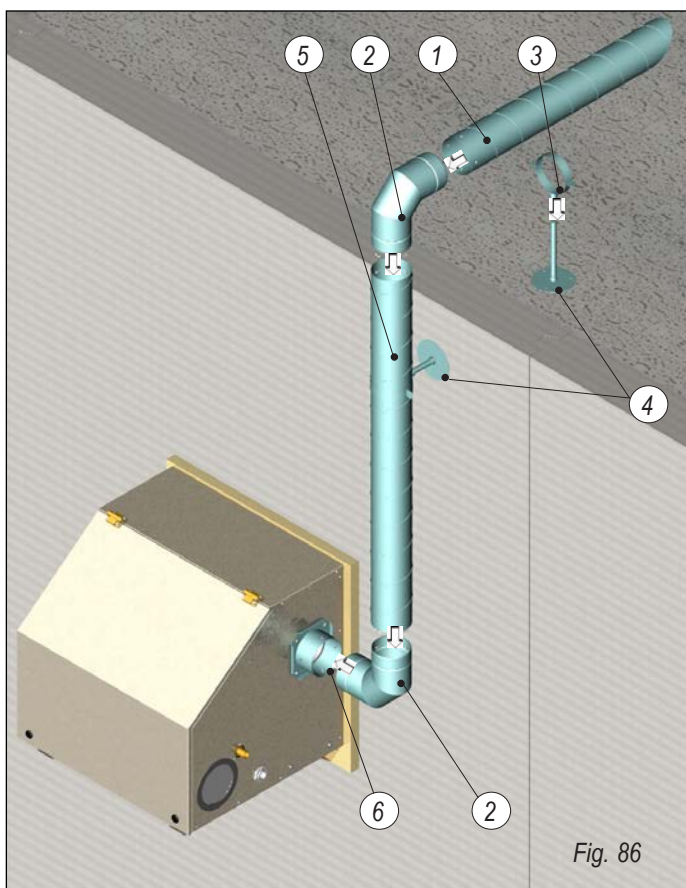


Fig. 86

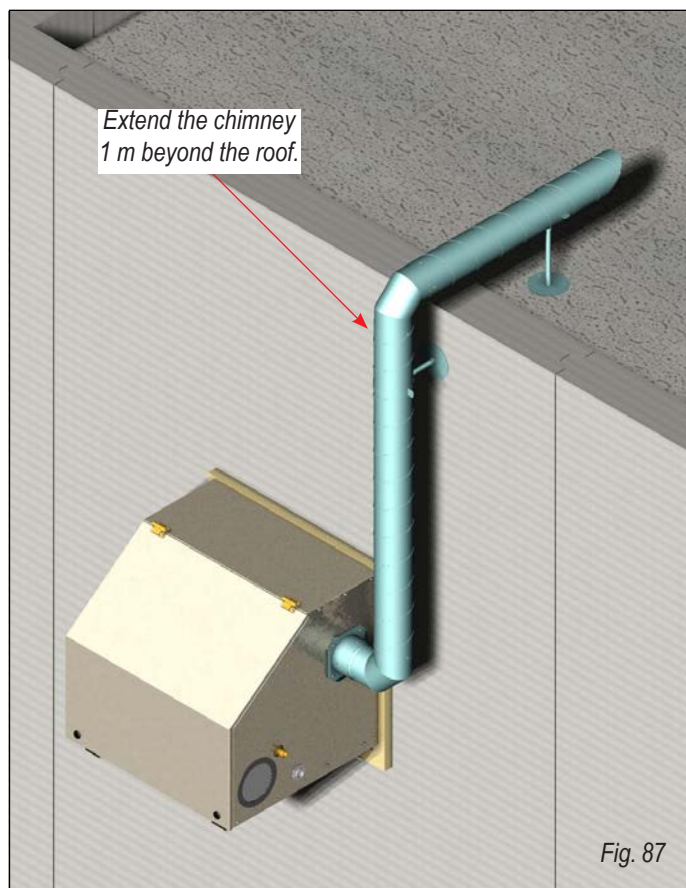


Fig. 87

The making of the exhaust gas duct for wall-installed generators model GSR50, GSR100.1, GSR100.1E and GSR150 is shown in figs. 86 and 87. The piece of **chimney tube (5)** must be **cut during the installation**. A drawing of the assembly of the various components described in the following is shown in fig. 86:

- | | |
|---------------------|--|
| 1 Exhaust terminal; | 4 Collar bearing foot; |
| 2 Elbow; | 5 Chimney tube; |
| 3 support collar; | 6 Generator exhaust gas duct connection. |



N.B.: in case of chimneys longer than 6m it is necessary to use a T-shaped condensate collector.

..... WITH WATER TRAP DEVICE

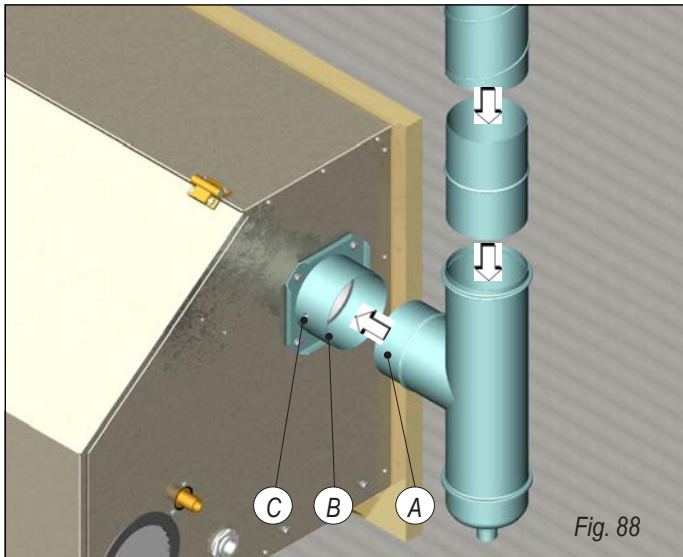


Fig. 88

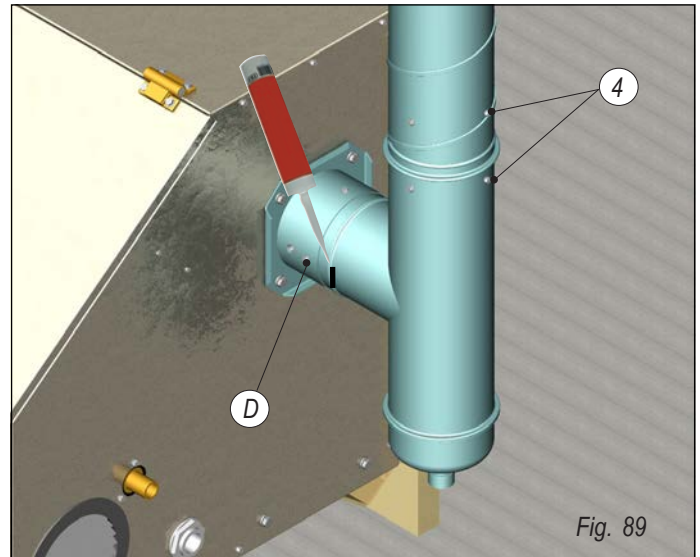


Fig. 89

Insert the water trap pipe fitting (A) on the generator exhaust gas duct connection (B) until the combustion test tap nut (C), see fig. 88. Seal the water trap pipe fitting on the generator exhaust gas duct connection with red silicone, seal all the other connections with gray silicone. Fasten all the connections with 4 self-drilling screws (D), see fig. 89.

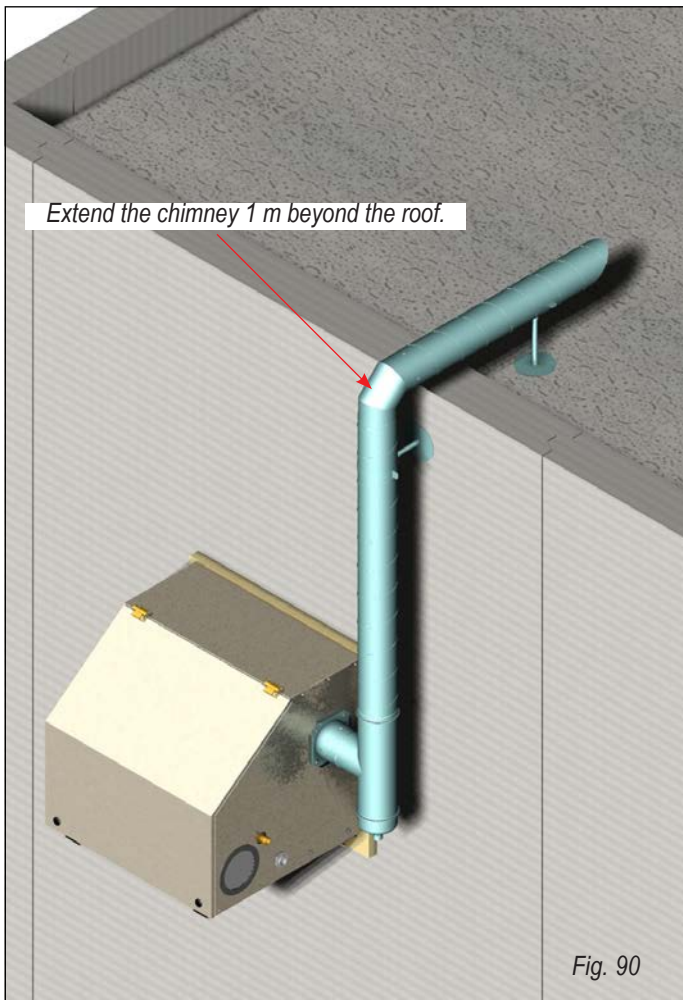


Fig. 90

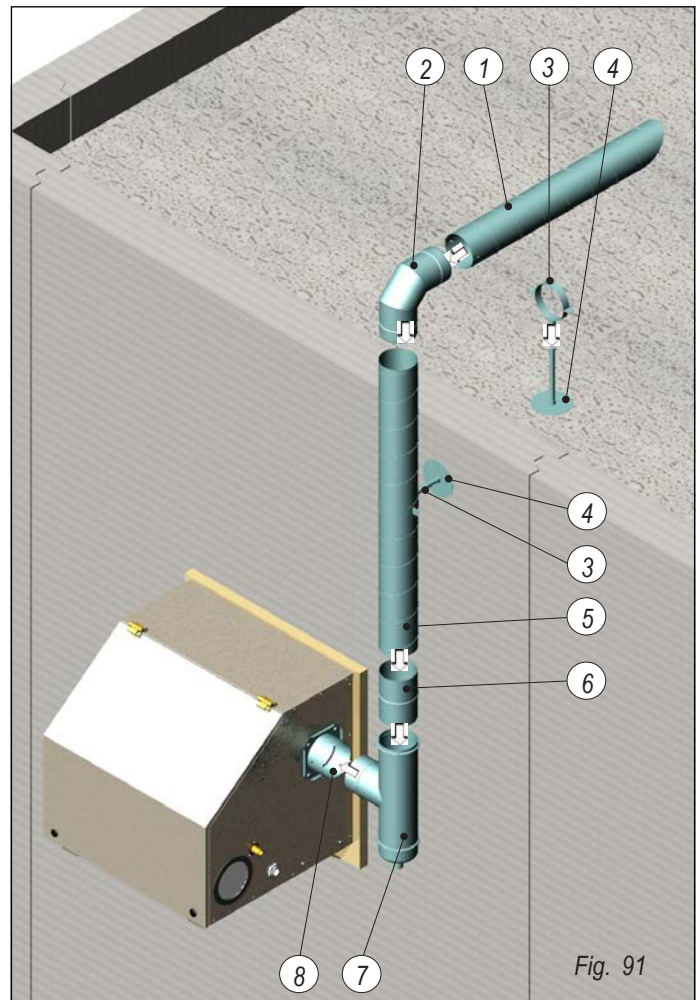
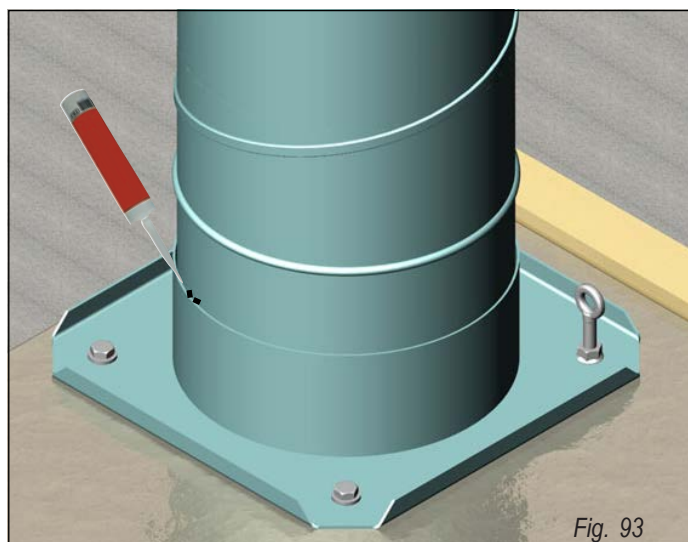
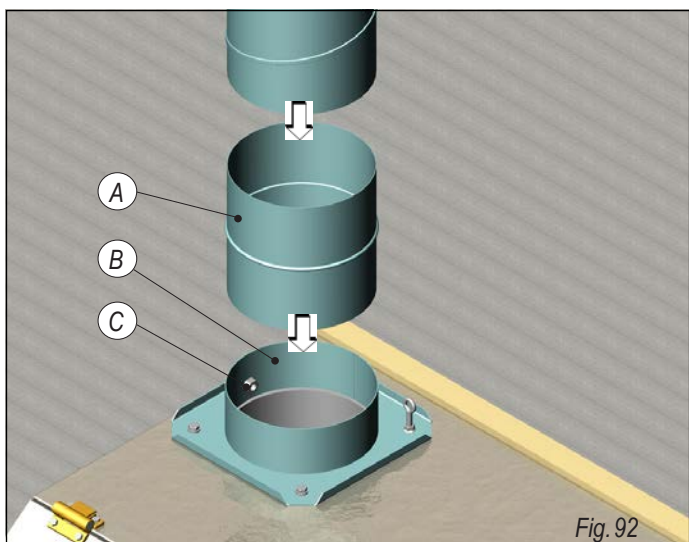


Fig. 91

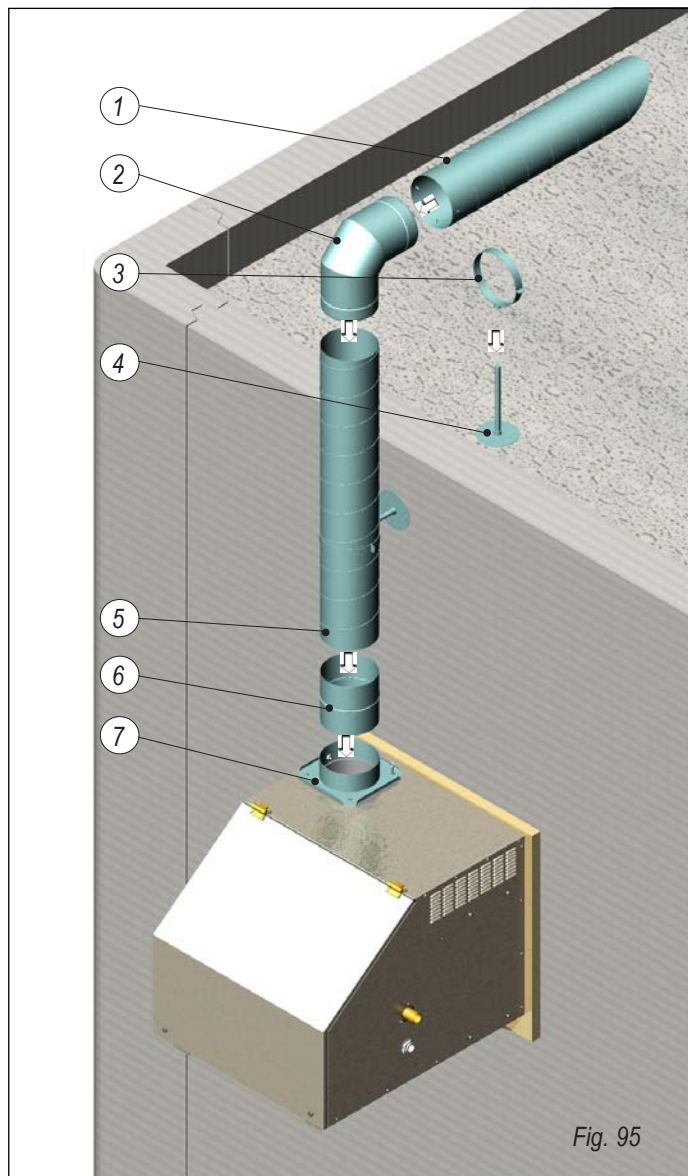
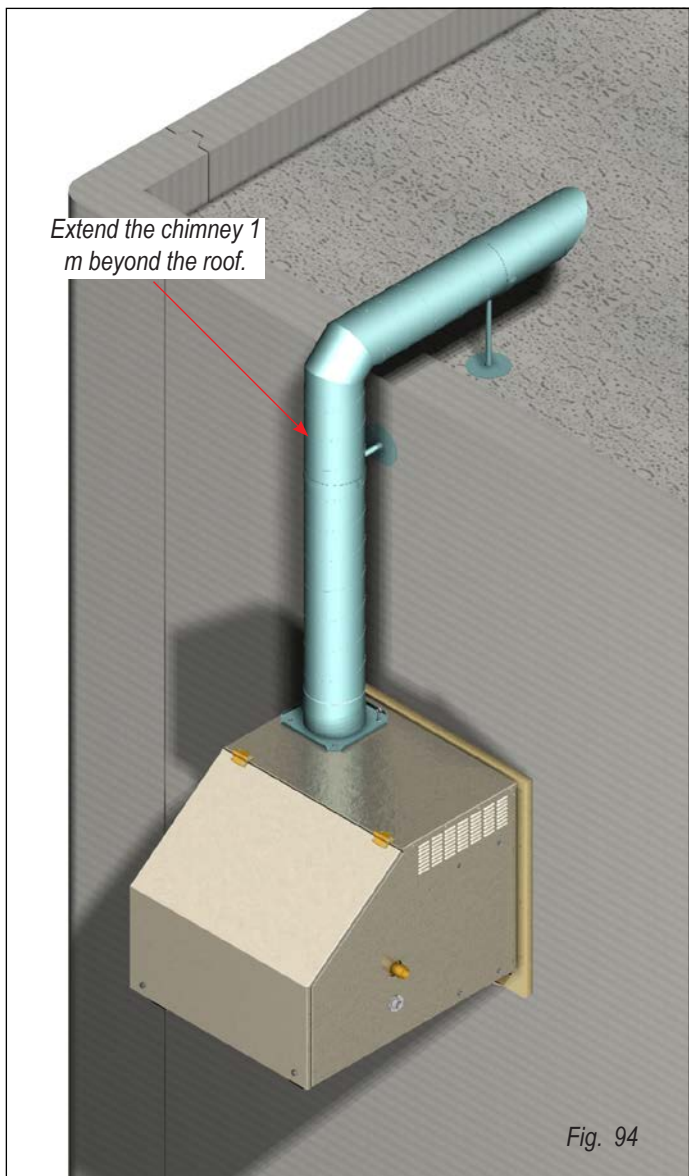
The making of the exhaust gas duct for generators models GSR 50.1, GSR 100.1, GSR 100.1E and GSR 150 installed on the wall with water trap device is shown in fig. 90. The piece of **chimney tube (5)** must be cut during installation. The diagram of the assembly of various components described in the following is shown in fig. 91:

- | | |
|------------------------|--|
| 1 Exhaust terminal. | 6 Pipe fitting (only for GSR100.1, GSR 100.1E, GSR150) |
| 2 Elbow. | 7 Water traps. |
| 3 Support collar. | 8 Generator exhaust gas duct connection. |
| 4 Collar bearing foot. | |
| 5 Chimney tube. | |

INSTALLATION OF EXHAUST GAS DUCT FOR GSR100.2 - 200.1 - 200.2 - 300.1 ON THE WALL



Insert the pipe fitting (A) in the generator exhaust gas duct connection (B) until the combustion test tap nut (C), see fig. 92. Seal the pipe fitting on the generator exhaust gas duct connection and all the other connections with silicone. Fasten all the connections with 4 self-drilling screws (D), see fig. 93.



The making of the exhaust gas duct for generators models GSR 200.1 and GSR 300.1 installed on the wall is shown in fig. 94. The pieces of chimney tube (5) must be cut during installation. The diagram of the assembly of various components described in the following is shown in fig. 95: 1 Exhaust terminal; 2 Elbow; 3 Support collar; 4 Collar bearing foot; 5 Chimney tube; 6 Pipe fitting; 7 Generator exhaust gas duct connection.

..... WITH WATER TRAP DEVICE

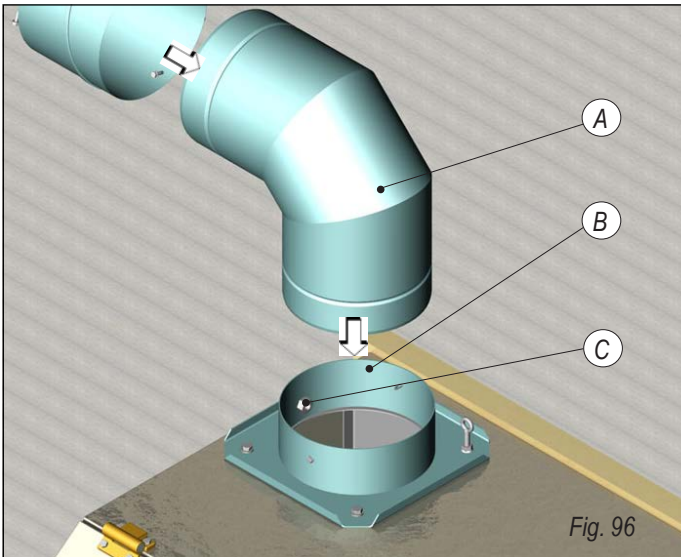


Fig. 96

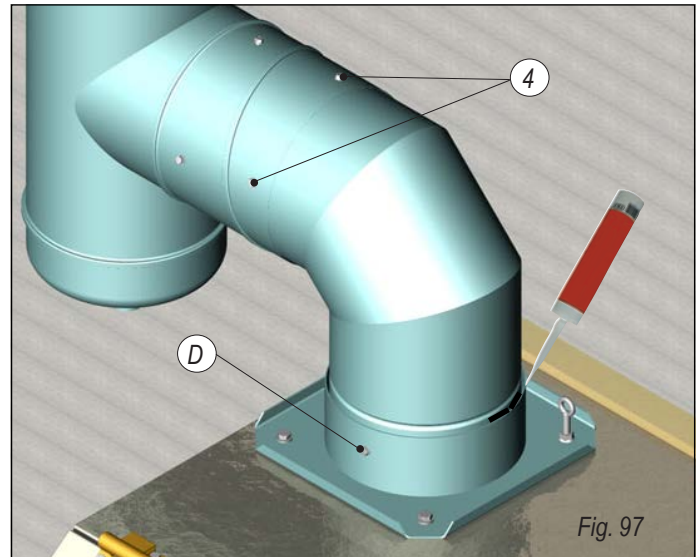


Fig. 97

Insert the elbow (A) in the generator exhaust gas duct connection (B) until the combustion test tap nut (C), see fig. 96. Seal the elbow on the generator exhaust gas duct connection and all the other connections with silicone. Fasten all the connections with 4 self-drilling screws, see fig. 97.

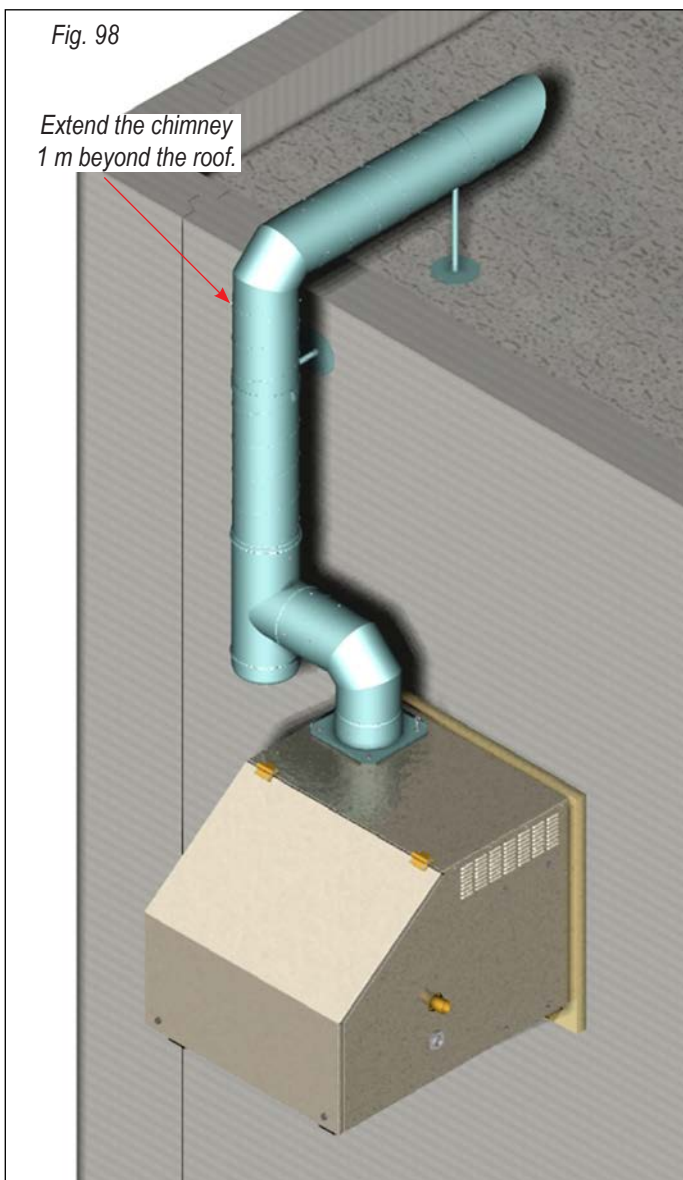


Fig. 98

Extend the chimney
1 m beyond the roof.

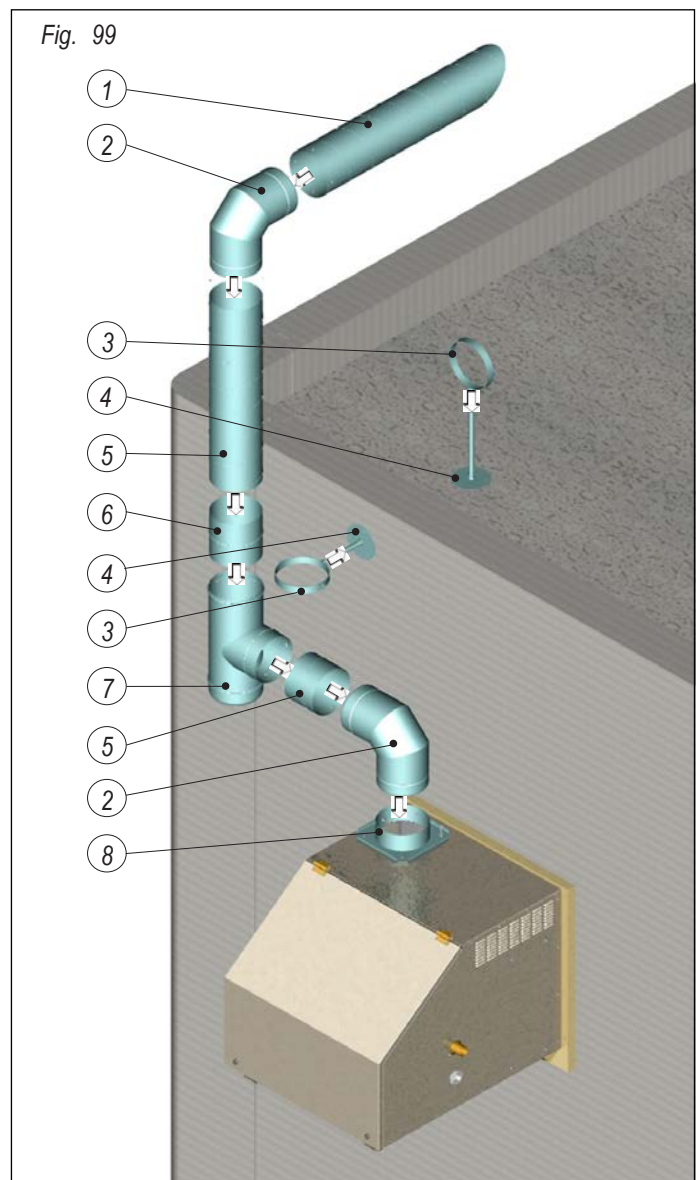


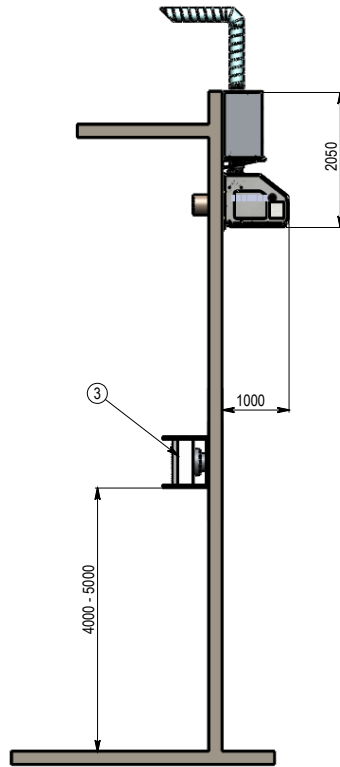
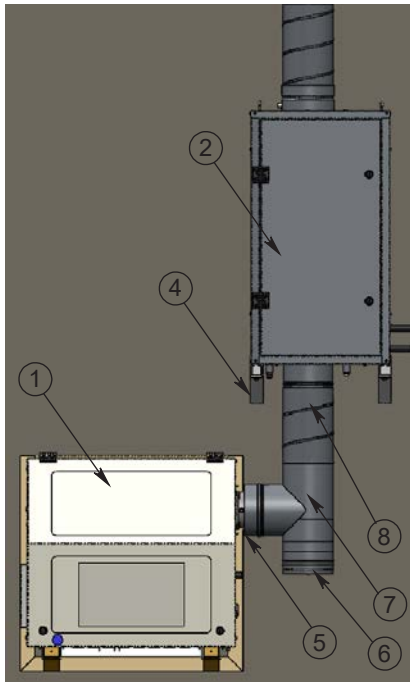
Fig. 99

The making of the exhaust gas duct for generators models GSR 200.1, GSR200.2 and GSR 300.1 installed on the wall with water trap device is shown in figs. 98 and 99. The pieces of **chimney tube (5)** must be **cut during installation**. The diagram of the assembly of various components described in the following is shown in fig. 99: 1 Exhaust terminal; 2 Elbow; 3 Support collar; 4 Collar bearing foot; 5 Chimney tube; 6 Pipe fitting; 7 Generator exhaust gas duct connection.

INSTALLATION EXAMPLE GSR 100.1 - GSR 100.1E - GSR 150 (CONDENSING)

Fig.100

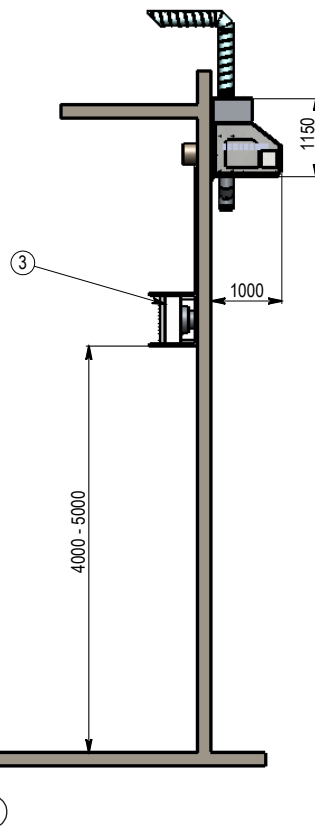
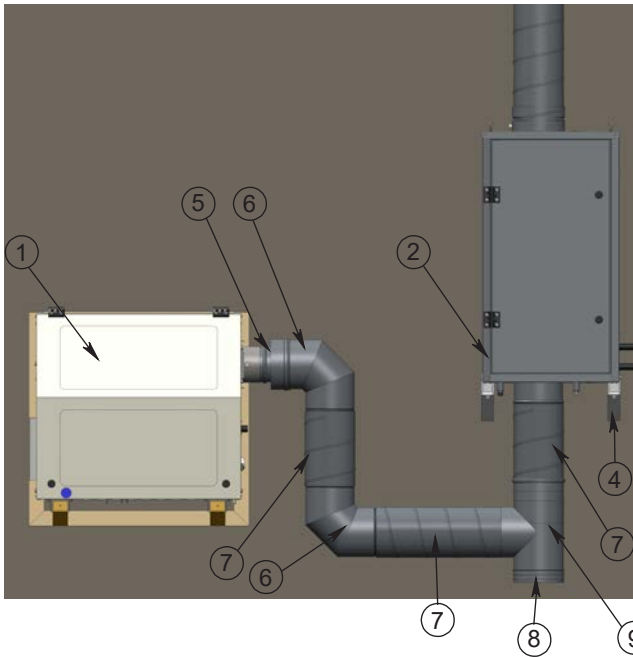
Recommended installation



Position	Description
1	GSR
2	Condenser
3	Forced convection heater
4	Condenser support bracket
5	Single wall joint Ø 140 to Ø 200 mm
6	Discharge cap single wall Ø 200 mm
7	90° single wall Tee Ø 200 mm
8	Single wall module customized Ø 200 mm

Dimensions in mm

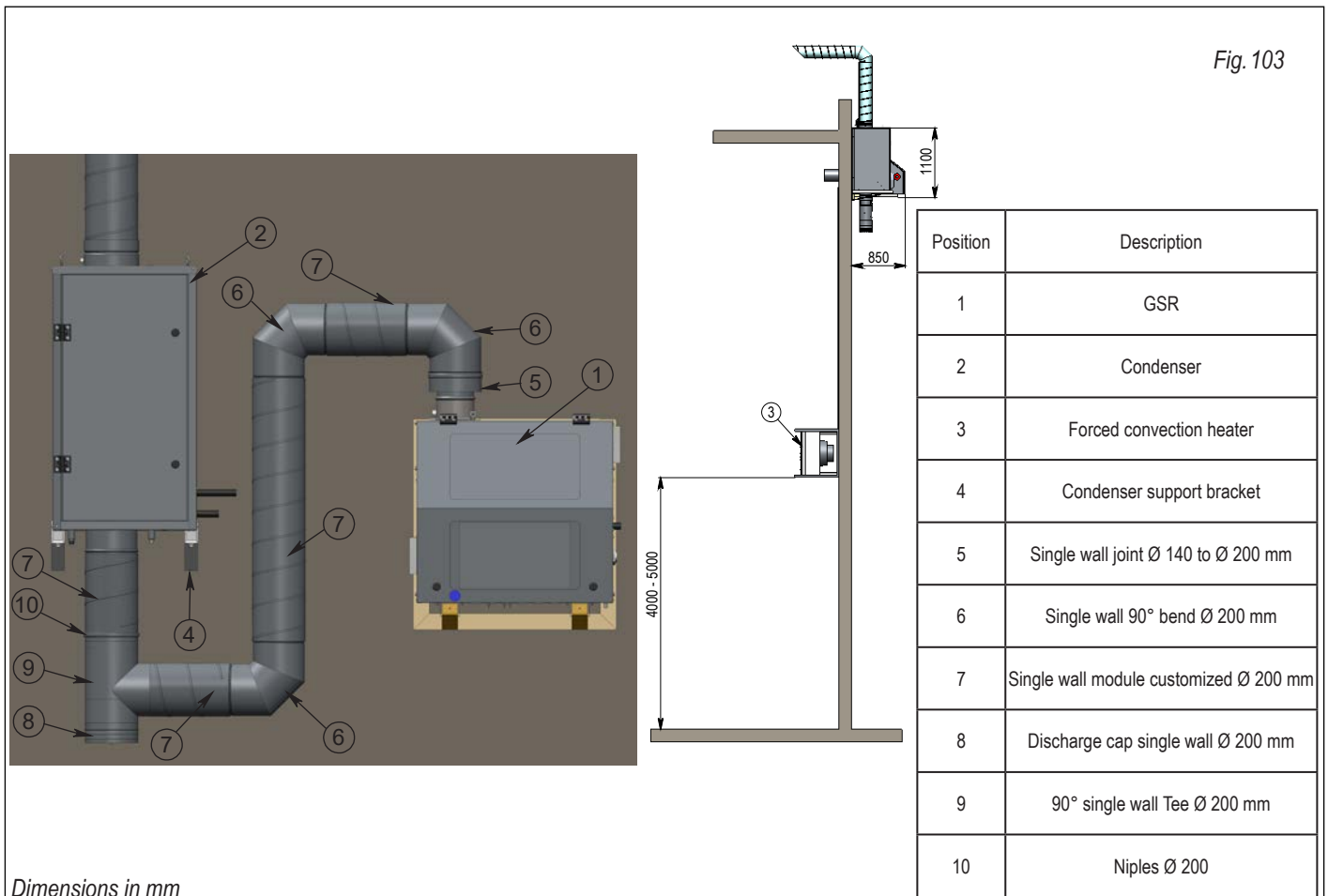
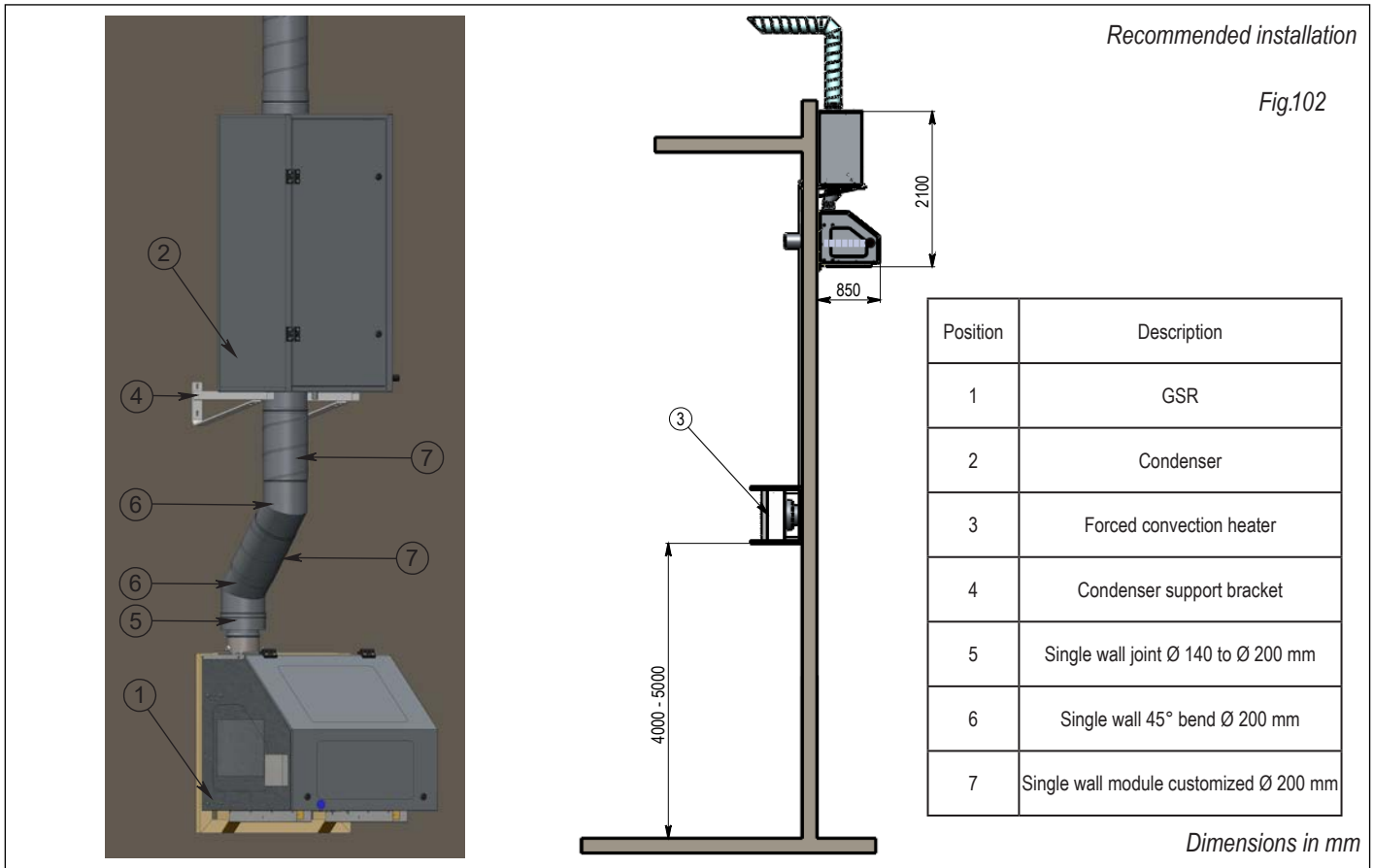
Fig.101



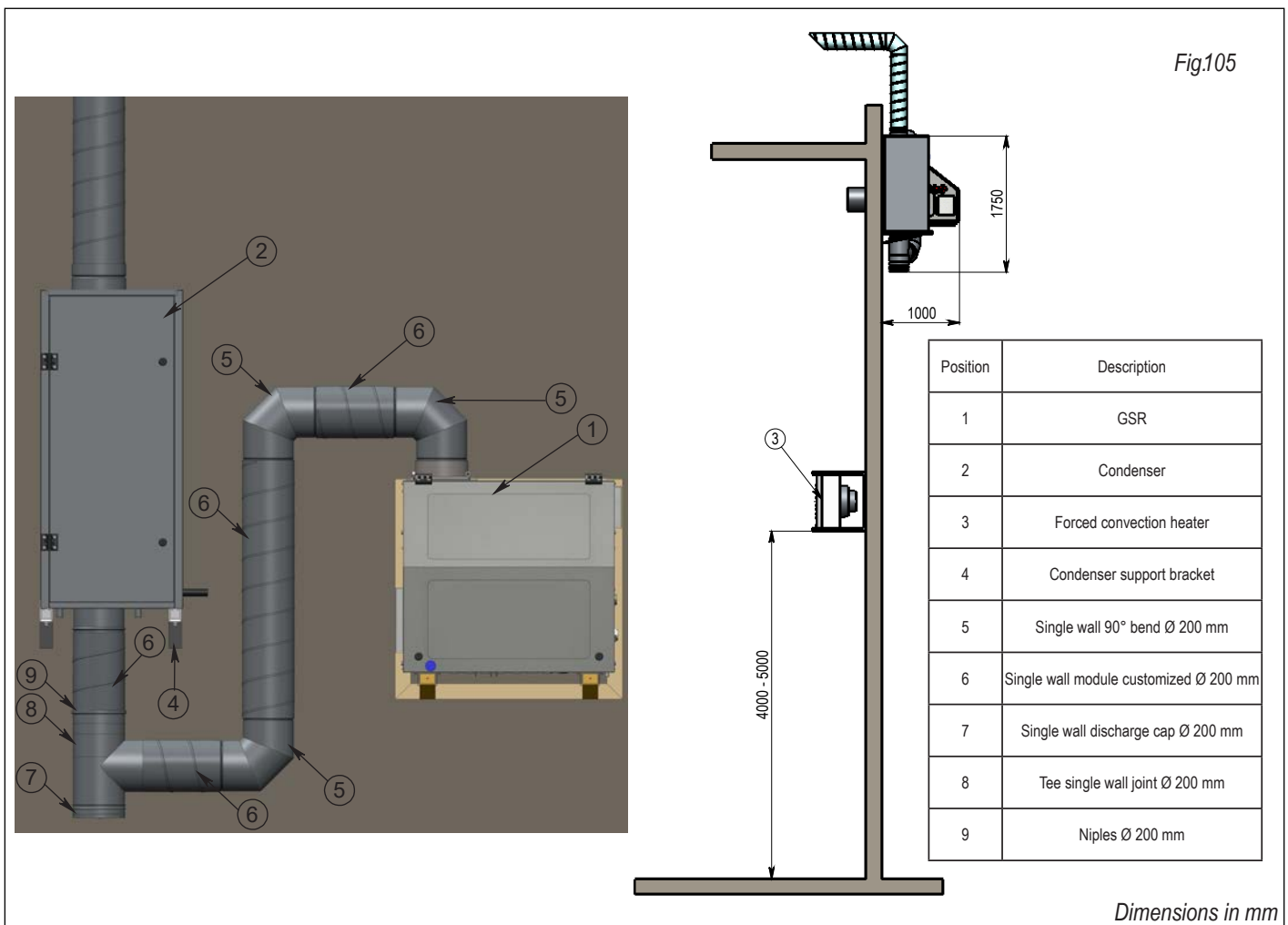
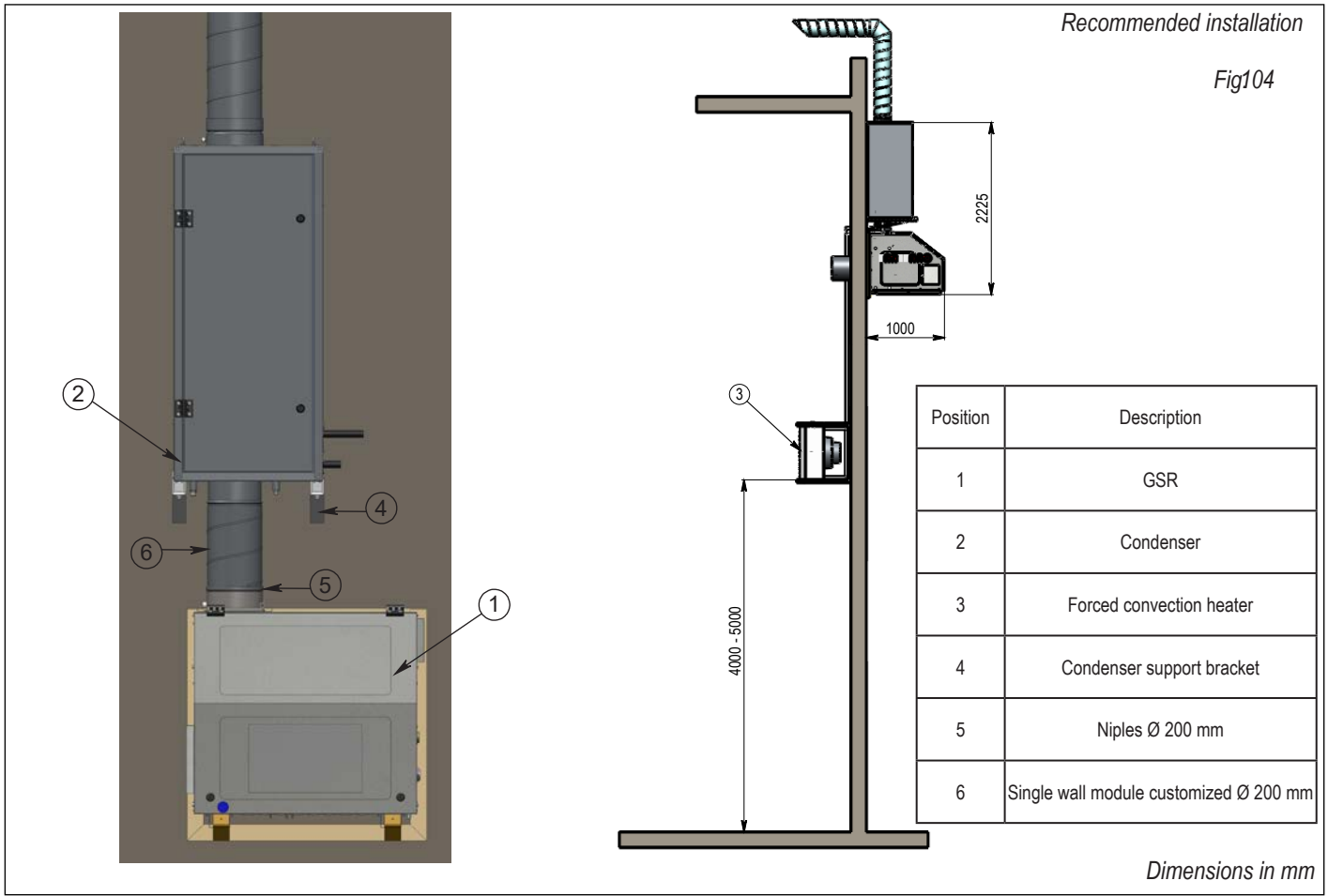
Position	Description
1	GSR
2	Condenser
3	Forced convection heater
4	Condenser support bracket
5	Single wall joint Ø 140 to Ø 200 mm
6	Single wall 90° bend Ø 200 mm
7	Single wall module customized Ø 200 mm
8	Discharge cap single wall Ø 200 mm
9	90° single wall Tee Ø 200 mm

Dimensions in mm

INSTALLATION EXAMPLE GSR 100.2 A (CONDENSING)



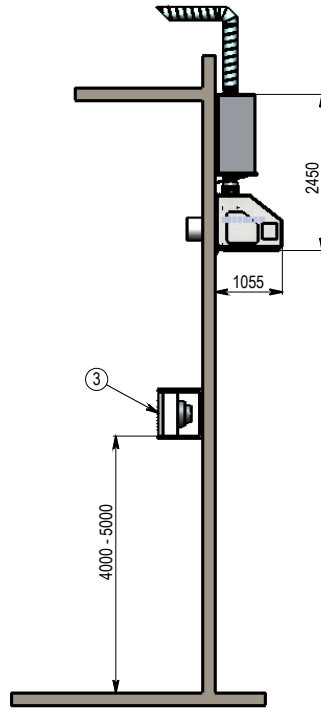
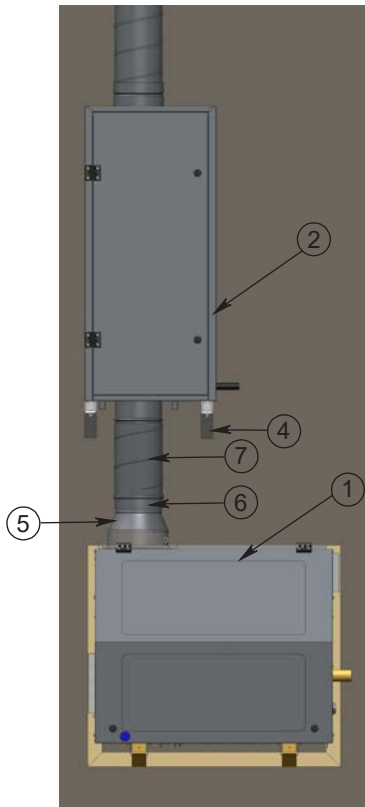
INSTALLATION EXAMPLE GSR 200.1 A (CONDENSING)



INSTALLATION EXAMPLE GSR 200.2 - GSR 300.1 A (CONDENSING)

Recommended installation

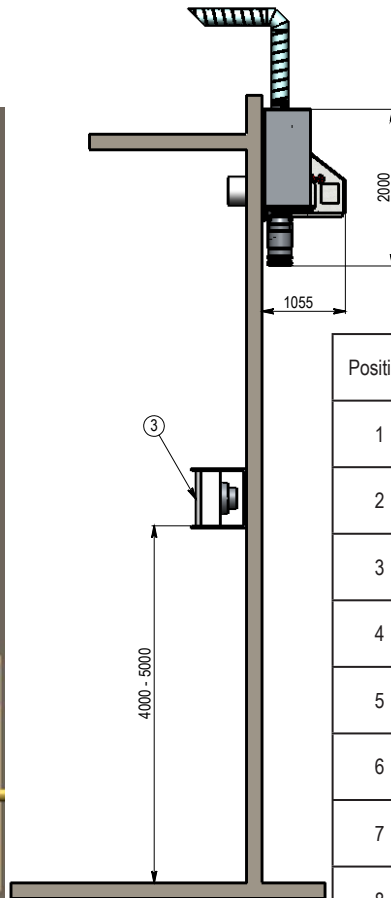
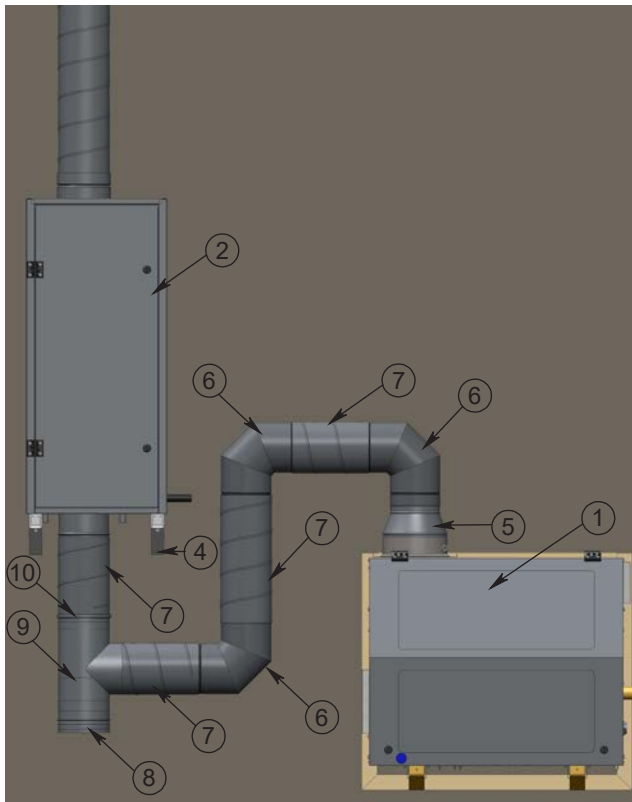
Fig. 106



Position	Description
1	GSR
2	Condenser
3	Forced convection heater
4	Condenser support bracket
5	Outflow reduction Ø 250 mm to Ø 200 mm
6	Nipples Ø 200
7	Single wall module customized Ø 200 mm

Dimensions in mm

Fig. 107



Position	Description
1	GSR
2	Condenser
3	Forced convection heater
4	Condenser support bracket
5	Outflow reduction Ø 250 mm to Ø 200 mm
6	Single wall 90° bend Ø 200 mm
7	Single wall module customized Ø 200 mm
8	Single wall discharge cap Ø 200 mm
9	Tee single wall joint Ø 200 mm
10	Nipples Ø 200 mm

Dimensions in mm

INSTALLATION EXAMPLE GSR (CONDENSING ROOF)

For install the condenser to the roof, is available a structure (accessory) above which support the condenser. Connections between Girad chimney and condenser are the same as wall version (see above).

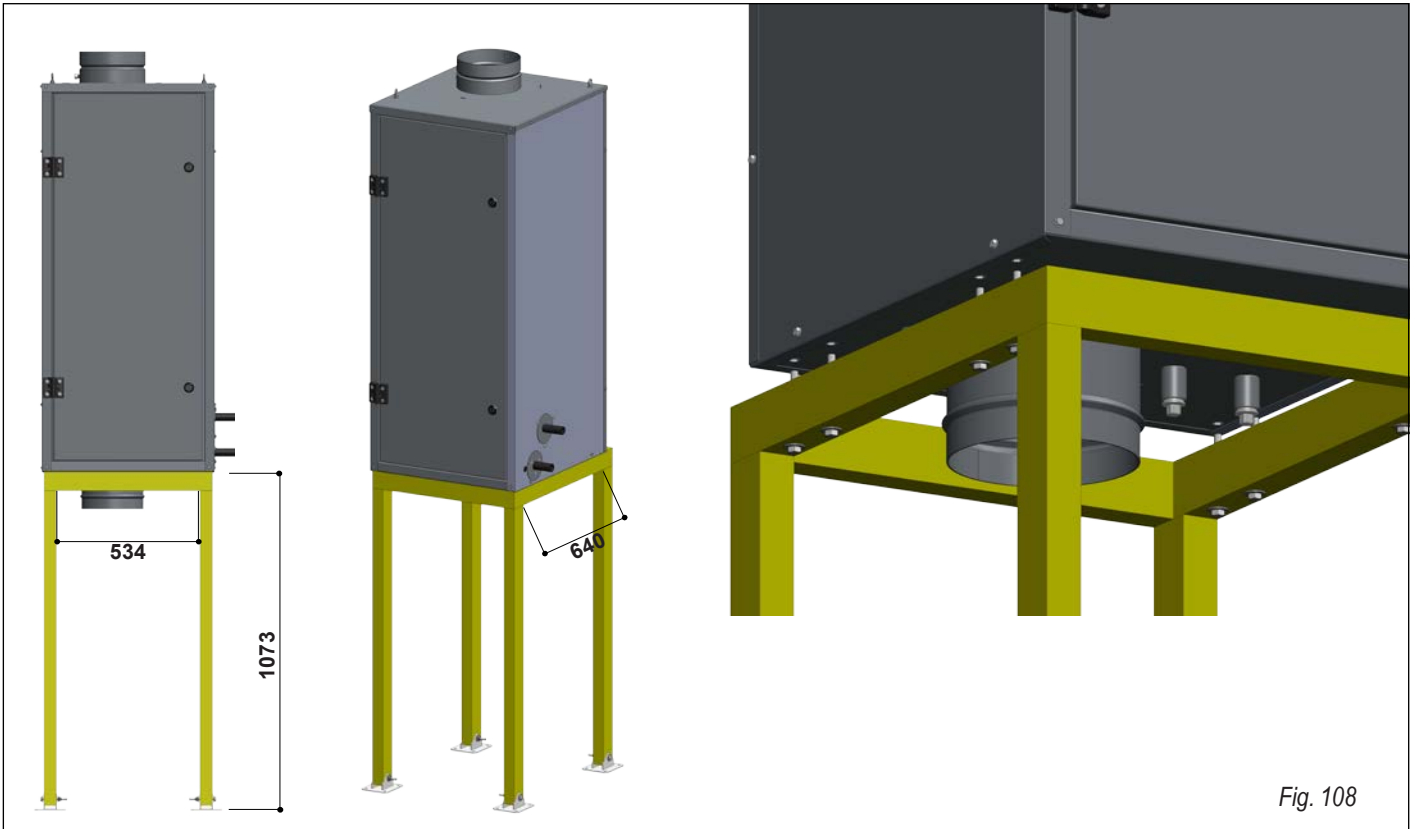


Fig. 108

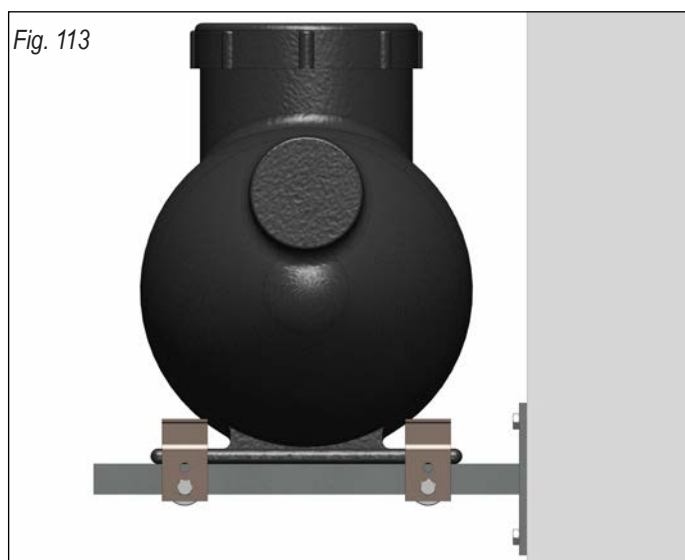
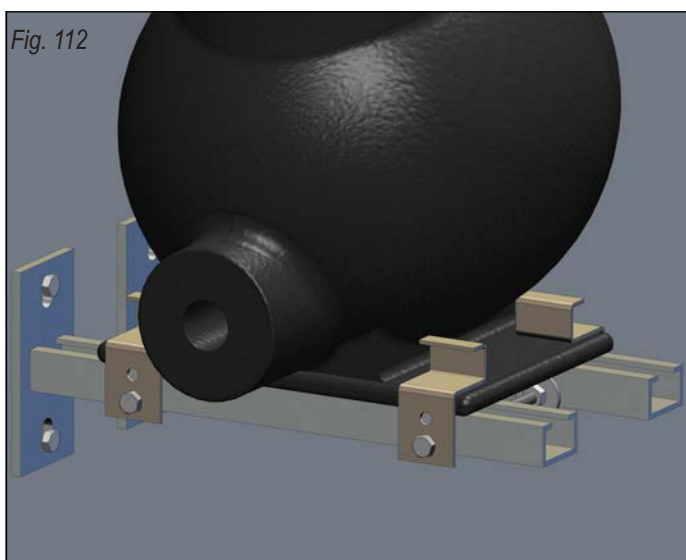
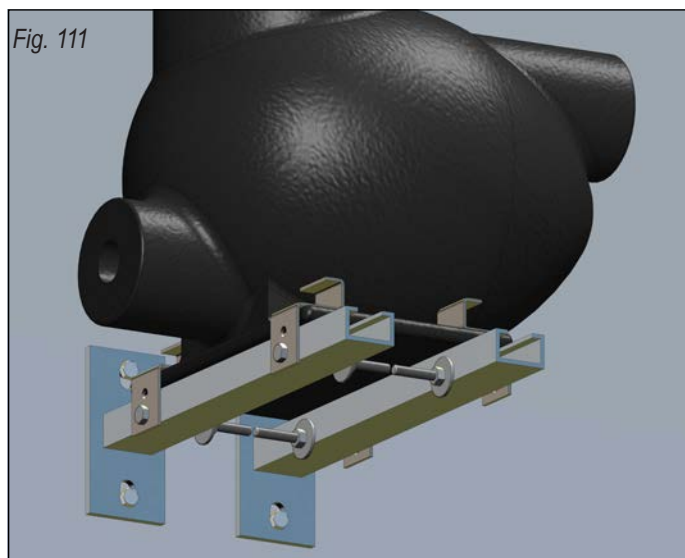
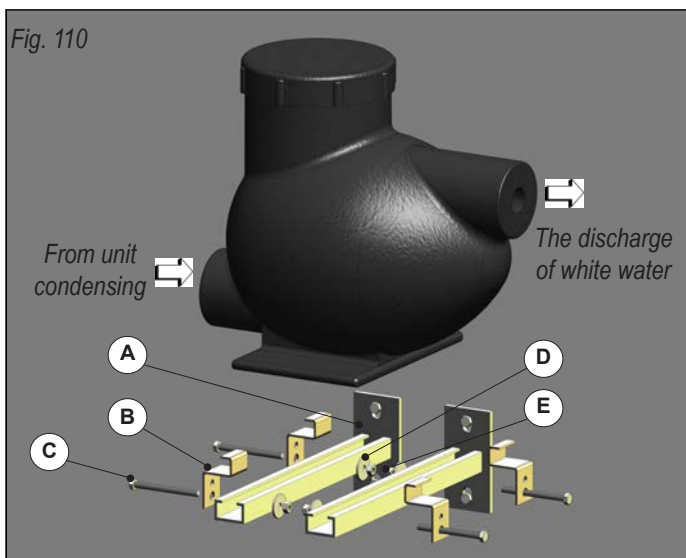


Example installation GSR 300.1 HC

Example installation GSR 100.1 HC

Fig. 109

INSTALLATION FILTER NEUTRALIZER ACIDIC CONDENSATE



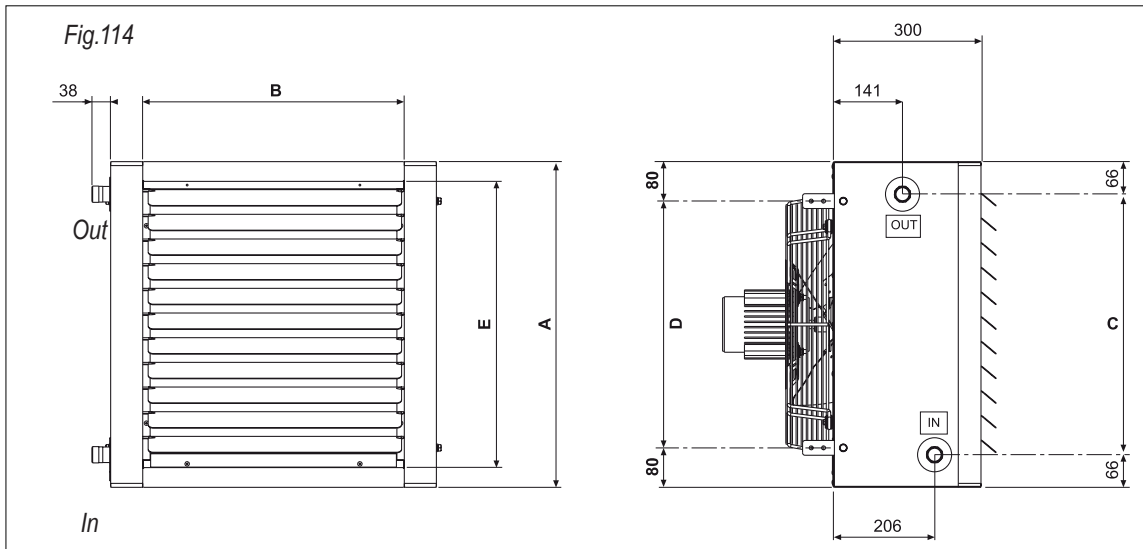
The condensate must pass through a salt purification kit (accessory) installed 1.5 m from the ground which reduces the acidity and makes it possible to unload in the white water. Carefully follow the instructions in the installation and maintenance use inside the kit box purification.

Fix to the wall with screws M6 the brackets support (A), place the filter over the brackets and drill this in order to pass the entire M6 screw inside. Anchor the hook to the filter and tighten the screw with nut and washer M6 supplied (fig. 110, 111, 112, 113).

The outlet pipe of the condensing unit must be connected in the lower part of the filter (input), while connection to the output (upper part) the discharge of the white waters.

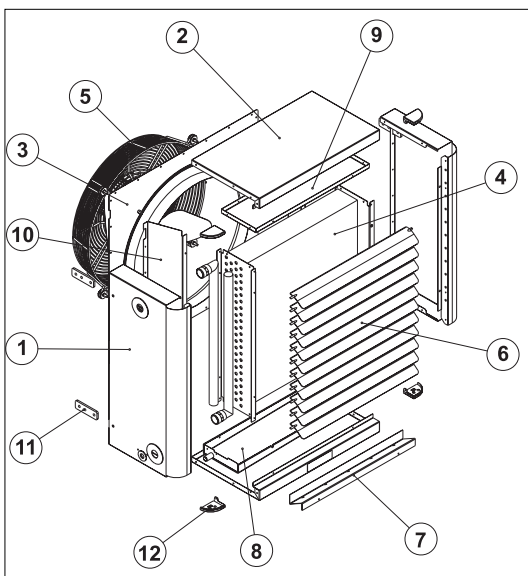
**MUST BE VERY CAREFUL NOT TO DRILL THE NEUTRALISER FILTER!
DO NOT INSTALL THE FILTER OUTSIDE OF THE BUILDING!**

DIMENSIONS SPECIFICATIONS OF THE FORCED CONVECTION HEATER



TYPE	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Φ 1	Φ 2
FORCED CONVECTION	860	730	728	700	780	1 ¼ "	1 ¼ "

Tab.11



- 1 = Cabinet side panel
- 2 = Cabinet upper/lower panel
- 3 = Rear panel/fan compartment
- 4 = Finned block heat exchanger (heat exchanger coil)
- 5 = Safety grille (fan) supporting motor
- 6 = Adjustable louvers
- 7 = Auxiliary drip tray
- 8 = Main drip tray
- 9 = Top cover of heat exchanger
- 10 = Conveyor duct
- 11 = Wall/ceiling mounting brackets
- 12 = Plastic corner trim on cabinet

Fig. 115

Forced convection heater is an indoor unit for heating medium to large interiors with a horizontal discharge of warm air. It comprises the following main components:

- A PRE-PAINTED SHEET STEEL CABINET, complete with ABS corner trim, internally insulated to prevent condensate from forming on the cabinet during operation with chilled water. The cabinet is complete with adjustable aluminium louvers (spring-operated) placed on the air outlet which enable an optimal distribution of air within the room. On the rear of the cabinet there are 4 brackets for suspending the fan heater from the ceiling or joining it to the mounting board for installation on the wall (accessory).
- HEAT EXCHANGER, made up of copper tubing and aluminium fins providing superior thermal conductivity compared to traditional iron pipe exchangers. The heat exchanger is set back in relation to the air outlet; an auxiliary drip tray is fitted onto the front to guarantee complete collection of condensate.
- Galvanised sheet steel DRIP TRAY insulated with closed-cell polyurethane, connected to the auxiliary tray.
- Two-speed ELECTRIC MOTOR, 4/6 or 6/8 poles, 400V three-phase star-triangle in performance; for the single-phase versions, the motor is single speed. All engines are equipped with internal thermal protection (klixon), class F windings, made with protection degree IP 55.
- AXIAL FAN with statically balanced sickle blades housed in a specially designed compartment that enhances ventilation and reduces noise emissions.
- SAFETY GRILLE made of electrogalvanised steel wire: it supports the motor and is fixed to the cabinet by means of vibration-damping supports.

When choosing an installation site, you should observe the following rules:

- The heating unit should not be placed immediately under a socket.
- do not install the unit in places where inflammable gases are present;
- do not expose the unit directly to sprays of water;
- install the unit on walls or ceilings able to withstand its weight; use accessories suited to the purpose and suitable screw anchors.

Store the unit in its packing container until you are ready to install it to prevent dust from infiltrating inside it.

INSTALLATION OF THE FORCED CONVECTION HEATER

Remove the forced convection heater from the packing and verify its condition, checking for damages during transport.

Before installing the equipment, verify that installation height and air output comply with the indications in table 12.

For wall installation, use the specific fastening template (accessory) or if you don't use genuine fastening templates, verify that the distance from the wall is not shorter than the value indicated in figure 118. Use fastening dowels suitable for the weight of the machine and verify that the fastening surface is suitable.

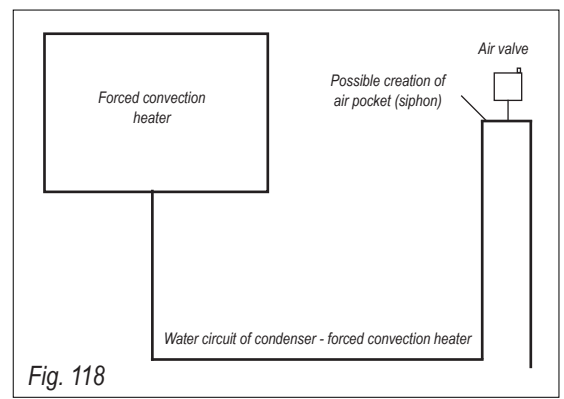
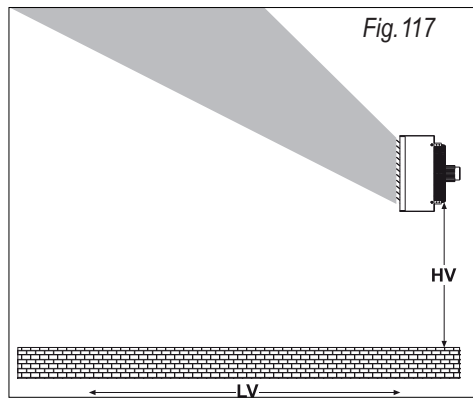
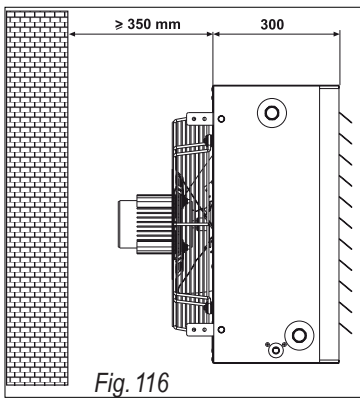
To enhance air distribution into the environment, rotate by 180° half of the air output baffles as indicated in figure 117, acting on the baffle to compress the spring. Use a suitable lifting device (a forklift is recommended) to bring the equipment to the installation location, resting it on the flaps side.

The hydraulic attachment, on the machine side, cannot be supporting and therefore cannot be used to support the equipment. The equipment installation must be perfectly level to avoid the creation of air pockets inside the thermal exchange battery.

The water inlet must correspond with the lower attachment, to ease a better air vent inside the battery and the correct operation of the heat exchanger. Once the machine is installed, open and position the swinging baffles.

The motors are 1 speed single phase asynchronous closed type motors, with klixon internal thermal protection directly acting on windings: **THUS NO EXTERNAL THERMAL PROTECTION IS REQUIRED.** Carry out electric connections without voltage, pursuant to the applicable safety standards. Wiring shall be carried out by qualified personnel only. It is available a kit (optional) composed of, a minimum thermostat and the motor speed controller. The minimum thermostat regulates the start up of the fan heater to the achievement of the water temperature set on the thermostat; the motor speed controller regulates the minimum value of the speed motor.

The system is provided with a kit, consisting of a minimum temperature thermostat, regulating the turning on/off of the heater, only when reaching the water temperature, set on the thermostat and an engine speed revolutions regulator, by which, by means of the appropriate trimmer, it is possible to adjust the minimum speed value of the motor.

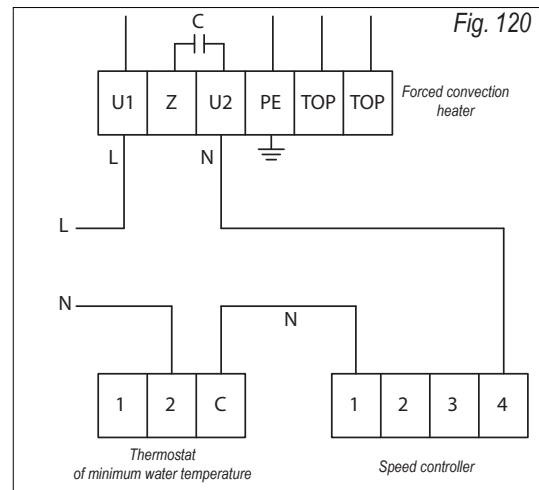
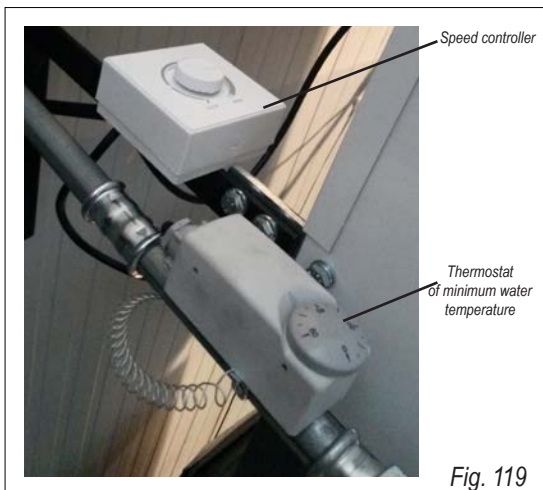


FORCED CONVECTION HEATER						
Number of poles	Air flow [m³/h]	Voltage [V]	Power input [W]	Current absorbed [A]	HV (m)	LV (m)
6 poli - 1400 rpm	5900	230	380	1,73	4,5	18

Tab. 12

CONNECTION BETWEEN LOW TEMPERATURE THERMOSTAT AND POWER CONTROLLER

Each heater is supplied with a minimum temperature thermostat, which enables incoming power to the heater when the water reaches the temperature set; moreover, it also comes with a manual speed single-phase controller, which regulates the fan rotation speed. Place the devices, as shown in fig. 119 and perform series connection, as shown in fig. 120.



INSTALLATION OF CONDENSING MODULE

The installation of the generator and of the system is to be carried out by qualified personnel, in compliance with the applicable standards in each country where the installation takes place. The materials used for installation and maintenance of the generators must comply with applicable standards. After positioning the generator, carry out chimney connections without the condenser; for chimney connections, follow the diagrams from page 34 to page 37, verifying that all seals are tight.

Then fasten the brackets to the wall with four dowels suitable for the weight of the module (approx. 130 kg), verifying as well that the rest surface is suitable for the purpose (fig. 121); in fact, the condensing module SHALL NOT for any reason be supported by the generator. Now proceed with the insertion of the condenser in the generator chimney and finally carry out the connections from the power grid and gas supply as indicated in the related paragraphs.

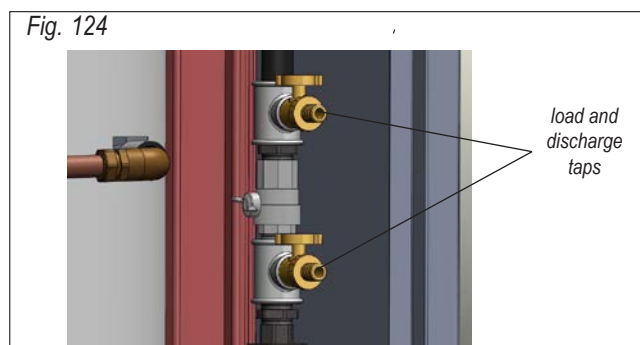
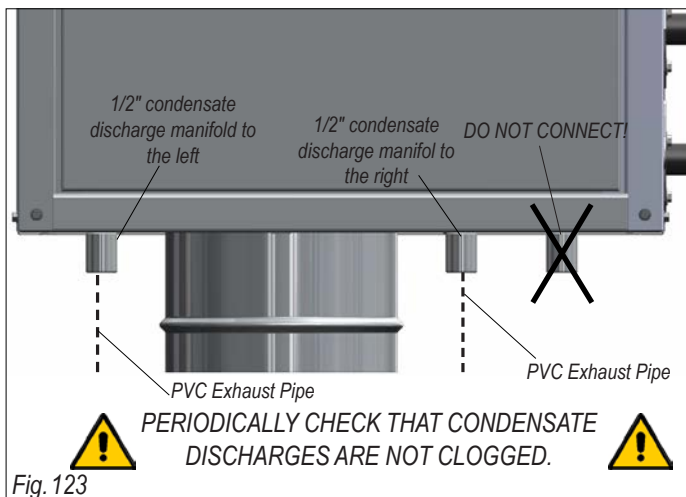
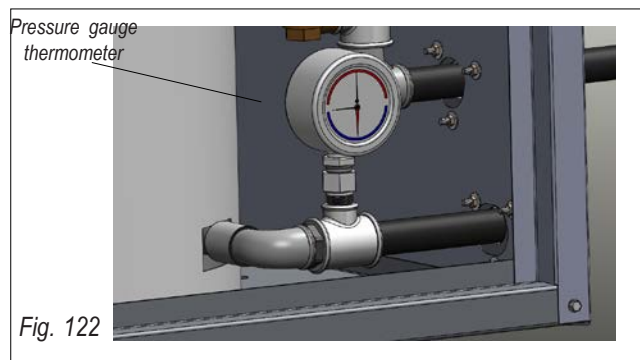
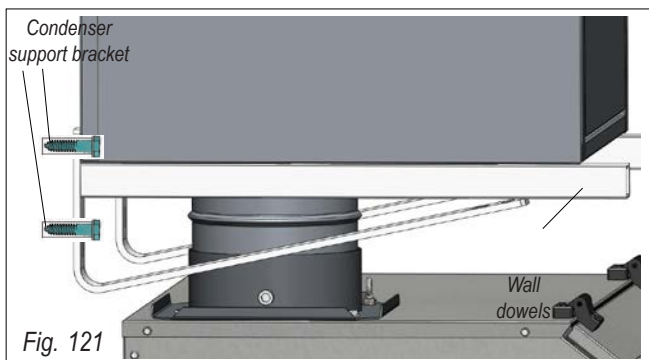
It is necessary to load the secondary system consisting of condenser, piping and forced convection heater; to do this, use a rubber hose and by means of the load tap located inside the condenser, load the entire system with water to lift all the deposits in the pipes; let water flow for approx. half an hour.

After completely emptying it, refill the entire secondary circuit (condenser - forced convection heater) with approx. 25% of antifreeze (approx. 7 l) and the remaining 75% with water (approx. 23 l). The exact amount of antifreeze depends on the minimum temperature required for freeze resistance; in particular with 25% of antifreeze the freezing point will be -15°C . Prepare the water-antifreeze mix before entering it into the system pouring antifreeze into water and not viceversa; we recommend to use a monopropylene glycol based antifreeze with anticorrosion protection (corrosion inhibitor) equal to 1,3% on 25% of antifreeze, for thermal conduction circuits; **we recommend as well to use an antifreeze which does not allow the creation of hard mineral antifreeze, ensuring a good thermal exchange and avoiding the risk of erosion of the ducts. Avoid glycol solutions with more than 35%.**

The pressure of the secondary water circuit (condenser - forced convection heater) shall be 1,5 - 2 bar.

Fig. 123 shows the attachment part for condensate discharge: the condensate pipe is in PVC and by means of a 1/2" male-male nipple carry out the engagement with the manifold located under the condenser. Concerning the installation of the secondary circuit (condenser - forced convection heater), it is indispensable to fit an air valve in the forced convection heater return pipe (fig 118) to avoid air pockets; we recommend to keep the length of the hydraulic pipe between the condenser and the forced convection heater at 10 m (5 m for delivery and 5 m for return), however not over 20 m. If it is necessary to perform height changes of the hydraulic pipe which create siphons for the connection to the forced convection heater, it is necessary to install an air valve for each siphon at the top point to avoid the creation of air pockets (fig. 118), regardless of the fact that the siphon is on the delivery or return circuit. To minimize thermal dispersion, we recommend to insulate the entire secondary water circuit (condenser - forced convection heater).

The forced convection heater is to be installed at a maximum height of 5 m (table 12) and wherever possible at a distance from the radiant strip of approx. 4 m. The supply of the condenser pump and of the forced convection heater shall be directly obtained from the generator; in fact inside the control panel of the Girad there is a dedicated relay to supply these two components when the generator is switched on.



CEILING INSTALLATION OF THE FIRST UNIT OF THE RADIANT BELT

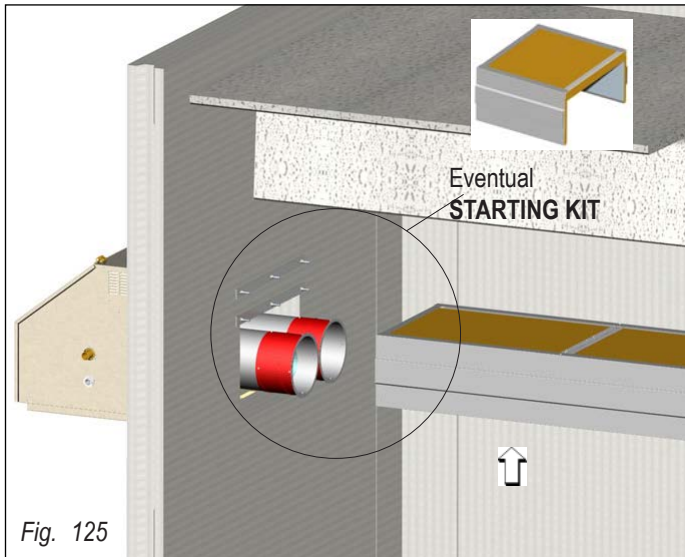
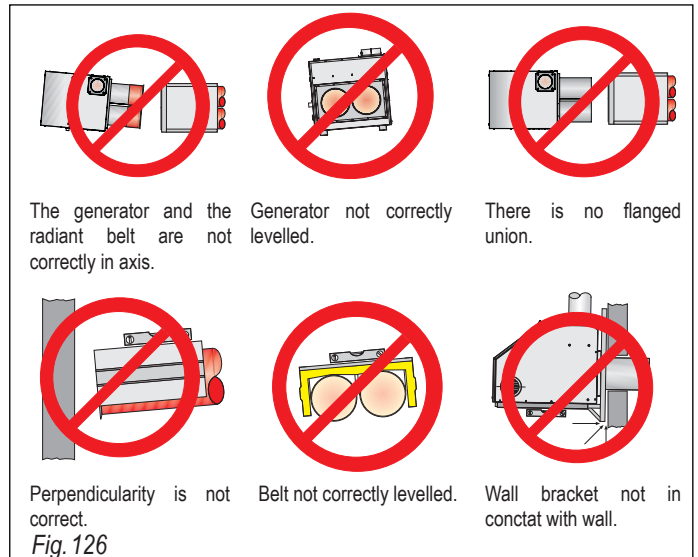


Fig. 125



The generator and the radiant belt are not levelled. Generator not correctly levelled. There is no flanged union.

Perpendicularity is not correct. Belt not correctly levelled. Wall bracket not in contact with wall.

Fig. 126

Lift the first unit of the radiant belt until the installation height in fig. 125, hook everything with the chains or tie rods on the ceiling. On request a **starting kit** is supplied to cover the initial part of the radiant tube. To be assembled at the work site.



Be very careful when installing the first unit of the radiant belt and make sure that the male tooth (A) is turned over on the side of the generator as shown in figs. 127, 128 and 129.

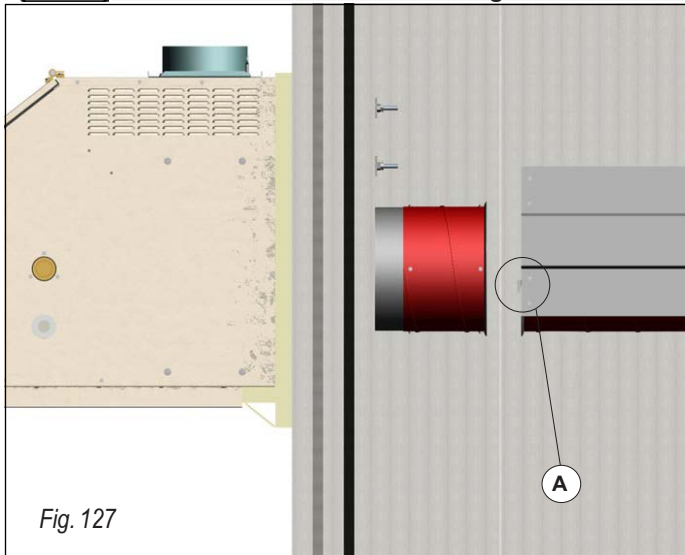


Fig. 127

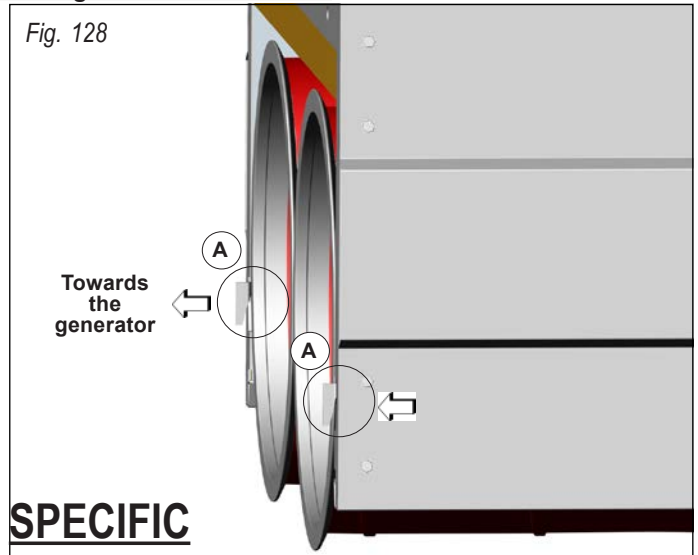


Fig. 128

SPECIFIC



THE MINIMUM DISTANCE FROM THE FLOOR AND THE RADIANT BELT MUST BE MORE OR EQUAL TO 4.0 M.

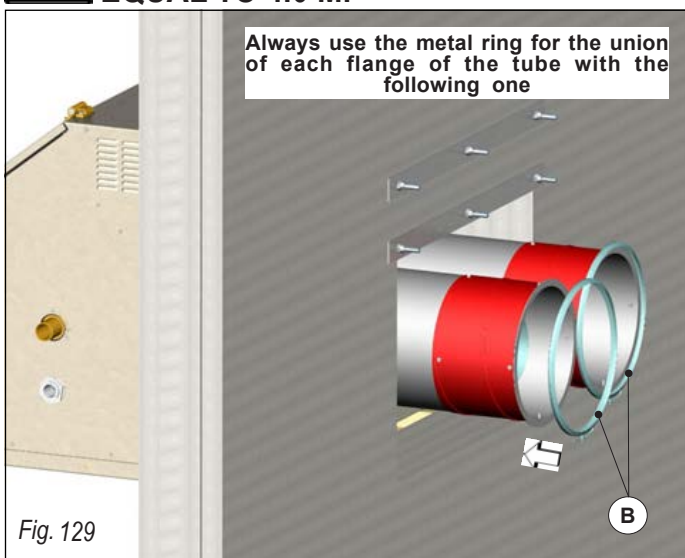


Fig. 129

Always use the metal ring for the union of each flange of the tube with the following one

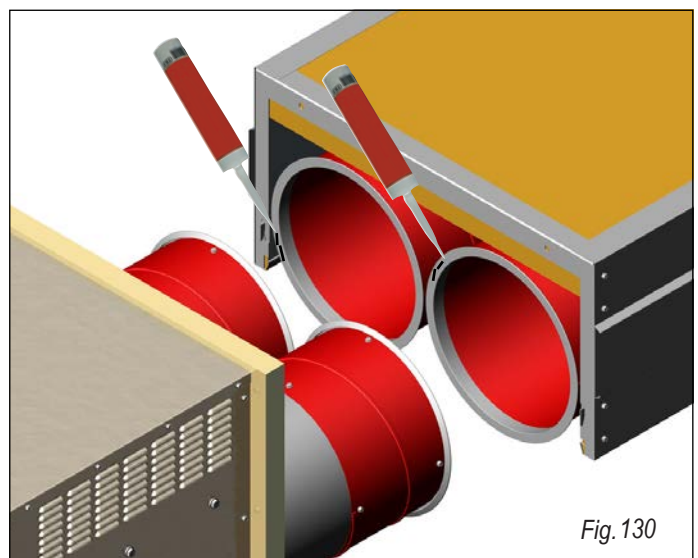


Fig. 130

The correct direction of the male tooth for the **first radiant belt unit** is shown in fig. 129. Insert the closing ring (B) in the coupling flanges located on the generator (fig. 129). Put a rim of silicon in the coupling flanges of the radiant belt, see fig. 130.

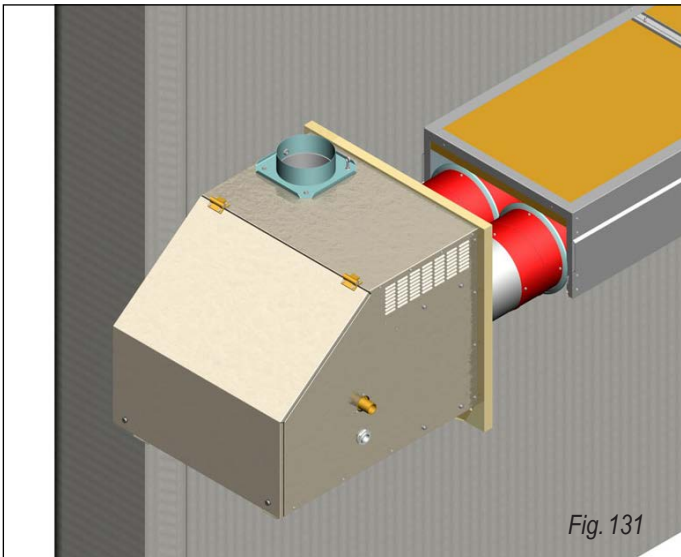


Fig. 131

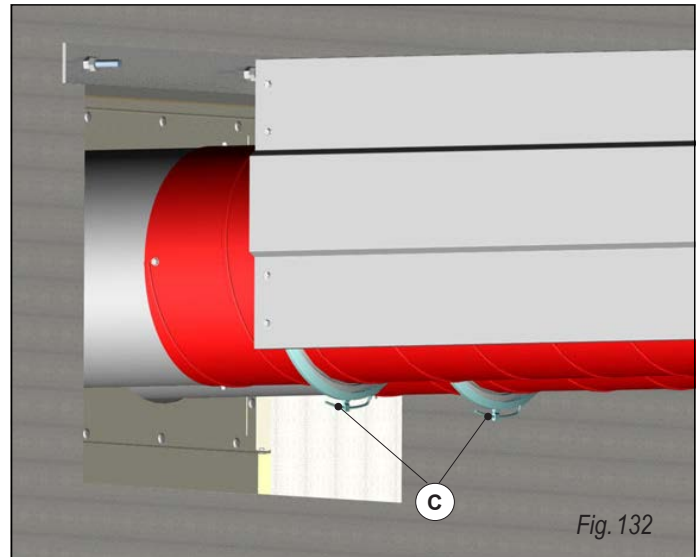


Fig. 132

Place the flanges of the first radiant belt unit on the flanges located on the generator as in fig. 131. Engage the closing ring and fasten the two flanges with the nut provided (C) (fig. 132).

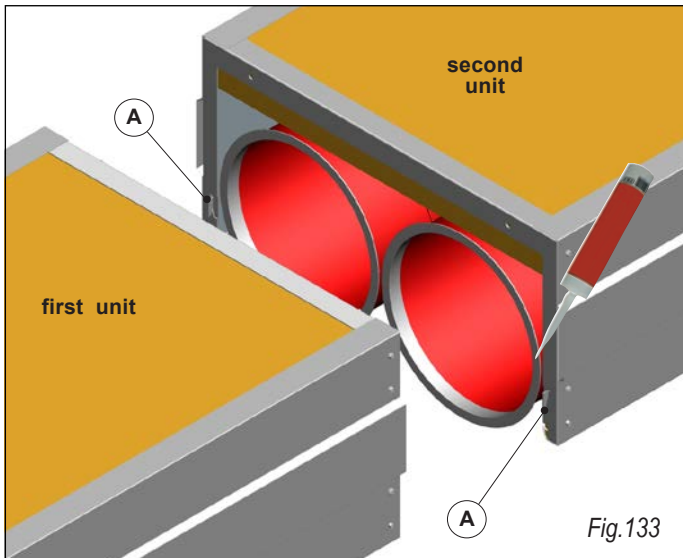


Fig. 133

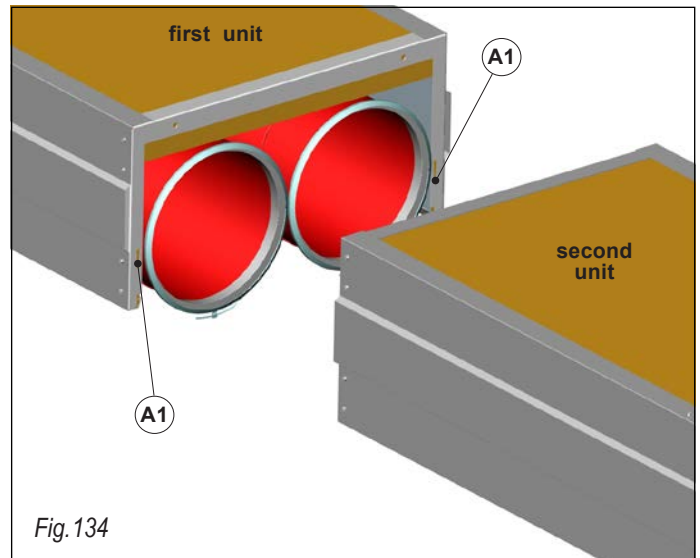


Fig. 134

After having inserted the closing ring in the coupling flanges located on the first unit, silicone the flanges of the second unit, insert the tooth (A) of the second radiant belt unit (fig. 133) in the proper slot (A1) located in the first radiant belt unit (fig. 134). Make sure the two couplers are engaged (fig. 128). Fasten the two frames with the two bolts as in fig. 134. The last step is fastening the closing ring as described above in fig. 132.

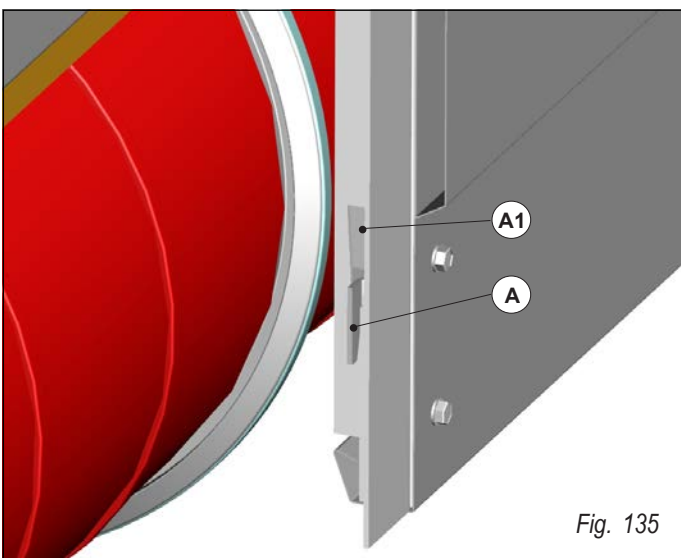


Fig. 135

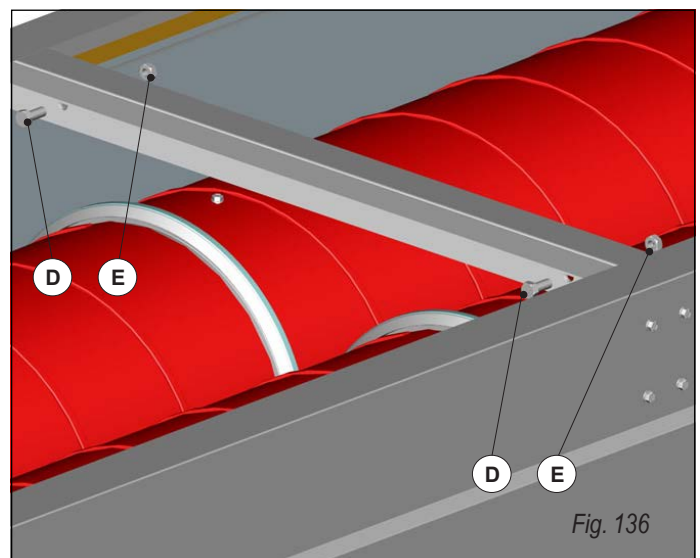
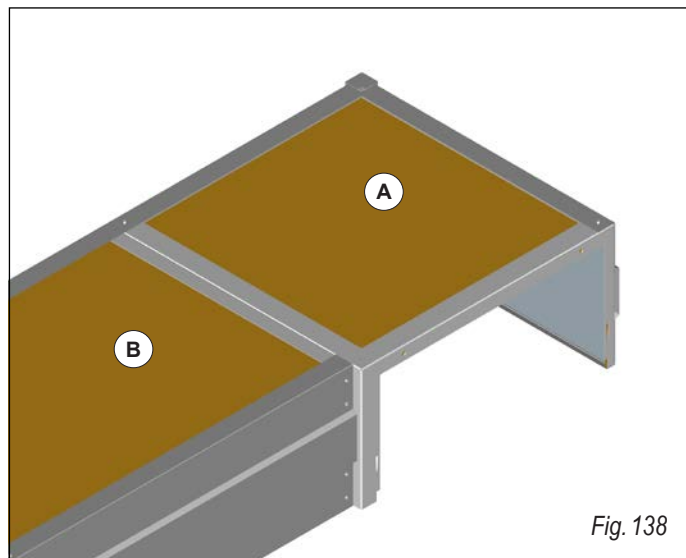
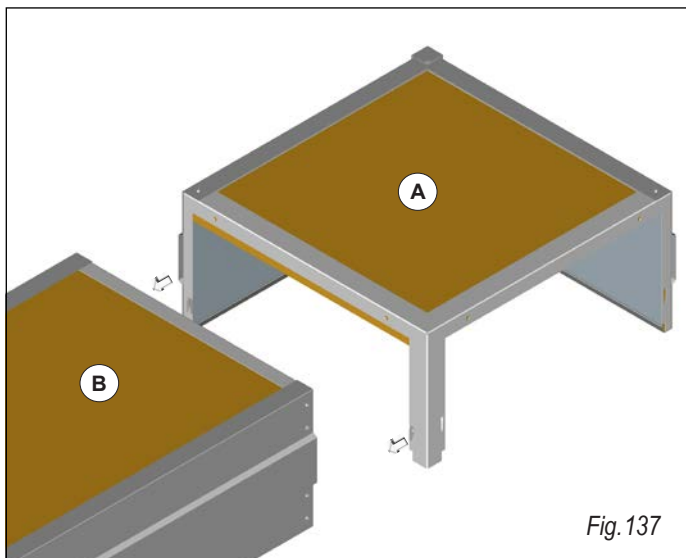


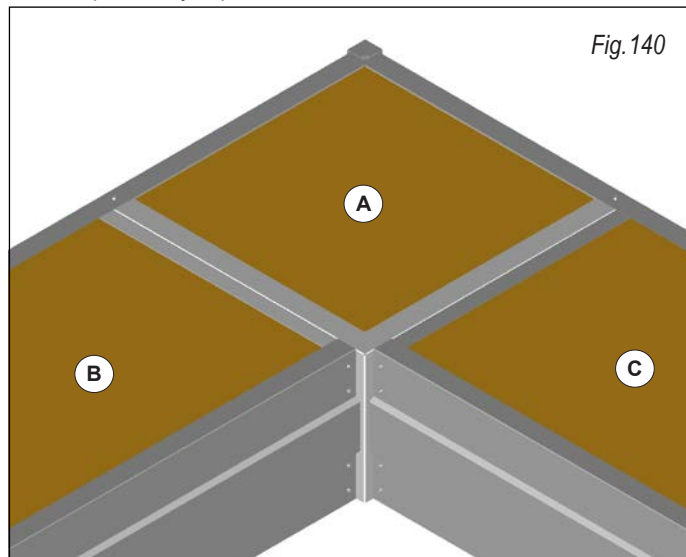
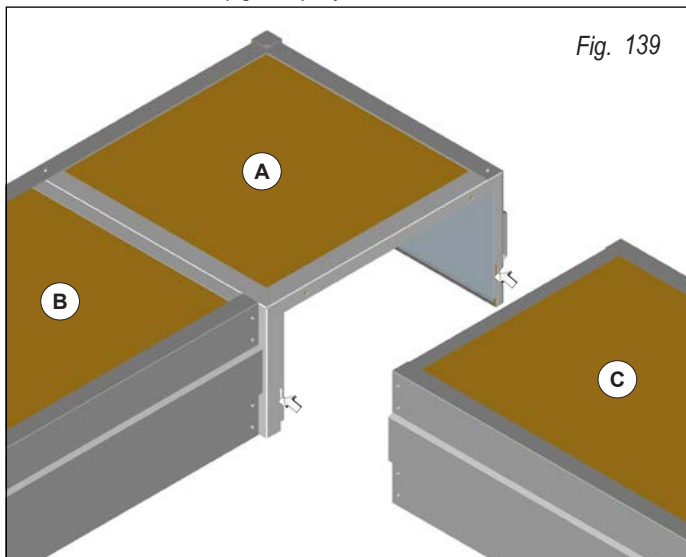
Fig. 136

A close up of the **tooth-slot** connection between the two radiant belt units is shown in fig. 135. The lateral flashing of the first unit has been removed for better viewing. The connection of the two radiant belt units by means of fastening the two frames with screw (D) and nut (E) is shown in fig. 136. The upper insulation in the two radiant belt units has been removed for better viewing.

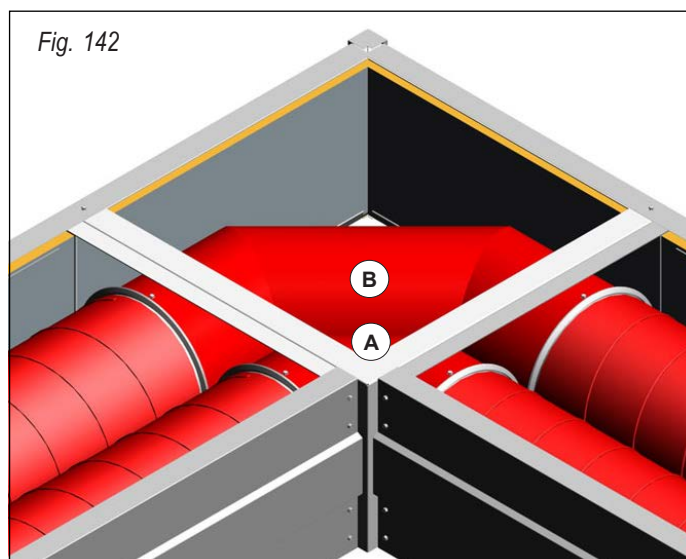
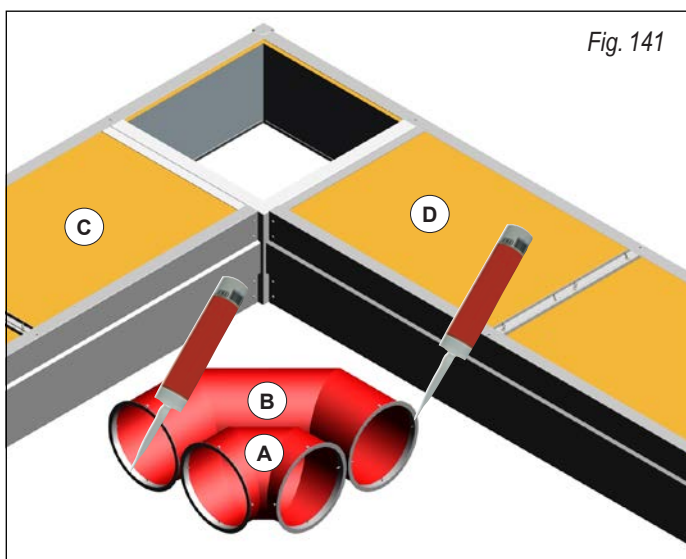
INSTALLATION OF RADIANT BELT UNIT AND ELBOW MODULE



Couple the elbow module **(A)** with the radiant belt unit **(B)** by means of the tooth and slot (fig. 137), as previously explained. Fasten the elbow module to the radiant belt unit (fig. 138), by means of the two frames with screw and nut as previously explained.



Couple the previously fastened elbow module **(A)** and the second radiant belt unit **(C)** by means of the tooth and slot (fig. 139), as previously described. Fasten the radiant belt unit to the elbow module with the two bolts (fig. 140).



Put a rim of silicone in both sides of the coupling flanges of the elbows as in fig. 141. Place the flanges of the short ray elbow **(A)** and the wide ray elbow **(B)** in the flanges of the first radiant belt unit **(C)**, engage the closing ring, fasten the two flanges with the nut and lock nut, see fig. 132. Carry out the same operations for the coupling of the flanged elbows to the second radiant belt unit **(D)**. The upper insulation of the belt and elbow module have been removed for better viewing of the elbows in fig. 142.

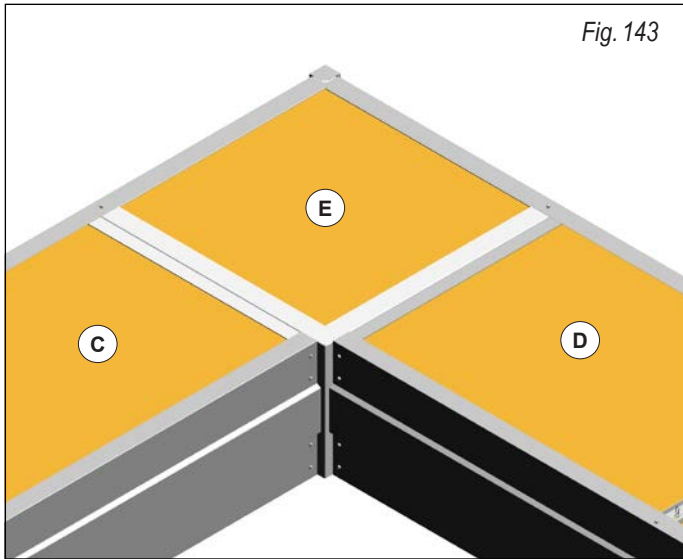


Fig. 143

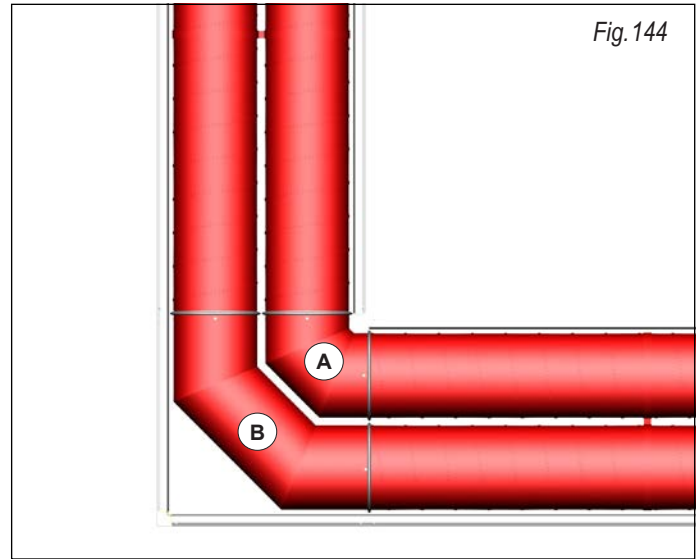


Fig. 144

The elbow module (E) is shown in fig. 143 (axonometric view) at the end of installation, the elbow module at the end of installation seen from bottom looking up is shown in fig. 144.

INSTALLATION BETWEEN RADIANT BELT UNIT AND CLOSING TERMINAL

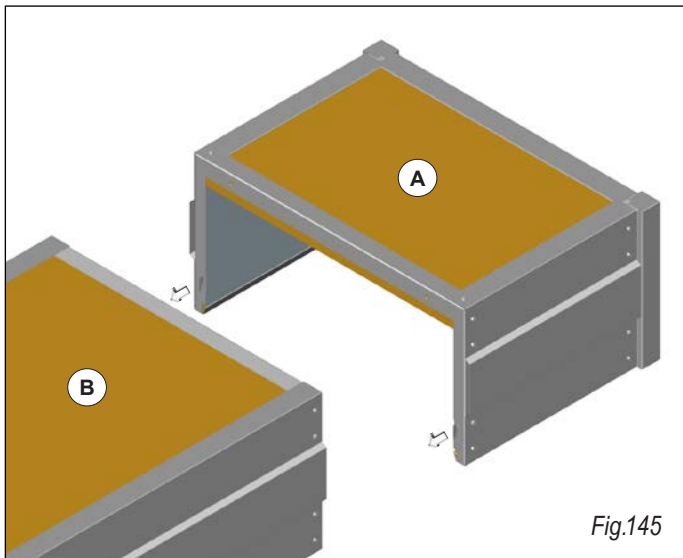


Fig.145

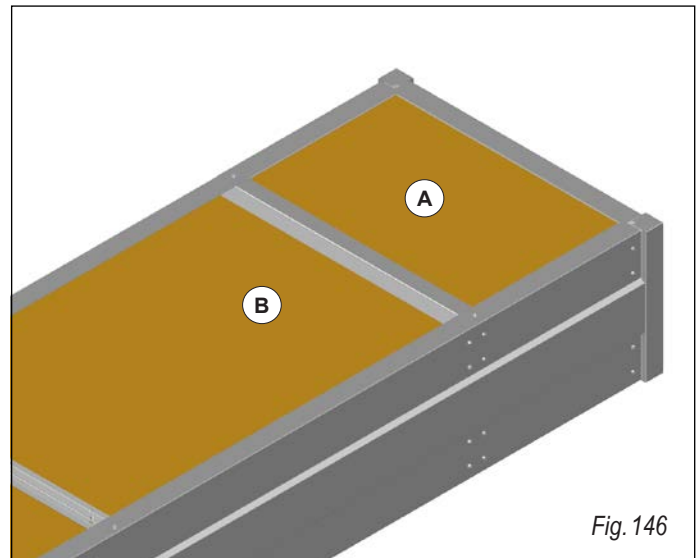


Fig. 146

Couple the terminal module (A) with the radiant belt (B) by means of the tooth and the slot (fig. 145), as previously explained. Fasten the terminal module to the radiant belt (fig. 146), using the two frames with screw and nut as previously described.

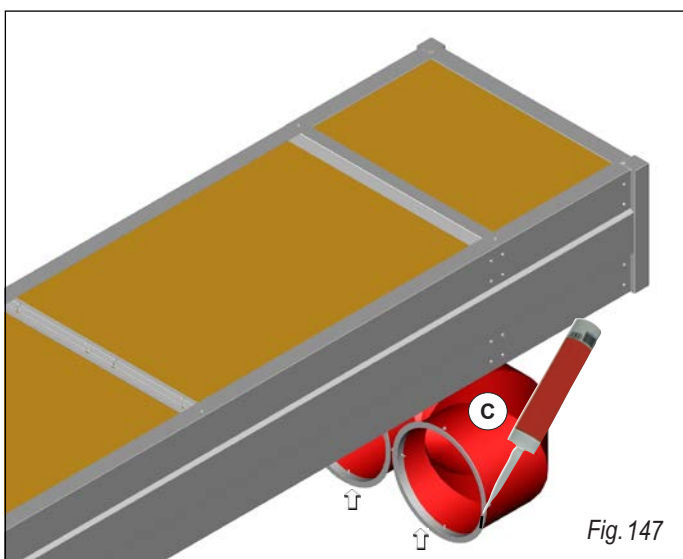


Fig. 147

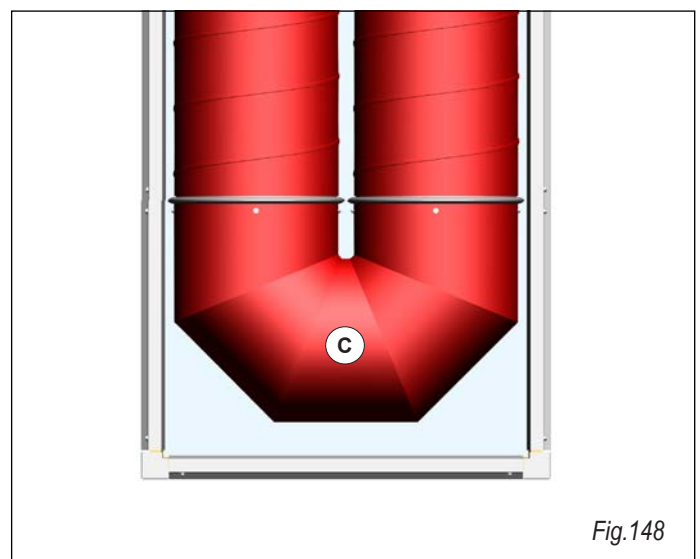


Fig.148

Put a rim of silicone in both sides of the coupler flange of the elbow as in fig. 147. Place the elbow flanges (C) in the flanges of the first radiant belt unit, engage the closing ring, fasten the two flanges with the nut and lock nut. The terminal module at the end of installation is shown in fig. 148 from the bottom looking up.

INSTALLATION OF 45° UPWARD HEIGHT VARIATION

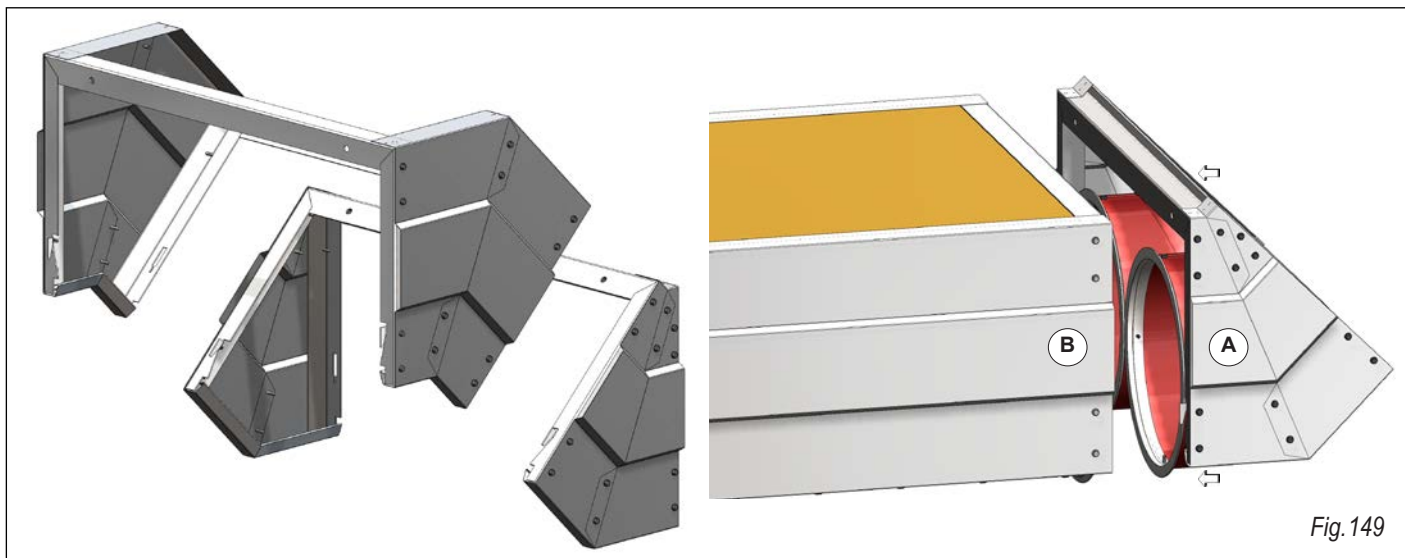


Fig. 149

Hook the kit for the height variation (A) with the radiant module (B) through the male tooth and the slot (Fig. 149), as previously explained.

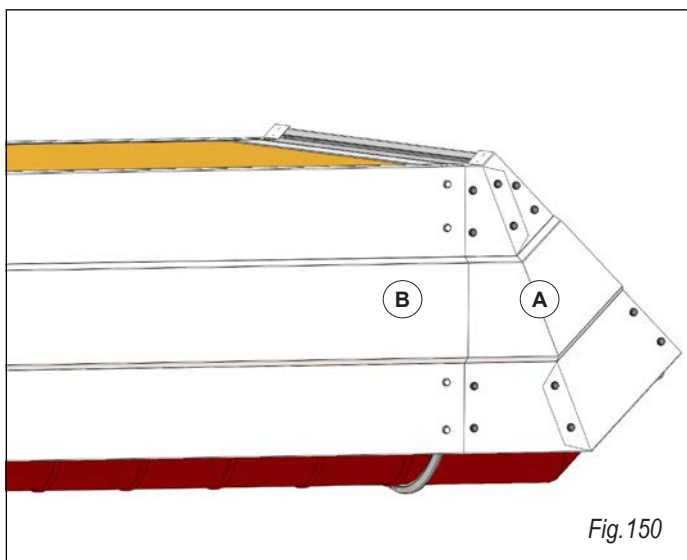


Fig. 150

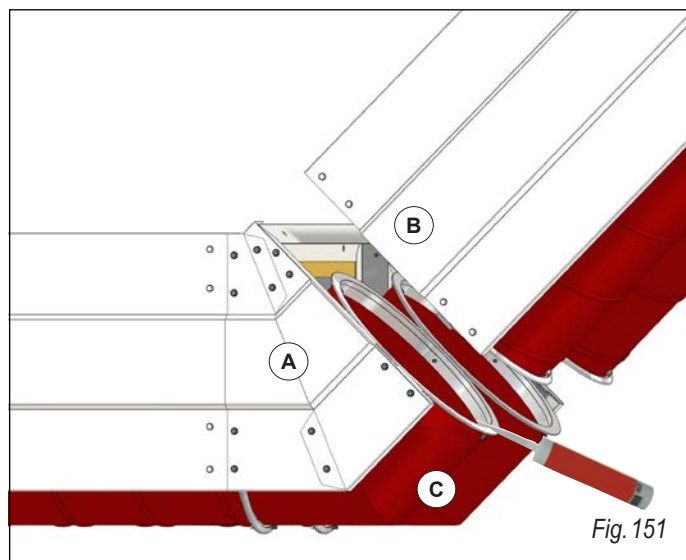


Fig. 151

Fix the first part of the height variation to the radiant module (Fig. 150). Put some silicone on both sides in the coupling flanges of the bend as in fig. 151 (C).

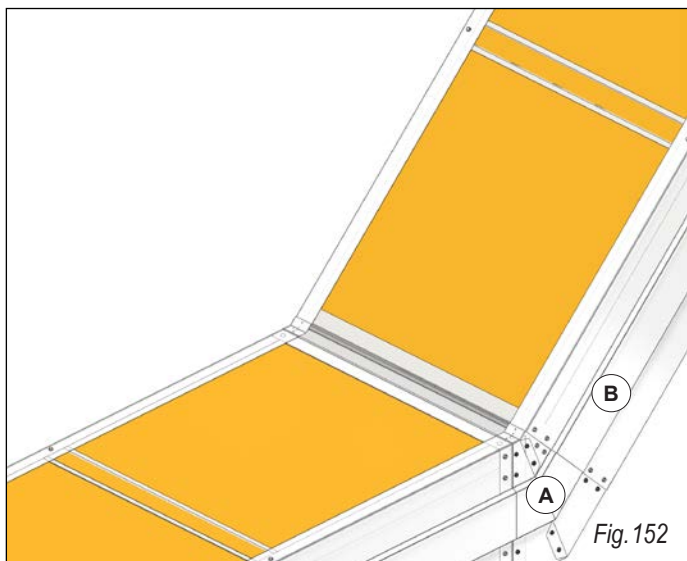


Fig. 152

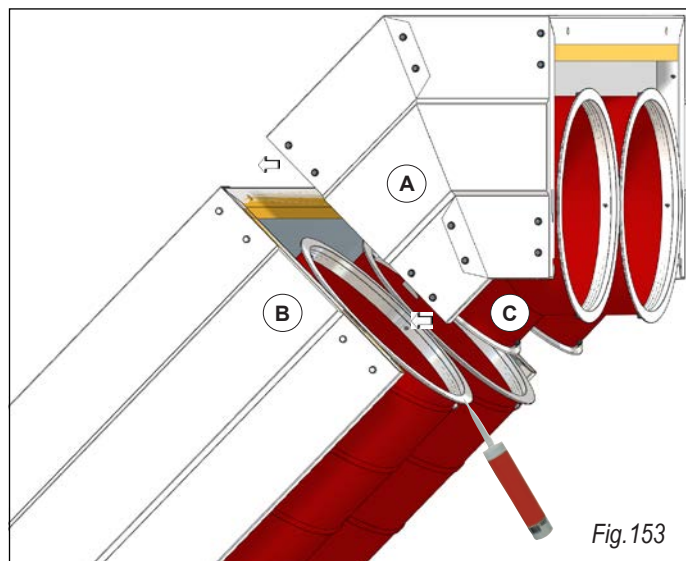


Fig. 153

Connect the kit (A) to the module (B) through the male tooth and the slot (fig.152). Put some silicone on both sides in the coupling flanges of the bend. Connect the second part of the kit for height variation (A) to the radiant module (B) through the male tooth and the slot (fig.153).

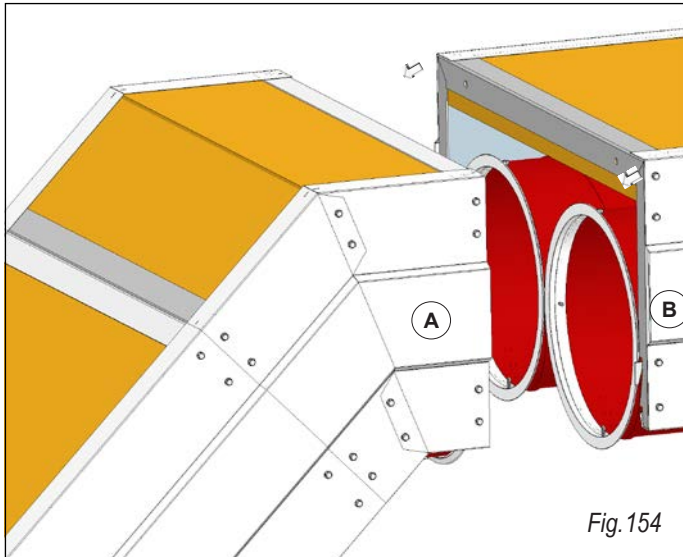


Fig. 154

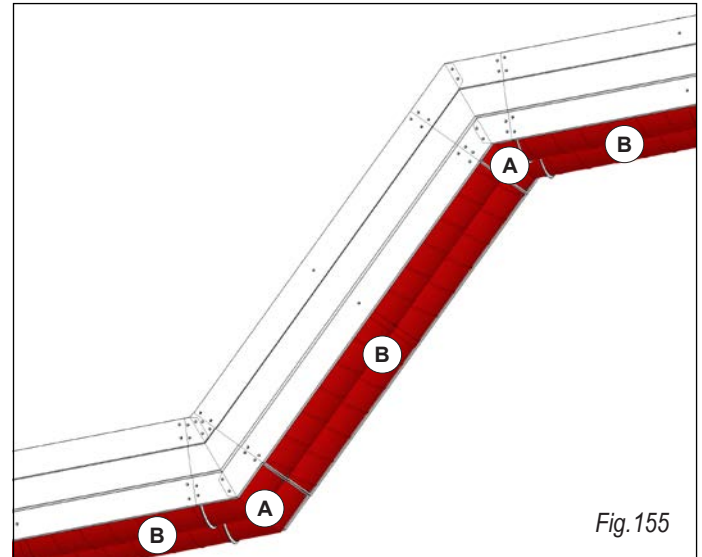


Fig. 155

Connect the kit to the following radiant module through the male tooth and the slot (fig. 154) so finishing the upward height variation (fig. 155).

INSTALLATION OF 45° DOWNWARD HEIGHT VARIATION

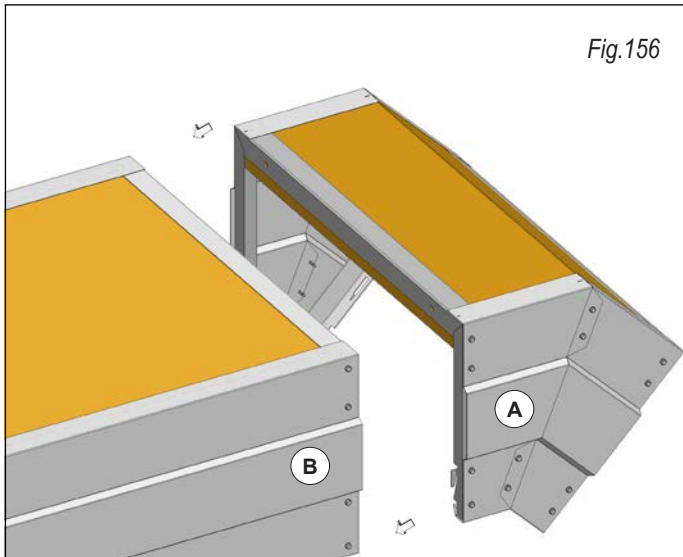


Fig. 156

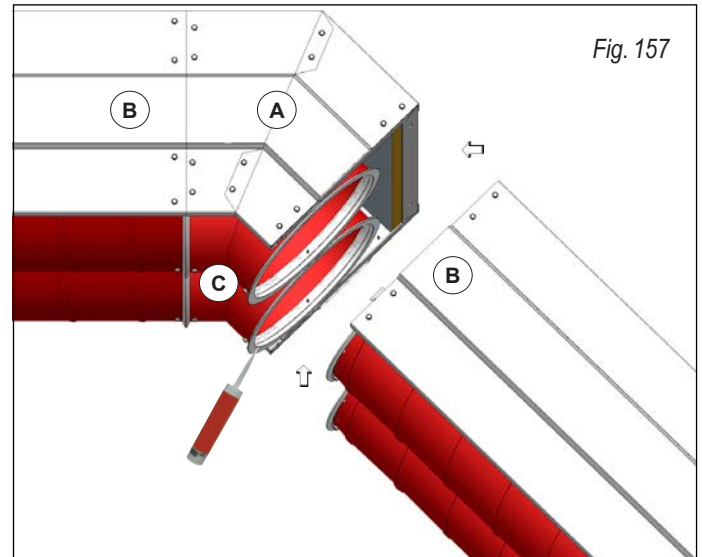


Fig. 157

Hook the change kit dimension (A) with the unit of radiant tape (B) via the nose piece and the slot (fig. 156), as explained previously. Fix the first part of the module change in proportion to the radiant tape (fig. 156). Spread on both sides in the coupling flanges of the curve a bead of silicone. Place the flanges of the bend (C) on the flanges of the previous radiant module, insert the locking ring, fix the two flanges by means of nut and locknut. Connect the kit to the following radiant module through the male tooth (fig. 157).

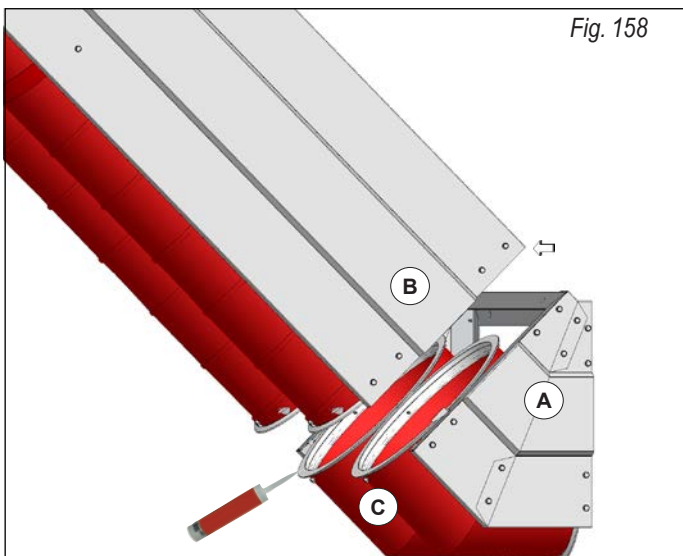


Fig. 158

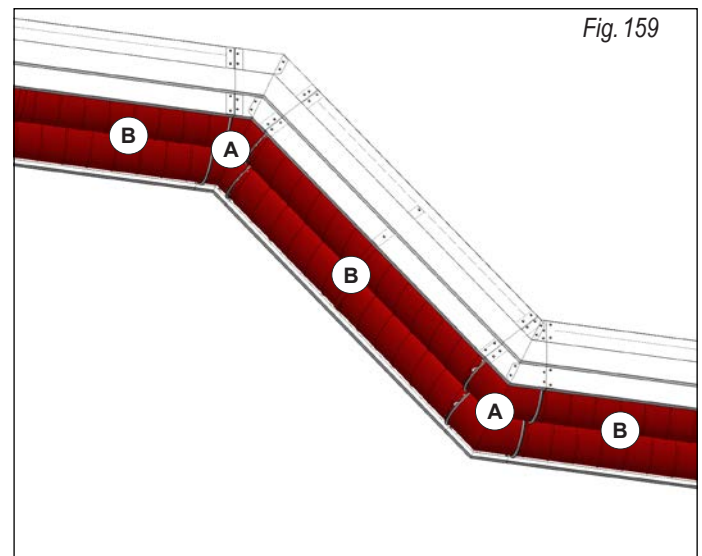


Fig. 159

Hook the second part of the kit variation dimension (A) with the unit of radiant previous tape (B) via the nose piece and the slot. Hook finally the kit to the next module radiant tape (B) via the nose piece and the slot (fig. 158) so finishing the upward height variation.

GAS FEED

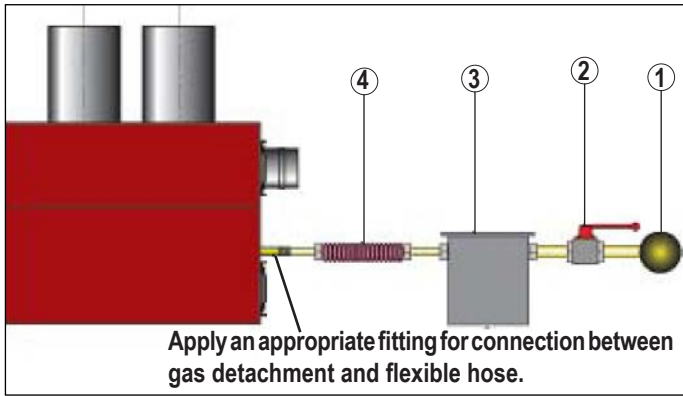


Fig. 160

The gas feed system can only be made by professionally qualified personnel and in compliance with laws in force of each country it is installed in. Size the gas feed piping according to the necessary capacity and pressure, providing safety and control devices established by the laws in force.

Close the shutter (2) during testing of the gas network.

An example of the connection of the generator to the gas line is shown in fig. 160.



MAXIMUM PRESSURE GAS VALVE 60 mbar

LEGEND:

- 1 = Main gas pipe
- 2 = Ball valve
- 3 = Gas filter/regulator with pressure teat connection
- 4 = Flexible tube

ELECTRICAL FEATURES OF THE GENERATORS

a) Feed the generator in the following way:

GSR50.1 with a single-phase line **230V/50Hz + neutral + ground** considering an absorption of **2,5 A**;

GSR100.2 with a single-phase line **230V/50Hz + neutral + ground** considering an absorption of **8,5 A**;

GSR100.1-GSR100.1E-GSR150-GSR200.1 with a single-phase line **230V/50Hz + neutral + ground** considering an absorption of **4,8 A**;

GSR300.1-GSR200.2 with a three phase line **400V/50Hz + neutral + ground** considering an absorption of **4,6 A**;

For HC versions consider that the pump absorbs 0.3 A and the heater has a power consumption of 3.8 A.

b) Install a differential magnetothermic automatic switch such as:

bipolar for GSR50.1 - GSR100.2 - GSR100.1 - GSR150 - GSR100.1E - GSR200.1;

tetrapolar for GSR200.2 - GSR300.1 for each generator, with the following characteristics:

GSR50.1 = 6A; GSR100.2 - GSR100.1 - GSR100.1E - GSR150 - GSR200.1 - GSR200.2 - GSR300.1 = 10 A;

I_{cn} = 6 KA; V_n = 400V; I_{Δn} = 0,03A

c) If this line feeds more than one generators, size a bipolar differential magnetothermic switch (GSR50.1-GSR100.2-GSR100.1-GSR100.1E-GSR150-GSR200.1), tetrapolar (GSR200.2 - GSR300.1), considering the real absorptions shown in **point a**. **When sizing the power supply network and the relative protections, note that the inrush current can reach values of about 5 - 8 times the rated current. The placing of the switch must be done so that it can be easily operated from the ground.**

The generator and all the equipment must be powered from a power supply, compliant with Directive CEI EN 50160. Shall Fraccaro identify any malfunctioning and/or equipment failure, the customer is obliged to provide certification of compliance of the main with the CEI EN 50160 regulation, along with the analysis report.

CHECK THAT THERE IS NO VOLTAGE BETWEEN THE NEUTRAL CONDUCTOR AND THE GROUND CONDUCTOR!

SERIAL NETWORK

1) The connection of the interface card located on the generators shall be executed by means of **shielded cable from AWG15 to AWG 20 WITH 4 TWISTED WIRES AND SHIELDING**.

2) Use **4-wire cables and twisted shielding** connecting the shielding to ground only on one side of each cable piece.

3) The maximum length of the connection cables of the circuit, including the pc where the supervision program is installed, shall not exceed 500 m and the **maximum number of machines is equal to 31**; the RS485 - ethernet converter connected to the PC is at position 32.

4) Before each system startup, verify the correct connection and communication of the BUS RS485.

5) If it is necessary to connect **directly the ethernet converter to the PC**, use a **cross cable**.

6) For connections **exceeding 500 m**, it is possible to install a **signal amplifier** (available as optional).

7) The AWG cable must be run in separated and dedicated race way.

8) In **alternative to the software PC** can be used a touch screen control panel **Franet Lite**. In this case the RS485 - ethernet converter are not necessary.

9) Connect the generator only in serial model network.

INSTALLATION OF GLOBEPROBE

1) The globe probe must be placed at a height of 1,80 m. from the ground, keeping the black semisphere turned towards the radiant belt. Has to be used a 4x0,75 mm² cable for connecting the globe probe to the generator.

2) Do not install the globeprobe **near the doors that communicate outside and at the beginning of the radiant circuit**, but place it half of this fixed on walls or columns placed within the environment.

INSTALLATION OF CRONO 30

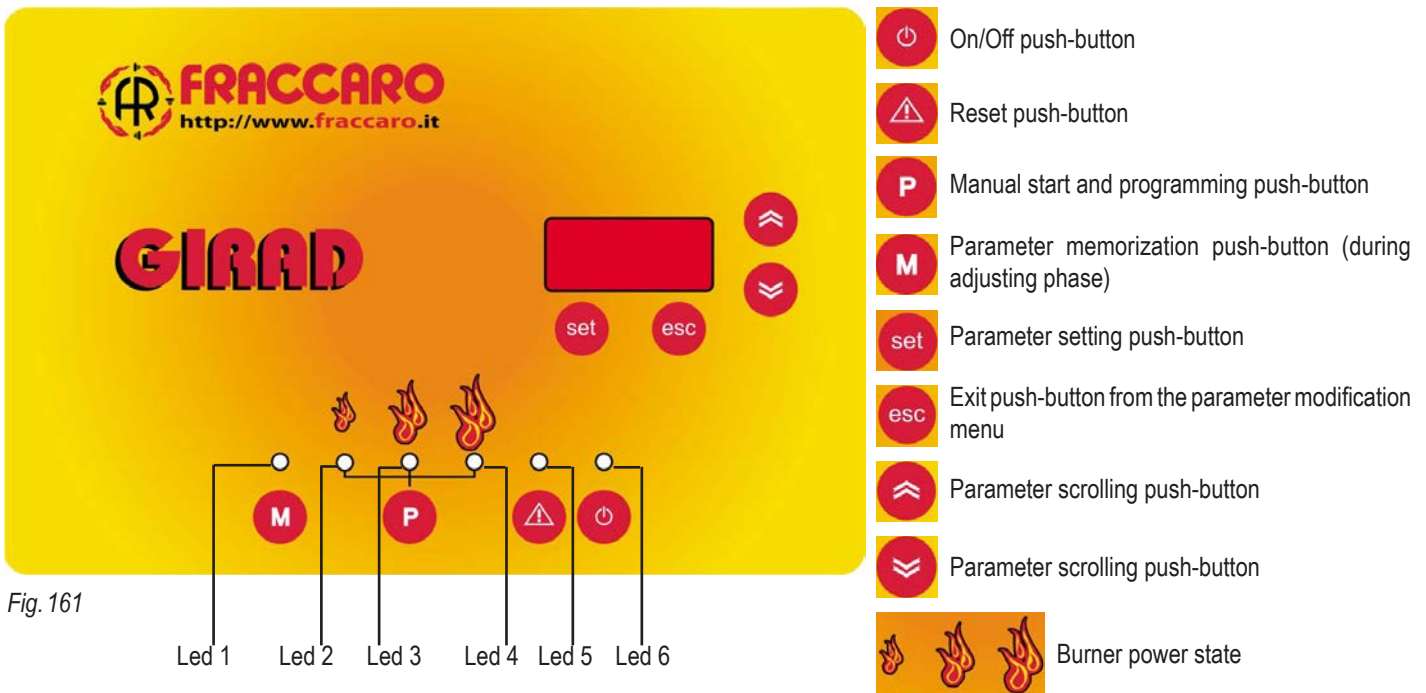
1) To control a single generator it is available a control board able to manage the time set, the calendar and view some data regarding the operation of the generator and globoprobe with including possible faults (see handbook for details).

2) The device works with open therm logic, requires no power and is to be installed at about 1.5 m from the ground.

3) Carefully follow **the package leaflet inside the CRONO 30 box**. It indicates how to connect the board that communicates with the other two cards in the control panel.

4) Use a **36 AWG cable or at least a two wire conductors shielded 0,75 mm²** and separate this from any other cable or high voltage with capacities greater than or equal to 1A.

THERMOREGULATION



START UP PHASE

Electronic board in off state: all the leds are off, the 7-segment displays show '---' symbol.

In this state:

- Adjusting of heat generator is allowed.
- Anti-frost feature is disabled.
- Burner start up requests are not allowed both in manual and automatic operating mode.

To begin the start up phase push "POWER" button more than 1 second.

Electronic board in on state:

- Led n° 6 is on.
- The 7-segment displays show the exhaust gas temperature value.
- Anti-frost feature is enabled.
- Burner start up requests are allowed both in manual and automatic operating mode.

To stop the burner push "POWER" button more than 1 second.

PARAMETER MODIFICATION

Modification of the parameters is allowed in the following operating condition:

- the electronic board is on or in stand-by mode.
- the adjusting operating mode is not set.

Activation and menu scrolling:

- Push the "SET" button for more than 3 seconds.
- Blinking of led n°6 and displaying '000' mean that it is possible to scroll the parameters.
- Use 'UP' and 'DOWN' push buttons to insert the password.
- Push 'SET' button to confirm.
- Use 'UP' and 'DOWN' push buttons to select the parameter.
- Push 'SET' button to confirm and to go into the parameter modification state.
- Use 'UP' and 'DOWN' push buttons to modify the parameter.
- Push 'SET' button to confirm the modification and to go back to the main menu.

Push 'ESC' button to exit from the parameter modification menu.

The board exits from this menu automatically after 30 minutes from activation

N.B.= Storage of parameter modification has effect exiting from the parameter modification function. After that the modified parameter values are enabled.

INTERFACE PARAMETER LIST

Tab. 13

PARAMETER		RANGE		DEFAULT	MEASUREMENT	PARAMETER		RANGE		DEFAULT	MEASUREMENT
		Min	Max					Min	Max		
P01	burner stop temperature	P02	255	80	1°C.	P16	modulating burner	OFF	ON	ON	
P02	modulation end temperature	P03	P01	70	1°C.	P17	minimum current	0	P18	0	mA
P03	modulation start temperature	50	P02	60	1°C.	P18	maximum current	P17	166	166	mA
P04	post-ventilation temperature	40	120	80	1°C.	P19	current variation speed	1	9	5	
P06	automatic gate enablement	OFF	ON	OFF		P20	anti-freeze temperature	0	35	8	1°C.
P07*	automatic shutter opening	0	P08	70	%	Read-only parameters					
P08*	automatic shutter closing	P07	P09	80	%	P21	round globe key position	Off / man / auto	//	//	
P10	gate opening in pre-ventilation	P09	100	100	%	P22	environment temperature	-30	40	//	0,1°C.
P11	environment probe correction	-5	5	0	0,1°C.	P23	external probe temperature	-50	50	//	1°C.
P15	burner number in modbus management	0	31	0							

It is not allowed to modify or access to all the operating parameters. Enabling the automatic shutter, some parameters are not accessible.

The default parameters are related to the card as a spare. Output of the card is already factory calibrated with the corresponding gas parameters, as shown in the table 18.

Enabling modulating burner:

Parameter P16 allows to enable the modulating burner:

- The default value of the parameter is 'OFF'.
- Enabling the modulating burner, parameters "P05" e "P09" are not accessible.
- Parameters "P17", "P18" e "P19" are accessible.

Enabling automatic shutter:

Parameter P06 allows to enable the shutter operating mode:

- The default value of the parameter is 'OFF' (automatic shutter not present).
- If the appliance does not require the shutter utilization, parameters "P07", "P08", "P09" e "P10" are not accessible.

Adjusting ambient temperature probe value:

Parameter P11 allows to adjust the correct value of the ambient temperature probe:

- The modification is reflected immediately in the parameter "P21".

'GLOBOSONDA' OFF STATE

In this state:

- Anti-frost operating mode is activated.
- All the thermoregulation requests are ignored.
- Adjusting operating mode is allowed.
- Post-purge period is always active. Updating the key position from "off-globo" to "man-globo" or "auto-globo" does not stop the possible post-purge operation.

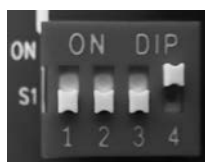
GLOBEPROBE CONFIGURATION

For the operation of globeprobe the dip-switch 4 must be set to "ON" (B). In case of detection of the temperature of a globeprobe not aligned with the others in the installation, you must configure the DIP switches 1 and 2.

In particular, setting the dip-switch 1 in "S1" and 2 in "S1" there will be a correction of + 1°C in reading the temperature (B). If you place the dip-switch 1 to "ON" and 2 in "S1" (C) there will be not be any correction, with the dip-switch 1 in "S1" and 2 "ON" (D) the correction will be -1°C and finally with both dip-switch to "ON" (E) correction of the globeprobe will be -2°C.



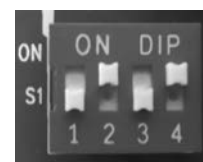
A - Sensor not connected



B - Sensor connected.
Probe correction +1°C



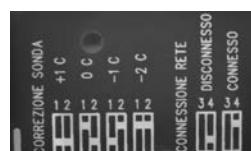
C - connected probe.
No probe correction



D - Sensor connected.
Probe correction -1°C



E - probe connected.
Probe correction -2°C



F - probe configuration diagram

MANUAL OPERATION WITH MODULATING BURNER AND AUTOMATIC SHUTTER ENABLED

To activate the manual operation the following conditions must occur:

- 'globosonda' key position "man-globo".
- Ambient temperature less than the value set in the 'globosonda' (Ambient temperature differential value 1st stage).
- Exhaust gas temperature less than threshold temperature 1 (-1°C).
- Absence of operating anomalies.

The total minimum time period between the start up request and the opening of the gas valve is never less than 35 seconds. During this period of at least 35 seconds, the shutter goes in the "pre-purge position". After the opening of the gas valve at the minimum power and after the flame detection, the shutter moves to the "minimum power position".

After the opening of the gas valve at the minimum power it is verified if there is the possibility to modulate the power:

- The temperature threshold 2 must be less than the exhaust gas temperature and this must be less than the temperature threshold 3.
- The ambient temperature must be between the minimum power ambient temperature differential value and the maximum power ambient temperature differential value.

The modulation of the power is related to the position of the shutter. Before to increase the power of the gas valve, the shutter has to move to the correct position. The time to reach the correct position of the shutter is proportional to the differential value of the input of the shutter in "minimum power position" and "maximum power position".

After decreasing of the power and increasing of the ambient temperature value, the shutter moves automatically in the correct position to have air modulation.

In case of shutter not enabled, the power modulation related to the exhaust gas temperature does not change.

AUTOMATIC OPERATION

To activate the manual operation the following conditions must occur:

- 'globosonda' key position "auto-globo".
- Ambient temperature less than the external set point value (Ambient temperature differential value 1st stage).
- Exhaust gas temperature less than threshold temperature 1.
- Absence of operating anomalies.

Operating modes:

- Program mode:

The burner starts the operation following the stored time slots to which is linked a different set point value. The programming of the time slots and the correspondent set point values is made through the FRANET supervisor software.

- Manual mode (supervisor mode):

The FRANET supervisor software directly starts the heat generator burner. This operation has priority respect the programmed time slots and the supervisor software manages the heat generator manually. This operation needs FRANET supervisor software always active and connected to the net.

AT THE FIRST START OF THE BURNER IN THE CALIBRATION MODE, IT IS ESSENTIAL TO ALSO PERFORM COOKING OF THE RADIANT TUBE, AS SHOWN IN POINT 8 ON PAGE 62.

MODULATING BURNER ADJUSTING MODE

Activation:

- The electronic board must be in the off state.

Led_1 blinking means that this operating mode is activated and the starting burner cycle begins immediately.

Before the access to the adjusting parameters, the burners operates modulating in base of the exhaust gas temperature. In this condition it is not allowed to force the maximum or minimum power pushing the "PROGRAM" button.

To access to the adjusting parameters:

- Adjusting operating mode is activated.
- Push the "SET" button for more 3 seconds.
- '000' blinking in the display shows that this operating mode is activated.
- Use 'UP' and 'DOWN' push buttons to insert the password.
- Push 'SET' button to confirm.

Modulating gas valve sequence:

- Led_2 begins blinking when the gas valves are at the minimum power.
- After a fixed time period of 10 seconds from the minimum power operating mode, led_3 blinks to show that it is allowed to go to the maximum power.
- Push the 'PROGRAM' button to go to the maximum power. Led_3 blinks to show that the burner operates at the maximum power.

Pushing again the "PROGRAM" button at the maximum power causes to go back to the minimum power.

After the modulation of the gas valves at the minimum and maximum power, the exhaust gas temperature values are not considered for the following 30 seconds. At the end of this period, if the temperature threshold related to the burner is less the exhaust gas temperature value, the heat generator goes to the minimum power or if necessary it stops.

In the modulating burner operating mode it is possible the use of the shutter.

The shutter moves to the position associated to the maximum or minimum power level position set by the operator after the pushing of the "PROGRAM" button.

The adjusting operating mode for modulating burner allows modifying 3 parameters:

- "Modulating current" parameter.
- "Shutter position" parameter.
- "Exhausting gas temperature" parameter.
- "Soft-start current" parameter (maximum speed of the current modification)
- "Off exhaust gas temperature T1" parameter.

The "Soft-start current" parameter and the "Off exhaust gas temperature T1" parameter are the same for both the power levels.

After the above mentioned modifiable parameters it is possible to read the exhaust gas temperature value in the "FUM" parameter (not modifiable). Before that the gas valves open to the minimum power, it is possible to adjust the shutter position correspondent to the pre-purge state pushing the "UP" and "DOWN" buttons.

The adjusting operating mode is confirmed by the presence of "Sec" in the display.

- Push "UP" and "DOWN" buttons to adjust the modulation current value (COR), the position of the shutter (SEC), if enabled, the exhaust gas temperature threshold (TEF) linked to the burner power, the soft-start modulation current (SPE) and the off exhaust gas temperature (T1).
- Push the "SET" button to access to the parameter.
- Use 'UP' and 'DOWN' push buttons to modify the parameter.
- Push 'SET' button to go back to the adjusting parameter menu.

N.B.= To store the parameter, push the "MEMORY" button for more than 1 second. The display blinking makes confirmation of the storage. The modifications of the parameters take immediately effect in the operation of the heat generator in the adjusting operating mode.

In this operating mode, if a parameter is modified but not stored, going back and re-entering the same power level, the parameter maintain the previously stored value. To fix a new value it is necessary to store with the above mentioned procedure.

Pushing the 'MEMORY' button if the access to the adjusting parameter operating mode or if you are not in the correct menu, in the display is shown "PAS" blinking.

Pushing the 'ESC' button you exit from the adjusting parameter operating mode and it is possible to read the exhaust gas temperature value. To go back into the adjusting parameter operating mode, push the 'SET' button for more than 3 seconds.

It is possible to exit from the adjusting parameter operating mode pushing the 'POWER' button for more than 1 second. The board goes automatically to the ON state and the not stored modifications of the parameters are lost.

POST-PURGE SET

Operating mode to start and end the post-purge function:

- FAN ON → Exhaust gas temperature must be greater than or equal to the post-purge temperature (+1°C).
- FAN OFF ← Exhaust gas temperature must be less than or equal to the post-purge temperature (-1°C).

The post-purge function is independent from the heat request and it is always linked to the actual exhaust gas probe temperature value.

EXHAUST GAS PROBE DAMAGED

The post-purge function is not activated.

POST-PURGE FUNCTION DURING ADJUSTING OPERATING MODE

The post-purge function is always activated when the adjusting operating mode ends even in case of “off-globo” state.

AUTOMATIC SHUTTER POSITION DURING POS-PURGE FUNCTION ACTIVATED

During post-purge function, if automatic shutter is set, the shutter is maintained closed.

ANTI-FROST PROTECTION

Independently from the position of the key of the “globosonda”, the anti-frost protection is always activated. The rules to manage the shutter and the opening of gas valves are the same both in manual and automatic operation.

Operating mode to start and end the anti-frost protection:

- Default activation threshold of the anti-frost protection = 8°C.
- The modulating operating function manages the power request during the anti-frost protection.

The activation threshold of the anti-frost protection is modifiable by the FRANET supervision software.

The activation threshold of the anti-frost protection is the lower value of the thermoregulation values. In case of manual operation set by the “globosonda”, if the set up is less than the activation threshold of the anti-frost protection, this threshold is used to set the power of the burner.

HEAT REQUEST MANAGEMENT

The heat generator works only if the “globosonda” is connected.

If the “globosonda” is missing or damaged there is only emergency operation.

Main operating mode descriptions:

- Manual operation → Operation based on the ambient temperature value by the “globosonda”. The heat request is always enabled.
- Manual operation by the supervisor software → Operation based on the ambient temperature value by the “globosonda” and by the supervisor. The supervisor activates the heat request. The function is enabled only if the supervisor software is connected to the net. The supervisor software can stop the single heat generator (OFF set); also the OFF set up mode is activated only if the supervisor software is connected to the net.
- Automatic operation → Operation based on the ambient temperature and on the set up value stored in the time-slot programs. The heat request is linked to the time-slots stored into the electronic board present in the heat generator.
- Emergency operating mode by the supervisor → No regulation. The supervisor software manages the heat request and it is limited to intervals of 30 minutes ON and 15 minutes OFF by the electronic board present in the heat generator.
- Emergency operating mode by the electronic board → No regulation. The time slots stored into the electronic board present in the heat generator manage the heat request and it is limited to intervals of 30 minutes ON and 15 minutes OFF by the electronic.
- Supervisor log out → In absence of data transmission between the supervisor and the electronic board for more than 4 minutes, the electronic board log out the supervisor.

ANOMALY TABLE

Description	Displayed error	Cause	Effect	Type of reset	Solutions
Flame detection anomaly	E02	Burner flame not detected for ignition cycle purposes	The ignition cycle does not start or stops immediately	Manually, from the machine, manually from Crono 30, automatic from Franet if active	Air in the gas pipe, gas outgoing pressure during ignition too low, hearth shutter too open with consequent flame tear, ignition and detection electrode in short circuit or placed in an inaccurate position, incoming gas pressure too high (over 60 bar), possible malfunctioning of the flame control board
Anomaly of probe PT 1000	E03	Failed communication between the probe fumes and the card	The ignition cycle does not start or stops	Volatile recovery reset	Replacement of smoke probe
Air pressure switch anomaly	E05	Air pressure switch with permanently open or closed contact	The ignition cycle does not start or stops	Volatile recovery reset of the air pressure switch contact	"Chimney effect" due to always enabled pressure switch contact, pressure switch calibration too high and when operating the contact opens, blocked silicone tubes and/or not housed in the appropriate slots, ongoing blocked pressure switch, possible malfunctioning of the flame control board
Gas pressure switch anomaly	E08	Gas pressure switch with open contact	The ignition cycle does not start or stops	Volatile recovery reset of the gas pressure switch contact	Check by means of the tester the continuity between the terminals of the gas pressure switch to understand the condition, possible malfunctioning of the flame control board
Fan thermal anomaly	E10	Motor anomalous drain (closed contact)	The ignition cycle does not start or stops	Volatile recovery reset of normal conditions	Check motor capacitor conditions, if broken or burnt motor must be replaced
Fan phase anomaly (GSR200.2-300.1 only)	E11	A supply phase is inverted (open contact)	The ignition cycle does not start or stops	Volatile recovery reset of normal conditions	Motor rotation phase to be reversed, if the motor turns properly, replace the module of the phase control
Damaged environment probe	E13	Open contact or short circuit	Manual: the ignition cycle does not start Automatic: timed ignition cycle	Check or replacement of probe	Faulty probe to replace
Round globe interface disconnected	E23	Wrong connection	Manual: the ignition cycle does not start Automatic: timed ignition cycle	Check the wiring or the connection cable	Wrong connection between interface board and terminal board of spheroidised probe, check connection
Round globe trimmer damaged	E33	Accidental breakage	Manual: the ignition cycle does not start Automatic: regular ignition cycle	Check or replace the component	Faulty probe to replace
Anomaly of modulator current	E35	Damaged coil solenoid valve wiring	Operation only first stage	Replacement	Replace board cod. 1098004
Power card electronic anomaly	E52	Damaged card	The ignition cycle does not start or stops	Replacement	Electrical reset of the control panel, if the error persists, faulty flame control board
Interface card electronic anomaly	E53	Damaged card	The ignition cycle does not start or stops	Replacement	Electrical reset of the control panel, if the error persists, faulty interface board
Drained battery anomaly	E60	Drained battery or not synchronize with Franet	Loss of timetable schedules	Replacement	Loss of time and date of the machine, check by means of the tester the battery voltage, reset from Crono 30 or Franet, as described in the next paragraph. For the reset by Crono 30 device, check the relative instructions manual.
Communication fault with interface card	E74	Lack of communication between the 2 cards	The ignition cycle does not start or stops	Replacement	Replacement of board cod. 1098001
Communication fault with card for flame control	E75	Lack of communication between the 2 cards	The ignition cycle does not start or stops	Replacement	Replacement of board cod. 1098000
Communication fault with Crono 30	E88	Lack of communication between the 2 cards	The ignition cycle does not start or stops	Replacement	Replacement of board cod. 1098070
Fault remote resets terminated	E99	Fault resets of the card terminated	Generator block	It is necessary to reset the flame control board for at least 10 sec	Reset with electric reset from machine, Fraccaro intervention recommended for search of failure

Alarm reset procedure in case of 'Low battery anomaly':

Tab. 14

1. Log out the FRANET supervisor software.
2. Switch off the power supply and substitute the battery in the electronic board.
3. Switch on the power supply of the heat generator electronic board.
4. Log in the FRANET supervisor software: the E60 anomaly code is still present.
5. At the end of the automatic weekly programming phase, log out the FRANET supervisor software.
6. Switch off and on the power supply of the heat generator electronic board.
7. Log in the FRANET supervisor software: the anomaly code is removed.

MANUAL AND AUTOMATIC RESET FROM LOCK-OUT STATE

The FRANET supervisor software is able to reset the burner control from the lockout state. The reset function is in conformity to EN14457 standard (maximum 4 reset attempts in 15 minutes). The remote reset function is possible only with the FRANET supervisor software connected.

PRE-IGNITION OF THE BURNER ON THE BASE OF THE WALL INSULATION AND THE EXTERNAL PROBE TEMPERATURE

The pre-ignition allows having the ignition of the first stage burner in advance considering the wall insulation and the external probe temperature. This function is activated only in automatic operation on the base of the described rules. The supervisor software enables the pre-ignition function and there are 4 set levels, other the off level, on the base of the wall insulation:

- Off (the anti-frost function is disabled if temperature is more than 15°C).
- Very good.
- Good.
- Poor.
- Very poor.

EXTERNAL TEMPERATURE	BUILDING INSULATION TYPE				
	EXCLUDED	EXCELLENT	GOOD	AVERAGE	POOR
[°C]	ignition advance [min]				
-20		120	180	240	255
-18		115	171	228	252
-15		110	157	210	246
-13		106	148	198	242
-11		101	139	186	238
-9		97	130	174	234
-7		92	121	162	222
-6		88	117	156	216
-5		83	112	150	210
-4		78	108	144	204
-3		74	103	138	198
-2		69	99	132	192
-1		65	94	126	186
0		60	90	120	180
1		54	87	117	174
2		48	84	114	168
3		42	81	111	162
4		36	78	108	156
5		30	75	105	150
7,5		15	67	97	135
10		0	60	90	120
Above 15	Pre-ignition excluded				

Tab. 15

MONITORING NUMBER OF IGNITIONS AND OPERATING HOURS

The FRANET supervisor software is able to monitor the number of successfully ignitions and the total number of operating hours of the heat generator. The total number of operating hours of the modulating burner is associated to a typical range of power of the heat generator. There are 3 ranges of power expressed in percentage respect the maximum power of the generator:

- 0% <= Minimum power range <=70%
- 70% < Medium power range <=85%
- 85% < Maximum power range <=100%

The number of the ignitions shows the number of correct ignition cycles of the heat generator after a heat request.

PANEL FUNCTIONAL ELECTRIC DIAGRAM

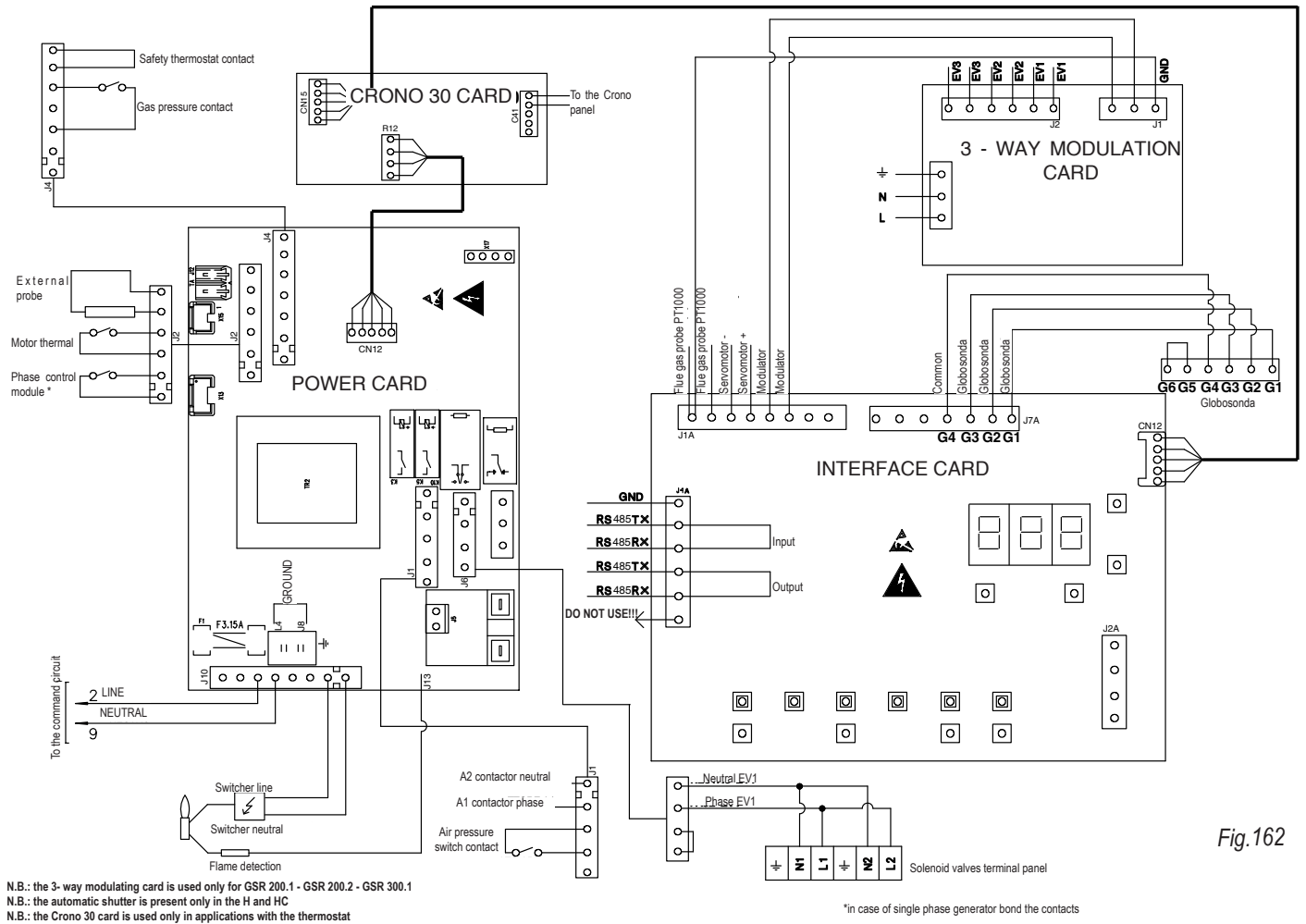
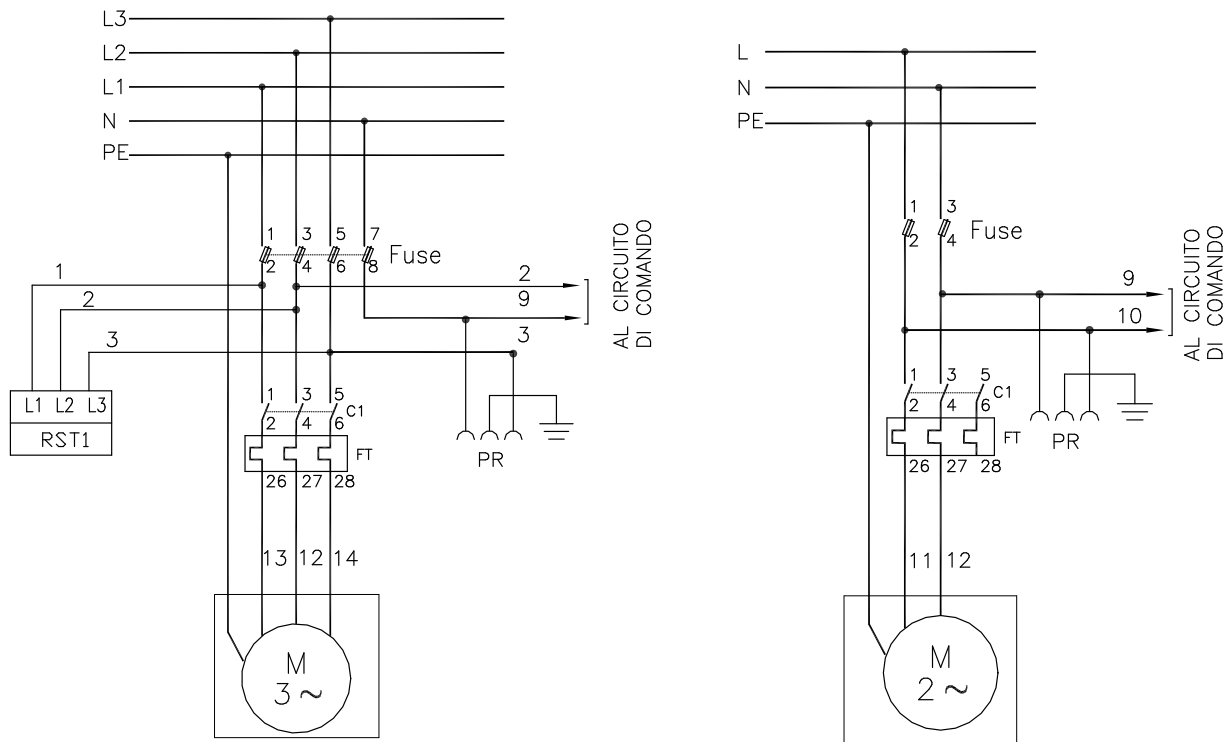


Fig.162

PANEL POWER ELECTRIC DIAGRAM



Components	Q.ty
Mod. 50.1-100.2 relé termico Lovato II RFNA 9.33 2-3.3A	1
Mod. 100.1-115-150-200.1 relé termico Lovato II RFNA 9.10 6-10A	1
Mod. 300.1 relé termico Lovato II RFA 9.75 4-7.5A	1
Modelli GSR 50.1-100.2 Fusibile aM 6A	1
Modelli GSR 100.1-115-150 Fusibile aM 10A	1
Modello GSR 300.1 Fusibile aM 10A	3

RST1: phase control relay.
 FT: motor thermal safety.
 C1: remote switch.

Fig. 163

OPERATION OF THE 3-WAY MODULATION CARD (GSR200.1 - GSR200.2 - GSR300.1)

In the 3 way modulation card, set the dip-switch (SW1) to ON (see below).



Third valve modulator operating



Third valve modulator not operating

Fig. 164

Supply the card as indicated in fig. 163; it will replicate the current to the modulating valve 1, 2 and 3 depending on the number of valves. If the modulating valves are two, set the dip-switch 1 to OFF; if the valves are three, set the dip-switch 1 to ON. In standard operating conditions, the led DL1 remains ON, yet in case of an anomaly in the connection to second and third valve (if any) they are OFF and the first one as well is electronically disconnected, with resultant flashing of led DL1. To restore the system and repair the anomaly of the equipment, it is necessary to remove the voltage from the control panel.

ELECTRIC WIRING BETWEEN GENERATOR, FORCED CONVECTION HEATER AND CONDENSER PUMP

For the connection between the generator terminal panel and the pump using the cable provided by 3x1,5 mm². The pump has three speeds and is recommended to adjust maximum speed (56 W).

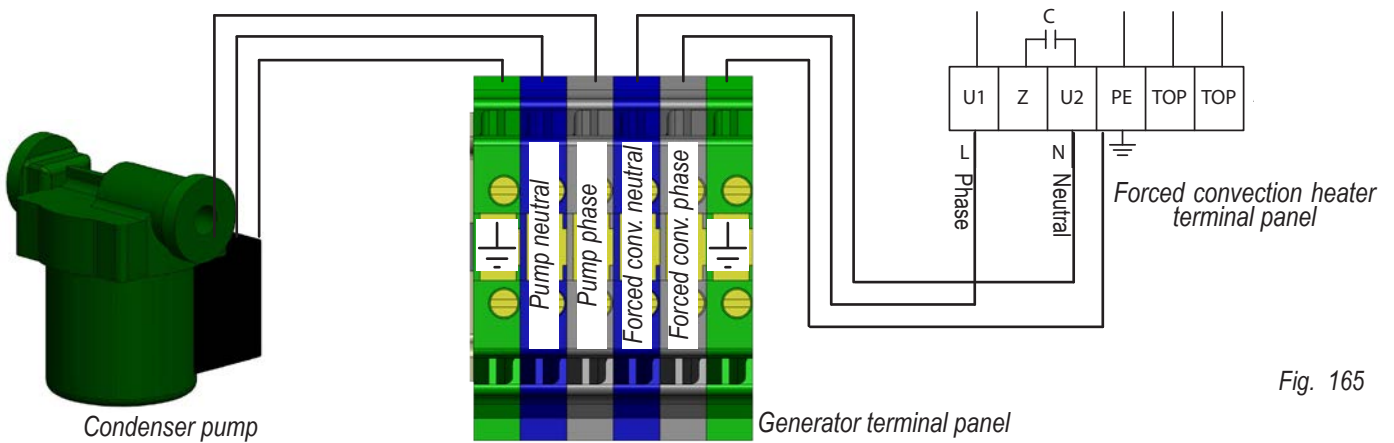


Fig. 165

ELECTRIC WIRING WITH CONTROL PANEL CRONO 30

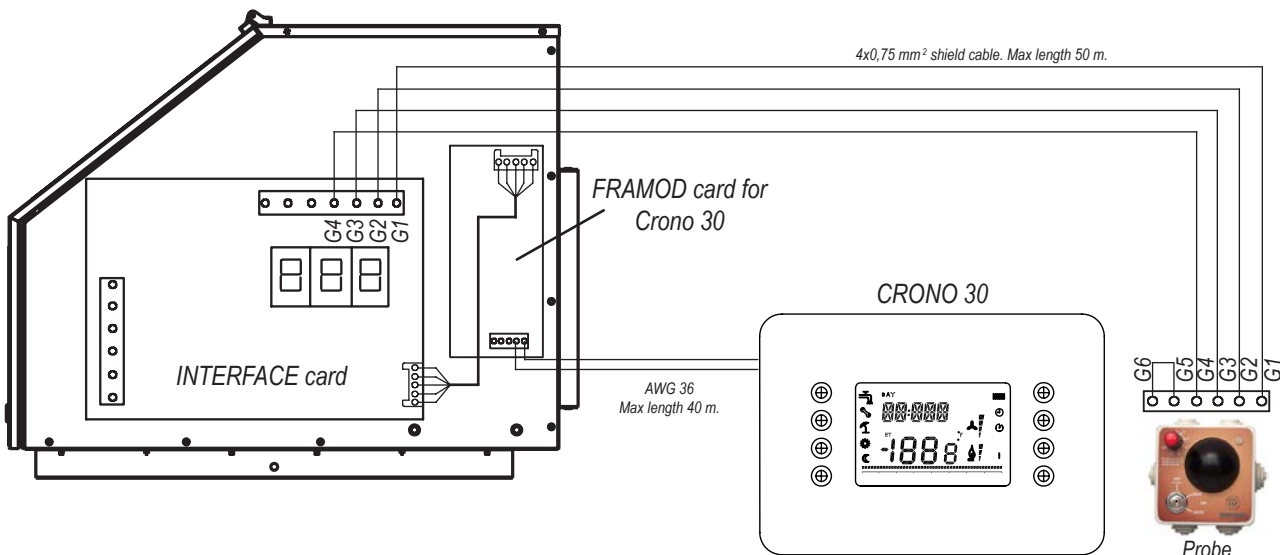


Fig. 166

CONNECTION WITH FRAMOD CARD AND INTERFACE CARD

Follow carefully the instructions which is into the Crono 30 box.



- Connect the longer "flat" to the Framod card.
- Connect the shorter "flat" to the Interface card.

ELECTRIC WIRING OF THE FRANET NETWORK

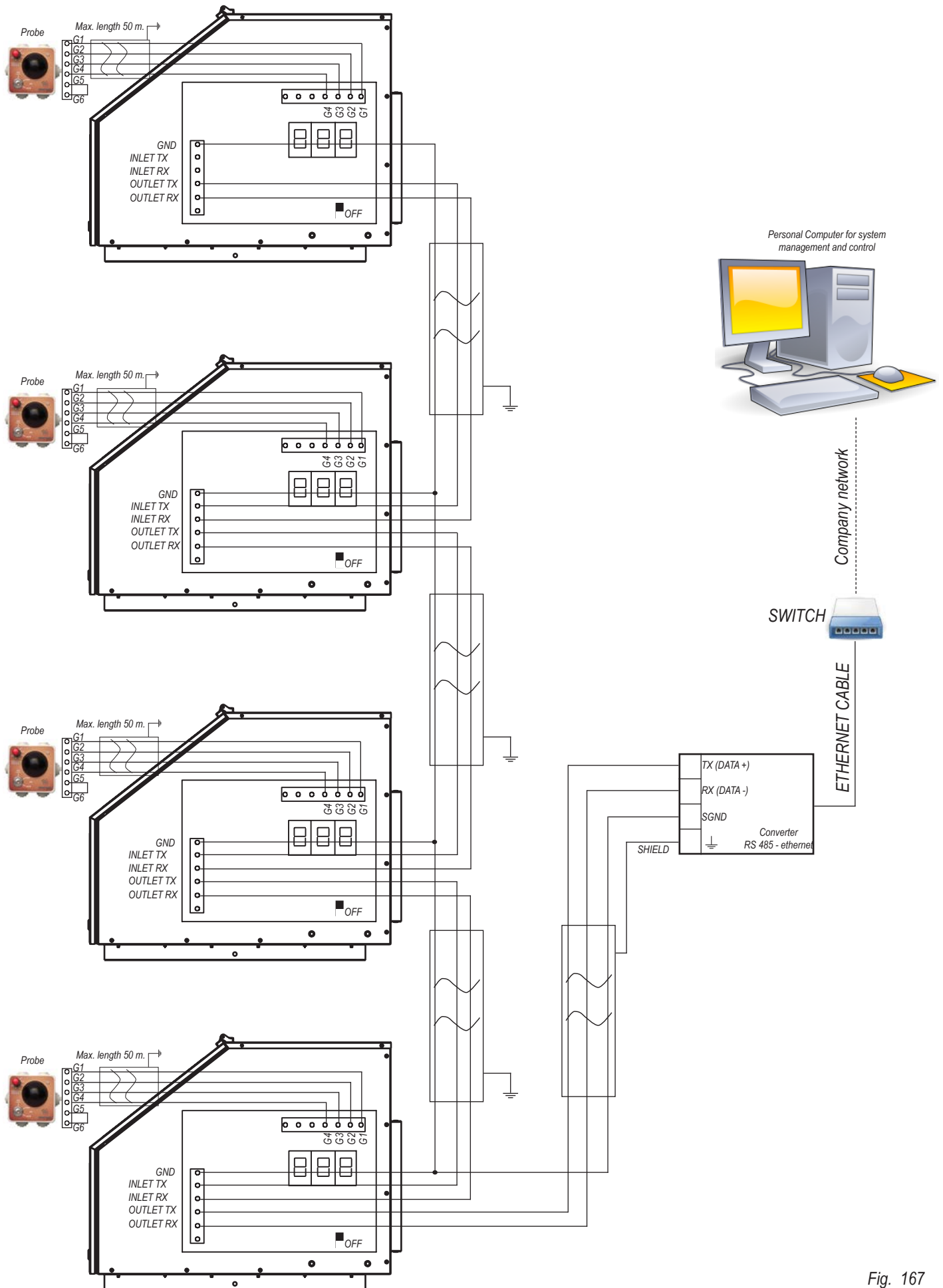


Fig. 167

ELECTRIC WIRING OF THE FRANET NETWORK PLUS

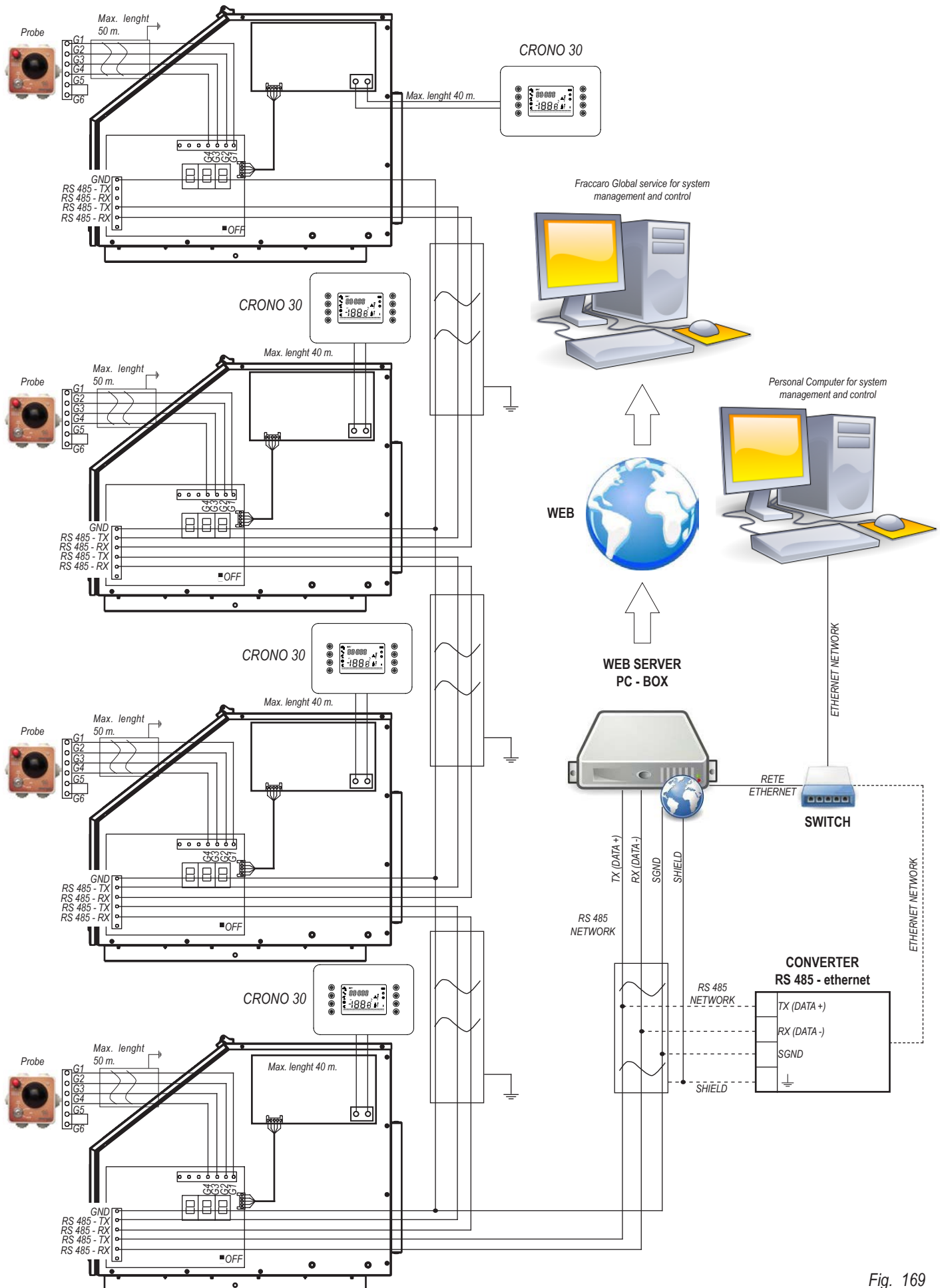


Fig. 169

ELECTRIC WIRING OF THE FRANET NETWORK WITH CONDENSATION GSR



See pag. 60 for the serial electric wiring between generator and Franet network.

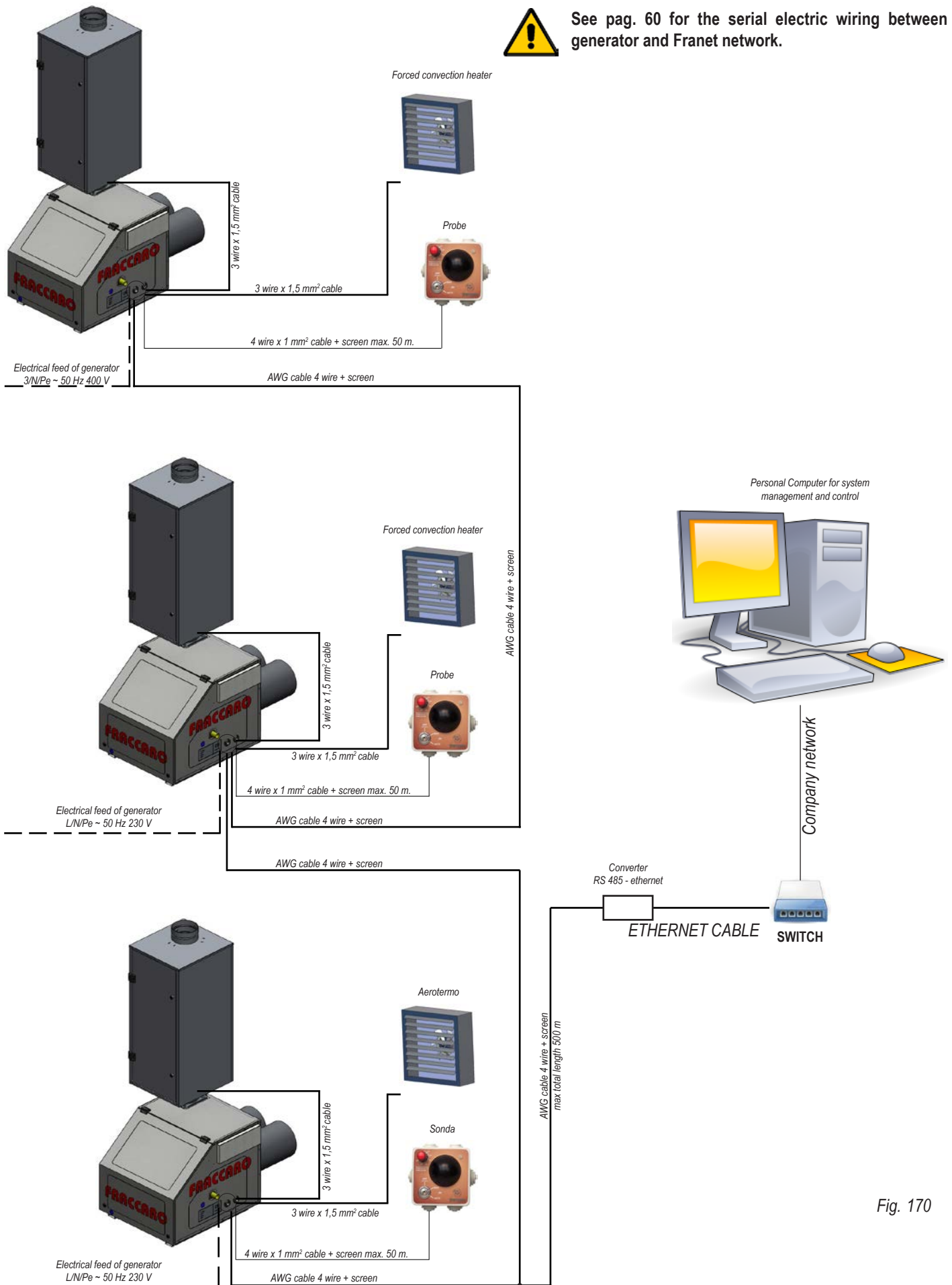


Fig. 170

START UP AND CALIBRATION OF THE GENERATORS FOR AUTHORIZED TECHNICIAN OR CAF**FRACCARO S.R.L. WAIVES ANY LIABILITY FOR DAMAGES CAUSED TO GOODS OR PERSONS DUE TO NON COMPLIANCE WITH THE FOLLOWING INSTRUCTIONS.**

To start the Girad generator, the following instruments must be available:

- a) combustible gas analyser for gaseous combustibles;
- b) 0 - 50 mbar scale pressure gauge to measure gas pressures;
- c) thermometer with contact probe scale 500°C or laser pyrometer.
- d) to measure and check the pressure of the incoming gas unscrew the screw and insert the manometer in the pressure socket no. 1 (fig. 171).
- e) to measure and check the pressure of the outgoing gas unscrew the screw and insert the manometer in the pressure socket no. 2 (fig. 171).
- 1) Verify that on the control panel of the generator, the fuse disconnecter is in open position, then provide voltage to the generator. Set the round probe to the manual state (MAN).
- 2) Verify that phase, neutral, and ground for GSR50.1 - GSR100.2 - GSR100.1 - GSR200.1 (three phases, neutral and ground for GSR200.2 - GSR300.1) correctly reach the generator supply input terminal panel.
- 3) Let the gas flow to the generator and check that the type of gas and the pressure correspond to the values listed on generator plate.
- 4) Close the fuse disconnecter and verify the rotation direction of the motor. If there is the condenser, simultaneously with the switch on of the generator extractor, the pump inside the condenser and the forced convection heater fan activate.
- 5) After having identified the first and the last generator of the system, set the DIP switch located inside the electric panel behind the interface card to OFF. The purpose of this procedure is to stabilize the dialogue between the generators and the supervision program installed on the PC.

The supervision program communicates with the different generators by means of a modbus address: it is necessary to provide each burner with an identification number whose value is 1 to 31. Then it is necessary to access the burner parameters. Press for approx. 3 seconds the "SET" button and enter the password using the browsing buttons. Press again "SET" to confirm the password and access the parameters (pag. 64). We recommend to assign number 1 to the first generator of the system and to assign increasing numbers to the following ones (parameter P15).

- 6) Press the card switch on/off button, to view the temperature of the flue gas probe.
- 7) With the card OFF (---), press the programming button "P" for about 5 seconds to start the burner in manual mode.
- 8) At the same time, the burner performs the pre-washing cycle (approx. 40 seconds) and if there is the servomotor the gate moves to its default position (100% open). Error E05 may temporarily display due to its opening time. During pre-washing, the display shows "SEC" and pressing the "SET" button, it is possible to change the position of the gate in pre-washing stage. The maximum value of chimney gate closure during pre-washing shall never be less than the opening position at maximum power. Once the value is set, press the button "M" for about 3 seconds to store the setting.
- 9) After switch on and ensuing flame detection, the burner starts at minimum power with led 2 flashing; pressing the "SET" button and accessing the parameters of the burner it is possible to change the switch off temperature threshold "TEF", to calibrate (if enabled) the motorized chimney gate "SEC", to change the opening speed of the modulator and change the flue gas temperature; During first switch on, varnish polymerizes. In fact the surface temperature of the tubes shall gradually increase and shall reach its maximum in about 2 hours, following this procedure:

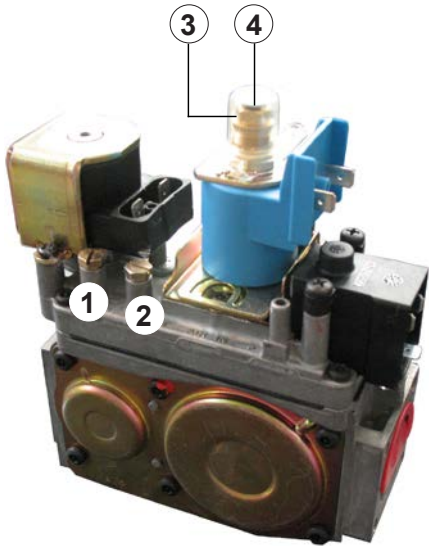


Fig. 171 Gas solenoid valve

a) 320 - 350°C choose the range that maximum temperature of the radiant belt; this temperature is measured on the inlet belt to the top of the second module (between 4 and 16 m from the generator), and in the same time verify the fumes temperatures (for ex. 150°C). For the better combustion adjust the position of the chimney servo motor with "SEC" parameter; now set up the START temperature of modulation (P03 parameter) that is corresponding to the temperature fumes value with less 5-10°C (for ex. 145°C); leave the set temperature END modulation at 190°C. Memorize the temperature with the "M" button and go out of the calibration mode with "ESC" button.

The burner have to starting at maximum power for heating quickly the radiant belt to get to the value temperature fumes of P03 (in the example 145°C) and starting the modulation (in the range of 145°C - 190°C) and consequently the flame and the gas input go down.

b) after a while the generator to get to the balance and the fumes temperature stops increasing. This is because the maximum temperature will remain more or less constant, but the average, return and the flue gas will continue to rise due to the inertia of the recirculation also. At the equilibrium value (for example, 160°C) Set the new temperature END modulation with an increase of 5 - 10°C (P02 will be of 165°C). Enter in calibration mode, insert the password and at the minimum power change the TEF parameter for to set the new temperature of end modulation.

In the end, power off the generator and stating another one cycle and verify that the set up the chimney servomotor (if it present) in pre-ventilation it's correct and the burner starts up.

Remove the protective plastic cap applying a force on the edge, connect the pressure gauge to the outgoing pressure socket indicated with no. 2, adjust the **minimum mechanic pressure** operating screw no. 4, adjust the **maximum mechanic pressure** operating bolt no. 3.

Pressure automatic adjustment can only occur within the limits of the newly regulated mechanic pressure.

The minimum electronic adjustment value is shown by the parameter "P17", while the maximum one is shown by the parameter "P18".

Minimum power calibration:

access the parameter "COR", check and change, if the set modulation current corresponds to the right value of the valve outgoing pressure (refer to table at page 64).

After having positioned the combustion analyzer in the specific flue gas collection point, adjust the motorized chimney gate (if any) by means of the parameter "SEC" so as to obtain optimum combustion.

Set by means of the parameter "TEF" the maximum temperature which you want to reach at modulation end.

Set by means of the parameter "T1" the burner switch off maximum temperature.

Verify by means of the parameter "SPE" the modulator opening speed depending on the gas being used (1 very slow - 9 very fast).

It is possible to display instantaneously the flue gas temperature by means of the parameter "FUM".

Now press the button "P" to reach maximum power.

EACH TIME A PARAMETER IS CHANGED, IT IS NECESSARY TO PRESS THE "M" BUTTON TO STORE THE VALUE IN THE MEMORY.

Maximum power calibration:

access the parameter "COR", check and change, if the set modulation current corresponds to the right value of the valve outgoing pressure (refer to table at page 64).

Adjust the motorized chimney gate (if any) by means of the parameter "SEC" so as to obtain optimum combustion.

Set by means of the parameter "TEF" the minimum temperature for modulation start.

The values of the parameters "T1" and "SPE" are the same because they are set during calibration at minimum power.

It is possible to display instantaneously the flue gas temperature by means of the parameter "FUM".

EACH TIME A PARAMETER IS CHANGED, IT IS NECESSARY TO PRESS THE "M" BUTTON TO STORE ITS VALUE IN THE MEMORY.

CALIBRATING VALVES ON/OFF FOR GSR 100.1EA/H/HC - GSR 150A/H/HC

To measure and check the pressure of **incoming gas** unfasten the screws and insert the pressure gauge in the pressure tap indicated by n° 1 in fig. 172. To measure and check the pressure of **outgoing gas** unfasten the screws and insert the pressure gauge in the pressure tap indicated by n° 2 in fig 172. Using gas from the II^a family, (G20 and G25), regulate the outgoing pressure at the nozzle with the values indicated in the tab pag. 66, by acting on the stabilizers incorporated on the valve. Regulate the outgoing pressure by acting on the **screw** indicated by point n°3. Using gas from the III^a family, (G30 and G31), regulate the pressure at the nozzle with the values indicated in the tables pag. 66, following the same procedure described above.

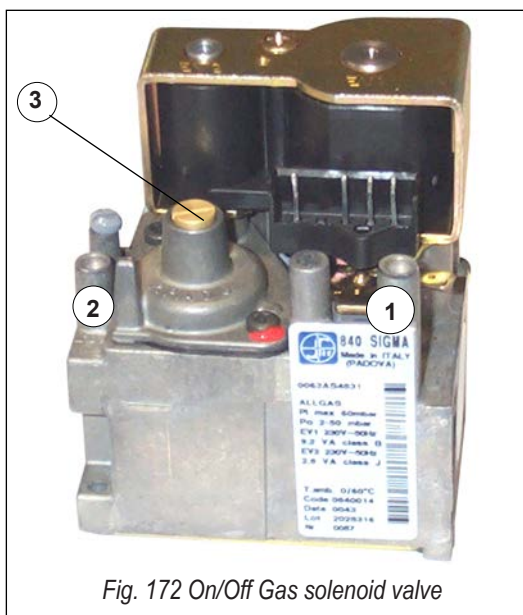


Fig. 172 On/Off Gas solenoid valve

BURNER OPERATING TABLE

According to the various states of the generator (pre-ventilation, minimum and maximum power) the same parameters are used in different situations as shown in the table.

Parameter	BURNER OPERATING		
	Pre-ventilation	Minimum power	Maximum power
TEF		P02	P03
SEC	P10	P07	P08
PASS			
COR		P17	P18
T1		P01	P01
SPE		P19	P19
FUM	Display value		

Display symbols:

- TEF: exhaust gas temperature probe;
- SEC: automatic shutter position;
- PASS: password requested;
- COR: modulation current;
- T1: maximum off burner temperature;
- SPE: opening modulator speed;
- FUM: instant fume temperature.

Tab.16

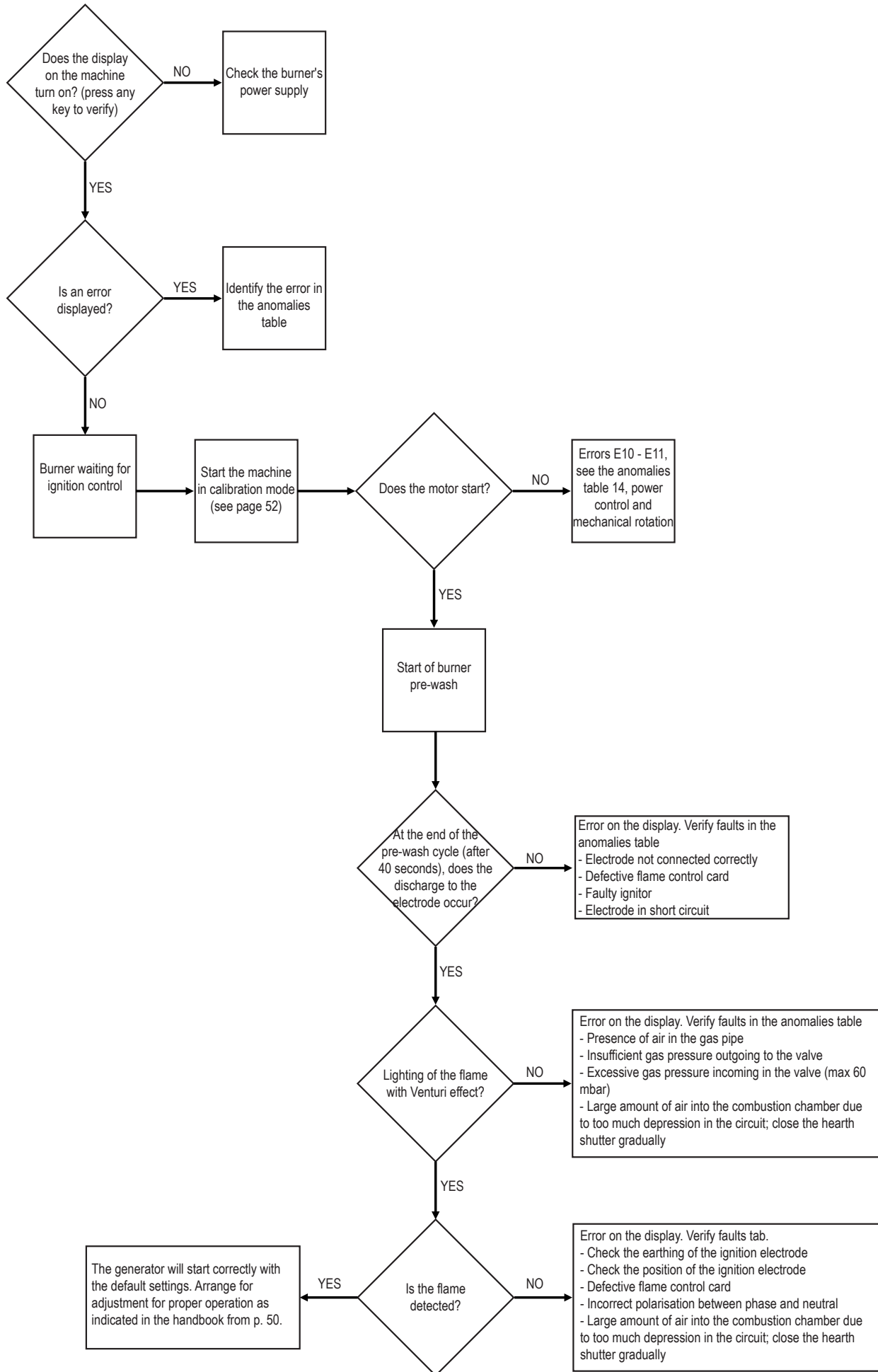
PARAMETER		RANGE		DEFAULT	MEASUREMENT	PARAMETER		RANGE		DEFAULT	MEASUREMENT
		Min	Max					Min	Max		
P01	burner stop temperature	P02	255	80	1°C.	P16	modulating burner	OFF	ON	ON	
P02	modulation end temperature	P03	P01	70	1°C.	P17	minimum current	0	P18	0	mA
P03	modulation start temperature	50	P02	60	1°C.	P18	maximum current	P17	166	166	mA
P04	post-ventilation temperature	40	120	80	1°C.	P19	current variation speed	1	9	5	
P06	automatic gate enablement	OFF	ON	OFF		P20	anti-freeze temperature	0	35	8	1°C.
P07*	automatic shutter opening	0	P08	70	%	Read-only parameters					
P08*	automatic shutter closing	P07	P09	80	%	P21	round globe key position	Off / man / auto		//	
P10	gate opening in pre-ventilation	P09	100	100	%	P22	environment temperature	-30	40	//	0,1 °C.
P11	environment probe correction	-5	5	0	0,1°C.	P23	external probe temperature	-50	50	//	1°C.
P15	burner number in modbus management	0	31	0							

Interface parameter list

Tab.17

The default parameters are related to the card as a spare. Output of the card is already factory calibrated with the corresponding gas parameters, as shown in the table 18.

TROUBLESHOOTING



DISTANCE FROM COMBUSTIBLE MATERIAL/WARNINGS

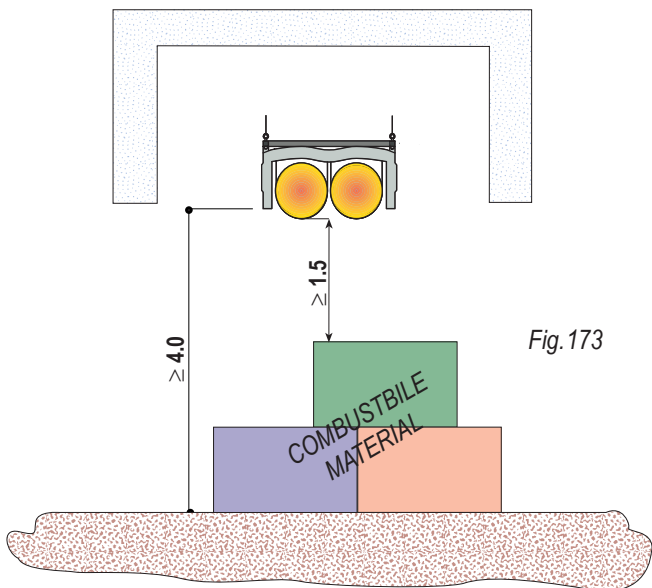


Fig. 173

- 1) Always check the compatibility of the surface temperature of the tubes and the work done inside the heated areas. Pay attention when choosing the surface temperature of the exchanger tubes when carrying out activities that create dust or vapor during their cycle which could cause explosions of fire. In case of doubt contact our technical office.
- 2) Never go over the temperature of 360°C on the surface of the tubes. Varnish coming off the tubes indicates that this temperature has been surpassed.
- 3) The minimum vertical distance of the radiant belts from combustible material must be more or equal to 1.5 m., the minimum distance from the floor and the radiant belt must be more or equal to 4.0 m. (fig. 173).
- 4) In the case of wall installations always check that the wall the generator leans on has enough resistance to support its weight.
- 5) In the presence of overhead cranes, bus ducts, electrical conduits, antifire systems is recommended to provide adequate thermal protection in order to safeguard the integrity of the components.
- 6) Use sealers with a minimum certified resistance at 350°C for the joints of the radiant belt unit.
- 7) Contact Fraccaro or an authorized assistance center to pass from gasses of the II^A family to gasses of the III^A.

PRESSURES AND NOZZLES

GAS	Input Pressure Pi [mbar]	Output Pressure Pu start generator [mbar]			COR modulation start current [mA]	Output Pressure Pu min power [mbar]			COR modulation end current [mA]	Output Pressure Pu max power [mbar]			Modulator start speed	Solenoid valve EV1 code	Solenoid valve EV2 code	Solenoid valve EV3 code	Stabilizer	Gas intervention pressure [mbar]	n° and Ø nozzle	Capacity min/max [kW]
		EV1	EV2	EV3		EV1	EV2	EV3		EV1	EV2	EV3								
GSR50.1A - GSR50.1H - GSR50.1HC																				
G20	20/25	3			55	5,5			90	9,5			4	827003			si	10	4 x 3,00	35/50
G31	30	12			85	14			135	29			8					20	4 x 1,85	
G31	37	12			95	15			155	36			8					30	4 x 1,80	
G31	50	15			110	23			155	49			8					40	4 x 1,65	
GSR100.1A - GSR100.1H - GSR100.1HC - GSR100.2A - GSR100.2H - GSR100.2HC																				
G20	20/25	3			51	6			80	11			4	827003			si	10	7 x 3,10	70/100
G31	30	12			82	13,5			135	26,8			8					20	7 x 2,00	
G31	37	12			88	15			140	33			8					30	7 x 1,90	
G31	50	15			116	25			155	46,5			8					40	7 x 1,75	
GSR100.1EA - GSR100.1EH - GSR100.1EHC																				
G20	20/25	3			71	6	11		100	11	11		4	827003	840014		si	10	10 x 2,70	90/115
G31	30	12			106	13,5	26,8		137	26,8	26,8		8					20	10 x 1,75	
G31	37	12			101	15	33		135	33	33		8					30	10 x 1,65	
G31	50	15			120	25	46,5		155	46,5	46,5		8					40	10 x 1,55	
GSR150A - GSR150H - GSR150HC																				
G20	20/25	3			71	6	11		100	11	11		4	827003	840014		si	10	10 x 3,10	120/150
G31	30	12			106	13,5	26,8		137	26,8	26,8		8					20	10 x 2,00	
G31	37	12			101	15	33		135	33	33		8					30	10 x 1,90	
G31	50	15			120	25	46,5		155	46,5	46,5		8					40	10 x 1,75	
GSR200.1A - GSR200.1H - GSR200.1HC - GSR200.2A - GSR200.2H - GSR200.2HC																				
G20	20/25	3	3		68	6	6		100	11	11		4	827003	827003		si	10	14 x 3,10	140/200
G31	30	12	12		96	13,5	13,5		140	26,8	26,8		8					20	14 x 2,00	
G31	37	12	12		100	15	15		140	33	33		8					30	14 x 1,90	
G31	50	15	15		121	25	25		155	46,5	46,5		8					40	14 x 1,75	
GSR300.1A - GSR300.1H - GSR300.1HC																				
G20	20/25	3	3	3	65	6	6	6	100	11	11	11	4	827003	827003	827003	si	10	21 x 3,10	210/300
G31	30	12	12	12	96	13,5	13,5	13,5	140	26,5	26,5	26,5	8					20	21 x 2,00	
G31	37	12	12	12	100	15	15	15	140	33	33	33	8					30	21 x 1,90	
G31	50	15	15	15	124	25	25	25	155	46,5	46,5	46,5	8					40	21 x 1,75	

Tab. 18

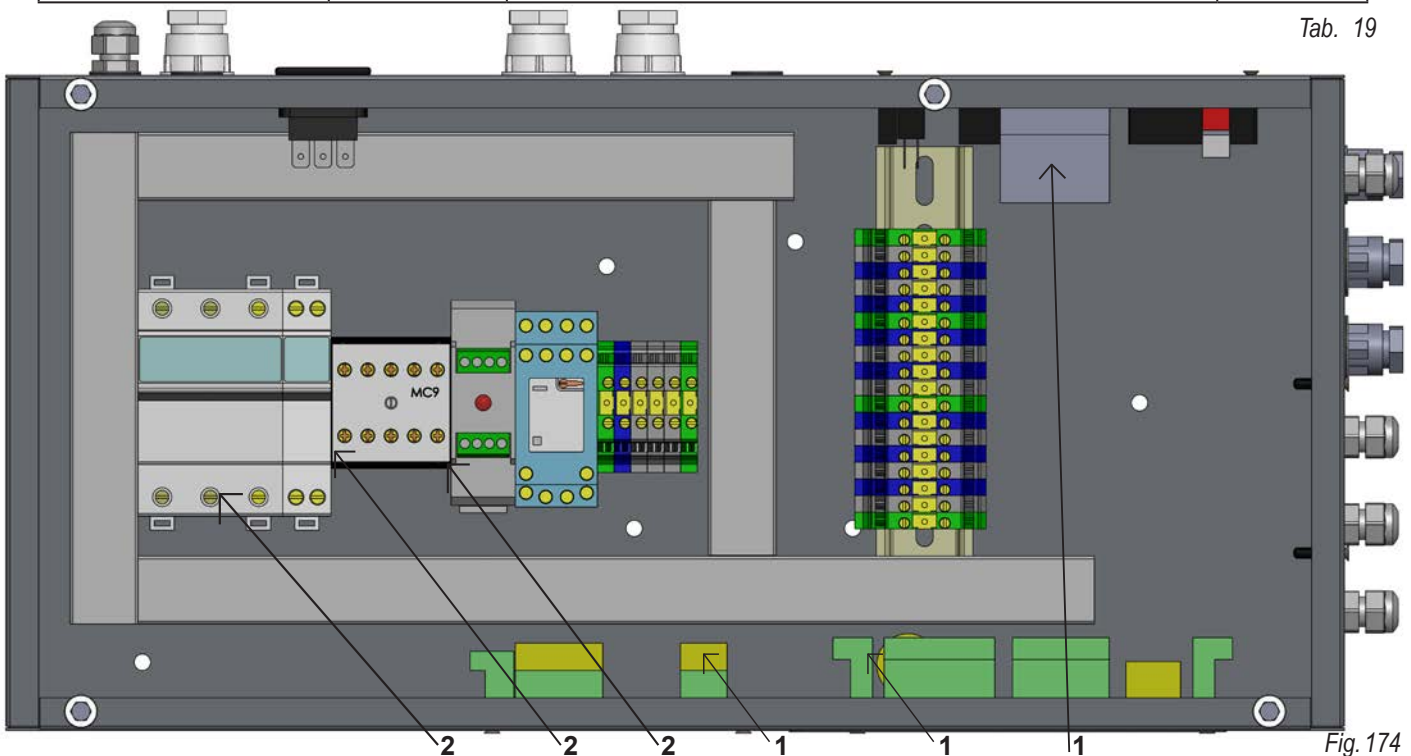
WE REMIND THAT THE MODULATION START AND END VALUES ARE FOR REFERENCE ONLY! THE CORRECT VALUE IS ESTABLISHED DURING SYSTEM TEST AND CALIBRATION.

ORDINARY MAINTENANCE

Appropriate use and correct maintenance of the equipment is necessary to ensure its reliability over time in safe conditions, enabling to limit system management and operation costs. Any intervention on the equipment shall be performed after having removed the electric supply and having closed the supply of fuel. We recommend that ordinary maintenance operations are carried out by an authorized FRACCARO service center.

MAINTENANCE			
TYPE OF CHECK	MINIMUM CHECK INTERVALS	HOW TO CARRY OUT THE CHECK	BURNER OPERATION
Check of the components in the electric panel	12 months - 2000 hours	Verify that all the cables inside the electric panel are connected (fig. 174)	OFF
General cleaning	12 months - 2000 hours	Remove any dirtiness in the nozzle block, in the gas pressure switch and in the connectors of the solenoid valves. If possible, with a slight jet of compressed air (fig. 175)	OFF
Gas pressure check	12 months - 2000 hours	Verify the correct incoming and outgoing pressure with a pressure gauge able to provide a reading from 0 to 60 mbar (page 66)	ON
Combustion analysis	12 months - 2000 hours	To carry out combustion analysis, unscrew the screw in the burner chimney and insert the probe in the hole. When the analysis is over, screw again the screw (fig. 176)	ON
Check of air and gas pressure switches intervention	12 months - 2000 hours	Verify the calibration of air and gas pressure switches and their activation (fig. 177 - 178)	ON
Motorized chimney gate check for high efficiency generators	12 months - 2000 hours	Verify that the motorized chimney gate opens and closes correctly as set on first test (fig. 179)	ON
Visual check	12 months - 2000 hours	Perform a general visual check, taking care of any loose screw	ON
Operative check of pump, safety and air valve	12 months - 2000 hours	Perform a general visual check, taking care of any loose screw	ON
Check of expansion tank tightness	12 months - 2000 hours	Perform a general visual check, taking care of any loose screw	ON
Emptying of secondary system, refill with new antifreeze and replacement of external water pipe insulation	24 months - 4000 hours	Empty the entire secondary system by means of the load/discharge tap inside the condenser. Refill the system with new antifreeze (see related paragraph) and replace the insulation of the condenser delivery and return pipes located outside the building.	OFF
Check of the pressure of the secondary water circuit (condenser - forced convection heater) at 1.5 bar	12 months - 2000 hours	Verify the correct pressure of the system by means of the manometer - thermometer located inside the condenser.	OFF
Checking and cleaning the condensate outlet of the unit condensing	12 months - 2000 hours	Unscrew the connections and clean the condensate outlet.	OFF
Check of operation and careful cleaning of the thermal exchange battery of the forced convection heater	12 months - 2000 hours	Carefully clean the thermal exchange battery of the forced convection heater from dusty residuals. Use a slight jet of compressed air. In case of grease, clean the fins taking care not to dampen the electric motor and to carefully dry the finned package before startup.	OFF

Tab. 19



With the burner OFF and after having removed voltage, verify that no cable is disconnected or loose (2) and fasten it if necessary; besides, verify that all the connectors of the two cards are correctly connected (1).

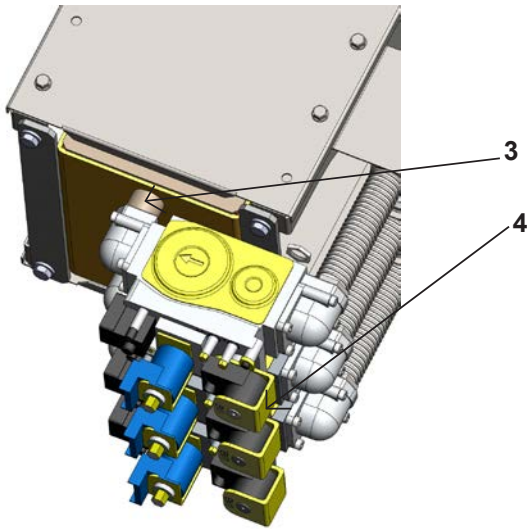


Fig. 175

With the burner OFF and after having removed voltage, remove with care any dirtiness in the nozzle block (3) and on the connectors of the solenoid valves (4), possibly with a jet of compressed air.

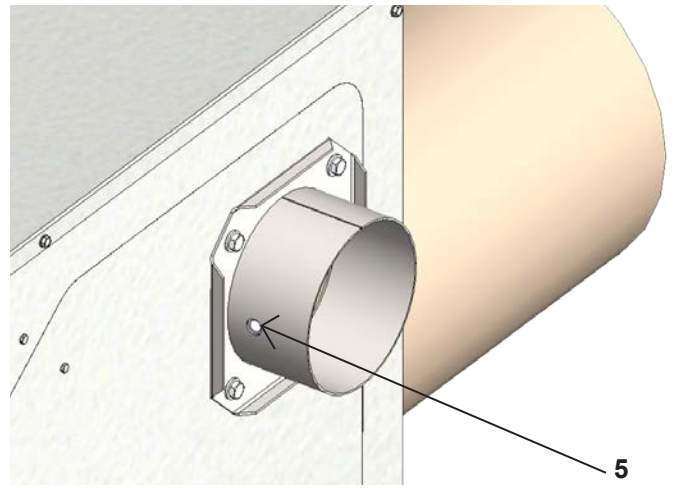


Fig. 176

Insertion point (5) of the flue gas probe to carry out combustion analysis. After the analysis, screw again the screw.

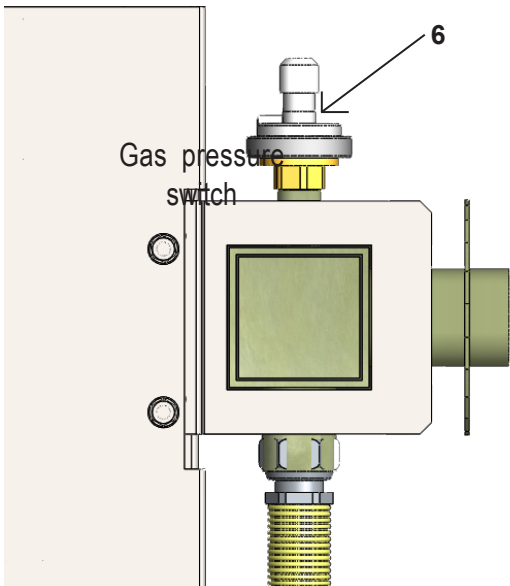


Fig. 177

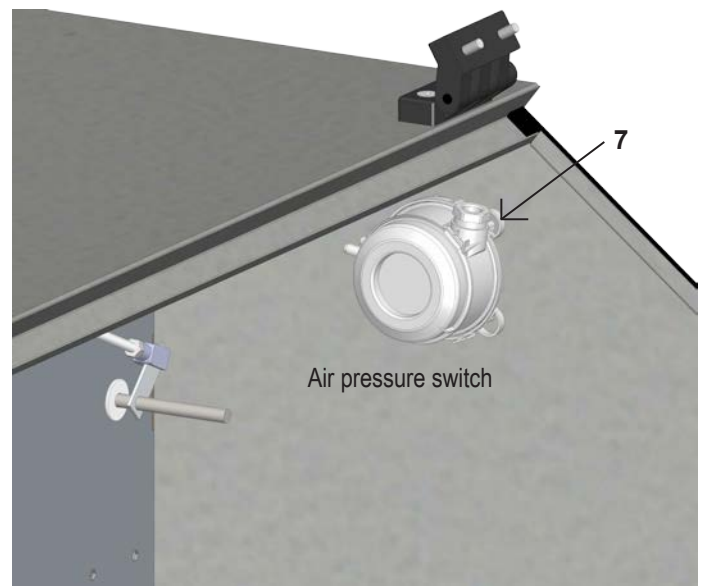
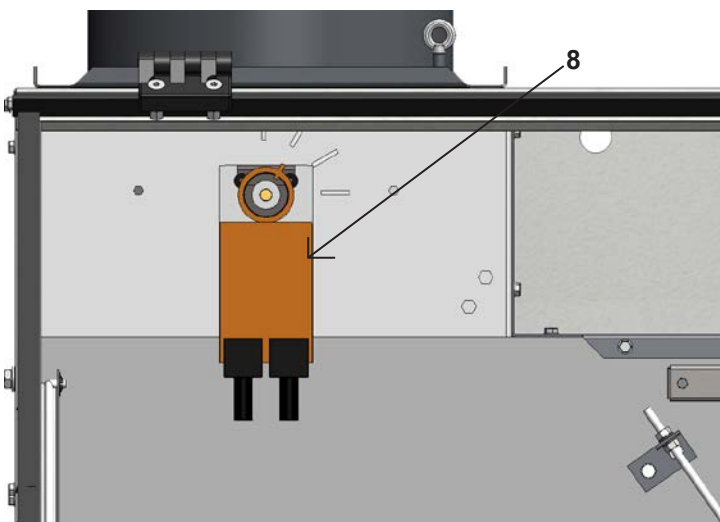


Fig. 178

With the burner ON, close the gas gate and verify whether the gas pressure switch (6) activates closing the contacts; then when the gate reopens, verify whether the pressure switch provides burner switch on consent.

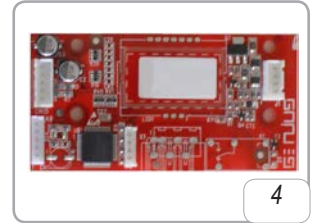
Concerning the air pressure switch (7), it is necessary to verify that at switch on, in particular when the fan creates a vacuum, the pressure switch starts to operate closing the contact and providing burner switch on consent.



Verify that on switch on the chimney gate (8) is fully open or however in the position set at first test. When the generator is switched off, verify that the gate fully closes.

Fig. 179

SPARE PARTS LIST



Pos.	Code	Description
1	1098000	FLAME CONTROL CARD
2	1098001	INTERFACE CARD
3	1098004	3-WAY MODULATION CARD
4	1098070	CRONO 30 INTERFACE CARD



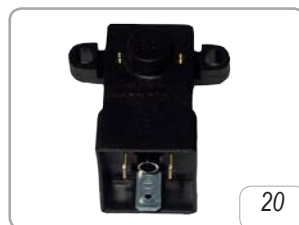
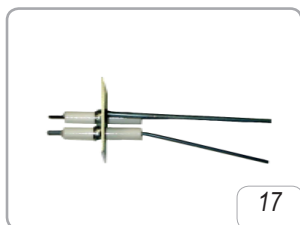
5	1088021	FUSE HOLDER 1P+N (SINGLE PHASE PANEL)
6	1088030	3-PHASE FUSE HOLDER LEGRAND 01260321 (3-PHASE PANEL)
7	1085293	REMOTE SWITCH LOVATO 11BG0910A230
8	1093042	FLUE GAS PROBE PT 1000



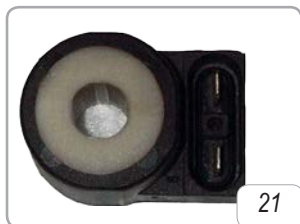
9	1093043	EXTERNAL TEMPERATURE PTC PROBE
10	1080523	THERMAL RELAY LOVATO 11RFNA 9.33 2-3.3A (GSR 50.1/100.2)
10	1080521	THERMAL RELAY LOVATO 11RFNA 9.10 6-10A (GSR 100.1/100.1E/150/200.1)
10	1080516	THERMAL RELAY LOVATO 11RFA 9.75 4-7.5A (GSR200.2/GSR 300.1)
11	1088603	FUSE aM 6A (GSR 50.1/100.2)
12	1088604	FUSE aM 10A (GSR 100.1/100.1E/150/200.1/200.2/300.1)
12	1088605	FUSE aM 16A (GSR 200.2/300.1)



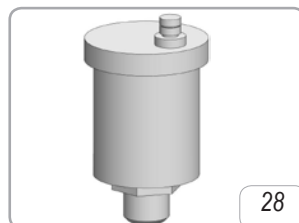
13	1094020	PHASE SEQUENCE CONTROL MODULE RST1
14	1090711	FLAME IGNITION TRANSFORMER
15	1080430	SCREW SOCKET FINDER 94.72
16	1080420	RELAY FINDER 55.32 10/A 250V AC1 FOR SCREW SOCKET FINDER 94.72



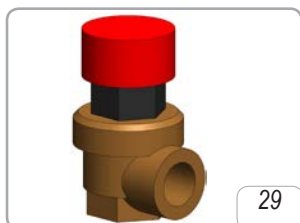
17	1088110	SQUARE PLATE PLUG ELECTRODE
18	1114016	HUBA AIR PRESSURE SWITCH
19	1114000	GAS PRESSURE SWITCH SIT 10-50
20	1111143	COIL FOR SOLENOID VALVE 827 EV2 1ST STAGE (3 FASTON)



21	1111144	COIL FOR SOLENOID VALVE 827 EV1 1ST STAGE (2 FASTON)
22	1118047	SOLENOID VALVE SIT 827 MODULATING
23	1118038	SOLENOID VALVE SIT 840 ON-OFF
24	SG602DN	MOTOR WITH IMPELLER (GSR100.1/100.1E/150/200.1)
24	SG603DN	MOTOR WITH IMPELLER (GSR50.1/100.2)
24	SG600DN	MOTOR WITH IMPELLER (GSR 200.2/300.1)



25	1083821	CHIMNEY GATE SERVOMOTOR
26	1089104	PUMP DAB VA35 130
27	1060006	FLAT EXPANSION TANK
28	1101510	1/2" AIR VALVE



29	1099015	CONDENSER SAFETY VALVE
30	1099014	MANOMETER - THERMOMETER

GIRAD TEST SHEET

MGQ 155 rev. 03

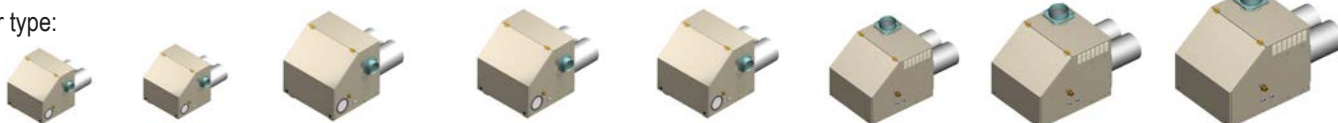
Date: _____

Tester: _____

Customer: _____

Installer: _____

Burner type:

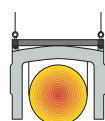


- | | | | | | | | |
|-----------------------------------|-------------------------------------|-------------------------------------|--------------------------------------|-----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| <input type="checkbox"/> GSR50.1A | <input type="checkbox"/> GSR100.2A | <input type="checkbox"/> GSR100.1A | <input type="checkbox"/> GSR100.1EA | <input type="checkbox"/> GSR150A | <input type="checkbox"/> GSR200.1A | <input type="checkbox"/> GSR200.2A | <input type="checkbox"/> GSR300.1A |
| <input type="checkbox"/> GSR50.1H | <input type="checkbox"/> GSR100.2H | <input type="checkbox"/> GSR100.1H | <input type="checkbox"/> GSR100.1EH | <input type="checkbox"/> GSR150H | <input type="checkbox"/> GSR200.1H | <input type="checkbox"/> GSR200.2H | <input type="checkbox"/> GSR300.1H |
| | <input type="checkbox"/> GSR100.2HC | <input type="checkbox"/> GSR100.1HC | <input type="checkbox"/> GSR100.1EHC | <input type="checkbox"/> GSR150HC | <input type="checkbox"/> GSR200.1HC | <input type="checkbox"/> GSR200.2HC | <input type="checkbox"/> GSR300.1HC |

Type of gas: _____

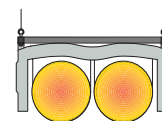
Pressure in static/dynamic line in mBar: _____

Radiant circuit length in mt: _____



Ø 200 MM

Ø 300 MM



Ø 200 MM

Ø 300 MM

Serial N°: _____

MODEL	DETECTION	VALUE
ALL	Burner stop temperature (°C) (P01)	
ALL	Modulation end temperature (°C) (P02)	
ALL	Modulation start temperature (°C) (P03)	
ALL	Post ventilation temperature (°C) (P04)	
ALL	Max temperature of the intervention tubes P03 (hottest spot) (hottest point) (indicate the discharge and return temperatures in °C)	
ALL	Max temperature of the tubes in operation mode (hottest spot) (hottest point) (indicate the discharge and return temperatures in °C)	
ALL	Temperature in the terminal of the radiant tube (in module 180° in the middle of the curve) (°C)	
ONLY 1 TUBE	Average temperature on the straight section of the radiant tube farthest from burner (°C)	
ALL	Air pressure switch "PA" calibrated at [Pa]	
ALL	Burner PA depression off in on phase (hot) [mbar/Pa]	
ALL	Burner PA depression in functioning at minimum power (steady operation) [mbar/Pa]	
ONLY H MODELS	Adjustment of flue gas discharge gate at Max. power 0°+90° (P08)	
ONLY H MODELS	Adjustment of flue gas discharge gate at Min. power 0°+90° (P07)	
ONLY H MODELS	Adjustment of flue gas discharge gate during pre-washing 0°+90° (P10)	
ALL	Position of the manual hearth shutter (0% closed 90% fully open)	
ALL	Position of the recirculation shutter in GSR200.1 - GSR200.2 - GSR300.1 (100% if completely open)	
ALL	Visibly check radiant circuit tube seal	
ALL	Check tube expansion efficiency	

Once the testing is finished send a copy of the filled in Girad Test Sheet to FRACCARO S.r.l.

GIRAD TEST SHEET

ALL	Electrical system made with screened and twisted cable AWG YES/NO and GSR feeding cable section	
ALL	Generator feeding cable [V]	
ALL	Check motor rotation	
ALL	Motor thermic protection calibrated [A]	
ALL	Generator electrical absorption steady operation [A]	
ALL	Generator electrical consumption at start-up [A]	
ALL	Day-time room temperature set [°C]	
ALL	Antifreeze [°C] (P20)	
ALL	Generator modbus address number (P15)	
ALL	Gas valve outlet pressure in ignition [mbar]	
ALL	Min. power gas pressure [mbar]	
ALL	Max. power gas pressure [mbar]	
ALL	Min. power modulating current [mA] (P17)	
ALL	Max. power modulating current [mA] (P18)	
ALL	Fume temperature measured at Min. power [°C]	
ALL	O ₂ value measured at Min. power [%]	
ALL	CO ₂ value measured at Min. power [%]	
ALL	CO value measured at Min. power [ppm]	
ALL	NO/NO _x value measured (0% O ₂) at Min. power [mg/kWh]	
ALL	Nominal CO value (0% O ₂) Min. power [ppm]	
ALL	NO/NO _x value calculated (0% O ₂) at Min. power [mg/kWh]	
ALL	Yield value measured at Min. power [%]	
ALL	Fume temperature measured at Max. power [°C]	
ALL	O ₂ value measured at Max. power [%]	
ALL	CO ₂ value measured at Max. power [%]	
ALL	CO ₂ value measured at Max. power [ppm]	
ALL	NO/NO _x value measured (0% O ₂) at Max. power [mg/kWh]	
ALL	Nominal CO value (0% O ₂) Max. power [ppm]	
ALL	NO/NO _x value calculated (0% O ₂) at Max. power [mg/kWh]	
ALL	Yield value measured at Min. power [%]	
ALL	Ionization current at Min. Cap. [μA]	
ALL	Ionization current at Max. Cap. [μA]	
ALL	Gas pressure switch "PG" calibrated at [mbar]	
ALL	Gas pressure switch "PG" intervention pressure [mbar]	
ALL	Gas circuit seal check done YES/NO	
ONLY CONDENSING	Temperature of condenser water in steady condition [°C]	
ONLY CONDENSING	Pressure water of unit condensig in steady condition [bar]	
ONLY CONDENSING	Check calibration and operation pump	

Once the testing is finished send a copy of the filled in Girad Test Sheet to FRACCARO S.r.l.

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