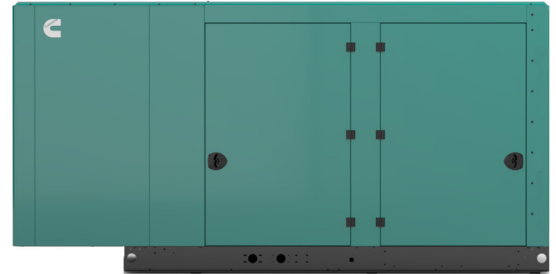




Quiet Connect™ Series RS125



Features and Benefits

Robust product design and testing - The generator is designed to operate under extreme environmental conditions including cold weather starts at as low as -40°F. The generator is tested and certified per the latest EPA, UL and IBC Seismic standards and is capable of meeting NFPA110 requirements when equipped with the necessary accessories and properly installed.

Flexible exercise mode - The innovative, flexible exercise mode enables the generator to exercise at a time, frequency and duration that suits the customer's preference - as little as 2 minutes every 6 months - reducing unnecessary fuel consumption, emissions and noise.

Advanced enclosure design - The aesthetically appealing enclosure incorporates special designs that deliver the quietest generator of its kind. Aluminum 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

Self-diagnostics and easy service - The generator is equipped with Cummins PowerCommand® electronic control to provide industry-leading self-diagnostic capabilities. In addition, critical components of the generator are designed to ensure service and preventive maintenance can be completed in a short period of time.

Weight, Size and Sound Level

Weight: 3915 lbs. (1776 kgs)²

Size: Length 143.0 in (3621 mm), width 40.0 in (1016 mm), height 72.0 in (1836 mm)

Sound: 71 dB(A) at 23 ft. (7 m) with sound level 2 enclosure

Series	Model	Phase	Voltage (V)	Frequency (Hz)	Rated amp ¹ (NG / LPV)	Circuit Breaker (Amps)
RS125	C125N6	1	120 / 240	60	520.8 / 520.8	600
		3	120 / 208	60	433.6 / 433.6	600
		3	277 / 480	60	187.9 / 187.9	250
		3	120 / 240	60	375.8 / 375.8	400

¹ Derating guidelines: Engine power available up to 1800 m (5900 ft.) and ambient temperatures up to 40°C (104°F). Above these conditions, derate at 4.25% per 300 m (985 ft.) and 2% per 10°C (18°F)

² Weight above is average. Actual weight varies with product configuration

Product Features

Engine

- Natural gas / Propane
- Engine air cleaner – normal duty
- Electronic governor, isochronous
- Engine starter, 12 VDC motor
- Shutdown – low oil pressure
- Extension – oil drain
- Engine oil – included

Fuel System

- Single fuel – natural gas or propane vapor, field selectable

Alternator

- 60 Hz, 1 phase, 4 lead, or 3 phase, 12 lead, 120° C temperature rise at 40° C ambient
- Exciter/voltage regulator – torque match

Control

- PowerCommand 2.3
- Display language – English
- Control mounting, left facing

Electrical

- Single circuit breaker, UL certified, right side mounted
- Battery charging alternator
- Battery charger – 6 Amps

Cooling

- Generator set cooling capacity – 50° C
- Shutdown – low coolant level
- Engine coolant – 50/50 mixture
- Extension – coolant drain

Enclosure

- Aluminum enclosure Sound Level 1 with muffler installed, green color
- Wind rating – 180 MPH

Code Compliance

- UL 2200
- EPA emissions, stationary emergency, 40CFR60
- IBC Seismic
- NFPA110 capable

Generator set application

- Coolant heater
- Battery rack
- Literature (English) – Operator's manual, Installation manual

Warranty

- Base: 2 years standby
- Extended warranties available

Packaging

- Shipping pallet

Generator Set Performance

Governor regulation class: ISO 8528 Part 1 Class G2

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: FCC code Title 47 part 15 Class B

Engine

Design: Turbocharged and aftercooled

Bore: 114.1 mm (4.49 in)

Stroke: 144.5 mm (5.69 in)

Displacement: 8.9 liters (543 in³)

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: 100 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

Fuel Supply Pressure

Minimum - in H₂O (kPa): NG 6.0 (1.5)

Maximum - in H₂O (kPa): NG 13.0 (3.5)

Control System

The PowerCommand® 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.

Sound Attenuated Enclosure

The aesthetically appealing enclosure incorporates special designs that deliver the quietest generator of its kind. Aluminum 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.

Average Fuel Consumption

Fuel consumption – Natural Gas

Load	1/4	1/2	3/4	Full
Ft ³ /hr.	652.0	981.3	1305.8	1665.6
M ³ /hr.	18.46	27.79	36.98	47.17

Fuel consumption – Propane

Load	1/4	1/2	3/4	Full
Ft ³ /hr.	262.8	383.7	517.3	674.1
M ³ /hr.	7.44	10.87	14.65	19.09

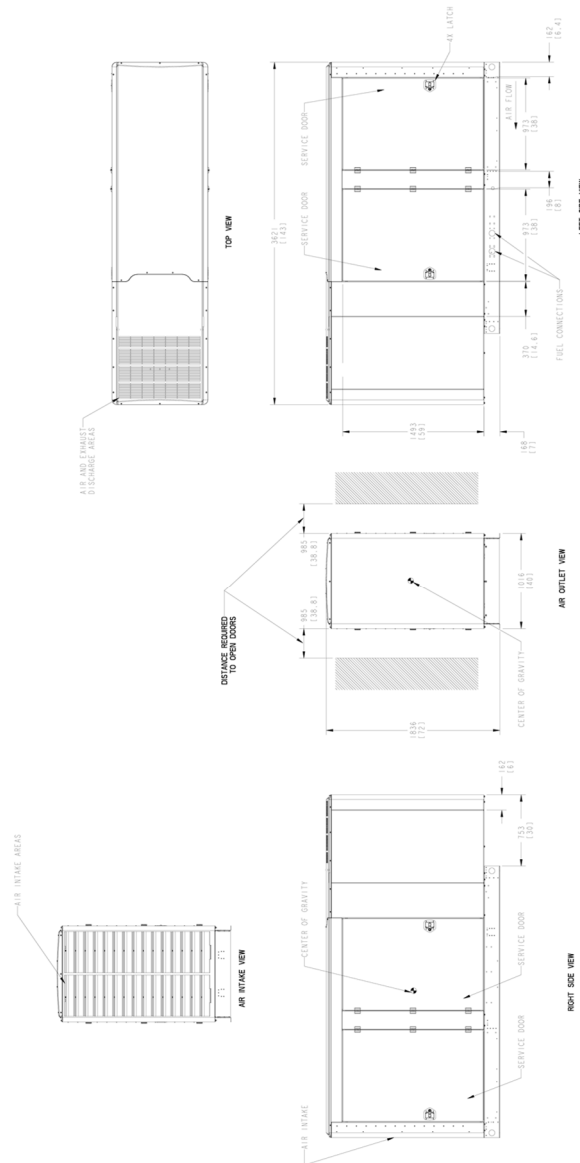
Conversion factor:

8.58 ft³ = 1 lb.

0.535 m³ = 1 kg

36.39 ft³ = 1 gal

Basic Dimension



Note: This outline drawing provides general reference only and is not intended for use in design or installation. For more information, see Operators and Installation manuals or contact your distributor or dealer for assistance.

Accessories

- Remote displays
- Auxiliary output relays (2)
- Auxiliary configurable signal inputs (8) and relay outputs (8)
- Annunciator – RS485
- Internet monitoring device – PowerCommand 500/550
- Battery charger – stand-alone, 12V
- Enclosure Sound Level 1 to Sound Level 2 upgrade kit
- Enclosure paint touch up kit
- Base barrier – elevated generator set
- Alternator heater
- Maintenance and service kit



⚠ WARNING:

Standby rating based on: Applicable for supplying emergency power for the duration of normal power interruption. No sustained overload capability is available for this rating. (Equivalent to fuel stop power in accordance with ISO3046, AS2789, DIN6271 and BS5514 nominally rated.) See T030.

⚠ WARNING:

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

Transfer Switch (also sold separately)

- Automatic Transfer Switches available in various amperages.
- Service Entrance and Non-Service Entrances models are available.
- Available for both Indoor and Outdoor applications.
- All models UL listed to UL 1008 standard.
- Compatibility with Cummins generator set helps reduce the installation time for the complete application.

Warranty Policy

The Cummins RS and RX liquid cooled generator set models come with a 2-year base warranty when used in EPA-Stationary Emergency application. Extended warranty options are available.

Please contact Cummins dealers/distributors for details

After Sale Support

Largest distributor/dealer support network

Cummins Power Generation generator sets are supported by the largest and best trained worldwide certified distributor/dealer network in the industry. This network of knowledgeable distributor/dealers will help you select and install the right generator set and accessories to meet the requirements of your specific application. This same network offers a complete selection of commonly used generator set maintenance parts, accessories and products plus manuals and specification sheets. Plus, they can answer your questions regarding proper operation, maintenance schedules and more.

Manuals: Operation and installation manuals ship with the generator set. To obtain additional copies or other manuals for this model, see your distributor/dealer. To easily locate the nearest certified distributor/dealer for Cummins Power Generation generators in your area, or for more information, contact us at 1-800-344-0039 or visit power.cummins.com.

Contact your distributor/dealer for more information.

Generator Set Data Sheet



Model: C125N6
Frequency: 60 Hz
Fuel type: Natural gas
kW rating: 125 Natural gas standby

Emissions level: EPA Emissions

Fuel Consumption	Natural gas Standby				Propane Standby			
	kW (kVA)				kW (kVA)			
Ratings	125 (156)				125 (156)			
Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full
scfh	652.0	981.3	1305.8	1665.6	262.8	383.7	517.3	674.1
m ³ /hr	18.46	27.79	36.98	47.17	7.44	10.87	14.65	19.09

Engine	Natural gas Standby Rating	Propane Standby Ratings
Engine model	QSJ8.9G	
Configuration	Cast Iron, In line, 6 cylinders	
Aspiration	Turbocharged and aftercooled	
Gross engine power output, kWm (bhp)	152.9 (205)	
Bore, mm (in)	114.1 (4.49)	
Stroke, mm (in)	144.5 (5.69)	
Rated speed, rpm	1800	
Compression ratio	9.7:1	
Lube oil capacity, L (qt)	20.8 (22)	

Fuel Supply Pressure	
Minimum operating pressure, kPa (in H ₂ O)	1.5 (6)
Maximum operating pressure, kPa (in H ₂ O)	3.5 (13)

Air	Natural gas Standby Rating	Propane Standby Rating
Combustion air, m ³ /min (scfm)	11.9 (421)	11.8 (417)
Maximum normal duty air cleaner restriction, kPa (in H ₂ O)	0.37 (1.5)	
Maximum heavy-duty air cleaner restriction, kPa (in H ₂ O)	3.7 (15.0)	

Exhaust	Natural gas	Propane
	Standby Rating	Standby Rating
Exhaust flow at set rated load, m ³ /min (cfm)	35.6 (1258)	36.9 (1305)
Exhaust temperature at set rated load, °C (°F)	645.6 (1194)	685 (1265)
Maximum back pressure, kPa (inH ₂ O)	9 (36.1)	

Standard set-mounted radiator cooling	Natural gas	Propane
	Standby rating	Standby rating
Ambient design, °C (°F)	50 (122)	
Fan load, kWm (HP)	10.3 (13.8)	
Coolant capacity (with radiator), L (US gal)	26 (6.9)	
Cooling system air flow, m ³ /min (scfm)	249.2 (8800)	
Maximum cooling air flow static restriction, kPa (inH ₂ O)	0.125 (0.5)	

Weights	Natural gas	Propane
	Unit wet weight kg (lb)	1776 (3915)

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 1800 m (5900 ft.) and ambient temperatures up to 40° C (104° F). Above these conditions, derate at 4.25% per 300 m (985 ft.) and 2% per 10° C (18° F)
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Propane

Standby	Engine power available up to 1800 m (5900 ft.) and ambient temperatures up to 40° C (104° F). Above these conditions, derate at 4.25% per 300 m (985 ft.) and 2% per 10° C (18° F).
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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

Standard alternators	Single phase table	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	BB88-2	B986-2	B946-2	B943-2	B952-2	BB86-2	BB88-2
Alternator data sheet number	ADS-211	ADS-208	ADS-208	ADS-208	ADS-209	ADS-208	ADS-211
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	126	131	130	131	132	131	Varies by voltage
Full load current amps at standby rating	521	376	434	188	151	411	Varies by voltage

Optional alternators for improved starting capability	Single phase table	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	105 °C
Feature code	BB87-2	BB94-2	BB93-2	BB95-2	BB92-2	BB85-2	BB87-2
Alternator data sheet number	ADS-211	ADS-209	ADS-209	ADS-208	ADS-209	ADS-209	ADS-211
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	127	133	132	132	133	132	Varies by voltage
Full load current amps at standby rating	521	376	434	188	151	411	Varies by voltage

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 buildings electrical system except through an approved device or after building main switch is open.

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

Phone 763 574 5000
 Fax 763 574 5298

Our energy working for you.™

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 NAS-6303-EN (06/19) A058H644

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Alternator Data Sheet Frame Size: UC3E

Characteristics		1-bearing weight		2-bearing weight		
Weights:	Stator assembly:	397 lb	180 kg	397 lb	180 kg	
	Rotor assembly:	370 lb	168 kg	346 lb	157 kg	
	Complete assembly:	1085 lb	492 kg	1127 lb	511 kg	
Maximum speed:		2250 rpm				
Excitation current:	Full load:	3 Amps				
	No load:	0.5 Amps				
Insulation system:	Class H throughout					
1 ∅ Ratings (1.0 power factor) <small>(Based on specific temperature rise at 40° C ambient temperature)</small>		50 Hz (winding no)		60 Hz (winding no)		
		<u>220 Double Delta</u> (311)	<u>240 Double Delta</u> (311)	<u>240</u> (06)	<u>240 Double Delta</u> (311)	
	125° C rise ratings	kW	85	85	115	96
		kVA	85	85	115	96
	105° C rise ratings	kW	75	75	100	84
	kVA	75	75	100	84	
1 ∅ Reactances (per unit ± 10%) <small>(Based on full load at 125° C rise rating)</small>		<u>220</u> (311)	<u>240</u> (311)	<u>240</u> (06)	<u>240</u> (311)	
	Synchronous	2.12	1.78	2.28	2.40	
	Transient	0.19	0.16	0.22	0.22	
	Subtransient	0.13	0.11	0.14	0.15	
	Negative sequence	0.14	0.12	0.16	0.17	
	Zero sequence	0.08	0.07	0.09	0.10	
1 ∅ Motor starting (90% sustained voltage)		<u>220</u> (311)	<u>240</u> (311)	<u>240</u> (06)	<u>240</u> (311)	
	Maximum kVA	-	-	422	-	
		(Shunt)	-	-	-	-
	(PMG)	389	389	497	497	
Time constants (sec)		<u>220</u> (311)	<u>240</u> (311)	<u>240</u> (06)	<u>240</u> (311)	
	Transient	0.032	0.032	0.032	0.032	
	Subtransient	0.01	0.01	0.01	0.01	
	Open circuit	0.85	0.85	0.85	0.85	
	DC	0.007	0.007	0.007	0.007	
Windings (@22° C)		<u>220</u> (311)	<u>240</u> (311)	<u>240</u> (06)	<u>240</u> (311)	
	Stator resistance	(L-L Ohms)	0.021	0.021	0.015	0.021
	Rotor resistance	(Ohms)	1.34	1.34	1.34	1.34
	Number of leads		12	12	4	12



Alternator Data Sheet Frame Size: UC3E

Characteristics		1-bearing weight		2-bearing weight				
Weights:	Stator assembly:	397 lb	180 kg	397 lb	180 kg			
	Rotor assembly:	370 lb	168 kg	346 lb	157 kg			
	Complete assembly:	1085 lb	492 kg	1127 lb	511 kg			
Maximum speed:		2250 rpm						
Excitation current:	Full load:	3 Amps						
	No load:	0.5 Amps						
Insulation system:	Class H throughout							
3 ∅ Ratings	(0.8 power factor)	50 Hz (winding no)		60 Hz (winding no)				
(Based on specific temperature rise at 40° C ambient temperature)		190/380 <u>220</u> (311)	208/415 <u>240</u> (311)	<u>190/380</u> (14)	<u>208/416</u> (14)	<u>346/600</u> (17)	208/416 <u>240</u> (311)	<u>240/480</u> (311)
150° C rise ratings	kW	116	116	136	136	150	136	150
	kVA	145	145	170	170	188	170	188
125° C rise ratings	kW	112	112	128	128	143	128	143
	kVA	140	140	160	160	179	160	179
105° C rise ratings	kW	100	100	112	112	128	112	128
	kVA	125	125	140	140	160	140	160
3 ∅ Reactances	(per unit ± 10%) (Based on full load at 125° C rise rating)	<u>190/380/220</u> (311)	<u>208/415/240</u> (311)	<u>190/380</u> (14)	<u>208/416</u> (14)	<u>346/600</u> (17)	208/416 <u>240</u> (311)	<u>240/480</u> (311)
Synchronous		2.34	1.96	2.06	1.72	2.06	2.68	2.25
Transient		0.21	0.18	0.19	0.16	0.18	0.25	0.21
Subtransient		0.14	0.12	0.13	0.11	0.13	0.17	0.14
Negative sequence		0.16	0.13	0.14	0.12	0.14	0.19	0.16
Zero sequence		0.10	0.08	0.09	0.07	0.09	0.11	0.09
3 ∅ Motor starting	(90% sustained voltage)	<u>190/380/220</u> (311)	<u>208/415/240</u> (311)	<u>190/380</u> (14)	<u>208/416</u> (14)	<u>346/600</u> (17)	208/416 <u>240</u> (311)	<u>240/480</u> (311)
Maximum kVA	(Shunt)	-	-	422	422	422	-	-
	(PMG)	389	389	497	497	497	497	497
Time constants	(sec)	<u>190/380/220</u> (311)	<u>208/415/240</u> (311)	<u>190/380</u> (14)	<u>208/416</u> (14)	<u>346/600</u> (17)	208/416 <u>240</u> (311)	<u>240/480</u> (311)
Transient		0.032	0.032	0.032	0.032	0.032	0.032	0.032
Subtransient		0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open circuit		0.85	0.85	0.85	0.85	0.85	0.85	0.85
DC		0.007	0.007	0.007	0.007	0.007	0.007	0.007
Windings	(@22° C)	<u>190/380/220</u> (311)	<u>208/415/240</u> (311)	<u>190/380</u> (14)	<u>208/416</u> (14)	<u>346/600</u> (17)	208/416 <u>240</u> (311)	<u>240/480</u> (311)
Stator resistance	(L-L Ohms)	0.0634	0.0634	0.0440	0.0440	0.10	0.0634	0.0634
Rotor resistance	(Ohms)	1.34	1.34	1.34	1.34	1.34	1.34	1.34
Number of leads		12	12	12	12	12	12	12



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-parallel 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 +/-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.

Droop electronic speed governing - Control can be adjusted to droop from 0 to 10% from no load to full load.

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 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 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 +/-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.

Droop voltage regulation - Control can be adjusted to droop from 0-10% from no load to full load.

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.

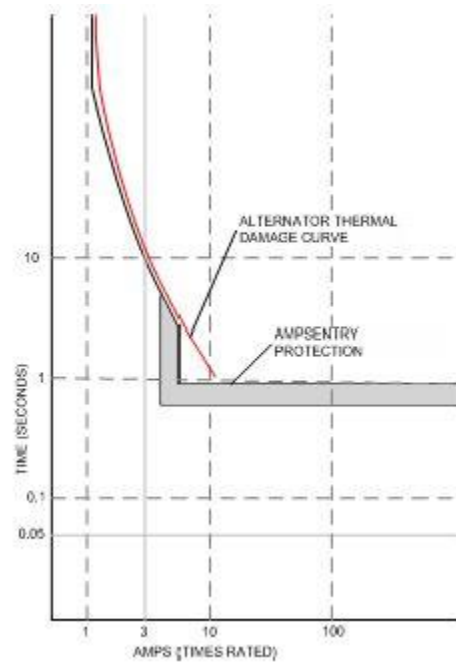
Fail to start (overcrank) shutdown - The control system will indicate a fault if the generator set fails to start by the completion of the engine crank sequence.

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:

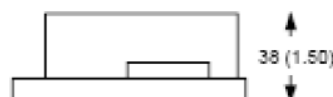
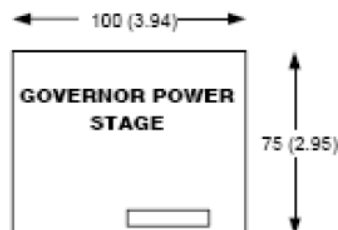
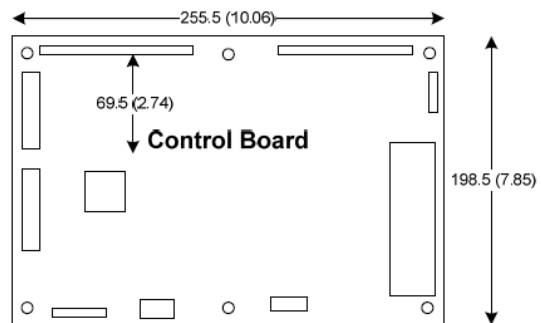
- PC tool interface: This RS-485 communication port allows the control to communicate with a personal computer running InPower software.

- 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

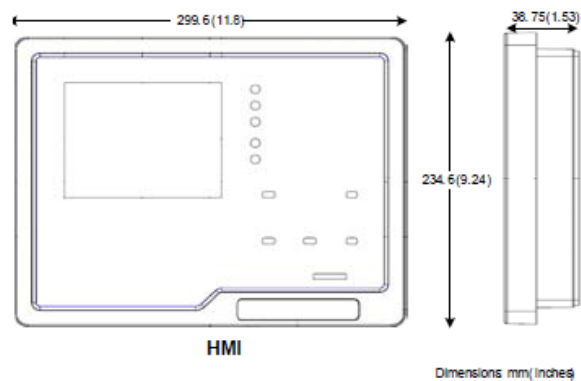
- LED indicating lamps:
 - Genset running
 - Remote start
 - Not in auto
 - Shutdown
 - Warning
 - Auto
 - Manual and stop
- 320 x 240 pixels graphic LED backlight LCD.
- Four tactile feel membrane switches for LCD defined operation. The functions of these switches are defined dynamically on the LCD.
- 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.™





Sound Pressure Level @ 7 meters, dB(A)

See notes 1-6 listed below

Configuration	Exhaust System	Position (Note 1)								8 Position Average
		1	2	3	4	5	6	7	8	
Standard – Unhoused	Infinite Exhaust	77.9	81.4	81.5	83.0	78.2	82.0	81.6	81.0	81.1
F216-2 Weather Protective Aluminium	Mounted	81.3	81.0	75.3	80.5	78.9	84.7	78.7	82.0	80.9
F231-2 Sound Attenuated Level 1, Aluminium	Mounted	80.0	75.8	70.7	72.3	71.8	72.6	70.7	75.5	75.2
F217-2 Sound Attenuated Level 2, Aluminium	Mounted	72.3	72.0	68.1	71.1	70.4	70.9	68.6	71.0	70.7

Sound Power Level, dB(A)

See notes 2-4, 7 and 8 listed below

Configuration	Exhaust System	Octave Band Center Frequency (Hz)										Overall Sound Power Level
		31.5	63	125	250	500	1000	2000	4000	8000	16000	
Standard – Unhoused	Infinite Exhaust	58.7	73.2	84.7	94.4	102.7	103.5	103.5	100.3	98.7	88.8	109.3
F216-2 Weather Protective Aluminium	Mounted	62.9	82.8	91.3	98.8	102.6	103.1	103.4	103.3	95.8	80.9	109.8
F231-2 Sound Attenuated Level 1, Aluminium	Mounted	61.9	76.9	85.8	92.0	95.9	96.7	95.9	93.8	96.1	79.0	103.2
F217-2 Sound Attenuated Level 2, Aluminium	Mounted	62.4	76.3	84.8	89.8	92.7	91.7	89.9	88.2	88.6	74.2	98.5

Exhaust Sound Power Level, dB(A)

See notes 2 & 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	16000	
	55.0	89.3	97.4	100.7	107.8	110.0	112.6	115.1	114.0	105.1	119.8

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 7m (23 ft) from the surface of the generator set and 1.2 m (48 inches) 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.



Exhaust Emission Data Sheet

C125N6

60 Hz Spark Ignited Generator Set

EPA Emissions

Engine Information:

Model:	Cummins QSJ8.9G-G2	Bore:	4.49 in. (114.1 mm)
Type:	4 cycle, in-line, 6 cylinder	Stroke:	5.69 in. (144.5 mm)
Aspiration:	Turbocharged and Aftercooled	Displacement:	543 cu. in. (8.9 liters)
Compression Ratio:	8.5:1		
Emission Control Device:	Electronic Air/Fuel Ratio & Closed-Loop Breather System		

Natural Gas

	<u>1/4</u>	<u>1/2</u>	<u>3/4</u>	<u>Full</u>
<u>Performance Data</u>	<u>Standby</u>	<u>Standby</u>	<u>Standby</u>	<u>Standby</u>
BHP @ 1800 RPM (60 Hz)	63.5	107.9	153.2	205.0
Fuel Consumption (SCFH)	652.0	981.3	1305.8	1665.6
Exhaust Gas Flow (CFM)	478.0	777.0	1028.0	1277.0
Exhaust Gas Temperature (°F)	1189.0	1200.0	1199.0	1192.0
Air to Fuel Ratio	21.7	23.8	24.3	24.3
 <u>Exhaust Emission Data</u>				
HC (Total Unburned Hydrocarbons)*	0.9	1.3	1.2	0.99
NOx (Oxides of Nitrogen as NO ₂)	1.7	0.8	0.8	1.18
CO (Carbon Monoxide)	1.9	1.5	1.4	1.36
	All values above are cited: g/BHP-hr			
HC (Total Unburned Hydrocarbons)*	380.0	532.0	516.0	464.0
NOx (Oxides of Nitrogen as NO ₂)	248.0	118.0	122.0	189.0
CO (Carbon Monoxide)	442.0	361.0	346.0	356.0
	All values above are cited: ppmv			

*HC includes NMHC, VOC, POC, and ROC constituents (Non-Methane HC, Volatile Organic Compounds, Precursor Organic Compounds and Reactive Organic Compounds).



Exhaust Emission Data Sheet

C125N6

60 Hz Spark Ignited Generator Set

EPA Emissions

<u>Propane (LP)</u>				
	<u>1/4</u>	<u>1/2</u>	<u>3/4</u>	<u>Full</u>
<u>Performance Data</u>	<u>Standby</u>	<u>Standby</u>	<u>Standby</u>	<u>Standby</u>
BHP @ 1800 RPM (60 Hz)	63.5	107.9	153.2	205.0
Fuel Consumption (SCFH)	262.8	383.7	517.3	674.1
Exhaust Gas Flow (CFM)	484.0	763.0	1027.0	1312.0
Exhaust Gas Temperature (°F)	1203.0	1280.0	1289.0	1261.0
Air to Fuel Ratio	20.9	21.8	22.4	23.0
<u>Exhaust Emission Data</u>				
HC (Total Unburned Hydrocarbons)*	0.36	0.35	0.33	0.38
NOx (Oxides of Nitrogen as NO ₂)	1.53	1.32	1.33	1.32
CO (Carbon Monoxide)	3.34	2.67	2.27	2.11
				All values above are cited: g/BHP-hr
HC (Total Unburned Hydrocarbons)*	150	161	161	182
NOx (Oxides of Nitrogen as NO ₂)	215	203	213	211
CO (Carbon Monoxide)	768	671	595	556
				All values above are cited: ppmv
*HC includes NMHC, VOC, POC, and ROC constituents (Non-Methane HC, Volatile Organic Compounds, Precursor Organic Compounds and Reactive Organic Compounds).				

Test Conditions	
Test Conditions apply to both Natural Gas and Propane	
Data is representative of steady-state engine speed (± 25 RPM) with full load (±2%). Pressures, temperatures, and emission rates were stabilized.	
Fuel Specification:	Natural Gas: Dry gas received from Supplier (1000 BTU/SCF) Propane: Meets the requirements for Commercial Grade Propane under the ASTM D1835 Standard Specification for Liquefied Gases.
Fuel Inlet Temperature:	60 ± 9 °F at flow transmitter
Fuel Pressure:	14.73PSIA ± 0.5 PSIA at Flow Transmitter
Air Inlet Temperature:	77 ± 9 °F
Barometric Pressure:	22.92 ± 1 in. Hg
Humidity:	NOx measurement corrected to 75 grains H ₂ O/lb (10.7 g/kg) of dry air
The NOx, HC, CO and PM emission data tabulated here are representative of test data taken from a single engine under the test conditions shown above. These data are subjected to instrumentation and engine-to-engine variability. Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures and instrumentation. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.	



2023 EPA Exhaust Emission Compliance Statement C125N6 Standby 60 Hz Spark Ignited Generator Set

Compliance Information:

The engine used in this generator set complies with U.S. EPA emissions regulations under the provisions of 40 CFR Part 60, Stationary Emergency Spark-Ignited emissions limits when tested per ISO 8178 D1.

Engine Manufacturer: Cummins Inc.
 EPA Certificate Number: PCEXB08.9ALB-007
 Effective Date: 07/27/2022
 Date Issued: 07/27/2022
 EPA Engine Family (Cummins Emissions Family): PCEXB08.9ALB

Engine Information:

Model: QSJ8.9G-G2 Bore: 4.49 in. (114 mm)
 Engine Nameplate HP: 240 Stroke: 5.69 in. (145 mm)
 Type: 4 Cycle, In-Line, 6 Cylinder Displacement: 543.0 cu. in. (8.9 liters)
 Aspiration: Turbocharged and Aftercooled Compression Ratio: 8.5:1
 Emission Control Device: Electronic Air/Fuel Ratio Control and Closed-Loop Breather System

U.S. Environmental Protection Agency Station Emergency SI Emission Limits

Natural Gas	Grams per BHP-hr			Grams per kW _m -hr		
	NO _x	VOC	CO	NO _x	VOC	CO
EPA Emissions Limit	2.0	1.0	4.0	2.7	1.3	5.4

Propane (LP)	Grams per BHP-hr			Grams per kW _m -hr		
	NO _x	VOC	CO	NO _x	VOC	CO
EPA Emissions Limit	2.0	1.0	4.0	2.7	1.3	5.4

Notes:

Tests conducted using alternate 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.



Prototype Test Support (PTS) 60 Hz Test Summary



<u>Generator set models</u>	<u>Representative prototype</u>
C125N6	Model: C150N6
C150N6	Engine: QSJ8.9G-G2
	Alternator: UC27J

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

Maximum motor starting: 220 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 result 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 rated voltages. Only the highest temperatures are reported.

Location	Maximum Rise (°C)
Alternator Stator:	N/A
Alternator Rotor:	N/A
Exciter Stator:	N/A
Exciter Rotor:	N/A

Torsional analysis and testing:
The generator set with UC27J 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 elevated ambient temperature under static restriction conditions.

Durability:
The generator set was subjected to a 1500 hour endurance test replicating field duty cycles operating at variable load up to the standby rating based upon MIL-STD-705 to verify structural soundness and durability of the design.

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

Voltage regulation:	± 1%
Random voltage variation:	± 1%
Frequency regulation:	Isochronous
Random frequency variation:	± 0.5%

Transient performance:
The generator set was tested with the listed alternator to verify single step loading capability as required by NFPA 110. Voltage and frequency response on load addition or rejection were evaluated. The following results were recorded at 0.8 power factor:

Full load acceptance:

Voltage dip:	26.9%
Recovery time:	5.3 seconds
Frequency dip:	16.2%
Recovery time:	6.3 seconds

Full load rejection:

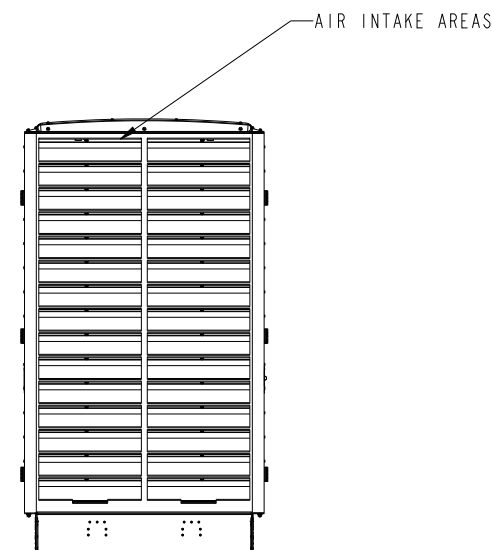
Voltage rise:	12.5%
Recovery time:	2.2 seconds
Frequency rise:	15.7%
Recovery time:	4.5 seconds

Harmonic analysis:
(per MIL-STD-705B, Method 601.4)

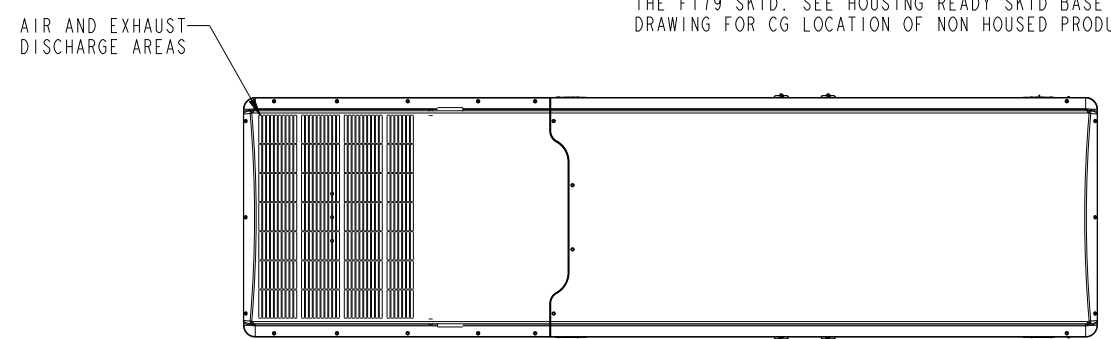
Harmonic	<u>Line to Line</u>		<u>Line to Neutral</u>	
	<u>No load</u>	<u>Full load</u>	<u>No load</u>	<u>Full load</u>
3	0.0	0.1	0.0	0.1
5	0.8	1.2	0.8	1.2
7	0.7	2.2	0.7	2.1
9	0.0	0.0	0.0	0.0
11	0.2	0.3	0.2	0.3
13	0.2	0.4	0.2	0.4
15	0.0	0.0	0.0	0.1

REL NO	REV NO	REVISION	DRN	CKD	APVD	DATE	
ECO-164828	A	1	PRODUCTION_RELEASE	YN	NK	A.CHINTHALURI	30SEP16

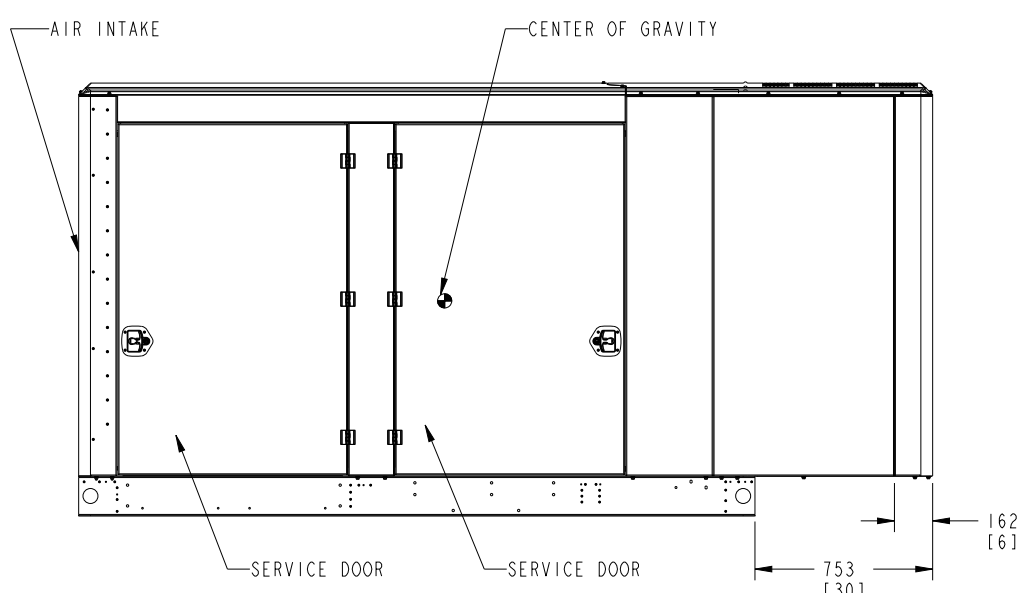
- NOTES:
- DIM [] IN INCHES
 - WITH THIS HOUSING INSTALLED ON AN OPEN GENERATOR SET, THE TOTAL WEIGHT WILL INCREASE BY 196 KG (432 LBS). THIS INCLUDES THE MUFFLER.
 - THE CENTER OF GRAVITY OF THE GENERATOR SET WHEN EQUIPPED WITH THIS HOUSING SHIFTS APPROXIMATELY 63MM (2.48 INCH) TOWARDS THE AIR DISCHARGE END OF THE HOUSING AND 36MM (1.42 INCH) HIGHER FROM THE GROUND, COMPARED TO THE EQUIVALENT NON-HOUSED PRODUCT WITH THE F179 SKID. SEE HOUSING READY SKID BASE OUTLINE DRAWING FOR CG LOCATION OF NON HOUSED PRODUCT.



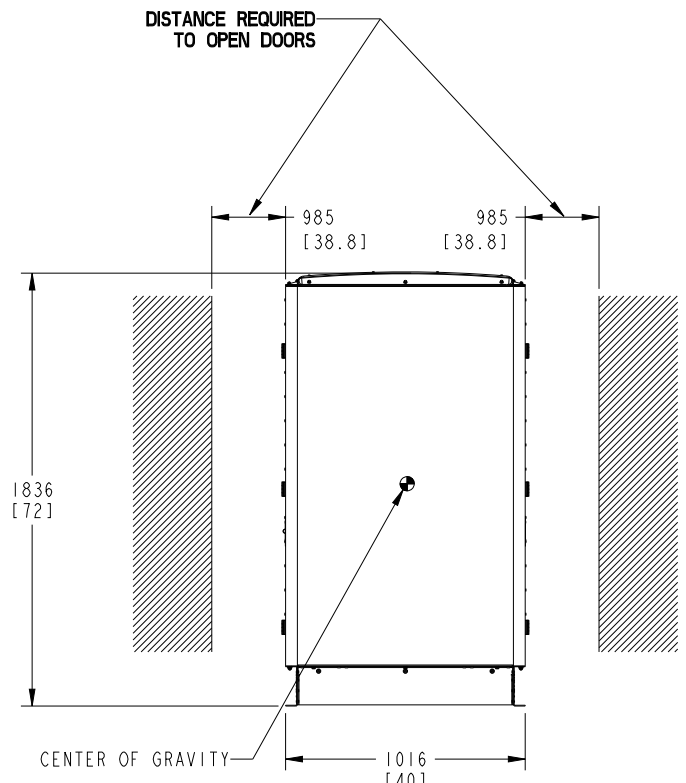
AIR INTAKE VIEW



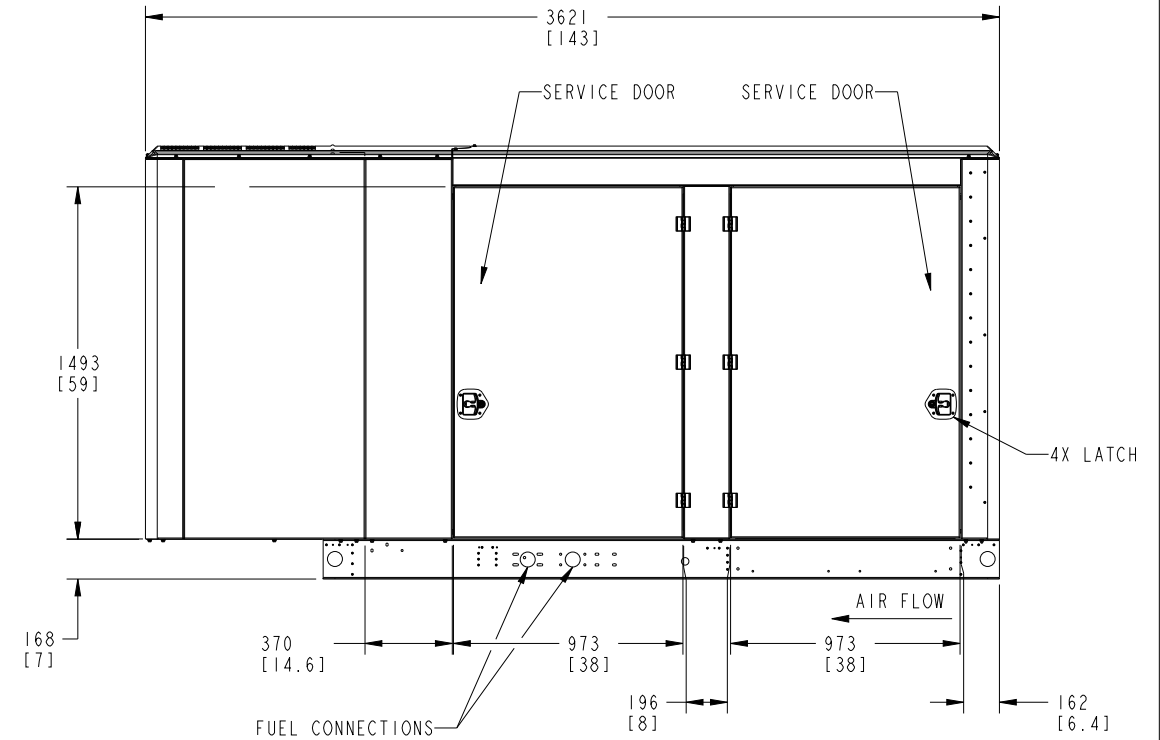
TOP VIEW



RIGHT SIDE VIEW



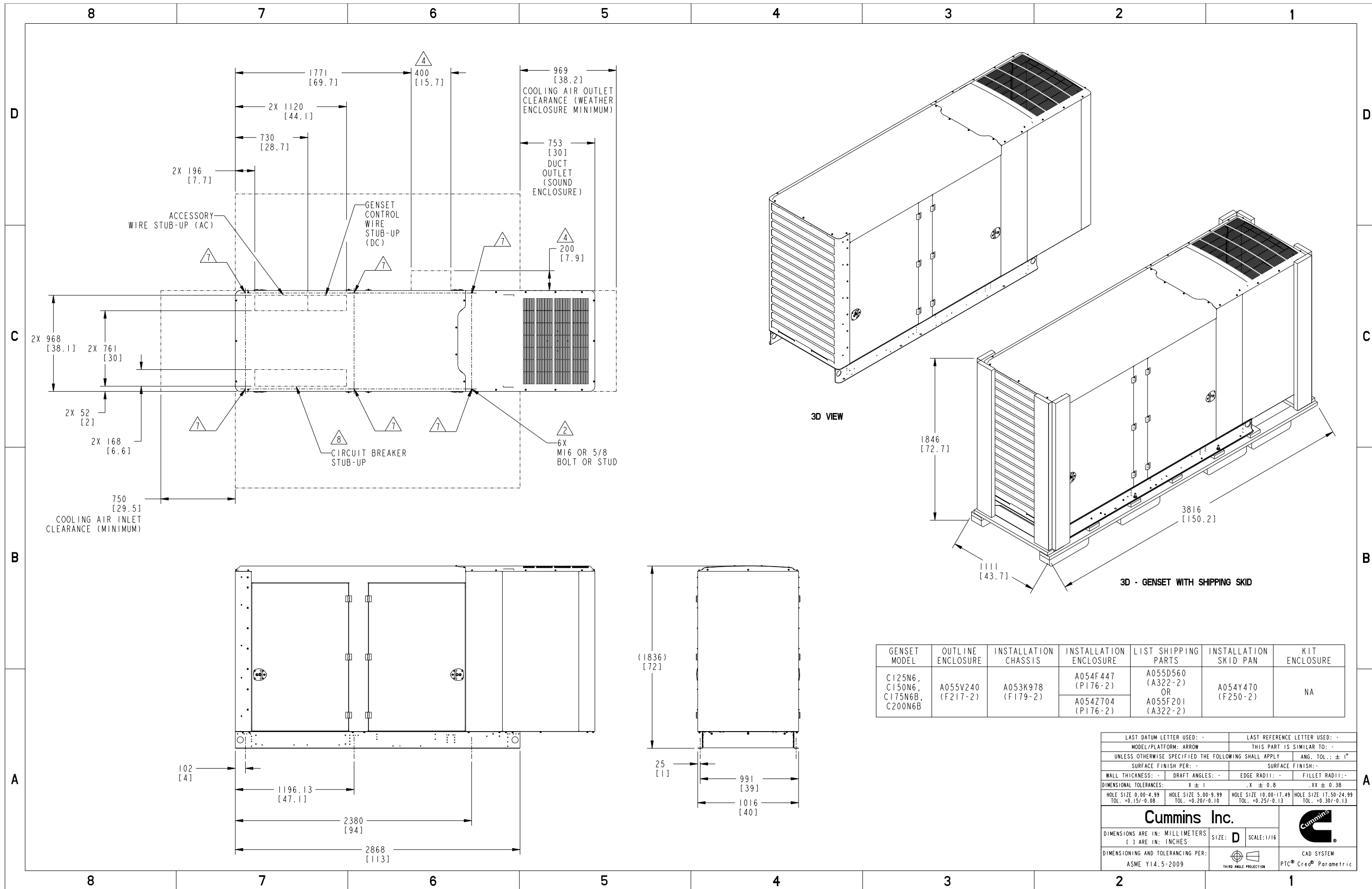
AIR OUTLET VIEW



LEFT SIDE VIEW

F231-2 ENCLOSURE CONFIGURATION

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS		SHW TO: A051P365	DRW: Y_NICHT		CUMMINS POWER GENERATION
DO NOT SCALE PRINT		CKD: N_KASIBHOTLA	APVD: A.CHINTHALURI		OUTLINE, ENCLOSURE
DIM	TOLERANCE	DATE: 20SEP16		SITE CODE:	
ANG TOL	SCALE	FIRST USED ON: ARROW		PGF	
± 1.0°	1/15	FOR INTERPRETATION OF DIMENSIONS AND TOLERANCING, SEE ASME Y14.5-2009		SIZE: D	CAD SHEET: 1 of 2



GENSET MODEL	OUTLINE ENCLOSURE	INSTALLATION CHASSIS	INSTALLATION ENCLOSURE	LIST SHIPPING PARTS	INSTALLATION SKID PAN	KIT ENCLOSURE
C125N6, C150N6, C175N6B, C200N6B	A055V240 (F217-2)	A053K978 (F179-2)	A054F447 (P176-2) A054Z704 (P176-2)	A055D560 (A322-2) OR A055F201 (A322-2)	A054Y470 (F250-2)	NA

LAST DATUM LETTER USED: -	LAST REFERENCE LETTER USED: -
MODEL/PLATFORM: ARROW	THIS PART IS SIMILAR TO: -
UNLESS OTHERWISE SPECIFIED THE FOLLOWING SHALL APPLY	ANG. TOL.: ± 1°
SURFACE FINISH PER: -	SURFACE FINISH:-
WALL THICKNESS: -	DRAFT ANGLES: -
EDGE RADI: -	FILLET RADI:-
DIMENSIONAL TOLERANCES: X ± 1, .X ± 0.8, .XX ± 0.38	
HOLE SIZE 0.00-4.99 TOL. +0.15/-0.08	HOLE SIZE 5.00-9.99 TOL. +0.20/-0.10
HOLE SIZE 10.00-17.49 TOL. +0.25/-0.13	HOLE SIZE 17.50-24.99 TOL. +0.30/-0.13

Cummins Inc.

DIMENSIONS ARE IN: MILLIMETERS
[] ARE IN: INCHES

DIMENSIONING AND TOLERANCING PER:
ASME Y14.5-2009

SIZE: **D** SCALE: 1/16

THIRD ANGLE PROJECTION

CAD SYSTEM
PTC® Creo® Parametric

Cummins Data Classification:
Cummins Confidential

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Part Number: **A055J590** Part Revision: **E**
Part Name: **OUTLINE,GENSET**
Drawing Category: **Detail** State: **Released** Sheet 3 of 4

Document Generated: 17AUG2022 19:56 GMT

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: _____