



02/2018

# Technical Description

## Genset

### JGS 208 GS-L.L

dyn. GC Profile 2 (150ms/5%)

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## Generating set for **ECOMAX 3 Landfill**

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Electrical output                                330     kW el.

#### Emission values

NOx     < 450 mg/Nm<sup>3</sup> (5% O<sub>2</sub>)



<b>0.01 Technical Data (at genset)</b>	<b>3</b>
Main dimensions and weights (at genset)	4
Connections	4
Output / fuel consumption	4
<b>0.02 Technical data of engine</b>	<b>5</b>
Thermal energy balance	5
Exhaust gas data	5
Combustion air data	5
Sound pressure level	6
Sound power level	6
<b>0.03 Technical data of generator</b>	<b>7</b>
Reactance and time constants (saturated) at rated output	7
<b>connection variant 208K</b>	<b>8</b>
<b>0.05 Cooling water circuit</b>	<b>9</b>
Oil - heat (Engine jacket water cooling circuit)	9
Engine jacket water - heat (Engine jacket water cooling circuit)	9
Intercooler - heat (Low temperature circuit)	9
<b>0.10 Technical parameters</b>	<b>10</b>



## 0.01 Technical Data (at genset)

			100%	75%	50%
Power input	[2]	kW	851	657	463
Gas volume	*)	Nm <sup>3</sup> /h	213	164	116
Mechanical output	[1]	kW	342	257	171
Electrical output	[4]	kW el.	330	247	163
<b>Heat to be dissipated</b> [5]					
~ Intercooler (Low temperature circuit)	[9]	kW	75	39	9
~ Lube oil (Engine jacket water cooling circuit)		kW	40	32	28
~ Jacket water		kW	113	104	87
~ Surface heat	ca. [7]	kW	32	~	~
Spec. fuel consumption of engine electric	[2]	kWh/kWel.h	2,58	2,66	2,85
Spec. fuel consumption of engine	[2]	kWh/kWh	2,49	2,56	2,71
Lube oil consumption	ca. [3]	kg/h	0,10	~	~
Electrical efficiency			38,8%	37,6%	35,1%
Fuel gas LHV		kWh/Nm <sup>3</sup>	4		

\*) approximate value for pipework dimensioning

[ ] Explanations: see 0.10 - Technical parameters

All heat data is based on standard conditions according to attachment 0.10. Deviations from the standard conditions can result in a change of values within the heat balance, and must be taken into consideration in the layout of the cooling circuit/equipment (intercooler; emergency cooling; ...). In the specifications in addition to the general tolerance of  $\pm 8\%$  on the thermal output a further reserve of  $+5\%$  is recommended for the dimensioning of the cooling requirements.



## Main dimensions and weights (at genset)

Length	mm	~ 4.900
Width	mm	~ 1.700
Height	mm	~ 2.000
Weight empty	kg	~ 5.900
Weight filled	kg	~ 6.100

## Connections

Jacket water inlet and outlet	DN/PN	50/16
Exhaust gas outlet [C]	DN/PN	150/10
Fuel Gas (at genset) [D]	DN/PN	80/16
Water drain ISO 228	G	½"
Condensate drain	mm	18
Safety valve - jacket water ISO 228 [G]	DN/PN	1½"/2,5
Lube oil replenishing (pipe) [I]	mm	28
Lube oil drain (pipe) [J]	mm	28
Jacket water - filling (flex pipe) [L]	mm	13
Intercooler water-Inlet/Outlet 1st stage	DN/PN	50/10
Intercooler water-Inlet/Outlet 2nd stage [M/N]	DN/PN	50/10

## Output / fuel consumption

ISO standard fuel stop power ICFN	kW	342
Mean effe. press. at stand. power and nom. speed	bar	16,50
Fuel gas type		Landfill gas
Based on methane number   Min. methane number	MZ	135   117 d)
Compression ratio	Epsilon	12
Min./Max. fuel gas pressure at inlet to gas train	mbar	80 - 200 c)
Max. rate of gas pressure fluctuation	mbar/sec	10
Maximum Intercooler 2nd stage inlet water temperature	°C	50
Spec. fuel consumption of engine	kWh/kWh	2,49
Specific lube oil consumption	g/kWh	0,30
Max. Oil temperature	°C	90
Jacket-water temperature max.	°C	95
Filling capacity lube oil (refill)	lit	~ 126

c) Lower gas pressures upon inquiry

d) based on methane number calculation software AVL 3.2



## 0.02 Technical data of engine

Manufacturer		GE Jenbacher
Engine type		J 208 GS-C21
Working principle		4-Stroke
Configuration		In - Line
No. of cylinders		8
Bore	mm	135
Stroke	mm	145
Piston displacement	lit	16,60
Nominal speed	rpm	1.500
Mean piston speed	m/s	7,25
Length	mm	1.890
Width	mm	1.020
Height	mm	1.630
Weight dry	kg	1.800
Weight filled	kg	2.000
Moment of inertia	kgm <sup>2</sup>	3,51
Direction of rotation (from flywheel view)		left
Radio interference level to VDE 0875		N
Starter motor output	kW	6
Starter motor voltage	V	24

### Thermal energy balance

Power input	kW	851
Intercooler	kW	75
Lube oil	kW	40
Jacket water	kW	113
Exhaust gas cooled to 180 °C	kW	192
Exhaust gas cooled to 100 °C	kW	237
Surface heat	kW	17

### Exhaust gas data

Exhaust gas temperature at full load	[8]	°C	508
Exhaust gas temperature at bmep= 12,4 [bar]		°C	~ 527
Exhaust gas temperature at bmep= 8,3 [bar]		°C	~ 546
Exhaust gas mass flow rate, wet		kg/h	1.858
Exhaust gas mass flow rate, dry		kg/h	1.725
Exhaust gas volume, wet		Nm <sup>3</sup> /h	1.444
Exhaust gas volume, dry		Nm <sup>3</sup> /h	1.278
Max.admissible exhaust back pressure after engine		mbar	60

### Combustion air data

Combustion air mass flow rate		kg/h	1.672
Combustion air volume		Nm <sup>3</sup> /h	1.294
Max. admissible pressure drop at air-intake filter		mbar	10



## Sound pressure level

<b>Aggregate a)</b>		<b>dB(A) re 20<math>\mu</math>Pa</b>	<b>92</b>
31,5 Hz		dB	80
63 Hz		dB	84
125 Hz		dB	89
250 Hz		dB	90
500 Hz		dB	88
1000 Hz		dB	87
2000 Hz		dB	83
4000 Hz		dB	81
8000 Hz		dB	86
<b>Exhaust gas b)</b>		<b>dB(A) re 20<math>\mu</math>Pa</b>	<b>107</b>
31,5 Hz		dB	99
63 Hz		dB	103
125 Hz		dB	111
250 Hz		dB	104
500 Hz		dB	105
1000 Hz		dB	103
2000 Hz		dB	99
4000 Hz		dB	88
8000 Hz		dB	67

## Sound power level

Aggregate		<b>dB(A) re 1pW</b>	<b>111</b>
Measurement surface		m <sup>2</sup>	83
Exhaust gas		<b>dB(A) re 1pW</b>	<b>115</b>
Measurement surface		m <sup>2</sup>	6,28

a) average sound pressure level on measurement surface in a distance of 1m (converted to free field) according to DIN 45635, precision class 3.

b) average sound pressure level on measurement surface in a distance of 1m according to DIN 45635, precision class 2.

The spectra are valid for aggregates up to bmep=16,5 bar. (for higher bmep add safety margin of 1dB to all values per increase of 1 bar pressure).

Engine tolerance  $\pm$  3 dB



### 0.03 Technical data of generator

Manufacturer		STAMFORD e)
Type		HC 534 E e)
Type rating	kVA	476
Driving power	kW	342
Ratings at p.f. = 1,0	kW	330
Ratings at p.f. = 0,8	kW	327
Rated output at p.f. = 0,8	kVA	408
Rated reactive power at p.f. = 0,8	kVar	245
Rated current at p.f. = 0,8	A	589
Frequency	Hz	50
Voltage	V	400
Speed	rpm	1.500
Permissible overspeed	rpm	1.800
Power factor (lagging - leading)		0,8 - 0,95
Efficiency at p.f. = 1,0		96,5%
Efficiency at p.f. = 0,8		95,5%
Moment of inertia	kgm <sup>2</sup>	8,70
Mass	kg	1.535
Radio interference level to EN 55011 Class A (EN 61000-6-4)		N
Ik" Initial symmetrical short-circuit current	kA	8,33
Is Peak current	kA	21,20
Insulation class		H
Temperature (rise at driving power)		F
Maximum ambient temperature	°C	40

#### Reactance and time constants (saturated) at rated output

xd direct axis synchronous reactance	p.u.	1,93
xd' direct axis transient reactance	p.u.	0,10
xd'' direct axis sub transient reactance	p.u.	0,07
x2 negative sequence reactance	p.u.	0,11
Td'' sub transient reactance time constant	ms	12
Ta Time constant direct-current	ms	19
Tdo' open circuit field time constant	s	2,50

e) GE Jenbacher reserves the right to change the generator supplier and the generator type. The contractual data of the generator may thereby change slightly. The contractual produced electrical power will not change.