

DATA SHEET

DIESEL GENERATOR 320KW

MODEL#FDK-CD400/H1

50HZ/1500RPM

CUMMINS MODEL: QSZ13-G6



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-CD400/H1 |
| Prime Power | 288KW/360KVA |
| Standby Power | 320KW/400KVA |
| Output Frequency / Rated speed | 50Hz/1500rpm |
| Rated Voltage | 230V/400V |

| | |
|------------------|-------------------|
| Engine Make | Cummins |
| Engine Model | QSZ13-G6 |
| Alternator model | Stamford HCI444FS |
| Control System | DSE6020 |
| 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 | QSZ13-G6 |
| Engine Manufacturer | Cummins (China Dongfeng) |
| Cylinder quantity | 6 |
| Cylinder Arrangement | Not available |
| Cycle | Not available |

| | |
|-------------------------------|---------------|
| Aspiration | Turbo-charged |
| Bore x Stroke (mm x mm) | 130×163 |
| Displacement | 13L |
| Compression Ratio | 17:1 |
| Prime power / Speed (KW/RPM) | 328/1500 |
| Standby power/ Speed (KW/RPM) | 374/1500 |



| | | | |
|---------------------------------------|---------|-------------------------------|----------------|
| Speed governor | MCRS | Fuel Consumption at 100% load | 214 at 1500rpm |
| Piston Speed | 8.15m/s | (g/KWh) | |
| Friction Energy Output | 31kw | Starter motor | DC24V |
| Total Lubrication System Capacity (L) | 75.33 | Alternator | DC24V |
| Coolant Capacity (L) | 23.1 | Low idle | 700rpm |

Alternator Specifications

| | | | |
|--------------------------|---|--------------------------|---|
| Alternator model | HCI444FS | 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 | 380KVA | 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 DSE6020 (DETAILED in INSTRUCTION)

DSE6020 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 |
|---|---|---|--|
| <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) | 3400×1400×1800 |
| Weight (kg) | 3050 |

Soundproof Version

| | |
|-----------------------------|----------------|
| Overall Size: L×W×H (mm) | 5000×1900×2250 |
| Weight (kg) | 5400 |

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.**





Dongfeng Cummins Technical Operations

Engine Model : QSZ13-G6

Curve and Datasheet : FR20379

Rev03 2016.4



Generator Engine Performance Data

Dongfeng Cummins Engine Co.,Ltd
Xiangyang, Hubei Province, China

Engine Model

QSZ13-G6

Curve Number

FR20379

CPL Code

3836

Compression Ratio: 17:1

Cylinders: 6

Bore: 130 mm

Stroke: 163 mm

Displacement: 13.0 L

Engine Configuration: D0C3004GX03

Fuel System: HPCR

Aspiration: Turbocharged & Charge Air Cooled

Governor Regulation: ≤1%

Emission Certification: Euro StageIII/ MEP StageIII

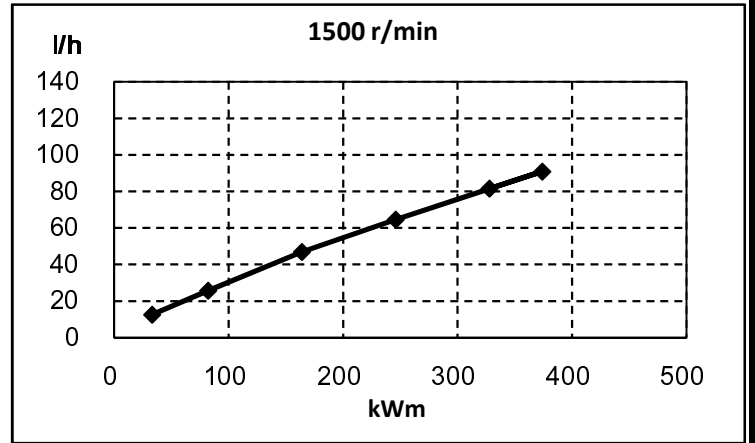
Engine Ratings*:

| Engine Speed r/min | Standby Power | | Prime Power | | Continuous Power | |
|-----------------------|---------------|-----|-------------|-----|------------------|-----|
| | bhp | kWm | bhp | kWm | bhp | kWm |
| 1500 | 501 | 374 | 439 | 328 | 395 | 295 |
| 1800 | 549 | 410 | 482 | 360 | 432 | 323 |

* All ratings refer to AEB26.02.

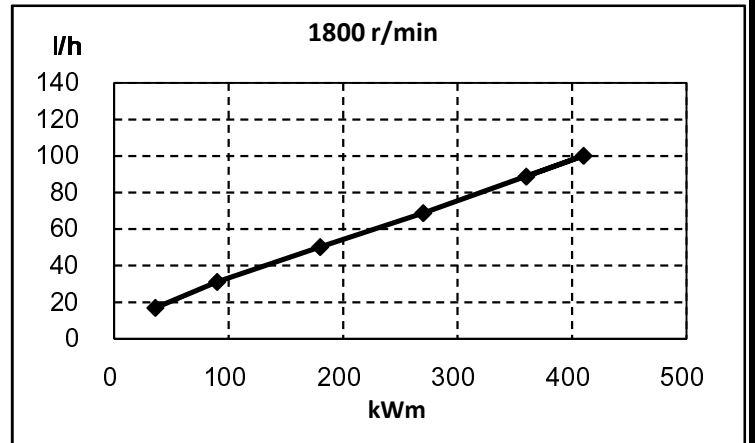
Engine Fuel Consumption @1500 r/min

| OUTPUT POWER | | | FUEL CONSUMPTION | | | |
|-------------------------|-----|-----|------------------|---------|-------|------|
| % | bhp | kWm | lb/bhp.h | g/kWm.h | gal/h | l/h |
| Standby Power | | | | | | |
| 100 | 501 | 374 | 0.344 | 209 | 24.0 | 90.9 |
| Prime Power | | | | | | |
| 100 | 439 | 328 | 0.352 | 214 | 21.5 | 81.6 |
| 75 | 329 | 246 | 0.372 | 226 | 17.1 | 64.6 |
| 50 | 220 | 164 | 0.405 | 246 | 12.4 | 46.9 |
| 25 | 110 | 82 | 0.442 | 269 | 6.8 | 25.6 |
| continuous Power | | | | | | |
| 100 | 395 | 295 | 0.359 | 218 | 19.7 | 74.8 |



Engine Fuel Consumption @1800 r/min

| OUTPUT POWER | | | FUEL CONSUMPTION | | | |
|-------------------------|-----|-----|------------------|---------|-------|-------|
| % | bhp | kWm | lb/bhp.h | g/kWm.h | gal/h | l/h |
| Standby Power | | | | | | |
| 100 | 549 | 410 | 0.345 | 210 | 26.4 | 100.1 |
| Prime Power | | | | | | |
| 100 | 482 | 360 | 0.349 | 212 | 23.4 | 88.7 |
| 75 | 362 | 270 | 0.360 | 219 | 18.1 | 68.8 |
| 50 | 241 | 180 | 0.395 | 240 | 13.3 | 50.2 |
| 25 | 121 | 90 | 0.488 | 297 | 8.2 | 31.1 |
| continuous Power | | | | | | |
| 100 | 432 | 323 | 0.336 | 204 | 20.2 | 76.6 |



Curves shown above represent gross engine performance capabilities obtained and corrected in accordance with GB/T18297 conditions of 29.61 in Hg (100 kPa) barometric pressure [263 ft (80 m) altitude], 77 deg F (25 deg C) inlet air temperature, and 0.30 in Hg (1 kPa) water vapor pressure with No. 2 diesel fuel.

All data obtained is based on the engine operating, under the test conditions of 14.9 in H₂O (3.7kPa) inlet air restriction and 2.95 in Hg (10 kPa) exhaust restriction,not included are alternator, fan, optional equipment and driven components.

The engine may be operated up to 5200 m (17,060 ft.) altitude.



Generator Engine Performance Data

Dongfeng Cummins Engine Co.,Ltd
Xiangyang, Hubei Province, China

Engine Model

QSZ13-G6

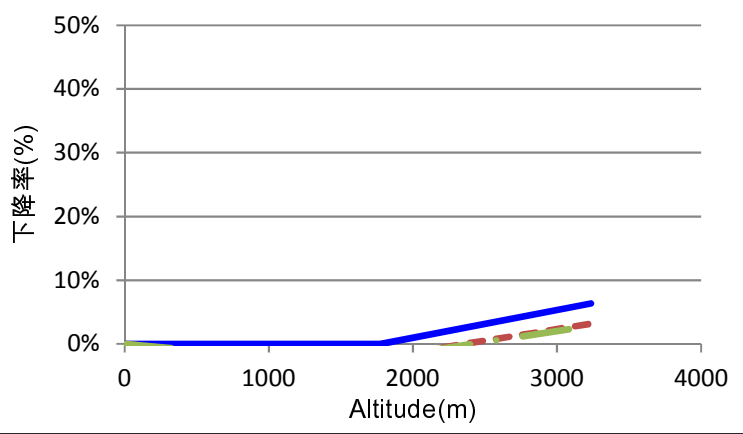
Curve Number

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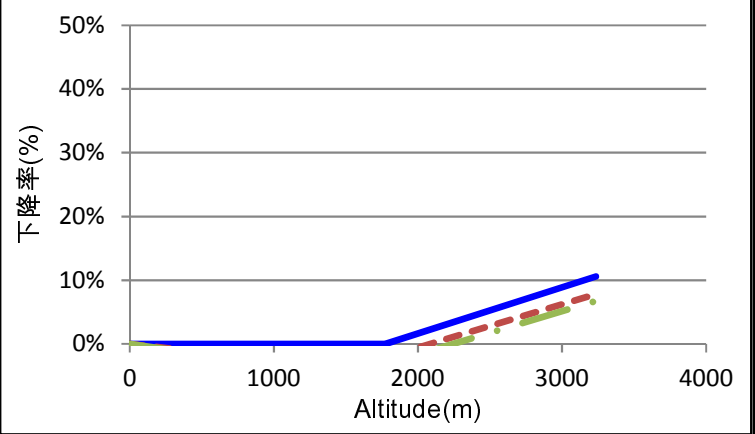
CPL Code

3836

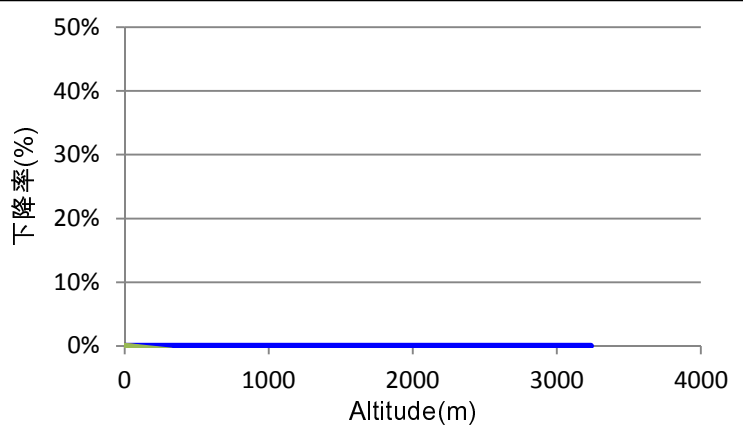
Power Derate Curves @1500 r/min
Standby Power



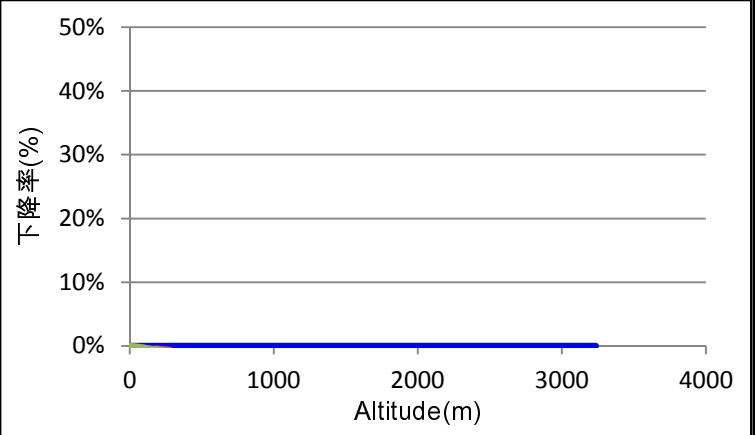
Power Derate Curves @1800 r/min
Standby Power



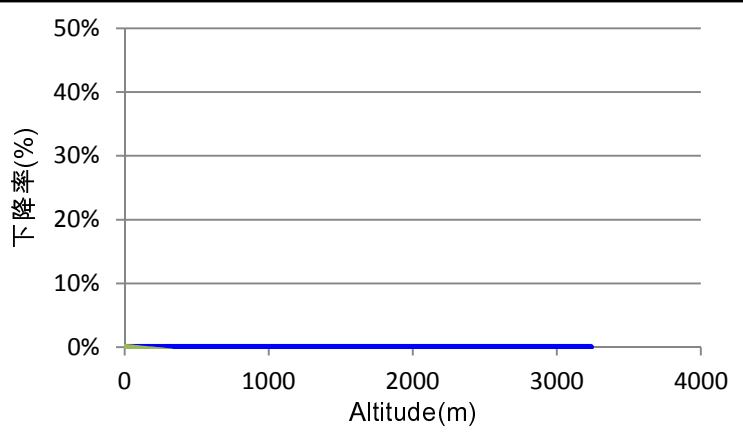
Prime Power



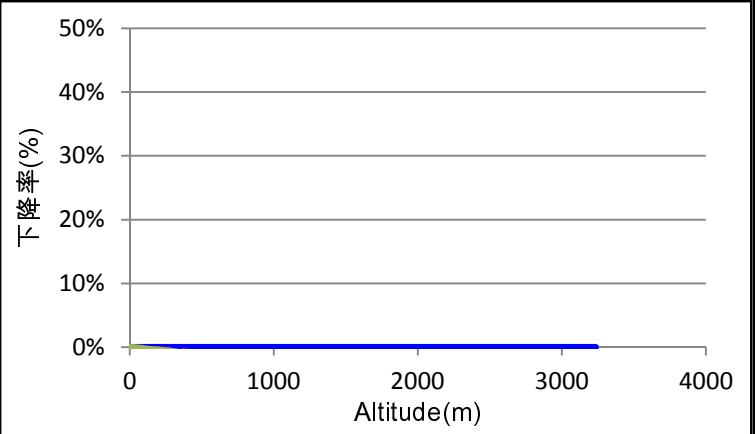
Prime Power



Continuous Power



Continuous Power



— 25 °C (77°F) - - - 15 °C (59°F) ··· 5 °C (41°F)

Engine tested under the ISA conditions of 50 deg C charge temperature, 3.7kPa inlet air restriction and 10 kPa exhaust restriction.



| | | | |
|---|--|--------------------------------|-------------------------|
| Generator Engine Performance Data Dongfeng Cummins Engine Co.,Ltd Xiangyang, Hubei Province, China | Engine Model QSZ13-G6 | Curve Number FR20379 | CPL Code 3836 |
| | | | |

GENERAL ENGINE DATA

| | |
|---|--------------------------------|
| Type: | Four cycle; Inline; 6 Cylinder |
| Aspiration: | Turbocharged Charge Air Cooled |
| Compression Ratio: | 17:1 |
| Fire Order: | 1-5-3-6-2-4 |
| Bore x Stroke: | - mm 130 x 163 |
| Displacement: | - L 13.0 |
| Low Idle Speed: | - r/min 700 |
| Maximum altitude for continuous operation: | - m 5200 |
| Approximate Engine Weight - Dry: | - kg 1245 |
| Approximate Engine Weight - Wet: | - kg 1310 |
| Center of Gravity from front face of block: | - mm 519 |
| Center of Gravity above crankshaft centerline: | - mm 201 |
| Rotation inertia of Complete Engine (without flywheel): | - kg.m ² 1.48 |

ENGINE MOUNTING

| | |
|---|------------|
| Maximum static mounting surface bending moment | |
| Rear face of block: | - N.m 1356 |
| Maximum static bending moment of FAN: | - N.m 21 |
| Maximum allowable weight on Engine Support: | - kg 1500 |

AIR INDUCTION SYSTEM

| | |
|--|-----------|
| Whole air intake pipe size (recommendatory): | - mm 200 |
| Charge air cooler pipe size (recommendatory): | - mm 115 |
| Maximum temperature rise between ambient air and engine air inlet: | - °C 11.1 |
| Maximum Temp. Rise Between Engine Air Intake and Intake Manifold: | - °C 30 |
| Maximum Intake Manifold Temperature (unable to result in power loss at sea level): | - °C 60* |
| Maximum Intake Manifold Temperature for Engine Protection: | - °C 85 |
| Maximum intake air restriction (heavy duty air cleaner): | |
| clean filter: | - kPa 3.2 |
| dirty filter: | - kPa 6.2 |
| Maximum allowable pressure drop across charge air cooler and OEM CAC piping (CACDP): | - kPa 13 |

EXHAUST SYSTEM

| | |
|---|----------|
| Max. back pressure imposed by complete exhaust system: | - kPa 13 |
| Maximum allowable static bending moment at exhaust outlet flange: | - N.m 19 |
| Exhaust pipe size (recommendatory): | - mm 130 |

*When excess the temperature.the durability/reliability/performance of the engine maybe impaired.



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LUBRICATION SYSTEM

| | | |
|---|---------|-----------|
| Oil pressure @ idle - minimum: | - kPa | 82.7 |
| Typical oil pressure range - warm engine: | - kPa | 207 - 300 |
| Total system capacity (standard pan): | - L | 75.33 |
| Maximum lube oil flow to all accessories: | - L/min | 7.57 |

COOLING SYSTEM

| | | |
|--|---------|------|
| Coolant Capacity (Engine Only): | - L | 23.1 |
| Engine coolant circuit thermostat opening temperature: | - °C | 82 |
| Engine coolant circuit thermostat fully open temperature: | - °C | 94 |
| Maximum coolant temperature - engine out: | - °C | 102 |
| Minimum operating block coolant temperature: | - °C | 71 |
| Maximum coolant temperature for engine protection controls: | - °C | 107 |
| Maximum coolant pressure(exclusive of pressure cap; closed thermostat at maximum no load speed): | - kPa | 407 |
| Minimum pressure cap rating at sea level: | - kPa | 103 |
| Maximum Coolant Friction Head External to Engine: | - kPa | 75 |
| Maximum deaeration time: | - min | 25 |
| Minimum fill rate (low level alarm required for most engines): | - L/min | 19 |
| Maximum coolant expansion space (% total system capacity): | - % | 10 |
| Minimum coolant expansion space (% total system capacity): | - % | 6 |

FUEL SYSTEM

| | | |
|---|--------|------|
| Maximum allowable restriction @ OEM point with maximum fuel flow: | - kPa | 13.5 |
| Maximum fuel drain restriction (total head) before (or without) check valve:..... | - kPa | 27 |
| Minimum fuel tank venting requirement: | - L/s | 0.2 |
| Maximum fuel inlet temperature: | - °C | 71 |
| Maximum heat rejection to return fuel..... | - kW | 5.36 |
| Maximum design fuel flow: | - kg/h | 204 |

ELECTRICAL SYSTEM

| | | |
|--|-------|-----|
| System voltage: | - V | 24 |
| Minimum battery capacity-cold soak at -18 C (0 F) or above | | |
| Engine only cold cranking amperes: | - CCA | 900 |
| Engine only reserve capacity: | - min | 270 |

COLD START CAPABILITY

| | | |
|---|------|-----|
| Minimum ambient temperature for unaided cold start: | - °C | -15 |
| Minimum ambient temperature with Intake Air Heater(engine no load): | - °C | -30 |

Exhaust Emissions Data

| | | |
|---------------------------------------|----------|------------|
| Gaseous Emissions per GB 20891-2014: | | 1500 r/min |
| - Weight-Specific NOx+HC: | - g/kW.h | 3.430 |
| - Weight-Specific CO: | - g/kW.h | 0.630 |
| - Weight-Specific Particulates: | - g/kW.h | 0.063 |



Generator Engine Performance Data

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Xiangyang, Hubei Province, China

Engine Model

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Performance Data

All data is based on:

Engine operating with fuel system, water pump, lubricating oil pump and air cleaner; not included are alternator, fan, and optional equipment and driven components.

Test Condition:

- GB18297 Engine test code - Performance
- Barometric Pressure : 100 kPa (29.53 in Hg)
- Air Temperature: 25 °C (77 °F)
- Altitude: 80 m (263 ft)
- Relative Humidity: 50%

Steady State Stability Band at any constant load (+/-):

5%

| | | Standby Power | | Prime Power | |
|---------------------------------|----------------------|---------------|------|-------------|------|
| Engine Speed | r/min | 1500 | 1800 | 1500 | 1800 |
| Gross Engine PowerOutput | kWm | 374 | 410 | 328 | 360 |
| Torque: | N.m | 2381 | 2175 | 2088 | 1910 |
| Brake Mean EffectivePressure | kPa | 2302 | 2103 | 2018 | 1846 |
| Piston Speed | m/s | 8.15 | 9.78 | 8.15 | 9.78 |
| Friction Horsepower | kW | 31 | 45 | 31 | 45 |
| Coolant Flow | L/min | 407 | 483 | 407 | 483 |
| Fuel Consumption | kg/h | 78.2 | 86.1 | 70.2 | 76.3 |
| Engine Data | | | | | |
| Intake Air Flow | m ³ /min. | 28.7 | 33.9 | 27.3 | 33.2 |
| Exhaust Gas Temp - DryStack | °C | 497 | 452 | 484 | 438 |
| Exhaust Gas Flow | kg/min. | 35.2 | 41.5 | 33.3 | 40.5 |
| Air to Fuel ratio | | 26.0 | 27.9 | 27.5 | 30.8 |
| Heat Rejection to Ambient | kW | 61 | 66 | 53 | 58 |
| Heat Rejection to JacketCoolant | kW | 150 | 166 | 134 | 153 |
| Heat Rejection to Exhaust | kW | 323 | 355 | 284 | 311 |
| Heat Rejection to Fuel* | kW | 5 | 5 | 5 | 5 |
| ATA CAC | | | | | |
| Heat Rejection to Aftercooler | kW | 88 | 106 | 76 | 99 |
| TurbochargerCompressor Outlet | kPa | 264 | 270 | 243 | 254 |
| Charge Air Flow | kg/min | 33.9 | 40.0 | 32.2 | 39.2 |
| TurbochargerCompressor Outlet | °C | 207 | 196 | 203 | 194 |

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



Generator Engine Performance Data

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Engine Model

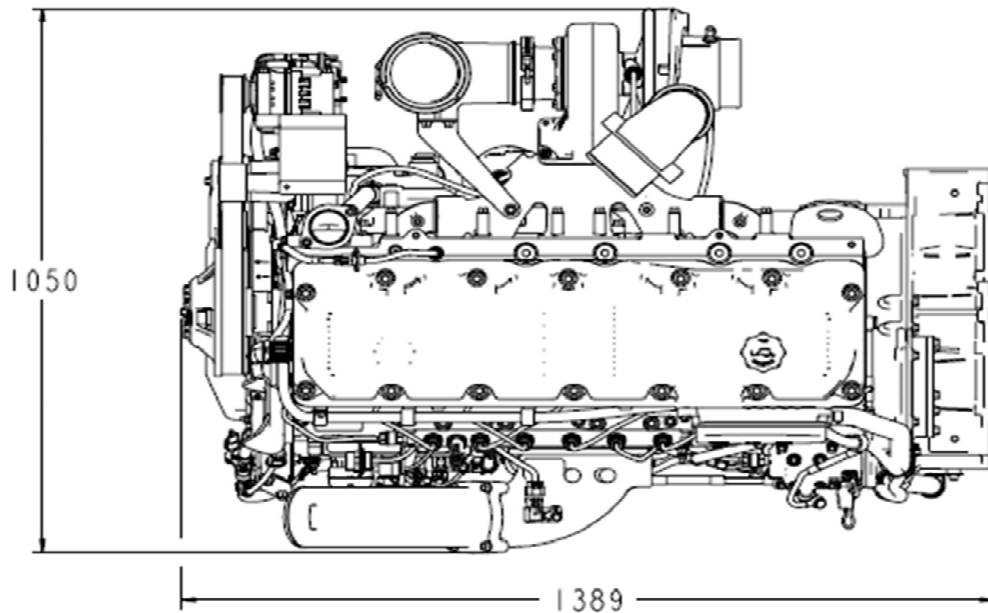
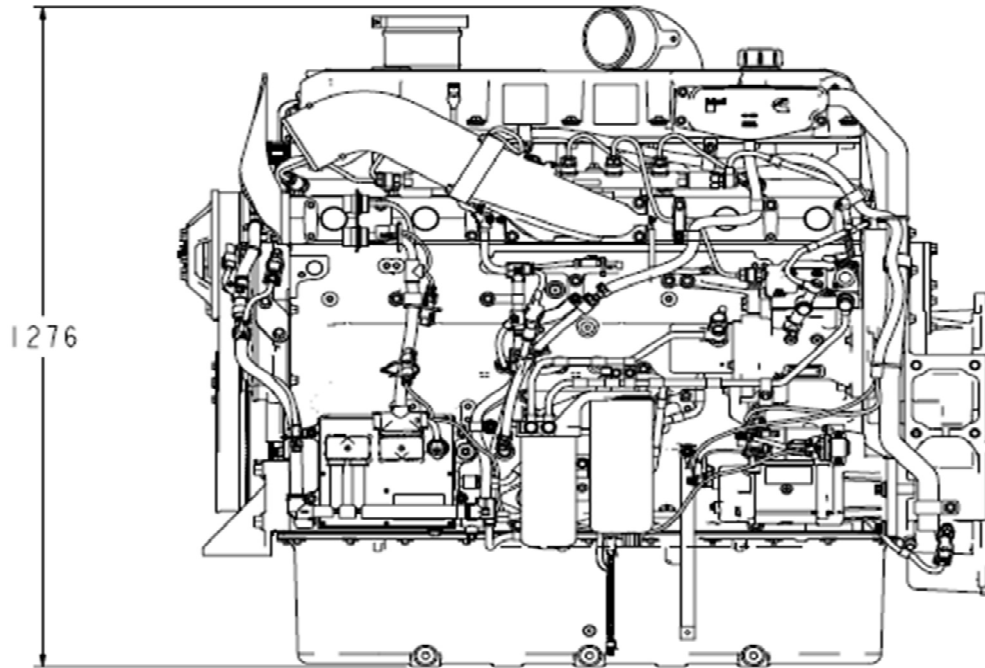
QSZ13-G6

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Generator Engine Performance Data

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STANDBY POWER RATING is 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.

CONTINUOUS POWER RATING is 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.

PRIME POWER RATING is 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

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.

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