CS-15-96

CHANGE ORDER APPROVAL FORM

PROJECT: Sheriff's Office Administration Building CHANGE ORDER: C

DATE: 11/18/15

CONTRACT NUMBER: CM2133

TO CONTRACTOR: ACON Construction Company, Inc.

Reason for Change Order: Deductive change order for Owner provided generator changes (see details on the attached change order request).

15 DEC -8 AM 9:31

Original Contract Sum.....	$	7,756,000.00
Net Change by Previous Change Order/Supplemental Agreement.	$	(778,558.93)
Contract Sum Prior to This Change Order.....	$	6,977,441.07
Amount of This Change Order (Add/Deduct).....	$	(745.00)
New Contract Sum Including this Change Order.....	$	6,976,696.07

The contract for substantial completion will be (~~increased~~) (~~decreased~~) (unchanged) by 0 days;
Substantial Completion: 08/11/16; Final Completion: 09/10/16

APPROVED BY: _____ DATE: 12/7/15
Project Manager (Department Head)

APPROVED BY: Charlotte J Young DATE: 12/8/15
Contract Manager

APPROVED BY: _____ DATE: 12-10-15
Director of Office of Management & Budget

12/9/15

APPROVED BY: _____ DATE: 12/10/15
County Manager

ACCOUNT NO.: 65213521-562000 SHADM

Acon Construction Co., Inc.
3653 Regent Boulevard, Suite 401
Jacksonville, FL 32224
Ph : 904-565-9060

Change Order

Project:
J14-012 Nassau County Sheriffs Office
77079 Robert E. Williams Drive
Yulee, FL 32097

Change Order: C
Date: 11/12/2015
Architect's Project:

To Contractor:
Acon Construction Co., Inc.
3653 Regent Boulevard, Suite 401
Jacksonville, FL 32224

The Contract is changed as follows:
Change Order for County Provided Generator

C Owner Provided Generator Changes	$-745.00

The original Contract Amount was	$7,756,000.00
Net change by previously authorized Change Orders	$-778,558.93
The Contract Amount prior to this Change Order was	$6,977,441.07
The Contract will be increased by this Change Order in the amount of	$-745.00
The new Contract Amount including this Change Order will be	$6,976,696.07

The Contract Time will be increased by 0 days.
The date of Substantial Completion as of the date of this Change Order therefore is 8/11/2016

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACT AND OWNER.

ARCHITECT	Acon Construction Co., Inc. CONTRACTOR 3653 Regent Boulevard, Suite 401 Jacksonville, FL 32224	OWNER
(Signature)	(Signature)	(Signature)
By STEPHEN WALKER	By	By T.J. Selby
Date 12 NOV 2015	Date 11-12-15	Date 12/10/15

Acon Construction Co., Inc.
3653 Regent Boulevard, Suite 401
Jacksonville, FL 32224
Ph : 904-565-9060

Change Request

To: Bob Knott
Nassau County
96135 Nassau Place
Suite 1
Yulee, FL 32097
Ph: 904-491-7377 Fax: 904-321-2658

Number: C
Date: 11/12/15
Job: J14-012 Nassau County Sheriffs Office
Phone:

Description: Owner Provided Generator Changes

We are pleased to offer the following specifications and pricing to make the following changes:

The Sheriff's Office procured a generator with far more capacity than that originally specified. They also tested the generator and confirmed it worked according to operational requirements. In order to make this work, ACON needed to do the following things:

1. Get credit for equipment originally designed
2. Have the County's contracted Generator Specialist install the system
3. Buy the correct equipment to interface with the generator and to house the generator with a fuel tank added
4. Change design drawings (Elec $1100, Struc $1000)

All of this came to a credit of $745 (please see attached breakout)

In order to make the entire process work, ACON will need to build a slab for the generator and housing to be mounted on and install some acoustic panels on the outside of the Sheriff's Office next to equipment. ACON will shuffle costs around and will donate approx $3500 to aid in getting the extra capabilities for the owner while maintaining a deductive change order.

The total amount to provide this work is ..... $-745.00
(Please refer to attached sheet for details.)

If you have any questions, please contact me at .

Submitted by:

Approved by: _____
Date: _____

Cc:

Acon Construction Co., Inc.
3653 Regent Boulevard, Suite 401
Jacksonville, FL 32224
Ph : 904-565-9060

Change Request Price Breakdown
Continuation Sheet

Description:

Subtotal:	**$0.00**
	$-745.00
Total:	**$-745.00**

Munson and Bryan Electric Co., Inc.

3434 St. Augustine Rd.
Jacksonville, Fl. 32207
904-396-6689 904-396-1136 fax

Proposal

To: ACON Construction. **October 29, 2015**
Attn: Frank Anderson
Project: Sheriffs Admin New Generator

Munson & Bryan is pleased to provide an electrical proposal for the project mentioned above. Please see the following scope of work.

Deductions:

- **Credit for 150 KW Tradewinds generator/ATS package...($57,200.00)**
- **Credit for 300 amp feeder to generator.....($6,600.00)**

Total credit for above items.....($63,800.00)

Additional costs for owner supplied generator:

- **Generac 800 amp ATS.....$6,765.00**
- **Replace 1200 amp breaker with 800 amp breaker in owner supplied generator.....$7,713.00**
- **800 amp feeder from ATS to generator.....$22,400.00**

Total additional costs for above items.....$36,878.00

− 63,800.00
< 26,922 >

Alternate:

- **800 amp rating plug for 1200 amp breaker in owner supplied generator.....$450.00**

NOTE EXISTING BREAKER IS DISCONTINUED

< 26,472 >

EXCLUSIONS

Concealed conditions.
Equipment purchase and install.
Equipment start up.
Generator fuel.

This proposal is valid for Thirty (30) days.
Thank you for the opportunity to provide our electrical services. Please call our office at 904-396-6689 with any questions.

*Signature:*_____ *Date:*_____

TRADEWINDS
POWER CORP
5820 NW 84th Avenue - Miami, Florida 33166
Tel 305-592-9745 Fax 305-592-7461
www.tradewindspower.com

Filters
Pump Sets
Power Units
Generator Sets
Automatic Engine Controls

Quote: TPDA 22251 8/12/2015

To: CED/JACKSO
2068 Edison Ave
Jacksonville, FL
Attn: Mr. John Schmidt
(904) 356-7174

Project Name: Sheriffs Admin

DETAIL

Model	**TP150E-60T3FGT**	**$51,957**
Application	Mobile	
Approval	Non-UL Unit	
Power Rating	150kW/187.5kVA Standby, 135kW/168.75kVA Prime	
Rating	Standby Power rated, to supply emergency power for the duration of normal power interruption.	
Phase	Three Phase, 0.8 PF	
Hertz	60 Hz @ 1800 RPM	
Voltage	277/480	
Amps	226	

Description
Tradewinds fully integrated Mobile power generator set, providing optimum performance, reliability and versatility. Efficiency matched heavy duty, liquid cooled, 4 cycle, diesel engine, with an AC Synchronous, brushless, single bearing alternator. Mounted on vibration isolators, factory tested at rated load,transient load, block load, and load rejection, Voltage and Frequency fluctuation, Safety shutdowns for high coolant temperature and low oil pressure, under/over frequency.FOR UNITS WITH FLEX ENGINE ONLY: Equipment Engine complies with EPA regulation pursuant to authority contained in 40CFR part 1039 Section 625 and 40CFR part 1068 Section 101, along with requirements of CCR2423(d).
The complete generator set assembly is rated at an ambient temperature of 40 °C.

Rating
Standby Power rated, to supply emergency power for the duration of normal power interruption.

Engine
Perkins 1106D-E66TAG3, U.S. EPA non road (or off road) source emission standard Tier 3 compliant diesel engine, 6 cylinder in-line; turbocharged, after cooled, heavy duty air cleaner; high pressure common rail fuel system, electronically controlled, fuel injection pump, fuel filter; oil filler and dipstick, oil filter; thermostatically controlled cooling system, gear driven circulation pump, belt driven pusher fan, radiator sized for 120°F ambient clearance; 12 VDC system, battery charging alternator; flywheel and housing SAE J620.

AC Alternator
Marathon Electric , 4 Pole, Brushless exciter, 2/3 pitch winding to minimize harmonic distortion, unirotor construction. Double shielded and pre -lubricated single bearing. Class 'H' insulation UL1446, and epoxy overcoat. NEMA MG-32, BS5000,IEC 34-1.
Permanent Magnet Generator (PMG)Excitation with DVR2000 voltage regulator.

TP150E-60T3FGT - 1106D-E66TAG3
250A,3P,600V, 250Vdc, Circuit Breaker, 80% rated
Cambox 800AMP, 6 Black, 2 white, 1 green female connectors.
Aluminum cover for 800A Cambox. Gas spring lid with 10A snap action limit switch, strip brushes, SS padlock latches.
431-6202, 12 Leads AC Alternator
Permanent Magnet Generator (PMG)Excitation with DVR2000 voltage regulator, OLD VERSION.
Digital Control Panel 2020 Series, 4 output ready; manual or remote start, AC voltmeter, hourmeter. All standard generator shutdowns; programmable for pre-alarm or alarm, USB Port; ECU communication via SAE J1939. MODBUS communication via RS485 Port. NO interface panel included.
Emergency Stop ONLY FOR 2020 panels.
Audible Alarm. 2020 Panel Series ONLY.
300 gal., STEEL sub base fuel tank, UL-142 double wall

151 up to 300 gal tank textured Urethane coating for protection against rust, corrosion, salt and damp conditions. UV resistant, waterproof.
Weather protective marine grade aluminum enclosure, in compliance to UL2200 standard; white powder coating finish on both sides, sound insulated.
Cast aluminum rain cap upgrade.
Enclosure interior lights, set of 2 FLUORESCENT, 8 Watts ea, 12VDC. Includes 4 output interface panel with timers.
Perimeter service Recess type Light, halogen 55W 12VDC, kit of 4. Includes 4 output interface panel with timers.
Exhaust Compartment Insulation, to enhance noise reduction and heat dissipation.
Battery, WET type, group 31.
Metal rack for battery, with security bolts and hold down.
Battery Charger, 6 Amp, 12 VDC, 90-265A AC 50/60Hz 115 VAC , compact type, UL Listed.
Low coolant level switch.
GFI duplex receptacle, 20A,120V, with clear cover, for battery charger and coolant block heater.NEMA 3R.
Engine coolant, to inhibit rust and corrosion. Freezing protection to –34 degrees Fahrenheit (-37 degrees Celsius) and boiling protection to 256 degrees Fahrenheit (129 degrees Celsius).
Radiator overflow bottle .
Plastic box for operator manuals.
Coolant block heater, 1500W, 120V, 1 Ph, 100 degrees Fahrenheit On - 120 degrees Fahrenheit Off. IP41 protection rating to IEC 529.
Shut off valves for coolant block heater
Automatic start contacts with clear cover.
Enclosure lockable door
Engine Operator Manual
Alternator Operator Manual
Generator Set Manual
Full Load Factory Tested
Standby Limited Warranty, Two (2) Years/ 1500 hrs.

Transfer Switch Option

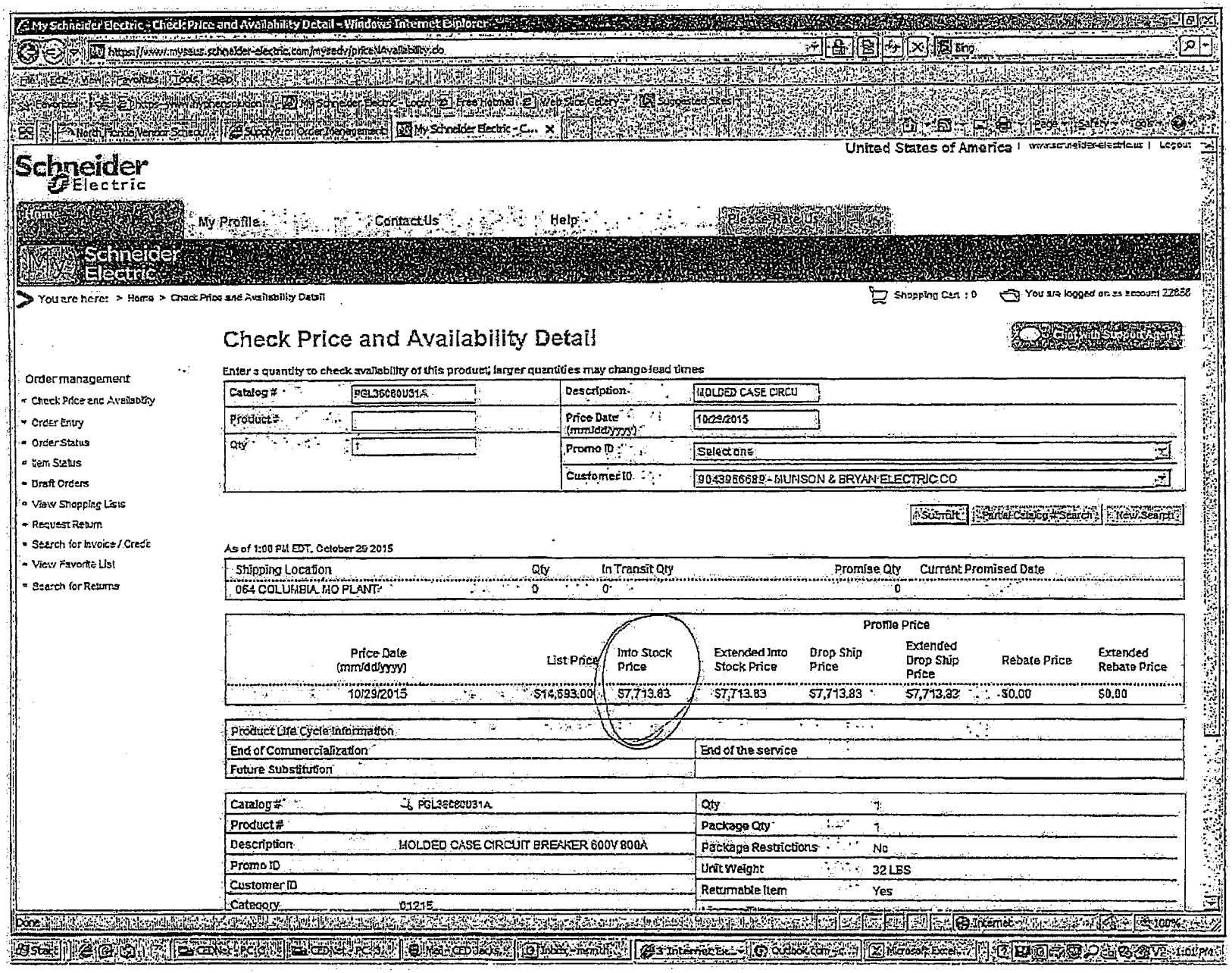
Thomson Industrial / Commercial Automatic Transfer Switch, TSC80e controller, 800A, 3P, 600V, N1, Open Transition, with programmable settings, Auto/ Test, exercise clock, generator over $5,243

Estimated Ship Date From Received Order: 9 weeks TBA

Prepared by: Diego Aleaga

Unit Price: $51,957
ATS Price: $5,243
Sub Total: $57,200
Unit Quantity: 1
Total Ex Works Miami: $57,200
Tax: $ -
Freight / Delivery Fee - Included: $ -
Grand Total EXW: $57,200

Price Validity: 45 days; 25% Deposit Required; 15% Cancellation Charge for Restocking
Letter of Credit: Standby, Irrevocable and Confirmed by Prime U.S. bank with payment at sight in U.S. dollars. All banking charges to applicant
Wire Transfer: Tradewinds Power Corp Division of South East Diesel Corp, F/B/O Wells Fargo Bank, Acct # 4945741023, ABA # 121000248



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Schneider Electric

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- Check Price and Availability
- Order Entry
- Order Status
- Item Status
- Draft Orders
- View Shopping Lists
- Request Return
- Search for Invoice / Credit
- View Favorite List
- Search for Returns

Enter a quantity to check availability of this product; larger quantities may change lead times

Catalog #	PGL36080U31A	Description	MOLDED CASE CIRCU
Product #		Price Date (mm/dd/yyyy)	10/29/2015
Qty	1	Promo ID	Select one
		Customer ID	9043966689 - MUNSON & BRYAN ELECTRIC CO

Submit | Partial Catalog Search | New Search

As of 1:00 PM EDT, October 29 2015

Shipping Location	Qty	In Transit Qty	Promise Qty	Current Promised Date
064 COLUMBIA, MO PLANT	0	0	0	

				Profile Price				
Price Date (mm/dd/yyyy)	List Price	Into Stock Price	Extended Into Stock Price	Drop Ship Price	Extended Drop Ship Price	Rebate Price	Extended Rebate Price
10/29/2015	$14,693.00	$7,713.83	$7,713.83	$7,713.83	$7,713.83	$0.00	$0.00

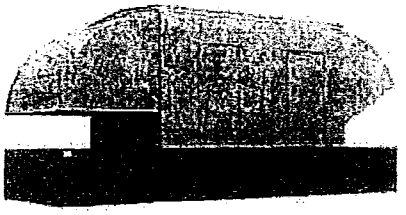
Product Life Cycle Information	
End of Commercialization	End of the service
Future Substitution	

Catalog #	PGL36080U31A	Qty	1
Product #		Package Qty	1
Description	MOLDED CASE CIRCUIT BREAKER 600V 800A	Package Restrictions	No
Promo ID		Unit Weight	32 LBS
Customer ID		Returnable Item	Yes
Category	01215		

Done | Internet | 100%

Start | 1:01 PM

Com-Fab, Inc.
4657 Price-Hilliards Rd.
Plain City, Ohio 43064
740-857-1107 Fax: 740-857-1757



Frank Anderson
ACON Construction Co.
3653 Regent Blvd
Suite 401
Jacksonville, FL 32224
Phone: 904-565-9060
Fax: 904-565-9080

Sales Quotation

Quote Number: 110315-F
Date 11/3/2015 **Quote Expires on:** 1/2/2016
Project Generator Enclosure
Questions? Please call Jim Sheehy

Qty	Description	Extend
1	14 gauge galvannealed steel on subbase weather enclosure with steel tubing frame, galvanized angle iron base, fixed intake louver, gravity radiator discharge louvers, hinged access doors, stainless steel t-handle latches and stainless steel hinge.	
1	External muffler brackets with rain shield, tailpipe and rain cap	
1	Critical grade muffler	
1	549 gallon UL142 listed double wall subbase tank	
1	Crossmembers with generator mounting holes	
1	Mechanical gauge, leak detection switch, 2" fill, normal vent, engine supply and return dip tubes, tank drain, extra 2" opening, removable end panel and conduit entry area	
1	Low fuel level switch	
1	High fuel level switch	
1	5 gallon spill containment	
1	4" emergency vent cap	
	Approx overall size 182" x 85" x 128"	
	Options: Mount customer supplied 600 DFGB generator add ~~$258.00~~	
	FDEP package with alarm add $1,313.00	
	Freight to Jacksonville, FL area add $ 3,550.00	

F.O.B. Factory Terms 1% 10 days Net 30 days

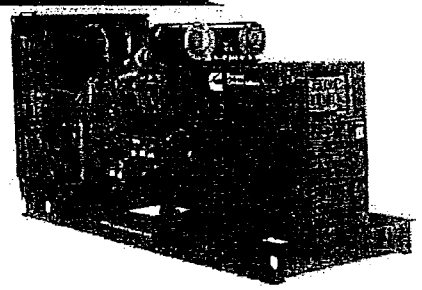
Com-Fab warrants its products against defects in material or workmanship under normal use and service for a period of 12 months from the date of shipment from its factory in Plain City, Ohio. All obligations and liabilities under this warranty are limited to repairing or replacing at our option F.O.B. Plain City, Oh. of such allegedly defective unit or parts returned, carrier charges prepaid. No liability is accepted for consequential damage or reinstallation labor. Warranty on accessories furnished by other manufacturers shall be limited by that manufacturers warranty. This warranty does not cover failure resulting from improper installation or use.

Total	$15,764.00

+4863.00
$ 20,627

COUNTY HOUSE

Power Generation



Diesel Generator Set
Model DFGB 60 Hz

600 kW, 750 kVA Standby
545 kW, 681 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 NFPA110 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 coolant heaters improve starting in extreme operating conditions. 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 UL 2200 Listed. 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 you with warranty, service, parts, and planned maintenance support.

Features

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

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

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

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.

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 rated power in ambient temperatures through 50°C.

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 scratches, corrosion, or fading.

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

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 world wide distributor network.

Generator Set

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

Specifications – General

See outline drawing 500-3477 installation design specifications.

Unit Width, in (mm)	72.1 (1830)
Unit Height, in (mm)	88.2 (2242)
Unit Length, in (mm)	169.5 (4305)
Unit Dry Weight, lb (kg)	13600 (6169)
Unit Wet Weight, lb (kg)	14160 (6423)
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)	30.0 (22.4)	30.0 (22.4)
Coolant Capacity with radiator, US Gal (L)	44.0 (166.5)	44.0 (166.5)
Coolant Flow Rate, Gal/min (L/min)	236.0 (893.3)	236.0 (893.3)
Heat Rejection To Coolant, Btu/min (MJ/min)	26065.0 (27.6)	20985.0 (22.2)
Heat Radiated To Room, Btu/min (MJ/min)	7790.0 (8.3)	6920.0 (7.3)
Maximum Coolant Friction Head, psi (kPa)	10.0 (68.9)	10.0 (68.9)
Maximum Coolant Static Head, ft (m)	60.0 (18.3)	60.0 (18.3)

Air		
Combustion Air, scfm (m^3/min)	2280.0 (64.5)	2065.0 (58.4)
Alternator Cooling Air, scfm (m^3/min)	4156.0 (117.6)	4156.0 (117.6)
Radiator Cooling Air, scfm (m^3/min)	42000.0 (1188.6)	42000.0 (1188.6)
Max. Static Restriction, in H_2O (Pa)	0.25 (62.25)	0.25 (62.25)

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 4600 ft (1403 m) at ambient temperatures up to 104°F (40°C). Above 4600 ft (1403 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

Base Engine	Cummins Model VTA28-G5, Turbocharged and Aftercooled, diesel-fueled
Displacement in^3 (L)	1710.0 (28.0)
Overspeed Limit, rpm	2100 ±50
Regenerative Power, kW	105.00
Cylinder Block Configuration	Cast iron with replaceable wet cylinder liners, 40°V 12 cylinder
Battery Capacity	660 amps minimum at ambient temperature of 32°F (0°C)
Battery Charging Alternator	55 amps
Starting Voltage	24-volt, negative ground
Lube Oil Filter Types	Three spin-on, full flow
Standard Cooling System	122°F (50°C) ambient radiator

Power Output	**Standby**	**Prime**
Gross Engine Power Output, bhp (kWm)	900.0 (671.4)	815.0 (608.0)
BMEP at Rated Load, psi (kPa)	226.0 (1558.2)	206.0 (1420.3)
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	13.1:1	13.1:1
Lube Oil Capacity, qt. (L)	89.0 (84.2)	89.0 (84.2)
Fuel Flow		
Fuel Flow at Rated Load, US Gal/hr (L/hr)	89.0 (336.9)	89.0 (336.9)
Maximum Inlet Restriction, in. Hg (mm Hg)	4.0 (101.6)	4.0 (101.6)
Maximum Return Restriction, in. Hg (mm Hg)	6.5 (165.1)	6.5 (165.1)
Air Cleaner		
Maximum Air Cleaner Restriction, in. H_2O (kPa)	25.0 (6.2)	25.0 (6.2)
Exhaust		
Exhaust Flow at Rated Load, cfm (m^3/min)	5040.0 (142.6)	4635.0 (131.2)
Exhaust Temperature, °F (°C)	935.0 (501.7)	885.0 (473.9)
Max Back Pressure, in. H_2O (kPa)	41.0 (10.2)	41.0 (10.2)

Fuel System	Direct injection, number 2 diesel fuel; fuel filter; automatic electric fuel shutoff.							
Fuel Consumption	**Standby**				**Prime**			
60 Hz Ratings, kW (kVA)	600 (750)				545 (681)			
Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full
US Gal/hr	14.7	24.3	34.1	44.2	13.9	22.6	31.2	40.3
L/hr	56	92	129	167	53	86	118	153

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
[ ] 220/380
[ ] 240/416
[ ] 254/440
[ ] 277/480

Three Phase Non-Reconnectable

[ ] 277/480
[ ] 347/600

Specifications – Alternator

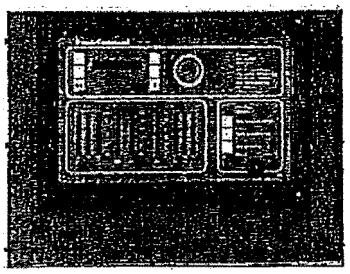
Design	Brushless, 4 pole, drip proof revolving field
Stator	2/3 pitch
Rotor	Direct coupled by flexible disc
Insulation System	Class H per NEMA MG1-1.65
Standard Temperature Rise	125°C @ Standby, 105°C @ Prime
Exciter Type	Permanent Magnet Generator (PMG)
Phase Rotation	A (U), B (V), C (W)
Alternator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

Three Phase Table[1]		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		310	309	309	309	309	309	307	308				
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		615	617	611	617	611	613	616	619				
Motor Starting kVA (at 90% sustained voltage)	PMG	3313	2944	2944	2944	2944	2944	2208	2429				
Full Load Current - Amps at Standby Rating	120/208 2081	127/220 1968	139/240 1804	220/380 1139	240/416 1041	254/440 984	277/480 902	347/600 722					

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.
- Standard PCCNet interface. 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	Engine Protection	Operator Interface
• 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	• 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	• 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**
• Line-to-line and line-to-neutral AC volts • 3-phase AC current • Frequency • Total and individual phase kW and kVA	• DC voltage • Lube oil pressure • Coolant temperature • Lube oil temperature (optional)	• 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**
• Integrated digital electronic isochronous governor • Temperature dynamic governing • Smart idle speed mode • Glow plug control (some models)	• Integrated digital electronic voltage regulator • 3-phase line to neutral sensing • PMG (Optional) • Single and three phase fault regulation • Configurable torque matching	• Data logging on faults • Fault simulation (requires InPower) • Time delay start and cooldown • Cycle cranking • PCCNet interface • (4) Configurable customer inputs • (4) Configurable customer outputs • (8) Configurable network inputs and (16) outputs (with optional network)
Options		
[ ] 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)

 Specifications subject to change without notice

Generator Set Options

Engine

[ ] 75 A battery charging alternator
[ ] Dual 208/240/480 V thermostatically controlled coolant heater for ambient above 40°F (4.5°C)
[ ] Dual 208/240/480 V thermostatically controlled coolant heater for ambient below 40°F (4.5°C)
[ ] Dual 120 V, 300 W lube oil heater
[ ] Dual 208/240 V, 300 W lube oil heater
[ ] Dual 480 V, 300 W lube oil heater
[ ] Bypass oil filter
[ ] Fuel/water separator
[ ] Heavy-duty air cleaner with safety element

Cooling System

[ ] Heat exchanger cooling
[ ] Remote radiator cooling

Alternator

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

Exhaust System

[ ] Critical-grade exhaust silencer
[ ] Industrial-grade exhaust silencer
[ ] Residential-grade exhaust silencer

Generator Set

[ ] AC entrance box
[ ] Battery charger, equalizer, float-type
[ ] Batteries
[ ] Export box packaging
[ ] Ground fault alarm
[ ] Main line circuit breaker
[ ] PowerCommand (3100) Digital Parallel Control
[ ] PowerCommand Network Communication Module (NCM)
[ ] Spring Isolators
[ ] 2-year standby warranty
[ ] 2-year prime power warranty
[ ] 5-year basic power warranty
[ ] 5-year comprehensive 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 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

Power Generation

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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.

 Specifications subject to change without notice S-1223h (9/06)