



WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**DIVISION OF AIR QUALITY**

601 57<sup>th</sup> Street, SE  
 Charleston, WV 25304  
 (304) 926-0475  
[www.dep.wv.gov/daq](http://www.dep.wv.gov/daq)

**APPLICATION FOR NSR PERMIT  
 AND  
 TITLE V PERMIT REVISION  
 (OPTIONAL)**

PLEASE CHECK ALL THAT APPLY TO NSR (45CSR13) (IF KNOWN):

- CONSTRUCTION     MODIFICATION     RELOCATION  
 CLASS I ADMINISTRATIVE UPDATE     TEMPORARY  
 CLASS II ADMINISTRATIVE UPDATE     AFTER-THE-FACT

PLEASE CHECK TYPE OF 45CSR30 (TITLE V) REVISION (IF ANY):

- ADMINISTRATIVE AMENDMENT     MINOR MODIFICATION  
 SIGNIFICANT MODIFICATION

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS ATTACHMENT S TO THIS APPLICATION

**FOR TITLE V FACILITIES ONLY:** Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

**Section I. General**

1. Name of applicant (as registered with the WV Secretary of State's Office):  
 Adjutant Generals Department

2. Federal Employer ID No. (FEIN):  
 556009554

3. Name of facility (if different from above):  
 Charleston Armory

4. The applicant is the:  
 OWNER     OPERATOR     BOTH

5A. Applicant's mailing address:  
 1703 Coonskin Drive  
 Charleston WV 25311

5B. Facility's present physical address:  
 170 Coonskin Drive  
 Charleston WV 25311

6. West Virginia 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 L.L.C./Registration (one page) including any name change amendments or other Business Certificate as Attachment A.

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

8. Does the applicant own, lease, have an option to buy or otherwise have control of the proposed site?     YES     NO

- If YES, please explain:    Owner  
 - If NO, you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be constructed, modified, relocated, administratively updated or temporarily permitted (e.g., coal preparation plant, primary crusher, etc.): Standby Emergency Generators

10. North American Industry Classification System (NAICS) code for the facility:  
 92811

11A. DAQ Plant ID No. (for existing facilities only):  
 039-00540

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):  
 R13-2659

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

Administrative Update #3

<p>12A.</p> <ul style="list-style-type: none"> <li>For <b>Modifications, Administrative Updates</b> or <b>Temporary permits</b> at an existing facility, please provide directions to the <i>present location</i> of the facility from the nearest state road;</li> <li>For <b>Construction</b> or <b>Relocation permits</b>, please provide directions to the <i>proposed new site location</i> from the nearest state road. Include a <b>MAP</b> as <b>Attachment B</b>.</li> </ul> <p>Take Exit 99 from Interstate 64/77. Proceed east to Coonskin Drive. Turn right onto Coonskin Drive. Facility is located before entrance to Coonskin Park.</p>		
12.B. New site address (if applicable):	12C. Nearest city or town: Charleston	12D. County: Kanawha
12.E. UTM Northing (KM): 4247.77	12F. UTM Easting (KM): 448.97	12G. UTM Zone: 17
13. Briefly describe the proposed change(s) at the facility: Incorporate RICE MACT standards into R13-2659		
14A. Provide the date of anticipated installation or change: 1/June/2015 – If this is an <b>After-The-Fact</b> permit application, provide the date upon which the proposed change did happen:     /     /		14B. Date of anticipated Start-Up if a permit is granted: /     /
14C. Provide a <b>Schedule</b> of the planned <b>Installation of/Change</b> to and <b>Start-Up</b> of each of the units proposed in this permit application as <b>Attachment C</b> (if more than one unit is involved).		
15. Provide maximum projected <b>Operating Schedule</b> of activity/activities outlined in this application: Hours Per Day                    Days Per Week                    Weeks Per Year		
16. Is demolition or physical renovation at an existing facility involved? <input type="checkbox"/> YES    XX <input checked="" type="checkbox"/> NO		
17. <b>Risk Management Plans.</b> If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see <a href="http://www.epa.gov/ceppo">www.epa.gov/ceppo</a> ), submit your <b>Risk Management Plan (RMP)</b> to U. S. EPA Region III.		
18. <b>Regulatory Discussion.</b> List all Federal and State air pollution control regulations that you believe are applicable to the proposed process ( <i>if known</i> ). A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance ( <i>if known</i> ). Provide this information as <b>Attachment D</b> .		
<b>Section II. Additional attachments and supporting documents.</b>		
19. Include a check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR22 and 45CSR13).		
20. Include a <b>Table of Contents</b> as the first page of your application package.		
21. Provide a <b>Plot Plan</b> , e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as <b>Attachment E</b> (Refer to <b>Plot Plan Guidance</b> ). – Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).		
22. Provide a <b>Detailed Process Flow Diagram(s)</b> showing each proposed or modified emissions unit, emission point and control device as <b>Attachment F</b> .		
23. Provide a <b>Process Description</b> as <b>Attachment G</b> . – Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).		
<i>All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.</i>		

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H**.  
 – For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I**.

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J**.

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K**.

28. Check all applicable **Emissions Unit Data Sheets** listed below:

<input type="checkbox"/> Bulk Liquid Transfer Operations	<input type="checkbox"/> Haul Road Emissions	<input type="checkbox"/> Quarry
<input type="checkbox"/> Chemical Processes	<input type="checkbox"/> Hot Mix Asphalt Plant	<input type="checkbox"/> Solid Materials Sizing, Handling and Storage Facilities
<input type="checkbox"/> Concrete Batch Plant	<input type="checkbox"/> Incinerator	<input type="checkbox"/> Storage Tanks
<input type="checkbox"/> Grey Iron and Steel Foundry	<input type="checkbox"/> Indirect Heat Exchanger	
<input checked="" type="checkbox"/> General Emission Unit, specify Standby Emergency Generators		

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L**.

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

<input type="checkbox"/> Absorption Systems	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Flare
<input type="checkbox"/> Adsorption Systems	<input type="checkbox"/> Condenser	<input type="checkbox"/> Mechanical Collector
<input type="checkbox"/> Afterburner	<input type="checkbox"/> Electrostatic Precipitator	<input type="checkbox"/> Wet Collecting System
<input type="checkbox"/> Other Collectors, specify		

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M**.

30. Provide all **Supporting Emissions Calculations** as **Attachment N**, or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O**.  
 > Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and *Example Legal Advertisement* for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?  
 YES       NO  
 > If YES, identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's "*Precautionary Notice – Claims of Confidentiality*" guidance found in the *General Instructions* as **Attachment Q**.

**Section III. Certification of Information**

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

<input type="checkbox"/> Authority of Corporation or Other Business Entity	<input type="checkbox"/> Authority of Partnership
<input checked="" type="checkbox"/> Authority of Governmental Agency	<input type="checkbox"/> Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R**.

*All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.*

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

**Certification of Truth, Accuracy, and Completeness**

I, the undersigned  Responsible Official /  Authorized Representative, hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

**Compliance Certification**

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE \_\_\_\_\_

(Please use blue ink)

DATE: \_\_\_\_\_

(Please use blue ink)

35B. Printed name of signee: Joseph P Stephens

35C. Title: C & FMO

35D. E-mail:  
joseph.p.stephens.mil@mail.mil

36E. Phone: 304-561-6367

36F. FAX: 304-561-6458

36A. Printed name of contact person (if different from above):

36B. Title:

36C. E-mail:

36D. Phone:

36E. FAX:

**PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:**

- |  |  |
|--|--|
| <input type="checkbox"/> Attachment A: Business Certificate                          | <input type="checkbox"/> Attachment K: Fugitive Emissions Data Summary Sheet                       |
| <input type="checkbox"/> Attachment B: Map(s)  | <input checked="" type="checkbox"/> Attachment L: Emissions Unit Data Sheet(s)                     |
| <input type="checkbox"/> Attachment C: Installation and Start Up Schedule            | <input type="checkbox"/> Attachment M: Air Pollution Control Device Sheet(s)                       |
| <input type="checkbox"/> Attachment D: Regulatory Discussion                         | <input checked="" type="checkbox"/> Attachment N: Supporting Emissions Calculations                |
| <input type="checkbox"/> Attachment E: Plot Plan                                     | <input checked="" type="checkbox"/> Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans |
| <input type="checkbox"/> Attachment F: Detailed Process Flow Diagram(s)              | <input type="checkbox"/> Attachment P: Public Notice   |
| <input type="checkbox"/> Attachment G: Process Description                           | <input type="checkbox"/> Attachment Q: Business Confidential Claims                                |
| <input type="checkbox"/> Attachment H: Material Safety Data Sheets (MSDS)            | <input checked="" type="checkbox"/> Attachment R: Authority Forms                                  |
| <input type="checkbox"/> Attachment I: Emission Units Table                          | <input type="checkbox"/> Attachment S: Title V Permit Revision Information                         |
| <input checked="" type="checkbox"/> Attachment J: Emission Points Data Summary Sheet | <input type="checkbox"/> Application Fee   |

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

**FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:**

- Forward 1 copy of the application to the Title V Permitting Group and:
- For Title V Administrative Amendments:
  - NSR permit writer should notify Title V permit writer of draft permit,
- For Title V Minor Modifications:
  - Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,
  - NSR permit writer should notify Title V permit writer of draft permit.
- For Title V Significant Modifications processed in parallel with NSR Permit revision:
  - NSR permit writer should notify a Title V permit writer of draft permit,
  - Public notice should reference both 45CSR13 and Title V permits,
  - EPA has 45 day review period of a draft permit.

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.



STATE OF WEST VIRGINIA  
**OFFICE OF THE ADJUTANT GENERAL**  
1703 COONSKIN DRIVE  
CHARLESTON, WEST VIRGINIA 25311-1085

James A. Hoyer  
Major General, WVARNG  
The Adjutant General

(304) 561-6317  
DSN: 623-6317  
FAX (304) 561-6327

19 May 2015

WVARNG Environmental Programs Division

Mr. William F. Durham  
Director – Division of Air Quality  
WV Department of Environmental Protection  
601 57<sup>th</sup> Street SE  
Charleston, WV 25304

Dear Mr. Durham:

Enclosed is a Class I Administrative Update to R13-2659 (Charleston Armory) to incorporate relevant provisions of the RICE MACT for two (2) emergency generators that will operate under the Demand Response Program.

This Class I Administrative Update was discussed with Ed Andrews and Gene Coccari.

The point of contact for this action is Phil Emmerth of my staff at 304-201-3529.

Sincerely,

A handwritten signature in black ink, appearing to read "JP Stephens".

Joseph P. Stephens  
Colonel, WV Army National Guard  
Construction and Facilities Management Officer  
WV Army National Guard

**ATTACHMENT J**

**EMISSION POINTS DATA SUMMARY SHEET**

# EMISSION POINTS DATA SUMMARY SHEET

**Table 1: Emissions Data**

Emission Point ID No. (Must match Equipment List Form & Plot Plan)	Source(s) Vented Through This Point (Must match Equipment List Form & Plot Plan)		Air Pollution Control Device (Must match Equipment List Form & Plot Plan)		Vent Time for Source (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS # <sup>2</sup> (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions <sup>3</sup>		Maximum Potential Controlled Emissions <sup>4</sup>		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used <sup>5</sup>	Emission Concentration (ppmv or mg/m <sup>3</sup> )
	ID No.	Source	ID No.	Device Type	Short Term <sup>1</sup>	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
S1 and S2	G1 and G2	Standby Emergency Generators	N	None	N/A	N/A	NOx	22.87	85.76	22.87	85.76	Gas/Vapor	Manufacturer test data	NA
							CO	4.03	15.12	4.03	15.12			
							PM	0.79	2.96	0.79	2.96	Solid		
							SO <sub>2</sub>	1.39	5.21	1.39	5.21			
							HC(VOC)	0.69	2.59	0.69	2.59			
							Benzene	0.0065	0.0244	0.0065	0.0244			
							Toluene	0.0028	0.0105	0.0028	0.0105			
							Xylenes	0.0019	0.0071	0.0019	0.0071			
							Propylene	0.0179	0.0671	0.0179	0.0671	Gas/Vapor		
							1,3-Butadiene	0.001	0.0038	0.001	0.0038			
							Formaldehyde	0.0598	0.2242	0.0598	0.2242			
							Acetaldehyde	0.0053	0.0199	0.0053	0.0199			
Acrolein	0.0007	0.0026	0.0007	0.0026										
Naphthalene	0.0006	0.0022	0.0006	0.0022										

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

<sup>1</sup> Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (e.g., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

<sup>2</sup> List all regulated air pollutants. Speciate VOCs, including all HAPS. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS<sub>2</sub>, VOCs, H<sub>2</sub>S, Inorganics, Lead, Organics, O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, SO<sub>3</sub>, etc. DO NOT LIST CO<sub>2</sub>, H<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, and Noble Gases.

<sup>3</sup> Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

<sup>4</sup> Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

<sup>5</sup> Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

<sup>6</sup> Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m<sup>3</sup>) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO<sub>2</sub>, use units of ppmv (See 45CSR10)



**ATTACHMENT L**  
**EMISSION UNIT DATA SHEET(S)**

**EMISSIONS UNIT DATA SHEET  
GENERAL**

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): G1

<p>1. Name or type and model of proposed affected source:</p> <p>Cummins Power Generator – DFBF5699663 275 kW Diesel</p>
<p>2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.</p>
<p>3. Name(s) and maximum amount of proposed process material(s) charged per hour:</p> <p>N/A</p>
<p>4. Name(s) and maximum amount of proposed material(s) produced per hour:</p> <p>N/A</p>
<p>5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:</p> <p>NAP</p>

\* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):			
(a) Type and amount in appropriate units of fuel(s) to be burned:			
Diesel Fuel – 21.6 gallons/hour			
(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:			
ASTM D975 No. 2 diesel fuel with 0.03-0.05% sulfur by weight and 40-48 cetane number			
(c) Theoretical combustion air requirement (ACF/unit of fuel):			
860 scfm	@	77	°F and 14.5 psia.
(d) Percent excess air:			
(e) Type and BTU/hr of burners and all other firing equipment planned to be used:			
NAP			
(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:			
NAP			
(g) Proposed maximum design heat input:			
		2.95	× 10 <sup>6</sup> BTU/hr.
7. Projected operating schedule: Not to exceed 7,500 hrs/yr			
Hours/Day	24	Days/Week	7
		Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:				
@	77	°F and	14.5	psia
a.	NO <sub>x</sub>	11.51	lb/hr	grains/ACF
b.	SO <sub>2</sub>	0.59	lb/hr	grains/ACF
c.	CO	0.74	lb/hr	grains/ACF
d.	PM	0.48	lb/hr	grains/ACF
e.	HC (VOC)	0.24	lb/hr	grains/ACF
f.	Pb	N/A	lb/hr	N/A grains/ACF
g. Specify other(s) Hazardous Air Pollutants (HAPS) AP-42 Section 3.3 Parameters				
h.	Benzene	0.0028	lb/hr	grains/ACF
i.	Toluene	0.0012	lb/hr	grains/ACF
j.	Xylenes	0.008	lb/hr	grains/ACF
k.	Propylene	0.00258	lb/hr	grains/ACF
l.	1,3- Butadiene	0.0005	lb/hr	grains/ACF
m.	Formaldehyde	0.0255	lb/hr	grains/ACF
n.	Acetaldehyde	0.0023	lb/hr	grains/ACF
o.	Acrolein	0.0003	lb/hr	grains/ACF
p.	Naphthalene	0.0003	lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

**MONITORING**

None

**RECORDKEEPING**

A person designated by a Responsible official shall maintain records of hours of operation and quantity of fuel burned. The quantity of fuel burnt will be estimated based on the maximum burn rate of 21.6 gallons/hour for Annex multiplied by the actual recorded hours of operation.

**REPORTING**

None

**TESTING**

None

**MONITORING.** PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

**RECORDKEEPING.** PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

**REPORTING.** PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

**TESTING.** PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

None provided.

**EMISSIONS UNIT DATA SHEET  
GENERAL**

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): G2

<p>1. Name or type and model of proposed affected source:</p> <p>Cummins Power Generator – 400 kW, 60 Hz 4 cycle, in-line 6 cylinder diesel turbocharged and aftercooled</p>
<p>2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.</p>
<p>3. Name(s) and maximum amount of proposed process material(s) charged per hour:</p> <p>N/A</p>
<p>4. Name(s) and maximum amount of proposed material(s) produced per hour:</p> <p>N/A</p>
<p>5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:</p> <p>NAP</p>

\* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):					
(a) Type and amount in appropriate units of fuel(s) to be burned:					
Diesel Fuel – 29.1 gallons/hour					
(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:					
ASTM D975 No. 2 diesel fuel with 0.03-0.05% sulfur by weight and 40-48 cetane number					
(c) Theoretical combustion air requirement (ACF/unit of fuel):					
1330 scfm	@	77	°F and	14.5	psia.
(d) Percent excess air: N/A					
(e) Type and BTU/hr of burners and all other firing equipment planned to be used:					
NAP					
(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:					
NAP					
(g) Proposed maximum design heat input: 3.98 × 10 <sup>6</sup> BTU/hr.					
7. Projected operating schedule: Not to exceed 7,500 hrs/yr.					
Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:				
@	77	°F and	14.5	psia
a.	NO <sub>x</sub>	91.48	lb/hr	grains/ACF
b.	SO <sub>2</sub>	9.14	lb/hr	grains/ACF
c.	CO	12.88	lb/hr	grains/ACF
d.	PM	2.70	lb/hr	grains/ACF
e.	HC (VOC)	6.44	lb/hr	grains/ACF
f.	Pb	N/A	lb/hr	N/A grains/ACF
g. Specify other(s) Hazardous Air Pollutants (HAPS) AP-42 Section 3.3 Parameters				
h.	Benzene	0.035	lb/hr	grains/ACF
i.	Toluene	0.0154	lb/hr	grains/ACF
j.	Xylenes	0.0106	lb/hr	grains/ACF
k.	Propylene	0.0968	lb/hr	grains/ACF
l.	1,3- Butadiene	0.0048	lb/hr	grains/ACF
m.	Formaldehyde	0.324	lb/hr	grains/ACF
n.	Acetaldehyde	0.0288	lb/hr	grains/ACF
o.	Acrolein	0.0034	lb/hr	grains/ACF
p.	Naphthalene	0.0032	lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing  
 Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

**MONITORING**

None

**RECORDKEEPING**

A person designated by a Responsible official shall maintain records of hours of operation and quantity of fuel burned. The quantity of fuel burnt will be estimated based on the maximum burn rate of 29.1 gallons/hour for Headquarters Building multiplied by the actual recorded hours of operation.

**REPORTING**

None

**TESTING**

None

**MONITORING.** PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

**RECORDKEEPING.** PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

**REPORTING.** PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

**TESTING.** PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

None provided.

**ATTACHMENT N**  
**SUPPORTING EMISSIONS CALCULATIONS**  
**AND**  
**MANUFACTURERS INFORMATION**

By: PEW  
Date: 3/1/2006

Annex DEF Combined

Checked By: CCS  
Date: 3/1/2006

**Attachment E**  
**Supporting Emission Calculations Charleston DEF & Annex Combined**

<b>Combined Total For Both Generators</b>		
<b>Regulated Pollutant</b>	<b>Hourly Emissions (lbs/hour)</b>	<b>Annual Emissions (tons/year)</b>
HC (VOC)	0.69	2.59
NOX	22.87	85.76
CO	4.03	15.12
PM (and PM10)	0.79	2.96
SO2	1.39	5.21
<b>Hazardous Air Pollutants (HAPS)</b>		
Benzene	0.0059	0.0221
Toluene	0.0023	0.0086
Xylenes	0.0016	0.0060
1,3-Butadiene	0.0003	0.0012
Formaldehyde	0.0038	0.0142
Acetaldehyde	0.0024	0.0090
Acrolein	0.0004	0.0015
Naphthalene	0.0006	0.0022
<i>Total HAPS</i>	0.0173	0.0648



**Attachment E**  
**Supporting Emission Calculations**

Diesel powered, 275 kW, 60 Hz Diesel Generator

**Specifications**

Manufacturer:	Cummins
Model Number:	DFBF5699663
Engine Type:	4 cycle in-line 6 cylinder
Aspiration:	Turbocharged
Displacement:	14 L
Fuel Consumption:	21.6 gallons/hour
Assumed Heating Value of Diesel Fuel:	136,600 Btu/gallon
Maximum Horsepower:	435 HP
Maximum Fuel Input:	2.95 MMBtu/hour
Power Rating:	275 kW

Emission rates determined using manufacturer test emission factors or emission factors from AP-42.

0.002204622 lb/ gram

Hours Per Year =

500

7500

Regulated Pollutant	Emission Factor (grams/HP-Hour)	Hourly Emissions (grams/hour)	Hourly Emissions (lbs/hour)	Annual Emissions (tons/year)	
				500 hrs	7500 hrs
HC (VOC)	0.25	108.75	0.24	0.06	0.90
NOX	12	5220.00	11.51	2.88	43.16
CO	0.77	334.95	0.74	0.19	2.78
PM (and PM10)	0.5	217.50	0.48	0.12	1.80
SO2	0.62	269.70	0.59	0.15	2.21

Checking 144 lb/day limit using highest Criteria Pollutant Value =

276.24 lbs/day

Regulated Pollutant	Emission Factor (lb/MMBtu)	Hourly Emissions (lbs/hour)	Annual Emissions (tons/year)	
			500 hrs	7500 hrs
PM10*	0.31	0.9147	0.2287	3.4301
Hazardous Air Pollutants (HAPS)				
Benzene*	0.000933	0.0028	0.0007	0.0105
Toluene*	0.000409	0.0012	0.0003	0.0045
Xylenes*	0.000285	0.0008	0.0002	0.0030
1,3-Butadiene*	0.0000391	0.0001	0.0001	0.0004
Formaldehyde*	0.00118	0.0035	0.0009	0.0131
Acetaldehyde*	0.000767	0.0023	0.0006	0.0086
Acrolein*	0.0000925	0.0003	0.0001	0.0011
Naphthalene*	0.0000848	0.0003	0.0001	0.0011
Total HAPS		0.0113	0.0030	0.0423

**Notes:**

1. Annual emissions are based on 7,500 hrs/year, and 500 hrs/year.
2. \* Indicates AP-42 3.3-1, 3.3-2 emission factor used.

Comment: Permit Required since source exceeds 144 lbs/day for a criteria pollutant.

*Revised Calc*

**Attachment N**  
**Supporting Emission Calculations**

Diesel powered, 275 kW, 60 Hz Diesel Generator (Annex)

**Specifications**  
 Manufacturer: Cummins  
 Model Number: DPF5699663  
 Engine Type: 4 cycle in-line 6 cylinder  
 Aspiration: Turbocharged  
 Displacement: 14 L  
 Fuel Consumption: 21.6 gallons/hour  
 Assumed Heating Value of Diesel Fuel: 136,600 Btu/gallon  
 Maximum Horsepower: 435 HP  
 Maximum Fuel Input: 2.95 MMBtu/hour  
 Power Rating: 275 kW

Emission rates determined using manufacturer test emission factors or emission factors from AP-42, Section 3.3, Table 3.3-1, updated October 1996.

Regulated Pollutant	Emission Factor (grams/HP-Hour)	Hourly Emissions (lbs/hour)	Annual Emissions (tons/year)	Hours Per Year =
HC (VOC)	0.25	108.75	7,600	7,500
NOX	12	5220.00	0.90	
CO	0.77	334.95	43.16	
PM	0.5	217.50	2.78	
SO2	0.62	269.70	1.80	
			2.21	
King 144 lbs/day limit using highest Criteria Pollutant Value =				276.24 lbs/day

Regulated Pollutant	Emission Factor (lb/MMBtu)	Hourly Emissions (lbs/hour)	Annual Emissions (tons/year)	Hours Per Year =
Hazardous Air Pollutants (HAPS)			7,500	
Benzene*	0.000933	0.0028	0.0105	
Toluene*	0.000409	0.0012	0.0045	
Xylenes*	0.000285	0.0008	0.0030	
Propylene*	0.00258	0.0078	0.0285	
1,3-Butadiene*	0.0000391	0.0005	0.0019	
Formaldehyde*	0.00118	0.0265	0.0955	
Acetaldehyde*	0.000767	0.0023	0.0086	
Acrolein*	0.0000925	0.0003	0.0011	
Naphthalene*	0.0000848	0.0003	0.0011	
Total HAPS		0.0413	0.1548	

**Notes:**

1. Annual emissions are based on 8,760 hrs/year, and 500 hrs/year.
2. \* Indicates AP-42 emission factor used.

Comment: Permit Required since source exceeds 144 lbs/day for a criteria pollutant.

**Combined Total For Both Generators**

Regulated Pollutant	Hourly Emissions (lbs/hour)	Annual Emissions (tons/year)
HC (VOC)	0.69	2.59
NOX	22.87	85.76
CO	4.03	15.12
PM	0.79	2.96
SO2	1.39	5.21
Hazardous Air Pollutants (HAPS)		
Benzene*	0.0055	0.0244
Toluene*	0.0028	0.0105
Xylenes*	0.0019	0.0071
Propylene*	0.0179	0.0671
1,3-Butadiene*	0.001	0.0038
Formaldehyde*	0.0598	0.2242
Acetaldehyde*	0.0053	0.0199
Acrolein*	0.0007	0.0026
Naphthalene*	0.0006	0.0022
Total HAPS	0.0965	0.3618

Diesel powered, 400 kW, 60 Hz Diesel Generator (Headquarters Building)

**Specifications**  
 Manufacturer: Cummins  
 Model Number: 400DF-CE-4952  
 Engine Type: 4 cycle in-line 6 cylinder  
 Aspiration: Turbocharged and Aftercooled  
 Displacement: 14 L  
 Fuel Consumption: 28.1 gallons/hour  
 Assumed Heating Value of Diesel Fuel: 136,600 Btu/gallon  
 Maximum Horsepower: 605 HP  
 Maximum Fuel Input: 3.99 MMBtu/hour  
 Power Rating: 400 kW

Emission rates determined using manufacturer test emission factors or emission factors from AP-42, Section 3.3, Table 3.3-1, updated October 1996.

Regulated Pollutant	Emission Factor (grams/HP-Hour)	Hourly Emissions (grams/hour)	Annual Emissions (tons/year)	Hours Per Year =
HC (VOC)	0.34	205.70	7,500	7,500
NOX	8.52	5154.50	1.69	
CO	2.47	1494.35	42.80	
PM	0.23	139.15	12.34	
SO2	0.6	363.00	1.16	
Checking 144 lbs/day limit using highest Criteria Pollutant Value =				272.64 lbs/day

Regulated Pollutant	Emission Factor (lb/MMBtu)	Hourly Emissions (lbs/hour)	Annual Emissions (tons/year)	Hours Per Year =
Hazardous Air Pollutants (HAPS)			7,500	
Benzene	0.000933	0.0037	0.0139	
Toluene	0.000409	0.0016	0.0060	
Xylenes	0.000285	0.0011	0.0041	
Propylene	0.00258	0.0103	0.0386	
1,3-Butadiene	0.0000391	0.0005	0.0019	
Formaldehyde	0.00118	0.0343	0.1266	
Acetaldehyde	0.000767	0.003	0.0113	
Acrolein	0.0000925	0.0004	0.0015	
Naphthalene	0.0000848	0.0003	0.0011	
Total HAPS		0.0552	0.20598	



**ENGINE**

Model: Cummins NT855-G6	Bore: 5.5 in. ( 140 mm )
Type: 4 Cycle, In-line 6 Cylinder Diesel	Stroke 6 in. ( 152 mm )
Aspiration: Turbocharged	Displacement: 855 cu. in. ( 14.0 liters )
Compression Ratio: 14:1	
Emission Control Device: Turbocharged	

<u>PERFORMANCE DATA</u>	<u>STANDBY</u>	<u>PRIME</u>
BHP @ 1800 RPM ( 60 Hz)	435	415
Fuel Consumption (gal/Hr)	21.6	19.6
Exhaust Gas Flow (CFM)	2400	2290
Exhaust Gas Temperature ( °F)	975	1125

**EXHAUST EMISSION DATA**

(All Values are Grams per HP-Hour)

<u>COMPONENT</u>	<u>STANDBY</u>	<u>PRIME</u>
HC ( Total Unburned Hydrocarbons )	0.25	0.18
NOx ( Oxides of Nitrogen as NO <sub>2</sub> )	12.00	10.89
CO ( Carbon Monoxide )	0.77	0.60
PM ( Particulate Matter )	0.50	0.50
SO <sub>2</sub> ( Sulfur Dioxide )	0.62	0.62

**TEST CONDITIONS**

Data was recorded during steady-state rated engine speed ( ± 25 RPM) with full load ( ± 2% ). Pressures, temperatures, and emission rates were stabilized.

Fuel Specification:	ASTM D975 No. 2-D diesel fuel with 0.03-0.05% sulfur content (by weight), and 40-48 cetane number.
Fuel Temperature:	99 ± 9 ° F ( at fuel pump inlet)
Intake Air Temperature:	77 ± 9 ° F
Barometric Pressure:	29.6 ± 1 in. Hg
Humidity:	NOx measurement corrected to 75 grains H <sub>2</sub> O/lb dry air
Reference Standard:	ISO 8178

The NOx, HC, CO and PM emission data tabulated here were taken from a single engine under the test conditions shown above. Data for the other components are estimated. These data are subject to instrumentation and engine-to-engine variability. Field emissions test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures and instrumentation. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.



**ENGINE**

Model: Cummins NTA855-G5	Bore: 5.5 in. ( 140 mm )
Type: 4 Cycle, In-line 6 Cylinder Diesel	Stroke 6 in. ( 152 mm )
Aspiration: Turbocharged and Aftercooled	Displacement: 855 cu. in. ( 14.0 liters )
Compression Ratio: 14:1	
Emission Control Device: Turbocharger and Aftercooler, with Variable Timing	

<u>PERFORMANCE DATA</u>	<u>STANDBY</u>
BHP @ 1800 RPM ( 60 Hz)	605
Fuel Consumption (gal/Hr)	29.1
Exhaust Gas Flow (CFM)	3780
Exhaust Gas Temperature ( °F)	995

**EXHAUST EMISSION DATA**

(All Values are Grams per HP-Hour)

<u>COMPONENT</u>	<u>STANDBY</u>
HC ( Total Unburned Hydrocarbons )	0.34
NOx ( Oxides of Nitrogen as NO2 )	8.52
CO ( Carbon Monoxide )	2.47
PM ( Particulate Matter )	0.23
SO <sub>2</sub> ( Sulfur Dioxide )	0.60

**TEST CONDITIONS**

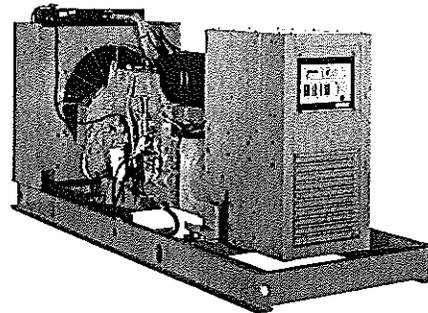
Data was recorded during steady-state rated engine speed ( ± 25 RPM) with full load ( ± 2% ). Pressures, temperatures, and emission rates were stabilized.

Fuel Specification:	ASTM D975 No. 2-D diesel fuel with 0.03-0.05% sulfur content (by weight), and 40-48 cetane number.
Fuel Temperature:	99 ± 9 ° F ( at fuel pump inlet)
Intake Air Temperature:	77 ± 9 ° F
Barometric Pressure:	29.6 ± 1 in. Hg
Humidity:	NOx measurement corrected to 75 grains H2O/lb dry air
Reference Standard:	ISO 8178

The NOx, HC, CO and PM emission data tabulated here were taken from a single engine under the test conditions shown above. Data for the other components are estimated. These data are subject to instrumentation and engine-to-engine variability. Field emissions test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures and instrumentation. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

## Diesel Generator Set Model DFBF 60 Hz

275 kW, 344 kVA Standby  
250 kW, 313 kVA Prime



### Description

The Cummins Power Generation DF-series commercial generator set is a fully integrated power generation system providing optimum performance, reliability, and versatility for stationary standby or prime power applications.

A primary feature of the DF GenSet 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 DF GenSet accepts 100% of the nameplate standby rating in one step, in compliance with NFPA 110 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 shield the generator set from extreme 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 and is available as UL2200 Listed. The PowerCommand control is UL508 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 Listed to UL2200.

**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 compliance. PowerCommand control is Listed to UL508.

**Cooling System** - Provides reliable running at the rated power level, at up to 40°C ambient temperature.

**Structural Steel Skid Base** - Robust skid base supports the engine, alternator, and radiator.

**E-Coat Finish** - Dual electro-deposition paint system provides high resistance to scratching, corrosion, and 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 500-3014 for installation design specifications.

Unit Width, in (mm)	50.0 (1270)
Unit Height, in (mm)	63.6 (1615)
Unit Length, in (mm)	142.0 (3607)
Unit Dry Weight, lb (kg)	7250 (3289)
Unit Wet Weight, lb (kg)	7480 (3393)
Rated Speed, rpm	1800
Voltage Regulation, No Load to Full Load	±0.5%
Random Voltage Variation	±0.5%
Frequency Regulation	Isochronous
Random Frequency Variation	±0.25%
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)	13.5 (51.1)	13.5 (51.1)
Coolant Flow Rate, Gal/min (L/min)	119.0 (450.4)	119.0 (450.4)
Heat Rejection To Coolant, Btu/min (MJ/min)	10005.0 (10.6)	9085.0 (9.6)
Heat Radiated To Room, Btu/min (MJ/min)	3920.0 (4.2)	3550.0 (3.8)
Maximum Coolant Friction Head, psi (kPa)	6.0 (41.4)	6.0 (41.4)
Maximum Coolant Static Head, ft (m)	60.0 (18.3)	60.0 (18.3)

Air	Standby	Prime
Combustion Air, scfm (m <sup>3</sup> /min)	860.0 (24.3)	835.0 (23.6)
Alternator Cooling Air, scfm (m <sup>3</sup> /min)	2780.0 (78.7)	2780.0 (78.7)
Radiator Cooling Air, scfm (m <sup>3</sup> /min)	19700.0 (557.5)	19700.0 (557.5)
Max. Static Restriction, in H <sub>2</sub> O (Pa)	0.5 (124.5)	0.5 (124.5)

### 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.

**Base Load (Continuous) Rating based on:** Applicable for supplying power continuously to a constant load up to the full output rating for unlimited hours. No sustained overload capability is available for this rating. Consult authorized distributor for rating. (Equivalent to Continuous Power in accordance with ISO8528, ISO3046, AS2789, DIN6271, and BS5514). This rating is not applicable to all generator set models.

### Site Derating Factors

Rated power available up to 3600 ft (1098 m) at ambient temperatures up to 104°F (40°C). Above 3600 ft (1098 m), derate at 4% per 1000 ft (305 m) and 1% per 10°F (2% per 11°C) above 104°F (40°C).

## 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

<b>Base Engine</b>	Cummins Model NT855-G6, Turbocharged, diesel-fueled
<b>Displacement in<sup>3</sup> (L)</b>	855.0 (14.0)
<b>Overspeed Limit, rpm</b>	2100 ±50
<b>Regenerative Power, kW</b>	44.00
<b>Cylinder Block Configuration</b>	Cast iron with replaceable wet cylinder liners, In-line 6 cylinder
<b>Battery Capacity</b>	565 amps minimum at ambient temperature of 32°F (0°C)
<b>Battery Charging Alternator</b>	55 amps
<b>Starting Voltage</b>	24-volt, negative ground
<b>Lube Oil Filter Types</b>	Single spin-on, combination full flow/bypass
<b>Standard Cooling System</b>	104°F (40°C) ambient radiator

<b>Power Output</b>	<b>Standby</b>	<b>Prime</b>							
Gross Engine Power Output, bhp (kWm)	435.0 (324.5)	395.0 (294.7)							
BMEP at Rated Load, psi (kPa)	213.0 (1468.6)	194.0 (1337.6)							
Bore, in. (mm)	5.50 (139.7)	5.50 (139.7)							
Stroke, in. (mm)	6.00 (152.4)	6.00 (152.4)							
Piston Speed, ft/min (m/s)	1800.0 (9.1)	1800.0 (9.1)							
Compression Ratio	14.0:1	14.0:1							
Lube Oil Capacity, qt. (L)	40.0 (37.9)	40.0 (37.9)							
<b>Fuel Flow</b>									
Fuel Flow at Rated Load, US Gal/hr (L/hr)	76.0 (287.7)	76.0 (287.7)							
Maximum Inlet Restriction, in. Hg (mm Hg)	4.0 (101.6)	4.0 (101.6)							
Maximum Return Restriction, in. Hg (mm Hg)	6.0 (152.4)	6.0 (152.4)							
<b>Air Cleaner</b>									
Maximum Air Cleaner Restriction, in. H <sub>2</sub> O (kPa)	25.0 (6.2)	25.0 (6.2)							
<b>Exhaust</b>									
Exhaust Flow at Rated Load, cfm (m <sup>3</sup> /min)	2380.0 (67.4)	2270.0 (64.2)							
Exhaust Temperature, °F (°C)	975.0 (523.9)	950.0 (510.0)							
Max Back Pressure, in. H <sub>2</sub> O (kPa)	41.0 (10.2)	41.0 (10.2)							
<b>Fuel System</b>	Direct injection, number 2 diesel fuel; fuel filter; automatic electric fuel shutoff.								
<b>Fuel Consumption</b>	<b>Standby</b>	<b>Prime</b>							
<b>60 Hz Ratings, kW (kVA)</b>	<b>275 (344)</b>								
	<b>250 (313)</b>								
	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full	
	US Gal/hr	6.9	11.2	15.7	20.4	6.6	10.5	14.4	18.7
	L/hr	26	42	59	77	25	40	55	71

## 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
- 115/200
- 120/208
- 127/220
- 139/240
- 120/240
- 220/380
- 240/415
- 254/440
- 277/480

### Three Phase Non-Reconnectable

- 277/480
- 347/600

# Specifications – Alternator

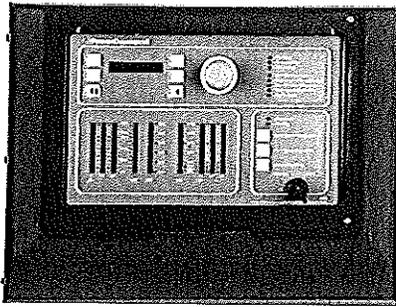
Design	Brushless, 4 pole, drip proof revolving field
Stator	2/3 pitch
Rotor	Direct coupled by flexible disc
Insulation System	Class H per NEMA MG1-1.65
Standard Temperature Rise	125°C @ Standby, 105°C @ Prime
Exciter Type	Permanent Magnet Generator (PMG)
Phase Rotation	A (U), B (V), C (W)
Alternator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

Three Phase Table <sup>1</sup>	80° C	80° C	105° C	105° C	125° C	125° C	125° C	125° C				
Feature Code	B260	B302	B259	B301	B258	B252	B246	B300				
Alternator Data Sheet Number	304	304	304	303	303	303	302	302				
Voltage Ranges	110/190 Thru 139/240 220/380 Thru 277/480	347/600	110/190 Thru 139/240 220/380 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	347/600				
Surge kW	290	293	290	293	288	291	291	291				
Motor Starting kVA (at 90% sustained voltage)	PMG	1372	1372	1372	1210	1210	1210	1028	1028			
Full Load Current - Amps at Standby Rating	<u>120/208</u> 954	<u>127/220</u> 902	<u>139/240</u> 827	<u>220/380</u> 522	<u>240/416</u> 477	<u>254/440</u> 451	<u>277/480</u> 413	<u>347/600</u> 331				

**Notes:**

1. **Single Phase Capability:** 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

- The PowerCommand Control is an integrated generator set control system providing governing, voltage regulation, engine protection, and operator interface functions.
- PowerCommand Controls include integral 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, and Smart-Starting control system.
- InPower PC-based service tool available for detailed diagnostics.
- Available with Echelon LonWorks™ network interface.
- 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

- 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

### Engine Protection

- 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

### Operator Interface

- 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

- Line-to-line and line-to-neutral AC volts
- 3-phase AC current
- Frequency
- Total and Individual phase kW and kVA

### Engine Data

- DC voltage
- Lube oil pressure
- Coolant temperature
- Lube oil temperature (optional)

### 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

- Integrated digital electronic isochronous governor
- Temperature dynamic governing
- Smart Idle speed mode
- Glow plug control (some models)

### Voltage Regulation

- Integrated digital electronic voltage regulator
- 3-phase line to neutral sensing
- PMG (Optional)
- 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
- (4) Configurable customer inputs
- (4) Configurable customer outputs
- (8) Configurable network inputs and (16) outputs (with optional network)

### Options

- Power Transfer Control
- Analog AC Meter Display
- Thermostatically Controlled Space Heater

- Key-type mode switch
- Ground fault module
- Engine oil temperature
- Auxiliary Relays (3)

- Echelon LonWorks interface
- Digital input and output module(s) (loose)
- Remote annunciator (loose)

## Generator Set Options

### Engine

- 208/240/480 V thermostatically controlled coolant heater for ambient above 40°F (4.5°C)
- 208/240/480 V thermostatically controlled coolant heater for ambient below 40°F (4.5°C)
- Fuel/water separator
- Heavy duty air cleaner with safety element

### Cooling System

- Radiator, 50° C Ambient
- Heat exchanger cooling
- Remote radiator cooling

### Fuel System

- 300 Gal (1136 L) Sub-base tank
- 400 Gal (1514 L) Sub-base tank
- 500 Gal (1893 L) Sub-base tank
- 600 Gal (2271 L) Sub-base tank
- 660 Gal (2498 L) Sub-base tank
- 720 Gal (2725 L) Sub-base tank
- 1470 Gal (5565 L) Sub-base tank

### Alternator

- 80°C rise alternator
- 105°C rise alternator
- 120/240 V, 300 W anti-condensation heater

### Exhaust System

- Critical grade exhaust silencer
- Exhaust packages
- Industrial grade exhaust silencer
- Residential grade exhaust silencer

### Generator Set

- AC entrance
- Batteries
- Battery charger
- Export box packaging
- Isolation pads
- UL2200 Listed
- Main line circuit breaker
- PowerCommand (3100) Digital Parallel Control
- PowerCommand Network
- Remote annunciator panel
- Sound-attenuated enclosure (2 levels) with internal silencers
- Spring isolators
- Weather-protective enclosure with internal 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 Power Generation 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 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 UL2200, Stationary Engine Generator Assemblies. The PowerCommand control is Listed to UL508 - Category NITW7 for U.S. and Canadian usage.

**See your distributor for more information**



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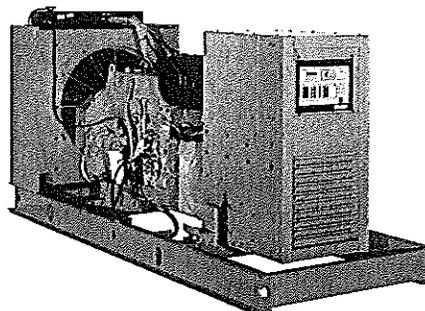
Cummins and PowerCommand are registered trademarks of Cummins Inc.  
AmpSentry is a trademark of Cummins Inc.  
LonWorks is a registered trademark of Echelon

**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.



## Diesel Generator Set Model DFCE 60 Hz

400 kW, 500 kVA Standby



### Description

The Cummins Power Generation DF-series commercial generator set is a fully integrated power generation system providing optimum performance, reliability, and versatility for stationary standby or prime power applications.

A primary feature of the DF GenSet 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 DF GenSet accepts 100% of the nameplate standby rating in one step, in compliance with NFPA 110 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 shield the generator set from extreme 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 and is available as UL2200 Listed. The PowerCommand control is UL508 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 Listed to UL2200.

**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 compliance. PowerCommand control is Listed to UL508.

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

**Structural Steel Skid Base** - Robust skid base supports the engine, alternator, and radiator.

**E-Coat Finish** - Dual electro-deposition paint system provides high resistance to scratching, corrosion, and 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 500-3084 for installation design specifications.

Unit Width, in (mm)	50.0 (1270)
Unit Height, in (mm)	63.6 (1615)
Unit Length, in (mm)	142.0 (3607)
Unit Dry Weight, lb (kg)	7250 (3289)
Unit Wet Weight, lb (kg)	7480 (3393)
Rated Speed, rpm	1800
Voltage Regulation, No Load to Full Load	±0.5%
Random Voltage Variation	±0.5%
Frequency Regulation	Isochronous
Random Frequency Variation	±0.25%
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	
Fan Load, HP (kW)	28.0 (20.9)	
Coolant Capacity with radiator, US Gal (L)	15.3 (57.9)	
Coolant Flow Rate, Gal/min (L/min)	130.0 (492.0)	
Heat Rejection To Coolant, Btu/min (MJ/min)	15125.0 (16.0)	
Heat Radiated To Room, Btu/min (MJ/min)	5580.0 (5.9)	
Maximum Coolant Friction Head, psi (kPa)	7.0 (48.3)	
Maximum Coolant Static Head, ft (m)	60.0 (18.3)	

Air		
Combustion Air, scfm (m <sup>3</sup> /min)	1330.0 (37.6)	
Alternator Cooling Air, scfm (m <sup>3</sup> /min)	2780.0 (78.7)	
Radiator Cooling Air, scfm (m <sup>3</sup> /min)	19700.0 (557.5)	
Max. Static Restriction, in H <sub>2</sub> O (Pa)	0.5 (124.5)	

### 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.

**Base Load (Continuous) Rating based on:** Applicable for supplying power continuously to a constant load up to the full output rating for unlimited hours. No sustained overload capability is available for this rating. Consult authorized distributor for rating. (Equivalent to Continuous Power in accordance with ISO8528, ISO3046, AS2789, DIN6271, and BS5514). This rating is not applicable to all generator set models.

### Site Derating Factors

Rated power available up to 2500 ft (762 m) at ambient temperature up to 104°F (40°C). Above 2500 ft (762 m), derate at 4% per 1000 (300 m) and 1% per 10°F (2% per 11°C).

## 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

<b>Base Engine</b>	Cummins Model NTA855-G5, Turbocharged and Aftercooled, diesel-fueled
<b>Displacement in<sup>3</sup> (L)</b>	855.0 (14.0)
<b>Regenerative Power, kW</b>	35.00
<b>Cylinder Block Configuration</b>	Cast iron with replaceable wet cylinder liners, In-line 6 cylinder
<b>Battery Capacity</b>	565 amps minimum at ambient temperature of 32°F (0°C)
<b>Battery Charging Alternator</b>	55 amps
<b>Starting Voltage</b>	24-volt, negative ground
<b>Lube Oil Filter Types</b>	Single spin-on, combination full flow/bypass
<b>Standard Cooling System</b>	122°F (50°C) ambient radiator

Power Output		Standby			
Gross Engine Power Output, bhp (kWm)		605.0 (451.3)			
BMEP at Rated Load, psi (kPa)		311.0 (2144.3)			
Bore, in. (mm)		5.50 (139.7)			
Stroke, in. (mm)		6.00 (152.4)			
Piston Speed, ft/min (m/s)		1800.0 (9.1)			
Compression Ratio		14.0:1			
Lube Oil Capacity, qt. (L)		40.0 (37.9)			
Fuel Flow		Standby			
Fuel Flow at Rated Load, US Gal/hr (L/hr)		56.3 (213.1)			
Maximum Inlet Restriction, in. Hg (mm Hg)		4.0 (101.6)			
Maximum Return Restriction, in. Hg (mm Hg)		6.0 (152.4)			
Air Cleaner		Standby			
Maximum Air Cleaner Restriction, in. H <sub>2</sub> O (kPa)		25.0 (6.2)			
Exhaust		Standby			
Exhaust Flow at Rated Load, cfm (m <sup>3</sup> /min)		3780.0 (107.0)			
Exhaust Temperature, °F (°C)		995.0 (535.0)			
Max Back Pressure, in. H <sub>2</sub> O (kPa)		41.0 (10.2)			
<b>Fuel System</b>		Direct injection, number 2 diesel fuel; fuel filter; automatic electric fuel shutoff.			
Fuel Consumption		Standby			
60 Hz Ratings, kW (kVA)		400 (500)			
	Load	1/4	1/2	3/4	Full
	US Gal/hr	9.1	15.9	22.1	29.1
	L/hr	34	60	84	110

## 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

- [ ] 115/200
- [ ] 120/208
- [ ] 139/240
- [ ] 120/240
- [ ] 277/480

### Three Phase Non-Reconnectable

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

# Specifications – Alternator

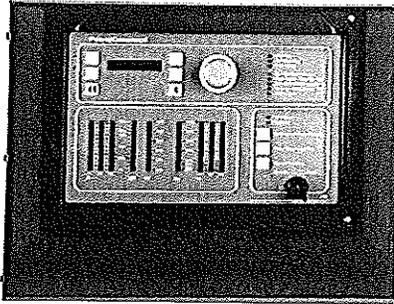
Design	Brushless, 4 pole, drip proof revolving field
Stator	2/3 pitch
Rotor	Direct coupled by flexible disc
Insulation System	Class H per NEMA MG1-1.65
Standard Temperature Rise	125°C @ Standby
Exciter Type	Permanent Magnet Generator (PMG)
Phase Rotation	A (U), B (V), C (W)
Alternator Cooling	Direct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

Three Phase Table <sup>1</sup>		105° C	105° C	125° C	125° C	125° C	125° C						
Feature Code		B259	B301	B258	B252	B246	B300						
Alternator Data Sheet Number		306	305	306	305	305	305						
Voltage Ranges		110/190 Thru 139/240 220/380 Thru 277/480	347/600	110/190 Thru 139/240 220/380 Thru 277/480	120/208 Thru 139/240 139/240 240/416 Thru 277/480	277/480	347/600						
Surge kW		404	406	404	403	407	406						
Motor Starting kVA (at 90% sustained voltage)	PMG	1896	1749	1896	1749	1749	1749						
Full Load Current - Amps at Standby Rating		<u>120/208</u> 1388	<u>139/240</u> 1203	<u>277/480</u> 601	<u>347/600</u> 481								

**Notes:**

1. **Single Phase Capability:** 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**

- The PowerCommand Control is an integrated generator set control system providing governing, voltage regulation, engine protection, and operator interface functions.
- PowerCommand Controls include integral 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, and Smart-Starting control system.
- InPower PC-based service tool available for detailed diagnostics.
- Available with Echelon LonWorks™ network interface.
- 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.

<p><b>AmpSentry AC Protection</b></p> <ul style="list-style-type: none"> <li>• Overcurrent and short circuit shutdown</li> <li>• Overcurrent warning</li> <li>• Single &amp; 3-phase fault regulation</li> <li>• Over and under voltage shutdown</li> <li>• Over and under frequency shutdown</li> <li>• Overload warning with alarm contact</li> <li>• Reverse power and reverse Var shutdown</li> <li>• Excitation fault</li> </ul>	<p><b>Engine Protection</b></p> <ul style="list-style-type: none"> <li>• Overspeed shutdown</li> <li>• Low oil pressure warning and shutdown</li> <li>• High coolant temperature warning and shutdown</li> <li>• High oil temperature warning (optional)</li> <li>• Low coolant level warning or shutdown</li> <li>• Low coolant temperature warning</li> <li>• High and low battery voltage warning</li> <li>• Weak battery warning</li> <li>• Dead battery shutdown</li> <li>• Fail to start (overcrank) shutdown</li> <li>• Fail to crank shutdown</li> <li>• Redundant start disconnect</li> <li>• Cranking lockout</li> <li>• Sensor failure indication</li> </ul>	<p><b>Operator Interface</b></p> <ul style="list-style-type: none"> <li>• OFF/MANUAL/AUTO mode switch</li> <li>• MANUAL RUN/STOP switch</li> <li>• Panel lamp test switch</li> <li>• Emergency Stop switch</li> <li>• Alpha-numeric display with pushbutton access, for viewing engine and alternator data and providing setup, controls, and adjustments</li> <li>• LED lamps indicating genset running, not in auto, common warning, common shutdown</li> <li>• (5) configurable LED lamps</li> <li>• LED Bargraph AC data display (optional)</li> </ul>
<p><b>Alternator Data</b></p> <ul style="list-style-type: none"> <li>• Line-to-line and line-to-neutral AC volts</li> <li>• 3-phase AC current</li> <li>• Frequency</li> <li>• Total and individual phase kW and kVA</li> </ul>	<p><b>Engine Data</b></p> <ul style="list-style-type: none"> <li>• DC voltage</li> <li>• Lube oil pressure</li> <li>• Coolant temperature</li> <li>• Lube oil temperature (optional)</li> </ul>	<p><b>Other Data</b></p> <ul style="list-style-type: none"> <li>• Genset model data</li> <li>• Start attempts, starts, running hours</li> <li>• KW hours (total and since reset)</li> <li>• Fault history</li> <li>• Load profile (hours less than 30% and hours more than 90% load)</li> <li>• System data display (optional with network and other PowerCommand gensets or transfer switches)</li> </ul>
<p><b>Governing</b></p> <ul style="list-style-type: none"> <li>• Integrated digital electronic isochronous governor</li> <li>• Temperature dynamic governing</li> <li>• Smart idle speed mode</li> <li>• Glow plug control (some models)</li> </ul>	<p><b>Voltage Regulation</b></p> <ul style="list-style-type: none"> <li>• Integrated digital electronic voltage regulator</li> <li>• 3-phase line to neutral sensing</li> <li>• PMG (Optional)</li> <li>• Single and three phase fault regulation</li> <li>• Configurable torque matching</li> </ul>	<p><b>Control Functions</b></p> <ul style="list-style-type: none"> <li>• Data logging on faults</li> <li>• Fault simulation (requires InPower)</li> <li>• Time delay start and cooldown</li> <li>• Cycle cranking</li> <li>• (4) Configurable customer inputs</li> <li>• (4) Configurable customer outputs</li> <li>• (8) Configurable network inputs and (16) outputs (with optional network)</li> </ul>
<p><b>Options</b></p>		
<ul style="list-style-type: none"> <li><input type="checkbox"/> Power Transfer Control</li> <li><input type="checkbox"/> Analog AC Meter Display</li> <li><input type="checkbox"/> Thermostatically Controlled Space Heater</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Key-type mode switch</li> <li><input type="checkbox"/> Ground fault module</li> <li><input type="checkbox"/> Engine oil temperature</li> <li><input type="checkbox"/> Auxiliary Relays (3)</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Echelon LonWorks interface</li> <li><input type="checkbox"/> Digital input and output module(s) (loose)</li> <li><input type="checkbox"/> Remote annunciator (loose)</li> </ul>

## Generator Set Options

### Engine

- 208/240/480 V thermostatically controlled coolant heater for ambient above 40°F (4.5°C)
- 208/240/480 V thermostatically controlled coolant heater for ambient below 40°F (4.5°C)
- Fuel/water separator
- Heavy duty air cleaner with safety element

### Fuel System

- 300 Gal (1136 L) Sub-base tank
- 400 Gal (1514 L) Sub-base tank
- 500 Gal (1893 L) Sub-base tank
- 600 Gal (2271 L) Sub-base tank
- 660 Gal (2498 L) Sub-base tank
- 720 Gal (2725 L) Sub-base tank
- 1470 Gal (5565 L) Sub-base tank

### Alternator

- 105°C rise alternator
- 120/240 V, 300 W anti-condensation heater

### Exhaust System

- Critical grade exhaust silencer
- Exhaust packages
- Industrial grade exhaust silencer
- Residential grade exhaust silencer

### Generator Set

- AC entrance
- Batteries
- Battery charger
- Export box packaging
- Isolation pads
- UL2200 Listed
- Main line circuit breaker
- PowerCommand (3100) Digital Parallel Control
- PowerCommand Network
- Remote annunciator panel
- Sound-attenuated enclosure (2 levels) with internal silencers
- Spring isolators
- Weather-protective enclosure with internal silencer
- 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 Power Generation 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 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 UL2200, Stationary Engine Generator Assemblies. The PowerCommand control is Listed to UL508 - Category NITW7 for U.S. and Canadian usage.

See your distributor for more information



**Power  
Generation**

Cummins Power Generation  
1400 73rd Avenue N.E.  
Minneapolis, MN 55432  
763.574.5000  
Fax: 763.574.5298  
[www.cumminspower.com](http://www.cumminspower.com)

Cummins and PowerCommand are registered trademarks of Cummins Inc.  
AmpSentry is a trademark of Cummins Inc.  
LonWorks is a registered trademark of Echelon

**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.

**ATTACHMENT O**

**MONITORING, RECORDKEEPING, REPORTING, TESTING PLANS**

## ATTACHMENT O

### MONITORING/RECORDKEEPING/REPORTING/TESTING PLANS

Testing is not required unless designated by the Secretary of DAQ. If testing is required, reports will be submitted to DAQ and records of testing, analysis, techniques, methods and test company information, will be maintained on site for a period of five (5) years. Submissions will be certified by the Responsible Official. Records will also be maintained regarding the hours of operation, and quantity of fuel burned. The applicant proposes to estimate the quantity of fuel by multiplying the amount of fuel used per hour at maximum horsepower by the total hours of operation.

Attachment R  
Authority Forms



STATE OF WEST VIRGINIA  
OFFICE OF THE ADJUTANT GENERAL  
1703 COONSKIN DRIVE  
CHARLESTON, WEST VIRGINIA 25311-1085

James A. Hoyer  
Major General, WVARNG  
The Adjutant General

(304) 561-6317

DSN: 623-6317

FAX (304) 561-6327

DEC 30 2013

NGWV-TAG

MEMORANDUM FOR RECORD

SUBJECT: Delegation of Persons to use Authority Line "FOR THE ADJUTANT GENERAL"

1. Reference: AR 25-50, Preparing and Managing Correspondence, Chapter 6.
2. Purpose: To delegate specific individuals, by name, authority to sign correspondence using the authority line "FOR THE ADJUTANT GENERAL."
3. General:
  - a. The authority line indicates that the person signing the correspondence has the authority to express the will of the Adjutant General. The designees listed below will only use the authority line for correspondence within the area of responsibility listed beside their name.
  - b. The Adjutant General retains the authority to cancel or withdraw his delegated signature from any person named herein at any time wither verbally or in writing. The delegated signature authority is restricted to the names listed and not inherent to a position or job. A change of the Adjutant General automatically rescinds this delegating authority.
4. This memorandum does not supersede nor rescind letters, "Delegation of Authority to Authorize and Authenticate Travel Orders", DA Form 1687 (Notice of Delegation of Authority - Receipt for Supplies); nor DD Form 577 (Signature Card) which were signed and approved by me. Only individuals noted on this memorandum may send e-mail under Distribution "A".
5. I, Major General James A. Hoyer, The Adjutant General, State of West Virginia, delegate to the persons shown below the authority to use "FOR THE ADJUTANT GENERAL" for correspondence within the scope of their listed position.

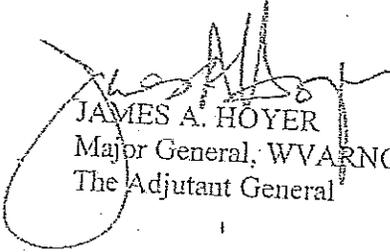
Brig Gen David T. Buckalew	Director, Joint Staff
BG Russell A. Crane	AAG, Installations & HLD
Brig Gen Timothy L. Frye	AAG, Air
BG Charles R. Veit	AAG, Army
COL William E. Crane	Chief of Staff, Army
COL Harrison B. Gilliam	Vice Chief of Joint Staff

NGWV-TAG

SUBJECT: Delegation of Persons to use Authority Line "FOR THE ADJUTANT GENERAL"

COL David P. Shafer  
COL Joseph P. Stephens  
COL William G. Suver  
Col Michael O. Cadle  
Col Paige P. Hunter  
LTC Kelly D. Ambrose  
LTC Joseph S. Peal  
Mr. Richard L. Dillon  
Mr. Johnnie L. Young  
Mrs. Rhonda Combs Wick  
End of List

MILPO  
CFMO  
G3/POTO  
Director of Staff, Air  
HRO  
JAG  
J3  
Advisor  
Director of Operations, WVMA  
Chief Financial Officer

  
JAMES A. HOYER  
Major General, WVARNG  
The Adjutant General

DISTRIBUTION:

"A"

Each Individual Listed