

## 23 KVA DIESEL GENERATOR

### FEATURES & BENEFITS

- Maximum 25 kVA, 380V, 1500 RPM
- Constant voltage AVR (Automatic Voltage Regulator)
- 12 Volt Electric Starter
- 45 Litre Fuel Tank, 10 Hours @ 75% load
- Silent Version ( $\pm 72$  dBA)
- Four cylinder, Water cooled diesel engine
- Three Phase Output
- DeepSea DSE6120 Digital Control Panel
- Low oil pressure system
- Low water cut out engine protection



 Baudouin

 DEEP SEA ELECTRONICS

### GENERAL DATA

<b>Model:</b>	BPD23S3-B
<b>Prime Power (P.R.P):</b>	23 kVA
<b>Stand-by Power (L.T.P):</b>	25 kVA
<b>Amps:</b>	37 A
<b>Power Factor / COS:</b>	0.8
<b>Frequency:</b>	50 Hz
<b>Voltage:</b>	380 V
<b>Phases:</b>	Three Phase
<b>Engine Speed:</b>	1500 RPM
<b>Length:</b>	1760 mm
<b>Width:</b>	740 mm
<b>Height:</b>	1050 mm
<b>Weight:</b>	636 kg's
<b>Tank Capacity:</b>	45 l

### ADDITIONAL

<b>Running Time:</b>	10 Hours @ 75% load
<b>Structure Type:</b>	Silent
<b>Noise Level (7m):</b>	72 dBA
<b>Auto Voltage Regulator:</b>	Constant voltage AVR
<b>ISO9001 Certified:</b>	Yes
<b>CE Certified:</b>	Yes
<b>Fuel Cons. @ 100% Load:</b>	6.1
<b>Fuel Cons. @ 75% Load:</b>	4.5
<b>Fuel Cons. @ 50% Load:</b>	3.2

### ENGINE DATA

<b>Brand:</b>	Baudouin
<b>Model:</b>	4M06G25/5
<b>Type:</b>	Four cylinder, Water cooled diesel engine
<b>Starting System:</b>	12 Volt Electric Starter
<b>Auto-Decompression:</b>	Yes
<b>Cubic Capacity (l):</b>	2.3
<b>Compression Ratio:</b>	17.5:1
<b>Rated Power (kW/RPM):</b>	23 / 1500
<b>Fuel Type:</b>	Diesel
<b>Lube Oil:</b>	15W40
<b>Low Pressure Alert:</b>	Yes
<b>Low Fuel Cut Out:</b>	Yes

### CONTROL PANEL

<b>Model:</b>	DeepSea DSE6120
<b>Type:</b>	Digital Control Panel
<b>Analogue Inputs:</b>	2
<b>Mains Phase Voltage:</b>	Yes
<b>Mains Line Voltage:</b>	Yes

### ALTERNATOR


<b>Model:</b>	DPC184E
<b>Pole Number:</b>	4
<b>Excitation Mode:</b>	Self Excitation

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	Model : <b>4M06G25/5</b>	Date : 04/11/20
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## Ratings


RPM	Gross Engine Output				Net Engine Output			
	PRP		ESP		PRP		ESP	
	kWm	BHP	kWm	BHP	kWm	BHP	kWm	BHP
1500	23	30.8	25	33.5	21.8	29.2	23.8	31.9

<sup>1</sup> kWm = 1,34102 BHP

## Basic data

Engine model.....	4M06G25/5
N° of Cylinders / Valves .....	4 / 8
Cylinders arrangement.....	In line
Bore x Stroke (mm).....	89 × 92
Displacement (L).....	2.3
Thermodynamic Cycle .....	Diesel 4 stroke
Cooling System.....	Liquid (water + 50% antifreeze)
Injection System .....	Direct
Fuel System.....	Mechanical Pump
Aspiration .....	Natural
Compression ratio.....	17.5 : 1
Flywheel housing .....	SAE 4
Flywheel .....	7.5"
N° of teeth on flywheel ring gear .....	104
Inertia of flywheel (kg•m <sup>2</sup> ).....	0.24
Inertia of crankshaft (kg•m <sup>2</sup> ).....	0.039
Emission standard .....	N/A
Overall Dimensions with radiator (Length x Width x Height) (mm) .....	1085 × 560 × 766
Engine dry weight without radiator and without radiator pipes (kg) .....	\
Engine dry weight with radiator and radiator pipes (kg) .....	264
Engine wet weight with radiator (includes oil, coolant) (kg).....	284.4

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### Air intake system

Air intake temperature rise (°C).....	≤ 5
Air intake restriction clean filter (mBar).....	≤ 35
Air intake restriction dirty filter (mBar) .....	≤ 60
Recommended air flow @ PRP (m <sup>3</sup> /min).....	1.44
Recommended air flow @ ESP (m <sup>3</sup> /min).....	1.44
Min. diameter of intake pipe (mm) .....	50

### Aftercooling system

Aftercooler system type.....	N/A
Aftercooler heat dissipating capacity @ PRP (kJ/s).....	N/A
Aftercooler heat dissipating capacity @ ESP (kJ/s) .....	N/A
Max. intake temperature @ 25°C ambient temperature (°C).....	N/A
Max. difference between intake temperature and ambient temperature (°C).....	N/A
Max. intake pressure drop of aftercooler (mBar) .....	N/A

### Lubrication system


Oil capacity Low / High (L) .....	7.1 / 9.5
Oil pressure in normal condition idle speed (Bar) .....	≥ 1
Oil pressure in normal condition at 1500 Rpm @ PRP (Bar) .....	2 - 5
Lowest oil pressure alarm (shutdown) (Bar) .....	1
Max. oil temperature (°C).....	115
Oil flow (L/min).....	22
Oil fuel consumption ratio based on engine fuel consumption data.....	≤ 0.4 %
Total system capacity (including filters) (L).....	11.5

### Heat balance test data (with ambient temperature 28 °C)

Total heat dissipation @ ESP (kJ/s).....	48
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### Exhaust system

Max. exhaust back pressure (mBar).....	80
Max. exhaust temperature before turbocharger (°C) .....	≤ 700
Max. exhaust temperature after turbocharger (°C) .....	N/A
Exhaust flow @ PRP (m <sup>3</sup> /min) .....	4.88
Exhaust flow @ ESP (m <sup>3</sup> /min).....	5.32
Min. diameter of exhaust pipe (mm).....	50
Max. bending moment of exhaust gas exit flange (Nm) .....	10

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## Cooling system with standard radiator version 2021

System designed for ambient temperature up to (°C) <sup>1</sup> .....	50
Radiator type .....	Mechanical
Fan type .....	Belt driven pusher
Min. inside diameter of coolant outlet pipe (mm) .....	35
Coolant capacity of radiator and pipes (L) .....	3.6
Coolant alarm (shutdown) temperature (°C) .....	105
Thermostat opening temperature / full open temperature (°C) .....	72 / 82
Min. pressure in cooling system (Bar) .....	0.15
Coolant capacity of the engine (L) .....	5
Cooling fan airflow (m <sup>3</sup> /min) .....	63
Max additional restriction - Duct allowance (Pa) .....	50

## Fuel system


Governor .....	Electronic
Governor steady state speed stability at constant load (ISO 8528-5 Class G3) .....	≤ +/- 0.5 %
Max. restriction at fuel pump inlet (Bar) .....	0.5
Max. fuel return restriction (Bar) .....	0.5
Max. fuel inlet temperature (°C) .....	70
Fuel supply flow (L/hr).....	40.2
Min. pressure of fuel pump (Bar) .....	1.3
Min. diameter of inlet pipe (mm).....	10
Min. diameter of return pipe (mm) .....	10

## Electrical system

Electrical system voltage (negative to ground) (Vdc) .....	12
Starter power (kW).....	3
Battery charger current (A).....	55
Battery charger absorbed power (kW).....	0.8
Max. electric resistance of starting circuit (Ω).....	0.004
Min. sectional area of wire (mm <sup>2</sup> ) .....	50
Min. cold start temperature without auxiliary starting device (°C) <sup>2</sup> .....	- 5
Min. cold start temperature with auxiliary starting device (°C) <sup>2</sup> .....	- 15

<sup>1</sup> The indicated value is based on an ATB value of 50°C for an engine tested at 100% of the ESP Power, 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.

<sup>2</sup> Engines used in emergency standby application or application that require immediate start under load, 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.

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## Performance data

Mean Piston Speed (m/s).....	4.6
BMEP (Bar) .....	8.69
Fan absorbed power (kW).....	0.45

## Noise

Diesel engine noise (Acoustic power level) (dB(A)) .....	105.9
Noise - upper side (dB(A)) .....	90.5
Noise - right side (view from flywheel) (dB(A)).....	90.3
Noise - left side (view from flywheel) (dB(A)).....	92.3
Noise - front (radiator) side (dB(A)).....	93
Noise - rear (flywheel) side (dB(A)).....	93.9

Notes :

- Noise test made at 100% of the ESP power, at 1 mt. distance, on engine without radiator, without cooling fan and without silencer.
- 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	238.9	7.1
100% PRP	224.2	6.1
75% PRP	218.5	4.5
50% PRP	230.7	3.2
25% PRP	289.8	2
Fuel consumption tolerance + 3 %		

## 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.

- All ratings are based on operating conditions under ISO 8528-1, ISO 3046, DIN6271. Performance tolerance of  $\pm 5\%$ .
- 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.
- 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.

# DSE6110/20 MKII

## AUTO START & AUTO MAINS FAILURE CONTROL MODULES

**DSE6110 MKII**

**DSE6120 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 to 10 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

**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

**RELATED MATERIALS**
**TITLE**

DSE6110/20 MKII Installation Instructions  
DSE6110/20 MKII Operator Manual  
DSE6110/20 MKII Configuration Suite PC Manual

**PART NO.**

053-173  
057-226  
057-224

**OPTIONAL PARTS**

PART	PART NUMBER
IP65 Gasket	020-521

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# 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

