

Technical specifications

Diesel Generator Set

Frequency: 50HZ

QES 60

Voltage: 400/230 V

Frequency: 50HZ



Genset Image for illustration purposes only

TECHNICAL INFORMATION

Standby Power (ESP)	kVA	63
	kW	50
Prime Power (PRP)	kVA	60
	kW	48
Rated current 3ph (PRP)	A	86
Mechanical structure		Soundproofed
Engine		CUMMINS 4BTA3.9-G2
Alternator		ATLASCOPCO ACA225D
Control card		DEEP SEA 4620
Measures (L x W x H) mm 2.220	mm	2.080 x 1.000x 1.280
Empty weight	kg	1300
Fuel tank	L	105
Acoustic pressure, LpA	dB(A) @ 7m	68
Acoustic power LwA	dB(A)	94

Voltages	Prime Power (PRP)		Standby Power (ESP)	
	(kVA)	(kW)	(kVA)	(kW)
380/220	60	48	63	50
400/230	60	48	63	50
415/240	60	48	63	50

Notes:

PRIME POWER: Electrical power data available at a variable load without limits of hours per year. An overload of up to 10 % (depending on engine/alternator maximum power) is allowed for 1 hour of every 12. In accordance with ISO 8528/1 (2005) – PRP

STANDBY POWER: Electrical power data at variable load in an emergency in accordance with standard ISO 8528/1 (2005) – ESP. Overloads of emergency power are not allowed.

The standard reference conditions are: 25 °C, 100 kPa and 30% relative humidity. Diesel density: 0.835 g/cm3.

General description

Specifically developed for the industrial applications, this soundproof generator set is easy to use and straightforward to maintain. The available features & options are designed to fully meet the requirements of all industrial applications. The generator set will automatically start on mains failure and cool down and stop as soon as the mains come back. The generator set also controls the load transfer between mains (utility) and generator set. It can also be start-up by means of an external signal. It's your solution for Predictable Power.

Engine

4BTA3.9-G2 CUMMINS diesel 4 stroke engine, with turbo, with direct injection and electronic regulation of the engine speed.

Engine brand	CUMMINS	Engine Capacity (l)	3.9
Model	4BTA3.9-G2	Bore (mm)	102
R.P.M.	1500	Stroke (mm)	120
Fuel	Diesel	Compression ratio	17.3:1
No. of cylinders	4 L	Type of regulation	Electronic governor

Cooling System

Cooling of the sleeves using cooling fluid comprised of water and glycol at 50% in a closed circuit driven by the engine pump.

The circuit is completed with a blower fan driven by the engine, radiator, expansion tank, cooling fluid purge system towards the outside of the bedplate and protections of all the running surfaces.

Cooling type	Water	Limit ambient temperature (°C)	40
Coolant capacity (l)	9		

Coolant heater with heating element is available as an option. A thermostat is included to maintain the temperature at optimum range and facilitate the starting of the engine.

Coolant heater power (W)	1 x 1000W	
--------------------------	-----------	--

Lubrication System

The lubrication system of this diesel engine comprises the oil pan, oil filter, oil switch and gear oil pump driven by the engine. All the components are original from the engine manufacturer.

It can be completed by an optional manual oil sump drain pump.

Oil capacity (l)	9.5	
------------------	-----	--

Air intake system

Air intake system for combustion with filtering device and filter change indicator. Intake air cooling after the turbo by means of an air/air exchanger.

Intake air flow (m³/min)	3.3	
--------------------------	-----	--

Exhaust System

The exhaust system consists of pipes, bellow, interior and exterior aluminized steel exhaust silencer that is highly resistant to corrosion, rain cap and hot part protections.

T^a gas emission (°C)	535	Engine Capacity (l)	3.9
Gas flow (m3/min)	8.94	Outlet diameter (mm)	76
Number of exhaust	1		

Start System

Start system that uses an electrical motor, battery and battery charge alternator that is driven by the engine itself. The start motor and the battery charge alternator are originals from the engine manufacturer.

Starter voltage system (V)	24	Battery type	2 x 12V 45Ah
-----------------------------------	----	---------------------	--------------

Fuel supply system

The fuel system consists of a fuel tank, feed pump, water separator fuel filter including 30 microns filtering element, injection pump and injection nozzles.

The fuel tank is made of steel and includes a filling connection with cap, a cleaning hatch and draining plug for easier maintenance. The fuel level is controlled thanks to a fuel level sensor or a fuel gauge (depending on the model).

Fuel tank capacity (L)	105
-------------------------------	-----

Fuel consumption panel

(range according to the standard configuration)

Load	Prime Power (PRP)		Standby Power (ESP)	
	(l/h)	Range (h)	(l/h)	Range (h)
0%	2.8	36.9	2.8	36.9
50%	6.8	15.3	7.7	13.7
75%	9.8	10.7	10.6	9.9
100%	13.0	8.1	13.7	7.7

Alternator

Atlas Copco alternator is 4 poles brushless synchronous alternator, with a lifetime lasting greased bearing, H class insulation and H degree Temp. Rising, 12 leads and AVR (Automatic Voltage Regulator) controlled.

Alternator winding insulation is protected by reinforced VPI by using ELANTAS R2003 varnish and VA42 protecting varnish. Higher insulation protection by covered coating GRC20GC is optional which can be used in high humidity(>95%) and salted air environment.

Standard self-excitation system is with alternator self-protection function with 1.5 times rated current for 30 seconds. The auxiliary winding excitation system(AWES) is optional to maintain 3 times short-circuit current for 10 seconds.

Joining of engine and alternator through flexible SAE coupling.

Regulations:

- IEC 34-1
- GB 755
- EN 60034
- VDE 0530
- BS 5000
- NEMA MG1-22
- ISO 8528:3
- ISO 3046

Low wave distribution:

- THC < 5%
- THD < 5%
- THF (IEC) < 2%
- TIF (NEMA) < 50

Incorporates electromagnetic emissions suppressor in accordance with standard VDE 0875, class K.

Engine brand	Atlas Copco	Voltage Stability	±1%
Model	ACA225D	Performance at 75% p.f. 0.8 (%)	90
Alternator Power (kVA)	60	Performance at 100% p.f. 0.8 (%)	89
Number of wires	12	Direct subtransient reactance X''d (%)	12
IP Alternator	IP 23	Subtransient time constant, T''d (ms)	7
Excitation system	SHUNT	Zero sequence reactance, Xo (%)	10
AVR model	SX460	Short-circuit ratio, Kcc	0.45

Bed plate

The engine-alternator set is coupled to the bedplate by means of anti-vibration shock mounts that absorb almost all the vibrations.

The base frame is able to hold 100% of the liquids of the genset, reducing any potential environmental impact. It has a drainage plug.

Sound proofed canopy

The canopy includes an external lifting beam (in standard scope or in option depending on the model) and latches with key.

It is lined inside with a noise-absorbing material of polyurethane foam with a 30 mm thick waterproof protector veil with a density of 26-29 kg/m3 (depending on the model).

It also has an emergency shutdown pushbutton that is accessible from the outside.

Electric panel

Easily accessed control cubicle integrated in the generator set with digital controller providing advanced engine monitoring and protection features. Performance and maintenance requirements can also be observed. The cubicle includes multi-poles thermal-magnetic protection circuit breaker against overloads and short-circuits.

Has a circuit breaker, manually actuated, with thermal-magnetic protection against overloads and short-circuits.

Circuit Breaker rated current (A)	100A 4P R	Battery charger	DSEBC2405
-----------------------------------	-----------	-----------------	-----------

A DEEP SEA battery charge maintainer is available in option, designed to be permanently connected to the battery and maintains it charged to its maximum capacity.

Has no moving parts. The charger switches to floating mode when the charge is complete.

Control Card

DEEP SEA control plate, DSE 4620 (Qc2011) monitors the generator set start-up and shutdown process as well as the proper operation of all the components. The generator set can also be start-up by means of an external signal. It also starts-up the generator set using an external signal.

Also, control plate DSE 4620 checks a large number of parameters of the generator set which allows it to display information, statuses and alarms. If required, it will shutdown the generator set: Due to high coolant fluid temperature, low oil pressure, low coolant fluid level, etc.

Includes a LCD screen with lighting, 2 navigation menubuttons, independent operational mode buttons, and alarms and status indicating LEDs.

Communications via USB, and Completely configurable using a PC in Windows environment and free Scada type software in real time.

Includes reading and displaying of parameters with RMS values, real time clock, events history log up to 15 events and programming of alarms, events, start-ups and shutdowns.

Operating modes: START-UP, SHUTDOWN, AUTO, MANUAL AND TEST.

Generator

- Generator voltage (L-N)
- Generator voltage (L-L)
- Generator frequency
- Generator current
- kW
- kVA
- kWh
- kVAh
- Power factor



Engine

- Turn speed
- Cooling fluid temperature
- Oil pressure
- Hour meter
- Battery voltage
- No. of start-ups
- Fuel level

Protections

- Start-up fault (generator set shutdown)
- High coolant temperature (alarm and generator set shutdown)
- Low oil pressure (alarm and generator set shutdown)
- Low fuel level (alarm)
- Low cooling fluid level (generator set shutdown)
- Overload (alarm and generator set shutdown)
- Battery voltage high (alarm)
- Battery voltage low (alarm)
- Battery charge alternator failure (alarm)
- Generator low frequency (alarm and shutdown)
- Generator high frequency (alarm and shutdown)
- Generator low voltage (alarm and shutdown)
- Generator high voltage (alarm and shutdown)
- External emergency shutdown (shutdown)
- Engine overspeed (shutdown)
- Maintenance interval (alarm)

PTB

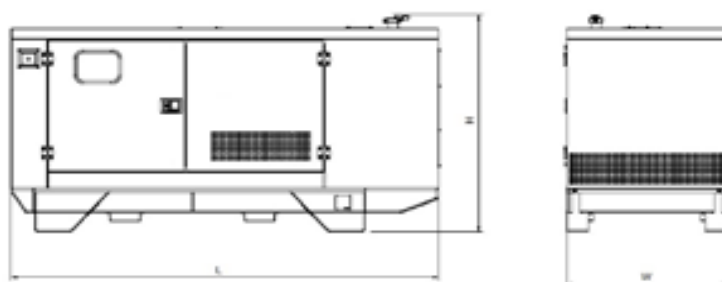
Optional Cabinet for switching between the grid and the generator set by means of Schneider brand contactors with an integrated mechanical and electrical interlocking device.

Controlled by free voltage contacts and based on contactors technology, this PTB allow the load transference between two sources (mains-generator). Mechanical and electrical interlocking systems guarantee the safety of the transference..

PTB	4P 125A 230-240V L-N CCM
------------	--------------------------

Dimensions and weight

Fuel Tank Capacity	8h	24h	48h
Length, L (mm)	2080	2080	2080
Width, A (mm)	1000	1000	1000
Height, H (mm)	1280	1400	1590
Net Weight (kg)	1300	1350	1450
Capacity Fuel Tank (l)	105	250	500



Performance class

Execution class in accordance with ISO 8528/5 (2005) taking into account the behaviour of the generator set in a permanent mode of operation with different load levels, as well as in a temporary mode of operation due to shocks in the load.

Performance class	G2
--------------------------	----

Regulation

The generator set has a CE Marking that includes the following directives:

- 2006/42/EC Machine Safety.
- 2014/35/EU Low Voltage.
- 2014/30/EU Electromagnetic compatibility.
- 2000/14/EC Noise emissions of machines outdoors in soundproof generator sets..

Regulation (EU) 2016/1628 Gases and contaminating particles emissions only for groups within its scope of stationary application.

Applicable international regulations:

- ISO 8528
- ISO 3046
- BS 5000
- IEC 60034
- 2000/14/EC