

SPECIFICATION SHEET

QUIET CONNECT™ Series RS100



Shown with
Sound Level 1 option

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 when equipped with the necessary accessories. The generator is tested and certified per the latest EPA, UL and IBC Seismic standards and is capable of meeting NFPA 110 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 ASCE 7-10. The design has hinged doors to provide easy access for service and maintenance.

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.

Self-diagnostics and easy service - The PowerCommand® electronic control provides 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: 2830 lbs (1284 kg)

Size: Length 118.7 in (3016 mm), width 40.0 in (1016 mm), height 58.3 in (1480 mm)

Sound: 73 dB(A) at 23 ft (7 m) with sound level 1 enclosure

Series	Model	Phase	Voltage (V)	Frequency (Hz)	Rated amps ¹ (NG/LPV fuel)	Circuit breaker (Amps)
RS100	C100N6	1	120/240	60	417/417	125-400
		3	120/208	60	347/347	125-400
		3	120/240	60	301/301	125-400
		3	277/480	60	150/150	200

Derating guidelines: 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 305m (1000 ft) and 2% per 10 °C above 25 °C (77 °F).

Product features

Engine

- Natural gas/propane 1800 rpm engine
- 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 1.1
- Display language – English
- Control mounting, left facing

Electrical

- Single circuit breaker, UL certified, right-side mounted
- Battery charging alternator, normal duty
- Battery charger – 6 Amp, regulated

Cooling

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

Enclosure

- Aluminum enclosure Sound Level 1 with muffler installed, sandstone color
- Wind rating – 180 mph

Code compliance

- UL 2200
- EPA emissions, stationary emergency, 40CFR60
- IBC Seismic
- NFPA 110 capable

Generator set application

- Coolant heater
- Crank case vent heater
- Battery rack
- Flexible fuel line
- Literature (English) – operator's manual, installation manual

Packaging

- Shipping pallet

Generator set performance

Governor regulation class: ISO 8528 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: FCC code

Title 47 part 15 Class B

Engine specifications

Design: Turbocharged and aftercooled

Bore: 102.1 mm (4.02 in)

Stroke: 119.9 mm (4.72 in)

Displacement: 5.9 liters (359 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: 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

Fuel supply pressure

Minimum fuel supply pressure: 1.5 kPa (6.0 in H₂O)

Maximum fuel supply pressure: 3.5 kPa (14.0 in H₂O)

Warranty

Base warranty – 2-year standby

Extended warranties available

Typical fuel consumption

Fuel consumption – natural gas

Load:	1/4	1/2	3/4	Full
ft ³ /hr:	549.6	805.4	1050.8	1317.7
m ³ /hr:	15.6	22.8	29.8	37.3

Fuel consumption – LP vapor

Load:	1/4	1/2	3/4	Full
ft ³ /hr:	207.5	311.8	411.2	518.7
m ³ /hr:	5.9	8.8	11.7	14.7
gal/hr	5.70	8.57	11.30	14.25

Conversion factor:

8.58 ft³ =

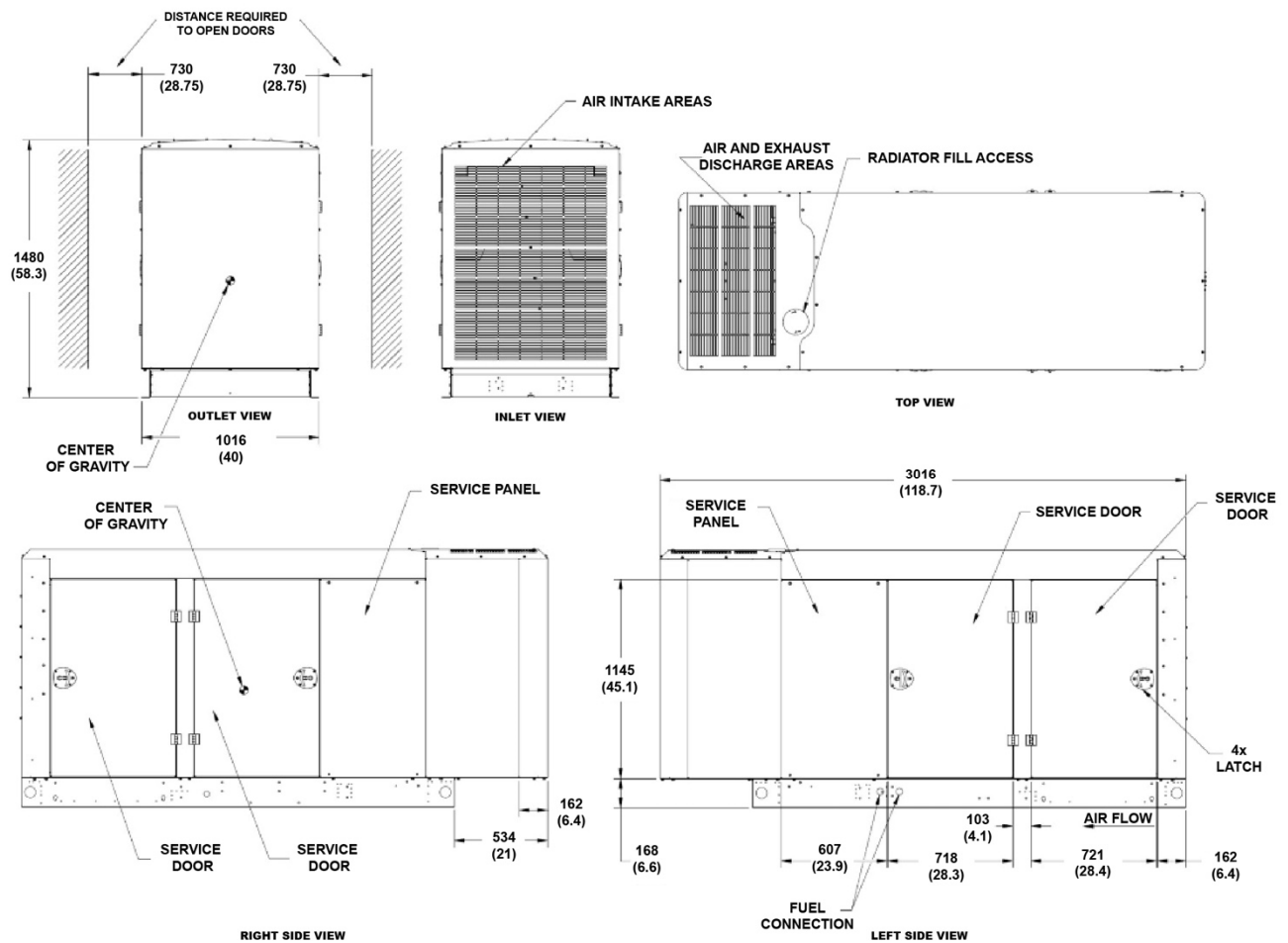
1 lb

0.535m³ =

1 kg

36.39 ft³ = 1 gal

Basic dimensions



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

Accessories

- HMI211RS in-home display, including pre-configured 12" harness
- HMI211 remote display, including pre-configured 12" harness
- HMI220 remote display
- Auxiliary output relays (2)
- Auxiliary configurable signal inputs (8) and relay outputs (8)
- Annunciator – RS 485
- Internet monitoring device – PowerCommand 500
- Battery chargers – 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
- Extreme cold weather kit for operating temperatures below 0 °F (-17 °C)



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 (sold separately)

- Automatic Transfer Switches available at various amperages. (Refer to NAS-5810-EN, S-1639)
- Service Entrance models are also available, which helps reduce the installation cost.
- All models listed to UL 1008 standard.
- Available for both indoor and outdoor applications.
- Compatibility with Cummins generator set helps reduce the installation time for the complete application.

Warranty policy

Cummins RS liquid cooled generator set models come with a 2 year base warranty when used in EPA-Stationary Emergency application. The RA series Automatic Transfer Switches come with a 2 year base warranty. Extended warranty options are available. Please contact your Cummins dealers for details.

After sale support

Largest dealer support network

Cummins generator sets are supported by the best trained and certified dealer network in the industry. This network of knowledgeable dealers will help you select the right generator for your application and advise you on associated accessories for your generator. Cummins dealers can also help answer any questions you may have regarding operation and maintenance requirements of the generators. Certified dealers also offer a complete selection of commonly used generator set maintenance parts and manuals.

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

Contact your dealer for more information.

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NAS-6171-EN (7/21)

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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	549.6	805.4	1050.8	1317.7	207.5	311.8	411.2	518.7
m ³ /hr	15.6	22.8	29.8	37.3	5.9	8.8	11.7	14.7

Engine

	Natural gas Standby rating	Propane Standby rating
Engine model	QSJ5.9G-G3	
Configuration	Cast Iron, In line, 6 cylinder	
Aspiration	Turbocharged and aftercooled	
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)	3.5 (14)

Air

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

Exhaust flow at set 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 (inH ₂ O)	8.5 (34.1)	8.5 (34.1)

Standard set-mounted radiator cooling	Natural gas Standby rating	Propane Standby rating
Ambient design, °C (°F)	50 (122)	50 (122)
Fan load, kWm (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 (inH ₂ O)	0.12 (0.5)	0.12 (0.5)

Weights	Natural gas	Propane
Unit dry weight kg (lb)	1276 (2812)	1276 (2812)
Unit wet weight kg (lb)	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 305m (1000ft) 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 305m (1000ft) and 2% per 10°C above 25°C (77°F).

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		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	360	516
	PMG	423	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	360	
	PMG	497	497	497	423	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.

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NAD-6098-EN (8/17) A054P034

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Alternator data sheet

Frame size: **UC3D**

Characteristics								
Weights:	Wound stator assembly:	265 lb	120 kg					
	Rotor assembly:	317 lb	144 kg					
	Complete alternator:	941 lb	427 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	78/78	100/100		68/68			
105 °C rise ratings	kW/kVA	72/72	87/87		60/60			
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>240/416</u>	<u>139/240</u> <u>277/480</u>	<u>190-208</u> <u>380-416</u>	<u>347/600</u>	<u>110/190</u> <u>220/380</u>	<u>120/208</u> <u>240/415</u>	<u>127/220</u> <u>254/440</u>
150 °C Rise ratings	kW	110	124	110	124	97	97	92
	kVA	138	155	138	155	121	121	116
125 °C Rise ratings	kW	105	117	105	117	91	91	87
	kVA	131	146	131	146	114	114	109
105 °C Rise ratings	kW	96	105	96	105	80	80	74
	kVA	120	131	120	131	100	100	93
80 °C Rise ratings	kW	80	88	80	88	72	72	67
	kVA	100	110	100	110	90	90	84
3 ∅ Reactances	(per unit, ±10%)							
(Based on full load at 105 °C rise rating)								
Synchronous		2.53	2.08	2.00	1.82	2.11	1.77	1.46
Transient		0.21	0.17	0.16	0.16	0.18	0.15	0.12
Subtransient		0.14	0.12	0.12	0.12	0.13	0.11	0.09
Negative sequence		0.17	0.14	0.14	0.14	0.14	0.11	0.09
Zero sequence		0.10	0.08	0.08	0.08	0.08	0.07	0.06
3 ∅ Motor starting								
Maximum kVA	(Shunt)	360	360	360		244		
(90% sustained voltage)	(PMG)	423	423	423		306		
Time constants	(Sec)							
Transient		0.030	0.030	0.030		0.030		
Subtransient		0.010	0.010	0.010		0.010		
Open circuit		0.820	0.820	0.820		0.820		
DC		0.007	0.007	0.007		0.007		



Alternator data sheet

Frame size: **UC3D**

Windings	(@ 20 °C)				
Stator resistance	(Line to Line, Ohms)	0.0900	0.0680	0.1250	0.0900
Rotor resistance	(Ohms)	1.2000	1.2000	1.2000	1.2000
Number of leads		12	12	6	12

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



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-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.
- 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

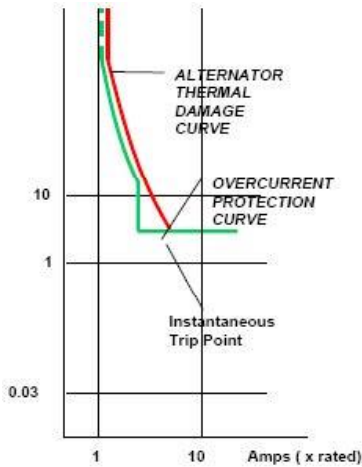
Engine fault detection is handled inside the engine ECM. Fault information is communicated via the SAE-J1939 data link for annunciation in the HMI

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 (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, 10 seconds, enabled.

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

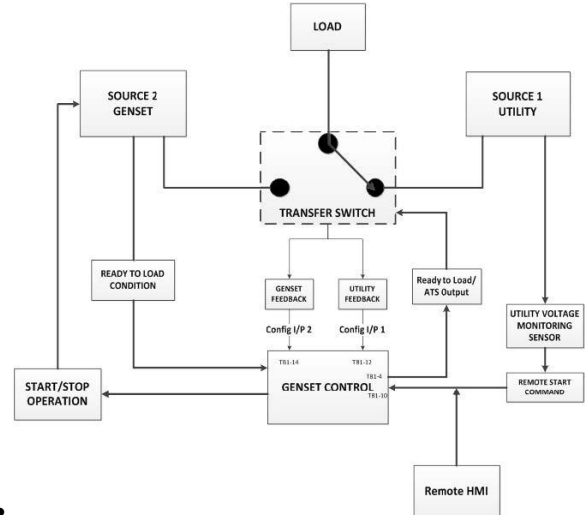
Field overload shutdown - Uses field voltage to shutdown generator set when a field overload condition occurs.

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

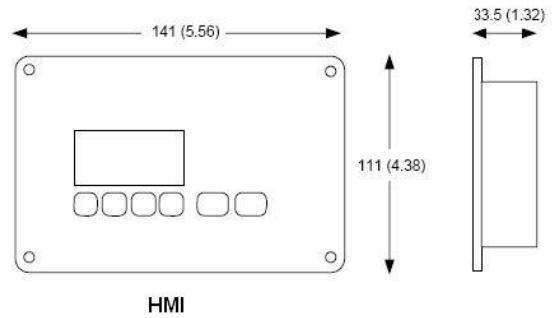
- LED indicating lamps:
 - Remote start
 - Not in auto
 - Shutdown
 - Warning
 - Auto
 - Run
- 128 x 64 pixels graphic LED backlight LCD.
- Four tactile feel membrane switches for LCD defined operation. The functions of these switches are defined dynamically on the LCD.
- Two tactile feel membrane switches 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 °C (158 °F), and for storage from -55 °C (-67 °F) to +80 °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 °C (158 °F), and for storage from -40 °C* (-40 °F) to +80 °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.™



Sound Pressure Level @ 7 meters, dB(A)

See Notes 2,5,7-11 listed below

Configuration		Position (Note 1)								8 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 1,3,6-11 listed below

Configuration		Octave Band Center Frequency (Hz)										Overall Sound Power Level
		31.5	63	125	250	500	1000	2000	4000	8000	16000	
Standard Unhoused	Infinite Exhaust	55.4	71.6	82.7	91.4	99.8	102.0	101.6	98.0	93.9	90.8	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	89.8	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	81.3	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	76.8	98.9

Exhaust Sound Power Level, dB(A)

See Notes 4,6,9 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	
	52.7	91.2	99.5	98.8	109.4	108.3	108.7	111.0	110.8	99.4	

Note.

1. Sound pressure levels at 1 meter are measured per the requirements of ISO 3744, ISO 8528-10, ANSI S1.13, ANSI S12.1 and European Communities Directive 2000/14/EC as applicable. The microphone measurement locations are 1 meter from a reference parallelepiped just enclosing the generator set (enclosed or unenclosed).
2. Seven-meter measurement location 1 is 7 meters (23 feet) from the generator (alternator) end of the generator set, and the locations proceed counterclockwise around the generator set at 45° angles at a height of 1.2 meters (48 inches) above the ground surface.
3. Sound Power Levels are calculated according to ISO 3744, ISO 8528-10, and or CE (European Union) requirements.
4. Exhaust Sound Levels are measured and calculated per ISO 6798, Annex A.
5. Reference Sound Pressure Level is 20 µPa.
6. Reference Sound Power Level is 1 pW (10⁻¹² Watt).
7. Sound data for remote-cooled generator sets are based on rated loads without cooling fan noise.
8. Sound data for the generator set with infinite exhaust do not include the exhaust noise contribution.
9. Sound levels are subject to instrumentation, measurement, installation, and manufacturing variability.
10. Unhoused/Open configuration generator sets refers to generator sets with no sound enclosures of any kind.
11. Housed/Enclosed/Closed/Canopy configuration generator sets refer to generator sets that have noise reduction sound enclosures installed over the generator set and usually integrally attached to the skid base/base frame/fuel container base of the generator set.



Exhaust Emission Data Sheet

C100 N6

60 Hz Spark Ignited Generator Set

EPA Emissions

Engine Information:

Model:	QSJ5.9G-G3	Bore:	4.02 in. (102.1 mm)
Type:	4 cycle, in-line, 6 cylinder	Stroke:	4.72 in. (119.9 mm)
Aspiration:	Turbocharged and Aftercooled	Displacement:	359 cu. in. (5.9 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)	36.4	62.4	89.1	116.3
Fuel Consumption (gal/Hr)	6.19	9.53	12.67	15.97
Exhaust Gas Flow (CFM)	N/A	N/A	N/A	986.0
Exhaust Gas Temperature (°F)	N/A	N/A	N/A	1225.4
Air to Fuel Ratio	21.11	23.44	23.44	23.44
 <u>Exhaust Emission Data</u>				
HC (Total Unburned Hydrocarbons)*	0.24	0.37	0.29	0.27
NOx (Oxides of Nitrogen as NO ₂)	2.15	0.71	1.24	1.88
CO (Carbon Monoxide)	1.14	1.17	0.95	0.87
	All values above are cited: g/BHP-hr			
HC (Total Unburned Hydrocarbons)*	104.3	161.7	137.6	129.6
NOx (Oxides of Nitrogen as NO ₂)	299.6	99.2	186.3	289.1
CO (Carbon Monoxide)	245.7	255.4	222.1	212.3
	All values above are cited: ppmvd			

*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

C100 N6

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)	36.4	62.4	89.1	116.3
Fuel Consumption (gal/Hr)	7.18	11.02	14.73	18.81
Exhaust Gas Flow (CFM)	N/A	N/A	N/A	974
Exhaust Gas Temperature (°F)	N/A	N/A	N/A	1274
Air to Fuel Ratio	20.27	21.46	21.72	22.22
 <u>Exhaust Emission Data</u>				
HC (Total Unburned Hydrocarbons)*	0.64	1.03	0.85	0.80
NOx (Oxides of Nitrogen as NO ₂)	1.86	1.28	1.82	1.80
CO (Carbon Monoxide)	2.06	1.74	1.47	1.44
	All values above are cited: g/BHP-hr			
HC (Total Unburned Hydrocarbons)*	255.3	260.6	237.5	253.7
NOx (Oxides of Nitrogen as NO ₂)	272.9	200.3	299.2	295.7
CO (Carbon Monoxide)	445.6	402.7	357.5	351.1
	All values above are cited: ppmvd			
*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 C100 N6 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: PCEXB05.9ALB-006
 Effective Date: 07/25/2022
 Date Issued: 07/25/2022
 EPA Engine Family (Cummins Emissions Family): PCEXB05.9ALB

Engine Information:

Model:	QSJ5.9G-G3	Bore:	4.02 in. (102 mm)
Engine Nameplate HP:	162.7	Stroke:	4.72 in. (120 mm)
Type:	4 Cycle, In-Line, 6 Cylinder	Displacement:	359.0 cu. in. (6 liters)
Aspiration:	Turbocharged and Aftercooled	Compression Ratio:	8.5:1
Emission Control Device:	Electronic Air/Fuel Ratio Control and Closed-Loop Breather System	Exhaust Stack Diameter:	4.0 in (102 mm)

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

Natural Gas	Grams per BHP-hr			Grams per kWm-hr		
	<u>NOx</u>	<u>VOC</u>	<u>CO</u>	<u>NOx</u>	<u>VOC</u>	<u>CO</u>
EPA Emissions Limit	2.0	1.0	4.0	2.7	1.3	5.4

Propane (LP)	Grams per BHP-hr			Grams per kWm-hr		
	<u>NOx</u>	<u>VOC</u>	<u>CO</u>	<u>NOx</u>	<u>VOC</u>	<u>CO</u>
EPA Emissions Limit	2.0	1.0	4.0	2.7	1.3	5.4

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>	
C70 N6	C100 N6	Model:	C100 N6
C80 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

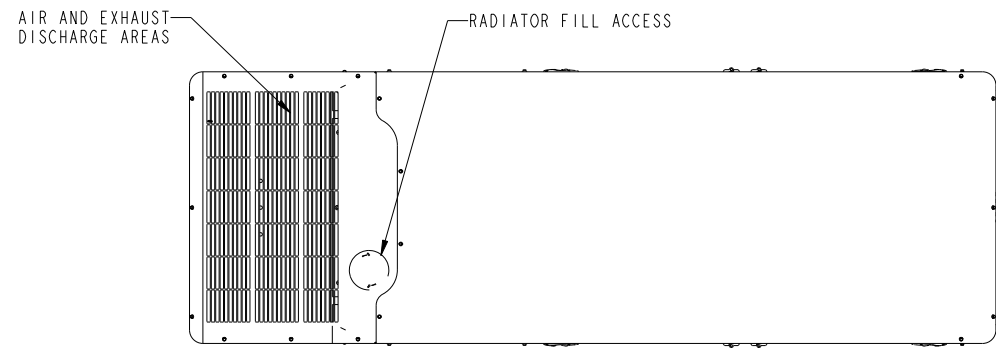
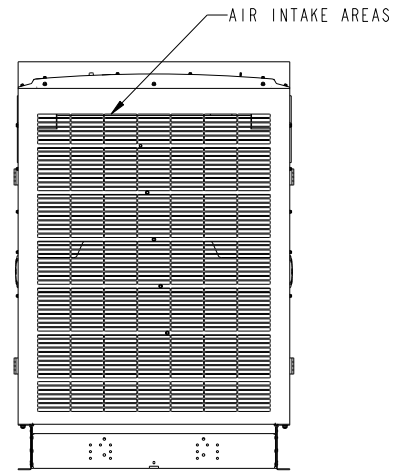
Harmonic analysis:
(per MIL-STD-705B, method 601.4)

<u>Harmonic</u>	<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

REL NO	LTR	NO	REVISION	DRN	CAD	APVD	DATE
ECO-152551	A	1	PRODUCTION RELEASE	CG	NK	M. WICKMANN	14MAY15

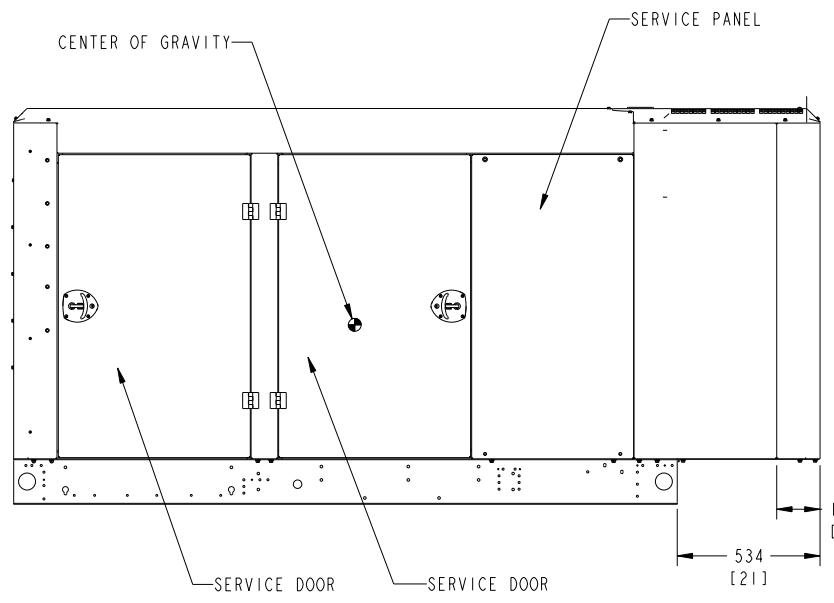
NOTES:

- DIM [] IN INCHES
- WHEN THE HOUSING INSTALLED ON AN OPEN GENERATOR SET, THE TOTAL WEIGHT WILL INCREASE BY 131.5 KG (290 LBS). THIS INCLUDES THE MUFFLER.
- THE CENTER OF GRAVITY (CG) OF THE GENERATOR SET WHEN EQUIPPED WITH THIS HOUSING SHIFTS APPROXIMATELY 65mm (2.55 inch) TOWARDS THE AIR DISCHARGE END OF THE HOUSING AND 42MM (1.66 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.

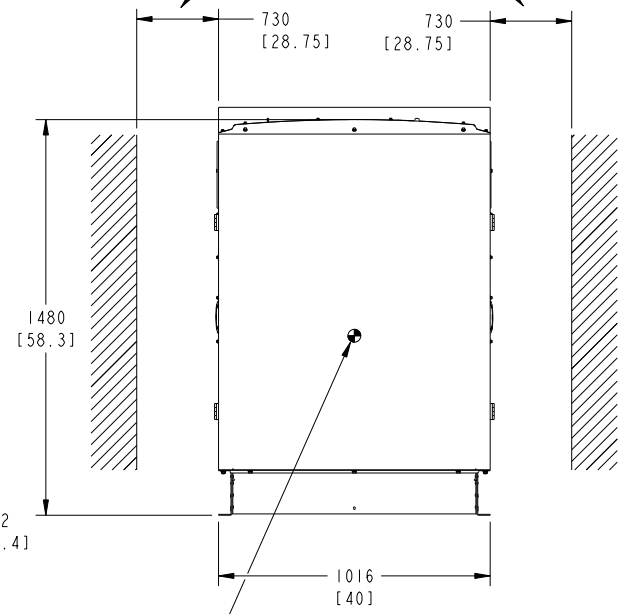


DISTANCE REQUIRED TO OPEN DOORS

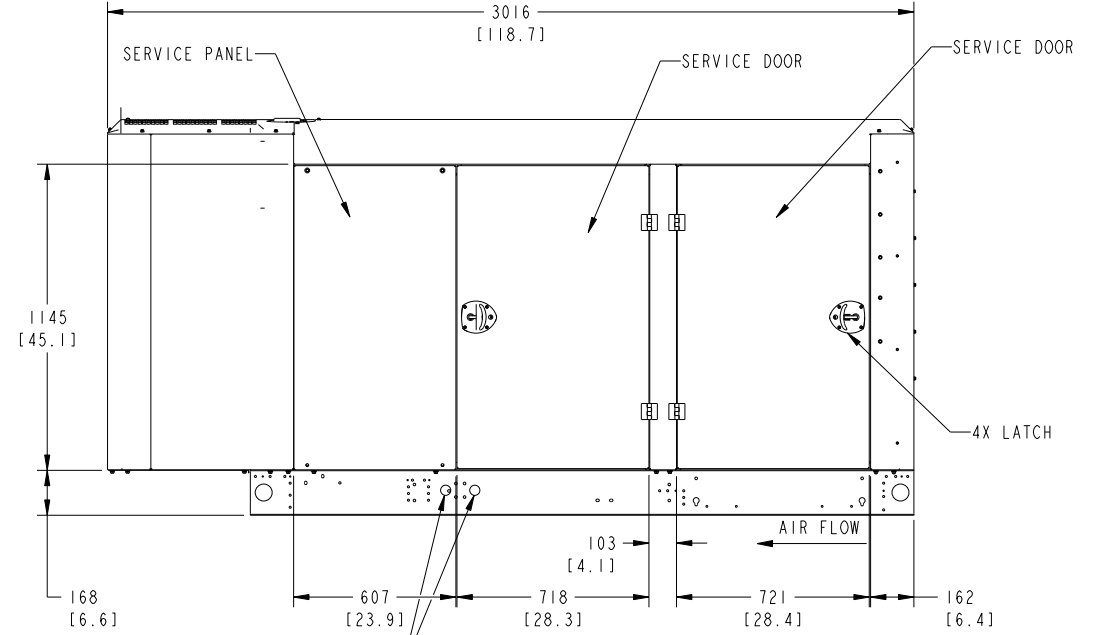
TOP VIEW



RIGHT SIDE VIEW



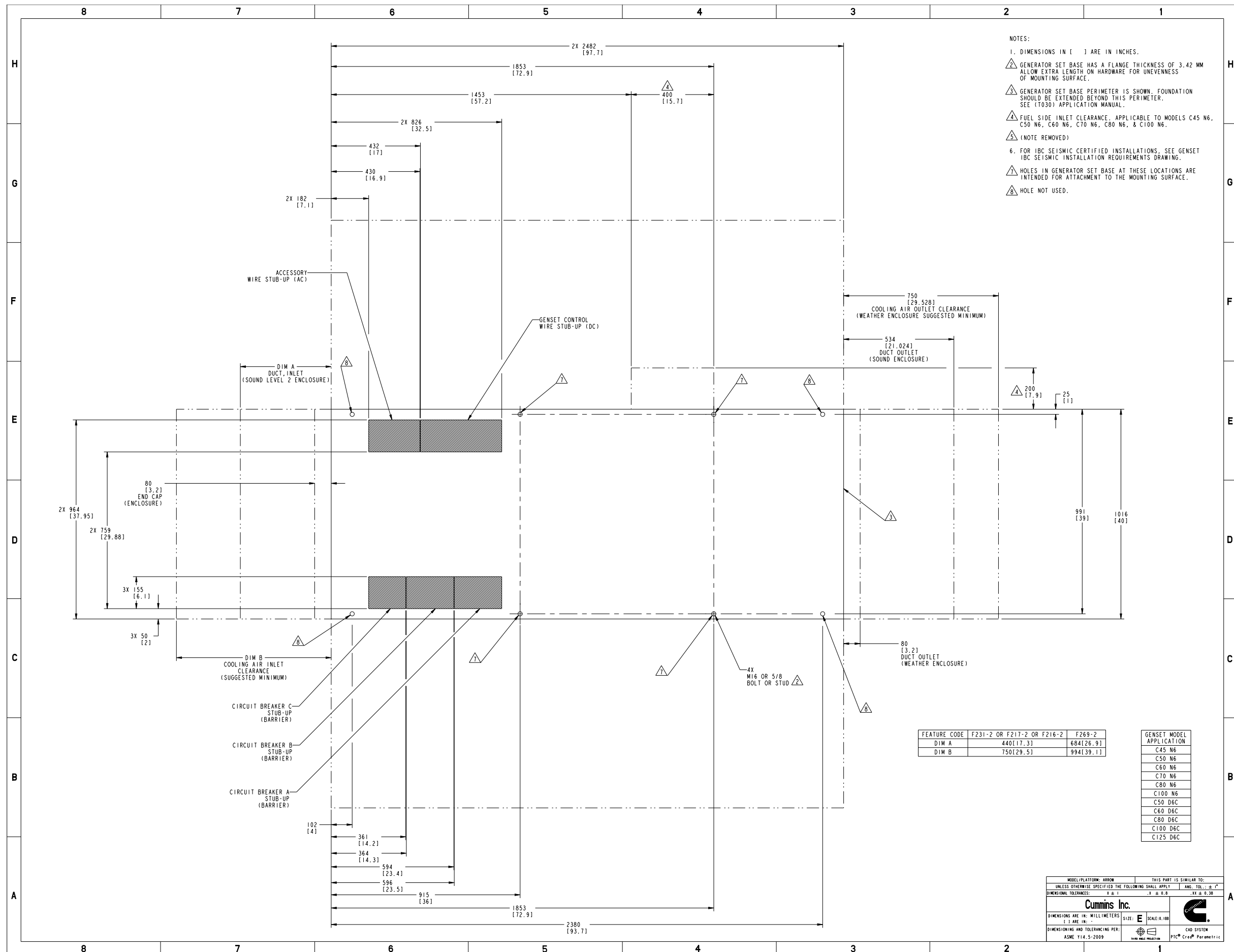
OUTLET VIEW



LEFT SIDE VIEW

F231-2 ENCLOSURE CONFIGURATION

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS		SIM 10 NONE	DRN C. GADE		CUMMINS POWER GENERATION	
DO NOT SCALE PRINT		CD N. KASIBHOTLA	OUTLINE, ENCLOSURE			
CH	X ± 1	0.00- 4.99 +0.15/-0.08	APVD M. WICKMANN	SITE CODE	REV D	A051P365
	.X ± 0.8	5.00- 9.99 +0.20/-0.10	DATE 14MAY15	PGF	SHEET 1 OF 2	REV A
	.XX ± 0.38	10.00-17.49 +0.25/-0.13		ARROW		
		17.50-24.99 +0.30/-0.13				
ANG TOL: ± 1.0°		SCALE: ~3/32	FOR INTERPRETATION OF DIMENSIONS AND TOLERANCING, SEE ASME Y14.5M-1994			



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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: _____