Josephine Kennedy

From: Helen Behan <Helen.Behan@bnm.ie>
Sent: 05 December 2011 17:02
To: Una O'Callaghan
Subject: CIRL queries
Attachments: SKMBT_C45111120516380.pdf

Hi Una,

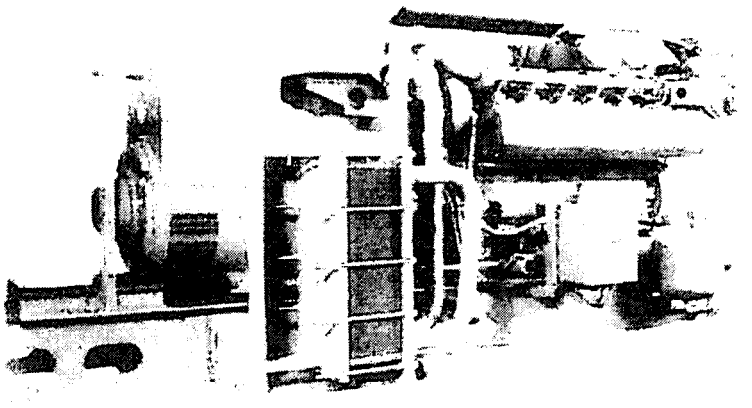
from the spec attached submitted in the EIS, the thermal efficiency is 40.2% for this biogas engine and 1,302 kw is the energy input.

I do not have clarification on the SOx yet as I am trying to contact relevant people.

Kind Regards,

Helen

Jenbacher gas engines
Technical Specification



JMS 312 GS-B.L

Biogas 526kW el.

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JMS 312 GS-B.L
Biogas 526kW el.

CO-GEN Module data:

Electrical output	kW el	526
Recoverable thermal output (220 °C)	kW	524
Energy input	kW	1 302
Fuel Consumption based on a LHV of 5 kWh/Nm³	Nm³/h	260
Electrical efficiency	%	40,4%
Thermal efficiency	%	40,2%
Total efficiency	%	80,6%
Heat to be dissipated (LT-Circuit)	kW	23
Emission values		

NOx < 500 mg/Nm³ (5% O2)

Additional information:

Sound pressure level (engine, average value 1m)	dB(A)	95
Sound pressure level exhaust gas (1m, 30° off engin	dB(A)	115
Exhaust gas mass flow rate, wet	kg/h	2 858
Exhaust gas volume, wet	Nm³/h	2 190
Max admissible exhaust back pressure after engine	mbar	60
Exhaust gas temperature at full load	°C [8]	450
Combustion air mass flow rate	kg/h	2 506
Combustion air volume	Nm³/h	1 939
Max. inlet cooling water temp. (intercooler)	°C	50
Max. pressure drop in front of intake-air filter	mbar	10
Return temperature	°C	70
Forward temperature	°C	90
Hot water flow rate	m³/h	22,5

Engine data:

Engine type		J 312 GS-C25
Configuration		V 70°
No. of cylinders		12
Bore	mm	135
Stroke	mm	170
Piston displacement	lit	29,20
Nominal speed	rpm	1 500
Mean piston speed	m/s	8,5
Mean effe. press. at stand. power and nom. spr	bar	14,90
Compression ratio	Epsilon	16,0
ISO standard fuel stop power ICFN	kW	544
Spec. fuel consumption of engine	kWh/kWh	2,39
Specific lube oil consumption	g/kWh	0,30
Weight dry	kg	3 500
Filling capacity lube oil	lit	230
Based on methane number	MZ	100

Alternator:

Manufacturer		STAMFORD e)
Type		HCI 634 H2 e)
Type rating	kVA	910
Efficiency at p.f. = 1,0	%	96,6%
Efficiency at p.f. = 0,8	%	95,7%
Ratings at p.f. = 1,0	kW	526
Ratings at p.f. = 0,8	kW	521
Frequency	Hz	50
Voltage	V	400
Protection Class		IP 23
Insulation class		H
Speed	rpm	1 500
Mass	kg	2 145

Technical parameters:

Applicable standards	Based on DIN-ISO 3046	
	Based on VDE 0530 REM with specified tolerance	
Standard conditions	Air pressure	1000 mbar or 100 m above sea level
	Air temperature	25°C or 298 K
	Relative Humidity	30%
Engine output derating	for plants installed at > 500m above sea level and/or intake temperature > 30°C the reduction of engine power is determined for each project	
Gas quality	according to TA 1000-0300	
	Gas flow pressure	80 - 200 mbar
		(Lower gas pressures upon inquiry)
	Max. variation in gas pressure ±10%	

All data are based on engine full load at specified media temperatures and are subject to change
The technical instruction TA 1100-0110 "PARAMETER FOR GE Jenbacher GAS ENGINES" must be strictly observed

>>> Scope of supply genset - JGS 312 GS-B.L

Basic engine equipment:
*Exhaust gas turbocharger, intercooler
*Motorized carburator for LEANOX control
*Electronic contactless high performance ignition system
*Lubricating oil pump (gear driven)
*Lubricating oil filters in main circuit
*Lubricating oil sump, Lubricating oil heat exchanger
*Jacket water pump
*Fuel-, lubricating oil and jacket water pipe work on engine
*Flywheel for alternator operation, Exhaust gas manifold
*Viscous damper
*Knock sensors

Engine accessories:
*Electric starter motor
*Electronic speed governor
*Electronic speed monitoring device including starting and overspeed control
*Transducers and switches for oil pressure, jacket water temp., jacket water pressure, charge pressure and mixture temperature
*One thermocouple per cylinder

Supplied loose:
Gas train according to DIN-DVGW consisting of
*Manual stop valve, fuel gas filter, two solenoid valves, Leakage control device, gas pressure regulator

Documentation:
*Operating and maintenance manual
*Spare parts manual
*Drawings

Assembly, painting, testing in Jenbach/Austria

Module equipment:
*Base frame for gas engine, alternator and heat exchangers
*Internal pole alternator with excitation alternator and with automatic voltage regulator, p f 0,8 lagging to 1 0
*Flexible coupling, belt housing
*Anti-vibration mounts
*Air filter
*Automatic lube oil replenishing with level control
*Wiring of components to module interface panel
*Crankcase breather
*Jacket water electric preheating

Module control panel:
*Totally enclosed , single door cubicle, wired to terminals and ready to operate, protection IP 40 outside, IP 10 inside, according to VDE-standards

Control equipment:
*Engine-Management-System dia ne (Dialog Network)
**Visualisation (industry PC-5 7" color graphics display) Operation data controller display,Exh gas temp.,Generator electr connection,etc
**Central engine- and module control Speed-, Power output-, LEANOX-Control and knock control, etc
*Multi-transducer
*Lockable operation mode selector switch Positions "OFF", "MANUAL", "AUTOMATIC"
*Demand switch

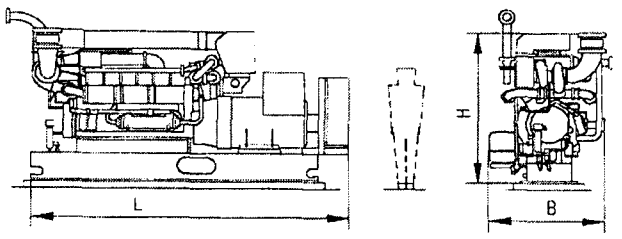
>>> Scope of supply module - JMS 312 GS-B.L

Identical to Genset except that heat recovery is included
*jacket water heat exchanger mounted on module frame
*exhaust gas heat exchanger mounted on module frame;
*all heat exchangers with complete pipework
*Heat exchangers and all inherent auxiliaries

>>> Scope of supply container - JG(M)C 312 GS-B.L

*Identical to module/genset but installed in 40' ISO container (65 dB(A) @ 10m); complete with all pipework and fittings
*Twin circuit radation cooler for dissipation of intercooler jacket water and lube oil thermal output, ventilation equipment
*Gas & smoke detectors, exhaust silencer, lube oil equipment, starting system, flexible connections
*Seperate control room complete with generator switchgear and all internal power and monitoring cables

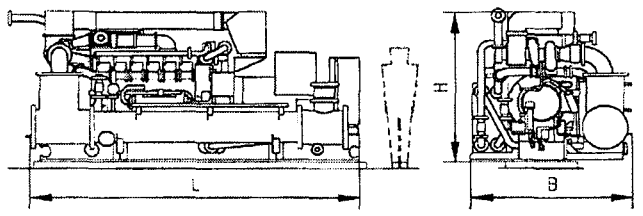
Genset



Main dimensions and weights (approximate value)		
Length L	mm	4 700
Width B	mm	1 800
Height H	mm	2.300
Weight empty	kg	8 000
Weight filled	kg	8 500

Connections (at genset)		
Jacket water inlet and outlet	DN/PN	80/10
Exhaust gas outlet	DN/PN	250/10
Fuel gas (at gas train)	DN/PN	80/16
Intercooler water connection:		
Low Temperature Circuit	DN/PN	65/10

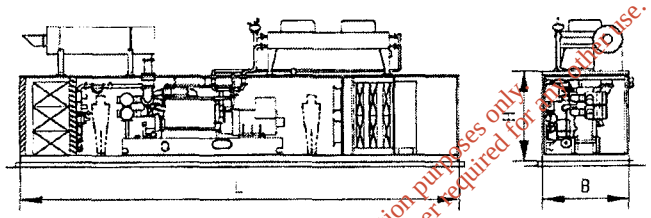
Module



Main dimensions and weights (approximate value)		
Length L	mm	4.700
Width B	mm	2 300
Height H	mm	2.300
Weight empty	kg	9 400
Weight filled	kg	9.900

Connections (at module)		
Hot water inlet and outlet	DN/PN	80/10
Exhaust gas outlet	DN/PN	250/10
Fuel gas (at gas train)	DN/PN	80/16
Intercooler water connection:		
Intercooler water-inlet/Outlet 2nd stage	DN/PN	65/10

Container



Main dimensions and weights (approximate value)		
Length L	mm	12.200
Width B	mm	2.500
Height H	mm	2.600
Container weight (dry)	kg	20.800
Container weight (filled)	kg	21.900

Connections (container)		
Jacket water inlet and outlet	DN/PN	80/10
Exhaust gas outlet	DN/PN	250/10
Fuel gas connection (container)	mm	100/16
Fresh oil connection	G	28x2"

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GE Jenbacher

J 312 GS - C225
Energy balance

Speed	**1500 1/min**	BMEP at M.C.R.	**14,90 bar**
Fuel Gas	**Biogas(50%CH4)**	Compression ratio	**16**
NOx-emission	**500 mg/m3**	CO-emission (app. value)	**1000 mg/m3**
Jacket water outl.max.	**95 °C**	intercooler watertemp. max	**50 °C**
Min. Methane number	**100**	Exhaust gas manifold	**uncooled**

standard rating conditions and tol. see general spec.; volume values at normal conditions;
exhaust flow at silencer; Pe = ICFN (ISO 3046/I)

Energy balance

Exhaust gas and pollutant emissions

Engine load		[%]	100
Theor. composition of wet exhaust gas at 100% fuel gas combustion:			
N2		Vol %	69,1
O2		Vol %	6,6
AR		Vol %	0,8
CO2		Vol %	11,9
H2O		Vol %	11,5
O2 dry exhaust gas		Vol %	7,4
Emission			
NOx	1)	ppm	201
NOx (als NO2)		g/kWh Qne	1,56
NOx (als NO2)		kg/h	0,85
NOx (als NO2)	2)	mg/m3	500 *
NOx (als NO2)		g/GJ Qzu	175
NOx (als NO2)		g/bhphr	1,167
CO	1)	ppm	678
CO		g/kWh Qne	3,13
CO		kg/h	1,70
CO	2)	mg/m3	1000
CO		g/GJ Qzu	351
CO		g/bhphr	2,334

1, in dry exhaust gas
2, in dry exhaust gas at 5% oxygen

offical in charge:
ArtnerOl

Sign:
ao

Printed: 27.03.08
Valid to: 31.12.08

Josephine Kennedy

From: Helen Behan <Helen.Behan@bnm.ie>
Sent: 06 December 2011 14:53
To: Una O'Callaghan
Cc: b.lyons@cleanirl.com; paddy hedigan
Subject: Biogas CHP engine

Hi Una,

I have consulted with Celtic Bioenergy and have the following comments on your query for you.

In brief, the level of H2S in the biogas is initially between 1,000 and
3,000 ppm. However, this is typically reduced down to <200 ppm ahead of the CHP via biological oxidation. As a result the expectation is that the SO2 concentration in the CHP exhaust will be less than 300 mg/m3. In the event that this needs to be reduced further, then further scrubbing of the biogas can be specified.

Sulphur dioxide dry gas referenced to 5%O2 in mg/Nm3:
<300 mg/m3

Let me know if you need anything else.

Do you know if this application will go to the Board before Christmas?

Kind Regards,
Helen

Josephine Kennedy

From: Helen Behan <Helen.Behan@bnm.ie>
Sent: 19 December 2011 16:58
To: Sean O'Donoghue; Una O'Callaghan
Cc: paddy hedigan
Subject: Clean Ireland WL-0253
Attachments: SKMBT_C45111121916530.pdf

Dear Sean & Una,

Please find attached a letter requesting an extension following the RFI from EPA on 8th December 2011.

I would be most grateful if you could revert this week to me before the Christmas break.

Kind Regards,

Helen Behan
Bord na Mona

ANUA
Bord na Móna - with nature

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F.A.O. Mr. Sean O'Donoghu
& Ms Una O Callaghan
Licensing
EPA
Regional Inspectorate,
Inniscara,
Co. Cork.
19/12/11

Re: W0253-01 Clean (Irl) Refuse & Recycling Ltd.
Further Information Request 8th December 2011

Dear Una and Sean,

Further to your letter dated 8th December 2011 regarding abatement, emissions and impact assessment of the proposed CHP Biogas engine, we wish to advise that due to Christmas leave and prior commitments of the Air Team, we will require and extension of 4 (four) weeks to provide a satisfactory response to your request.

In the event a complex air dispersion model has to be effected for the CHP engine, the team are unable to schedule this work until January 2012.

I would be grateful if the EPA could grant an extension to the 16th February 2012.

Yours Sincerely,

Ms. Helen Behan

On behalf of Clean (Irl) Refuse & Recycling Ltd.

Environmental Consultant
Anua Technical Services
Bord na Mona Plc, Main Street,
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