

TGE2000-BG

Biogas Genset

Standard Basic Module -Open Type

- Highly efficient gas engine
- AC synchronous alternator
- Gas safety train and gas protection device against leakage
- Cooling system suitable for ambient temperature up to 50°C
- Advanced engine control system, including: ignition system, detonation control system, speed control system, air/fuel ratio control system and cylinder temp. protection system
- Strict shop test for all gensets
- Industrial silencer reduces the noise by 12-20dB(A)
- Integrated the control & switch cabinet
- Multi-functional control system with easy operation
- Data communication interfaces integrated into control system
- Monitoring battery voltage and charging from mains
- Bus interface for connecting to higher level control unit



Structure and control cabinet

Structure type	Open type
Container painting	High-class paint
Electrical control cabinet	Integrated, IP54
Noise level @ 1m, dB(A)	110
@ 7m, dB(A)	95
@ 10m, dB(A)	89

Dimension and weight

Dimension (LxWxH), mm	9800x2250x2190
Weight, kg	19000

Special statement :

- The technical data are based on a gas mixture of 50% methane and 50% carbon dioxide with a calorific value of 5,0 kWh/Nm³ and a methane no. > 100.
- The technical data is measured in standard conditions:
Absolute atmospheric pressure: 100kPa
Ambient temperature : 25°C
Relative air humidity : 30%
- Rating adaptation at ambient conditions acc to DIN ISO 3046/1.
The tolerance for the specific fuel consumption is + 5 % at rated output.
- 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.

Electric data @50Hz

Voltage-V	Power-kW	Efficiency-%	Current-A
380	2000	43.0	3798
400	2000	43.0	3609
415	2000	43.0	3478

Fuel and emission

Fuel type	Biogas
Fuel composition	60%-CH ₄ /40%-CO ₂
Methane number	MN > 100
Fuel consumption @ 100% load, m ³ /h	932
Supply gas pressure range, kPa	20~30
Emission without catalytic converter	
NO _x , mg/Nm ³	≤ 500
CO , mg/Nm ³	≤ 300
Emission with catalytic converter (optional)	
NO _x , mg/Nm ³	≤ 250

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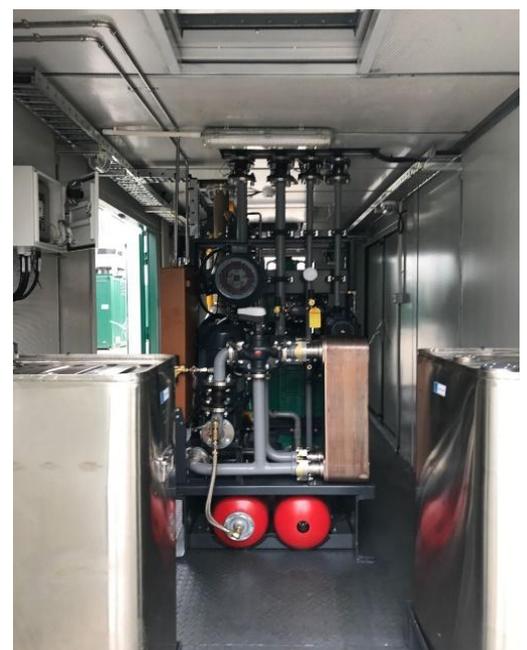
Standard Basic Module + Acoustic Attenuated Container (Optional)



Dimension and Noise Level

Optional container (mm)	<input type="checkbox"/>	13500*3000*2896
(customized container modeling service available)	<input type="checkbox"/>	15000*3200*3000
	<input type="checkbox"/>	17000*3200*3000
Noise Level@ 1m , dB(A)		88
@ 7m , dB(A)		78
@ 10m , dB(A)		73

- 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



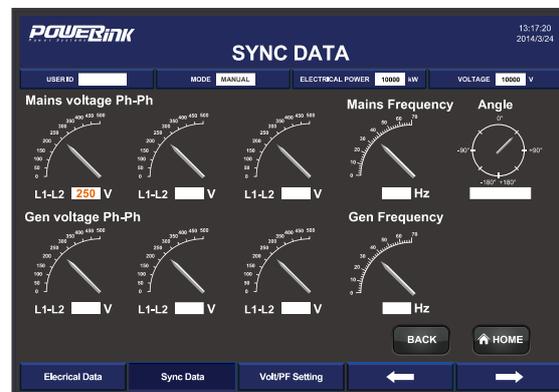
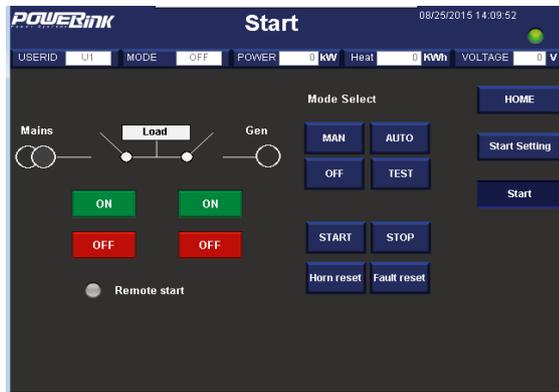
Genset performance data and manufacturing technology

Genset model	TGE2000-BG	Telephone interference factor(TIF)	≤50
Frequency(Hz)	50	Telephone harmonious factor(THF)	≤2% , as per BS4999
Electrical output power (kW)	2000	<p>Manufacturing technology</p> <ul style="list-style-type: none"> ● Special welded base frame, inner vibration isolators and design for whole lifting ● With high quality paint, enduring brightness as well resistance against abrasion and defacing ● Installation manual, operation and maintenance manual circuit diagram <p>Standards and certificate</p> <ul style="list-style-type: none"> ● ISO3046 , ISO8528 , GB2820 ● BS5000PT99 , AS1359 , IEC34 ● ISO9001:2008 quality system certification 	
Genset electrical efficiency	42.9%		
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		

Gas engine		AC alternator	
Model	TCG2020V20	Model	MJB 560LA4
NO. of cylinders	20	Rated output power @400V (kW)	1982
Cylinders arrangement	V-form	Power factor	0.8
Bore x Stroke (mm)	170x195	Rated current @400V (A)	3576
Displacement (L)	89	Excitation system	AREP
Cooling system	Water cooled	THF (BS EN60034- 1)	<2%
Rated speed (rpm)	1500	TIF (NEMA MG 1-22)	<50
Rated output power (kW)	2310	Winding material	100% copper
Fuel input	4662	Wiring connection	Star
Intake system	Turbocharged, intercooled	Rotor insulation class	H
Oil consumption (kg/h)	0.2	Winding pitch	2/3
Combustion type	Lean burn	A.V.R. model	R450
Battery voltage	24V	Voltage fluctuation(no load to full load)	± 0.5%
Coolant type	Glycol mixture	Housing protection	IP23
Gas consumption(m³/h)@ 100%load	932	Excitation method	Brushless
75%load	720	Rated ambient temperature(°C)	40
50%load	507	Rated stator temperature rise(°C)	125

PCC-300 control system

Open control system is adopted with touch screen display , and various functions, including: engine protection and control, CHP parallel and grid connection, 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

- Alternator protection**
- 2xReverse power
 - 2xOverload
 - 4xOvercurrent
 - 1xOvervoltage
 - 1xUndervoltage
 - 1xOver/underfrequency
 - 1xUnbalanced current
- Busbar/mains protection**
- 1xOvervoltage
 - 1xUndervoltage
 - 1xOver/under frequency
 - 1xPhase sequence
 - 1xROCOF alarm

Standard control functions

- Powercontrol**
- RPM control(synchronization)
 - Power control(grid connection)
 - Load share(island)
- Lubrication control**
- Auto refilling
 - Warning and monitoring
- Fan control**
- Ventilation for engine room
 - Radiator fan
 - Emergency radiator fan
- Engine protection**
- Various routine and customized protection functions
 - Monitoring
- Voltage control**
- Voltage tracking (synchronization)
 - Voltage control(island)
 - PF control(grid connection)
 - Reactive power share (island)
- Pump control**
- Cooling system
 - Emergency radiator
- Valve control**
- Cooling system
 - Heating system
 - Emergency radiator

Standard configuration

Engine	Alternator	Canopy and base	Electrical cabinet
Gas engine Oil pressure sensor Coolant temperature sensor Inlet water temp./Pressure sensor Electrical start motor Crankshaftposition sensor Battery system Cylinder temp. protection system Lambda controller Detonation control system Speed control system Lockable isolator switch Air/oilseparator	AREP AC alternator H class insulation IP23 protection AVR voltage regulator	Steel monocoque base frame Engine bracket Vibration isolators Alternator base	PLC LCD screen Air circuit breaker Paralleling control system Communication interfaces Breaker cabinet Lighting system Mains float charger
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 used oil tank (Only applicable to container , two inch with the daily oil tank)	380/220V 400/230V 415/240V 440/254V	Air filter Exhaust silencer Exhaust bellows Gas leakage protection(Only applicable to canopy and container)
Cooling system	Service and documents		
Intercoolerradiator Jacket water radiator Jacket water circulation pump Mixture circulation pump Coolant level switch	Tools package Installation and operation manual Maintenance manual Software manual Parts manual	Engine operation and maintenance manual Gas quality specification Control system manual After service guide Standard package	

Optional configuration

Engine	Alternator	Lubrication system
Jacket water heater	Space heater Treatments against humidity and corrosion	
Electrical system	Gas supply system	Service and documents
RCD ATS control cabinet Thermal power gauge Electric power gauge	Gas flow gauge Emergency pressure relief torch Refrigerated gas drier Water separator Gas compressor Gas purification device	Service tools Maintenance and service parts
Voltage	Exhaust system	Exhaust gas using
220V230V240V	Three-way catalytic converter	Exhaust gas evaporator LiBr refrigerator