

DATA SHEET

DIESEL GENERATOR 220KW

MODEL#FDK-CG275/H1

50HZ/1500RPM

CUMMINS MODEL: QSL9-G3



General Features:

- ♦ All qualified generator sets are subjected to a comprehensive performance test which includes 50% load, 70% load, 100% load, 110% load and to check, verify that all control systems, alarm and shut-down protection.
- ♦ Equipped with battery charger and 24V high performance maintenance-free lead-acid starting batteries and connecting cables.
- ♦ Stainless galvanized zinc plates with strong corrosion-proof.
- ♦ Vibration isolators between the engine/alternator and base frame.
- ♦ Equipped with industrial silencer and flexible exhaust hose.
- ♦ Designed to comply with ISO8528/GB2820.
- ♦ Powered by Cummins engine and coupled with Stamford alternator.
- ♦ Water jacket preheater, oil heater and double air cleaner, etc. are available.

FDK Diesel Generator Set Data

Genset Model	FDK-CG275/H1	Engine Make	Cummins
Prime Power	200KW/250KVA	Engine Model	QSL9-G3
Standby Power	220KW/275KVA	Alternator model	Stamford UCIDI274K
Output Frequency / Rated speed	50Hz/1500rpm	Control System	DSE7320
Rated Voltage	230V/400V	Phase	Three

(1) **Prime power:** The rating is available for an unlimited of annual operating hours in variable load applications, in accordance with ISO8528-1.A 10% overload is available for a period of 1 hour within 12-hour period of operation, in accordance with ISO 3046-1.

(2) **Standby power:** The rating is applicable for supplying emergency power in variable load applications for up to 200 hours per year in accordance with ISO8528-1. Overload is not allowed.

(3) **Rated voltage:** available with customer requirement.

Engine Specifications (DETAILED in APPENDIX)

Engine Model	QSL9-G3	Bore x Stroke (mm x mm)	114×145
Engine Manufacturer	Cummins (USA)	Displacement	8.8L
Cylinder quantity	6	Compression Ratio	16.8:1
Cylinder Arrangement	In-line	Prime power / Speed (KW/RPM)	227/1500
Cycle	4	Standby power/ Speed (KW/RPM)	257/1500
Aspiration	Turbo-charged	Type Injection System	Bosch HPCR



Piston Speed	7.2m/s
Friction Energy Output	26kw
Total Lubrication System Capacity (L)	26.5
Coolant Capacity (L)	11

Fuel Consumption at 100% load (L/H)	59L at 1500rpm
Starter motor	DC24V
Alternator	DC24V
Low idle	700-900rpm

Alternator Specifications

Alternator model	UCDI274K
Alternator manufacturer	STAMFORD
Exciter type	Single bearing, Brushless, Self-excited
Rated output prime power	250KVA
Rated speed	1500 rpm
Rated frequency	50Hz

Number of phase	3
Rated voltage	400V (Available with custom requirements)
Power factor	0.8
Voltage regulation NL-FL	≤±1%
Insulation grade	H
Protection grade	IP23

Alternator option: Leroy Somer, MECC, Marathon, Engga, Faraday

Control System DSE7320 (DETAILED in INSTRUCTION)

DSE7320 is an advanced control module based on micro-processor, containing all necessary functions for protection of the genset and the breaker control. It can monitor the mains supply, breaker control and automatically start the engine when the mains are abnormal. Accurately measure various operational parameters and display all values and alarms information on the LCD. In addition, the control module can automatically shut down the engine and indicate the engine failure.

FEATURES

- Microprocessor control, with high stability and credibility.
- Monitoring and measuring operational parameters of the mains supply and genset.
- Indicating operation status, fault conditions, all parameters and alarms.
- Multiple protections; multiple parameters display, like pressure, temp. etc.
- Manual, automatic and remote work mode selectable.
- Real time clock for time and date display, overall runtime display, 250 log entries.
- Overall power output display.
- Integral speed/frequency detecting, telling status of start, rated operation, overspeed etc.
- Communication with PC via RS485 OR RS232 interface, using MODBUS protocol.

Soundproof Enclosure Specification

FDK silent generator is designed by professional acoustic engineers based on years of experience. Now we can make the noise of the generator less than 80-85dB(A) at 1m, or 70-75dB(A) at 7m, 60-65dB(A) at 15m.

FEATURES

- Multi-way air intake and exhaust guarantee the power performance of the generator.
- Large-scale impedance combined type silencer effectively reduce noise of the generator.
- Internal high performance rubber damper and flexible materials reduce vibration.
- Base mounted fuel tank supports the generator running for 8 hours.

Optional



ISO9001:2008

FDK reserves the right to change the specifications and designs without notice.

Generator set	Alternator	Low environment Temp	ATS
<input type="checkbox"/> Open generator set <input type="checkbox"/> Silent generator set <input type="checkbox"/> Trailer generator set <input type="checkbox"/> ABB MCCB circuit breaker	<input type="checkbox"/> Stamford <input type="checkbox"/> Marathon <input type="checkbox"/> Mecc Alte <input type="checkbox"/> Leroy Somer <input type="checkbox"/> Farady <input type="checkbox"/> Engga	<input type="checkbox"/> Water heater <input type="checkbox"/> Oil heater <input type="checkbox"/> Battery heater	<input type="checkbox"/> CHINT <input type="checkbox"/> SCHNEIDER <input type="checkbox"/> ABB
Fuel system	Control system	Voltage	Synchronized system
<input type="checkbox"/> 12hrs base tank <input type="checkbox"/> 24hrs base tank <input type="checkbox"/> Dual wall base fuel tank <input type="checkbox"/> Outside fuel tank	<input type="checkbox"/> AMF function <input type="checkbox"/> ATS control cabinet <input type="checkbox"/> DSE7320 <input type="checkbox"/> DSE7510 <input type="checkbox"/> GU620A	<input type="checkbox"/> 415/240V <input type="checkbox"/> 400/230V <input type="checkbox"/> 380/220V <input type="checkbox"/> 220/127V <input type="checkbox"/> 200/115V	<input type="checkbox"/> CHINT Cabinet <input type="checkbox"/> SCHNEIDER Cabinet <input type="checkbox"/> DSE8610 Module <input type="checkbox"/> COMAQ Module <input type="checkbox"/> DEIF Module

Dimension & Weight

Open

Overall Size: L×W×H (mm)	3135×1100×1928
Weight (kg)	2300

Soundproof Version

Overall Size: L×W×H (mm)	3200×1133×1766
Weight (kg)	3094

Sales Promises

- ◆ FDK provides a full line of brand new and high quality products. Each and every unit is strictly factory tested before shipment.
- ◆ Quality warranty is according to our standard conditions: 12 months from BL date or 1000 running hours, whichever comes first.
- ◆ Service and parts are available from FDK or distributors in your location.
- ◆ FDK guarantee use **BRAND NEW & GENUINE MACHINE.**





Cummins Inc.
Columbus, Indiana 47202-3005
Engine Data Sheet

Basic Engine Model:
QSL9-G3 NR3

Curve Number:
FR-91996

G-DRIVE
QSL
1

Engine Critical Parts List:
CPL: 1404

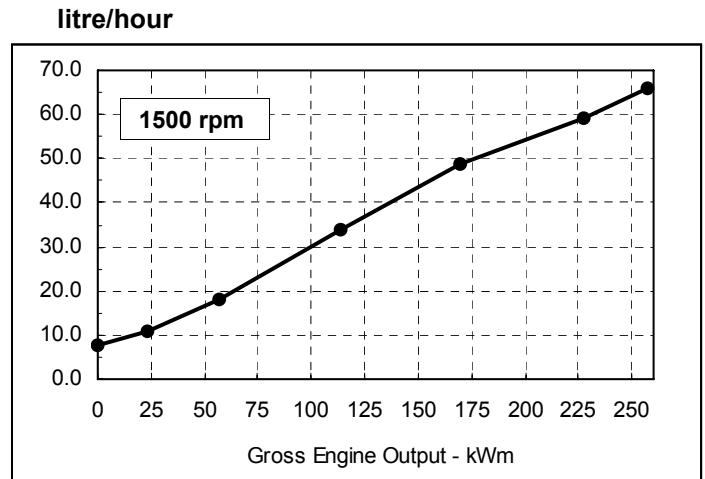
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Displacement : **8.8 litre (543 in³)** Bore : **114 mm (4.49 in.)** Stroke : **145 mm (5.69 in.)**
No. of Cylinders : **6** Aspiration : **Turbocharged and Charge Air Cooled**

Engine Speed rpm	Standby Power		Prime Power		Continuous Power	
	kWm	hp	kWm	hp	kWm	hp
1500	257	345	227	305	193	259
1800	297	399	262	352	178	238

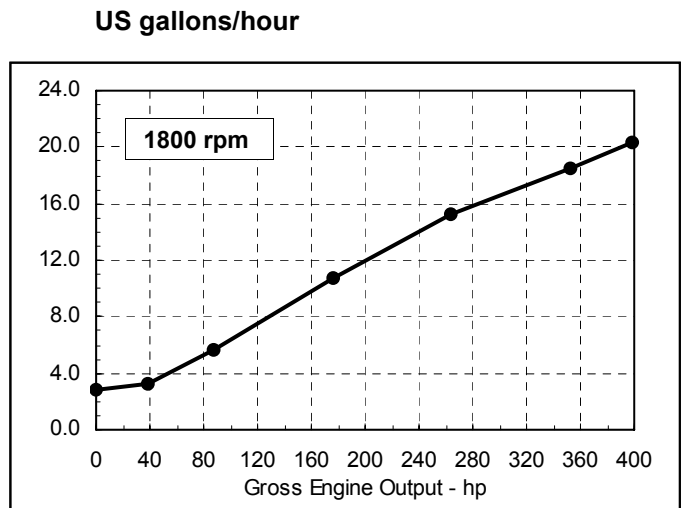
Engine Performance Data @ 1500 rpm

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	hp	kg/ kWm·h	lb/ hp·h	litre/ hour	US gal/ hour
STANDBY POWER						
100	257	345	0.217	0.357	66	17.3
PRIME POWER						
100	227	305	0.221	0.364	59	15.6
75	170	228	0.246	0.405	49	13.0
50	114	152	0.253	0.416	34	8.9
25	57	76	0.264	0.435	18	4.7
CONTINUOUS POWER						
100	193	259	0.234	0.386	53	14.1



Engine Performance Data @ 1800 rpm

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	hp	kg/ kWm·h	lb/ hp·h	litre/ hour	US Gal/ hour
STANDBY POWER						
100	297	399	0.221	0.364	77	20.4
PRIME POWER						
100	262	352	0.226	0.373	70	18.5
75	197	264	0.248	0.409	58	15.2
50	131	176	0.266	0.437	41	10.8
25	66	88	0.274	0.451	21	5.6
CONTINUOUS POWER						
100	178	238	0.256	0.420	53	14.1



CONVERSIONS: (litres = US Gal x 3.785) (US Gal = litres x 0.2642)

These guidelines have been formulated to ensure proper application of generator drive engines in A.C. generator set installations. **STANDBY POWER RATING:** Applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. Under no condition is an engine allowed to operate in parallel with the public utility at the Standby Power rating. This rating should be applied where reliable utility power is available. A Standby rated engine should be sized for a maximum of an 80% average load factor and 200 hours of operation per year. This includes less than 25 hours per year at the Standby Power rating. Standby ratings should never be applied except in true emergency power outages. Negotiated power outages contracted with a utility company are not considered an emergency. **PRIME POWER RATING:** Applicable for supplying electric power in lieu of commercially purchased power. Prime Power applications must be in the form of one of the following two categories: **UNLIMITED TIME RUNNING PRIME POWER:** Prime Power is available for an unlimited number of hours per year in a variable load application. Variable load should not exceed a 70% average of the Prime Power rating during any operating period of 250 hours. The total operating time at 100% Prime Power shall not exceed 500 hours per year. A 10% overload capability is available for a period of 1 hour within a 12-hour period of operation. Total operating time at the 10% overload power shall not exceed 25 hours per year. **LIMITED TIME RUNNING PRIME POWER:** Limited Time Prime Power is available for a limited number of hours in a non-variable load application. It is intended for use in situations where power outages are contracted, such as in utility power curtailment. Engines may be operated in parallel to the public utility up to 750 hours per year at power levels never to exceed the Prime Power rating. The customer should be aware, however, that the life of any engine will be reduced by this constant high load operation. Any operation exceeding 750 hours per year at the Prime Power rating should use the Continuous Power rating. **CONTINUOUS POWER RATING:** Applicable for supplying utility power at a constant 100% load for an unlimited number of hours per year. No overload capability is available for this rating.

Data Subject to Change Without Notice

Reference AEB 10.47 for determining Electrical Output.

Data shown above represent gross engine performance capabilities obtained and corrected in accordance with ISO-3046 conditions of 100 kPa (29.53 in Hg) barometric pressure [110 m (361 ft) altitude], 25 °C (77 °F) air inlet temperature, and relative humidity of 30% with No. 2 diesel or a fuel corresponding to ASTM D2. Derates shown are based on 10 in H₂O air intake restriction and 2 in Hg exhaust back pressure.

The fuel consumption data is based on No. 2 diesel fuel weight at 0.85 kg/litre (7.1 lbs/US gal). 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, optional equipment and driven components.

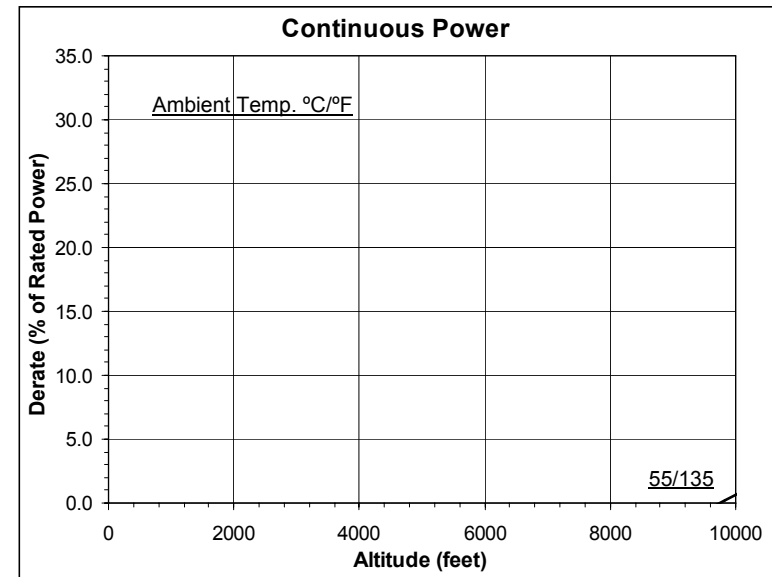
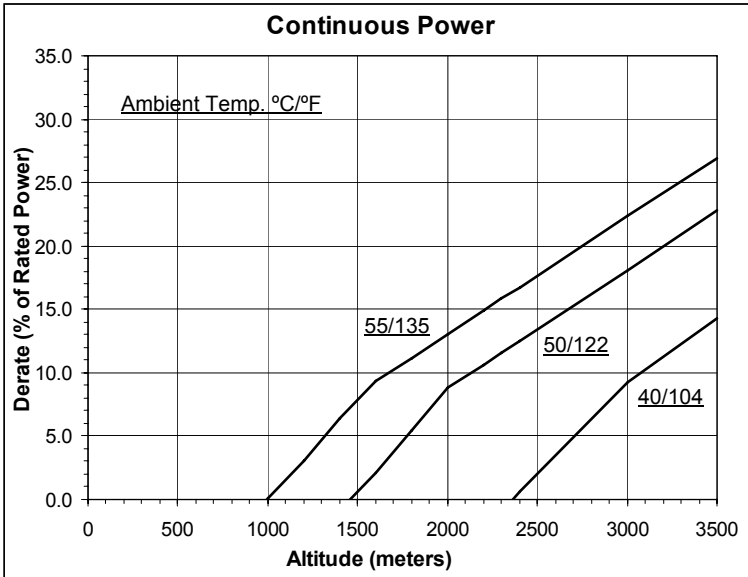
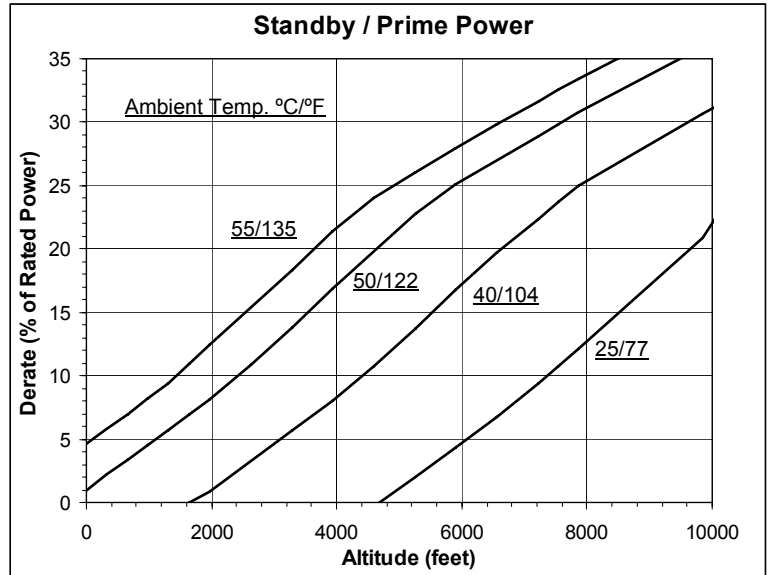
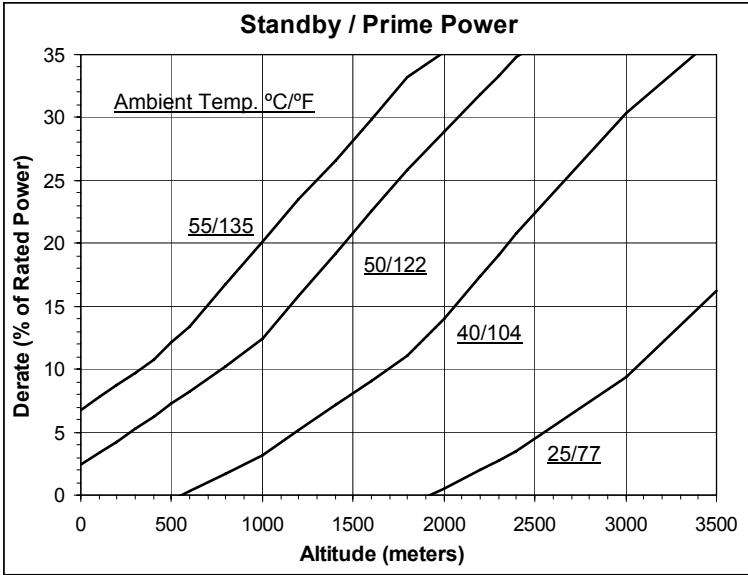
Data Status: --Limited Production--

Data Tolerance: ± 5%

Chief Engineer:

1500 rpm Derate Curves

1800 rpm Derate Curves



Operation At Elevated Temperature And Altitude:

For **Standby/Prime Operation** above these conditions, derate by an additional 4.1% per 300 m (1000 ft), and 15% per 10 °C (18 °F).
 For **Continuous Operation** above these conditions, derate by an additional 4.8% per 300 m (1000 ft), and 15% per 10 °C (18 °F).

Operation At Elevated Temperature And Altitude:

For **Standby/Prime Operation** above these conditions, derate by an additional 7.5% per 300 m (1000 ft), and 9% per 10 °C (18 °F).
 For **Continuous Operation** above these conditions, derate by an additional 7.2% per 300 m (1000 ft), and 9% per 10 °C (18 °F).

Cummins Inc.

Engine Data Sheet

ENGINE MODEL : **QSL9-G3 NR3** CONFIGURATION NUMBER : D563007GX03

DATA SHEET : DS1404
 DATE : 16Apr07

PERFORMANCE CURVE : FR-91996

INSTALLATION DIAGRAM

• Fan to Flywheel: 4953752

CPL NUMBER

• Engine Critical Parts List: 1404

GENERAL ENGINE DATA

Type	4-Cycle; In-line; 6-Cylinder Diesel
Aspiration	Turbocharged and Charge Air Cooled
Bore x Stroke	4.49 x 5.69 (114 x 145)
Displacement	543 (8.8)
Compression Ratio	17.8 : 1
Dry Weight (Approximate), Fan to Flywheel Engine	— lb (kg) 1575 (714)
Wet Weight (Approximate), Fan to Flywheel Engine	— lb (kg) 1627 (738)
Moment of Inertia of Rotating Components	
• with FW 9878 Flywheel	— lb _m • ft ² (kg • m ²) 42.50 (1.79)
• with FW 9525 Flywheel	— lb _m • ft ² (kg • m ²) 58.66 (2.47)
Center of Gravity from Rear Face of Block	— in (mm) 16.89 (429)
Center of Gravity Above Crankshaft Centerline	— in (mm) 8.35 (212)
Maximum Static Loading at Rear Main Bearing	— lb (kg) N.A. N.A.

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block	— lb • ft (N • m) 1000 (1356)
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EXHAUST SYSTEM

Maximum Back Pressure	— in Hg (kPa) 3 (10.2)
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AIR INDUCTION SYSTEM

Maximum Intake Air Restriction	
• with Dirty Filter Element	— in H ₂ O (kPa) 25 (6.2)
• with Clean Filter Element	— in H ₂ O (kPa) 15 (3.7)

COOLING SYSTEM

Jacket Water Circuit Requirements

Coolant Capacity — Engine Only	— US gal (litre) 2.9 (11)
Maximum Static Head of Coolant Above Engine Crank Centerline	— ft (m) 60 (18.3)
Standard Thermostat (Modulating) Range	— °F (°C) 180-199 (82-93)
Minimum Pressure Cap	— psi (kPa) 15 (103)
Maximum Top Tank Temperature for Standby / Prime Power	— °F (°C) 230/219 (110/104)
Maximum Coolant Friction Head External to Engine — 1800 rpm	— psi (kPa) 5 (35)
— 1500 rpm	— psi (kPa) 4 (28)

Air to Air Core Requirements

Maximum Temp. Rise Between Engine Air Intake and Intake Manifold	— °F (°C) 45 (25)
Maximum Air Pressure Drop from Turbo Air outlet to Intake Manifold — 1800 rpm	— in Hg (kPa) 4 (13.6)
— 1500 rpm	— in Hg (kPa) 2.5 (8.5)
Maximum Intake Manifold Temperature @ 77°F (25 °C) ambient	— °F (°C) 122 (50)
Maximum Intake Manifold Temperature for engine protection (Warning Threshold)	— °F (°C) 200 (93)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed	— psi (kPa) 15 (103)
@ Governed Speed	— psi (kPa) 40-60 (276-414)
Maximum Oil Temperature	— °F (°C) 250 (121)
Oil Capacity with OP 9451 Oil Pan : High - Low	— US gal (litre) 6.3-5.3 (24-20)
Total System Capacity (Including Combo Filter)	— US gal (litre) 7 (26.5)

FUEL SYSTEM

Type Injection System.....	Bosch HPCR	
Maximum Restriction at Lift Pump	6	(20.3)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head)	10	(33.9)
Maximum Fuel Flow to Injector Pump	22	(83)
Maximum Return Fuel Flow	19	(72)
Maximum Fuel Inlet Temperature	160	(70)

ELECTRICAL SYSTEM

Cranking Motor (Heavy Duty, Positive Engagement)	12	24
Battery Charging System, Negative Ground	100	70
Maximum Allowable Resistance of Cranking Circuit	0.001	0.002
Minimum Recommended Battery Capacity		
• Cold Soak @ 0 °F to 32 °F (-18 °C to 0 °C)	1500	(750)

COLD START CAPABILITY

Minimum Ambient Temperature for NFPA 110 Cold Start (90 degrees F Coolant Temperature)	40	(4)
Minimum Ambient Temperature for Unaided Cold Start	10	(-12)

PERFORMANCE DATA

- All data is based on:
- Engine operating with fuel system, water pump, lubricating oil pump, air cleaner and exhaust silencer; not included are battery charging alternator, fan, and optional driven components.
 - Engine operating with fuel corresponding to grade No. 2-D per ASTM D975.
 - ISO 3046, Part 1, Standard Reference Conditions of:

Barometric Pressure : 100 kPa (29.53 in Hg)	Air Temperature : 25 °C (77 °F)
Altitude : 110 m (361 ft)	Relative Humidity : 30%

Steady State Stability Band at Any Constant Load	— %	+/-0.25
Estimated Free Field Sound Pressure Level of a Typical Generator Set;		
Excludes Exhaust Noise; at Rated Load and 7.5 m (24.6 ft); 1800 rpm	— dBA	118.8
Exhaust Noise at 1 m Horizontal from Centerline of Exhaust Pipe Outlet Upwards at 45 °; 1800 rpm.....	— dBA	119.5

Governed Engine Speed	rpm
Engine Idle Speed	rpm
Gross Engine Power Output.....	hp (kW _m)
Brake Mean Effective Pressure.....	psi (kPa)
Piston Speed	ft/min (m/s)
Friction Horsepower	HP (kW _m)
Engine Water Flow at Stated Friction Head External to Engine:	
• 2.5 psi Friction Head.....	US gpm (litre/s)
• Maximum Friction Head	US gpm (litre/s)

	STANDBY		PRIME POWER	
	60 hz	50 hz	60 hz	50 hz
	1800	1500	1800	1500
	700 - 900	700 - 900	700 - 900	700 - 900
Governed Engine Speed	399 (298)	345 (257)	352 (262)	305 (227)
Engine Idle Speed	700 - 900	700 - 900	700 - 900	700 - 900
Gross Engine Power Output.....	325 (2241)	338 (2330)	287 (1979)	297 (2048)
Brake Mean Effective Pressure.....	1707 (8.7)	1422 (7.2)	1707 (8.7)	1422 (7.2)
Piston Speed	47 (35)	35 (26)	47 (35)	35 (26)
Friction Horsepower	64 (4.0)	52 (3.3)	64 (4.0)	52 (3.3)
Engine Water Flow at Stated Friction Head External to Engine:				
• 2.5 psi Friction Head.....	60 (3.8)	47 (3.0)	60 (3.8)	47 (3.0)
• Maximum Friction Head				
Intake Air Flow	785 (370)	660 (315)	770 (365)	655 (310)
Exhaust Gas Temperature	1105 (595)	1080 (585)	1035 (560)	995 (535)
Exhaust Gas Flow	2165 (1020)	1800 (850)	2040 (965)	1685 (795)
Air to Fuel Ratio.....	23 : 1	23 : 1	25 : 1	25 : 1
Radiated Heat to Ambient	1160 (25)	1090 (20)	1145 (25)	960 (20)
Heat Rejection to Jacket Coolant.....	6940 (125)	6030 (110)	6310 (115)	5535 (100)
Heat Rejection to Exhaust	16015 (285)	13150 (235)	14510 (255)	11735 (210)
Heat Rejected to Fuel	65 (1.1)	65 (1.1)	65 (1.1)	65 (1.1)
Heat Rejected to Aftercooler.....	3600 (65)	3005 (55)	3430 (65)	2925 (55)
Charge Air Flow.....	56 (26)	47 (22)	55 (25)	46 (22)
Turbocharger Compressor Outlet Pressure	65 (220)	64 (217)	63 (213)	61 (207)
Turbocharger Compressor Outlet Temperature.....	374 (190)	368 (187)	364 (184)	357 (181)

N.A. - Not Available
N/A - Not Applicable to this Engine
TBD - To Be Determined

ENGINE MODEL : QSL9-G3 NR3
DATA SHEET : DS-1404
DATE : 16Apr07
CURVE NO. : FR-91996