

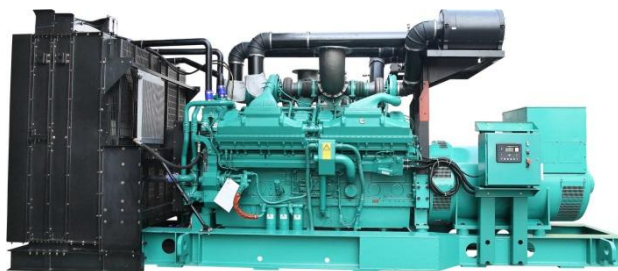
DATA SHEET

DIESEL GENERATOR 2200KW

MODEL#FDK-CG2750/H1

50HZ/1500RPM

CUMMINS MODEL: QSK78-G18



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-CG2750/H1
Prime Power	2200KW/2500KVA
Standby Power	2200KW/2750KVA
Output Frequency / Rated speed	50Hz/1500rpm
Rated Voltage	230V/400V

Engine Make	Cummins UK
Engine Model	QSK78-G18
Alternator model	Stamford LVSI804S
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	QSK78-G18
Engine Manufacturer	Cummins ORIGINAL UK
Cylinder quantity	18
Cylinder Arrangement	60° Vee
Cycle	4

Aspiration	Turbo-charged
Bore x Stroke (mm x mm)	170×190
Displacement	77.6L
Compression Ratio	15.5:1
Prime power / Speed (KW/RPM)	2093kw/1500
Standby power/ Speed (KW/RPM)	2326kw/1500



Type Injection System	Cummins HPI-PT	Fuel Consumption at 100% load (L/H)	481 at 1500rpm
Piston Speed	9.5m/s	Starter motor	DC24V
Friction Energy Output	189kw	Low idle	700-900pm
Total Lubrication System Capacity	465.6L	Coolant Capacity (L)	167

Alternator Specifications

Alternator model	LVSI804S	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	2790 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.



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)	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.**

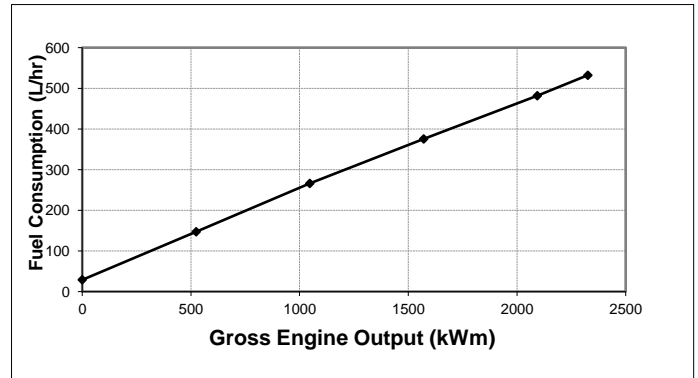


	Engine Performance Data Cummins Inc. Columbus, Indiana 47202-3005 http://www.cummins.com	G-Drive		Date 28-Mar-16		
		QSK78-G18 FR60424		Configuration D773002GX03	CPL 4444	Revision -
Compression Ratio	15.5	Displacement	77.6 L (4735.4 in ³)			
Fuel System	Cummins HPI-PT	Aspiration	Turbocharged and Low Temperature Aftercooled			
Aftertreatment	None	Emission Certification	Non Certified			

Engine Speed		Standby Power		Prime Power		Continuous Power	
rpm		kWm	bhp	kWm	bhp	kWm	bhp
1500		2326	3119	2093	2807	1884	2527

Engine Fuel Consumption @ 1500 rpm

Output Power			Fuel Consumption			
%	kWm	bhp	kg/kWm-hr	lb/bhp-hr	L/hr	US gal/hr
Standby Power						
100	2326	3119	0.195	0.320	532	140.5
Prime Power						
100	2093	2807	0.195	0.321	481	127.0
75	1570	2105	0.203	0.334	375	99.0
50	1047	1404	0.216	0.356	266	70.3
25	523	702	0.240	0.394	148	39.0
Continuous Power						
100	1884	2527	0.199	0.327	441	116.5



Data Subject to Change Without Notice

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 Max 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 NCE 10-97 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 H₂O 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/L (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 : Production

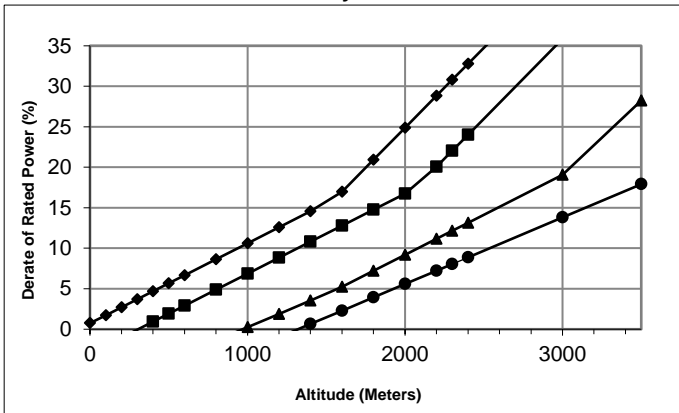
Tolerance : +/- 5%

Chief Engineer

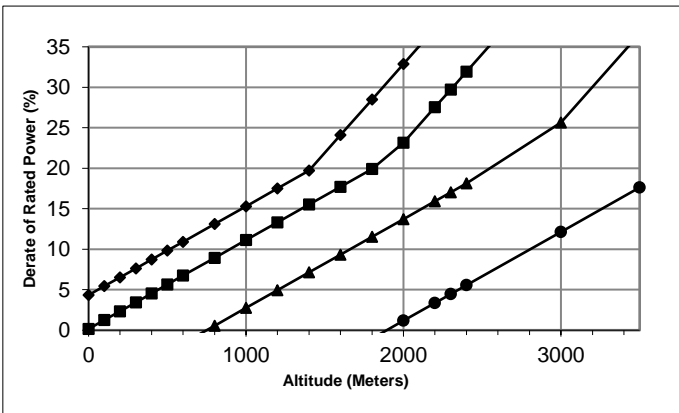


1,500 rpm Power Derate Curves

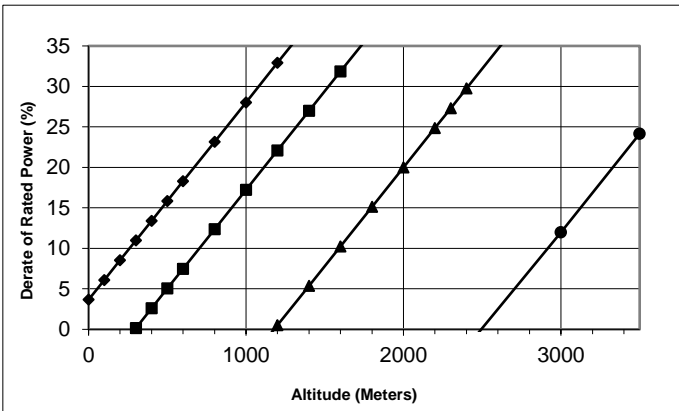
Standby Power



Prime Power



Continuous Power



- ◆ 131 °F (55 °C)
- 122 °F (50 °C)
- ▲ 104 °F (40 °C)
- 77 °F (25 °C)

Operation At Elevated Temperature And Altitude:

For **Standby Operation** above these conditions, derate by an additional 5.9% per 300m (1000 ft), and 17.5% per 10 °C (18 °F).

For **Prime Operation** above these conditions, derate by an additional 6.6% per 300m (1000 ft), and 19.4% per 10 °C (18 °F).

For **Continuous Operation** above these conditions, derate by an additional 7.3% per 300m (1000 ft), and 21.6% per 10 °C (18 °F).

General Engine Data

Installation Drawing Number	4954111		
Type	4-Cycle; 60° Vee; 18-Cylinder Diesel		
Aspiration	Turbocharged and Low Temperature Aftercooled		
Bore x Stroke	in x in (mm x mm)	6.69 x 7.48	(170 x 190)
Displacement	in ³ (L)	4735	(77.6)
Compression Ratio	15.5		
Dry Weight (Approximate)	lbm (kg)	20327	(9220)
Wet Weight (Approximate)	lbm (kg)	21627	(9810)
Aftertreatment Weight (Approximate)	lbm (kg)	N/A	(N/A)
Moment of Inertia of Rotating Components			
with FW 6057 Flywheel, SAE 00	in • lbf • sec ² (kg • m ²)	289.3	(32.69)
Center of Gravity from Rear Face of Block	in (mm)	48.3	(1227)
Center of Gravity Above Crankshaft Centerline	in (mm)	12.0	(305)

Engine Mounting

Max Bending Moment at Rear Face of Block	lb • ft (N • m)	7634	(10350)
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Exhaust System

Max Allowable Static Bending Moment @ Exhaust Outlet Flange	lb • ft (N • m)	N/A	(N/A)
Max Back Pressure at Standby Power (Turbo Outlet)	in Hg (kPa)	2	(6.8)
Pressure Drop Across Aftertreatment	in H ₂ O (kPa)	N/A	(N/A)
Minimum Unaided Operating Temperature	°F (°C)	N/A	(N/A)
Max Ambient Operating Temperature (Warning)	°F (°C)	N/A	(N/A)
Max DEF Supply Flow	US gph (L/hr)	N/A	(N/A)
Max DEF Return Flow	US gph (L/hr)	N/A	(N/A)
Max Static Head (From Pump to Injector)	ft (m)	N/A	(N/A)

Air Induction System

Max Intake Air Restriction			
With Normal Duty Air Cleaner and Clean Filter Element	in H ₂ O (kPa)	15	(3.7)
With Heavy Duty Air Cleaner and Clean Filter Element	in H ₂ O (kPa)	N/A	(N/A)
With Dirty Filter Element	in H ₂ O (kPa)	25	(6.2)

Cooling System**Jacket Water/ High Temperature Circuit Requirements**

Max Coolant Friction Head External to Engine (1500 rpm)	psi (kPa)	7	(48.3)
Engine Water Flow at Stated Friction Head External to Engine:			
2.5 psi Friction Head (1500 rpm)	US gpm (L/m)	524	(1984)
Maximum Friction Head (1500 rpm)	US gpm (L/m)	500	(1893)
Coolant Capacity - Engine	US gal (L)	44.0	(167)
Minimum Pressure Cap Rating at Sea Level	psi (kPa)	11	(75.8)
Max Static Head of Coolant Above Crankshaft Centerline	ft (m)	60	(18.3)
Max Coolant (Top Tank) Temperature for Standby/Prime Power	°F (°C)	220 / 212	(104 / 100)
Thermostat (Modulating) Range	°F (°C)	180 - 200	(82 - 93)
Max Intake Manifold Temp Warning/Shutdown	°F (°C)	N/A / N/A	(N/A / N/A)

Low Temperature Circuit (LTC) Requirements

Max Coolant Friction Head External to Engine (1500 rpm)	psi (kPa)	5	(34.5)
Aftercooler Water Flow at Stated Friction Head External to Engine:			
2.5 psi Friction Head (1500 rpm)	US gpm (L/m)	227	(859)
Maximum Friction Head (1500 rpm)	US gpm (L/m)	218	(825)
Max Coolant Temp into LTC @ 77°F (25°C) Ambient	°F (°C)	120	(49)
Max Coolant Temperature into LTC @			
Limiting Ambient Conditions for Standby	°F (°C)	150 / N/A	(66 / N/A)
Thermostat (Modulating) Range	°F (°C)	115 - 135	(46 - 57)
Coolant Capacity - Aftercooler	US gal (L)	15	(56.8)

Charge Air Cooler Requirements

CAC piping (1500 rpm)	in Hg (kPa)	N/A	(N/A)
Max Charge Air Cooler Outlet to Ambient at 77°F (25°C)(CAC dT)	Δ°F (Δ°C)	N/A	(N/A)

Lubrication System

Oil Pressure at Minimum Idle Speed	psi (kPa)	30	(206.8)
Oil Pressure at Governed Speed	psi (kPa)	60 - 70	(414 - 482.6)
Max Oil Temperature	°F (°C)	250	(121)
Oil Capacity with OP 6156: Low - High	US gal (L)	93.0 - 109.0	(352 - 412.6)
Total System Capacity (With Combo Filter)	US gal (L)	123.0	(465.6)

Fuel System

Max Fuel Supply Restriction at Fuel Pump Inlet (clean/dirty filter)	in Hg (kPa)	5 / 9	(16.9 / 30.5)
Max Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head)	in Hg (kPa)	10	(33.9)
Max Fuel Inlet Temperature	°F (°C)	160	(71)
Max Supply Fuel Flow	US gph (L/hr)	524	(1984)
Max Return Fuel Flow	US gph (L/hr)	500	(1893)

Electrical System

System Voltage	volts	24	N/A
Minimum Recommended Battery Capacity			
Cold Soak @ 0 °F (-18 °C)	CCA	2200	N/A
Max Starting Circuit Resistance	ohm	0.002	N/A
Max Current Draw of the System	Amps	N/A	N/A

Cold Start Capability

Unaided Cold Start			
Minimum Cranking Speed	rpm	N/A	N/A
Minimum Ambient Temp for Unaided Cold Start	°F (°C)	10	(-12)

Performance Data

		STANDBY	PRIME	CONTINUOUS
		50 Hz	50 Hz	50 Hz
Governed Engine Speed	rpm	1500	1500	1500
Engine Idle Speed	rpm	700 - 900	700 - 900	700 - 900
Gross Engine Power Output	bhp (kWm)	3119 (2326)	2807 (2093)	2527 (1884)
Brake Mean Effective Pressure	psi (kPa)	348 (2400)	313 (2159)	282 (1945)
Friction Power	hp (kWm)	253 (189)	253 (189)	253 (189)
Intake Air Flow	ft ³ /min (L/sec)	6601 (3116)	6202 (2928)	5898 (2784)
Exhaust Gas Temp	°F (°C)	791 (422)	773 (412)	759 (404)
Exhaust Gas Flow	ft ³ /min (L/sec)	14727 (6951)	13794 (6511)	13035 (6152)
Air:Fuel Ratio		28.4:1	29.5:1	30.6:1
Radiated Heat to Ambient	BTU/min (kWm)	12170 (214)	11004 (194)	10090 (178)
Heat to JW Radiator	BTU/min (kWm)	47681 (838)	45326 (797)	41512 (730)
Heat to Exhaust	BTU/min (kWm)	77948 (1370)	69171 (1216)	66137 (1162)
* Heat to Fuel	BTU/min (kWm)	2500 (44)	2500 (44)	2500 (44)
Heat to Aftercooler Radiator	BTU/min (kWm)	31635 (556)	28011 (493)	24803 (436)
Charge Air Flow	lb/min (kg/min)	N/A (N/A)	N/A (N/A)	N/A (N/A)
Turbo Comp Outlet Pressure	psi (kPa)	N/A (N/A)	N/A (N/A)	N/A (N/A)
Turbo Comp Outlet Temp	°F (°C)	N/A (N/A)	N/A (N/A)	N/A (N/A)

* This is the maximum heat rejection to fuel.

Noise Emissions

Frequency (Hz)		63	125	250	500	1000	2000	4000	8000	Overall
Sound Power dB(A) ¹²³										
1500 rpm	Engine ⁴	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
50 Hz	Exhaust ⁵	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

1. The test figures quoted are from a single gen-set test and do not constitute a guarantee of performance for any particular engine. The data is subject to instrumentation, measurement, and engine to engine variability.

2. Test reference procedures ISO 3744 and ANSI S12.34-1998 as applicable.

3. All data are "A" weighted and are rounded to the nearest dB.

4. Engine with "typical Radiator and fan", Sound Power (dB).

5. Engine Exhaust at 1 Meter from open stack, Sound Pressure (dB).

Emissions Data

ATTENTION: This data was taken from a single engine test according to the Test Methods and Conditions specified. This data is subject to instrumentation, measurement, and engine-to-engine variability. Field emissions test data is not guaranteed to these levels. For air permit programs, refer to "Not to Exceed" Emissions.

Nominal Exhaust Emissions Data @ 1500 rpm

Component	STANDBY			PRIME			CONTINUOUS		
	g/bhp-hr	mg/m ³	PPM	g/bhp-hr	mg/m ³	PPM	g/bhp-hr	mg/m ³	PPM
HC (Total Unburned Hydrocarbons)	0.14	71	N/A	0.14	67.83	N/A	0.15	72	N/A
Nox (Oxides of Nitrogen as NO ₂)	7.86	3833	N/A	7.42	3574.43	N/A	6.56	3094	N/A
CO (Carbon Monoxide)	0.25	122	N/A	0.25	118.69	N/A	0.21	101	N/A
PM (Particulate Matter)	0.01	5	N/A	0.01	3.58	N/A	0.01	4	N/A
SO ₂ (Sulfur Dioxide)	0.10	40	17	0.10	39.82	16.87	0.10	40	17
CO ₂ (Carbon Dioxide)	465	226185	115194	469	224703	114440	477	223902	114032

Note: mg/m³ and PPM numbers are measured dry and corrected to 5% O₂ content.

Test Methods and Conditions:

Test is to demonstrate compliance with the regulated levels shown above were conducted per 97/68/EC (ref. ISO8178-1) and weighted at load points prescribed 97/68/EC Annex 3, "test procedures" (ref. ISO8178-4,D2).

Fuel Specification:

46.5 Cetane Number, 0.035 Max. Wt. % Sulfur; Reference ISO8178-5, 40CFR86.1313-98 Type 2-D and ASTM D975 No. 2-D.

Reference:

25 °C (77°F) Air inlet Temperature, 40 °C (104°F) Fuel inlet Temperature, 100 kPa (29.53 in Hg) Barometric Pressure; 10.7 g/kg (75 grains H₂O/lb) of dry air Humidity (required for NOx correction); Intake Restriction set to Max allowable limit for clean filter; Exhaust Back Pressure set to Max allowable limit.