FDK ENERGY

GUANGDONG FUDIANKANG DIESEL GENSET CO., LTD
SHENZHEN FUDIANKANG DIESEL GENESET CO., LTD
Tel: 86-1371008799
Web: www.fdkenergy.com Email: info@fdkenergy.com

DATA SHEET

DIESEL GENERATOR 1000KW
MODEL#FDK-CG1250/H2
60HZ/1800RPM
CUMMINS MODEL: QST30-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-CG1000E/H2	Engine Make	Cummins USA
Prime Power	900KW/1125KVA	Engine Model	QST30-G4
Standby Power	1000KW/1250KVA	Alternator model	Stamford HCI634J
Output Frequency / Rated speed	60Hz/1800rpm	Control System	DSE7320
Rated Voltage	277V/480V	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	QST30-G4	Aspiration	Turbo-charged
Engine Manufacturer	Cummins ORIGINAL USA	Bore x Stroke (mm x mm)	140×165
		Displacement	30.48L
Cylinder quantity	12	Compression Ratio	14.0:1
Cylinder Arrangement	50° Vee	Prime power / Speed (KW/RPM)	1007kw/1800
Cycle	4	Standby power/ Speed (KW/RPM)	1112kw/1800

CE ISO9001:2008

Type Injection System	Bosch P8500 LLA Direct Injection	Fuel Consumption at 100% load (g/KWh)	203 at 1800rpm
Piston Speed	9.9m/s	Starter motor	24V
Friction Energy Output	82kw	Low idle	700-900pm
Total Lubrication System Capacity	154L	Coolant Capacity (L)	79

Alternator Specifications

Alternator model	HCI634J	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	1300KVA	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.

Optional

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

Dimension & Weight

Open

Overall Size: L×W×H (mm)	3800×1818×2350
Weight (kg)	7450

Soundproof Version

Overall Size: L×W×H (mm)	5800×2000×2550
Weight (kg)	9700

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.**

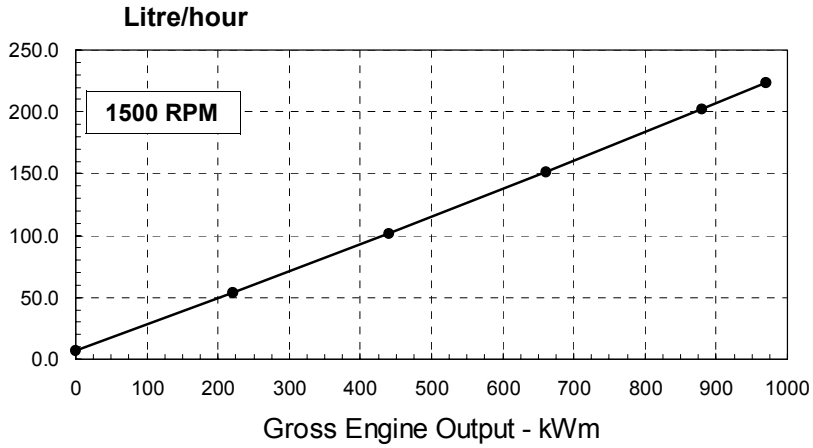
CUMMINS ENGINE COMPANY, INC Columbus, Indiana 47201 **ENGINE PERFORMANCE CURVE**	Basic Engine Model: **QST30-G4**	Date: **10JAN11**	*G-DRIVE* **QST** **1**
	Engine Critical Parts List: **CPL: 3203 (2 Pump / 2 Loop)** **CPL: 3204 (Air-to-Air)**	Curve Number: **FR-5276 (2P/ 2L)** **FR-5277 (Air-to-Air)**	

Displacement : **30.48** litre (**1860** in^3)	Bore : **140** mm (**5.51** in) Stroke : **165** mm (**6.50** in)
No. of Cylinders : **12**	Aspiration : **Turbocharged and Low Temperature Aftercooled**

Engine Speed	Standby Power		Prime Power		Continuous Power	
RPM	kWm	BHP	kWm	BHP	kWm	BHP
1500	970	1300	880	1180	683	915
1800	1112	1490	1007	1350	832	1115

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	970	1300	0.196	0.323	224	59.1
PRIME POWER						
100	880	1180	0.195	0.320	202	53.2
75	660	885	0.194	0.319	151	39.8
50	440	590	0.197	0.324	102	26.9
25	220	295	0.207	0.341	54	14.2
CONTINUOUS POWER						
100	683	915	0.194	0.319	156	41.1



CONVERSIONS: (litres = U.S. Gal x 3.785) (Engine kWm = BHP x 0.746) (U.S. Gal = litres x 0.2642) (Engine BHP = Engine kWm x 1.34)

These guidelines have been formulated to ensure proper application of generator drive engines in A.C. generator set installations. Generator drive engines are not designed for and shall not be used in variable speed D.C. generator set applications.

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 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.

See reverse side for application rating guidelines.

The fuel consumption data is based on No. 2 diesel fuel weight at 0.85 kg/litre (7.1 lbs/U.S. gal).

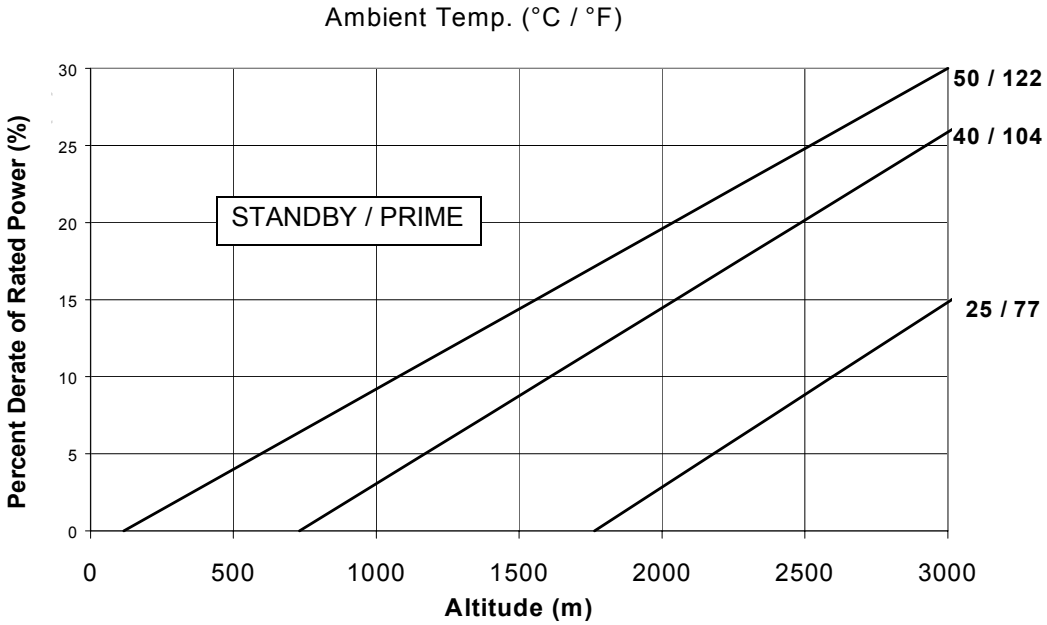
Power output curves are based on the engine operating with fuel system, water pump and lubricating oil pump; not included are battery charging alternator, fan, optional equipment and driven components.

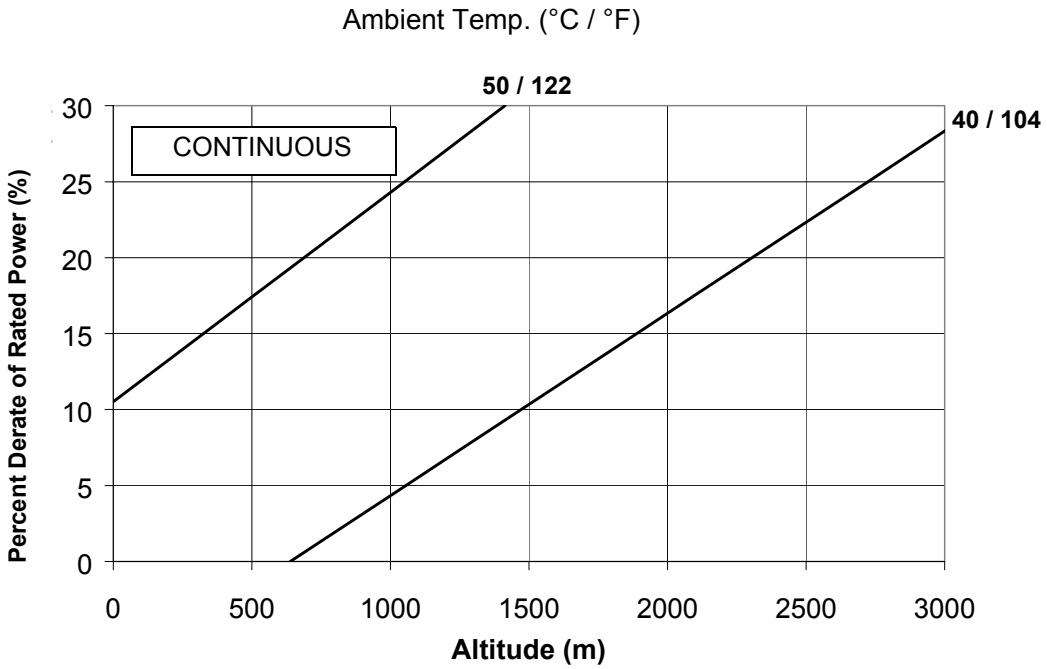
D K. Trueblood

TECHNICAL DATA DEPT. **CERTIFIED WITHIN 5%** **CHIEF ENGINEER**

QST30-G4 Derate Curves @ 1500 RPM

CURVE NO: FR-5276 (2 Pump 2 loop)
FR-5277 (Air-to-Air)
DATE: 10JAN11





Reference Standards:

BS-5514 and DIN-6271 standards are based on ISO-3046.

Operation At Elevated Altitude and Temperature:

For sustained operation above these conditions, derate an additional 9% per 500 m (1640 ft) and 15% per 10°C (18°F)

Note: Derates shown are based on 15 in H_20 air intake restriction and 2 in Hg exhaust back pressure.

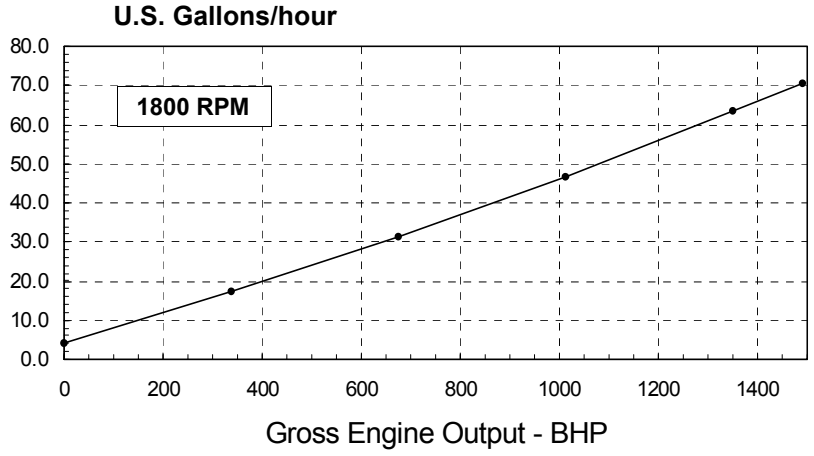
CUMMINS ENGINE COMPANY, INC Columbus, Indiana 47201 **ENGINE PERFORMANCE CURVE**	Basic Engine Model: **QST30-G4**	Date: **10JAN11**	*G-DRIVE* **QST** **3**
	Engine Critical Parts List: **CPL: 3203 (2 Pump / 2 Loop)** **CPL: 3204 (Air-to-Air)**	Curve Number: **FR-5276 (2P / 2L)** **FR-5277 (Air-to-Air)**	

Displacement : **30.48** litre (**1860** in^3)	Bore : **140** mm (**5.51** in) Stroke : **165** mm (**6.50** in)
No. of Cylinders : **12**	Aspiration : **Turbocharged and Low Temperature Aftercooled**

Engine Speed	Standby Power		Prime Power		Continuous Power	
RPM	kWm	BHP	kWm	BHP	kWm	BHP
1500	970	1300	880	1180	683	915
1800	1112	1490	1007	1350	832	1115

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	1112	1490	0.204	0.336	267	70.5
PRIME POWER						
100	1007	1350	0.203	0.333	240	63.3
75	756	1013	0.199	0.327	177	46.7
50	504	675	0.202	0.331	119	31.5
25	252	338	0.223	0.366	66	17.4
CONTINUOUS POWER						
100	832	1115	0.199	0.327	194	51.4



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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 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.

See reverse side for application rating guidelines.

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.

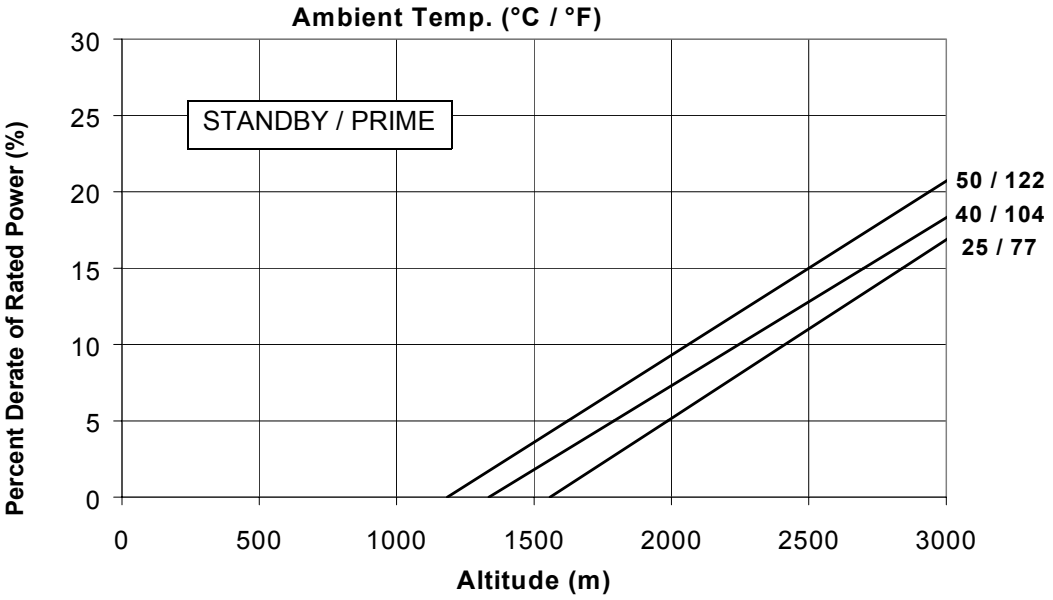
D K. Trueblood

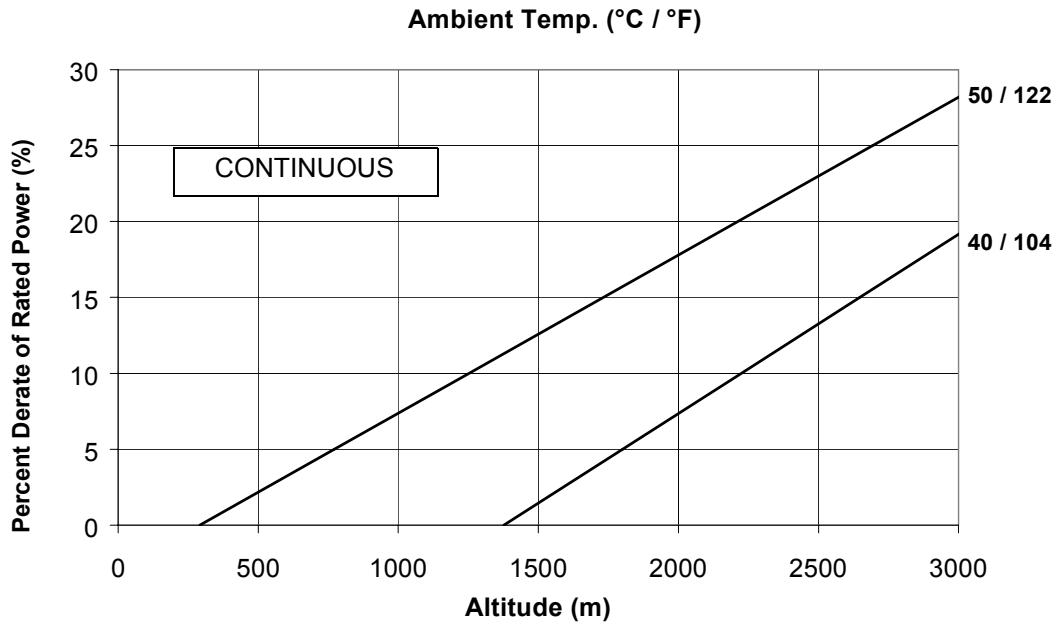
TECHNICAL DATA DEPT. **CERTIFIED WITHIN 5%** **CHIEF ENGINEER**

G-DRIVE
QST
4

QST30-G4 Derate Curves @ 1800 RPM

CURVE NO: FR-5276 (2 Pump 2 loop)
FR-5277 (Air-to-Air)
DATE: 10JAN11





Reference Standards:

BS-5514 and DIN-6271 standards are based on ISO-3046.

Operation At Elevated Altitude and Temperature:

For sustained operation above these conditions, derate an additional 9% per 1000 ft (300 m) and 15% per 10°C (18°F).

Note: Derates shown are based on 15 in H_20 air intake restrictions and 2 in Hg exhaust back pressure.

Cummins Engine Company, Inc.
Engine Data Sheet

ENGINE MODEL : **QST30-G4** **CONFIGURATION NUMBER :** D573001GX03

DATA SHEET : DS-5276
DATE : 10JAN11
PERFORMANCE CURVE : FR-5276 (2P / 2L)
FR-5277 (A - A)

INSTALLATION DIAGRAM
- Fan to Flywheel (2 Pump / 2 Loop): 3170314
- Fan to Flywheel (Air-to-Air): 3170341

CPL NUMBER
- Engine Critical Parts List (2 Pump / 2 Loop) :3203
- Engine Critical Parts List (Air-to-Air) :3204

GENERAL ENGINE DATA

Type		4-Cycle; 50° Vee; 12-Cylinder Diesel	
Aspiration		Turbocharged and Low Temperature Aftercooled	
Bore x Stroke	— mm x mm (in x in)	140 x165 (5.51 x 6.50)	
Displacement	— (litre) in^3	30.48 (1860)	
Compression Ratio		14.0 : 1	
Dry Weight,Fan to Flywheel Engine	— kg (lb)	3012	(6640)
Wet Weight,Fan to Flywheel Engine	— kg (lb)	3112	(6860)
Moment of Inertia of Rotating Components			
• with FW 5050 Flywheel	— kg • m^2 (lb_m • ft^2)	8.7	(206)
Center of Gravity from Rear Face of Flywheel Housing (FH 5031)	— mm (in)	845	(33.3)
Center of Gravity Above Crankshaft Centerline	— mm (in)	195	(7.7)
Maximum Static Loading at Rear Main Bearing	— kg (lb)	950	(2100)

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block	— N • m (lb • ft)	3100	(2286)

EXHAUST SYSTEM

Maximum Back Pressure	— mm Hg (in Hg)	51	(2)

AIR INDUCTION SYSTEM

Maximum Intake Air Restriction			
• with Dirty Filter Element	— mm H_2O (in H_2O)	635	(25)
• with Clean Filter Element	— mm H_2O (in H_2O)	381	(15)

COOLING SYSTEM (Low Temperature Aftercooling Required)

Coolant Capacity — Engine Only	— litre (US gal)	79	(21)
— Aftercoolers (2 Pump / 2 Loop)	— litre (US gal)	12	(3.2)
Minimum Pressure Cap	— kPa (psi)	69	(10)
Jacket Water Circuit Requirements			
Maximum Coolant Friction Head External to Engine — 1500 / 1800 rpm	— kPa (psi)	48 / 69	(7 / 10)
Maximum Static Head of Coolant Above Engine Crank Centerline	— m (ft)	14	(46)
Standard Thermostat (Modulating) Range	— °C (°F)	82 - 95	(180 - 203)
Maximum Top Tank Temperature for Standby / Prime Power	— °C (°F)	104 / 100	(220 / 212)
Aftercooler Circuit Requirements (2 Pump / 2 Loop Aftercooling)			
Maximum Inlet Water Temperature to Aftercooler @ 77 °F	— °C (°F)	49	(120)
Maximum Inlet Water Temperature to Aftercooler	— °C (°F)	65	(150)
Maximum Coolant Friction Head External to Engine — 1500 / 1800 rpm	— kPa (psi)	35 / 48	(5 / 7)
Air-to-Air Core Requirements			
Maximum Temp. Rise Between Engine Air Inlet and Intake Manifold — 1500 / 1800 rpm	— °C (°F)	33 / 39	(60 / 70)
Maximum Air Press. Drop from Turbo AIr Outlet to Intake Manifold — 1500 / 1800 rpm	— mm (in Hg)	102 / 127	(4 / 5)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed	— kPa (psi)	166	(24)
@ Governed Speed	— kPa (psi)	310 - 386	(45 - 56)
Maximum Oil Temperature	— °C (°F)	121	(250)
Oil Capacity with OP 5133 Oil Pan : High - Low	— litre (US gal)	133 - 114	(35 - 30)
Total System Capacity (Including Bypass Filter)	— litre (US gal)	154	(40.7)

FUEL SYSTEM

Type Injection System	Bosch P8500 LLA Direct Injection		
Maximum Restriction at Lift Pump — with Clean Fuel Pre-Filter	— mm Hg (in Hg)	102	(4.0)
— with Dirty Fuel Pre-Filter	— mm Hg (in Hg)	203	(8.0)
Maximum Allowable Head on Injector Return Line (Consisting of Friction and Static Head)	— mm Hg (in Hg)	508	(20)
Maximum Fuel Flow to Injection Pumps (Left and Right Banks Combined) 1500 / 1800 rpm	— litre / hr (US gph)	550 / 570	(145 / 150)
Maximum Fuel Inlet Temperature	— °C (°F)	71	(150)
Maximum Return Flow 1500 / 1800 rpm	— litre / hr (US gph)	530 / 550	(140 / 145)

ELECTRICAL SYSTEM

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

COLD START CAPABILITY

Minimum Ambient Temperature for Cold Start with 8000 watt Coolant Heater to Rated Speed	— °C (°F)	-7	(20)
Minimum Ambient Temperature for Unaided Cold Start to Idle Speed	— °C (°F)	7	(45)
Minimum Ambient Temperature for NFPA110 Cold Start (90°F Minimum Coolant Temperature)	— °C (°F)	0	(32)

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	254 mm H_2O (10 in H_2O)	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 / 1800 rpm	— dBA	91 / 93
Exhaust Noise at 1 m Horizontally from Centerline of Exhaust Pipe Outlet Upwards at 45° @1500 / 1800 rpm	— dBA	128 / 131

		STANDBY POWER				PRIME POWER			
		60 hz		*50 hz*		*60 hz*		*50 hz*	
Governed Engine Speed	— rpm	1800		1500		1800		1500	
Engine Idle Speed	— rpm	700 - 900		700 - 900		700 - 900		700 - 900	
Gross Engine Power Output	— kW_m (BHP)	1112	(1490)	970	(1300)	1007	(1350)	880	(1180)
Brake Mean Effective Pressure	— kPa (psi)	2427	(352)	2544	(369)	2199	(319)	2310	(335)
Piston Speed	— m / s (ft / min)	9.9	(1949)	8.3	(1634)	9.9	(1949)	8.3	(1634)
Friction Horsepower	— kW_m (BHP)	82	(110)	58	(78)	82	(110)	58	(78)
Engine Jacket Water Flow at Stated Friction Head External to Engine:									
• 5 psi Friction Head	— litre / s (US gpm)	17.0	(270)	14.2	(225)	17.0	(270)	14.2	(225)
• Maximum Friction Head	— litre / s (US gpm)	16.5	(262)	13.7	(217)	16.5	(262)	13.7	(217)
Engine Data with Dry Type Exhaust Manifold									
Intake Air Flow	— litre / s (cfm)	1340	(2840)	1005	(2130)	1250	(2650)	945	(2005)
Exhaust Gas Temperature	— °C (°F)	525	(975)	575	(1070)	495	(920)	565	(1050)
Exhaust Gas Flow	— litre / s (cfm)	3670	(7775)	2980	(6310)	3285	(6960)	2750	(5820)
Air to Fuel Ratio	— air : fuel	25 : 1		22 : 1		26.5 : 1		22.6 : 1	
Radiated Heat to Ambient	— kW_m (BTU / min)	130	(7460)	115	(6410)	115	(6650)	105	(5860)
Heat Rejection to Jacket Water Coolant	— kW_m (BTU / min)	365	(20880)	335	(18940)	340	(19350)	320	(18150)
Heat Rejection to Exhaust	— kW_m (BTU / min)	740	(42130)	670	(38050)	660	(37640)	600	(33990)
Engine Aftercooler Data									
Heat Rejection to Aftercooler	— kW_m (BTU / min)	270	(15420)	170	(9560)	215	(12120)	145	(8240)
Aftercooler Water Flow at Stated Friction Head External to Engine:									
• 2 psi Friction Head	— litre / s (US gpm)	5.4	(85)	4.5	(71)	5.4	(85)	4.5	(71)
• Maximum Friction Head	— litre / s (US gpm)	5.0	(80)	4.4	(68)	5.0	(80)	4.4	(68)
Charge Air Flow	— kg/ min (lb / min)	93	(205)	70	(154)	87	(192)	66	(145)
Turbocharger Compressor Outlet Pressure	— mm Hg (in / Hg)	1859	(73)	1534	(60)	1666	(66)	1374	(54)
Turbocharger Compressor Outlet Temperature	— °C (°F)	202	(395)	177	(350)	183	(360)	165	(330)

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