



General Catalog Biomass

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Company history



The **MTR Biomass Boilers** company originates from the entrepreneurial activity of craftsmen who are aware of the importance of including passion, dedication and commitment in every product produced, without sofferming to the present but always keeping an eye on the future and new technologies. We are talking about a company whose roots go back as far as 1982, founded as a company specialising in the production of gas/diesel boilers and reverse-flame wood boilers for civil use, when in Italy, as in the rest of the world, there was still no talk of sustainability, renewable energy and environmental impact.

All products, from sheet metal cutting to painting, as well as production, assembly and testing, are manufactured in our factory in Mantua (Italy), as the best guarantee of quality, as well as all research, conception, design and study activities finished with the realisation of all products, for an increasingly attentive and demanding clientele, all proudly branded **Made in Italy**.



CALOR: wood boiler



**CALOR wood-fired boiler with
aspirated reverse fire - electronic
modulation of the flame - great
autonomy and maximum efficiency**

Description and operation



The generators use a dry exchange system, an optimal solution adopted for years to minimise combustion residues on the surfaces and consequently simplify cleaning operations.

CALOR is the evolution of traditional wood boilers, as it is:

- reverse flame type
- total gasification
- with suction fan the total gasification and reversed-fire technology makes it possible to burn the gases produced by the primary combustion of wood, developing
- significant increase in heat production
- pollution abatement
- reduction of residues and ash.

Combustion air enters the boiler by means of a correctly sized fan located at the rear directly connected to the flue gas box. The system allows optimal combustion even in the presence of mediocre fuels. The electronic control unit equipped with convenient display is able to manage different types of heating systems and automatically all the functions of ignition, shutdown, release and management of the DHW. High efficiency is achieved by precise and continuous modulation of the speed of the flue gas fan. The electronic control unit detects, by means of special probes, the temperature of the boiler water and the flue gases, decreasing or increasing the speed of the flue gas fan accordingly (constant modulation), allowing precise control of the combustion air and lower fuel consumption. The additional advantages are:

- reduction of ignition time
- elimination of smoke leakage during ignition and loading phases
- noise reduction

The difference in operation compared to a traditional wood boiler, where the fire is totally free to develop, depending on the wood available, without taking into account the effective need for heat, is evident.



Smart modulation



ENERGY FROM NATURE

CALOR boiler constitutes the evolution of wood boilers: total gasification with reverse flame with fan motor working in suction at the rear of the generator.

High efficiency is achieved through precise control of combustion air, given by the accurate regulation of primary and secondary air, allowing the right mixture to be obtained for combustion optimisation. The boiler also regulates its functions on the measurement of water temperature and flue gas outlet temperature by means of special probes. After setting the maximum temperature in the boiler, this is compared with the temperature detected by the probe located on the system flow, and the difference is calculated. When the detected temperature is 5°C lower than the set temperature, the electronic control unit acts on the fan, modulating its speed and progressively reducing its revolutions (and consequently decreasing the air necessary for combustion) until the set temperature is reached. If the temperature in the boiler exceeds the required temperature, the fan speed is gradually reduced to a minimum until it is switched off. In the event of an increase in heat demand, the control unit will increase the fan speed to promote combustion and the release of energy.



Advantages of modulating technology:

- Reduction of the amount of wood to be burned
- Input of thermal energy only when required
- Use of less oxygen for combustion.

Quality & Technology



COMBUSTION CHAMBER

The wood storage compartment is easy to access and very large to facilitate fuel loading and the autonomy of the boiler itself, which can be up to 6 hours. Inside there are cast-iron grates (barrotti)* on which to place the wood logs. Their shape has been specifically designed to favour the correct combustion of the wood and optimise flame inversion and thus the efficiency of the boiler itself. Once the flame reversal has taken place, it comes into contact with the thermal steel cradle and the exchanger located in the lower part of the heater.

STAINLESS STEEL BRAZIER - Protection against corrosion

Expecting the use of wood that is not always top quality, and therefore richer in moisture, or particularly aggressive wood, and therefore rich in polyphenolic compounds (tannins), the solution with a stainless steel combustion chamber offers the certainty of maximum corrosion resistance.

The stainless steel used has a thickness of no less than 6 mm and allows the warranty on the firebox to be extended to 10 years.

CONTROL PANEL

When modulation is synonymous with savings

Modulating technology allows energy to be delivered according only to the effective needs of the system. Once the temperature has been set via the room thermostat, the heater automatically modulates the fire, optimising fuel consumption to meet demand in the shortest possible time, reducing waste and thus cutting costs.

The more demand there is from the system, the more the control unit will run the boiler at maximum power. Vice versa, if there is no demand from the room thermostat, only embers will be kept in the boiler ready to resume vigour at the next demand for heat. The modulating technology of the control panel, combined with a room chronothermostat, therefore allows considerable savings both in terms of fuel and in economic terms.

Rear part of the boiler

The rear of the boiler houses the flow and return connections, the safety coil connections, the probe wells and the flue gas box.

Directly connected to the smoke box are the anti-burst doors, which are also used for cleaning operations, the outlet for the flue connection and the connection of the suction fan motor complete with flange and gasket.



The fan motor operates the boiler under vacuum, bringing the following advantages:

- Reduction of ignition times
- Elimination of flue gas output during door opening during loading

Stainless steel fan

The electro-ventilation consists of a fan with a self-cleaning stainless steel blade with double impeller, one for smoke extraction and the other for motor cooling. The shape and lightness given by the use of stainless steel create forced ventilation, guaranteeing low consumption and significantly raising performance levels.



Control panel

When modulation means savings

Modulating technology makes it possible to deliver energy according only to the actual needs of the system.

Once the temperature has been set via the room thermostat, the generator automatically automatic way, modulates the fire, optimising the fuel consumption, in order to meet the demand in the shortest possible time, reducing waste and thus reducing costs. The more demand there is from the plant, the more the control unit will operate the boiler at maximum power.

Conversely, if there is no demand from the room thermostat, only embers will be kept in the boiler, ready to resume vigour at the next demand for heat. The modulating technology of the control panel combined with a room chronothermostat therefore allows considerable savings both in terms of fuel and in economic terms.

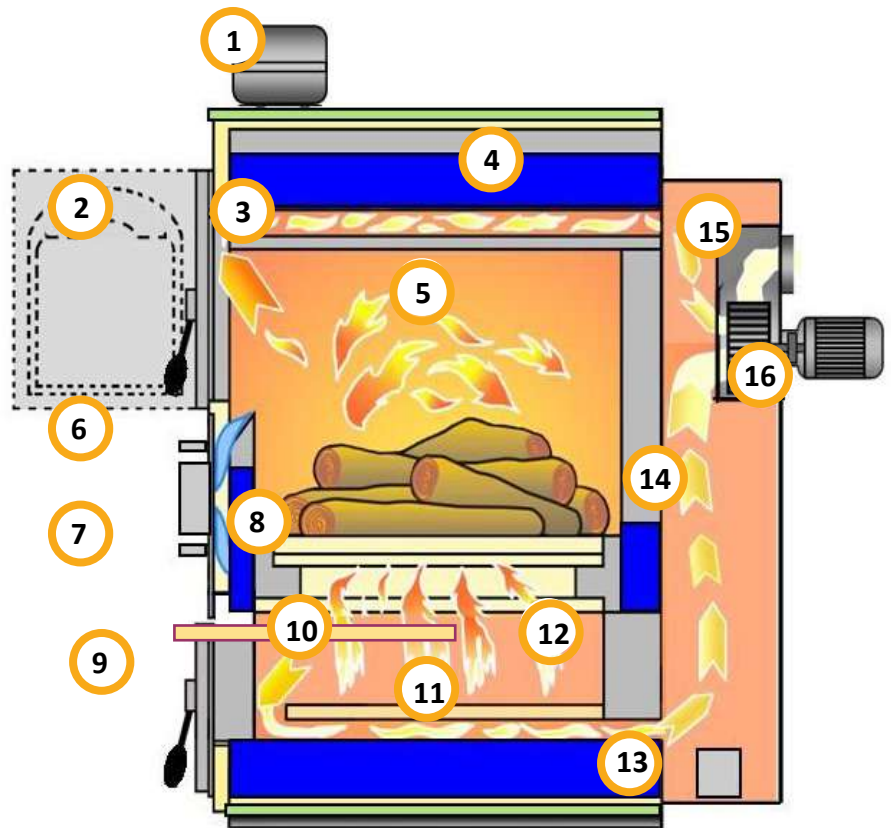


Break-through technologies



4-PASS GASES DISCHARGE

To meet the strict parameters required in terms of output and emissions by European standard EN 303.5, the generators were designed with a 4-turn smoke path, which leads to a significant reduction in emissions and an appreciable increase in efficiency.



INSULATION

An 80 mm thick rock wool mattress placed directly on the painted steel casing that covers the boiler body offers optimal insulation.

- (1) ELECTRONIC CONTROL UNIT, electronically manages all boiler functions
- (2) UPPER DOOR FOR LOADING WOOD TRUNKS, lined internally with refractory cement
- (3) FLUE BY-PASS
- (4) BOILER WATER and WET WALLS
- (5) WOOD STORE, large and well accessible, with back lined with refractory cement
- (6) PRIMARY AIR INLET
- (7) SECONDARY AIR INLET
- (8) REFRACTORY CEMENT STONE with CAST IRON grates inside
- (9) FLAME SPIKE
- (10) THERMAL STEEL CELL for first flue gas pass
- (11) ANGULAR for heat exchange
- (12) REFRACTORY CEMENT
- (13) EXPLOSION-PROOF DOOR
- (14) SMOKE CHAMBER
- (15) SMOKE OUTLET CHIMNEY CONNECTION
- (16) FAN placed in intake

Safety & Maintenance



ELECTRONIC SAFETY

The electronic control unit constantly detects the flue gas temperature and water temperature. In the event of water overtemperature, it directly and instantaneously activates all pumps, so that the temperature drops quickly.

MECHANICAL SAFETY

Inside the boiler body, immersed directly in the generator water, is a safety exchanger which, if connected to a thermal discharge valve (optional) in the event of excessively high temperatures (95° - 98°) requires cold water from the water system and brings the temperature back to optimum levels.

MAINTENANCE

Routine maintenance is facilitated by the use of cleaning equipment to the generator and the great accessibility of all its parts. Extraordinary maintenance must be carried out at the end of the season by authorised personnel. Regular maintenance is very important to keep both the boiler and the entire system efficient and durable over time.

Accessory components



RECIRCULATION PUMP

Obbligatory

It is compulsory to include a recirculation pump in the system, otherwise the warranty will be void.

MIXING VALVE

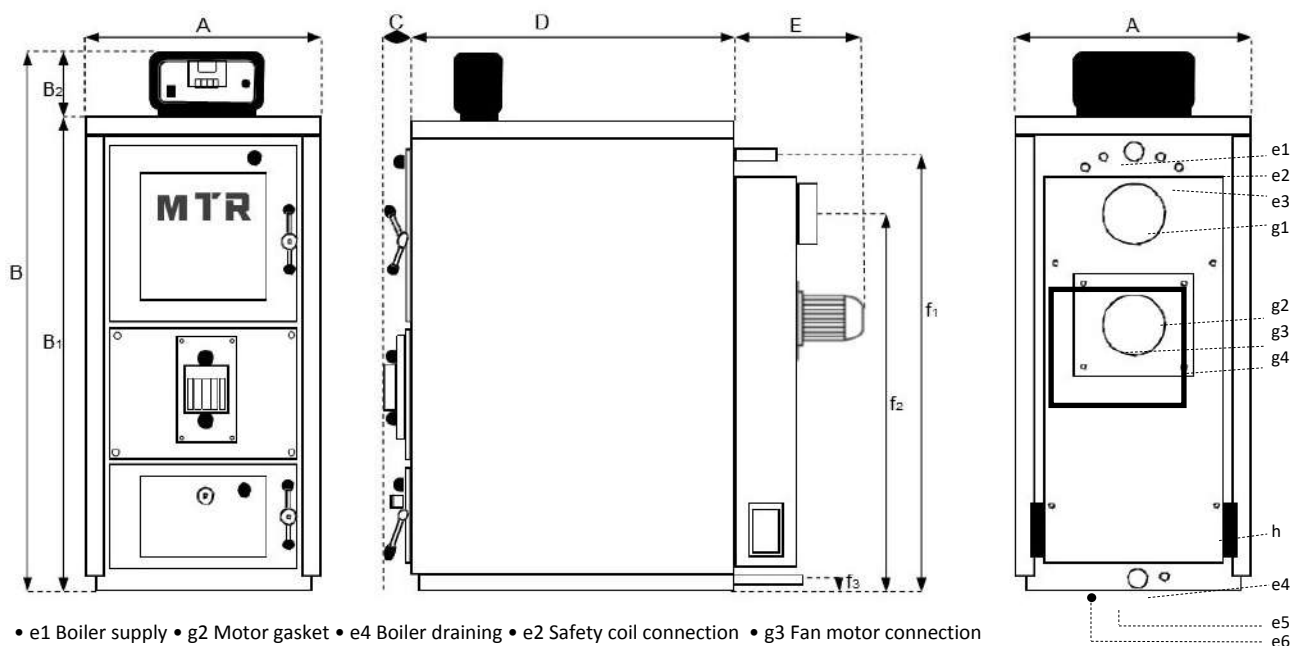
Obbligatory

In order to limit the production of condensate as much as possible, it is advisable to keep the operating temperature of the boiler high, even though the heater has expedients and construction features to limit the formation of condensate, it is advisable to use a mixing valve.

PUFFER

The inclusion of a puffer or cylinder in the system is strongly recommended. The use of a thermal storage tank allows a higher cyclic efficiency and continuous boiler operation with constant and precise modulation, reducing the amount of fuel used and optimising the number of ignitions.

Technical data



- e1 Boiler supply • g2 Motor gasket • e4 Boiler draining • e2 Safety coil connection • g3 Fan motor connection
- e5 Boiler return • e3 Water probe wells • g4 Motor connection flange • e6 Water return probe well • g1 Flue gas outlet
- h Flue doors

MODELLO / Models	POTENZA UTILE MAX/ MAX USEFUL POWER Kcal/h Kw	POTENZA MAX FOC./ MAX FOCULAR POWER Kcal/h Kw	ATTACCHI / Connections mm			CAPACITA' ACQUA/ Capacity water Lt
			MANDATA / Supply ISO 7/1	RITORNO / Return ISO 7/1	Uscita Fumi / Smoke outlet	
CALOR 32	25.000 / 29	28.000 / 32	Ø 1 1/4"	Ø 1 1/4"	Ø 180 mm	90
CALOR 45	35.000 / 41	43.000 / 50	Ø 1 1/2"	Ø 1 1/2"	Ø 180 mm	110
CALOR 55	42.000 / 49	52.000 / 60	Ø 1 1/2"	Ø 1 1/2"	Ø 180 mm	130
CALOR 75	58.500 / 68	68.000 / 80	Ø 2"	Ø 2"	Ø 200 mm	190
CALOR 95	76.000 / 88	93.000 / 108	Ø 2"	Ø 2"	Ø 200 mm	230
CALOR 125	96.000 / 112	118.000 / 138	Ø 2"	Ø 2"	Ø 200 mm	255
CALOR 150	122.000 / 142	148.000 / 172	Ø 2"	Ø 2"	Ø 250 mm	320

MODELLO / Models	DIMENSIONI / Dimensions mm						ALTEZZA ATTACCHI / Connections height mm			PESO / Weight KG	Lungh. tronchi length of logs cm	Apertura per caricamento / Opening for loading mm	
	A	B	B1	B2	C	D	E	F1	F2				F3
CALOR 32	550	1390 1230 160			150 680 380			1120 1000 65			395	50	300 x 330
CALOR 45	650	1500 1340 160			150 680 380			1230 1100 65			520	50	350 x 430
CALOR 55	650	1500 1340 160			150 840 380			1230 1100 65			600	65	350 x 430
CALOR 75	820	1670 1510 160			150 900 400			1430 1200 65			820	75	380 x 540
CALOR 95	820	1670 1510 160			150 1200 400			1430 1200 65			980	106	380 x 540
CALOR 125	820	1670 1510 160			170 1200 680			UP 1200 65			1020	106	380 x 540
CALOR 150	850	1870 1710 160			170 1450 680			UP 1460 65			1350	120	380 x 540

Versions



VERSION CALOR SN

Instantaneous domestic hot water

The version with instantaneous DHW production, called CALOR SN, is the model that offers the possibility of being able to produce instantaneous domestic hot water, through the insertion of a copper exchanger, 22 mm in diameter, immersed directly in the boiler water, sized according to the boiler output.



It is also possible to have a stainless steel firebox for this version.

VERSION CALOR SF

The SF version is the basic model from which total gasification reverse flame combustion technology was developed.

It is equipped with an air blower at the front of the boiler that blows combustion air and a manual by-pass.



VERSION CALOR COMBI

With gas/diesel backup boiler

COMBI versions are available in the range, i.e. equipped with a back-up boiler on top of each other. The wood boiler part remains the same, but the safety of a back-up boiler is added, for a blown gas or oil burner, ready to go into operation in the event of the end of the wood charge or at the user's request, if operated manually.



Warranty



The CALOR boiler is covered by a 5-year warranty on the boiler body, 2 years on electrical parts and refractory cements, 1 year on cast-iron bars.

The CALOR boiler with INOX firebox is covered by a 10-year warranty on the boiler body, 2 years on electrical parts and refractory cements, 1 year on cast-iron bars.

The COMBI version's soffiata gas/oil burner backup boiler is covered by a 3-year warranty on the boiler body.

The first ignition, which must take place only when the hydraulic and electrical system is finished and in accordance with the law, is free of charge, except as provided for in the general guarantee and sales conditions. The guarantee is excluded for all corrosion phenomena, including galvanic currents, and in the case of a system that does not comply with the law. The installation of a recirculation pump is mandatory.

***CLEAN ENERGY:
multi-fuel boiler***



**CLEAN-ENERGY: vertical
aspirated combi-boiler
Electronic fire modulation
Poly-fuel: wood, pellets,
granular bio-fuel**

Description and operation



The generators use a dry exchange system, a solution already adopted for years on wood boilers with excellent results, as combustion residues on the surfaces are minimised and cleaning operations are simplified accordingly. The stainless steel fan motor, located at the rear of the boiler and directly connected to the flue gas box, works in a vacuum combustion chamber, increasing the generator's output. The generators are designed to operate without the use of external burners. The fuel is transported by a special auger from the container directly over a high quality thermal steel grate, passing through a flexible connection hose. This is where ignition takes place thanks to the ceramic heating element at the rear, and combustion takes place. The wood logs are placed inside the combustion chamber itself.



The electronic control unit, equipped with a convenient display, is able to manage different types of systems and independently all the functions of ignition, shutdown, maintenance, unlocking and DHW management.

By electronically reading the appropriate probes, it detects the temperature of the boiler water and the flue gases at the outlet, consequently modulating the flue fan precisely and continuously, reducing fuel consumption and CO2 emissions. All possible errors and/or anomalies are also signalled on the display, by means of codes that can be consulted in the user and maintenance manual.

Quality & Technology



The generators consist of a single combustion chamber with a thick steel firebox.

A system of flue gas angles is located in the upper part of the chamber to increase heat exchange.

Regular cleaning of the flue gas angles with a special brush promotes higher efficiency with fuel savings. The lower part of the combustion chamber houses the thermal steel grill, where combustion takes place, and the ceramic electrical resistance.

This type of electrical heating element allows the ignition of various types of granular fuel such as pellets, hazelnuts, almond shells, maize, etc., using only a small fraction of energy compared to common ignition heaters.

Thanks to a much higher delivered temperature, twice as high as a conventional one, ignition times are greatly reduced, saving energy during use.

The use of ceramic protects this igniter from oxidation and corrosion, thus increasing its durability.



The advantage of having only one combustion chamber is the possibility of automatically switching from wood fuel to granular fuel. In addition, during operation with granular fuel it is possible to safely open the magazine door and directly insert the wood. The control unit will stop the descent of the granular fuel until the wood is used up and then restart it, or continue to burn both fuels at the same time in the event of high demand from the system.

Granular multi-fuel type



The CLEAN ENERGY model generator is the result of careful research in the field of biomass boilers. THE POSSIBILITY TO USE INDIFFERENTLY BOTH POOR GRANULAR FUELS (NUT, PELLET, SAND...) AND WOOD FUELS, as well as the simplicity of switching from one fuel to another and the combined function that can be performed at the touch of a button, make it a cutting-edge product in the sector.



The use of an economical and environmentally friendly fuel, together with the automatic management of all functions ensured by the electronic control unit, allow low consumption and CO2 emissions while respecting the environment, and a combustion efficiency of more than 90%* with savings of 40% to 60% compared to traditional liquid or gaseous fuels. The generators consist of a high-quality, thick steel boiler body, an electronic control unit, a feed screw, a fuel container, a suction fan and a ceramic electric heater for automatic ignition. Thanks to the latter's innovative features, it is possible to ignite particularly difficult granular fuels, such as hazelnut, without having to mix them with pellet fuel.

FUEL TYPE	CALORIFIC VALUE	MEASURE UNIT	= KW
PELLET	4500	Kcal/H/Kg	5,2
BRICKETS	4500	Kcal/H/Kg	5,2
OLIVE PITS	4500	Kcal/H/Kg	5,2
GRAPE SEEDS	4500	Kcal/H/Kg	5,2
HAZELNUT SHELLS	4200	Kcal/H/Kg	4,9
ALMOND SHELLS	4200	Kcal/H/Kg	4,9
WOOD LOGS	3500	Kcal/H/Kg	4



* Use of top-quality pellet fuel, moisture content max. 10% by weight and ash content max. 6%, certified according to international standards DIN51731 and O-NORM M7135

Rear part of the boiler



At the rear of the boiler are the flow and return connections, the safety coil connections, the probe wells and the flue gas box.

Directly connected to the smoke box are the anti-burst door, also used for routine cleaning operations, the fan motor connection with flange and gasket, and the outlet for the flue pipe connection.

INLET FAN

The fan is equipped with a self-cleaning stainless steel blade fan with a double impeller, one for smoke extraction and the other for motor cooling. The conformation and lightness provided by the use of stainless steel create forced ventilation, guaranteeing lower consumption and significantly raising efficiency levels. The fan is also equipped with the latest generation of bearings suitable for high temperatures, making the motor quieter. A satinised steel casing covers the fan, making it impact-resistant.

The fan motor operates the boiler under vacuum, bringing the following advantages:

- Reduction of ignition time
- Elimination of flue gas outlet when opening the door during loading



CHIMNEY

The flue pipe performs the important function of conveying and disposing of combustion products (fumes) outside. It is important for the correct operation of the heater, as well as to reduce consumption, to provide inspection openings to allow for the recovery of soot and facilitate cleaning actions, and to use fittings without sharp bends, with an inclination of no more than 45° (preferably 30°), without horizontal sections, section variations or internal edges (constant section) as required by current regulations on the installation of solid fuel heat generators. This will optimise combustion and avoid draught losses. To keep the chimney efficient, it is necessary to have it regularly cleaned by qualified chimney sweeps.

Break-through technologies

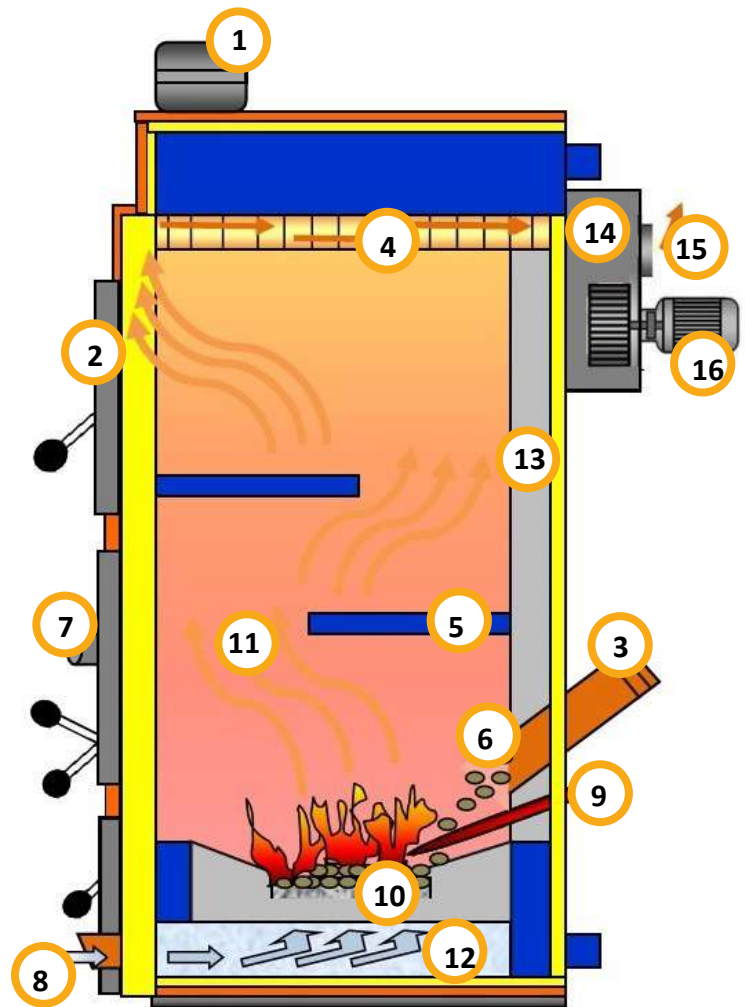


3-PASS GASES DISCHARGE

To meet the strict parameters required in terms of output and emissions by European standard EN 303.5, the generators were designed with a 3-turn smoke path, which leads to a significant reduction in emissions and an appreciable increase in efficiency of up to 90%.

INSULATION

An 80 mm thick rock wool mattress placed directly on the painted steel casing that covers the boiler body offers optimal insulation.



- (1) ELECTRONIC CONTROL UNIT, electronically manages all boiler functions
- (2) UPPER DOOR FOR LOADING WOOD TRUNKS, lined internally with refractory cement
- (3) FLEXIBLE CONNECTION PIPE between fuel container and boiler
- (4) ANGLE for heat exchange
- (5) WET WALLS
- (6) FUEL INLET in combustion chamber
- (7) FLAME SIGHT
- (8) AIR INLET
- (9) CERAMIC RESISTANCE for automatic ignition
- (10) stainless steel GRID
- (11) COMBUSTION CHAMBER, well-accessible, with refractory concrete-lined backside
- (12) ASH COLLECTION BOX
- (13) REFRACTORY CEMENT
- (14) SMOKE CHAMBER
- (15) SMOKE OUTLET CHIMNEY CONNECTION
- (16) FAN placed in intake

Safety & Maintenance



ELECTRONIC SAFETY

The electronic control unit constantly detects the flue gas temperature and water temperature. In the event of water overtemperature, it directly and instantaneously activates all pumps, so that the temperature drops quickly.

MECHANICAL SAFETY

Inside the boiler body, immersed directly in the generator water, is a safety exchanger which, if connected to a thermal discharge valve (optional) in the event of excessively high temperatures (95°-98°) requires cold water from the water system and brings the temperature back to optimum levels.

MAINTENANCE

Routine maintenance is facilitated by the use of cleaning equipment to the generator and the great accessibility of all its parts. Extraordinary maintenance must be carried out at the end of the season by authorised personnel. Regular maintenance is very important to keep both the boiler and the entire system efficient and durable over time.

RECIRCULATION PUMP

Obbligatory

It is compulsory to include a recirculation pump in the system, otherwise the warranty will be void.

MIXING VALVE

Obbligatory

In order to limit the production of condensate as much as possible, it is advisable to keep the operating temperature of the boiler high, even though the heater has expedients and construction features to limit the formation of condensate, it is advisable to use a mixing valve.

PUFFER

The inclusion of a puffer or cylinder in the system is strongly recommended. The use of a thermal storage tank allows a higher cyclic efficiency and continuous boiler operation with constant and precise modulation, reducing the amount of fuel used and optimising the number of ignitions.



SN VERSION

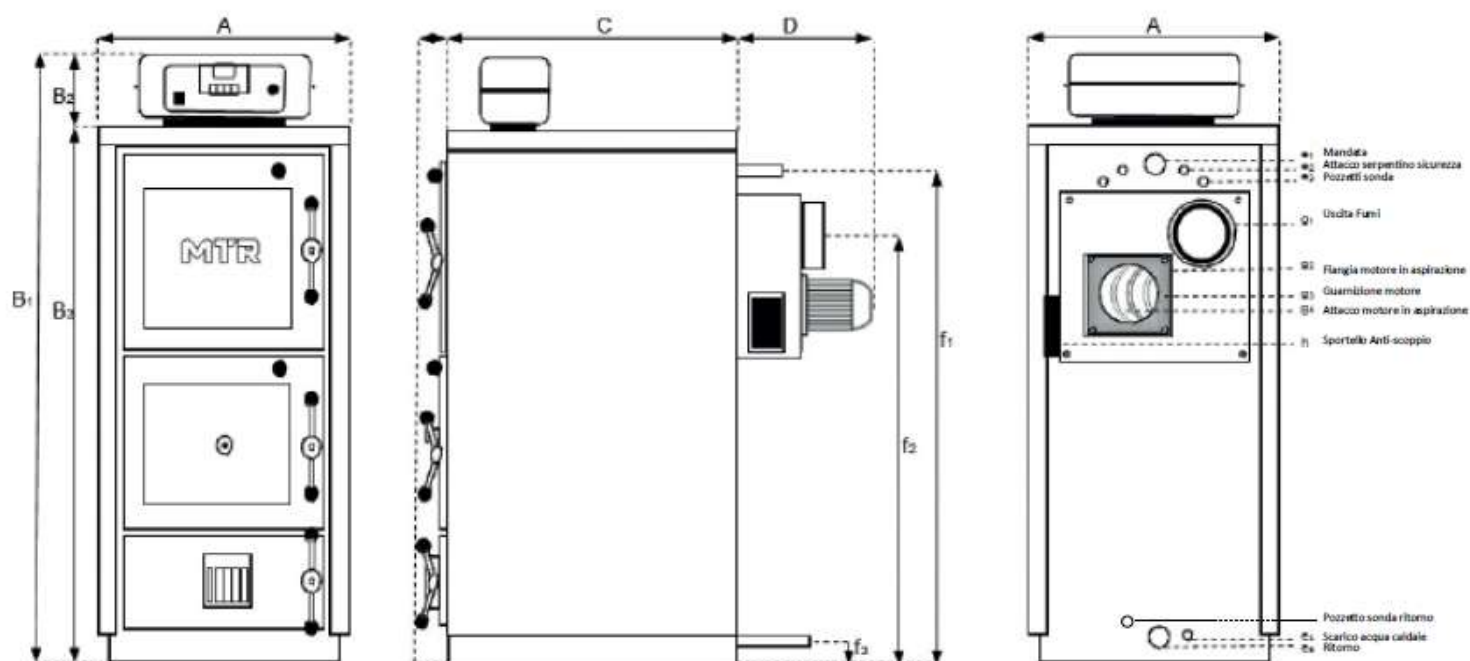
The SN version is characterised by the possibility of producing instantaneous DHW, through the insertion of a copper exchanger immersed directly in the boiler water, sized according to boiler output.

CLEAN-ENERGY INOX VERSION

Stainless steel firebox = Corrosion protection

Expecting the use of wood that is not always of the highest quality, and therefore richer in moisture, or particularly aggressive wood, and therefore rich in polyphenolic compounds (tannins), the solution with a stainless steel combustion chamber offers the certainty of maximum resistance to corrosion. The stainless steel used is a good 6 mm thick and allows an extension of the warranty on the firebox up to 10 years.

Technical data



MODELLO / Models	Potenza Utile MAX / MAX Useful Power Kcal/h Kw		Potenza MAX Foc. / MAX Foc. Power Kcal/h Kw		ATTACCHI / Connections mm			Pressione / Pressure MAX BAR
					MANDATA / Delivery	RITORNO / Return	Uscita Fumi / smoke outlet	
CLEAN ENERGY 21	16.000	18	18.500	21	Ø 1 1/4"	Ø 1 1/4"	Ø 150 mm	3
CLEAN ENERGY 32	25.000	29	27.500	32	Ø 1 1/4"	Ø 1 1/4"	Ø 150 mm	3
CLEAN ENERGY 43	35.000	40	37.500	43	Ø 1 1/2"	Ø 1 1/2"	Ø 180 mm	3
CLEAN ENERGY 53	43.000	50	45.500	53	Ø 1 1/2"	Ø 1 1/2"	Ø 200 mm	3

MODELLO / Models	DIMENSIONI / Dimensions mm									PESO / Weight KG	CAPACITA' ACQUA/ Capacity water Lt	Lungh. Tronchi Length of logs cm	
	A	B	B1	B2	CD	C	D	f1	f2				f3
CLEAN ENERGY 21	550	1500	150	1350	950	570	380	1230	1060	265	270	70	33
CLEAN ENERGY 32	550	1500	150	1350	1100	720	380	1230	1060	265	320	90	50
CLEAN ENERGY 43	650	1600	150	1450	1100	720	380	1330	1160	285	400	110	50
CLEAN ENERGY 53	650	1600	150	1450	1300	920	380	1330	1160	285	470	135	65

DIMENSIONI / Dimensions	CONTENITORE COMBUSTIBILE AFFIANCATO / Side fuel container		
	STANDARD	MEDIUM (Optional)	LARGE (Optional)
LARGHEZZA / Width mm	300	450	600
PROFONDITA' / Depth mm	800	900	900
ALTEZZA / Height mm	1200	1500	1500
CAPACITA' / Capacity KG	130	250	400

GIANNINA: pellet boiler



**GIANNINA polycombustible granular boiler
with vertical aspirated flame
Ceramic heating element, automatic ignition
Electronic flame modulation**

Description and operation



The generators use a dry exchange system, a solution already adopted for years on wood boilers with excellent results, as combustion residues on the surfaces are minimised and cleaning operations are simplified accordingly. The motor with a stainless steel fan, located at the rear of the boiler and connected directly to the flue gas box, works in a vacuum combustion chamber, increasing the generator's output. The generators are designed to operate without the use of external burners. The fuel is transported by a special auger from the container directly into a high quality thermal steel brazier, passing through a connecting hose. Inside the brazier, ignition takes place via a ceramic heating element at the front and combustion takes place.

The electronic control unit, equipped with a display, manages different types of systems and independently all the functions of ignition, shutdown, maintenance, unlocking and DHW management through the electronic reading of the appropriate probes, detects the temperature of the boiler water and the flue gases at the outlet, consequently modulating the flue gas fan precisely and continuously, reducing fuel consumption and CO₂ emissions.

All possible errors and/or anomalies are also signalled on the display, by means of codes that can be consulted in the user and maintenance manual.



Quality & Technology



The generators consist of a single combustion chamber with a thick steel firebox. A system of smoke flaps designed to increase heat exchange is located in the upper part of the chamber. The regular cleaning of the flue gas flaps with a special brush, promotes higher efficiency and significant fuel savings. The lower part of the combustion chamber houses the stainless steel brazier, where ignition and combustion take place thanks to the ceramic electrical heating element.

This innovative electric heating element allows the ignition of various types of granular fuel such as pellets, hazelnuts, almond shells, etc., using only a small fraction of energy compared to common ignition heaters.

Thanks to a much higher delivered temperature, twice as high as that of a common metal heating element, ignition times are greatly reduced, saving electricity during use. The use of ceramic protects the igniter from oxidation and corrosion risks, increasing its durability.



In the lower part, the generators are equipped with a convenient ash collection drawer, totally removable, which simplifies cleaning operations allowing long emptying intervals (up to the GIANNINA 50 model).

Granular multi-fuel type



The CLEAN ENERGY model generator is the result of careful research in the field of biomass boilers. THE POSSIBILITY TO USE INDIFFERENTLY BOTH POOR GRANULAR FUELS (NUT, PELLET, SAND...) AND WOOD FUELS, as well as the simplicity of switching from one fuel to another and the combined function that can be performed at the touch of a button, make it a cutting-edge product in the sector.



The use of an economical and environmentally friendly fuel, together with the automatic management of all functions ensured by the electronic control unit, allow low consumption and CO2 emissions while respecting the environment, and a combustion efficiency of more than 90%* with savings of 40% to 60% compared to traditional liquid or gaseous fuels. The generators consist of a high-quality, thick steel boiler body, an electronic control unit, a feed screw, a fuel container, a suction fan and a ceramic electric heater for automatic ignition. Thanks to the latter's innovative features, it is possible to ignite particularly difficult granular fuels, such as hazelnut, without having to mix them with pellet fuel.

FUEL TYPE	CALORIFIC VALUE	MEASURE UNIT	= KW
PELLETS	4500	Kcal/H/Kg	5,2
BRICKETS	4500	Kcal/H/Kg	5,2
OLIVE PITS	4500	Kcal/H/Kg	5,2
GRAPE SEEDS	4500	Kcal/H/Kg	5,2
HAZELNUT SHELLS	4200	Kcal/H/Kg	4,9
ALMOND SHELLS	4200	Kcal/H/Kg	4,9
WOOD LOGS	3500	Kcal/H/Kg	4



* Use of top-quality pellet fuel, moisture content max. 10% by weight and ash content max. 6%, certified according to international standards DIN51731 and O-NORM M7135

Rear part of the boiler



At the rear of the boiler are the flow and return connections, the safety coil connections, the probe wells and the flue gas box.

Directly connected to the smoke box are the anti-burst door, also used for routine cleaning operations, the fan motor connection with flange and gasket, and the outlet for the flue pipe connection and, at the level of the box, the gearmotor for automatic fuel filling (only for GIANNINA SV).

INLET FAN

The fan is equipped with a self-cleaning stainless steel blade fan with a double impeller, one for smoke extraction and the other for motor cooling. The conformation and lightness provided by the use of stainless steel create forced ventilation, guaranteeing lower consumption and significantly raising efficiency levels. The fan is also equipped with the latest generation of bearings suitable for high temperatures, making the motor quieter. A satinised steel casing covers the fan, making it impact-resistant.

The fan motor operates the boiler under vacuum, bringing the following advantages:

- Reduction of ignition time
- Elimination of flue gas outlet when opening the door during loading

CHIMNEY

The flue pipe performs the important function of conveying and disposing of combustion products (fumes) outside. It is important for the correct operation of the heater, as well as to reduce consumption, to provide inspection openings to allow for the recovery of soot and facilitate cleaning actions, and to use fittings without sharp bends, with an inclination of no more than 45° (preferably 30°), without horizontal sections, section variations or internal edges (constant section) as required by current regulations on the installation of solid fuel heat generators. This will optimise combustion and avoid draught losses. To keep the chimney efficient, it is necessary to have it regularly cleaned by qualified chimney sweeps.



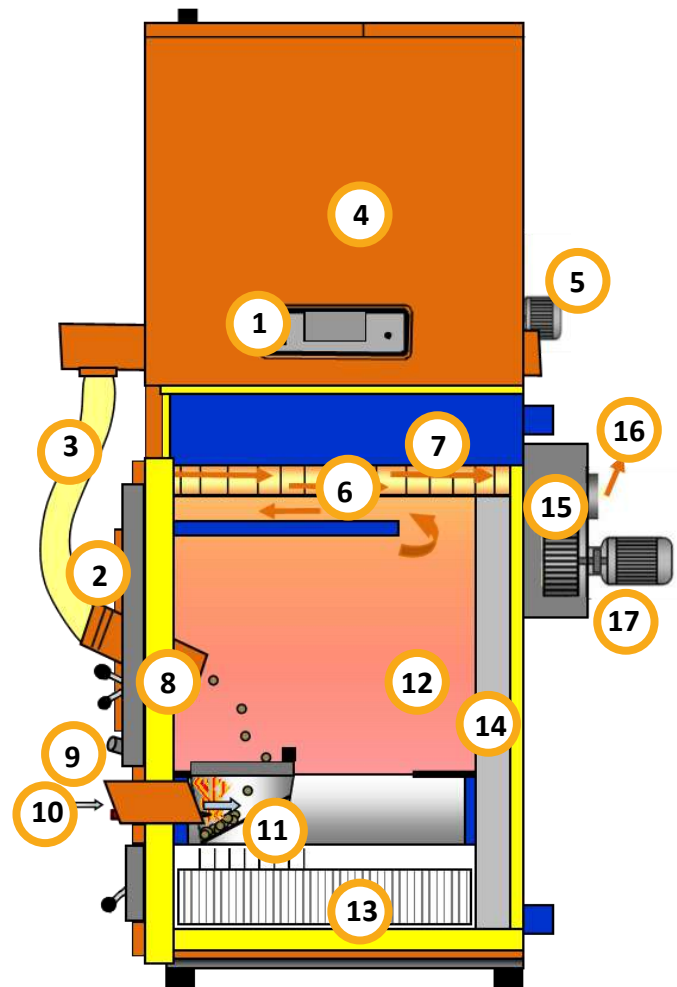


3-PASS GASES DISCHARGE

To meet the strict parameters required in terms of output and emissions by European standard EN 303.5, the generators were designed with a 3-turn smoke path, which leads to a significant reduction in emissions and an appreciable increase in efficiency of up to 90%.

INSULATION

An 80 mm thick rock wool mattress placed directly on the painted steel casing that covers the boiler body offers optimal insulation.



- (1) ELECTRONIC CONTROL UNIT, electronically manages all boiler functions
- (2) UPPER DOOR, lined internally with refractory cement
- (3) FLEXIBLE CONNECTION PIPE between fuel container and boiler
- (4) SUPERIMPOSED PELLET CONTAINER
- (5) MOTOR-REDUCER connected to auger for fuel loading
- (6) ANGLE FLAPS for heat exchange
- (7) WETTED WALLS
- (8) FUEL INLET in combustion chamber
- (9) FLAME SIGHT
- (10) AIR INLET and CERAMIC RESISTANCE for automatic ignition
- (11) stainless steel BRAZIER
- (12) COMBUSTION CHAMBER, easily accessible, with refractory concrete-lined back
- (13) ASH COLLECTION DRAWER
- (14) REFRACTORY CEMENT
- (15) SMOKE CHAMBER
- (16) SMOKE OUTLET CHIMNEY CONNECTION
- (17) FAN placed in intake

Safety & Maintenance



ELECTRONIC SAFETY

The electronic control unit constantly detects the flue gas temperature and water temperature. In the event of water overtemperature, it directly and instantaneously activates all pumps, so that the temperature drops quickly.

MECHANICAL SAFETY

Inside the boiler body, immersed directly in the generator water, is a safety exchanger which, if connected to a thermal discharge valve (optional) in the event of excessively high temperatures (95°-98°) requires cold water from the water system and brings the temperature back to optimum levels.

MAINTENANCE

Routine maintenance is facilitated by the use of cleaning equipment to the generator and the great accessibility of all its parts. Extraordinary maintenance must be carried out at the end of the season by authorised personnel. Regular maintenance is very important to keep both the boiler and the entire system efficient and durable over time.

RECIRCULATION PUMP

Obbligatory

It is compulsory to include a recirculation pump in the system, otherwise the warranty will be void.

MIXING VALVE

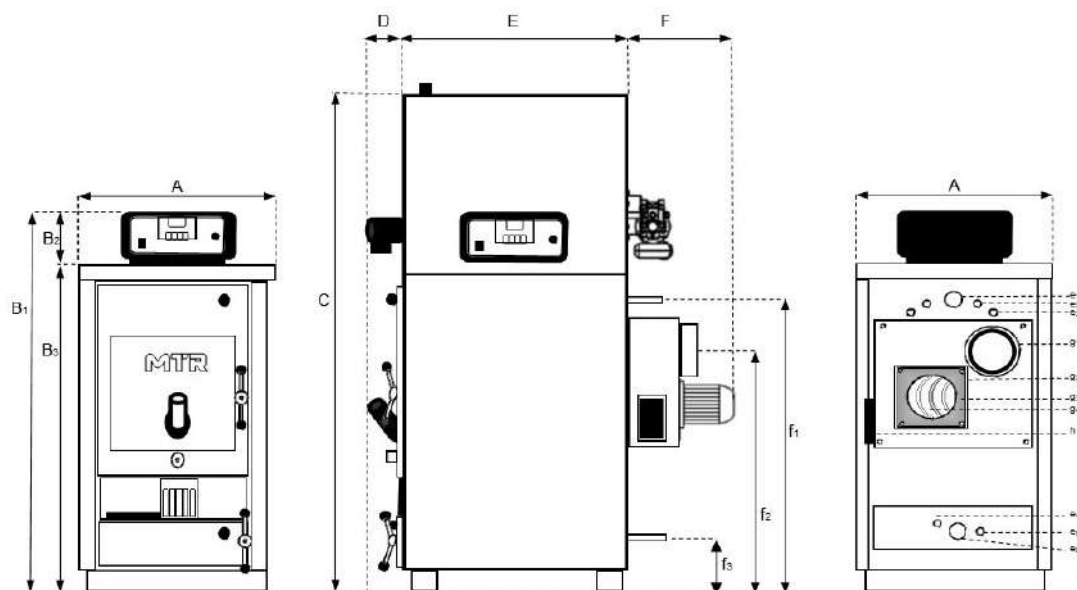
Obbligatory

In order to limit the production of condensate as much as possible, it is advisable to keep the operating temperature of the boiler high, even though the heater has expedients and construction features to limit the formation of condensate, it is advisable to use a mixing valve.

PUFFER

The inclusion of a puffer or cylinder in the system is strongly recommended. The use of a thermal storage tank allows a higher cyclic efficiency and continuous boiler operation with constant and precise modulation, reducing the amount of fuel used and optimising the number of ignitions.

Technical data



- e1 Boiler supply • g2 Motor gasket • e4 Boiler draining • e2 Safety coil connection • g3 Fan motor connection • e5 Water return probe well • e3 Water probe wells • g4 Motor connection flange • e6 Boiler return • g1 Flue gas outlet • h Flue doors

MODELLO /	Potenza Utile MAX/ MAX Useful Power		Potenza MAX Foc./ MAX Foc. Power		ATTACCHI / Connections mm			Pressione/ Pressure
					MANDATA /	RITORNO /	Uscita Fumi /	
GIANNINA 20	17.200	20	18.900	22	Ø 1 1/4"	Ø 1 1/4"	Ø 150 mm	3
GIANNINA 30	25.800	30	28.400	33	Ø 1 1/4"	Ø 1 1/4"	Ø 150 mm	3
GIANNINA 40	34.400	40	41.500	48	Ø 1 1/2"	Ø 1 1/2"	Ø 150 mm	3
GIANNINA 50	43.000	50	52.000	60	Ø 1 1/2"	Ø 1 1/2"	Ø 150 mm	3
GIANNINA 70	60.200	70	69.600	81	Ø 2"	Ø 2"	Ø 180 mm	3
GIANNINA 90	77.400	90	88.000	102	Ø 2"	Ø 2"	Ø 180 mm	3
GIANNINA 120	102.000	118	112.000	130	Ø 2"	Ø 2"	Ø 200 mm	3
GIANNINA 150	129.500	150	146.000	170	Ø 2"	Ø 2"	Ø 200 mm	3

MODELLO / Models	DIMENSIONI / Dimensions mm								PESO / Weight KG	CAPACITA' ACQUA/ Capacity water Lt			
	A	Solo GIANNINA SB			Solo GIANNINA SV	D	E	F			Attacchi		
		B1	B2	B3	C						f1	f2	f3
GIANNINA 20	550	1200 160 1040			1500	150 1100 220			860 715 220			200	55
GIANNINA 30	550	1200 160 1040			1500	150 1240 230			860 715 220			250	70
GIANNINA 40	650	1300 160 1140			1600	150 1240 230			960 815 240			330	90
GIANNINA 50	650	1300 160 1140			1600	150 1360 230			960 815 240			400	110
GIANNINA 70	750	1400 160 1240			---	150 1360 250			1060 915 260			510	150
GIANNINA 90	750	1400 160 1240			---	170 1560 250			1060 915 260			600	190
GIANNINA 120	850	1500 160 1340			---	170 1560 300			1160 1015 280			700	250
GIANNINA 150	950	1600 160 1440			---	170 1600 300			1260 1150 300			880	310

Versions



COMMON FEATURES

- Automatic switch- on
- Power modulation on four levels
- Continuous detection of water temperature and flue gas temperature
- Combustion optimisation by modulation on water temperature and modulation on flue gas temperature
- Ventilator located on the flue gas chamber for combustion optimisation
- Control panel with display: ignition, shutdown release, DHW management
- Correct sensor operation signal
- Momentary power failure protection
- Boiler water over- temperature protection
- Possibility on request of insertion of copper exchanger for direct DHW

GIANNINA SV VERSION: Space optimisation

The superimposed fuel tank, which automatically feeds the generator, is fitted with a lid with a handle and ensures practicality and reduced space requirements. Possibility of positioning the control panel either to the right or left of the generator. Available models range from 20 to 50 Kw/h.



GIANNINA SB VERSION:

Possibility of positioning the pellet container to the right or left of the boiler, thanks to the use of a flexible connection pipe and loading auger (accessories included). Available models range from 20 to 150 KW/h.



	CONTENITORE COMBUSTIBILE AFFIANCATO / Side fuel container		
	STANDARD	MEDIUM (Optional)	LARGE (Optional)
LARGHEZZA / Width mm	300	450	600
PROFONDITA' / Depth mm	800	900	900
ALTEZZA / Height mm	1200	1500	1500
CAPACITA' / capacity KG	130	250	400

CLEAN ENERGY PLUS
Industrial pellet boilers



**CL-EN PLUS: INDUSTRIAL BOILER FOR
BURNER PELLET
100 - 200 - 350 - 500 kW**

Description and operation



CONSTRUCTION TECHNOLOGY

The generator is monobloc, in three passes with actual flame passing, pressurized combustion. The technology in three passes with flame passing reduces the residence time of the combustion gases in high temperature areas. The property to “narrow” width solves the unique needs of installation and introduction in thermal power plants with a reduced size.

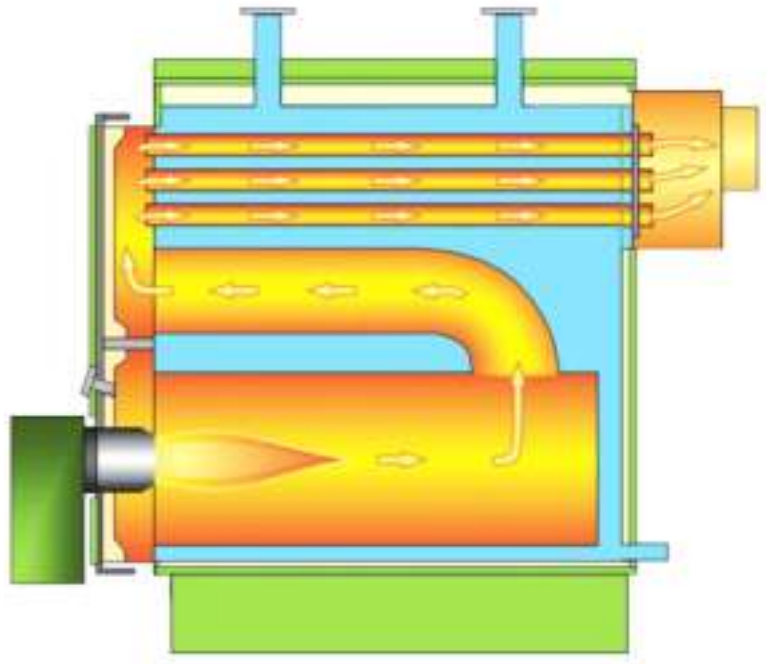
PRINCIPLE OF OPERATION

BODY BOILER

- The shell is made of high quality metal and is welded at full penetration. - The combustion chamber is cylindrical, internally and externally welded to the front plate and the rear closed with bottom completely wet. - The smoking pipes are welded to the tube plates arranged above the combustion chamber. Their arrangement is been designed to optimize the circulation. Are also protruding from the rear plate to raise the temperature of the weld bead, avoiding the formation of acid condensation on the same.

ATTACKS

- A diaphragm inserted inside the boiler body allows optimum circulation of water: the temperature inside is uniform and therefore the formation of deposits is contained.
- At the top of the generator are planned attacks and water supply and return connection for the connection to the expansion tank.- In the lower part is provided for the attack for the discharge sludge.
- The front plate is equipped with provision for grounding.
- Attacks of water supply and return are flanged, complete with flanges, bolts and gaskets.



SMOKE REAR CAMERA

- The rear smoke chamber, made of sheet steel is complete with seal, horizontal attack without flange for the discharge of fumes, cleaning door, and attack for the discharge of flue gas condensate.

Description and operation



FRONT DOOR

- The front door, openable from both sides by hinges is steel internally lined with insulating / refractory material, provided with seal and blanking plate for attachment of the burner and indicator for the control of the flame.

COATING

- The body coating is made of mineral wool 80 mm thick.
- The external protection is given by panels of painted galvanized steel covering the boiler body and the tailgate.

SAFETY

Inside the boiler, immersed directly into the generator, there is a heat exchanger which, when connected to a temperature relief valve (optional), when you arrive at high temperature (95-98°C), cold water from the water and shows the temperature at optimum levels.

OPTIONALS

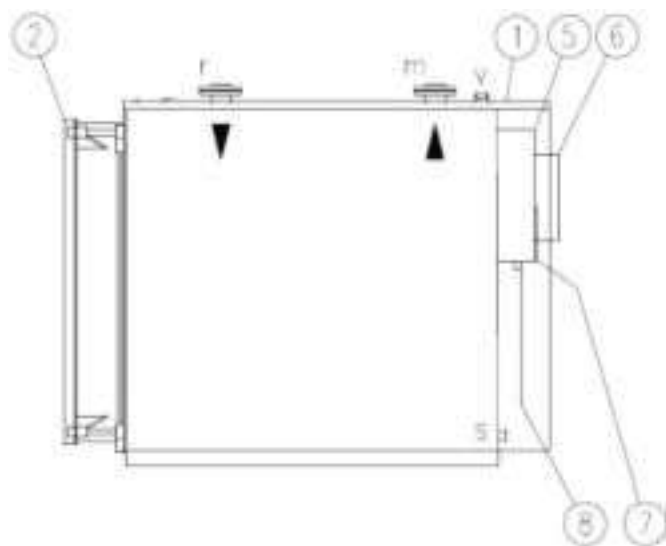
- pellet burner



- pellet storage system



Technical data



- 1 - Boiler body
- 2 - Hatch
- 3 - Burner plate
- 4 - Flame control indicator
- 5 - Flue chamber
- 6 - Flue outlet pipe
- 7 - Cleaning door
- 8 - Flue gas condensate drain
- 9 - Nameplate and technical data

m - Heating supply r - Heating return s - Sludge drain
v - Safety valve connection or expansion tank

MODELS

MODEL	HEIGHT mm	WIDTH mm	DEPTH mm	WEIGHT kg	FUME OUTLET Ø mm	Supply/return mm	Power max Kcal/h - KW
Clean-Energy Plus 100	1.660	780	2.000	850	250	65	86.000 - 100
Clean-Energy Plus 200	1.830	880	2.150	1.100	250	65	172.00 - 200
Clean-Energy Plus 350	1.830	880	2.400	1.300	250	65	301.000-350
Clean-Energy Plus 500	2.000	980	2.600	1.550	300	80	430.000 - 500

BASIC SYSTEM SCHEME

