

# GRS12S-NG

## Natural Gas Genset

### Main Features

- 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 ECU control system, including: ignition system, speed control system, air/fuel ratio control system
- Strict shop test for all gensets
- Able to be used directly outdoors with durable and firm characteristics and design against rain and dust
- 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             | Soundproof                  |
| Spraying Process           | High quality powder coating |
| Electrical control cabinet | Integrated, IP54            |
| Noise level@1m, dB(A)      | 75.3                        |
| @7m, dB(A)                 | 62.5                        |
| @10m, dB(A)                | 60.7                        |

#### Dimension and weight

|                         |               |
|-------------------------|---------------|
| Dimension ( LxWxH ), mm | 1810x930x1145 |
| Weight, kg              | 755           |

#### Special statement :

1. The technical data are based on natural gas with a lower calorific value of 36.0MJ/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       | 12       | 28.6         | 23        |
| 400       | 12       | 28.6         | 22        |
| 415       | 12       | 28.6         | 21        |
| 440       | 12       | 28.6         | 20        |

#### Fuel and emission

|                                                    |                          |
|----------------------------------------------------|--------------------------|
| Fuel type                                          | Natural gas              |
| Methane number                                     | MN > 80                  |
| Excess air factor ( Lambda )                       | 1.2                      |
| Fuel consumption @100% load, m <sup>3</sup> /h     | 4.0                      |
| Supply gas pressure range (gage pressure), kPa     | 10~20                    |
| <b>Emission without catalytic converter</b>        |                          |
| NOx , mg/Nm <sup>3</sup>                           | < 500mg/Nm <sup>3</sup>  |
| CO , mg/Nm <sup>3</sup>                            | < 650mg/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> |

### Genset performance data and manufacturing technology

|                                       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |
|---------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Genset model                          | GRS12S-NG | Telephone interference factor(TIF)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ≤50                 |
| Frequency(Hz)                         | 50        | Telephone harmonious factor(THF)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ≤2% , as per BS4999 |
| Electrical output power (kW)          | 12        | <b>Manufacturing technology</b> <ul style="list-style-type: none"> <li>● Special welded base frame, inner vibration isolators and design for whole lifting</li> <li>● With high quality paint, enduring brightness as well resistance against abrasion and defacing</li> <li>● Installation manual, operation and maintenance manual circuit diagram</li> </ul> <b>Standards and certificate</b> <ul style="list-style-type: none"> <li>● ISO3046 , ISO8528 , GB2820</li> <li>● BS5000PT99 , AS1359 , IEC34</li> <li>● ISO9001:2008 quality system certification</li> </ul> |                     |
| Genset electrical efficiency          | 30%       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |
| 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 degree              | 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                             |                    |
|---------------------------------|-------------------|-------------------------------------------|--------------------|
| Brand                           | PowerLink         | Brand                                     | PowerLink          |
| Model                           | GR2.7 E01N        | Model                                     | PL1D               |
| NO. of cylinders                | 4                 | Rated output power @400V (kW)             | 12.8               |
| Cylinders arrangement           | In line           | Power factor                              | 0.8                |
| Bore x Stroke (mm)              | 90x105            | Rated current @400V (A)                   | 23                 |
| Displacement (L)                | 2.67              | Excitation system                         | Self excited,SHUNT |
| Cooling system                  | Water cooled      | THF (BS EN60034- 1)                       | <2%                |
| Rated speed (rpm)               | 1500              | TIF (NEMA MG 1-22)                        | <50                |
| Rated output power (kW)         | 19                | Winding material                          | 100% copper        |
| Excess air factor               | 1.20              | Wiring connection                         | Star               |
| Intake system                   | Natural aspirated | Rotor insulation class                    | H                  |
| Lube oil consumption (kg/h)     | 0.0036            | Winding pitch                             | 2/3                |
| Combustion type                 | Stoichiometric    | A.V.R. model                              | SX460              |
| Battery voltage                 | 12V               | Voltage fluctuation(no load to full load) | ± 0.5%             |
| Coolant type                    | Glycol mixture    | Drip proof                                | IP23               |
| Gas consumption(m³/h)@ 100%load | 4.0               | Excitation method                         | Brushless          |
| 75%load                         | 3.0               | Rated ambient temperature(°C)             | 40                 |
| 50%load                         | 2.1               | Rated stator temperature rise(°C)         | 125                |

### GCC92 control system



#### Features

- Auto start and stop
- Voltage and PF control
- Engine monitor: speed, oil pressure, coolant temperature, battery voltage, running time and so forth
- Alternator data : U, I, Hz, kW, kVA, kVAr, PF, kWh, kVAh
- Grid data : voltage, frequency
- USB port
- Remote control with internet
- Data logging & trending and PLC functionality
- Manual, auto and remote control mode optional
- CAN and modbus communication

#### 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                                                                                                                                                                                                |                                                                                                                                                       | Standard control functions |                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Alternator protection</b> <ul style="list-style-type: none"> <li>- Overload</li> <li>- Overcurrent</li> <li>- Overvoltage</li> <li>- Undervoltage</li> <li>- Over/underfrequency</li> <li>- Unbalanced current</li> </ul> | <b>Powercontrol</b> <ul style="list-style-type: none"> <li>- RPM control</li> </ul>                                                                   |                            | <b>Voltage control</b> <ul style="list-style-type: none"> <li>- Voltage control(island)</li> </ul>                              |
|                                                                                                                                                                                                                              | <b>Valve control</b> <ul style="list-style-type: none"> <li>- Cooling system</li> </ul>                                                               |                            | <b>Pump control</b> <ul style="list-style-type: none"> <li>- Cooling system</li> </ul>                                          |
| <b>Busbar/grid protection</b> <ul style="list-style-type: none"> <li>- voltage</li> <li>- Frequency</li> </ul>                                                                                                               | <b>Engine protection</b> <ul style="list-style-type: none"> <li>- Various routine and customized protectionfunctions</li> <li>- Monitoring</li> </ul> |                            | <b>Lubrication control</b> <ul style="list-style-type: none"> <li>- Auto refilling</li> <li>- Warning and monitoring</li> </ul> |

### Standard configuration

| Engine                                                                                                                                             | Alternator                                                                                                  | Canopy and base                                                                                                                          | Electrical cabinet                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Gas engine<br>Ignition system<br>Lambda controller<br>Speed control system<br>Electrical start motor<br>Battery system<br>Lockable isolator switch | AC alternator<br>H class insulation<br>IP23 protection<br>AVR voltage regulator                             | Steel monocoque base frame<br>Engine bracket<br>Vibration isolators<br>Alternator base                                                   | GCC92 control system<br>LCD screen<br>Main circuit breaker<br>Electrical switch cabinet<br>Communication interfaces<br>Mains float charger |
| Gas supply system                                                                                                                                  | Lubrication system                                                                                          | Standard voltage                                                                                                                         | Intake/ exhaust system                                                                                                                     |
| Gas safety train<br>Air/fuel mixer<br>Throttle valve                                                                                               | Oil filter                                                                                                  | 380/220V<br>400/230V<br>415/240V<br>440/254V                                                                                             | Air filter<br>Exhaust silencer<br>Exhaust bellows                                                                                          |
| Cooling system                                                                                                                                     | Service and documents                                                                                       |                                                                                                                                          |                                                                                                                                            |
| Jacket water radiator                                                                                                                              | Tools package<br>Installation and operation manual<br>Maintenance manual<br>Software manual<br>Parts manual | Engine operation and maintenance manual<br>Gas quality specification<br>Control system manual<br>After service guide<br>Standard package |                                                                                                                                            |

### Optional configuration

| Engine                                      | Alternator                                                | Lubrication system                             |
|---------------------------------------------|-----------------------------------------------------------|------------------------------------------------|
| Jacket water heater                         | Space heater<br>Treatments against humidity and corrosion | Oil tank<br>Auto refilling oil system          |
| Electrical system                           | Gas supply system                                         | Service and documents                          |
| ATS control cabinet<br>Electric power gauge | Gas flow gauge                                            | Service tools<br>Maintenance and service parts |
| Voltage                                     | Exhaust system                                            |                                                |
| 220V<br>230V<br>240V                        | Three-way catalytic converter                             |                                                |