

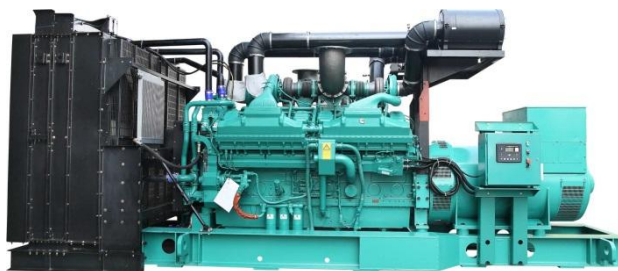
# DATA SHEET

DIESEL GENERATOR 2000KW

MODEL#FDK-CG2500/H1

50HZ/1500RPM

CUMMINS MODEL: QSK60-G21



## 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-CG2500/H1	Engine Make	Cummins ONAN UK
Prime Power	1800KW/2250KVA	Engine Model	QSK60-G21
Standby Power	2000KW/2500KVA	Alternator model	Stamford PI734H
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	QSK60-G21	Aspiration	Turbo-charged
Engine Manufacturer	Cummins ORIGINAL UK	Bore x Stroke (mm x mm)	159×190
Cylinder quantity	16	Displacement	60.2L
Cylinder Arrangement	60° Vee	Compression Ratio	14.5:1
Cycle	4	Prime power / Speed (KW/RPM)	1936kw/1500
		Standby power/ Speed (KW/RPM)	2164kw/1500



ISO9001:2008

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

Type Injection System	Cummins MCRS	Fuel Consumption at 100% load (L/H)	455L at 1500rpm
Piston Speed	9.5m/s	Starter motor	DC24V
Friction Energy Output	146kw	Low idle	700-900pm
Total Lubrication System Capacity	280L	Coolant Capacity (L)	159

**Alternator Specifications**

Alternator model	PI734H	Number of phase	3
Alternator manufacturer	STAMFORD	Rated voltage	400V (Available with custom requirements)
Exciter type	Single bearing, Brushless, Self-excited	Power factor	0.8
Rated output prime power	2325 KVA	Voltage regulation NL-FL	≤±1%
Rated speed	1500 rpm	Insulation grade	H
Rated frequency	50Hz	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.



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## 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)	5900×2100×2750
Weight (kg)	16000


### Soundproof Version

Overall Size: L×W×H (mm)	40FT CONTAINER
Weight (kg)	29000

## 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.**

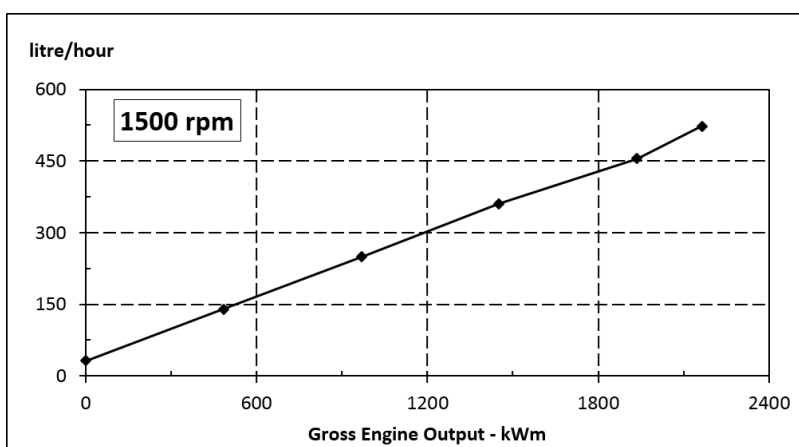


	<b>Cummins Inc.</b>  Columbus, Indiana 47202-3005	Basic Engine Model: <b>QSK60-G21</b>	Curve Number: <b>FR60297</b>	<i>G-DRIVE</i> <b>QSK</b> <b>1</b>
	<b>ENGINE PERFORMANCE DATASHEET</b>	Engine Critical Parts List: <b>CPL : 3582</b>	Date: <b>21 OCT 14</b>	
Compression Ratio : <b>14.5 : 1</b>		Displacement : <b>60.2 litre (3,673 in³)</b>		
Fuel System : <b>Cummins MCERS</b>		Aspiration : <b>Turbocharged and Aftercooled</b>		
Certification : <b>US EPA Tier 2</b>				

Engine Speed	Standby Power		Prime Power		Continuous Power	
rpm	kWm	bhp	kWm	bhp	kWm	bhp
<b>1500</b>	2,164	2,901	1,936	2,595	N.A.	N.A.

## Engine Performance Data @ 1500 rpm

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	bhp	kg/ kWm·h	lb/ bhp·h	litre/ hour	US gal/ hour
<b>STANDBY POWER</b>						
100	2,164	2,901	0.206	0.338	523	138.1
<b>PRIME POWER</b>						
100	1,936	2,595	0.200	0.329	455	120.1
75	1,452	1,946	0.211	0.348	361	95.3
50	968	1,298	0.218	0.359	249	65.6
25	484	649	0.246	0.405	140	37.0
<b>CONTINUOUS POWER</b>						
100	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.



### 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.

### 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 15 in H<sub>2</sub>O air intake restriction and 4 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.

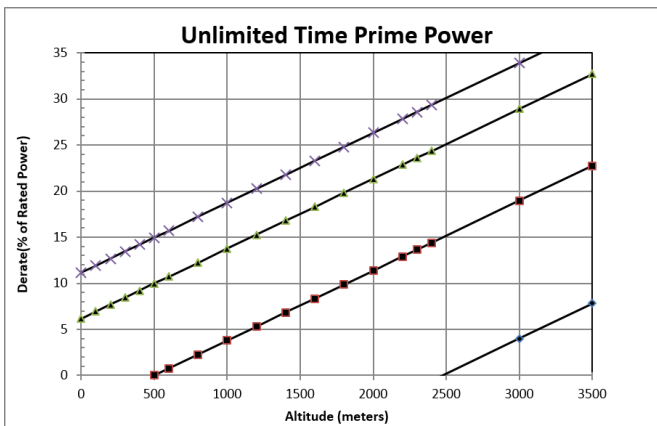
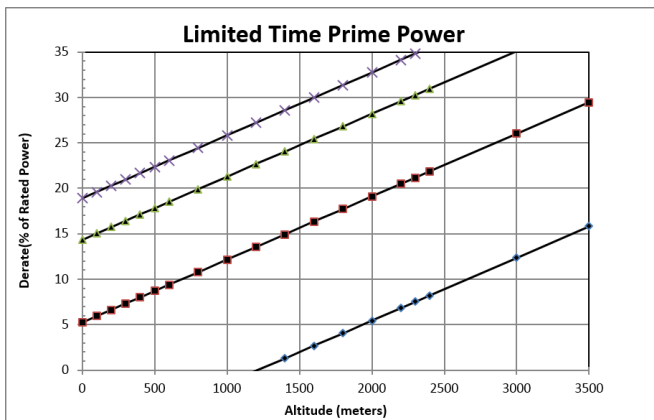
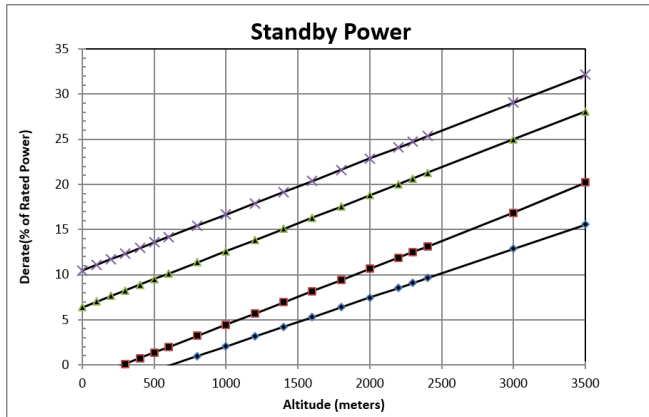
Data Status: Limited Production

Data Tolerance: ± 5%

Chief Engineer:



## 1500 RPM Power Derate Curves

**Operation At Elevated Temperature And Altitude:**

For **Standby Operation** above these conditions, derate by an additional 2% per 1,000 ft (305 m), and 8% per 18 delta deg F (10 delta deg C).

For **Limited Time Prime Operation** above these conditions, derate by an additional 2% per 1,000 ft (305 m), and 9% per 18 delta deg F (10 delta deg C).

For **Unlimited Time Prime Operation** above these conditions, derate by an additional 2% per 1,000 ft (305 m), and 10% per 18 delta deg F (10 delta deg C).

—◆— 25 C    —■— 40 C

—▲— 50 C    —×— 55 C

## Cummins Inc.

## Engine Datasheet

ENGINE MODEL : QSK60-G21

**INSTALLATION DIAGRAM**

• Fan to Flywheel: 3170634

CONFIGURATION NUMBER : D593008GX03

**CPL NUMBER**

• Engine Critical Parts List : 3582

DATASHEET : FR60297

DATE : 21 OCT 14

**GENERAL ENGINE DATA**

Type .....	Four Cycle; Vee; 16 Cylinder	
Aspiration .....	Turbocharged and Aftercooled (2P2L)	
Bore x Stroke .....	6.26 x 7.48 (159 x 190)	
Displacement.....	3,673	(60.2)
Compression Ratio.....	14.5 : 1	
Dry Weight (Approximate).....	17,460	(7,920)
Wet Weight (Approximate) .....	18,893	(8,570)
Moment of Inertia of Rotating Components		
with FW6073 Flywheel .....	376	(42.4)
Center of Gravity from Rear Face of Block .....	39.4	(1,001)
above Crankshaft Centerline .....	8.6	(218)
Maximum Static Loading at Rear Main Bearing .....	2,500	(1,134)

**ENGINE MOUNTING**

Maximum Bending Moment at Rear Face of Block .....	7,634	(10,350)
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**EXHAUST SYSTEM**

Maximum Back Pressure at Standby Power .....	2	(7)
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**AIR INDUCTION SYSTEM**

Maximum Intake Air Restriction: with Dirty Filter Element .....	25	(6.2)
with Normal Duty Air Cleaner and Clean Filter Element .....	15	(3.7)

**COOLING SYSTEM****Jacket Water Circuit Requirements**

Coolant Capacity — Engine Only.....	42	(159)
Minimum Pressure Cap Rating at Sea Level .....	11	(76)
Maximum Static Head of Coolant Above Engine Crank Centerline .....	60	(18.3)
Maximum Coolant Temperature (Max Top Tank Temp) for Standby/Prime Power.....	220 / 212	(104 / 100)
Thermostat (Modulating) Range.....	180 - 200	(82 - 93)
Maximum Coolant Friction Head External to Engine -1500 RPM.....	7	(48.3)

**Aftercooler Circuit Requirements**

Coolant Capacity - Aftercooler.....	9	(34.1)
Maximum Coolant Friction Head External to Engine -1500 RPM.....	5	(34.5)
Maximum Coolant Temperature into Aftercooler @ 77°F (25°C) Ambient .....	120	(49)
Max Coolant Temp into Aftercooler @ Limiting Ambient Conditions for Standby/Prime .....	160 / 150	(71 / 66)
Thermostat (Modulating) Range.....	115 - 135	(46 - 57)

**LUBRICATION SYSTEM**

Oil Pressure @ Minimum Low Idle .....	20	(138)
@ Governed Speed .....	60 - 70	(413.7 - 482.6)
Maximum Oil Temperature .....	250	(121)
Oil Capacity with OP 6107 Oil Pan : Low - High .....	61 - 69	(230.9 - 261.2)
Total System Capacity (With Combo Filters) .....	74	(280.1)

**FUEL SYSTEM**

Type Injection System.....	Cummins MCRS	
Max Fuel Supply Restriction at Fuel Pump Inlet		
with Clean Fuel Filter Element(s) at Max Fuel Flow.....	5	(16.9)
with Dirty Fuel Filter Element(s) at Maximum Fuel Flow.....	9	(30)
Maximum Allowable Head on Injector Return Line		
(Consisting of Friction Head and Static Head) .....	10	(34)
Maximum Fuel Inlet Temperature .....	160	(71)
Maximum Supply Fuel Flow - 1500 RPM .....	263	(995)
Maximum Return Fuel Flow - 1500 RPM .....	116	(439)

**ELECTRICAL SYSTEM**

System Voltage.....	—volt	24
Minimum Recommended Battery Capacity		
• Cold Soak @ 10°C (50°F) and above.....	— CCA	1,800
• Cold Soak @ 0°C to 10°C (32°F to 50°F).....	— CCA	1,800
• Cold Soak @ -18°C to 0°C (0°F to 32°F).....	— CCA	1,800
Maximum starting circuit resistance .....	— ohm	0.002

**COLD START CAPABILITY**

Unaided Cold Start		
Minimum Cranking Speed.....	— RPM	150
Minimum Ambient Temperature for Unaided Cold Start .....	— °F (°C)	10 (-12.2)

**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); @1500 rpm .....	— dBA	N.A.
Exhaust Noise at 1 m Horizontally from Centerline of Exhaust Pipe Outlet Upwards at 45° .....	— dBA	N.A.

	<b>STANDBY POWER</b>		<b>PRIME POWER</b>	
	<b>60 hz</b>	<b>50 hz</b>	<b>60 hz</b>	<b>50 hz</b>
Governed Engine Speed..... rpm	N/A	1,500	N/A	1,500
Engine Idle Speed..... rpm	N/A	700 - 900	N/A	700 - 900
Gross Engine Power Output..... hp (kW)	N/A	2,901 (2,163)	N/A	2,595 (1,936)
Brake Mean Effective Pressure..... psi (kPa)	N/A	417 (2,875)	N/A	373 (2,573)
Piston Speed..... ft/min (m/s)	N/A	1,869 (9.5)	N/A	1,869 (9.5)
Friction Horsepower..... hp (kW)	N/A	277 (207)	N/A	277 (207)
Engine Water Flow at Stated Friction Head External to Engine:				
• 4 psi Friction Head..... US gpm (litre/min)	N/A	442 (1,673)	N/A	442 (1,673)
• Maximum Friction Head..... US gpm (litre/min)	N/A	420 (1,590)	N/A	420 (1,590)
<b>Engine Data</b>				
Intake Air Flow..... cfm (litre/s)	N/A	5,450 (2,572)	N/A	5,209 (2,459)
Exhaust Gas Temperature..... °F (°C)	N/A	944 (507)	N/A	878 (471)
Exhaust Gas Flow..... cfm (litre/s)	N/A	13,883 (6,552)	N/A	12,818 (6,050)
Air to Fuel Ratio..... air : fuel		23.8 : 1		26.4 : 1
Heat Rejection to Ambient..... BTU/min (kW)	N/A	11,969 (210)	N/A	10,401 (183)
Heat Rejection to Jacket Coolant..... BTU/min (kW)	N/A	46,957 (826)	N/A	32,198 (566)
Heat Rejection to Exhaust..... BTU/min (kW)	N/A	83,352 (1,466)	N/A	77,423 (1,361)
Heat Rejected to Fuel*..... BTU/min (kW)	N/A	475 (8.4)	N/A	475 (8.4)
<b>2P2L</b>				
Heat Rejection to Aftercooler Coolant..... BTU/min (kW)	N/A	33,332 (586)	N/A	29,494 (519)
Engine Water Flow at Stated Friction Head External to Engine:				
• 2.5 psi Friction Head..... US gpm (litre/min)	N/A	139 (526)	N/A	139 (526)
• Maximum Friction Head..... US gpm (litre/min)	N/A	133 (503)	N/A	133 (503)

\*This is the maximum heat rejection, not specified to the load listed.

N.A. - Not Available

N/A - Not Applicable to this Engine

TBD - To Be Determined