

CSDG - C100N6

CUMMINS / C100N6 100



**Sales and
Service**

Cummins Sales and Service

CSDG - C100N6

For assistance, questions or concerns on any material contained within this submittal packet contact one of the following people:

NOTICE

A COPY OF THIS GENERATOR SET SUBMITTAL MUST BE RETURNED TO OUR OFFICE, APPROVED IN ITS ENTIRETY AND BEARING THE DATE OF APPROVAL, STAMP OR SIGNATURE AND TITLE OF THE APPROVING AUTHORITY, BEFORE ANY ITEM WILL BE RELEASED FOR MANUFACTURE OR SHIPMENT. WE ASSUME NO RESPONSIBILITY FOR DELAYS IN OUR FORECASTED SHIPPING SCHEDULES ON ANY ITEM ON WHICH SUBMITTAL APPROVAL IS BEYOND THIRTY (30) DAYS FROM THE SUBMISSION DATE ON THE COVER PAGE.

THIS SUBMITTAL IS BASED UPON OUR INTERPRETATION OF THE PROJECT REQUIREMENTS AND/OR SPECIFICATIONS AND IS IN ACCORDANCE WITH YOUR ORDER AND PRODUCT AVAILABILITY OF FROM OUR VENDORS. PLEASE REVIEW THE ENCLOSED DATA COMPLETELY AND CAREFULLY. SHOULD ADDITIONAL INFORMATION OR CLARIFICATION BE REQUIRED PLEASE FORWARD A SUBMITTAL COPY, COMPLETE WITH YOUR NOTATIONS, TO OUR OFFICE WITHIN THIRTY (30) DAYS FOR A PROMPT RESPONSE AND/OR RESUBMITTAL.

CONSIDERABLE ATTENTION IS GIVEN TO THE PREPARATION OF THIS SUBMITTAL TO ENSURE IT IS COMPLETE, CONCISE AND CORRECT AS IS POSSIBLE. PLEASE REVIEW IT CAREFULLY AND THOROUGHLY.

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CSDG – 100kw

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Bill of Materials

Feature Code	Description	Qty
C100 N6 Install-US-Stat C100 N6 A331-2 L155-2 L090-2 L193-2 B184-2 R098-2 BB88-2 F217-2 P176-2 F252-2 F065-2 F179-2 H609-2 H700-2 H012-2 K796-2 H536-2 KV03-2 KX30-2 A366-2 C284-2 A422-2 D041-2 A333-2 BB89-2 E125-2 H527-2 E089-2 H669-2 E153-2 H487-2 H706-2 L028-2 L050-2 A322-2 H268-2 L260-2	C100N6, 100kW, 60Hz, Standby, Natural Gas/Propane Genset U.S. EPA, Stationary Emergency Application C100N6, 100kW, 60Hz, Standby, Natural Gas/Propane Genset Duty Rating - Standby Power (ESP) Emissions Certification - SI, EPA, Emergency, Stationary, 40CFR60 Listing - UL 2200 NFPA 110 Type 10 Level 1 Capable Exciter/Regulator - Permanent Magnet Generator, 3 Phase Sensor Voltage - 120/208, 3 Phase, Wye, 4 Wire Alternator - 60Hz, Reconnect, Full Output, 120C, 40C Ambient, Increased Motor Starting (IMS) Aluminum Sound Attenuated Level 2 Enclosure, with Exhaust System Enclosure Color - Green, Aluminum Enclosure - Wind Load 180 MPH, ASCE7-10 Battery Rack Skidbase - Housing Ready Control Mounting - Left Facing PowerCommand 1.1 Controller Gauge - Oil Pressure Stop Switch - Emergency Control Display Language - English Load Connection - Single Circuit Breaker, Location A, 125A - 400A, 3P, LSI, 600 Volts AC, 100%, UL Engine Governor - Electronic, Isochronous Single Gas Fuel - NG or LP Vapor Engine Starter - 12 Volt DC Motor Engine Air Cleaner - Normal Duty Battery Charging Alternator Battery Charger - 6 Amp, Regulated Engine Cooling - Radiator, High Ambient Air Temperature, Ship Fitted Warning - Low Coolant Level Extension - Coolant Drain Engine Coolant - 50% Antifreeze, 50% Water Mixture Coolant Heater Engine Oil Heater - 120 Volts AC, Single Phase Engine Oil Genset Warranty - 2 Years Base Literature - English Packing - Skid, Poly Bag Extension - Oil Drain Green Sound Level 2 Intake Baffle - Ship Loose	2
A052M018	Sound Level2 Baffle, Shipped Loose	2



Spark-ignited generator set

45–100 kW Standby

EPA emissions



Description

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

Features

Gas engine - Rugged 4-cycle Cummins QSJ5.9G spark-ignited engine delivers reliable power. The electronic air/fuel ratio control provides optimum engine performance 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.

Control system - The PowerCommand® 1.1 electronic control is standard equipment and provides total generator set system integration including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, output metering, auto-shutdown at fault detection and NFPA 110 Level 1 compliance. The PowerCommand 2.3 control is also optional and is UL 508 Listed and provides AmpSentry™ protection.

Cooling system - Standard cooling package provides reliable running at up to 50 °C (122 °F) ambient temperature.

Enclosures - The aesthetically appealing enclosure incorporates special designs that deliver one of the quietest generators of its kind. Aluminium material plus durable powder coat paint provides the best anti-corrosion performance. The generator set enclosure has been evaluated to withstand 180 MPH wind loads in accordance with ASCE7 -10. The design has hinged doors to provide easy access for service and maintenance.

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

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

Model	Natural gas		Propane		Data sheets
	Standby		Standby		
	kW	kVA	kW	kVA	
C45 N6	45	56	45	56	NAD-6093-EN
C50 N6	50	63	50	63	NAD-6094-EN
C60 N6	60	75	60	75	NAD-6095-EN
C70 N6	70	88	70	88	NAD-6096-EN
C80 N6	80	100	80	100	NAD-6097-EN
C100 N6	100	125	100	125	NAD-6098-EN

Generator set specifications

Governor regulation class	ISO8528 Part 1 Class G3
Voltage regulation, no load to full load	± 1.0%
Random voltage variation	± 1.0%
Frequency regulation	Isochronous
Random frequency variation	± 0.25% @ 60 Hz
Radio frequency emissions compliance	Meets requirements of most industrial and commercial applications

Engine specifications

Design	Naturally aspirated or turbocharged (varies by generator set model)
Bore	102.1 mm (4.02 in.)
Stroke	119.9 mm (4.72 in.)
Displacement	5.9 liters (359 in ³)
Cylinder block	Cast iron, in-line 6 cylinder
Battery capacity	850 amps at ambient temperature of 0 °F to 32 °F (-18 °C to 0 °C)
Battery charging alternator	52 amps
Starting voltage	12 volt, negative ground
Lube oil filter type(s)	Spin-on with relief valve
Standard cooling system	50 °C (122 °F) ambient cooling system
Rated speed	1800 rpm

Alternator specifications

Design	Brushless, 4 pole, drip proof, revolving field
Stator	2/3 pitch
Rotor	Direct coupled, flexible disc
Insulation system	Class H per NEMA MG1-1.65
Standard temperature rise	120 °C (248 °F) Standby
Exciter type	Torque match (shunt) with PMG as option
Alternator cooling	Direct drive centrifugal blower
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

1-phase	3-phase				
• 120/240	• 120/208	• 120/240	• 277/480	• 347/600	• 127/220

Generator set options

Fuel system

- Single fuel - natural gas or propane vapor, field selectable
- Dual fuel – natural gas and propane vapor auto changeover
- Low fuel gas pressure warning

Engine

- Engine air cleaner
- Shut down – low oil pressure
- Extension – oil drain
- Engine oil heater

Alternator

- 120 °C temperature rise alternator
- 105 °C temperature rise alternator
- PMG
- Alternator heater, 120 V
- Reconnectable full 1 phase output alternator

Control

- AC output analog meters
- Stop switch – emergency
- Auxiliary output relays (2)
- Auxiliary configurable signal inputs (8) and relay outputs (8)

Electrical

- One, two or three circuit breaker configurations
- 80% rated circuit breakers
- 100% rated LSI circuit breakers
- Battery charger

Enclosure

- Sound Level 1 or Level 2 enclosure, sandstone or green color
- Weather protective enclosure with muffler installed, green color
- Winter protective enclosure, green color

Cooling system

- Shutdown – low coolant level
- Warning – low coolant level
- Extension – coolant drain
- Coolant heater options:
 - <4 °C (40 °F) – cold weather
 - <-17 °C (0 °F) – extreme cold

Exhaust system

- Exhaust connector NPT
- Exhaust muffler mounted

Generator set application

- Base barrier – elevated genset
- Battery rack, standard battery
- Battery rack, larger battery
- Radiator outlet duct adapter

Warranty

- Base warranty – 2 year/1000 hours, Standby
- 3 year Standby warranty options
- 5 year Standby warranty options

Generator set accessories

- Coolant heaters – 1000 W/1500 W
- Battery rack, standard/larger battery
- Battery heater kit
- Engine oil heater
- Remote control displays
- Auxiliary output relays (2)
- Auxiliary configurable signal inputs (8) and relay outputs (8)
- Annunciator – RS485
- Remote monitoring device – PowerCommand 500/550
- Battery charger – stand-alone, 12 V
- Circuit breakers
- Enclosure Sound Level 1 to Sound Level 2 upgrade kit
- Base barrier – elevated generator set
- Mufflers – industrial, residential or critical
- Alternator PMG
- Alternator heater

Control system PowerCommand 1.1



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

- Battery monitoring and testing features and smart starting control system.
- Standard PCCNet interface to devices such as remote annunciator for NFPA 110 applications.
- Control boards potted for environmental protection.
- Control suitable for operation in ambient temperatures from -40 °C to +70 °C (-40 °F to +158 °F) and altitudes to 5000 meters (13,000 feet).
- Prototype tested; UL, CSA, and CE compliant.
- InPower™ PC-based service tool available for detailed diagnostics.

Operator/display panel

- Manual off switch
- Alpha-numeric display with pushbutton access for viewing engine and alternator data and providing setup, controls and adjustments (English or international symbols)
- LED lamps indicating generator set running, not in auto, common warning, common shutdown, manual run mode and remote start
- Suitable for operation in ambient temperatures from -40 °C to +70 °C
- Bargraph display (optional)

AC protection

- Over current warning and shutdown
- Over and under voltage shutdown
- Over and under frequency shutdown
- Over excitation (loss of sensing) fault
- Field overload

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

Alternator data

- Line-to-Line and Line-to-neutral AC volts
- 3-phase AC current
- Frequency
- Total kVa

Engine data

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

Other data

- Generator set model data
- Start attempts, starts, running hours
- Fault history
- RS485 Modbus® interface
- Data logging and fault simulation (requires InPower service tool)

Digital governing (optional)

- Integrated digital electronic isochronous governor
- Temperature dynamic governing

Digital voltage regulation

- Integrated digital electronic voltage regulator
- 2-phase Line-to-Line sensing
- Configurable torque matching

Control functions

- Time delay start and cooldown
- Cycle cranking
- PCCNet interface
- (2) Configurable inputs
- (2) Configurable outputs
- Remote emergency stop
- Automatic Transfer Switch (ATS) control
- Generator set exercise, field adjustable

Options

- Auxiliary output relays (2)
- Remote annunciator with (3) configurable inputs and (4) configurable outputs
- PMG alternator excitation
- PowerCommand 500/550 for remote monitoring and alarm notification (accessory)
- Auxiliary, configurable signal inputs (8) and configurable relay outputs (8)

• Digital governing

- AC output analog meters (bargraph)
 - Color-coded graphical display of:
 - 3-phase AC voltage
 - 3-phase current
 - Frequency
 - kVa
- Remote operator panel
- PowerCommand 2.3 control with AmpSentry protection

Ratings definitions

Emergency Standby Power (ESP):

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

Limited-Time Running Power (LTP):

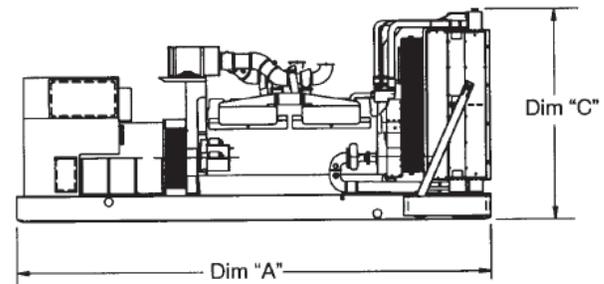
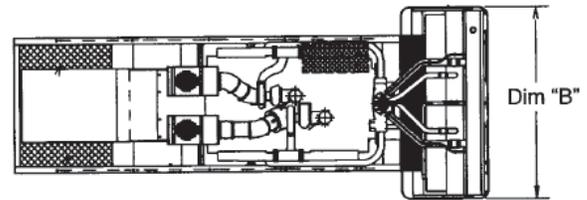
Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.

Prime Power (PRP):

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

Base Load (Continuous) Power (COP):

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



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

Do not use for installation design

Model	Dim "A" mm (in.)	Dim "B" mm (in.)	Dim "C" mm (in.)	Set weight* kg (lbs.)
Open set				
C45 N6	2489 (98)	1016 (40)	1473 (58)	989 (2180)
C50 N6	2489 (98)	1016 (40)	1473 (58)	989 (2180)
C60 N6	2489 (98)	1016 (40)	1473 (58)	1103 (2431)
C70 N6	2489 (98)	1016 (40)	1473 (58)	1111 (2449)
C80 N6	2489 (98)	1016 (40)	1473 (58)	1173 (2587)
C100 N6	2489 (98)	1016 (40)	1473 (58)	1233 (2719)
Weather protective enclosure				
C45 N6	2489 (98)	1016 (40)	1473 (58)	1070 (2359)
C50 N6	2489 (98)	1016 (40)	1473 (58)	1070 (2359)
C60 N6	2489 (98)	1016 (40)	1473 (58)	1184 (2610)
C70 N6	2489 (98)	1016 (40)	1473 (58)	1192 (2628)
C80 N6	2489 (98)	1016 (40)	1473 (58)	1255 (2766)
C100 N6	2489 (98)	1016 (40)	1473 (58)	1315 (2898)
Sound attenuated enclosure Level 1				
C45 N6	3023 (119)	1016 (40)	1473 (58)	1114 (2455)
C50 N6	3023 (119)	1016 (40)	1473 (58)	1114 (2455)
C60 N6	3023 (119)	1016 (40)	1473 (58)	1227 (2706)
C70 N6	3023 (119)	1016 (40)	1473 (58)	1236 (2724)
C80 N6	3023 (119)	1016 (40)	1473 (58)	1298 (2862)
C100 N6	3023 (119)	1016 (40)	1473 (58)	1358 (2994)
Sound attenuated enclosure Level 2				
C45 N6	3454 (136)	1016 (40)	1473 (58)	1127 (2485)
C50 N6	3454 (136)	1016 (40)	1473 (58)	1127 (2485)
C60 N6	3454 (136)	1016 (40)	1473 (58)	1241 (2736)
C70 N6	3454 (136)	1016 (40)	1473 (58)	1249 (2754)
C80 N6	3454 (136)	1016 (40)	1473 (58)	1312 (2892)
C100 N6	3454 (136)	1016 (40)	1473 (58)	1372 (3024)
Winter protective enclosure				
C45 N6	3701 (146)	1016 (40)	1473 (58)	1152 (2535)
C50 N6	3701 (146)	1016 (40)	1473 (58)	1152 (2535)
C60 N6	3701 (146)	1016 (40)	1473 (58)	1266 (2786)
C70 N6	3701 (146)	1016 (40)	1473 (58)	1275 (2804)
C80 N6	3701 (146)	1016 (40)	1473 (58)	1337 (2942)
C100 N6	3701 (146)	1016 (40)	1473 (58)	1397 (3074)

see below drawings for overall shipping weight and dimensions

* Weights above are average. Actual weight varies with product configuration.

Codes and standards

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

	<p>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.</p>		<p>The generator set is available Listed to UL 2200, Stationary Engine Generator Assemblies.</p>
<p>International Building Code</p>	<p>The generator set is certified to International Building Code (IBC) 2012.</p>		<p>All low voltage models are CSA certified to product class 4215-01.</p>
	<p>This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.</p>	<p>U.S. EPA</p>	<p>Engine certified to U.S. EPA SI Stationary Emission Regulation 40 CFR, Part 60.</p>

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

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

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Generator Set Data Sheet



Model: C100 N6
Frequency: 60 Hz
Fuel Type: Natural Gas/Propane
kW Rating: 100 Natural Gas Standby
 100 Propane Standby
Emissions Level: EPA Emissions

Fuel Consumption	Natural gas Standby				Propane Standby			
	kW (kVA)				kW (kVA)			
Ratings	100 (125)				100 (125)			
Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full
scfh	538	788	1028	1290	210.2	316.3	418.64	526.6
m³/hr	15.2	22.3	29.1	36.5	5.95	8.96	11.86	14.91

Engine	Natural gas Standby rating	Propane Standby rating
Engine model	QSJ5.9G-G3	
Configuration	Cast iron, in line, 6 cylinder	
Aspiration	Turbocharged and after-cooled	
Gross engine power output, kWm (bhp)	121.3 (162.7)	
Bore, mm (in.)	102.1 (4.02)	
Stroke, mm (in.)	119.9 (4.72)	
Rated speed, rpm	1800	
Compression ratio	8.5:1	
Lube oil capacity, L (qt.)	14.2 (15)	
Overspeed limit, rpm	2250	

Fuel Supply Pressure	
Minimum operating pressure, kPa (in H ₂ O)	1.5 (6)
Maximum operating pressure, kPa (in H ₂ O)	3.2 (13)

Air	Natural gas Standby rating	Propane Standby rating
Combustion air, m ³ /min (scfm)	8.4 (297.8)	8.5 (298.5)
Maximum normal duty air cleaner restriction, kPa (in H ₂ O)	0.4 (1.5)	0.4 (1.5)
Maximum heavy duty air cleaner restriction, kPa (in H ₂ O)	3.7 (15)	3.7 (15)

Exhaust	Natural gas Standby rating	Propane Standby rating
Exhaust flow at rated load, m ³ /min (cfm)	27.3 (965)	25.7 (908.7)
Exhaust temperature at set rated load, °C (°F)	635.2 (1175.4)	645.7 (1194.3)
Maximum back pressure, kPa (in H ₂ O)	8.5 (34.1)	8.5 (34.1)

Standard Set-Mounted Radiator Cooling

Ambient design, °C (°F)	50 (122)	50 (122)
Fan load, kW _m (HP)	9.0 (12)	9.0 (12)
Coolant capacity (with radiator), L (US gal)	16 (4.2)	16 (4.2)
Cooling system air flow, m ³ /min (scfm)	218.0 (7700)	218.0 (7700)
Maximum cooling air flow static restriction, kPa (in H ₂ O)	0.12 (0.5)	0.12 (0.5)

Weights	Natural gas	Propane
Unit dry weight kgs (lbs)	1276 (2812)	1276 (2812)
Unit wet weight kgs (lbs)	1315 (2898)	1315 (2898)

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

Derating Factors

Natural gas

Standby

Engine power available up to 488 m (1600 ft.) at ambient temperatures up to 25 °C (77 °F). Above these elevations derate at 4% per 305 m (1000 ft.) and 2% per 10 °C above 25 °C (77 °F).

Propane

Standby

Engine power available up to 488 m (1600 ft.) at ambient temperatures up to 25 °C (77 °F). Above these elevations derate at 4% per 305 m (1000 ft.) and 2% per 10 °C above 25 °C (77 °F).

see below drawings for overall shipping weight and dimensions

Ratings Definitions

Emergency Standby Power (ESP):

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

Limited-Time Running Power (LTP):

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

Prime Power (PRP):

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

Base Load (Continuous) Power (COP):

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

Alternator Data

Standard alternators	Natural gas/propane single phase table	Natural gas/propane three phase table					Full single phase output, reconnectable
Maximum temperature rise above 40 °C ambient	120 °C	120 °C	120 °C	120 °C	120 °C	120 °C	120 °C
Feature code	BB90-2	B986-2	B946-2	B943-2	B952-2	BB86-2	BB88-2
Alternator data sheet number	ADS-207	ADS-207	ADS-207	ADS-207	ADS-207	ADS-207	ADS-209
Voltage ranges	120/240	120/240	120/208	277/480	347/600	127/220	120 - 480
Voltage feature code	R104-2	R106-2	R098-2	R002-2	R114-2	R020-2	Varies by voltage
Surge kW	98.7	102.7	102.7	103.9	103.9	103.2	Varies by voltage
Motor starting kVA (at 90% sustained voltage)	Shunt	360	360	360	360	360	516
	PMG	423	423	423	423	423	607
Full load current amps at Standby rating	417	301	347	150	120	328	Varies by voltage

Optional alternators for improved starting capability	Natural gas/propane single phase table	Natural gas/propane three phase table					Full single phase output, reconnectable
Maximum temperature rise above 40 °C ambient	105 °C	105 °C	105 °C	105 °C	105 °C	105 °C	Not available
Feature code	BB91-2	BB94-2	BB93-2	BB95-2	BB92-2	BB85-2	
Alternator data sheet number	ADS-208	ADS-208	ADS-208	ADS-207	ADS-207	ADS-207	
Voltage ranges	120/240	120/240	120/208	277/480	347/600	127/220	
Voltage feature code	R104-2	R106-2	R098-2	R002-2	R114-2	R020-2	
Surge kW	100.1	104.5	104.5	103.9	103.9	103.2	
Motor starting kVA (at 90% sustained voltage)	Shunt	422	422	422	360	360	
	PMG	497	497	497	423	423	
Full load current amps at Standby rating	417	301	347	150	120	328	

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® 1.1 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

Easy to view: HMI 211RS for residential use. 128 x 64 pixel graphic LED backlight LCD.

Easy to use: Tactile buttons for generator set start/stop. Residential Standby display for convenient use.

Modbus® interface: Eliminates need for MODLON.

Progressive protective functions: Advanced Overcurrent Protection – Generator set monitoring & protection.

Digital voltage regulation: Single phase full wave SCR type regulator compatible with either shunt or PMSG systems.

Digital engine speed governing: Provides isochronous frequency regulation.

12 and 24 VDC battery operation.

Automatic mains failure: Smooth & automatic transfer and re-transfer of load from utility to generator set & vice-versa.

Exerciser clock: Runs generator set exerciser routines for dependability of operation.

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

Certification: 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 Generator Set Control PCC 1302



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.
- Digital engine speed governing (where applicable) - Provides isochronous frequency regulation.
- Full authority engine communications (where applicable) - Provides communication and control with the Engine Control Module (ECM).
- 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.
- 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.
- 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.
- Exerciser function – Routine exercising of generator set.
- Supports dual fuel control.
- Automatic Mains Failure function built in generator set controller. Modbus interface - for interconnecting to customer equipment.

- Configurable inputs and outputs - Four discrete inputs and two 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, UKCA 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.

Fault history - Provides a record of the most recent fault conditions with control hours time stamp. Up to 10 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)
- kVA (three phase and total)
- Frequency
- Engine data
- Starting battery voltage
- Engine speed
- Engine temperature
- Engine oil pressure
- Partial 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:
 - Engine speed governor adjustments
 - Voltage regulation adjustments
 - Cycle cranking
 - Configurable fault set up
 - Configurable output set up
 - Meter calibration
 - 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.

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

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.

Remote start mode - 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 wake up 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 three methods: magnetic pickup, battery charging alternator feedback or main alternator output frequency. The control also supports configurable glow plug control when applicable.

Cycle cranking - 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 line-to-line sensing voltage regulation system that is compatible with shunt or PMG excitation systems. The voltage regulation system is full wave rectified and has an SCR output for good motor starting capability. Major system features include:

Digital output voltage regulation - Capable of regulating output voltage to within +/-1.0% for any loads between no load and full load. Voltage drift will not exceed +/-1.5% for a 40 °C (104 °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.

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.

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 labelling the input.

Emergency stop

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

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.

Hydro mechanical fuel system engine protection

Overspeed shutdown - Default setting is 115% of nominal.

Low lube oil pressure warning/shutdown - Level is pre-set (configurable with InPower) to match the capabilities of the engine used. Control includes time delays to prevent nuisance alarms.

High lube oil temperature warning/shutdown - Level is pre-set (configurable with InPower) to match the capabilities of the engine used. Control includes time delays to prevent nuisance alarms.

High engine temperature warning/shutdown - Level is pre-set (configurable with InPower) to match the capabilities of the engine used. Control includes time delays to prevent nuisance alarms.

Low coolant temperature warning - Indicates that engine temperature may not be high enough for a 10 second start or proper load acceptance.

Sensor failure indication - Logic is provided on the base control to detect analog sensor or interconnecting wiring failures.

Full authority electronic engine protection

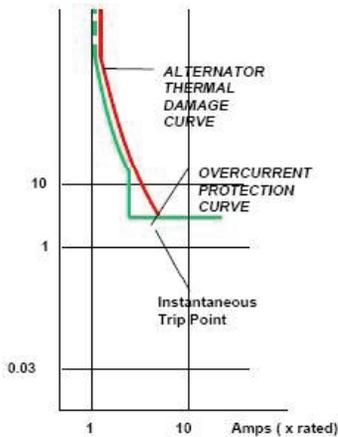
Engine fault detection is handled inside the engine ECM. Fault information is communicated via the SAE-J1939 data link for annunciation in the HMI

Alternator protection

High AC voltage shutdown (59) - Output voltage on any phase exceeds pre-set values. Time to trip is inversely proportional to amount above threshold. Values adjustable from 105-130% 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 pre-set value. Adjustable over a range of 50-95% of reference voltage, time delay 2-20 seconds. Default value is 85% for 10 seconds.

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



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

Over frequency shutdown/warning (81o) - 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, 10 seconds, enabled.

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

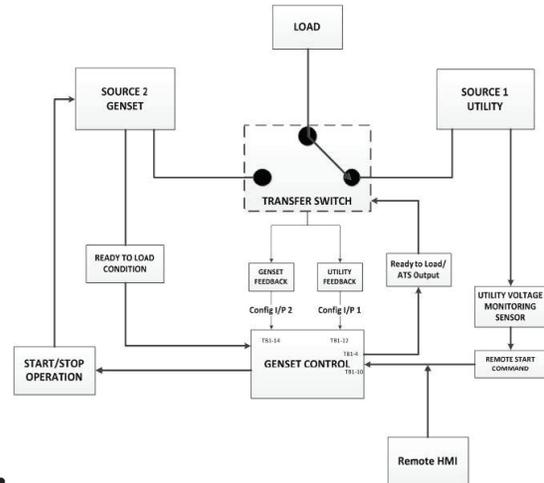
Field overload shutdown - Uses field voltage to shutdown generator set when a field overload condition occurs.

Advanced Functions

Automatic mains failure*

The built in AMF feature provides the automatic transfer and re-transfer of the load from utility to generator set and vice-versa.

- Automatically starts-stops the generator set in the event of utility failure.
- Annunciates faults.



- * A utility voltage monitoring sensor (as shown in the AMF diagram above) must be connected in order to use the AMF feature on the 1302 control. Use Schneider Electric Relay RSB1A120U7 and Socket RSZE1S35M.

Exerciser clock

The exerciser clock runs the generator set exerciser routines for dependability of operation.

Field Control Interface

Input signals to the base control include:

- Remote start
- Local and Emergency stop
- 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:

- Configurable relay outputs: Control includes (2) relay output contacts rated at 2 A. 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.

PowerCommand Human Machine Interface HMI211



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 generator set status LED lamps with both internationally accepted symbols and English text to comply with customer 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

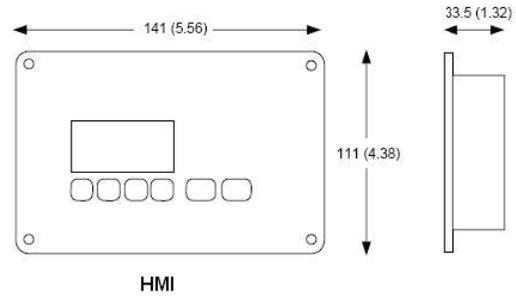
- LED indicating lamps:
 - Remote start
 - Not in auto
 - Shutdown
 - Warning
 - Auto
 - Run
- 128 x 64 pixels graphic LED backlight LCD.
- Four tactile feel membrane switches for LCD defined operation. The functions of these switches are defined dynamically on the LCD.
- Two tactile feel membrane switches dedicated for off and back.
- 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, UKCA and CSA standards.
- HMI 211RS provides convenience for residential use.

Communications Connections

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



Dimensions: mm (inches)

Software

InPower (beyond 6.0 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 (-40°F) to $+70^{\circ}\text{C}$ (158°F), and for storage from -55°C (-67°F) to $+80^{\circ}\text{C}$ (176°F). Control will operate with humidity up to 95%, non-condensing.

The HMI is designed for proper operation in ambient temperatures from -40°C^* (-40°F) to $+70^{\circ}\text{C}$ (158°F), and for storage from -40°C^* (-40°F) to $+80^{\circ}\text{C}$ (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.

* Heater accessory (pn: A040H853) is available for enhanced operation below -20°C

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 and UKCA marking: The control system is suitable for use on generator sets to be CE and UKCA-marked.
- EN 50081-1,2 residential/light industrial emissions or industrial emissions.
- EN 50082-1,2 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.
- PowerCommand control systems and generator sets are designed and manufactured in ISO 9001 certified facilities.
- 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.

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

Accessories

1301-1302 Upgrade Kit (HM)	0541-1431
PowerCommand 500 (LAN)	A040X126
Remote HMI 211	0541-1394
Remote HMI 211RS	A046K103
I/O Expansion (Aux 101)	0541-1291
HMI Heater Accessory Kit	A040H853

Parts Ordering Information

1302 Control Board	0327-1617-02
1302 control Board – Arrow	A043W505
Aux 104 (Governor Control)	0327-1507
HMI 211 Without Heater	0300-6014
HMI 211 with Heater	A026G237

Additional Resources

Resource	Where to find
1302 Service Manual	QSOL
Accessories Catalog	cumminspower.com
Additional Controls Information	PowerSuite Library



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

Our energy working for you.™





Alternator data sheet

Frame size: **UC3F**

Characteristics								
Weights:		Wound stator assembly:	337 lb	153 kg				
		Rotor assembly:	419 lb	190 kg				
		Complete alternator:	1175 lb	533 kg				
Maximum speed:			2250 rpm					
Excitation current:		Full load:	2 Amps					
		No load:	0.5 Amps					
Insulation system:		Class H throughout						
1 ∅ Ratings (1.0 power factor)		60 Hz			50 Hz			
(Based on specific temperature rise at 40 °C ambient temperature)		Double delta		4 lead	Double delta			
		<u>120/240</u>		<u>120/240</u>	<u>110-120</u>			
					<u>220-240</u>			
125 °C rise ratings	kW/kVA	109/109	135/135		96/96			
105 °C rise ratings	kW/kVA	98/98	125/125		87/87			
3 ∅ Ratings (0.8 power factor)		Upper broad range		LBR*	347/600	Broad range		
(Based on specified temperature rise at 40 °C ambient temperature)		<u>120/208</u>	<u>139/240</u>	<u>190-208</u>		<u>110/190</u>	<u>120/208</u>	<u>127/220</u>
		<u>240/416</u>	<u>277/480</u>	<u>380-416</u>	<u>347/600</u>	<u>220/380</u>	<u>240/415</u>	<u>254/440</u>
150 °C Rise ratings	kW	150	170	148	170	136	136	128
	kVA	188	213	185	213	170	170	160
125 °C Rise ratings	kW	145	165	144	165	128	128	120
	kVA	181	206	180	206	160	160	150
105 °C Rise ratings	kW	130	150	128	150	116	116	108
	kVA	163	188	160	188	145	145	135
80 °C Rise ratings	kW	112	128	110	128	101	101	94
	kVA	140	160	138	160	126	126	118
3 ∅ Reactances (per unit, ±10%)								
(Based on full load at 105 °C rise rating)								
Synchronous		2.21	1.92	1.68	1.97	2.04	1.71	1.42
Transient		0.18	0.15	0.14	0.16	0.17	0.15	0.12
Subtransient		0.13	0.11	0.09	0.10	0.12	0.10	0.09
Negative sequence		0.14	0.12	0.10	0.11	0.13	0.11	0.09
Zero sequence		0.08	0.07	0.07	0.07	0.08	0.07	0.06
3 ∅ Motor starting								
Maximum kVA	(Shunt)	516	516	516		367		
(90% sustained voltage)	(PMG)	607	607	607		458		
Time constants (Sec)								
Transient		0.035	0.035	0.035		0.035		
Subtransient		0.011	0.011	0.011		0.011		
Open circuit		0.900	0.900	0.900		0.900		
DC		0.009	0.009	0.009		0.009		



Alternator data sheet

Frame size: **UC3F**

Windings	(@ 20 °C)				
Stator resistance	(Line to Line, Ohms)	0.0480	0.0400	0.0700	0.0480
Rotor resistance	(Ohms)	0.0480	0.0400	0.0700	0.0480
Number of leads		12	12	6	12

* Lower broad range 110/190 thru 120/208, 220/380 thru 240/416.



Prototype Test Supported Emergency/Standby Generator Sets Certification

Cummins Power Generation certifies that its commercial generator sets bearing the Prototype Test Supported (PTS) seal have been subjected to a design and development process that includes extensive prototype testing and evaluation. A PTS production model is engineered and manufactured according to documentation developed through comprehensive research, design and design verification.

Design verification is based on tests of preproduction prototype models manufactured specifically for prototype test purposes and not sold as new equipment. To be certified as a PTS model, the generator set must satisfy these prerequisites:

DESIGN - The PTS certified generator set must be designed specifically for emergency/standby applications that require high reliability and rapid response.

PROTOYPE TESTING - Design suitability of the PTS certified generator set must be proven by tests on preproduction prototype models. The prototype test program is intended to:

1. Confirm the engine and generator have reserve capacity beyond rating to minimize the potential of damage or shutdown during steady state or transient loading conditions, including momentary overloads.
2. Demonstrate generator set, controls and accessories capability to perform reliably and compatibly in service during disturbances common in actual load circuits.
3. Verify the integrity of the generator and excitation system insulation systems and electrical components to withstand heating under rated load and transient overcurrent conditions.
4. Evaluate generator set mechanical and electrical strength to perform without damage during abnormal operating conditions, such as short circuits or out-of-phase paralleling. While operating at rated load, the generator set must be subjected to several 3-phase short circuits of 20 second duration. After the tests, the generator set is inspected to verify that no electrical or mechanical damage was incurred by any components.
5. Determine by endurance testing that no resonance conditions exist in the generator set or accessories that will cause premature failure of components on production units.
6. Investigate and identify failure modes to minimize the risk of any single component failure or human error that could lead to lack of essential electrical supply.
7. Provide a margin of safety, by actual trials, between the generator set component design and protection systems so that the components are not damaged before the protective devices activate a shutdown.

DOCUMENTATION AND SOFTWARE - The PTS certified generator set must be documented in a single drawing package with all components identified with Cummins Power Generation part numbers. A PTS test certificate must be created for each PTS generator set certifying the PTS testing performed.

QUALITY ASSURANCE - Engineering drawings, specifications and test requirements for a PTS certified generator set must be classified by components and assembly quality characteristics. A component and process inspection and test plan must be developed and maintained to measure product conformance to documentation requirements.

PRODUCTION MODEL TESTING - PTS certified generator sets must be subjected to complete production tests that demonstrate conformance to specifications at all rated conditions, including start-up, full load pickup and a performance run at full rated load and power factor.



Prototype Test Support (PTS) 60 Hz test summary



<u>Generator set models</u>	<u>Representative prototype</u>
C70 N6 C80 N6	Model: C100 N6 Alternator: UC274D Engine: QSJ5.9G

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: 105.7 kW

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

Maximum motor starting: 130 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.

Alternator temperature rise:

The highest rated temperature rise (120 °C) test results are reported as follows to verify that worst case temperature rises do not exceed allowable NEMA MG1 limits for class H insulation. Tests were conducted per IEEE 115, rise by resistance and embedded detector, with the rated voltages. Only the highest temperatures are reported.

<u>Location</u>	<u>Maximum rise (°C)</u>
Alternator stator	75
Alternator rotor	95
Exciter stator	N/A
Exciter rotor	N/A

Torsional analysis and testing:

The generator set was tested to verify that the design is not subjected to harmful torsional stresses. A spectrum analysis of the transducer output was conducted over the speed range of 1650 to 1950 RPM.

Cooling system: 50 °C ambient
0.5 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 static restriction conditions.

Durability:

The generator set was subjected to a minimum 100 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 if the steady state operating performance was within the specified maximum limits.

Voltage regulation:	± 1%
Random voltage variation:	± 1%
Frequency regulation:	± 0.25%
Random frequency variation:	± 0.25%

Transient performance:

The generator set was tested to verify single step loading capability as required by NFPA 110 and verify acceptable voltage and frequency response on load addition or rejection. The following results were recorded at 0.8 power factor:

Full load acceptance:

Voltage dip:	35.3%
Recovery time:	5.2 seconds
Frequency dip:	19.5%
Recovery time:	8.4 seconds

Full load rejection:

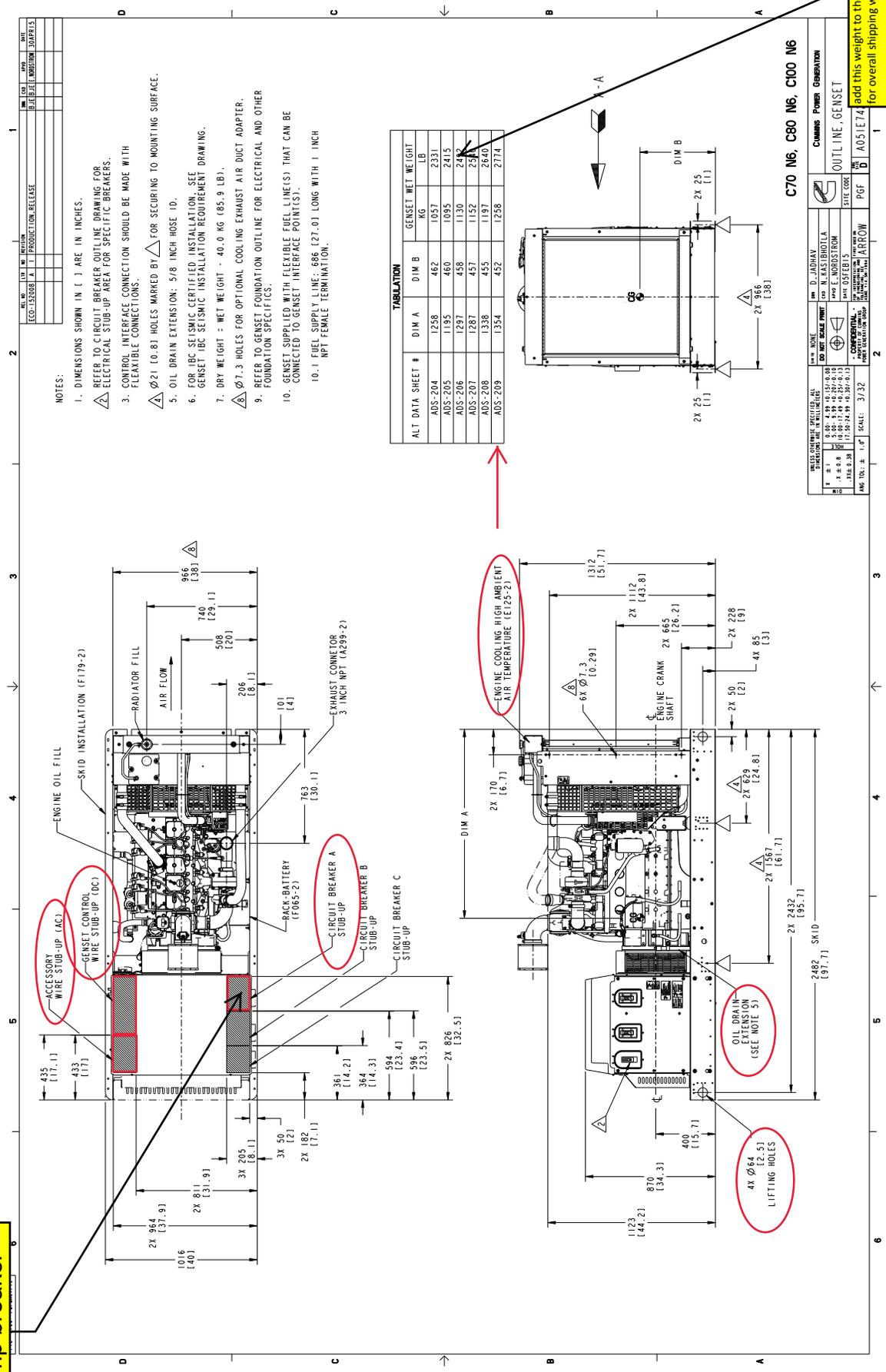
Voltage rise:	24.7%
Recovery time:	3.3 seconds
Frequency rise:	13.4%
Recovery time:	6.4 seconds

Harmonic analysis:

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

Harmonic	<u>Line to Line</u>		<u>Line to Neutral</u>	
	<u>No load</u>	<u>Full load</u>	<u>No load</u>	<u>Full load</u>
3	0.04	0.15	0.15	0.15
5	0.2	0.2	0.2	0.2
7	0.6	0.6	0.6	0.6
9	0.02	0.04	0.04	0.04
11	0.52	0.52	0.52	0.52
13	0.26	0.26	0.26	0.26
15	0.0	0.0	0.0	0.0

400 amp breaker



- NOTES:
1. DIMENSIONS SHOWN IN () ARE IN INCHES.
 2. REFER TO CIRCUIT BREAKER OUTLINE DRAWING FOR ELECTRICAL STUB-UP AREA FOR SPECIFIC BREAKERS.
 3. CONTROL INTERFACE CONNECTION SHOULD BE MADE WITH FLEXIBLE CONNECTIONS.
 4. Ø21 (0.81) HOLES MARKED BY Δ FOR SECURING TO MOUNTING SURFACE.
 5. OIL DRAIN EXTENSION: 5/8 INCH HOSE ID.
 6. FOR IBC SEISMIC CERTIFIED INSTALLATION, SEE GENSET IBC SEISMIC INSTALLATION REQUIREMENT DRAWING.
 7. DRY WEIGHT = NET WEIGHT - 40.0 KG (85.9 LB).
 8. Ø7.3 HOLES FOR OPTIONAL COOLING EXHAUST AIR DUCT ADAPTER.
 9. REFER TO GENSET FOUNDATION OUTLINE FOR ELECTRICAL AND OTHER FOUNDATION SPECIFICS.
 10. GENSET SUPPLIED WITH FLEXIBLE FUEL LINE(S) THAT CAN BE CONNECTED TO GENSET INTERFACE POINT(S).
10.1 FUEL SUPPLY LINE: 666 (27.0) LONG WITH 1 INCH NPT FEMALE TERMINATION.

TABULATION

ALT DATA SHEET #	DIM A	DIM B	GENSET WET WEIGHT
			KG
ADS-204	1258	462	057
ADS-205	1195	460	095
ADS-206	1297	458	1130
ADS-207	1287	457	1152
ADS-208	1338	455	1197
ADS-209	1354	452	1258
			2774

C70 N6, C80 N6, C100 N6

Cummins Power Generation	
OUTLINE GENSET STATE CODE:	PGF: B A051E742
ADD THIS WEIGHT TO THE ENCLOSURE WEIGHT FOR OVERALL SHIPPING WEIGHT.	USE THE ENCLOSURE DRAWING FOR OVERALL SHIPPING DIMENSIONS.

Drawing Name: A051E742 Revision: A
 Part Name: A051E742 Revision: A
 Sheet 1 of 3

Pi® Corp. Parametric

REV. NO.	DATE	BY	CHKD.	DESCRIPTION
ECO-155008 A				PRODUCTION RELEASE

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D

C

B

A

1

2

3

4

5

6

D

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6

D



Data Sheet

Circuit Breakers

Description

This Data sheet provides circuit breaker manufacturer part numbers and specifications. The Circuit breaker box description is the rating of that breaker box installation on a Cummins Generator. Please refer to the website of the circuit breaker manufacturer for breaker specific ratings and technical information.

Applicable Models

Engine	Models					
Kubota	C10D6	C15D6	C20D6			
QSJ2.4	C20N6	C25N6	C30N6	C30N6H	C36N6	C36N6H
	C40N6	C40N6H	C50N6H	C60N6H		
B3.3	C25D6	C30D6	C35D6	C40D6	C50D6	C60D6
QSJ5.9G	C45N6	C50N6	C60N6	C70N6	C80N6	C100N6
QSJ8.9G	C125N6	C150N6				
QSB5	DSFAC	DSFAD	DSFAE	C50D6C	C60D6C	C80D6C
	C100D6C	C125D6C				
QSB7	DSGAA	DSGAB	DSGAC	DSGAD	DSGAE	
		C125D6D	C150D6D	C175D6D	C200D6D	
QSL9	DSHAD	DQDAA	DQDAB	DQDAC		
QSM11	DQHAB					
QSX15	DFEJ	DFEK				

Instructions

1. Locate the circuit breaker feature code or part number and use the charts below to find the corresponding manufacturer circuit breaker catalog number.
2. Use the first letter of the circuit breaker catalog number to determine the "frame" of the breaker. If the first letter is an "N", use the second letter. Then follow the corresponding website link from the table below to find the breaker catalog number description.

Please refer to the catalog numbering systems page, which is given in the chart, to understand the nomenclature of the catalog number.

Frame	Catalog name*	Catalog number description page(s)
P	0612CT0101 http://www.schneider-electric.us/en/download/document/0612CT0101/	16-17
H, J, and L	0611CT1001 http://www.schneider-electric.us/en/download/document/0611CT1001/	8-9
Q	0734CT0201 http://www.schneider-electric.us/en/download/document/0734CT0201/	4

*The following link may also be used to search specifically by the breaker part number or for the catalog name listed above. <http://products.schneider-electric.us/technical-library/>

3. Search the catalog by using the first 3 letters of the breaker catalog number and the first 5 numbers to find information such as trip curves, accessories, and dimensional details regarding the circuit breaker.

*If the catalog number starts with "N", skip the N and begin your search with the second letter.

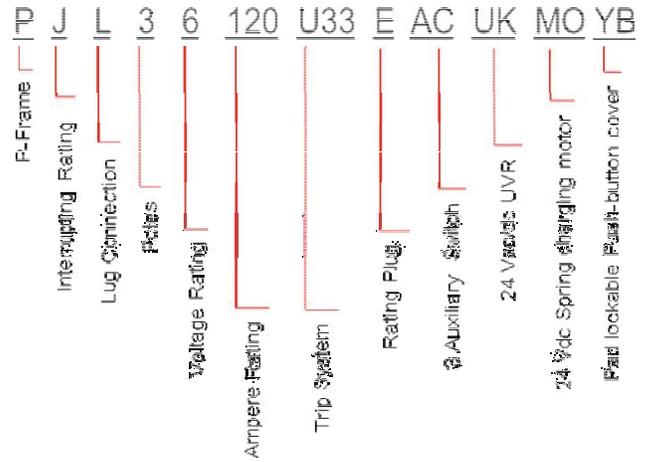
*If the first 3 letters are "PJP," the search will not work. You will need to start with just "PJ" and use the description pages to obtain the information you are looking for on the "PJP."

Example

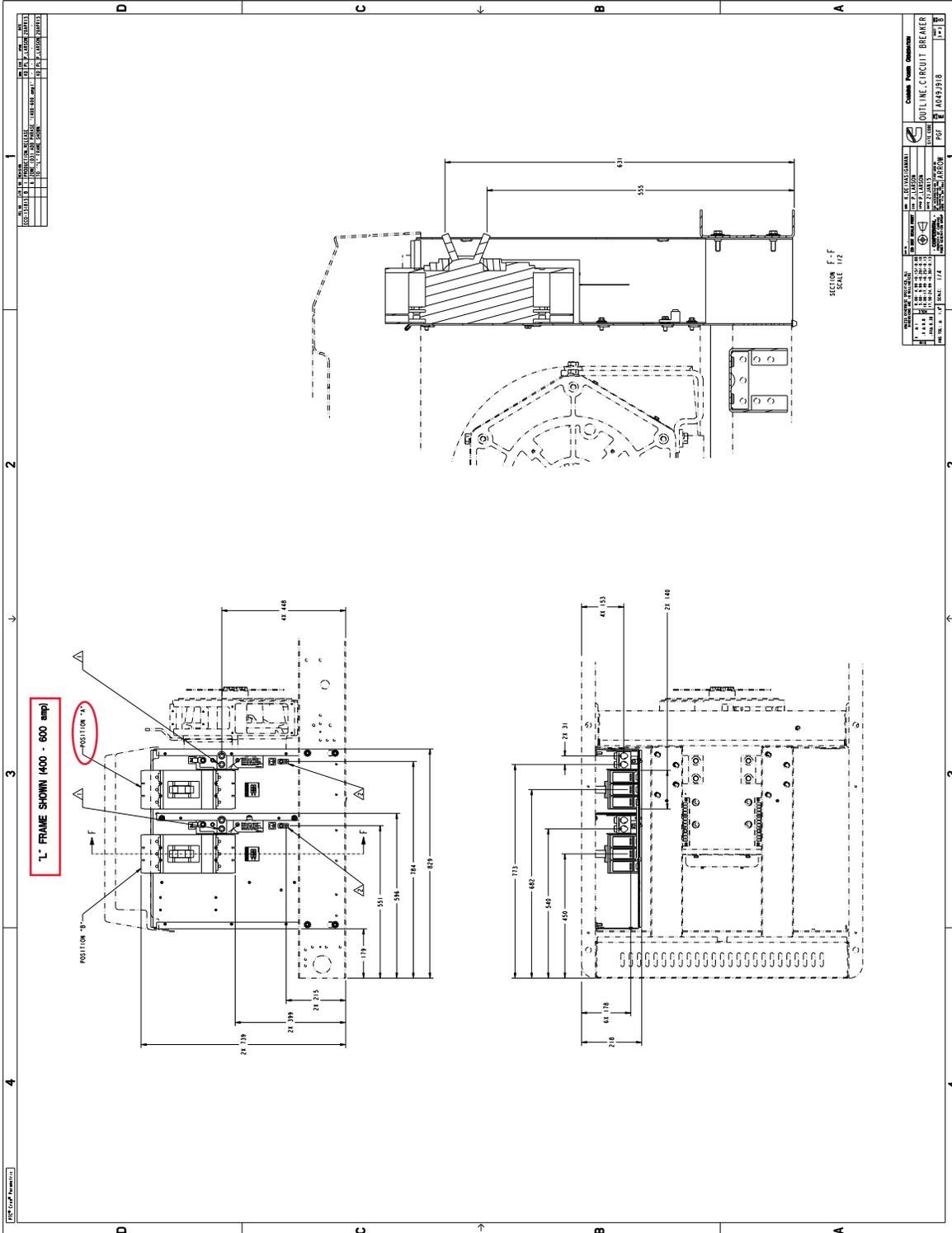
After finding your circuit breaker catalog number to be "PJL36120U33EACUKMOYB," navigate to the P-frame catalog by using the link provided.

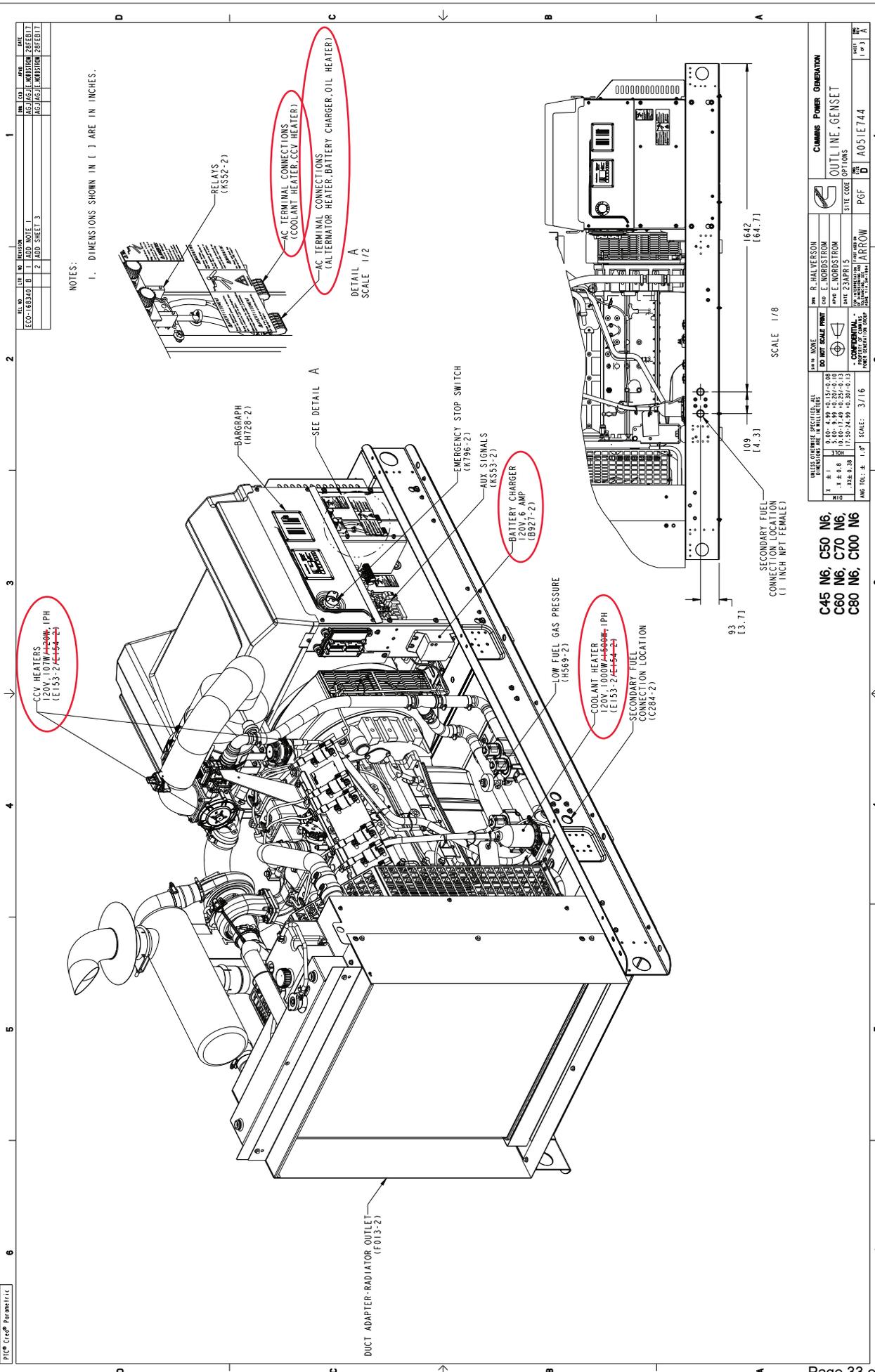
Look at pages 16-17 of the pdf catalog to find the nomenclature of the breaker.

Search the P-frame spec sheet using the search "PJL36120."



Feature Code	Breaker Box Description	Cummins Part #	Manufacturer	Breaker Catalog Number	Trip Unit	Plug Type
KX27-2	CB, Loc B, 70A-250A, 3P, LSI, 600VAC, 80%, UL	A050J727	Schneider Electric	JDL36250CU33X	MicroLogic 3.2S	N/A
KX28-2	CB, Loc B, 70A-250A, 3P, LSI, 600VAC, 100%, UL	A050J727	Schneider Electric	JDL36250CU33X	MicroLogic 3.2S	N/A
KX29-2	CB, Loc C, 70A-250A, 3P, LSI, 600VAC, 100%, UL	A050J727	Schneider Electric	JDL36250CU33X	MicroLogic 3.2S	N/A
KX30-2	CB, Loc A, 125A-400A, 3P, LSI, 600VAC, 100%, UL	A051D115	Schneider Electric	LGL36400CU33X	MicroLogic 3.3S	N/A
KX31-2	CB, Loc B, 125A-400A, 3P, LSI, 600VAC, 100%, UL	A051D115	Schneider Electric	LGL36400CU33X	MicroLogic 3.3S	N/A
KX32-2	CB, Loc A, 200A-600A, 3P, LSI, 600VAC, 80%, UL	A044T468	Schneider Electric	NLGL36600U33X-600A	MicroLogic 3.3S	N/A
KX33-2	CB, Loc B, 200A-600A, 3P, LSI, 600VAC, 80%, UL	A044T468	Schneider Electric	NLGL36600U33X-600A	MicroLogic 3.3S	N/A
KX34-2	CB, Loc C, 15A, 3P, 600VAC, 80%, UL	A043L506	Schneider Electric	HDL36015	Thermal Magnetic	N/A
KX35-2	CB, Loc C, 20A, 3P, 600VAC, 80%, UL	A043L480	Schneider Electric	HDL36020	Thermal Magnetic	N/A
KX36-2	CB, Loc C, 25A, 3P, 600VAC, 80%, UL	A043L508	Schneider Electric	HDL36025	Thermal Magnetic	N/A
KX37-2	CB, Loc C, 30A, 3P, 600VAC, 80%, UL	A043L475	Schneider Electric	HDL36030	Thermal Magnetic	N/A
KX38-2	CB, Loc C, 40A, 3P, 600VAC, 80%, UL	A043L464	Schneider Electric	HDL36040	Thermal Magnetic	N/A
KX39-2	CB, Loc C, 50A, 3P, 600VAC, 80%, UL	A043L461	Schneider Electric	HDL36050	Thermal Magnetic	N/A
KX40-2	CB, Loc C, 60A, 3P, 600VAC, 80%, UL	A043L459	Schneider Electric	HDL36060	Thermal Magnetic	N/A
KX41-2	CB, Loc C, 70A, 3P, 600VAC, 80%, UL	A043L451	Schneider Electric	HDL36070	Thermal Magnetic	N/A
KX42-2	CB, Loc C, 80A, 3P, 600VAC, 80%, UL	A043L012	Schneider Electric	HDL36080	Thermal Magnetic	N/A





NOTES:
1. DIMENSIONS SHOWN IN () ARE IN INCHES.

REV	DATE	BY	CHKD	DESCRIPTION
1	08/11/00	WJ	WJ	REVISED TO ADD SERIAL NUMBER
2	08/11/00	WJ	WJ	REVISED TO ADD SERIAL NUMBER
3	08/11/00	WJ	WJ	REVISED TO ADD SERIAL NUMBER

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS
1. 0.00-4.99 +0.15/-0.08
2. 5.00-9.99 +0.20/-0.13
3. 10.00-14.99 +0.25/-0.13
4. 15.00-24.99 +0.30/-0.13
5. 25.00-49.99 +0.35/-0.13
6. 50.00-99.99 +0.40/-0.13
7. 100.00-149.99 +0.45/-0.13
8. 150.00-249.99 +0.50/-0.13
9. 250.00-499.99 +0.55/-0.13
10. 500.00-999.99 +0.60/-0.13
11. 1000.00-1499.99 +0.65/-0.13
12. 1500.00-2499.99 +0.70/-0.13
13. 2500.00-4999.99 +0.75/-0.13
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99. 10000000000000000000000000.00-14999999999999999999999999.99 +5.05/-0.13
100. 15000000000000000000000000.00-24999999999999999999999999.99 +5.10/-0.13

C45 N6, C50 N6, C60 N6, C70 N6, C80 N6, C100 N6

DESIGNER	DATE	BY	CHKD	DESCRIPTION
P. HALVORSON	08/11/00	WJ	WJ	REVISED TO ADD SERIAL NUMBER
E. ANDERSON	08/11/00	WJ	WJ	REVISED TO ADD SERIAL NUMBER
E. ANDERSON	08/11/00	WJ	WJ	REVISED TO ADD SERIAL NUMBER
Z. ANDERSON	08/11/00	WJ	WJ	REVISED TO ADD SERIAL NUMBER

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS
1. 0.00-4.99 +0.15/-0.08
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84. 1500000000000000000000.00-2499999999999999999999.99 +4.30/-0.13
85. 2500000000000000000000.00-4999999999999999999999.99 +4.35/-0.13
86. 5000000000000000000000.00-99999999999



Sound pressure level @ 7 meters, dB(A)

See notes 1-6 listed below

Configuration		Position (note 1)								Position average
		1	2	3	4	5	6	7	8	
Standard – unhoused	Infinite exhaust	75.5	79.9	79.3	81.5	76.8	81.7	79.7	79.9	79.7
F216-2 weather protective enclosure, aluminium	Mounted	77.4	81.3	80.4	83.4	79.3	83	80.5	80.6	81.1
F231-2 sound attenuated level 1 enclosure, aluminium	Mounted	75.7	74.8	70.5	72.6	72.5	72.6	70.3	75	73.4
F217-2 sound attenuated level 2 enclosure, aluminium	Mounted	71	71.8	69.9	71.5	71.3	70.9	68.9	71.7	71

Sound power level, dB(A)

See notes 2-4, 7 and 8 listed below

Configuration		Octave band center frequency (Hz)									Overall sound power level
		31.5	63	125	250	500	1000	2000	4000	8000	
Standard – unhoused	Infinite exhaust	55.4	71.6	82.7	91.4	99.8	102.0	101.6	98.0	93.9	107.1
F216-2 weather protective enclosure, aluminium	Mounted	57.2	89.7	96.8	94.6	100.5	101.3	100.5	97.9	95.3	107.4
F231-2 sound attenuated level 1 enclosure, aluminium	Mounted	59.1	73.8	83.3	89.9	95.6	96.8	95.5	92.0	87.9	101.9
F217-2 sound attenuated level 2 enclosure, aluminium	Mounted	61.7	73.8	83.4	88.9	94.3	92.7	91.1	87.6	83.9	98.9

Exhaust sound power level, dB(A)

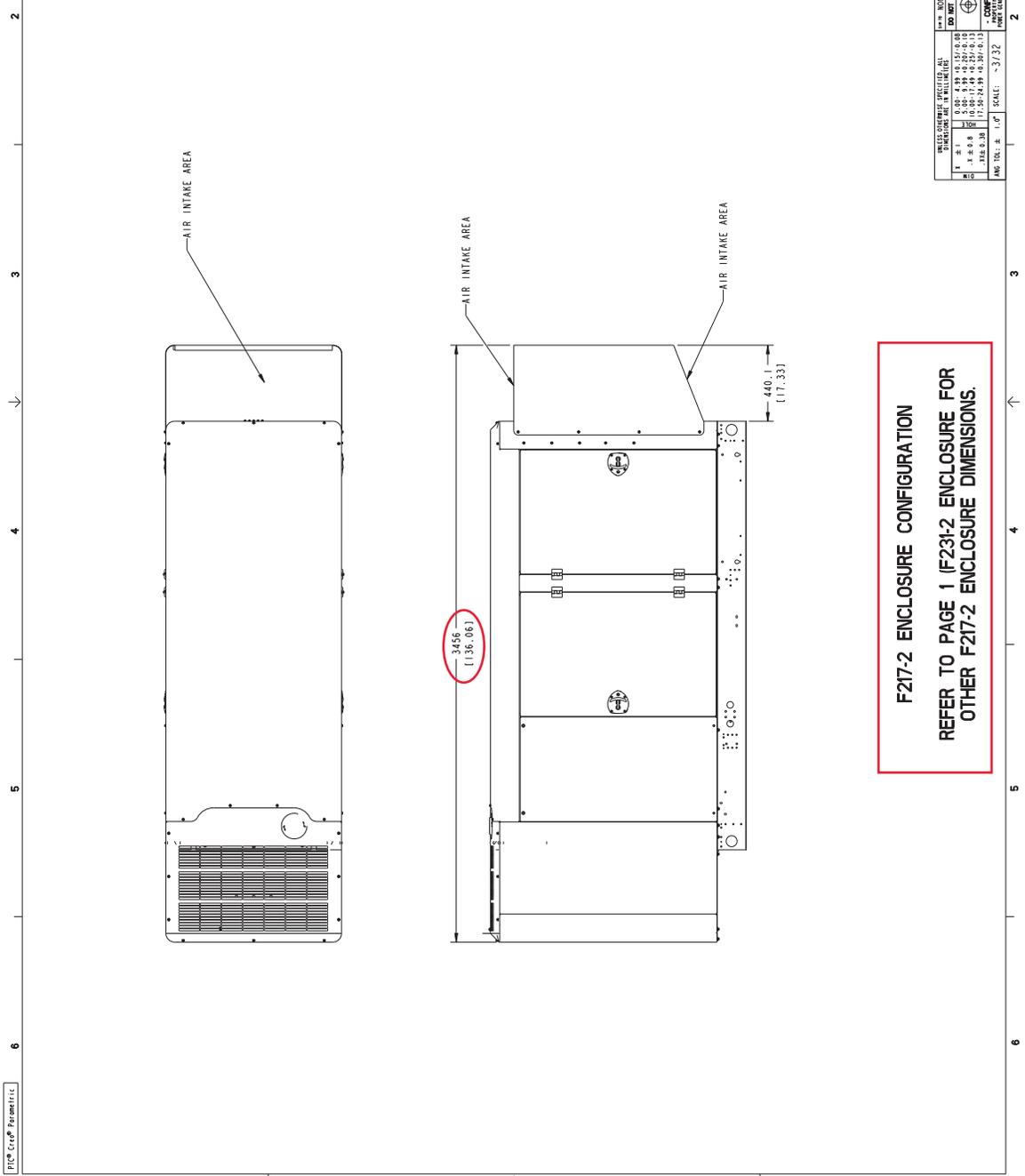
See note 2 and 9 listed below

Open exhaust (no muffler) @ rated load	Octave band center frequency (Hz)									Overall sound power level
	31.5	63	125	250	500	1000	2000	4000	8000	
	41.3	79.8	88.1	87.4	98.0	96.9	97.3	99.6	99.4	105.6

Note:

1. Position 1 faces the generator front per ISO 8528-10. 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.
2. Sound levels are subject to instrumentation, measurement, installation and manufacturing variability.
3. Data based on full rated load.
4. Sound data for generator set with infinite exhaust do not include exhaust noise.
5. Sound pressure levels are measured per ANSI S1.13 and ANSI S12.18, as applicable.
6. Reference sound pressure is 20 µPa.
7. Sound power levels per ISO 3744 and ISO 8528-10, as applicable.
8. Reference power = 1 pw (10⁻¹² W).
9. Exhaust sound power levels are per ISO 6798, as applicable.

REV. NO.	DATE	BY	CHKD.	DATE
ECO-155551 A				
ECO-155551 A - PRODUCTION RELEASE				
ECO-155551 A				
ECO-155551 A				



**F217-2 ENCLOSURE CONFIGURATION
REFER TO PAGE 1 (F231-2 ENCLOSURE FOR
OTHER F217-2 ENCLOSURE DIMENSIONS.**

SCALE	1:1	0.00-4.99	0.127-0.08
SCALE	2:1	5.00-9.99	0.127-0.127
SCALE	3:1	10.00-14.99	0.254-0.127
SCALE	4:1	15.00-19.99	0.381-0.127
SCALE	5:1	20.00-24.99	0.508-0.127
SCALE	6:1	25.00-29.99	0.635-0.127
SCALE	7:1	30.00-34.99	0.762-0.127
SCALE	8:1	35.00-39.99	0.889-0.127
SCALE	9:1	40.00-44.99	1.016-0.127
SCALE	10:1	45.00-49.99	1.143-0.127
SCALE	11:1	50.00-54.99	1.270-0.127
SCALE	12:1	55.00-59.99	1.397-0.127
SCALE	13:1	60.00-64.99	1.524-0.127
SCALE	14:1	65.00-69.99	1.651-0.127
SCALE	15:1	70.00-74.99	1.778-0.127
SCALE	16:1	75.00-79.99	1.905-0.127
SCALE	17:1	80.00-84.99	2.032-0.127
SCALE	18:1	85.00-89.99	2.159-0.127
SCALE	19:1	90.00-94.99	2.286-0.127
SCALE	20:1	95.00-99.99	2.413-0.127
SCALE	21:1	100.00-104.99	2.540-0.127
SCALE	22:1	105.00-109.99	2.667-0.127
SCALE	23:1	110.00-114.99	2.794-0.127
SCALE	24:1	115.00-119.99	2.921-0.127
SCALE	25:1	120.00-124.99	3.048-0.127
SCALE	26:1	125.00-129.99	3.175-0.127
SCALE	27:1	130.00-134.99	3.302-0.127
SCALE	28:1	135.00-139.99	3.429-0.127
SCALE	29:1	140.00-144.99	3.556-0.127
SCALE	30:1	145.00-149.99	3.683-0.127
SCALE	31:1	150.00-154.99	3.810-0.127
SCALE	32:1	155.00-159.99	3.937-0.127
SCALE	33:1	160.00-164.99	4.064-0.127
SCALE	34:1	165.00-169.99	4.191-0.127
SCALE	35:1	170.00-174.99	4.318-0.127
SCALE	36:1	175.00-179.99	4.445-0.127
SCALE	37:1	180.00-184.99	4.572-0.127
SCALE	38:1	185.00-189.99	4.699-0.127
SCALE	39:1	190.00-194.99	4.826-0.127
SCALE	40:1	195.00-199.99	4.953-0.127
SCALE	41:1	200.00-204.99	5.080-0.127
SCALE	42:1	205.00-209.99	5.207-0.127
SCALE	43:1	210.00-214.99	5.334-0.127
SCALE	44:1	215.00-219.99	5.461-0.127
SCALE	45:1	220.00-224.99	5.588-0.127
SCALE	46:1	225.00-229.99	5.715-0.127
SCALE	47:1	230.00-234.99	5.842-0.127
SCALE	48:1	235.00-239.99	5.969-0.127
SCALE	49:1	240.00-244.99	6.096-0.127
SCALE	50:1	245.00-249.99	6.223-0.127
SCALE	51:1	250.00-254.99	6.350-0.127
SCALE	52:1	255.00-259.99	6.477-0.127
SCALE	53:1	260.00-264.99	6.604-0.127
SCALE	54:1	265.00-269.99	6.731-0.127
SCALE	55:1	270.00-274.99	6.858-0.127
SCALE	56:1	275.00-279.99	6.985-0.127
SCALE	57:1	280.00-284.99	7.112-0.127
SCALE	58:1	285.00-289.99	7.239-0.127
SCALE	59:1	290.00-294.99	7.366-0.127
SCALE	60:1	295.00-299.99	7.493-0.127
SCALE	61:1	300.00-304.99	7.620-0.127
SCALE	62:1	305.00-309.99	7.747-0.127
SCALE	63:1	310.00-314.99	7.874-0.127
SCALE	64:1	315.00-319.99	8.001-0.127
SCALE	65:1	320.00-324.99	8.128-0.127
SCALE	66:1	325.00-329.99	8.255-0.127
SCALE	67:1	330.00-334.99	8.382-0.127
SCALE	68:1	335.00-339.99	8.509-0.127
SCALE	69:1	340.00-344.99	8.636-0.127
SCALE	70:1	345.00-349.99	8.763-0.127
SCALE	71:1	350.00-354.99	8.890-0.127
SCALE	72:1	355.00-359.99	9.017-0.127
SCALE	73:1	360.00-364.99	9.144-0.127
SCALE	74:1	365.00-369.99	9.271-0.127
SCALE	75:1	370.00-374.99	9.398-0.127
SCALE	76:1	375.00-379.99	9.525-0.127
SCALE	77:1	380.00-384.99	9.652-0.127
SCALE	78:1	385.00-389.99	9.779-0.127
SCALE	79:1	390.00-394.99	9.906-0.127
SCALE	80:1	395.00-399.99	10.033-0.127
SCALE	81:1	400.00-404.99	10.160-0.127
SCALE	82:1	405.00-409.99	10.287-0.127
SCALE	83:1	410.00-414.99	10.414-0.127
SCALE	84:1	415.00-419.99	10.541-0.127
SCALE	85:1	420.00-424.99	10.668-0.127
SCALE	86:1	425.00-429.99	10.795-0.127
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SCALE	88:1	435.00-439.99	11.049-0.127
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SCALE	90:1	445.00-449.99	11.303-0.127
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SCALE	92:1	455.00-459.99	11.557-0.127
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SCALE	94:1	465.00-469.99	11.811-0.127
SCALE	95:1	470.00-474.99	11.938-0.127
SCALE	96:1	475.00-479.99	12.065-0.127
SCALE	97:1	480.00-484.99	12.192-0.127
SCALE	98:1	485.00-489.99	12.319-0.127
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SCALE	100:1	495.00-499.99	12.573-0.127
SCALE	101:1	500.00-504.99	12.700-0.127
SCALE	102:1	505.00-509.99	12.827-0.127
SCALE	103:1	510.00-514.99	12.954-0.127
SCALE	104:1	515.00-519.99	13.081-0.127
SCALE	105:1	520.00-524.99	13.208-0.127
SCALE	106:1	525.00-529.99	13.335-0.127
SCALE	107:1	530.00-534.99	13.462-0.127
SCALE	108:1	535.00-539.99	13.589-0.127
SCALE	109:1	540.00-544.99	13.716-0.127
SCALE	110:1	545.00-549.99	13.843-0.127
SCALE	111:1	550.00-554.99	13.970-0.127
SCALE	112:1	555.00-559.99	14.097-0.127
SCALE	113:1	560.00-564.99	14.224-0.127
SCALE	114:1	565.00-569.99	14.351-0.127
SCALE	115:1	570.00-574.99	14.478-0.127
SCALE	116:1	575.00-579.99	14.605-0.127
SCALE	117:1	580.00-584.99	14.732-0.127
SCALE	118:1	585.00-589.99	14.859-0.127
SCALE	119:1	590.00-594.99	14.986-0.127
SCALE	120:1	595.00-599.99	15.113-0.127
SCALE	121:1	600.00-604.99	15.240-0.127
SCALE	122:1	605.00-609.99	15.367-0.127
SCALE	123:1	610.00-614.99	15.494-0.127
SCALE	124:1	615.00-619.99	15.621-0.127
SCALE	125:1	620.00-624.99	15.748-0.127
SCALE	126:1	625.00-629.99	15.875-0.127
SCALE	127:1	630.00-634.99	16.002-0.127
SCALE	128:1	635.00-639.99	16.129-0.127
SCALE	129:1	640.00-644.99	16.256-0.127
SCALE	130:1	645.00-649.99	16.383-0.127
SCALE	131:1	650.00-654.99	16.510-0.127
SCALE	132:1	655.00-659.99	16.637-0.127
SCALE	133:1	660.00-664.99	16.764-0.127
SCALE	134:1	665.00-669.99	16.891-0.127
SCALE	135:1	670.00-674.99	17.018-0.127
SCALE	136:1	675.00-679.99	17.145-0.127
SCALE	137:1	680.00-684.99	17.272-0.127
SCALE	138:1	685.00-689.99	17.399-0.127
SCALE	139:1	690.00-694.99	17.526-0.127
SCALE	140:1	695.00-699.99	17.653-0.127
SCALE	141:1	700.00-704.99	17.780-0.127
SCALE	142:1	705.00-709.99	17.907-0.127
SCALE	143:1	710.00-714.99	18.034-0.127
SCALE	144:1	715.00-719.99	18.161-0.127
SCALE	145:1	720.00-724.99	18.288-0.127
SCALE	146:1	725.00-729.99	18.415-0.127
SCALE	147:1	730.00-734.99	18.542-0.127
SCALE	148:1	735.00-739.99	18.669-0.127
SCALE	149:1	740.00-744.99	18.796-0.127
SCALE	150:1	745.00-749.99	18.923-0.127
SCALE	151:1	750.00-754.99	19.050-0.127
SCALE	152:1	755.00-759.99	19.177-0.127
SCALE	153:1	760.00-764.99	19.304-0.127
SCALE	154:1	765.00-769.99	19.431-0.127
SCALE	155:1	770.00-774.99	19.558-0.127
SCALE	156:1	775.00-779.99	19.685-0.127
SCALE	157:1	780.00-784.99	19.812-0.127
SCALE	158:1	785.00-789.99	19.939-0.127
SCALE	159:1	790.00-794.99	20.066-0.127
SCALE	160:1	795.00-799.99	20.193-0.127
SCALE	161:1	800.00-804.99	20.320-0.127
SCALE	162:1	805.00-809.99	20.447-0.127
SCALE	163:1	810.00-814.99	20.574-0.127
SCALE	164:1	815.00-819.99	20.701-0.127
SCALE	165:1	820.00-824.99	20.828-0.127
SCALE	166:1	825.00-829.99	20.955-0.127
SCALE	167:1	830.00-834.99	21.082-0.127
SCALE	168:1	835.00-839.99	21.209-0.127
SCALE	169:1	840.00-844.99	21.336-0.127
SCALE	170:1	845.00-849.99	21.463-0.127
SCALE	171:1	850.00-854.99	21.590-0.127
SCALE	172:1	855.00-859.99	21.717-0.127
SCALE	173:1	860.00-864.99	21.844-0.127
SCALE	174:1	865.00-869.99	21.971-0.127
SCALE	175:1	870.00-874.99	22.098-0.127
SCALE	176:1	875.00-879.99	22.225-0.127
SCALE	177:1	880.00-884.99	22.352-0.127
SCALE	178:1	885.00-889.99	22.479-0.127
SCALE	179:1	890.00-894.99	22.606-0.127
SCALE	180:1	895.00-899.99	22.733-0.127
SCALE	181:1	900.00-904.99	22.860-0.127
SCALE	182:1	905.00-909.99	22.987-0.127
SCALE	183:1	910.00-914.99	23.114-0.127
SCALE	184:1	915.00-919.99	23.241-0.127
SCALE	185:1	920.00-924.99	23.368-0.127
SCALE	186:1	925.00-929.99	23.495-0.127
SCALE	187:1	930.00-934.99	23.622-0.127
SCALE	188:1	935.00-939.99	23.749-0.127
SCALE	189:1	940.00-944.99	23.876-0.127
SCALE	190:1	945.00-949.99	24.003-0.127
SCALE	191:1	950.00-954.99	24.130-0.127
SCALE	192:1	955.00-959.99	24.257-0.127
SCALE	193:1	960.00-964.99	24.384-0.127
SCALE	194:1	965.	



Battery charger-6 amp

A045D925 60Hz/50Hz



Description

Cummins Power Generation fully automatic battery chargers are designed to both recharge your batteries, and extend your battery's life in applications where it is stored for long periods of time. This charger can handle poor power quality, exposure to extreme weather and rough handling.

To maximize battery life, a 3-stage charging cycle is implemented. The three charging stages are bulk stage, absorption stage and maintenance stage. During the bulk stage, the charger uses its full amp output to do the heaviest charging, quickly bringing your battery to about 75% of capacity. In the absorption stage, the current slows, adjusting for maximum charging efficiency while it gently tops off the battery to about 98% of capacity.

During the maintenance stage, a lower, closely-regulated, constant voltage is applied to maintain full charge and prevent discharge.

Unlike some "trickle chargers," the float charger won't apply more current than necessary to maintain full charge. Batteries can be connected indefinitely, without harm; in fact, the float charge extends battery life.

Features

Protection – Surge protected to IEEE and EN standards. All models include single pole cartridge type fuses mounted on the printed circuit board to protect against input or output overcurrent.

Lightweight and silent – Lighter than transformer types, completely silent but still provides full output when overloaded outlets drop AC voltage below the normal 115V.

Monitoring – Status LED indicators are provided to show the condition or charging status of the battery. When the red LED is on, it indicates that the battery is discharged and is recharging at the 'BULK' rate. When both the red and green LEDs are on, the battery is charging at the 'midrange' rate. When the green LED is on, the battery is 90% charged and ready for use.

Construction – Made using epoxy-potted cases making it the ultimate in durability, completely waterproof and able to withstand numerous caustic chemicals and gases, as well as being shockproof.

Fault Indication – The charger senses and indicates the following fault conditions: Defective or damaged cells, under-voltage at the battery, battery drawing more current than charger can replace, loss of power or extremely low AC voltage at the charger, other battery fault conditions and charger failure.

Compatibility – Works with Sealed Lead Acid (SLA), Absorbed Glass Mat (AGM) and Gel type batteries.

Low Electromagnetic and Radio

Frequency Interference – This product meets FCC class B for conducted and radiated emissions.

Listed – This product is UL listed according to the UL 1236 Standard.

Warranty – This product has a two year warranty

Specifications

Performance and physical characteristics

Output:	Nominal voltage	12 VDC
	Float voltage – 12 V batteries	13.0-13.6 VDC at 0-2 amps
	Maximum output current	6 A @ 12 VDC nom
Input:	Voltage AC	115, 208, 240 ±10%, 90-135
	Frequency	60 Hz ±5%
Battery:	Maximum battery size	150 Amp Hours
	Maximum recharge time	20 hours
Approximate net weight:		4 lbs. (1.81 Kg)
Approximate dimensions: height x width x depth-in(mm)		2.25 x 6.4 x 3.5 (57 x 162 x 89)
Ambient temperature operation: At full rated output		- 40°F to 158 °F (-40 °C to 70 °C)



Americas

1400 73rd Avenue N.E.
Minneapolis, MN 55432 USA
Phone: 763 574 5000
Fax: 763 574 5298

Europe, CIS, Middle East and Africa

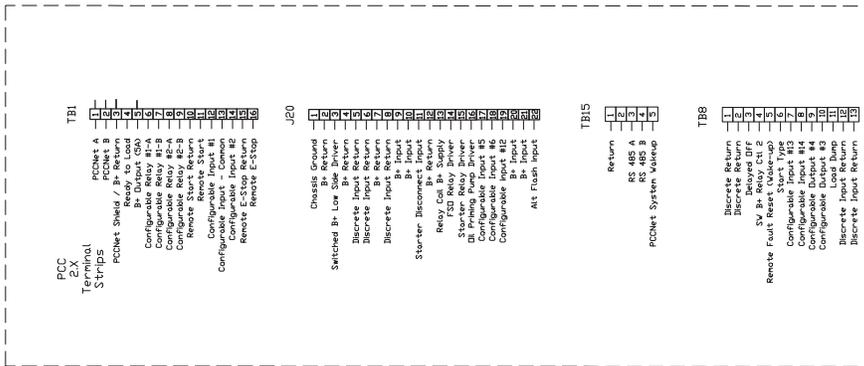
Manston Park Columbus Ave.
Manston Ramsgate
Kent CT 12 5BF United Kingdom
Phone 44 1843 255000
Fax 44 1843 255902

Asia Pacific

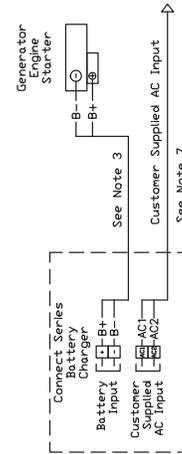
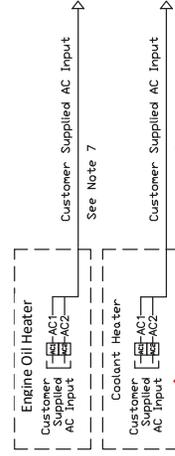
10 Toh Guan Road #07-01
TT International Tradepark
Singapore 608838
Phone 65 6417 2388
Fax 65 6417 2399

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.



- Notes:
1. FTT-10 network cable use Belden 8471 or equivalent. Run cable between devices in a 'Daisy Chain' configuration. See FTT-10 manual for max distances and further detail.
 2. PCC NET network cable use Belden 9729 or equivalent. See Cummins documentation for max distances and further detail.
 3. See size chart in battery charger installation manual or NEC guide.
 4. See instruction sheet 16730 for Modem II Gateway Kit pinout and further detail.
 5. See instruction sheet 16730 for Modem II Gateway Kit pinout and further detail.
 6. See AUX 101 / 102 Operator Manual for pinout and further detail.
 7. See BDM for voltage.



see page 32 for termination point(s)

Project: _____
 Title: _____
 AUTHDR: D. Fields Date: _____

Revision:	M
Sheet:	1 of 1

Limited Warranty

Commercial Generating Set

This limited 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. See table for details.

Continuous Power (COP) is defined as being the maximum power which the generating set is capable of delivering continuously whilst supplying a constant electrical load when operated for an unlimited number of hours per year. No overload capability is available for this rating.

Prime Power (PRP) is defined as being the maximum power which a generating set is capable of delivering continuously whilst supplying a variable electrical load when operated for an unlimited number of hours per year. The permissible average power output over 24 hours of operation shall not exceed 70% of the PRP. For applications requiring permissible average output higher than stated, a COP rating should be used.

Limited-Time Running Power (LTP) is defined as the maximum power available, under the agreed operating conditions, for which the generating set is capable of delivering for up to 500 hours of operation per year.

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 or under test conditions for up to 500 hours of operation per year. The permissible average power output over 24 hours of operation shall not exceed 70% of the ESP.

Environmental Protection Agency – Stationary Emergency (EPA-SE) is defined as being the maximum power available during a variable electrical power sequence, under the stated operating conditions, for which a generator set is capable of delivering in the event of a utility power outage or under test conditions and used in strict accordance with the EPA NSPS for stationary engines, 40 CFR part 60, subparts IIII and JJJJ, where a reliable utility must be present. The permissible average power output over 24 hours of operation shall not exceed 70% of the EPA-SE.

Data Center Continuous (DCC) is defined as the maximum power which the generator is capable of delivering continuously to a constant or varying electrical load for unlimited hours in a data center application.

Base Warranty Coverage Duration (Whichever occurs first)

Rating	Months	Max. Hours
COP	12	Unlimited
PRP	12	Unlimited
LTP	12	500 hrs
ESP	24	1000 hrs
EPA-SE	24	Unlimited
DCC	24	Unlimited

[†] Warranty start date for designated rental and oil and gas model Products is determined to be date of receipt of Product by the end customer.

Cummins Power Generation® Responsibilities:

In the event of a failure of the Product during the 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.
- 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 warranty does not cover Product failures resulting from:

- Inappropriate use relative to designated power rating.
- Inappropriate use relative to application guidelines.
- Inappropriate use of an EPA-SE application generator set relative to EPA's standards.
- Normal wear and tear.
- Improper and/or unauthorized installation.
- Negligence, accidents or misuse.
- Lack of maintenance or unauthorized repair.
- 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.
- 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 warranty does not cover costs resulting from:

- Difficulty in gaining access to the Product.
- Damage to customer property.

A "Data center" is defined as a dedicated facility that house computers and associated equipment for data storage and data handling.

Reliable utility is defined as utility power without routine or regularly scheduled black-outs.

Please contact your local Cummins Power Generation® Distributor for clarification concerning these limitations.

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.

Extended Warranty:

Cummins Power Generation® offers several levels of Extended Warranty Coverage. Please contact your local Cummins Power Generation® Distributor for details.

www.power.cummins.com

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 warranty shall be enforced to the maximum extent permitted by applicable law. This limited 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: _____