SPEC SHEET

NPE
NATIONAL PUMP & ENERGY

QAC 1450 TWINPOWER SD ESF

This document gives a complete list of technical data with some detailed explanations of the main systems, subsystems and performance of our generators, in order to support local sales documentation, tenders or even technical doubts.

While every effort has been made to ensure that the information in this manual is correct Atlas Copco does not assume responsibility for possible errors. Atlas Copco reserves the right to make changes without prior notice.

Standard Model Scope

The QAC is our twenty-foot containerized unit, which provides superior power, is super silent and ideal for heavy duty applications. Its complete configuration makes it our High spec product.

The innovative dual compartment design whereby the power compartment and the cooling compartment are completely separate ensures maximum efficiency and safe operation in the most extreme conditions. In the power compartment, which houses the alternator and the engine, there are dual, contra-rotating fans facing each other, which help to reduce the noise level.

Serviceability is one our main concerns. Doors can be easily opened so that all components are always within reach, ensuring maintenance a service. Engine has full step-in access, alternator and air filters share same door access to avoid wasting time and sliding base concept also enables parts to be accessed by simply sliding out the appropriate section

Standard Qc4004 controller with paralleling system makes possible to work with the mains and with other units (till 16) in applications as Independent Power Plants (IPP) all over the world. Providing Atlas Copco Power Management System (PMS), which is a smart management of the load of our customers, saving costs in terms of fuel, maintenance and performance.

Features

- Carefully selected components, accurately developed and tested configuration
- Superior standard configuration and extensive option list
- 500 hours service interval and superior accessibility to all service points
- Compact and safe concept and sturdy design
- Designed and built to last

Benefits

- Accurate and stable power regardless of the conditions
- Ability to power a wide range of applications
- Service efficiency: increased up-time
- Increased transport efficiency, separated control and power cubicle
- Superior resale value / longer life time

Manufacturing and Environmental Standards

The QAC range is manufactured following stringent ISO 9001 regulations, and by a fully implemented Environmental Management System fulfilling ISO 14001 requirements.

Attention has been given to ensure minimum negative impact to the environment.

The QAC range complies with the latest noise emission directives.

Declaration of Conformity

Our QAC EC falls under the provisions of the article 12.2 of the EC Directive 2005/42/EC on the approximation of the laws of the Member States relating to machinery, is in conformity with, the relevant Essential Health and Safety Requirements of this directive:
MACHINERY SAFETY (2006/42/EC): EN ISO 12100-1, EN ISO 12100-2, UNE EN 12601
ELECTROMAGNETIC COMPATIBILITY (2004/108/EC): EN 61000-6-5, EN 61000-6-4
LOW VOLTAGE EQUIPMENT (2006/95/EC): EN 60034, EN60204-1, EN 60439
OUTDOOR NOISE EMISSION (2000/14/EC): ISO 3744
IS0 8528: QAC generators are design to comply with ISO 8528 regulation

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1. Performance Data

Generator		QAC 1450 TwinPower Sd	
Rated speed	rpm	1500	1800
Rated power factor (lagging)		0.80	0.80
Rated Prime Power, PRP	kVA	1447	1446
	kW	1158	1157
Limited Time Power, ESP (Stand-by)	kVA	1590	1589
	kW	1272	1271
Continuous Operation Power, COP (Continuous)	kVA	1117	1116
	kW	894	893
Rated voltage (3ph. line to line)	V	400	480
Rated voltage (1ph. line to neutral)	V	230	277
Rated current 3ph. (PRP)	A	2088	1740
Rated current 3ph. (ESP)	A	2297	1913
Rated current 3ph. (COP)	A	1614	1343
Maximum sound power level (LWA) complies with 2000/14/EC	dB(A)	108,1	110,2
Maximum sound pressure level (LPA) at 7 m	dB(A)	80,1	82,2
Coupling engine/alternator		Direct	
Fuel Autonomy at full load	h	5.9	5.7
Single step load acceptance (within G2, acc. ISO 8528-5:1993)	%	50	65
Single step load capability	%	65	100
Frequency droop (lower than % isochronous)	%	≤0.25	
Maximum oil consumption 100% load	l/h	0.26	0.26

Derating Table (%)

	0ºC	5 ºC	10 ºC	15 ºC	20 ºC	25 ºC	30 ºC	35 ºC	40 ºC	45 ºC	50 ºC
0 m	100	100	100	100	100	100	95	95	95	90	80
500 m	90	90	90	90	90	90	90	90	90	90	80
1000 m	85	85	85	85	85	85	85	85	80	80	80
1500 m	80	80	80	80	80	80	80	80	80	80	80
2000 m	80	80	80	80	80	80	80	80	80	80	80
2500 m	80	80	80	80	80	80	80	80	80	NA	NA
3000 m	75	75	75	75	75	75	75	75	75	NA	NA
3500 m	70	70	70	70	70	70	70	NA	NA	NA	NA
4000 m	70	70	70	70	70	70	70	NA	NA	NA	NA

Limitations*		QAC 1450 TwinPower Sd
Maximum ambient temperature	ºC	50
Altitude capability	m	4000
Relative air humidity maximum	%	85
Minimum starting temperature	ºC	-10
Minimum starting temperature, with coldstart equipment	ºC	-25
Minimum running temperature, with coldstart equipment*	ºC	-10

*** on high humidity regions freezing may occur on the *breather pipes***

Application Data		QAC 1450 TwinPower Sd
Mode of operation		PRP / ESP / COP
Max. Inclination		15 º
Operation		Single / Parallel
Start-up and control mode		Manual / Auto
Climatic exposure		Open air

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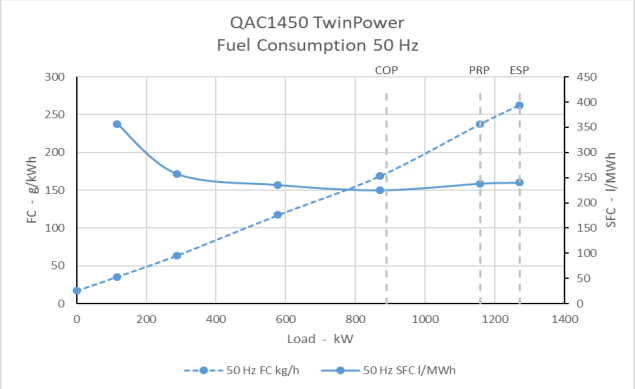
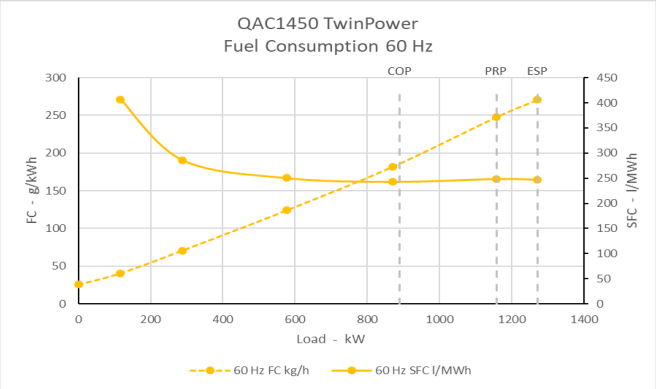
		QAC 1450 TwinPower Sd	
	rpm	1500	1800
Fuel Consumption at*:			
0% Load (Single / Twin)	l/h	10.0 / 20.0	14.9 / 29.8
10% Load (Single / Twin)	l/h	20.7 /41.4	23.6 / 47.2
25% Load (Single / Twin)	l/h	37.1 / 74.2	41.2 / 82.3
50% Load (Single / Twin)	l/h	68.1 / 136.3	72.3 / 144.7
75% Load (Single / Twin)	l/h	98.0 / 196.0	105.7 / 211.4
100% Load (Single / Twin)	l/h	138.0 / 276.0	144.0 / 287.9
110% Load (Single / Twin)	l/h	152.8 / 305.6	157.3 / 314.7
77% Load (COP for QAC1450) (Single / Twin)	l/h	100.8 / 201.6	108.4 / 216.7
Specific Fuel Consumption at:			
0% Load	kg/kWh	NA	NA
10% Load	kg/kWh	0.307	0.350
25% Load	kg/kWh	0.222	0.246
50% Load	kg/kWh	0.203	0.215
75% Load	kg/kWh	0.194	0.209
100% Load	kg/kWh	0.205	0.214
110% Load	kg/kWh	0.207	0.213
77% Load (COP for QAC1450)	kg/kWh	0.195	0.209

Diesel fuel type No. 2 diesel or a fuel corresponding to ASTM D2. Density: 0,86kg/l.





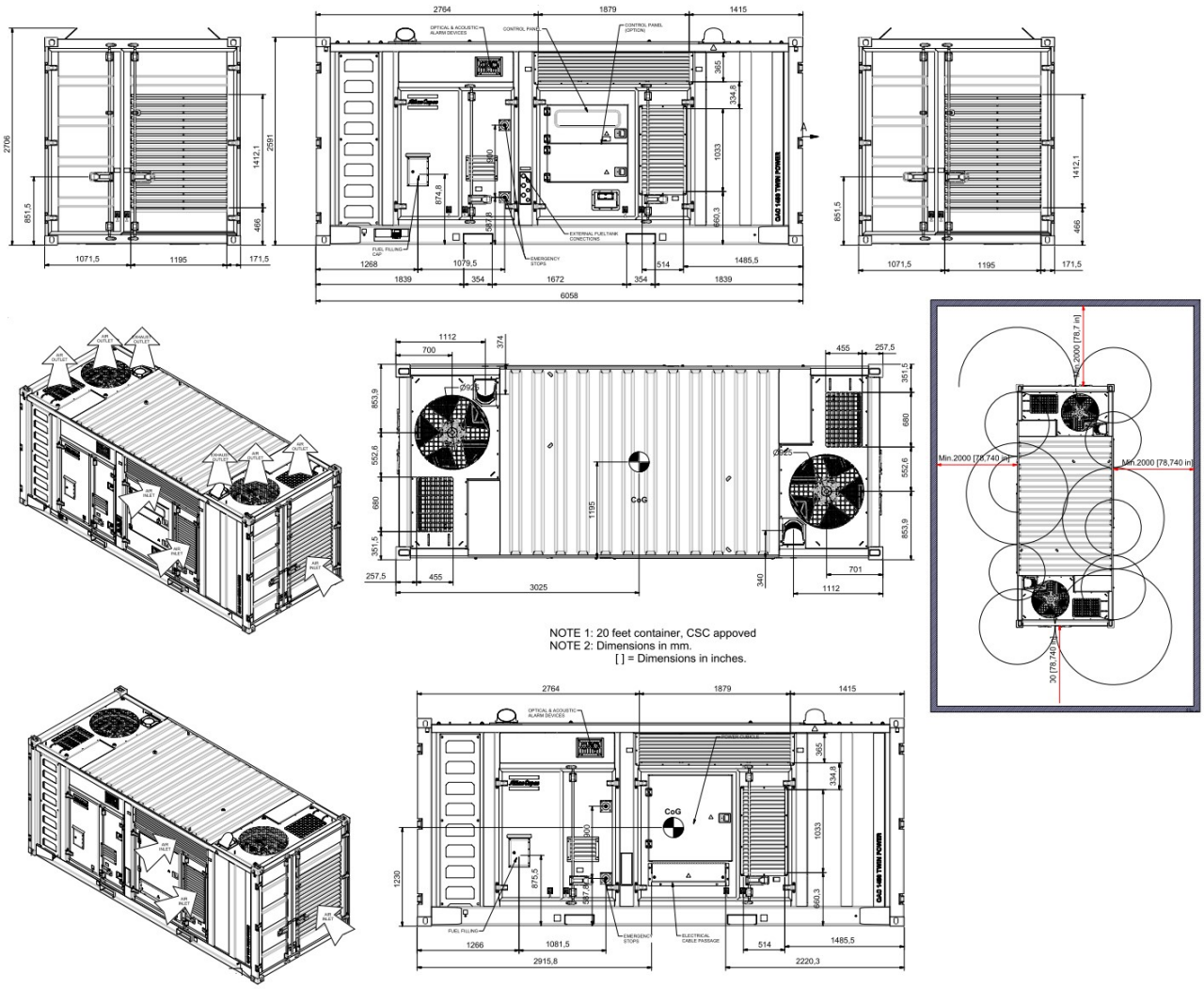
(Reference conditions at 25ºC Air Inlet Temperature, 60% Relative Humidity, 1bar Absolute inlet pressure, for different conditions or limitations contact Atlas Copco technical support).

QAC 1450 TWINPOWER SD ESF

2. Box

Dimensions (L x W x H)	mm	6058 x 2438 x 2591 (ISO 20')
Weight		
Net mass	Kg	14900
Wet mass	Kg	16500
Capacity of spillage free frame	l	1771
Colour specification		
Grey	RAL	7015
Yellow	RAL	1004
Foam silencer		
Thickness	mm	50
Temperature	°C	Min -30 Max 120

Containers metal structure (internal and external) are all treated with a prime process that avoids rust and corrosion and is painted with powder paint.



QAC 1450 TWINPOWER SD ESF

3. Engine

		QAC 1450 TwinPower Sd	
	rpm	1500	1800
General			
Manufacturer		Scania	
Model		DC16 078A	
Standard		ISO 3046 / ISO 8528-2	
Power rated speed	KW	621	620
Number of cylinders	u.	8	
Configuration		8 in V	
Aspiration		Turbocharged	
Speed governor		EMS S8	
Bore	mm	130	
Stroke	mm	154	
Electrical system (DC)	V	24	
Compression ratio		16,7:1	
Displacement (swept volume)	l	16.4	
Piston speed	m/s	7.7	9.24
Combustion system		Direct injection	
Charged air cooling system		Intercooled	
Maximum permissible load factor of PRP during 24h period	%	70	
Lubrication system			
Capacity of oil tank	l	NA	
Lube level Regulator		NA	
Oil pump		NA	
Engine capacity of oil (sump + filters)	l	108	
Capacity of oil sump	l	96	
Oil pressure at rated speed	kPa	3 - 6 Bar	
Maximum Lubrication oil temperature	ºC	90-110	
Oil Filter (Standard)		Atlas Copco	
Oil Filter (By-pass)		Atlas Copco	
Air intake system			
Air consumption 25ºC (PRP)	m³/min	43	45
Air consumption 25ºC (ESP)	m³/min	44	47
Max allowable air intake restriction	kPa	4 (cleaned or new filter) / 6 (blocked-dirty filter)	
Air Filters		Atlas Copco	
Air filter cleaning efficiency	%	99.9	
Cooling system			
Coolant volume engine	l	24	
Coolant temperature	ºC	90-95	
Coolant radiator medium		Water / Glycol 50/50	
Coolant radiator volume	l	36	
Coolant radiator heat rejection	kW	192	
Coolant radiator max. temperature	ºC	110	
Coolant radiator flow rate	l/min	325	
Coolant radiator max. pressure drop	kPa	70	
Air radiator medium		Air	
Air radiator volume	l	28	
Air radiator heat rejection	kW	121	
Air radiator max. temperature	ºC	220	
Air radiator flow rate	kg/s	0,783	
Air radiator max. pressure drop	kPa	20	
Radiator values at PRP (50Hz)			
Fan airflow	m³/h	25000	
Fan power consumption at nominal speed	kW	5,83	
Fan static pressure	Pa	477	

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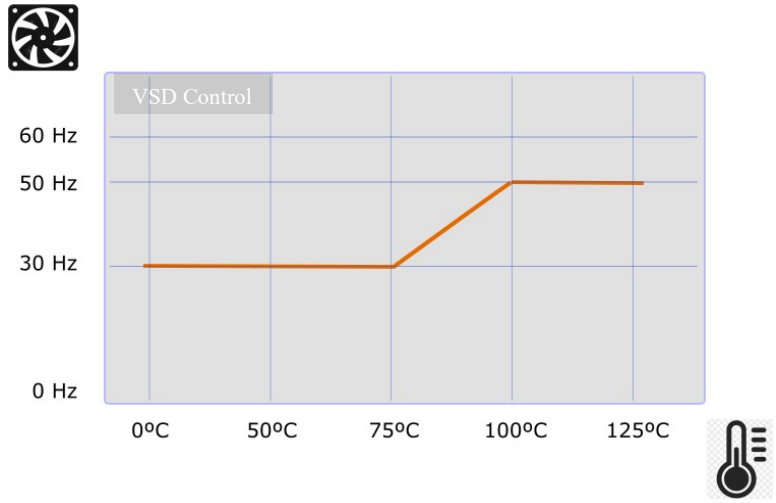
Fan nominal speed	rpm	1800
Fan inside diameter	mm	900
VSD Commander		Schneider ATV320



Fuel system			
Injection system		XPI (Extra high pressure)	
Capacity fuel tank	l	1610	
Fuel tank specifications		Plastic	
Automatic fuel transfer AFT		Standard	
Fuel transfer pump		Calpeda CAM 90/A	
Quick coupling IN		DN20 ISO-B ¾"	
External fuel supply (combined with EFT)		Standard	
Quick couplings IN		2 x DN20 ISO-B ¾"	
Quick couplings OUT		2 x DN13 ISO-B ½"	
Fuel filter			
Micron rate	micro	3	
Maximum fuel flow	l/h	238.8	242.8
Fuel pre-filter		Water Separator	
Micron rate	micro	5	
Design Pressure	bar	1.2	
Test pressure	Bar	1.8	
Temperature	ºC	-25ºC to 120ºC	
Volume	l	10	
Emission compliance		Fuel Optimized	
NOx	g/kWh	14.085	13.935
CO	g/kWh	0.27	0.914
HC	g/kWh	0.062	0.068
PM	g/kWh	0.035	0.036

The EFT (External Fuel Tank) enables the generator to run for long periods of time on an external fuel supply without having to refuel. EFT is not provided by Atlas Copco.

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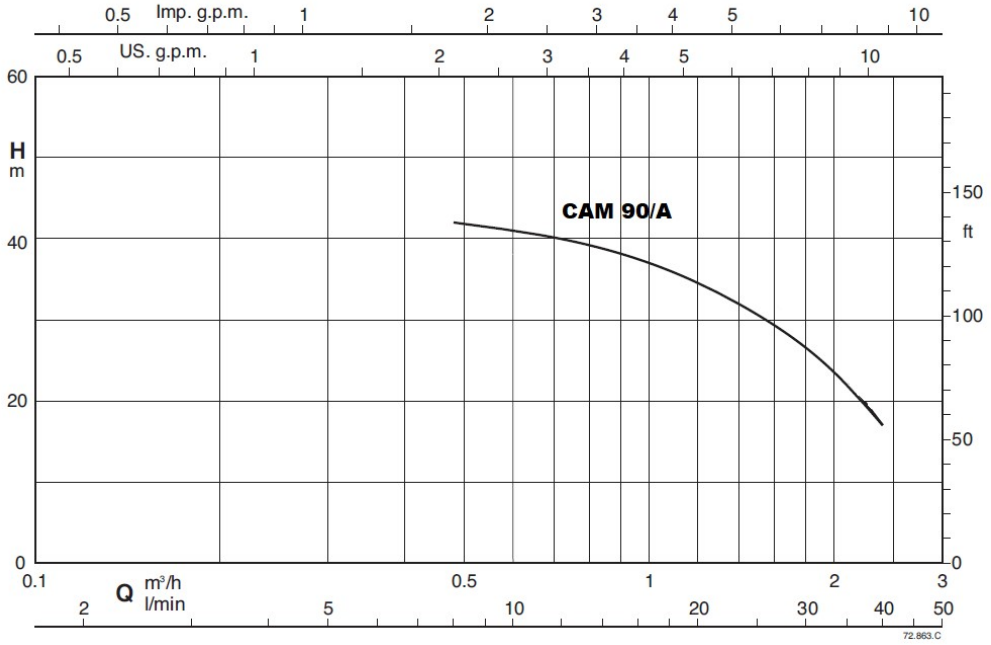
Fuel pump performance

Coverage chart n ≈ 2900 rpm



4. Alternator

		QAC 1450 TwinPower Sd	
	rpm	1500	1800
General			
Manufacturer		Leroy Somer	
Model		LSA 49.3 M8	
Standard		IEC 60034 / NEMAG MG 1.32-33 / ISO 8528-3 / CSA / UL 1446	
Rated net power, 50Hz	kVA	820	1025
Number of wires		6	
Voltage regulator accuracy		+/- 0.5%	
Degree of protection / Insulation class		IP 23 / H	
Environment Protection		System 2 (Humid atmosphere)	
Number of poles		4	
Number phases		3	
Overspeed	rpm	2250	
Air flow	m³/s	1	1.2
Total Harmonic Distortion THD		< 5%	
Waveform: NEMA = TIF		< 50	
Xd Direct axis synchro reactance unsaturated	%	348	362
X'd Direct axis transient reactance saturated	%	16.6	17.3
X"d Direct axis subtransient reactance saturated	%	13.3	13.8
Excitation system		PMG	
Sustained short-circuit current	%	300% (3 x In)	
Time sustained short-circuit current	s	10	
Frame dimensions (single bearing)			
Lmax without PMG	mm	1372	
LB	mm	1346.5	
Xg	mm	636	
Weight	kg	1685	
AVR			

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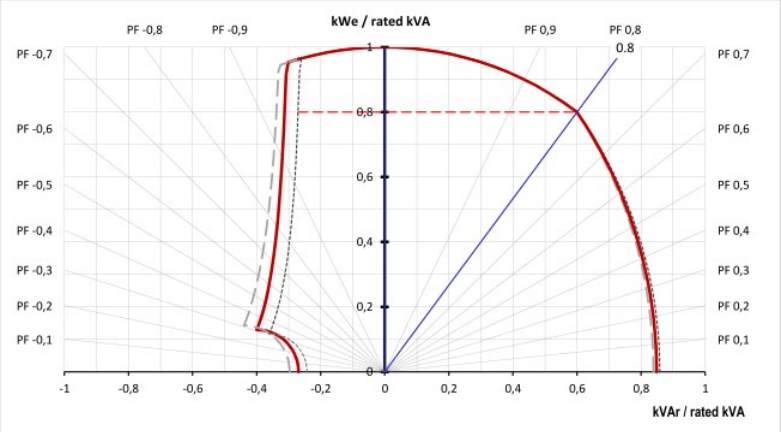
Model		D350
Sensing		3 phase
Range of sensing	V(AC)	0-530
Field excitation rated	A	0-5
Field excitation short-circuit (max.)	A	10
Power supply	V(AC/DC)	50-277 / 50-400
PC Software		EasyReg

Capability Curve

400V – 50Hz

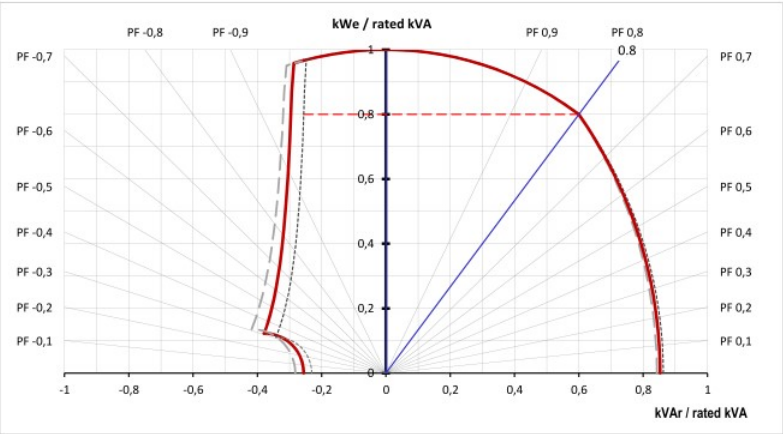
Umax + 5% 420 V
Un **400** V
Umin - 5% 380 V



Capability Curve

480V – 60Hz

Umax + 5% 504 V
Un **480** V
Umin - 5% 456 V

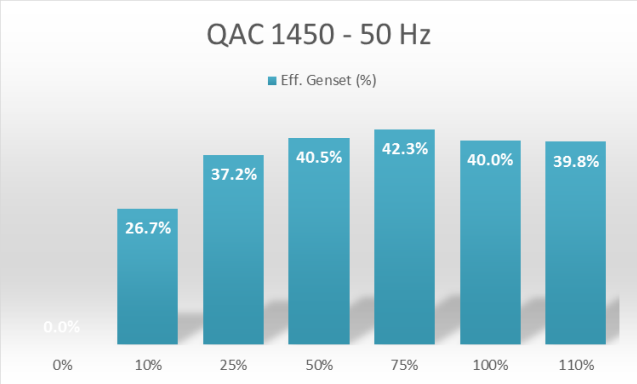


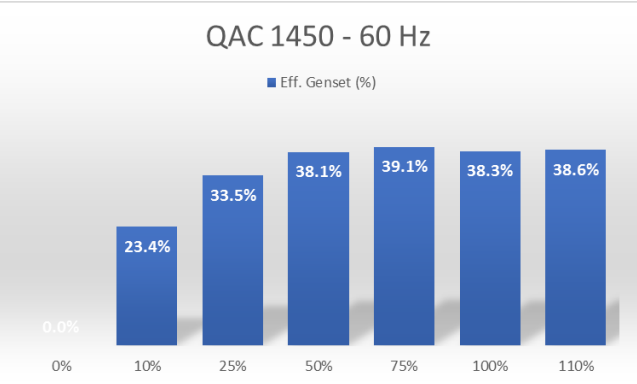
QAC 1450 TWINPOWER SD ESF

5. Generator

		QAC 1450 TwinPower Sd	
	rpm	1500	1800
Energy Balance			
Engine			
Heat rejection to exhaust (PRP)	kW	414	451
Heat rejection to surrounding air (PRP)	kW	56	59
Heat rejection to coolant (PRP)	kW	192	231
Alternator (PF 0,8)			
Efficiency at full load	%	94.60%	

Genset Efficiency





Exhaust System			
Flow (PRP)	Kg/min	45	47
Flow (ESP)	Kg/min	46	49
Exhaust gas temperature "after turbine" (PRP)	ºC	524	541
Exhaust gas temperature "after turbine" (ESP)	ºC	578	557
Max. Backpressure	kPa	2	2,5
Output pipe diameter	mm	203,2	
Battery			
Quantity		4	
Voltage	V	12	
Capacity (one unit)	Ah	50	
Connection		2x Serie / Parallel	
Dimensions (L x W x H)	mm	254 x 175 x 200	
Cold cranking current (one unit)	A	815 (-18ºC) / 1000 (0ºC)	
Time to 90% charge (100A)	min	35	
Time to 90% charge (50A)	min	75	
Time to 90% charge (25A)	min	140	
Sensor			
Oil (temp, pressure & level)		via EMS	
Coolant (temp & level)		via EMS	
Intake manifold (temp)		via EMS	
Fuel (boost pressure)		via EMS	
Charge air (temp & pressure)		Via EMS	
Fuel Level		4-20 mA sensor	
Air Temperature		PT100 sensor	
Coolant (temp) VSD		PT100 sensor	

QAC 1450 TWINPOWER SD ESF

6. Power Output

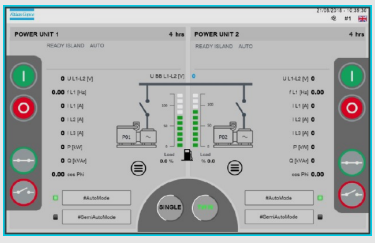
		QAC 1450 TwinPower Sd	
	rpm	1500	1800
Circuit Breaker			
Model		NS1250 (Schneider Electric)	
Poles		4P	
Rated current (In)	A	1250	
Long time protection (Ir)	A	1000 (In x 0.8)	875 (In x 0.7)
Long time protection timer (tr)	s	12	
Short time protection (Isd)	A	4000 (4 x Ir)	3500 (4 x Ir)
Motor Driven DC voltage	V	24	
Breaking capacity (at 440V AC 50/60 Hz)	kA	50	
Rated service breaking cap. (at 440VAC 50/60 Hz)	kA	37	
Mounting mode		Fixed	
Neutral position		Left	
Status of neutral			
TN-S (earthed)		Standard	
Terminal Board			
Type		4 + 4 Strip copper 100x10 mm	
Bolts diameter per strip	mm	4 x 12	

7. Controller

Controller		
Base Box model		2 x Qc4004
Touchscreen / Display model		Qd1001

Qc4004

Qc4004



Qd1001

8. Options

Mechanical Options

		QAC 1450 TwinPower Sd	
	rpm	1500	1800
Special Equipment (Refinery kit)			
Spark arrestor + Exhaust			
Standards & Regulations		DNV GL	
Max. Backpressure	kPa	2	2,5
Inlet shutdown valve			
Model		AMOT XT 4"	
Max charge air pressure	bar	4.0	
Reset		Manual	
Actuator		Electric power to close – 24VDC	
Ambient air temperature	ºC	From -20º To +125º	
Switch type		Valve open, switch closed (failsafe)	

Spark arrestor is a device that is designed to trap any exhaust particles or combustible materials, such as sparks or other flaming debris, from escaping into hazardous areas where they might cause fires. Exhaust particles are centrifuged in the spark arrestor, then collected and stored in a reservoir until emptied by an operator. An inlet shutdown valve serves to stop the engine by closing the air intake once the controller detects an over speed in the engine.

Offshore Container		
Standards & Regulations		EN 12079-1 / DNV 2.7-1
Painting		One colour / Special colour
Oil level maintainer		
Capacity of each oil tank	l	75

Electrical Options

Controller		
Base Box model		2 x Qc4004
Touchscreen / Display model		2 x Qd0301

Earth leakage protection		
Relay model		RH99M (Schneider Electric)
Type		A
Relay power supply	V(DC)	24
Threshold	A	0,03
AVR		
Model		D510C
Sensing		3 phase

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Range of sensing	V(AC)	0-480
Field excitation rated	A	0-6
Field excitation short-circuit (max.)	A	10
Constant power supply	V(DC)	24
PC Software		EasyReg
Fleetlink		
Model		Basic / Advanced
Power supply	V(DC)	24
Coverage		2G (Basic) / 2G-3G (Advanced)
COM Protocol		Modbus Serial (Advanced)