BOROKO MOTORS POWER SYSTEMS

20KVA CUMMINS DIESEL GENERATOR SET

Model: KH-16GF	Control Panel: UK DEEPSEA
Engine: CUMMINS	Prime Power: 20KVA/16KW
Alternator: STAMFORD	Standby Power: 22KVA/17.6KW

Prime power is available for an unlimited number of annual hours in variable load applications, in accordance with GB/T2820-97. A 10% overload capability is available for a period of 1 hour within a 12-hour operation cycle.

The standby power rating is intended for supplying emergency power during utility power interruptions. No overload, utility parallel, or negotiated outage operation capabilities are available at this rating.

Standard Specification	
Genset model	KH-16GF
Voltage	240/415V
Frequency	50HZ
Phase	3
Power Factory	0.8(lagging)
Protection Class	IP23
Insulation Grade	H

Engine and genset output rating	
Engine model	4B3.9-G2
Engine Speed (RPM)	1500
Prime (KW/HP)	27/36
Standby (KW/HP)	24/32
Genset Model	KH-16GF
Prime (KVA/KW)	20/16
Standby (KVA/KW)	22/17.6

Scope of standard supply	
Engine:	CUMMINS
Alternator:	STAMFORD
Controller:	Automatic controller DSE7320MKII with AMF function.
Breaker:	Manual circuit breaker 3-pole, China CHNT.
Radiator:	Cummins 50°C.
Vibration:	Vibration damper installed between the engine/alternator and the base frame.
Base:	Heavy duty steel channel base frame.
Silencer:	Heavy duty industrial type silencer with flexible bellow, elbow.
Battery:	High capacity sealed free maintenance battery C/W battery cables.
Manuals:	Standard tools, operator's manual of engine, alternator, controller, breaker.

Optionals	
Sound attenuated enclosure	Synchronisation system
Heater preservation cabinet	Breaker brand (ABB, Simens, Schneider)
Rainproof cabinet	Anti condensation heater
Standard container cabinet (20GP/20HC/40HC)	Daily fuel tank
Trailer (10-500KVA)	Output cable
Oil/ Water/Fuel heating system	Maintenance spare parts
Automatic Transfer Switch (ATS)	Plywood case packing
Remote control system	

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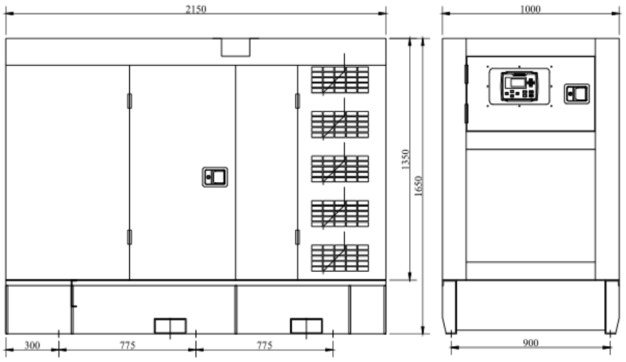
DIMENSIONS(L*W*H) and Weight

PROCESS FLOW: Drawing → Cutting → Bending → Welding → Spraying → Assembling → Testing

Open Type	800KG
	1600*750*1200mm
Silent Type	1050KG
	2150*1000*1650mm



Sound Attenuated Enclosure

IP rated sound attenuated weatherproof enclosure designed for rugged conditions

Excellent security: The totally-enclosure is manufactured from 2 mm high quality galvanised cold-rolled steel plates.

Ventilation: combined combustion and ventilation cooling.

Excellent sound attenuation, with anti-drumming treatment which effectively lowers the sectional noise during normal running of the gen-sets.

The enclosure uses high frequency, medium frequency and low frequency type of PUR anti-flaming and sound-absorbing cotton, which could reduce the noise produced by the genset.

The door uses an EPDM type sealing system.

High efficiency absorbative mufflers which helps reduce exhaust noise.

Convenient transport using four point lifting arrangement.

Warranty

Warranty is according to our standard conditions:
12 months or 1,000 running hours, subject to the earlier one (artificial damage to be an exception).

Certification

European Safety Standard: CE Certificate.

ISO9001:2015 Quality Control System.

CUMMINS OEM CERTIFICATE.

STAMFORD OEM CERTIFICATE.

CUMMINS Diesel Engine

Engine Brand	Cummins
Engine Manufacturer	Cummins (China) Power Technology Co.,Ltd
Engine Model	4B3.9-G2
Engine Rated Power	24KW @1500RPM
Cylinder Arrangement	4 in line
Cycle	Four stroke
Aspiration	Naturally Aspirated
Fuel System	Cummins PT
Bore×Stroke (mm×mm)	102x120
Displacement(L)	3.9
Compression Ratio	17.3:1
Speed Governor	Electronic
Cooling System	Forced Water Cooling Cycle
Starter Motor	DC24V electrical starting

Exhaust System

Exhaust Gas Flow (L/min)	68
Exhaust Temperature(°C)	410
Standby Power	410
Prime Power	380
Max Back Pressure(kPa)	10

Air Intake System

Max Intake Restriction (kPa)	4 (Clean Element)
Dirty Element	6
Clean Element	4
Air Flow(L/min)	33

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Fuel System	
Type Injection System	BYC A Direct Injection
110%(Standby Power) Load(L/H)	7.5
100%(Prime Power) Load(L/H)	6.7
75%(Prime Power) Load(L/H)	5.2
50%(Prime Power) Load(L/H)	4
25%(Prime Power) Load(L/H)	2.7

Oil System	
Maximum Oil Temperature(°C)	121
Oil Pressure at Rated RPM	207-345
Minimum Required Lube System Capacity (L)	10.9

Cooling System	
Coolant Capacity – Engine Only(L)	7.2
Thermostat range(°C)	82-95
Max Water Temperature Standby/ Prime(°C)	104/100

Specification of STAMFORD Alternator	STAMFORD
Alternator Brand	Stamford
Engine Manufacturer	Cummins GeneratorTechnologies (China) Co., Ltd
Alternator Model	S0L2-G1
Alternator Rated Power	20KVA/16KW
Rated Voltage	415V
Rated frequency	50HZ
Connecting Type	3 Phase and 4 Wires
Number of Bearing	1
Protection Grade	IP23
Altitude	≤1000m
Exciter Type	Brushless, Self-exciting, AVR automatic voltage regulating, 100% Copper winding wire
Insulation Class	H
Telephone Influence Factor (TIF)	≤50
THF	≤2%
Voltage Regulation, Steady State	≤±1%
Transient State Voltage	≤-15%~+20%

Specification of control System (Deepsea DSE7320MKII Module)

DSE7320 controller is an advanced control module based on micro-processor, It is an Auto Mains (Utility) Failure Control Module (AMF), have been designed to start and stop generating sets that include electronic And non-electronic engines. Include the additional capability of being able to monitor a mains (utility) supply. when main is not available. It can automatically start the engine and close generating sets breaker automatically, Accurately measure various operational parameters and display all values and alarms information on the LCD. In additional, it can automatically open breaker, and shutdown the engine after the main supply recovers.

Main Features

- AMF and ATS and communication and expansion function.
- Designed to work with electronic or non-electronic or gas engine simultaneously. (support many kinds of engines ECU).
- Manual, Automatic, Test and remote control mode selectable.
- Monitoring and measuring operational parameters of the mains supply and genset.
- Indicating operation status, fault conditions, all parameters and alarms.
- Multiple protections and multiple parameters display.
- Includes 12 inputs and eight outputs. 8 inputs are configurable and 4 outputs are configurable.
- 4 analog inputs for kinds of optional sensors that can be used for measuring oil pressure, coolant temperature, fuel level and so on; parameters can be configured by user.
- Can be programmed using the front panel or by using the PC software.
- Support twelve languages. The language was edited by customer.
- Graded protection: pre-alarm, shutdown and electrical trip, flexible setting.
- The module can be pre-set for four operating modes and protecting parameters.
- The firmware can be updated automatically, so customer can have the latest version.

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Key Features

4-Line back-lit LCD text display.

- Multiple Display Languages.
- Five key menu navigation.
- LCD alarm indication.
- Heated display option available.
- Customisable power-up text and images.
- DSENet expansion compatibility.
- Data logging facility. Internal PLC editor.
- Protections disable feature Fully configurable via PC using USB, RS232 & RS485 communication.
- Front panel configuration with PIN protection.
- Power save mode.
- 3 phase generator sensing and protection.
- 3 phase mains (utility) sensing and protection (DSE7320 MKII only).
- Automatic load transfer control (DSE7320 MKII only).
- Generator current and power monitoring (kW, kvar, kVA, pf).
- Mains current and power monitoring (kW, kvar, kVA, pf) (DSE7320 MKII only).
- kW and kvar overload and reverse power alarms.
- Over current protection.
- Unbalanced load protection.
- Independent earth fault protection. Breaker control via fascia buttons.
- Fuel and start outputs configurable when using CAN.
- 6 configurable DC outputs.
- 2 configurable volt-free relay outputs.
- 6 configurable analogue/digital inputs

Key Features

- Support for 0 V to 10 V & 4 mA to 20 mA sensors.
- 8 configurable digital inputs.
- Configurable 5 stage dummy load and load shedding outputs.
- CAN, MPU and alternator frequency speed sensing in one variant
- Manual and automatic fuel pump control
- Engine pre-heat and post-heat functions
- Engine run-time scheduler
- Engine idle control for starting & stopping
- Fuel usage monitor and low fuel level alarms
- Simultaneous use of RS232 and RS485 communication ports
- True dual mutual standby using RS232 or RS485 for accurate engine hours balancing.
- MODBUS RTU support with configurable MODBUS pages.
- Advanced SMS messaging (additional external modem required)
- Start & stop capability via SMS messaging
- 3 configurable maintenance alarms
- Compatible with a wide range of CAN engines, including tier 4 engine support
- Uses DSE Configuration Suite PC Software for simplified configuration
- Licence-free PC software
- IP65 rating (with supplied gasket) offers increased resistance to water ingress
- Modules can be integrated into building management systems (BMS) using MODBUS RTU

Key Benefits

- Automatically transfers between mains (utility) and generator (DSE7320 MKII only) for convenience.
- Hours counter provides accurate information for monitoring and maintenance periods.
- User-friendly set-up and button layout for ease of use.
- Multiple parameters are monitored & displayed simultaneously for full visibility.
- The module can be configured to suit a wide range of applications for user flexibility.
- PLC editor allows user configurable functions to meet user specific application requirements.