

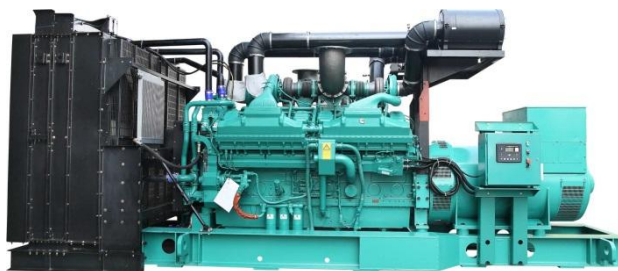
DATA SHEET

DIESEL GENERATOR 800KW

MODEL#FDK-CG1000/H2

60HZ/1800RPM

CUMMINS MODEL: QSK23-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-CG820/H2
Prime Power	727KW/909KVA
Standby Power	800KW/1000KVA
Output Frequency / Rated speed	60Hz/1800rpm
Rated Voltage	277V/480V

Engine Make	Cummins Original
Engine Model	QSK23-G3
Alternator model	Stamford HCI634G
Control System	DSE7320
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	QSK23-G3
Engine Manufacturer	Cummins ORIGINAL
Cylinder quantity	6
Cylinder Arrangement	In-line
Cycle	4

Aspiration	Turbo-charged
Bore x Stroke (mm x mm)	170×170
Displacement	23.15L
Compression Ratio	16.0:1
Prime power / Speed (KW/RPM)	809kw/1800
Standby power/ Speed (KW/RPM)	895kw/1800



ISO9001:2008

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

Type Injection System	Cummins HPI-PT	Fuel Consumption at 100% load (g/KWh)	199 at 1800rpm
Piston Speed	10.3m/s	Starter motor	24V
Friction Energy Output	93kw	Low idle	750pm
Total Lubrication System Capacity (L)	103	Coolant Capacity (L)	46.5

Alternator Specifications

Alternator model	HCI634G	Number of phase	3
Alternator manufacturer	STAMFORD	Rated voltage	480V (Available with custom requirements)
Exciter type	Single bearing, Brushless, Self-excited	Power factor	0.8
Rated output prime power	1000KVA	Voltage regulation NL-FL	±1%
Rated speed	1800 rpm	Insulation grade	H
Rated frequency	60Hz	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.



ISO9001:2008

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

Optional

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)	3800×1818×2350
Weight (kg)	7000


Soundproof Version

Overall Size: L×W×H (mm)	5800×2000×2550
Weight (kg)	9300

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 47201 Engine Data Sheet	Basic Engine Model: QSK23-G3	Curve Number: FR-50011	G-DRIVE QSK 1
		Engine Critical Parts List: CPL: 8352	Date: 16Jan06	

Displacement : 23.15 litre (1413 in³)	Bore : 170 mm (6.69 in.) Stroke : 170 mm (6.69 in.)
No. of Cylinders : 6	Aspiration : Turbocharged and Air to Air Aftercooled

Engine Speed	Standby Power		Prime Power		Continuous Power	
	kWm	BHP	kWm	BHP	kWm	BHP
1500	768	1030	701	940	537	720
1800	895	1200	809	1085	652	875

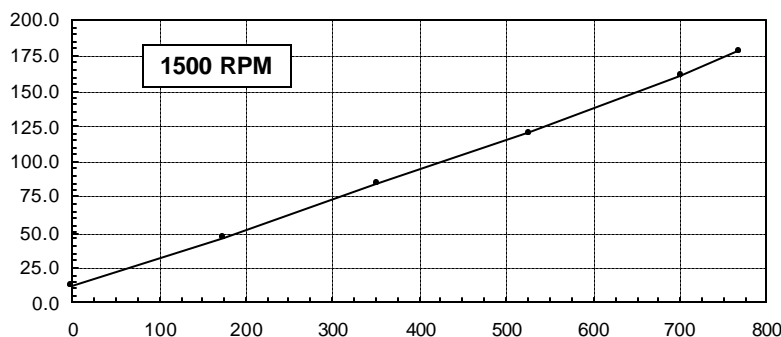
Emissions Certification (1800 RPM Only)

"For mobile applications in the U.S. and Canada, this rating may only be sold in accordance with the OEM TPEM provisions of 40 CFR 89.102. For stationary applications in the U.S. (except California), this rating may be sold through 2006 under the NSPS provisions of 40 CFR Part 60."

Engine Performance Data @ 1500 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm-h	lb/ BHP-h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	768	1030	0.197	0.323	178	46.9
PRIME POWER						
100	701	940	0.195	0.321	161	42.5
75	526	705	0.196	0.322	121	32.0
50	351	470	0.206	0.338	85	22.4
25	175	235	0.223	0.370	46	12.2
CONTINUOUS POWER						
100	537	720	0.198	0.326	125	33.1

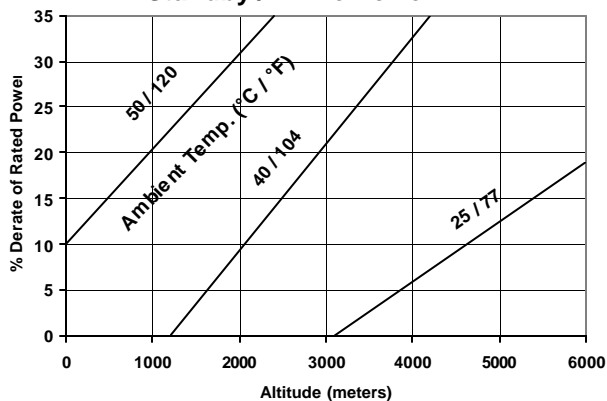
Litre/hour



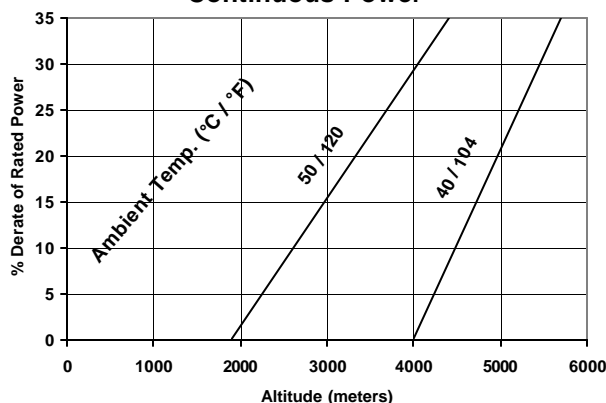
Gross Engine Output - kWm

Power Derate Curves @ 1500 RPM

Standby / Prime Power



Continuous Power




Operation At Elevated Temperature And Altitude:

For sustained operation above these conditions, derate by an additional 3.4% per 300 m (1000 ft), and 20% per 10° C (18° F).

CONVERSIONS:(litres = U.S. Gal x 3.785) (U.S. Gal = litres x 0.2642)

Data Subject to Change Without Notice

<p>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.</p>	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 15 in H ₂ O 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/U.S. 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: <i>D.K. Trueblood</i>

	Cummins Inc. Columbus, Indiana 47201 Engine Data Sheet	Basic Engine Model: QSK23-G3	Curve Number: FR-50011	<i>G-DRIVE</i> QSK 2
		Engine Critical Parts List: CPL: 8352	Date: 16Jan06	
Displacement : 23.15 litre (1413 in³)		Bore : 170 mm (6.69 in.) Stroke : 170 mm (6.69 in.)		
No. of Cylinders : 6		Aspiration : Turbocharged and Air to Air Aftercooled		

Engine Speed RPM	Standby Power		Prime Power		Continuous Power	
	kWm	BHP	kWm	BHP	kWm	BHP
1500	768	1030	701	940	537	720
1800	895	1200	809	1085	652	875

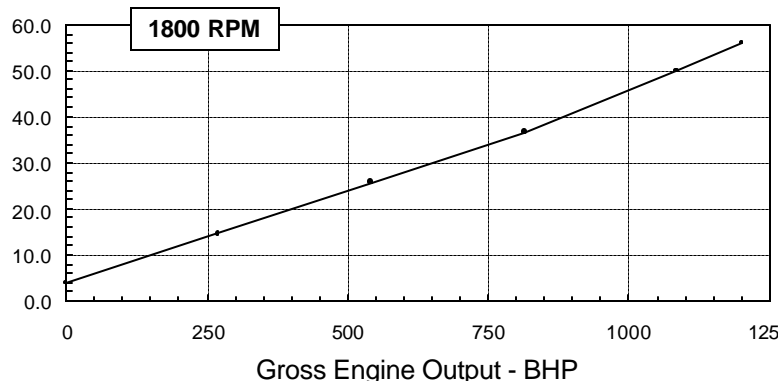
Emissions Certification (1800 RPM Only)

"For mobile applications in the U.S. and Canada, this rating may only be sold in accordance with the OEM TPEM provisions of 40 CFR 89.102. For stationary applications in the U.S. (except California), this rating may be sold through 2006 under the NSPS provisions of 40 CFR Part 60."

Engine Performance Data @ 1800 RPM

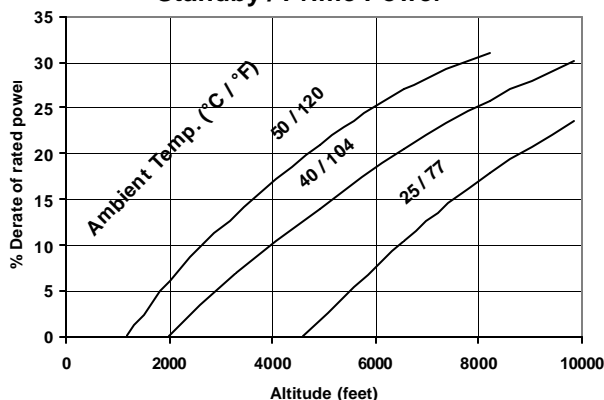
OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	895	1200	0.201	0.332	212	56.1
PRIME POWER						
100	809	1085	0.199	0.326	189	49.8
75	607	814	0.195	0.320	139	36.7
50	405	543	0.204	0.336	97	25.7
25	202	271	0.236	0.385	56	14.7
CONTINUOUS POWER						
100	653	875	0.194	0.320	149	39.4

U.S. Gallons / hour

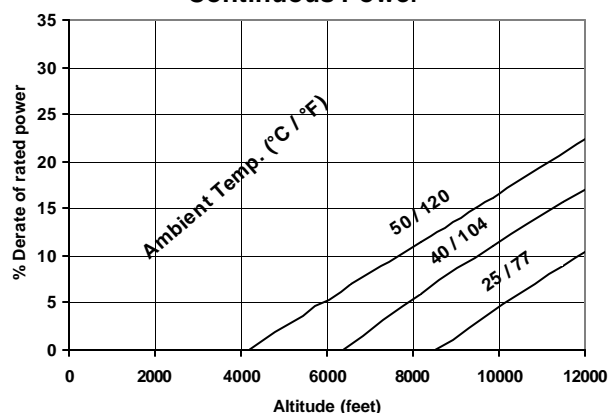


Power Derate Curves @ 1800 RPM

Standby / Prime Power



Continuous Power




Operation At Elevated Temperature And Altitude:

For sustained operation above these conditions, derate by an additional 5.0% per 300 m (1000 ft), and 7% per 10° C (18° F).

CONVERSIONS:(litres = U.S. Gal x 3.785) (U.S. Gal = litres x 0.2642)

Data Subject to Change Without Notice

<p>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.</p>	<p>Reference AEB 10.47 for determining Electrical Output.</p> <p>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 15 in H₂O air intake restriction and 2 in Hg exhaust back pressure.</p> <p>The fuel consumption data is based on No. 2 diesel fuel weight at 0.85 kg/litre (7.1 lbs/U.S. 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.</p>
	Data Status: Limited Production
	Data Tolerance: ± 5%
	Chief Engineer: 

(19 - 27)

FUEL SYSTEM

Type Injection System	Cummins HPI-PT
Maximum Restriction at Fuel Injection Pump — with Clean Fuel Filter	120 (4.0)
— with Dirty Fuel Filter	203 (8.0)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head)	229 (9.0)
Maximum Inlet Temperature	70 (160)
Maximum Fuel Flow to Injection Pump	684 (181)
Maximum Drain Flow	662 (175)

ELECTRICAL SYSTEM

Cranking Motor (Heavy Duty, Positive Engagement)	24
Battery Charging System, Negative Ground	35
Maximum Allowable Resistance of Cranking Circuit	0.002
Minimum Recommended Battery Capacity	
• Cold Soak @ 10 °C (50 °F) and Above	1200
• Cold Soak @ 0 °C to 10 °C (32 °F to 50 °F)	1280
• Cold Soak @ -18 °C to 0 °C (0 °F to 32 °F)	1800

COLD START CAPABILITY

Minimum Ambient Temperature for Cold Start with 1500 watt Coolant Heater to Rated Speed	-30 (-22)
Minimum Ambient Temperature for Unaided Cold Start to Idle Speed	0 (32)
Minimum Ambient Temperature for NFPA 110 Cold Start (90° F Minimum Coolant Temperature)	10 (50)

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%
Air Intake Restriction : 381 mm H ₂ O (15 in H ₂ O)	Exhaust Restriction : 51 mm Hg (2 in Hg)

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); @ 1500 rpm..... — dBA TBD

Exhaust Noise at 1 m Horizontally from Centerline of Exhaust Pipe Outlet Upwards at 45°..... — dBA TBD

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

Engine Data

Intake Air Flow — litre / s (cfm)
 Exhaust Gas Temperature — °C (°F)
 Exhaust Gas Flow — litre / s (cfm)
 Air-to-Fuel Ratio — air : fuel
 Radiated Heat to Ambient — kW_m (BTU / min)
 Heat Rejection to Jacket Water Coolant..... — kW_m (BTU / min)
 Heat Rejection to Exhaust..... — kW_m (BTU / min)
 Heat Rejection to Fuel*..... — kW_m (BTU / min)
 Charge Air Cooler Heat Rejection..... — kW_m (BTU / min)
 Turbo Compressor Outlet Temperature — °C (°F)
 Turbo Compressor Outlet Pressure — kPa (psi)

STANDBY POWER		PRIME POWER	
60 hz	50 hz	60 hz	50 hz
1800	1500	1800	1500
750	750	750	750
895 (1200)	768 (1030)	809 (1085)	701 (940)
2600 (377)	2675 (388)	2350 (341)	2441 (354)
10.3 (2010)	8.6 (1675)	10.3 (2010)	8.6 (1675)
93 (124)	72 (96)	93 (124)	72 (96)
10.4 (165)	7.6 (120)	10.4 (165)	7.9 (126)
10.1 (160)	7.6 (120)	10.1 (160)	7.6 (120)
1132 (2398)	888 (1882)	1094 (2318)	815 (1720)
514 (957)	543 (1010)	467 (872)	532 (990)
3056 (6475)	2463 (5218)	2773 (5875)	2259 (4786)
25.5 : 1	23.8 : 1	27.6 : 1	25.3 : 1
85 (4862)	71 (4058)	76 (4313)	65 (3682)
269 (15305)	222 (12636)	235 (13358)	215 (12252)
656 (37334)	570 (32417)	569 (32392)	507 (28877)
9.1 (520)	6.8 (387)	9.1 (520)	6.8 (387)
223 (12673)	146 (8329)	198 (11270)	122 (6944)
227 (440)	199 (390)	209 (408)	182 (360)
283 (41)	248 (36)	269 (39)	214 (31)

* This is the maximum heat rejection to fuel, which is at low load **N.A.** - Not Available

N/A - Not Applicable to this Engine

TBD - To Be Determined

ENGINE MODEL : QSK23-G3

DATA SHEET : DS-50011-LP

DATE : 16Jan06

CURVE NO. : FR-50011