CG1000-BG

Biogas CHP Unit

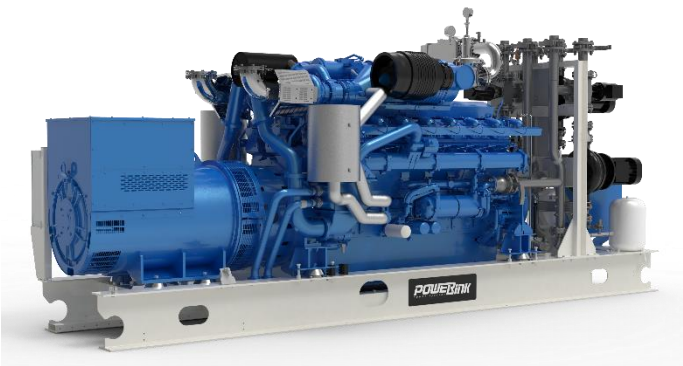
POWERLINK Power Systems

We Produce Green Energy...

Jacket water heater Standard Basic

Module - Open Type

- Highly efficientgas engine
- Highly reliable AC synchronous alternator
- Gas train
- Exhaust/water heat exchanger
- Water/water heat exchanger
- Heating circulation system
- Advanced engine control system, including: ignition system, detonation control system ,speed control system , air/fuel ratio control system
- Industrial silencer
- Control cabinet and switch cabinet
- Multi-functional control system with simple operation
- Data communication interfaces integrated into control system
- Battery charger
- Automatic oil refilling system
- Island mode or connecting to the grid mode



Structure and control cabinet

Structure type	Open type
Container painting	High-class powder coating
Electrical control cabinet	Integrated,IP54
Noise level@1m, dB(A)	107.8
@7m, dB(A)	92.1
@10m, dB(A)	85.8

Dimension and weight

Dimension (LxWxH) , mm	7000X2000X2200
Weight, kg	18000

Special statement :

1、The technical data are based on a gas mixture of 60% methane and 40% carbondioxid with a calorific value of 6,0 kWh/Nm³ and a methane no. > 100.

2、The technical data is measured in standard conditions:
Absolute atmospheric pressure：100kPa
Ambient temperature : 25°C
Relative air humidity : 30%

3、Rating adaptation at ambient conditions acc to DIN ISO 3046/1. The tolerance for the specific fuel consumption is + 5 % at rated output.

4、Technical data above are just for standard product ,and may be subject to change. As this document is used only for presale reference, take the specification supplied by PowerLink before ordering as final.

Power and efficiency @50Hz

Electric power -kW	1000	Electric efficiency	38.7%
Heat power-kW	1090	Heat efficiency	42.2%
Fuel input-kW	2584	Total efficiency	80.9%

Fuel and emission

Fuel type	Special gas
Fuel component	60%-CH_4/40%-CO_2
Methane number	MN > 100
Excess air factor（Lambda）	1.7
Fuel consumption @100% load, m³/h	431
Supply gas pressure range, kPa	20~25
Emission without catalytic converter	
NOx , mg/Nm³	<480mg/Nm³
CO , mg/Nm³	<870mg/Nm³
HCHO (formaldehyde) , mg/Nm³	<60mg/Nm³
NMHC , mg/Nm³	<150mg/Nm³
Emission with catalytic converter (optional)	
NOx , mg/Nm³	≤250

CG1000-BG

Biogas CHP Unit

We Produce Green Energy...

Standard Basic Module + Acoustic Attenuated Container (Optional)

Dimension and Noise Level	
Optional container（mm）（customized container modeling service available）	☐ 12192*2438*2896 ☐ 12192*3000*2896 ☐ 13500*3000*2896 ☐ 15000*3200*3000 ☐ 17000*3200*3000
Noise Level@ 1m，dB(A)	86
@ 7m，dB(A)	75
@ 10m，dB(A)	70

☐ Outdoor application enabled, weatherproof and dustproof, corrosion preventive ☐ Environmental friendly low emission

☐ Modular designed and manufactured for plug and play ☐ Low noise does not affect the surrounding environment

CG1000-BG

Biogas CHP Unit

POWERink Power Systems

We Produce Green Energy...

CHP Unit performance data and manufacturing technology

CHP unit model	CG1000-BG
Electric output power (kW)	1000
Heat output power (kW)	1090
CHP unit electric efficiency	38.7%
CHP unit heat efficiency	42.2%
CHP unit total efficiency	80.9%
Hot water production @inlet 70℃/outlet 90℃[t/h]	44.419
Overload runtime at 1.1xSe(hour)	1
Steady-state voltage deviation	≤±1%
Transient-state voltage deviation	-15%~20%
Voltage recovery time(s)	≤4
Voltage unbalance	1%
Steady-state frequency regulation	±0.5%
Transient -state frequency regulation	±5%
Frequency recovery time(s)	≤3
Steady-state frequency band	0.5%
Recovery time response(s)	0.5
Telephone interference factor(TIF)	≤50
Telephone harmonious factor(THF)	≤2% , as per BS4999

Power and efficiency

Load	100%	75%	50%
Electric power (kW)	1000	750	500
Heat power (kW)	1090	801	537
Energy input (kW)	2584	1962	1320
Electric efficiency	38.7%	38.2%	37.9%
Heat efficiency	42.2%	40.8%	40.7%
Total efficiency	80.9%	79.1%	78.6%

Manufacturing technology

- Special welded base frame, inner vibration isolators and design for whole lifting
- With high-class paint, endurable brightness as well resistance against abrasion and defacing
- Installation manual, operation and maintenance manual wiring program

Standards and certificate

- ISO3046 , ISO8528 , GB2820
- BS5000PT99 , AS1359 , IEC34
- ISO9001:2008 quality system certification

AC alternator performance data

Alternator brand	Leroy-Somer
Alternator model	LSA50.2L8
Rated output power (kW)	1200
Power factor	0.8
Rated current @ 400V and 100% load (A)	2165
Excitation system	Brushless
THF (BS EN60034- 1)	<2%
Bearing number	2
Winding material	100% copper
Wiring connection	Series star
Rotor insulation class	H
Winding pitch	2/3
A.V.R. model	R450
Voltage fluctuation(no load to full load)	± 0.5%
Housing protection	IP23
TIF (NEMA MG 1-22)	<50
Excitation method	AREP
Rated ambient temperature(℃)	40
Rated stator temperature rise(℃)	125

Voltage	Power
380V	1200 kW
400V	1200 kW
415V	1200 kW
440V	1100 kW

CG1000-BG

Biogas CHP Unit

POWERLINK Power Systems
We Produce Green Energy...

Efficient gas engine

General data

NO. of		16
Engine type		4-stroke, turbo charged and air to water cooled, lean burn
Cylinder arrangement		V-form , 60°
Bore x stroke	mm	160×190
Displacement	L	61.123
Compression ratio		12 : 1
Rated speed	rpm	1500
Rated output power	kW	1042
Excess air factor		1.7
Rotation direction		Anti-clockwise viewed on flywheel
Ignition timing	°BTDC	26

Cooling system

Total coolant capacity	L	95
Jacket water pressure in crankcase	kPa	≤100
Total coolant flow	L/min	950
Max. coolant exit temperature	°C	96
Max. coolant entry temperature	°C	81
Charge coolant flow	L/min	600
Charge coolant exit temperature	°C	40
Charge coolant entry temperature	°C	36
Coolant type		Mixture of 50% Inhibited ethylene glycol or propylene glycol and 50% clean fresh water. Lower ambient temp, higher content of antifreeze.

Induction/exhaust system

Exhaust flow	kg/h	5652
Max. exhaust temp. before turbo	°C	600
Max. exhaust temp. after turbo	°C	468
Max. exhaust back pressure	mmH_2O	400
Max. suction restriction	mmH_2O	380
Exhaust outlet flange size	mm	2×152

Fuel control system

Gas train，Including：
- ball valves
- filters
- gas pressure gauge
- safety solenoid valves
- constant pressure regulator etc
- gas pressure relief valve

Lubrication system

Total capacity	L	286
Sump maximum	L	257
Sump minimum	L	147
Oil temperature	°C	88
Oil pressure at rated speed	kPa	470
Oil flow - 1500rpm	L/min	402
Max. consumption	g/kWhr	0.25
Oil type		Single grade
Oil pump		Gear driven

Energy balance

Load		100%
Mechanical power	kW	1042
Coolant and oil heat	kW	445
Charge coolant heat	kW	180
Exhaust heat up to 120°C	kW	646
Max. radiation heat	kW	132
Energy input	kW	2584

Ignition system

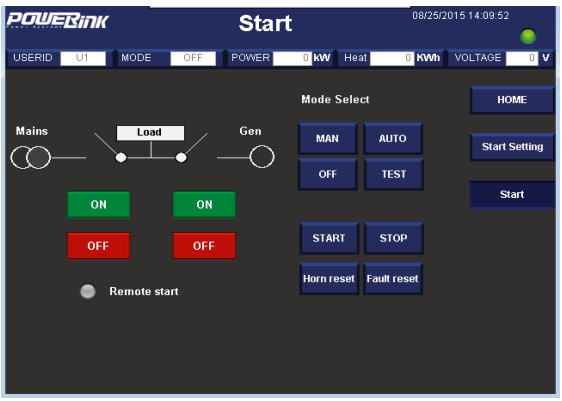
Ignition type	Electronic ignition system
Polarity	Negative earth
Spark plug	Separate for every cylinder

Fuel consumption

100% load	m^3/h	431
75% load	m^3/h	327
50% load	m^3/h	220

PCC-300 control system

Open control system is adopted with touch screen display , and various functions, including: engine protection and control, paralleling between gensets or gensets and mains, and CHP control functions, as well as communication functions，etc.



Main functions

- Engine monitor：coolant, lubrication, exhaust, battery
- Supply gas circuit monitor：pressure, temperature and CH4 content
- Auto paralleling and load share
- Voltage and PF control
- Alternator data：U, I, Hz, kW, kVA, kVAr, PF, kWh, kVAh
- Mains data：U, I, Hz, kW, kVAr, PF
- Modbus communication protocol based on RS232 and RS485 interfaces
- SMS message
- Internet connection and USB 2.0 interface
- 10-inch touch screen
- Internet monitor, auto orientation and cloud communication
- 1000 history events log

Advantages

- Accordant with consumer requirement
- Complete control project
- Convenient remote monitor and service
- Simplified engine start/stop control
- Enhanced stability and safety

Standard protection functions	Standard control functions	
Alternator protection - 2xReverse power - 2xOverload - 4xOvercurrent - 1xOvervoltage - 1xUndervoltage - 1xOver/under frequency 1xUnbalanced current	**Power control** - RPM control(synchronization) - Power control(grid connection) - Load share(island)	**Voltage control** - Voltage tracking (synchronization) - Voltage control(island) - PF control(grid connection) - Reactive power share (island）
	Lubrication control - Auto refilling - Warning and monitoring	**Pump control** - Cooling system - Emergency radiator
Busbar/mains protection - 1xOvervoltage - 1xUndervoltage - 1xOver/under frequency - 1xPhase sequence - 1xROCOF alarm	**Fan control** - Ventilation for engine room - Radiator fan - Emergency radiator fan	**Valve control** - Cooling system - Heating system - Emergency radiator
	Engine protection - Various routine and customized protection functions - Monitoring	

CG1000-BG

Biogas CHP Unit

POWERLINK Power Systems
We Produce Green Energy...

Standard configuration

Engine	Alternator	Canopy and base	Electrical cabinet
Gas engine Ignition system Lambda controller Speed control system Electrical start motor Battery system Detonation control system Lockable isolator switch Turbocharger & intercooler Jacket water heater	PMG AC alternator H class insulation IP23 protection AVR voltage regulator	Steel monocoque base frame Engine bracket Vibration isolators Alternator base	Air circuit breaker PCC300 control system 10.4-inch touch screen Communication interfaces Breaker cabinet Mains floating charger Paralleling protection
Gas supply system	**Lubrication system**	**Standard voltage**	**Induction/ exhaust system**
Gas safety train Air/fuel mixer Throttle valve Flame arrester	Oil filter Daily auxiliary oil tank Auto refilling oil system New and waste oil tank (Only applicable to container)	380/220V 400/230V 415/240V 440/254V	Air filter Exhaust silencer Exhaust bellows Gas leakage protection(Only applicable to canopy and container)
Heat exchange system	**Service and documents**		
Exhaust/water heat exchanger Jacket water circulation pump Water/water heat exchanger Mixture circulation pump Expansion tank, Shut-off valve Three-way valve Intercooler radiator Emergency radiator	Tools package Installation and operation manual Maintenance manual Software manual Parts manual	Engine operation and maintenance manual Gas quality declaration Control system manual After service guide	

Optional configuration

Alternator	Electrical system	Gas supply system
Space heater Treatments against humidity and corrosion	RCD ATS control cabinet Thermal power gauge Electric power gauge	Gas flow gauge Emergency relief flare Water separator Gas compressor Gas purification plant
Voltage	**Service and documents**	**Exhaust system**
220V 230V 240V	Service tools Maintenance and service parts	Three-way catalytic converter

POWERLINK Power Systems
Web: www.powerlinkworld.com

Data is subject to change without prior notice as new products are always developed.
Please contact PowerLink or local agent with any doubts or for more information