SUBMITTAL PACKAGE

☐ Revise with corrections provided

☐ Approved and released for production

Date:

By (name and company):

Requested delivery date:

Requested delivery address:

Contact person and phone # for deliveries:

Serving Cummins Customers

Cummins power solutions are supported by the largest and best-trained worldwide-certified sales/distributor network in the industry. This network will help you select and install the critical power solution to meet the requirements of your specific application. This same network provides experts with advanced technology to make your life easier while providing a seamless support experience.

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

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

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

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

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

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

Sales and Service

TABLE OF CONTENTS

SECTION 1
PROJECT INFORMATION

Sales and Service

Bill of Material

Feature Code	Description	Qty
C200N6B	**C200N6B, 200kW, 60Hz, Standby, Natural Gas Genset**	1
Install-US-Stat	U.S. EPA, Stationary Emergency Application	
C200N6B	C200N6B, 200kW, 60Hz, Standby, Natural Gas Genset	
A331-2	Duty Rating - Standby Power (ESP)	
L155-2	Emissions Certification - SI, EPA, Emergency, Stationary, 40CFR60	
L090-2	Listing - UL 2200	
L193-2	NFPA 110 Type 10 Level 1 Capable	
L224-2	IBC Seismic Certification	
L225-2	OSHPD Seismic Certification	
B184-2	Exciter / Regulator - Permanent Magnet Generator, 3 Phase Sensor	
R002-2	Voltage - 277 / 480, 3 Phase, Wye, 4 Wire	
BB95-2	Alternator - 60Hz, 12L, 480/277V, 105C, 40C Ambient, Increased Motor Starting (IMS)	
F231-2	Aluminum Sound Attenuated Level 1 Enclosure, with Exhaust System	
P176-2	Enclosure Color - Green, Aluminum	
F252-2	Enclosure - Wind Load 180 MPH, ASCE7-10	
F065-2	Battery Rack	
F179-2	Skidbase - Housing Ready	
H609-2	Control Mounting - Left Facing	
H703-2	PowerCommand2.3 Controller	
H012-2	Gauge - Oil Pressure	
H569-2	Warning - Low Fuel Gas Pressure	
H606-2	Analog Meters - AC Output	
K796-2	Stop Switch - Emergency	
KS52-2	Relays - Aux, Qty2 - 25A - 15 Volts DC / 10A - 30 Volts DC	
KS53-2	Signals - Aux, Input / Output	
H536-2	Control Display Language - English	
KV04-2	Load Connections - Dual	
KY06-2	Circuit Breaker, Location A, 200A - 600A, 3P, LSI, 600 Volts AC, 100%, UL	
KY07-2	Circuit Breaker, Location B, 200A - 600A, 3P, LSI, 600 Volts AC, 100%, UL	
4400	Circuit Breaker or Terminal Box (Position C) - None	
KB72-2	Bottom Entry, Right	
A366-2	Engine Governor - Electronic, Isochronous	
C002-2	Single Gas Fuel - NG	
A422-2	Engine Starter - 12 Volt DC Motor	
D041-2	Engine Air Cleaner - Normal Duty	
A333-2	Battery Charging Alternator	
BB89-2	Battery Charger - 6 Amp, Regulated	
E125-2	Engine Cooling - Radiator, High Ambient Air Temperature, Ship Fitted	
H527-2	Warning - Low Coolant Level	
E089-2	Extension - Coolant Drain	
H669-2	Engine Coolant - 50% Antifreeze, 50% Water Mixture	
E153-2	Coolant Heater	
H487-2	Engine Oil Heater - 120 Volts AC, Single Phase	
H706-2	Engine Oil	
L028-2	Genset Warranty - 2 Years Base	
L050-2	Literature - English	
A322-2	Packing - Skid, Poly Bag	
H268-2	Extension - Oil Drain	

NOTES:

- All ship loose items installed by others.
- Unloading, installation, and fuel are not included and will be the responsibility of others.

- **Natural Gas or LP Gas Generator:**
  - Main gas regulator, flex piping and stepdown regulator provided by others. Installation of main gas regulator not done by Cummins Personnel
  - Gas Pressure – For generators between 20kW-200kW 6-14 inches H2O to engine, for generators 250kW - 750kW 15-20 inches H2O to engine– Main gas supply should be 5 PSI+ feeding a step-down regulator located as close to the engine as possible. Line should be dedicated to the generator.
- **Warranty:** Cummins warranty begins at the successful completion of startup and testing in lieu of acceptance or substantial completion.
- **Startup & Training:**
  - Providing Cummins standard startup and the specific testing listed above only. All other testing including NETA testing is provided by others.
  - Training for maintenance personnel will be concurrent at time of startup unless otherwise noted.
  - No videotaping is included with this quotation. All taping is supplied by others.
- *NOTICE: As a result of the outbreaks of the disease COVID-19 arising from the novel coronavirus, temporary delays in delivery, labor, or services from Cummins and its sub-suppliers or subcontractors may occur. Among other factors, Cummins' delivery is subject to correct and punctual supply from our sub-suppliers or subcontractors, and Cummins reserves the right to make partial deliveries or modify its labor or service. While Cummins shall make every commercially reasonable effort to meet the delivery, service, or completion described herein, such date(s) is(are) subject to change.*

IMPORTANT!

FUEL SUPPLY REQUIREMENTS

Fuel Source: Natural Gas

Fuel Consumption at Full Load: 2599.1 SCFH

Required Operating Fuel Pressure: 6.0 - 14.0 in H_2O

Fuel pressure required at the engine mounted regulator while the generator set is in operation, no load to full load. ***Please Note: The pressure listed is not a static pressure. If the above pressure is not maintained while the generator set is operating up to full load, the system will not function as required and the fuel delivery system will need to be reworked to provide operating pressure as listed.***

Required Fuel Pressure **AND** Volume **MUST** be available under **ALL** operating conditions at the generator set location.

All generator sets must be installed with a flexible fuel line and fuel strainer prior to the engine connection:

Flexible Fuel Line: [ ] included loose accessory
[ ] included engine mounted

Fuel Strainer: [ ] included loose accessory

SECTION 2
GENERATOR SPECIFICATIONS

Specification Sheet

Spark-Ignited Generator set

125, 150, 175, & 200 kW
Standby
EPA Emissions

Description

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

Features

Gas engine - Rugged 6-cyclinder Cummins QSJ8.9G spark-ignited engine delivers reliable power. The electronic air/fuel ratio control provides optimum engine performance and fast response to load changes.

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

Control system - The PowerCommand® 2.3 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.

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

Enclosures - The aesthetically appealing enclosure incorporates special designs that deliver one of the quietest generators of its kind. 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.

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

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

	Natural Gas		
	Standby (60 Hz)		Data sheets
Model	kW	kVA	60 Hz
C125N6	125	156	NAD-6303
C150N6	150	188	NAD-6304
C175N6B	175	218	NAD-6632
C200N6B	200	250	NAD-6633

Generator Set Specifications

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	114.1 mm (4.49 in)
Stroke	144.5 mm (5.69 in)
Displacement	8.9 liters (543 in^3)
Cylinder block	Cast iron, in-line 6 cylinder
Battery capacity	850 amps standard, dual battery optional
Battery charging alternator	100 amps
Starting voltage	12-volt, negative ground
Lube oil filter type(s)	Spin-on
Standard cooling system	125 kW - 50 °C (122 °F) ambient cooling system 150 kW - 45 °C (113 °F) ambient cooling system 175 kW - 50° C (122° F) ambient cooling system 200 kW - 45° C (113° F) ambient cooling system
Rated speed	1800 rpm

Alternator Specifications

Design	Brushless, 4 pole, drip proof, revolving field
Stator	2/3 pitch
Rotor	Direct coupled, flexible disc
Insulation system	Class H per NEMA MG1-1.65
Standard temperature rise	120 ºC (248 °F) standby
Exciter type	Torque match (shunt) with PMG as option
Alternator cooling	Direct drive centrifugal blower
AC waveform total harmonic distortion	< 5% no load to full linear load, < 3% for any single harmonic
Telephone influence factor (TIF)	< 50 per NEMA MG1-22.43
Telephone harmonic factor (THF)	< 3%

Available Voltages

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

Generator Set Options

Fuel system
- ☐ 125 and 150 kW:
  - ○ Single fuel – natural gas or propane vapor, field selectable
  - ○ Dual fuel – natural gas or propane vapor, auto changeover
- ☐ 175 and 200 kW:
  - ○ Single fuel – natural gas
- ☐ Low fuel gas pressure warning

Engine
- ☐ Normal or Heavy-duty engine air cleaner
- ☐ Shut down – low oil pressure
- ☐ Extension – oil drain
- ☐ Engine oil heater

Electrical
- ☐ One, two or three circuit breaker configurations
- ☐ 80% rated circuit breakers
- ☐ 100% rated LSI circuit breakers

Control
- ☐ PC2.3 with AmpSentry
- ☐ PC3.3 with Paralleling option
- ☐ AC output analog meters
- ☐ Stop switch – emergency
- ☐ Auxiliary output relays (2)
- ☐ Auxiliary configurable signal inputs (8) and relay outputs (8)

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

Enclosure
- ☐ Aluminum enclosures with muffler installed – green color
  - ○ Weather
  - ○ Sound Level 1
  - ○ Sound Level 2
  - ○ Winter

Cooling system
- ☐ Shutdown – low coolant level
- ☐ Warning – low coolant level
- ☐ Extension – coolant drain
- ☐ Coolant heater options:
  - ○ < 4 °C (40 °F) - Cold weather
  - ○ < -17 °C (0 °F) - Extreme cold

Exhaust system
- ☐ Exhaust connector NPT
- ☐ Exhaust muffler mounted

Generator set application
- ☐ Base barrier – elevated genset
- ☐ Battery rack, single or dual battery
- ☐ Radiator outlet duct adapter

Warranty
- ☐ Base warranty – 2 year / 1000 hours, standby
- ☐ 3-year standby warranty options
- ☐ 5-year standby warranty options

Generator Set Accessories

- ☐ Coolant heaters – 1500W / 2000W
- ☐ Battery rack, single or dual battery
- ☐ Battery heater kit
- ☐ Engine oil heater
- ☐ Remote control displays
- ☐ Auxiliary output relays (2)
- ☐ Auxiliary configurable signal inputs (8) and relay outputs (8)
- ☐ Annunciator – RS485
- ☐ Remote monitoring device – PowerCommand 500/550
- ☐ Battery charger – stand-alone, 12V
- ☐ Circuit breakers
- ☐ Enclosure Sound Level 1 to Sound Level 2 upgrade kit
- ☐ Base barrier – elevated generator set
- ☐ Mufflers – industrial, residential, or critical
- ☐ Alternator PMG
- ☐ Alternator heater

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Control System PowerCommand 2.3

An integrated generator set control system providing voltage regulation, engine protection and operator interface.

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

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

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

Control boards - Potted for environmental protection.

Ambient operation - Suitable for operation in ambient temperatures from -40 °C to +70 °C and altitudes to 13,000 feet (5,000 meters).

AC Protection

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

Engine protection

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

Operator/display panel

- Manual off switch
- 320 x 240 Pixels graphic LED backlight LCD with push button access for viewing engine and alternator data and providing setup, controls, and adjustments (English, Spanish, or French).
- LED lamps indicating genset running, not in auto, common warning, common shutdown, manual run mode and remote start
- Suitable for operation in ambient temperatures from -20 °C to +70 °C

Alternator data

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

Engine data

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

Other data

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

Digital governing (optional)

- Integrated digital electronic isochronous governor
- Temperature dynamic governing

Digital voltage regulation

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

Control functions

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

Options

☐ Auxiliary output relays (2)
☐ Remote annunciator with (3) configurable inputs and (4) configurable outputs
☐ PMG alternator excitation
☐ PowerCommand 500/550 for remote monitoring and alarm notification (accessory)
☐ Auxiliary, configurable signal inputs (8) and configurable relay outputs (8)
☐ Digital governing
☐ AC output analog meters (bargraph)
- Color-coded graphical display of:
  - 3-phase AC voltage
  - 3-phase current
  - Frequency
  - kVa

☐ Remote operator panel

For further detail on PC 2.3, see document S-1569
For further detail on PC 3.3, see document S-1570

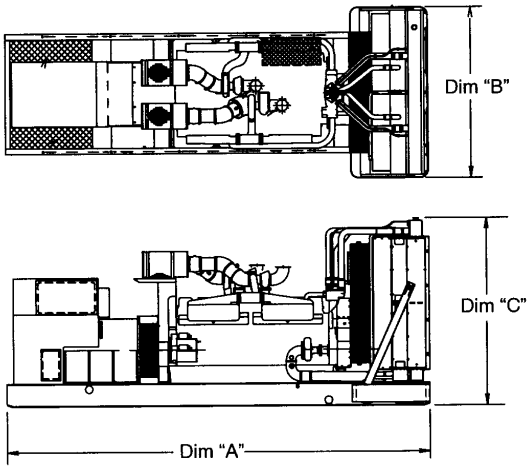
Ratings Definitions

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

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

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

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



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

Do not use for installation design

Model	Dim "A" mm (in.)	Dim "B" mm (in.)	Dim "C" mm (in.)	Set Weight* wet kg (lbs.)
		Open Set		
C125N6	2867 (113)	1016 (40)	1415 (56)	1580 (3483)
C150N6	2867 (113)	1016 (40)	1415 (56)	1580 (3483)
C175N6B	2867 (113)	1016 (40)	1478 (58)	1610 (3543)
C200N6B	2867 (113)	1016 (40)	1478 (58)	1698 (3735)
		Weather Protective Enclosure		
C125N6	2867 (113)			1661 (3662)
C150N6	2867 (113)			1661 (3662)
C175N6B	2867 (113)			1691 (3728)
C200N6B	2867 (113)	1016 (40)	1836 (72)	1779 (3922)
		Sound Attenuated Enclosure Level 1		
C125N6	3621 (143)	1016 (40)	1836 (72)	1776 (3915)
C150N6	3621 (143)	1016 (40)	1836 (72)	1776 (3915)
C175N6B	3621 (143)	1016 (40)	1836 (72)	1806 (3982)
C200N6B	3621 (143)	1016 (40)	1836 (72)	1894 (4176)
		Sound Attenuated Enclosure Level 2		
C125N6	4061 (160)	1016 (40)	1836 (72)	1791 (3940)
C150N6	4061 (160)	1016 (40)	1836 (72)	1791 (3940)
C175N6B	4061 (160)	1016 (40)	1836 (72)	1821 (4015)
C200N6B	4061 (160)	1016 (40)	1836 (72)	1909 (4209)

Refer to drawings for specific weights and dimensions

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

Codes and Standards

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

	The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Cummins Power Generation products bearing the PTS symbol meet the prototype test requirements of NFPA 110 for Level 1 systems.		This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.
			The generator set is available Listed to UL 2200, Stationary Engine Generator Assemblies.
International Building Code	The generator set is certified to International Building Code (IBC) 2012.		All low voltage models are CSA certified to product class 4215-01.
		U.S. EPA	Engine certified to U.S. EPA SI Stationary Emission Regulation 40 CFR, Part 60.

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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USA

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NAS-6298-EN (12/22) A057Y417

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Generator Set Data Sheet

Model: C200N6B
Frequency: 60 Hz
Fuel type: Natural gas
kW rating: 200 Natural gas standby

Emissions level: EPA Emissions

Fuel Consumption

	Natural Gas Standby kW (kVA)			
Ratings	200 (250)			
Load	1/4	1/2	3/4	Full
scfh	834.1	1442.4	1961.2	2599.1
m^3/hr	23.62	40.85	55.54	73.61

Engine

	Natural gas Standby Rating
Engine model	QSJ8.9G-G3
Configuration	Cast Iron, In line, 6 cylinders
Aspiration	Turbocharged and aftercooled
Gross engine power output, kWm (bhp)	231 (310)
Bore, mm (in)	114.1 (4.49)
Stroke, mm (in)	144.5 (5.69)
Rated speed, rpm	1800
Compression ratio	8.5:1
Lube oil capacity, L (qt)	21 (22)

Fuel Supply Pressure

Minimum operating pressure, kPa (in H_2O)	1.5 (6)
Maximum operating pressure, kPa (in H_2O)	3.5 (14)

Air

	Natural gas Standby Rating
Combustion air, m^3/min (scfm)	17 (600)
Maximum normal duty air cleaner restriction, kPa (in H_2O)	3.7 (15.0)
Maximum heavy-duty air cleaner restriction, kPa (in H_2O)	3.7 (15.0)

Exhaust	Natural gas Standby Rating
Exhaust flow at set rated load, m^3/min (cfm)	39.6 (1399.5)
Exhaust temperature at set rated load, °C (°F)	588.9 (1092)
Maximum back pressure, kPa (inH_2O)	9 (36.1)

Standard set-mounted radiator cooling	Natural gas Standby rating
Ambient design, °C (°F)	50 (122)
Fan load, kWm (HP)	10.1 (13.5)
Coolant capacity (with radiator), L (US gal)	21 (5.6)
Cooling system air flow, m^3/min (scfm)	368.1 (13000)
Maximum cooling air flow static restriction, kPa (inH_2O)	0.125 (0.5)

Weights	Refer to drawings for specific weights and dimensions
Unit wet weight kg (lb)	

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 600 m (1969 ft) and ambient temperatures up to 40° C (104° F). Above these conditions, derate at 3.2% per 300 m (985 ft) and 2.5% per 5.5° C (10° 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	Single phase table	Three phase table				
Maximum temperature rise above 40° C ambient	120° C	120° C				
Feature code	BB90-2	B946-2	B986-2	B952-2	B943-2	BB86-2
Alternator data sheet number	ADS-213	ADS-213	ADS-212	ADS-212	ADS-212	ADS-212
Voltage ranges	120/240	120/208	120/240	347/600	277/480	127/220
Voltage feature code	R104-2	R098-2	R106-2	R114-2	R002-2	R020-2
Surge kW	205.7	211.1	213.4	214.3	213.4	211.6
Motor Starting kVA (at 90% sustained voltage) Shunt	770	770	672	770	770	770
Motor Starting kVA (at 90% sustained voltage) PMG	920	920	791	920	920	920
Full load current amps at standby rating	833	694	602	240	301	656

Optional alternators for improved starting capability	Three phase table				
Maximum temperature rise above 40 °C ambient	105° C				
Feature code	BB94-2	BB95-2	BB92-2	BB85-2	BB93-2
Alternator data sheet number	ADS-212	ADS-212	ADS-212	ADS-212	ADS-213
Voltage ranges	120/240	277/480	347/600	127/220	120/208
Voltage feature code	R106-2	R002-2	R114-2	R020-2	R098-2
Surge kW	213.4	213.4	214.3	211.6	211.1
~~Motor Starting kVA (at 90% sustained voltage) Shunt~~	770	~~770~~	770	770	770
Motor Starting kVA (at 90% sustained voltage) PMG	920	920	920	920	920
Full load current amps at standby rating	602	301	240	656	694

Notes:
[1] Single phase power can be taken from a three phase generator set at up to 2/3 set rated 3-phase kW at 1.0 power factor
[2] Full single phase output up to full set rated 3-phase kW at 1.0 power factor

Formulas for calculating full load currents:

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

Phone 763 574 5000
Fax 763 574 5298

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NAD-6633-EN (12/22) PD00001228

Three phase output

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

Single phase output

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

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.

 NAD-6633-EN (12/22) PD00001228

Specification Sheet

PowerCommand®
2.3 Control System

Control System Description

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

Features

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

PowerCommand Digital Genset Control PCC 2300

Description

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

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

Features

- 12 and 24 VDC battery operation.
- Digital voltage regulation - Three phase full wave FET type regulator compatible with either shunt or PMG systems. Sensing is three phase.
- Full authority engine communications (where applicable) - Provides communication and control with the Engine
- due to thermal Control Module (ECM).
- AmpSentry" protection provides industry-leading alternator overcurrent protection:
  - Time-based generator protection applicable to both line-to-line and line-to-neutral, that can detect an unbalanced fault condition and swiftly react appropriately. Balanced faults can also be detected by AmpSentry and appropriate acted upon.
- Reduces the risk of Arc Flash overload or electrical faults by inverse time protection
- Common harnessing - with higher feature Cummins controls. Allows for easy field upgrades.
- Generator set monitoring - Monitors status of all critical engine and alternator functions.
- Digital genset metering (AC and DC).
- Genset battery monitoring system to sense and warn against a weak battery condition.
- Configurable for single or three phase AC metering.
- Engine starting - Includes relay drivers for starter, Fuel Shut Off (FSO), glow plug/spark ignition power and switch B+ applications.
- Generator set protection – Protects engine and alternator.
- Real time clock for fault and event time stamping.
- Exerciser clock and time of day start/stop.
- Advanced serviceability - using InPower™, a PC-based software service tool.
- Environmental protection - The control system is designed for reliable operation in harsh environments. The main control board is a fully encapsulated module that is protected from the elements.
- Modbus interface for interconnecting to customer equipment.
- Configurable inputs and outputs - Four discrete inputs and four dry contact relay outputs.
- Warranty and service - Backed by a comprehensive warranty and worldwide distributor service network.
- Certifications - Suitable for use on generator sets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std., CE and CSA standards.

Base Control Functions

HMI Capability

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

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

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

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

Alternator data

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

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

Engine data

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

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

Service adjustments (continued)

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

Engine Control

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

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

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

Isochronous governing - (where applicable) Capable of controlling engine speed within +/-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 wakeup the control.

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

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

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

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

Alternator Control

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

Major system features include:

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

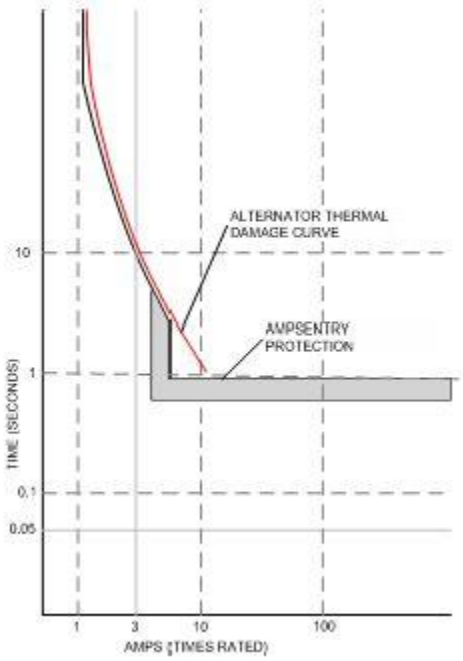
Fail to start (overcrank) shutdown - The control system will indicate a fault if the generator set fails to start by the completion of the engine crack sequence.

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:

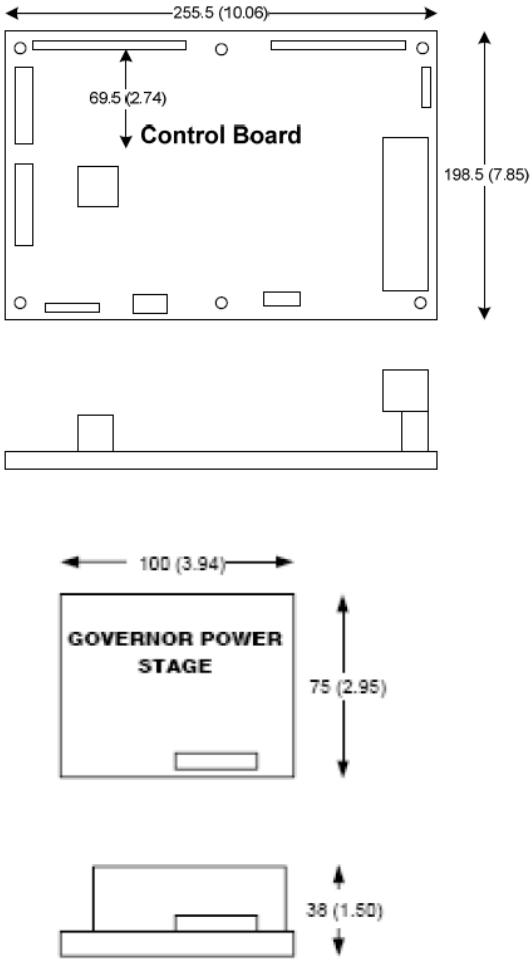
- Load dump signal: Operates when the generator set is in an overload condition.
- Delayed off signal: Time delay based output which will continue to remain active after the control has removed the run command. Adjustment range: 0 – 120 seconds. Default: 0 seconds.
- Configurable relay outputs: Control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

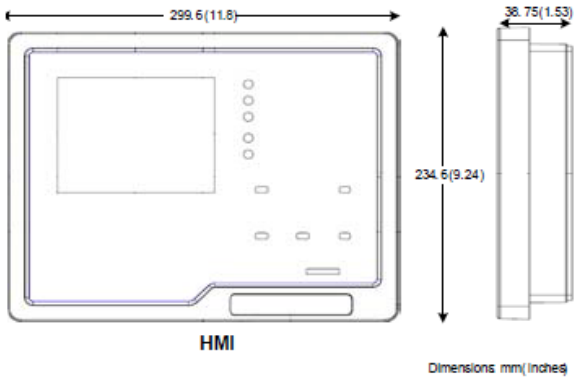
Features

- 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 ºC to +70º C (-40 ºF to 158 ºF) and for storage from -55 ºC to +80 ºC (-67 ºF to 176 ºF). Control will operate with humidity up to 95%, non-condensing.

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

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.

PCCNet COMPATIBLE

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

Our energy working for you.™

PDS-1569 | PD00000157 | (02/22)

Alternator data sheet

Frame size: UCD3J

Characteristics

Weights:	Wound stator assembly:	670.205 lb	304 kg
	Rotor assembly:	597.45 lb	271.9 kg
	Complete alternator:	1602.76 lb	727 kg
Maximum speed:		2250 rpm	
Excitation current:	Full load:	2.20 Amps	
	No load:	0.50 Amps	
Insulation system:	Class H throughout		

1 Ø Ratings (1.0 power factor) (Based on specific temperature rise at 40 °C ambient temperature)		**60 Hz** (winding no)			**50 Hz** (winding no)	
		Double delta	4 lead		Double delta	
		120/240	120/240		110-120 220-240	
125 °C Rise ratings	kW/kVA	161/201	175/219		140/175	
105 °C Rise ratings	kW/kVA	150/188	157/196		126/158	

3 Ø Ratings (0.8 power factor) (Based on specified temperature rise at 40 °C ambient temperature)		Upper broad range			LBR*	347/600	Broad range			
		120/208 240/416	127/220 255/440	139/240 277/480	190-208 380-416	 347/600	110/190 220/380	115/200 230/400	120/208 240/415	127/220 254/440
150 °C Rise ratings	kW	230	240	255	255	230	200	200	200	172
	kVA	288	300	319	319	288	250	250	250	215
125 °C Rise ratings	kW	215	225	240	240	215	184	184	184	164
	kVA	269	281	300	300	269	230	230	230	205
105 °C Rise ratings	kW	200	211	220	220	200	168	168	168	148
	kVA	250	264	275	275	250	210	210	210	185
80 °C Rise ratings	kW	170	180	190	190	170	154	154	154	128
	kVA	213	225	238	238	213	193	193	193	160

3 Ø Reactances (per unit, ±10%) (Based on full load at 105 °C rise rating)	**416**	**440**	**480**	**380**	**600**	**380**	**400**	**415**	**440**
Synchronous	2.651	2.457	2.221	2.00	2.00	1.939	1.75	1.626	N/A
Transient	0.164	0.153	0.137	0.13	0.13	0.103	0.093	0.086	N/A
Subtransient	0.096	0.09	0.08	0.07	0.07	0.07	0.064	0.059	N/A
Negative sequence	0.117	0.109	0.098	0.14	0.14	0.117	0.105	0.098	N/A
Zero sequence	0.048	0.045	0.04	0.04	0.04	0.044	0.04	0.037	N/A

3 Ø Motor starting		Broad range	LBR*	600	Broad range
Maximum kVA	(Shunt)	770	770	770	535
(90% sustained voltage)	(PMG)	920	920	920	678

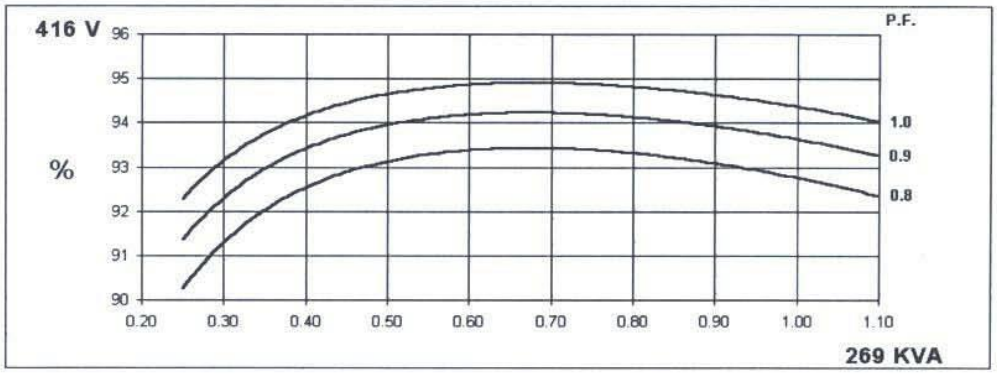
Time constants (Sec)				
Transient	0.045	0.045	0.045	0.045
Subtransient	0.015	0.015	0.015	0.015
Open circuit	1.270	1.270	1.270	1.270
DC	0.030	0.030	0.030	0.030

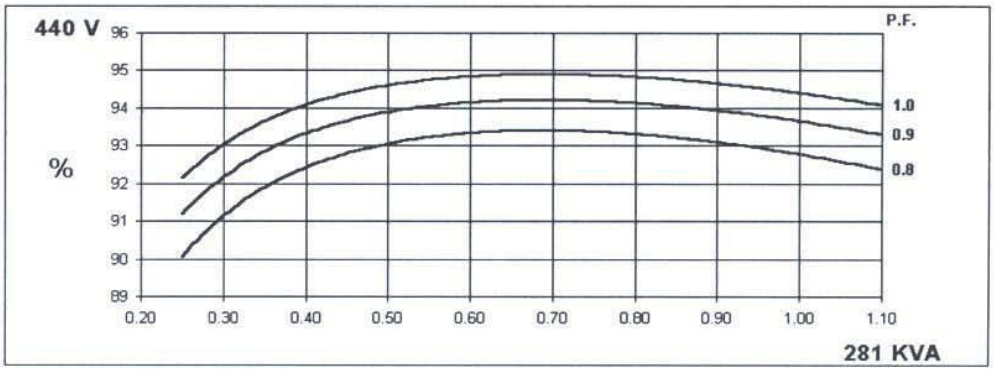
Windings (@ 20° C)					
Stator resistance	(Ohms per phase)	0.0128	0.0128	0.0128	0.0128
Rotor resistance	(Ohms)	2.0000	2.0000	2.0000	2.0000
Number of leads		12	12	6	12

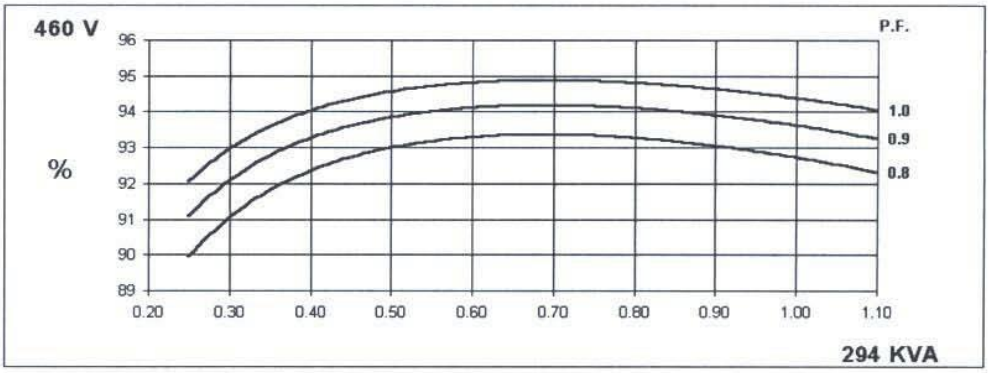
* Lower broad range 110/190 thru 120/208, 220/380 thru 240/416.

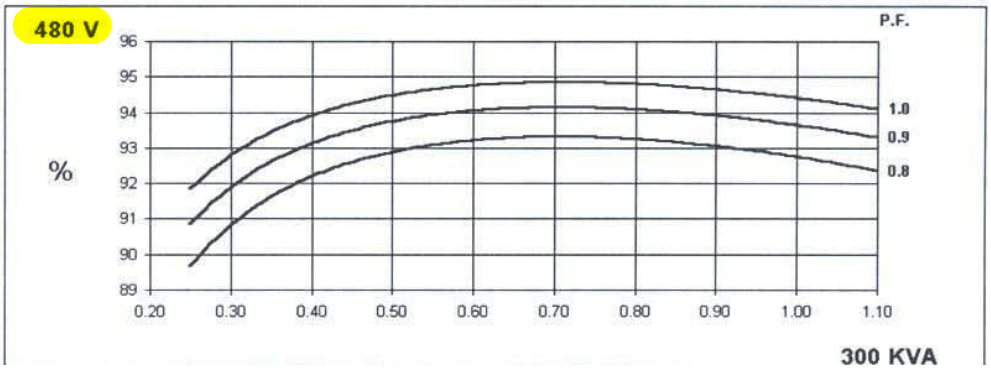
Winding 311

THREE PHASE EFFICIENCY CURVES



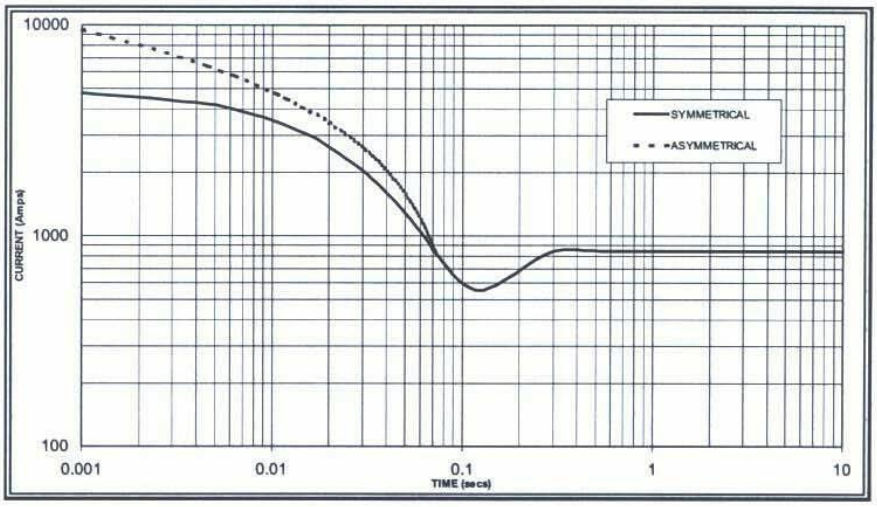






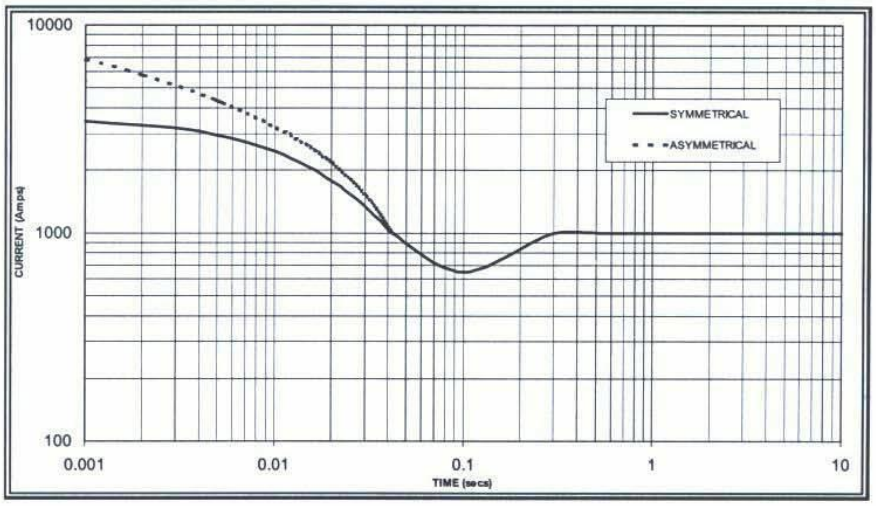
Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed
Based on star (wye) connection.

50 Hz



Sustained Short Circuit = 850 Amps

60 Hz



Sustained Short Circuit = 1,000 Amps

Note 1

The following multiplication factors should be used to adjust the values from curve between time 0.001 seconds and the minimum current point in respect of nominal operating voltage :

50Hz		60Hz	
Voltage	Factor	Voltage	Factor
380v	X 1.00	416v	X 1.00
400v	X 1.05	440v	X 1.07
415v	X 1.10	460v	X 1.12
440v	X 1.16	480v	X 1.16

The sustained current value is constant irrespective of voltage level

Note 2

The following multiplication factor should be used to convert the values calculated in accordance with NOTE 1 to those applicable to the various types of short circuit :

	3-phase	2-phase L-L	1-phase L-N
Instantaneous	x 1.00	x 0.87	x 1.30
Minimum	x 1.00	x 1.80	x 3.20
Sustained	x 1.00	x 1.50	x 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

All other times are unchanged

Note 3

Curves are drawn for Star (Wye) connected machines. For other connection the following multipliers should be applied to current values as shown :

Parallel Star = Curve current value X 2

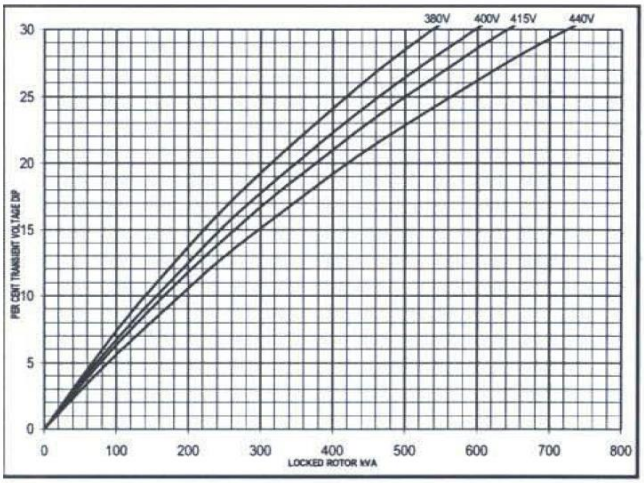
Series Delta = Curve current value X 1.732

Winding 311

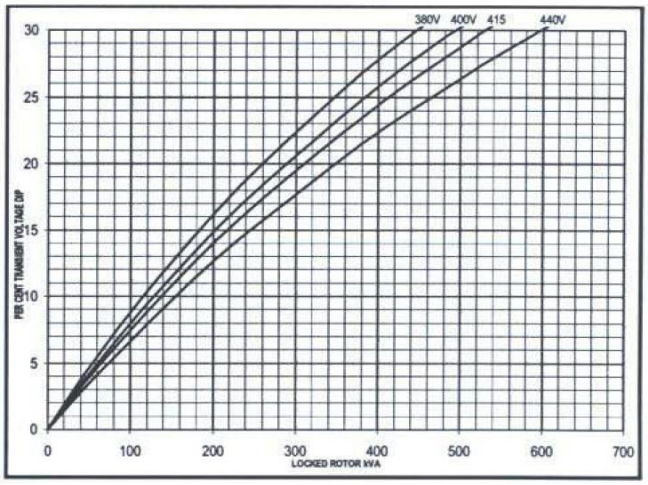
Locked Rotor Motor Starting Curve

50 Hz

MX

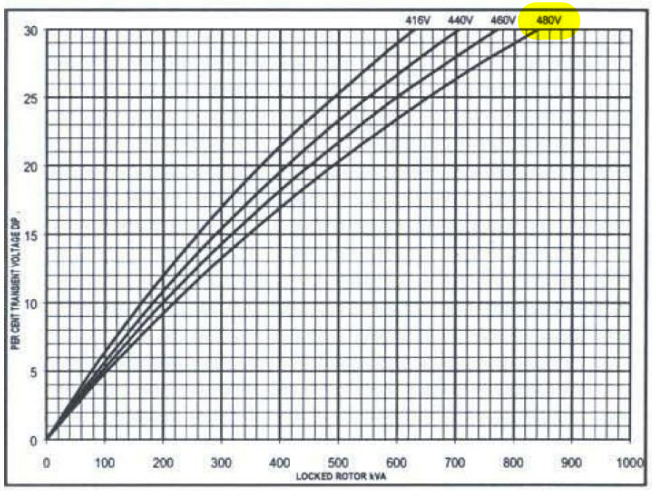


SX

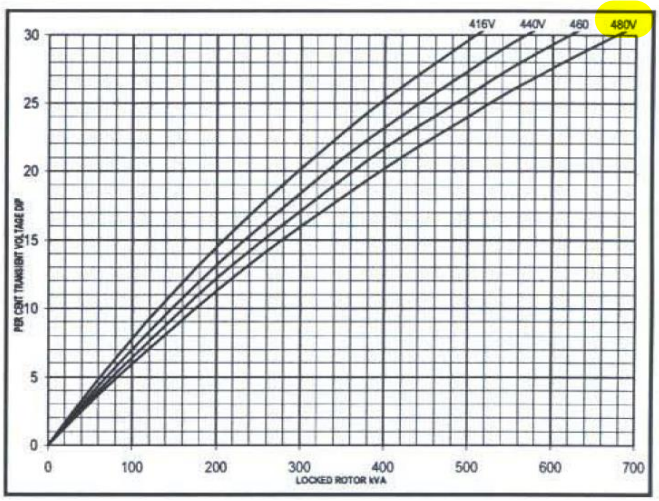


60 Hz

MX



SX



Sound Data
C200N6B
QSL8.9G-G3 60Hz Natural Gas

A-weighted Sound Pressure Level @ 7 meters, dB(A)

See notes 2, 5 and 7-11 listed below

Configuration	Exhaust	Applied Load	Position (Note 2)								8 Position Average
			1	2	3	4	5	6	7	8	
Standard - Unhoused	Infinite Exhaust	100% Standby	89.0	89.4	89.5	90.1	89.7	90.3	89.0	89.2	89.5
F216-2 Weather Protective Aluminium	Mounted	100% Standby	86.5	84.3	80.8	87.2	84.3	90.2	83.8	86.5	86.2
F231-2 Sound Attenuated Level 1, Aluminium	Mounted	100% Standby	83.7	79.7	75.7	77.3	77.8	78.1	76.2	79.2	79.2
F217-2 Sound Attenuated Level 2, Aluminium	Mounted	100% Standby	75.2	74.1	72.8	74.1	75.2	75.4	73.4	74.7	74.4

Average A-weighted Sound Pressure Level @ 1 meter, dB(A)

See notes 1, 5 and 7-14 listed below

Configuration	Exhaust	Applied Load	Octave Band Center Frequency (Hz)										Overall Sound Pressure Level
			16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
Standard - Unhoused	Infinite Exhaust	100% Standby	11.0	33.7	48.7	66.3	76.1	80.5	85.8	86.0	82.1	83.9	73.5	99.0
F216-2 Weather Protective Aluminium	Mounted	100% Standby	23.3	37.7	51.5	65.9	79.1	82.7	85.5	89.3	85.5	76.6	68.6	96.6
F231-2 Sound Attenuated Level 1, Aluminium	Mounted	100% Standby	19.1	45.4	61.3	72.4	83.3	83.4	84.4	82.5	79.3	76.0	66.7	90.1
F217-2 Sound Attenuated Level 2, Aluminium	Mounted	100% Standby	17.2	47.5	61.8	71.6	78.4	79.6	82.1	81.0	78.0	73.3	64.9	87.4

A-weighted Sound Pressure Level @ Operator Location, dB(A)

See notes 1, 5 and 7-15 listed below

Configuration	Exhaust	Applied Load	Octave Band Center Frequency (Hz)										Overall Sound Pressure Level
			16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
Standard - Unhoused	Infinite Exhaust	100% Standby	13.4	33.8	50.6	70.1	75.8	81.4	86.5	88.0	83.2	86.6	75.0	100.2
F216-2 Weather Protective Aluminium	Mounted	100% Standby	19.7	46.5	63.3	71.9	83.8	87.1	87.4	90.0	85.5	79.2	68.8	94.4
F231-2 Sound Attenuated Level 1, Aluminium	Mounted	100% Standby	18.3	45.8	61.6	71.1	78.9	78.5	78.0	75.4	72.5	71.9	60.0	84.7
F217-2 Sound Attenuated Level 2, Aluminium	Mounted	100% Standby	14.4	42.3	61.1	72.7	75.8	75.0	74.4	74.2	71.6	70.4	62.1	82.3

Sound Data
C200N6B
QSL8.9G-G3 60Hz Natural Gas

A-weighted Sound Power Level, dB(A)

See notes 1, 3 and 6-14 listed below

Configuration	Exhaust	Applied Load	Octave Band Center Frequency (Hz)											Overall Sound Power Level
			16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
Standard - Unhoused	Infinite Exhaust	100% Standby	28.3	51.0	66.0	83.6	93.4	97.8	103.1	103.3	99.4	101.2	90.8	116.3
F216-2 Weather Protective Aluminium	Mounted	100% Standby	41.0	63.4	86.3	92.9	105.3	106.0	107.6	109.2	106.2	100.1	91.1	114.3
F231-2 Sound Attenuated Level 1, Aluminium	Mounted	100% Standby	37.3	63.6	79.4	90.6	101.5	101.6	102.5	100.6	97.5	94.1	84.8	108.3
F217-2 Sound Attenuated Level 2, Aluminium	Mounted	100% Standby	35.7	66.0	80.3	90.1	96.8	98.0	100.6	99.5	96.5	91.7	83.3	105.9

Exhaust Sound Power Level, dB(A)

See notes 4 and 6-14 listed below

Configuration	Applied Load	Octave Band Center Frequency (Hz)										Overall Sound Power Level
		16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
Open Exhaust (No Muffler)	100% Standby	21.0	50.2	74.9	79.1	98.2	103.3	107.2	110.5	112.4	106.4	93	121.2

Global Notes:

1. Sound pressure levels at 1 meter are measured per the requirements of ISO 3744, ISO 8528-10, 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 counter-clockwise 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. Published sound levels are measured at CE certified test site and 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.
12. Published sound levels meet the requirements India's Central Pollution Control Board (Ministry of Environment & Forests),vide GSR 371 (E), which states the A-weighted sound level at1meter from any diesel generator set up to a power output rating of 1000kVA shall not exceed 75dB(A)
13. For updated noise pollution information for India see website: http://www.envfor.nic.in/legis/legis.html
14. Sound levels must meet India's Ambient Air Noise Quality Standards detailed for Daytime/Night-time operation in Noise Pollution (Regulation and Control) Rules, 2000
15. Operator Location is near genset control panel and is at 1 meter distance from genset control panel and at 1.6 meter height.

2023 EPA Exhaust Emission Compliance Statement C200N6B Standby

60 Hz Spark Ignited Generator Set

Compliance Information:

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

Engine Manufacturer:	Cummins Inc.
EPA Certificate Number:	PCEXB08.9ALB-007
Effective Date:	7/27/2022
Date Issued:	7/27/2022
EPA Engine Family (Cummins Emissions Family):	PCEXB08.9ALB

Engine Information:

Model:	QSJ8.9G-G3	Bore:	4.49 in. (114 mm)
Engine Nameplate HP:	310	Stroke:	5.69 in. (145 mm)
Type:	4 Cycle, In-Line, 6 Cylinder	Displacement:	543 cu. in. (9 liters)
Aspiration:	Turbocharged and Aftercooled	Compression Ratio:	8.5:1
Emission Control Device:	Electronic Air/Fuel Ratio & Closed-Loop Breather System		

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

	Grams per BHP-hr			Grams per kW_m-hr		
Natural Gas	**NOx**	**VOC**	**CO**	**NOx**	**VOC**	**CO**
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.

Exhaust Emission Data Sheet
C200N6B
60 Hz Spark Ignited Generator Set
EPA Emissions

Engine Information:			
Model:	QSJ8.9G-G3	Bore:	4.49 in. (114 mm)
Type:	4 cycle, in-line, 6-cylinder	Stroke:	5.69 in. (145 mm)
Aspiration:	Turbocharged and Aftercooled	Displacement:	543 cu. in. (9 liters)
Compression Ratio:	8.5:1		
Emission Control Device:	Electronic Air/Fuel Ratio & Closed-Loop Breather System		

Natural Gas				
	1/4	**1/2**	**3/4**	**Full**
Performance Data	**Standby**	**Standby**	**Standby**	**Standby**
BHP @ 1800 RPM (60 Hz)	86.6	156.3	228.2	310.7
Fuel Consumption (gal/Hr)	6235	10805	14662	19470
Exhaust Gas Flow (CFM)	593	1028	1227	1400
Exhaust Gas Temperature (°F)	1167	1133	1107	1092
Air to Fuel Ratio				
Exhaust Emission Data				
HC (Total Unburned Hydrocarbons)*	0.84	1.79	1.16	0.58
NOx (Oxides of Nitrogen as NO_2)	2.20	0.46	0.80	1.53
CO (Carbon Monoxide)	1.67	1.60	1.52	1.45
				All values above are cited: g/BHP-hr
HC (Total Unburned Hydrocarbons)*	360	709	496	259
NOx (Oxides of Nitrogen as NO_2)	284	55	103	204
CO (Carbon Monoxide)	353	313	320	317
				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
C200N6B
60 Hz Spark Ignited Generator Set
EPA Emissions

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)
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_2O/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 results in elevated emission levels.

Prototype Test Support (PTS)
60 Hz test summary

Generator set models	Representative prototype	
C175N6B	Model:	C200N6B
C200N6B	Engine:	QSJ8.9G-G3
	Alternator:	UCDI274K

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: 211.5 kW

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

Maximum motor starting: N/A

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.

Torsional analysis and testing:

The generator set on UCDI274K 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 1710 to 1890 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 500 hour endurance test replicating field duty cycles operating at variable load up to the standby rating based in MIL-STD-705 to verify structural soundness and durability of the design.

Electrical and mechanical strength:

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

Steady state performance:

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

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

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:	36.8%
Recovery time:	4.7 seconds
Frequency dip:	19.7%
Recovery time:	8.4 seconds

Full load rejection:

Voltage rise:	18.7%
Recovery time:	2.1 seconds
Frequency rise:	20.5%
Recovery time:	3.3 seconds

All data based on 0.8 power factor:

Harmonic analysis:

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

	Line to Line		Line to Neutral	
Harmonic	No load	Full load	No load	Full load
3	0.1	0.1	0.1	0.2
5	0.7	1.0	0.7	1.0
7	1.0	3.1	1.0	3.1
9	0.0	0.0	0.0	0.0
11	0.1	0.3	0.1	0.3
13	0.1	0.4	0.1	0.4
15	0.0	0.0	0.0	0.0

VMC GROUP
THE POWER OF TOGETHER™

CERTIFICATE OF COMPLIANCE
SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certification No.

VMA-51070-01C (Revision 8)

Expiration Date: 1/31/2023

Certification Parameters:

The nonstructural products (mechanical and/or electrical components) listed on this certificate are CERTIFIED[1] FOR SEISMIC APPLICATIONS in accordance with the following building code[2] releases.

IBC 2012, 2015, 2018

The following model designations, options, and accessories are included in this certification. Reference report number VMA-51070-01 as issued by The VMC Group for a complete list of certified models, included accessories/options, and certified installation methods.

Cummins Power Generation, Inc.; Gas Generators
C20-150N6 Series; 20kW - 150kW

The above referenced equipment is **APPROVED** for seismic application when properly installed[3], used as intended, and contains a Seismic Certification Label referencing this Certificate of Compliance[4]. As limited by the tabulated values, below grade, grade, and roof-level installations, installations in essential facilities, for life safety applications, and/or of equipment containing hazardous contents are permitted and included in this certification with an Equipment Importance Factor assigned as I_p=1.5. The equipment is qualified by successful seismic shake table testing at the nationally recognized Dynamic Certification Laboratories under the review of the ISO Accredited Product Certification Agency, The VMC Group.

Certified Seismic Design Levels			
Certified **IBC**	**Importance I_p ≤ 1.5** Soil Classes A-E Risk Categories I-IV Design Categories A-F	z/h ≤ 1.0	z/h = 0.0
		S_{DS} ≤ 2.500 g	S_{DS} ≤ 2.500 g

Certified Seismic Installation Methods
Rigid Mounting From Unit Base To Rigid Structure

HEADQUARTERS
113 Main Street
Bloomingdale, NJ 07403
Phone: 973.838.1780
Toll Free: 800.569.8423
Fax: 973.492.8430

CALIFORNIA
180 Promenade Circle
Suite 300
Sacramento, CA 95834
Phone: 916.634.7771

TEXAS
11930 Brittmoore Park Drive
Houston, TX 77041
Phone: 713.466.0003
Fax: 713.466.1355

thevmcgroup.com

VMC GROUP
THE POWER OF TOGETHER™

CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Notes & Comments:

1. All equipment listed herein successfully passed the seismic acceptance criteria for shake testing non-structural components and systems as set forth in the ICC AC-156. The Test Response Spectrum (TRS) enveloped the Required Response Spectrum (RRS) for all units tested. The units cited in this certification were representative sample(s) of a contingent of models and all remained captive and structurally sound after the seismic shake simulation. The units also remained functionally operational after the simulation testing as functional testing was completed by the equipment manufacturer before and after the seismic simulations. Although a seismic qualified unit inherently contains some wind resisting capacity, that capacity is undetermined and is excluded from this certification. Snow/Ice loads have been neglected and thus limit the unit to be installed both indoors (covered by an independent protective structure) and out of doors (exposed to accumulating snow/ice) for ground snow loads no greater than 30 psf for all applications.

2. The following building codes are addressed under this certification:
   IBC 2018 referencing ASCE7-16 and ICC-ES AC-156
   IBC 2015 referencing ASCE7-10 and ICC-ES AC-156
   IBC 2012 referencing ASCE7-10 and ICC-ES AC-156

3. Refer to the manufacturer supplied installation drawings for anchor requirements and mounting considerations for seismic applications. Required anchor locations, size, style, and load capacities (tension and shear) may be specified on the installation drawings or specified by a 3rd party. Mounting requirement details such as anchor brand, type, embedment depth, edge spacing, anchor-to-anchor spacing, concrete strength, special inspection, wall design, and attachment to non-building structures must be outlined and approved by the Engineer of Record for the project or building. Structural walls, structural floors, and housekeeping pads must also be seismically designed and approved by the project or building Structural Engineer of Record to withstand the seismic anchor loads as defined on the installation drawings. The installing contractor is responsible for ensuring the proper installation of all anchors and mounting hardware.

4. For this certificate and certification to remain valid, this certificate must correspond to the "Seismic Certification Label" found affixed to the unit by the factory. The label ensures the manufacturer built the unit in conformance to the IBC seismic design criteria set forth by the Certified Seismic Qualification Agency, The VMC Group, and meets the seismic design levels claimed by this certificate.

5. Mechanical, Electrical, and Plumbing connections to the equipment must be flexibly attached as to not transfer load through the connection. The structural integrity of any conduit, cable trays, piping, ductwork and/or flexible connections is the responsibility of others. This certification does not guarantee the equipment will remain compliant to NEMA, IP, UL, or CSA standards after a seismic event.

6. This certificate applies to units manufactured at:
   Cummins Power Generation Inc., 1400 73rd Ave. NE, Minneapolis, MN 55432

John P. Giuliano, PE
President, The VMC Group

IBC® CERTIFIED VMC GROUP

VMA-51070-01C (Revision 8)
Issue Date: Friday, July 3, 2015
Revision Date: Tuesday, February 11, 2020
Expiration Date: Tuesday, January 31, 2023

SECTION 3
GENERATOR ACCESSORIES

Product data sheet

Specifications

Circuit breaker, PowerPact L, unit mount, Micrologic 3.3S, 600A, 3 pole, 18kA, 600VAC

LGL36600U33X

QUANTITY OF TWO (2)

Main

Range	PowerPact
Product name	PowerPact L
Device short name	L-Frame
Product or Component Type	Circuit breaker
Device application	Distribution

Complementary

Line Rated Current	600 A
Number of Poles	3P
Control type	Toggle
Breaking capacity code	G
Breaking capacity	65 kA 240 V AC 50/60 Hz UL 489 35 kA 480 V AC 50/60 Hz UL 489 18 kA 600 V AC 50/60 Hz UL 489 20 kA 250 V DC UL 489 20 kA 500 V DC UL 489
[Ue] rated operational voltage	600 V AC 50/60 Hz IEC 60947-3
Network Frequency	50/60 Hz
[Ics] rated service breaking capacity	65 kA 220/240 V AC 50/60 Hz IEC 60947-2 35 kA 380/440/415 V AC 50/60 Hz IEC 60947-2 18 kA 500/525 V AC 50/60 Hz IEC 60947-2 20 kA 250 V DC IEC 60947-2 20 kA 500 V DC IEC 60947-2
[Uimp] rated impulse withstand voltage	8 kV IEC 60947-2
Trip unit technology	Electronic, standard, Micrologic 3.3 S, LSI
[Ui] rated insulation voltage	750 V IEC 60947-2
Trip unit name	Micrologic 3.3 S
Protection technology	Current limiter
Suitability for isolation	Yes IEC 60947-2
Utilisation category	Category A
AWG gauge	Please see CB outline drawing for lug and termination details

Local signalling	Ready 1 LED green) Alarm 1 LED 90 % Ir orange) Alarm LED 105 % Ir red) Switched off (OFF) 1 trip indicator green)
Mounting mode	Unit mount lug)
Mounting Support	Lug
Electrical connection	Lugs line Lugs load
Terminal identifier	Please see CB outline drawing for lug and termination details
Long time pick-up adjustment range	0.25...1 x In
Tightening torque	442.54 lbf.in (50 N.m) 0.11…0.37 in² (70…240 mm²) (AWG 2/0...500 kcmil)
Number of slots	2 auxiliary switch OF plug-in) 1 alarm switch SD plug-in) 1 overcurrent trip switch SDE plug-in) 1 voltage release MN or MX plug-in)
Power wire stripping length	1.22 in (31 mm) 2.40 in (61 mm)
Color	Black
Height	13.39 in (340 mm)
Width	5.51 in (140 mm)
Depth	4.33 in (110 mm)
Net weight	13.67 lb(US) (6.2 kg)
Communication interface	Modbus Ethernet

Environment

Standards	UL CSA NEMA NOM-003-SCFI-2000 IEC 60947-2
Product certifications	UL CSA NOM
IP degree of protection	Front cover IP40
Pollution degree	3 IEC 60947-1
Ambient Air Temperature for Operation	28…158 °F (-2…70 °C)
Ambient Air Temperature for Storage	-58…185 °F (-50…85 °C)
Operating altitude	< 6561.68 ft (2000 m) without derating 5000 m with derating

Ordering and shipping details

Category	01116-L ELEC TRIP UNIT MOUNT BREAKER/SW
Discount Schedule	DE2
GTIN	785901638674
Nbr. of units in pkg.	1
Package weight(Lbs)	15.00 lb(US) (6.804 kg)
Returnability	Yes
Country of origin	US

Packing Units

Unit Type of Package 1	PCE
Package 1 Height	8.75 in (22.225 cm)
Package 1 width	10.75 in (27.305 cm)
Package 1 Length	19.50 in (49.53 cm)

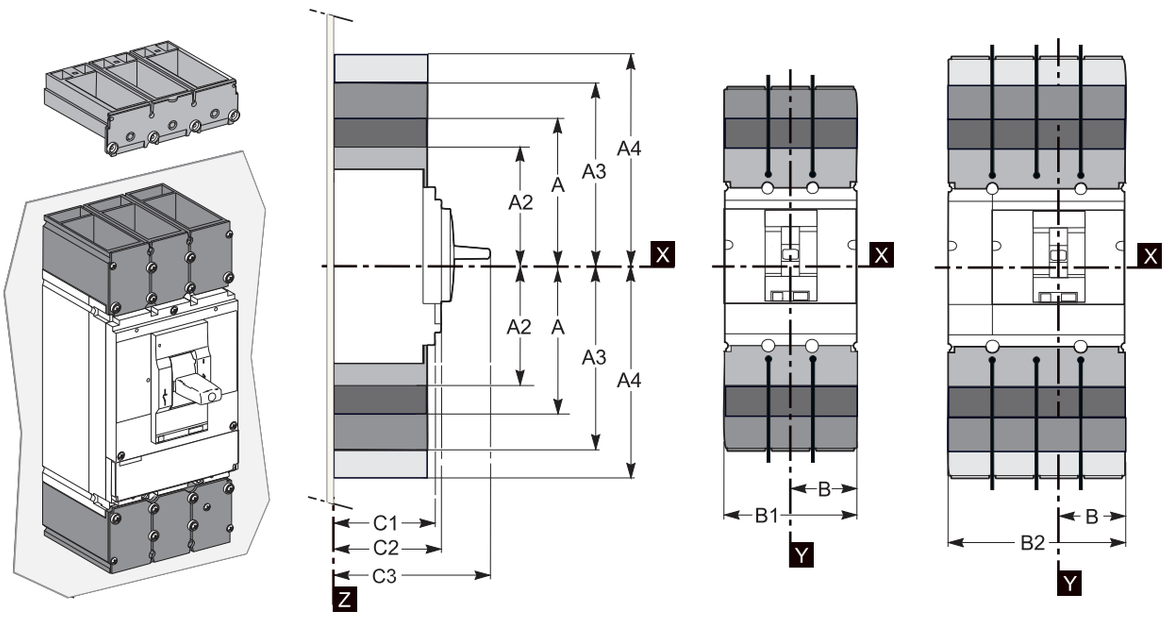
Offer Sustainability

Sustainable offer status	Green Premium product
California proposition 65	WARNING: This product can expose you to chemicals including: DINP, which is known to the State of California to cause cancer, and DIDP, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov
REACh Regulation	REACh Declaration
EU RoHS Directive	Compliant EU RoHS Declaration
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS declaration Product out of China RoHS scope. Substance declaration for your information.
Environmental Disclosure	Product Environmental Profile
Circularity Profile	End of Life Information
PVC free	Yes

Product data sheet LGL36600U33X

Technical Illustration

Dimensions



A2 = Short Lug Pack
AL400L61K3
CU400L61K3
AL600LF52K3
CU600LF5283

A = Medium Lug Pack
AL400L61K4
CU400L61K4
AL600LS52K3
AL600LS52K4
CU600LS52K3
CU600LS52K4

A3 = Long Lug Pack
Compression Lug Kits

A4 = 500 Vdc Lug Pack

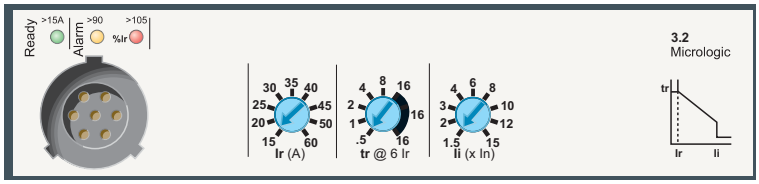
L-Frame

	A	A2	A3	A4	B	B1	B2	C1	C2	C3
inch	6.69	5.65	7.87	9.53	2.76	5.51	7.28	3.76	4.33	6.61
mm	170	143.5	200	242	70	140	185	105	110	168

Please see CB outline drawing for lug and termination details

Micrologic™ 3 Trip Units

Micrologic 3 trip units can be used on PowerPact H-, J-, and L-Frame circuit breakers with performance levels D/G/J/L.



They provide:

- standard protection of distribution cables
- indication of:
  - — overloads (using LEDs)
  - — overload tripping (using the SDx relay module).

Circuit breakers equipped with Micrologic 3 trip units can be used to protect distribution systems supplied by transformers.

Protection

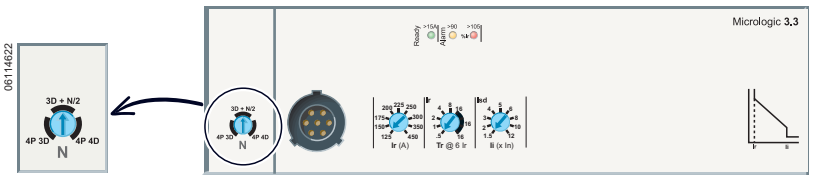
Settings are made using the adjustment rotary switches.

Overloads: Long time protection (I_r)

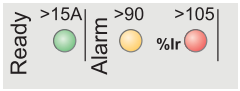
Inverse time protection against overloads with an adjustable current pick-up Ir set using a rotary switch and an adjustable time delay t_r.

Neutral protection

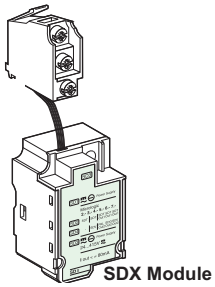
- On 3-pole L-frame circuit breakers, neutral protection is not possible.
- On four-pole L-frame circuit breakers, neutral protection may be set using a three-position switch:
  - — switch position 4P 3D: neutral unprotected
  - — switch position 4P 3D + N/2: neutral protection at half the value of the phase pick-up, (0.5 x Ir)
  - — switch position 4P 4D: neutral fully protected at I_r



Indicators



Front Indicators



SDX Module

Front indicators

- The green “Ready” LED blinks slowly when the electronic trip unit is ready to provide protection. It indicates the trip unit is operating correctly.
- Orange overload pre-alarm LED: steady on when I > 90% I_r
- Red overload LED: steady on when I > 105% I_r

Remote indicators

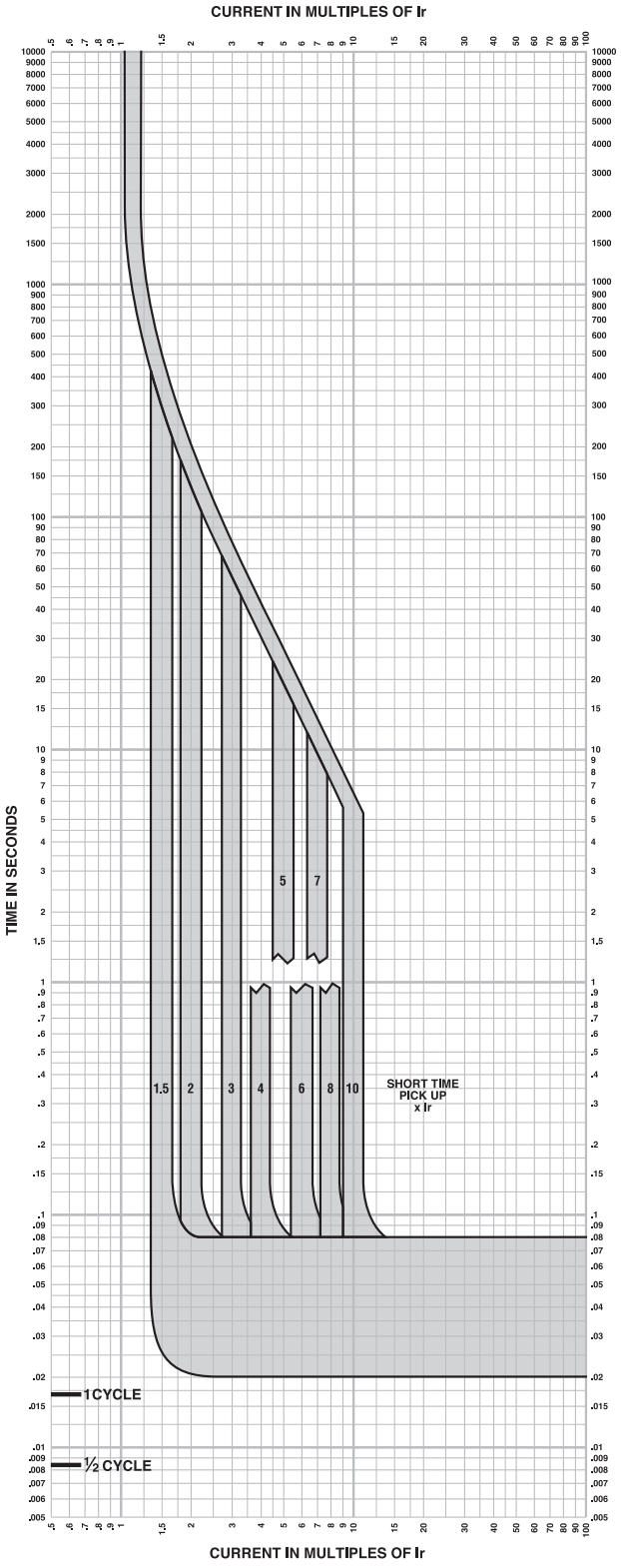
An overload trip signal can be remotely checked by installing an SDx relay module inside the circuit breaker. This module receives the signal from the Micrologic electronic trip unit through an optical link and makes it available on the terminal block. The signal is cleared when the circuit breaker is reclosed. See page 94.

Table 50: Micrologic™ 3 Trip Unit

Ratings	I_n at 104°F (40°C)[1]		60 A	100 A	150 A	250 A	400 A	600 A			
Circuit Breaker	H-frame		X	X	X						
	J-frame					X					
	L-frame					X	X	X			
Micrologic 3.2 / 3.3 trip units											
L Long-time protection											
Pick-Up (A) Tripping between 1.05 and 1.20 Ir	I_r		Value depending on sensor rating (I_n) and setting on rotary switch								
	I_n =60 A	I_r =	15	20	25	30	35	40	45	50	60
	I_n = 100 A	I_r =	35	40	45	50	60	70	80	90	100
	I_n = 150 A	I_r =	50	60	70	80	90	100	110	125	150
	I_n = 250 A	I_r =	70	80	100	125	150	175	200	225	250
	I_n = 400 A	I_r =	125	150	175	200	225	250	300	350	400
	I_n = 600 A	I_r =	200	225	250	300	350	400	450	500	600
Time Delay (s) Accuracy 0 to -20%	t_r		0.5	1	2	4	8	16			
		1.5 x I_r	15	25	50	100	200	400			
		6 x I_r	0.5	1	2	4	8	16			
		7.2 x I_r	0.35	0.7	1.4	2.8	5.5	11			
Thermal memory			20 minutes before and after tripping								
I Instantaneous											
Pick-up (A) accuracy ± 15%	I_i x	60 A	1.5	2	3	4	6	8	10	12	15
		100 A	1.5	2	3	4	6	8	10	12	15
		150 A	1.5	2	3	4	6	8	10	12	15
		250 A	1.5	2	3	4	5	6	8	10	12
		400 A	1.5	2	3	4	5	6	8	10	12
		600 A	1.5	2	3	4	5	6	8	10	11
	Non-tripping time Maximum break time		10 ms 50 ms for I > 1.5 Ii								
Micrologic 3.2S / 3.3S trip units											
L Long-time protection											
Pick-Up (A) Tripping between 1.05 and 1.20 Ir	I_r		Value depending on sensor rating (I_n) and setting on rotary switch								
	I_n =60 A	I_r =	15	20	25	30	35	40	45	50	60
	I_n = 100 A	I_r =	35	40	45	50	60	70	80	90	100
	I_n = 150 A	I_r =	50	60	70	80	90	100	110	125	150
	I_n = 250 A	I_r =	70	80	100	125	150	175	200	225	250
	I_n = 400 A	I_r =	125	150	175	200	225	250	300	350	400
	I_n = 600 A	I_r =	200	225	250	300	350	400	450	500	600
Time Delay (s) Accuracy 0 to -20%	t_r		non-adjustable								
		1.5 x I_r	400								
		6 x I_r	16								
		7.2 x I_r	11								
Thermal memory			20 minutes before and after tripping								
S Short-time protection											
Pick-up (A) accuracy ± 10%	I_{sd} - I_r x...		1.5	2	3	4	5	6	7	8	10
Time delay (ms)	t_{sd}		non-adjustable								
	Non-tripping time Maximum break time		20 80								
I Instantaneous											
Pick-up (A) accuracy ± 15%	I_i x I_n		1.5	2	3	4	6	8	10	12	15
	Non-tripping time Maximum break time		10 ms 50 ms for I > 1.5 Ii								

1 If the trip units are used in high-temperature environments, the Micrologic trip unit setting must take into account the thermal limitations of the circuit breaker. See the temperature derating information on page 126.

Figure 125: Micrologic 3.3S and 3.3S-W Electronic Trip Unit Long Time/Short Time Trip Curve



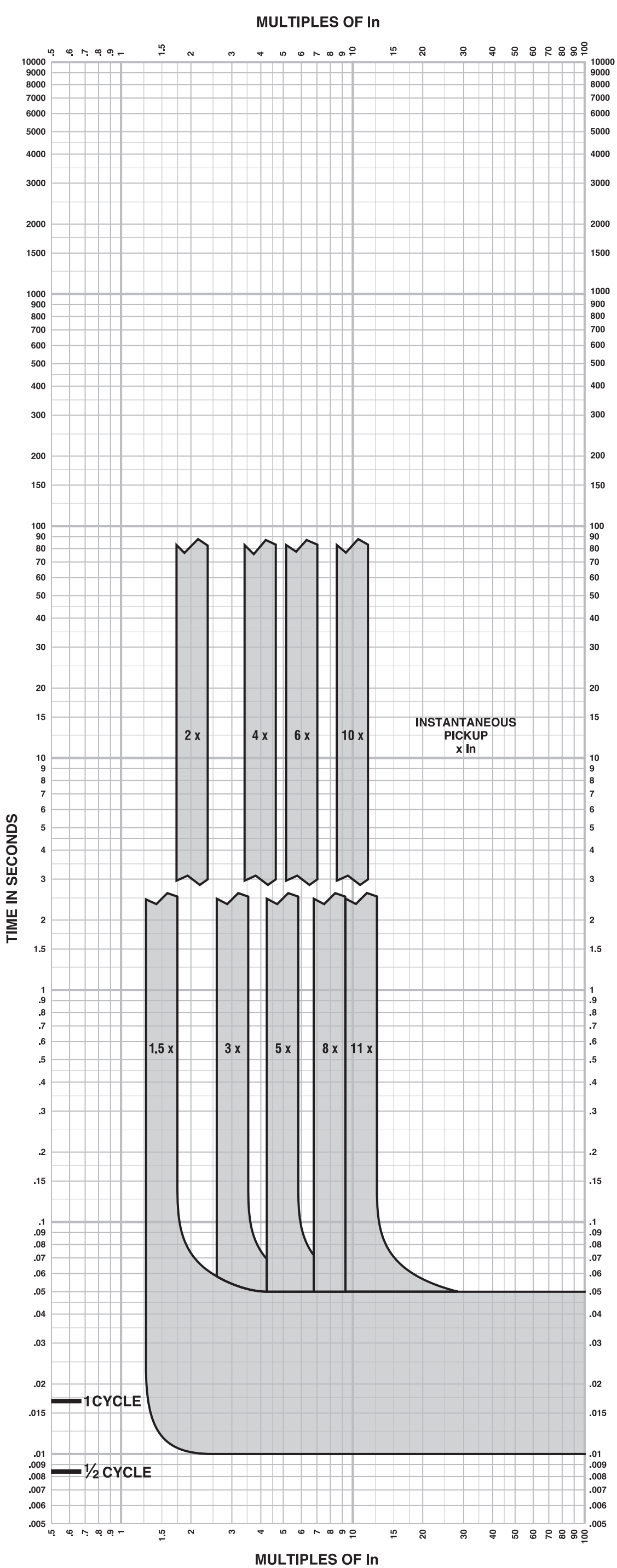
MICROLOGIC™ ELECTRONIC TRIP UNITS
Micrologic™ 3.3S and 3.3S-W
Long Time/Short Time Trip Curve
600A L-Frame

The time-current curve information is to be used for application and coordination purposes only.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.

Curves apply from -35ºC to +70ºC (-31ºF to +158ºF) ambient temperature.



MICROLOGIC™ ELECTRONIC TRIP UNITS
Micrologic™ 3.3/3.3S/5.3A or E/6.3A or E
Instantaneous Trip Curve
600A L-Frame

The time-current curve information is to be used for application and coordination purposes only.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
3. In = Maximum dial setting of Ir.
   600A L-Frame: In = 600A = Max Ir setting

Curves apply from -35°C to +70°C (-31°F to +158°F) ambient temperature.

Schneider Electric

Drawing No. S1A8147600
March 2011

Specification Sheet

Battery Charger-6 Amp

A045D925 60Hz/50Hz

Description

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

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

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

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

Features

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

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

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

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

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

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

Low Electromagnetic and Radio

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

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

Warranty – This product has a two-year warranty

Specifications

Performance and Physical Characteristics

Output:	Nominal voltage	12 VDC
	Float voltage – 12 V batteries	13.0-13.6 VDC at 0-2 amps
	Maximum output current	6 A @ 12 VDC nom
Input:	Voltage AC	115, 208, 240 ±10%, 90-135
	Frequency	60 Hz ±5%
Battery:	Maximum battery size	150 Amp Hours
	Maximum recharge time	20 hours
Approximate net weight		4 lbs. (1.81 Kg)
Approximate dimensions: height x width x depth-in(mm)		2.25 x 6.4 x 3.5 (57 x 162 x 89)
Ambient temperature operation: At full rated output		-40°F to 122 °F (-40 °C to 50 °C)

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

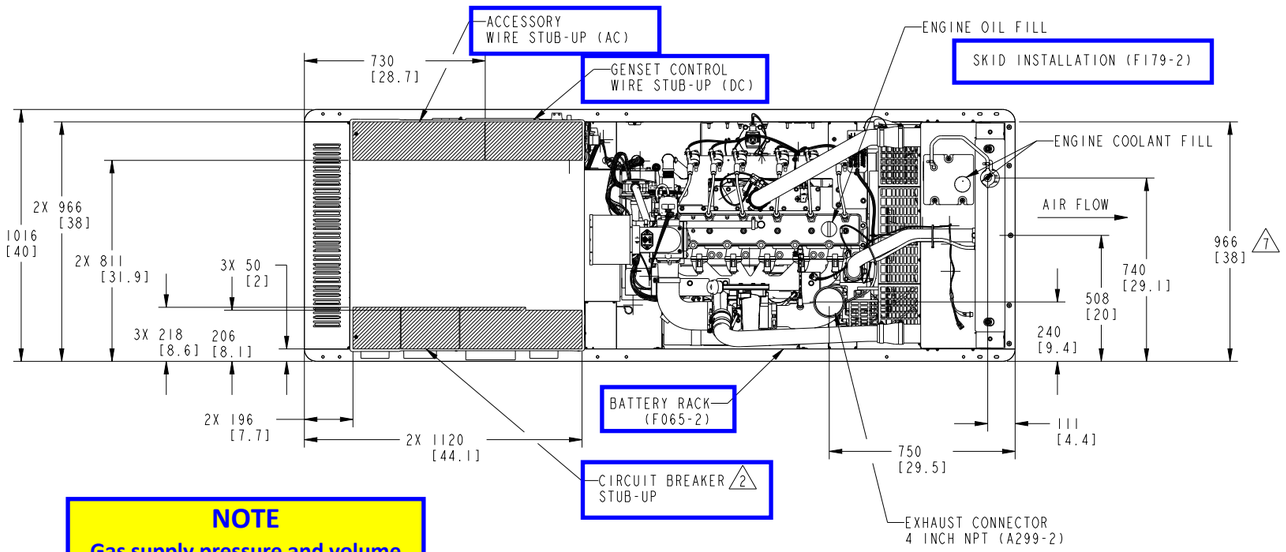
Warning: For professional use only. Must be installed by a qualified service technician. Improper installation presents hazards of electrical shock and improper operation, resulting in severe personal injury and/or property damage.

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

Our energy working for you.™

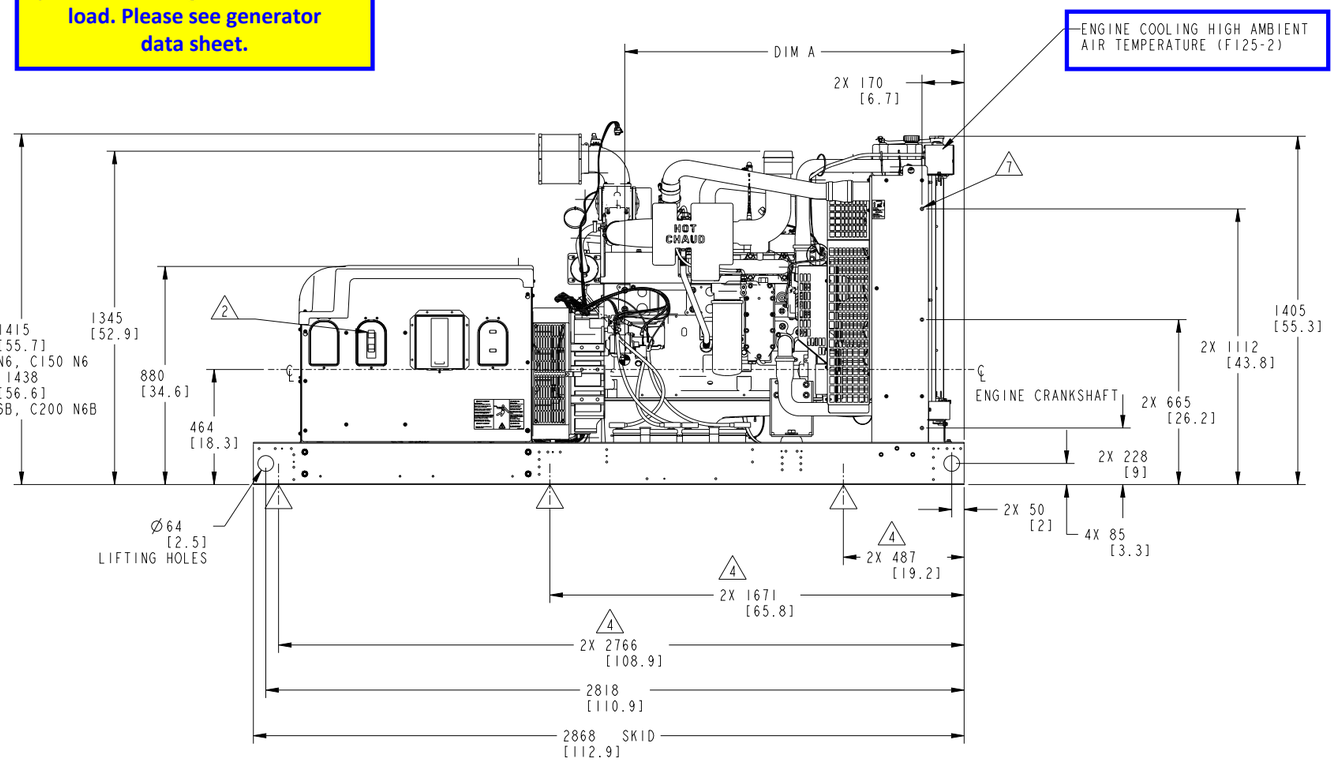
NAAC-5943-EN PDA059R693 (03/22)

SECTION 4
GENERATOR DRAWINGS AND INTERCONNECTS



NOTE

Gas supply pressure and volume must meet requirements to allow operation of the generator at 100% load. Please see generator data sheet.

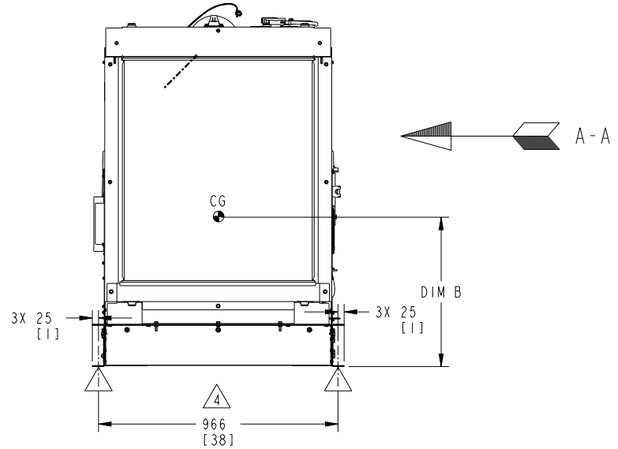


NOTES:

1. DIMENSIONS SHOWN IN [ ] ARE IN INCHES.
2. REFER TO CIRCUIT BREAKER OUTLINE DRAWING FOR COMPLETE ELECTRICAL STUB-UP INFORMATION FOR SPECIFIC BREAKERS AND BREAKER POSITIONS.
3. CONTROL INTERFACE CONNECTION SHOULD BE MADE WITH FLEXIBLE CONNECTIONS.
4. Ø21 [0.8] HOLES MARKED BY △ FOR SECURING TO MOUNTING SURFACE.
5. OIL DRAIN EXTENSION: 15.8 [0.62] INCH ID HOSE.
6. FOR IBC SEISMIC CERTIFIED INSTALLATION, SEE GENSET IBC SEISMIC INSTALLATION REQUIREMENT DRAWING.
7. Ø7.3 [0.28] HOLES FOR OPTIONAL COOLING EXHAUST AIR DUCT ADAPTER.
8. REFER TO GENSET FOUNDATION OUTLINE FOR ELECTRICAL AND OTHER FOUNDATION SPECIFICS.

TABULATION

ALT DATA SHEET #	DIM A	DIM B	GENSET WET WEIGHT	
			KG	LB
ADS-208	1400	546	1485	3267
ADS-209	1421	544	1534	3375
ADS-210	1445	541	1571	3457
ADS-211	1467	538	1610	3543
ADS-212	1495	533	~~1698~~	3735
ADS-213	1495	533	1698	3735



C125 N6, C150 N6, C175 N6B, C200 N6B

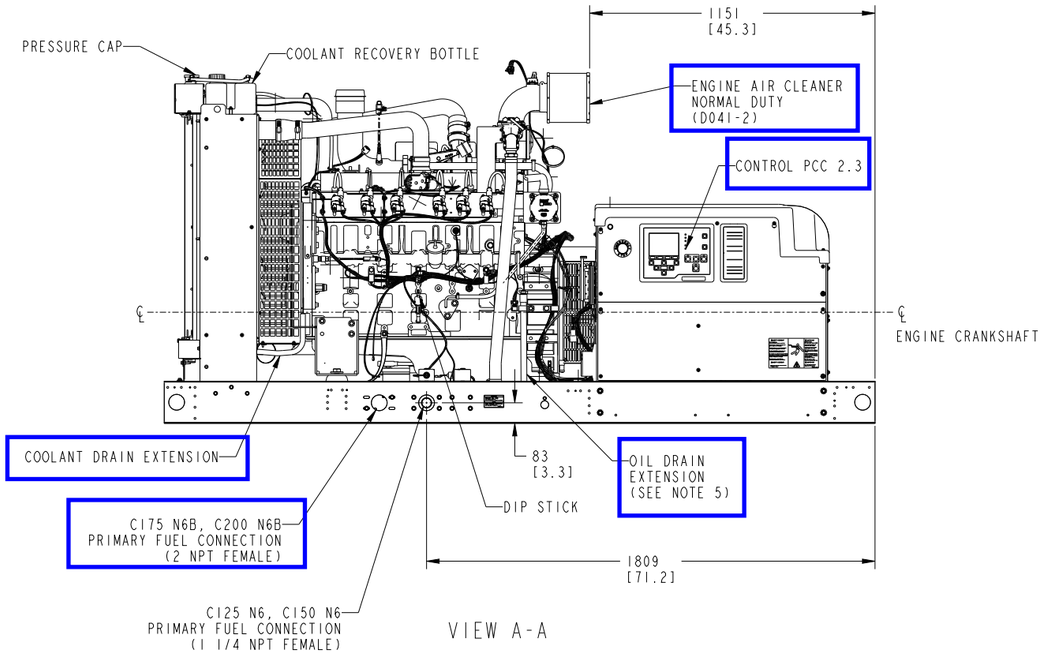
Cummins Inc.		
DIMENSIONS ARE IN: MILLIMETERS [ ] ARE IN: -	SIZE: D	SCALE:3:32
DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009	THIRD ANGLE PROJECTION	CAD SYSTEM PTC® Creo® Parametric

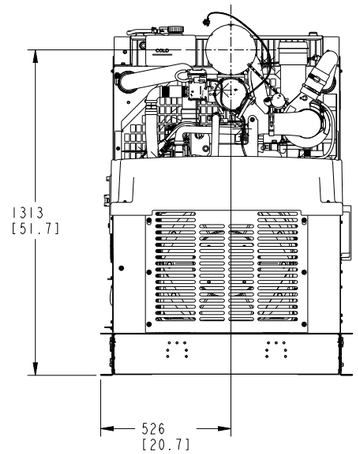
Document Generated: **17AUG2022 19:56 GMT**

Part Number: **A055J588** Part Revision: **D**

Part Name: **OUTLINE,GENSET**

Drawing Category: **Detail** State: **Released**





C125 N6, C150 N6, C175 N6B, C200 N6B

Cummins Inc.

DIMENSIONS ARE IN: MILLIMETERS
[ ] ARE IN: -
SIZE: D
SCALE:3:32
DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009
THIRD ANGLE PROJECTION
CAD SYSTEM
PTC® Creo® Parametric

Document Generated: **17AUG2022 19:56 GMT**

Part Number: **A055J588** Part Revision: **D**
Part Name: **OUTLINE,GENSET**
Drawing Category: **Detail** State: **Released**

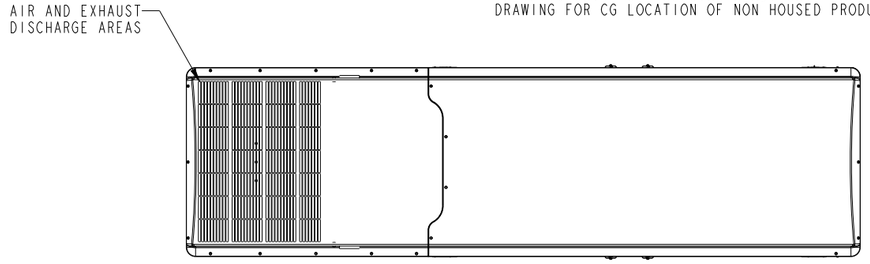
PTC® Creo® Parametric

REL NO	REV	NO	REVISION	DWN	CKD	APVD	DATE
ECO-164828	A	1	PRODUCTION_RELEASE	YN	NK	A_CHINTHALURI	30SEP16

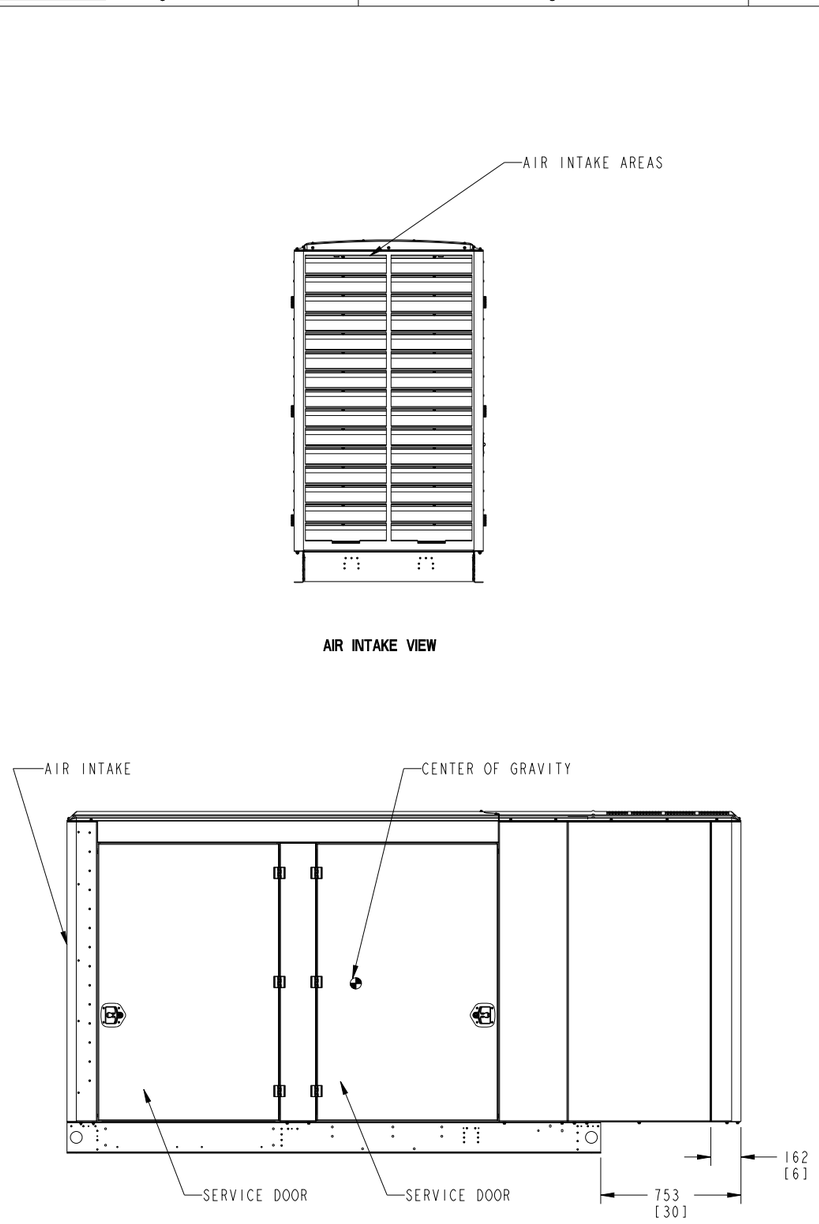
NOTES:

1. DIM [] IN INCHES
2. WITH THIS HOUSING INSTALLED ON AN OPEN GENERATOR SET, THE TOTAL WEIGHT WILL INCREASE BY ~~136 KG~~ (432 LBS). THIS INCLUDES THE MUFFLER.
3. 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.

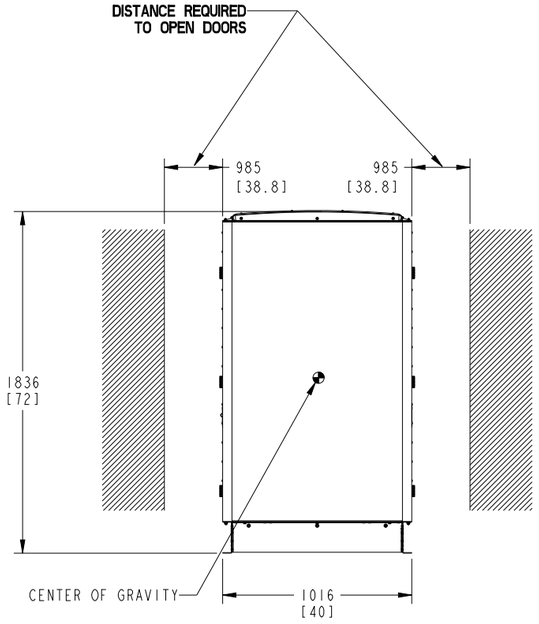
AIR INTAKE VIEW



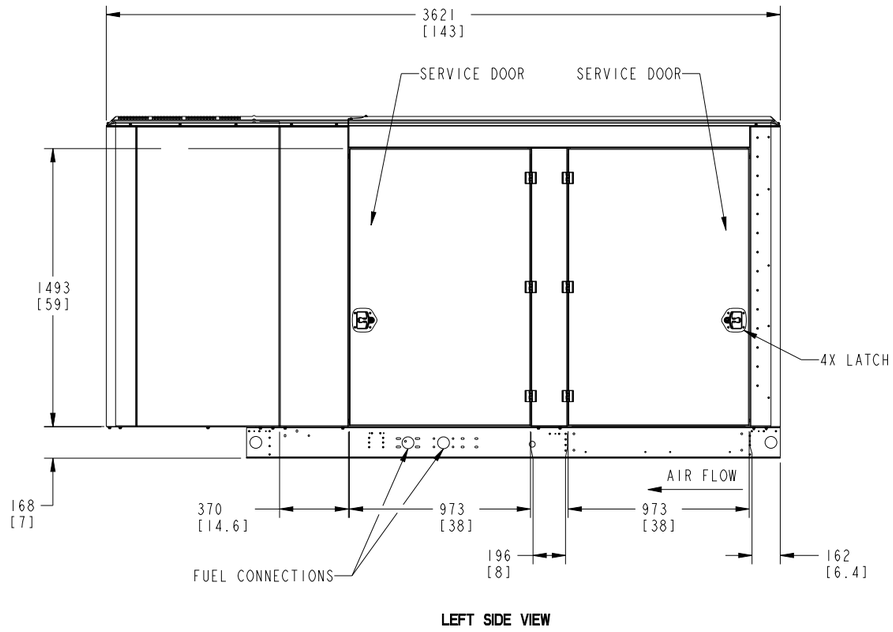
TOP VIEW



RIGHT SIDE VIEW



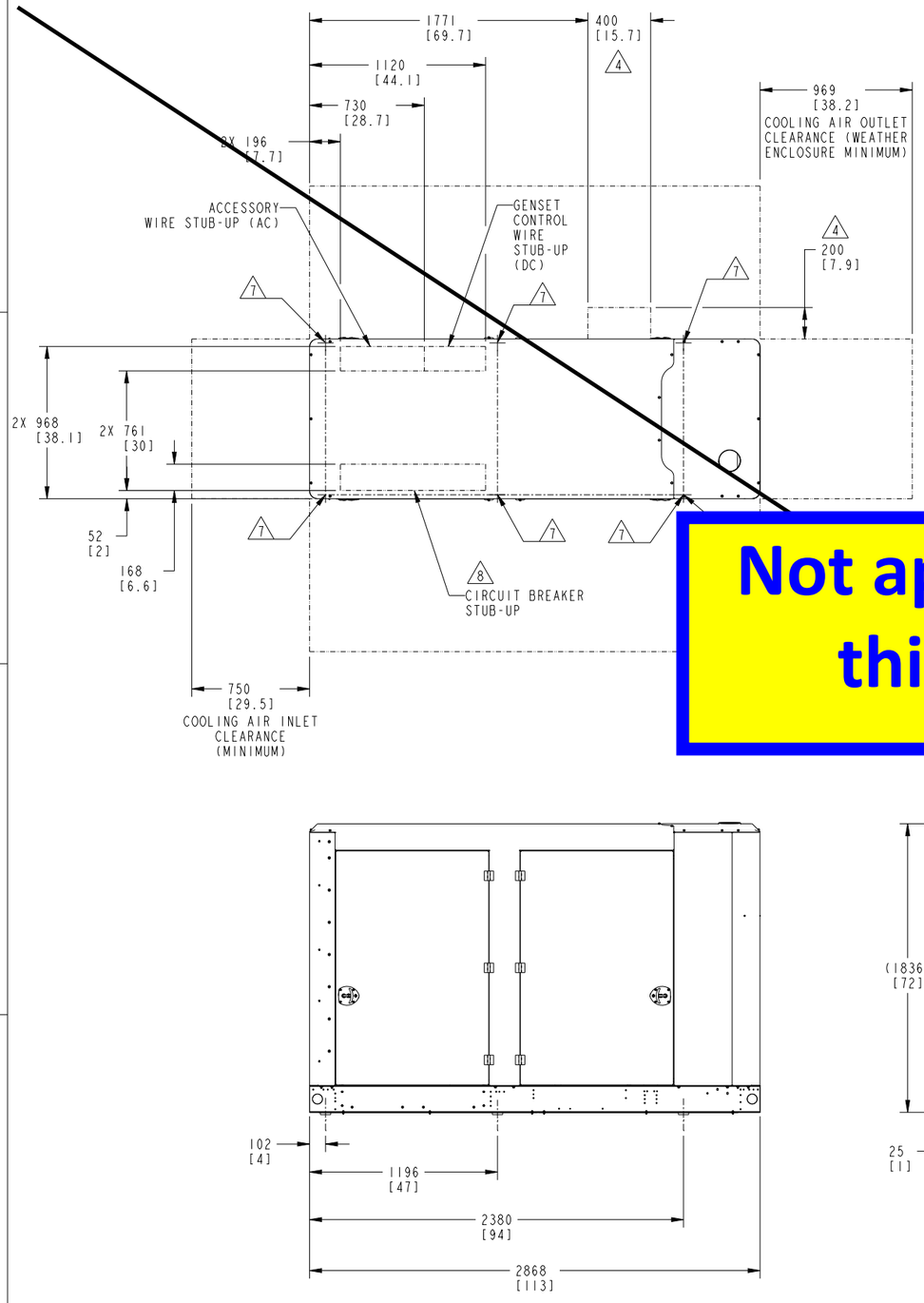
AIR OUTLET VIEW

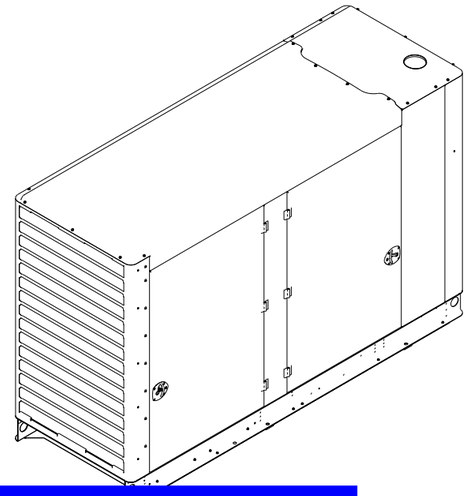


LEFT SIDE VIEW

F231-2 ENCLOSURE CONFIGURATION

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS	SIM TO A051P365	DWN Y_NICHIT	Cummins	CUMMINS POWER GENERATION	
DIM: X ±1; .X ±0.8; .XX± 0.38 — HOLE: 0.00- 4.99 +0.15/-0.08; 5.00- 9.99 +0.20/-0.10; 10.00-17.49 +0.25/-0.13; 17.50-24.99 +0.30/-0.13	DO NOT SCALE PRINT	CKD N_KASIBHOTLA		OUTLINE, ENCLOSURE	
		APVD A_CHINTHALURI			
		DATE 20SEP16	SITE CODE		
ANG TOL ± 1.0° — SCALE 1/15	THIS DOCUMENT (AND THE INFORMATION SHOWN THEREON) IS CONFIDENTIAL AND PROPRIETARY AND SHALL NOT BE DISCLOSED TO OTHERS IN HARD COPY OR ELECTRONIC FORM, REPRODUCED BY ANY MEANS, OR USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC.	FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009 — FIRST USED ON ARROW	PGF	DWG SIZE D — A055V240	CAD SHEET 1 OF 2

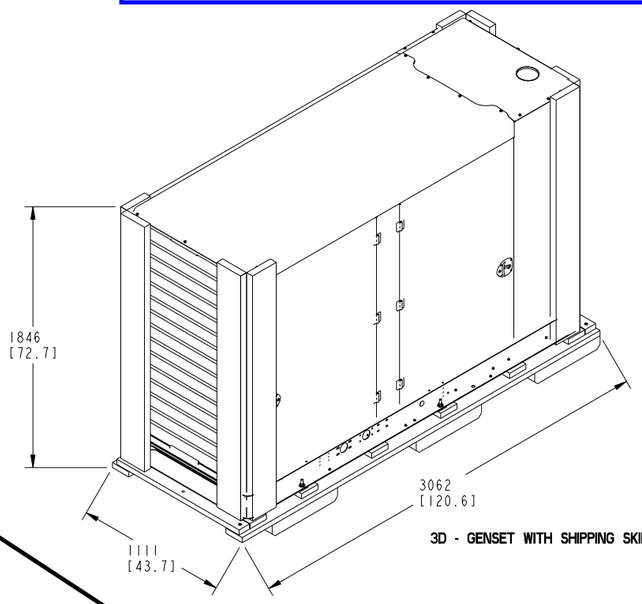




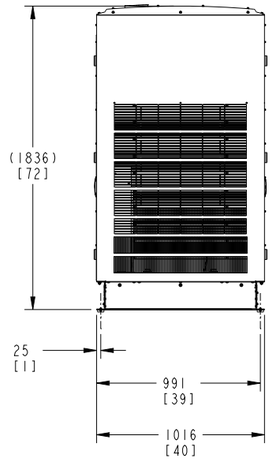
Not applicable on this system

NOTES:

1. DIMENSIONS IN [ ] ARE IN INCHES.
2. GENERATOR SET BASE HAS A FLANGE THICKNESS OF 3.42 MM. ALLOW EXTRA LENGTH ON HARDWARE FOR UNEVENESS OF MOUNTING SURFACE.
3. GENERATOR SET BASE PERIMETER IS SHOWN. FOUNDATION SHOULD BE EXTENDED BEYOND THIS PERIMETER. SEE (T030) APPLICATION MANUAL.
4. FUEL SIDE INLET CLEARANCE.
5. (NOTE REMOVED)
6. FOR IBC SEISMIC CERTIFIED INSTALLATION. SEE GENSET IBC SEISMIC INSTALLATION REQUIREMENTS DRAWING.
7. HOLES IN GENERATOR SET BASE AT THESE LOCATIONS ARE INTENDED FOR ATTACHMENT TO THE MOUNTING SURFACE.
8. REFER TO CIRCUIT BREAKER OUTLINE DRAWING FOR COMPLETE ELECTICAL STUB-UP INFORMATION FOR SPECIFIC BREAKERS AND BREAKER POSITIONS.



3D - GENSET WITH SHIPPING SKID



GENSET MODEL	OUTLINE ENCLOSURE	INSTALLATION CHASSIS	INSTALLATION ENCLOSURE	LIST SHIPPING PARTS	INSTALLATION SKID PAN	KIT ENCLOSURE
C125N6, C200N6, C175N6B, C200N6B	A055V238 (F216-2)	A053K978 (F179)-2	A054F443 (P176-2)	A055D562 (A322-2)	A054Y470 (F250-2)	NA
			A054Z702 (P176-2)	A055F203 (A322-2)		

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 RADII: -	FILLET RADII: -
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

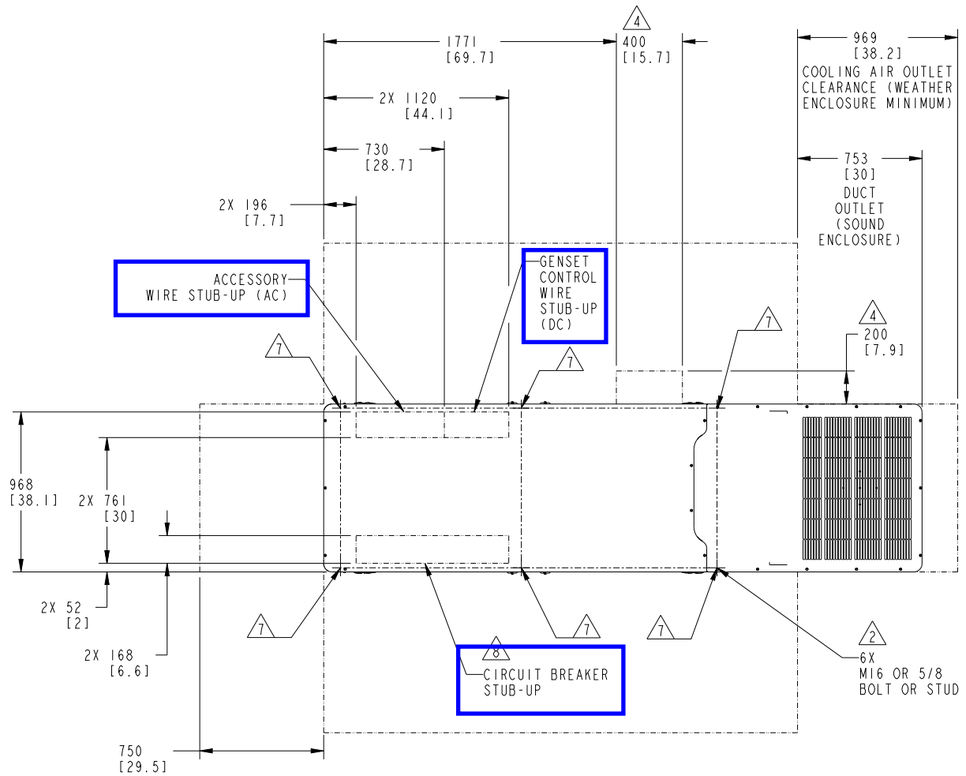
Cummins Inc.

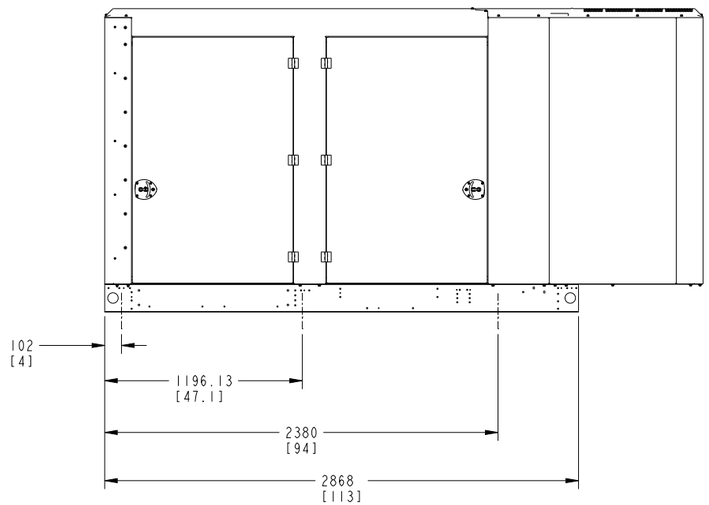
DIMENSIONS ARE IN: MILLIMETERS [ ] ARE IN: INCHES	SIZE: D	SCALE: 1/16
DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009	THIRD ANGLE PROJECTION	CAD SYSTEM PTC® Creo® Parametric

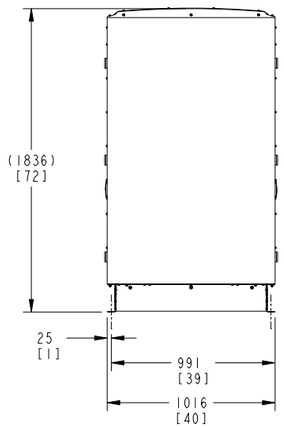
Part Number: **A055J590** Part Revision: **E**

Part Name: **OUTLINE,GENSET**

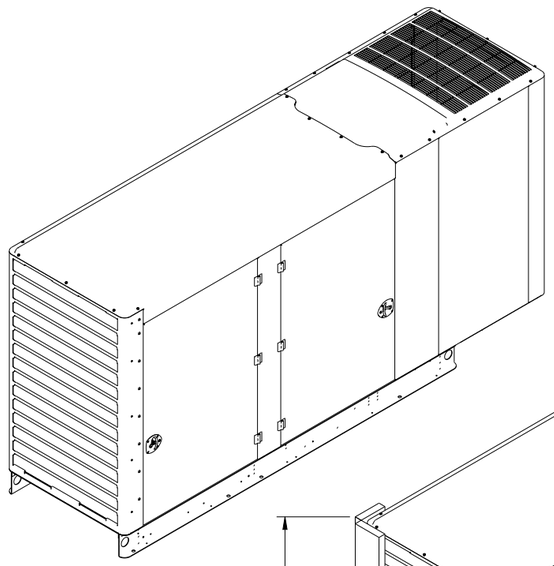
Drawing Category: **Detail** State: **Released**



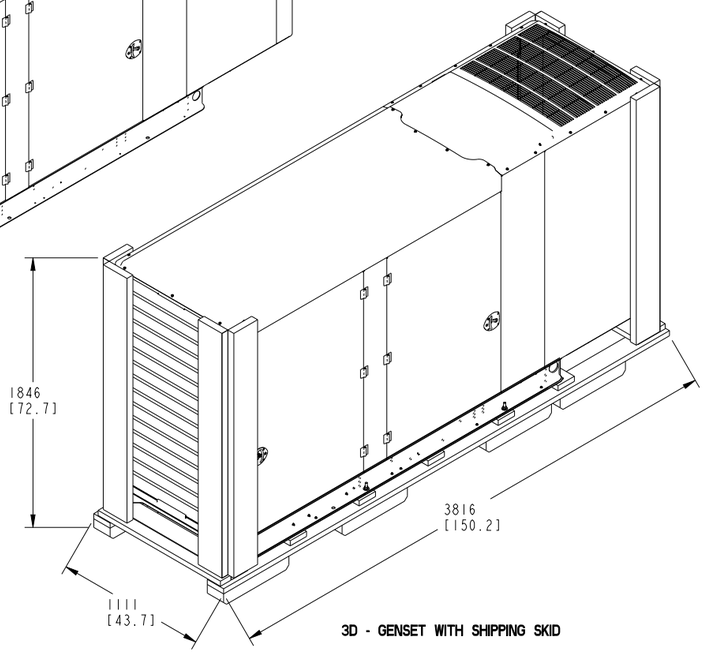




PLEASE NOTE
This is NOT a pad drawing.
Please add at least 1' to overall length and width of generator when determining pad layout.



3D VIEW



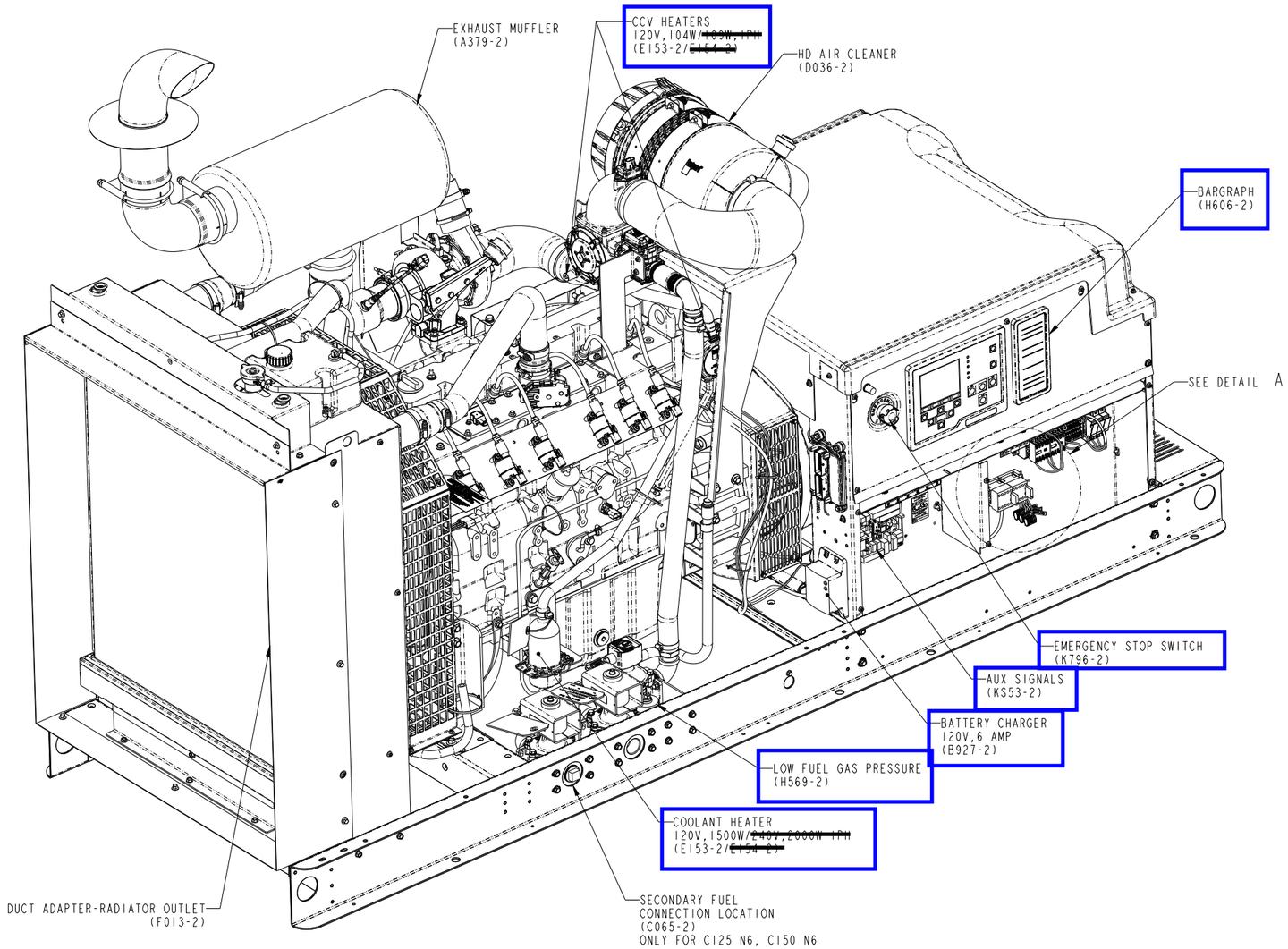
3D - GENSET WITH SHIPPING SKID

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)	A055D560 (A322-2) OR A055F201 (A322-2)	A054Y470 (F250-2)	NA
			A054Z704 (P176-2)			

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 RADII: -	FILLET RADII:-
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

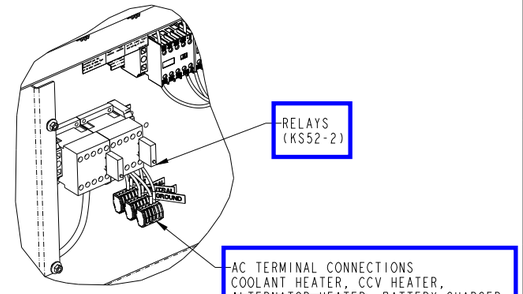
Cummins Inc.

DIMENSIONS ARE IN: MILLIMETERS
[ ] ARE IN: INCHES
SIZE: D
SCALE: 1/16
DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009
THIRD ANGLE PROJECTION
CAD SYSTEM PTC® Creo® Parametric



NOTES:

1. DIMENSIONS SHOWN IN [ ] ARE IN INCHES.



DETAIL A
SCALE 3:8

UNLESS OTHERWISE SPECIFIED THE FOLLOWING SHALL APPLY			ANG. TOL.: ± 1°
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: -
SIZE: A1 SCALE:3:16

DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009
THIRD ANGLE PROJECTION

CAD SYSTEM
PTC® Creo® Parametric

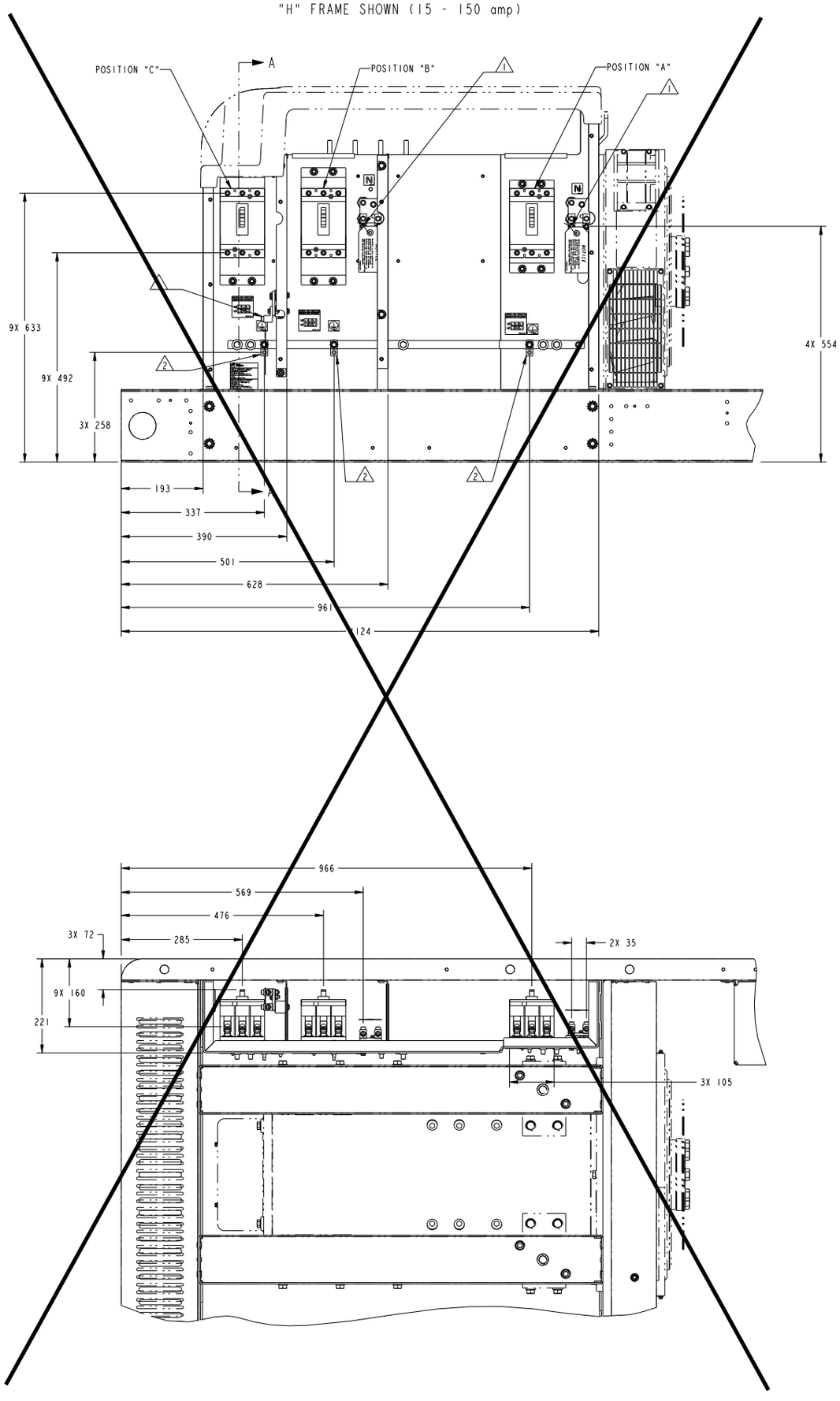
C125 N6, C150 N6, C175 N6B, C200 N6B

Document Generated: **17AUG2022 19:55 GMT**

Part Number: **A055J592** Part Revision: **C**
Part Name: **OUTLINE,GENSET**
Drawing Category: **Detail** State: **Released**

REL NO	REV	NO	REVISION	DRN	CKD	APVD	DATE
ECO-181477	E	1	ADD SHEET 6	RT	MT	M.TULADHAR	05NOV18
		2	ZONE (A1) ADD TABLE	RT	MT	M.TULADHAR	05NOV18
		3	ZONE (B1) UPDATE "CIRCUIT BREAKER ACCESSORIES" TABLE	RT	MT	M.TULADHAR	05NOV18

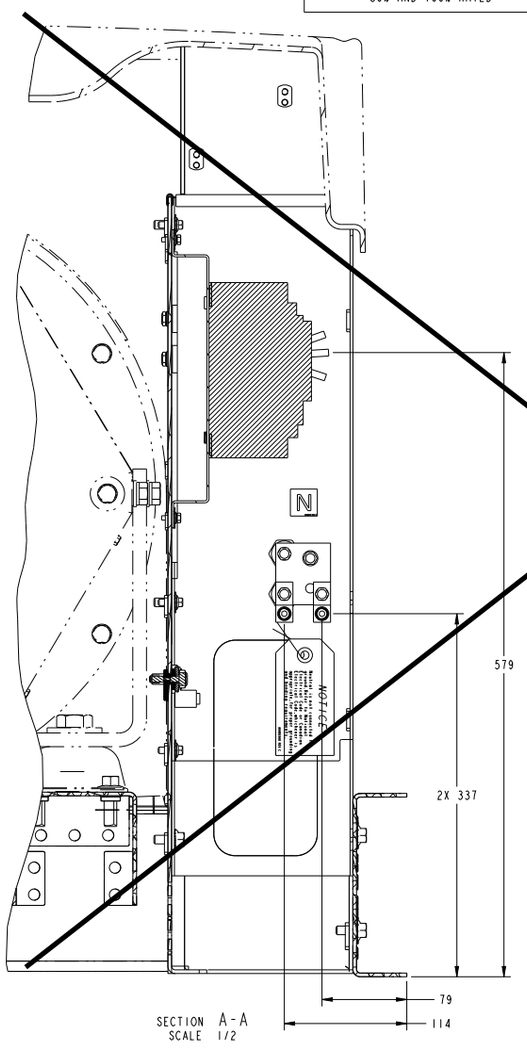
"H" FRAME SHOWN (15 - 150 amp)



QUANTITY OF TWO (2):
LOC. A: 200A-600A
LOC. B: 200A-600A

NOTES:
1. NEUTRAL LUG (1) #14-2/0.
2. GROUND LUG (1) #14-1/0.
3. NEUTRAL LUG (1) #6-350 kcmil.
4. NEUTRAL LG (2) #2-600 kcmil OR (4) 1/0-250 kcmil.

FRAME	LUG	LUG WIRE RANGE	WIRE STRIP LENGTH	CB LUG TORQUE
H-FRAME THERMAL-MAGNETIC 15-150 AMP 80% RATED	AL150HD	(1) AL #14 - 3/0 AWG (1) CU #14 - 3/0 AWG	0.65 inch	#14 - #10 50 lb-in (6.0 Nm) #8 - 3/0 120 lb-in (14.0 Nm)
J-FRAME THERMAL-MAGNETIC 175 AMP 80% RATED	AL175HD	(1) AL #4 - 4/0 AWG (1) CU #4 - 4/0 AWG	1.00 inch	225 lb-in (26.0 Nm)
J-FRAME THERMAL-MAGNETIC 200-250 AMP 80% RATED	AL250JD	(1) AL 3/0 - 350 kcmil (1) CU 3/0 - 350 kcmil	1.00 inch	225 lb-in (26.0 Nm)
J-FRAME LSI ELECTRONIC TRIP ADJUSTABLE TRIP 70-250 AMP 100% RATED, COPPER CONDUCTORS ONLY	CU250JD	(1) CU 1/0 - 300 kcmil	1.00 inch	250 lb-in (28.0 Nm)
L-FRAME (400) LSI ELECTRONIC TRIP ADJUSTABLE TRIP 125-400 AMP 80% RATED	AL400L61K3	(1) AL #2 - 500 kcmil (1) CU #2 - 600 kcmil	1.20 inch	442 lb-in (50 Nm)
L-FRAME (400) LSI ELECTRONIC TRIP ADJUSTABLE TRIP 125-400 AMP 100% RATED, COPPER CONDUCTORS ONLY	AL600LS52K3	(2) CU 2/0 - 500 kcmil	(1) 1.20 inch (1) 2.40 inch	442 lb-in (50 Nm)
L-FRAME (600) LSI ELECTRONIC TRIP ADJUSTABLE TRIP 200-600 AMP 80% RATED 100% RATED, COPPER CONDUCTORS ONLY	AL600LS52K3	(2) AL 2/0 - 500 kcmil (2) CU 2/0 - 500 kcmil	(1) 1.20 inch (1) 2.40 inch	442 lb-in (50 Nm)
P-FRAME MANUAL & AUTOMATIC LSI ELECTRONIC TRIP ADJUSTABLE TRIP 400, 600 & 800 AMP 80% AND 100% RATED	AL800LS52K3	(3) AL 3/0 - 500 kcmil (3) CU 3/0 - 500 kcmil	(3) 1.20 inch	442 lb-in (50 Nm)



SECTION A-A
SCALE 1/2

CIRCUIT BREAKER ACCESSORIES	
1	SHUNT TRIP (MX) P/N A043X760 12 VDC COIL BURDEN < 5 WATTS 10 AMP IN-RUSH
2	AUXILIARY CONTACTS P/N A043X785 OPEN/CLOSED (OF) TRIP INDICATION (SD) FORM C CONTACTS RATING: 6 AMPS AT 24 VAC, 48 VAC, 110 VAC 6 AMPS AT 24 VDC, 2.5 AMPS AT 48 VDC 0.6 AMPS AT 110 VDC H & J FRAME, MAXIMUM OF 4 CONTACTS PER CIRCUIT BREAKER L FRAME, MAXIMUM OF 5 CONTACTS PER CIRCUIT BREAKER P FRAME, MAXIMUM OF 5 CONTACTS PER CIRCUIT BREAKER
3	ACCESSORY KIT P/N A060M822 TOP ENTRY LOAD CABLE ENTRY APPLICABLE FOR MODEL AND BREAKER CONFIGURATION AS PER "TABLE 1"

TABLE 1			
KIT PART NUMBER	MODELS AFFECTED		ENCLOSURES AFFECTED
A060M822	C125 N6- C150 N6 C125 D6D- C800 D6D		OPEN ONLY
KIT PART NUMBER	NUMBER OF CB'S	LIMITATION	
		POS A	POS B	POS C
A060M822	1	ANY RATING	-	-
	2	ANY RATING	600A OR BELOW	-
	3	ANY RATING	400A OR BELOW	250A OR BELOW

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS
DIM: X ± 1, .X ± 0.8, .XX± 0.38
ROUGH: 0.00- 4.99 +0.15/-0.08; 5.00- 9.99 +0.20/-0.10; 10.00-17.49 +0.25/-0.13; 17.50-24.99 +0.30/-0.13
ANG TOL ± 1.0° | SCALE 1/4
DO NOT SCALE PRINT
THIS DOCUMENT AND THE INFORMATION SHOWN THEREON IS CONFIDENTIAL AND PROPRIETARY AND SHALL NOT BE DISCLOSED TO OTHERS OR USED FOR ANY PURPOSE EXCEPT AS AUTHORIZED BY AND AND IT SHALL NOT BE REPRODUCED IN WHOLE OR IN PART, OR USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC.
DRN A_JOHNSON
CKD A_JOHNSON
APVD P_LARSON
DATE 02MAY16
FOR INTERPRETATION OF DIMENSIONS AND TOLERANCES SEE ASME Y14.5-2009
FIRST USED ON ARROW

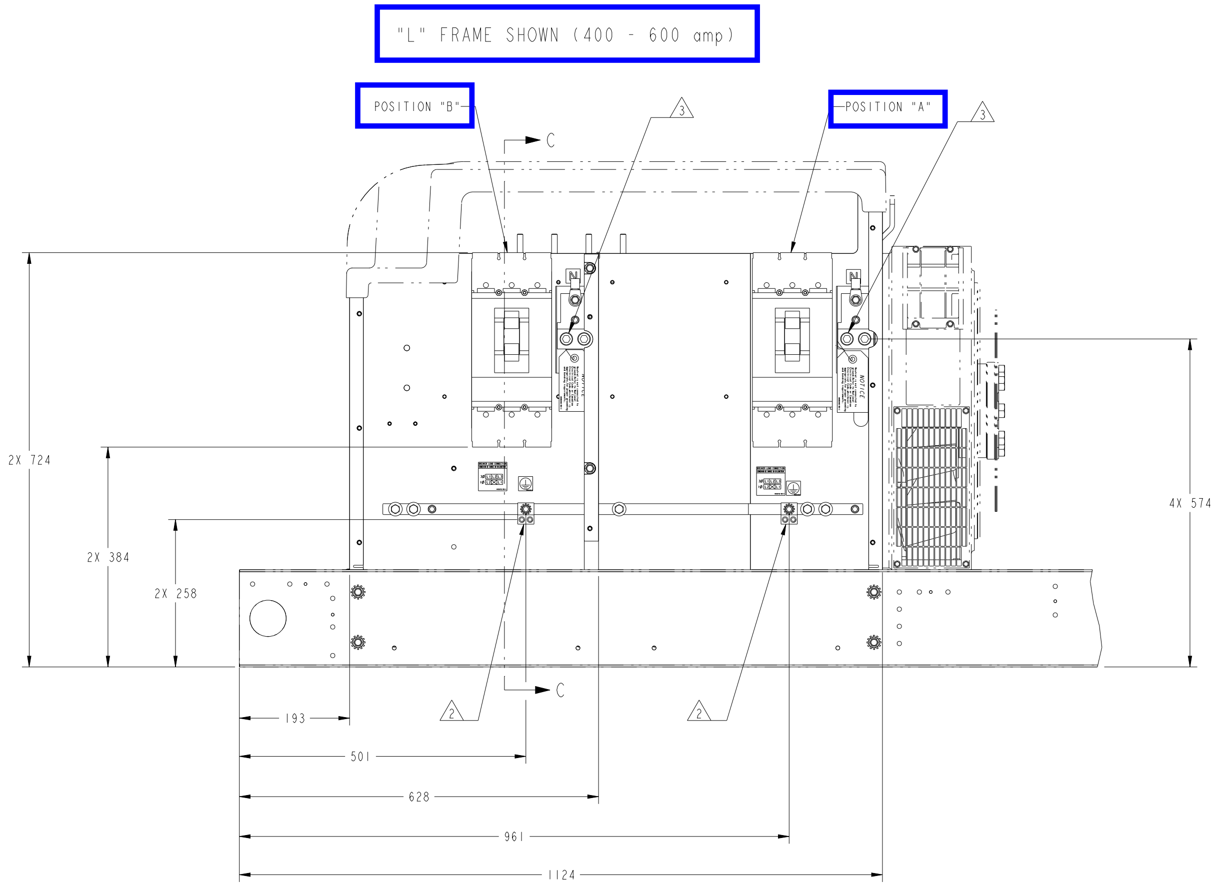
CUMMINS POWER GENERATION
OUTLINE,CIRCUIT BREAKER
SITE CODE PGF
DWG SIZE E
A055B603
CAD SHEET 1 OF 6

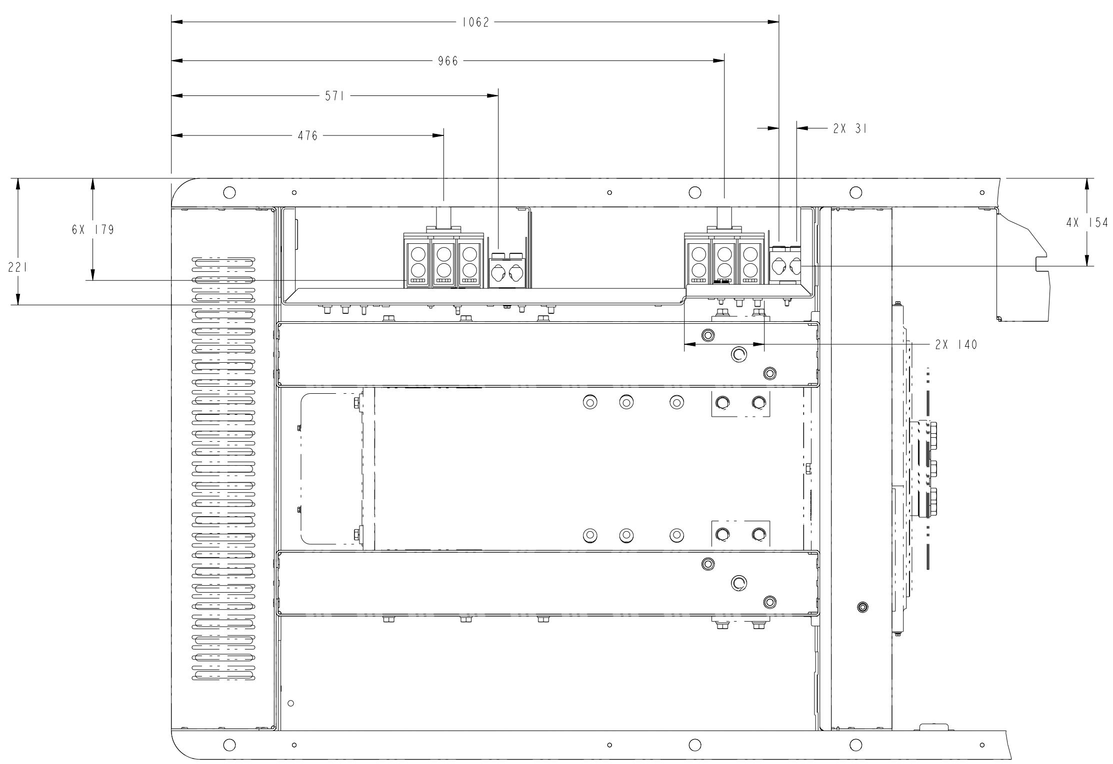
Regulatory Review and Approval is required prior to changing this item per PGG 1-01-01-116. This item impacts compliance with these External Regulations: UL,CSA

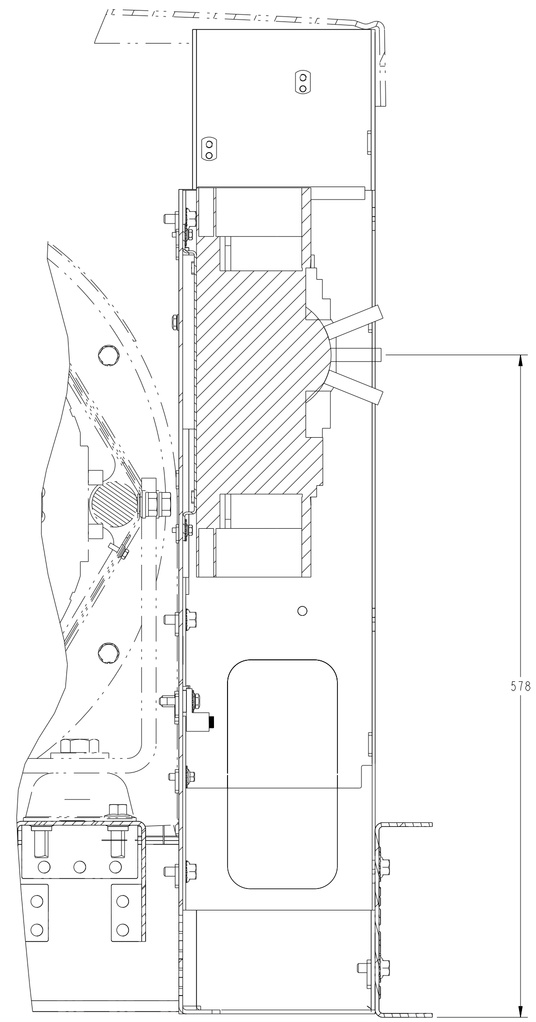
Drawing Name: A055B604 Revision: E
Part Name: A055B603 Revision: E
ECO-181477 Sheet 1 of 7

PTC® Creo® Parametric

REL NO	REV	NO	REVISION	DWN	CKD	APVD	DATE
ECO-181477	E	-	---	RT	MT	M_TULADHAR	05NOV18







SECTION C-C
SCALE 1/2

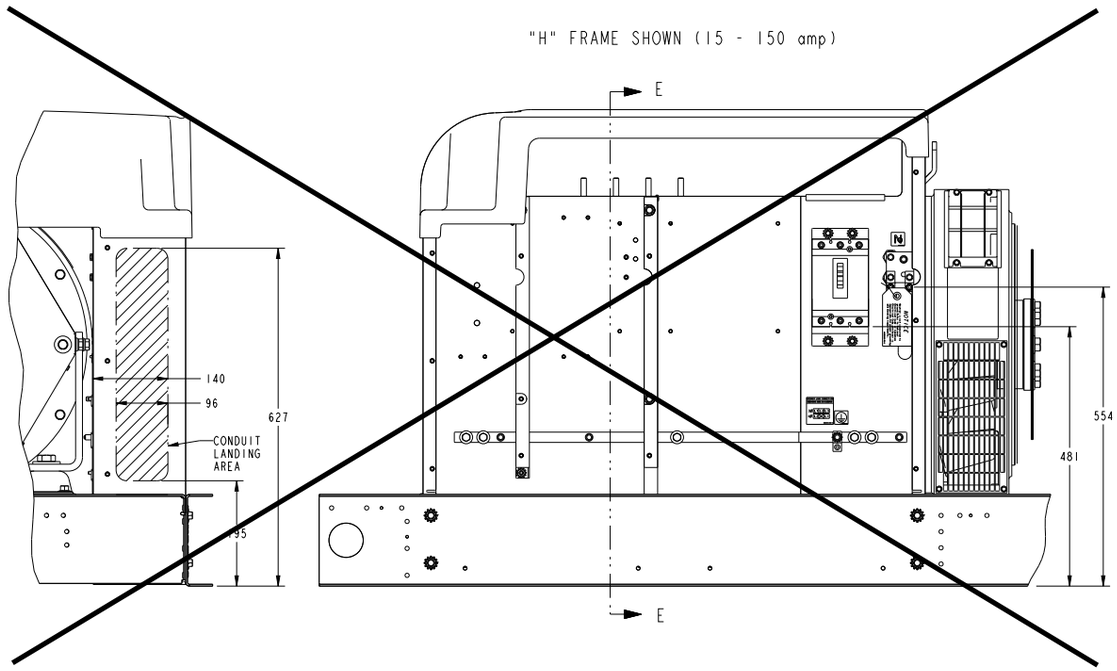
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS	SIM TO .	DWN A_JOHNSON	CUMMINS POWER GENERATION
DIM: X ±1; .X ±0.8; .XX± 0.38 — HOLE: 0.00-4.99 +0.15/-0.08; 5.00-9.99 +0.20/-0.10; 10.00-17.49 +0.25/-0.13; 17.50-24.99 +0.30/-0.13	DO NOT SCALE PRINT	CKD A_JOHNSON; APVD P_LARSON; DATE 02MAY16	OUTLINE,CIRCUIT BREAKER
ANG TOL ± 1.0°; SCALE 1/4	THIS DOCUMENT (AND THE INFORMATION SHOWN THEREON) IS CONFIDENTIAL AND PROPRIETARY AND SHALL NOT BE DISCLOSED TO OTHERS IN HARD COPY OR ELECTRONIC FORM, REPRODUCED BY ANY MEANS, OR USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC.	FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009; FIRST USED ON ARROW	SITE CODE PGF; DWG SIZE E; A055B603; CAD SHEET 3 OF 6

Regulatory Review and Approval is required prior to changing this item per PGG 1-01-01-116. This item impacts compliance with these External Regulations: UL,CSA

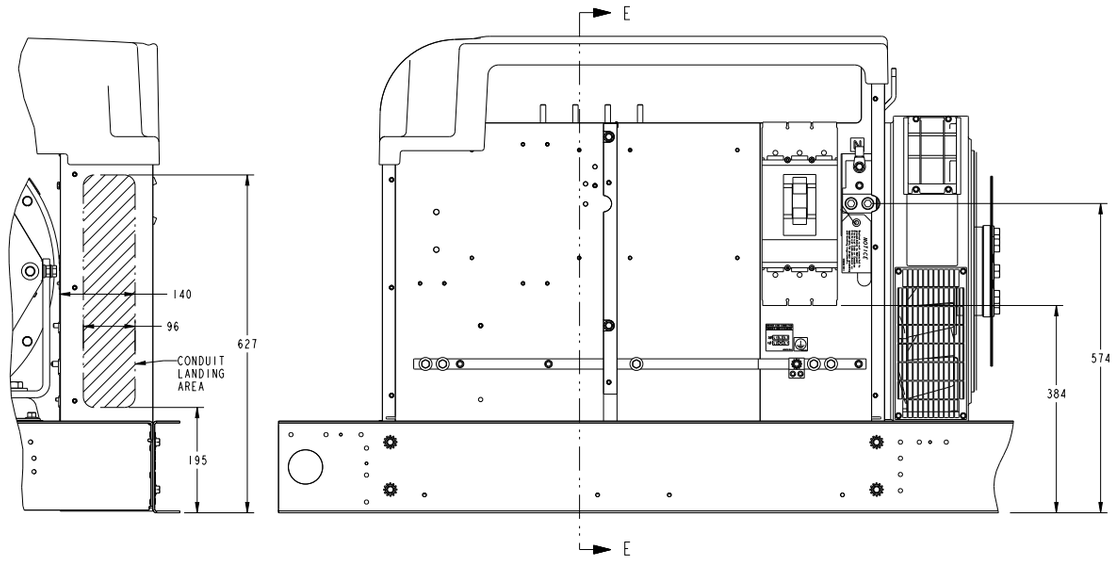
PTC® Creo® Parametric

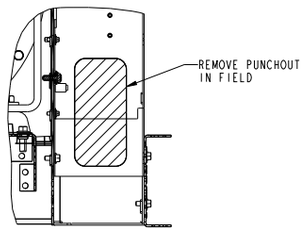
REL NO	REV	NO	REVISION	DRN	CKD	APVD	DATE
ECO-181477	E	-	---	RT	MT	M_TULADHAR	05NOV18

"H" FRAME SHOWN (15 - 150 amp)



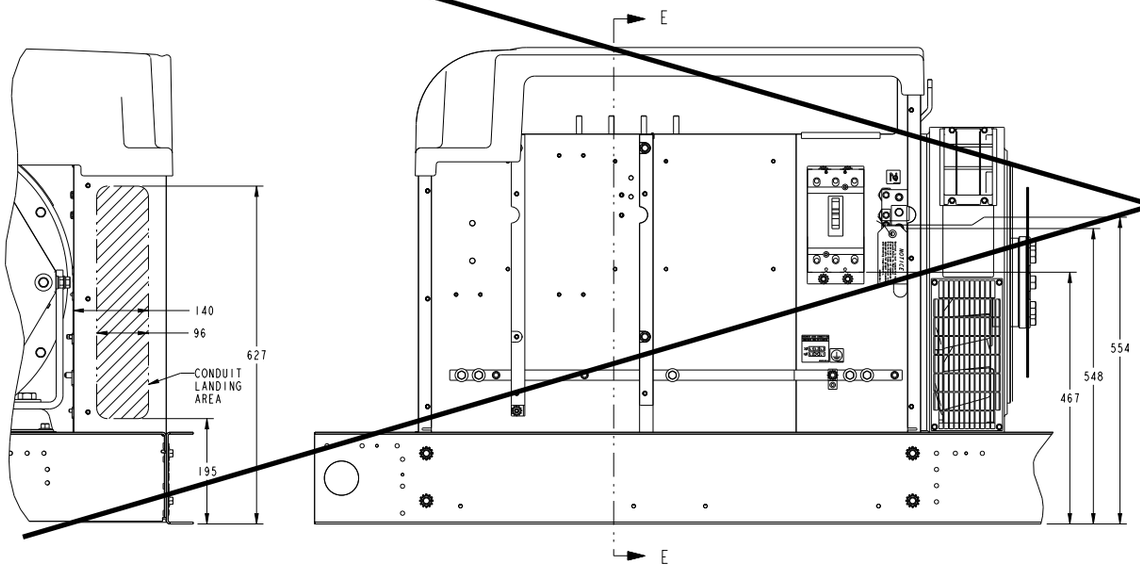
"L" FRAME SHOWN (400 - 600 amp)



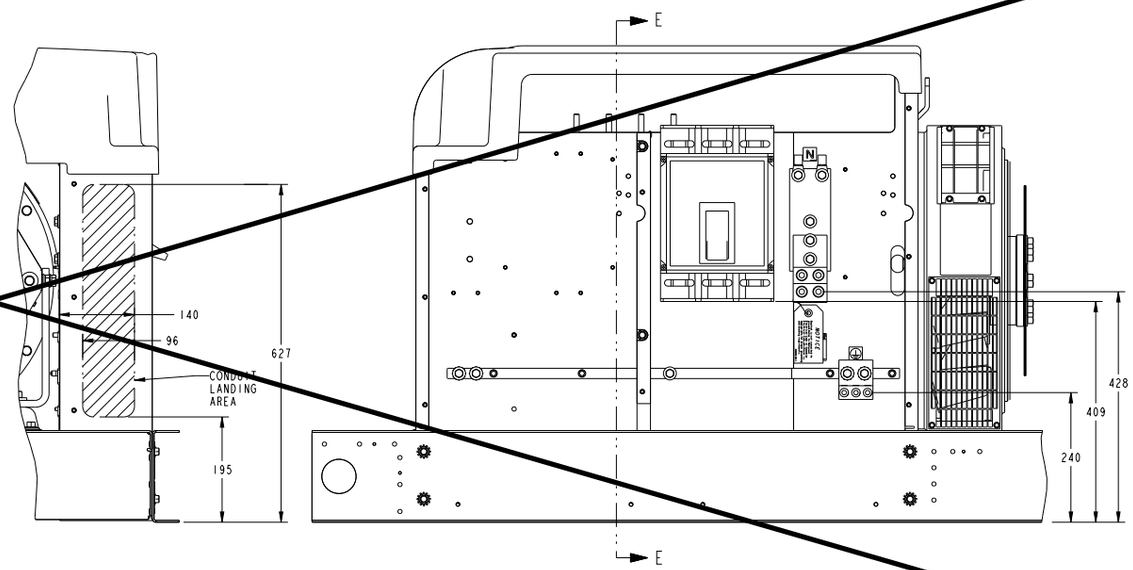


SECTION E-E

"J" FRAME SHOWN (175 - 250 amp)



"P" FRAME SHOWN (400-800 amp)



UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS				DRN A_JOHNSON	CUMMINS POWER GENERATION
DIM	SCALE	DO NOT SCALE PRINT		CKD A_JOHNSON	OUTLINE,CIRCUIT BREAKER
X ±1 .X ± 0.8 .XX± 0.38	0.00- 4.99 +0.15/-0.08 5.00- 9.99 +0.20/-0.10 10.00-17.49 +0.25/-0.13 17.50-24.99 +0.30/-0.13			APVD P_LARSON DATE 02MAY16	SITE CODE PGF
ANG TOL ± 1.0°	SCALE 1/4	THIS DOCUMENT AND THE INFORMATION SHOWN THEREON IS CONFIDENTIAL AND PROPRIETARY TO CUMMINS INC. IT IS LOANED SUBJECT TO THE AGREEMENT THAT IT WILL NOT BE REPRODUCED OR USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC.		FOR INTERPRETATION OF DIMENSIONS AND TOLERANCES, SEE ASME Y14.5-2009 FIRST USED ON ARROW	DWG SIZE E A055B603 CAD SHEET 5 of 6

Regulatory Review and Approval is required prior to changing this item per PGG 1-01-01-116. This item impacts compliance with these External Regulations: UL,CSA

Drawing Name: A055B604 Revision: E
Part Name: A055B603 Revision: E
ECO-181477 Sheet 5 of 7

PTC® Creo® Parametric

REL NO	LTR	NO	REVISION	DWN	CKD	APVD	DATE
ECO-165950	A	1	PRODUCTION RELEASE	AGJ	AGJ	M_WICKMANN	07NOV16

SEISMIC INSTALLATIONS NOTES:

1. THE DESIGN OF POST-INSTALLED ANCHORS IN CONCRETE USED FOR THE COMPONENT ANCHORAGE IS PRE-QUALIFIED FOR SEISMIC APPLICATIONS IN ACCORDANCE WITH "ACI 355.2-07" AND DOCUMENTED IN A REPORT BY A REPUTABLE TESTING AGENCY. (EX. THE EVALUATION SERVICE REPORT ISSUED BY THE INTERNATIONAL CODE COUNCIL)

2. ANCHORS MUST BE INSTALLED TO AN EMBEDMENT DEPTH AS RECOMMENDED IN THE PRE-QUALIFICATION TEST REPORT AS DEFINED IN NOTE 1. FOR "CBC 2016" APPLICATIONS.

3. ANCHORS MUST BE INSTALLED IN MINIMUM 3000 PSI COMPRESSIVE STRENGTH NORMAL WEIGHT STRUCTURAL CONCRETE. CONCRETE AGGREGATE MUST COMPLY WITH "ASTM C33".

4. ANCHORS MUST BE INSTALLED TO THE TORQUE SPECIFICATION AS RECOMMENDED BY THE ANCHOR MANUFACTURER.

5. ANCHORS MUST BE INSTALLED IN LOCATIONS SPECIFIED ON THIS INSTALLATION DRAWING.

6. WASHERS MUST BE INSTALLED AT EACH ANCHOR LOCATION BETWEEN THE ANCHOR HEAD AND EQUIPMENT FOR TENSION LOAD DISTRIBUTION. WASHERS MUST BE TYPE A OR B PLAIN WASHERS MEETING ASME B18.21.1-2009. WASHER SIZE TO MATCH ANCHOR DIAMETER.

7. CONCRETE FLOOR SLAB AND CONCRETE HOUSEKEEPING PADS MUST BE DESIGNED FOR SEISMIC APPLICATIONS IN ACCORDANCE WITH "ACI 318-11".

8. ALL HOUSEKEEPING PAD THICKNESSES MUST BE DESIGNED IN ACCORDANCE WITH THE PRE-QUALIFICATION TEST REPORT AS DEFINED IN NOTE 1 OR A MINIMUM OF 1.5X THE ANCHOR EMBEDMENT DEPTH, WHICHEVER IS LARGEST (UNLESS NOTED OTHERWISE).

9. ALL HOUSEKEEPING PADS MUST BE DOWELLED OR CAST INTO THE BUILDING STRUCTURAL FLOOR SLAB AND DESIGNED FOR SEISMIC APPLICATION PER "ACI 318-11" AND AS APPROVED BY THE STRUCTURAL ENGINEER OF RECORD.

10. FLOOR MOUNTED EQUIPMENT (WITH OR WITHOUT A HOUSEKEEPING PAD) MUST BE INSTALLED TO A STEEL REINFORCED STRUCTURAL CONCRETE FLOOR THAT IS SEISMICALLY DESIGNED AND APPROVED BY THE ENGINEER OF RECORD TO RESIST ALL LOADS FROM EQUIPMENT BEING ANCHORED TO THE FLOOR.

11. COORDINATE REINFORCEMENT OF SUPPORT STRUCTURE WITH EQUIPMENT ANCHOR LOCATIONS.

12. ATTACHING SEISMIC CERTIFIED EQUIPMENT TO FLOOR OTHER THAN THOSE DESIGNED TO ACCEPT THE SEISMIC LOADS FROM CERTIFIED EQUIPMENT BY THE STRUCTURAL ENGINEER OF RECORD IS PROHIBITED.

13. INSTALLATION ONTO A STEEL ROOF STRUCTURE OR MANUFACTURED STEEL CURB SHALL BE COORDINATED WITH THE STRUCTURAL ENGINEER OF RECORD.

14. CONNECTIONS TO THE EQUIPMENT, INCLUDING BUT NOT LIMITED TO CONDUIT, WIRING FROM CABLE TRAYS, OTHER ELECTRICAL SERVICES OR OTHER CONNECTIONS, ARE THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR AND BEYOND THE SCOPE OF THIS DOCUMENT. FLEXIBLE ATTACHMENTS MUST BE USED FOR SEISMIC CONNECTIONS TO ISOLATED COMPONENTS OR ISOLATED EQUIPMENT. THE FLEXIBLE ATTACHMENT MUST PROVIDE FOR ENOUGH RELATIVE DISPLACEMENT TO REMAIN CONNECTED TO THE EQUIPMENT AND FUNCTIONAL DURING AND AFTER A SEISMIC EVENT.

15. REFER TO GENSET OUTLINE DRAWINGS FOR WEIGHT, CG AND CONFIGURATION SPECIFICS.

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS
DIM: X ± 1 | .X ± 0.8 | .XX± 0.38
HOLE: 0.00- 4.99 +0.15/-0.08 | 5.00- 9.99 +0.20/-0.10 | 10.00-17.49 +0.25/-0.13 | 17.50-24.99 +0.30/-0.13
ANG TOL: ± 1.0° SCALE: 1/1

SIM TO NONE
DO NOT SCALE PRINT
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DWN A_JOHNSON
CKD A_JOHNSON
APVD M_WICKMANN
DATE 07NOV16
FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5M-1994. FIRST USED ON ARROW

SITE CODE PGF

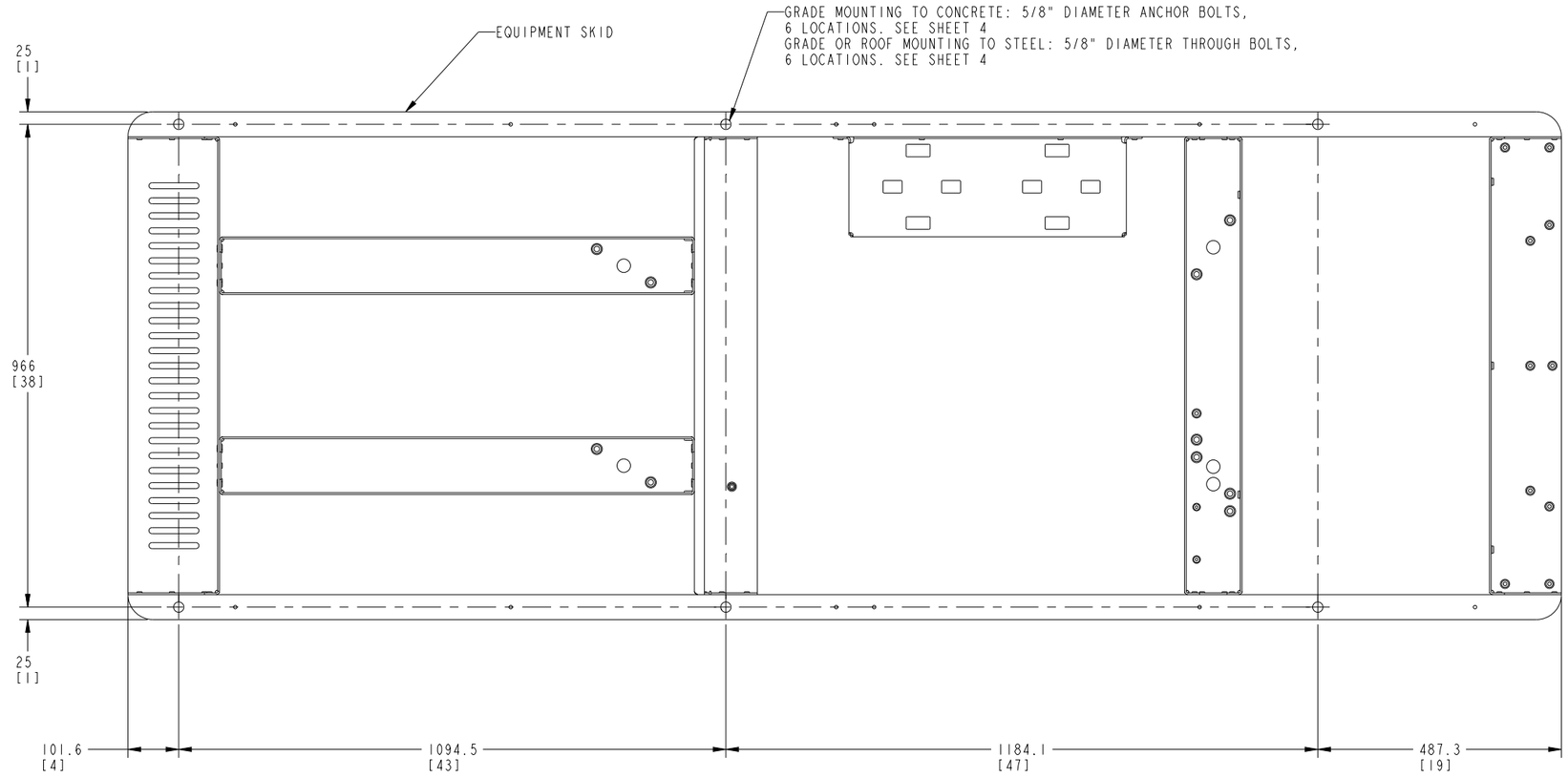
CUMMINS POWER GENERATION
INSTALLATION, GENSET
SEISMIC REQUIREMENTS
DWG SIZE D | A056M541 | SHEET 1 of 4 | DWG REV A

Regulatory Review and Approval is required prior to changing this item per PGG 1-01-01-116. This item impacts compliance with these External Regulations: IBC,OSHPD

Drawing Name: A056M542 Revision: A
Part Name: A056M541 Revision: A
ECO-165950 Sheet 1 of 5

PTC® Creo® Parametric

REL NO	LTR	NO	REVISION	DWN	CKD	APVD	DATE
ECO-165950	A	1	PRODUCTION RELEASE	AGJ	AGJ	M_WICKMANN	07NOV16



SCALE 3/16

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS

DIM		HOLE	
	X ± 1		0.00- 4.99 +0.15/-0.08
	.X ± 0.8		5.00- 9.99 +0.20/-0.10
	.XX± 0.38		10.00-17.49 +0.25/-0.13
			17.50-24.99 +0.30/-0.13

ANG TOL: ± 1.0° SCALE: 1/1

SIM TO NONE

DO NOT SCALE PRINT

- CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP

DWN A_JOHNSON
CKD A_JOHNSON
APVD M_WICKMANN
DATE 07NOV16

FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5M-1994 FIRST USED ON ARROW

SITE CODE PGF

CUMMINS POWER GENERATION

INSTALLATION, GENSET
SEISMIC REQUIREMENTS

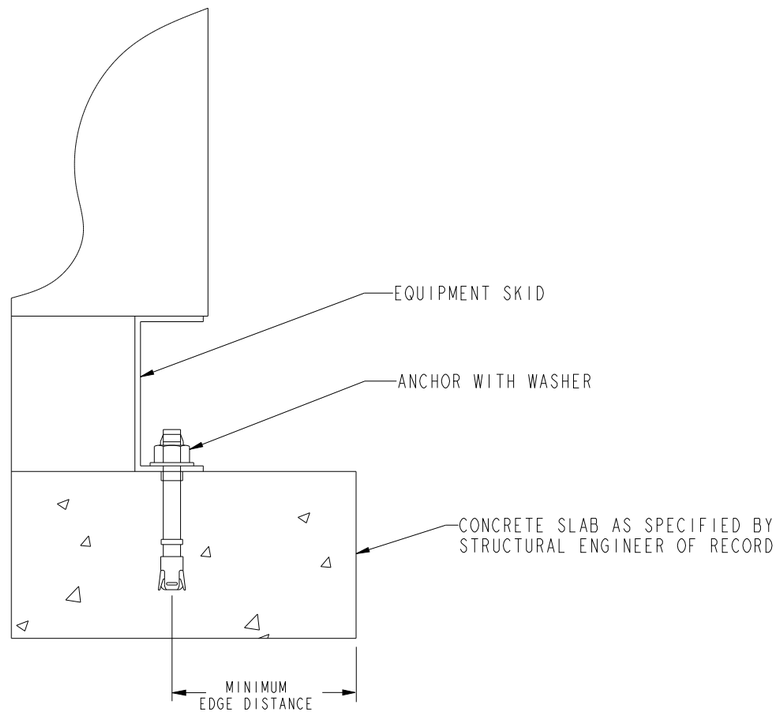
DWG SIZE D | A056M541 | SHEET 3 of 4 | DWG REV A

Regulatory Review and Approval is required prior to changing this item per PGG 1-01-01-116. This item impacts compliance with these External Regulations: IBC,OSHPD

Drawing Name: A056M542 Revision: A
Part Name: A056M541 Revision: A
ECO-165950 Sheet 3 of 5

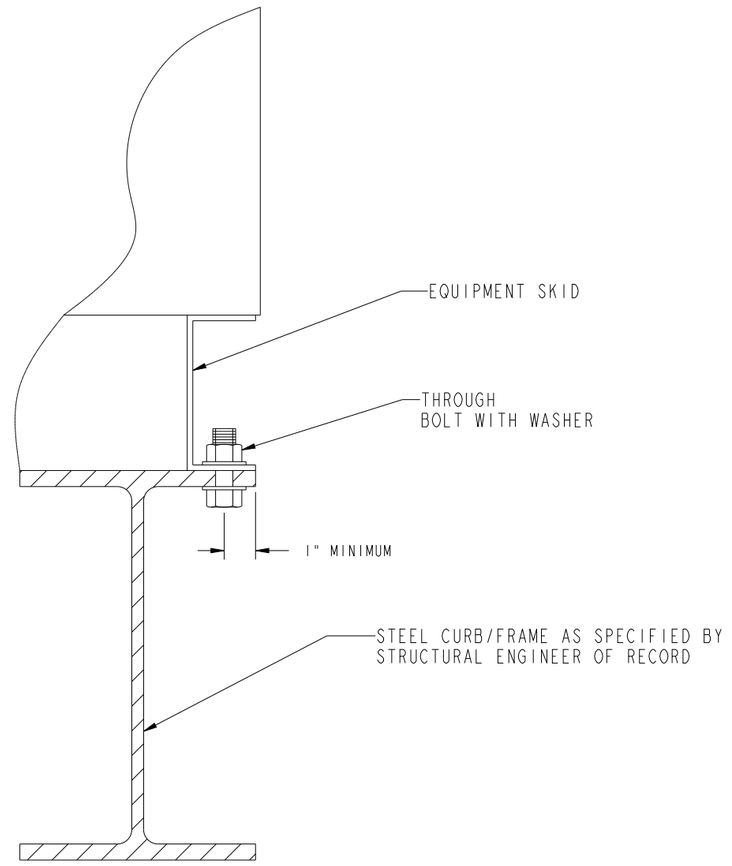
PTC® Creo® Parametric

REL NO	LTR	NO	REVISION	DWN	CKD	APVD	DATE
ECO-165950	A	1	PRODUCTION RELEASE	AGJ	AGJ	M_WICKMANN	07NOV16



TO BE DESIGNED BY ENGINEER OF RECORD

CONCRETE CONNECTION



STEEL CONNECTION

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS

DIM		HOLE
X	± 1	0.00- 4.99 +0.15/-0.08
.X	± 0.8	5.00- 9.99 +0.20/-0.10
.XX	± 0.38	10.00-17.49 +0.25/-0.13
		17.50-24.99 +0.30/-0.13

ANG TOL: ± 1.0° SCALE: 1/1

SIM TO NONE

DO NOT SCALE PRINT

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DWN	A_JOHNSON
CKD	A_JOHNSON
APVD	M_WICKMANN
DATE	07NOV16

FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, REF ASME Y14.5M-1994 — FIRST USED ON: ARROW

SITE CODE: PGF

CUMMINS POWER GENERATION

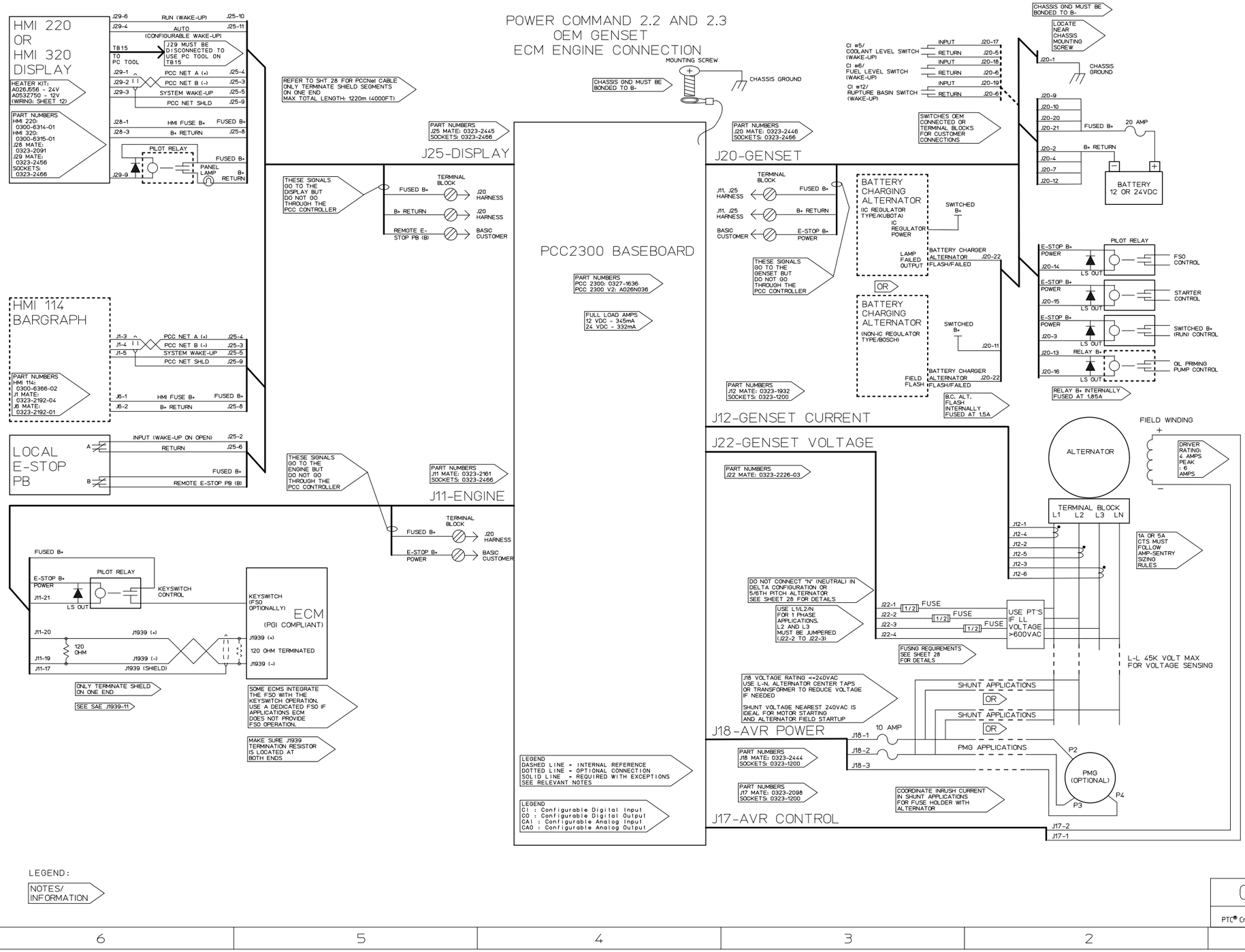
INSTALLATION, GENSET
SEISMIC REQUIREMENTS

DWG SIZE: D | A056M541 | SHEET 4 OF 4 | DWG REV: A

Regulatory Review and Approval is required prior to changing this item per PGG 1-01-01-116. This item impacts compliance with these External Regulations: IBC,OSHPD

Drawing Name: A056M542 Revision: A
Part Name: A056M541 Revision: A
ECO-165950 Sheet 4 of 5

POWER COMMAND 2.2 AND 2.3 OEM GENSET ECM ENGINE CONNECTION



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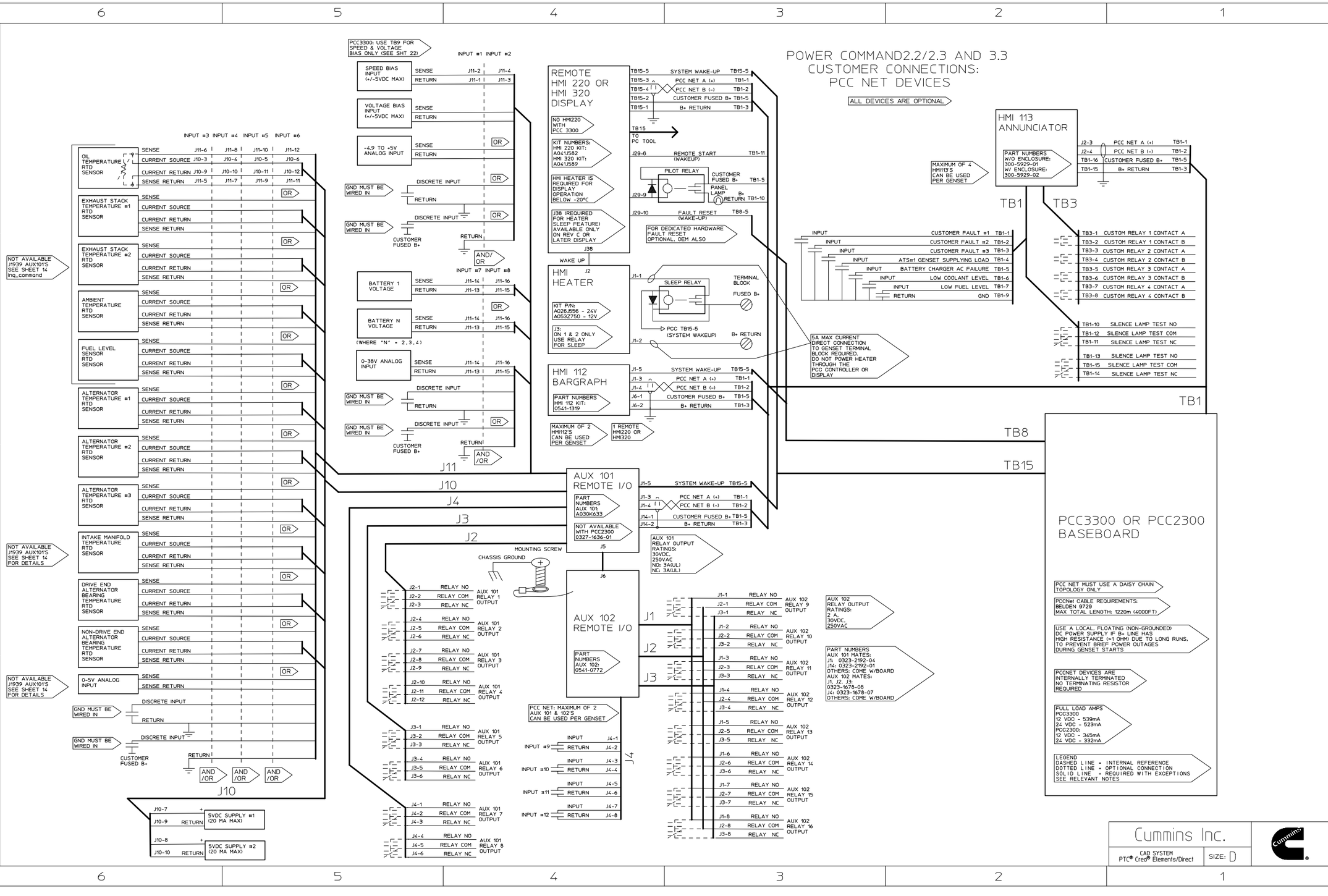

Document Generated: **05APR2022 06:13 GMT**

Cummins Data Classification:
Cummins Confidential

Part Number: **0630-3440** Part Revision: **U**
Part Name: **DIAGRAM,CONTROL SCHEMATIC**
Drawing Category: **Detail** State: **Released** Sheet **12** of **29**

POWER COMMAND 3.3 AND 2.2/2.3 CUSTOMER CONNECTIONS

ALL DEVICES ARE OPTIONAL

TB1 - BASIC

PART NUMBERS
TB 1 MATE: 0323-1678-15

THESE SIGNALS GO TO THE CUSTOMER BUT DO NOT GO THROUGH THE PCC CONTROLLER

TERMINAL BLOCK

E-STOP B+ POWER → J11, J20 HARNESS

LOCAL E-STOP PB (B) → J25 HARNESS

REMOTE E-STOP PB
(REMOVE JUMPER IF USED)

A: INPUT (WAKE-UP ON OPEN) TB1-16
RETURN TB1-15

B: LOCAL E-STOP PB (B)
E-STOP B+ POWER

SEE APPLICATION NOTES SECTION FOR HIGH LEVEL E-STOP CIRCUIT

REMOTE START (WAKE-UP): INPUT TB1-11, RETURN TB1-10

CUSTOMER INPUT #1: INPUT TB1-12, RETURN TB1-13

CUSTOMER INPUT #2: INPUT TB1-14, RETURN TB1-15

TB1-1 PCC NET A (+) - RS485
TB1-2
TB1-3 PCC NET B (-) - RS485
PCC NET B SHIELD

PCC NET DEVICES
(SEE CUSTOMER - PCC NET PAGE)

RELAY OUTPUT RATINGS: 3.5 A, 30VDC

TB1-6 RELAY NO — CUSTOMER OUTPUT #1 — OUTPUT #1 DEFAULT: 1540 COMMON WARNING
TB1-7 RELAY COM

TB1-8 RELAY NO — CUSTOMER OUTPUT #2 — OUTPUT #2 DEFAULT: 1541 COMMON SHUTDOWN
TB1-9 RELAY COM

TB1-4 LOW SIDE DRIVER — READY TO LOAD OUTPUT

TB1-5 +
TB1-10 RETURN

CUSTOMER FUSED BATTERY SUPPLY (3A MAX)

BATTERY

ITEMS IN DASHED LINES REPRESENT INTERNAL PCC CIRCUITRY.

PC TOOL

PC TOOL HARNESS

PART NUMBERS
PC TOOL HARNESS KIT: 0338-3277

NOTE:
A FEMALE-FEMALE ADAPTER CABLE IS ALSO REQUIRED

J14 - PC TOOL

NOTE:
PCC3300 ONLY

PCC3300 OR PCC2300 BASEBOARD

FULL LOAD AMPS
PCC3300
12 VDC - 539mA
24 VDC - 523mA
PCC2300:
12 VDC - 345mA
24 VDC - 332mA

TB8 - PREMIUM

PART NUMBERS
TB 8 MATE: 0323-2325-03

FAULT RESET (WAKE-UP): INPUT TB8-5, RETURN TB8-1

START TYPE: INPUT TB8-6, RETURN TB8-2

CUSTOMER INPUT #3: INPUT TB8-7, RETURN TB8-12

CUSTOMER INPUT #4: INPUT TB8-8, RETURN TB8-13

BATTERY

TB8-3 LOW SIDE DRIVER — DELAYED OFF OUTPUT
TB8-4 LOW SIDE DRIVER — SWITCHED B+ (RUN) OUTPUT
TB8-11 LOW SIDE DRIVER — LOAD DUMP OUTPUT
TB8-10 LOW SIDE DRIVER — CUSTOMER OUTPUT #3 — OUTPUT #3 DEFAULT: 1463 NOT IN AUTO
TB8-9 LOW SIDE DRIVER — CUSTOMER OUTPUT #4 — OUTPUT #4 DEFAULT: 1465 READY TO LOAD

LOW SIDE DRIVER OUTPUT RATINGS: 250MA, 1A INRUSH, 30 VDC, 100uA OFF STATE LEAKAGE

TB15 - MODBUS/PC TOOL

PART NUMBERS
TB 15 MATE: 0323-2192-04

SYSTEM WAKEUP: GROUND IF THE PCC CONTROL SYSTEM IS TO ALWAYS STAY AWAKE.

TB15 - 5 SYSTEM WAKE-UP

PCC NET DEVICES
(SEE CUSTOMER - PCC NET PAGE)

TB15 - 3 RS485 (+)
120 OHM
TB15 - 4 RS485 (-)
TB15 - 1 SHIELD

MODBUS
(+)
120 OHM TERMINATED
(-)
GND REF

REQUIRED CABLE FOR MODBUS
USE BELDEN 9729,BELDEN 3106A,BELDEN 3107A
ONLY TERMINATE SEGMENTS ON ONE END
MAX TOTAL LENGTH: 1220m (4000FT)

OR

PC TOOL HARNESS

PART NUMBERS
PC TOOL HARNESS: 0541-1199

OR

PC TOOL

PC500/550 (REMOTE MONITORING DEVICE)

REFER TO SHEETS 26 AND 27 FOR I/O WIRING DETAILS

LEGEND
DASHED LINE - INTERNAL REFERENCE
DOTTED LINE - OPTIONAL CONNECTION
SOLID LINE - REQUIRED WITH EXCEPTIONS
SEE RELEVANT NOTES

LEGEND
CI : Configurable Digital Input
CO : Configurable Digital Output
CAI : Configurable Analog Input
CAO : Configurable Analog Output

Cummins Inc.
CAD SYSTEM PTC® Creo® Elements/Direct
SIZE: D

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PCC GENERAL INFORMATION

RECOMMENDED TWISTED PAIR CABLE

CABLE TYPE/MFG & PART NUMBER	PCCNet	s-CAN	RS-485 MODBUS	LOAD SHARE	FIRST START
TWISTED,SHIELDED PAIR,22AWG OR LARGER				X	X
BELDEN 9729 (2 PAIR)	X 2)		X 2)		
BELDEN 3106A (1.5 PAIR)		X	X	X 1)	X
BELDEN 3107A (2 PAIR)		X 2)	X 2)	X	X 3)

NOTES:
1) TWO INDIVIDUAL CABLES ARE NEEDED TO MEET THE REQUIREMENT FOR THIS SIGNAL
2) SECOND PAIR USED FOR GND REFERENCE ONLY
3) SECOND PAIR NOT USED

GENERAL NOTE:
NO TWO SIGNALS LISTED ABOVE MAY BE COMBINED INTO A SINGLE CABLE WITH EXCEPTION TO kW AND kVARLOAD SHARE

CONTROL DEVICE COMPATIBILITY

CONTROL PLATFORM	CONTROL	BARGRAPH				LOCAL DISPLAY				REMOTE DISPLAY		
		HMI112-01 KVA ONLY	HMI112-02 KW + PF	HMI114 KVA ONLY	HMI114 KW + PF	HMI211	HMI220	HMI320-01 W/O CB	HMI320-02 W/ CB	HMI211	HMI220-03	HMI320-03
POWER COMMAND 1.1/1.2	PCC1302	X		X		X	X			X	X	
POWER COMMAND 2.2/2.3	PCC2300		X		X		X	X			X	X
POWER COMMAND 3.3	PCC3300		X		X				X			X

MAXIMUM NUMBER OF EACH DEVICE ON PCCNet BY PLATFORM

CONTROL PLATFORM	CONTROL	LOCAL DISPLAY	REMOTE DISPLAY	BARGRAPH	AUX101/ AUX102 REMOTE I/O	HMI113 NFPA 110 ANNUNCIATOR
POWER COMMAND 1.1/1.2	1	1	1	2	1	4
POWER COMMAND 2.2/2.3	1	1	1	2	2	4
POWER COMMAND 3.3	1	1	1	2	2	4

FUSING REQUIREMENTS FOR J22 AND TB7:

- FUSE PER NFPA 70E
- FUSING REQUIRED UNLESS ALL 3 OF THE FOLLOWING ARE TRUE:
  - A) LL VOLTAGE <= 240 VAC ON TB7/J22
  - B) NOT PARALLELED OR USING A SIGNAL TRANSFORMER
  - C) SIZE <= 125 KVA
- USE FUSE FERRAZ SHAWMUT ATMR 1/2 OR EQUIV.
- USE FUSE HOLDER FERRAZ SHAWMUT 3Ø323R (ONLY 200K AIC) OR EQUIV.
- PLACE IN ALTERNATOR HOUSING FOR J22
- PLACE NEAR BUS SOURCE FOR TB7
- FUSE TRANSFORMER PRIMARY AS NEEDED FOR TB7 IF APPLICABLE

3RD HARMONICS IMPACT ON PCC VOLTAGE METERING

- PCCs VOLTAGE METERING (GENSET AND BUS) ARE IMPACTED BY 3RD HARMONIC VOLTAGE DISTORTION
- 5/6TH PITCH ALTERNATORS HAVE PROMINENT 3RD HARMONICS. 2/3 PITCH ALTERNATORS DO NOT HAVE 3RD HARMONICS
- SOLUTION: ISOLATE THE NEUTRAL CONNECTION ON J22 AND TB7 WHEN USING THE DELTA CONFIGURATION OR WHEN USING A 5/6 PITCH ALTERNATOR
- REFER TO ALTERNATOR MANUFACTURING DAT SHEET TO IDENTIFY ALTERNATOR PITCH

Cummins Inc.
CAD SYSTEM PTC® Creo® Elements/Direct
SIZE: D

SECTION 5
WARRANTY

Our energy working for you.™

Cummins Power Generation

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:_____