

# Atlas Copco Generators

QAC1000-1006

Containerised Super Silenced power



*Atlas Copco*

# QAC: the Atlas Copco generator range that sets new standards in power generation

Atlas Copco QAC Containerised Super Silenced generator sets are available in power ranges from 1000 to 1250 kVA at 50 Hz and 60Hz. As well as providing quiet, dependable standby power for noise sensitive applications including hospitals, supermarkets and banks, the generators deliver the power stability demanded by sectors including telecommunication. QAC generators are also suitable for continuous duty applications in quarries, mines, power stations and large construction sites. QAC generators are easy to operate, have simple routine maintenance and require minimal supervision. These features make them the obvious choice for construction and rental companies.

Easily handled by crane or lift truck, the purpose made 20 ft CSC ISO certified generator housing has wide opening doors to provide full access to the engine/alternator and the cooling compartment. The doors can be locked or bolted shut to prevent unauthorised access.

An innovative, variable speed cooling system is standard. This has been tested to ensure the optimum operating temperature is maintained for all components in ambient temperatures between  $-20^{\circ}\text{C}$  and  $+50^{\circ}\text{C}$  and at altitudes of up to 2450 m.

The alternator used in QAC gensets is produced for Atlas Copco by Mecc-Alte, Detroit Diesel manufacturing the engine. These World-class suppliers work to the exacting standards demanded by Atlas Copco, which is itself fully accredited to ISO 9001 and ISO 14001.

Every QAC genset meets or exceeds international approval specifications, including ISO 8528.

**All models are compliant with current EC safety and OND 2000/14/EC environmental regulations.**

The QAC range has been conceived to offer reliability, safety, economy and concern for the environment. These major design parameters have resulted in a range of units that are compact, fully protected and Super Silenced. These state-of-the-art gensets offer remarkably low fuel consumption and come with the full Worldwide support that only Atlas Copco can provide.



## Power rating definitions according to ISO 8528-1: 1993(E)

**LTP / Limited Time Power:** LTP limited time running power is the maximum power the generating set is capable of delivering between stated maintenance intervals and under stated ambient conditions for up to 500 hours per year of which a maximum of 300 hours is continuous running.

**PRP / Prime Power:** PRP prime power is the maximum power available during a variable power sequence, between stated maintenance intervals and under the stated ambient conditions, which may be run for an unlimited number of hours per year at a load factor below 80%. PRP ratings can be obtained by reducing the LTP ratings by 10%.

## Reference conditions

Engine performance to ISO 3046/1-1981 & BS5514

Absolute inlet pressure	kPa	100
Altitude above sea level	m	100
Relative air humidity	%	30
Air inlet temperature at air filter	°C	25

## Limitations

Maximum ambient temperature	°C	50*
Altitude capability	m	2450*
Relative air humidity	%	85
Minimum starting temperature	°C	-20

\* Above 40°C and 1000 m altitude, de-rated performance applies. Consult the nearest Atlas Copco sales office for de-rated data

# The basic package

## Alternator

The alternator used in QAC gensets is purpose designed and manufactured for Atlas Copco by Mecc-Alte. Mecc-Alte alternators are manufactured in accordance with and comply to CEI 2-3, IEC 34-1, EN 60034-1, VDE 0530, BS 4999-5000, CAN/CSA – C 22.2 N° 14-95 – N° 100-95

- 3-phase, synchronous, brushless type
- 12 Leads
- Self-exciting and self-regulating
- 3-phase sensing Automatic Voltage Regulator operating to within 1% of any power factor at speed variations between -5% and +30% of rated speed
- In order to reduce the harmonic content of the voltage, the alternator windings have an Optimum 2/3 pitch
- Electric motor starting. Permissible overloads are 300% for 20 seconds, 50% for 2 minutes and 10% for 1 hour every 6 hours
- The alternators meet the standard application demands to include lighting and electric motor starting. Technological requirements, including military and telecommunication applications, are also met
- Robust mechanical structure with standard protection to IP23
- Impregnation with tropicalised epoxy black rubber varnish (BUTADIENIC)
- Radio interference suppression in accordance with VDE 0875 degree G and N. EMC compliance to EN 50081-1 and EN 50082-1
- A 230V anti-condensation heater is standard

## Engine

DDC/MTU series 2000

- V 16 2000 engine
- Self priming
- Four-stroke diesel
- Twin turbochargers for rapid load acceptance
- Four-valve cylinder heads for optimum air flow and maximum performance
- Separate charge-cooling circuit. Maximises air cooling for optimum performance, minimises white smoke at low ambient temperature
- DDEC electronic fuel control system maximises output, reduces smoke emissions and reduces fuel consumption
- Advanced, electronic control delivers unmatched stability of 0.25% and isochronous speed control
- Individually calibrated electronic injectors for optimum combustion at all engine speeds

- 24 V DC starter
- Maximum reliability and Up Time
- Field proven Worldwide: Low maintenance. Low cost of operation.
- Low fuel consumption. Long life to overhaul
- Worldwide product support
- All Series 2000 engines produce their rated power. The power you buy is the power you get

## Air Filter System

- 3 Two-stage air intake filters with safety cartridge. Maximum protection in all environments
- Service indicator shows when the filters need to be cleaned

## Cooling System

- Tandem radiators
- Variable Speed Drive electric fans ensure optimum cooling at ambient temperatures of up to 50°C
- Coolant level switch

## Fuel System

- 3 Primary fuel filters, each incorporating a water separator
- 2 Secondary fuel filters
- All fuel filters have replaceable elements
- Double skin removable fuel tank with leakage sensor
- 8 Hours fuel capacity at 75% load
- Electric fuel transfer pump allows refuelling from an external supply
- External fuel connections to hook up to an external fuel tank
- Overfill warning and overfill shut down switch
- Low fuel warning and low fuel shut down switch with an audible and visual alarm

## Oil System

- 3 Spin-on cartridge filters
- Manual oil sump drain pump

## Engine Exhaust System

- Integrated heavy-duty silencer. Residential rating
- Thermally insulated

# QAC generators

- 1 ABB variable speed cooling fan and engine compartment
- 2 Stainless steel roof
- 3 Spillage free frame (Container integral bund)
- 4 Fork slots
- 5 Turbocharged and aftercooled Detroit diesel engine
- 6 Triple fuel prefilters with water separator
- 7 Power outlet terminal board behind lockable doors
- 8 Emergency stop
- 9 Stainless steel handles and hinges
- 10 Mecc-Alte 1050-1260 kVA alternator impregnated with tropicalised epoxy black rubber varnish (BUTADIENIC)

Manual oil drain pump



Spilt liquid manual drain pump



Cooling fan VSD variable speed system



TERASAKI motorised 1500 A circuit breaker



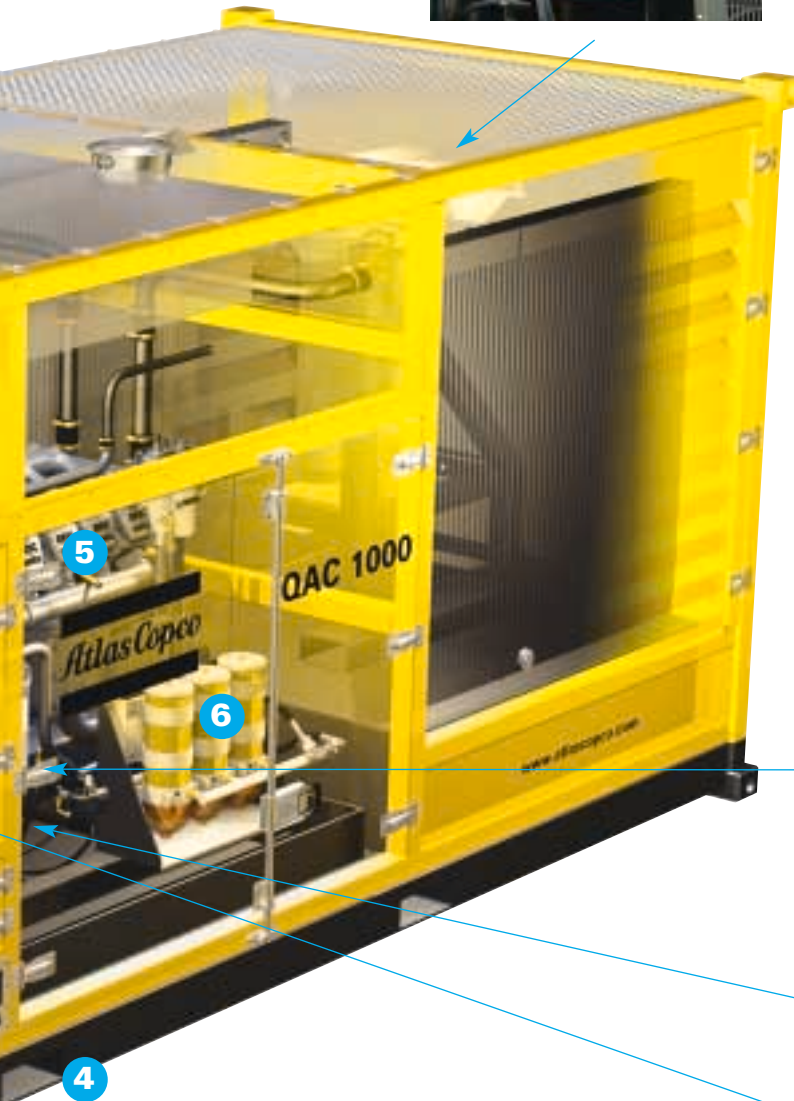
ABB variable speed cooling fan and cooler compartment



Fuel connection and electric transfer fuel pump



Dual wall fuel tank leakage detector



Electric fuel pump



Automatic oil filler (Automatic Oil Make Up System)



Automatic mains failure and parallel operation between multiple gensets and the mains



Coolant heater 6 kW

## Electrical System

- 24 V system with separate battery charging alternator
- Axial type starter motor
- 2 Heavy-duty, maintenance-free 12 V batteries. Engine start at -20°C
- Battery rack and cover mounted inside the generating set
- Heavy-duty cables with integral battery isolation switch

## Safety Devices

- Full guarding for all rotating parts, hot spot parts and electrical connections
- If the terminal board access door is opened during operation, the main circuit breaker trip switch is instantly activated

## Control System

- The control system includes the Qc4001™ control panel, with features that include an integrated LCD screen, Island operation, Automatic Mains Failure, Parallel operation between multiple generators and the mains.
- With Local as well as Remote start-up capabilities.
- An RS232 interface enables a Laptop / PC to directly interface with the control panel, for Remote Control and Monitoring
- The Qc4001™ control panel is tested in accordance with EMC standards IEC EN 50081-2 and IEC EN 50082-2 to procedures set out in EN 61000.
- A 4-pole (50 Hz) or 3-pole (60 Hz) motorised integral trip provides thermal and magnetic overload protection. Fully encapsulated, it is fitted inside a vibration isolated box for maximum protection and longevity
- Auxiliary circuit breakers
- Illuminated control panel
- Alternator/engine compartment lighting switch
- Control panel mounted fuse for DC circuit
- DDEC engine diagnostic socket
- Engine diagnostic lights with switch
- Emergency stop button
- External power source sockets for alternator/engine compartment lights and alternator anti-condensation heater
- Earth leakage relay
- Automatic or manual fuel tank refilling controls
- Low and high fuel level audible and visible alarm
- DC and AC wiring looms utilise industrial multi-pin connectors to speed fault finding and simplify retrofitting remote control systems
- Oversized terminals on the terminal board allow fast and easy connection up of power cables

## Enclosure

- Alternator/engine assembly fully enclosed in a sound attenuated 20 ft CSC certified ISO container
- Fully sealed integral bund offers 110% liquid containment
- Spilt liquid can be removed by the manual drain pump and/or via drain plugs in the container base
- Purpose-made enclosure includes noise reducing features, such as variable speed cooling fans, for improved levels of silencing
- In-built fork slots for safe transport by lift truck
- Wide opening access doors to all main components ease maintenance
- All doors feature triple stainless steel hinges and handles and are fully lockable to prevent unauthorized access
- The alternator/engine compartment is fitted with 3 service lights. These can be powered for a limited period via the unit's own DC batteries or via an external power source
- Engine exhaust rain caps prevent water ingress

## Generating set finish

- The alternator and engine parts are cleaned and then finished with an industrial quality paint for maximum protection against corrosion
- The container frame and sheet metal are cleaned prior to coating with an extremely durable polyester powder high gloss finish

## Miscellaneous

- A rigorous inspection and full load test is carried out prior to delivery
- Factory acceptance test certificate issued with each individual unit
- EC declaration of conformity issued with each individual unit
- A 50 hour first Service Pack supplied as standard
- A complete set of manuals, including spare parts lists, supplied as standard

## Qc4001™

### LCD screen with LEDs

- Power on
- Generator running
- Voltage / Frequency stable
- Generator breaker closed
- Mains breaker closed
- Mains present and stable
- AUTO-mode selected
- SEMI-AUTO mode selected
- General alarm

### Readings on LCD screen

- Voltage ( Line to Line and Line to Neutral )
- Amps on each phase
- Frequency
- Speed
- Power read outs ( kVA, kVAr, cos  $\phi$ , kW, kWh )
- Average power
- Oil pressure
- Coolant temperature
- Fuel level
- Battery voltage
- Running hours
- Service counter

### Warning & Shutdowns

### Integrated Automatic Mains Failure

### Paralleling Functions

- Synchronisation between multiple units
- Synchronisation with the mains
- No break return / Automatic back synchronisation to the mains
- Automatic synchroniser
- Load sharing ( active / reactive )
- Peak shaving / Peak lopping
- Fixed power to the mains
- Cos  $\phi$  regulation ( fixed cos  $\phi$  or fixed kVAr )

*Note: Paralleling with the mains might require extra protection functions that are dependant on local regulations and should be specified separately for the installation.*

# Technical data

Performance data <sup>1)</sup> (Power Factor 0.8)	QAC1000 (Dual Frequency)		QAC1006
	50 Hz	60 Hz	60Hz
Rated voltage 3 phase Line to Line voltage	V	400	480
Rated voltage Line to Neutral voltage	V	230	277
Rated standby power 3 phase	kVA/kW	1000/800	1125/900
Rated prime power 3 phase	kVA/kW	900/720	1012/810
Rated standby current 3 phase	A	1445	1355
Rated prime current 3 phase	A	1300	1217

## Consumption (acc. to ISO 3046-1)

Fuel tank capacity	l	1500	1500	1500
Fuel consumption at 100% load	l/h	201.3	234.3	274
Fuel consumption at 75% load	l/h	151.7	175.1	223
Fuel consumption at 50% load	l/h	104.8	120.6	174
Specific fuel consumption at 100% load	kg/kWh	0.216	0.224	0.236
Specific fuel consumption at 75% load	kg/kWh	0.217	0.223	0.235
Specific fuel consumption at 50% load	kg/kWh	0.225	0.230	0.242
Maximum lube oil consumption at full load	kg/h	0.364	0.412	0.472

## Water and oil capacity

Capacity engine oil	l	96.5	96.5	96.5
Capacity coolant circuit	l	260	260	260

## Cooling system

Engine heat rejection to coolant	kW	615	615	615
Engine radiated heat Rejection	kW	191	191	191
Cooling fan electric motor cooler comp.	kW	25	25	25
Cooling fan electric motor engine comp.	kW	7.5	7.5	7.5

## Exhaust system

Exhaust temperature	°C	463	463	463
Exhaust flow	m <sup>3</sup> /min	208	209	209

## Emission at 100% load

NOx	g/hr	5655	6830	6830
CO	g/hr	932	359	359
HC	g/hr	62.2	144	144
SO2	g/hr	1815	2070	2070
Particulates	g/hr	31	22.2	22.2

## Alternator

		Mecc-Alte	Mecc-Alte	Mecc-Alte
Make		ECO 43-1L/4	ECO 43-1L/4	ECO 43-1L/4
Model		ECO 43-1L/4	ECO 43-1L/4	ECO 43-1L/4
Rated output, Class H temperature rise	kVA	1050	1260	1260
Degree of protection	IP	23	23	23
Insulation stator	Class	H	H	H
Insulation rotor	Class	H	H	H
Number of wires		12	12	12

## Engine

		Detroit Diesel	Detroit Diesel	Detroit Diesel
Make		16V2000 R163-7K37	16V2000 R163-7K37	16V2000 G81
Model		16V2000 R163-7K37	16V2000 R163-7K37	16V2000 G81
Rated net output	kW	895	1007	1115
Coolant		Water	Water	Water
Combustion system		Direct Injection	Direct Injection	Direct Injection
Aspiration		Turbocharged Intercooled	Turbocharged Intercooled	Turbocharged Intercooled
Number of cylinders		16	16	16
Swept volume		32	32	32
Speed governing		Electronic	Electronic	Electronic

## Noise at 75% load and 70% of the cooling fan speed

Sound power level (LWA) OND 2000/14/EC	dB(A)	95	101	101
Sound pressure level (LPA) 1 m distance	dB(A)	74	80	80
Sound pressure level (LPA) 7 m distance	dB(A)	64	70	70

<sup>1)</sup> at Reference Conditions 40°C ambient and 1000 m altitude

## Dimensions and Weight

Mass dry / wet	kg	16300/18100
Dimensions LxWxH	mm	6058x2438x2591

## Centre of Gravity

Distance measured from the edge of the container

in mm	Dry	Wet
X-axis	2875	3050
Y-axis	1219	1219

