



APTIM

8725 Rosehill Rd, Suite 450

Lenexa, KS 66215

TEL: (877) 829-5505

FAX: (225) 987-8573

walmartepmsupport@aptim.com

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MAR - 9 2020
APCD
Stationary
Sources

March 6, 2020

Colorado Department of Public Health & Environment

Air Pollution Control Division

APCD-SS-B1

4300 Cherry Creek Drive South

Denver, CO 80246-1530

Subject: 5-Year APEN Update

Walmart Colorado Data Center, Facility #7497

Colorado Springs, CO

Permit 12EP1155

To Whom It May Concern:

On behalf of Walmart Inc., doing business as Colorado Data Center, Facility #7497 in Colorado Springs, enclosed are the 5-year APEN update forms. This facility is covered under permit 12EP1155. The emissions sources at the facility consist of twelve (12) diesel internal combustion engines powering backup power generators. The facility is permitted for up to twenty-four (24) identical diesel engines to be installed in phases spanning several years; however, to this point only 12 of the 24 generators have been installed. While there are no immediate plans to install any additional generators in the near future, the master plan for the facility still includes future expansion with the addition of the remaining generators. As required by permit 12EP1155, an application for a permit modification will be submitted prior to the installation of any additional generators.

There have been NO changes to the existing 12 diesel engines at the facility and this submittal is not seeking to change any of the operating limits in permit 12EP1155.

The table below identifies the engines at the facility and those that are planned for the future.

Emission Source (as identified in Permit 12EP1155)	Emission Source (Walmart's ID #)	AIRS ID Number	Year of Initial Operation
Generator #1	Generator #10	041 / 2067 / 001	2012
Generator #2	Generator #11	041 / 2067 / 002	2012
Generator #3	Generator #12	041 / 2067 / 003	2012
Generator #4	Same as permit	041 / 2067 / 004	2012
Generator #5	Same as permit	041 / 2067 / 005	2012
Generator #6	Same as permit	041 / 2067 / 006	2012
Generator #7	Same as permit	041 / 2067 / 007	2016

Emission Source (as identified in Permit 12EP1155)	Emission Source (Walmart's ID #)	AIRS ID Number	Year of Initial Operation
Generator #8	Same as permit	041 / 2067 / 008	2016
Generator #9	Same as permit	041 / 2067 / 009	2016
Generator #10	Generator #1	041 / 2067 / 010	2016
Generator #11	Generator #2	041 / 2067 / 011	2016
Generator #12	Generator #3	041 / 2067 / 012	2016
Generator #13	Same as permit	041 / 2067 / 013	2023 (projected)
Generator #14	Same as permit	041 / 2067 / 014	2023 (projected)
Generator #15	Same as permit	041 / 2067 / 015	2023 (projected)
Generator #16	Same as permit	041 / 2067 / 016	2023 (projected)
Generator #17	Same as permit	041 / 2067 / 017	2023 (projected)
Generator #18	Same as permit	041 / 2067 / 018	2023 (projected)
Generator #19	Same as permit	041 / 2067 / 019	2025 (projected)
Generator #20	Same as permit	041 / 2067 / 020	2025 (projected)
Generator #21	Same as permit	041 / 2067 / 021	2025 (projected)
Generator #22	Same as permit	041 / 2067 / 022	2025 (projected)
Generator #23	Same as permit	041 / 2067 / 023	2025 (projected)
Generator #24	Same as permit	041 / 2067 / 024	2025 (projected)

Included with this submittal are the following documents:

- Credit Card Authorization Form for APEN fee payments (24 APENs @\$191.13 each).
- Form APCD-233, Compression Ignition Engine APEN, 1 for all 24 engines
- Form APCD-214, 40 CFR Part 60, Subpart IIII Addendum Form for Diesel Engines, 1 for all 24 engines
- Emissions calculations for each engine based on 2019 hours of operation as reported on the APCD-233.
- Genset/engine specifications including manufacturer's emissions data used in calculations.
- Site Plan for informative purposes. There have been no changes to the site plan previously submitted in 2015.
- Copy of the limited Power of Attorney signed by Walmart's Sr. Vice President and Chief Ethics and Compliance Officer designating APTIM as an authorized representative of Walmart regarding environmental permitting matters and granting APTIM the authority to sign permit-related documents on Walmart's behalf.

Any questions specific to this submittal may be directed to my attention at the contact information provided below.
Thank you.

Michael Lewis

Michael Lewis, P.E.
Sr. Environmental Engineer
913-317-2630
michael.lewis@aptim.com



December 9, 2019

RE: Walmart / APTIM Partnership for Managing Permitting Requirements

To Whom It May Concern:

This letter is to inform you that Walmart Inc. has contracted with APTIM Environmental & Infrastructure, Inc. (APTIM) to manage **environmental related permit renewals** for an indefinite period of time. Environmental permitting, registration, and notification responsibilities are being handled by APTIM.

Please note: Submittals that do not come from APTIM should not be returned to APTIM, these should be sent back to the original party who submitted them.

Walmart has provided the attached limited Power of Attorney which provides APTIM the authority to sign applications as an agent for Walmart Inc. and its subsidiaries.

Any future correspondence, permits and associated **renewal** invoices for **environmental related items** should be provided to:

**APTIM Licensing Support
8725 Rosehill Road, Suite 450
Lenexa, KS 66215**

If you have any additional questions, please contact APTIM at the following:

Phone: 877-829-5505

Fax: 225-987-8573

Email: walmartepmsupport@aptim.com

Thank you,
APTIM Licensing Support

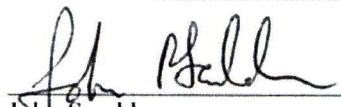
SPECIAL POWER OF ATTORNEY

We, **JOHN SCUDDER**, Senior Vice President and U.S. Chief Ethics and Compliance Officer, and **DANIEL RICE**, Assistant Secretary, acting on behalf of **WALMART INC.**, in its own capacity, and in its capacity as parent corporation of wholly-owned subsidiaries **SAM'S WEST, INC.**, **SAM'S REAL ESTATE BUSINESS TRUST**, **SAM'S EAST, INC.**, **WAL-MART REALTY CO.**, **WAL-MART PROPERTY CO.**, **WAL-MART STORES EAST, LP**, **WAL-MART LOUISIANA, LLC.**, **WAL-MART STORES TEXAS, LLC.**, **WAL-MART STORES ARKANSAS, LLC.**, **WALMART FULFILLMENT SERVICES, LLC.**, and **WAL-MART REAL ESTATE BUSINESS TRUST** (collectively, the "SUBSIDIARIES"), do hereby appoint **APTIM ENVIRONMENTAL & INFRASTRUCTURE, INC.**, of 4171 Essen Lane, Baton Rouge, Baton Rouge Parrish, Louisiana, as our attorney in fact to act in our place for the purpose of signing and processing the following on behalf of **WALMART INC.** and **SUBSIDIARIES**:

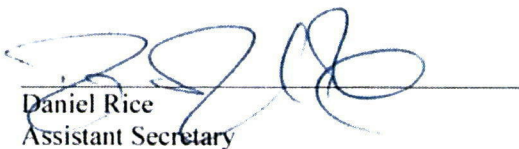
- (i) All documents required by any governmental agency regarding new environmental permits and renewal of existing environmental permits required for **WALMART INC.** or **SUBSIDIARIES**;
- (ii) All documentation required to update the corporate records on file with governmental agencies identifying the Officers authorized to sign documents on behalf of **WALMART INC.** or **SUBSIDIARIES**; and

We further grant to our attorney in fact full authority to act in any manner both proper and necessary to the exercise of the foregoing powers, including the full power of substitution and revocation, and ratify every act that they may lawfully perform in exercising those powers. This power of attorney is granted for the period beginning on the execution date below until December 31, 2020.

Executed on December 5, 2019, at Bentonville, Arkansas.



John Scudder
SVP, U.S. Chief Ethics and Compliance Officer



Daniel Rice
Assistant Secretary

ACKNOWLEDGEMENT

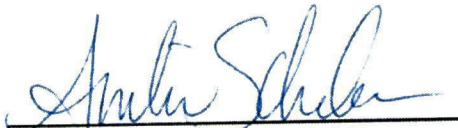
STATE OF ARKANSAS

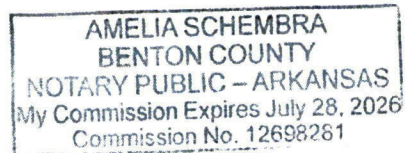
COUNTY OF BENTON

On December 5, 2019, before me, Amelia Schembra,
Notary Public, personally appeared **JOHN SCUDDER** and **DANIEL RICE**, acting on
behalf of **WALMART INC.**, who proved to me on the basis of satisfactory evidence to
be the persons whose names are subscribed to the within instrument and acknowledged to
me that they executed the same in their authorized capacities, and that by their signatures
on the instrument the persons, or entity upon behalf of which the persons acted, executed
the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of Arkansas that the
foregoing paragraph is true and correct.

WITNESS my hand and official seal.


Signature of Notary Public



My Commission expires: 7/28/26

Walmart Data Center - Colorado Springs, CO - Altitude Corrections

ENGINE POWER ALTITUDE DERATE

Maximum engine power at sea level (all temps): 3,634 BHP

Site Conditions:

Altitude: 6707 ft

*Ambient Operating Temperature: 70 F

* = All engines are located inside the building. Average room temperature of 70 F assumed.

Altitude Derated Engine Power:

Altitude	BHP ^[1] @ 70 F
6,000	3,270
6,707	x
7,000	3,142

x = maximum engine power at site conditions (i.e., derated engine power)

Using linear interpolation, $x = 3270 + [(3142 - 3270) * (6707 - 6000) / (7000 - 6000)]$

x = **3,180 BHP**

^[1] BHP data from "Altitude Corrected Power Capability (BHP)" table contained in Caterpillar's performance data document DM9228 for Caterpillar engine model 3516C.

Manufacturer's Emissions Data At Derated Power:

BHP	NOx ^[2]	CO ^[2]	VOC ^[2]	PM ^[2]
3,633	5.32	0.42	0.1	0.04
3,180	a	b	c	d
2,760	4.3	0.26	0.14	0.03

^[2] All emission rates in g/HP-hr. Emission rates at 100% load (3,633 BHP) and 75% load (2,760 BHP) taken from Caterpillar nominal emissions data table contained in performance document DM8266 for Caterpillar engine model 3516C.

Using linear interpolation:

a = NOx emission rate at derated engine power

$a = 4.30 + [(5.32 - 4.30) * (3180 - 2760) / (3633 - 2760)]$

a = **4.79** g/HP-hr

b = CO emission rate at derated engine power

$b = 0.26 + [(0.42 - 0.26) * (3180 - 2760) / (3633 - 2760)]$

b = **0.34** g/HP-hr

c = VOC emission rate at derated engine power

$c = 0.14 + [(0.1 - 0.14) * (3180 - 2760) / (3633 - 2760)]$

c = **0.12** g/HP-hr

d = PM emission rate at derated engine power

$d = 0.03 + [(0.04 - 0.03) * (3180 - 2760) / (3633 - 2760)]$

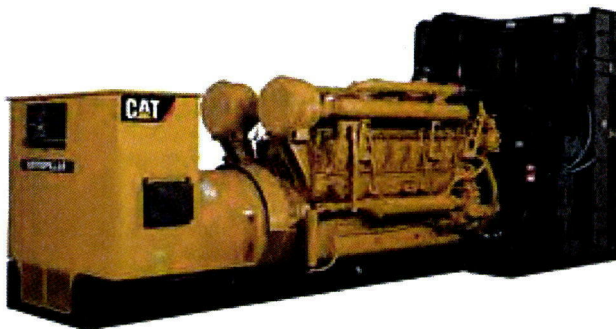
d = **0.03** g/HP-hr

3516C Generator Set

Electric Power



Caterpillar is leading the power generation marketplace with Power Solutions engineered to deliver unmatched flexibility, expandability, reliability, and cost-effectiveness.



Specifications

Generator Set Specifications	
Voltage	220 to 13800 volts
Minimum Rating	1650 ekW (2500 kVA)
Maximum Rating	2500 ekW (2750 kVA)
Frequency	50 or 60 Hz
Speed	1500 or 1800 RPM

Generator Set Configurations	
Emissions/Fuel Strategy	EPA Certified for Stationary Emergency Application (Emits Equivalent U.S. EPA Tier 2 Nonroad Standards), Low Fuel Consumption

Engine Specifications		
Engine Model	3516C, ATAAC, V-16,4-Stroke Water-Cooled Diesel	
Bore	170 mm	6.69 in
Stroke (Std)	190 mm	7.48 in
Stroke (HD)	215 mm	8.46 in
Compression Ratio	14.7:1	
Aspiration	TA	
Governor Type	Adem™3	
Fuel System	Electronic unit injection	

Benefits And Features

Cat Diesel Engine

- Reliable, rugged, durable design
- Field-proven in thousands of applications worldwide
- Four-stroke-cycle diesel engine combines consistent performance and excellent fuel economy with minimum weight

Generator

- Matched to the performance and output characteristics of Cat engines
- Industry leading mechanical and electrical design
- Industry leading motor starting capabilities
- High Efficiency

Cat EMCP Control Panel

The EMCP controller features the reliability and durability you have come to expect from your Cat equipment. EMCP4 is a scalable control platform designed to ensure reliable generator set operation, providing extensive information about power output and engine operation. EMCP4 systems can be further customized to meet your needs through programming and expansion modules.

Seismic Certification

- Seismic Certification available.
- Anchoring details are site specific, and are dependent on many factors such as generator set size, weight, and concrete strength.
- IBC Certification requires that the anchoring system used is reviewed and approved by a Professional Engineer
- Seismic Certification per Applicable Building Codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007, CBC 2010
- Pre-approved by OSHPD and carries an OSP-0321-10 for use in healthcare projects in California

Design Criteria

The generator set accepts 100% rated load in one step per NFPA 110 and meets ISO 8528-5 transient response.

UL 2200 / CSA - Optional

- UL 2200 listed packages
- CSA Certified
- Certain restrictions may apply.
- Consult with your Cat® Dealer.

Single-Source Supplier

Fully prototype tested with certified torsional vibration analysis available

World Wide Product Support

Cat Dealers provide extensive post sale support including maintenance and repair agreements. Cat dealers have over 1,800 dealer branch stores operating in 200 countries. The Cat® SOSSM program cost effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products.

Standard Equipment

Air Inlet

- Air Cleaner

Cooling

- Package mounted radiator

Exhaust

- Exhaust flange outlet

Fuel

- Primary fuel filter with integral water separator
- Secondary fuel filter
- Fuel priming pump

Generator

- Matched to the performance and output characteristics of Cat engines
- IP23 Protection

Power Termination

- Bus Bar

Control Panel

- EMCP 4 Genset Controller

General

- Paint - Caterpillar Yellow except rails and radiators gloss black

Optional Equipment

Exhaust

- Exhaust mufflers

Generator

- Anti-condensation heater
- Excitation: [] Permanent Magnet Excited (PM) [] Internally Excited (IE)
- Oversize and premium generators

Power Termination

- Circuit breakers, UL listed
- Circuit breakers, IEC compliant

Control Panels

- EMCP (4.2) (4.3) (4.4)
- Generator temperature monitoring & protection
- Load share module
- Digital I/O module
- Remote monitoring software

Mounting

- Rubber anti-vibration mounts
- Spring-type vibration isolator
- IBC isolators

Starting/Charging

- Battery chargers
- Oversize batteries
- Jacket water heater
- Heavy-duty starting system
- Charging alternator
- Air starting motor with control and silencer

General

- The following options are based on regional and product configuration:
- Seismic Certification per applicable building codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007
- UL 2200 package
- EU Certificate of Conformance (CE)
- CSA Certification
- EEC Declaration of Conformity
- Enclosures: sound attenuated, weather protective
- Automatic transfer switches (ATS)
- Integral & sub-base fuel tanks
- Integral & sub-base UL listed dual wall fuel tanks

The International System of Units (SI) is used in this publication. CAT, CATERPILLAR, their respective logos, ADEM, EUI, S-O-S, "Caterpillar Yellow" and the "Power Edge" trade dress, as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.

ELECTRIC POWER - Technical Spec Sheet STANDARD



3516C

2500 ekW/ 3125 kVA/ 60 Hz/ 1800 rpm/ 12470 V/ 0.8 Power Factor

Rating Type: STANDBY

Emissions: EPA Certified for Stationary Emergency
Application (Emits Equivalent U.S. EPA Tier 2 Nonroad
Standards)

3516C

2500 ekW/ 3125 kVA
60 Hz/ 1800 rpm/ 12470 V

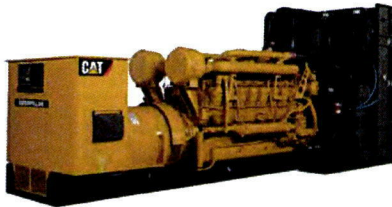


Image shown may not reflect actual configuration

Metric

English

Package Performance

Genset Power Rating with Fan @ 0.8 Power Factor	2500 ekW	
Genset Power Rating	3125 kVA	
Aftercooler (Separate Circuit)	N/A	N/A

Fuel Consumption

100% Load with Fan	656.8 L/hr	173.5 gal/hr
75% Load with Fan	510.8 L/hr	134.9 gal/hr
50% Load with Fan	372.4 L/hr	98.4 gal/hr
25% Load with Fan	219.3 L/hr	57.9 gal/hr

Cooling System¹

Engine Coolant Capacity	233.0 L	61.6 gal
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Inlet Air

Combustion Air Inlet Flow Rate	204.2 m ³ /min	7212.2 cfm
Max. Allowable Combustion Air Inlet Temp	50 ° C	122 ° F

Exhaust System

Exhaust Stack Gas Temperature	490.7 ° C	915.2 ° F
Exhaust Gas Flow Rate	554.5 m ³ /min	19578.8 cfm
Exhaust System Backpressure (Maximum Allowable)	6.7 kPa	27.0 in. water

ELECTRIC POWER - Technical Spec Sheet STANDARD



3516C

2500 ekW/ 3125 kVA/ 60 Hz/ 1800 rpm/ 12470 V/ 0.8 Power Factor

Rating Type: STANDBY

Emissions: EPA Certified for Stationary Emergency
Application (Emits Equivalent U.S. EPA Tier 2 Nonroad
Standards)

Heat Rejection		
Heat Rejection to Jacket Water	826 kW	46992 Btu/min
Heat Rejection to Exhaust (Total)	2502 kW	142265 Btu/min
Heat Rejection to Aftercooler	786 kW	44723 Btu/min
Heat Rejection to Atmosphere from Engine	161 kW	9146 Btu/min
Heat Rejection to Atmosphere from Generator	107 kW	6079 Btu/min

Alternator ²	
Motor Starting Capability @ 30% Voltage Dip	4478 skVA
Current	145 amps
Frame Size	2770
Excitation	PM
Temperature Rise	130 ° C

Emissions (Nominal) ³		
NOx	2349.1 mg/Nm ³	5.3 g/hp-hr
CO	195.4 mg/Nm ³	0.4 g/hp-hr
HC	42.1 mg/Nm ³	0.1 g/hp-hr
PM	14.1 mg/Nm ³	0.0 g/hp-hr

DEFINITIONS AND CONDITIONS

1. For ambient and altitude capabilities consult your Cat dealer. Air flow restriction (system) is added to existing restriction from factory.
2. UL 2200 Listed packages may have oversized generators with a different temperature rise and motor starting characteristics. Generator temperature rise is based on a 40° C ambient per NEMA MG1-32.
3. Emissions data measurement procedures are consistent with those described in EPA CFR 40 Part 89, Subpart D & E and ISO8178-1 for measuring HC, CO, PM, NOx. Data shown is based on steady state operating conditions of 77° F, 28.42 in HG and number 2 diesel fuel with 35° API and LHV of 18,390 btu/lb. The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% load and thus cannot be used to compare to EPA regulations which use values based on a weighted cycle.

ELECTRIC POWER - Technical Spec Sheet STANDARD



3516C

2500 ekW/ 3125 kVA/ 60 Hz/ 1800 rpm/ 12470 V/ 0.8 Power Factor

Rating Type: STANDBY

Emissions: EPA Certified for Stationary Emergency
Application (Emits Equivalent U.S. EPA Tier 2 Nonroad
Standards)

Applicable Codes and Standards:

AS1359, CSA C22.2 No100-04, UL142, UL489, UL869, UL2200,
NFPA37, NFPA70, NFPA99, NFPA110, IBC, IEC60034-1, ISO3046, ISO8528,
NEMA MG1-22, NEMA MG1-33, 72/23/EEC, 98/37/EC, 2004/108/EC

Note: Codes may not be available in all model configurations. Please consult your local Cat Dealer representative for availability.

STANDBY: Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Ratings are based on SAE J1349 standard conditions. These ratings also apply at ISO3046 standard conditions

Fuel Rates are based on fuel oil of 35° API [16° C (60° F)] gravity having an LHV of 42 780 kJ/kg (18,390 Btu/lb) when used at 29° C (85° F) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.). Additional ratings may be available for specific customer requirements, contact your Cat representative for details. For information regarding Low Sulfur fuel and Biodiesel capability, please consult your Cat dealer.

www.Cat-ElectricPower.com

Performance No.: DM8266-04

Feature Code: 516DE8G

Generator Arrangement: 3111156

Date: 02/26/2015

Source Country: U.S.

The International System of Units (SI) is used in this publication. CAT, CATERPILLAR, their respective logos, ADEM, EUI, S-O-S, "Caterpillar Yellow" and the "Power Edge" trade dress, as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.

PERFORMANCE DATA[DM8266]

January 27, 2015

Performance Number: DM8266

Change Level: 04

SALES MODEL: 3516C
ENGINE POWER (BHP): 3,634
GEN POWER WITH FAN (EKW): 2,500.0
COMPRESSION RATIO: 14.7
RATING LEVEL: STANDBY
PUMP QUANTITY: 2
FUEL TYPE: DIESEL
MANIFOLD TYPE: DRY
GOVERNOR TYPE: ADEM3
ELECTRONICS TYPE: ADEM3
CAMSHAFT TYPE: STANDARD
IGNITION TYPE: CI
INJECTOR TYPE: EUI
FUEL INJECTOR: 2501368
REF EXH STACK DIAMETER (IN): 12
MAX OPERATING ALTITUDE (FT): 2,953

COMBUSTION: DI
ENGINE SPEED (RPM): 1,800
HERTZ: 60
FAN POWER (HP): 130.1
ASPIRATION: TA
AFTERCOOLER TYPE: ATAAC
AFTERCOOLER CIRCUIT TYPE: JW+OC, ATAAC
INLET MANIFOLD AIR TEMP (F): 122
JACKET WATER TEMP (F): 210.2
TURBO CONFIGURATION: PARALLEL
TURBO QUANTITY: 4
TURBOCHARGER MODEL: GT6041BN-48T-1.10
CERTIFICATION YEAR: 2006
CRANKCASE BLOWBY RATE (FT3/HR): 3,619.4
FUEL RATE (RATED RPM) NO LOAD (GAL/HR): 16.2
PISTON SPD @ RATED ENG SPD (FT/MIN): 2,539.4

INDUSTRY	SUBINDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	PACKAGED GENSET
OIL AND GAS	LAND PRODUCTION	PACKAGED GENSET

General Performance Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	IN-HG	DEG F
2,500.0	100	3,633	336	0.334	173.5	78.1	121.9	1,235.6	67.6	915.2
2,250.0	90	3,283	303	0.335	157.1	71.3	119.4	1,190.0	61.3	881.2
2,000.0	80	2,935	271	0.339	142.3	64.3	116.9	1,158.9	55.3	864.0
1,875.0	75	2,760	255	0.342	134.9	60.7	115.8	1,145.6	52.3	858.5
1,750.0	70	2,586	239	0.346	127.6	57.0	114.7	1,133.3	49.3	854.6
1,500.0	60	2,237	207	0.354	113.0	49.5	112.7	1,112.4	43.2	851.2
1,250.0	50	1,889	174	0.365	98.4	41.3	111.0	1,091.8	36.8	850.7
1,000.0	40	1,547	143	0.373	82.5	31.4	109.4	1,061.5	29.3	856.6
750.0	30	1,203	111	0.385	66.2	21.7	107.9	1,010.3	22.1	848.2
625.0	25	1,029	95	0.394	57.9	17.2	107.2	968.3	18.7	831.1
500.0	20	854	79	0.403	49.2	12.7	106.4	902.0	15.5	796.1
250.0	10	497	46	0.441	31.3	4.8	104.1	700.7	9.8	647.3

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
EKW	%	BHP	IN-HG	DEG F	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
2,500.0	100	3,633	85	466.7	7,212.2	19,578.8	32,046.3	33,260.4	7,001.7	6,362.4
2,250.0	90	3,283	78	443.0	6,831.8	17,980.7	30,219.3	31,318.8	6,593.0	6,013.7
2,000.0	80	2,935	70	417.8	6,404.5	16,560.6	28,284.6	29,277.2	6,151.5	5,625.4
1,875.0	75	2,760	66	404.7	6,173.3	15,893.2	27,261.3	28,202.4	5,928.1	5,427.1
1,750.0	70	2,586	63	391.2	5,929.9	15,232.6	26,196.0	27,086.8	5,698.4	5,222.0
1,500.0	60	2,237	55	363.5	5,411.9	13,879.0	23,947.5	24,739.5	5,205.5	4,779.1
1,250.0	50	1,889	46	334.6	4,843.3	12,413.0	21,444.3	22,133.2	4,657.5	4,283.2
1,000.0	40	1,547	36	297.5	4,121.4	10,609.5	18,262.0	18,840.0	3,963.0	3,647.2
750.0	30	1,203	25	249.8	3,423.0	8,763.8	15,175.3	15,640.3	3,294.6	3,037.8
625.0	25	1,029	21	223.4	3,104.6	7,844.6	13,765.1	14,171.8	2,988.1	2,760.8
500.0	20	854	16	197.2	2,791.2	6,823.5	12,376.2	12,722.2	2,671.7	2,476.1
250.0	10	497	7	152.3	2,237.9	4,800.2	9,917.6	10,136.8	2,132.0	1,999.8

Heat Rejection Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHAUST RECOVERY TO 350F	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
EKW	%	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
2,500.0	100	3,633	46,992	9,146	142,265	79,907	19,835	44,723	154,077	372,403	396,702
2,250.0	90	3,283	44,242	8,557	127,929	70,449	17,960	39,380	139,243	337,204	359,207
2,000.0	80	2,935	41,477	8,162	116,879	63,561	16,262	34,167	124,444	305,311	325,233
1,875.0	75	2,760	40,076	8,007	111,588	60,518	15,425	31,612	117,053	289,608	308,505
1,750.0	70	2,586	38,657	7,874	106,293	57,637	14,588	29,085	109,651	273,881	291,752
1,500.0	60	2,237	35,755	7,684	95,729	52,220	12,915	24,201	94,874	242,485	258,307
1,250.0	50	1,889	32,626	7,527	85,184	46,626	11,245	19,401	80,109	211,118	224,893
1,000.0	40	1,547	29,235	7,262	72,693	40,153	9,427	13,873	65,583	176,995	188,544
750.0	30	1,203	25,476	6,784	59,425	32,726	7,565	8,706	51,005	142,037	151,305
625.0	25	1,029	23,394	6,435	52,542	28,568	6,621	6,496	43,653	124,317	132,429
500.0	20	854	21,006	5,995	44,739	23,683	5,624	4,534	36,223	105,594	112,484
250.0	10	497	15,737	5,026	27,795	12,371	3,578	1,916	21,071	67,181	71,564

Emissions Data

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN	EKW	2,500.0	1,875.0	1,250.0	625.0	250.0
PERCENT LOAD	%	100	75	50	25	10
ENGINE POWER	BHP	3,633	2,760	1,889	1,029	497
TOTAL NOX (AS NO2)	G/HR	22,948	14,101	7,004	3,568	3,185
TOTAL CO	G/HR	2,726	1,304	1,092	1,496	2,098
TOTAL HC	G/HR	500	499	543	408	437
PART MATTER	G/HR	185.5	123.7	132.1	139.5	141.0
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	2,818.9	2,229.5	1,544.3	1,352.7	2,230.2
TOTAL CO	(CORR 5% O2) MG/NM3	351.8	213.9	252.3	594.6	1,552.7
TOTAL HC	(CORR 5% O2) MG/NM3	55.9	72.8	108.8	140.7	282.4
PART MATTER	(CORR 5% O2) MG/NM3	19.7	16.5	25.8	48.5	88.2
TOTAL NOX (AS NO2)	(CORR 5% O2) PPM	1,373	1,086	752	659	1,086
TOTAL CO	(CORR 5% O2) PPM	281	171	202	476	1,242
TOTAL HC	(CORR 5% O2) PPM	104	136	203	263	527
TOTAL NOX (AS NO2)	G/HP-HR	6.38	5.15	3.74	3.50	6.47
TOTAL CO	G/HP-HR	0.76	0.48	0.58	1.47	4.26
TOTAL HC	G/HP-HR	0.14	0.18	0.29	0.40	0.89
PART MATTER	G/HP-HR	0.05	0.05	0.07	0.14	0.29
TOTAL NOX (AS NO2)	LB/HR	50.59	31.09	15.44	7.87	7.02
TOTAL CO	LB/HR	6.01	2.88	2.41	3.30	4.62
TOTAL HC	LB/HR	1.10	1.10	1.20	0.90	0.96
PART MATTER	LB/HR	0.41	0.27	0.29	0.31	0.31

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN	EKW	2,500.0	1,875.0	1,250.0	625.0	250.0
PERCENT LOAD	%	100	75	50	25	10
ENGINE POWER	BHP	3,633	2,760	1,889	1,029	497
TOTAL NOX (AS NO2)	G/HR	19,123	11,751	5,837	2,974	2,654
TOTAL CO	G/HR	1,515	725	607	831	1,165
TOTAL HC	G/HR	376	375	408	307	329
TOTAL CO2	KG/HR	1,740	1,340	966	559	296
PART MATTER	G/HR	132.5	88.4	94.3	99.6	100.7
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	2,349.1	1,857.9	1,286.9	1,127.3	1,858.5
TOTAL CO	(CORR 5% O2) MG/NM3	195.4	118.8	140.1	330.3	862.6
TOTAL HC	(CORR 5% O2) MG/NM3	42.1	54.8	81.8	105.8	212.3
PART MATTER	(CORR 5% O2) MG/NM3	14.1	11.8	18.4	34.7	63.0
TOTAL NOX (AS NO2)	(CORR 5% O2) PPM	1,144	905	627	549	905
TOTAL CO	(CORR 5% O2) PPM	156	95	112	264	690
TOTAL HC	(CORR 5% O2) PPM	79	102	153	197	396
TOTAL NOX (AS NO2)	G/HP-HR	5.32	4.30	3.12	2.92	5.39
TOTAL CO	G/HP-HR	0.42	0.26	0.32	0.82	2.37
TOTAL HC	G/HP-HR	0.10	0.14	0.22	0.30	0.67
PART MATTER	G/HP-HR	0.04	0.03	0.05	0.10	0.20
TOTAL NOX (AS NO2)	LB/HR	42.16	25.91	12.87	6.56	5.85
TOTAL CO	LB/HR	3.34	1.60	1.34	1.83	2.57
TOTAL HC	LB/HR	0.83	0.83	0.90	0.68	0.72
TOTAL CO2	LB/HR	3,836	2,955	2,130	1,233	654
PART MATTER	LB/HR	0.29	0.19	0.21	0.22	0.22
OXYGEN IN EXH	%	9.4	10.4	11.3	12.2	14.4
DRY SMOKE OPACITY	%	1.7	1.4	1.9	2.5	3.8
BOSCH SMOKE NUMBER		0.58	0.49	0.62	0.92	1.27

Regulatory Information

EPA TIER 2			2006 - 2010	
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 89 SUBPART D AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.				
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 2	CO: 3.5 NOx + HC: 6.4 PM: 0.20

EPA EMERGENCY STATIONARY			2011 - —	
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE EMERGENCY STATIONARY REGULATIONS.				
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	STATIONARY	EMERGENCY STATIONARY	CO: 3.5 NOx + HC: 6.4 PM: 0.20

Altitude Derate Data

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	50	60	70	80	90	100	110	120	130	NORMAL
ALTITUDE (FT)										
0	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634
1,000	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,625	3,563	3,634
2,000	3,634	3,634	3,634	3,634	3,634	3,614	3,551	3,490	3,430	3,634
3,000	3,634	3,634	3,634	3,607	3,542	3,478	3,417	3,358	3,301	3,634
4,000	3,634	3,604	3,536	3,470	3,407	3,346	3,288	3,231	3,176	3,574
5,000	3,534	3,466	3,401	3,338	3,277	3,218	3,162	3,107	3,055	3,461
6,000	3,398	3,332	3,270	3,209	3,151	3,094	3,040	2,987	2,937	3,351
7,000	3,266	3,203	3,142	3,084	3,028	2,974	2,922	2,871	2,823	3,243
8,000	3,137	3,077	3,019	2,963	2,909	2,857	2,807	2,758	2,712	3,137
9,000	3,013	2,955	2,899	2,845	2,794	2,744	2,696	2,649	2,604	3,034
10,000	2,892	2,837	2,783	2,732	2,682	2,634	2,588	2,543	2,500	2,933
11,000	2,776	2,722	2,671	2,621	2,574	2,528	2,483	2,441	2,399	2,835
12,000	2,663	2,611	2,562	2,515	2,469	2,425	2,382	2,341	2,301	2,739
13,000	2,553	2,504	2,457	2,411	2,367	2,325	2,284	2,245	2,207	2,645
14,000	2,447	2,400	2,354	2,311	2,269	2,228	2,189	2,151	2,115	2,554
15,000	2,344	2,299	2,256	2,214	2,174	2,135	2,097	2,061	2,026	2,465