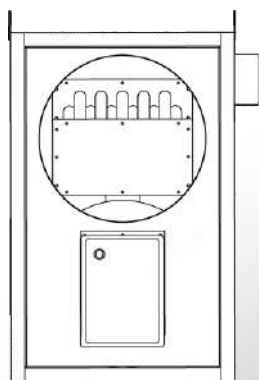
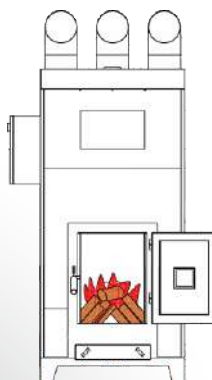




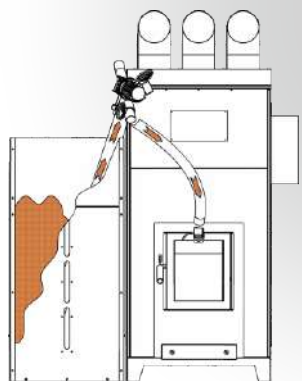
HOT GENERATORS FOR HEATING



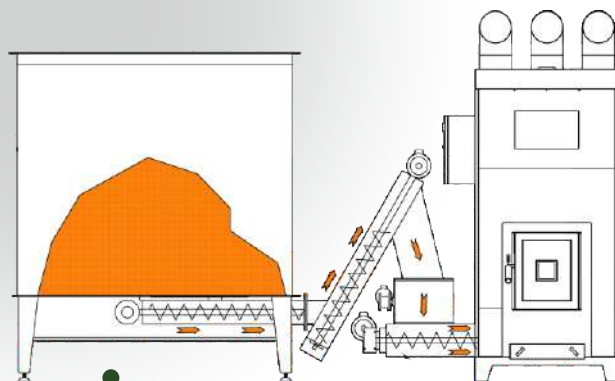
GAS/DIESEL



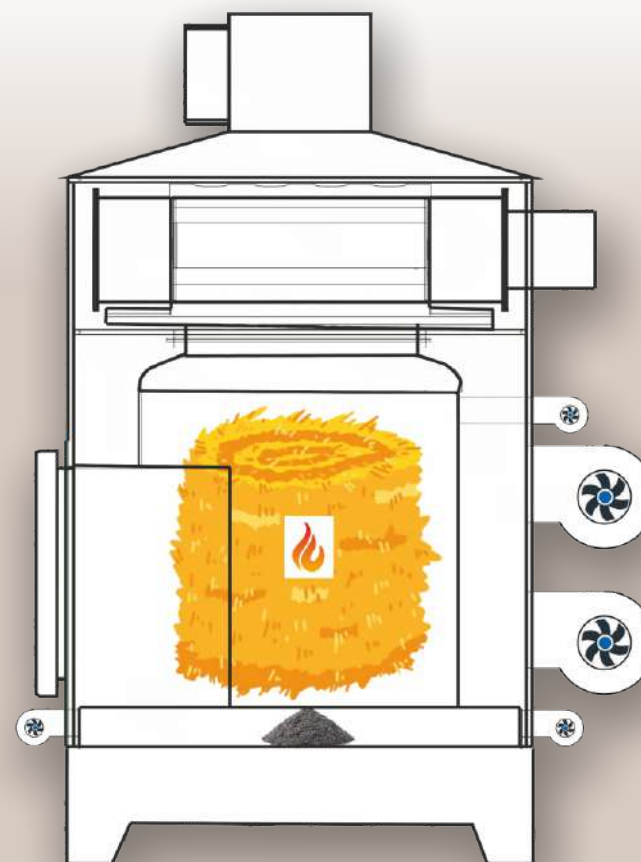
FIREWOOD



PELLETS



WOOD CHIPS



STRAW

HOT AIR GENERATORS POWERED



ON STRAW

The principle of operation is simple, but extremely effective: the air sucked in by the ventilation unit is fed into the heat exchanger by heating surfaces, which, heating up as a result of combustion developing inside it, increase the temperature and are distributed in the environment that needs to be heated.

Gorenje The generator can only be loaded manually, through the front loading door. The fan start is delayed compared to the ignition of the material inside the combustion chamber, both at start and stop; this avoids the release of unpleasantly cold air into the environment and ensures complete and safe cooling of the heat exchanger.

The devices are designed to be able to carry out, in the summer season, even the only ventilation of the environment. The peculiarity of the "direct hot air exchange" technology is the direct and immediate transfer of heat generated during combustion into a heated medium without the use of intermediate liquids (each intermediate heat exchange is associated with thermodynamic losses), ensuring high overall efficiency of the system combined with very low thermal inertia.

These distinctive features make it especially advantageous to install hot air generators in cases where periodic or irregular heating is required or when there is a risk of frost. In the case of ducted systems (duct system), depending on the required pressure, high pressure options from 450 Pa to 800 Pa are available.

The standard version is designed for air treatment at a minimum temperature of -15°C.



BY PELLET

The use of pellets is very versatile; it can be received packaged in 15kg bags (ideal for domestic use), or in 1 ton big-bales which are ideal for industrial and agricultural use. In recent times, many manufacturers can also make deliveries of bulk material to be loaded directly via special pneumatic systems or mechanical screw conveyors into customers' silos.

Wood pellets can be burned using mechanical burners that are very similar in operating principle to fossil fuel burners; these are burners where the pellet is fed by augers which drop the pellet into a special brazier where it is ignited by electrical resistors and then kept lit thanks to fans which continuously balance the combustion air. The combustion chamber of the pellet hot air generator has a vertical development for better exploitation of the internal convective currents and a base equipped with a refractory concrete surface to protect the metal parts which would remain in contact with the burning coals of the pellets.

The combustion chamber is made of stainless steel and the brazier of the burners is made of the highest quality austenitic stainless steel to resist temperatures up to 1100°C. The heat tube exchanger is placed above the vault of the combustion chamber.

The exchanger is also made of stainless steel. The fan or fans (when the machine is very large) are centrifugal with high performances.



BY WOOD CHIPS

The variability in the type and size of the fuel makes this type of combustion more susceptible to variations and therefore with more parameters to control.

The ventilation of the combustion air is very important and these machines have air injections in various positions to have the best possible homogeneity of temperatures inside the combustion chamber. The combustion chamber of the wood chip hot air generator has a vertical development and a base equipped with a refractory concrete surface and a heavy steel or cast iron grate for the passage of the ashes. The stainless steel heat tube exchanger is placed above the vault of the main combustion chamber.

Correct feeding of fuel into the combustion chamber is particularly important as in many cases the material is extremely irregular in size, shape, weight and humidity level; for this reason the feeding tank is always equipped with a mechanical mixer and a heavy loading screw moved by powerful gearmotors.



BY PIECES OF WOOD

Chopped wood or wood briquettes can be burned in machines that basically have the same architecture and structure as wood chip machines.

The combustion chamber of the pellet hot air generator has a vertical development for better exploitation of the internal convective currents and a base equipped with a refractory concrete surface to protect the metal parts which would remain in contact with the burning coals of the pellets. The combustion chamber is made of stainless steel and the brazier of the burners is made of the highest quality austenitic stainless steel to resist temperatures up to 1100°C.

The machine is loaded and then turned on manually and remains in operation until the fuel runs out, which then must be loaded manually again.



BY FOSSIL FUELS

Fossil fuels (natural gas and diesel) are particularly versatile, simple to supply and apply. Hot air generators for this type of fuel are absolutely the simplest type and always consist of two main components: the fuel burner and the heat generator.

The fuel burner is always a commercial component that can also be chosen by the final user.

The heat generator is basically represented by three parts: the combustion chamber, the heat tube exchanger, the ventilation unit. The combustion chamber to withstand the temperatures of the direct flame of the burner is made of stainless steel, has a cylindrical shape and is equipped with a flange connecting to the burner.

The heat tube exchanger represents the main exchange surface and is also made of stainless steel. The fan can be helical or centrifugal (option).

ECONOMIC ANALYSIS OF HEATING SYSTEMS WITH HEAT GENERATORS

Traditionally, industrial heating systems are developed on radiation or convection systems where the heat exchange fluid is hot water or superheated water (saturated steam). The application of hot water systems lends itself favorably to large surfaces and requires precise and branched heat distribution. The unitary investment for these systems is, obviously, inversely proportional to the surface to be heated but usually represents the largest cost center compared to all other technological systems within environments to be heated. In cases of medium (1-2 ha) or small (less than 1ha) surfaces, the application of hot air generators can be very advantageous, as they do not require particular infrastructures (they do not require installation rooms as instead happens for hot water boilers), are simple to install and particularly versatile (they can be moved and placed in other sites quickly).

The operating principle is simple: the fuel is burned in a special combustion chamber, the hot combustion products touch the surfaces of a tube bundle which acts as a heat exchanger with the same air from the greenhouse which is sucked in from the environment and therefore reintroduced at a higher temperature after passing over the surfaces of the heat exchanger. Here we will examine the different types of hot air generators and the areas of application, analyzing their advantages and particularities.

GAS

The investment in this technology compared to hot water systems is very advantageous for the same surface area. The expense is 5-8 times lower than that with hot water systems, with minimal installation times and without particular infrastructure costs.

Obviously each hot air generator must be adequately powered by the essential fuel and it will therefore be necessary in each case to design the diesel or natural gas distribution network. The hot air outlet temperatures for these machines are usually around 60-80°C with fume outlet temperatures above 140-150°C

WOOD CHIPS

The investment for these machines compared to hot water systems, for the same surface area, is still advantageous, especially due to the extreme cheapness of the fuel.

The investment cost is 3-4 times lower than that with hot water systems. The hot air outlet temperatures for these machines are usually around 50-70°C with fume outlet temperatures above 180-220°C

PELLETS

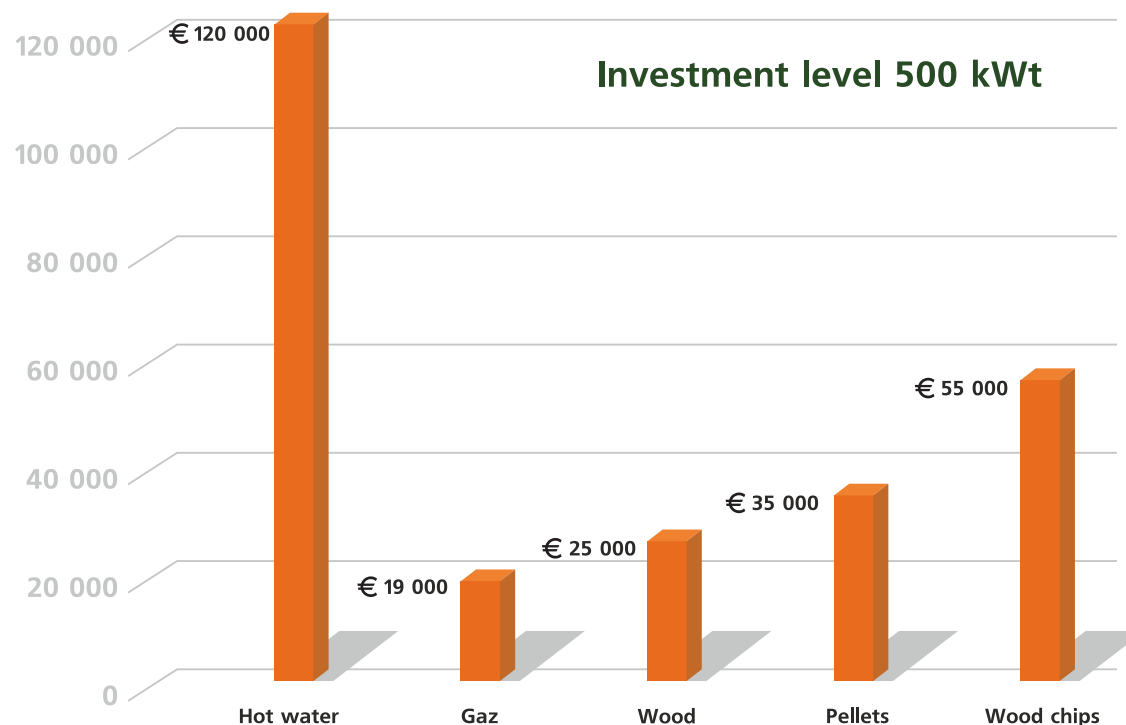
Installation and use are particularly simple and the uniformity of the fuel makes these machines very popular in small and medium industrial applications for heating greenhouses, warehouses, sports sites, tensile structures, places of worship.

The investment for these machines compared to hot water systems, for the same surface area, is very advantageous, especially when there is no possibility of supplying natural gas or the supply of diesel fuel is difficult (peripheral places or in the open countryside). The expense is 4-6 times lower than that with hot water systems, and here too the installation times are negligible and no particular infrastructural arrangements are necessary.

The hot air outlet temperatures for these machines are usually around 50-70°C with fume outlet temperatures above 150-200°C

WOOD

The advantage of these types of generators lies in the use of zero-cost or extremely economical fuels and very available in some circumstances.



IN CONCLUSIONS

Hot air generators are an economical and safe solution for all medium and small surfaces where the intervention with hot water systems is invasive and expensive and lends itself to advantageous and fast economic amortization.



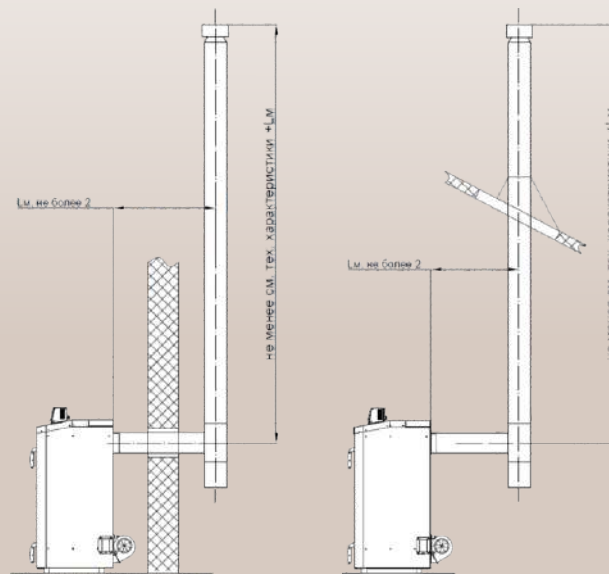
TRANSPORT AND STORAGE

Transport takes place on palletized packaging which allows movement over long distances. Loading and unloading must take place with suitable lifting machines and storage must always be carried out in covered and dry places.



INSTALLATION

Hot air generators can be installed inside industrial and agricultural environments or placed outside. In this case the generators are connected to the environment to be heated via special ducts which introduce the heated air inside. In the case of indoor installation, the generators must be placed in positions that allow the intake of air without obstacles and that allow maintenance without handling problems.



SMOKES



The air generators must be connected to smoke pipes of adequate diameter and must be sized and installed so that there are as few horizontal sections as possible which reduce the draft, that there are condensate drains in the correct positions and that they are connected in stable way to the supporting walls on the outside to prevent falling in the wind.



SPECIAL INSTALLATIONS IN CONTAINERS

SPECIAL INSTALLATIONS

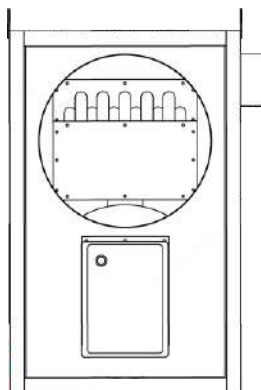
It is possible to create heating stations with hot air generators pre-installed in modular containers. The containers in this case are complete with the biomass storage and loading system with loading from the top. The interior is equipped with hot air generators and electrical safety and control systems. The positioning of the container on a special concrete platform must be carried out with adequate lifting systems directly on site.



AIR GENERATORS: GAS/DIESEL

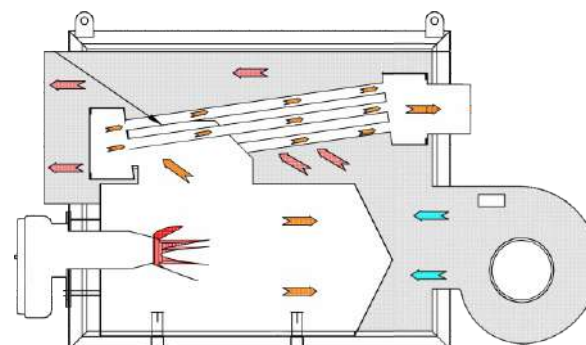
AIR GENERATORS GAS/DIESEL POWERED

- **Supporting frame** in welded and painted carbon steel tubing
- **Machine body** and heat exchanger in AISI304 steel
- **Heat exchanger tubes** in AISI304 welded tube Ø42x1.5mm
- **Heat exchanger front plate** in AISI304 removable for extraordinary cleaning
- **Heat exchanger rear plate** in AISI304 removable for extraordinary cleaning
- **Internal deflectors** to facilitate the passage of air in the exchanger
- **Closing panels** with carbon steel reinforcement folds painted in RAL colour
- **Possibility of attaching** plenum for double outlet
- **Possibility of connecting** standard pre-perforated PVC hoses/sheaths Ø600mm
- **4 lifting eyebolts** on the upper corners
- **8-blade axial fan** in reinforced PP mounted on motor support net
- **IP55 electrical panel** with Honeywell L4064 working-safety bi-thermostat
- **Electrical panel** connectable to external controller/ thermostat
- **Pre-drilled burner housing plate** (Riello standard) or to be drilled
- **Packaging** on 120x120 pallets
- **Certification CE**
- **EAC certification** (Russian Federation and CIS countries)
- **Compliant with ERP 2015 regulations**



	AGRO A150	AGRO A250
Total power (kWt)	149	245
Heating power (kWt)	129	220
Efficiency (%)	> 87%	> 89%
Total air flow (m ³ /h)	10.000	13.000
Chimney diameter (mm)	200	200
Supply voltage (V)	400	400
Hot air outlet diameter (mm)	1xØ600	1xØ600
Rated electrical power (kW)	0,72	1,28
Weight (kg)	210	275
Hourly consumption of methane (G20) (Nm ³ /h) (*)	15,5	25,5

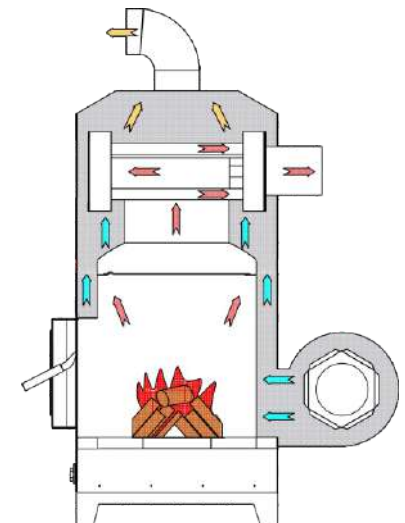
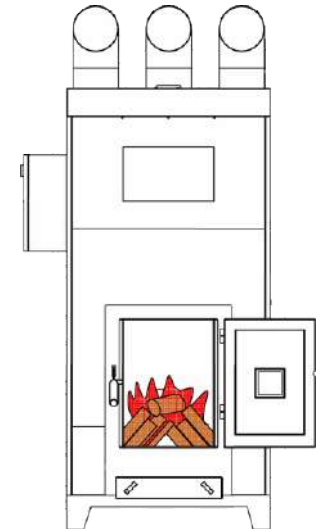
(*) Calorific value of methane (G20) = 8.850kcal/h



HOT AIR GENERATORS WITH PIECES OF WOOD



- **Machine body and heat exchanger** in AISI304 steel
- **Heat exchanger tubes** in AISI304 welded tube
- **Heat exchanger front plate** in AISI304 removable for extraordinary cleaning
- **Heat exchanger rear plate** in AISI304 removable for extraordinary cleaning
- **Internal deflectors to facilitate** the passage of air in the exchanger
- **Closing panels with carbon steel reinforcement folds** painted in RAL colour
- **Possibility of connecting plenum** for standard pre-perforated PVC hoses/sheaths Ø600mm
- **High prevalence centrifugal fan**
- **Centrifugal fan(s)** for combustion air
- **Heavy steel grate** for ash passage
- **IP55 electrical panel** with easy thermostatic control unit
- **Certification CE**
- **EAC certification** (Russian Federation and CIS countries)

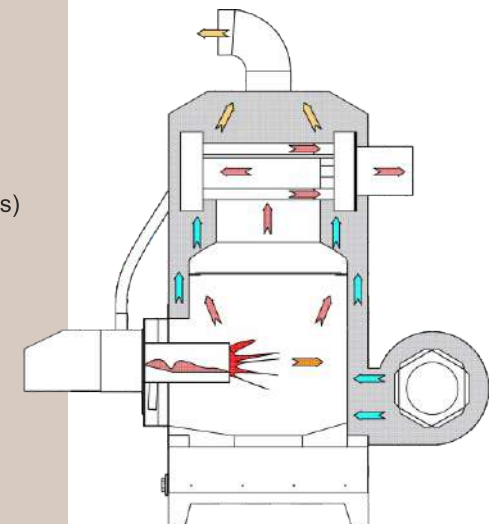
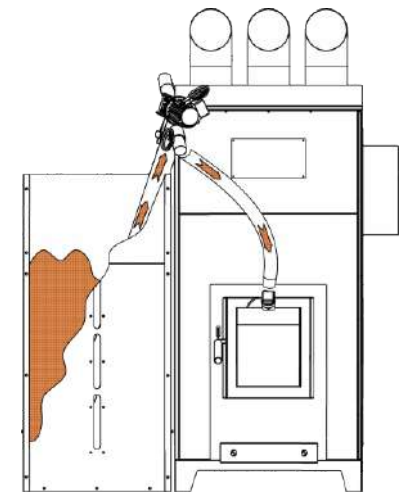


	GML 30	GML 50	GML 80	GML 100	GML 150	GML 250	GML 300	GML 400	GML 500
Heating power (kcal/h)	25.700	42.900	73.000	99.000	150.000	206.400	258.000	350.000	435.000
Heating power (kWt)	29.80	50	85	115	174,5	240	300	407	505
Efficiency (%)	> 85%	> 85%	> 85%	> 87%	> 87%	> 86%	> 85%	> 85%	> 85%
Total air flow (m ³ /h)	2.200	4.000	5.000	6.000	11.000	13.000	18.000	25.000	34.000
Outlet air pressure (Pa)	600	620	620	643	630	630	660	675	720
Noise level (dB)	83	83	83	83	84	84	84	83.5	83
Chimney diameter (mm)	200	200	200	200	220	250	250	300	400
Supply voltage (V)	230	230/400	400	400	400	400	400	400	400
Hot air outlet diameter (mm)	2xØ200	2xØ200	3xØ180	3xØ200	3xØ250	3xØ250	3xØ300	3xØ300	3xØ400
Rated electrical power (kW)	1,5	1,75	1,9	2,5	2,85	3,5	4,5	9	12.5
Weight (kg)	350	380	420	550	770	850	980	1750	2450
Hourly consumption of wood (kg/h) (*)	9,44	15,77	26,88	35,56	53,87	75	94,85	128,67	160

(*) Calorific value of wood = 3.200 kcal/h

HOT AIR GENERATORS PELLET POWERED

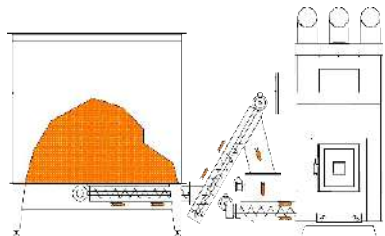
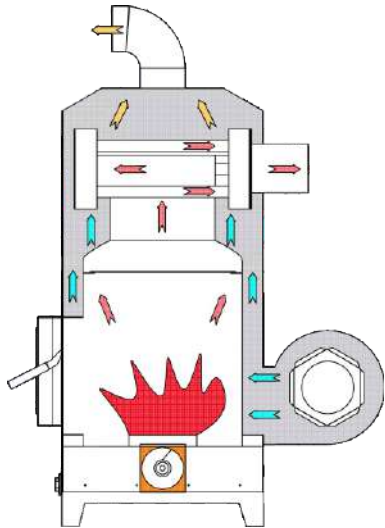
- Machine body and heat exchanger in AISI304 steel
- Heat exchanger tubes in AISI304 welded tube
- Heat exchanger front plate in AISI304 removable for extraordinary cleaning
- Heat exchanger rear plate in AISI304 removable for extraordinary cleaning
- Internal deflectors to facilitate the passage of air in the exchanger
- Burner with ventilator for combustion-air
- Container for pellet with motorized screw
- Closing panels with carbon steel reinforcement folds painted in RAL colour
- Possibility of connecting plenum for standard pre-perforated PVC hoses/sheaths Ø600mm
- High prevalence centrifugal fan
- Heavy steel grate for ash passage
- IP55 electrical panel with electronic control unit
- Certification CE
- EAC certification (Russian Federation and CIS countries)



	GAP 30	GAP 50	GAP 80	GAP 100	GAP 150	GAP 250	GAP 300	GAP 400	GAP 500
Heating power (kcal/h)	25.700	42.900	73.000	99.000	150.000	206.400	258.000	350.000	435.000
Heating power (kWt)	29.80	50	85	115	174,5	240	300	407	505
Efficiency (%)	> 85%	> 85%	> 85%	> 87%	> 87%	> 86%	> 85%	> 85%	> 85%
Total air flow (m ³ /h)	2.200	4.000	5.000	6.000	11.000	13.000	18.000	25.000	34.000
Outlet air pressure (Pa)	600	620	620	643	630	630	660	675	720
Noise level (dB)	83	83	83	83	84	84	84	83.5	83
Chimney diameter (mm)	200	200	200	200	220	250	250	300	400
Supply voltage (V)	230	230/400	400	400	400	400	400	400	400
Hot air outlet diameter (mm)	2xØ200	2xØ200	3xØ180	3xØ200	3xØ250	3xØ250	3xØ300	3xØ300	3xØ400
Rated electrical power (kW)	2	2,25	2,4	2,7	3	3,8	4,9	11	13.5
Weight (kg)	360	390	430	570	790	875	1010	1790	2490
Hourly consumption of wood (kg/h) (*)	6,71	11,21	19,1	25,27	38,32	53,33	67,45	91,5	113,75

(*) Calorific value of Pellet = 4.500 kcal

HOT AIR GENERATORS WOOD CHIPS POWERED



- **Machine body and heat exchanger** in AISI304 steel
- **Heat exchanger tubes** in AISI304 welded tube
- **Heat exchanger front plate** in AISI304 removable for extraordinary cleaning
- **Heat exchanger rear plate** in AISI304 removable for extraordinary cleaning
- **Internal deflectors to facilitate** the passage of air in the exchanger
- **Centrifugal ventilator** for combustion air (variable speed)
- **Container for chips** with rotative mixer
- **Stainless steel** loading screw
- **Automatic ignition** with electric resistance
- **Closing panels with carbon steel reinforcement folds** painted in RAL colour
- **Possibility of connecting plenum for standard pre-perforated PVC hoses/sheaths** Ø600mm
- **High prevalence centrifugal fan**
- **Burning place** in special stainless steel AISI310 with holes ash passage
- **IP55 electrical panel** with electronic control unit
- **Certification CE**
- **EAC certification** (Russian Federation and CIS countries)



WOOD CHIPS

	GCA 30	GCA 50	GCA 80	GCA 100	GCA 150	GCA 250	GCA 300	GCA 400	GCA 500
Heating power (kcal/h)	25.700	42.900	73.000	99.000	150.000	206.400	258.000	350.000	435.000
Heating power (kWt)	29.80	50	85	115	174,5	240	300	407	505
Efficiency (%)	> 85%	> 85%	> 85%	> 87%	> 87%	> 86%	> 85%	> 85%	> 85%
Total air flow (m ³ /h)	2.200	4.000	5.000	6.000	11.000	13.000	18.000	25.000	34.000
Outlet air pressure (Pa)	600	620	620	643	630	630	660	675	720
Noise level (dB)	83	83	83	83	84	84	84	83.5	83
Chimney diameter (mm)	200	200	200	200	220	250	250	300	400
Supply voltage (V)	230	230/400	400	400	400	400	400	400	400
Hot air outlet diameter (mm)	2xØ200	2xØ200	3xØ180	3xØ200	3xØ250	3xØ250	3xØ300	3xØ300	3xØ400
Rated electrical power (kW)	2	2,25	2,4	2,7	3	3,8	4,9	11	13.5
Weight (kg)	360	390	430	570	790	875	1010	1790	2490
Hourly consumption of wood (kg/h) (*)	9,75	16,28	27,7	36,7	55,65	77,42	97,91	132,82	165,1

(*) Calorific value of Wood Chips M25 = 3.100 kcal/h

HOT AIR GENERATORS POWERED WITH ROLL OF STRAW

- **Machine body and heat** exchanger in AISI304 steel
- **Heat exchanger tubes** in AISI304 welded tube
- **Heat exchanger front plate** in AISI304 removable for extraordinary cleaning
- **Heat exchanger rear plate** in AISI304 removable for extraordinary cleaning
- **Internal deflectors** to facilitate the passage of air in the exchanger
- **Centrifugal ventilators** for combustion air (variable speed) primary air
- **Centrifugal ventilators** for combustion air (variable speed) secondary air
- **Charging door** 1,5x1,5m on 3 supports
- **Closing panels** with carbon steel reinforcement folds painted in RAL colour
- **Possibility of connecting plenum for standard pre-perforated** PVC hoses/sheaths 11600mm
- **High prevalence centrifugal fans**
- **Burning place in heavy steel** with holes ash passage
- **Large dimension ash drawer** with gasket and locking handles
- **IP55 electrical panel** with electronic control unit
- **Certification CE**
- **EAC certification** (Russian Federation and CIS countries)



STRAW

	GML400S
Heating power (kcal/h)	400.000
Heating power (kWt)	465
Efficiency (%)	> 85%
Total air flow (m3/h)	25.000
Outlet air pressure (Pa)	675
Noise level (dB)	84
Chimney diameter (mm)	400
Supply voltage (V)	400
Hot air outlet diameter (mm)	1xØ600
Rated electrical power (kW)	13.5
Weight (kg)	3600
Hourly consumption of wood (kg/h) (*)	120-150

(*) Straw roll with max humidity 25%



ACCESSORIES FOR AGRO GAS/DIESEL



Plenum for diffusion
L and R



Kit GPL
for gas burner



Centrifugal ventilator **вентилятор**



Thermostat HP 11
With room sensor



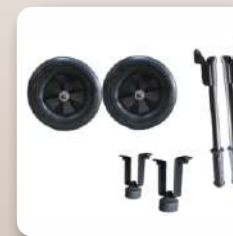
Chimney stainless
steel Ø200 mm lg. 1m



Chimney elbow 90°
st.steel Ø200 mm



Terminal chimney st.steel
inox Ø200 mm



Kit trolley with: wheels
handle and support feet



Crossing wall kit



Fixing ring



Wall bracket



Spiral.outlet pipe Ø600 lg.3m
For hose connection

CHARGERS FOR HOT AIR GENERATORS WITH CHIPS



- **Heavy welded carbon steel structure** painted in RAL color
- **Internal mixer** with two blades and double leaf spring moved by a gearmotor
- **Rotating distribution plate**
- **Heavy stainless steel transport screw** driven by a gear motor
- **Motorized anti-backfire** rotary valve
- **Possibility of movable cover** for outdoor applications
- **Flow rate** adjustment by electronic control of the generator
- **Height-adjustable** support feet
 - Available in models of 0.8 – 1.7 – 3.5 – 5 m3

DRYERS FOR HERBS AND FRUIT

- **Structure** in 50mm insulating panel
- **Variable length** according to production needs
- **Gas or biomass drying station** with hot air generator
- **Internal drying flow** with three selectable flows
- **Trolleys with multi-level** stainless steel grid
- **Electronic temperature and humidity control**



BURNERS, CONTROL UNITS, SCREWS



Our hot air generators are built with top quality elements.

The high standard of the components chosen for our machines allows for high performance and reliability with every fuel and in every application







NOTES



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