BGES

Application Information

Technical Descriptions

Reference : BAI #1

Model : Peako-500-COMPACT

01 General Performance

System : BGES (Biomass Gasification Engine System)

Model : Peako-500-COMPACT (Basic model)

No	General Performance	Unit	Data
1	Power available : Gross	$kW_{(Gross)}$	1750
2	Power available : Electrical	kW_e	500
3	Power available : Thermal	kW_t	1250
4	Biomass consumption	kg/kWh	1.1 ~ 2.0
5	Self-consumed electrical power	kW	40 ~ 60
6	Water consumption (vaporization)	Liter/kWh	< 0.2

02 Technical Parameters

All data in the BGES Application Information data sheets are based on BGES at full load (unless stated otherwise) and at Standard Operating Condition (SOC).

Deviation from SOC can result in changes of values within the heat balance, and must be taken into consideration in the system configuration.

The BGES thermal output (kW_t) is designed to provide hot water for environment heating. If the hot water is used for cleaning without water returning to the BGES system, then equivalent amount of water at room temperature is required to replenish the used quantity. If the hot water is not used for whatever reasons, then additional cooling tower must be installed to dissipate the un-used thermal energy.

No	Terms	**Definition**
1	Power output	The power (kW_e and kW_t) are the rated system outputs; The recommended continuous rating is 90% of the rated values, i.e. the power delivered continuously between normal maintenance intervals and overhauls as required by Peako.
2	Gross power output	Summation of kW_e and kW_t
3	Biomass consumption	The amount of biomass feedstock consumed to generate 1 kWh of electrical power (kW_e).

No	Items	**Standard Operating Conditions (SOC)**
1	Air temperature	25°C
2	Relative humidity	30%
3	Biomass feedstock	< 20% Moisture content in particle form
4	Altitude	< 500mPD above sea level (0.8% reduction of output for every 100m above 500mPD)
5	Ambient Air Temperature	< 35°C Ambient air temperature (1.5% reduction of output for every 1°C above 35°C)

03 Major System Components

Module No.	Major System Components
M-1	Gasifier
M-2	Biomass silo & Ash silo
M-3	Scrubber & ESP (Electrostatic precipitator)
M-4	Waste water treatment tower
M-5	Settlement tank
M-6	Gas blower & Safety water seal
M-7	Control room
M-8	Air cooler
M-9	Generator #1, #2
M-10	Platforms, Ladders & Handrails

04 General Technical Specification

Model : Peako-500-COMPACT

No	Group	General Technical Specification	Unit	Data
1	General	Power available : Gross	$kW_{(Gross)}$	1750
2		Power available : Electrical	kW_e	500
3		Power available : Thermal	kW_t	1250
4		Biomass consumption	kg/kWh	1.1 ~ 2.0
5		Recommend continuous rating	%	90
6		Self-consumed electrical power	kW	40 ~ 60
7		Water consumption (vaporization)	Liter/kWh	< 0.2
8	Gasifier	Gasification efficiency	%	70 ± 5
9		Producer gas heat value (LHV)	kJ/Nm^3	5000 ± 500
10		Producer gas capacity	Nm^3/hr	1200
11		Producer gas Tar content	mg/Nm^3	< 50
12		Producer gas pressure	mmH_2O	< 400
13	Gas Engine	Fuel consumption	MJ/kWh	12 ~ 14
14		Rated speed (50Hz)	rpm	1500
15		Exhaust temperature	^oC	< 650
16		Bore x Stroke	mm	150 x 180
17		No. of cylinder	number	V 12

05 Factory Acceptance Test (FAT) / Handover Test (HOT)

Factory Acceptance Test (FAT) shall be conducted at Peako factory to demonstrate the specified system performance;

Handover Test (HOT) shall be conducted after the successful Testing & Commissioning (T&C) of the BGES on site as the contractual terms for Handover of the system.

No	FAT / HOT	Unit	Data
1	Gasifier : Gas heat value (LHV)	kJ/Nm^3	5000 ± 500
2	Gasifier : Gas capacity (by maximum flaring)	Nm^3/hr	1200
3	Generator : Steady operation @50% loading	hr	8
4	Generator : Steady operation @100% loading	hr	8

06 Biomass Feedstock Requirements

As the physical and chemical composition of the biomass feedstock will obviously affect the BGES performance and biomass consumption, the analysis results from laboratory should be used in the relevant contractual documents.

No	Biomass Feedstock Requirements	Unit	Data
1	Type of biomasses	--	Woody
2	Gross heat value (HHV)	kJ/kg	>12000
3	Particle size (Approx. max. L x W x H)	mm	40 x 10 x 10
4	Moisture content	%	< 20
5	Mud and soil contamination	%	< 0.3
6	Ash content	%	< 3.5
7	Carbon content	%	> 60

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