TCG1200-NG

Natural Gas CHP Unit

POWERINK Power Systems
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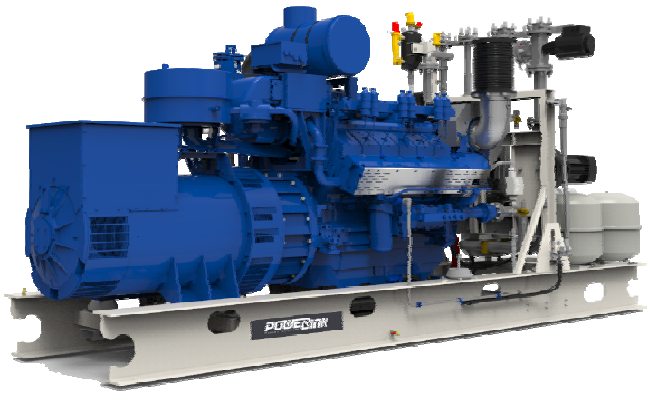
Standard Basic Module -Open Type

- Highlyefficientgas engine
- AC synchronous alternator
- Gas safety train and gas protection device against leakage
- Water/waterand exhaust/water heat exchanger
- Heating water and jacket watercirculation system
- Advanced engine control system, including: ignition system, detonation control system, speed control system, air/fuel ratio control system and cylinder temp. protection system
- Air transfer protection system
- Strict shop test for all CHP unit
- Ventilationfan,electric inlet and outlet shutter
- Industrial silencer reduces the noise by 12-20dB(A)
- Unattachedswitch cabinet and electric control cabinet
- Multi-functional control system with easy operation
- Data communication interfaces integrated into control system
- Monitoring battery voltage and chargingautomatically
- Auto refilling oil system
- 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)	108.8
@7m, dB(A)	92.7
@10m, dB(A)	86

Dimension and weight

Dimension (LxWxH) , mm	7500x1900x2210
Weight,kg	13500

Power andefficiency@50Hz

Electric power -kW	1200	Electric efficiency	43.6%
Heat power-kW	1190	Heat efficiency	43.3%
Input power-kW	2791	Total efficiency	86.9%

Fuel and emission

Fuel type	Natural gas
Methane number	MN > 80
Low heat value (KWh/m³)	10.0
Gas density (Kg/m³)	0.8
Fuel consumption @100% load, m³/h	275
Supply gas pressure range, kPa	10~20
Emission without catalytic converter	
NOx , mg/Nm^3	≤500
CO , mg/Nm^3	≤300
Emission with catalytic converter (optional)	
NOx , mg/Nm^3	≤250

Special statement :

1、The technical data are based on natural gas with a lower calorific value of 36MJ/Nm³.The technical data indicated is based on standard conditions according toISO8528/1, ISO3046/1 and BS5514/1.

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.

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Standard Basic Module + Acoustic Attenuated Container (Optional)

Dimension and Noise Level

Optional container（mm）（customized container modeling serviceavailable）	☐ 12192*3000*2896 ☐ 13500*3000*2896 ☐ 15000*3200*3000 ☐ 17000*3200*3000
Noise Level@ 1m，dB(A)	87
@ 7m，dB(A)	75
@ 10m，dB(A)	72

☐ 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

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CHP Unit performance data and manufacturing technology

CHP unit model	TCG1200-NG	Telephone interference factor(TIF)	≤50
Electricoutput power (kW)	1200	Telephone harmonious factor(THF)	≤2% , as perBS4999
Heat output power (kW)	1190		
CHP unit electric efficiency	43.6%		
CHP unit heat efficiency	43.3%		
CHP unit total efficiency	86.9%		
Hot water production @inlet 70℃/outlet 90℃[t/h	48.4		
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		

Manufacturing technology

- Specialwelded base frame, inner vibration isolators and design for whole lifting
- With high quality paint, endurable brightness as well resistance against abrasion and defacing
- Installation manual, operation and maintenance manual circuit diagram

Standards and certificate

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

AC alternatorperformance data

Alternator model	MJB 450LB4	**Voltage**	**Power**
Rated output power (kW)	1187	380V	1187kW
Power factor	0.8	400V	1187kW
Rated current @ 400V and 100% load (A)	2142	415V	1187kW
Excitation system	Brushless	440V	1187kW
THF (BS EN60034- 1)	<2%		
Bearing number	2		
Winding material	100% copper		
Wiring connection	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		

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Efficient gas engine

General data

NO. of		12
Engine type		4-stroke, turbo charged, lean burn
Cylinder arrangement		V-form , 60°
Bore x stroke	mm	170x195
Displacement	L	53
Compression ratio		13.5 : 1
Rated speed	rpm	1500
Rated output power	kW	1187
Rotation direction		Anti-clockwise viewed on flywheel

Cooling system

Total coolant capacity	m^3	131
Total coolant flow	m^3/h	76
Max. coolant exit temperature	°C	93
Max. coolant entry temperature	°C	80
Charge coolant flow	m^3/h	35
Charge coolant exit temperature	°C	43
Charge coolant entry temperature	°C	40
Coolant type		Mixture of 50% Inhibited ethylene glycol or propyleneglycol and 50% clean fresh water. Lower ambient temp, highercontent of antifreeze.

Induction/exhaust system

Combustion air flow	kg/h	6262
Exhaust flow	kg/h	6476
Max. exhaust temp. after turbo	°C	414
Max. exhaust back pressure	mbar	50
Max. suction restriction	mbar	100

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

Oil temperature	°C	88
Max. consumption	g/kWhr	0.2
Oil type		Single grade
Oil pump		Gear driven

Energy balance

Load		100%
Mechanical power	kW	1320
Coolantheat	kW	608
Exhaust heat up to 120°C	kW	581
Energy input	kW	2746

Ignition system

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

Fuel consumption

100% load	m^3/h	275
75% load	m^3/h	212
50% load	m^3/h	149

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 wellas 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 communicationprotocol 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/underfrequency 1xUnbalanced current	**Powercontrol** - 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	

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Standard configuration

Engine	Alternator	Canopy and base	Electrical cabinet
Gas engine Ignition system Lambda controller Electronic governor actuator Electrical start motor Battery system Auto chargingsystem Detonation control system Cylinder temp. protection system Coupling	AREP AC alternator H class insulation IP23 protection AVR voltage regulator PF control	Steel monocoque base frame Engine bracket Vibration isolators Alternator base	Air circuitbreaker Paralleling control system 10-inch touch screen Communication interfaces Electrical switch cabinet Lighting system Smoke alarm system
Gas supply system	**Lubrication system**	**Standard voltage**	**Induction/ exhaust system**
Gas safety train Air/fuel mixer	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 flowmeter Gas leakage protection(Only applicable to canopy and container)
Heat exchange system	**Service and documents**		
Exhaust heat exchanger Jacket water circulation pump Jacket water heat exchanger Mixture circulation pump Intercoolerradiator Expansion tank, Shut-off valve Three-way auto proportional valve	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 radiator Jacket water heater	Space heater Treatments against humidity and corrosion	
Electrical system	**Exhaust system**	**Service and documents**
RCD Grounding bar	Three-way catalytic converter	Service tools Maintenance and service parts
Voltage	**Gas supply system**	**Exhaust gas using**
200V220V 230V240V	Gas flow gauge	Exhaust gas evaporator LiBr refrigerator

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