



RECORD ONLY SUBMITTAL PACKAGE

CSDG - 5115

Prepared For:

Central States Diesel Generators
1901 South Prairie Avenue
Waukesha, Wisconsin 53189

THIS SUBMITTAL IS BEING PREPARED FOR RECORD PURPOSES ONLY

The information presented in this submittal package has been approved

and is provided for record purposes only.

Date: 8/12/2026

Opportunity # O-806422

BMS# 485889

Customer PO# Signed Quote/5115



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IMPORTANT: *The critical power solution information and specifications included in this pdf can be used by the site contractor(s) and/or engineer(s) to assist with planning for and accomplishing the overall power solution installation. Please forward this document to the appropriate personnel, as necessary.*

It is the obligation of the electrical contractor and reviewing engineer to determine that the item quantities and accuracy of this submittal is correct as required for the job. Any inaccuracies or deviations must be addressed with Cummins Inc. before release to manufacturing. Any releases of material to manufacturing by the above parties constitute an acceptance of the accuracy of the submittal. Any changes after release will be viewed as a change order, subject to pricing changes. Please take the time to review this package for accuracy to prevent any after-shipment problems that could cause delay in energization.

Cummins certifies that these drawings, material lists, specification and datasheets have been checked prior to submittal and they:

- accurately depict the proposed equipment*
- provide current information to the date of the submittal and*
- present true and accurate equipment information.*

This Approval Drawing Package is submitted as our interpretation of the project requirements and/or the specifications for this job. Please note that issuance of these submittals shall not be deemed or interpreted as performance nor acceptance of your purchase order terms and conditions.

For questions or comments regarding this submittal, please contact the Cummins Project Manager listed on the title page.

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RFQ B048D

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SECTION 1

Project Information



Bill of Material

Feature Code	Description	Qty
A074S183	Remote Emergency Stop Switch	1
A075C111	Connector Kit for Remote Emergency Stop Switch (limited product applicability)	1
A041C902	Preventative Maintenance Kit-Normal Duty Air Cleaner (QSX15-G9)	1
DFEK	DFEK Commercial Diesel Generator Set, 500kW Standby 60Hz	1
500DFEK	500DFEK, Diesel Genset, 60Hz, 500kW-Standby Rating	
Install-US-Stat	U.S. EPA, Stationary Emergency Application	
Z555-2	B408D – Option 1B 2000A Breaker	
A331-2	Duty Rating - Standby Power (ESP)	
L170-2	Emission Certification, EPA, Tier 2, NSPS CI Stationary Emergency	
0220	None - Standards & Compliance	
0170	None - Vibration Isolators	
R098-2	Voltage - 120/208, 3 Phase, Wye, 4 Wire	
B258-2	Alternator - 60Hz, 12 Lead, Extended Range, 125/105C	
A292-2	Alternator Heater, 120 Volt AC	
F200-2	Steel Weather Protective Enclosure, with Exhaust System	
P175-2	Enclosure Color - Green, Steel	
F206-2	Wind Rating - 150 MPH, Steel Housing	
C207-2	Fuel Tank - Sub Base, 850 Gallon, UL142 Compliant	
L163-2	Listing, ULC - S601-07	
C127-2	Fuel Water Separator	
H609-2	Control Mounting - Left Facing	
H703-2	PowerCommand 2.3 Controller	
H678-2	LCD Control Display	
KA08-2	Alarm - Audible, Engine Shutdown	
KS53-2	Signals - Auxiliary, 8 Inputs/8 Outputs	
H536-2	Control Display Language - English	

KP78-2	Right CB - Right Side - 2000A Breaker - RLF36200U33A with 5.0 Trip	
KB78-2	Left CB - Left Side - 400A Breaker	
D041-2	Engine Air Cleaner - Normal Duty	
E074-2	Engine Cooling-Radiator, 50C Ambient	
H527-2	Warning - Low Coolant Level	
H557-2	Coolant Heater - 208/240/480 Volts AC, Below 40F Ambient Temperature	
L010-2	Test Record - Strip Chart	
L026-2	Cummins Certified Test Record	
L190-2	Standby 10 Year 5000 Hour Parts+Labor+Travel	
L050-2	Literature - English	
A412-2	Packing - None, Base Mounted Housing	
A072H671	Battery Charger-10Amp, 120/208/240VAC, 12/24V, 50/60Hz	1

EXCEPTIONS AND CLARIFICATIONS:

Proposal is for equipment only, offloading, rigging, and installation by others.

Fuel and permits, unless listed above, is not included.

Cummins Standard Start-up and testing is included. Additional tests, such as NETA testing, if required, is by others

Coordination Study not provided.

SECTION 2

Generator Specifications





Diesel generator set QSX15 series engine

450 kW – 500 kW Standby



Description

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

Features

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

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

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

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

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

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

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

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

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

	Standby rating	Prime rating	Continuous rating	Data sheets
Model	60 Hz kW (kVA)	60 Hz kW (kVA)	60 Hz kW (kVA)	60 Hz
DFEJ	450 (563)	410 (513)		D-3400
DFEK	500 (625)	455 (569)		D-3401

Generator set specifications

Governor regulation class	ISO 8528 part 1 Class G3
Voltage regulation, no load to full load	± 0.5%
Random voltage variation	± 0.5%
Frequency regulation	Isochronous
Random frequency variation	± 0.25%
EMS compatibility	IEC 61000-4-2: Level 4 Electrostatic discharge IEC 61000-4-3: Level 3 Radiated susceptibility

Engine specifications

Design	Turbocharged with air-to-air charge air-cooling
Bore	136.9 mm (5.39 in.)
Stroke	168.9 mm (6.65 in.)
Displacement	14.9 L (912.0 in ³)
Cylinder block	Cast iron with replaceable wet liners, in-line 6 cylinder
Battery capacity	1400 Amps minimum at ambient temperature 0 °C (32 °F)
Battery charging alternator	35 Amps
Starting voltage	24 volt, negative ground
Fuel system	Full authority electronic (FAE) Cummins HPI-TP
Fuel filter	
Air cleaner type	
Lube oil filter type(s)	Single spin-on combination full flow and bypass filters
Standard cooling system	40 °C (104 °F) ambient radiator

Alternator specifications

Design	Brushless, 4 pole, drip-proof revolving field
Stator	2/3 pitch
Rotor	Single bearing, flexible discs
Insulation system	Class H
Standard temperature rise	125 °C standby at 40 °C ambient
Exciter type	PMG (Permanent Magnet Generator)
Phase rotation	A (U), B (V), C (W)
Alternator cooling	Direct drive centrifugal blower fan
AC waveform total harmonic distortion (THDV)	< 5% no load to full linear load, < 3% for any single harmonic
Telephone influence factor (TIF)	< 50% per NEMA MG1-22.43
Telephone harmonic factor (THF)	< 3%

Available voltages

60 Hz Line – Neutral/Line - Line

- | | | | |
|-----------|-----------|-----------|-----------|
| • 110/190 | • 110/220 | • 115/200 | • 115/230 |
| • 120/208 | • 127/220 | • 139/240 | • 220/380 |
| • 230/400 | • 240/416 | • 255/440 | • 277/480 |
| • 347/600 | | | |

Note: Consult factory for other voltages.

Generator set options

Engine

- 208/240/480 V thermostatically controlled coolant heater for ambient above 4.5 °C (40°F)
- 208/240/480 V thermostatically controlled coolant heater for ambient below 4.5 °C (40°F)
- 120 V 300 W lube oil heater
- Heavy duty air cleaner with safety element

Alternator

- 100 °C rise
- 125 °C rise
- 150 °C rise
- 120/240 V 200 W anti-condensation heater

Exhaust system

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

Fuel system

- 1022 L (270 gal) sub-base tank
- 1136 L (300 gal) sub-base tank
- 1514 L (400 gal) sub-base tank
- 1893 L (500 gal) sub-base tank
- 2271 L (600 gal) sub-base tank
- 2498 L (660 gal) sub-base tank
- 3218 L (850 gal) sub-base tank
- 6435 L (1700 gal) sub-base tank
- 9558 L (2525 gal) sub-base tank

Cooling system

- High ambient 50 °C radiator

Control panel

- PC 2.3
- PC 3.3 with MLD
- 120/240 V 100 W control anti-condensation heater
- Ground fault indication
- Remote fault signal package
- Run relay package

Generator set

- AC entrance box
- Battery
- Battery charger
- Export box packaging
- UL 2200 Listed
- Main line circuit breaker
- Paralleling accessories
- Remote annunciator panel
- Spring isolators
- Enclosure: aluminium, steel, weather protective or sound attenuated
- 2 year standby power warranty
- 2 year prime power warranty
- 5 year basic power warranty
- 10 year major components warranty

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

Control system 2.3

The PowerCommand 2.3 control system - An integrated generator set control system providing voltage regulation, engine protection, generator protection, operator interface and isochronous governing (optional).

Control - Provides battery monitoring and testing features and smart-starting control system.

InPower™ - PC-based service tool available for detailed diagnostics.

PCCNet RS485 - Network interface (standard) to devices such as remote annunciator for NFPA 110 applications.

Control boards - Potted for environmental protection.

Ambient operation - Suitable for operation in ambient temperatures from -40 °C to +70 °C and altitudes to 13,000 feet (5000 meters). Prototype tested - UL, CSA and CE compliant.

AC protection

- AmpSentry protective relay
- Over current warning and shutdown
- Over and under voltage shutdown
- Over and under frequency shutdown
- Over excitation (loss of sensing) fault
- Field overload
- Overload warning
- Reverse kW shutdown
- Reverse Var shutdown
- Short circuit protection

Engine protection

- Overspeed shutdown
- Low oil pressure warning and shutdown
- High coolant temperature warning and shutdown
- Low coolant level warning or shutdown
- Low coolant temperature warning

- High, low and weak battery voltage warning
- Fail to start (overcrank) shutdown
- Fail to crank shutdown
- Redundant start disconnect
- Cranking lockout
- Sensor failure indication
- Low fuel level warning or shutdown
- Fuel-in-rupture-basin warning or shutdown

Operator/display panel

- Manual off switch
- 128 x 128 Alpha-numeric display with push button access for viewing engine and alternator data and providing setup, controls and adjustments (English or international symbols)
- LED lamps indicating genset running, not in auto, common warning, common shutdown, manual run mode and remote start
- Suitable for operation in ambient temperatures from -20 °C to +70 °C

Alternator data

- Line-to-Neutral AC volts
- Line-to-Line AC volts
- 3-phase AC current
- Frequency
- kVA, kW, power factor

Engine data

- DC voltage
- Lube oil pressure
- Coolant temperature

Control functions

- Time delay start and cool down
- Glow plug control (some models)
- Cycle cranking
- PCCNet interface
- (4) Configurable inputs
- (4) Configurable outputs
- Remote emergency stop
- Battle short mode
- Load shed
- Real time clock with exerciser
- Derate

Digital governing (optional)

- Integrated digital electronic isochronous governor
- Temperature dynamic governing

Digital voltage regulation

- Integrated digital electronic voltage regulator
- 3-phase Line-to-Line sensing
- Configurable torque matching
- Fault current regulation under single or three phase fault conditions

Other data

- Genset model data
- Start attempts, starts, running hours
- Fault history
- RS485 Modbus® interface
- Data logging and fault simulation (requires InPower service tool)
- Total kilowatt hours
- Load profile

Options

- Auxiliary output relays (2)
- 120/240 V, 100 W anti-condensation heater
- Remote annunciator with (3) configurable inputs and (4) configurable outputs
- **PMG alternator excitation**
- PowerCommand for Windows® remote monitoring software (direct connect)
- AC output analogue meters
- **PowerCommand 2.3** and 3.3 control **with AmpSentry protection**

For further detail on PC 2.3 see document S-1569.

For further detail on PC 3.3 see document S-1570.

Emergency Standby Power (ESP):

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

Limited-Time running Power (LTP):

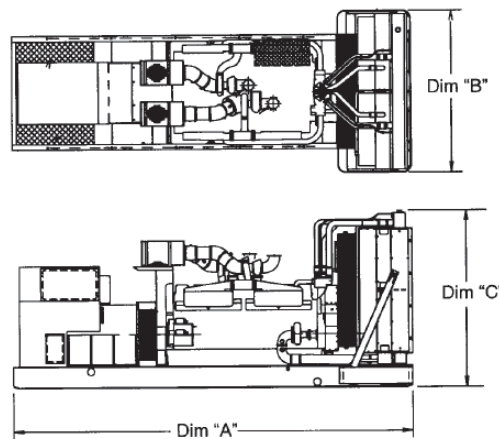
Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.

Prime Power (PRP):

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

Base Load (Continuous) Power (COP):

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



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

Do not use for installation design

Model	Dim 'A' mm (in.)	Dim 'B'	Dim 'C'	Set weight dry*	Set weight wet* kg (lbs)
DFEJ	3864 (152.1)	Refer to drawings for specific weights and dimensions			4234 (9335)
DFEK	3864 (152.1)				4461 (9835)

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

Codes and standards

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

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

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

For more information contact your local Cummins distributor or visit power.cummins.com

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Generator set data sheet



Model: **DFEK**
Frequency: **60 Hz**
Fuel type: **Diesel**
kW rating: **500 Standby**
455 Prime
Emissions level: **EPA NSPS Stationary Emergency Tier 2**

Exhaust emission data sheet:	EDS-173
Exhaust emission compliance sheet:	EPA-1005
Sound performance data sheet:	MSP-177
Cooling performance data sheet:	MCP-105
Prototype test summary data sheet:	PTS-145
Standard set-mounted radiator cooling outline:	0500-3326
Optional set-mounted radiator cooling outline:	
Optional heat exchanger cooling outline:	
Optional remote radiator cooling outline:	

Fuel consumption	Standby				Prime				Continuous
	kW (kVA)				kW (kVA)				kW (kVA)
Ratings	500 (625)				455 (569)				
Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full	Full
US gph	11.6	18.8	25.7	34.4	10.9	17.6	23.7	30.4	
L/hr	44	71	97	130	41	67	90	115	

Engine	Standby rating	Prime rating	Continuous rating
Engine manufacturer	Cummins Inc.		
Engine model	QSX15-G9		
Configuration	Cast iron with replaceable wet cylinder liners, in-line 6 cylinder		
Aspiration	Turbocharged with air-to-air charge air-cooling		
Gross engine power output, kWm (bhp)	563.0 (755.0)	507.3 (680.0)	
BMEP at set rated load, kPa (psi)	2433.9 (353.0)	2213.2 (321.0)	
Bore, mm (in.)	136.9 (5.39)		
Stroke, mm (in.)	168.9 (6.65)		
Rated speed, rpm	1800		
Piston speed, m/s (ft/min)	10.1 (1995.0)		
Compression ratio	17.0:1		
Lube oil capacity, L (qt)	83.3 (88.0)		
Overspeed limit, rpm	2150 ± 50		
Regenerative power, kW	52.00		

Fuel flow	Standby rating	Prime rating	Continuous rating
Maximum fuel flow, L/hr (US gph)	423.9 (112.0)		
Maximum inlet restriction, mm Hg (in Hg)	127.0 (5.0)		
Maximum return restriction, mm Hg (in Hg)	165.1 (6.5)		

Air

Combustion air, m³/min (scfm)	41.6 (1470.0)	38.8 (1370.0)	
Maximum air cleaner restriction, kPa (in H ₂ O)	6.2 (25.0)		
Alternator cooling air, m³/min (scfm)	62.0 (1290.0)		

Exhaust

Exhaust flow at set rated load, m³/min (cfm)	102.6 (3625.0)	88.7 (3135.0)	
Exhaust temperature, °C (°F)	482.8 (901.0)	466.7 (872.0)	
Maximum back pressure, kPa (in H ₂ O)	10.2 (41.0)		

Standard set-mounted radiator cooling

Ambient design, °C (°F)	40 (104)		
Fan load, kW _m (HP)	19 (25.5)		
Coolant capacity (with radiator), L (US gal)	57.9 (15.3)		
Cooling system air flow, m³/min (scfm)	707.5 (25000.0)		
Total heat rejection, MJ/min (Btu/min)	19.6 (18485.0)	17.7 (16680.0)	
Maximum cooling air flow static restriction, kPa (in H ₂ O)	0.12 (0.5)		

Optional set-mounted radiator cooling

Ambient design, °C (°F)	50 (122)		
Fan load, kW _m (HP)	19 (25.5)		
Coolant capacity (with radiator), L (US gal)	57.9 (15.3)		
Cooling system air flow, m³/min (scfm)	707.5 (25000.0)		
Total heat rejection, MJ/min (Btu/min)	19.6 (18485.0)	17.7 (16680.0)	
Maximum cooling air flow static restriction, kPa (in H ₂ O)	0.12 (0.5)		

Optional heat exchanger cooling

Set coolant capacity, L (US Gal.)			
Heat rejected, jacket water circuit, MJ/min (Btu/min)			
Heat rejected, after-cooler circuit, MJ/min (Btu/min)			
Heat rejected, fuel circuit, MJ/min (Btu/min)			
Total heat radiated room, MJ/min (Btu/min)			
Maximum raw water pressure, jacket water circuit, kPa (psi)			
Maximum raw water pressure, after-cooler circuit, kPa (psi)			
Maximum raw water pressure, fuel circuit, kPa (psi)			
Maximum raw water flow, jacket water circuit, L/min (US gal/min)			
Maximum raw water flow, after-cooler circuit, L/min (US gal/min)			
Maximum raw water flow, fuel circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, after-cooler circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/min (US gal/min)			

Optional heat exchanger cooling (continued)

Raw water delta P at min flow, jacket water circuit, kPa (psi)			
Raw water delta P at min flow, after-cooler circuit, kPa (psi)			
Raw water delta P at min flow, fuel circuit, kPa (psi)			
Maximum jacket water outlet temp, °C (°F)			
Maximum after-cooler inlet temp, °C (°F)			
Maximum after-cooler inlet temp at 25 °C (77 °F) ambient, °C (°F)			

Optional remote radiator cooling¹

Set coolant capacity, L (US gal)	
Max flow rate at max friction head, jacket water circuit, L/min (US gal/min)	
Max flow rate at max friction head, after-cooler circuit, L/min (US gal/min)	
Heat rejected, jacket water circuit, MJ/min (Btu/min)	
Heat rejected, after-cooler circuit, MJ/min (Btu/min)	
Heat rejected, fuel circuit, MJ/min	
Total heat radiated to room, MJ/min (Btu/min)	
Maximum friction head, jacket water circuit, kPa (psi)	
Maximum friction head, after-cooler circuit, kPa (psi)	
Maximum static head, jacket water circuit, m (ft)	
Maximum static head, after-cooler circuit, m (ft)	
Maximum jacket water outlet temp, °C (°F)	
Maximum after-cooler inlet temp at 25 °C (77 °F) ambient, °C (°F)	
Maximum after-cooler inlet temp, °C (°F)	
Maximum fuel flow, L/hr (US gph)	
Maximum fuel return line restriction, kPa (in Hg)	

Weights²

Unit dry weight kgs (lbs)	Refer to drawings for specific weights and dimensions
Unit wet weight kgs (lbs)	

Notes:

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

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

Derating factors

Standby	Genset may be operated at up to 1400 m (4593 ft) and 40°C (104°F) without power deration. For sustained operation above these conditions, derate by 3.1% per 305 m (1000 ft), and 9% per 10°C (9% per 18°F). Genset may be operated at up to 500 m (1640 ft) and 50°C (122°F) without power deration. For sustained operation above these conditions, derate by 3% per 305 m (1000 ft), and 9.5% per 10°C (9% per 18°F).
Prime	Genset may be operated at up to 2250 m (7382 ft) and 40°C (104°F) without power deration. For sustained operation above these conditions, derate by 3.2% per 305 m (1000 ft), and 16.6% per 10°C (16.6% per 18°F). Genset may be operated at up to 1600 m (5249 ft) and 50°C (122°F) without power deration. For sustained operation above these conditions, derate by 3.2% per 305 m (1000 ft), and 16.6% per 10°C (16.6% per 18°F).
Continuous	

Ratings definitions

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

Alternator data

Three phase table ¹		105 °C	105 °C	105 °C	125 °C	125 °C	125 °C	125 °C	125 °C	150 °C
Feature code		B262	B301	B252	B258	B252	B414	B246	B300	B413
Alternator data sheet number		308	307	307	308	307	308	306	306	307
Voltage ranges		110/190 thru 139/240 220/380 thru 277/480	347/600	120/208 thru 139/240 240/416 thru 277/480	110/190 thru 139/240 220/380 thru 277/480	120/208 thru 139/240 240/416 thru 277/480	120/208 thru 139/240 240/416 thru 277/480	277/480	347/600	120/208 thru 139/240 240/416 thru 277/480
Surge kW		514	517	514	514	514	516	515	515	514
Motor starting kVA (at 90% sustained voltage)	Shunt									
	PMG	2429	2208	2208	2429	2208	2429	1896	1896	2208
Full load current - amps at Standby rating		110/190 1901	120/208 1737	110/220 1642	115/230 1571	139/240 1505	220/380 951	230/400 903	240/416 868	277/480 753

Note:

¹ 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.

Formulas for calculating full load currents:

Three phase output

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

Single phase output

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

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

For more information contact your local Cummins distributor or visit power.cummins.com

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PowerCommand®

2.3 Control System



Control System Description

The PowerCommand control system is a microprocessor-based generator set monitoring, metering and control system designed to meet the demands of today's engine driven generator sets. The integration of all control functions into a single control system provides enhanced reliability and performance, compared to conventional generator set control systems. These control systems have been designed and tested to meet the harsh environment in which gensets are typically applied.

Features

- 320 x 240 pixels graphic LED backlight LCD.
- Multiple language support.
- AmpSentry™ protective relay - true alternator overcurrent protection.
- Real time clock for fault and event time stamping.
- Exerciser clock and time of day start/stop.
- Digital voltage regulation. Three phase full wave FET type regulator compatible with either shunt or PMG systems.
- Generator set monitoring and protection.
- 12 and 24 VDC battery operation.
- Modbus® interface for interconnecting to customer equipment.
- Warranty and service. Backed by a comprehensive warranty and worldwide distributor service network.
- Certifications - suitable for use on generator sets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std., CE, UKCA and CSA standards.

PowerCommand Digital Genset Control PCC 2300



Description

The PowerCommand generator set control is suitable for use on a wide range of generator sets in non-paralleling applications. The PowerCommand control is compatible with shunt or PMG excitation style. It is suitable for use with reconnectable or non-reconnectable generators, and it can be configured for any frequency, voltage and power connection from 120-600 VAC Line-to-Line.

Power for this control system is derived from the generator set starting batteries. The control functions over a voltage range from 8 VDC to 30 VDC.

Features

- 12 and 24 VDC battery operation.
- Digital voltage regulation - Three phase full wave FET type regulator compatible with either shunt or PMG systems. Sensing is three phase.
- Full authority engine communications (where applicable) - Provides communication and control with the Engine
- due to thermal Control Module (ECM).
- AmpSentry™ protection provides industry-leading alternator overcurrent protection:
 - Time-based generator protection applicable to both line-to-line and line-to-neutral, that can detect an unbalanced fault condition and swiftly react appropriately. Balanced faults can also be detected by AmpSentry and appropriate acted upon.
- Reduces the risk of Arc Flash overload or electrical faults by inverse time protection
- Common harnessing - with higher feature Cummins controls. Allows for easy field upgrades.
- Generator set monitoring - Monitors status of all critical engine and alternator functions.
- Digital genset metering (AC and DC).
- Genset battery monitoring system to sense and warn against a weak battery condition.
- Configurable for single or three phase AC metering.
- Engine starting - Includes relay drivers for starter, Fuel Shut Off (FSO), glow plug/spark ignition power and switch B+ applications.
- Generator set protection – Protects engine and alternator.
- Real time clock for fault and event time stamping.
- Exerciser clock and time of day start/stop.
- Advanced serviceability - using InPower™, a PC-based software service tool.

- Environmental protection - The control system is designed for reliable operation in harsh environments. The main control board is a fully encapsulated module that is protected from the elements.
- Modbus interface for interconnecting to customer equipment.
- Configurable inputs and outputs - Four discrete inputs and four dry contact relay outputs.
- Warranty and service - Backed by a comprehensive warranty and worldwide distributor service network.
- Certifications - Suitable for use on generator sets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std., CE and CSA standards.

Base Control Functions

HMI Capability

Operator adjustments - The HMI includes provisions for many set up and adjustment functions.

Generator set hardware data - Access to the control and software part number, generator set rating in kVA and generator set model number is provided from the HMI or InPower.

Data logs - Includes engine run time, controller on time, number of start attempts, total kWh, and load profile (control logs data indicating the operating hours at percent of rated kW load, in 5% increments. The data is presented on the operation panel based on total operating hours on the generator.)

Fault history - Provides a record of the most recent fault conditions with control date and time stamp. Up to 32 events are stored in the control non-volatile memory.

Alternator data

- Voltage (single or three phase Line-to-Line and Line-to-Neutral)
- Current (single or three phase)
- kW, kVar, power factor, kVA (three phase and total)
- Frequency

AmpSentry: 3x current regulation for downstream tripping/motor inrush management. Thermal damage curve (3-phase short) or fixed timer (2 sec for 1- Phase Short or 5 sec for 2-Phase short).

Engine data

- Starting battery voltage
- Engine speed
- Engine temperature
- Engine oil pressure
- Engine oil temperature
- Intake manifold temperature
- Comprehensive Full Authority Engine (FAE) data (where applicable)

Service adjustments - The HMI includes provisions for adjustment and calibration of generator set control functions. Adjustments are protected by a password. Functions include:

Service adjustments (continued)

- Engine speed governor adjustments
- Voltage regulation adjustments
- Cycle cranking
- Configurable fault set up
- Configurable output set up
- Meter calibration
- Display language and units of measurement

Engine Control

SAE-J1939 CAN interface to full authority ECMs (where applicable). Provides data swapping between genset and engine controller for control, metering and diagnostics.

12 VDC/24 VDC battery operations - PowerCommand will operate either on 12 VDC or 24 VDC batteries.

Temperature dependent governing dynamics (with electronic governing) - modifies the engine governing control parameters as a function of engine temperature. This allows the engine to be more responsive when warm and more stable when operating at lower temperature levels.

Isochronous governing - (where applicable) Capable of controlling engine speed within $\pm 0.25\%$ for any steady state load from no load to full load. Frequency drift will not exceed $\pm 0.5\%$ for a $33\text{ }^{\circ}\text{C}$ ($60\text{ }^{\circ}\text{F}$) change in ambient temperature over an 8 hour period.

Remote start mode - It accepts a ground signal from remote devices to automatically start the generator set and immediately accelerate to rated speed and voltage. The remote start signal will also wake up the control from sleep mode. The control can incorporate a time delay start and stop.

Remote and local emergency stop - The control accepts a ground signal from a local (genset mounted) or remote (facility mounted) emergency stop switch to cause the generator set to immediately shut down. The generator set is prevented from running or cranking with the switch engaged. If in sleep mode, activation of either emergency stop switch will wakeup the control.

Sleep mode - The control includes a configurable low current draw state to minimize starting battery current draw when the genset is not operating. The control can also be configured to go into a low current state while in auto for prime applications or applications without a battery charger.

Engine starting - The control system supports automatic engine starting. Primary and backup start disconnects are achieved by one of two methods: magnetic pickup or main alternator output frequency. The control also supports configurable glow plug control when applicable.

Cycle cranking - Is configurable for the number of starting cycles (1 to 7) and duration of crank and rest periods. Control includes starter protection algorithms to prevent the operator from specifying a starting sequence that might be damaging.

Time delay start and stop (cooldown) - Configurable for time delay of 0-300 seconds prior to starting after receiving a remote start signal and for time delay of 0-600 seconds prior to shut down after signal to stop in normal operation modes. Default for both time delay periods is 0 seconds.

Alternator Control

The control includes an integrated three phase Line-to-Line sensing voltage regulation system that is compatible with shunt or PMG excitation systems. The voltage regulation system is a three phase full wave rectified and has an FET output for good motor starting capability.

Major system features include:

Digital output voltage regulation - Capable of regulating output voltage to within $\pm 1.0\%$ for any loads between no load and full load. Voltage drift will not exceed $\pm 1.5\%$ for a $40\text{ }^{\circ}\text{C}$ ($104\text{ }^{\circ}\text{F}$) change in temperature in an eight hour period. On engine starting or sudden load acceptance, voltage is controlled to a maximum of 5% overshoot over nominal level. The automatic voltage regulator feature can be disabled to allow the use of an external voltage regulator.

Torque-matched V/Hz overload control - The voltage roll-off set point and rate of decay (i.e. the slope of the V/Hz curve) is adjustable in the control.

Fault current regulation - PowerCommand will regulate the output current on any phase to a maximum of three times rated current under fault conditions for both single phase and three phase faults. In conjunction with a permanent magnet generator, it will provide three times rated current on all phases for motor starting and short circuit coordination purpose.

Protective Functions

On operation of a protective function the control will indicate a fault by illuminating the appropriate status LED on the HMI, as well as display the fault code and fault description on the LCD. The nature of the fault and time of occurrence are logged in the control. The service manual and InPower service tool provide service keys and procedures based on the service codes provided.

Protective functions include:

Battle Short Mode

When enabled and the *battle short* switch is active, the control will allow some shutdown faults to be bypassed. If a bypassed shutdown fault occurs, the fault code and description will still be annunciated, but the genset will not shutdown. This will be followed by a *fail to shutdown* fault. Emergency stop shutdowns and others that are critical for proper operation are not bypassed. Please refer to the control application guide or manual for list of these faults.

Derate

The derate function reduces output power of the genset in response to a fault condition. If a derate command occurs while operating on an isolated bus, the control will issue commands to reduce the load on the genset via contact closures or modbus.

Configurable Alarm and Status Inputs

The control accepts up to four alarm or status inputs (configurable contact closed to ground or open) to indicate a configurable (customer-specified) condition. The control is programmable for warning, shutdown or status indication and for labeling the input.

Emergency Stop

Annunciated whenever either emergency stop signal is received from external switch.

Full Authority Electronic Engine Protection

Engine fault detection is handled inside the engine ECM. Fault information is communicated via the SAE-J1939 data link for annunciation in the HMI.

General Engine Protection

Low and high battery voltage warning - Indicates status of battery charging system (failure) by continuously monitoring battery voltage.

Weak battery warning - The control system will test the battery each time the generator set is signaled to start and indicate a warning if the battery indicates impending failure.

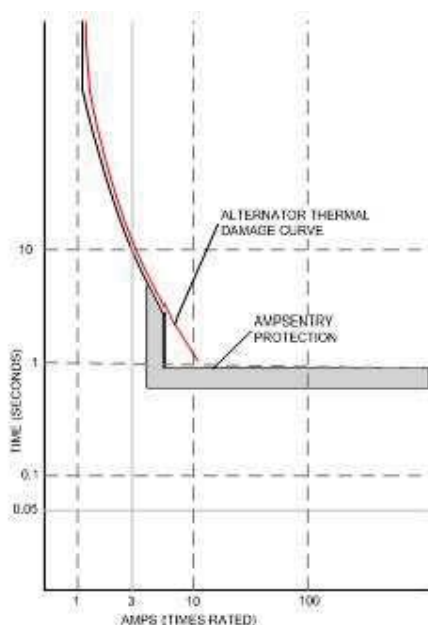
Fail to start (overcrank) shutdown - The control system will indicate a fault if the generator set fails to start by the completion of the engine crank sequence.

Fail to crank shutdown - Control has signaled starter to crank engine but engine does not rotate.

Cranking lockout - The control will not allow the starter to attempt to engage or to crank the engine when the engine is rotating.

Alternator Protection

AmpSentry protective relay - A comprehensive monitoring and control system integral to the PowerCommand Control System that guards the electrical integrity of the alternator and power system by providing protection against a wide array of fault conditions in the generator set or in the load. It also provides single and three phase fault current regulation so that downstream protective devices have the maximum current available to quickly clear fault conditions without subjecting the alternator to potentially catastrophic failure conditions. Thermal damage curve (3-Phase short) or fixed timer (2 sec for 1-Phase short, 5 sec for 2-Phase short). See document R1053 for a full-size time over current curve.



AmpSentry Maintenance Mode (AMM) - Instantaneous tripping, if AmpSentry Maintenance mode is active (50mS response to turn off AVR excitation/shutdown genset) for arc flash reduction when personnel are near genset.

High AC voltage shutdown (59) - Output voltage on any phase exceeds preset values. Time to trip is inversely proportional to amount above threshold. Values adjustable from 105-125% of nominal voltage, with time delay adjustable from 0.1-10 seconds. Default value is 110% for 10 seconds.

Low AC voltage shutdown (27) - Voltage on any phase has dropped below a preset value. Adjustable over a range of 50-95% of reference voltage, time delay 2-20 seconds. Default value is 85% for 10 seconds. Function tracks reference voltage. Control does not nuisance trip when voltage varies due to the control directing voltage to drop, such as during a V/Hz roll-off during synchronizing.

Under frequency shutdown (81 u) - Generator set output frequency cannot be maintained. Settings are adjustable from 2-10 Hz below reference governor set point, for a 5-20 second time delay. Default: 6 Hz, 10 seconds.

Under frequency protection is disabled when excitation is switched off, such as when engine is operating in idle speed mode.

Over frequency shutdown/warning (81 o) - Generator set is operating at a potentially damaging frequency level. Settings are adjustable from 2-10 Hz above nominal governor set point for a 1-20 second time delay. Default: 6 Hz, 20 seconds, disabled.

Overcurrent warning/shutdown - Thresholds and time delays are configurable. Implementation of the thermal damage curve with instantaneous trip level calculated based on current transformer ratio and application power rating.

Loss of sensing voltage shutdown - Shutdown of generator set will occur on loss of voltage sensing inputs to the control.

Field overload shutdown - Monitors field voltage to shutdown generator set when a field overload condition occurs.

Over load (kW) warning - Provides a warning indication when engine is operating at a load level over a set point.

Adjustment range: 80-140% of application rated kW, 0-120 second delay. Defaults: 105%, 60 seconds.

Reverse power shutdown (32) - Adjustment range: 5-20% of standby kW rating, delay 1-15 seconds. Default: 10%, 3 seconds.

Reverse Var shutdown - Shutdown level is adjustable: 15-50% of rated Var output, delay 10-60 seconds. Default: 20%, 10 seconds.

Short circuit protection - Output current on any phase is more than 175% of rating and approaching the thermal damage point of the alternator. Control includes algorithms to protect alternator from repeated over current conditions over a short period of time.

Field Control Interface

Input signals to the PowerCommand control include:

- Coolant level (where applicable)
- Fuel level (where applicable)
- Remote emergency stop
- Remote fault reset
- Remote start
- Battleshort
- Rupture basin
- Start type signal
- Configurable inputs - Control includes (4) input signals from customer discrete devices that are configurable for warning, shutdown or status indication, as well as message displayed

Output signals from the PowerCommand control include:

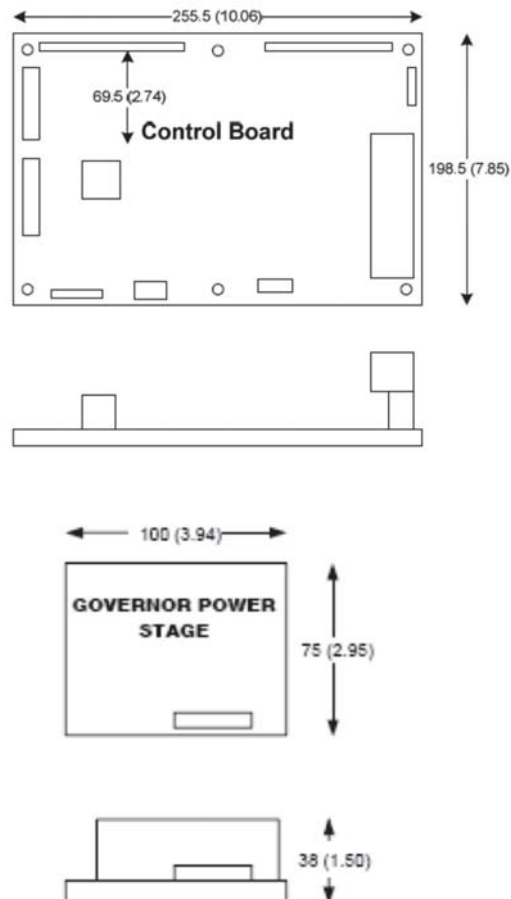
- Load dump signal: Operates when the generator set is in an overload condition.
- Delayed off signal: Time delay based output which will continue to remain active after the control has removed the run command. Adjustment range: 0 – 120 seconds. Default: 0 seconds.

- Configurable relay outputs: Control includes (4) relay output contacts (3 A, 30 VDC). These outputs can be configured to activate on any control warning or shutdown fault as well as ready to load, not in auto, common alarm, common warning and common shutdown.
- Ready to load (generator set running) signal: Operates when the generator set has reached 90% of rated speed and voltage and latches until generator set is switched to off or idle mode.

Communications Connections Include:

- PC tool interface: This RS-485 communication port allows the control to communicate with a personal computer running InPower software.
 - Modbus RS-485 port: Allows the control to communicate with external devices such as PLCs using Modbus protocol.
- Note - An RS-232 or USB to RS-485 converter is required for communication between PC and control.
- Networking: This RS-485 communication port allows connection from the control to the other Cummins products.

Mechanical Drawings



PowerCommand Human Machine Interface HMI320



Description

This control system includes an intuitive operator interface panel that allows for complete genset control as well as system metering, fault annunciation, configuration and diagnostics. The interface includes five genset status LED lamps with both internationally accepted symbols and English text to comply with customer's needs. The interface also includes an LED backlit LCD display with tactile feel soft-switches for easy operation and screen navigation. It is configurable for units of measurement and has adjustable screen contrast and brightness.

The *run/off/auto* switch function is integrated into the interface panel.

All data on the control can be viewed by scrolling through screens with the navigation keys. The control displays the current active fault and a time-ordered history of the five previous faults.

Features

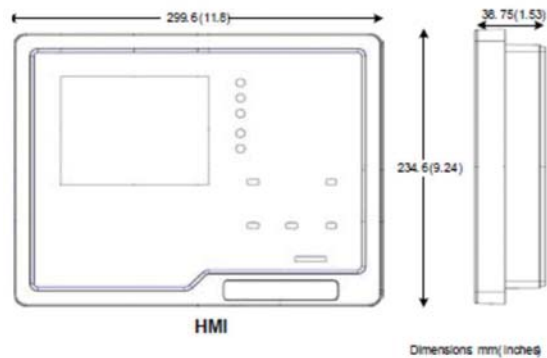
- LED indicating lamps:
 - Genset running
 - Remote start
 - Not in auto
 - Shutdown
 - Warning
 - Auto
 - Manual and stop
- 320 x 240 pixels graphic LED backlight LCD.
- Four tactile feel membrane switches for LCD defined operation. The functions of these switches are defined dynamically on the LCD.
- Seven tactile feel membrane switches dedicated screen navigation buttons for up, down, left, right, ok, home and cancel.
- Six tactile feel membrane switches dedicated to control for auto, stop, manual, manual start, fault reset and lamp test/panel lamps.

- Two tactile feel membrane switches dedicated to control of circuit breaker (where applicable).
- Allows for complete genset control setup.
- Certifications: Suitable for use on generator sets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std., CE and CSA standards.
- LCD languages supported: English, Spanish, French, German, Italian, Greek, Dutch, Portuguese, Finnish, Norwegian, Danish, Russian and Chinese Characters.

Communications connections include:

- PC tool interface - This RS-485 communication port allows the HMI to communicate with a personal computer running InPower.
- This RS-485 communication port allows the HMI to communicate with the main control board.

Mechanical Drawing



Software

InPower (beyond 6.5 version) is a PC-based software service tool that is designed to directly communicate to PowerCommand generator sets and transfer switches, to facilitate service and monitoring of these products.

Environment

The control is designed for proper operation without recalibration in ambient temperatures from -40 °C to +70° C (-40 °F to 158 °F) and for storage from -55 °C to +80 °C (-67 °F to 176 °F). Control will operate with humidity up to 95%, non-condensing.

The HMI is designed for proper operation in ambient temperatures from -20 °C to +70 °C (-4 °F to 158 °F) and for storage from -30 °C to +80 °C (-22 °F to 176 °F).

The control board is fully encapsulated to provide superior resistance to dust and moisture. Display panel has a single membrane surface, which is impervious to effects of dust, moisture, oil and exhaust fumes. This panel uses a sealed membrane to provide long reliable service life in harsh environments.

The control system is specifically designed and tested for resistance to RFI/EMI and to resist effects of vibration to provide a long reliable life when mounted on a generator set. The control includes transient voltage surge suppression to provide compliance to referenced standards.

Certifications

PowerCommand meets or exceeds the requirements of the following codes and standards:

- NFPA 110 for level 1 and 2 systems.
- ISO 8528-4: 1993 compliance, controls and switchgear.
- CE marking: The CE marking is only valid when equipment is used in a fixed installation application. Material compliance declaration is available upon request.
- UKCA marking: The UKCA marking is only valid when equipment is used in a fixed installation application. Material compliance declaration is available upon request.
- EN50081-1,2 residential/light industrial emissions or industrial emissions.
- EN50082-1,2 residential/light industrial or industrial susceptibility.
- ISO 7637-2, level 2; DC supply surge voltage test.
- Mil Std 202C, Method 101 and ASTM B117: Salt fog test.
- UL 6200 recognized and suitable for use on UL 2200 Listed generator sets.
- CSA C282-M1999 compliance
- CSA 22.2 No. 14 M91 industrial controls.
- PowerCommand control systems and generator sets are designed and manufactured in ISO 9001 certified facilities.

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.



For more information contact your local Cummins distributor
or visit power.cummins.com

Our energy working for you.™



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Alternator Data Sheet

Frame Size: HC5F

Characteristics				1-bearing weight		2-bearing weight			
Weights:	Stator assembly:		1775 lb	805 kg	1775 lb	805 kg			
	Rotor assembly:		1508 lb	684 kg	1444 lb	655 kg			
	Complete assembly:		3715 lb	1685 kg	3735 lb	1694 kg			
Maximum speed:			2250 rpm						
Excitation current:	Full load:		2.6 Amps						
	No load:		0.6 Amps						
Insulation system:	Class H throughout								
3 Ø Ratings (0.8 power factor)			60 Hz (winding no)						
150° C rise ratings	@40C	kW	700	570	625	655	678	700	625
		kVA	875	713	781	819	848	875	781
	125° C rise ratings	kW	660	538	590	620	640	660	590
		kVA	825	673	738	775	800	825	738
105° C rise ratings	@40C	kW	600	500	550	575	585	600	550
		kVA	750	625	688	719	731	750	688
80° C rise ratings	@40C	kW	528	440	484	506	514	528	484
		kVA	660	550	605	633	643	660	605
3 Ø Reactances (per unit ± 10%)			347/600 (07/17)	110/190 220/380 (311)	120/208 240/416 (311)	127/220 254/440 (311)	133/230 266/460 (311)	139/240 277/480 (311)	120/240 Delta (311)
(Based on full load at 125° C rise rating)									
Synchronous			2.44	3.64	3.33	3.13	2.95	2.80	3.33
Transient			0.11	0.17	0.16	0.15	0.14	0.13	0.16
Subtransient			0.09	0.12	0.11	0.10	0.10	0.09	0.11
Negative sequence			0.16	0.23	0.21	0.20	0.19	0.18	0.21
Zero sequence			0.07	0.10	0.09	0.08	0.08	0.08	0.09
3 Ø Motor Starting (90% sustained voltage)			347/600 (07/17)	110/190 220/380 (311)	120/208 240/416 (311)	127/220 254/440 (311)	133/230 266/460 (311)	139/240 277/480 (311)	120/240 Delta (311)
Maximum kVA			2429	2429	2429	2429	2429	2429	2429
Time Constants (sec)			347/600 (07/17)	110/190 220/380 (311)	120/208 240/416 (311)	127/220 254/440 (311)	133/230 266/460 (311)	139/240 277/480 (311)	120/240 Delta (311)
Transient			0.08	0.08	0.08	0.08	0.08	0.08	0.08
Subtransient			0.012	0.012	0.012	0.012	0.012	0.012	0.012
Open circuit			2.5	2.5	2.5	2.5	2.5	2.5	2.5
DC			0.019	0.019	0.019	0.019	0.019	0.019	0.019
Windings (@22° C)			347/600 (07/17)	110/190 220/380 (311)	120/208 240/416 (311)	127/220 254/440 (311)	133/230 266/460 (311)	139/240 277/480 (311)	120/240 Delta (311)
Stator resistance (Ohms L-L)			0.0098	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074
Rotor resistance (Ohms)			2.16	2.16	2.16	2.16	2.16	2.16	2.16
Number of leads			12	12	12	12	12	12	12



Sound data

500DFEK
60Hz Diesel

Sound pressure level @ 7 meters, dB(A)

See notes 1-8 listed below

Configuration		Measurement location number								Average
		1	2	3	4	5	6	7	8	
Standard – unhooded	Infinite exhaust	89	92	92	91	88	91	91	93	91
F183 – residential muffler	Mounted muffler	88	90	90	89	88	88	88	90	89
F200 – weather	Mounted muffler	91	90	85	88	89	88	85	91	89
F201 – quiet site II first stage	Mounted muffler	90	89	84	83	79	81	83	90	87
F202 – quiet site II second stage	Mounted muffler	71	73	71	72	73	74	74	73	73

Sound power level, dB(A)

See notes 2-6, 9, 10 listed below

Configuration		Octave band center frequency (Hz)								Overall sound power level
		63	125	250	500	1000	2000	4000	8000	
Standard – unhooded (note 3)	Infinite exhaust	82	98	104	109	112	113	111	113	119
F183 – residential muffler	Mounted muffler	105	114	115	111	108	108	102	101	119
F200 – weather	Mounted muffler	101	108	106	110	112	111	107	102	118
F201 – quiet site II first stage	Mounted muffler	101	108	105	108	111	109	106	99	116
F202 – quiet site II second stage	Mounted muffler	84	93	93	96	98	99	96	89	104

Exhaust sound power level, dB(A)

Open exhaust (no muffler) @ rated load	Octave band center frequency (Hz)								Overall sound power level
	63	125	250	500	1000	2000	4000	8000	
	103	119	125	123	125	126	127	121	133

Note:

- Position 1 faces the engine front. The positions proceed around the generator set in a counter-clockwise direction in 45° increments. All positions are at 7 m (23 ft) from the surface of the generator set and 1.2 m (48 in.) from floor level.
- Sound levels are subject to instrumentation, measurement, installation and manufacturing variability.
- Sound data with remote-cooled generator sets are based on rated loads without cooling fan noise.
- Sound levels for aluminum enclosures are approximately 2 dB(A)s higher than listed sound levels for steel enclosures.
- Sound data for generator set with infinite exhaust do not include exhaust noise.
- Data is based on full rated load with standard radiator-cooling fan package.
- Sound pressure levels are measured per ANSI S1.13 and ANSI S12.18, as applicable.
- Reference sound pressure is 20 µPa.
- Sound power levels per ISO 3744 and ISO 8528-10, as applicable.
- Reference power = 1 pw (10⁻¹² W).
- Exhaust sound power levels are per ISO 6798, as applicable.



Cooling system data

500DFEK 60Hz

40 Degree C ambient radiator cooling system

Duty		Rating (kW)	Max cooling @ air flow static restriction, unhooded (inches water/mm water)					Housed in free air, no air discharge restriction			
			0.0/0.0	0.25/6.4	0.5/12.7	0.75/19.1	1.0/25.4	F183	F200	F201	F202
			Maximum allowable ambient temperature, degree C								
60 Hz	Standby	500	43	43	43	43	40	43	43	43	43
	Prime	455	43	43	43	43	39	N/A	N/A	N/A	N/A
50 Hz	Standby	440	43	43	43	43	43	N/A	N/A	N/A	N/A
	Prime	400	43	43	43	43	43	N/A	N/A	N/A	N/A

50 Degree C ambient radiator cooling system

Duty		Rating (kW)	Max cooling @ air flow static restriction, unhooded (inches water/mm water)					Housed in free air, no air discharge restriction			
			0.0/0.0	0.25/6.4	0.5/12.7	0.75/19.1	1.0/25.4	F183	F200	F201	F202
			Maximum allowable ambient temperature, degree C								
60 Hz	Standby	500	53	52	52	46	40	55	54	54	53
	Prime	455	53	52	52	43	39	N/A	N/A	N/A	N/A
50 Hz	Standby	440	55	55	55	55	54	N/A	N/A	N/A	N/A
	Prime	400	55	55	55	55	53	N/A	N/A	N/A	N/A

Notes:

1. Data shown are anticipated cooling performance for typical generator set.
2. Cooling data is based on 1000 ft (305 m) site test location.
3. Generator set power output may need to be reduced at high ambient conditions. Consult generator set data sheet for derate schedules.
4. Cooling performance may be reduced due to several factors including but not limited to: Incorrect installation, improper operation, fouling of the cooling system, and other site installation variables.



2026 EPA Tier 2 Exhaust Emission Compliance Statement

500DFEK

Stationary Emergency 60 Hz Diesel Generator Set

Compliance Information:

The engine used in this generator set complies with Tier 2 emissions limit of U.S. EPA New Source Performance Standards for stationary emergency engines under the provisions of 40 CFR 60 Subpart IIII.

Engine Manufacturer: Cummins Inc.
EPA Certificate Number: TCEXL015.AAJ-035
Effective Date: 11/5/2025
Date Issued: 11/5/2025
EPA Engine Family (Cummins Emissions Family): TCEXL015.AAJ

Engine Information:

Model: QSX/QSX15/QSX15-G/QSX15-G9 Bore: 5.39 in. (137 mm)
Engine Nameplate HP: 755 Stroke: 6.65 in. (169 mm)
Type: 4 Cycle, In-line, 6 Cylinder Diesel Displacement: 912 cu. in. (15 liters)
Aspiration: Turbocharged and CAC Compression ratio: 17.0:1
Emission Control Device: Electronic Control Exhaust stack diameter: 8 in. (203 mm)

Diesel Fuel Emission Limits

D2 Cycle Exhaust Emissions

	Grams per BHP-hr			Grams per kWm-hr		
	<u>NO_x + NMHC</u>	<u>CO</u>	<u>PM</u>	<u>NO_x + NMHC</u>	<u>CO</u>	<u>PM</u>
EPA Emissions Limit	4.8	2.6	0.15	6.4	3.5	0.20

Test methods: EPA emissions recorded per 40 CFR Part 60, 89, 1039, 1065 and weighted at load points prescribed in the regulations for constant speed engines.

Diesel fuel specifications: Cetane number: 40-50, Reference: ASTM D975 No. 2-D, 300-500 ppm Sulfur

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

Tests conducted using alternate test methods, instrumentation, fuel or reference conditions can yield different results. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.



Exhaust Emission Data Sheet

500DFEK

60 Hz Diesel Generator Set EPA NSPS Stationary Emergency

Engine Information:

Model:	Cummins Inc. QSX15-G9 NR 2	Bore:	5.39 in. (137 mm)
Nameplate BHP @ 1800 RPM:	755	Stroke:	6.65 in. (169 mm)
Type:	4 cycle, in-line, 6 cylinder diesel	Displacement:	912 cu. in. (14.9 liters)
Aspiration:	Turbocharged with air-to-air charge air cooling		
Compression Ratio:	17:1		
Emission Control Device:	Turbocharged with charge air-cooled		

Performance Data

	<u>1/4</u> <u>Standby</u>	<u>1/2</u> <u>Standby</u>	<u>3/4</u> <u>Standby</u>	<u>Full</u> <u>Standby</u>	<u>Full</u> <u>Prime</u>
Engine HP @ Stated Load (1800 RPM)	202	379	555	732	668
Fuel Consumption (gal/Hr)	11.3	18.7	25.8	34.7	30.6
Exhaust Gas Flow (CFM)	1400	2150	2730	3625	3160
Exhaust Gas Temperature (°F)	745	830	820	900	880

Exhaust Emission Data

HC (Total Unburned Hydrocarbons)	0.24	0.09	0.07	0.14	0.12
NOx (Oxides of Nitrogen as NO ₂)	3.24	3.65	4.64	4.43	4.04
CO (Carbon Monoxide)	0.57	0.34	0.40	0.39	0.36
PM (Particulate Matter)	0.09	0.05	0.05	0.02	0.02
Smoke (Pierburg)	0.52	0.44	0.42	0.21	0.20

All values (except smoke) are cited: g/BHP-hr

Test Methods and Conditions

Steady-state emissions recorded per ISO8178-1 during operation at rated engine speed (+/- 2%) and stated constant load (+/- 2%) with engine temperatures, pressures and emission rated stabilized.

Fuel specification:	40-48 Cetane Number, 0.05 Wt.% max. Sulfur; Reference ISO8178-5, 40CFR86.1313-98 Type 2-D and ASTM D975 No. 2-D.
Air Inlet Temperature:	25 °C (77 °F)
Fuel Inlet Temperature:	40 °C (104 °F)
Barometric Pressure:	100 kPa (29.53 in Hg)
Humidity:	10.7 g/kg (75 grains H ₂ O/lb) of dry air (required for NOx correction)
Intake Restriction:	Set to maximum allowable limit for clean filter
Exhaust Back Pressure:	Set to maximum allowable limit

Data was taken from a single engine test according to the test methods, fuel specification and reference conditions stated above and is subjected to instrumentation and engine-to-engine variability. Tests conducted with alternate test methods, instrumentation, fuel or reference conditions can yield different results.



PROTOTYPE TEST SUPPORT (PTS) 60 HZ TEST SUMMARY

GENERATOR SET MODELS	REPRESENTATIVE PROTOTYPE
450DFEJ	Model: 500DFEK
500DFEK	Engine: QSX15-G9
	Alternator: HC5F



The following summarizes prototype testing conducted on the designated representative prototype of the specified models. This testing is conducted to verify the complete generator set electrical and mechanical design integrity. Prototype testing is conducted only on generator sets not sold as new equipment.

Maximum Surge Power: **516 KW**

The generator set was evaluated to determine the stated maximum surge power.

Maximum Motor Starting: **2429 KVA**

The generator set was tested to simulate motor starting by applying the specified kVA load at low lagging power factor (0.4 or lower). With this load applied, the generator set recovered to a minimum of 90% rated voltage

Torsional Analysis and Testing:

The generator set was tested to verify that the design is not subjected to harmful torsional stresses in excess of 5000psi. A spectrum analysis of the transducer output was conducted over the speed range of 1200 to 2000 RPM.

Cooling System: 50 °C Ambient
0.50 in. H2O restriction

The cooling system was tested to determine ambient temperature and static restriction capabilities. The test was performed at full rated load in elevated ambient temperature under stated static restriction conditions.

Durability:

The generator set was subjected to a minimum 500 hour endurance test operating at variable load up to the standby rating based upon MIL-STD-705 to verify structural soundness and durability of the design.

Electrical and Mechanical Strength:

The generator set was tested to several single phase and three phase faults to verify that the generator can safely withstand the forces associated with short circuit conditions. The generator set was capable of producing full rated output at the conclusion of the testing.

Steady State Performance:

The generator set was tested to verify steady state operating performance was within the specified maximum limits.

Voltage Regulation:	±0.5%
Random Voltage Variation:	±0.3%
Frequency Regulation:	Isochronous
Random Frequency Variation:	±0.25%

Transient Performance:

The generator set was tested with the standard alternator to verify single step loading capability as required by NFPA 110. Verify acceptable Voltage and frequency response on load addition or rejection were evaluated. The following results were recorded:

Full Load Acceptance:

Voltage Dip:	30.1 %
Recovery Time:	3.6 Second
Frequency Dip:	9.9 %
Recovery Time:	3.8 Second

Full Load Rejection:

Voltage Rise:	12.8 %
Recovery Time:	3.8 Second
Frequency Rise:	3.2 %
Recovery Time:	1.5 Second

Harmonic Analysis:

(per MIL-STD-705B, Method 601.4)

Line to Line

Line to Neutral

Harmonic	No Load	Full Load	No Load	Full Load
3	0.1	0.1	0.1	0.1
5	0.3	1.2	0.3	1.1
7	0.4	1.1	0.4	1.0
9	0.0	0.0	0.0	0.0
11	0.7	0.9	0.6	0.8
13	0.2	0.3	0.1	0.2
15	0.0	0.0	0.0	0.0

SECTION 3

Generator Accessories





Enclosures and Tanks

250-1000 kW Gensets



Enclosure Standard Features

- 14-gauge steel construction (panels)
- Stainless steel hardware
- Zinc phosphate pretreatment, e-coat primer and super durable powder topcoat paint minimize corrosion and color fade
- Package listed to UL 2200
- Designed to satisfy national electrical code installation requirements
- Fuel and electrical stub-up area within enclosure perimeter
- Fixed louvers
- Cambered roof prevents water accumulation
- Recessed, lockable doors in two sides
- Retainers hold doors open for easy access
- Enclosed exhaust silencer ensures safety and protects against rust
- Rain cap
- Exterior oil and coolant drains with interior valves for ease of service
- Rodent barriers on inlet
- Non-hygroscopic sound attenuating material
- Side mounted controls and circuit breakers
- Easy access lifting points for spreader bars
- Dual vibration isolation system (250-500 kW)
- Spring vibration isolation system (600-1000 kW)
- Enclosure mounts to lifting base or fuel tank (250-500 kW)
- Enclosure mounts to lifting base (600-1000 kW)
- Factory pre-assembled package
- Designed for outdoor use only
- Externally mounted emergency stop button for operator safety (optional on 250-500 kW)
- Horizontal air discharge to prevent leaf and snow accumulation (600-1000 kW)

Options

- Three levels of sound attenuation
- Motorized louvers to protect from ice and snow accumulation (available on air inlet for all models and on air outlet on level II, 250-500 kW enclosures only)
- Horizontal air discharge, sound level 2 only (250-500 kW)
- Aluminium construction with roll-coated polymer paint
- **Wind rated to 150 mph**
- Neutral sandstone paint color
- Factory mounted battery charger
- External 120 VAC service outlet
- Rain hoods for air inlet (250-500 kW)
- Lifting base in lieu of a sub-base tank (250-500 kW)
 - Pre-wired AC distribution package
 - 100 amp (250-500 kW) or 150 amp (600-1000 kW) main circuit breaker; connected to 120 VAC Line-Neutral and 208 or 240 VAC Line-Line, spare breaker positions and capacity for future upgrades (600-1000 kW)
 - GFCI protected internal 120 VAC service receptacle
 - GFCI protected weather proof external 120 volt service receptacle
 - All factory installed AC powered features pre-wired into load center
- Interior lights – 120 volt (600-1000 kW)
- Rain hoods for air inlet (250-500 kW)
- Seismic isolators available (600-1000 kW)

Fuel Tanks

Standard sub-base tank features

- UL 142 Listed
- ULC-S601-07 Listed
- NFPA37 compliant
- Dual walled, steel construction
- Emergency tank and rupture basin vents
- Tank mounted mechanical fuel gauge
- Fuel supply and return tubes
- Top mounted leak detection float switch
- Low and high level fuel switches
- Mounting brackets for optional pump and control (250-500 kW)
- Integral lifting points

Sub-base tank options

- Pre-wired fuel pump and control
- Fuel overfill alarm – internal or external
- Overflow and tank fill plugs
- Five gallon spill fill box – internal or external
- Fill pipe extender
- Local code approvals available

200-500 kW Dual Wall Sub-base Fuel Tanks – usable operating hours

Genset model (60 Hz)	Gallons /hour at full load	270 gallon tank	300 gallon tank	400 gallon tank	500 gallon tank	600 gallon tank	660 gallon tank	720 gallon tank	850 gallon tank	1420 gallon tank	1470 gallon tank	1700 gallon tank	2050 gallon tank	2525 gallon tank
250 DQDAA	20	14	15	20	25	30	33	36		72	74		104	
275 DQDAB	21	13	14	19	24	29	31	34		66	70		96	
300 DQDAC	23	12	13	17	22	26	29	31		61	64		88	
300 DQHAB	23	12	13	17	22	26	29		37			74		
450 DFEJ	30	9	10	13	17	20	22		28			57		84
500 DFEK	34	8	9	11	15	18	19		25			50		74

Operating hours are measured at 60 Hz, standby rating.

600-1000 kW Dual Wall Sub-base Fuel Tanks – usable operating hours

Genset model	Gallons /hour at full load	200 gallon tank	660 gallon tank	1000 gallon tank	1500 gallon tank	2000 gallon tank	2400 gallon tank
600 DQCA	42	5	16	24	36	48	57
600 DQPAA	45	4	15	22	33	44	53
650 DQPAB	50	4	13	20	30	40	48
750 DQCB	51	4	13	20	29	39	47
750 DQFAA	53	4	12	19	28	38	45
800 DQCC	53	4	12	19	28	38	45
800 DQFAB	56	4	12	18	27	36	43
900 DQFAC	64	3	10	16	23	31	38
1000 DQFAD	72	3	9	14	21	28	33

*3000 gallon tank offered as an accessory kit – refer to NAAC-5853 spec sheet.

- Operating hours are measured at 60 Hz, standby rating.
- Up to 90% fill alarm to comply with NFPA30, operating capacity is reduced by 10%.

Enclosure Package Sound Pressure Levels @ 7 meters dB(A)

Genset model	Weather protective enclosure (F200, F203)	QuietSite level 1 sound attenuated enclosure (F201, F204)	QuietSite level 2 sound attenuated enclosure (F202, F205)
250 DQDAA	90	88	72
275 DQDAB	90	88	73
300 DQDAC	90	88	73
300 DQHAB	89	88	76
450 DFEJ	88	85	74
500 DFEK	89	87	73
600 DQCA	90.6/86*	79.3/78*	74.1/73*
600 DQPAA	89.10	80.70	74.70
650 DQPAB	89.70	81.40	75
750 DQCB	91.1/87*	79.9/79*	75.3/74*
750 DQFAA	87.8	77.8	73.8
800 DQCC	91.3/87*	80.2/79*	75.7/74*
800 DQFAB	88.1	78.3	74
900 DQFAC	88.8	79.1	74.6
1000 DQFAD	89.6	80.1	75.3

- All data is 60 Hz, full load standby rating, steel enclosures only.

- Data is a measured average of 8 positions.

- Sound levels for aluminium enclosures are approximately 2 dB(A) higher than listed sound levels for steel enclosures.

* Sound data with seismic feature codes L228-2 (IBC) and/or L225-2 (OSHPD)

Package Dimensions of Enclosure, Exhaust System, and UL Tank

250-500 kW

Tank size (gal)	Weather protective package length (in)	QuietSite level 1 package length (in)	QuietSite level 2 package length (in)	Width (in)	Height (in)	Weather protective package weight (lbs)	QuietSite level 1 package weight (lbs)	QuietSite level 2 package weight (lbs)
270	188	188	222	82	106	4991	5471	6711
300	188	188	222	82	104	5648	6073	6991
400	188	188	222	82	106	5833	6258	7176
500	188	188	222	82	108	5956	6381	7299
600	188	188	222	82	111	6116	6541	7459
660	188	188	222	82	113	6235	6660	7578
720	188	188	222	82	114	6174	6599	7517
850	188	188	222	82	118	6529	6954	7872
1420	200	200	222	82	128	6863	7343	8583
1470	192	192	222	82	128	7253	7733	8973
1700	234	234	234	82	128	7982	8407	9325
2050	284	284	284	82	128	8383	8863	10103
2525	346	346	346	82	128	9391	9871	11111
Lifting base	188	188	222	82	100	4335	4760	5678

600-1000 kW

Tank size (gal)	Weather protective package length (in)	QuietSite level 1 package length (in)	QuietSite level 2 package length (in)	Width (in)	Height (in)	Weather protective package weight (lbs)	QuietSite level 1 package weight (lbs)	QuietSite level 2 package weight (lbs)
200	260	303	315	98	137	10194	13074	14954
660	260	303	315	98	137	9586	12466	14346
1000	260	303	315	98	141	10117	12997	14877
1500	260	303	315	98	146	10677	13557	15437
2000	292	327	327	98	143	11959	14839	16719
2400	338	338	338	98	143	12961	15841	17721

- This weight does not include the generator set. Consult your local Cummins distributor or the appropriate generator specification sheet.

- Width is 86" lifting eye to lifting eye (250-500 kW), 102" lifting eye to lifting eye (600-1000 kW).
- Height - Florida, Michigan, and Suffolk add 6.4" (250-500 kW) or 2" (600-1000 kW) for bottom space.
- Maximum length emergency vent removed.



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



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.

For more information contact your local Cummins distributor or visit power.cummins.com

Our energy working for you.™



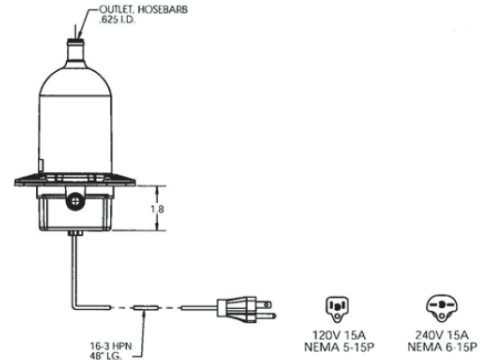


Coolant heaters

Control thermostat range ON @ 80° F (27° C)
OFF @ 100° F (38° C)

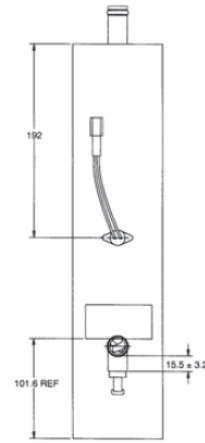
Control thermostat tolerance ± 7.0° F (4° C) on close (ON)
± 5.0° F (3° C) on open (OFF)

Approvals UL listed
CSA compliant
CE compliant



Coolant heater kit	Critical component	Voltage	Wattage	Heater amps	Instruction sheet
0333-0632-01	0333-0588-01	120	1000	8.3	000G-0406
0333-0632-01	0333-0588-01	120	1000	8.3	000G-0406
0541-0802-01	0333-0588-01	120	1000	8.3	000G-0539
0333-0548	0333-0588-01	120	1000	8.3	000G-0190
0179-4755-03	0333-0588-01	120	1000	8.3	000C-0703
0179-4938-03	0333-0588-01	120	1000	8.3	000G-0714
0333-0632-02	0333-0588-02	208/240	750/1000	3.6/4.16	000G-0406
0333-0632-02	0333-0588-02	208/240	750/1000	3.6/4.16	000G-0406
0541-0802-02	0333-0588-02	208/240	750/1000	3.6/4.16	000G-0539
0333-0549	0333-0588-02	208/240	750/1000	3.6/4.16	000G-0190
0179-4755-04	0333-0588-02	208/240	750/1000	3.6/4.16	000C-0703
0179-4938-04	0333-0588-02	208/240	750/1000	3.6/4.16	000G-0714
0300-5420-01	0333-0588-03	120	1500	12.5	000G-0447
0333-0631-01	0333-0588-03	120	1500	12.5	000G-0406
0333-0630-01	0333-0588-03	120	1500	12.5	000G-0406
0333-0631-01	0333-0588-03	120	1500	12.5	000G-0406
0300-5422-01	0333-0588-03	120	1500	12.5	000G-0453
0300-5422-01	0333-0588-03	120	1500	12.5	000G-0453
0333-0631-01	0333-0588-03	120	1500	12.5	000G-0406
0179-4902-03	0333-0588-03	120	1500	12.5	
0179-4908-03	0333-0588-03	120	1500	12.5	
0333-0713-03	0333-0588-03	120	1500	12.5	000G-0664
0300-5420-02	0333-0588-04	208/240	1125/1500	5.4/6.25	000G-0447
0333-0631-02	0333-0588-04	208/240	1125/1500	5.4/6.25	000G-0406
0333-0630-02	0333-0588-04	208/240	1125/1500	5.4/6.25	000G-0406
0333-0631-02	0333-0588-04	208/240	1125/1500	5.4/6.25	000G-0406
0300-5422-02	0333-0588-04	208/240	1125/1500	5.4/6.25	000G-0453
0300-5422-02	0333-0588-04	208/240	1125/1500	5.4/6.25	000G-0453
0333-0631-02	0333-0588-04	208/240	1125/1500	5.4/6.25	000G-0406
0179-4902-04	0333-0588-04	208/240	1125/1500	5.4/6.25	
0179-4908-04	0333-0588-04	208/240	1125/1500	5.4/6.25	
0333-0713-04	0333-0588-04	208/240	1125/1500	5.4/6.25	000G-0664

Heater phase Single phase heater voltage
Element diameter .315 IN
Pressure tested by vendor 75 PSIG hydrostatic
Approvals UL listed
 CSA compliant



Coolant heater kit	Critical component	Voltage	Wattage	Heater amps	Heater qty	Element wire gauge	Element wire gauge
0179-3087-03	0333-0677-01	208/240/480	3744/4990/4990	23.1/26.8/13.4	2	24	000G-0617
0179-3268-03	0333-0677-01	208/240/480	3744/4990/4990	18.0/20.8/10.4	2	24	000G-0618
0179-3325-03	0333-0677-01	208/240/480	3744/4990/4990	18.0/20.8/10.4	2	24	000G-0616
0179-3536-03	0333-0677-01	208/240/480	3744/4990/4990	18.0/20.8/10.4	1	24	000G-0615
0179-3577-03	0333-0677-01	208/240/480	3744/4990/4990	18.0/20.8/10.4	2	24	000G-0639
0179-3578-03	0333-0677-01	208/240/480	3744/4990/4990	18.0/20.8/10.4	1	24	000G-0638
0179-3579-05	0333-0677-01	208/240/480	3744/4990/4990	18.0/20.8/10.4	1	24	000G-0641
0179-3579-07	0333-0677-01	208/240/480	3744/4990/4990	18.0/20.8/10.4	1	24	000G-0641
0179-3817-03	0333-0677-01	208/240/480	3744/4990/4990	18.0/20.8/10.4	1	24	000G-0640
0179-3850-03	0333-0677-01	208/240/480	3744/4990/4990	18.0/20.8/10.4	1	24	000G-0637
0179-4299-03	0333-0677-01	208/240/480	3744/4990/4990	18.0/20.8/10.4	2	24	000G-0662
0179-4329-03	0333-0677-01	208/240/480	3744/4990/4990	23.1/26.8/13.4	2	24	000G-0657
0179-4606-03	0333-0677-01	208/240/480	3744/4990/4990	18.0/20.8/10.4	2	24	000G-0617
0179-4966-03	0333-0677-01	208/240/480	3744/4990/4990	18.0/20.8/10.4	1	24	000G-0638
0179-5536-03	0333-0677-01	208/240/480	3744/4990/4990	18.0/20.8/10.4	1	24	000G-0640
0179-3087-04	0333-0677-02	208/240/480	4815/6420/6420	23.1/26.8/13.4	2	23	000G-0617
0179-3268-04	0333-0677-02	208/240/480	4325/6420/6420	23.2/26.75/13.375	2	23	000G-0618
0179-3325-04	0333-0677-02	208/240/480	4825/6420/6420	23.2/26.75/13.375	2	23	000G-0616
0179-3536-04	0333-0677-02	208/240/480	4825/6420/6420	23.2/26.75/13.375	1	23	000G-0615
0179-3577-04	0333-0677-02	208/240/480	4825/6420/6420	23.2/26.75/13.375	2	23	000G-0639
0179-3578-04	0333-0677-02	208/240/480	4825/6420/6420	23.2/26.75/13.375	1	23	000G-0638
0179-3579-06	0333-0677-02	208/240/480	4825/6420/6420	23.2/26.75/13.375	1	23	000G-0641
0179-3579-08	0333-0677-02	208/240/480	4825/6420/6420	23.2/26.75/13.375	1	23	000G-0641
0179-3817-04	0333-0677-02	208/240/480	4825/6420/6420	23.2/26.75/13.375	1	23	000G-0640
0179-3850-04	0333-0677-02	208/240/480	4825/6420/6420	23.2/26.75/13.375	1	23	000G-0637
0179-4299-04	0333-0677-02	208/240/480	4325/6420/6420	23.2/26.75/13.375	2	23	000G-0662
0179-4329-04	0333-0677-02	208/240/480	4325/6420/6420	23.2/26.75/13.375	2	23	000G-0657
0179-4606-04	0333-0677-02	208/240/480	4815/6420/6420	23.1/26.8/13.4	2	23	000G-0617
0179-4966-04	0333-0677-02	208/240/480	4825/6420/6420	23.2/26.75/13.375	1	23	000G-0638
0179-5536-04	0333-0677-02	208/240/480	4825/6420/6420	23.2/26.75/13.375	1	23	000G-0640

Model	Spec level	Production part #	Coolant heater kit – by feature option				Applicable compatibility rules/s		Coolant heater interface outline
			H036-2	H074-2	H540-2	H556-2	H557-2	Also required	
DFAB	N	0179-3578-01				0179-3578-03			0500-3873
DFAB	N	0179-3578-02					0179-3578-04		0500-3873
DFAC	N	0179-3578-01				0179-3578-03			0500-3873
DFAC	N	0179-3578-02					0179-3578-04		0500-3873
DFCB	Z	0179-3579-01				0179-3579-05		E079-2 (Heat Exchanger)	0500-3850
DFCB	Z	0179-3579-03				0179-3579-07		E079-2 (Heat Exchanger)	0500-3850
DFCB	Z	0179-3579-02					0179-3579-06	E079-2 (Heat Exchanger)	0500-3850
DFCB	Z	0179-3579-04					0179-3579-08	E079-2 (Heat Exchanger)	0500-3850
DFCC	Z	0179-3579-01				0179-3579-05		E079-2 (Heat Exchanger)	0500-3850
DFCC	Z	0179-3579-03				0179-3579-07		E079-2 (Heat Exchanger)	0500-3850
DFCC	Z	0179-3579-02					0179-3579-06	E079-2 (Heat Exchanger)	0500-3850
DFCC	Z	0179-3579-04					0179-3579-08	E079-2 (Heat Exchanger)	0500-3850
DFCE	J	0179-3579-01				0179-3579-05		E079-2 (Heat Exchanger)	0500-3850
DFCE	J	0179-3579-03				0179-3579-07		E079-2 (Heat Exchanger)	0500-3850
DFCE	J	0179-3579-02					0179-3579-06	E079-2 (Heat Exchanger)	0500-3850
DFCE	J	0179-3579-04					0179-3579-08	E079-2 (Heat Exchanger)	0500-3850
DFEC	L	0179-3817-01				0179-3817-03			0500-3989
DFEC	L	0179-3817-02					0179-3817-04		0500-3989
DFED	H	0179-3817-01				0179-3817-03			0500-3989
DFED	H	0179-3817-02					0179-3817-04		0500-3989
DFEG	F	0179-3536-01				0179-3536-03			0500-3820
DFEG	F	0179-3536-02					0179-3536-04		0500-3820
DFEH	F	0179-3536-01				0179-3536-03			0500-3820
DFEH	F	0179-3536-02					0179-3536-04		0500-3820
DFEJ	F	0179-3536-01				0179-3536-03			0500-3820
DFEJ	F	0179-3536-02					0179-3536-04		0500-3820
DFEK	F	0179-3536-01				0179-3536-03			0500-3820
DFEK	F	0179-3536-02					0179-3536-04		0500-3820
DFFB	K	0179-3325-01				0179-3325-03			0500-3136
DFFB	K	0179-3325-02					0179-3325-04		0500-3136
DFGE	C	0179-3325-01				0179-3325-03			0500-3136
DFGE	C	0179-3325-02					0179-3325-04		0500-3136
DFHA	H	0179-3577-01				0179-3577-03			0500-3846
DFHA	H	0179-3577-02					0179-3577-04		0500-3846
DFHB	H	0179-3577-01				0179-3577-03			0500-3846



Cummins A072H671 - Model # - M1-22-1006-D

MicroGenius[®]

Genset Battery Chargers

12V-12A / 24V-10A



Small. Powerful. Rugged.

Hardened switchmode powertrain - delivers first-class abuse resistance and energy efficiency

Patented charging algorithms - recharge faster and more safely; cut risk of sudden battery failure

UL Listed for emergency generators - from 6 to 100 amp output

Tested to high vibration levels - survive harsh genset duty

Standard J-1939 and Modbus communications - facilitate genset and building integration

Small, lightweight packages - enable installation in smaller spaces



STORED ENERGY SYSTEMS

Robust reliability. More power in less space.

SENS MicroGenius advanced technology genset battery chargers deliver from 6 to 100 amps at 12 or 24 volts*.

MicroGenius is the only family of genset chargers that meets all modern battery charging and energy efficiency regulations.

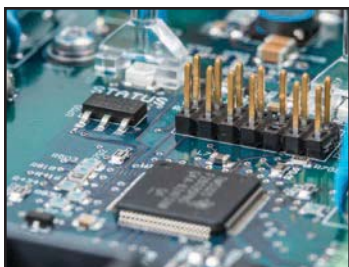
- UL listed to category BBHH required for "Emergency Generators"
- Legal for sale under California and Oregon energy efficiency regulations
- All units survive harsh EN 60068 standard vibration abuse at the 4G level

**Consult factory for higher output voltage MicroGenius chargers up to 120 volts DC nominal*

State-of-the-art features

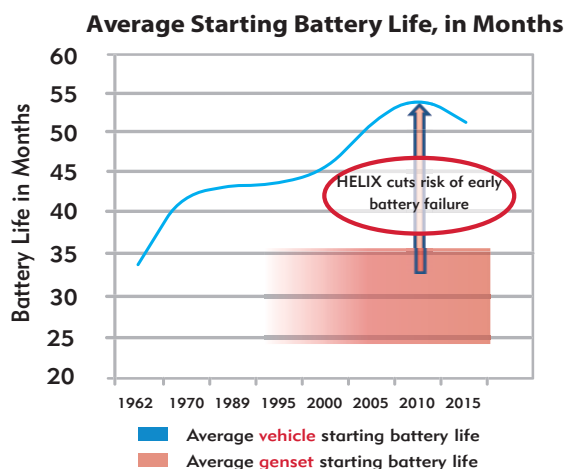
Patented Dynamic Boost™ charging

Dynamic Boost charges batteries faster and more completely than similarly rated conventional chargers, but with lower risk of overcharge.



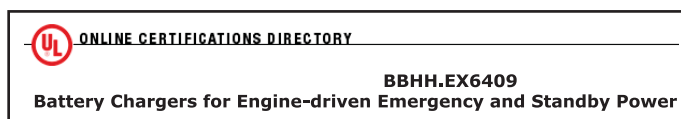
Safer, more reliable battery performance

Revolutionary HELIX™ (High Efficiency, Life-eXtending) technology from SENS reduces the risk of both early and catastrophic genset battery failures.



UL listed for emergency and standby generator duty

MicroGenius chargers rated 6 through 100A output are UL listed to category code BBHH "Emergency & Standby Generators"

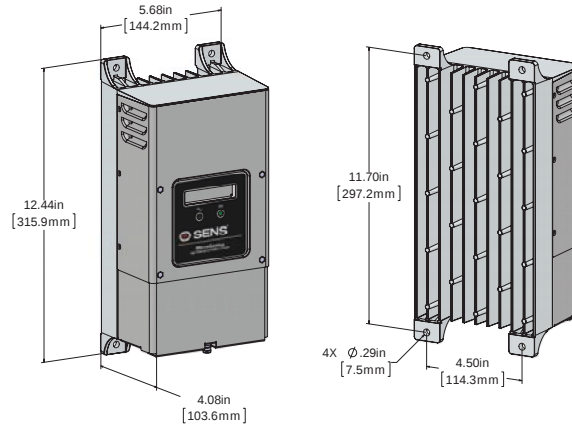


MicroGenius 2

6.0 lbs. (2.8 kg) for 12/24V and $\leq 15A$

7.2 lbs. (3.3 kg) maximum

Choose **MicroGenius 2** if your DC current requirement is $\leq 25A$



Specifications for MicroGenius 2: 6A to 25A Output

AC input	VAC, Hz	90-265 ¹ single-phase VAC, 47-63 Hz DC voltage applied at AC terminals: 100-375 VDC, 0Hz ($\geq 500W$ models only, output limited to 2/3 rated power)
	Protection	Supplementary overcurrent protection fuse, transient protected to EN 61000-4-5 level 4
	Power factor & efficiency	PF > .95 typical; max efficiency 93-95%; meets CEC Title 20 Efficiency Regulations; standby AC draw <3W for 180-450W and <7W for 500-750W
DC output	Volts, amps	12V/24V nom. at 10A/6A, 12A/10A, 15A/15A ¹ , 20A/20A, or 25A/25A
	Charging modes	Multi-stage, including float, boost and two additional HELIX voltages in flooded lead-acid battery program
	Current limit	Factory set at 100% of rating. Field adjustable w/optional keypad or from PC ²
	Charging characteristic	Constant voltage, current limited; patented Dynamic Boost control and HELIX (when FLA battery is selected)
	Line & load regulation	$\pm 0.5\%$
	Output ripple	< 30 mVrms with or without battery. Delivers fast-responding, stable, well-filtered DC without battery.
	Battery temp. compensation	Standard. Optional remote battery temperature probe ³
	Output protection	Current limit, supplementary overcurrent protection fuse, transient protected
	Dead battery charge	Starts into, and recharges zero volt battery without user intervention
Adjustment & Controls	Parallel operation	Two or more chargers operate with all modes synchronized for increased current or fault tolerance ⁴
	Charge mode control	Fully automatic patented Dynamic Boost system (VRLA or ultracap charging program disables boost mode). Manually initiated timed boost & commissioning modes available with keypad option ⁵ .
	Adjustments	12 or 24-volt; battery type program; fine voltage setting; alarm setpoints; alarm relay mapping
	Battery type programs	Flooded lead-acid, AGM, NiZn, NaCl (salt), NiCd, VRLA, ultracapacitor
Status display	Field voltage adjustment	3 methods: jumper pins, from front panel keypad ⁵ or from PC ²
	LEDs	Two multi-color front panel status LEDs
	Metering & status display	Optional. Voltmeter accurate to $\pm 1\%$; ammeter to $\pm 1\%$; 20-character display of status & alarm messages ⁶ .
Alarms	Alarms	Factory set, field reconfigurable, latching or non-latching. Alarm functions announced on the J-1939 and Modbus ports and on the optional LCD include summary, AC fail, charger fail, high DC volts, low DC volts, low cranking volts, overvoltage shutdown, reverse polarity battery, incompatible battery, invalid settings, I/O bus inactive, thermal fold back, no temperature probe, current limiting, ground fault and low current. Any alarm is assignable to Form C contacts.
	Alarms: Form C contacts	Optional. Two ⁷ or five ⁸ Form C contacts, each rated 30V, 2A resistive, assignable. Standard configuration includes summary, AC fail, charger fail, high DC volts, low DC volts and low cranking volts.
Networking	J-1939 communications	CAN 2.0 extended ID on RJ-45 port
	Modbus communications	Modbus RS-485 on RJ-45 port
	SENSbus/USB	Proprietary bus for connection of paralleled chargers, SENS accessories and SENS Setup Utility
Environmental	Operating temperature ⁹	Convection cooled; -40C to +70C; full spec from -40C to +50C ¹⁰
	Humidity	5% to 95%, non-condensing
	Ingress protection	NEMA2/IP22; NEMA3R/IP34; UL Listed "Rainproof"
	Vibration & shock resistance	Vib: Swept Sine (EN60068-2-6): 4G, 18-500 Hz, 3 axes. Random: 20-500Hz, .01G ² /Hz. Shock: EN 60068-2-27 (15G)
	Electrical transient	ANSI/IEEE C62.41 & EN 61000-4-12 on power terminals
Abuse protection	Reverse polarity	Charger self-protects without fuse clearing. Indication via LED & optional LCD.
	Wrong voltage battery	Charger-battery voltage mismatch shuts down charger. Indication via LED & optional LCD.
	Overvoltage shutdown	Selective; shutdown only operates if charger causes the overvoltage condition
	Overtemperature protection	Gradual output power reduction if heatsink temperature becomes excessive
Regulatory compliance	North America	C-UL Listed for US & Canada: UL 1236 categories BBGQ, BBHH, BBJY and QWIR ¹¹ , CSA 22.2, No. 107.2. Certified to UL 1236 supplements SB (marine), SC (fire pump) and SE (emergency generator).
		NFPA-70, NFPA-110 ¹²
		FCC Part 15, Class B, $\geq 600W$ models Class A
	European Union (CE)	Seismic: Rigid & non-structure wall mount; max S_{DS} of 2.5G. IBC 2000-2022, Calif. BC 2007-2022
		American Bureau of Shipping, type approved
		EMC: 2014/30/EU (EN 61000-6-2 & EN 61000-6-4) LVD: 2014/35/EU (EN 60335-1 & EN 60335-2-29) RoHS: 2015/863 (EN 63000)
Construction	Housing/configuration	Die-cast aluminum heatsink base with stainless steel covers & fasteners
	Connections	AC & DC terminal blocks: 20 to 10 AWG. J-1939 and Modbus-485: RJ-45. Form C alarms: 28 to 16 AWG

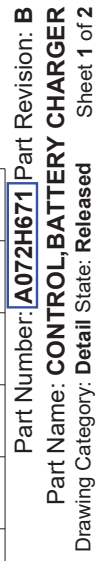
¹ When set for 24-volt output, full 15A output of 450W available above 170 VAC input, 12A output current max between 100 VAC and 170 VAC input ² Requires USB charger option or adapter SENS p/n 209254 plus free SENS software available at www.sens-usa.com ³ Remote battery temp sensor is optional. Order SENS p/n 209481 ⁴ Requires standard RJ-45 network cable to connect paralleling bus. Order SENS p/n 208118-72 (72-inch length) or 208118-180 (180-inch length) ⁵ Requires that digit 12 of the model number be F ⁶ Requires that digit 12 of the model number be D, E, or F ⁷ Models with E as digit 12 of the model number include 2 ea. Form C alarm contacts ⁸ Models with D or F as digit 12 of the model number include 5 ea. Form C alarm contacts ⁹ At 65 deg. C and above the LCD display may be unreadable and display life will be reduced ¹⁰ Full spec to +55C for 180W and +40C for 450W ¹¹ 300W and 450W models only ¹² All chargers equipped with an alarm / display board meet NFPA-110 requirements. For chargers without an alarm / display board to meet NFPA-110, charger volts, amps and charger fail alarm available on the J-1939 port must be announced by the genset control panel.

How To Order **MicroGenius 2**

Product Type	Power	-	Output Volts	-	Output Current	-	Alrms & Comms	Adapter & RTS
M	3	-	22	-	1210	-	D	

(A)
(B)
(C)
(D)
(E)
(F)

	Parameter	Code	Value
(A)	Product Family	M	MicroGenius 2
(B)	Power	1 3 4 6 7	180W 300W 450W 600W 750W
(C)	Output Voltage	22	12/24V
(D)	Output Current	1006 1210 1515 2020 2525	10A @ 12V; 6A @ 24V (180W only) 12A @ 12V; 10A @ 24V (300W only) 15A @ 12V; 15A @ 24V (450W only) 20/20A @ 12/24V (600W only) 25/25A @ 12/24V (750W only)
(E)	Alarm & Communication Options	A D E F G	Base model; includes J-1939 & Modbus RS-485 communications Base model + LCD + USB-C + 5 ea. Form C alarm relays Base model + LCD + USB-C + 2 ea. Form C alarm relays Base model + LCD + USB-C + 5 ea. Form C relays + keypad control Base model + LCD + USB-C + 5 ea. Form C relays + keypad control + Modbus TCP/IP
(F)	Adapter Plate & Remote Temperature Sensor Options	F G L N T	FC to MicroGenius 2 adapter plate (enclosed charger only) MicroGenius 150 to MicroGenius 2 adapter plate (enclosed charger only) LC to MicroGenius 2 adapter plate (enclosed charger only) NRG10 to MicroGenius 2 adapter plate (enclosed charger only) Remote Temperature Sensor shipped with charger



PowerCommand[®] input/output expansion module **AUX 101** and **AUX 102**



Description

The PowerCommand AUX 101 input/output module and the AUX 102 input/output expansion module provide up to sixteen (16) relay output and up to twelve (12) discrete/analog inputs for auxiliary control and monitoring of the power system.

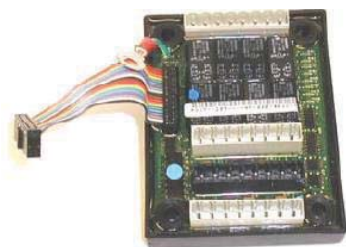
Analog/discrete inputs can be used for system fault expansion and/or generator set metering.

Relay outputs can be used for controlling equipment such as motors, louvers, lamps, fans and pumps. The relays may be configured individually from the genset control operator interface or using InPower™ software.

The AUX 101 and AUX 102 modules are compatible with genset controls supporting a PCCNet network and require a twisted pair connection. This includes the PCC 1301 control.

AUX 101 - Contains eight (8) Form-C relay output sets and eight (8) discrete/analog inputs.

AUX 102 - Easily connects to the AUX 101 to provide an additional eight (8) Form-C relay outputs and (4) additional discrete inputs.



AUX 102 - Expansion

Features

- Up to sixteen (16) configurable Form-C relays provide easy control of system equipment such as lamps, louvers, motors and pumps. LED status of each relay.
- Up to twelve (12) configurable discrete inputs for monitoring equipment status and faults. Equipment status and faults will be annunciated.
- Up to eight (8) analog inputs. Analog inputs can be assigned one of seven preprogrammed functions:
 - Oil temperature
 - Exhaust temperature
 - Fuel level
 - Ambient temperature
 - Alternator RTD
 - Speed bias (for manual paralleling only)
 - Voltage bias (for manual paralleling only)
- Two 5 VDC voltage sources for use with active senders.
- Four programmable current sources for use with resistive senders.
- Two status LEDs:
 - DS1 (green) indicates the AUX 101 is connected to the network and operating normally
 - DS2 (red) indicates the AUX 101 has lost its connection or is not connected to the network
- Device number indicator. Seven segment LED used to uniquely define more than one AUX 101 on the same network.
- May be connected at any point in the PCCNet network.
- Plug-and-play networking - No binding required.
- Pluggable terminal blocks allow easy one-time wiring.
- Less wiring makes installation and system upgrades quick and easy
- PowerCommand controls are supported by a worldwide network of independent distributors who provide parts, service and warranty support.
- UL Listed and labeled; CSA certified; CE compliant.

Specifications

Signal requirements

Network connections: RS485, twisted-pair 78 kbps

Control power: 5-40 VDC

Current

- 200 mA typical at 12 V, no active relay
- 100 mA typical at 24 V, no active relay
- 800 mA at 12 V, all relays active

Terminations for control power accept wire up to 16 ga.

Environment

The AUX 101 and AUX 102 are designed for proper operation in ambient temperatures from -40 °C to +60 °C (-40 °F to +140 °F) and for storage from -40 °C to +80 °C (-40 °F to +176 °F). Modules will operate with humidity up to 95%, non-condensing

Relay ratings (AUX 101)

- Normally closed: 3 A at 250 VAC or 30 VDC
- Normally open: 5 A at 250 VAC or 30 VDC

Relay ratings (AUX 102)

- 2 A at 125 VAC, 2 A at 30 VDC

Input ratings (AUX 101)

- Active low inputs
- Maximum voltage 24 VDC (inputs 1 - 6)
- Maximum voltage 40 VDC (inputs 7 - 8)

Network length

Maximum 1219 m (4000 ft)

Approved wiring

Cat 4 or Cat 5 (stranded)

Configurations

All configurations are stored in the main genset control and are modified from the generator set control HMI or using InPower PC software.

Discrete/analog inputs:

Each AUX 101 input can be configured as discrete or analog. AUX 102 inputs are discrete only. Discrete inputs have the following configuration options:

- Active high or active low
- Event, warning or shutdown
- Programmable text (displayed on genset HMI and InPower software)

Analog inputs have a set of predefined functions and can only be configured on certain module inputs. Below is a list of functions and possible module inputs:

- Input 1 - Voltage bias (-3 to +3 VDC)*
- Input 2 - Speed bias (0 to +5 VDC)*
- Inputs 3 – 6
 - Oil temperature
 - Exhaust temperature
 - Ambient air temperature
 - Fuel level
 - Alternator temperature

Inputs are defaulted to disabled

* Please note that speed and voltage bias interfaces are for manual paralleling only and must not be used with automatic paralleling controls.

Relay outputs

Outputs can be configured to energize on occurrence of any event or fault code supported by the genset control.

The relay outputs default to the following:

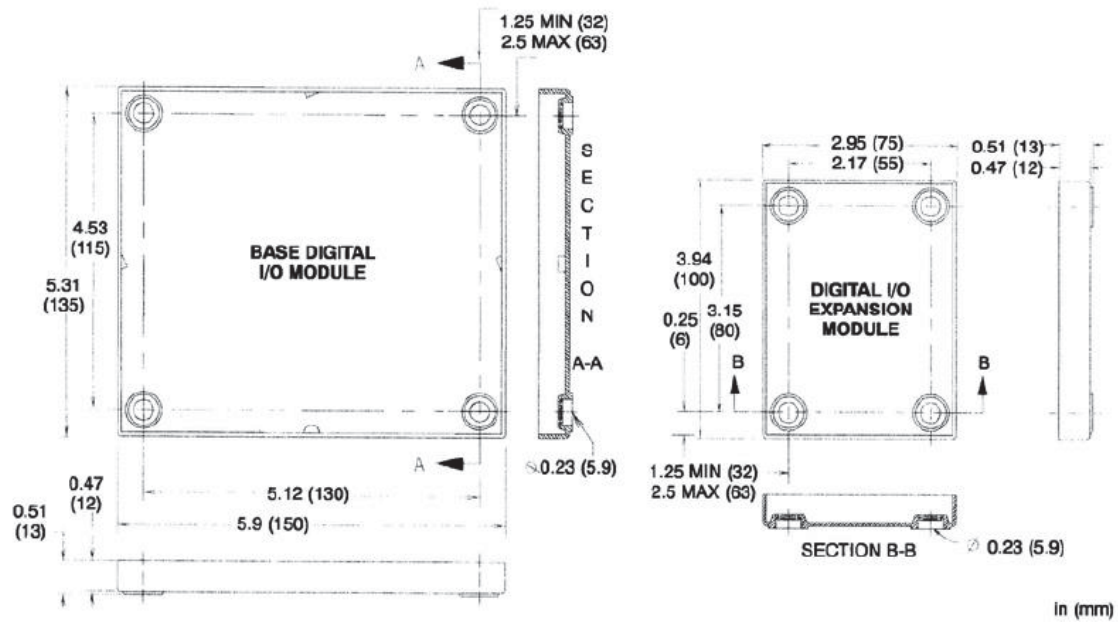
AUX 101

- 1 - Low oil pressure
- 2 - High engine temperature
- 3 - Charger AC failure
- 4 - Battery (low, weak, high)
- 5 - Engine overspeed
- 6 - Fail-to-start
- 7 - Not-in-auto
- 8 - Generator set running

AUX 102

- 9 - Pre-low oil pressure
- 10 - Pre-high engine temperature
- 11 - Low coolant level*
- 12 - Low fuel level*
- 13 - Low coolant temperature
- 14 - Common alarm
- 15 - Not defined
- 16 - Not defined

Dimensions



Ordering information

Part number	Description
A030K633	AUX101 Control Kit, 8 Discrete/Analog Input/ 8 Form-C Output-PCC 1.x/2.x/3.x
0184-0263	AUX 101 Digital Input/output Module - Base – PCC 1301 on DN and GN model generator sets
0630-3142	AUX 102 Digital Input/output Module wiring diagram - Instruction sheet C693
0541-0772	AUX 102 Digital Input/output Module - Expansion

PCCNet logo

Look for this logo on spec sheets of PCCNet compatible devices.



For more information contact your local Cummins distributor or visit power.cummins.com

Our energy working for you.™

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Remote Emergency Stop Switch Accessory

10kW – 3500kW Standby

Description

The generator remote emergency stop switch is an essential safety accessory designed to provide quick and convenient shutdown capabilities for generators in emergency situations. This device ensures the immediate stoppage of generator operation from a remote location, enhancing safety and convenience in various applications.



Features

Remote Operation – This switch allows users to stop the generator remotely from a safe distance, preventing the need to access potentially hazardous areas during emergencies.

Versatile Compatibility – The switch is compatible with a wide range of generator models (see below) and can be easily integrated into new or existing generator systems.

Emergency Stop Button – The prominent red emergency stop button provides quick and highly visible access, enabling immediate shutdown in emergency scenarios.

Clear Hinged Cover – Equipped with a translucent cover to prevent accidental activation, reducing the risk of false alarms. Protects remote e-stop switch from dirt and debris.

Emergency Compliance – Designed to comply with safety regulations and standards to ensure peace of mind during critical situations.

Mounting – External mounting feet top & bottom.

Lockout Tagout – Provisioned with lockable shroud.

Specifications

- Current Rating – 6 A at 120 V
- Continuous Current Rating – 10 A at 120 V
- Ambient Air Operating Temperature – -40°C to +70°C
- Dimensions – See dimensional diagrams below
- Station (excluding cover) Certification – UL Listed; cUL Listed; NEMA 4x
- Installation Wire Recommendation – 16 AWG w/ max length of 50m (wire not included in kit)

New Accessories:

Part Number	Description	Comments
A074S183	Remote Emergency Stop Switch	
A075C111	Connector Kit for Remote Emergency Stop Switch (limited product applicability)	Accessory A075C111 must be selected when accessory A074S183 is selected with any product in the following Engine Family(s): QJSJ2.4G, D1703, V2203, B3.3, QJSJ5.9G, QJSJ8.9G, QSB5, QSB7. Sold separately from A074S183.

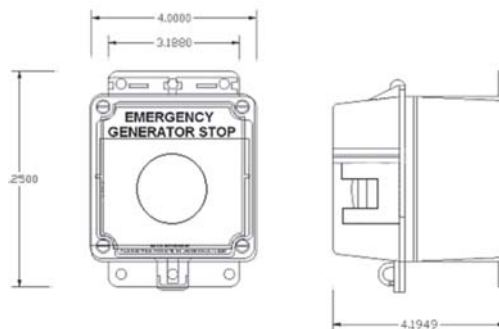
Genset Model Applicability

Engine Family	Genset Model	Model/Engine Family	Genset Model
QSJ2.4G	C20N6	QSL9	DSHAD
	C25N6		DQDAA
	C30N6		DQDAB
	C36N6		DQDAC
	C40N6	QSX15	DFEJ
D1703	C10D6		DFEK
	C15D6	QSK23	DQCA
V2203	C20D6		DQCB
B3.3	C25D6		DQCC
	C30D6	QST30	DQFAA
	C35D6		DQFAB
	C40D6		DQFAC
	C50D6		DQFAD
	C60D6		DQFAH
QSJ5.9G	C45N6	QSK38	C1250D6E
	C60N6		C1500D6E
	C80N6	QSK60	DQKAA
	C50N6		DQKAB
	C70N6		DQKAD
	C100N6		DQKAE
QSJ8.9G	C125N6		DQKAF
	C150N6		DQKAM
	C175N6B		DQKAN
	C200N6B	QSK78	DQLE
QSB5	C50D6C		DQLF
	C60D6C		DQLH
	C80D6C	QSK95	C3000D6E
	C100D6C		C3000D6
	C125D6C		C3250D6E
QSB7	C125D6D		C3250D6
	C150D6D		C3500D6E
	C175D6D		C3500D6
	C200D6D		

Dimensional Diagrams

* Do not use for installation design*

Remote emergency stop accessory kit (A074S813)

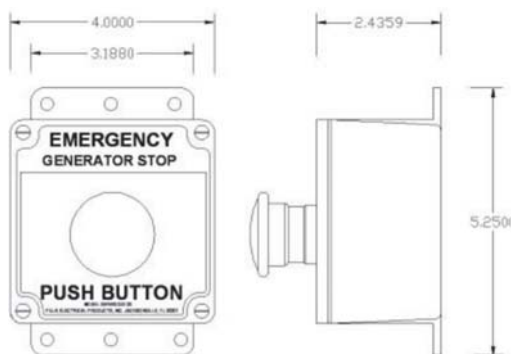


Our energy working for you.™

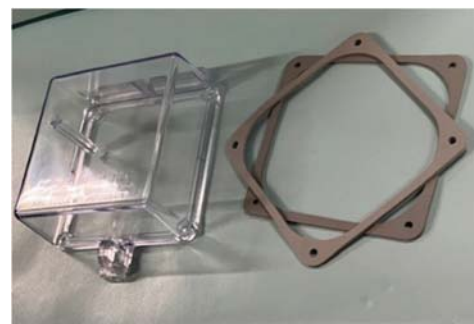
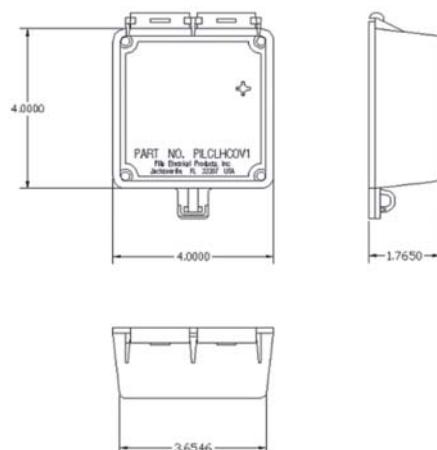
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power.cummins.com

Remote emergency stop switch without cover

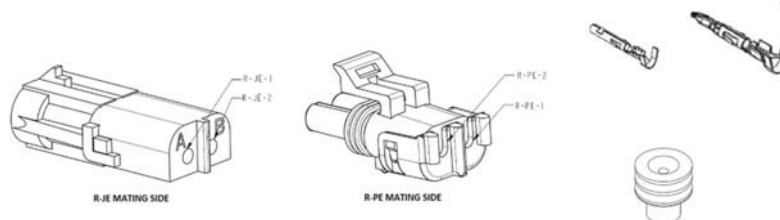


Cover for remote emergency stop switch



Connector kit (A075C111) for remote emergency stop (A074S813) installation on products that reside in the following Engine Family(s): QJSJ2.4G, D1703, V2203, B3.3, QJSJ5.9G, QJSJ8.9G, QSB5, QSB7.

Please consult QuickServe Online for installation instructions and information; do not use this drawing for installation design



Note(s):

- Ensure proper installation and periodic testing of the generator remote emergency stop switch to maintain its reliable performance.
- If you are using this remote emergency stop switch for an outdoor application, then you must use the appropriate outdoor rated entrance fitting to ensure weather integrity (outdoor fitting not included). No openings are provided in the non-metallic housing (must be field drilled).

For more information contact your local Cummins distributor or visit power.cummins.com

Our energy working for you.™





Preventative Maintenance Kits

10-2750 kW generator sets



Description

Cummins® Preventative Maintenance kits include our state-of-the-art technology in oil, fuel, and air filtration. These components meet or exceed specifications for maximum quality and performance. We custom-design high end systems for engine lubricating oil, fuel, and air filtering. These performance-tested systems feature a variety of media with particle retention capabilities to micrometer filtration that enhance protection without sacrificing quality. CPG provides the filtration products that you need to protect and maintain modern engines.

Oil - Lube oil is an essential to life of your engine. It lubricates and protects engine components. Since contaminants enter the lube system due to engine wear, it is vital that you use the best quality oil filtration.

Fuel - With filtration requirements as low as 2 microns on some high-pressure common rail (HPCR) fuel systems, and new fuels like ultra low sulfur diesel, it is imperative that you have the best quality fuel filtration.

Air - Clean air is essential to the performance and longevity of any internal combustion engine. With increasingly stricter levels of emissions having to be met, it's imperative that you use the best quality air filtration.

Coolant - Fully formulated coolants contain specific amounts of glycol, de-ionized water, and coolant additives. Over time contaminants enter the cooling system making it imperative to use the best quality coolant filtration.

Features

- 250 Hours or 6 months run time
- Increased uptime
- Enhanced fuel economy
- Lower Operating costs
- Environmental safety
- Reliability and durability
- Highest performance
- Optimized performance
- Convenience of ordering with generator
- Prolonged engine life
- Reduced maintenance costs

Genset model	Engine model	PM kit part number normal duty air cleaner	PM kit part number heavy duty air cleaner
C10D6	D1703-M	A048V427	N/A
C15D6	D1703-M	A048V427	N/A
C20D6	V2203-M	A048V427	N/A
C25D6	B3.3	A048V433	A048V431
C30D6	B3.3	A048V433	A048V431
C35D6	B3.3	A048V433	A048V431
C40D6	B3.3	A048V433	A048V431
C50D6	B3.3	A048V433	A048V431
C60D6	B3.3	A048V433	A048V431
C20N6	QSJ2.4	A046N985	N/A
C25N6	QSJ2.4	A046N985	N/A
C30N6	QSJ2.4	A046N985	A046N983
C36N6	QSJ2.4	A046N987	A046N983
C40N6	QSJ2.4	A046N987	A046N983
C45N6	QSJ5.9	A052S206	A052S208
C50N6	QSJ5.9	A052S206	A052S208
C60N6	QSJ5.9	A052S206	A052S208
C70N6	QSJ5.9	A052S210	A052S212
C80N6	QSJ5.9	A052S210	A052S212
C100N6	QSJ5.9	A052S210	A052S212
C125N6	QSJ8.9	A056H790	A056H795
C150N6	QSJ8.9	A056H790	A056H795
DFE's	QXS15L-G9 NR2	A041C902	A041C904
DFH's	QST30-G1	A041D162	A041D167
DFLC	KTA50-G3	N/A	N/A
DFLE	KTA50-G9	A041D205	A041D221
DGB's	4B3.9-G2	N/A	N/A
DGC's	4BT3.9-G4	N/A	A041C669
DGCG	4BTA3.9-G3	A041C671	N/A
DGDB	6BT5.9-G6	A041C772	N/A
DGDK	6BTA5.9-G3	N/A	N/A
DGFA/B	6CTA8.3-G2	A041C806	N/A
DGFC/S	6CTAA8.3-G2	N/A	A041C806
DGH's	4BT3.3-G5/G7	A044C436	N/A
DKA's	F2803-E2BG	A041B930	N/A
DQC's	QSK23-G3/G7 NR2	A041D139	A041D143
DQDA's	QSL9-G3	A041C870	A041C874
DQFA's	QST30-G5 NR2	A041D169	A041D187
DQGA's	QSK50-G4 NR2	A041D225	N/A
DQGAC	QSK50-DR (Oil & Gas)	N/A	N/A
DQHA's	QSM11-G4 NR3	A041C889	A041C891
DQKAA/B	QSK60-G6 (A034D142)	A041D324	N/A
DQKAA/B	QSK60-G6 (0100-3997)	N/A	N/A
DQKAD/E/F	QSK60-G6/G14	N/A	N/A
DQKB/C	QSK60-G3 (hi cap oil)	A041D318	N/A
DQKB/C/D/H	QSK60-G4/G6/G8	A041D316	N/A

Certifications/standards/codes



UL 142 Listed - Cummins dual wall sub-base tanks are UL Listed (File MH17470) and constructed in accordance with Underwriters Laboratories Standard UL 142 "steel aboveground tanks for flammable and combustible liquids", as a "secondary containment generator base tank"



NFPA - Cummins tanks are built in accordance with all applicable NFPA codes:

- NFPA 30 - Flammable and Combustible Liquids code
- NFPA 37 - Standard for Installation and use of Stationary Combustible Engine and Gas Turbines
- NFPA 110 - Standard for Emergency and Standby Power Systems



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



ULC - Cummins tanks are built in accordance with all applicable ULC codes



FDEP - Cummins tanks are built in accordance with all applicable Florida Department of Environmental Protection codes (EQ749)

Warning: Back feed 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.

Warning: For professional use only. Must be installed by a qualified service technician. Improper installation presents hazards of electrical shock and improper operation, resulting in severe personal injury and/or property damage.

For more information contact your local Cummins distributor
or visit power.cummins.com

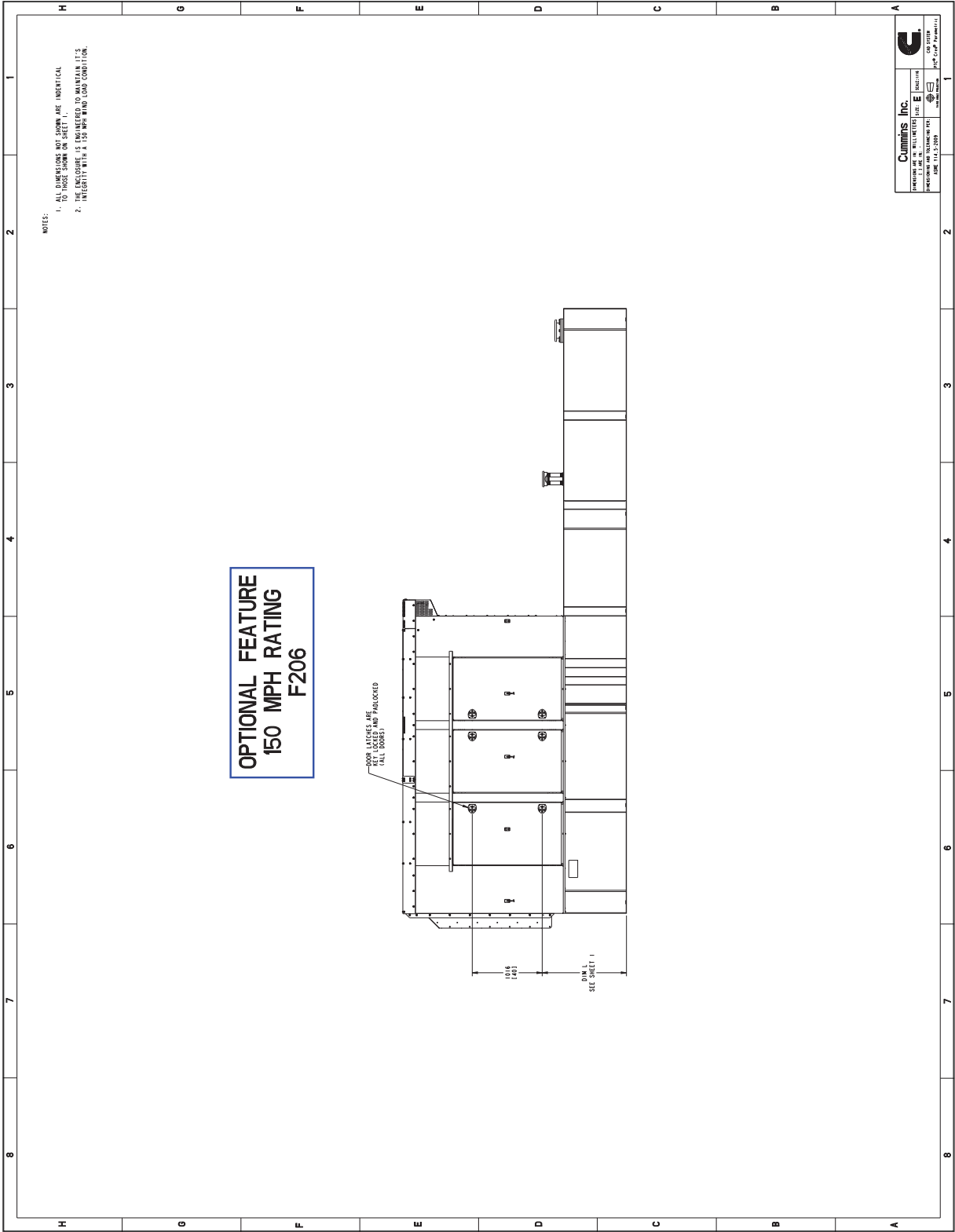
Our energy working for you.™



SECTION 4

Generator Drawings





8	7	6	5	4	3	2	1
TABULATION							
FEATURE CODES	MODEL	ALT DATA SHEET	WEIGHT KG (LBS)	CG-DIM "A" MM (IN)	CG-DIM "B" MM (IN)	CG-DIM "C" MM (IN)	
F214 W/F215	DFEJ, DFEK	305	4625 (10196)	2088 (82.2)	617 (24.3)		
	DFEJ, DFEK	306	4755 (10482)	2116 (83.3)	620 (24.4)		
	DFEJ, DFEK	307	4905 (10833)	2141 (84.3)	622 (24.5)		
	DFEJ, DFEK	308	5045 (11122)	2174 (85.6)	625 (24.6)		
WEIGHT, DRY TANK AND NET GENSET							
FEATURE CODES	MODEL	ALT DATA SHEET	WEIGHT KG (LBS)	CG-DIM "A" MM (IN)	CG-DIM "B" MM (IN)	CG-DIM "C" MM (IN)	
C201 W/F215	DFEJ, DFEK	305	5153 (11360)	2091 (82.3)	538 (21.2)		
	DFEJ, DFEK	306	5283 (11646)	2114 (83.2)	543 (21.4)		
	DFEJ, DFEK	307	5433 (11971)	2136 (84.1)	547 (21.5)		
	DFEJ, DFEK	308	5573 (12266)	2166 (85.3)	552 (21.7)		
C202 W/F215	DFEJ, DFEK	305	5217 (11501)	2094 (82.4)	532 (20.9)		
	DFEJ, DFEK	306	5347 (11787)	2117 (83.3)	537 (21.1)		
	DFEJ, DFEK	307	5497 (12118)	2139 (84.2)	540 (21.3)		
	DFEJ, DFEK	308	5637 (12427)	2169 (85.4)	546 (21.5)		
C203 W/F215	DFEJ, DFEK	305	5282 (11666)	2085 (82.1)	515 (20.3)		
	DFEJ, DFEK	306	5421 (11952)	2108 (83.0)	521 (20.5)		
	DFEJ, DFEK	307	5571 (12283)	2130 (83.9)	525 (20.7)		
	DFEJ, DFEK	308	5712 (12592)	2160 (85.0)	530 (20.9)		
C204 W/F215	DFEJ, DFEK	305	5356 (11809)	2081 (81.9)	498 (19.6)		
	DFEJ, DFEK	306	5486 (12095)	2103 (82.8)	504 (19.8)		
	DFEJ, DFEK	307	5636 (12426)	2126 (83.7)	508 (20.0)		
	DFEJ, DFEK	308	5777 (12735)	2155 (84.8)	514 (20.2)		
C205 W/F215	DFEJ, DFEK	305	5403 (11912)	2079 (81.9)	489 (19.3)		
	DFEJ, DFEK	306	5533 (12198)	2101 (82.7)	495 (19.5)		
	DFEJ, DFEK	307	5683 (12529)	2123 (83.6)	499 (19.6)		
	DFEJ, DFEK	308	5823 (12838)	2152 (84.7)	505 (19.9)		
C207 W/F215	DFEJ, DFEK	305	5531 (12193)	2072 (81.6)	454 (17.9)		
	DFEJ, DFEK	306	5660 (12479)	2093 (82.4)	461 (18.1)		
	DFEJ, DFEK	307	5811 (12803)	2115 (83.3)	466 (18.3)		
	DFEJ, DFEK	308	5951 (13119)	2144 (84.4)	472 (18.6)		
C209 W/F215	DFEJ, DFEK	305	6221 (13715)	2514 (101.3)	360 (14.2)		
	DFEJ, DFEK	306	6351 (14001)	2598 (102.3)	369 (14.5)		
	DFEJ, DFEK	307	6501 (14332)	2674 (103.3)	376 (14.8)		
	DFEJ, DFEK	308	6641 (14641)	2654 (104.5)	384 (15.1)		
C211 W/F215	DFEJ, DFEK	305	7134 (15728)	5653 (222.6)	274 (10.8)		
	DFEJ, DFEK	306	7264 (16014)	5687 (223.9)	283 (11.1)		
	DFEJ, DFEK	307	7414 (16345)	5722 (225.3)	291 (11.5)		
	DFEJ, DFEK	308	7554 (16654)	5761 (226.8)	300 (11.8)		
C242 W/F215	DFEJ, DFEK	305	5138 (11328)	2091 (82.3)	538 (21.2)		
	DFEJ, DFEK	306	5268 (11614)	2114 (83.2)	543 (21.4)		
	DFEJ, DFEK	307	5418 (11945)	2136 (84.1)	547 (21.5)		
	DFEJ, DFEK	308	5558 (12241)	2166 (85.3)	552 (21.7)		
***WEIGHT & CG'S ARE SHOWN WITH FUEL TANK AND STANDARD NET GENSET. ADDITION OF OTHER FEATURES MAY CHANGE THE WEIGHT.							
TABULATION							
FEATURE CODE	TANK CAPACITY	WEIGHTS KG (LBS)	CG-DIM "A" MM (IN)	CG-DIM "B" MM (IN)	CG-DIM "C" MM (IN)	CG-DIM "D" MM (IN)	CG-DIM "E" MM (IN)
LIFT BASE	F214	---	---	---	---	---	---
FUEL TANK	C201	300	---	---	---	---	---
	C202	400	---	---	---	---	---
	C203	500	---	---	---	---	---
	C204	600	---	---	---	---	---
FUEL TANK	C205	660	---	---	---	---	---
	C207	850	---	---	---	---	---
	C209	1700	---	---	---	---	---
	C211	2525	---	---	---	---	---
C242	270	---	---	---	---	---	---

- NOTES:
- DIMENSIONS SHOWN IN [] ARE INCHES.
 - FOUNDATION REFERENCE POINT (---), SEE FOUNDATION DRAWING FOR DETAILS.
 - FOR FEATURE CODE L116 (FLORIDA TANKS) AND L120 (MICHIGAN TANKS) ADD 162 (6.4) TO DIMS D-J.
 - SEE SHEET 2 FOR TANK VENT LOCATIONS.
 - SUBBASE FUEL TANK MOUNTING:
EXCESSIVE TWISTING OF THE FUEL TANK, WHEN FASTENING IT TO A SUBBASE, MAY CAUSE FUEL TANK CRACKING. TO AVOID THIS, ENSURE THE INSTALLATION DOES NOT EXCESSIVELY TWIST THE FUEL TANK. THE FOLLOWING PROCEDURE MUST BE OBSERVED:
5.1 REFER TO CUMMINS APPLICATION MANUAL T030 FOR GENERAL GENSET/TANK MOUNTING GUIDELINES.
5.2 TIGHTEN TANK HOLD DOWN MOUNTING FASTENERS.
 - GENSET SUPPLIED WITH FLEXIBLE FUEL LINES THAT CAN BE CONNECTED TO GENERATOR SET INTERFACE POINTS.
6.1 SPEC A-N
FUEL SUPPLY LINE: 1600 (63) LONG WITH 1/2-1ANPT (MALE) TERMINATION.
FUEL RETURN LINE: 2166 (85) LONG WITH 1/2-1ANPT (MALE) TERMINATION.
6.2 SPEC P-A
FUEL SUPPLY LINE: 1700 (67) LONG WITH 1/2-1ANPT (MALE) TERMINATION.
FUEL RETURN LINE: 1500 (59) LONG WITH 1/2-1ANPT (MALE) TERMINATION.
 - TABULATED WEIGHT AND CG IS FOR GENERATOR SET WITH NO OPTIONS.
 - REFER TO CIRCUIT BREAKER OUTLINE DRAWING FOR ELECTRICAL STUB-UP AREA FOR SPECIFIC BREAKERS.
 - REFER TO SUBBASE FUEL TANK OUTLINE DRAWING FOR ELECTRICAL STUB-UP AREA AVAILABLE WITH FUEL TANKS.
 - FUEL STUB-UP AREA: REFER TO SUBBASE FUEL TANK OUTLINE OR GENSET FOUNDATION OUTLINE FOR AVAILABLE STUB-UP AREAS.
 - DIMENSION IS Δ AS INDICATED ON CIRCUIT BREAKER OUTLINE DRAWING (0300-2233).
 - CONTROL INTERFACE CONNECTIONS SHOULD BE MADE WITH FLEXIBLE CONNECTIONS. NOT RIGID CONDUIT.
 - ENTRANCE BOX (SHOWN) OR OPTIONAL BREAKER BOX (NOT SHOWN) WILL BE MOUNTED ON THE RIGHT SIDE AS VIEWED FROM THE CONTROL.

TABULATION							
TANK/LIFT BASE FEATURE CODE	TANK CAPACITY	DIM-G-03X15 L-FRAME	DIM-G-03X15 P-FRAME				
F214	N/A	1606.3 (63.24)	1580.5 (61.42)				
C201	300	107.9 (167.24)	1580 (61.42)				
C202	400	178.7 (169.24)	1610.9 (63.42)				
C203	500	181.1 (171.54)	1663.3 (65.12)				
C204	600	185.7 (174.24)	1717.9 (68.42)				
C205	660	195.9 (175.94)	1781 (70.12)				
C207	850	263.5 (181.24)	1945.7 (75.42)				
C209	1700	231.5 (191.24)	1945.7 (75.42)				
C211	2525	231.5 (191.24)	1945.7 (75.42)				
C242	270	107.9 (167.24)	1580 (61.42)				

TABULATION							
FEATURE CODE	TANK CAPACITY	WEIGHTS KG (LBS)	CG-DIM "A" MM (IN)	CG-DIM "B" MM (IN)	CG-DIM "C" MM (IN)	CG-DIM "D" MM (IN)	CG-DIM "E" MM (IN)
LIFT BASE	F214	---	---	---	---	---	---
FUEL TANK	C201	300	---	---	---	---	---
	C202	400	---	---	---	---	---
	C203	500	---	---	---	---	---
	C204	600	---	---	---	---	---
FUEL TANK	C205	660	---	---	---	---	---
	C207	850	---	---	---	---	---
	C209	1700	---	---	---	---	---
	C211	2525	---	---	---	---	---
C242	270	---	---	---	---	---	---



DIMENSIONS ARE IN MILLIMETERS
1:1 ARE IN.

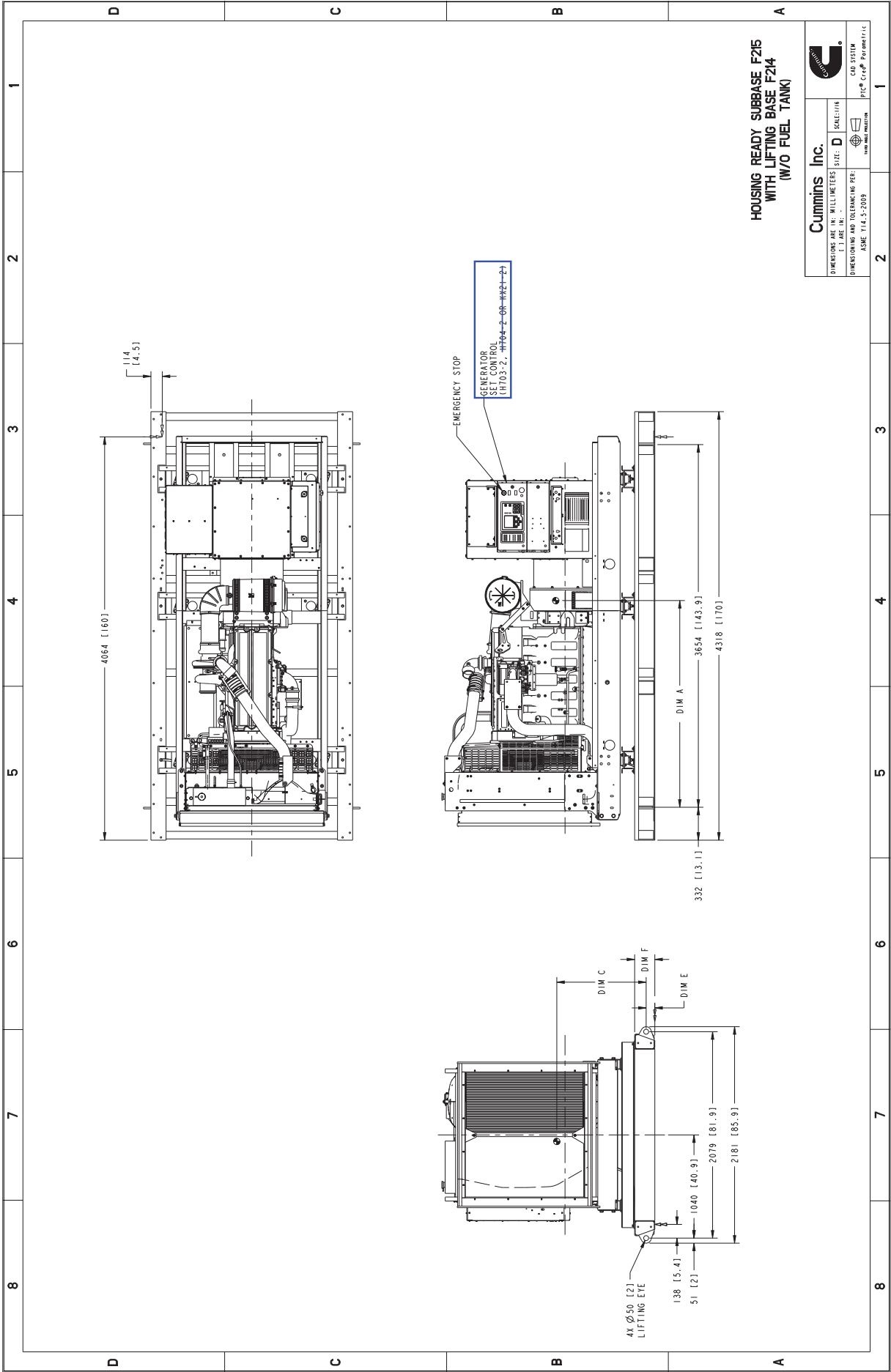
SCALE: 1:1

DIMENSIONS AND TOLERANCES PER:
ASME Y14.5-2009



CUMMINS INC.
P.O. BOX 100
COLUMBIANA, OH 43081-0100
CUMMINS INC. PARAMETRIC

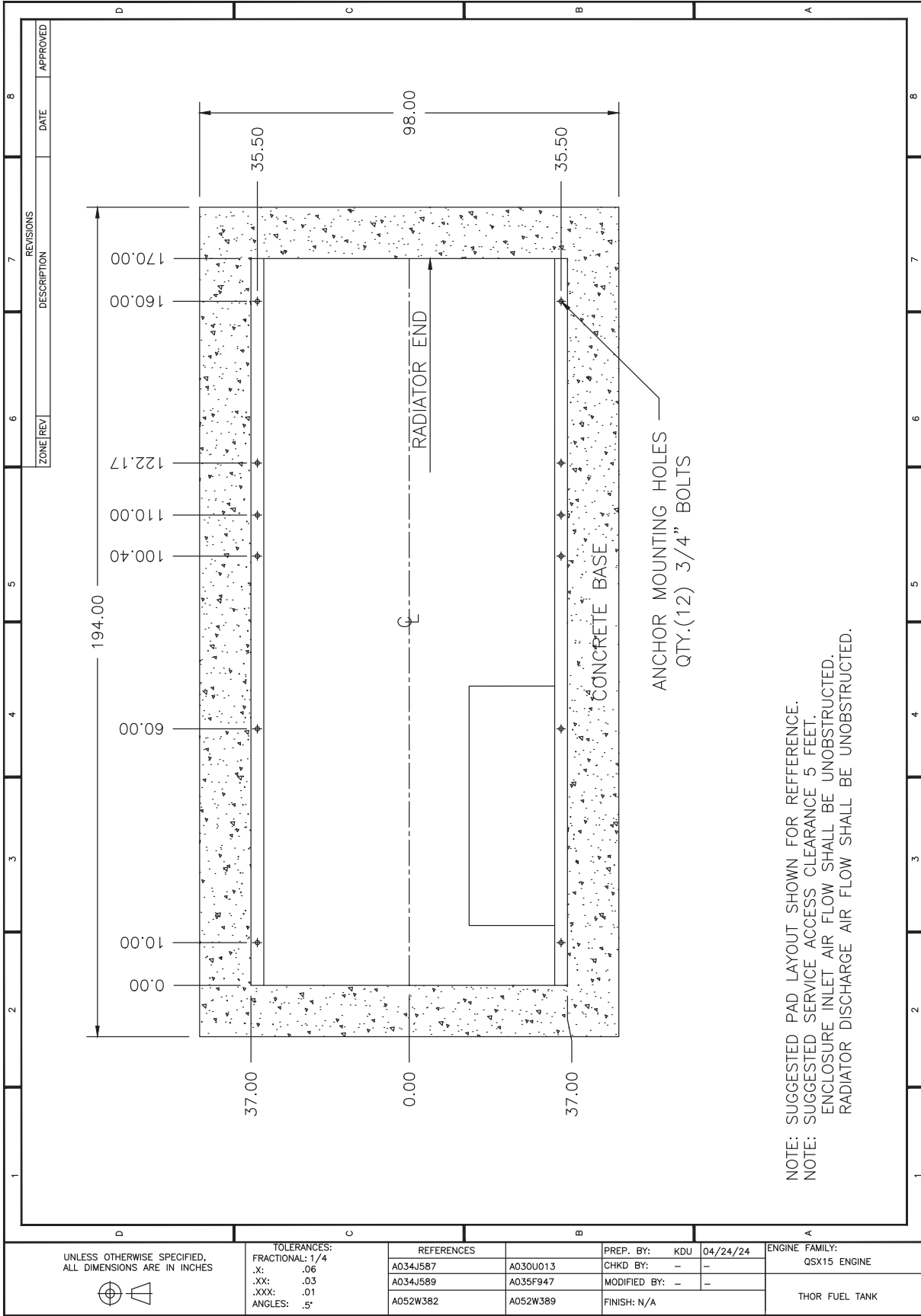




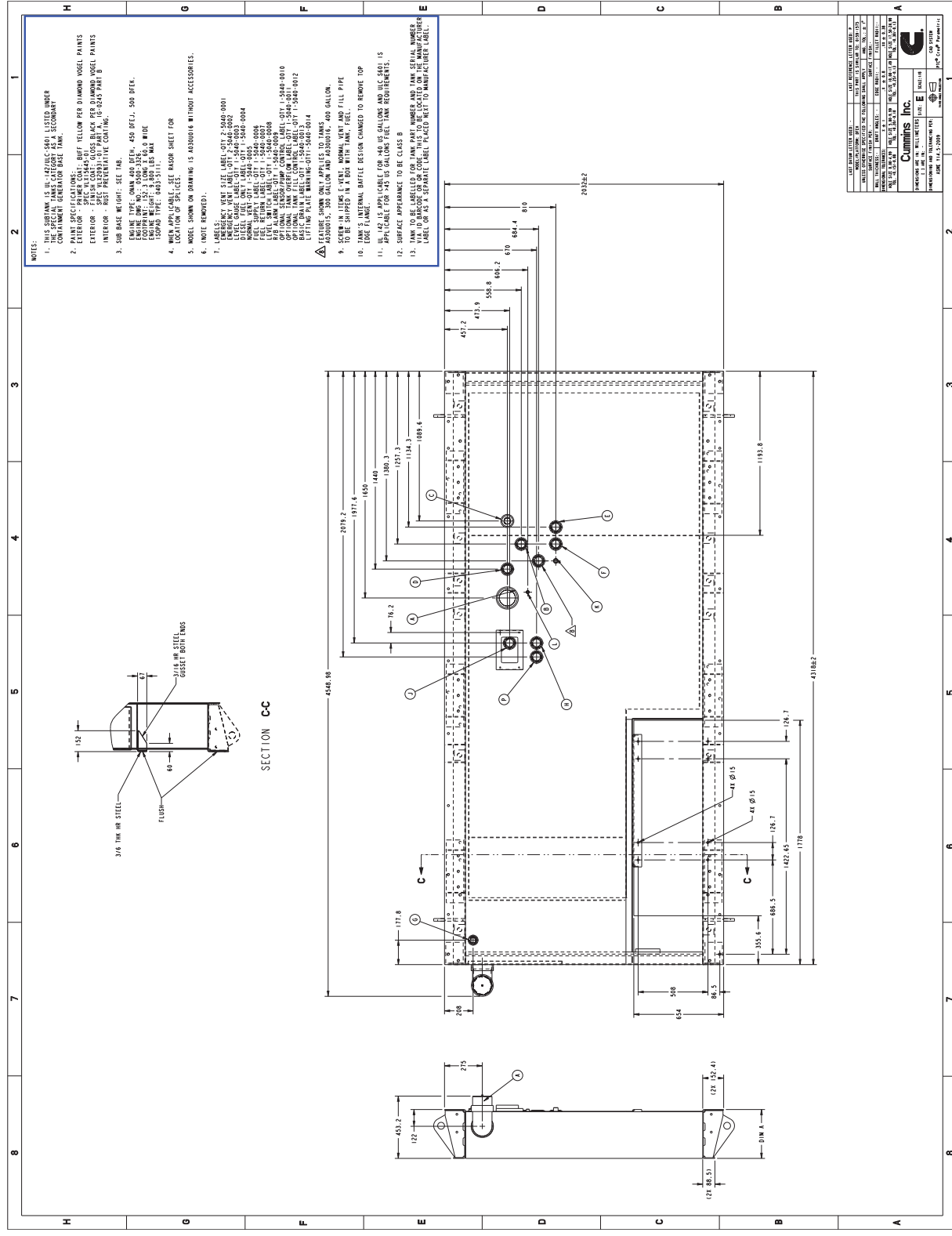
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Part Number: **A052W384** Part Revision: **B**
Part Name: **OUTLINE, GENSET**
Drawing Category: **Detail State: Released** Sheet 5 of 7





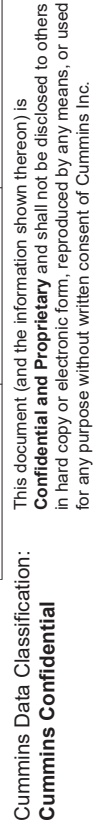
 CSSNA POWER GENERATION		SITE NAME:		CONTACT NAME:		CUSTOMER PROJECT NO:		TITLE:	
		-		-		-		DFELJ & DFEK DIESEL GENERATOR SETS	
								C201 THRU C207 FUEL TANKS	
		CONTRACTOR NAME:		CONTACT NO:		CSSNA PROJECT NO:		SIZE: DWG NO: QXS15 ELECTRICAL STUB-UP REV	
				-		-		SCALE: NONE DO NOT SCALE PRINT SHEET 1 OF 1	

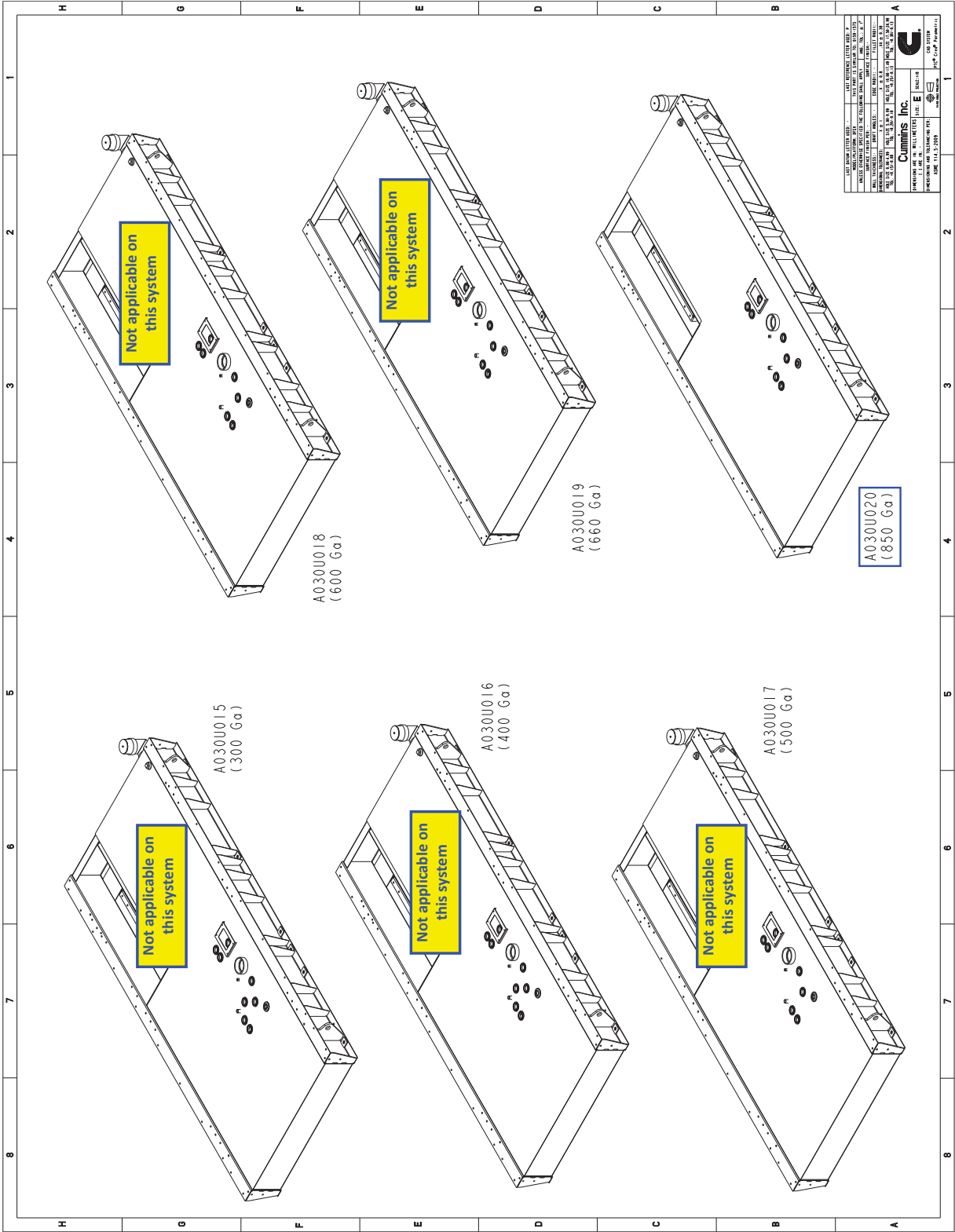


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Part Number: **A030U019** Part Revision: **L**
 Part Name: **TANK,FUEL**
 Drawing Category: **Detail (Tabulation)** Stats: **Released** Sheet 1 of 6





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ITEM NO.	DESCRIPTION	WIRE LENGTH IN	FEED REEL	MARKING	SWITCH POINT ALL TANKS EXCEPT CITY OF NEW YORK	SWITCH POINT CITY OF NEW YORK
6.	HUPHINE BASIN	08	STRIPPED - 4 IN	HUPHINE BASIN	455	455
7.	LOW FUEL	135	STRIPPED - 4 IN	LOW FUEL	403	403
8	LOW FUEL	40	WALL - 18" - FASION WASCATED	HIGH FUEL	905	905
9	LOW FUEL	40	WALL - 18" - FASION WASCATED	HIGH FUEL	952	952

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3



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2

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SECTION 5

Startup & Warranty





Warranty Statement

Generator Sets

Commercial Standby Extended Warranty

**Limited Standby 10 Year or 5,000 Hour
Parts + Labor + Travel Extended
Warranty – L190**

Commercial Generating Set

When purchased, this limited extended warranty applies to all Cummins Power Generation® branded commercial generating sets and associated accessories (hereinafter referred to as "Product").

This warranty covers any failures of the Product, under normal use and service, which result from a defect in material or factory workmanship.

Warranty Period:

The warranty start date is the date of initial start up, first rental, demonstration or 18 months after factory ship date, whichever is sooner. The coverage duration is 10 years from warranty start date or 5,000 hours, whichever occurs first.

Emergency Standby Power (ESP) is defined as the maximum power available during a variable electrical power sequence, under the stated operating conditions, for which a generating set is capable of delivering in the event of a utility power outage. The permissible average power output over 24 hours of operation shall not exceed 70% of the ESP.

**Cummins Power Generation®
Responsibilities:**

In the event of a failure of the Product during the extended warranty period due to defects in material or workmanship, Cummins Power Generation® will only be responsible for the following costs:

- All parts and labor required to repair the Product.
- Reasonable travel expenses to and from the Product site location.
- Maintenance items that are contaminated or damaged by a warrantable failure.

Owner Responsibilities:

The owner will be responsible for the following:

- Notifying Cummins Power Generation® distributor or dealer within 30 days of the discovery of failure.
- Installing, operating, commissioning and maintaining the Product in accordance with Cummins Power Generation®'s published policies and guidelines.
- Providing evidence for date of commissioning.
- Providing sufficient access to and reasonable ability to remove the Product from the installation in the event of a warrantable failure.

In addition, the owner will be responsible for:

- Incremental costs and expenses associated with Product removal and reinstallation resulting from non-standard installations.
- Costs associated with rental of generating sets used to replace the Product being repaired.
- Costs associated with labor overtime and premium shipping requested by the owner.
- All downtime expenses, fines, all applicable taxes, and other losses resulting from a warrantable failure.

Limitations:

This limited extended warranty does not cover Product failures resulting from:

- Inappropriate use relative to designated power rating.
- Inappropriate use relative to application guidelines.
- Failures due to normal wear, corrosion, varnished fuel system parts, lack of reasonable and necessary maintenance, unauthorized modifications and/or repair, and use of add-on or modified parts.
- Improper and/or unauthorized installation.
- Owner's or operator's negligence, accidents or misuse.
- Noncompliance with any Cummins Power Generation® published guideline or policy.
- Use of improper or contaminated fuels, coolants or lubricants.
- Improper storage before and after commissioning.
- Owner's delay in making Product available after notification of potential Product problem.
- Replacement parts and accessories not authorized by Cummins Power Generation®.
- Use of Battle Short Mode

Limitations Continued:

- Owner or operator abuse or neglect such as: operation without adequate coolant or lubricants; overfueling; overspeeding; lack of maintenance to lubricating, cooling or air intake systems; late servicing and maintenance; improper storage, starting, warm-up, run-in or shutdown practices, or for progressive damage resulting from a defective shutdown or warning device.
- Damage to parts, fixtures, housings, attachments and accessory items that are not part of the generating set.

This limited extended warranty does not cover costs resulting from:

- Difficulty in gaining access to the Product.
- Damage to customer property.
- Repair of cosmetic damage to enclosures.

Items not covered by this limited extended warranty:

- Batteries
- Enclosures
- Coolant heaters
- Exhaust systems and aftertreatment components
- Maintenance items

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CUMMINS POWER GENERATION® RIGHT TO FAILED COMPONENTS:

Failed components claimed under warranty remain the property of Cummins Power Generation®. Cummins Power Generation® has the right to reclaim any failed component that has been replaced under warranty.

THE WARRANTIES SET FORTH HEREIN ARE THE SOLE WARRANTIES MADE BY CUMMINS POWER GENERATION® IN REGARD TO THE PRODUCT. CUMMINS POWER GENERATION® MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OR OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT IS CUMMINS POWER GENERATION® LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

This limited extended warranty shall be enforced to the maximum extent permitted by applicable law. This limited extended warranty gives the owner specific rights that may vary from state to state or from jurisdiction to jurisdiction.

Product Model Number: _____

Product Serial Number: _____

Date in Service: _____

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