

### Standard Basic Module -Open Type

- Highly efficient gas 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
Canopy painting	High-class powder coating
Electrical control cabinet	Integrated, IP54
Noise level @ 1m, dB(A)	88.1
@ 7m, dB(A)	84.2
@ 10m, dB(A)	80.8

#### Dimension and weight

Dimension ( LxWxH ) , mm	2800x1050x1550
Weight, kg	1800

#### Special statement :

- The technical data are based on natural gas with a lower calorific value of 36MJ/Nm<sup>3</sup>. The technical data indicated is based on standard conditions according to ISO8528/1, ISO3046/1 and BS5514/1.
- 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.

#### Power and efficiency @50Hz

Electric power -kW	50	Electric efficiency	36.5%
Heat power-kW	73	Heat efficiency	53.5%
Fuel input-kW	137	Total efficiency	90.0%

#### Fuel and emission

Fuel type	Natural gas
Methane number	MN > 80
Excess air factor ( Lambda )	1
Fuel consumption @ 100% load, m <sup>3</sup> /h	14
Supply gas pressure range, kPa	10~20
<b>Emission without catalytic converter</b>	
NOx , mg/Nm <sup>3</sup>	<7000mg/Nm <sup>3</sup>
CO , mg/Nm <sup>3</sup>	<4000mg/Nm <sup>3</sup>
<b>Emission with catalytic converter (optional)</b>	
NOx , mg/Nm <sup>3</sup>	≤ 250

# CG50-NG

Natural Gas CHP Unit

## Standard Basic Module + Acoustic Attenuated Canopy (Optional)



### Dimension and Noise Level

Canopy Size	3000*1050*1550mm
Noise Level@ 1m , dB(A)	75.1
@ 7m , dB(A)	62.2
@ 10m , dB(A)	60.4

- Modular designed and manufactured for plug and play
- Environmental friendly low emission
- Small indoor space required for installation
- Low noise does not affect the surrounding environment



# CG50-NG

Natural Gas CHP Unit

## Standard Basic Module + Acoustic Attenuated Container (Optional)



### Dimension and Noise Level

Optional container (mm) (customized container modeling service available)	<input type="checkbox"/>	7000*2300*2500
	<input type="checkbox"/>	6058*2438*2591
	<input type="checkbox"/>	12192*2438*2896
	<input type="checkbox"/>	12192*3000*2896
	<input type="checkbox"/>	13500*3000*2896
	<input type="checkbox"/>	15000*3200*3000
Noise Level@ 1m , dB(A)		73
@ 7m , dB(A)		60
@ 10m , dB(A)		58

- 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



## CHP Unit performance data and manufacturing technology

CHP unit model	CG50-NG	Power and efficiency			
Electric output power ( kW )	50	Load	100%	75%	50%
Heat output power ( kW )	73	Electric power (kW)	50	38	25
CHP unit electric efficiency	36.5%	Heat power (kW)	73	55	37
CHP unit heat efficiency	53.5%	Energy input (kW)	137	104	71
CHP unit total efficiency	90.0%	Electric efficiency	36.5%	36.9%	35.3%
Hot water production @inlet 70°C/outlet 90°C[t/h]	3.216	Heat efficiency	53.5%	52.9%	52.1%
Overload runtime at 1.1xSe(hour)	1	Total efficiency	90.0%	89.8%	87.4%
Steady-state voltage deviation	≤±1%	<p><b>Manufacturing technolog</b></p> <ul style="list-style-type: none"> <li>● Special welded base frame, inner vibration isolators and design for whole lifting</li> <li>● With high-class paint, endurable brightness as well resistance against abrasion and defacing</li> <li>● Installation manual, operation and maintenance manual wiring program</li> </ul> <p><b>Standards and certificate</b></p> <ul style="list-style-type: none"> <li>● ISO3046 , ISO8528 , GB2820</li> <li>● BS5000PT99 , AS1359 , IEC34</li> <li>● ISO9001:2008 quality system certification</li> </ul>			
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				

## AC alternator performance data

Alternator brand	Leroy-Somer	Voltage	Power
Alternator model	LSA44.3S3	380V	64 kW
Rated output power (kW)	64	400V	64 kW
Power factor	0.8	415V	64kW
Rated current @ 400V and 100% load (A)	115	440V	58 kW
Excitation system	Brushless		
THF (BS EN60034- 1)	<2%		
Bearing number	1		
Winding material	100% copper		
Wiring connection	Star		
Rotor insulation class	H		
Winding pitch	2/3		
A.V.R. model	R438		
Voltage fluctuation(no load to full load)	± 0.5%		
Housing protection	IP23		
TIF (NEMA MG 1-22)	<50		
Excitation method	AREP		
Rated ambient temperature(°C)	40		
Rated stator temperature rise(°C)	125		

## Efficient gas engine

### General data

NO. of cylinders		4
Engine type		4-stroke,natural aspirated, stoichiometric
Cylinder arrangement		In line
Bore x stroke	mm	108x125
Displacement	L	4.58
Compression ratio		13 : 1
Rated speed	rpm	1500
Rated output power	kW	54
Excess air factor		1
Rotation direction		Anti-clockwise viewed on flywheel
Ignition timing	°BTDC	18

### Cooling system

Coolant refilling capacity	L	12
Max. jacket water operating pressure	kPa	200
Min. jacket water circulation flow	L/min	137
Min. jacket water temperature	°C	80
Max. jacket water temperature	°C	88
Max. jacket water difference(inlet-outlet)	K	6
Coolant type		Mixture of 40 % antifreeze and 60% clean fresh water. Lower ambient temperature, higher content of antifreeze.

### Induction/exhaust system

Exhaust flow(wet)	kg/h	192
Combustion air flow	kg/h	181
Exhaust temperature	°C	620
Max. exhaust back pressure	mbar	40
Max. suction restriction	mbar	15

### 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

Max. refilling capacity	L	13
Min. refilling capacity	L	9
Max. consumption	kg/h	0.075
Lubrication oil pump		Gear driven

### Energy balance and gas flow

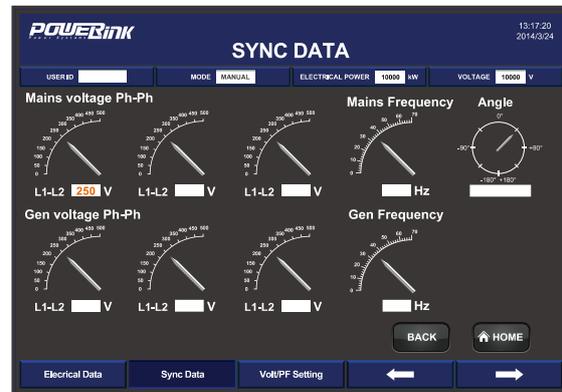
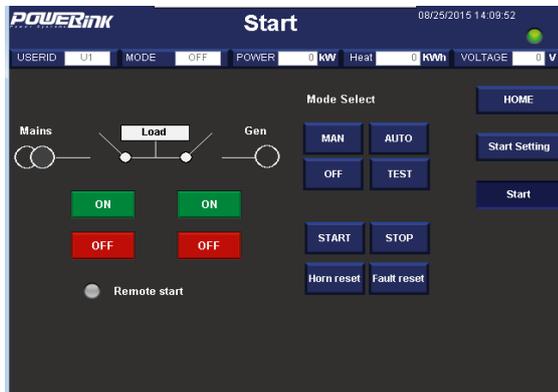
Load	100%	75%	50%
Mechanical power, kW	54	41	27
Coolant heat, kW	40	36	29
Exhaust heat up to 120°C, kW	33	24	17
Max. radiation heat, kW	12	/	/
Energy input, kW	137	104	71
Combustion air flow, kg/h	181	146	113
Fuel consumption, m³/h	14	10	7
Exhaust gas flow,kg/h	192	155	120
Exhaust gas temperature, °C	620	580	540

### Ignition system

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

## PCC-300 control system

Programmable 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 CH<sub>4</sub> content
- Auto paralleling and load share
- Voltage and PF control
- Alternator data : U, I, Hz, kW, kVA, kVAr, PF, kWh, kVAh
- Grid 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 solution
- 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/ Gridprotection**
- 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 Ignition system Lambda controller Speed control system Electrical start motor Battery 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 circuitbreaker PCC300 control system 10.4-inch touch screen Communication interfaces Breaker cabinet Mains floating charger Paralleling protection
Gas supply system	Lubrication system	Standard voltage	Intake/ exhaust system
Gas safety train Air/fuel mixer Throttle valve	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 Heating circulation pump Three-way valves Intercoolerradiator	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

Engine/Alternator	Electrical system	Gas supply system
Jacket water radiator Space heater Treatments against humidity and corrosion	RCD ATS control cabinet Thermal power gauge Electric power gauge	Gas flow gauge Emergency pressure relief torch Water separator Gas compressor Gas purification device
Voltage	Exhaust system	Exhaust gas using
220V 230V.240V	Three-way catalytic converter	Steam boiler LiBr refrigerator