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BLUE SKY ENVIRONMENTAL LLC

March 6, 2015

West Virginia Dept. of Environmental Protection
Division of Air Quality
Permitting Section
601 57th Street, SE
Charleston, WV 25304

RE: G60-C – Class II Emergency Generator Registration
Highland-Charleston Hospital

Dear Madam/Sir:

On behalf of the Highland Hospital Association, attached please find an Application for General Permit Registration for a G60-C – Class II Emergency Generators for two generators located at the Highland-Charleston Hospital at 300 56th St. SE in Charleston. The generators operate under the U.S. EPA New Source Performance Standards (“NSPS”) as per 40 CFR 60 Subpart IIII and will participate in the PJM emergency demand response program which is an allowed use under Subpart IIII for emergency generators. Attached please find one original and two copies of the application along with a check for \$1,500 for the registration fee. The certified notification of the legal publication will be submitted to DEP once it is available. The publication is scheduled for March 17, 2015 in the Charleston Daily Mail.

If you have any questions or require additional information, please do not hesitate to contact me at don@blueskyenviro.com or 617-834-8408.

Sincerely,
Blue Sky Environmental LLC

Don C. DiCristofaro, CCM
President
Attachments

Cc: T. Jones



General Permit Registration
G60-C – Class II Emergency Generator
Highland Hospital Association

Highland-Charleston Hospital
300 56th St. SE
Charleston, WV 25304

Submitted To:
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Submitted:
March, 2015



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WEST VIRGINIA
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
 DIVISION OF AIR QUALITY
 601 57th Street, SE
 Charleston, WV 25304
 Phone: (304) 926-0475 • www.dep.wv.gov/daq

APPLICATION FOR GENERAL PERMIT REGISTRATION
 CONSTRUCT, MODIFY, RELOCATE OR ADMINISTRATIVELY UPDATE
 A STATIONARY SOURCE OF AIR POLLUTANTS

CONSTRUCTION MODIFICATION RELOCATION CLASS I ADMINISTRATIVE UPDATE
 CLASS II ADMINISTRATIVE UPDATE

CHECK WHICH TYPE OF GENERAL PERMIT REGISTRATION YOU ARE APPLYING FOR:

G10-D – Coal Preparation and Handling
G20-B – Hot Mix Asphalt
G30-D – Natural Gas Compressor Stations
G33-A – Spark Ignition Internal Combustion Engines
G35-A – Natural Gas Compressor Stations (Flare/Glycol Dehydration Unit)

G40-C – Nonmetallic Minerals Processing
G50-B – Concrete Batch
 G60-C – Class II Emergency Generator
G65-C – Class I Emergency Generator
G70-A – Class II Oil and Natural Gas Production Facility

SECTION I. GENERAL INFORMATION

1. Name of applicant (as registered with the WV Secretary of State's Office):
 Highland Hospital Association

2. Federal Employer ID No. (FEIN):
 55-0392395

3. Applicant's mailing address:

300 56th Street SE

Charleston, WV 25304-2361

4. Applicant's physical address:

300 56th Street SE

Charleston, WV 25304-2361

5. If applicant is a subsidiary corporation, please provide the name of parent corporation:

6. **WV BUSINESS REGISTRATION.** Is the applicant a resident of the State of West Virginia? YES NO

- IF YES, provide a copy of the Certificate of Incorporation/ Organization / Limited Partnership (one page) including any name change amendments or other Business Registration Certificate as Attachment A.
- IF NO, provide a copy of the Certificate of Authority / Authority of LLC / Registration (one page) including any name change amendments or other Business Certificate as Attachment A.

SECTION II. FACILITY INFORMATION

7. Type of plant or facility (stationary source) to be constructed, modified, relocated or administratively updated (e.g., coal preparation plant, primary crusher, etc.): Hospital

8a. Standard Industrial Classification AND 8b. North American Industry Classification

Classification (SIC) code: 8063

System (NAICS) code: 622210

9. DAQ Plant ID No. (for existing facilities only):

10. List all current 45CSR13 and other General Permit numbers associated with this process (for existing facilities only):

A: PRIMARY OPERATING SITE INFORMATION

<p>11A. Facility name of primary operating site:</p> <p><u>Highland-Charleston Hospital</u></p>	<p>12A. Address of primary operating site:</p> <p>Mailing: <u>300 56th St. SE</u> Physical: <u>300 56th St. SE</u></p> <p align="center"><u>Charleston, WV 25304-2361</u></p>	
<p>13A. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? <input checked="" type="checkbox"/> YES NO</p> <p>— IF YES, please explain: <u>Highland Hospital Association owns the property that the generators are situated on.</u></p> <p>— IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.</p>		
<p>14A. — For Modifications or Administrative Updates at an existing facility, please provide directions to the present location of the facility from the nearest state road;</p> <p>— For Construction or Relocation permits, please provide directions to the proposed new site location from the nearest state road. include a MAP as Attachment F.</p> <p><u>US 87 (West Virginia Turnpike) to Macconkle Ave SR (Rt. 61) then right onto 56 St. SE to No. 300</u></p>		
<p>15A. Nearest city or town:</p> <p>Charleston</p>	<p>16A. County:</p> <p>Kanawha</p>	<p>17A. UTM Coordinates:</p> <p>Northing (KM): <u>4,204.90617</u></p> <p>Easting (KM): <u>450.28858</u></p> <p>Zone: <u>17</u></p>
<p>18A. Briefly describe the proposed new operation or change (s) to the facility:</p> <p>Standby Emergency Generators to be used for emergencies, emergency demand response, testing, and maintenance</p>		<p>19A. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):</p> <p>Latitude: <u>38.31489</u></p> <p>Longitude: <u>81.56864</u></p>

B: 1ST ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits)

<p>11B. Name of 1st alternate operating site:</p> <p>_____</p> <p>_____</p>	<p>12B. Address of 1st alternate operating site:</p> <p>Mailing: _____ Physical: _____</p> <p>_____</p>
<p>13B. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? 9 YES 9 NO</p> <p>— IF YES, please explain: _____</p> <p>— IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.</p>	

14B. — For Modifications or Administrative Updates at an existing facility, please provide directions to the present location of the facility from the nearest state road; — For Construction or Relocation permits, please provide directions to the proposed new site location from the nearest state road. Include a MAP as Attachment F.		
<hr/> <hr/> <hr/>		
15B. Nearest city or town:	16B. County:	17B. UTM Coordinates: Northing (KM): _____ Easting (KM): _____ Zone: _____
18B. Briefly describe the proposed new operation or change (s) to the facility:		19B. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: _____ Longitude: _____

C: 2ND ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits):

11C. Name of 2 nd alternate operating site: _____	12C. Address of 2 nd alternate operating site: Mailing: _____ Physical: _____	
13C. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? 9 YES 9 NO — IF YES, please explain: _____ _____ — IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.		
14C. — For Modifications or Administrative Updates at an existing facility, please provide directions to the present location of the facility from the nearest state road; — For Construction or Relocation permits, please provide directions to the proposed new site location from the nearest state road. Include a MAP as Attachment F.		
<hr/> <hr/> <hr/>		
15C. Nearest city or town:	16C. County:	17C. UTM Coordinates: Northing (KM): _____ Easting (KM): _____ Zone: _____
18C. Briefly describe the proposed new operation or change (s) to the facility:		19C. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: _____ Longitude: _____

<p>20. Provide the date of anticipated installation or change:</p> <p>____/____/____</p> <p>X If this is an After-The-Fact permit application, provide the date upon which the proposed change did happen: :</p> <p><u>6 / 21 / 2012</u></p>	<p>21. Date of anticipated Start-up if registration is granted:</p> <p>____/____/____</p>
<p>22. Provide maximum projected Operating Schedule of activity/activities outlined in this application if other than 8760 hours/year. (Note: anything other than 24/7/52 may result in a restriction to the facility's operation).</p> <p>Hours per day <u>500 hrs/yr</u> Days per week _____ Weeks per year _____ Percentage of operation _____</p>	

SECTION III. ATTACHMENTS AND SUPPORTING DOCUMENTS

<p>23. Include a check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR22 and 45CSR13).</p>
<p>24. Include a Table of Contents as the first page of your application package.</p>
<p>All of the required forms and additional information can be found under the Permitting Section (General Permits) of DAQ's website, or requested by phone.</p>
<p>25. Please check all attachments included with this permit application. Please refer to the appropriate reference document for an explanation of the attachments listed below.</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> ATTACHMENT A : CURRENT BUSINESS CERTIFICATE <input checked="" type="checkbox"/> ATTACHMENT B: PROCESS DESCRIPTION <input checked="" type="checkbox"/> ATTACHMENT C: DESCRIPTION OF FUGITIVE EMISSIONS <input checked="" type="checkbox"/> ATTACHMENT D: PROCESS FLOW DIAGRAM <input checked="" type="checkbox"/> ATTACHMENT E: PLOT PLAN <input checked="" type="checkbox"/> ATTACHMENT F: AREA MAP <input checked="" type="checkbox"/> ATTACHMENT G: EQUIPMENT DATA SHEETS AND REGISTRATION SECTION APPLICABILITY FORM <input checked="" type="checkbox"/> ATTACHMENT H: AIR POLLUTION CONTROL DEVICE SHEETS <input checked="" type="checkbox"/> ATTACHMENT I: EMISSIONS CALCULATIONS <input checked="" type="checkbox"/> ATTACHMENT J: CLASS I LEGAL ADVERTISEMENT <input checked="" type="checkbox"/> ATTACHMENT K: ELECTRONIC SUBMITTAL <input checked="" type="checkbox"/> ATTACHMENT L: GENERAL PERMIT REGISTRATION APPLICATION FEE <input checked="" type="checkbox"/> ATTACHMENT M: SITING CRITERIA WAIVER <input checked="" type="checkbox"/> ATTACHMENT N: MATERIAL SAFETY DATA SHEETS (MSDS) <input checked="" type="checkbox"/> ATTACHMENT O: EMISSIONS SUMMARY SHEETS <input checked="" type="checkbox"/> OTHER SUPPORTING DOCUMENTATION NOT DESCRIBED ABOVE (Equipment Drawings, Aggregation Discussion, etc.) <p>Please mail an original and two copies of the complete General Permit Registration Application with the signature(s) to the DAQ Permitting Section, at the address shown on the front page of this application. Please DO NOT fax permit applications. For questions regarding applications or West Virginia Air Pollution Rules and Regulations, please refer to the website shown on the front page of the application or call the phone number also provided on the front page of the application.</p>

SECTION IV. CERTIFICATION OF INFORMATION

This General Permit Registration Application shall be signed below by a Responsible Official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of a Board of Directors, or Owner, depending on business structure. A business may certify an Authorized Representative who shall have authority to bind the Corporation, Partnership, Limited Liability Company, Association, Joint Venture or Sole Proprietorship. Required records of daily throughput, hours of operation and maintenance, general correspondence, Emission Inventory, Certified Emission Statement, compliance certifications and all required notifications must be signed by a Responsible Official or an Authorized Representative. If a business wishes to certify an Authorized Representative, the official agreement below shall be checked off and the appropriate names and signatures entered. Any administratively incomplete or improperly signed or unsigned Registration Application will be returned to the applicant.

FOR A CORPORATION (domestic or foreign)

I certify that I am a President, Vice President, Secretary, Treasurer or in charge of a principal business function of the corporation

FOR A PARTNERSHIP

I certify that I am a General Partner

FOR A LIMITED LIABILITY COMPANY

I certify that I am a General Partner or General Manager

FOR AN ASSOCIATION

I certify that I am the President or a member of the Board of Directors

FOR A JOINT VENTURE

I certify that I am the President, General Partner or General Manager

FOR A SOLE PROPRIETORSHIP

I certify that I am the Owner and Proprietor

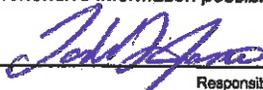
ff I hereby certify that (please print or type) Todd Jones

is an Authorized Representative and in that capacity shall represent the interest of the business (e.g., Corporation, Partnership, Limited Liability Company, Association Joint Venture or Sole Proprietorship) and may obligate and legally bind the business. If the business changes its Authorized Representative, a Responsible Official shall notify the Director of the Office of Air Quality immediately, and/or,

I hereby certify that all information contained in this General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible

Signature

(please use blue ink)



Responsible Official

1-29-15

Date

Name & Title Todd Jones; Director of Facilities/Plant Operations

(please print or type)

Signature

(please use blue ink)

Authorized Representative (if applicable)

Date

Applicant's Name Highland-Charleston Hospital

Phone & Fax 304-419-2713

Phone

Fax

Email tjones@highlandhosp.com

Attachment A

Business Registration Certificate

**WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION
CERTIFICATE**

ISSUED TO:
**HIGHLAND HOSPITAL ASSOCIATION
300 56TH ST SE
CHARLESTON, WV 25304-2308**

BUSINESS REGISTRATION ACCOUNT NUMBER 1034-5646

This certificate is issued on: **09/15/2012**

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with Chapter 11, Article 12, of the West Virginia Code.

*The person or organization identified on this certificate is registered
to conduct business in the State of West Virginia at the location above.*

This certificate is not transferrable and must be displayed at the location for which issued.
This certificate shall be permanent until cessation of the business for which the certificate of registration
was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new
certificate shall be required.

TRAVELING STREET VENDORS: Must have a copy of this certificate in every vehicle operated by them.
CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of
this certificate displayed at every job site within West Virginia.

Attachment B

Process Description

ATTACHMENT B

PROCESS DESCRIPTION

The Highland-Charleston Hospital currently operates the following:

- Cummins DQFAD, 1,000 kW
- Cummins DQDAA, 250 kW

diesel emergency generators at its facility at 300 56th Street SE in Charleston. The generators will be used for emergency operations, testing/maintenance, and in the PJM Emergency Load Response Program ("ELRP"). The ELRP exists in order to prevent brownouts and blackouts. Numerous states now allow emergency engines to participate during such times (as opposed to waiting for a blackout), principally because studies prove that it is better to prevent a blackout by using a subset of emergency generators for a short period of time as opposed to losing the grid, which would mean all emergency generators in the state operating for many hours or possibly days. The emergency generators at the facility will not be synchronized with the grid. The generators will simply be turned on when PJM declares an emergency under the PJM Program, thereby lessening the need for more power on the grid.

The ELRP is activated according to the procedures in the PJM Manual 13 Emergency Operations for a PJM Declared Emergency. A "PJM Declared Emergency" means a condition that exists where the PJM Interconnection LLC notifies electric distributors that an emergency exists or may occur and it is necessary to implement the procedures in the PJM Manual 13 Emergency Operations. The ELRP has rarely been declared – it is truly reserved for emergency situations. This declaration should not be confused with other PJM programs that are enacted for economic reasons (e.g., economic demand response or "peak shaving").

West Virginia falls under two PJM (the entity that runs the electric grid) zones: APS and AEP. The Emergency Load Response Program (ELRP) (e.g., emergency demand response) is called by zone. Below is a summary of emergency DR events (ELRP) in West Virginia with generator usage since 2008. Three years there were no events. In 2010 there were 12 hours of events in APS only, in 2012 there were 4 hours in AEP only, and in 2013 there were 3 hours in AEP only.

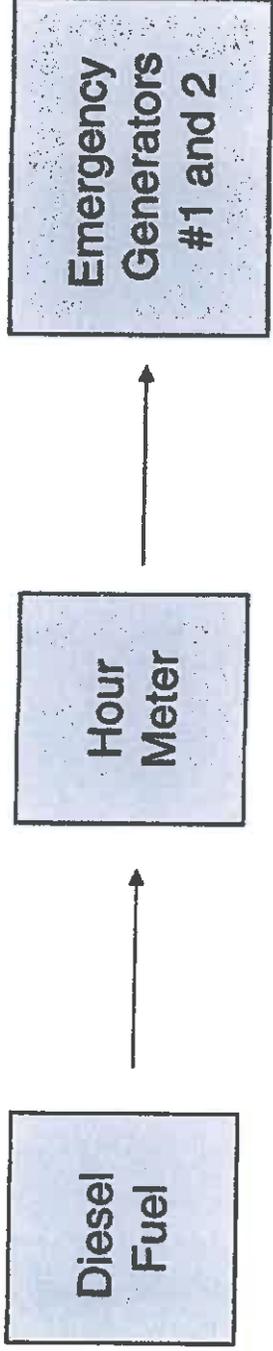
Year	Date	Hours	Zone
2008		0	
2009		0	
2010	9/23	6	APS
	9/24	6	APS
2011		0	
2012	7/17	4	AEP
2013	9/11	3	AEP

Source: <https://www.pjm.com/~media/planning/res-adeq/load-forecast/alm-history.ashx>

Both engines were manufactured in 2011 and operate under the EPA New Source Performance Standards (“NSPS”) as per 40 CFR 60 Subpart IIII. The larger engine is Tier 2 certified and the smaller engine is Tier 3 certified. The NSPS allows for 100 hours per year for testing/maintenance/emergency demand response (“DR”). The ELRP meets the EPA definition of emergency DR as per 40 CFR 60.4211(f)(2)(ii). Although under the NSPS, true emergency use is unlimited, the total use of the engines including true emergencies are limited to 500 hours per year as per the WV DEP General Permit.

Attachment D

Process Flow Diagram



Attachment D:
Process Flow Diagram
Highland-Charleston Hospital

Attachment E

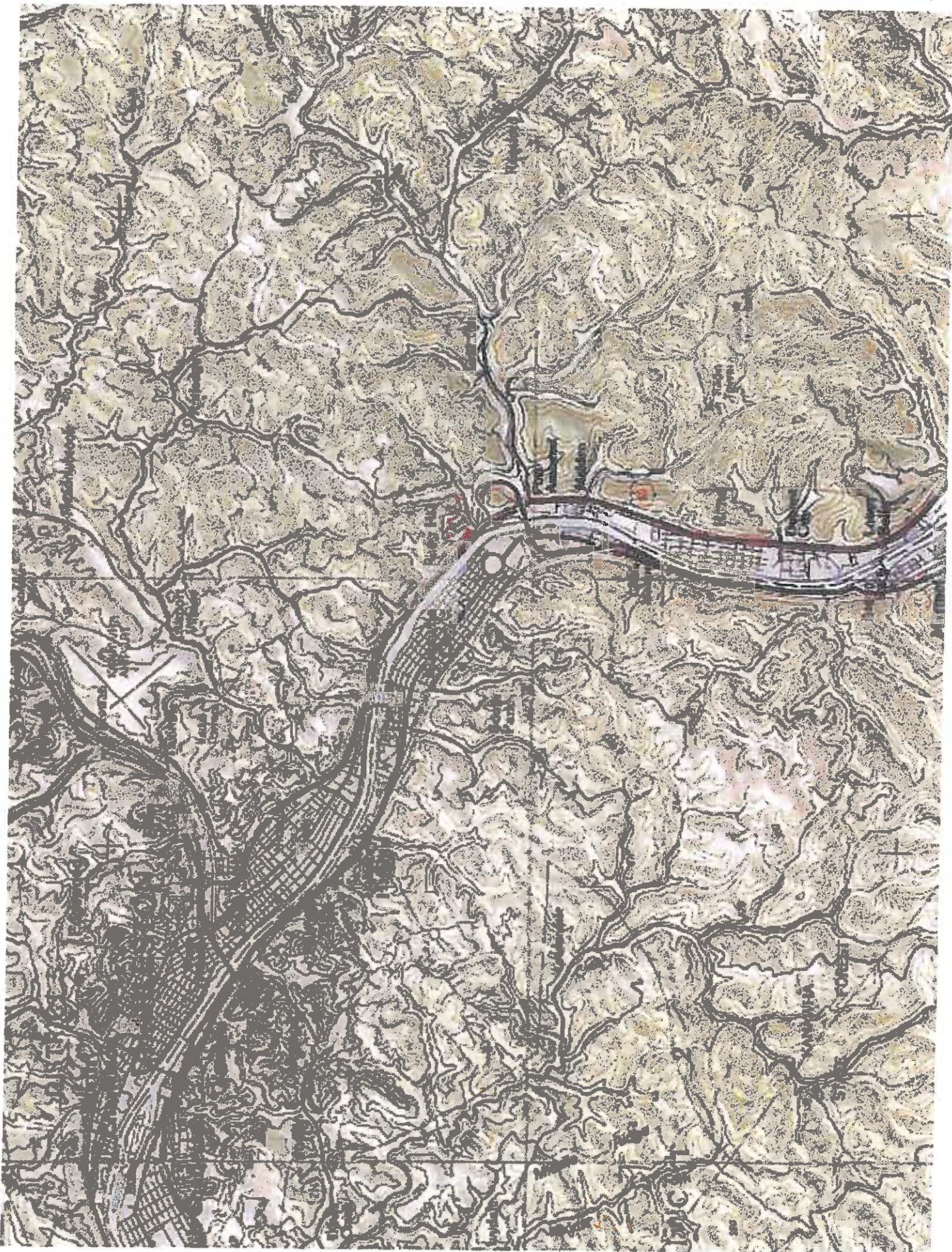
Plot Plan



Attachment F

Area Map





Attachment G

**Equipment Data Sheets and Registration Section
Applicability Form**

General Permit G60-C Registration Section Applicability Form

General Permit G60-C was developed to allow qualified registrants to seek registration for emergency generator(s).

General Permit G60-C allows the registrant to choose which sections of the permit that they wish to seek registration under. Therefore, please mark which sections that you are applying for registration under. Please keep in mind, that if this registration is approved, the issued registration will state which sections will apply to your affected facility.

- | | | |
|-----------|---|-------------------------------------|
| Section 5 | Reciprocating Internal Combustion Engines (R.I.C.E.)* | <input checked="" type="checkbox"/> |
| Section 6 | Tanks | <input checked="" type="checkbox"/> |
| Section 7 | Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (40CFR60 Subpart IIII) | <input checked="" type="checkbox"/> |
| Section 8 | Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (40CFR60 Subpart JJJJ) | <input type="checkbox"/> |

*** Affected facilities that are subject to Section 5 may also be subject to Sections 7 or 8. Therefore, if the applicant is seeking registration under both sections, please select both.**

EMERGENCY GENERATOR ENGINE DATA SHEET

Source Identification Number ¹		EG-1		EG-2			
Engine Manufacturer and Model		Cummins QST30-G5-NR2		Cummins QSL9-G3-NR3			
Manufacturer's Rated bhp/rpm		1,490/1,800		476/1,800			
Source Status ²		NS		NS			
Date Installed/Modified/Removed ³		6/21/12		6/21/12			
Engine Manufactured/Reconstruction Date ⁴		2011		2011			
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart IIII? (Yes or No) ⁵		Yes		Yes			
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No) ⁶		No		No			
Engine, Fuel and Combustion Data	Engine Type ⁷						
	APCD Type ⁸	Turbocharger & Low T Aftercooled		Turbocharger & Low T Aftercooled			
	Fuel Type ⁹	2FO		2FO			
	H ₂ S (gr/100 scf)						
	Operating bhp/rpm	1,490/1,800		476/1,800			
	BSFC (Btu/bhp-hr)	6,542		5,048			
	Fuel throughput (ft ³ /hr)	72.2 gph		17.8 gph			
	Fuel throughput (MMft ³ /yr)	36,100 gpy		8,900 gpy			
	Operation (hrs/yr)	500		500			
Reference ¹⁰	Potential Emissions ¹¹	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
MD	NO _x	15.67	3.92	3.13	0.78		
MD	CO	8.57	2.14	2.74	0.68		
AP	VOC	1.05	0.26	1.18	0.29		
AP	SO ₂	0.02	0.005	0.98	0.24		
MD	PM ₁₀	0.49	0.12	0.16	0.04		
AP	Formaldehyde	7.69E-4	1.92E-4	2.84E-3	7.09E-4		

1. Enter the appropriate Source Identification Number for each emergency generator. Generator engines should be designated EG-1, EG-2, EG-3 etc. If more than three (3) engines exist, please use additional sheets.
2. Enter the Source Status using the following codes:

NS	Construction of New Source (installation)	ES	Existing Source
MS	Modification of Existing Source	RS	Removal of Source

3. Enter the date (or anticipated date) of the engine's installation (construction of source), modification or removal.
4. Enter the date that the engine was manufactured, modified or reconstructed.
5. Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart III. If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance according to 40CFR§60.4210 as appropriate.

Provide a manufacturer's data sheet for all engines being registered.

6. Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart JJJJ. If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance according to 40CFR§60.4243a(2)(i) through (iii), as appropriate.

Provide a manufacturer's data sheet for all engines being registered.

7. Enter the Engine Type designation(s) using the following codes:

LB2S	Lean Burn Two Stroke	RB4S	Rich Burn Four Stroke
LB4S	Lean Burn Four Stroke		

8. Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:

A/F	Air/Fuel Ratio	IR	Ignition Retard
HEIS	High Energy Ignition System	SIPC	Screw-in Precombustion Chambers
PSC	Prestratified Charge	LEC	Low Emission Combustion
NSCR	Rich Burn & Non-Selective Catalytic Reduction	SCR	Lean Burn & Selective Catalytic Reduction

9. Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas
2FO	#2 Fuel Oil	LPG	Liquid Propane Gas

10. Enter the Potential Emissions Data Reference designation using the following codes. Attach all referenced data to this *Compressor/Generator Data Sheet(s)*.

MD	Manufacturer's Data	AP	AP-42	
GR	GRI-HAPCalc TM	OT	Other _____	(please list)

11. Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the *Emissions Summary Sheet*.

STORAGE TANK DATA SHEET

Source ID # ¹	Status ²	Content ³	Volume ⁴	Dia ⁵	Throughput ⁶	Orientation ⁷	Liquid Height ⁸
T01 (Gen 1)	NEW	Diesel	2,400	Approx 14.9 ft X 5.9 ft	<< 36,100	HORZ	< 3.3 ft
T02 (Gen 2)	NEW	Diesel	1,470	Approx 14.9 ft X 5.9 ft	<< 8,900	HORZ	< 3.3 ft

1. Enter the appropriate Source Identification Numbers (Source ID #) for each storage tank located at the compressor station. Tanks should be designated T01, T02, T03, etc.
2. Enter storage tank Status using the following:

EXIST Existing Equipment	NEW Installation of New Equipment
REM Equipment Removed	
3. Enter storage tank content such as condensate, pipeline liquids, glycol (DEG or TEG), lube oil, etc.
4. Enter storage tank volume in gallons.
5. Enter storage tank diameter in feet.
6. Enter storage tank throughput in gallons per year.
7. Enter storage tank orientation using the following:

VERT Vertical Tank	HORZ Horizontal Tank
--------------------	----------------------
8. Enter storage tank average liquid height in feet.

Generator 1

Model: DQFAD
Frequency: 60
Fuel type: Diesel
KW rating: 1000 standby
900 prime

Emissions level: EPA NSPS Stationary Emergency Tier 2

> Generator set data sheet



Our energy working for you.™

Exhaust emission data sheet:	EDS-1063
Exhaust emission compliance sheet:	EPA-1007
Sound performance data sheet:	MSP-1038
Cooling performance data sheet:	MCP-156
Prototype test summary data sheet:	PTS-266
Standard set-mounted radiator cooling outline:	0500-4391
Optional set-mounted radiator cooling outline:	
Optional heat exchanger cooling outline:	
Optional remote radiator cooling outline:	0500-4390

Fuel consumption	Standby				Prime				Continuous
	kW (kVA)				kW (kVA)				kW (kVA)
Ratings	1000 (1250)				900 (1125)				
Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full	Full
US gph	19.1	35.8	54.1	72.2	17.3	32.1	47.5	63.9	
L/hr	72.3	135.5	204.8	273.3	65.5	121.5	179.8	241.9	

Engine	Standby rating	Prime rating	Continuous rating
Engine manufacturer	Cummins Inc.		
Engine model	QST30-G5 NR2		
Configuration	Cast iron, V 12 cylinder		
Aspiration	Turbocharged and low temperature aftercooled		
Gross engine power output, kWm (bhp)	1112 (1490)	1007 (1350)	
BMEP at set rated load, kPa (psi)	2417 (351)	2160 (313)	
Bore, mm (in)	140 (5.51)		
Stroke, mm (in)	165 (6.5)		
Rated speed, rpm	1800		
Piston speed, m/s (ft/min)	9.91 (1950)		
Compression ratio	14.7:1		
Lube oil capacity, L (qt)	154 (162.8)		
Overspeed limit, rpm	2100 ±50		
Regenerative power, kW	82		

Fuel flow	
Maximum fuel flow, L/hr (US gph)	570 (150)
Maximum fuel inlet restriction, kPa (in Hg)	27 (8.0)
Maximum fuel inlet temperature, °C (°F)	66 (150)

Air	Standby rating	Prime rating	Continuous rating
Combustion air, m ³ /min (scfm)	88 (3150)	81 (2880)	
Maximum air cleaner restriction, kPa (in H ₂ O)	6.2 (25)		
Alternator cooling air, m ³ /min (cfm)	204 (7300)		

Exhaust			
Exhaust flow at set rated load, m ³ /min (cfm)	211 (7540)	195 (6950)	
Exhaust temperature, °C (°F)	477 (890)	467 (873)	
Maximum back pressure, kPa (in H ₂ O)	6.8 (27)		

Standard set-mounted radiator cooling			
Ambient design, °C (°F)	50 (122)		
Fan load, kW (HP)	43 (57)		
Coolant capacity (with radiator), L (US gal)	201 (53.2)		
Cooling system air flow, m ³ /min (scfm)	952 (34000)		
Total heat rejection, MJ/min (Btu/min)	48.9 (46455)	43.9 (41660)	
Maximum cooling air flow static restriction, kPa (in H ₂ O)	0.12 (0.5)		
Maximum fuel return line restriction kPa (in Hg)	67.5 (20)		

Optional set-mounted radiator cooling			
Ambient design, °C (°F)			
Fan load, kW (HP)			
Coolant capacity (with radiator), L (US gal)			
Cooling system air flow, m ³ /min (scfm)			
Total heat rejection, MJ/min (Btu/min)			
Maximum cooling air flow static restriction, kPa (in H ₂ O)			
Maximum fuel return line restriction, kPa (in Hg)			

Optional heat exchanger cooling			
Set coolant capacity, L (US gal)			
Heat rejected, jacket water circuit, MJ/min (Btu/min)			
Heat rejected, aftercooler circuit, MJ/min (Btu/min)			
Heat rejected, fuel circuit, MJ/min (Btu/min)			
Total heat radiated to room, MJ/min (Btu/min)			
Maximum raw water pressure, jacket water circuit, kPa (psi)			
Maximum raw water pressure, aftercooler circuit, kPa (psi)			
Maximum raw water pressure, fuel circuit, kPa (psi)			
Maximum raw water flow, jacket water circuit, L/min (US gal/min)			
Maximum raw water flow, aftercooler circuit, L/min (US gal/min)			
Maximum raw water flow, fuel circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, aftercooler circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/min (US gal/min)			
Raw water delta P at min flow, jacket water circuit, kPa (psi)			
Raw water delta P at min flow, aftercooler circuit, kPa (psi)			
Raw water delta P at min flow, fuel circuit, kPa (psi)			
Maximum jacket water outlet temp, °C (°F)			
Maximum aftercooler inlet temp, °C (°F)			
Maximum aftercooler inlet temp at 25 °C (77 °F) ambient, °C (°F)			
Maximum fuel return line restriction, kPa (in Hg)			

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Optional remote radiator cooling ¹	Standby rating	Prime rating	Continuous rating
Set coolant capacity, L (US gal)			
Max flow rate at max friction head, jacket water circuit, L/min (US gal/min)	992 (262)		
Max flow rate at max friction head, aftercooler circuit, L/min (US gal/min)	303 (80)		
Heat rejected, jacket water circuit, MJ/min (Btu/min)	22.67 (21500)	21.01 (19925)	
Heat rejected, aftercooler circuit, MJ/min (Btu/min)	18.35 (17400)	15.69 (14885)	
Heat rejected, fuel circuit, MJ/min (Btu/min)			
Total heat radiated to room, MJ/min (Btu/min)	6.1 (5753)	5.6 (5301)	
Maximum friction head, jacket water circuit, kPa (psi)	69 (10)		
Maximum friction head, aftercooler circuit, kPa (psi)	48 (7)		
Maximum static head, jacket water circuit, m (ft)	14 (46)		
Maximum static head, aftercooler circuit, m (ft)	14 (46)		
Maximum jacket water outlet temp, °C (°F)	104 (220)	100 (212)	
Maximum aftercooler inlet temp at 25 °C (77 °F) ambient, °C (°F)	41 (105)		
Maximum aftercooler inlet temp, °C (°F)	62 (143)	56 (133)	
Maximum fuel flow, L/hr (US gph)			
Maximum fuel return line restriction, kPa (in Hg)	67.5 (20)		

Weights²

Unit dry weight kgs (lbs)	7633 (16824)
Unit wet weight kgs (lbs)	7931 (17480)

Notes:

¹ For non-standard remote installations contact your local Cummins Power Generation representative.

² Weights represent a set with standard features. See outline drawing for weights of other configurations.

Derating factors

Standby	Engine power available up to 701 m (2300 ft) at ambient temperatures up to 40 °C (104 °F). Above these elevations, derate at 3.5% per 305 m (1000 ft) and 7% per 10 °C (18 °F).
Prime	Engine power available up to 727 m (2385 ft) at ambient temperatures up to 40 °C (104 °F). Above these elevations, derate at 3.5% per 305 m (1000 ft) and 7% per 10 °C (18 °F).
Continuous	

Ratings definitions

Emergency standby power (ESP):	Limited-time running power (LTP):	Prime power (PRP):	Base load (continuous) power (COP):
Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.	Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) is in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271 and BS 5514.

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Alternator data

Voltage	Connection ¹	Temp rise degrees C	Duty ¹	Single phase factor ²	Max surge kVA ³	Winding No.	Alternator data sheet	Feature Code
120/208-139/240	12-lead	125/105	S/P		4234	1019	ADS-312	B252
240/416-277/480	12-lead	125/105	S/P		4234	1019	ADS-312	B252
277/480	Wye, 3-phase	125/105	S/P		3866	1018	ADS-311	B276
220/380-277/480	Wye, 3-phase	125/105	S/P		4602	1018	ADS-330	B282
220/380-277/480	Wye, 3-phase	105/80	S/P		4602	1018	ADS-330	B283
210/380-277/480	Wye, 3-phase	80	S		5521	1024	ADS-331	B284
240/416-277/480	Wye	125/105	S/P		4234	1019	ADS-312	B288
347/600	3-phase	125/105	S/P		3866	1021	ADS-311	B300
347/600	3-phase	105/80	S/P		4234	1024	ADS-312	B301
347/600	3 phase	80	S		4602	1004	ADS-330	B604

Notes:

¹ Limited single phase capability is available from some three phase rated configurations. To obtain single phase rating, multiply the three phase kW rating by the Single Phase Factor². All single phase ratings are at unity power factor.

² Standby (S), Prime (P) and Continuous ratings (C).

³ Factor for the *Single Phase Output from Three Phase Alternator* formula listed below.

⁴ Maximum rated starting kVA that results in a minimum of 90% of rated sustained voltage during starting.

Formulas for calculating full load currents:

Three phase output

$$\frac{\text{kW} \times 1000}{\text{Voltage} \times 1.73 \times 0.8}$$

Single phase output

$$\frac{\text{kW} \times \text{SinglePhaseFactor} \times 1000}{\text{Voltage}}$$

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Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open

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QST30-G5

**Emissions Compliance:
EPA Tier 2 at 60 Hz**



> Specification sheet

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Description

The QST30 Quantum series utilises sophisticated electronics and premium engineering to provide outstanding performance levels from its compact 30 litre, V12 configuration. In fact, the QST30-Series delivers more power and torque in a smaller package than any other diesel engine on the market.



This engine has been built to comply with CE certification.



This engine has been designed in facilities certified to ISO9001 and manufactured in facilities certified to ISO9001 or ISO9002.

Features

Quantum electronic fuel systems and controls provide superior performance, efficiency and diagnostics. The electronic fuel pumps deliver up to 1100 bar injection pressure and eliminate mechanical linkage adjustments.

Holset HX62 turbocharging utilises exhaust energy with greater efficiency for improved emissions and fuel consumption.

Low Temperature Aftercooling – Air-to-air or two-pump two-loop.

Cast Iron Pistons – High strength design delivers superior durability.

Coolpac Integrated Design - Products are supplied complete with cooling package and air cleaner kit for a complete power package. Each component has been specifically developed and rigorously tested for G-Drive products, ensuring high performance, durability and reliability.

Service and Support - G-Drive products are backed by an uncompromising level of technical support and after sales service, delivered through a world class service network.

1500 rpm (50 Hz Ratings)

Gross Engine Output			Net Engine Output			Typical Generator Set Output					
Standby	Prime	Base	Standby	Prime	Base	Standby (ESP)		Prime (PRP)		Base (COP)	
kWm/BHP			kWm/BHP			kWe	kVA	kWe	kVA	kWe	kVA
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

1800 rpm (60 Hz Ratings)

Gross Engine Output			Net Engine Output			Typical Generator Set Output					
Standby	Prime	Base	Standby	Prime	Base	Standby (ESP)		Prime (PRP)		Base (COP)	
kWm/BHP			kWm/BHP			kWe	kVA	kWe	kVA	kWe	kVA
1112/1490	1007/1350	832/1115	1069/1434	975/1308	800/1073	1000	1250	910	1138	752	940

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General Engine Data

Type	4 cycle, Turbocharged and After cooled
Bore mm	140 mm (5.51 in.)
Stroke mm	165 mm (6.50 in.)
Displacement Litre	30.48 litre (1860 in ³)
Cylinder Block	Cast iron, 50°V 12 cylinder
Battery Charging Alternator	35 amps
Starting Voltage	24-volt, negative ground
Fuel System	Direct injection
Fuel Filter	Spin on fuel filters with water separator
Lube Oil Filter Type(s)	Spin on full flow filter
Lube Oil Capacity (l)	40.7
Flywheel Dimensions	0/19

Coolpac Performance Data

Cooling System Design	Air-Air Charge Cooled
Coolant Ratio	
Coolant Capacity (l)	
Limiting Ambient Temp.**	
Fan Power	
Cooling System Air Flow (m ³ /s)**	
Air Cleaner Type	Dry replaceable element with restriction indicator

** @ 12 mm H₂O

Weight & Dimensions

Length	Width	Height	Weight (dry)
mm	mm	mm	kg
2026	1427	1662	3012

Fuel Consumption 1500 (50 Hz)

%	kWm	BHP	L/ph	US gal/ph
Standby Power				
100	N/A	N/A	N/A	N/A
Prime Power				
100	N/A	N/A	N/A	N/A
75	N/A	N/A	N/A	N/A
50	N/A	N/A	N/A	N/A
25	N/A	N/A	N/A	N/A
Continuous Power				
100	N/A	N/A	N/A	N/A

Fuel Consumption 1800 (60 Hz)

%	kWm	BHP	L/ph	US gal/ph
Standby Power				
100	1112	1490	275	72.7
Prime Power				
100	1007	1350	248	66.4
75	755	1013	185	48.8
50	504	675	126	33.1
25	252	338	69	18.2
Continuous Power				
100	832	1115	246	64.9

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Ratings Definitions

Emergency Standby Power (ESP):
Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3048, AS 2789, DIN 6271 and BS 5514.

Limited-Time Running Power (LTP):
Applicable for supplying power to a constant electrical load for limited hours. Limited-Time Running Power (LTP) is in accordance with ISO 8528.

Prime Power (PRP):
Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3048, AS 2789, DIN 6271 and BS 5514.

Base Load (Continuous) Power (COP):
Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) in accordance with ISO 8528, ISO 3046, AS 2789, DIN6271 and BS 5514.

Specification sheet



**Power
Generation**

Diesel generator set QST30 series engine

680 kW - 1000 kW 60 Hz



Description

Cummins Power Generation commercial generator sets are fully integrated power generation systems providing optimum performance, reliability and versatility for stationary standby and prime power applications.

Features

Cummins® heavy-duty engine - Rugged 4-cycle, industrial diesel delivers reliable power, low emissions and fast response to load changes.

Alternator - Several alternator sizes offer selectable motor starting capability with low reactance 2/3 pitch windings, low waveform distortion with non-linear loads and fault clearing short-circuit capability.

Permanent magnet generator (PMG) - Offers enhanced motor starting and fault clearing short-circuit capability.

Control system - The PowerCommand® electronic control is standard equipment and provides total genset system integration including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, AmpSentry™ protection, output metering, auto-shutdown at fault detection and NFPA 110 Level 1 compliance.

Cooling system - Standard integral set-mounted radiator system, designed and tested for rated ambient temperatures, simplifies facility design requirements for rejected heat.

NFPA - The genset accepts full rated load in a single step in accordance with NFPA 110 for Level 1 systems.

Warranty and service - Backed by a comprehensive warranty and worldwide distributor network.

Model	Standby rating		Prime rating		Continuous rating		Data sheets	
	60 Hz kW (kVA)	50 Hz kW (kVA)	60 Hz kW (kVA)	50 Hz kW (kVA)	60 Hz kW (kVA)	50 Hz kW (kVA)	60 Hz	50 Hz
DQFAA	750 (938)		680 (850)				D-3329	
DQFAB	800 (1000)		725 (907)				D-3330	
DQFAC	900 (1125)		818 (1023)				D-3331	
DQFAD	1000 (1250)		900 (1125)				D-3332	

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Generator set specifications

Governor regulation class	ISO 8528 Part 1 Class G3
Voltage regulation, no load to full load	± 0.5%
Random voltage variation	± 0.5%
Frequency regulation	Isochronous
Random frequency variation	± 0.25%
Radio frequency emissions compliance	IEC 801.2 through IEC 801.5; MIL STD 481C, Part 9

Engine specifications

Bore	140 mm (5.51 in)
Stroke	165.0 mm (6.5 in)
Displacement	30.5 litres (1860 in ³)
Configuration	Cast iron, V, 12 cylinder
Battery capacity	1800 amps minimum at ambient temperature of -18 °C to 0 °C (0 °F to 32 °F)
Battery charging alternator	35 amps
Starting voltage	24 volt, negative ground
Fuel system	Direct injection: number 2 diesel fuel, fuel filter, automatic electric fuel shutoff
Fuel filter	Triple element, 10 micron filtration, spin-on fuel filters with water separator
Air cleaner type	Dry replaceable element
Lube oil filter type(s)	Four spin-on, combination full flow filter and bypass filters
Standard cooling system	High ambient radiator

Alternator specifications

Design	Brushless, 4 pole, dnp proof, revolving field
Stator	2/3 pitch
Rotor	Single bearing flexible discs
Insulation system	Class H on low and medium voltage, Class F on high voltage
Standard temperature rise	150 °C standby at 40 °C ambient
Exciter type	PMG (permanent magnet generator)
Phase rotation	A (U), B (V), C (W)
Alternator cooling	Direct drive centrifugal blower fan
AC waveform total harmonic distortion	< 5% no load to full linear load, < 3% for any single harmonic
Telephone influence factor (TIF)	< 50 per NEMA MG1-22.43
Telephone harmonic factor (THF)	< 3

Available voltages

60 Hz line-neutral/line-line	50 Hz line-neutral/line-line
<ul style="list-style-type: none"> • 120/208 • 139/240 • 220/380 • 230/400 • 240/416 • 277/480 • 347/600 	

Note: Consult factory for other voltages.

Generator set options and accessories

Engine

- 208/240/480 V coolant heater for ambient above 4.5 °C (40 °F)
- 208/240/480 V coolant heater for ambient below 4.5 °C (40 °F)

Control panel

- 120/240 V 100 W control anti-condensation heater
- Paralleling configuration
- Remote fault signal package
- Run relay package

Alternator

- 80 °C rise
- 105 °C rise
- 125 °C rise
- 120/240 V 300 W, anti-condensation heater
- Temperature sensor - RTDs, 2/phase
- Temperature sensor - alternator bearing RTD
- Differential current transformers

Exhaust system

- Industrial grade exhaust silencer
- Residential grade exhaust silencer
- Critical grade exhaust silencer

Cooling system

- Remote radiator
- ### Generator set
- AC entrance box
 - Battery

- Battery rack with hold-down - floor standing
- Circuit breaker - set mounted
- Disconnect switch - set mounted
- PowerCommand Network
- Remote annunciator panel
- Spring isolators
- 2 year warranty
- 5 year warranty
- 10 year major components warranty

Note: Some options may not be available on all models - consult factory for availability.

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Control system PCC3201



PowerCommand control is an integrated generator set control system providing governing, voltage regulation, engine protection and operator interface functions. Major features include:

- Integral AmpSentry™ Protective Relay providing a full range of alternator protection functions that are matched to the alternator provided.
- Battery monitoring and testing features and smart starting control system.
- Three phase sensing, full wave rectified voltage regulation system, with a PWM output for stable operation with all load types.
- Control suitable for operation in ambient temperatures from -40 °C to +70 °C (-40 °F to +158 °F) and altitudes to 5000 meters (13,000 feet).
- Prototype tested; UL, CSA, and CE compliant.
- InPower™ PC-based service tool available for detailed diagnostics.
- Optional Echelon® LONWORKS® network interface.

Operator/display panel

- Off/manual/auto mode switch
- Manual run/stop switch
- Panel lamp test switch
- Emergency stop switch
- Exercise switch
- Alpha-numeric display with pushbutton access for viewing engine and alternator data and providing setup, controls and adjustments
- LED lamps indicating not in auto, common warning, common shutdown, remote start
- Configurable for local language

Engine protection

- Overspeed shut down
- Low oil pressure warning and shut down
- High coolant temperature warning and shut down
- High oil temperature warning
- Low coolant level warning or shut down
- Low coolant temperature warning
- High and low battery voltage warning
- Weak battery warning
- Dead battery shut down
- Fail to start (overcrank) shut down
- Fail to crank shut down
- Redundant start disconnect
- Cranking lockout
- Sensor failure indication

Engine data

- DC voltage
- Lube oil pressure
- Coolant temperature
- Lube oil temperature
- Engine speed
- Engine ECM data

AmpSentry AC protection

- Over current and short-circuit shut down
- Over current warning
- Single and three phase fault regulation
- Over and under voltage shut down
- Over and under frequency shut down
- Overload warning with alarm contact
- Reverse power and reverse Var shut down

Alternator data

- Line-to-line and line-to-neutral AC volts
- Three phase AC current
- Frequency
- Total and individual phase power factor, kW and kVA
- Bus voltage and frequency (with paralleling options)

Other data

- Genset model data
- Start attempts, starts, running hours
- kW hours (total and since reset)
- Fault history
- Load profile (accessible with InPower)

Governing

- Digital electronic isochronous governor
- Temperature dynamic governing
- Smart idle speed mode

Voltage regulation

- Digital PWM electronic voltage regulation
- Three phase line-to-neutral sensing
- Single and three phase fault regulation
- Configurable torque matching

Control functions

- Data logging on faults
- Fault simulation (requires InPower)
- Time delay start and cooldown
- Cycle cranking
- Configurable customer outputs (4)
- Configurable network inputs (8) and outputs (16) (with optional network)
- Remote emergency stop

Paralleling (Option)

- Active digital phase lock loop synchronizer
- Isochronous kW and kVar load sharing controls
- kW import/export and kVar/PF control for utility (mains) paralleling

Options

- Thermostatically controlled space heater
- Key-type mode switch
- Ground fault module
- Auxiliary relays (3)
- Echelon LONWORKS interface
- Modicon Gateway to convert to Modbus (loose)
- PowerCommand iWatch web server for remote monitoring and alarm notification (loose)
- Digital input and output module(s) (loose)
- Remote annunciator (loose)
- Paralleling
- Power transfer control

For further detail see document S-1444.

Emergency standby power (ESP):

Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Limited-time running power (LTP):

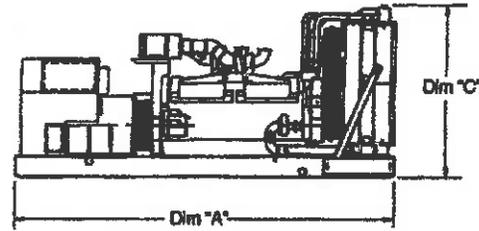
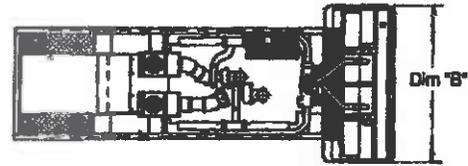
Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.

Prime power (PRP):

Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Base load (continuous) power (COP):

Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271 and BS 5514.



This outline drawing is for reference only. See respective model data sheet for specific model outline drawing number.

Do not use for installation design

Model	Dim "A" mm (in.)	Dim "B" mm (in.)	Dim "C" mm (in.)	Set Weight* dry kg (lbs)	Set Weight* wet kg (lbs)
DQFAA	4338 (170.7)	2000 (79)	2353 (93)	6673 (14707)	6971 (15383)
DQFAB	4338 (170.7)	2000 (79)	2353 (93)	6696 (15199)	7194 (15855)
DQFAC	4338 (170.7)	2000 (79)	2353 (93)	7375 (16254)	7672 (16910)
DQFAD	4338 (170.7)	2000 (79)	2353 (93)	7633 (16824)	7931 (17480)

* Weights represent a set with standard features. See outline drawings for weights of other configurations.

Codes and standards

Codes or standards compliance may not be available with all model configurations – consult factory for availability.

 <p>This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.</p>	 <p>The generator set is available listed to UL 2200, Stationary Engine Generator Assemblies for all 60 Hz low voltage models. The PowerCommand control is Listed to UL 508 - Category NITW7 for U.S. and Canadian usage. Circuit breaker assemblies are UL 489 Listed for 100% continuous operation and also UL 869A Listed Service Equipment.</p>
 <p>The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Cummins Power Generation products bearing the PTS symbol meet the prototype test requirements of NFPA 110 for Level 1 systems.</p>	<p>U.S. EPA</p> <p>Engine certified to Stationary Emergency U.S. EPA New Source Performance Standards, 40 CFR 60 subpart III Tier 2 exhaust emission levels. U.S. applications must be applied per this EPA regulation.</p>
 <p>All low voltage models are CSA certified to product class 4215-01.</p>	<p>International Building Code</p> <p>The generator set package is available certified for seismic application in accordance with the following International Building Code: IBC2000, IBC2003, IBC2006, IBC2009 and IBC2012.</p>

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open.

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S-15081 (3/13)



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Spec.

E

ten Ordering Parts

Commander Des Pieces

99-2433

R GENERATION

E.

55432 U.S.A.

U.S.A.

STANDBY	60 HZ	PRIME
SPM	1PH	3PH
1000.0	0.0	0.0
0.0	0.0	0.0
1200.0	0.0	0.0

AMPS

1503.6

AMPS

Model No
Model

DQFAD-7797932

Serial No.
Série

1110247696

Spec.

IMPORTANT

Model & Serial No. Required When Ordering Parts

Model & No. Same Request Pour Commander Des Pieces

99-2433

09/16/2011 10:00:00 AM
 0326-6919
 1704
 Feature P/N Feature P/N Feature P/N
 3415087 3415089 3415092
 3415095 3415114 3415144
 3415181 4810704
 0xe260

Build Date
 Calibration P/M
 CPL #

Checksum

Engine A-Q5H30
 ESN-372506A0

Operator
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Engine No. 37250040

EPA Family 05200.030.AAD

FR FRO325000

Date of Mfg. 08/11

Model Q5T30-05 MR2

Ref. No. A0340631

Standby HP/kW /

AT 1500 RPM 13

Prime HP/kW /

AT 1500 RPM 13

NO_x PBL 0.4

PM PBL 0.20

Power Category

Valve Lash Cold IN/mm

Swirl Meter /

AT 1500 RPM 1400/1111 AT 1800 RPM

ECS. D

Power Meter /

AT 1500 RPM 3350/1807 AT 1800 RPM

Disp. L

NOx FEL 6.4

PM FEL 0.20

Inj. Tim

Power Category

CPL 170

Valve Lead Cold In/mm

0.017/0.432 Int.

22

EMISSION CONTROL INFORMATION: This engine complies with U.S. EPA and California regulations for 2011 stationary emergency engines. Use in a generator set, Constant Speed Applications Only.

WARRANTY: See the applicable literature for details. **Warranty Excludes:** See literature.

1021

Generator 2

Diesel Generator Set Model DQDAA 60 Hz

**250 kW, 313 kVA Standby
225 kW, 281 kVA Prime**



Description

Cummins Power Generation commercial generator sets are fully integrated power generation systems providing optimum performance, reliability, and versatility for stationary standby or prime power applications.

A primary feature is strong motor-starting capability and fast recovery from transient load changes. The torque-matched system includes a heavy-duty Cummins 4-cycle diesel engine, an AC alternator with high motor-starting kVA capacity, and an electronic voltage regulator with three phase sensing for precise regulation under steady-state or transient loads. The GenSet accepts 100% of the nameplate standby rating in one step, in compliance with NFPA 110 Level 1 requirements.

The standard PowerCommand[®] digital electronic control is an integrated system that combines engine and alternator controls for high reliability and optimum GenSet performance.

Optional weather-protective enclosures and coolant heaters allow generators to perform in outdoor weather operating conditions. Environmental concerns are addressed by low exhaust emission engines, sound-attenuated enclosures, exhaust silencers, and dual-wall fuel tanks. A wide range of options, accessories, and services are available, allowing configuration to your specific power generation needs.

Every production unit is factory tested at rated load and power factor. This testing includes demonstration of rated power and single-step rated load pickup. Cummins Power Generation manufacturing facilities are registered to ISO9001 quality standards, emphasizing our commitment to high quality in the design, manufacture, and support of our products. The generator set is CSA certified (pending) and is available as UL 2200 Listed (pending). The PowerCommand control is UL 508 Listed.

All Cummins Power Generation systems are backed by a comprehensive warranty program and supported by a worldwide network of 170 distributors and service branches to assist with warranty, service, parts, and planned maintenance support.

Features

UL Listed Generator Set - The complete generator set assembly is available as UL 2200 Listed.

Low Exhaust Emissions Exhaust emissions from the generator set meet levels formerly defined by U.S. EPA as Tier 1.

Cummins Heavy-Duty Engine - Rugged 4-cycle industrial diesel engine delivers reliable power, low emissions, and fast response to load changes.

Alternator - Several alternator sizes offer selectable motor starting capability with low reactance 2/3 pitch windings; low waveform distortion with non-linear loads, fault clearing short-circuit capability, and class H insulation. The alternator electrical insulation system is UL1446 Recognized.

Permanent Magnet Generator (PMG) - Offers enhanced motor starting and fault clearing short circuit capability.

Control System - The PowerCommand electronic control is standard equipment and provides total genset system integration, including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, AmpSentry[™] protection, output metering, auto-shutdown at fault detection, and NFPA 110 Level 1 compliance. PowerCommand control is Listed to UL508.

Cooling System - Provides reliable running at the rated power level, at up to 50°C ambient temperature.

Integral Vibration Isolation - Robust skid base supports the engine, alternator, and radiator on isolators, minimizing transmitted vibration.

E-Coat Finish - Dual electro-deposition paint system provides high resistance to scratches, corrosion, or fading.

Enclosures - Optional weather-protective and sound-attenuated enclosures are available.

Fuel Tanks - Dual wall sub-base fuel tanks are also offered.

Certifications - Generator sets are designed, manufactured, tested, and certified to relevant UL, NFPA, ISO, IEC, and CSA standards.

Warranty and Service - Backed by a comprehensive warranty and worldwide distributor network.

Generator Set

The general specifications provide representative configuration details. Consult the outline drawing for installation design.

Specifications – General

See outline drawing 500-4288 for installation design specifications.

Unit Width, in (mm)	50.0 (1270)
Unit Height, in (mm)	66.0 (1676)
Unit Length, in (mm)	119.0 (3023)
Unit Dry Weight, lb (kg)	4814 (2184)
Unit Wet Weight, lb (kg)	4926 (2234)
Rated Speed, rpm	1800
Voltage Regulation, No Load to Full Load	±0.5%
Random Voltage Variation	±0.5%
Frequency Regulation	Isochronous
Random Frequency Variation	±0.5%
Radio Frequency Interference	IEC 801.2, Level 4 Electrostatic Discharge IEC 801.3, Level 3 Radiated Susceptibility IEC 801.4, Level 4 Electrical Fast Transients IEC 801.5, Level 5 Voltage Surge Immunity MIL STD 461C, Part 9 Radiated Emissions (EMI)

Cooling	Standby	Prime
Fan Load, HP (kW)	17.0 (12.7)	17.0 (12.7)
Coolant Capacity with radiator, US Gal (L)	8.0 (30.3)	8.0 (30.3)
Coolant Flow Rate, Gal/min (L/min)	64.0 (242.2)	64.0 (242.2)
Heat Rejection To Coolant, Btu/min (MJ/min)	5645.0 (6.0)	4925.0 (5.2)
Heat Radiated To Room, Btu/min (MJ/min)	2328.0 (2.5)	2058.0 (2.2)
Maximum Coolant Friction Head, psi (kPa)	5.0 (34.5)	5.0 (34.5)
Maximum Coolant Static Head, ft (m)	60.0 (18.3)	60.0 (18.3)

Air	Standby	Prime
Combustion Air, scfm (m ³ /min)		
Alternator Cooling Air, scfm (m ³ /min)	790.0 (22.4)	761.0 (21.5)
Radiator Cooling Air, scfm (m ³ /min)	2100.0 (59.4)	2100.0 (59.4)
Max. Static Restriction, in H ₂ O (Pa)	20075.0 (568.1)	20075.0 (568.1)
	0.50 (124.50)	0.50 (124.50)

Rating Definitions

Standby Rating based on: Applicable for supplying emergency power for the duration of normal power interruption. No sustained overload capability is available for this rating. (Equivalent to Fuel Stop Power in accordance with ISO3046, AS2789, DIN6271 and BS5514). Nominally rated.

Prime (Unlimited Running Time) Rating based on: Applicable for supplying power in lieu of commercially purchased power. Prime power is the maximum power available at a variable load for an unlimited number of hours. A 10% overload capability is available for limited time. (Equivalent to Prime Power in accordance with ISO8528 and Overload Power in accordance with ISO3046, AS2789, DIN6271, and BS5514). This rating is not applicable to all generator set models.

Site Derating Factors

Standby engine power available at 40°C (104°F) ambient temperature and 3300 meters (10827 ft) altitude capability. Consult your Cummins Power Generation distributor for temperature and ambient requirements outside these parameters.

Engine

Cummins heavy duty diesel engines use advanced combustion technology for reliable and stable power, low emissions, and fast response to sudden load changes.

Electronic governing provides precise speed regulation, especially useful for applications requiring constant (isochronous) frequency regulation such as Uninterruptible Power Supply (UPS) systems, non-linear loads, or sensitive electronic loads. Optional coolant heaters are recommended for all emergency standby installations or for any application requiring fast load acceptance after start-up.

Specifications – Engine

Base Engine	Cummins, Inc Model QSL9-G5, Turbocharged and CAC, diesel-fueled
Displacement in³ (L)	543.0 (8.9)
Overspeed Limit, rpm	2070 ±50
Regenerative Power, kW	35.00
Cylinder Block Configuration	Cast iron, In-line 6 cylinder
Battery Capacity	750 amps at ambient temperature of 10°F (-12C) and above
Battery Charging Alternator	70 amps
Starting Voltage	24-volt, negative ground
Lube Oil Filter Types	Single spin-on, combination full flow and bypass filters
Standard Cooling System	122°F (50°C) ambient radiator

Power Output	Standby	Prime							
Gross Engine Power Output, bhp (kWm)	476.0 (355.1)	412.0 (307.4)							
BMEP at Rated Load, psi (kPa)	302.0 (2082.2)	273.0 (1882.3)							
Bore, in. (mm)	4.49 (114.0)	4.49 (114.0)							
Stroke, in. (mm)	4.69 (119.1)	4.69 (119.1)							
Piston Speed, ft/min (m/s)	1707.0 (8.7)	1707.0 (8.7)							
Compression Ratio	16.8:1	16.8:1							
Lube Oil Capacity, qt. (L)	24.0 (22.7)	24.0 (22.7)							
Fuel Flow									
Fuel Flow at Rated Load, US Gal/hr (L/hr)	43.0 (162.8)	43.0 (162.8)							
Maximum Inlet Restriction, in. Hg (mm Hg)	6.0 (152.4)	6.0 (152.4)							
Maximum Return Restriction, in. Hg (mm Hg)	10.0 (254.0)	10.0 (254.0)							
Air Cleaner									
Maximum Air Cleaner Restriction, in. H ₂ O (kPa)	25.0 (6.2)	25.0 (6.2)							
Exhaust									
Exhaust Flow at Rated Load, cfm (m ³ /min)	1218.0 (34.5)	1170.0 (33.1)							
Exhaust Temperature, °F (°C)	869.0 (465.0)	799.0 (426.1)							
Max Back Pressure, in. H ₂ O (kPa)	41.0 (10.2)	41.0 (10.2)							
Fuel System	Direct injection, number 2 diesel fuel; fuel filters (one with water separator); automatic electric fuel shutoff								
Fuel Consumption	Standby	Prime							
60 Hz Ratings, kW (kVA)	250 (313)	225 (281)							
	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full	
	US Gal/hr	4.8	8.9	13.1	17.8	4.4	8.1	11.8	15.7
	L/hr	18	34	50	67	17	31	45	59

Alternator

Several alternators are available for application flexibility based on the required motor-starting kVA and other requirements. Larger alternator sizes have lower temperature rise for longer life of the alternator insulation system. In addition, larger alternator sizes can provide a cost-effective use of engine power in across-the-line motor-starting applications and can be used to minimize voltage waveform distortion caused by non-linear loads.

Single-bearing alternators couple directly to the engine flywheel with flexible discs for drivetrain reliability and durability. No gear reducers or speed changers are used. Two-thirds pitch windings eliminate third-order harmonic content of the AC voltage waveform and provide the standardization desired for paralleling of generator sets. The standard excitation system is a PMG excited system.

Alternator Application Notes

Separately Excited Permanent Magnet Generator (PMG) System - This standard system uses an integral PMG to supply power to the voltage regulator. A PMG system generally has better motor-starting performance, lower voltage dip upon load application, and better immunity from problems with harmonics in the main alternator output induced by non-linear loads. This system provides improved performance over self-excited regulators in applications that have large transient loads, sensitive electronic loads (especially UPS applications), harmonic content, or that require sustained short-circuit current (sustained 3-phase short circuit current at approximately 3 times rated for 10 seconds).

Alternator Sizes - On any given model, various alternator sizes are available to meet individual application needs. Alternator sizes are differentiated by maximum winding temperature rise, at the generator set standby or prime rating, when operated in a 40°C ambient environment. Available temperature rises range from 80°C to 150°C. Not all temperature rise selections are available on all models. Lower temperature rise is accomplished using larger alternators at lower current density. Lower temperature rise alternators have higher motor-starting kVA, lower voltage dip upon load application, and they are generally recommended to limit voltage distortion and heating due to harmonics induced by non-linear loads.

Alternator Space Heater - is recommended to inhibit condensation.

Available Output Voltages

Three Phase Reconnectable

- [] 110/190
- [] 120/208
- [] 127/220
- [] 139/240
- [] 120/240
- [] 220/380
- [] 240/416
- [] 254/440
- [] 277/480

Three Phase Non-Reconnectable

- [] 277/480
- [] 347/600

Specifications – Alternator

Design	Brushless, 4 pole, drip proof revolving field
Stator	2/3 pitch
Rotor	Direct coupled by flexible disc
Insulation System	Class H per NEMA MG1-1.65
Standard Temperature Rise	125°C Standby, 105°C @ Prime
Exciter Type	Permanent Magnet Generator (PMG)
Phase Rotation	A (U), B (V), C (W)
Alternator Cooling	Direct drive centrifugal blower
AC Waveform Total Harmonic Distortion	<5% total no load to full linear load <3% for any single harmonic <50 per NEMA MG1-22.43
Telephone Influence Factor (TIF)	<3
Telephone Harmonic Factor (THF)	<3

Three Phase Table ¹		80° C	80° C	80° C	80° C	105° C	105° C	105° C	125° C	125° C	125° C	125° C	125° C
Feature Code		B290	B257	B251	B302	B259	B258	B301	B258	B252	B248	B247	B300
Alternator Data Sheet Number		342	341	341	341	341	341	340	341	340	339	340	338
Voltage Ranges		110/190 Thru 139/240 220/380 Thru 277/480	120/208 Thru 139/240 240/416 Thru 277/480	277/480	347/600	110/190 Thru 139/240 220/380 Thru 277/480	120/208 Thru 139/240 240/416 Thru 277/480	347/600	110/190 Thru 139/240 220/380 Thru 277/480	120/208 Thru 139/240 240/416 Thru 277/480	277/480	277/480	347/600
Surge kW		322	322	322	322	322	322	322	322	322	322	322	322
Motor Starting kVA (at 90% sustained voltage)	PMG	1372	1210	1210	1210	1210	1210	1028	1210	1028	904	1028	904
Full Load Current - Amps at Standby Rating		<u>120/208</u> 887	<u>127/220</u> 820	<u>139/240</u> 752	<u>220/380</u> 475	<u>240/416</u> 434	<u>254/440</u> 410	<u>277/480</u> 378	<u>347/600</u> 301				

Notes:

Single phase power can be taken from a three phase generator set at up to 40% of the generator set nameplate kW rating at unity power factor.

Control System

	PowerCommand Control with AmpSentry™ Protection (PCC2100 CAN)	
<ul style="list-style-type: none"> • The PowerCommand Control is an integrated generator set control system providing governing, voltage regulation, engine protection, and operator interface functions. • PowerCommand Controls include integral UL Listed AmpSentry protection. AmpSentry provides a full range of alternator protection functions that are matched to the alternator provided. • Controls provided include Battery monitoring and testing features. • Integral PCCNet interface, to allow high speed network interconnections to remote input/output (I/O) and annunciator modules. • InPower PC-based service tool available for detailed diagnostics. • NEMA 3R enclosure. • Suitable for operation in ambient temperatures from -40C to +70C, and altitudes to 13,000 feet (5000 meters). • Prototype tested; UL, CSA, and CE compliant. 		
AmpSentry AC Protection	Engine Protection	Operator interface
<ul style="list-style-type: none"> • Overcurrent and short circuit shutdown • Overcurrent warning • Single & 3-phase fault regulation • Over and under voltage shutdown • Over and under frequency shutdown • Overload warning with alarm contact • Reverse power and reverse Var shutdown • Excitation fault 	<ul style="list-style-type: none"> • Overspeed shutdown • Low oil pressure warning and shutdown • High coolant temperature warning and shutdown • High oil temperature warning (optional) • Low coolant level warning or shutdown • Low coolant temperature warning • High and low battery voltage warning • Weak battery warning • Dead battery shutdown • Fail to start (overcrank) shutdown • Fail to crank shutdown • Redundant start disconnect • Cranking lockout • Sensor failure indication 	<ul style="list-style-type: none"> • OFF/MANUAL/AUTO mode switch • MANUAL RUN/STOP switch • Panel lamp test switch • Emergency Stop switch • Alpha-numeric display with pushbutton access, for viewing engine and alternator data and providing setup, controls, and adjustments • LED lamps indicating genset running, not in auto, common warning, common shutdown • (5) configurable LED lamps • LED Bargraph AC data display (optional)
Alternator Data	Engine Data	Other Data
<ul style="list-style-type: none"> • Line-to-line and line-to-neutral AC volts • 3-phase AC current • Frequency • Total and individual phase kW and KVA 	<ul style="list-style-type: none"> • DC voltage • Lube oil pressure • Coolant temperature • Lube oil temperature (optional) 	<ul style="list-style-type: none"> • Genset model data • Start attempts, starts, running hours • KW hours (total and since reset) • Fault history • Load profile (hours less than 30% and hours more than 90% load) • System data display (optional with network and other PowerCommand gensets or transfer switches)
Governing	Voltage Regulation	Control Functions
<ul style="list-style-type: none"> • Digital electronic isochronous governor • CAN data-link interface to full authority electronic engine control 	<ul style="list-style-type: none"> • Integrated digital electronic voltage regulator • 3-phase line to neutral sensing • PMG (Optional) • Single and three phase fault regulation • Configurable torque matching 	<ul style="list-style-type: none"> • Data logging on faults • Fault simulation (requires InPower) • Time delay start and cooldown • Cycle cranking • (4) Configurable customer inputs • (4) Configurable customer outputs • PCCNet interface, network interconnections to I/O modules, annunciators, and other equipment
Options		
<ul style="list-style-type: none"> <input type="checkbox"/> Analog AC Meter Display <input type="checkbox"/> Thermostatically-Controlled Space Heater 	<ul style="list-style-type: none"> <input type="checkbox"/> Key-type mode switch <input type="checkbox"/> Engine oil temperature sensing and alarm <input type="checkbox"/> Auxiliary Relays (3) 	<ul style="list-style-type: none"> <input type="checkbox"/> Echelon LonWorks interface <input type="checkbox"/> LonWorks network input and output module(s) (loose) (8) Configurable inputs and (16) outputs <input type="checkbox"/> Remote network annunciator (loose) - LonWorks

Generator Set Options

Engine

- 120/240 V, 1500 W coolant heater
- 120/240 V, 150 W lube oil heater
- Heavy Duty Air Cleaner

Cooling System

- 125°F (50°C) ambient cooling

Fuel System

- 12 hour dual wall sub-base tank
- 24 hour dual wall sub-base tank
- Single wall sub-base fuel tank, 125 gal

Alternator

- 80°C Rise Alternator
- 105°C rise alternator
- 125°C rise alternator
- 120/240 V, 100 W anti-condensation heater
- PMG excitation
- Single phase

Control Panel

- 120/240 V, 100 W control anti-condensation heater
- Exhaust pyrometer
- Ground fault indication
- Remote fault signal package
- Run relay package

Exhaust System

- GenSet mounted muffler
- Heavy duty exhaust elbow
- Slip on exhaust connection
- NPT Exhaust connection

Generator Set

- AC entrance box
- Batteries
- Battery charger
- Export box packaging
- UL 2200 Listed
- Main line circuit breaker
- PowerCommand Network Communication Module (NCM)
- QuietSite Stage 1 housing w/silencer
- QuietSite Stage 2 housing w/silencer
- Remote annunciator panel
- Spring isolators
- Weather protective enclosure with silencer
- 2 year prime power warranty
- 2 year standby warranty
- 5 year basic power warranty
- 10 year major components warranty

Available Products and Services

A wide range of products and services is available to match your power generation system requirements. Cummins Onan products and services include:

Diesel and Spark-Ignited Generator Sets

Transfer Switches

Bypass Switches

Parallel Load Transfer Equipment

Digital Paralleling Switchgear

PowerCommand Network and Software

Distributor Application Support

Planned Maintenance Agreements

Warranty

All components and subsystems are covered by an express limited one-year warranty. Other optional and extended factory warranties and local distributor maintenance agreements are available. Contact your distributor/dealer for more information.

Certifications



ISO9001 - This generator set was designed and manufactured in facilities certified to ISO9001.



CSA - This generator set is CSA certified to product class 4215-01.



PTS - The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Products bearing the PTS symbol have been subjected to demanding tests in accordance to NFPA 110 Level 1 to verify the design integrity and performance under both normal and abnormal operating conditions including short circuit, endurance, temperature rise, torsional vibration, and transient response, including full load pickup.



UL - The generator set is available Listed to UL 2200, Stationary Engine Generator Assemblies. The PowerCommand control is Listed to UL 508 - Category NITW7 for U.S. and Canadian usage.

See your distributor for more information



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Detector and AmpSentry are trademarks of Cummins Inc

Important: Backfeed to a utility system can cause electrocution and/or property damage. Do not connect generator sets to any building electrical system except through an approved device or after building main switch is open.

Specification sheet



Diesel generator set QSL9-G7 series engine



250 kW - 300 kW standby

Description

Cummins Power Generation commercial generator sets are fully integrated power generation systems providing optimum performance, reliability and versatility for stationary standby and prime power applications.

Features

Cummins® heavy-duty engine - Rugged 4-cycle, industrial diesel delivers reliable power, low emissions and fast response to load changes.

Alternator - Several alternator sizes offer selectable motor starting capability with low reactance 2/3 pitch windings, low waveform distortion with non-linear loads and fault clearing short-circuit capability.

Permanent magnet generator (PMG) - Offers enhanced motor starting and fault clearing short-circuit capability.

Control system - The PowerCommand® electronic control is standard equipment and provides total genset system integration including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, AmpSentry™ protection, output metering, auto-shutdown at fault detection and NFPA 110 Level 1 compliance.

Cooling system - Standard cooling package provides reliable running at the rated power level.

Enclosures - Optional weather protective and sound attenuated enclosures are available.

Fuel tanks - Dual wall sub-base fuel tanks are also available.

NFPA - The genset accepts full rated load in a single step in accordance with NFPA 110 for Level 1 systems.

Warranty and service - Backed by a comprehensive warranty and worldwide distributor network.

Model	Standby rating		Prime rating		Continuous rating		Data sheets	
	60 Hz kW (kVA)	50 Hz kW (kVA)	60 Hz kW (kVA)	50 Hz kW (kVA)	60 Hz kW (kVA)	50 Hz kW (kVA)	60 Hz	50 Hz
DQDAA	250 (313)		225 (281)				D-3442	
DQDAB	275 (344)		250 (313)				D-3443	
DQDAC	300 (375)		270 (338)				D-3444	

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Generator set specifications

Governor regulation class	ISO 8528 Part 1 Class G3
Voltage regulation, no load to full load	± 0.5%
Random voltage variation	± 0.5%
Frequency regulation	isochronous
Random frequency variation	± 0.5%
Radio frequency emissions compliance	IEC 801.2 through IEC 801.5; MIL-STD-461C, Part 9

Engine specifications

Bore	114.0 mm (4.49 in)
Stroke	145 mm (5.69 in)
Displacement	8.9 L (543 in ³)
Configuration	Cast iron, in-line 6 cylinder
Battery capacity	750 amps minimum at ambient temperature of -18 °C (-0.4 °F) and above
Battery charging alternator	70 amps
Starting voltage	24 volt, negative ground
Fuel system	Direct injection: number 2 diesel fuel, fuel filter, automatic electric fuel shutoff
Fuel filter	Dual element with water separator
Air cleaner type	Normal duty
Lube oil filter type(s)	Single spin-on, combination full flow and bypass filters
Standard cooling system	High ambient radiator

Alternator specifications

Design	Brushless, 4 pole, drip proof revolving field
Stator	2/3 pitch
Rotor	Single bearing, flexible discs
Insulation system	Class H
Standard temperature rise	125 °C standby, 105 °C prime
Exciter type	PMG (Permanent magnet generator)
Phase rotation	A (U), B (V), C (W)
Alternator cooling	Direct drive centrifugal blower
AC waveform total harmonic distortion	< 5% no load to full linear load, < 3% for any single harmonic
Telephone influence factor (TIF)	< 50 per NEMA MG1-22.43
Telephone harmonic factor (THF)	< 3

Available voltages

60 Hz 3-phase			50 Hz 3-phase	
Reconnectable	Non-Reconnectable		Reconnectable	Non-Reconnectable
<ul style="list-style-type: none"> • 110/190 • 139/240 • 240/416 	<ul style="list-style-type: none"> • 120/208 • 120/240 • 254/440 	<ul style="list-style-type: none"> • 127/220 • 220/380 • 277/480 	<ul style="list-style-type: none"> • 277/480 • 347/600 	

Note: Consult factory for other voltages.

Generator set options and accessories

Engine

- 120/240 V 1500 W coolant heater
- 120/240 V 150 W tube oil heater
- Heavy duty air cleaner
- Engine oil temperature

Control panel

- 120/240 V 100 W control anti-condensation heater
- Exhaust pyrometer
- Ground fault indication
- Remote fault signal package
- Run relay package
- Paralleling configuration

Alternator

- 80 °C rise
- 105 °C rise
- 125 °C rise
- 120/240 V 100 W anti-condensation heater
- PMG excitation
- Single phase

Exhaust system

- Genset mounted muffler
- Heavy duty exhaust elbow
- Slip on exhaust connection
- NPT exhaust connection

Fuel system

- 1022 L (270 gal) sub-base tank
- 1136 L (300 gal) sub-base tank
- 1514 L (400 gal) sub-base tank
- 1893 L (500 gal) sub-base tank
- 2271 L (600 gal) sub-base tank
- 2498 L (660 gal) sub-base tank
- 2725 L (720 gal) sub-base tank
- 5565 L (1470 gal) sub-base tank

Generator set

- AC entrance box
- Battery
- Battery charger
- Export box packaging
- UL 2200 Listed

- Main line circuit breaker
- PowerCommand Network
- Communications Module (NCM)
- Remote annunciator panel
- Spring Isolators
- Enclosure: aluminum, steel, weather protective or sound attenuated

- 2 year standby power warranty
- 2 year prime power warranty
- 5 year basic power warranty
- 10 year major components warranty

Note: Some options may not be available on all models - consult factory for availability.

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Control system PCC 2100



PowerCommand control is an integrated generator set control system providing governing, voltage regulation, engine protection and operator interface functions. Major features include:

- Integral AmpSentry™ Protective Relay providing a full range of alternator protection functions that are matched to the alternator provided.
- Battery monitoring and testing features and smart starting control system.
- Three phase sensing, full wave rectified voltage regulation system, with a PWM output for stable operation with all load types.
- Standard PCCNet™ and optional Echelon® LonWorks® network interface.
- Control suitable for operation in ambient temperatures from -40 °C to +70 °C (-40 °F to +158 °F) and altitudes to 5000 meters (13,000 feet).
- Prototype tested; UL, CSA, and CE compliant.
- InPower™ PC-based service tool available for detailed diagnostics.

Operator/display panel

- Off/manual/auto mode switch
- Manual run/stop switch
- Panel lamp test switch
- Emergency stop switch
- Alpha-numeric display with pushbutton access for viewing engine and alternator data and providing setup, controls and adjustments
- LED lamps indicating genset running, not in auto, common warning, common shutdown
- Configurable LED lamps (5)
- Configurable for local language

Engine protection

- Overspeed shut down
- Low oil pressure warning and shut down
- High coolant temperature warning and shut down
- High oil temperature warning (some models)
- Low coolant level warning or shut down
- Low coolant temperature warning
- High and low battery voltage warning
- Weak battery warning
- Dead battery shut down
- Fail to start (overcrank) shut down
- Fail to crank shut down
- Redundant -start disconnect
- Cranking lockout
- Sensor failure indication

Engine data

- DC voltage
- Lube oil pressure
- Coolant temperature
- Lube oil temperature (some models)
- Engine speed

AmpSentry AC protection

- Over current and short-circuit shut down
- Over current warning
- Single and three phase fault regulation
- Over and under voltage shut down
- Over and under frequency shut down
- Overload warning with alarm contact
- Reverse power and reverse Var shut down
- Excitation fault

Alternator data

- Line-to-line and line-to-neutral AC volts
- Three phase AC current
- Frequency
- Total and individual phase power factor, kW and kVA

Other data

- Genset model data
- Start attempts, starts, running hours
- kW hours (total and since reset)
- Fault history
- Load profile (hours less than 30% and hours more than 90% load)
- System data display (optional with network and other PowerCommand gensets or transfer switches)

Governing

- Digital electronic isochronous governor
- Temperature dynamic governing
- Smart idle speed mode
- Glow plug control (some models)

Voltage regulation

- Digital PWM electronic voltage regulation
- Three phase line-to-neutral sensing
- Suitable for PMG or shunt excitation
- Single and three phase fault regulation
- Configurable torque matching

Control functions

- Data logging on faults
- Fault simulation (requires InPower)
- Time delay start and cooldown
- Cycle cranking
- PCCNet interface
- Configurable customer inputs (4)
- Configurable customer outputs (4)
- Configurable network inputs (8) and outputs (16) (with optional network)
- Remote emergency stop

Options

- LED bargraph AC data display
- Thermostatically controlled space heater
- Key-type mode switch
- Ground fault module
- Auxiliary relays (3)
- Echelon LONWORKS interface
- Modlon Gateway to convert to Modbus (loose)
- PowerCommand iWatch web server for remote monitoring and alarm notification (loose)
- Digital input and output module(s) (loose)
- Remote annunciator (loose)

For further detail see document S-1409.

Ratings definitions

Emergency standby power (ESP):

Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Limited-time running power (LTP):

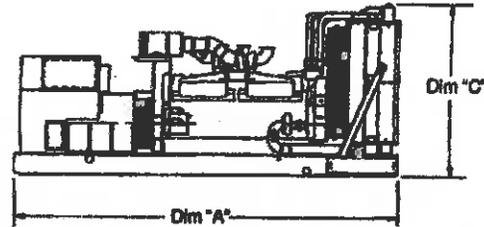
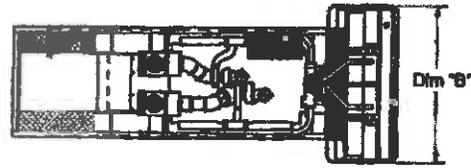
Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.

Prime power (PRP):

Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Base load (continuous) power (COP):

Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271 and BS 5514.



This outline drawing is for reference only. See respective model data sheet for specific model outline drawing number.

Do not use for installation design

Model	Dim "A" mm (in.)	Dim "B" mm (in.)	Dim "C" mm (in.)	Estimated Set Weight* dry kg (lbs)	Estimated Set Weight* wet kg (lbs)
DQDAA	3023 (119.0)	1270 (50.0)	1676 (66.0)	2184 (4814)	2234 (4926)
DQDAB	3023 (119.0)	1270 (50.0)	1676 (66.0)	2184 (4814)	2234 (4926)
DQDAC	3023 (119.0)	1270 (50.0)	1676 (66.0)	2319 (5113)	2370 (5225)

* Weights represent a set with standard features. See outline drawings for weights of other configurations.

Codes and standards

Codes or standards compliance may not be available with all model configurations – consult factory for availability.

	<p>This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.</p>		<p>The generator set is available Listed to UL2200. Stationary Engine Generator Assemblies for all 60 Hz low voltage models.</p>
	<p>The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Cummins Power Generation products bearing the PTS symbol meet the prototype test requirements of NFPA 110 for Level 1 systems.</p>	<p>U.S. EPA</p>	<p>Engine certified to Stationary Emergency U.S. EPA New Source Performance Standards, 40 CFR 60 subpart IIII Tier 3 exhaust emission levels. U.S. applications must be applied per this EPA regulation.</p>
	<p>All low voltage models are CSA certified to product class 4215-01.</p>	<p>International Building Code</p>	<p>The generator set package is available certified for seismic application in accordance with the following International Building Code: IBC2000, IBC2003, IBC2006, IBC2009 and IBC2012.</p>

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open.

North America
1400 73rd Avenue N.E.
Minneapolis, MN 55432
USA

Phone 763 574 5000
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S-1585e (3/13)



cumminspowers.com

QSL9-G3

Emissions Compliance:
EU Stage IIIA at 50 Hz
EPA Tier 3 at 60 Hz



> Specification sheet

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Description

Cummins QSL engines are built to deliver heavy-duty performance. Full-authority electronic engine controls combine with the high-pressure fuel system, 24-valve design and centred injectors for one of the highest power-to-weight ratios in its class. At the same time, the QSL delivers better fuel economy, has better cold starting capability and is up to 50% quieter in operation than its predecessors.



This engine has been built to comply with CE certification.



This engine has been designed in facilities certified to ISO9001 and manufactured in facilities certified to ISO9001 or ISO9002.

Features

Common Rail Fuel System and Controls - Bosch high pressure common rail (HPCR) - Optimize engine performance to provide seamless integration and advanced diagnostics and programming options.

Holset HX40 Turbocharging - Wastegated design optimizes transient response.

Integrated Block Design - Integrated fluid circuits replace hoses and eliminate potential leaks.

24-Valve Cylinder Head - Four valves per cylinder for increased power with faster response & fuel economy.

Coolpac Integrated Design - Products are supplied complete with cooling package and air cleaner kit for a complete power package. Each component has been specifically developed and rigorously tested for G-Drive products, ensuring high performance, durability and reliability.

Service and Support - G-Drive products are backed by an uncompromising level of technical support and after sales service, delivered through a world class service network.

1500 rpm (50 Hz Ratings)

Gross Engine Output			Net Engine Output			Typical Generator Set Output					
Standby	Prime	Base	Standby	Prime	Base	Standby (ESP)		Prime (PRP)		Base (COP)	
kWm/BHP			kWm/BHP			kWe	kVA	kWe	kVA	kWe	kVA
257/345	227/305	193/259	244/327	217/291	183/245	220	275	200	250	170	213

1800 rpm (60 Hz Ratings)

Gross Engine Output			Net Engine Output			Typical Generator Set Output					
Standby	Prime	Base	Standby	Prime	Base	Standby (ESP)		Prime (PRP)		Base (COP)	
kWm/BHP			kWm/BHP			kWe	kVA	kWe	kVA	kWe	kVA
297/399	262/352	178/238	260/375	248/332	164/219	250	313	227	284	152	190

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General Engine Data

Type	4 cycle, in-line, Turbo Charged, Air-cooled
Bore mm	114 mm (4.5in.)
Stroke mm	145 mm (5.7in.)
Displacement Litre	8.8 litre (543 in. ³)
Cylinder Block	Cast iron, 6 cylinder
Battery Charging Alternator	70 amps
Starting Voltage	24 volt, negative ground
Fuel System	Direct injection
Fuel Filter	Spin-on fuel filters with water separator
Lube Oil Filter Type(s)	Spin-on full flow filter
Lube Oil Capacity (l)	26.5
Flywheel Dimensions	SAE1

Coolpac Performance Data

Cooling System Design	Air-Air Charge Cooled
Coolant Ratio	50% ethylene glycol; 50% water
Coolant Capacity (l)	15.0
Limiting Ambient Temp.** (°C)	50 (50Hz); 55 (60Hz)
Fan Power (kWm)	10 (50Hz); 11 (60Hz)
Cooling System Air Flow (m ³ /s)**	7.9 (50Hz); 8 (60Hz)
Air Cleaner Type	Light duty dry replaceable element with restriction indicator

** @ 13 mm W8

Weight & Dimensions

Length	Width	Height	Weight (dry)
mm	mm	mm	kg
1624	1064	1463	861

Fuel Consumption 1500 (50 Hz)

%	kWm	BHP	L/ph	US gal/ph
Standby Power				
100	257	345	66	17.3
Prime Power				
100	227	305	59	15.6
75	170	228	49	13.0
50	114	152	34	8.9
25	57	76	18	4.7
Continuous Power				
100	193	259	53	14.1

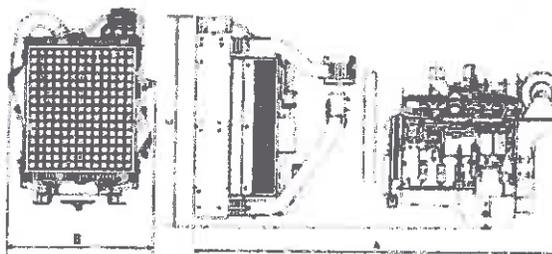
Ratings Definitions

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Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Limited-Time Running Power (LTP):
Applicable for supplying power to a constant electrical load for limited hours. Limited-Time Running Power (LTP) is in accordance with ISO 8528.

Prime Power (PRP):
Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Base Load (Continuous) Power (COP):
Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) in accordance with ISO 8528, ISO 3046, AS 2789, DIN6271 and BS 5514.



Fuel Consumption 1800 (60 Hz)

%	kWm	BHP	L/ph	US gal/ph
Standby Power				
100	297	399	77	20.4
Prime Power				
100	262	352	70	18.5
75	197	264	58	15.2
50	131	176	41	10.8
25	66	88	21	5.6
Continuous Power				
100	178	238	53	14.1

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USA Toll-free 1 877 769 7669
Fax 1 763 574 5198

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QSL9-G3

Emissions Compliance:
EU Stage IIIA at 50 Hz
EPA Tier 3 at 60 Hz



> Specification sheet

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Description

Cummins QSL engines are built to deliver heavy-duty performance. Full-authority electronic engine controls combine with the high-pressure fuel system, 24-valve design and centred injectors for one of the highest power-to-weight ratios in its class. At the same time, the QSL delivers better fuel economy, has better cold starting capability and is up to 50% quieter in operation than its predecessors.



This engine has been built to comply with CE certification.



This engine has been designed in facilities certified to ISO9001 and manufactured in facilities certified to ISO9001 or ISO9002.

Features

Common Rail Fuel System and Controls - Bosch high pressure common rail (HPCR) - Optimize engine performance to provide seamless integration and advanced diagnostics and programming options.

Holset HX40 Turbocharging - Wastegated design optimizes transient response.

Integrated Block Design - Integrated fluid circuits replace hoses and eliminate potential leaks.

24-Valve Cylinder Head - Four valves per cylinder for increased power with faster response & fuel economy.

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Service and Support - G-Drive products are backed by an uncompromising level of technical support and after sales service, delivered through a world class service network.

1500 rpm (50 Hz Ratings)

Gross Engine Output			Net Engine Output			Typical Generator Set Output					
Standby	Prime	Base	Standby	Prime	Base	Standby (ESP)		Prime (PRP)		Base (COP)	
kWm/BHP			kWm/BHP			kWe	kVA	kWe	kVA	kWe	kVA
257/345	227/305	193/259	244/327	217/291	183/245	220	275	200	250	170	213

1800 rpm (60 Hz Ratings)

Gross Engine Output			Net Engine Output			Typical Generator Set Output					
Standby	Prime	Base	Standby	Prime	Base	Standby (ESP)		Prime (PRP)		Base (COP)	
kWm/BHP			kWm/BHP			kWe	kVA	kWe	kVA	kWe	kVA
297/399	262/352	178/238	280/375	248/332	164/219	250	313	227	284	152	190

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General Engine Data

Type	4 cycle, in-line, Turbo Charged, Air-cooled
Bore mm	114 mm (4.5in.)
Stroke mm	145 mm (5.7in.)
Displacement Litre	8.8 litre (543 in. ³)
Cylinder Block	Cast Iron, 6 cylinder
Battery Charging Alternator	70 amps
Starting Voltage	24 volt, negative ground
Fuel System	Direct injection
Fuel Filter	Spin-on fuel filters with water separator
Lube Oil Filter Type(s)	Spin-on full flow filter
Lube Oil Capacity (l)	26.5
Flywheel Dimensions	SAE1

Coolpac Performance Data

Cooling System Design	Air-Air Charge Cooled
Coolant Ratio	50% ethylene glycol; 50% water
Coolant Capacity (l)	15.0
Limiting Ambient Temp.** (°C)	50 (50Hz); 55 (60Hz)
Fan Power (kWm)	10 (50Hz); 11 (60Hz)
Cooling System Air Flow (m ³ /s)**	7.9 (50Hz); 8 (60Hz)
Air Cleaner Type	Light duty dry replaceable element with restriction indicator

** @ 13 mm H₂O

Weight & Dimensions

Length	Width	Height	Weight (dry)
mm	mm	mm	kg
1624	1064	1463	861

Fuel Consumption 1500 (50 Hz)

%	kWm	BHP	L/ph	US gal/ph
Standby Power				
100	257	345	66	17.3
Prime Power				
100	227	305	59	15.6
75	170	228	49	13.0
50	114	152	34	8.9
25	57	76	16	4.7
Continuous Power				
100	193	259	53	14.1

Fuel Consumption 1800 (60 Hz)

%	kWm	BHP	L/ph	US gal/ph
Standby Power				
100	297	399	77	20.4
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100	262	352	70	18.5
75	197	264	58	15.2
50	131	176	41	10.8
25	66	88	21	5.6
Continuous Power				
100	178	238	53	14.1

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Fax 44 1843 255902

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Guarulhos, SP 07180-900
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Mexico
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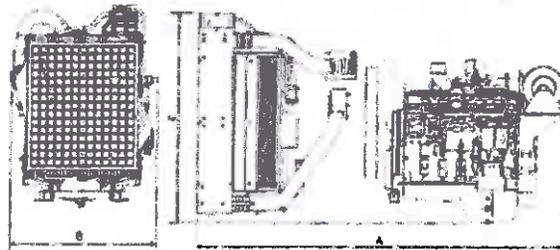
Ratings Definitions

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Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Limited-Time Running Power (LTP):
Applicable for supplying power to a constant electrical load for limited hours. Limited-Time Running Power (LTP) is in accordance with ISO 8528.

Prime Power (PRP):
Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Base Load (Continuous) Power (COP):
Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) in accordance with ISO 8528, ISO 3046, AS 2789, DIN6271 and BS 5514.



Model No. **DDDA - 7797934**
 Modelo
 Serial No. **I110248339** Spec. **E**
 Serie

IMPORTANT!
 Model & Serial No. (Required for Warranty)
 Modelo & No. Serie (Requerido para Garantía)

CUMMINS POWER GENERATION
 1400 73RD AVE. N.E.
 MINNEAPOLIS, MN 55432 U.S.A.
 MADE IN U.S.A.

DESCRIPTION	12V	CHARGES	NO. WZ	PHASE	AMPS
STARTING MOTOR	187.5	250.0	00	00	0.0
STARTER MOTOR	1.2	0.4	00	00	0.0
12 VOLTAGE	162.5	512.5	00	00	0.0
BATTERY					
24 VOLT	120/200	507.4			
	120/240	751.3			
	120/220	673.1			
	133/250	784.5			
	130/240	751.6			
	240/416	423.7			
	255/440	410.1			
NOMINAL RATED	260/360	367.2			
	277/480	376.9			

FUEL: **MAX FLOW**
 Diesel: **163 L/hr (43 gal/hr)**

Model No. **DDDA - 7797934**
 Modelo
 Serial No. **I110248339** Spec.
 Serie

09/21/2011 H000Y00Y
 0326-6007
 Feature P/N: 0326-5482
 0326-5480
 0326-5570
 0326-5003
 0326-0066

Build Date
 Calibration P/N
 Feature P/N: 0326-5488
 0326-5556
 0326-5553
 0326-6770

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Application

University of California

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Product Code: 7337888

Product Name: Mid-Duty

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Attachment I

Emissions Calculations

Engine Emissions Analysis

Highland-Charleston Hospital
 300 96th St. SE
 Charleston, WV 25304-2361

Generator	Make/Model	Size (kW)	Make/Model	Engine	Model Year	Size (hp)	Fuel	Fuel Use (gph)	Heat Input (mmBtu/hr)	NOx	CO	SO ₂	PM	VOC	Formaldehyde	Hours	Permitted Emissions (t/yr)					
1	Cummins DQFAD	1000	Cummins QST30-G5-NR3	2011	1460	Diesel	72.2	9.7	15.67	8.57	0.02	0.49	1.05	1.05	7.89E-04	500	2.14	0.005	0.12	0.26	1.92E-04	
2	Cummins DQDAA	250	Cummins QSL9-G3-NR3	2011	476	Diesel	17.8	2.4	3.13	2.74	0.98	0.16	1.18	1.18	2.84E-03	500	0.88	0.24	0.04	0.28	7.99E-04	
TOTAL									18.80	11.31	0.99	0.65	2.23	2.23	3.60E-03		4.70	2.83	0.25	0.16	0.56	9.01E-04

Notes: Engine hp derived from internet searches for Gens #1 and 2 and nameplate for Gen #3; Diesel Fuel Input estimated as 0.09*Engine kW; Estimated Diesel Heat Input = gcal/hr * 135,000 Btu/gal Emission Factors.

Emergency Gener.	Size (kW)	Make/Model	Engine	Model Year	Size (hp)	Fuel	Fuel Use (gph)	Heat Input (mmBtu/hr)	NOx	CO	SO ₂	PM	VOC	Formaldehyde	Hours	Permitted Emissions (t/yr)
EPA AP-42, < 600 hp									15.67	8.57	0.02	0.49	1.05	7.89E-04	500	2.14
NOx									3.13	2.74	0.98	0.16	1.18	2.84E-03	500	0.88
VOC									18.80	11.31	0.99	0.65	2.23	3.60E-03		4.70
CO																
PM																
SO _x																

Toxic Pollutant	Calculation Source	Value
Formaldehyde	1.18E-03	1.18E-03
Xylenes	2.85E-04	2.85E-04
Toluene	4.09E-04	4.09E-04
Benzene	9.33E-04	9.33E-04
< 600 hp	EPA AP-42, Fifth Edition, October, 1996	1.93E-04
> 600 hp	EPA AP-42, Fifth Edition, October, 1996	7.76E-04

Emergency Gener.	Size (kW)	Make/Model	Engine	Model Year	Size (hp)	Fuel	Fuel Use (gph)	Heat Input (mmBtu/hr)	NOx	CO	SO ₂	PM	VOC	Formaldehyde	Hours	Permitted Emissions (t/yr)
EPA AP-42, > 600 hp									15.67	8.57	0.02	0.49	1.05	7.89E-04	500	2.14
NOx									3.13	2.74	0.98	0.16	1.18	2.84E-03	500	0.88
VOC									18.80	11.31	0.99	0.65	2.23	3.60E-03		4.70
CO																
PM																
SO _x																

Toxic Pollutant	Calculation Source	Value
Formaldehyde	1.18E-03	1.18E-03
Xylenes	2.85E-04	2.85E-04
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< 600 hp	EPA AP-42, Fifth Edition, October, 1996	1.93E-04
> 600 hp	EPA AP-42, Fifth Edition, October, 1996	7.76E-04

Emergency Gener.	Size (kW)	Make/Model	Engine	Model Year	Size (hp)	Fuel	Fuel Use (gph)	Heat Input (mmBtu/hr)	NOx	CO	SO ₂	PM	VOC	Formaldehyde	Hours	Permitted Emissions (t/yr)
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NOx									3.13	2.74	0.98	0.16	1.18	2.84E-03	500	0.88
VOC									18.80	11.31	0.99	0.65	2.23	3.60E-03		4.70
CO																
PM																
SO _x																

Toxic Pollutant	Calculation Source	Value
Formaldehyde	1.18E-03	1.18E-03
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Toluene	4.09E-04	4.09E-04
Benzene	9.33E-04	9.33E-04
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Emergency Gener.	Size (kW)	Make/Model	Engine	Model Year	Size (hp)	Fuel	Fuel Use (gph)	Heat Input (mmBtu/hr)	NOx	CO	SO ₂	PM	VOC	Formaldehyde	Hours	Permitted Emissions (t/yr)
EPA AP-42, < 600 hp									15.67	8.57	0.02	0.49	1.05	7.89E-04	500	2.14
NOx									3.13	2.74	0.98	0.16	1.18	2.84E-03	500	0.88
VOC									18.80	11.31	0.99	0.65	2.23	3.60E-03		4.70
CO																
PM																
SO _x																

Toxic Pollutant	Calculation Source	Value
Formaldehyde	1.18E-03	1.18E-03
Xylenes	2.85E-04	2.85E-04
Toluene	4.09E-04	4.09E-04
Benzene	9.33E-04	9.33E-04
< 600 hp	EPA AP-42, Fifth Edition, October, 1996	1.93E-04
> 600 hp	EPA AP-42, Fifth Edition, October, 1996	7.76E-04

Engine Emissions Analysis - HAPs

Highland Charleston Hospital
300 56th St. SE
Charleston, WV 25304-2361

Gen #	Generator		Size (kW)	Make/Model	Engine Model Year	Size (hp)	Fuel	Fuel Use (gph)	Heat Input (mmBtu/hr)	Emissions (lb/yr)			Permitted Emissions (tpy)					
	Make	Model								Benzene	Toluene	Xylenes	Formaldehyde	Benzene	Toluene	Xylenes	Formaldehyde	
	1	Cummins DCFAD	1000	Cummins	CST30-GE-NR	2011	1490 Diesel	72.2	9.7	7.58E-03	2.74E-03	1.88E-03	7.69E-04	300	1.88E-03	6.85E-04	4.70E-04	1.92E-04
	2	Cummins DCCAA	250	Cummins	QSL9-G3-NFS	2011	476 Diesel	17.8	2.4	2.24E-03	9.83E-04	6.85E-04	2.84E-03	500	5.80E-04	2.48E-04	1.71E-04	7.08E-04
TOTAL										9.81E-03	3.72E-03	2.57E-03	3.80E-03		2.45E-03	9.30E-04	6.42E-04	9.01E-04

Notes:
 Engine hp derived from internet searches for Gens #1 and 2 and nameplate for Gen #3; Diesel Fuel Input estimated as 0.08*Engine kW; Estimated Diesel Heat Input = gal/hr * 135,000 Btu/gal
 Emission Factors:

Toxic Pollutant Calculations for Emergency Generator
 Source: EPA AP-42, Fifth Edition, October, 1998

< 600 hp
 Benzene 9.33E-04
 Toluene 4.08E-04
 Xylenes 2.85E-04
 Formaldehyde 1.18E-03

Toxic Pollutant Calculations for Emergency Generator
 Source: EPA AP-42, Fifth Edition, October, 1998

> 600 hp
 Benzene 7.76E-04
 Toluene 2.81E-04
 Xylenes 1.93E-04
 Formaldehyde 7.89E-05

Attachment L

General Permit Registration Application Fee

Silicon Valley Bank
Pittsburgh, PA

60-160/433

DATE	3/5/2013	CHECK NUMBER	000179499
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EnerNOC Inc.
One Marina Park Drive, Suite 400
Boston, MA 02210

PAY One thousand five hundred and 00 / 100 Dollars Only *****

AMOUNT	\$1,500.00
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WEST VIRGINIA DEPT. OF ENVIRONMENT PROT.
Div. of Air Quality
601 - 57th Street
Charleston, WV 25304

TO THE
ORDER
OF



VOID AFTER 180 DAYS



⑈000179499⑈ ⑆043301601⑆ 190⑈8387⑈

Attachment O

Emissions Summary Sheets

EMERGENCY GENERATOR EMISSION SUMMARY SHEET FOR CRITERIA POLLUTANTS

Emergency Generator Location: <u>Highland-Charleston Hospital</u>		Registration Number (Agency Use) <u>G60-C</u>								
Source ID No.	Potential Emissions (lbs/hr)									
	NO _x	CO	VOC	SO ₂	PM ₁₀	NO _x	CO	VOC	SO ₂	PM ₁₀
EG-1	15.67	8.57	1.05	0.02	0.49	3.92	2.14	0.26	0.005	0.12
EG-2	3.13	2.74	1.18	0.98	0.16	0.78	0.68	0.29	0.24	0.04
Total	18.80	11.31	2.23	0.99	0.65	4.70	2.83	0.56	0.25	0.16

Attachment J

Class I Legal Advertisement (TO BE PUBLISHED)

TO BE PUBLISHED IN CHARLESTON DAILY MAIL ON MARCH 17, 2015

**AIR QUALITY PERMIT NOTICE
Notice of Application**

Notice is given that Highland Hospital Association has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a General Permit Registration for emergency backup generators located at Highland-Charleston Hospital, 300 56th Street SE, in Charleston in Kanawha County, West Virginia. The latitude and longitude coordinates are: 38.31489N, 81.56864W.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: 4.7 tons per year (tpy) for Oxides of Nitrogen; 2.8 tpy for Carbon Monoxide; 0.3 tpy for Sulfur Dioxide, 0.2 tpy for Particulate Matter; 0.6 tpy for Volatile Organic Compounds; 0.002 tpy for Benzene; 0.001 for Toluene; 0.001 tpy for Xylenes; and 0.001 tpy for Formaldehyde.

Startup of operation began in June, 2012. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the 17th day of March, 2015.

By: Highland Hospital Association
Todd Jones
Director of Facilities/Plant Operations
300 56th Street SE
Charleston, WV 25304