

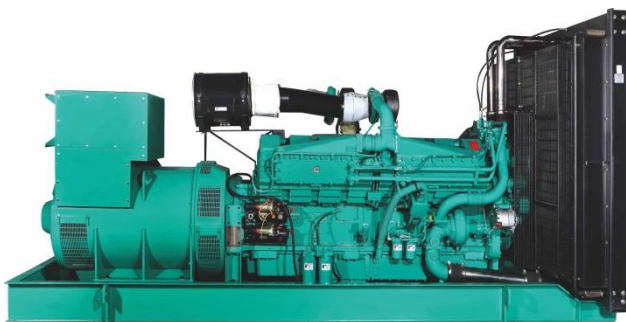
DATA SHEET

DIESEL GENERATOR 1360KW

MODEL#FDK-CC1700/H1

50HZ/1500RPM

CUMMINS MODEL: QSK50-G4



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-CC1700/H1
Prime Power	1232KW/1540KVA
Standby Power	1360KW/1700KVA
Output Frequency / Rated speed	50Hz/1500rpm
Rated Voltage	230V/400V

Engine Make	Cummins
Engine Model	QSK50-G4
Alternator model	Stamford PI734C
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	QSK50-G4
Engine Manufacturer	Cummins Original
Cylinder quantity	16
Cylinder Arrangement	60° Vee
Cycle	4
Aspiration	Turbo-charged

Bore x Stroke (mm x mm)	159×159
Displacement	50.3L
Compression Ratio	15:1
Prime power / Speed (KW/RPM)	1328kw/1500
Standby power/ Speed (KW/RPM)	1477kw/1500
Type Injection System	Cummins



	MCRS	Fuel Consumption at 100% load (L/H)	330Lat 1500rpm
Piston Speed	9.5m/s	Starter motor	DC24V
Friction Energy Output	175kw	Low idle	700-900pm
Total Lubrication System Capacity	234.7L	Coolant Capacity (L)	140.1

Alternator Specifications

Alternator model	PI734C	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	1550KVA	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.



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)	4900×2150×2450
Weight (kg)	10300

Soundproof Version

Overall Size: L×W×H (mm)	40FT CONTAINER
Weight (kg)	22000

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.**





Engine Performance Data

Cummins Inc

Columbus, Indiana 47202-3005
 http://www.cummins.com

Power Generation

QSK50-G4

FR 6878

Configuration
D283039GX03

CPL Code
3621

Revision
04 SEP 12

Compression Ratio: **15.0:1**
 Fuel System: **Cummins MCRS**
 Emission Certification: **U.S. EPA Tier 2, CARB Tier 2**

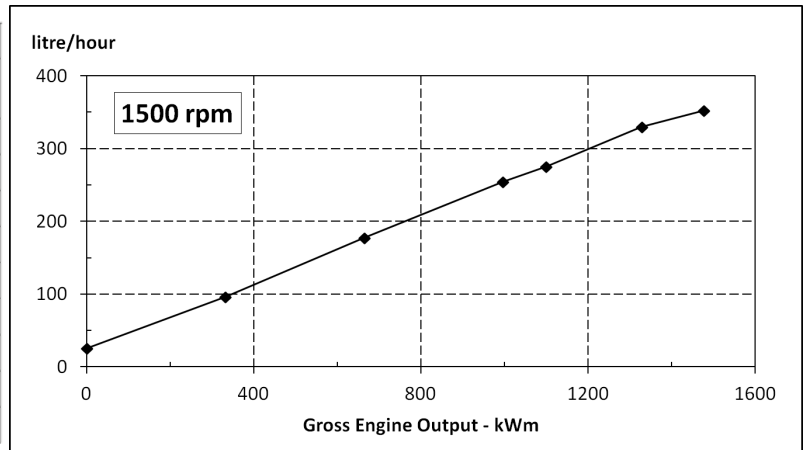
Displacement: **3,069 in3 (50.3 L)**
 Aspiration: **Turbocharged and Low Temperature Aftercooled**

Engine Ratings:

Engine Speed	Standby Power		Prime Power		Continuous Power	
	RPM	bhp	kWm	bhp	kWm	bhp
1,500	1,980	1,477	1,780	1,328	1,475	1,100
1,800	2,220	1,656	1,971	1,470	1,640	1,223

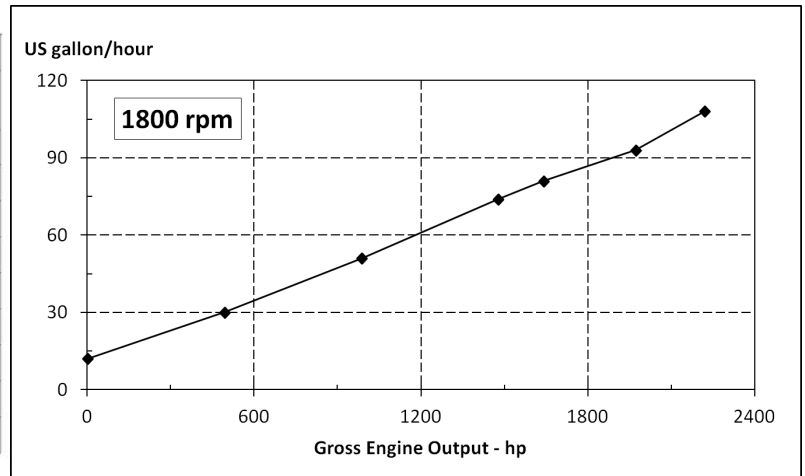
Engine Fuel Consumption @1,500 RPM

Output Power			Fuel Consumption			
%	bhp	kWm	lb/ bhp-h	kg/ kWm-h	gal/hr	l/hr
Standby Power						
100	1,980	1,477	0.333	0.203	93	352
Prime Power						
100	1,780	1,328	0.348	0.212	87	330
75	1,335	996	0.357	0.217	67	254
50	890	664	0.372	0.226	47	177
25	445	332	0.406	0.247	25	96
Continuous Power						
100	1,475	1,100	0.350	0.213	73	275



Engine Fuel Consumption @1,800 RPM

Output Power			Fuel Consumption			
%	bhp	kWm	lb/ bhp-h	kg/ kWm-h	gal/hr	l/hr
Standby Power						
100	2,220	1,656	0.346	0.210	108	410
Prime Power						
100	1,971	1,470	0.345	0.210	96	363
75	1,478	1,103	0.354	0.215	74	279
50	986	735	0.369	0.225	51	194
25	493	368	0.437	0.265	30	115
Continuous Power						
100	1,640	1,223	0.350	0.213	81	307



Rating Type:

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.

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 0 in H2O air intake restriction and 0 in Hg exhaust back pressure.

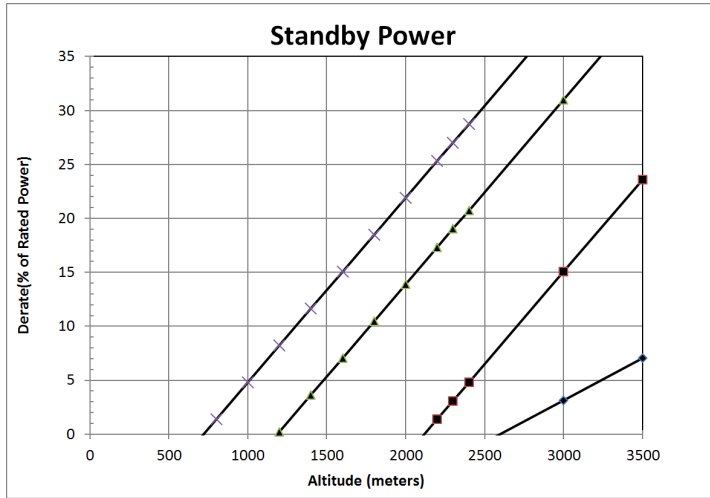
The fuel consumption data is based on No. 2 diesel fuel weight at 0.85 kg/litre (7.1 lbs/U.S. gal). Power output curves are based on the engine operating with fuel system, water pump and lubricating oil pump; not included are battery charging alternator, fan, optional equipment and driven components.

Data Subject to Change Without Notice

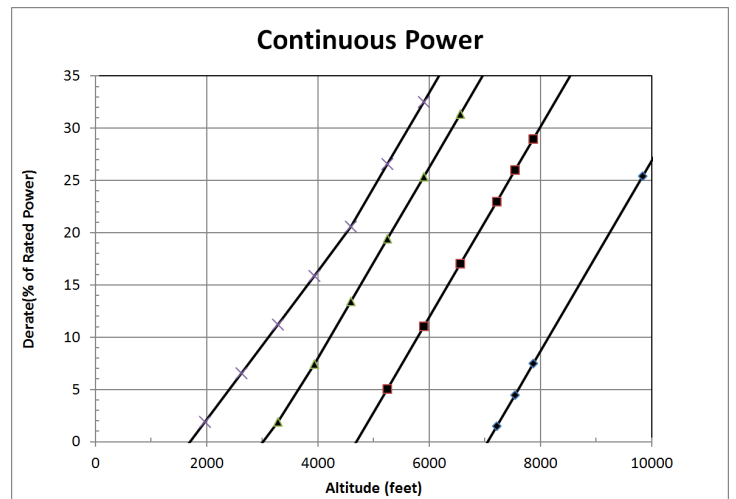
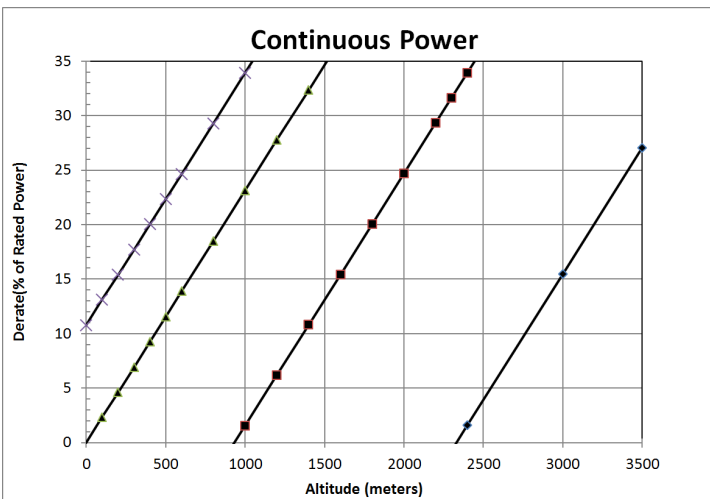
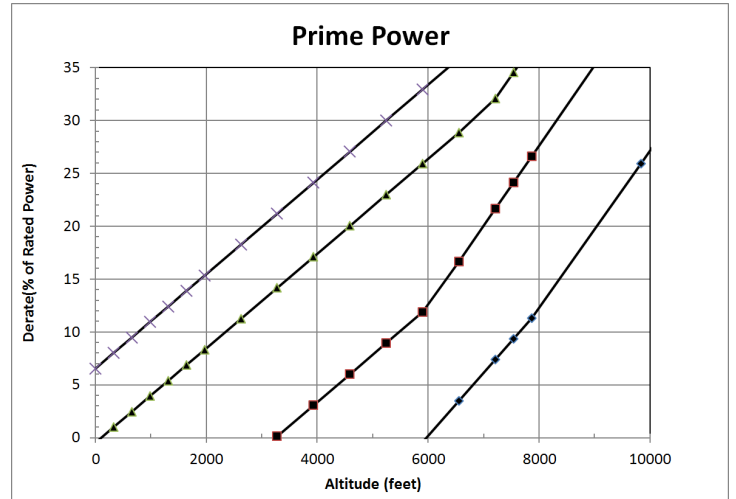
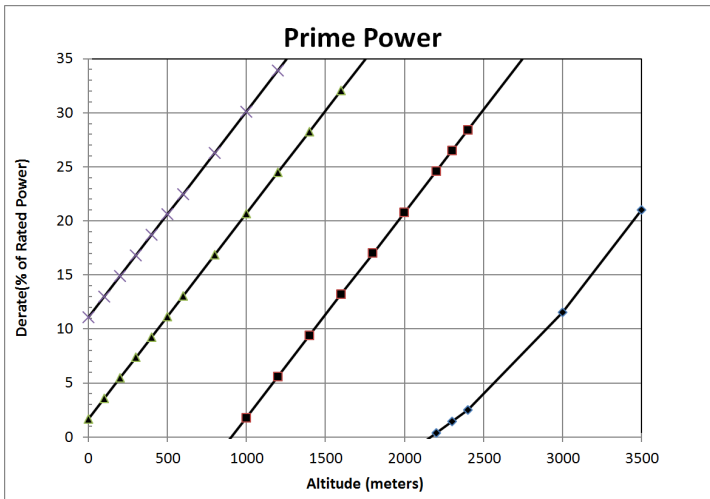
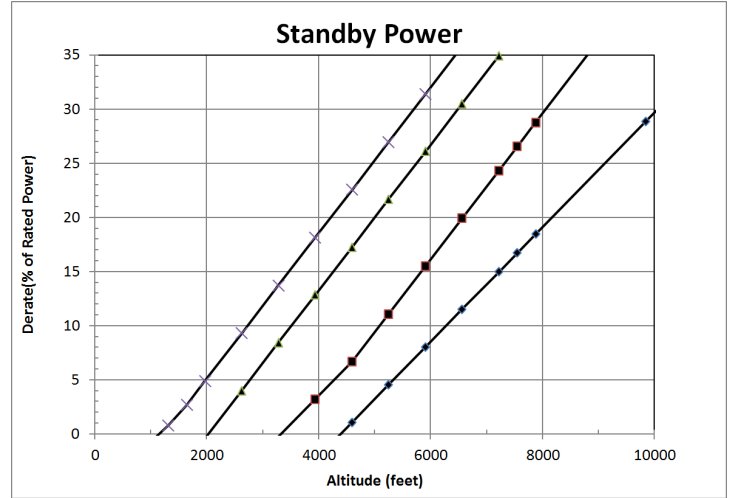
Data Status: Preliminary-(Estimated data)

Data Tolerance: +/- 5 %
 CHIEF ENGINEER:

1,500 RPM Power Derate Curves



1,800 RPM Power Derate Curves



Operation at Elevated Temperature and Altitude:

For Standby operation above these conditions, derate by an additional 5 % per 984 ft (300 m), and 16 % per 18 delta deg F (10 delta deg C)
 For Prime operation above these conditions, derate by an additional 6 % per 984 ft (300 m), and 19 % per 18 delta deg F (10 delta deg C)
 For Continuous operation above these conditions, derate by an additional 7 % per 984 ft (300 m), and 21 % per 18 delta deg F (10 delta deg C)

- ◆ 25 C
- 40 C
- ▲ 50 C
- ✕ 55 C

Operation at Elevated Temperature and Altitude:

For Standby operation above these conditions, derate by an additional 6 % per 984 ft (300 m), and 14 % per 18 delta deg F (10 delta deg C)
 For Prime operation above these conditions, derate by an additional 7 % per 984 ft (300 m), and 14 % per 18 delta deg F (10 delta deg C)
 For Continuous above these conditions, derate by an additional 9 % per 984 ft (300 m), and 19 % per 18 delta deg F (10 delta deg C)

Cummins Inc.

Engine Data Sheet

ENGINE MODEL : QSK50-G4

CONFIGURATION NUMBER : D283039GX03

DATA SHEET : FR6878

DATE : 04 SEP 12

INSTALLATION DIAGRAM

• Fan to Flywheel: 3170631

CPL NUMBER

• Engine Critical Parts List: 3621

GENERAL ENGINE DATA

Type	Four Cycle; Vee; 16 Cylinder
Aspiration	Turbocharged and Low Temp Aftercooled (2P2L)
Bore x Stroke	6.26 x 6.26 (159 x 159)
Displacement	3,069 (50.3)
Compression Ratio	15.0 : 1
Dry Weight (Approximate)	11,927 (5,410)
Wet Weight (Approximate)	12,593 (5,712)
Moment of Inertia of Rotating Components	
• with FW 6066 Flywheel	112 (12.7)
Center of Gravity from Rear Face of Block	47.48 (1,206)
Center of Gravity Above Crankshaft Centerline	10.98 (279)

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block	4,499 (6,100)
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EXHAUST SYSTEM

Maximum Back Pressure at Standby Power	2 (6.8)
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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

Coolant Capacity — Engine	148 (140.1)
Minimum Pressure Cap Rating at Sea Level	14 (97)
Maximum Static Head of Coolant Above Crankshaft 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)

Jacket Water Circuit Requirements

Maximum Coolant Friction Head External to Engine - 1500/1800 RPM	7 / 10 (48.3 / 68.9)
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Aftercooler Circuit Requirements

Coolant Capacity — Aftercooler	9 (34)
Maximum Coolant Friction Head External to Engine - 1500/1800 RPM	5 / 7 (34.5 / 48.3)
Maximum Coolant Temperature into Aftercooler @ 77 °F (25 °C) Ambient	120 (49)
Maximum Coolant Temperature into Aftercooler @	
Limiting Ambient Conditions for Standby/Prime power	160 / 150 (71 / 66)
Thermostat (Modulating) Range	115 - 135 (46 - 57)

LUBRICATION SYSTEM

Oil Pressure @ Minimum Idle Speed	20 (138)
@ Governed Speed	50 - 70 (350 - 485)
Maximum Oil Temperature	250 (121)
Oil Capacity with OP 6100 Oil Pan : Low - High	46 - 54 (174.1 - 204.4)
Total System Capacity (with Combo Filter)	62 (234.7)

FUEL SYSTEM

Type Injection System	Cummins MCERS
Maximum Fuel Supply Restriction at Fuel Pump Inlet (clean/dirty filter)	5 / 9 (16.9 / 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 - 1500/1800 RPM	222 / 241 (840 / 912)
Maximum Return Fuel Flow - 1500/1800 RPM	116 / 124 (439 / 469)

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 °C 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.....	— °C (°F)	7.2	(45)

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 / 1800 rpm	— dBA	95 / 97.1	(est.)
Exhaust Noise at 1 m Horizontal from Centerline of Exhaust Pipe Outlet Upwards at 45° @ 1500 / 1800 rpm....	— dBA	125 / 128	(est.)

	STANDBY POWER		PRIME POWER		
	60 hz	50 hz	60 hz	50 hz	
Governed Engine Speed	RPM	1,800	1,500	1,800	1,500
Engine Idle Speed.....	RPM	700 - 900	700 - 900	700 - 900	700 - 900
Gross Engine Power Output	hp (kW)	2,220 (1,655)	1,980 (1,476)	1,971 (1,470)	1,780 (1,327)
Brake Mean Effective Pressure	psi (kpa)	317 (2,186)	339 (2,337)	281 (1,937)	305 (2,103)
Piston Speed	ft/min (m/s)	1,875 (9.5)	1,562 (6.9)	1,875 (9.5)	1,562 (6.9)
Friction Horsepower	hp (kW)	221 (165)	235 (175)	221 (165)	235 (175)
Engine Water Flow at Stated Friction Head External to Engine:					
• 4 psi Friction Head.....	gpm (L/min)	536 (2,029)	448 (1,696)	536 (2,029)	448 (1,696)
• Maximum Friction Head	gpm (L/min)	500 (1,893)	416 (1,575)	500 (1,893)	416 (1,575)
Engine Data					
Intake Air Flow	ft ³ /min (L/s)	4,934 (2,329)	4,052 (1,912)	4,761 (2,247)	3,992 (1,884)
Exhaust Gas Temperature - Dry Stack	°F (°C)	880 (471)	905 (485)	811 (433)	905 (485)
Exhaust Gas Flow	ft ³ /min (L/s)	11,783 (5,561)	9,875 (4,660)	10,838 (5,115)	9,727 (4,591)
Air to Fuel Ratio	air : fuel	27.6 : 1	26.2 : 1	30.0 : 1	27.4 : 1
Radiated Heat to Ambient	BTU/min (kW)	9,365 (165)	8,055 (142)	8,293 (146)	7,555 (133)
Heat Rejection to Jacket Coolant	BTU/min (kW)	31,796 (559)	29,337 (516)	29,808 (524)	28,500 (501)
Heat Rejection to Exhaust	BTU/min (kW)	73,416 (1,291)	61,836 (1087)	63,073 (1,109)	59,914 (1,054)
Heat Rejected to *Fuel	BTU/min (kW)	522 (10)	475 (9)	522 (10)	475 (9)
2P / 2L					
Heat Rejection to Aftercooler Coolant	BTU/min (kW)	24,846 (437)	17,675 (311)	22,017 (387)	16,911 (297)
Aftercooler Water Flow at Stated Friction Head External to Engine:					
• 2 psi Friction Head.....	gpm (L/min)	159 (602)	123 (466)	159 (602)	123 (466)
• Maximum Friction Head	gpm (L/min)	142 (538)	121 (458)	142 (538)	121 (458)

* This is the maximum heat rejection to fuel.

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

ENGINE MODEL : QSK50-G4
DATA SHEET : FR6878
DATE : 04 SEP 12