BPD2000S3-B

2000 KVA DIESEL GENERATOR

FEATURES & BENEFITS

- Maximum 2200 kVA, 380V, 1500 RPM
- Constant voltage AVR (Automatic Voltage Regulator)
- 24 Volt Electric Starter
- 3500 Litre Fuel Tank, 11 Hours @ 75% load
- Silent Version (±85dBA)
- V-Type, 4 stroke, water-cooled, Turbo charged with aftercooler
- Three Phase Output
- DeepSea DSE6120 Digital Control Panel
- Low oil pressure system
- Low water cut out engine protection

GENERAL DATA	
Model:	BPD2000S3-B
Prime Power (P.R.P):	2000 kVA
Stand-by Power (L.T.P):	2200 kVA
Amps:	3342 A
Power Factor / COS:	0.8
Frequency:	50 Hz
Voltage:	380 V
Phases:	Three Phase
Engine Speed:	1500 RPM
Length:	12192 mm
Width:	2438 mm
Height:	2896 mm
Weight:	24100 kg's
Tank Capacity:	3500 l

ADDITIONAL	
Running Time:	11 Hours @ 75% load
Structure Type:	Silent
Noise Level (7m):	85 dBA
Auto Voltage Regulator:	Constant voltage AVR
ISO9001 Certified:	Yes
CE Certified:	Yes
Fuel Cons. @ 100% Load:	428.6
Fuel Cons. @ 75% Load:	311.3
Fuel Cons. @ 50% Load:	208.8

ENGINE DATA	
Brand:	Baudouin
Model:	16M33G2250/5^
Type:	V-Type, 4 stroke, water-cooled, Turbo charged with aftercooler
Starting System:	24 Volt Electric Starter
Auto-Decompression:	Yes
Cubic Capacity (l):	52.3
Compression Ratio:	14:1
Rated Power (kW/RPM):	1980 / 1500
Fuel Type:	Diesel
Lube Oil:	15W40
Low Pressure Alert:	Yes
Low Fuel Cut Out:	Yes

CONTROL PANEL	
Model:	DeepSea DSE6120
Type:	Digital Control Panel
Analogue Inputs:	2
Mains Phase Voltage:	Yes
Mains Line Voltage:	Yes

ALTERNATOR	
Model:	LSA 52.3 S6
Pole Number:	4
Excitation Mode:	Self Excitation

Johannesburg 011 397 7373

Pietermaritzburg 033 007 0812

Nelspruit 013 007 1753

Bloemfontein 051 001 1429

www.BunduPower.co.za

Ratings

RPM	Gross Engine Output				Net Engine Output			
	PRP		ESP		PRP		ESP	
	kWm	BHP	kWm	BHP	kWm	BHP	kWm	BHP
1500	1800 *	2414 *	1980	2655	1718 *	2304 *	1898	2546

1 kWm = 1,34102 BHP

Basic data

Engine model 16M33G2250/5
N° of Cylinders / Valves ..... 16 / 64
Cylinders arrangement ..... At Vee
Bore x Stroke (mm) ..... 150 x 185
Displacement (L) 52.3
Thermodynamic Cycle ..... Diesel 4 stroke
Mean Piston Speed (m/s) 9.25
BMEP @ ESP (Bar) 30.29
Cooling System ..... Liquid (water + 50% antifreeze)
Injection System ..... Direct
Fuel System ..... High Pressure Common Rail
Aspiration ..... Turbocharged and Aftercooled
Compression ratio ..... 14 : 1
Flywheel housing ..... SAE 0
Flywheel ..... 18"
N° of teeth on flywheel ring gear 194
Inertia of flywheel (kg•m²) 7.2
Inertia of crankshaft (kg•m²) 10.1
Emission standard ..... N/A
Overall Dimensions with radiator (Length x Width x Height) (mm) 4116x 2756x 2870
Engine dry weight without radiator and without radiator pipes (kg) 5200
Engine dry weight with radiator and radiator pipes (kg) 6825
Engine wet weight with radiator (includes oil, coolant) (kg) 7526

* The indicated PRP Power is for reference only. This engine is designed for emergency standby power (ESP) applications only.

Air intake system

Air intake temperature rise (°C) ..... ≤ 5
Air intake restriction clean filter (mBar) ..... ≤ 30
Air intake restriction dirty filter (mBar) ..... ≤ 62
Recommended air flow @ PRP (m³/min) 118.2
Recommended air flow @ ESP (m³/min) 127.7
Min. diameter of intake pipe (mm) 140

Aftercooling system

Aftercooler system type ..... Air to Water
Max. intake temperature @ 25°C ambient temperature (°C) 55
Max. difference between intake temperature and ambient temperature (°C) 30
Max. intake pressure drop of aftercooler (mBar) 80

Lubrication system

Oil capacity Low / High (L) ..... 114 / 171
Oil pressure in normal condition idle speed (Bar) ..... ≥ 2
Oil pressure in normal condition at 1500 Rpm @ PRP (Bar) ..... 4 - 6.5
Lowest oil pressure alarm (shutdown) (Bar) 2
Max. oil temperature (°C) 105
Oil flow at 1500 Rpm (L/min) ..... ≥ 533
Oil fuel consumption ratio based on engine fuel consumption data ..... ≤ 0.3 %
Total system capacity (including filters) (L) 175

Heat balance test data (with ambient temperature 26.0 °C)

Total heat dissipation @ ESP (kJ/s) 2867.8
- Heat Rejection to Jacket Water @ ESP (kJ/s) 683.0
- Heat Rejection to AfterCooler @ ESP (kJ/s) 455.0
- Radiated Heat to Ambient @ ESP (kJ/s) 239.8
- Heat Rejected to Exhaust @ ESP (kJ/s) 1490.0

Exhaust system

Max. exhaust back pressure (mBar) 75
Max. exhaust temperature before turbocharger (°C) 750
Max. exhaust temperature after turbocharger (°C) 550
Exhaust flow @ PRP (m³/min) 400.5
Exhaust flow @ ESP (m³/min) 440.6
Min. diameter of exhaust pipe (mm) 200
Max. bending moment of exhaust gas exit flange (Nm) 10

Cooling system with standard radiator version 2020

System designed for ambient temperature up to (°C) [1] 50
Radiator type ..... Mechanical
Fan type ..... Belt driven pusher
Min. inside diameter of coolant outlet pipe (mm) 100
Coolant capacity of radiator and pipes (L) 412
Coolant alarm (shutdown) temperature (°C) 103
Thermostat opening temperature / full open temperature (°C) ..... 80 / 92
Max. additional restriction for external cooling circuit (Bar) 0,34
Coolant capacity of the engine (L) 130
Cooling fan airflow (m³/min) 3480
Fan absorbed power (kW) 80
Additional restriction (for reference) - Duct allowance (Pa) 150

Fuel system

Governor ..... ECU
Governor steady state speed stability at constant load (ISO 8528-5 Class G3) [2] ..... ≤ +/- 0.5 %
Max. restriction at fuel inlet (Bar) 0.5
Max. pressure at fuel inlet (Bar) 0.5
Max. fuel return restriction (Bar) 0.2
Max. fuel inlet temperature (°C) 50
Fuel supply flow (L/hr) 1900
Min. internal diameter of inlet pipe (mm) 19
Min. internal diameter of return pipe (mm) 19

Electrical system

Electrical system voltage (negative to ground) (Vdc) 24
Starter power (kW) ..... 2 x 8.5
Battery charger current (A) 55
Battery charger absorbed power (kW) 1,6
Max. electric resistance of starting circuit (Ω) 0.008
Min. sectional area of wire (mm²) 95
Min. cold start temperature without auxiliary starting device (°C) [3] ..... - 10
Min. cold start temperature with auxiliary starting device (°C) [3] ..... - 25

[1] The indicated value is based on the AOT value of 50°C for an engine tested at 100% of the ESP Power, reflecting temperature in an open condition, without an enclosure or container, without any airflow obstruction in the front of the radiator, without air recirculation, with free exhaust gas exit and with the engine thermostatic valve in its full open condition, without a closing plate present. The reference air restriction is equal to 50Pa. For the equivalent ATB (Air-to-Boil) performance in a customer or project basis, please consult Baudouin Application Engineering.

[2] This refers only to the frequency response of the engine and should not be confused with the performance class of the Generator Set, which is subject to additional contributing factors such as alternator selection and control settings.

[3] Engines used in emergency standby application or applications that require immediate start under load, they must be equipped with coolant heaters. Baudouin recommend heaters installation to be executed by providing constant coolant circulation across all the engine components. Two heaters are required for V-type engines, one per each side.

Noise

Diesel engine noise (Acoustic power level) (dB(A)) 120.5
Noise - upper side (dB(A)) 102,2
Noise - right side (view from flywheel) (dB(A)) 101,8
Noise - left side (view from flywheel) (dB(A)) 104,4
Noise – front (radiator) side (dB(A)) 103,1
Noise – rear (flywheel) side (dB(A)) 102,7

Notes :

a) Noise test made at 100% of the ESP power, at 1 mt. distance, on engine without radiator, without cooling fan and without silencer.
b) Noise test refers to GB/T 1859 norm : "Reciprocating internal combustion engines. Measurement of emitted airborne noise. Engineering method and survey method".

Fuel consumption

Rating	gr/kWh	L/hr
100% ESP	205.6	484.6
100% PRP	200	428.6
75% PRP	193.7	311.3
50% PRP	194.9	208.8
25% PRP	210.4	112.7
	Fuel consumption tolerance + 3 %	

Notes:

This engine is designed for ESP (Emergency Standby) applications only, the values shown above at PRP levels refer to the Referenced Power (1800 kWm).

Ratings definitions

Emergency Standby Power (ESP)

Emergency Standby Power is the maximum power available for a varying load for the duration of a main power network failure. The average load factor over 24 hours of operation should not exceed 70% of the engine's ESP power rating. Typical operational hours of the engine is 200 hours per year, with a maximum usage of 500 hours per year. This includes an annual maximum of 25 hours per year at the ESP power rating. No overload capability is allowed. The engine is not to be used for sustained utility paralleling applications.

Prime Power (PRP)

Prime Power is the maximum power available for unlimited hours of usage in a variable load application. The average load factor should not exceed 70% of the engine's PRP power rating during any 24 hour period. An overload capability of 10% is available, however, this is limited to 1 hour within every 12 hour period.

1) All ratings are based on operating conditions under ISO 8528-1, ISO 3046, DIN6271. Performance tolerance of ±5%.
2) Test conditions : 100 kPa, 25°C air inlet temperature, relative humidity of 30%, with fuel density 0.84 kg/L. Derating may be required for conditions outside these; please contact the factory for details.
3) Power output curves are based on the engine operating with fuel system, water pump and lubricating oil pump; not included are battery charging alternator, fan and optional equipment.

DSEGenset®

DSE6110/20 MKII

AUTO START & AUTO MAINS FAILURE CONTROL MODULES

DSE**6120 MKII**

DSE**6110 MKII**

KEY FEATURES

- Large back-lit text display
- Multiple display languages
- Heated display option available
- DSENet® expansion compatible
- Data logging facility
- Fully configurable via PC using USB communication
- Front panel configuration
- Efficient power save mode
- 3 phase generator sensing
- 3 phase mains (utility) sensing (DSE6120 MKII only)
- Generator/load power monitoring (kW, kV A, kV Ar, pf)
- Accumulated power monitoring (kW h, kVA h, kVAr h)
- Generator/load current monitoring and protection
- Generator overload protection (kW)
- Breaker control via fascia buttons
- Fuel and start outputs, configurable when using CAN
- 4 configurable DC outputs
- 4 configurable analogue/digital inputs
- Support for 0 to10 V & 4 to 20 mA oil pressure sensors
- 6 configurable digital inputs
- Configurable staged loading outputs
- CAN, MPU and alternator speed sensing in one variant
- 3 engine maintenance alarms
- Engine speed protection
- Engine hours counter
- Engine pre-heat
- Engine run-time scheduler
- Engine idle control for starting & stopping
- Fuel pump control
- Real time clock
- Battery voltage monitoring
- Start on low battery voltage
- Configurable remote start input
- 1 alternative configuration
- Comprehensive warning, electrical trip or shutdown protection upon fault condition
- LCD and LED alarm indication
- Customisable information screens
- Configurable event log (100)
- Tier 4 ECO engine support including exhaust fluids & filters
- J1939-75 instrumentation output, configurable CAN instrumentation and alarms
- Start on low battery
- Enhanced alarm functionality
- Low load alarm

KEY BENEFITS

- Automatically transfers between mains (utility) and generator (DSE6120 MKII only)
- Increased input and output expansion capability via DSENet®
- User-friendly set-up and button layout for ease of use
- Multiple parameters are monitored simultaneously which are clearly displayed on a large back-lit text display via multiple languages
- The module can be configured to suit a wide range of applications
- Uses DSE Configuration Suite PC Software for simplified configuration
- Licence-free PC software
- IP65 rating (with optional gasket) offers increased resistance to water ingress

RELATED MATERIALS

TITLE	PART NO.
DSE6110/20 MKII Installation Instructions	053-173
DSE6110/20 MKII Operator Manual	057-226
DSE6110/20 MKII Configuration Suite PC Manual	057-224

SPECIFICATIONS

DC SUPPLY

CONTINUOUS VOLTAGE RATING
8 V to 35 V Continuous

CRANKING DROPOUTS
Able to survive 0 V for 50 mS, providing supply was at least 10 V before dropout and supply recovers to 5 V. This is achieved without the need for internal batteries. LEDs and backlight will not be maintained during cranking.

MAXIMUM OPERATING CURRENT
100 mA at 12 V, 105 mA at 24 V

MAXIMUM STANDBY CURRENT
60 mA at 12 V, 55 mA at 24 V

MAXIMUM SLEEP CURRENT
40 mA at 12 V, 35 mA at 24 V

GENERATOR & MAINS (UTILITY)

VOLTAGE RANGE
15 V to 415 V AC (Ph to N)
26 V to 719 V AC (Ph to Ph)

FREQUENCY RANGE
3.5 Hz to 75 Hz

INPUTS

DIGITAL INPUTS A to F
Negative switching

ANALOGUE INPUT A
Configurable as:
Negative switching digital input
0 V to 10 V
4 mA to 20 mA
0 Ω to 240 Ω

ANALOGUE INPUTS B TO D
Configurable as:
Negative switching digital input
0 Ω to 480 Ω

OUTPUTS

OUTPUT A (FUEL)
10 A short term, 5 A continuous, at supply voltage

OUTPUT B (START)
10 A short term, 5 A continuous, at supply voltage

AUXILIARY OUTPUTS C, D, E & F
2 A DC at supply voltage

DIMENSIONS

OVERALL
216 mm x 158 mm x 43 mm
8.5” x 6.2” x 1.5”

PANEL CUT-OUT
184 mm x 137 mm
7.2” x 5.3”

MAXIMUM PANEL THICKNESS
8 mm
0.3”

STORAGE TEMPERATURE RANGE
-40 °C to +85 °C
-40 °F to +185 °F

OPERATING TEMPERATURE RANGE

NON HEATED DISPLAY VARIANT
-30°C to +70°C
-22 °F to +158 °F

HEATED DISPLAY VARIANT
-40 °C to +70 °C
-40 °F to +158 °F

OPTIONAL PARTS

PART	PART NUMBER
IP65 Gasket	020-521

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DSEGenset®

DSE6110/20 MKII

AUTO START & AUTO MAINS FAILURE CONTROL MODULES

The DSE6110 MKII Auto Start Control Module and the DSE6120 MKII Auto Mains (Utility) Failure Control Module are suitable for a wide variety of single gen-set applications.

Monitoring engine speed, oil pressure, coolant temperature, frequency, voltage, current, power and fuel level, the modules give comprehensive engine and alternator protection. This is indicated on a large back-lit LCD text display via an array of warning, electrical trip and shutdown alarms in multiple languages.

Electronic J1939 (CAN) and non-electronic MPU and alternator sensing engine support for diesel, gas and petrol engines all in one variant. With a number of flexible inputs, outputs and protections, the modules can be easily adapted to suit a wide range of applications.

Through USB Communication both modules can be configured using the DSE Configuration Suite PC Software or through the module's front panel editor.

Using the DSE Configuration Suite PC Software the controller is easy to use and configure which allows alteration of operating parameters, sequences, timers and alarms.

AVAILABLE VARIANTS

6110-03	Auto Start with real time clock
6120-03	Auto Mains Failure with real time clock

ENVIRONMENTAL TESTING STANDARDS

ELECTRO-MAGNETIC COMPATIBILITY
BS EN 61000-6-2
EMC Generic Immunity Standard for the Industrial Environment
BS EN 61000-6-4
EMC Generic Emission Standard for the Industrial Environment

ELECTRICAL SAFETY
BS EN 60950
Safety of Information Technology Equipment, including Electrical Business Equipment

TEMPERATURE
BS EN 60068-2-1
Ab/Ae Cold Test -30 °C
BS EN 60068-2-2
Bb/Be Dry Heat +70 °C

VIBRATION
BS EN 60068-2-6
Ten sweeps in each of three major axes
5 Hz to 8 Hz at +/-7.5 mm,
8 Hz to 500 Hz at 2 GN

HUMIDITY
BS EN 60068-2-30
Db Damp Heat Cyclic 20/55 °C at 95% RH 48 Hours
BS EN 60068-2-78
Cab Damp Heat Static 40 °C at 93% RH 48 Hours

SHOCK
BS EN 60068-2-27
Three shocks in each of three major axes
15 GN in 11 mS

DEGREES OF PROTECTION PROVIDED BY ENCLOSURES
BS EN 60529
IP65 - Front of module when installed into the control panel with the optional sealing gasket.

COMPREHENSIVE FEATURE LIST TO SUIT A WIDE VARIETY OF GEN-SET APPLICATIONS