

### Standard Basic Module - Open Type

- Highly efficient gas engine
- AC synchronous alternator
- Gas safety train
- 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
- Strict shop test for all gensets
- Expansion tank and water jacket heater
- Industrial silencer with silencing ability of 12-20dB(A)
- Unattached switch cabinet and electric control cabinet
- Multi-functional control system with simple operation
- Data communication interfaces integrated into control system
- Monitoring battery voltage and charging automatically
- Auto refilling oil system
- Bus interface for connecting to higher level control unit



#### Structure and control cabinet

Structure type	Open type
Canopy painting	High-class powder coating
Electrical control cabinet	Integrated,IP54
Noise level @1m, dB(A)	101.3
@7m, dB(A)	88.8
@10m, dB(A)	83.8

#### Dimension and weight

Dimension (LxWxH) ,mm	5300x2000X2100
Weight, kg	6800

#### Special statement :

1. 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.
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.

#### Electric data @50Hz

Voltage-V	Power-kW	Efficiency-%	Current-A
380	450	42.1	855
400	450	42.1	812
415	450	42.1	783

#### Fuel and emission

Fuel type	Natural gas
Methane number	MN > 80
Excess air factor (Lambda)	1.46
Fuel consumption @100% load, m <sup>3</sup> /h	107
Supply gas pressure range, kPa	10~20
<b>Emission without catalytic converter</b>	
NOx , mg/Nm <sup>3</sup>	<6500mg/Nm <sup>3</sup>
CO, mg/Nm <sup>3</sup>	<6500mg/Nm <sup>3</sup>
HCHO (formaldehyde) , mg/Nm <sup>3</sup>	<60mg/Nm <sup>3</sup>
NMHC, mg/Nm <sup>3</sup>	<150mg/Nm <sup>3</sup>
<b>Emission with catalytic converter (optional)</b>	
NOx , mg/Nm <sup>3</sup>	≤250 mg/Nm <sup>3</sup>

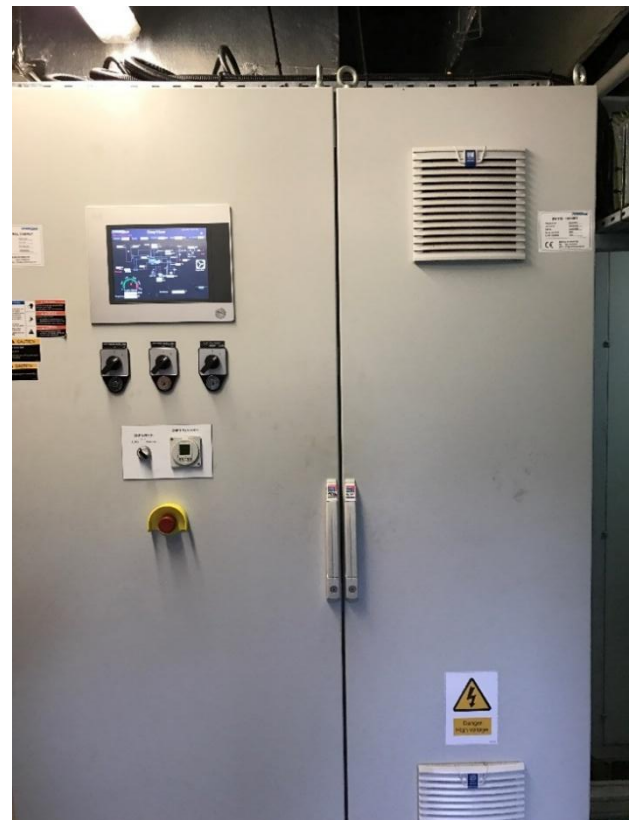
## Standard Basic Module + Acoustic Attenuated Canopy (Optional)



### Dimension and Noise Level

Canopy Size	5500*2180*2620mm
Noise Level@ 1m , dB(A)	87.3
@ 7m , dB(A)	78.6
@ 10m , dB(A)	74.1

- 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



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



### Dimension and Noise Level

Optional container (mm) (customized container modeling service available)	<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
	<input type="checkbox"/>	17000*3200*3000
Noise Level@ 1m , dB(A)		85
@ 7m , dB(A)		76
@ 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



### Genset performance data and manufacturing technology

Genset model	GE450-NG	Telephone interference factor(TIF)	≤50
Electrical output power (kW)	450	Telephone harmonious factor(THF)	≤2% , as per BS4999
Genset electrical efficiency	42.1%	<p><b>Manufacturing technology</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, enduring 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>	
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		

### AC alternator performance data

Alternator brand	Leroy-Somer	Voltage	Power
Alternator model	LSA49.3S4A	380V	500kW
Rated output power (kW)	500	400V	500kW
Power factor	0.8	415V	500kW
Rated current @ 400V and 100% load (A)	902		
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(°C)	40		
Rated stator temperature rise(°C)	125		

## Efficient gas engine

### General data

NO. of cylinders		12
Engine type	4-stroke, turbo charged and air to water cooled, lean burn	
Cylinder arrangement		V-form
Bore x stroke	mm	128x142
Displacement	L	24.78
Compression ratio		12: 1
Rated speed	rpm	1500
Rated output power	kW	500
Excess air factor		1.46
Rotation direction	Anti-clockwise viewed on flywheel	
Ignition timing	°BTDC	16

### Cooling system

Coolant refilling capacity	L	30
Max. jacket water operating pressure	kPa	300
Min. jacket water circulation flow	L/min	650
Min. jacket water temperature	°C	80
Max. jacket water temperature	°C	88
Max. jacket water difference(inlet-outlet)	K	6
Min. circulation flow LT	L/min	130
Min. circulation flow HT	L/min	350
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	2772
Combustion air flow	kg/h	2675
Exhaust temperature	°C	450
Max. exhaust back pressure	mbar	40
Max. suction restriction	mbar	15

### Fuel consumption

100% load	m <sup>3</sup> /h	107
75% load	m <sup>3</sup> /h	80
50% load	m <sup>3</sup> /h	55

Fuel: Natural Gas - LHV = 36 MJ/m<sup>3</sup>

### Lubrication system

Max. refilling capacity	L	90
Min. refilling capacity	L	40
Max. consumption	kg/h	0.2
Lubrication oil pump	Gear driven	

### Fuel control system

Gas train, Including:

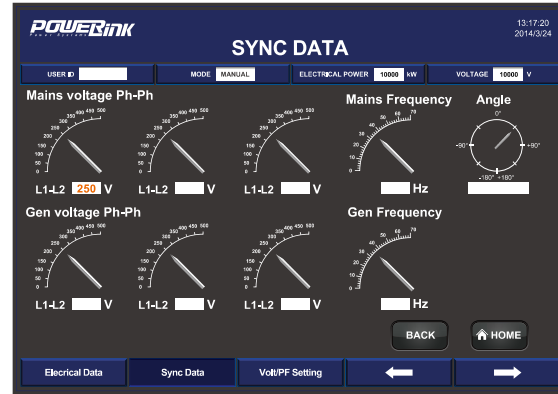
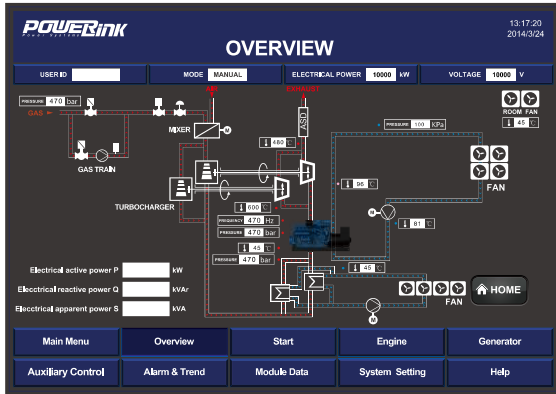
- ball valves
- filters
- gas pressure gauge
- safety solenoid valves
- constant pressure regulator etc
- gas pressure relief valve

### Ignition system

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

## 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, 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, kVA<sub>r</sub>, PF, kWh, kVAh
- Mains data: U, I, Hz, kW, kVA<sub>r</sub>, 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/under frequency
  - 1xUnbalanced current
- Busbar/mains protection**
- 1xOver voltage
  - 1xUnder voltage
  - 1xOver/under frequency
  - 1xPhase sequence
  - 1xROCOF alarm

### Standard control functions

- Power control**
- RPM control(synchronization)
  - Power control(grid connection)
  - Load share(island )
- Valve control**
- Cooling system
- Fan control**
- Ventilation for engine room
  - 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
- Lubrication control**
- Auto refilling
  - Warning and monitoring

## Standard configuration

Engine	Alternator	Canopy and base	Electrical cabinet
Gas engine Ignition system Lambda controller Electronic governor actuator Electrical start motor Battery system Auto charging system Detonation control 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 circuit breaker Paralleling control system 10-inch touch screen Communication interfaces Electrical switch cabinet
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 leakage protection(Only applicable to canopy and container)
Cooling system	Service and documents		
Jacket water circulation pump Mixture circulation pump Intercooler radiator Jacket water constant temp. valve Intercooler water constant temp. valve Expansion tank	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
Heavy duty air filter Backfire safety control valve Jacket water radiator Jacket water heater	Space heater Treatments against humidity and corrosion	Oil consumption gauge
Canopy and base	Electrical system	Gas supply system
SECC base frame		Gas flow gauge
Exhaust system	Voltage	Service and documents
Guard shield from touch Residential silencer Three-way catalytic converter	200V 220V 230V 240V	Service tools Maintenance and service parts